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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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 Module

MCC255-12io1

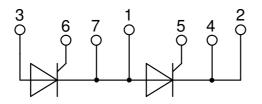
V_{RRM}	= 2 2	x 1200 V
I _{tav}	=	250 A
VT	=	1.08 V

Phase leg

Part number MCC255-12io1



Backside: isolated **E**72873



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
- 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

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MCC255-12io1

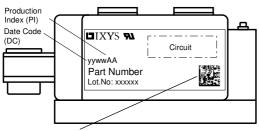
Thyristo	r				Ratings	5	1
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V _{RSM/DSM}	max. non-repetitive reverse/forwa	ard blocking voltage	$T_{vJ} = 25^{\circ}C$			1300	V
V _{RRM/DRM}	max. repetitive reverse/forward b	locking voltage	$T_{VJ} = 25^{\circ}C$			1200	V
I _{R/D}	reverse current, drain current	$V_{R/D} = 1200 V$	$T_{vJ} = 25^{\circ}C$			1	mA
		$V_{R/D} = 1200 V$	$T_{vJ} = 140^{\circ}C$			40	mA
V _T	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
ITAV	average forward current	T _c = 85°C	T _{v.i} = 140°C			250	A
I _{T(RMS)}	RMS forward current	180° sine				450	A
V _{T0}	threshold voltage		T _{v.i} = 140°C			0.80	V
r _T	slope resistance { for power l	oss calculation only	¥5			0.68	mΩ
R _{thJC}	thermal resistance junction to cas	Se				0.14	K/W
R _{thCH}	thermal resistance case to heats				0.040	-	K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$			820	W
	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,i} = 45^{\circ}C$	-		9.20	
TSM		t = 8,3 ms; (60 Hz), sine	$V_{\rm N} = 0 V$			9.94	kA
		t = 0.0 ms; (00 Hz), sine t = 10 ms; (50 Hz), sine	$T_{\rm WI} = 140^{\circ}{\rm C}$			7.82	kA
			40			8.45	kA
124	value for fusing	t = 8,3 ms; (60 Hz), sine t = 10 ms; (50 Hz), sine	$V_{\rm R} = 0 V$				
l²t	value for fusing		$T_{VJ} = 45^{\circ}C$			423.2	1
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			410.6	kA ² s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 140 ^{\circ}\text{C}$			305.8	kA²s
		t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			296.7	kA²s
C	junction capacitance	$V_R = 400 V$ f = 1 MHz	$T_{VJ} = 25^{\circ}C$		438		pF
P _{GM}	max. gate power dissipation	t _P = 30 μs	$T_c = 140 °C$			120	W
		t _P = 500 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, $I_{T} = 860 \text{ A}$			100	A/μs
		t_{P} = 200 µs; di _G /dt = 1 A/µs; -					1
		$I_{G} = 1 \text{ A}; \text{ V} = \frac{2}{3} \text{ V}_{DRM} $ no	on-repet., $I_{T} = 250 \text{ A}$			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	ige rise)				
V _{gt}	gate trigger voltage	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			2	V
			$T_{vJ} = -40 ^{\circ}\text{C}$			3	V
I _{GT}	gate trigger current	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			150	mA
			$T_{vJ} = -40 ^{\circ}\text{C}$			220	mA
V _{gd}	gate non-trigger voltage	$V_{D} = \frac{2}{3} V_{DBM}$	$T_{v,i} = 140^{\circ}C$			0.25	V
	gate non-trigger current	5 Dim				10	mA
	latching current	t _p = 30 μs	$T_{vJ} = 25 °C$			200	-
- L	0	$I_{\rm g} = 0.45 \text{A}; \text{di}_{\rm g}/\text{dt} = 0.45 \text{A}/\mu\text{s}$					
I _H	holding current	$V_{\rm D} = 6 V R_{\rm GK} = \infty$	T _{vJ} = 25°C			150	mA
	gate controlled delay time	$V_{\rm D} = 0 V + N_{\rm GK} = 0$ $V_{\rm D} = 1/2 V_{\rm DRM}$	$T_{VJ} = 25^{\circ}C$			2	i
t _{gd}	gate controlled delay little					2	μs
	turn-off time	$I_{\rm G} = 1 \text{A}; \text{di}_{\rm G}/\text{dt} = 1 \text{A}/\mu\text{s}$			000		
t _q	เนกา-บก แกษ	$V_{\rm R} = 100 \text{ V}; \ I_{\rm T} = 300 \text{ A}; \text{ V} = \frac{2}{3}$			200		μs
		$di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 50 \text{ V}$	/μs t _p = 200 μs				

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MCC255-12io1

Package	Y1			F	Ratings	S	
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					680		g
M _D	mounting torque			4.5		7	Nm
M _T	terminal torque			11		13	Nm
d _{Spp/App}	creepage distance on surface strikin	a distance through air	terminal to terminal	16.0			mm
d _{Spb/Apb}	creepage ustance on surface / surking	g distance through an	terminal to backside	16.0			mm
V	isolation voltage	t = 1 second		3600			V
		t = 1 minute	50/60 Hz, RMS; liso∟ ≤ 1 mA				V



