

Surface Mount Polymer PTC

Automotive Grade, High Operating Temperature

PAT Series, 1206 Size

Features:

- AEC-Q200 Rev-D stress test qualification
- Operating temperature range up to 125 °C
- Low thermal derating factor
- Higher hold currents at elevated temperature
- RoHS compliant
- Halogen free

Applications:

- Protection of automotive circuitry including engine control modules
- Overcurrent surge protection of electronic equipment required to operate at high operating temperature ranges
- Resettable fault protection of general electronic equipment

Ordering Code:

PAT 1206-016

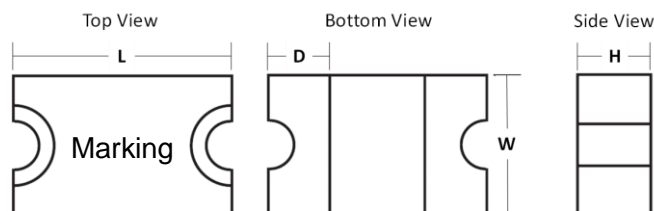
(1) (2) (3)

- (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. |
| PAT1206-010 PAT1206-016 PAT1206-020 PAT1206-035 | 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) |
| PAT1206-050 PAT1206-075 | 3.00 (0.118) | 3.40 (0.134) | 1.40 (0.055) | 1.80 (0.071) | 0.60 (0.024) | 1.20 (0.047) | 0.25 (0.010) |

Typical Ratings and Characteristics (@ 23°C):

✧ Operating temperature: -40 to +125°C

| Part Number | Current (A) | | V _{Max} (Vdc) | I _{Max} (A) | Max. Time to Trip (sec) | | Typical Power (Pd, W) | Resistance Min. (Ω) | One Hours Post Reflow Resistance R ₁ Max. (Ω) ¹ |
|-------------|------------------------|------------------------|---------------------------|-------------------------|-------------------------|------------|--------------------------|------------------------|--|
| | Hold (I _H) | Trip (I _T) | | | Current (A) | Time (sec) | | | |
| PAT1206-010 | 0.10 | 0.50 | 30 | 20 | 2.50 | 1.50 | 0.9 | 1.00 | 7.50 |
| PAT1206-016 | 0.16 | 0.80 | 30 | 20 | 8.00 | 0.10 | 0.9 | 0.70 | 6.00 |
| PAT1206-020 | 0.20 | 1.00 | 30 | 20 | 8.00 | 0.10 | 0.9 | 0.60 | 5.00 |
| PAT1206-035 | 0.35 | 1.75 | 30 | 20 | 8.00 | 0.10 | 0.9 | 0.40 | 2.60 |
| PAT1206-050 | 0.50 | 2.50 | 16 | 20 | 8.00 | 0.10 | 0.9 | 0.17 | 1.60 |
| PAT1206-075 | 0.75 | 3.00 | 12 | 40 | 8.00 | 5.00 | 1.2 | 0.08 | 0.70 |

¹ 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.

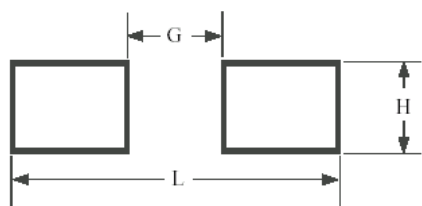
Packaging and Marking Information:

| Part Number | Part Marking | Tape & Reel Quantity (piece) |
|-------------|--------------|------------------------------|
| PAT1206-010 | B | 3,000 |
| PAT1206-016 | D | |
| PAT1206-020 | N | |
| PAT1206-035 | F | |
| PAT1206-050 | H | |
| PAT1206-075 | L | |

