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!



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Thyristor

CS30-16io1

V_{RRM}	=	1600 V
I _{tav}	=	30 A
V _T	=	1,3 V

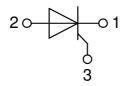
Single Thyristor

Part number

CS30-16io1



Backside: anode



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-247

- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0

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.

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CS30-16io1

Thyristo		• ····			Ratings		
Symbol	Definition	Conditions		min.	typ.	max.	Uni
V _{RSM/DSM}	max. non-repetitive reverse/forwa	0 0	$T_{VJ} = 25^{\circ}C$			1700	\
V _{RRM/DRM}	max. repetitive reverse/forward bl		$T_{vJ} = 25^{\circ}C$			1600	١
R/D	reverse current, drain current	V _{R/D} = 1600 V	$T_{vJ} = 25^{\circ}C$			50	μ/
		V _{R/D} = 1600 V	$T_{VJ} = 125^{\circ}C$			2	m/
V _T	forward voltage drop	$I_{T} = 30 \text{ A}$	$T_{vJ} = 25^{\circ}C$			1,30	١
		$I_{T} = 60 \text{ A}$				1,63	١
		$I_{T} = 30 \text{ A}$	$T_{vJ} = 125^{\circ}C$			1,30	١
		I _T = 60 A				1,71	١
ITAV	average forward current	T _c = 120°C	$T_{vJ} = 150^{\circ}C$			30	ŀ
I _{T(RMS)}	RMS forward current	180° sine				47	ļ
V _{T0}	threshold voltage		T _{v.i} = 150°C			0,87	١
r _T	slope resistance } for power lo	oss calculation only				14,2	m۵
R thJC	thermal resistance junction to cas	e				0,5	K/W
R _{thCH}	thermal resistance case to heatsi				0,25	,	K/W
P _{tot}	total power dissipation		$T_c = 25^{\circ}C$		-,	250	W
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	$T_{v,i} = 45^{\circ}C$			400	ļ
• 15M		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			430	ļ
		t = 0,0 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$T_{\rm VI} = 150^{\circ}{\rm C}$			340	,
		t = 8,3 ms; (60 Hz), sine	$V_{\rm R} = 0 V$			365	ļ
12+	value for fusing	t = 0.5 ms; (50 Hz), sine t = 10 ms; (50 Hz), sine	$\frac{V_{R}}{T_{VJ}} = 45^{\circ}C$			800	A ² s
l ² t value f	value for fusing						1
		t = 8,3 ms; (60 Hz), sine	$\frac{V_{R} = 0 V}{T_{R} + 150 \Omega}$			770	A ²
		t = 10 ms; (50 Hz), sine	$T_{vJ} = 150 ^{\circ}C$			580	A ² s
		t = 8,3 ms; (60 Hz), sine	$\frac{V_{R} = 0 V}{T_{R} = 0 V}$		10	555	A ² s
C,	junction capacitance	$V_{\rm R} = 400 \text{V} \text{f} = 1 \text{MHz}$	$T_{VJ} = 25^{\circ}C$		16	10	pl
P _{GM}	max. gate power dissipation	$t_{\rm P} = 30 \mu s$	$T_c = 150 ^{\circ}C$			10	W
		t _P = 300 μs				5	W
P _{GAV}	average gate power dissipation					0,5	N
(di/dt) _{cr}	critical rate of rise of current	$T_{v_J} = 125 ^{\circ}C; f = 50 \text{Hz}$ re	•			150	A/μ
		$t_{P} = 200 \mu s; di_{G}/dt = 0.3 A/\mu s; -$					
		$I_{G} = 0,3A; V = \frac{2}{3}V_{DRM}$ no	on-repet., $I_{T} = 30 \text{ A}$			500	A/με
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{vJ} = 125^{\circ}C$			1000	V/µs
		R _{GK} = ∞; method 1 (linear voltag	ge rise)				
V _{GT}	gate trigger voltage	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			1	١
			$T_{vJ} = -40^{\circ}C$			1,2	١
I _{GT}	gate trigger current	$V_{D} = 6 V$	$T_{vJ} = 25^{\circ}C$			55	mÆ
			$T_{vJ} = -40 ^{\circ}C$			80	mA
V _{gd}	gate non-trigger voltage	$V_{\rm D} = \frac{2}{3} V_{\rm DBM}$	T _{vJ} = 125°C			0,2	١
I _{GD}	gate non-trigger current					5	mÆ
	latching current	t _p = 10 μs	$T_{vJ} = 25 ^{\circ}\text{C}$			150	m/
-	č	$I_{\rm g} = 0.3 \text{A}; \text{di}_{\rm g}/\text{dt} = 0.3 \text{A}/\mu\text{s}$					
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			100	m/
	gate controlled delay time	$V_{\rm D} = \frac{1}{2} V_{\rm DBM}$	$T_{VJ} = 25^{\circ}C$			2	i
t _{gd}	gate controlled delay lille					2	μ
	turn-off time	$I_{\rm G} = 0.3 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.3 \text{A}/\mu\text{s}$			100		
t _q	เนกา-บท แกษ	$V_{\rm R} = 100 \text{ V}; \ I_{\rm T} = 30 \text{ A}; \ V = \frac{2}{2}$			150		μ
		$di/dt = 15 A/\mu s dv/dt = 20 V/$	/μs t _p = 200 μs				-

