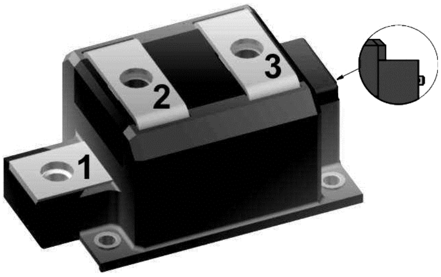
Thyristor Module

V_{RRM} = 2x 1600 V
I_{TAV} = 700 A
V_T = 1.11 V

Phase leg
optional usage as Dual Thyristor Triac

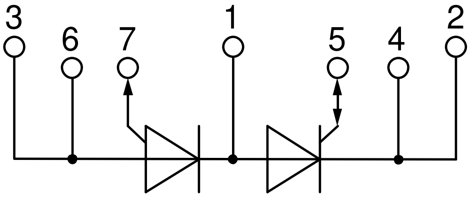
Part number

MCMA700P1600NCA



Backside: isolated

E72873



Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability
- Direct Copper Bonded Al2O3-ceramic
- Gate current polarities
  - upper SCR (2 -> 1) = positive/negative
  - lower SCR (1 -> 3) = negative

Applications:

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

Package: ComPack

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Base plate: Copper internally DCB isolated
- Advanced power cycling
- Phase Change Material available

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.

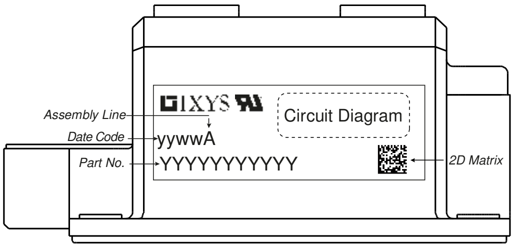
Rectifier

Symbol	Definition	Conditions		min.	typ.	max.	Unit
					Ratings		
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage		T_{VJ} = 25°C			1700	V
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage		T_{VJ} = 25°C			1600	V
$I_{R/D}$	reverse current, drain current	$V_{R/D}$ = 1600 V	T_{VJ} = 25°C			2	mA
		$V_{R/D}$ = 1600 V	T_{VJ} = 125°C			40	mA
V_T	forward voltage drop	I_T = 700 A	T_{VJ} = 25°C			1.16	V
		I_T = 1400 A				1.41	V
		I_T = 700 A	T_{VJ} = 125°C			1.11	V
		I_T = 1400 A				1.41	V
I_{TAV}	average forward current	T_C = 85°C	T_{VJ} = 140°C			700	A
$I_{T(RMS)}$	RMS forward current	180° sine				1100	A
V_{T0}	threshold voltage	for power loss calculation only	T_{VJ} = 140°C			0.82	V
r_T	slope resistance					0.4	mΩ
R_{thJC}	thermal resistance junction to case					0.05	K/W
R_{thCH}	thermal resistance case to heatsink				0.02		K/W
P_{tot}	total power dissipation		T_C = 25°C			2300	W
I_{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			19.0	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			20.5	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 140°C			16.2	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			17.4	kA
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1.81	MA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.75	MA^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 140°C			1.30	MA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1.27	MA^2s
C_J	junction capacitance	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		876		pF
P_{GM}	max. gate power dissipation	t_P = 30 µs	T_C = 140°C			240	W
		t_P = 300 µs				120	W
P_{GAV}	average gate power dissipation					40	W
$(di/dt)_{cr}$	critical rate of rise of current	T_{VJ} = 140°C; f = 50 Hz	repetitive, I_T = 2100 A			100	A/µs
		t_P = 200 µs; di_G/dt = 1 A/µs;					
		I_G = 1 A; V = ⅔ V_{DRM}	non-repet., I_T = 700 A			500	A/µs
$(dv/dt)_{cr}$	critical rate of rise of voltage	V = ⅔ V_{DRM}	T_{VJ} = 140°C			1000	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)					
V_{GT}	gate trigger voltage	V_D = 6 V	T_{VJ} = 25°C			2	V
			T_{VJ} = -40°C			3	V
I_{GT}	gate trigger current	V_D = 6 V	T_{VJ} = 25°C			± 300	mA
			T_{VJ} = -40°C			± 400	mA
V_{GD}	gate non-trigger voltage	V_D = ⅔ V_{DRM}	T_{VJ} = 140°C			0.25	V
I_{GD}	gate non-trigger current					± 10	mA
I_L	latching current	t_p = 30 µs	T_{VJ} = 25°C			400	mA
		I_G = 1 A; di_G/dt = 1 A/µs					
I_H	holding current	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			300	mA
t_{gd}	gate controlled delay time	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 1 A; di_G/dt = 1 A/µs					
t_q	turn-off time	V_R = 100 V; I_T = 700A; V = ⅔ V_{DRM}	T_{VJ} = 125 °C		350		µs
		di/dt = 10 A/µs dv/dt = 50 V/µs	t_p = 200 µs				

