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**Каталог IXYS .**



## **Электронные компоненты, радиодетали**

Мы не работаем с частными (физическими ) лицами.  
Мы работаем только с юридическими лицами(организациями) и ИП и только по безналичному расчёту.

### **где и как купить в Минске?**

каталог, описание, технические, характеристики, datasheet, параметры, маркировка, габариты, фото, Производитель, Наименование, IXYS

Основными компонентами поставки IXYS являются силовые полупроводниковые приборы:

### **MOSFET-транзисторы**

**высокочастотные транзисторы**

**линейные транзисторы**

**транзисторы общего назначения**

**MOSFET-модули**

**мощные транзисторы в модульном корпусе**

**инверторные модули**

**IGBT-транзисторы**

**IGBT-транзисторы средней мощности**

**мощные IGBT-транзисторы в модульном корпусе**

**сверх-мощные Press-Pack IGBT-транзисторы**

**IGBT-модули**

**диоды**

**выпрямительные диоды**

**диоды Шоттки**

**быстро восстанавливающиеся диоды**

**тиристоры и тиристорные модули**

**сверхмощные модульные тиристоры**

**тиристоры средней и малой мощности**

**мощные низкочастотные модули**

**тиристорно-тиристорные модули**

**тиристорно-диодные модули**

**диодно-диодные модули**

**опто-электронные приборы**

**твердотельные оптореле**

**оптопары**

**драйверы**

**MOSFET и IGBT драйверы**

**LED-драйверы и драйверы мощных лазерных диодов**

**ePaper драйверы**

**драйверы электролюминисцентных ламп**

**защитные BreakOver диоды**

**солнечные элементы.**

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# Power Semiconductor & IC

## 2023–2024 Selection Guide

A comprehensive portfolio of power semiconductor and integrated circuit technologies in industry standard and innovative packages



## About this guide

This selection guide offers a comprehensive look at the breadth and depth of the IXYS: A Littelfuse Technology power semiconductor and control IC portfolio. From milliwatt to gigawatt system solutions and everything in between, we've got the devices that meet your needs.

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Proudly presenting world-class **power semiconductor and IC technologies, quality, and customer support.**

## Littelfuse: Everywhere, Every Day

Founded in 1927, Littelfuse is a diversified industrial technology manufacturing company empowering a sustainable, connected, and safer world. Across more than 20 countries, and with approximately 18,000 global associates, we partner with customers to design and deliver innovative, reliable solutions.

Littelfuse offers an extensive technology portfolio - fuses, semiconductors, polymers, ceramics, relays, sensors, switches, and more. Serving over 100,000 end customers, our products are found in a variety of industrial, transportation, and electronics end markets—everywhere, every day.

## Why Choose Littelfuse

Our history of innovation, combined with our customer-first culture, drives us to collaborate with you to develop safer, more reliable products that are energy efficient and compliant with global regulations. We will partner with you to solve complex problems wherever electrical energy is used, bringing design, engineering, and technical expertise to deliver business results.

Complementing our wide portfolio of products is a global network of design and technical support expertise. We offer decades of design experience to help you address application challenges and achieve regulatory compliance.

### Your Single Source

Littelfuse offers an extensive power semiconductor product line. We design forward-thinking, application-specific solutions to provide assurance that your most demanding requirements will be met. Our goal is to provide the most complete range of options so you will not have to compromise.

### Testing Support

Littelfuse can help ensure that your products withstand most common threats repeatedly and fail safely under extreme circumstances. We can serve as an independent source to provide assistance as you design, by offering lab testing capabilities for customer applications. This testing includes industry-specific required power fault and electrostatic discharge (ESD) / electrically fast transients (EFT) / lightning surge conditions.

### Application Knowledge

For over 95 years, engineers and designers around the world have relied on Littelfuse products and application knowledge to support their designs.

### Global Support

Littelfuse stays close to customers. With manufacturing, lab, and design facilities located around the globe, application knowledge and technical support are locally available. Also, we offer a network of regional customer support offices and hundreds of independent authorized distributor contacts to assist you. Visit [Littelfuse.com/contact-us](https://www.littelfuse.com/contact-us) to find local support near you.

### Operational Excellence

With our global manufacturing footprint, Littelfuse is firmly committed to manufacturing quality products at a competitive price. We build quality into our products and services, striving for zero defects in everything we do, thereby reducing cost and increasing your total satisfaction. We strive to exceed expectations every day.

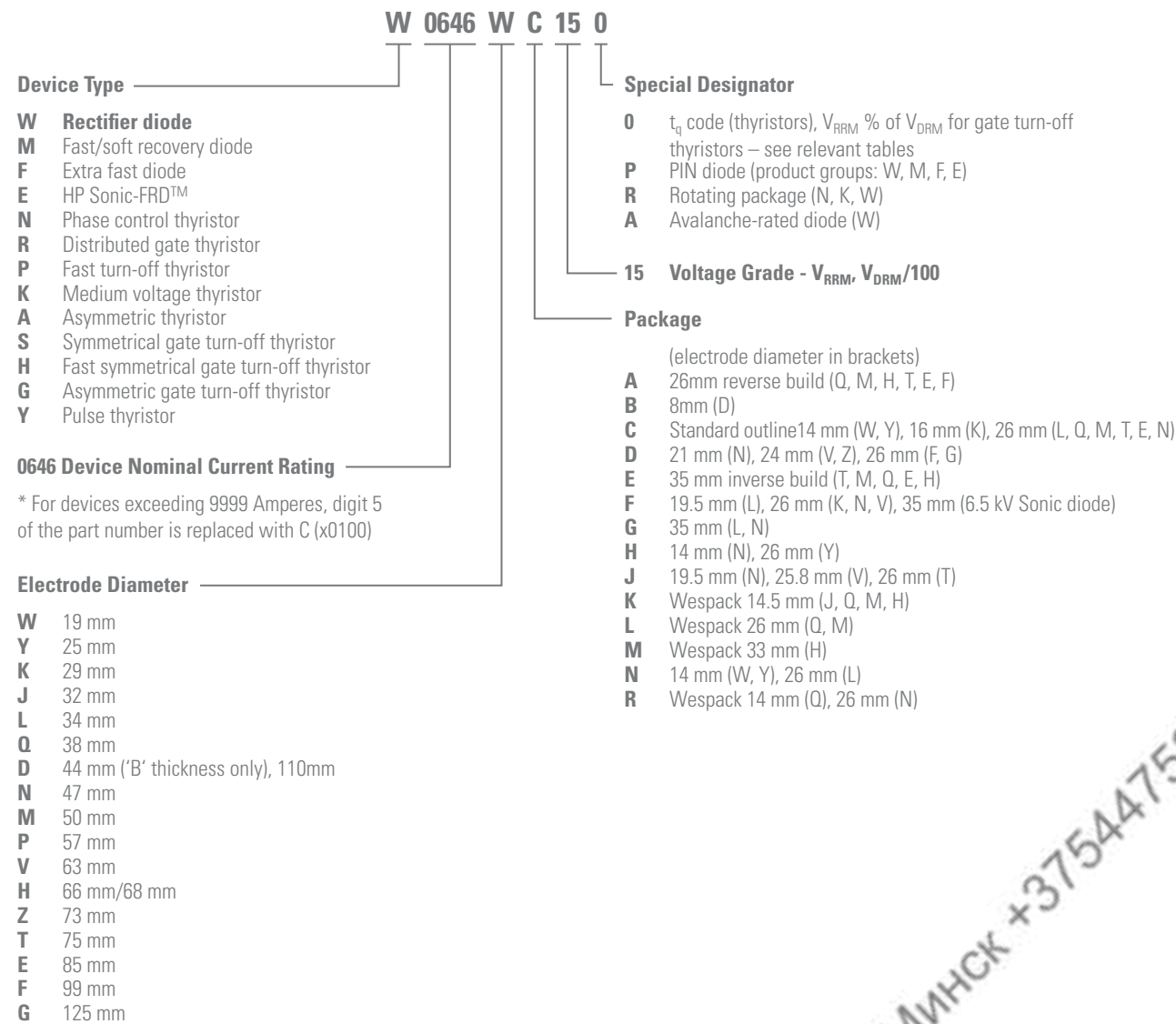
### Quality Assurance

Our global manufacturing facilities abide by strict quality assurance requirements and hold the following quality management system registrations:

- ISO 9001
- ISO14001
- IATF 16949



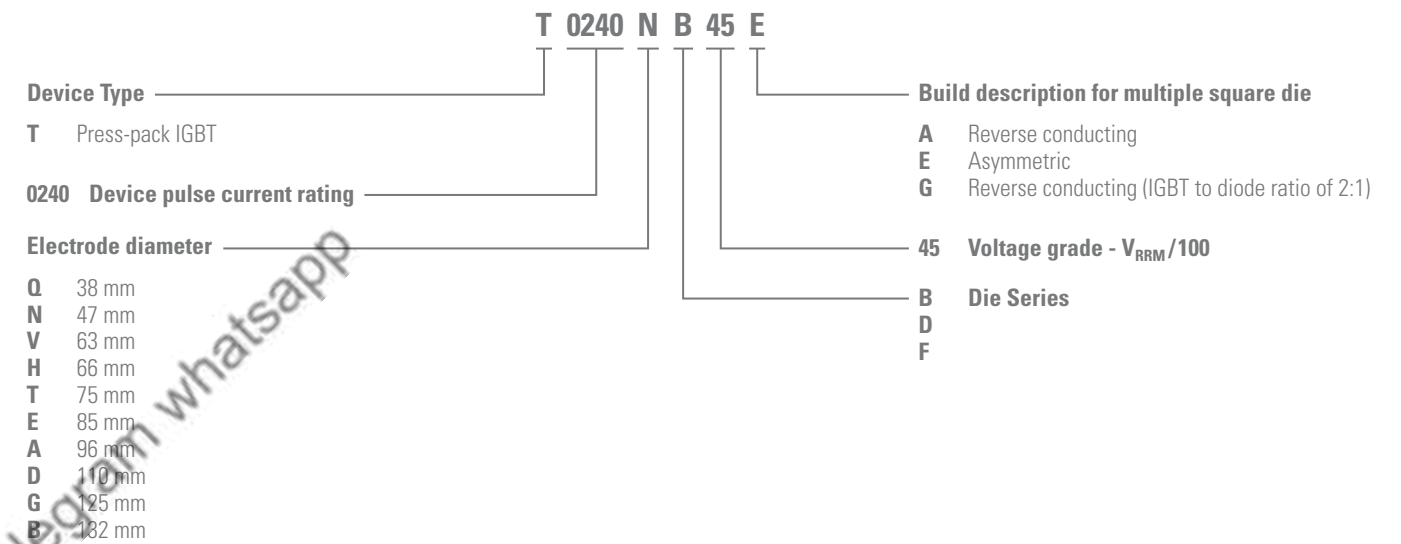
## Capsule Devices - Excluding IGBT's



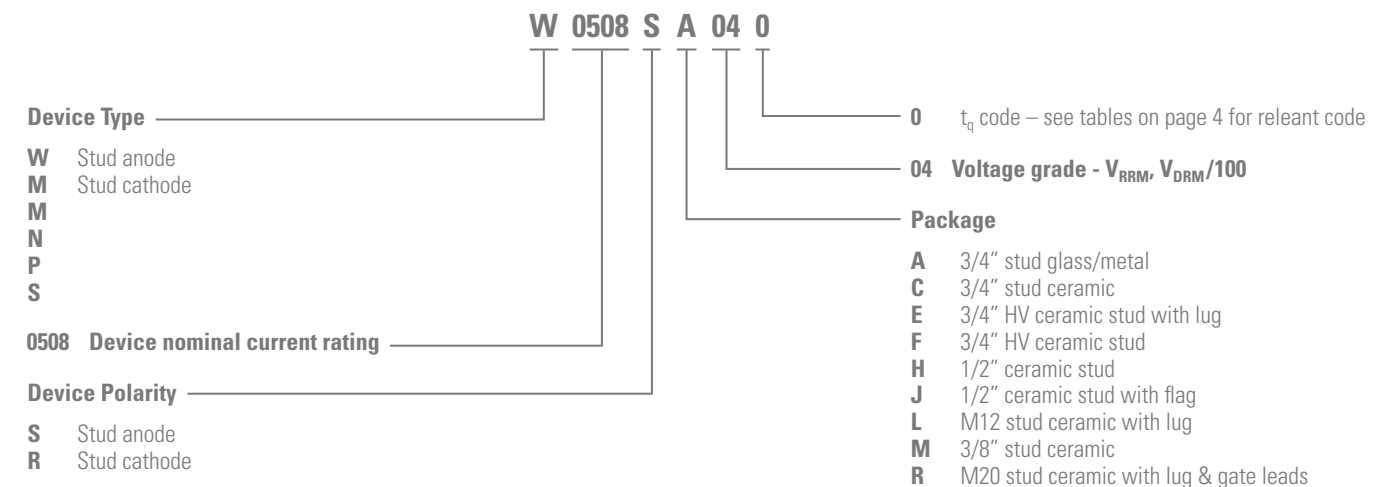
t <sub>q</sub> Code			
v	No Code		
A	10	M	70
B	12	N	100
C	15	P	120
D	20	R	140
E	25	S	160
F	30	T	200
G	35	V	250
H	40	W	300
J	50	X	400
K	60	Y	500
L	65	Z	1000

V <sub>RRM</sub> % of V <sub>DRM</sub> for GTO's (S and H types only)	
0	100%
D	80%
Y	100 V

## Press-Pack IGBT Capsule Devices



## Stud Devices



All IXYS UK stud devices are available with or without leads, sleeving, nuts, and washers.

Please add one of the following three-letter codes (based on the options required) to the end of the part number when ordering:

- 000** Leaded stud, no sleeving, no nuts and washers supplied
- S0L** Leaded stud with standard\* sleeving, nuts and washers supplied loose
- 00L** Leaded stud, no sleeving, nuts and washers supplied loose
- NLL** Non-leaded stud, nuts and washers supplied loose (also applies to devices with flag/tag terminals)
- S0F** Leaded stud with standard\* sleeving, fitted nuts and washers
- 00F** Leaded stud, no sleeving, nuts and washers fitted
- NLF** Non-leaded stud, nuts and washers fitted (also applies to devices with flag/tag terminals)
- S00** Leaded stud with standard\* sleeving, no nuts and washers supplied
- NLS** Non-leaded stud, no nuts and washers fitted (also applies to devices with flag/tag terminals)

\* Standard sleeving means the following:  
 Red for all thyristor studs  
 Blue for "S" polarity diode studs  
 Red for "R" polarity diode studs

# Nomenclature

- Valid only for products from IXYS/Littelfuse Lampertheim.
- Usage for new technologies, chips, packages, and/or groups.
- Newer data sheets contain description of part number.

Index	0	1	2	3	Value 1	4	5	Value 2	6 (a-c)	6 d	7	8		9
Example 1	M	I	X	G	120	W		1200	DPF	T	E	H	-	PC
Example 2		I	X	A	40	P	G	1200	DHG		L	B	-	TUB
Example 3		C	M	A	20	E		1600			P	Z	-	TRL

Index	Description
0	M = Module; no letter for discretes
1	Kind of main chip: C = SCR, D = Diode, I = IGBT, M = MOSFET
2	Chip technology
3	Chip generation respective to precisely defined technology
Value 1	Current rating
4	Basic circuit
5	Precisely defined circuit
Value 2	Voltage rating
6 (a-c)	as Index 1-3; usage (e.g. for special chips like SiC)
6 d	Specials (e.g., thermistor)
7	Basic package
8	Precisely defined package
Hyphen	-
9	Extras (e.g. delivery formats, auxiliaries)

## Examples for Indexes

Index 1 & 2	Description	Detailed
CL	High-Efficiency Thyristor	up to 1200V
CM	Thyristor	up to 1800V
CN	High-Voltage Thyristor	> 2000V
DF	FRED	Gold
DH	Sonic Fast Recovery Diode	Helium
DL	Low Voltage Standard Rectifier	up to 1200V
DM	Standard Rectifier	up to 1800V
DN	High Voltage Standard Rectifier	> 2000V
DP	HiPerFRED™	Platinum
DS	Schottky Diode	2nd Generation
IG	IGBT	PT (Punch Through)
IT	IGBT	Trench
IX	IGBT	XPT™
MK	Superjunction MOSFET	Powered by Infineon CoolMOS™ Bare Die
MT	MOSFET	Trench

Index 4	Description	Detailed	Index 4 & 5
A	Common anode/emitter/source	Thyristor/diode	AD
B	1 Phase Rectifier Bridge	Half-controlled (high side)	BH
C	Common cathode/collector/drain	Thyristor/diode	CD
E	Single Part	+ Multiple cathode pins	EM
H	H Bridge	+ 1 Phase rectifier bridge	HD
I	Single Part	Copack	IF
M	AC-Controlling	Triac	MT
P	Phase Leg	High-side thyristor low-side diode	PD
Q	Buck Chopper	With series connected dice	QS
R	Boost/Brake Chopper	+ Freewheeling diode + $V_{ce,sat}$ -Diode	RG
S	Brake Chopper (Rating IGBT >> Rating Diode)	+ Freewheeling diode	SF
U	3 Phase Rectifier Bridge	+ Brake unit	UB
W	6-Pack	+ 3 Phase rectifier bridge & brake unit	WB
X	Parallel legs	Anti-parallel	XA
Y	Half 3 Phase Bridge	Common anode	YA

Index 7 & 8 Discretes	Description	Index 7 & 8 Discretes	Description
FA	i4-Pac (3sym)	NB	SOT-227UI (minibloc)
FB	i4-Pac (3HV)	PA	TO-220AC (2)
FC	i4-Pac (5)	PB	TO-220AB (3)
FD	i4-Pac (5HC)	PC	TO-263AB (D2Pak) (2)
FE	i4-Pac (2HV)	PJ	ISOPLUS220AB (3)
HA	TO-247AD (2)	PM	TO-220ACFP (2)
HB	TO-247AD (3)	PN	TO-220ABFP (3)
HF	PLUS247 (3)	PZ	TO-263AB (D2Pak) (2HV)
HI	ISOPLUS247 (2)	QB	TO-3P (3)
HJ	ISOPLUS247 (3)	TC	TO-268AA (D3Pak) (2)
HR	ISO247 (3)	TZ	TO-268AA (D3Pak) (2HV)
IB	TO-262 (I2Pak) (3)	UC	TO-252AA (DPak)
LB	SMPD-B	UZ	TO-252AA (DPak) (2HV)
NA	SOT-227B (minibloc)		

Index 7 & 8 Discretes	Description	Index 7 & 8 Discretes	Description
CA	ComPack	TA	TO-240AA-1B
CB	ComPack	TB	TO-240AA-1B
CC	ComPack	TG	TO-240AA-1B
ED	E2-Pack	VA	V1-A-Pack
EH	E3-Pack	VC	V1-B-Pack
KA	Y1-CU	VH	V2-Pack
KB	Y1-CU	YA	Y4-M6
KC	Y1-CU	YB	Y4-M6
SF	Simbus F	YD	Y4-M6

Index 6 d	Specials	Index 9	Packaging
P	PressFit-Pin	NI	No Metal Inserts
PT	PressFit-Pin + Thermistor	PC	Phase Change Material
PST	PressFit-Pin + Shunt + Thermistor	TRL	Tape & Reel Left
S	Shunt	TRR	Tape & Reel Right
T	Thermistor	TUB	Tube

## PressFit-Pin for E2, E3, and SimBus F Module Packages

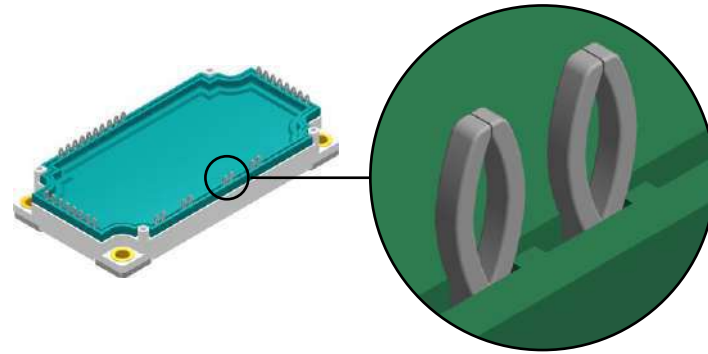
IXYS presents new PressFit-Pin technology for E2 and E3 module packages. Modules equipped with these pins can be connected to the PCB without soldering. For the pressing process, either hand tools or pressing machines can be used. The benefits of the assembly are as follows:

- Simplified process
- Reduced mounting time
- No risk of bad solder contacts
- Reduced aging of pin contact
- No thermal stress for the PCB assembly
- Press-out is possible for maintenance

The pin concept is based on the proven “Bison-pin” concept. The pressing process is a plastic deformation of pin and via of the board, ending in a cold welding. The pin features are as follows:

- Pin qualification according to IEC 60352-5
- High conductive Cu alloy with Ni gal. tin surface
- Very low contact resistance
- Low press-in force per pin; PCB hole diameter has independent press-out force
- Littelfuse PressFit-Pins are compatible to market standards

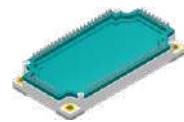
A Close Look at the PressFit-Pin Technology



## Start with the Following Module Types:



E2



E3



SimBus F

Board and Via Requirements E2 and E3			
Parameter	Min.	Typical	Max.
Drill hole diameter	–	2.35 mm	–
Final hole diameter	2.14 mm	2.20 mm	2.29 mm
Cu thickness inside the hole	>25 µm	–	–
Sn thickness inside the hole	–	–	<15 µm
Cu thickness for PCB tracks	35 µm	70 µm 105 µm	–
PCB thickness	1.60 mm	2.00 mm	–
Metallization PCB	chem. tin	–	–

Board and Via Requirements SimBus F			
Parameter	Min.	Typical	Max.
Drill hole diameter	–	1.16 mm	–
Final hole diameter	1.00 mm	1.05 mm	1.10 mm
Cu thickness inside the hole	>25 µm	–	–
Sn thickness inside the hole	–	–	<15 µm
Cu thickness for PCB tracks	35 µm	70 µm 105 µm	–
PCB thickness	1.60 mm	2.00 mm	–
Metallization PCB	chem. tin	–	–

## High Voltage TO-252 (D-Pak) Package

Creepage (min): pin/pin: 3.6 mm  
pin/Cu back-side: 2.5 mm



X004a  
TO-252AA

Part Number	Technology	Config.	V <sub>RRM</sub>	I <sub>FAV</sub> / I <sub>D</sub> @ T <sub>C</sub>	
			V	A	°C
<b>Diode</b>					
DMA10IM1200UZ	Standard Diode	Single	1200	10	150
DMA10IM1600UZ	Standard Diode	Single	1600	10	150
DMA10P1200UZ	Standard Diode	Phase Leg	2 × 1200	10	150
DMA10P1600UZ	Standard Diode	Phase Leg	2 × 1200	10	150
<b>Sonic Diode</b>					
DHG10IM1800UZ	Fast Recovery Diode	Single	1800	10	100
<b>MOSFET</b>					
IXTY1R4N120PHV	Standard MOSFET	Single	1200	1.4	25

## High Voltage TO-263 (D2-Pak) Package

Creepage (min): pin/pin: 4.2 mm  
pin/Cu back-side: 4.7 mm



X011c  
TO-263ABHV

Part Number	Technology	Config.	V <sub>RRM</sub>	I <sub>FAV</sub> / I <sub>D</sub> @ T <sub>C</sub>	
			V	A	°C
<b>Diode</b>					
DMA10IM1600PZ	Standard Diode	Single	1600	10	150
DMA30IM1600PZ	Standard Diode	Single	1600	30	140
DNA30E2200PZ	Standard Diode	Single	2200	30	140
DNA30EM2200PZ	Standard Diode	Single	2200	30	140
DMA10P1600PZ	Standard Diode	Phase Leg	2 × 1800	10	150
DMA10P1800PZ	Standard Diode	Phase Leg	2 × 1800	10	150
DAA10EM1800PZ	Avalanche Diode	Single	1800	10	150
DAA10P1800PZ	Avalanche Diode	Phase Leg	2 × 1800	10	150
<b>FRED / HiPerFRED</b>					
DSEI12-12AZ	FRED	Single	1200	11	100
DSEP12-12AZ	HiPerFRED	Single	1200	12	135
DSEP12-12BZ	HiPerFRED	Single	1200	15	130
<b>SiC Diodes</b>					
LSIC2SD065D10A	Schottky Barrier Diode	Single	650	10	147
LSIC2SD065D20A	Schottky Barrier Diode	Single	650	20	135
LSIC2SD120D10A	Schottky Barrier Diode	Single	1200	10	151
LSIC2SD120D20A	Schottky Barrier Diode	Single	1200	20	150



# Featured Packages

## High Voltage TO-263 (D<sup>2</sup>-Pak) Package

Creepage (min): pin/pin: 4.2 mm  
pin/Cu back-side: 4.7 mm



Part Number	Technology	Config.	V <sub>RRM</sub>	I <sub>FAV</sub> / I <sub>D</sub> @ T <sub>C</sub>	
			V	A	°C
<b>Thyristor</b>					
CLA5E1200PZ	High Efficiency SCR	Single	1200	5	135
CLA15E1200NPZ				15	120
CLA30E1200NPZ				30	115
CLB30I1200PZ	High Efficiency SCR	Single	1200	30	115
CLA40E1200NPZ				40	125
CLB40I1200PZ	High Efficiency SCR	Single	1200	40	125
CMA20E1600PZ				20	115
CMA30E1600PZ	Standard Thyristor	Single	1600	30	115
CME30E1600PZ				30	80
<b>Triac</b>					
CLA30MT1200NPZ	High Efficiency	Triac	1200	15	120
CLA40MT1200NPZ				20	115

Part Number	Technology	Config.	V <sub>CE(sat)</sub>	I <sub>C25</sub>	V <sub>CE(sat)</sub>
			V	A	V
<b>IGBT &amp; BiMOS™</b>					
IXA4IF1200UC	XPT™ IGBT	Copack	1200	9	1.8
IXYA20N120C3HV	Fast XPT™ IGBT	Single	1200	40	3.4
IXYA20N120A4HV	Gen4 XPT™ IGBT	Single	1200	80	1.7
IXYA20N120B4HV				76	1.8
IXYA20N120C4HV	Gen4 XPT™ IGBT	Single	1200	68	2.1
IXYA30N120A4HV				106	1.6
IXYA8N250CHV	High Voltage XPT™ IGBT	Single	2500	29	3.4
IXYA12N250CHV				28	3.7
IXBA16N170AHV	High Voltage BiMOS™	Single	1700	16	6
IXBA10N300HV	High Voltage BiMOS™	Single	3000	34	2.8
IXBA14N300HV				38	2.7

Part Number	Technology	Config.	V <sub>DSS</sub>	I <sub>D25</sub>	R <sub>DSon</sub> max.
			V	A	mΩ
<b>MOSFET</b>					
IXFA8N85XHV	X-Class HiPerFET™	Single	850	8	0.85
IXFA14N85XHV				14	0.55
IXFA20N85XHV				20	0.33
IXTA08N100D2HV	Depletion Mode MOSFET	Single	1000	0.8	21
IXTA3N100D2HV				3	6
IXTA05N100HV	High Voltage MOSFET	Single	1000	0.75	17
IXTA3N120HV		Single	1200	3	4.5
IXTA3N150HV	High Voltage MOSFET	Single	1500	2	7.3
IXTA4N150HV				4	6
IXTA1N200P3HV	High Voltage MOSFET	Single	2000	1	40
IXTA02N250HV		Single	2500	0.2	450

## High Voltage TO-268 (D<sup>3</sup>-Pak) Package

Creepage (min): pin/pin: 9.4 mm  
pin/Cu back-side: 5.8 mm



Part Number	Technology	Config.	V <sub>CE(sat)</sub> / V <sub>DSS</sub>	I <sub>C25</sub> / I <sub>D25</sub>	V <sub>CE(sat)</sub> typ.	R <sub>DSon</sub> Max
			V	A	V	mΩ
<b>IGBT</b>						
IXYT30N65C3H1HV	Gen3™ XPT™ IGBT	Single	650	60	2.7	–
IXYT20N120C3D1HV			1200	36	3.4	–
IXYT40N120A4HV	Gen4™ XPT™ IGBT	Single	1200	150	1.8	–
IXYT55N120A4HV				175	1.5	–
IXYT85N120A4HV				300	1.5	–
IXYT12N250CV1HV	High Voltage XPT™ IGBT	Single	2500	28	3.7	–
IXYT25N250CHV				95	4	–
IXYT30N450HV	High Voltage XPT™ IGBT	Single	4500	60	3.9	–
IXBT16N170AHV	High Voltage BiMOS™	Single	1700	16	6	–
IXBT22N300HV			3000	60	2.7	–
IXBT32N300HV	High Voltage BiMOS™	Single	3000	80	2.8	–
IXBT42N300HV				104	3	–
IXBT16N360HV	High Voltage BiMOS™	Single	3600	48	2.5	–
IXBT20N360HV				70	3.4	–
<b>MOSFET</b>						
IXTT140N075L2HV	Linear MOSFET	Single	75	140	–	11
IXTT44N25L2HV			250	44	–	75
IXFT26N100XHV	X-class HiPerFET™	Single	1000	26	–	320
IXFT32N100XHV				32	–	220
IXTT34N65X2HV	X2-class MOSFET	Single	650	34	–	96
IXFT60N65X2HV	X2-class HiPerFET™	Single	650	60	–	52
IXFT80N65X2HV				80	–	38
IXFT30N85XHV	X2-class HiPerFET™	Single	850	30	–	230
IXFT40N85XHV				40	–	145
IXFT50N85XHV				50	–	105
IXFT140N20X3HV	X3-class HiPerFET™	Single	200	140	–	96
IXFT180N20X3HV				180	–	75
IXFT220N20X3HV				220	–	62
IXFT120N25X3HV				120	–	120
IXFT150N25X3HV	X3-class HiPerFET™	Single	250	150	–	90
IXFT170N25X3HV				170	–	74
IXFT100N30X3HV	X3-class HiPerFET™	Single	300	100	–	135
IXFT120N30X3HV				120	–	110
IXFT150N30X3HV				150	–	83
IXTT240N15X4HV	X4-class MOSFET	Single	150	240	–	4.4
IXTT4N150HV	High Voltage MOSFET	Single	1500	4	–	6
IXTT12N150HV				12	–	2
IXTT3N200P3HV	High Voltage MOSFET	Single	2000	3	–	8
IXTT1N250HV			2500	1.5	–	40
IXTT1N300P3HV	High Voltage MOSFET	Single	3000	1	–	50
IXTT2N300P3HV				2	–	21
IXTT02N450HV	High Voltage MOSFET	Single	4500	0.2	–	625
IXTT1N450HV				1	–	80

## Featured Packages

### High Voltage TO-268 (D<sup>3</sup>-Pak) Package

Creepage (min): pin/pin: 9.4 mm  
pin/Cu back-side: 5.8 mm



Part Number	Technology	Config.	$V_{RRM}$			$I_{DAV}/I_{TAV} @ T_C$		
			V	A	°C	A	°C	°C
<b>Rectifier</b>								
DSEI120-12AZ	FRED	Single	1200	109	60			
DSEP60-12AZ	HiPerFRED	Single	1200	60	115			
DSEP90-12AZ	HiPerFRED	Single	1200	90	105			
DSP45-12AZ	Standard Diode	Phase leg	2 × 1200	45	130			
DSP45-16AZ			2 × 1600	45	130			
DLA100IM1200TZ	Standard Diode	Phase leg	1200	100	105			
CLA60MT1200NTZ	High Efficiency	Triac	1200	30	120			
CLA100E1200TZ	Standard Thyristor	Single	1200	100	105			
CNE60E2200TZ	High Voltage Thyristor	Single	2200	60	80			

### ISO247 Package



Part Number	Technology	Config.	$V_{RRM}$			$I_{DAV}/I_{TAV} @ T_C$		
			V	A	°C	A	°C	°C
<b>Diode</b>								
DSA90C200HR	Schottky Diode	Common Cathode	200	2 × 45	145			
DPF30P600HR	HiPerFRED	Phase Leg	2 × 600	30	130			
DMA10P1200HR	Standard	Phase Leg	2 × 1200	10	145			
DMA10P1600HR			2 × 1600	10	145			
DMA30P1600HR	Standard	Phase Leg	2 × 1600	30	105			
DMA50P1200HR			2 × 1200	50	105			
DCG10P1200HR	SiC Schottky Diode	Phase Leg	2 × 1200	10	80			
DCG17P1200HR				17	80			
DCG20C1200HR	SiC Schottky Diode	Common Cathode	1200	2 × 10	80			
DCG35C1200HR				2 × 17	80			
<b>Thyristor</b>								
CLA40E1200HR	High Efficiency	Single	1200	40	95			
CMA40E1600HR	Standard	Single	1600	40	90			
CLA60MT1200NHR	High Efficiency	Triac	1200	30	100			
CLA80MT1200NHR				40	100			
CMA60MT1600NHR	Standard	Triac	1600	30	90			
CMA80MT1600NHR				40	95			

### High Voltage TO-247HV and PLUS247HV Packages



Part Number	Technology	$V_{CES}/V_{DSS}$	$I_{C25}/I_{D25} (I_{C100})$	$V_{CE(sat)}$ typ.	w / Diode	$R_{DS(on)}$ max.	Package	
		V	A	V		mΩ		
<b>IGBT</b>								
IXYH8N250CHV	XPT™ IGBT	2500	(8)	4	–	–	TO-247HV	
IXYH8N250CV1HV			(8)	4	•	–		
IXYH12N250CHV			(12)	4.5	–	–	TO-247HV	
IXYH12N250CV1HV			(12)	4.5	•	–		
IXYH16N250CV1HV			(16)	4	•	–	TO-247HV	
IXYH25N250CHV			(25)	4	–	–		
IXYX25N250CV1HV			(25)	4	•	–	PLUS247HV	
IXYX40N250CHV			(40)	4	–	–		
IXYH30N450HV			4500	(30)	3.9	–	–	TO-247HV
IXYX40N450HV				40	3.9	–	–	PLUS247HV
IXBH10N300HV	BiMOSFET™	3000	34	2.8	–	–	TO-247HV	
IXBH14N300HV			38	2.7	–	–		
IXBH22N300HV			60	2.7	–	–	TO-247HV	
IXBX28N300HV			62	2.7	–	–	PLUS247HV	
IXBH32N300HV			(32)	2.8	–	–	TO-247HV	
IXBH42N300HV			(42)	2.5	–	–		
IXBH16N360HV			3600	48	2.5	–	–	TO-247HV
IXBH20N360HV				70	3.4	–	–	
IXBX50N360HV				125	2.9	–	–	PLUS247HV
<b>MOSFET</b>								
IXTH02N450HV	MOSFET	4500	0.2	–	–	625	TO-247HV	
IXTH1N450HV			1	–	–	80		
IXTX1R4N450HV	MOSFET	4500	1.4	–	–	40	PLUS247HV	
IXTH1N200P3HV	Polar 3 MOSFET	2000	1	–	–	40	TO-247HV	
IXTH3N200P3HV			3	–	–	8		
IXTX6N200P3HV	Polar 3 MOSFET	2000	6	–	–	4	PLUS247HV	
IXTH06N220P3HV	Polar 3 MOSFET	2200	0.6	–	–	80	TO-247HV	
IXTH1R8N220P3HV			1.8	–	–	21.5		
IXTH05N250P3HV	Polar 3 MOSFET	2500	0.5	–	–	110	TO-247HV	
IXTH04N300P3HV	Polar 3 MOSFET	3000	0.4	–	–	190		
IXTH1N300P3HV			1	–	–	50	TO-247HV	
IXTH2N300P3HV			2	–	–	21		
IXTX4N300P3HV	Polar 3 MOSFET	3000	4	–	–	12.5	PLUS247HV	

## ISO247 Package



Part Number	Technology	Config.	$V_{CES}/V_{DSS}$	$I_{C25}/I_{D25}$	$V_{CE(sat)}$ typ.	$R_{DS(on)}$ max.
			V	A	V	mΩ
<b>IGBT</b>						
IXA20IF1200HR	XPT™ IGBT	Copack	1200	33	1.8	–
IXA30IF1200HR				48	1.8	–
IXA40IF1200HR				63	1.8	–
ITF48IF1200HR	Fast Trench IGBT	Copack	1200	72	2.4	–
<b>MOSFET</b>						
IXFJ26N50P3	Polar3™ HiperFET™	Single	500	14	–	0.265
IXFJ80N25X3	X3-Class HiPerFET™	Single	250	44	–	0.018
IXFJ20N85X			850	9.5	–	0.36
IXTJ3N150	High Voltage MOSFET	Single	1500	2.3	–	8
IXTJ4N150				2.5	–	6
IXTJ6N150				3	–	3.85

## TO-247-4L Package



Part Number	$V_{DSS}$	$I_D$ $T_C = 25\text{ °C}$	$I_D$ $T_C = 100\text{ °C}$	$R_{DS(on)}$ $T_J = 25\text{ °C}$	$C_{iss}$ typ.	$Q_g$ typ.	$R_{th(jc)}$
	V	A	A	mW (typ)	pF	nC	K/W
<b>SiC MOSFET</b>							
LSIC1MO120G0025	1200	100	70	25	4465	250	0.3
LSIC1MO120G0040	1200	65	50	40	2825	160	0.42

## Isolated Discrete Packages

ISOPLUS247™ is the Direct Copper Bond (DCB) - isolated version of the PLUS247™ package, TO-247 without a mounting hole. The design of this patented package is revolutionary: the silicon chip is soft soldered onto a DCB substrate instead of the usual copper lead frame. The DCB ceramic, which is the same substrate material used in high-power modules, provides not only a high isolation capability of 2500 V<sub>RMS</sub> but also unbeatable low thermal resistance compared to conventional, externally mounted isolation materials.

Advantages:

- Isolation capability from leads to backside of 2500 V<sub>RMS</sub> – no external isolation foil needed
- Thermal resistance from junction to case only slightly higher than for non-isolated versions
- Increased power and temperature cycling capability
- DCB can be patterned like printed circuit boards to allow special functions to be realized

While the junction-to-case thermal resistance is higher than that of an equivalent non-isolated device, what really matters is the total thermal resistance from junction-to-heatsink ( $R_{th(jh)}$ ). After comparing a device in ISOPLUS247™ to its companion in the non-isolated package with an external isolation foil, the overall  $R_{th}$  was found to be lower for the ISOPLUS247 package.

Due to the matched thermal expansion coefficients of silicon and DCB ceramic, mechanical stress to the die and solder caused by power and temperature cycling is reduced, improving reliability. Mounting is done with clips; this not only saves time but also guarantees constant pressure over the lifetime of the assembly.

Parts in the ISOPLUS247™ housing can be identified by the letter “R” in the IXYS part number. Potentially, all devices now encapsulated in TO-247, TO-264, and PLUS247™ housings can be molded in the ISOPLUS247™. There are already more than 100 types of ISOPLUS247™ available.

Another interesting feature is the capability to pattern the DCB substrate like a printed circuit board. Now, additional special functions can be realized, e.g., the series connection of single diode chips within one package.

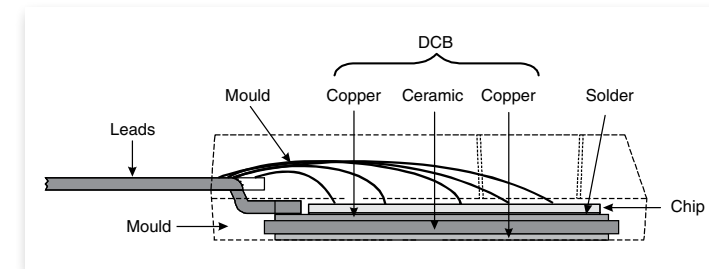
ISOPLUS220™, ISOPLUS247™, and ISOPLUS264™ are the DCB-based substitutes for the corresponding standard packages.

A larger version of this packaging technology is the ISOPLUSi4-PACT™, which has up to five terminal pins, making it possible to create full diode bridges, phase-leg transistor configurations, buck and boost converters, and much more within one isolated discrete package.

ISOPLUS-DIL™ 37.5 mm long and 25 mm wide provides the largest mounting area in the ISOPLUS™ family. It is available in 2 pin out version: “GWM” configuration with polar power pins for 300 A<sub>RMS</sub> on one side, 12 control pins on the opposite side, and the “GMM” configuration with 12 pins on either side. The package is intended for high-current low voltage applications as either a single switch or a 6-pack. With its high power density and reliability, ISOPLUS-DIL™ is recommended for use in automotive designs.

ISOPLUS-SMPD™ is a member of the IXYS ISOPLUS™ family and provides an increased creepage distance between pins to DCB.

Package Cross-Section



Example:

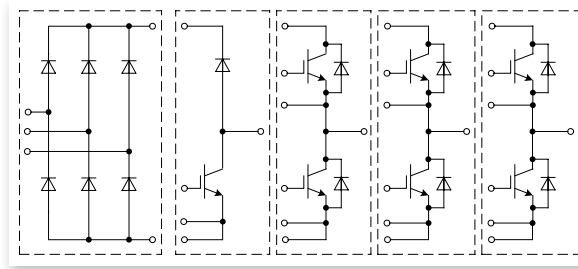
### ISOPLUS247™ Compared to Conventional Isolated Devices

Type	Package	Isolation	$R_{th(jc)}$ K/W	$R_{th(jh)}$ K/W	Total K/W	Factor
IXFR 180N10	ISOPLUS247™	Internal DCB	0.3	0.15	0.45	1
IXFX 180N10	PLUS247™	External Foil	0.22	1.02	1.24	2.8

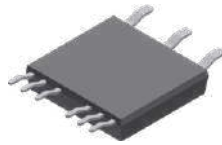


## Features and Benefits

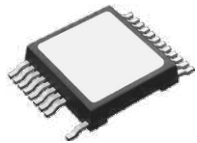
- Electrical isolation of 2500 V
- Low thermal resistance
- Increased power & temperature cycling
- Saves PCB mounting area
- Replaces multiple discretes
- Reduces parasitic inductance & capacitance
- Reduces EMI
- Improved heat spreading



### SMPD-B



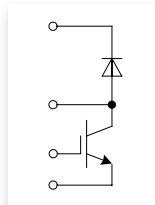
### SMPD-X



### Brake & Boost

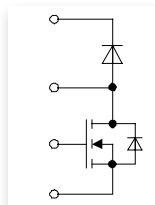
#### XPT™ - IGBT

IXA 20RG1200DHGLB  
IXA 30RG1200DHGLB  
IXA 40RG1200DHGLB



#### CoolMOS™ Boost

MKE 38RK600DFELB & FRED Diode  
MKG 40RK600LB & Sonic Diode  
MKH 17RP650DCGLB Dual Boost & SiC



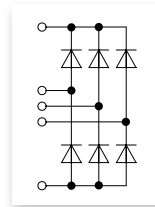
### Rectifier

#### Line Rectifier

DNA 90U1800LB

#### Sonic-FRD

DHG 60U1200LB



#### Line Rectifier

DLA 100B1200LB

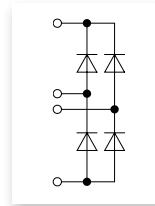
DLA 100B800LB

#### Fast Rectifier

DPG 60B600LB HiPerFRED

DCG 20B650LB SiC

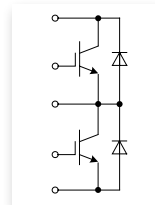
DHG 40B1200LB Sonic



### Inverter

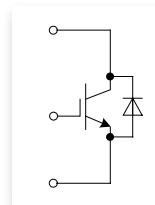
#### XPT™ - IGBT

IXA 20PG1200DHGLB  
IXA 30PG1200DHGLB  
IXA 40PG1200DHGLB  
ITF 40PF1200DHGTLB



#### XPT™ - IGBT

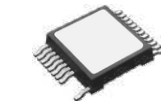
MMIX 1X100N60B3H1  
MMIX 1X200N60B3H1  
MMIX 1Y82N120C3H1  
MMIX 1Y100N120C3H1  
IXG 70IF1200LB



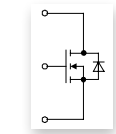
## MOSFET



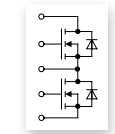
X030a  
SMPD-B



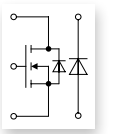
X031a  
SMPD-X



A



B



C

Part Number	Circuit Diagram/Technology	V <sub>DS</sub>	I <sub>D25</sub>	R <sub>DS(on)</sub> max.	Q <sub>g</sub>	Package
		V	A	A	nC	
<b>Single and Copack</b>						
MMIX1T600N04T2	A Trench2	40	600	1.3	590	SMPD-X
MMIX1T550N055T2	A Trench2	55	550	1.3	595	
MMIX1F520N075T2	A Trench2 HiPerFET™	75	500	1.6	545	
MMIX1F420N10T	A Trench HiPerFET™	100	334	2.6	670	
MMIX1F360N15T2	A Trench2 HiPerFET™	150	235	4.4	715	
MMIX1F230N20T	A Trench HiPerFET™	200	156	8.3	358	
MMIX1F180N25T	A Trench HiPerFET™	250	132	13	364	
MMIX1F160N30T	A Trench HiPerFET™	300	102	20	376	
MMIX1F210N30P3	A Polar3 HiPerFET™	300	108	16	268	
MMIX1F132N50P3	A Polar3 HiPerFET™	500	63	43	267	
MMIX1F44N100Q3	A Q3 HiPerFET™	1000	30	245	264	
<b>Buck / Boost</b>						
MKE38RK600DFELB <sup>2</sup>	C MOSFET <sup>1</sup> CP & FRED	600	50	45	150	SMPD-B
MXB40RK600DFELB	C X2 Class & FRED	600	68	38	140	SMPD-B
<b>Phase-Leg</b>						
MMIX2F150N20T	B Trench™ HiPerFET™	200	84	16.5	177	SMPD-X
MMIX2F60N50P3	B Trench™ HiPerFET™	500	30	110	96	
MKE38P600LB <sup>3</sup>	B MOSFET <sup>1</sup> CP	600	50	40	150	SMPD-B
MXB40P650LB	B X2 Class	650	68	38	140	
MCB20P1200LB	B SiC	1200	22	98 (80 typ.)	62	SMPD
MCB30P1200LB	B SiC	1200	37	52 (40 typ.)	115	
MCB40P1200LB	B SiC	1200	58	34 (25 typ.)	161	SMPD
MCL10P1200LB	B SiC	1200	16	160	50	

<sup>1</sup> Powered by Infineon CoolMOS™ superjunction bare die

<sup>2</sup> NFND. Replacement part MXB40RK600DFELB

<sup>3</sup> NFND. Replacement part MXB40P650LB

## More Information

### Mounting and Cooling Solutions for SMPD Packages

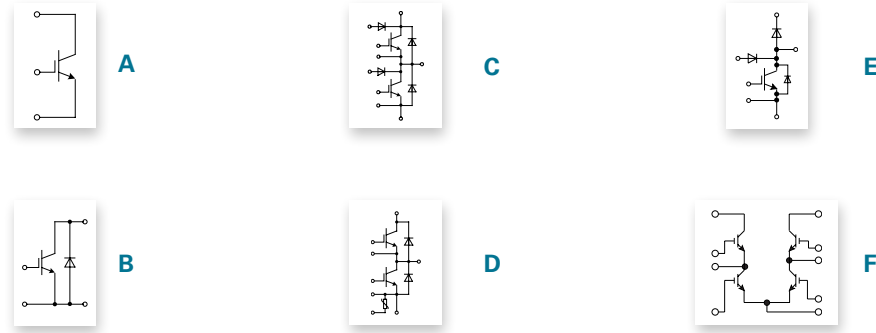
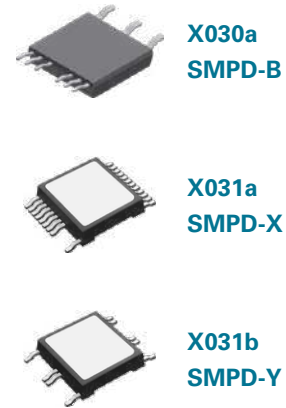
This application note discusses various mounting solutions for Surface Mount Power Device (SMPD) packages. Mounting instructions are provided for single and multi-device mounting, respectively. Read on to learn more.



Scan to visit now

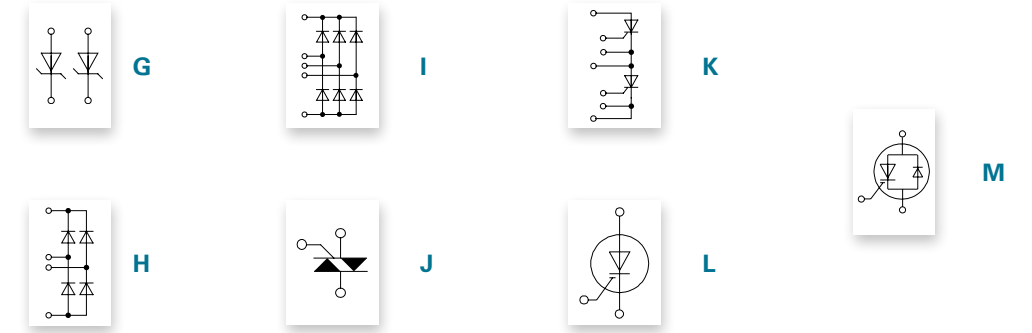
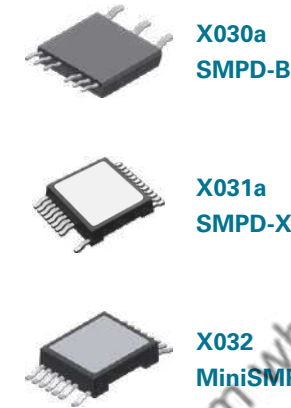
# Featured Packages

## IGBTs



Part Number	Circuit Diagram/Technology	V <sub>ce</sub>	I <sub>C25</sub> T <sub>C</sub> = 25 °C	V <sub>CE(sat)</sub> typ. T <sub>C</sub> = 25 °C	E <sub>off</sub> typ. T <sub>J</sub> = 150 °C (125 °C)	Package
		V	A	A	mJ	
<b>Single and Copack</b>						
MMIX1X200N60B3	A	XPT™	223	1.4	3.45	SMPD-X
MMIX1X100N60B3H1	B	XPT™ & Sonic	145	1.5	2.8	
MMIX1X200N60B3H1	B	XPT™ & Sonic	175	1.4	3.45	SMPD-X
MMIX1X340N65B4	A	XPT™ IGBT Gen4™	450	1.4	2.54	
MMIX1Y82N120C3H1	B	XPT™ fast & Sonic	78	2.9	(3.7)	SMPD-X
MMIX1Y100N120C3H1	B	XPT™ fast & Sonic	92	2.9	3.55	
MMIX1G120N120A3V1	B	Gen3 IGBT & Sonic	110	1.85	58	SMPD-X
<b>Boost</b>						
IXA20RG1200DHGLB	E	XPT™ & Sonic	1200	32	1.7	SMPD-B
IXA30RG1200DHGLB	E	XPT™ & Sonic	1200	43	3	SMPD-B
IXA40RG1200DHGLB	E	XPT™ & Sonic	1200	63	4.1	SMPD-B
<b>Phase-Leg</b>						
IXA20PG1200DHGLB	C	XPT™ & Sonic	1200	32	1.7	SMPD-B
IXA30PG1200DHGLB	C	XPT™ & Sonic		43	3	
IXA40PG1200DHGLB	C	XPT™ & Sonic		63	4.1	
ITF40PF1200DHGTLB	D	Trench IGBT & Sonic & NTC	1200	56	2.6	SMPD-B
ITF40PG1200DHGLB	C	Trench IGBT & Sonic		56	2.05	
<b>Full-Bridge</b>						
MMIX4B22N300	F	IGBT for cap discharge	3000	38	3.1 max	SMPD-Y

## IGBTs



Part Number	Circuit Diagram/Technology	V <sub>RRM</sub>	I <sub>D(AV)M</sub> @ T <sub>C</sub>		Package	
		V	A	°C		
<b>Dual</b>						
DSA120X150LB	G	Schottky	150	2 × 60	150	SMPD-B
DSA120X200LB	G	Schottky	200	2 × 60	150	SMPD-B
DSA240X200LB	G	Schottky		2 × 120	150	
DCG40X1200LB	G	SiC	1200	2 × 14.5	80	SMPD-B
<b>1 Phase Bridge</b>						
DPG60B600LB	H	HiPerFRED	600	60	110	SMPD-B
DCG20B650LB	H	SiC	650	21	80	
DLA100B800LB <sup>1</sup>	H	Rectifier	800	124	80	SMPD-B
DMA120B800LB	H	Rectifier		130	90	
DLA100B1200LB	H	Rectifier	1200	124	80	SMPD-B
DHG40B1200LB	H	Sonic		34	80	
<b>3 Phase Bridge</b>						
DHG60U1200LB	I	Sonic	1200	62	80	SMPD-B
DMA90U1800LB	I	Rectifier	1800	99	80	

<sup>1</sup> AECQ qualified

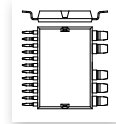
## Thyristors and Triacs

Part Number	Circuit Diagram/Technology	V <sub>RRM</sub>	I <sub>TAV</sub> @ T <sub>C</sub>		Package	
		V	A	°C		
<b>Dual</b>						
CLA60MU1200LB	2 × J	Triac	1200	2 × 30	100	SMPD-B
CMA50P1600LB	K	Thyristor	2 × 1600	50	90	SMPD-B

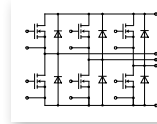
## MOS-Gated Thyristors

Part Number	V <sub>DM</sub>	I <sub>TSM</sub> 1μs T <sub>C</sub> = 25°C	I <sub>TSM</sub> 10μs T <sub>C</sub> = 25°C	r <sub>T</sub> typ.	V <sub>T</sub> Max.	Q <sub>g(on)</sub> typ.	t <sub>ri</sub> typ. T <sub>C</sub> = 25°C	V <sub>GK(th)</sub> max.	Circuit Diagram	Package
	V	kA	kA	mW	V	nC	ns	V		
MMJX1H40N150	1500	15.5	6.4	1.2	6	99	100	5	L	MiniSMPD
MMIX1H60N150V1	1500	32	11.8	1.2	6	180	100	5	M	SMPD-X

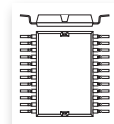
ISOPLUS-DIL™



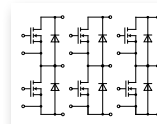
MTI...W..GC  
MTC...W..GC  
Surface Mount Device



Part Number	V <sub>DS max.</sub>	I <sub>D</sub> T <sub>C</sub> = 25 °C	I <sub>D90</sub> T <sub>C</sub> = 90 °C	R <sub>DS(on) typ.</sub> T <sub>J</sub> = 25 °C	C <sub>iss typ.</sub>	Q <sub>g typ.</sub>	R <sub>thJC</sub>
	V	A	A	mW	nF	nC	K/W
<b>FPO</b>							
MTC120W55GC	55	160	120	2.2	7	110	1
MTI85W100GC	100	110	83	3.2	6.3	90	1.5



MTI...WX...GD  
MTC...X...TGD  
GMM...  
Surface Mount Device



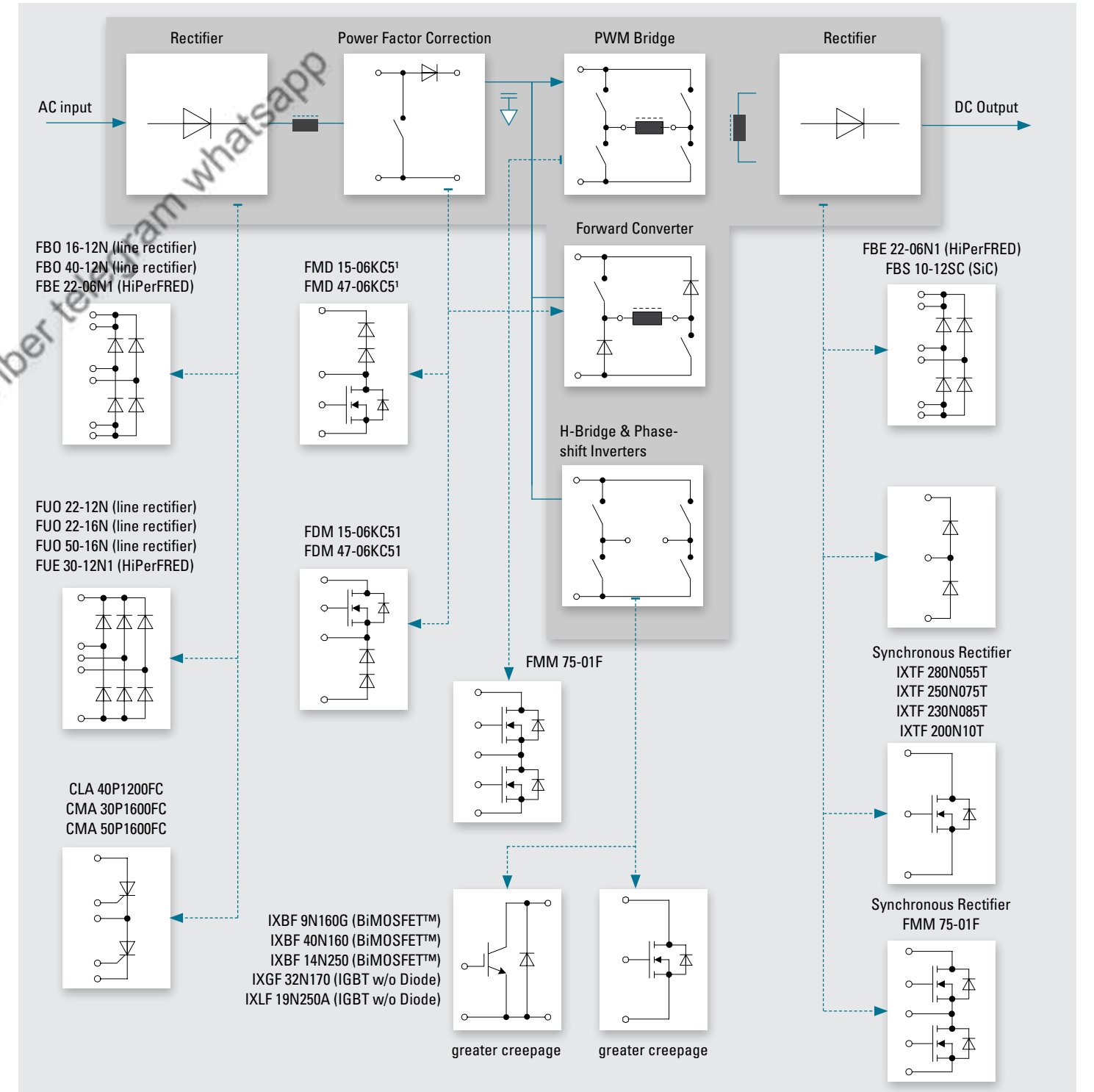
Part Number	V <sub>DS max.</sub>	I <sub>D</sub> T <sub>C</sub> = 25 °C	I <sub>D90</sub> T <sub>C</sub> = 90 °C	R <sub>DS(on) typ.</sub> T <sub>J</sub> = 25 °C	C <sub>iss typ.</sub>	Q <sub>g typ.</sub>	R <sub>thJC</sub>
	V	A	A	mW	nF	nC	K/W
<b>FPO</b>							
MTC120WX55GD	55	160	120	2.2	7	110	1
MTC120WX75GD	75	160	120	2.2	10.5	178	0.8
MTI200WX75GD		265	200	1.1	10.8	155	0.9
MTI85WX100GD	100	110	83	3.2	6.3	90	1.5
MTI145WX100GD		190	145	1.7	11	155	0.9
GMM3X60-015X2	150	50	38	19	5.8	97	

Potential Application Block Diagram Exmple (for i4-PAC™)

3, 4, and 5 leaded packages for various circuit topologies and DCB base plate

- Electrical isolation of 2500 V
- Low thermal resistance
- Increased power and temperature cycling
- Saves PCB mounting area
- Replaces multiple discretes
- Reduces parasitic inductance and capacitance
- Reduces EMI
- Less weight

--- Solutions offered by IXYS  
— System implementation options



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# Featured Packages



**X024a**  
ISOPLUS-i4pac(5)



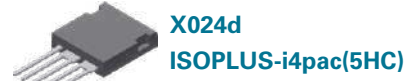
**X024b**  
ISOPLUS-i4pac(3sym)



**X024e**  
ISOPLUS-i4pac(2sym)



**X024b**  
ISOPLUS-i4pac(3sym)



**X024d**  
ISOPLUS-i4pac(5HC)

## MOSFET

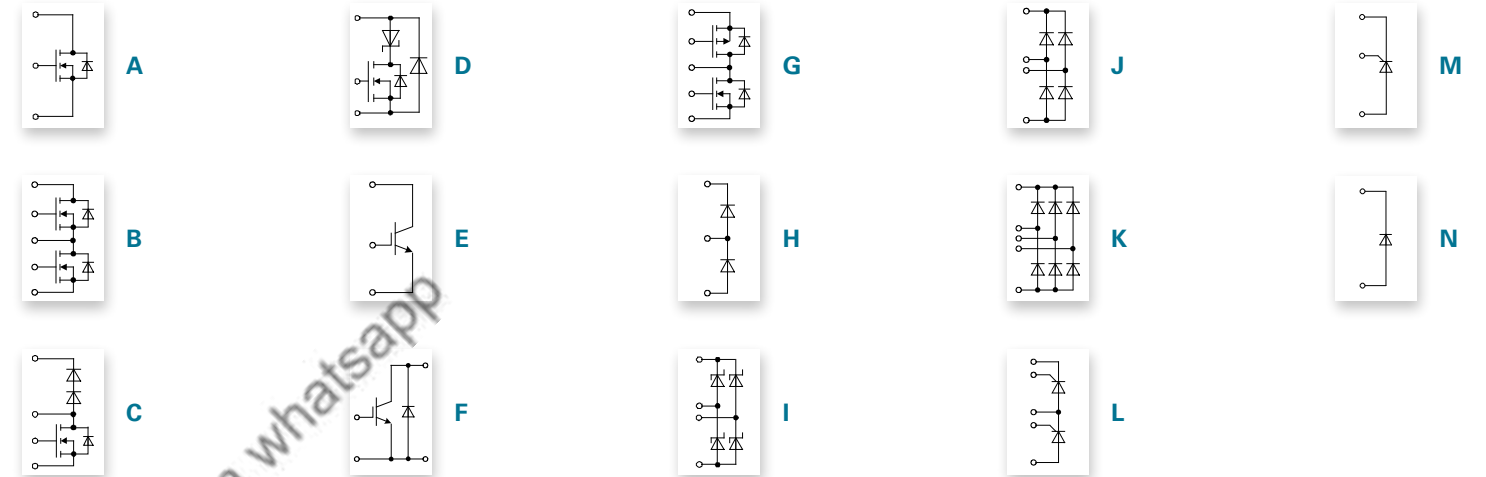
Part Number	Configuration	Circuit Diagram/Technology	V <sub>DSS</sub>	I <sub>D25</sub>	I <sub>D90/110</sub>	R <sub>DS(on)</sub>	Package
			V	A	A	mΩ	
IXTF200N10T	Single	A Trench MOSFET	100	90	na	7	ISOPLUS-i4pac (5HC)
IXTF6N200P3	Single	A Polar3™ High Voltage MOSFET	2000	4	(2.3)	<(4.2)	ISOPLUS-i4pac(3asym)
IXTF2N300P3		A Polar3™ High Voltage MOSFET	3000	1.6	(0.9)	<(21)	
IXTF1N250		A High Voltage MOSFET	2500	1	na	<(40)	
IXTF1R4N450	Single	A High Voltage MOSFET	4500	1.4	na	<(40)	ISOPLUS-i4pac(3asym)
IXTF02N450		A High Voltage MOSFET		0.2	na	<(625)	
IXTF1N450		A High Voltage MOSFET		0.9	na	<(80)	
FMD15-06KC5 <sup>1</sup>	Boost	C MOSFET & HiPerDynFRED	600	15	11	150	ISOPLUS-i4pac(5)
FMM75-01F	Phase leg	B HiPerFET	100	75	50	18	ISOPLUS-i4pac(5)
FMM60-02TF	Phase leg	B Trench HiPerFET	200	33	na	32	ISOPLUS-i4pac(5)
FMM50-025TF		B Trench HiPerFET	250	30	na	<60	

<sup>1</sup> NFND. Replacement part MXB12R600DPHFC

## IGBTs

Part Number	Configuration	Circuit Diagram/Technology	V <sub>CES</sub>	I <sub>D25</sub>	I <sub>D90/110</sub>	V <sub>CE(sat)</sub> typ	Package
			V	A	A	V	
IXYF30N170CV <sup>1</sup>	Single	F High voltage XPT™ IGBT	1700	36	(20)	3.5	ISOPLUS-i4pac (3asym)
IXGF32N170		E High voltage IGBT		44	(19)	2.7	
IXGF20N250	Single	E High voltage IGBT	2500	23	14	<3.1	ISOPLUS-i4pac (3asym)
IXGF25N250		E High voltage IGBT		30	(15)	<2.9	
IXYF16N250CV <sup>1</sup>	Single	F High voltage XPT™ IGBT	2500	26	(14)	3.3	ISOPLUS-i4pac (3asym)
IXBF22N300	Single	F BiMOSFET™	3000	38	22	2.2	ISOPLUS-i4pac (3asym)
IXBF32N300	Single	F BiMOSFET™	3000	40	22	2.3	ISOPLUS-i4pac (3asym)
IXBF42N300	Single	F BiMOSFET™	3000	60	(24)	2.5	ISOPLUS-i4pac (3asym)
IXBF55N300		F BiMOSFET™		86	(34)	2.7	
IXYF30N450	Single	E High voltage XPT™ IGBT	4500	23	(17)	3.2	ISOPLUS-i4pac (3asym)
IXYF40N450		E High voltage XPT™ IGBT		60	(32)	3.2	

<sup>1</sup> Not for new design



Part Number	Configuration	Circuit diagram/Technology	Voltage	I <sub>DI(AV)M</sub>	Package
			V	A	
CS20-22MOF1	Single	M Thyristor	2200	18	ISOPLUS-i4pac (3asym)
DNA30E2200FE	High voltage	N Rectifier	2200	30	ISOPLUS-i4pac(2sym)
CS20-25MO1F		M Thyristor	2500	18	ISOPLUS-i4pac (3asym)
CLA40P1200FC	Phase leg	L Thyristor	2 × 1200	40	ISOPLUS-i4pac(5)
DSEE55-24N1F		H HiPerFRED		55	ISOPLUS-i4pac(3sym)
CMA30P1600FC	Phase leg	L Thyristor	2 × 1600	30	ISOPLUS-i4pac(5)
CMA50P1600FC		L Thyristor		50	
DHH55-36N1F	Phase leg	H Sonic-FRD	2 × 1800	50	ISOPLUS-i4pac(3sym)
FBE22-06N1	1-Phase bridge	J HiPerFRED	600	20	ISOPLUS-i4pac(5)
FBS10-12SC		I Si-Carbide	1200	10	ISOPLUS-i4pac(5)
FBO16-12N	1-Phase bridge	J Rectifier	1200	22	ISOPLUS-i4pac(5)
FBO40-12N		J Rectifier		40	
FUO22-12N	3-Phase bridge	K Rectifier	1200	27	ISOPLUS-i4pac(5)
FUE30-12N1		K HiPerFRED		30	
FUO22-16N	3-Phase bridge	K Rectifier	1600	27	ISOPLUS-i4pac(5)
FUO50-16N		K Rectifier		50	

The Insulated Gate Bipolar Transistor (IGBT) is a key component used in major industrial and automotive applications today. IXYS is one of the largest portfolios of IGBTs in terms of package, current, and voltage. Adapting to the different needs of various applications, IXYS offers optimized IGBTs for conduction and switching losses. These IGBTs come in A, B, and C switching classes. The portfolio includes both single IGBTs and co-pack IGBTs having anti-parallel diode inside the package. The A class is optimized for low frequency applications and has considerably less conduction losses. Class B and C IGBTs are optimized for medium and high-switching frequency applications.

IXYS IGBTs offer low thermal resistance  $R_{th(j-c)}$  which helps simplify and enhance the overall thermal efficiency of the system. The industry-leading low gate charge  $Q_g$  requirement drastically reduces the gate driver requirements of the IGBTs, respectively.

The following table summarizes the IGBT portfolio.

## IGBT Technology

**IGBT Technologies and their Distinctive Characteristics**  
600–1200 V

IGBT Characteristics	XPT™ Gen3 Planar		XPT™ Gen3 Planar			XPT™ Gen4 Trench			XPT™ Gen5 Trench		
	IXA*	IXX*	IXY*			IXX* (650 V), IXY* (1200 V)			IXY*		
Sub-family	IXA*	IXX*	IXY*			IXX* (650 V), IXY* (1200 V)			IXY*		
Switching class	–	B3 C3	A3 B3 C3	A4 B4 C4	A5 B5 C5						
Speed	Medium	Medium High	Low Medium High	Low Medium High	Low Medium High						
Surge Current Capability	Medium	Medium	Medium	Medium (650 V), High (1200 V)	High						
Square RBSOA	Yes	Yes	Yes	Yes (650 V), No (1200 V)	Yes						
Short Circuit Rated	Yes	Yes	Yes	Yes (650 V), No (900 V, 1200 V)	Yes (650 V), No (1200 V)						
Voltage Class	1200 V	600 V	650 V, 900 V, 1200 V	650 V, 1200 V	650 V						

**IGBT Technologies and their Distinctive Characteristics**  
1600–4500 V

IGBT Characteristics	XPT™ Gen3 Planar	XPT™ Gen3 Planar
Sub-family	IXY*	IXB*
Switching class	–	–
Speed	Medium	Medium
Surge Current Capability	Medium	Medium
Square RBSOA	No	No
Short Circuit Rated	No	No
Voltage Class	1700–4500 V	1600–3600 V

## IGBT Product Families

### Xtreme Light Punch Through (XPT™) Planar IGBTs

These are the extremely rugged technology platform of IGBTs, which are ideal for critical applications that require low conduction and low switching losses with a 10  $\mu$ s short circuit withstand capability. Either discrete or co-packaged with ultrafast soft recovery Sonic diodes. IXYS XPT™ IGBTs have lower saturation voltage  $V_{CE(sat)}$  and low total switching energy ( $E_{on} + E_{off}$ ). A large portfolio of module-packed Planar XPT™ s is available for applications such as UPS, Motor Drive, and solar inverters.

### Xtreme Light Punch Through (X2PT™) Planar IGBTs

These are the second generation of XPT™ IGBTs. Its features are 10  $\mu$ s short circuit capability, 175°C max junction temperature, further reduced  $V_{CE(sat)}$ , and lower turn-off losses ( $E_{off}$ ), resulting in competitive performance that is comparable to the latest trench devices at reduced  $R_{th}$ . Thus, they are ideally suited for Motor Drive inverters.

### Xtreme Light Punch Through (XPT™) Trench IGBTs

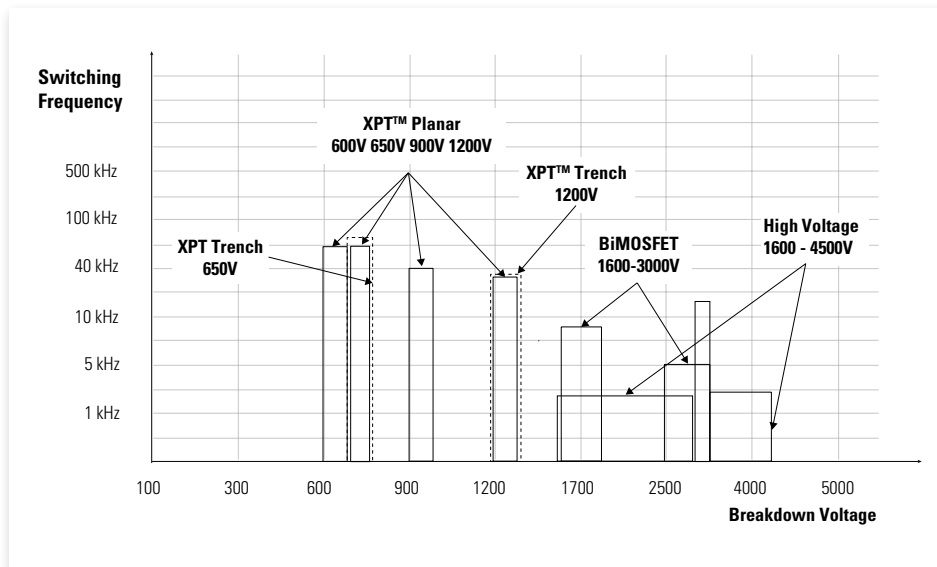
These are the latest developments from IXYS, starting at 650 V. This range features not only a low  $V_{CE(sat)}$ , but extremely low switching losses, making the platform attractive for fast switching applications while retaining good SOA rating and a positive temperature coefficient. Either discrete or co-packaged with ultrafast soft recovery sonic diodes. IXYS XPT™ IGBTs have industry leading efficiency at medium to high switching frequency.

### Very High Voltage (2500 V–4000 V) IGBTs

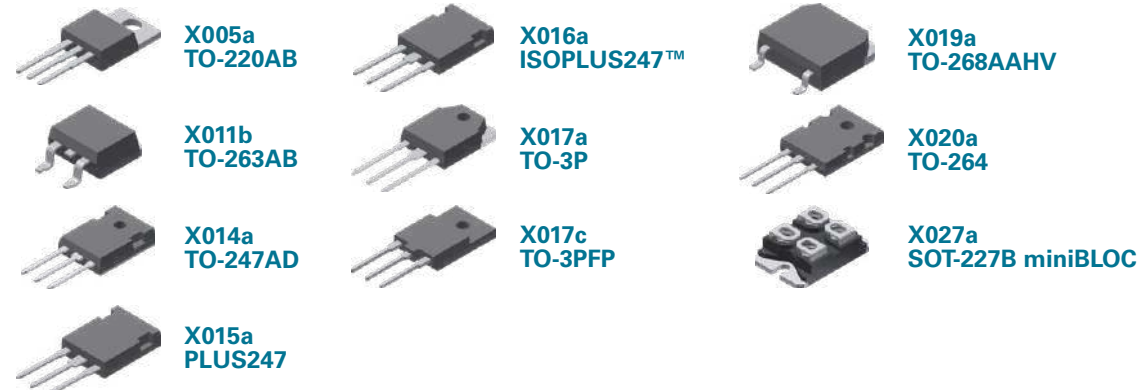
IXYS offers a unique portfolio of discrete 2500 V, 3000 V, and 4000 V VHV IGBTs with collector current ratings spanning from 2 A to 75 A ( $T_c = 110^\circ\text{C}$ ). The voltage and current ratings of these devices, coupled with simplified MOS gate-control, allow the system designer to greatly reduce the complexity of many high voltage switching designs. These IGBTs enable the use of a single device in systems whose circuits previously used multiple, cascaded, lower-voltage switches.

### BiMOSFET™ IGBTs

IXYS BiMOSFET™ s are devices that have combined strengths of MOSFETs and IGBTs. BiMOSFET™ s feature a monolithic intrinsic diode that can reduce die count in many applications.



# IGBT Discrete



## 600V XPT™ Planar IGBTs

XPT™ = Xtreme Light Punch Through, short-circuit rated IGBTs

Part Number	V <sub>CES</sub>	I <sub>C25</sub> T <sub>C</sub> = 25 °C	I <sub>C110</sub> T <sub>C</sub> = 110 °C	V <sub>CE(sat)</sub> T <sub>C</sub> = 25 °C	t <sub>fi</sub> typ. T <sub>J</sub> = 150 °C	E <sub>off</sub> typ. T <sub>J</sub> = 150 °C	R <sub>thJC</sub>	Diode	I <sub>F110</sub> Diode T <sub>C</sub> = 110 °C	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package
	V	A	A	V	ns	mJ	K/W	A	K/W	W		
<b>B3 Class (5–30 kHz Switching)</b>												
IXXQ30N60B3M	600	33	19	1.85	180	0.7	1.66	–	–	–	90	TO-3PFP
IXXH30N60B3		60	30	1.85	180	0.7	0.55	–	–	–	270	TO-247AD
IXXH30N60B3D1		60	30	1.85	180	0.7	0.55	•	30	0.9	270	TO-247AD
IXXA50N60B3		120	50	1.8	190	1.2	0.25	–	–	–	600	TO-263AB
IXXH50N60B3		120	50	1.8	190	1.2	0.25	–	–	–	600	TO-247AD
IXXH50N60B3D1		120	50	1.8	190	1.2	0.25	•	30	0.9	600	TO-247AD
IXXP50N60B3		120	50	1.8	190	1.2	0.25	–	–	–	600	TO-220AB
IXXR100N60B3H1		145	68	1.8	200	2.8	0.31	•	–	0.62	400	ISOPLUS247™
IXXH75N60B3		160	75	1.85	170	2.2	0.2	–	–	–	750	TO-247AD
IXXH75N60B3D1		160	75	1.85	170	2.2	0.200	•	30	0.9	750	TO-247AD
IXXN100N60B3H1		170	100 (90°C)	1.8	200	2.8	0.25	•	50	0.42	500	SOT-227B miniBLOC
IXXK100N60B3H1		200	100 (100°C)	1.8	200	2.8	0.18	•	65	0.3	695	TO-64
IXXN200N60B3H1		200	98	1.7	215	3.45	0.16	•	30	0.7	780	SOT-227B miniBLOC
IXXX100N60B3H1		200	100 (100°C)	1.8	200	2.8	0.18	•	65	0.3	695	PLUS247
IXXH100N60B3		220	100	1.8	200	2.8	0.18	–	–	–	830	TO-247AD
IXXN200N60B3		280	160	1.7	215	3.45	0.16	–	–	–	940	SOT-227B miniBLOC
IXXK200N60B3		380	200	1.7	215	3.45	0.092	–	–	–	1630	TO-64
IXXX200N60B3		380	200	1.7	215	3.45	0.092	–	–	–	1630	PLUS247
IXXK300N60B3		550	300	1.6	200	3.7	0.065	–	–	–	2300	TO-64
IXXX300N60B3		550	300	1.6	200	3.7	0.065	–	–	–	2300	PLUS247
<b>C3 Class (20–60 kHz Switching)</b>												
IXXH30N60C3	600	60	30	2.2	32	0.4	0.55	–	–	–	270	TO-247AD
IXXH30N60C3D1		60	30	2.2	78	0.4	0.55	•	30	0.9	270	TO-247AD
IXXH50N60C3		100	50	2.3	90	0.48	0.25	–	–	–	600	TO-247AD
IXXH50N60C3D1		100	50	2.3	90	0.48	0.25	•	30	0.9	600	TO-247AD
IXXH75N60C3		150	75	2.3	80	1.07	0.2	–	–	–	750	TO-247AD
IXXH75N60C3D1		150	75	2.3	80	1.07	0.2	•	30	0.9	750	TO-247AD
IXXK100N60C3H1		170	100 (90°C)	2.2	115	1.4	0.18	•	65	0.3	695	TO-64
IXXX100N60C3H1		170	100 (90°C)	2.2	115	1.4	0.18	•	65	0.3	695	PLUS247
IXXH100N60C3		190	100	2.2	115	1.4	0.18	–	–	–	830	TO-247AD
IXXN200N60C3H1		200	98	2.1	90	2.1	0.16	•	30	0.7	780	SOT-227B miniBLOC
IXXK200N60C3		340	200	2.1	90	2.1	0.092	–	–	–	1630	TO-64
IXXX200N60C3		340	200	2.1	90	2.1	0.092	–	–	–	1630	PLUS247
IXXK300N60C3		510	300	2	90	2.35	0.065	–	–	–	2300	TO-64
IXXX300N60C3		510	300	2	90	2.35	0.065	–	–	–	2300	PLUS247

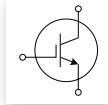
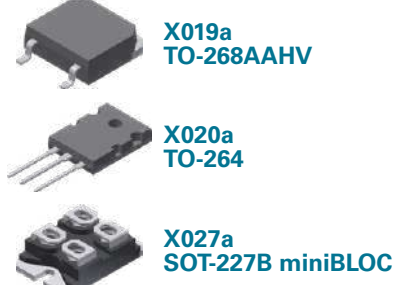
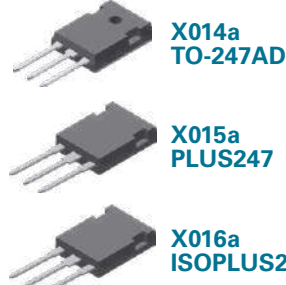
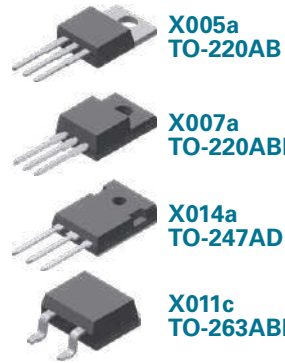
## 650V XPT™ Planar IGBTs

XPT™ = Xtreme Light Punch Through, short-circuit rated IGBTs

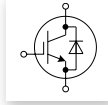
Part Number	V <sub>CES</sub>	I <sub>C25</sub> T <sub>C</sub> = 25 °C	I <sub>C110</sub> T <sub>C</sub> = 110 °C	V <sub>CE(sat)</sub> T <sub>C</sub> = 25 °C	t <sub>fi</sub> typ. T <sub>J</sub> = 150 °C	E <sub>off</sub> typ. T <sub>J</sub> = 150 °C	R <sub>thJC</sub>	Diode	I <sub>F110</sub> Diode T <sub>C</sub> = 110 °C	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package	
	V	A	A	V	ns	mJ	K/W	A	K/W	W			
<b>A3 Class (up to 5 kHz Switching)</b>													
IXYN100N65A3	650	170	100	1.8	160	2.4	0.25	–	–	–	600	SOT-227B miniBLOC	
IXYH100N65A3		240	100	1.8	225	3.7	0.18	–	–	–	470	TO-247AD	
IXYN300N65A3		470	300	1.6	175	7.3	0.1	–	–	–	1500	SOT-227B miniBLOC	
IXYK300N65A3		600	300	1.6	175	7.3	0.065	–	–	–	2300	TO-264	
IXYX300N65A3		600	300	1.6	175	7.3	0.065	–	–	–	2300	PLUS247	
<b>B3 Class (10–30 kHz Switching)</b>													
IXYA20N65B3	650	58	20	2.1	147	0.76	0.65	–	–	–	230	TO-263AB	
IXYH20N65B3		58	20	2.1	147	0.76	0.65	–	–	–	230	TO-247AD	
IXYP20N65B3		58	20	2.1	147	0.76	0.65	–	–	–	230	TO-220AB	
IXYH40N65B3		86	40	2	174	1.15	0.5	–	–	–	300	TO-247AD	
IXYH40N65B3D1		86	40	2	174	1.15	0.5	•	50	0.6	300	TO-247AD	
IXYH100N65B3		225	100	1.85	160	2.16	0.18	–	–	–	830	TO-247AD	
IXYH120N65B3		340	120	1.9	196	2.2	0.11	–	–	–	–	–	TO-247AD
IXYK200N65B3		410	200	1.7	230	5.6	0.096	–	–	–	–	–	TO-264
IXYX200N65B3		410	200	1.7	230	5.6	0.096	–	–	–	–	–	PLUS247
<b>C3 Class (20–60 kHz Switching)</b>													
IXYP10N65C3	650	30	10	2.5	38	0.15	0.94	–	–	–	160	TO-220AB	
IXYP15N65C3		38	15	2.5	42	0.24	0.75	–	–	–	200	TO-220AB	
IXYA20N65C3		50	20	2.5	36	0.4	0.65	–	–	–	230	TO-263AB	
IXYP10N65C3		30	10	2.5	38	0.15	0.94	–	–	–	160	TO-220AB	
IXYA15N65C3D1		38	15	2.5	42	0.24	0.75	•	23	1.85	200	TO-263AB	
IXYP15N65C3		38	15	2.5	42	0.24	0.75	–	–	–	200	TO-220AB	
IXYP15N65C3D1		38	15	2.5	42	0.24	0.75	•	23	1.85	200	TO-220AB	
IXYA20N65C3		50	20	2.5	36	0.4	0.65	–	–	–	230	TO-263AB	
IXYA20N65C3D1		50	20	2.5	36	0.4	0.65	•	18	1.85	200	TO-263AB	
IXYH20N65C3		50	20	2.5	36	0.4	0.65	–	–	–	230	TO-247AD	
IXYP20N65C3D1		50	20	2.5	36	0.4	0.65	•	18	1.85	200	TO-220AB	
IXYH30N65C3H1		60	30	2.7	30	0.41	0.55	•	29	0.8	270	TO-247AD	
IXYH30N65C3		60	30	2.7	30	0.41	0.55	–	–	–	270	TO-247AD	
IXYT30N65C3H1HV		60	30	2.7	30	0.41	0.55	•	29	0.8	270	TO-268AAHV	
IXYP30N65C3		60	30	2.7	30	0.41	0.55	–	–	–	270	TO-220AB	
IXYQ40N65C3D1		80	40	2.35	30	0.53	0.5	•	50	0.6	300	TO-3P	
IXYH40N65C3		80	40	2.35	30	0.53	0.5	–	–	–	300	TO-247AD	
IXYH40N65C3H1		80	40	2.35	80	0.46	0.5	•	40	0.6	300	TO-247AD	
IXYH50N65C3H1		130	50	2.1	42	0.56	0.25	•	40	0.6	600	TO-247AD	
IXYP50N65C3		132	50	2.1	32	0.7	0.25	–	–	–	600	TO-220AB	
IXYH50N65C3		132	50	2.1	32	0.7	0.25	–	–	–	600	TO-247AD	
IXYA50N65C3		132	50	2.1	32	0.7	0.25	–	–	–	600	TO-263AB	
IXYN100N65C3H1		160	90	2.3	66	1.15	0.25	•	50	0.42	600	SOT-227B miniBLOC	
IXYH75N65C3H1		170	75	2.3	58	1.3	0.2	•	62	0.45	750	TO-247AD	
IXYH75N65C3		175	75	2.3	64	1.3	0.2	–	–	–	750	TO-247AD	
IXYX100N65C3D1		200	100	2.3	66	1.15	0.18	•	67	0.36	830	PLUS247	
IXYH100N65C3		200	100	2.3	66	1.15	0.18	–	–	–	830	TO-247AD	
IXYK100N65C3D1		200	100	2.3	66	1.15	0.18	•	67	0.36	830	TO-264	
IXYH120N65C3		260	120	2.8	60	0.7	0.11	–	–	–	–	–	TO-247AD



# IGBT Discrete



IXX...  
IXY...



IXX...D1/H1  
IXY...D1/H1

## 650 V XPT™ Trench IGBTs

XPT™ = Xtreme Light Punch Through, short-circuit rated IGBTs

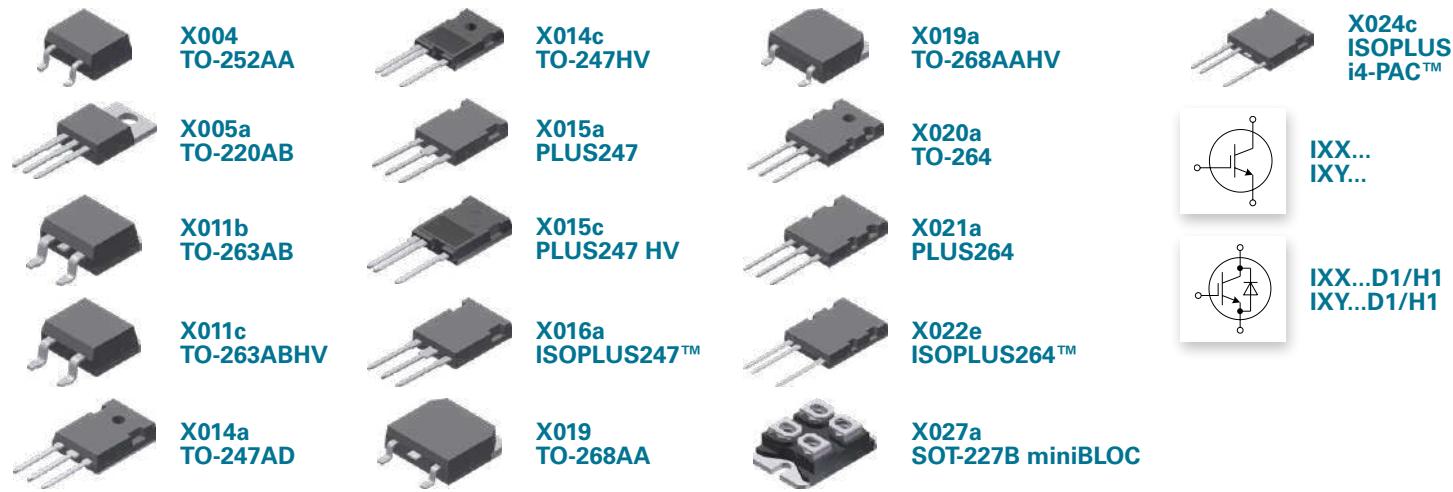
Part Number	V <sub>CES</sub>	I <sub>C25</sub> T <sub>C</sub> = 25 °C	I <sub>C110</sub> T <sub>C</sub> = 110 °C	V <sub>CE(sat)</sub> T <sub>C</sub> = 25 °C	t <sub>fi</sub> typ. T <sub>J</sub> = 150 °C	E <sub>off</sub> typ. T <sub>J</sub> = 150 °C	R <sub>thJC</sub>	Diode	I <sub>F110</sub> Diode T <sub>C</sub> = 110 °C	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package
	V	A	A	V	ns	mJ	K/W					
<b>A4 Class (up to 5 kHz Switching)</b>												
IXXN200N65A4	650	440	200	1.8	190	8	0.12	–	–	–	1250	SOT-227B miniBLOC
<b>A5 Class (up to 5 kHz Switching)</b>												
IXYP60N65A5	650	134	60	1.35	240	2.5	0.38	–	–	–	395	TO-220AB
IXYH90N65A5		220	90	1.35	360	5	0.23	–	–	–	650	TO-247AD
IXYH120N65A5		290	120	1.35	290	4.7	0.18	–	–	–	830	TO-247AD
<b>B4 Class (5–30 kHz Switching)</b>												
IXXP12N65B4	650	38	12	1.95	110	0.38	0.94	–	–	–	160	TO-220AB
IXXP12N65B4D1		38	12	1.95	110	0.38	0.94	•	11	2.3	160	TO-220AB
IXXH30N65B4		70	30	2	60	1.07	0.65	–	–	–	230	TO-247AD
IXXH40N65B4		115	40	2	116	1.3	0.33	–	–	–	455	TO-247AD
IXXH60N65B4		120	60	2.2	88	1.8	0.33	–	–	–	536	TO-247AD
IXXH60N65B4H1		120	60	2.2	88	1.8	0.33	•	47	0.6	536	TO-247AD
IXXH40N65B4H1		123	40	2	73	1.4	0.33	•	40	0.6	455	TO-247AD
IXXR110N65B4H1		150	70	2.2	105	1.4	0.33	•	48	0.7	455	ISOPLUS247™
IXXH80N65B4		160	80	2.1	94	2.7	0.24	–	–	–	625	TO-247AD
IXXH80N65B4H1		160	80	2.1	102	3.1	0.24	•	62	0.45	625	TO-247AD
IXXN110N65B4H1		230	110	2.1	110	2.16	0.2	•	70	0.42	750	SOT-227B miniBLOC
IXXH110N65B4		250	110	2.1	110	2.16	0.17	–	–	–	880	TO-247AD
IXXK110N65B4H1		250	110	2.1	110	2.16	0.17	•	78	0.38	880	TO-264
IXXX110N65B4H1		250	110	2.1	110	2.16	0.17	•	78	0.38	880	PLUS247
IXXK160N65B4		310	160	1.8	160	2.36	0.16	–	–	–	940	TO-264
IXXX160N65B4		310	160	1.8	160	2.36	0.16	–	–	–	940	PLUS247
IXXH140N65B4		340	140	1.9	100	3.9	0.125	–	–	–	1200	TO-247AD
IXXX140N65B4H1		350	140	1.9	100	3.9	0.125	•	72	0.24	1200	PLUS247
IXXK200N65B4		480	200	1.7	120	5	0.092	–	–	–	1630	TO-264
IXXX200N65B4		480	200	1.7	120	2.54	0.092	–	–	–	1630	PLUS247
IXXN340N65B4	520	340 (90°C)	1.7	110	2.54	0.1	–	–	–	1500	SOT-227B miniBLOC	
<b>C4 Class (20–60 kHz Switching)</b>												
IXXH60N65C4	650	125	60	2.4	54	1.5	0.33	–	–	–	536	TO-247AD
IXXN110N65C4H1		210	110	2.35	40	0.9	0.2	•	70	0.42	750	SOT-227B miniBLOC
IXXH110N65C4		235	110	2.35	40	0.9	0.17	–	–	–	880	TO-247AD
IXXK160N65C4		290	160	2.1	57	1.3	0.16	–	–	–	940	TO-264
IXXX160N65C4		290	160	2.1	57	1.3	0.16	–	–	–	940	PLUS247
IXXH140N65C4		320	160	2.3	63	2.5	0.125	–	–	–	1200	TO-247AD

## 1200 V XPT™ Trench IGBTs

XPT™ = Xtreme Light Punch Through, short-circuit rated IGBTs

Part Number	V <sub>CES</sub>	I <sub>C25</sub> T <sub>C</sub> = 25 °C	I <sub>C110</sub> T <sub>C</sub> = 110 °C	V <sub>CE(sat)</sub> T <sub>C</sub> = 25 °C	t <sub>fi</sub> typ. T <sub>J</sub> = 125 °C	E <sub>off</sub> typ. T <sub>J</sub> = 120 °C	R <sub>thJC</sub>	Diode	I <sub>F110</sub> Diode T <sub>C</sub> = 110 °C	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package
	V	A	A	V	ns	mJ	K/W					
<b>A4 Class (up to 5 kHz Switching)</b>												
IXYA20N120A4HV	1200	80	20	1.9	286	4.85	0.4	–	–	–	375	TO-263ABHV
IXYP20N120A4		80	20	1.9	286	4.85	0.4	–	–	–	375	TO-220AB
IXYA30N120A4HV		106	30	1.9	270	5.6	0.3	–	–	–	500	TO-263ABHV
IXYH30N120A4		106	30	1.9	270	5.6	0.3	–	–	–	500	TO-247AD
IXYP30N120A4		106	30	1.9	270	5.6	0.3	–	–	–	500	TO-220AB
IXYH40N120A4		150	40	1.8	365	8.3	0.22	–	–	–	680	TO-247AD
IXYT40N120A4HV		150	40	1.8	365	8.3	0.22	–	–	–	680	TO-268AAHV
IXYT55N120A4HV		175	55	1.8	270	8.8	0.23	–	–	–	650	TO-268AAHV
IXYH55N120A4		175	55	1.8	270	8.8	0.23	–	–	–	650	TO-247AD
IXYT85N120A4HV		300	85	1.8	280	13.7	0.13	–	–	–	1150	TO-268AAHV
IXYH85N120A4		300	85	1.8	280	13.7	0.13	–	–	–	1150	TO-247AD
IXYK110N120A4		375	140	1.8	320	20	0.1	–	–	–	1360	TO-264
IXYN110N120A4		375	140	1.8	320	20	0.14	–	–	–	830	SOT0227B miniBLOC
IXYX110N120A4		375	140	1.8	320	20	0.1	–	–	–	1360	PLUS247
IXYK140N120A4		480	140	1.7	320	20	0.1	–	–	–	1500	TO-264
IXYN140N120A4		480	140	1.7	320	20	0.14	–	–	–	1070	SOT0227B miniBLOC
IXYX140N120A4		480	140	1.7	320	20	0.1	–	–	–	1500	PLUS247
<b>B4 Class (5–30 kHz Switching)</b>												
IXYA20N120B4HV	1200	76	20	2.1	170	2.7	0.4	–	–	–	375	TO-263ABHV
IXYP20N120B4		76	20	2.1	170	2.7	0.4	–	–	–	375	TO-220AB
IXYH30N120B4		100	30	2.1	190	4	0.3	–	–	–	500	TO-247AD
IXYH40N120B4		136	40	2.1	190	4.4	0.22	–	–	–	680	TO-247AD
IXYK110N120B4		340	110	2.1	210	6.45	0.11	–	–	–	1360	TO-264
IXYX110N120B4		340	110	2.1	210	6.45	0.11	–	–	–	1360	PLUS247
IXYH40N120B4H1		112	40	2.1	190	4.4	0.25	•	32	0.35	600	TO-247AD
IXYH55N120B4H1		138	55	2.1	340	4.5	0.23	•	32	0.35	650	TO-247AD
IXYN110N120B4H1		218	110	2.1	210	6.45	0.18	•	74	0.41	830	SOT227B miniBLOC
<b>C4 Class (20–50 kHz Switching)</b>												
IXYA20N120C4HV	1200	68	20	2.5	86	1.6	0.4	–	–	–	375	TO-263ABHV
IXYP20N120C4		68	20	2.5	86	1.6	0.4	–	–	–	375	TO-220AB
IXYH30N120C4		94	30	2.4	100	2.7	0.3	–	–	–	500	TO-247AD
IXYH40N120C4		120	40	2.5	80	2.65	0.22	–	–	–	680	TO-247AD
IXYH55N120C4		140	55	2.5	123	2.5	0.23	–	–	–	650	TO-247AD
IXYH85N120C4		160	85	2.5	112	3.3	0.13	–	–	–	1150	TO-247AD
IXYK110N120C4		310	110	2.4	90	3.2	0.11	–	–	–	1360	TO-264
IXYN110N120C4		220	110	2.4	90	3.2	0.17	–	–	–	830	SOT0227B miniBLOC
IXYX110N120C4		310	110	2.4	110	3.2	0.11	–	–	–	1360	PLUS247
IXYH40N120C4H1		110	40	2.5	80	2.65	0.22	•	32	0.35	680	TO-247AD
IXYH55N120C4H1		126	55	2.5	123	2.5	0.35	•	37	0.35	650	TO-247AD
IXYN85N120C4H1		150	85	2.5	110	3.3	0.25	•	74	0.41	600	SOT227B miniBLOC
IXYK85N120C4H1		220	85	2.5	110	3.3	0.13	•	140	0.16	1150	TO-264
IXYN110N120C4H1		210	110	2.4	90	3.2	0.18	•	74	0.41	830	SOT227B miniBLOC

# IGBT Discrete



## XPT™ Planar IGBT

XPT™ = Xtreme Light Punch Through

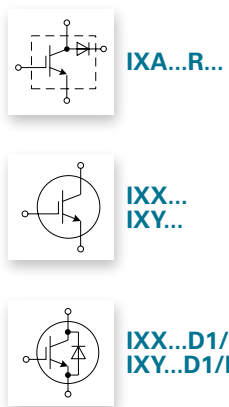
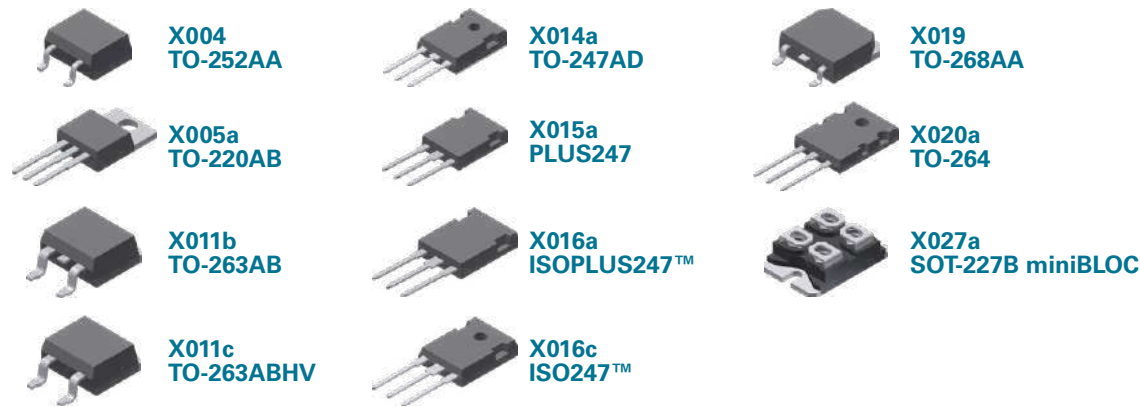
Part Number	V <sub>CES</sub>	I <sub>C25</sub>	I <sub>C110</sub>	V <sub>CE(sat)</sub>	t <sub>ri</sub> typ.	E <sub>off</sub> typ.	R <sub>thJC</sub>	Diode	I <sub>F110</sub> Diode	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package
	V	A	A	V	ns	mJ	K/W					
<b>1700V XPT™ Planar IGBTs</b>												
IXYH10N170C	1700	36	10	4.1	94	0.9	0.53	–	–	–	280	TO-247AD
IXYH10N170CV1		36	10	4.1	94	0.9	0.53	•	22	0.7	280	TO-247AD
IXYF30N170CV1		36	20	4	134	3.5	0.65	•	20	0.86	230	ISOPLUS i4-PAC™
IXYH16N170C		40	16	3.8	140	1.95	0.48	–	–	–	310	TO-247AD
IXYH16N170CV1		40	16	3.8	140	1.95	0.48	•	22	0.7	310	TO-247AD
IXYH24N170C		58	24	4	140	2.66	0.3	–	–	–	500	TO-247AD
IXYH24N170CV1		58	24	4	140	2.66	0.3	•	28	0.55	500	TO-247AD
IXYN30N170CV1		80	30	4	134	3.5	0.22	•	33	0.43	680	SOT-227B miniBLOC
IXYL50N170CV1		90	46	3.7	160	8.2	0.26	•	26	0.83	580	ISOPLUS264™
IXYH30N170C		100	30	4	134	3.5	0.16	–	–	–	937	TO-247AD
IXYK30N170CV1		100	30	4	134	3.5	0.16	•	38	0.36	937	TO-264
IXYX30N170CV1		100	30	4	134	3.5	0.16	•	38	0.36	937	PLUS247
IXYN50N170CV1		120	50	3.7	160	8.2	0.17	•	42	0.42	880	SOT-227B miniBLOC
IXYX50N170C		178	50	3.7	160	8.2	0.1	–	–	–	1500	PLUS247
<b>2500V XPT™ Planar IGBTs</b>												
IXYF16N250CV1	2500	26	14	4	236	4.4	0.83	•	9	1.5	180	ISOPLUS i4-PAC™
IXYA12N250CHV		28	12	4.5	138	1.95	0.48	–	–	–	310	TO-263ABHV
IXYH12N250CHV		28	12	4.5	138	1.95	0.48	–	–	–	310	TO-247HV
IXYH12N250CV1HV		28	12	4.5	138	1.95	0.48	•	14	0.8	310	TO-247HV
IXYT12N250CV1HV		28	12	4.5	138	1.95	0.48	•	14	0.8	310	TO-268AAHV
IXYA8N250CHV		29	8	4	128	1.2	0.53	–	–	–	280	TO-263ABHV
IXYH8N250CHV		29	8	4	128	1.2	0.53	–	–	–	280	TO-247HV
IXYH8N250CV1HV		29	8	4	128	1.2	0.53	•	14	0.8	280	TO-247HV
IXYH16N250CV1HV		38	16	4	236	4.4	0.3	•	14	0.8	500	TO-247HV
IXYL40N250CV1		80	40	4	250	11.5	0.26	•	23	0.83	577	ISOPLUS264™
IXYH25N250CHV		95	25	4	350	10.5	0.16	–	–	–	937	TO-247HV
IXYT25N250CHV		95	25	4	350	10.5	0.16	–	–	–	937	TO-268AAHV
IXYX25N250CV1		95	25	4	350	10.5	0.16	•	30	0.32	937	PLUS247
IXYX25N250CV1HV		95	25	4	350	10.5	0.16	•	30	0.32	937	PLUS247 HV
IXYX40N250CHV		154	40	4	250	11.5	0.1	–	–	–	1500	PLUS247 HV

## 900/1200 V XPT™ Planar IGBTs

Part Number	V <sub>CES</sub>	I <sub>C25</sub>	I <sub>C110</sub>	V <sub>CE(sat)</sub>	t <sub>ri</sub> typ.	E <sub>off</sub> typ.	R <sub>thJC</sub>	Diode	I <sub>F110</sub> Diode	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package	
	V	A	A	V	ns	mJ	K/W						A
<b>C3 Class (20–50 kHz Switching)</b>													
IXYA8N90C3D1	900	20	8	2.5	163	0.22	1.2	•	12	2.5	125	TO-263AB	
IXYP8N90C3		20	8	2.5	163	0.22	1.2	–	–	–	125	TO-220AB	
IXYP8N90C3D1		20	8	2.5	163	0.22	1.2	•	12	2.5	125	TO-220AB	
IXYY8N90C3		20	8	2.5	163	0.22	1.2	–	–	–	125	TO-252AA	
IXYH24N90C3		44	24	2.7	130	0.55	0.62	–	–	–	240	TO-247AD	
IXYH24N90C3D1		44	(24)	2.7	130	0.55	0.62	•	15	1.6	200	TO-247AD	
IXYH40N90C3D1		90	40	2.5	150	1.2	0.25	•	25	0.9	500	TO-247AD	
IXYH40N90C3		105	40	2.5	150	1.2	0.25	–	–	–	600	TO-247AD	
IXYN80N90C3H1		115	(70)	2.7	(98)	(2.5)	0.25	•	42	0.42	500	SOT-227B miniBLOC	
IXYH60N90C3		140	60	2.7	(165)	(2.15)	0.2	–	–	–	750	TO-247AD	
IXYH80N90C3		165	80	2.7	(98)	(2.5)	0.18	–	–	–	830	TO-247AD	
IXYT80N90C3		165	80	2.7	(98)	(2.5)	0.18	–	–	–	830	TO-268AA	
IXYK140N90C3		310	140	2.7	(125)	(5)	0.09	–	–	–	1630	TO-264	
IXYX140N90C3		310	140	2.7	(125)	(5)	0.09	–	–	–	1630	PLUS247	
<b>B3 Class (5–30 kHz Switching)</b>													
IXYH40N120B3D1		1200	86	40	2.9	206	2.05	0.26	•	25	0.9	480	TO-247AD
IXYH40N120B3	96		40	2.9	206	2.05	0.26	–	–	–	577	TO-247AD	
IXYN100N120B3H1	165		76	2.6	(260)	(10.1)	0.18	•	42	0.42	690	SOT-227B miniBLOC	
IXYK100N120B3	225		100	2.6	(260)	(10.1)	0.13	–	–	–	1150	TO-264	
IXYX100N120B3	225		100	2.6	(260)	(10.1)	0.13	–	–	–	1150	PLUS247	
IXYK120N120B3	320		120	2.2	(406)	(27.9)	0.1	–	–	–	1500	TO-264	
IXYX120N120B3	320	120	2.2	(407)	(27.9)	0.1	–	–	–	1500	PLUS247		
<b>C3 Class (20–50 kHz Switching)</b>													
IXYH20N120C3D1	1200	36	17	3.4	(105)	(0.7)	0.54	•	23	0.9	230	TO-247AD	
IXYT20N120C3D1HV		36	17	3.4	(105)	(0.7)	0.54	•	23	0.9	230	TO-268AAHV	
IXYA20N120C3HV		40	20	3.4	(105)	(0.7)	0.54	–	–	–	278	TO-263ABHV	
IXYH20N120C3		40	20	3.4	(105)	(0.7)	0.54	–	–	–	278	TO-247AD	
IXYP20N120C3		40	20	3.4	(105)	(0.7)	0.54	–	–	–	278	TO-220AB	
IXYR50N120C3D1		56	(32)	4	(60)	(1.4)	0.43	•	25	0.9	290	ISOPLUS247™	
IXYH30N120C3D1		66	30	4	88	0.9	0.3	•	25	0.9	416	TO-247AD	
IXYH30N120C3		75	30	3.3	(140)	(1.6)	0.3	–	–	–	500	TO-247AD	
IXYP30N120C3		75	30	3.3	(140)	(1.6)	0.3	–	–	–	500	TO-220AB	
IXYH40N120C3D1		80	(40)	3.5	(143)	(2.1)	0.26	•	25	0.9	480	TO-247AD	
IXYH40N120C3		90	40	3.5	(143)	(2.1)	0.26	–	–	–	577	TO-247AD	
IXYH50N120C3D1		90	50**	4	(60)	(1.4)	0.2	•	25	0.9	625	TO-247AD	
IXYH50N120C3		100	50	3.5	60	1.4	0.2	–	–	–	750	TO-247AD	
IXYR100N120C3		104	58	3.5	125	3.55	0.31	–	–	–	484	ISOPLUS247™	
IXYN82N120C3H1		105	46	3.2	95	3.7	0.25	•	42	0.42	500	SOT-227B miniBLOC	
IXYN82N120C3		120	66	3.2	95	3.7	0.25	–	–	–	600	SOT-227B miniBLOC	
IXYN100N120C3H1	134	62	3.5	125	3.55	0.18	•	42	0.42	690	SOT-227B miniBLOC		
IXYN100N120C3	152	86	3.5	125	3.55	0.18	–	–	–	830	SOT-227B miniBLOC		
IXYB82N120C3H1	164	82	3.2	95	3.7	0.12	•	42	0.35	1040	ISOPLUS i4-PACTM		
IXYK100N120C3	188	100	3.5	125	3.55	0.13	–	–	–	–	TO-264		
IXYX100N120C3	188	100	3.5	125	3.55	0.13	–	–	–	–	PLUS247		
IXYH82N120C3	200	82	3.2	95	3.7	0.12	–	–	–	–	TO-247AD		
IXYK120N120C3	240	120	3.2	(120)	(7.2)	0.1	–	–	–	1500	TO-264		
IXYX120N120C3	240	120	3.2	(120)	(7.2)	0.1	–	–	–	1500	PLUS247		
IXYN120N120C3	240	120	3.2	(120)	(7.2)	0.13	–	–	–	1200	SOT-227B miniBLOC		

\*\* TC = 100°C

# IGBT Discrete



## XPT™ IGBT

XPT™ = Xtreme Light Punch Through

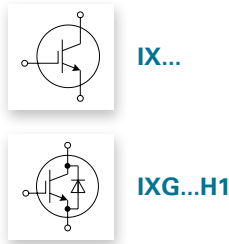
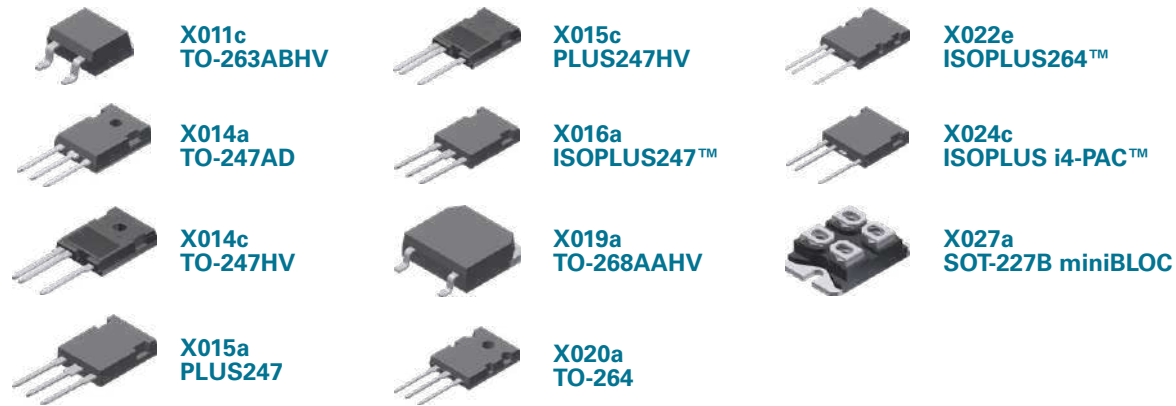
Part Number	V <sub>CES</sub>	I <sub>C25</sub> IGBT T <sub>C</sub> = 25 °C	I <sub>C110</sub> IGBT T <sub>C</sub> = 110 °C	V <sub>CE(sat)</sub> typ. IGBT T <sub>C</sub> = 25 °C	E <sub>off</sub> IGBT T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	Diode	I <sub>F100</sub> Diode T <sub>J</sub> = 100 °C	Package
	V	A	A	V	mJ	K/W		A	
<b>1200 V XPT™ IGBT</b>									
IXA4IF1200UC	1200	9	5	1.8	0.25	2.7	•	6	TO-252AA
IXA4IF1200TC		9	5	1.8	0.25	2.7	•	6	TO-268AA
IXA12IF1200HB		20	13	1.8	1.1	1.5	•	14	TO-247AD
IXA12IF1200PB		20	13	1.8	1.1	1.5	•	14	TO-220AB
IXA12IF1200TC		20	13	1.8	1.1	1.5	•	14	TO-268AA
IXA17IF1200HJ		28	18	1.8	1.7	1.26	•	19	ISOPLUS247™
IXA20IF1200HB		38	22	1.8	1.7	0.76	•	24	TO-247AD
IXA20I1200PB		38	22	1.8	1.7	0.76	–	–	TO-220AB
IXA20I1200PZ		38	22	1.8	1.7	0.76	–	–	TO-263ABHV
IXA27IF1200HJ		43	24	1.8	3	0.84	•	25	ISOPLUS247™
IXA33IF1200HB		58	34	1.8	3	0.5	•	33	TO-247AD
IXA37IF1200HJ		58	33	1.8	4.1	0.64	•	25	ISOPLUS247™
IXA45IF1200HB		78	45	1.8	4.1	0.38	•	33	TO-247AD
IXA55I1200HJ		84	54	1.8	5.5	0.43	–	–	ISOPLUS247™
IXA60IF1200NA		88	56	1.8	5.5	0.43	•	51	SOT-227B miniBLOC
IXA70I1200NA		100	65	1.8	5.5	0.35	–	–	SOT-227B miniBLOC
<b>1200 V Fast Trench IGBT</b>									
ITF48IF1200HR	1200	72	56 (80°C)	2.05	2.4 (150°C)	0.38	•	(80°C) 50	ISO247™
<b>FPO</b>									
IXG70IF1200NA	1200	130	86	1.8	5.3 (150°C)	0.38	•	71	SOT-227B miniBLOC

## 600 V, 1000 V, and 1200 V IGBTs

Part Number	V <sub>CES</sub>	I <sub>C25</sub> T <sub>C</sub> = 25 °C	I <sub>C110</sub> T <sub>C</sub> = 110 °C	V <sub>CE(sat)</sub> max. T <sub>C</sub> = 25 °C	t <sub>fi</sub> typ. T <sub>J</sub> = 125 °C	E <sub>off</sub> typ. T <sub>J</sub> = 125 °C	R <sub>thJC</sub> max.	Diode	I <sub>F110</sub> Diode T <sub>C</sub> = 110 °C	R <sub>thJC</sub> max. Diode	P <sub>C</sub>	Package
	V	A	A	V	ns	mJ	K/W		A	K/W	W	
<b>A4 Class (5–20 kHz Switching)</b>												
IXGH48N60A3D1		75	48	1.35	224	5.6	0.42	•	–	0.9	300	TO-247AD
IXGH72N60A3		75	72	1.35	250	6.5	0.23	–	–	–	540	TO-247AD
IXGT72N60A3		75	72	1.35	250	6.5	0.23	–	–	–	540	TO-268AA
IXGX120N60A3		200	120	1.35	260	10.4	0.16	–	–	–	780	PLUS247
IXGK320N60A3		320	210	1.25	740	na	0.13	–	–	–	1000	TO-264a
IXGN320N60A3		320	170	1.25	740	na	0.17	–	–	–	735	SOT-227B miniBLOC
IXGN400N60A3		400	190	1.25	270	na	0.15	–	–	–	830	SOT-227B miniBLOC
IXGA48N60A3		na	48	1.35	224	5.6	0.42	–	–	–	300	TO-263AB
IXGH48N60A3		na	48	1.35	224	5.6	0.42	–	–	–	300	TO-247AD
IXGP36N60A3		na	36	1.4	325	5.3	0.56	–	–	–	220	TO-220AB
IXGP48N60A3		na	48	1.35	224	5.6	0.42	–	–	–	300	TO-220AB
IXGT32N100A3		75	32	2.2	540	13	0.42	–	–	–	300	TO-268AA
IXGA12N120A3	1200	22	na	3	1035	na	1.25	–	–	–	100	TO-263AB
IXGH12N120A3		22	na	3	1035	na	1.25	–	–	–	100	TO-247AD
IXGP12N120A3		22	na	3	1035	na	1.25	–	–	–	100	TO-220AB
IXGA20N120A3		40	20	2.5	715	10.1	0.69	–	–	–	180	TO-263AB
IXGH20N120A3		40	20	2.5	715	10.1	0.69	–	–	–	180	TO-247AD
IXGP20N120A3		40	20	2.5	715	10.1	0.69	–	–	–	180	TO-220AB
IXGH32N120A3		75	na	2.35	1240	na	0.42	–	–	–	300	TO-247AD
IXGT32N120A3		75	32	2.35	1240	na	0.42	–	–	–	300	TO-268AA
IXGK55N120A3H1		125	55	2.3	282	29	0.27	•	–	0.42	460	TO-264a
IXGX55N120A3H1		125	55	2.3	282	29	0.27	•	–	0.42	460	PLUS247
IXGK120N120A3		240	120	2.2	325	58	0.15	–	–	–	830	TO-264a
IXGX120N120A3		240	120	2.2	325	58	0.15	–	–	–	830	PLUS247
IXGK82N120A3		260	82	2.05	780	22.5	0.1	–	–	–	1250	TO-264a
IXGX82N120A3		260	82	2.05	780	22.5	0.1	–	–	–	1250	PLUS247



# IGBT Discrete



## Very High Voltage NPT IGBTs

2.5 kV – 4.5 kV NPT IGBT

Part Type	V <sub>ce</sub>	I <sub>c25</sub> T <sub>c</sub> = 25 °C	I <sub>c110</sub> T <sub>c</sub> = 90 °C (100 °C) 110 °C	V <sub>CE(sat)</sub> max. T <sub>c</sub> = 25 °C	t <sub>ri</sub> typ. T <sub>J</sub> = 25 °C	E <sub>off</sub> typ. T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	P <sub>c</sub>	Package
	V	A	A	V	ns	mJ	K/W	W	
IXGF20N250	2500	23	[14]	3.1	930	na	1.25	100	ISOPLUS i4-PAC™
IXGA20N250HV		30	12	3.1	930	na	0.83	150	TO-263ABHV
IXGF25N250		30	15	2.9	200	na	1.1	114	ISOPLUS i4-PAC™
IXGH25N250		60	25	2.9	200	na	0.5	250	TO-247AD
IXGT25N250		60	25	2.9	200	na	0.5	250	TO-268AA
IXGT25N250HV		60	25	2.9	200	na	0.5	250	TO-268AAHV
IXGL75N250		110	[65]	2.9	455	na	0.29	430	ISOPLUS264™
IXGK75N250		170	75	2.7	455	na	0.16	780	TO-264
IXGX75N250		170	75	2.7	455	na	0.16	780	PLUS247
IXEL40N400		4000	90	40	3.5	425	205	0.26	380
IXG50I4500KN	4500	74	-42	3.2	1350	73	0.34	368	ISOPLUS264™

## XPT Very High Voltage IGBTs

Part Type	V <sub>ce</sub>	I <sub>c25</sub> T <sub>c</sub> = 25 °C	I <sub>c110</sub> T <sub>c</sub> = 90 °C (100 °C) 110 °C	V <sub>CE(sat)</sub> max. T <sub>c</sub> = 25 °C	t <sub>ri</sub> typ. T <sub>J</sub> = 25 °C	E <sub>off</sub> typ. T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	P <sub>c</sub>	Package
	V	A	A	V	ns	mJ	K/W	W	
IXYF30N450	4500	23	17	3.9	1220	na	0.54	230	ISOPLUS i4-PAC™
IXYT30N450HV		60	30	3.9	1220	na	0.29	430	TO-268AAHV
IXYF40N450		60	32	3.9	1120	na	0.43	290	ISOPLUS i4-PAC™
IXYH30N450HV		60	30	3.9	1220	na	0.29	430	TO-247HV
IXYL60N450		90	38	3.3	1360	na	0.3	417	ISOPLUS264™
IXYX40N450HV		95	40	3.9	1120	na	0.19	660	PLUS247HV
IXG20I3300FB	3300	48	20	3.0	480	6.1	0.50	250	ISOPLUS i4-PAC™
IXYF30N400	4000	39	16	5.5	250	na	0.66	190	ISOPLUS i4-PAC™
IXYF20N400C		29	13	4.2	190	na	0.66	190	ISOPLUS i4-PAC™
IXYF30N400V1		39	16	3.3	250	na	0.66	190	ISOPLUS i4-PAC™

## Reverse Conducting IGBTs (BiMOSFET™) 1.7 kV–2.5 kV

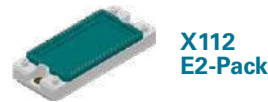
Part Number	V <sub>ce</sub>	I <sub>c25</sub> T <sub>c</sub> = 25 °C	I <sub>c</sub> T <sub>c</sub> = 110 °C	V <sub>CE(sat)</sub> typ. max. T <sub>c</sub> = 25 °C	Q <sub>g</sub> typ.	t <sub>i</sub> (t <sub>ri</sub> ) typ. T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	Package	
	V	A	A	V	ns	mJ	K/W		
IXBH6N170	1700	12	6	2.84	17	600	1.65	TO-247AD	
IXBT6N170		12	6	2.84	17	600	1.65	TO-268AA	
IXBA16N170AHV		16	10	-	65	-	0.83	TO-263ABHV	
IXBH16N170A		16	10	-	65	-	0.83	TO-247AD	
IXBT16N170A		16	10	-	65	-	0.83	TO-268AA	
IXBT16N170AHV		16	10	-	65	-	0.83	TO-268AAHV	
IXBH10N170		20	10	3.4	30	-	0.89	TO-247AD	
IXBT10N170		20	10	3.4	30	-	0.89	TO-268AA	
IXBN42N170A		38	21	5.2	188	-	0.4	SOT-227B miniBLOC	
IXBH16N170		40	16	-	72	705	0.5	TO-247AD	
IXBH42N170A		42	21	5.2	188	-82	0.35	TO-247AD	
IXBT42N170A		42	21	5.2	188	-82	0.35	TO-268AA	
IXBR42N170		57	32	-	188	740	0.62	ISOPLUS247™	
IXBH24N170		60	24	-	140	960	0.5	TO-247AD	
IXBT24N170		60	24	-	140	960	0.5	TO-268AA	
IXBH42N170		80	42	-	188	740	0.35	TO-247AD	
IXBT42N170		80	42	-	188	740	0.35	TO-268AA	
IXBX75N170A		110	65	4.95	358	-175	0.12	PLUS247	
IXBN75N170		145	75	2.6	350	580	0.2	SOT-227B miniBLOC	
IXBK75N170		200	75	2.6	350	580	0.12	TO-264	
IXBX75N170		200	75	2.6	350	580	0.12	PLUS247	
IXCH36N250		2500	73	36	2.6	177	900	0.21	TO-247AD
IXCK36N250			73	36	2.6	177	900	0.21	TO-264
IXBL64N250			116	46	2.5	400	175	0.25	ISOPLUS264™
IXBK64N250			156	64	2.5	400	175	0.17	TO-264
IXBX64N250			156	64	2.5	400	175	0.17	PLUS247
IXBX64N250			156	64	2.5	400	175	0.17	PLUS247

## Reverse Conducting IGBTs (BiMOSFET™) 3 kV

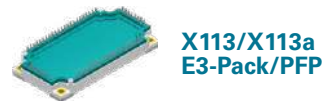
Part Number	V <sub>ce</sub>	I <sub>c25</sub> T <sub>c</sub> = 25 °C	I <sub>c</sub> T <sub>c</sub> = 110 °C	V <sub>CE(sat)</sub> typ. max. T <sub>c</sub> = 25 °C (110 °C)	Q <sub>g</sub> typ.	t <sub>i</sub> (t <sub>ri</sub> ) typ. T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	Package
	V	A	A	V	ns	mJ	K/W	
IXBH10N300	3000	30	10	2.8	45	1030	0.69	TO-247AD
IXBA10N300HV		34	10	2.2	46	2010	0.69	TO-263ABHV
IXBH10N300HV		34	10	2.2	46	2010	0.69	TO-247HV
IXBF22N300		38	22	2.2	110	1650	0.83	ISOPLUS i4-PAC™
IXBA14N300HV		38	14	2.2	62	1730	0.62	TO-263ABHV
IXBH14N300HV		38	14	2.2	62	1730	0.62	TO-247HV
IXBF32N300		40	22	2.8	142	630	0.78	ISOPLUS i4-PAC™
IXBF42N300		60	24	2.5	200	490	0.52	ISOPLUS i4-PAC™
IXBT22N300HV		60	22	2.2	110	1650	0.43	TO-268AAHV
IXBH22N300HV		60	22	2.2	110	1650	0.43	TO-247HV
IXBX28N300HV		62	28	2.3	110	3280	0.36	PLUS247HV
IXBH32N300		80	32	2.8	142	630	0.31	TO-247AD
IXBH32N300HV		80	32	2.8	142	630	0.31	TO-247HV
IXBT32N300HV		80	32	2.8	142	630	0.31	TO-268AAHV
IXBF55N300		86	34	2.7	335	260	0.35	ISOPLUS i4-PAC™
IXBH42N300HV		104	42	2.5	200	490	0.25	TO-247HV
IXBT42N300HV		104	42	2.5	200	490	0.25	TO-268AAHV
IXBK55N300		130	55	2.7	335	260	0.2	TO-264
IXBX55N300		130	55	2.7	335	260	0.2	PLUS247



# IGBT Modules



X112  
E2-Pack



X113/X113a  
E3-Pack/PFP

## Six-Pack IGBT Modules in E2 Housings

Part Number	V <sub>CES</sub>	I <sub>C25</sub> IGBT T <sub>C</sub> = 25 °C	I <sub>C80</sub> IGBT T <sub>C</sub> = 80 °C	V <sub>CE(sat)</sub> typ. IGBT T <sub>J</sub> = 25 °C	E <sub>off</sub> IGBT T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	I <sub>F25</sub> Diode T <sub>C</sub> = 25 °C	I <sub>F80</sub> Diode T <sub>C</sub> = 80 °C	NTC	Layout	Package
	V	A	A	V	mJ	K/W	A	A			
<b>1200 V XPT™ IGBT</b>											
MIXA30W1200TED <sup>1</sup>	1200	43	30	1.8	3	0.84	44	29	•	B	E2-Pack
MIXA40W1200TED <sup>1</sup>		60	40	1.8	4.1	0.64	44	29	•	B	
MIXA41W1200ED <sup>1</sup>		60	40	1.8	4.1	0.64	44	29	-	A	
MIXA60W1200TED <sup>1</sup>		85	60	1.8	5.5	0.43	88	59	•	B	
MIXA80W1200TED <sup>1</sup>		120	84	1.8	8.3	0.32	135	90	•	B	
MIXA80W1200PTED <sup>1,2</sup>		120	84	1.8	8.3	0.32	135	90	•	B	

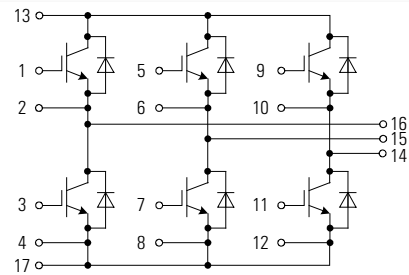
<sup>1</sup> Options: PressFit-Pin version and phase change material; please contact IXYS sales office for availability  
<sup>2</sup> PressFit-Pins version

## Six-Pack IGBT Modules in E3 Housings

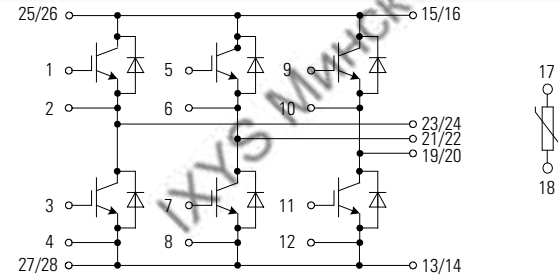
Part Number	V <sub>CES</sub>	I <sub>C25</sub> IGBT T <sub>C</sub> = 25 °C	I <sub>C80</sub> IGBT T <sub>C</sub> = 80 °C	V <sub>CE(sat)</sub> typ. IGBT T <sub>J</sub> = 25 °C	E <sub>off</sub> IGBT T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	I <sub>F25</sub> Diode T <sub>C</sub> = 25 °C	I <sub>F80</sub> Diode T <sub>C</sub> = 80 °C	NTC	Layout	Package	
	V	A	A	V	mJ	K/W	A	A				
<b>1200 V XPT™ IGBT</b>												
MIXA80W1200TEH <sup>1</sup>	1200	120	84	1.8	8.3	0.32	135	90	•	C	E2-Pack	
MIXA100W1200TEH <sup>1</sup>		155	108	1.8	11	0.25	135	90	•	C		
MIXA150W1200TEH <sup>1</sup>		220	150	1.8	16	0.18	190	130	•	C		
<b>1200 V X2PT™ IGBT</b>												
MIXG120W1200TEH <sup>1</sup>	1200	185	140	1.7	8.2 (150°C)	0.3	180	135	•	C	E2-Pack	
MIXG180W1200TEH <sup>1</sup>		260	195	1.7	14.7 (150°C)	0.18	230	170	•	C		
MIXG180W1200PTEH <sup>2</sup>		260	195	1.7	14.7 (150°C)	0.18	230	170	•	C		E3-Pack/PFP
MIXG240W1200TEH <sup>1</sup>		312	233	1.7	20.5 (150°C)	0.16	200	144	•	C		E2-Pack
<b>1200 V X2PT™ IGBT and Shunt Resistor</b>												
MIXG240W1200PZTEH <sup>2</sup>	1200	312	233	1.7	20.5 (150°C)	0.16	189	136	•	D	E3-Pack/PFP	
MIXG240W1200PZTEH-PC <sup>2,3</sup>		312	233	1.7	20.5 (150°C)	0.16	189	136	•	D		

<sup>1</sup> Options: PressFit-Pin version and phase change material; please contact IXYS sales office for availability  
<sup>2</sup> PressFit-Pins version  
<sup>3</sup> Phase-change material (PCM)

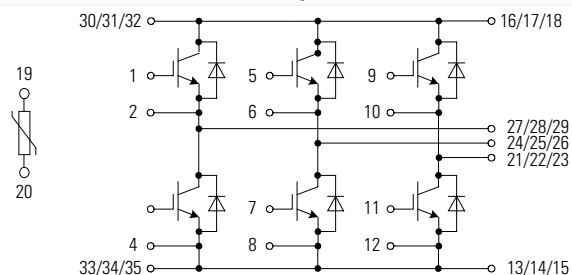
Layout A



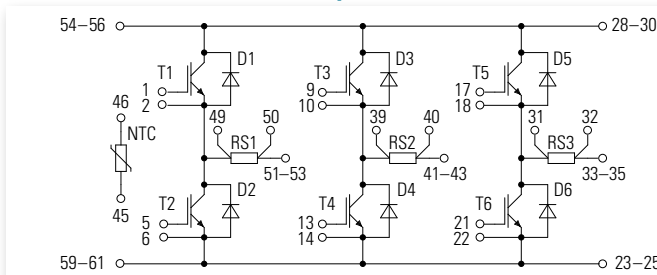
Layout B



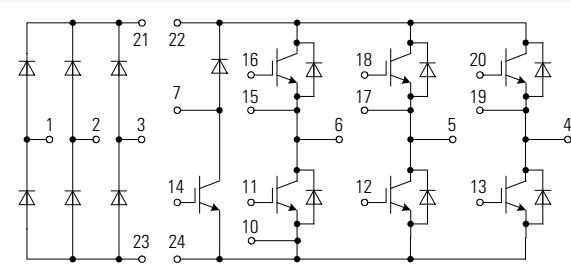
Layout C



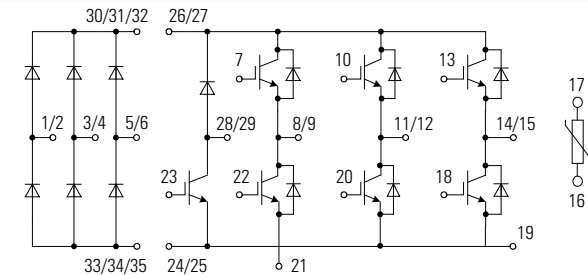
Layout D



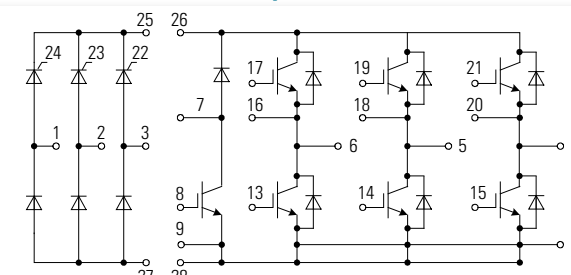
Layout E



Layout F



Layout G



## CBI IGBT Modules in E3-Pack

Part Number	Rectifier 3 Phase			Inverter 3 Phase				Brake chopper			Layout	Package	
	V <sub>RRM</sub>	I <sub>DAVM</sub> T <sub>C</sub> = 80 °C	R <sub>thJC</sub> typ.	V <sub>CES</sub>	I <sub>C</sub> T <sub>C</sub> = 25 °C	I <sub>C</sub> T <sub>C</sub> = 80 °C	V <sub>CE(sat)</sub> typ.	R <sub>thJC</sub> typ.	V <sub>CES</sub>	I <sub>C</sub> T <sub>C</sub> = 80°C			R <sub>thJC</sub> typ.
	V	A	K/W	V	A	A	V	K/W	V	A	K/W		
<b>1200 V XPT™ IGBT</b>													
MIXA60WB1200TEH	1600	190	0.65	1200	85	60	1.8	0.43	1200	40	0.64	E	E3-Pack
MIXA60WH1200TEH <sup>1</sup>		135	0.65		85	60	1.8	0.43		40	0.64	G	E3-Pack
MIXA80WB1200TEH		265	0.5		120	84	1.8	0.32		40	0.64	E	E3-Pack
MIXA81WB1200TEH		290	0.45		120	84	1.8	0.32		60	0.43	F	E3-Pack
<b>1700 V Trench IGBT</b>													
MUBW50-17T8	2200	130	1.1	1700	74	53	2	0.49	1700	34	0.62	E	E3-Pack
MUBW50-17T8-PFPC <sup>2</sup>		130	1.1		74	53	2	0.49		34	0.62	E	E3-Pack/PFP
MUBW75-17T8		155	0.95		113	80	2	0.28		34	0.62	E	E3-Pack
MUBW75-17T8-PFPC <sup>2</sup>		155	0.95		113	80	2	0.28		34	0.62	E	E3-Pack/PFP

<sup>1</sup> Input rectifier half-controlled; <sup>2</sup> with PressFit-Pins and pre-applied phase change material;  
**Options:** PressFit-Pins version and phase change material; please contact the IXYS sales office for availability.

## CBI IGBT Modules in E2-Pack

Part Number	Rectifier 3 Phase			Inverter 3 Phase				Brake Chopper			Layout	Package	
	V <sub>RRM</sub>	I <sub>DAVM</sub> T <sub>C</sub> = 80°C	R <sub>thJC</sub> typ.	V <sub>CES</sub>	I <sub>C</sub> T <sub>C</sub> = 25 °C	I <sub>C</sub> T <sub>C</sub> = 80 °C	V <sub>CE(sat)</sub> typ.	R <sub>thJC</sub> typ.	V <sub>CES</sub>	I <sub>C</sub> T <sub>C</sub> = 80°C			R <sub>thJC</sub> typ.
	V	A	K/W	V	A	A	V	K/W	V	A	K/W		
<b>1200 V XPT™ IGBT</b>													
MIXA10WB1200TED	1600	105	1.1	1200	17	12	1.8	2	1200	12	2	E	E2-Pack
MIXA20WB1200TED		105	1.1		28	20	1.8	1.26		12	2		
MIXA30WB1200TED		105	1.1		43	30	1.8	0.84		12	2		
MIXA40WB1200TED		105	1.1		50	40	1.8	0.64		20	1.26		

# IGBT Modules



## IGBT XPT™ Modules in SimBus F Package

- Saves space
- Reduced protection circuits
- Package is designed for wave soldering
- PressFit-Pins version is available



Part Number	V <sub>CES</sub>	I <sub>C80</sub> IGBT T <sub>C</sub> = 80 °C	V <sub>CE(sat)</sub> typ. IGBT T <sub>J</sub> = 25 °C	E <sub>on</sub> IGBT T <sub>J</sub> = 125 °C	E <sub>off</sub> IGBT T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	I <sub>F80</sub> Diode T <sub>C</sub> = 80 °C	R <sub>thJC</sub> Diode	Package
	V	A	V	mJ	mJ	K/W	A	K/W	
<b>XPT™ / X2PT™ IGBT Phase Leg</b>									
MIXA225PF1200TSF	1200	250	1.8	20	27	0.115	185	0.145	Simbus F
MIXA300PF1200TSF		325	1.8	20	42	0.085	185	0.145	
MIXA450PF1200TSF		450	1.8	22	68	0.06	265	0.095	

Options: PressFit-Pins version and phase-change material; please contact the IXYS sales office for availability

## Brake Buck Boost Chopper IGBT Modules



Part Number	V <sub>CES</sub>	I <sub>C25</sub> IGBT T <sub>C</sub> = 25 °C	I <sub>C80</sub> IGBT T <sub>C</sub> = 80 °C	V <sub>CE(sat)</sub> typ. IGBT T <sub>J</sub> = 25 °C	E <sub>off</sub> IGBT T <sub>J</sub> = 125 °C	R <sub>thJC</sub> IGBT	I <sub>F25</sub> Diode T <sub>C</sub> = 25 °C	I <sub>F80</sub> Diode T <sub>C</sub> = 80 °C	Package
	V	A	A	V	mJ	K/W	A	A	
<b>X2PT™ IGBT Brake</b>									
MIXG240RF1200TED <sup>1</sup>	1200	335	250	1.7	23 (150°C)	0.12	265	195	E2-Pack
MIXG240RF1200PTED <sup>2</sup>		335	250	1.7	23 (150°C)	0.12	265	195	E2-Pack PFP
MIXG240RF1200PTED-PC <sup>2,3</sup>		335	250	1.7	23 (150°C)	0.12	265	195	E2-Pack
MIXG360RF1200TED <sup>1</sup>		532	400	1.7	30 (150°C)	0.08	390	285	E2-Pack PFP
MIXG360RF1200PTED-PC <sup>2,3</sup>	532	400	1.7	30 (150°C)	0.08	390	285	E2-Pack PFP	
<b>Trench IGBT Brake</b>									
MITA300RF1700PTED <sup>2</sup>	1700	450	310	1.7	34	0.09	390	285	E2-Pack PFP
MITA300RF1700PTED-PC <sup>2,3</sup>	450	310	1.7	34	0.09	390	285		
<b>XPT™ IGBT Brake Boost Chopper</b>									
MIXA80R1200VA	1200	120	84	1.9	8,3	0.32	135	90	V1-A-Pack
MIXA150R1200VA		220	150	1.8	16	0.18	190	130	
<b>XPT™ IGBT Buck Chopper</b>									
MIXA150Q1200VA	1200	220	150	1.8	16	0.18	190	130	V1-A-Pack
<b>XPT™ IGBT Buck Boost Switched Reluctance Chopper</b>									
MIXA60HU1200VA	1200	85	60	1.8	5.5	0.43	88	59	V1-A-Pack

<sup>1</sup> Options: PressFit-Pins version and/or phase-change material; please contact the IXYS sales office for availability  
<sup>2</sup> PressFit-Pins version  
<sup>3</sup> Phase-change material (PCM)

# Power MOSFET

The metal oxide semiconductor field effect transistor (MOSFET) is used for high-frequency switching control of power electronic systems. IXYS offers various MOSFET technologies based on the customer requirement for voltage, and switching frequency. Here is a graphical representation of our basic MOSFET offerings:

R<sub>DS(on)</sub> and Blocking Voltage Ranges per MOSFET Technology



### Trench and TrenchT2™ Power MOSFET

IXYS Trench Power MOSFETs are ideally suited for low-voltage, high-current applications. These MOSFETs feature an exceptionally low R<sub>DS(on)</sub>, thus guaranteeing low power dissipation. Trench HiPerFET™ versions feature all of the advantages presented by IXYS's Trench Standard Power MOSFET with the added benefit of a fast intrinsic rectifier that provides low reverse recovery charge (Q<sub>rr</sub>) and excellent commutating dV/dt ratings for enhanced power switching capabilities and device ruggedness.

