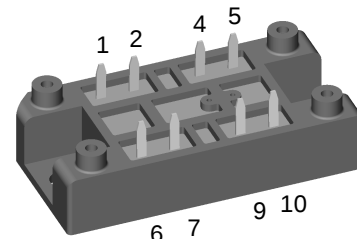
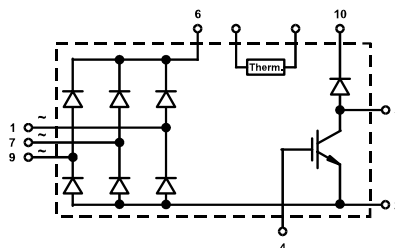


Three Phase Rectifier Bridge with IGBT and Fast Recovery Diode for Braking System

$$V_{RRM} = 1200-1600 \text{ V}$$

$$I_{dAVM} = 70 \text{ A}$$

V_{RRM} V	Type
1200	VUB 60-12 NO1
1600	VUB 60-16 NO1



Symbol	Test Conditions	Maximum Ratings
V_{RRM} I_{dAV} I_{dAVM}	$T_H = 110^\circ\text{C}$, sinusoidal 120° limited by leads	1200 / 1600 V 59 A 70 A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$, $t = 10 \text{ ms}$, $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$, $t = 10 \text{ ms}$, $V_R = 0 \text{ V}$	530 A 475 A
I^2t	$T_{VJ} = 45^\circ\text{C}$, $t = 10 \text{ ms}$, $V_R = 0 \text{ V}$ $T_{VJ} = 150^\circ\text{C}$, $t = 10 \text{ ms}$, $V_R = 0 \text{ V}$	1400 A 1130 A
P_{tot}	$T_H = 80^\circ\text{C}$ per diode	49 W
V_{CES} V_{GE}	$T_{VJ} = 25^\circ\text{C}$ to 150°C Continuous	1200 V $\pm 20 \text{ V}$
I_{C25} I_{C70} I_{C80}	$T_H = 25^\circ\text{C}$, DC $T_H = 70^\circ\text{C}$, DC $T_H = 80^\circ\text{C}$, DC	31 A 23 A 21 A
I_{CM}	$t_p = \text{Pulse width limited by } T_{VJM}$	62 A
P_{tot}	$T_H = 80^\circ\text{C}$	70 W
V_{RRM} I_{FAV} I_{FRMS} I_{FRM}	$T_H = 80^\circ\text{C}$, rectangular $d = 0.5$ $T_H = 80^\circ\text{C}$, rectangular $d = 0.5$ $T_H = 80^\circ\text{C}$, $t_p = 10 \mu\text{s}$, $f = 5 \text{ kHz}$	1200 V 8 A 12 A 90 A
I_{FSM}	$T_{VJ} = 45^\circ\text{C}$, $t = 10 \text{ ms}$ $T_{VJ} = 150^\circ\text{C}$, $t = 10 \text{ ms}$	75 A 60 A
P_{tot}	$T_H = 80^\circ\text{C}$	22 W
T_{VJ} T_{VJM} T_{stg}		$-40 \dots +150^\circ\text{C}$ 150 $^\circ\text{C}$ $-40 \dots +125^\circ\text{C}$
V_{ISOL}	50/60 Hz $I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ min}$ $t = 1 \text{ s}$	3000 V~ 3600 V~
M_d	Mounting torque (M5) (10-32 unf)	2-2.5 Nm 18-22 lb.in.
Weight	typ.	35 g

Features

- Soldering connections for PCB mounting
- Isolation voltage 3600 V~
- Ultrafast freewheel diode
- Convenient package outline
- UL registered E 72873
- Thermistor

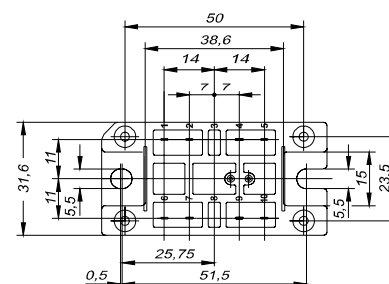
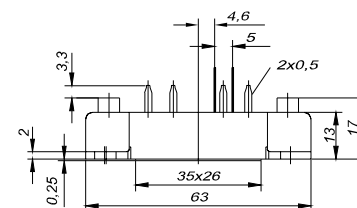
Applications

- Drive Inverters with brake system

Advantages

- 2 functions in one package
- No external isolation
- Easy to mount with two screws
- Suitable for wave soldering
- High temperature and power cycling capability

Dimensions in mm (1 mm = 0.0394")



Data according to IEC 60747

IXYS reserves the right to change limits, test conditions and dimensions.

