

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!



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Thyristor

 \mathbf{V}_{RRM} 1200 V

57 A

1,2 V

Single Thyristor

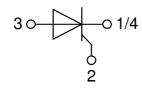
Part number

MCO50-12io1



Backside: isolated

F1 E72873



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 60747 and per semiconductor unless otherwise specified

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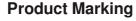


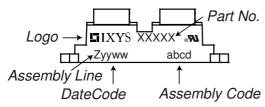
Thyristo				" 	Ratings	1	1
Symbol	Definition	Conditions		min.	typ.	max.	Un
V _{RSM/DSM}	max. non-repetitive reverse/forwa	rd blocking voltage	$T_{VJ} = 25^{\circ}C$			1300	ļ
V _{RRM/DRM}	max. repetitive reverse/forward bl	<u> </u>	$T_{VJ} = 25^{\circ}C$			1200	
R/D	reverse current, drain current	$V_{R/D} = 1200 \text{ V}$	$T_{VJ} = 25^{\circ}C$			50	μ
		$V_{R/D} = 1200 \text{ V}$	$T_{VJ} = 125^{\circ}C$			3	m.
V _T	forward voltage drop	$I_T = 50 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1,27	
		$I_{T} = 100 \text{ A}$				1,53	
		$I_T = 50 \text{ A}$	T _{VJ} = 125°C			1,20	
		$I_T = 100 \text{ A}$				1,50	
I _{TAV}	average forward current	T _C = 80°C	T _{vJ} = 150°C			57	
T(RMS)	RMS forward current	180° sine				90	
V _{T0}	threshold voltage		T _{vJ} = 150°C			0,88	
r _T	slope resistance	oss calculation only				6	m!
R _{thJC}	thermal resistance junction to cas	e				0,72	K/V
R _{thCH}	thermal resistance case to heatsi				0,20	,	K/V
P _{tot}	total power dissipation		$T_{\rm C} = 25^{\circ}{\rm C}$			170	٧
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v.i} = 45^{\circ}C$			740	
-15M		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			800	
		t = 0,0 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	T _{VJ} = 150°C			630	
		t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			680	
l²t	value for fusing	t = 0.5 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			2,74	!
- L	value for fushing	t = 8.3 ms; (60 Hz), sine	$V_{R} = 0 V$			2,66	ļ
		t = 0.5 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$V_{R} = 0 V$ $T_{VJ} = 150 ^{\circ}C$			1,99	
						-	ĺ
^	iunation canacitanas	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$		20	1,93	
C,	junction capacitance	V _R = 400 V f = 1 MHz	$T_{VJ} = 25^{\circ}C$		32	10	р
P_{GM}	max. gate power dissipation	$t_P = 30 \mu s$	$T_{C} = 150^{\circ}C$			10	۷
_		$t_{P} = 300 \mu s$				1	۷
P _{GAV}	average gate power dissipation					0,5	۷
(di/dt) _{cr}	critical rate of rise of current	· · · · · · · · · · · · · · · · · · ·	epetitive, $I_T = 150 A$			100	A/μ
		$t_P = 200 \mu s; di_G/dt = 0.3 A/\mu s; -$					
			on-repet., $I_T = 50 \text{ A}$			500	<u>i </u>
$(dv/dt)_{cr}$	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{VJ} = 150$ °C			1000	V/μ
		R _{GK} = ∞; method 1 (linear volta					
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			1,4	١
			$T_{VJ} = -40$ °C			1,6	,
I _{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			80	m
			$T_{VJ} = -40$ °C			200	m
V _{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 150^{\circ}C$			0,2	,
I _{GD}	gate non-trigger current					5	m
I _L	latching current	t _p = 10 μs	$T_{VJ} = 25$ °C			450	m
		$I_{G} = 0.3 \text{ A}; \text{ di}_{G}/\text{dt} = 0.3 \text{ A}/\mu\text{s}$	3				į
I _H	holding current	V _D = 6 V R _{GK} = ∞	$T_{VJ} = 25$ °C			100	m
t _{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	T _{VJ} = 25°C			2	<u> </u>
gu	- ,	$I_{\rm G} = 0.3 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.3 \text{A}/\mu \text{s}$				_	٣
t _q	turn-off time	$V_R = 100 \text{ V}; I_T = 50 \text{ A}; V = \frac{2}{3}$			150		μ
∙ q		$\mathbf{v}_{R} - 100 \mathbf{v}, \mathbf{i}_{T} - 30 \mathbf{A}, \mathbf{v} = 7$	- DRM IVJ - IZO O		100		μ