### Polar™ Power MOSFET

Polar™ MOSFETs (IXT.) feature a proprietary cell design and process that has resulted in a MOSFET with a 30% reduction in R<sub>DS(on)</sub> per unit area along with a decrease in gate charge. IXYS also reduces the wafer thickness, which substantially reduces the thermal resistance. The combination of lower R<sub>DS(on)</sub>, lower gate charge Q<sub>g</sub>, and higher power dissipation capability has resulted in a new class of MOSFET that will increase the cost effectiveness in switch mode power supply (SMPS) applications.

IXYS's Polar™ HiPerFETs™ (IXF.) combine the strengths of the Polar Standard product family with a faster body diode, whose reverse recovery time (t<sub>rr</sub>) is reduced, making them suitable for phase-shift bridges, motor control, and uninterruptible power supply applications (UPS). This family of HiPerFETs™ provides the lowest R<sub>DS(on)</sub>, low R<sub>thJC</sub>, low Q<sub>g</sub>, and enhanced DV/DT capability.

### PolarP2™ Power MOSFET

PolarP2™ devices represent an optimized range of the standard Polar platform for 500V device ratings.

### PolarP3™ HiPerFET™ Power MOSFET

The PolarP3™ HiPerFET™ product family is the latest addition to IXYS's benchmark high-performance Polar-Series product line for our product portfolio between 500 V and 600 V. Its high figure of merit (FOM), the multiplication of Q<sub>g</sub> and in R<sub>DS(on)</sub>, provides an excellent alternative to weaker super junction technologies. All IXYS Polar MOSFET are 100% tested for avalanche energy, proving that it is the industry standard for reliability and ruggedness.

### Ultrajunction Technology Power MOSFET

These devices are developed charge compensation principles and proprietary process technology, resulting in Power MOSFET having significantly reduced resistance R<sub>DS(on)</sub> and gate charge Q<sub>g</sub>. They also exhibit superior dv/dt capability and avalanche performance. The Ultrajunction family of power MOSFETs is available in four generations of technology, namely X, X2, X3 and X4, depending on voltage class. They are designed for applications such as switched mode and resonant mode power supplies, DC-DC converters, PFC circuits, AC and DC motor drives, and robotic and servo control. These MOSFETs enable higher efficiency, along with high power density and cooler system performance. The X-, X2-, and X3-Class Power MOSFETs are also available with fast body diodes (HiPerFET™).

### Q3-Class HiPerFET™ MOSFET

Q3-Class HiPerFET™ MOSFETs (identified by the suffix letter Q3) are the direct result of a revolutionary new chip design that decreases the MOSFET total gate charge (Q<sub>g</sub>) and the Miller capacitance (C<sub>rss</sub>) while maintaining the ruggedness and fast-switching intrinsic diode of the company's current HiPerFET™ product line. The result is a MOSFET with dramatically improved switching efficiencies, thus enabling higher frequency operation and smaller power supplies.

## Extended FBSOA Linear Power MOSFET

IXYS's Extended FBSOA Linear Power MOSFETs are a class of rugged Power MOSFETs tailored specifically for applications that require Power MOSFETs to operate in their current saturation region. These new devices feature low static drain to source on-resistances and provide unparalleled performance and reliability in controlled current output applications. Typical applications that stand to benefit from this new class of extended FBSOA power MOSFETs include circuit breakers, current sources, programmable loads, power controllers, power regulators, motor control, power amplifiers, and soft start applications. In the linear mode, power MOSFETs are subjected to high thermo-electrical stress caused by the simultaneous occurrence of high drain voltage and current, resulting in high power dissipation. IXYS has optimized the internal structure of these MOSFETs, achieving an extended forward bias safe operating area (FBSOA) capability to overcome the limitations posed by conventional power MOSFETs operating in current saturation regions. These extended FBSOA Power MOSFETs are not intended for high-speed switching applications.

## Depletion-Mode MOSFET

Depletion-Mode Power MOSFETs operate in a "normally-on" mode that does not require energy or gate voltage to turn on. Unlike the regular enhancement type MOSFETs, these Depletion-Mode MOSFETs require a negative gate bias to turn off. Consequently, they remain at or above zero gate bias voltage; otherwise, however, they have similar MOSFET characteristics. The "normally-on" operational mode of these devices, combined with an enhanced linear operating capability, allows for ideal device selection in terms of current sources, current regulators, solid-state relays, level shifting, active loads, start-up circuits, and active power filters. Since these devices require no energy or gate voltage to turn on, high energy efficiency can be achieved through device implementation in zero power, "normally on" load switch applications. Given the high degree of current regulation, these devices can also act as active inductors with high dynamic impedance in power filter applications to limit the voltage, current noise, and spikes. Furthermore, these devices can provide active circuit protection to limit the surge of current during short circuits or overload conditions.

## PolarP™ P-Channel Power MOSFET

IXYS's Polar technology platform, employed in our PolarP™ P-Channel MOSFETs, uses a proprietary cell design that improves overall device efficiency and performance. This technology platform reduces on-state resistance by as much as 30% and gate charge by 40% compared to legacy counterparts. With such low on-state resistances, these devices offer low conduction and switching losses and low input capacitance. The combination of low  $R_{DS(on)}$  and gate

charge allows for improved energy efficiency. These P-Channel MOSFETs are dynamic dV/dt and avalanche-rated, making them extremely rugged in demanding operating environments and can easily be paralleled due to an on-state resistance with a positive temperature coefficient. These are ideal for "high-side" switching in which a simple drive circuit referenced to ground can be used, circumventing additional "high-side" driver circuitry commonly involved in the use of N-Channel MOSFETs. This will help designers reduce component count and improve reliability. Furthermore, it allows for the design of a complementary power output stage with a corresponding IXYS N-Channel MOSFET for a power half-bridge stage with a simple drive circuit.

## TrenchP™ P-Channel Power MOSFET

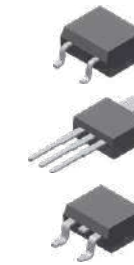
This family of P-Channel devices benefits from technological advances derived from IXYS' robust trench cell design commonly implemented in their wide portfolio of industry-recognized power devices. They feature an ultra low  $R_{DS(on)}$ , minimizing conduction losses and promoting improved operating and thermal efficiencies. These TrenchP™ P-Channel MOSFETs are suitable for "high-side" switching in which a simple drive circuit referenced to ground can be employed, circumventing additional "high-side" driver circuitry commonly involved in the use of an N-Channel MOSFET. This enables designers to reduce component count, thereby improving drive circuit simplicity and cost structure. Furthermore it allows for the design of a complementary power output stage with a corresponding IXYS N-Channel MOSFET for a power half-bridge stage with a simple drive circuit. Common applications that will greatly benefit from these devices include high side Switching, high current regulators, DC Choppers, CMOS high power amplifiers, push-pull amplifiers and power solid state relays.

## Very High Voltage Power MOSFET

IXYS' VHV N-Channel Power MOSFETs are specifically designed to address demanding, fast-switching applications requiring blocking capabilities of 2.5kV to 4.5kV. These VHV Power MOSFETs are also ideally suited for parallel operation due to the positive temperature coefficient of their on-state resistance. Parallel operation with these devices provides a more cost-effective solution than employing series-connected, lower-voltage MOSFET. The reduction or replacement of multiple series-connected devices and the associated gate drive circuitry commonly involved simplifies design, improves reliability, and reduces over-all system costs.

These VHV MOSFETs are an optimal solution in applications such as laser and x-ray generation systems, high-voltage power supplies, pulse circuits, high voltage automated test equipment, and capacitor discharge circuits. 4.5kV device offerings feature high isolation capability with superior thermal performance.

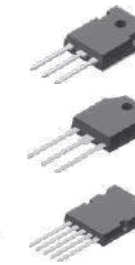
## Trench Power MOSFET



X004  
TO-252AA

X005a  
TO-220AB

X011b  
TO-263AB



X014a  
TO-247AD

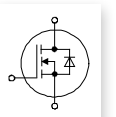
X017a  
TO-3P

X022c  
ISOPLUS264™



X024d  
ISOPLUS i4-PAC™

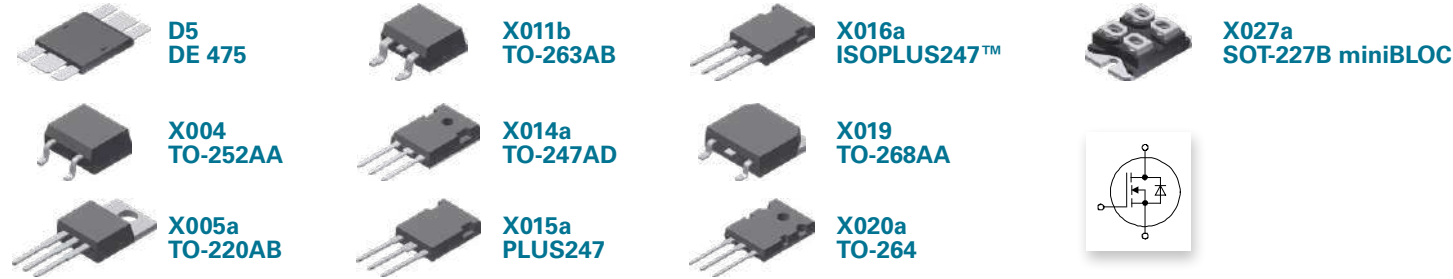
X027a  
SOT-227B miniBLOC



Part Number	$V_{DSS}$	$I_{D(cont)}$ Chip	$R_{DS(on)}$	$C_{iss}$ typ.	$Q_g$ typ.	$t_r$ typ.	$R_{thJC}$	$P_D$	Package
	V	$T_C = 25^\circ C$	$T_J = 25^\circ C$	pF	nC	ns	K/W	W	
IXTP44N10T	100	44	0.03	1567	27.4	60	1.15	130	TO-220AB
IXTY44N10T		44	0.03	1567	27.4	60	1.15	130	TO-252AA
IXTP60N10T		60	0.018	2650	49	59	0.85	176	TO-220AB
IXTA60N10T		60	0.018	2650	49	59	0.85	176	TO-263AB
IXTQ60N10T		60	0.018	2650	49	59	0.85	176	TO-3P
IXTP80N10T		80	0.014	3040	60	100	0.65	230	TO-220AB
IXTF200N10T		90	0.007	9400	152	76	0.96	156	ISOPLUS i4-PAC™
IXTP130N10T		130	0.0091	5080	104	67	0.42	360	TO-220AB
IXTH130N10T		130	0.0091	5080	104	67	0.42	360	TO-247AD
IXTA130N10T		130	0.0091	5080	104	67	0.42	360	TO-263AB
IXTQ130N10T		130	0.0091	5080	104	67	0.42	360	TO-3P
IXTP180N10T		180	0.0064	6900	151	72	0.31	480	TO-220AB
IXTH180N10T		180	0.0064	6900	151	100	0.31	480	TO-247AD
IXTA180N10T		180	0.0064	6900	151	72	0.31	480	TO-263AB
IXTQ180N10T	180	0.0064	6900	151	100	0.31	480	TO-3P	
IXTP200N10T	200	0.0055	9400	152	76	0.3	550	SOT-227B miniBLOC	
IXTH200N10T	200	0.0055	9400	152	76	0.27	550	TO-247AD	
IXTQ200N10T	200	0.0055	9400	152	76	0.27	550	TO-3P	
IXTP48N20T	200	48	0.05	3090	60	130	0.5	250	TO-220AB
IXTA48N20T		48	0.05	3090	60	130	0.5	250	TO-263AB
IXTQ48N20T		48	0.05	3090	60	130	0.5	250	TO-3P
IXTP60N20T		60	0.04	4530	73	118	0.3	500	TO-220AB
IXTA60N20T		60	0.04	4530	73	118	0.3	500	TO-263AB
IXTQ60N20T		60	0.04	4530	73	118	0.3	500	TO-3P
IXTP86N20T		86	0.029	4500	90	140	0.31	480	TO-220AB
IXTA86N20T		86	0.029	4500	90	140	0.31	480	TO-263AB
IXTQ86N20T		86	0.029	4500	90	140	0.31	480	TO-3P
IXTH130N20T		130	0.016	8800	150	150	0.18	830	TO-247AD
IXTP50N25T		50	0.06	4000	78	166	0.31	400	TO-220AB
IXTH50N25T		50	0.06	4000	78	166	0.31	400	TO-247AD
IXTA50N25T		50	0.06	4000	78	166	0.31	400	TO-263AB
IXTQ50N25T		50	0.06	4000	78	166	0.31	400	TO-3P
IXTP76N25T	76	0.039	4920	92	148	0.27	460	TO-220AB	
IXTH76N25T	76	0.039	4920	92	148	0.27	460	TO-247AD	
IXTA76N25T	76	0.039	4920	92	148	0.27	460	TO-263AB	
IXTQ76N25T	76	0.039	4920	92	148	0.27	460	TO-3P	
IXTH86N25T	86	0.037	5330	105	156	0.23	540	TO-247AD	
IXTQ86N25T	86	0.037	5330	105	156	0.23	540	TO-3P	
IXTH96N25T	96	0.029	6100	114	158	0.2	625	TO-247AD	
IXTQ96N25T	96	0.029	6100	114	158	0.2	625	TO-3P	
IXTH110N25T	110	0.024	9400	157	170	0.18	694	TO-247AD	



# Power MOSFET



## Trench HiPerFET™ MOSFET with Fast Intrinsic Diode

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25°C	R <sub>DS(on)</sub> T <sub>J</sub> = 25°C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> max (typ.)	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
IXFA130N10T	100	130	0.0091	5080	104	67	0.42	360	TO-263AB
IXFP130N10T		130	0.0091	5080	104	67	0.42	360	TO-220AB
IXFH230N10T		230	0.0047	15300	250	-82	0.23	650	TO-247AD
IXFX360N10T		360	0.0029	33000	525	130	0.12	1250	PLUS247
IXFN360N10T		360	0.0026	33000	525	130	0.18	830	SOT-227B miniBLOC
IXFK360N10T		360	0.0029	33000	525	130	0.12	1250	TO-264
IXFX420N10T		420	0.0026	47000	670	140	0.09	1670	PLUS247
IXFN420N10T		420	0.0023	47000	670	140	0.14	1070	SOT-227B miniBLOC
IXFK420N10T		420	0.0026	47000	670	140	0.09	1670	TO-264
IXFA102N15T		150	102	0.018	5220	87	120	0.33	455
IXFH102N15T	102		0.018	5220	87	120	0.33	455	TO-247AD
IXFP102N15T	102		0.018	5220	87	120	0.33	455	TO-220AB
IXFH160N15T	160		0.0096	8800	160	90	0.18	830	TO-247AD
IXFH150N20T	150		0.015	11700	177	-100	0.14	890	TO-247AD
IXFT150N20T	150	0.015	11700	177	-100	0.14	890	TO-268AA	
IXFR230N20T	200	156	0.008	28000	378	200	0.25	600	ISOPLUS247™
IXFX170N20T		170	0.011	19600	265	200	0.13	1150	PLUS247
IXFK170N20T		170	0.011	19600	265	200	0.13	1150	TO-264
IXFN230N20T		220	0.0075	28000	378	200	0.138	1090	SOT-227B miniBLOC
IXFX230N20T		230	0.0075	28000	378	200	0.09	1670	PLUS247
IXFK230N20T	230	0.0075	28000	378	200	0.9	1670	TO-264	
IXFZ140N25T	250	100	0.017	19000	255	200	0.28	445	DE 475
IXFH110N25T		110	0.024	9400	157	170	0.18	694	TO-247AD
IXFH120N25T		120	0.023	11300	180	-108	0.14	890	TO-247AD
IXFT120N25T		120	0.023	11300	180	-108	0.14	890	TO-268AA
IXFN140N25T		120	0.017	19000	255	200	0.18	690	SOT-227B miniBLOC
IXFX140N25T		140	0.017	19000	255	200	0.13	960	PLUS247
IXFK140N25T		140	0.017	19000	255	200	0.13	960	TO-264
IXFN180N25T		168	0.0129	23800	364	200	0.138	900	SOT-227B miniBLOC
IXFX180N25T		180	0.0129	23800	364	200	0.09	1390	PLUS247
IXFK180N25T		180	0.0129	23800	364	200	0.09	1390	TO-264
IXFH46N30T	300	46	0.08	4770	86	150	0.27	460	TO-247AD
IXFT46N30T		46	0.08	4770	86	150	0.27	460	TO-268AA
IXFH86N30T		86	0.043	11300	180	150	0.15	830	TO-247AD
IXFT86N30T		86	0.043	11300	180	150	0.15	830	TO-268AA
IXFH94N30T		94	0.036	11400	190	-155	0.14	890	TO-247AD
IXFT94N30T		94	0.036	11400	190	-155	0.14	890	TO-268AA
IXFX120N30T		120	0.024	20000	265	200	0.13	960	PLUS247
IXFK120N30T		120	0.024	20000	265	200	0.13	960	TO-264
IXFN160N30T		130	0.019	28000	335	200	0.138	900	SOT-227B miniBLOC
IXFX160N30T		160	0.019	28000	335	200	0.09	1390	PLUS247
IXFK160N30T	160	0.019	28000	335	200	0.09	1390	TO-264	

## Trench HiPerFET™ MOSFET with Fast Intrinsic Diode

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25°C	R <sub>DS(on)</sub> T <sub>J</sub> = 25°C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> max (typ.)	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTP100N04T2	40	100	0.007	2690	25,5	34	1	150	TO-220AB	
IXTA100N04T2		100	0.007	2690	25,5	34	1	150	TO-263AB	
IXTP120N04T2		120	0.0061	3240	58	35	0.75	200	TO-220AB	
IXTA120N04T2		120	0.0061	3240	58	35	0.75	200	TO-263AB	
IXTP160N04T2		160	0.005	4640	79	40	0.6	250	TO-220AB	
IXTA160N04T2		160	0.005	4640	79	40	0.6	250	TO-263AB	
IXTP220N04T2		220	0.0035	6820	112	45	0.42	360	TO-220AB	
IXTA220N04T2		220	0.0035	6820	112	45	0.42	360	TO-263AB	
IXTP300N04T2		300	0.0025	10700	145	53	0.31	480	TO-220AB	
IXTH300N04T2		300	0.0025	10700	145	53	0.31	480	TO-247AD	
IXTA300N04T2		300	0.0025	10700	145	53	0.31	480	TO-263AB	
IXTH420N04T2		420	0.002	19700	315	74	0.16	935	TO-247AD	
IXTH500N04T2		500	0.0016	25000	405	84	0.15	1000	TO-247AD	
IXTT500N04T2		500	0.0016	25000	405	84	0.15	1000	TO-268AA	
IXTX600N04T2		600	0.0015	40000	590	100	0.12	1250	PLUS247	
IXTN600N04T2		600	0.0011	40000	590	100	0.16	940	SOT-227B miniBLOC	
IXTK600N04T2		600	0.0015	40000	590	100	0.12	1250	TO-264	
IXTA90N055T2		55	90	0.0084	2770	42	37	1	150	TO-263AB
IXTP90N055T2			90	0.0084	2770	42	37	1	150	TO-220AB
IXTY90N055T2			90	0.0084	2770	42	37	1	150	TO-252AA
IXTP110N055T2	110		0.0066	3060	57	38	0.82	180	TO-220AB	
IXTA110N055T2	110		0.0066	3060	57	38	0.82	180	TO-263AB	
IXTP140N055T2	140		0.0054	4760	82	40	0.6	250	TO-220AB	
IXTA140N055T2	140		0.0054	4760	82	40	0.6	250	TO-263AB	
IXTP200N055T2	200		0.0042	6970	109	49	0.42	360	TO-220AB	
IXTA200N055T2	200		0.0042	6970	109	49	0.42	360	TO-263AB	
IXTP260N055T2	260		0.0033	10800	140	60	0.31	480	TO-220AB	
IXTH260N055T2	260	0.0033	10800	140	60	0.31	480	TO-247AD		
IXTA260N055T2	260	0.0033	10800	140	60	0.31	480	TO-263AB		
IXTH360N055T2	360	0.0024	20000	330	78	0.16	935	TO-247AD		
IXTT360N055T2	360	0.0024	20000	330	78	0.16	935	TO-268AA		
IXTH440N055T2	440	0.0018	25000	405	76	0.15	1000	TO-247AD		
IXTT440N055T2	440	0.0018	25000	405	76	0.15	1000	TO-268AA		
IXTX550N055T2	550	0.0016	40000	595	100	0.12	1250	PLUS247		
IXTN550N055T2	550	0.0013	40000	595	100	0.16	940	SOT-227B miniBLOC		
IXTK550N055T2	550	0.0016	40000	595	100	0.12	1250	TO-264		
IXTZ550N055T2	550	0.001	40000	595	100	0.25	600	DE 475		
IXTP130N065T2	65	130	0.0066	4800	79	41	0.6	250	TO-220AB	
IXTA130N065T2		130	0.0066	4800	79	41	0.6	250	TO-263AB	
IXTP70N075T2	75	70	0.012	2580	46	48	1	150	TO-220AB	
IXTA70N075T2		70	0.012	2580	46	48	1	150	TO-263AB	
IXTP90N075T2		90	0.01	3290	54	50	0.82	180	TO-220AB	
IXTA90N075T2		90	0.01	3290	54	50	0.82	180	TO-263AB	
IXTP120N075T2		120	0.0077	4740	78	50	0.6	250	TO-220AB	
IXTA120N075T2		120	0.0077	4740	78	50	0.6	250	TO-263AB	
IXTP170N075T2		170	0.0054	6860	109	63	0.42	360	TO-220AB	
IXTA170N075T2		170	0.0054	6860	109	63	0.42	360	TO-263AB	
IXTP230N075T2		230	0.0042	10.5	178	66	0.31	480	TO-220AB	
IXTA230N075T2		230	0.0042	10.5	178	66	0.31	480	TO-263AB	
IXTP80N12T2	120	80	0.017	4740	80	90	0.46	325	TO-220AB	
IXTA80N12T2		80	0.017	4740	80	90	0.46	325	TO-263AB	



# Power MOSFET



**D5  
DE 475**



**X005a  
TO-220AB**



**X007a  
TO-220ABFP**



**X011b  
TO-263AB**



**X014a  
TO-247AD**



**X015a  
TO-247AD**



**X019  
TO-268AA**



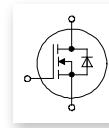
**X020a  
TO-264**



**X027a  
SOT-227B miniBLOC**



**X031a  
SMPD-X**



## TrenchT2™ MOSFET in SMPD Package

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
MMIX1T600N04T2	40	600	0.0013	40000	590	100	0.18	830	SMPD-X
MMIX1T550N055T2	55	550	0.0013	40000	595	100	0.18	830	SMPD-X
MMIX1F520N075T2	75	500	0.0016	41000	545	150	0.18	830	SMPD-X

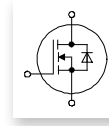
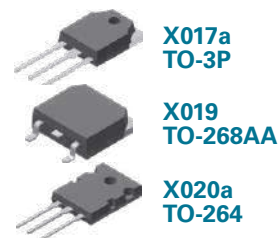
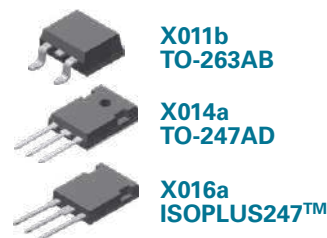
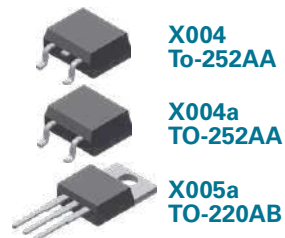
## TrenchT2™ HiPerFET™ Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFP230N075T2	75	230	0.0042	10500	178	59	0.31	480	TO-220AB	
IXFH230N075T2		230	0.0042	10500	178	59	0.31	480	TO-247AD	
IXFA230N075T2		230	0.0042	10500	178	59	0.31	480	TO-263AB	
IXFH340N075T2		340	0.0032	19000	300	75	0.16	935	TO-247AD	
IXFT340N075T2		340	0.0032	19000	300	75	0.16	935	TO-268AA	
IXFH400N075T2		400	0.0023	24000	420	77	0.15	1000	TO-247AD	
IXFT400N075T2		400	0.0023	24000	420	77	0.15	1000	TO-268AA	
IXFZ520N075T2		420	0.0016	41000	545	n/a	0.25	600	DE 475	
IXFN520N075T2		480	0.0019	41000	545	n/a	0.16	940	SOT-227B miniBLOC	
IXFX520N075T2		520	0.0022	41000	545	n/a	0.12	1250	PLUS247	
IXFK520N075T2		520	0.0022	41000	545	n/a	0.12	1250	TO-264	
IXFP130N10T2		100	130	0.0091	6600	130	n/a	0.42	360	TO-220AB
IXFA130N10T2			130	0.0091	6600	130	n/a	0.42	360	TO-263AB
IXFP180N10T2			180	0.006	10500	185	66	0.31	480	TO-220AB
IXFA180N10T2	180		0.006	10500	185	66	0.31	480	TO-263AB	
IXFH320N10T2	320		0.0035	25000	430	98	0.15	1000	TO-247AD	
IXFT320N10T2	320		0.0035	26000	430	98	0.15	1000	TO-268AA	

## TrenchT2™ HiPerFET™ Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFP76N15T2	150	76	0.02	5800	97	69	0.43	350	TO-220FPAB	
IXFA76N15T2		76	0.02	5800	97	69	0.43	350	TO-263AB	
IXFP110N15T2		110	0.013	8600	150	85	0.31	480	TO-220AB	
IXFH110N15T2		110	0.013	8600	150	85	0.31	480	TO-247AD	
IXFA110N15T2		110	0.013	8600	150	85	0.31	480	TO-263AB	
IXFH160N15T2		160	0.009	15000	253	n/a	0.17	880	TO-247AD	
IXFX240N15T2		240	0.0052	32000	460	n/a	0.12	1250	PLUS247	
IXFN240N15T2		240	0.0052	32000	460	n/a	0.18	830	SOT-227B miniBLOC	
IXFK240N15T2		240	0.0052	32000	460	n/a	0.12	1250	TO-264	
IXFN360N15T2		310	0.004	47500	715	n/a	0.14	1070	SOT-227B miniBLOC	
IXFX360N15T2		360	0.004	47500	715	n/a	0.09	1670	PLUS247	
IXFK360N15T2		360	0.004	47500	715	n/a	0.09	1670	TO-264	
IXFX220N17T2		170	220	0.0063	31000	500	n/a	0.12	1250	PLUS247
IXFK220N17T2			220	0.0063	31000	500	n/a	0.12	1250	TO-264
IXFN320N17T2			260	0.0052	45000	640	n/a	0.14	1070	SOT-227B miniBLOC
IXFX320N17T2			320	0.0052	45000	640	n/a	0.09	1670	PLUS247
IXFK320N17T2	320	0.0052	45000	640	n/a	0.09	1670	TO-264		
IXFH150N17T2	175	150	0.012	14600	233	n/a	0.17	880	TO-247AD	
IXFT150N17T2		150	0.012	14600	233	n/a	0.17	880	TO-268AA	

# Power MOSFET



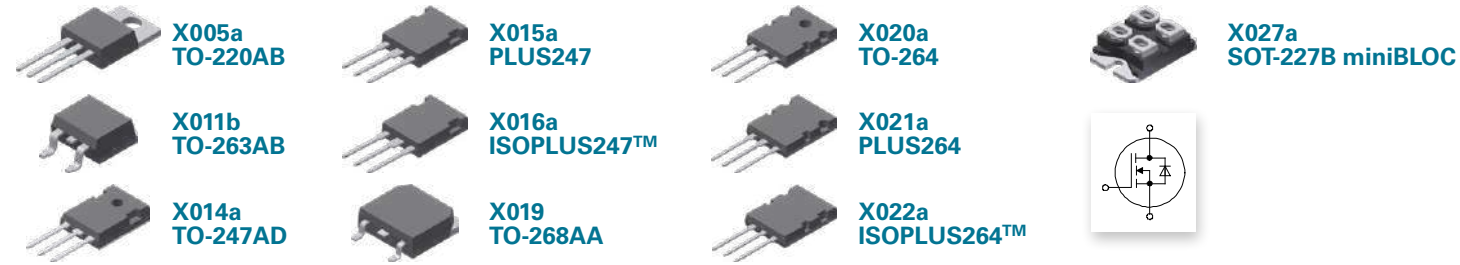
## Polar™ Standard MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTP75N10P	100	75	0.025	2250	74	120	0.42	360	TO-220AB	
IXTA75N10P		75	0.025	2250	74	120	0.42	360	TO-263AB	
IXTQ75N10P		75	0.025	2250	74	120	0.42	360	TO-3P	
IXTT110N10P		110	0.015	3550	110	130	0.31	480	TO-268AA	
IXTQ110N10P		110	0.015	3550	110	130	0.31	480	TO-3P	
IXTR200N10P		120	0.008	7600	235	100	0.5	300	ISOPLUS247™	
IXTT140N10P		140	0.011	4700	155	120	0.25	600	TO-268AA	
IXTQ140N10P		140	0.011	4700	155	120	0.25	600	TO-3P	
IXTK170N10P		170	0.009	6000	198	120	0.21	715	TO-264	
IXTT170N10P		170	0.009	6000	198	120	0.21	715	TO-268AA	
IXTQ170N10P		170	0.009	6000	198	120	0.21	715	TO-3P	
IXTK200N10P		200	0.0075	7600	240	100	0.18	800	TO-264	
IXTP62N15P		150	62	0.04	2250	70	150	0.42	350	TO-220AB
IXTA62N15P			62	0.04	2250	70	150	0.42	350	TO-263AB
IXTQ62N15P	62		0.04	2250	70	150	0.42	350	TO-3P	
IXTT96N15P	96		0.024	3500	110	150	0.31	480	TO-268AA	
IXTQ96N15P	96		0.024	3500	110	150	0.31	480	TO-3P	
IXTT120N15P	120		0.016	4900	150	150	0.25	600	TO-268AA	
IXTQ120N15P	120		0.016	4900	150	150	0.25	600	TO-3P	
IXTK150N15P	150		0.013	5800	190	150	0.21	714	TO-264	
IXTQ150N15P	150		0.013	5800	190	150	0.21	714	TO-3P	
IXTK180N15P	180		0.01	7000	240	150	0.18	800	TO-264	
IXTP50N20P	200	50	0.06	2720	70	150	0.42	360	TO-220AB	
IXTA50N20P		50	0.06	2720	70	150	0.42	360	TO-263AB	
IXTQ50N20P		50	0.06	2720	70	150	0.42	360	TO-3P	
IXTT74N20P		74	0.034	3300	107	160	0.31	480	TO-268AA	
IXTQ74N20P		74	0.034	3300	107	160	0.31	480	TO-3P	
IXTH96N20P		96	0.024	4800	145	160	0.25	600	TO-247AD	
IXTT96N20P		96	0.024	4800	145	160	0.25	600	TO-268AA	
IXTQ96N20P		96	0.024	4800	145	160	0.25	600	TO-3P	
IXTK120N20P		120	0.022	6000	152	180	0.21	714	TO-264	
IXTQ120N20P		120	0.022	6000	152	180	0.21	714	TO-3P	
IXTK140N20P		140	0.018	7500	240	180	0.18	800	TO-264	
IXTP42N25P		250	42	0.084	2300	70	200	0.42	300	TO-220AB
IXTA42N25P			42	0.084	2300	70	200	0.42	300	TO-263AB
IXTQ42N25P			42	0.084	2300	70	200	0.42	300	TO-3P
IXTT64N25P	64		0.049	3450	105	200	0.31	400	TO-268AA	
IXTQ64N25P	64		0.049	3450	105	200	0.31	400	TO-3P	
IXTK82N25P	82		0.035	4800	142	200	0.25	500	TO-264	
IXTT82N25P	82		0.035	4800	142	200	0.25	500	TO-268AA	
IXTQ82N25P	82		0.035	4800	142	200	0.25	500	TO-3P	
IXTK100N25P	100		0.027	6300	185	200	0.21	600	TO-264	
IXTT100N25P	100		0.027	6300	185	200	0.21	600	TO-268AA	
IXTQ100N25P	100	0.027	6300	185	200	0.21	600	TO-3P		
IXTK120N25P	120	0.024	8700	185	200	0.18	700	TO-264		
IXTP36N30P	300	36	0.11	2250	70	250	0.42	300	TO-220AB	
IXTA36N30P		36	0.11	2250	70	250	0.42	300	TO-263AB	
IXTQ36N30P		36	0.11	2250	70	250	0.42	300	TO-3P	
IXTT52N30P		52	0.066	3490	110	250	0.31	400	TO-268AA	
IXTQ52N30P		52	0.066	3490	110	250	0.31	400	TO-3P	

## Polar™ Standard MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTT69N30P	300	69	0.0490	4960	156	330	0.25	500	TO-268AA	
IXTQ69N30P		69	0.0490	4960	156	330	0.25	500	TO-3P	
IXTH88N30P		88	0.0400	6300	180	250	0.21	600	TO-247AD	
IXTK88N30P		88	0.0400	6300	180	250	0.21	600	TO-264	
IXTT88N30P		88	0.0400	6300	180	250	0.21	600	TO-268AA	
IXTQ88N30P		88	0.0400	6300	180	250	0.21	600	TO-3P	
IXTK102N30P		102	0.0330	7500	224	250	0.18	700	TO-264	
IXTK140N30P		140	0.2400	14800	185	250	0.12	1040	TO-264	
IXTP12N50P		500	12	0.5000	1830	29	300	0.62	200	TO-220AB
IXTA12N50P			12	0.5000	1830	29	300	0.62	200	TO-263AB
IXTP16N50P			16	0.4000	2480	43	400	0.42	300	TO-220AB
IXTA16N50P			16	0.4000	2480	43	400	0.42	300	TO-263AB
IXTQ16N50P			16	0.4000	2480	43	400	0.42	300	TO-3P
IXTH22N50P			22	0.2700	2880	50	400	0.35	350	TO-247AD
IXTQ22N50P	22		0.2700	2880	50	400	0.35	350	TO-3P	
IXTT26N50P	26		0.2300	3600	65	300	0.31	400	TO-268AA	
IXTQ26N50P	26		0.2300	3600	65	300	0.31	400	TO-3P	
IXTH30N50P	30		0.2000	4150	70	400	0.27	460	TO-247AD	
IXTT30N50P	30		0.2000	4150	70	400	0.27	460	TO-268AA	
IXTQ30N50P	30		0.2000	4150	70	400	0.27	460	TO-3P	
IXTH36N50P	36		0.1700	4700	82	400	0.23	540	TO-247AD	
IXTT36N50P	36		0.1700	4700	82	400	0.23	540	TO-268AA	
IXTQ36N50P	36	0.1700	4700	82	400	0.23	540	TO-3P		
IXTQ44N50P	44	0.1400	5440	98	400	0.19	650	TO-3P		
IXTP10N60P	600	10	0.7400	1720	32	500	0.62	200	TO-220AB	
IXTA10N60P		10	0.7400	1720	32	500	0.62	200	TO-263AB	
IXTP14N60P		14	0.5500	2500	36	500	0.42	300	TO-220AB	
IXTA14N60P		14	0.5500	2500	36	500	0.42	300	TO-263AB	
IXTQ14N60P		14	0.5500	2500	36	500	0.42	300	TO-3P	
IXTQ18N60P		18	0.4200	2500	49	500	0.35	360	TO-3P	
IXTQ22N60P		22	0.3500	3600	62	500	0.31	400	TO-3P	
IXTH26N60P		26	0.2700	4150	72	500	0.27	460	TO-247AD	
IXTT26N60P		26	0.2700	4150	72	500	0.27	460	TO-268AA	
IXTQ26N60P		26	0.2700	4150	72	500	0.27	460	TO-3P	
IXTH30N60P		30	0.2400	5050	82	500	0.23	540	TO-247AD	
IXTT30N60P		30	0.2400	5050	82	500	0.23	540	TO-268AA	
IXTQ30N60P		30	0.2400	5050	82	500	0.23	540	TO-3P	
IXTP05N100P		1000	0.5	30.000	196	8.1	750	2.50	50	TO-220AB
IXTA05N100P	0.5		30.000	196	8.1	750	2.50	50	TO-263AB	
IXTP08N100P	0.8		20.000	240	11.3	750	3.00	42	TO-220AB	
IXTY08N100P	0.8		20.000	240	11.3	750	3.00	42	TO-252AA	
IXTA08N100P	0.8		20.000	240	11.3	750	3.00	42	TO-263AB	
IXTP1N100P	1		15.000	331	15.5	750	2.50	50	TO-220AB	
IXTY1N100P	1		15.000	331	15.5	750	2.50	50	TO-252AA	
IXTA1N100P	1		15.000	331	15.5	750	2.50	50	TO-263AB	
IXTP1R4N100P	1.4		11.000	450	17.8	750	2.00	63	TO-220AB	
IXTY1R4N100P	1.4		11.000	450	17.8	750	2.00	63	TO-252AA	
IXTA1R4N100P	1.4		11.000	450	17.8	750	2.00	63	TO-263AB	
IXTP2N100P	2		7.500	655	24.3	800	1.45	86	TO-220AB	
IXTY2N100P	2		7.500	655	24.3	800	1.45	86	TO-252AA	
IXTA2N100P	2		7.500	655	24.3	800	1.45	86	TO-263AB	
IXTP3N100P	3	4.800	1100	39	820	1.00	125	TO-220AB		
IXTH3N100P	3	4.800	1100	39	820	1.00	125	TO-247AD		
IXTA3N100P	3	4.800	1100	39	820	1.00	125	TO-263AB		
IXTP02N120P	1200	0.2	75.000	104	4.7	1600	3.80	33	TO-220AB	
IXTY02N120P		0.2	75.000	104	4.7	1600	3.80	33	TO-252AA	
IXTP06N120P		0.6	34.000	236	13.3	900	3.00	42	TO-220AB	
IXTA06N120P		0.6	34.000	236	13.3	900	3.00	42	TO-263AB	
IXTP08N120P		0.8	25.000	333	14	900	2.50	50	TO-220AB	
IXTA08N120P		0.8	25.000	333	14	900	2.50	50	TO-263AB	
IXTP1N120P		1	20.000	445	17.6	900	2.00	63	TO-220AB	
IXTA1N120P		1	20.000	445	17.6	900	2.00	63	TO-263AB	
IXTP1R4N120P		1.4	13.000	666	24.8	900	1.45	86	TO-220AB	
IXTY1R4N120P		1.4	13.000	666	24.8	900	1.45	86	TO-252AA	
IXTA1R4N120P		1.4	13.000	666	24.8	900	1.45	86	TO-263AB	
IXTP2R4N120P		2.4	7.500	1207	37	920	1.00	125	TO-220AB	
IXTH2R4N120P		2.4	7.500	1207	37	920	1.00	125	TO-247AD	
IXTA2R4N120P		2.4	7.500	1207	37	920	1.00	125	TO-263AB	

# Power MOSFET



## Polar™ HiPerFET™ MOSFET With Fast Intrinsic Diode

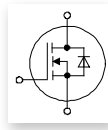
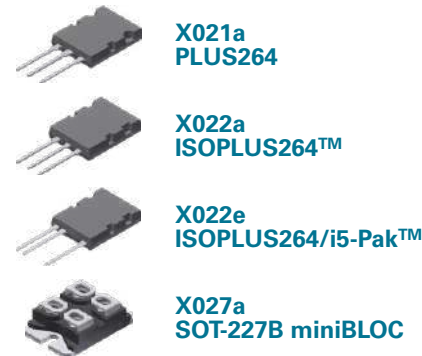
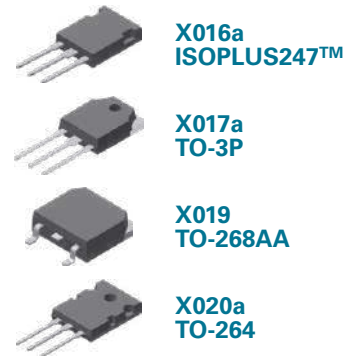
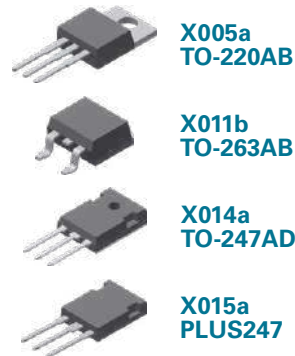
Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFH110N10P	100	110	0.015	3550	110	150	0.31	480	TO-247AD	
IXFR200N10P		120	0.009	7600	235	150	0.50	300	ISOPLUS247™	
IXFH140N10P		140	0.011	4700	155	150	0.25	600	TO-247AD	
IXFT140N10P		140	0.011	4700	155	150	0.25	600	TO-268AA	
IXFH170N10P		170	0.009	6000	198	150	0.21	715	TO-247AD	
IXFK170N10P		170	0.009	6000	198	150	0.21	715	TO-264	
IXFX200N10P		200	0.0075	7600	235	150	0.18	830	PLUS247	
IXFN200N10P		200	0.0075	7600	235	150	0.22	680	SOT-227B miniBLOC	
IXFK200N10P		200	0.0075	7600	235	150	0.18	830	TO-264	
IXFX250N10P		250	0.0065	16000	205	200	0.12	1250	PLUS247	
IXFK250N10P		250	0.0065	16000	205	200	0.12	1250	TO-264	
IXFN300N10P		295	0.0055	23	279	200	0.14	1070	SOT-227B miniBLOC	
IXFB300N10P		300	0.0055	23	279	200	0.10	1500	PLUS264	
IXFH96N15P		150	96	0.024	3500	110	200	0.31	480	TO-247AD
IXFR180N15P			100	0.013	7000	240	200	0.50	300	ISOPLUS247™
IXFH120N15P			120	0.016	4900	150	200	0.25	600	TO-247AD
IXFT120N15P	120		0.016	4900	150	200	0.25	600	TO-268AA	
IXFN180N15P	150		0.011	7000	240	200	0.22	680	SOT-227B miniBLOC	
IXFH150N15P	150		0.013	5800	190	200	0.21	714	TO-247AD	
IXFK150N15P	150		0.013	5800	190	200	0.21	714	TO-264	
IXFX180N15P	180		0.011	7000	240	200	0.18	830	PLUS247	
IXFK180N15P	180		0.011	7000	240	200	0.18	830	TO-264	
IXFX220N15P	220		0.009	15.4	162	200	0.12	1250	PLUS247	
IXFK220N15P	220		0.009	15.4	162	200	0.12	1250	TO-264	
IXFH74N20P	200		74	0.034	3300	107	200	0.31	480	TO-247AD
IXFR140N20P			90	0.022	7500	240	200	0.50	300	ISOPLUS247™
IXFH96N20P			96	0.024	4800	145	200	0.25	600	TO-247AD
IXFT96N20P			96	0.024	4800	145	200	0.25	600	TO-268AA
IXFN140N20P			115	0.018	7500	240	200	0.22	680	SOT-227B miniBLOC
IXFH120N20P		120	0.022	6000	152	200	0.21	714	TO-247AD	
IXFK120N20P		120	0.022	6000	152	200	0.21	714	TO-264	
IXFK140N20P		140	0.018	7500	240	200	0.18	830	TO-264	
IXFX170N20P		170	0.014	11.4	185	200	0.12	1250	PLUS247	
IXFK170N20P		170	0.014	11.4	185	200	0.12	1250	TO-264	
IXFN210N20P		188	0.0105	18.6	255	200	0.14	1070	SOT-227B miniBLOC	
IXFB210N20P		210	0.0105	18.6	255	200	0.10	1500	PLUS264	
IXFH100N25P		250	100	0.027	6300	185	200	0.21	600	TO-247AD
IXFX120N25P			120	0.024	8700	185	200	0.18	700	PLUS247
IXFK120N25P			120	0.024	8700	185	200	0.18	700	TO-264
IXFH52N30P			52	0.066	3490	110	200	0.31	400	TO-247AD
IXFR102N30P	60		0.036	7500	224	200	0.50	250	ISOPLUS247™	
IXFH69N30P	69		0.049	4960	156	200	0.25	500	TO-247AD	
IXFT69N30P	69		0.049	4960	156	200	0.25	500	TO-268AA	
IXFR140N30P	70		0.026	14800	185	200	0.35	360	ISOPLUS247™	

## Polar™ HiPerFET™ MOSFET With Fast Intrinsic Diode

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFN102N30P	300	86	0.0330	7500	224	200	0.22	570	SOT-227B miniBLOC	
IXFH88N30P		88	0.0400	6300	180	200	0.21	600	TO-247AD	
IXFK88N30P		88	0.0400	6300	180	200	0.21	600	TO-264	
IXFT88N30P		88	0.0400	6300	180	200	0.21	600	TO-268AA	
IXFK102N30P		102	0.0330	7500	224	200	0.18	700	TO-264	
IXFN140N30P		110	0.0240	14800	185	200	0.18	700	SOT-227B miniBLOC	
IXFN170N30P		138	0.0018	20	258	200	0.14	890	SOT-227B miniBLOC	
IXFX140N30P		140	0.0240	14800	185	200	0.12	1040	PLUS247	
IXFK140N30P		140	0.0240	14800	185	200	0.12	1040	TO-264	
IXFB170N30P		170	0.0180	20	258	200	0.10	1250	PLUS264	
IXFP12N50P		500	12	0.500	1830	29	200	0.62	200	TO-220AB
IXFA12N50P			12	0.500	1830	29	200	0.62	200	TO-263AB
IXFP16N50P			16	0.400	2480	43	200	0.42	300	TO-220AB
IXFH16N50P			16	0.400	2480	43	200	0.42	300	TO-247AD
IXFA16N50P			16	0.400	2480	43	200	0.42	300	TO-263AB
IXFR36N50P			19	0.190	5500	93	200	0.75	156	ISOPLUS247™
IXFH22N50P	22		0.270	2880	50	200	0.35	350	TO-247AD	
IXFR44N50P	24		0.150	5440	98	200	0.60	208	ISOPLUS247™	
IXFH26N50P	26		0.230	3600	60	200	0.31	400	TO-247AD	
IXFH30N50P	30		0.200	4150	70	200	0.27	460	TO-247AD	
IXFT30N50P	30		0.200	4150	70	200	0.27	460	TO-268AA	
IXFH36N50P	36		0.170	5500	93	200	0.23	540	TO-247AD	
IXFR36N50P	36		0.170	5500	93	200	0.23	540	TO-268AA	
IXFR44N50P	37		0.095	9700	150	200	0.42	300	ISOPLUS247™	
IXFH44N50P	44		0.140	5440	98	200	0.19	650	TO-247AD	
IXFK44N50P	44		0.140	5440	98	200	0.19	650	TO-264	
IXFT44N50P	44		0.140	5440	98	200	0.19	650	TO-268AA	
IXFR80N50P	45		0.072	12700	197	200	0.35	360	ISOPLUS247™	
IXFN64N50P	50		0.085	9700	150	200	0.20	625	SOT-227B miniBLOC	
IXFX64N50P	64		0.085	9700	150	200	0.15	830	PLUS247	
IXFK64N50P	64		0.085	9700	150	200	0.15	830	TO-264	
IXFN80N50P	66		0.065	12700	195	200	0.18	700	SOT-227B miniBLOC	
IXFL100N50P	68		0.052	20000	240	200	0.20	625	ISOPLUS264™	
IXFX80N50P	80		0.065	12700	197	200	0.12	1040	PLUS247	
IXFK80N50P	80	0.065	12700	197	200	0.12	1040	TO-264		
IXFN100N50P	90	0.049	20000	240	200	0.12	1040	SOT-227B miniBLOC		
IXFB100N50P	100	0.049	20000	240	200	0.10	1250	PLUS264		
IXFP10N60P	600	10	0.740	1720	32	200	0.62	200	TO-220AB	
IXFA10N60P		10	0.740	1720	32	200	0.62	200	TO-263AB	
IXFP14N60P		14	0.550	2500	36	200	0.42	300	TO-220AB	
IXFH14N60P		14	0.550	2500	36	200	0.42	300	TO-247AD	
IXFA14N60P		14	0.550	2500	36	200	0.42	300	TO-263AB	
IXFR30N60P		15	0.250	3820	85	200	0.75	166	ISOPLUS247™	
IXFH18N60P		18	0.400	2500	50	200	0.35	360	TO-247AD	
IXFR36N60P		20	0.200	5800	102	200	0.60	208	ISOPLUS247™	
IXFH22N60P		22	0.350	3600	58	200	0.31	400	TO-247AD	
IXFH26N60P		26	0.270	4150	72	200	0.27	460	TO-247AD	
IXFT26N60P		26	0.270	4150	72	200	0.27	460	TO-268AA	
IXFH30N60P		30	0.240	4000	82	200	0.25	500	TO-247AD	
IXFT30N60P		30	0.240	4000	82	200	0.25	500	TO-268AA	
IXFR48N60P		32	0.150	8860	150	200	0.42	300	ISOPLUS247™	
IXFR64N60P		36	0.105	12000	200	200	0.35	360	ISOPLUS247™	
IXFH36N60P		36	0.190	5800	102	200	0.19	650	TO-247AD	
IXFK36N60P		36	0.190	5800	102	200	0.19	650	TO-264	
IXFT36N60P		36	0.190	5800	102	200	0.19	650	TO-268AA	
IXFN48N60P		40	0.140	8860	150	200	0.20	625	SOT-227B miniBLOC	
IXFX48N60P		48	0.135	8860	150	200	0.15	830	PLUS247	
IXFK48N60P		48	0.135	8860	150	200	0.15	830	TO-264	
IXFN64N60P		50	0.096	12000	200	200	0.18	700	SOT-227B miniBLOC	
IXFL82N60P		55	0.078	23000	240	200	0.20	625	ISOPLUS264™	
IXFX64N60P		64	0.096	12000	200	200	0.12	1040	PLUS247	
IXFK64N60P	64	0.096	12000	200	200	0.12	1040	TO-264		
IXFN82N60P	72	0.075	23000	240	200	0.12	1040	SOT-227B miniBLOC		
IXFB82N60P	82	0.075	23000	240	200	0.10	1250	PLUS264		



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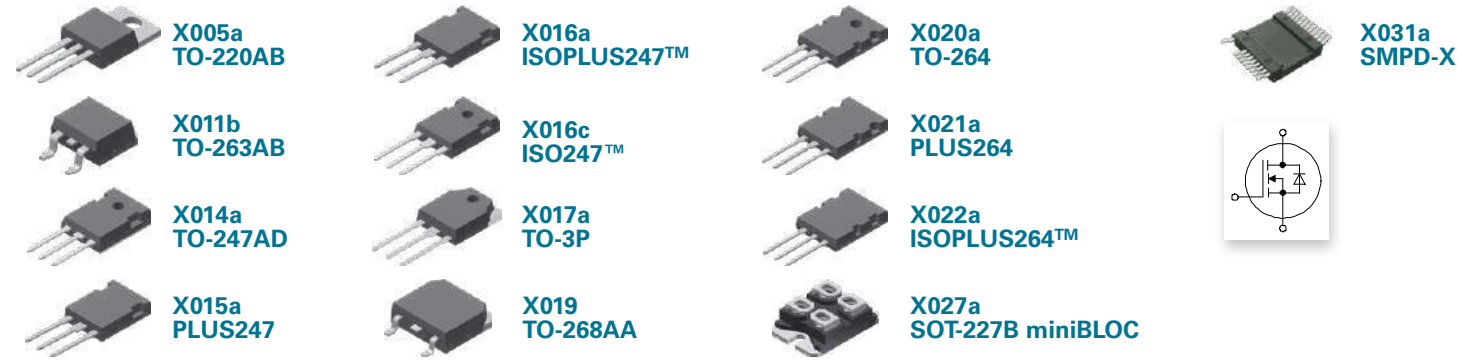
Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>th(jc)</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFP7N80P	800	7	1.440	1800	32	250	0.62	200	TO-220AB	
IXFA7N80P		7	1.440	1800	32	250	0.62	200	TO-263AB	
IXFR20N80P		10	0.570	4685	86	250	0.80	160	ISOPLUS247™	
IXFP10N80P		10	1.100	2050	40	250	0.42	300	TO-220AB	
IXFH10N80P		10	1.100	2050	40	250	0.42	300	TO-247AD	
IXFA10N80P		10	1.100	2050	40	250	0.42	300	TO-263AB	
IXFQ10N80P		10	1.100	2050	40	250	0.42	300	X017a	
IXFH12N80P		12	0.850	2800	51	250	0.35	360	TO-247AD	
IXFR24N80P		13	0.420	7200	105	250	0.60	208	ISOPLUS247™	
IXFH14N80P		14	0.720	3900	61	250	0.31	400	TO-247AD	
IXFT14N80P		14	0.720	3900	61	250	0.31	400	TO-268AA	
IXFQ14N80P		14	0.720	3900	61	250	0.31	400	X017a	
IXFH16N80P		16	0.600	4000	70	250	0.27	460	TO-247AD	
IXFT16N80P		16	0.600	4000	70	250	0.27	460	TO-268AA	
IXFR32N80P		20	0.290	8800	150	250	0.42	300	ISOPLUS247™	
IXFH20N80P		20	0.520	4685	86	250	0.25	500	TO-247AD	
IXFT20N80P		20	0.520	4685	86	250	0.25	500	TO-268AA	
IXFH24N80P		24	0.400	5800	100	250	0.19	650	TO-247AD	
IXFK24N80P		24	0.400	7200	105	250	0.19	650	TO-264	
IXFT24N80P		24	0.400	5800	100	250	0.19	650	TO-268AA	
IXFR44N80P		26	0.190	12000	200	250	0.35	360	ISOPLUS247™	
IXFN32N80P		29	0.270	8820	150	250	0.20	625	SOT-227B miniBLOC	
IXFX32N80P		32	0.270	8800	150	250	0.15	830	PLUS247	
IXFK32N80P		32	0.270	8800	150	250	0.15	830	TO-264	
IXFN44N80P		39	0.190	18000	200	250	0.18	694	SOT-227B miniBLOC	
IXFL60N80P		40	0.150	18000	250	250	0.20	625	ISOPLUS264™	
IXFX44N80P		44	0.190	12000	198	250	0.12	1200	PLUS247	
IXFK44N80P		44	0.190	12000	198	250	0.12	1200	TO-264	
IXFN60N80P		53	0.140	18000	250	250	0.12	1040	SOT-227B miniBLOC	
IXFB60N80P		60	0.140	18000	250	250	0.10	1250	PLUS264	
IXFR18N90P		900	10.5	0.660	5230	97	300	0.62	200	ISOPLUS247™
IXFH12N90P			12	0.900	3080	56	300	0.33	380	TO-247AD
IXFR24N90P	13		0.460	7200	130	300	0.54	230	ISOPLUS247™	
IXFH18N90P	18		0.600	5230	97	300	0.23	540	TO-247AD	
IXFT18N90P	18		0.600	5230	97	300	0.23	540	TO-268AA	
IXFR40N90P	21		0.230	14000	230	300	0.42	300	ISOPLUS247™	
IXFH24N90P	24		0.420	7200	130	300	0.19	660	TO-247AD	
IXFT24N90P	24		0.420	7200	130	300	0.19	660	TO-268AA	
IXFK32N90P	32		0.300	10600	215	300	0.13	960	TO-264	
IXFX32N90P	32		0.300	10600	215	300	0.13	960	PLUS247	
IXFN40N90P	33		0.21	14000	230	300	0.18	695	SOT-227B miniBLOC	
IXFX40N90P	40		0.21	14000	230	300	0.13	960	PLUS247	
IXFK40N90P	40		0.21	14000	230	300	0.13	960	TO-264	
IXFN52N90P	43		0.16	19000	308	300	0.14	890	SOT-227B miniBLOC	

## Polar™ HiPerFET™ MOSFET With Fast Intrinsic Diode

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>th(jc)</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
IXFB52N90P	900	52	0.210	19000	308	300	0.13	1250	PLUS264
IXFN56N90P		56	0.210	23000	375	300	0.13	1000	SOT-227B miniBLOC
IXFP4N100P		4	0.210	1456	26	300	0.83	150	TO-220AB
IXFA4N100P		4	0.160	1456	26	300	0.83	150	TO-263AB
IXFP5N100P		5	0.160	1830	33.4	200	0.50	250	TO-220AB
IXFH5N100P		5	0.145	1830	33.4	200	0.50	250	TO-247AD
IXFA5N100P		5	3.30	1830	33.4	200	0.50	250	TO-263AB
IXFA7N100P		7	3.30	2590	47	300	0.42	300	TO-263AB
IXFH7N100P		7	2.80	2590	47	300	0.42	300	TO-247AD
IXFP7N100P		7	2.80	2590	47	300	0.42	300	TO-220AB
IXFH10N100P		10	2.80	3030	56	300	0.33	380	TO-247AD
IXFR20N100P		11	1.90	7300	126	300	0.54	230	ISOPLUS247™
IXFH12N100P		12	1.90	4080	80	300	0.27	463	TO-247AD
IXFR26N100P		15	1.90	11900	197	300	0.43	290	ISOPLUS247™
IXFH15N100P		15	1.40	5140	97	300	0.23	543	TO-247AD
IXFR32N100P		18	0.64	14200	225	300	0.39	320	ISOPLUS247™
IXFH20N100P	20	1.05	7300	126	300	0.19	660	TO-247AD	
IXFT20N100P	20	0.43	7300	126	300	0.19	660	TO-268AA	
IXFL44N100P	22	0.76	19000	305	300	0.35	357	ISOPLUS264/i5-Pak™	
IXFN26N100P	23	0.34	11900	197	300	0.21	595	SOT-227B miniBLOC	
IXFX26N100P	26	0.57	11900	197	300	0.16	780	PLUS247	
IXFK26N100P	26	0.57	11900	197	300	0.16	780	TO-264	
IXFN32N100P	27	0.24	14200	225	300	0.18	690	SOT-227B miniBLOC	
IXFL38N100P	29	0.39	24000	350	300	0.24	520	ISOPLUS264/i5-Pak™	
IXFX32N100P	32	0.39	14200	225	300	0.13	960	PLUS247	
IXFK32N100P	32	0.39	14200	225	300	0.13	960	TO-264	
IXFN44N100P	37	0.32	19000	305	300	0.14	890	SOT-227B miniBLOC	
IXFN38N100P	38	0.23	24000	350	300	0.125	1000	SOT-227B miniBLOC	
IXFB44N100P	44	0.32	19000	305	300	0.10	1250	PLUS264	
IXFL40N110P	21	0.32	19000	310	300	0.35	357	ISOPLUS264/i5-Pak™	
IXFL36N110P	26	0.22	23000	350	300	0.24	520	ISOPLUS264/i5-Pak™	
IXFN40N110P	34	0.21	19000	310	300	0.14	890	SOT-227B miniBLOC	
IXFB40N110P	40	0.22	19000	310	300	0.10	1250	PLUS264	
IXFP6N120P	1200	6	0.28	2830	92	300	0.50	250	TO-220AB
IXFH6N120P		6	0.26	2830	92	300	0.50	250	TO-247AD
IXFA6N120P		6	0.26	2830	92	300	0.50	250	TO-263AB
IXFR16N120P		9	0.26	6900	120	300	0.54	230	ISOPLUS247™
IXFH12N120P		12	2.40	5400	103	300	0.23	543	TO-247AD
IXFR20N120P		13	2.40	12900	193	300	0.43	290	ISOPLUS247™
IXFR26N120P		15	2.40	14000	225	300	0.39	320	ISOPLUS247™
IXFH16N120P		16	1.04	6900	120	300	0.19	660	TO-247AD
IXFT16N120P		16	1.35	6900	120	300	0.19	660	TO-268AA
IXFL30N120P		18	0.63	19000	310	300	0.35	357	ISOPLUS264/i5-Pak™
IXFX20N120P		20	0.50	11100	193	300	0.16	780	PLUS247
IXFN20N120P		20	0.95	11100	193	300	0.21	595	SOT-227B miniBLOC
IXFK20N120P		20	0.95	11100	193	300	0.16	780	TO-264
IXFN26N120P		23	0.38	14000	225	300	0.18	695	SOT-227B miniBLOC
IXFL32N120P		24	0.57	21000	360	300	0.24	520	ISOPLUS264/i5-Pak™
IXFX26N120P		26	0.57	14000	225	300	0.13	960	PLUS247
IXFK26N120P	26	0.57	14000	225	300	0.13	960	TO-264	
IXFB30N120P	30	0.46	22500	310	300	0.10	1250	PLUS264	
IXFN30N120P	30	0.34	19000	310	300	0.14	890	SOT-227B miniBLOC	
IXFN32N120P	32	0.46	21000	360	300	0.125	1000	SOT-227B miniBLOC	



# Power MOSFET



## PolarP3™ HiPerFET™ Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> max. (typ.)	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFP36N30P3	300	36	0.1100	2040	30	-125	0.36	347	TO-220AB	
IXFA36N30P3		36	0.1100	2040	30	-125	0.36	347	TO-263AB	
IXFH94N30P3		94	0.0360	5510	102	250	0.12	1040	TO-247AD	
IXFQ94N30P3		94	0.0360	5510	102	250	0.12	1040	TO-3P	
IXFT94N30P3		94	0.0360	5510	102	250	0.12	1040	TO-268AA	
IXFL210N30P3		108	0.0160	16200	268	250	0.24	520	ISOPLUS264™	
IXFK120N30P3		120	0.0270	8630	150	250	0.11	1130	TO-264	
IXFX120N30P3		120	0.0270	8630	150	250	0.11	1130	PLUS247	
IXFK150N30P3		150	0.0190	12100	197	250	0.10	1300	TO-264	
IXFX150N30P3		150	0.0190	12100	197	250	0.10	1300	PLUS247	
IXFN210N30P3		192	0.0145	16200	268	250	0.08	1500	SOT-227B miniBLOC	
IXFB210N30P3		210	0.0145	16200	268	250	0.07	1890	PLUS264	
IXFJ26N50P3		500	14	0.265	2220	42	250	0.69	180	ISO247™
IXFA16N50P3			16	0.36	1515	29	250	0.38	330	TO-263AB
IXFH16N50P3			16	0.36	1515	29	250	0.38	330	TO-247AD
IXFP16N50P3			16	0.36	1515	29	250	0.38	330	TO-220AB
IXFA20N50P3	20		0.3	1800	36	250	0.36	380	TO-263AB	
IXFH20N50P3	20		0.3	1800	36	250	0.36	380	TO-247AD	
IXFP20N50P3	20		0.3	1800	36	250	0.36	380	TO-220AB	
IXFQ20N50P3	20		0.3	1800	36	250	0.36	380	TO-3P	
IXFA26N50P3	26		0.23	2220	42	250	0.25	500	TO-263AB	
IXFH26N50P3	26		0.23	2220	42	250	0.25	500	TO-247AD	
IXFP26N50P3	26		0.23	2220	42	250	0.25	500	TO-220AB	
IXFQ26N50P3	26		0.23	2220	42	250	0.25	500	TO-3P	
IXFH34N50P3	34		0.17	3260	60	250	0.18	695	TO-247AD	
IXFQ34N50P3	34		0.17	3260	60	250	0.18	695	TO-3P	
IXFH60N50P3	60		0.1	6250	96	250	0.12	1040	TO-247AD	
IXFQ60N50P3	60		0.1	6250	96	250	0.12	1040	TO-3P	
IXFT60N50P3	60	0.1	6250	96	250	0.12	1040	TO-268AA		
IXFL132N50P3	63	0.043	18600	250	250	0.24	520	ISOPLUS264™		
IXFK78N50P3	78	0.068	9900	147	250	0.11	1130	TO-264		
IXFX78N50P3	78	0.068	9900	147	250	0.11	1130	PLUS247		
IXFK98N50P3	98	0.05	13100	197	250	0.096	1300	TO-264		
IXFX98N50P3	98	0.05	13100	197	250	0.096	1300	PLUS247		
IXFN132N50P3	112	0.039	18600	250	250	0.083	1500	SOT-227B miniBLOC		
IXFB132N50P3	132	0.039	18600	250	250	0.066	1890	PLUS264		

## PolarP3™ HiPerFET™ Power MOSFET

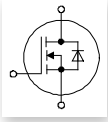
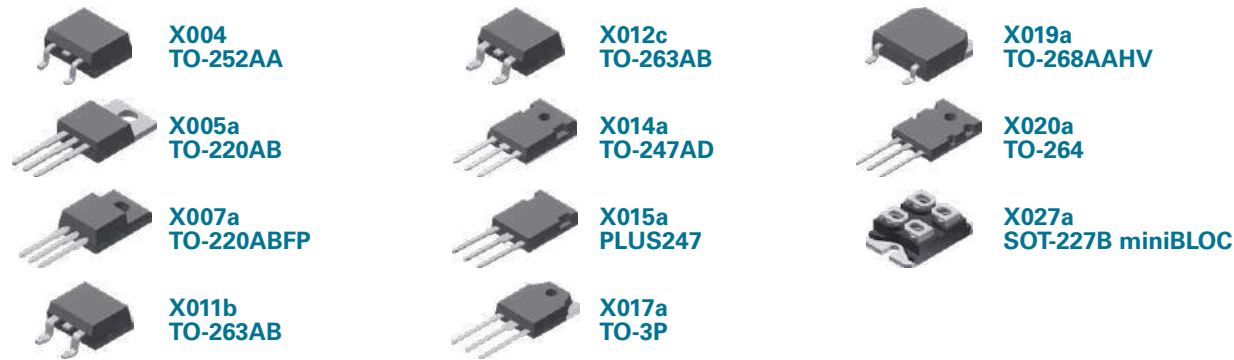
Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> max. (typ.)	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
IXFA14N60P3	600	14	0.54	1480	25	250	0.38	327	TO-263AB
IXFH14N60P3		14	0.54	1480	25	250	0.38	327	TO-247AD
IXFP14N60P3		14	0.54	1480	25	250	0.38	327	TO-220AB
IXFA16N60P3		16	0.44	1830	36	250	0.36	347	TO-263AB
IXFH16N60P3		16	0.44	1830	36	250	0.36	347	TO-247AD
IXFP16N60P3		16	0.44	1830	36	250	0.36	347	TO-220AB
IXFA22N60P3		22	0.36	2600	38	250	0.25	500	TO-263AB
IXFH22N60P3		22	0.36	2600	38	250	0.25	500	TO-247AD
IXFP22N60P3		22	0.36	2600	38	250	0.25	500	TO-220AB
IXFQ22N60P3		22	0.36	2600	38	250	0.25	500	TO-3P
IXFH28N60P3		28	0.26	3560	50	250	0.18	695	TO-247AD
IXFQ28N60P3		28	0.26	3560	50	250	0.18	695	TO-3P
IXFH42N60P3		42	0.185	5150	78	250	0.15	830	TO-247AD
IXFR80N60P3		48	0.076	13100	190	250	0.23	540	ISOPLUS247™
IXFH50N60P3		50	0.145	6300	94	250	0.12	1040	TO-247AD
IXFQ50N60P3		50	0.145	6300	94	250	0.12	1040	TO-3P
IXFT50N60P3		50	0.145	6300	94	250	0.12	1040	TO-268AA
IXFK64N60P3		64	0.095	9900	145	250	0.11	1130	TO-264
IXFX64N60P3		64	0.095	9900	145	250	0.11	1130	PLUS247
IXFN80N60P3		66	0.077	13100	190	250	0.13	960	SOT-227B miniBLOC
IXFK80N60P3		80	0.07	13100	190	250	0.096	1300	TO-264
IXFX80N60P3		80	0.07	13100	190	250	0.096	1300	PLUS247
IXFN110N60P3		90	0.056	18000	245	250	0.083	1500	SOT-227B miniBLOC
IXFB110N60P3		110	0.056	18000	245	250	0.066	1890	PLUS264

## PolarP3™ Power MOSFET

With Current & Temperature Sensing in SMPD Package

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
MMIX1T132N50P3	500	63	0.043	18600	267	600	0.24	520	SMPD-X

# Power MOSFET



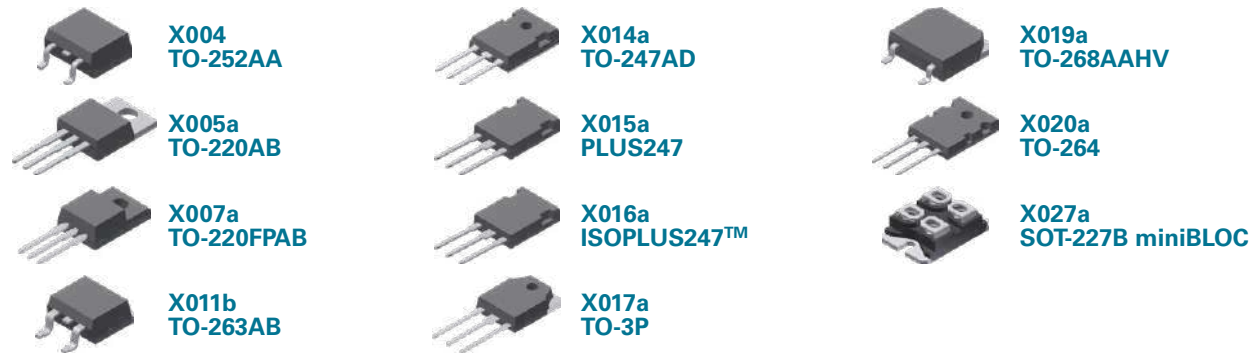
## Ultra Junction Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
<b>135 V Ultra Junction X4-Class Power MOSFET</b>									
IXTP170N13X4	135	170	0.0063	5460	105	86	0.31	480	TO-220AB
IXTA100N15X4	150	100	0.0115	3970	74	90	0.4	375	TO-263AB
IXTP100N15X4		100	0.0115	3970	74	90	0.4	375	TO-220AB
IXTH130N15X4		130	0.0085	4770	87	93	0.31	400	TO-247AD
IXTP130N15X4		130	0.0085	4770	87	93	0.31	400	TO-220AB
IXTA130N15X4		130	0.008	4770	87	93	0.31	400	TO-263AB
IXTA130N15X4-7		130	0.008	4770	87	93	0.31	400	TO-263AB
IXTH150N15X4		150	0.0072	5500	105	100	0.31	480	TO-247AD
IXTP150N15X4		150	0.0072	5500	105	100	0.31	480	TO-220AB
IXTA150N15X4		150	0.0069	5500	105	100	0.31	480	TO-263AB
IXTA150N15X4-7		150	0.0069	5500	105	100	0.31	480	TO-263AB
IXTH240N15X4		240	0.0044	8900	195	130	0.16	940	TO-247AD
IXTT240N15X4HV		240	0.0044	8900	195	130	0.16	940	TO-268AAHV
IXTK400N15X4		400	0.0031	14500	430	175	0.1	1500	TO-264
IXTN400N15X4		400	0.0031	14500	430	175	0.14	1070	SOT-227B miniBLOC
IXTX400N15X4		400	0.0031	14500	430	175	0.1	1500	PLUS247
<b>200 V X3-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>									
IXFA36N20X3	200	36	0.0450	1425	21	75	0.73	170	TO-263AB
IXFP36N20X3		36	0.0450	1425	21	75	0.73	170	TO-220AB
IXFP36N20X3M		36	0.0450	1425	21	75	3.50	36	TO-220FPAB
IXFY36N20X3		36	0.0450	1425	21	75	0.73	170	TO-252AA
IXFA50N20X3		50	0.0300	2100	33	70	0.52	240	TO-263AB
IXFP50N20X3		50	0.0300	2100	33	70	0.52	240	TO-220AB
IXFP50N20X3M		50	0.0300	2100	33	70	3.70	34	TO-220FPAB
IXFA72N20X3		72	0.0200	3780	55	95	0.39	320	TO-263AB
IXFP72N20X3		72	0.0200	3780	55	95	0.39	320	TO-220AB
IXFP72N20X3M		72	0.0200	3780	55	95	3.50	36	TO-220FPAB
IXFQ72N20X3		72	0.0200	3780	55	95	0.39	320	TO-3P
IXFA90N20X3		90	0.0128	5420	78	95	0.32	390	TO-263AB
IXFH90N20X3		90	0.0128	5420	78	95	0.32	390	TO-247AD
IXFP90N20X3		90	0.0128	5420	78	95	0.32	390	TO-220AB
IXFP90N20X3M		90	0.0128	5420	78	95	3.50	36	TO-220FPAB
IXFQ90N20X3		90	0.0128	5420	78	95	0.32	390	TO-3P

## Ultra Junction Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
<b>200 V X3-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>										
IXFH140N20X3	200	140	0.0096	7660	127	105	0.26	480	TO-247AD	
IXFQ140N20X3		140	0.0096	7660	127	105	0.26	480	TO-3P	
IXFT140N20X3HV		140	0.0096	7660	127	105	0.26	480	TO-268AAHV	
IXFN220N20X3		160	0.0062	13600	204	128	0.32	390	SOT-227B miniBLOC	
IXFH180N20X3		180	0.0075	10300	154	120	0.17	735	TO-247AD	
IXFT180N20X3HV		180	0.0075	10300	154	120	0.17	735	TO-268AAHV	
IXFH220N20X3		220	0.0062	13600	204	128	0.14	890	TO-247AD	
IXFK220N20X3		220	0.0062	13600	204	128	0.14	890	TO-264	
IXFT220N20X3HV		220	0.0062	13600	204	128	0.14	890	TO-268AAHV	
IXFK300N20X3		300	0.0040	23800	375	172	0.10	1250	TO-264	
IXFN300N20X3		300	0.0035	23800	375	172	0.18	695	SOT-227B miniBLOC	
IXFX300N20X3		300	0.0040	23800	375	172	0.10	1250	PLUS247	
<b>200V Ultra Junction X4-Class Power MOSFET</b>										
IXTA86N20X4		200	86	0.013	2250	70	96	0.5	300	TO-263AB
IXTP86N20X4			86	0.013	2250	70	96	0.5	300	TO-220AB
IXTA94N20X4			94	0.0106	5050	77	130	0.42	360	TO-263AB
IXTP94N20X4	94		0.0106	5050	77	130	0.42	360	TO-220AB	
IXTH94N20X4	94		0.0106	5050	77	130	0.42	360	TO-247AD	
IXTH220N20X4	220		0.0055	12300	157	140	0.19	800	TO-247AD	
IXTT220N20X4HV	220		0.0055	12300	157	140	0.19	800	TO-268AAHV	
IXTP60N20X4	60		0.021	2450	33	107	0.6	250	TO-220AB	
IXTH60N20X4	60		0.021	2450	33	107	0.6	250	TO-247AD	
IXTA60N20X4	60		0.021	2450	33	107	0.6	250	TO-263AB	
IXTH120N20X4	120		0.0095	6100	108	190	0.36	417	TO-247AD	
IXTP120N20X4	120		0.0095	6100	108	190	0.36	417	TO-220AB	
<b>250V X3-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>										
IXFA30N25X3	250		30	0.0600	1450	21	82	0.73	170	TO-263AB
IXFP30N25X3			30	0.0600	1450	21	82	0.73	170	TO-220AB
IXFP30N25X3M			30	0.0600	1450	21	82	3.50	36	TO-220FPAB
IXFY30N25X3		30	0.0600	1450	21	82	0.73	170	TO-252AA	
IXFA44N25X3		44	0.0400	2200	33	87	0.52	240	TO-263AB	
IXFJ80N25X3		44	0.0180	5430	83	120	1.20	104	X016c	
IXFP44N25X3		44	0.0400	2200	33	87	0.52	240	TO-220AB	
IXFP44N25X3M		44	0.0400	2220	33	87	3.70	34	TO-220FPAB	
IXFA60N25X3		60	0.0230	3610	50	95	0.39	320	TO-263AB	
IXFP60N25X3		60	0.0230	3610	50	95	0.39	320	TO-220AB	
IXFP60N25X3M		60	0.0230	3610	50	95	3.50	36	TO-220FPAB	
IXFQ60N25X3		60	0.0230	3610	50	95	0.39	320	TO-3P	
IXFA80N25X3		80	0.0160	5430	83	120	0.32	390	TO-263AB	
IXFH80N25X3		80	0.0160	5430	83	120	0.32	390	TO-247AD	
IXFP80N25X3		80	0.0160	5430	83	120	0.32	390	TO-220AB	
IXFQ80N25X3		80	0.0160	5430	83	120	0.32	390	TO-3P	
IXFH120N25X3		120	0.0120	7870	122	140	0.26	480	TO-247AD	
IXFQ120N25X3		120	0.0120	7870	122	140	0.26	480	TO-3P	
IXFT120N25X3HV		120	0.0120	7870	122	140	0.26	480	TO-268AAHV	
IXFH150N25X3		150	0.0090	10400	154	140	0.17	735	TO-247AD	
IXFT150N25X3HV	150	0.0090	10400	154	140	0.17	735	TO-268AAHV		
IXFH170N25X3	170	0.0074	13500	190	140	0.14	890	TO-247AD		
IXFK170N25X3	170	0.0074	13500	190	140	0.14	890	TO-264		
IXFN170N25X3	170	0.0074	13500	190	135	0.32	390	SOT-227B miniBLOC		
IXFT170N25X3HV	170	0.0074	13500	190	140	0.14	890	TO-268AAHV		
IXFK240N25X3	240	0.0050	23800	345	177	0.10	1250	TO-264		
IXFN240N25X3	240	0.0045	23800	345	165	0.18	695	SOT-227B miniBLOC		
IXFX240N25X3	240	0.0050	23800	345	177	0.10	1250	PLUS247		

# Power MOSFET



## Ultra Junction Power MOSFET

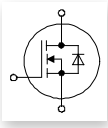
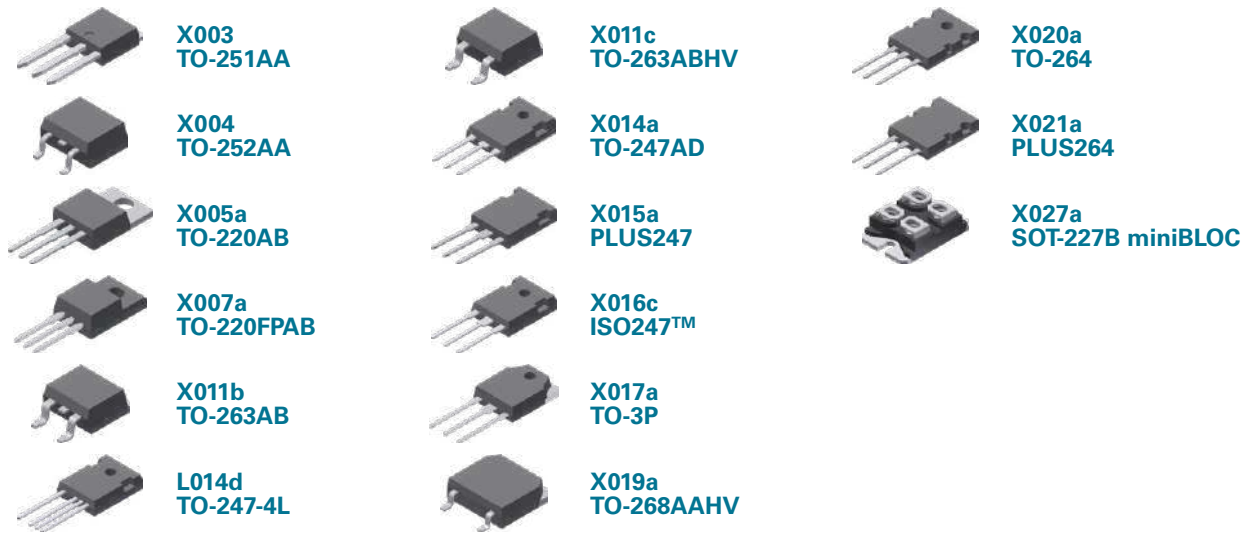
Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
<b>300 V X3-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>									
IXFA26N30X3	300	26	0.0660	1465	22	105	0.73	170	TO-263AB
IXFP26N30X3		26	0.0660	1465	22	105	0.73	170	TO-220AB
IXFY26N30X3		26	0.0660	1465	22	105	0.73	170	TO-252AA
IXFA38N30X3		38	0.0500	2240	35	90	0.52	240	TO-263AB
IXFP38N30X3		38	0.0500	2240	35	90	0.52	240	TO-220AB
IXFP38N30X3M		38	0.0500	2440	35	90	3.70	34	TO-220FPAB
IXFA56N30X3		56	0.0270	3750	56	115	0.39	320	TO-263AB
IXFH56N30X3		56	0.0270	3750	56	115	0.39	320	TO-247AD
IXFP56N30X3		56	0.0270	3750	56	115	0.39	320	TO-220AB
IXFP56N30X3M		56	0.0270	3750	56	115	3.50	36	TO-220FPAB
IXFA72N30X3		72	0.0190	5400	82	100	0.32	390	TO-263AB
IXFH72N30X3		72	0.0190	5400	82	100	0.32	390	TO-247AD
IXFP72N30X3		72	0.0190	5400	82	100	0.32	390	TO-220AB
IXFP72N30X3M		72	0.0190	5400	82	100	3.50	36	TO-220FPAB
IXFQ72N30X3		72	0.0190	5400	82	100	0.32	390	TO-3P
IXFH100N30X3		100	0.0135	7660	122	130	0.26	48	TO-247AD
IXFT100N30X3HV		100	0.0135	7660	122	130	0.26	480	TO-268AAHV
IXFH120N30X3		120	0.0110	10500	170	145	0.17	735	TO-247AD
IXFT120N30X3HV		120	0.0110	10500	170	145	0.17	735	TO-268AAHV
IXFH150N30X3		150	0.0083	13100	254	167	0.14	890	TO-247AD
IXFK150N30X3		150	0.0083	13100	254	167	0.14	890	TO-264
IXFT150N30X3HV	150	0.0083	13100	254	167	0.14	890	TO-268AAHV	
IXFK210N30X3	210	0.0055	24200	375	190	0.10	1250	TO-264	
IXFN210N30X3	210	0.0046	24200	375	190	0.18	695	SOT-227B miniBLOC	
IXFX210N30X3	210	0.0055	24200	375	190	0.10	1250	PLUS247	

## Ultra Junction Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
<b>650V X2-Class Power MOSFET</b>									
IXTP2N65X2	650	2	2.300	180	4.3	137	2.27	55	TO-220AB
IXTY2N65X2		2	2.300	180	4.3	137	2.27	55	TO-252AA
IXTA4N65X2		4	0.850	455	8.3	160	1.56	80	TO-263AB
IXTP4N65X2		4	0.850	455	8.3	160	1.56	80	TO-220AB
IXTY4N65X2		4	0.850	455	8.3	160	1.56	80	TO-252AA
IXTA8N65X2		8	0.500	800	12	200	0.83	150	TO-263AB
IXTP8N65X2		8	0.500	800	12	200	0.83	150	TO-220AB
IXTP8N65X2M		8	0.550	800	12	200	3.90	32	TO-220FPAB
IXTY8N65X2		8	0.500	800	12	200	0.83	150	TO-252AA
IXTA12N65X2		12	0.300	1100	17.7	270	0.69	180	TO-263AB
IXTH12N65X2		12	0.300	1100	17.7	270	0.69	180	TO-247AD
IXTP12N65X2		12	0.300	1100	17.7	270	0.69	180	TO-220AB
IXTP12N65X2M		12	0.300	1100	17.7	270	3.10	40	TO-220FPAB
IXTA20N65X2		20	0.185	1450	27	350	0.43	290	TO-263AB
IXTH20N65X2		20	0.185	1450	27	350	0.43	290	TO-247AD
IXTP20N65X2		20	0.185	1450	27	350	0.43	290	TO-220AB
IXTP20N65X2M		20	0.185	1450	27	350	3.50	36	TO-220FPAB
IXTA24N65X2		24	0.145	2060	36	390	0.32	390	TO-263AB
IXTH24N65X2		24	0.145	2060	36	390	0.32	390	TO-247AD
IXTP24N65X2		24	0.145	2060	36	390	0.32	390	TO-220AB
IXTP24N65X2M		24	0.145	2060	36	390	3.37	37	TO-220FPAB
IXTA30N65X2	30	0.120	2260	44	355	0.27	460	TO-263AB	
IXTP30N65X2	30	0.120	2260	44	355	0.27	460	TO-247AD	
IXTH30N65X2	30	0.120	2260	44	355	0.27	460	TO-247AD	
IXTA34N65X2	34	0.096	3000	54	390	0.23	540	TO-263AB	
IXTA34N65X2	34	0.096	3000	54	390	0.23	540	TO-263AB	
IXTH34N65X2	34	0.096	3000	54	390	0.23	540	TO-247AD	
IXTP34N65X2	34	0.096	3000	54	390	0.23	540	TO-220AB	
IXTT34N65X2HV	34	0.096	3000	54	390	0.23	540	TO-268AAHV	
IXTH48N65X2	48	0.065	4300	76	400	0.19	660	TO-247AD	
IXTR102N65X2	54	0.033	10900	152	450	0.38	330	ISOPLUS247™	
IXTH62N65X2	62	0.050	5800	100	445	0.16	780	TO-247AD	
IXTN102N65X2	76	0.030	10900	152	450	0.21	595	SOT-227B miniBLOC	
IXTH80N65X2	80	0.038	7800	137	465	0.14	890	TO-247AD	
IXTK102N65X2	102	0.030	10900	152	450	0.12	1040	TO-264	
IXTX102N65X2	102	0.030	10900	152	450	0.12	1040	PLUS247	
IXTK120N65X2	120	0.023	13600	230	505	0.10	1250	TO-264	
IXTQ34N65X2M	34	0.096	3000	54	390	2.9	43	TO-3P	
IXTQ48N65X2M	48	0.065	4300	76	400	1.78	70	TO-3P	
<b>650V X2-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>									
IXFA8N65X2	650	8	0.45	790	11	105	0.83	150	TO-263AB
IXFP8N65X2		8	0.45	790	11	105	0.83	150	TO-220AB
IXFY8N65X2		8	0.45	790	11	105	0.83	150	TO-252AA
IXFA12N65X2		12	0.31	1134	18.5	155	0.69	180	TO-263AB
IXFH12N65X2		12	0.31	1134	18.5	155	0.69	180	TO-247AD
IXFP12N65X2		12	0.31	1134	18.5	155	0.69	180	TO-220AB
IXFP12N65X2M		12	0.31	1134	18.5	155	3.10	40	TO-220FPAB
IXFA18N65X2		18	0.2	1520	29	135	0.43	290	TO-263AB
IXFH18N65X2		18	0.2	1520	29	135	0.43	290	TO-247AD
IXFP18N65X2		18	0.2	1520	29	135	0.43	290	TO-220AB
IXFP18N65X2M		18	0.2	1520	29	135	3.50	36	TO-220FPAB
IXFA22N65X2		22	0.145	2190	37	145	0.32	390	TO-263AB
IXFH22N65X2		22	0.145	2190	37	145	0.32	390	TO-247AD
IXFP22N65X2		22	0.145	2190	37	145	0.32	390	TO-220AB
IXFP22N65X2M		22	0.145	2190	37	145	3.37	37	TO-220FPAB



# Power MOSFET



## Ultra Junction Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
<b>650V X2-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>									
IXFA34N65X2	650	34	0.100	3230	56	164	0.23	540	TO-263AB
IXFH34N65X2		34	0.100	3230	56	164	0.23	540	TO-247AD
IXFP34N65X2		34	0.100	3230	56	164	0.23	540	TO-220AB
IXFP34N65X2M		34	0.100	3230	56	164	3.10	40	TO-220FPAB
IXFH46N65X2		46	0.069	4570	98	180	0.19	660	TO-247AD
IXFH60N65X2		60	0.052	6300	108	180	0.16	780	TO-247AD
IXFH60N65X2-4		60	0.052	6300	108	180	0.16	780	TO-247-4L
IXFT60N65X2HV		60	0.052	6300	108	180	0.16	780	TO-268AAHV
IXFN100N65X2		78	0.030	10800	183	200	0.21	595	SOT-227B miniBLOC
IXFH80N65X2		80	0.038	8300	140	200	0.14	890	TO-247AD
IXFH80N65X2-4		80	0.038	8300	140	200	0.14	890	TO-247-4L
IXFK80N65X2		80	0.038	8300	140	200	0.14	890	TO-264
IXFT80N65X2HV		80	0.038	8300	140	200	0.14	890	TO-268AAHV
IXFK100N65X2		100	0.030	10800	183	200	0.12	1040	TO-264
IXFX100N65X2		100	0.030	10800	183	200	0.12	1040	PLUS247
IXFN120N65X2		108	0.024	14000	240	220	0.14	890	SOT-227B miniBLOC
IXFK120N65X2		120	0.024	14000	240	220	0.10	1250	TO-264
IXFX120N65X2		120	0.024	14000	240	220	0.10	1250	PLUS247
IXFN150N65X2		145	0.017	21000	355	260	0.12	1040	SOT-227B miniBLOC
IXFB150N65X2		150	0.017	21000	355	260	0.08	1560	PLUS264
IXFN170N65X2	170	0.013	27000	434	270	0.11	1170	SOT-227B miniBLOC	

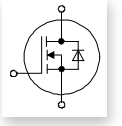
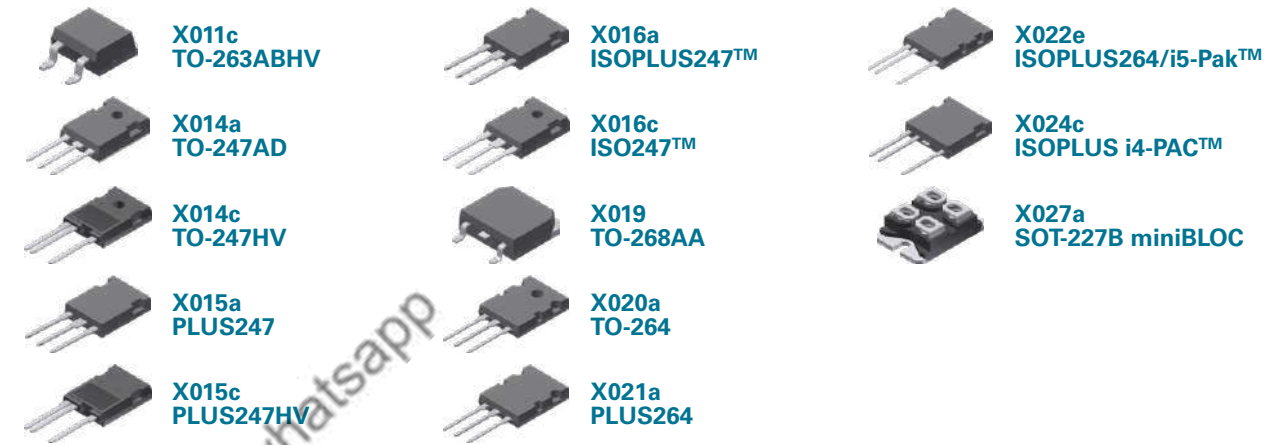
## Ultra Junction Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
<b>700V X2-Class Power MOSFET</b>										
IXTA4N70X2	700	4	0.850	386	11.8	186	1.56	80	TO-263AB	
IXTP4N70X2		4	0.850	386	11.8	186	1.56	80	TO-220AB	
IXTP4N70X2M		4	0.850	386	11.8	186	4.16	30	TO-220FPAB	
IXTU4N70X2		4	0.850	386	11.8	186	1.56	80	TO-251AA	
IXTY4N70X2		4	0.850	386	11.8	186	1.56	80	TO-252AA	
IXTA8N70X2		8	0.500	800	12	200	0.83	150	TO-263AB	
IXTP8N70X2		8	0.500	800	12	200	0.83	150	TO-220AB	
IXTP8N70X2M		8	0.550	800	12	200	3.90	32	TO-220FPAB	
IXTU8N70X2		8	0.500	800	12	200	0.83	150	TO-251AA	
IXTY8N70X2		8	0.500	800	12	200	0.83	150	TO-252AA	
IXTA12N70X2		12	0.300	960	19	270	0.69	180	TO-263AB	
IXTH12N70X2		12	0.300	960	19	270	0.69	180	TO-247AD	
IXTP12N70X2		12	0.300	960	19	270	0.69	180	TO-220AB	
IXTP12N70X2M		12	0.300	960	19	270	3.10	40	TO-220FPAB	
<b>850V X-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>										
IXFA4N85X		850	3.5	2.500	247	7	170	0.830	150	TO-263AB
IXFP4N85X	3.5		2.500	247	7	170	0.830	150	TO-220AB	
IXFP4N85XM	3.5		2.500	247	7	170	3.570	35	TO-220FPAB	
IXFY4N85X	3.5		2.500	247	7	170	0.830	150	TO-252AA	
IXFA8N85XH	8		0.850	654	17	125	0.630	200	TO-263ABHV	
IXFP8N85X	8		0.850	654	17	125	0.630	200	TO-220AB	
IXFP8N85XM	8		0.850	654	17	125	3.780	33	TO-220FPAB	
IXFQ8N85X	8		0.850	654	17	125	0.630	200	TO-3P	
IXFJ20N85X	9.5		0.360	1660	63	190	1.130	110	ISO247™	
IXFA14N85XH	14		0.550	1043	30	116	0.270	460	TO-263ABHV	
IXFH14N85X	14		0.550	1043	30	116	0.270	460	TO-247AD	
IXFP14N85X	14		0.550	1043	30	116	0.270	460	TO-220AB	
IXFP14N85XM	14		0.550	1043	30	116	3.300	38	TO-220FPAB	
IXFA20N85XH	20		0.330	1660	63	190	0.230	540	TO-263ABHV	
IXFH20N85X	20		0.330	1660	63	190	0.230	540	TO-247AD	
IXFP20N85X	20		0.330	1660	63	190	0.230	540	TO-220AB	
IXFH30N85X	30		0.230	2460	68	160	0.180	695	TO-247AD	
IXFT30N85XH	30		0.230	2460	68	160	0.180	695	TO-268AAHV	
IXFH40N85X	40		0.145	3700	98	200	0.145	860	TO-247AD	
IXFT40N85XH	40		0.145	3700	98	200	0.145	860	TO-268AAHV	
IXFH50N85X	50		0.105	4480	152	218	0.140	890	TO-247AD	
IXFK50N85X	50		0.105	4480	152	218	0.140	890	TO-264	
IXFT50N85XH	50		0.105	4480	152	218	0.140	890	TO-268AAHV	
IXFN66N85X	65		0.065	8900	230	250	0.150	830	SOT-227B miniBLOC	
IXFK66N85X	66		0.065	8900	230	250	0.100	1250	TO-264	
IXFX66N85X	66		0.065	8900	230	250	0.100	1250	PLUS247	
IXFB90N85X	90		0.041	13300	340	250	0.070	1785	PLUS264	
IXFN90N85X	90		0.041	13300	340	250	0.104	1200	SOT-227B miniBLOC	
IXFN110N85X	110		0.033	17000	425	205	0.107	1170	SOT-227B miniBLOC	
<b>1000V X-Class HiPerFET™ Power MOSFET With Fast Body Diodes</b>										
IXFH26N100X	1000		26	0.32	3290	113	220	0.145	860	TO-247AD
IXFT26N100XH			26	0.32	3290	113	220	0.145	860	TO-268AAHV
IXFH32N100X		32	0.22	4075	130	200	0.140	890	TO-247AD	
IXFK32N100X		32	0.22	4075	130	200	0.140	890	TO-264	
IXFT32N100XH		32	0.22	4075	130	200	0.140	890	TO-268AAHV	
IXFN52N100X		44	0.125	6725	245	260	0.150	830	SOT-227B miniBLOC	
IXFK52N100X		52	0.125	6725	245	260	0.100	1250	TO-264	
IXFX52N100X		52	0.125	6725	245	260	0.100	1250	PLUS247	
IXFN70N100X		65	0.089	9150	350	310	0.104	1200	SOT-227B miniBLOC	
IXFB70N100X		70	0.089	9160	350	310	0.070	1785	PLUS264	
IXFN74N100X		74	0.0660	17000	425	290	0.107	1170	SOT-227B miniBLOC	



Q3-Class HiPerFET™ Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> max. (typ.)	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXFH70N20Q3	200	70	0.040	3150	67	250	0.18	690	TO-247AD	
IXFT70N20Q3		70	0.040	3150	67	250	0.18	690	TO-268AA	
IXFH50N30Q3	300	50	0.080	3160	65	250	0.18	690	TO-247AD	
IXFT50N30Q3		50	0.080	3160	65	250	0.18	690	TO-268AA	
IXFT70N30Q3		70	0.054	4735	98	250	0.15	830	TO-268AA	
IXFH70N30Q3	500	70	0.054	4735	98	250	0.15	830	TO-247AD	
IXFR44N50Q3		25	0.154	4800	93	250	0.41	300	ISOPLUS247™	
IXFT30N50Q3		30	0.200	3200	62	250	0.18	690	TO-268AA	
IXFH30N50Q3		30	0.200	3200	62	250	0.18	690	TO-247AD	
IXFH44N50Q3		44	0.140	4800	93	250	0.15	830	TO-247AD	
IXFT44N50Q3		44	0.140	4800	93	250	0.15	830	TO-268AA	
IXFR64N50Q3		45	0.094	6950	145	250	0.25	500	ISOPLUS247™	
IXFR80N50Q3		50	0.072	10000	200	250	0.22	570	ISOPLUS247™	
IXFN80N50Q3		63	0.065	10000	200	250	0.16	780	SOT-227B miniBLOC	
IXFK64N50Q3		64	0.085	6950	145	250	0.13	1000	TO-264	
IXFX64N50Q3		64	0.085	6950	145	250	0.13	1000	PLUS247	
IXFX80N50Q3		80	0.065	10000	200	250	0.10	1250	PLUS247	
IXFK80N50Q3		80	0.065	10000	200	250	0.10	1250	TO-264	
IXFN100N50Q3		82	0.049	13800	255	250	0.13	960	SOT-227B miniBLOC	
IXFB100N50Q3		100	0.049	13800	255	250	0.08	1560	PLUS264	
IXFR48N60Q3		600	32	0.154	7020	140	300	0.25	500	ISOPLUS247™
IXFR64N60Q3			42	0.104	9930	190	300	0.22	568	ISOPLUS247™
IXFK48N60Q3	48		0.140	7020	140	300	0.13	1000	TO-264	
IXFX48N60Q3	48		0.140	7020	140	300	0.13	1000	PLUS247	
IXFK64N60Q3	64		0.095	9930	190	300	0.10	1250	TO-264	
IXFX64N60Q3	64		0.095	9930	190	300	0.10	1250	PLUS247	
IXFN82N60Q3	66		0.075	13500	275	300	0.13	960	SOT-227B miniBLOC	
IXFB82N60Q3	82		0.075	13500	275	300	0.08	1560	PLUS264	
IXFR32N80Q3	24		0.300	6940	140	300	0.25	500	ISOPLUS247™	
IXFK32N80Q3	32		0.270	6940	140	300	0.125	1000	TO-264	
IXFX32N80Q3	32	0.270	6940	140	300	0.125	1000	PLUS247		
IXFN44N80Q3	800	37	0.190	10950	185	300	0.16	780	SOT-227B miniBLOC	
IXFX44N80Q3		44	0.190	10950	185	300	0.10	1250	PLUS247	
IXFK44N80Q3		44	0.190	10950	185	300	0.10	1250	TO-264	
IXFN62N80Q3		49	0.140	13600	270	300	0.13	960	SOT-227B miniBLOC	
IXFB62N80Q3		62	0.140	13600	270	300	0.08	1560	PLUS264	
IXFR15N100Q3		10	1.200	3250	64	250	0.31	400	ISOPLUS247™	
IXFT15N100Q3	15	1.050	3250	64	250	0.18	690	TO-268AA		
IXFH15N100Q3	15	1.050	3250	64	250	0.18	690	TO-247AD		
IXFH18N100Q3	18	0.660	4890	90	300	0.15	830	TO-247AD		
IXFT18N100Q3	18	0.660	4890	90	300	0.15	830	TO-268AA		
IXFR24N100Q3	18	0.490	7200	140	300	0.25	500	ISOPLUS247™		
IXFR32N100Q3	1000	23	0.350	10900	195	300	0.22	570	ISOPLUS247™	
IXFK24N100Q3		24	0.440	7200	140	300	0.125	1000	TO-264	
IXFX24N100Q3		24	0.440	7200	140	300	0.125	1000	PLUS247	
IXFN32N100Q3		28	0.320	10900	195	300	0.16	780	SOT-227B miniBLOC	
IXFK32N100Q3		32	0.320	10900	195	250	0.10	1250	TO-264	
IXFX32N100Q3		32	0.320	10900	195	250	0.10	1250	PLUS247	
IXFN44N100Q3		38	0.220	13600	264	300	0.13	960	SOT-227B miniBLOC	
IXFB44N100Q3		44	0.220	13600	264	300	0.08	1560	PLUS264	
IXFN40N110Q3	1100	35	0.260	14000	300	-434	0.13	960	SOT-227B miniBLOC	
IXFB40N110Q3		40	0.260	14000	300	-434	0.08	1560	PLUS264	



Very High Voltage Power MOSFET (2–4.7 kV)

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTH1N200P3	2000	1	40	646	23.5	2300	1.00	125	TO-247AD	
IXTH1N200P3HV		1	40	646	23.5	2300	1.00	125	TO-247HV	
IXTA1N200P3HV		1	40	646	23.5	2300	1.00	125	TO-263ABHV	
IXTH3N200P3HV		3	8	1860	70	420	0.24	520	TO-247HV	
IXTT3N200P3HV		3	8	1860	70	420	0.24	520	TO-268AA	
IXTF6N200P3		4	4.2	3700	143	520	0.58	215	ISOPLUS i4-PAC™	
IXTX6N200P3HV		6	4	3700	143	520	0.13	960	PLUS247HV	
IXTH06N220P3HV		2200	0.6	80	290	10.4	1100	1.20	104	TO-247HV
IXTH1R8N220P3HV			1.8	21.5	965	31	1300	0.64	194	TO-247HV
IXTA02N250HV		2500	0.2	450	116	7.4	1500	1.50	83	TO-263ABHV
IXTH02N250	0.2		450	116	7.4	1500	1.50	83	TO-247AD	
IXTH05N250P3HV	0.5		110	303	10.5	1200	1.20	104	TO-247HV	
IXTF1N250	1		40	1660	41	2500	1.13	110	ISOPLUS i4-PAC™	
IXTH1R4N250P3	1.4		28	960	33	1800	0.64	195	TO-247AD	
IXTH1N250	1.5		40	1660	41	2500	0.50	250	TO-247AD	
IXTT1N250HV	1.5		40	1660	41	2500	0.50	250	TO-268AA	
IXTN5N250	5		8.8	8560	200	1200	0.18	700	SOT-227B miniBLOC	
IXTK5N250	5		8.8	8560	200	1200	0.13	960	TO-264	
IXTX5N250	5		8.8	8560	200	1200	0.13	960	PLUS247	
IXTH04N300P3HV	3000	0.4	190	283	13	1100	1.20	104	TO-247HV	
IXTT1N300P3HV		1	50	895	30.6	1800	0.64	195	TO-268AA	
IXTH1N300P3HV		1	50	895	30.6	1800	0.64	195	TO-247HV	
IXTF2N300P3		1.6	21	1890	73	400	0.77	160	ISOPLUS i4-PAC™	
IXTH2N300P3HV		2	21	1890	73	400	0.24	520	TO-247HV	
IXTT2N300P3HV		2	21	1890	73	400	0.24	520	TO-268AA	
IXTX4N300P3HV		4	12.5	3680	139	420	0.13	960	PLUS247HV	
IXTH02N450HV		4500	0.2	625	246	10.6	1600	1.10	113	TO-247HV
IXTF02N450			0.2	625	246	10.6	1600	1.60	78	ISOPLUS i4-PAC™
IXTT02N450HV			0.2	625	246	10.6	1600	1.10	113	TO-268AA
IXTF1N450	0.9		80	1700	46	1750	0.77	165	ISOPLUS i4-PAC™	
IXTT1N450HV	1		80	1700	46	1750	0.24	520	TO-268AA	
IXTH1N450HV	1		80	1700	46	1750	0.24	520	TO-247HV	
IXTF1R4N450	1.4		40	3300	88	660	0.65	190	ISOPLUS i4-PAC™	
IXTX1R4N450HV	1.4		40	3300	88	660	0.13	960	PLUS247HV	
IXTL2N450	2		20	6860	180	1750	0.56	220	ISOPLUS264/i5-Pak	
IXTL2N470	4700		2	20	6860	180	1750	0.56	220	ISOPLUS264/i5-Pak

# Power MOSFET



**X005a**  
TO-220AB



**X011c**  
TO-263ABHV



**X014a**  
TO-247AD



**X016c**  
ISO247™



**X017a**  
TO-3P



**X019**  
TO-268AA



**X015a**  
PLUS247



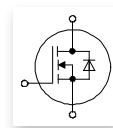
**X019a**  
TO-268AAHV



**X020a**  
TO-264



**X027a**  
SOT-227B miniBLOC



**X014a**  
TO-247AD



**X019**  
TO-268AA



**X021a**  
PLUS264



**X015a**  
PLUS247



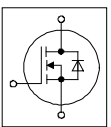
**X020a**  
TO-264



**X027a**  
SOT-227B miniBLOC



**X017a**  
TO-3P



## Legacy (Standard) Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package
	V	A	Ω	pF	nC	ns	K/W	W	
IXTA05N100HV	1000	0.75	17	260	7.8	710	3.10	40	TO-263ABHV
IXTP3N120	1200	3.00	4.5	1050	39	700	0.62	200	TO-220AB
IXTH3N120		3.00	4.5	1050	39	700	0.80	100	TO-247AD
IXTA3N120		3.00	4.5	1050	39	700	0.62	200	TO-263AB
IXTA3N120HV		3.00	4.5	1050	39	700	0.62	200	TO-263ABHV
IXTH6N120		6.00	2.4	1950	56	850	0.42	300	TO-247AD
IXTT6N120		6.00	2.4	1950	56	850	0.42	300	TO-268AA
IXTA3N150HV	1500	3.00	7.3	1375	38.6	900	0.50	110	TO-263ABHV
IXTH3N150		3.00	7.3	1375	38.6	900	0.50	250	TO-247AD
IXTJ3N150		2.50	8	1375	38.6	900	1.13	250	ISO247™
IXTA4N150HV		4.00	6	1576	44.5	900	0.45	280	TO-263ABHV
IXTH4N150		4.00	6	1576	44.5	900	0.45	280	TO-247AD
IXTJ4N150		2.50	6	1576	44.5	900	1.13	110	ISO247™
IXTT4N150HV		4.00	6	1576	44.5	900	0.45	280	TO-268AAHV
IXTH6N150		6.00	3.5	2230	67	1500	0.23	540	TO-247AD
IXTJ6N150		3.00	3.85	2230	67	1500	1.00	125	ISO247™
IXTT6N150		6.00	3.5	2230	67	1500	0.23	540	TO-247AD
IXTT12N150HV		12	2	3720	106	1200	0.14	890	TO-268AAHV

## Linear L™ Power MOSFET with Extended FBSOAs

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTH80N20L	200	80	0.032	6160	180	250	0.24	520	TO-247AD	
IXTT80N20L		80	0.032	6160	180	250	0.24	520	TO-268AA	
IXTN46N50L	500	46	0.16	7000	260	600	0.18	700	SOT-227B miniBLOC	
IXTK46N50L		46	0.16	7000	260	600	0.18	700	TO-264	
IXTX46N50L		46	0.16	7000	260	600	0.18	700	PLUS247	
IXTH24N50L		24	0.3	2500	160	500	0.31	400	TO-247AD	
IXTN30N100L	1000	30	0.45	13700	545	1000	0.156	800	SOT-227B miniBLOC	
IXTB30N100L		30	0.45	13700	545	1000	0.156	800	PLUS264	
IXTN22N100L		22	0.6	7050	270	1000	0.18	700	SOT-227B miniBLOC	
IXTK22N100L		22	0.6	7050	270	1000	0.18	700	TO-264	
IXTX22N100L		22	0.6	7050	270	1000	0.18	700	PLUS247	
IXTH12N100L		12	1.3	2500	155	1000	0.31	400	TO-247AD	
IXTH4N100L		4	2.8	1496	75	1100	0.43	290	TO-247AD	
IXTK17N120L		1200	17.00	0.9	8300.00	155	1830	0.18	700	TO-264
IXTX17N120L			17.00	0.9	8300.00	155	1830	0.18	700	PLUS247
IXTN17N120L			15.0	0.9	8300.00	155	1830	0.23	540	SOT-227B miniBLOC
IXTK8N150L	1500	8.00	3.6	8000.00	250	1700	0.18	700	TO-264	
IXTX8N150L		8.00	3.6	8000.00	250	1700	0.18	700	PLUS247	
IXTN8N150L		7.50	3.6	8000.00	250	1700	0.23	545	SOT-227B miniBLOC	
IXTH2N150L		2.00	15	1470.00	72	1860	0.43	290	TO-247AD	
IXTN3N250L	2500	3.00	0.0083	5400.00	230	370	0.36	347	SOT-227B miniBLOC	
IXTK3N250L		3.00	0.0083	5400.00	230	370	0.3	471	TO-264	
IXTX3N250L		3.00	0.0083	5400.00	230	370	0.3	417	PLUS247	

## More Information

### Straight Facts about Linear MOSFETs and their Applications

Linear MOSFETs are the most appropriate choice for linear-mode applications to ensure reliable operation. Read on to learn more.

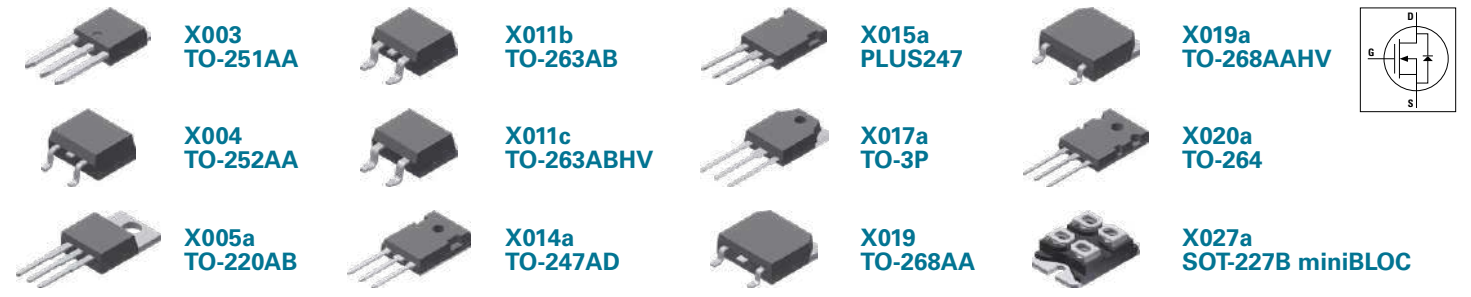


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## Linear L2™ Power MOSFET With Extended FBSOAs

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ.	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTP80N075L2	75	80	0.024	3600	103	160	0.35	357	TO-220AB	
IXTA80N075L2		80	0.024	3600	103	160	0.35	357	TO-263AB	
IXTH80N075L2		80	0.024	3600	103	160	0.35	357	TO-247AD	
IXTH140N075L2		140	0.011	9300	275	200	0.23	540	TO-247AD	
IXTT140N075L2HV		140	0.011	9300	275	200	0.23	540	TO-268AAHV	
IXTN240N075L2		225	0.007	19000	546	206	0.17	735	SOT-227B miniBLOC	
IXTK240N075L2		240	0.007	19000	546	206	0.13	960	TO-264	
IXTX240N075L2		240	0.007	19000	546	206	0.13	960	PLUS247	
IXTA64N10L2		100	64	0.032	3620	100	180	0.35	357	TO-263AB
IXTH64N10L2	64		0.032	3620	100	180	0.35	357	TO-247AD	
IXTP64N10L2	64		0.032	3620	100	180	0.35	357	TO-220AB	
IXTH75N10L2	75		0.021	8100	215	180	0.31	400	TO-247AD	
IXTT75N10L2	75		0.021	8100	215	180	0.31	400	TO-268AA	
IXTH110N10L2	110		0.018	10500	260	230	0.21	600	TO-247AD	
IXTT110N10L2	110		0.018	10500	260	230	0.21	600	TO-268AA	
IXTN200N10L2	178		0.011	23000	540	245	0.15	830	SOT-227B miniBLOC	
IXTX200N10L2	200		0.011	23000	540	245	0.12	1040	PLUS247	
IXTK200N10L2	200		0.011	23000	540	245	0.12	1040	TO-264	
IXTH60N20L2	200	60	0.045	10500	255	330	0.23	540	TO-247AD	
IXTT60N20L2		60	0.045	10500	255	330	0.23	540	TO-268AA	
IXTQ60N20L2		60	0.045	10500	255	330	0.23	540	TO-3P	
IXTN110N20L2		100	0.024	23000	500	420	0.17	735	SOT-227B miniBLOC	
IXTX110N20L2		110	0.024	23000	500	420	0.13	960	PLUS247	
IXTK110N20L2		110	0.024	23000	500	420	0.13	960	TO-264	
IXTA30N25L2		250	30	0.140	3200	130	315	0.35	355	TO-263AB
IXTH30N25L2			30	0.140	3200	130	315	0.35	355	TO-247AD
IXTP30N25L2			30	0.140	3200	130	315	0.35	355	TO-220AB
IXTH44N25L2			44	0.075	5740	256	366	0.31	400	TO-247AD
IXTT44N25L2HV	44		0.075	5740	256	366	0.31	400	TO-268AAHV	
IXTH58N25L2	58		0.064	9200	330	400	0.23	540	TO-247AD	
IXTX90N25L2	90		0.033	23000	640	266	0.13	960	PLUS247	
IXTN90N25L2	90		0.033	23000	640	266	0.17	735	SOT-227B miniBLOC	
IXTK90N25L2	90		0.033	23000	640	266	0.13	960	TO-264	
IXTH38N30L2	300		38	0.100	7200	260	420	0.31	400	TO-247AD
IXTT38N30L2		38	0.100	7200	260	420	0.31	400	TO-268AA	
IXTH50N30L2		50	0.072	9300	330	430	0.23	540	TO-247AD	
IXTK80N30L2		80	0.038	19100	660	485	0.13	960	TO-264	
IXTN80N30L2		80	0.038	19100	660	485	0.17	735	SOT-227B miniBLOC	
IXTX80N30L2		80	0.038	19100	660	485	0.13	960	PLUS247	
IXTA15N50L2		500	15	0.480	4080	123	570	0.42	300	TO-263AB
IXTP15N50L2			15	0.480	4080	123	570	0.42	300	TO-220AB
IXTH15N50L2			15	0.480	4080	123	570	0.42	300	TO-247AD
IXTH30N50L2			30	0.200	8100	240	500	0.31	400	TO-247AD
IXTT30N50L2	30		0.200	8100	240	500	0.31	400	TO-268AA	
IXTQ30N50L2	30		0.200	8100	240	500	0.31	400	TO-3P	
IXTH40N50L2	40		0.170	10400	320	500	0.23	540	TO-247AD	
IXTT40N50L2	40		0.170	10400	320	500	0.23	540	TO-268AA	
IXTQ40N50L2	40		0.170	10400	320	500	0.23	540	TO-3P	
IXTN60N50L2	53		0.100	24000	610	980	0.17	735	SOT-227B miniBLOC	
IXTX60N50L2	60	0.100	24000	610	980	0.13	960	PLUS247		
IXTK60N50L2	60	0.100	24000	610	980	0.13	960	TO-264		
IXTH30N60L2	600	30	0.240	10700	335	710	0.23	540	TO-247AD	
IXTT30N60L2		30	0.240	10700	335	710	0.23	540	TO-268AA	
IXTQ30N60L2		30	0.240	10700	335	710	0.23	540	TO-3P	



## Depletion Mode Power MOSFETs

"Normally on" devices

Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	V <sub>GS(off)</sub> max.	C <sub>iss</sub> typ.	C <sub>rss</sub> typ.	Q <sub>g</sub> typ.	R <sub>thJC</sub>	Package
	V	A	Ω	V	pF	pF	nC	K/W	
IXTH16N10D2	100	16.00	0.064	-4	5700	940	225	695	TO-247AD
IXTT16N10D2		16.00	0.064	-4	5700	940	225	695	TO-268AA
IXTH16N20D2		200	16.00	0.073	-4	5500	607	208	695
IXTT16N20D2	16.00		0.073	-4	5500	607	208	695	TO-268AA
IXTP08N50D2	500	0.80	4.6	-4	312	11	12.7	60	TO-220AB
IXTY08N50D2		0.80	4.6	-4	312	11	12.7	60	TO-252AA
IXTA08N50D2		0.80	4.6	-4	312	11	12.7	60	TO-263AB
IXTP1R6N50D2		1.60	2.3	-4	645	16.5	23.7	100	TO-220AB
IXTY1R6N50D2		1.60	2.3	-4	645	16.5	23.7	100	TO-252AA
IXTA1R6N50D2		1.60	2.3	-4	645	16.5	23.7	100	TO-263AB
IXTP3N50D2		3.00	1.5	-4	1070	24	40	125	TO-220AB
IXTA3N50D2		3.00	1.5	-4	1070	24	40	125	TO-263AB
IXTP6N50D2		6.00	0.5	-4	2800	64	96	300	TO-220AB
IXTH6N50D2		6.00	0.5	-4	2800	64	96	300	TO-247AD
IXTA6N50D2	6.00	0.5	-4	2800	64	96	300	TO-263AB	
IXTH16N50D2	1000	16.00	0.24	-4	5250	130	199	695	TO-247AD
IXTT16N50D2		16.00	0.24	-4	5250	130	199	695	TO-268AA
IXTP08N100D2	1700	0.80	21	-4	325	6.5	14.6	60	TO-220AB
IXTY08N100D2		0.80	21	-4	325	6.5	14.6	60	TO-252AA
IXTA08N100D2		0.80	21	-4	325	6.5	14.6	60	TO-263AB
IXTA08N100D2HV		0.80	21	-4	325	6.5	14.6	60	TO-263ABHV
IXTP1R6N100D2		1.60	10	-4.5	645	11	27	100	TO-220AB
IXTY1R6N100D2		1.60	10	-4.5	645	11	27	100	TO-252AA
IXTA1R6N100D2		1.60	10	-4.5	645	11	27	100	TO-263AB
IXTP3N100D2		3.00	5.5	-4.5	1020	17	37.5	125	TO-220AB
IXTA3N100D2		3.00	5.5	-4.5	1020	17	37.5	125	TO-263AB
IXTA3N100D2HV		3.00	6	-4.5	1020	17	37.5	125	TO-263ABHV
IXTP6N100D2	6.00	2.2	-4.5	2650	41	95	300	TO-220AB	
IXTH6N100D2	6.00	2.2	-4.5	2650	41	95	300	TO-247AD	
IXTA6N100D2	6.00	2.2	-4.5	2650	41	95	300	TO-263AB	
IXTT10N100D2	1700	10.00	1.5	-4.5	5320	70	200	695	TO-268AA
IXTH10N100D2		10.00	1.5	-4.5	5320	70	200	695	TO-247AD
IXTT2N170D2	1700	2.00	6.5	-4	3650	80	110	568	TO-268AA
IXTH2N170D2		2.00	6.5	-4	3650	80	110	568	TO-247AD
IXTA1N170D2HV		1.00	16	-4.5	3090	30	47	290	TO-263ABHV
IXTH1N170D2HV	1.00	16	-4.5	3090	30	47	290	TO-247HV	



# Power MOSFET



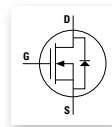
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TO-220AB



X017a  
TO-3P



SOT-89



X011b  
TO-263AB



X019  
TO-268AA



SOT-223



X014a  
TO-247AD



X020a  
TO-264



SOT-223-2L



X015a  
PLUS247



X027a  
SOT-227B miniBLOC



X016a  
ISOPLUS247™



SOT-23



X005a  
TO-220AB



X015a  
PLUS247



X019  
TO-268AA



X027a  
SOT-227B miniBLOC



X011b  
TO-263AB



X016a  
ISOPLUS247™



X020a  
TO-264



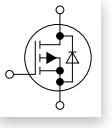
X014a  
TO-247AD



X017a  
TO-3P



X021a  
PLUS264



## N-Channel Depletion Mode FETs

Our N-channel depletion mode field effect transistors (FETs) utilize a proprietary third-generation vertical DMOS process. This third-generation process realizes world-class, high-voltage MOSFET performance in an economical silicon gate process. This process also yields a robust device for low-power applications with high input impedance. These highly reliable FET devices have been used extensively in our solid state relays for industrial and telecommunications applications. These “normally on” MOSFETs are well suited for low-cost, pre-regulator applications that are tolerant of high voltage drops and power dissipation between the power source and the output regulator stage.

Part Number	$V_{(BR)DSX}$	$R_{DS(on)}$ max.	$V_{GS(off)}$ min.	$V_{GS(off)}$ max.	$I_b$ min.	Package
	V	$\Omega$	V	V	mA	
CPC3701	60	1	-1.4	-3.1	600	SOT-89
CPC3703	250	4	-1.6	-3.9	360	SOT-89
CPC3708	350	14	-2	-3.6	130	SOT-89 / SOT-223
CPC3710	250	10	-1.6	-3.9	220	SOT-89
CPC3714	350	14	-1.6	-3.9	240	SOT-89
CPC3720	350	22	-1.6	-3.9	130	SOT-89
CPC3730	350	35	-1.6	-3.9	140	SOT-89
CPC3902	250	2.5	-1.4	-3.1	400	SOT-89 / SOT-223
CPC3909	400	6	-1.4	-3.1	300	SOT-89 / SOT-223
CPC3960	600	44	-1.4	-3.1	100	SOT-223
CPC3980	800	45	-1.4	-3.1	100	SOT-223
CPC3981	800	45	-1.4	-3.1	100	SOT-223-2L
CPC3982	800	380	-1.4	-3.1	20	SOT-23

## P-Channel PolarP™ Power MOSFET

Part Number	$V_{DSS}$	$I_{D(cont)}$ Chip $T_C = 25^\circ C$	$R_{DS(on)}$ $T_J = 25^\circ C$	$C_{iss}$ typ.	$Q_g$ typ.	$t_{rr}$ typ.	$R_{thJC}$	$P_D$	Package
	V	A	$\Omega$	pF	nC	ns	K/W	W	
IXTX32P60P	-600	-32	0.350	11100	196	480	0.14	890	PLUS247
IXTN32P60P		-32	0.350	11100	196	480	0.14	890	SOT-227B miniBLOC
IXTK32P60P		-32	0.350	11100	196	480	0.14	890	TO-264
IXTR32P60P		-18	0.385	11100	196	480	0.40	310	ISOPLUS247™
IXTH16P60P		-16	0.720	5120	92	440	0.27	460	TO-247AD
IXTT16P60P		-16	0.720	5120	92	440	0.27	460	TO-268AA
IXTR16P60P		-10	0.790	5120	92	440	0.66	190	ISOPLUS247™
IXTX40P50P		-40	0.230	11.5	205	477	0.14	890	PLUS247
IXTN40P50P		-40	0.230	11500	205	477	0.14	890	SOT-227B miniBLOC
IXTK40P50P		-40	0.230	11500	205	477	0.14	890	TO-264
IXTR40P50P	-500	-22	0.260	11500	205	477	0.40	312	ISOPLUS247™
IXTH20P50P		-20	0.450	5120	103	406	0.27	460	TO-247AD
IXTT20P50P		-20	0.450	5120	103	406	0.27	460	TO-268AA
IXTR20P50P		-13	0.490	5120	103	406	0.66	190	ISOPLUS247™
IXTP10P50P		-10	1.000	2670	50	414	0.50	300	TO-220AB
IXTH10P50P		-10	1.000	2670	50	414	0.50	300	TO-247AD
IXTA10P50P		-10	1.000	2670	50	414	0.50	300	TO-263AB
IXTQ10P50P		-10	1.000	2670	50	414	0.50	300	TO-3P
IXTX90P20P		-90	0.044	12000	205	315	0.14	890	PLUS247
IXTN90P20P		-90	0.044	12000	205	315	0.14	890	SOT-227B miniBLOC
IXTK90P20P	-90	0.044	12000	205	315	0.14	890	TO-264	
IXTR90P20P	-200	-53	0.048	12000	205	315	0.40	312	ISOPLUS247™
IXTH48P20P		-48	0.085	5400	103	260	0.27	462	TO-247AD
IXTT48P20P		-48	0.085	5400	103	260	0.27	462	TO-268AA
IXTR48P20P		-30	0.093	5400	103	260	0.66	190	ISOPLUS247™
IXTP26P20P		-26	0.170	2740	56	240	0.42	300	TO-220AB
IXTH26P20P		-26	0.170	2740	56	240	0.42	300	TO-247AD
IXTA26P20P		-26	0.170	2740	56	240	0.42	300	TO-263AB
IXTQ26P20P		-26	0.170	2740	56	240	0.42	300	TO-3P
IXTP36P15P		-36	0.110	3100	55	228	0.42	300	TO-220AB
IXTH36P15P		-36	0.110	3100	55	228	0.42	300	TO-247AD
IXTA36P15P	-36	0.110	3100	55	228	0.42	300	TO-263AB	
IXTQ36P15P	-36	0.110	3100	55	228	0.42	300	TO-3P	
IXTR36P15P	-150	-22	0.120	2950	55	150	1.00	150	ISOPLUS247™
IXTX170P10P		-170	0.012	12600	240	176	0.14	890	PLUS247
IXTN170P10P		-170	0.012	12600	240	176	0.14	890	SOT-227B miniBLOC
IXTK170P10P		-170	0.012	12600	240	176	0.14	890	TO-264
IXTR170P10P		-108	0.013	12600	240	176	0.40	312	ISOPLUS247™
IXTH90P10P		-90	0.025	5800	120	144	0.27	462	TO-247AD
IXTT90P10P		-90	0.025	5800	120	144	0.27	462	TO-268AA
IXTR90P10P		-57	0.027	5800	120	144	0.66	190	ISOPLUS247™
IXTP52P10P		-52	0.050	2845	60	120	0.42	300	TO-220AB
IXTH52P10P		-52	0.050	2845	60	120	0.42	300	TO-247AD
IXTA52P10P	-52	0.050	2845	60	120	0.42	300	TO-263AB	
IXTQ52P10P	-52	0.05	2845	60	120	0.42	300	TO-3P	

## More Information

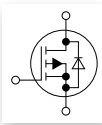
### Depletion MOSFETs Bodo's Article

Littelfuse depletion-mode MOSFETs are available from 60 V to 1700V and can be used whenever application demands current at zero gate voltage. The applications highlighted in this article will help designers select these devices in various industrial applications.



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P-Channel Trench™ Power MOSFET



Part Number	V <sub>DSS</sub>	I <sub>D(cont)</sub> Chip T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	t <sub>rr</sub> typ. (max)	R <sub>thJC</sub>	P <sub>D</sub>	Package	
	V	A	Ω	pF	nC	ns	K/W	W		
IXTK120P20T	-200	-120	0.030	73000	740	-300	0.12	1040	TO-264	
IXTX120P20T		-120	0.030	73000	740	-301	0.12	1040	PLUS247	
IXTN120P20T		-106	0.030	73000	740	-302	0.15	830	SOT-227B miniBLOC	
IXTR120P20T		-90	0.032	73000	740	-303	0.21	595	ISOPLUS247™	
IXTH68P20T		-68	0.055	33400	380	245	0.22	568	TO-247AD	
IXTT68P20T		-68	0.055	33400	380	245	0.22	568	TO-268AA	
IXTR68P20T		-44	0.064	33400	380	245	0.46	270	ISOPLUS247™	
IXTA32P20T		-32	0.130	14500	185	190	0.42	300	TO-263AB	
IXTP32P20T		-32	0.130	14500	185	190	0.42	300	TO-220AB	
IXTH32P20T		-32	0.130	14500	185	190	0.42	300	TO-247AD	
IXTQ32P20T		-32	0.130	14500	185	190	0.42	300	TO-3P	
IXTP44P15T		-150	-44	0.065	13400	175	140	0.42	298	TO-220AB
IXTH44P15T	-44		0.065	13400	175	140	0.42	298	TO-247AD	
IXTA44P15T	-44		0.065	13400	175	140	0.42	298	TO-263AB	
IXTQ44P15T	-44		0.065	13400	175	140	0.42	298	TO-3P	
IXTP15P15T	-15		0.240	3650	48	116	0.83	150	TO-220AB	
IXTY15P15T	-15		0.240	3650	48	116	0.83	150	TO-252AA	
IXTA15P15T	-15		0.240	3650	48	116	0.83	150	TO-263AB	
IXTP10P15T	-10		0.350	2210	36	120	1.50	83	TO-220AB	
IXTY10P15T	-10		0.350	2210	36	120	1.50	83	TO-252AA	
IXTA10P15T	-10		0.350	2210	36	120	1.50	83	TO-263AB	
IXTK210P10T	-100		-210	0.008	69500	740	-200	0.12	1040	TO-264
IXTN210P10T			-210	0.008	69500	740	-201	0.15	830	SOT-227B miniBLOC
IXTX210P10T		-210	0.008	69500	740	-202	0.12	1040	PLUS247	
IXTR210P10T		-195	0.008	69500	740	-203	0.32	390	ISOPLUS247™	
IXTH140P10T		-140	0.012	31400	400	130	0.22	568	TO-247AD	
IXTT140P10T		-140	0.012	31400	400	130	0.22	568	TO-268AA	
IXTR140P10T		-90	0.013	31400	400	130	0.46	270	ISOPLUS247™	
IXTP76P10T		-76	0.025	13700	197	70	0.42	298	TO-220AB	
IXTH76P10T		-76	0.025	13700	197	70	0.42	298	TO-247AD	
IXTA76P10T		-76	0.025	13700	197	70	0.42	298	TO-263AB	
IXTP26P10T		-26	0.090	3820	52	70	0.83	150	TO-220AB	
IXTY26P10T		-26	0.090	3820	52	70	0.83	150	TO-252AA	
IXTA26P10T	-26	0.090	3820	52	70	0.83	150	TO-263AB		
IXTP18P10T	-85	-18	0.120	2100	39	62	1.50	83	TO-220AB	
IXTH18P10T		-18	0.120	2100	39	62	1.50	83	TO-252AA	
IXTA18P10T		-18	0.120	2100	39	62	1.50	83	TO-263AB	
IXTP96P085T		-96	0.013	13100	180	55	0.42	298	TO-220AB	
IXTH96P085T		-96	0.013	13100	180	55	0.42	298	TO-247AD	
IXTA96P085T		-96	0.013	13100	180	55	0.42	298	TO-263AB	
IXTP24P085T		-24	0.065	2090	41	40	1.50	83	TO-220AB	
IXTA24P085T		-24	0.065	2090	41	40	1.50	83	TO-263AB	
IXTP120P065T		-65	-120	0.010	13200	185	53	0.42	298	TO-220AB
IXTH120P065T			-120	0.010	13200	185	53	0.42	298	TO-247AD
IXTA120P065T			-120	0.010	13200	185	53	0.42	298	TO-263AB
IXTP28P065T			-28	0.045	2030	46	31	1.50	83	TO-220AB
IXTA28P065T	-28		0.045	2030	46	31	1.50	83	TO-263AB	
IXTP140P05T	-50		-140	0.009	13500	200	53	0.42	298	TO-220AB
IXTH140P05T			-140	0.009	13500	200	53	0.42	298	TO-247AD
IXTA140P05T			-140	0.009	13500	200	53	0.42	298	TO-263AB
IXTP48P05T			-48	0.030	3660	53	30	0.83	150	TO-220AB
IXTY48P05T			-48	0.030	3660	53	30	0.83	150	TO-252AA
IXTA48P05T			-48	0.030	3660	53	30	0.83	150	TO-263AB
IXTP32P05T			-32	0.039	1975	46	26	1.50	83	TO-220AB
IXTY32P05T		-32	0.039	1975	46	26	1.50	83	TO-252AA	
IXTA32P05T		-32	0.039	1975	46	26	1.50	83	TO-263AB	

**X004**  
TO-252AA

**X005a**  
TO-220AB

**X011b**  
TO-263AB

**X014a**  
TO-247AD

**X015a**  
PLUS247

**X016a**  
ISOPLUS247™

**X017a**  
TO-3P

**X019**  
TO-268AA

**X020a**  
TO-264

**X022c**  
ISOPLUS264

**X024a**  
ISOPLUS i4-PAC™

**X024c**  
ISOPLUS i4-PAC™

**X027a**  
SOT-227B miniBLOC

**X030a**  
SMPD-B

...P...

IXKF

FMD

...RK...

LKK

Superjunction Power MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D25</sub> T <sub>C</sub> = 25 °C	R <sub>DS(on)</sub> max. T <sub>J</sub> = 25 °C	Q <sub>g</sub> typ.	R <sub>thJC</sub>	Config.	Package
	V	A	Ω	nC	K/W		
<b>Configurations in i4-PAC™</b>							
FMD15-06KC5 <sup>1</sup>	600	15	0.165	40	1.10	boost	ISOPLUS i4-PACTM
<b>Configuration in the ISOPLUS264™ Package</b>							
LKK47-06C5	600	2 × 47	0.045	150	0.45	dual	ISOPLUS264
<b>Configurations in the SMPD Package</b>							
MKE38RK600DFELB <sup>2</sup>	600	50	0.045	150	0.40	buck/boost	SMPD-B
MKE38P600LB <sup>3</sup>	600	50	0.040	150	0.40	phase leg	SMPD-B

<sup>1</sup> NFND. Replacement part MXB12R600DPHFC  
<sup>2</sup> NFND. Replacement part MXB40RK600DFELB  
<sup>3</sup> NFND. Replacement part MXB40P650LB

# Power MOSFET

Littelfuse SiC MOSFETs offer a rewarding alternative to traditional Si-based power transistor devices. The MOSFET device structure enables lower per-cycle switching losses and improved light-load efficiency when compared to similarly rated IGBTs. Inherent material properties allow the SiC MOSFET to outclass its Si MOSFET counterparts in terms of blocking voltage, specific on resistances, and junction capacitances.



## SiC MOSFET

Part Number	V <sub>DSS</sub>	I <sub>D</sub> T <sub>C</sub> = 25 °C	I <sub>D</sub> T <sub>C</sub> = 100 °C	R <sub>DS(on)</sub> typ. T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	R <sub>thJC</sub>	Package	
	V	A	A	mΩ	pF	nC	K/W		
LSIC1MO120E0080	1200	39	25	80	1825	95	0.70	TO-247 AD	
LSIC1MO120E0120		27	18	120	1125	80	0.90		
LSIC1MO120E0160		22	14	160	870	57	1.00		
LSIC1MO120G0025		90	60	25	4465	250	0.30		
LSIC1MO120G0040		65	50	40	2825	160	0.42	TO-247-4L	
LSIC1MO120T0080		39	25	80	1825	95	0.70		
LSIC1MO120T0120		27	18	120	1125	80	0.90	TO-263 (7)	
LSIC1MO120T0160		22	14	160	870	57	1.00		
LSIC1MO170E0750		1700	5	3.5	750	200	15	2.30	TO-247 AD
LSIC1MO170T0750			5	3.5	750	200	15	2.30	TO-263 (7)
LSIC1MO170H0750	5		3.5	750	200	15	2.30	TO-268AA (HV)	

## More Information

### SMPD™: An Advanced Isolated Packaging to Fully Exploit the Advantages of SiC MOSFETs

The advanced isolated packages from Littelfuse such as SMPD fill the gap between modules and discretes, offering the performance of power module with the flexibility of discrete devices. Read on to learn more.



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### Mounting and Cooling Solutions for SMPD Packages

This application note discusses various mounting solutions for Surface Mount Power Device (SMPD) packages. Read on to learn more.



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### 60 W Auxiliary Power Supply

This application note describes the design and performance of 60 W auxiliary power supply with wide input voltage for industrial applications using 1.7 kV 1 ohm SiC MOSFETs from Littelfuse. Read on to learn more.



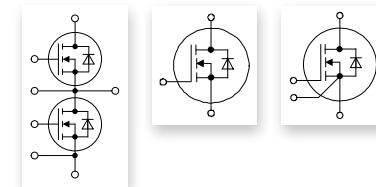
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### Optimization of Freewheeling Device Implementation in SiC MOSFETs

This paper discusses the optimization of freewheeling device implementation for SiC MOSFETs in a half-bridge configuration. Read on to learn more.



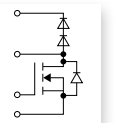
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Part Number	V <sub>DSS</sub>	I <sub>D</sub> T <sub>C</sub> = 25 °C	I <sub>D80</sub> T <sub>C</sub> = 80 °C	R <sub>DS(on)</sub> typ. T <sub>J</sub> = 25 °C	C <sub>iss</sub> typ.	Q <sub>g</sub> typ.	R <sub>thJC</sub>	Package
	V	A	A	mΩ	pF	nC	K/W	
IXFN130N90SK <sup>1</sup>	900	136	109	10	4500	68	0.42	SOT-227B miniBLOC
IXFN27N120SK <sup>1</sup>	1200	27	21.5	80	950	62	1.10	SOT-227B miniBLOC
IXFN50N120SIC		47	35	40	1900	100	0.55	SOT-227B miniBLOC
IXFN50N120SK <sup>1</sup>		48	38	40	1895	115	0.60	SOT-227B miniBLOC
IXFN70N120SK <sup>1</sup>		68	55	25	2790	160	0.45	SOT-227B miniBLOC
<b>Phase Leg</b>								
MCL10P1200LB	1200	16	11	160	890	50	2.30	SMPD-B
MCB20P1200LB		22	17.5	80	950	62	1.60	SMPD-B
MCB30P1200LB		37	29.5	40	1895	115	1.00	SMPD-B

<sup>1</sup> Kelvin source-gate connection;

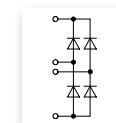
## Buck/Boost Circuits



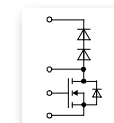
Part Number	Circuit and Technology	V <sub>DSS</sub> max.	I <sub>D80</sub> TC = 80 °C	R <sub>DS(on)</sub> typ.	I <sub>F80</sub> Boost Diode	Package
		V	A	Ω	A	
MXB12R600DPHFC	X2 Class MOSFET + HiperDynFRED diode	650	13	0.16 (max)	16	ISOPLUS i4-PAC™

Part Number	Circuit and Technology	V <sub>DSS</sub> max.	I <sub>D</sub> TC = 25 °C	R <sub>DS(on)</sub> max.	V <sub>RRM</sub> Boost Diode	Package
		V	A	Ω	A	
<b>MOSFET</b>						
FMD15-06KC5 <sup>1</sup>	C Superjunction CP1	600	15	0.165	650	ISOPLUS i4-PAC™
MKE38RK600DFELB <sup>2</sup>	F Superjunction CP1	650	50	0.045	600	SMPD-B

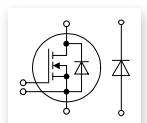
<sup>1</sup> NFND. Replacement part MXB12R600DPHFC  
<sup>2</sup> NFND. Replacement part MXB40RK600DFELB



A 1 Phase Bridge



C MOS + HiPerDyn



F buck/boost

## 1-phase PFC

Part Number	Circuit and Technology	V <sub>RRM</sub>	I <sub>DAV</sub> @ T <sub>C</sub>	Package
		V	A	
<b>Rectifier</b>				
FBO16-12N <sup>2</sup>	A	Standard	22	ISOPLUS i4-PAC™
FBO40-12N <sup>2</sup>		Standard	40	
DLA100B800LB <sup>3,4</sup>	A	low VF	124	SMPD-B
DLA100B1200LB <sup>3</sup>		low VF	124	

<sup>1</sup> Powered by Infineon CoolMOS™ superjunction bare die  
<sup>2</sup> Recommended in combination with FMD and FID  
<sup>3</sup> Recommended in combination with MKE, MKG, and MXB  
<sup>4</sup> AEC-Q-101



## Diodes for High Switching Frequencies

### Fast Recovery Epitaxial Diodes (HiPerFRED, FRED) and FRD (SONIC)

Power switches (IGBT, MOSFET, BJT, GTO) for applications in electronics are only as good as their associated free wheeling diodes. At increasing switching frequencies, the proper functioning and efficiency of the power switch, aside from conduction losses, is determined by the turn-off behavior of the diode (characterized by  $Q_{rr}$ ,  $I_{RM}$ , and  $t_{rr}$  Figure 1). With optimized ultra-fast switching diodes, the development engineer has various possibilities: either higher pulse rate or higher current load, or smaller heatsink or more conservative operation due to cooler chips.

