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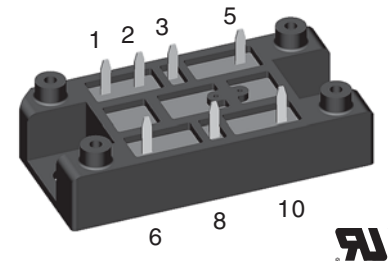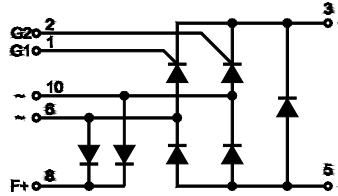
Half Controlled
Single Phase Rectifier Bridge
Including Freewheeling Diode and Field Diodes

V_{RRM} = 800-1600 V
I_{dAVM} = 32 A

V_{RSM} V_{DSM}	V_{RRM} V_{DRM}	Type
V	V	
900	800	VHFD 29-08io1
1300	1200	VHFD 29-12io1
1700	1600	VHFD 29-16io1

Bridge and Freewheeling Diode

Symbol	Conditions		Maximum Ratings	
I_{dAV}	T_H = 85°C, module		28	A
I_{dAVM} ✱	module		32	A
I_{FRMS}, I_{TRMS}	per leg		25	A
I_{FSM}, I_{TSM}	T_{VJ} = 45°C;	t = 10 ms (50 Hz), sine	300	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	330	A
	T_{VJ} = T_{VJM}	t = 10 ms (50 Hz), sine	270	A
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	300	A
I^2t	T_{VJ} = 45°C	t = 10 ms (50 Hz), sine	440	A²s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	455	A²s
	T_{VJ} = T_{VJM}	t = 10 ms (50 Hz), sine	365	A²s
	V_R = 0 V	t = 8.3 ms (60 Hz), sine	370	A²s
$(di/dt)_{cr}$	T_{VJ} = 125°C	repetitive, I_T = 50 A	150	A/µs
	f = 50 Hz, t_p = 200 µs V_D = 2/3 V_{DRM}			
	I_G = 0.3 A,	non repetitive, I_T = 0.5 I_{dAV}	500	A/µs
	di_G/dt = 0.3 A/µs			
$(dv/dt)_{cr}$	T_{VJ} = $T_{(vj)m}$; V_{DR} = 2/3 V_{DRM}		1000	V/µs
	R_{GK} = ∞; method 1 (linear voltage rise)			
V_{RGM}			10	V
P_{GM}	T_{VJ} = T_{VJM}	t_p = 30 µs	≤ 10	W
	I_T = 0.5 I_{dAVM}	t_p = 500 µs	≤ 5	W
		t_p = 10 ms	≤ 1	W
P_{GAVM}			0.5	W
T_{VJ}			-40...+125	°C
T_{VJM}			125	°C
T_{stg}			-40...+125	°C
V_{ISOL}	50/60 Hz, RMS	t = 1 min	3000	V~
	I_{ISOL} ≤ 1 mA	t = 1 s	3600	V~
d_S	Creep distance on surface		12.7	mm
d_A	Strike distance in air		9.4	mm
a	Max. allowable acceleration		50	m/s²
M_d	Mounting torque	(M5)	2-2.5	Nm
		(10-32 UNF)	18-22	lb.in.
Weight			35	g

Features
- Package with DCB ceramic base plate
- Isolation voltage 3600 V~
- Planar passivated chips
- Blocking voltage up to 1600 V
- Low forward voltage drop
- Leads suitable for PC board soldering
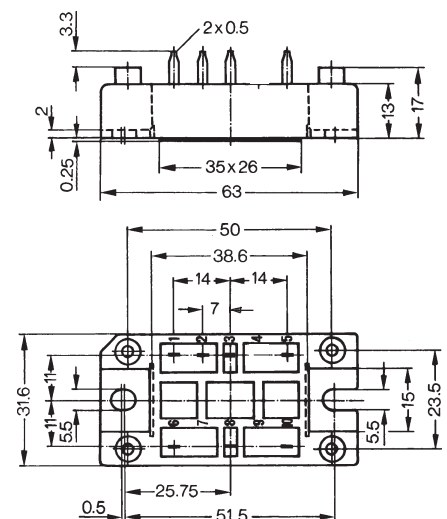- UL registered E 72873

