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

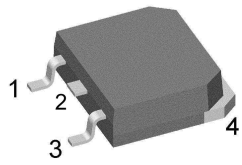
High Efficiency Thyristor

V_{RRM}	=	1200 V
I_{TAV}	=	50 A
V_T	=	1,27 V

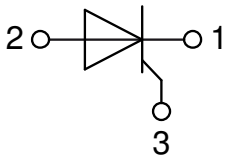
Single Thyristor

Part number

CLA50E1200TC



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

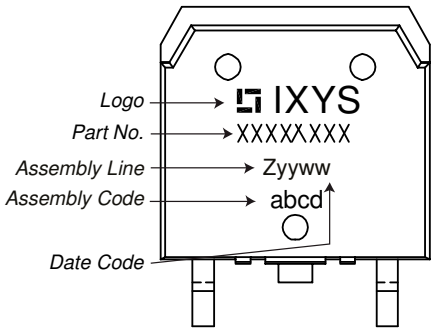
Package: TO-268AA (D3Pak)

- 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			1300	V
$V_{RRM/DRM}$	*max. repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1200	V
$I_{R/D}$	*reverse current, drain current*	$V_{R/D}$ = 1200 V	T_{VJ} = 25°C			50	µA
		$V_{R/D}$ = 1200 V	T_{VJ} = 125°C			4	mA
V_T	*forward voltage drop*	I_T = 50 A	T_{VJ} = 25°C			1,32	V
		I_T = 100 A				1,60	V
		I_T = 50 A	T_{VJ} = 125°C			1,27	V
		I_T = 100 A				1,65	V
I_{TAV}	*average forward current*	T_C = 125°C	T_{VJ} = 150°C			50	A
$I_{T(RMS)}$	*RMS forward current*	180° sine				79	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0,88	V
r_T	*slope resistance* }					7,7	mΩ
R_{thJC}	*thermal resistance junction to case*					0,25	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,15		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			500	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			650	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			700	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			555	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			595	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			2,12	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			2,04	kA²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			1,54	kA²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,48	kA²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		25		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 150°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} = 150°C; f = 50 Hz repetitive,	I_T = 150 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 = 50 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V = ⅔ V_{DRM}	T_{VJ} = 150°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			50	mA
			T_{VJ} = -40°C			80	mA
V_{GD}	*gate non-trigger voltage*	V_D = ⅔ V_{DRM}	T_{VJ} = 150°C			0,2	V
I_{GD}	*gate non-trigger current*					3	mA
I_L	*latching current*	t_p = 10 µs	T_{VJ} = 25°C			125	mA
		I_G = 0,3 A; di_G/dt = 0,3 A/µs					
I_H	*holding current*	V_D = 6 V R_{GK} = ∞	T_{VJ} = 25°C			100	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0,3 A; di_G/dt = 0,3 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 50 A; V = ⅔ V_{DRM}	T_{VJ} = 125 °C		200		µs
		di/dt = 10 A/µs dv/dt = 20 V/µs t_p = 200 µs					

Package TO-268AA (D3Pak)			Ratings			
Symbol	**Definition**	**Conditions**	**min.**	**typ.**	**max.**	**Unit**
I_{RMS}	*RMS current*	per terminal			70	A
T_{VJ}	*virtual junction temperature*		-40		150	°C
T_{op}	*operation temperature*		-40		125	°C
T_{stg}	*storage temperature*		-40		150	°C
Weight				5		g
F_C	*mounting force with clip*		20		120	N

Product Marking



Part description

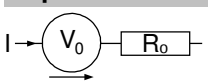
C = Thyristor (SCR)
L = High Efficiency Thyristor
A = (up to 1200V)
50 = Current Rating [A]
E = Single Thyristor
1200 = Reverse Voltage [V]
TC = TO-268AA (D3Pak) (2)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA50E1200TC	CLA50E1200TC	Tube	30	502708