The reverse current characteristic following the peak reverse-current  $I_{RM}$  is another important property of our diodes. The slope of the decaying reverse current  $di_{rr}/dt$  results from design parameters (i.e., technology and diffusion of the diode chips). In a circuit, this current slope, in conjunction with parasitic inductances (e.g., connecting leads), causes over-voltage spikes and high-frequency interference voltages. The higher the  $di_{rr}/dt$  ("hard recovery" or "snap-off" behavior), the higher the resulting additional stress for both the diode and the paralleled switch. A slow decay of the reverse current ("soft recovery" behavior) is the most desirable characteristic, and this is designed into all diodes. The wide range of available blocking voltages makes it possible to apply these diodes as output rectifiers in switch-mode power supplies (SMPS) as well as protective and free-wheeling diodes for power switches in inverters.

### Silicon Carbide (SiC) Schottky Barrier Diodes

SiC Schottky Barrier Diodes (SBD) offer promising potential for high-efficiency high power density applications due to their superior performance over Si devices. For SiC SBD, the reverse recovery (RR) behavior caused by minority carrier extraction during forced diode turnoffs can be eliminated, as compared with Si P-N junction diodes. The switching losses are ultra-low, and they are independent of  $di/dt$ , current level, and temperature. The paralleling of SiC SBD are easy thanks to its positive temperature coefficient. The merged p-n Schottky (MPS) device architecture enhances surge capability and provides low leakage.

## Diodes for General Purpose Applications

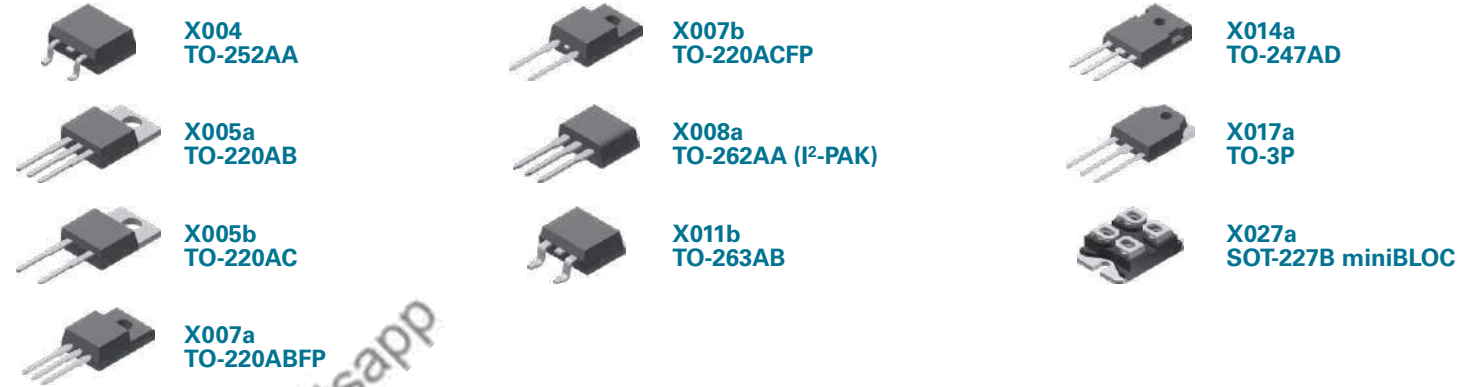
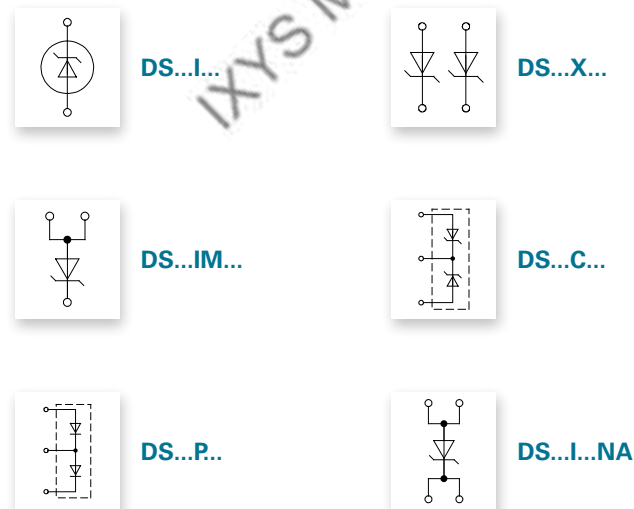
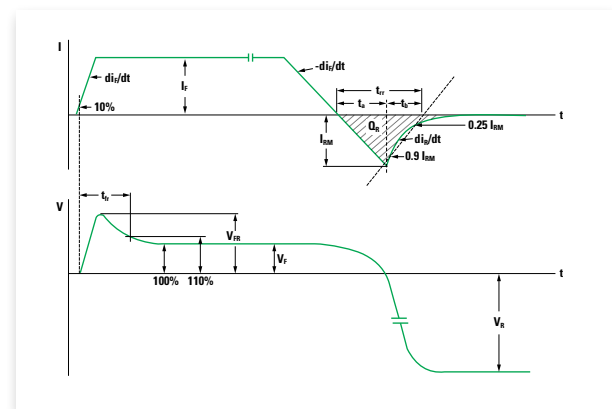
### Rectifier Diodes

Diodes of the DS-series (anode on stud) and of the DSI-series (cathode on stud) are mainly used for rectifying 50 or 60 Hz main currents. Discrete diodes in plastic and metal housings, as well as different diode bridges, are available for standard line voltages from 110 V to 690 V AC.

### Avalanche Diodes

Avalanche diodes or surge-voltage-proof rectifier diodes of the series DSA (anode on stud) and DSAI (cathode on stud) differ from standard diodes of the series DS and DSI: the operation in avalanche breakdown above the normal reverse blocking voltage ( $V_{RRM}$ ) can be tolerated as long as the power is within the specified maximum permissible non-repetitive reverse surge dissipation PRSM at the specified pulse width. For technologically good control of the avalanche breakdown, it is important to ensure homogeneous doping of the middle zone of the silicon chip and suitable junction termination and passivation at the edges where PN-junctions are exposed to the surface (high field strength at the edge). Because of this ruggedness against periodically occurring short-term voltage surges in the blocking direction, the user can frequently do without protective overvoltage networks. In addition, if avalanche diodes are placed in series for high voltage applications, the sharp avalanche breakdown of the blocking characteristic ensures static and dynamic voltage distribution uniformly across each device. Thus, in general, none of the series diodes will be overstressed by reverse voltages that are substantially above the avalanche voltage. All high-voltage rectifier modules manufactured in quantity are assembled with avalanche diodes.

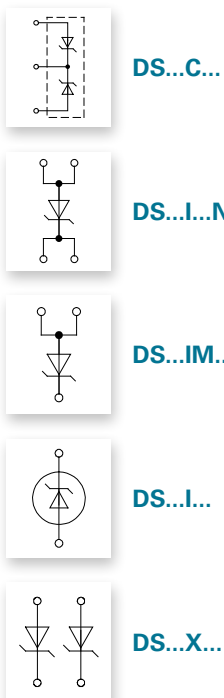
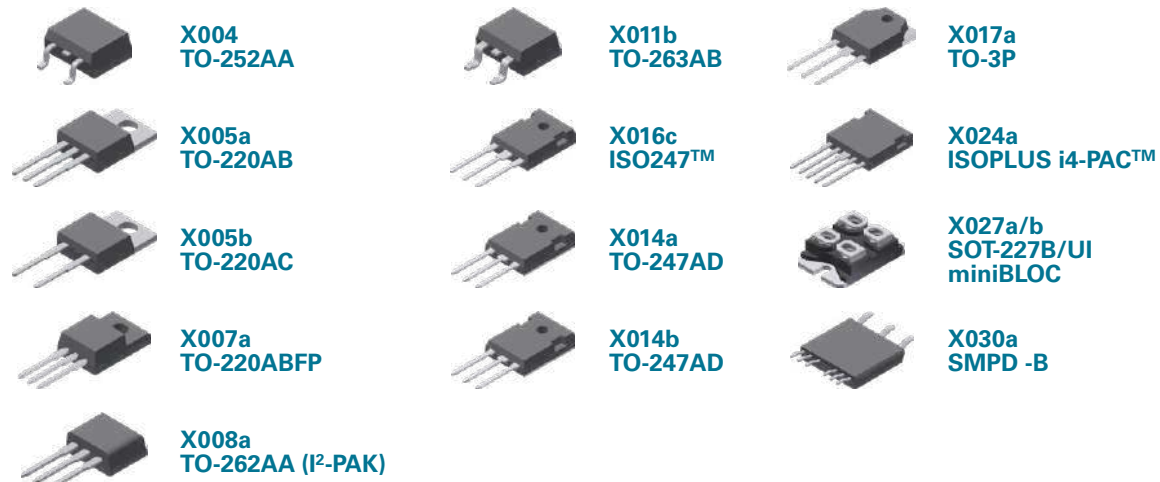
Figure 1:  
Current and Voltage During Turn-On and Turn-Off Switching of Fast Diodes



## Schottky Gen<sup>2</sup> Diodes

Part Number	$V_{RRM}$ V	$I_{FAV} @ T_c$ d = 0.5		$V_F @ I_F$ $T_{VJ} = 125^\circ C$		$T_{VJM}$ °C	$R_{thJC}$ K/W	Package	
		A	°C	V	A				
DSB20I15PA	15	20	130	0.39	20	150	1.75	TO-220AC	
DSB40C15PB		2 × 20	130	0.39	20	150	1.75	TO-220AB	
DSB15IM30UC		15	130	0.44	15	150	2.00	TO-252AA	
DSB30C30PB	30	2 × 15	135	0.44	15	150	1.75	TO-220AB	
DSB60C30PB		2 × 30	130	0.49	30	150	0.85	TO-220AB	
DSB60C30HB		2 × 30	125	0.47	30	150	0.95	TO-247AD	
DSB10I45PM	45	10	115	0.52	10	150	4.50	TO-220ACFP	
DSA20C45PB		2 × 10	160	0.64	10	175	2.40	TO-220AB	
DSA15I45PA		15	155	0.63	15	175	1.75	TO-220AC	
DSA15IM45UC		15	150	0.63	15	175	2.00	TO-252AA	
DSA15IM45IB		15	155	0.63	15	175	1.75	TO-262AA (I2-PAK)	
DSB15IM45IB		15	130	0.60	15	150	1.75	TO-262AA (I2-PAK)	
DSA30C45PB		2 × 15	155	0.63	15	175	1.75	TO-220AB	
DSA30C45PC		2 × 15	155	0.63	15	175	1.75	TO-263AB	
DSB30C45PB		2 × 15	125	0.55	15	150	1.75	TO-220AB	
DSA30C45HB		2 × 15	155	0.62	15	175	1.75	TO-247AD	
DSB30C45HB		2 × 15	125	0.54	15	150	1.75	TO-247AD	
DSA60C45PB		2 × 30	155	0.70	30	175	0.85	TO-220AB	
DSB60C45PB		2 × 30	125	0.64	30	150	0.85	TO-220AB	
DSA60C45HB		2 × 30	150	0.66	30	175	0.95	TO-247AD	
DSB60C45HB		2 × 30	125	0.58	30	150	0.95	TO-247AD	
DSA80C45HB	2 × 40	150	0.69	40	175	0.70	TO-247AD		
DSB80C45HB	2 × 40	120	0.59	40	150	0.70	TO-247AD		
DSA20C60PB	60	2 × 10	155	0.70	10	175	2.40	TO-220AB	
DSA20C60PN		2 × 10	140	0.70	10	175	4.80	TO-220ABFP	
DSB20C60PN		2 × 10	110	0.62	10	150	4.50	TO-220ABFP	
DSA30C60PB		2 × 15	155	0.72	15	175	1.75	TO-220AB	
DSB30C60PB		2 × 15	130	0.64	15	150	1.75	TO-220AB	
DSA60C60PB		2 × 30	155	0.77	30	175	0.85	TO-220AB	
DSB60C60PB		2 × 30	155	0.69	30	150	0.85	TO-220AB	
DSA60C60HB		2 × 30	150	0.75	30	175	0.95	TO-247AD	
DSB60C60HB		2 × 30	125	0.67	30	150	0.95	TO-247AD	
DSA10I100PM		100	10	140	0.71	10	175	4.50	TO-220ACFP
DSA10IM100UC			10	150	0.71	10	175	3.00	TO-252AA
DSA20C100PB			2 × 10	155	0.71	10	175	2.40	TO-220AB
DSA20C100PN			2 × 10	140	0.71	10	175	4.50	TO-220ABFP
DSA30C100PB			2 × 15	155	0.73	15	175	1.75	TO-220AB
DSA30C100PN			2 × 15	120	0.73	15	175	4.25	TO-220ABFP
DSA30C100HB	2 × 15		150	0.72	15	175	1.75	TO-247AD	
DSA30C100QB	2 × 15		155	0.72	15	175	1.75	TO-3P	
DSA50C100HB	2 × 25		155	0.72	25	175	0.95	TO-247AD	
DSA50C100QB	2 × 25		155	0.72	25	175	0.95	TO-3P	
DSA30I100PA	30		150	0.78	30	175	0.85	TO-220AC	
DSA60C100PB	2 × 30		150	0.78	30	175	0.85	TO-220AB	
DSA70C100HB	2 × 35		150	0.74	35	175	0.70	TO-247AD	
DSA80C100PB	2 × 40		150	0.80	40	175	0.60	TO-220AB	

# Diodes



## Schottky Gen<sup>2</sup> Diodes

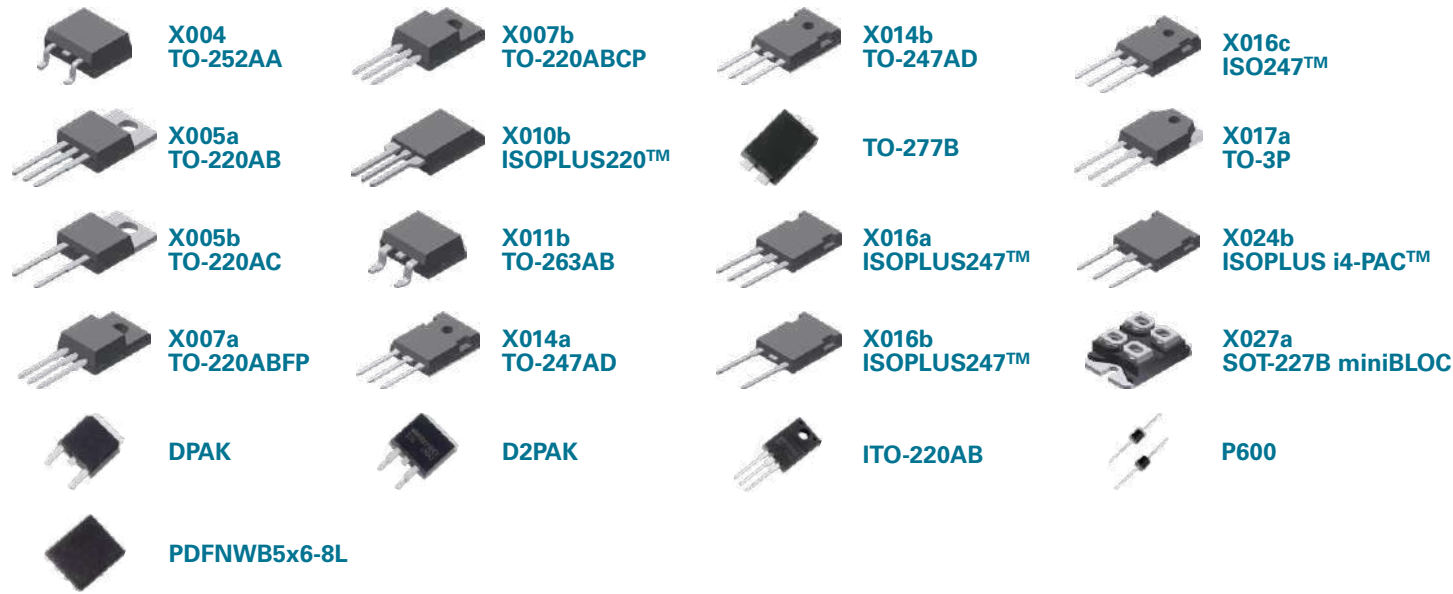
Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> @ T <sub>C</sub> d = 0.5		V <sub>F</sub> @ I <sub>F</sub> T <sub>VJ</sub> = 125 °C		T <sub>VJM</sub> °C	R <sub>thJC</sub> K/W	Package
		A	°C	V	A			
		DSA10C150PB	150	2 × 5	160			
DSA10C150UC	150	2 × 5	155	0.71	5	175	4.80	TO-252AA
DSA20C150PB	150	2 × 10	140	0.73	10	175	2.40	TO-220AB
DSA20C150PN	150	2 × 10	140	0.73	10	175	4.50	TO-220ABFP
DSA15IM150UC	150	15	150	0.75	15	175	2.00	TO-252AA
DSA30C150PB	150	2 × 15	155	0.75	15	175	1.75	TO-220AB
DSA30C150PC	150	2 × 15	155	0.75	15	175	1.75	TO-263AB
DSA30C150HB	150	2 × 15	150	0.74	15	175	1.75	TO-247AD
DSA50C150HB	150	2 × 25	155	0.74	25	175	0.95	TO-247AD
DSA30I150PA	150	30	150	0.80	30	175	0.85	TO-220AC
DSA60C150PB	150	2 × 30	150	0.80	30	175	0.85	TO-220AB
DSA70C150HB	150	2 × 35	150	0.77	35	175	0.70	TO-247AD
DSA120C150QB	150	2 × 60	150	0.85	60	175	0.40	TO-3P
DSA120X150LB	150	2 × 60	150	0.80	60	175	0.80	SMPD-B
DSA240X150NA	150	2 × 120	95	0.85	120	150	0.40	SOT-227B miniBLOC
DSA20C200PB	200	2 × 10	155	0.75	10	175	2.40	TO-220AB
DSA15IM200UC	200	15	150	0.78	15	175	2.00	TO-252AA
DSA30C200IB	200	2 × 15	155	0.78	15	175	1.75	TO-262AA (I²-PAK)
DSA30C200PB	200	2 × 15	155	0.78	15	175	1.75	TO-220AB
DSA30C200PC	200	2 × 15	155	0.78	15	175	1.75	TO-263AB
DSA70C200HB	200	2 × 35	150	0.79	35	175	0.70	TO-247AD
DSA90C200HB	200	2 × 45	145	0.86	45	175	0.55	TO-247AD
DSA120X200LB	200	2 × 60	150	0.87	60	175	0.80	SMPD-B
DSA240X200LB	200	2 × 120	150	0.87	120	175	0.40	SMPD-B
DSA240X200NA	200	2 × 120	90	0.87	120	150	0.40	SOT-227B miniBLOC

## Schottky Diodes

Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> @ T <sub>C</sub> d = 0.5		V <sub>F</sub> @ I <sub>F</sub> T <sub>VJ</sub> = 125 °C		T <sub>VJM</sub> °C	R <sub>thJC</sub> K/W	Package
		A	°C	V	A			
		DSS40-0008D	8	40	130			
DSSK80-0008D	8	2 × 40	130	0.28	40	150	0.80	TO-247AD
DSS20-0015B	15	20	135	0.33	20	150	1.40	TO-220AC
DSSK40-0015B	15	2 × 20	135	0.32	20	150	1.40	TO-247AD
DSSK70-0015B	15	2 × 35	130	0.35	35	150	1.10	TO-247AD
DSS6-0025BS	25	6	140	0.35	6	150	3.00	TO-252AA
DSS25-0025B	25	25	125	0.45	25	150	1.40	TO-220AC
DSSK18-0025BS	25	2 × 10	140	0.37	10	150	1.70	TO-263AB
DSSK38-0025B	25	2 × 20	130	0.40	20	150	1.40	TO-220AB
DSSK38-0025BS	25	2 × 20	130	0.40	20	150	1.40	TO-263AB
DSSK50-0025B	25	2 × 25	125	0.43	25	150	1.40	TO-247AD
DSSK80-0025B	25	2 × 40	130	0.39	40	150	0.80	TO-247AD
DSSK48-003BS	30	2 × 25	130	0.40	20	150	1.20	TO-263AB
DSSK70-003B	30	2 × 35	125	0.39	35	150	1.10	TO-247AD
DSSK80-003B	30	2 × 40	130	0.39	40	150	0.80	TO-247AD
DSS6-0045AS	45	6	165	0.53	6	175	3.00	TO-252AA
DSS10-0045B	45	10	135	0.50	10	150	1.70	TO-220AC
DSS16-0045A	45	16	160	0.60	16	175	1.40	TO-220AC
DSS16-0045AS	45	16	160	0.60	16	175	1.40	TO-263AB
DSS25-0045A	45	25	155	0.64	25	175	1.10	TO-220AC
DSS60-0045B	45	60	105	0.57	60	150	0.80	TO-247AD
DSSK20-0045B	45	2 × 10	135	0.46	10	150	1.70	TO-220AB
DSSK28-0045BS	45	2 × 15	135	0.43	15	150	1.40	TO-263AB
DSSK60-0045A	45	2 × 30	150	0.58	30	175	1.10	TO-247AD
DSSK60-0045B	45	2 × 30	125	0.45	30	150	1.10	TO-247AD
DSSK80-0045B	45	2 × 40	125	0.46	40	150	0.80	TO-247AD
DSS2x61-0045A	45	2 × 60	110	0.65	60	150	0.80	SOT-227B miniBLOC
DSS2x81-0045B	45	2 × 80	85	0.63	80	150	0.80	SOT-227B miniBLOC
DSS2x121-0045B	45	2 × 120	100	0.59	120	150	0.40	SOT-227B miniBLOC
DSS2x160-0045A <sup>1</sup>	45	2 × 160	90	0.72	160	150	0.40	SOT-227UI miniBLOC
DSS10-006A	60	10	160	0.65	10	175	1.70	TO-220AC
DSSK28-006BS	60	2 × 15	135	0.52	15	150	1.40	TO-263AB
DSSK40-006B	60	2 × 20	135	0.46	20	150	1.10	TO-247AD
DSSK80-006B	60	2 × 40	120	0.51	40	150	0.80	TO-247AD
DSSK40-008B	80	2 × 20	130	0.52	20	150	1.10	TO-247AD
DSSK70-008A	80	2 × 35	150	0.64	35	175	0.80	TO-247AD
DSS2x111-008A	80	2 × 110	105	0.72	100	150	0.40	SOT-227B miniBLOC
DSS10-01A	100	10	160	0.66	10	175	1.70	TO-220AC
DSS10-01AS	100	10	160	0.75	10	175	1.70	TO-263AB
DSS16-01A	100	16	155	0.65	16	175	1.40	TO-220AC
DSS16-01AS	100	16	155	0.65	16	175	1.40	TO-263AB
DSSK16-01A	100	2 × 8	165	0.63	8	175	1.70	TO-220AB
DSSK16-01AS	100	2 × 8	165	0.63	8	175	1.70	TO-263AB
DSSK28-01AS	100	2 × 15	160	0.64	15	175	1.40	TO-263AB
DSSK30-01A	100	2 × 15	160	0.63	15	175	1.40	TO-247AD
DSSK50-01A	100	2 × 25	155	0.64	25	175	1.10	TO-247AD
DSS2x41-01A	100	2 × 40	110	0.70	40	150	1.10	SOT-227B miniBLOC
DSS2x61-01A	100	2 × 60	105	0.74	60	150	0.80	SOT-227B miniBLOC
DSS2x160-01A <sup>1</sup>	100	2 × 160	80	0.81	160	150	0.40	SOT-227UI miniBLOC

<sup>1</sup> Non isolated base plate

# Diodes



## Schottky Diodes



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> @ T <sub>C</sub>		V <sub>F</sub> @ I <sub>F</sub>		T <sub>JM</sub>	R <sub>thJC</sub>	Package
		d = 0.5		T <sub>J</sub> = 125 °C				
	V	A	°C	V	A	°C	K/W	
DSS6-015AS	150	6	165	0.65	6	175	3.0	TO-252AA
DSSK20-015A		2 x 10	165	0.65	10	175	1.4	TO-220AB
DSSK50-015A		2 x 25	150	0.68	25	175	1.1	TO-247AD
DSSK60-015A		2 x 30	155	0.66	30	175	0.8	TO-247AD
DSS2X101-015A	150	2 x 100	110	0.77	100	150	0.4	SOT-227B miniBLOC
DSSK10-018A	180	2 x 5	165	0.60	5	175	1.7	X005a
DSSK30-018A		2 x 15	150	0.66	15	175	1.7	TO-220AB
DSSK60-02A	200	2 x 30	155	0.70	30	175	0.8	TO-247AD
DSS2X101-02A		2 x 100	105	0.84	100	150	0.4	SOT-227B miniBLOC

## Traditional Schottky (MBR)



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> @ T <sub>C</sub>		V <sub>F</sub> @ I <sub>F</sub>		T <sub>JM</sub>	R <sub>thJC</sub>	Package
		d = 0.5		T <sub>J</sub> = 125 °C				
	V	A	°C	V	A	°C	K/W	
MBR1045	45	10	115	-	-	150	2.0	TO-220AC
MBRF2045CT		2 x 10	105	0.72	20	150	5.0	ITO-220AB
MBR6045WT		2 x 30	135	0.55	30	150	1.0	TO-247AD
MBRB1060CT		2 x 5	105	0.65	5	150	2.0	D2PAK
MBRF1060CTL	60	2 x 5	75	-	-	125	3.5	ITO-220AB
MBR1060CTL		2 x 5	100	-	-	125	2.0	TO-220AB
MBRB2060CT		2 x 10	105	-	-	150	2.3	D2PAK
MBRF2060CT		2 x 10	105	-	-	150	2.3	ITO-220AB
MBR2060CT	100	2 x 10	100	0.70	10	150	2.3	TO-220AB
MBRF3060CT		2 x 15	95	0.67	15	150	3.0	ITO-220AB
MBRB10100CT		2 x 5	105	0.75	5	150	6.0	D2PAK
MBRD10100CT		2 x 5	105	0.75	5	150	6.0	DPAK
MBRF10100CTL	100	2 x 5	135	0.75	5	150	4.5	ITO-220AB
MBRF10100CTR		2 x 5	105	0.75	5	150	4.5	ITO-220AB
MBR10100CT		2 x 5	100	0.75	5	150	2.0	TO-220AB
MBRB20100CT		2 x 10	105	0.80	10	150	2.0	D2PAK
MBRF20100CTP	100	2 x 10	105	0.80	10	150	3.5	ITO-220AB
MBRF20100CTP		2 x 10	105	0.80	10	150	3.5	TO-220AB
MBRF30100CTP		2 x 15	133	0.70	15	150	2.0	ITO-220AB
MBR40100WT		2 x 20	135	0.74	20	150	2.0	TO-247AD

## Traditional Schottky (MBR)

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> @ T <sub>C</sub>		V <sub>F</sub> @ I <sub>F</sub>		T <sub>JM</sub>	R <sub>thJC</sub>	Package
		d = 0.5		T <sub>J</sub> = 125 °C				
	V	A	°C	V	A	°C	K/W	
MBRD10150CT	150	2 x 5	105	0.80	5	150	4.5	DPAK
MBRF10150CTL		2 x 5	100	0.73	5	150	4.5	ITO-220AB
MBR10150CT		2 x 5	105	0.73	5	150	4.5	TO-220AB
MBRF20150CT		2 x 10	125	0.83	10	175	1.5	TO-220AB
MBRF20150CT		2 x 10	100	0.80	10	175	3.5	ITO-220AB
MBRF30150CT		2 x 15	133	0.80	15	150	2.0	ITO-220AB
MBRD10200CT	200	2 x 5	105	0.74	5	150	3.5	DPAK
MBRF10200CT		2 x 5	105	0.78	5	150	4.5	ITO-220AB
MBR10200CT		2 x 5	105	0.78	5	150	3.5	TO-220AB
MBRF20200CT		2 x 10	105	0.85	10	175	4.5	ITO-220AB
MBRF20200CTR		2 x 10	105	0.85	10	175	4.5	ITO-220AB
MBRF30200CT		2 x 15	109	0.75	15	150	3.3	ITO-220AB

## Ultralow Trench Schottky (DST)



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> @ T <sub>C</sub>		V <sub>F</sub> @ I <sub>F</sub>		T <sub>JM</sub>	R <sub>thJC</sub>	Package
		d = 0.5		T <sub>J</sub> = 125 °C				
	V	A	°C	V	A	°C	K/W	
DST2045AX	45	20	25 <sup>b</sup>	0.50	20	150	-	P600
DSTB2045C		2 x 10	80	0.42	10	150	3.0	D2PAK
DSTF2045C		2 x 10	80	0.52	10	150	6.0	ITO-220AB
DST2045C		2 x 10	80	0.52	10	150	3.0	TO-220AB
DSTF3045C	50	2 x 15	90	0.45 <sup>a</sup>	15	150	5.0	ITO-220AB
DSTF4045C		2 x 20	90	0.51 <sup>a</sup>	20	150	5.0	ITO-220AB
DSTF2050C		2 x 10	110	0.44 <sup>a</sup>	10	150	6.0	ITO-220AB
DSTF4050C		2 x 20	90	0.55	20	150	5.0	ITO-220AB
DST2060DJF	60	20	80	0.70	20	150	2.6	PDFNWB5x6-8L
DST2060C		2 x 10	125	0.59	10	150	3.0	TO-220AB
DSTF2060C		2 x 10	85	0.59	10	150	6.0	ITO-220AB
DST3060DJF		30	80	0.72	30	150	2.6	PDFNWB5x6-8L
DST3060LC	60	2 x 15	105	0.44 <sup>a</sup>	15	125	5.0	TO-220AB
DSTF3060C		2 x 15	60	0.65	15	150	6.0	ITO-220AB
DSTF3060CR		2 x 15	60	0.65	15	150	6.0	ITO-220AB
DSTF4060C		2 x 20	85	0.57	20	150	5.0	ITO-220AB
DSTF2080C	80	2 x 10	85	0.70	10	150	6.0	ITO-220AB
DST2080C		2 x 10	125	0.70	10	150	3.0	TO-220AB
DSTF3080C		2 x 15	60	0.70	15	150	6.0	ITO-220AB
DST3080C		2 x 15	100	0.70	15	150	2.5	TO-220AB
DSTF20100C	100	2 x 10	100	0.70	10	150	5.5	ITO-220AB
DSTF30100C		2 x 15	95	0.70	15	150	5.5	ITO-220AB
DSTF30100S		30	70	0.78	30	150	4.0	ITO-220AB
DST20100C		2 x 10	120	0.70	10	150	2.8	TO-220AB
DST30100C	100	2 x 15	115	0.70	15	150	2.5	TO-220AB
DSTF40100C		2 x 20	85	0.70	20	150	4.0	ITO-220AB
DST40100C		2 x 20	115	0.70	20	150	2.0	TO-220AB
DSTB60100C		2 x 30	105	0.80	30	150	2.0	D2PAK
DSTF60100C	120	2 x 30	105	0.80	30	150	5.0	ITO-220AB
DSTF20120C		2 x 10	74	0.72	10	150	5.0	ITO-220AB
DSTF20120CR		2 x 10	74	0.72	10	150	5.0	ITO-220AB
DSTF30120C		2 x 15	80	0.76	15	150	4.5	ITO-220AB
DSTF30120CR	120	2 x 15	80	0.76	15	150	4.5	ITO-220AB
DSTF40120C		2 x 20	74	0.76	20	150	4.0	ITO-220AB
DSTF20150CR		2 x 10	80	0.80	10	150	5.0	ITO-220AB
DST20150C		2 x 10	105	0.80	10	150	2.8	TO-220AB
DSTF30150C	150	2 x 15	50	0.79	15	150	4.5	ITO-220AB
DSTF40150C		2 x 20	70	0.82	20	150	4.0	ITO-220AB
DST5200		5	100	0.73	5	150	3.5	TO-220AC
DSTD5200		5	100	0.73	5	150	2.4	DPAK
DSTF10200C	200	2 x 5	90	0.73	5	150	7.0	ITO-220AB
DSTB30200C		2 x 15	100	0.72	15	150	2.0	D2PAK

a: Typical value  
b: T<sub>a</sub>, Ambient temperature



## Ultralow Trench Schottky (DST, TO-277B)



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> @ T <sub>L</sub>		V <sub>F</sub> @ I <sub>F</sub>		T <sub>JM</sub>	R <sub>thJL</sub>	Package
		d = 0.5		T <sub>J</sub> = 125 °C				
	V	A	°C	V	A	°C	K/W	
DST1040S-A	40	10	125	0.50	10	150	3.5	TO-277B
DST1040S		10	125	0.41 <sup>a</sup>	10	150	3.5	TO-277B
DST1045S-A	45	10	125	0.50	10	150	3.5	TO-277B
DST1045S		15	125	0.51	15	150	3.5	TO-277B
DST1050S-A	50	10	125	0.49	10	150	3.5	TO-277B
DST1050S		15	125	0.50	15	150	3.5	TO-277B
DST1550S	60	20	125	0.60	20	150	3.5	TO-277B
DST2050S		5	125	0.60	5	150	4.0	TO-277B
DST560S-A	80	5	125	0.60	5	150	4.0	TO-277B
DST560S		8	125	0.55	8	150	4.0	TO-277B
DST860S-A	100	5	125	0.66	5	150	4.0	TO-277B
DST860S		8	125	0.55	8	150	4.0	TO-277B
DST580S-A	120	5	125	0.66	5	150	4.0	TO-277B
DST580S		20	85 <sup>b</sup>	0.65	20	150	-	TO-277B
DST2080S	140	5	125	0.70	5	150	4.0	TO-277B
DST5100S		5	125	0.70	5	150	4.0	TO-277B
DST8100S-A	160	8	125	0.62	8	150	4.0	TO-277B
DST8100S		8	125	0.62	8	150	4.0	TO-277B
DST10100S-A	180	10	125	0.65	10	150	3.5	TO-277B
DST10100S		10	125	0.65	10	150	3.5	TO-277B
DST12100S	12	125	0.64	12	150	3.5	TO-277B	

a: Typical value  
b: T<sub>a</sub>, Ambient temperature

## HiPerDyn™ FRED

Series connected diodes for high switching frequencies; packages isolated (2500 V<sub>RMS</sub>)



DSEP 2x...C



DPH...IS...  
DSEP/DSS...C

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>		T <sub>C</sub>	V <sub>F</sub>		@ T <sub>VJ</sub>	t <sub>rr</sub> typ.	I <sub>RM</sub> typ.	@ -di/dt	T <sub>VJM</sub>	R <sub>thJC</sub>	Package
		d = 0.5			I <sub>F</sub> = I <sub>FAV</sub>								
	V	A	°C	V	°C	ns	A	A/μs	°C	K/W			
DSS17-06CR	600	17	95	2.71	125	45	2.0	100	175	1.40	ISOPLUS247™		
DPH30IS600HI		30	140	1.89	150	35	3.0	200	175	0.55	ISOPLUS247™		
DSEP15-12CR	1200	15	135	2.67	150	15	10.0	600	175	1.00	ISOPLUS247™		
DSEP30-12CR		30	120	3.18	150	15	5.5	600	175	0.60	ISOPLUS247™		
DSEP2x25-12C	1200	2 × 25	90	2.95	150	15	5.5	600	150	0.60	SOT-227B miniBLOC		
DPJ50XS1800NA	1800	2 × 25	90	4.33	150	15	4.0	600	150	0.40	SOT-227B miniBLOC		

## Dual Ultrafast Diodes

Series connected diodes for high switching frequencies with middle connection; packages isolated (2500 V<sub>RMS</sub>)



DHH/DSEE  
DPF/G...P..

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>		T <sub>C</sub>	V <sub>F</sub>		@ T <sub>VJ</sub>	t <sub>rr</sub> typ.	I <sub>RM</sub> typ.	@ -di/dt	T <sub>VJM</sub>	R <sub>thJC</sub>	Package
		d = 0.5			I <sub>F</sub> = I <sub>FAV</sub>								
	V	A	°C	V	°C	ns	A	A/μs	°C	K/W			
DPG30P300PJ	2 × 300	30	135	0.99	150	35	3	200	175	1.05	ISOPLUS220TM		
DPG10P400PJ	2 × 400	10	145	1.03	150	45	4	200	175	2.5	ISOPLUS220TM		
DPG30P400PJ	2 × 400	30	135	1.05	30	45	4	200	175	1.05	ISOPLUS220TM		
DSEE15-12CC	2 × 600	15	100	1.50	125	35	4	100	175	1.6	ISOPLUS220TM		
DSEE29-12CC	2 × 600	30	90	1.75	125	30	4	100	175	0.9	ISOPLUS220TM		
DPF30P600HR	2 × 600	30	130	1.27	150	35	17	600	175	0.9	ISOPLUS247TM		
DSEE30-12A	2 × 600	30	90	1.78	125	30	4	100	175	0.9	TO-247AD		
DSEE55-24N1F	2 × 1200	60	110	1.56	150	75	35	600	175	0.6	ISOPLUS i4-PACTM		
DHH55-36N1F	2 × 1800	60	50	2.06	125	230	60	800	150	0.6	ISOPLUS i4-PACTM		

## HiPerFRED 2™ Diodes



DPF/G/H...I\*...



DPG...P..



DPF/G...C...



DPF...XA...



DPF...X...



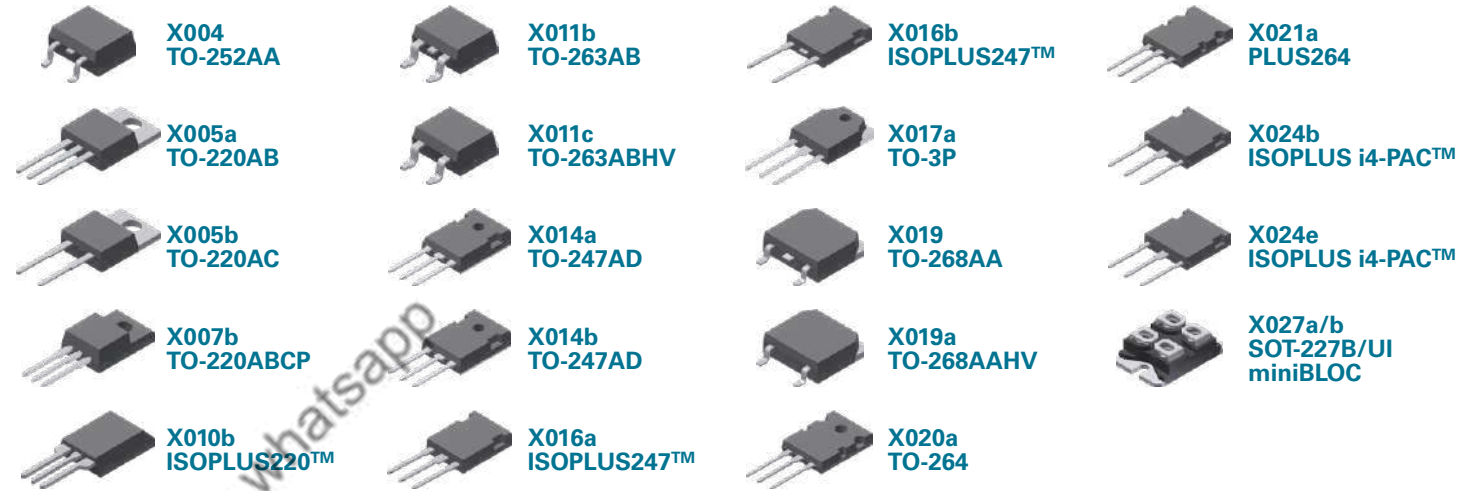
DPF...C...

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> d = 0.5	@ T <sub>C</sub>	I <sub>FSM</sub> 10 ms 45 °C	V <sub>F</sub>		@ I <sub>F</sub>	t <sub>rr</sub>	I <sub>RM</sub>	-di/dt	T <sub>VJM</sub>	R <sub>thJC</sub>	Package
					V	@ T <sub>VJ</sub> = 150 °C							
	V	A	°C	A	V	°C	ns	A	A/μs	°C	K/W		
DPG10I200PA	200	10	145	140	0.98	10	35	3	200	175	2.30	TO-220AC	
DPG10I200PM		10	125	140	0.98	10	35	3	200	175	4.40	TO-220ACFP	
DPG20C200PB	200	2 × 10	145	140	0.98	10	35	3	200	175	2.30	TO-220AB	
DPG20C200PN		2 × 10	125	140	0.98	10	35	3	200	175	4.40	TO-220ABFP	
DPG15I200PA	200	15	140	240	1.01	15	35	3	200	175	1.70	TO-220AC	
DPG30C200PB		2 × 15	140	240	1.01	15	35	3	200	175	1.70	TO-220AB	
DPG30C200PC	200	2 × 15	140	240	1.01	15	35	3	130	175	1.70	TO-263AB	
DPG30C200HB		2 × 15	140	240	1.00	15	35	3	200	175	1.70	TO-247AD	
DPF60C200HB	200	2 × 30	130	400	0.98	30	35	4	200	175	0.95	TO-247AD	
DPF60C200HJ		2 × 30	130	560	0.88	30	35	4	200	175	1.05	ISOPLUS247™	
DPG60C200HB	200	2 × 30	135	360	1.06	30	35	3	200	175	0.95	TO-247AD	
DPG60C200QB		2 × 30	135	360	1.06	30	35	3	200	175	0.95	TO-3P	
DPF80C200HB	200	2 × 40	140	560	0.95	40	35	4	200	175	0.70	TO-247AD	
DPF100C1200HB		1200	2 × 50	125	400	4.41	50	60	18	400	175	0.75	TO-247AD
DPF60I200HA	200	60	135	650	0.98	60	35	4	200	175	0.55	TO-247AD	
DPF240X200NA		2 × 120	120	1800	0.90	120	35	4	200	175	0.45	SOT-227B miniBLOC	
DPG10I300PA	300	10	145	140	0.98	10	35	3	200	175	2.30	TO-220AC	
DPG10I300UC		10	150	140	0.98	10	35	3	200	175	2.30	TO-252AA	
DPG20C300PB	300	2 × 10	145	140	0.98	10	35	3	200	175	2.30	TO-220AB	
DPG20C300PN		2 × 10	125	140	0.98	10	35	3	200	175	4.40	TO-220ABFP	
DPG15I300PA	300	15	140	240	1.01	15	35	3	200	175	1.70	TO-220AC	
DPG30C300PB		2 × 15	140	240	1.01	15	35	3	200	175	1.70	TO-220AB	
DPG30C300PC	300	2 × 15	140	240	1.01	15	35	3	200	175	1.70	TO-263AB	
DPG30C300HB		2 × 15	140	240	1.00	15	35	3	200	175	1.70	TO-247AD	
DPF30I300PA	300	30	145	390	0.98	30	55	6	200	175	0.85	TO-220AC	
DPG30I300HA		30	135	360	1.06	30	35	3	200	175	0.95	TO-247AD	
DPG30I300PA	300	30	140	360	1.08	30	35	3	200	175	0.85	TO-220AC	
DPG30I300PC		30	140	360	1.08	30	35	3	200	175	0.85	TO-263AB	
DPG30P300PJ	2 × 300	30	135	450	0.99	30	35	3	200	175	1.05	ISOPLUS220™	
DPF60C300HB	300	2 × 30	140	400	0.97	30	55	6	200	175	0.95	TO-247AD	
DPG60C300HB		2 × 30	135	360	1.06	30	35	3	200	175	0.95	TO-247AD	
DPG60C300HJ	300	2 × 30	135	450	0.96	30	35	3	200	175	1.05	ISOPLUS247™	
DPG60C300PC		2 × 30	140	360	1.08	30	35	3	200	175	0.85	TO-263AB	
DPG60C300QB	300	2 × 30	135	360	1.06	30	35	3	200	175	0.95	TO-3P	
DPG80C300HB		2 × 40	135	450	1.07	40	35	3	200	175	0.70	TO-247AD	
DPG60I300HA	300	60	125	450	1.10	60	35	3.5	200	175	0.55	TO-247AD	
DPG60I300PC		60	135	450	1.14	60	35	3.5	200	175	0.45	TO-263AB	
DPG120C300QB	300	2 × 60	125	450	1.10	60	35	3.5	200	175	0.55	TO-3P	
DPG10I400PA		400	10	145	150	1.03	10	45	4	200	175	2.30	TO-220AC
DPG10I400PM	10		120	150	1.03	10	45	4	200	175	4.40	TO-220ACFP	
DPG10P400PJ	2 × 400	10	145	130	1.03	10	45	4	200	175	2.50	ISOPLUS220™	
DPG20C400PB	400	2 × 10	145	150	1.03	10	45	4	200	175	2.30	TO-220AB	
DPG20C400PC		2 × 10	145	150	1.03	10	45	4	200	175	2.30	TO-263AB	
DPG20C400PN	400	2 × 10	120	150	1.03	10	45	4	200	175	4.40	TO-220ABFP	
DPG15I400PM		15	90	190	1.14	15	45	4	200	175	4.20	TO-220ACFP	
DPG30C400PB	400	2 × 15	140	190	1.14	15	45	4	200	175	1.70	TO-220AB	
DPG30C400HB		2 × 15	140	190	1.13	15	45	4	200	175	1.70	TO-247AD	
DPG30I400HA	400	30	135	360	1.13	30	45	4	200	175	0.95	TO-247AD	
DPG30I400PC		30	145	300	1.16	30	45	4	200	175	0.85	TO-263AB	
DPG30P400PJ	2 × 400	10	135	400	1.05	30	45	4	200	175	1.05	ISOPLUS220™	
DPG60C400HB	400	2 × 30	135	360	1.13	30	45	4	200	175	0.95	TO-247AD	
DPG60C400QB		2 × 30	135	360	1.13	30	45	4	200	175	0.95	TO-3P	
DPG80C400HB	400	2 × 40	135	400	1.14	40	45	4	200	175	0.70	TO-247AD	
DPG60I400HA		60	120	450	1.22	60	45	4	200	175	0.55	TO-247AD	
DPF60I400HB	400	60	130	600	1.09	60	60	6	200	175	0.55	TO-247AD	
DPG60I400QB		60	1										

HiPerFRED™ Diodes



Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> @ T <sub>C</sub> d = 0.5		I <sub>FSM</sub> 10 ms 45 °C	V <sub>F</sub> @ I <sub>F</sub> T <sub>VJ</sub> = 150 °C		t <sub>rr</sub> I <sub>RM</sub> -di/dt typ. typ. T <sub>VJ</sub> = 25 °C			T <sub>VJM</sub> °C	R <sub>thJC</sub> K/W	Package
		A	°C		V	°C	ns	A	A/μs			
DSEP40-03AS	300	40	125	340	1.18	40	35	3.5	200	175	0.85	TO-263AB
DSEP6-06AS	600	6	150	40	1.34	6	20	3.5	100	175	2.80	TO-252AA
DSEP6-06BS		6	140	40	1.77	6	15	2.0	100	175	2.80	TO-252AA
DSEP8-06A	600	10	145	50	1.42	10	35	3.5	100	175	2.50	TO-220AC
DSEP8-06B		10	130	50	1.85	10	30	2.0	100	175	2.50	TO-220AC
DSEP15-06A	600	15	140	110	1.35	15	35	4.0	100	175	1.60	TO-220AC
DSEP15-06AS		15	140	110	1.35	15	35	4.0	100	175	1.60	TO-263AB
DSEP15-06B	600	15	130	110	1.59	15	25	2.0	100	175	1.60	TO-220AC
DSEP15-06BS		15	130	110	1.59	15	25	2.0	100	175	1.60	TO-263AB
DSEP29-06A	600	30	135	250	1.26	30	35	5.5	100	175	0.90	TO-220AC
DSEP29-06AS		30	135	250	1.26	30	35	5.5	100	175	0.90	TO-263AB
DSEP29-06B	600	30	120	250	1.63	30	30	3.0	100	175	0.90	TO-220AC
DPG30I600PM		15	95	250	1.63	30	25	4.5	200	175	3.50	TO-220ACFP
DSEP30-06A	600	30	135	250	1.25	30	35	5.5	100	175	0.90	TO-247AD
DSEP30-06B		30	120	250	1.61	30	30	3.0	100	175	0.90	TO-247AD
DSEP30-06BR	600	30	100	250	1.61	30	30	3.0	100	175	1.10	ISOPLUS247™
DSEP60-06A	600	60	110	600	1.39	60	35	5.5	100	175	0.65	TO-247AD
DSEP60-06AT		60	110	600	1.39	60	35	5.5	100	175	0.65	TO-268AA
DSEP75-06AR	600	75	115	1000	1.38	75	35	6.5	200	175	0.50	ISOPLUS247™
DSEP8-12A	1200	10	130	40	1.96	10	40	4.0	100	175	2.50	TO-220AC
DSEP12-12A		15	130	90	1.87	15	40	4.5	100	175	1.60	TO-220AC
DSEP12-12AZ	1200	15	130	90	1.87	15	40	4.5	100	175	1.60	TO-263ABHV
DSEP12-12B		15	130	90	2.06	15	35	3.0	100	175	1.60	TO-220AC
DSEP12-12BZ	1200	15	130	90	2.06	15	35	3.0	100	175	1.60	TO-263ABHV
DSEP29-12A		30	120	200	1.81	30	40	8.5	100	175	0.90	TO-220AC
DSEP29-12B	1200	30	100	200	2.31	30	35	5.0	100	175	0.90	TO-220AC
DSEP30-12A		30	115	200	1.79	30	40	8.5	100	175	0.90	TO-247AD
DSEP30-12B	1200	30	100	200	2.30	30	35	5.0	100	175	0.90	TO-247AD
DSEP30-12AR		30	100	200	1.79	30	40	8.5	100	175	1.10	ISOPLUS247™
DSEP60-12A	1200	60	85	500	1.81	60	40	8.5	100	175	0.65	TO-247AD
DSEP60-12B		60	110	500	2.20	60	35	-	100	175	0.45	TO-247AD
DSEP60-12AR	1200	60	60	500	1.81	60	40	8.5	100	175	0.80	ISOPLUS247™
DSEP60-12AZ		60	115	500	1.81	60	40	8.5	100	175	0.45	TO-268AAHV
DSEP90-12AZ	90	105	800	1.79	90	40	8.5	100	175	0.35	TO-268AAHV	
DSEC16-06A	600	2 × 10	145	50	1.42	10	35	3.5	100	175	2.50	TO-220AB
DSEC16-06AC		2 × 8	85	50	1.20	10	35	3.5	100	175	3.00	ISOPLUS220™
DSEC29-06AC	600	2 × 15	140	110	1.34	15	35	4.0	100	175	1.60	ISOPLUS220™
DSEC30-06A	600	2 × 15	140	110	1.34	15	35	4.0	100	175	1.60	TO-247AD
DSEC30-06B		2 × 15	130	110	1.58	15	25	2.0	100	175	1.60	TO-247AD
DSEC59-06BC	600	2 × 30	105	200	1.56	30	30	4.0	100	175	1.10	ISOPLUS220™
DSEC60-06A		2 × 30	135	250	1.25	30	35	5.5	100	175	0.90	TO-247AD
DSEC60-06B	600	2 × 30	120	250	1.61	30	30	3.0	100	175	0.90	TO-247AD
DSEC16-12A		2 × 10	130	40	1.96	10	40	4.0	100	175	2.50	TO-220AB
DSEC16-12AS	1200	2 × 10	130	40	1.96	10	40	4.0	100	175	2.50	TO-263AB
DSEC30-12A		2 × 15	115	90	1.86	15	40	4.5	100	175	1.60	TO-247AD
DSEC60-12A	1200	2 × 30	115	200	1.79	30	40	8.5	100	175	0.90	TO-247AD
DSEC120-12AK		2 × 60	85	500	1.81	60	40	7.0	100	175	0.65	TO-264
DSEP2X31-03A	300	2 × 30	110	300	0.90	30	30	4.5	100	150	1.15	SOT-227B miniBLOC
DSEP2X61-03A		2 × 60	75	600	1.26	60	30	4.0	100	150	0.85	SOT-227B miniBLOC
DSEP2X91-03A	600	2 × 90	70	1000	1.10	90	30	4.5	100	150	0.60	SOT-227B miniBLOC
DSEP2X31-06A		2 × 30	95	250	1.23	30	35	5.5	100	150	1.15	SOT-227B miniBLOC
DSEP2X31-06B	600	2 × 30	75	250	1.59	30	30	3.0	100	150	1.15	SOT-227B miniBLOC
DSEP2X61-06A		2 × 60	65	600	1.48	60	35	5.5	100	150	0.85	SOT-227B miniBLOC
DSEP2X91-06A	600	2 × 90	55	1000	1.39	90	35	8.0	100	150	0.60	SOT-227B miniBLOC
DSEP2X31-12A		2 × 30	70	200	1.77	30	40	8.5	100	150	1.15	SOT-227B miniBLOC
DSEP2X60-12A	1200	2 × 60	80	800	1.52	60	40	8.0	100	150	0.60	SOT-227B miniBLOC
DSEP2X61-12A		2 × 60	80	800	1.52	60	40	8.0	100	150	0.60	SOT-227B miniBLOC
DSEP2X101-04A	400	2 × 100	45	1000	1.22	125	30	5.5	100	150	0.60	SOT-227B miniBLOC
DSEC240-04A		2 × 120	75	2000	1.00	120	30	5.5	100	150	0.45	SOT-227UI miniBLOC
DSEC240-06A	600	2 × 120	75	2000	1.26	120	35	8.0	100	150	0.40	SOT-227UI miniBLOC



SONIC-FRDTM Diodes

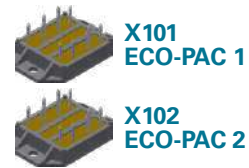
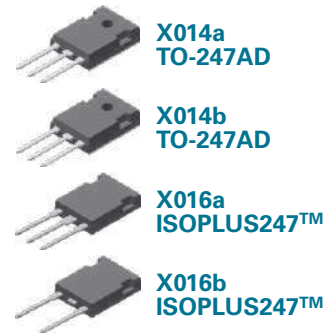
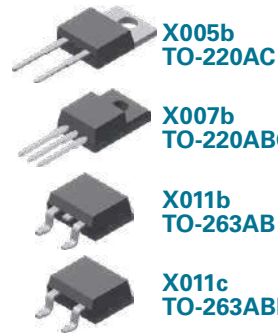
- Ultrasoft and fast recovery
- Very low temperature dependence



Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> @ T <sub>C</sub> d = 0.5		I <sub>FSM</sub> 10 ms 45 °C	V <sub>F</sub> @ I <sub>F</sub> T <sub>VJ</sub> = 150 °C		t <sub>rr</sub> I <sub>RM</sub> typ. -di/dt typ. typ. T <sub>VJ</sub> = 25 °C			T <sub>VJM</sub> °C	R <sub>thJC</sub> K/W	Package
		A	°C		V	°C	ns	A	A/μs			
DHG5I600PA	600	5	105	40	2.17	5	35	2	100	150	3.15	TO-220AC
DHG5I600PM		5	85	40	2.17	5	35	2	100	150	4.20	TO-220ACFP
DHG10C600PB	600	2 × 5	105	40	2.17	5	35	2	100	150	3.15	TO-220AB
DHG30I600PA	600	30	95	200	2.24	30	35	12	600	150	0.60	TO-220AC
DHG30IM600PC		30	95	200	2.22	30	35	12	600	150	0.60	TO-263AB
DHG30I600HA	600	30	85	200	2.21	30	35	12	600	150	0.70	TO-247AD
DHG60C600HB		2 × 30	85	200	2.21	30	35	12	600	150	0.70	TO-247AD
DHG60I600HA	600	60	95	430	2.10	60	35	24	1200	150	0.30	TO-247AD
DHG50X650NA		650	2 × 25	70	200	2.03	25	35	12	600	150	1.20
DHG100X650NA	2 × 50		80	430	2.00	50	35	20	1200	150	0.60	SOT-227b miniBLOC
DHG10I1200PA	1200	10	95	65	2.13	10	75	8	350	150	1.80	TO-220AC
DHG10I1200PM		10	30	65	2.13	10	75	8	350	150	4.00	TO-220ACFP
DHG20C1200PB	1200	2 × 10	95	65	2.13	10	75	8	350	150	1.80	TO-220AB
DHG20I1200PA		20	105	135	2.16	20	75	19	750	150	0.80	TO-220AC
DHG20I1200HA	1200	20	95	135	2.14	20	75	19	750	150	0.90	TO-247AD
DHG40C1200HB		2 × 20	95	135	2.14	20	75	19	750	150	0.90	TO-247AD
DHG50X1200NA	1200	2 × 25	70	180	2.00	25	75	25	1000	150	1.20	SOT-227b miniBLOC
DHG30I1200HA		30	90	180	2.16	30	75	25	1000	150	0.70	TO-247AD
DHG100X1200NA	1200	2 × 50	65	430	2.05	50	75	50	2500	150	0.60	SOT-227b miniBLOC
DHG60I1200HA		60	95	430	2.22	60	75	50	2500	150	0.30	TO-247AD
DHG10I1800PA	1800	10	85	65	2.30	10	300	8	200	150	2.15	TO-220AC
DHG10IM1800UZ		10	100	60	2.33	10	300	13	250	150	1.50	TO252AA
DH20-18A	1800	20	95	150	2.35	20	300	22	400	150	0.90	TO-247AD
DH40-18A		40	100	400	2.08	40	300	50	750	150	0.45	TO-247AD
DH60-14A	1400											TO-247AD
DH60-16A	1600	60	100	700	2.03	60	230	60	800	150	0.30	TO-247AD
DH60-18A	1800											TO-247AD
DHH55-36N1F	2 × 1800	60	50	700	2.03	60	230	60	800	150	0.60	ISOPLUS i4-PAC™
DH2X60-18A		2 × 60	55	700	2.02	60	230	60	800	150	0.60	SOT-227b miniBLOC
DH2X61-18A	1800	2 × 60	55	700	2.02	60	230	60	800	150	0.60	SOT-227b miniBLOC
DHG55I3300FE		3300	50	80	600	3.40	60	1650	55	500	150	0.45
DHG40I4500KO	4500	43	80	600	3.50	50	1450	80	800	150	0.50	ISOPLUS264



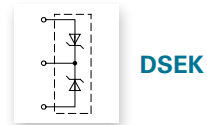
# Diodes



## FRED Diodes

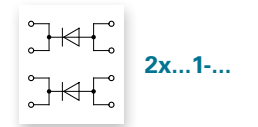
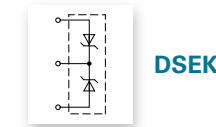
Fast Recovery Epitaxial Diodes

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> d = 0.5	@ T <sub>C</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub> 10 ms 45 °C	V <sub>F</sub> T <sub>VJ</sub> = 150 °C	@ I <sub>F</sub>	t <sub>rr</sub> typ. T <sub>VJ</sub> = 25 °C	I <sub>RM</sub> typ. T <sub>VJ</sub> = 100 °C	-di/dt	R <sub>thJC</sub>	Package
	V	A	°C	A	A	V	A	ns	A	A/μs	K/W	
DSEI8-06A	600	8	115	16	100	1.30	8	35	2.5	64	2.50	TO-220AC
DSEI8-06AS	600	8	115	16	100	1.30	8	35	2.5	64	2.50	TO-263AB
DFE10I600PM	600	10	100	16	100	1.30	10	35	2.5	64	4.20	TO-220ACFP
DSEI12-06A	600	14	100	25	100	1.50	16	35	4.0	100	2.00	TO-220AC
DSEI12-06AS	600	14	100	25	100	1.50	16	35	4.0	100	2.00	TO-263AB
DSEI12-10A	1000	12	100	25	75	2.10	12	50	6.5	100	1.60	TO-220AC
DSEI12-12A	1200	11	100	25	75	2.20	12	50	6.5	100	1.60	TO-220AC
DSEI12-12AZ	1200	11	100	25	75	2.20	12	50	6.5	100	1.60	TO-263ABHV
DSEI20-12A	1200	17	85	70	130	1.87	12	40	7.0	100	1.60	TO-220AC
DSEI25-06A	600	25	110	35	240	1.55	25	35	9.0	200	1.20	TO-220AC
DSEI19-06AS	600	20	65	25	100	1.50	16	35	4.0	100	2.00	TO-263AB
DSEI25-06AS	600	25	110	35	240	1.55	25	35	9.0	200	1.20	TO-263AB
DSEI36-06AS	600	37	85	70	300	1.40	37	35	10.0	240	1.00	TO-263AB
DFE25I600HA	600	25	110	70	240	1.52	25	35	9.0	200	1.20	TO-247AD
DSEI30-06A	600	37	85	70	300	1.40	37	35	10.0	240	1.00	TO-247AD
DSEI30-10A	1000	30	85	70	200	2.00	36	35	16.0	240	0.90	TO-247AD
DSEI30-10AR	1000	30	85	70	200	2.00	36	35	16.0	240	0.90	ISOPLUS247™
DSEI30-12A	1200	26	85	70	200	2.20	30	40	16.0	240	0.90	TO-247AD
DSEK60-02A	200	2 × 34	115	50	325	0.85	30	35	4.0	100	1.00	TO-247AD
DSEK60-02AR	200	2 × 34	115	50	325	0.85	30	35	4.0	100	1.00	ISOPLUS247™
DSEK60-06A	600	2 × 30	85	50	300	1.40	37	35	10.0	240	1.00	TO-247AD
DSEK60-12A	1200	2 × 26	85	50	200	2.20	30	40	16.0	240	0.90	TO-247AD
DSEI60-02A	200	69	85	98	600	0.88	60	35	8.0	200	0.75	TO-247AD
DSEI60-06A	600	60	70	100	550	1.50	70	35	19.0	480	0.75	TO-247AD
DSEI60-10A	1000	60	60	100	500	1.80	60	35	32.0	480	0.66	TO-247AD



## FRED Diodes

Fast Recovery Epitaxial Diodes



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> d = 0.5	@ T <sub>C</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub> 10 ms 45 °C	V <sub>F</sub> T <sub>VJ</sub> = 150 °C	@ I <sub>F</sub>	t <sub>rr</sub> typ. T <sub>VJ</sub> = 25 °C	I <sub>RM</sub> typ. T <sub>VJ</sub> = 100 °C	-di/dt	R <sub>thJC</sub>	Package
	V	A	°C	A	A	V	A	ns	A	A/μs	K/W	
DSEI60-12A	1200	52	60	100	500	2.00	60	40	32	480	0.66	TO-247AD
DSEI120-06A	600	126	70	100	600	1.12	70	35	17	200	0.35	TO-247AD
DSEI120-12A	1200	109	60	100	600	1.55	70	40	25	200	0.35	TO-247AD
DSEI120-12AZ	1200	109	60	100	600	1.55	70	40	25	200	0.35	TO-268AAHV
DSEK300-06A	600	2 × 150	105	270	2000	1.20	150	77	50	600	0.20	SOT-227UI miniBLOC
DSEI2x30-04C	400	2 × 30	85	70	300	1.40	30	35	10	240	1.25	SOT-227B miniBLOC
DSEI2x30-06C	600	2 × 30	85	70	300	1.40	30	35	10	240	1.25	SOT-227B miniBLOC
DSEI2x30-10B	1000	2 × 30	50	70	200	2.00	30	35	16	240	1.25	SOT-227B miniBLOC
DSEI2x30-12B	1200	2 × 28	50	70	200	2.20	30	40	16	240	1.25	SOT-227B miniBLOC
DSEI2x31-04C	400	2 × 30	85	70	300	1.40	30	35	10	240	1.25	SOT-227B miniBLOC
DSEI2x31-06C	600	2 × 30	85	70	300	1.40	30	35	10	240	1.25	SOT-227B miniBLOC
DSEI2x31-10B	1000	2 × 30	50	70	200	2.00	30	35	16	240	1.25	SOT-227B miniBLOC
DSEI2x31-12B	1200	2 × 28	50	70	200	2.20	30	40	16	240	1.25	SOT-227B miniBLOC
DSEI2x61-02A	200	2 × 71	85	100	950	0.88	60	35	8	200	0.80	SOT-227B miniBLOC
DSEI2x60-04C	400	2 × 60	70	100	550	1.50	60	35	19	480	0.70	SOT-227B miniBLOC
DSEI2x61-04C	400	2 × 60	70	100	550	1.50	60	35	19	480	0.70	SOT-227B miniBLOC
DSEI2x61-06C	600	2 × 60	70	100	550	1.50	60	35	19	480	0.70	SOT-227B miniBLOC
DSEI2x61-10B	1000	2 × 60	50	100	500	1.80	60	35	32	480	0.70	SOT-227B miniBLOC
DSEI2x61-12B	1200	2 × 52	50	100	450	2.15	60	40	32	480	0.70	SOT-227B miniBLOC
DSEI2x61-06P	600	2 × 60	70	100	550	1.50	60	35	19	480	0.70	ECO-PAC 1
DSEI2x61-12P	1200	2 × 52	50	100	450	2.15	60	40	32	540	0.70	ECO-PAC 1
DSEI2x121-02A	200	2 × 123	70	150	1200	0.95	120	35	12	200	0.50	SOT-227B miniBLOC
DSEI2x101-06A	600	2 × 96	70	150	1200	1.17	100	35	19	200	0.50	SOT-227B miniBLOC
DFE240X600NA	600	2 × 120	80	150	1200	1.20	120	35	27	600	0.40	SOT-227B miniBLOC
DFE250X600NA	600	2 × 125	80	150	1300	1.16	125	35	27	600	0.40	SOT-227B miniBLOC
DSEI2x101-12A	1200	2 × 91	50	130	900	1.61	100	40	24	200	0.50	SOT-227B miniBLOC
DSEI2x101-06P	600	2 × 96	70	150	1200	1.17	100	40	19	200	0.50	ECO-PAC 2
DSEI2x101-12P	1200	2 × 91	50	130	900	1.61	100	40	24	200	0.50	ECO-PAC 2
DSEI2x161-02P	200	2 × 165	70	270	1200	1.05	200	35	20	200	0.29	ECO-PAC 2
DSEI2x161-06P	600	2 × 147	70	270	1200	1.40	200	35	45	200	0.29	ECO-PAC 2
DSEI2x161-12P	1200	2 × 128	70	270	1200	1.75	200	40	48	200	0.29	ECO-PAC 2



# Diodes

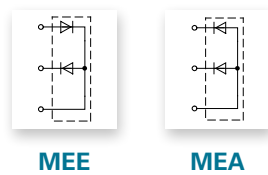


## FRED & HiPerFRED™ Modules

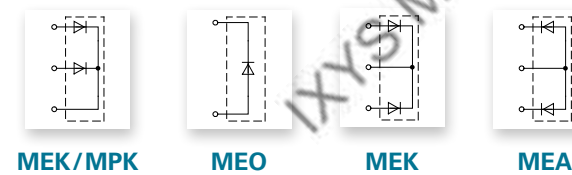
Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub>	V <sub>F</sub>	@ I <sub>F</sub>	t <sub>rr</sub> typ.	I <sub>RM</sub> typ.	-di/dt	R <sub>thJC</sub>	P <sub>tot</sub>	Package
	V	A	°C	A	10 ms 45 °C	V	A	ns	A	A/μs	K/W	W	
<b>FRED</b>													
MEO550-02DA	200	582		822		1.08		150	15	200			Y4
MEO500-06DA	600	514	75	726	4800	1.41	520	250	132	800	0.071	1750	
MEO450-12DA	1200	453		640		1.76		450	165	800			
MEK75-12DA	1200	2 × 75											TO-240
MEA75-12DA	1200	2 × 75	75	107	1200	1.85	100	250	33	200	0.45	280	
MEE75-12DA	2 × 1200	75											
MEK95-06DA	600	2 × 95											TO-240
MEA95-06DA	600	2 × 95	75	142	1200	1.36	100	250	21	200	0.45	280	
MEE95-06DA	2 × 600	95											
MEK250-12DA	1200	2 × 260											Y4
MEA250-12DA	1200	2 × 260	75	367	2400	1.54	260	450	83	400	0.143	875	
MEE250-12DA	2 × 1200	260											
MEK300-06DA	600	2 × 304											Y4
MEA300-06DA	600	2 × 304	75	430	2400	1.19	260	250	66	400	0.143	875	
MEE300-06DA	2 × 600	304											
MEK350-02DA	200	2 × 356	75	503	2400	0.92	260	150	15	200	0.143	875	Y4
<b>HiPerFRED™</b>													
MEK150-04DA	400	2 × 150	100	200	1200	1.401	300	300	11	100	0.350	360	TO-240
MEK600-04DA	400	2 × 575	80	800	3000	1.1	400	220	80	900	0.110	1100	Y4
MPK95-06DA	600	2 × 95	110	200	1200	1.4	100	35	5.5	100	0.575	215	TO-240

1 T<sub>VJM</sub> = 150 °C

Diode connections for Fig. X125 (TO-240)



Diode connections for Fig. X126 (Y4: 34 mm package)



## SemiFast Diodes

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub>	V <sub>F</sub>	@ I <sub>F</sub>	t <sub>rr</sub> typ.	I <sub>RM</sub> typ.	-di/dt	R <sub>thJC</sub>	Package
	V	A	°C	A	10 ms 45 °C	V	A	ns	A	A/μs	K/W	
DSDI60-14A	1400	63	60	100	500	4.1	70	300	60	500	0.4	TO-247AD
DSDI60-16A	1600	63	60	100	500	4.1	70	300	60	500	0.4	TO-247AD
DSDI60-18A	1800	63	60	100	500	4.1	70	300	60	500	0.4	TO-247AD

## Silicon Carbide Schottky Diodes Discrete



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	V <sub>F</sub>	I <sub>F</sub>	Q <sub>c</sub>	R <sub>thJC</sub>	Package
	V	A	°C	V	A	nC	K/W	
LSIC2SD065A10A	650	10	147	27	1.5	30	1.50	TO-220AC
LSIC2SD065A20A		20	135	45	1.5	63	1.10	
LSIC2SD065D10A	650	10	147	27	1.5	30	1.50	TO-263ABHV
LSIC2SD065D20A		20	135	45	1.5	63	1.10	
LSIC2SD065E20CCA	650	10/20 <sup>1</sup>	147	27/54 <sup>1</sup>	1.5	30	1.5/0.75 <sup>1</sup>	TO-247AD
LSIC2SD065E40CCA		20/40 <sup>1</sup>	135	45/90 <sup>1</sup>	1.5	63	1.1/0.55 <sup>1</sup>	
LSIC2SD120A10A	1200	10	151	28	1.5	57	1.10	TO-220AC
LSIC2SD120A20A		20	150	54.5	1.5	115	0.60	
LSIC2SD120D10A	1200	10	151	28	1.5	57	1.10	TO-263ABHV
LSIC2SD120D20A		20	150	54.5	1.5	115	0.60	
LSIC2SC120E20CCA	1200	10/20	154	32/64	1.5	56	1/0.5	TO-247AD
LSIC2SC120E30CCA		15/30	152	26/52	1.5	91	0.7/0.37	
LSIC2SC120E40CCA	1200	20/40	149	55/110	1.5	125	0.6/0.3	TO-247AD
LSIC2SB170B10A		10	150	30	1.5	57	TBD	
LSIC2SB170B25A	1700	25	150	61	1.5	122	TBD	TO-247AD
LSIC2SB170B50A		50	150	143	1.5	392	0.20	

1 per leg/component

## Silicon Carbide Schottky Diodes

No reverse recovery



Part Number	V <sub>RRM</sub>	I <sub>F80</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	V <sub>F</sub>	I <sub>F</sub>	R <sub>thJC</sub>	Package
	V	A	A	°C	V	A	K/W	
<b>Dual</b>								
DCG45X1200NA	1200	30	2 × 22	80	2.20	20	1.10	SOT-227B miniBLOC
DCG85X1200NA	1200	59	2 × 43	80	2.20	40	0.57	SOT-227B miniBLOC
DCG130X1200NA	1200	88	2 × 64	80	2.30	60	0.39	SOT-227B miniBLOC
LSIC2SD120N40PA	1200	33	2 × 50	80	2.10	20	0.95	SOT-227B miniBLOC
LSIC2SD120N80PA		60	2 × 90	80	2.10	20	0.58	SOT-227B miniBLOC
LSIC2SD120N120PA		96	2 × 146	80	2.10	20	0.34	SOT-227B miniBLOC
DCG200X1200NA		120	2 × 90	80	2.25	100	0.27	SOT-227B miniBLOC
<b>Common Cathode</b>								
DCG20C1200HR	1200	13	2 × 10	80	2.20	10	3.00	ISO247™
DCG35C1200HR	1200	23	2 × 17	80	2.20	20	1.80	ISO247™
<b>Phase Leg</b>								
DCG10P1200HR	2 × 1200	13	10	80	2.20	10	3.00	ISO247™
DCG17P1200HR	2 × 1200	23	17	80	2.20	20	1.80	ISO247™
<b>Rectifier Bridge</b>								
DCH15B1200FC	1200	12	4 × 17	80	2.20	10	3.50	ISOPLUS i4-PAC™
DCG80B1200NA	1200	53	2 × 79	80	1.6	50	0.7	SOT-227B
DCG81B1200NA	1200	53	2 × 79	80	1.6	50	0.7	SOT-227B

## More Information

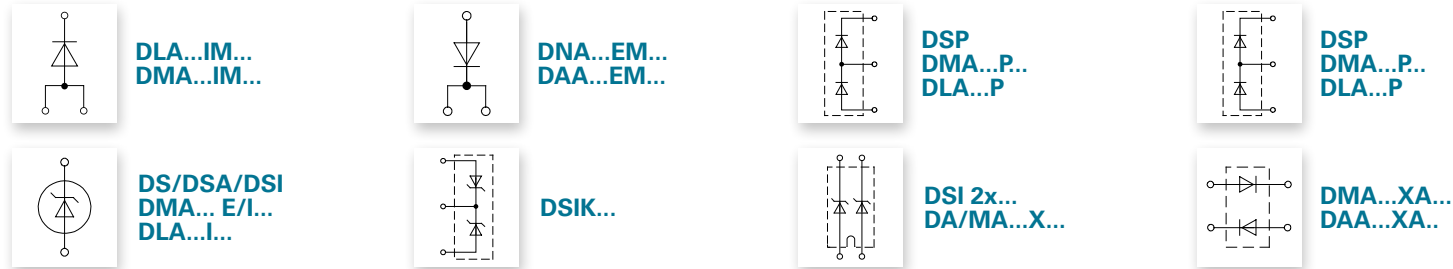
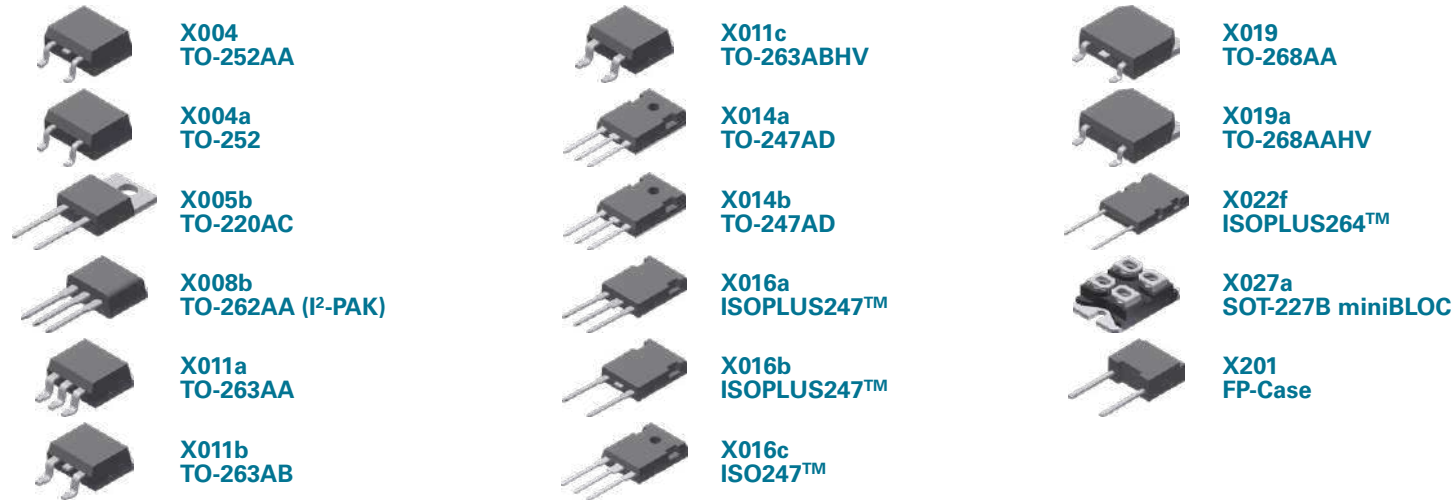
### Optimization of Freewheeling Device Implementation in SiC MOSFETS

This paper discusses the optimization of freewheeling device implementation for SiC MOSFETs in a half-bridge configuration. It presents the dynamic characterization of multiple freewheeling device implementations with SiC MOSFET switching. The behaviors of SiC MOSFET body diode and SiC Schottky barrier diode (SBD) are compared with switching devices of SiC MOSFETs with and without Kelvin source connections. This paper aims to determine whether the body diode of a SiC MOSFET is a limiting factor for high speed switching of MOSFETs.



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# Diodes



## Rectifier Diodes

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	P <sub>RSM</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub> 10 ms 45 °C	V <sub>10</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thCH</sub>	Package
	V	A	°C	KW	A	A	V	mΩ	°C	K/W	K/W	
DSA1-12D	1200	2.3	45	1.6	7	110	0.80	67	150	80.00	-	FP-Case
DSA1-16D	1600											
DSA1-18D	1800											
DLA5P800UC	2 × 800	5	140	-	20	40	0.74	44	175	5.50	0.50	TO-252AA
DSP8-08S	2 × 800	8	160	-	25	100	0.79	33	175	1.50	0.25	TO-263AB
DSP8-12S	2 × 1200											
DSP8-08A	2 × 800											
DSP8-12A	2 × 1200	8	160	-	25	100	0.79	33	175	1.50	0.25	TO-220AB
DSP8-08AS	2 × 800											
DSP8-12AS	2 × 1200											
DLA10IM800UC	800	10	100	-	20	80	0.80	22	175	3.15	0.50	TO-252AA
DLA20IM800PC	800	20	100	-	35	200	0.80	19	175	1.80	0.25	TO-263AB
DMA10IM1200UZ	1200	10	150	-	20	120	0.82	37	175	1.50	0.50	TO-252
DMA10IM1600UZ	1600											
DMA10P1200UZ	1200	10	140	-	20	100	0.90	37	175	2.00	0.50	TO-252
DMA10P1600UZ	1600											
DMA10I1600PA	1600	10	150	-	20	120	0.82	37	175	1.50	0.50	TO-220AC
DMA10IM1600PZ	1600	10	150	-	20	120	0.82	37	175	1.50	0.25	TO-263ABHV
DMA10P1600PZ	2 × 1600											
DMA10P1800PZ	2 × 1800											
DAA10EM1800PZ	1800	10	150	1.6	25	150	0.81	32	175	1.50	0.25	TO-263ABHV
DAA10P1800PZ	2 × 1800	10	150	1.6	25	150	0.82	37	175	1.50	0.25	

## Rectifier Diodes

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	P <sub>RSM</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub> 10 ms 45 °C	V <sub>10</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thCH</sub>	Package
	V	A	°C	KW	A	A	V	mΩ	°C	K/W	K/W	
DMA10P1200HR	2 × 1200	10	145	-	25	120	0.81	34	175	2.00	0.25	ISO247™
DMA10P1600HR	2 × 1600											
DSP25-12A	2 × 1200	25	135	-	70	300	0.81	13.8	175	0.90	0.25	TO-247AD
DSP25-16A	2 × 1600											
DSP25-12AT	2 × 1200	25	135	-	70	300	0.81	13.8	175	0.90	0.15	TO-268AA
DSP25-16AT	2 × 1600											
DSP25-16AR	2 × 1600	25	110	-	70	300	0.81	13.8	175	1.50	0.25	ISOPLUS247™
DSI30-08A	800	30	130	-	35	300	0.82	14.9	175	0.90	0.50	TO-220AC
DSI30-12A	1200											
DSI30-16A	1600											
DSI30-08AS	800	30	130	-	35	300	0.82	14.9	175	0.90	0.25	TO-263AB
DSI30-12AS	1200											
DSI30-16AS	1600											
DMA30IM1600PZ	1600	30	140	-	35	300	0.82	14.1	175	0.70	0.25	TO-263ABHV
DMA30E1800HA	1800	30	140	-	70	370	0.88	12.1	175	0.70	0.25	TO-247AD
DMA30P1200HB	2 × 1200	30	130	-	70	370	0.81	12.7	175	0.80	0.25	TO-247AD
DMA30P1600HB	2 × 1600											
DMA30P1600HR	2 × 1600	30	105	-	50	300	0.82	13.5	175	1.30	0.25	ISO247™
DNA30ER2200Y	2200	30	140	-	35	370	0.88	12.9	175	0.70	0.50	TO-262AA (I2-PAK)
DNA30E2200PA												TO-220AC
DNA30E2200PZ	2200	30	140	-	35	370	0.88	12.9	175	0.70	0.25	TO-263ABHV
DNA30EM2200PZ												
DNA30E2200FE	2200	30	100	-	70	370	0.88	12.2	175	1.35	0.20	ISOPLUS i4-PAC™
DLA40IM800PC	800	40	130	-	35	300	0.81	8	175	0.80	0.25	TO-263AB
DSI45-08A	800	45	130	-	70	480	0.81	9.1	175	0.55	0.25	TO-247AD
DSI45-12A	1200	45	130	-	70	480	0.81	9.1	175	0.55	0.25	TO-247AD
DSI45-16A	1600											
DSP45-12A	2 × 1200	45	130	-	70	480	0.81	9.1	175	0.55	0.25	TO-247AD
DSP45-12AZ												TO-268AAHV
DSP45-16A	2 × 1600	45	130	-	70	480	0.81	9.1	175	0.55	0.25	TO-247AD
DSP45-16AZ												TO-268AAHV
DSP45-18A	2 × 1800	45	130	-	70	480	0.81	9.1	175	0.55	0.25	TO-247AD
DSI45-16AR	1600	45	100	-	70	480	0.81	9.1	175	0.90	0.25	ISOPLUS247™
DSIK45-16AR	1600											
DSP45-16AR	2 × 1600											

# Diodes



**X014a**  
TO-247AD



**X019a**  
TO-268AAHV



**X022f**  
ISOPLUS264™



**X016c**  
ISO247™



**X027a**  
SOT-227B miniBLOC



**DSI 2x...**  
DA/MA...X...



**DSP**  
DMA...P...  
DLA...P



**DS/DSA/DSI**  
DMI...E/I...  
DLA...I...



**DMA...XA...**  
DAA...XA...

## Rectifier Diodes

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	@ T <sub>C</sub>	P <sub>RSM</sub>	I <sub>FRMS</sub>	I <sub>FSM</sub> 10 ms 45 °C	V <sub>10</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thCH</sub>	Package
	V	A	°C	kW	A	A	V	mΩ	°C	K/W	K/W	
DMA50I800HA	800	50	130	-	70	500	0.81	8.6	175	0.45	0.25	TO-247AD
DMA50I1200HA	1200											TO-247AD
DMA50I1600HA	1600											TO-247AD
DMA50P1200HR	2 × 1200	50	130	-	70	500	0.82	9.0	175	0.70	0.25	ISO247™
DMA50P1200HB	2 × 1200											TO-247AD
DMA50P1600HB	2 × 1600											TO-247AD
DLA60I1200HA	1200	60	150	-	70	850	0.77	4.2	175	0.30	0.25	TO-247AD
DMA80I1600HA	1600	80	125	-	70	1300	0.82	4.8	175	0.35	0.25	
DMA80I1600HB	1600	80	125	-	70	1300	0.82	4.8	175	0.35	0.25	TO-268AAHV
DLA100I1200TZ	1200	100	105	-	70	1300	0.85	4.6	175	0.35	0.15	
DSI2x55-12A	1200	2 × 60	95	-	120	800	0.83	6.2	150	0.60	0.10	SOT-227B miniBLOC
DSI2x55-16A	1600											
DNA120E2200KO	2200	120	125	-	70	2000	0.75	3.8	175	0.25	0.15	ISOPLUS264™
DMA150E1600NA	1600	150	90	-	150	3000	0.83	2.0	150	0.25	0.10	SOT-227B miniBLOC
DMA200X1600NA	1600	2x100	100	-	150	1500	0.8	4.0	150	0.30	0.10	SOT-227B miniBLOC
DMA200XA1600NA												
DAA200X1800NA	1800	2x100	100	20	150	1500	0.8	4.0	150	0.30	0.10	SOT-227B miniBLOC
DAA200XA1800NA												

# Breakover Diodes

## Break-Over-Diodes Sets

We deliver the following:

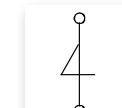
- A special selection of more than 2 pieces IXBOD1-... for every break down voltage of V<sub>BO</sub> > 2000 V
- Example type designations
  - IXBOD Set SA05/00
  - V<sub>BO</sub> = 4700 V ±100 V
  - (we deliver 5 pieces of single-selected IXBOD1-... in one plastic bag)
  - Customers use these products on PCB connected in series with parallel resistor R = 10 MW across each IXBOD.



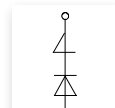
**X021**  
FP-Case (oil-proof)



**X202**  
BOD-Package



**Version R**



**Version RD**

## Fast Break-Over Diodes

Part Number	V <sub>BO</sub>		I <sub>BO</sub>	I <sub>H</sub>	V <sub>H</sub>	I <sub>D</sub>	I <sub>AVM</sub> <sup>1</sup>	I <sub>SM</sub>	dv/dt	R <sub>thJA</sub>	Package
	T <sub>VJ</sub> = 25 °C		mA	T <sub>VJ</sub> = 25 °C		μA	T <sub>amb</sub> = 50 °C				
	V	mA		mA	V		A	A			
IXBOD 1-06	600	±50	<15	30	4-8	20	0.9	200	>1000	60	FP-Case (oil proof)
IXBOD 1-07	700										
IXBOD 1-08	800										
IXBOD 1-09	900	±50	<15	30	4-8	20	0.9	200	>1000	60	FP-Case (oil proof)
IXBOD 1-10	1000										
IXBOD 1-12R	1200	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-12RD											
IXBOD 1-13R	1300	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-13RD											
IXBOD 1-14R	1400	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-14RD											
IXBOD 1-15R	1500	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-15RD											
IXBOD 1-16R	1600	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-16RD											
IXBOD 1-17R	1700	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-17RD											
IXBOD 1-18R	1800	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-18RD											
IXBOD 1-19R	1900	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-19RD											
IXBOD 1-20R	2000	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-20RD											
IXBOD 1-21R	2100	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-21RD											
IXBOD 1-22R	2200	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-22RD											
IXBOD 1-23R	2300	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-23RD											
IXBOD 1-24R	2400	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-24RD											
IXBOD 1-25R	2500	±50	<15	30	4-8	100	0.9	200	>1500	20	BOD-Package
IXBOD 1-25RD											
IXBOD 1-26R	2600	±100	<15	30	4-8	100	0.9	200	>2500	20	BOD-Package
IXBOD 1-26RD											
IXBOD 1-28R	2800	±100	<15	30	4-8	100	0.9	200	>2500	20	BOD-Package
IXBOD 1-28RD											
IXBOD 1-30R	3000	±100	<15	30	4-8	100	0.9	200	>2500	20	BOD-Package
IXBOD 1-30RD											
IXBOD 1-32R	3200	±100	<15	30	4-8	100	0.9	200	>2500	20	BOD-Package
IXBOD 1-32RD											
IXBOD 1-34R	3400	±100	<15	30	4-8	100	0.9	200	>3500	20	BOD-Package
IXBOD 1-36R											
IXBOD 1-38R	3800	±100	<15	30	4-8	100	0.9	200	>3500	20	BOD-Package
IXBOD 1-40R											
IXBOD 1-42R	4200	±100	<15	30	4-8	100	0.9	200	>3500	20	BOD-Package



# Breakover Diodes

## Advantages compared with IXBOD 1:

- Temperature coefficient  $K_T$  reduced by a factor of 3
  - Tighter definition of the break-over voltage  $V_{BO}$ 
    - $V_{BO}(T_{VJ}) = V_{BO}, 25^\circ\text{C} [1 + K_T (T_{VJ} - 25^\circ\text{C})]$
    - More precise and controllable design due to smaller tolerances
- Significant reduction of switching-on time, now down to just a few nanoseconds

## Applications:

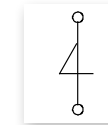
- Protection circuits for thyristors in highly valuable designs
  - High-DC current power transmissions for long distances, such as for offshore windmills or hydroelectric dams
- High intensity discharge lighting (HID)

Part Number	$V_{BO}$		$I_{BO}$	$I_H$	$V_H$	$I_D$	$I_{AVM}^1$	$I_{SM}$	dv/dt	$R_{thJA}$	Package
	$T_{VJ} = 25^\circ\text{C}$										
	$K_T = 0.7 \cdot 10^{-3} \text{ K}^{-1}$		$V$	$\text{mA}$	$\mu\text{A}$	$\text{A}$	$\text{V}/\mu\text{s}$	$\text{K}/\text{W}$			
IXBOD 2-01	100	$\pm 10\% \cdot V_{BO}$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-02	200										
IXBOD 2-03	300	$\pm 10\% \cdot V_{BO}$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-04	400										
IXBOD 2-05	500	$\pm 50$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-06	600										
IXBOD 2-07	700	$\pm 50$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-08	800										
IXBOD 2-09	900	$\pm 50$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-10	1000										
IXBOD 2-11	1100	$\pm 50$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-12	1200										
IXBOD 2-13	1300	$\pm 50$	15	20	4-8	200	0.90	250	>1000	60	FP-Case (oil proof)
IXBOD 2-14	1400										
IXBOD 2-15R	1500	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-15RD											
IXBOD 2-16R	1600	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-16RD											
IXBOD 2-17R	1700	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-17RD											
IXBOD 2-18R	1800	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-18RD											
IXBOD 2-19R	1900	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-19RD											
IXBOD 2-20R	2000	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-20RD											
IXBOD 2-21R	2100	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-21RD											
IXBOD 2-22R	2200	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-22RD											
IXBOD 2-23R	2300	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-23RD											
IXBOD 2-24R	2400	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-24RD											
IXBOD 2-25R	2500	$\pm 50$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-25RD											
IXBOD 2-26R	2600	$\pm 100$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-26RD											
IXBOD 2-27R	2700	$\pm 100$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-27RD											
IXBOD 2-28R	2800	$\pm 100$	15	20	4-8	200	0.90	250	>1500	20	BOD-Package
IXBOD 2-28RD											

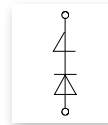
## Fast Break-Over Diodes



BOD-Package



Version R

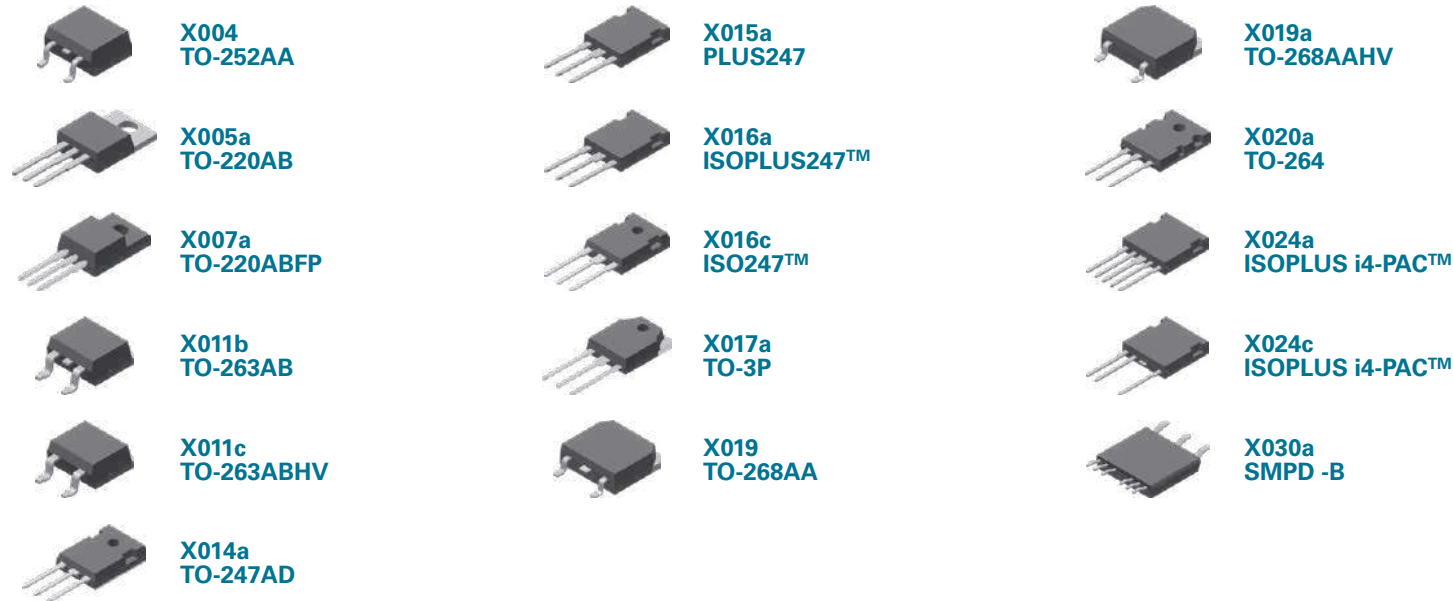


Version RD

Part Number	$V_{BO}$		$I_{BO}$	$I_H$	$V_H$	$I_D$	$I_{AVM}^1$	$I_{SM}$	dv/dt	$R_{thJA}$
	$T_{VJ} = 25^\circ\text{C}$									
	$K_T = 0.7 \cdot 10^{-3} \text{ K}^{-1}$		$V$	$\mu\text{A}$	$\text{A}$	$\text{V}/\mu\text{s}$	$\text{K}/\text{W}$			
IXBOD2-29R	2900	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-29RD										
IXBOD2-30R	3000	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-30RD										
IXBOD2-31R	3100	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-31RD										
IXBOD2-32R	3200	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-32RD										
IXBOD2-33R	3300	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-33RD										
IXBOD2-34R	3400	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-34RD										
IXBOD2-35R	3500	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-35RD										
IXBOD2-36R	3600	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-36RD										
IXBOD2-37R	3700	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-37RD										
IXBOD2-38R	3800	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-38RD										
IXBOD2-39R	3900	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-39RD										
IXBOD2-40R	4000	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-40RD										
IXBOD2-41R	4100	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-41RD										
IXBOD2-42R	4200	$\pm 100$	15	20	4-8	200	0.90	250	>2500	20
IXBOD2-42RD										
IXBOD2-43R	4300	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-44R										
IXBOD2-45R	4500	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-46R										
IXBOD2-47R	4700	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-48R										
IXBOD2-49R	4900	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-50R										
IXBOD2-51R	5100	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-52R										
IXBOD2-53R	5300	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-54R										
IXBOD2-55R	5500	$\pm 100$	15	20	4-8	200	0.90	250	>3500	20
IXBOD2-56R										

<sup>1</sup> Leads soldered on PCB board,  $T_{stg}$  and  $T_{VJ} = -40 \dots +125^\circ\text{C}$

# Thyristors

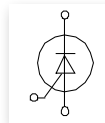


Compared to all other controlled semiconductor components, thyristors are very rugged devices. They feature the highest current capacity per chip area, especially at high voltages, and are mainly used as control devices in 50 Hz and 60 Hz AC main equipment

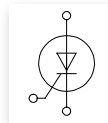
Principal applications include static converter circuits for the speed control of DC-drives, switching, and control functions for temperature, lighting, soft-start, etc. in single-phase and three-phase AC switch configurations. Phase control thyristors are designed for optimal forward conduction and reverse-blocking characteristics, as they have only moderate requirements for turn-on and turn-off parameters.

## Phase Control Thyristors

$I_{TAV} = 5-30 \text{ A}$



CLB...

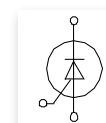


CS.../CL/MA...E/I...

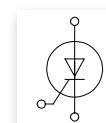
Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	@ $T_c$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C} 10 \text{ ms}$	$(dv/dt)_{cr}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	°C	A	A	V/ $\mu\text{s}$	V	m $\Omega$	°C	K/W	K/W	
CLA5E1200UC	1200	5	135	8	70	500	0.89	85.0	150	1.50	0.50	TO-252AA
CLA5E1200PZ											0.25	TO-263ABHV
CLA15E1200NPB	1200	15	120	33	170	500	0.89	30	150	0.95	0.50	TO-220AB
CLA15E1200NPZ												TO-263ABHV
CLA16E800PN	800	10	90	16	180	500	0.81	24	150	4.00	0.50	TO-220ABFP
CLA16E1200PN	1200											
CS19-08ho1	800	20	110	31	160	500	0.86	22	150	0.70	0.50	TO-220AB
CS19-12ho1	1200											
CS19-08ho1S	800	20	110	31	160	500	0.86	22	150	0.70	0.50	TO-263AB
CS19-12ho1S	1200											
CMA20E1600PB	1600	20	115	31	180	500	0.92	28	150	0.70	0.50	TO-220AB
CMA20E1600PZ											0.25	TO-263ABHV
CS20-12io1	1200	20	130	31	260	1000	0.87	17.3	150	0.60	0.25	TO-257AD
CS20-14io1	1400											
CS20-16io1	1600											
CS20-22moF1	2200	18	85	28	200	2500	0.97	17	125	0.92	0.15	ISOPLUS i4-PAC™
CS20-25mo1F												
CS20-25moT1	2500	18	85	28	200	2500	0.97	17	125	0.80	0.15	TO-268AA
CS22-08io1M	800											
CS22-12io1M	1200	16	90	25	300	500	0.86	13.2	150	2.50	0.50	TO-220ABFP
CLA30E1200PB	1200	30	115	47	300	500	0.86	13.2	150	0.50	0.50	TO-220AB
CLA30E1200PC	TO-263AB											
CLA30E1200PZ	TO-263ABHV											

## Phase Control Thyristors

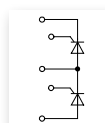
$I_{TAV} = 30-100 \text{ A}$



CLB...



CS.../CL/MA...E/I...



CLA.CMA...P...

Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	@ $T_c$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C} 10 \text{ ms}$	$(dv/dt)_{cr}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	°C	A	A	V/ $\mu\text{s}$	V	m $\Omega$	°C	K/W	K/W	
CLA100E1200TZ	1200	30	115	47	300	500	0.86	13.2	150	0.50	0.25	TO-268AAHV
CLB30I1200PZ												TO-263ABHV
CLA30E1200HB	1200	30	120	47	300	500	0.86	12.5	150	0.50	0.25	TO-257AD
CLB30I1200HB <sup>1</sup>												TO-257AD
CMA30E1600PB	1600	30	115	47	260	500	0.92	18	150	0.75	0.50	TO-220AB
CMA30E1600PZ	1600	30	115	47	260	500	0.92	18	150	0.75	0.25	TO-263ABHV
CMA30E1600PN	1600	30	40	47	260	500	0.92	18	150	2.50	0.50	TO-220ABFP
CS30-12io1	1200	30	120	47	400	1000	0.87	14.2	150	0.50	0.25	TO-257AD
CS30-14io1	1400											
CS30-16io1	1600											
CMA30P1600FC	2 × 1600	30	90	47	400	1000	0.87	14.2	150	1.00	0.25	ISOPLUS i4-PAC™
CLA40E1200NPZ	1200	40	125	63	520	500	0.85	9.9	150	0.40	0.25	TO-263ABHV
CLA40E1200NHB	1200	40	120	63	520	500	0.85	9.2	150	0.50	0.25	TO-257AD
CLA40E1200HR	1200	40	95	63	650	1000	0.85	7.9	150	0.80	0.25	ISO247™
CLB40I1200PZ	1200	40	125	63	520	500	0.85	9.9	150	0.40	0.25	TO-263ABHV
CLA40P1200FC	2 × 1200	40	95	63	650	1000	0.86	7.9	150	0.80	0.20	ISOPLUS i4-PAC™
CMA40E1600HR	1600	40	90	63	550	1000	0.81	9.8	150	0.80	0.25	ISO247™
CS45-08io1	800	45	110	71	520	1000	0.88	11	150	0.40	0.25	TO-257AD
CS45-12io1	1200											
CS45-16io1	1600											
CS45-16io1R	1600	45	80	71	520	1000	0.88	11	150	0.80	0.25	ISOPLUS247™
CLA50E1200HB	1200	50	125	79	650	1000	0.88	7.7	150	0.25	0.25	TO-257AD
CLA50E1200TC											0.15	TO-268AA
CMA50E1600HB	1600	50	110	79	550	1000	0.83	9.6	150	0.40	0.25	TO-257AD
CMA50E1600QB												TO-3P
CMA50P1600FC	2 × 1600	50	90	79	720	1000	0.88	6.7	150	0.70	0.20	ISOPLUS i4-PAC™
CS60-12io1	1200	60	110	75	1400	1000	0.82	5.3	140	0.32	0.15	PLUS247
CS60-14io1	1400											
CS60-16io1	1600											
CS60-16io1R	1600	60	90	75	1400	1000	0.82	5.3	140	0.45	0.15	ISOPLUS247™
CLA80E1200HF	1200	80	115	126	900	1000	0.88	6.3	150	0.20	0.25	PLUS247
CMA80E1600HB	1600	80	115	126	720	1000	0.9	6.4				TO-257AD
CLA100E1200HB	1200	100	105	160	1100	1000	0.82	5.2	150	0.20	0.15	TO-257AD
CLA100E1200KB												TO-264
CLA100E1200TZ												TO-268AAHV

<sup>1</sup> Anode-gated

## Fast Phase Control Thyristors

Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	@ $T_c$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C} 10 \text{ ms}$	$(dv/dt)_{cr}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	°C	A	A	V/ $\mu\text{s}$	V	m $\Omega$	°C	K/W	K/W	
CLE20E1200PC	1200	20	115	31	160	500	0.92	24	150	0.7	0.25	TO-263ABHV
CME30E1600PZ	1600	30	105	47	280	500	0.96	25	150	0.5	0.25	TO-263ABHV
CLF20E1200PB	1200	20	110	31	150	500	0.96	26	150	0.7	0.50	TO-220AB
CLE30E1200PB	1200	30	115	47	270	500	0.92	14	150	0.5	0.50	TO-220AB
CNE60E2200TZ	2200	60	80	94	720	1000	1.90	12.6	150	0.3	0.15	TO-268AAHV
CLE90UH1200TLB	1200	90	90	-	350	500	0.92	13	150	0.9	0.40	SMPD-B

# Thyristors



## SCR

Littelfuse SCR products are half-wave, silicon-controlled rectifiers that represent the state of the art in design and performance. Because of its unidirectional switching capability, the SCR is used in circuits where high surge currents or latching actions are required. They may also be used for half-wave-type circuits where gate-controlled rectification action is required. Applications include crowbars in power supplies, camera flash units, smoke alarms, motor controls, battery chargers, and engine ignition.

## Standard SCRs

Series Number	V <sub>DRM</sub> V <sub>RRM</sub>				I <sub>T(RMS)</sub> A	I <sub>GT max</sub> mA	T <sub>J</sub> °C	Package															
								Surface Mount								Through-hole							
	400	600	800	1000				SOT23	SO-8	SOT-89	SOT-223	DO-214-3L	TO-252	TO-263	TO-92-3L	TO-225 (C77)	TO-251	TO-225AA	TO-220 Iso	TO-220	TO-218AC Iso	TO-218AC	TO-218X Iso
NYC0102B (200V)	-	-	-	-	0.25	0.2	125	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S8X5ECSx	-	-	•	-	0.5	0.05, 0.1	125	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-
Sxx8BBSx	-	•	-	-	0.8	0.2, 0.45	125	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sxx8xSx	•	•	•	-	0.8	0.005, 0.05, 0.2, 0.45	125	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-
EC103x/SxSx	•	•	-	-	0.8	0.012, 0.05, 0.2, 0.5	110	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-
Sx01E/SxN1	•	•	-	-	1	10	110	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-
S802CSx	-	-	•	-	1.25	0.05, 0.1	110	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-
Sx02xSx	•	•	-	-	1.5	0.05, 0.1, 0.2	125	-	-	•	•	-	-	-	-	-	-	-	-	-	-	-	-
TCR22-x	•	•	-	-	1.5	0.2	110	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-
S802xSx	-	-	•	-	1.5	0.1	125	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-
STx802U2Sx	-	-	•	-	1.5	0.1	125	-	•	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S6002xS	-	•	-	-	2	0.2	125	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-	-
C106x, MCR106-x	•	•	-	-	4	0.2	125	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
Sxx04xSx	•	•	-	-	4	0.05, 0.2	125	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-
Sxx06xxx	•	•	•	•	6	0.2, 0.5, 15	125	-	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-
Sxx08xxx	•	•	•	•	8	0.05, 0.1, 0.2, 0.5, 15	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
SRUK208x (1200V)	-	-	-	-	8	15	125	-	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-
Sxx10xxx	•	•	•	•	10	0.2, 0.5, 15	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
Sxx12xx	•	•	•	•	12	20	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
MCR12DSx	-	•	•	-	12	0.2	110	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-	-
Sxx16xx	•	•	•	•	16	30	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
Sxx20xx	•	•	•	•	20	30	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
Sxx25xx	•	•	•	•	25	35	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
Sxx35x	•	•	•	•	35	40	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-
Sxx40x	•	•	•	•	40	40	125	-	-	-	-	-	-	•	•	•	-	-	-	-	-	-	-

## Standard SCRs

Series Number	V <sub>DRM</sub> V <sub>RRM</sub>				I <sub>T(RMS)</sub> A	I <sub>GT max</sub> mA	T <sub>J</sub> °C	Package															
								Surface Mount								Through-hole							
	400	600	800	1000				SOT23	SO-8	SOT-89	SOT-223	DO-214-3L	TO-252	TO-263	TO-92-3L	TO-225 (C77)	TO-251	TO-225AA	TO-220 Iso	TO-220	TO-218AC Iso	TO-218AC	TO-218X Iso
S4040xQx	•	-	-	-	40	35, 45, 60	125	-	-	-	-	-	-	-	•	-	-	-	-	-	•	-	-
Sxx55x	•	•	•	•	55	40	125	-	-	-	-	-	-	-	-	-	-	-	-	-	•	•	-
Sxx65x	•	•	•	•	65	50	125	-	-	-	-	-	-	-	-	-	-	-	-	-	•	•	-
Sxx70x	•	•	•	•	70	50	125	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	•

## High Temperature SCRs

Series Number	V <sub>DRM</sub> V <sub>RRM</sub>				I <sub>T(RMS)</sub> A	I <sub>GT max</sub> mA	T <sub>J</sub> °C	Package															
								Surface Mount								Through-hole							
	400	600	800	1000				SOT23	SO-8	SOT-89	SOT-223	DO-214-3L	TO-252	TO-263	TO-92-3L	TO-225 (C77)	TO-251	TO-225AA	TO-220 Iso	TO-220	TO-218AC Iso	TO-218AC	TO-218X Iso
SJxx04xSx	•	•	-	-	4	0.2	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx06xxx	•	•	-	-	6	0.2, 6, 15	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx08xxx	•	•	-	-	8	0.2, 6, 15	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx10xxx	•	•	-	-	10	0.2, 6, 15	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx12xx	•	•	-	-	12	6, 10, 20	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SVxx12xx	•	•	•	-	12	6, 10	150	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-
SVxx12xxQ	•	•	-	-	12	6, 10	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx16xx	•	•	-	-	16	6, 10, 30	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SVxx16xx	-	•	-	-	16	6, 10	150	-	-	-	-	-	•	•	-	-	-	-	-	-	-	-	-
SVxx16xxQ	•	•	-	-	16	6, 10	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx20xx	•	•	-	-	20	6, 10, 35	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SVxx20xx	•	•	-	-	20	6, 10	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SVxx20xxQ	•	•	-	-	20	6, 10	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx25xx	•	•	-	-	25	6, 10, 35	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SVxx25xx	•	•	-	-	25	6, 10	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SVxx25xxQ	•	•	-	-	25	6, 10	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx32xx	•	•	-	-	32	15, 40	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SJxx40xx	•	•	-	-	40	15, 40	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-
SV6050xx	-	•	-	-	50	15	150	-	-	-	-	-	•	-	-	-	-	-	-	-	-	-	-

## Automotive Grade AECQ101 Qualified SCRs

Series Number	V <sub>DRM</sub> V <sub>RRM</sub>				I <sub>T(RMS)</sub> A	I <sub>GT max</sub> mA	T <sub>J</sub> °C	Package															
								Surface Mount								Through-hole							
	400	600	800	1000				SOT23	SO-8	SOT-89	SOT-223	DO-214-3L	TO-252	TO-263	TO-92-3L	TO-225 (C77)	TO-251	TO-225AA	TO-220 Iso	TO-220	TO-218AC Iso	TO-218AC	TO-218X Iso
S8016xAx	-	-	•	-	16	50	125	-	-	-	-	-	-	•	-	-	-	-	-	-	•	-	-
SJxx20xxA	•	•	-	-	20	6, 10, 35	150	-	-	-	-	-	•	-	-	-	-	-	-	-	•	•	-
SJxx25xxA	•	•	-	-	25	6, 10, 35	150	-	-	-	-	-	•	-	-	-	-	-	-	-	•	•	-
SJxx32xxA	•	•	-	-	32	15, 40	150	-	-	-	-	-	•	-	-	-	-	-	-	-	•	•	-
SJxx40xxA	•	•	-	-	40	15, 40	150	-	-	-	-	-	•	-	-	-	-	-	-	-	•	•	-
HS4040xAQx	•	-	-	-	40	35, 45, 65	150	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-
SV6050xAx	-	•	-	-	50	15	150	-	-	-	-	-	•	-	-	-	-	-	-	-	•	-	-



# TRIAC



## TRIAC

Switching Thyristors are solid state switches that are normally open circuits (very high impedance), capable of withstanding rated blocking/off-state voltage until triggered to on state. Used for circuit control applications, Littelfuse offers Triac, QUADRAC® Semiconductors, SCRs, Rectifiers plus Alternistor Triacs for best commutating and noise immunity. Offered in various and other configurations for a wide range of currents blocking/off-state voltages, packages, and triggering.

## TRIACS

Part Number	V <sub>DRM</sub>	I <sub>T(RMS)</sub>	@T <sub>c</sub>	I <sub>TSM</sub> 20 ms	I <sub>GT</sub> QI-QII-QIII (-QIV)	T <sub>J</sub>	Package
	V	A	°C	A	A	°C	
LX807MTRP	600	0.8	90	8	5-5-5-7	125	SOT-223
LX807MBRP	600	0.8	60	8	5-5-5-7	125	SOT-89
L0103NERP	800	1	50	10	3-3-3-5	125	TO-92
L0107NTRP	800	1	90	10	5-5-5-7	125	SOT-223
L0109NERP	800	1	50	10	10-10-10-10	125	TO-92
LJ6004D8RP	600	4	135	40	10-10-10-20	150	TO-252AA
QJ6004D4RP	600	4	135	40	25-25-25-50	150	TO-252AA
Q8004D4RP	800	4	110	46	25-25-25-50	125	TO-252AA
QJ6006DH4RP	600	6	130	60	35-35-35	150	TO-252AA
Q8006RH4TP	800	6	100	80	35-35-35	125	TO-220AB
QJ6008DH4RP	600	8	120	70	35-35-35	150	TO-252AA
Q8008LH4TP	800	8	90	83	35-35-35	125	TO-220AB (ISO)
Q6012LH1LEDTP	600	12	90	110	40461	125	TO-220AB (ISO)
QJ8012LH5TP	800	12	120	110	50-50-50	150	TO-220AB (ISO)
Q8015LTP	800	15	80	167	50-50-50-100	125	TO-220AB (ISO)
QJ6016NH2RP	600	16	130	167	40461	150	TO-263AB
QJ6016RH3TP	600	16	130	167	20-20-20	150	TO-220AB
QJ6016LH4TP	600	16	115	167	35-35-35	150	TO-220AB (ISO)
QJ6016NH6RP	600	16	130	167	80-80-80	150	TO-263AB
QJ8016NH4RP	800	16	132	167	35-35-35	150	TO-263AB
QJ8016LH6TP	800	16	110	167	80-80-80	150	TO-220AB (ISO)
QJ6025NH5RP	600	25	120	208	50-50-50	150	TO-263AB
QJ6025RH5TP	600	25	120	208	50-50-50	150	TO-220AB
QJ6025LH5TP	600	25	90	208	50-50-50	150	TO-220AB (ISO)
QJ6025KH6TP	600	25	110	208	80-80-80	150	TO-218AC
QJ8025LH5TP	800	25	90	208	50-50-50	150	TO-220AB (ISO)
Q8025K6TP	800	25	85	208	80-80-80	125	TO-218AC
QJ8025NH5RP	800	25	120	208	50-50-50	150	TO-263AB
QJ8030LH4TP	800	30	105	290	35-35-35	150	TO-220AB (ISO)
Q6035NH5RP	600	35	90	290	50-50-50	125	TO-263AB
Q8040K3TP	800	40	75	335	35-35-35-70	125	TO-218AC
QK040K4TP	1000	40	75	335	50-50-50-120	125	TO-218AC
Q8040K5TP	800	40	75	335	50-50-50	125	TO-218AC
QK040J7TP	1000	40	75	335	100-100-100	125	TO-218ACa
QJ8040KH5TP	800	40	100	420	50-50-50	150	TO-218AC

## TRIAC 1 Phase

I<sub>RMS</sub> = 30–650 A



Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>RMS</sub>	@T <sub>c</sub>	I <sub>TSM</sub> 10 ms, 45 °C	V <sub>TO</sub>	r <sub>T</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
CLA30MT1200NPB	1200	400	33	120	170	0.89	30.5	150	0.95	1.45	TO-220AB
CLA30MT1200NPZ	1200	400	33	120	170	0.89	30.5	150	0.95	1.20	TO-263ABHV
CLA40MT1200NPB	1200	400	44	110	180	0.89	27.9	150	0.80	1.30	TO-220AB
CLA40MT1200NPZ	1200	400	44	110	180	0.89	27.9	150	0.80	1.05	TO-263ABHV
CLA40MT1200NHB	1200	400	44	110	180	0.89	27.9	150	0.80	1.05	TO-247AD
CLA60MT1200NHB	1200	400	66	120	380	0.86	12.5	150	0.55	0.80	TO-247AD
CLA60MT1200NTZ	1200	400	66	120	380	0.86	12.5	150	0.55	0.70	TO-268AAHV
CLA60MT1200NHR	1200	400	66	100	380	0.86	12.5	150	0.90	1.15	ISO247™
CMA60MT1600NHB	1600	500	66	115	260	0.9	16.6	150	0.55	0.80	TO-247AD
CMA60MT1600NHR	1600	500	66	90	260	0.9	16.6	150	0.90	1.15	ISO247™
CLA80MT1200NHB	1200	400	88	120	480	0.85	9.2	150	0.40	0.65	TO-247AD
CLA80MT1200NHR	1200	400	88	100	480	0.85	9.2	150	0.65	0.90	ISO247™
CMA80MT1600NHB	1600	400	88	115	400	0.9	12	150	0.40	0.65	TO-247AD
CMA80MT1600NHR	1600	500	88	95	400	0.9	12	150	0.65	0.90	ISO247™
MCMA650MT1400NKD	1400	440	650	85	9600	0.81	0.68	140	0.12	0.04	Y1-2-Cu
MCMA650MT1800NKD	1800	575	650	400	9600	0.81	0.68	140	0.12	0.04	Y1-2-Cu

## Standard TRIACs

Series Number	V <sub>DRM</sub>				I <sub>T(RMS)</sub>	T <sub>J</sub> max	I <sub>GT(QI)</sub> max	Package																
	400	600	800	1000				Surface Mount					Through-hole											
					SOT23	SO-8	SOT-89	SOT-223	DO-214-3L	TO-252	TO-263	TO-92-3L	TO-225 (C77)	TO-251	TO-220 Iso	TO-220	TO-218AC Iso	TO-218AC	TO-218X Iso	TO-218X				
LxX8Ex / LxXx / QxX8Ex / QxXx	•	•	–	–	0.8	125	3,5,10,25	–	–	–	–	•	–	–	•	–	–	–	–	–	–	–	–	–
LX8	•	•	–	–	0.8	125	3,5	–	–	•	•	–	–	–	•	–	–	–	–	–	–	–	–	–
Lx01Ex / LxNx / Qx01Ex / QxNx	•	•	–	–	1	110	3,5,10,25	–	–	–	–	•	–	–	•	–	–	–	–	–	–	–	–	–
L01	•	•	•	–	1	125	3,5,10	–	–	•	–	–	–	•	–	–	–	–	–	–	–	–	–	–
T2322B (200V)	•	–	–	–	2.5	110	10	–	–	–	–	–	–	•	•	–	–	–	–	–	–	–	–	–
2N607xA/B	•	•	–	–	4	110	3,5	–	–	–	–	–	–	•	•	–	–	–	–	–	–	–	–	–
Lxx04xx / Qxx04xx	•	•	•	•	4	125	3,5,10,25	–	–	–	–	–	–	•	•	•	•	•	•	•	•	•	•	•
Lxx06xx / Qxx06xx / Qxx06xHx	•	•	•	•	6	125	5,10,25,35,50	–	–	–	–	–	–	•	•	•	•	•	•	•	•	•	•	•
Lxx08xx / Qxx08xx / Qxx08xHx	•	•	•	•	8	125	5,10,25,35,50	–	–	–	–	–	–	•	•	•	•	•	•	•	•	•	•	•
Q6008xH1LED	•	•	–	–	8	125	10	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Qxx10xx / Qxx10xHx	•	•	•	•	10	125	5,25,50	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Qxx12xHx	•	•	•	•	12	125	10,50	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Q6012xH1LED	•	•	–	–	12	125	10	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Qxx15xx / Qxx16xHx	•	•	•	•	15	125	10,25,35,50,80	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Q6016LH1LED	–	•	–	–	16	125	5	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Qxx25xx / Qxx25xHx	•	•	•	•	25	125	50,80	–	–	–	–	–	–	•	–	–	–	–	–	•	•	•	•	•
Qxx30xHx / Qxx35xHx	•	•	–	–	30	125	25,50	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–
Qxx40xx	•	•	•	•	40	125	35,50,80,100	–	–	–	–	–	–	•	–	–	–	–	–	•	•	•	•	•
MS0690J-D1TE (SOT-227)	–	•	–	–	90	125	50	–	–	–	–	–	–	•	–	–	–	–	–	•	•	–	–	–

### High Temperature TRIACs

Series Number	V <sub>DRM</sub>				I <sub>T(RMS)</sub> A	T <sub>J</sub> max °C	I <sub>GT(IG)</sub> max mA	Package															
	400	600	800	1000				Surface Mount						Through-hole									
								SOT23	SO-8	SOT-89	SOT-223	DO-214-3L	TO-252	TO-263	TO-92-3L	TO-225 (C77)	TO-251	TO-220 Iso	TO-220	TO-218AC Iso	TO-218AC	TO-218X Iso	TO-218X
LJxx04xx / QJxx04xx	•	•	-	-	4	150	10,25	-	-	-	-	-	•	-	-	-	•	-	-	-	-	-	-
LJxx06xx / QJxx06xHx / QJxx06xx	•	•	•	-	6	150	10,20,35,50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
LJxx08xx / QJxx08xHx / QJxx08xx	•	•	•	-	8	150	10,20,35,50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QJxx10xx / QJxx10xHx	-	-	•	-	10	150	10,25,35,50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QJxx12xHx	-	-	•	-	12	150	35,50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QVxx12xHx	-	•	-	-	12	150	35,50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QJxx16xHx	-	•	•	-	16	150	10,20,35,50,80	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QVxx16xHx	-	•	-	-	16	150	10,20,35,50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
HQ6025xH5	-	-	-	-	25	150	50	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QJxx25xHx	•	•	•	-	25	150	35,50,80	-	-	-	-	-	•	•	-	-	•	•	•	-	•	-	-
QJxx30LH4 / QJxx35xHx	-	•	•	-	30	150	35	-	-	-	-	-	•	•	-	-	•	•	•	-	-	-	-
QJxx40xx	-	•	•	-	40	150	35,50,80,100	-	-	-	-	-	•	•	-	-	•	•	•	-	•	-	-

### Quadrac

Series Number	V <sub>DRM</sub>				I <sub>T(RMS)</sub> A	T <sub>J</sub> max °C	V <sub>BO</sub> max V	I <sub>H</sub> max mA	Package
	400	600	800	1000					
Qxx04LT	•	•	-	-	4	125	43	40	TO-220 Iso
Qxx06LT / Qxx06LTH	•	•	-	-	6	125	43	50	TO-220 Iso
Qxx08LT / Qxx08LTH	•	•	-	-	8	125	43	60	TO-220 Iso
Qxx10LT / Qxx10LTH	•	•	-	-	10	125	43	60	TO-220 Iso
Qxx15LT / Qxx15LTH	•	•	-	-	15	125	43	70	TO-220 Iso
Q6008LTH1LED	-	•	-	-	8	125	43	6	TO-220 Iso
Q6012LTH1LED	-	•	-	-	12	125	43	8	TO-220 Iso

### SIDAC

Part Number	SIDAC Type	Nomial VBO																I <sub>TRM</sub> @ 5 Hz A	I <sub>TRM</sub> @ 60 Hz A	T <sub>J</sub> Max °C	Package			
		82	90	105	110	120	130	140	150	180	200	220	230	240	250	300	360							
		V																			A	A	°C	SMA
Kxxx0yU	Unidirectional	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	160 / 280	80 / 120	125 / 150	•	-	•	-
Kxxxzy	Bidirectional	-	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	160	80	125	-	•	•	•
Kxxx0yH	Bidirectional	-	-	-	-	-	-	-	-	•	•	•	•	•	•	•	280	120	125	-	•	•	•	
Kxxx1GL	Multipulse	-	-	-	-	-	-	-	-	•	•	•	•	•	•	•	n/a	n/a	125	-	-	•	-	
K2xx0yHU	Unidirectional	-	-	-	-	-	-	-	-	•	•	•	•	•	•	•	280	120	125	-	•	•	-	
Kxxx1G	Multipulse	-	-	-	-	-	-	-	-	•	•	•	•	•	•	•	n/a	n/a	125	-	-	•	-	

One of the essential advantages of power semiconductor modules has over discrete designs is the electrical isolation between the baseplates of the module and the parts subject to voltage (3.6 - 4.8 kV<sub>RMS</sub> tested). This makes the mount-down of any number of the same or different modules on a common heatsink possible. It is feasible to use standard housings with appropriate accessories for designing a compact power converter operating from AC mains up to 690 V.

#### Plastic Housing with DCB Substrate

IXYS has succeeded in simplifying the conventional multilayer module construction by applying the direct copper bonding (DCB) technique.

Other features include:

- Top-side electrical terminals with captured nuts;
- Series-connected diodes/diode, thyristor/diode, and thyristor/thyristor modules; and
- Easy assembly

All thyristor modules with DCB ceramic base contacts are available in volume with two standardized twin plugs (2.8 mm x 0.8 mm) for gate and auxiliary cathode control terminals (version 1). Modules in TO-240 housing of version 8 are delivered with gate plugs only (i.e., without auxiliary cathode terminal; mounting screws available on request). The module housing is designed for adequate clearance and creepage distance, resulting in UL recognition by Underwriters Laboratories, Inc., USA for all types.

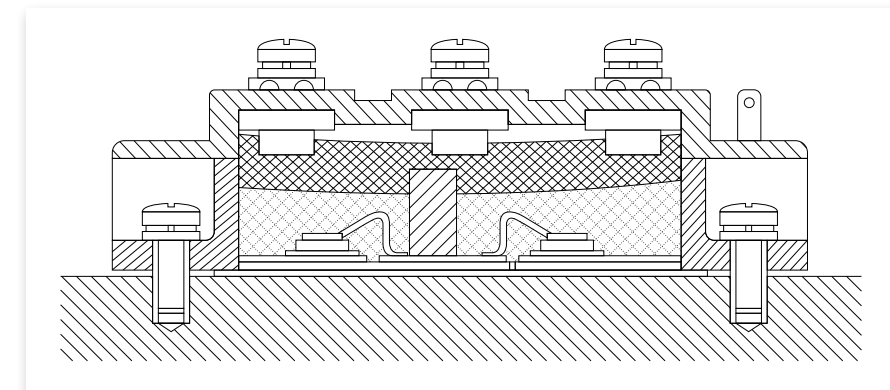
#### New Generation Silicon Chips

All chips are designed by applying separation diffusion processes such that the zones responsible for the surface field strength are located at the upper chip side. This results in the ability to solder the entire chip area onto the DCB ceramic substrate without a molybdenum strain buffer, which in turn leads to the effective stability of the chips as well as to large area heat dissipation if a load is applied. All zones at the edges decisive for blocking stability are coated with passivation glasses, the coefficient of expansion of which match that of silicon. Silicon chips have increasingly used planar technology with guard rings and channel stoppers to reduce electrical surface fields. This chip design supersedes the design of thyristor chips fabricated with passivation moats so that modules of the new series designed with the updated state-of-the-art use planar passivated chips processed by separation diffusion techniques. The contact areas of the chips possess physical vapor deposited metal layers. For the user, the improved properties are as follows:

- Excellent long-term stability of blocking currents and blocking voltages;
- Increased life time of the internal soldered connections; and
- High power cycling capability (> 50 000)

The thyristor/diode chips have been optimized in terms of their turn-off parameters: decreasing the carrier lifetime results in reduces stored charges Q<sub>S</sub>, which in turn significantly reduces requirements for RC-snubbers for over-voltage protection. Cost reduction and improved efficiency are among the benefits of these characteristics. By redeveloping the silicon chips, improvements in the firing characteristics were achieved by specifying a higher "gate current not to fire" IGD, resulting in substantially less susceptibility to misfiring. This leads to improved safety of operation and higher equipment reliability.

Fig. 1: Principal Cross Section of an IXYS Module with DCB Technology



# Rectifier Modules



**X125e**  
TO-240AA



**X126c**  
Y4



**X131c**  
Y1



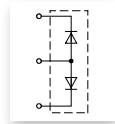
**X141c**  
SimBus A



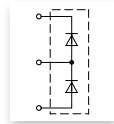
**X143a**  
SimBus A F PFP

## Diodes Modules–Dual

I<sub>FAV</sub> = 25–85 A



MDA



MDD...  
MDM/NA...P...

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thCH</sub>	Package
	V	A	°C	A	V	mΩ	°C	K/W	K/W	
MDMA25P1200TG	1200	25	100	320	0.85	11.10	150	1.10	0.20	TO-240AA (e)
MDMA25P1600TG	1600									
MDMA25P1800TG	1800	25	100	320	0.85	11.10	150	1.10	0.20	TO-240AA (e)
MDNA25P2200TG	2200									
MDD26-08N1B	800	36	100	650	0.80	6.10	150	1.00	0.20	TO-240AA (e)
MDD26-12N1B	1200									
MDD26-14N1B	1400	36	100	650	0.80	6.10	150	1.00	0.20	TO-240AA (e)
MDD26-16N1B	1600									
MDD26-18N1B	1800	35	100	500	0.83	7.30	150	0.90	0.20	TO-240AA (e)
MDMA35P1200TG	1200									
MDMA35P1600TG	1600	35	100	500	0.83	7.30	150	0.90	0.20	TO-240AA (e)
MDMA35P1800TG	1800									
MDNA35P2200TG	2200	59	100	1150	0.80	4.30	150	0.59	0.20	TO-240AA (e)
MDD44-08N1B	800									
MDD44-12N1B	1200	59	100	1150	0.80	4.30	150	0.59	0.20	TO-240AA (e)
MDD44-14N1B	1400									
MDD44-16N1B	1600	50	100	850	0.85	5.70	150	0.65	0.20	TO-240AA (e)
MDD44-18N1B	1800									
MDMA50P1200TG	1200	50	100	850	0.85	5.70	150	0.65	0.20	TO-240AA (e)
MDMA50P1600TG	1600									
MDMA50P1800TG	1800	71	100	1400	0.80	3.00	150	0.51	0.20	TO-240AA (e)
MDNA50P2200TG	2200									
MDD56-08N1B	800	71	100	1400	0.80	3.00	150	0.51	0.20	TO-240AA (e)
MDD56-12N1B	1200									
MDD56-14N1B	1400	65	100	1100	0.81	4.30	150	0.50	0.20	TO-240AA (e)
MDD56-16N1B	1600									
MDD56-18N1B	1800	65	100	1100	0.81	4.30	150	0.50	0.20	TO-240AA (e)
MDMA65P1200TG	1200									
MDMA65P1600TG	1600	85	100	1500	0.79	3.50	150	0.35	0.20	TO-240AA (e)
MDMA65P1800TG	1800									
MDNA65P2200TG	2200	85	100	1500	0.79	3.50	150	0.35	0.20	TO-240AA (e)
MDMA85P1200TG	1200									
MDMA85P1600TG	1600	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDMA85P1800TG	1800									
MDNA85P2200TG	2200	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD200-14N1	1400									
MDD200-16N1	1600	224	100	10500	0.8	0.60	150	0.13	0.10	Y4
MDD200-18N1	1800									
MDD200-22N1	2200	280	100	10500	0.74	1.00	150	0.13	0.06	Y4
MDMA200P1600SA	1600									
MDD175-28N1	2800	240	100	8500	0.74	1.27	150	0.14	0.04	Y1
MDD175-34N1	3400									
MDD255-12N1	1200	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD255-14N1	1400									
MDD255-16N1	1600	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD255-18N1	1800									
MDD255-20N1	2000	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD255-22N1	2200									
MDMA280P1600YD	1600	280	100	10500	0.74	1.00	150	0.13	0.06	Y4
MDNA280P2200YD	2200									
MDMA300P1600PTSF	1600	300	100	8000	0.78	1.30	150	0.1	0.05	SimBus F PFP
MDNA300P2200PTSF	2200									

## Diodes Modules–Dual

I<sub>FAV</sub> = 99–300 A

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>	T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thCH</sub>	Package
	V	A	°C	A	V	mΩ	°C	K/W	K/W	
MDD72-08N1B	800	99	100	1700	0.80	2.30	150	0.35	0.20	TO-240AA (e)
MDD72-12N1B	1200									
MDD72-14N1B	1400	99	100	1700	0.80	2.30	150	0.35	0.20	TO-240AA (e)
MDD72-16N1B	1600									
MDD72-18N1B	1800	110	100	2000	0.82	2.80	150	0.3	0.20	TO-240AA (e)
MDMA110P1200TG	1200									
MDMA110P1600TG	1600	110	100	2000	0.82	2.80	150	0.3	0.20	TO-240AA (e)
MDMA110P1800TG	1800									
MDNA110P2200TG	2200	120	100	2800	0.75	1.95	150	0.26	0.20	TO-240AA (e)
MDD95-08N1B	800									
MDD95-12N1B	1200	120	100	2800	0.75	1.95	150	0.26	0.20	TO-240AA (e)
MDD95-14N1B	1400									
MDD95-16N1B	1600	120	100	2800	0.75	1.95	150	0.26	0.20	TO-240AA (e)
MDD95-18N1B	1800									
MDD95-20N1B	2000	120	100	2800	0.75	1.95	150	0.26	0.20	TO-240AA (e)
MDD95-22N1B	2200									
MDA95-22N1B	2200	140	100	2800	0.78	2.20	150	0.23	0.20	TO-240AA (e)
MDMA140P1200TG	1200									
MDMA140P1600TG	1600	140	100	2800	0.78	2.20	150	0.23	0.20	TO-240AA (e)
MDMA140P1800TG	1800									
MDNA140P2200TG	2200	165	100	4700	0.80	1.30	150	0.21	0.10	Y4
MDD142-08N1	800									
MDD142-12N1	1200	165	100	4700	0.80	1.30	150	0.21	0.10	Y4
MDD142-14N1	1400									
MDD142-16N1	1600	180	100	4400	0.77	1.40	150	0.2	0.11	Y4
MDD142-18N1	1800									
MDMA180P1600YD	1600	190	100	6600	0.80	0.80	150	0.21	0.10	Y4
MDNA180P2200YD	2200									
MDD172-08N1	800	190	100	6600	0.80	0.80	150	0.21	0.10	Y4
MDD172-12N1	1200									
MDD172-14N1	1400	190	100	6600	0.80	0.80	150	0.21	0.10	Y4
MDD172-16N1	1600									
MDD172-18N1	1800	210	100	6600	0.67	1.20	150	0.17	0.09	Y4
MDMA210P1600YD	1600									
MDNA210P2200YD	2200	224	100	10500	0.8	0.60	150	0.13	0.10	Y4
MDD200-14N1	1400									
MDD200-16N1	1600	224	100	10500	0.8	0.60	150	0.13	0.10	Y4
MDD200-18N1	1800									
MDD200-22N1	2200	280	100	10500	0.74	1.00	150	0.13	0.06	Y4
MDMA200P1600SA	1600									
MDD175-28N1	2800	240	100	8500	0.74	1.27	150	0.14	0.04	Y1
MDD175-34N1	3400									
MDD255-12N1	1200	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD255-14N1	1400									
MDD255-16N1	1600	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD255-18N1	1800									
MDD255-20N1	2000	270	100	9500	0.80	0.60	150	0.14	0.04	Y1
MDD255-22N1	2200									
MDMA280P1600YD	1600	280	100	10500	0.74	1.00	150	0.13	0.06	Y4
MDNA280P2200YD	2200									
MDMA300P1600PTSF	1600	300	100	8000	0.78	1.30	150	0.1	0.05	SimBus F PFP
MDNA300P2200PTSF	2200									



# Rectifier Modules

**X027a**  
SOT-227B miniBLOC

**X125b**  
TO-240AA

**X125d**  
TO-240AA

**X129c**  
Y2

**X131c**  
Y1

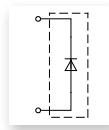
**X132b**  
Y1

**X142c**  
ComPack

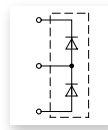
**X143a**  
SimBus A F PFP

## Diode Modules—Single and Dual

$I_{FAV} = 350\text{--}700\text{ A}$



MDO

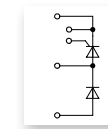


MDD...  
MDM/NA...P...

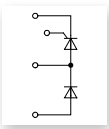
Part Number	$V_{RRM}$	$I_{FAV}$	$T_c$	$I_{FSM} 45^\circ\text{C } 10\text{ ms}$	$V_{F0}$	$r_F$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	$^\circ\text{C}$	A	V	m $\Omega$	$^\circ\text{C}$	K/W	K/W	
<b>FPO</b>										
MDD310-12N1	1200	305	100	11500	0.75	0.63	150	0.129	0.04	Y2
MDD310-14N1	1400									
MDD310-16N1	1600									
MDD310-18N1	1800									
MDD310-20N1	2000									
MDD310-22N1	2200	Y2								
MDD312-12N1	1200	310	100	10500	0.80	0.60	150	0.12	0.04	Y1
MDD312-14N1	1400									
MDD312-16N1	1600									
MDD312-18N1	1800									
MDD312-20N1	2000									
MDD312-22N1	2200	Y1								
MDMA380P1600KC	1600	380	100	11000	0.75	0.53	150	0.11	0.04	Y1
MDMA380P1800KC	1800									
MDNA380P2200KC	2200									
MDMA425P1600PTSF	1600	425	100	10000	0.77	1.01	150	0.07	0.04	SimBus F PFP
MDNA425P2200PTSF	2200									
MDO500-12N1	1200	560	85	15000	0.80	0.38	140	0.072	0.02	Y1
MDO500-14N1	1400									
MDO500-16N1	1600									
MDO500-18N1	1800									
MDO500-20N1	2000									
MDO500-22N1	2200	Y1								
MDMA600P1600PTSF	1600	600	100	15000	0.78	0.67	150	0.05	0.03	SimBus F PFP
MDNA600P2200PTSF	2200									
MDO600-16N1	1600	700	100	20000	0.76	0.32	140	0.072	0.02	Y1
MDMA700P1600CC	1600									
MDMA700P1800CC	1800									
MDNA700P2200CC	2200									

## Thyristor/Diode Modules

$I_{TAV} = 25\text{--}85\text{ A}$



MCD...io1  
MCM/NA...PD...



MCD...io8/...io6  
CLA/CMA...PD...

Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	$T_c$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C } 10\text{ ms}$	$V_{T0}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	$^\circ\text{C}$	A	A	V	m $\Omega$	$^\circ\text{C}$	K/W	K/W	
MCMA25PD1200TB	1200	25	82	40	400	0.87	13.00	140	1.20	0.20	TO-240AA (b)
MCMA25PD1600TB	1600										
MCD26-08io1B	800	27	85	50	520	0.85	11.00	125	0.88	0.20	TO-240AA (b)
MCD26-12io1B	1200										
MCD26-14io1B	1400										
MCD26-16io1B	1600										
MCD26-08io8B	800										
MCD26-12io8B	1200	27	85	50	520	0.85	11.00	125	0.88	0.20	TO-240AA (d)
MCD26-14io8B	1400										
MCD26-16io8B	1600										
MCMA35PD1200TB	1200										
MCMA35PD1600TB	1600										
MCD40-12io6	1200	40	85	63	500	0.87	10.50	150	0.70	0.10	SOT-227B miniBLOC
MCD40-16io6	1600										
MCD44-08io1B	800	49	85	77	1150	0.85	5.30	125	0.53	0.20	TO-240AA (b)
MCD44-12io1B	1200										
MCD44-14io1B	1400										
MCD44-16io1B	1200										
MCD44-18io1B	1600										
MCD44-08io8B	800	49	85	77	1150	0.85	5.30	125	0.53	0.20	TO-240AA (d)
MCD44-12io8B	1200										
MCD44-14io8B	1400										
MCD44-16io8B	1600										
MCD44-18io8B	1800										
MCNA40PD2200TB	2200	40	85	63	500	0.84	11.40	140	0.70	0.20	TO-240AA (b)
MCMA50PD1200TB	1200										
MCMA50PD1600TB	1600	50	85	79	800	0.89	5.30	140	0.70	0.20	TO-240AA (b)
CLA60PD1200NA	1200										
MCD56-08io1B	800	60	85	100	1500	0.85	3.70	125	0.45	0.20	TO-240AA (b)
MCD56-12io1B	1200										
MCD56-14io1B	1400										
MCD56-16io1B	1600										
MCD56-18io1B	1800										
MCD56-08io8B	800	60	85	100	1500	0.85	3.70	125	0.45	0.20	TO-240AA (d)
MCD56-12io8B	1200										
MCD56-14io8B	1400										
MCD56-16io8B	1600										
MCD56-18io8B	1800										
MCNA55PD2200TB	2200	55	85	86	800	0.9	9.00	150	0.50	0.20	TO-240AA (b)
MCMA65PD1200TB	1200										
MCMA65PD1600TB	1600	65	85	105	1150	0.85	4.80	140	0.50	0.20	TO-240AA (b)
MCMA65PD1800TB	1800										
CMA80PD1600NA	1600										
MCD72-08io1B	800	85	85	180	1700	0.85	3.20	125	0.30	0.20	TO-240AA (b)
MCD72-12io1B	1200										
MCD72-14io1B	1400										
MCD72-16io1B	1600										
MCD72-18io1B	1800										
MCD72-08io8B	800	85	85	180	1700	0.85	3.20	125	0.30	0.20	TO-240AA (d)
MCD72-12io8B	1200										
MCD72-14io8B	1400										
MCD72-16io8B	1600										
MCD72-18io8B	1800										

# Rectifier Modules

**X125b**  
TO-240AA

**X125d**  
TO-240AA

**X125y**  
TO-240AA

**X126b**  
Y4

**X027a**  
SOT-227B miniBLOC

**X129b**  
Y2

**X132b**  
Y1

**X141b**  
SimBus A

**X142b**  
ComPack

**X143a**  
SimBus A F PFP

## Thyristor/Diode Modules

$I_{TAV} = 85-140$  A



Part Number	$V_{RRM}$ $V_{DRM}$	$I_{TAV}$	$T_C$	$I_{T(RMS)}$	$I_{TSM}$ 45 °C 10 ms	$V_{T0}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package										
	V	A	°C	A	A	V	mΩ	°C	K/W	K/W											
MCNA75PD2200TB	2200	75	85	118	1050	0.90	6.50	140	0.38	0.20	TO-240AA (b)										
MCMA85PD1200TB	1200	85	85	135	1500	0.85	3.90	140	0.38	0.20	TO-240AA (b)										
MCMA85PD1600TB	1600																				
MCMA85PD1800TB	1800																				
CLA100PD1200NA	1200																				
MCD94-20io1B	2000	104	85	180	1700	0.85	3.20	125	0.22	0.20	TO-240AA (b)										
MCD94-22io1B	2200																				
MCD95-08io1B	800	116	85	180	2250	0.85	2.40	125	0.22	0.20	TO-240AA (b)										
MCD95-12io1B	1200																				
MCD95-14io1B	1400																				
MCD95-16io1B	1600																				
MCD95-18io1B	1800	116	85	180	2250	0.85	2.40	125	0.22	0.20	TO-240AA (b)										
MCD95-16io1	1600																				
MCD95-16io8B	800											116	85	180	2250	0.85	2.40	125	0.22	0.20	TO-240AA (d)
MCD95-12io8B	1200																				
MCD95-14io8B	1400																				
MCD95-16io8B	1600																				
MCD95-18io8B	1800	95	85	149	1400	0.90	5.00	140	0.30	0.20	TO-240AA (b)										
MCNA95PD2200TB	2200																				
MCMA110PD1200TB	1200																				
MCMA110PD1600TB	1600																				
MCMA110PD1800TB	1800	110	85	170	1900	0.85	3.30	140	0.30	0.20	TO-240AA (b)										
MCNA120PD2200TB	2200																				
MCNA120PD2200TB-NI	2200																				
MCD132-08io1	800											130	85	300	4750	0.80	1.50	125	0.23	0.10	Y4
MCD132-12io1	1200																				
MCD132-14io1	1400																				
MCD132-16io1	1600																				
MCD132-18io1	1800	140	85	200	2400	0.85	2.80	140	0.22	0.20	TO-240AA (b)										
MCMA140PD1200TB	1200																				
MCMA140PD1600TB	1600																				
MCMA140PD1800TB	1800																				
MCMA140PD1600TB-NI	1600	140	85	200	2400	0.85	2.80	140	0.22	0.20	TO-240AA (y)										

## Thyristor/Diode Modules

$I_{TAV} = 180-700$  A

Part Number	$V_{RRM}$ $V_{DRM}$	$I_{TAV}$	$T_C$	$I_{T(RMS)}$	$I_{TSM}$ 45 °C 10 ms	$V_{T0}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package										
	V	A	°C	A	A	V	mΩ	°C	K/W	K/W											
MCNA150PD2200YB	2200	150	85	235	4300	0.86	2.10	140	0.210	0.11	Y4										
MCD161-20io1	2000	165	85	300	6000	0.80	1.60	125	0.155	0.07	Y4										
MCD161-22io1	2200																				
MCD162-08io1	800	181	85	300	6000	0.88	1.15	125	0.155	0.07	Y4										
MCD162-12io1	1200																				
MCD162-14io1	1400																				
MCD162-16io1	1600																				
MCD162-18io1	1800	180	85	280	5400	0.85	1.80	140	0.170	0.09	Y4										
MCNA180PD2200YB	2200																				
MCMA200PD1600SA	1600											200	85	314	6000	0.81	1.60	140	0.150	0.08	SimBus A
MCD200-14io1	1400																				
MCD200-16io1	1600																				
MCD200-18io1	1800																				
MCNA220PD2200YB	2200	220	85	345	7200	0.84	1.50	140	0.130	0.07	Y4										
MCD224-20io1	2000																				
MCD224-22io1	2200																				
MCD225-12io1	1200																				
MCD225-14io1	1400	221	85	400	8000	0.80	0.76	130	0.157	0.04	Y1										
MCD225-16io1	1600																				
MCD225-18io1	1800																				
MCNA250PD2200PTSF	2200											250	85	400	5900	0.76	2.20	150	0.100	0.05	SimBUS F PFP
MCD255-12io1	1200																				
MCD255-14io1	1400																				
MCD255-16io1	1600																				
MCD255-18io1	1800	250	85	450	9000	0.80	0.68	130	0.140	0.04	Y1										
MCMA260PD1600YB	1600																				
MCMA260PD1800YB	1800																				
MCMA265PD1600KB	1600																				
MCMA265PD1800KB	1800	260	85	408	8500	0.80	0.75	140	0.160	0.04	Y1										
MCMA280PD1600PTSF	1600																				
MCD310-08io1	800											320	85	500	9200	0.80	0.82	140	0.112	0.04	Y2
MCD310-12io1	1200																				
MCD310-14io1	1400																				
MCD310-16io1	1600																				
MCD310-18io1	1800	320	85	500	8000	0.80	0.82	140	0.112	0.04	Y2										
MCD310-20io1	2000																				
MCD310-22io1	2200																				
MCD312-12io1	1200											320	85	520	9200	0.80	0.68	140	0.120	0.04	Y1
MCD312-14io1	1400																				
MCD312-16io1	1600																				
MCD312-18io1	1800																				
MCNA360PD2200PTSF	2200	360	85	570	8400	0.74	1.57	150	0.070	0.04	SimBUS F PFP										
MCMA400PD1600PTSF	1600																				
MCNA500PD2200PTSF	2200																				
MCMA550PD1600PTSF	1600																				
MCNA650PD2200CB	2200	650	85	1020	16000	0.75	0.63	140	0.045	0.02	ComPack										
MCMA700PD1600CB	1600																				
MCMA700PD1800CB	1800																				
MCMA700PD1800CB	1800																				

# Rectifier Modules



**X103**  
V1-A-Pack



**X125a**  
TO-240AA



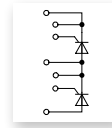
**X125c**  
TO-240AA



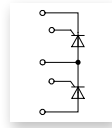
**X125z**  
TO-240AA



**X126a**  
Y4



**MCC...io1B**  
MCM/NA...P...



**MCC...io8B**

## Thyristor Modules – Dual

$I_{TAV} = 18 - 60 \text{ A}$

Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	$T_C$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C} 10 \text{ ms}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V										
MCC19-08io1B	800	18	85	40	400	0.85	18	125	1.300	0.2	TO-240AA (a)
MCC19-12io1B	1200										
MCC19-14io1B	1400	18	85	40	400	0.85	18	125	1.300	0.2	TO-240AA (a)
MCC19-16io1B	1600										
MCC19-08io8B	800	18	85	40	400	0.85	18	125	1.300	0.2	TO-240AA (c)
MCC19-12io8B	1200										
MCC19-14io8B	1400	18	85	40	400	0.85	18	125	1.300	0.2	TO-240AA (c)
MCC19-16io8B	1600										
MCC21-08io8B	800	21	85	33	320	0.85	15	125	1.100	0.2	TO-240AA (c)
MCC21-12io8B	1200										
MCC21-14io8B	1400	21	85	33	320	0.85	15	125	1.100	0.2	TO-240AA (c)
MCC21-16io8B	1600										
MCMA25P1200TA	1200	25	85	40	400	0.87	13	140	1.200	0.2	TO-240AA (a)
MCMA25P1600TA	1600										
MCC26-08io1B	800	27	85	50	520	0.85	11	125	0.880	0.2	TO-240AA (a)
MCC26-12io1B	1200										
MCC26-14io1B	1400	27	85	50	520	0.85	11	125	0.880	0.2	TO-240AA (a)
MCC26-16io1B	1600										
MCC26-14io1	1400	27	85	50	520	0.85	11	125	0.880	0.2	TO-240AA (z)
MCC26-08io8B	800										
MCC26-12io8B	1200	27	85	50	520	0.85	11	125	0.880	0.2	TO-240AA (c)
MCC26-14io8B	1400										
MCC26-16io8B	1600	27	85	50	520	0.85	11	125	0.880	0.2	TO-240AA (c)
MCMA35P1200TA	1200										
MCMA35P1600TA	1600	35	85	55	520	0.87	9.8	140	0.900	0.2	TO-240AA (a)
MCNA40P2200TA	2200										
MCC44-08io1B	800	49	85	77	1150	0.85	5.3	125	0.530	0.2	TO-240AA (a)
MCC44-12io1B	1200										
MCC44-14io1B	1400	49	85	77	1150	0.85	5.3	125	0.530	0.2	TO-240AA (a)
MCC44-16io1B	1600										
MCC44-18io1B	1800	49	85	77	1150	0.85	5.3	125	0.530	0.2	TO-240AA (a)
MCC44-08io8B	800										
MCC44-12io8B	1200	49	85	77	1150	0.85	5.3	125	0.530	0.2	TO-240AA (c)
MCC44-14io8B	1400										
MCC44-16io8B	1600	49	85	77	1150	0.85	5.3	125	0.530	0.2	TO-240AA (c)
MCC44-18io8B	1800										
MCMA50P1200TA	1200	50	85	79	800	0.89	5.3	140	0.700	0.2	TO-240AA (a)
MCMA50P1600TA	1600										
MCNA55P2200TA	2200	55	85	86	800	0.9	9	140	0.500	0.2	TO-240AA (a)
MCC56-08io1B	800										
MCC56-12io1B	1200	60	85	100	1500	0.85	3.7	125	0.450	0.2	TO-240AA (a)
MCC56-14io1B	1400										
MCC56-16io1B	1600	60	85	100	1500	0.85	3.7	125	0.450	0.2	TO-240AA (a)
MCC56-18io1B	1800										
MCC56-14io1	1400	60	85	100	1500	0.85	3.7	125	0.450	0.2	TO-240AA (z)

## Thyristor Modules – Dual

$I_{TAV} = 60 - 181 \text{ A}$



**MCC...io1B**  
MCM/NA...P...



**MCC...io8B**

Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	$T_C$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C} 10 \text{ ms}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V										
MCC56-08io8B	800	60	85	100	1500	0.85	3.7	125	0.450	0.2	TO-240AA (c)
MCC56-12io8B	1200										
MCC56-14io8B	1400	60	85	100	1500	0.85	3.7	125	0.450	0.2	TO-240AA (c)
MCC56-16io8B	1600										
MCC56-18io8B	1800	65	85	105	1150	0.85	4.8	140	0.500	0.2	TO-240AA (a)
MCMA65P1200TA	1200										
MCMA65P1600TA	1600	85	85	180	1700	0.85	3.2	125	0.300	0.2	TO-240AA (a)
MCMA65P1800TA	1800										
MCC72-08io1B	800	85	85	180	1700	0.85	3.2	125	0.300	0.2	TO-240AA (a)
MCC72-12io1B	1200										
MCC72-14io1B	1400	85	85	180	1700	0.85	3.2	125	0.300	0.2	TO-240AA (a)
MCC72-16io1B	1600										
MCC72-18io1B	1800	85	85	180	1700	0.85	3.2	125	0.300	0.2	TO-240AA (c)
MCC72-08io8B	800										
MCC72-12io8B	1200	85	85	180	1700	0.85	3.2	125	0.300	0.2	TO-240AA (c)
MCC72-14io8B	1400										
MCC72-16io8B	1600	85	85	180	1700	0.85	3.2	125	0.300	0.2	TO-240AA (c)
MCC72-18io8B	1800										
MCNA75P2200TA	2200	75	85	118	1050	0.90	6.5	140	0.380	0.2	TO-240AA (a)
MCMA85P1200TA	1200										
MCMA85P1600TA	1600	85	85	135	1500	0.85	3.9	140	0.380	0.2	TO-240AA (a)
MCMA85P1800TA	1800										
MCC94-20io1B	2000	104	85	180	1700	0.85	3.2	125	0.220	0.2	TO-240AA (a)
MCC94-22io1B	2200										
MCC94-24io1B	2400	116	85	180	2250	0.83	2.4	125	0.220	0.2	TO-240AA (a)
MCC95-08io1B	800										
MCC95-12io1B	1200	116	85	180	2250	0.83	2.4	125	0.220	0.2	TO-240AA (a)
MCC95-14io1B	1400										
MCC95-16io1B	1600	116	85	180	2250	0.83	2.4	125	0.220	0.2	TO-240AA (a)
MCC95-18io1B	1800										
MCC95-14io1	1400	116	85	180	2250	0.83	2.4	125	0.220	0.2	TO-240AA (z)
MCC95-16io1	1600										
MCC95-08io8B	800	116	85	180	2250	0.85	2.4	125	0.220	0.2	TO-240AA (c)
MCC95-12io8B	1200										
MCC95-14io8B	1400	116	85	180	2250	0.85	2.4	125	0.220	0.2	TO-240AA (c)
MCC95-16io8B	1600										
MCC95-18io8B	1800	95	85	149	1400	0.90	5	140	0.300	0.2	TO-240AA (a)
MCNA95P2200TA	2200										
MCMA110P1200TA	1200	110	85	170	1900	0.85	3.3	140	0.300	0.2	TO-240AA (a)
MCMA110P1600TA	1600										
MCMA110P1800TA	1800	110	85	170	1900	0.85	3.3	140	0.300	0.2	V1-A-Pack
MCMA110P1600VA	1600										
MCNA120P2200TA	2200	120	85	190	1700	0.90	3.7	140	0.220	0.2	TO-240AA (a)
MCMA140P1200TA	1200										
MCMA140P1400TA	1400	140	85	220	2400	0.85	2.8	140	0.220	0.2	TO-240AA (a)
MCMA140P1600TA	1600										
MCMA140P1800TA	1800	140	85	220	2400	0.85	2.8	140	0.220	0.2	TO-240AA (a)
MCC132-08io1	800										
MCC132-12io1	1200	130	85	300	4750	0.8	1.5	125	0.230	0.1	Y4
MCC132-14io1	1400										
MCC132-16io1	1600	130	85	300	4750	0.8	1.5	125	0.230	0.1	Y4
MCC132-18io1	1800										
MCNA150P2200YA	2200	150	85	235	4300	0.86	2.1	140	0.210	0.11	Y4
MCMA160P1600YA	1600										
MCMA160P1800YA-MI	1800	160	85	250	4750	0.82	1.63	140	0.210	0.11	Y4
MCC161-20io1	2000										
MCC161-22io1	2200	165	85	300	6000	0.80	1.6	125	0.155	0.07	Y4
MCC162-08io1	800										
MCC162-12io1	1200	181	85	300	6000	0.88	1.15	125	0.155	0.07	Y4
MCC162-14io1	1400										
MCC162-16io1	1600	181	85	300	6000	0.88	1.15	125	0.155	0.07	Y4
MCC162-18io1	1800										



# Rectifier Modules



**X102**  
ECO-PAC 2



**X126a**  
Y4



**X129a**  
Y2



**X027a**  
SOT-227B miniBLOC



**X131a**  
Y1



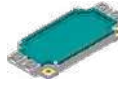
**X132a**  
Y1-2-Cu



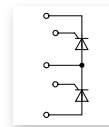
**X141a**  
SimBus A



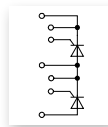
**X142a**  
ComPack



**X143a**  
SimBus A F PFP



**MCC...io8B**



**MCC...io1B**  
MCM/NA...P..

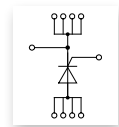
## Thyristor Modules – Dual

$I_{TAV} = 180 - 700 \text{ A}$

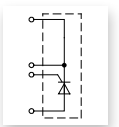
Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	$T_C$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C } 10 \text{ ms}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V										
MCNA180P2200YA	2200	180	85	280	5400	0.85	1.8	140	0.170	0.09	Y4
MCMA200P1600SA	1600	200	90	314	6000	0.81	1.6	140	0.150	0.08	SimBus A
MCMA200P1600YA	1600	200	85	315	6000	0.83	1.43	140	0.170	0.09	Y4
MCMA200P1800YA-MI	1800										
MCC200-14io1	1400	216	85	340	8000	0.80	1.4	125	0.130	0.05	Y4
MCC200-16io1	1600										
MCC200-18io1	1800										
MCK200-18io1	1800	216	85	340	8000	0.80	1.4	125	0.130	0.05	Y4
MCNA220P2200YA	2200										Y4
MCC224-20io1	2000	240	85	400	8000	0.80	0.76	130	0.139	0.04	Y1
MCC224-22io1	2200										
MCC224-24io1	2400										
MCC225-12io1	1200	221	85	400	8000	0.80	0.76	130	0.157	0.04	Y1
MCC225-14io1	1400										
MCC225-16io1	1600										
MCC225-18io1	1800	250	85	450	9000	0.80	0.68	130	0.140	0.04	Y1
MCNA250P2200PTSF	2200										Y1
MCC255-12io1	1200										
MCC255-14io1	1400	250	85	450	9000	0.80	0.68	130	0.140	0.04	Y1
MCC255-16io1	1600										
MCC255-18io1	1800										
MCMA260P1600YA	1600	260	85	408	8300	0.81	1.23	140	0.130	0.08	Y4
MCMA260P1800YA	1800										
MCMA265P1600KA	1600	260	85	408	8500	0.80	0.75	140	0.160	0.04	Y1
MCMA265P1800KA	1800										
MCMA280P1600PTSF	1600	280	85	440	7000	0.83	1.57	150	0.100	0.05	SimBus F PFP
MCC310-08io1	800	320	85	500	9200	0.80	0.82	140	0.112	0.04	Y2
MCC310-12io1	1200										
MCC310-14io1	1400										
MCC310-16io1	1600	320	85	500	9200	0.80	0.82	140	0.112	0.04	Y2
MCC310-18io1	1800										
MCC312-12io1	1200										320
MCC312-14io1	1400										
MCC312-16io1	1600	320	85	520	9200	0.80	0.68	140	0.120	0.04	Y1
MCC312-18io1	1800										
MCNA360P2200PTSF	2200	360	85	570	8400	0.74	1.57	150	0.070	0.04	SimBus F PFP
MCNA400P1600PTSF	1600	400	85	630	10000	0.82	1.14	150	0.070	0.04	SimBus F PFP
MCNA500P2200PTSF	2200	500	85	790	11000	0.75	1.11	150	0.050	0.03	SimBus F PFP
MCMA550P1600PTSF	1600	550	85	860	13000	0.82	0.8	150	0.050	0.03	SimBus F PFP
MCNA650P2200CA	2200	650	85	1020	16000	0.75	0.63	140	0.045	0.02	ComPack
MCMA700P1600CA	1600	700	85	1100	19000	0.82	0.4	140	0.050	0.02	ComPack
MCMA700P1800CA	1800										
MCMA700P1600NCA	1600	700	85	1100	19000	0.82	0.4	140	0.050	0.02	ComPack
MCMA700P1800NCA	1800										

## Thyristor Modules – Single

$I_{TAV} = 32 - 600 \text{ A}$



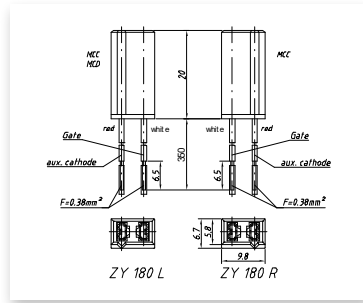
**VCO...**



**MCO**

Part Number	$V_{RRM} V_{DRM}$	$I_{TAV}$	$T_C$	$I_{T(RMS)}$	$I_{TSM} 45^\circ\text{C } 10 \text{ ms}$	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V										
MCO25-12io1	1200	32	80	50	370	0.86	13.9	150	1.100	0.30	SOT-227B miniBLOC
MCO25-16io1	1600										
MCO50-12io1	1200	57	80	90	740	0.88	6.00	150	0.720	0.20	SOT-227B miniBLOC
MCO50-16io1	1600										
MCO75-12io1	1200	80	80	125	1070	0.85	5.50	150	0.450	0.10	SOT-227B miniBLOC
MCO75-16io1	1600										
MCO100-12io1	1200	101	80	160	1400	0.85	4.50	150	0.350	0.10	SOT-227B miniBLOC
MCO100-16io1	1600										
VCO132-12io7	1200	130	85	200	3600	0.80	1.65	150	0.250	0.10	ECO-PAC 2
VCO132-16io7	1600										
MCO150-12io1	1200	158	80	250	2000	0.84	3.50	150	0.200	0.10	SOT-227B miniBLOC
MCO150-16io1	1600										
VCO180-12io7	1200	180	90	280	4500	0.75	1.23	150	0.170	0.06	ECO-PAC 2
VCO180-16io7	1600										
MCO450-20io1	2000	464	85	750	15000	0.77	0.42	130	0.072	0.02	Y1-2-Cu
MCO450-22io1	2200										
MCO500-12io1	1200	560	85	880	17000	0.80	0.38	140	0.072	0.02	Y1-2-Cu
MCO500-14io1	1400										
MCO500-16io1	1600	560	85	880	17000	0.80	0.38	140	0.072	0.02	Y1-2-Cu
MCO500-18io1	1800										
MCO600-16io1	1600	600	85	940	15000	0.81	0.40	140	0.065	0.02	Y1-2-Cu
MCO600-18io1	1800										
MCO600-20io1	2000	600	85	940	15000	0.81	0.40	140	0.065	0.02	Y1-2-Cu
MCO600-22io1	2200										

## Optional Accessories for Thyristor Diode Modules

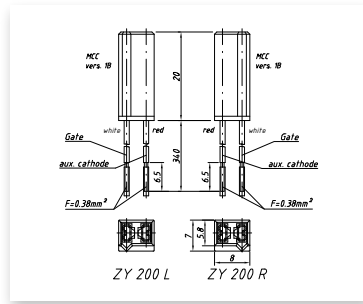


For module type Y1, Y2, Y4 and ComPACK MCC/MCD/MCO/MCMA/MCNA 132, 161 up to 700 (for MCD/MCO only Left-Type):

Keyed gate cathode twin plugs with wire length = 350/480 mm gate = white, cathode = red

Type ZY200Lx (L = left for pin pair 4/5)  
Type ZY200Rx (R = right for pin pair 6/7)

Part Number	Description
ZY180L350	Left plug + cable – Length 350 mm
ZY180L480	Left plug + cable – length 480 mm
ZY180LM	Left plug only
ZY180R350	Right plug + cable – length 350 mm
ZY180R480	Right plug + cable – length 480 mm
ZY180RM	Right plug only



For module type TO-240 package MCC/MCD/CMA/MCNA 19 Up to 120 and 140 (version 1):

Keyed gate cathode twin plugs with wire length = 340/460 mm; gate = white, cathode = red

Type ZY200Lx (L = left for pin pair 4/5)  
Type ZY200Rx (R = right for pin pair 6/7)

Part Number	Description
ZY200L340	Left plug + cable – length 340 mm
ZY200L460	Left plug + cable – length 460 mm
ZY200LM	Left plug only
ZY200R340	Right plug + cable – length 340 mm
ZY200R460	Right plug + cable – length 460 mm
ZY200RM	Right plug only

For ZY180 and ZY200: UL 758 Style 3751

## Design Information

For Thyristors, Diodes, Thyristor Diode Modules, and Rectifier Bridges

### Surge current

The 60 Hz value of  $I_{TSM}$  is 10% higher than the 50 Hz value. The  $I_{TSM}$  value at  $T_{VJM}$  is 10% to 15% lower than the 45°C value.

### Limiting $I^2t$

50 Hz:  $I^2t [A^2s] = I_{TSM} [A] \cdot I_{TSM} [A] \cdot 0.005 [s]$ ; use rated  $I_{TSM}$  value (10 ms). 60 Hz:  $I^2t [A^2s] = I_{TSM} [A] \cdot I_{TSM} [A] \cdot 0.0042 [s]$ ; use 60-Hz-value of  $I_{TSM}$ .

### Forward current

The average current ratings in tables are mostly specified for temperature conditions of  $T_A = 45^\circ C$ ,  $T_C = 85^\circ C$ , or  $T_C = 100^\circ C$ . For other temperature conditions, the current ratings can be calculated using the following formulas, which are applicable up to 400 Hz.

$$I_{TAV} = \frac{-V_{T0} + \sqrt{V_{T0}^2 + 4 \cdot k^2 \cdot r_T \cdot P}}{2 \cdot k^2 \cdot r_T} \quad \text{where} \quad P = \frac{T_{VJM} - T_A}{R_{thJA}} \quad \text{or} \quad P = \frac{T_{VJM} - T_C}{R_{thJC}}$$

$I_{TAV} [A], P [W]; V_{T0} [V]; r_T [W]; T_{VJM} [^\circ C], T_C [^\circ C], T_A [^\circ C], R_{thJC} [K/W], R_{thJA} [K/W]$

$k^2 = 1$  for DC current

$k^2 = 2.5$  for sinusoidal half wave current

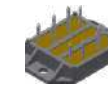
$k^2 = 3$  for 120° rectangular current

$k^2 = 6$  for 60° rectangular current

The average forward current is limited by the RMS current value  $I_{T(RMS)}$ . When the calculated value  $I_{TAV}$  is higher than  $I_{T(RMS)} / k$ , replace it with  $I_{TAV} = I_{T(RMS)} / k$ .



X101  
ECO-PAC 1



X102  
ECO-PAC 2



X103  
V1-A-Pack



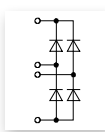
X024a  
ISOPLUS i4-PAC™



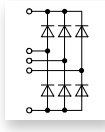
X027a  
SOT-227B miniBLOC



X030a  
SMPD -B



1-phase, B2U



3-phase, B6U

## Rectifier Bridges with Fast Diodes

Part Number	$V_{RRM}$	$I_{dAV}$	@ $T_C$	$I_{FSM} 45^\circ C 10 ms$	$V_{FO}$	$r_F$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	°C	A	V	mΩ	°C	K/W	K/W	
<b>1-phase, B2U</b>										
VBE17-06NO7	600	27	85	50	1.18	22.0	150	2.50	0.30	ECO-PAC 1
VBE17-12NO7	1200	19	85	40	1.32	30.0	150	2.50	0.30	ECO-PAC 1
VBE26-06NO7	600	44	85	110	1.13	13.0	150	1.60	0.30	ECO-PAC 1
VBE26-12NO7	1200	32	85	90	1.32	30.0	150	1.60	0.30	ECO-PAC 1
VBE55-06NO7	600	68	100	250	0.98	8.0	150	0.90	0.30	ECO-PAC 1
VBE55-12NO7	1200	59	85	200	1.31	15.0	150	0.90	0.30	ECO-PAC 1
VBE60-06A	600	60	100	250	0.98	8.20	150	1.15	0.10	SOT-227B miniBLOC
VBE60-12A	1200	60	70	200	1.31	14.0	150	1.15	0.10	SOT-227B miniBLOC
DHG40B1200LB	1200	34	80	150	1.35	42.0	175	1.50	0.50	SMPD-B
DPG60B600LB	600	60	100	250	0.85	17.0	175	1.10	0.40	SMPD-B
FBE22-06N1	600	22	115	50	1.04	24.0	175	3.00	0.20	ISOPLUS i4-PAC™
VBE100-06NO7	600	100	85	600	1.09	4.30	150	0.80	0.20	ECO-PAC 2
VBE100-12NO7	1200	100	70	500	1.07	8.20	150	0.80	0.20	ECO-PAC 2
DCG20B650LB*	650	21	80	250	0.74	118.0	175	2.10	0.70	SMPD-B
<b>3-phase, B6U</b>										
DHG60U1200LB	1200	60	80	200	1.35	2.90	150	1.20	0.40	SMPD-B
VUE50-12NO1	1200	50	85	200	1.65	18.20	150	1.20	0.30	V1-A-Pack
VUE22-06NO7	600	34	85	50	1.18	22.0	150	2.50	0.30	ECO-PAC 1
VUE22-12NO7	1200	24	85	40	1.39	55.0	150	2.50	0.30	ECO-PAC 1
VUE35-06NO7	600	56	85	110	1.13	13.0	150	1.60	0.30	ECO-PAC 1
VUE35-12NO7	1200	40	85	90	1.32	30.0	150	1.60	0.30	ECO-PAC 1
VUE75-06NO7	600	86	100	250	0.98	8.0	150	0.90	0.30	ECO-PAC 1
VUE75-12NO7	1200	74	85	200	1.31	15.0	150	0.90	0.30	ECO-PAC 1
FUE30-12N1	1200	30	120	90	0.97	48.0	175	2.30	0.20	ISOPLUS i4-PAC™
VUE130-06NO7	600	130	85	600	1.09	4.30	150	0.80	0.20	ECO-PAC 2
VUE130-12NO7	1200	130	70	500	1.07	8.20	150	0.80	0.20	ECO-PAC 2

\* SiC-Diodes

## Rectifier Bridges Incorporating Fast Diodes

Power-switching semiconductors are used in inverter systems with DC-Link. Due to high switching frequencies, harmonics and line distortion may be generated. It is important that new designs reduce these influences and fulfill the EMI filtering requirements according to EMI/EMC VDE 0871 and other standards.

Noise level can be reduced by up to 10dB when the input rectifier is equipped with semi-fast diodes and is therefore optimized for turn off, resulting in a lower peak recovery current compared to non-optimized and normal rectifier diodes. The noise level can be further reduced by another 5 dB when using rectifier bridges equipped with fast recovery epitaxial diodes (FRED) like module types VBE (single phase bridge) and VUE (three phase bridge). These are more expensive; however, they may be necessary in some applications to fulfill VDE and other standards.

This behavior has a direct influence on the design of the EMI filter networks with its capacitors and inductors, of which the size and costs can be reduced. More detailed information is available in the IXYS application note D98005E "Input Rectifiers with Semi-fast Diodes for DC Link" on [www.ixys.com](http://www.ixys.com).

# Rectifier Modules

**X024a**  
ISOPLUS i4-PAC™

**X025a**  
GBFP

**X030a**  
SMPD -B

**X027a**  
SOT-227B miniBLOC

**X101**  
ECO-PAC 1

**X102**  
ECO-PAC 2

**X116b**  
FO-B

**X103**  
V1-A-Pack

**X122b**  
PWS-D

**X123e**  
PWS-E

## 1 Phase Rectifier Bridges

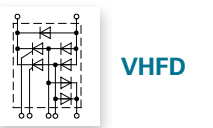
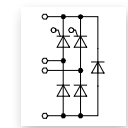
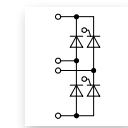


Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAV</sub>	@T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	P <sub>RSM</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	kW	
<b>1 Phase Rectifier Bridges with Standard Diodes, B2U</b>												
FBO16-12N	1200	400	20	130	150	0.81	32.00	175	3.00	3.20	–	ISOPLUS i4-PAC™
VBO21-08NO7	800	250	20	115	120	0.84	28.80	150	2.50	2.90	–	ECO-PAC 1
VBO21-12NO7	1200	400										
VBO22-08NO8	800	250	14	85	380	0.77	14.20	150	8.00	9.00	–	FO-B
VBO22-12NO8	1200	400										
VBO22-16NO8	1600	500										
VBO22-18NO8	1800	575	14	85	380	0.77	14.20	150	8.00	9.00	–	FO-B
GBO25-12NO1	1200	400										
GBO25-16NO1	1600	500	25	105	370	0.74	16.30	175	4.30	4.80	–	GBFP
VBO36-08NO8	800	250										
VBO36-12NO8	1200	400	18	85	550	0.76	9.10	150	7.00	8.00	–	FO-B
VBO36-16NO8	1600	500										
VBO36-18NO8	1800	575										
FBO40-12N	1200	400	40	130	300	0.79	14.00	175	1.50	1.70	–	ISOPLUS i4-PAC™
VBO40-08NO6	800	250	40	115	320	0.81	12.10	150	1.30	1.40	–	SOT-227B miniBLOC
VBO40-12NO6	1200	400										
VBO40-16NO6	1600	500										
VBO52-08NO7	800	250	60	115	550	0.78	8.10	150	1.10	1.50	–	PWS-D
VBO52-12NO7	1200	400										
VBO52-16NO7	1600	500	60	115	550	0.78	8.10	150	1.10	1.50	–	PWS-D
VBO52-18NO7	1800	575										
VBO54-08NO7	800	250										
VBO54-12NO7	1200	400	55	105	300	0.82	12.20	150	1.10	1.50	–	ECO-PAC 1
VBO54-16NO7	1600	500										
VBO68-08NO7	800	250	70	105	550	0.81	7.80	150	0.90	1.30	–	ECO-PAC 1
VBO68-12NO7	1200	400										
VBO68-16NO7	1600	500										
VBO72-08NO7	800	250	70	110	750	0.78	6.00	150	0.90	1.30	–	PWS-D
VBO72-12NO7	1200	400										
VBO72-16NO7	1600	500										
VBO72-18NO7	1800	575	70	110	750	0.78	6.00	150	0.90	1.30	–	PWS-D

## 1 Phase Rectifier Bridges



Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAV</sub>	@T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
<b>1 Phase Rectifier Bridges with Standard Diodes, B2U</b>											
VBO78-08NO7	800	250	80	115	750	0.81	5.9	150	0.70	1.00	ECO-PAC 2
VBO78-12NO7	1200	400									
VBO78-16NO7	1600	500									
VBO88-08NO7	800	250	90	115	1000	0.80	4.6	150	0.60	0.90	ECO-PAC 2
VBO88-12NO7	1200	400									
VBO88-16NO7	1600	500									
DLA100B800LB	800	400	124	80	400	0.75	4.2	175	1.00	1.45	SMPD-B
DLA100B1200LB	1200										
DMA120B800LB	800	250	130	90	500	0.88	6.4	175	0.80	1.30	
VBO130-08NO7	800	250									
VBO130-12NO7	1200	400	130	110	1800	0.77	3.4	150	0.50	0.70	PWS-E
VBO130-16NO7	1600	500									
VBO130-18NO7	1800	575	130	110	1800	0.77	3.4	150	0.50	0.70	PWS-E
VBO160-08NO7	800	250									
VBO160-12NO7	1200	400	160	110	2800	0.74	2.4	150	0.40	0.55	PWS-E
VBO160-16NO7	1600	500									
VBO160-18NO7	1800	575	160	110	2800	0.74	2.4	150	0.40	0.55	PWS-E



Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAV</sub>	@T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>T0</sub>	r <sub>T</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
<b>1 Phase Half Controlled Rectifier Bridges with Freewheeling Diode, B2HKF</b>											
VHF25-08io7	800	250	32	85	200	0.85	27	125	1.30	1.80	ECO-PAC 1
VHF25-12io7	1200	400									
VHFD37-08io1	800	250	36	85	320	0.85	13	125	1.20	1.55	V1-A-Pack
VHFD37-12io1	1200	400									
VHFD37-16io1	1600	500									
<b>1 Phase Half Controlled Rectifier Bridge, B2HZ</b>											
VGO36-16io7	1600	500	36	85	320	0.85	13	125	1.40	2.00	ECO-PAC 1



# Rectifier Modules

 **X024a**  
ISOPLUS i4-PAC™

 **X025b**  
GUPF

 **X030a**  
SMPD -B

 **X101**  
ECO-PAC 1

 **X102**  
ECO-PAC 2

 **X103**  
V1-A-Pack

 **X116b**  
FO-B

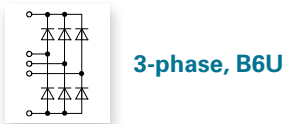
 **X122a**  
PWS-D

 **X122c**  
PWS-D Flat

 **X123c**  
PWS-E

## 3 Phase Rectifier Bridges

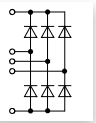
3 Phase Rectifier Bridges With Standard Diodes, B6U



Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAV</sub>	@T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
<b>FPO</b>											
FUO22-12N	1200	400	30	120	150	0.81	31.0	175	3.00	3.20	ISOPLUS i4-PAC™
FUO22-16N	1600	500									ISOPLUS i4-PAC™
VUO25-08NO8	800	250	20	85	380	0.77	14.2	150	8.00	9.00	FO-B
VUO25-12NO8	1200	400									FO-B
VUO25-14NO8	1400	440									FO-B
VUO25-16NO8	1600	500									FO-B
VUO25-18NO8	1800	575									
VUO28-08NO7	800	250	30	105	120	0.84	28.8	150	2.50	2.90	ECO-PAC 1
VUO28-12NO7	1200	400									ECO-PAC 1
VUO36-08NO8	800	250	27	85	550	0.76	9.1	150	7.00	8.00	FO-B
VUO36-12NO8	1200	400									FO-B
VUO36-14NO8	1400	440									FO-B
VUO36-16NO8	1600	500									FO-B
VUO36-18NO8	1800	575									
VUO34-08NO1	800	250	45	110	300	0.81	14.9	150	1.70	2.10	V1-A-Pack
VUO34-12NO1	1200	400									V1-A-Pack
VUO34-16NO1	1600	500	45	110	300	0.81	14.9	150	1.70	2.10	V1-A-Pack
VUO34-18NO1	1800	575									V1-A-Pack
GUO40-08NO1	800	250	40	90	370	0.74	16.3	175	4.30	4.80	GUPF
GUO40-12NO1	1200	400									GUPF
GUO40-16NO1	1600	500									GUPF
DMA40U1800GU	1800	575									GUPF
DNA40U2200GU	2200	690									
FUO50-16N	1600	500	50	120	270	0.78	17.0	175	2.10	2.30	ISOPLUS i4-PAC™
VUO52-08NO1	800	250	60	110	350	0.83	11.5	150	1.30	1.60	V1-A-Pack
VUO52-12NO1	1200	400									V1-A-Pack
VUO52-16NO1	1600	500									V1-A-Pack
VUO52-18NO1	1800	500									V1-A-Pack
VUO52-20NO1	2000	575	60	110	350	0.83	11.5	150	1.30	1.60	V1-A-Pack
VUO52-22NO1	2200	690									V1-A-Pack

## 3 Phase Rectifier Bridges

3 Phase Rectifier Bridges With Standard Diodes, B6U



**3-phase, B6U**

Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAV</sub>	@T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
VUO62-08NO7	800	250	60	120	550	0.78	8.1	150	1.10	1.50	PWS-D
VUO62-12NO7	1200	400									PWS-D
VUO62-14NO7	1400	440									PWS-D
VUO62-16NO7	1600	500									PWS-D
VUO62-18NO7	1800	575									
VUO64-16NO7	1600	500	60	120	550	0.78	8.1	150	1.10	1.50	PWS-D Flat
VUO68-08NO7	800	250	70	105	300	0.82	12.2	150	1.10	1.50	ECO-PAC 1
VUO68-12NO7	1200	400									ECO-PAC 1
VUO68-16NO7	1600	500									
VUO80-08NO1	800	250	80	110	600	0.81	7.8	150	1.10	1.40	V1-A-Pack
VUO80-12NO1	1200	400									V1-A-Pack
VUO80-16NO1	1600	500	80	110	600	0.81	7.8	150	1.10	1.40	V1-A-Pack
VUO80-18NO1	1800	575									V1-A-Pack
VUO82-08NO7	800	250	90	115	750	0.78	6.0	150	0.90	1.30	PWS-D
VUO82-12NO7	1200	400									PWS-D
VUO82-14NO7	1400	440									PWS-D
VUO82-16NO7	1600	500	90	115	750	0.78	6.0	150	0.90	1.30	PWS-D
VUO82-18NO7	1800	575									PWS-D
VUO84-16NO7	1600	500	90	115	750	0.78	6.0	150	0.90	1.30	PWS-D Flat
VUO86-08NO7	600	125	90	105	550	0.81	7.8	150	0.90	1.30	ECO-PAC 1
VUO86-12NO7	1200	400									ECO-PAC 1
VUO86-16NO7	1600	500									ECO-PAC 1
DMA90U1800LB	1800	575	90	110	350	0.81	12.7	175	1.10	1.50	SMPD-B
DNA90U2200LB	2200	690									SMPD-B
VUO98-08NO7	800	250	105	115	750	0.81	5.9	150	0.70	1.00	ECO-PAC 2
VUO98-12NO7	1200	400									ECO-PAC 2
VUO98-16NO7	1600	500									ECO-PAC 2
VUO105-18NO7	1800	575	120	105	1500	0.78	4.8	150	0.80	1.10	X121a
VUO110-08NO7	800	250	125	110	1200	0.79	4.5	150	0.70	1.00	PWS-E
VUO110-12NO7	1200	400									PWS-E
VUO110-16NO7	1600	500									PWS-E
VUO110-18NO7	1800	575									
MDMA120U1600VA	1600	500	120	110	850	0.79	5.9	150	0.65	0.85	V1-A-Pack
MDMA150U1600VA	1600	500	150	110	1100	0.83	4.7	150	0.50	0.70	V1-A-Pack
VUO121-16NO1	1600	500	120	105	700	0.80	7.6	150	0.65	0.75	E2-Pack
VUO122-08NO7	800	250	125	115	1000	0.80	4.6	150	0.60	0.90	ECO-PAC 2
VUO122-12NO7	1200	400									ECO-PAC 2
VUO122-16NO7	1600	500									ECO-PAC 2

# Rectifier Modules



**X027a**  
SOT-227B miniBLOC



**X103**  
V1-A-Pack



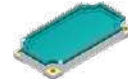
**X104**  
V2-Pack



**X112**  
E2-Pack



**X112a**  
E2-Pack PFP



**X113a**  
E3-Pack PFP



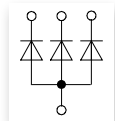
**X123c**  
PWS-E



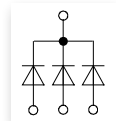
**X123h**  
PWS-E Flat

## 3 Phase Rectifier Bridges

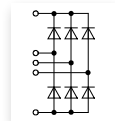
3 Phase Rectifier Bridges With Standard Diodes, B6U



DM/NA...YA...



DM/NA...YC...

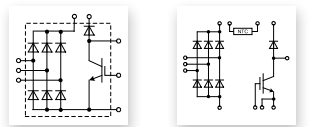


VUO..DM/NA..U..  
MDM/NA..U..

Part Number	V <sub>RRM</sub>	V <sub>RMS</sub>	I <sub>dAV</sub>	@T <sub>C</sub>	I <sub>FSM</sub> 45 °C 10 ms	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
DNA90YA2200NA	2200	690	90	85	370	0.86	11.4	150	1.20	1.30	SOT-227B miniBLOC
DNA90YC2200NA	2200	690									
DMA150YA1600NA	1600	500	150	95	700	0.82	6.3	150	0.60	0.70	SOT-227B miniBLOC
DMA150YC1600NA	1600	500									
DMA200YA1600NA	1600	500	200	100	1000	0.86	4.4	150	0.45	0.55	SOT-227B miniBLOC
DMA200YC1600NA	1600	500									
DMA240YA1600NA	1600	500	240	100	1300	0.86	4.0	150	0.35	0.45	SOT-227B miniBLOC
DMA240YC1600NA	1600	500									
VUO160-08NO7	800	250	175	110	1800	0.77	3.4	150	0.50	0.70	PWS-E
VUO160-12NO7	1200	400									
VUO160-16NO7	1600	500	175	110	1800	0.77	3.4	150	0.50	0.70	PWS-E
VUO160-18NO7	1800	575									
VUO162-16NO7	1600	500	175	110	1800	0.77	3.4	150	0.50	0.70	PWS-E FLat
VUO190-08NO7	800	250									
VUO190-12NO7	1200	400	240	110	2800	0.74	2.4	150	0.40	0.55	PWS-E
VUO190-16NO7	1600	500									
VUO190-18NO7	1800	575	240	110	2800	0.74	2.4	150	0.40	0.55	PWS-E
VUO192-16NO7	1600	500									
VUO192-16NO7	1600	500	240	110	2800	0.74	2.4	150	0.40	0.55	PWS-E FLat
MDNA240U2200ED	2200	690	240	90	1500	0.79	5.1	150	0.35	0.45	E2-Pack
MDMA450U1600PTEH	1600	450	500	85	2400	0.82	2.7	150	0.20	0.10	E3-Pack PFP
MDMA660U1600PTEH	1600	500	660	85	5000	0.77	1.8	150	0.15	0.08	E3-Pack PFP
MDNA660U2200PTEH	2200	690									
MDMA900U1600PTEH	1600	500	900	85	8000	0.76	1.4	150	0.10	0.05	E3-Pack PFP

## 3 Phase Rectifier Bridges

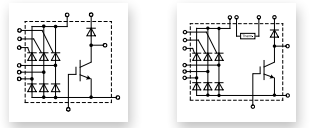
3 Phase Rectifier Bridges With IGBT and Fast Diode for Brake Unit



Part Number	Rectifier			IGBT		Fast Diode			Package
	V <sub>RRM</sub> V	I <sub>dAV</sub> A	@ T <sub>C</sub> °C	V <sub>CES</sub> V	I <sub>C80</sub> A	V <sub>RRM</sub> V	I <sub>F(AV)</sub> A	t <sub>tr</sub> ns	
VUB72-12NOXT	1200	75	110	1200	40	1200	21	130	V1-A-Pack
VUB72-16NOXT	1600								
VUI72-16NOXT	1600	75	110	1200	40	-	-	-	V1-A-Pack
VUB116-16NOXT	1600	120	105	1200	84	1200	32	150	E2-Pack
VUB120-16NOX	1600	180	90	1200	140	1200	32	300	V2-Pack
VUB120-16NOXT	1600								
VUB135-22NO1	2200	150	105	1700	80	1700	33	900	E2-Pack
VUB145-16NOXT	1600	150	105	1200	140	1200	32	300	E2-Pack
VUB160-16NOX	1600	180	90	1200	175	1200	32	150	V2-Pack
VUB160-16NOXT	1600								
MDMA210UB1600PTED	1600	210	85	1200	84	1200	59	350	E2-Pack PFP
MDNA210UB2200PTED	2200	210	85	1700	100	1700	54	550	E2-Pack PFP
MDNA210UB2200TED	2200	210	85	1700	100	1700	54	550	E2-Pack
MDMA240UB1600ED	1600	240	85	1200	140	1200	59	350	E2-Pack
MDMA280UB1600PTED	1600	280	85	1200	140	1200	59	350	E2-Pack PFP
MDNA280UB2200PTED	2200	280	85	1700	100	1700	54	550	E2-Pack PFP
MDMA360UB1600PTED	1600	360	85	1200	175	1200	90	350	E2-Pack PFP
MDNA360UB2200PTED	2200	360	85	1700	145	1700	83	550	E2-Pack PFP
MDMA450UB1600PTED	1600	450	85	1200	175	1200	90	350	E2-Pack PFP
MDMA450UB1600PTEH	1600	450	85	1200	175	1200	90	350	E3-Pack PFP

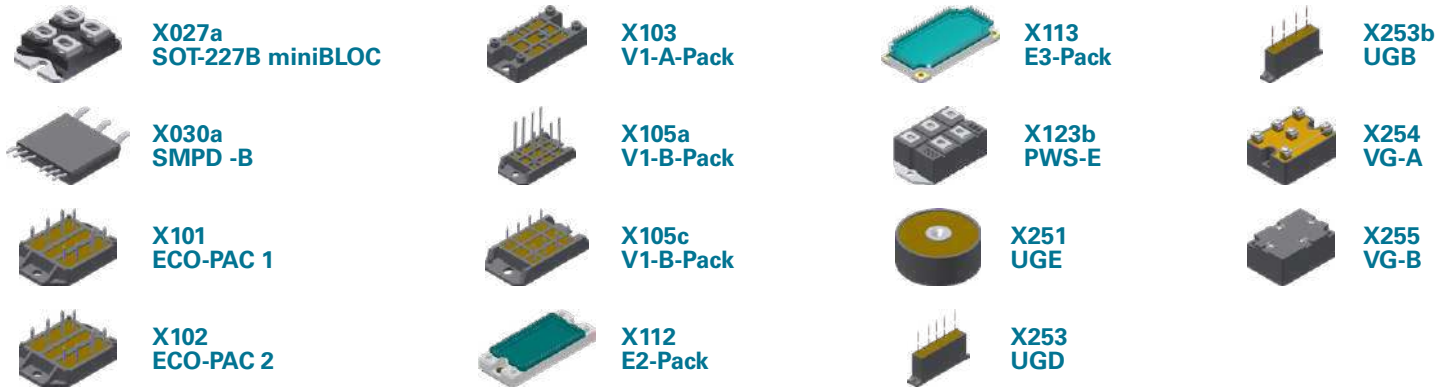
## 3 Phase Rectifier Bridges

With IGBT and Fast Diode for Brake Unit



Part Number	Rectifier			IGBT		Fast Diode			Package
	V <sub>RRM</sub> V	I <sub>dAV</sub> A	@ T <sub>C</sub> °C	V <sub>CES</sub> V	I <sub>C80</sub> A	V <sub>RRM</sub> V	I <sub>F(AV)</sub> A	t <sub>tr</sub> ns	
VVZB120-16ioX	1600	180	85	1200	140	1200	32	300	V2-Pack
MCNA120UI2200TED	2200	117	80	1700	80	1700	50	550	E2-Pack
MCNA120UI2200PED	2200	120	80	1700	80	1700	50	550	E2-Pack PFP
VVZB135-16ioXT	1600	150	85	1200	84	1200	32	150	E2-Pack
VVZB170-16ioXT	1600	180	85	1200	140	1200	32	300	E2-Pack
MCMA240UI1600ED	1600	240	80	1200	140	1200	59	350	E2-Pack
MCMA240UI1600PED	1600	240	80	1200	140	1200	59	350	E2-Pack PFP
MCMA245UI1600ED	1600	240	80	1200	175	1200	90	350	E2-Pack

# Rectifier Modules



## 3 Phase Rectifier Bridges

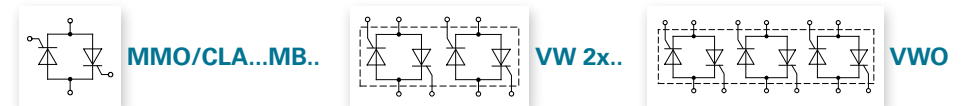


Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAVM</sub>	@T <sub>H</sub>	I <sub>FSM/TSM</sub> 10 ms, 45 °C	V <sub>T0</sub>	r <sub>T</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
<b>3 Phase Rectifier Bridges with Standard or Fast Diodes (t<sub>r</sub> = 1.5 ms) &amp; Integrated Softstart Thyristor</b>											
VUC36-12go2	1200	400	34	85	Dio. 300 Thy. 400	1.20 0.85	16 10	125	1.40	2.00	V1-B-Pack (a)
VUC36-16go2	1600	500	34	85	Dio. 300 Thy. 400	1.20 0.85	16 10	125	1.40	2.00	
MDMA60UC1600VC	1600	500	60	110	Dio. 350 Thy. 800	0.83 0.89	11.5 5.3	150	1.30	1.60	V1-B-Pack (c)
MDMA360UC1600TED	1600	500	360	85	Dio. 1900 Thy. 2400	0.82 0.84	3.4 3.1	150	0.25	0.35	

Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>dAVM</sub>	@T <sub>H</sub>	I <sub>FSM/TSM</sub> 10 ms, 45 °C	V <sub>T0</sub>	r <sub>T</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
<b>3 Phase Half-Controlled Rectifier Bridges, B6HK</b>											
VVZ39-08ho7	800	250	39	85	200	0.85	27.0	125	1.30	1.80	ECO-PAC 1
VVZ39-12ho7	1200	400									
VVZ40-12io1	1200	400	34	100	320	0.85	15.0	125	1.00	1.60	V1-B-Pack (a)
VVZ40-16io1	1600	500									
CLE90UH1200TLB	1200	400	90	90	350	0.92	13.0	150	0.90	1.30	SMPD-B
VVZ110-12io7	1200	400	110	85	1150	0.85	6.0	125	0.65	0.80	PWS-E
VVZ175-12io7	1200	400	167	85	1500	0.85	3.5	125	0.46	0.55	PWS-E
VVZ175-16io7	1600	500									
MCMA450UH1600TEH	1600	500	450	90	2400	0.84	3.1	150	0.17	0.25	E3-Pack
<b>3 Phase Half-Controlled Rectifier Bridges with Freewheeling Diodes, B6HKF</b>											
MCMA120UJ1800ED	1800	575	117	80	500	0.89	13.6	150	0.65	0.75	E2-Pack
<b>3 Phase Full-Controlled Rectifier Bridges, B6C</b>											
VTO39-08ho7	800	250	39	85	200	0.85	27.0	125	1.30	1.80	ECO-PAC 1
VTO39-12ho7	1200	400									

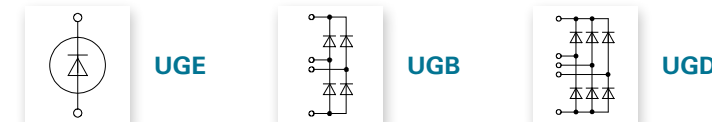
## AC Controller-1,2,&3 Phase

I<sub>RMS</sub> = 35-230 A



Part Number	V <sub>RRM</sub>	V <sub>VRMS</sub>	I <sub>RMS</sub>	@T <sub>C</sub>	I <sub>TSM</sub> 10 ms, 45 °C	V <sub>T0</sub>	r <sub>T</sub>	T <sub>VJM</sub>	R <sub>thJC</sub>	R <sub>thJH</sub>	Package
	V	V	A	°C	A	V	mΩ	°C	K/W	K/W	
1 Phase	MMO62-12io6	1200	400	66	95	400	0.87	13.6	150	0.90	1.10
	MMO62-16io6	1600	500								
	MMO74-12io6	1200	400	88	95	600	0.87	10.5	150	0.70	0.80
	MMO74-16io6	1600	500								
	MMO90-12io6	1200	400	110	95	800	0.88	6.0	150	0.60	0.70
	MMO90-14io6	1400	440								
	MMO90-16io6	1600	500	110	110	1100	0.78	4.9	150	0.55	0.65
	CLA110MB1200NA	1200	400								
	MMO110-12io7	1200	400	112	85	1000	0.85	5.6	150	0.80	0.92
	MMO110-14io7	1400	440								
	MMO140-12io7	1200	400	130	85	1150	0.85	5.2	150	0.70	0.82
	MMO140-16io7	1600	500								
	MMO175-12io7	1200	400	175	85	1500	0.85	3.7	150	0.50	0.62
	MMO175-16io7	1600	500								
MMO230-12io7	1200	400	230	85	2250	0.8	2.4	125	0.26	0.46	
MMO230-16io7	1600	500									
2 Phase	VW2x60-12io1	1200	400	2 × 60	85	520	0.85	11.0	125	0.92	1.22
	VW2x60-14io1	1400	440								
	VW2x60-16io1	1600	500								
3 Phase	VWO35-08ho7	800	250	3 × 35	85	200	0.85	27.0	125	1.30	1.80
	VWO35-12ho7	1200	400								

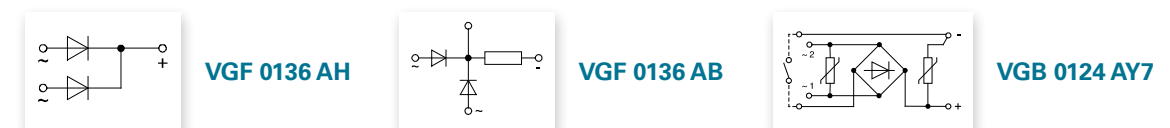
## 1 and 3 Phase High Voltage Rectifier Modules



Part Number	V <sub>RRM</sub>	I <sub>dAV</sub> <sup>1/2</sup>	I <sub>FSM</sub> 10 ms, 45 °C	V <sub>F0</sub>	r <sub>F</sub>	T <sub>VJM</sub>	R <sub>thJA1</sub> <sup>1</sup>	R <sub>thJA2</sub> <sup>2</sup>	Package
	V	V	A	V	mΩ	°C	K/W	K/W	
UGE0421AY4	3200	23 / 7.4	300	1.70	16	150	1.9	7.1	UGE
UGE0221AY4	4800	10 / 3.8	180	2.55	90	150	1.7	8.0	UGE
UGE1112AY4	8000	4.2 / 2.0	120	4.25	215	150	4.2	10.0	UGE
UGE3126AY4	24000	2.0 / 0.8	70	12.00	1800	150	2.7	8.7	UGE
UGB3132AD	4800	1.3	60	-	-	150	-	-	UGB
UGB6124AG	10500	1.0	50	-	-	150	-	-	UGB
UGD6123AG	7200	1.8	50	-	-	150	-	-	UGD
UGD8124AG	10500	1.2	50	-	-	150	-	-	UGD

1 for oil-cooling with cooling plate, T<sub>A</sub> = 35 °C  
 2 for natural air cooling without cooling plate, T<sub>A</sub> = 45 °C

## Braking Rectifier Assemblies



Part Number	V <sub>VRMS</sub> typ.	V <sub>dAV</sub> typ.	I <sub>dAVM</sub> typ.	I <sub>dAVM</sub> max.	V <sub>RRM</sub> max.	I <sub>FSM</sub> max.	I <sup>2</sup> t max.	Package
	V	V	A	A	V	A	A <sup>2</sup> s	
VGB0124AY7a	380	340	1.0	1.0	1400	60	28	VG-A
VGF0136AB	1000	440	1.2	1.5	2800	80	40	VG-B



IXYS Integrated Circuits' line of solid state relays is one of the broadest in the industry. The devices use discrete semiconductor components and the patented OptoMOS® architecture to deliver fast, reliable, bounce-free switching in a compact design. Semiconductor relays are an ideal replacement for larger reed and electromechanical relays. Compared to these old electromagnetic technologies, our OptoMOS® relays offer significantly lower drive current, small package size, no susceptibility to magnetic interaction, and solid state reliability. All of these are key requirements for the design of today's complex, low-power, multi-channel products.

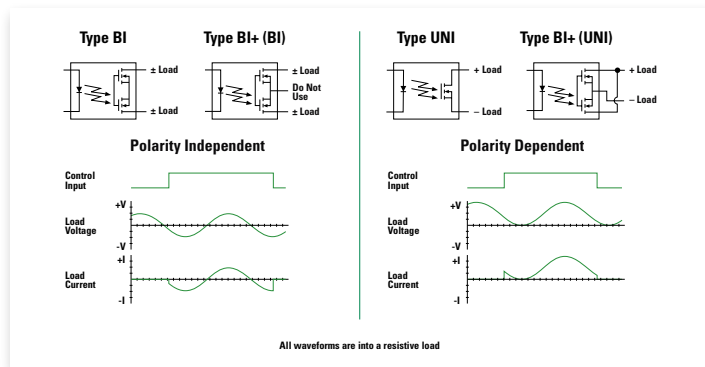
## Features

- Low drive current
- High reliability
- No EMI/RFI generation
- Arc-free with no snubbing circuits
- AC or DC switching
- Current limiting devices available
- Low off-state leakage

## Applications

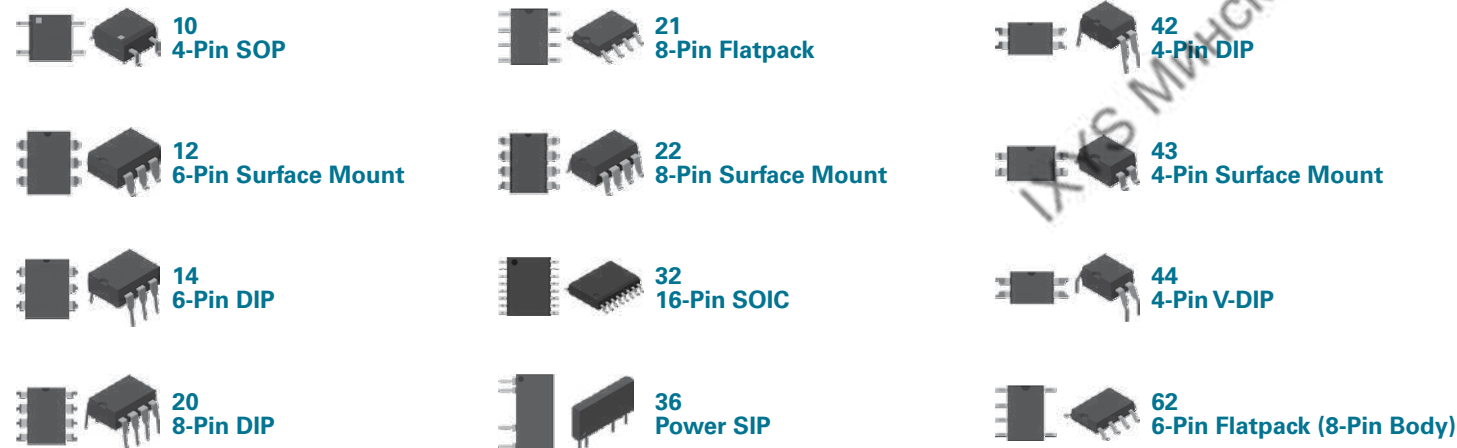
- Telecommunications / data communications
- Instrumentation
- Multiplexers
- Data acquisition / electronic switching
- Meters (watt-hour, water, gas)
- Medical equipment (patient/equipment isolation)
- Security
- Industrial controls

## Output Configurations

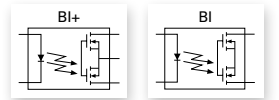


- Type BI** relays conduct load current in both directions.
  - Type BI+** relays, in BI configuration, conduct load current in both directions.
  - Type UNI** relays conduct load current from the positive terminal to the negative terminals only
  - Type BI+** relays, in UNI configuration with output MOSFET wired in parallel, enable higher load current from positive terminal to negative terminal only.
- The accompanying SSR tables reference these types (BI, BI+, & UNI) for all devices listed.

## 1-Form-A Relays: Single-Pole



## 1-Form-A Relays: Single-Pole

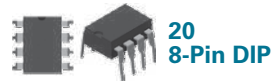


Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
CPC1006N	BI	60	75	10	0.5	10 / 10	1500	1	10
CPC1008N	BI	100	150	8	2	2 / 1	1500	1	10
CPC1009N	BI	100	150	8	2	2 / 0.5	1500	0.02	10
CPC1010N	BI	250	170	11.5	2	3 / 3	1500	1	10
CPC1014N	BI	60	400	2	2	2 / 1	1500	1	10
CPC1016N	BI	100	100	16	2	2 / 1	1500	1	10
CPC1017N	BI	60	100	16	1	10 / 10	1500	1	10
CPC1018N	BI	60	600	0.8	1	3 / 2	1500	1	10
CPC1019N	BI	60	750	0.6	2	3 / 3	1500	1	10
CPC1020N	BI	30	1200	0.25	2	3 / 3	1500	1	10
CPC1025N	BI	400	120	30	2	2 / 1	1500	1	10
CPC1030N	BI	350	120	30	2	2 / 1	1500	1	10
CPC1035N	BI	350	100	35	2	2 / 1	1500	1	10
CPC1225N	BI	400	120	30	2	2 / 1	1500	1	10
CPC1230N	BI	350	120	30	2	2 / 1	1500	1	10
CPC1330	BI	350	120	30	2	2 / 1	5000	1	42, 43
CPC1335	BI	350	100	35	1	10 / 10	3750	1	21
CPC1390	BI	400	140	22	2	1 / 1	5000	1	42, 43, 44
CPC1393	BI	600	90	50	2	5 / 5	5000	1	42, 43, 44
CPC1394	BI	600	120	35	2	5 / 3	5000	1	42, 43, 44
CPC1510	BI+	250	200	15	2	2 / 2	3750	1	12, 14
CPC1511	BI	230	450	4	2.5	4 / 2	3750	1	36
CPC1540	BI+	350	120	25	2	2 / 2	3750	1	12, 14
CPC1560	BI+	60	300	5.6	1.1	0.1 / 0.4	3750	1	20, 22
CPC1561B	BI	60	1000	0.245	2.5	2.5 / 0.5	3750	1	32
CPC1563	BI+	600	120	35	2	2 / 2	3750	1	12, 14
CPC1593	BI+	600	120	35	2	2 / 2	3750	1	12, 14
LCA100	BI+	350	120	25	5	5 / 5	3750	1	12, 14
LCA100L	BI+	350	120	25	5	5 / 5	3750	1	12, 14
LCA110	BI+	350	120	35	2	3 / 3	3750	1	12, 14
LCA110L	BI+	350	120	35	2	3 / 3	3750	1	12, 14
LCA120	BI+	250	170	20	5	3 / 3	3750	1	12, 14
LCA120L	BI+	250	150	20	5	3 / 3	3750	1	12, 14
LCA125	BI+	300	170	16	5	5 / 5	3750	1	12, 14
LCA125L	BI+	300	170	20	5	5 / 5	3750	1	12, 14
LCA127	BI+	250	200	10	5	5 / 5	3750	1	12, 14
LCA127L	BI+	250	170	15	5	5 / 5	3750	1	12, 14
LCA129	BI+	250	170	20	2	8 / 8	3750	1	12, 14
LCA182	BI+	350	120	35	0.25	3 / 3	3750	1	12, 14
LCA701	BI+	100	1500	0.3	2	4 / 1	3750	1	12, 14
LCA710	BI+	60	1000	0.5	10	2.5 / 0.25	3750	1	12, 14
LCA712	BI+	60	1000	0.5	10	2.5 / 0.35	3750	0.01	12, 14
LCA715	BI+	60	2200	0.15	5	2.5 / 0.25	3750	1	12, 14
LCA717	BI+	30	2000	0.15	2	3 / 3	3750	1	12, 14
OMA160	BI+	250	50	100	10	0.125 / 0.125	3750	0.025	12, 14
PLA110	BI+	400	150	22	5	1 / 0.5	3750	1	12, 14
PLA110L	BI+	400	150	25	5	1 / 0.25	3750	1	12, 14
PLA132	BI+	60	600	1	2	5 / 2	3750	1	12, 14
PLA140	BI+	400	250	8	5	3 / 1	3750	1	12, 14
PLA140L	BI+	400	200	13	5	5 / 3	3750	1	12, 14
PLA143	BI+	600	100	50	2	5 / 5	4000	1	12, 14
PLA150	BI+	250	250	7	5	2.5 / 0.5	3750	1	12, 14
PLA160	BI+	300	50	100	10	0.05 / 0.05	3750	0.025	12, 14
PLA170	BI+	800	100	50	5	5 / 5	3750	1	12, 14
PLA171	BI	800	100	50	2	5 / 5	5000	1	62
PLA172P	BI	800	100	50	2	5 / 5	5000	1	62
PLA190	BI+	400	150	22	5	1 / 0.5	5000	1	12, 14
PLA191	BI+	400	250	8	5	3 / 1	5000	1	12, 14
PLA192	BI+	600	150	22	5	5 / 5	5000	1	12, 14
PLA193	BI+	600	100	50	5	5 / 5	5000	1	12, 14
PLA194	BI+	600	130	35	2	3 / 2	5000	1	12, 14
XCA170	BI+	350	100	50	5	5 / 5	3750	1	12, 14

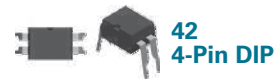
# Solid State Relays



10  
4-Pin SOP



20  
8-Pin DIP



42  
4-Pin DIP



12  
6-Pin Surface Mount



21  
8-Pin Flatpack



43  
4-Pin Surface Mount



14  
6-Pin DIP



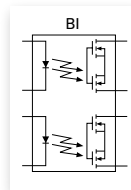
22  
8-Pin Surface Mount



62  
6-Pin Flatpack (8-Pin Body)



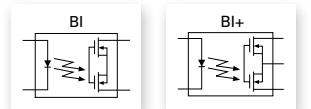
17  
8-Pin SOP



## 1-Form-A Relays: Dual Single-Pole

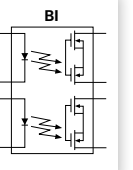
Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
CPC2014N	BI	60	400	2	2	2 / 1	1500	1	17
CPC2017N	BI	60	120	16	1	3 / 3	1500	1	17
CPC2025N	BI	400	120	30	2	2 / 1	1500	1	17
CPC2030N	BI	350	120	30	2	2 / 1	1500	1	17
LAA100	BI	350	120	25	5	5 / 5	3750	1	20, 21, 22
LAA100L	BI	350	120	25	5	5 / 5	3750	1	20, 21, 22
LAA108	BI	100	300	8	2	3 / 3	3750	1	20, 21, 22
LAA110	BI	350	120	35	5	3 / 3	3750	1	20, 21, 22
LAA110L	BI	350	120	35	5	3 / 3	3750	1	20, 21, 22
LAA120	BI	250	170	20	5	5 / 5	3750	1	20, 21, 22
LAA120L	BI	250	150	25	5	5 / 5	3750	1	20, 21, 22
LAA125	BI	350	170	16	5	5 / 5	3750	1	20, 21, 22
LAA125L	BI	350	150	18	5	5 / 5	3750	1	20, 21, 22
LAA127	BI	250	200	10	5	5 / 5	3750	1	20, 21, 22
LAA127L	BI	250	170	10	5	5 / 5	3750	1	20, 21, 22
LAA710	BI	60	1000	0.5	10	2.5 / 0.25	3750	1	20, 22
OAA160	BI	250	50	100	6	0.125 / 0.125	3750	0.025	20, 21, 22
PAA110	BI	400	150	22	5	1 / 0.25	3750	1	20, 21, 22
PAA110L	BI	400	150	25	5	1 / 0.5	3750	1	20, 21, 22
PAA127	BI	280	200	10	3	0.5 / 0.5	3750	0.025	20, 21, 22
PAA132	BI	60	600	1	2	5 / 2	3750	1	20, 22
PAA140	BI	400	250	8	5	3 / 1	3750	1	20, 21, 22
PAA140L	BI	400	200	13	5	5 / 3	3750	1	20, 22
PAA150	BI	250	250	7	5	2.5 / 0.5	3750	1	20, 21, 22
PAA190	BI	400	150	22	5	1 / 0.5	5000	1	20, 22
PAA191	BI	400	250	8	5	3 / 1	5000	1	20, 22
PAA193	BI	600	100	50	5	5 / 5	5000	10	20, 22
XAA117	BI	60	150	16	1	5 / 5	3750	1	20, 21, 22
XAA170	BI	350	100	50	5	5 / 5	3750	1	20, 21, 22

## 1-Form-B Relays: Single-Pole



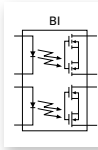
Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
CPC1106N	BI	60	75	10	0.5	10 / 10	1500	1	10
CPC1114N	BI	60	400	2	2	2 / 5	1500	1	10
CPC1117N	BI	60	150	16	1	10 / 10	1500	1	10
CPC1125N	BI	400	100	35	2	2 / 2	1500	5	10
CPC1130N	BI	350	120	30	2	2 / 2	1500	5	10
CPC1135N	BI	350	120	35	2	2 / 2	1500	5	10
CPC1150N	BI	350	120	50	2	1 / 2	1500	5	10
CPC1231N	BI	350	120	30	2	2 / 2	1500	5	10
CPC1333	BI	350	130	30	2	2 / 3	5000	1	42, 43
LCB110	BI+	350	120	35	5	3 / 3	3750	1	12, 14
LCB111	BI+	350	120	35	2	5 / 5	3750	1	12, 14
LCB120	BI+	250	170	20	5	5 / 5	3750	1	12, 14
LCB126	BI+	250	170	15	5	5 / 5	3750	1	12, 14
LCB127	BI+	250	200	10	5	5 / 5	3750	1	12, 14
LCB710	BI+	60	1000	0.6	2	3 / 3	3750	1	12, 14
LCB716	BI+	60	500	2	2	3 / 3	3750	1	12, 14
LCB717	BI+	30	1500	0.3	2	2 / 5	3750	1	12, 14
PLB150	BI+	250	250	7	5	1 / 2.5	3750	1	12, 14
PLB171	BI	800	80	55	2	5 / 5	5000	1	62
PLB190	BI+	400	130	25	2	1 / 2.5	5000	1	12, 14
XCB170	BI+	350	100	50	5	5 / 5	3750	1	12, 14

## 1-Form-B Relays: Dual Single-Pole



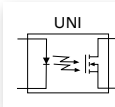
Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
CPC2125N	BI	400	100	35	2	2 / 2	1500	5	17
LBB110	BI	350	120	35	5	3 / 3	3750	1	20, 21, 22
LBB120	BI	250	170	20	5	5 / 5	3750	1	20, 22
LBB126	BI	250	170	15	5	5 / 5	3750	1	20, 21, 22
LBB127	BI	250	200	10	5	5 / 5	3750	1	20, 21, 22
PBB150	BI	250	250	7	5	2.5 / 2.5	3750	1	20, 21, 22
PBB190	BI	400	130	25	2	1 / 2.5	5000	1	20, 22
XBB170	BI	350	100	50	5	5 / 5	3750	1	20, 21, 22

## 1-Form-A & 1-Form-B Combination Relays



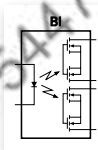
Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
CPC2317N	BI	60	120	16	1	3/3	1500	1/1	17
CPC2330N	BI	350	120	30	2	3/3	1500	1/5	17
LBA110	BI	350	120	35	2	3/3	3750	1/1	20, 21, 22
LBA110L	BI	350	120	35	5	3/3	3750	1/1	20, 21, 22
LBA120	BI	250	170	20	5	5/5	3750	1/1	20, 21, 22
LBA120L	BI	250	150	25	5	5/5	3750	1/1	20, 22
LBA127	BI	250	200	10	5	5/5	3750	1/1	20, 21, 22
LBA127L	BI	250	150	15	5	5/5	3750	1/1	20, 22
LBA710	BI	60	1000	0.6	2	5/5	3750	1/1	20, 22
LBA716	BI	60	1000	0.4	2	5/5	3750	1/1	20, 22
PBA150	BI	250	250	7	5	2.5/2.5	3750	1/1	20, 22

## 1-Form-A Relays: Single-Pole, Unidirectional (DC-only)



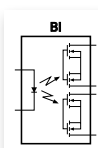
Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
CPC1002N	UNI	60	700	0.55	2	5/2	1500	1/1	10
CPC1004N	UNI	100	300	4	2	3/1	1500	1/1	10

## 2-Form-A Relays: Double-Pole, Single-Throw



Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
LCA210	BI	350	85	35	8	3/3	3750	1/1	20, 22
LCA210L	BI	350	85	35	8	4/4	3750	1/1	20, 22
LCA220	BI	250	120	20	10	5/5	3750	1/1	20, 22

## 1-Form-C Relays: Common Input, Single-Pole, Double-Throw



Part Number	Relay Type	Blocking Voltage	Load Current	On Resistance	Input Control Current	Switching Speeds	Isolation Voltage	Off-State Leakage	Package Type
		V <sub>p</sub>	mA	Ω	mA	t <sub>on</sub> /t <sub>off</sub> ms	V <sub>rms</sub>	μA	
LCC110	BI	350	120	35	8	4/4	3750	1/1	20, 21, 22
LCC120	BI	250	170	20	10	5/5	3750	1/1	20, 22

## Current Limiting SSRs with Voltage Triggered Shutdown & Thermal Management

All of the Fault-Protected Solid State Relays (SSR) listed below feature active current limiting and Thermal Management, while the CPC1540, CPC1563, and CPC1593 additionally feature Voltage-Triggered Shutdown, or VTS.

Fault-Protected SSRs can directly replace footprint-compatible standard SSRs in existing designs to improve end-product survivability.

These Fault-Protected relays resume normal operation upon removal of the fault condition or upon cycling the input control current. Should the fault condition repeat or persist, the fault protection will immediately resume.

**Active Current Limiting:** All Fault-Protected SSRs limit load current to protect both the load and the SSR.

**Voltage Triggered Shutdown:** CPC1540, CPC1563, and CPC1593 incorporate a third protection feature called Voltage-Triggered Shutdown (VTS).

During a current limiting event, this advanced thermal management protection feature reduces the relay current to <100μA whenever the voltage drop across the relay exceeds a non-adjustable predetermined threshold, thereby preventing excessive heating of the SSR.

**Thermal Management:** All Fault-Protected relays include a traditional thermal management feature that deactivates the SSR outputs if the die temperature exceeds a safe limit, regardless of the Active Current Limiting state and, when equipped, the Voltage-Triggered Shutdown state. This feature provides excellent power cross immunity.

### Features & Benefits

- Provide excellent power-cross immunity
- Resumes normal operation after fault is removed
- Ideal for use in electromagnetically noisy environments

### Applications

- Telephony hook switches
- Electronic switching
- Security
- Industrial controls

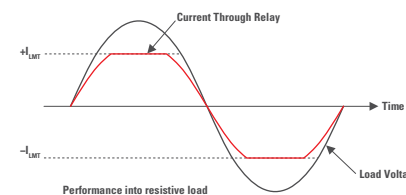
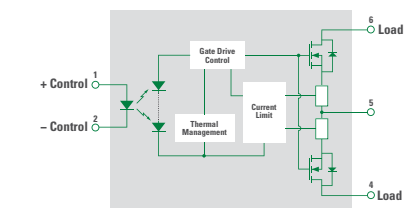


Part Number	Blocking Voltage (V <sub>p</sub> )	Input Control Current (mA)	On-Resistance (Max) Configuration		Load Current (Max) Configuration		Current Limit (Max) Configuration		VTS <sup>1</sup> Threshold (V <sub>TH</sub> ) (V)	Switching Speed t <sub>on</sub> / t <sub>off</sub> (ms)	Isolation Voltage (V <sub>rms</sub> )	Package Type
			DC (Ω)	AC (Ω)	DC (mA)	AC (mA)	DC (mA <sub>p</sub> )	AC (mA <sub>p</sub> )				
			CPC1510	250	2	3.75	15	350				
CPC1511	230	2.5	—	4	—	450	—	1400	—	4 / 2	3750	36
CPC1540	350	2	6.75	25	250	120	570	285	100 <sup>1</sup>	2 / 2	3750	12, 14
CPC1560	60	1.1	1.4	5.6	600	300	1500	900	—	0.1 / 0.4	3750	20, 22
CPC1561	60	2.5	—	0.245	—	1000 <sup>2</sup>	—	3000	—	2.5 / 0.5	3750	32
CPC1563	600	2	11.75	35	250	120	570	285	100 <sup>1</sup>	2 / 2	3750	12, 14
CPC1593	600	2	11.75	35	250	120	570	285	175 <sup>1</sup>	2 / 2	3750	12, 14

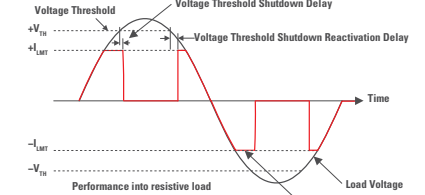
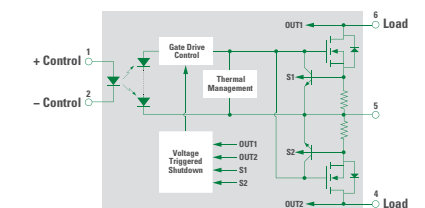
<sup>1</sup> Deactivates the switch when the load voltage exceeds the VTH threshold while the switch is in current limit.

<sup>2</sup> Load current rating at up to 60°C.

With I<sub>LIMIT</sub> Without VTS

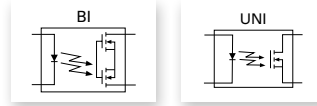


With I<sub>LIMIT</sub> With VTS





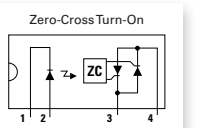
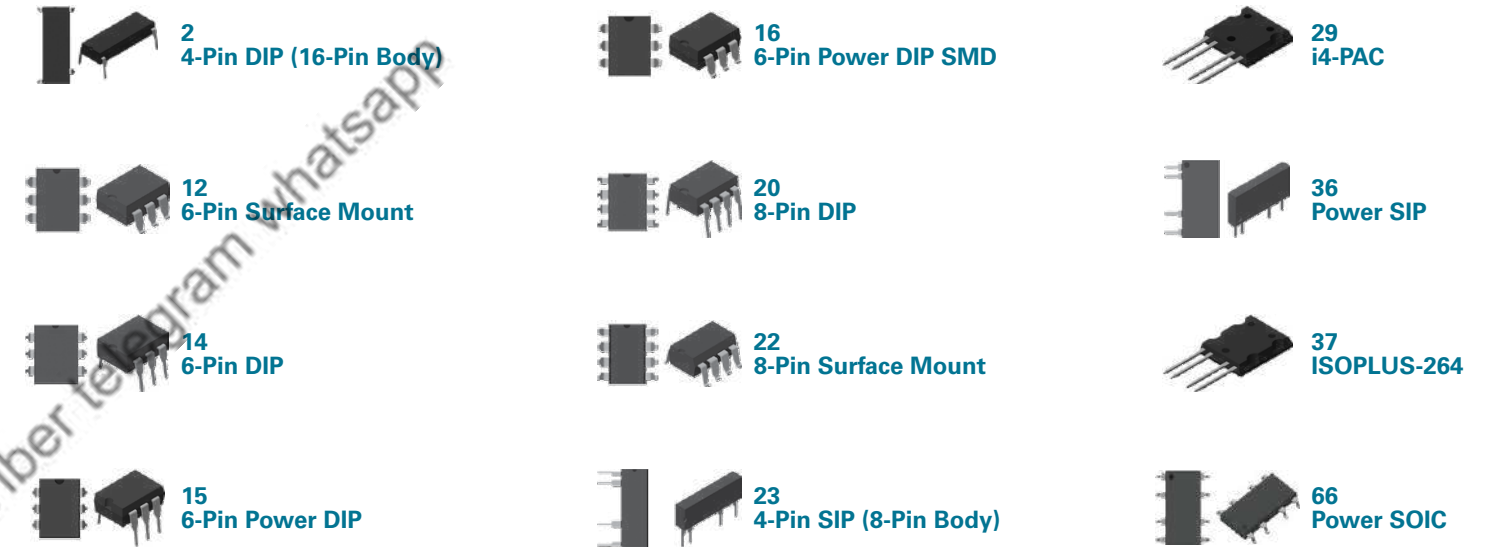
## 1-Form-A Power Relays: Single-Pole, Bidirectional



Part Number	Relay Type	Blocking Voltage V <sub>P</sub>	Load Current			On Resistance Ω	Input Control Current mA	Switching Speeds t <sub>on</sub> / t <sub>off</sub> ms	Isolation Voltage V <sub>rms</sub>	Off-State Leakage μA	Package Type
			Free Air A <sub>rms</sub>	5°C/W Heat Sink A <sub>rms</sub>	T <sub>C</sub> =25°C A <sub>rms</sub>						
<b>1-Form-A Power Relays: Single-Pole, Bidirectional</b>											
CPC1906Y	BI	60	2	–	–	0.30	10	10 / 5	2500	1	36
CPC1907B	BI	60	6	–	–	0.06	5	5 / 1	5000	1	66
CPC1908J	BI	60	3.5	8.5	15	0.30	10	20 / 5	2500	1	29
CPC1909J	BI	60	6.5	15	15	0.10	10	25 / 10	2500	1	37
CPC1916Y	BI	100	2.5	–	–	0.34	10	5 / 3	2500	1	36
CPC1918J	BI	100	5.25	13	15	0.10	10	25 / 10	2500	1	37
CPC1926Y	BI	250	0.7	–	–	1.40	10	10 / 10	2500	1	36
CPC1927J	BI	250	2.7	6.7	15	0.20	10	25 / 10	2500	1	37
CPC1967J	BI	400	1.35	3.35	13.15	0.85	10	20 / 5	2500	1	29
CPC1968J	BI	500	2	5	15	0.35	10	20 / 5	2500	1	37
CPC1973Y	BI	400	0.35	–	–	5.00	10	5 / 3	2500	1	36
CPC1977J	BI	600	1.25	3.1	8	1.00	10	20 / 5	2500	1	29
CPC1978J	BI	800	0.75	1.85	7.25	2.30	10	20 / 5	2500	1	29
CPC1979J	BI	600	1.4	3.5	14.5	0.75	10	25 / 5	2500	1	37
CPC1981Y	BI	1000	0.18	–	–	18.00	10	10 / 5	2500	1	36
CPC1983B	BI	600	0.5	–	–	6.00	5	5 / 2	5000	1	66
CPC1983Y	BI	600	0.5	–	–	6.00	5	5 / 2	2500	1	36
CPC1983YE	BI	600	0.5	–	–	6.00	5	5 / 2	4000	1	36
CPC1984Y	BI	600	1	–	–	0.66	5	10 / 2	4000	1	36
CPC1986J	BI	1000	0.65	1.6	6.5	3.00	10	20 / 5	2500	1	29
CPC1988J	BI	1000	0.9	2.25	9.4	2.50	10	20 / 5	2500	1	37
<b>Dual 1-Form-A Power Relay: Bidirectional</b>											
CPC2907B	BI	60	2	–	–	0.15	5	2.5 / 0.25	4000	1	66
<b>1-Form-A Power Relays: Single-Pole, Unidirectional</b>											
CPC1706Y	UNI	60	4	–	–	0.09	5	5 / 2	2500	1	36
CPC1708J	UNI	60	4	11.85	24	0.08	10	20 / 5	2500	1	29
CPC1709J	UNI	60	9	22.8	32	0.05	10	20 / 5	2500	1	37
CPC1718J	UNI	100	6.75	17.5	32	0.08	10	20 / 5	2500	1	37
CPC1726Y	UNI	250	1	–	–	0.75	10	5 / 2	2500	1	36
CPC1727J	UNI	250	3.4	8.6	20	0.09	10	20 / 5	2500	1	37
CPC1777J	UNI	600	1.5	4.6	15	0.50	10	20 / 5	2500	1	29
CPC1779J	UNI	600	1.65	4.12	15	0.40	10	20 / 5	2500	1	37
CPC1786J	UNI	1000	0.65	1.75	6.9	2.00	10	20 / 5	2500	1	29
CPC1788J	UNI	1000	1	2.45	10.3	1.25	10	20 / 5	2500	1	37
<b>1-Form-B Power Relay: Single-Pole, Unidirectional</b>											
CPC1705Y	UNI	60	3.25	–	–	0.09	5	2 / 12	2500	1	36

## Optically Isolated AC Power Switches: I<sub>LOAD</sub> < 1A

The OptoMOS line of power products uses dual power-SCR outputs to produce an alternative to optocoupler and TRIAC circuits. AC Power Switches provide a blocking voltage of up to 800V<sub>P</sub>. In addition, tightly controlled zero-cross circuitry ensures the switching of AC loads while minimizing the generation of transients. The input and output circuits are optically coupled to provide 3750V<sub>rms</sub> of isolation and noise immunity between control and load circuits. Long life and environmental integrity make these power switches ideal for controlling a variety of AC circuits in industrial environments in which electromagnetic interference would disrupt the operation of electromechanical relays.



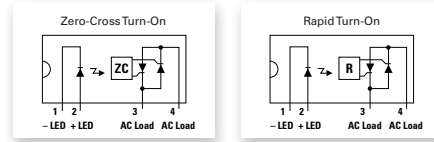
Part Number	Blocking Voltage V <sub>P</sub>	Load Current A	Input Control Current mA	Operating Frequency Range Hz	Isolation Voltage V <sub>rms</sub>	Fig. No.
CPC1943	400	0.5	5	20 - 500	3750	15, 16
CPC1945G	400	1	5	20 - 400	3750	2
CPC1945Y	400	1	5	20 - 400	3750	23
CPC1961 Dual	600	0.25 <sup>1</sup>	5	20 - 500	3750	20, 22
CPC1963	600	0.5	5	20 - 500	3750	15, 16
CPC1965G	600	1	5	20 - 400	3750	2
CPC1965Y	600	1	5	20 - 400	3750	23
CPC1972	800	0.25	5	20 - 500	3750	12, 14
PD1201	400	1	5	20 - 500	3750	2
PD2401	500	1	5	20 - 500	3750	2
PD2601	600	1	5	20 - 500	3750	2
PM1204	400	0.5	5	20 - 500	3750	15, 16
PM1205	500	0.5	5	20 - 500	3750	15, 16
PM1206	600	0.5	5	20 - 500	3750	15, 16
PS1201	400	1	5	20 - 500	3750	23
PS2401	500	1	5	20 - 500	3750	23
PS2601	600	1	5	20 - 500	3750	23

<sup>1</sup> Maximum continuous load current of a single pole or the sum of the load currents with both poles operating simultaneously.

# Solid State Relays



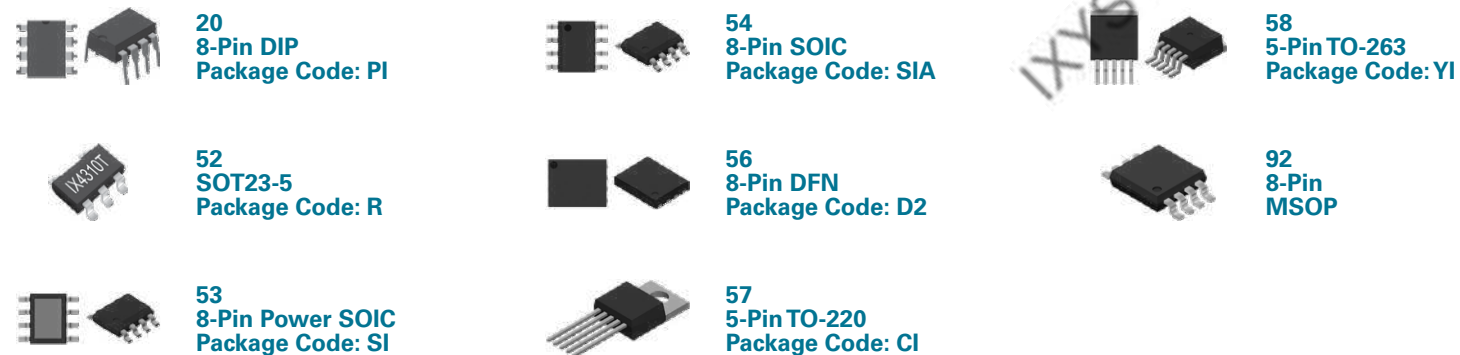
## Optically-Isolated AC Power Switches: $I_{LOAD} > 1A$



Part Number	Blocking Voltage $V_P$	Load Current			Input Control Current mA	Operating Frequency Range Hz	Isolation Voltage $V_{rms}$	Fig. No.
		No Heat Sink $A_{rms}$	with 5°C/W Heat Sink $A_{rms}$	$T_C = 25^\circ C$ $A_{rms}$				
CPC1964B	800	1.5	–	–	5	20 – 500	5000	66
CPC1964BX6 <sup>1</sup>	600	1.5	–	–	5	20 – 500	5000	66
CPC1966	600	3	–	–	5	20 – 500	3750	36
CPC1966B	800	3	–	–	5	20 – 500	5000	66
CPC1966BX8 <sup>1</sup>	800	3	–	–	5	20 – 500	5000	66
CPC1966YX6 <sup>1</sup>	600	3	–	–	5	20 – 500	3750	36
CPC1966YX8 <sup>1</sup>	800	3	–	–	5	20 – 500	3750	36
CPC1976	600	2	–	–	5	20 – 500	3750	36
CPC1976YX6 <sup>1</sup>	600	2	–	–	5	20 – 500	3750	36
CPC1998J	800	5	20	50	5	20 – 500	2500	29
CPC40055ST	800	5	20	40	5	20 – 500	2500	64

<sup>1</sup> Rapid turn-on (non-zero-cross)  
Rapid turn-on devices turn on when the control input becomes true regardless of the load voltage phase. They turn off when the load current crosses zero.

## Gate Driver IC Packages



# Gate Driver ICs

## Low-Side Gate Drivers

IXYS Integrated Circuits offer powerful families of ultra-fast Low-Side Gate Drivers for MOSFETs and IGBTs, with a large mix of logic configurations, packaging, and drive current capabilities. Five of these devices are AEC-Q100 qualified.

Single-output and dual-output low-side driver ICs include selectable options for logic combinations. The range of current ratings offered is the broadest available, extending to 30A peak, which is the LARGEST PEAK DRIVE CURRENT capability for an integrated driver on the market.

In all series devices, internal circuitry eliminates cross conduction and current “shoot-through,” and the driver is virtually immune to latch up.

### Features & Benefits

- 1.5A to 30A peak source sink drive current
- Wide operating voltage range up to 36V
- -40°C to +125°C extended operating temperature range
- Logic input withstands negative swing of up to -5V
- Dual drivers have matched rise and fall times
- Low propagation delay time

### Applications

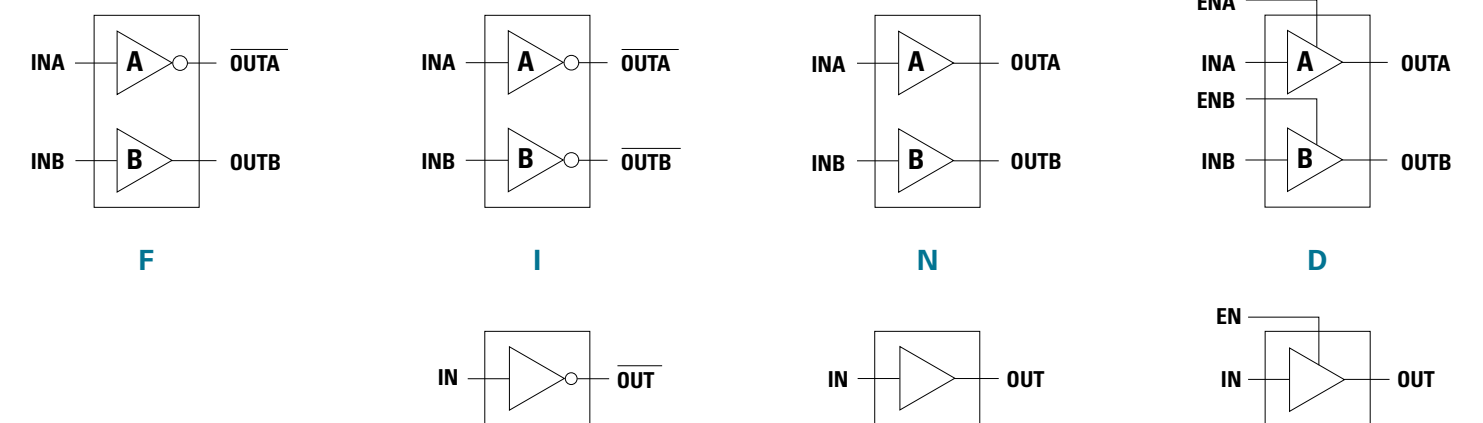
- Efficient power MOSFET and IGBT switching
- Switch mode power supplies
- Motor controls
- DC-to-DC converters
- Class-D switching amplifiers
- Pulse transformer driver

Part Number	Output Type	$I_{PEAK}$ $T_C = 25^\circ C$	Output Resistance	Logic Configuration	Enable Function	Under-Voltage Lockout	Figure Number
		$A_P$	$\Omega$			V	
IX4426	DUAL	1.5	8	I	–	–	54, 56
IX4427	DUAL	1.5	8	N	–	–	54, 56
IX4428	DUAL	1.5	8	F	–	–	54, 56
IX4310T	SINGLE	2	3	D	–	$V_{CC} < 4.2$	52
IXD_602	DUAL	2	4	F, I, N	–	–	20, 53, 54, 56
IXD_604	DUAL	4	2.5	F, I, N, D	•	–	20, 53, 54, 56
IX4340	DUAL	5	1.5	D	•	$V_{CC} < 3.8$	53, 54, 92
IXD_609	SINGLE	9	1	I, N, D	•	–	20, 53, 54, 56, 57, 58
IXD_614	SINGLE	14	0.8	I, N, D	•	–	20, 53, 57, 58
IXD_630	SINGLE	30	0.4	I, N, D	•	$V_{CC} < 12.5$	57, 58
IXD_630M	SINGLE	30	0.4	I, N, D	•	$V_{CC} < 9$	57, 58

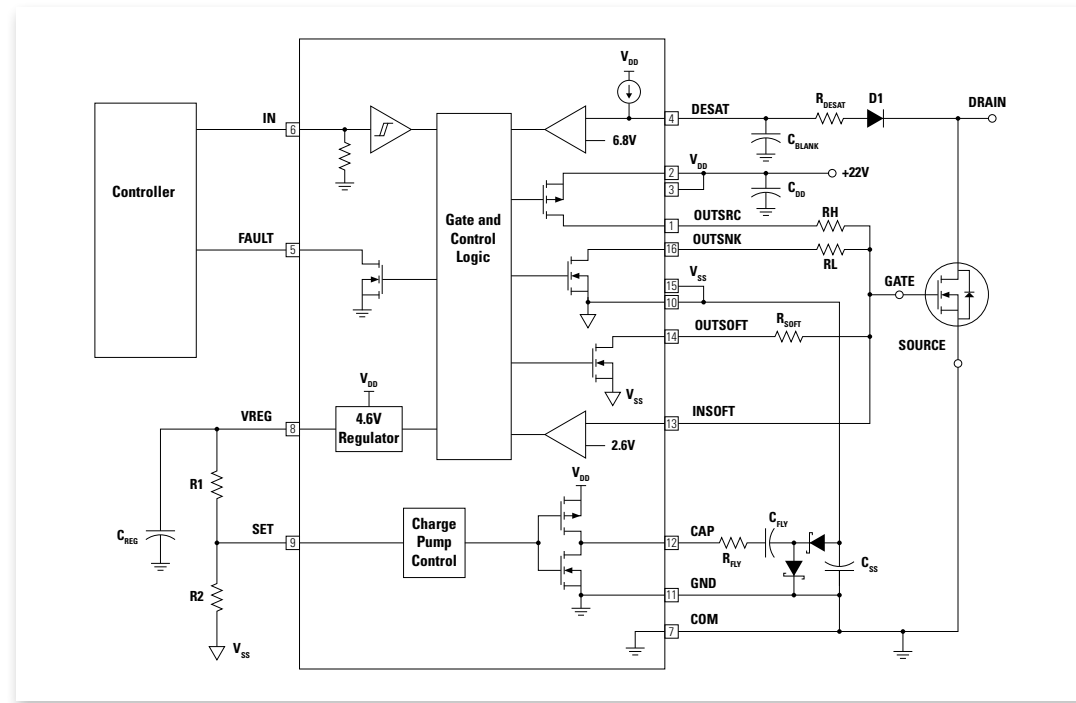
## AEC-Q100-Qualified Low-Side Gate Drivers

Part Number	Output Type	$I_{PEAK}$ $T_C = 25^\circ C$	Output Resistance	Logic Configuration	Enable Function	Under-Voltage Lockout	Figure Number
		$A_P$	$\Omega$			V	
IXD_604SI	DUAL	4	2.5	F, I, N, D	•	–	53
IXD_604SIA	DUAL	4	2.5	F, I, N, D	•	–	54
IX4340NE	DUAL	5	1.5	D	•	$V_{CC} < 3.8$	53
IXD_609SI	SINGLE	9	1	I, N, D	•	–	53
IXD_614SI	SINGLE	14	0.8	I, N, D	•	–	53

### Logic Configurations



## IX4351NE 9A Low-Side SiC MOSFET & IGBT Driver



The IX4351NE is designed specifically to drive SiC MOSFETs and high-power IGBTs. Separate 9A source and sink outputs allow for tailored turn-on and turn-off timing while minimizing switching losses. An internal negative charge regulator provides a selectable negative gate drive bias for improved dV/dt immunity and faster turn-off.

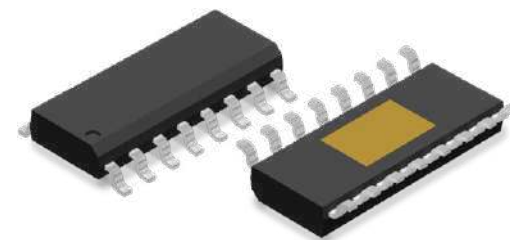
Desaturation detection circuitry senses an overcurrent condition of the SiC MOSFET or IGBT and initiates a soft turn-off, thus preventing a potentially damaging dV/dt event. The non-inverting logic input, IN, is TTL and CMOS compatible; internal level shifters provide the necessary bias to accommodate negative gate drive bias voltages. Additional protection features include UVLO detection and thermal shutdown. An open drain FAULT output signals a fault condition to the microcontroller.

The IX4351NE is rated for an operational temperature range of  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$ , and is available in a thermally enhanced 16-pin narrow SOIC package.

### Features & Benefits

- Separate 9A peak source and sink outputs
- $V_{DD}$  input supply voltage range: +13V to +25V
- Adjustable gate drive voltage range:  $-10\text{V}$  to  $+25\text{V}$
- Internal logic level shifters
- Desaturation detection with soft shutdown sink driver
- Under Voltage Lockout (UVLO)
- Thermal shutdown
- Open drain FAULT output
- TTL and CMOS compatible input

**IX4351NE**  
(16-pin narrow SOIC package with exposed pad)



### Applications

- Driving SiC MOSFETs and IGBTs
- On-board charger and DC charging station
- AC/DC and DC/DC converters
- Industrial power inverters
- Motor controllers

## High-Side and Low-Side Gate Driver ICs

High-side and low-side drivers control two N-Channel MOSFETs or IGBTs in fast switching applications. The gate driver converts PWM input signals into gate signals compatible with MOSFETs or IGBTs, providing a robust and efficient power semiconductor control. An integrated bootstrap circuit is generates a floating voltage that enables the high-side driver to operate up to  $600V_{DC}$ .

The drivers accept wide  $V_{DD}$  supply voltage as well as wide logic input voltage ranges. Various built-in protection features ensure the safe operation of the driver and the driven power semiconductors.

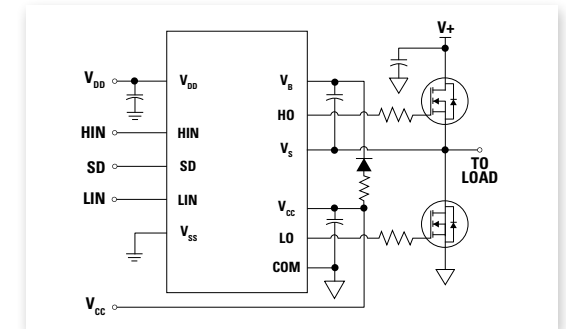
### Features & Benefits

- High-side operation up to  $600V_{DC}$
- Outputs tolerant to negative transients
- Supply voltage range: 10V to 20V
- Logic input voltage range: 3.3V to 20V
- Fixed or programmable deadtime
- Cycle-by-cycle edge-triggered shutdown circuitry
- Under Voltage Lockout (UVLO)
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

### Applications

- DC-DC Converters
- AC-DC Inverters
- Motor Controls
  - Servo Motor Control
  - Pumps and Fans
- Class-D Power Amplifiers
- Uninterruptable Power Supplies (UPS)
- Welding
- Induction Cooking

### LF2110 and LF2113 Application Circuit



Part Number	Type / Description	Max. Offset Voltage	Typ. Sink/Source Peak Drive Current	Inputs	Deadtime	Propagation Delay $t_{ON}/t_{OFF}$	Rise/Fall Time $t_r/t_f$	Package
LF2101NTR	High-Side / Low-Side	600 V	600 mA / 290 mA	HIN / LIN	none	160 ns / 150 ns	70 ns / 35 ns	8-pin SOIC
LF2106NTR	High-Side / Low-Side	600 V	600 mA / 290 mA	HIN / LIN	none	220 ns / 200 ns	100 ns / 35 ns	8-pin SOIC
LF21064NTR	High-Side / Low-Side	600 V	600 mA / 290 mA	HIN / LIN	none	220 ns / 200 ns	100 ns / 35 ns	14-pin SOIC
LF2181NTR	High-Side / Low-Side	600 V	2.3 A / 1.9 A	HIN / LIN	none	180 ns / 220 ns	40 ns / 20 ns	8-pin SOIC
LF21814NTR	High-Side / Low-Side	600 V	2.3 A / 1.9 A	HIN / LIN	none	180 ns / 220 ns	40 ns / 20 ns	14-pin SOIC
LF2110BTR	High-Side / Low-Side	600 V	2.3 A / 1.9 A	HIN / LIN	none	105 ns / 94 ns	15 ns / 13 ns	16-pin SOIC
LF2113BTR	High-Side / Low-Side	600 V	2.3 A / 1.9 A	HIN / LIN	none	105 ns / 94 ns	15 ns / 13 ns	16-pin SOIC
LF2190NTR	High-Side / Low-Side	600 V	4.5 A / 4.5 A	HIN / LIN	none	140 ns / 140 ns	25 ns / 20 ns	8-pin SOIC
LF21904NTR	High-Side / Low-Side	600 V	4.5 A / 4.5 A	HIN / LIN	none	140 ns / 140 ns	25 ns / 20 ns	14-pin SOIC

## Half-Bridge Gate Driver ICs

Half-bridge gate drivers control two N-Channel MOSFETs or IGBTs in fast switching applications. The gate driver converts PWM input signals into gate-signals compatible to MOSFETs or IGBTs, providing a robust and efficient power semiconductor control. An integrated bootstrap circuit is generating a floating voltage with enables the high-side driver to operate up to  $600V_{DC}$ .

The drivers accept wide  $V_{DD}$  supply voltage as well as wide logic input voltage ranges. Various built-in protection features ensure safe operation of the driver and the driven power semiconductors.

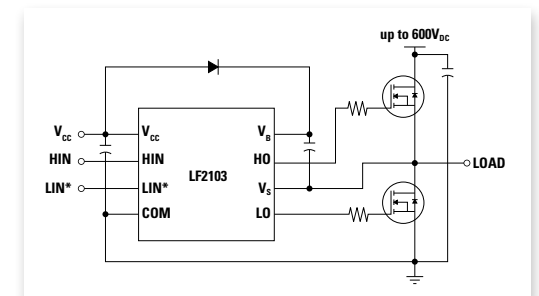
### Features & Benefits

- High-side operation up to  $600V_{DC}$
- Outputs tolerant to negative transients
- Supply voltage range: 10V to 20V
- Logic input voltage range: 3.3V to 20V
- Fixed or programmable deadtime
- Cycle-by-cycle edge-triggered shutdown circuitry
- Under Voltage Lockout (UVLO)
- Operating temperature range:  $-40^{\circ}\text{C}$  to  $+125^{\circ}\text{C}$

### Applications:

- Motor Controls / Drives
- Stepper Motor Drives
- DC/DC-Converters
- AC/DC-Inverters
- Robotics
- Cordless Power Tools
- Drones

### LF2103 Application Circuit



Part Number	Type / Description	Max. Offset Voltage	Typ. Sink/Source Peak Drive Current	Inputs	Deadtime	Propagation Delay $t_{ON}/t_{OFF}$	Rise/Fall Time $t_r/t_f$	Package
LF2103NTR	High-Side / Low-Side	600 V	600 mA / 290 mA	HIN / LIN*	520 ns	680 ns / 150 ns	70 ns / 35 ns	8-pin SOIC
LF2104NTR	High-Side / Low-Side	600 V	600 mA / 290 mA	IN / SD*	520 ns	680 ns / 150 ns	70 ns / 35 ns	8-pin SOIC
LF2304NTR	High-Side / Low-Side	600 V	600 mA / 290 mA	HIN / LIN	100 ns	150 ns / 150 ns	70 ns / 35 ns	8-pin SOIC
LF2184NTR	High-Side / Low-Side	600 V	2.3 A / 1.9 A	IN / SD*	400 ns	680 ns / 270 ns	40 ns / 20 ns	8-pin SOIC
LF21844NTR	High-Side / Low-Side	600 V	2.3 A / 1.9 A	IN / SD*	400 ns - 5 $\mu\text{s}$	680 ns / 270 ns	40 ns / 20 ns	14-pin SOIC



## 3-Phase Half-Bridge Gate Driver ICs

Switching three pairs of N-Channel MOSFETs or IGBTs in 6-pack configurations is challenging in fast switching applications. 3-phase gate drivers convert PWM input signals into gate signals compatible to MOSFETs or IGBTs, providing robust and efficient power semiconductor control.

Integrated bootstrap circuits generate floating voltages, enabling the three high-side drivers to operate up to 600 V<sub>DC</sub>.

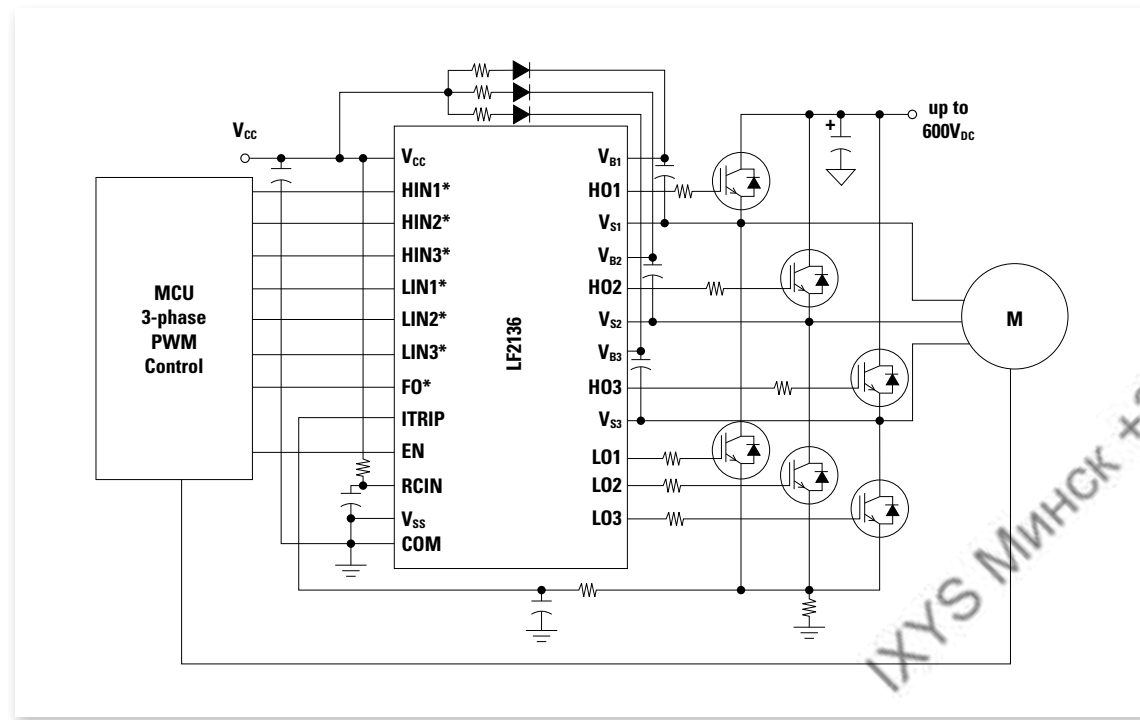
The drivers accept wide V<sub>DD</sub> supply voltage as well as wide logic input voltage ranges. Various built-in protection features ensure the safe operation of the driver and the driven power semiconductors.

### Features & Benefits

- High-side operation up to 600V<sub>DC</sub>
- Outputs tolerant to negative transients
- Supply voltage range: 10V to 20V
- Logic input voltage range: 3.3V to 20V
- Cycle-by-cycle edge-triggered shutdown circuitry
- Under Voltage Lockout (UVLO)
- Matched propagation delay times
- Cross-conduction prevention logic
- Shoot-through protection logic
- Internal deadtime
- Operating temperature range: -40°C to +125°C

### Applications

- 3-Phase Motor Drives
- White Goods
  - Pump Motors
  - Compressor Motors
  - Fan Motors
- Air Conditioners
- Cordless Power Tools
- Robotics



20-Pin SOIC



28-Pin SOIC

Part Number	Max. Offset Voltage	Typ. Sink/Source Peak Drive Current	Inputs	Deadtime	Propagation Delay		Rise/Fall Time		Package
					t <sub>ON</sub> /t <sub>OFF</sub>	t <sub>r</sub> /t <sub>f</sub>			
LF2388BTR	600 V	650 mA / 350 mA	HIN / LIN	270 ns	130 ns / 150 ns	50 ns / 35 ns			20-Pin SOIC
LF2136BTR	600 V	350 mA / 200 mA	HIN* / LIN*	290 ns	330 ns / 330 ns	90 ns / 35 ns			28-Pin SOIC

## Optically Isolated Load-Biased Gate Drivers

The CPC1580 and CPC1590 devices are MOSFET Gate Drivers that require no external power supply: They regulate the input voltage drawn from the load (up to 65V or 200V, respectively), down to 12.2V for internal use. They are specifically designed for low duty cycle switching applications that drive up to 4nF of gate capacitance.

The CPC1580 and CPC1590 devices accomplish very fast MOSFET turn-on by supplying stored charge from an external capacitor to the MOSFET gate when LED input control current is applied. After the MOSFET is turned on, photocurrent from the input optocoupler keeps it on for as long as sufficient input control current flows, so there is no low-frequency operating limit. When the MOSFET is turned off, the storage capacitor charges from the device's regulated internal voltage in preparation for the next turn-on.

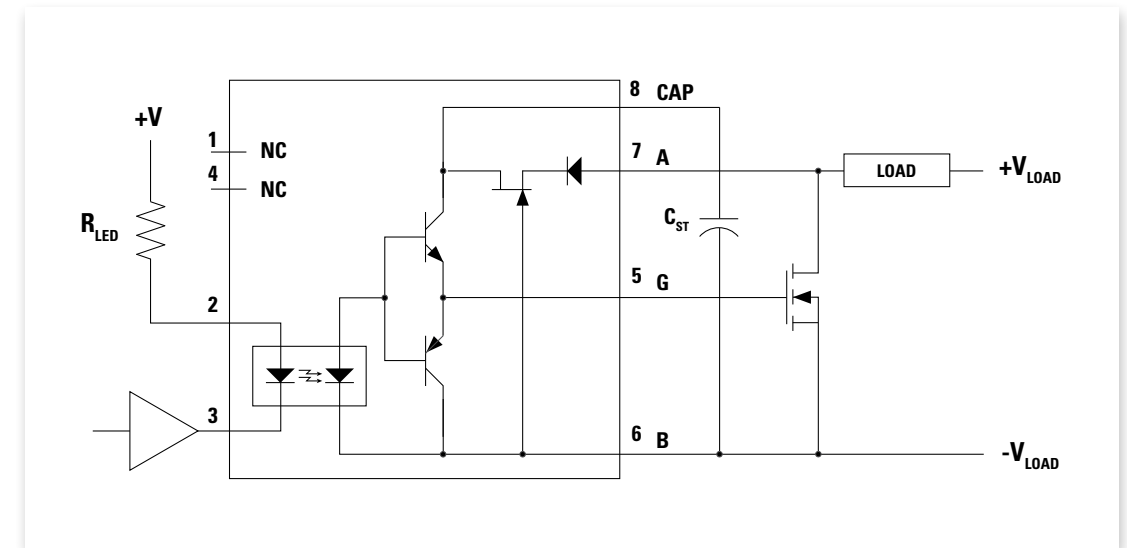
### Features & Benefits

- No external IC power supply required
- Low drive power requirements (TTL/CMOS compatible)
- Load voltages up to 200V
- Fast switching speeds: 40µs on; 400µs off

### Applications

- Instrumentation
- Multiplexers
- I/O subsystems
- Meters (Watt-Hour, water, gas)
- Medical equipment (patient / equipment isolation)
- Security
- Industrial controls

Typical CPC1590 Application Diagram



8-Pin Flatpack

Part Number	Input Control Current (mA)	Gate Voltage @ I <sub>F</sub> = 5mA (V <sub>G</sub> )	Blocking Voltage (V <sub>P</sub> )	Regulated Capacitor Voltage	Switching Speeds	Isolation Voltage (V <sub>rms</sub> )
				V <sub>CAP(max)</sub> (V)	t <sub>on</sub> /t <sub>off</sub> (µs)	
CPC1580	2.5	7.5 - 12	65	V <sub>DS</sub> - 0.2	40 / 400	3750
CPC1590	2.5	7.5 - 12	200	16	40 / 400	3750

## CPC1596: 570V Optically Isolated Load-Biased Gate Driver

The CPC1596 is an optically isolated, load-biased gate driver that requires no additional power supply to bias the external MOSFET gates; in the off-state, it regulates the voltage drawn from the load (up to 570V) down to 12.2V for internal use. It is specifically designed for low duty cycle switching applications such as an optically isolated DC relay using a single MOSFET or an AC relay with two MOSFETs.

The CPC1596 accomplishes very fast MOSFET turn-on by supplying charge stored in an external capacitor to the MOSFET gate when input control current is applied to the device's LED. After the MOSFET is turned on, photocurrent from the internal optocoupler keeps the MOSFET active for as long as sufficient input control current is applied, ensuring a very low-frequency operation. When the MOSFET is turned off, the storage capacitor charges from the load voltage via the regulated internal voltage in preparation for the next turn-on.

Provided in a small, 8-pin package and requiring no separate power supply, the CPC1596 provides a flexible design solution that minimizes PCB real estate.

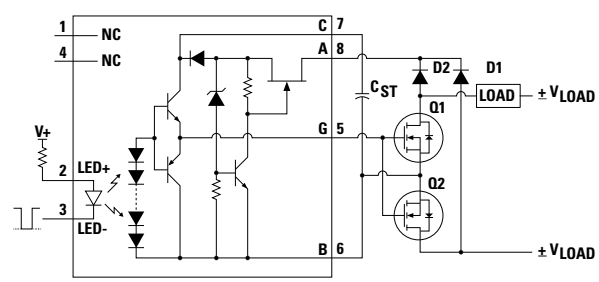
### Features & Benefits

- Requires No Load-Side
- Power Supply
- Drives External Power MOSFET
- Only 2.5mA Input LED Current to Drive External MOSFET
- 3750V<sub>RMS</sub> Input-to-Output Isolation

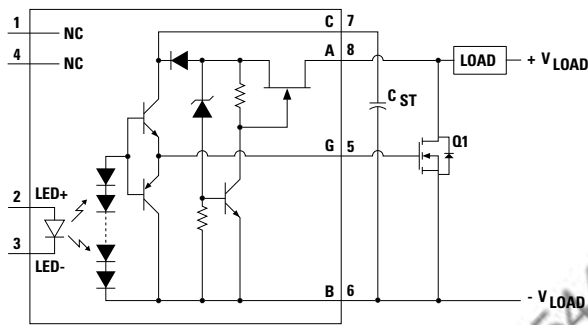
### Applications

- Industrial Controls
- Instrumentation
- Medical Equipment Isolation
- Electronic Switching
- I/O Subsystems
- Appliances

CPC1596 AC Application Circuit



CPC1596 DC Application Circuit



## Optically Isolated Photovoltaic Gate Drivers

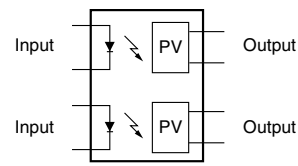
These dual optically isolated photodiode arrays, which can produce an open-circuit voltage of up to 12V, are well suited for use in discrete solid state relay designs. FDA215 and FDA217 are available in 8-pin DIP and 8-pin surface-mount packages.

### Features

- Isolated 5.5V to 12V photovoltaic output
- Floating outputs for parallel or series configuration

### Applications

- MOSFET drivers
- Isolated floating power sources



Part Number	Input Control Current	Nominal Open-Circuit Voltage	Nominal Short-Circuit Current	Switching Speeds	Isolation Voltage	Package Type
	mA	V <sub>OC</sub>	I <sub>SC</sub>	t <sub>on</sub> /t <sub>off</sub>		
FDA215	5	5.5	2.5	5 / 5	3750	8-Pin DIP, 8-Pin Surface Mount
FDA217	5	11.75	4.5	2 / 0.5	3750	8-Pin DIP, 8-Pin Surface Mount

## Linear Optocouplers

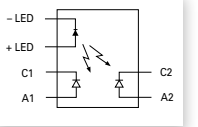
IXYS IC Division linear optocouplers feature an infrared LED optically coupled with two photodiodes. One feedback (input) photodiode is used to generate a control signal that provides a servomechanism to the LED drive current, thus compensating for the LED's nonlinear time and temperature characteristics. The other (output) photodiode provides an output signal that is linear with respect to the servo LED current. The devices feature wide bandwidth, high input-to-output isolation, and excellent servo linearity.

### Features & Benefits

- Couples analog & digital signals
- 3750V<sub>RMS</sub> input-to-output isolation
- 200kHz bandwidth in photoconductive mode
- 40kHz bandwidth in photovoltaic mode
- High gain stability
- Low input-to-output capacitance
- Low power consumption
- 0.01% servo linearity
- THD 87dB typical

### Applications

- Power supply feedback voltage/current
- Industrial and medical sensors
- Isolation of process control transducers
- Isolated 4-20mA converters



Part Number	Servo Gain	Forward Gain	Transfer Gain	Input Control Current	Isolation Voltage	Package Type
	K1 = I <sub>1</sub> /I <sub>F</sub> Min/Max	K2 = I <sub>2</sub> /I <sub>F</sub> Min/Max	K3 = K <sub>2</sub> /K <sub>1</sub> Min/Max	(mA)	(V <sub>rms</sub> )	
LOC110	0.004 / 0.03	0.004 / 0.03	0.668 / 1.179	2 - 10	3750	20, 21, 22
LOC111	0.008 / 0.03	0.006 / 0.03	0.733 / 1.072	2 - 10	3750	20, 21, 22
LOC112	0.004 / 0.03	0.004 / 0.03	0.733 / 1.072	2 - 10	3750	20, 21, 22
LOC117	0.008 / 0.03	0.006 / 0.03	0.887 / 1.072	2 - 10	3750	20, 21, 22

## Two fundamental operating configurations

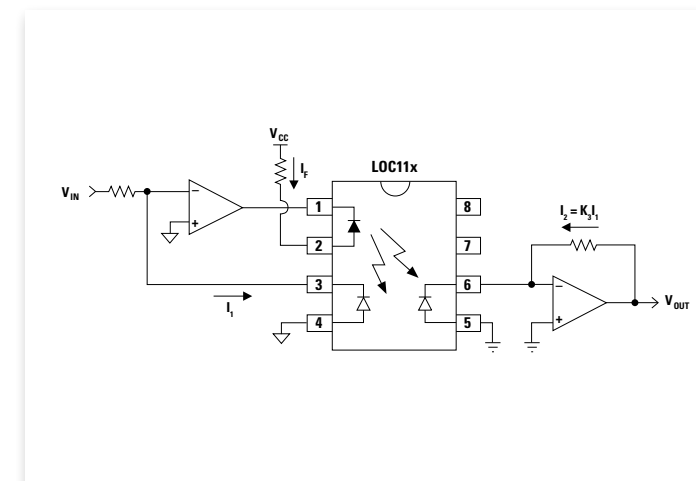
### Photovoltaic Mode

- 14-bit linearity
- 40kHz bandwidth

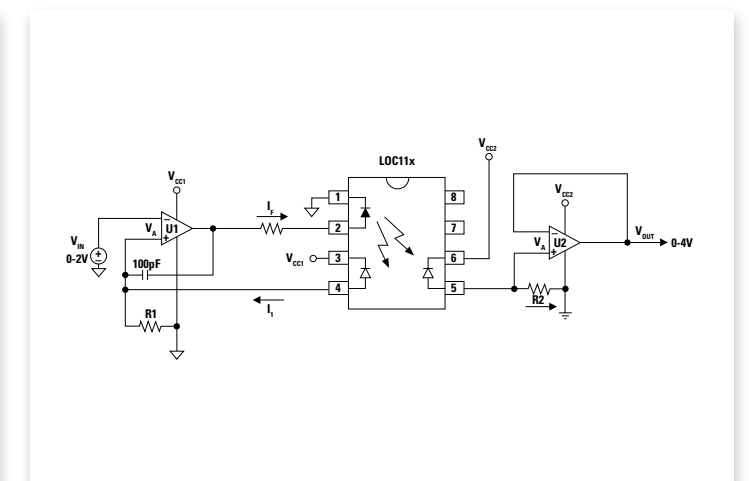
### Photoconductive Mode

- 200kHz bandwidth
- 8-bit linearity

### Isolation Amplifier Photovoltaic Mode



### Isolation Amplifier Photoconductive Mode



# High-Power Devices



**W23**  
Weight 250 g



**W114**  
Weight 650 g



**WC65**



**WC64**



**W24**  
Weight 250 g



**W39**  
Weight 250 g



**WC66**

Our comprehensive range of rectifier diodes offers class-leading performance and reliability. Our devices are available with blocking voltages from 200 V up to 7.2 kV. Optimized to offer low conduction losses, these devices are ideally suited to line frequency applications up to 400 Hz, including input rectifiers for variable speed drives, traction converters, trackside substations, welding, and DC power supplies. Featuring high temperature alloyed die construction, these devices offer low thermal impedance with high overload capacity and are designed to survive even the most arduous applications.

The latest additions to the IXYS UK Rectifier Diode family are the new 38 mm and 50 mm Wespac rectifier diodes and the new 96 mm large area rectifier diodes. These new designs were constructed using low temperature sintering technology and have an improved package design for maximum power-to-package ratio, as well as better thermal and electromechanical performance. The Wespac parts are available in current ratings up to 5332 A and voltage ratings up to 3000 V. The 96 mm parts are available in current ratings up to 12100 A and voltage ratings up to 6000 V.

Also available is a new 1263 A-rated M24 stud-based assembly with voltage grades of up to 2500 V.

## Rectifier Diodes—Stud Types



Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> TC = 55°C A	I <sub>FSM</sub>		V <sub>TO</sub> V	r <sub>T</sub> mΩ	T <sub>JM</sub> °C	R <sub>thJC</sub>		Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>					d.c. 180° sine K/W	120° Rect. K/W	
			A	A <sup>2</sup> s						
LW0428RE250	2500	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W39
W0428RE280	2800	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W39
W0428RE320	3200	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W39
W0428RF250	2500	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W24
W0428RF280	2800	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W24
W0428RF320	3200	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W24
W0428SE250	2500	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W39
W0428SE280	2800	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W39
W0428SE320	3200	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W39
W0428SF250	2500	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W24
W0428SF280	2800	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W24
W0428SF320	3200	428	5500	151 × 10 <sup>3</sup>	0.926	0.739	150	0.1300	0.1530	W24
W0503RC160	1600	503	5500	151 × 10 <sup>3</sup>	0.990	0.740	180	0.1300	0.1530	W24
W0503RC200	2000	503	5500	151 × 10 <sup>3</sup>	0.990	0.740	180	0.1300	0.1530	W24
W0503RC240	2400	503	5500	151 × 10 <sup>3</sup>	0.990	0.740	180	0.1300	0.1530	W24
W0503SC160	1600	503	5500	151 × 10 <sup>3</sup>	0.990	0.740	180	0.1300	0.1530	W24
W0503SC200	2000	503	5500	151 × 10 <sup>3</sup>	0.990	0.740	180	0.1300	0.1530	W24
W0503SC240	2400	503	5500	151 × 10 <sup>3</sup>	0.990	0.740	180	0.1300	0.1530	W24
W0735RA120	1200	735	9000	405 × 10 <sup>3</sup>	0.790	0.342	190	0.1300	0.1530	W23
W0735RA150	1500	735	9000	405 × 10 <sup>3</sup>	0.790	0.342	190	0.1300	0.1530	W23
W0735SA120	1200	735	9000	405 × 10 <sup>3</sup>	0.790	0.342	190	0.1300	0.1530	W23
W0735SA150	1500	735	9000	405 × 10 <sup>3</sup>	0.790	0.342	190	0.1300	0.1530	W23
W1263YC200KER	2000	675	11000	405 × 10 <sup>3</sup>	0.870	0.330	175	0.1249	0.1359	W114
W1263YC250KER	2500	675	11000	405 × 10 <sup>3</sup>	0.870	0.330	175	0.1249	0.1359	W114
W1263YC200KES	2000	675	11000	405 × 10 <sup>3</sup>	0.870	0.330	175	0.1249	0.1359	W114
W1263YC250KES	2500	675	11000	405 × 10 <sup>3</sup>	0.870	0.330	175	0.1249	0.1359	W114

## Standard Base Clamp Kits

Part Number	Old square base part no.	Base polarity	V <sub>RRM</sub>	I <sub>FAV</sub> T <sub>C</sub> = 100°C	I <sub>FSM</sub>	I <sup>2</sup> t	V <sub>T</sub>	r <sub>T</sub>	R <sub>th</sub>	Temp	Fig. No.
			V	A	kA	A <sup>2</sup> s	V	mΩ	K/W	°C	
W1185LC450KBR <sup>1</sup>	SW45KBR515	Anode	4500	435	10.2	520 × 10 <sup>3</sup>	1.000	0.575	0.085	160	WC64
W1185LC450KBN <sup>1</sup>	SW45KBN515	Cathode	4500	380	10.2	520 × 10 <sup>3</sup>	1.000	0.575	0.101	160	WC64
W1411LC360KBR <sup>1</sup>	SW36KBR595	Anode	3600	505	12.2	744 × 10 <sup>3</sup>	0.900	0.388	0.085	160	WC64
W1411LC360KBN <sup>1</sup>	SW36KBN595	Cathode	3600	445	12.2	744 × 10 <sup>3</sup>	0.900	0.388	0.101	160	WC64
W1524LC300KBR <sup>1</sup>	SW30KBR636	Anode	3000	540	13.4	898 × 10 <sup>3</sup>	0.870	0.323	0.085	160	WC64
W1524LC300KBN <sup>1</sup>	SW30KBN636	Cathode	3000	470	13.4	898 × 10 <sup>3</sup>	0.870	0.323	0.101	160	WC64
W1748LC220KBR <sup>1</sup>	SW22KBR805	Anode	2200	660	13.5	911 × 10 <sup>3</sup>	0.870	0.280	0.085	175	WC64
W1748LC220KBN <sup>1</sup>	SW22KBN805	Cathode	2200	582	13.5	911 × 10 <sup>3</sup>	0.870	0.280	0.101	175	WC64
W2058LC120KBR <sup>1</sup>	SW12KBR935	Anode	1200	760	16.1	1.30 × 10 <sup>6</sup>	0.790	0.192	0.085	175	WC64
W2058LC120KBN <sup>1</sup>	SW12KBN935	Cathode	1200	665	16.1	1.30 × 10 <sup>6</sup>	0.790	0.192	0.101	175	WC64
W1185LC450KCR	SW45KBR515	Anode	4500	455	10.2	520 × 10 <sup>3</sup>	1.000	0.575	0.080	160	WC65
W1185LC450KCN	SW45KBN515	Cathode	4500	395	10.2	520 × 10 <sup>3</sup>	1.000	0.575	0.097	160	WC65
W1411LC360KCR	SW36KBR595	Anode	3600	530	12.0	720 × 10 <sup>3</sup>	0.900	0.388	0.080	160	WC65
W1411LC360KCN	SW36KBN595	Cathode	3600	460	12.0	720 × 10 <sup>3</sup>	0.900	0.388	0.097	160	WC65
W1524LC300KCR	SW30KBR635	Anode	3000	565	13.4	898 × 10 <sup>3</sup>	0.870	0.323	0.080	160	WC65
W1524LC300KCN	SW30KBN636	Cathode	3000	490	13.4	898 × 10 <sup>3</sup>	0.870	0.323	0.097	160	WC65
W1748LC220KCR	SW22KBR805	Anode	2200	690	13.5	911 × 10 <sup>3</sup>	0.870	0.280	0.080	175	WC65
W1748LC220KCN	SW22KBN805	Cathode	2200	600	13.5	911 × 10 <sup>3</sup>	0.870	0.280	0.097	175	WC65
W2058LC120KCR	SW12KBR935	Anode	1200	800	16.1	1.30 × 10 <sup>6</sup>	0.790	0.192	0.080	175	WC65
W2058LC120KCN	SW12KBN935	Cathode	1200	690	16.1	1.30 × 10 <sup>6</sup>	0.790	0.192	0.097	175	WC65
W3082MC450KDR	SB45KDR680	Anode	4500	1115	26.6	3.54 × 10 <sup>6</sup>	0.923	0.192	0.037	160	WC66
W3082MC450KDN	SB45KDN680	Cathode	4500	1030	26.6	3.54 × 10 <sup>6</sup>	0.923	0.192	0.041	160	WC66
W3708MC350KDR	SB35KDR820	Anode	3500	1240	33.7	5.68 × 10 <sup>6</sup>	0.958	0.112	0.037	160	WC66
W3708MC350KDN	SB35KDN820	Cathode	3500	1145	33.7	5.68 × 10 <sup>6</sup>	0.958	0.112	0.041	160	WC66
W3842MC280KDR	SB28KDR950	Anode	2800	1325	33.5	5.61 × 10 <sup>6</sup>	0.831	0.118	0.037	160	WC66
W3842MC280KDN	SB28KDN950	Cathode	2800	1225	33.5	5.61 × 10 <sup>6</sup>	0.831	0.118	0.041	160	WC66
W5636MC150KDR	SB15KDR14C	Anode	1500	2035	43.9	9.64 × 10 <sup>6</sup>	0.698	0.059	0.037	175	WC66
W5636MC150KDN	SB15KDN14C	Cathode	1500	1875	43.9	9.64 × 10 <sup>6</sup>	0.698	0.059	0.041	175	WC66

<sup>1</sup> Assembly supplied either as kit of parts or sub-assembly with selected diodes or thyristors.



