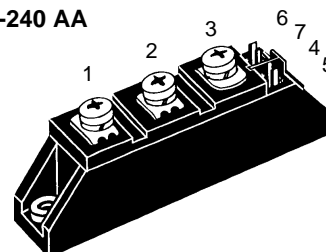


# Thyristor Modules

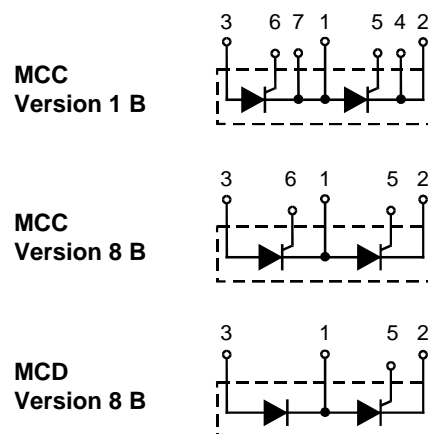
## Thyristor/Diode Modules

$I_{TRMS} = 2 \times 50 \text{ A}$   
 $I_{TAVM} = 2 \times 32 \text{ A}$   
 $V_{RRM} = 800-1600 \text{ V}$

$V_{RSM}$	$V_{RRM}$	Type		
$V_{DSM}$	$V_{DRM}$	Version 1 B	Version 8 B	Version 8 B
V	V			
900	800	MCC 26-08io1 B	MCC 26-08io8 B	MCD 26-08io8 B
1300	1200	MCC 26-12io1 B	MCC 26-12io8 B	MCD 26-12io8 B
1500	1400	MCC 26-14io1 B	MCC 26-14io8 B	MCD 26-14io8 B
1700	1600	MCC 26-16io1 B	MCC 26-16io8 B	MCD 26-16io8 B

**TO-240 AA**


Symbol	Test Conditions	Maximum Ratings	
$I_{TRMS}, I_{FRMS}$ $I_{TAVM}, I_{FAVM}$	$T_{VJ} = T_{VJM}$	50	A
	$T_C = 75^\circ\text{C}; 180^\circ \text{ sine}$	32	A
	$T_C = 85^\circ\text{C}; 180^\circ \text{ sine}$	27	A
$I_{TSM}, I_{FSM}$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine	520 A
		t = 8.3 ms (60 Hz), sine	560 A
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine	460 A
		t = 8.3 ms (60 Hz), sine	500 A
$\int i^2 dt$	$T_{VJ} = 45^\circ\text{C}; V_R = 0$	t = 10 ms (50 Hz), sine	1350 A <sup>2</sup> s
		t = 8.3 ms (60 Hz), sine	1300 A <sup>2</sup> s
	$T_{VJ} = T_{VJM}; V_R = 0$	t = 10 ms (50 Hz), sine	1050 A <sup>2</sup> s
		t = 8.3 ms (60 Hz), sine	1030 A <sup>2</sup> s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}; f = 50 \text{ Hz}; t_p = 200 \mu\text{s}; V_D = 2/3 V_{DRM}; I_G = 0.45 \text{ A}; di_G/dt = 0.45 \text{ A}/\mu\text{s}$	repetitive, $I_T = 45 \text{ A}$	150 A/ $\mu\text{s}$
		non repetitive, $I_T = I_{TAVM}$	500 A/ $\mu\text{s}$
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}; R_{GK} = \infty; \text{method 1 (linear voltage rise)}$	$V_{DR} = 2/3 V_{DRM}$	1000 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	°C
$T_{VJM}$		125	°C
$T_{stg}$		-40...+125	°C
$V_{ISOL}$	50/60 Hz, RMS $I_{ISOL} \leq 1 \text{ mA}$	t = 1 min	3000 V~
		t = 1 s	3600 V~
$M_d$	Mounting torque (M5) Terminal connection torque (M5)		2.5-4.0/22-35 Nm/lb.in.
			2.5-4.0/22-35 Nm/lb.in.
Weight	Typical including screws	90	g


