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

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Email & Skype: info@chipsmall.com Web: www.chipsmall.com
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

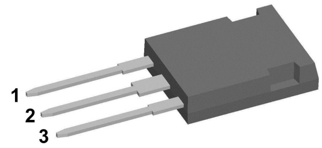
Thyristor

V_{RRM}	=	1600 V
I_{TAV}	=	60 A
V_T	=	1,14 V

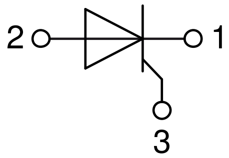
Single Thyristor

Part number

CS60-16io1



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

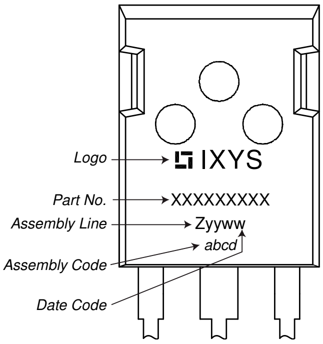
Package: PLUS247

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

Thyristor				Ratings			
Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage		T_{VJ} = 25°C			1700	V
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage		T_{VJ} = 25°C			1600	V
$I_{R/D}$	reverse current, drain current	$V_{R/D}$ = 1600 V	T_{VJ} = 25°C			200	µA
		$V_{R/D}$ = 1600 V	T_{VJ} = 140°C			10	mA
V_T	forward voltage drop	I_T = 60 A	T_{VJ} = 25°C			1,18	V
		I_T = 120 A				1,44	V
		I_T = 60 A	T_{VJ} = 125°C			1,14	V
		I_T = 120 A				1,46	V
I_{TAV}	average forward current	T_C = 110°C	T_{VJ} = 140°C			60	A
$I_{T(RMS)}$	RMS forward current	180° sine				75	A
V_{T0}	threshold voltage	for power loss calculation only	T_{VJ} = 140°C			0,82	V
r_T	slope resistance					5,3	mΩ
R_{thJC}	thermal resistance junction to case					0,32	K/W
R_{thCH}	thermal resistance case to heatsink				0,15		K/W
P_{tot}	total power dissipation		T_C = 25°C			360	W
I_{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1,40	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,51	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 140°C			1,19	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,29	kA
I^2t	value for fusing	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			9,80	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			9,49	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 140°C			7,08	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			6,87	kA²s
C_J	junction capacitance	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		74		pF
P_{GM}	max. gate power dissipation	t_P = 30 µs	T_C = 140°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} = 140°C; f = 50 Hz	repetitive, I_T = 180 A			150	A/µs
		t_P = 200 µs; di_G/dt = 0,3 A/µs;					
		I_G = 0,3 A; V = ⅔ V_{DRM}	non-repet., I_T = 60 A			500	A/µs
$(dv/dt)_{cr}$	critical rate of rise of voltage	V = ⅔ V_{DRM}	T_{VJ} = 140°C			1000	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)					
V_{GT}	gate trigger voltage	V_D = 6 V	T_{VJ} = 25°C			1,5	V
			T_{VJ} = -40°C			1,6	V
I_{GT}	gate trigger current	V_D = 6 V	T_{VJ} = 25°C			100	mA
			T_{VJ} = -40°C			200	mA
V_{GD}	gate non-trigger voltage	V_D = ⅔ V_{DRM}	T_{VJ} = 140°C			0,2	V
I_{GD}	gate non-trigger current					10	mA
I_L	latching current	t_p = 10 µs	T_{VJ} = 25°C			450	mA
		I_G = 0,45 A; di_G/dt = 0,45 A/µs					
I_H	holding current	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			200	mA
t_{gd}	gate controlled delay time	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0,45 A; di_G/dt = 0,45 A/µs					
t_q	turn-off time	V_R = 100 V; I_T = 60 A; V = ⅔ V_{DRM}	T_{VJ} = 125 °C		150		µs
		di/dt = 10 A/µs dv/dt = 20 V/µs t_p = 200 µs					

