

**Thyristor Module** 

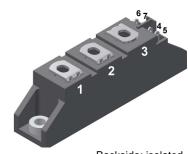
## **MCMA140P1400TA**

$V_{RRM}$	<i>=</i> 2x 1400 V				
I <sub>tav</sub>	=	140 A			
Vτ	=	1.28 V			

Phase leg

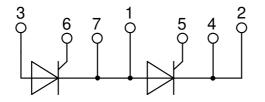
Part number

MCMA140P1400TA



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: 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

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# MCMA140P1400TA

Thyristo		- ····		_	Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V <sub>RSM/DSM</sub>	max. non-repetitive reverse/forwa	0 0	$T_{VJ} = 25^{\circ}C$			1500	\ 
V <sub>RRM/DRM</sub>	max. repetitive reverse/forward bi		$T_{vJ} = 25^{\circ}C$			1400	١
R/D	reverse current, drain current	$V_{R/D} = 1400 V$	$T_{vJ} = 25^{\circ}C$			100	μ/
		$V_{R/D} = 1400 V$	$T_{vJ} = 140^{\circ}C$			10	m/
V <sub>T</sub>	forward voltage drop	$I_{T} = 150 \text{ A}$	$T_{vJ} = 25^{\circ}C$			1.29	١
		$I_{T} = 300 \text{ A}$				1.63	١
		$I_{T} = 150 \text{ A}$	$T_{VJ} = 125 \degree C$			1.28	١
		$I_{T} = 300 \text{ A}$				1.70	١
I <sub>tav</sub>	average forward current	$T_c = 85^{\circ}C$	$T_{vJ} = 140$ °C			140	ļ
I <sub>T(RMS)</sub>	RMS forward current	180° sine				220	ļ
V <sub>T0</sub>	threshold voltage		T <sub>v.i</sub> = 140°C			0.85	١
r <sub>T</sub>	slope resistance } for power lo	oss calculation only				2.8	m۵
R thJC	thermal resistance junction to cas					0.22	K/W
R <sub>thCH</sub>	thermal resistance case to heatsi				0.2		K/W
P <sub>tot</sub>	total power dissipation		$T_c = 25^{\circ}C$		-	520	W
I <sub>TSM</sub>	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,i} = 45^{\circ}C$			2.40	k/
• I SM		t = 8,3  ms; (60  Hz),  sine	$V_{\rm N} = 0 V$			2.59	k/
		t = 0,0  ms; (50  Hz),  sine t = 10  ms; (50  Hz),  sine	$T_{\rm V,I} = 140^{\circ}{\rm C}$			2.04	k/
		t = 8,3 ms; (60 Hz), sine	$V_{\rm NJ} = 140$ C $V_{\rm R} = 0$ V			2.04	k/
l²t	value for fusing	t = 0.5  ms; (50  Hz),  sine	$V_{R} = 0 V$ $T_{VJ} = 45^{\circ}C$				1
1-1	value for fusing					28.8	kA <sup>2</sup>
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$				kA <sup>2</sup>
		t = 10 ms; (50 Hz), sine	$T_{vJ} = 140 ^{\circ}C$			20.8	kA <sup>2</sup>
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			20.2	
CJ	junction capacitance	$V_{\rm R} = 400  \text{V}  \text{f} = 1  \text{MHz}$	$T_{VJ} = 25^{\circ}C$		119		pl
P <sub>GM</sub>	max. gate power dissipation	t <sub>P</sub> = 30 μs	$T_c = 140 ^{\circ}C$			10	W
		t <sub>P</sub> = 300 μs				5	W
P <sub>GAV</sub>	average gate power dissipation					0.5	N
(di/dt) <sub>cr</sub>	critical rate of rise of current	$T_{vJ} = 140 ^{\circ}C; f = 50  Hz$ re	epetitive, $I_{T} = 450 \text{ A}$			150	A/μ
		$t_P = 200 \mu s; di_G/dt = 0.45 \text{ A/}\mu s; -$					
		$I_{G} = 0.45 \text{ A}; \text{ V} = \frac{2}{3} \text{ V}_{DRM}$ no	on-repet., $I_{\tau} = 150 \text{ A}$			500	A/μ
(dv/dt) <sub>cr</sub>	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{vJ} = 140^{\circ}C$			1000	V/μ
		R <sub>GK</sub> = ∞; method 1 (linear volta	ge rise)				     
V <sub>gt</sub>	gate trigger voltage	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			1.5	١
			$T_{vJ} = -40 ^{\circ}\text{C}$			1.6	١
I <sub>GT</sub>	gate trigger current	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			150	m/
		-	$T_{vJ} = -40 ^{\circ}\text{C}$			200	m/
V <sub>gd</sub>	gate non-trigger voltage	$V_{D} = \frac{2}{3} V_{DBM}$	$T_{VJ} = 140^{\circ}C$			0.2	١
I <sub>GD</sub>	gate non-trigger current		¥0			10	m/
	latching current	t <sub>p</sub> = 10 μs	T <sub>vJ</sub> = 25°C			200	m/
1		$I_{g} = 0.45 \text{ A}; \text{ di}_{g}/\text{dt} = 0.45 \text{ A}/\mu\text{s}$				200	
1	holding ourront	$V_{\rm D} = 6 V R_{\rm GK} = \infty$	T <sub>vJ</sub> = 25°C			200	m
I <sub>H</sub>	holding current						m/
t <sub>gd</sub>	gate controlled delay time	$V_{\rm D} = \frac{1}{2} V_{\rm DRM}$	$T_{vJ} = 25 °C$			2	μ
	turn-off time	$\frac{I_{G} = 0.45 \text{ A}; \text{ di}_{G}/\text{dt} = 0.45 \text{ A}/\mu s}{V_{B} = 100 \text{ V}; I_{T} = 150 \text{ A}; \text{ V} = 3}$			185		; ; ;
tq			6 V I 106 VC				μ