Package ComPack

Ratings

Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				1200	A
T_{VJ}	*virtual junction temperature*			-40		140	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		125	°C
Weight					500		g
M_D	*mounting torque*			3		5	Nm
M_T	*terminal torque*			12		14	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	21.0			mm
$d_{Spb/Apb}$			*terminal to backside*	18.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	4800			V
		t = 1 minute		4000			V



Part description

M = Module
C = Thyristor (SCR)
M = Thyristor
A = (up to 1800V)
700 = Current Rating [A]
P = Phase leg
1600 = Reverse Voltage [V]
N = Three Quadrants operation: QI - QIII
CA = ComPack

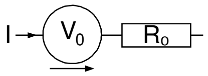
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCMA700P1600NCA	MCMA700P1600NCA	Box	3	515494

Similar Part	Package	Voltage class
MCMA700P1600CA	ComPack	1600

Equivalent Circuits for Simulation

* on die level

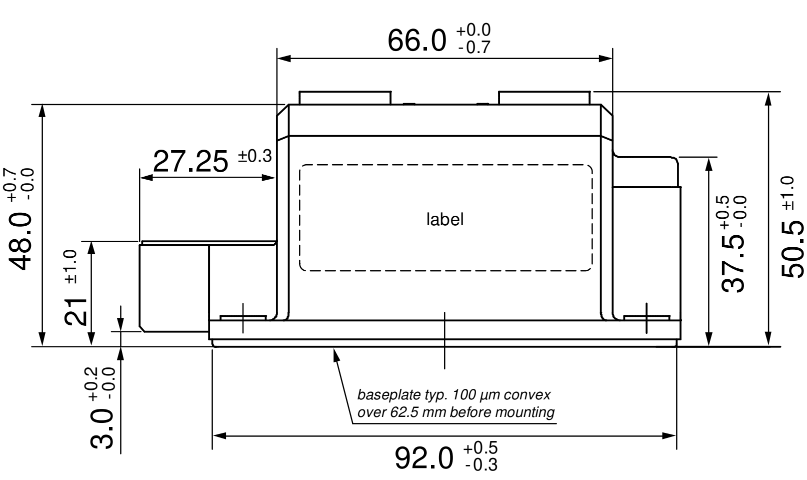
$T_{VJ} = 140°C$

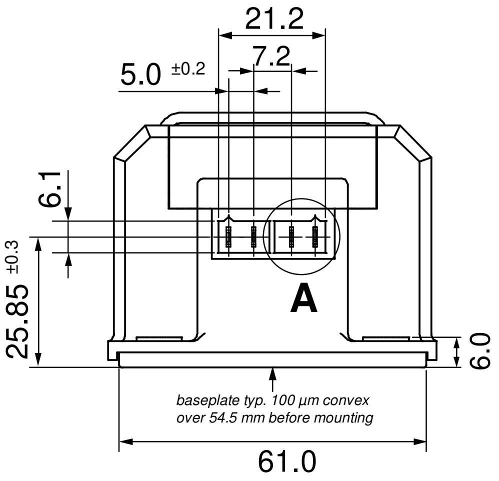


Thyristor

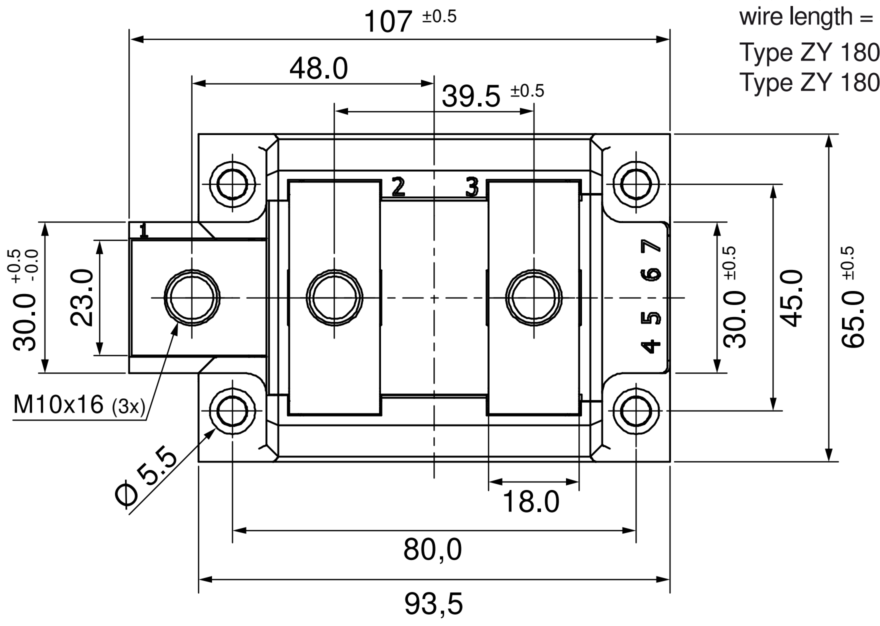
$V_{0\ max}$	*threshold voltage*	0.82	V
$R_{0\ max}$	*slope resistance **	0.21	mΩ

