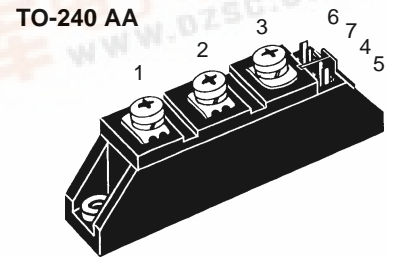


High Voltage Thyristor Module

High Voltage Thyristor/Diode Modules

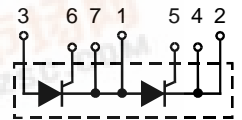
$I_{TRMS} = 2x 180 A$
 $I_{TAVM} = 2x 104 A$
 $V_{RRM} = 2000-2200 V$

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
2100	2000	MCC 94-20io1 B MCD 94-20io1 B
2300	2200	MCC 94-22io1 B MCD 94-22io1 B

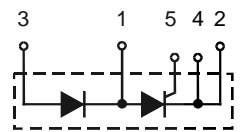


Symbol	Test Conditions	Maximum Ratings
I_{TRMS}	$T_{VJ} = T_{VJM}$ $T_C = 85^\circ C$; 180° sine	180 A
		104 A
I_{TSM}	$T_{VJ} = 45^\circ C$; $V_R = 0$	t = 10 ms (50 Hz) 1700 A
		t = 8.3 ms (60 Hz) 1800 A
$\int i^2 dt$	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz) 1540 A
		t = 8.3 ms (60 Hz) 1640 A
$(di/dt)_{cr}$	$T_{VJ} = 45^\circ C$ $V_R = 0$	t = 10 ms (50 Hz) 14450 A ² s
		t = 8.3 ms (60 Hz) 13500 A ² s
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $V_{DR} = 2/3 V_{DRM}$ $R_{GK} = \infty$; method 1 (linear voltage rise)	11850 A ² s
		11300 A ² s
P_{GM}	$T_{VJ} = T_{VJM}$ $I_T = I_{TAVM}$	$t_p = 30 \mu s$ 10 W
		$t_p = 300 \mu s$ 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 t = 1 min	3000 V~
		$I_{ISOL} \leq 1 mA$ t = 1 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

MCC



MCD



Features

- International standard package, JEDEC TO-240 AA
- Direct Copper Bonded Al₂O₃ -ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL registered, E 72873
- Gate-cathode twin pins for version 1B

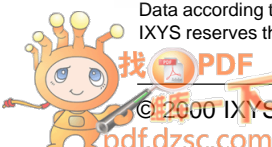
Applications

- 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



Symbol	Test Conditions	Characteristic Values
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	15 mA
V_T	$I_T = 300 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.74 V
V_{T0}	For power-loss calculations only ($T_{VJ} = T_{VJM}$)	0.85 V
r_T		3.2 mΩ
V_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$	1.5 V
	$T_{VJ} = -40^\circ\text{C}$	1.6 V
I_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$	100 mA
	$T_{VJ} = -40^\circ\text{C}$	200 mA
V_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	0.25 V
I_{GD}	$T_{VJ} = T_{VJM}; V_D = 2/3 V_{DRM}$	10 mA
I_L	$T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; t_p = 30 \mu\text{s}$ $di_G/dt = 0.45 \text{ A}/\mu\text{s}; I_G = 0.45 \text{ A}$	200 mA
I_H	$T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; R_{GK} = \infty$	150 mA
t_{gd}	$T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $di_G/dt = 0.45 \text{ A}/\mu\text{s}; I_G = 0.45 \text{ A}$	2 μs
t_q	$T_{VJ} = T_{VJM}; V_R = 100 \text{ V}; V_D = 2/3 V_{DRM}; t_p = 200 \mu\text{s}$ $dv/dt = 20 \text{ V}/\mu\text{s}; I_T = 150 \text{ A}; -di/dt = 10 \text{ A}/\mu\text{s}$	typ. 185 μs
Q_S	$T_{VJ} = T_{VJM}$ $-di/dt = 6 \text{ A}/\mu\text{s}; I_T = 50 \text{ A}$	170 μC
I_{RM}		45 A
R_{thJC}	per thyristor; DC current	0.22 K/W
	per module	0.11 K/W
R_{thJK}	per thyristor; DC current	0.42 K/W
	per module	0.21 K/W
d_s	Creeping distance on surface	12.7 mm
d_A	Creepage distance in air	9.6 mm
a	Maximum allowable acceleration	50 m/s ²

Optional accessories for module-type MCC 94 version 1 B

Keyed gate/cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red

Type **ZY 200L** (L = Left for pin pair 4/5) } UL 758, style 1385,
Type **ZY 200R** (R = right for pin pair 6/7) } CSA class 5851, guide 460-1-1

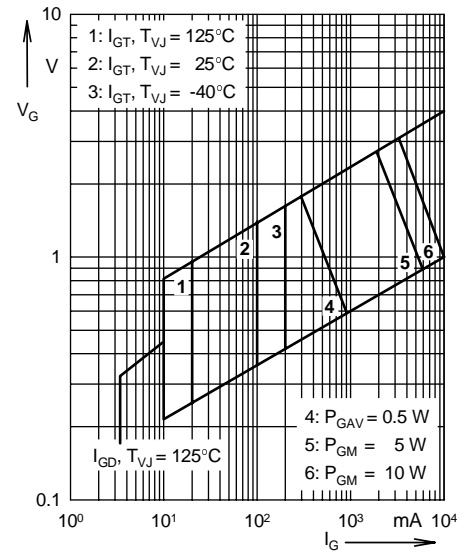


Fig. 1 Gate trigger characteristics

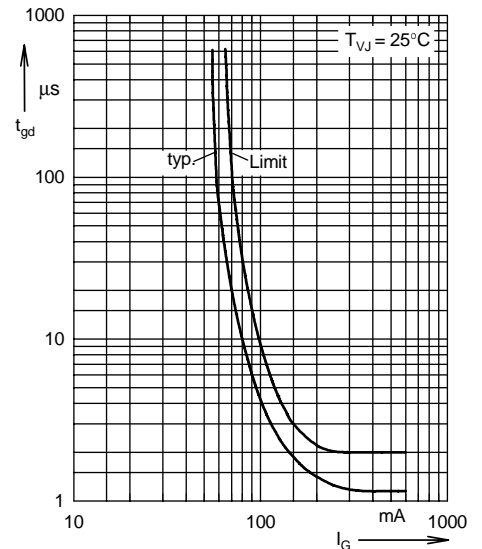
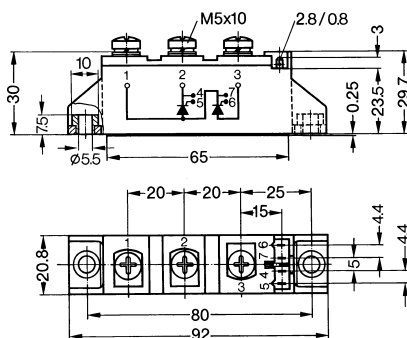


Fig. 2 Gate trigger delay time

Dimensions in mm (1 mm = 0.0394")



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

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