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

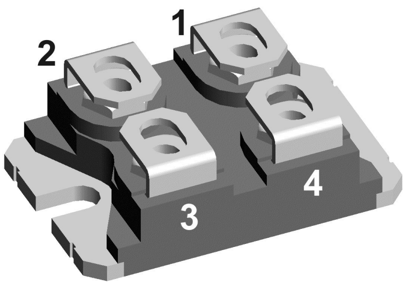
High Efficiency Thyristor

V_{RRM}	=	1200 V
I_{TAV}	=	50 A
V_T	=	1,04 V

AC Controlling
1~ full-controlled

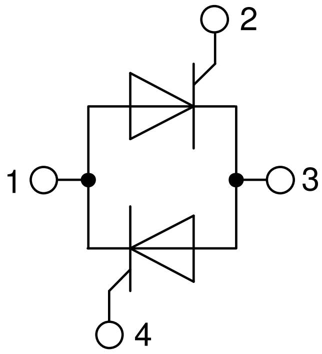
Part number

CLA110MB1200NA



Backside: Isolated

UL E72873



Features / Advantages:

- AC controller for line frequency
- Planar passivated chip
- Long-term stability of blocking currents and voltages

Applications:

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

Package: SOT-227B (minibloc)

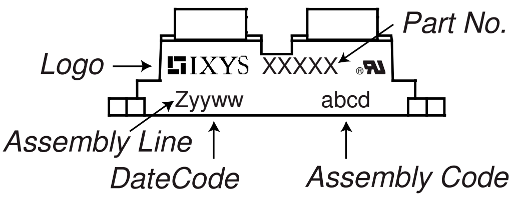
- Isolation Voltage: 3000 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Base plate: Copper internally DCB isolated
- Advanced power cycling

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			5	mA
V_T	*forward voltage drop*	I_T = 50 A	T_{VJ} = 25°C			1,12	V
		I_T = 100 A				1,32	V
		I_T = 50 A	T_{VJ} = 125°C			1,04	V
		I_T = 100 A				1,28	V
I_{TAV}	*average forward current*	T_C = 110°C	T_{VJ} = 150°C			50	A
I_{RMS}	*RMS forward current per phase*	180° sine				110	A
V_{T0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			0,78	V
r_T	*slope resistance*					4,9	mΩ
R_{thJC}	*thermal resistance junction to case*					0,55	K/W
R_{thCH}	*thermal resistance case to heatsink*				0,10		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			220	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			1,10	kA
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,19	kA
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			935	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			1,01	kA
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			6,05	kA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			5,89	kA^2s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			4,37	kA^2s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			4,25	kA^2s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		86		pF
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 150°C			10	W
		t_P = 300 µs				1	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 = 0,45 A/µs;					
		I_G = 0,45 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			40	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*					5	mA
I_L	*latching current*	t_p = 10 µs	T_{VJ} = 25°C			150	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			100	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM}	T_{VJ} = 25°C			2	µs
		I_G = 0,5 A; di_G/dt = 0,5 A/µs					
t_q	*turn-off time*	V_R = 100 V; I_T = 50 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 SOT-227B (minibloc)

Symbol	Definition	Conditions		min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				150	A
T_{VJ}	*virtual junction temperature*			-40		150	°C
T_{op}	*operation temperature*			-40		125	°C
T_{stg}	*storage temperature*			-40		150	°C
Weight					30		g
M_D	*mounting torque*			1,1		1,5	Nm
M_T	*terminal torque*			1,1		1,5	Nm
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*	*terminal to terminal*	10,5	3,2			mm
$d_{Spb/Apb}$		*terminal to backside*	8,6	6,8			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3000			V
		t = 1 minute		2500			V

Product Marking



Part description

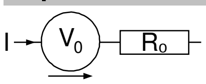
C = Thyristor (SCR)
L = High Efficiency Thyristor
A = (up to 1200V)
110 = Current Rating [A]
MB = 1~ full-controlled
1200 = Reverse Voltage [V]
NA = SOT-227B (minibloc)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA110MB1200NA	CLA110MB1200NA	Tube	10	513128

