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Contact us

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Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

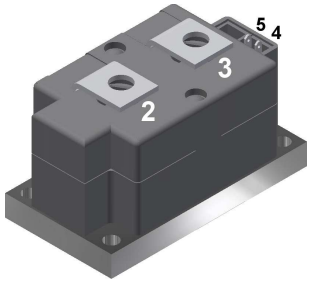
High Voltage Thyristor Module

V_{RRM} = 2200 V
I_{TAV} = 600 A
V_T = 1.06 V

Single Thyristor

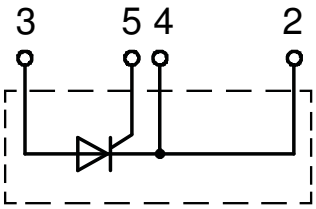
Part number

MCO600-22io1



Backside: isolated

E72873



Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability
- Direct Copper Bonded Al2O3-ceramic

Applications:

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

Package: Y1

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Base plate: Copper internally DCB isolated
- Advanced power cycling

Terms _Conditions of usage:

The data contained in this product data sheet is exclusively intended for technically trained staff. The user will have to evaluate the suitability of the product for the intended application and the completeness of the product data with respect to his application. The specifications of our components may not be considered as an assurance of component characteristics. The information in the valid application- and assembly notes must be considered. Should you require product information in excess of the data given in this product data sheet or which concerns the specific application of your product, please contact your local sales office.
Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact your local sales office.
Should you intend to use the product in aviation, in health or life endangering or life support applications, please notify. For any such application we urgently recommend
- to perform joint risk and quality assessments;
- the conclusion of quality agreements;
- to establish joint measures of an ongoing product survey, and that we may make delivery dependent on the realization of any such measures.

IXYS reserves the right to change limits, conditions and dimensions. Data according to IEC 60747and per semiconductor unless otherwise specified 20170112e

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Thyristor				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			2300	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			2200	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 2200 V	T_{VJ} = 25°C			2	mA
		$V_{R/D}$ = 2200 V	T_{VJ} = 125°C			40	mA
V_T	*forward voltage drop*	I_T = 600 A	T_{VJ} = 25°C			1.12	V
		I_T = 1200 A				1.34	V
		I_T = 600 A	T_{VJ} = 125°C			1.06	V
		I_T = 1200 A				1.33	V
I_{TAV}	*average forward current*	T_C = 85°C	T_{VJ} = 140°C			600	A
$I_{T(RMS)}$	*RMS forward current*	180° sine				940	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 140°C			0.81	V
r_T	*slope resistance* }					0.4	mΩ
R_{thJC}	*thermal resistance junction to case*					0.065	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.020		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			1770	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			15.0	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			16.2	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 140°C			12.8	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			13.8	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1.13	MA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.09	MA^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 140°C			812.8	kA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			788.8	kA^2s
C_J	*junction capacitance*	V_R = 700 V f = 1 MHz	T_{VJ} = 25°C		469		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 140°C			120	W
		t_P = 300 µs				60	W
P_{GAV}	*average gate power dissipation*					20	W
$(di/dt)_{cr}$	*critical rate of rise of current*	T_{VJ} = 140°C; f = 50 Hz	repetitive, I_T = 1800 A			100	A/µs
		t_P = 200 µs; di_G/dt = 1 A/µs;					
		I_G = 1 A; V = ⅔ V_{DRM}	non-repet., I_T = 600 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V = ⅔ V_{DRM}	T_{VJ} = 140°C			1000	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)					
V_{GT}	*gate trigger voltage*	V_D = 6 V	T_{VJ} = 25°C			2	V
			T_{VJ} = -40°C			3	V
I_{GT}	*gate trigger current*	V_D = 6 V	T_{VJ} = 25°C			300	mA
			T_{VJ} = -40°C			400	mA
V_{GD}	*gate non-trigger voltage*	V_D = ⅔ V_{DRM}	T_{VJ} = 140°C			0.25	V
I_{GD}	*gate non-trigger current*					10	mA
I_L	*latching current*	t_p = 30 µs	T_{VJ} = 25°C			400	mA
		I_G = 1 A; di_G/dt = 1 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			300	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 1 A; di_G/dt = 1 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 600 A; V = ⅔ V_{DRM}	T_{VJ} = 125 °C		350		µs
		di/dt = 10 A/µs dv/dt = 50 V/µs t_p = 200 µs					

