

Thyristor Modules

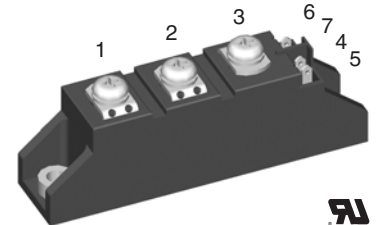
Thyristor/Diode Modules

$$I_{TRMS} = 2 \times 180 \text{ A}$$

$$I_{TAVM} = 2 \times 116 \text{ A}$$

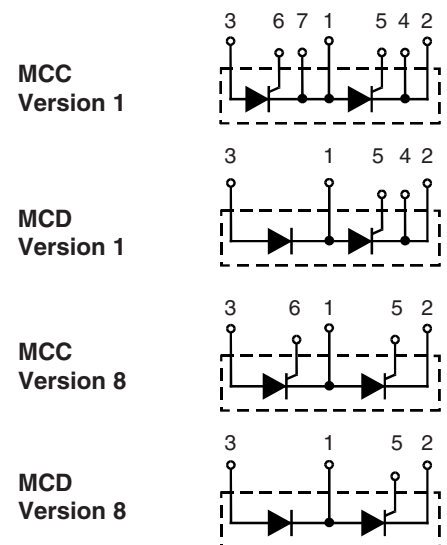
$$V_{RRM} = 800-1800 \text{ V}$$

V_{RSM}	V_{RRM}	Type			
V_{DSM}	V_{DRM}	Version		Version	
V	V	1 B	8 B	1 B	8 B
900	800	MCC 95-08	io1 B / io8 B	MCD 95-08	io1 B / io8 B
1300	1200	MCC 95-12	io1 B / io8 B	MCD 95-12	io1 B / io8 B
1500	1400	MCC 95-14	io1 B / io8 B	MCD 95-14	io1 B / io8 B
1700	1600	MCC 95-16	io1 B / io8 B	MCD 95-16	io1 B / io8 B
1900	1800	MCC 95-18	io1 B / io8 B	MCD 95-18	io1 B / io8 B

TO-240 AA


Symbol	Conditions	Maximum Ratings		
I_{TRMS}, I_{FRMS} I_{TAVM}, I_{FAVM}	$T_{VJ} = T_{VJM}$ $T_C = 85^\circ\text{C}; 180^\circ \text{ sine}$	180	A	
I_{TSM}, I_{FSM}	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ $t = 8.3 \text{ ms (60 Hz), sine}$	2250 2400 A	
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}$ $V_R = 0$	$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ $t = 8.3 \text{ ms (60 Hz), sine}$	25 300 23 900 A^2s
		$T_{VJ} = T_{VJM}$ $V_R = 0$	$t = 10 \text{ ms (50 Hz), sine}$ $t = 8.3 \text{ ms (60 Hz), sine}$	20 000 19 100 A^2s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM};$ $f = 50 \text{ Hz}; t_p = 200 \mu\text{s}$ $V_D = \frac{2}{3} V_{DRM};$ $I_G = 0.45 \text{ A};$ $di_G/dt = 0.45 \text{ A}/\mu\text{s}$	repetitive, $I_T = 250 \text{ A}$	150	$\text{A}/\mu\text{s}$
		non repetitive, $I_T = I_{TAVM}$	500	$\text{A}/\mu\text{s}$
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM};$ $R_{GK} = \infty; \text{method 1 (linear voltage rise)}$	$V_{DR} = \frac{2}{3} V_{DRM}$	1000	$\text{V}/\mu\text{s}$
P_{GM}	$T_{VJ} = T_{VJM};$ $I_T = I_{TAVM};$	$t_p = 30 \mu\text{s}$	10	W
		$t_p = 300 \mu\text{s}$	5	W
P_{GAV}			0.5	W
V_{RGM}			10	V
T_{VJ}			-40...+125	$^\circ\text{C}$
T_{VJM}			125	$^\circ\text{C}$
T_{stg}			-40...+125	$^\circ\text{C}$
V_{ISOL}	50/60 Hz, RMS; $I_{ISOL} \leq 1 \text{ mA};$	$t = 1 \text{ min}$	3000	V~
		$t = 1 \text{ s}$	3600	V~
M_d	Mounting torque (M5)		2.5-4.0/22-35	Nm/lb.in.
	Terminal connection torque (M5)		2.5-4.0/22-35	Nm/lb.in.
Weight	Typical including screws		90	g