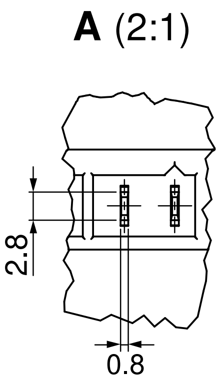
Outlines ComPack

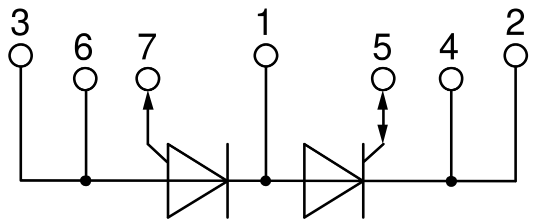




Optional accessories for modules
Keyed gate/cathode twin plugs with
wire length = 350 mm, gate = white, cathode = red
Type ZY 180L (L = Left for pin pair 4/5) } UL 758,
Type ZY 180R (R = Right for pin pair 6/7) } style 3751







Thyristor

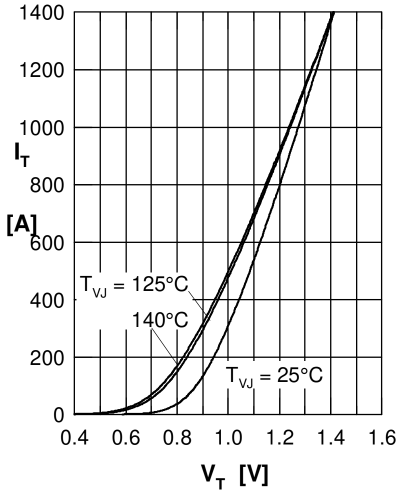


Fig. 1 Forward characteristics

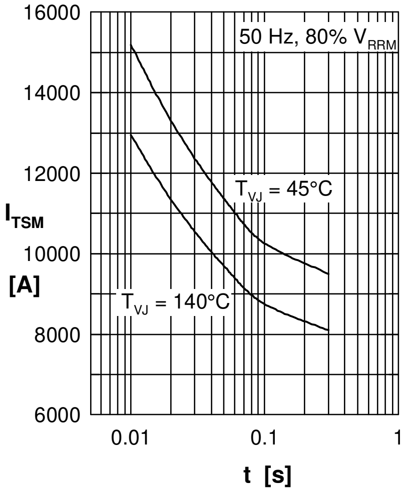


Fig. 2 Surge overload current
I_{TSM}: crest value, t: duration

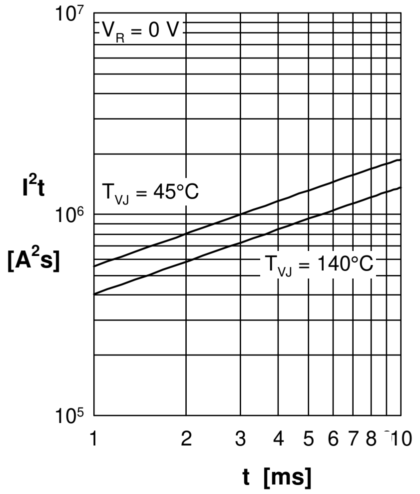


Fig. 3 I^2t versus time (1-10 s)