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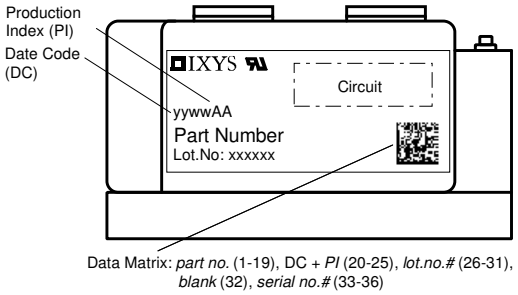
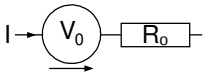
Package Y1				Ratings			
Symbol	**Definition**	**Conditions**		**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal				600	A
T_{VJ}	*virtual junction temperature*			-40		140	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					650		g
M_D	*mounting torque*			4.5		7	Nm
M_T	*terminal torque*			11		13	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	16.0			mm
$d_{Spb/Apb}$			*terminal to backside*	25.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3600			V
		t = 1 minute		3000			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCO600-22io1	MCO600-22io1	Box	3	474339

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 140 °C



Thyristor

$V_{0\,max}$	*threshold voltage*	0.81	V
$R_{0\,max}$	*slope resistance **	0.22	mΩ

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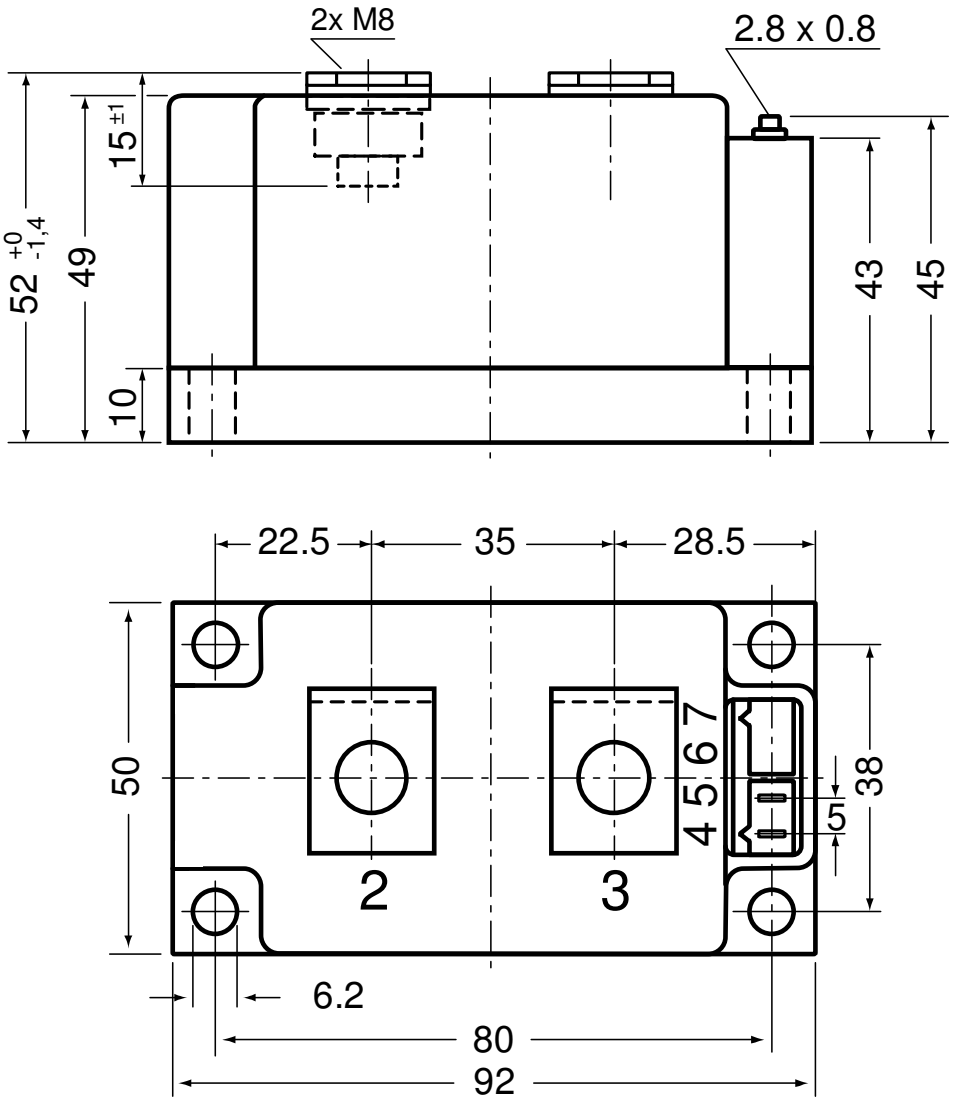
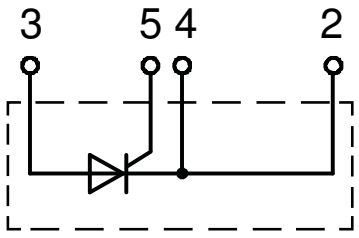
Outlines Y1



