

Surface Mount Polymer PTC

PAT1210 Series (Automotive Grade, 1210 Size)

Features:

- Automotive grade with AEC-Q200 qualification
- Operating temperature range up to 125°C
- Low thermal derating factor
- Higher hold currents at elevated temperature

Applications:

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

Product Identification:

PAT 1210 – 010

(1) (2) (3)

(1) **Series Code:** Surface Mount Polymer PTC

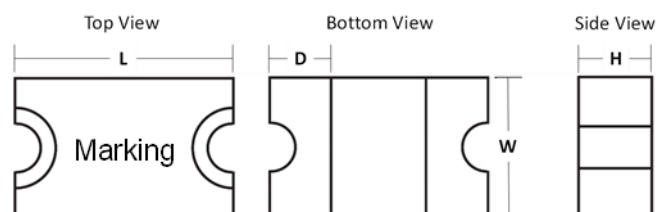
(2) **Size Code:** L x W (inch), the first two digits - L (length), the last two digits - W (width)

(3) **Current Rating Code:** 010 - 0.10A

Agency Approval:

- Pending

Shape and Dimensions:



Part Number	L mm (inches)		W mm (inches)		H mm (inches)		D mm (inches)
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
PAT1210-010							
PAT1210-016							
PAT1210-020	3.00	3.43	2.35	2.80	0.40	0.85	0.30
PAT2120-035	(0.118)	(0.135)	(0.093)	(0.110)	(0.016)	(0.033)	(0.012)
PAT1210-050							
PAT1210-075	3.00	3.43	2.35	2.80	0.60	1.20	0.30
	(0.118)	(0.135)	(0.093)	(0.110)	(0.024)	(0.047)	(0.012)
PAT1210-110							
PAT1210-125	3.00	3.43	2.35	2.80	0.80	1.60	0.30
PAT1210-150	(0.118)	(0.135)	(0.093)	(0.110)	(0.031)	(0.063)	(0.012)

Surface Mount Polymer PTC

PAT1210 Series (Automotive Grade, 1210 Size)

Ordering Information:

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 Re- sistance R ₁ Max. (Ω) ¹
	Hold (I _H)	Trip (I _T)			Current (A)	Time (sec)			
PAT1210-010	0.10	0.50	30	20	2.50	1.50	1.0	1.00	7.50
PAT1210-016	0.16	0.80	30	20	8.00	0.10	1.0	0.70	6.00
PAT1210-020	0.20	1.00	30	20	8.00	0.10	1.0	0.60	5.00
PAT1210-035	0.35	1.75	30	20	8.00	0.10	1.0	0.40	2.20
PAT1210-050	0.50	2.50	30	20	8.00	0.10	1.0	0.30	1.60
PAT1210-075	0.75	3.75	16	20	8.00	5.00	1.0	0.10	1.00
PAT1210-110	1.10	5.50	9	20	8.00	5.00	1.0	0.06	0.50
PAT1210-125	1.25	3.75	9	40	8.00	5.00	1.5	0.03	0.30
PAT1210-150	1.50	4.50	9	40	8.00	5.00	1.5	0.025	0.25

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.

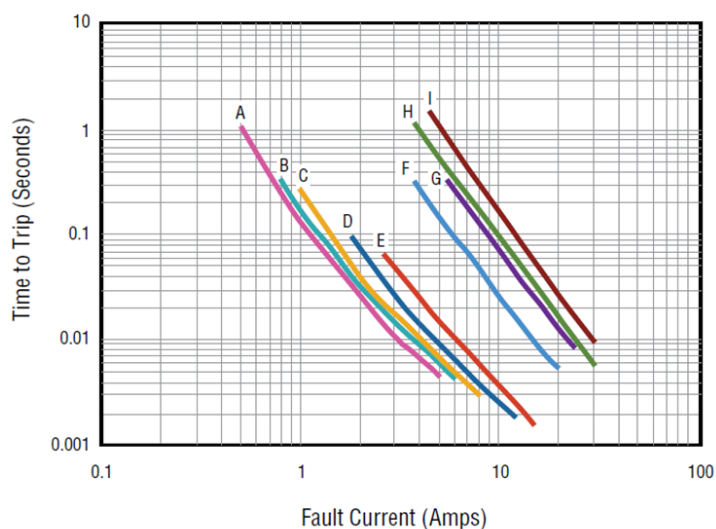
Temperature De-rating:

