

# Surface Mount Polymer PTC High Operating Temperature PBT Series, 1210 Size

## Features:

- Operating temperature range up to 125 °C
- Low thermal derating factor
- Higher hold currents at elevated temperature
- RoHS compliant
- Halogen free

## Applications:

- Overcurrent surge protection of electronic equipment required to operate at high operating temperature ranges
- Resettable fault protection of general electronic equipment

## Ordering Code:

### PBT 1210-016

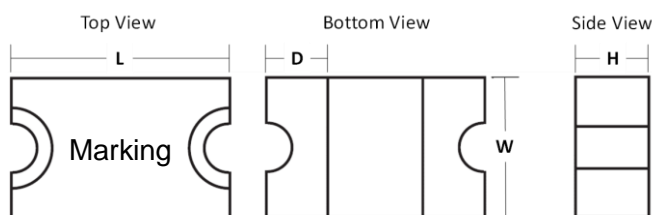
(1) (2) (3)

- (1) Series code
- (2) Size code
- (3) Current rating code  
016: 0.16A

## Agency Approval:

Pending

## Product Dimensions:



Part Number	L mm (inches)		W mm (inches)		H mm (inches)		D mm (inches)
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
PBT1210-010	3.00	3.43	2.35	2.80	0.40	0.85	0.30
PBT1210-050	(0.118)	(0.135)	(0.093)	(0.110)	(0.016)	(0.033)	(0.012)
PBT1210-075	3.00	3.43	2.35	2.80	0.60	1.20	0.30
PBT1210-110	(0.118)	(0.135)	(0.093)	(0.110)	(0.024)	(0.047)	(0.012)
PBT1210-150	3.00	3.43	2.35	2.80	0.80	1.60	0.30
PBT1210-150	(0.118)	(0.135)	(0.093)	(0.110)	(0.031)	(0.063)	(0.012)

## Typical Ratings and Characteristics (@ 23°C):

✧ Operating temperature: -40 to +125°C

Part Number	Current (A)		V <sub>Max</sub> (Vdc)	I <sub>Max</sub> (A)	Max. Time to Trip (sec)		Typical Power (Pd, W)	Resistance Min. (Ω)	One Hours Post Reflow Resistance R <sub>1</sub> Max. (Ω) <sup>1</sup>
	Hold (I <sub>H</sub> )	Trip (I <sub>T</sub> )			Current (A)	Time (sec)			
PBT1210-010	0.10	0.50	30	20	2.50	1.50	1.0	1.00	7.50
PBT1210-016	0.16	0.80	30	20	8.00	0.10	1.0	0.70	6.00
PBT1210-020	0.20	1.00	30	20	8.00	0.10	1.0	0.60	5.00
PBT1210-035	0.35	1.75	30	20	8.00	0.10	1.0	0.40	2.20
PBT1210-050	0.50	2.50	30	20	8.00	0.10	1.0	0.30	1.60
PBT1210-075	0.75	3.75	16	20	8.00	5.00	1.0	0.10	1.00
PBT1210-110	1.10	5.50	9	20	8.00	5.00	1.0	0.06	0.50
PBT1210-125	1.25	3.75	9	40	8.00	5.00	1.5	0.03	0.30
PBT1210-150	1.50	4.50	9	40	8.00	5.00	1.5	0.025	0.25

<sup>1</sup> The max resistance of one-hour post reflow is a reference value. The value may change a little according to reflow conditions and soldering state.

## Packaging and Marking Information:

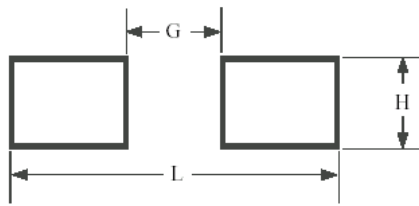
Part Number	Part Marking	Tape & Reel Quantity (piece)
PBT1210-010	B w	3,000
PBT1210-016	D w	
PBT1210-020	E w	
PBT1210-035	F w	
PBT1210-050	K w	
PBT1210-075	L w	
PBT1210-110	N w	2,000
PBT1210-125	P w	
PBT1210-150	S w	

B w → B = 0.10A; w = Week code (w=Y → week 49~50)