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


Features

- International standard package, JEDEC TO-240 AA
- Direct copper bonded Al_2O_3 -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E72873
- Gate-cathode twin pins for version 1

Applications

- DC motor control
- Softstart AC motor controller
- Light, heat and temperature control

Advantages

- Space and weight savings
- Simple mounting with two screws
- Improved temperature and power cycling
- Reduced protection circuits

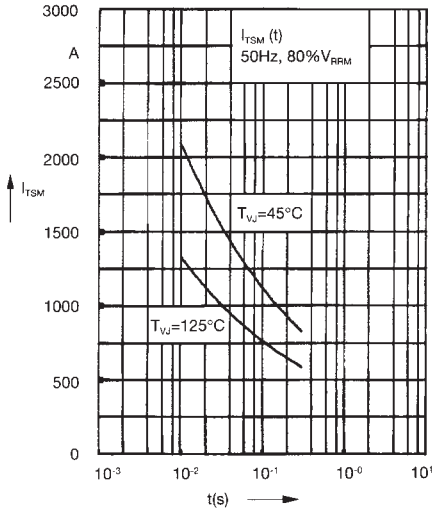


Fig. 3 Surge overload current
 I_{TSM} , I_{FSM} : Crest value, t: duration

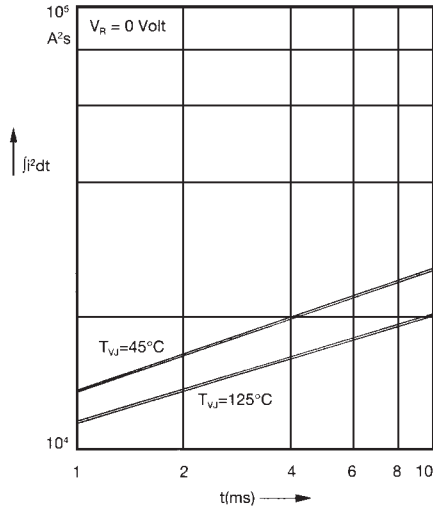


Fig. 4 $\int i^2 dt$ versus time (1-10 ms)

