imall

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832 Email & Skype: info@chipsmall.com Web: www.chipsmall.com Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



Thyristor Module

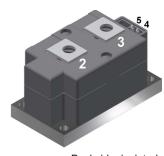
MCO500-12io1

V_{RRM}	=	1200 V
I _{tav}	=	560 A
V _T	=	1.01 V

Single Thyristor

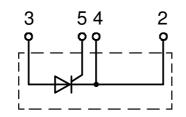
Part number

MCO500-12io1



Backside: isolated **E**72873

20170112g



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

MCO500-12io1

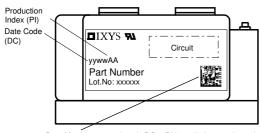
Thyristo					Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V _{RSM/DSM}	max. non-repetitive reverse/forwa		$T_{VJ} = 25^{\circ}C$			1300	V
V _{RRM/DRM}	max. repetitive reverse/forward b	0 0	$T_{VJ} = 25^{\circ}C$			1200	۷
R/D	reverse current, drain current	V _{R/D} = 1200 V	$T_{vJ} = 25^{\circ}C$			2	mA
		V _{R/D} = 1200 V	$T_{VJ} = 125^{\circ}C$			40	mA
V _T	forward voltage drop	$I_{\tau} = 500 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1.08	۷
		I _T =1000 A				1.27	۷
		$I_{T} = 500 \text{ A}$	$T_{vJ} = 125 ^{\circ}C$			1.01	٧
		I _T =1000 A				1.24	٧
ITAV	average forward current	$T_c = 85^{\circ}C$	$T_{vJ} = 140^{\circ}C$			560	A
T(RMS)	RMS forward current	180° sine				880	A
V _{T0}	threshold voltage		T _{v.i} = 140°C			0.80	V
r _T	slope resistance } for power le	oss calculation only				0.38	mΩ
R _{thJC}	thermal resistance junction to cas	<i>66</i>				0.072	K/W
R _{thCH}	thermal resistance case to heatsi				0.024		K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$			1600	W
	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{\rm VI} = 45^{\circ}\rm C$			17.0	kA
TTSM Max. forward surge current	t = 8,3 ms; (60 Hz), sine	$V_{\rm N} = 0 V$			18.4	kA	
	t = 0.0 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$T_{y,l} = 140^{\circ}C$			14.5	kA	
	t = 8,3 ms; (60 Hz), sine	$V_{\rm NJ} = 140$ C $V_{\rm R} = 0$ V				k/	
124	value for fusing	t = 0.3 ms; (50 Hz), sine				15.6	l
l²t	value for fusing		-				MA ² s
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$				MA ² s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 140 ^{\circ}\text{C}$				MA ² s
_		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			1.01	MA ² s
C	junction capacitance	$V_{R} = 400 V$ f = 1 MHz	$T_{VJ} = 25^{\circ}C$		876		pF
P _{GM}	max. gate power dissipation	t _P = 30 μs	$T_{\rm C} = 140^{\circ}{\rm C}$			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	$T_{vJ} = 140 ^{\circ}C; f = 50 Hz$ re	epetitive, $I_{T} = 1500 \text{ A}$			100	A/μs
		t_{P} = 200 µs; di _G /dt = 1 A/µs; -					
		$I_{G} = 1 \text{ A}; \text{ V} = \frac{2}{3} \text{ V}_{DRM}$ n	on-repet., $I_{T} = 500 \text{ A}$			500	A/μs
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{vJ} = 140^{\circ}C$			1000	V/µs
		R _{GK} = ∞; method 1 (linear volta	age rise)				
V _{gt}	gate trigger voltage	$V_{\rm D} = 6 \text{ V}$	$T_{v,i} = 25^{\circ}C$			2	V
		-	$T_{yJ} = -40^{\circ}C$			3	V
I _{GT}	gate trigger current	$V_{D} = 6 V$	T _{vJ} = 25°C			300	mA
-61			$T_{\rm VJ} = -40^{\circ}\rm C$			400	mA
V _{gd}	gate non-trigger voltage	$V_{D} = \frac{2}{3} V_{DBM}$	$T_{v,i} = 140^{\circ}C$			0.25	٧
	gate non-trigger current					10	mA
		t 20.00	T _{vJ} = 25°C				
I.	latching current	t _p = 30 μs I _G = 1 A; di _G /dt = 1 A/μs	-			400	mA
I _H	holding current	$V_{\rm D} = 6 \ V \ R_{\rm GK} = \infty$	$T_{vJ} = 25^{\circ}C$			300	mA
t _{gd}	gate controlled delay time	$V_{D} = \frac{1}{2} V_{DRM}$	$T_{v_J} = 25 \degree C$			2	με
-		$I_{\rm G} = 1 {\rm A}; {\rm di}_{\rm G}/{\rm dt} = 1 {\rm A}/{\rm \mu}s$	S				
tq	turn-off time	$V_{\rm B} = 100 \text{ V}; \ I_{\rm T} = 500 \text{ A}; \text{ V} = \frac{2}{3}$			350		μs
ч		$di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 50 \text{ V}$					