Applications
- Supply for DC power equipment
- DC motor control

Advantages
- Easy to mount with two screws
- Space and weight savings
- Improved temperature and power cycling

Dimensions in mm (1 mm = 0.0394")

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

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Symbol	Conditions			Characteristic Values	
I_R, I_D	$V_R = V_{RRM}$; $V_D = V_{DRM}$	$T_{VJ} = T_{VJM}$	$\leq$	5	mA
		$T_{VJ} = 25°C$	$\leq$	0.3	mA
V_T, V_F	I_T, $I_F = 45$ A; $T_{VJ} = 25°C$		$\leq$	1.6	V
V_{T0}	For power-loss calculations only ($T_{VJ} = 125°C$)			0.9	V
r_T				15	mΩ
V_{GT}	$V_D = 6$ V;	$T_{VJ} = 25°C$	$\leq$	1.0	V
		$T_{VJ} = -40°C$	$\leq$	1.2	V
I_{GT}	$V_D = 6$ V;	$T_{VJ} = 25°C$	$\leq$	65	mA
		$T_{VJ} = -40°C$	$\leq$	80	mA
		$T_{VJ} = 125°C$	$\leq$	50	mA
V_{GD}	$T_{VJ} = T_{VJM}$;	$V_D = 2/3 \, V_{DRM}$	$\leq$	0.2	V
I_{GD}	$T_{VJ} = T_{VJM}$;	$V_D = 2/3 \, V_{DRM}$	$\leq$	5	mA
I_L	$I_G = 0.3$ A; $t_G = 30$ μs;	$T_{VJ} = 25°C$	$\leq$	150	mA
	$di_G/dt = 0.3$ A/μs;	$T_{VJ} = -40°C$	$\leq$	200	mA
		$T_{VJ} = 125°C$	$\leq$	100	mA
I_H	$T_{VJ} = 25°C$; $V_D = 6$ V; $R_{GK} = \infty$		$\leq$	100	mA
t_{gd}	$T_{VJ} = 25°C$; $V_D = 0.5 V_{DRM}$ $I_G = 0.3$ A; $di_G/dt = 0.3$ A/μs		$\leq$	2	μs
t_q	$T_{VJ} = 125°C$, $I_T = 15$ A, $t_P = 300$ μs, $V_R = 100$ V		typ.	150	μs
Q_r	$di/dt = -10$ A/μs, $dv/dt = 20$ V/μs, $V_D = 2/3 \, V_{DRM}$			75	μC
R_{thJC}	per thyristor (diode); DC current			1.4	K/W
	per module			0.35	K/W
R_{thJH}	per thyristor (diode); DC current			2.0	K/W
	per module			0.5	K/W

Fig. 1 Gate trigger range

1: I_{GT}, $T_{VJ} = 125°C$
2: I_{GT}, $T_{VJ} = 25°C$
3: I_{GT}, $T_{VJ} = -40°C$

4: $P_{GAV} = 0.5$ W
5: $P_{GM} = 1$ W
6: $P_{GM} = 10$ W

I_{GD}, $T_{VJ} = 125°C$

Field Diodes

Symbol	Conditions		Maximum Ratings	
I_{FAV}	$T_H = 85°C$, per Diode		4	A
I_{FAVM}	per diode		4	A
I_{FRMS}	per diode		6	A
I_{FSM}	$T_{VJ} = 45°C$;	$t = 10$ ms (50 Hz), sine	100	A
	$V_R = 0$ V	$t = 8.3$ ms (60 Hz), sine	110	A
	$T_{VJ} = T_{VJM}$	$t = 10$ ms (50 Hz), sine	85	A
	$V_R = 0$ V	$t = 8.3$ ms (60 Hz), sine	94	A
I^2t	$T_{VJ} = 45°C$	$t = 10$ ms (50 Hz), sine	50	A²s
	$V_R = 0$ V	$t = 8.3$ ms (60 Hz), sine	50	A²s
	$T_{VJ} = T_{VJM}$	$t = 10$ ms (50 Hz), sine	36	A²s
	$V_R = 0$ V	$t = 8.3$ ms (60 Hz), sine	37	A²s
I_R	$V_R = V_{RRM}$	$T_{VJ} = T_{VJM}$	1	mA
		$T_{VJ} = 25°C$	0.15	mA
V_F	$I_F = 21$ A; $T_{VJ} = 25°C$		1.83	V
V_{T0}	For power-loss calculations only ($T_{VJ} = 125°C$)		0.9	V
r_T			50	mΩ
R_{thJC}	per diode; DC current		4.4	K/W
R_{thJH}	per diode; DC current		5.2	K/W

