# 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

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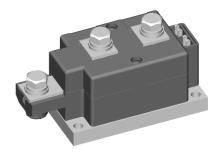
**Thyristor Module** 

### MCC255-18io1

$V_{\text{RRM}}$	= 2x 1800 V		
I <sub>tav</sub>	=	250 A	
VT	=	1.08 V	

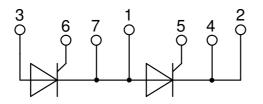
Phase leg

Part number MCC255-18io1



Backside: isolated **E**72873

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### Features / Advantages:

- International standard package
- Direct copper bonded Al2O3-ceramic with copper base plate
- Planar passivated chip
- Isolation voltage 3600 V~
- Keyed gate/cathode twin pins

### **Applications:**

- Motor control, softstarter
- Power converter
- · Heat and temperature control for industrial furnaces and chemical processes
- Lighting control
- · Solid state switches

### Package: Y1

- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- 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

# LIXYS

## MCC255-18io1

Thyristo	r			1	Ratings	S	
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V <sub>RSM/DSM</sub>	max. non-repetitive reverse/forwa	ard blocking voltage	$T_{VJ} = 25^{\circ}C$			1900	V
V <sub>RRM/DRM</sub>	max. repetitive reverse/forward b	locking voltage	$T_{VJ} = 25^{\circ}C$			1800	V
R/D	reverse current, drain current	$V_{R/D} = 1800 V$	$T_{VJ} = 25^{\circ}C$			1	mA
		$V_{R/D} = 1800 V$	$T_{vJ} = 140^{\circ}C$			40	mA
V <sub>T</sub>	forward voltage drop	$I_{T} = 300 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1.14	V
		$I_{T} = 600 \text{ A}$				1.36	V
		$I_{T} = 300 \text{ A}$	$T_{vJ} = 125 \degree C$			1.08	V
		$I_{T} = 600 \text{ A}$				1.33	V
Ιταν	average forward current	$T_c = 85^{\circ}C$	$T_{vJ} = 140^{\circ}C$			250	A
I <sub>T(RMS)</sub>	RMS forward current	180° sine				450	A
V <sub>T0</sub>	threshold voltage		$T_{VJ} = 140^{\circ}C$			0.80	V
r <sub>T</sub>	slope resistance } for power l	oss calculation only				0.68	mΩ
R <sub>thJC</sub>	thermal resistance junction to cas	5e				0.14	K/W
<b>R</b> <sub>thCH</sub>	thermal resistance case to heats	ink			0.040		K/W
P <sub>tot</sub>	total power dissipation		$T_c = 25^{\circ}C$			820	W
I <sub>TSM</sub>	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,l} = 45^{\circ}C$			9.20	kA
		t = 8,3 ms; (60 Hz), sine	$V_{\rm B} = 0 V$			9.94	kA
		t = 10 ms; (50 Hz), sine	T <sub>v.l</sub> = 140°C			7.82	kA
		t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			8.45	kA
l²t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			423.2	kA²s
-	-	t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			410.6	
		t = 10  ms; (50  Hz),  sine	T <sub>vJ</sub> = 140°C			305.8	kA²s
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			296.7	
C	junction capacitance	$V_{\rm B} = 400 V  f = 1 \text{ MHz}$	$T_{\rm VJ} = 25^{\circ}{\rm C}$		438		pF
P <sub>GM</sub>	max. gate power dissipation	$t_{\rm P} = 30 \mu {\rm s}$	$T_c = 140^{\circ}C$			120	W
- GM	max. gate power accipation	t <sub>P</sub> = 500 μs				60	W
P <sub>GAV</sub>	average gate power dissipation					20	w
(di/dt) <sub>cr</sub>	critical rate of rise of current	T <sub>v/l</sub> = 140°C; f = 50 Hz re	petitive, $I_T = 860 \text{ A}$			100	A/μs
(al/at/cr		$t_{\rm P} = 200 \mu\rm{s}; di_{\rm G}/dt = 1 \rm{A}/\mu\rm{s}; -$				100	γνμο
			on-repet., $I_{\tau} = 250 \text{ A}$			500	A/μs
(dv/dt) <sub>cr</sub>	critical rate of rise of voltage	$V = \frac{2}{3} V_{\text{DRM}}$	$T_{v,i} = 140^{\circ}C$			1000	i
(uv/ut) <sub>cr</sub>	emical rate of fise of voltage	$R_{GK} = \infty$ ; method 1 (linear voltage				1000	v/μ3
V	gate trigger voltage	$V_{\rm D} = 6 \text{ V}$	$T_{vJ} = 25^{\circ}C$			2	V
V <sub>gt</sub>	gale lingger vonage	$\mathbf{v}_{\mathrm{D}} = 0 \mathbf{v}$	$T_{vJ} = -40^{\circ}C$			3	v
	acto triagor ourront						
I <sub>GT</sub>	gate trigger current	$V_{D} = 6 V$	$T_{VJ} = 25^{\circ}C$			150	mA
	and and this second to be	NI 2/ NI	$T_{\rm VJ} = -40^{\circ}\rm C$			220	mA
V <sub>GD</sub>	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{vJ} = 140^{\circ}C$			0.25	V
I <sub>GD</sub>	gate non-trigger current					10	mA
I.	latching current	$t_p = 30 \ \mu s$	$T_{vJ} = 25 \degree C$			200	mA
_		$I_{\rm G} = 0.45 \text{A};  \text{di}_{\rm G}/\text{dt} = 0.45 \text{A}/\mu\text{s}$					
I <sub>H</sub>	holding current	$V_{\rm D} = 6 \ V \ R_{\rm GK} = \infty$	$T_{VJ} = 25^{\circ}C$			150	mA
t <sub>gd</sub>	gate controlled delay time	$V_{D} = \frac{1}{2} V_{DRM}$	$T_{vJ} = 25 ^{\circ}C$			2	μs
		$I_{G} = 1 \text{ A}; \text{ di}_{G}/\text{dt} = 1 \text{ A}/\mu \text{s}$					
t <sub>q</sub>	turn-off time	$V_{R} = 100 \text{ V}; I_{T} = 300 \text{ A}; \text{ V} = \frac{2}{3}$	ά V <sub>DRM</sub> T <sub>VJ</sub> =125 °C		200		μs
		$di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 50 \text{ V}/\mu \text{s}$	/μs  t <sub>p</sub> = 200 μs				ļ