Symbol	Test Conditions	Characteristic Values ($T_{VJ} = 25^{\circ}\text{C}$, unless otherwise specified)		
		min.	typ.	max.
I_R	Rectifier Diodes $V_R = V_{RRM}$ $T_{VJ} = 25^{\circ}\text{C}$ $V_R = V_{RRM}$ $T_{VJ} = 150^{\circ}\text{C}$			0.1 mA 3 mA
V_F				1.3 V
V_{T0}				0.85 V
r_T				8.5 m Ω
R_{thJH}				1.42 K/W
$V_{BR(CES)}$	IGBT $V_{GS} = 0\text{ V}$, $I_C = 3\text{ mA}$ $I_C = 10\text{ mA}$	1200		V
$V_{GE(th)}$		5		7.5 V
I_{GES}				500 nA
I_{CES}				250 μA 1 mA
V_{CESat}				3.5 V
t_{SC} (SCSOA)				10 μs
RBSOA				50 A
C_{ies}			2.85	nF
$t_{d(on)}$			100	ns
$t_{d(off)}$			220	ns
t_{fi}			1600	ns
E_{on}			3.5	mJ
E_{off}			12	mJ
R_{thJH}				1 K/W
I_R	Fast Recovery Diode $V_R = V_{RRM}$ $T_{VJ} = 25^{\circ}\text{C}$ $V_R = 800\text{ V}$ $T_{VJ} = 150^{\circ}\text{C}$			0.2 mA 6 mA
V_F				2.7 V
V_{T0}				1.65 V
r_T				46 m Ω
I_{RM}			6.5	7 A
t_{rr}			50	70 ns
R_{thJH}				3.12 K/W
R_{25}	NTC	Siemens Typ S 891/2,2k/+9		2.2 k Ω
d_s	Module	Creep distance on surface		12.7 mm
d_A		Strike distance in air		9.4 mm
a		Maximum allowable acceleration		50 m/s ²

