

High Voltage Thyristor \ Diode Module

= 2x 2200 V

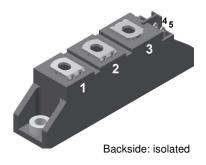
95 A

 V_{τ} 1.24 V

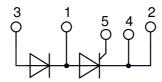
Phase leg

Part number

MCNA95PD2200TB







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: TO-240AA

- Isolation Voltage: 4800 V~
- Industry standard outline
- RoHS compliant
- Soldering pins for PCB mounting
- Base plate: DCB ceramic
- · Reduced weight
- Advanced power cycling

Terms and 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

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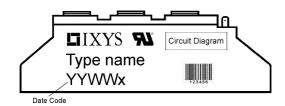


Rectifier					Ratings		!
Symbol	Definition	Conditions		min.	typ.	max.	Un
V _{RSM/DSM}	max. non-repetitive reverse/forwa	rd blocking voltage	$T_{VJ} = 25^{\circ}C$			2300	
V _{RRM/DRM}	max. repetitive reverse/forward bl	<u> </u>	$T_{VJ} = 25^{\circ}C$			2200	,
I _{R/D}	reverse current, drain current	$V_{R/D} = 2200 \text{ V}$	$T_{VJ} = 25^{\circ}C$			100	μ
		$V_{R/D} = 2200 \text{ V}$	$T_{VJ} = 140$ °C			10	m
V _T	forward voltage drop	$I_T = 95 A$	$T_{VJ} = 25^{\circ}C$			1.26	ļ ,
		$I_T = 190 A$				1.54	١
		$I_T = 95 \text{ A}$	T _{VJ} = 125°C			1.24	, ,
		$I_T = 190 A$				1.63	,
I _{TAV}	average forward current	T _C = 85°C	T _{vJ} = 140°C			95	,
I _{T(RMS)}	RMS forward current	180° sine				149	
V _{T0}	threshold voltage		T _{vJ} = 140°C			0.84	١
r _T	slope resistance	oss calculation only				4.1	m۵
R _{thJC}	thermal resistance junction to cas	e				0.3	K/V
R _{thCH}	thermal resistance case to heatsin				0.20		K/V
P _{tot}	total power dissipation		T _C = 25°C		00	383	٧
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			1.70	k,
-15M		t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			1.84	k/
		t = 0,0 ms; (50 Hz), sine	$T_{VJ} = 140^{\circ}C$			1.45	k,
		t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			1.56	k,
l²t	value for fusing	t = 0.5 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			14.5	kA ²
	value for rushing	t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			14.0	1
		t = 0.5 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$V_{R} = 0 V$ $T_{V,I} = 140 ^{\circ}C$			10.4	kA ²
			• •				į
^	iunation canacitanas	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$		ΕO	10.1	kA ²
C,	junction capacitance	V _R = 700 V f = 1 MHz	$T_{VJ} = 25^{\circ}C$		50	10	pl
P_{GM}	max. gate power dissipation	$t_P = 30 \mu s$	$T_{C} = 140 ^{\circ}C$			10	۷
_		$t_{P} = 300 \mu s$				5	۷
P _{GAV}	average gate power dissipation					0.5	V
(di/dt) _{cr}	critical rate of rise of current		epetitive, $I_T = 285 A$			150	A/μ
		$t_p = 200 \mu s; di_g/dt = 0.45 A/\mu s;$					
			on-repet., $I_T = 95 A$			500	i
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{VJ} = 140$ °C			1000	V/µ
		R _{GK} = ∞; method 1 (linear volta					! ! !
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			1.5	١
			$T_{VJ} = -40$ °C			1.6	١
I _{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			150	m/
			$T_{VJ} = -40$ °C			200	m/
V _{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 140^{\circ}C$			0.2	١
I _{GD}	gate non-trigger current					10	m/
I _L	latching current	t _p = 10 μs	T _{VJ} = 25°C			200	m
		$I_G = 0.45 \text{A}; di_G/dt = 0.45 \text{A/}\mu s$	3				; ! ! !
I _H	holding current	V _D = 6 V R _{GK} = ∞	$T_{VJ} = 25$ °C			200	m
t _{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	T _{VJ} = 25°C			2	μ
yu	- ,	$I_{\rm G} = 0.45 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.45 \text{A}/\mu \text{s}$				_	r
t _q	turn-off time	$V_R = 100 \text{ V}; I_T = 95 \text{ A}; V = \frac{2}{3}$			500		μ
• q		$di/dt = 10 \text{ A}/\mu \text{s} \text{ dv/dt} = 20 \text{ V}$			550		μ