**Features**

- International standard package, JEDEC TO-240 AA
- Direct copper bonded  $\text{Al}_2\text{O}_3$  -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873
- Gate-cathode twin pins for version 1B

**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

Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated. IXYS reserves the right to change limits, test conditions and dimensions



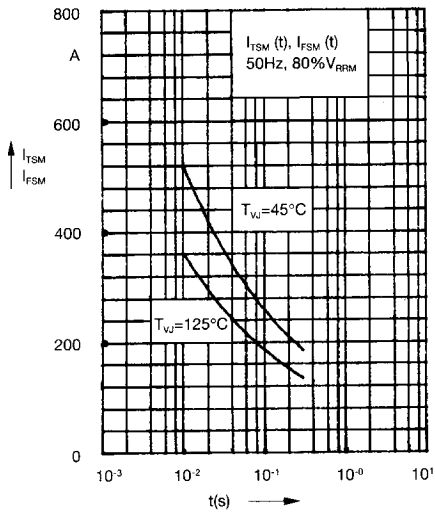


Fig. 3 Surge overload current  
 $I_{TSM}, I_{FSM}$ : Crest value,  $t$ : duration

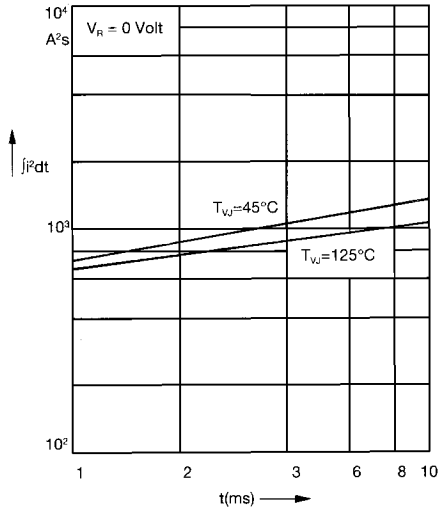


Fig. 4  $\int i^2 dt$  versus time (1-10 ms)

