SMD1210 Surface Mount PTC Devices

R.O.C. Patent#415624

- The SMD1210 Series, a smaller sized surface mountable device, is a new product extension of Polymeric Positive Temperature Coefficient (PPTC) resettable fuse.
- The new designed SMD1210 Series provides smallest footprint in a 3225(mm) package with current ratings from 0.05A to 1.5A and voltage ratings from 6V to 30V.
- Application: The exciting new SMD1210 product family is ideal for palm-top PC, personal digital assistants (PDAs), digital camera and other peripherals.
- Agency Approval: UL/CSA File No. E201431
  TÜV Certificate # R9956421.

ELECTRICAL CHARACTERISTICS

Part Number	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Maximum Time To Trip		Resistance			Agency Approval
						Current (A)	Time (Sec.)	R_{min} (Ω)	R_{typ} (Ω)	R_{1max} (Ω)	
SMD1210P005TS	0.05	0.15	30	10	0.60	0.25	1.50	3.600	25.00	50.00	UL/CSA/TÜV
SMD1210P010TS	0.10	0.30	30	10	0.60	0.50	1.50	1.600	7.000	15.00	UL/CSA/TÜV
SMD1210P020TS	0.20	0.40	30	10	0.60	8.00	0.02	0.800	2.900	5.000	UL/CSA/TÜV
SMD1210P035TS	0.35	0.70	6	40	0.60	8.00	0.20	0.320	0.810	1.300	UL/CSA/TÜV
SMD1210P050TS	0.50	1.00	13.2	40	0.60	8.00	0.10	0.250	0.550	0.900	UL/CSA/TÜV
SMD1210P075TS	0.75	1.50	6	40	0.60	8.00	0.10	0.130	0.290	0.400	UL/CSA/TÜV
SMD1210P110TS	1.10	2.20	6	40	0.60	8.00	0.30	0.060	0.140	0.210	UL/CSA/TÜV
SMD1210P150TS	1.50	3.00	6	40	0.80	8.00	0.50	0.040	0.070	0.110	UL/CSA/TÜV

Note: I_{hold} = Hold current: maximum current device will pass without tripping in 20℃ still air.

I_{trip} = Trip current: minimum current at which the device will trip in 20℃ still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max})

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max})

P_d = Power dissipated from device when in the tripped state at 20℃ still air.

R_{min} = Minimum resistance of device in initial (un-soldered) state.

R_{typ} = Typical resistance of device in initial (un-soldered) state.

R_{1max} = Maximum resistance of device at 20℃ measured one hour after tripping or reflow soldering of 260℃ for 20 sec.

All products may be followed by suffix TF

Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

Recognitions: UL, CSA, TÜV recognized.

◎Specifications are subject to change without notice.

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How to Select a Polymer PTC fuse:

(1) Determine the following operating parameters for the circuits:
  (A) Normal Operating Current (I hold)
  (B) Maximum Circuit Voltage (V max)
  (C) Maximum Interrupt Current (I max)
  (D) Normal Operating Temperature (min℃/max℃)
(2) Select the device form factor and dimension suitable for the application:
  Surface Mount Device (SMD Series)
  Radial Leaded Device (RLD Series)
  Axial Leaded Strap Device (STD Series)
  Other Custom-designed Device (Disc/Chip)
(3) Compare the maximum ratings for V max and I max of the PTC device with the circuit in application and make sure that the circuit's requirement does not exceed the device ratings.
(4) Check that the PTC device's trip time (time-to-trip) will protect the circuit.
(5) Verify that the circuit operating temperatures are within the PTC device's normal operating temperature range.
(6) Verify the performance and suitability of the chosen PTC device in the application.

