

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from, Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

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!



Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China







Thyristor

 V_{RRM} 1600 V

23 A

1.42 V

Single Thyristor

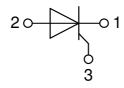
Part number

CMA30E1600PN



Backside: Isolated

F1 E72873



Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability

Applications:

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

Package: TO-220FP

- Isolation Voltage: 2500 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Base plate: Plastic overmolded tab
- · Reduced weight

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 the sales office, which is responsible for you.

Due to technical requirements our product may contain dangerous substances. For information on the types in question please contact the sales office, which is responsible for you.

Should you intend to use the product in aviation, in health or live 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

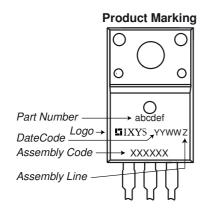
20150827d



Thyristo] _	Ratings		
Symbol	Definition	Conditions	T 0500	min.	typ.	max.	Un
V _{RSM/DSM}	max. non-repetitive reverse/forwa		$T_{VJ} = 25^{\circ}C$			1700	
V _{RRM/DRM}	max. repetitive reverse/forward blo	<u> </u>	$T_{VJ} = 25^{\circ}C$			1600	'
R/D	reverse current, drain current	$V_{R/D} = 1600 \text{ V}$	$T_{VJ} = 25^{\circ}C$			10	μ
		$V_{R/D} = 1600 \text{ V}$	$T_{VJ} = 125$ °C			2	m
V _T	forward voltage drop	$I_T = 30 A$	$T_{VJ} = 25^{\circ}C$			1.42	,
		I _T = 60 A				1.80	١
		$I_{T} = 30 \text{ A}$	$T_{VJ} = 125$ °C			1.42	,
		$I_T = 60 \text{ A}$				1.92	,
I _{TAV}	average forward current	$T_C = 40$ °C	T _{vJ} = 150°C			23	1
I _{T(RMS)}	RMS forward current	180° sine				36	,
V _{T0}	threshold voltage		T _{v.i} = 150°C			0.90	١
r _T	slope resistance } for power lo	ess calculation only				17	m۵
R _{thJC}	thermal resistance junction to case	e				2.5	K/V
R _{thCH}	thermal resistance case to heatsin				0.50		K/V
P _{tot}	total power dissipation		T _C = 25°C		0.00	50	٧
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{V,I} = 45^{\circ}C$			260	
*TSM	max. Torward burge burren	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			280	,
		t = 0.5 ms; (60 Hz), sine t = 10 ms; (50 Hz), sine	$T_{V,I} = 150$ °C			220	,
		. , , , ,	••				į
101	valva fau fivalia a	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			240	40
l²t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			340	A ²
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			325	A ²
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150$ °C			240	A ²
		t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			240	A ²
C,	junction capacitance	$V_R = 400 V$ $f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		9		pl
P_{GM}	max. gate power dissipation	t _P = 30 μs	$T_{C} = 150^{\circ}C$			10	٧
		$t_P = 300 \mu s$				5	٧
P_{GAV}	average gate power dissipation					0.5	٧
(di/dt) _{cr}	critical rate of rise of current	$T_{VJ} = 125 ^{\circ}\text{C}; f = 50 \text{Hz}$ re	epetitive, $I_T = 90 A$			150	Α/μ
		$t_P = 200 \mu s; di_G/dt = 0.2 A/\mu s;$					
		$I_{G} = 0.2 \text{ A}; V = \frac{2}{3} V_{DRM}$ no	on-repet., $I_T = 30 \text{ A}$			500	Α/μ
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DBM}$	T _{v.i} = 125°C			500	i
(/	J	R _{GK} = ∞; method 1 (linear volta	• •				
V _{GT}	gate trigger voltage	$V_D = 6 \text{ V}$	$T_{VJ} = 25^{\circ}C$			1.3	١
▼ GT	gate ingger reliage	V _D = 0 V	$T_{VJ} = -40$ °C			1.6	١
	gate trigger current	$V_D = 6 \text{ V}$	$T_{VJ} = 25^{\circ}C$!
I _{GT}	gate ingger current	$\mathbf{v}_{D} = \mathbf{o} \ \mathbf{v}$				28	m
.,	and a second discount of the second	V 2/ V	$T_{VJ} = -40$ °C			50	m/
V _{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 125^{\circ}C$			0.2	١
I _{GD}	gate non-trigger current	10				1	m
I _L	latching current	t _p = 10 μs	$T_{VJ} = 25$ °C			90	m
		$I_G = 0.2 A; di_G/dt = 0.2 A/\mu s$					
l _H	holding current	$V_D = 6 V R_{GK} = \infty$	$T_{VJ} = 25$ °C			80	m
t _{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	$T_{VJ} = 25^{\circ}C$			2	μ
		$I_{G} = 0.5 A; di_{G}/dt = 0.5 A/\mu s$	3				
tq	turn-off time	$V_R = 100 \text{ V}; I_T = 30 \text{ A}; V = \frac{2}{3}$	√3 V _{DRM} T _{VJ} = 125 °C		150		μ
•		$di/dt = 10 \text{ A/}\mu\text{s} \text{ dv/dt} = 20 \text{ V/}\mu$					



