Thyristor Module

MCMA265P1600KA

preliminary

V_{RRM}	<i>=</i> 2x 1600 V		
I _{tav}	=	260 A	
V _T	=	1.15 V	

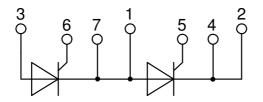
Phase leg

Part number

MCMA265P1600KA



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: Y1

- Isolation Voltage: 4800 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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Thyristo				1	Ratings	1	!
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V _{RSM/DSM}	max. non-repetitive reverse/forwa		$T_{VJ} = 25^{\circ}C$			1700	١
V _{RRM/DRM}	max. repetitive reverse/forward bl		$T_{VJ} = 25^{\circ}C$			1600	١
R/D	reverse current, drain current	$V_{R/D} = 1600 V$	$T_{vJ} = 25^{\circ}C$			300	μA
		V _{R/D} = 1600 V	$T_{VJ} = 140^{\circ}C$			30	mA
V _T	forward voltage drop	$I_{T} = 300 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1.19	١
		$I_{T} = 600 \text{ A}$				1.46	١
		$I_{T} = 300 \text{ A}$	$T_{VJ} = 125 \degree C$			1.15	١
		$I_{T} = 600 \text{ A}$				1.44	١
ITAV	average forward current	$T_c = 85^{\circ}C$	T _{vJ} = 140°C			260	ŀ
T(RMS)	RMS forward current	180° sine				408	ļ
V _{T0}	threshold voltage		T _{v.i} = 140°C			0.80	١
r _T	slope resistance } for power lo	oss calculation only				0.75	mΩ
R _{thJC}	thermal resistance junction to cas	e				0.16	K/W
R _{thCH}	thermal resistance case to heatsi				0.04		K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$		0.0.	720	W
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v_{i}} = 45^{\circ}C$			8.50	k/
ISM		t = 8,3 ms; (60 Hz), sine	$V_{\rm N} = 0 V$			9.18	k/
		t = 0,0 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$\frac{V_{R}}{T_{V,l}} = 140^{\circ}C$			7.23	k/
		t = 8,3 ms; (60 Hz), sine	$V_{\rm NJ} = 140$ C $V_{\rm R} = 0$ V			7.81	k/
124	value for fusing		$V_{R} = 0 V$ $T_{VJ} = 45^{\circ}C$				1
l²t	value for fusing	t = 10 ms; (50 Hz), sine				361.3	1
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			350.6	
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 140 ^{\circ}C$			261.0	kA ² s
	·	t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			253.4	
C	junction capacitance	$V_{R} = 400 V f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		366		pF
P _{GM}	max. gate power dissipation	t _P = 30 μs	$T_{\rm C} = 140^{\circ}{\rm C}$			120	W
		t _P = 500 μs				60	N
P _{GAV}	average gate power dissipation					20	N
(di/dt) _{cr}	critical rate of rise of current	$T_{vJ} = 140 ^{\circ}C; f = 50 Hz$ re	epetitive, $I_T = 750 \text{ A}$			100	A/μs
		$t_{P} = 200 \mu s; di_{G}/dt = 1 A/\mu s;$: : : :
		$I_{G} = 1 \text{ A}; \text{ V} = \frac{2}{3} \text{ V}_{DRM} $ n	on-repet., $I_{T} = 268 \text{ A}$			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
		$R_{GK} = \infty$; method 1 (linear volta	age rise)				1 1 1 1
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
			$T_{vJ} = -40 ^{\circ}\text{C}$			220	mA
V _{gd}	gate non-trigger voltage	$V_{D} = \frac{2}{3} V_{DBM}$	T _{vJ} = 140°C			0.25	V
	gate non-trigger current		10			10	mA
IL	latching current	t _p = 30 μs	$T_{vJ} = 25 °C$			200	mA
1		$I_{g} = 0.45 \text{ A}; \text{ di}_{g}/\text{dt} = 0.45 \text{ A}/\mu$				200	
I _H	holding current	$V_{\rm D} = 6 V R_{\rm GK} = \infty$	$T_{vJ} = 25 ^{\circ}C$			150	m/
			$T_{VJ} = 25 \text{ C}$ $T_{VJ} = 25 \text{ C}$				1
t _{gd}	gate controlled delay time	$V_{\rm D} = \frac{1}{2} V_{\rm DRM}$				2	μ
-	turn all the -	$I_{\rm G} = 1 {\rm A}; {\rm di}_{\rm G}/{\rm dt} = 1 {\rm A}/\mu{\rm s}$: : : :
t _q	turn-off time	$V_{R} = 100 \text{ V}; I_{T} = 300 \text{ A}; \text{ V} = \frac{2}{3}$			200		με
		$di/dt = 10 \text{ A}/\mu \text{s} dv/dt = 50 \text{ V}$	//μs t _p = 200 μs				