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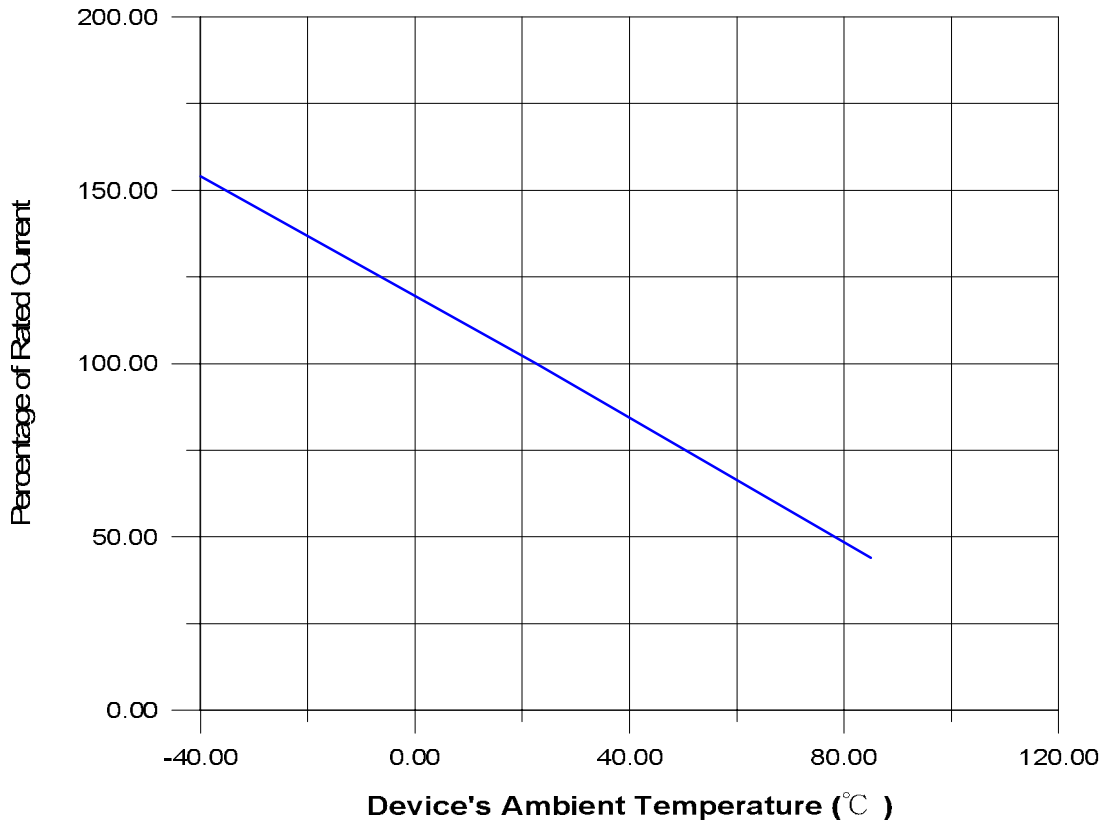
THERMAL DERATING CURVE FOR SMD1210 SERIES



THERMAL DERATING CHART FOR SMD1210 SERIES – Ihold (Amps)

Model	Ambient Operation Temperature								
	-40℃	-20℃	0℃	23℃	40℃	50℃	60℃	70℃	85℃
SMD1210P005TS	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
SMD1210P010TS	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
SMD1210P020TS	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
SMD1210P035TS	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
SMD1210P050TS	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
SMD1210P075TS	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
SMD1210P100TS	1.69	1.48	1.29	1.10	0.88	0.76	0.65	0.57	0.43
SMD1210P150TS	2.13	1.92	1.71	1.50	1.26	1.14	1.01	0.89	0.71

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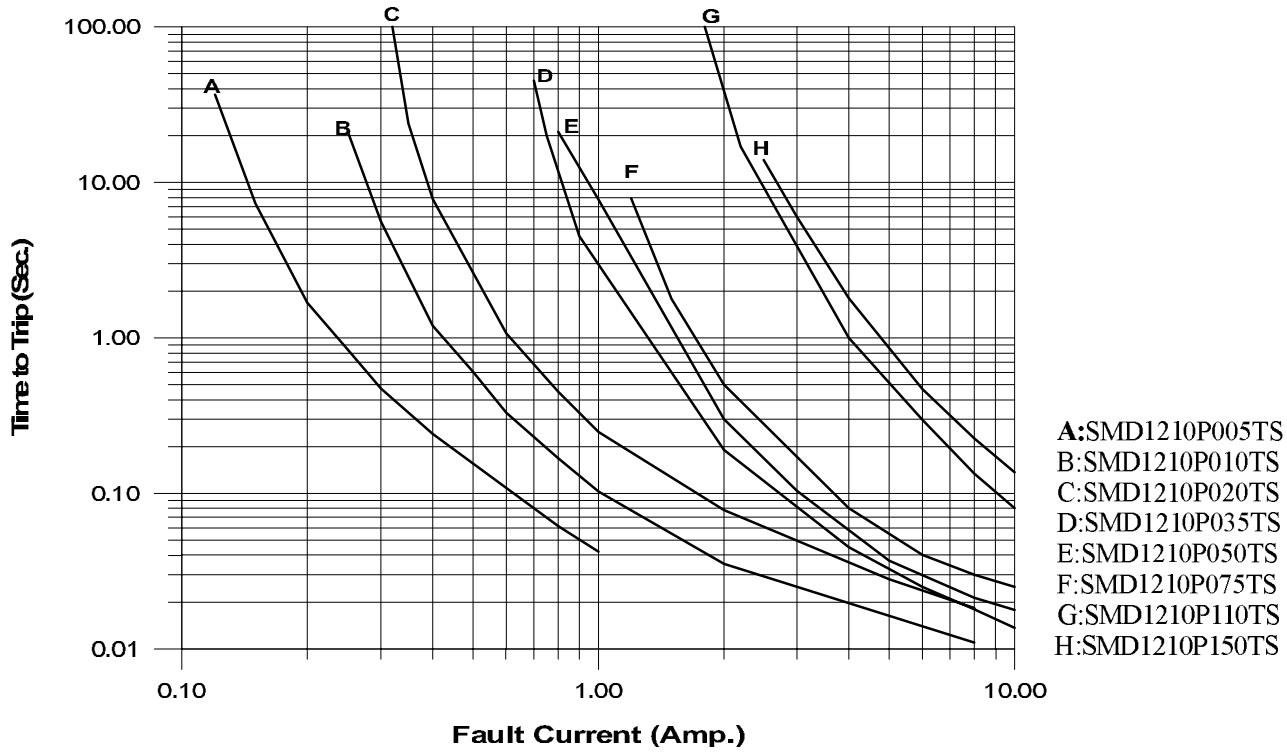
AVERAGE TIME-CURRENT CURVE FOR SMD1210 SERIES



