

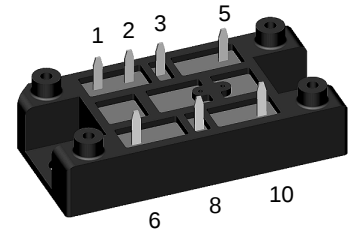
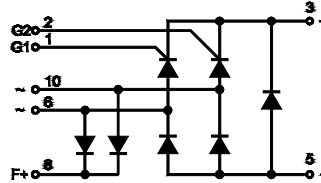
Half Controlled Single Phase Rectifier Bridge

Including Freewheeling Diode and Field Diodes

$$V_{RRM} = 800-1600 \text{ V}$$

$$I_{dAVM} = 21 \text{ A}$$

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
900	800	VHFD 16-08io1
1300	1200	VHFD 16-12io1
1500	1400	VHFD 16-14io1
1700	1600	VHFD 16-16io1



Bridge and Freewheeling Diode

Symbol	Test Conditions		Maximum Ratings	
I _{dAV}	T _H = 85°C, module		16	A
I _{dAVM} ①	module		21	A
I _{FRMS} , I _{TRMS}	per leg		15	A
I _{FSM} , I _{TSM}	T _{VJ} = 45°C;	t = 10 ms (50 Hz), sine	150	A
	V _R = 0 V	t = 8.3 ms (60 Hz), sine	170	A
	T _{VJ} = T _{VJM}	t = 10 ms (50 Hz), sine	130	A
	V _R = 0 V	t = 8.3 ms (60 Hz), sine	140	A
I ² t	T _{VJ} = 45°C	t = 10 ms (50 Hz), sine	110	A²s
	V _R = 0 V	t = 8.3 ms (60 Hz), sine	120	A²s
	T _{VJ} = T _{VJM}	t = 10 ms (50 Hz), sine	85	A²s
	V _R = 0 V	t = 8.3 ms (60 Hz), sine	80	A²s
(di/dt) _{cr}	T _{VJ} = 125°C f = 50 Hz, t _p = 200 μs V _D = 2/3 V _{DRM} I _G = 0.3 A, di _G /dt = 0.3 A/μs	repetitive, I _T = 50 A	150	A/μs
		non repetitive, I _T = 0.5 I _{dAV}	500	A/μs
(dv/dt) _{cr}	T _{VJ} = T _{VJM} ; V _{DR} = 2/3 V _{DRM} R _{GK} = ∞; method 1 (linear voltage rise)		1000	V/μs
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
				0.5
P _{GAVM}				
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

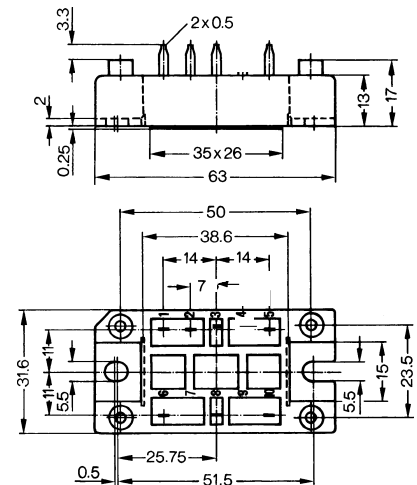
Applications

- 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")