Package PLUS247			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			70	A
T_{VJ}	*virtual junction temperature*		-40		140	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		140	°C
Weight				6		g
F_C	*mounting force with clip*		20		120	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	5,5			mm
$d_{Spb/Apb}$		*terminal to backside*	5,5			mm

Product Marking

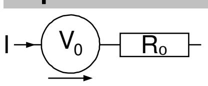


Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CS60-16io1	CS60-16io1	Tube	30	503360

Similar Part	Package	Voltage class
CS60-12io1	PLUS247 (3)	1200
CS60-14io1	PLUS247 (3)	1400

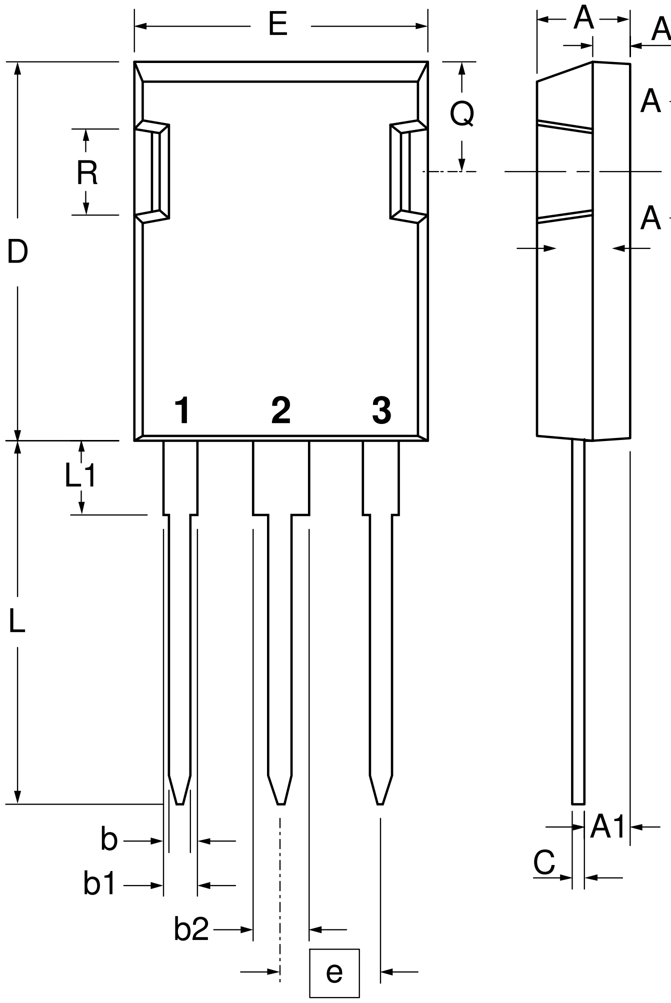
Equivalent Circuits for Simulation

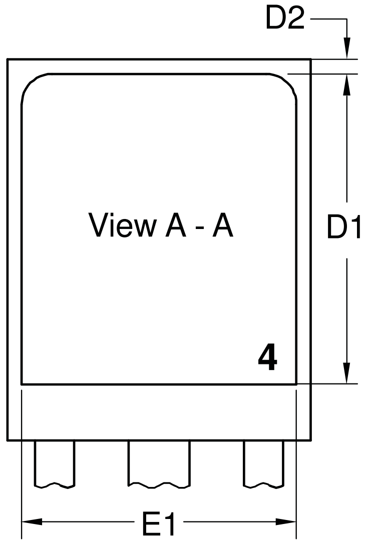
** on die level* T_{VJ} = 140 °C



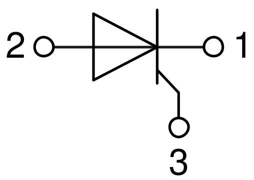
		Thyristor	
$V_{0\,max}$	*threshold voltage*	0,82	V
$R_{0\,max}$	*slope resistance **	3	mΩ

