

High Efficiency Thyristor

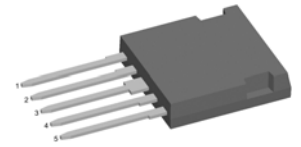
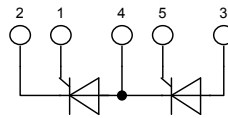
Phase leg

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

$$I_{T(AV)M} = 40 \text{ A}$$

$$I_{T(RMS)} = 63 \text{ A}$$

Part number

CLA 40 P 1200 FC


Backside: isolated

Features / Advantages:

- Thyristor for line frequency
- Planar passivated chip
- Long-term stability

Applications:

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

Package:

- Housing: i4-Pac
- DCB isolated backside
- Isolation Voltage 3000 V
- 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	$V_{RD} = 1200 \text{ V}$			50	μA	
		$V_{RD} = 1200 \text{ V}$			4	mA	
V_T	forward voltage drop	$I_T = 40 \text{ A}$			1.25	V	
		$I_T = 80 \text{ A}$			1.49	V	
		$I_T = 40 \text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.19	V
		$I_T = 80 \text{ A}$	$T_{VJ} = 125^{\circ}\text{C}$			1.50	V
$I_{T(AV)M}$	average forward current	$T_C = 95^{\circ}\text{C}$			40	A	
$I_{T(RMS)}$	RMS forward current	180° sine			63	A	
V_{T0}	threshold voltage	$T_{VJ} = 150^{\circ}\text{C}$			0.86	V	
r_T	slope resistance				7.9	m Ω	
R_{thJC}	thermal resistance junction to case				0.80	K/W	
T_{VJ}	virtual junction temperature		-40		150	$^{\circ}\text{C}$	
P_{tot}	total power dissipation	$T_C = 25^{\circ}\text{C}$			150	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	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$		550	A	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		595	A	
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$		470	A	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		505	A	
I_{t^2}	value for fusing	$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 45^{\circ}\text{C}$		1.52	kA ² s	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		1.48	kA ² s	
		$t = 10 \text{ ms}; (50 \text{ Hz}), \text{ sine}$	$T_{VJ} = 150^{\circ}\text{C}$		1.11	kA ² s	
		$t = 8,3 \text{ ms}; (60 \text{ Hz}), \text{ sine}$	$V_R = 0 \text{ V}$		1.06	kA ² s	
C_J	junction capacitance	$V_R = 400 \text{ V}$ $f = 1 \text{ MHz}$	$T_{VJ} = 25^{\circ}\text{C}$		25	pF	

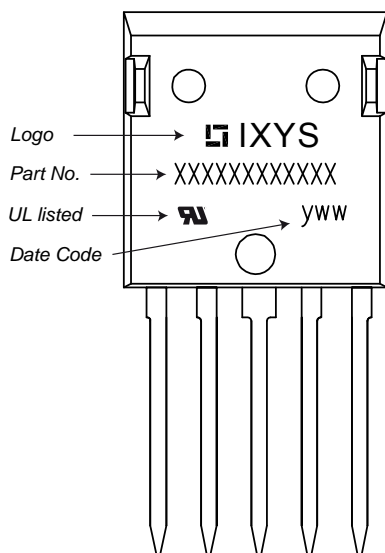
Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
$(di/dt)_{cr}$	critical rate of rise of current	$T_{VJ} = 150^{\circ}\text{C}$ repetitive, $I_T = 40\text{ A}$ $f = 50\text{ Hz}$; $t_p = 200\ \mu\text{s}$ $I_G = 0.3\text{ A}$; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			150	$\text{A}/\mu\text{s}$
		$V_D = \frac{2}{3} V_{DRM}$ non-repetitive, $I_T = 50\text{ A}$			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)			1000	$\text{V}/\mu\text{s}$
V_{GT}	gate trigger voltage	$V_D = 6\text{ V}$ $T_{VJ} = 25^{\circ}\text{C}$ $T_{VJ} = -40^{\circ}\text{C}$			1.5	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
					50	mA
					80	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				3	mA
I_L	latching current	$t_p = 10\ \mu\text{s}$ $T_{VJ} = 25^{\circ}\text{C}$ $I_G = 0.3\text{ A}$; $di_G/dt = 0.3\text{ A}/\mu\text{s}$			125	mA
I_H	holding current	$V_D = 6\text{ V}$ $R_{GK} = \infty$ $T_{VJ} = 25^{\circ}\text{C}$			100	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	$V_R = 100\text{ V}$; $I_T = 33\text{ A}$ $T_{VJ} = 150^{\circ}\text{C}$		200		μs
		$V_D = \frac{2}{3} V_{DRM}$; $t_p = 200\ \mu\text{s}$ $di/dt = 10\text{ A}/\mu\text{s}$; $dv/dt = 20\text{ V}/\mu\text{s}$				

