# 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.

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## Contact us

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### MCD44-18io8B

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 $V_{RRM}$ 

I TAV

VT

= 2x 1800 V

49 A

1.34 V

## **Thyristor \ Diode Module**

Phase leg

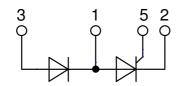
Part number

MCD44-18io8B





Backside: isolated **E**72873



### 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: TO-240AA

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting

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- Base plate: DCB ceramic
- Reduced weight
- 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

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# LIXYS

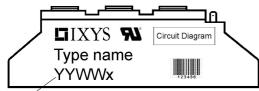
## MCD44-18io8B

<b>.</b>		•		-	Ratings	1	
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V <sub>RSM/DSM</sub>	max. non-repetitive reverse/forwa	0 0	$T_{VJ} = 25^{\circ}C$			1900	\ 
V <sub>RRM/DRM</sub>	max. repetitive reverse/forward bl		$T_{vJ} = 25^{\circ}C$			1800	١
R/D	reverse current, drain current	V <sub>R/D</sub> = 1800 V	$T_{vJ} = 25^{\circ}C$			100	μ/
		V <sub>R/D</sub> = 1800 V	$T_{vJ} = 125^{\circ}C$			5	m/
V <sub>T</sub>	forward voltage drop	$I_{T} = 100 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1.34	١
		$I_{T} = 200 \text{ A}$				1.75	١
		$I_{T} = 100 \text{ A}$	$T_{VJ} = 125^{\circ}C$			1.34	١
		I <sub>T</sub> = 200 A				1.80	١
ITAV	average forward current	$T_c = 85^{\circ}C$	T <sub>vJ</sub> = 125°C			49	1
I <sub>T(RMS)</sub>	RMS forward current	180° sine				77	1
V <sub>T0</sub>	threshold voltage		T <sub>v.i</sub> = 125°C			0.85	١
r <sub>T</sub>	slope resistance } for power lo	oss calculation only				5.3	m۵
R <sub>thJC</sub>	thermal resistance junction to cas	e				0.53	K/W
R <sub>thCH</sub>	thermal resistance case to heatsi				0.20		K/W
P <sub>tot</sub>	total power dissipation		$T_c = 25^{\circ}C$		00	180	٧
I <sub>TSM</sub>	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,i} = 45^{\circ}C$			1.15	k/
ISM		t = 8,3  ms; (60  Hz),  sine	$V_{\rm N} = 0 V$			1.24	k/
		t = 0,0  ms; (00  Hz),  sine t = 10  ms; (50  Hz),  sine	$T_{y,i} = 125^{\circ}C$			980	10
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			1.06	, k/
12+	value for fusing	t = 0.5  ms; (50  Hz),  sine	$\frac{v_{R}}{T_{V,I}} = 45^{\circ}C$			6.62	
l²t	value for fusing						1
		t = 8,3 ms; (60 Hz), sine	$\frac{V_{R} = 0 V}{T_{R} = 105 \circ C}$			6.40	
		t = 10 ms; (50 Hz), sine	$T_{vJ} = 125 ^{\circ}C$			4.80	
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$		54	4.63	
C,	junction capacitance	$V_{\rm R} = 400  \text{V}  \text{f} = 1  \text{MHz}$	$T_{VJ} = 25^{\circ}C$		54		pl
P <sub>GM</sub>	max. gate power dissipation	t <sub>P</sub> = 30 μs	$T_c = 125^{\circ}C$			10	۷
		t <sub>P</sub> = 300 μs				5	v
P <sub>GAV</sub>	average gate power dissipation					0.5	V
(di/dt) <sub>cr</sub>	critical rate of rise of current		epetitive, $I_{T} = 150 \text{ A}$			150	A/μ
		$t_{P}$ = 200 µs; di <sub>G</sub> /dt = 0.45 A/µs; -					 
		$I_{G} = 0.45 \text{ A}; \text{ V} = \frac{2}{3} \text{ V}_{DRM}$ no	on-repet., $I_{T} = 49 \text{ A}$			500	A/μ
(dv/dt) <sub>cr</sub>	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{vJ} = 125^{\circ}C$			1000	V/μ
		$R_{GK} = \infty$ ; method 1 (linear volta	ge rise)				
V <sub>GT</sub>	gate trigger voltage	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			1.5	١
			$T_{vJ} = -40^{\circ}C$			1.6	١
I <sub>GT</sub>	gate trigger current	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			100	m/
			$T_{vJ} = -40^{\circ}C$			200	m/
V <sub>gd</sub>	gate non-trigger voltage	$V_{\rm D} = \frac{2}{3} V_{\rm DBM}$	T <sub>vJ</sub> = 125°C			0.2	١
I <sub>GD</sub>	gate non-trigger current	5 5				10	m/
- GD IL	latching current	t <sub>p</sub> = 10 μs	$T_{vJ} = 25 ^{\circ}C$			450	m/
•L	U U	$I_{g} = 0.45 \text{ A}; \text{ di}_{g}/\text{dt} = 0.45 \text{ A}/\mu\text{s}$					
I <sub>H</sub>	holding current	$\frac{V_{\rm D} = 6  \text{V}  \text{R}_{\rm GK} = \infty}{\text{V}_{\rm D} = 6  \text{V}  \text{R}_{\rm GK} = \infty}$	T <sub>vJ</sub> = 25°C			200	m/
	gate controlled delay time	$V_{\rm D} = \frac{1}{2} V_{\rm DRM}$	$T_{VJ} = 25 ^{\circ}\text{C}$			200	i
t <sub>gd</sub>	gate controlled delay lille					2	μ
		$I_{\rm G} = 0.45 \text{A};  di_{\rm G}/dt = 0.45 \text{A}/\mu s$					
ta	turn-off time	$V_{R} = 100 \text{ V}; I_{T} = 120 \text{ A}; \text{ V} = \frac{2}{3}$			150		μ