 $\ensuremath{\mathsf{IXYS}}$ reserves the right to change limits, conditions and dimensions.

20170112g

MCO500-12io1

Package Y1			Ratings		6		
Symbol	Definition Conditions		min.	typ.	max.	Unit	
	RMS current	per terminal				600	Α
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 strik	ing distance through air	terminal to terminal	16.0			mm
d _{Spb/Apb}	creepage distance on surface / surface	ing distance through an	terminal to backside	25.0			mm
V	isolation voltage	t = 1 second		3600			V
		t = 1 minute	50/60 Hz, RMS; liso⊾ ≤ 1 mA	3000			V



Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCO500-12io1	MCO500-12io1	Box	3	463728

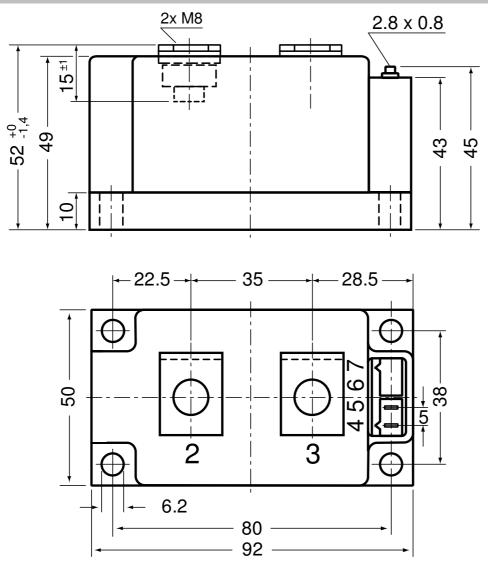
Similar Part	Package	Voltage class
MCO500-14io1	Y1-2-CU	1400
MCO500-16io1	Y1-2-CU	1600
MCO500-18io1	Y1-2-CU	1800
MCO600-20io1	Y1-2-CU	2000
MCO600-22io1	Y1-2-CU	2200

Equivalent Circuits for Simulation			* on die level	$T_{VJ} = 140 \ ^{\circ}C$
	⊢R₀_⊢	Thyristor		
V _{0 max}	threshold voltage	0.8		V
$\mathbf{R}_{0 \max}$	slope resistance *	0.22		mΩ

 $\ensuremath{\mathsf{IXYS}}$ reserves the right to change limits, conditions and dimensions.