## Thermal De-rating Hold Current (A) at Ambient Temperature (23°C):

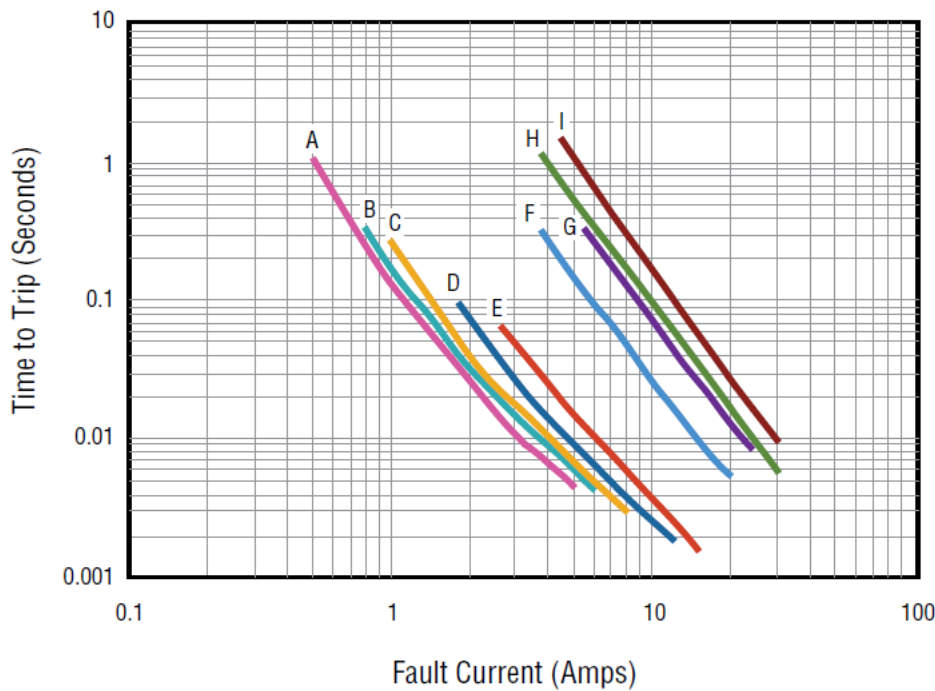
Part Number	Ambient temperature									
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C	125°C
PBT1210-010	0.15	0.13	0.12	0.10	0.09	0.08	0.07	0.07	0.06	0.03
PBT1210-016	0.23	0.21	0.19	0.16	0.14	0.13	0.12	0.11	0.09	0.04
PBT1210-020	0.29	0.26	0.23	0.20	0.18	0.16	0.15	0.13	0.11	0.05
PBT1210-035	0.51	0.46	0.41	0.35	0.31	0.28	0.26	0.23	0.20	0.09
PBT1210-050	0.73	0.66	0.58	0.50	0.44	0.41	0.37	0.34	0.28	0.14
PBT1210-075	1.09	0.98	0.87	0.75	0.66	0.61	0.56	0.50	0.42	0.20
PBT1210-110	1.60	1.44	1.28	1.10	0.97	0.89	0.81	0.74	0.62	0.30
PBT1210-125	1.81	1.64	1.45	1.25	1.10	1.01	0.93	0.84	0.70	0.34
PBT1210-150	2.18	1.97	1.74	1.50	1.32	1.22	1.11	1.01	0.84	0.41

**Recommended Foot Print Dimensions:**



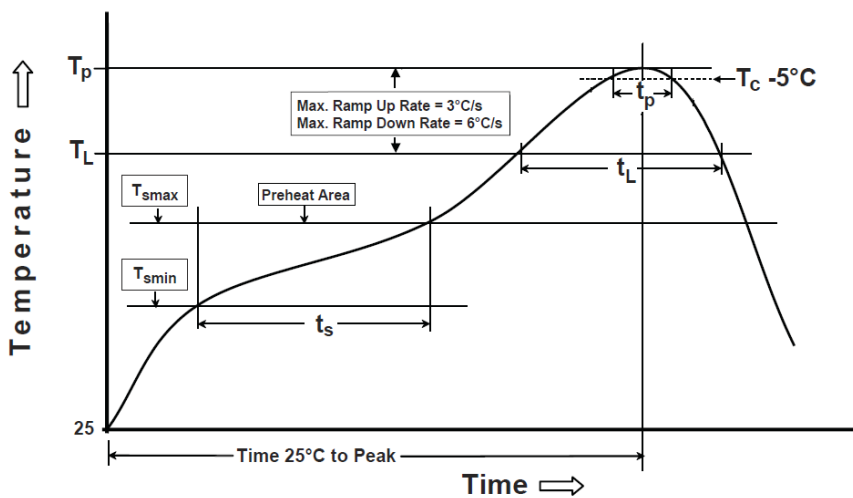
G (mm)	H (mm)	L (mm)
1.8±0.1	2.8±0.1	3.8±0.1

**Typical Time to Trip (@ 23°C):**



- A- PBT1210-010
- B- PBT1210-016
- C- PBT1210-020
- D- PBT1210-035
- E- PBT1210-050
- F- PBT1210-075
- G- PBT1210-110
- H- PBT1210-125
- I- PBT1210-150

**Recommended Reflow Soldering Profile:**



Profile Feature	Pb-Free Assembly
<b>Preheat/Soak</b>	
Temperature Min ( $T_{smin}$ )	150°C
Temperature Max( $T_{smax}$ )	200°C
Time( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60~180 seconds
Ramp-uprate ( $T_L$ to $T_p$ )	3°C/second max.
Liquidous temperature( $T_L$ )	217°C
Time( $t_L$ ) maintained above $T_L$	60~150 seconds
Peak package body temperature ( $T_p$ )	260°C
Time ( $t_p$ )*within 5°C of the specified classification temperature ( $T_c$ )	20~40 seconds *
Ramp-down rate ( $T_p$ to $T_L$ )	6°C/second max.
Time 25°C to peak temperature	8 minutes max.
* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum	

**Note:**

- PBT1210 series cannot be wave soldered. Please contact AEM for hand soldering recommendations.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
- Compatible with Pb and Pb-free solder reflow profiles.
- Excess solder may cause a short circuit, especially during hand soldering.

**Caution:** Operation beyond the rated voltage or current may result in rupture electrical arcing or flame.


**WARNING:**

- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- The devices are intended for protection against occasional over-current or over-temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal and mechanical procedures for electronic components.
- Operation in circuit with a large inductance can generate a circuit voltage ( $L di/dt$ ) above the rated voltage of the PPTC device.

Do not use this product in any Automotive Power train or Safety equipment such as ECU, ABS systems, or Battery Pack, Battery Management System, Battery Charger for Electric Vehicles and Plug-in Hybrid Vehicles. Only AEM products clearly described as "for Automotive Use" on its catalog can be used for automobile applications such as Power train and Safety equipment.