Similar Part	Package	Voltage class
MMO90-12io6	SOT-227B (minibloc)	1200

Equivalent Circuits for Simulation

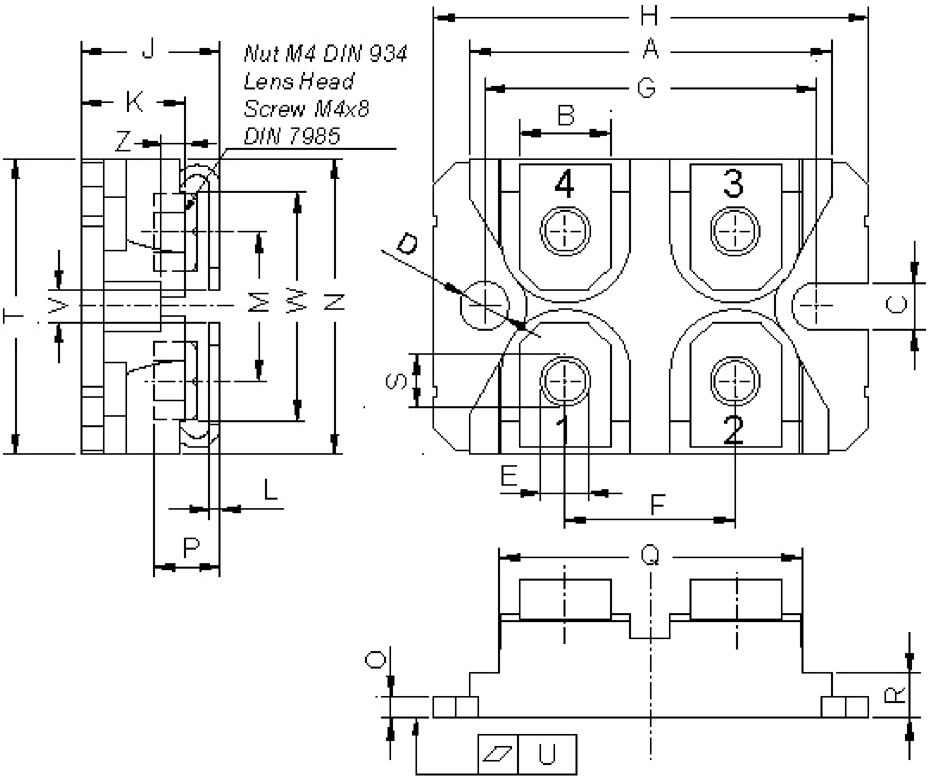
** on die level* T_{VJ} = 150 °C



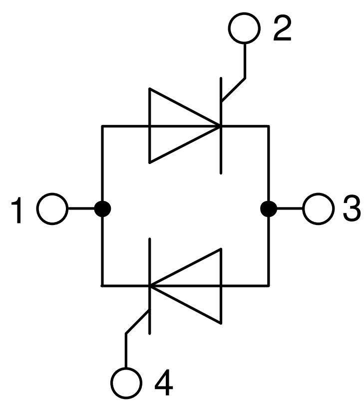
Thyristor

$V_{0\,max}$	*threshold voltage*	0,78	V
$R_{0\,max}$	*slope resistance **	3	mΩ

Outlines SOT-227B (minibloc)



Dim.	Millimeter		Inches	
	min	max	min	max
A	31.50	31.88	1.240	1.255
B	7.80	8.20	0.307	0.323
C	4.09	4.29	0.161	0.169
D	4.09	4.29	0.161	0.169
E	4.09	4.29	0.161	0.169
F	14.91	15.11	0.587	0.595
G	30.12	30.30	1.186	1.193
H	37.80	38.23	1.488	1.505
J	11.68	12.22	0.460	0.481
K	8.92	9.60	0.351	0.378
L	0.74	0.84	0.029	0.033
M	12.50	13.10	0.492	0.516
N	25.15	25.42	0.990	1.001
O	1.95	2.13	0.077	0.084
P	4.95	6.20	0.195	0.244
Q	26.54	26.90	1.045	1.059
R	3.94	4.42	0.155	0.167
S	4.55	4.85	0.179	0.191
T	24.59	25.25	0.968	0.994
U	-0.05	0.10	-0.002	0.004
V	3.20	5.50	0.126	0.217
W	19.81	21.08	0.780	0.830
Z	2.50	2.70	0.098	0.106



Thyristor

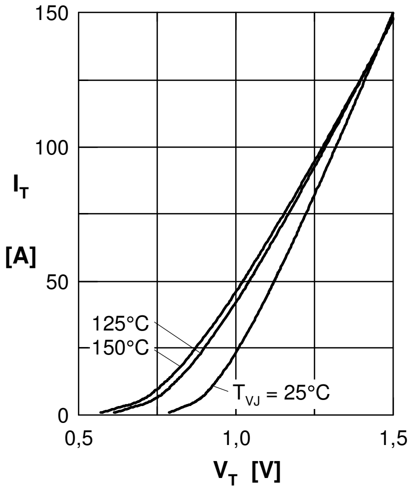


Fig. 1 Forward characteristics

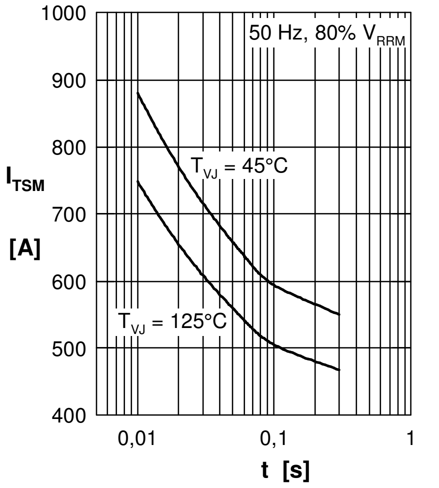


Fig. 2 Surge overload current

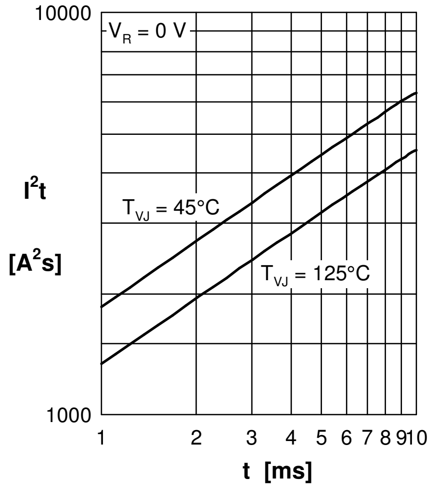


Fig. 3 I^2t versus time (1-10 ms)

