

High Power Single Thyristor Module

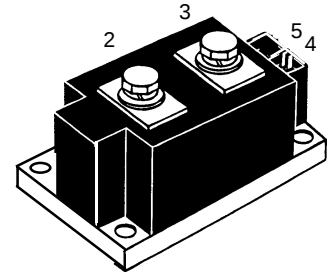
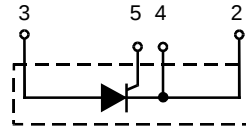
$$I_{TRMS} = 928 \text{ A}$$

$$I_{TAV} = 600 \text{ A}$$

$$V_{RRM} = 2000\text{-}2200 \text{ V}$$

Preliminary data

V_{RSM} V_{DSM} V	V_{RRM} V_{DRM} V	Type
2100	2000	MCO 600-20io1
2300	2200	MCO 600-22io1



Symbol	Test Conditions	Maximum Ratings
I_{TRMS}	$T_{VJ} = T_{VJM}$	928 A
I_{TAV}	$T_C = 85^\circ\text{C}$; 180° sine	600 A
I_{TSM}	$T_{VJ} = 45^\circ\text{C}$	
	$t = 10 \text{ ms}$ (50 Hz)	15000 A
	$V_R = 0$	
	$t = 8.3 \text{ ms}$ (60 Hz)	16000 A
I^2t	$T_{VJ} = T_{VJM}$	
	$t = 10 \text{ ms}$ (50 Hz)	13000 A
	$V_R = 0$	
	$t = 8.3 \text{ ms}$ (60 Hz)	14400 A
$(di/dt)_{cr}$	$T_{VJ} = 45^\circ\text{C}$	
	$t = 10 \text{ ms}$ (50 Hz)	1125000 A ² s
	$V_R = 0$	
	$t = 8.3 \text{ ms}$ (60 Hz)	1062000 A ² s
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$	
	$t = 10 \text{ ms}$ (50 Hz)	845000 A ² s
	$V_R = 0$	
	$t = 8.3 \text{ ms}$ (60 Hz)	813000 A ² s
$(di/dt)_{cr}$	$T_{VJ} = T_{VJM}$ repetitive, $I_T = 960 \text{ A}$	100 A/ μs
	$f = 50 \text{ Hz}$, $t_p = 200 \mu\text{s}$	
	$V_D = 2/3 V_{DRM}$	
	$I_G = 1 \text{ A}$, non repetitive, $I_T = I_{TAVM}$	500 A/ μs
$(dv/dt)_{cr}$	$T_{VJ} = T_{VJM}$; $V_{DR} = 2/3 V_{DRM}$	
	$R_{GK} = \infty$; method 1 (linear voltage rise)	1000 V/ μs
P_{GM}	$T_{VJ} = T_{VJM}$	120 W
	$t_p = 30 \mu\text{s}$	
	$I_T = I_{TAVM}$	60 W
	$t_p = 500 \mu\text{s}$	
P_{GAV}		30 W
V_{RGM}		10 V
T_{VJ}		-40...140 °C
T_{VJM}		140 °C
T_{stg}		-40...125 °C
V_{ISOL}	50/60 Hz, RMS $t = 1 \text{ min}$	3000 V~
	$I_{ISOL} \leq 1 \text{ mA}$ $t = 1 \text{ s}$	3600 V~
M_d	Mounting torque (M6)	4.5-7/40-62 Nm/lb.in.
	Terminal connection torque (M8)	11-13/97-115 Nm/lb.in.
Weight	Typical including screws	650 g

Features

- Direct copper bonded Al_2O_3 -ceramic with copper base plate
- Planar passivated chips
- Isolation voltage 3600 V~
- UL applied
- Keyed gate/cathode twin pins

Applications

- Motor control, softstarter
- Power converter
- Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- Solid state switches

Advantages

- 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

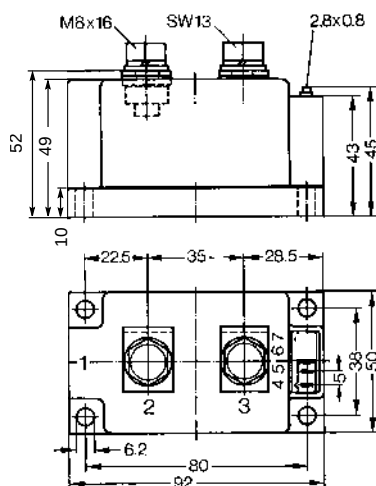
Symbol	Test Conditions	Characteristic Values	
I_{RRM}	$T_{VJ} = T_{VJM}; V_R = V_{RRM}$	60	mA
V_T	$I_T = 600 \text{ A}; T_{VJ} = 25^\circ\text{C}$	1.15	V
V_{T0}	For power-loss calculations only ($T_{VJ} = T_{VJM}$)	0.77	V
r_T		0.42	m Ω
V_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$	2	V
	$T_{VJ} = -40^\circ\text{C}$	3	V
I_{GT}	$V_D = 6 \text{ V}; T_{VJ} = 25^\circ\text{C}$	300	mA
	$T_{VJ} = -40^\circ\text{C}$	400	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	$T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; t_p = 30 \mu\text{s}$ $di_G/dt = 1 \text{ A}/\mu\text{s}; I_G = 1 \text{ A}$	400	mA
I_H	$T_{VJ} = 25^\circ\text{C}; V_D = 6 \text{ V}; R_{GK} = \infty$	300	mA
t_{gd}	$T_{VJ} = 25^\circ\text{C}; V_D = 1/2 V_{DRM}$ $di_G/dt = 1 \text{ A}/\mu\text{s}; I_G = 1 \text{ A}$	2	μs
t_q	$T_{VJ} = T_{VJM}; V_R = 100 \text{ V}; V_D = 2/3 V_{DRM}; t_p = 200 \mu\text{s}$ $dv/dt = 50 \text{ V}/\mu\text{s}; I_T = 500 \text{ A}; -di/dt = 10 \text{ A}/\mu\text{s}$	typ. 350	μs
R_{thJC}	DC current	0.065	K/W
R_{thJK}	DC current	0.085	K/W
d_s	Creep distance on surface	12.7	mm
d_A	Strike distance in air	9.6	mm
a	Maximum allowable acceleration	50	m/s ²