A:SMD1210P005TS
B:SMD1210P010TS
C:SMD1210P020TS
D:SMD1210P035TS
E:SMD1210P050TS
F:SMD1210P075TS
G:SMD1210P110TS
H:SMD1210P150TS

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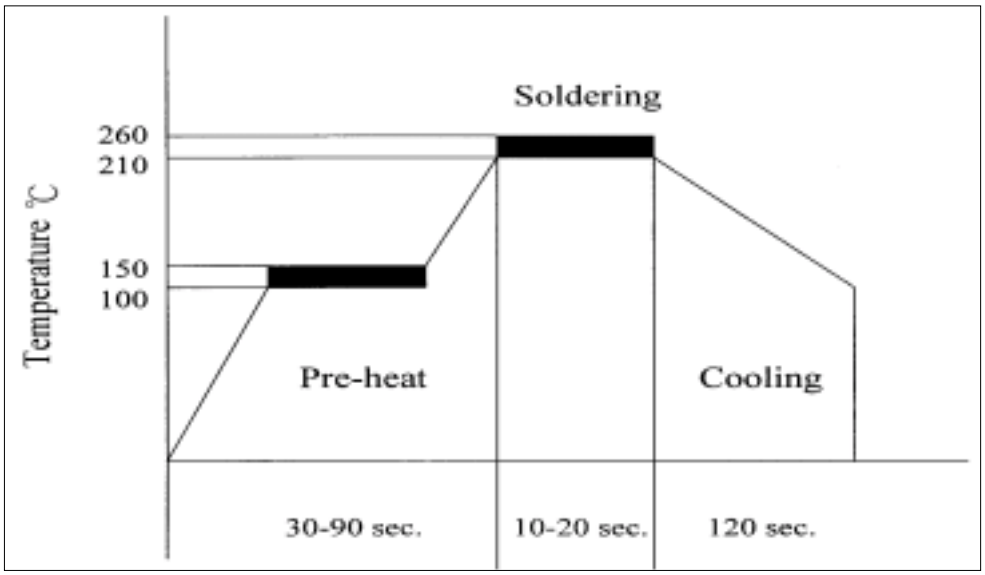
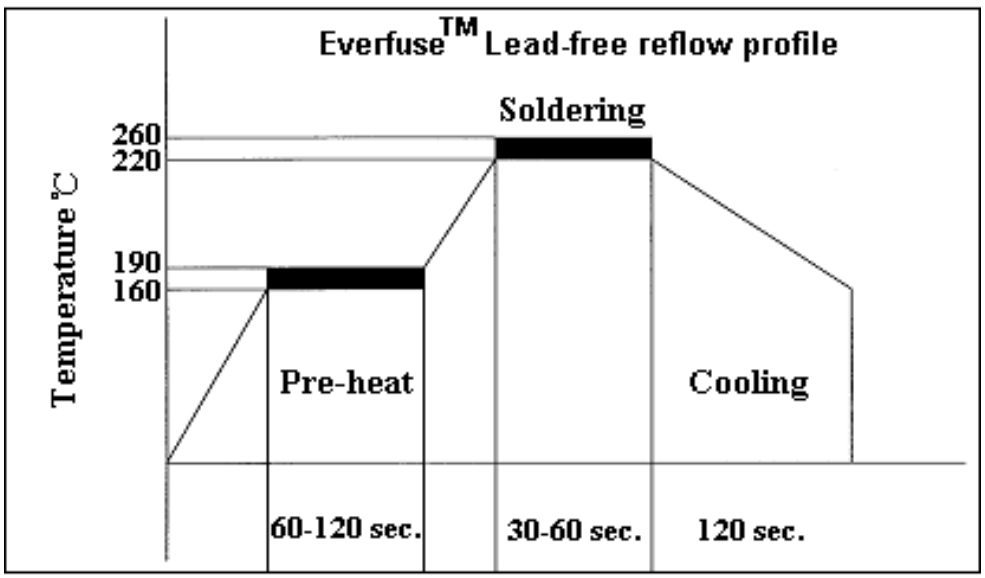
SOLDER REFLOW