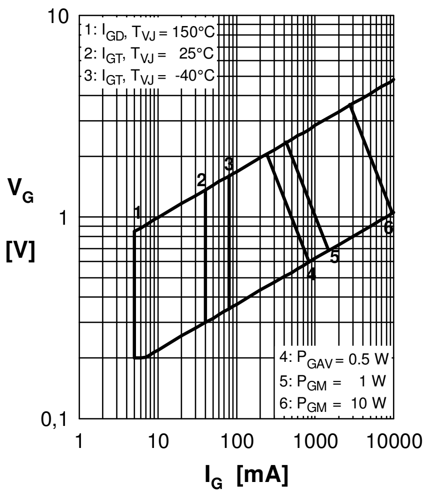


Fig. 4 Gate trigger characteristics

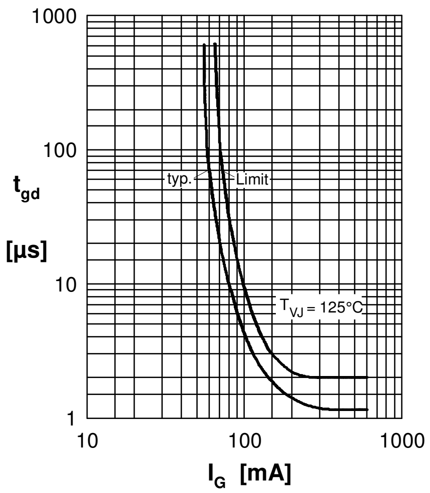


Fig. 5 Gate controlled delay time

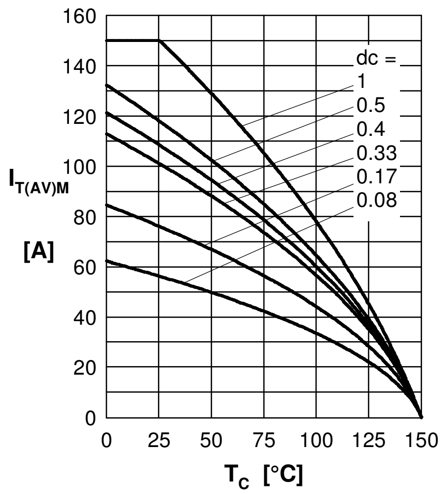


Fig. 6 Max. forward current at case temperature

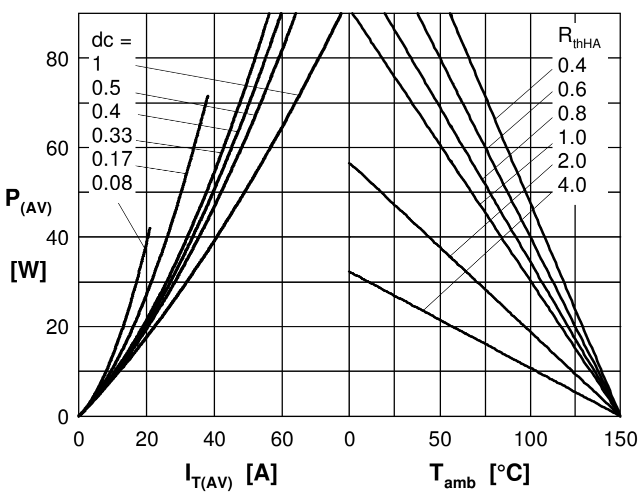


Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature

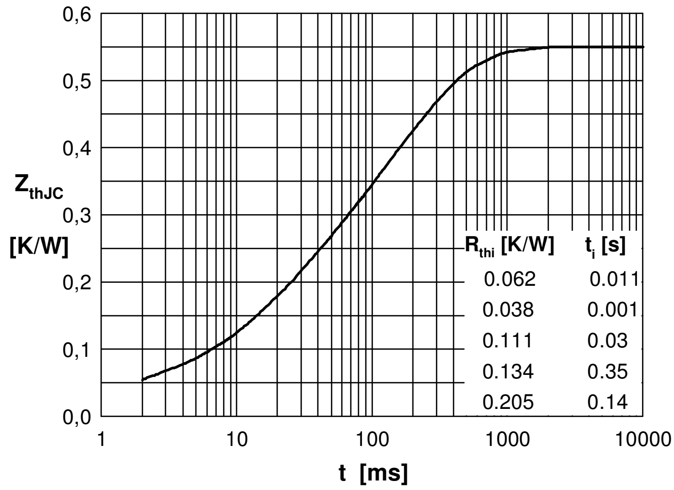


Fig. 8 Transient thermal impedance junction to case

 Data according to IEC 60747and per semiconductor unless otherwise specified 20150827c