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.
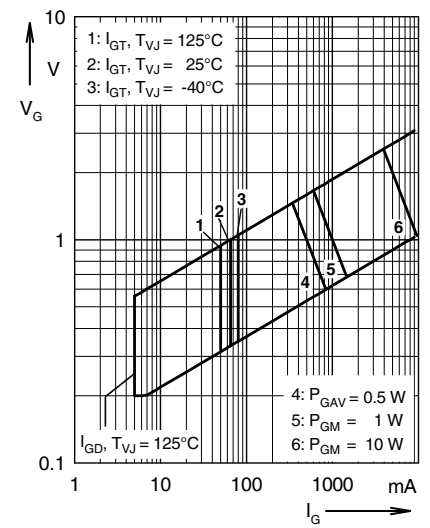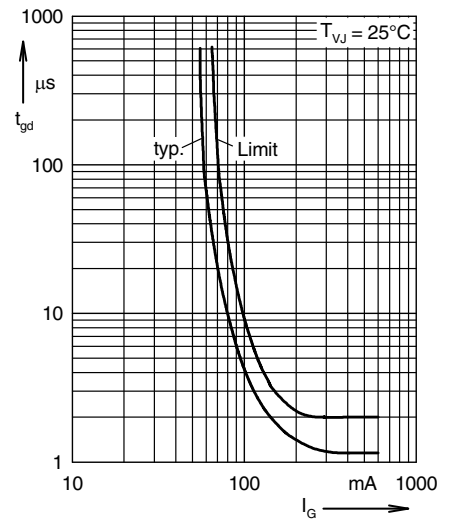
∗ for resistive load

Fig. 2 Gate controlled delay time t_{gd}

$T_{VJ} = 25°C$

typ. Limit

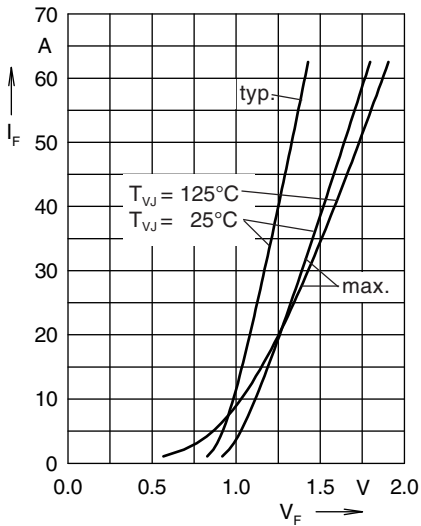IXYS reserves the right to change limits, test conditions and dimensions.

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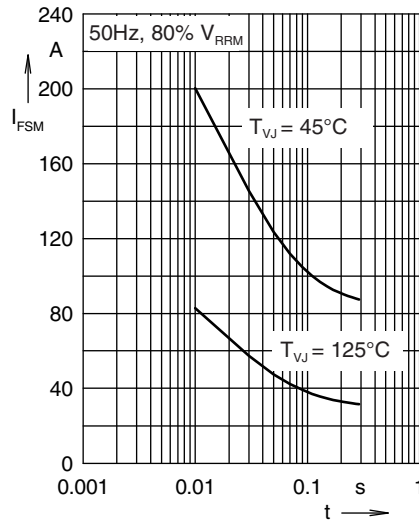
Fig. 3 Forward current vs. voltage drop per diode
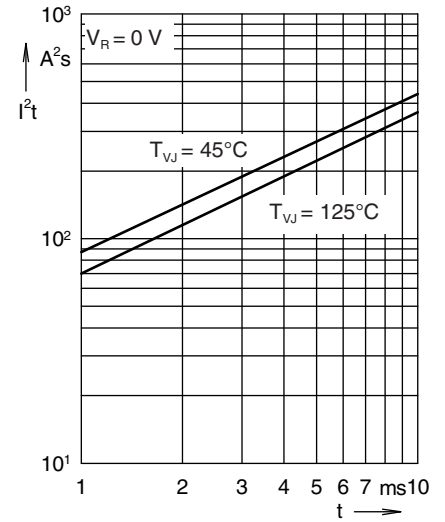

