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.

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Thyristor

MCO50-16io1

V_{RRM}	=	1600 V
I _{tav}	=	57 A
VT	=	1,2 V

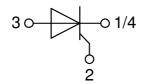
Single Thyristor

Part number

MCO50-16io1



Backside: isolated **E**72873



Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability

Applications:

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

Package: SOT-227B (minibloc)

- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- 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 the sales office, which is responsible for you. Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you. Should you intend to use the product in aviation, in health or live 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

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MCO50-16io1

Thyristo					Ratings		ļ
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V _{RSM/DSM}	max. non-repetitive reverse/forwa		$T_{VJ} = 25^{\circ}C$			1700	\
V _{RRM/DRM}	max. repetitive reverse/forward bl		$T_{VJ} = 25^{\circ}C$			1600	١
R/D	reverse current, drain current	$V_{R/D} = 1600 V$	$T_{VJ} = 25^{\circ}C$			50	μA
		V _{R/D} = 1600 V	$T_{VJ} = 125^{\circ}C$			3	mA
V _T	forward voltage drop	$I_{T} = 50 \text{ A}$	$T_{vJ} = 25^{\circ}C$			1,27	١
		$I_{T} = 100 \text{ A}$				1,53	١
		$I_{T} = 50 \text{ A}$	$T_{vJ} = 125 ^{\circ}C$			1,20	١
		$I_{T} = 100 \text{ A}$				1,50	١
ITAV	average forward current	$T_c = 80^{\circ}C$	$T_{vJ} = 150^{\circ}C$			57	A
I _{T(RMS)}	RMS forward current	180° sine				90	A
V _{T0}	threshold voltage		T _{vJ} = 150°C			0,88	١
r _T	slope resistance } for power lo	oss calculation only				6	mΩ
R _{thJC}	thermal resistance junction to cas	6e				0,72	K/W
R _{thCH}	thermal resistance case to heatsi				0,20		K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$			170	W
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,l} = 45^{\circ}C$			740	A
-15M	5	t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			800	ļ
		t = 0, 0, ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$T_{\rm H} = 0.0$ $T_{\rm VI} = 150^{\circ}{\rm C}$			630	, A
		t = 8,3 ms; (60 Hz), sine	$V_{\rm N} = 0 V$			680	, ,
l²t	value for fusing	t = 0.5 ms; (50 Hz), sine	$\frac{V_{R} = 0.V}{T_{VJ} = 45^{\circ}C}$			2,74	ر kA²s
1-1	value for rusing					2,74	1
		t = 8,3 ms; (60 Hz), sine t = 10 ms; (50 Hz), sine	$V_{\rm R} = 0 V$				kA ² s
			$T_{VJ} = 150 ^{\circ}C$			1,99	kA ² s
		t = 8,3 ms; (60 Hz), sine	$\frac{V_{R} = 0 V}{T_{R} = 0 V}$		00	1,93	kA²s
C,	junction capacitance	$V_{\rm R} = 400 \text{V} \text{f} = 1 \text{MHz}$	$T_{VJ} = 25^{\circ}C$		32	10	pF
P _{GM}	max. gate power dissipation	t _P = 30 μs	$T_c = 150 ^{\circ}C$			10	W
		$t_{P} = 300 \mu s$				1	W
P _{GAV}	average gate power dissipation					0,5	W
(di/dt) _{cr}	critical rate of rise of current		epetitive, $I_{T} = 150 \text{ A}$			100	A/με
		$t_{P} = 200 \mu s; di_{G}/dt = 0.3 A/\mu s; -$					
		$I_{G} = 0,3A; V = \frac{2}{3} V_{DRM}$ n	on-repet., $I_{T} = 50 \text{ A}$			500	A/με
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{vJ} = 150^{\circ}C$			1000	V/µs
		$R_{GK} = \infty$; method 1 (linear volta	ige rise)				
V _{gt}	gate trigger voltage	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			1,4	١
			$T_{vJ} = -40^{\circ}C$			1,6	١
I _{GT}	gate trigger current	$V_{\rm D} = 6 \text{ V}$	$T_{vJ} = 25^{\circ}C$			80	mA
			$T_{vJ} = -40 ^{\circ}\text{C}$			200	mA
V _{gd}	gate non-trigger voltage	$V_{\rm D} = \frac{2}{3} V_{\rm DBM}$	T _{vJ} = 150°C			0,2	١
I _{GD}	gate non-trigger current	D DIW				5	mA
	latching current	t _n = 10 μs	$T_{y_J} = 25 ^{\circ}C$			450	mA
		$I_{g} = 0,3A; di_{g}/dt = 0,3A/\mu$					
I _H	holding current	$V_{\rm D} = 6 V R_{\rm GK} = \infty$	T _{vJ} = 25°C			100	mA
	gate controlled delay time	$V_{\rm D} = 0 V \Pi_{\rm GK} = \infty$ $V_{\rm D} = \frac{1}{2} V_{\rm DRM}$	$T_{VJ} = 25 \text{ C}$ $T_{VJ} = 25 \text{ C}$			2	Ì
t _{gd}	gate controlled delay little					2	με
		$\frac{I_{G} = 0.3 \text{ A}; \text{ di}_{G}/\text{dt} = 0.3 \text{ A}/\mu \text{s}}{V_{B} = 100 \text{ V}; I_{T} = 50 \text{ A}; \text{ V} = 2}$			150		
t _q	turn-off time						με

