

# Surface Mount Polymer PTC

## PBS Series, 1206 Size



### **Features:**

- Resettable over-current protection
- Small size of 1206
- Fast time-to-trip
- RoHS compliant
- Halogen free

### **Applications:**

- Mobile phones - Battery and port protection
- Portable electronic devices
- Industrial controls
- Multimedia-PDAs / digital cameras
- Game console port protection
- USB port protection - USB 2.0, 3.0 & OTG
- HDMI 1.4 Source protection
- PC motherboards - Plug and Play protection
- Telecom & broadband instruments

### **Ordering Code:**

#### **PBS 1206-035-16 F**

(1) (2) (3) (4) (5)

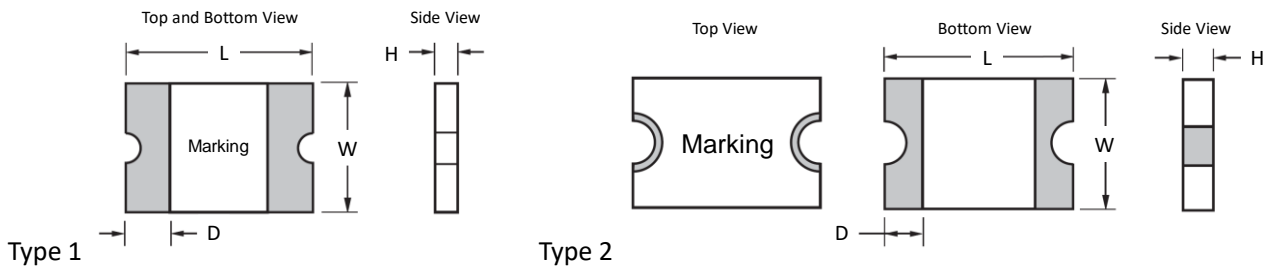
- (1) Series code
- (2) Size code
- (3) Current rating code  
035: 0.35A
- (4) Voltage rating code  
16: 16V
- (5) Identification code

### **Agency Approval:**

UL file number: E355716

TÜV certification number: R50371842, R50371875 and R50385152. Tested for EN60738-1: 2006+A1; EN60738-1:2008; EN60730-1: 2011 clause 15, 17 and Annex J.

## Product Dimensions:



Part Number	Type	L mm (inches)		W mm (inches)		H mm (inches)		D mm (inches)
		Min.	Max.	Min.	Max.	Min.	Max.	Min.
PBS1206-012	1	3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.70 (0.028)	1.10 (0.043)	0.25 (0.010)
PBS1206-016	1	3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.48 (0.019)	0.85 (0.033)	0.25 (0.010)
PBS1206-020		3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.40 (0.016)	0.85 (0.033)	0.25 (0.010)
PBS1206-020-30F	2	3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.48 (0.019)	0.85 (0.033)	0.25 (0.010)
PBS1206-025F		3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.40 (0.016)	0.85 (0.033)	0.25 (0.010)
PBS1206-035	1	3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.48 (0.019)	0.85 (0.033)	0.25 (0.010)
PBS1206-035-16F	2	3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.40 (0.016)	0.85 (0.033)	0.25 (0.010)
PBS1206-050		3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.48 (0.019)	0.85 (0.033)	0.25 (0.010)
PBS1206-075	1	3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.40 (0.016)	0.70 (0.028)	0.25 (0.010)
PBS1206-110		3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.40 (0.016)	0.70 (0.028)	0.25 (0.010)
PBS1206-150		3.00 (0.118)	3.40 (0.134)	1.40 (0.055)	1.80 (0.071)	0.40 (0.016)	0.70 (0.028)	0.25 (0.010)
PBS1206-200	1	3.00 (0.118)	3.50 (0.138)	1.40 (0.055)	1.80 (0.071)	0.70 (0.028)	1.60 (0.063)	0.25 (0.010)