Similar Part	Package	Voltage class
CLA50E1200HB	TO-247AD (3)	1200

Equivalent Circuits for Simulation

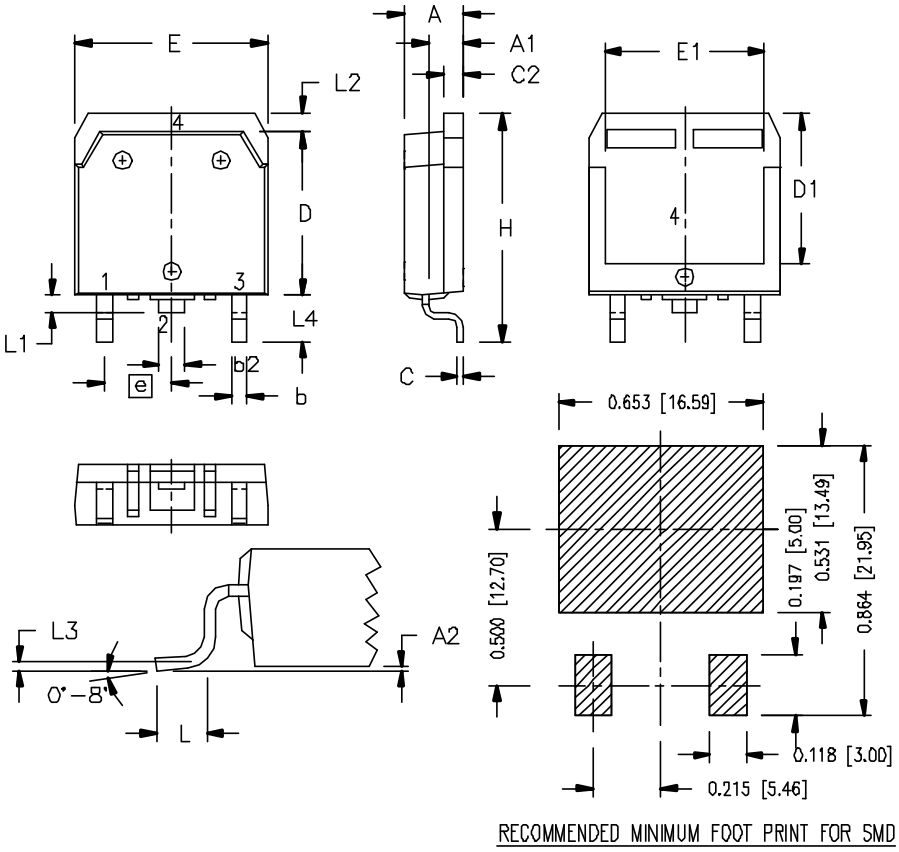
** on die level* T_{VJ} = 150 °C



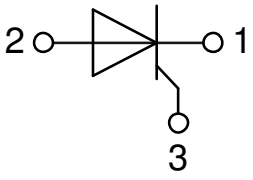
Thyristor

$V_{0\,max}$	*threshold voltage*	0,88	V
$R_{0\,max}$	*slope resistance **	5,2	mΩ

Outlines TO-268AA (D3Pak)



Dim.	Millimeter		Inches	
	min	max	min	max
A	4.90	5.10	0.193	0.201
A1	2.70	2.90	0.106	0.114
A2	0.02	0.25	0.001	0.100
b	1.15	1.45	0.045	0.057
b2	1.90	2.10	0.075	0.083
C	0.40	0.65	0.016	0.026
C2	1.45	1.60	0.057	0.063
D	13.80	14.00	0.543	0.551
D1	12.40	12.70	0.488	0.500
E	15.85	16.05	0.624	0.632
E1	13.30	13.60	0.524	0.535
e	5.45 BSC		0.215 BSC	
H	18.70	19.10	0.736	0.752
L	2.40	2.70	0.094	0.106
L1	1.20	1.40	0.047	0.055
L2	1.00	1.15	0.039	0.045
L3	0.25 BSC		0.100 BSC	
L4	3.80	4.10	0.150	0.161



Thyristor

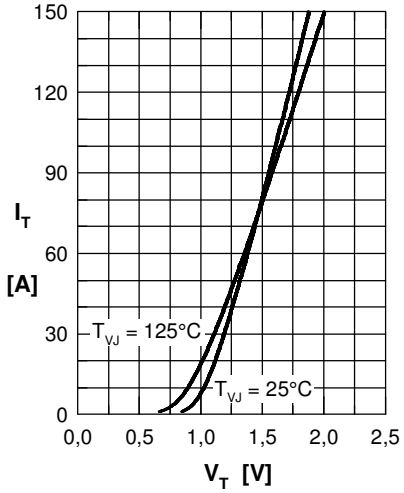


Fig. 1 Forward characteristics

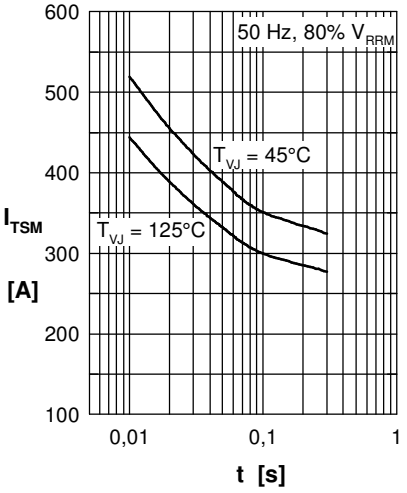


Fig. 2 Surge overload current
I_{TSM}: crest value, t: duration

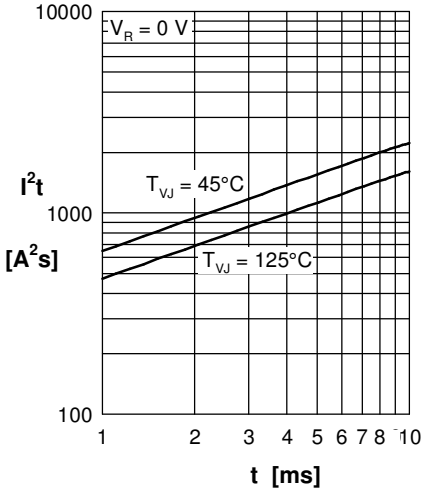


Fig. 3 I^2t versus time (1-10 s)