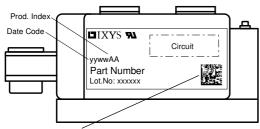
 $\ensuremath{\mathsf{IXYS}}$  reserves the right to change limits, conditions and dimensions.

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# LIXYS

## MCC255-18io1

Package Y1			1	Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
	RMS current	per terminal				600	Α
T <sub>vj</sub>	virtual junction temperature			-40		140	°C
T <sub>op</sub>	operation temperature			-40		125	°C
T <sub>stg</sub>	storage temperature			-40		125	°C
Weight					680		g
M <sub>D</sub>	mounting torque			4.5		7	Nm
M <sub>T</sub>	terminal torque			11		13	Nm
d <sub>Spp/App</sub>	creepage distance on surface   strik	ing distance through air	terminal to terminal	16.0			mm
<b>d</b> <sub>Spb/Apb</sub>	creepage distance on surface ( strik	ing distance through an	terminal to backside				mm
V	isolation voltage	t = 1 second		3600			V
		t = 1 minute	50/60 Hz, RMS; liso⊾ ≤ 1 mA	3000			V



Data Matrix: Typ (1-19), DC+Prod.Index (20-25), FKT# (26-31) leer (33), lfd.# (33-36)

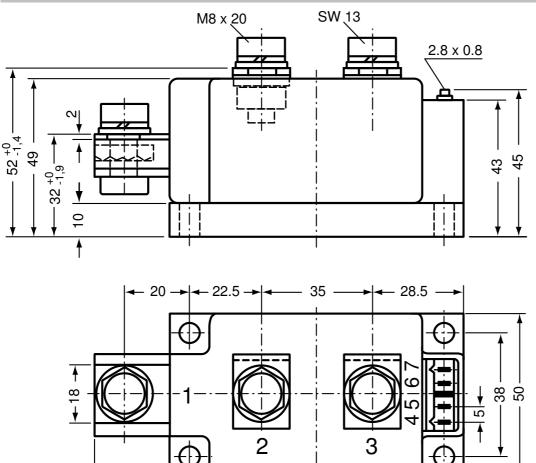
ſ	Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
	Standard	MCC255-18io1	MCC255-18io1	Box	3	461539

Equiv	alent Circuits for	Simulation	* on die level	T <sub>vJ</sub> = 140 °C
	$-R_{o}-$	Thyristor		
$V_{0 max}$	threshold voltage	0.8		V
$\mathbf{R}_{0 \text{ max}}$	slope resistance *	0.5		mΩ

