imall

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



CS22-12io1M

High Efficiency Thyristor

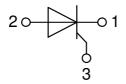
<u><u> </u></u>	
Cinala	Ibvrictor
SHIUE	
e	Thyristor

Part number

CS22-12io1M



Backside: isolated **E**72873



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.

V_{RRM}	=	1200 V
I _{tav}	=	16 A
VT	=	1.27 V

CS22-12io1M

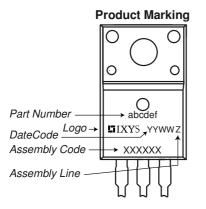
Thyristo				1	Ratings		1
Symbol	Definition	Conditions		min.	typ.	max.	Unit
V _{RSM/DSM}	max. non-repetitive reverse/forwa	ard blocking voltage	$T_{VJ} = 25^{\circ}C$			1300	V
V _{RRM/DRM}	max. repetitive reverse/forward b	0 0	$T_{VJ} = 25^{\circ}C$			1200	V
I _{R/D}	reverse current, drain current	$V_{R/D} = 1200 V$	$T_{vJ} = 25^{\circ}C$			10	μA
		V _{R/D} = 1200 V	$T_{vJ} = 125^{\circ}C$			2	mA
VT	forward voltage drop	$I_{T} = 30 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1.30	V
		$I_{T} = 60 \text{ A}$				1.59	V
		$I_{T} = 30 \text{ A}$	$T_{VJ} = 125^{\circ}C$			1.27	V
		$I_{T} = 60 \text{ A}$				1.65	V
I TAV	average forward current	$T_c = 90^{\circ}C$	$T_{vJ} = 150^{\circ}C$			16	A
T(RMS)	RMS forward current	180° sine				25	A
V _{T0}	threshold voltage		T _{v.i} = 150°C			0.86	V
r _T	slope resistance } for power l	oss calculation only				13.2	mΩ
R _{thJC}	thermal resistance junction to cas	Se .				2.5	K/W
R _{thCH}	thermal resistance case to heats				0.50		K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$			50	W
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,l} = 45^{\circ}C$			300	A
•15M		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			325	A
		t = 0,0 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$T_{\rm v,i} = 150^{\circ} C$			255	A
		t = 8,3 ms; (60 Hz), sine	$V_{R} = 0 V$			275	A
l²t	value for fusing	t = 0.5 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$\frac{v_{R} = 0.7}{T_{VJ} = 45^{\circ}C}$			450	<u> </u>
	value for fushing						1
		t = 8,3 ms; (60 Hz), sine	$\frac{V_{\rm R}}{T_{\rm R}} = 0 V$			440	A ² s
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150 ^{\circ}C$			325	A ² s
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$		10	315	A ² s
CJ	junction capacitance	$V_{R} = 400 V f = 1 MHz$	$T_{VJ} = 25^{\circ}C$		13		pF
P _{GM}	max. gate power dissipation	$t_P = 30 \ \mu s$	$T_c = 150 ^{\circ}C$			10	W
		t _P = 300 μs				5	W
P _{GAV}	average gate power dissipation					0.5	W
(di/dt) _{cr}	critical rate of rise of current	$T_{vJ} = 125 ^{\circ}C; f = 50 \text{Hz}$ re	epetitive, $I_T = 90 A$			150	A/μs
		$t_{P} = 200 \mu s; di_{G}/dt = 0.3 A/\mu s; -$					
		$I_{g} = 0.3 \text{ A}; V = \frac{2}{3} V_{DRM}$ no	on-repet., $I_{T} = 30 \text{ A}$			500	A/µs
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{vJ} = 125^{\circ}C$			500	V/µs
		$R_{GK} = \infty$; method 1 (linear volta	ge rise)				- - - - - -
V _{gt}	gate trigger voltage	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			1.3	V
			$T_{vJ} = -40^{\circ}C$			1.6	V
I _{GT}	gate trigger current	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			30	mA
			$T_{vJ} = -40^{\circ}C$			50	mA
V _{gd}	gate non-trigger voltage	$V_{\rm D} = \frac{2}{3} V_{\rm DBM}$	T _{vJ} = 150°C			0.2	V
I _{GD}	gate non-trigger current	2 2				1	mA
	latching current	t _n = 10 μs	$T_{vJ} = 25 °C$			90	mA
•L	ŭ	$I_{\rm g} = 0.3 \text{A}; \text{di}_{\rm g}/\text{dt} = 0.3 \text{A}/\mu\text{s}$					
I _H	holding current	$\frac{V_{\rm D} = 6 V R_{\rm GK} = \infty}{V_{\rm D} = 6 V R_{\rm GK} = \infty}$	T _{vJ} = 25°C			60	mA
	gate controlled delay time	$V_{\rm D} = \frac{1}{2} V_{\rm DRM}$	$T_{VJ} = 25 °C$			2	μs
t _{gd}	gate controlled dolay unit					2	μο
		$I_{\rm G} = 0.3 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.3 \text{A}/\mu\text{s}$					
t _q	turn-off time	$V_{\rm B} = 100 \text{ V}; I_{\rm T} = 30 \text{ A}; \text{ V} = \frac{2}{3}$			150		μs