Package TO-220FP				Ratings				
Symbol	Definition	Conditions			min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal					35	Α
T _{VJ}	virtual junction temperature				-40		150	°C
Top	operation temperature				-40		125	°C
T _{stg}	storage temperature				-40		150	°C
Weight						2		g
M _D	mounting torque				0.4		0.6	Nm
F _c	mounting force with clip				20		60	N
d _{Spp/App}	creepage distance on surface strikir	na distance through air	terminal to terminal	1.6	1.0			mm
$d_{Spb/Apb}$	creepage distance on surface strikir	ig distance unough an	terminal to backside	2.5	2.5			mm
V _{ISOL}	isolation voltage	t = 1 second	50/00 II - BMO I		2500			٧
		t = 1 minute	50/60 Hz, RMS; IISOL ≤ 1 mA		2100			٧



Part description

C = Thyristor (SCR) M = Thyristor

A = (up to 1800V) 30 = Current Rating [A]

E = Single Thyristor

1600 = Reverse Voltage [V] PN = TO-220ABFP (3)

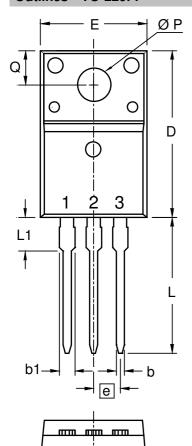
0	rdering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
S	standard	CMA30E1600PN	CMA30E1600PN	Tube	50	505254

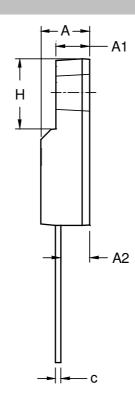
Similar Part	Package	Voltage class
CMA30E1600PB	TO-220AB (3)	1600
CMA30E1600PZ	TO-263AB (D2Pak) (2HV)	1600
CS22-12io1M	TO-220ABFP (3)	1200
CLA30E1200PB	TO-220AB (3)	1200
CLA30E1200PC	TO-263AB (D2Pak) (2)	1200
CLA30E1200HB	TO-247AD (3)	1200
CS22-08io1M	TO-220ABFP (3)	800

Equiva	lent Circuits for	Simulation	* on die level	T _{vJ} = 150 °C
$I \rightarrow V_0$)—[R_o]-	Thyristor		
V _{0 max}	threshold voltage	0.9		V
$R_{0 max}$	slope resistance *	14		$m\Omega$

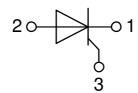


Outlines TO-220FP





Dim.	Millim	neters	Incl	hes
DIIII.	min	max	min	max
Α	4.50	4.90	0.177	0.193
A1	2.34	2.74	0.092	0.108
A2	2.56	2.96	0.101	0.117
b	0.70	0.90	0.028	0.035
С	0.45	0.60	0.018	0.024
D	15.67	16.07	0.617	0.633
Е	9.96	10.36	0.392	0.408
е	2.54	BSC	0.100	BSC
Н	6.48	6.88	0.255	0.271
L	12.68	13.28	0.499	0.523
L1	3.03	3.43	0.119	0.135
ØΡ	3.08	3.28	0.121	0.129
Q	3.20	3.40	0.126	0.134





Thyristor

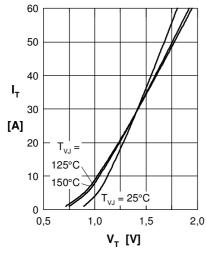


Fig. 1 Forward characteristics

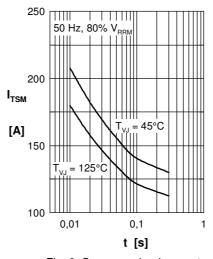


Fig. 2 Surge overload current I_{TSM} : crest value, t: duration

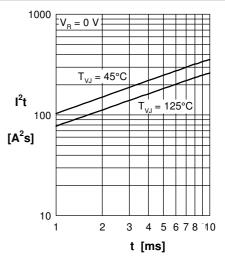


Fig. 3 I²t versus time (1-10 s)

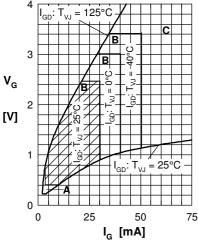


Fig. 4 Gate voltage & gate current Triggering: A = no; B = possible; C = safe

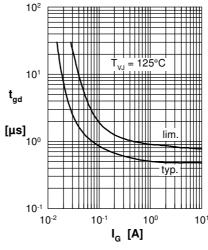


Fig. 5 Gate controlled delay time t_{qd}

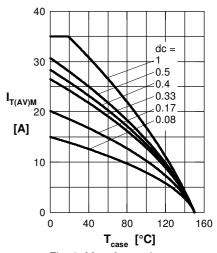


Fig. 6 Max. forward current at case temperature

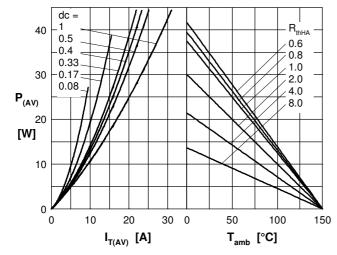


Fig. 7a Power dissipation versus direct output current Fig. 7b and ambient temperature

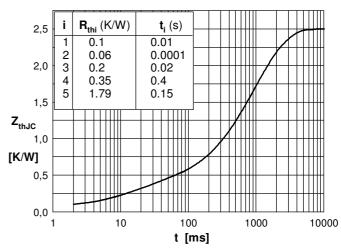


Fig. 7 Transient thermal impedance junction to case