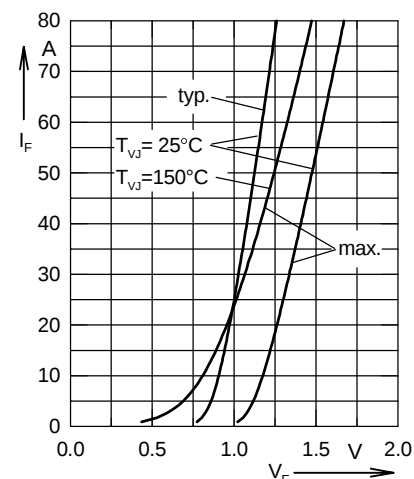


Fig. 1 Forward current versus voltage drop per rectifier diode

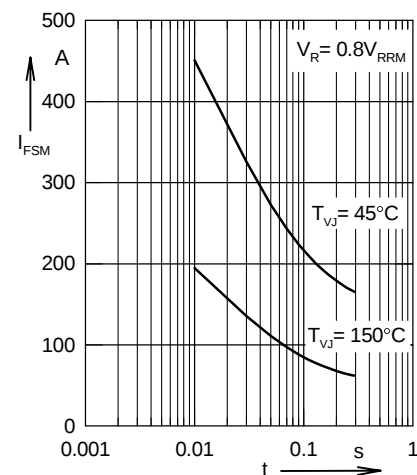


Fig. 2 Surge overload current per rectifier diode

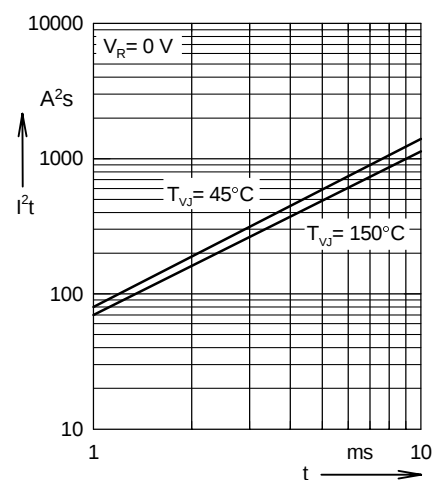


Fig. 3 I^2t versus time per rectifier diode

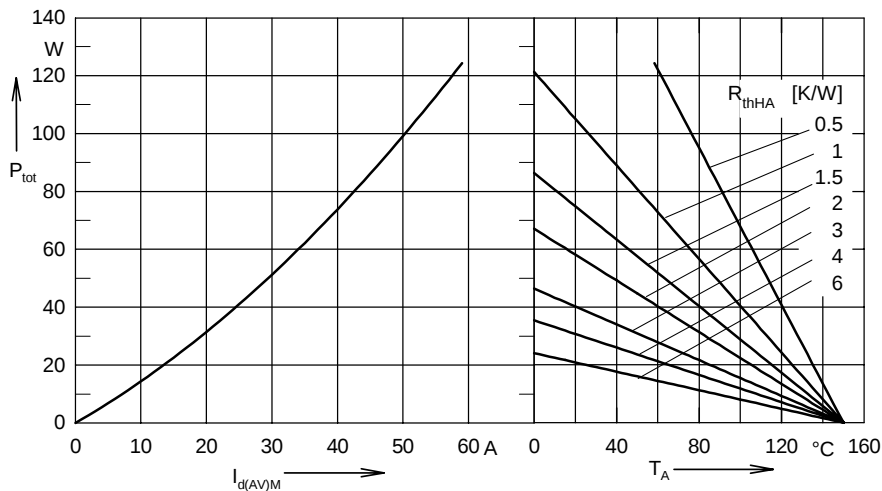


Fig. 4 Power dissipation versus direct output current and ambient temperature (Rectifier bridge)

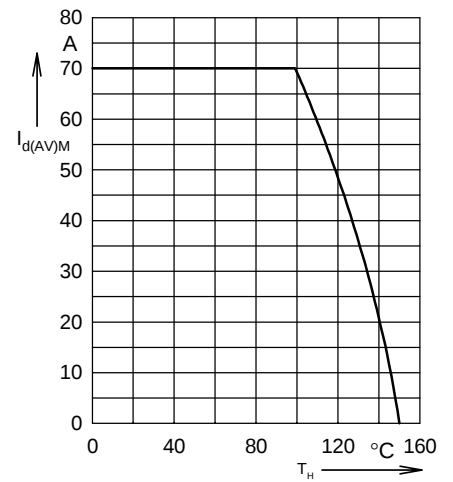


Fig. 5 Maximum forward current versus heatsink temperature (Rectifier bridge)

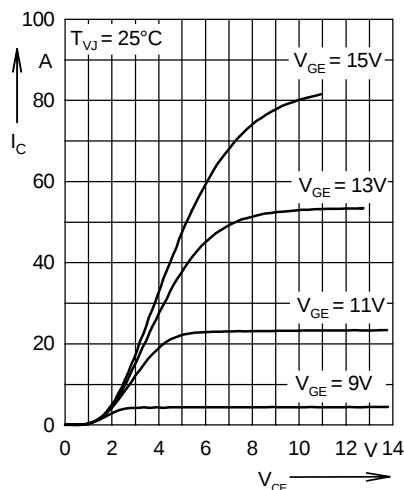


Fig. 6 Output characteristics for braking (IGBT)

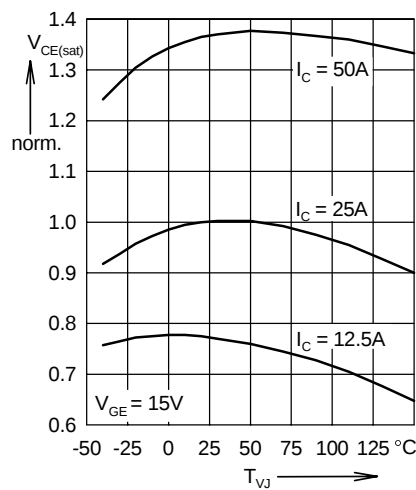


Fig. 7 Saturation voltage versus junction temperature normalized (IGBT)

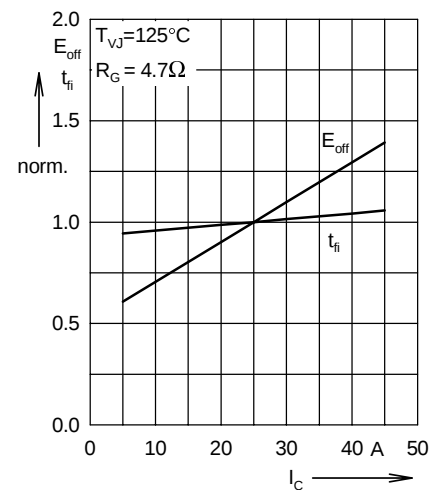


Fig. 8 Turn-off energy per pulse and fall time versus collector current, normalized (IGBT)