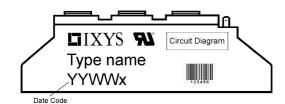
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## MCMA140P1400TA

Package TO-240AA			Ratings					
Symbol	Definition	Conditions			min.	typ.	max.	Unit
	RMS current	per terminal					200	Α
$\mathbf{T}_{v_J}$	virtual junction temperature				-40		140	°C
T <sub>op</sub>	operation temperature				-40		125	°C
T <sub>stg</sub>	storage temperature				-40		125	°C
Weight						81		g
M <sub>D</sub>	mounting torque				2.5		4	Nm
M <sub>T</sub>	terminal torque				2.5		4	Nm
d <sub>Spp/App</sub>	creepage distance on surface   striking distance through air		terminal to terminal	13.0	9.7			mm
<b>d</b> <sub>Spb/Apb</sub>			terminal to backside	16.0	16.0			mm
V	isolation voltage	t = 1 second			4800			V
	t = 1 minute		50/60 Hz, RMS; lıso∟ ≤ 1 mA		4000			V



## Part description

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	MCMA140P1400TA	MCMA140P1400TA	Box	36	512958

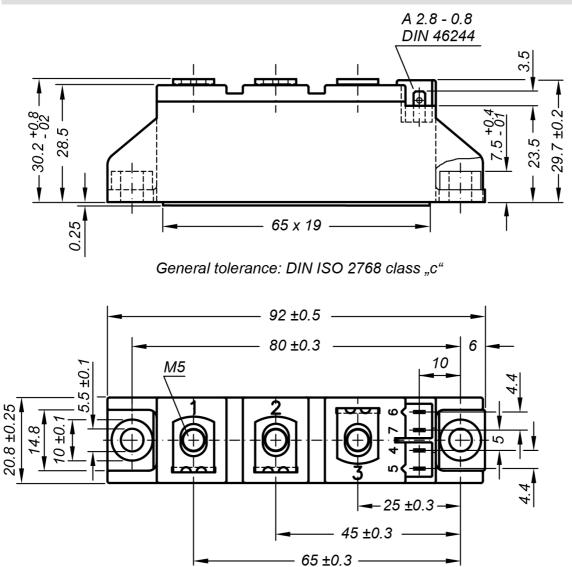
Similar Part	Package	Voltage class
MCMA140P1600TA	TO-240AA-1B	1600

Equiva	alent Circuits for	Simulation	* on die level	$T_{VJ} = 140^{\circ}C$
	)[R	Thyristor		
V <sub>0 max</sub>	threshold voltage	0.85		V
$\mathbf{R}_{0 \max}$	slope resistance *	1.6		mΩ

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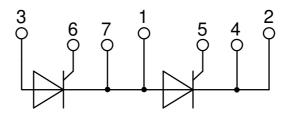


**Outlines TO-240AA** 



Optional accessories for modules

Keyed gate/cathode twin plugs with wire length = 350 mm, gate = white, cathode = red Type ZY 200L (L = Left for pin pair 4/5) Type ZY 200R (R = Right for pin pair 6/7) UL 758, style 3751



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