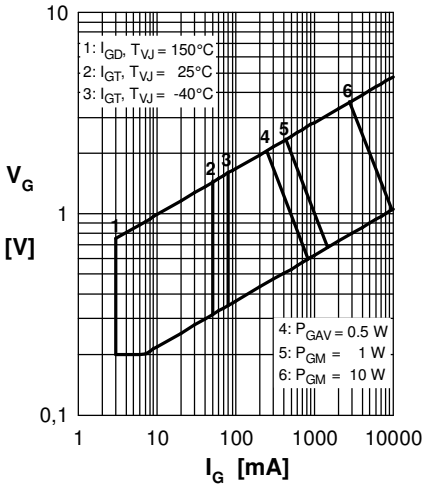


Fig. 4 Gate voltage & gate current

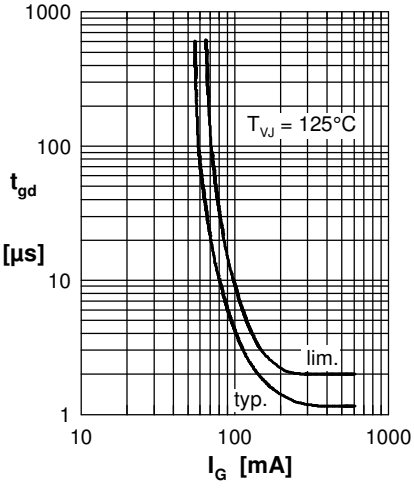


Fig. 5 Gate controlled delay time t_{gd}

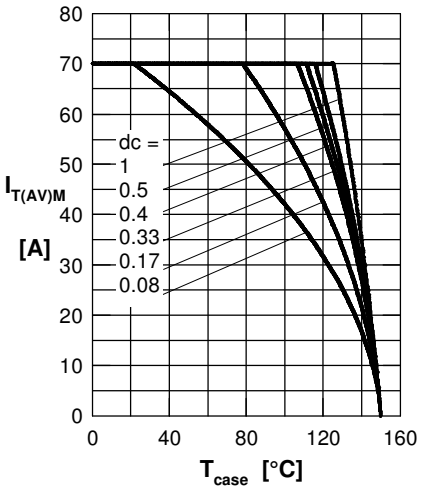


Fig. 6 Max. forward current at case temperature

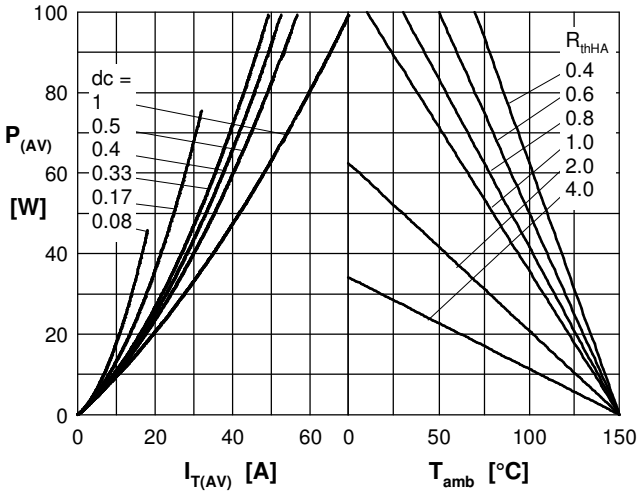
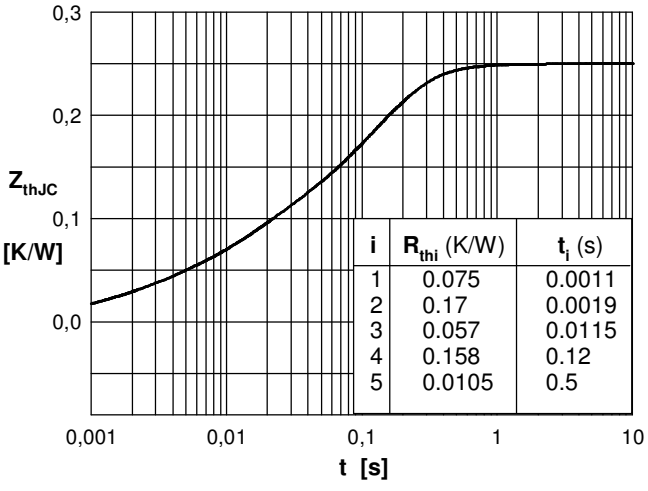


Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature



i	R_{thi} (K/W)	t_i (s)
1	0.075	0.0011
2	0.17	0.0019
3	0.057	0.0115
4	0.158	0.12
5	0.0105	0.5

Fig. 7 Transient thermal impedance junction to case