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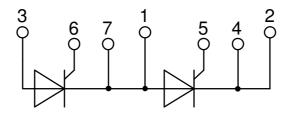
### Outlines Y1

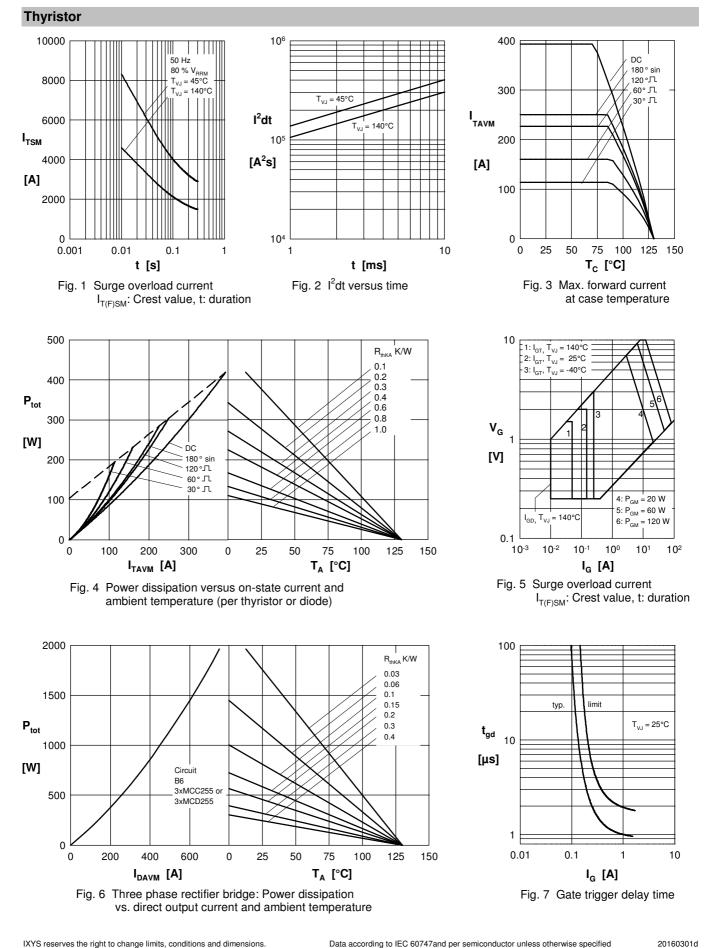


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Optional accessories for modules

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







# LIXYS

## MCC255-18io1

### Thyristor

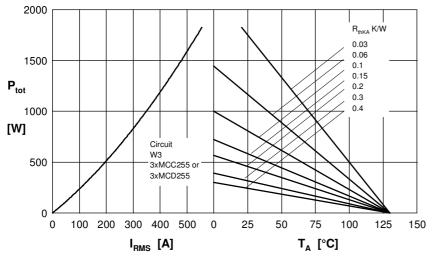


Fig. 8 Three phase AC-controller: Power dissipation versus  $R_{\rm MS}$  output current and ambient temperature

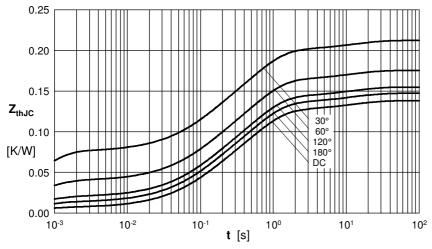
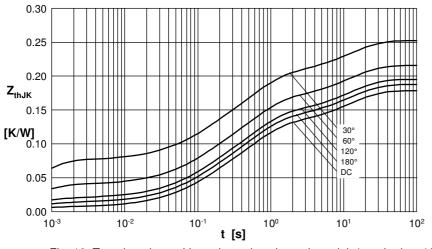
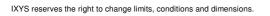


Fig. 9 Transient thermal impedance junction to case (per thyristor/diode)





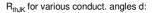


R<sub>thJC</sub> for various conduct. angles d:

d	R <sub>thJC</sub> [K/W]
DC	0.139
180°	0.148
120°	0.156
60°	0.176
30°	0.214

Constants for  $\rm Z_{\rm thJC}$  calculation:

i	R <sub>thi</sub> [K/W]	t <sub>i</sub> [s]
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12



d	R <sub>thJK</sub> [K/W]
DC	0.179
180°	0.188
120°	0.196
60°	0.216
30°	0.254

Constants for  $Z_{\text{thJK}}$  calculation:

i	R <sub>thi</sub> [K/W]	t <sub>i</sub> [s]
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12
5	0.04	12