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High Efficiency Thyristor

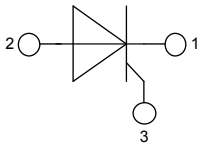
Single Thyristor

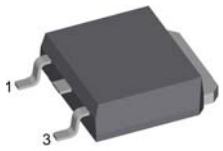
V_{RRM} = 1200 V
$I_{T(AV)M}$ = 5 A
$I_{T(RMS)}$ = 7.8 A

Part number

CLA 5 E 1200 UC

Marking on Product: C5TLUE





Backside: anode

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: TO-252 (DPak)
- Industry standard outline
- Epoxy meets UL 94V-0
- RoHS compliant

Symbol	Definition	Conditions		Ratings 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			10	µA
		$V_{R/D}$ = 1200 V	T_{VJ} = 125°C			1	mA
V_T	*forward voltage drop*	I_T = 5 A	T_{VJ} = 25°C			1.30	V
		I_T = 10 A				1.60	V
		I_T = 5 A	T_{VJ} = 125°C			1.30	V
		I_T = 10 A				1.60	V
$I_{T(AV)M}$	*average forward current*	T_C = 125°C	T_{VJ} = 150°C			5	A
$I_{T(RMS)}$	*RMS forward current*	180° sine				7.8	A
V_{T0}	*threshold voltage* } *for power loss calculation only*		T_{VJ} = 150°C			0.90	V
r_T	*slope resistance* }					85	mΩ
R_{thJC}	*thermal resistance junction to case*					2.50	K/W
T_{VJ}	*virtual junction temperature*			-40		150	°C
P_{tot}	*total power dissipation*		T_C = 25°C			50	W
P_{GM}	*max. gate power dissipation*	t_P = 30 µs	T_C = 150°C			5	W
		t_P = µs				2.5	W
P_{GAV}	*average gate power dissipation*					0.25	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			50	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			54	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			43	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			46	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			13	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			12	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			9.0	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			8.8	A²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		2		pF

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Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
$(di/dt)_{cr}$	*critical rate of rise of current*	T_{VJ} = 150 °C repetitive, I_T = 10 A			150	A/µs
		f = 50 Hz; t_P = 200 µs				
		I_G = 0.1 A; di_G/dt = 0.1 A/µs				
		V_D = ⅔ V_{DRM} non-repetitive, I_T = 5 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V_D = ⅔ V_{DRM} T_{VJ} = 150 °C			500	V/µs
		R_{GK} = ∞; method 1 (linear voltage rise)				
V_{GT}	*gate trigger voltage*	V_D = 6 V T_{VJ} = 25 °C			1.8	V
		T_{VJ} = -40 °C			1.9	V
I_{GT}	*gate trigger current*	V_D = 6 V T_{VJ} = 25 °C			20	mA
		T_{VJ} = -40 °C			40	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*				1	mA
I_L	*latching current*	t_p = 10 µs T_{VJ} = 25 °C			45	mA
		I_G = 0.1 A; di_G/dt = 0.1 A/µs				
I_H	*holding current*	V_D = 6 V R_{GK} = ∞ T_{VJ} = 25 °C			30	mA
t_{gd}	*gate controlled delay time*	V_D = ½ V_{DRM} T_{VJ} = 25 °C			2	µs
		I_G = 0.1 A; di_G/dt = 0.1 A/µs				
t_q	*turn-off time*	V_R = 100 V; I_T = 5 A T_{VJ} = 150 °C		150		µs
		V_D = ⅔ V_{DRM}; t_p = 200 µs				
		di/dt = 10 A/µs; dv/dt = 20 V/µs				

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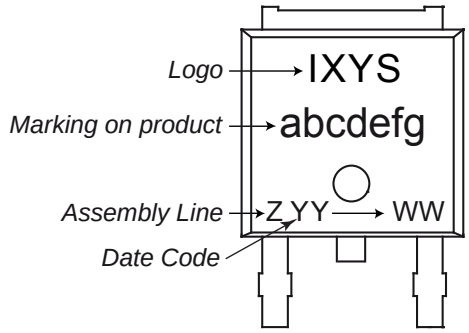
Symbol	Definition	Conditions	Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal			20	A
R_{thCH}	*thermal resistance case to heatsink*			0.50		K/W
T_{stg}	*storage temperature*		-55		150	°C
Weight				0.3		g
F_C	*mounting force with clip*		20		60	N