Outlines PLUS247





Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	0.190	0.205	4.83	5.21
A1	0.090	0.100	2.29	2.54
A2	0.075	0.085	1.91	2.16
b	0.045	0.055	1.14	1.40
b1	0.075	0.084	1.91	2.13
b2	0.115	0.123	2.92	3.12
C	0.024	0.031	0.61	0.80
D	0.819	0.840	20.80	21.34
D1	0.515	-	13.07	-
D2	0.010	0.053	0.51	1.35
E	0.620	0.635	15.75	16.13
E1	0.530	-	13.45	-
e	0.215 BSC		5.45 BSC	
L	0.780	0.800	19.81	20.32
L1	0.150	0.170	3.81	4.32
Q	0.220	0.244	5.59	6.20
R	0.170	0.190	4.32	4.83



Thyristor

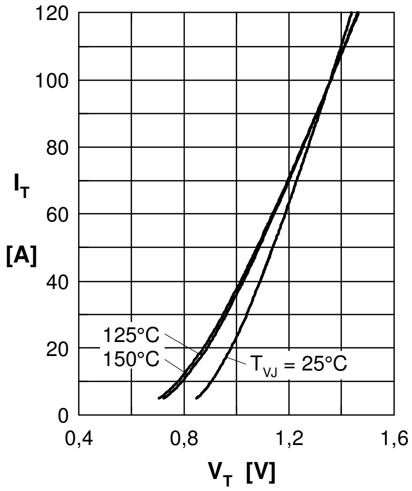


Fig. 1 Forward characteristics

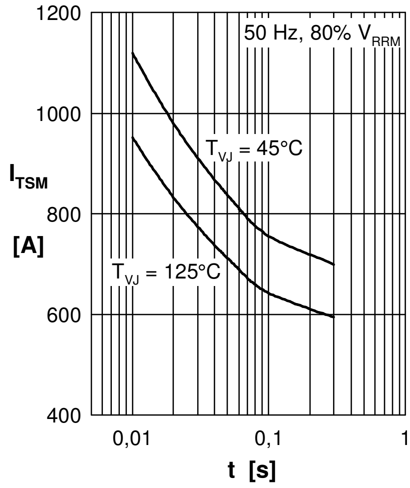


Fig. 2 Surge overload current

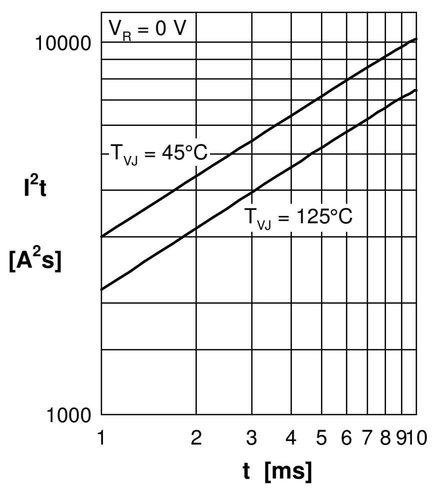


Fig. 3 I^2t versus time (1-10 ms)

