

Thyristor Module

$$V_{RRM} = 2 \times 1200 \text{ V}$$

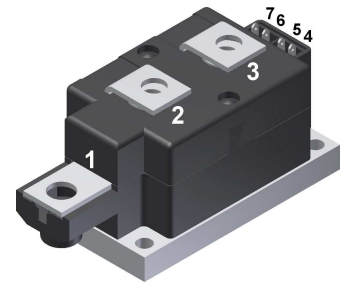
$$I_{TAV} = 220 \text{ A}$$

$$V_T = 1.18 \text{ V}$$

Phase leg

Part number

MCC225-12io1



Backside: isolated

 E72873



Features / Advantages:

- International standard package
- Direct copper bonded Al₂O₃-ceramic with copper base plate
- Planar passivated chip
- 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

Disclaimer Notice

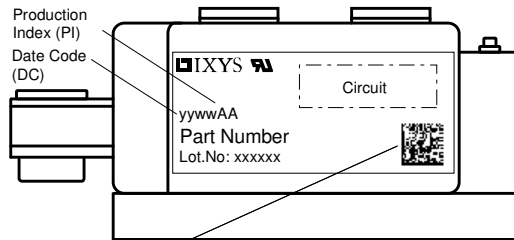
Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.



Rectifier			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}C$			1300	V
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}C$			1200	V
I_{RD}	reverse current, drain current	$V_{R/D} = 1200 V$	$T_{VJ} = 25^{\circ}C$		1	mA
		$V_{R/D} = 1200 V$	$T_{VJ} = 125^{\circ}C$		40	mA
V_T	forward voltage drop	$I_T = 200 A$	$T_{VJ} = 25^{\circ}C$		1.04	V
		$I_T = 400 A$			0.97	V
		$I_T = 200 A$	$T_{VJ} = 125^{\circ}C$		1.18	V
		$I_T = 400 A$			1.14	V
I_{TAV}	average forward current	$T_C = 85^{\circ}C$	$T_{VJ} = 140^{\circ}C$		220	A
$I_{T(RMS)}$	RMS forward current	180° sine			400	A
V_{T0}	threshold voltage	} for power loss calculation only	$T_{VJ} = 140^{\circ}C$		0.79	V
r_T	slope resistance				0.83	mΩ
R_{thJC}	thermal resistance junction to case				0.157	K/W
R_{thCH}	thermal resistance case to heatsink			0.04		K/W
P_{tot}	total power dissipation		$T_C = 25^{\circ}C$		730	W
I_{TSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}C$		8.00	kA
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 V$		8.64	kA
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 140^{\circ}C$		6.80	kA
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 V$		7.35	kA
I^2t	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}C$		320.0	kA ² s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 V$		310.5	kA ² s
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 140^{\circ}C$		231.2	kA ² s
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 V$		224.4	kA ² s
C_J	junction capacitance	$V_R = 400 V \quad f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}C$		366	pF
P_{GM}	max. gate power dissipation	$t_p = 30 \mu s$	$T_C = 140^{\circ}C$		120	W
		$t_p = 500 \mu s$			60	W
P_{GAV}	average gate power dissipation				20	W
$(di/dt)_{cr}$	critical rate of rise of current	$T_{VJ} = 140^{\circ}C; f = 50 \text{ Hz}$	repetitive, $I_T = 660 A$		100	A/μs
		$t_p = 200 \mu s; di_G/dt = 1 A/\mu s;$	non-repet., $I_T = 220 A$		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
		$R_{GK} = \infty; \text{method 1 (linear voltage rise)}$				
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$		2	V
			$T_{VJ} = -40^{\circ}C$		3	V
I_{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$		150	mA
			$T_{VJ} = -40^{\circ}C$		220	mA
V_{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 140^{\circ}C$		0.25	V
I_{GD}	gate non-trigger current				10	mA
I_L	latching current	$t_p = 30 \mu s$	$T_{VJ} = 25^{\circ}C$		200	mA
		$I_G = 0.45 A; di_G/dt = 0.45 A/\mu s$				
I_H	holding current	$V_D = 6 V \quad R_{GK} = \infty$	$T_{VJ} = 25^{\circ}C$		150	mA
t_{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	$T_{VJ} = 25^{\circ}C$		2	μs
		$I_G = 1 A; di_G/dt = 1 A/\mu s$				
t_q	turn-off time	$V_R = 100 V; I_T = 220 A; V = \frac{2}{3} V_{DRM}$	$T_{VJ} = 125^{\circ}C$		200	μs
		$di/dt = 10 A/\mu s \quad dv/dt = 50 V/\mu s \quad t_p = 200 \mu s$				