Product Marking



a) C = Semiconductor
b) 5 = Current Rating
c) T = Voltage Class
d) L = Technology
e) U = Package
f) E = Configuration

Part number

C = Thyristor (SCR)
L = High Efficiency Thyristor
A = (up to 1200 V)
5 = Current Rating [A]
E = Single Part
1200 = Reverse Voltage [V]
UC = TO-252AA (DPak)

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLA 5 E 1200 UC	C5TLUE	Tape & Reel	2500	509799

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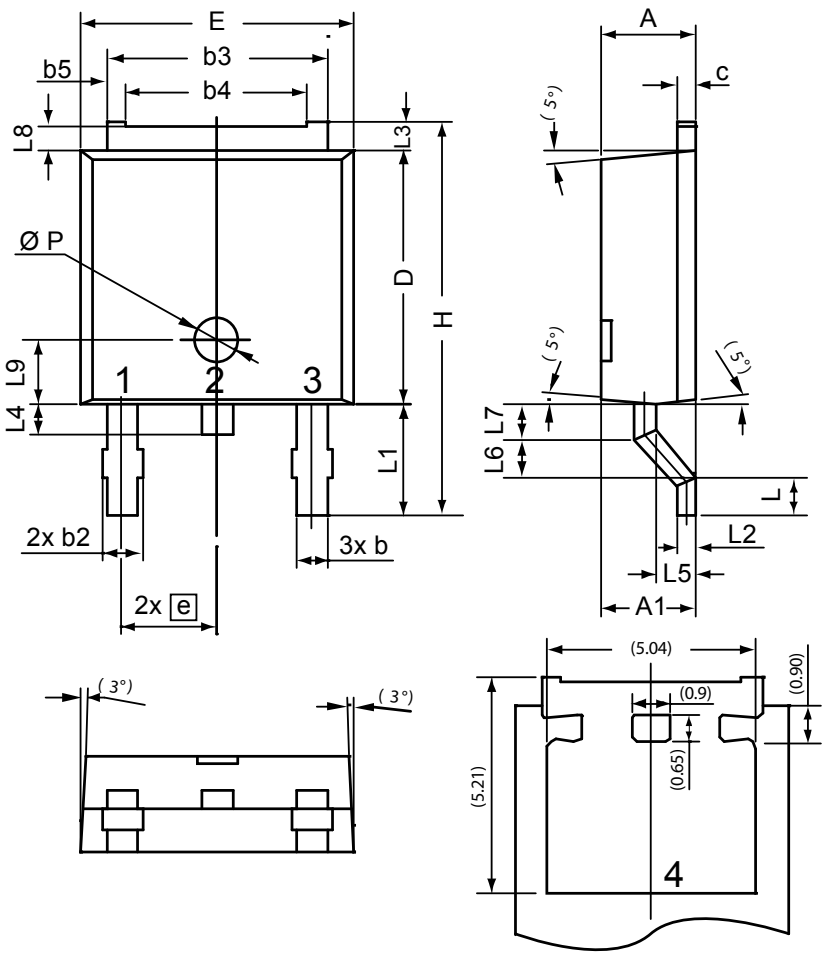
Outlines TO-252 (DPak)



Dim.	Millimeters		Inches	
	min	max	min	max
A	2.20	2.40	0.087	0.094
A1	2.10	2.50	0.083	0.098
b	0.66	0.86	0.026	0.034
b2	-	0.96	-	0.038
b3	5.04	5.64	0.198	0.222
b4	4.34 BSC		0.171 BSC	
b5	0.50 BSC		0.020 BSC	
c	0.40	0.60	0.016	0.024
D	5.90	6.30	0.232	0.248
E	6.40	6.80	0.252	0.268
e	2.10	2.50	0.083	0.098
H	9.20	9.80	0.362	0.386
L	0.55	1.02	0.022	0.040
L1	2.50	2.90	0.098	0.114
L2	0.40	0.60	0.016	0.024
L3	0.50	0.90	0.020	0.035
L4	0.60	1.00	0.024	0.039
L5	0.82	1.22	0.032	0.048
L6	0.79	0.99	0.031	0.039
L7	0.81	1.01	0.032	0.040
L8	0.40	0.80	0.016	0.031
L9	1.50 BSC		0.059 BSC	
Ø P	1.00 BSC		0.039 BSC	