Fig. 4 Surge overload current
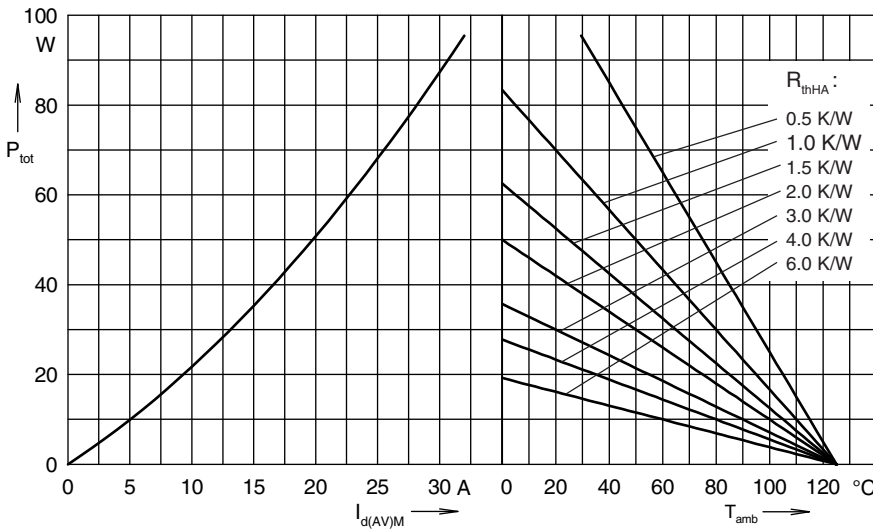

Fig. 5 I²t versus time per diode

Fig. 6 Power dissipation vs. direct output current and ambient temperature

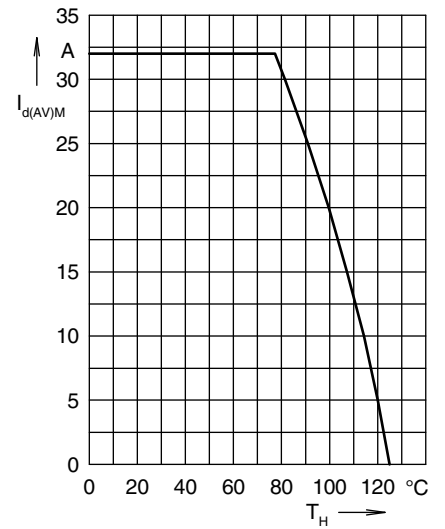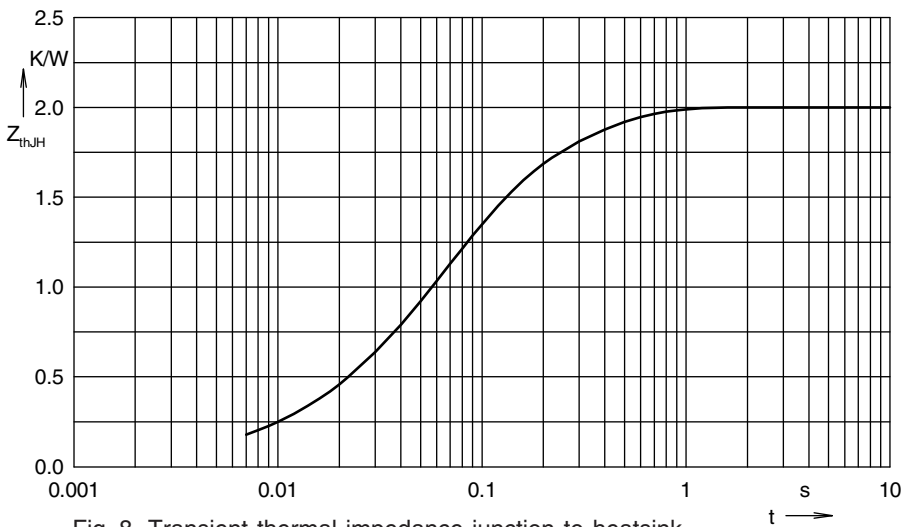Fig. 7 Max. forward current vs. heatsink temperature

Fig. 8 Transient thermal impedance junction to heatsink

Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.007	0.008
2	0.266	0.05
3	1.127	0.06
4	0.6	0.25

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