Package Y1			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal			600	A
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 striking distance through air	terminal to terminal	16.0			mm
$d_{Spb/Apb}$		terminal to backside	16.0			mm
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V



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

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCC225-12io1	MCC225-12io1	Box	3	463280

Equivalent Circuits for Simulation

* on die level

$T_{VJ} = 140^{\circ}C$

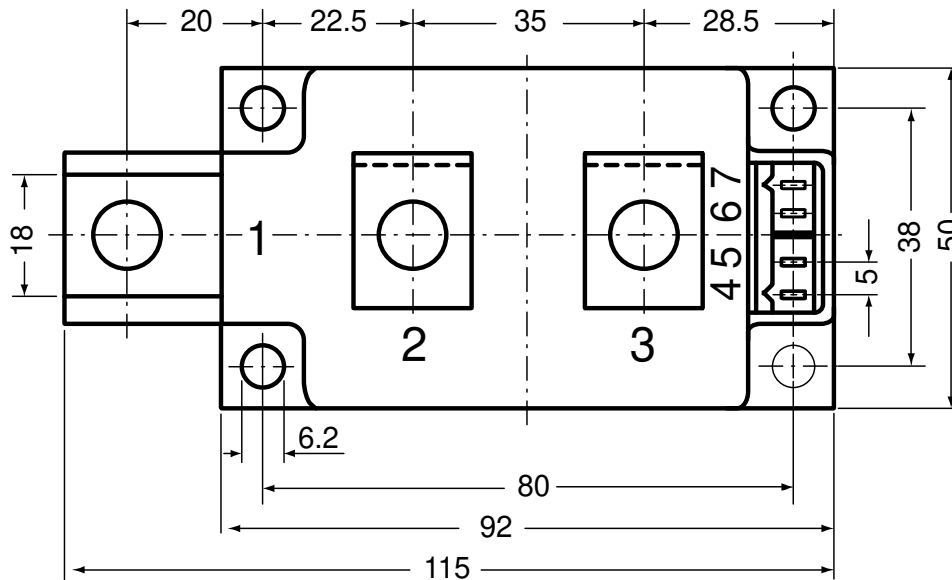
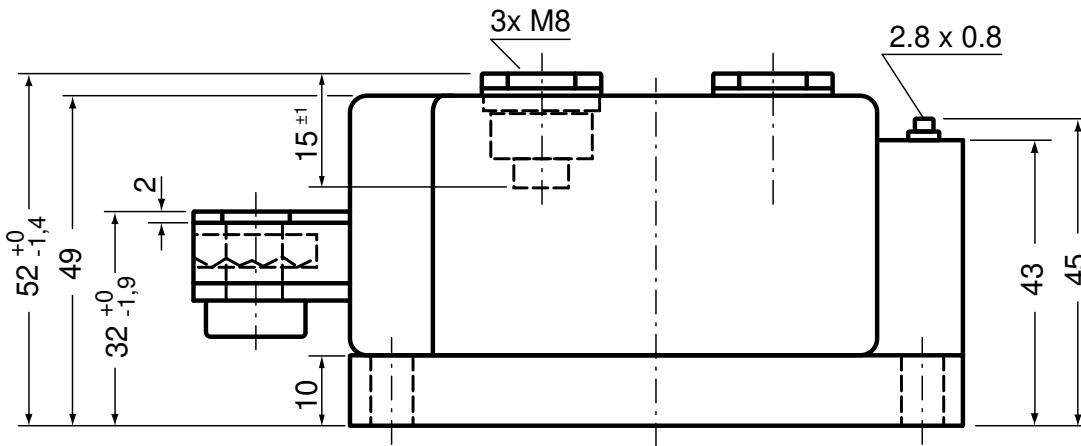