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

✧ Operating temperature: -40 to +85°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>	Agency Approval	
	Hold (I <sub>H</sub> )	Trip (I <sub>T</sub> )			Current (A)	Time (sec)				UL	TÜV
PBS1206-012	0.12	0.29	30	10	1.0	0.20	0.6	1.35	8.50	√	√
PBS1206-016	0.16	0.37	30	10	1.0	0.30	0.6	0.7	6.00	√	√
PBS1206-020	0.20	0.46	24	10	1.0	0.60	0.6	0.60	2.60	√	√
PBS1206-020-30F	0.20	0.40	30	60	1.0	0.60	0.6	0.60	3.30	√	√
PBS1206-025F	0.25	0.50	16	20	8.0	0.08	0.6	0.45	2.30	√	√
PBS1206-035	0.35	0.75	6	100	8.0	0.10	0.6	0.30	1.20	√	√
PBS1206-035-16F	0.35	0.75	16	20	3.5	0.14	0.6	0.30	1.40	√	√
PBS1206-050	0.50	1.00	13.2	100	8.0	0.10	0.6	0.15	0.70	√	√
PBS1206-075	0.75	1.50	6	100	8.0	0.10	0.6	0.10	0.40	√	√
PBS1206-110	1.10	2.20	6	100	8.0	0.2	0.6	0.06	0.20	√	√
PBS1206-150	1.50	3.00	6	100	8.0	0.30	0.6	0.03	0.13	√	√
PBS1206-200	2.00	4.00	6	100	8.0	1.00	0.6	0.02	0.085	√	√

<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.

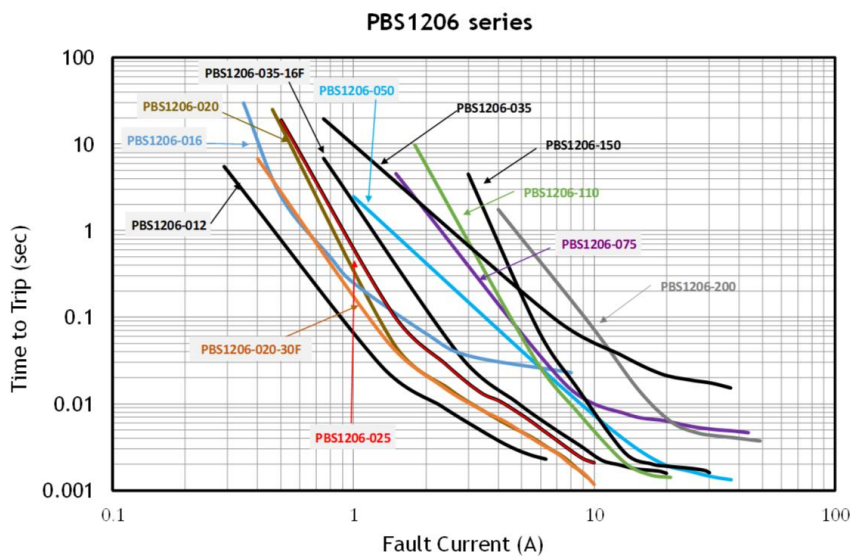
### Packaging and Marking Information:

Part Number	Part Marking	Tape & Reel Quantity (piece)
PBS1206-012	<u>0</u>	3,000
PBS1206-016	<u>1</u>	
PBS1206-020	<u>2</u>	
PBS1206-020-30F	2	
PBS1206-025F	C	
PBS1206-035	<u>3</u>	
PBS1206-035-16F	3	
PBS1206-050	<u>4</u>	
PBS1206-075	<u>5</u>	
PBS1206-110	<u>6</u>	
PBS1206-150	<u>8</u>	
PBS1206-200	<u>A</u>	

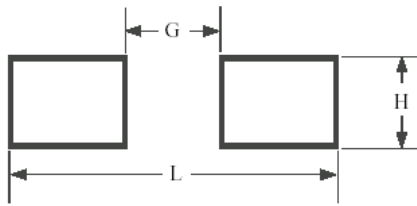
### Thermal De-rating Hold Current (A) at Ambient Temperature (23°C):