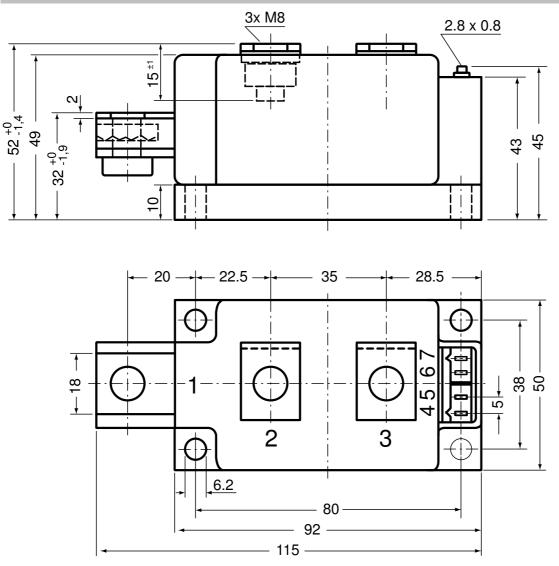
Data Matrix: part no. (1-19), DC + PI (20-25), lot.no.# (26-31), blank (32), serial no.# (33-36)

Orderin	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standar	MCC255-12io1	MCC255-12io1	Box	3	461512

Equiva	alent Circuits for	Simulation	* on die level	T _{vj} = 140 °C
	$-R_{o}-$	Thyristor		
V _{0 max}	threshold voltage	0.8		V
$\mathbf{R}_{0 \text{ max}}$	slope resistance *	0.5		mΩ

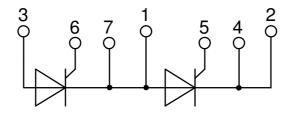
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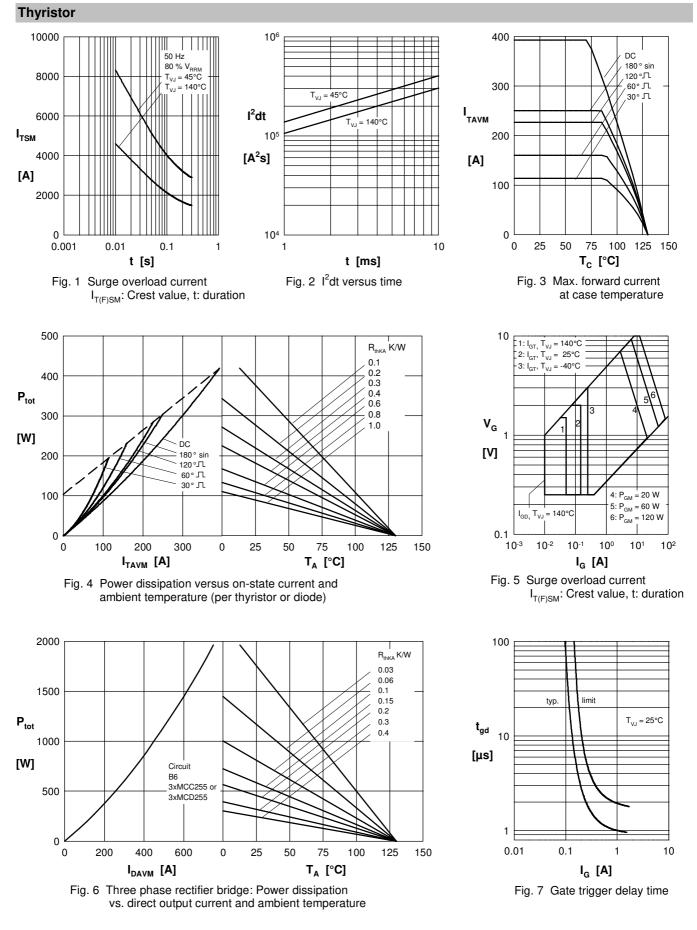
Outlines Y1



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





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MCC255-12io1

Thyristor

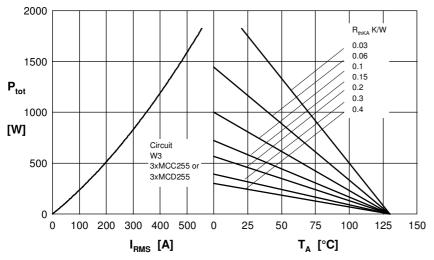


Fig. 8 Three phase AC-controller: Power dissipation versus $R_{\rm MS}$ output current and ambient temperature

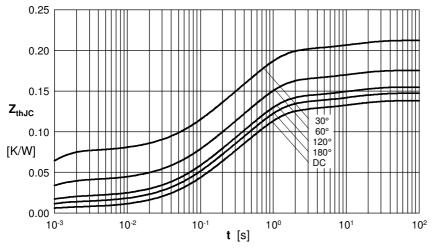
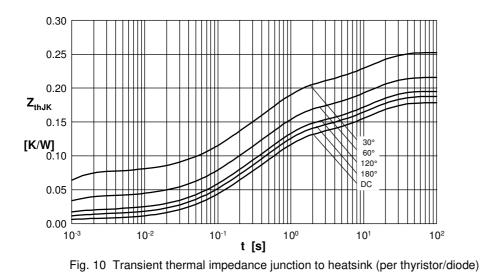


Fig. 9 Transient thermal impedance junction to case (per thyristor/diode)



 $[\]mathbf{R}_{\text{thJK}}$ for various conduct. angles d:

d	R _{thJK} [K/W]
DC	0.179
180°	0.188
120°	0.196
60°	0.216
30°	0.254

Constants for Z_{thJK} calculation:

i	R _{thi} [K/W]	t _i [s]
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12
5	0.04	12

 $\mathrm{R}_{\mathrm{thJC}}$ for various conduct. angles d:

d	R _{thJC} [K/W]
DC	0.139
180°	0.148
120°	0.156
60°	0.176
30°	0.214

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

i	R _{thi} [K/W]	t _i [s]
1	0.0066	0.00054
2	0.0358	0.098
3	0.0831	0.54
4	0.0129	12