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CS22-12io1M

Package TO-220FP					Ratings			
Symbol	Definition	Conditions			min.	typ.	max.	Unit
	RMS current	per terminal					35	Α
T _{vj}	virtual junction temperature				-55		150	°C
T _{op}	operation temperature				-55		125	°C
T _{stg}	storage temperature				-55		150	°C
Weight						2		g
M _D	mounting torque				0.4		0.6	Nm
F _c	mounting force with clip				20		60	Ν
d _{Spp/App}	creenade distance on surfac	e striking distance through air	terminal to terminal	1.6	1.0			mm
d _{Spb/Apb}	creepage distance on surrac	e suiking ustance through an	terminal to backside	2.5	2.5			mm
V	isolation voltage	t = 1 second	50/60 Hz, RMS; IIso∟ ≤ 1 mA		2500			V
		t = 1 minute			2100			V



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CS22-12io1M	CS22-12io1M	Tube	50	500226

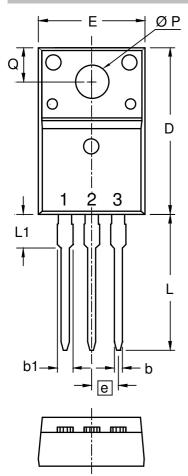
Similar Part	Package	Voltage class
	J	
CS22-08io1M	TO-220ABFP (3)	800
CMA30E1600PN	TO-220ABFP (3)	1600
CLA30E1200PB	TO-220AB (3)	1200
CLA30E1200PC	TO-263AB (D2Pak) (2)	1200
CLA30E1200HB	TO-247AD (3)	1200
CMA30E1600PB	TO-220AB (3)	1600
CMA30E1600PZ	TO-263AB (D2Pak) (2HV)	1600

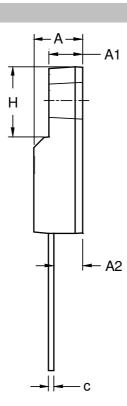
Equivalent Circuits for Simulation			* on die level	$T_{vJ} = 150 \ ^{\circ}C$
		Thyristor		
V _{0 max}	threshold voltage	0.86		V
$\mathbf{R}_{0 \max}$	slope resistance *	10.1		mΩ

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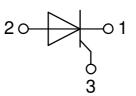
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Outlines TO-220FP





Dire	Millimeters		Inc	hes
Dim.	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



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_{vJ} = 125°C

4 5 6 7 8 10

1000

l²t

[A²s]

100

30

1

 $V_{\rm R} = 0$ V

 $T_{VJ} = 45^{\circ}C$

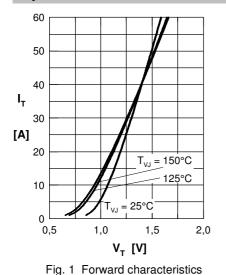
2

3

Fig. 3 I²t versus time (1-10 s)

t [ms]

Thyristor



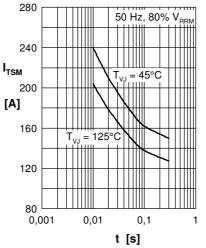
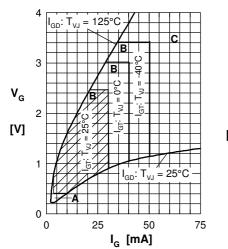
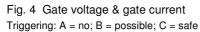
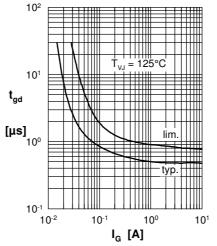
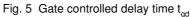


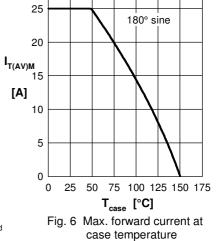
Fig. 2 Surge overload current I_{TSM}: crest value, t: duration











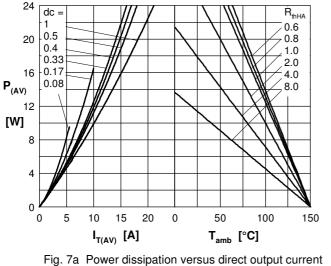
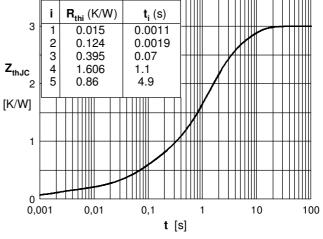


Fig. 7a Power dissipation versus direct output cur Fig. 7b and ambient temperature

g. 5 Gate controlled delay time t_{gd}





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