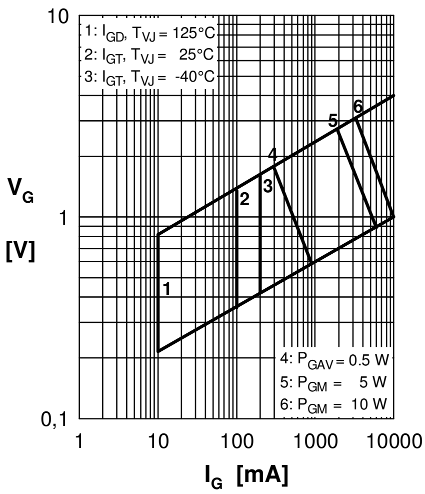


Fig. 4 Gate trigger characteristics

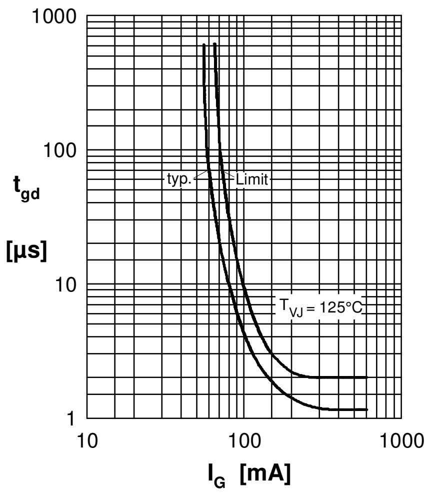


Fig. 5 Gate controlled delay time

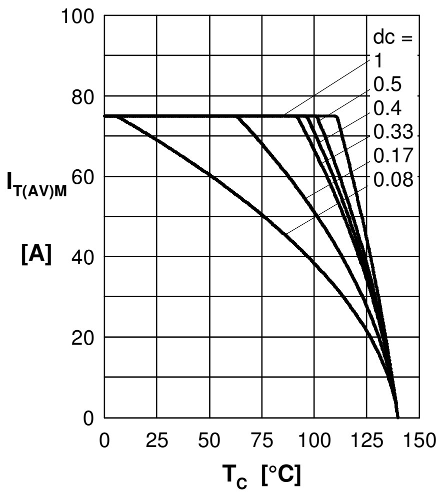


Fig. 6 Max. forward current at case temperature

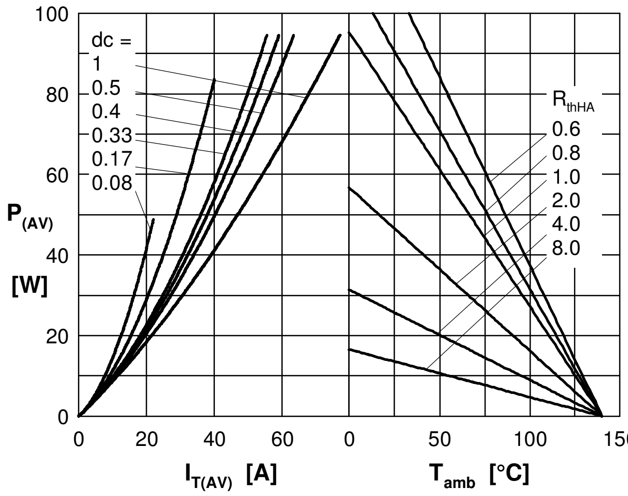


Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature

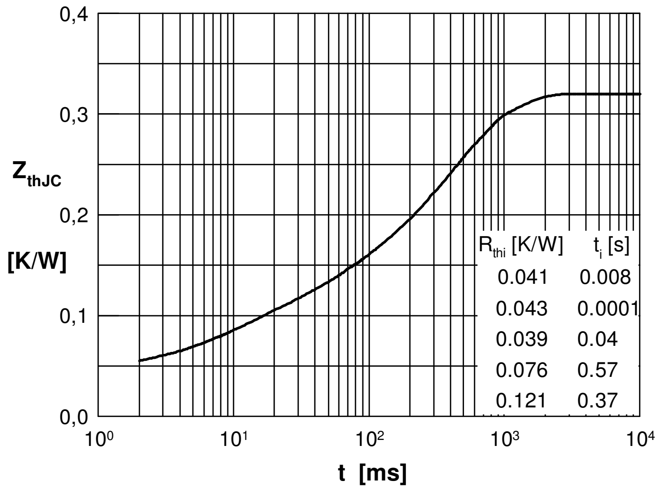


Fig. 8 Transient thermal impedance junction to case

Data according to IEC 60747and per semiconductor unless otherwise specified
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