Optional accessories for modules
Keyed gate/cathode twin plugs with wire length = 350 mm, gate = white, cathode = red
Type ZY 180L (L = Left for pin pair 4/5)
Type ZY 180R (R = Right for pin pair 6/7) } UL 758, style 3751



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Thyristor

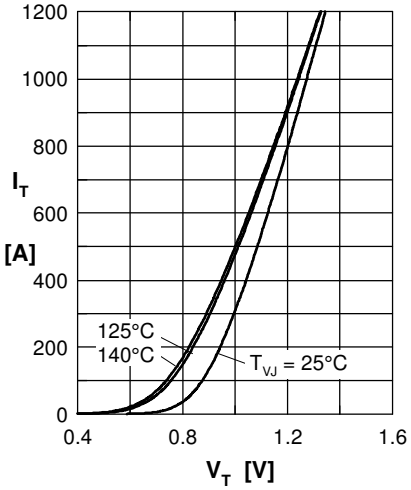

Fig. 1 Forward characteristics

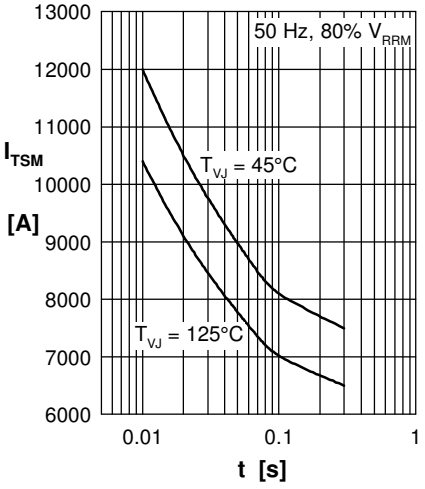

Fig. 2 Surge overload current

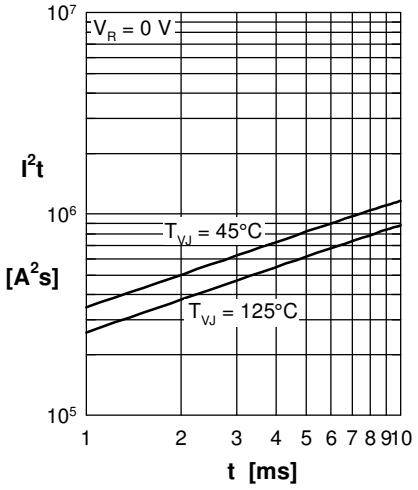

Fig. 3 I^2t versus time (1-10 ms)

