High Efficiency Thyristor

V_{RRM}	=	1200 V
I_{TAV}	=	40 A
V_T	=	1.19 V

Single Thyristor

Part number

CLA40E1200HR
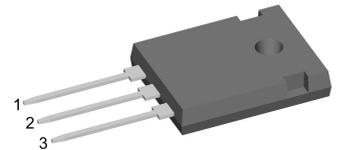
Backside: isolated
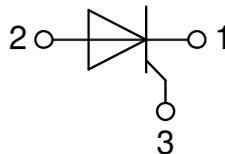
Features / Advantages:
- Thyristor for line frequency
- Planar passivated chip
- Long-term stability

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

Package: ISO247
- Isolation Voltage: 3600 V~
- Industry standard outline
- RoHS compliant
- Epoxy meets UL 94V-0
- Soldering pins for PCB mounting
- Backside: DCB ceramic
- Reduced weight
- Advanced power cycling

Disclaimer Notice

Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

Thyristor

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	$I_T = 40$ A	$T_{VJ} = 25°C$			1.25	V
		$I_T = 80$ A				1.49	V
		$I_T = 40$ A	$T_{VJ} = 125°C$			1.19	V
		$I_T = 80$ A				1.50	V
I_{TAV}	average forward current	$T_C = 95°C$	$T_{VJ} = 150°C$			40	A
$I_{T(RMS)}$	RMS forward current	180° sine				63	A
V_{T0}	threshold voltage	for power loss calculation only	$T_{VJ} = 150°C$			0.86	V
r_T	slope resistance					7.9	mΩ
R_{thJC}	thermal resistance junction to case					0.8	K/W
R_{thCH}	thermal resistance case to heatsink				0.3		K/W
P_{tot}	total power dissipation	$T_C = 25°C$				155	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, $I_T = 120$ 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., $I_T = 40$ 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; $I_T = 40$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   ISO247

Symbol	Definition	Conditions			min.	typ.	max.	Unit
I_{RMS}	RMS current	per terminal					70	A
T_{VJ}	virtual junction temperature				-55		150	°C
T_{op}	operation temperature				-55		125	°C
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
$d_{Spp/App}$	creepage distance on surface | striking distance through air		terminal to terminal		2.7			mm
$d_{Spb/Apb}$			terminal to backside		4.1			mm
V_{ISOL}	isolation voltage	t = 1 second	50/60 Hz, RMS; $I_{ISOL} \leq 1$ mA		3600			V
		t = 1 minute			3000			V

Ratings

Product Marking

Logo → ⊔ IXYS
Part Number → XXXXXXXXX
Date Code → yywwZ
Lot# → 123456
Location →
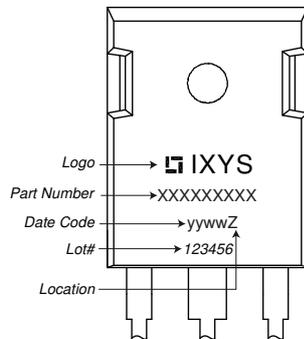
Part description

C = Thyristor (SCR)
L = High Efficiency Thyristor
A = (up to 1200V)
40 = Current Rating [A]
E = Single Thyristor
1200 = Reverse Voltage [V]
HR = ISO247 (3)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA40E1200HR	CLA40E1200HR	Tube	30	515428

Similar Part	Package	Voltage class
CMA40E1600HR	ISO247 (3)	1600

Equivalent Circuits for Simulation   *on die level $T_{VJ} = 150°C$
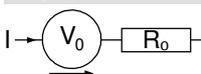
Thyristor

