advanced

High Efficiency Thyristor

3~ Rectifier		
V_{RRM}	=	1200 V
I_{DAV}	=	90 A
I_{FSM}	=	350 A

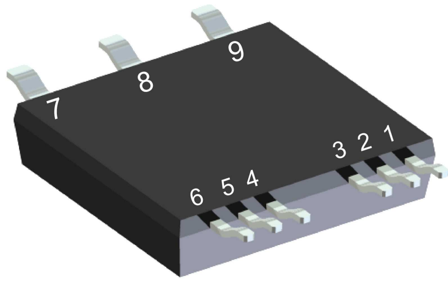
SemiFast

3~ Rectifier Bridge, half-controlled (high-side)

Part number

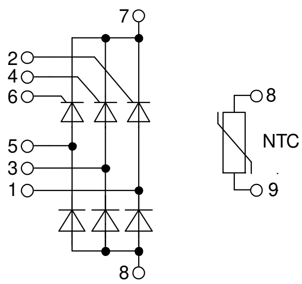
CLE90UH1200TLB

Marking on Product: CLE90UH1200TLB



Backside: isolated

E72873



Features / Advantages:

- Thyristor for line and moderate frequencies
- Short turn-off time
- Planar passivated chip
- Long-term stability

Applications:

- Line rectifying 50/60 Hz
- Drives
- SMPS
- UPS

Package: SMPD

- Isolation Voltage: 3000 V~
- Industry convenient 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.

© 2019 IXYS all rights reserved

advanced

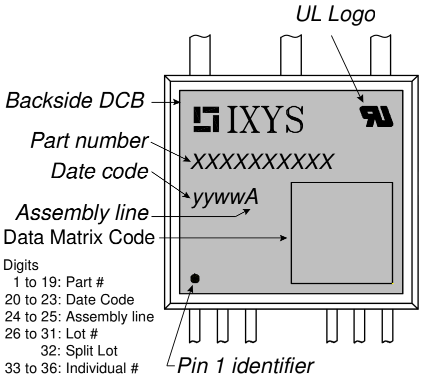
Rectifier

Symbol	Definition	Conditions		min.	typ.	max.	Unit
$V_{RSM/DSM}$	*max. non-repetitive reverse/forward blocking voltage*		T_{VJ} = 25°C			1200	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			2	mA
V_T	*forward voltage drop*	I_T = 30 A	T_{VJ} = 25°C			1.30	V
		I_T = 90 A				1.80	V
		I_T = 30 A	T_{VJ} = 125°C			1.28	V
		I_T = 90 A				1.95	V
I_{DAV}	*bridge output current*	T_C = 90°C	T_{VJ} = 150°C			90	A
		120° sine					
V_{T0}	*threshold voltage*	*for power loss calculation only*	T_{VJ} = 150°C			0.92	V
r_T	*slope resistance*					13	mΩ
R_{thJC}	*thermal resistance junction to case*					0.9	K/W
R_{thCH}	*thermal resistance case to heatsink*				0.40		K/W
P_{tot}	*total power dissipation*		T_C = 25°C			140	W
I_{TSM}	*max. forward surge current*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			350	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			380	A
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			300	A
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			320	A
I^2t	*value for fusing*	t = 10 ms; (50 Hz), sine	T_{VJ} = 45°C			615	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			600	A²s
		t = 10 ms; (50 Hz), sine	T_{VJ} = 150°C			450	A²s
		t = 8,3 ms; (60 Hz), sine	V_R = 0 V			425	A²s
C_J	*junction capacitance*	V_R = 400 V f = 1 MHz	T_{VJ} = 25°C		13		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 = 90 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 = 30 A			500	A/µs
$(dv/dt)_{cr}$	*critical rate of rise of voltage*	V = 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			1.4	V
			T_{VJ} = -40°C			1.7	V
I_{GT}	*gate trigger current*	V_D = 6 V	T_{VJ} = 25°C			30	mA
			T_{VJ} = -40°C			50	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			90	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			60	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 = 30 A; V = ⅔ V_{DRM}	T_{VJ} = 125 °C		50		µs
		di/dt = 10 A/µs dv/dt = 20 V/µs t_p = 200 µs					

© 2019 IXYS all rights reserved

Package SMPD

Symbol	Definition	Conditions		Ratings min.	typ.	max.	Unit
I_{RMS}	*RMS current*	per terminal				100	A
T_{VJ}	*virtual junction temperature*			-55		150	°C
T_{op}	*operation temperature*			-55		125	°C
T_{stg}	*storage temperature*			-55		150	°C
Weight					8.5		g
F_C	*mounting force with clip*			40		130	N
$d_{Spp/App}$	*creepage distance on surface | striking distance through air*		*terminal to terminal*	1.6			mm
$d_{Spb/Apb}$			*terminal to backside*	4.0			mm
V_{ISOL}	*isolation voltage*	t = 1 second	50/60 Hz, RMS; I_{ISOL} ≤ 1 mA	3000			V
		t = 1 minute		2500			V



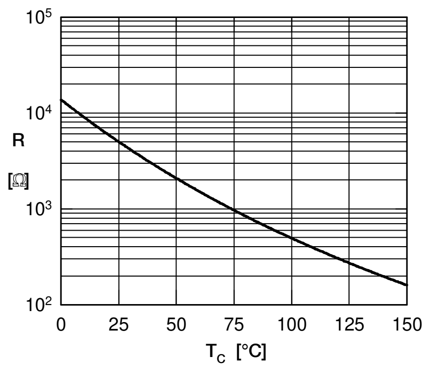
Part description

- C = Thyristor (SCR)
- L = High Efficiency Thyristor
- E = Semifast (up to 1200V)
- 90 = Current Rating [A]
- UH = 3~ Rectifier Bridge, half-controlled (high-side)
- 1200 = Reverse Voltage [V]
- T = Thermistor \ Temperature sensor
- LB = SMPD-B