Thyristor

$V_{0\ max}$	threshold voltage	0.79	V
$R_{0\ max}$	slope resistance *	0.64	mΩ



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



Thyristor

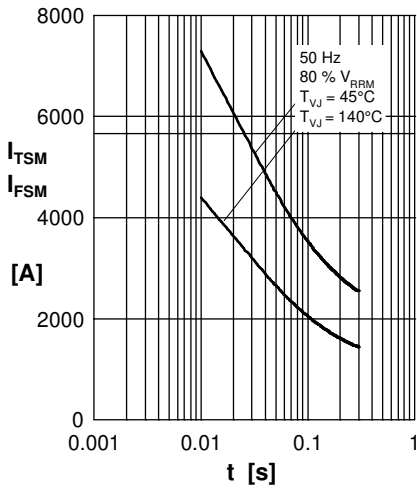


Fig. 1 Surge overload current
 $I_{TSM/FSM}$: Crest value, t : duration



Fig. 2 I^2dt versus time



Fig. 3 Max. forward current at case temperature

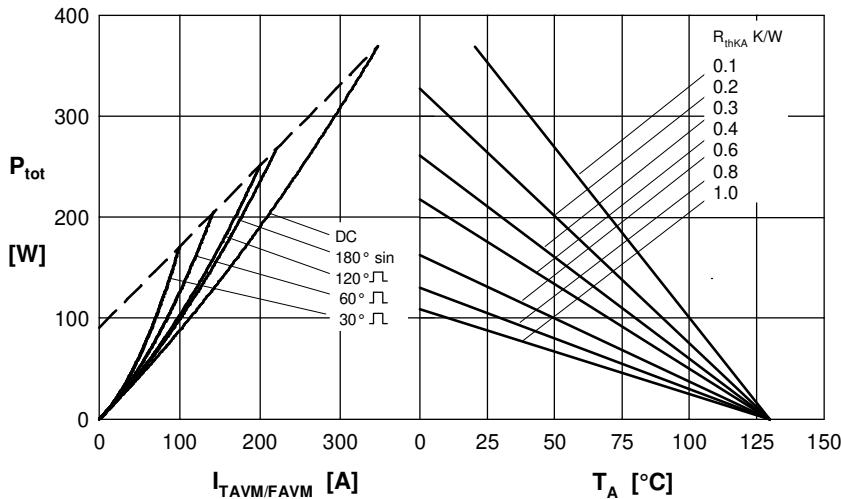


Fig. 4 Power dissipation versus on-state current and ambient temperature (per thyristor or diode)

