

Data Sheet

Customer: _____

Product: Resettable Fuse (PPTC). SMD Type _____

Size : 0603/0805/1206/1210/1812/2920 _____

Issued Date: 15-Apr.-2016 _____

Edition: Ver. 2 _____

Record of change

Date	Ver.	Description	Page
10-Jun.-2015	1		
15-Apr-2016	2	Updated spec.	

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10-Jun.-2015	10-Jun.-2015	10-Jun.-2015	
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RESETTABLE FUSE (PPTC)

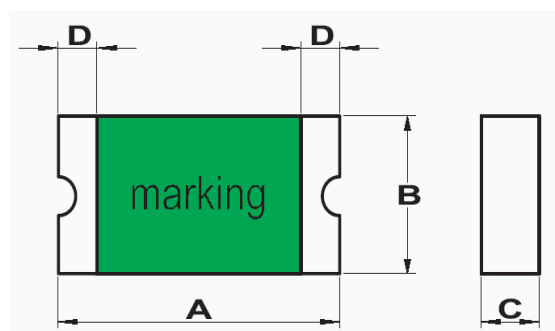
Features

- Suitable for lead free soldering.
- Compatible with flow and reflow soldering

Applications

- Consumer Electronics
- USB hub, M/B, Modem
- PDAs & Charger
- Analog & digital line card.
- Digital camera, Disk drivers, CD-ROMs

Construction & Dimension



Unit:mm

Terminal Pad Material :
Tin-plated Nickel-Copper

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0603SMD005	1.45	1.85	0.65	1.05	0.40	1.00	0.15
0603SMD010	1.45	1.85	0.65	1.05	0.40	1.00	0.15
0603SMD020	1.45	1.85	0.65	1.05	0.40	1.00	0.15
0603SMD025	1.45	1.85	0.65	1.05	0.40	1.00	0.15
0603SMD035	1.45	1.85	0.65	1.05	0.40	1.00	0.15
0603SMD050	1.45	1.85	0.65	1.05	0.50	1.00	0.15
0603SMD075	1.45	1.85	0.65	1.05	0.50	1.00	0.15

Package : 5,000pcs/reel

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
0805SMD010	2.00	2.20	1.20	1.50	0.50	1.00	0.20
0805SMD020	2.00	2.20	1.20	1.50	0.45	1.00	0.20
0805SMD035	2.00	2.20	1.20	1.50	0.45	1.00	0.20
0805SMD050	2.00	2.20	1.20	1.50	0.30	0.60	0.20
0805SMD075	2.00	2.20	1.20	1.50	0.65	1.25	0.20
0805SMD100	2.00	2.20	1.20	1.50	1.80	1.80	0.20
0805SMD110	2.00	2.20	1.20	1.50	0.50	1.20	0.20

Package : 010~050 5,000pcs/reel, 075~110 4,000pcs/reel

RESETTABLE FUSE (PPTC)

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1206SMD005	3.00	3.50	1.50	1.80	0.60	1.10	0.15
1206SMD010	3.00	3.50	1.50	1.80	0.60	1.10	0.15
1206SMD012	3.00	3.50	1.50	1.80	0.60	1.10	0.15
1206SMD025	3.00	3.50	1.50	1.80	0.40	0.90	0.15
1206SMD035	3.00	3.50	1.50	1.80	0.50	1.20	0.15
1206SMD050	3.00	3.50	1.50	1.80	0.50	1.20	0.15
1206SMD050/13.2	3.00	3.50	1.50	1.80	0.50	1.20	0.15
1206SMD075	3.00	3.50	1.50	1.80	0.50	1.20	0.15
1206SMD100	3.00	3.50	1.50	1.80	0.50	1.20	0.15
1206SMD110	3.00	3.50	1.50	1.80	0.40	0.80	0.15
1206SMD150	3.00	3.50	1.50	1.80	0.50	1.20	0.15
1206SMD200	3.00	3.50	1.50	1.80	0.50	1.20	0.15

Package : 005~012, 50/13.2, 150,200 : 3,500pcs/reel, 025~050, 075~100 : 5,000pcs/reel

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min	Max.	Min.
1210SMD005	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD010	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD020	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD035	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD050	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD075	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD110	3.00	3.43	2.35	2.80	0.40	0.90	0.30
1210SMD150	3.00	3.43	2.35	2.80	0.50	1.20	0.30
1210SMD175	3.00	3.43	2.35	2.80	0.50	1.20	0.30
1210SMD200	3.00	3.43	2.35	2.80	0.50	1.20	0.30

Package : 050, 075 : 4,000pcs/reel, The others : 4,500pcs/reel

RESETTABLE FUSE (PPTC)