Package SOT-227B (minibloc)			Ratings					
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal 1)					150	Α
T _{VJ}	virtual junction temperature	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
\mathbf{M}_{T}	terminal torque				1,1		1,5	Nm
d _{Spp/App}	terminal to terminal creepage distance on surface striking distance through air		10,5	3,2			mm	
d _{Spb/Apb}	creepage distance on sun	ace striking distance through an	terminal to backside	8,6	6,8			mm
V _{ISOL}	isolation voltage	t = 1 second			3000			٧
1002	t = 1 minute		50/60 Hz, RMS; lisoL ≤ 1 mA		2500			٧

¹⁾ I_{hus} 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.



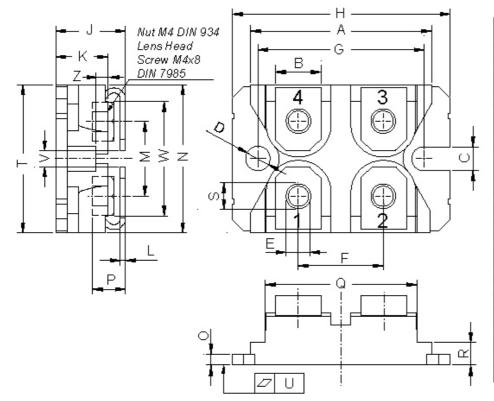


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCO50-12io1	MCO50-12io1	Tube	10	500555

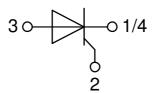
Equivalent Circuits for Simulation			* on die level	$T_{VJ} = 150 ^{\circ}\text{C}$
$I \rightarrow V_0$	R_0	Thyristor		
V _{0 max}	threshold voltage	0,88		V
$R_{0 \text{ max}}$	slope resistance *	4,1		$m\Omega$



Outlines SOT-227B (minibloc)



Dim	Millimeter		Inches		
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	
M	12.50	13.10	0.492	0.516	
N	25.15	25.42	0.990	1.001	
0	1.95	2.13	0.077	0.084	
Р	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 0.99		
U	-0.05	0.10	-0.002 0.00		
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	





Thyristor

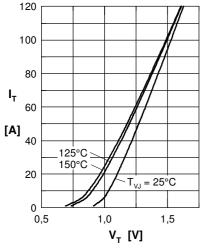


Fig. 1 Forward characteristics

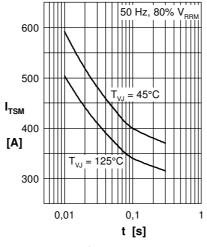


Fig. 2 Surge overload current

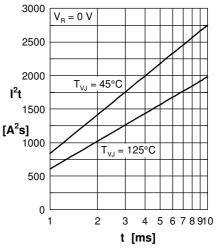


Fig. 3 I²t versus time (1-10 ms)

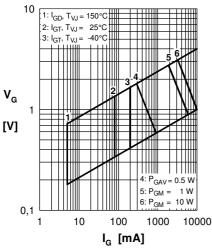


Fig. 4 Gate trigger characteristics

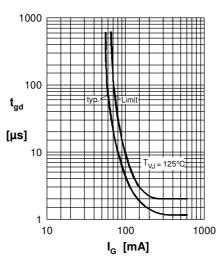


Fig. 5 Gate controlled delay time

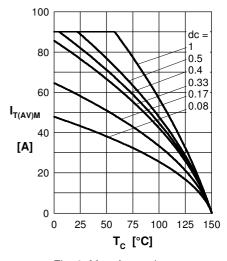


Fig. 6 Max. forward current at case temperature

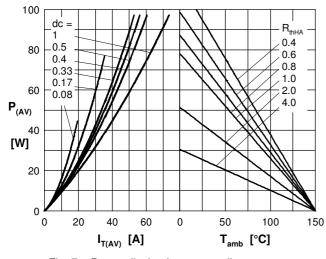


Fig. 7a Power dissipation versus direct output current Fig. 7b and ambient temperature

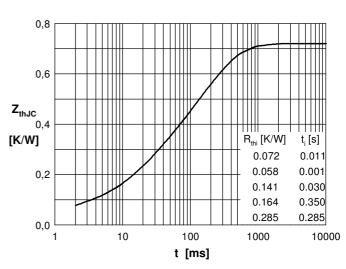


Fig. 8 Transient thermal impedance junction to case