$V_{0\ max}$	threshold voltage	0.86	V
$R_{0\ max}$	slope resistance *	5.4	mΩ

Outlines   ISO247
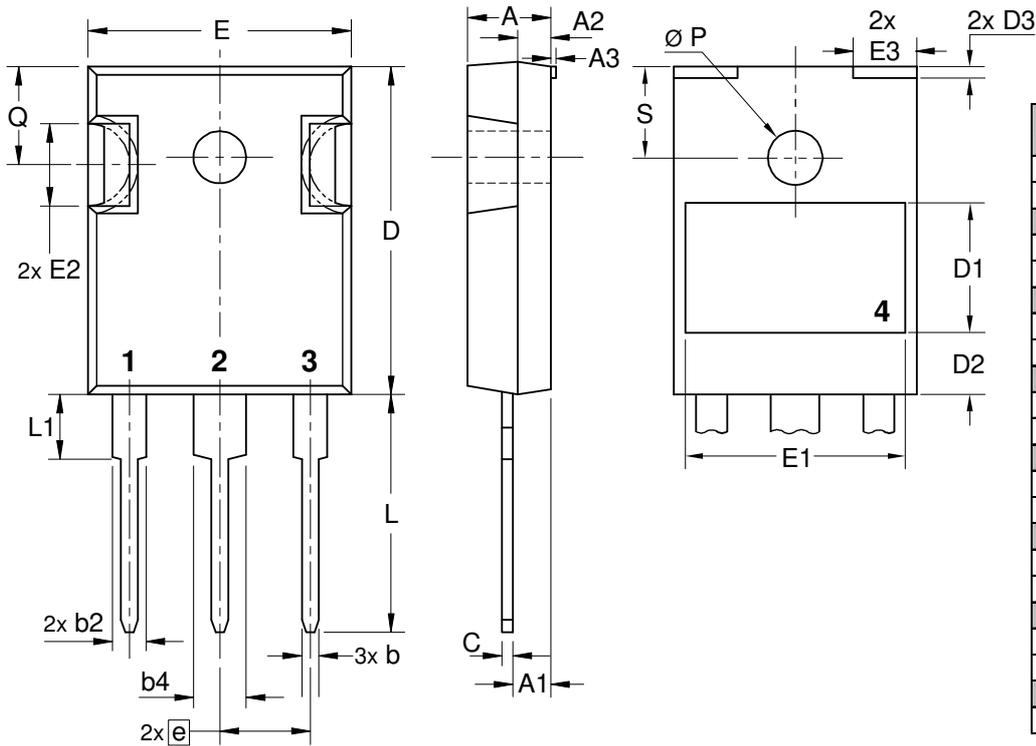
Dim.	Millimeter		Inches	
	min	max	min	max
A	4.70	5.30	0.185	0.209
A1	2.21	2.59	0.087	0.102
A2	1.50	2.49	0.059	0.098
A3	typ. 0.05		typ. 0.002	
b	0.99	1.40	0.039	0.055
b2	1.65	2.39	0.065	0.094
b4	2.59	3.43	0.102	0.135
c	0.38	0.89	0.015	0.035
D	20.79	21.45	0.819	0.844
D1	typ. 8.90		typ. 0.350	
D2	typ. 2.90		typ. 0.114	
D3	typ. 1.00		typ. 0.039	
E	15.49	16.24	0.610	0.639
E1	typ. 13.45		typ. 0.530	
E2	4.31	5.48	0.170	0.216
E3	typ. 4.00		typ. 0.157	
e	5.46 BSC		0.215 BSC	
L	19.80	20.30	0.780	0.799
L1	-	4.49	-	0.177
Ø P	3.55	3.65	0.140	0.144
Q	5.38	6.19	0.212	0.244
S	6.14 BSC		0.242 BSC	

IXYS reserves the right to change limits, conditions and dimensions.   Data according to IEC 60747and per semiconductor unless otherwise specified   20191202c