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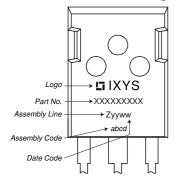
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CS30-16io1

Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit
I _{RMS}	RMS current	per terminal			70	Α
T _{vj}	virtual junction temperature		-40		150	°C
T _{op}	operation temperature		-40		125	°C
T _{stg}	storage temperature		-40		150	°C
Weight				6		g
M _D	mounting torque		0,8		1,2	Nm
F _c	mounting force with clip		20		120	Ν

Product Marking



Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CS30-16io1	CS30-16io1	Tube	30	466581

Similar Part	Package	Voltage class
CS30-12io1	TO-247AD (3)	1200
CS30-14io1	TO-247AD (3)	1400

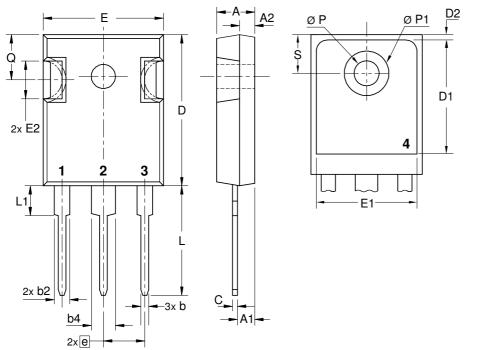
Equivalent Circuits for Simulation		* on die level	T _{vj} = 150 °C	
)[R ₀_]-	Thyristor		
V _{0 max}	threshold voltage	0,87		V
$\mathbf{R}_{0 \max}$	slope resistance *	11,7		mΩ

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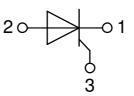
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CS30-16io1

Outlines TO-247



Sym.	Inch	Inches		eter
	min.	max.	min.	max.
А	0.185	0.209	4.70	5.30
A1	0.087	0.102	2.21	2.59
A2	0.059	0.098	1.50	2.49
D	0.819	0.845	20.79	21.45
E	0.610	0.640	15.48	16.24
E2	0.170	0.216	4.31	5.48
е	0.215	BSC	5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
ØР	0.140	0.144	3.55	3.65
Q	0.212	0.244	5.38	6.19
S	0.242 BSC		6.14	BSC
b	0.039	0.055	0.99	1.40
b2	0.065	0.094	1.65	2.39
b4	0.102	0.135	2.59	3.43
с	0.015	0.035	0.38	0.89
D1	0.515	-	13.07	-
D2	0.020	0.053	0.51	1.35
E1	0.530	-	13.45	-
Ø P1	-	0.29	-	7.39



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CS30-16io1

= 125°C

4 5 6 7 8 9 1 0

Τ_v

3

t [ms]

Fig. 3 I²t versus time (1-10 ms)

1000

l²t

[A²s]

100

1

50 Hz, 80% V_{BB}

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

0,1

t [s]

 $v_1 = 125^{\circ}$

1000

100

I_G [mA]

Fig. 5 Gate controlled delay time

Fig. 2 Surge overload current

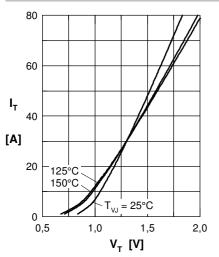
°C

 $-V_{R} = 0 V$

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

2

Thyristor



400

350

300

250

200

150

100

1000

100

10

1

10

0,01

 $T_{VJ} = 125^{\circ}C$

I_{TSM}

[A]

Fig. 1 Forward characteristics

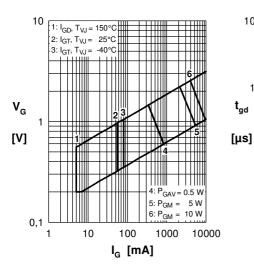


Fig. 4 Gate trigger characteristics

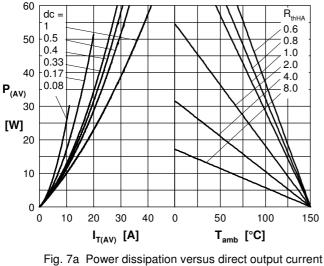


Fig. 7a Power dissipation versus direct output cur Fig. 7b and ambient temperature

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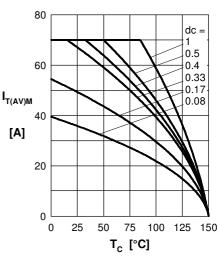


Fig. 6 Max. forward current at case temperature

