

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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High Efficiency Thyristor

1200 V

30 A

1,25 V

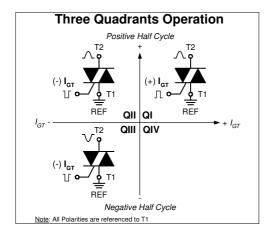
Three Quadrants operation: QI - QIII 1~ Triac

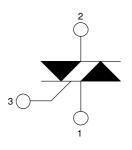
Part number

CLA60MT1200NHB



Backside: Terminal 2





Features / Advantages:

- Triac for line frequency
- Three Quadrants Operation
- QI QIII
- 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: 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.



Rectifier		Condition -		!	.	3	
Symbol	Definition	Conditions	T 0500	min.	typ.	max.	Uni
V _{RSM/DSM}	max. non-repetitive reverse/forwar		$T_{VJ} = 25^{\circ}C$			1300	,
V _{RRM/DRM}	max. repetitive reverse/forward blo		$T_{VJ} = 25^{\circ}C$			1200	١
I _{R/D}	reverse current, drain current	$V_{R/D} = 1200 \text{ V}$	$T_{VJ} = 25^{\circ}C$			10	μ
		V _{R/D} = 1200 V	$T_{VJ} = 125$ °C			2	m/
V _T	forward voltage drop	$I_T = 30 \text{ A}$	$T_{VJ} = 25^{\circ}C$			1,28	١
		$I_T = 60 \text{ A}$				1,56	١
		$I_T = 30 A$	$T_{VJ} = 125$ °C			1,25	,
		$I_T = 60 \text{ A}$				1,61	,
ITAV	average forward current	T _C = 120°C	$T_{VJ} = 150$ °C			30	,
I _{RMS}	RMS forward current per phase	180° sine				66	1
V _{T0}	threshold voltage	an and addition and a	T _{vJ} = 150°C			0,86	١
r _T	slope resistance	ss calculation only				12,5	m۵
R _{thJC}	thermal resistance junction to case	9				0,55	K/W
R _{thCH}	thermal resistance case to heatsing	k			0,25		K/V
P _{tot}	total power dissipation		T _C = 25°C		·	230	٧
I _{TSM}	max. forward surge current	t = 10 ms; (50 Hz), sine	T _{v.i} = 45°C			380	1
10111	-	t = 8,3 ms; (60 Hz), sine	$V_R = 0 V$			410	,
		t = 10 ms; (50 Hz), sine	T _{v,i} = 150°C			325	/
		t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			350	,
l²t	value for fusing	t = 10 ms; (50 Hz), sine	$T_{VJ} = 45^{\circ}C$			720	A ²
-τ	Tanab isi isanig	t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			700	A ²
		t = 10 ms; (50 Hz), sine	$T_{VJ} = 150^{\circ}C$			530	A ² :
		t = 8.3 ms; (60 Hz), sine	$V_R = 0 V$			510	A ² :
C _J	junction capacitance	$V_{\rm B} = 400 \text{V} \text{f} = 1 \text{MHz}$	$T_{VJ} = 25^{\circ}C$		25	310	pl
		$t_{\rm P} = 30 \mu {\rm s}$	$T_{\rm C} = 150^{\circ}{\rm C}$		23	10	V
P _{GM}	max. gate power dissipation	•	1 _C = 150 C			5	۷
n		$t_{P} = 300 \mu s$				_	! !
P _{GAV}	average gate power dissipation	T 45000 (50 H	1'1' L 00 A			0,5	۷
(di/dt) _{cr}	critical rate of rise of current	$T_{VJ} = 150 ^{\circ}\text{C}; f = 50 \text{Hz}$ re	•			150	A/µ
		$t_P = 200 \mu s; di_G/dt = 0.3 A/\mu s; -$					
			on-repet., $I_T = 30 \text{ A}$			500	
(dv/dt) _{cr}	critical rate of rise of voltage	$V = \frac{2}{3} V_{DRM}$	$T_{VJ} = 150$ °C			500	V/µ
		R _{GK} = ∞; method 1 (linear volta					! ! ! !
V_{GT}	gate trigger voltage	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			1,7	١
			$T_{VJ} = -40$ °C			1,9	١
I _{GT}	gate trigger current	$V_D = 6 V$	$T_{VJ} = 25^{\circ}C$			± 60	m/
			$T_{VJ} = -40$ °C			± 80	m/
V _{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$	$T_{VJ} = 150^{\circ}C$			0,2	١
I _{GD}	gate non-trigger current					± 1	m/
I _L	latching current	t _p = 10 μs	T _{VJ} = 25°C			90	m/
-		$I_{G} = 0.3 \text{ A}; di_{G}/dt = 0.3 \text{ A/}\mu\text{s}$	3				1
I _H	holding current	$V_D = 6 \text{ V } R_{GK} = \infty$	T _{vJ} = 25°C			60	m/
t _{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$	T _{VJ} = 25°C			2	μ
gu	÷ ,	$I_{\rm G} = 0.3 \text{A}; \text{di}_{\rm G}/\text{dt} = 0.3 \text{A}/\mu \text{s}$				_	μ,
+	turn-off time	$V_{\rm R} = 100 \text{ V}; \ I_{\rm T} = 30 \text{ A}; \ V = \frac{2}{2}$			150		110
t _q		$\mathbf{v}_{R} - 100 \mathbf{v}, \mathbf{i}_{T} = 30 \Lambda, \mathbf{v} = 7$	3 *DRM 1VJ = 123 U		130		μ



