

High Efficiency Thyristor

Two Quadrants Operation QI & QIII
Single Triac

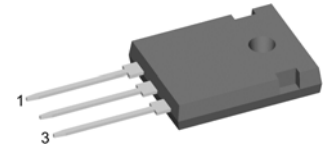
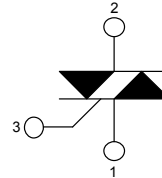
$$V_{RRM} = 1200 \text{ V}$$

$$I_{T(AV)M} = 30 \text{ A}$$

$$I_{RMS} = 66 \text{ A}$$

Part number

CLA 60 MT 1200 M HB



Backside: Terminal 2

Features / Advantages:

- Triac for line frequency
- Two Quadrants Operation - QI & QIII
- Planar passivated chip
- Long-term stability of blocking currents and voltages

Applications:

- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

Package:

- Housing: TO-247
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

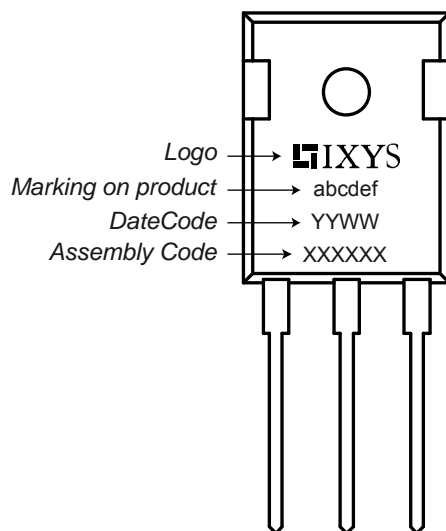
Ratings

Symbol	Definition	Conditions	Ratings			Unit	
			min.	typ.	max.		
$V_{RSM/DSM}$	max. non-repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$			1300	V	
$V_{RRM/DRM}$	max. repetitive reverse/forward blocking voltage	$T_{VJ} = 25^{\circ}\text{C}$			1200	V	
I_{RD}	reverse current, drain current	$V_{RD} = 1200 \text{ V}$			10	μA	
		$V_{RD} = 1200 \text{ V}$			2	mA	
V_T	forward voltage drop	$I_T = 30 \text{ A}$			1.28	V	
		$I_T = 60 \text{ A}$			1.56	V	
		$I_T = 30 \text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.25	V
		$I_T = 60 \text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.61	V
$I_{T(AV)M}$	average forward current	$T_C = 120^{\circ}\text{C}$			30	A	
I_{RMS}	RMS forward current per phase	180° sine			66	A	
V_{T0}	threshold voltage	$T_{VJ} = 150^{\circ}\text{C}$			0.86	V	
r_T	slope resistance				12.5	m Ω	
R_{thJC}	thermal resistance junction to case				0.55	K/W	
T_{VJ}	virtual junction temperature		-40		150	$^{\circ}\text{C}$	
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			220	W	
P_{GM}	max. gate power dissipation	$t_p = 30 \mu\text{s}$			10	W	
		$t_p = 300 \mu\text{s}$			5	W	
P_{GAV}	average gate power dissipation				0.5	W	
I_{TSM}	max. forward surge current	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$		300	A	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		325	A	
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$		255	A	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		275	A	
I_{t^2}	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$		450	A ² s	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		440	A ² s	
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$		325	A ² s	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		315	A ² s	
C_J	junction capacitance	$V_R = 400 \text{ V}$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		25	pF	

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$(di/dt)_{cr}$	critical rate of rise of current	$T_{VJ} = 150^{\circ}\text{C}$ repetitive, $I_T = 40\text{ A}$ $f = 50\text{ Hz}$; $t_p = 200\ \mu\text{s}$ $I_G = 0.3\text{ A}$; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			150	$\text{A}/\mu\text{s}$
		$V_D = \frac{2}{3} V_{DRM}$ non-repetitive, $I_T = 30\text{ A}$			500	$\text{A}/\mu\text{s}$
$(dv/dt)_{cr}$	critical rate of rise of voltage	$V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 150^{\circ}\text{C}$ $R_{GK} = \infty$; method 1 (linear voltage rise)			500	$\text{V}/\mu\text{s}$
V_{GT}	gate trigger voltage	$V_D = 6\text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			1.3	V
I_{GT}	gate trigger current	$V_D = 6\text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			1.6	V
					30	mA
					50	mA
V_{GD}	gate non-trigger voltage	$V_D = \frac{2}{3} V_{DRM}$ $T_{VJ} = 150^{\circ}\text{C}$			0.2	V
I_{GD}	gate non-trigger current				1	mA
I_L	latching current	$t_p = 10\ \mu\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$ $I_G = 0.3\text{ A}$; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			90	mA
I_H	holding current	$V_D = 6\text{ V}$ $R_{GK} = \infty$ $T_{VJ} = 25^{\circ}\text{C}$			60	mA
t_{gd}	gate controlled delay time	$V_D = \frac{1}{2} V_{DRM}$ $T_{VJ} = 25^{\circ}\text{C}$ $I_G = 0.3\text{ A}$; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			2	μs
t_q	turn-off time	$V_R = 100\text{ V}$; $I_T = 30\text{ A}$ $T_{VJ} = 150^{\circ}\text{C}$		150		μs
		$V_D = \frac{2}{3} V_{DRM}$; $t_p = 200\ \mu\text{s}$ $di/dt = 10\text{ A}/\mu\text{s}$; $dv/dt = 20\text{ V}/\mu\text{s}$				