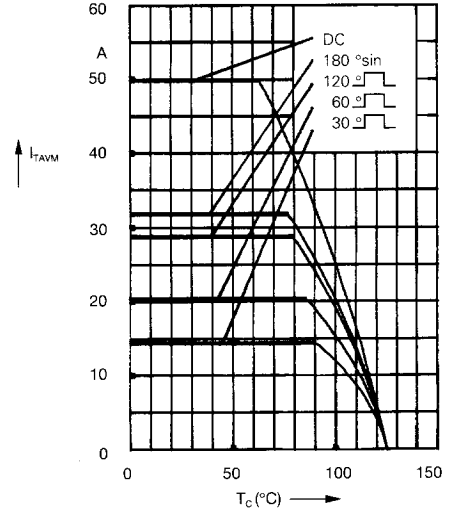


Fig. 4a Maximum forward current at case temperature

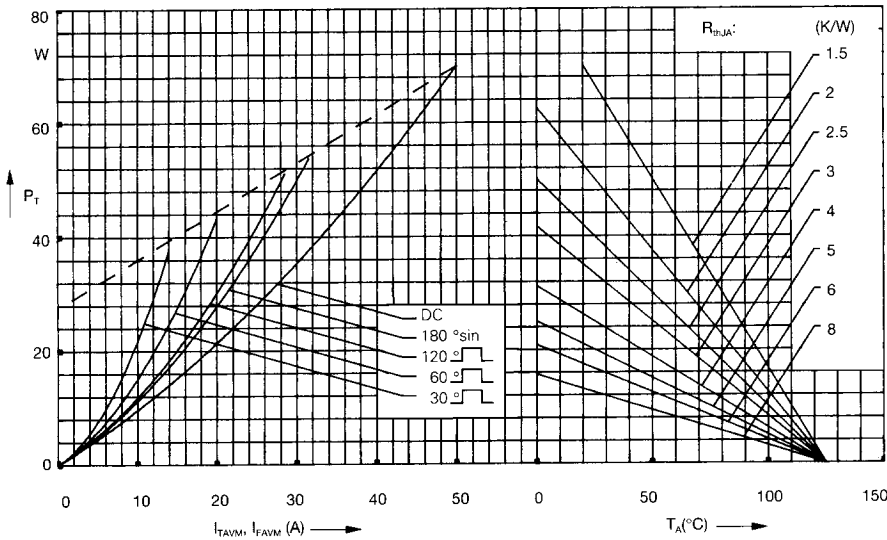


Fig. 5 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

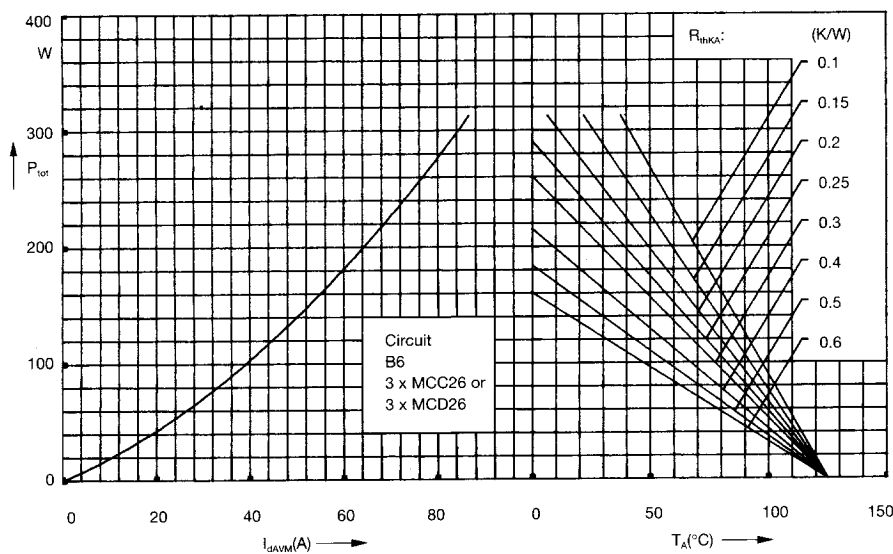


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

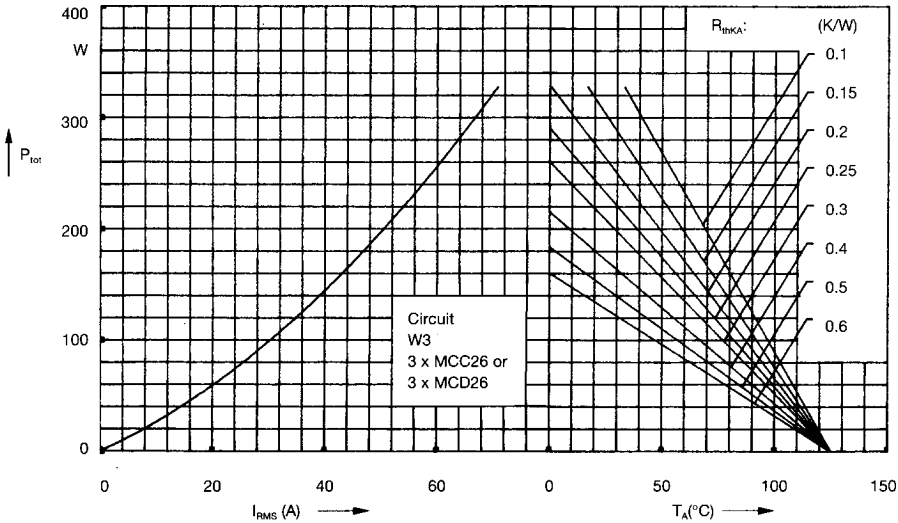


Fig. 7 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperature

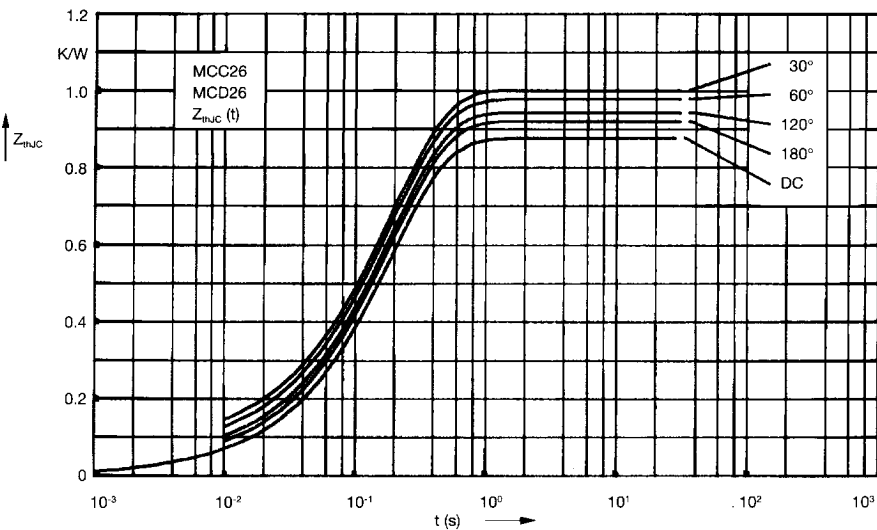


Fig. 8 Transient thermal impedance junction to case (per thyristor or diode)

$R_{thJC}$  for various conduction angles  $d$ :