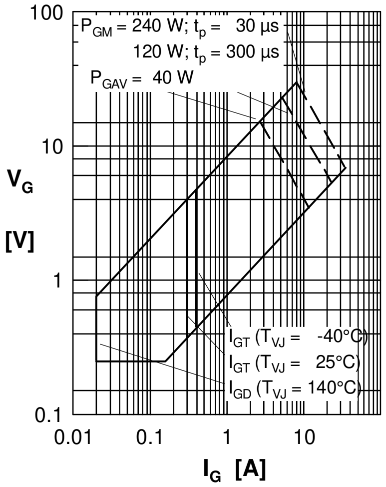


Fig. 4 Gate voltage & gate current

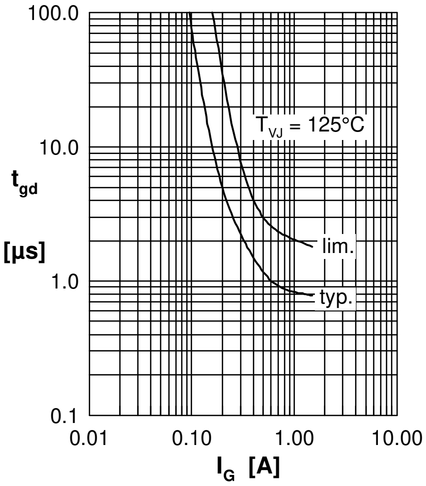


Fig. 5 Gate controlled delay time t_{gd}

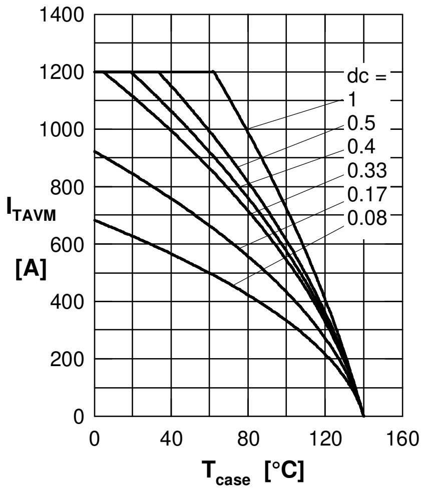


Fig. 6 Max. forward current at case temperature

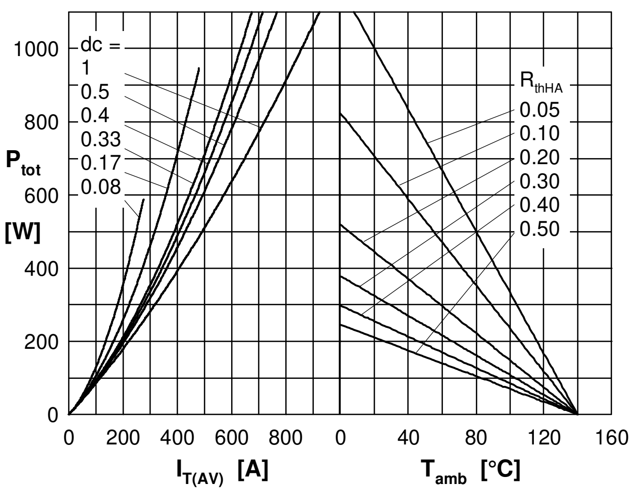
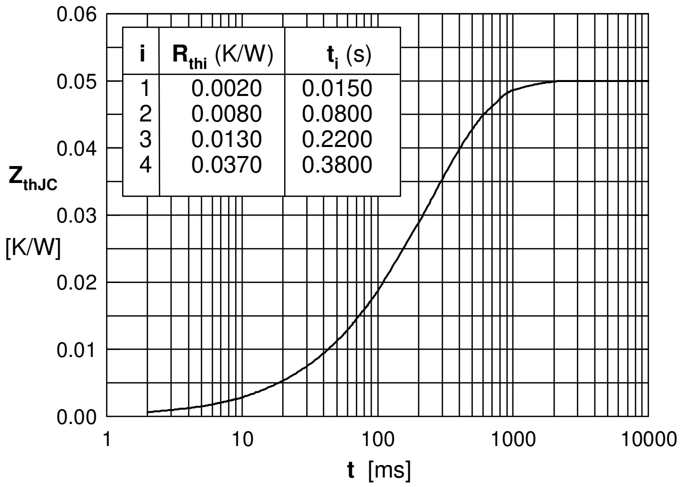


Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature



i	R_{thi} (K/W)	t_i (s)
1	0.0020	0.0150
2	0.0080	0.0800
3	0.0130	0.2200
4	0.0370	0.3800

Fig. 8 Transient thermal impedance junction to case

MOSCHIP.RU
ВМЕСТЕ МЫ СОЗДАЕМ БУДУЩЕЕ

ПОСТАВКА
ЭЛЕКТРОННЫХ КОМПОНЕНТОВ

многоканальный
+7 495 668 12 70
info@moschip.ru

Общество с ограниченной ответственностью «МосЧип» ИНН 7719860671 / КПП 771901001
Адрес: 105318, г.Москва, ул.Щербаковская д.3, офис 1107

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