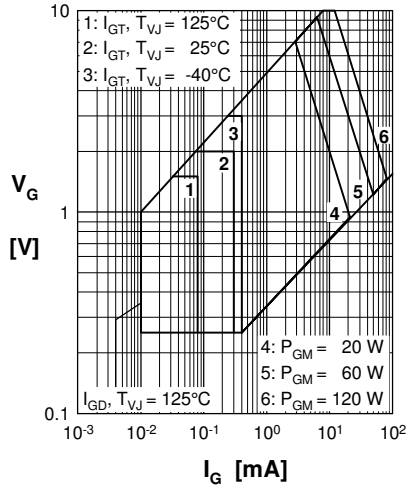

Fig. 4 Gate trigger characteristics

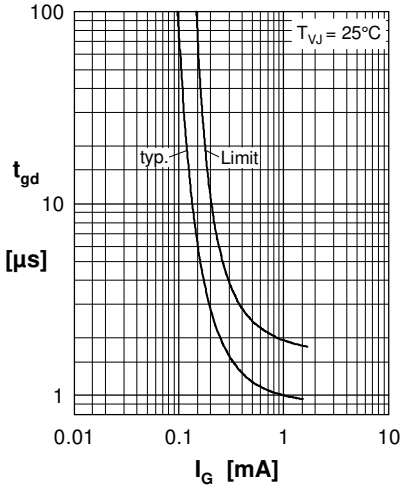

Fig. 5 Gate controlled delay time

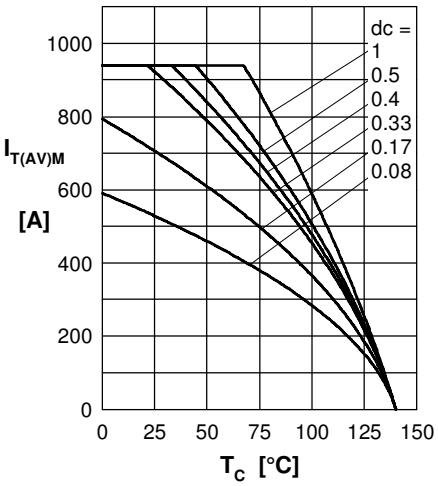

Fig. 6 Max. forward current at case temperature

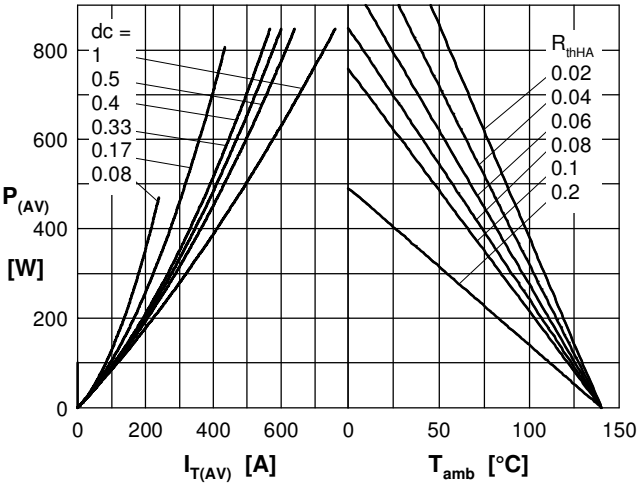

Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature

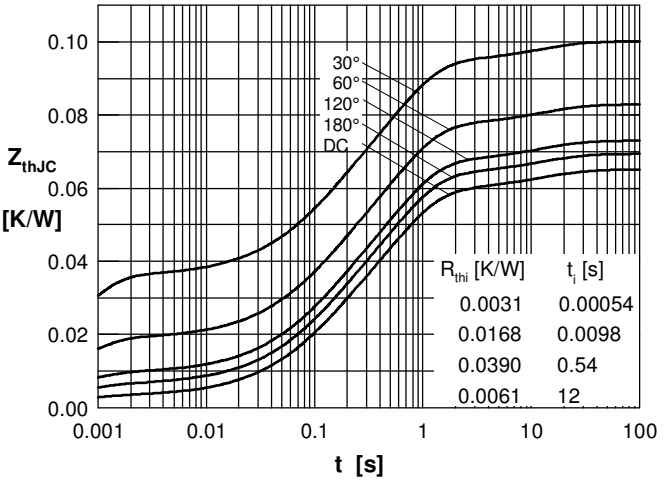

Fig. 8 Transient thermal impedance

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IGBT

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