

# Surface Mount Polymer PTC

## PBS Series, 0603 Size



### Features:

- Resettable over-current protection
- Small size of 0603
- Fast time-to-trip
- RoHS compliant
- Halogen free

### Applications:

- Battery packs
- Portable electronic devices
- Industrial controls
- Multimedia
- Game machines
- Telecom & broadband instruments

### Ordering Code:

#### **PBS 0603-035 F**

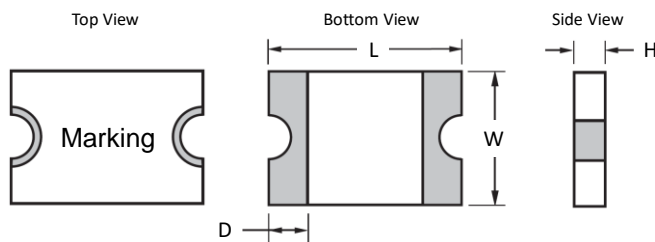
(1) (2) (3) (4)

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

### Agency Approval:

Recognized under the components program of UL.  
File number: E355716

### Product Dimensions:



Part Number	L mm (inches)		W mm (inches)		H mm (inches)		D mm (inches)
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
PBS0603-010F							
PBS0603-020F	1.45	1.85	0.65	1.05	0.30	0.65	0.20
PBS0603-025F	(0.057)	(0.073)	(0.026)	(0.041)	(0.012)	(0.026)	(0.008)
PBS0603-035F							
PBS0603-050F	1.45	1.85	0.65	1.05	0.65	1.00	0.20
	(0.057)	(0.073)	(0.026)	(0.041)	(0.026)	(0.039)	(0.008)

### 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>
	Hold (I <sub>H</sub> )	Trip (I <sub>T</sub> )			Current (A)	Time (sec)			
PBS0603-010F	0.10	0.30	15	40	0.5	1.00	0.50	0.900	6.000
PBS0603-020F	0.20	0.50	9	40	1.0	0.60	0.50	0.550	3.500
PBS0603-025F	0.25	0.75	6	40	8.0	0.10	0.50	0.200	1.400
PBS0603-035F	0.35	0.75	6	40	8.0	0.10	0.50	0.200	1.400
PBS0603-050F	0.50	1.00	6	40	8.0	0.10	0.50	0.100	0.800

<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.

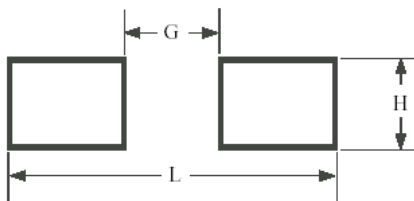
### Packaging and Marking Information:

Part Number	Part Marking	Tape & Reel Quantity (piece)
PBS0603-010F	II	5,000
PBS0603-020F	I	6,000
PBS0603-025F	+	
PBS0603-035F	•	
PBS0603-050F	-	4,000

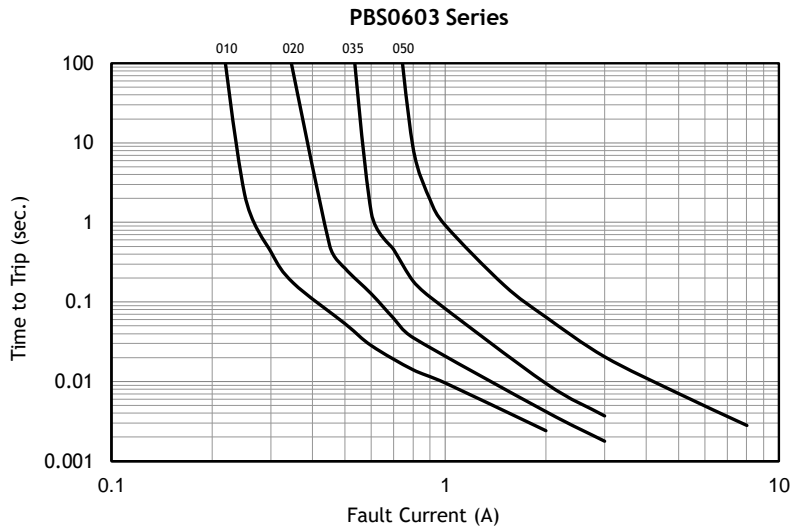
### Thermal De-rating Hold Current (A) at Ambient Temperature:

Part Number	Ambient temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
PBS0603-010F	0.13	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.03
PBS0603-020F	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07
PBS0603-020F	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
PBS0603-035F	0.47	0.41	0.38	0.35	0.29	0.26	0.24	0.20	0.14
PBS0603-050F	0.67	0.59	0.54	0.50	0.41	0.37	0.34	0.29	0.20