CLA60MT1200NHB

Package	Package TO-247			Ratings			
Symbol	Definition	Conditions	min.	typ.	max.	Unit	
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	N	

Product Marking Logo II IXYS Part No. XXXXXXXXX Assembly Line Zyyww Assembly Code Assembly Code

Part description

C = Thyristor(SCR)

L = High Efficiency Thyristor

A = (up to 1200V) 60 = Current Rating [A]

MT = 1~ Triac

1200 = Reverse Voltage [V]

N = Three Quadrants operation: QI - QIII

HB = TO-247AD(3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA60MT1200NHB	CLA60MT1200NHB	Tube	30	512073

Similar Part	Package	Voltage class
CLA60MT1200NHR	ISO247 (3)	1200
CLA60MT1200NTZ	TO-268AA (D3Pak)	1200

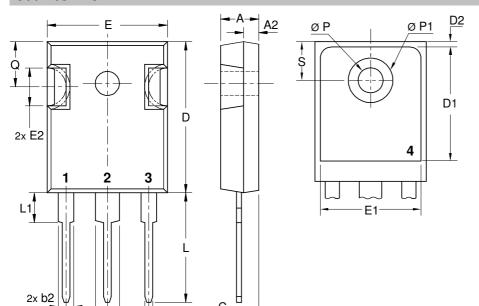
Equiva	alent Circuits for	Simulation	* on die level	$T_{VJ} = 150 ^{\circ}\text{C}$
$I \rightarrow V_0$	R_0	Thyristor		
V _{0 max}	threshold voltage	0,86		V
$R_{0 \text{ max}}$	slope resistance *	10		$m\Omega$





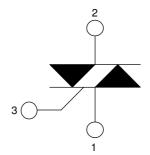
Outlines TO-247

2xe



-−3x b

Sym.	Inches		Millimeter	
	min.	max.	min.	max.
Α	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
Е	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
ØΡ	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





Thyristor

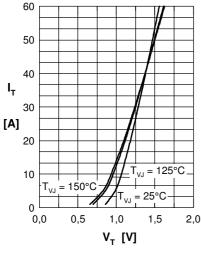


Fig. 1 Forward characteristics

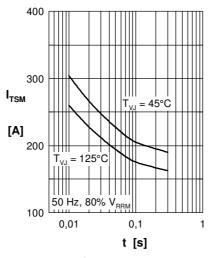


Fig. 2 Surge overload current I_{TSM} : crest value, t: duration

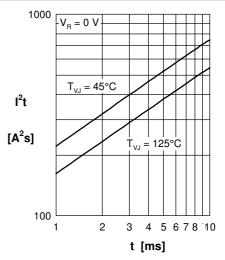


Fig. 3 I²t versus time (1-10 s)

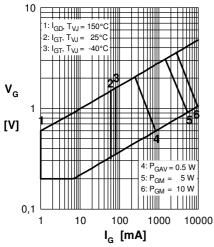


Fig. 4 Gate voltage & gate current

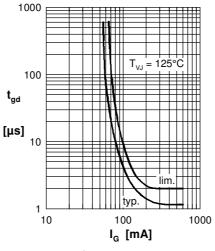


Fig. 5 Gate controlled delay time t_{ad}

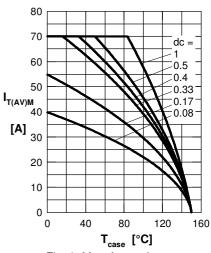


Fig. 6 Max. forward current at case temperature

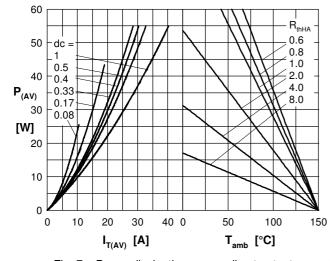


Fig. 7a Power dissipation versus direct output current Fig. 7b and ambient temperature

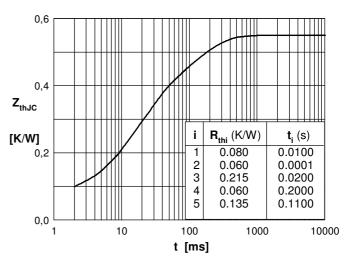


Fig. 7 Transient thermal impedance junction to case