© 2019 IXYS all rights reserved
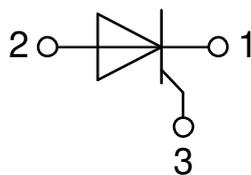
Thyristor
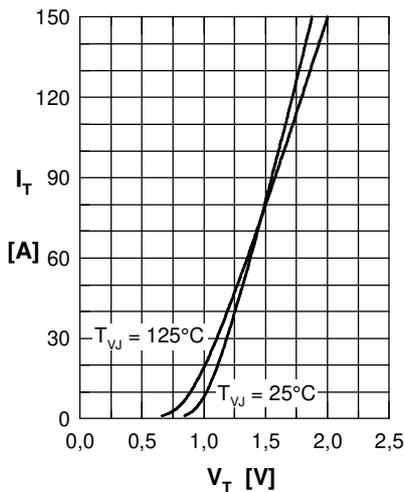
Fig. 1 Forward characteristics
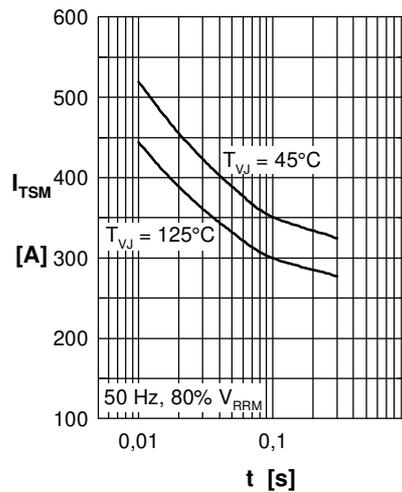
Fig. 2 Surge overload current
I_{TSM}: crest value, t: duration
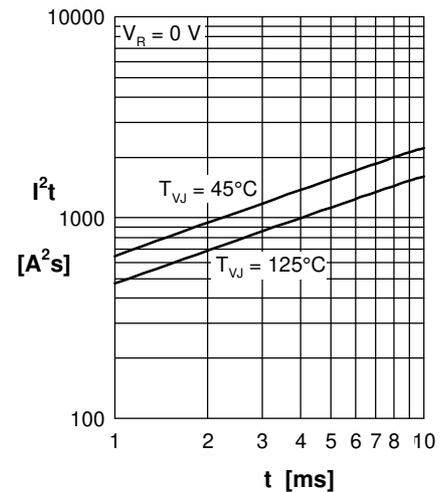
Fig. 3 I^2t versus time (1-10 s)
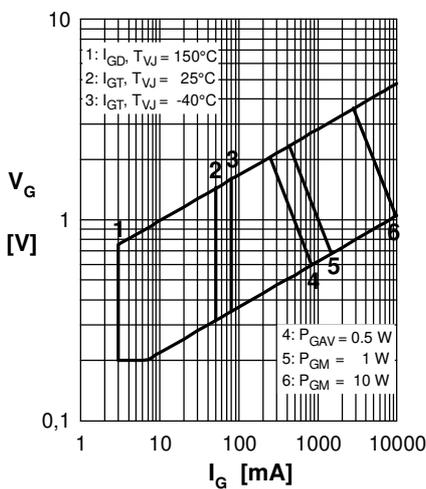
Fig. 4 Gate voltage & gate current
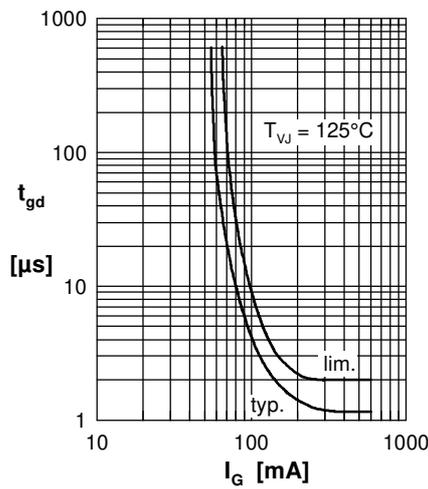
Fig. 5 Gate controlled delay time t_{gd}
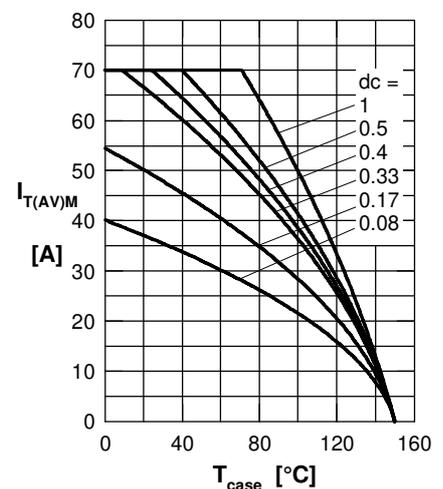
Fig. 6 Max. forward current at case temperature
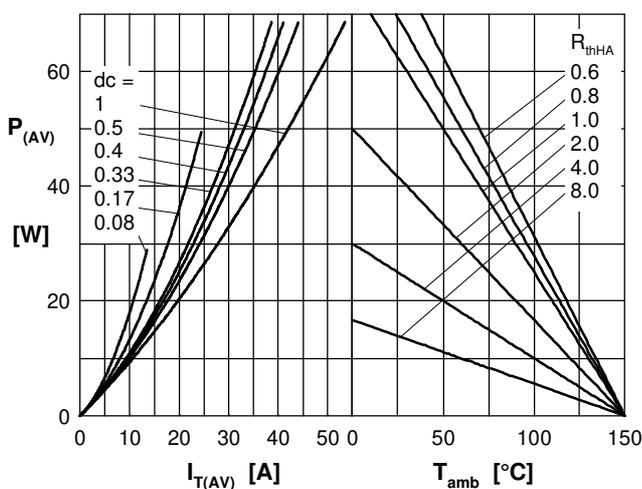
Fig. 7a Power dissipation versus direct output current
Fig. 7b and ambient temperature
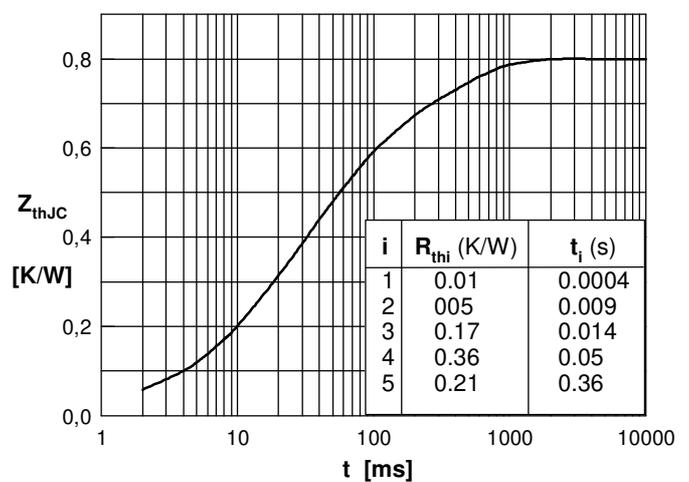
Fig. 7 Transient thermal impedance junction to case