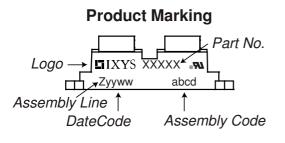
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MCO50-16io1

Package SOT-227B (minibloc)			Ratings					
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal 1)					150	А
T _{vj}	virtual junction temperatur	е			-40		150	°C
T _{op}	operation temperature				-40		125	°C
T _{stg}	storage temperature				-40		150	°C
Weight						30		g
M _D	mounting torque				1,1		1,5	Nm
M _T	terminal torque				1,1		1,5	Nm
d _{Spp/App}	araanaaa diatanaa an aurt	ace striking distance through air	terminal to terminal	10,5	3,2			mm
d _{Spb/Apb}	creepage distance on sun	ace Sinking distance infough an	terminal to backside	8,6	6,8			mm
V	isolation voltage	t = 1 second			3000			V
		t = 1 minute	50/60 Hz, RMS; liso∟ ≤ 1 mA		2500			V

¹⁾ I_{BMS} is typically limited by the pin-to-chip resistance (1); or by the current capability of the chip (2). In case of (1) and a product with multiple pins for one chip-potential, the current capability can be increased by connecting the pins as one contact.



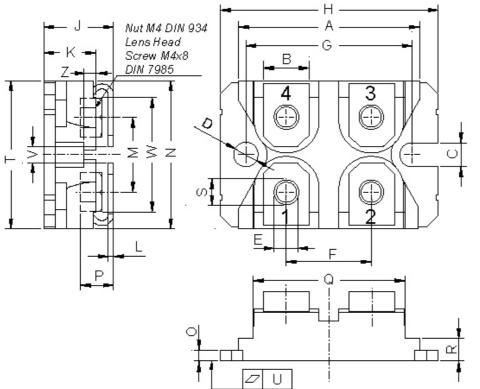
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCO50-16io1	MCO50-16io1	Tube	10	500598

Equivalent Circuits for Simulation		* on die level	T _{vj} = 150 °C	
$I \rightarrow V_0$)- <u> </u>	Thyristor		
$V_{0 max}$	threshold voltage	0,88		V
$\mathbf{R}_{0 \text{ max}}$	slope resistance *	4,1		mΩ

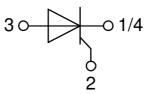
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Outlines SOT-227B (minibloc)



Dim.	Millir	Millimeter		hes
Dim.	min	max	min	max
Α	31.50	31.88	1.240	1.255
в	7.80	8.20	0.307	0.323
С	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
Е	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
Н	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
Μ	12.50	13.10	0.492	0.516
Ν	25.15	25.42	0.990	1.001
0	1.95	2.13	0.077	0.084
Ρ	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
Т	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Ζ	2.50	2.70	0.098	0.106



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Thyristor

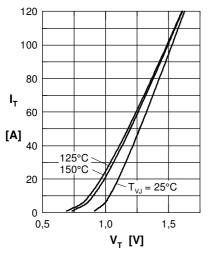


Fig. 1 Forward characteristics

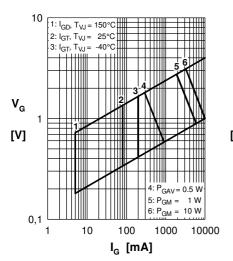


Fig. 4 Gate trigger characteristics

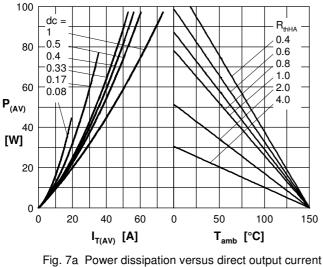


Fig. 7b and ambient temperature



2000 $T_{VJ} = 45^{\circ}C$ l²t 1500 [A²s] 1000 T_{VJ} = 125°C 500 0 2 3 4 5 6 7 8 9 1 0 1 t [ms]

3000

2500

50 Hz, 80% V_{RR}

= 45°C T_{v.}

600

500

400

300

T_{VJ}

0,01

125°C

0,1

t [s]

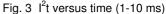
Fig. 2 Surge overload current

1

I_{TSM}

[A]

 $V_{R} = 0 V$



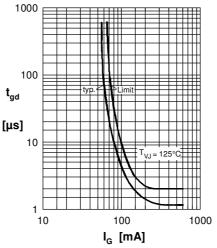


Fig. 5 Gate controlled delay time

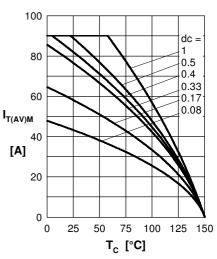
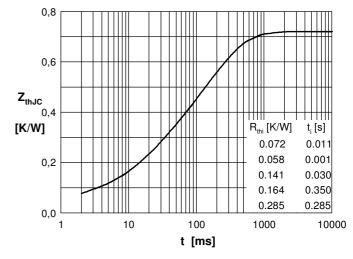


Fig. 6 Max. forward current at case temperature





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