PolySwitch® PTC Devices

Over-temperature Protection Device

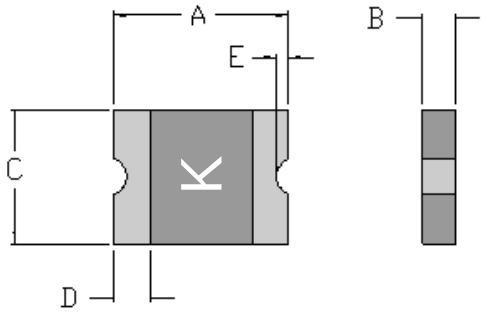
PRODUCT: 450CC1210LR-C

Specification Status: Released

FEATURES:

- Maximum electrical rating
  Voltage: 21V_{DC}
  Current: 5A

- Designed for charging cable protection
- Compact design
- Low resistance
- Marking: K



Notes:
1. Termination Finish: NiSn
2. Drawing not to scale

DIMENSIONS:

	A		B		C		D		E
	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
mm:	3.00	3.43	0.50	0.80	2.35	2.80	0.25	0.75	0.076
in:	(0.118)	(0.135)	(0.019)	(0.031)	(0.092)	(0.110)	(0.010)	(0.030)	(0.003)

PERFORMANCE RATINGS:

THERMAL CUT-OFF TEMPERATURE WITH RATED CURRENTS**				RESISTANCE VALUES		RESISTANCE VALUES POST TRIP	TRIPPED-STATE POWER DISSIPATION***
DEGREE C AT 2.0AMPS		DEGREE C AT 3.0AMPS		OHMS AT 20°C		OHMS AT 20°C	WATTS AT 20°C, 21V
MIN	MAX	MIN	MAX	MIN	MAX*	MAX**	MAX
90	115	75	100	0.002	0.008	0.020	1.3

* Maximum resistance is measured 1 hour after reflow.
**Values specified were determined using PCB's with 0.115"X1.0 ounce copper traces.
***Resistance after reliability testing specified in this document.

PERFORMANCE TESTING:

Test Items	Method/Condition	Specification	
Thermal Cut-Off Test	Put the device into the thermostatic chamber controlled at room temperature or 25degC. Apply the specified current to the device and increase the chamber temperature at the rate of 2degC/minute. Measure the device ambient temperature when the applied current has reduced to less than 20% of initial value.	3.0A	75~100°C
Power Dissipation	At room temperature trip the PTC device with 6V/the specified trip current, then increase the voltage to 21Vdc and waiting for 10miniutes to measure the power dissipation.	Max 1.3W	

RELIABILITY TESTING:

Test Items	Method/Condition	Specification
Trip Cycle	Repeat thermal cut-off test 20 times at rated current/voltage. The power applied to the device to be removed within 1 minute after device trip. The device to be left at room temperature for more than 30 minutes before starting next cycle.	Post Trip Resistance Max. 0.020 ohms
Trip Endurance	Conduct thermal cut-off test at rated current/voltage. After device trip, decrease the chamber temperature with keeping the trip state. Keep the trip state for 48hours at room temperature.	Post Trip Resistance Max 0.020 ohms

Reference Document: PS300
Precedence: This specification takes precedence over documents referenced herein.
Effectivity: Reference documents shall be the issue in effect on the date of invitation for bid.

MATERIALS INFORMATION:

ROHS Compliant
Directive 2011/65/EU Compliant

ELV Compliant
Directive 2002/95/EC Compliant

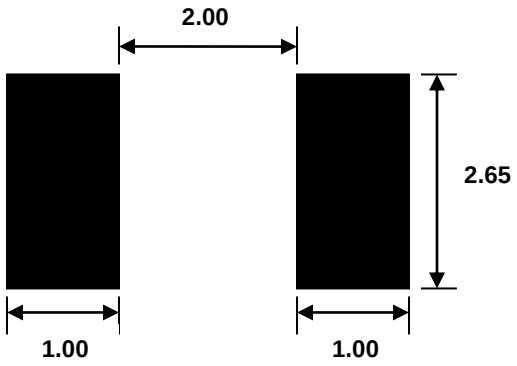
Pb-Free

Halogen Free*
HF

* Halogen Free refers to: Br≤900ppm, Cl≤900ppm, Br+Cl≤1500ppm.

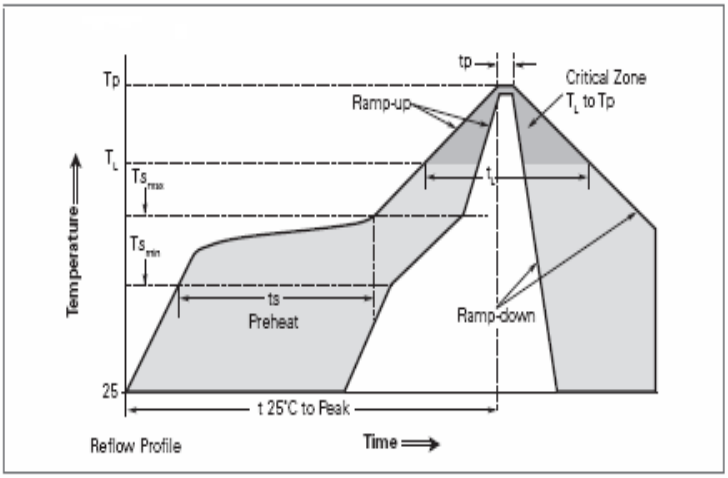
SOLDER REFLOW RECOMMENDATIONS:

Recommended pad layout (mm.)