i	R_{thi} (K/W)	t_i (s)
1	0.01	0.0004
2	005	0.009
3	0.17	0.014
4	0.36	0.05
5	0.21	0.36

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for SCRs *category:*

Click to view products by IXYS *manufacturer:*

Other Similar products are found below :

NTE5428 NTE5448 NTE5457 NTE5511 T1500N16TOF VT T720N18TOF T880N14TOF T880N16TOF TS110-7UF TT104N12KOF-A TT104N12KOF-K TT162N16KOF-A TT162N16KOF-K TT330N16AOF VS-16RIA100 VS-22RIA20 VS-2N5206 VS-2N685 VS-40TPS08A-M3 VS-ST230S12P1VPBF 057219R CLB30I1200HB T1190N16TOF VT T1220N22TOF VT T201N70TOH T830N18TOF TD92N16KOF-A TT250N12KOF-K VS-2N692 VS-2N689 VS-25RIA40 VS-16RIA120 VS-10RIA120 VS-30TPS08PBF NTE5427 NTE5442 VS-2N690 VS-ST300S20P0PBF TT251N16KOF-K VS-22RIA100 VS-16RIA40 CR02AM-8#F00 VS-ST110S12P0VPBF TD250N16KOF-A VS-ST110S16P0 VS-10RIA10 VS-16TTS08-M3 TS110-7A1-AP T930N36TOF VT T2160N24TOF VT