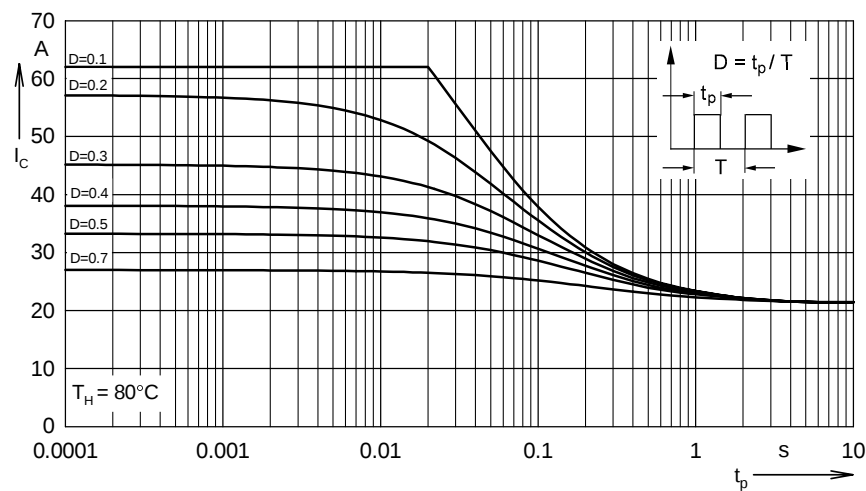


Fig. 9 Collector current versus pulse width and duty cycle (IGBT)

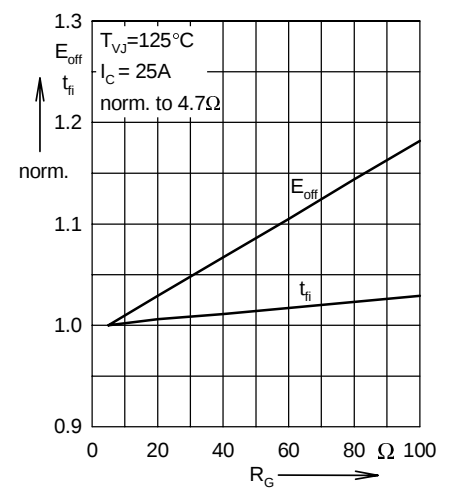


Fig.10 Turn-off energy per pulse and fall time versus R_G (IGBT)

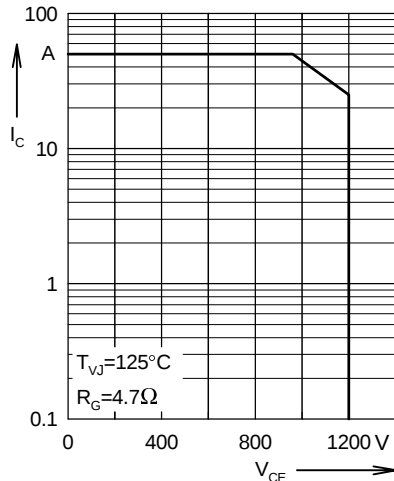


Fig.11 Reverse biased safe operation area (IGBT)

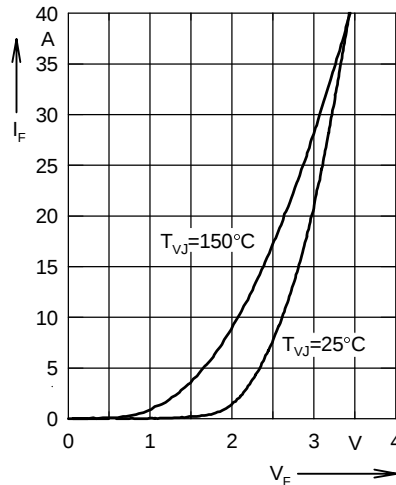


Fig. 12 Forward current versus voltage drop (Fast Diode)

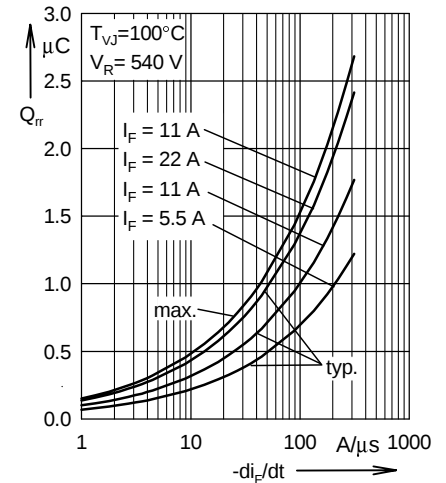


Fig. 13 Recovery charge versus $-di_F/dt$ (Fast Diode)