Symbol	Test Conditions	Characteristic Values
I_R, I_D	$V_R = V_{RRM}; V_D = V_{DRM}$ $T_{VJ} = T_{VJM}$ $T_{VJ} = 25^\circ\text{C}$	≤ 5 mA ≤ 0.3 mA
V_T, V_F	$I_T, I_F = 45$ A; $T_{VJ} = 25^\circ\text{C}$	≤ 2.55 V
V_{T0}	For power-loss calculations only ($T_{VJ} = 125^\circ\text{C}$)	1.0 V
r_T		40 m Ω
V_{GT}	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$	≤ 1.0 V ≤ 1.2 V
I_{GT}	$V_D = 6$ V; $T_{VJ} = 25^\circ\text{C}$ $T_{VJ} = -40^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	≤ 65 mA ≤ 80 mA ≤ 50 mA
V_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	≤ 0.2 V
I_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	≤ 5 mA
I_L	$I_G = 0.3$ A; $t_G = 30$ μs ; $T_{VJ} = 25^\circ\text{C}$ $di_G/dt = 0.3$ A/ μs ; $T_{VJ} = -40^\circ\text{C}$ $T_{VJ} = 125^\circ\text{C}$	≤ 150 mA ≤ 200 mA ≤ 100 mA
I_H	$T_{VJ} = 25^\circ\text{C}; V_D = 6$ V; $R_{GK} = \infty$	≤ 100 mA
t_{gd}	$T_{VJ} = 25^\circ\text{C}; V_D = 0.5 V_{DRM}$ $I_G = 0.3$ A; $di_G/dt = 0.3$ A/ μs	≤ 2 μs
t_i	$T_{VJ} = 125^\circ\text{C}; I_T = 15$ A; $t_p = 300$ μs ; $V_R = 100$ V	typ. 150 μs
Q_f	$di/dt = -10$ A/ μs ; $dv/dt = 20$ V/ μs ; $V_D = 2/3 V_{DRM}$	75 μC
R_{thJC}	per thyristor (diode); DC current	2.4 K/W
	per module	0.6 K/W
R_{thJH}	per thyristor (diode); DC current	3.0 K/W
	per module	0.75 K/W