RECOMMENDED REFLOW PROFILE:

Profile Feature	Pb-Free Assembly
Average ramp up rate (Ts_{max} to Tp)	3°C/s max.
Preheat • Temperature min. (Ts_{min}) • Temperature max. (Ts_{max}) • Time (ts_{min} to ts_{max})	 150°C 200°C 60-120s
Time maintained above: • Temperature (T_L) • Time (t_L)	 217°C 60-150s
Peak/Classification temperature (Tp)	260°C
Time within 5°C of actual peak temperature (tp)	30s max.
Ramp down rate	2°C/s max.
Time 25°C to peak temperature	8 mins max.

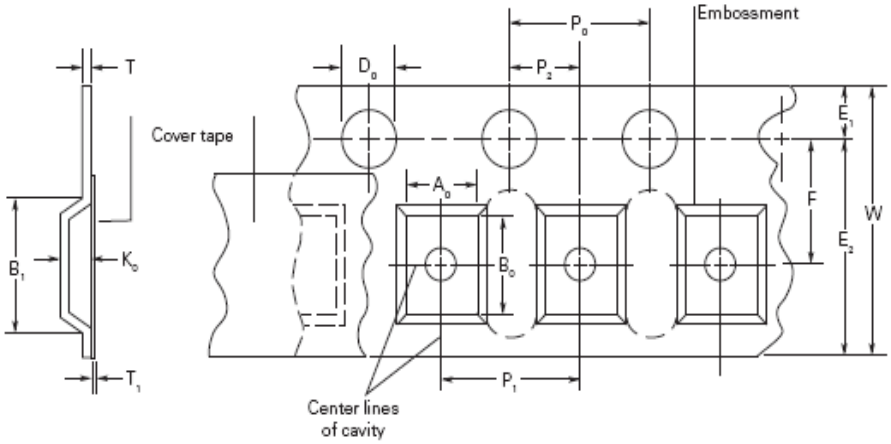


Notes:

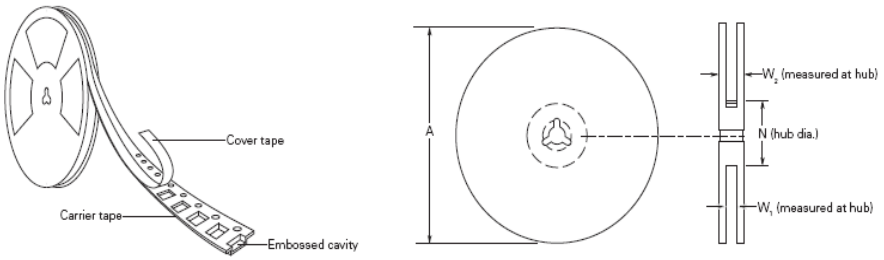
- All temperature refers to topside of the package, measured on the package body surface
- If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements
- Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents
- Devices can be reworked using the standard industry practices.

PACKAGING INFORMATION:

Tape specification



Reel dimensions



Description	EIA 481-1 (mm)
W	8.0 ± 0.30
P_0	4.0 ± 0.10
P_1	4.0 ± 0.10
P_2	2.0 ± 0.05
A_0	2.9 ± 0.10
B_0	3.55 ± 0.10
B_1 max.	4.35
D_0	1.55 ± 0.05
F	3.50 ± 0.05

Description	EIA 481-1 (mm)
E_1	1.75 ± 0.10
E_2 min.	6.25
T max.	0.3
T_1 max.	0.1
K_0	1.27 ± 0.10
Amax	179
Nmin	53.5
W1	9.5± 0.5
W2max	15

Standard Pack Quantity: 3,000pcs, **Minimum Order Quantity:** 15,000pcs

STORAGE AND FLOOR LIFE:

40°C Max., 70% R.H max. Devices performance may not meet specified ratings if storage condition is exceeded. After opening the packaging, the devices should be used up one time, or the rest of devices should be re-vacuum packaged ASAP.

WARNING:

- Electrical performance can differ according to installation condition of the device. Users shall independently assess the suitability of the device under actual using condition.
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire
- These devices are intended to protect against the effects of temporary over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the performance of these PPTC devices
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses
- Circuits with inductance may generate a voltage (L di/dt) above the rated voltage of the PPTC device.
- Consult with LF when the device is to be applied with thermal process other than reflow onto the board, like molding/hand soldering