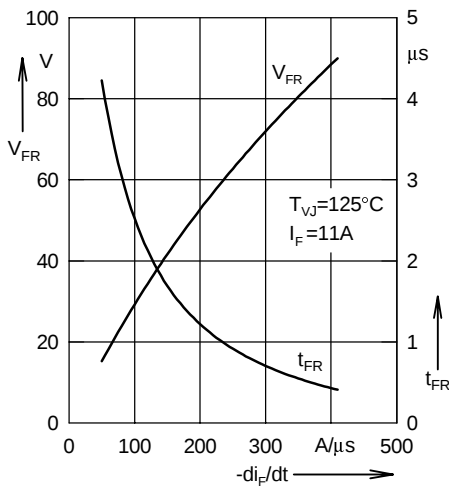


Fig.14 Peak forward voltage and recovery time versus $-di_F/dt$ (Fast Diode)

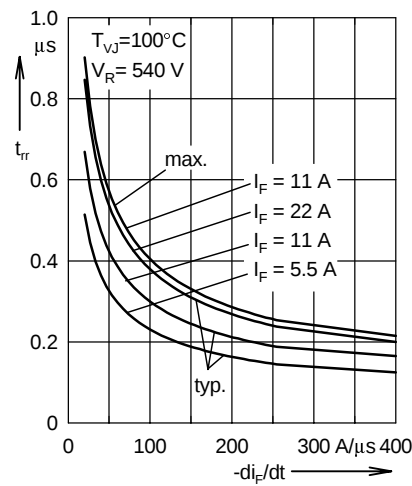


Fig.15 Recovery time versus $-di_F/dt$ (Fast Diode)

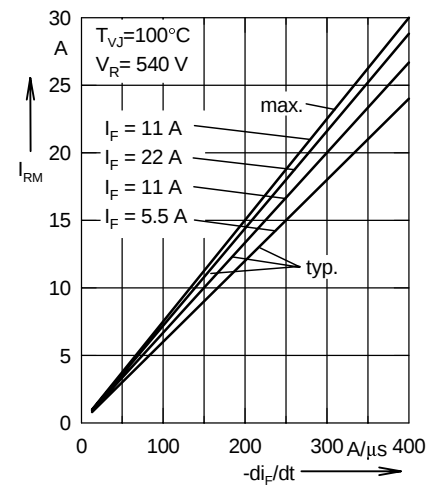


Fig.16 Peak reverse current versus $-di_F/dt$ (Fast Diode)

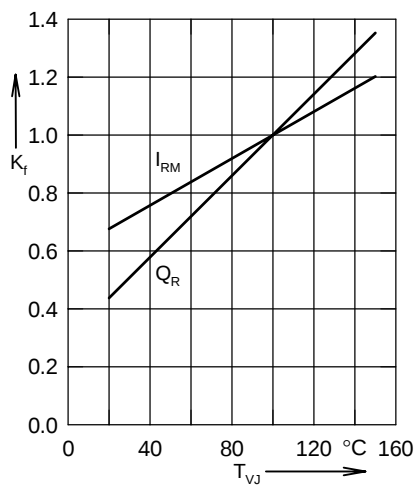


Fig.17 Dynamic parameters versus junction temperature (Fast Diode)

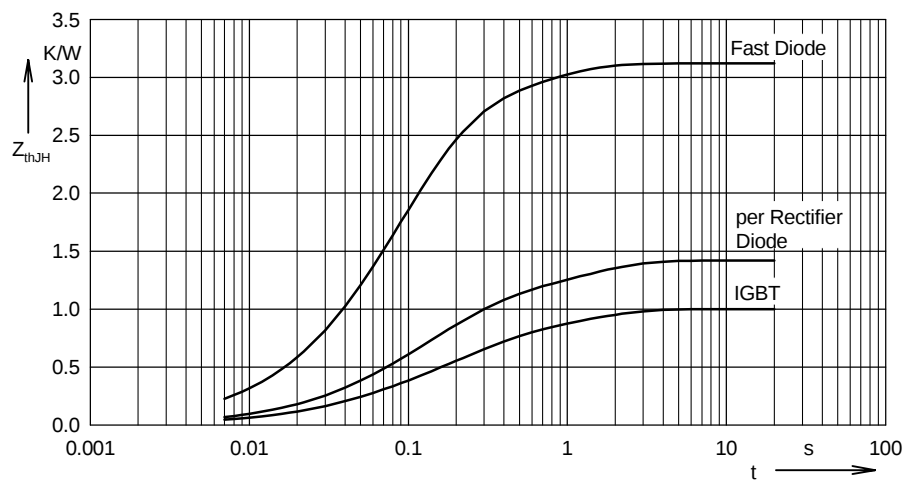


Fig.18 Transient thermal impedance junction to heatsink Z_{thJH}