Field Diodes

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

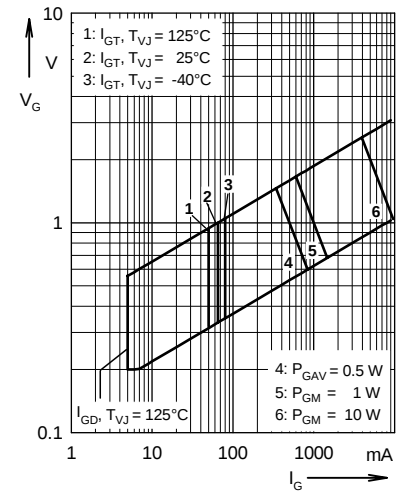


Fig. 1 Gate trigger range

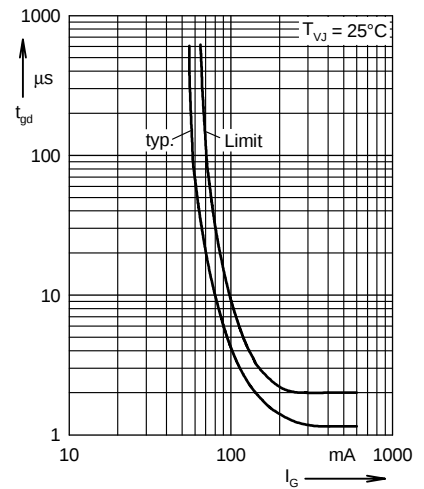


Fig. 2 Gate controlled delay time t_{gd}

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

① for resistive load

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

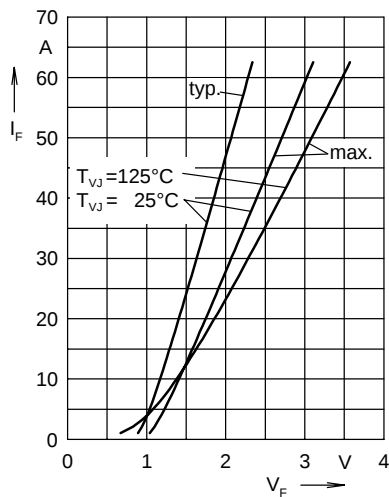


Fig. 3 Forward current versus voltage drop per diode

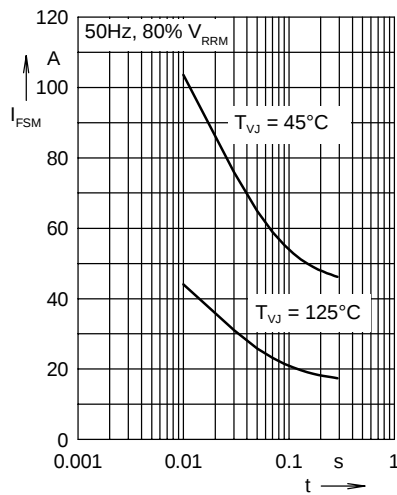


Fig. 4 Surge overload current

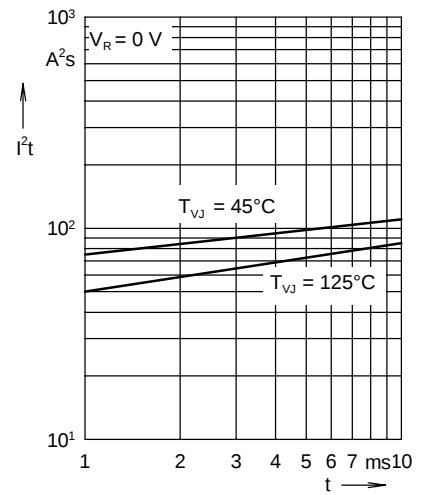


Fig. 5 I^2t versus time per diode

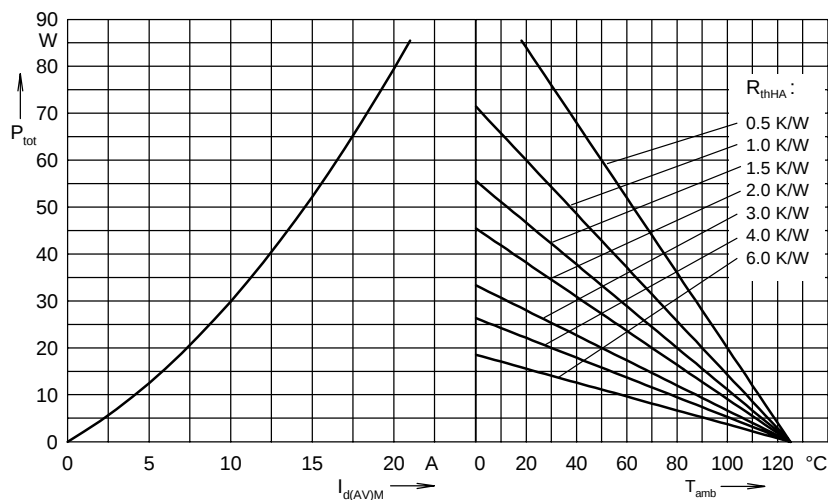


Fig. 6 Power dissipation versus direct output current and ambient temperature

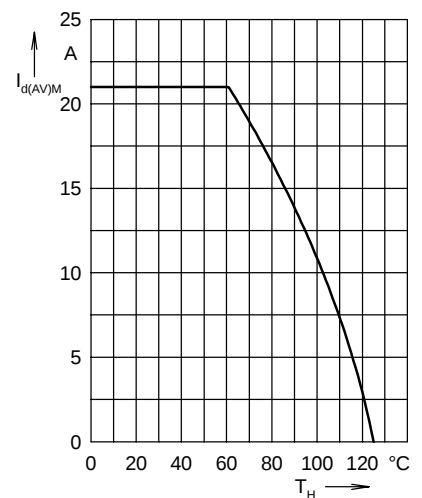


Fig. 7 Max. forward current versus heatsink temperature

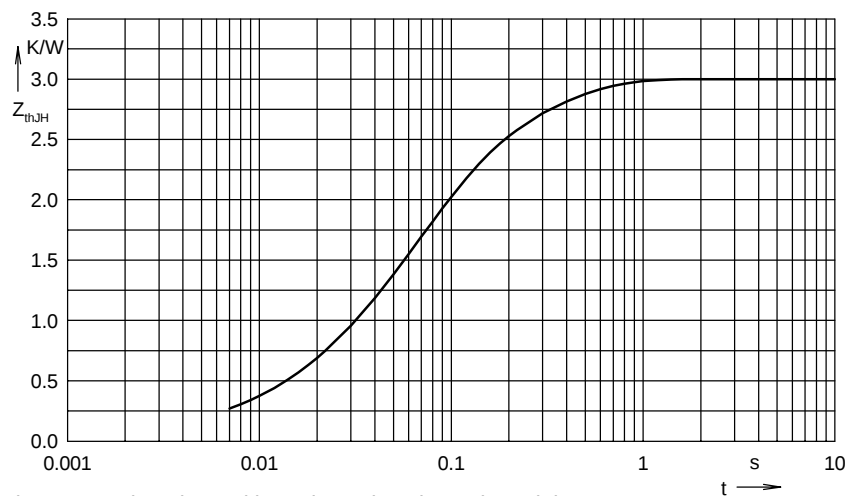


Fig. 8 Transient thermal impedance junction to heatsink

Constants for Z_{thJH} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.01	0.008
2	0.4	0.05
3	1.69	0.06
4	0.9	0.25