tentative

Symbol	Definition	Conditions	Ratings			Unit
			min.	typ.	max.	
I_{RMS}	RMS current	per terminal			70	A
R_{thCH}	thermal resistance case to heatsink			0.20		K/W
T_{stg}	storage temperature		-55		150	°C
Weight				9		g
F_C	mounting force with clip		20		120	N
V_{ISOL}	isolation voltage	t = 1 second	3600			V
		t = 1 minute	3000			V
d_s	creepage distance on surface		1.7			mm
d_A	striking distance through air		5.5			mm

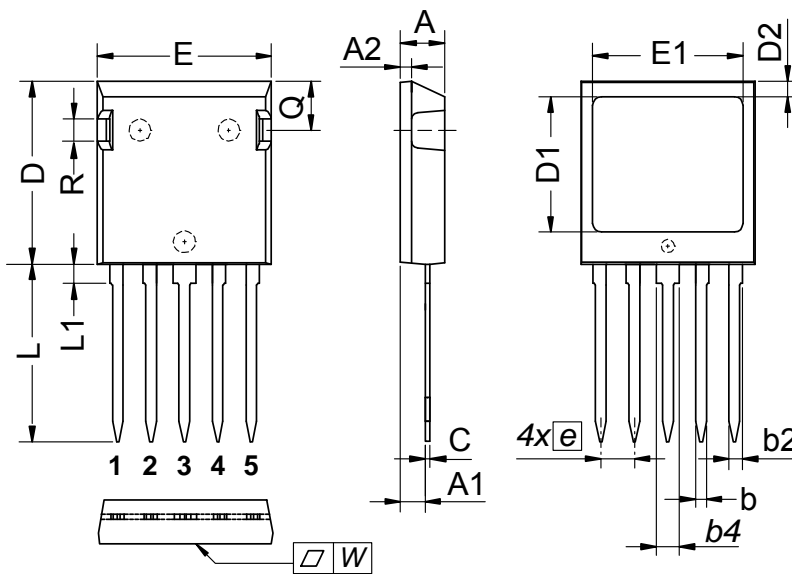
Part number

- C = Thyristor (SCR)
- L = High Efficiency Thyristor
- A = (up to 1200 V)
- 40 = Current Rating [A]
- P = Phase leg
- 1200 = Reverse Voltage [V]
- FC = i4-Pac (5)

Product Marking


Ordering	Part Name	Marking on Product	Delivering Mode	Base Qty	Code Key
Standard	CLA 40 P 1200 FC	CLA40P1200FC	Tube	25	510210

Outlines i4-Pac



DIM.	MILLIMETER		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.190	0.205
A1	2.59	3.00	0.102	0.118
A2	1.17	2.16	0.046	0.085
b	1.14	1.40	0.045	0.055
b2	1.47	1.73	0.058	0.068
b4	2.54	2.79	0.100	0.110
C	0.51	0.74	0.020	0.029
D	20.80	21.34	0.819	0.840
D1	14.99	15.75	0.590	0.620
D2	1.65	2.03	0.065	0.080
E	19.56	20.29	0.770	0.799
E1	16.76	17.53	0.660	0.690
e	3.81 BSC		0.15 BSC	
L	19.81	21.34	0.780	0.840
L1	2.11	2.59	0.083	0.102
Q	5.33	6.20	0.210	0.244
R	2.54	4.57	0.100	0.180
W	—	0.10	—	0.004

Die konvexe Form des Substrates ist typ. < 0.05 mm über der Kunststoffoberfläche der Bauteilunterseite
 The convexbow of substrate is typ. < 0.05 mm over plastic surface level of device bottom side