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Package TO-240AA			Ratings					
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I <sub>RMS</sub>	RMS current	per terminal					200	Α
T <sub>vj</sub>	virtual junction temperature				-40		125	°C
T <sub>op</sub>	operation temperature				-40		100	°C
<b>T</b> <sub>stg</sub>	storage temperature				-40		125	°C
Weight						81		g
M <sub>D</sub>	mounting torque			2.5		4	Nm	
M <sub>T</sub>	terminal torque				2.5		4	Nm
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through a	, ctriking dictance through air	terminal to terminal	13.0	9.7			mm
<b>d</b> <sub>Spb/Apb</sub>	creepage distance on surrace / striking distance through		terminal to backside	16.0	16.0			mm
V	isolation voltage	t = 1 second			3600			V
	t = 1 minute		50/60 Hz, RMS; lıso∟ ≤ 1 mA		3000			V



Date Code

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCD44-18io8B	MCD44-18io8B	Box	36	454451

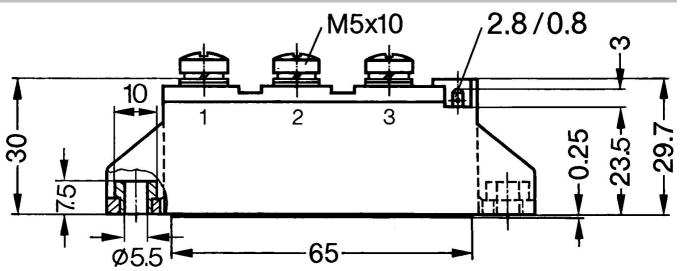
Equivalent Circuits for Simulation			* on die level	T <sub>vj</sub> = 125 °C
$I \rightarrow V_0$	$-R_{o}-$	Thyristor		
V <sub>0 max</sub>	threshold voltage	0.85		V
$\mathbf{R}_{0 \max}$	slope resistance *	4.1		mΩ

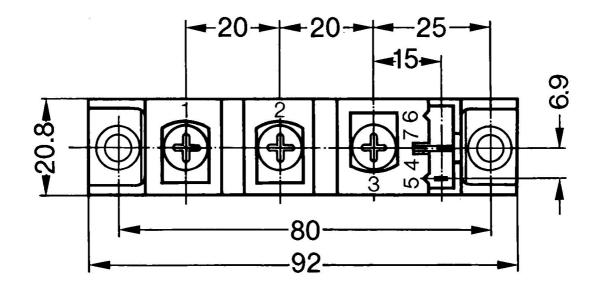
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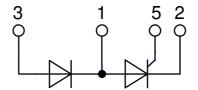
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# 