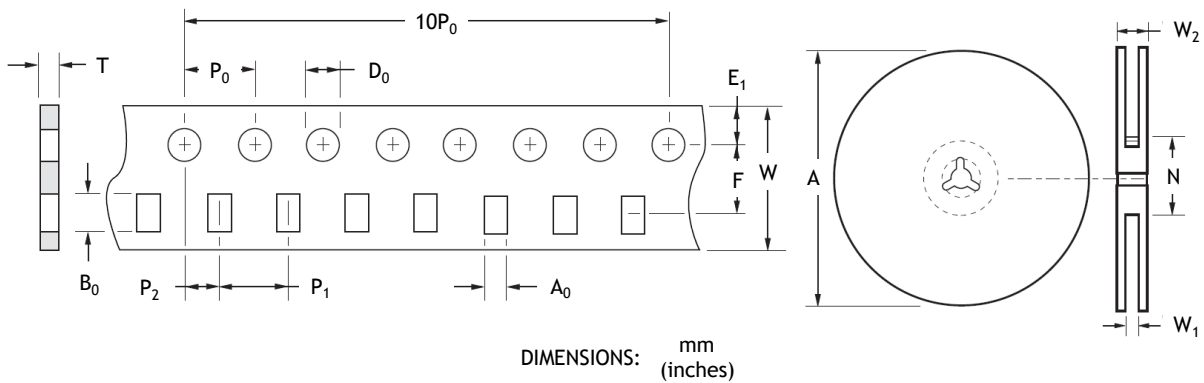
### Recommended Foot Print Dimensions:



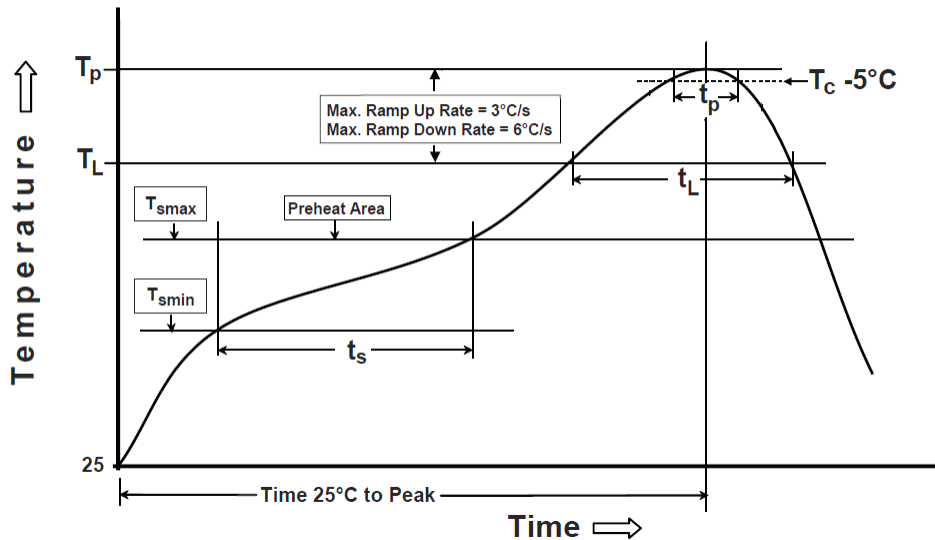
G (mm)	H (mm)	L (mm)
0.8±0.1	1.0±0.1	2.2±0.1

**Typical Time to Trip (@ 23°C):**

**Tape and Reel Specifications:**

Dimensions (Tape)	PBS0603-010F	PBS0603-020F PBS0603-025F PBS0603-035F	PBS0603-050F	Dimensions (Reel)	PBS0603 Series
W	8.0±0.1 (0.315±0.004)	8.0±0.1 (0.315±0.004)	8.0±0.1 (0.315±0.004)	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)	N min.	50 (1.97)
P <sub>1</sub>	4.0±0.05 (0.157±0.002)	4.0±0.05 (0.157±0.002)	4.0±0.05 (0.157±0.002)	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)	W <sub>2</sub> max.	14.4 (0.567)
A <sub>0</sub>	1.17±0.05 (0.046±0.002)	1.17±0.05 (0.046±0.002)	1.17±0.05 (0.046±0.002)		
B <sub>0</sub>	2.02±0.05 (0.079±0.002)	2.02±0.05 (0.079±0.002)	2.02±0.05 (0.079±0.002)		
D <sub>0</sub>	1.55±0.05 (0.061±0.002)	1.55±0.05 (0.061±0.002)	1.55±0.05 (0.061±0.002)		
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)		
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)		
T	0.75±0.05 (0.030±0.002)	0.60±0.05 (0.024±0.002)	0.95±0.05 (0.037±0.002)		
10P <sub>0</sub>	40.0±0.1 (1.575±0.004)	40.0±0.1 (1.575±0.004)	40.0±0.1 (1.575±0.004)		



### 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 $T_{smax}$ )	60~120 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 $5^\circ\text{C}$ of the specified classification temperature ( $T_c$ )	30 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:

- PBS0603 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.