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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!



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### **MCMA265PD1600KB**

preliminary

= 2x 1600 V

260 A

 $V_{T}$ 1.15 V

# **Thyristor \ Diode Module**

### Phase leg

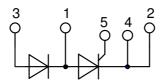
#### Part number

#### MCMA265PD1600KB



Backside: isolated





#### 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 60747 and per semiconductor unless otherwise specified

20170116c



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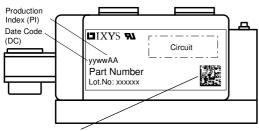
Rectifier					Ratings	İ	!
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V <sub>RSM/DSM</sub>	max. non-repetitive reverse/forwa		$T_{VJ} = 25^{\circ}C$			1700	١
V <sub>RRM/DRM</sub>	max. repetitive reverse/forward ble		$T_{VJ} = 25^{\circ}C$			1600	٧
I <sub>R/D</sub>	reverse current, drain current	$V_{R/D} = 1600 \text{ V}$	$T_{VJ} = 25^{\circ}C$			300	μA
		$V_{R/D} = 1600 \text{ V}$	$T_{VJ} = 140$ °C			30	m₽
V <sub>T</sub>	forward voltage drop	$I_T = 300 A$	$T_{VJ} = 25^{\circ}C$			1.19	٧
		$I_T = 600 A$				1.46	٧
		$I_{T} = 300 \text{ A}$	T <sub>vJ</sub> = 125°C			1.15	٧
		$I_T = 600 \text{ A}$				1.44	٧
I <sub>TAV</sub>	average forward current	T <sub>C</sub> = 85°C	T <sub>vJ</sub> = 140°C			260	Δ
I <sub>T(RMS)</sub>	RMS forward current	180° sine				408	Δ
V <sub>T0</sub>	threshold voltage		T <sub>vJ</sub> = 140°C			0.80	٧
r <sub>T</sub>	slope resistance } for power lo	oss calculation only				0.75	mΩ
R <sub>thJC</sub>	thermal resistance junction to cas	e				0.16	K/W
R <sub>thCH</sub>	thermal resistance case to heatsin				0.04		K/W
P <sub>tot</sub>	total power dissipation		T <sub>C</sub> = 25°C			720	W
I <sub>TSM</sub>	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			8.50	kΑ
- 1 3 W	Ü	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			9.18	kΑ
		t = 10  ms; (50  Hz),  sine	T <sub>v.i</sub> = 140°C			7.23	k٨
		t = 8,3  ms; (60  Hz),  sine	$V_R = 0 V$			7.81	kA
l²t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			361.3	kA <sup>2</sup> s
• •	value iei iubilig	t = 8.3  ms; (60 Hz), sine	$V_R = 0 V$			350.6	kA <sup>2</sup> s
		t = 0.5  ms, (60  Hz),  sine t = 10  ms; (50  Hz),  sine	$T_{VJ} = 140^{\circ}C$			261.0	kA <sup>2</sup> s
		t = 8.3  ms; (60 Hz), sine	$V_R = 0 V$			253.4	į
<u> </u>	junction capacitance		$V_R = 0 V$ $T_{VJ} = 25^{\circ}C$		366	200.4	-
C,		V <sub>R</sub> = 400 V f = 1 MHz	$T_{VJ} = 25 \text{ C}$ $T_{C} = 140 ^{\circ}\text{C}$		300	100	pF W
$P_{GM}$	max. gate power dissipation	$t_P = 30 \mu s$	$I_{C} = 140^{\circ}C$			120	1
_		$t_{P} = 500  \mu s$				60	W
P <sub>GAV</sub>	average gate power dissipation	T 44000 ( 5044	1 750 4			20	W
(di/dt) <sub>cr</sub>	critical rate of rise of current	,	epetitive, $I_T = 750 A$			100	A/μs
		$t_P = 200 \mu s; di_G/dt = 1 A/\mu s; -$					
			on-repet., $I_T = 268 A$				A/µs
(dv/dt) <sub>cr</sub>	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{VJ} = 140$ °C			1000	V/μs
		R <sub>GK</sub> = ∞; method 1 (linear volta					! ! !
$V_{GT}$	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			2	٧
			$T_{VJ} = -40$ °C			3	٧
I <sub>GT</sub>	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			150	m₽
			$T_{VJ} = -40$ °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	٧
I <sub>GD</sub>	gate non-trigger current					10	m₽
I <sub>L</sub>	latching current	t <sub>p</sub> = 30 μs	$T_{VJ} = 25 ^{\circ}C$			200	mA
		$I_G = 0.45 A;  di_G/dt = 0.45 A/\mu s$	S				i I I I
I <sub>H</sub>	holding current	V <sub>D</sub> = 6 V R <sub>GK</sub> = ∞	T <sub>vJ</sub> = 25°C			150	mA
t <sub>gd</sub>	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	T <sub>VJ</sub> = 25°C			2	μs
34	•	$I_G = 1 \text{ A}; \text{ di}_G/\text{dt} = 1 \text{ A}/\mu s$					F
	turn-off time	$V_{\rm R} = 100 \text{ V}; \ I_{\rm T} = 300 \text{ A}; \ V = \frac{2}{3}$			200		με
t <sub>q</sub>		*H = 100 *, 11 - 00071, * - /	- JUHM I VJ - 120 0			ı	μο