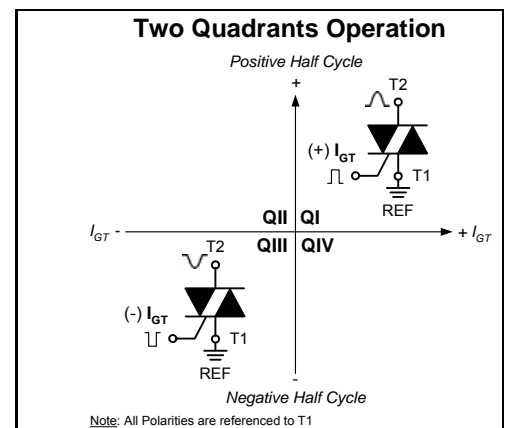
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per terminal			70	A
R_{thCH}	thermal resistance case to heatsink			0.25		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				6		g
M_D	mounting torque		0.8		1.2	Nm
F_C	mounting force with clip		20		120	N

Product Marking

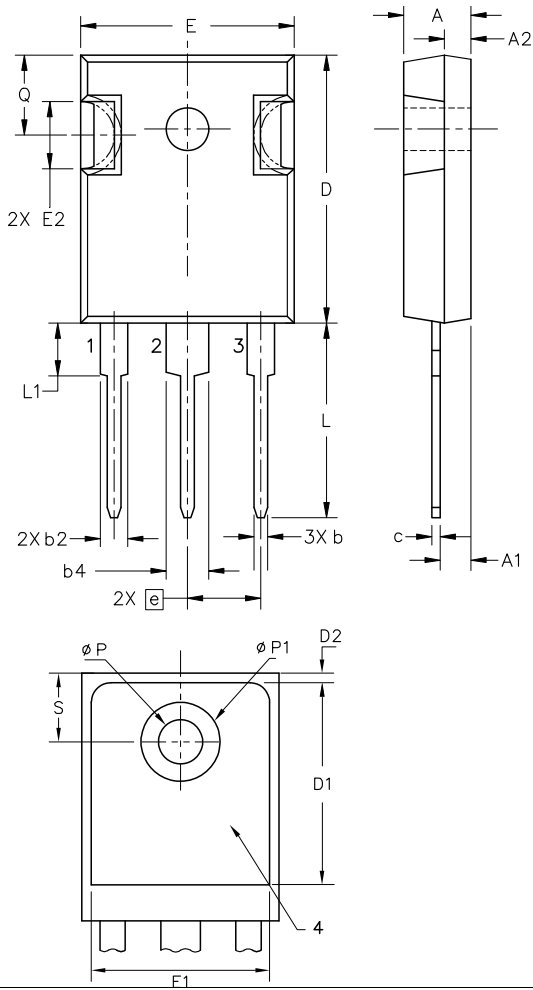


Part number

- C = Thyristor (SCR)
- L = High Efficiency Thyristor
- A = (up to 1200 V)
- 60 = Current Rating [A]
- MT = AC-Controlling / Triac
- 1200 = Reverse Voltage [V]
- M = Two Quadrants Operation: QI & QIII
- HB = TO-247AD (3)



Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	CLA 60 MT 1200 M HB	CLA60MT1200MHB	Tube	30	501362

Outlines TO-247


Sym.	Inches		Millimeter	
	min.	max.	min.	max.
A	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
e	0.215 BSC		5.46 BSC	
L	0.780	0.800	19.80	20.30
L1	-	0.177	-	4.49
Ø P	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
c	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