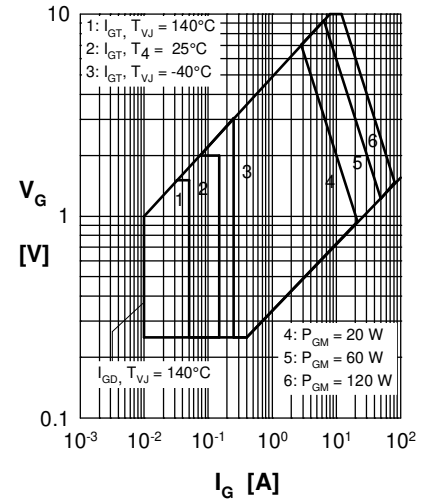


Fig. 5 Gate voltage and current

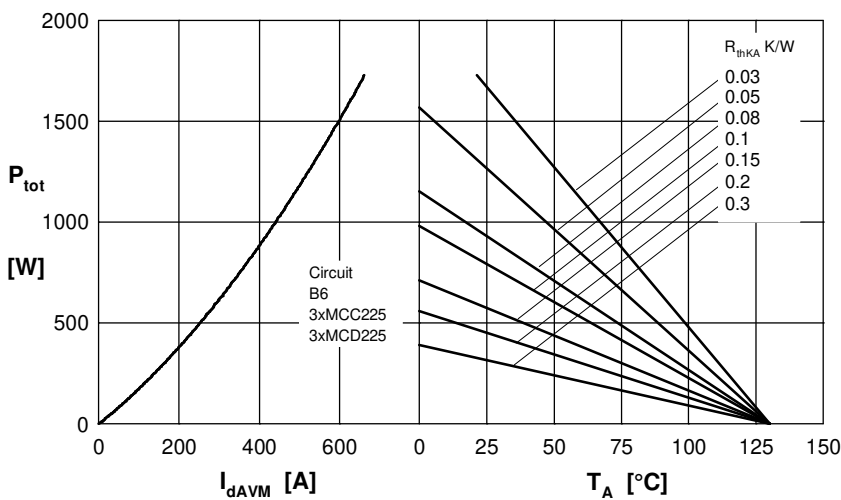


Fig. 6 Three phase rectifier bridge: Power dissipation versus direct output current and ambient temperature