**W1**  
Weight 70 g

**W2**  
Weight 80 g

**W3**  
Weight 140 g

**W4**  
Weight 340 g

**W5**  
Weight 510 g

**W6**  
Weight 1 kg

**W37**  
Weight 510 g

**W43**  
Weight 800 g

**W54**  
Weight 530 g

**W89**  
Weight 1.3 kg

**W94**  
Weight 1.6 kg

**W120**  
Weight 450 g

**W121**  
Weight 330 g

**W123**  
Weight 330 g

## Rectifier Diodes—Capsule Types



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> T <sub>K</sub> = 55°C	I <sub>FSM</sub>		V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub>		Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>					180° Sine	120° Rect.	
			A	A <sup>2</sup> s						
W0507YH420	4200	505	7600	289 × 10 <sup>3</sup>	0.970	0.880	160	0.1000	0.1170	W3
W0507YH450	4500	505	7600	289 × 10 <sup>3</sup>	0.970	0.880	160	0.1000	0.1170	W3
W0642WC160	1600	680	5500	151 × 10 <sup>3</sup>	1.070	0.676	190	0.0900	0.0980	W1
W0642WC200	2000	680	5500	151 × 10 <sup>3</sup>	1.070	0.676	190	0.0900	0.0980	W1
W0642WC240	2400	680	5500	151 × 10 <sup>3</sup>	1.070	0.676	190	0.0900	0.0980	W1
W0790LG650	6500	790	6000	180 × 10 <sup>3</sup>	0.919	1.249	150	0.0394	0.0445	W120
W0880LC620	6200	880	6000	180 × 10 <sup>3</sup>	0.919	1.249	150	0.033	0.04	W4
W0880LC650	6500	880	6000	180 × 10 <sup>3</sup>	0.919	1.249	150	0.033	0.04	W4
W0880LC680	6800	880	6000	180 × 10 <sup>3</sup>	0.919	1.249	150	0.033	0.04	W4
W0925LG500	5000	925	7200	259 × 10 <sup>3</sup>	1.000	0.702	150	0.0394	0.0445	W120
W0925LG560	5600	925	7200	259 × 10 <sup>3</sup>	1.000	0.702	150	0.0394	0.0445	W120
W0925LG600	6000	925	7200	259 × 10 <sup>3</sup>	1.000	0.702	150	0.0394	0.0445	W120
W0944WC120	1200	944	9000	405 × 10 <sup>3</sup>	0.790	0.342	190	0.0900	0.0980	W1
W0944WC150	1500	944	9000	405 × 10 <sup>3</sup>	0.790	0.342	190	0.0900	0.0980	W1
W1032LC500	5000	1032	7200	259 × 10 <sup>3</sup>	1.000	0.702	150	0.0330	0.0400	W4
W1032LC560	5600	1032	7200	259 × 10 <sup>3</sup>	1.000	0.702	150	0.0330	0.0400	W4
W1032LC600	6000	1032	7200	259 × 10 <sup>3</sup>	1.000	0.702	150	0.0330	0.0400	W4
W1060LG420	4200	1060	9200	423 × 10 <sup>3</sup>	1.000	0.575	160	0.0394	0.0445	W120
W1060LG450	4500	1060	9200	423 × 10 <sup>3</sup>	1.000	0.575	160	0.0394	0.0445	W120
W1074YC200	2000	1074	10800	583 × 10 <sup>3</sup>	0.920	0.390	160	0.0500	0.0610	W2
W1074YC260	2600	1074	10800	583 × 10 <sup>3</sup>	0.920	0.390	160	0.0500	0.0610	W2
W1074YC320	3200	1074	10800	583 × 10 <sup>3</sup>	0.920	0.390	160	0.0500	0.0610	W2
W1074YH200	2000	1074	10800	583 × 10 <sup>3</sup>	0.920	0.390	160	0.0500	0.0610	W3
W1074YH260	2600	1074	10800	583 × 10 <sup>3</sup>	0.920	0.390	160	0.0500	0.0610	W3
W1074YH320	3200	1074	10800	583 × 10 <sup>3</sup>	0.920	0.390	160	0.0500	0.0610	W3
W1185LC420	4200	1185	9200	423 × 10 <sup>3</sup>	1.000	0.575	160	0.0330	0.0393	W4
W1185LC450	4500	1185	9200	423 × 10 <sup>3</sup>	1.000	0.575	160	0.0330	0.0393	W4
W1260LG320	3200	1260	10600	562 × 10 <sup>3</sup>	0.900	0.388	160	0.0394	0.0445	W120
W1260LG360	3600	1260	10600	562 × 10 <sup>3</sup>	0.900	0.388	160	0.0394	0.0445	W120
W1263YC160	1600	1263	11700	684 × 10 <sup>3</sup>	0.870	0.330	175	0.0500	0.0610	W2
W1263YC220	2200	1263	11700	684 × 10 <sup>3</sup>	0.870	0.330	175	0.0500	0.0610	W2
W1263YC250	2500	1263	11700	684 × 10 <sup>3</sup>	0.870	0.330	175	0.0500	0.0610	W2
W1263YH160	1600	1263	11700	684 × 10 <sup>3</sup>	0.870	0.330	175	0.0500	0.0610	W3
W1263YH200	2000	1263	11700	684 × 10 <sup>3</sup>	0.870	0.330	175	0.0500	0.0610	W3

## Rectifier Diodes—Capsule Types

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> T <sub>K</sub> = 55°C	I <sub>FSM</sub>		V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub>		Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>					180° Sine	120° Rect.	
			A	A <sup>2</sup> s						
W1263YH250	2500	1263	11700	684 × 10 <sup>3</sup>	0.870	0.330	175	0.0500	0.0610	W3
W1360LG240	2400	1360	12700	800 × 10 <sup>3</sup>	0.870	0.323	160	0.0394	0.0445	W120
W1360LG300	3000	1360	12700	800 × 10 <sup>3</sup>	0.870	0.323	160	0.0394	0.0445	W120
W1748LC180	1800	1748	15400	118 × 10 <sup>3</sup>	0.870	0.280	175	0.0330	0.0393	W4
W1748LC250	2500	1748	15400	118 × 10 <sup>3</sup>	0.870	0.280	175	0.0330	0.0393	W4
W1856NC400	4000	1856	16000	128 × 10 <sup>3</sup>	0.975	0.348	160	0.0220	0.0255	W5
W1856NC500	5000	1856	16000	128 × 10 <sup>3</sup>	0.975	0.348	160	0.0220	0.0255	W5
W1975MC620	6200	1975	18000	1.62 × 10 <sup>6</sup>	0.95	0.51	150	0.014	0.0158	W54
W1975MC650	6500	1975	18000	1.62 × 10 <sup>6</sup>	0.950	0.510	150	0.0140	0.0158	W54
W1975MC680	6800	1975	18000	1.62 × 10 <sup>6</sup>	0.950	0.510	150	0.0140	0.0158	W54
W2054NC420	4200	2054	19000	1.81 × 10 <sup>6</sup>	0.800	0.300	160	0.0220	0.0274	W5
W2054NC450	4500	2054	19000	1.81 × 10 <sup>6</sup>	0.800	0.300	160	0.0220	0.0274	W5
W2058LC100	1000	2058	19500	1.90 × 10 <sup>6</sup>	0.790	0.192	175	0.0330	0.0393	W4
W2058LC120	1200	2058	19500	1.90 × 10 <sup>6</sup>	0.790	0.192	175	0.0330	0.0393	W4
W2058LC140	1400	2058	19500	1.90 × 10 <sup>6</sup>	0.790	0.192	175	0.0330	0.0393	W4
W2115MC520	5200	2122	19000	1.81 × 10 <sup>6</sup>	1.074	0.405	150	0.0140	0.0158	W54
W2115MC560	5600	2122	19000	1.81 × 10 <sup>6</sup>	1.074	0.405	150	0.0140	0.0158	W54
W2115MC600	6000	2122	19000	1.81 × 10 <sup>6</sup>	1.074	0.405	150	0.0140	0.0158	W54
W2134NC360	3600	2134	20000	2.00 × 10 <sup>6</sup>	0.865	0.260	160	0.0220	0.0255	W5
W2134NC400	4000	2134	20000	2.00 × 10 <sup>6</sup>	0.865	0.260	160	0.0220	0.0255	W5
W2624NC240	2400	2624	28000	3.92 × 10 <sup>6</sup>	0.780	0.160	160	0.0220	0.0255	W5
W2624NC280	2800	2624	28000	3.92 × 10 <sup>6</sup>	0.780	0.160	160	0.0220	0.0255	W5
W2624ND240	2400	2624	28000	3.92 × 10 <sup>6</sup>	0.780	0.160	160	0.0220	0.0255	W37
W2624ND280	2800	2624	28000	3.92 × 10 <sup>6</sup>	0.780	0.160	160	0.0220	0.0255	W37
W2820VC420	4200	2820	26200	3.43 × 10 <sup>6</sup>	1.300	0.147	160	0.0160	0.0190	W6
W2820VC450	4500	2820	26200	3.43 × 10 <sup>6</sup>	1.300	0.147	160	0.0160	0.0190	W6
W2820VF420	4200	2820	26200	3.43 × 10 <sup>6</sup>	1.300	0.147	160	0.0160	0.0190	W43
W2820VF450	4500	2820	26200	3.43 × 10 <sup>6</sup>	1.300	0.147	160	0.0160	0.0190	W43
W2830HE520	5200	2830	32000	5.12 × 10 <sup>6</sup>	0.910	0.260	150	0.0123	0.0133	W123
W2830HE560	5600	2830	32000	5.12 × 10 <sup>6</sup>	0.910	0.260	150	0.0123	0.0133	W123
W2830HE600	6000	2830	32000	5.12 × 10 <sup>6</sup>	0.910	0.260	150	0.0123	0.0133	W123
W2865HA620	6200	2862	32400	5.25 × 10 <sup>6</sup>	0.982	0.308	150	0.0105	0.0116	W121
W2865HA650	6500	2862	32400	5.25 × 10 <sup>6</sup>	0.982	0.308	150	0.0105	0.0116	W121
W2865HA680	6800	2862	32400	5.25 × 10 <sup>6</sup>	0.982	0.308	150	0.0105	0.0116	W121
W2899MC460	4600	2899	25400	3.23 × 10 <sup>6</sup>	0.996	0.222	160	0.0140	0.0158	W54
W2899MC480	4800	2899	25400	3.23 × 10 <sup>6</sup>	0.996	0.222	160	0.0140	0.0158	W54
W3082MC420	4200	3120	26000	3.23 × 10 <sup>6</sup>	0.923	0.192	160	0.0140	0.0160	W54
W3082MC450	4500	3120	26000	3.23 × 10 <sup>6</sup>	0.923	0.192	160	0.0140	0.0160	W54
W3090HA520	5200	3110	32000	5.12 × 10 <sup>6</sup>	0.910	0.260	150	0.0105	0.0116	W121
W3090HA560	5600	3110	32000	5.12 × 10 <sup>6</sup>	0.910	0.260	150	0.0105	0.0116	W121
W3090HA600	6000	3110	32000	5.12 × 10 <sup>6</sup>	0.910	0.260	150	0.0105	0.0116	W121
W3128VC360	3600	3128	30000	5.12 × 10 <sup>6</sup>	0.875	0.158	160	0.0160	0.0190	W6
W3128VC400	4000	3128	30000	5.12 × 10 <sup>6</sup>	0.875	0.158	160	0.0160	0.0190	W6
W3128VF360	3600	3128	30000	4.50 × 10 <sup>6</sup>	0.875	0.158	160	0.0160	0.0190	W43
W3128VF400	4000	3128	30000	4.50 × 10 <sup>6</sup>	0.875	0.158	160	0.0160	0.0190	W43
W3270NC200	2000	3270	28000	3.92 × 10 <sup>6</sup>	0.826	0.104	1			



## Rectifier Diodes—Capsule Types



Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> T <sub>K</sub> = 55°C A	I <sub>FSM</sub> 10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>		V <sub>TO</sub> V	r <sub>T</sub> mΩ	T <sub>JM</sub> °C	R <sub>thJK</sub>		Fig. No.
			A	A <sup>2</sup> s				180° Sine K/W	120° Rect. K/W	
			@T <sub>JM</sub>							
W3708MC350	3500	3753	30000	4.50 × 10 <sup>6</sup>	0.958	0.112	160	0.0140	0.0158	W54
W3743ZC400	4000	3750	35000	6.13 × 10 <sup>6</sup>	0.976	0.170	160	0.0110	0.0132	W7
W3743ZC450	4500	3750	35000	6.13 × 10 <sup>6</sup>	0.976	0.170	160	0.0110	0.0132	W7
W3743ZC500	5000	3750	35000	6.13 × 10 <sup>6</sup>	0.976	0.170	160	0.0110	0.0132	W7
W3743ZD400	4000	3750	35000	6.13 × 10 <sup>6</sup>	0.976	0.170	160	0.0110	0.0132	W42
W3743ZD450	4500	3750	35000	6.13 × 10 <sup>6</sup>	0.976	0.170	160	0.0110	0.0132	W42
W3743ZD500	5000	3750	35000	6.13 × 10 <sup>6</sup>	0.976	0.170	160	0.0110	0.0132	W42
W3841VC300	3000	3841	39800	7.92 × 10 <sup>6</sup>	0.860	0.115	175	0.0160	0.0190	W6
W3841VC340	3400	3841	39800	7.92 × 10 <sup>6</sup>	0.860	0.115	175	0.0160	0.0190	W6
W3841VF300	3000	3841	39800	7.92 × 10 <sup>6</sup>	0.860	0.115	175	0.0160	0.0190	W43
W3841VF340	3400	3841	39800	7.92 × 10 <sup>6</sup>	0.860	0.115	175	0.0160	0.0190	W43
W3842MC240	2400	3842	35100	6.16 × 10 <sup>6</sup>	0.831	0.118	160	0.0140	0.0158	W54
W3842MC280	2800	3842	35100	6.16 × 10 <sup>6</sup>	0.831	0.118	160	0.0140	0.0158	W54
W3842MC28A <sup>1</sup>	2800	3842	35100	6.16 × 10 <sup>6</sup>	0.831	0.118	160	0.0140	0.0158	W54
W3864QK120	1200	3864	22200	2.46 × 10 <sup>6</sup>	0.861	0.109	180	0.0170	0.0210	WD2
W3864QK150	1500	3864	22200	2.46 × 10 <sup>6</sup>	0.861	0.109	180	0.0170	0.0210	WD2
W3864QK180	1800	3864	22200	2.46 × 10 <sup>6</sup>	0.861	0.109	180	0.0170	0.0210	WD2
W4096ZC420	4200	4096	41700	8.70 × 10 <sup>6</sup>	0.730	0.158	160	0.0110	0.0132	W7
W4096ZC450	4500	4096	41700	8.70 × 10 <sup>6</sup>	0.730	0.158	160	0.0110	0.0132	W7
W4096ZD420	4200	4096	41700	8.70 × 10 <sup>6</sup>	0.730	0.158	160	0.0110	0.0132	W42
W4096ZD450	4500	4096	41700	8.70 × 10 <sup>6</sup>	0.730	0.158	160	0.0110	0.0132	W42
W4205TJ520	5200	4205	45000	10.1 × 10 <sup>6</sup>	0.850	0.190	150	0.0080	0.0085	W89
W4205TJ560	5600	4205	45000	10.1 × 10 <sup>6</sup>	0.850	0.190	150	0.0080	0.0085	W89
W4205TJ600	6000	4205	45000	10.1 × 10 <sup>6</sup>	0.850	0.190	150	0.0080	0.0085	W89
W4205TE520	5200	4205	45000	10.1 × 10 <sup>6</sup>	0.850	0.190	150	0.0080	0.0085	W94
W4205TE560	5600	4205	45000	10.1 × 10 <sup>6</sup>	0.850	0.190	150	0.0080	0.0085	W94
W4205TE600	6000	4205	45000	10.1 × 10 <sup>6</sup>	0.850	0.190	150	0.0080	0.0085	W94
W4534NC030	300	4534	40000	8.00 × 10 <sup>6</sup>	0.765	0.052	190	0.0220	0.0255	W5
W4534NC060	600	4534	40000	8.00 × 10 <sup>6</sup>	0.765	0.052	190	0.0220	0.0255	W5
W4534ND030	300	4534	40000	8.00 × 10 <sup>6</sup>	0.765	0.052	190	0.0220	0.0255	W37
W4534ND060	600	4534	40000	8.00 × 10 <sup>6</sup>	0.765	0.052	190	0.0220	0.0255	W37
W4693QK050	500	4693	31500	4.98 × 10 <sup>6</sup>	0.904	0.057	180	0.0170	0.0207	WD2
W4693QK080	800	4693	31500	4.98 × 10 <sup>6</sup>	0.904	0.057	180	0.0170	0.0207	WD2
W4693QR050	500	4693	31500	4.98 × 10 <sup>6</sup>	0.904	0.057	180	0.0170	0.0207	WD7
W4693QR080	800	4693	31500	4.98 × 10 <sup>6</sup>	0.904	0.057	180	0.0170	0.0207	WD7

<sup>1</sup> Avalanche Rated Diode

## Rectifier Diodes—Capsule Types

Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> T <sub>K</sub> = 55°C A	I <sub>FSM</sub> 10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>		V <sub>TO</sub> V	r <sub>T</sub> mΩ	T <sub>JM</sub> °C	R <sub>thJK</sub>		Fig. No.
			A	A <sup>2</sup> s				180° Sine K/W	120° Rect. K/W	
			@T <sub>JM</sub>							
W4713HL300	3000	4713	56000	15.70 × 10 <sup>6</sup>	0.807	0.090	160	0.0120	0.0132	WD5
W4713HL350	3500	4713	56000	15.70 × 10 <sup>6</sup>	0.807	0.090	160	0.0120	0.0132	WD5
W4713HM300	3000	4713	56000	15.70 × 10 <sup>6</sup>	0.807	0.090	160	0.0120	0.0132	WD6
W4713HM350	3500	4713	56000	15.70 × 10 <sup>6</sup>	0.807	0.090	160	0.0120	0.0132	WD6
W4767MC180	1800	4755	38000	7.22 × 10 <sup>6</sup>	0.827	0.083	175	0.0140	0.0158	W54
W4767MC220	2200	4755	38000	7.22 × 10 <sup>6</sup>	0.827	0.083	175	0.0140	0.0158	W54
W5092ZC320	3200	5092	58000	16.8 × 10 <sup>6</sup>	0.874	0.079	160	0.0110	0.0132	W7
W5092ZC350	3500	5092	58000	16.8 × 10 <sup>6</sup>	0.874	0.079	160	0.0110	0.0132	W7
W5092ZD320	3200	5092	58000	16.8 × 10 <sup>6</sup>	0.874	0.079	160	0.0110	0.0132	W42
W5092ZD350	3500	5092	58000	16.8 × 10 <sup>6</sup>	0.874	0.079	160	0.0110	0.0132	W42
W5130MK240	2400	5130	42000	8.82 × 10 <sup>6</sup>	0.910	0.070	175	0.0130	0.0149	WD3
W5130MK280	2800	5130	42000	8.82 × 10 <sup>6</sup>	0.910	0.070	175	0.0130	0.0149	WD3
W5139TJ450	4500	5139	55000	15.10 × 10 <sup>6</sup>	0.826	0.136	160	0.0080	0.0085	W89
W5139TJ480	4800	5139	55000	15.10 × 10 <sup>6</sup>	0.826	0.136	160	0.0080	0.0085	W89
W5139TE450	4500	5139	55000	15.10 × 10 <sup>6</sup>	0.826	0.136	160	0.0080	0.0085	W94
W5139TE480	4800	5139	55000	15.10 × 10 <sup>6</sup>	0.826	0.136	160	0.0080	0.0085	W94
W5282ZC240	2400	5282	60000	18.00 × 10 <sup>6</sup>	0.970	0.064	160	0.0110	0.0132	W7
W5282ZC300	3000	5282	60000	18.00 × 10 <sup>6</sup>	0.970	0.064	160	0.0110	0.0132	W7
W5282ZD240	2400	5282	60000	18.00 × 10 <sup>6</sup>	0.970	0.064	160	0.0110	0.0132	W42
W5282ZD300	3000	5282	60000	18.00 × 10 <sup>6</sup>	0.970	0.064	160	0.0110	0.0132	W42
W5334MK200	2000	5334	46800	10.95 × 10 <sup>6</sup>	0.892	0.069	180	0.0130	0.0149	WD3
W5334MK220	2200	5334	46800	10.95 × 10 <sup>6</sup>	0.892	0.069	180	0.0130	0.0149	WD3
W5636MC120	1200	5636	46000	10.58 × 10 <sup>6</sup>	0.698	0.059	175	0.0140	0.0160	W54
W5636MC150	1500	5636	46000	10.58 × 10 <sup>6</sup>	0.698	0.059	175	0.0140	0.0160	W54
W5696VC100	1000	5696	53000	14.00 × 10 <sup>6</sup>	0.650	0.059	190	0.0160	0.0190	W6
W5696VC140	1400	5696	53000	14.00 × 10 <sup>6</sup>	0.650	0.059	190	0.0160	0.0190	W6
W5696VF100	1000	5696	53000	14.00 × 10 <sup>6</sup>	0.650	0.059	190	0.0160	0.0190	W43
W5696VF140	1400	5696	53000	14.00 × 10 <sup>6</sup>	0.650	0.059	190	0.0160	0.0190	W43
W5715ED520	5200	5715	60600	18.36 × 10 <sup>6</sup>	0.863	0.135	150	0.0060	0.0063	W112
W5715ED560	5600	5715	60600	18.36 × 10 <sup>6</sup>	0.863	0.135	150	0.0060	0.0063	W112
W5715ED600	6000	5715	60600	18.36 × 10 <sup>6</sup>	0.863	0.135	150	0.0060	0.0063	W112
W5838ZC180	1800	5838	64000	20.50 × 10 <sup>6</sup>	0.800	0.074	175	0.0110	0.0132	W7
W5838ZC220	2200	5838	64000	20.50 × 10 <sup>6</sup>	0.800	0.074	175	0.0110	0.0132	W7
W5838ZD180	1800	5838	64000	20.50 × 10 <sup>6</sup>	0.800	0.074	175	0.0110	0.0132	W42
W5838ZD220	2200	5838	64000	20.50 × 10 <sup>6</sup>	0.800	0.074	175	0.0110	0.0132	W42
W5984TJ360	3600	5984	62000	19.20 × 10 <sup>6</sup>	0.758	0.097	160	0.0080	0.0085	W89
W5984TJ400	4000	5984	62000	19.20 × 10 <sup>6</sup>	0.758	0.097	160	0.0080	0.0085	W89
W5984TE360	3600	5984	62000	19.20 × 10 <sup>6</sup>	0.758	0.097	160	0.0080	0.0085	W94
W5984TE400	4000	5984	62000	19.20 × 10 <sup>6</sup>	0.758	0.097	160	0.0080	0.0085	W94
W6262ZC200	2000	6262	67000	22.40 × 10 <sup>6</sup>	0.730	0.064	175	0.0110	0.0132	W7
W6262ZC240	2400	6262	67000	22.40 × 10 <sup>6</sup>	0.730	0.064	175	0.0110	0.0132	W7
W6262ZD200	2000	6262	67000	22.40 × 10 <sup>6</sup>	0.730	0.064	175	0.0110	0.0132	W42
W6262ZD240	2400	6262	67000	22.40 × 10 <sup>6</sup>	0.730	0.064	175	0.0110	0.0132	W42
W6360EC520	5200	6360	60600	18.36 × 10 <sup>6</sup>	0.863	0.135	150	0.0050	0.0054	W111
W6360EC560	5600	6360	60600	18.36 × 10 <sup>6</sup>	0.863	0.135	150	0.0050	0.0054	W111
W6360EC600	6000	6360	60600	18.36 × 10 <sup>6</sup>	0.863	0.135	150	0.0050	0.0054	W111
W6672TE320	3200	6672	65700	21.58 × 10 <sup>6</sup>	0.864	0.067	160	0.0080	0.0085	W94
W6672TE350	3500	6672	65700	21.58 × 10 <sup>6</sup>	0.864	0.067	160	0.0080	0.0085	W94
W6672TJ320	3200	6672	65700	21.58 × 10 <sup>6</sup>	0.864	0.067	160	0.0080	0.0085	W89
W6672TJ350	3500	6672	65700	21.58 × 10 <sup>6</sup>	0.864	0.067	160	0.0080	0.0085	W89
W7045MC030	300	7045	54000	14.60 × 10 <sup>6</sup>	0.793	0.033	190	0.0140	0.0158	W54
W7045MC060	600	7045	54000	14.60 × 10 <sup>6</sup>	0.793	0.033	190	0.0140	0.0158	W54
W8405ZC100	1000	8405	72000	25.90 × 10 <sup>6</sup>	0.670	0.038	190	0.0110	0.0132	W7
W8405ZC140	1400	8405	72000	25.90 × 10 <sup>6</sup>	0.670	0.038	190	0.0110	0.0132	W7
W8405ZD100	1000	8405	72000	25.90 × 10 <sup>6</sup>	0.670	0.038	190	0.0110	0.0132	



# High-Power Devices

**W2**  
Weight 80 g

**W3**  
Weight 140 g

**W4**  
Weight 340 g

**W5**  
Weight 510 g

**W6**  
Weight 1 kg

**W7**  
Weight 1.7 kg

**W37**  
Weight 510 g

**W42**  
Weight 1.2 kg

**W43**  
Weight 800 g

**W89**  
Weight 1.3 kg

**W94**  
Weight 1.6 kg

**W111**  
Weight 1.6 kg

**W112**  
Weight 2.1 kg

**W121**  
Weight 330 g

## Rectifier Diodes—Capsule Types



Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> T <sub>K</sub> = 55°C A	I <sub>FSM</sub>		V <sub>TO</sub> V	r <sub>T</sub> mΩ	T <sub>JM</sub> °C	R <sub>thJK</sub>		Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>					180° Sine	120° Rect.	
			A	A <sup>2</sup> s				K/W	K/W	
W8570TE180	1800	8570	70200	24.60 × 10 <sup>6</sup>	0.690	0.050	175	0.0080	0.0085	W94
W8570TE220	2200	8570	70200	24.60 × 10 <sup>6</sup>	0.690	0.050	175	0.0080	0.0085	W94
W9830TJ120	1200	9830	72000	25.90 × 10 <sup>6</sup>	0.670	0.043	190	0.0080	0.0085	W89
W9830TJ150	1500	9830	72000	25.90 × 10 <sup>6</sup>	0.670	0.043	190	0.0080	0.0085	W89
W9830TE120	1200	9830	72000	25.90 × 10 <sup>6</sup>	0.670	0.043	190	0.0080	0.0085	W94
W9830TE150	1500	9830	72000	25.90 × 10 <sup>6</sup>	0.670	0.043	190	0.0080	0.0085	W94
W106CEC240	2400	10650	92000	42.32 × 10 <sup>6</sup>	0.734	0.047	160	0.0050	0.0054	W111
W106CEC280	2800	10650	92000	42.32 × 10 <sup>6</sup>	0.734	0.047	160	0.0050	0.0054	W111
W108CED180	1800	11300	94500	44.65 × 10 <sup>6</sup>	0.678	0.039	175	0.0060	0.0063	W112
W108CED220	2200	11300	94500	44.65 × 10 <sup>6</sup>	0.678	0.039	175	0.0060	0.0063	W112
W121CEC180	1800	12650	94500	44.65 × 10 <sup>6</sup>	0.678	0.039	175	0.0050	0.0054	W111
W121CEC220	2200	12650	94500	44.65 × 10 <sup>6</sup>	0.678	0.039	175	0.0050	0.0064	W111

## Fast Recovery Diodes

Fast recovery diodes are an essential component of any switching device and are frequently the limiting factor in the design and performance of modern power converters. To address the needs of our customers, we have developed an unparalleled range of fast recovery diodes. These diodes are available with blocking voltages of up to 6.5 kV, making them suitable for operation with DC link voltages up to 3.3 kV and average current ratings to 3370A, depending upon type. The devices use both alloyed and floating silicon technologies to deliver robust devices that can be relied upon in demanding applications. This range has been subclassified as follows to facilitate appropriate device selection: Fast Recovery, Soft Recovery, Extra Fast Recovery Diodes, and HP Sonic-FRDs.

## Standard Fast Recovery—Capsule Types

These parts are particularly suitable for use as anti-parallel diodes in Gate Turn-Off thyristors, Fast Thyristor inverters, and diodes for choppers.



Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> T <sub>K</sub> = 55°C A	I <sub>FSM</sub> A	I <sup>2</sup> t 10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub> A <sup>2</sup> s	Typ. Reverse Recovery T <sub>J</sub> = 150°C				V <sub>TO</sub> V	r <sub>T</sub> mΩ	T <sub>JM</sub> °C	R <sub>thJK</sub> d.c. 180° sine K/W	Fig. No.
					t <sub>rr</sub> μs	Q <sub>rr</sub> μC	@ I <sub>FM</sub>						
							A	A/μs					
M0588LC400	4000	588	3955	78.2 × 10 <sup>3</sup>	3.50	450	1000	60	2.320	1.770	150	0.0330	W4
M0588LC450	4500	588	3955	78.2 × 10 <sup>3</sup>	3.50	450	1000	60	2.320	1.770	150	0.0330	W4
M0790YC200	2000	790	9000	405 × 10 <sup>3</sup>	4.00	425	1000	60	1.272	0.584	150	0.0500	W2
M0790YC250	2500	790	9000	405 × 10 <sup>3</sup>	4.00	425	1000	60	1.272	0.584	150	0.0500	W2
M0790YH200	2000	790	9000	405 × 10 <sup>3</sup>	4.00	425	1000	60	1.272	0.584	150	0.0500	W3
M0790YH250	2500	790	9000	405 × 10 <sup>3</sup>	4.00	425	1000	60	1.272	0.584	150	0.0500	W3
M0914LC200	2000	914	8500	361 × 10 <sup>3</sup>	3.20	300	1000	60	1.768	0.653	150	0.0320	W4
M0914LC250	2500	914	8500	361 × 10 <sup>3</sup>	3.20	300	1000	60	1.768	0.653	150	0.0320	W4
M1010NC400	4000	1010	9600	461 × 10 <sup>3</sup>	3.20	1450	1000	200	1.700	1.030	150	0.0220	W5
M1010NC450	4500	1010	9600	461 × 10 <sup>3</sup>	3.20	1450	1000	200	1.700	1.030	150	0.0220	W5
M1010ND400	4000	1010	9600	461 × 10 <sup>3</sup>	3.20	1450	1000	200	1.700	1.030	150	0.0220	W37
M1010ND450	4500	1010	9600	461 × 10 <sup>3</sup>	3.20	1450	1000	200	1.700	1.030	150	0.0220	W37
M1163NC400	4000	1163	10800	583 × 10 <sup>3</sup>	6.40	1200	1000	60	1.500	0.770	150	0.0220	W5
M1163NC450	4500	1163	10800	583 × 10 <sup>3</sup>	6.40	1200	1000	60	1.500	0.770	150	0.0220	W5
M1163ND400	4000	1163	10800	583 × 10 <sup>3</sup>	6.40	1200	1000	60	1.500	0.770	150	0.0220	W37
M1163ND450	4500	1163	10800	583 × 10 <sup>3</sup>	6.40	1200	1000	60	1.500	0.770	150	0.0220	W37
M1502NC200	2000	1502	17000	1.45 × 10 <sup>6</sup>	3.50	350	1000	60	1.240	0.440	150	0.0220	W5
M1502NC250	2500	1502	17000	1.45 × 10 <sup>6</sup>	3.50	350	1000	60	1.240	0.440	150	0.0220	W5
M1502ND200	2000	1502	17000	1.45 × 10 <sup>6</sup>	3.50	350	1000	60	1.240	0.440	150	0.0220	W37
M1502ND250	2500	1502	17000	1.45 × 10 <sup>6</sup>	3.50	3v50	1000	60	1.240	0.440	150	0.0220	W37
M1583VC400	4000	1583	24800	3.08 × 10 <sup>6</sup>	5.00	2000	1000	200	1.693	0.525	150	0.0160	W6
M1583VC450	4500	1583	24800	3.08 × 10 <sup>6</sup>	5.00	2000	1000	200	1.693	0.525	150	0.0160	W6
M1583VF400	4000	1583	24800	3.08 × 10 <sup>6</sup>	5.00	2000	1000	200	1.693	0.525	150	0.0160	W43
M1583VF450	4500	1583	24800	3.08 × 10 <sup>6</sup>	5.00	2000	1000	200	1.693	0.525	150	0.0160	W43
M1609NC200	2000	1609	17500	1.53 × 10 <sup>6</sup>	3.20	800	1000	200	1.310	0.345	150	0.0220	W5
M1609NC260	2600	1609	17500	1.53 × 10 <sup>6</sup>	3.20	800	1000	200	1.310	0.345	150	0.0220	W5
M1609ND200	2000	1609	17500	1.53 × 10 <sup>6</sup>	3.20	800	1000	200	1.310	0.345	150	0.0220	W37
M1609ND260	2600	1609	17500	1.53 × 10 <sup>6</sup>	3.20	800	1000	200	1.310	0.345	150	0.0220	W37
M2273VC300	3000	2273	28000	3.92 × 10 <sup>6</sup>	8.50	2500	1000	60	1.239	0.244	150	0.0160	W6
M2273VC360	3600	2273	28000	3.92 × 10 <sup>6</sup>	8.50	2500	1000	60	1.239	0.244	150	0.0160	W6
M2273VF300	3000	2273	28000	3.92 × 10 <sup>6</sup>	8.50	2500	1000	60	1.239	0.244	150	0.0160	W43
M2273VF360	3600	2273	28000	3.92 × 10 <sup>6</sup>	8.50	2500	1000	60	1.239	0.244	150	0.0160	W43
M2325HA400	4000	2325	28000	3.92 × 10 <sup>6</sup>	5.40	2300	1000	200	1.581	0.402	150	0.0105	W121
M2325HA450	4500	2325	28000	3.92 × 10 <sup>6</sup>	5.40	2300	1000	200	1.581	0.402	150	0.0105	W121
M2408NC020	200	2408	24000	2.88 × 10 <sup>6</sup>	1.90	250	1000	200	1.065	0.122	150	0.0220	W5
M2408NC060	600	2408	24000	2.88 × 10 <sup>6</sup>	1.90	250	1000	200	1.065	0.122	150	0.0220	W5
M2408ND020	200	2408	24000	2.88 × 10 <sup>6</sup>	1.90	250	1000	200	1.065	0.122	150	0.0220	W37
M2408ND060	600	2408	24000	2.88 × 10 <sup>6</sup>	1.90	250	1000	200	1.065	0.122	150	0.0220	W37
M2639ZC360	3600	2639	27520	3.79 × 10 <sup>6</sup>	8.50	2300	1000	60	1.380	0.290	150	0.0110	W7
M2639ZC420	4200	2639	27520	3.79 × 10 <sup>6</sup>	8.50	2300	1000	60	1.380	0.290	150	0.0110	W7
M2639ZD360	3600	2639	27520	3.79 × 10 <sup>6</sup>	8.50	2300	1000	60	1.380	0.290	150	0.0110	W42
M2639ZD420	4200	2639	27520	3.79 × 10 <sup>6</sup>	8.50	2300	1000	60	1.380	0.290	150	0.0110	W42
M2698ZC250	2500	2698	27800	3.86 × 10 <sup>6</sup>	6.20	1200	1000	60	1.000	0.330	150	0.0110	W7



**W6**  
Weight 1 kg

**W7**  
Weight 1.7 kg

**W42**  
Weight 1.2 kg

**W43**  
Weight 800 g

**W20**  
Weight 85 kg

**W21**  
Weight 85 kg

**W22**  
Weight 200 kg

**W23**  
Weight 250 g

**W24**  
Weight 250 g

## Standard Fast Recovery—Capsule Types

These parts are particularly suitable for use as anti-parallel diodes in Gate Turn-Off thyristors, Fast Thyristor inverters, and diodes for choppers.

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> T <sub>K</sub> = 55°C	I <sub>FSM</sub>		Typ. Reverse Recovery				V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub> d.c. 180° sine	Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		T <sub>J</sub> = 150°C								
			A	A <sup>2</sup> s	t <sub>rr</sub>	Q <sub>rr</sub>	@ I <sub>FM</sub>	@ -di <sub>r</sub> /dt					
V	A	A	A <sup>2</sup> s	μs	μC	A	A/μs	V	mΩ	°C	K/W		
M2698ZC280	2800	2698	27800	3.86 × 10 <sup>6</sup>	6.20	1200	1000	60	1.000	0.330	150	0.0110	W7
M2698ZC350	3500	2698	27800	3.86 × 10 <sup>6</sup>	6.20	1200	1000	60	1.000	0.330	150	0.0110	W7
M2698ZD250	2500	2698	27800	3.86 × 10 <sup>6</sup>	6.20	1200	1000	60	1.000	0.330	150	0.0110	W42
M2698ZD280	2800	2698	27800	3.86 × 10 <sup>6</sup>	6.20	1200	1000	60	1.000	0.330	150	0.0110	W42
M2698ZD350	3500	2698	27800	3.86 × 10 <sup>6</sup>	6.20	1200	1000	60	1.000	0.330	150	0.0110	W42
M2837VC180	1800	2837	31800	5.10 × 10 <sup>6</sup>	7.00	2100	1000	60	0.900	0.170	150	0.0160	W6
M2837VC250	2500	2837	31800	5.10 × 10 <sup>6</sup>	7.00	2100	1000	60	0.900	0.170	150	0.0160	W6
M2837VF180	1800	2837	31800	5.10 × 10 <sup>6</sup>	7.00	2100	1000	60	0.900	0.170	150	0.0160	W43
M2837VF250	2500	2837	31800	5.10 × 10 <sup>6</sup>	7.00	2100	1000	60	0.900	0.170	150	0.0160	W43
M3770ZC200	2000	3770	44000	9.68 × 10 <sup>6</sup>	7.00	2000	1000	60	1.190	0.118	150	0.0110	W7
M3770ZC240	2400	3770	44000	9.68 × 10 <sup>6</sup>	7.00	2000	1000	60	1.190	0.118	150	0.0110	W7
M3770ZC300	3000	3770	44000	9.68 × 10 <sup>6</sup>	7.00	2000	1000	60	1.190	0.118	150	0.0110	W7
M3770ZD200	2000	3770	44000	9.68 × 10 <sup>6</sup>	7.00	2000	1000	60	1.190	0.118	150	0.0110	W42
M3770ZD240	2400	3770	44000	9.68 × 10 <sup>6</sup>	7.00	2000	1000	60	1.190	0.118	150	0.0110	W42
M3770ZD300	3000	3770	44000	9.68 × 10 <sup>6</sup>	7.00	2000	1000	60	1.190	0.118	150	0.0110	W42



## Soft Recovery Diodes

Our soft recovery diodes are available in a range of reverse recovery characteristics tailored to meet the requirements of both freewheeling and snubber applications. These devices are available with blocking voltages up to 6 kV and average currents up to 4305 A 24 mm to 75 mm diameter silicon slices. These parts are particularly suitable where soft recovery is required, such as in RCD snubbers, voltage clamping, and snubberless applications.

## Soft Recovery Diodes—Stud Types



Part Number	V <sub>RRM</sub>	I <sub>FAV</sub> T <sub>K</sub> = 55°C	I <sub>FSM</sub>		Typ. Reverse Recovery				V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub> d.c. 180° sine	Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		T <sub>J</sub> = 150°C								
			A	A <sup>2</sup> s	t <sub>rr</sub>	Q <sub>rr</sub>	@ I <sub>FM</sub>	@ -di <sub>r</sub> /dt					
V	A	A	A <sup>2</sup> s	μs	μC	A	A/μs	V	mW	°C	K/W		
M0130RL200	2000	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W20
M0130RL250	2500	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W20
M0130SL200	2000	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W20
M0130SL250	2500	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W20
M0130RM200	2000	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W21
M0130RM250	2500	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W21
M0130SM200	2000	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W21
M0130SM250	2500	130	2240	25.0 × 10 <sup>3</sup>	2.60	430	1000	150	1.290	1.540	125	0.3000	W21
M0139RL120	1200	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W20
M0139RL180	1800	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W20
M0139SL120	1200	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W20
M0139SL180	1800	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W20
M0139RM120	1200	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W21
M0139RM180	1800	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W21
M0139SM120	1200	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W21
M0139SM180	1800	139	2450	30.0 × 10 <sup>3</sup>	1.00	125	1000	100	1.240	1.280	125	0.3000	W21
M0268RC200	2000	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W24
M0268RC250	2500	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W24
M0268SC200	2000	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W24
M0268SC250	2500	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W24
M0268RJ200	2000	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W22
M0268RJ250	2500	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W22
M0268SJ200	2000	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W22
M0268SJ250	2500	268	4250	90.3 × 10 <sup>3</sup>	2.80	300	1000	150	1.210	1.200	125	0.1300	W22
M0280RC200	2000	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W24
M0280RC250	2500	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W24
M0280SC200	2000	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W24
M0280SC250	2500	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W24
M0280RJ200	2000	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W22
M0280RJ250	2500	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W22
M0280SJ200	2000	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W22
M0280SJ250	2500	280	4500	100 × 10 <sup>3</sup>	2.80	610	1000	150	1.280	0.920	125	0.1300	W22
M0334RC120	1200	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W24
M0334RC200	2000	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W24
M0334SC120	1200	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W24
M0334SC200	2000	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W24
M0334RJ120	1200	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W22
M0334RJ200	2000	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W22
M0334SJ120	1200	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W22
M0334SJ200	2000	334	4500	101 × 10 <sup>3</sup>	3.50	160	550	40	1.000	0.740	125	0.1300	W22
M0336RA120	1200	336	4500	101 × 10 <sup>3</sup>	3.00	140	550	40	1.020	0.700	125	0.1300	W23
M0336RA140	1400	336	4500	101 × 10 <sup>3</sup>	3.00	140	550	40	1.020	0.700	125	0.1300	W23
M0336SA120	1200	336	4500	101 × 10 <sup>3</sup>	3.00	140	550	40	1.020	0.700	125	0.1300	W23
M0336SA140	1400	336	4500	101 × 10 <sup>3</sup>	3.00	140	550	40	1.020	0.700	125	0.1300	W23



## Standard Fast Recovery—Capsule Types

Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> T <sub>K</sub> = 55°C A	I <sub>FSM</sub>		Typ. Reverse Recovery				V <sub>TO</sub> V	r <sub>T</sub> mW	T <sub>JM</sub> °C	R <sub>thJK</sub> d.c. 180° sine K/W	Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		T <sub>JM</sub>								
			A	A <sup>2</sup> s	t <sub>rr</sub> μs	Q <sub>rr</sub> μC	@ I <sub>FM</sub> A	@ -di <sub>r</sub> /dt A/μs					
M0225YH300	3000	225	2000	20 × 10 <sup>3</sup>	3.00	220	550	40	1.900	4.160	150	0.1000	W3
M0225YH360	3600	225	2000	20 × 10 <sup>3</sup>	3.00	220	550	40	1.900	4.160	150	0.1000	W3
M0225YH450	4500	225	2000	20 × 10 <sup>3</sup>	3.00	220	550	40	1.900	4.160	150	0.1000	W3
M0310YH300	3000	310	4590	105 × 10 <sup>3</sup>	2.80	275	1000	100	1.490	2.060	150	0.1000	W3
M0310YH350	3500	310	4590	105 × 10 <sup>3</sup>	2.80	275	1000	100	1.490	2.060	150	0.1000	W3
M0347WC160	1600	347	4250	90.3 × 10 <sup>3</sup>	2.80	210	550	40	1.210	1.200	125	0.0900	W1
M0347WC200	2000	347	4250	90.3 × 10 <sup>3</sup>	2.80	210	550	40	1.210	1.200	125	0.0900	W1
M0347WC250	2500	347	4250	90.3 × 10 <sup>3</sup>	2.80	210	550	40	1.210	1.200	125	0.0900	W1
M0358WC120	1200	358	2450	30 × 10 <sup>3</sup>	1.40	125	1000	100	1.460	0.800	125	0.0900	W1
M0358WC180	1800	358	2450	30 × 10 <sup>3</sup>	1.40	125	1000	100	1.460	0.800	125	0.0900	W1
M0367WC140	1400	367	4500	101 × 10 <sup>3</sup>	3.30	300	550	40	1.280	0.920	125	0.0900	W1
M0367WC220	2200	367	4500	101 × 10 <sup>3</sup>	3.30	300	550	40	1.280	0.920	125	0.0900	W1
M0367WC280	2800	367	4500	101 × 10 <sup>3</sup>	3.30	300	550	40	1.280	0.920	125	0.0900	W1
M0371YH350	3500	371	4900	120 × 10 <sup>3</sup>	3.20	1260	1000	200	1.050	1.650	150	0.1000	W3
M0371YH450	4500	371	4900	120 × 10 <sup>3</sup>	3.20	1260	1000	200	1.050	1.650	150	0.1000	W3
M0433WC120	1200	433	4500	101 × 10 <sup>3</sup>	3.50	270	550	40	1.000	0.740	125	0.0900	W1
M0433WC160	1600	433	4500	101 × 10 <sup>3</sup>	3.50	270	550	40	1.000	0.740	125	0.0900	W1
M0433WC200	2000	433	4500	101 × 10 <sup>3</sup>	3.50	270	550	40	1.000	0.740	125	0.0900	W1
M0437WC080	800	437	4500	101 × 10 <sup>3</sup>	3.00	75	550	40	1.020	0.700	125	0.0900	W1
M0437WC140	1400	437	4500	101 × 10 <sup>3</sup>	3.00	75	550	40	1.020	0.700	125	0.0900	W1
M0451YC120	1200	451	4500	101 × 10 <sup>3</sup>	2.80	120	550	40	1.000	0.740	125	0.0850	W2
M0451YC160	1600	451	4500	101 × 10 <sup>3</sup>	2.80	120	550	40	1.000	0.740	125	0.0850	W2
M0451YC200	2000	451	4500	101 × 10 <sup>3</sup>	2.80	120	550	40	1.000	0.740	125	0.0850	W2
M0659LC400	4000	659	7620	290 × 10 <sup>3</sup>	4.20	800	1000	60	1.710	0.925	125	0.0330	W4
M0659LC450	4500	659	7620	290 × 10 <sup>3</sup>	4.20	800	1000	60	1.710	0.925	125	0.0330	W4
M0710LC560	5600	710	8400	353 × 10 <sup>3</sup>	4.00	2100	1000	200	1.450	0.875	125	0.0330	W4
M0710LC600	6000	710	8400	353 × 10 <sup>3</sup>	4.00	2100	1000	200	1.450	0.875	125	0.0330	W4
M0736LC400	4000	736	9000	405 × 10 <sup>3</sup>	5.20	1250	1000	60	1.606	0.700	125	0.0330	W4
M0736LC450	4500	736	9000	405 × 10 <sup>3</sup>	5.20	1250	1000	60	1.606	0.700	125	0.0330	W4
M0759YC120	1200	759	9500	450 × 10 <sup>3</sup>	2.00	80	550	50	1.130	0.380	125	0.0500	W2
M0759YC160	1600	759	9500	450 × 10 <sup>3</sup>	2.00	80	550	50	1.130	0.380	125	0.0500	W2
M0759YH120	1200	759	9500	450 × 10 <sup>3</sup>	2.00	80	550	50	1.130	0.380	125	0.0500	W3
M0759YH160	1600	759	9500	450 × 10 <sup>3</sup>	2.00	80	550	50	1.130	0.380	125	0.0500	W3
M0859LC140	1400	859	10000	500 × 10 <sup>3</sup>	3.00	280	800	50	1.170	0.320	125	0.0440	W4
M0859LC160	1600	859	10000	500 × 10 <sup>3</sup>	3.00	280	800	50	1.170	0.320	125	0.0440	W4
M0859LC180	1800	859	10000	500 × 10 <sup>3</sup>	3.00	280	800	50	1.170	0.320	125	0.0440	W4

## Standard Fast Recovery—Capsule Types

Part Number	V <sub>RRM</sub> V	I <sub>FAV</sub> T <sub>K</sub> = 55°C A	I <sub>FSM</sub>		Typ. Reverse Recovery				V <sub>TO</sub> V	r <sub>T</sub> mW	T <sub>JM</sub> °C	R <sub>thJK</sub> d.c. 180° sine K/W	Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		T <sub>JM</sub>								
			A	A <sup>2</sup> s	t <sub>rr</sub> μs	Q <sub>rr</sub> μC	@ I <sub>FM</sub> A	@ -di <sub>r</sub> /dt A/μs					
M0863LC260	2600	863	10000	500 × 10 <sup>3</sup>	4.80	950	1000	60	1.308	0.538	125	0.0330	W4
M0863LC300	3000	863	10000	500 × 10 <sup>3</sup>	4.80	950	1000	60	1.308	0.538	125	0.0330	W4
M0863LC360	3600	863	10000	500 × 10 <sup>3</sup>	4.80	950	1000	60	1.308	0.538	125	0.0330	W4
M0872LC140	1400	872	10000	500 × 10 <sup>3</sup>	4.00	700	1000	60	1.090	0.340	125	0.0440	W4
M0872LC180	1800	872	10000	500 × 10 <sup>3</sup>	4.00	700	1000	60	1.090	0.340	125	0.0440	W4
M0872LC210	2100	872	10000	500 × 10 <sup>3</sup>	4.00	700	1000	60	1.090	0.340	125	0.0440	W4
M0955LC200	2000	955	11700	684 × 10 <sup>3</sup>	3.40	500	1000	60	1.440	0.330	125	0.0330	W4
M0955LC250	2500	955	11700	684 × 10 <sup>3</sup>	3.40	500	1000	60	1.440	0.330	125	0.0330	W4
M1022LC120	1200	1022	14000	980 × 10 <sup>3</sup>	3.00	375	1000	60	1.240	0.330	125	0.0330	W4
M1022LC160	1600	1022	14000	980 × 10 <sup>3</sup>	3.00	375	1000	60	1.240	0.330	125	0.0330	W4
M1022LC200	2000	1022	14000	980 × 10 <sup>3</sup>	3.00	375	1000	60	1.240	0.330	125	0.0330	W4
M1080LC100	1000	1080	13500	910 × 10 <sup>3</sup>	1.90	85	1000	60	1.125	0.314	125	0.0330	W4
M1080LC120	1200	1080	13500	910 × 10 <sup>3</sup>	1.90	85	1000	60	1.125	0.314	125	0.0330	W4
M1102NC500	5000	1102	13000	845 × 10 <sup>3</sup>	5.50	3300	1000	200	1.360	0.557	125	0.0220	W5
M1102NC600	6000	1102	13000	845 × 10 <sup>3</sup>	5.50	3300	1000	200	1.360	0.557	125	0.0220	W5
M1102ND500	5000	1102	13000	845 × 10 <sup>3</sup>	5.50	3300	1000	200	1.360	0.557	125	0.0220	W37
M1102ND600	6000	1102	13000	845 × 10 <sup>3</sup>	5.50	3300	1000	200	1.360	0.557	125	0.0220	W37
M1104NC400	4000	1104	13000	845 × 10 <sup>3</sup>	6.00	2100	1000	60	1.370	0.553	125	0.0220	W5
M1104NC450	4500	1104	13000	845 × 10 <sup>3</sup>	6.00	2100	1000	60	1.370	0.553	125	0.0220	W5
M1104ND400	4000	1104	13000	845 × 10 <sup>3</sup>	6.00	2100	1000	60	1.370	0.553	125	0.0220	W37
M1104ND450	4500	1104	13000	845 × 10 <sup>3</sup>	6.00	2100	1000	60	1.370	0.553	125	0.0220	W37
M1242NC260	2600	1242	16400	1.34 × 10 <sup>6</sup>	6.00	1500	1000	60	1.270	0.420	125	0.0220	W5
M1242NC360	3600	1242	16400	1.34 × 10 <sup>6</sup>	6.00	1500	1000	60	1.270	0.420	125	0.0220	W5
M1242ND260	2600	1242	16400	1.34 × 10 <sup>6</sup>	6.00	1500	1000	60	1.270	0.420	125	0.0220	W37
M1242ND360	3600	1242	16400	1.34 × 10 <sup>6</sup>	6.00	1500	1000	60	1.270	0.420	125	0.0220	W37
M1494NC160	1600	1494	19600	1.92 × 10 <sup>6</sup>	3.90	815	1000	60	1.150	0.265	125	0.0220	W5
M1494NC250	2500	1494	19600	1.92 × 10 <sup>6</sup>	3.90	815	1000	60	1.150	0.265	125	0.0220	W5
M1494ND160	1600	1494	19600	1.92 × 10 <sup>6</sup>	3.90	815	1000	60	1.150	0.265	125	0.0220	W37
M1494ND250	2500	1494	19600	1.92 × 10 <sup>6</sup>	3.90	815	1000	60	1.150	0.265	125	0.0220	W37
M1494NK160	1600	1494	19600	1.92 × 10 <sup>6</sup>	3.90	815	1000	60	1.150	0.265	125	0.0145	WD8
M1494NK250	2500	1494	19600	1.92 × 10 <sup>6</sup>	3.90	815	1000	60	1.150	0.265	125	0.0145	WD8
M1565VC400	4000	1565	19700	1.94 × 10 <sup>6</sup>	5.00	4000	1000	200	1.090	0.360	125	0.0180	W6
M1565VC450	4500	1565	19700	1.94 × 10 <sup>6</sup>	5.00	4000	1000	200	1.090	0.360	125	0.0180	W6
M1565VF400	4000	1565	19700	1.94 × 10 <sup>6</sup>	5.00	4000	1000	200	1.090	0.360	125	0.0180	W43
M1565VF450	4500	1565	19700	1.94 × 10 <sup>6</sup>	5.00	4000	1000	200	1.090	0.360	125	0.0180	W43
M1858NC100	1000	1858	25000	3.25 × 10 <sup>6</sup>	2.50	120	1000	60	1.127	0.127	125	0.0220	W5
M1858NC120	1200	1858	25000	3.25 × 10 <sup>6</sup>	2.50	120	1000	60	1.127	0.127	125	0.0220	W5
M1858ND120	1200	1858	25000	3.25 × 10 <sup>6</sup>	2.50	120	1000	60	1.127	0.127	125	0.0220	W37
M1858ND100	1000	1858	25000	3.25 × 10 <sup>6</sup>	2.50	120	1000	60	1.127	0.127	125	0.0220	W37
M2322ZC300	3000	2322	23000	2.64 × 10 <sup>6</sup>	6.50	3200	1000	150	1.670	0.186	125	0.0110	W7
M2322ZC400	4000	2322	23000	2.64 × 10 <sup>6</sup>	6.50	3200	1000	150	1.670	0.186	125	0.0110	W7
M2322ZD300	3000	2322	23000	2.64 × 10 <sup>6</sup>	6.50	3200	1000	150	1.670	0.186	125	0.0110	W42
M2322ZD400	4000	2322	23000	2.64 × 10 <sup>6</sup>	6.50	3200							

## Extra Fast Recovery Diodes

These products are designed to offer the lowest practical values of reverse recovery current while offering the wide safe operating area and high di/dt capability required by modern switching parts.



## Extra Fast Recovery Diodes—Capsule Types

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>			I <sub>FSM</sub>			I <sup>2</sup> t			Typ. Reverse Recovery					V <sub>T0</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub> d.c. 180° sine	Fig. No.
		T <sub>K</sub> = 55°C	10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		I <sub>m</sub>	t <sub>rr</sub>	Q <sub>rr</sub>	@I <sub>FM</sub>	@ -di <sub>F</sub> /dt	T <sub>JM</sub>										
			V	A						A	A <sup>2</sup> s	A	μs	μC	A					
F0240YC250	2500	240	3100	48.1 × 10 <sup>3</sup>	40	2.00	100	550	40	2.271	2.853	150	0.1000	W2						
F0240YC300	3000	240	3100	48.1 × 10 <sup>3</sup>	40	2.00	100	550	40	2.271	2.853	150	0.1000	W2						
F0240YH250	2500	240	3100	48.1 × 10 <sup>3</sup>	40	2.00	100	550	40	2.271	2.853	150	0.1000	W3						
F0240YH300	3000	240	3100	48.1 × 10 <sup>3</sup>	40	2.00	100	550	40	2.271	2.853	150	0.1000	W3						
F0300WC140	1400	240	2700	36.5 × 10 <sup>3</sup>	530	3.00	70	550	40	1.760	2.210	125	0.0950	W1						
F0300WC180	1800	240	2700	36.5 × 10 <sup>3</sup>	530	3.00	70	550	40	1.760	2.210	125	0.0950	W1						
F0800LC140	1400	775	7630	291 × 10 <sup>3</sup>	380	1.10	200	1000	200	1.494	0.692	125	0.0320	W4						
F0800LC180	1800	775	7630	291 × 10 <sup>3</sup>	380	1.10	200	1000	200	1.494	0.692	125	0.0320	W4						
F0900VC450	4500	816	10450	546 × 10 <sup>3</sup>	120	3.80	230	1000	60	2.024	1.274	115	0.0160	W6						
F0900VC520	5200	816	10450	546 × 10 <sup>3</sup>	120	3.80	230	1000	60	2.024	1.274	115	0.0160	W6						
F0900VF450	4500	816	10450	546 × 10 <sup>3</sup>	120	3.80	230	1000	60	2.024	1.274	115	0.0160	W43						
F0900VF520	5200	816	10450	546 × 10 <sup>3</sup>	120	3.80	230	1000	60	2.024	1.274	115	0.0160	W43						
F1000LC080	800	826	8500	361 × 10 <sup>3</sup>	320	1.60	250	1000	800	1.530	0.547	125	0.0320	W4						
F1000LC120	1200	826	8500	361 × 10 <sup>3</sup>	320	1.60	250	1000	800	1.530	0.547	125	0.0320	W4						
F1300NC45P	4500	1346	20800	2.16 × 10 <sup>6</sup>	470	4.30	2150	1000	200	1.569	0.318	140	0.0240	W5						
F1300NC50P	5000	1346	20800	2.16 × 10 <sup>6</sup>	470	4.30	2150	1000	200	1.569	0.318	140	0.0240	W5						
F1300NC55P	5500	1346	20800	2.16 × 10 <sup>6</sup>	470	4.30	2150	1000	200	1.569	0.318	140	0.0240	W5						
F1400NC140	1400	1093	17250	1.49 × 10 <sup>6</sup>	800	1.50	1000	1400	1000	1.618	0.388	125	0.0240	W5						
F1400NC180	1800	1093	17250	1.49 × 10 <sup>6</sup>	800	1.50	1000	1400	1000	1.618	0.388	125	0.0240	W5						
F1500NC200	2000	1054	13750	950 × 10 <sup>3</sup>	1065	1.50	1500	1500	2000	1.372	0.535	125	0.0240	W5						
F1500NC250	2500	1054	13750	950 × 10 <sup>3</sup>	1065	1.50	1500	1500	2000	1.372	0.535	125	0.0240	W5						
F1600NC080	800	1326	20000	2.0 × 10 <sup>6</sup>	480	2.30	700	1600	800	1.320	0.268	125	0.0240	W5						
F1600NC120	1200	1326	20000	2.0 × 10 <sup>6</sup>	480	2.30	700	1600	800	1.320	0.268	125	0.0240	W5						

## High-Power Sonic FRDs

IXYS UK brings you a world-leading class of ultra fast and ultra soft recovery diode available from 3.3 kV to 6.5 kV in current ratings from 500 A to 4000 A. These diodes incorporate a unique manufacturing process and lifetime control to offer a class-leading trade-off between conduction and Switching losses. The wide safe operating area (SOA) makes them ideal as freewheeling diodes for snubberless IGBT and IGCT applications or any application that requires a fast, low loss diode (e.g., traction, medium voltage drives, induction heating, and pulsed power applications).

## High-Power Sonic FRD's—Capsule Type

Part Number	V <sub>RRM</sub>	I <sub>FAV</sub>			I <sub>FSM</sub>			I <sup>2</sup> t			Typ. Reverse Recovery					V <sub>T0</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub> 180° sine	Fig. No.
		T <sub>K</sub> = 55°C	10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		I <sub>m</sub>	t <sub>rr</sub>	Q <sub>rr</sub>	@I <sub>FM</sub>	@ -di <sub>F</sub> /dt	T <sub>JM</sub>										
			V	A						A	A <sup>2</sup> s	A	μs	μC	A					
E0460QC45E	4500	533	6800	231 × 10 <sup>3</sup>	460	1.15	685	500	1000	2.246	2.716	140	0.0274	W117						
E0660NC45E	4500	760	9160	420 × 10 <sup>3</sup>	700	1.10	1050	660	1500	2.194	1.814	140	0.0200	W5						
E0660NH45E	4500	760	9160	420 × 10 <sup>3</sup>	700	1.10	1050	660	1500	2.194	1.814	140	0.0200	W47						
E1250HC45E	4500	1355	20500	2.11 × 10 <sup>6</sup>	1000	1.20	1850	1250	2000	2.072	1.166	140	0.0105	W122						
E1500MC33E	3300	1580	17330	1.5 × 10 <sup>6</sup>	1380	1.85	2040	1500	2000	1.509	0.464	140	0.0162	W54						
E1500NC36P	3600	1280	17050	1.45 × 10 <sup>6</sup>	1425	2.80	2750	1000	1000	1.417	0.656	140	0.0190	W5						
E1500NC42P	4200	1280	17050	1.45 × 10 <sup>6</sup>	1425	2.80	2750	1000	1000	1.417	0.656	140	0.0190	W5						
E1500NC48P	4800	1280	17050	1.45 × 10 <sup>6</sup>	1425	2.80	2750	1000	1000	1.417	0.656	140	0.0190	W5						
E1500NH36P	3600	1280	17050	1.45 × 10 <sup>6</sup>	1425	2.80	2750	1000	1000	1.417	0.656	140	0.0190	W47						
E1500NH42P	4200	1280	17050	1.45 × 10 <sup>6</sup>	1425	2.80	2750	1000	1000	1.417	0.656	140	0.0190	W47						
E1500NH48P	4800	1280	17050	1.45 × 10 <sup>6</sup>	1425	2.80	2750	1000	1000	1.417	0.656	140	0.0190	W47						
E1780TG65E	6500	1780	25600	3.29 × 10 <sup>6</sup>	1590	1.22	3500	1375	3500	2.200	0.917	140	0.0770	W126						
E1800TC45E	4500	2215	29050	4.22 × 10 <sup>6</sup>	1490	1.15	2800	1800	3000	2.171	0.634	140	0.0068	W89						
E2400EC45E	4500	2490	32100	5.15 × 10 <sup>6</sup>	2130	1.22	3900	2400	4000	2.114	0.646	140	0.0056	W111						
E3000EC33E	3300	4314	58600	17.2 × 10 <sup>6</sup>	3600	1.87	6150	3000	5500	1.544	0.185	140	0.0056	W111						
E3000EC45E	4500	3410	45700	10.5 × 10 <sup>6</sup>	3050	1.25	5000	3000	5000	2.124	0.339	140	0.0050	W111						
E4000FD45E	4500	4210	54800	15.0 × 10 <sup>6</sup>	3650	1.50	5750	4000	5000	2.117	0.351	140	0.0035	W59						



## Phase Control Thyristors

IXYS UK provides one of the most comprehensive ranges of standard phase control thyristors in the industry. Devices with voltage ranges from 200 V to 5200 V are available, making them suitable for applications with line voltages from 230 V to over 1000 V (higher voltage applications are now served by our range of medium voltage thyristors). IXYS UK Westcode Ltd. is a leading supplier of phase control products for markets such as demanding industrial DC drives, controlled rectifiers, marine/rail propulsion systems, wind power converters, electrochemical power supplies, and soft starters. These devices are optimized to generate low conduction losses and are primarily intended for applications with line frequencies of up to 400 Hz.

The Wespack outline (WPxx) is an innovative concept in phase control thyristors for applications requiring devices rated to 2200 V. It gives the maximum power rating for weight and volume without compromising on quality and reliability. It also gives the maximum current rating and lowest thermal resistance for the package size.

The newest additions to IXYS UK's phase control thyristor range are the 96 mm diameter die capsules. These devices are constructed using low temperature sintering technology offering better thermal and electromechanical capability and are available with current ratings up to 6405 A and voltage ratings up to 4500 V.



## Phase Control Thyristors—Stud Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub>	I <sub>TSM</sub>	I <sup>2</sup> t	V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.	
		T <sub>c</sub> = 55°C		10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>				d.c. 180° sine	120° Rect.		
		A	A	A							A <sup>2</sup> S
N0180SH120	1200	180	2450	30.0 × 10 <sup>3</sup>	0.900	1.790	125	0.2300	0.2800	W17	
N0180SH160	1600	180	2450	30.0 × 10 <sup>3</sup>	0.900	1.790	125	0.2300	0.2800	W17	
N0335SC120	1200	335	4650	108 × 10 <sup>3</sup>	0.920	0.990	125	0.1200	0.1400	W18	
N0335SC160	1600	335	4650	108 × 10 <sup>3</sup>	0.920	0.990	125	0.1200	0.1400	W18	
N0416SC040	400	416	6000	180 × 10 <sup>3</sup>	0.850	0.535	125	0.1200	0.1400	W18	
N0416SC080	800	416	6000	180 × 10 <sup>3</sup>	0.850	0.535	125	0.1200	0.1400	W18	

## Phase Control Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub>	I <sub>TSM</sub>	I <sup>2</sup> t	V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.	
		T <sub>c</sub> = 55°C		10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>				d.c. 180° sine	120° Rect.		
		A	A	A							A <sup>2</sup> S
N0392WC120	1200	392	4650	108 × 10 <sup>3</sup>	0.920	0.990	125	0.0950	0.1100	W8	
N0392WC160	1600	392	4650	108 × 10 <sup>3</sup>	0.920	0.990	125	0.0950	0.1100	W8	
N0606YC200	2000	606	7100	252 × 10 <sup>3</sup>	1.103	0.804	125	0.0500	0.0580	W58	
N0606YC250	2500	606	7100	252 × 10 <sup>3</sup>	1.103	0.804	125	0.0500	0.0580	W58	
N0616LC400	4000	616	5250	138 × 10 <sup>3</sup>	1.220	1.530	125	0.0320	0.0393	W10	
N0616LC450	4500	616	5250	138 × 10 <sup>3</sup>	1.220	1.530	125	0.0320	0.0393	W10	
N0634LC380	3800	634	7000	245 × 10 <sup>3</sup>	1.100	1.500	125	0.0320	0.0393	W10	
N0634LC420	4200	634	7000	245 × 10 <sup>3</sup>	1.100	1.500	125	0.0320	0.0393	W10	
N0646LC300	3000	646	5700	162 × 10 <sup>3</sup>	1.210	1.360	125	0.0320	0.0393	W10	
N0646LC360	3600	646	5700	162 × 10 <sup>3</sup>	1.210	1.360	125	0.0320	0.0393	W10	

## Phase Control Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub>	I <sub>TSM</sub>	I <sup>2</sup> t	V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.	
		T <sub>c</sub> = 55°C		10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>				d.c. 180° sine	120° Rect.		
		A	A	A							A <sup>2</sup> S
N0676YC120	1200	676	7500	281 × 10 <sup>3</sup>	1.090	0.587	125	0.0500	0.0580	W58	
N0676YC180	1800	676	7500	281 × 10 <sup>3</sup>	1.090	0.587	125	0.0500	0.0580	W58	
N0734YC120	1200	734	8400	353 × 10 <sup>3</sup>	1.03	0.483	125	0.0500	0.0580	W58	
N0734YC160	1600	734	8400	353 × 10 <sup>3</sup>	1.03	0.483	125	0.0500	0.0580	W58	
N0882NC400	4000	882	7700	296 × 10 <sup>3</sup>	1.300	0.920	125	0.0240	0.0273	W11	
N0882NC450	4500	882	7700	296 × 10 <sup>3</sup>	1.300	0.920	125	0.0240	0.0273	W11	
N0910LC200	2000	910	9200	423 × 10 <sup>3</sup>	1.040	0.606	125	0.0320	0.0393	W10	
N0910LC260	2600	910	9200	423 × 10 <sup>3</sup>	1.040	0.606	125	0.0320	0.0393	W10	
N0910LC280	2800	910	9200	423 × 10 <sup>3</sup>	1.040	0.606	125	0.0320	0.0393	W10	
N1010NC300	3000	1010	12100	732 × 10 <sup>3</sup>	1.170	0.687	125	0.0240	0.0273	W11	
N1010NC380	3800	1010	12100	732 × 10 <sup>3</sup>	1.170	0.687	125	0.0240	0.0273	W11	
N1052LC200	2000	1052	13200	870 × 10 <sup>3</sup>	1.000	0.416	125	0.0320	0.0393	W10	
N1052LC220	2200	1052	13200	870 × 10 <sup>3</sup>	1.000	0.416	125	0.0320	0.0393	W10	
N1114LC120	1200	1114	12700	806 × 10 <sup>3</sup>	1.000	0.349	125	0.0320	0.0393	W10	
N1114LC180	1800	1114	12700	806 × 10 <sup>3</sup>	1.000	0.349	125	0.0320	0.0393	W10	
N1132NC300	3000	1132	14300	1.02 × 10 <sup>6</sup>	1.150	0.510	125	0.0240	0.0271	W11	
N1132NC340	3400	1132	14300	1.02 × 10 <sup>6</sup>	1.150	0.510	125	0.0240	0.0271	W11	
N1132NC360	3600	1132	14300	1.02 × 10 <sup>6</sup>	1.150	0.510	125	0.0240	0.0271	W11	
N1159NC380	3800	1159	14500	1.05 × 10 <sup>6</sup>	1.100	0.574	125	0.0220	0.0255	W11	
N1159NC420	4200	1159	14500	1.05 × 10 <sup>6</sup>	1.100	0.574	125	0.0220	0.0255	W11	
N1174JK200	2000	1174	13200	870 × 10 <sup>3</sup>	1.000	0.416	125	0.0270	0.0314	WP1	
N1174JK220	2200	1174	13200	870 × 10 <sup>3</sup>	1.000	0.416	125	0.0270	0.0314	WP1	
N1263JK160	1600	1263	15000	1.13 × 10 <sup>6</sup>	1.015	0.332	125	0.0270	0.0314	WP1	
N1263JK180	1800	1263	15000	1.13 × 10 <sup>6</sup>	1.015	0.332	125	0.0270	0.0314	WP1	
N1351VC400	4000	1351	17500	1.53 × 10 <sup>6</sup>	1.200	0.553	125	0.0170	0.0206	W12	
N1351VC450	4500	1351	17500	1.53 × 10 <sup>6</sup>	1.200	0.553	125	0.0170	0.0206	W12	
N1351VF400	4000	1351	17500	1.53 × 10 <sup>6</sup>	1.200	0.553	125	0.0170	0.0206	W62	
N1351VF450	4500	1351	17500	1.53 × 10 <sup>6</sup>	1.200	0.553	125	0.0170	0.0206	W62	
N1366JK080	800	1366	15900	1.26 × 10 <sup>6</sup>	0.985	0.270	125	0.0270	0.0314	WP1	
N1366JK120	1200	1366	15900	1.26 × 10 <sup>6</sup>	0.985	0.270	125	0.0270	0.0314	WP1	
N1366JK140	1400	1366	15900	1.26 × 10 <sup>6</sup>	0.985	0.270	125	0.0270	0.0314	WP1	
N1449QL200	2000	1410	17300	1.50 × 10 <sup>6</sup>	1.060	0.317	125	0.0230	0.0272	WP6	
N1449QL220	2200	1410	17300	1.50 × 10 <sup>6</sup>	1.060	0.317	125	0.0230	0.0272	WP6	
N1467NC200	2000	1467	21500	2.31 × 10 <sup>6</sup>	1.000	0.272	125	0.0240	0.0271	W11	
N1467NC260	2600	1467	21500	2.31 × 10 <sup>6</sup>	1.000	0.272	125	0.0240	0.0271	W11	
N1547NC160	1600	1547	23300	2.71 × 10 <sup>6</sup>	0.920	0.252	125	0.0240	0.0271	W11	
N1547NC200	2000	1547	23300	2.71 × 10 <sup>6</sup>	0.920	0.252	125	0.0240	0.0271	W11	
N1581QL160	1600	1535	19100	1.82 × 10 <sup>6</sup>	1.022	0.253	125	0.0230	0.0270	WP6	
N1581QL180	1800	1535	19100	1.82 × 10 <sup>6</sup>	1.022	0.253	125	0.0230	0.0270	WP6	
N1651QK200	2000	1651	17300	1.50 × 10 <sup>6</sup>	1.060	0.317	125	0.0180	0.0217	WP2	
N1651QK220	2200	1651	17300	1.50 × 10 <sup>6</sup>	1.060	0.317	125	0.0180	0.0217	WP2	
N1661VC300	3000	1661	23000	2.65 × 10 <sup>6</sup>	1.040	0.350	125	0.0170	0.0206	W12	
N1661VC360	3600	1661	23000	2.65 × 10 <sup>6</sup>	1.040	0.350	125	0.0170	0.0206	W12	
N1661VF300	3000	1661	23000	2.65 × 10 <sup>6</sup>	1.040	0.350	125	0.0170	0.0206	W62	
N1661VF360	3600	1661	23000	2.65 × 10 <sup>6</sup>	1.040	0.350	125	0.0170	0.0206	W62	
N1718NC120	1200	1718	27200	3.70 × 10 <sup>6</sup>	0.979	0.169	125	0.0240	0.0271	W11	
N1718NC180	1800	1718	27200	3.70 × 10 <sup>6</sup>	0.979	0.169	125	0.0240	0.0271	W11	
N1718NC200	2000	1718	27200	3.70 × 10 <sup>6</sup>	0.979	0.169	125	0.0240	0.0271	W11	
N1725MC320	3200	1725	20000	2.00 × 10 <sup>6</sup>	1.022	0.396	125	0.0150	0.0165	W70	

# High-Power Devices



## Phase Control Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>		I <sub>TAV</sub>	I <sub>TSM</sub>	I <sup>2</sup> t	V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.
			T <sub>k</sub> = 55°C	10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>		@ T <sub>JM</sub>			d.c. 180° sine	120° Rect.	
	V	A	A	A <sup>2</sup> S	V	mΩ	°C		K/W	K/W	
N1725MC360	3600	1725	20000	2.00 × 10 <sup>6</sup>	1.022	0.396	125	0.0150	0.0165	W70	
N1802NC120	1200	1802	29600	4.38 × 10 <sup>6</sup>	0.855	0.171	125	0.0240	0.0271	W11	
N1802NC160	1600	1802	29600	4.38 × 10 <sup>6</sup>	0.855	0.171	125	0.0240	0.0271	W11	
N1806QK160	1600	1806	19100	1.82 × 10 <sup>6</sup>	1.022	0.253	125	0.0180	0.0217	WP2	
N1806QK180	1800	1806	19100	1.82 × 10 <sup>6</sup>	1.022	0.253	125	0.0180	0.0217	WP2	
N1817QL080	800	1760	22000	2.42 × 10 <sup>6</sup>	0.955	0.177	125	0.0230	0.0272	WP6	
N1817QL120	1200	1760	22000	2.42 × 10 <sup>6</sup>	0.955	0.177	125	0.0230	0.0272	WP6	
N1817QL140	1400	1760	22000	2.42 × 10 <sup>6</sup>	0.955	0.177	125	0.0230	0.0272	WP6	
N2015ML200	2000	2015	32400	5.25 × 10 <sup>6</sup>	0.883	0.210	125	0.0180	0.0201	WP5	
N2015ML220	2200	2015	32400	5.25 × 10 <sup>6</sup>	0.883	0.210	125	0.0180	0.0201	WP5	
N2055MC260	2600	2105	25800	3.33 × 10 <sup>6</sup>	0.970	0.240	125	0.0150	0.0165	W70	
N2055MC280	2800	2105	25800	3.33 × 10 <sup>6</sup>	0.970	0.240	125	0.0150	0.0165	W70	
N2055HE420	4200	2055	24000	2.88 × 10 <sup>6</sup>	0.977	0.342	125	0.0125	0.0138	W80	
N2055HE450	4500	2055	24000	2.88 × 10 <sup>6</sup>	0.977	0.342	125	0.0125	0.0138	W80	
N2083QK080	800	2083	22000	2.42 × 10 <sup>6</sup>	0.955	0.177	125	0.0180	0.0217	WP2	
N2083QK120	1200	2083	22000	2.42 × 10 <sup>6</sup>	0.955	0.177	125	0.0180	0.0217	WP2	
N2083QK140	1400	2083	22000	2.42 × 10 <sup>6</sup>	0.955	0.177	125	0.0180	0.0217	WP2	
N2086NC060	600	2086	35000	6.13 × 10 <sup>6</sup>	0.840	0.108	125	0.0240	0.0271	W11	
N2086NC100	1000	2086	35000	6.13 × 10 <sup>6</sup>	0.840	0.108	125	0.0240	0.0271	W11	
N2154JK020	200	2154	22700	2.58 × 10 <sup>6</sup>	0.890	0.107	140	0.0270	0.0314	WP1	
N2154JK040	400	2154	22700	2.58 × 10 <sup>6</sup>	0.890	0.107	140	0.0270	0.0314	WP1	
N2154JK060	600	2154	22700	2.58 × 10 <sup>6</sup>	0.890	0.107	140	0.0270	0.0314	WP1	
N2172ZC420	4200	2172	28000	3.92 × 10 <sup>6</sup>	1.350	0.294	125	0.0110	0.0119	W13	
N2172ZC450	4500	2172	28000	3.92 × 10 <sup>6</sup>	1.350	0.294	125	0.0110	0.0119	W13	
N2172ZD420	4200	2172	28000	3.92 × 10 <sup>6</sup>	1.350	0.294	125	0.0110	0.0119	W46	
N2172ZD450	4500	2172	28000	3.92 × 10 <sup>6</sup>	1.350	0.294	125	0.0110	0.0119	W46	
N2191ML160	1600	2191	34500	5.95 × 10 <sup>6</sup>	0.940	0.154	125	0.0180	0.0201	WP5	
N2191ML180	1800	2191	34500	5.95 × 10 <sup>6</sup>	0.940	0.154	125	0.0180	0.0201	WP5	
N2367MK200	2000	2367	32400	5.25 × 10 <sup>6</sup>	0.883	0.210	125	0.0140	0.0157	WP3	
N2367MK220	2200	2367	32400	5.25 × 10 <sup>6</sup>	0.883	0.210	125	0.0140	0.0157	WP3	
N2418ZC300	3000	2418	30000	4.50 × 10 <sup>6</sup>	1.160	0.246	125	0.0110	0.0119	W13	
N2418ZC360	3600	2418	30000	4.50 × 10 <sup>6</sup>	1.160	0.246	125	0.0110	0.0119	W13	
N2418ZD300	3000	2418	30000	4.50 × 10 <sup>6</sup>	1.160	0.246	125	0.0110	0.0119	W46	
N2418ZD360	3600	2418	30000	4.50 × 10 <sup>6</sup>	1.160	0.246	125	0.0110	0.0119	W46	
N2500VC120	1200	2500	37000	6.85 × 10 <sup>6</sup>	0.880	0.124	125	0.0170	0.0206	W12	
N2500VC160	1600	2500	37000	6.85 × 10 <sup>6</sup>	0.880	0.124	125	0.0170	0.0206	W12	
N2500VF120	1200	2500	37000	6.85 × 10 <sup>6</sup>	0.880	0.124	125	0.0170	0.0206	W62	

## Phase Control Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>		I <sub>TAV</sub>	I <sub>TSM</sub>	I <sup>2</sup> t	V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.
			T <sub>k</sub> = 55°C	10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>		@ T <sub>JM</sub>			d.c. 180° sine	120° Rect.	
	V	A	A	A <sup>2</sup> S	V	mΩ	°C		K/W	K/W	
N2500VF160	1600	2500	37000	6.85 × 10 <sup>6</sup>	0.880	0.124	125	0.0170	0.0206	W62	
N2520ML080	800	2520	38200	7.30 × 10 <sup>6</sup>	0.980	0.090	125	0.0180	0.0201	WP5	
N2520ML120	1200	2520	38200	7.30 × 10 <sup>6</sup>	0.980	0.090	125	0.0180	0.0201	WP5	
N2520ML140	1400	2520	38200	7.30 × 10 <sup>6</sup>	0.980	0.090	125	0.0180	0.0201	WP5	
N2543ZC240	2400	2543	32000	5.12 × 10 <sup>6</sup>	0.780	0.274	125	0.0110	0.0119	W13	
N2543ZC300	3000	2543	32000	5.12 × 10 <sup>6</sup>	0.780	0.274	125	0.0110	0.0119	W13	
N2543ZD240	2400	2543	32000	5.12 × 10 <sup>6</sup>	0.780	0.274	125	0.0110	0.0119	W46	
N2543ZD300	3000	2543	32000	5.12 × 10 <sup>6</sup>	0.780	0.274	125	0.0110	0.0119	W46	
N2593MK160	1600	2593	34500	5.95 × 10 <sup>6</sup>	0.940	0.154	125	0.0140	0.0157	WP3	
N2593MK180	1800	2593	34500	5.95 × 10 <sup>6</sup>	0.940	0.154	125	0.0140	0.0157	WP3	
N2600MC160	1600	2600	30000	4.50 × 10 <sup>6</sup>	0.950	0.130	125	0.0150	0.0165	W70	
N2600MC180	1800	2600	30000	4.50 × 10 <sup>6</sup>	0.950	0.130	125	0.0150	0.0165	W70	
N2825TE420	4200	2825	36900	6.81 × 10 <sup>6</sup>	1.210	0.270	125	0.0080	0.0085	W82	
N2825TE450	4500	2825	36900	6.81 × 10 <sup>6</sup>	1.210	0.270	125	0.0080	0.0085	W82	
N2825TJ420	4200	2825	36900	6.81 × 10 <sup>6</sup>	1.210	0.270	125	0.0080	0.0085	W81	
N2825TJ450	4500	2825	36900	6.81 × 10 <sup>6</sup>	1.210	0.270	125	0.0080	0.0085	W81	
N2830HE260	2600	2830	36000	6.48 × 10 <sup>6</sup>	0.930	0.150	125	0.0125	0.0138	W80	
N2830HE280	2800	2830	36000	6.48 × 10 <sup>6</sup>	0.930	0.150	125	0.0125	0.0138	W80	
N2900QL020	200	2900	28000	3.92 × 10 <sup>6</sup>	0.850	0.080	150	0.0230	0.0272	WP6	
N2900QL040	400	2900	28000	3.92 × 10 <sup>6</sup>	0.850	0.080	150	0.0230	0.0272	WP6	
N2900QL060	600	2900	28000	3.92 × 10 <sup>6</sup>	0.850	0.080	150	0.0230	0.0272	WP6	
N3012ZC200	2000	3012	45100	10.2 × 10 <sup>6</sup>	0.920	0.160	125	0.0110	0.0119	W13	
N3012ZC260	2600	3012	45100	10.2 × 10 <sup>6</sup>	0.920	0.160	125	0.0110	0.0119	W13	
N3012ZD200	2000	3012	45100	10.2 × 10 <sup>6</sup>	0.920	0.160	125	0.0110	0.0119	W46	
N3012ZD260	2600	3012	45100	10.2 × 10 <sup>6</sup>	0.920	0.160	125	0.0110	0.0119	W46	
N3022MK080	800	3022	38200	7.30 × 10 <sup>6</sup>	0.981	0.090	125	0.0140	0.0157	WP3	
N3022MK120	1200	3022	38200	7.30 × 10 <sup>6</sup>	0.981	0.090	125	0.0140	0.0157	WP3	
N3022MK140	1400	3022	38200	7.30 × 10 <sup>6</sup>	0.981	0.090	125	0.0140	0.0157	WP3	
N3029ZC240	2400	3029	38200	7.30 × 10 <sup>6</sup>	0.947	0.154	125	0.0110	0.0119	W13	
N3029ZC280	2800	3029	38200	7.30 × 10 <sup>6</sup>	0.947	0.154	125	0.0110	0.0119	W13	
N3029ZD240	2400	3029	38200	7.30 × 10 <sup>6</sup>	0.947	0.154	125	0.0110	0.0119	W46	
N3029ZD280	2800	3029	38200	7.30 × 10 <sup>6</sup>	0.947	0.154	125	0.0110	0.0119	W46	
N3165HA260	2600	3165	36000	6.48 × 10 <sup>6</sup>	0.930	0.150	125	0.0105	0.0118	W79	
N3165HA280	2800	3165	36000	6.48 × 10 <sup>6</sup>	0.930	0.150	125	0.0105	0.0118	W79	
N3175HE160	1600	3175	45500	10.40 × 10 <sup>6</sup>	0.900	0.110	125	0.0125	0.0138	W80	
N3175HE180	1800	3175	45500	10.40 × 10 <sup>6</sup>	0.900	0.110	125	0.0125	0.0138	W80	
N3229QK020	200	3229	28000	3.92 × 10 <sup>6</sup>	0.926	0.067	140	0.0180	0.0217	WP2	
N3229QK040	400	3229	28000	3.92 × 10 <sup>6</sup>	0.926	0.067	140	0.0180	0.0217	WP2	
N3229QK060	600	3229	28000	3.92 × 10 <sup>6</sup>	0.926	0.067	140	0.0180	0.0217	WP2	
N3533ZC140	1400	3533	50000	12.5 × 10 <sup>6</sup>	0.970	0.095	125	0.0110	0.0120	W13	
N3533ZC180	1800	3533	50000	12.5 × 10 <sup>6</sup>	0.970	0.095	125	0.0110	0.0120	W13	
N3533ZC220	2200	3533	50000	12.5 × 10 <sup>6</sup>	0.970	0.095	125	0.0110	0.0120	W13	
N3533ZD140	1400	3533	50000	12.5 × 10 <sup>6</sup>	0.970	0.095	125	0.0110	0.0120	W46	
N3533ZD180	1800	3533	50000	12.5 × 10 <sup>6</sup>	0.970	0.095	125	0.0110	0.0120	W46	
N3533ZD220	2200	3533	50000	12.5 × 10 <sup>6</sup>	0.970	0.095	125	0.0110	0.0120	W46	
N3565HA160	1600	3565	45500	10.4 × 10 <sup>6</sup>	0.900	0.110	125	0.0105	0.0118	W79	
N3565HA180	1800	3565	45500	10.4 × 10 <sup>6</sup>	0.900	0.110	125	0.0105	0.0118	W79	
N3597ML020	200	3597	45400	10.3 × 10 <sup>6</sup>	0.840	0.053	140	0.0180	0.0201	WP5	
N3597ML040	400	3597	45400	10.3 × 10 <sup>6</sup>	0.840	0.053	140	0.0180	0.0201	WP5	
N3597ML060	600	3597	45400	10.3 × 10 <sup>6</sup>	0.840	0.053	140	0.0180	0.0201	WP5	
N3620TE320	3200	3620	52500	11.2 × 10 <sup>6</sup>	0.911	0.168	125	0.0080	0.0085	W82	
N3620TE360	3600	3620	52500	11.2 × 10 <sup>6</sup>	0.911	0.168	125	0.0080	0.0085	W82	
N3620TJ320	3200	3620	52500	11.2 × 10 <sup>6</sup>	0.911	0.168	125	0.0080	0.0085	W81	
N3620TJ360	3600	3620	52500	11.2 × 10 <sup>6</sup>	0.911	0.168	125	0.0080	0.0085	W81	
N3790TE240	2400	3790	49500	12.3 × 10<							



# High-Power Devices



## Phase Control Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub>		I <sub>TSM</sub>		I <sup>2</sup> t		V <sub>TO</sub>		r <sub>T</sub>		T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.
		T <sub>k</sub> = 55°C		10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		@ T <sub>JM</sub>		°C		K/W					
		V	A	A	A <sup>2</sup> S	V	mΩ	°C	K/W	K/W					
N3790TJ240	2400	3790	49500	12.3 × 10 <sup>6</sup>	0.900	0.150	125	0.0080	0.0085	W81					
N3790TJ280	2800	3790	49500	12.3 × 10 <sup>6</sup>	0.900	0.150	125	0.0080	0.0085	W81					
N3880ZD160	1600	3880	59000	17.4 × 10 <sup>6</sup>	0.986	0.068	125	0.0110	0.0119	W46					
N3880ZD180	1800	3880	59000	17.4 × 10 <sup>6</sup>	0.986	0.068	125	0.0110	0.0119	W46					
N3904HK200	2000	3904	50900	12.95 × 10 <sup>6</sup>	0.920	0.111	125	0.0090	0.0099	WP4					
N3904HK220	2200	3904	50900	12.95 × 10 <sup>6</sup>	0.920	0.111	125	0.0090	0.0099	WP4					
N3930ZC120	1200	3930	54000	14.6 × 10 <sup>6</sup>	0.841	0.080	125	0.0110	0.0119	W13					
N3930ZC160	1600	3930	54000	14.6 × 10 <sup>6</sup>	0.841	0.080	125	0.0110	0.0119	W13					
N3930ZD120	1200	3930	54000	14.6 × 10 <sup>6</sup>	0.841	0.080	125	0.0110	0.0119	W46					
N3930ZD160	1600	3930	54000	14.6 × 10 <sup>6</sup>	0.841	0.080	125	0.0110	0.0119	W46					
N4085ZC080	800	4085	64000	20.5 × 10 <sup>6</sup>	0.850	0.070	125	0.0110	0.0119	W13					
N4085ZC120	1200	4085	64000	20.5 × 10 <sup>6</sup>	0.850	0.070	125	0.0110	0.0119	W13					
N4085ZD080	800	4085	64000	20.5 × 10 <sup>6</sup>	0.850	0.070	125	0.0110	0.0119	W46					
N4085ZD120	1200	4085	64000	20.5 × 10 <sup>6</sup>	0.850	0.070	125	0.0110	0.0119	W46					
N4165EE420	4200	4165	56000	15.7 × 10 <sup>6</sup>	0.977	0.177	125	0.0060	0.0064	W108					
N4165EE450	4500	4165	56000	15.7 × 10 <sup>6</sup>	0.977	0.177	125	0.0060	0.0064	W108					
N4240EA480	4800	4240	43200	9.33 × 10 <sup>6</sup>	1.039	0.216	125	0.0050	0.0054	W107					
N4240EA520	5200	4240	43200	9.33 × 10 <sup>6</sup>	1.039	0.216	125	0.0050	0.0054	W107					
N4316MK020	200	4316	45400	10.3 × 10 <sup>6</sup>	0.840	0.053	140	0.0140	0.0157	WP3					
N4316MK040	400	4316	45400	10.3 × 10 <sup>6</sup>	0.840	0.053	140	0.0140	0.0157	WP3					
N4316MK060	600	4316	45400	10.3 × 10 <sup>6</sup>	0.840	0.053	140	0.0140	0.0157	WP3					
N4340TE180	1800	4340	55000	15.1 × 10 <sup>6</sup>	0.886	0.105	125	0.0080	0.0085	W82					
N4340TE220	2200	4340	55000	15.1 × 10 <sup>6</sup>	0.886	0.105	125	0.0080	0.0085	W82					
N4340TJ180	1800	4340	55000	15.1 × 10 <sup>6</sup>	0.886	0.105	125	0.0080	0.0085	W81					
N4340TJ220	2200	4340	55000	15.1 × 10 <sup>6</sup>	0.886	0.105	125	0.0080	0.0085	W81					
N4472HK160	1600	4472	59000	17.40 × 10 <sup>6</sup>	0.986	0.068	125	0.0090	0.0099	WP4					
N4472HK180	1800	4472	59000	17.40 × 10 <sup>6</sup>	0.986	0.068	125	0.0090	0.0099	WP4					
N4650EA420	4200	4650	56000	15.7 × 10 <sup>6</sup>	0.977	0.177	125	0.0050	0.0054	W107					
N4650EA450	4500	4650	56000	15.7 × 10 <sup>6</sup>	0.977	0.177	125	0.0050	0.0054	W107					
N4845EE320	3200	4845	65000	21.1 × 10 <sup>6</sup>	0.913	0.125	125	0.0060	0.0065	W108					
N4845EE360	3600	4845	65000	21.1 × 10 <sup>6</sup>	0.913	0.125	125	0.0060	0.0065	W108					
N4940HK120	1200	4940	62000	19.0 × 10 <sup>6</sup>	0.939	0.520	125	0.0090	0.0099	WP4					
N4940HK140	1400	4940	62000	19.0 × 10 <sup>6</sup>	0.939	0.520	125	0.0090	0.0099	WP4					
N5320FE420	4200	5320	78000	30.42 × 10 <sup>6</sup>	1.060	0.130	125	0.0048	0.0051	W119					
N5320FE450	4500	5320	78000	30.42 × 10 <sup>6</sup>	1.060	0.130	125	0.0048	0.0051	W119					
N5715EE240	2400	5715	80000	32.0 × 10 <sup>6</sup>	0.840	0.085	125	0.0060	0.0065	W108					
N5715EE280	2800	5715	80000	32.0 × 10 <sup>6</sup>	0.840	0.085	125	0.0060	0.0065	W108					
N5910FA420	4200	5910	78000	30.42 × 10 <sup>6</sup>	1.060	0.130	125	0.0040	0.0044	W118					
N5910FA450	4500	5910	78000	30.42 × 10 <sup>6</sup>	1.060	0.130	125	0.0040	0.0044	W118					
N6012ZD020	200	6012	65000	21.13 × 10 <sup>6</sup>	0.853	0.029	140	0.0110	0.0119	W46					

## Phase Control Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub>		I <sub>TSM</sub>		I <sup>2</sup> t		V <sub>TO</sub>		r <sub>T</sub>		T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.
		T <sub>k</sub> = 55°C		10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		@ T <sub>JM</sub>		°C		K/W					
		V	A	A	A <sup>2</sup> S	V	mΩ	°C	K/W	K/W					
N6012ZD040	400	6012	65000	21.13 × 10 <sup>6</sup>	0.853	0.029	140	0.0110	0.0119	W46					
N6012ZD060	600	6012	65000	21.13 × 10 <sup>6</sup>	0.853	0.029	140	0.0110	0.0119	W46					
N6405EA240	2400	6405	80000	32.0 × 10 <sup>6</sup>	0.840	0.085	125	0.0050	0.0054	W107					
N6405EA280	2800	6405	80000	32.0 × 10 <sup>6</sup>	0.840	0.085	125	0.0050	0.0054	W107					
N6974HK020	200	6974	65000	21.13 × 10 <sup>6</sup>	0.853	0.029	140	0.0090	0.0099	WP4					
N6974HK040	400	6974	65000	21.13 × 10 <sup>6</sup>	0.853	0.029	140	0.0090	0.0099	WP4					
N6974HK060	600	6974	65000	21.13 × 10 <sup>6</sup>	0.853	0.029	140	0.0090	0.0099	WP4					
N7585FE240	2400	7535	110000	60.50 × 10 <sup>6</sup>	0.780	0.062	125	0.0048	0.0051	W119					
N7585FE280	2800	7535	110000	60.50 × 10 <sup>6</sup>	0.780	0.062	125	0.0048	0.0051	W119					
N7905FE180	1800	7905	117000	68.44 × 10 <sup>6</sup>	0.770	0.056	125	0.0048	0.0051	W119					
N7905FE220	2200	7905	117000	68.44 × 10 <sup>6</sup>	0.770	0.056	125	0.0048	0.0051	W119					
N8440FA240	2400	8440	110000	60.50 × 10 <sup>6</sup>	0.780	0.062	125	0.0040	0.0044	W118					
N8440FA280	2800	8440	110000	60.50 × 10 <sup>6</sup>	0.780	0.062	125	0.0040	0.0044	W118					
N8800FA180	1800	8800	117000	68.44 × 10 <sup>6</sup>	0.770	0.056	125	0.0040	0.0044	W118					
N8800FA220	2200	8800	117000	68.44 × 10 <sup>6</sup>	0.770	0.056	125	0.0040	0.0044	W118					

## Phase Control Thyristors—Capsule Types, B-Series

IXYS UK Littelfuse presents the new family of phase control thyristors for industrial application. Devices with voltage ranges from 1200V to 2500V are available, making them suitable for applications with line voltages from 230V to over 600V.

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub>		I <sub>TSM</sub>		I <sup>2</sup> t		V <sub>TO</sub>		r <sub>T</sub>		T <sub>JM</sub>	R <sub>thJC</sub>		Fig. No.
		T <sub>k</sub> = 55°C		10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>		@ T <sub>JM</sub>		°C		K/W					
		V	A	A	A <sup>2</sup> S	V	mΩ	°C	K/W	K/W					
B0470WC120	1200	470	4650	108 × 10 <sup>3</sup>	0.92	0.99	125	0.0722	0.0891	W8					
B0470WC160	1600	470	4650	108 × 10 <sup>3</sup>	0.92	0.99	125	0.0722	0.0891	W8					
B0713YC200	2000	713	7100	252 × 10 <sup>3</sup>	1.103	0.804	125	0.039	0.046	W58					
B0713YC220	2200	713	7100	252 × 10 <sup>3</sup>	1.103	0.804	125	0.039	0.046	W58					
B0713YC240	2400	713	7100	252 × 10 <sup>3</sup>	1.103	0.804	125	0.039	0.046	W58					
B0713YC250	2500	713	7100	252 × 10 <sup>3</sup>	1.103	0.804	125	0.039	0.046	W58					
B0800YC120	1200	800	7500	281 × 10 <sup>3</sup>	1.08	0.596	125	0.0389	0.046	W58					
B0800YC140	1400	800	7500	281 × 10 <sup>3</sup>	1.08	0.596	125	0.0389	0.046	W58					
B0800YC160	1600	800	7500	281 × 10 <sup>3</sup>	1.08	0.596	125	0.0389	0.046	W58					
B0800YC180	1800	800	7500	281 × 10 <sup>3</sup>	1.08	0.596	125	0.0389	0.046	W58					
B0870YC120	1200	870	8400	353 × 10 <sup>3</sup>	1.03	0.48	125	0.0389	0.0461	W58					
B0870YC140	1400	870	8400	353 × 10 <sup>3</sup>	1.03	0.48	125	0.0389	0.0461	W58					
B0870YC160	1600	870	8400	353 × 10 <sup>3</sup>	1.03	0.48	125	0.0389	0.0461	W58					
B1115LC160	1600	1157	12700	806 × 10 <sup>3</sup>	0.973	0.369	125	0.032	0.0388	W10					
B1115LC180	1800	1157	12700	806 × 10 <sup>3</sup>	0.973	0.369	125	0.032	0.0388	W10					
B1230LC120	1200	1226	15000	1.125 × 10 <sup>6</sup>	0.883	0.297	125	0.032	0.0388	W10					
B1230LC140	1400	1226	15000	1.125 × 10 <sup>6</sup>	0.883	0.297	125	0.032	0.0388	W10					
B1230LC160	1600	1226	15000	1.125 × 10 <sup>6</sup>	0.883	0.297	125	0.032	0.0388	W10					
B1725NC120	1200	1725	27200	3.70 × 10 <sup>6</sup>	0.972	0.169	125	0.0248	0.0271	W11					
B1725NC140	1400	1725	27200	3.70 × 10 <sup>6</sup>	0.972	0.169	125	0.0248	0.0271	W11					
B1725NC160	1600	1725	27200	3.70 × 10 <sup>6</sup>	0.972	0.169	125	0.0248	0.0271	W11					
B1725NC180	1800	1725	27200	3.70 × 10 <sup>6</sup>	0.972	0.169	125	0.0248	0.0271	W11					
B1815NC120	1200	1815	29600	4.38 × 10 <sup>6</sup>	0.847	0.17	125	0.0248	0.0271	W11					
B1815NC140	1400	1815	29600	4.38 × 10 <sup>6</sup>	0.847	0.17	125	0.0248	0.0271	W11					
B1815NC160	1600	1815	29600	4.38 × 10 <sup>6</sup>	0.847	0.17	125	0.0248	0.0271	W11					



## Medium Voltage Thyristors

Medium voltage applications place additional demands on phase-controlled thyristors. To meet these demands, we have developed a comprehensive range of thyristors optimized for medium voltage applications and series operation. As voltages increase, so do switching losses and turn-off time, to a point where they become significant in line-frequency applications. Our patented distributed gate architecture ensures excellent switching performance over a wide range of voltage, current, and di/dt. Device lifetime is also engineered to achieve an optimum balance between conduction losses, commutation losses, and turn-off time to give maximum power handling from line frequency to 400 Hz. This also gives significant benefits when series or parallel connection of devices is required. Medium voltage thyristors are available from 2.8 kV up to 6.5 kV with silicon diameters from 38 mm to 96 mm making them particularly suitable for high-power converters such as medium voltage DC drives, medium voltage soft starts, and utility applications such as HVDC, static VAR compensators, excitation, and transfer switches.

We recognize the importance of reliability in these large, capital intensive applications and, as a result, we subject these parts to extended levels of both routine and type testing to ensure that investments provide years of trouble-free service.



## Medium Voltage Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub> T <sub>K</sub> = 55°C	I <sub>TSM</sub>	I <sup>2</sup> t 10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>	t <sub>q</sub> @ 200 V/μs	Typ. Reverse Recovery Charge			V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub>		Fig. No.			
						T <sub>JM</sub>						V	mΩ		°C	180° sine K/W	120° Rect. K/W
						Q <sub>rr</sub>	@ I <sub>TM</sub>	@ -di/dt									
V	A	A	A <sup>2</sup> S	μs	μC	A	A/μs	V	mΩ	°C	K/W	K/W					
K0443LC600	6000	443	4800	115 × 10 <sup>3</sup>	1100	3100	1000	10	1.57	2.43	125	0.032	0.039	W10			
K0443LC650	6500	443	4800	115 × 10 <sup>3</sup>	1100	3100	1000	10	1.57	2.43	125	0.032	0.039	W10			
K0769NC600	6000	769	8600	370 × 10 <sup>3</sup>	1200	3100	1000	10	1.57	1.77	125	0.025	0.027	W11			
K0769NC650	6500	769	8600	370 × 10 <sup>3</sup>	1200	3100	1000	10	1.57	1.77	125	0.025	0.027	W11			
K0890NC360	3600	890	10900	594 × 10 <sup>3</sup>	350-550	4000	1000	10	1.516	0.800	125	0.0240	0.0270	W11			
K0890NC420	4200	890	10900	594 × 10 <sup>3</sup>	350-550	4000	1000	10	1.516	0.800	125	0.0240	0.0270	W11			
K1121NC320	3200	1121	15000	1.13 × 10 <sup>6</sup>	200-300	2000	1000	10	1.098	0.542	125	0.0240	0.0270	W11			
K1121NC360	3600	1121	15000	1.13 × 10 <sup>6</sup>	200-300	2000	1000	10	1.098	0.542	125	0.0240	0.0270	W11			
K1197NC280	2800	1197	10650	567 × 10 <sup>3</sup>	200-300	2700	1000	10	1.335	0.372	125	0.0240	0.0270	W11			
K1197NC320	3200	1197	10650	567 × 10 <sup>3</sup>	200-300	2700	1000	10	1.335	0.372	125	0.0240	0.0270	W11			
K1351VF600	6000	1351	14300	1.02 × 10 <sup>6</sup>	1000	7200	2000	10	1.41	0.6	125	0.013	0.0145	W62			
K1351VF620	6200	1351	14300	1.02 × 10 <sup>6</sup>	1000	7200	2000	10	1.41	0.6	125	0.013	0.0145	W63			
K1351VF640	6400	1351	14300	1.02 × 10 <sup>6</sup>	1000	7200	2000	10	1.41	0.6	125	0.013	0.0145	W64			
K1351VF650	6500	1351	14300	1.02 × 10 <sup>6</sup>	1000	7200	2000	10	1.41	0.6	125	0.013	0.0145	W65			
K1947ZC400	4000	1947	25000	3.13 × 10 <sup>6</sup>	600-700	8800	1000	10	1.221	0.425	125	0.0110	0.0119	W13			

## Medium Voltage Thyristors—Capsule Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub> T <sub>K</sub> = 55°C	I <sub>TSM</sub>	I <sup>2</sup> t 10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>	t <sub>q</sub> @ 200 V/μs	Typ. Reverse Recovery Charge			V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJK</sub>		Fig. No.			
						T <sub>JM</sub>						V	mΩ		°C	180° sine K/W	120° Rect. K/W
						Q <sub>rr</sub>	@ I <sub>TM</sub>	@ -di/dt									
V	A	A	A <sup>2</sup> S	μs	μC	A	A/μs	V	mΩ	°C	K/W	K/W					
K1947ZC450	4500	1947	25000	3.13 × 10 <sup>6</sup>	600-700	8800	1000	10	1.221	0.425	125	0.0110	0.0119	W13			
K1947ZD400	4000	1947	25000	3.13 × 10 <sup>6</sup>	600-700	8800	1000	10	1.221	0.425	125	0.0110	0.0119	W46			
K1947ZD450	4500	1947	25000	3.13 × 10 <sup>6</sup>	600-700	8800	1000	10	1.221	0.425	125	0.0110	0.0119	W46			
K2085TE600	6000	2145	33000	5.45 × 10 <sup>6</sup>	1450-1800	11000	3000	10	1.260	0.410	125	0.0095	0.0101	W82			
K2085TE650	6500	2145	33000	5.45 × 10 <sup>6</sup>	1450-1800	11000	3000	10	1.260	0.410	125	0.0095	0.0101	W82			
K2095ZC360	3600	2095	18200	1.66 × 10 <sup>6</sup>	400-500	4550	2000	10	1.502	0.296	125	0.0110	0.0119	W13			
K2095ZC420	4200	2095	18200	1.66 × 10 <sup>6</sup>	400-500	4550	2000	10	1.502	0.296	125	0.0110	0.0119	W13			
K2095ZD360	3600	2095	18200	1.66 × 10 <sup>6</sup>	400-500	4550	2000	10	1.502	0.296	125	0.0110	0.0119	W46			
K2095ZD420	4200	2095	18200	1.66 × 10 <sup>6</sup>	400-500	4550	2000	10	1.502	0.296	125	0.0110	0.0119	W46			
K2325TJ600	6000	2380	33000	5.45 × 10 <sup>6</sup>	1450-1800	11000	3000	10	1.260	0.410	125	0.0080	0.0085	W81			
K2325TJ650	6500	2380	33000	5.45 × 10 <sup>6</sup>	1450-1800	11000	3000	10	1.260	0.410	125	0.0080	0.0085	W81			
K3745EA600	6000	3745	35400	6.26 × 10 <sup>6</sup>	1500-1800	14000	4000	10	1.320	0.270	125	0.0050	0.0054	W107			
K3745EA650	6500	3745	35400	6.26 × 10 <sup>6</sup>	1500-1800	14000	4000	10	1.320	0.270	125	0.0050	0.0054	W107			
K4005EA480	4800	4005	43200	9.33 × 10 <sup>6</sup>	1300-1600	8000	4000	10	1.359	0.216	125	0.0050	0.0054	W107			
K4005EA520	5200	4005	43200	9.33 × 10 <sup>6</sup>	1300-1600	8000	4000	10	1.359	0.216	125	0.0050	0.0054	W107			
K4215EA420	4200	4215	47000	11.0 × 10 <sup>6</sup>	1200-1500	4800	4000	10	1.224	0.201	125	0.0050	0.0054	W107			
K4215EA450	4500	4215	47000	11.0 × 10 <sup>6</sup>	1200-1500	4800	4000	10	1.224	0.201	125	0.0050	0.0054	W107			

## Fast Turn-Off Thyristors

IXYS UK Westcode Ltd's "P" series of fast switching thyristors have a regenerative gate structure to ensure low switching losses and high di/dt performance. "P" series devices are suitable for existing inverters, DC chopper drives, UPS, and Pulse Power applications. In addition to pressure contact technology, these devices offer low reverse recovery charge values, low forward switching losses, and high reliability. These devices are not recommended for new designs.

**W8**  
Weight 70 g

**W10**  
Weight 340 g

**W58**  
Weight 90 g

**W16**  
Weight 100 g

**W115**  
Weight 650 g

**W17**  
Weight 130 g

**W18**  
Weight 280 g

## Fast Turn-Off Thyristors—Stud Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub> T <sub>C</sub> = 55°C	I <sub>TSM</sub> 10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>	I <sup>2</sup> t A <sup>2</sup> S	t <sub>q</sub> @ 200 V/μs	Typ. Reverse Recovery Charge			V <sub>TO</sub>	r <sub>T</sub> mΩ	R <sub>thJC</sub> 180° sine K/W	Fig. No.
						T <sub>JM</sub>						
						Q <sub>rr</sub> μC	@ I <sub>TM</sub> A	@ -di/dt A/μs				
P0128SH10C	1000	128	1700	19 × 10 <sup>3</sup>	15	50	100	10	1.600	2.490	0.2300	W17
P0128SH10D	1000	128	1700	19 × 10 <sup>3</sup>	20	50	100	10	1.600	2.490	0.2300	W17
P0128SH10E	1000	128	1700	19 × 10 <sup>3</sup>	25	50	100	10	1.600	2.490	0.2300	W17
P0128SH12C	1200	128	1700	19 × 10 <sup>3</sup>	15	50	100	10	1.600	2.490	0.2300	W17
P0128SH12D	1200	128	1700	19 × 10 <sup>3</sup>	20	50	100	10	1.600	2.490	0.2300	W17
P0128SH12E	1200	128	1700	19 × 10 <sup>3</sup>	25	50	100	10	1.600	2.490	0.2300	W17
P0128SJ10C	1000	128	1700	19 × 10 <sup>3</sup>	15	50	100	10	1.600	2.490	0.2300	W16
P0128SJ10D	1000	128	1700	19 × 10 <sup>3</sup>	20	50	100	10	1.600	2.490	0.2300	W16
P0128SJ10E	1000	128	1700	19 × 10 <sup>3</sup>	25	50	100	10	1.600	2.490	0.2300	W16
P0128SJ12C	1200	128	1700	19 × 10 <sup>3</sup>	15	50	100	10	1.600	2.490	0.2300	W16
P0128SJ12D	1200	128	1700	19 × 10 <sup>3</sup>	20	50	100	10	1.600	2.490	0.2300	W16
P0128SJ12E	1200	128	1700	19 × 10 <sup>3</sup>	25	50	100	10	1.600	2.490	0.2300	W16
R0472YC12EKER	1200	240	4000	80 × 10 <sup>3</sup>	25	155	550	40	1.648	1.125	0.1249	W115
R0472YC12FKER	1200	240	4000	80 × 10 <sup>3</sup>	30	155	550	40	1.648	1.125	0.1249	W115
R0472YC16EKER	1600	240	4000	80 × 10 <sup>3</sup>	25	155	550	40	1.648	1.125	0.1249	W115
R0472YC16FKER	1600	240	4000	80 × 10 <sup>3</sup>	30	155	550	40	1.648	1.125	0.1249	W115
P0248SC12D	1200	248	2700	36.5 × 10 <sup>3</sup>	20	45	300	20	1.600	1.230	0.1200	W18
P0248SC12E	1200	248	2700	36.5 × 10 <sup>3</sup>	25	45	300	20	1.600	1.230	0.1200	W18
P0273SC12D	1200	273	3250	52.8 × 10 <sup>3</sup>	20	80	300	20	1.550	0.870	0.1200	W18
P0273SC12E	1200	273	3250	52.8 × 10 <sup>3</sup>	25	80	300	20	1.550	0.870	0.1200	W18
P0273SC12F	1200	273	3250	52.8 × 10 <sup>3</sup>	30	80	300	20	1.550	0.870	0.1200	W18
P0306SC08A	800	306	4700	110 × 10 <sup>3</sup>	10	50	300	20	1.400	0.670	0.1200	W18
P0306SC08B	800	306	4700	110 × 10 <sup>3</sup>	12	50	300	20	1.400	0.670	0.1200	W18
P0306SC08C	800	306	4700	110 × 10 <sup>3</sup>	15	50	300	20	1.400	0.670	0.1200	W18
P0311SC12E	1200	311	3600	64.8 × 10 <sup>3</sup>	25	55	300	20	1.170	0.920	0.1200	W18
P0311SC12F	1200	311	3600	64.8 × 10 <sup>3</sup>	30	55	300	20	1.170	0.920	0.1200	W18
P0330SC04A	400	330	5000	125 × 10 <sup>3</sup>	10	55	300	20	1.050	0.880	0.1200	W18
P0330SC04C	400	330	5000	125 × 10 <sup>3</sup>	15	55	300	20	1.050	0.880	0.1200	W18
P0330SC06A	600	330	5000	125 × 10 <sup>3</sup>	10	55	300	20	1.050	0.880	0.1200	W18
P0330SC06C	600	330	5000	125 × 10 <sup>3</sup>	15	55	300	20	1.050	0.880	0.1200	W18
P0330SC08A	800	330	5000	125 × 10 <sup>3</sup>	10	55	300	20	1.050	0.880	0.1200	W18
P0330SC08C	800	330	5000	125 × 10 <sup>3</sup>	15	55	300	20	1.050	0.880	0.1200	W18
P0431SC04B	400	431	6500	211 × 10 <sup>3</sup>	12	190	300	20	0.950	0.377	0.1200	W18
P0431SC04C	400	431	6500	211 × 10 <sup>3</sup>	15	190	300	20	0.950	0.377	0.1200	W18
P0431SC06B	600	431	6500	211 × 10 <sup>3</sup>	12	190	300	20	0.950	0.377	0.1200	W18
P0431SC06C	600	431	6500	211 × 10 <sup>3</sup>	15	190	300	20	0.950	0.377	0.1200	W18

## Fast Turn-Off Thyristors—Stud Types

Part Number	V <sub>DRM</sub> V <sub>RRM</sub>	I <sub>TAV</sub> T <sub>C</sub> = 55°C	I <sub>TSM</sub> 10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>	I <sup>2</sup> t A <sup>2</sup> S	t <sub>q</sub> @ 200 V/μs	Typ. Reverse Recovery Charge			V <sub>TO</sub>	r <sub>T</sub> mΩ	R <sub>thJC</sub> 180° sine K/W	Fig. No.
						T <sub>JM</sub>						
						Q <sub>rr</sub> μC	@ I <sub>TM</sub> A	@ -di/dt A/μs				
P0295WC12D	1200	295	2700	36.5 × 10 <sup>3</sup>	20	50	300	20	1.600	1.230	0.0950	W8
P0295WC12E	1200	295	2700	36.5 × 10 <sup>3</sup>	25	50	300	20	1.600	1.230	0.0950	W8
P0327WC08C	800	327	3250	63.9 × 10 <sup>3</sup>	15	45	300	20	1.550	0.870	0.0950	W8
P0327WC08D	800	327	3250	63.9 × 10 <sup>3</sup>	20	45	300	20	1.550	0.870	0.0950	W8
P0327WC08E	800	327	3250	63.9 × 10 <sup>3</sup>	25	45	300	20	1.550	0.870	0.0950	W8
P0327WC08F	800	327	3250	63.9 × 10 <sup>3</sup>	30	45	300	20	1.550	0.870	0.0950	W8
P0327WC12C	1200	327	3250	63.9 × 10 <sup>3</sup>	15	45	300	20	1.550	0.870	0.0950	W8
P0327WC12D	1200	327	3250	63.9 × 10 <sup>3</sup>	20	45	300	20	1.550	0.870	0.0950	W8
P0327WC12E	1200	327	3250	63.9 × 10 <sup>3</sup>	25	45	300	20	1.550	0.870	0.0950	W8
P0327WC12F	1200	327	3250	63.9 × 10 <sup>3</sup>	30	45	300	20	1.550	0.870	0.0950	W8
P0366WC04A	400	366	4700	110 × 10 <sup>3</sup>	10	25	300	20	1.400	0.670	0.0950	W8
P0366WC04B	400	366	4700	110 × 10 <sup>3</sup>	12	25	300	20	1.400	0.670	0.0950	W8
P0366WC04C	400	366	4700	110 × 10 <sup>3</sup>	15	25	300	20	1.400	0.670	0.0950	W8
P0366WC06A	600	366	4700	110 × 10 <sup>3</sup>	10	25	300	20	1.400	0.670	0.0950	W8
P0366WC06B	600	366	4700	110 × 10 <sup>3</sup>	12	25	300	20	1.400	0.670	0.0950	W8
P0366WC06C	600	366	4700	110 × 10 <sup>3</sup>	15	25	300	20	1.400	0.670	0.0950	W8
P0366WC08A	800	366	4700	110 × 10 <sup>3</sup>	10	25	300	20	1.400	0.670	0.0950	W8
P0366WC08B	800	366	4700	110 × 10 <sup>3</sup>	12	25	300	20	1.400	0.670	0.0950	W8
P0366WC08C	800	366	4700	110 × 10 <sup>3</sup>	15	25	300	20	1.400	0.670	0.0950	W8
P0367WC12E	1200	367	3600	64.8 × 10 <sup>3</sup>	25	50	300	20	1.170	0.920	0.0950	W8
P0367WC12F	1200	367	3600	64.8 × 10 <sup>3</sup>	30	50	300	20	1.170	0.920	0.0950	W8
P0389WC04B	400	389	5000	125 × 10 <sup>3</sup>	12	30	300	20	1.050	0.880	0.0950	W8
P0389WC04C	400	389	5000	125 × 10 <sup>3</sup>	15	30	300	20	1.050	0.880	0.0950	W8
P0389WC08B	800	389	5000	125 × 10 <sup>3</sup>	12	30	300	20	1.050	0.880	0.0950	W8
P0389WC08C	800	389	5000	125 × 10 <sup>3</sup>	15	30	300	20	1.050	0.880	0.0950	W8
P0515WC04B	400	515	6500	211 × 10 <sup>3</sup>	12	180	300	20	0.950	0.377	0.0950	W8
P0515WC04C	400	515	6500	211 × 10 <sup>3</sup>	15	180	300	20	0.950	0.377	0.0950	W8
P0515WC04D	400	515	6500	211 × 10 <sup>3</sup>	20	180	300	20	0.950	0.377	0.0950	W8
P0515WC06B	600	515	6500	211 × 10 <sup>3</sup>	12	180	300	20	0.950	0.377	0.0950	W8
P0515WC06C	600	515	6500	211 × 10 <sup>3</sup>	15	180	300	20	0.950	0.377	0.0950	W8
P0515WC06D	600	515	6500	211 × 10 <sup>3</sup>	20	180	300	20	0.950	0.377	0.0950	W8
P0838LC06B	600	1110	12300	750 × 10 <sup>3</sup>	12	160	800	50	1.200	0.280	0.0320	W10
P0838LC06C	600	1110	12300	750 × 10 <sup>3</sup>	15	160	800	50	1.200	0.280	0.0320	W10
P0838LC08B	800	1110	12300	750 × 10 <sup>3</sup>	12	160	800	50	1.200	0.280	0.0320	W10
P0838LC08C	800	1110	12300	750 × 10 <sup>3</sup>	15	160	800	50	1.200	0.280	0.0320	W10
P0848YC04B	400	848	8750	383 × 10 <sup>3</sup>	12	200	550	40	1.010	0.305	0.0500	W58
P0848YC04C	400	848	8750	383 × 10 <sup>3</sup>	15	200	550	40	1.010	0.305	0.0500	W58
P0848YC06B	600	848	8750	383 × 10 <sup>3</sup>	12	200	550	40	1.010	0.305	0.0500	W58
P0848YC06C	600	848	8750	383 × 10 <sup>3</sup>	15	200	550	40	1.010	0.305	0.0500	W58
P1007LC08D	800	1007	9500	451 × 10 <sup>3</sup>	20	400	800	50	1.509	0.265	0.0320	W10
P1007LC08E	800	1007	9500	451 × 10 <sup>3</sup>	25	400	800	50	1.509	0.265	0.0320	W10
P1007LC08F	800	1007	9500	451 × 10 <sup>3</sup>	30	400	800	50	1.509	0.265	0.0320	W10
P1007LC12D	1200	1007	9500	451 × 10 <sup>3</sup>	20	400	800	50	1.509	0.265	0.0320	W10
P1007LC12E	1200	1007	9500	451 × 10 <sup>3</sup>	25	400	800	50	1.509	0.265	0.0320	W10
P1007LC12F	1200	1007	9500	451 × 10 <sup>3</sup>	30	400	800	50	1.509	0.265	0.0320	W10

## Distributed Gate Thyristors

IXYS UK Westcode Ltd. is recognized as the world leader in distributed gate technology. These devices are available with blocking voltages of up to 4.5 kV and average currents in excess of 5 kA, with  $t_q$  ratings from 10  $\mu$ s. This unique distributed gate design and these lifetime control features give these devices both high di/dt capability and fast, low-recovery turn-off while maintaining a low on-state voltage drop. They are ideally suited to applications such as: induction power supplies, high frequency inverters/converters, UPS, and pulse power.



**W10**  
Weight 340 g



**W11**  
Weight 510 g



**W58**  
Weight 90 g

## Distributed Gate Thyristors—Capsule Types

Part Number	$V_{DRM}$	$V_{RRM}$	$I_{TAV}$			$t_q$ @ 200 V/ $\mu$ s	Typ. Reverse Recovery Charge @ $T_{JM}$			$V_{TO}$		$r_T$ @ $T_{JM}$	$R_{thJK}$ 180° sine K/W	Fig. No.
			$T_K = 55^\circ C$				$Q_r$	@ $I_{TM}$	@ -di/dt	V	m $\Omega$			
			A	A	A <sup>2</sup> S									
R0472YC12E	1200	1200	472	4300	$92.5 \times 10^3$	25	155	550	40	1.648	1.125	0.0500	W58	
R0472YC12F	1200	1200	472	4300	$92.5 \times 10^3$	30	155	550	40	1.648	1.125	0.0500	W58	
R0472YC16E	1600	1600	472	4300	$92.5 \times 10^3$	25	155	550	40	1.648	1.125	0.0500	W58	
R0472YC16F	1600	1600	472	4300	$92.5 \times 10^3$	30	155	550	40	1.648	1.125	0.0500	W58	
R0487YC12D	1200	1200	487	4300	$92.5 \times 10^3$	20	90	550	40	1.738	0.943	0.0500	W58	
R0487YC12E	1200	1200	487	4300	$92.5 \times 10^3$	25	90	550	40	1.738	0.943	0.0500	W58	
R0487YC14D	1400	1400	487	4300	$92.5 \times 10^3$	20	90	550	40	1.738	0.943	0.0500	W58	
R0487YC14E	1400	1400	487	4300	$92.5 \times 10^3$	25	90	550	40	1.738	0.943	0.0500	W58	
R0577YC12C	1200	1200	577	6000	$180 \times 10^3$	15	150	550	40	1.510	0.640	0.0500	W58	
R0577YC12D	1200	1200	577	6000	$180 \times 10^3$	20	150	550	40	1.510	0.640	0.0500	W58	
R0577YC12E	1200	1200	577	6000	$180 \times 10^3$	25	150	550	40	1.510	0.640	0.0500	W58	
R0633YC12D	1200	1200	633	6300	$200 \times 10^3$	20	125	550	40	1.250	0.614	0.0500	W58	
R0633YC12E	1200	1200	633	6300	$200 \times 10^3$	25	125	550	40	1.250	0.614	0.0500	W58	
R0633YC12F	1200	1200	633	6300	$200 \times 10^3$	30	125	550	40	1.250	0.614	0.0500	W58	
R0717LC14G	1400	1400	717	7050	$248.5 \times 10^3$	35	425	1000	60	1.752	0.732	0.0320	W10	
R0717LC14H	1400	1400	717	7050	$248.5 \times 10^3$	40	425	1000	60	1.752	0.732	0.0320	W10	
R0717LC16G	1600	1600	717	7050	$248.5 \times 10^3$	35	425	1000	60	1.752	0.732	0.0320	W10	
R0717LC16H	1600	1600	717	7050	$248.5 \times 10^3$	40	425	1000	60	1.752	0.732	0.0320	W10	
R0736LC20J	2000	2000	736	6800	$231 \times 10^3$	50	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC20K	2000	2000	736	6800	$231 \times 10^3$	60	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC22J	2200	2000	736	6800	$231 \times 10^3$	50	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC22K	2200	2000	736	6800	$231 \times 10^3$	60	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC25J	2500	2000	736	6800	$231 \times 10^3$	50	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC25K	2500	2000	736	6800	$231 \times 10^3$	60	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC25L	2500	2000	736	6800	$231 \times 10^3$	65	640	1000	60	1.842	0.619	0.0320	W10	
R0736LC25M	2500	2000	736	6800	$231 \times 10^3$	70	640	1000	60	1.842	0.619	0.0320	W10	
R0809LC10A	1000	1000	809	8000	$320 \times 10^3$	10	120	1000	60	2.100	0.300	0.0320	W10	
R0809LC10B	1000	1000	809	8000	$320 \times 10^3$	12	120	1000	60	2.100	0.300	0.0320	W10	
R0830LC12C	1200	1200	830	8500	$361 \times 10^3$	15	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC12D	1200	1200	830	8500	$361 \times 10^3$	20	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC12E	1200	1200	830	8500	$361 \times 10^3$	25	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC12F	1200	1200	830	8500	$361 \times 10^3$	30	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC14C	1400	1400	830	8500	$361 \times 10^3$	15	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC14D	1400	1400	830	8500	$361 \times 10^3$	20	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC14E	1400	1400	830	8500	$361 \times 10^3$	25	285	1000	60	1.900	0.357	0.0320	W10	
R0830LC14F	1400	1400	830	8500	$361 \times 10^3$	30	285	1000	60	1.900	0.357	0.0320	W10	
R0878LC18K	1800	1800	878	7500	$281 \times 10^3$	60	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC18L	1800	1800	878	7500	$281 \times 10^3$	65	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC18M	1800	1800	878	7500	$281 \times 10^3$	70	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC20K	2000	1800	878	7500	$281 \times 10^3$	60	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC20L	2000	1800	878	7500	$281 \times 10^3$	65	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC20M	2000	1800	878	7500	$281 \times 10^3$	70	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC21K	2100	1800	878	7500	$281 \times 10^3$	60	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC21L	2100	1800	878	7500	$281 \times 10^3$	65	720	1000	60	1.447	0.480	0.0320	W10	
R0878LC21M	2100	1800	878	7500	$281 \times 10^3$	70	720	1000	60	1.447	0.480	0.0320	W10	
R0929LC12A	1200	1200	929	9000	$405 \times 10^3$	10	150	1000	60	1.549	0.350	0.0320	W10	
R0929LC12B	1200	1200	929	9000	$405 \times 10^3$	12	150	1000	60	1.549	0.350	0.0320	W10	
R0929LC12C	1200	1200	929	9000	$405 \times 10^3$	15	150	1000	60	1.549	0.350	0.0320	W10	

## Distributed Gate Thyristors—Capsule Types

Part Number	$V_{DRM}$	$V_{RRM}$	$I_{TAV}$			$t_q$ @ 200 V/ $\mu$ s	Typ. Reverse Recovery Charge @ $T_{JM}$			$V_{TO}$		$r_T$ @ $T_{JM}$	$R_{thJK}$ 180° sine K/W	Fig. No.
			$T_K = 55^\circ C$				$Q_r$	@ $I_{TM}$	@ -di/dt	V	m $\Omega$			
			A	A	A <sup>2</sup> S									
R0964LC10C	1000	1000	964	9400	$442 \times 10^3$	15	170	1000	60	1.530	0.309	0.0320	W10	
R0964LC10D	1000	1000	964	9400	$442 \times 10^3$	20	170	1000	60	1.530	0.309	0.0320	W10	
R0964LC10E	1000	1000	964	9400	$442 \times 10^3$	25	170	1000	60	1.530	0.309	0.0320	W10	
R0964LC12C	1200	1200	964	9400	$442 \times 10^3$	15	170	1000	60	1.530	0.309	0.0320	W10	
R0964LC12D	1200	1200	964	9400	$442 \times 10^3$	20	170	1000	60	1.530	0.309	0.0320	W10	
R0964LC12E	1200	1200	964	9400	$442 \times 10^3$	25	170	1000	60	1.530	0.309	0.0320	W10	
R0990LC08A	800	800	990	11000	$605 \times 10^3$	10	90	1000	60	1.350	0.350	0.0320	W10	
R0990LC08B	800	800	990	11000	$605 \times 10^3$	12	90	1000	60	1.350	0.350	0.0320	W10	
R0990LC08C	800	800	990	11000	$605 \times 10^3$	15	90	1000	60	1.350	0.350	0.0320	W10	
R1045NC28L	2800	2800	1055	12500	$781 \times 10^3$	60	950	1000	60	1.640	0.430	0.0240	W11	
R1045NC28M	2800	2800	1055	12500	$781 \times 10^3$	70	950	1000	60	1.640	0.430	0.0240	W11	
R1045NC32L	3200	3200	1055	12500	$781 \times 10^3$	60	950	1000	60	1.640	0.430	0.0240	W11	
R1045NC32M	3200	3200	1055	12500	$781 \times 10^3$	70	950	1000	60	1.640	0.430	0.0240	W11	
R1124NC18J	1800	1800	1124	13500	$0.91 \times 10^6$	50	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC18K	1800	1800	1124	13500	$0.91 \times 10^6$	60	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC18L	1800	1800	1124	13500	$0.91 \times 10^6$	65	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC18M	1800	1800	1124	13500	$0.91 \times 10^6$	70	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC20J	2000	1800	1124	13500	$0.91 \times 10^6$	50	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC20K	2000	1800	1124	13500	$0.91 \times 10^6$	60	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC20L	2000	1800	1124	13500	$0.91 \times 10^6$	65	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC20M	2000	1800	1124	13500	$0.91 \times 10^6$	70	640	1000	60	1.540	0.379	0.0240	W11	
R1124NC21J	2100	1800	1124	13500	$0.91$									





## Distributed Gate Thyristors—Capsule Types



Part Number	V <sub>DRM</sub> V	V <sub>RRM</sub> V	I <sub>TAV</sub>			t <sub>q</sub> @ 200 V/μs	Typ. Reverse Recovery Charge @ T <sub>JM</sub>			V <sub>TO</sub>		R <sub>thJK</sub> 180° sine K/W	Fig. No.
			T <sub>K</sub> = 55°C	10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>			Q <sub>rr</sub> μC	@ I <sub>TM</sub>	@ -di/dt	@ T <sub>JM</sub>			
				A	A					A <sup>2</sup> S	V		
R1280NC21L	2100	2100	1280	14800	1.10 × 10 <sup>6</sup>	65	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC21M	2100	2100	1280	14800	1.10 × 10 <sup>6</sup>	70	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC22J	2200	2100	1280	14800	1.10 × 10 <sup>6</sup>	50	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC22K	2200	2100	1280	14800	1.10 × 10 <sup>6</sup>	60	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC22L	2200	2100	1280	14800	1.10 × 10 <sup>6</sup>	65	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC22M	2200	2100	1280	14800	1.10 × 10 <sup>6</sup>	70	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC25J	2500	2100	1280	14800	1.10 × 10 <sup>6</sup>	50	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC25K	2500	2100	1280	14800	1.10 × 10 <sup>6</sup>	60	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC25L	2500	2100	1280	14800	1.10 × 10 <sup>6</sup>	65	1200	1000	60	1.440	0.330	0.0220	W11
R1280NC25M	2500	2100	1280	14800	1.10 × 10 <sup>6</sup>	70	1200	1000	60	1.440	0.330	0.0220	W11
R1331NC10B	1000	1000	1331	18200	1.66 × 10 <sup>6</sup>	12	200	1000	60	1.450	0.285	0.0220	W11
R1331NC10C	1000	1000	1331	18200	1.66 × 10 <sup>6</sup>	15	200	1000	60	1.450	0.285	0.0220	W11
R1331NC10D	1000	1000	1331	18200	1.66 × 10 <sup>6</sup>	20	200	1000	60	1.450	0.285	0.0220	W11
R1331NC12B	1200	1200	1331	18200	1.66 × 10 <sup>6</sup>	12	200	1000	60	1.450	0.285	0.0220	W11
R1331NC12C	1200	1200	1331	18200	1.66 × 10 <sup>6</sup>	15	200	1000	60	1.450	0.285	0.0220	W11
R1331NC12D	1200	1200	1331	18200	1.66 × 10 <sup>6</sup>	20	200	1000	60	1.450	0.285	0.0220	W11
R1446NC12C	1200	1200	1446	19500	1.90 × 10 <sup>6</sup>	15	300	1000	60	1.304	0.199	0.0240	W11
R1446NC12D	1200	1200	1446	19500	1.90 × 10 <sup>6</sup>	20	300	1000	60	1.304	0.199	0.0240	W11
R1446NC12E	1200	1200	1446	19500	1.90 × 10 <sup>6</sup>	25	300	1000	60	1.304	0.199	0.0240	W11
R1446NC12F	1200	1200	1446	19500	1.90 × 10 <sup>6</sup>	30	300	1000	60	1.304	0.199	0.0240	W11
R1448NC14H	1400	1400	1448	15500	1.20 × 10 <sup>6</sup>	40	950	1000	60	1.300	0.250	0.0220	W11
R1448NC14J	1400	1400	1448	15500	1.20 × 10 <sup>6</sup>	50	950	1000	60	1.300	0.250	0.0220	W11
R1448NC18H	1800	1800	1448	15500	1.20 × 10 <sup>6</sup>	40	950	1000	60	1.300	0.250	0.0220	W11
R1448NC18J	1800	1800	1448	15500	1.20 × 10 <sup>6</sup>	50	950	1000	60	1.300	0.250	0.0220	W11
R1448NC20H	2000	2000	1448	15500	1.20 × 10 <sup>6</sup>	40	950	1000	60	1.300	0.250	0.0220	W11
R1448NC20J	2000	2000	1448	15500	1.20 × 10 <sup>6</sup>	50	950	1000	60	1.300	0.250	0.0220	W11
R1448NC20K	2000	2000	1448	15500	1.20 × 10 <sup>6</sup>	60	950	1000	60	1.300	0.250	0.0220	W11
R1448NC20L	2000	2000	1448	15500	1.20 × 10 <sup>6</sup>	65	950	1000	60	1.300	0.250	0.0220	W11
R1448NC20M	2000	2000	1448	15500	1.20 × 10 <sup>6</sup>	70	950	1000	60	1.300	0.250	0.0220	W11
R1605MC20E	2000	2000	1605	20700	2.14 × 10 <sup>6</sup>	25	900	1000	60	2.100	0.200	0.0150	W70
R1605MC20F	2000	2000	1605	20700	2.14 × 10 <sup>6</sup>	30	900	1000	60	2.100	0.200	0.0150	W70
R1605MC20G	2000	2000	1605	20700	2.14 × 10 <sup>6</sup>	35	900	1000	60	2.100	0.200	0.0150	W70
R1605MC20H	2000	2000	1605	20700	2.14 × 10 <sup>6</sup>	40	900	1000	60	2.100	0.200	0.0150	W70
R1605MC20J	2000	2000	1605	20700	2.14 × 10 <sup>6</sup>	50	900	1000	60	2.100	0.200	0.0150	W70
R1605MC22E	2200	2200	1605	20700	2.14 × 10 <sup>6</sup>	25	900	1000	60	2.100	0.200	0.0150	W70
R1605MC22F	2200	2200	1605	20700	2.14 × 10 <sup>6</sup>	30	900	1000	60	2.100	0.200	0.0150	W70
R1605MC22G	2200	2200	1605	20700	2.14 × 10 <sup>6</sup>	35	900	1000	60	2.100	0.200	0.0150	W70
R1605MC22H	2200	2200	1605	20700	2.14 × 10 <sup>6</sup>	40	900	1000	60	2.100	0.200	0.0150	W70
R1605MC22J	2200	2200	1605	20700	2.14 × 10 <sup>6</sup>	50	900	1000	60	2.100	0.200	0.0150	W70
R1700MC18E	1800	1800	1700	20000	2.0 × 10 <sup>6</sup>	25	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC18F	1800	1800	1700	20000	2.0 × 10 <sup>6</sup>	30	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC18G	1800	1800	1700	20000	2.0 × 10 <sup>6</sup>	35	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC18H	1800	1800	1700	20000	2.0 × 10 <sup>6</sup>	40	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC18J	1800	1800	1700	20000	2.0 × 10 <sup>6</sup>	50	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC21E	2100	1800	1700	20000	2.0 × 10 <sup>6</sup>	25	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC21F	2100	1800	1700	20000	2.0 × 10 <sup>6</sup>	30	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC21G	2100	1800	1700	20000	2.0 × 10 <sup>6</sup>	35	1400	1000	60	1.600	0.250	0.0150	W70

## Distributed Gate Thyristors—Capsule Types



Part Number	V <sub>DRM</sub> V	V <sub>RRM</sub> V	I <sub>TAV</sub>			t <sub>q</sub> @ 200 V/μs	Typ. Reverse Recovery Charge @ T <sub>JM</sub>			V <sub>TO</sub>		R <sub>thJK</sub> 180° sine K/W	Fig. No.
			T <sub>K</sub> = 55°C	10 ms ½ sine V <sub>R</sub> - ≤60% V <sub>RRM</sub>			Q <sub>rr</sub> μC	@ I <sub>TM</sub>	@ -di/dt	@ T <sub>JM</sub>			
				A	A					A <sup>2</sup> S	V		
R1700MC21H	2100	1800	1700	20000	2.0 × 10 <sup>6</sup>	40	1400	1000	60	1.600	0.250	0.0150	W70
R1700MC21J	2100	1800	1700	20000	2.0 × 10 <sup>6</sup>	50	1400	1000	60	1.600	0.250	0.0150	W70
R1955MC14D	1400	1400	1955	26500	3.51 × 10 <sup>6</sup>	20	1000	1000	60	1.460	0.910	0.0150	W70
R1955MC14E	1400	1400	1955	26500	3.51 × 10 <sup>6</sup>	25	1000	1000	60	1.460	0.910	0.0150	W70
R1955MC14F	1400	1400	1955	26500	3.51 × 10 <sup>6</sup>	30	1000	1000	60	1.460	0.910	0.0150	W70
R1955MC16D	1600	1600	1955	26500	3.51 × 10 <sup>6</sup>	20	1000	1000	60	1.460	0.910	0.0150	W70
R1955MC16E	1600	1600	1955	26500	3.51 × 10 <sup>6</sup>	25	1000	1000	60	1.460	0.910	0.0150	W70
R1955MC16F	1600	1600	1955	26500	3.51 × 10 <sup>6</sup>	30	1000	1000	60	1.460	0.910	0.0150	W70
R2075MC12A	1200	1200	2075	29000	4.21 × 10 <sup>6</sup>	10	300	1000	60	1.390	0.167	0.0150	W70
R2075MC12B	1200	1200	2075	29000	4.21 × 10 <sup>6</sup>	12	300	1000	60	1.390	0.167	0.0150	W70
R2075MC12C	1200	1200	2075	29000	4.21 × 10 <sup>6</sup>	15	300	1000	60	1.390	0.167	0.0150	W70
R2295HA22F	2200	2200	2295	30000	4.50 × 10 <sup>6</sup>	30	875	1000	60	1.690	0.190	0.0110	W79
R2295HA22H	2200	2200	2295	30000	4.50 × 10 <sup>6</sup>	40	875	1000	60	1.690	0.190	0.0110	W79
R2475ZC28M	2800	2800	2475	31000	4.81 × 10 <sup>6</sup>	70	3900	4000	60	1.504	0.174	0.0110	W13
R2475ZC28N	2800	2800	2475	31000	4.81 × 10 <sup>6</sup>	100	3900	4000	60	1.504	0.174	0.0110	W13
R2475ZC28R	2800	2800	2475	31000	4.81 × 10 <sup>6</sup>	140	3900	4000	60	1.504	0.174	0.0110	W13
R2475ZD28M	2800	2800	2475	31000	4.81 × 10 <sup>6</sup>	70	3900	4000	60	1.504	0.174	0.0110	W46
R2475ZD28N	2800	2800	2475	31000	4.81 × 10 <sup>6</sup>	100	3900	4000	60	1.504	0.174	0.0110	W46
R2475ZD28R	2800	2800	2475	31000	4.81 × 10 <sup>6</sup>	140	3900	4000	60	1.504	0.174	0.0110	W46
R2619ZC18J	1800	1800	2619	33800	5.71 × 10 <sup>6</sup>	50	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC18K	1800	1800	2619	33800	5.71 × 10 <sup>6</sup>	60	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC18L	1800	1800	2619	33800	5.71 × 10 <sup>6</sup>	65	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC20J	2000	2000	2619	33800	5.71 × 10 <sup>6</sup>	50	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC20K	2000	2000	2619	33800	5.71 × 10 <sup>6</sup>	60	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC20L	2000	2000	2619	33800	5.71 × 10 <sup>6</sup>	65	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC21J	2100	2100	2619	33800	5.71 × 10 <sup>6</sup>	50	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC21K	2100	2100	2619	33800	5.71 × 10 <sup>6</sup>	60	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC21L	2100	2100	2619	33800	5.71 × 10 <sup>6</sup>	65	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC25J	2500	2100	2619	33800	5.71 × 10 <sup>6</sup>	50	1850	4000	60	1.308	0.173	0.0110	W13
R2619ZC25K	2500	2100	2619	33800	5.71 × 10 <sup>6</sup>	60							

# High-Power Devices

**W11**  
Weight 510 g

**W13**  
Weight 1.7 kg

**W34**  
Weight 120 g

**W36**  
Weight 500 g

**W46**  
Weight 1.2 kg

**W58**  
Weight 90 g

**W81**  
Weight 1.2 kg

**W107**  
Weight 1.6 kg

**W118**  
Weight 2.2 kg

## Distributed Gate Thyristors—Capsule Types



Part Number	V <sub>DRM</sub> V	V <sub>RRM</sub> V	I <sub>TAV</sub> T <sub>K</sub> = 55°C			t <sub>q</sub> @ 200 V/μs μs	Typ. Reverse Recovery Charge @ T <sub>JM</sub>			V <sub>TO</sub> V	r <sub>T</sub> mΩ	R <sub>thJK</sub> 180° sine K/W	Fig. No.
			10 ms ½ sine V <sub>R</sub> ≤ 60% V <sub>RRM</sub>				Q <sub>rr</sub> μC	@ I <sub>TM</sub> A	@ -di/dt A/μs				
			A	A	A <sup>2</sup> S								
R2714ZD18H	1800	1800	2714	35600	6.34 × 10 <sup>6</sup>	40	1400	4000	60	1.250	0.163	0.0110	W46
R2714ZD18J	1800	1800	2714	35600	6.34 × 10 <sup>6</sup>	50	1400	4000	60	1.250	0.163	0.0110	W46
R2714ZD18K	1800	1800	2714	35600	6.34 × 10 <sup>6</sup>	60	1400	4000	60	1.250	0.163	0.0110	W46
R3115TJ24J	2400	2400	3115	56000	15.68 × 10 <sup>6</sup>	50	3350	2000	60	1.884	0.120	0.0080	W81
R3115TJ24K	2400	2400	3115	56000	15.68 × 10 <sup>6</sup>	60	3350	2000	60	1.884	0.120	0.0080	W81
R3115TJ28J	2800	2800	3115	56000	15.68 × 10 <sup>6</sup>	50	3350	2000	60	1.884	0.120	0.0080	W81
R3115TJ28K	2800	2800	3115	56000	15.68 × 10 <sup>6</sup>	60	3350	2000	60	1.884	0.120	0.0080	W81
R3370ZC12C	1200	1200	3370	43900	9.64 × 10 <sup>6</sup>	15	600	4000	60	1.353	0.064	0.0110	W13
R3370ZC12D	1200	1200	3370	43900	9.64 × 10 <sup>6</sup>	20	600	4000	60	1.353	0.064	0.0110	W13
R3370ZC12E	1200	1200	3370	43900	9.64 × 10 <sup>6</sup>	25	600	4000	60	1.353	0.064	0.0110	W13
R3370ZD12C	1200	1200	3370	43900	9.64 × 10 <sup>6</sup>	15	600	4000	60	1.353	0.064	0.0110	W46
R3370ZD12D	1200	1200	3370	43900	9.64 × 10 <sup>6</sup>	20	600	4000	60	1.353	0.064	0.0110	W46
R3370ZD12E	1200	1200	3370	43900	9.64 × 10 <sup>6</sup>	25	600	4000	60	1.353	0.064	0.0110	W46
R4680EA24K	2400	2400	4680	67000	22.40 × 10 <sup>6</sup>	60	3000	1000	60	1.509	0.128	0.0050	W107
R4680EA24L	2400	2400	4680	67000	22.40 × 10 <sup>6</sup>	65	3000	1000	60	1.509	0.128	0.0050	W107
R4680EA24M	2400	2400	4680	67000	22.40 × 10 <sup>6</sup>	70	3000	1000	60	1.509	0.128	0.0050	W107
R4680EA28K	2800	2800	4680	67000	22.40 × 10 <sup>6</sup>	60	3000	1000	60	1.509	0.128	0.0050	W107
R4680EA28L	2800	2800	4680	67000	22.40 × 10 <sup>6</sup>	65	3000	1000	60	1.509	0.128	0.0050	W107
R4680EA28M	2800	2800	4680	67000	22.40 × 10 <sup>6</sup>	70	3000	1000	60	1.509	0.128	0.0050	W107
R5145FA42V	4200	4500	5145	66000	21.78 × 10 <sup>6</sup>	250	12000	4000	60	1.659	0.107	0.0045	W118
R5145FA42W	4200	4500	5145	66000	21.78 × 10 <sup>6</sup>	300	12000	4000	60	1.659	0.107	0.0045	W118
R5145FA45V	4500	4500	5145	66000	21.78 × 10 <sup>6</sup>	250	12000	4000	60	1.659	0.107	0.0045	W118
R5145FA45W	4500	4500	5145	66000	21.78 × 10 <sup>6</sup>	300	12000	4000	60	1.659	0.107	0.0045	W118
R5370EA18J	1800	1800	5370	70000	24.5 × 10 <sup>6</sup>	50	3000	1000	60	1.661	0.071	0.0050	W107
R5370EA18K	1800	1800	5370	70000	24.5 × 10 <sup>6</sup>	60	3000	1000	60	1.661	0.071	0.0050	W107
R5370EA22J	2200	2200	5370	70000	24.5 × 10 <sup>6</sup>	50	3000	1000	60	1.661	0.071	0.0050	W107
R5370EA22K	2200	2200	5370	70000	24.5 × 10 <sup>6</sup>	60	3000	1000	60	1.661	0.071	0.0050	W107

## Asymmetric Thyristors

These devices are available up to a voltage of 2800 V. They exhibit quick turn-on times and are capable of high values in both critical di/dt and dv/dt. For the device type, they also exhibit high current ratings in excess of 1000 A. Asymmetric construction optimizes the forward losses against the turn-off losses and provides the best performance in their voltage class.