## MCMA265PD1600KB

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Package Y1				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
I <sub>RMS</sub>	RMS current	per terminal				600	Α
T <sub>vJ</sub>	virtual junction temperature			-40		140	°C
Top	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
$\mathbf{M}_{_{T}}$	terminal torque			11		13	Nm
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through air		terminal to terminal	16.0			mm
$d_{Spb/Apb}$			terminal to backside	16.0			mm
V <sub>ISOL</sub>	isolation voltage	t = 1 second		4800			٧
	t = 1 minute		50/60 Hz, RMS; I <sub>ISOL</sub> ≤ 1 mA	4000			٧



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

#### Part description

M = Module

M = Module
C = Thyristor (SCR)
M = Thyristor
A = (up to 1800V)
265 = Current Rating [A]
PD = Phase leg

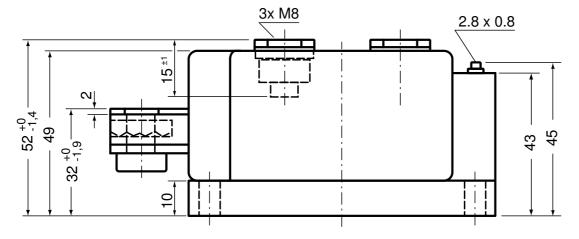
1600 = Reverse Voltage [V] KB = Y1-CU

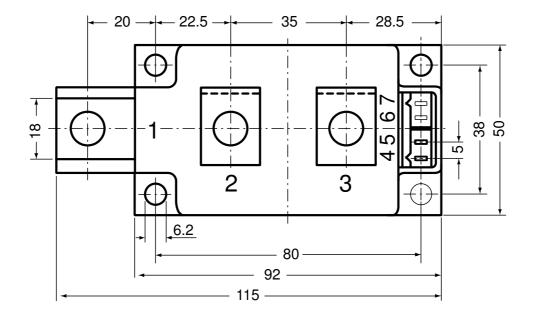
Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCMA265PD1600KB	MCMA265PD1600KB	Box	3	509202

Equiva	alent Circuits for	Simulation	* on die level	$T_{VJ} = 140 ^{\circ}\text{C}$
$I \rightarrow V_0$	)—[R_o_]-	Thyristor		
V <sub>0 max</sub>	threshold voltage	8.0		V
$R_{0\;max}$	slope resistance *	0.51		$m\Omega$

preliminary

#### **Outlines Y1**



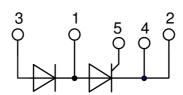


Optional accessories for modules

. 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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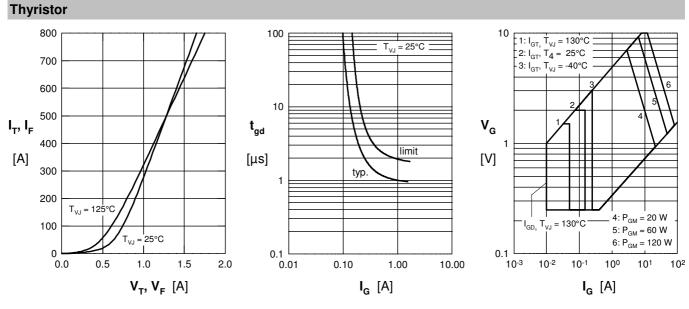
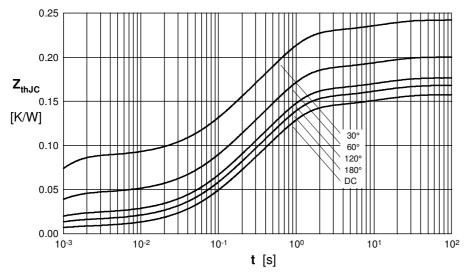


Fig. 1 Forward voltage drop

Fig. 2 Gate trigger delay time

Fig. 3 Gate trigger characteristics



 $\boldsymbol{R}_{\text{thJC}}$  for various conduction angles d:

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

Constants for  $Z_{th}$  calculation:

i	R <sub>thi</sub> (K/W)	t <sub>i</sub> (s)
1	0.0076	0.0054
2	0.0406	0.098
3	0.0944	0.54
4	0.0147	12

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