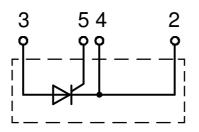
20170112g

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



DC

180 ° sin

120 ⁰Л

60°Л

30° Г

100 125 150

1000

800

600

400

200

0

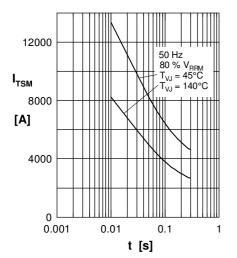
0

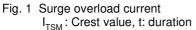
25 50

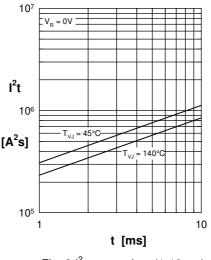
 I_{TAVM}

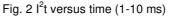
[A]

Thyristor









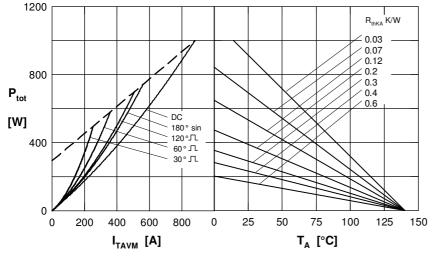
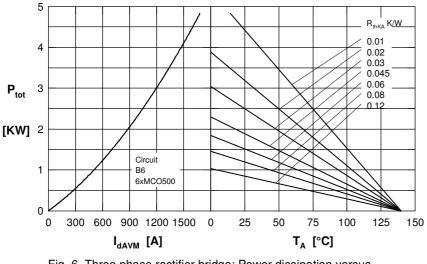
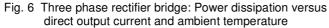


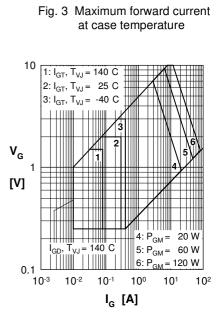
Fig. 4 Power dissipation versus on-state current & ambient temperature





IXYS reserves the right to change limits, conditions and dimensions.

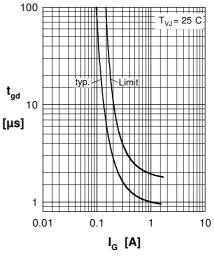
© 2017 IXYS all rights reserved

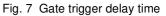


75

T_c [°C]

Fig. 5 Gate trigger characteristics





Thyristor

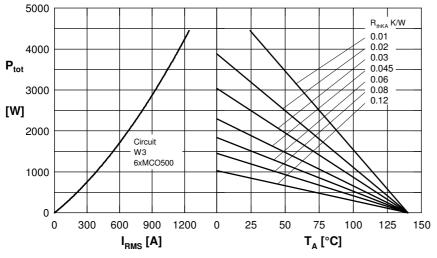
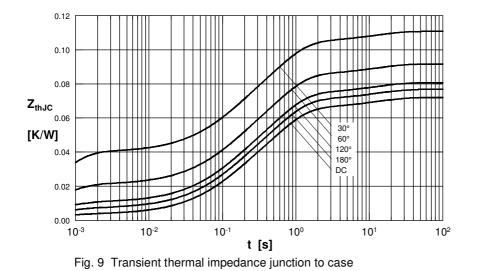


Fig. 8 Three phase AC-controller: Power dissipation versus RMS output current and ambient temperatur



0.12						
Ζ_{thJK} 0.08						
[K/W]						
0.04					30° 60° 120°	
					2 DC	
0.00 10)-3	10 ⁻²	10 ⁻¹ t	10° [s]	10 ¹	10 ²
	Fig.10 1	Fransient the		nce junction to	heatsink	

IXYS reserves the right to change limits, conditions and dimensions.

R_{thJC} for	various conduction angles d:
d	R _{thJC} (K/W)
DC	0.072
180°	0.0768
120°	0.081
60°	0.092
30°	0.111

d DC

180°

120°

60°

30°

i

1

2

3

4

5

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

i	R _{thi} (K/W)	t _i (s)	
1	0.0035	0.0054	
2	0.0186	0.098	
3	0.0432	0.54	
4	0.0067	12	

 R_{thJK} (K/W)

0.096

0.105

0.116

0.135

R_{thi} (K/W)

0.0035

0.0186

0.0432

0.0067

0.024

Constants for Z_{thJK} calculation:

t_i (s)

0.0054

0.098

0.54

12

12

0.1