Thyristor Module

Preliminary data

I_{TRMS} **= 2x 100 A**
I_{TAVM} **= 2x 64 A**
$V_{RRM,DRM}$ **= 1600 V**

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
1700	1600	MCC 60-16io1 B

3 6 7 1 5 4 2

TO-240 AA

Features

- International standard package
- Direct copper bonded Al_2O_3-ceramic base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- Gate-cathode twin pins

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
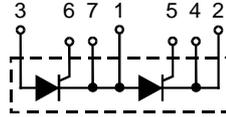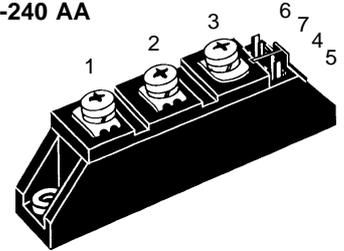
Symbol	Conditions			Maximum Ratings	
I_{TRMS}, I_{FRMS} I_{TAVM}	$T_{VJ} = T_{VJM}$ $T_C = 85°C$; 180° sine			100 64	A A
I_{TSM}, I_{FSM}	$T_{VJ} = 45°C$; $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine		1150 1230	A A
	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine		1000 1070	A A
I²dt	$T_{VJ} = 45°C$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine		6610 6350	A²s A²s
	$T_{VJ} = T_{VJM}$ $V_R = 0$	t = 10 ms (50 Hz), sine t = 8.3 ms (60 Hz), sine		5000 4810	A²s A²s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ f = 50Hz, $t_P = 200µs$ $V_D = {}^2/_3 V_{DRM}$ $I_G = 0.45 A$ $di_G/dt = 0.45 A/µs$	repetitive, $I_T = 150 A$ non repetitive, $I_T = I_{TAVM}$		150 500	A/µs A/µs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $R_{GK} = \infty$; method 1 (linear voltage rise)	$V_{DR} = {}^2/_3 V_{DRM}$		1000	V/µs
P_{GM}	$T_{VJ} = T_{VJM}$ $I_T = I_{TAVM}$	$t_P =$ $t_P =$	30 µs 300 µs	10 5	W W
P_{GAV}				0.5	W
V_{RGM}				10	V
T_{VJ} T_{VJM} T_{stg}				-40...+140 140 -40...+125	°C °C °C
V_{ISOL}	50/60 Hz, RMS $I_{ISOL} \leq 1 mA$	t = 1 min t = 1 s		3000 3600	V~ V~
M_d	Mounting torque (M5) Terminal connection torque (M5)			2.5-4.0/22-35 2.5-4.0/22-35	Nm/lb.in. Nm/lb.in.
Weight	Typical including screws			90	g

Dimensions in mm (1 mm = 0.0394")

M5x10   2.8/0.8
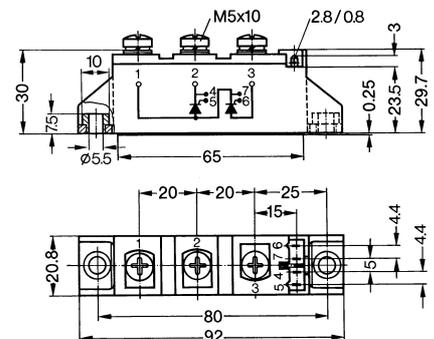
Data according to IEC 60747 and refer to a single thyristor/diode unless otherwise stated.
IXYS reserves the right to change limits, test conditions and dimensions