MCNA95PD2200TB

Package TO-240AA					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal					200	Α
T _{VJ}	virtual junction temperatur	е			-40		140	°C
T _{op}	operation temperature				-40		125	°C
T _{stg}	storage temperature				-40		125	°C
Weight						81		g
M _D	mounting torque				2.5		4	Nm
$\mathbf{M}_{_{\mathbf{T}}}$	terminal torque				2.5		4	Nm
d _{Spp/App}	oroopago distanco on surf	ace striking distance through air	terminal to terminal	13.0	9.7			mm
$d_{\text{Spb/Apb}}$	creepage distance on sun	ace Striking distance through an	terminal to backside	16.0	16.0			mm
V _{ISOL}	isolation voltage	t = 1 second		•	4800			V
		t = 1 minute	50/60 Hz, RMS; I _{ISOL} ≤ 1 mA		4000			٧



Part description

M = Module

C = Thyristor (SCR)

N = High Voltage Thyristor

A = (>= 2000V) 95 = Current Rating [A]

PD = Phase leg

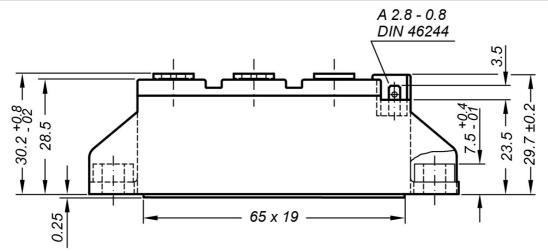
2200 = Reverse Voltage [V] TB = TO-240AA-1B

(Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
:	Standard	MCNA95PD2200TB	MCNA95PD2200TB	Box	36	523300

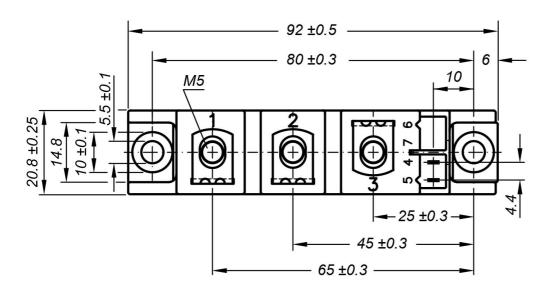
Equiva	alent Circuits for	Simulation	* on die level	$T_{VJ} = 140 ^{\circ}\text{C}$
$I \rightarrow V_0$)—[R_o_]-	Thyristor		
V _{0 max}	threshold voltage	0.84		V
$R_{0\;max}$	slope resistance *	2.9		$m\Omega$



Outlines TO-240AA

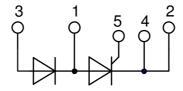


General tolerance: DIN ISO 2768 class "c"



Optional accessories: Keyed gate/cathode twin plugs Wire length: 350 mm, gate = white, cathode = red UL 758, style 3751

Type **ZY 200L** (L = Left for pin pair 4/5)





Thyristor

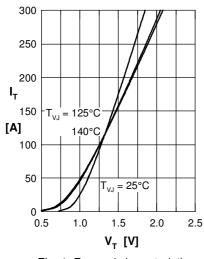


Fig. 1 Forward characteristics

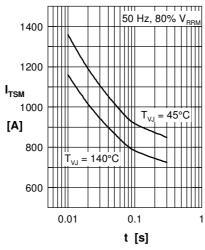


Fig. 2 Surge overload current I_{TSM} : crest value, t: duration

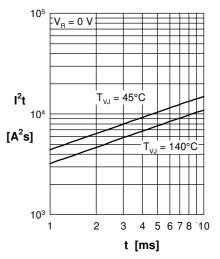


Fig. 3 I²t versus time (1-10 s)

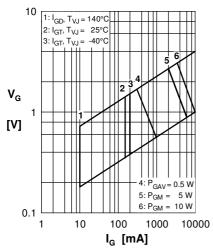


Fig. 4 Gate voltage & gate current

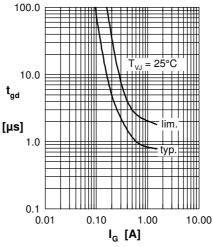


Fig. 5 Gate controlled delay time t_{ad}

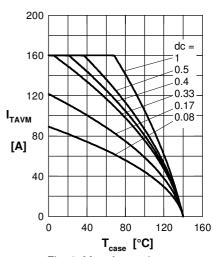


Fig. 6 Max. forward current at case temperature

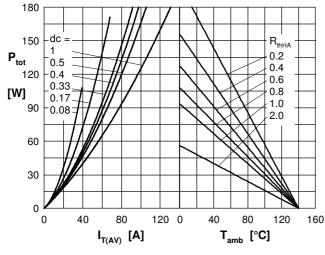


Fig. 7a Power dissipation versus direct output current Fig. 7b and ambient temperature

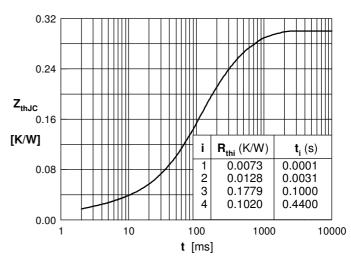


Fig. 8 Transient thermal impedance junction to case