Outlines TO-240AA







sin

150

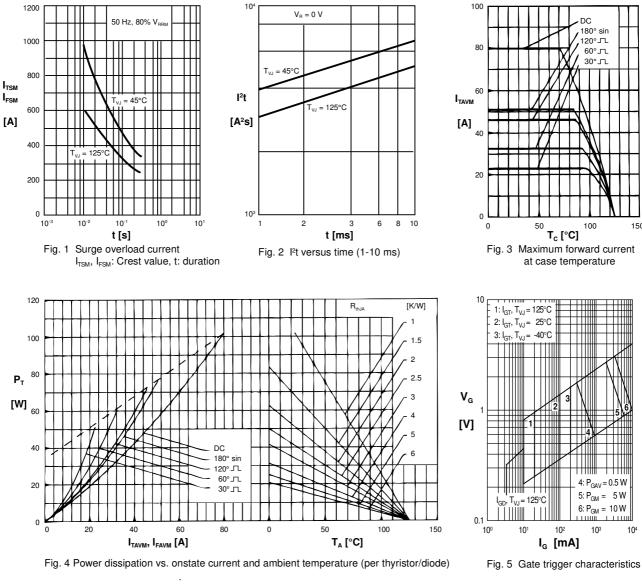
= 0.5 W

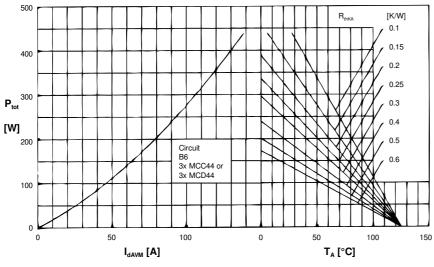
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### Thyristor





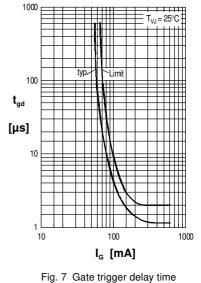
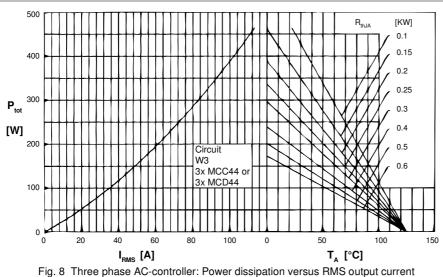


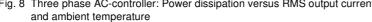
Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature

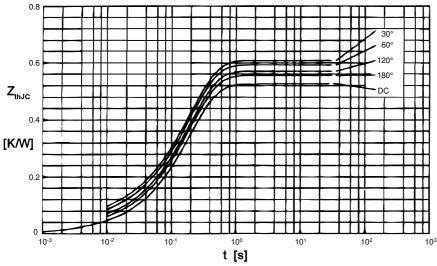
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### MCD44-18io8B

### Rectifier







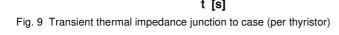
liiju					
	d R <sub>u</sub>	<sub>,JC</sub> [K/W]			
	DC	0.53			
	180°	0.55			
	120°	0.58			
	60°	0.60			
	30°	0.62			
Constants for $Z_{thJC}$ calculation:					
i F	R <sub>thi</sub> [K/W	] t <sub>i</sub> [s]			
1	0.015	0.0035			
2	0.026	0.0200			

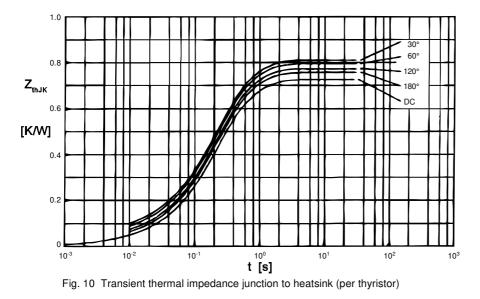
0.1950

3

0.489

 $\mathbf{R}_{_{thJC}}$  for various conduction angles d:





$\boldsymbol{R}_{_{thJK}}$ for various conduction angles d:					
	d R <sub>tt</sub>	<sub>JK</sub> [K/W]			
	DC	0.73			
	180°	0.75			
	120°	0.78			
	60°	0.80			
	30°	0.82			
Constants for Z <sub>thJK</sub> calculation: i R <sub>thI</sub> [K/W] t <sub>i</sub> [s]					
1	0.015	0.0035			
2	0.026	0.0200			
3	0.489	0.0195			
4	0.200	0.6800			

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