Part Number	V <sub>DRM</sub> V	V <sub>RRM</sub> V	I <sub>TAV</sub> T <sub>K</sub> = 55°C	I <sub>TSM</sub>	I <sup>2</sup> t	t <sub>gd</sub> 25°C typ.	typ. tq @ 200 V/ μs	(di/dt) <sub>cr</sub> @ T <sub>JM</sub>	(dv/dt) <sub>cr</sub> @ T <sub>JM</sub>	V <sub>TO</sub> @ T <sub>JM</sub>	r <sub>T</sub> @ T <sub>JM</sub>	T <sub>JM</sub>	R <sub>thJK</sub> 180° sine	Fig. No.
			A	A	A <sup>2</sup> S	μs	μC	A/μs	V/μs	V	mΩ	°C	K/W	
A0516YC240	2400	10	516	5700	151 × 10 <sup>3</sup>	0.5	55.00	2000	3000	1.630	0.850	125	0.0500	W58
A0516YC280	2800	10	516	5700	151 × 10 <sup>3</sup>	0.5	55.00	2000	3000	1.630	0.850	125	0.0500	W58
A1237NC240	2400	30	1237	18000	1.62 × 10 <sup>6</sup>	0.9	30.00	2000	3000	1.707	0.212	125	0.0240	W11
A1237NC280	2800	30	1237	18000	1.62 × 10 <sup>6</sup>	0.9	30.00	2000	3000	1.707	0.212	125	0.0240	W11

## Pulse Thyristors

IXYS UK Westcode Ltd. is at the forefront of solid state pulsed power technology, offering custom solutions to complex pulsed power problems.

Standard Devices with voltage ratings to 2.5 kV, pulsed currents to 50 kA peak, and di/dt capabilities of over 30 kA/μs are available. Please consult the factory for other requirements for voltage ratings up to 4.5kV and pulsed current ratings >200 kA.

Part Number	V <sub>DRM</sub> V <sub>GK</sub> = 2 V	V <sub>RRM</sub> V	V <sub>DC</sub> V <sub>GK</sub> = 2 V	I <sub>PULSE</sub> kA	(di/dt) <sub>cr</sub> kA/μs	V <sub>TO</sub>	r <sub>T</sub>	T <sub>JM</sub>	R <sub>thJC</sub> 180° sine K/W	Fig. No.
	V		V			V	mΩ			
Y200CKC250	2500	2000	1500	20	5	1.216	2.20	125	0.065	W34
Y500CNC250	2500	2000	1500	50	11	1.755	1.12	125	0.027	W36

## Gate Turn-Off Thyristors

IXYS UK offers a broad range of high-specification devices with voltage ratings to 4.5 kV (2.8 kV DC link) and controllable current ratings of up to 4 kA, which are available to meet the toughest demands in applications such as traction propulsion and auxiliaries, AC industrial drives, FACTs, and active VAR controllers. We offer both symmetrical devices for applications with a reverse blocking requirement (e.g., current sourced inverters) and asymmetric blocking devices for applications where no reverse blocking requirement exists (e.g., voltage sourced inverters).

Gate turn-off thyristors are still the component of choice when it comes to very high power converters, and we remain totally committed to this technology for the foreseeable future through our active program for continued product improvement.



Part Number	$V_{DRM}$	$V_{RRM}$	$I_{TGM} @ C_s$		$I_{TAV}$	$I_{TSM}$	$I^2t$	Typ. Switching Times		$V_T$	$T_{JM}$	$R_{thJC}$	Fig. No.
	$V_{GK} = -2V$		A	$\mu C$	$T_K = 55^\circ C$	10 ms		$\frac{1}{2}$ sine VR $\leq 10V$	$t_{gt}$				
	V	V	A	$\mu C$	A	kA	kA <sup>2</sup> s	$\mu s$	$\mu s$	V	°C	K/W	
G1000NC45B	4500	18	1000	2.0	545	8.00	$320 \times 10^3$	3.5	15.00	4.000	125	0.0270	W36
G1000QC25B	2500	18	1000	1.0	615	8.00	$320 \times 10^3$	2.8	13.00	2.500	125	0.0380	W35
G1000QC45B	4500	18	1000	1.0	443	6.50	$211 \times 10^3$	3.4	14.00	4.000	125	0.0380	W35
G2000HF250	2500	18	2000	4.0	1030	16.00	$1.28 \times 10^6$	3.0	25.00	2.800	125	0.0220	W85
G2000HF450	4500	18	2000	4.0	890	13.70	$938 \times 10^3$	4.0	25.00	3.500	125	0.0220	W85
G2500HF250	2500	18	2500	6.0	1085	16.00	$1.28 \times 10^6$	3.0	25.00	3.100	125	0.0200	W85
G3000TF250	2500	18	3000	5.0	1690	30.00	$4.5 \times 10^6$	3.5	26.00	2.500	125	0.0120	W86
G3000TF450	4500	18	3000	6.0	1381	24.00	$2.88 \times 10^6$	4.0	22.00	4.000	125	0.0120	W86
G4000EF250	2500	18	4000	6.0	2005	32.00	$5.12 \times 10^6$	4.5	28.00	3.000	125	0.0110	W104
G4000EF450	4500	18	4000	6.0	1480	26.00	$3.38 \times 10^6$	4.0	30.00	4.400	125	0.0110	W104
H0500KC200	2000	2000	500	1.0	280	3.00	$45 \times 10^3$	2.0	5.00	3.200	125	0.0650	W34
H0500KC20Y	2000	100	500	1.0	280	3.00	$45 \times 10^3$	2.0	5.00	3.200	125	0.0650	W34
H0500KC25D	2500	2000	500	1.0	280	3.00	$45 \times 10^3$	2.0	5.00	3.200	125	0.0650	W34
H0500KC25Y	2500	100	500	1.0	280	3.00	$45 \times 10^3$	2.0	5.00	3.200	125	0.0650	W34
H0700KC140	1400	1400	700	1.5	360	4.00	$80 \times 10^3$	3.0	5.00	2.800	125	0.0630	W34
H0700KC14Y	1400	100	700	1.5	360	4.00	$80 \times 10^3$	3.0	5.00	2.800	125	0.0630	W34
H0700KC17D	1700	1400	700	1.5	360	4.00	$80 \times 10^3$	3.0	5.00	2.800	125	0.0630	W34
H0700KC17Y	1700	100	700	1.5	360	4.00	$80 \times 10^3$	3.0	5.00	2.800	125	0.0630	W34
H1200NC200	2000	2000	1200	3.0	670	10.50	$550 \times 10^3$	3.0	12.00	3.300	125	0.0270	W36
H1200NC20Y	2000	100	1200	3.0	670	10.50	$550 \times 10^3$	3.0	12.00	3.300	125	0.0270	W36
H1200NC25D	2500	2000	1200	3.0	670	10.50	$550 \times 10^3$	3.0	12.00	3.300	125	0.0270	W36
H1200NC25Y	2500	100	1200	3.0	670	10.50	$550 \times 10^3$	3.0	12.00	3.300	125	0.0270	W36
S0300SR12Y	1200	100	480	1.0	215	3.50	$61.2 \times 10^3$	3.5	9.00	2.400	125	0.1300	W87
S0500YC20Y	2000	100	500	1.0	275	4.00	$80 \times 10^3$	3.5	10.00	2.500	125	0.0870	W93
S0500YC25Y	2500	100	500	1.0	275	4.00	$80 \times 10^3$	3.5	10.00	2.500	125	0.0870	W93
S0500KC200	2000	2000	500	1.0	330	4.00	$80 \times 10^3$	3.5	10.00	2.500	125	0.0650	W34
S0500KC20Y	2000	100	500	1.0	330	4.00	$80 \times 10^3$	3.5	10.00	2.500	125	0.0650	W34
S0500KC25D	2500	2000	500	1.0	330	4.00	$80 \times 10^3$	3.5	10.00	2.500	125	0.0650	W34
S0500KC25Y	2500	100	500	1.0	330	4.00	$80 \times 10^3$	3.5	10.00	2.500	125	0.0650	W34
S0700KC140	1400	1400	700	1.5	430	5.00	$125 \times 10^3$	3.0	10.00	2.200	125	0.0630	W34
S0700KC14Y	1400	100	700	1.5	430	5.00	$125 \times 10^3$	3.0	10.00	2.200	125	0.0630	W34
S0700KC17D	1700	1400	700	1.5	430	5.00	$125 \times 10^3$	3.0	10.00	2.200	125	0.0630	W34
S0700KC17Y	1700	100	700	1.5	430	5.00	$125 \times 10^3$	3.0	10.00	2.200	125	0.0630	W34
S1200NC200	2000	2000	1200	3.0	790	13.00	$840 \times 10^3$	4.5	19.00	2.700	125	0.0270	W36
S1200NC20Y	2000	100	1200	3.0	790	13.00	$840 \times 10^3$	4.5	19.00	2.700	125	0.0270	W36
S1200NC25D	2500	2000	1200	3.0	790	13.00	$840 \times 10^3$	4.5	19.00	2.700	125	0.0270	W36
S1200NC25Y	2500	100	1200	3.0	790	13.00	$840 \times 10^3$	4.5	19.00	2.700	125	0.0270	W36

## Insulated Gate Bi-polar Transistors

As a pioneer of Press-Pack IGBT technology, we are able to offer a range of class-leading devices with voltage ratings of 1.7 kV (900 V DC link), 3.3 kV (1.8 kV DC link), 4.5 kV (2.8 kV DC link), and 6.5 kV (3.6 kV DC link). The construction of these devices is totally free from wires and solder bonds, which all but eliminates the problems of mechanical fatigue associated with conventional modules. Internal stray inductance in both the gate connections and emitter connections is vastly reduced when compared to conventional modules, leading to improved ruggedness and short circuit behavior, which is further enhanced by the direct cooling of the emitter side of the chip.

These devices are based on a state-of-the-art soft punch through (SPT++) process, which yields exceptional values of  $V_{CE(sat)}$  and soft switching behavior despite the high voltage ratings. The devices feature a positive temperature coefficient, making them suitable for reliable parallel operation. Devices are available with or without integral anti-parallel diode; a range of complimentary high-power sonice diodes optimized for use with these IGBTs is now accessible, with a new generation using improved technology currently in development. Please contact your representative for more information.

Press-pack IGBTs exhibit exceptional power cycling performance that is typically an order of magnitude better than other modules, making them highly suited to applications in which there are repeated cyclic power demands, such as in metals and traction drive systems. Press-pack IGBTs have a stable short circuit failure mode which, given its safety benefits, make them an ideal choice for medium- and high-voltage applications in which series connection is required. Stable short circuit failure mode allows for the design in of n+ redundancy without additional bypass switches and costly explosion proof enclosures. Typical examples include HVDC, FACTs, Active VAR controllers/compensators, and medium-voltage drives. In applications above 4 MW, press-pack IGBTs offer exceptional power density that far exceeds that which is achievable with comparable modules in multi-level/MMC-based converters.

These PPIGBT are largely backward-compatible with standard 4.5 kV GTOs in many applications, such as AC drives. Thus, these parts are a simple and economical path to upgrade or refurbish equipment that previously used GTOs, such as locomotives or medium-voltage drives.

They are suitable for all cooling options, including direct liquid immersion. Complementary gate drives, mounting clamps, and passive components are all available.

## Capsule Types

Part Number	$V_{CES}$	$I_C$	$I_{CM}$	$V_{CE(sat)} @ I_C$	IGBT Switching Typical		$V_F$ $I_F = I_C$	Diode Recovery Typical			$T_{JM}$	$R_{thJK}$		Fig. No.
					$E_{ON}$	$E_{OFF}$		$I_{rm}$	$t_r$	$Q_r$		IGBT	Diode	
	V	A	A	V	J	J	V	A	$\mu s$	$\mu C$	°C	K/W	K/W	
T0600NC17A	1700	600	1200	3.0	0.3	0.50	2.250	300.000	0.500	175.000	125	0.0541	0.1250	W40
T0840NC17E	1700	840	1680	3.0	0.4	0.70	N/A	N/A	N/A	N/A	125	0.0386	N/A	W40
T0960VC17G	1700	960	1920	3.0	0.5	0.80	2.050	540.000	0.600	310.000	125	0.0338	0.0625	W67
T1440VC17E	1700	1440	2880	3.0	0.7	1.20	N/A	N/A	N/A	N/A	125	0.0225	N/A	W67
T0140QC33G	3300	140	280	3.4	0.4	0.38	3.000	100.000	1.900	150.000	125	0.1080	0.1728	W109
T0285NC33E	3300	285	570	3.4	0.7	0.75	N/A	N/A	N/A	N/A	125	0.0546	N/A	W40
T0425VC33G	3300	425	850	3.4	1.1	1.12	3.000	305.000	1.700	440.000	125	0.0364	0.0576	W67
T0640VC33E	3300	640	1280	3.4	1.7	1.68	N/A	N/A	N/A	N/A	125	0.0243	N/A	W67
T0710TC33A	3300	710	1420	3.4	1.8	1.87	3.300	455.000	1.500	655.000	125	0.0218	0.0432	W41
T1000TC33E	3300	1000	2000	3.4	2.6	2.70	N/A	N/A	N/A	N/A	125	0.0156	N/A	W41
T1000EC33G	3300	1000	2000	3.4	2.6	2.70	3.000	470.000	1.700	1040.000	125	0.0156	0.0247	W44
T1500EC33E	3300	1500	3000	3.4	3.9	4.05	N/A	N/A	N/A	N/A	125	0.0104	N/A	W44
T2000GC33G	3300	2000	4000	3.4	5.2	5.40	3.000	940.000	2.200	2070.000	125	0.0078	0.0123	W45
T3000GC33E	3300	3000	6000	3.4	3.1	8.00	N/A	N/A	N/A	N/A	125	0.0052	N/A	W45





## IGBTs—Capsule Types

Part Number	V <sub>CES</sub> V	I <sub>C</sub> A	I <sub>CM</sub> A	V <sub>CE(sat)</sub> @ I <sub>C</sub> V	IGBT Switching Typical		V <sub>F</sub> I <sub>F</sub> = I <sub>C</sub> V	Diode Recovery Typical			T <sub>JM</sub> °C	R <sub>thJK</sub>		Fig. No.
					E <sub>ON</sub> J	E <sub>OFF</sub> J		I <sub>rrm</sub> A	t <sub>rr</sub> µs	Q <sub>r</sub> µC		IGBT K/W	Diode K/W	
T0115QB45G	4500	115	230	3.65	0.80	0.62	3.7	120	1.5	145	125	0.1080	0.172	W109
T0240NB45E	4500	240	480	3.6	1.50	1.00	N/A	N/A	N/A	N/A	125	0.0546	N/A	W40
T0340VB45G	4500	340	680	3.5	2.20	1.30	3.45	220	3.2	500	125	0.0364	0.0576	W67
T0510VB45E	4500	510	1020	3.5	3.30	2.20	N/A	N/A	N/A	N/A	125	0.0243	N/A	W67
T0600TB45A	4500	600	1200	3.7	3.60	2.50	3.7	640	1.2	700	125	0.0218	0.0432	W41
T0800TB45E	4500	800	1600	3.5	5.00	3.50	3.50	N/A	N/A	N/A	125	0.0156	N/A	W41
T0800EB45G	4500	800	1600	3.5	5.00	3.50	3.5	550	1.7	1020	125	0.0156	0.0247	W44
T0900EB45A	4500	900	1800	3.6	5.40	3.80	3.9	800	1.6	1000	125	0.0146	0.0288	W44
T1200EB45E	4500	1200	2400	3.6	7.00	5.50	N/A	N/A	N/A	N/A	125	0.0104	N/A	W44
T1600GB45G	4500	1600	3200	3.5	12.00	8.70	3.45	1270	1.75	1960	125	0.0078	0.0123	W45
T1800GB45A	4500	1800	3600	3.6	11.00	10.50	3.9	1600	1.6	2000	125	0.0073	0.0115	W45
T2000BB45G	4500	2000	4000	3.5	14.00	12.50	3.55	2050	1.6	2450	125	0.0064	0.0096	W110
T2400GB45E	4500	2400	4800	3.6	14.00	13.00	N/A	N/A	N/A	N/A	125	0.0052	N/A	W45
T2960BB45E	4500	3000	6000	3.6	11.50	17.50	N/A	N/A	N/A	N/A	125	0.0042	N/A	W110
T0258HF65G	6500	258	516	4.8	1.80	1.45	3.450	300	1.0	410	125	0.0328	0.0567	W95
T0385HF65E	6500	385	770	4.8	2.70	2.20	N/A	N/A	N/A	N/A	125	0.0219	N/A	W95
T0900AF65E	6500	900	1800	4.8	6.3	5.1	N/A	N/A	N/A	N/A	125	0.0094	N/A	W98
T0900DF65A	6500	900	1800	4.8	6.30	5.10	3.400	1050	1.0	1450	125	0.0094	0.0155	W96
T1290BF65A	6500	1290	2580	4.8	9.00	7.30	3.600	1400	1.0	1900	125	0.0066	0.0122	W103
T1375DF65E	6500	1375	2750	4.8	9.60	7.80	N/A	N/A	N/A	N/A	125	0.0062	N/A	W96
T1890BF65E	6500	1890	3780	4.8	13.20	10.60	N/A	N/A	N/A	N/A	125	0.0045	N/A	W103

## Press-Pack IGBT Gate Drive Units

The C0044BG400 IGBT Gate Driver is a low-power consumption driver with on board VCE desaturation detection for high-reliability applications.

The driver features a fibre-optic communication interface for drive, status, and switching feedback signals. A fully supervised DC/DC converter with EMI filtering, low coupling capacitance, and high partial discharge level is integrated into the board. The high-voltage collector sense and gate interface are implemented on a separate card to allow close coupling to the IGBT. A range of pre-configured boards is available to complement IXYS UK's range of press-pack IGBTs — other applications upon request.

Gate Drive Part Number	IGBT Type
C0044BG400SCB	T0600NC17A
C0044BG400SCA	T0840NC17E
C0044BG400SCC	T0960VC17G
C0044BG400SCD	T1440VC17E
C0044BG400SCE	T1680TC17G
C0044BG400SCF	T0140QC33G
C0044BG400SCG	T0285NC33E
C0044BG400SCH	T0425VC33G
C0044BG400SCJ	T0640VC33E
C0044BG400SCK	T0710TC33A
C0044BG400SCM	T1000EC33G
C0044BG400SCL	T1000TC33E
C0044BG400SCN	T1500EC33E
C0044BG400SCS	T2000GC33G
C0044BG400SCT	T3000GC33E
C0044BG400SBX	T0115QB45G
C0044BG400SBL	T0240NB45E
C0044BG400SBQ	T0340VB45G
C0044BG400SBE	T0510VB45E
C0044BG400SBM	T0600TB45A
C0044BG400SBG	T0800EB45G
C0044BG400SBN	T0800TB45E
C0044BG400SBP	T0900EB45A
C0044BG400SBR	T1200EB45E
C0044BG400SBJ	T1600GB45G
C0044BG400SBS	T1800GB45A
C0044BG400SBZ	T2000BB45G
C0044BG400SBT	T2400GB45E
C0044BG400SBW	T2960BB45E

### Features

- High reliability topology
- Designed for ultra low-power consumption
- Build-in DC/DC-converter with soft start
- Integrated input filter for low EMI
- Separate low-impedance path for parasitic EMI currents
- PD-Voltage levels available up to 11 kV on request.
- Low impedance from gate to emitter at start-up and power fail
- Monitoring of all secondary supply voltages
- Monitoring of IGBT switching status (VCE-de-sat detection)
- Soft switch-OFF at VCE-de-sat fault condition
- Fiber-optic links for switching commands and status control
- Low-light protection for input signals
- Short-pulse suppression (configurable)
- Balanced propagation delay time
- Gate current up to 44 A
- Optional gate-speed-up capacitors

### Application

- Large and medium drives
- Renewable generation
- Utilities; scale converters





W116

## Single Pre-Mounted Thyristors

Part Number	$V_{RRM}$ $V_{DRM}$	$I_{TAV}$	@ $T_C$	$I_{TRMS}$	$I_{TRMS}$ 125°C 10 ms	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	°C	A	A	V	mΩ	°C	per Die K/W K/W		
N4340TJ180MBR	1800	1110	85	3500	55000	0.886	0.105	125	0.031	0.0035	W116
N4340TJ220MBR	2200	1110	85	3500	55000	0.886	0.105	125	0.031	0.0035	W116

## Single Pre-Mounted Diodes

IXYS UK Westcode Ltd. has Underwriters Laboratories Inc. (UL) certification for most modules.

Part Number	$V_{RRM}$ $V_{DRM}$	$I_{TAV}$	@ $T_C$	$I_{TRMS}$	$I_{TRMS}$ 150°C 10 ms	$V_{TO}$	$r_T$	$T_{VJM}$	$R_{thJC}$	$R_{thCH}$	Package
	V	A	°C	A	A	V	mΩ	°C	per Die K/W K/W		
W8570TJ180MBR	1800	2830	85	6435	70200	0.69	0.050	175	0.031	0.0035	W116
W8570TJ220MBR	2200	2830	85	6435	70200	0.69	0.050	175	0.031	0.0035	W116
W9830TJ120MBR	1200	3345	85	7280	72000	0.67	0.043	190	0.031	0.0035	W116
W9830TJ150MBR	1500	3345	85	7280	72000	0.67	0.043	190	0.031	0.0035	W116

## Power Semiconductor Accessories

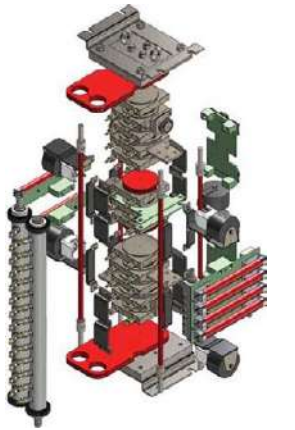
With over 80 years of experience, our dedicated team of talented engineers delivers a wide variety of industry leading solutions ranging from simple standard sub-assemblies to complicated, multi-megawatt power systems.

The Power Electronic Stacks group has been an integral part of our core business since the early 1920s, when we began production on the first commercially available solid-state rectifiers.

Our dedicated global team of highly experienced specialists are on hand to provide our customers with first-class support on everything from a simple air-cooled

rectifiers to highly integrated custom power converters. Using the latest 3D modeling and simulation techniques, we can significantly reduce the cycle time from concept to fully developed design, minimizing risk and identifying opportunities for optimization early on in the project.

Our 300m<sup>2</sup> dedicated production facility in the UK is complemented by a well-equipped power lab and similar production facilities in Long Beach, California. These facilities are supported by an expanded team of engineers and technicians as well as continued investment and growth in this strategic area of our business.



## IGBT Assemblies

Our catalogue of standard press-pack IGBT assemblies include a range of 3-level inverters. Three separate designs are available: a totally independent 3.3kV system, a 6.6kV system, and a 10kV system. The 6.6kV and 10kV systems are based on the combination of two IGBT stacks and one diode stack. Each system benefits from direct water cooling to provide highly effective heat dissipation away from the devices and pre-loaded disc

spring clamping to evenly distribute the applied force across the entire surface area of the device.

Also designed into each system are an integrated snubber circuit design and an isolated clamping rod system to limit the occurrence of Eddy currents within the unit.

## Pulsed Power

As a pioneer in the development of solid-state pulsed power components and systems, we deliver anything from discrete components to fully integrated energy transfer switches. With systems successfully delivering voltage ratings of over 50kV and pulsed currents of up to 140kA, we have a wealth of experience at your disposal. Our modular design solutions based on either pulse thyristor or press-pack IGBT technology. Our integration of control and protection functions provides you with

a flexible “black-box” approach to energy transfer problems.

We are involved with pulsed power on a global basis, working with prestigious research organizations such as CERN, Switzerland as well as medium-voltage manufacturers for emerging commercial applications such as laser supplies, PUV and PEF sterilization, magnetization, and metal forming.



## Traction Applications

With over 40 years of experience, our dedicated team of engineers provides solutions to a wide range of design problems, ranging from simple trackside rectifiers to complex propulsion converters.

The Power Electronic Stacks group pioneered the early development of solid-state converters for traction systems in the late 1950s as part of the Westinghouse Brake & Signal Company. Over the years, we have gained an enviable reputation within the rail sector as a solution provider.

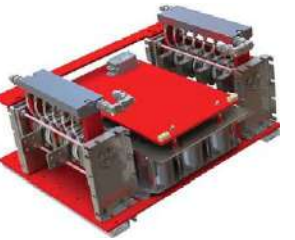
By leveraging our experience and broad network of contacts within the industry, we can offer assistance in tackling issues such as component obsolescence, improving power equipment reliability, contract maintenance of power modules, refurbishment of power electronics, upgrades to existing systems and, of course, subcontracting manufacturers for new projects.

Working systematically to the highest international standards, we can give your equipment a new lease on life and help protect your investments in these valuable assets.

Component obsolescence is becoming a significant problem for the rail sector, as equipment design life invariably exceeds that of the modern power electronics components. Our highly skilled team of engineers can re-engineer older equipment to incorporate the latest technology whilst maintaining compatibility.

As equipment reaches its half-life, many of its major power components will reach the end of their useful life, resulting in a sharp decline in its reliability and availability. In these circumstances, we can offer a full overhaul and refurbishment program for your power electronics, from engineering analyses, tests, and measurements through to delivery and validation of refurbished equipment.

For larger projects such as fleet-wide refits, we can work within a consortium of specialist international companies to ensure that you have the right skills on hand to deliver turnkey solutions to your requirements. This may include system analysis, project management, risk assessment, and safety cases.





## Custom Assemblies—Our Design Philosophy

From concept through development and manufacturing to after sales support, we strongly believe in working closely with our customer every step of the way—extending our philosophy of teamwork beyond our own organization.

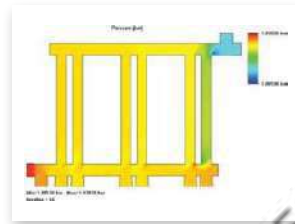
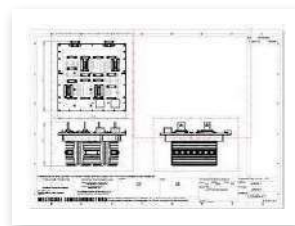
We understand that good communication and close collaboration help us provide the very best services to our customers.

Using the latest 3D modeling techniques, we can visualize concepts and check form, fit, and function with virtual prototypes. In addition, by utilizing advanced

software packages, we can carry out simulation modeling to model pressure drops through coolers/manifolds and heat flows through heatsinks.

Whether finding solutions to complex engineering problems or simply manufacturing to your designs, you will find the Power Electronic Stacks Group offers outstanding value for money, excellent quality, and first-class customer service.

By working closely together from the very start of our projects, we aim to provide the best solutions on time and within budget.



## Silicon Assemblies

A wide range of units is available, incorporating international-standard outline silicon semiconductors. Our products have gained a global reputation for quality in military, industrial, and domestic applications.

Standard extruded aluminum heatsink profiles are used for mounting discrete semiconductor devices in various configurations, for example:

- Single-phase diode bridges with current ratings from 70 to 5710 Amps DC
- Single-phase half or fully controlled bridges from 35 to 2200 Amps DC
- Three-phase diode bridges with current ratings from 100 to 7190 Amps DC
- Three-phase half or fully controlled bridges from 45 to 3790 Amps DC
- Hexaphase single way diode assemblies from 200 to 14380 Amps DC
- Hexaphase single way thyristor assemblies from 90 to 7580 Amps DC
- AC regulators, single and three-phase from 40 to 2940 Amps RMS

Included in our standard range are solid-state, water-cooled AC regulators for resistance welding, with ratings from 315 to 3020 Amps RMS. Also available are water-cooled, single and three-phase assemblies from 1200 to 6000 Amps RMS. All the above ranges are suitable for 440VRMS, 50Hz mains operation.

## Beyond Semiconductors

Our flexible manufacturing facility can readily adapt to our customers' needs. In addition to power semiconductor assembly, we offer complementary sub-assemblies tailored to our customers' requirements, such as fuse panels and capacitor banks. Lastly, we can also contract manufacturers for your designs.

## Application and engineering support

Our highly experienced technical team is on hand to provide our customers with first-class support for everything from the applications of our range of discrete devices to the design and development of complex systems. We can help you from concept through design, to manufacturing and tests, working closely with you every step of the way.

### Components

To complement our range of power semiconductors and assemblies, we offer a range of supporting components, including:

- Heatsinks
- Coolers
- Mounting clamps
- Ultra-rapid semiconductor protection fuses
- Capacitors
  - Snubbers
  - Rectification
  - Specialist DC link
- Gate drive units



## Westack—Modular Solutions

Assembly Part Number	I <sub>DC</sub> amps Air Forced 2.5m/s			I <sub>FSM</sub> amps	I <sub>TSM</sub> amps	I <sub>t</sub> A <sup>2</sup> s	Dimensions (mm)			Mass kg	Device Type and Quantity	Heat Sink Type		
	T <sub>a</sub> = 25°C	T <sub>a</sub> = 35°C	T <sub>a</sub> = 45°C				Fig.	W	H					D
<b>Single-Phase Diode Bridges</b>													<b>Approx. Total Loss 2 × I<sub>DC</sub> @ 25°C</b>	
SXB1375B	1375	1303	1230	19500	1.9 × 10 <sup>6</sup>	1	382	325	405	20	W2058LC (4)	B(2 × 83.1 × 180)		
SXB2096B	2096	1987	1874	33000	5.45 × 10 <sup>6</sup>	1	382	325	405	20	W3270NC (4)	B(2 × 83.1 × 180)		
SXB3442B	3442	3277	3109	53000	13.5 × 10 <sup>6</sup>	2	382	593	405	40	W5696VC (4)	B(2 × 180)		
SXB4264B	4264	4051	3835	72000	22.5 × 10 <sup>6</sup>	2	382	593	405	40	W8405ZC (4)	B(2 × 180)		
<b>Three-Phase Diode Bridges</b>													<b>Approx. Total Loss 2.5 × I<sub>DC</sub> @ 25°C</b>	
SXB1920G	1920	1822	1721	19500	1.9 × 10 <sup>6</sup>	3	548	325	405	30	W2058LC (6)	B(2 × 83.1 × 180)		
SXB2939G	2939	2788	2634	33000	5.45 × 10 <sup>6</sup>	3	548	325	405	30	W3270NC (6)	B(2 × 83.1 × 180)		
SXB4869G	4869	4640	4407	53000	13.5 × 10 <sup>6</sup>	4	548	593	405	60	W5696VC (6)	B(2 × 180)		
SXB5993G	5993	5701	5402	72000	22.5 × 10 <sup>6</sup>	4	548	593	405	60	W8405ZC (6)	B(2 × 180)		
<b>Six-Phase Diode, Single Way With IPT</b>													<b>Approx. Total Loss 1.25 × I<sub>DC</sub> @ 25°C</b>	
SXB3840HEX	3840	3644	3442	19500	1.9 × 10 <sup>6</sup>	5	548	325	395	30	W2058LC (6)	B(2 × 83.1 × 180)		
SXB5877HEX	5877	5576	5268	33000	5.45 × 10 <sup>6</sup>	5	548	325	395	30	W3270NC (6)	B(2 × 83.1 × 180)		
SXB9737HEX	9737	9281	8813	53000	13.5 × 10 <sup>6</sup>	6	548	593	395	60	W5696VC (6)	B(2 × 180)		
SXB11987HEX	11987	11401	10804	72000	22.5 × 10 <sup>6</sup>	6	548	593	395	60	W8405ZC (6)	B(2 × 180)		
<b>Six-Phase Thyristor, Single Way With IPT</b>													<b>Approx. Total Loss 1.5 × I<sub>DC</sub> @ 25°C</b>	
SXB3529HEXT	3529	3244	2949	29600	4.38 × 10 <sup>6</sup>	5	548	325	395	30	N1802LC (6)	B(2 × 83.1 × 180)		
SXB4649HEXT	4649	4270	3878	37000	6.85 × 10 <sup>6</sup>	6	548	593	395	60	N2500VC (6)	B(2 × 180)		
SXB6240HEXT	6240	5714	5173	64000	20.5 × 10 <sup>6</sup>	6	548	593	395	60	N4085ZC (6)	B(2 × 180)		
<b>Single-Phase Fully Controlled Bridges</b>													<b>Approx. Total Loss 2.5 × I<sub>DC</sub> @ 25°C</b>	
SXB1265FB	1265	1161	1054	29600	4.38 × 10 <sup>6</sup>	1	382	325	405	20	N1802NC (4)	B(2 × 83.1 × 180)		
SXB1645FB	1645	1508	1367	37000	6.85 × 10 <sup>6</sup>	2	382	593	405	40	N2500VC (4)	B(2 × 180)		
SXB2167FB	2167	1981	1790	64000	20.5 × 10 <sup>6</sup>	2	382	593	405	40	N4085ZC (4)	B(2 × 180)		
<b>Three-Phase Fully Controlled Bridges</b>													<b>Approx. Total Loss 3 × I<sub>DC</sub> @ 25°C</b>	
SXB1764FG	1764	1622	1475	29600	4.38 × 10 <sup>6</sup>	3	548	325	405	30	N1802NC (6)	B(2 × 83.1 × 180)		
SXB2324FG	2324	2135	1939	37000	6.85 × 10 <sup>6</sup>	4	548	593	405	60	N2500VC (6)	B(2 × 180)		
SXB3120FG	3120	2857	2586	64000	20.5 × 10 <sup>6</sup>	4	548	593	405	60	N4085ZC (6)	B(2 × 180)		



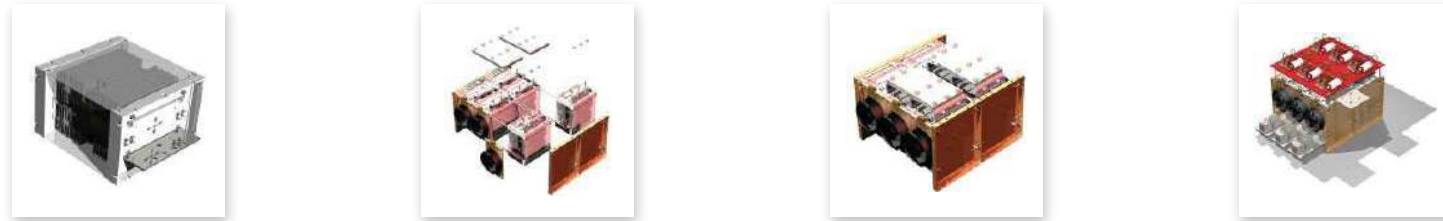
## Westack—Modular Solutions

Cooling for each module section is provided using a low noise 115/230 V AC fan that is protected against overloading by an integral thermal cut-out.

Surge suppression and fusing provide reliable and safe operation. Surge suppression (which protects devices from voltage transients) and high-speed fuses (which protect against short circuits) are available. Contact IXYS UK for details.

All plastic components are UL-recognized and meet the requirements of the European Union Directive 2002/95/EC covering the restricted use of certain hazardous substances in electrical and electronic equipment.

ISO 9000 provides the standard against which all our products and services are measured.



Westack—Modular Solutions are available in six standard configurations; others by request.

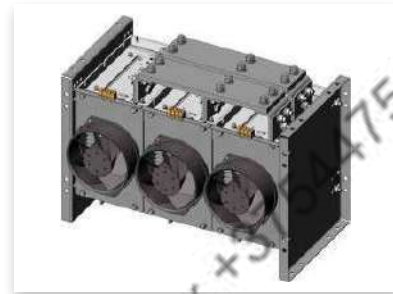
**Figure 1**  
Weight 20 kg



**Figure 2**  
Weight 40 kg



**Figure 3**  
Weight 20 kg



**Figure 4**  
Weight 60 kg



**Figure 5**  
Weight 30 kg



**Figure 6**  
Weight 60 kg



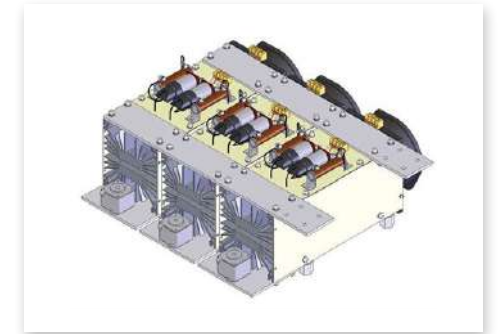
## WestackLITE—Modular Solutions

A simple but highly efficient range of stacks incorporating the WESPACK range of phase control thyristors.

Currently available in three standard configurations:

- AC voltage regulators
- Single-phase bridges
- Three-phase bridges

These stacks can easily be modified to meet individual customer requirements. Fully dimensioned drawings are available upon request from the Chippenham Factory.



## Features and Benefits

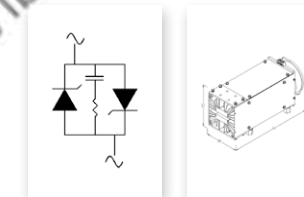
WESPACK devices provide a maximum power rating for weight and volume without compromising on quality and reliability.

Cooling is provided by means of a low-noise, dual-voltage (230V/115V) AC fan that is protected against overloading by an integral thermal cut-out.

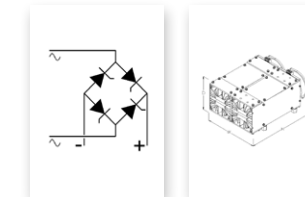
Surge suppression and fusing can be added to protect the devices from voltage transients and short circuits.

ISO 9000 2000 provides the standard against which all our products and services are measured.

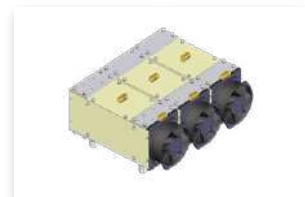
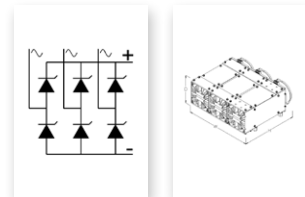
**Figure 1**  
Weight 10 kg



**Figure 2**  
Weight 20 kg



**Figure 3**  
Weight 30 kg



## WestackLITE—Modular Solutions

Assembly Part Number	I <sub>DC</sub> amps Air Forced 2.5m/s			I <sub>FSM</sub> amps I <sub>TSM</sub> amps	P <sub>t</sub> A <sup>2</sup> s	Dimensions (mm)			Mass kg	Device Type and Quantity	Heat Sink Type		
	T <sub>a</sub> = 25°C	T <sub>a</sub> = 35°C	T <sub>a</sub> = 45°C			Fig.	W	H					D
<b>AC Regulators</b>											Approx. Total Loss 1.3·I <sub>RMS</sub>		
SXC1195FR	1195	1098	997	19100	1.82 × 10 <sup>6</sup>	1	168	415	212	10	N1806QK (2)	(2 × 150.1 × 330)	
SXC1464FR	1464	1348	1227	32400	5.25 × 10 <sup>6</sup>	1	168	415	212	10	N2367MK (2)	(2 × 150.1 × 330)	
SXC1788FR	1788	1636	1480	50900	12.95 × 10 <sup>6</sup>	1	168	415	212	10	N3904HK (2)	(2 × 150.1 × 330)	
<b>Single Phase Fully Controlled Bridges</b>											Approx. Total Loss 2.5 × I <sub>DC</sub>		
SXC1076FB	1076	988	897	19100	1.82 × 10 <sup>6</sup>	2	330	415	212	20	N1806QK (4)	(2 × 150.1 × 330)	
SXC1318FB	1318	1213	1104	32400	5.25 × 10 <sup>6</sup>	2	330	415	212	20	N2367MK (4)	(2 × 150.1 × 330)	
SXC1609FB	1609	1473	1332	50900	12.95 × 10 <sup>6</sup>	2	330	415	212	20	N3904HK (4)	(2 × 150.1 × 330)	
<b>Three Phase Fully Controlled Bridges</b>											Approx. Total Loss 3 × I <sub>DC</sub>		
SXC1517FG	1517	1396	1270	19100	1.82 × 10 <sup>6</sup>	3	492	415	212	30	N1806QK (6)	(2 × 150.1 × 330)	
SXC1871FG	1871	1725	1573	32400	5.25 × 10 <sup>6</sup>	3	492	415	212	30	N2367MK (6)	(2 × 150.1 × 330)	
SXC2319FG	2319	2125	1926	50900	12.95 × 10 <sup>6</sup>	3	492	415	212	30	N3904HK (6)	(2 × 150.1 × 330)	

## Power Semiconductor Accessories

As part of our continuing commitment to meet our customers' demands, we offer a range of products to support our high-power semiconductor devices and our silicon assembly business.

The following pages show a selection of accessories available to our customers, from heatsinks and coolers, to bar or box clamps, to mounting grease:

Part Number	Old Part Number	Accessory
XST1000M08P	PTFE1000M8	M8 PTFE tube × 1 m length insulation
XST1000M10P	PTFE1000M10	M10 PTFE tube × 1 m length insulation
XST1000M12P	PTFE1000M12	M12 PTFE tube × 1 m length insulation
XST1000M16P	PTFE1000M16	M16 PTFE tube × 1 m length insulation
L0001YC600XXX	n/a	30mm diameter electrode Insulator Capsule
L0001QC600XXX	n/a	38mm diameter electrode Insulator Capsule
L0001NC600XXX	n/a	47mm diameter electrode Insulator Capsule
L0001HC600XXX	n/a	66mm diameter electrode Insulator Capsule
L0001ZF600XXX	n/a	73mm diameter electrode Insulator Capsule
L0001TC600XXX	n/a	75mm diameter electrode Insulator Capsule

Part Number	Old Part Number	Accessory	Type
XSL200D8WRC	U9948	200mm long single Co-Axial cable, Red / White, M5 ring terminal for Ø75 IGBT & below	IGBT
XSL200D8WRCP	U9947	200mm long double Co-Axial cable, Red / White, M5 ring terminal for Ø85 IGBT & above	IGBT
XSL220C2WRT	-	220mm long twisted pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL300C2WRP	U9900	300mm long pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL300C2WS	U9900 (Gate Only)	300mm long gate wire, Silicone sleeve cable 16/0,2, White, M4 ring terminal	Thyristor
XSL350C2WRP	U9723	350mm long pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL400C2WRP	U9860	400mm long pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL500C2WRP	U9855	500mm long pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL600C2WRP	U9775	600mm long pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL1000C2WRP	U9734/U9801/U9849	1000mm long pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL1000C2WRT	U9952	1000mm long twisted pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor
XSL1100C2WRT	U9779	1100mm long twisted pair, Silicone sleeve cable 16/0,2, Red / White, M4 ring terminal	Thyristor



WC 18



WC 45



WC 48/49



WC 50

## Standard Bar Clamps

Part Number	Fixing Centers	Rod Size	Outline	Mounting Surface Diameter	Nominal Thickness	T <sub>J Max.</sub> °C	Outline No.
	mm			mm	mm		
XK0450DA056M	65	M8	DO-200AA/TO-200AB	19.0	13.8	190	WC2
XK0450DT056M	65	M8	DO-200AA/TO-200AB	19.0	13.8	190	WC3
XK0450SA056M	65	M8	DO-200AA/TO-200AB	19.0	13.8	190	WC1
XK0550DA056M	65	M8	GTO	29.5	16	190	WC5
XK0550SA056M	65	M8	GTO	29.5	16	190	WC4
XK0900DA056M	65	M8	Diode/Thyristor	25.1	14.6	190	WC7
XK0900DT056M	65	M8	Diode/Thyristor	25.1	14.6	190	WC8
XK0900SA056M	65	M8	Diode/Thyristor	25.1	14.6	190	WC6
XK0600DA074M	89	M10	Press-Pack IGBTs	47.0	27	190	WC10
XK0600SA074M	89	M10	Press-Pack IGBTs	47.0	27	190	WC9
XK1000DA074M	89	M10	Press-Pack IGBTs	47.0	27	190	WC12
XK1000SA074M	89	M10	Press-Pack IGBTs	47.0	27	190	WC11
XK1100DA076M	89	M10	DO-200AB/TO-200AC	34.0	26.2	190	WC13
XK1130DA076M	89	M10	DO-200AB/TO-200AC	34.0	26.2	190	WC15
XK1130DT076M	89	M10	DO-200AB/TO-200AC	34.0	26.2	190	WC16
XK1130SA076M	89	M10	DO-200AB/TO-200AC	34.0	26.2	190	WC14
XK1800DA076M	89	M10	Wespack PCT	38.0	14	190	WC18
XK1800DT076M	89	M10	Wespack PCT	38.0	14	190	WC19
XK1800SA076M	89	M10	Wespack PCT	38.0	14	190	WC17
XK2100DA076M	89	M10	GTO	47.0	27	190	WC21
XK2100DA076ML	89	M10	GTO	47.0	27	125	WC21
XK2100SA076M	89	M10	GTO	47.0	27	190	WC20
XK2100SA076ML	89	M10	GTO	47.0	27	125	WC20
XK2140DA076M	89	M10	DO-200/Thyristor	47.0	26.8	190	WC23
XK2140DA076ML	89	M10	DO-200/Thyristor	47.0	26.8	125	WC23
XK2140DT076M	89	M10	DO-200/Thyristor	47.0	26.8	190	WC24
XK2140DT076ML	89	M10	DO-200/Thyristor	47.0	26.8	125	WC24
XK2140SA076M	89	M10	DO-200/Thyristor	47.0	26.8	190	WC22
XK2140SA076ML	89	M10	DO-200/Thyristor	47.0	26.8	125	WC22
XK2700DA076M	89	M10	Wespack PCT	50.0	14	190	WC26
XK2700DT076M	89	M10	Wespack PCT	50.0	14	190	WC27
XK2700SA076M	89	M10	Wespack PCT	50.0	14	190	WC25

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Standard Bar Clamps

Part Number	Fixing Centers	Rod Size	Outline	Mounting Surface Diameter	Nominal Thickness	T <sub>J Max.</sub>	Outline No.
	mm			mm	mm	°C	
XK2000DA114M	132	M12	Press-Pack IGBTs	75.0	26	190	WC29
XK2000SA114M	132	M12	Press-Pack IGBTs	75.0	26	190	WC28
XK2500DA114M	132	M12	Press-Pack IGBTs	75.0	26	190	WC31
XK2500SA114M	132	M12	Press-Pack IGBTs	75.0	26	190	WC30
XK2500DA116M	132	M12	GTO	63.0	26	190	WC33
XK2500DA116ML	132	M12	GTO	63.0	26	125	WC33
XK2500SA116M	132	M12	GTO	63.0	26	190	WC32
XK2500SA116ML	132	M12	GTO	63.0	26	125	WC32
XK3000DA116M	132	M12	DO-200AD/Thyristor	63.0	33	190	WC35
XK3000DA116ML	132	M12	DO-200AD/Thyristor	63.0	33	125	WC35
XK3000SA116M	132	M12	DO-200AD/Thyristor	63.0	33	190	WC34
XK3000SA116ML	132	M12	DO-200AD/Thyristor	63.0	33	125	WC34
XK3500DA116M	132	M12	GTO	75.0	26	190	WC37
XK3500DA116ML	132	M12	GTO	75.0	26	125	WC37
XK3500SA116M	132	M12	GTO	75.0	26	190	WC36
XK3500SA116ML	132	M12	GTO	75.0	26	125	WC36
XK4000DA116M	132	M12	Diode/Thyristor	73.0	36.8	190	WC39
XK4000DA116ML	132	M12	Diode/Thyristor	73.0	36.8	125	WC39
XK4000SA116M	132	M12	Diode/Thyristor	73.0	36.8	190	WC38
XK4000SA116ML	132	M12	Diode/Thyristor	73.0	36.8	125	WC38
XK5000DA128M	146	M16	GTO	75.0	26	190	WC40
XK5000DA128ML	146	M16	GTO	75.0	26	125	WC40
XK7000DA128M	146	M16	Diode/Thyristor	75.0	26.6	190	WC41
XK7000DA128ML	146	M16	Diode/Thyristor	75.0	26.6	125	WC41
XK3060DA140ML	154	M12	Press-Pack IGBTs	85.1	26	125	WC43
XK3060SA140ML	154	M12	Press-Pack IGBTs	85.1	26	125	WC42
XK9000SA160M	180	M16	Thyristor	99.3	35.8	190	WC44
XK9000SA160ML	180	M16	Thyristor	99.3	35.8	125	WC44
XK9000DA160M	180	M16	Thyristor	99.3	35.8	190	WC45
XK9000DA160ML	180	M16	Thyristor	99.3	35.8	125	WC45
XK6120DA180ML	196	M16	Press-Pack IGBTs	125.0	26	125	WC46
XK6120SA180ML	196	M16	Press-Pack IGBTs	125.0	26	125	WC47
XK8000DA180ML	196	M16	Press-Pack IGBTs	132.0	26	125	WC67
XK8000SA180ML	196	M16	Press-Pack IGBTs	132.0	26	125	WC68

Standard Bar Clamp Kits

for rectifier diodes & phase control thyristors

These single-side cooled square base mounting clamps are suitable for 34 mm to 50 mm diameter electrode devices with clamping forces that range from 1130 Kgf to 2140 Kgf. They are suitable for devices with blocking voltages from 400 volts up to 6 KV.

Part Number	Electrode Diameter	Outline
XK1500CB034M	34-38	WC64
XK1130SB076M	34-38	WC65
XK2140SB076M	47-50	WC66

Standard part replacements for the obsolete flat-base power silicon diodes types KBN/R, KCN/R, and KDN/R. For other voltages and thyristor options, please consult the factory.



Standard Bar Clamps

Range	Part Number	### = Force	Max cell dia.	T <sub>JMAX</sub>	xxx = max Z - dim range	Outline No.
		kgf	mm	°C	mm	
XSK042	XSK###DA042xxx	0500/0900	42	190	025-076*	WC58
	XSK###DT042xxx	0500/0900	42	190	025-076*	WC59
	XSK###DF042xxx	0500/0900	42	190	025-076*	WC60
XSK054	XSK###DA054xxx	900	54	190	025-076*	WC58
	XSK###DT054xxx	900	54	190	025-076*	WC59
	XSK###DF054xxx	900	54	190	025-076*	WC60
XSK056	XSK###DA056xxx	0500/0900	56	190	038-120*	WC58
	XSK###DT056xxx	0500/0900	56	190	038-120*	WC59
	XSK###DF056xxx	0500/0900	56	190	038-120*	WC60
	XSK###DA056xxx	1500	56	190	038-120*	WC58/SP
	XSK###DT056xxx	1500	56	190	038-120*	WC59/SP
	XSK###DF056xxx	1500	56	190	038-120*	WC60/SP
XSK065	XSK###DA065xxx	0500/0900	65	190	038-120*	WC58
	XSK###DT065xxx	0500/0900	65	190	038-120*	WC59
	XSK###DF065xxx	0500/0900	65	190	038-120*	WC60
	XSK###DA065xxx	1500	65	190	038-120*	WC58/SP
	XSK###DT065xxx	1500	65	190	038-120*	WC59/SP
XSK075	XSK###DA075xxx	0900/1500	75	190	038-120*	WC58
	XSK###DT075xxx	0900/1500	75	190	038-120*	WC59
	XSK###DF075xxx	0900/1500	75	190	038-120*	WC60
	XSK###DA075xxx	2200	75	190	038-120*	WC61
	XSK###DT075xxx	2200	75	190	038-120*	WC62
	XSK###DF075xxx	2200	75	190	038-120*	WC63
XSK087	XSK###DA087xxx	1500/2200	87	190	038-120*	WC61
	XSK###DT087xxx	1500/2200	87	190	038-120*	WC62
	XSK###DF087xxx	1500/2200	87	190	038-120*	WC63
	XSK###DA087xxx	3000	87	190	038-120*	WC61/SP
	XSK###DT087xxx	3000	87	190	038-120*	WC62/SP
	XSK###DF087xxx	3000	87	190	038-120*	WC63/SP
XSK103	XSK###DA103xxx	2200	103	190	038-120*	WC58/SP
	XSK###DF103xxx	2200	103	190	038-120*	WC60/SP
	XSK###DA103xxx	3200	103	190	038-120*	WC61/SP
	XSK###DF103xxx	3200	103	190	038-120*	WC63/SP
	XSK###DA103xxx	4000	103	190	038-120*	WC61/SP
XSK112	XSK###DA112xxx	2800/3200/3800/4500	112	190	038-120*	WC61/SP
	XSK###DF112xxx	2800/3200/3800/4500	112	190	038-120*	WC63/SP
XSK120	XSK###DA120xxx	3800/4500/5000	120	190	050-120*	WC61/SP
	XSK###DF120xxx	3800/4500/5000	120	190	050-120*	WC63/SP
XSK126	XSK###DA126xxx	3800/4500/5000	126	190	050-120*	WC61/SP
	XSK###DF126xxx	3800/4500/5000	126	190	050-120*	WC63/SP
XSK160	XSK###DA160xxx	8000/9000	160	190	050-120*	WC61/SP
	XSK###DF160xxx	8000/9000	160	190	050-120*	WC63/SP



# Stacks and Accessories



## Bar Clamps

Range	A	A1	B	C	C1	D	E	F	G	H	Fixing
XSK042	69.85	74.89	54.00	15.88	21.04	42.00	8.64	PCF	PCF	12.70	M6
XSK054	82.55	86.04	65.00	15.88	21.04	54.00	8.62	34.93	PCF	12.70	M6
XSK056	95.25	-	70.00	25.40	-	56.00	12.19	PCF	PCF	9.53	M8
XSK065	104.39	-	79.00	25.40	-	65.00	12.19	PCF	PCF	12.70	M8
XSK075	112.78	-	89.00	25.40	-	75.00	12.19	PCF	PCF	12.70	M8
XSK087	127.00	-	102.00	25.40	-	87.00	12.19	PCF	PCF	19.05	M8
XSK103 (2200/3200)	144.78	-	118.00	25.40	36.00	103.00	12.19	PCF	PCF	19.05	M8
XSK103 (4000)	144.78	154.11	118.00	25.40	36.00	103.00	16.56	PCF	PCF	19.05	M10
XSK112	165.02	-	132.00	25.40	36.00	112.00	16.56	PCF	PCF	25.40	M10
XSK120	172.72	-	140.00	25.40	36.00	120.00	16.56	PCF	PCF	25.40	M10
XSK126	181.1	-	146	25.4	36	126	16.56	PCF	PCF	25.4	M10
XSK160	216.07	-	180	38.1	-	160	16.56	PCF	PCF	38.1	M12

**Notes:**  
 PCF = Dimension is dependent on clamp force and cell height. Please consult the factory.  
 "A1" dimension only shown where "A1" is larger than "A".  
 "C1" dimension only shown where "C1" is larger than "C".  
 All dimensions in mm.

## Bar Clamps for WESPACK™ and GTO range

Part Number	Rod Size & Length	Insulator Size & Length	Fixing Centers	Electrode Diameter	Clamp Forces	"Z"	"D"	Fig. No.
	mm	mm				mm	mm	
XSK1500DA076038	M8 × 90	M8 × 60	89.0	32	10kN to 20kN	38	27.5	WC51
XSK1500DA076076	M8 × 130	M8 × 95	89.0	32	10kN to 20kN	76	62.5	WC51
XSK1500DA076101	M8 × 160	M8 × 120	89.0	32	10kN to 20kN	101	87.6	WC51
XSK2000DA076038	M8 × 95	M8 × 60	89.0	38	13kN to 20kN	38	25.9	WC52
XSK2000DA076076	M8 × 130	M8 × 95	89.0	38	13kN to 20kN	76	61.0	WC52
XSK2000DA076101	M8 × 160	M8 × 120	89.0	38	13kN to 20kN	101	85.9	WC52
XSK3000DA076038	M8 × 100	M8 × 65	89.0	50	25kN to 31kN	38	26.2	WC53
XSK3000DA076076	M8 × 130	M8 × 100	89.0	50	25kN to 31kN	76	56.1	WC53
XSK3000DA076101	M8 × 160	M8 × 125	89.0	50	25kN to 31kN	101	86.1	WC53
XSK3400DA076038	M8 × 100	M8 × 65	89.0	50	27kN to 34kN	38	24.6	WC54
XSK3400DA076076	M8 × 140	M8 × 105	89.0	50	27kN to 34kN	76	64.5	WC54
XSK3400DA076101	M8 × 160	M8 × 130	89.0	50	27kN to 34kN	101	89.7	WC54
XSK3800DA116M076	M10 × 150	M12 × 100	132.0	66	32kN to 38kN	76	59.7	WC55
XSK3800DA116M101	M10 × 180	M12 × 125	132.0	66	32kN to 38kN	101	84.6	WC55
XSK4400DA116M076	M10 × 150	M12 × 105	132.0	68	36kN to 44kN	76	63.0	WC56
XSK4400DA116M101	M10 × 180	M12 × 130	132.0	68	36kN to 44kN	101	87.9	WC56
XSK6000DA116M076	M10 × 150	M12 × 105	132.0	75	50kN to 60kN	76	59.9	WC57
XSK6000DA116M101	M10 × 180	M12 × 130	132.0	75	50kN to 60kN	101	84.8	WC57

Notes: 1 kgf = 9.8 Newtons      T<sub>max</sub> = 190 °C

## Box Clamps

Part Number	Moulded Box Style	Fixing Centers	Rod Size	Capsule Device			Outline Ref.
				Outline	Mounting Surface Ø	Normal Thickness	
					mm	mm	
XK0450BA019M	Injection	50 PCD	M5x50 Bolts	W1 / W8 / W90	19.0	13.8	WC48
XK0450BB019M	Compression	50 PCD	M5x50 Bolts	W1 / W8 / W90	19.0	13.8	WC48
XK0450BA025M	Injection	50 PCD	M5x50 Bolts	W2 / W58	25.1	14.6	WC49
XK0450BB025M	Compression	50 PCD	M5x50 Bolts	W2 / W58	25.1	14.6	WC49
XK1000BA025M	Injection	50 PCD	M5x50 Bolts	W91	25.1	14.0	WC49
XK1500BA034M	Injection	70 PCD	M6x50 Bolts	W4 / W10 / W92	34.0	26.2	WC50

## Heatsinks

Part Number	Weight	Periphery	Area	Fig.
	kg/m	mm	mm <sup>2</sup>	
XSFGxxxxAN	8.1	1059	2979	WH1
XSFGAxxxxAN	15.6	1682	5867	WH2
XSFHxxxxAN	12.7	1684	4655	WH3
XSFTxxxxAN	20	2065	7573	WH4
XSFTBxxxxAN	29	2467	10905	WH5
XSFTCxxxxAN	28	2544	10561	WH6
XSFLPxxxxAN	30	6620	11172	WH7
XSF46xxxxAN	20	2822	7411	WH8
XSF30xxxxAN	Dimensions 125 mm × 125 mm × 4 vanes			

# Stacks and Accessories



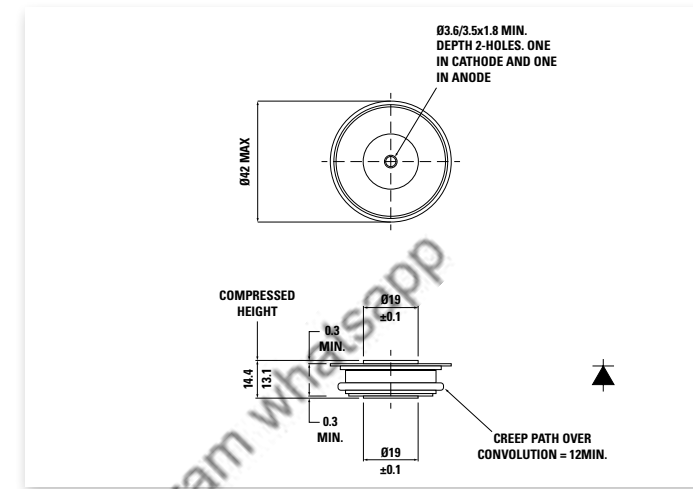
# Coolers

Part Number	Weight	Cooler Thickness	Busbar Thickness	Description	Fig. No.
	kg	mm	mm		
XW076NC16A	0.418	16	N/A	47 mm WC Cu	WCL2
XW076NC16B	0.612	16	6,4	47 mm WC Cu with Busbar (10 mm Hose)	WCL1
XW076NC16BS	0.612	16	6,4	47 mm WC Cu with Busbar + spirol pins fitted (10 mm Hose)	WCL1
XW076NC16BT	0.612	16	6,4	47 mm WC Cu with Busbar + thermostat hole (10 mm Hose)	WCL1
XW076NC16C	0.612	16	6,4	47 mm WC Cu with Busbar (1/2" Hose)	WCL1
XW076NC16CT	0.612	16	6,4	47 mm WC Cu with Busbar + thermostat hole (1/2" Hose)	WCL1
XW076NC16R	0.581	16	6,35	47 mm WC Cu reversed with Busbar	WCL12
XW076NC16W	0.400	16	N/A	47 mm WC Cu reversed	WCL13
XW116ZC20A	1.300	20	N/A	73 mm WC Cu	WCL4
XW116ZC20B	1.750	20	10	73 mm WC Cu with Busbar	WCL3
XW116ZC20C	2.120	20	10	73 mm WC Cu with alt, Busbar	WCL5
XW116ZC20R	1.672	20	10	73 mm WC Cu reversed with Busbar	WCL14
XW116ZC20W	1.119	20	N/A	73 mm WC Cu reversed	WCL15
XW127EC25A	1.650	25	N/A	85 mm WC Cu Helix	WCL16
XW127EC25B	2.200	25	8	85 mm WC Cu with Busbar Helix	WCL17
XW127EA25A	0.500	25	N/A	85 mm WC Al Helix	WCL16
XW127EA25B	0.650	25	8	85 mm WC Al with Busbar Helix	WCL17
XW160FC25A	3.620	25	N/A	100 mm WC Cu	WCL6
XW160FC25B	4.520	25	10	100 mm WC Cu with Busbar	WCL7
XW180GC34A	4.920	34	N/A	125 mm WC Cu Helix	WCL11
XW180GC34B	5.950	34	10	125 mm WC Cu with Busbar Helix	WCL10
XW180GA34A	1.500	34	N/A	125 mm WC Al Helix	WCL11
XW180GA34B	1.800	34	10	125 mm WC Al with Busbar Helix	WCL10
XW180BA34E	1.550	34	N/A	132 mm WC Al Helix	WCL19
XW180BA34F	1.850	34	10	132 mm WC Al with Busbar Helix	WCL20
XW270QA25A	2.941	25	N/A	270 x 190 mm WC Al Cold Plate	WCL9

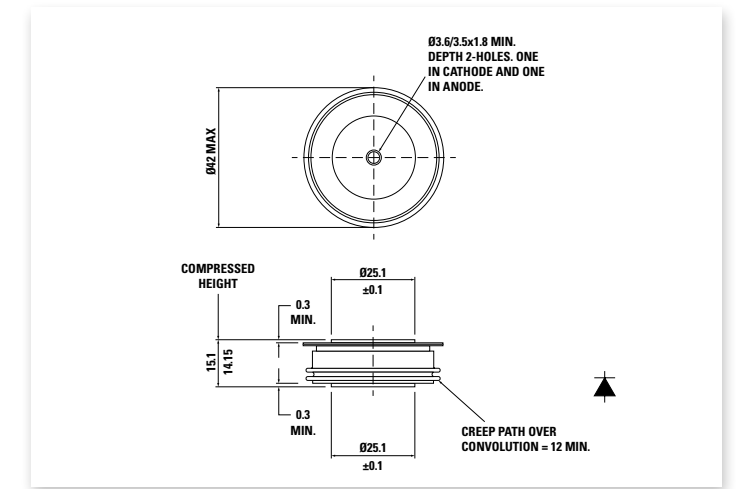
Part Number	Cooler Accessories
XSNM12H10S	M12 Cooler Connection, 10mm Hose & Stainless Steel material
XSNM12H12S	M12 Cooler Connection, 12mm Hose & Stainless Steel material

# Outline Drawings

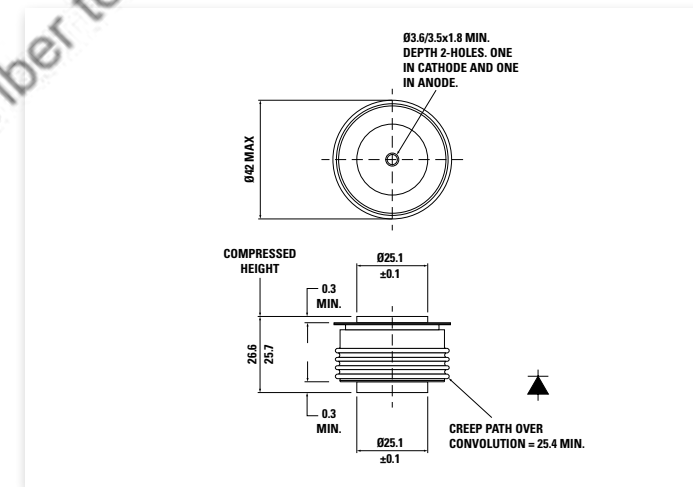
W1 - 100A241



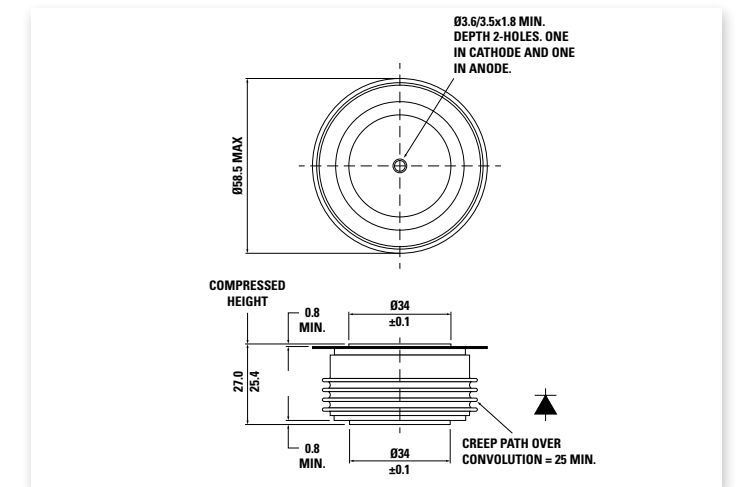
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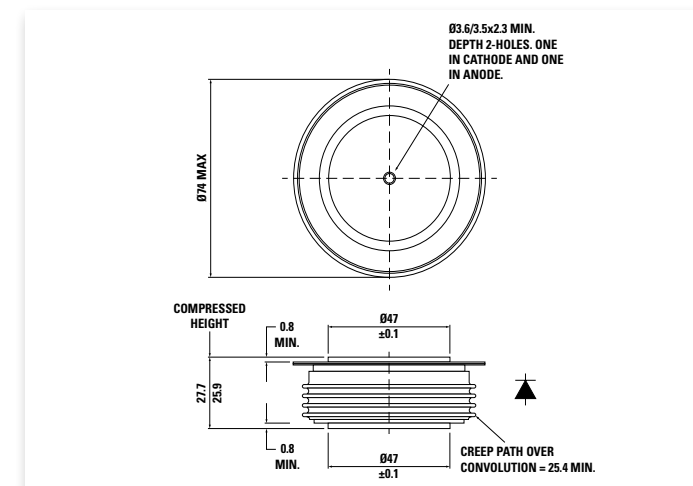
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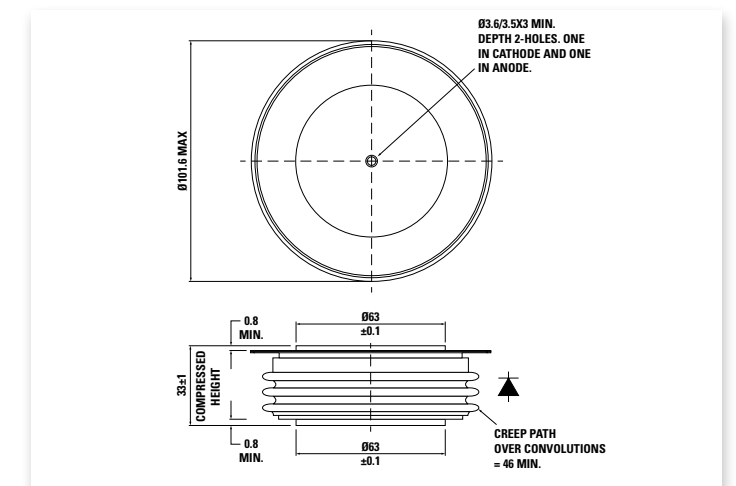
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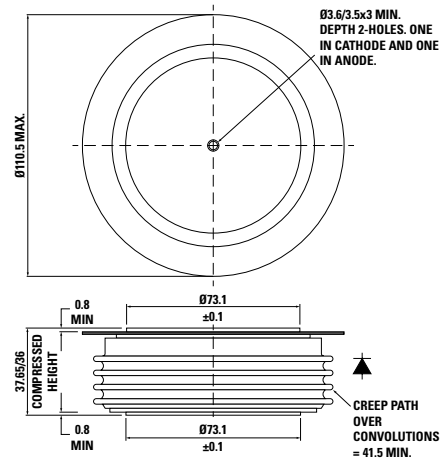
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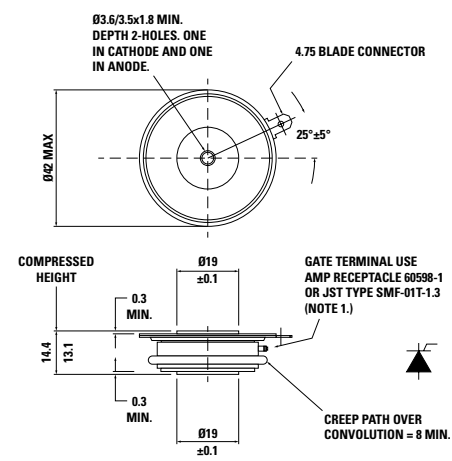
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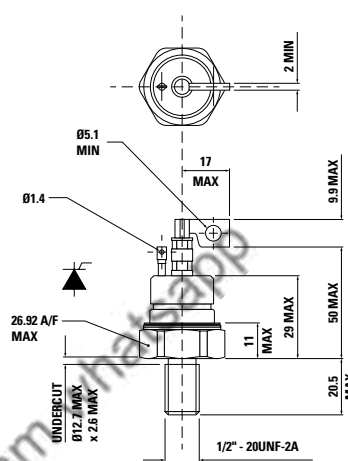
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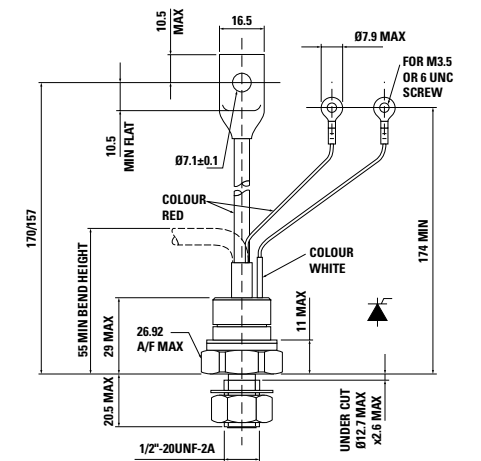
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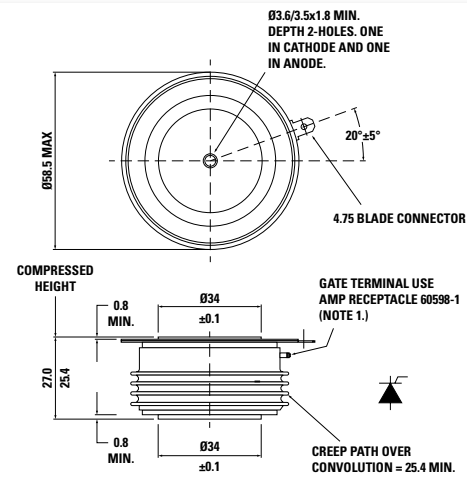
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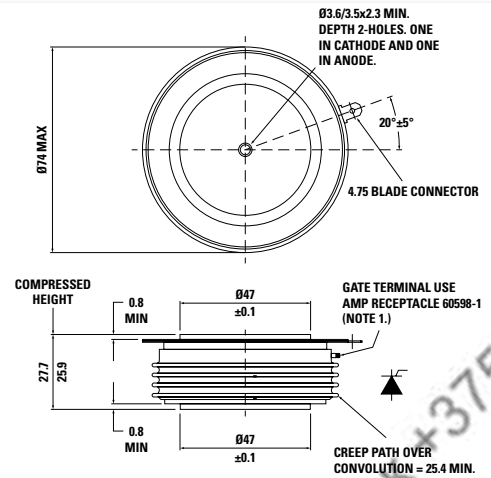
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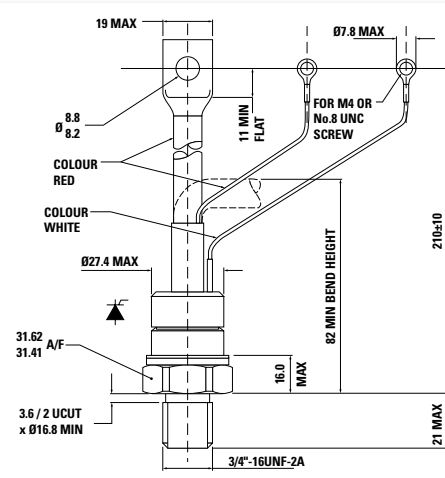
W10 - 101A216



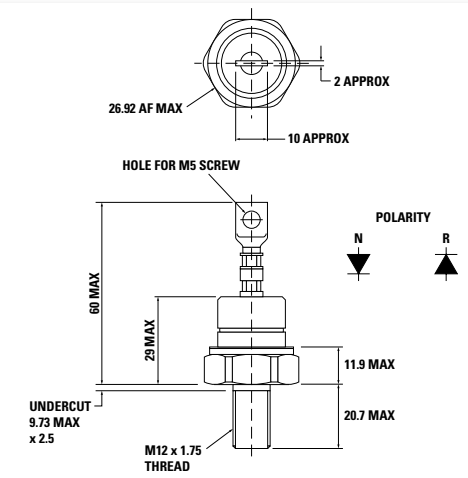
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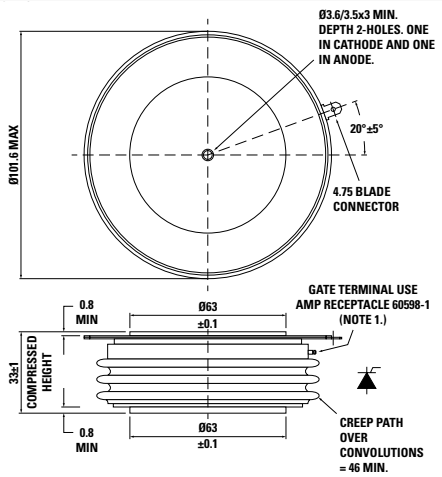
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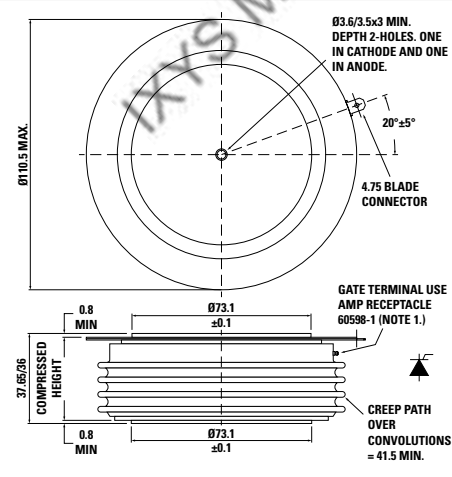
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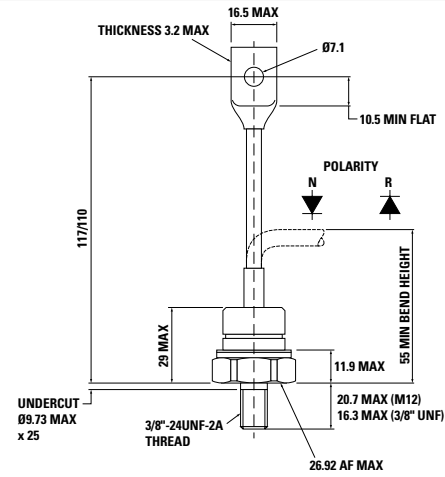
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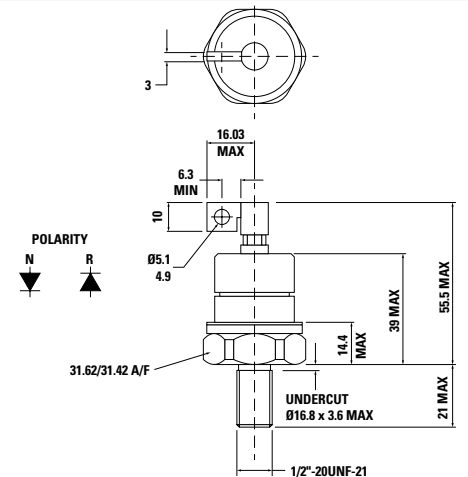
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W21 - 100A294

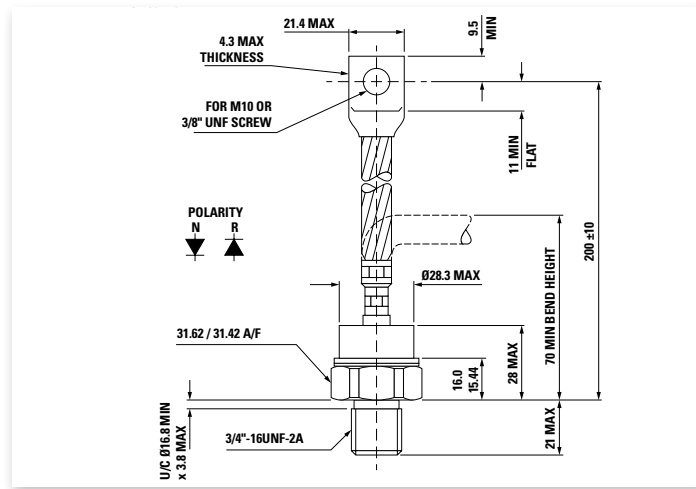


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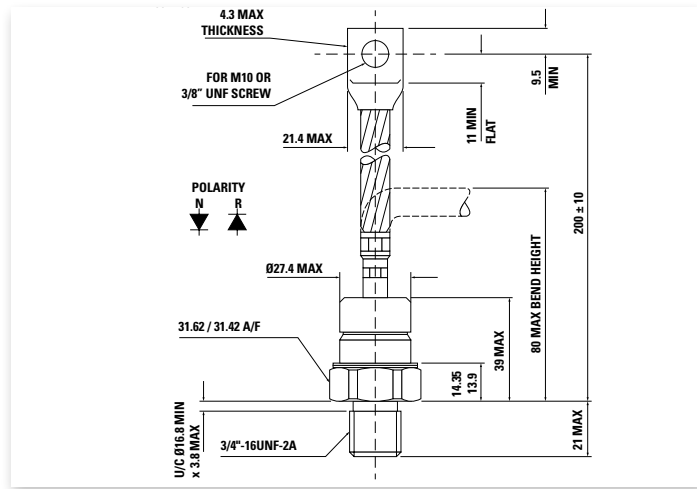




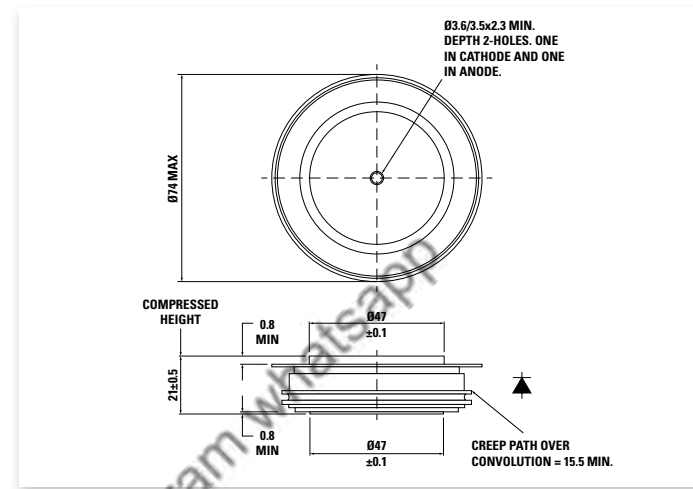
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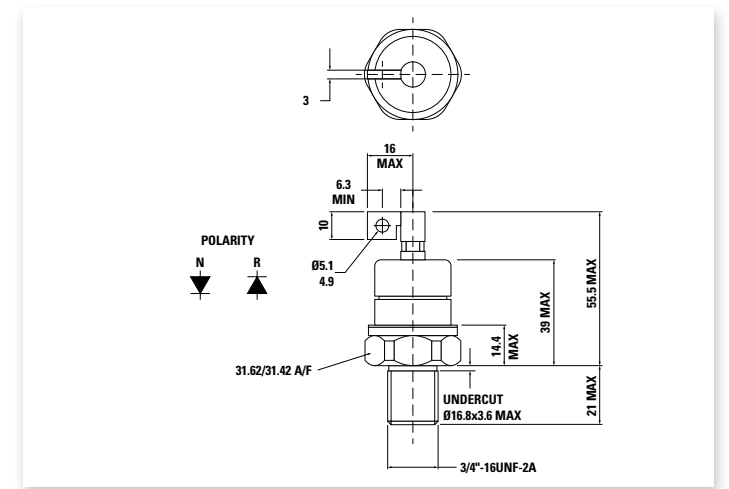
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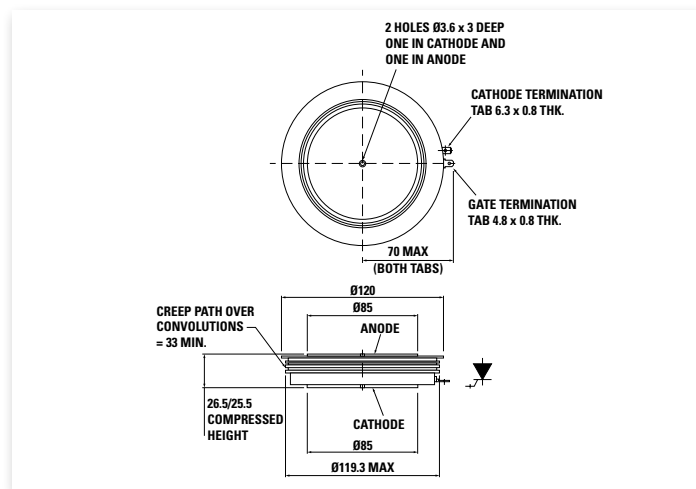
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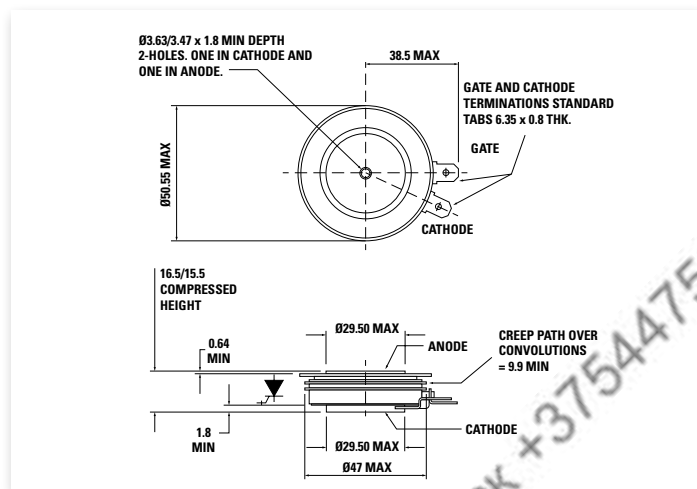
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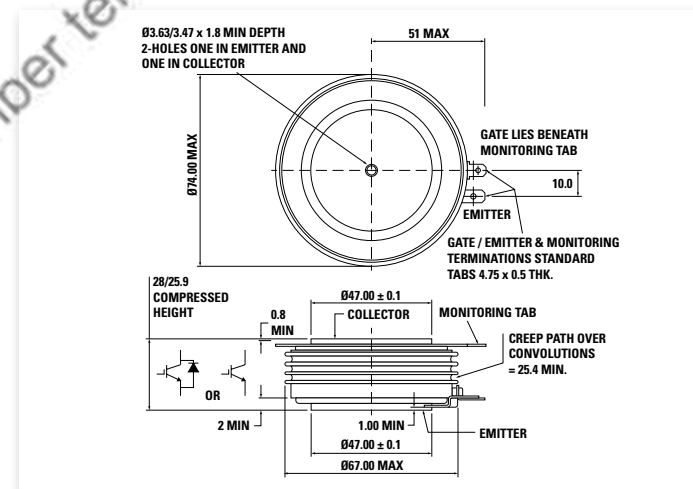
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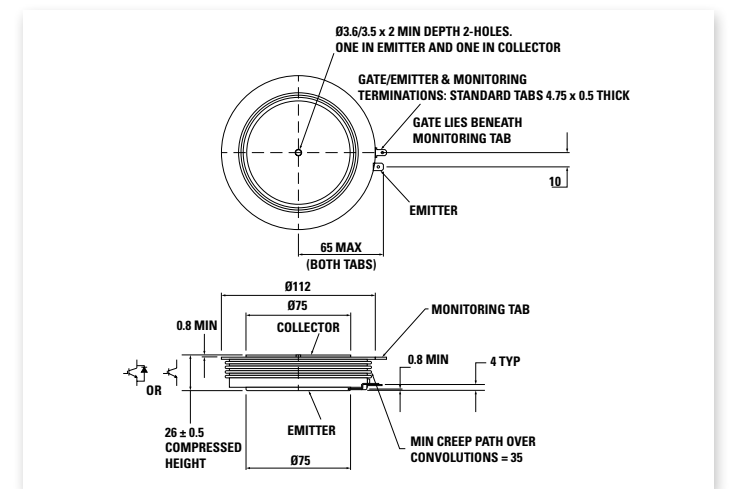
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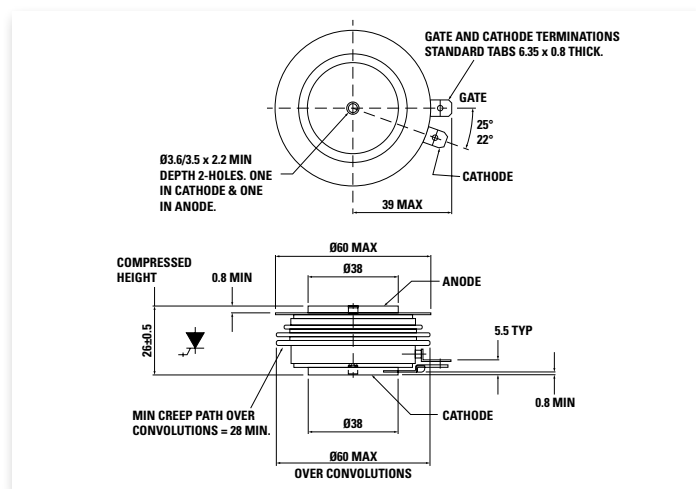
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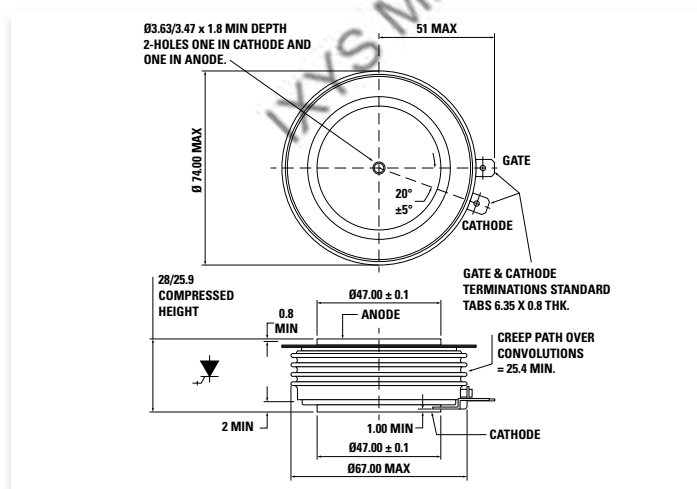
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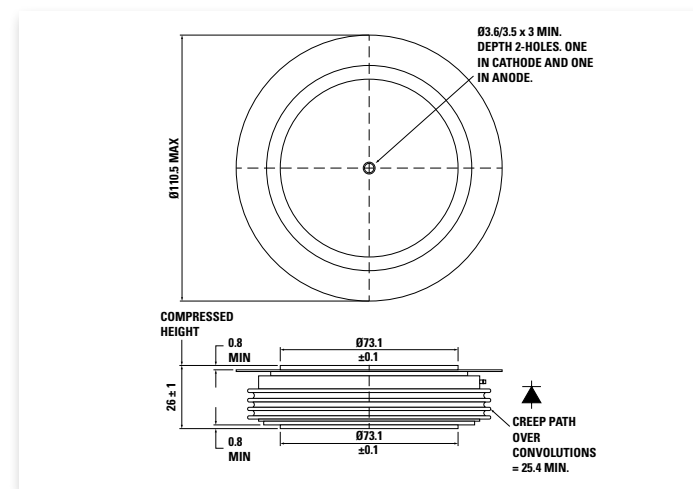
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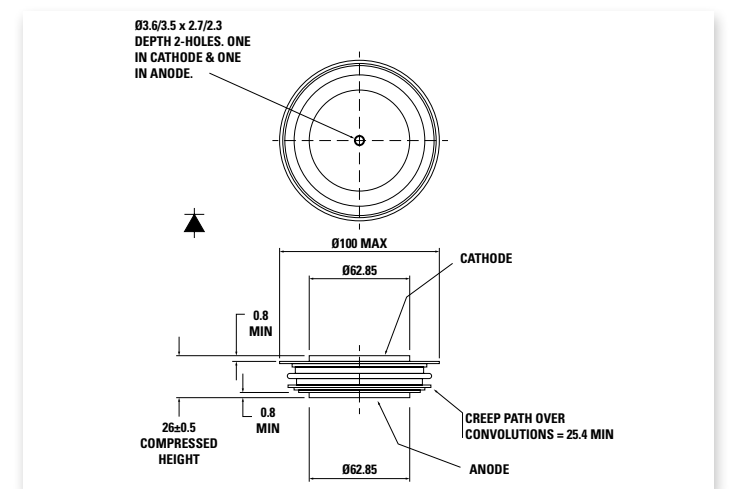
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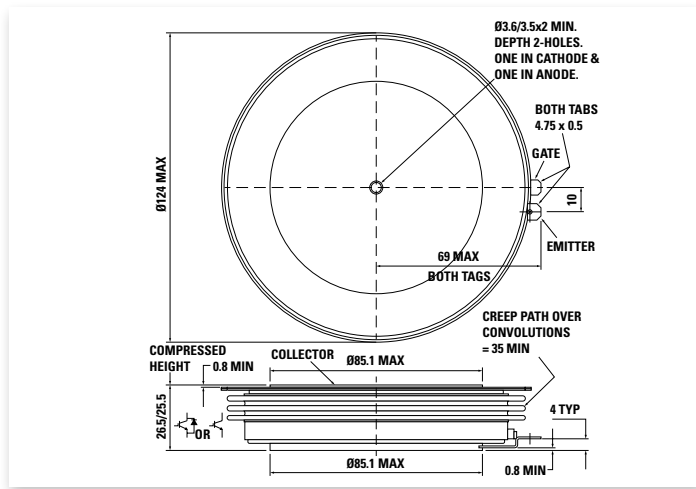
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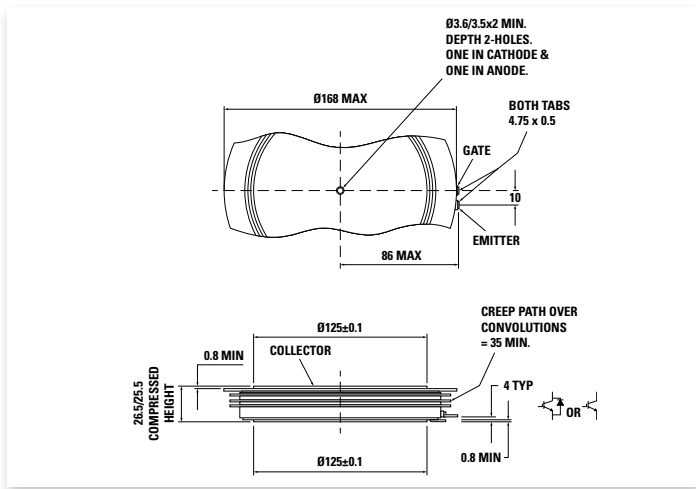
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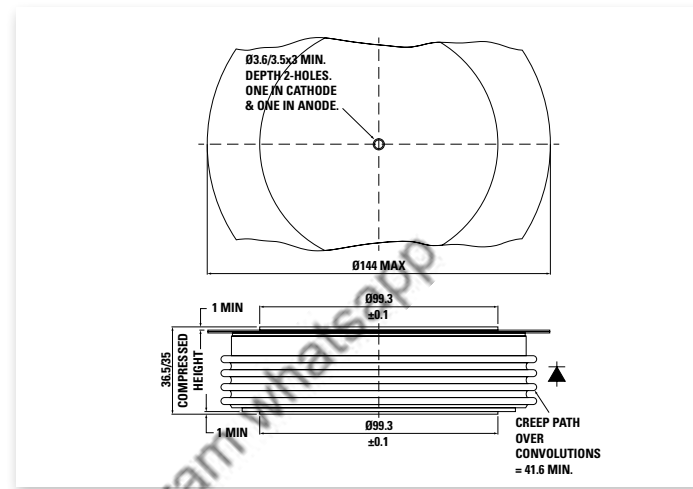
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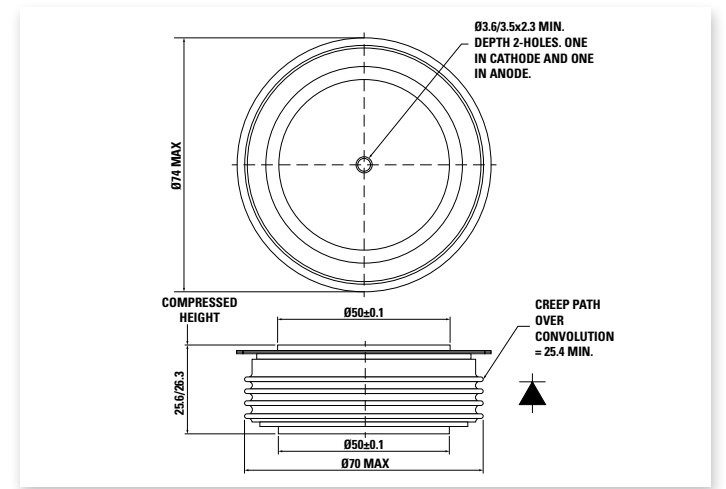
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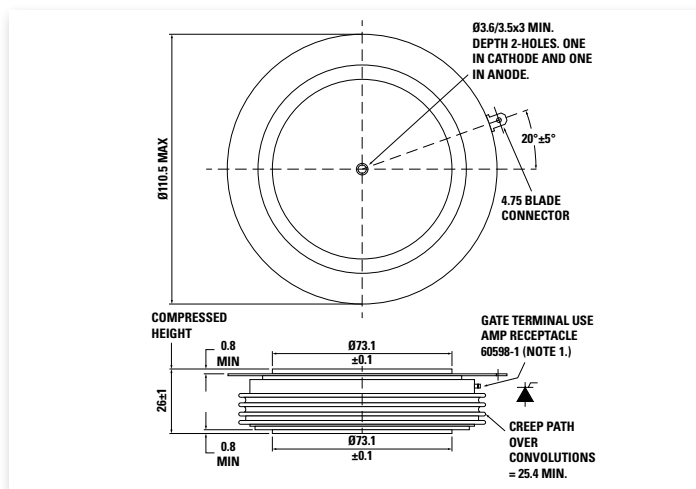
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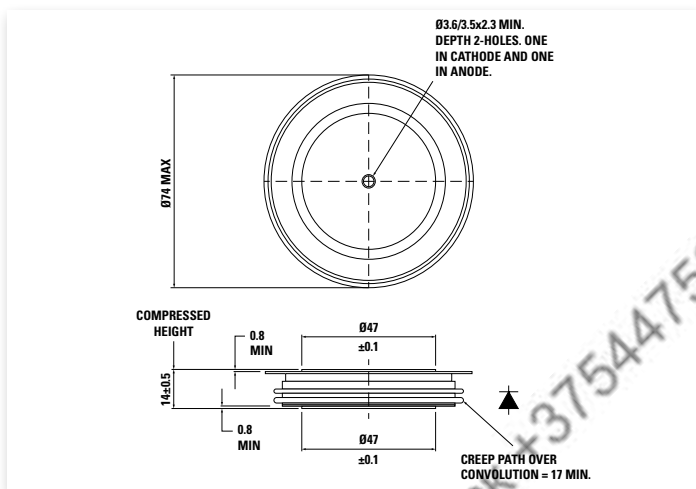
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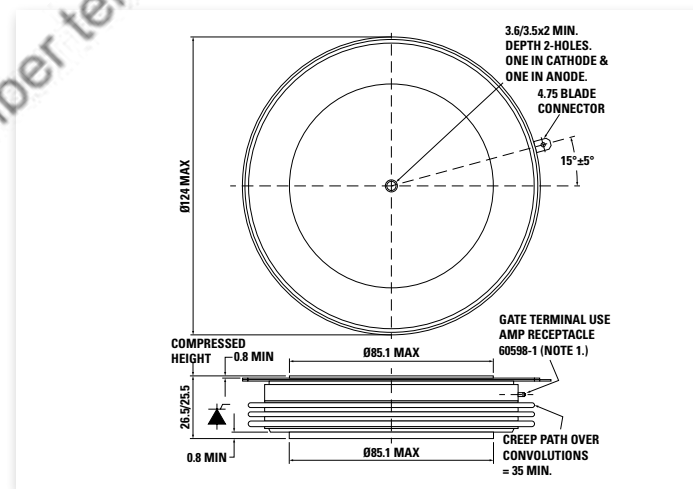
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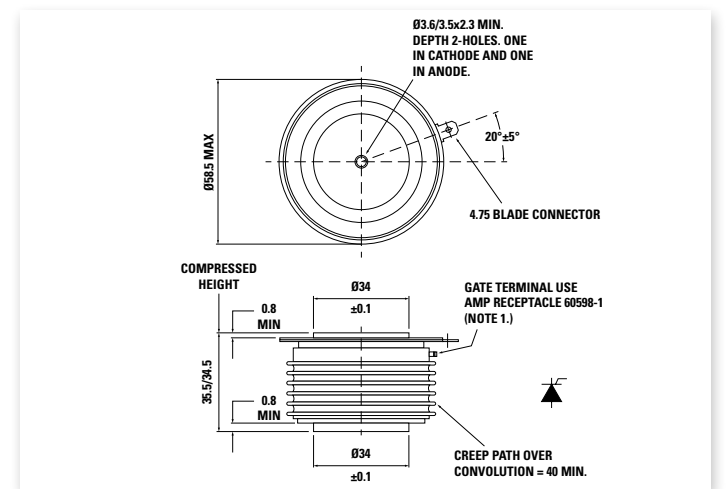
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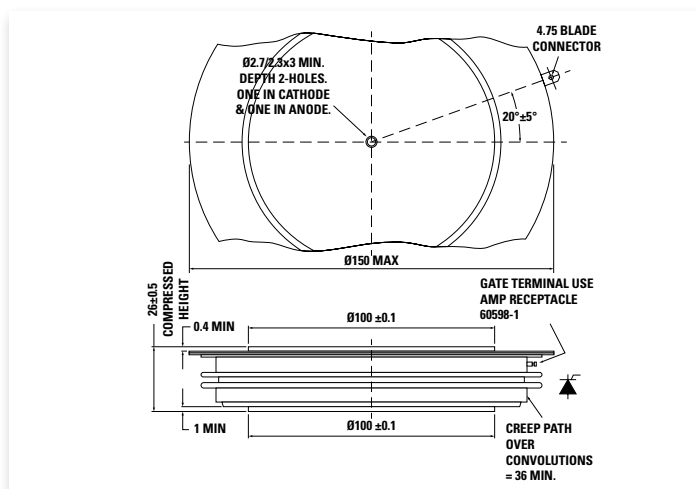
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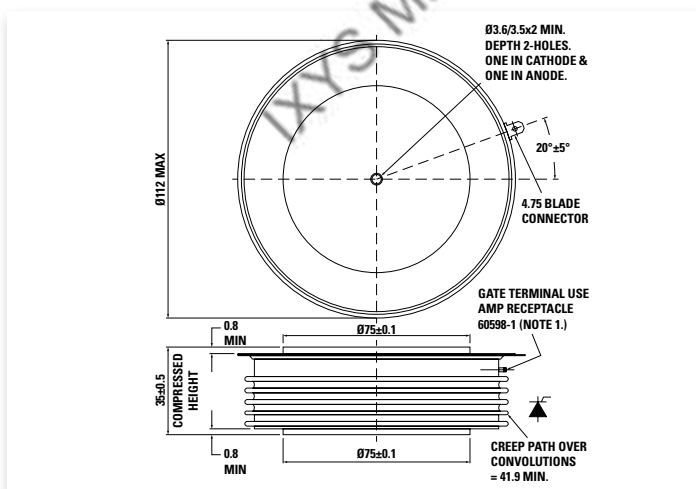
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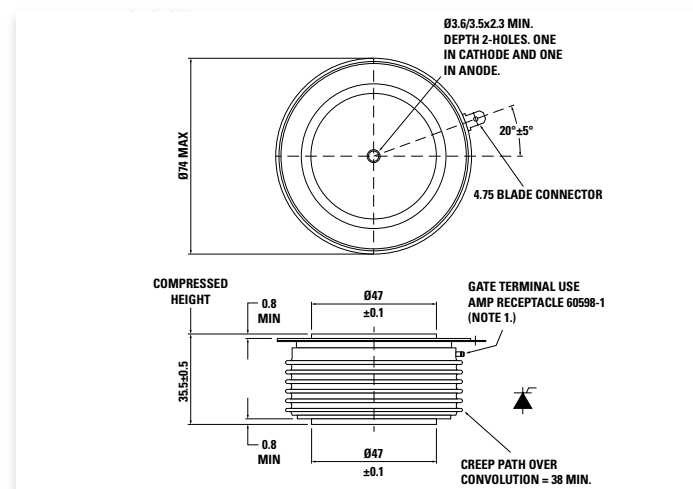
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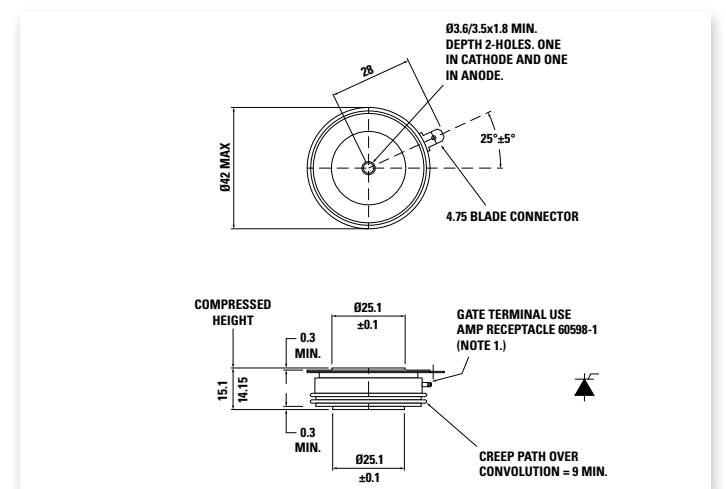
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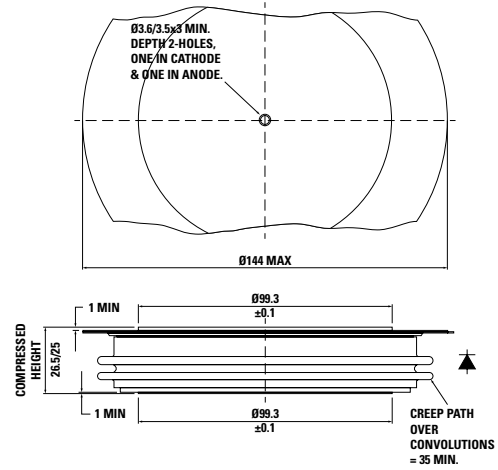
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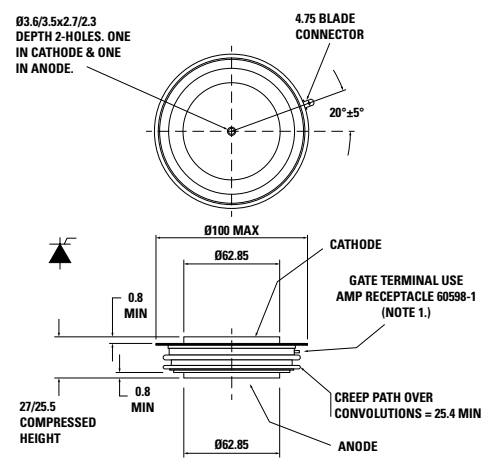
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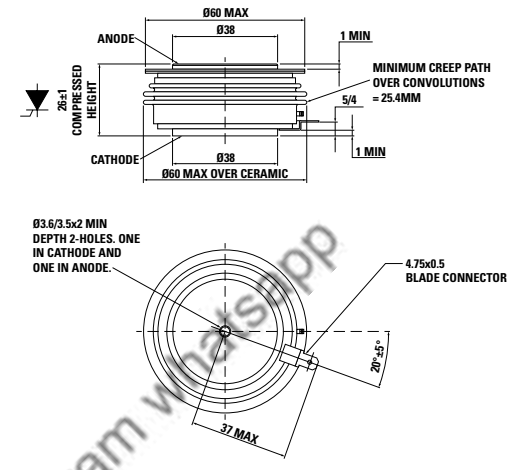
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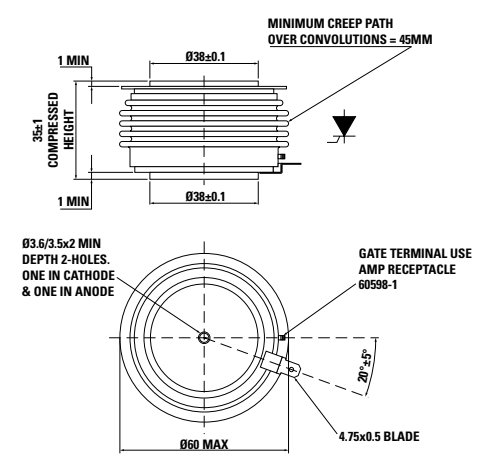
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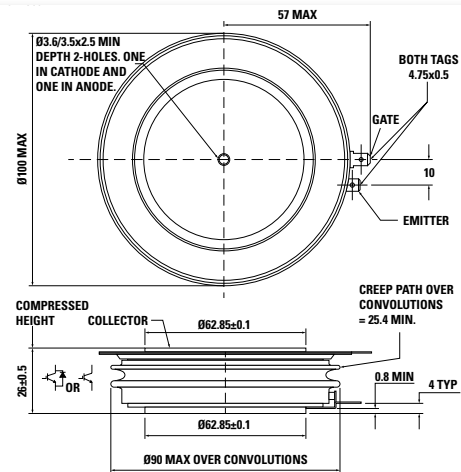
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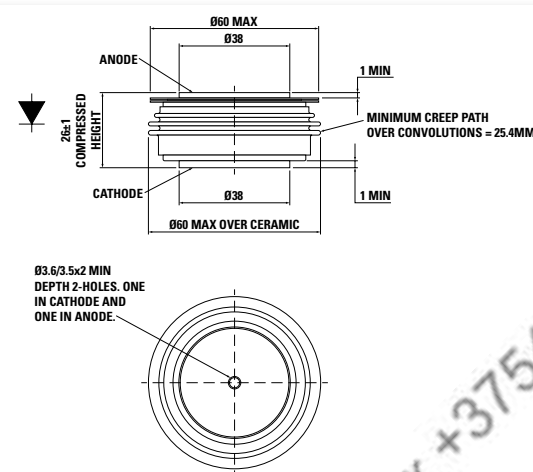
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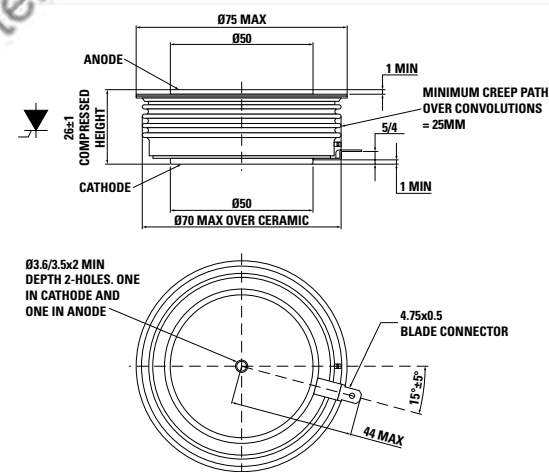
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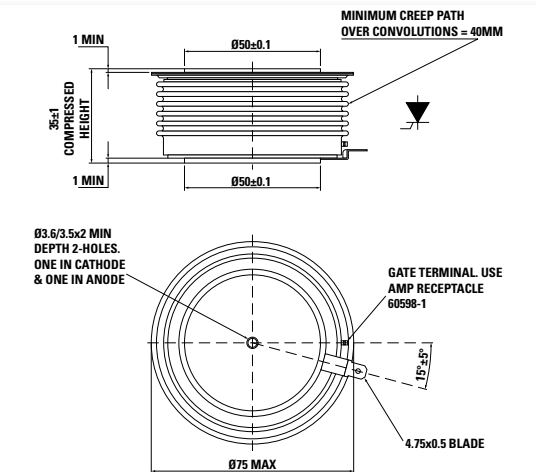
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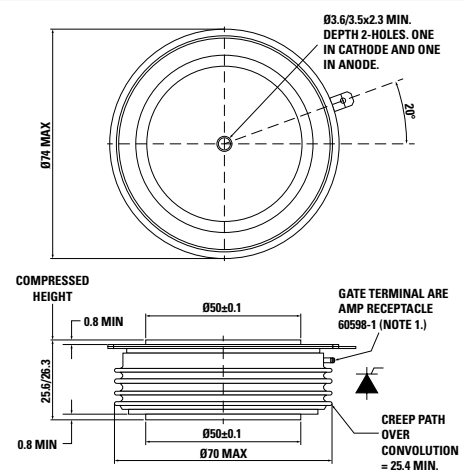
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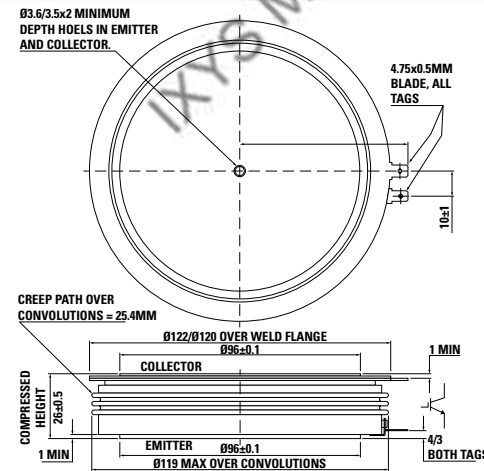
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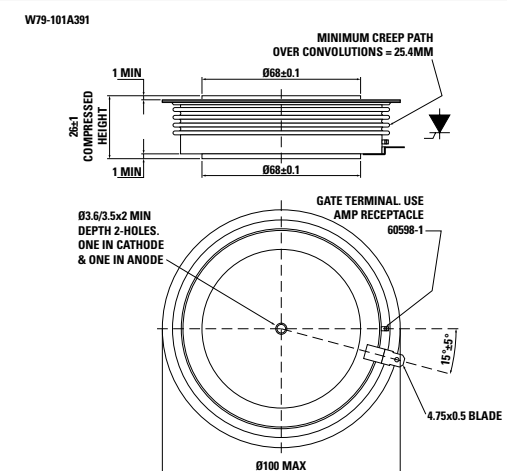
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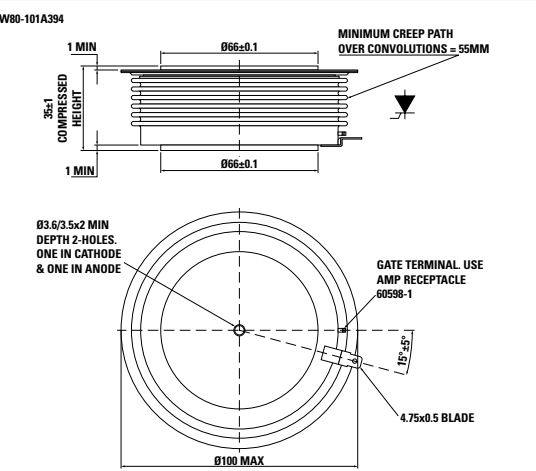
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W79 - 101A391



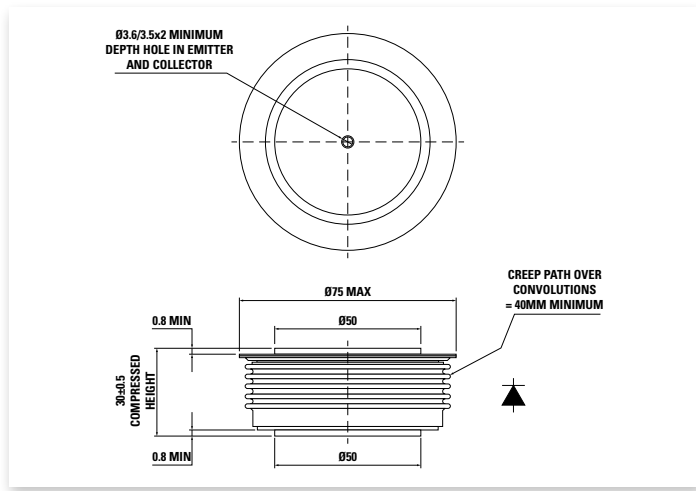
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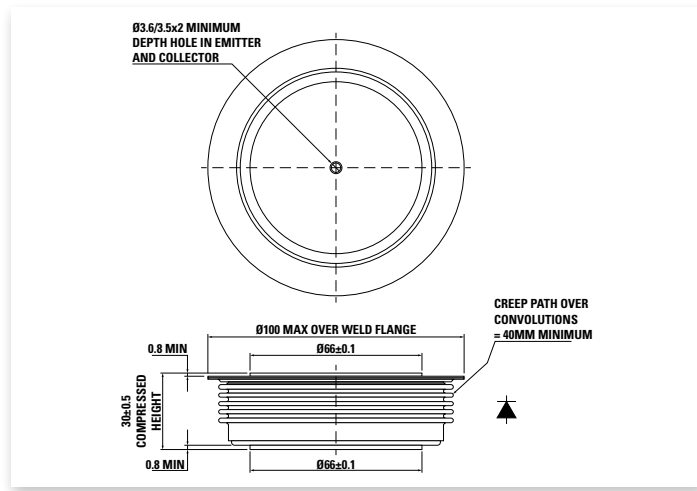




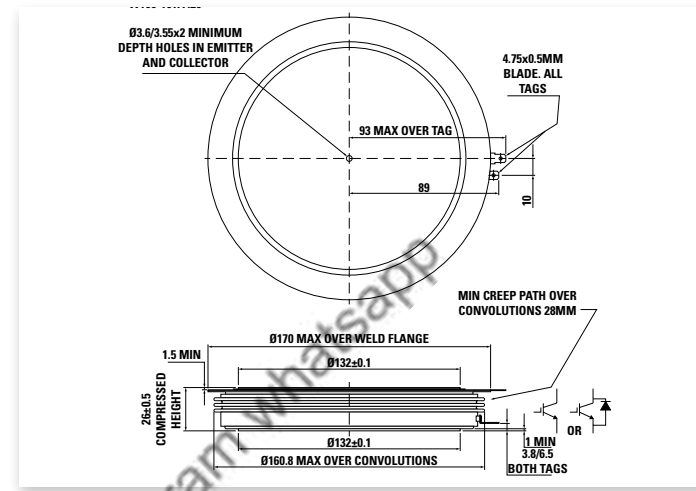
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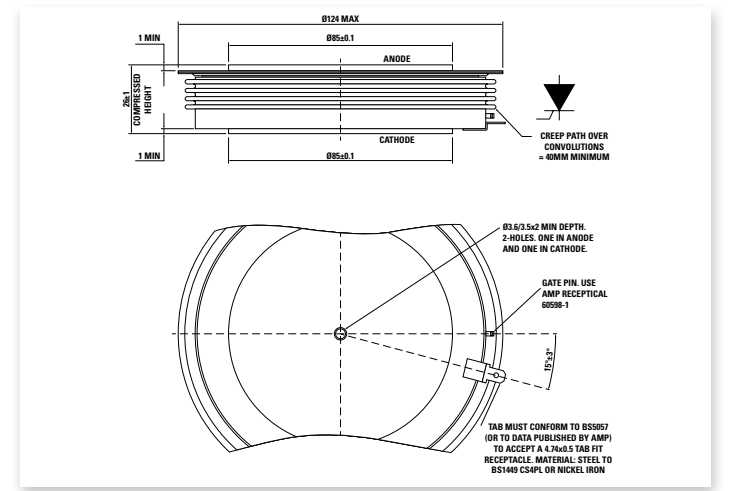
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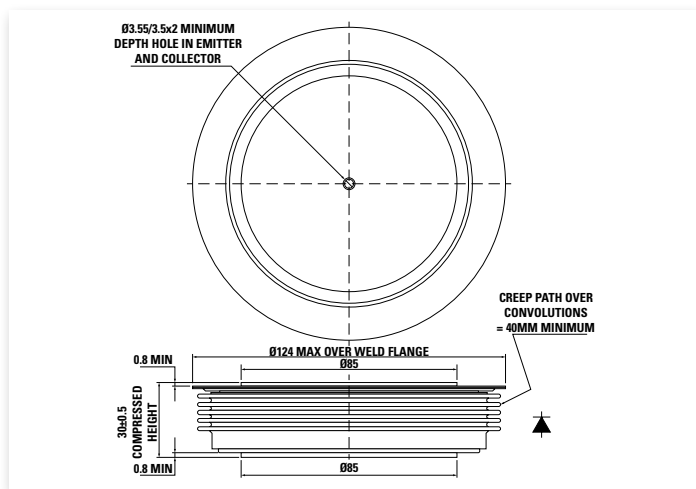
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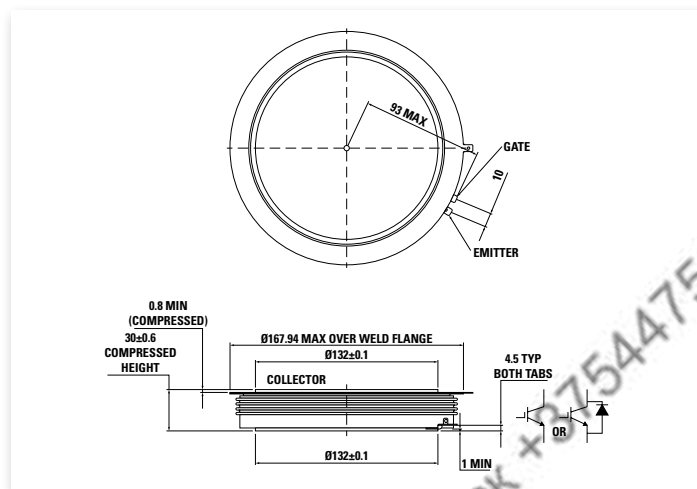
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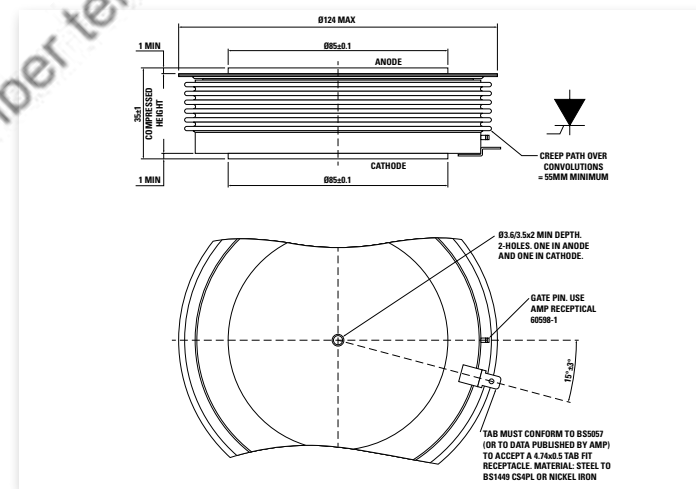
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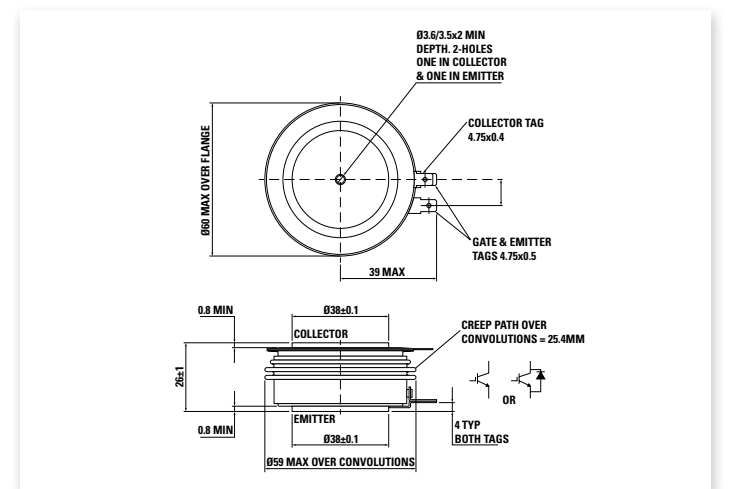
W103 - 101A401



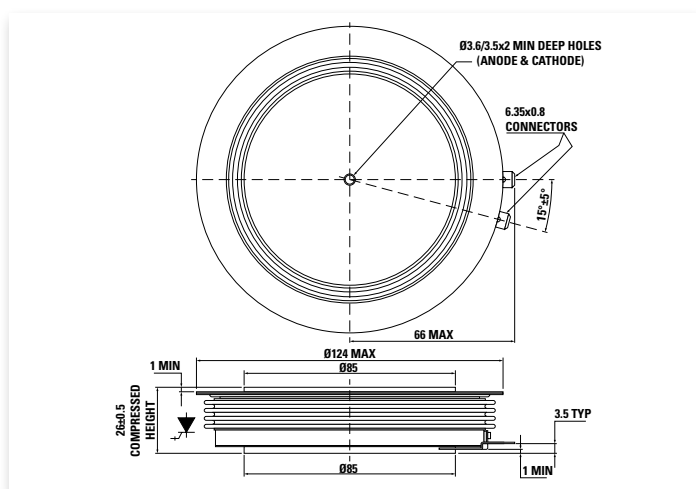
W108 - 101A410



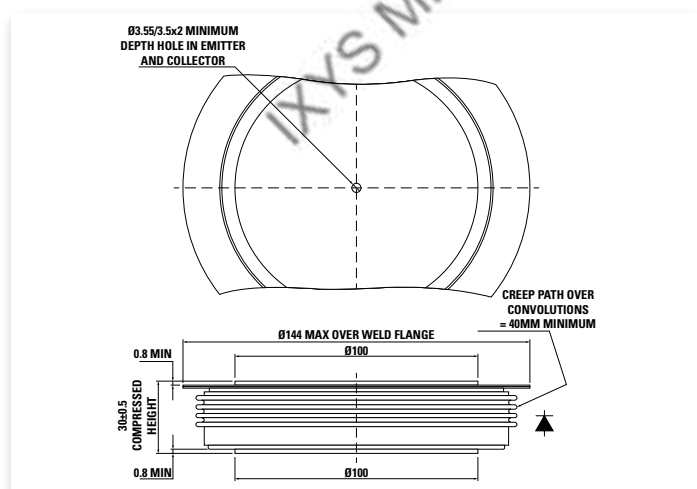
W109 - 101A425



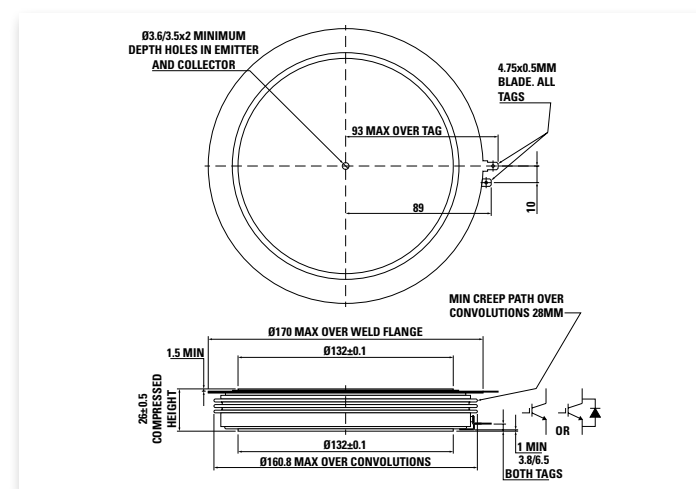
W104 - 101A408



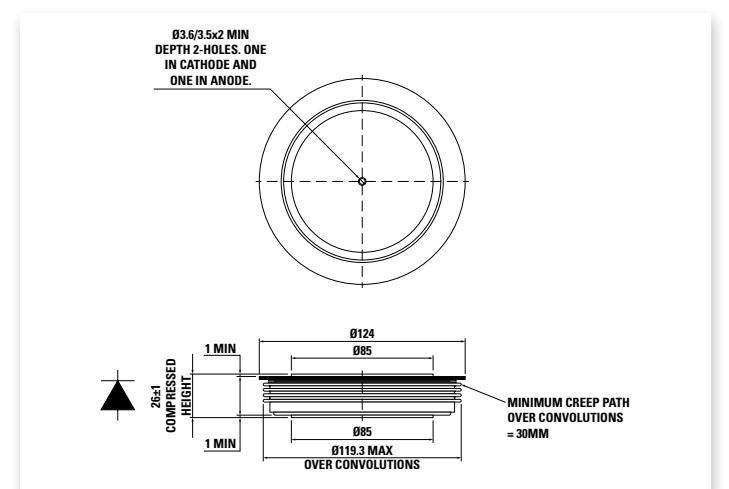
W105 - 100A385



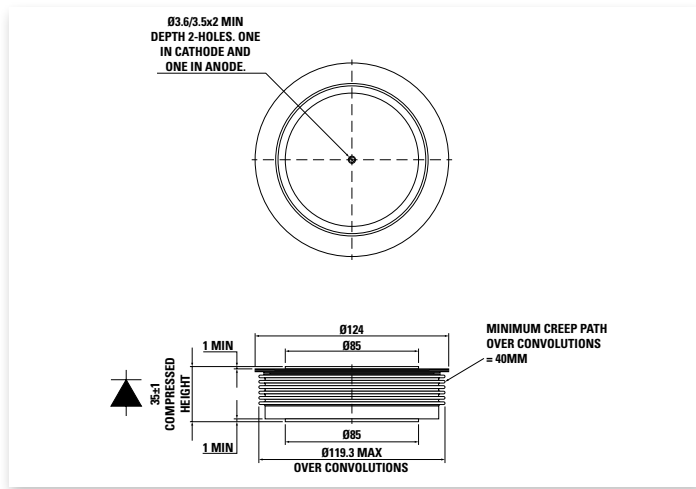
W110 - 101A418



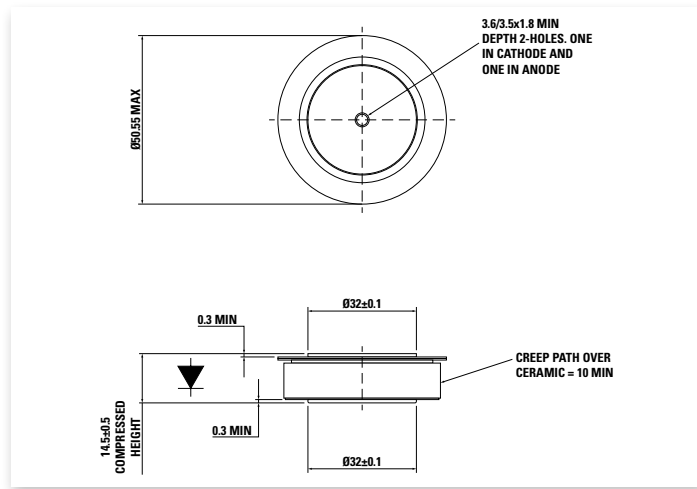
W111 - 100A378



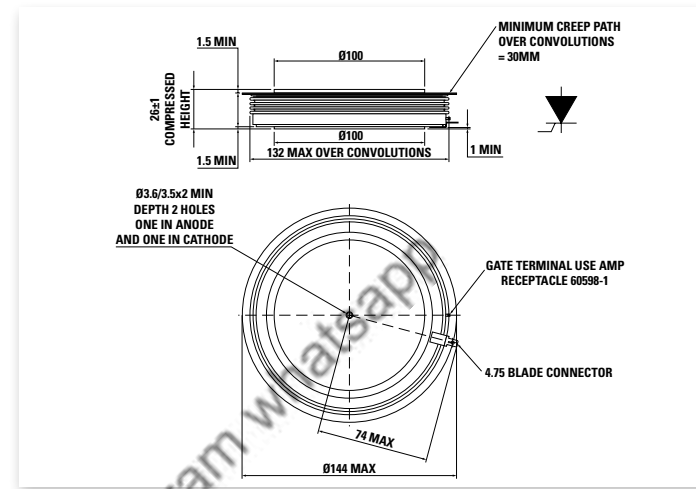
W112 - 100A377



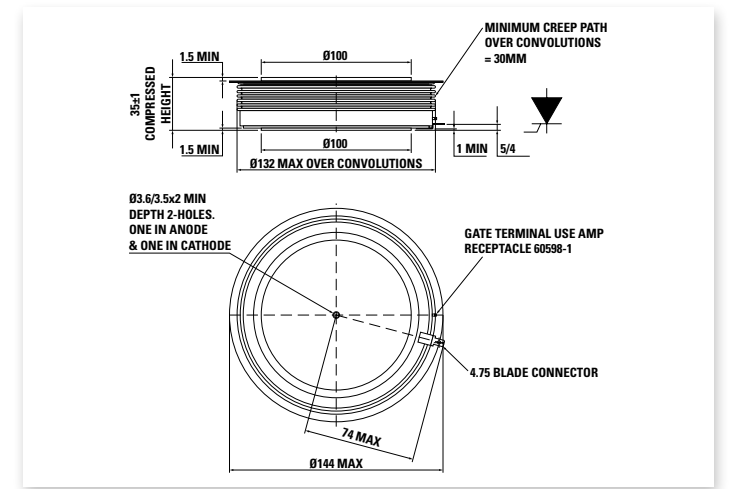
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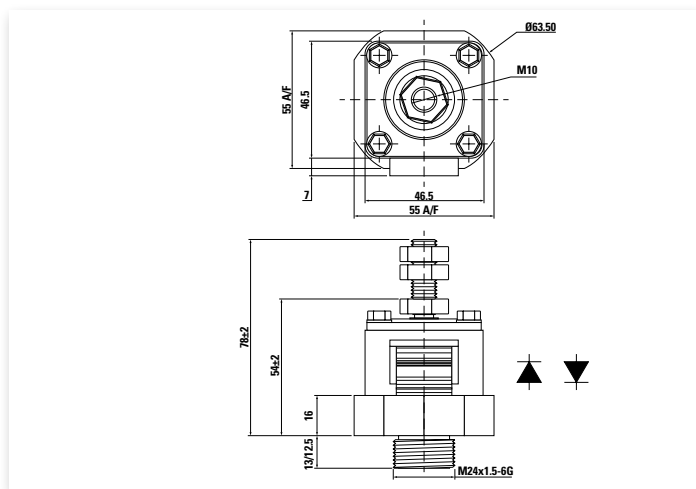
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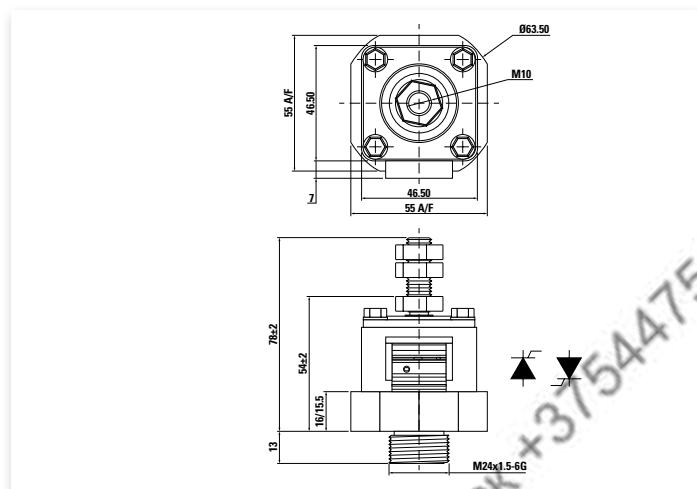
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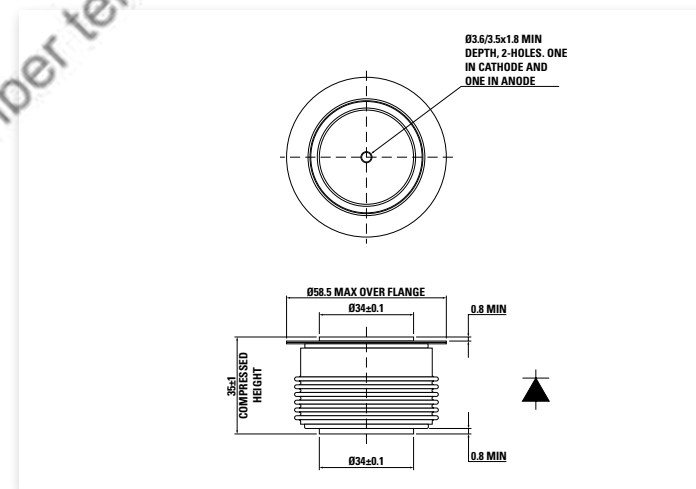
W114 - 100A394