Optional accessories for modules

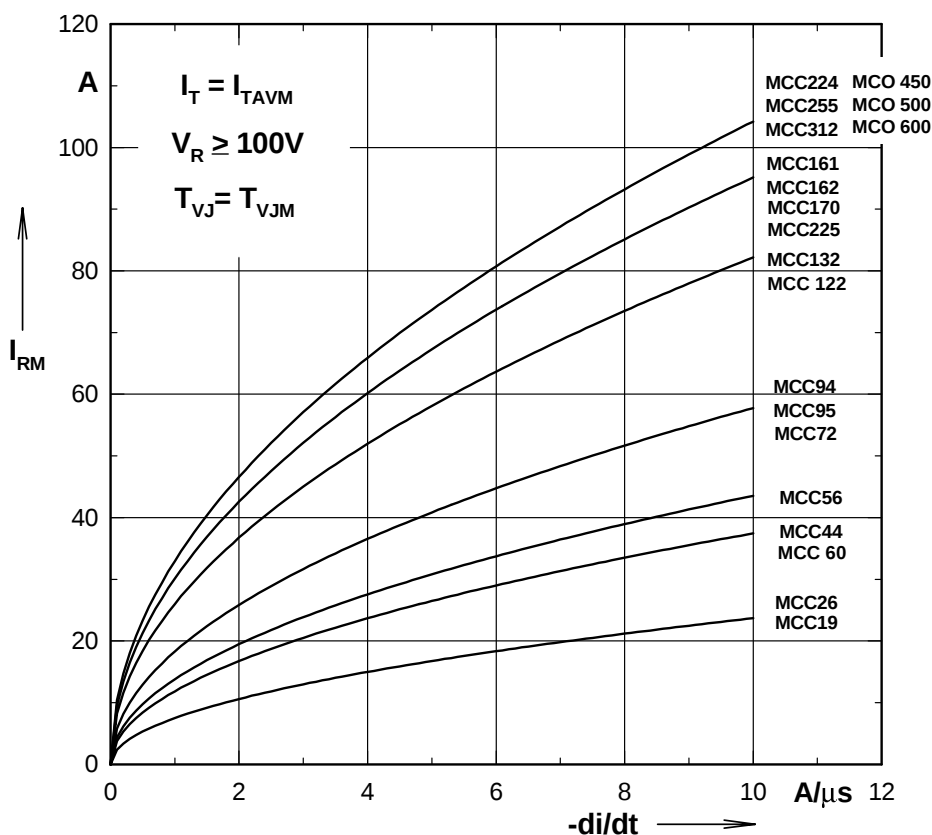
Keyed Gate/Cathode twin plugs with wire length = 350 mm, gate = yellow, cathode = red

Type **ZY 180 L** (L = Left for pin pair 4/5) $\left\{ \begin{array}{l} \text{UL 758, style 1385, File E 38136,} \\ \text{CSA class 5851, guide 460-1-1, appl. 41234} \end{array} \right.$

Dimensions in mm (1 mm = 0.0394")



Peak reverse recovery current versus $-di/dt$



Recommended RC snubber network against hole storage effect overvoltage

Type	Supply Voltage V_{VRMS}		
	$\leq 250 V$	$\leq 400 V$	$\leq 575 V$
MCC/MCD/MDD 19/26	R = 68 Ω /6 W C = 0.22 μF	R = 68 Ω /6 W C = 0.22 μF	R = 100 Ω /10 W C = 0.1 μF
MCC/MCD/MDD 44/56/60/72/94/95	R = 33 Ω /10 W C = 0.22 μF	R = 47 Ω /10 W C = 0.22 μF	R = 68 Ω /10 W C = 0.1 μF
MCC/MCD/MDD/MCO/MDO 122/132/142/161/162/170/172/220/225/250/255/310/312/450/500/600	R = 33 Ω /25 W C = 0.47 μF	R = 33 Ω /25 W C = 0.47 μF	R = 47 Ω /25 W C = 0.1 μF

Conditions

$f = 40 - 60 \text{ Hz}$
 Short circuit voltage 4-6 %
 Voltage safety factor 2.5