Part Number	Ambient temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
PBS1206-012	0.19	0.17	0.15	0.12	0.11	0.10	0.09	0.08	0.07
PBS1206-016	0.21	0.20	0.18	0.16	0.14	0.13	0.12	0.11	0.09
PBS1206-020	0.30	0.27	0.24	0.20	0.18	0.16	0.14	0.12	0.11
PBS1206-020-30F	0.30	0.27	0.24	0.20	0.18	0.16	0.14	0.12	0.10
PBS1206-025F	0.39	0.35	0.31	0.25	0.23	0.21	0.18	0.16	0.13
PBS1206-035	0.51	0.46	0.40	0.35	0.30	0.27	0.24	0.22	0.18
PBS1206-035-16F	0.51	0.46	0.40	0.35	0.30	0.27	0.24	0.22	0.18
PBS1206-050	0.76	0.68	0.59	0.50	0.44	0.40	0.35	0.32	0.26
PBS1206-075	1.11	1.00	0.85	0.75	0.67	0.61	0.52	0.50	0.42
PBS1206-110	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
PBS1206-150	2.20	1.99	1.77	1.50	1.34	1.23	1.10	1.01	0.84
PBS1206-200	2.88	2.61	2.28	2.00	1.80	1.66	1.51	1.39	1.19

### Typical Time to Trip (@ 23°C):



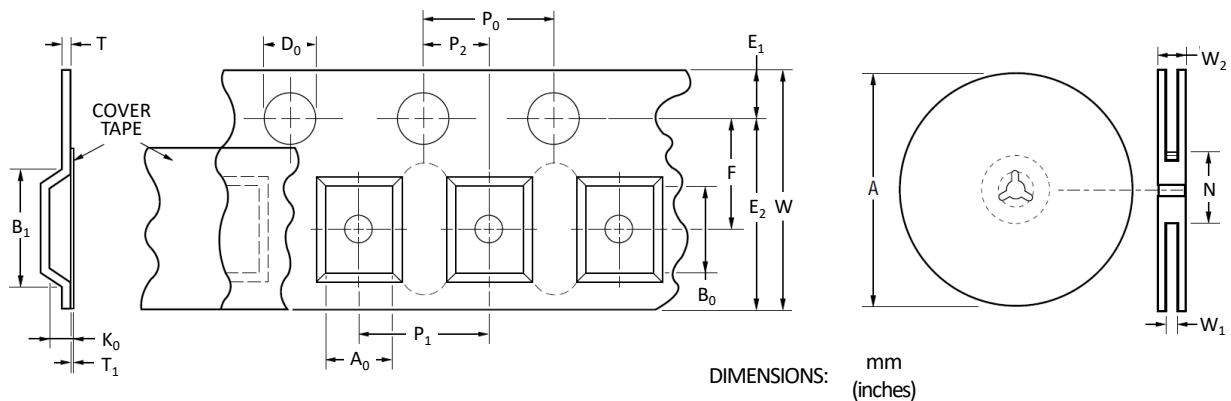
### Recommended Foot Print Dimensions:



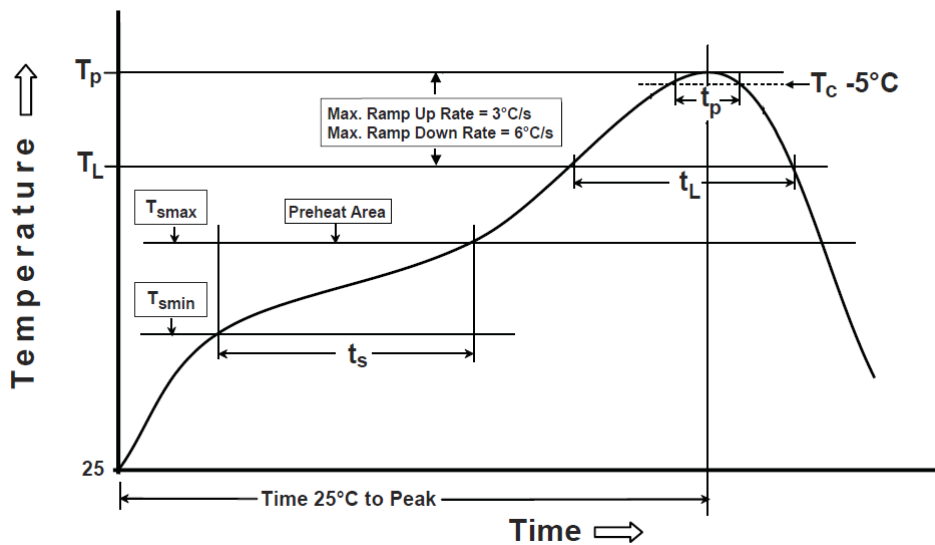
G (mm)	H (mm)	L (mm)
2.0±0.1	1.6±0.1	4.0±0.1