Ordering	Ordering Number	Marking on Product	Delivery Mode	Quantity	Code No.
Standard	CLE90UH1200TLB-TUB	CLE90UH1200TLB	Tube	20	517456
Alternative	CLE90UH1200TLB-TRR	CLE90UH1200TLB	Tape & Reel	200	517463

Temperature Sensor NTC

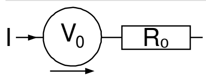
Symbol	Definition	Conditions	min.	typ.	max.	Unit
R_{25}	*resistance*	T_{VJ} = 25°	4.75	5	5.25	kΩ
$B_{25/50}$	*temperature coefficient*			3375		K



Typ. NTC resistance vs. temperature

Equivalent Circuits for Simulation

** on die level* T_{VJ} = 150 °C

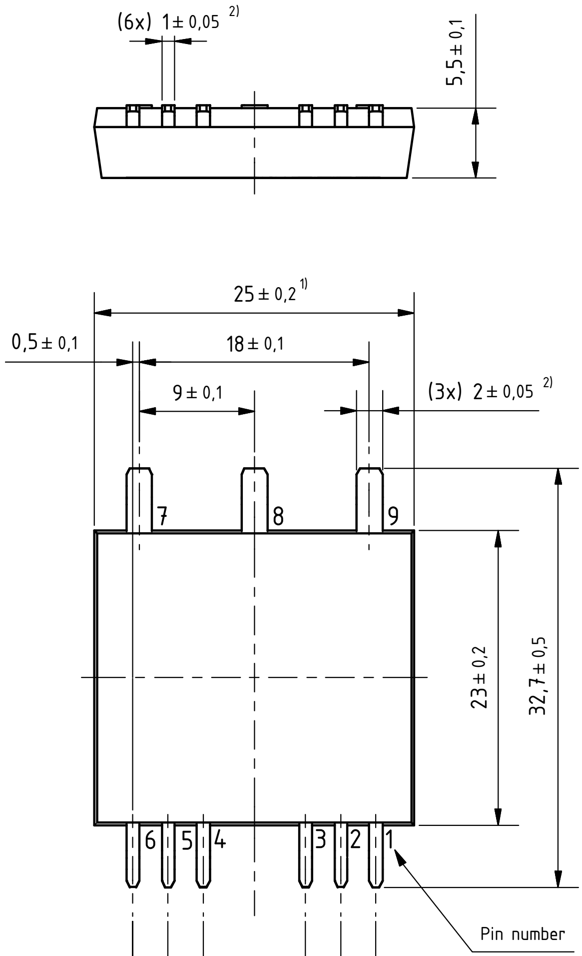


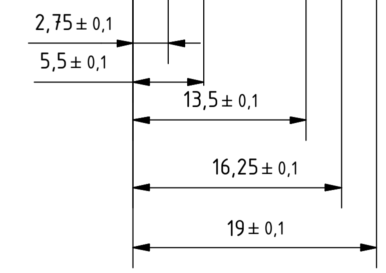
Thyristor

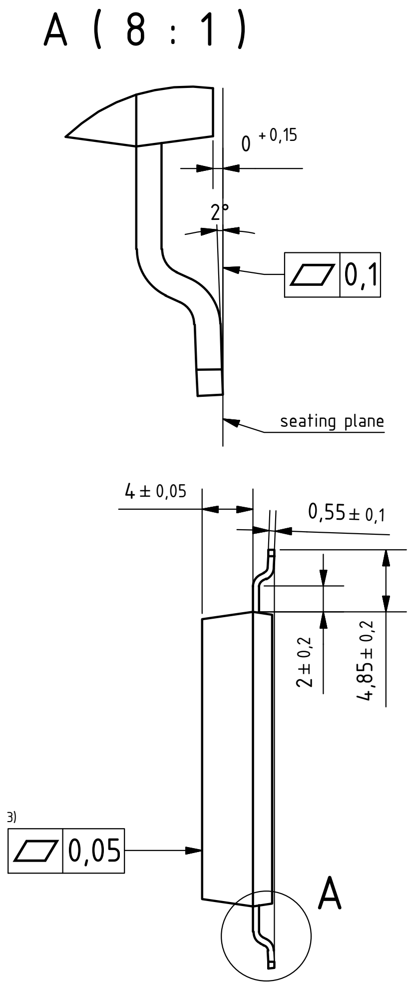
$V_{0\ max}$	*threshold voltage*	0.92	V
$R_{0\ max}$	*slope resistance **	10.5	mΩ

© 2019 IXYS all rights reserved

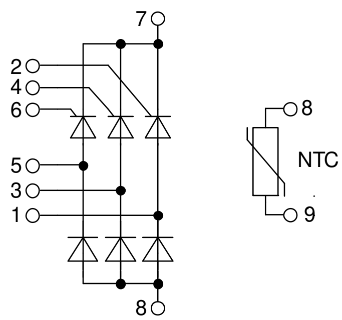
Outlines SMPD







Notes:
1) potrusion may add 0.2 mm max. on each side
2) additional max. 0.05 mm per side by punching misalignement
   or overlap of dam bar or bending compression
3) DCB area 10 to 50 µm convex;
   position of DCB area in relation to plastic rim: ±25 µm
   (measured 2 mm from Cu rim)
4) terminal plating: 0.2 - 1 µm Ni + 10 - 25 µm Sn (gal v.)
   cutting edges may be partially free of plating



© 2019 IXYS all rights reserved