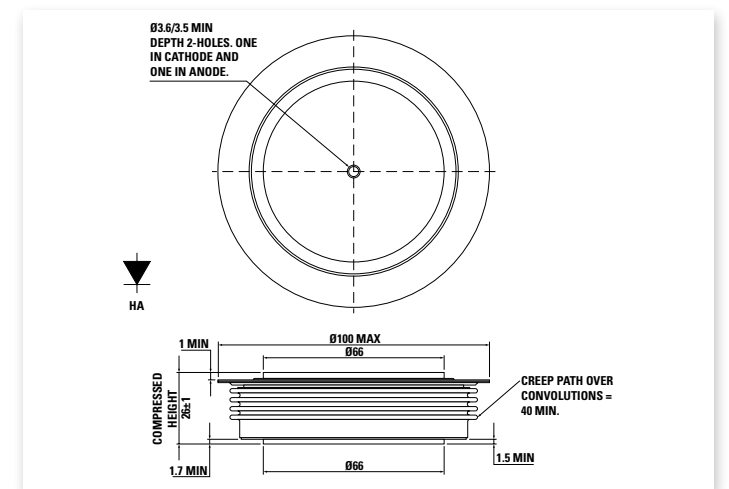
W115 - 101A427



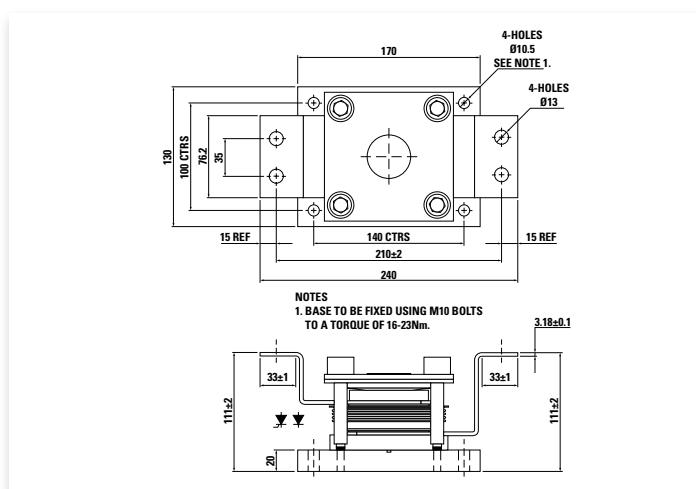
W120 - 100A395



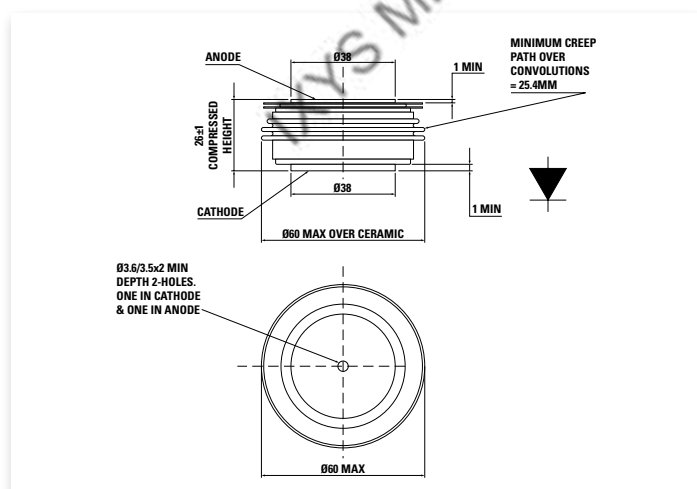
W121 - 100A381



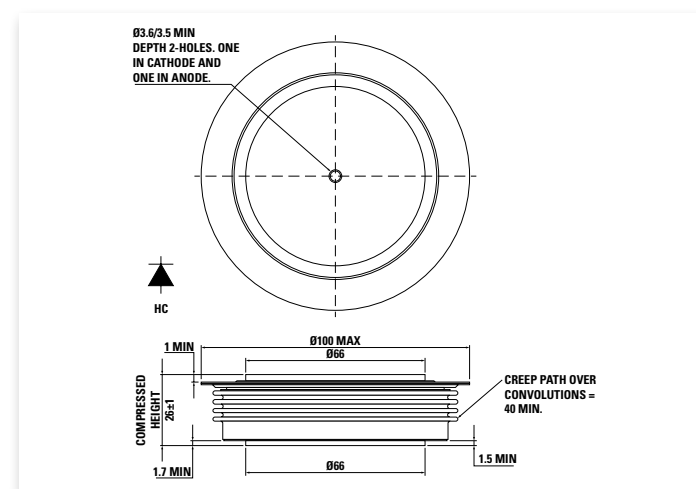
W116 - 150A132



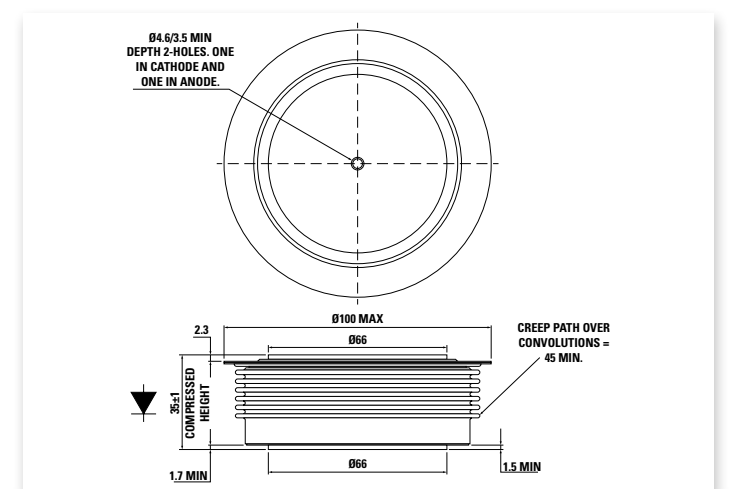
W117 - 100A375



W122 - 100A396

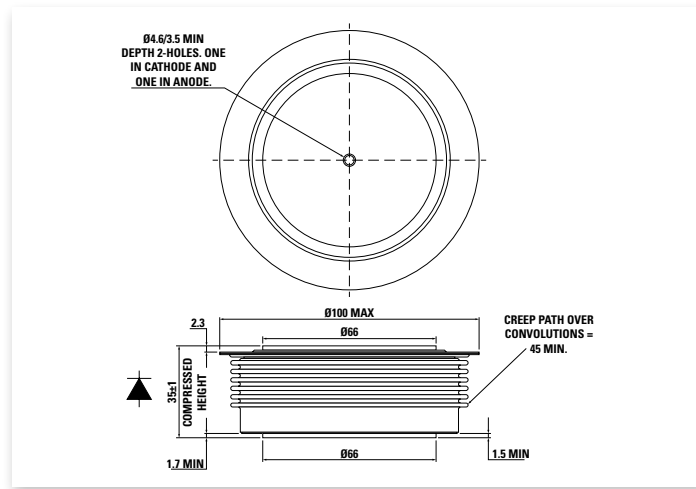


W123 - 100A382

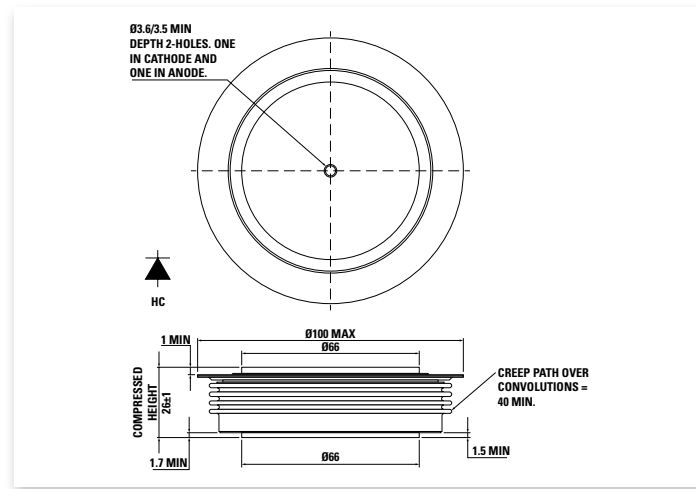




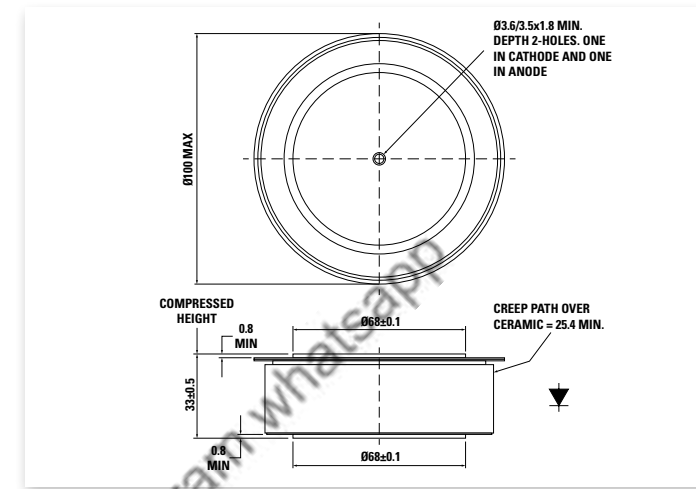
W124 - 100A397



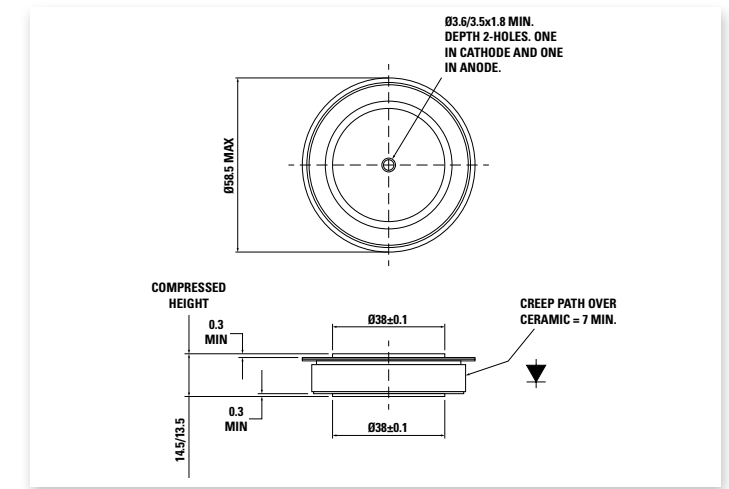
W126 - 100A368



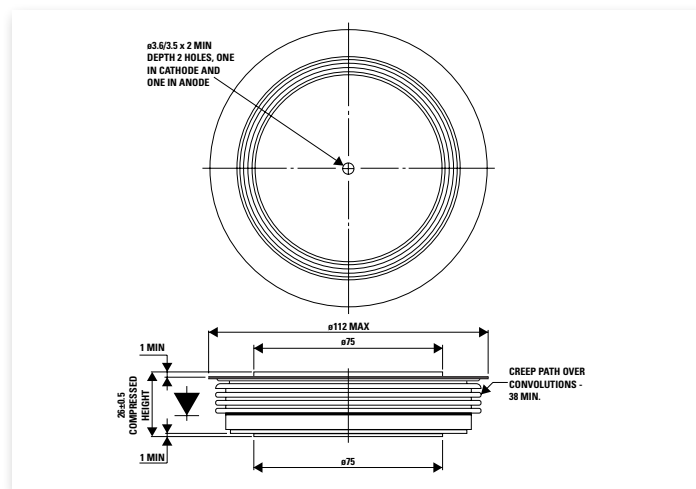
WD6 - 100A360 - 33 mm thick



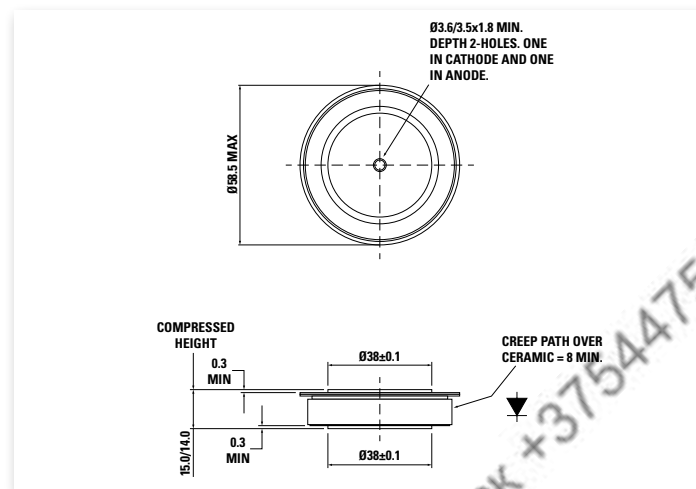
WD7 - 100A363



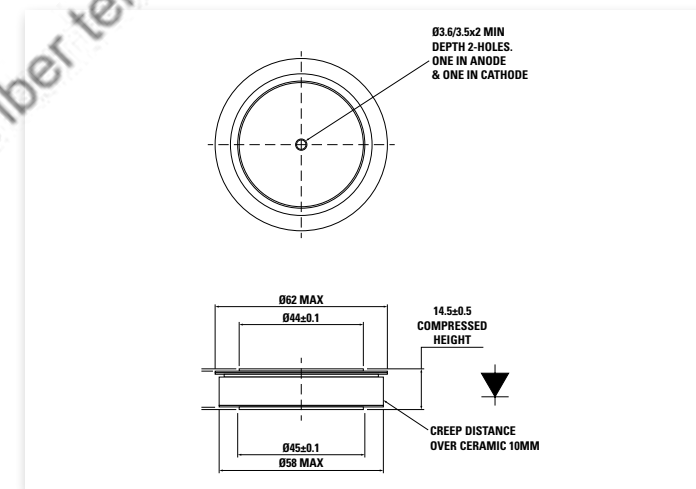
W127 - 100A368



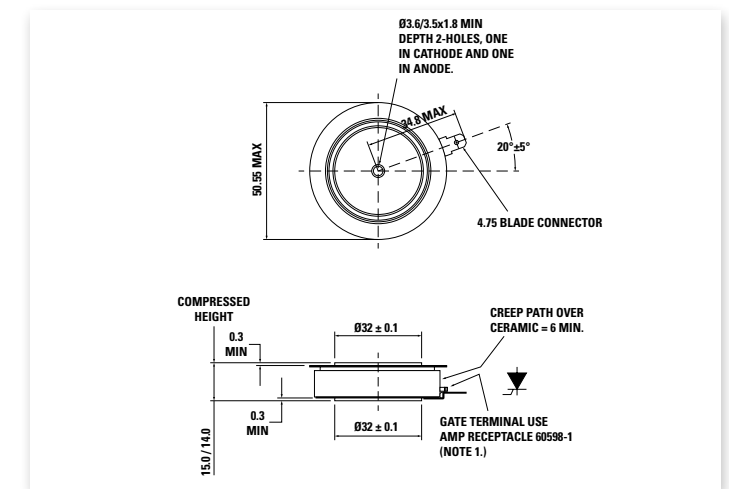
WD2 - 100A325



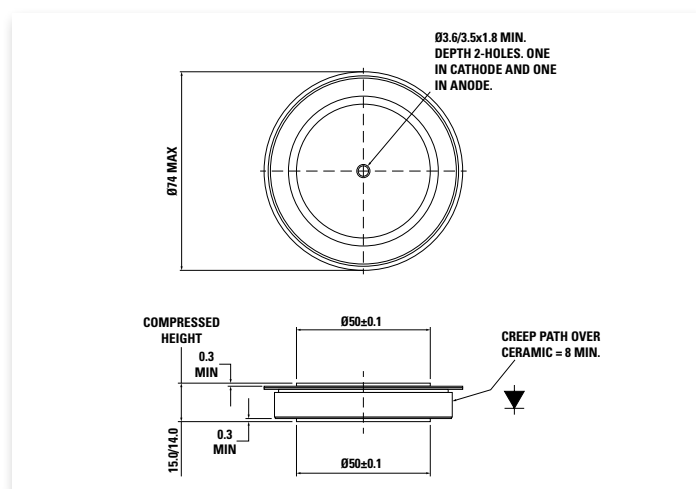
WD8 - 100A392



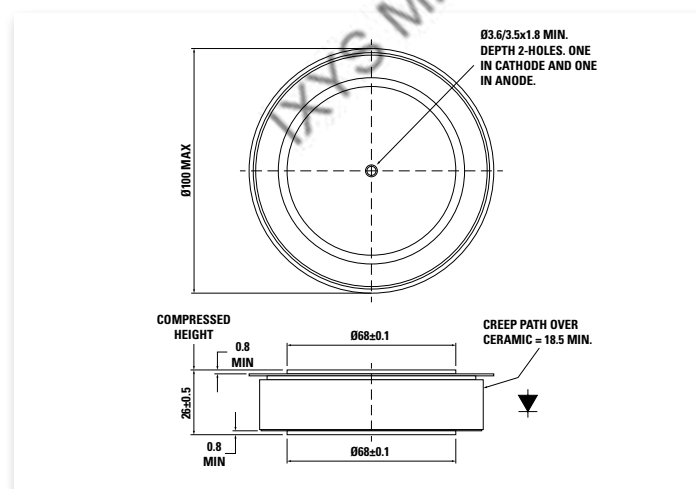
WP1 - 101A361



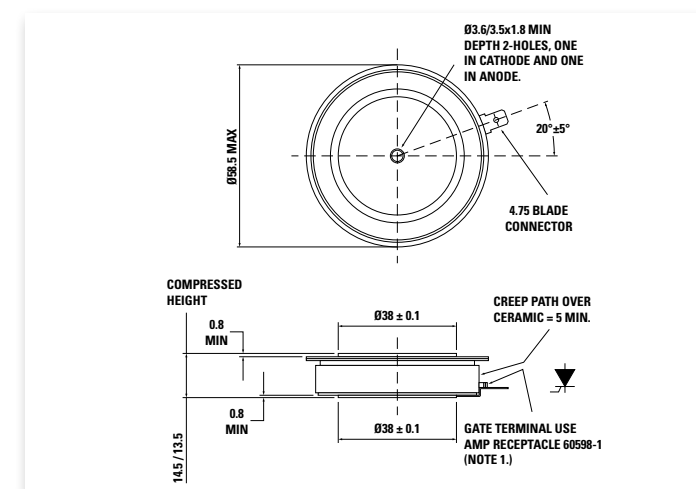
WD3 - 100A356



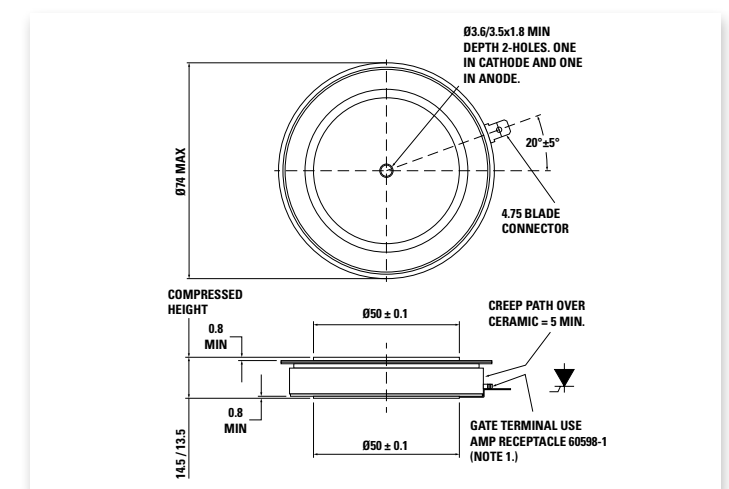
WD5 - 100A361 - 26 mm thick



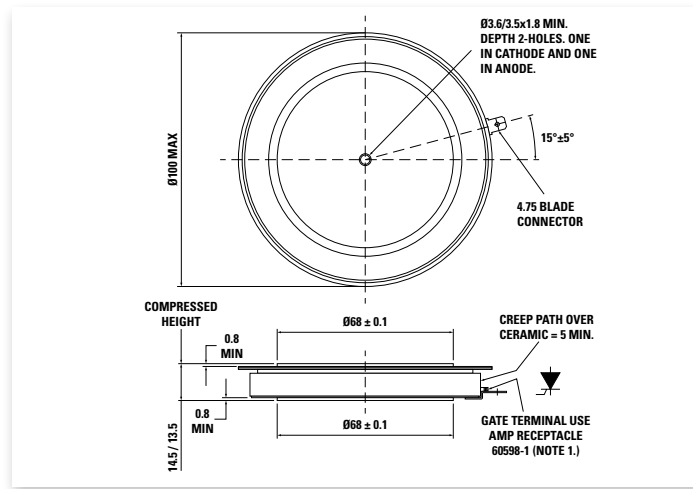
WP2 - 101A354



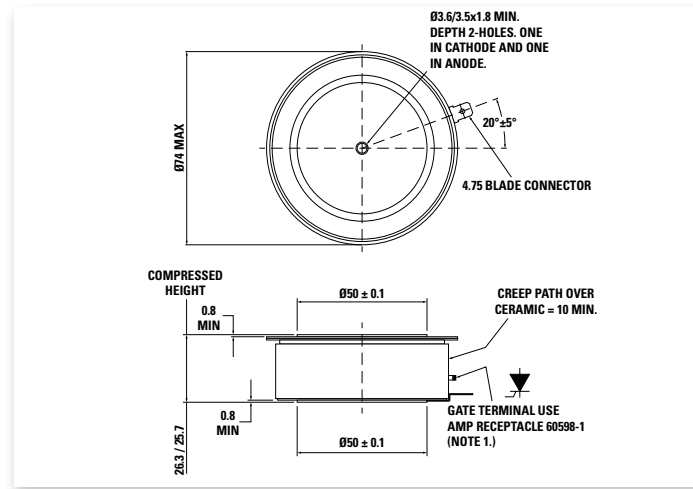
WP3 - 101A353



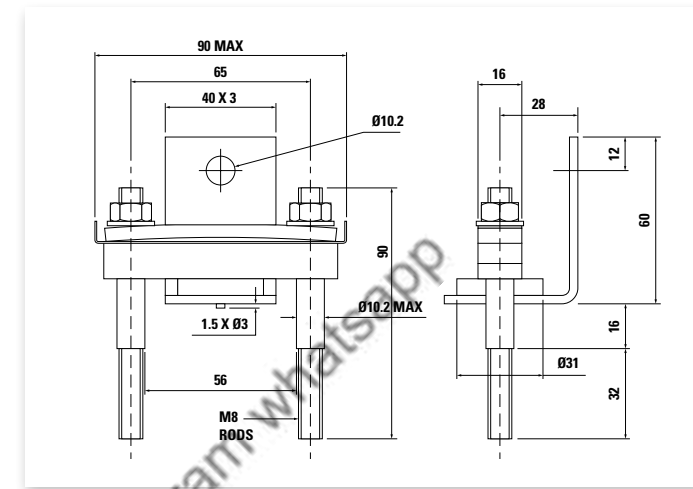
WP4 - 101A355



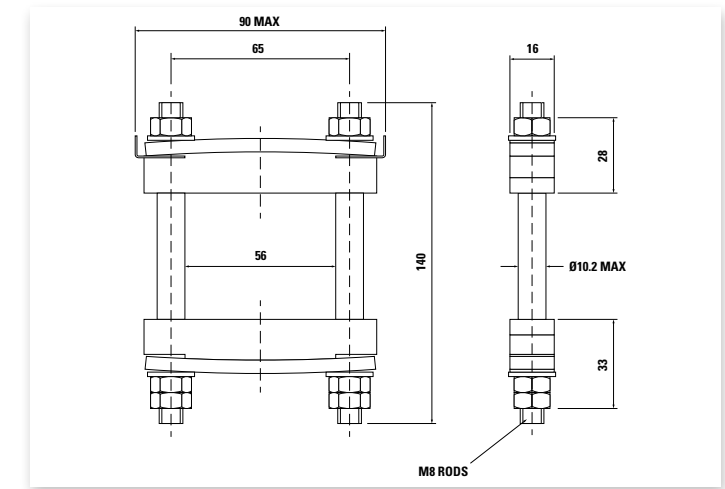
WP5 - 101A356



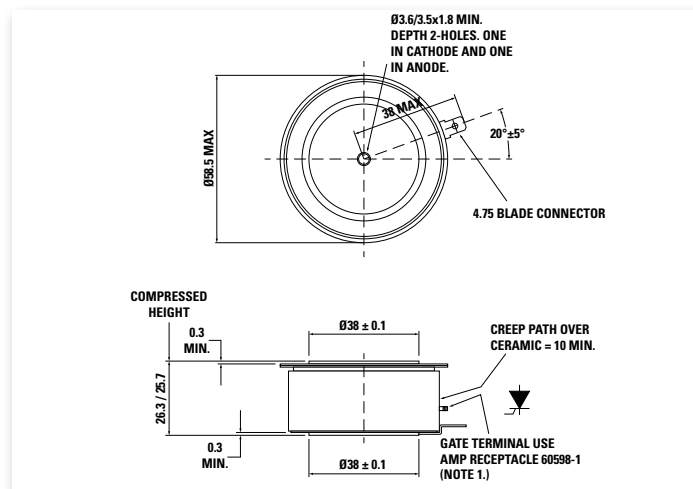
WC4 - XK0550SA056M



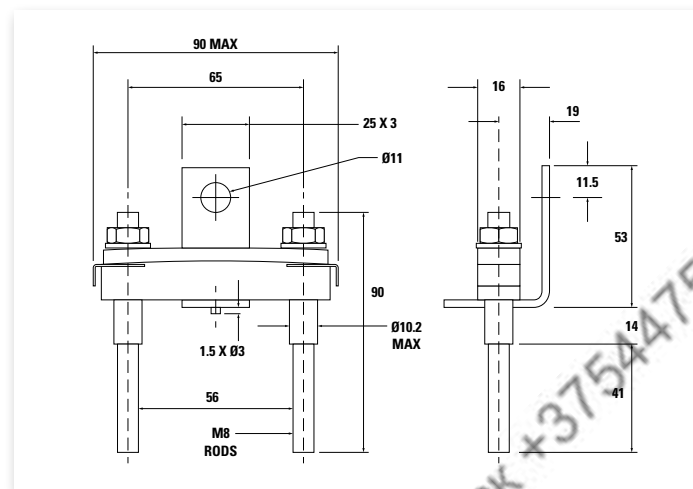
WC5 - XK0550DA056M



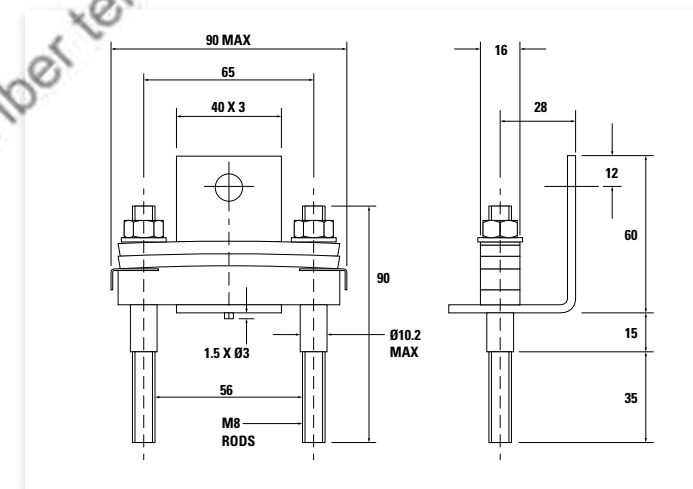
WP6 - 101A389



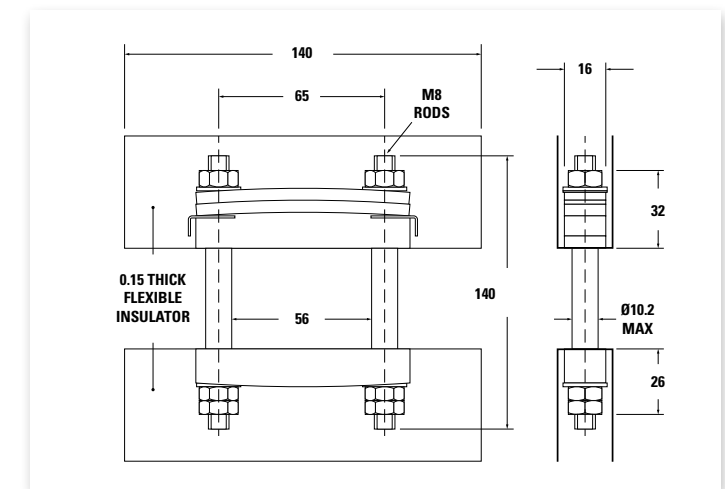
WC1 - XK0450SA056M



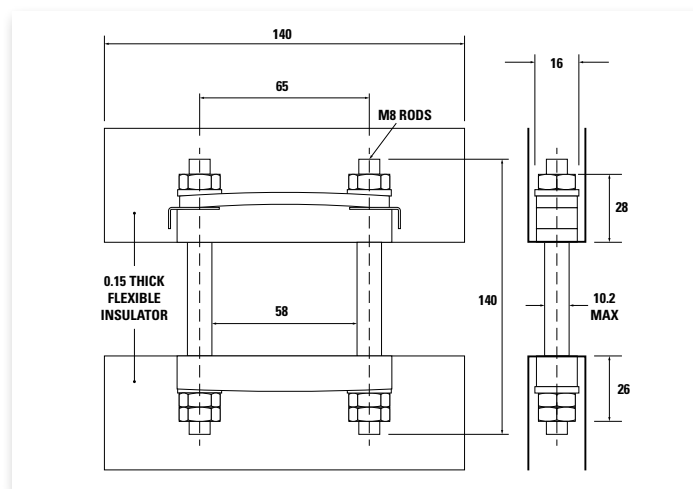
WC6 - XK0900SA056M



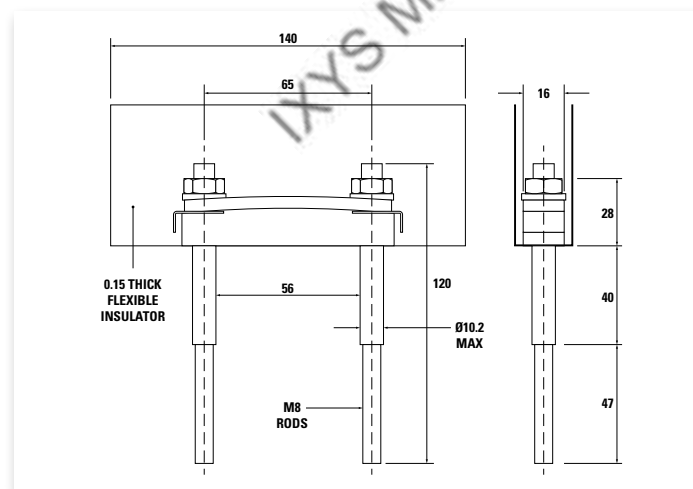
WC7 - XK0900DA056M



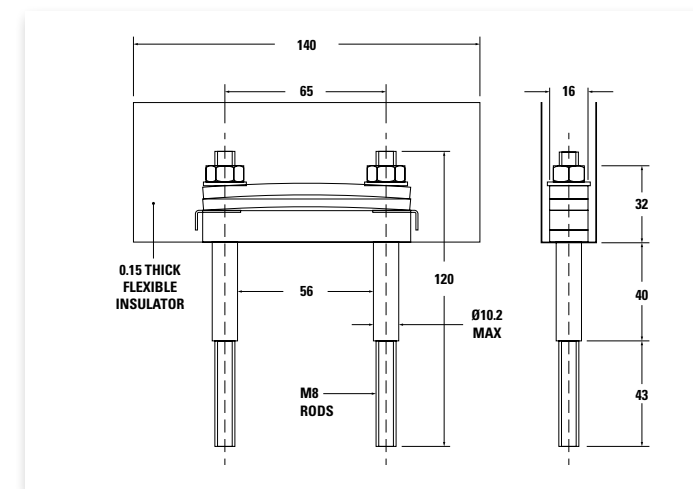
WC2 - XK0450DA056M



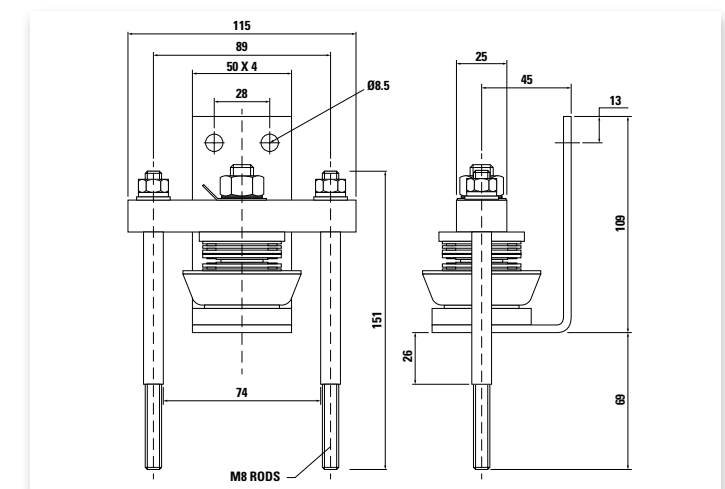
WC3 - XK0450DT056M



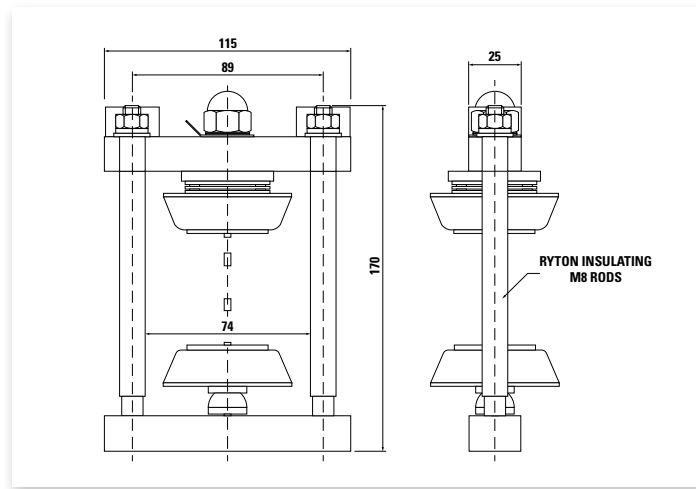
WC8 - XK0900DT056M



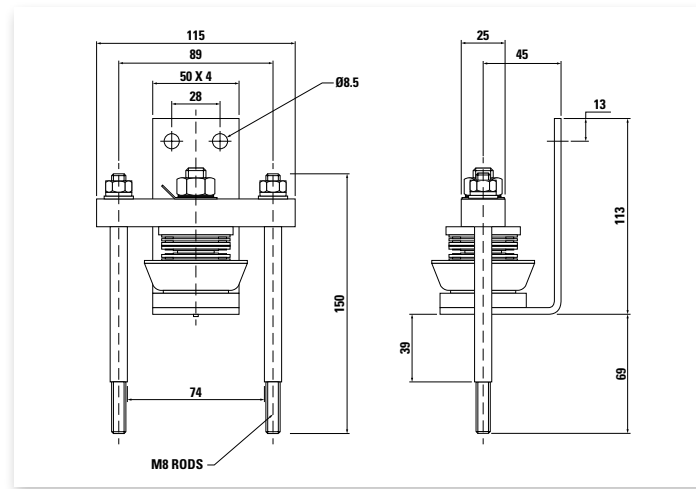
WC9 - XK0600SA074M



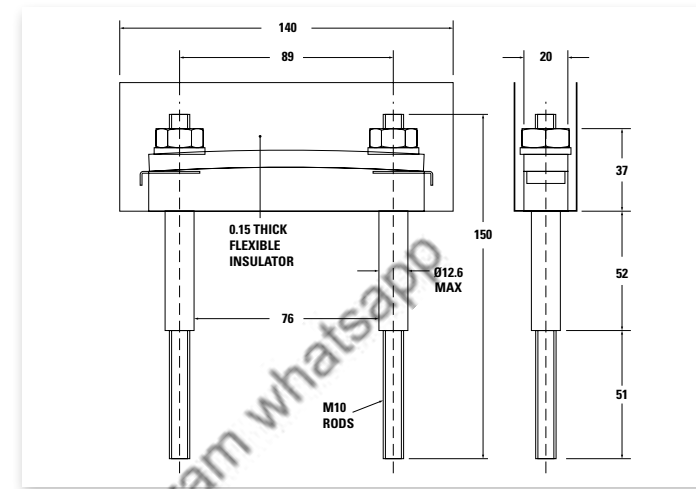
WC10 - XK0600DA074M



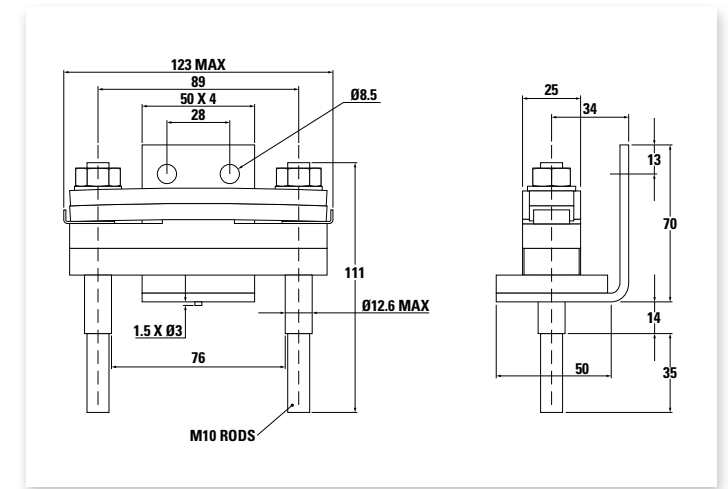
WC11 - XK1000SA074M



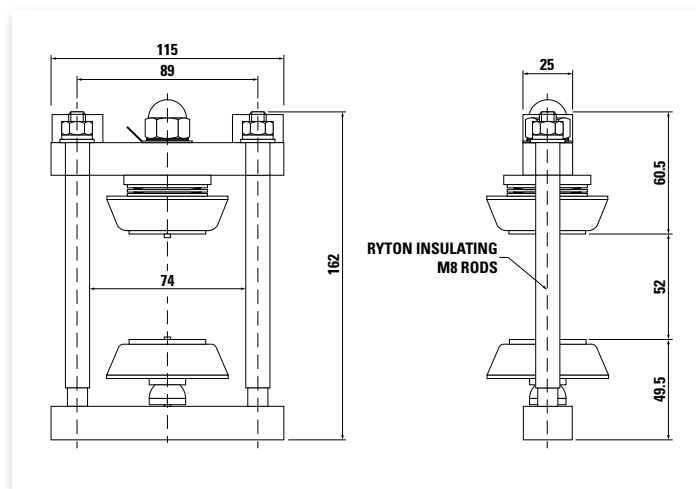
WC16 - XK1130DT076M



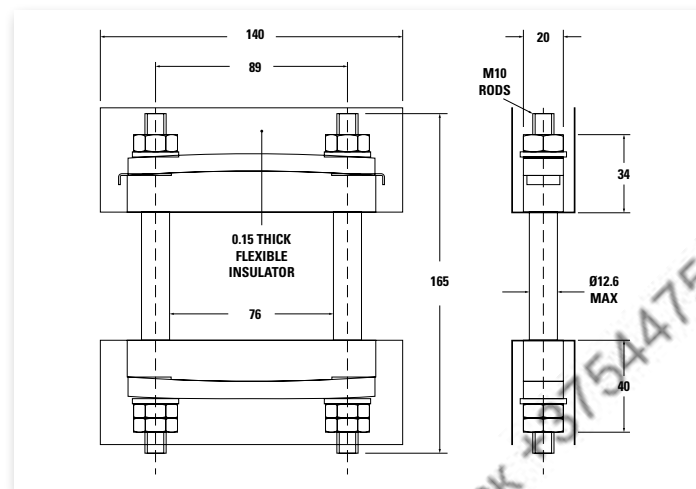
WC17 - XK1800SA076M



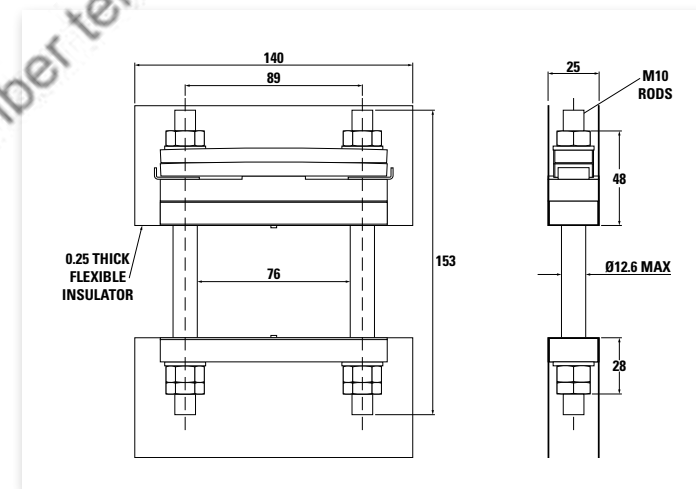
WC12 - XK1000DA074M



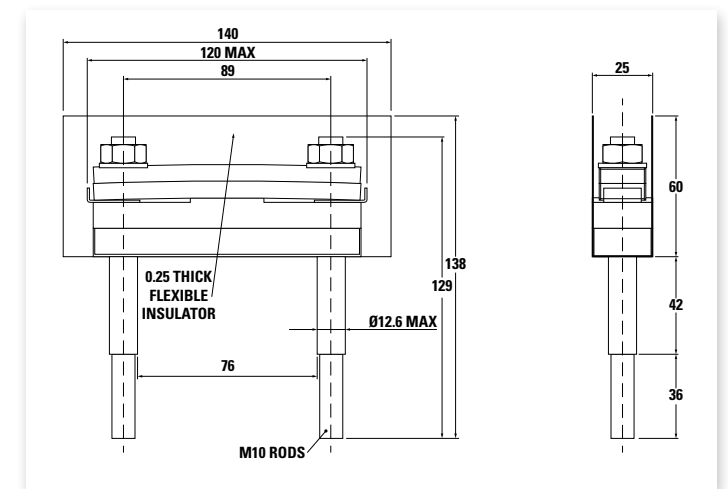
WC13 - XK1100DA076M



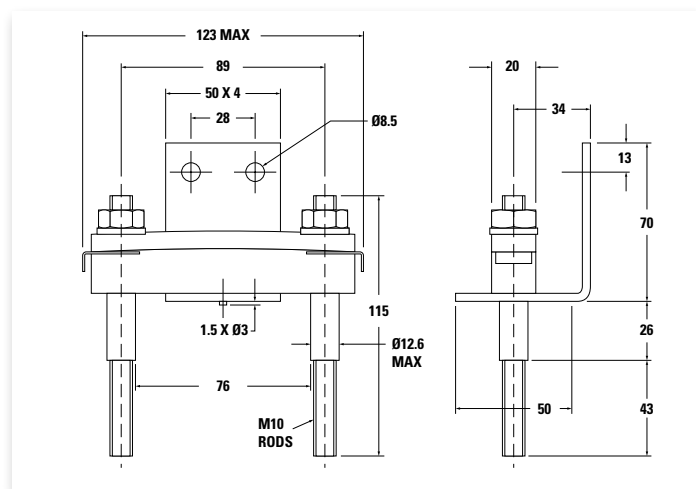
WC18 - XK1800DA076M



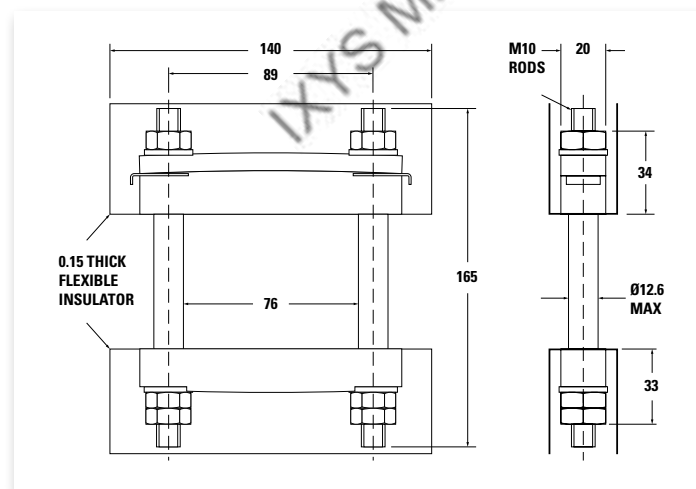
WC19 - XK1800DT076M



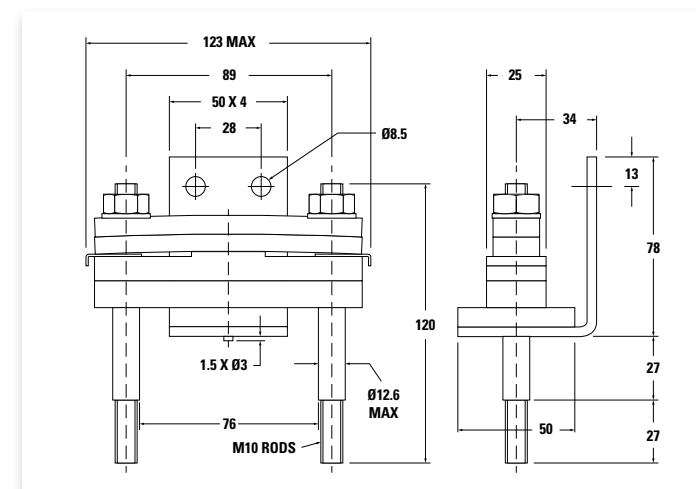
WC14 - XK1130SA076M



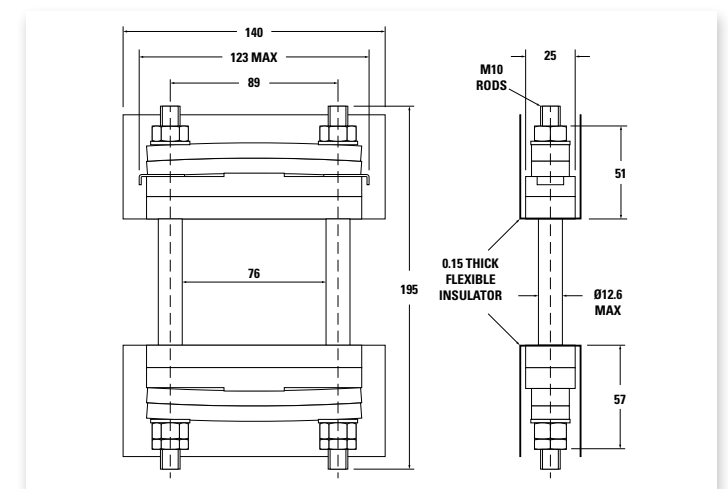
WC15 - XK1130DA076M



WC20 - XK2100SA076M/ML

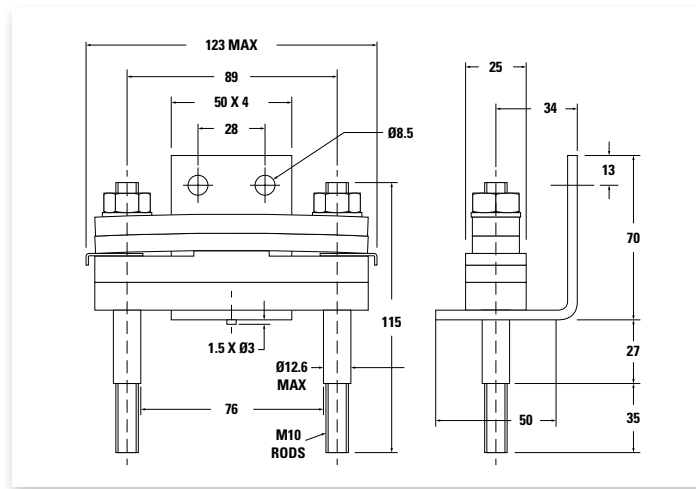


WC21 - XK2100DA076M/ML

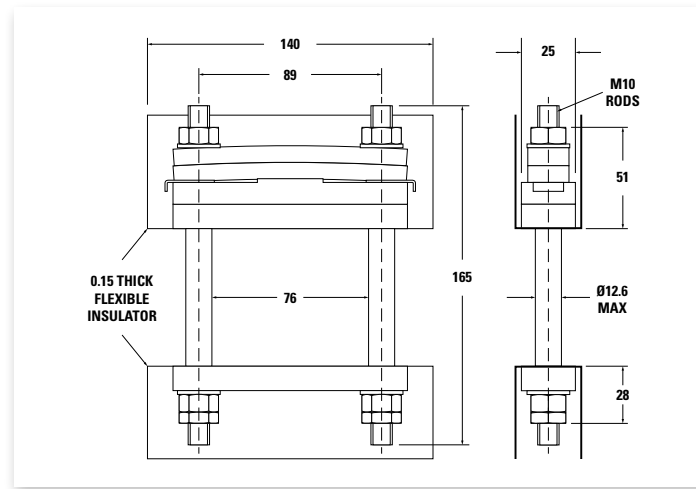




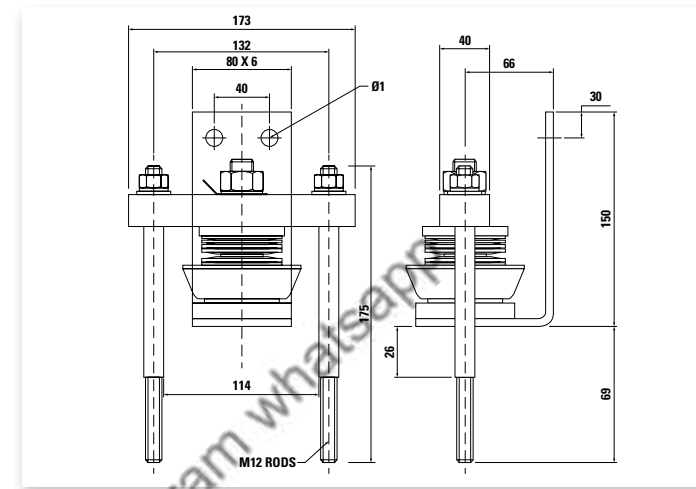
FPO WC22 - XK2140SA076M/ML



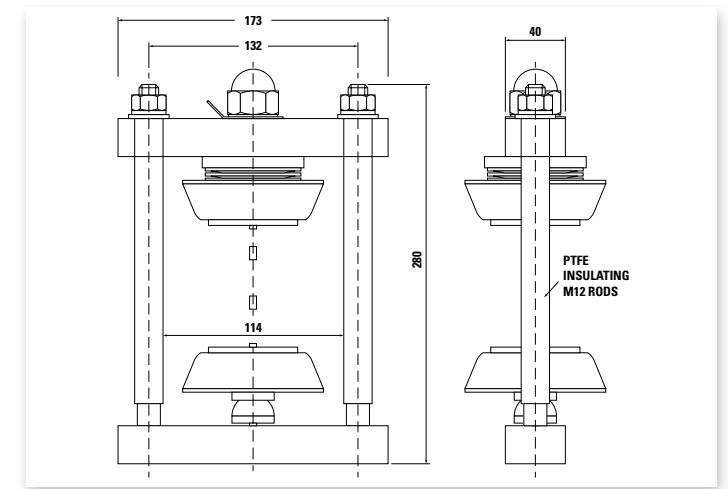
WC23 - XK2140DA076M/ML



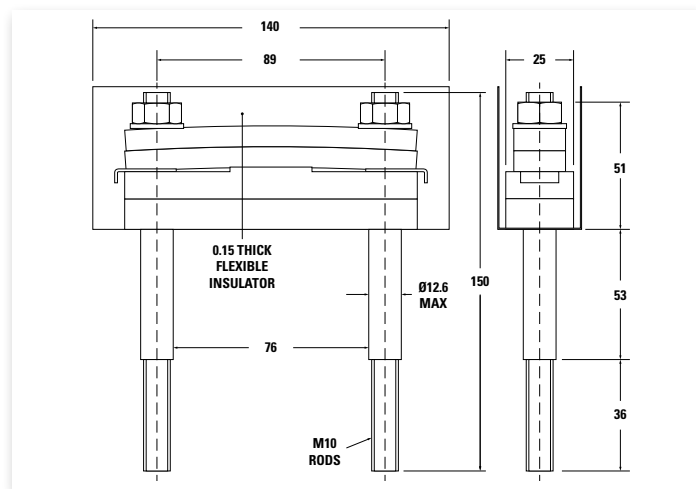
WC28 - XK2000SA114M



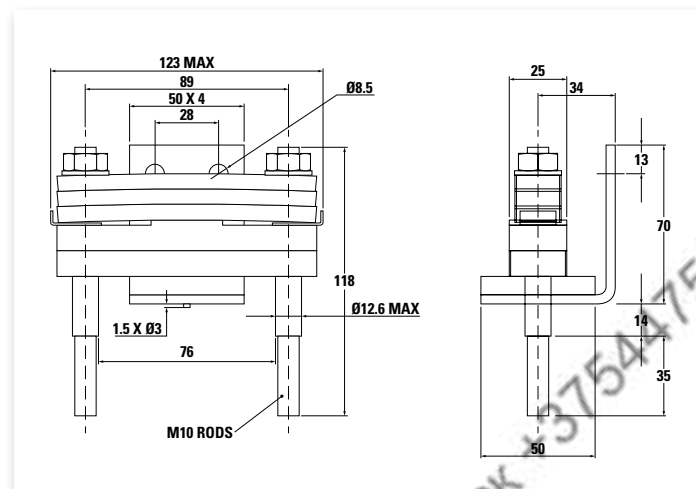
WC29 - XK2000DA114M



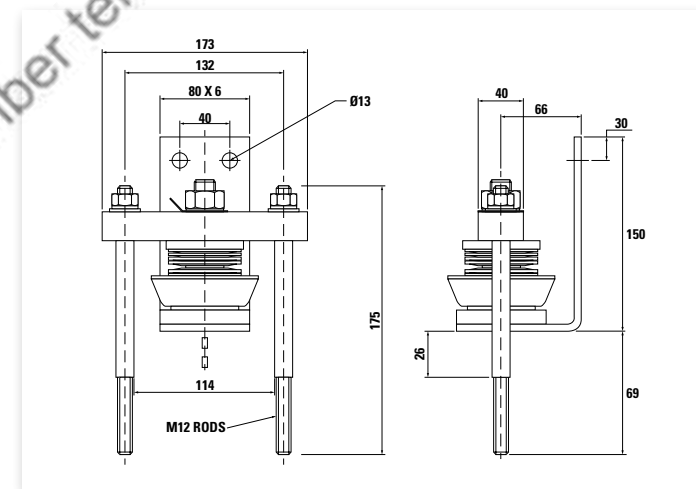
WC24 - XK2140DT076M/ML



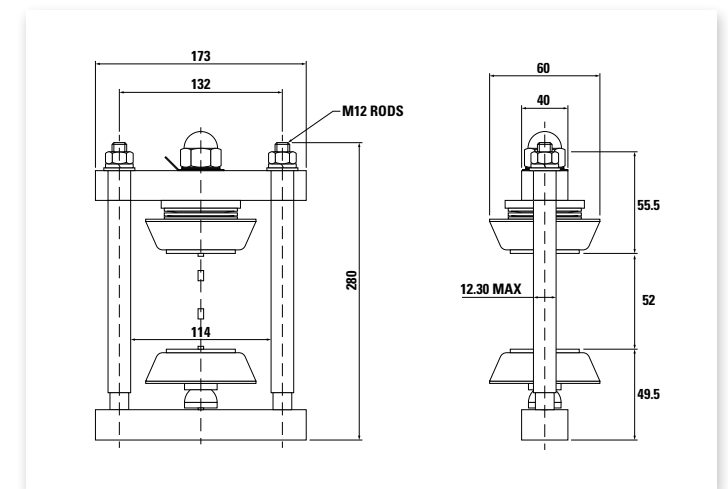
WC25 - XK2700SA076M



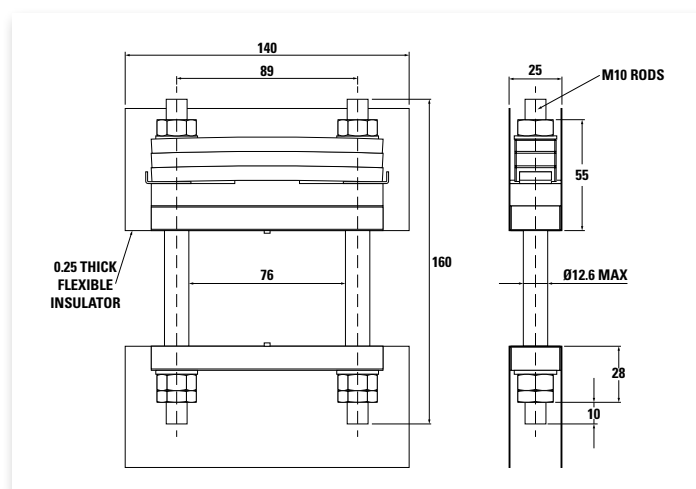
WC30 - XK2500SA114M



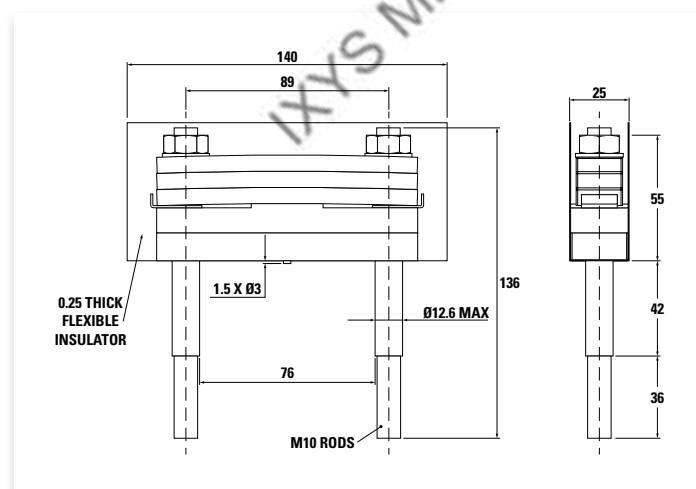
WC31 - XK2500DA114M



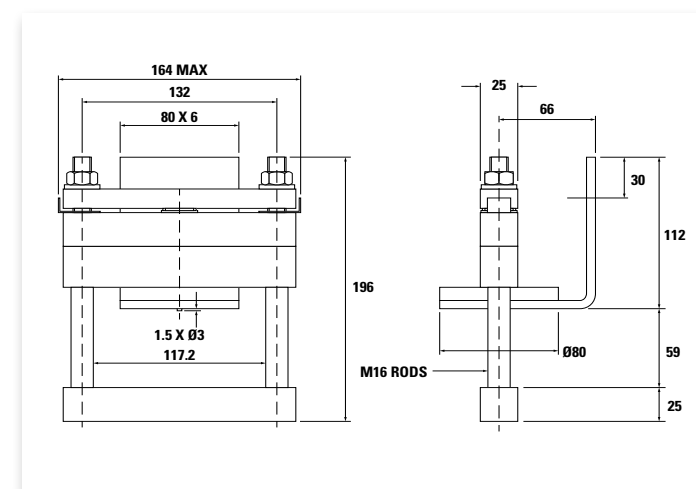
WC26 - XK2700DA076M



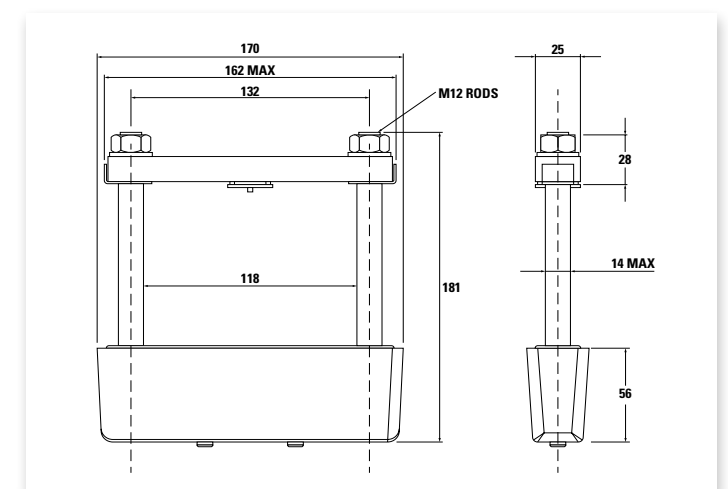
WC27 - XK2700DT076M



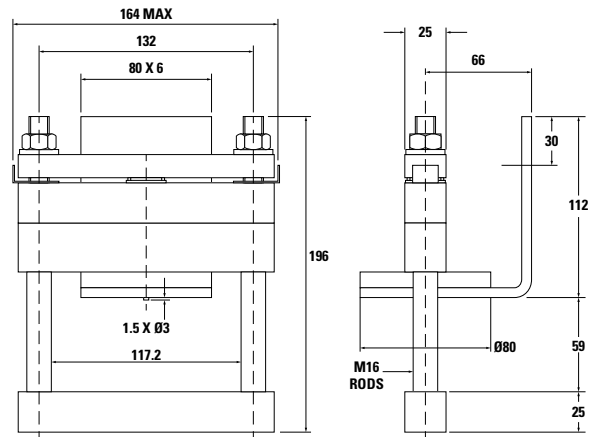
WC32 - XK2500SA116M/ML



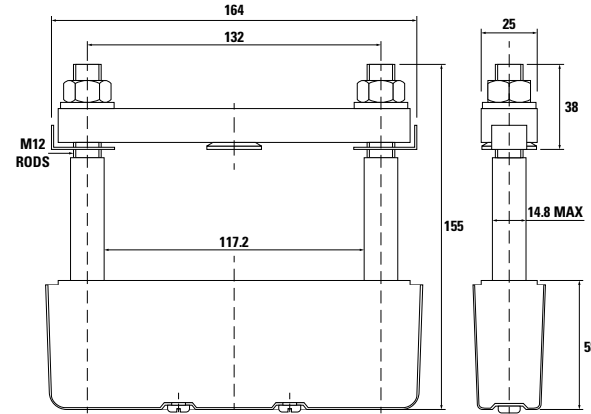
WC33 - XK2500DA116M/ML



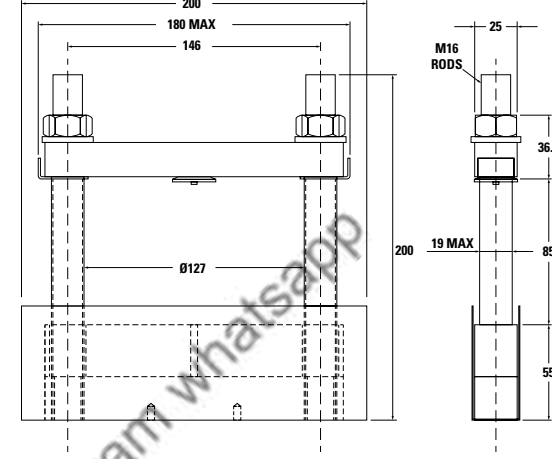
WC34 - XK3000SA116M/ML



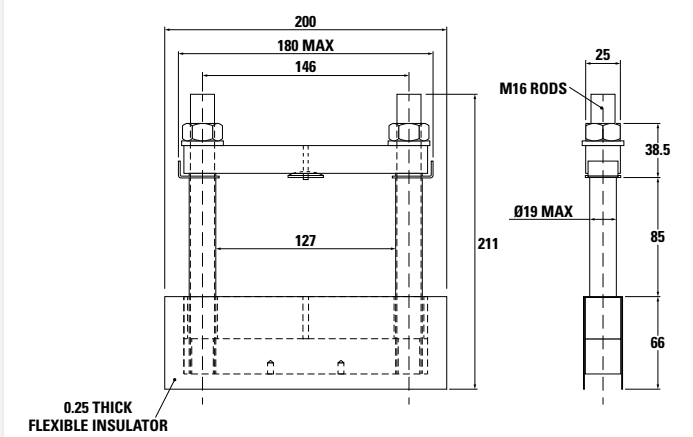
WC35 - XK3000DA116M/Mx



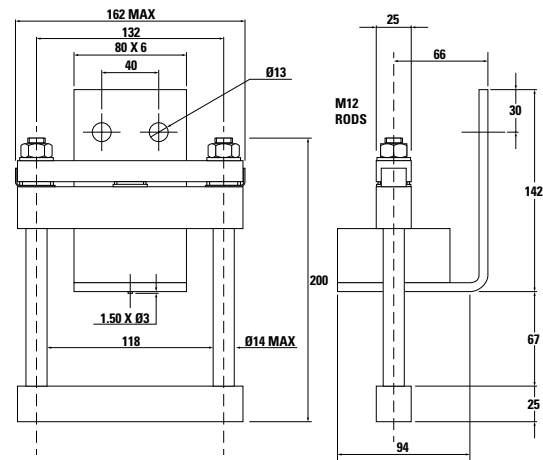
WC40 - XK5000DA128M/ML



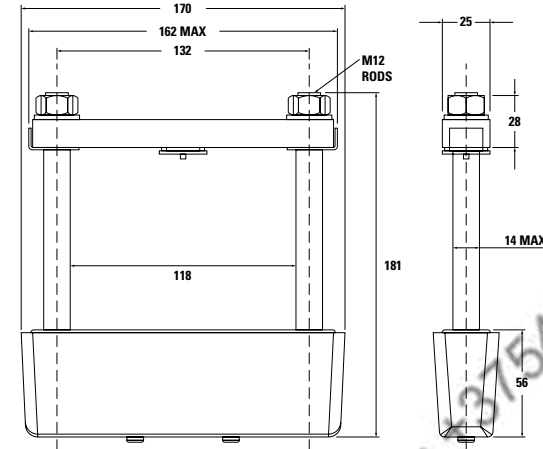
WC41 - XK7000DA128M/ML



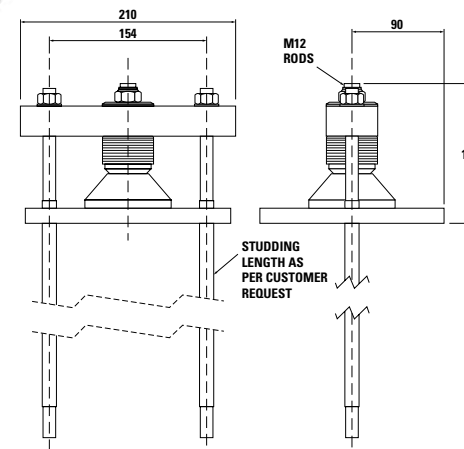
WC36 - XK3500SA116M/ML



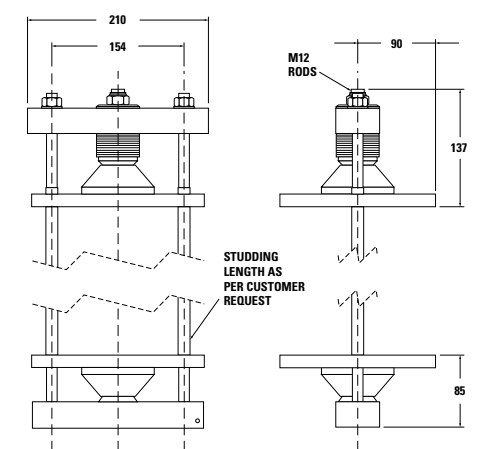
WC37 - XK3500DA116M/ML



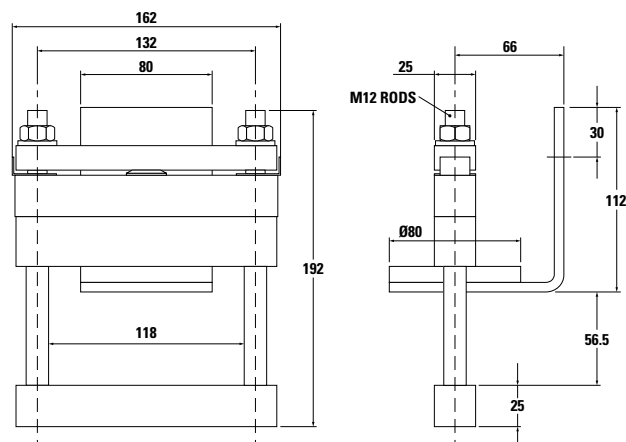
WC42 - XK3060SA140ML



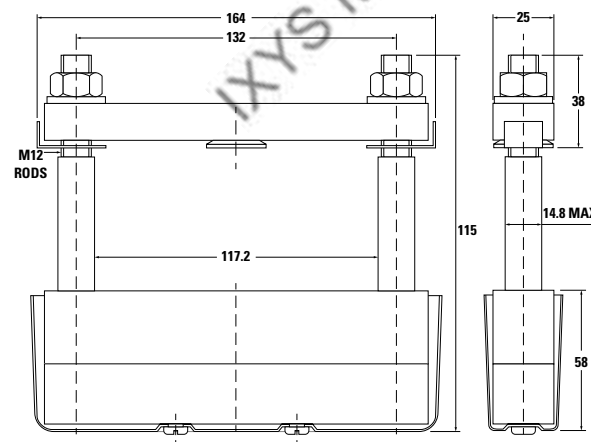
WC43 - XK3060DA140ML



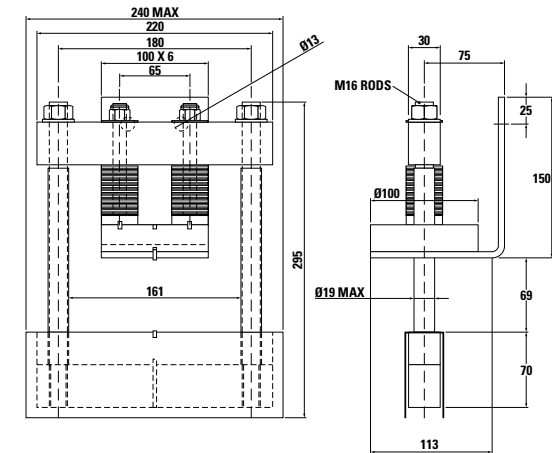
WC38 - XK4000SA116M/ML



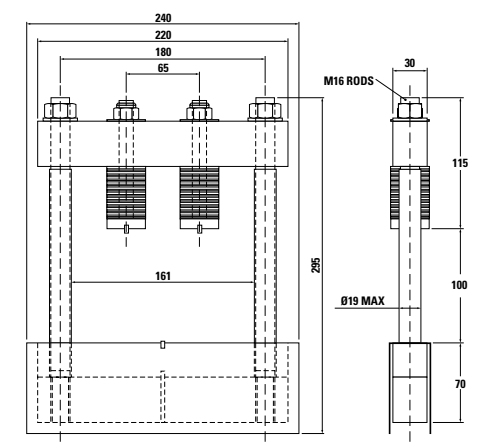
WC39 - XK4000DA116M/ML



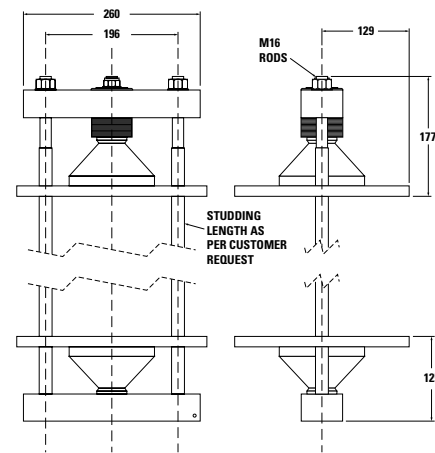
WC44 - XK9000SA160M/ML



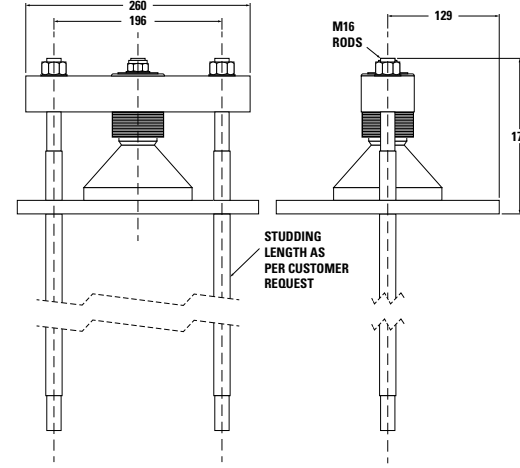
WC45 - XK9000DA160M/ML



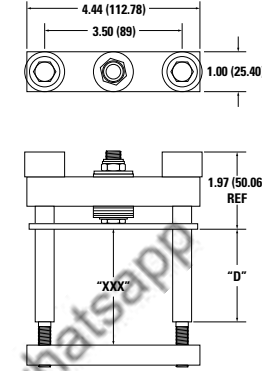
WC46 - XK6120DA180ML



WC47 - XK6120SA180ML

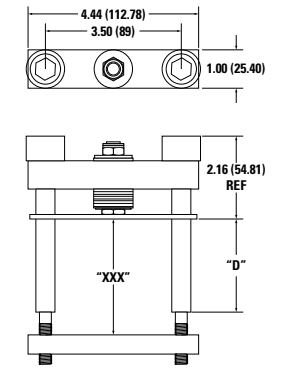


WC52 - XSK2000DA076xxx



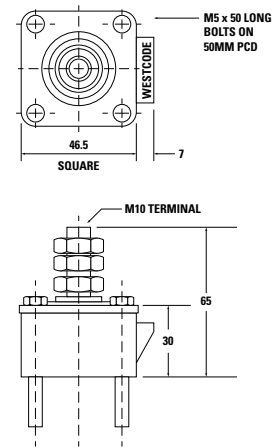
Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.

WC53 - XSK3000DA076xxx

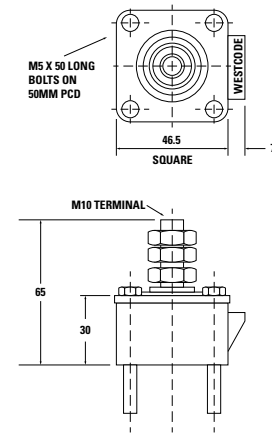


Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.

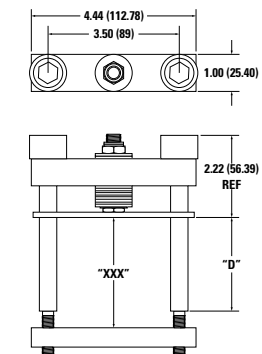
WC48 - XK0450xx019M



WC49 - XK####xx025M

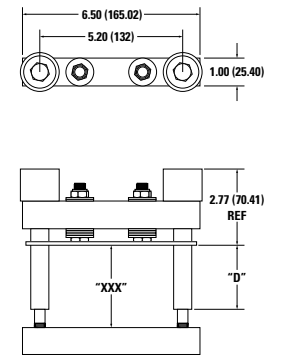


WC54 - XSK3400DA076xxx



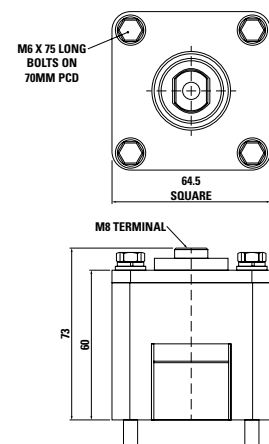
Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.

WC55 - SK3800DA116Mxxx

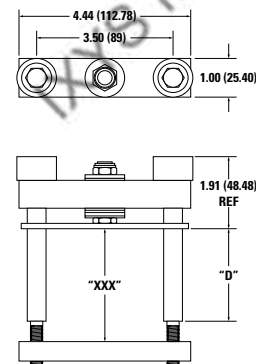


Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSIONS CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.

WC50 - XK1500BA034M

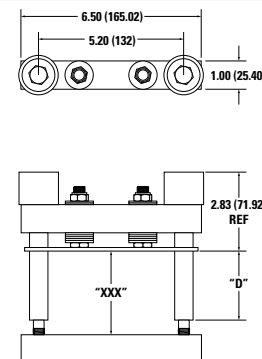


WC51 - XSK1500DA076xxx



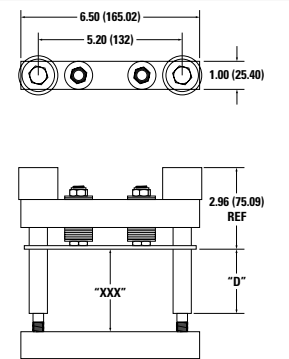
Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.

WC56 - XSK4400DA116Mxxx



Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.

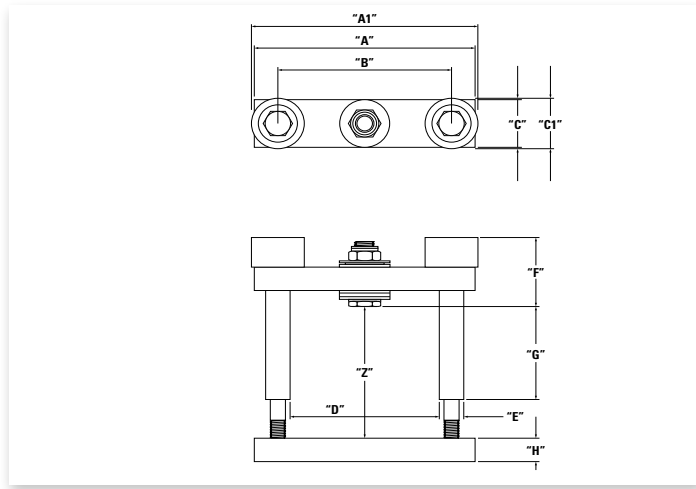
WC57 - XSK6000DA116Mxxx



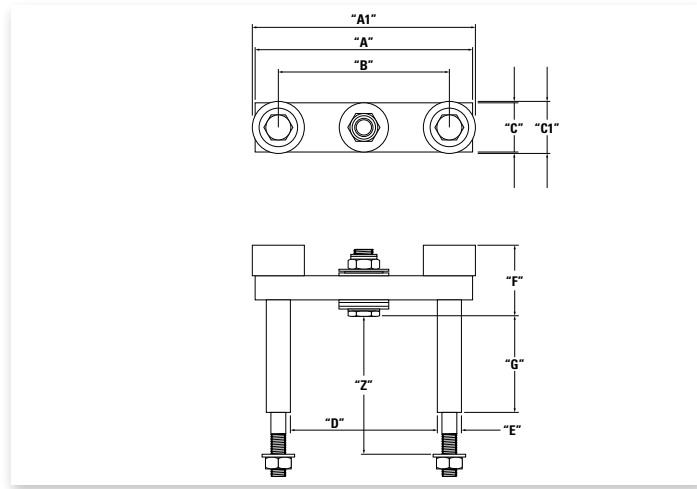
Notes:  
 1. DIMENSIONS IN INCHES (MILLIMETERS).  
 2. "Z" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.  
 3. "D" DIMENSION CAN BE CHANGED AS PER REQUIREMENT.



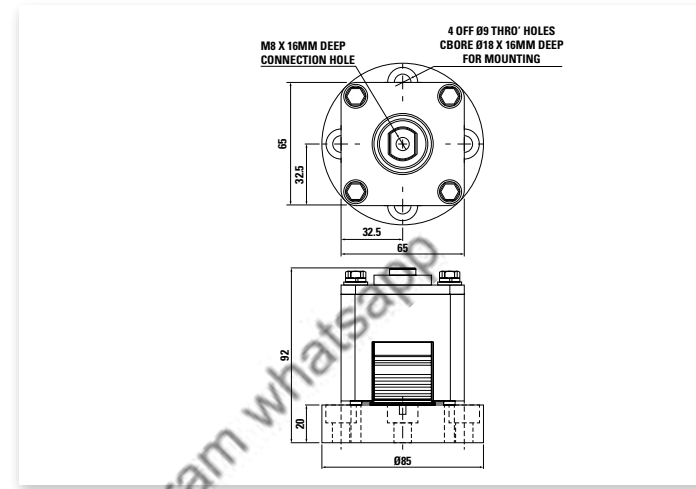
WC58 - DA



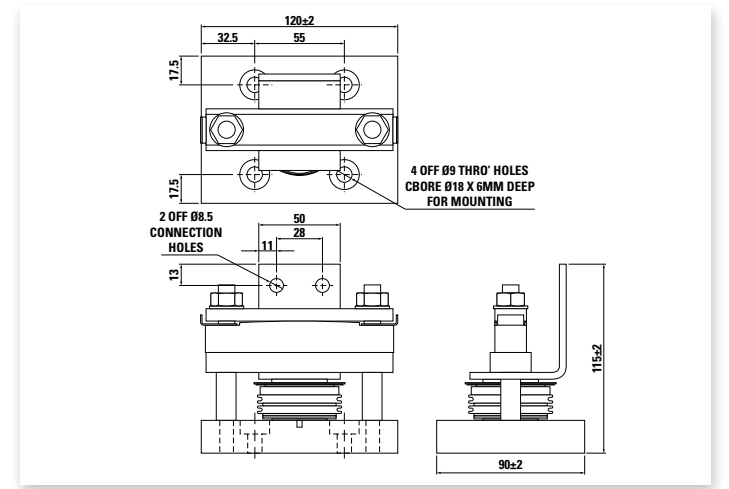
WC59 - DT



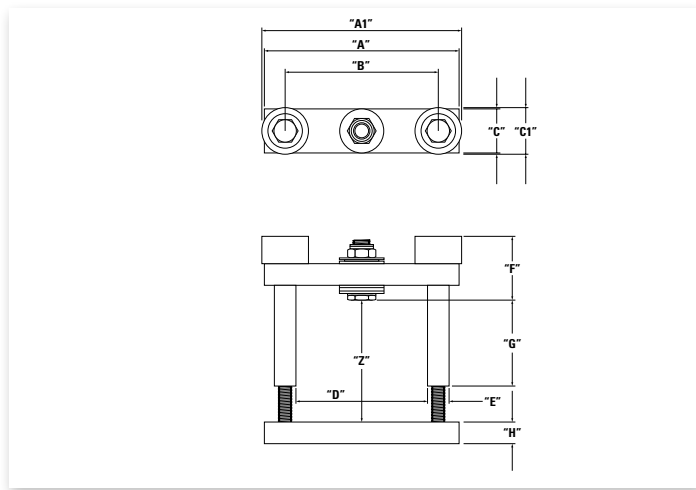
WC64 - XK1500CB034M



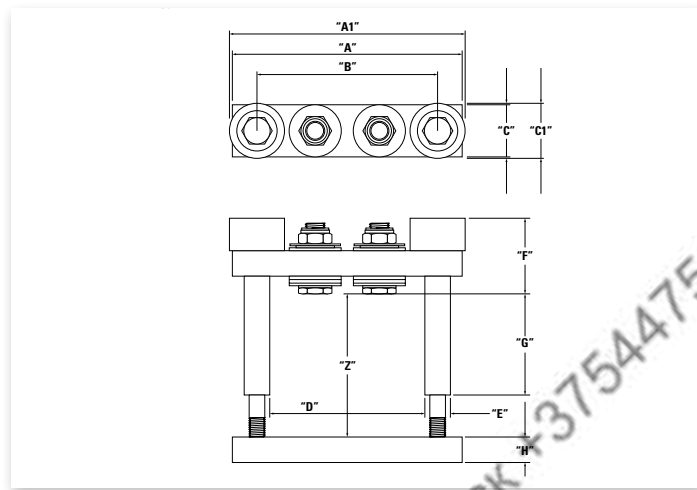
WC65 - XK1130SB076M



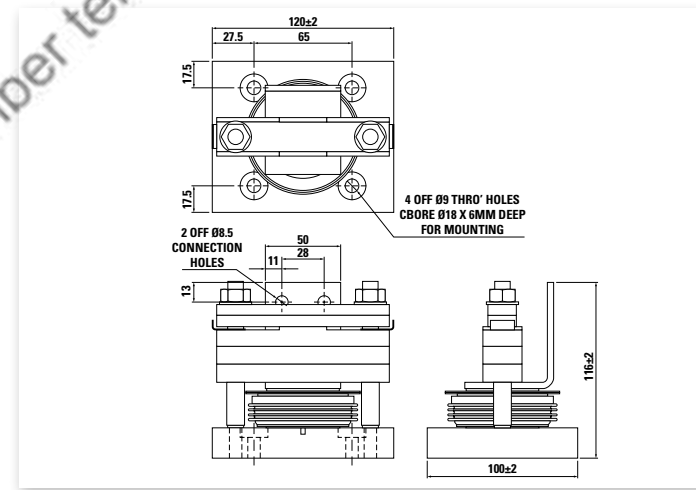
WC60 - DF



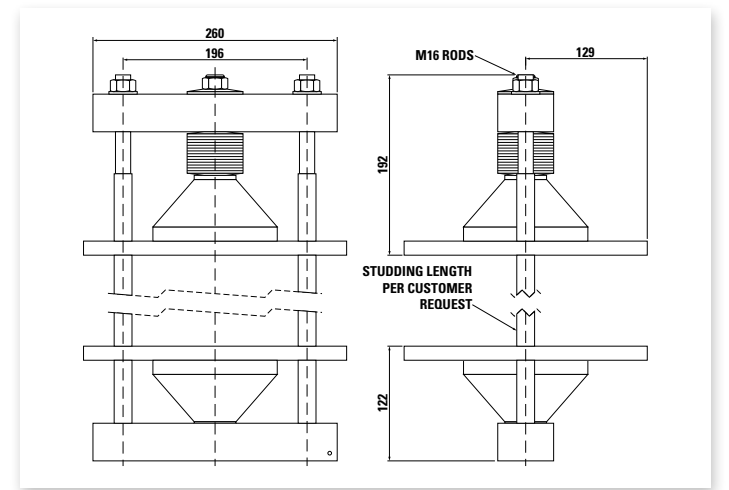
WC61 - DA



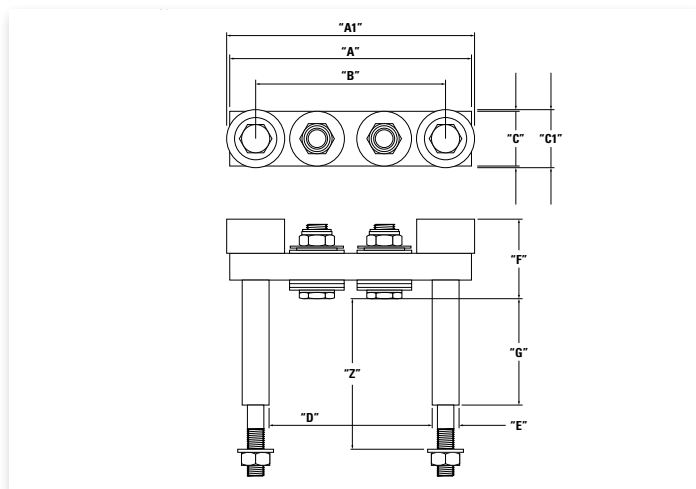
WC66 - XK2140SB076M



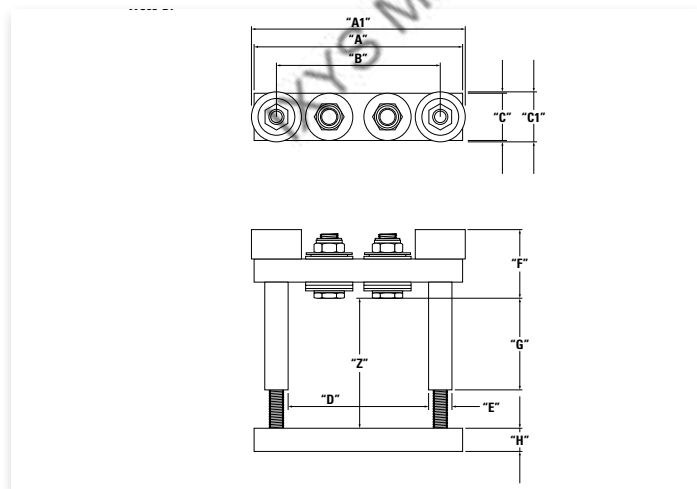
WC67 - XK8000DA180ML



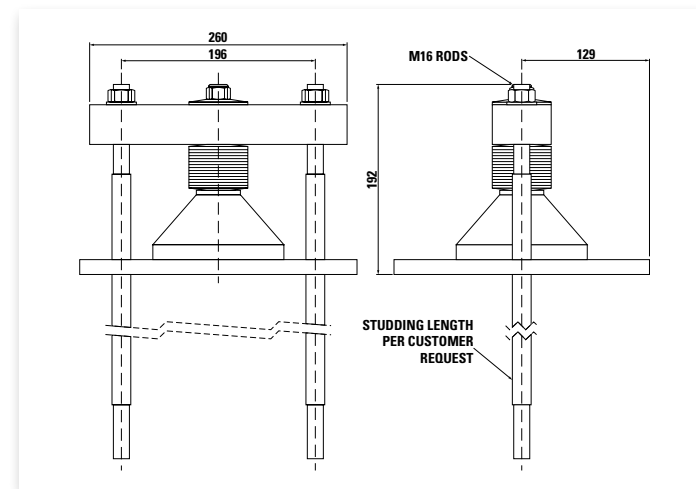
WC62 - DT



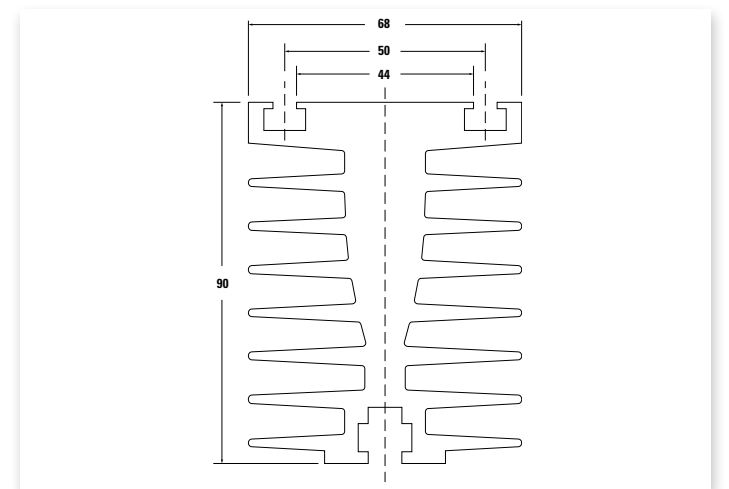
WC63 - DF



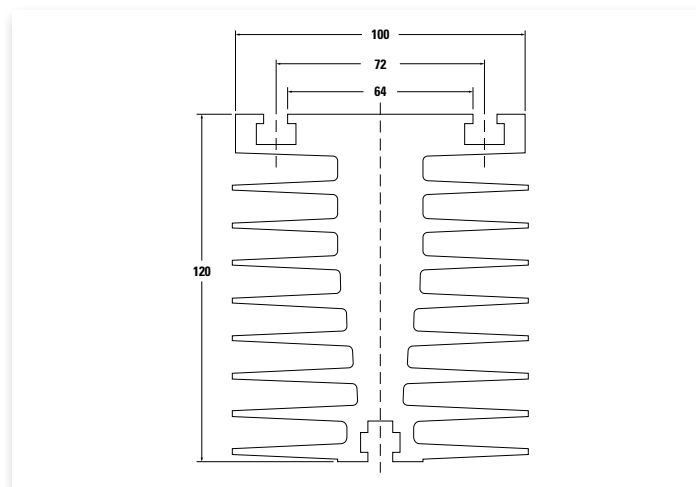
WC68 - XK8000SA180ML



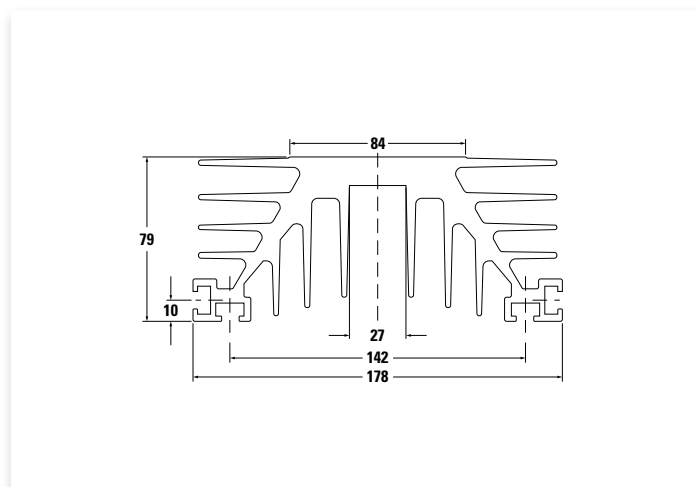
WH1 - G FIN



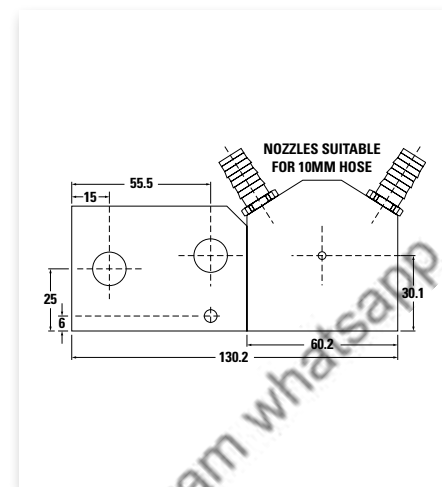
WH2 - GA FIN



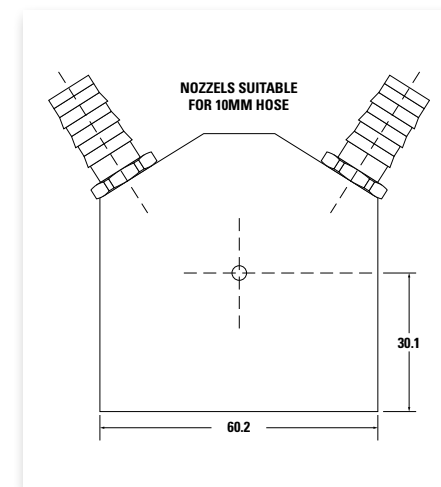
WH3 - H FIN



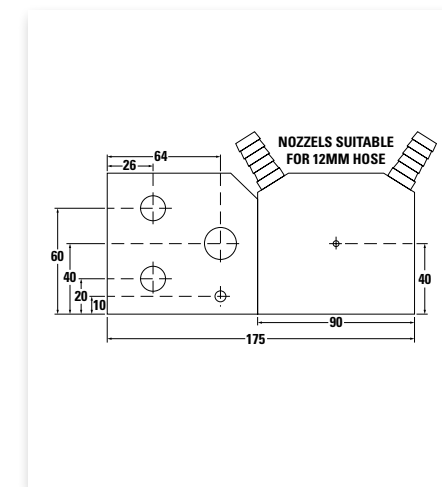
WCL1 - LK COOLER



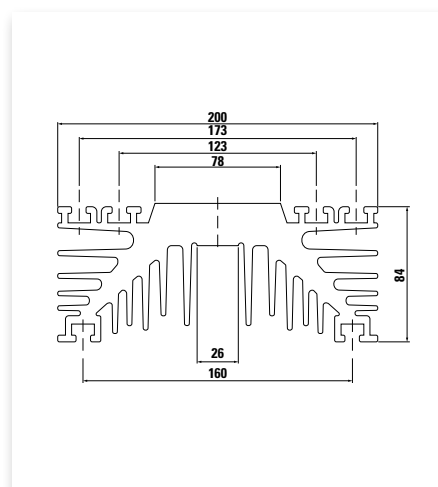
WCL2 - LKA COOLER



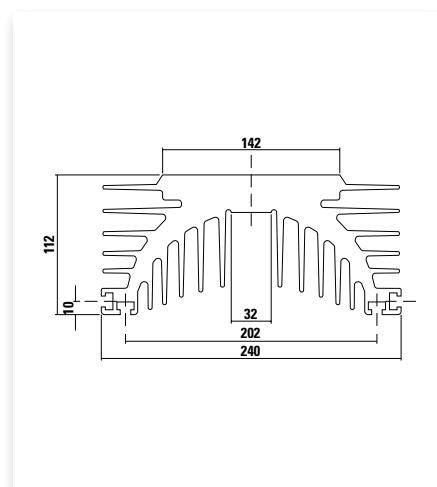
WCL3 - LKB COOLER



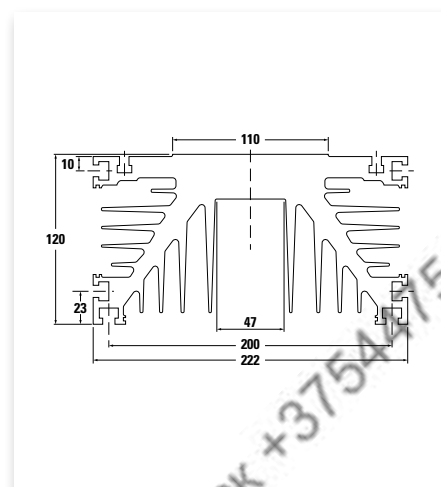
WH4 - T FIN



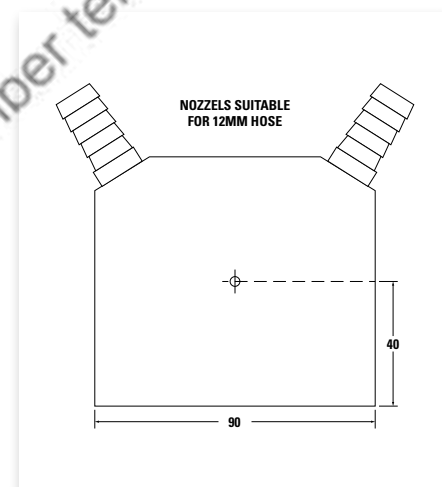
WH5 - TB FIN



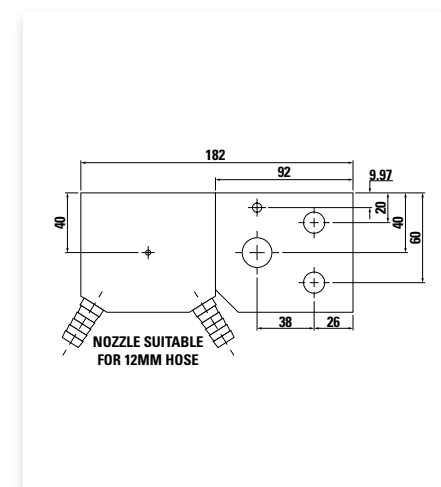
WH6 - TC FIN



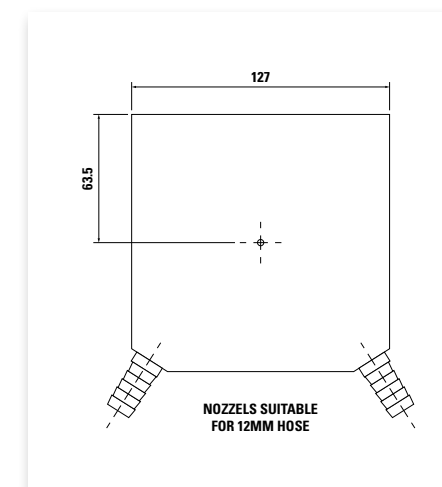
WCL4 - LKC COOLER



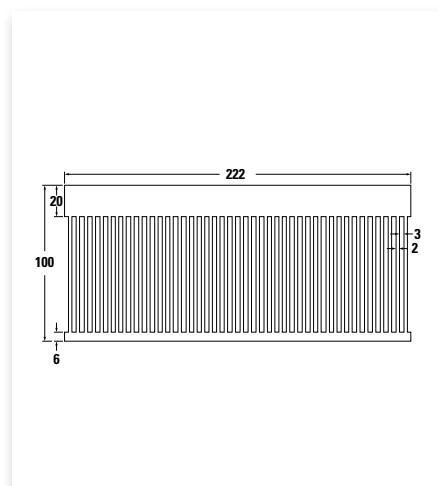
WCL5 - LKD COOLER



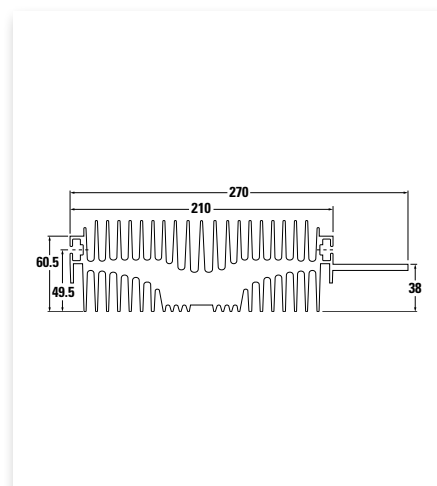
WCL6 - LKE COOLER



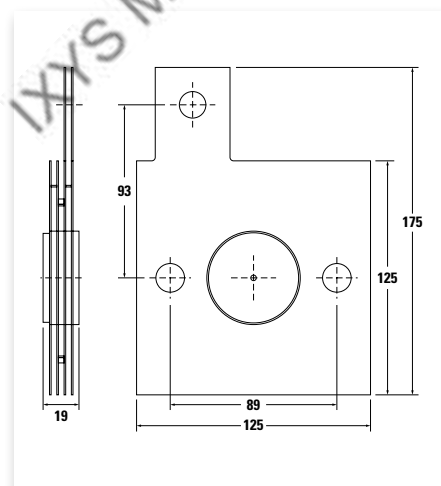
WH7 - LP100



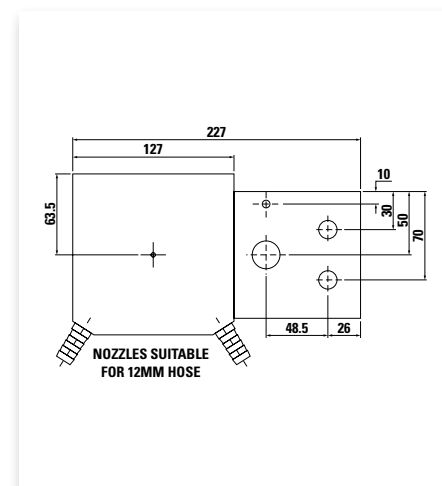
WH8 - WS46



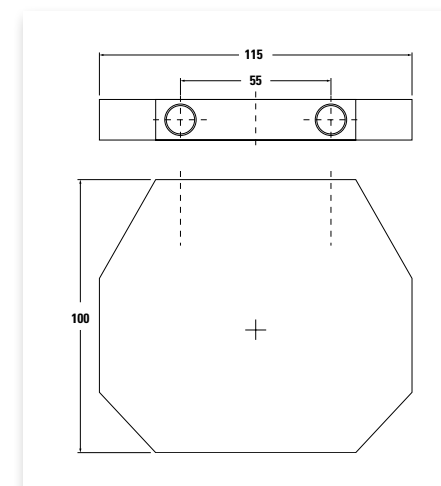
WH9 - WS30 - COPPER



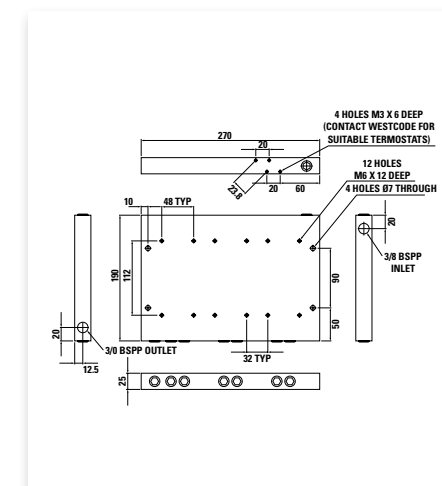
WCL7 - LKF



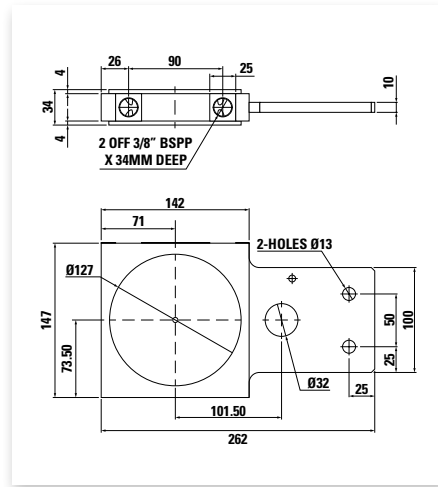
WCL8 - WS27



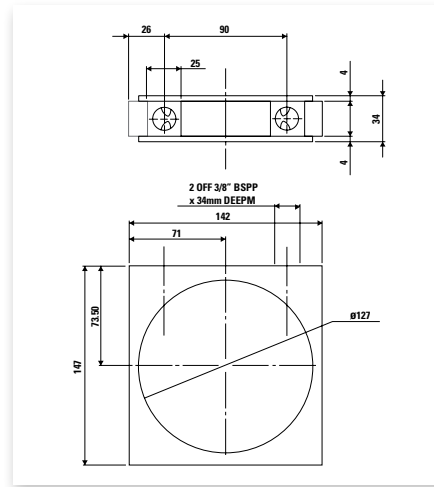
WCL9 - WS65 COOLER



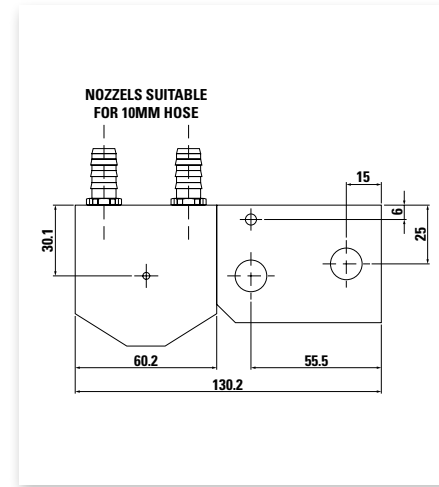
WCL10 - WS69 COOLER



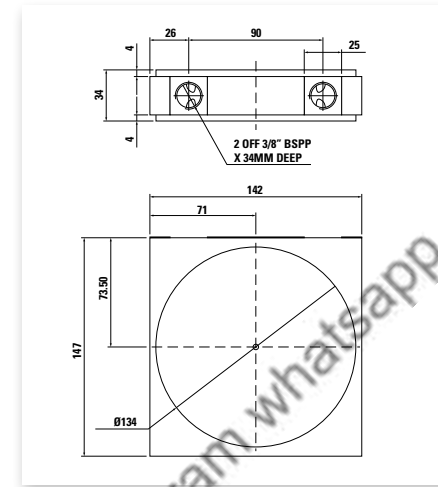
WCL11 - WS70 COOLER



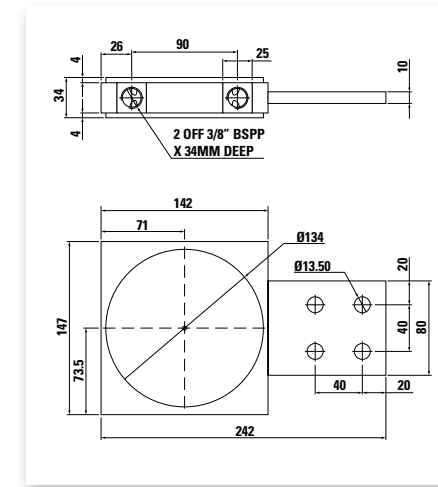
WCL12 - WS71-1 COOLER



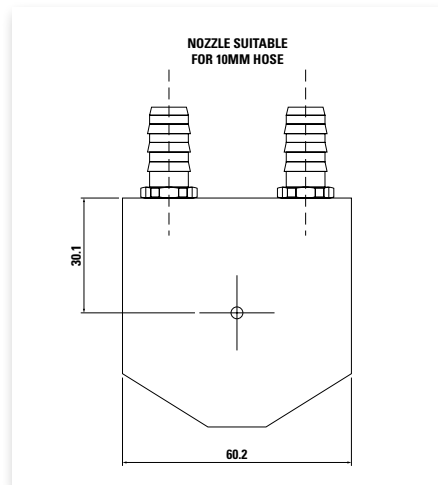
WCL19 - XW180BxxxE



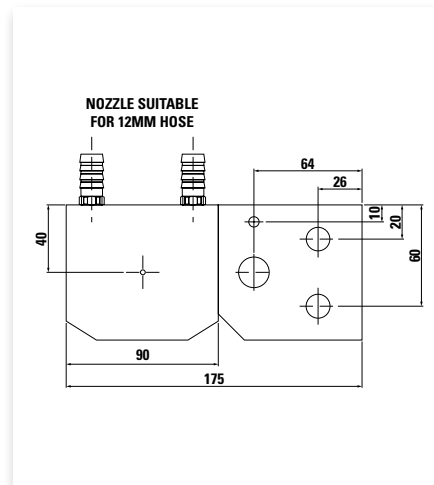
WCL20 - XW180BxxxF



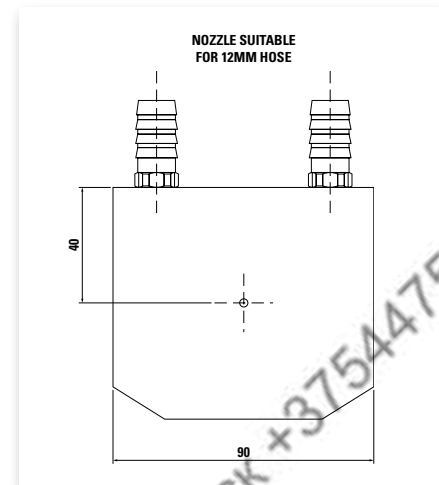
WCL13 - WS71-2 COOLER



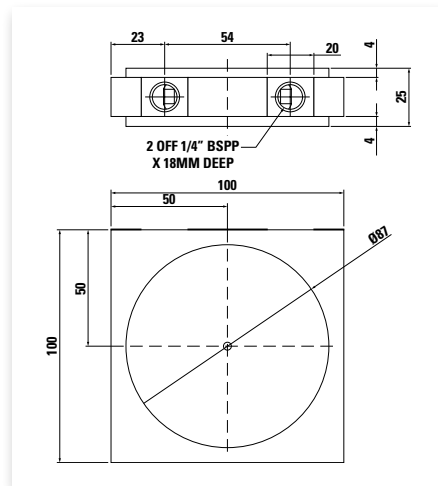
WCL14 - WS72-1 COOLER



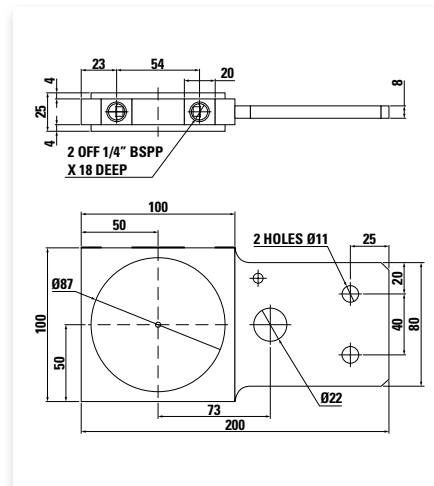
WCL15 - WS72-2 COOLER



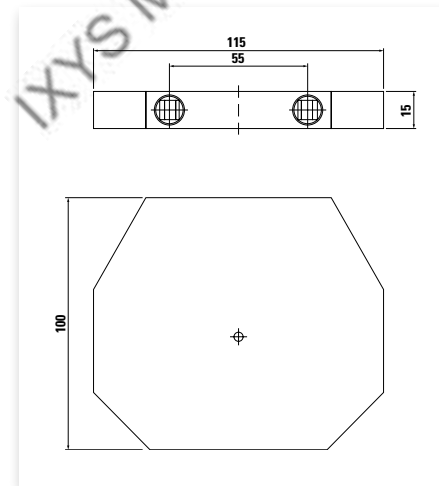
WCL16 - XW127ExxxA



WCL17 - XW127ExxxB

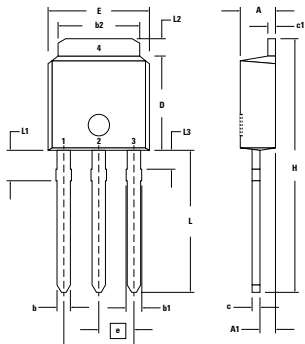


WCL18 - XW180GN25A



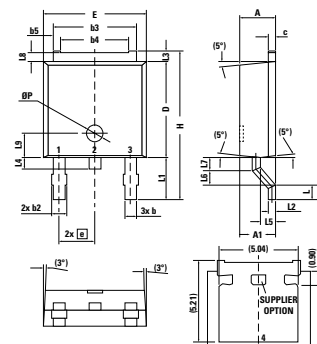


**X003 TO-251 AA**  
Weight = 0.4 g



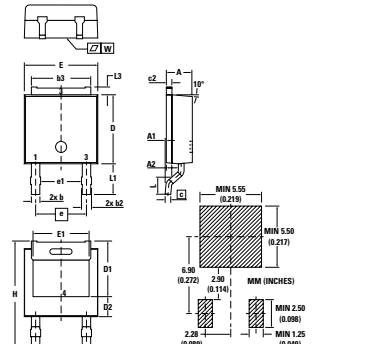
Dim	Millimeters		Inches	
	min	max	min	max
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.35	6.73	0.250	0.265
e	2.28 BSC		0.090 BSC	
e1	4.57 BSC		0.180 BSC	
H	17.02	17.78	0.670	0.700
L	8.89	9.65	0.350	0.380
L1	1.91	2.28	0.075	0.090
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.045	0.060

**X004 TO-252 AA (D PAK)**  
Weight = 0.3 g



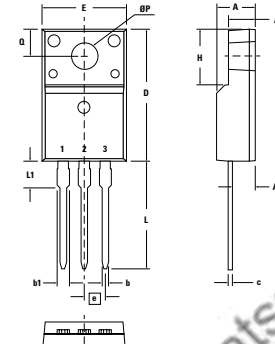
Dim	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
A2	0.66	0.86	0.026	0.034
b	-	0.96	-	0.038
b1	5.04	5.64	0.198	0.222
b2	4.34 BSC		0.171 BSC	
b3	0.50 BSC		0.020 BSC	
c	0.40	0.60	0.016	0.024
c1	5.90	6.30	0.232	0.248
D	6.40	6.80	0.252	0.268
E	2.10	2.50	0.083	0.098
H	9.20	9.80	0.362	0.386
L	0.55	1.02	0.022	0.040
L1	2.50	2.90	0.098	0.114
L2	0.40	0.60	0.016	0.024
L3	0.50	0.90	0.020	0.035
L4	0.60	1.00	0.024	0.039
L5	0.82	1.22	0.032	0.048
L6	0.79	0.99	0.031	0.039
L7	0.81	1.01	0.032	0.040
L8	0.40	0.80	0.016	0.031
L9	1.50 BSC		0.059 BSC	
P	1.00 BSC		0.039 BSC	

**X004a TO-252 AA (D PAK HV)**  
Weight = 0.3 g



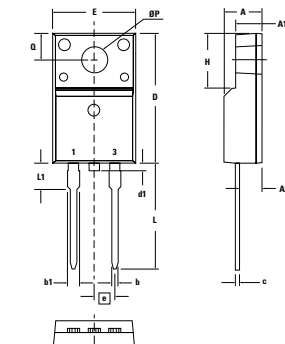
Dim	Millimeters		Inches	
	min	max	min	max
A	2.18	2.39	0.086	0.094
A1	0.00	0.13	0.000	0.005
A2	0.97	1.17	0.038	0.046
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.08	5.59	0.200	0.220
c	0.46	0.61	0.018	0.024
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.57	5.21	0.180	0.205
D2	2.03		0.080	
E	6.35	6.73	0.250	0.265
E1	4.32	5.21	0.170	0.205
e	4.57		0.180	
e1	3.62		0.143	
H	9.15	10.34	0.360	0.407
L	1.40	1.78	0.055	0.070
L1	2.54	2.92	0.100	0.115
L3	0.64	1.02	0.025	0.040
W	typ. 0.02	0.040	typ. 0.0008	0.000

**X007a TO-220 ABFP**  
Weight = 2 g



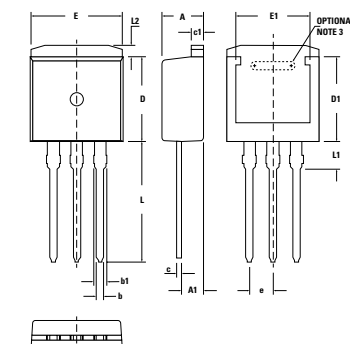
Dim	Millimeters		Inches	
	min	max	min	max
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
b1	1.27	1.47	0.050	0.058
c	0.45	0.60	0.018	0.024
D	15.67	16.07	0.617	0.633
E	9.96	10.36	0.392	0.408
e	2.54 BSC		0.100 BSC	
H	6.48	6.88	0.255	0.271
L	12.68	13.28	0.499	0.523
L1	3.03	3.43	0.119	0.135
P	3.08	3.28	0.121	0.129
Q	3.20	3.40	0.126	0.134

**X007b TO-220 ACFP**  
Weight = 2 g



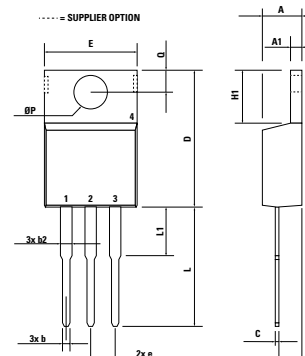
Dim	Millimeters		Inches	
	min	max	min	max
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
b1	1.27	1.47	0.050	0.058
c	0.45	0.60	0.018	0.024
D	15.67	16.07	0.617	0.633
E	9.96	10.36	0.392	0.408
e	2.54 BSC		0.100 BSC	
H	6.48	6.88	0.255	0.271
L	12.68	13.28	0.499	0.523
L1	3.03	3.43	0.119	0.135
P	3.08	3.28	0.121	0.129
Q	3.20	3.40	0.126	0.134

**X008a TO-262 I2PAK**  
Weight = 1.5 g



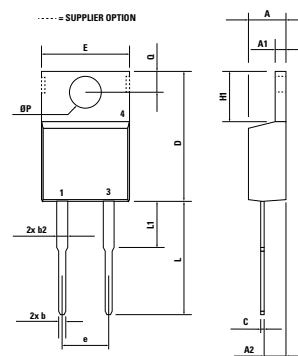
Dim	Millimeters		Inches	
	min	max	min	max
A	4.30	4.70	0.169	0.185
A1	2.20	2.60	0.087	0.102
b	0.70	0.90	0.028	0.035
b1	1.37	1.57	0.054	0.062
c	0.45	0.60	0.018	0.024
c1	1.25	1.40	0.049	0.055
D	9.00	9.40	0.355	0.370
D1	7.20		0.284	
E	9.70	9.90	0.382	0.390
E1	7.00		0.276	
e	2.54 BSC		0.100 BSC	
H	6.48	6.88	0.255	0.271
L	12.88	13.28	0.507	0.523
L1	3.03	3.43	0.119	0.135
P	3.08	3.28	0.121	0.129
L2	1.00	1.40	0.039	0.055

**X005a TO-220 AB**  
Weight = 2 g



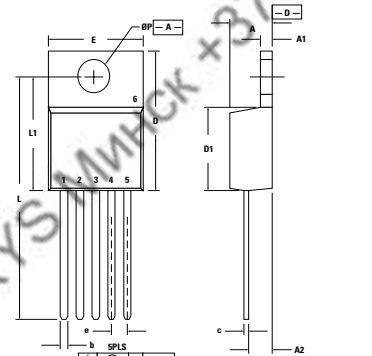
Dim	Millimeters		Inches	
	min	max	min	max
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	2.54 BSC		0.100 BSC	
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
P	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125

**X005b TO-220 AC**  
Weight = 2 g



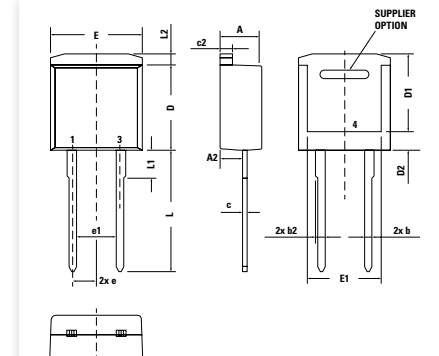
Dim	Millimeters		Inches	
	min	max	min	max
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b2	1.15	1.65	0.045	0.065
C	0.35	0.56	0.014	0.022
D	14.73	16.00	0.580	0.630
E	9.91	10.66	0.390	0.420
e	5.08 BSC		0.200 BSC	
H1	5.85	6.85	0.230	0.270
L	12.70	13.97	0.500	0.550
L1	2.79	5.84	0.110	0.230
P	3.54	4.08	0.139	0.161
Q	2.54	3.18	0.100	0.125

**X006 TO-220 (5)**  
Weight = 2 g



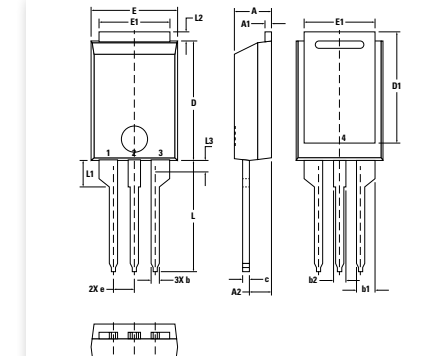
Dim	Millimeters		Inches	
	min	max	min	max
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
c	0.38	0.64	0.015	0.025
D	14.73	15.75	0.580	0.620
D1	8.64	9.40	0.340	0.370
E	9.91	10.54	0.390	0.415
e	1.70 BSC		0.067 BSC	
k	0.00	0.36	0.000	0.014
L	25.27	26.54	0.995	1.045
L1	11.94	12.95	0.470	0.510
P	3.53	3.96	0.139	0.156

**X008b TO-262 I2PAK**  
Weight = 1.5 g



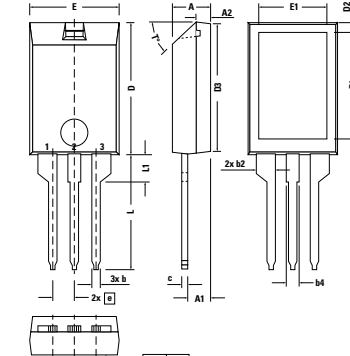
Dim	Millimeters		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.5		0.098	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2.54 BSC		0.100 BSC	
e1	4.28		0.169	
L	13.00	13.60	0.512	0.535
L1	2.90	3.10	0.114	0.122
L2	1.02	1.68	0.040	0.066

**X009a PLUS220TM**  
Weight = 2.5 g b) middle leg cut



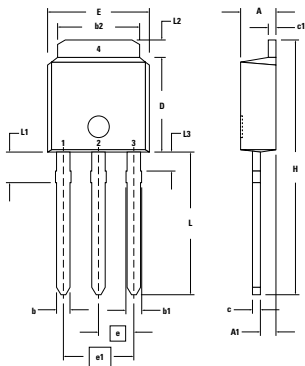
Dim	Millimeters		Inches	
	min	max	min	max
A	4.30	4.70	0.169	0.185
A1	0.70	0.90	0.028	0.035
A2	2.50	3.00	0.098	0.118
b	0.90	1.20	0.035	0.047
b1	2.03	2.41	0.080	0.095
b2	1.37	1.63	0.054	0.064
c	0.70	0.90	0.028	0.035
D	14.00	15.00	0.551	0.591
D1	13.00	13.70	0.512	0.539
E	10.00	11.00	0.394	0.433
E1	8.40	8.80	0.331	0.346
e	2.54 BSC		0.100 BSC	
L	13.00	14.00	0.512	0.551
L1	3.00	3.50	0.118	0.138
L2	0.90	1.30	0.035	0.051
L3	1.20	1.50	0.047	0.059

**X010a ISOPLUS220TM AB**  
Weight = 2.5 g



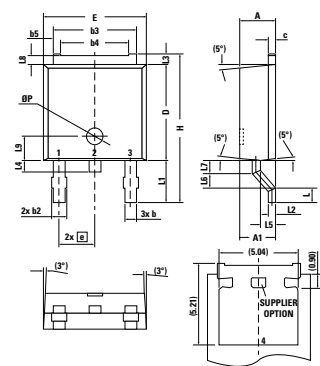
Dim	Millimeters		Inches	
	min	max	min	max
A	4.00	5.00	0.157	0.197
A1	2.50	3.00	0.098	0.118
A2	1.60	1.80	0.063	0.071
b	0.90	1.30	0.035	0.051
b2	2.35	2.55	0.093	0.100
b4	1.25	1.65	0.049	0.065
c	0.70	1.00	0.028	0.039

**X003 TO-251 AA**  
Weight = 0.4 g



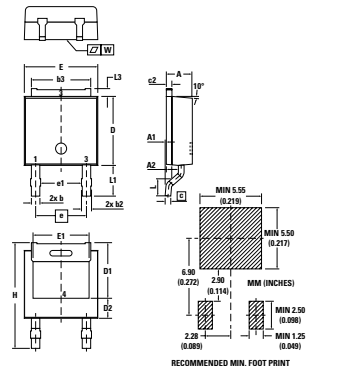
Dim	Millimeters		Inches	
	min	max	min	max
A	2.19	2.38	0.086	0.094
A1	0.89	1.14	0.035	0.045
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.21	5.46	0.205	0.215
c	0.46	0.58	0.018	0.023
c1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
E	6.35	6.73	0.250	0.265
e	2.28 BSC		0.090 BSC	
e1	4.57 BSC		0.180 BSC	
H	17.02	17.78	0.670	0.700
L	8.89	9.65	0.350	0.380
L1	1.91	2.28	0.075	0.090
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.045	0.060

**X004 TO-252 AA (D PAK)**  
Weight = 0.3 g



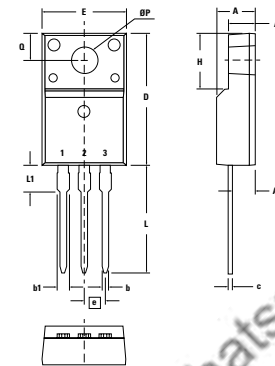
Dim	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
b	0.66	0.86	0.026	0.034
b1	-	0.96	-	0.038
b2	5.04	5.64	0.198	0.222
b3	4.34 BSC		0.171 BSC	
b4	0.50 BSC		0.020 BSC	
b5	0.40	0.60	0.016	0.024
c	5.90	6.30	0.232	0.248
D	6.40	6.80	0.252	0.268
E	2.10	2.50	0.083	0.098
e	9.20	9.80	0.362	0.386
H	0.55	1.02	0.022	0.040
L	2.50	2.90	0.098	0.114
L1	0.40	0.60	0.016	0.024
L2	0.50	0.90	0.020	0.035
L3	0.60	1.00	0.024	0.039
L4	0.82	1.22	0.032	0.048
L5	0.79	0.99	0.031	0.039
L6	0.81	1.01	0.032	0.040
L7	0.40	0.80	0.016	0.031
L8	1.50 BSC		0.059 BSC	
L9	1.00 BSC		0.039 BSC	
P	1.00 BSC		0.039 BSC	

**X004a TO-252 AA (D PAK HV)**  
Weight = 0.3 g



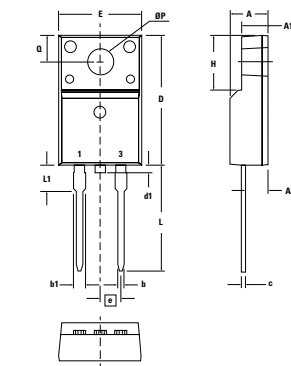
Dim	Millimeters		Inches	
	min	max	min	max
A	2.18	2.39	0.086	0.094
A1	0.00	0.13	0.000	0.005
A2	0.97	1.17	0.038	0.046
b	0.64	0.89	0.025	0.035
b1	0.76	1.14	0.030	0.045
b2	5.08	5.59	0.200	0.220
b3	0.46	0.61	0.018	0.024
b4	0.46	0.58	0.018	0.023
b5	5.97	6.22	0.235	0.245
c	4.57	5.21	0.180	0.205
c1	2.03		0.080	
D	6.35	6.73	0.250	0.265
E	4.32	5.21	0.170	0.205
e	4.57		0.180	
e1	3.62		0.143	
H	9.15	10.34	0.360	0.407
L	1.40	1.78	0.055	0.070
L1	2.54	2.92	0.100	0.115
L2	0.64	1.02	0.025	0.040
L3	typ. 0.02		typ. 0.0008	
L4	0.040		0.0008	

**X007a TO-220 ABFP**  
Weight = 2 g



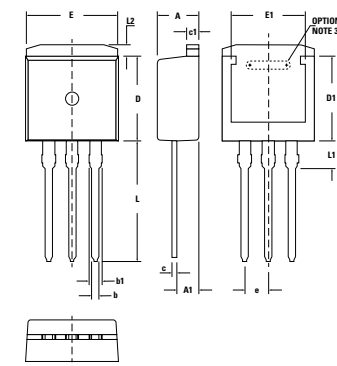
Dim	Millimeters		Inches	
	min	max	min	max
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
b1	1.27	1.47	0.050	0.058
b2	0.45	0.60	0.018	0.024
c	15.67	16.07	0.617	0.633
D	9.96	10.36	0.392	0.408
E	2.54 BSC		0.100 BSC	
e	6.48	6.88	0.255	0.271
H	12.68	13.28	0.499	0.523
L	3.03	3.43	0.119	0.135
L1	3.03	3.43	0.119	0.135
L2	3.08	3.28	0.121	0.129
L3	3.20	3.40	0.126	0.134

**X007b TO-220 ACFP**  
Weight = 2 g



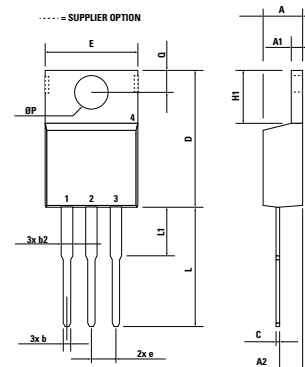
Dim	Millimeters		Inches	
	min	max	min	max
A	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
b1	1.27	1.47	0.050	0.058
b2	0.45	0.60	0.018	0.024
c	15.67	16.07	0.617	0.633
D	9.96	10.36	0.392	0.408
E	2.54 BSC		0.100 BSC	
e	6.48	6.88	0.255	0.271
H	12.68	13.28	0.499	0.523
L	3.03	3.43	0.119	0.135
L1	3.03	3.43	0.119	0.135
L2	3.08	3.28	0.121	0.129
L3	3.20	3.40	0.126	0.134

**X008a TO-262 I2PAK**  
Weight = 1.5 g



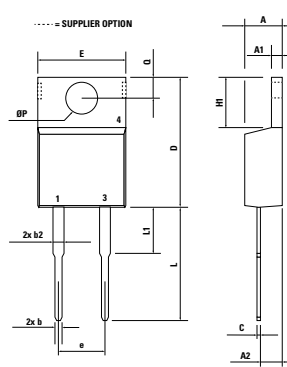
Dim	Millimeters		Inches	
	min	max	min	max
A	2.20	2.60	0.087	0.102
A1	0.70	0.90	0.028	0.035
b	1.37	1.57	0.054	0.062
b1	0.45	0.60	0.018	0.024
c	1.25	1.40	0.049	0.055
D	9.00	9.40	0.355	0.370
E	7.20		0.284	
e	9.70	9.90	0.382	0.390
H	7.00		0.276	
L	2.54 BSC		0.100 BSC	
L1	12.88	13.28	0.507	0.523
L2	3.00	-	0.118	-
L3	1.00	1.40	0.039	0.055

**X005a TO-220 AB**  
Weight = 2 g



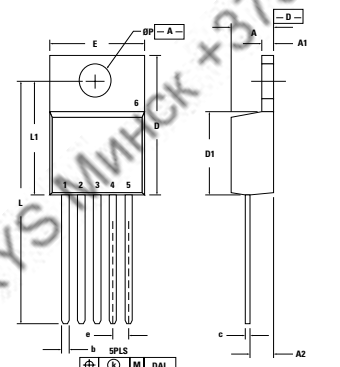
Dim	Millimeters		Inches	
	min	max	min	max
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b1	1.15	1.65	0.045	0.065
b2	0.35	0.56	0.014	0.022
c	14.73	16.00	0.580	0.630
D	9.91	10.66	0.390	0.420
E	2.54 BSC		0.100 BSC	
e	5.85	6.85	0.230	0.270
H	12.70	13.97	0.500	0.550
L	2.79	5.84	0.110	0.230
L1	3.54	4.08	0.139	0.161
L2	2.54	3.18	0.100	0.125

**X005b TO-220 AC**  
Weight = 2 g



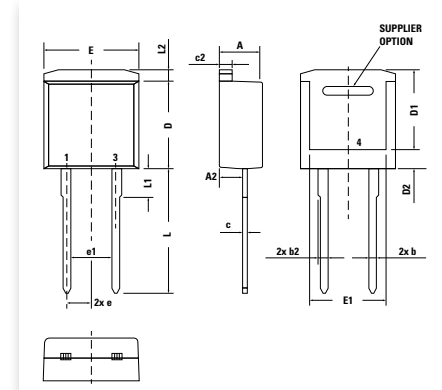
Dim	Millimeters		Inches	
	min	max	min	max
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b1	1.15	1.65	0.045	0.065
b2	0.35	0.56	0.014	0.022
c	14.73	16.00	0.580	0.630
D	9.91	10.66	0.390	0.420
E	5.08 BSC		0.200 BSC	
e	5.85	6.85	0.230	0.270
H	12.70	13.97	0.500	0.550
L	2.79	5.84	0.110	0.230
L1	3.54	4.08	0.139	0.161
L2	2.54	3.18	0.100	0.125

**X006 TO-220 (5)**  
Weight = 2 g



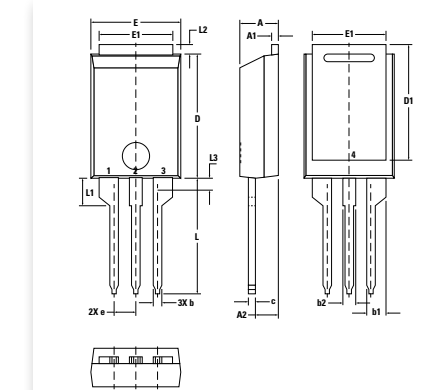
Dim	Millimeters		Inches	
	min	max	min	max
A	4.32	4.82	0.170	0.190
A1	1.14	1.39	0.045	0.055
A2	2.29	2.79	0.090	0.110
b	0.64	1.01	0.025	0.040
b1	1.15	1.65	0.045	0.065
b2	0.35	0.56	0.014	0.022
b3	14.73	15.75	0.580	0.620
b4	8.64	9.40	0.340	0.370
b5	9.91	10.54	0.390	0.415
c	1.70 BSC		0.067 BSC	
D	0.00	0.36	0.000	0.014
E	25.27	26.54	0.995	1.045
L	11.94	12.95	0.470	0.510
L1	3.53	3.96	0.139	0.156

**X008b TO-262 I2PAK**  
Weight = 1.5 g



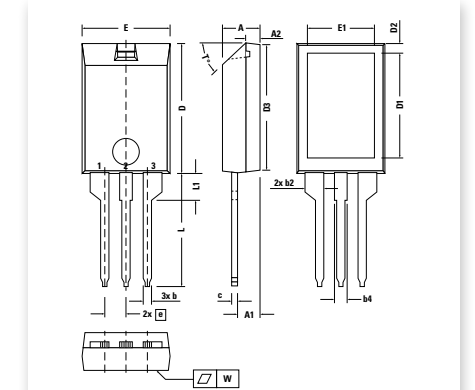
Dim	Millimeters		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b1	1.14	1.40	0.045	0.055
b2	0.40	0.74	0.016	0.029
c	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.5		0.098	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2.54 BSC		0.100 BSC	
e1	4.28		0.169	
L	13.00	13.60	0.512	0.535
L1	2.90	3.10	0.114	0.122
L2	1.02	1.68	0.040	0.066

**X009a PLUS220TM**  
Weight = 2.5 g b) middle leg cut



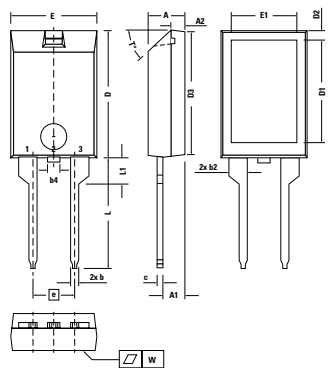
Dim	Millimeters		Inches	
	min	max	min	max
A	4.30	4.70	0.169	0.185
A1	0.70	0.90	0.028	0.035
A2	2.50	3.00	0.098	0.118
b	0.90	1.20	0.035	0.047
b1	2.03	2.41	0.080	0.095
b2	1.37	1.63	0.054	0.064
c	0.70	0.90	0.028	0.035
D	14.00	15.00	0.551	0.591
D1	13.00	13.70	0.512	0.539
E	10.00	11.00	0.394	0.433
E1	8.40	8.80	0.331	0.346
e	2.54 BSC		0.100 BSC	
L	13.00	14.00	0.512	0.551
L1	3.00	3.50	0.118	0.138
L2	0.90	1.30	0.035	0.051
L3	1.20	1.50	0.047	0.059

**X010a ISOPLUS220TM AB**  
Weight = 2.5 g



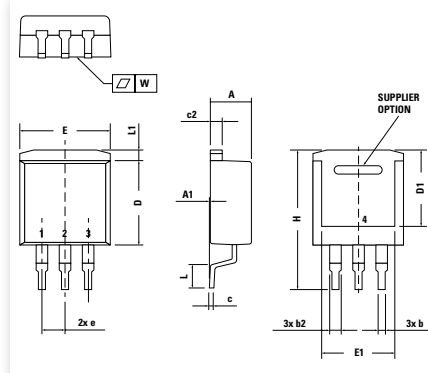
Dim	Millimeters		Inches	
	min	max	min	max
A	4.00	5.00	0.157	0.197
A1	2.50	3.00	0.098	0.118
A2	1.60	1.80	0.063	0.071
b	0.90	1.30	0.035	0.051
b1	2.35	2.55	0.093	0.100
b2	1.25	1.65	0.049	0.065
c	0.70	1.00	0.028	0.039
D	15.00	16.00	0.591	0.630
D1	12.00	13.00	0.472	0.512

**X010b ISOPLUS220TM AC**  
Weight = 2.5 g



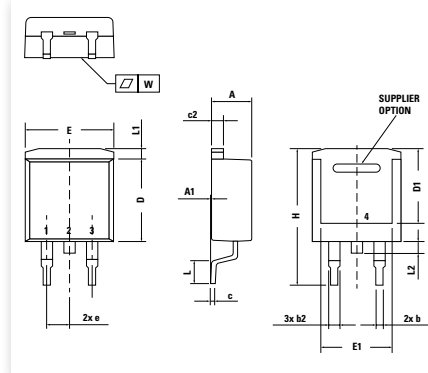
Dim	Millimeters		Inches	
	min	max	min	max
A	4.00	5.00	0.157	0.197
A1	2.50	3.00	0.098	0.118
A2	1.60	1.80	0.063	0.071
b	0.90	1.30	0.035	0.051
b2	1.25	1.65	0.049	0.065
b4	2.35	2.55	0.093	0.100
c	0.70	1.00	0.028	0.039
D	15.00	16.00	0.591	0.630
D1	12.00	13.00	0.472	0.512
D2	1.10	1.50	0.043	0.059
D3	14.90	15.50	0.587	0.610
E	10.00	11.00	0.394	0.433
E1	7.50	8.50	0.295	0.335
e	5.08 BSC		0.200 BSC	
L	13.00	14.50	0.512	0.571
L1	3.00	3.50	0.118	0.138
T°	42.5	47.5	-	-
W	-	0.10	-	0.004

**X011a TO-263 AA (D2PAK)**  
Weight = 1.5 g



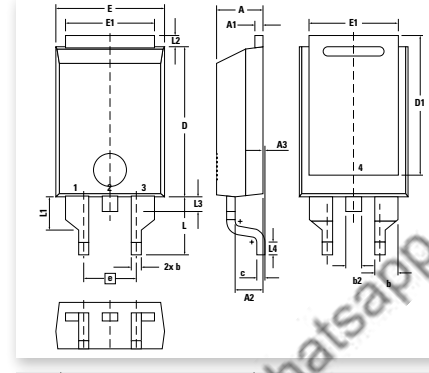
Dim	Millimeters		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	9.65	10.41	0.380	0.410
E	6.22	8.13	0.245	0.320
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

**X011b TO-263 AB (D2PAK)**  
Weight = 1.5 g



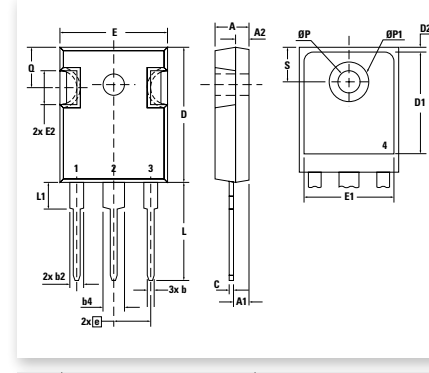
Dim	Millimeters		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	9.65	10.41	0.380	0.410
E	6.22	8.13	0.245	0.320
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

**X013 PLUS220TM (SMD)**  
Weight = 2 g



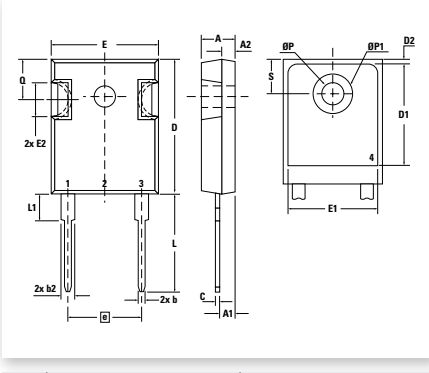
Dim	Millimeters		Inches	
	min	max	min	max
A	4.30	4.70	0.169	0.185
A1	0.70	0.90	0.028	0.035
A2	2.50	3.00	0.098	0.118
A3	0.00	0.25	0.000	0.010
b	0.90	1.20	0.035	0.047
b2	2.03	2.41	0.080	0.095
b4	1.37	1.63	0.054	0.064
c	0.70	0.90	0.028	0.035
D	14.00	15.00	0.551	0.591
D1	13.00	13.70	0.512	0.539
D2	10.00	11.00	0.394	0.433
E	8.40	8.80	0.331	0.346
e	5.08 BSC		0.200 BSC	
L	5.30	5.80	0.209	0.228
L1	3.00	3.50	0.118	0.138
L2	0.90	1.30	0.035	0.051
L3	1.20	1.50	0.047	0.059
L4	1.00	1.50	0.039	0.059

**X014a TO-247 AD**  
Weight = 6 g



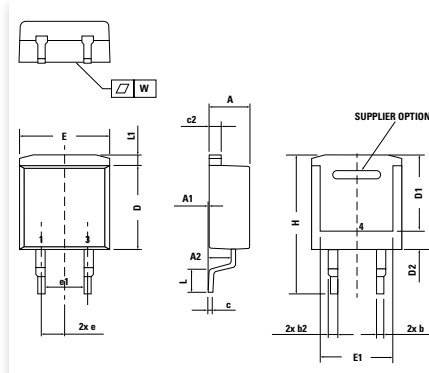
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.53	-
E2	4.31	5.48	0.170	0.216
e	5.45 BSC		0.215 BSC	
L	19.80	20.30	0.078	0.800
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
Ø P1	-	7.39	-	0.290
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

**X014b TO-247 AD**  
Weight = 6 g



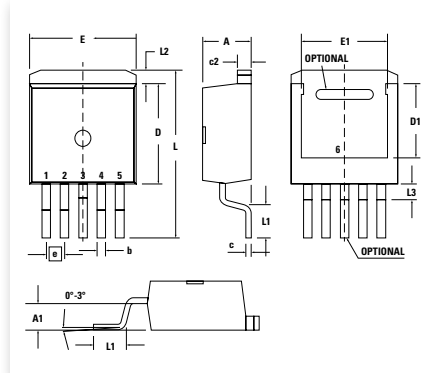
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.530	-
E2	4.31	5.48	0.170	0.216
e	10.90 BSC		0.430 BSC	
L	19.80	20.30	0.078	0.800
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
Ø P1	-	7.39	-	0.290
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

**X011c TO-263 AB (D2PAK HV)**  
Weight = 1.5 g



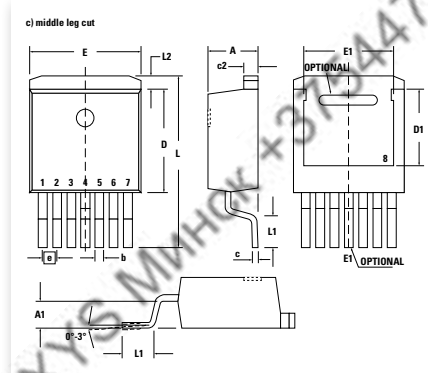
Dim	Millimeters		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ. 0.10		typ. 0.004	
A2	2.410		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.5		0.098	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2.54 BSC		0.100 BSC	
e1	4.280		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L2	1.02	1.68	0.040	0.066
W	typ. 0.02	0.040	typ. 0.0008	0.002

**X012a TO-263 (5)**  
Weight = 1.5 g



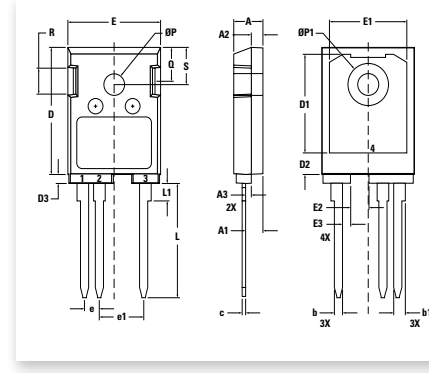
Dim	Millimeters		Inches	
	min	max	min	max
A	4.20	4.80	0.160	0.190
A1	2.10	2.70	0.083	0.106
A2	0.60	0.99	0.024	0.039
b	0.40	0.70	0.016	0.028
c	1.20	1.40	0.047	0.055
c2	8.80	9.50	0.346	0.374
D	6.60	7.20	0.260	0.283
D1	9.65	10.30	0.380	0.406
D2	7.50	8.20	0.295	0.323
e	1.70 BSC		0.067 BSC	
L	14.80	15.80	0.583	0.622
L1	2.24	2.84	0.088	0.112
L2	1.00	1.40	0.039	0.067
L3	1.20	1.70	0.047	0.067

**X012b TO-263 (7)**  
Weight = 2.5 g c) middle leg cut



Dim	Millimeters		Inches	
	min	max	min	max
A	4.20	4.60	0.165	0.181
A1	2.45	2.75	0.096	0.108
A2	0.65	0.90	0.026	0.035
b	0.40	0.60	0.016	0.024
c	1.14	1.40	0.045	0.055
c2	8.38	8.64	0.330	0.340
D	6.10	6.35	0.240	0.250
D1	10.00	10.30	0.394	0.406
D2	7.34	8.00	0.290	0.315
e	1.27 BSC		0.050 BSC	
L	14.73	15.75	0.580	0.620
L1	2.24	2.84	0.088	0.112
L2	1.35	1.55	0.053	0.061

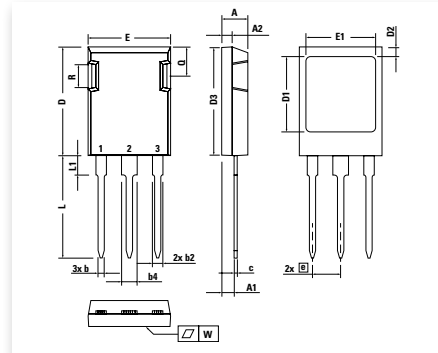
**X014c TO-247 AD**  
Weight = 6 g



Dim	Millimeters		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.90	3.10	0.114	0.122
A2	1.90	2.10	0.075	0.083
A3	0.90	1.10	0.035	0.043
b	1.35	1.50	0.053	0.059
b1	1.90	2.10	0.075	0.083
c	0.55	0.75	0.022	0.030
D	20.80	21.40	0.819	0.843
D1	16.20	16.40	0.638	0.646
D2	3.40	3.70	0.134	0.146
D3	1.40	1.60	0.055	0.063
E	15.80	16.20	0.622	0.638
E1	13.20	13.40	0.520	0.528
E2	3.00	3.20	0.118	0.126
E3	1.30	1.50	0.051	0.059
e	2.54 BSC		0.100 BSC	
e1	7.62 BSC		0.300 BSC	
L	18.60	19.00	0.732	0.748
L1	2.70	3.00	0.106	0.118
Ø P	3.50	3.60	0.138	0.142
Ø P1	6.90	7.10	0.272	0.280
Q	5.50	5.70	0.216	

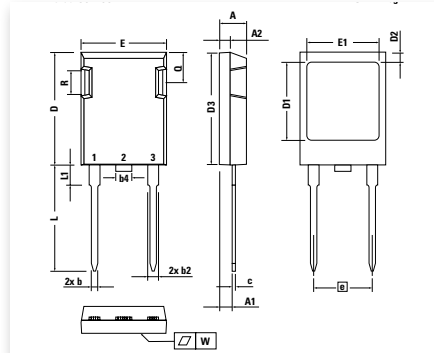


**X016a ISOPLUS247TM**  
Weight = 4.5 g



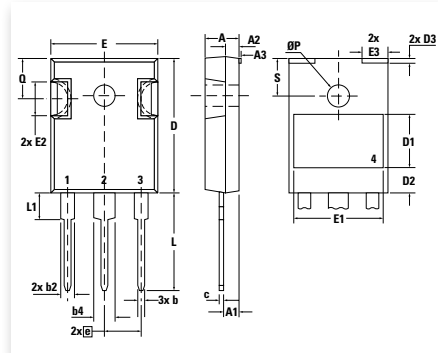
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	5.45 BSC		0.215 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

**X016b ISOPLUS247TM**  
Weight = 4.5 g



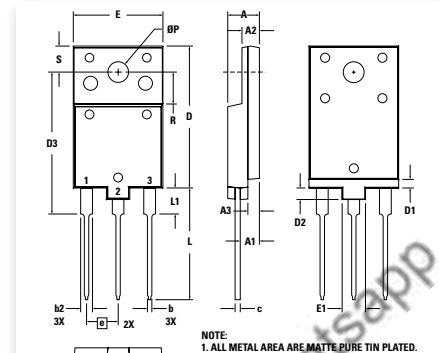
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.29	2.54	0.090	0.100
A2	1.91	2.16	0.075	0.085
b	1.14	1.40	0.045	0.055
b2	1.91	2.20	0.075	0.087
b4	2.92	3.24	0.115	0.128
c	0.61	0.83	0.024	0.033
D	20.80	21.34	0.819	0.840
D1	15.75	16.26	0.620	0.640
D2	1.65	2.15	0.065	0.085
D3	20.30	20.70	0.799	0.815
E	15.75	16.13	0.620	0.635
E1	13.21	13.72	0.520	0.540
e	5.45 BSC		0.215 BSC	
L	19.81	20.60	0.780	0.811
L1	3.81	4.38	0.150	0.172
Q	5.59	6.20	0.220	0.244
R	4.25	5.50	0.167	0.217
W	-	0.10	-	0.004

**X016c ISO247TM**  
Weight = 4.5 g



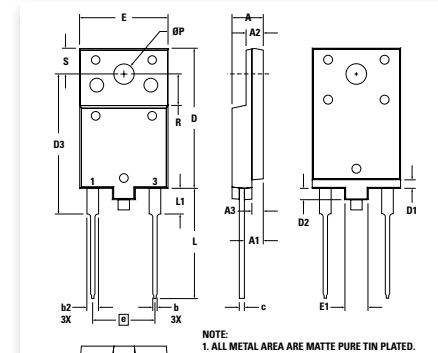
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
A3	typ.	0.05	typ.	0.002
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.844
D1	typ.	8.90	typ.	0.350
D2	typ.	2.90	typ.	0.114
D3	typ.	1.00	typ.	0.039
E	15.49	16.24	0.610	0.639
E1	typ.	13.45	typ.	0.530
E2	4.31	5.48	0.170	0.216
E3	typ.	4.00	typ.	0.157
e	5.46	BSC	0.215	BSC
L	19.80	20.30	0.780	0.799
L1	-	4.49	-	0.177
Q P	3.55	3.65	0.140	0.144
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

**X017c TO-3PFP**  
Weight = 5.5 g



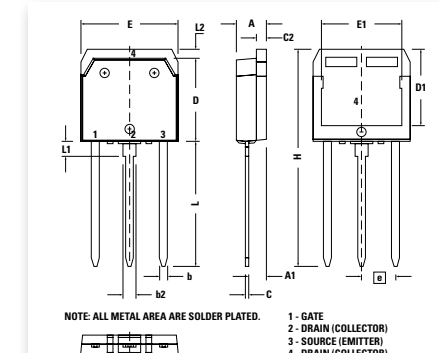
Dim	Millimeters		Inches	
	min	max	min	max
A	5.40	5.80	0.213	0.228
A1	3.10	3.50	0.122	0.138
A2	2.90	3.30	0.114	0.130
A3	1.90	2.30	0.075	0.091
b	0.65	0.95	0.026	0.037
b2	1.90	2.30	0.075	0.091
c	0.80	1.10	0.031	0.043
D	24.30	24.70	0.957	0.972
D1	1.80	1.70	0.051	0.067
D2	1.80	2.2	0.071	0.087
E	15.40	15.80	0.606	0.622
E1	3.90	4.30	0.154	0.169
e	5.45 BSC		0.215 BSC	
L	19.00	19.50	0.748	0.768
L1	4.30	4.70	0.169	0.185
Q P	3.40	3.80	0.134	0.150
R	5.30	5.70	0.209	0.224
S	4.30	4.70	0.169	0.185

**X017d TO-3PFP**  
Weight = 5.4 g



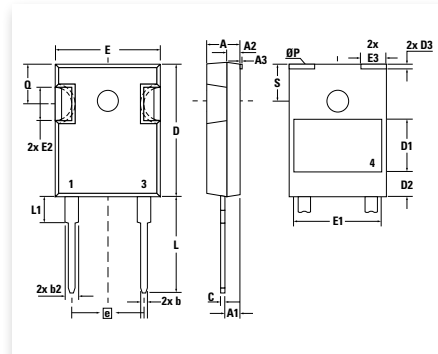
Dim	Millimeters		Inches	
	min	max	min	max
A	5.40	5.80	0.213	0.228
A1	3.10	3.50	0.122	0.138
A2	2.90	3.30	0.114	0.130
A3	1.90	2.30	0.075	0.091
b	0.65	0.95	0.026	0.037
b2	1.90	2.30	0.075	0.091
c	0.80	1.10	0.031	0.043
D	24.30	24.70	0.957	0.972
D1	1.80	1.70	0.051	0.067
D2	1.80	2.2	0.071	0.087
E	15.40	15.80	0.606	0.622
E1	3.90	4.30	0.154	0.169
e	5.45 BSC		0.215 BSC	
L	19.00	19.50	0.748	0.768
L1	4.30	4.70	0.169	0.185
Q P	3.40	3.80	0.134	0.150
R	5.30	5.70	0.209	0.224
S	4.30	4.70	0.169	0.185

**X018 TO-268 I3PAK**  
Weight = 4.5 g



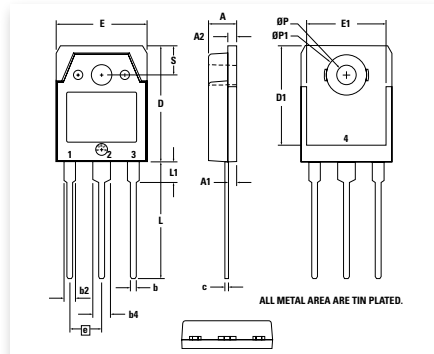
Dim	Millimeters		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
b	1.15	1.45	0.045	0.057
b2	1.90	2.10	0.075	0.083
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	12.40	12.70	0.488	0.500
D2	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.45 BSC		0.215 BSC	
H	34.67	35.43	1.365	1.395
L	19.81	20.32	0.780	0.800
L1	2.00	2.30	0.079	0.091
L2	1.00	1.15	0.039	0.045

**X016d ISO247TM**  
Weight = 4 g



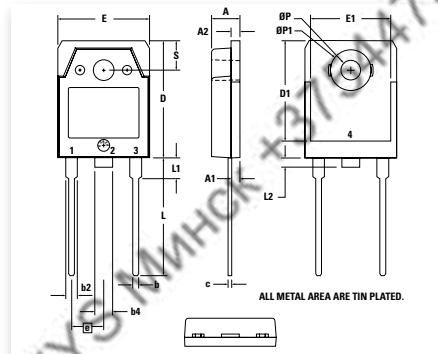
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
A3	typ.	0.05	typ.	0.002
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
C	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.844
D1	typ.	8.90	typ.	0.350
D2	typ.	2.90	typ.	0.114
D3	typ.	1.00	typ.	0.039
E	15.49	16.24	0.610	0.639
E1	typ.	13.45	typ.	0.530
E2	4.31	5.48	0.170	0.216
E3	typ.	4.00	typ.	0.157
e	10.92	BSC	0.430	BSC
L	19.80	20.30	0.780	0.799
L1	-	4.49	-	0.177
Q P	3.55	3.65	0.140	0.144
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

**X017a TO-3P**  
Weight = 5.5 g



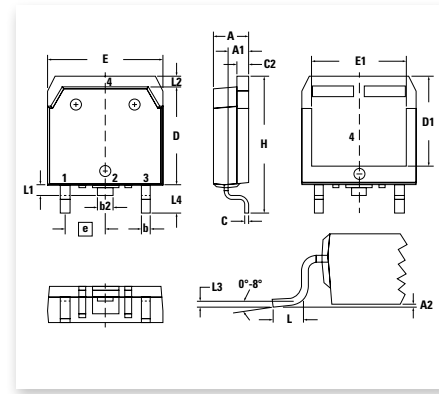
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	4.90	0.185	0.193
A1	1.30	1.50	0.051	0.059
A2	1.45	1.65	0.057	0.065
b	0.90	1.15	0.035	0.045
b2	1.90	2.20	0.075	0.087
b4	2.90	3.20	0.114	0.126
c	0.55	0.80	0.022	0.031
D	19.80	20.10	0.780	0.791
D1	16.90	17.20	0.665	0.677
E	15.50	15.80	0.610	0.622
E1	13.50	13.70	0.531	0.539
e	5.45 BSC		0.215 BSC	
L	19.80	20.20	0.780	0.795
L1	3.40	3.60	0.134	0.142
L2	3.20	3.40	0.126	0.134
Q P1	6.90	7.10	0.272	0.280
Q	4.90	5.10	0.193	0.201
S	4.90		0.193	

**X017b TO-3P**  
Weight = 5.5 g



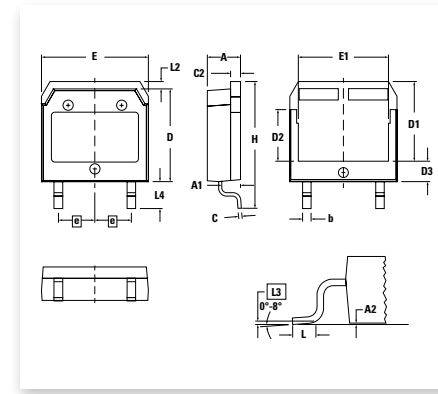
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	4.90	0.185	0.193
A1	1.30	1.50	0.051	0.059
A2	1.45	1.65	0.057	0.065
b	0.90	1.15	0.035	0.045
b2	1.90	2.20	0.075	0.087
b4	2.90	3.20	0.114	0.126
c	0.55	0.80	0.022	0.031
D	19.80	20.10	0.780	0.791
D1	16.90	17.20	0.665	0.677
E	15.50	15.80	0.610	0.622
E1	13.50	13.70	0.531	0.539
e	5.45 BSC		0.215 BSC	
L	19.80	20.20	0.780	0.795
L1	3.40	3.60	0.134	0.142
L2	0.00	1.40	0.000	0.055
Q P	3.20	3.40	0.126	0.134
Q P1	6.90	7.10	0.272	0.280
S	4.90	5.10	0.193	0.201

**X019 TO-268 AA (D3PAK)**  
Weight = 4 g



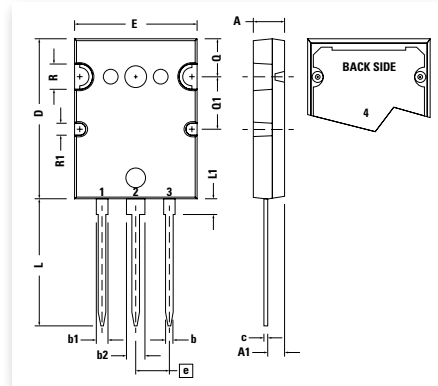
Dim	Millimeters		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.100
b	1.15	1.45	0.045	0.057
b2	1.90	2.10	0.075	0.083
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	12.40	12.70	0.488	0.500
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.45 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	2.40	2.70	0.094	0.106
L1	1.20	1.40	0.047	0.055
L2	1.00	1.15	0.039	0.045
L3	2.54 BSC		0.100 BSC	
L4	3.80	4.10	0.150	0.161

**X019a TO-268 AA (D3PAK HV)**  
Weight = 4 g



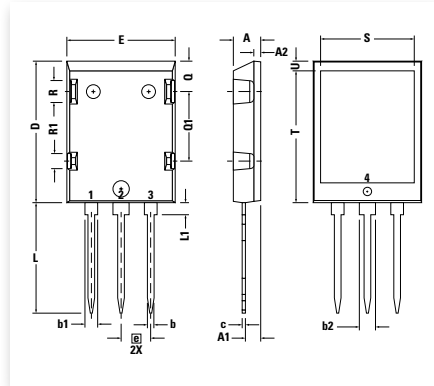
Dim	Millimeters		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.100
b	1.15	1.45	0.	