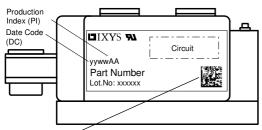
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Package Y1					Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit	
I _{RMS}	RMS current	per terminal				600	Α	
T _{vj}	virtual junction temperature			-40		140	°C	
T _{op}	operation temperature			-40		125	°C	
T _{stg}	storage temperature			-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 striking dist	tanaa thraugh air	terminal to terminal	16.0			mm	
d _{Spb/Apb}		stance infough an	terminal to backside	16.0			mm	
V	isolation voltage	t = 1 second		4800			V	
		t = 1 minute	50/60 Hz, RMS; liso∟ ≤ 1 mA	4000			V	



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

Part description

M = Module

C = Thyristor (SCR)M = Thyristor

A = (up to 1800V) 265 = Current Rating [A] P = Phase leg

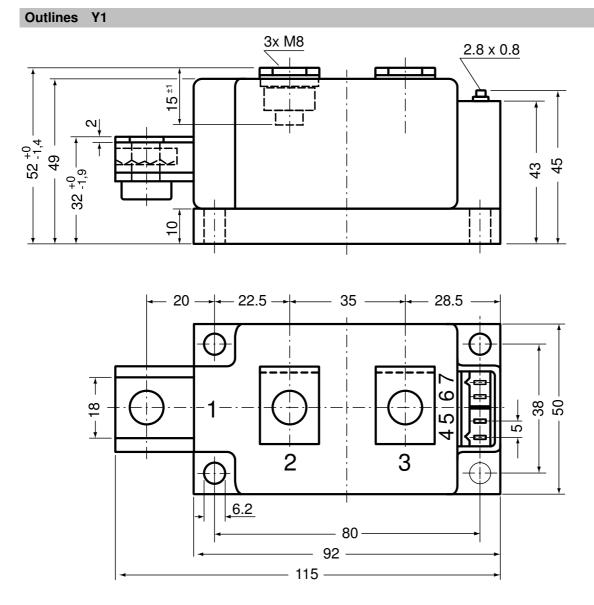
1600 = Reverse Voltage [V] KA = Y1-CU

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCMA265P1600KA	MCMA265P1600KA	Box	3	509792

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 *	0.51		mΩ

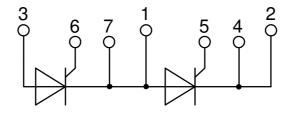
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Optional accessories for modules

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



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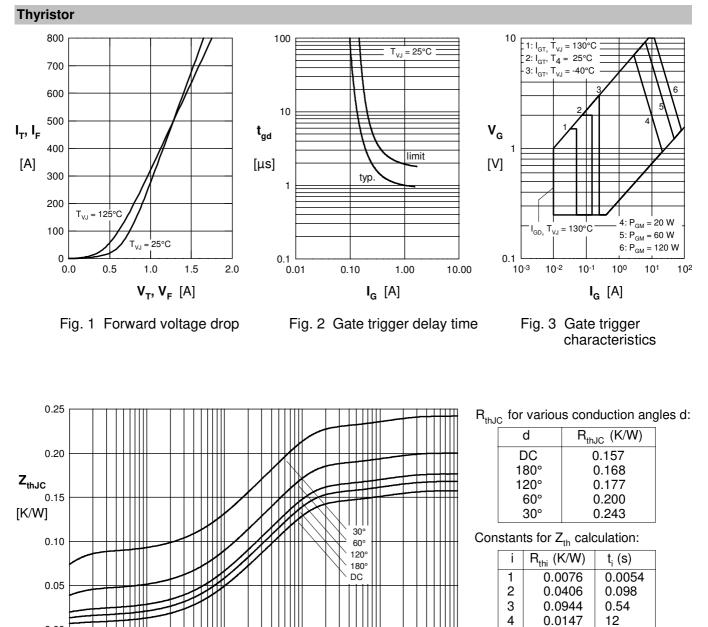


Fig. 4 Transient thermal impedance junction to case (per thyristor/diode)

t [s]

100

10¹

10²

10-1

10-2

0.00

10-3

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