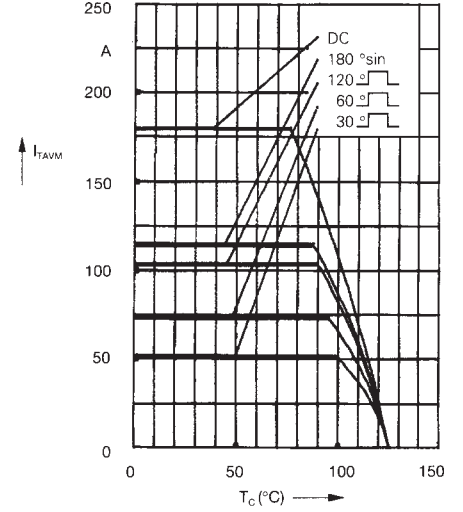


Fig. 4a Maximum forward current at case temperature

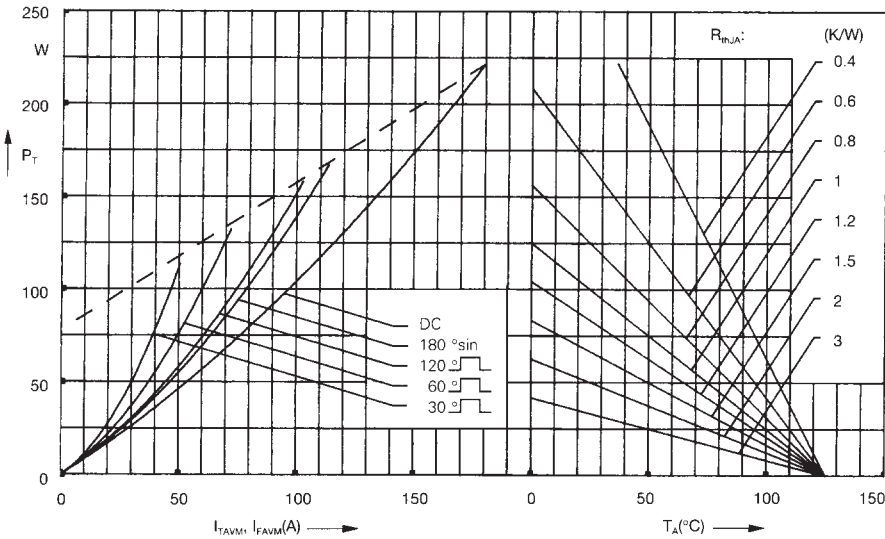


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

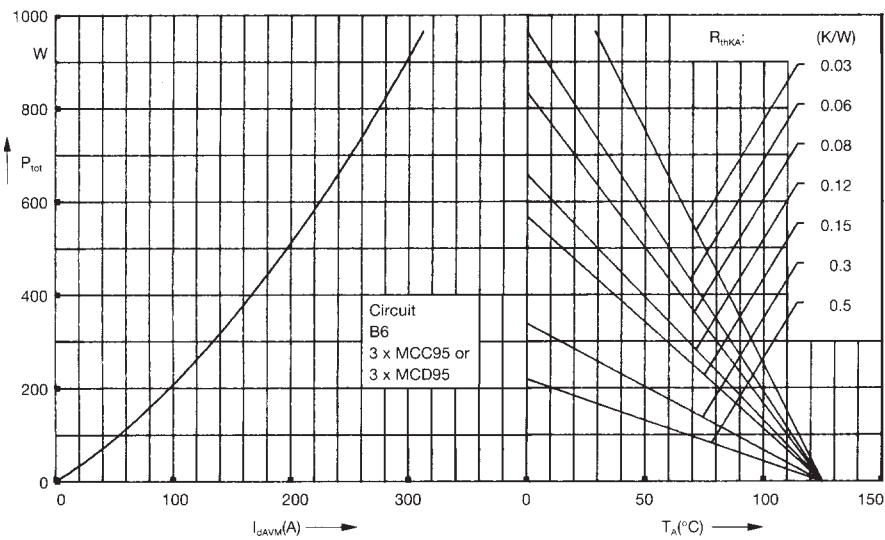


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

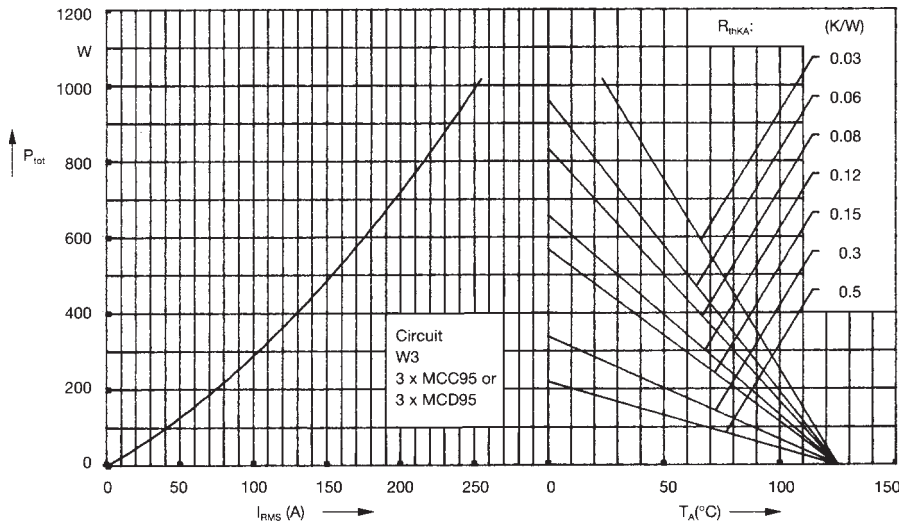


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

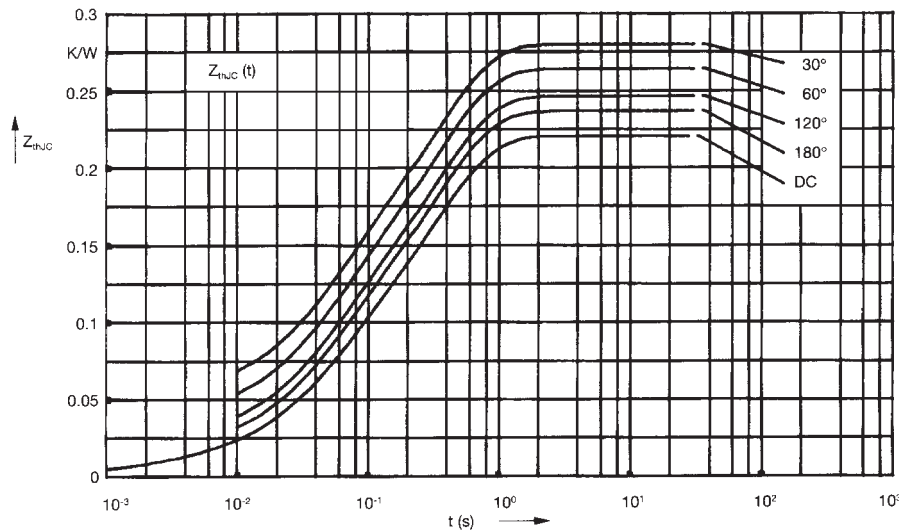


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

R_{thJC} for various conduction angles d :