$d$	$R_{thJC}$ (K/W)
DC	0.88
180°	0.92
120°	0.95
60°	0.98
30°	1.01

Constants for  $Z_{thJC}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.019	0.0031
2	0.029	0.0216
3	0.832	0.191

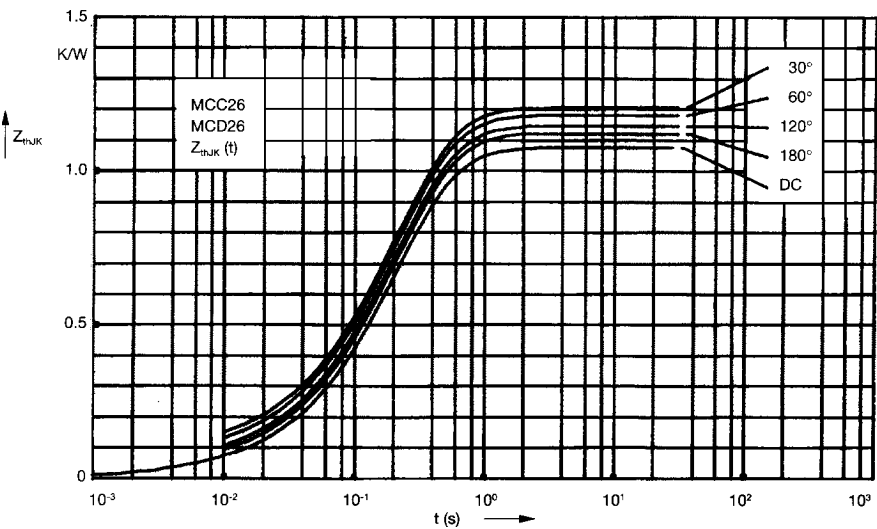


Fig. 9 Transient thermal impedance junction to heatsink (per thyristor or diode)

$R_{thJK}$  for various conduction angles  $d$ :

$d$	$R_{thJK}$ (K/W)
DC	1.08
180°	1.12
120°	1.15
60°	1.18
30°	1.21

Constants for  $Z_{thJK}$  calculation:

$i$	$R_{thi}$ (K/W)	$t_i$ (s)
1	0.019	0.0031
2	0.029	0.0216
3	0.832	0.191
4	0.2	0.45