- Recommended reflow methods: IR, vapor phase oven, hot air oven, N_2 environment for lead-free
- Devices are not designed to be wave soldered to the bottom side of the board.
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents.

Note: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

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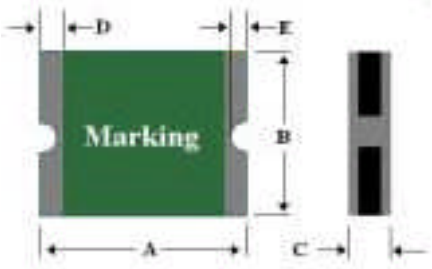
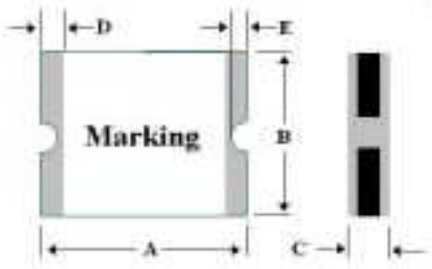
FIGURE

TS

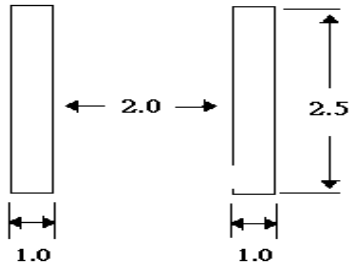


TF



SOLDER PAD LAYOUTS

(Dimension in mm)



PHYSICAL DIMENSIONS (mm)

Part Number	A		B		C		D	E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.	Max.
SMD1210P005TS	3.00	3.43	2.35	2.80	0.75	1.25	0.25	0.20	0.50
SMD1210P010TS	3.00	3.43	2.35	2.80	0.75	1.25	0.25	0.20	0.50
SMD1210P020TS	3.00	3.43	2.35	2.80	0.60	1.00	0.25	0.20	0.50
SMD1210P035TS	3.00	3.43	2.35	2.80	0.50	0.85	0.25	0.20	0.50
SMD1210P050TS	3.00	3.43	2.35	2.80	0.50	0.85	0.25	0.20	0.50
SMD1210P075TS	3.00	3.43	2.35	2.80	0.50	0.85	0.25	0.20	0.50
SMD1210P110TS	3.00	3.43	2.35	2.80	0.90	1.30	0.25	0.20	0.50
SMD1210P150TS	3.00	3.43	2.35	2.80	0.80	1.80	0.25	0.20	0.50

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ENVIRONMENTAL SPECIFICATIONS

Operating/Storage Temperature	-40℃ to +85℃	
Maximum Device Surface Temperature in Tripped State	125℃	
Passive Aging	+85℃, 1000 hours	±5% typical resistance change
Humidity Aging	+85℃, 85%R.H. 1000 hours	±5% typical resistance change
Thermal Shock	MIL-STD-202 Method 107G +85℃/-40℃ 20 times	 -30% typical resistance change
Solvent Resistance	MIL-STD-202, Method 215	No change
Vibration	MIL-STD-883C, Method 2007.1, Condition A	No change