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Max.
1812SMD010	4.37	4.73	3.07	3.41	0.50	1.00	0.25
1812SMD014	4.37	4.73	3.07	3.41	0.50	1.00	0.25
1812SMD020	4.37	4.73	3.07	3.41	0.50	1.30	0.25
1812SMD030	4.37	4.73	3.07	3.41	0.50	1.30	0.25
1812SMD050	4.37	4.73	3.07	3.41	0.40	0.90	0.25
1812SMD050/33	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD075	4.37	4.73	3.07	3.41	0.40	0.90	0.25
1812SMD075/16	4.37	4.73	3.07	3.41	0.40	0.90	0.25
1812SMD075/24	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD110	4.37	4.73	3.07	3.41	0.40	0.90	0.25
1812SMD110/16	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD125	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD150	4.37	4.73	3.07	3.41	0.40	0.90	0.25
1812MD150/16	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD160	4.37	4.73	3.07	3.41	0.40	0.90	0.25
1812SMD200	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD260	4.37	4.73	3.07	3.41	0.60	1.30	0.25
1812SMD300	4.37	4.73	3.07	3.41	0.50	1.30	0.25
1812SMD350	4.37	4.73	3.07	3.41	0.60	1.30	0.25

* Package : 1,500pcs/reel

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
2920SMD030	6.73	7.98	4.80	5.44	0.60	1.15	0.30
2920SMD050	6.73	7.98	4.80	5.44	0.60	1.15	0.30
2920SMD075	6.73	7.98	4.80	5.44	0.60	1.15	0.30
2920SMD100	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD125	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD150/16	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD150/33	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD185	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD200/16	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD200/24	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD250	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD260/6	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD260/16	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD300/6	6.73	7.98	4.80	5.44	0.50	1.30	0.30
2920SMD300/16	6.73	7.98	4.80	5.44	0.50	1.30	0.30

package : 2,000pcs/reel

RESETTABLE FUSE (PPTC)

Electrical Characteristic

Definition :

I_{hold} = Hold Current. Maximum current device will not trip in 25°C still air.

I_{trip} = Trip Current. Minimum current at which the device will always trip in 25°C still air.

V_{max} = Maximum operating 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 dissipation when device is in the tripped state in 25°C still air environment at rated voltage.

R_{i min}/max = Minimum/Maximum device resistance prior to tripping at 25°C.

R_{I max} = Maximum device resistance is measured one hour post reflow.

CAUTION : Operation beyond the specified ratings may result in damage and possible arcing and flame.

Model	V max (Vdc)	I max (Amps)	I hold (Amps)	I trip (Amps)	R _i min (Ω)	R _I max (Ω)	Max Time To Trip		P (d) (Watts)
							Amps	Sec.	
0603SMD005	15.0	40	0.05	0.20	2.00	10.0	0.50	1.00	0.50
0603SMD010	15.0	40	0.10	0.30	0.90	6.00	0.50	1.00	0.50
0603SMD020	9.0	40	0.20	0.50	0.55	3.50	1.00	0.60	0.50
0603SMD025	9.0	40	0.25	0.55	0.50	3.00	8.00	0.08	0.50
0603SMD035	6.0	40	0.35	0.75	0.20	1.40	8.00	0.10	0.50
0603SMD050	6.0	40	0.50	1.00	0.10	0.80	8.00	0.10	0.50
0603SMD075	6.0	40	0.75	1.40	0.06	0.45	8.00	0.10	0.50

Model	V max (Volts)	I max (Amps)	I hold (Amps)	I trip (Amps)	R min (Ω)	R _I max (Ω)	Max Time To Trip		P (d) (Watts)
							Amps	Sec.	
0805SMD010	15.0	100	0.10	0.30	1.00	6.000	0.50	1.50	0.5
0805SMD020	9.0	100	0.20	0.50	0.65	3.500	8.0	0.02	0.5
0805SMD035	6.0	100	0.35	0.75	0.25	1.200	8.0	0.10	0.5
0805SMD050	6.0	100	0.50	1.00	0.15	0.850	8.0	0.10	0.5
0805SMD075	6.0	40	0.75	1.50	0.09	0.385	8.0	0.20	0.6
0805SMD100	6.0	100	1.00	1.95	0.06	0.230	8.0	0.30	0.6
0805SMD110	6.0	100	1.10	2.20	0.06	0.21	8.0	0.30	0.60

RESETTABLE FUSE (PPTC)