d	R_{thJC} (K/W)
DC	0.22
180°	0.23
120°	0.25
60°	0.27
30°	0.28

Constants for Z_{thJC} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.0019
2	0.0678	0.0477
3	0.1456	0.344

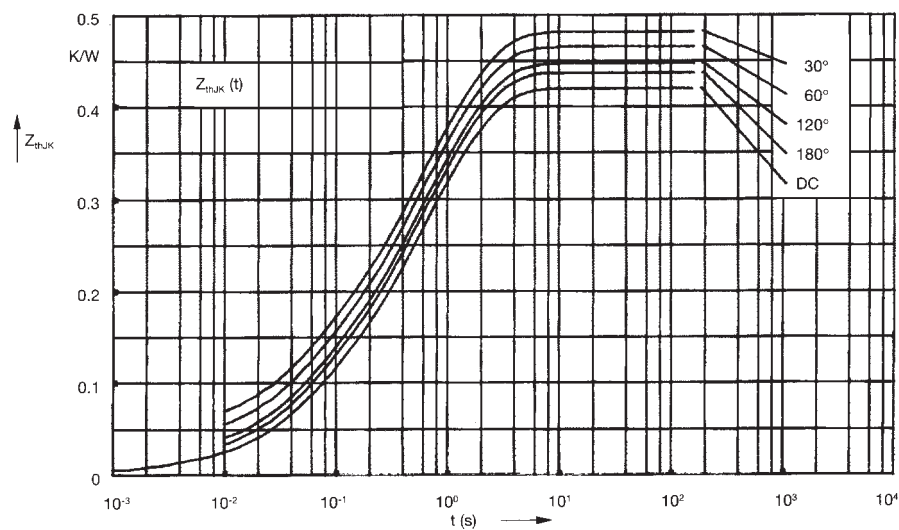


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

R_{thJK} for various conduction angles d :

d	R_{thJK} (K/W)
DC	0.42
180°	0.43
120°	0.45
60°	0.47
30°	0.48

Constants for Z_{thJK} calculation:

i	R_{thi} (K/W)	t_i (s)
1	0.0066	0.0019
2	0.0678	0.0477
3	0.1456	0.344
4	0.2	1.32