Part Number	Ambient temperature									
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C	125°C
PAT1210-010	0.15	0.13	0.12	0.10	0.09	0.08	0.07	0.07	0.06	0.03
PAT1210-016	0.23	0.21	0.19	0.16	0.14	0.13	0.12	0.11	0.09	0.04
PAT1210-020	0.29	0.26	0.23	0.20	0.18	0.16	0.15	0.13	0.11	0.05
PAT1210-035	0.51	0.46	0.41	0.35	0.31	0.28	0.26	0.23	0.20	0.09
PAT1210-050	0.73	0.66	0.58	0.50	0.44	0.41	0.37	0.34	0.28	0.14
PAT1210-075	1.09	0.98	0.87	0.75	0.66	0.61	0.56	0.50	0.42	0.20
PAT1210-110	1.60	1.44	1.28	1.10	0.97	0.89	0.81	0.74	0.62	0.30
PAT1210-125	1.81	1.64	1.45	1.25	1.10	1.01	0.93	0.84	0.70	0.34
PAT1210-150	2.18	1.97	1.74	1.50	1.32	1.22	1.11	1.01	0.84	0.41

Surface Mount Polymer PTC

PAT1210 Series (Automotive Grade, 1210 Size)

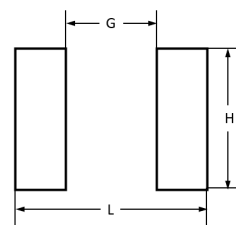
Typical Time to Trip (@ 23°C):



- A. PAT1210-010
- B. PAT1210-016
- C. PAT1210-020
- D. PAT1210-035
- E. PAT1210-050
- F. PAT1210-075
- G. PAT1210-110
- H. PAT1210-125
- I. PAT1210-150

Recommended Land Pattern:

Chip Size	1210	Unit
G (mm)	1.8±0.1	mm
H (mm)	2.8±0.1	mm
L (mm)	3.8±0.1	mm



Packaging and Marking Information:

Part Number	Part Marking	Tape & Reel Quantity
PAT1210-010	B w	3,000
PAT1210-016	D w	
PAT1210-020	E w	
PAT1210-035	F w	
PAT1210-050	K w	
PAT1210-075	L w	
PAT1210-110	N w	2,000
PAT1210-125	P w	
PAT1210-150	S w	

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

Operating Temperature Range:

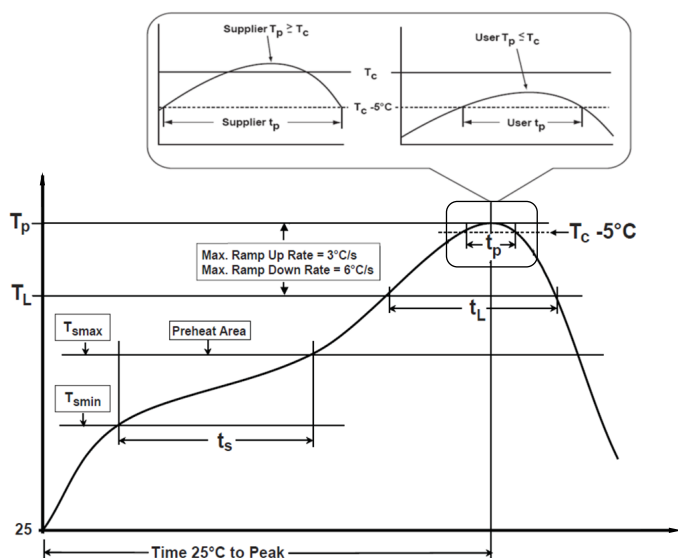
- -40°C ~ +125°C (with de-rating)

Surface Mount Polymer PTC

PAT1210 Series (Automotive Grade, 1210 Size)

Recommended Temperature Profile:

* Recommended Temperature Profile for Reflow Soldering



Profile Feature	Pb-Free Assembly
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	150°C 200°C 60~180 seconds
Ramp-up rate (T_L to T_p)	3°C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217°C 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:

- PAT1210 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.

Disclaimer

Specifications are subject to change without notice. AEM products are designed for specific applications and should not be used for any purpose (including, without limitation, automotive, aerospace, medical, life-saving applications, or any other application which requires especially high reliability for the prevention of such defect as may directly cause damage to the third party's life, body or property) not expressly set forth in applicable AEM product documentation. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Warranties granted by AEM shall be deemed void for products used for any purpose not expressly set forth in applicable AEM product documentation. AEM shall not be liable for any claims or damages arising out of products used in applications not expressly intended by AEM as set forth in applicable AEM product documentation. The sale and use of AEM products is subject to AEM terms and conditions of sale. Please refer to AEM's website for updated catalog and terms and conditions of sale.



AEM Components (Suzhou) Co., Ltd

**461 Zhongnan Street,
China-Singapore Suzhou Industrial Park
Jiangsu, P. R. China, 215026**

Tel: 86-512-6258-0028

Fax: 86-512-6258-0018

Email: marketing@aemchina.com

AEM Components (USA), Inc.

6670 Cobra Way, San Diego, CA 92121, USA

Tel: 1-858-750-6100

Fax: 1-858-481-1123

Email: sales@aemcomponents.com