### Tape and Reel Specifications:

Dimensions (Tape)	PBS1206-012 PBS1206-200	PBS1206-020 PBS1206-050 PBS1206-016 PBS1206-035	PBS1206-075	PBS1206-150 PBS1206-110	PBS1206-020-30F PBS1206-025F PBS1206-035-16F	Dimensions (Reel)	PBS1206 Series
W	8.0±0.3 (0.315±0.012)	8.0±0.3 (0.315±0.012)	8.0±0.3 (0.315±0.012)	8.0±0.3 (0.315±0.012)	8.0±0.3 (0.315±0.012)	A max.	185 (7.28)
P <sub>0</sub>	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	N min.	50 (1.97)
P <sub>1</sub>	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	4.0±0.1 (0.157±0.004)	W <sub>1</sub>	8.4+1.5/-0.0 (0.331+0.059/-0.0)
P <sub>2</sub>	2.0±0.05 (0.079±0.002)	2.0±0.05 (0.079±0.002)	2.0±0.05 (0.079±0.002)	2.0±0.05 (0.079±0.002)	2.0±0.05 (0.079±0.002)	W <sub>2</sub> max.	14.4 (0.567)
A <sub>0</sub>	1.95±0.1 (0.077±0.004)	1.9±0.1 (0.075±0.004)	1.9±0.1 (0.075±0.004)	1.9±0.1 (0.075±0.004)	1.95±0.10 (0.077±0.004)		
B <sub>0</sub>	3.55±0.1 (0.140±0.004)	3.45±0.10 (0.136±0.004)	3.5±0.1 (0.138±0.004)	3.45±0.1 (0.138±0.004)	3.55±0.10 (0.140±0.004)		
B <sub>1</sub> max.	4.35 (0.171)	4.35 (0.171)	4.35 (0.171)	4.35 (0.171)	4.35 (0.171)		
D <sub>0</sub>	1.5+0.1/-0.0 (0.059+0.004/-0.0)	1.5+0.1/-0.0 (0.059+0.004/-0.0)	1.5+0.1/-0.0 (0.059+0.004/-0.0)	1.5+0.1/-0.0 (0.059+0.004/-0.0)	1.5+0.1/-0.0 (0.059+0.004/-0.0)		
F	3.5±0.05 (0.138±0.002)	3.5±0.05 (0.138±0.002)	3.5±0.05 (0.138±0.002)	3.5±0.05 (0.138±0.002)	3.5±0.05 (0.138±0.002)		
E <sub>1</sub>	1.75±0.1 (0.069±0.004)	1.75±0.1 (0.069±0.004)	1.75±0.1 (0.069±0.004)	1.75±0.1 (0.069±0.004)	1.75±0.1 (0.069±0.004)		
E <sub>2</sub> max.	6.25 (0.246)	6.25 (0.246)	6.25 (0.246)	6.25 (0.246)	6.25 (0.246)		
T max.	0.6 (0.024)	0.6 (0.024)	0.6 (0.024)	0.6 (0.024)	0.6 (0.024)		
T <sub>1</sub> max.	0.1 (0.004)	0.1 (0.004)	0.1 (0.004)	0.1 (0.004)	0.1 (0.004)		
K <sub>0</sub>	1.35±0.1 (0.053±0.004)	1.04±0.1 (0.041±0.004)	0.85±0.1 (0.033±0.004)	0.85±0.1 (0.033±0.004)	0.80±0.15 (0.031±0.006)		



### 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-up rate ( $T_L$ 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 ( $T_c$ )	20-40seconds *
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:

- PBS1206 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.