Fig. 7 Gate trigger characteristics

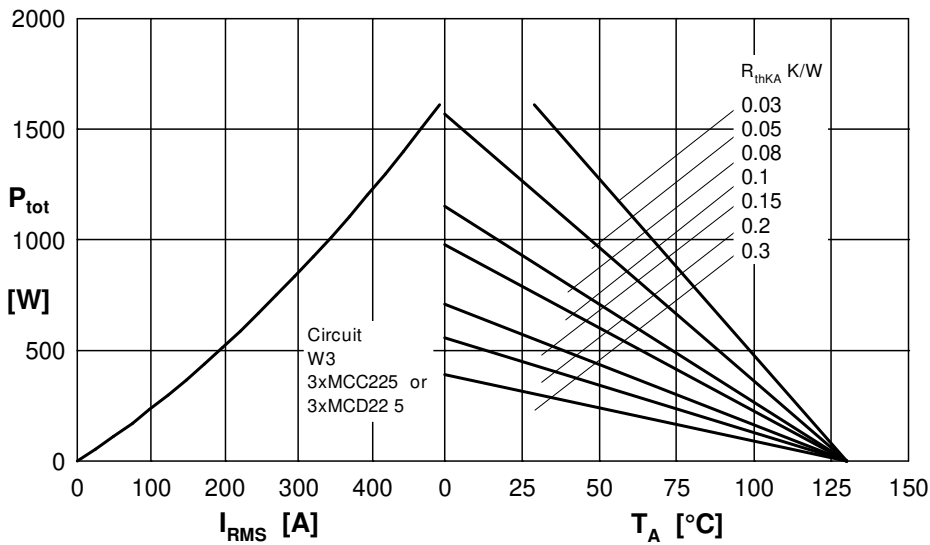
Rectifier


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

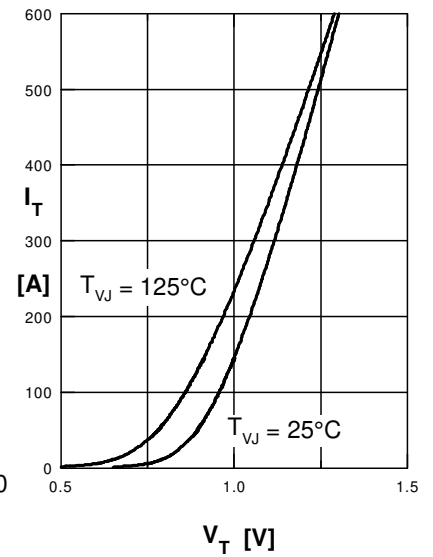


Fig. 9 Forward characteristics

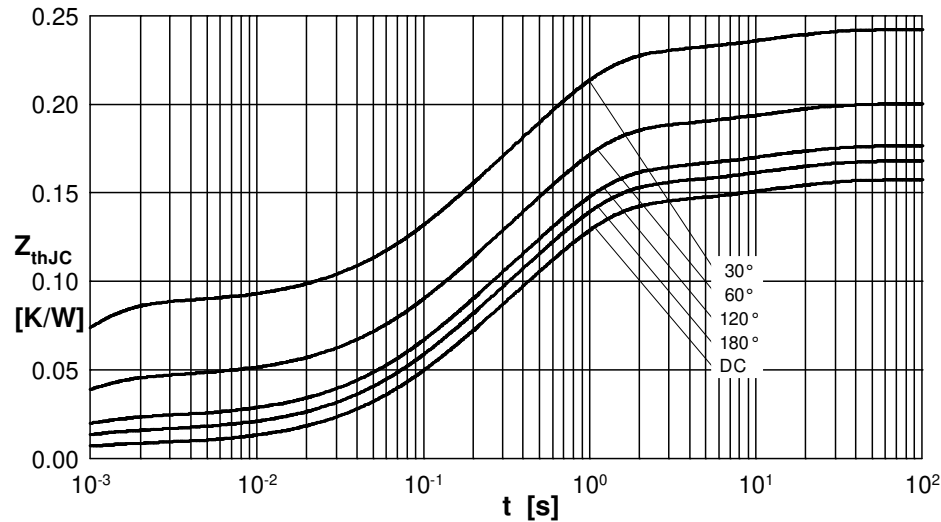


Fig. 10 Transient thermal impedance junction to case (per thyristor/diode)

R_{thJC} for various conduct. angles d:

d	R_{thJC} (K/W)
DC	0.157
180°	0.168
120°	0.177
60°	0.200
30°	0.243

Constants for Z_{thJC} calculation:

i	R_{th} (K/W)	t (s)
1	0.0076	0.00054
2	0.0406	0.09800
3	0.0944	0.54000
4	0.0147	12.0000

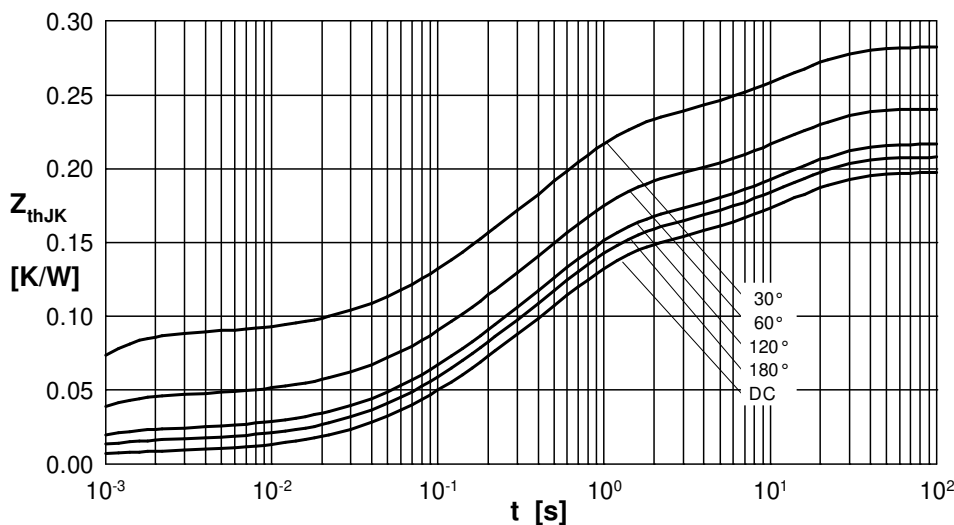


Fig. 11 Transient thermal impedance junction to heatsink (per thyristor/diode)

R_{thJK} for various conduct. angles d:

d	R_{thJK} (K/W)
DC	0.197
180°	0.208
120°	0.217
60°	0.240
30°	0.283

Constants for Z_{thJK} calculation:

i	R_{th} (K/W)	t (s)
1	0.0076	0.00054
2	0.0406	0.09800
3	0.0944	0.54000
4	0.0147	12.0000
5	0.0400	12.0000

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9