PHYSICAL SPECIFICATIONS

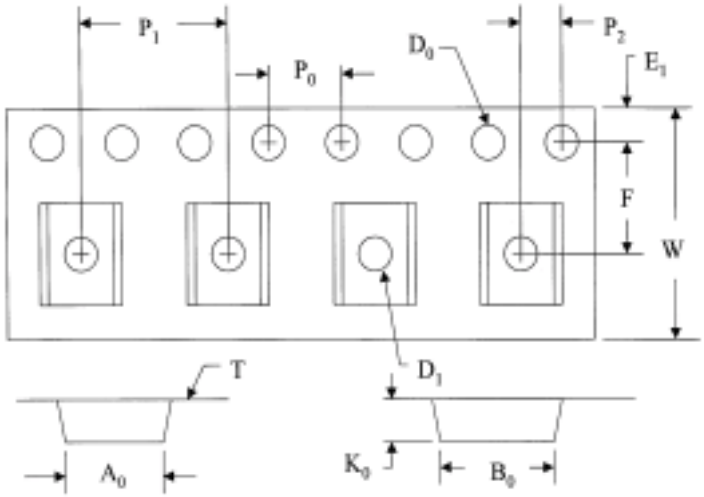
Terminal Material	Solder-Plated Copper (Solder Material: 63/37 SnPb or Tin(Sn))
Lead Solderability	Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.
Packaging	8 mm tape on 7 inch reel per EIA-481-1(equivalent to IEC286, part3) 2000 devices per reel for P150TS 3000 devices per reel for P005TS,P010TS,P020TSTS,P110TS for the others: 4000 devices per reel.

◎ Specifications are subject to change without notice. **04/09/2004**

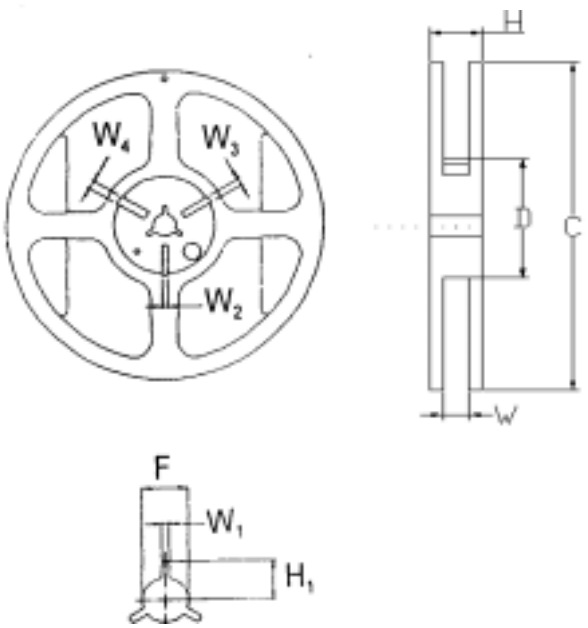
TAPE SPECIFICATIONS: EIA-481-1

	P035-P050 P075	P005-P010 P020-P110	P150
W	8.0+/-0.30	8.0+/-0.30	8.0+/-0.30
F	3.5+/-0.05	3.5+/-0.05	3.5+/-0.05
E_1	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10
D_0	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05
D_1	1.0 (min)	1.0 (min)	1.0 (min)
P_0	4.0+/-0.10	4.0+/-0.10	4.0+/-0.10
P_1	4.0+/-0.10	4.0+/-0.10	4.0+/-0.10
P_2	2.0+/-0.05	2.0+/-0.05	2.0+/-0.05
A_0	2.82+/-0.10	2.82+/-0.10	2.67+/-0.10
B_0	3.46+/-0.10	3.46+/-0.10	3.36+/-0.10
T	0.25+/-0.10	0.25+/-0.10	0.25+/-0.10
K_0	1.00+/-0.10	1.30+/-0.10	1.65+/-0.10
Leader min.	390	390	390
Trailer min.	160	160	160

(mm)



REEL DIMENSIONS : EIA-481-1



H	12.0+/-0.05
W	9.0+/-0.5
D	Ø60+0.5
F	Ø13.0+/-0.2
C	Ø178+/-1.0
H_1	11+/-0.5
W_1	2.2+/-0.5
W_2	3.0+0.5
W_3	4.0+0.5
W_4	5.5+0.5

(mm)

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PART NUMBERING SYSTEM

SMD 1210 P □□□ TS / F

- F: Lead-free
- S: Solder Plated Termination
- Multilayer Thickness Version
- Current Rating
- Polytronics Symbol
- Device Dimensions: Length/Width(Unit: 1/100 inch)
- Surface Mount Device

CROSS REFERENCE

Polytronics/ EVERFUSE™	Cross Reference	
	Raychem/ PolySwitch®	Bourns/ Multifuse®
SMD1210P005TS	MicroSMD005	MF-USMD005
SMD1210P010TS	MicroSMD010	MF-USMD010
SMD1210P020TS	N/A	MF-USMD020
SMD1210P035TS	MicroSMD035	MF-USMD035
SMD1210P050TS	MicroSMD050	MF-USMD050
SMD1210P075TS	MicroSMD075	MF-USMD075
SMD1210P110TS	MicroSMD110	MF-USMD110
SMD1210P150TS	MicroSMD150	N/A

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04/09/2004