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Symbol	Conditions		Characteristic Values	
I_{RRM}, I_{DRM}	$T_{VJ} = T_{VJM}$; $V_R = V_{RRM}$; $V_D = V_{DRM}$		20	mA
V_T, V_F	$I_T, I_F = 200$ A; $T_{VJ} = 25°C$		1.70	V
V_{T0}	$T_{VJ} = 125°C$; For power-loss calculations only		0.85	V
r_T	$T_{VJ} = T_{VJM}$		4.8	mΩ
V_{GT}	$V_D = 6$ V;	$T_{VJ} = 25°C$	1.4	V
		$T_{VJ} = -40°C$	1.6	V
I_{GT}	$V_D = 6$ V;	$T_{VJ} = 25°C$	100	mA
		$T_{VJ} = -40°C$	200	mA
V_{GD}	$T_{VJ} = T_{VJM}$;	$V_D = {}^2\!/_3\ V_{DRM}$	0.2	V
I_{GD}			10	mA
I_L	$T_{VJ} = 25°C$; $t_P = 10$ µs, $V_D = 6$ V		450	mA
	$I_G = 0.45$ A; $di_G/dt = 0.45$ A/µs			
I_H	$T_{VJ} = 25°C$; $V_D = 6$ V; $R_{GK} = \infty$		200	mA
t_{gd}	$T_{VJ} = 25°C$; $V_D = \frac{1}{2}\ V_{DRM}$		2	µs
	$I_G = 0.45$ A; $di_G/dt = 0.45$ A/µs			
t_q	$T_{VJ} = T_{VJM}$; $I_T = 120$ A, $t_P = 200$ µs; $-di/dt = 10$ A/µs typ.		150	µs
	$V_R = 100$ V; $dv/dt = 20$ V/µs; $V_D = {}^2\!/_3\ V_{DRM}$			
Q_S	$T_{VJ} = T_{VJM}$; $I_T, I_F = 50$ A, $-di/dt = 0.64$ A/µs		110	µC
I_{RM}			12	A
R_{thJC}	per thyristor/diode; DC current		0.5	K/W
	per module		0.25	K/W
R_{thCH}	per thyristor/diode; DC current	typ.	0.1	K/W
d_S	Creepage distance on surface		12.7	mm
d_A	Strike distance through air		9.6	mm
a	Maximum allowable acceleration		50	m/s²

Optional accessories for module-type MCC 60 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

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: $P_{GM} = 5$ W
6: $P_{GM} = 10$ W
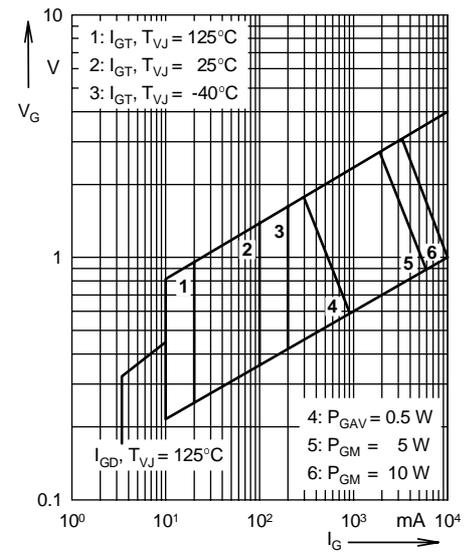
Fig. 1 Gate trigger characteristics
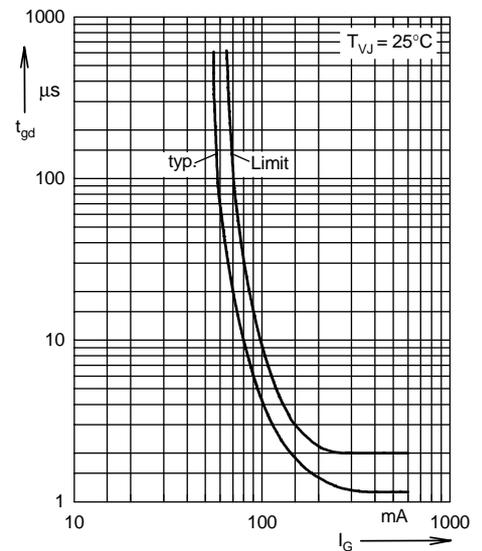
Fig. 2 Gate trigger delay time