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

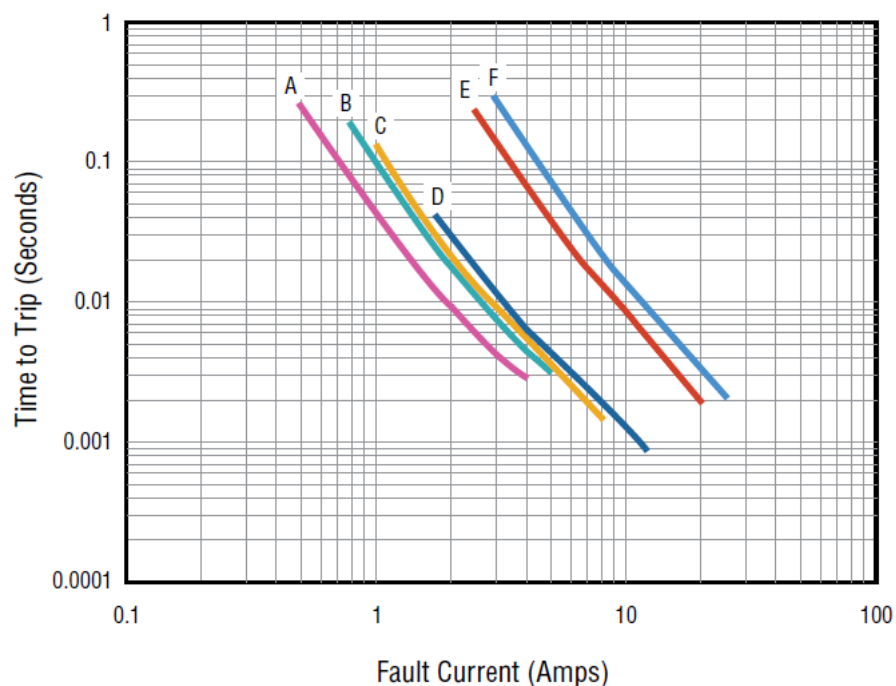
| Part Number | Ambient temperature | | | | | | | | | |
|-------------|---------------------|-------|------|------|------|------|------|------|------|-------|
| | -40°C | -20°C | 0°C | 23°C | 40°C | 50°C | 60°C | 70°C | 85°C | 125°C |
| PAT1206-010 | 0.15 | 0.13 | 0.12 | 0.10 | 0.09 | 0.08 | 0.07 | 0.07 | 0.06 | 0.03 |
| PAT1206-016 | 0.23 | 0.21 | 0.19 | 0.16 | 0.14 | 0.13 | 0.12 | 0.11 | 0.09 | 0.04 |
| PAT1206-020 | 0.29 | 0.26 | 0.23 | 0.20 | 0.18 | 0.16 | 0.15 | 0.13 | 0.11 | 0.05 |
| PAT1206-035 | 0.51 | 0.46 | 0.41 | 0.35 | 0.31 | 0.28 | 0.26 | 0.23 | 0.20 | 0.09 |
| PAT1206-050 | 0.73 | 0.66 | 0.58 | 0.50 | 0.44 | 0.41 | 0.37 | 0.34 | 0.28 | 0.14 |
| PAT1206-075 | 1.09 | 0.98 | 0.87 | 0.75 | 0.66 | 0.61 | 0.56 | 0.50 | 0.42 | 0.20 |

Recommended Foot Print Dimensions:

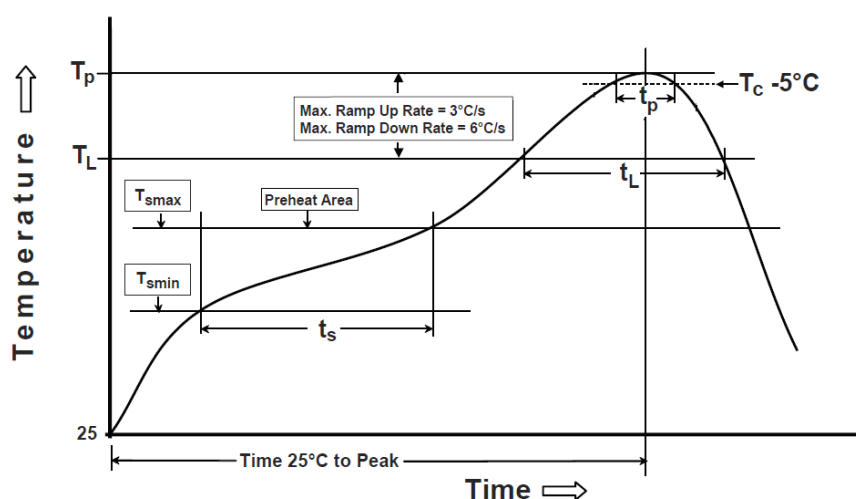


| G (mm) | H (mm) | L (mm) |
|---------|---------|---------|
| 2.0±0.1 | 1.6±0.1 | 4.0±0.1 |

Typical Time to Trip (@ 23°C):



Recommended Reflow Soldering Profile:



| Profile Feature | Pb-Free Assembly |
|--|------------------|
| Preheat/Soak | |
| 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) | 20~40 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:

- PAT1206 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.