**X021a PLUS264TM**  
Weight = 10 g



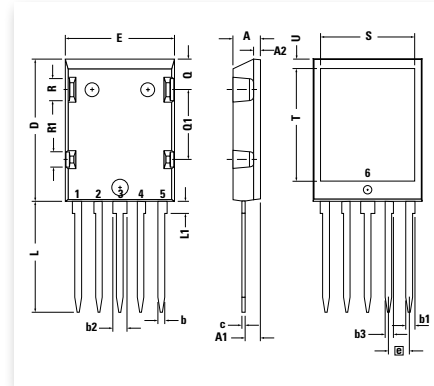
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.31	0.185	0.209
A1	2.59	3.00	0.102	0.118
b	0.94	1.40	0.037	0.055
b1	2.21	2.59	0.087	0.102
b2	2.79	3.20	0.110	0.126
c	0.43	0.74	0.017	0.029
D	25.58	26.59	1.007	1.047
E	19.30	20.29	0.760	0.799
e	5.45 BSC		0.215 BSC	
L	19.79	21.39	0.779	0.842
L1	2.21	2.59	0.087	0.102
Q	6.10	6.50	0.240	0.256
Q1	8.38	8.79	0.330	0.346
ØR	3.94	4.75	0.155	0.187
ØR1	2.16	2.36	0.085	0.093

**X022a ISOPLUS264TM**  
Weight = 7.5 g



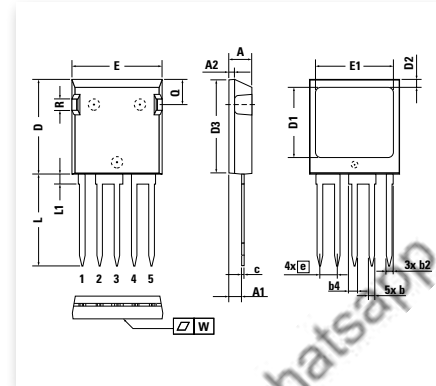
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	1.40	0.046	0.055
b	1.14	1.40	0.045	0.055
b1	1.60	1.83	0.063	0.072
b2	2.54	2.79	0.100	0.110
b3	1.47	1.73	0.058	0.068
c	0.51	0.74	0.020	0.029
D	25.91	26.42	1.020	1.040
E	19.56	20.29	0.770	0.799
e	3.81 BSC		0.150 BSC	
L	19.81	21.83	0.780	0.820
L1	2.03	2.59	0.080	0.102
Q	5.33	5.97	0.210	0.235
Q1	12.45	13.03	0.490	0.513
R	3.81	4.57	0.150	0.180
R1	2.54	3.30	0.100	0.130
S	16.97	17.53	0.668	0.690
T	20.34	20.85	0.801	0.821
U	1.65	2.03	0.065	0.080

**X022 ISOPLUS264TM**  
Weight = 7.5 g



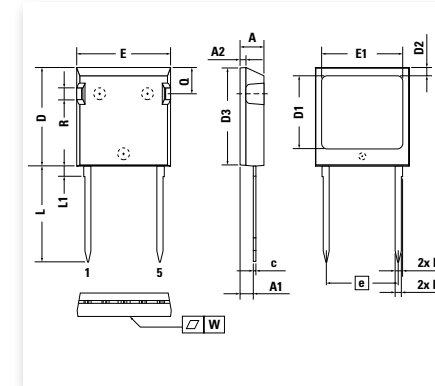
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	1.40	0.046	0.055
b	1.14	1.40	0.045	0.055
b1	1.60	1.83	0.063	0.072
b2	2.54	2.79	0.100	0.110
b3	1.47	1.73	0.058	0.068
c	0.51	0.74	0.020	0.029
D	25.91	26.42	1.020	1.040
E	19.56	20.29	0.770	0.799
e	3.81 BSC		0.150 BSC	
L	19.81	21.83	0.780	0.820
L1	2.03	2.59	0.080	0.102
Q	5.33	5.97	0.210	0.235
Q1	12.45	13.03	0.490	0.513
R	3.81	4.57	0.150	0.180
R1	2.54	3.30	0.100	0.130
S	16.97	17.53	0.668	0.690
T	20.34	20.85	0.801	0.821
U	1.65	2.03	0.065	0.080

**X024d ISOPLUS i4-PAC™**  
Weight = 6 g



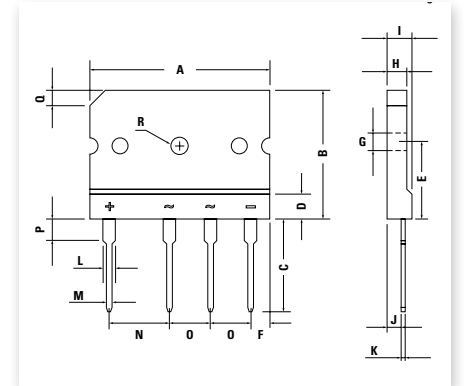
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	3.81	BSC	0.150	BSC
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

**X024e ISOPLUS i4-PAC™**  
Weight = 6 g



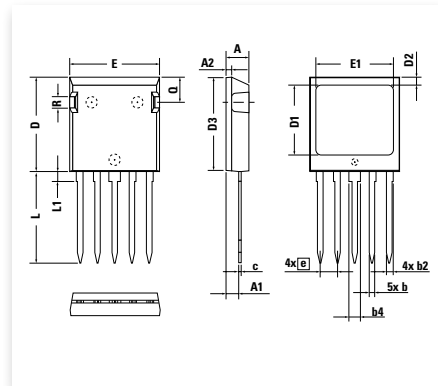
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	15.24	BSC	0.600	BSC
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

**X025a GBFP**  
Weight = 7 g



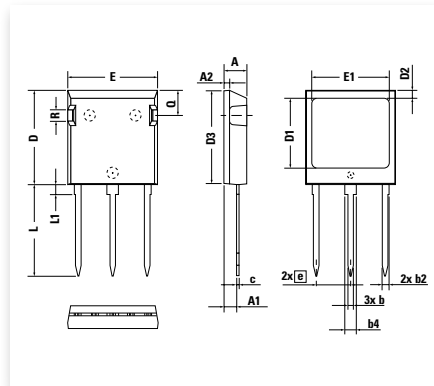
Dim	Millimeters		Inches	
	min	max	min	max
A	29.70	30.30	1.170	1.194
B	19.70	20.30	0.776	0.800
C	17.00	18.00	0.670	0.709
D	4.70	4.90	0.185	0.193
E	10.80	11.20	0.426	0.441
F	2.30	2.70	0.091	0.106
G	3.10	3.40	0.122	0.134
H	3.40	3.80	0.134	0.150
I	4.40	4.80	0.173	0.189
J	2.50	2.90	0.099	0.114
K	0.60	0.80	0.024	0.032
L	2.00	2.40	0.079	0.095
M	0.90	1.10	0.035	0.043
N	9.80	10.20	0.386	0.402
O	7.30	7.70	0.288	0.303
P	3.80	4.20	0.150	0.165
Q	(3.0) × 45°		(0.118) × 45°	
ØR	3.1	3.4	0.122	0.134

**X024a ISOPLUS i4-PAC™**  
Weight = 6 g



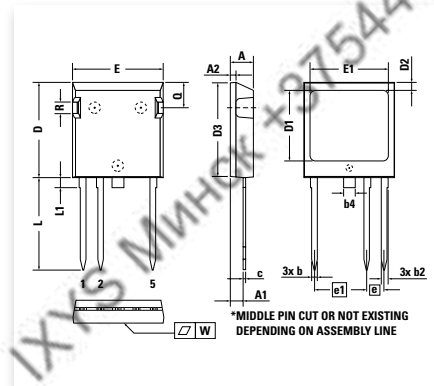
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	3.81 BSC		0.150 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

**X024b ISOPLUS i4-PAC™**  
Weight = 5.5 g



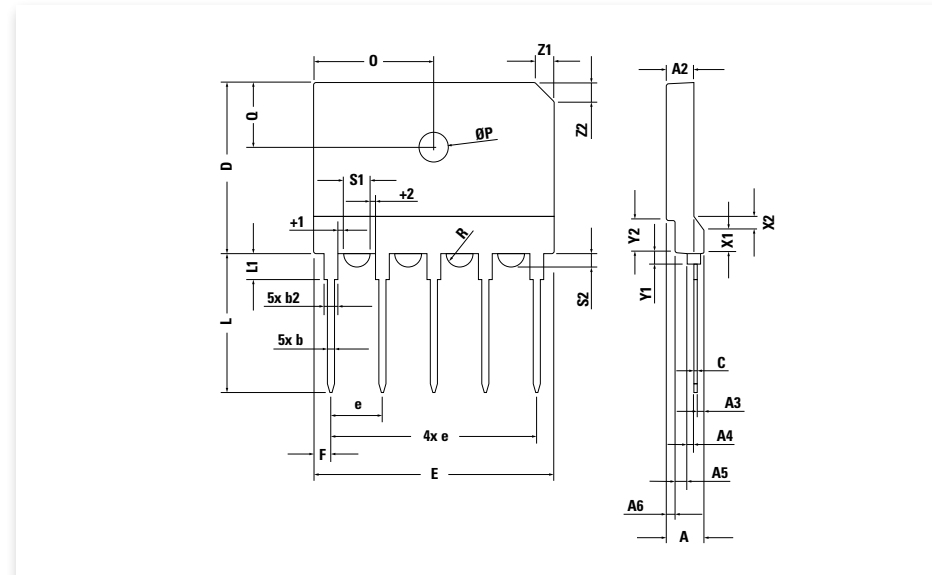
Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	7.62 BSC		0.300 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

**X024c ISOPLUS i4-PAC™**  
Weight = 5.5 g



Dim	Millimeters		Inches	
	min	max	min	max
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4*	2.54	2.79	0.100	0.110
c	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
D3	20.30	20.70	0.799	0.815
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	3.81 BSC		0.150 BSC	
e1	11.43 BSC		0.450 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	-	0.10	-	0.004

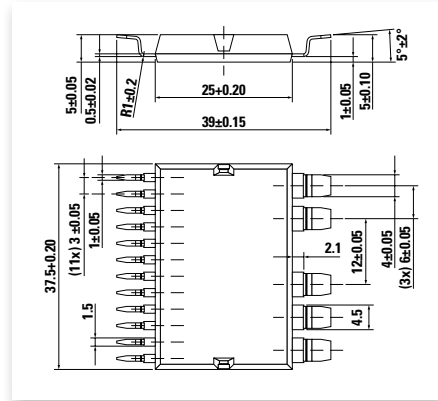
**X025b GUPF**  
Weight = 8.5 g



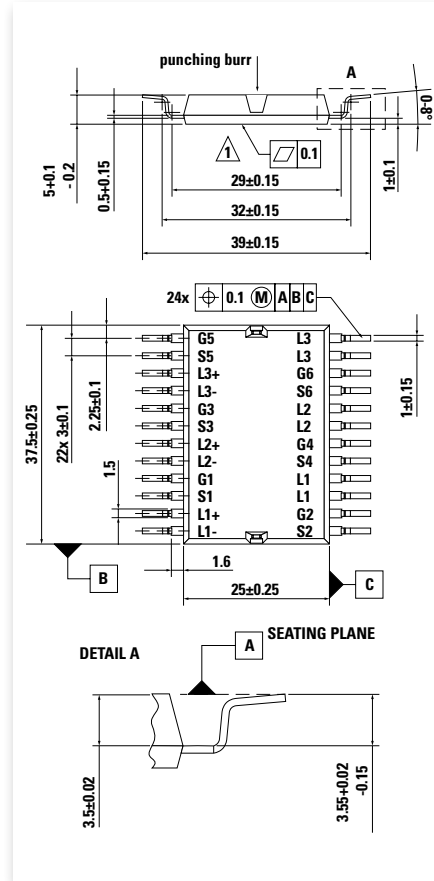
Dim	Millimeters			Inches		
	min	typ.	max	min	typ.	max
A	5.40	5.50	5.60	0.213	0.217	0.221
A2	3.90	4.00	4.10	0.154	0.158	0.162
A3	0.95	1.00	1.10	0.037	0.039	0.043
A4	0.95	1.00	1.05	0.037	0.039	0.041
A5	1.60	1.70	1.80	0.063	0.067	0.071
A6	1.25	1.30	1.35	0.049	0.051	0.053
b	0.95	1.00	1.05	0.037	0.039	0.041
b2	1.95	2.00	2.05	0.077	0.079	0.081
C	0.45	0.50	0.55	0.018	0.020	0.022
D	24.80	25.00	25.20	0.977	0.985	0.993
E	34.70	35.00	35.30	1.367	1.379	1.391
e	BSC 7.50		-	BSC 0.296		-
F	2.40	2.50	2.60	0.095	0.099	0.102
L	2.30	2.40	2.50	0.091	0.094	0.099
L1	3.70	3.75	3.80	0.146	0.148	0.150
O	17.40	17.50	17.60	0.686	0.690	0.693
ØP	4.10	4.20	4.30	0.162	0.165	0.169
Q	9.20	9.30	9.40	0.362	0.366	0.370
Ø/2 R	-	1.77	-	-	0.070	-
s1	3.45	3.50	3.55	0.136	0.138	0.140
s2	1.45	1.50	1.55	0.057	0.059	0.061
t1	0.95	1.00	1.05	0.037	0.039	0.041
t2	0.95	1.00	1.05	0.037	0.039	0.041
x1	3.20	3.30	3.40	0.126	0.130	0.134
x2	1.90	2.00	2.10	0.075	0.079	0.083
y1	1.60	1.65	1.70	0.063	0.065	0.067
y2</						

# Outline Drawings

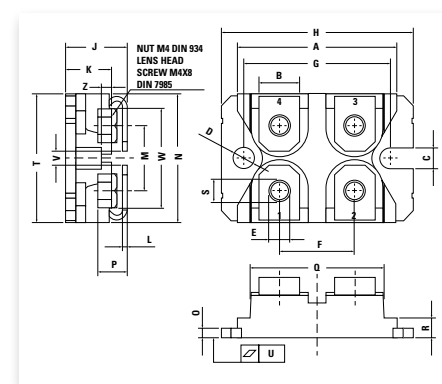
**X026c ISOPLUS™-DIL (SMD)**  
Weight = 13 g



**X026d ISOPLUS™-DIL (SMD)**  
Weight = 13 g



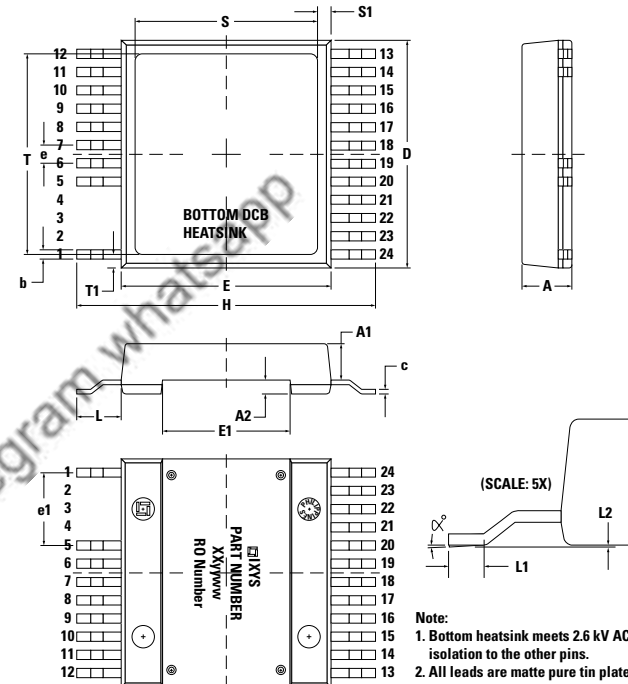
**X027a SOT-227 B miniBLOC** Weight = 29 g  
**X027b SOT-227 UI miniBLOC**



Dim	Millimeters		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

**X031...\* SMPD- x**  
Weight = 8.5 g\*

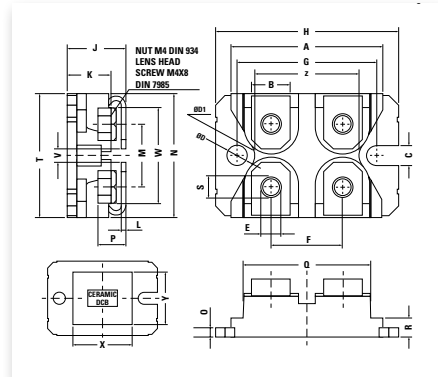
\* See data sheet for pin arrangement



Note:  
1. Bottom heatsink meets 2.6 kV AC isolation to the other pins.  
2. All leads are matte pure tin plated.

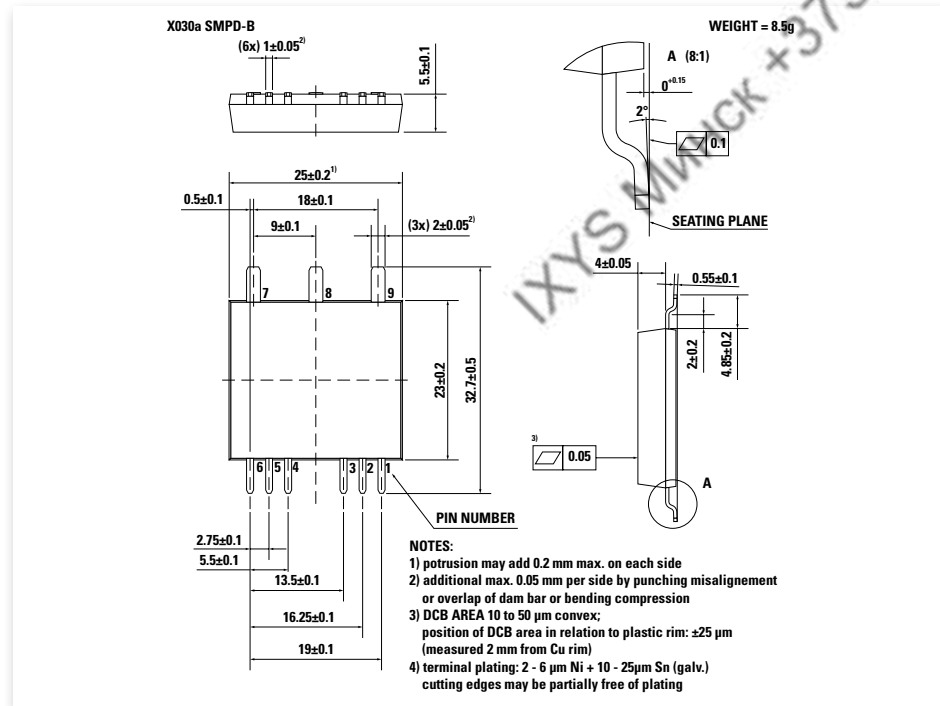
Dim	Millimeters		Inches	
	min	max	min	max
A	5.30	5.70	0.209	0.224
A1	3.90	4.10	0.154	0.161
A2	1.40	1.60	0.055	0.063
b	0.90	1.15	0.035	0.045
c	0.45	0.65	0.018	0.026
D	24.80	25.25	0.976	0.994
E	22.80	23.25	0.898	0.915
E1	13.80	14.20	0.543	0.559
e	2.00	BSC	0.079	BSC
e1	8.00	BSC	0.315	BSC
H	32.30	33.30	1.272	1.311
L	4.60	5.30	0.181	0.209
L1	1.30	1.70	0.051	0.067
L2	0.00	0.15	0.000	0.006
S	18.85	20.12	0.742	0.792
S1	1.45	2.08	0.057	0.082
T	20.90	22.17	0.823	0.873
T1	1.42	2.03	0.056	0.080
a	4°	-	4°	-

**X028 ISOPLUS227™**  
Weight = 19 g



Dim	Millimeters		Inches	
	min	max	min	max
A	31.50	32.26	1.240	1.270
B	7.87	8.38	0.310	0.330
C	3.94	4.19	0.155	0.165
D	3.94	4.19	0.155	0.165
D1	3.81	3.98	0.150	0.157
E	4.06	4.27	0.160	0.168
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.489	1.505
J	11.81	12.22	0.465	0.481
K	9.40	9.65	0.370	0.380
L	0.76	0.84	0.030	0.033
M	12.60	12.85	0.496	0.506
N	25.15	25.42	0.990	1.001
O	2.54	2.64	0.100	0.105
P	4.95	5.97	0.195	0.235
Q	26.54	26.90	1.045	1.059
R	4.06	4.32	0.160	0.170
S	4.72	4.85	0.186	0.191
T	24.59	25.07	0.968	0.987
U	-0.03	0.05	-0.001	0.002
V	3.30	4.06	0.130	0.160
W	19.81	21.08	0.780	0.830
X	19.56	20.57	0.770	0.810
Y	17.27	18.29	0.680	0.720
Z	22.48	22.66	0.885	0.892

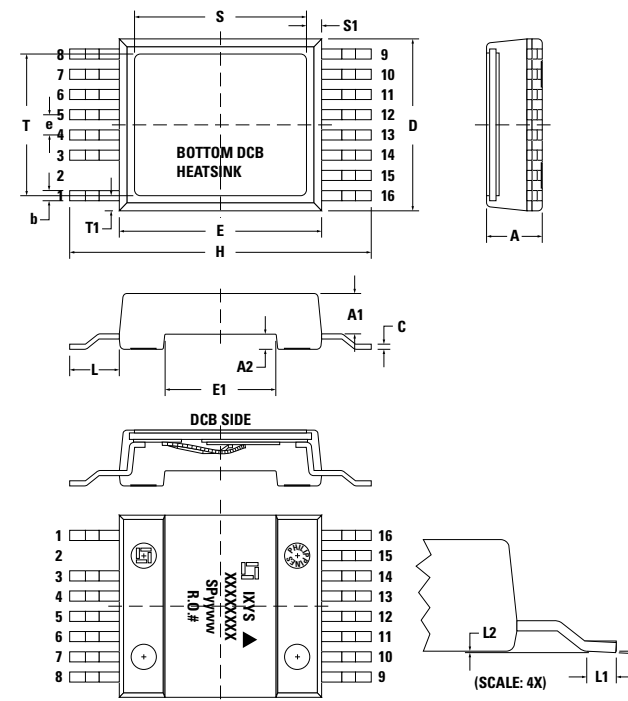
**X030a SMPD-B**  
Weight = 8.5 g



NOTES:  
1) protrusion may add 0.2 mm max. on each side  
2) additional max. 0.05 mm per side by punching misalignment or overlap of dam bar or bending compression  
3) DCB AREA 10 to 50 µm convex; position of DCB area in relation to plastic rim: ±25 µm (measured 2 mm from Cu rim)  
4) terminal plating: 2 - 6 µm Ni + 10 - 25µm Sn (galv.) cutting edges may be partially free of plating

**X032...\* MiniSMPD- x**

\* See data sheet for pin arrangement



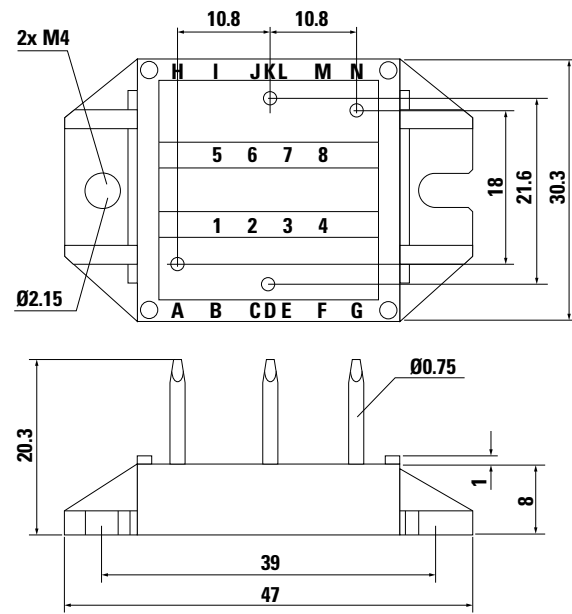
Dim	Millimeters		Inches	
	min	max	min	max
A	5.30	5.70	0.209	0.224
A1	3.90	4.10	0.154	0.161
A2	1.40	1.60	0.055	0.063
b	0.90	1.15	0.035	0.045
c	0.45	0.65	0.018	0.026
D	16.80	17.20	0.661	0.677
E	19.80	20.20	0.780	0.795
E1	10.80	11.20	0.425	0.441
e	2.00	BSC	0.079	BSC
H	29.50	30.10	1.161	1.185
L	4.60	5.30	0.181	0.209
L1	1.30	1.70	0.051	0.067
L2	0.00	0.15	0.000	0.006
S	16.80	17.20	0.661	0.677
S1	1.30	1.70	0.051	0.067
T	13.80	14.20	0.543	0.559
T1	1.30	1.70	0.051	0.067

Note:  
1. All leads are matte pure tin plated.  
2. Cu surface of bottom DCB is pre-Ni plated unless otherwise.  
3. Cu surface of bottom DCB is electrically isolated 2.500V AC from all other leads.  
4. Unless other specified, pin out are as follows:  
Pin #1 - Gate  
Pin #3 - Gate return or source  
Pin #4 through #8 - Source (emitter)  
Pin #9 through #16 - Drain (collector)



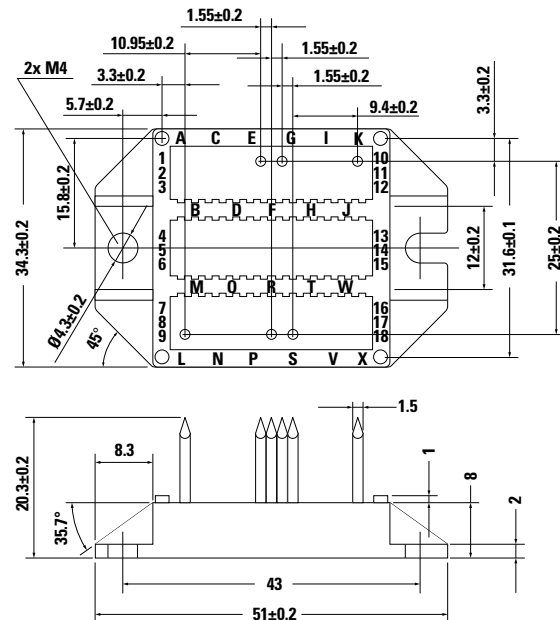
**X101 ECO-PAC1**  
Weight = 19 g

\* See data sheet for pin arrangement



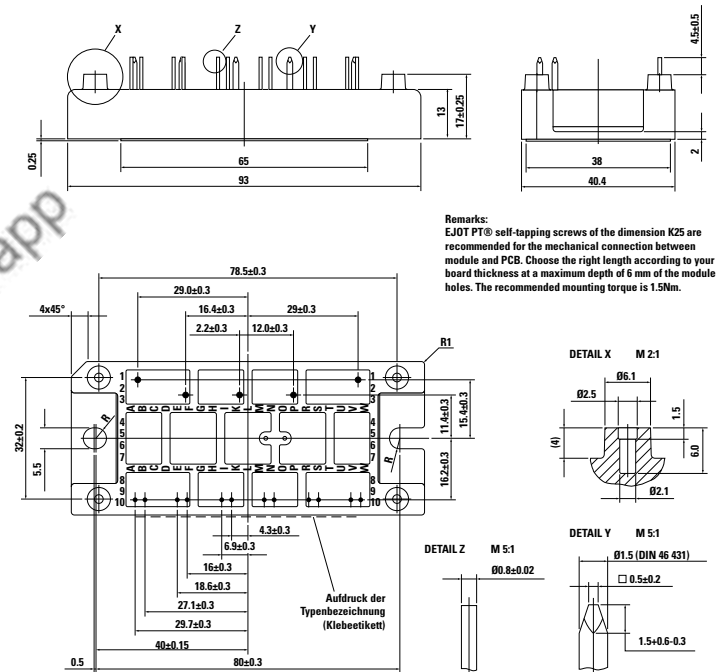
**X102 ECO-PAC2**  
Weight = 23 g

\* See data sheet for pin arrangement



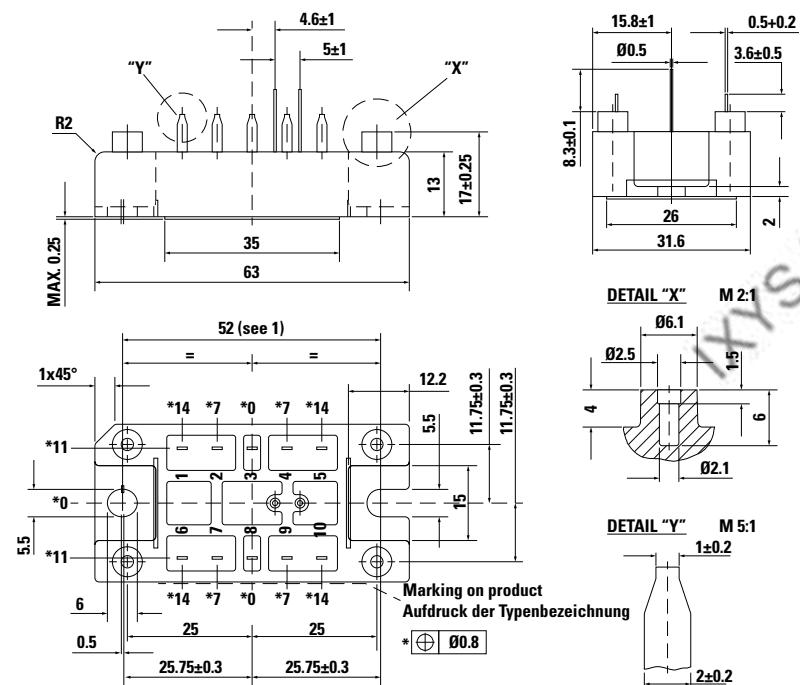
**X104 V2-Pack**  
Weight = 76 g

\* See data sheet for pin arrangement



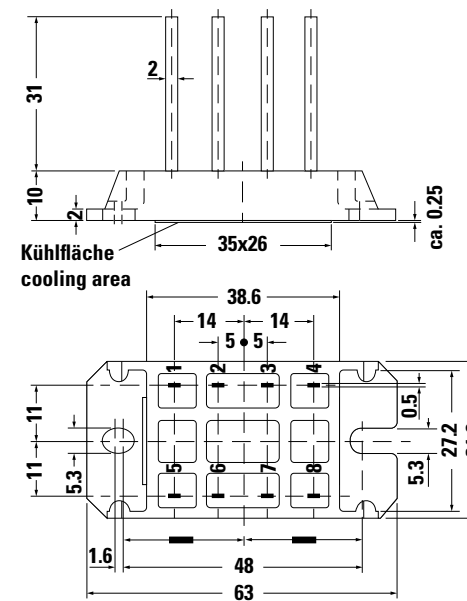
**X103 V1-A-Pack**  
Weight = 37 g

\* See data sheet for pin arrangement



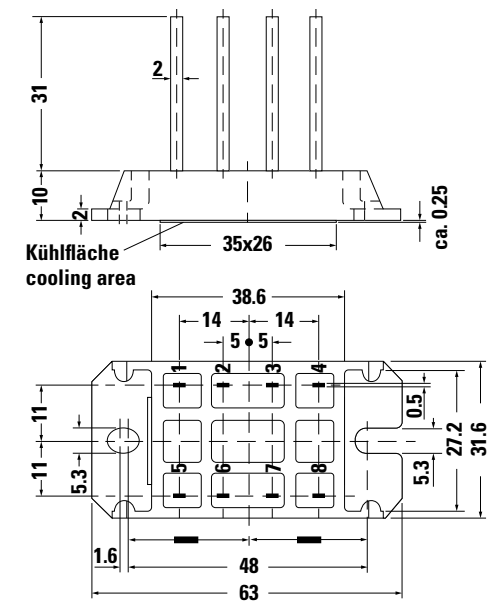
**X105 V1-B-Pack**

a: pin length = 31 mm  
b: pin length = 16 mm  
Weight = 30 g  
Weight = 28 g



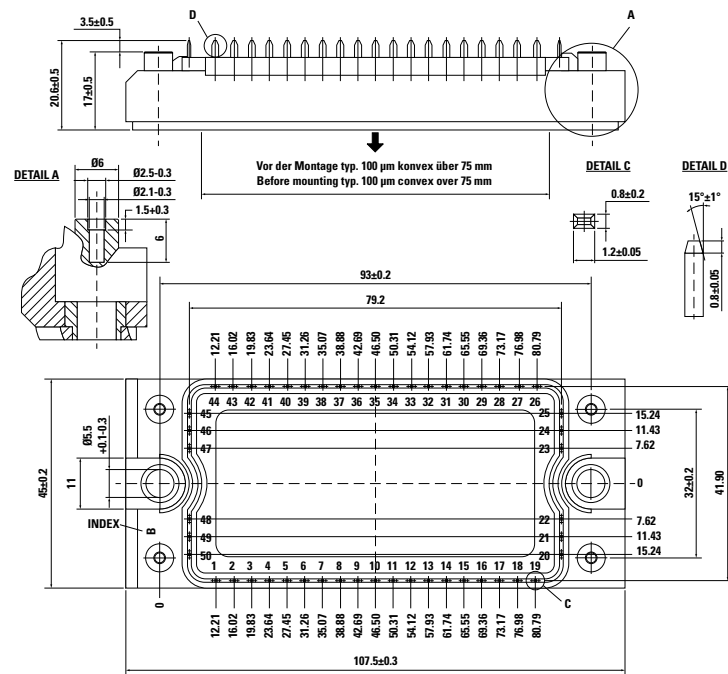
**X105c V1-B-Pack**  
Weight = 25 g

\* See data sheet for pin arrangement



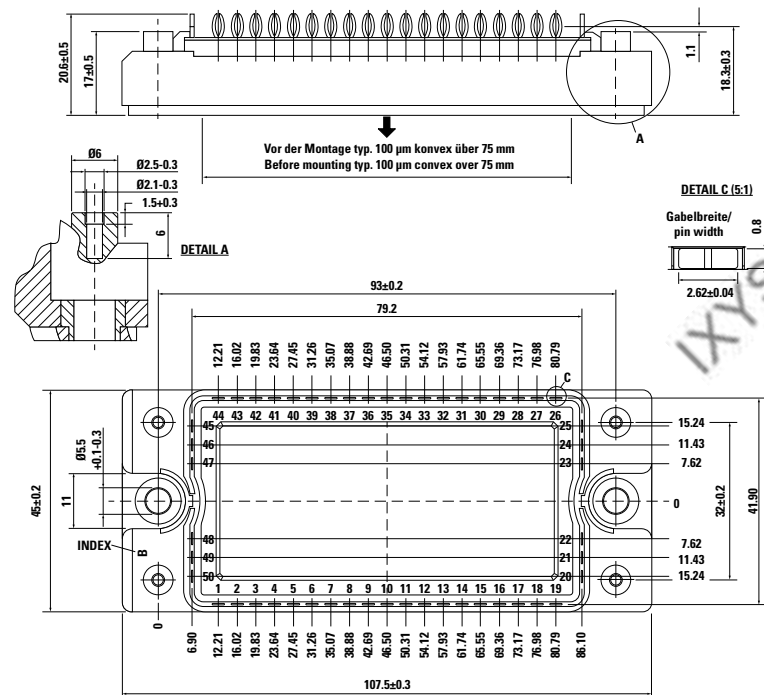
**X112 E2-Pack**  
Weight = 176 g

\* See data sheet for pin arrangement



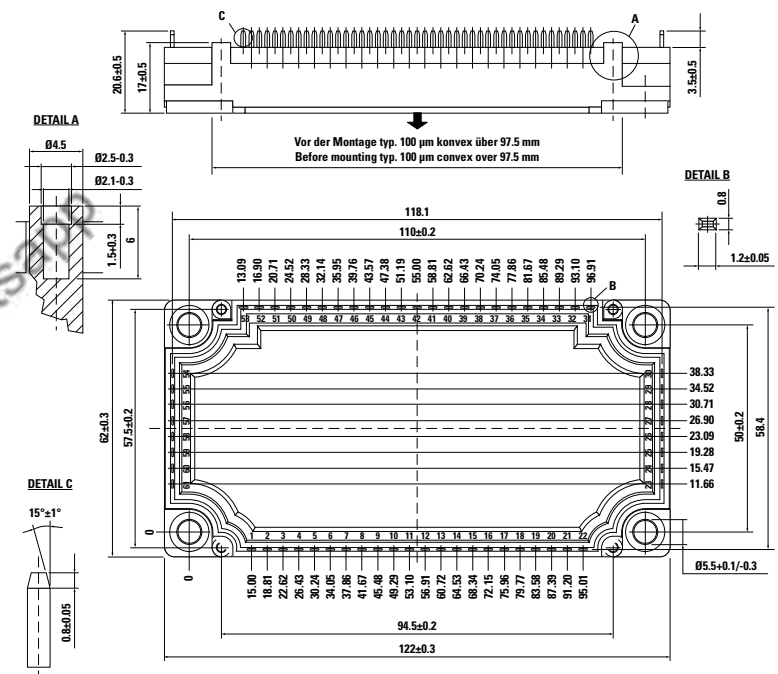
**X112a E2-Pack PFP**  
Weight = 176 g

\* See data sheet for pin arrangement



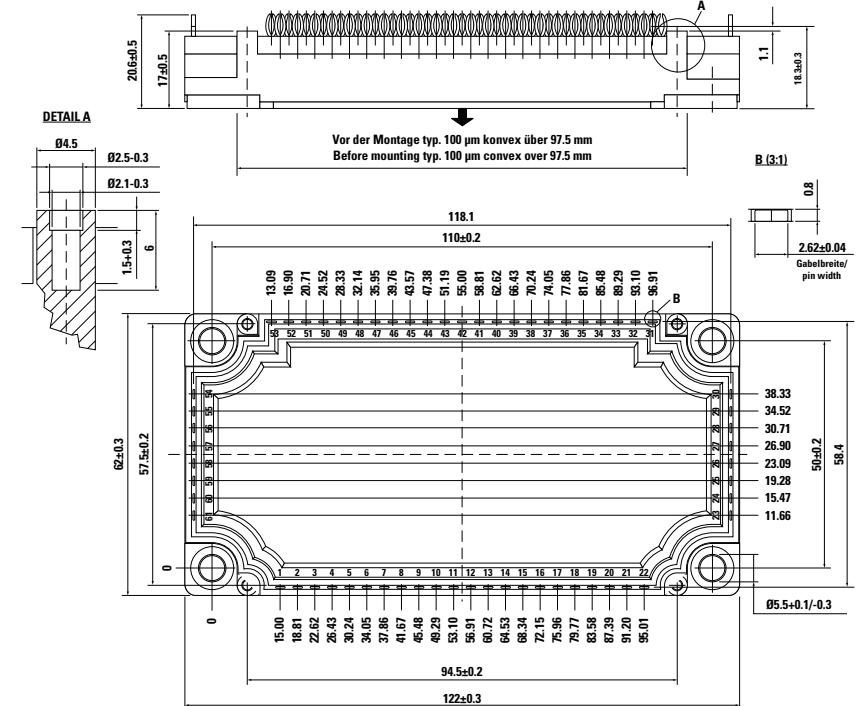
**X113 E3-Pack**  
Weight = 270 g

\* See data sheet for pin arrangement

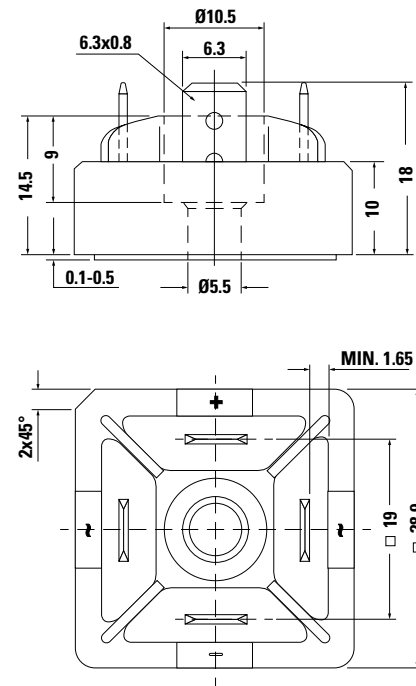


**X113a E3-Pack PFP**  
Weight = 270 g

\* See data sheet for pin arrangement

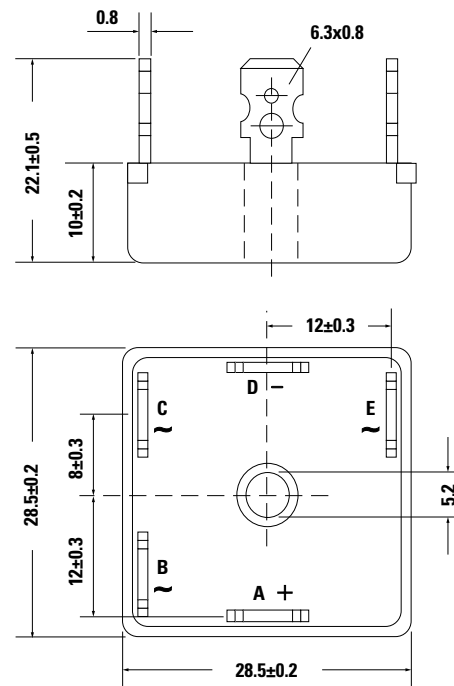


**X115 FO-A**  
Weight = 15 g



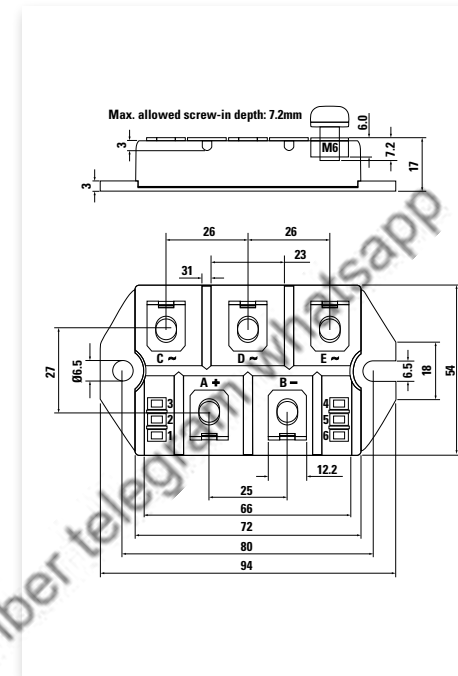
**X116 FO-B**

a: VUO Weight = 20 g  
b: w/o terminal C (VBO) Weight = 19 g



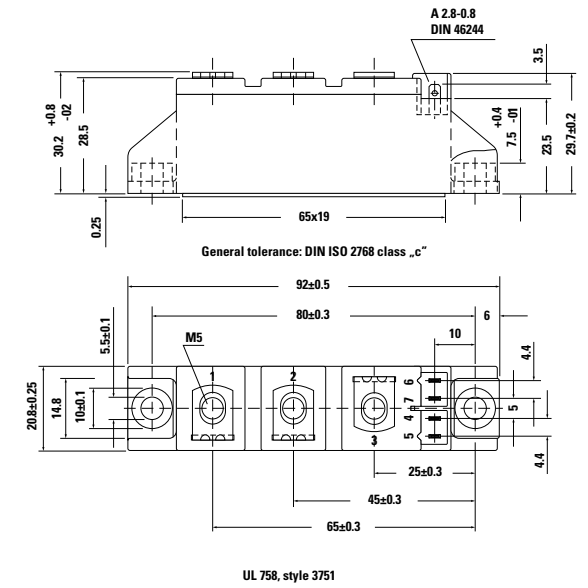
**X123 PWS-E Flat**

w/o terminal 1, 2, 3, 4, 5 & 6 (VUO) Weight = 159 g



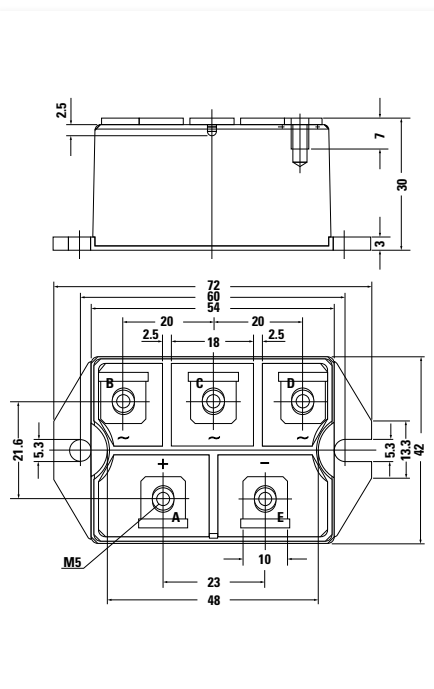
**X125 TO-240AA**

a, z: + Kelvin contact (MCC) Weight = 81 g  
b, y: + Kelvin contact, w/o pin 6 & 7 (MCD) Weight = 81 g  
c: w/o Kelvin contact 4 & 7 (MCC) Weight = 81 g  
d: w/o Kelvin contact 4, 7 & pin 6 (MCD) Weight = 81 g  
e: w/o terminal D, 1, 2, 3, 4, 5 & 6 (VBO) Weight = 81 g  
y, z: w/o metal inserts



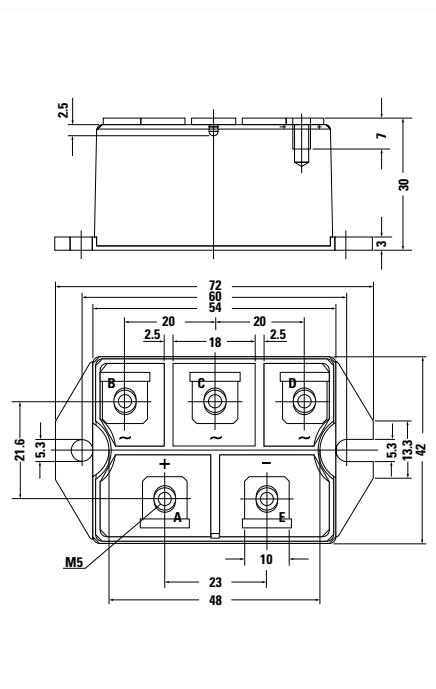
**X122 PWS-D**

a: VUO Weight = 159 g  
b: w/o terminal C (VBO) Weight = 153 g



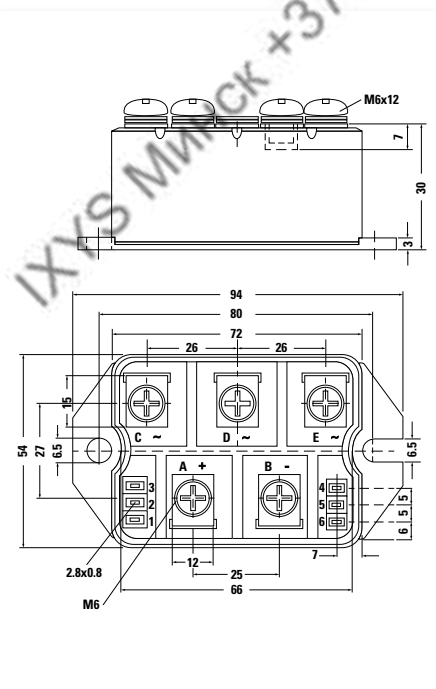
**X122 PWS-D Flat**

c: VUO Weight = 118 g



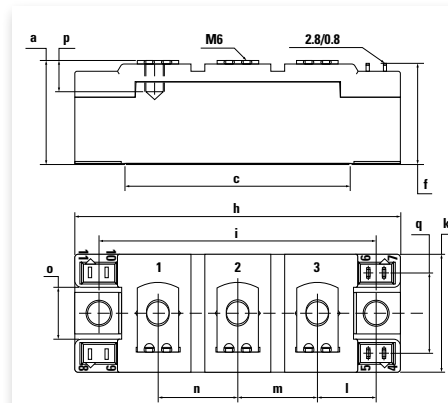
**X123 PWS-E**

a: VTO Weight = 284 g  
b: w/o terminal 4, 5 & 6 (VWZ) Weight = 284 g  
c: w/o terminal 1, 2, 3, 4, 5 & 6 (VUO) Weight = 284 g  
d: w/o terminal D, 3, 4, 5 & 6 (VHF) Weight = 273 g  
e: w/o terminal D, 1, 2, 3, 4, 5 & 6 (VBO) Weight = 273 g



**X126 Y4-M6**

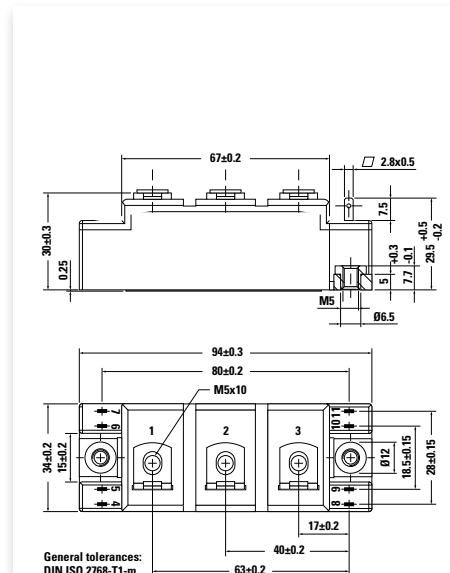
a, z: + Kelvin cont., w/o pin 8 up to 11 (MCC) Weight = 131 g  
b, y: + Kelvin cont., w/o pin 6 up to 11 (MCD) Weight = 131 g  
c: w/o pin 4 up to 11 (MDD) Weight = 126 g  
d: w/o terminal 2 & pin 4 up to 11 (MEO) Weight = 108 g  
y, z: with metal inserts



Dim	Millimeters		Inches	
	min	max	min	max
a	30.0	30.6	1.181	1.205
c	64.0	65.0	2.520	2.559
f	28.6	29.2	1.126	1.150
h	93.5	94.5	3.681	3.720
i	79.5	80.5	3.130	3.169
j	4.8	5.2	0.189	0.205
k	33.4	34.0	1.315	1.339
l	16.7	17.3	0.657	0.681
m	22.7	23.3	0.894	0.917
n	22.7	23.3	0.894	0.917
o	14.0	15.0	0.551	0.591
p	typ. 10.5		typ. 0.413	
q	22.8	23.3	0.898	0.917

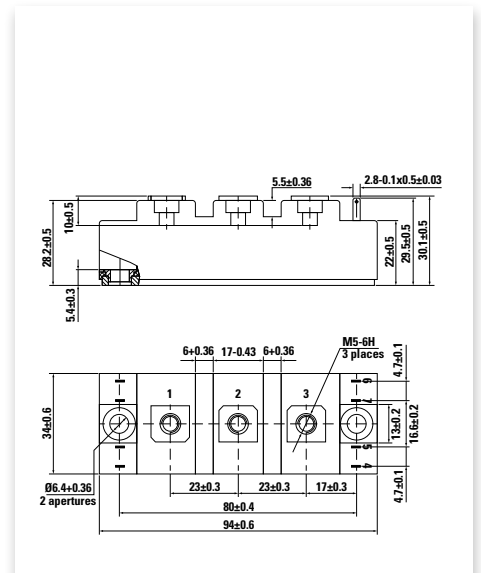
**X127 Y4-M5**

a: w/o pin 8 up to 11 (MI) Weight = 110 g  
b: w/o pin 6 up to 11 (MID) Weight = 108 g  
c: w/o pin 4, 5 & 8 up to 11 (MDI) Weight = 108 g



**X127 Y4-M5-A**

d: w/o pin 8 up to 11 (...PF.) Weight = 170 g  
e: w/o pin 6 up to 11 (...RF.) Weight = 168 g  
f: w/o pin 4, 5 & 8 up to 11 (...QF.) Weight = 166 g

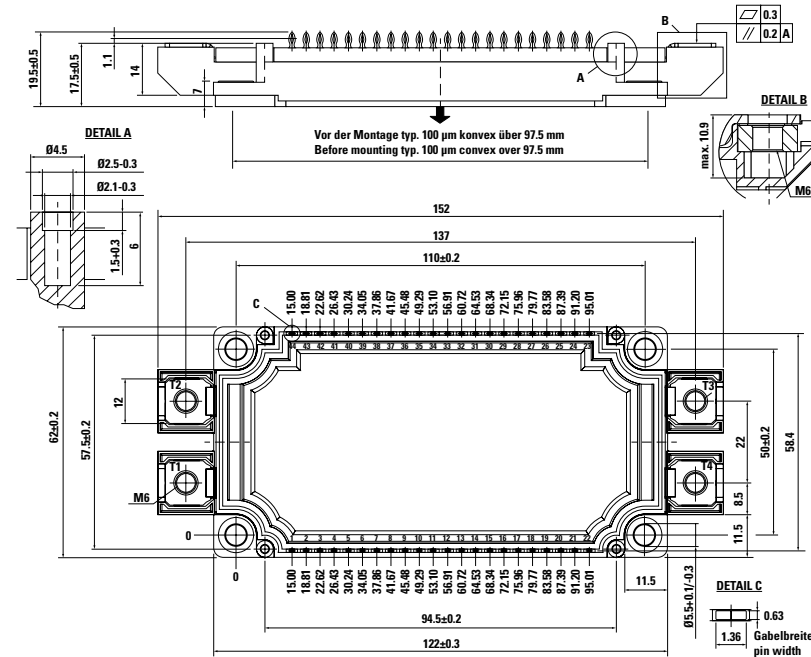




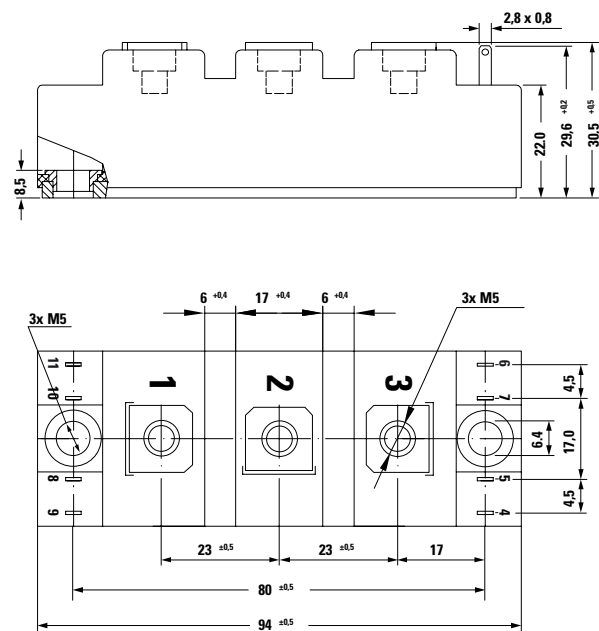


**X143a SimBus F PFP**  
Weight = 150 g

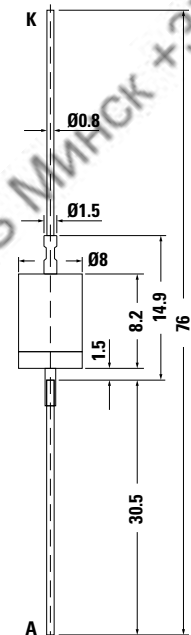
\* See data sheet for pin arrangement



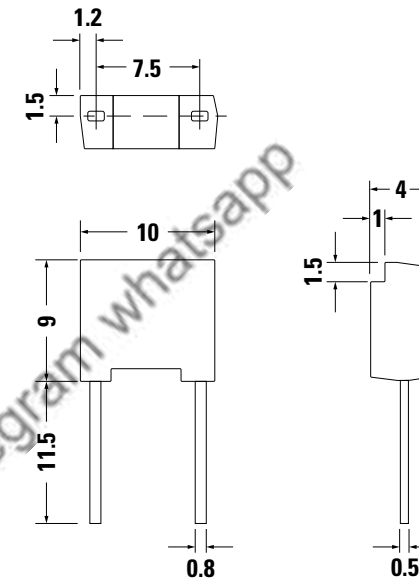
**Modul-34mm**  
Weight = 160 g



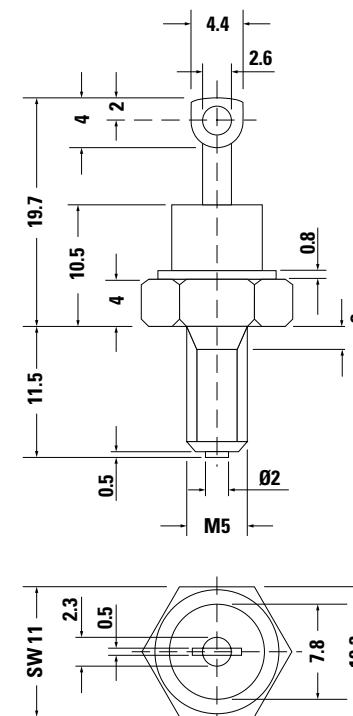
**X200 Metal-can**  
Weight = 2.5 g



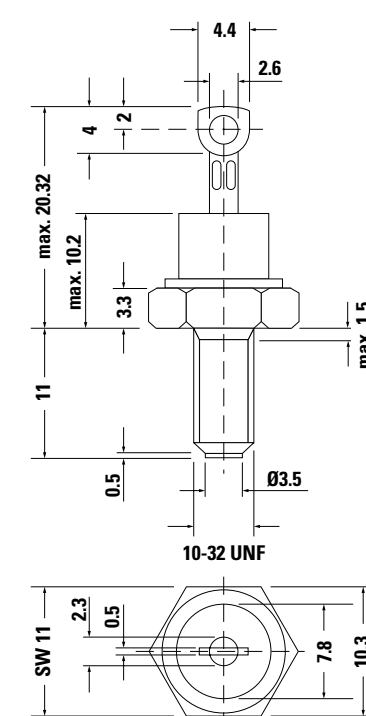
**X201 FP-Case (oilproof)**  
Weight = 0.9 g



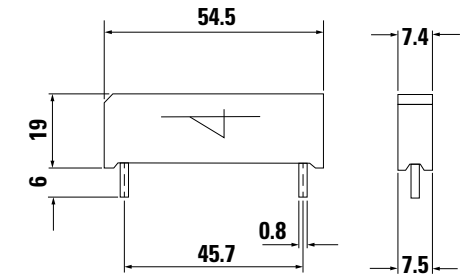
**X204 DO-203 AA [M] (DO-4)**  
Weight = 6 g



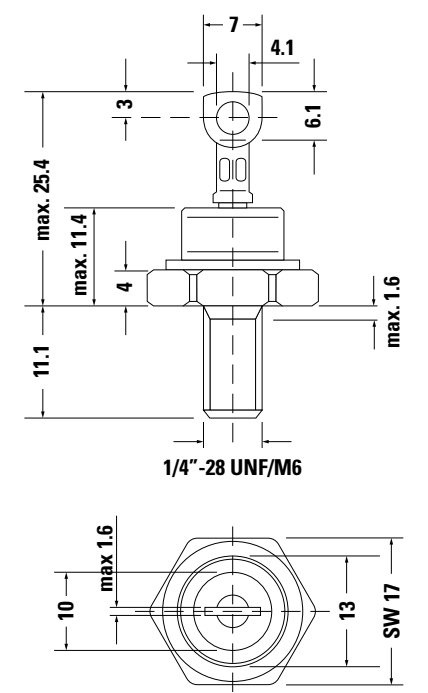
**X205 DO-203 AA [UNF] (DO-4)**  
Weight = 5.5 g



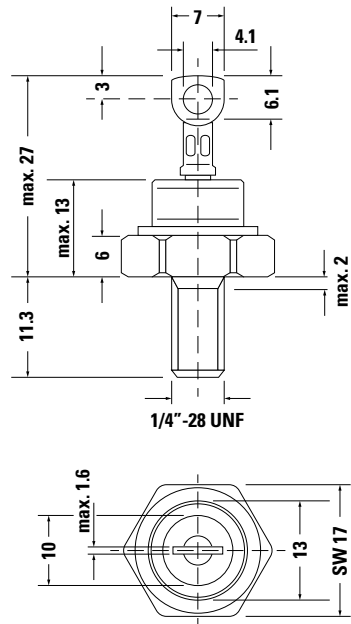
**X202 BOD-Package**  
Weight = 9.5 g



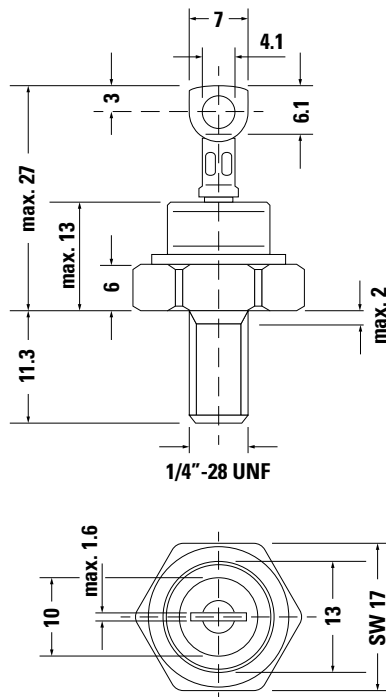
**X206a DO-203 AB [UNF] (DO-5)**  
**X206b DO-203 AB [M] (DO-5)**  
Weight = 14 g



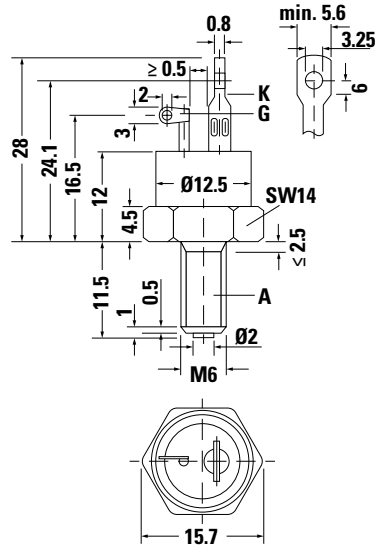
**X207 DO-203 AB (DO-5)**  
Weight = 20 g



**X207 DO-203 AB (DO-5)**  
Weight = 20 g

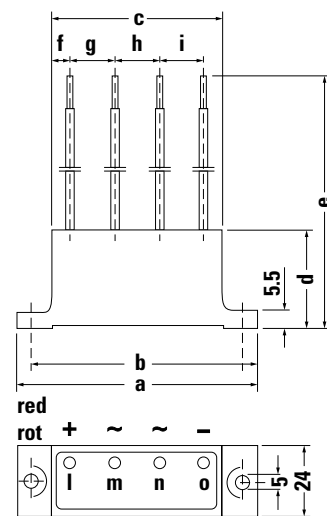


**X209 TO-208 AA (TO-48)**  
Weight = 11.6 g



**X252 UG**  
Weight = 155 g

\* See data sheet for pin arrangement

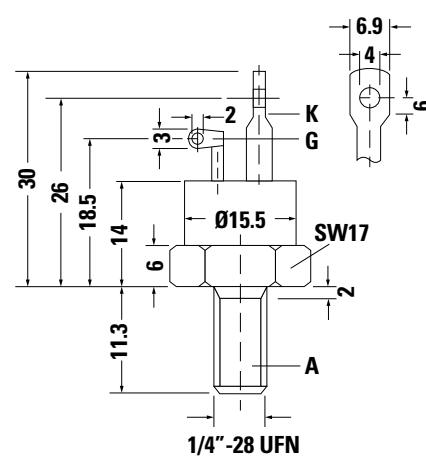


Type	a	b	c	d	e	f	g	h	i	k
UGB 3132 AD	80	70	57	58.5	260	6	15	15	15	-
UGB 6124 AG	135	125	112	58.5	260	11	32.5	25	32.5	-
UGD 6123 AG	135	125	112	58.5	260	8	30	18	18	30
UGD 8124 AG	135	125	112	58.5	260	8	30	18	18	30

Dimensions in mm

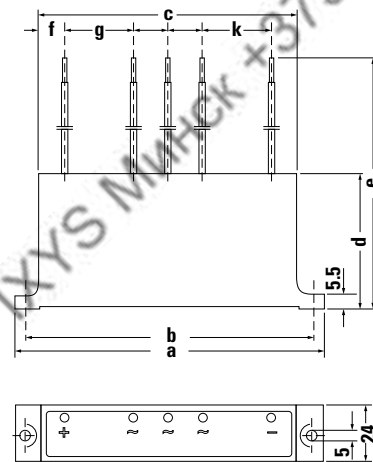
**X210 TO-208 AC (TO-65)**  
Weight = 21.7 g

\* See data sheet for pin arrangement

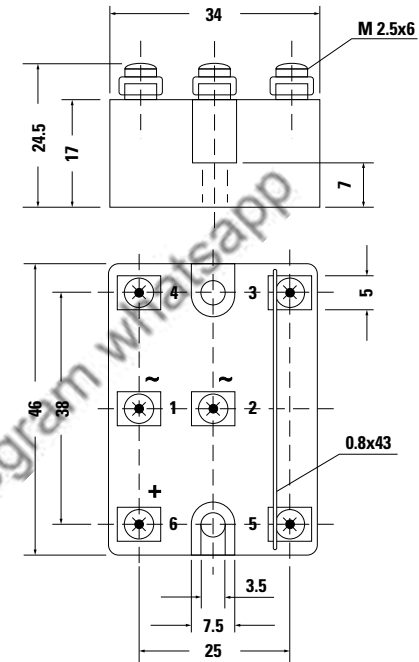


**X253a UG**  
Weight = 310 g

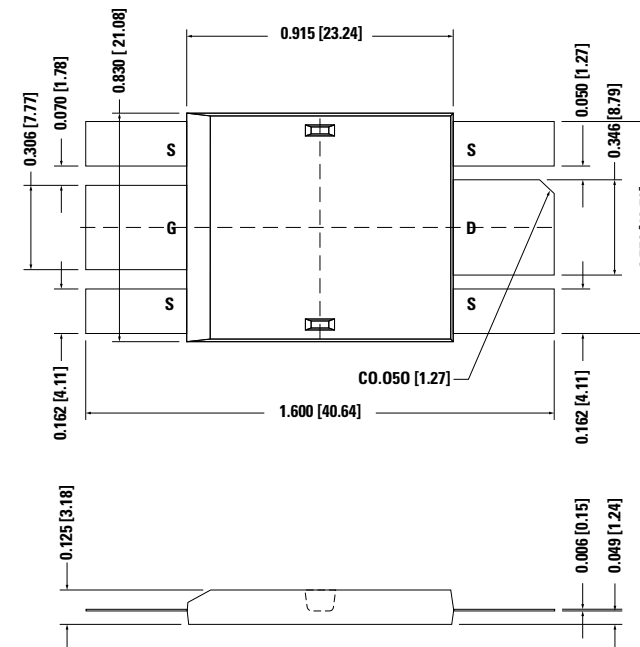
b: w/o middle terminal



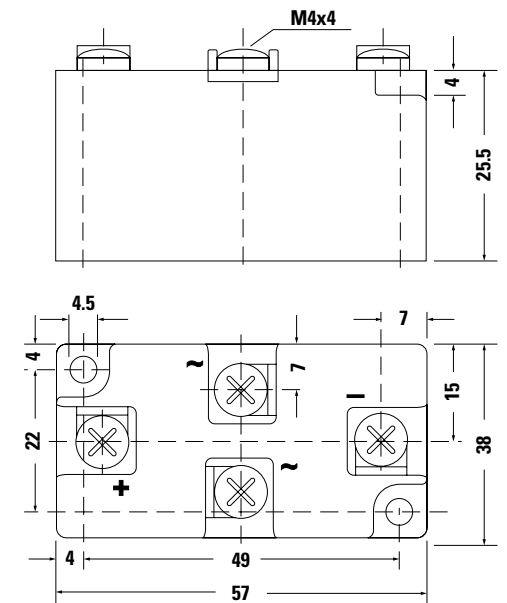
**X254 VG-A**  
Weight = 61 g



**D5 DE475**

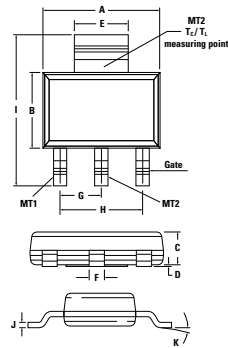


**X255 VG-B**  
Weight = 87 g



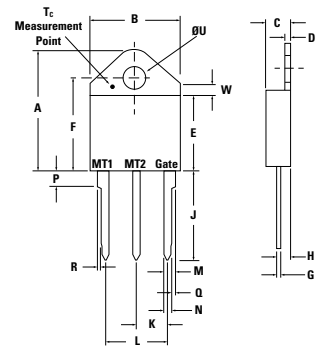


**L001 SOT-223**  
Weight = 0.11 g



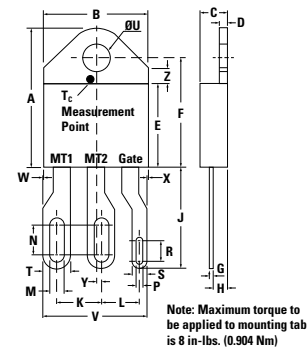
Dim	Millimeters			Inches		
	min	typ	max	min	typ	max
A	6.30	6.50	6.70	0.248	0.256	0.264
B	3.30	3.50	3.70	0.130	0.138	0.146
C	-	-	1.80	-	-	0.071
D	0.02	-	0.10	0.001	-	0.004
E	2.90	3.00	3.15	0.114	0.118	0.124
F	0.60	0.70	0.85	0.024	0.027	0.034
G	-	2.30	-	-	0.090	-
H	-	4.60	-	-	0.181	-
I	6.70	7.00	7.30	0.264	0.276	0.287
J	0.24	0.26	0.35	0.009	0.010	0.014
K	10° max					

**L002 TO-218AC**  
Weight = 5 g



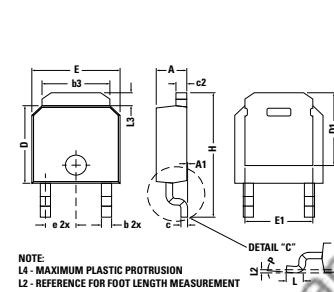
Dim	Millimeters		Inches	
	min	max	min	max
A	20.57	21.21	0.810	0.835
B	15.49	16.00	0.610	0.630
C	4.52	4.78	0.178	0.188
D	1.40	1.78	0.055	0.070
E	12.37	12.62	0.487	0.497
F	16.13	16.64	0.635	0.655
G	0.56	0.74	0.022	0.029
H	1.91	2.41	0.075	0.095
J	14.61	15.88	0.575	0.625
K	5.36	5.56	0.211	0.219
L	10.72	11.10	0.422	0.437
M	1.47	1.73	0.058	0.068
N	1.14	1.40	0.045	0.055
P	2.41	2.92	0.095	0.115
Q	0.20	0.41	0.008	0.016
R	0.20	0.41	0.008	0.016
U	4.10	4.20	0.164	0.165
W	2.17	2.42	0.085	0.095

**L002a TO-218 x**  
Weight = 5.2 g



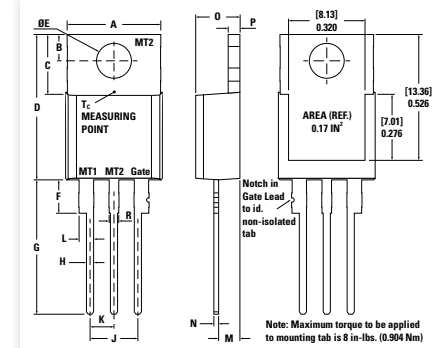
Dim	Millimeters		Inches	
	min	max	min	max
A	20.57	21.21	0.810	21.210
B	15.49	16.00	0.610	16.000
C	4.52	4.78	0.178	4.780
D	1.40	1.78	0.055	1.780
E	12.37	12.62	0.487	12.620
F	16.13	16.64	0.635	16.640
G	0.56	0.74	0.022	0.740
H	1.91	2.41	0.075	2.410
J	14.61	15.88	0.575	15.880
K	6.50	6.71	0.256	6.710
L	5.58	5.79	0.220	5.790
M	2.03	2.24	0.080	2.240
N	4.29	4.49	0.169	4.490
P	0.86	1.07	0.034	1.070
R	2.87	3.07	0.113	3.070
S	2.18	2.44	0.086	2.440
T	3.96	4.22	0.156	4.220
U	0.41	0.42	0.164	0.420
V	15.31	15.70	0.603	15.700
W	0.00	0.13	0.000	0.130
X	0.07	0.30	0.003	0.300
Y	0.71	0.81	0.028	0.810
Z	2.17	2.42	0.085	2.420

**L005a TO-220AB (NON-ISO)**  
Weight = 2 g



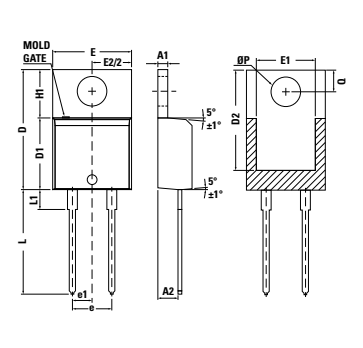
Dim	Millimeters			Inches		
	min	nom	max	min	nom	max
A	2.16	2.29	2.41	0.085	0.090	0.095
A1	0	0.08	0.13	0	0.003	0.005
b	0.64	0.76	0.89	0.025	0.030	0.035
b3	4.95	5.08	5.46	0.195	0.200	0.215
c	0.46	0.51	0.61	0.018	0.020	0.024
C2	0.46	0.81	0.89	0.018	0.032	0.035
D	5.97	6.10	6.22	0.235	0.240	0.245
D1	5.21	-	-	0.205	-	-
E	6.35	6.60	6.73	0.250	0.260	0.265
E1	4.32	-	-	0.170	-	-
e	2.29 BSC			0.090 BSC		
H	9.40	9.83	10.41	0.370	0.387	0.410
L	1.02	1.14	1.27	0.040	0.045	0.050
L2	0.25 BSC			0.010 BSC		
L3	0.89	-	1.27	0.035	-	0.050
P	0°	-	8°	0°	-	8°

**L005a TO-220AB (NON-ISO)**  
Weight = 2 g



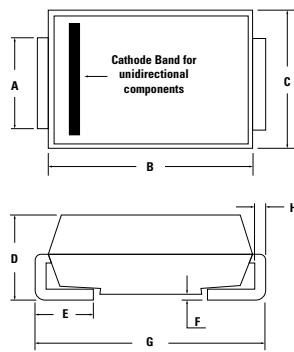
Dim	Millimeters		Inches	
	min	max	min	max
A	9.65	10.67	0.380	0.420
B	2.67	2.92	0.105	0.115
C	5.84	6.35	0.230	0.250
D	14.99	15.75	0.590	0.620
E	3.61	3.73	0.142	0.147
F	2.79	3.30	0.110	0.130
G	13.72	14.61	0.540	0.575
H	0.64	0.89	0.025	0.035
J	4.95	5.21	0.195	0.205
K	2.41	2.67	0.095	0.105
L	1.52	1.91	0.060	0.075
M	2.16	2.41	0.085	0.095
N	0.46	0.61	0.018	0.024
O	4.52	4.78	0.178	0.188
P	1.14	1.52	0.045	0.060
R	0.97	1.22	0.038	0.048

**L005b TO-220AC**  
Weight = 2 g



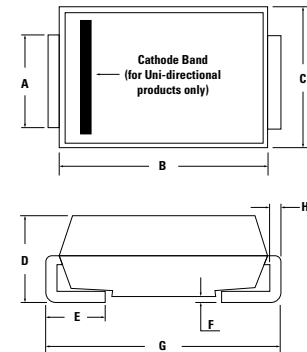
Dim	Millimeters		
	min	nominal	max
A	4.320	4.450	4.570
A1	1.140	1.270	1.400
A2	2.500	-	2.740
b	0.690	-	0.880
b1	0.680	-	0.870
b2	1.230	-	1.390
b3	1.220	1.270	1.380
c	0.360	-	0.503
c1	0.630	-	0.527
D	14.900	-	15.600
D1	8.615	-	9.017
D2	12.840	-	12.950
E	10.000	10.180	10.360
E1	7.570	7.610	7.680
e1	2.490	2.540	2.590
e	5.030	5.080	5.130
H1	6.295	6.545	6.795
L	13.000	13.500	14.000
L1	2.390	-	3.250
oP	3.710	3.840	3.960
Q	2.650	-	3.050
R	-	-	0.254

**L003a DO-214AA**  
Weight = 0.1 g



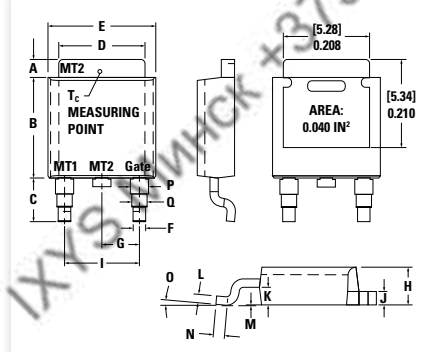
Dim	Millimeters		Inches	
	min	max	min	max
A	1.950	2.200	0.077	0.086
B	4.060	4.570	0.160	0.180
C	3.300	3.940	0.130	0.155
D	2.130	2.440	0.084	0.096
E	0.760	1.520	0.030	0.060
F	-	0.203	-	0.008
G	5.210	5.590	0.205	0.220
H	0.152	0.305	0.006	0.012

**L003b DO-214AB**  
Weight = 0.2 g



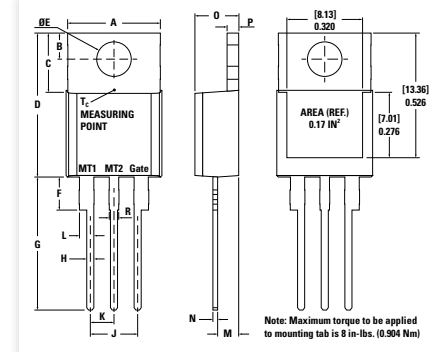
Dim	Millimeters		Inches	
	min	max	min	max
A	2.900	3.200	0.114	0.126
B	6.600	7.110	0.260	0.280
C	5.590	6.220	0.220	0.245
D	2.060	2.620	0.079	0.103
E	0.760	1.520	0.030	0.060
F	-	0.203	-	0.008
G	7.750	8.130	0.305	0.320
H	0.152	0.305	0.006	0.012

**L004 TO-252AA**  
Weight = 0.3 g



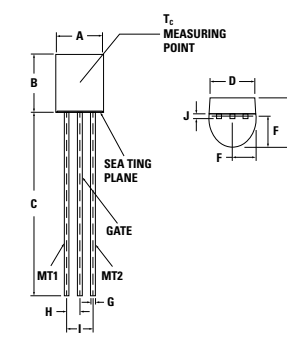
Dim	Millimeters			Inches		
	min	nom	max	min	nom	max
A	0.94	1.01	1.09	0.037	0.040	0.043
B	5.97	6.16	6.22	0.235	0.243	0.245
C	2.69	2.74	2.87	0.106	0.108	0.113
D	5.21	5.29	5.41	0.205	0.208	0.213
E	6.48	6.65	6.73	0.255	0.262	0.265
F	0.69	0.80	0.84	0.027	0.031	0.033
G	2.21	2.28	2.36	0.087	0.090	0.093
H	2.16	2.33	2.41	0.085	0.092	0.095
I	4.47	4.55	4.67	0.176	0.179	0.184
K	0.46	0.51	0.58	0.018	0.020	0.023
L	0.90	0.95	1.00	0.04	0.04	0.04
M	0.46	0.51	0.58	0.018	0.020	0.023
N	0.00	0.00	0.10	0.000	0.000	0.004
O	0.53	0.67	0.69	0.02	0.03	0.03
P	0°	0°	5°	0°	0°	5°
Q	1.06	1.20	1.32	0.042	0.047	0.052
R	0.86	1.00	1.11	0.034	0.039	0.044

**L005c TO-220AB (ISO)**  
Weight = 2 g



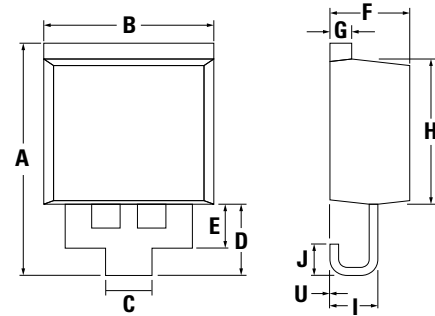
Dim	Millimeters		Inches	
	min	max	min	max
A	9.65	10.67	0.380	0.420
B	2.67	2.92	0.105	0.115
C	5.84	6.35	0.230	0.250
D	14.99	15.75	0.590	0.620
E	3.61	3.73	0.142	0.147
F	2.79	3.30	0.110	0.130
G	13.72	14.61	0.540	0.575
H	0.64	0.89	0.025	0.035
J	4.95	5.21	0.195	0.205
K	2.41	2.67	0.095	0.105
L	1.52	1.91	0.060	0.075
M	2.16	2.41	0.085	0.095
N	0.46	0.61	0.018	0.024
O	4.52	4.78	0.178	0.188
P	1.14	1.52	0.045	0.060
R	0.97	1.22	0.038	0.048

**L006a TO-92**  
**L006b TO-92 (GAK)**  
Weight = 0.2 g



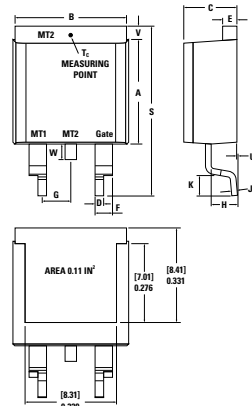
Dim	Millimeters		Inches	
	min	max	min	max
A	4.450	5.200	0.175	0.205
B	4.320	5.330	0.170	0.210
C	12.70	-	0.500	-
D	3.430	-	0.135	-
E	3.180	4.190	0.125	0.165
F	2.			

**L007 SMT0-263**  
Weight = 2.6 g



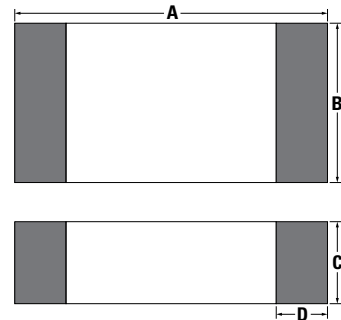
Dim	Millimeters		Inches	
	min	max	min	max
A	14.44	15.24	0.568	0.600
B	9.65	10.67	0.38	0.420
C	2.50	2.90	0.098	0.114
D	4.30	4.80	0.169	0.189
E	2.60	3.00	0.102	0.118
F	4.52	4.78	0.178	0.188
G	1.14	1.52	0.045	0.06
H	9.14	9.40	0.360	0.370
I	2.69	3.09	0.106	0.122
J	1.75	2.25	0.069	0.089
U	0	0.25	0	0.010

**L011b TO-263AB**  
Weight = 1.5 g



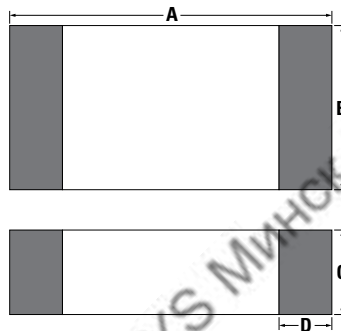
Dim	Millimeters		Inches	
	min	max	min	max
A	9.14	9.40	0.360	0.370
B	9.65	10.67	0.380	0.420
C	4.52	4.78	0.178	0.188
D	0.64	0.89	0.025	0.035
E	1.14	1.52	0.045	0.060
F	1.52	1.91	0.060	0.075
G	2.41	2.67	0.095	0.105
H	2.34	2.59	0.092	0.102
J	0.46	0.61	0.018	0.024
K	2.29	2.79	0.090	0.110
S	14.99	15.88	0.590	0.625
V	0.89	1.14	0.035	0.045
U	0.05	0.25	0.002	0.010
W	1.02	1.78	0.040	0.070

**L008 1206 SMD**  
Weight = 0.008g



Dim	Millimeters		Inches	
	min	max	min	max
A	3.022	3.378	0.119	0.133
B	1.430	1.730	0.056	0.068
C	0.820	0.850	0.027	0.039
D	0.320	0.720	0.012	0.028

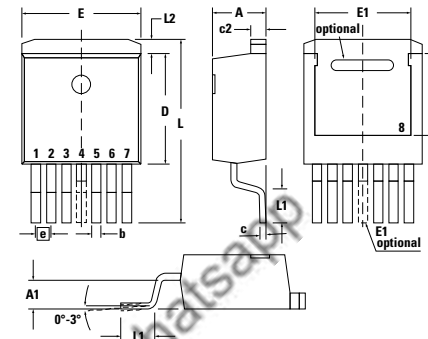
**L008 1206 SMD**  
Weight = 0.008g



Dim	Millimeters		Inches	
	min	max	min	max
A	4.06	4.83	0.160	0.190
A1	typ 0.10		typ 0.004	
A2	2.41		0.095	
b	0.51	0.99	0.020	0.039
b2	1.14	1.40	0.045	0.055
c	0.40	0.74	0.016	0.029
c2	1.14	1.40	0.045	0.055
D	8.38	9.40	0.330	0.370
D1	8.00	8.89	0.315	0.350
D2	2.5		0.098	
E	9.65	10.41	0.380	0.410
E1	6.22	8.50	0.245	0.335
e	2.54 BSC		0.100 BSC	
e1	4.28		0.169	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L2	1.02	1.68	0.040	0.066
W	typ 0.02	0.040	typ 0.0008	0.002

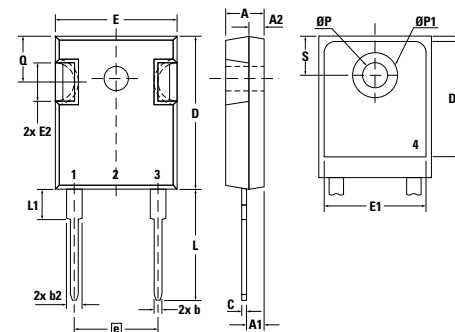
**L012b TO-263 (7)**  
Weight = 2.5 g

C) middle leg cut



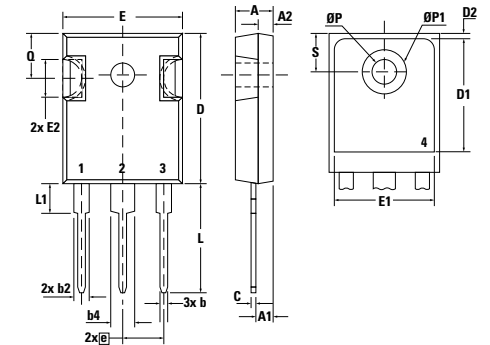
Dim	Millimeters		Inches	
	min	max	min	max
A	4.20	4.60	0.165	0.181
A1	2.45	2.75	0.096	0.108
b	0.66	0.90	0.026	0.035
c	0.40	0.60	0.016	0.024
c2	1.14	1.40	0.045	0.055
D	8.38	8.64	0.330	0.340
D1	6.10	6.35	0.240	0.250
E	10.00	10.30	0.394	0.406
E1	7.34	8.00	0.290	0.315
e	1.27 BSC		0.050 BSC	
L	14.73	15.75	0.580	0.620
L1	2.24	2.84	0.088	0.112
L2	1.35	1.55	0.053	0.061

**L014b TO-247AD**  
Weight = 6 g



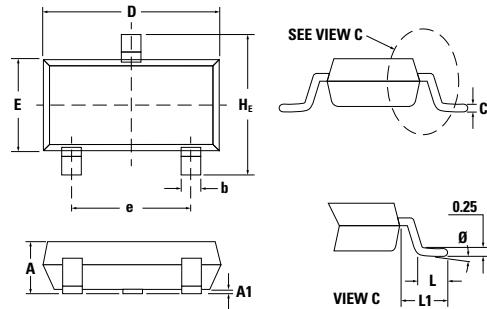
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.530	-
E2	4.31	5.48	0.170	0.216
e	10.90 BSC		0.430 BSC	
L	19.80	20.30	0.078	0.800
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
Ø P1	-	7.39	-	0.290
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

**L014a TO-247AD**  
Weight = 6 g



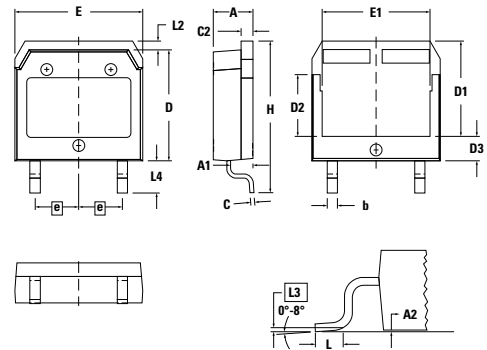
Dim	Millimeters		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.845
D1	13.07	-	0.515	-
D2	0.51	1.35	0.020	0.053
E	15.48	16.24	0.610	0.640
E1	13.45	-	0.53	-
E2	4.31	5.48	0.170	0.216
e	5.45 BSC		0.215 BSC	
L				

**L015 SOT-23**  
Weight = 0.008 g



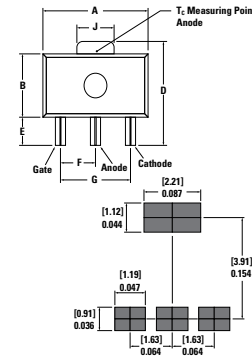
Dim	Millimeters		Inches	
	min	max	min	max
A	0.89	1.17	0.035	0.046
A1	0.05	0.15	0.001	0.006
b	0.30	0.50	0.012	0.020
c	0.08	0.20	0.003	0.008
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
e	1.90 BSC		0.075 BSC	
L	0.40	0.58	0.016	0.023
L1	0.46	0.64	0.018	0.025
HE	2.10	2.49	0.083	0.098
Ø	0°	10°	0°	10°

**L019a TO-268 AA (D3PAK HV)**  
Weight = 4 g



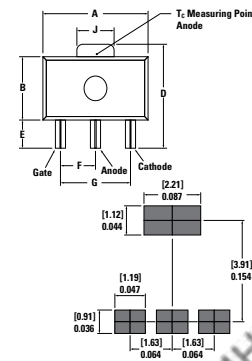
Dim	Millimeters		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.100
b	1.15	1.45	0.045	0.057
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	11.80	12.10	0.465	0.476
D2	7.50	7.80	0.295	0.307
D3	2.90	3.20	0.114	0.126
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.45 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	1.70	2.00	0.067	0.079
L2	1.00	1.15	0.039	0.045
L3	0.25 BSC		0.010 BSC	
L4	3.80	4.10	0.150	0.161

**L016 SOT-89**  
Weight = 0.045 g



Dim	Millimeters		Inches	
	min	max	min	max
A	4.40	4.60	0.173	0.181
B	2.29	2.60	0.090	0.102
C	1.40	1.60	0.055	0.063
D	3.94	4.25	0.155	0.167
E	0.89	1.20	0.035	0.047
F	1.42	1.57	0.056	0.062
G	2.92	3.07	0.115	0.121
H	0.35	0.44	0.014	0.017
I	0.36	0.48	0.014	0.019
J	1.62	1.83	0.064	0.072

**L016 SOT-89**  
Weight = 0.045 g



Dim	Millimeters		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.174
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106

**Symbols**

2N607xA	97
<b>A</b>	
A0516YC240	165
A0516YC280	165
A1237NC240	165
A1237NC280	165
<b>B</b>	
B0470WC120	155
B0470WC160	155
B0713YC200	155
B0713YC220	155
B0713YC240	155
B0713YC250	155
B0800YC120	155
B0800YC140	155
B0800YC160	155
B0800YC180	155
B0870YC120	155
B0870YC140	155
B0870YC160	155
B1115LC160	155
B1115LC180	155
B1230LC120	155
B1230LC140	155
B1230LC160	155
B1230LC180	155
B1725NC120	155
B1725NC140	155
B1725NC160	155
B1725NC180	155
B1815NC120	155
B1815NC140	155
B1815NC160	155
<b>C</b>	
C106x	94
CLA5E1200PZ	10, 92
CLA5E1200UC	92
CLA15E1200NPB	92
CLA15E1200NPZ	10, 92
CLA16E800PN	92
CLA16E1200PN	92
CLA30E1200HB	93
CLA30E1200NPZ	10, 92
CLA30E1200PB	92
CLA30E1200PC	92
CLA30MT1200NPB	97
CLA30MT1200NPZ	10, 97
CLA40E1200HR	12, 93
CLA40E1200NHB	93
CLA40E1200NPZ	10, 93
CLA40MT1200NHB	97
CLA40MT1200NPB	97
CLA40MT1200NPZ	10, 97
CLA40P1200FC	23, 93
CLA50E1200HB	93
CLA50E1200TC	93
CLA60MT1200NHB	97
CLA60MT1200NHR	12, 97
CLA60MT1200NTZ	12, 97
CLA60MU1200LB	19
CLA60PD1200NA	103
CLA80E1200HF	93

CLA80MT1200NHB	97	CPC1394	121	CPC2030N	122
CLA80MT1200NHR	12, 97	CPC1510	121, 125	CPC2125N	123
CLA100E1200HB	93	CPC1511	121, 125	CPC2317N	124
CLA100E1200KB	93	CPC1540	121, 125	CPC2330N	124
CLA100E1200TZ	12, 93	CPC1560	121, 125	CPC2907B	126
CLA100PD1200NA	104	CPC1561	121, 125	CPC3701	66
CLA110MB1200NA	119	CPC1563	121, 125	CPC3703	66
CLB30I1200HB	93	CPC1580	133	CPC3708	66
CLB30I1200PZ	10, 93	CPC1590	133	CPC3710	66
CLB40I1200PZ	10, 93	CPC1593	121, 125	CPC3714	66
CLE20E1200PC	93	CPC1705Y	126	CPC3720	66
CLE30E1200PB	93	CPC1706Y	126	CPC3730	66
CLE90UH1200TLB	93, 118	CPC1708J	126	CPC3902	66
CLF20E1200PB	93	CPC1709J	126	CPC3909	66
CMA20E1600PB	92	CPC1718J	126	CPC3960	66
CMA20E1600PZ	10, 92	CPC1726Y	126	CPC3980	66
CMA30E1600PB	93	CPC1727J	126	CPC3981	66
CMA30E1600PN	93	CPC1777J	126	CPC3982	66
CMA30E1600PZ	10, 93	CPC1779J	126	CPC40055ST	128
CMA30P1600FC	23, 93	CPC1786J	126	CS19	92
CMA40E1600HR	12, 93	CPC1788J	126	CS20	92
CMA50E1600HB	93	CPC1906Y	126	CS20-22MOF1	23
CMA50E1600QB	93	CPC1907B	126	CS20-25MO1F	23
CMA50P1600FC	23, 93	CPC1908J	126	CS22	92
CMA50P1600LB	19	CPC1909J	126	CS30	93
CMA60MT1600NHB	97	CPC1916Y	126	CS45	93
CMA60MT1600NHR	12, 97	CPC1918J	126	CS60	93
CMA80E1600HB	93	CPC1926Y	126	<b>D</b>	
CMA80MT1600NHB	97	CPC1927J	126	DAA10EM1800PZ	9, 86
CMA80MT1600NHR	12, 97	CPC1943	127	DAA10P1800PZ	9, 86
CMA80PD1600NA	103	CPC1945G	127	DAA200X1800NA	88
CME30E1600PZ	10, 93	CPC1945Y	127	DAA200XA1800NA	88
CNE60E2200TZ	12, 93	CPC1961	127	DCG10P1200HR	12, 85
CPC1002N	124	CPC1963	127	DCG17P1200HR	12, 85
CPC1004N	124	CPC1964B	128	DCG20B650LB	111
CPC1006N	121	CPC1964BX6	128	DCG20C1200HR	12, 85
CPC1008N	121	CPC1965G	127	DCG35C1200HR	12, 85
CPC1009N	121	CPC1965Y	127	DCG40X1200LB	19
CPC1010N	121	CPC1966	128	DCG45X1200NA	85
CPC1014N	121	CPC1966B	128	DCG80B1200NA	85
CPC1016N	121	CPC1966BX8	128	DCG81B1200NA	85
CPC1017N	121	CPC1966YX6	128	DCG85X1200NA	85
CPC1018N	121	CPC1966YX8	128	DCG130X1200NA	85
CPC1019N	121	CPC1967J	126	DCG200X1200NA	85
CPC1020N	121	CPC1968J	126	DCH15B1200FC	85
CPC1025N	121	CPC1972	127	DFE10I600PM	82
CPC1030N	121	CPC1973Y	126	DFE25I600HA	82
CPC1035N	121	CPC1976	128	DFE240X600NA	83
CPC1106N	123	CPC1976YX6	128	DFE250X600NA	83
CPC1114N	123	CPC1977J	126	DH2X60	81
CPC1117N	123	CPC1978J	126	DH2X61	81
CPC1125N	123	CPC1979J	126	DH20	81
CPC1130N	123	CPC1981Y	126	DH40	81
CPC1135N	123	CPC1983B	126	DH60	81
CPC1150N	123	CPC1983Y	126	DHG5I600PA	81
CPC1225N	121	CPC1983YE	126	DHG5I600PM	81
CPC1230N	121	CPC1984Y	126	DHG10C600PB	81
CPC1231N	123	CPC1986J	126	DHG10I1200PA	81
CPC1330	121	CPC1988J	126	DHG10I1200PM	81
CPC1333	123	CPC1998J	128	DHG10I1800PA	81
CPC1335	121	CPC2014N	122	DHG10IM1800UZ	9, 81
CPC1390	121	CPC2017N	122	DHG20C1200PB	81
CPC1393	121	CPC2025N	122	DHG20I	



DHG20I1200PA..... 81	DNA30E2200PZ..... 9, 87	DPG60I300PC..... 79	DSA240X200NA..... 74	DSEP15..... 78, 80	DST3060DJF..... 77	F0240YH250..... 148	H1200NC200..... 166
DHG30I600HA..... 81	DNA30EM2200PZ..... 9, 87	DPG60IM400QB..... 79	DSB10I45PM..... 73	DSEP29..... 80	DST3060LC..... 77	F0240YH300..... 148	HQ6025xH5..... 98
DHG30I600PA..... 81	DNA30ER2200IY..... 87	DPG80C300HB..... 79	DSB15IM30UC..... 73	DSEP30..... 78, 80	DST3080C..... 77	F0300WC140..... 148	HS4040xAQx..... 95
DHG30I1200HA..... 81	DNA40U2200GU..... 114	DPG80C400HB..... 79	DSB15IM45IB..... 73	DSEP40-03AS..... 80	DST5100S..... 78	F0300WC180..... 148	I
DHG30IM600PC..... 81	DNA90U2200LB..... 115	DPG120C300QB..... 79	DSB20C60PN..... 73	DSEP60..... 80	DST5200..... 77	F0800LC140..... 148	ITF40PF1200DHGTLB..... 18
DHG40B1200LB..... 19, 111	DNA90YA2200NA..... 116	DPH30IS600HI..... 78, 79	DSB20I15PA..... 73	DSEP60-12AZ..... 12	DST8100S..... 78	F0800LC180..... 148	ITF40PG1200DHGLB..... 18
DHG40C1200HB..... 81	DNA90YC2200NA..... 116	DPJ50XS1800NA..... 78	DSB30C30PB..... 73	DSEP75..... 80	DST10100S..... 78	F0900VC450..... 148	ITF48IF1200HR..... 14, 32
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DHG50X650NA..... 81	DPF30I300PA..... 86	DSA1-12D..... 86	DSB30C45PB..... 73	DSEP90-12AZ..... 12	DST20100C..... 77	F0900VF450..... 148	IX4340..... 129
DHG50X1200NA..... 81	DPF30P600HR..... 12, 78	DSA10C150PB..... 74	DSB30C60PB..... 73	DSI2x55..... 88	DST20150C..... 77	F0900VF520..... 148	IX4340NE..... 129
DHG55I3300FE..... 81	DPF60C200HB..... 79	DSA10C150UC..... 74	DSB40C15PB..... 73	DSI30..... 87	DST30100C..... 77	F1000LC080..... 148	IX4426..... 129
DHG60C600HB..... 81	DPF60C200HJ..... 79	DSA10I100PM..... 73	DSB60C30HB..... 73	DSI45..... 87	DST40100C..... 77	F1000LC120..... 148	IX4427..... 129
DHG60I600HA..... 81	DPF60C300HB..... 79	DSA10IM100UC..... 73	DSB60C30PB..... 73	DSIK45..... 87	DSTB2045C..... 77	F1300NC45P..... 148	IX4428..... 129
DHG60I1200HA..... 81	DPF60I200HA..... 79	DSA15I45PA..... 73	DSB60C45HB..... 73	DSP8..... 86	DSTB30200C..... 77	F1300NC50P..... 148	IXA4IF1200TC..... 32
DHG60U1200LB..... 19, 111	DPF60IM400HB..... 79	DSA15IM45IB..... 73	DSB60C45PB..... 73	DSP25..... 87	DSTB60100C..... 77	F1300NC55P..... 148	IXA4IF1200UC..... 10, 32
DHG100X650NA..... 81	DPF80C200HB..... 79	DSA15IM45UC..... 73	DSB60C60HB..... 73	DSP45..... 87	DSTD5200..... 77	F1400NC140..... 148	IXA12IF1200HB..... 32
DHG100X1200NA..... 81	DPF100C1200HB..... 79	DSA15IM150UC..... 74	DSB60C60PB..... 73	DSP45-12AZ..... 12	DSTF2045C..... 77	F1400NC180..... 148	IXA12IF1200PB..... 32
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Qxx10LT.....	98	R0878LC21L.....	160	R1279NC25J.....	161	R2075MC12C.....	163	R3370ZD12D.....	164	SVxx25xxQ.....	95	T0800TB45E.....	168	VUB120.....	117
Qxx10LTH.....	98	R0878LC21M.....	160	R1279NC25K.....	161	R2295HA22F.....	163	R3370ZD12E.....	164	Sx01E.....	94	T0840NC17E.....	167	VUB135.....	117
Qxx10xHx.....	97	R0929LC12A.....	160	R1279NC25L.....	161	R2295HA22H.....	163	R4680EA24K.....	164	Sx02xSx.....	94	T0900AF65E.....	168	VUB145.....	117
Qxx10xx.....	97	R0929LC12B.....	160	R1279NC25M.....	161	R2475ZC28M.....	163	R4680EA24L.....	164	SXB1265FB.....	173	T0900DF65A.....	168	VUB160.....	117
Qxx12xHx.....	97	R0929LC12C.....	160	R1280NC21J.....	161	R2475ZC28N.....	163	R4680EA24M.....	164	SXB1375B.....	173	T0900EB45A.....	168	VUC36.....	118
Qxx15LT.....	98	R0964LC10C.....	161	R1280NC21K.....	161	R2475ZC28R.....	163	R4680EA24N.....	164	SXB1645FB.....	173	T0960VC17G.....	167	VUC36-12go2.....	118
Qxx15LTH.....	98	R0964LC10D.....	161	R1280NC21L.....	162	R2475ZD28M.....	163	R4680EA28K.....	164	SXB1764FG.....	173	T1000EC33G.....	167	VUE22.....	111
Qxx15xx.....	97	R0964LC10E.....	161	R1280NC21M.....	162	R2475ZD28N.....	163	R4680EA28L.....	164	SXB1920G.....	173	T1000TC33E.....	167	VUE35.....	111
Qxx16xHx.....	97	R0964LC12C.....	161	R1280NC22J.....	162	R2619ZC28R.....	163	R4680EA28M.....	164	SXB2096B.....	173	T1200EB45E.....	168	VUE50.....	111
Qxx25xHx.....	97	R0964LC12D.....	161	R1280NC22K.....	162	R2619ZC18J.....	163	R5145FA42V.....	164	SXB2167FB.....	173	T1290BF65A.....	168	VUE75.....	111
Qxx25xx.....	97	R0964LC12E.....	161	R1280NC22L.....	162	R2619ZC18K.....	163	R5145FA42W.....	164	SXB2324FG.....	173	T1375DF65E.....	168	VUE130.....	111
Qxx30xHx.....	97	R0990LC08A.....	161	R1280NC22M.....	162	R2619ZC18L.....	163	R5145FA45V.....	164	SXB2939G.....	173	T1440VC17E.....	167	VUI72.....	117
Qxx35xHx.....	97	R0990LC08B.....	161	R1280NC25J.....	162	R2619ZC20J.....	163	R5145FA45W.....	164	SXB3120FG.....	173	T1500EC33E.....	167	VUO25.....	114
Qxx40xx.....	97	R0990LC08C.....	161	R1280NC25K.....	162	R2619ZC20K.....	163	R5370EA18K.....	164	SXB3442B.....	173	T1600GB45G.....	168	VUO28.....	114
QxXx.....	97	R1045NC28L.....	161	R1280NC25L.....	162	R2619ZC20L.....	163	R5370EA22J.....	164	SXB3529HEXT.....	173	T1800GB45A.....	168	VUO34.....	114
<b>R</b>		R1045NC28M.....	161	R1280NC25M.....	162	R2619ZC21J.....	163	R5370EA22K.....	164	SXB3840HEX.....	173	T1890BF65E.....	168	VUO36.....	114
R0472YC12E.....	160	R1045NC32L.....	161	R1331NC10B.....	162	R2619ZC21K.....	163	SXB4264B.....	173	SXB4649HEXT.....	173	T2000BB45G.....	168	VUO52.....	114
R0472YC12EKER.....	158	R1045NC32M.....	161	R1331NC10C.....	162	R2619ZC21L.....	163	SXB4649HEXT.....	173	SXB4649HEXT.....	173	T2000GC33G.....	167	VUO62.....	115
R0472YC12F.....	160	R1124NC18J.....	161	R1331NC10D.....	162	R2619ZC25J.....	163	SXB4869G.....	173	SXB4869G.....	173	T2322B.....	97	VUO62-08NO7.....	115
R0472YC12FKER.....	158	R1124NC18K.....	161	R1331NC12B.....	162	R2619ZC25K.....	163	SXB5877HEX.....	173	SXB5877HEX.....	173	T2400GB45E.....	168	VUO64.....	115
R0472YC16E.....	160	R1124NC18L.....	161	R1331NC12C.....	162	R2619ZC25L.....	163	SXB5993G.....	173	SXB5993G.....	173	T2960BB45E.....	168	VUO68.....	115
R0472YC16EKER.....	158	R1124NC18M.....	161	R1331NC12D.....	162	R2619ZD18J.....	163	SXB6240HEXT.....	173	SXB6240HEXT.....	173	T3000GC33E.....	167	VUO80.....	115
R0472YC16FKER.....	158	R1124NC20J.....	161	R1446NC12C.....	162	R2619ZD18K.....	163	SXB9737HEX.....	173	SXB9737HEX.....	173	TCR22.....	94	VUO82.....	115
R0472YC16F.....	160	R1124NC20K.....	161	R1446NC12D.....	162	R2619ZD18L.....	163	SXB11987HEX.....	173	SXB11987HEX.....	173			VUO84.....	115
R0472YC16FKER.....	158	R1124NC20L.....	161	R1446NC12E.....	162	R2619ZD20J.....	163	SXC1076FB.....	175	SXC1076FB.....	175			VUO86.....	115
R0487YC12D.....	160	R1124NC20M.....	161	R1446NC12F.....	162	R2619ZD20K.....	163	SXC1195FR.....	175	SXC1195FR.....	175			VUO98.....	115
R0487YC12E.....	160	R1124NC21J.....	161	R1448NC14H.....	162	R2619ZD20L.....	163	SXC1318FB.....	175	SXC1318FB.....	175			VUO105.....	115
R0487YC14D.....	160	R1124NC21K.....	161	R1448NC14J.....	162	R2619ZD21J.....	163	SXC1464FR.....	175	SXC1464FR.....	175			VUO110.....	115
R0487YC14E.....	160	R1124NC21L.....	161	R1448NC18H.....	162	R2619ZD21K.....	163	SXC1517FG.....	175	SXC1517FG.....	175			UGD8124AG.....	119
R0577YC12C.....	160	R1124NC21M.....	161	R1448NC18J.....	162	R2619ZD21L.....	163	SXC1517FG.....	175	SXC1517FG.....	175			UGE0221AY4.....	119
R0577YC12D.....	160	R1127NC32P.....	161	R1448NC18L.....	162	R2619ZD21M.....	163	SXC1609FB.....	175	SXC1609FB.....	175			UGE0421AY4.....	119
R0577YC12E.....	160	R1127NC32R.....	161	R1448NC20H.....	162	R2619ZD22J.....	163	SXC1788FR.....	175	SXC1788FR.....	175			UGE1112AY4.....	119
R0633YC12D.....	160	R1127NC32S.....	161	R1448NC20J.....	162	R2620ZC22J.....	163	SXC1871FG.....	175	SXC1871FG.....	175			UGE3126AY4.....	119
R0633YC12E.....	160	R1127NC32T.....	161	R1448NC20K.....	162	R2620ZC22K.....	163	SXC2319FG.....	175	SXC2319FG.....	175				
R0633YC12F.....	160	R1127NC34R.....	161	R1448NC20L.....	162	R2620ZC22L.....	163	Sxx04xSx.....	94	Sxx04xSx.....	94				
R0717LC14G.....	160	R1127NC34S.....	161	R1448NC20M.....	162	R2620ZC25J.....	163	Sxx06xxx.....	94	Sxx06xxx.....	94			VBE17.....	111
R0717LC14H.....	160	R1127NC34T.....	161	R1605MC20E.....	162	R2620ZC25K.....	163	Sxx08xxx.....	94	Sxx08xxx.....	94			VBE17-06NO7.....	111
R0717LC16G.....	160	R1127NC34U.....	161	R1605MC20F.....	162	R2620ZC25L.....	163	Sxx10xxx.....	94	Sxx10xxx.....	94			VBE26.....	111
R0717LC16H.....	160	R1127NC36R.....	161	R1605MC20G.....	162	R2620ZD22J.....	163	Sxx12xx.....	94	Sxx12xx.....	94			VBE55.....	111
R0736LC20J.....	160	R1127NC36S.....	161	R1605MC20H.....	162	R2620ZD22K.....	163	Sxx16xx.....	94	Sxx16xx.....	94			VBE60.....	111
R0736LC20K.....	160	R1127NC36T.....	161	R1605MC20J.....	162	R2620ZD22L.....	163	Sxx20xx.....	94	Sxx20xx.....	94			VBE100.....	111
R0736LC22J.....	160	R1158NC26N.....	161	R1605MC20K.....	162	R2620ZD25J.....	163	Sxx25xx.....	94	Sxx25xx.....	94			VBO21.....	112
R0736LC22K.....	160	R1158NC26P.....	161	R1605MC20L.....	162	R2620ZD25K.....	163	Sxx35x.....	94	Sxx35x.....	94			VBO22.....	112
R0736LC25J.....	160	R1178NC14E.....	161	R1605MC22E.....	162	R2620ZD25L.....	163	Sxx40x.....	94	Sxx40x.....	94			VBO36.....	112
R0736LC25L.....	160	R1178NC14F.....	161	R1605MC22F.....	162	R2714ZC14H.....	163	Sxx55x.....	95	Sxx55x.....	95			VBO40.....	112
R0736LC25M.....	160	R1178NC14G.....	161	R1605MC22G.....	162	R2714ZC14J.....	163	Sxx65x.....	95	Sxx65x.....	95			VBO52.....	112
R0809LC10A.....	160	R1211NC12C.....	161	R1605MC22H.....	162	R2714ZC14K.....	163	Sxx70x.....	95	Sxx70x.....	95			VBO54.....	112
R0809LC10B.....	160	R1211NC12D.....	161	R1605MC22J.....	162	R2714ZC18H.....	163							VBO54.....	112
R0830LC12C.....	160	R1211NC12E.....	161	R1605MC22K.....	162	R2714ZC18J.....	163							VBO68.....	112
R0830LC12D.....	160	R1271NC12B.....	161	R1605MC22L.....	162	R2714ZC18K.....	163							VBO72.....	112
R0830LC12E.....	160	R1271NC12C.....	161	R1605MC22M.....	162	R2714ZD14H.....	163							VBO78.....	113
R0830LC12F.....	160	R1271NC12D.....	161	R1605MC22N.....	162	R2714ZD14J.....	163							VBO78-08NO7.....	113
R0830LC14C.....	160	R1275NC18L.....	161	R1605MC22P.....	162	R2714ZD14K.....	163							VBO88.....	113
R0830LC14D.....	160	R1275NC18M.....	161	R1605MC22Q.....	162	R2714ZD14L.....	163							VBO130.....	113
R0830LC14E.....	160	R1275NC20L.....	161	R1605MC22R.....	162	R2714ZD18H.....	164							VBO160.....	113
R0830LC14F.....	160	R1275NC20M.....	161	R1605MC22S.....	162	R2714ZD18J.....	164							VCO132.....	109
R0878LC18K.....	160	R1275NC21L.....	161	R1605MC22T.....	162	R2714ZD18K.....	164							VCO180.....	109
R0878LC18L.....	160			R1700MC18E.....	162	R3115TJ24J.....	164							W0428RF250.....	136
				R1700MC18F.....	162	R3115TJ24K.....	164							W0428RF280.....	136
				R1700MC18G.....	162	R3115TJ28J.....	164							W0428RF320.....	136
				R1700MC18H.....	162									W0428SE250.....	136
				R1700MC18J.....	162									W0428SE280.....	136
				R1700MC18K.....	162										
				R1700MC18L.....	162										
				R1700MC18M.....	162										
				R1700MC18N.....	162										
				R1700MC18P.....	162										
				R1700MC18Q.....	162										
				R1700MC18R.....	162										
				R1700MC18S.....	162										
				R1700MC18T.....	162										
				R1700MC18U.....	162										
				R1700MC18V.....	162										
				R1700MC18W.....	162										

W0428SE320	136	W1524LC300KBN	137	W3630TE650	139	W5282ZC300	141	XK0450DA056M	177	XK7000DA128M	178	XW116ZC20C	182
W0428SF250	136	W1524LC300KBR	137	W3630TJ650	139	W5282ZD240	141	XK0450DT056M	177	XK7000DA128ML	178	XW116ZC20R	182
W0428SF280	136	W1524LC300KCN	137	W3697VC220	139	W5282ZD300	141	XK0450SA056M	177	XK8000DA180ML	178	XW116ZC20W	182
W0428SF320	136	W1524LC300KCR	137	W3697VC280	139	W5334MK200	141	XK0550DA056M	177	XK8000SA180ML	178	XW127EA25A	182
W0503RC160	136	W1748LC180	139	W3697VF220	139	W5334MK220	141	XK0550SA056M	177	XK9000DA160M	178	XW127EA25B	182
W0503RC200	136	W1748LC220KBN	137	W3697VF280	139	W5636MC120	141	XK0600DA074M	177	XK9000DA160ML	178	XW127EC25A	182
W0503RC240	136	W1748LC220KBR	137	W3708MC320	139	W5636MC150	141	XK0600SA074M	177	XK9000SA160M	178	XW127EC25B	182
W0503SC160	136	W1748LC220KCN	137	W3708MC350	140	W5636MC150KDN	137	XK0900DA056M	177	XK9000SA160ML	178	XW160FC25A	182
W0503SC200	136	W1748LC220KCR	137	W3708MC350KDN	137	W5696VC100	141	XK0900DT056M	177	XSF30xxxxAN	181	XW160FC25B	182
W0503SC240	136	W1748LC250	139	W3708MC350KDR	137	W5696VC140	141	XK0900SA056M	177	XSF46xxxxAN	181	XW180BA34E	182
W0507YH420	138	W1856NC400	139	W3743ZC400	140	W5696VC140	141	XK1000BA025M	181	XSFGAxxxxAN	181	XW180BA34F	182
W0507YH450	138	W1856NC500	139	W3743ZC450	140	W5696VF100	141	XK1000DA074M	177	XSFGxxxxAN	181	XW180GA34A	182
W0642WC160	138	W1975MC620	139	W3743ZC500	140	W5715ED520	141	XK1000SA074M	177	XSFHxxxxAN	181	XW180GA34B	182
W0642WC200	138	W1975MC650	139	W3743ZD400	140	W5715ED560	141	XK1100DA076M	177	XSFLPxxxxAN	181	XW180GC34A	182
W0642WC240	138	W1975MC680	139	W3743ZD450	140	W5715ED600	141	XK1130DA076M	177	XSFTBxxxxAN	181	XW180GC34B	182
W0735RA120	136	W2054NC420	139	W3743ZD500	140	W5838ZC180	141	XK1130DT076M	177	XSFTCxxxxAN	181	XW270QA25A	182
W0735RA150	136	W2054NC450	139	W3841VC300	140	W5838ZC180	141	XK1130SA076M	177	XSFTxxxxAN	181		
W0735SA120	136	W2058LC100	139	W3841VC340	140	W5838ZC220	141	XK1130SB076M	178	XSK1500DA076038	181		
W0735SA150	136	W2058LC120	139	W3841VF300	140	W5838ZD180	141	XK1500BA034M	181	XSK1500DA076076	181	Y200CKC250	165
W0790LG650	138	W2058LC120KBN	137	W3841VF340	140	W5838ZD220	141	XK1500CB034M	178	XSK1500DA076101	181	Y500CNC250	165
W0880LC620	138	W2058LC120KBR	137	W3842MC28A	140	W5984TE360	141	XK1800DA076M	177	XSK2000DA076038	181		
W0880LC650	138	W2058LC120KCN	137	W3842MC240	140	W5984TE400	141	XK1800DT076M	177	XSK2000DA076076	181		
W0880LC680	138	W2058LC120KCR	137	W3842MC280	140	W5984TJ360	141	XK1800SA076M	177	XSK2000DA076101	181		
W0925LG500	138	W2058LC140	139	W3842MC280KDN	137	W5984TJ400	141	XK2000DA114M	178	XSK3000DA076038	181		
W0925LG560	138	W2115MC520	139	W3842MC280KDR	137	W6262ZC200	141	XK2000SA114M	178	XSK3000DA076076	181		
W0925LG600	138	W2115MC560	139	W3864QK120	140	W6262ZC240	141	XK2100DA076M	177	XSK3000DA076101	181		
W0944WC120	138	W2115MC600	139	W3864QK150	140	W6262ZD200	141	XK2100DA076ML	177	XSK3400DA076038	181		
W0944WC150	138	W2134NC360	139	W3864QK180	140	W6262ZD240	141	XK2100SA076M	177	XSK3400DA076076	181		
W1032LC500	138	W2134NC400	139	W4096ZC420	140	W6360EC520	141	XK2100SA076ML	177	XSK3400DA076101	181		
W1032LC560	138	W2624NC240	139	W4096ZC450	140	W6360EC560	141	XK2140DA076M	177	XSK3800DA116M076	181		
W1032LC600	138	W2624NC280	139	W4096ZD420	140	W6360EC600	141	XK2140DA076ML	177	XSK3800DA116M101	181		
W1060LG420	138	W2624ND240	139	W4096ZD450	140	W6672TE320	141	XK2140DT076M	177	XSK4400DA116M076	181		
W1060LG450	138	W2624ND280	139	W4205TE520	140	W6672TE350	141	XK2140DT076ML	177	XSK4400DA116M101	181		
W1074YC200	138	W2820VC420	139	W4205TE560	140	W6672TJ320	141	XK2140SA076M	177	XSK6000DA116M076	181		
W1074YC260	138	W2820VC450	139	W4205TE600	140	W6672TJ350	141	XK2140SA076ML	177	XSK6000DA116M101	181		
W1074YC320	138	W2820VF420	139	W4205TJ520	140	W7045MC030	141	XK2140SB076M	178	XSL200D8WRC	176		
W1074YH200	138	W2820VF450	139	W4205TJ560	140	W7045MC060	141	XK2500DA114M	178	XSL200D8WRCP	176		
W1074YH260	138	W2830HE520	139	W4205TJ600	140	W8405ZC100	141	XK2500DA116M	178	XSL220C2WRT	176		
W1074YH320	138	W2830HE560	139	W4534NC030	140	W8405ZC140	141	XK2500DA116ML	178	XSL300C2WRP	176		
W1185LC420	138	W2830HE600	139	W4534NC060	140	W8405ZD100	141	XK2500SA114M	178	XSL300C2WS	176		
W1185LC450	138	W2865HA620	139	W4534ND030	140	W8405ZD140	141	XK2500SA116M	178	XSL350C2WRP	176		
W1185LC450KBN	137	W2865HA650	139	W4534ND060	140	W8570TE180	142	XK2500SA116ML	178	XSL400C2WRP	176		
W1185LC450KBR	137	W2865HA680	139	W4693QK050	140	W8570TE220	142	XK2700DA076M	177	XSL500C2WRP	176		
W1185LC450KCN	137	W2899MC460	139	W4693QK080	140	W8570TJ180	141	XK2700DT076M	177	XSL600C2WRP	176		
W1185LC450KCR	137	W2899MC480	139	W4693QR050	140	W8570TJ180MBR	170	XK2700SA076M	177	XSL1000C2WRP	176		
W1260LG320	138	W3082MC420	139	W4693QR080	140	W8570TJ220	141	XK3000DA116M	178	XSL1000C2WRT	176		
W1260LG360	138	W3082MC450	139	W4713HL300	141	W8570TJ220MBR	170	XK3000DA116ML	178	XSL1100C2WRT	176		
W1263YC160	138	W3082MC450KDN	137	W4713HL350	141	W9830TE120	142	XK3000SA116M	178	XSNM12H10S	182		
W1263YC200KER	136	W3082MC450KDR	137	W4713HM300	141	W9830TE150	142	XK3000SA116ML	178	XSNM12H12S	182		
W1263YC200KES	136	W3090HA520	139	W4713HM350	141	W9830TJ120	142	XK3060DA140ML	178	XST1000M08P	176		
W1263YC220	138	W3090HA560	139	W4767MC180	141	W9830TJ120MBR	170	XK3060SA140ML	178	XST1000M10P	176		
W1263YC250	138	W3090HA600	139	W4767MC220	141	W9830TJ150	142	XK3500DA116M	178	XST1000M12P	176		
W1263YC250KER	136	W3128VC360	139	W5092ZC320	141	W9830TJ150MBR	170	XK3500DA116ML	178	XST1000M16P	176		
W1263YC250KES	136	W3128VC400	139	W5092ZC350	141			XK3500SA116M	178	XW076NC16A	182		
W1263YH160	138	W3128VF360	139	W5092ZD320	141	X		XK3500SA116ML	178	XW076NC16B	182		
W1263YH200	138	W3128VF400	139	W5092ZD350	141	XAA117	122	XK4000DA116M	178	XW076NC16BS	182		
W1263YH250	139	W3270NC22A	139	W5130MK240	141	XAA170	122	XK4000DA116ML	178	XW076NC16BT	182		
W1360LG240	139	W3270NC200	139	W5130MK280	141	XBB170	123	XK4000SA116M	178	XW076NC16C	182		
W1360LG300	139	W3270NC220	139	W5139TE450	141	XCA170	121	XK4000SA116ML	178	XW076NC16CT	182		
W1411LC360KBN	137	W3455QK200	139	W5139TE480	141	XCB170	123	XK5000DA128M	178	XW076NC16R	182		
W1411LC360KBR	137	W3455QK220	139	W5139TJ450	141	XK0450BA019M	181	XK5000DA128ML	178	XW076NC16W	182		
W1411LC360KCN	137	W3477MC360	139	W5139TJ480	141	XK0450BA025M	181	XK6120DA180ML	178	XW116ZC20A	182		
W1411LC360KCR	137	W3477MC400	139	W5282ZC240	141	XK0450BB019M	181	XK6120SA180ML	178	XW116ZC20B	182		
						XK0450BB025M	181						