Model	V max (Vdc)	I max (Amps)	I hold (Amps)	I trip (Amps)	R _i min (Ω)	R ₁ max (Ω)	Max Time To Trip		P (d) (Watts)
							Amps	Sec.	
1206SMD005	60.0	100	0.05	0.15	3.600	50.00	0.25	1.50	0.40
1206SMD010	60.0	100	0.10	0.25	1.600	15.00	0.50	1.00	0.40
1206SMD012	60.0	100	0.12	0.29	1.600	15.00	0.50	1.00	0.40
1206SMD025	16.0	100	0.25	0.50	0.350	2.500	8.00	0.08	0.60
1206SMD035	6.00	100	0.35	0.75	0.250	1.300	8.00	0.10	0.60
1206SMD050	6.00	100	0.50	1.00	0.150	0.700	8.00	0.10	0.60
1206SMD050/13.2	6.00	100	0.50	1.00	0.150	0.700	8.00	0.10	0.60
1206SMD075	6.00	100	0.75	1.50	0.090	0.500	8.00	0.20	0.60
1206SMD100	6.00	100	1.00	1.80	0.055	0.270	8.00	0.30	0.60
1206SMD110	6.00	100	1.10	2.20	0.050	0.250	8.00	0.30	0.60
1206SMD150	6.00	100	1.50	3.00	0.040	0.130	8.00	1.00	0.80
1206SMD200	6.00	100	2.00	3.50	0.018	0.080	8.00	1.50	0.80

Model	V max (Vdc)	I max (Amps)	I hold (Amps)	I trip (Amps)	R _i min (Ω)	R ₁ max (Ω)	Max Time To Trip		P (d) (Watts)
							Amps	Sec.	
1210SMD005	30	100	0.05	0.15	2.800	50.00	0.25	1.50	0.60
1210SMD010	30	100	0.10	0.30	0.800	15.00	0.50	0.60	0.60
1210SMD020	30	100	0.20	0.40	0.400	5.000	8.00	0.02	0.60
1210SMD035	6.0	100	0.35	0.75	0.200	1.300	8.00	0.20	0.60
1210SMD050	13.2	100	0.50	1.00	0.180	0.900	8.00	0.10	0.60
1210SMD075	6.0	100	0.75	1.50	0.070	0.400	8.00	0.10	0.60
1210SMD110	6.0	100	1.10	2.20	0.050	0.210	8.00	0.30	0.60
1210SMD150	6.0	100	1.50	3.00	0.030	0.110	8.00	0.50	0.60
1210SMD175	6.0	100	1.75	3.50	0.020	0.080	8.00	0.60	0.80
1210SMD200	6.0	100	2.00	4.00	0.015	0.070	8.00	1.00	0.80

RESETTABLE FUSE (PPTC)

Model	V max (Vdc)	I max (Amps)	I hold (Amps)	I trip (Amps)	R _i min (Ω)	R1 max (Ω)	Max Time To Trip		P (d) (Watts)
							Amps	Sec.	
1812SMD010	30.0	100	0.10	0.30	0.750	15.00	0.50	1.50	0.80
1812SMD014	60.0	100	0.14	0.34	0.650	6.000	1.50	0.15	0.80
1812SMD020	30.0	100	0.20	0.40	0.350	5.000	8.00	0.02	0.80
1812SMD030	30.0	100	0.30	0.60	0.250	3.000	8.00	0.10	0.80
1812SMD050	15.0	100	0.50	1.00	0.150	1.000	8.00	0.15	0.80
1812SMD050/33	33.0	100	0.50	1.00	0.150	1.000	8.00	0.15	0.80
1812SMD075	13.2	100	0.75	1.50	0.090	0.450	8.00	0.20	0.80
1812SMD075/16	16.0	100	0.75	1.50	0.090	0.450	8.00	0.20	0.80
1812SMD075/24	24.0	100	0.75	1.50	0.090	0.450	8.00	0.20	0.80
1812SMD110	8.0	100	1.10	2.20	0.050	0.250	8.00	0.30	0.80
1812SMD110/16	16.0	100	1.10	2.20	0.050	0.250	8.00	0.30	0.80
1812SMD125	16.0	100	1.25	2.50	0.050	0.140	8.00	0.40	0.80
1812SMD150	8.0	100	1.50	3.00	0.040	0.160	8.00	0.50	0.80
1812MD150/16	16.0	100	1.50	3.00	0.040	0.160	8.00	0.50	0.80
1812SMD160	8.0	100	1.60	2.80	0.030	0.130	8.00	1.00	0.80
1812SMD200	8.0	100	2.00	4.00	0.020	0.100	8.00	2.00	0.80
1812SMD260	8.0	100	2.60	5.00	0.015	0.050	8.00	2.50	0.80
1812SMD300	8.0	100	3.00	5.00	0.012	0.040	8.00	4.00	0.80
1812SMD350	6.0	100	3.50	6.00	0.008	0.030	10.0	4.00	2.00

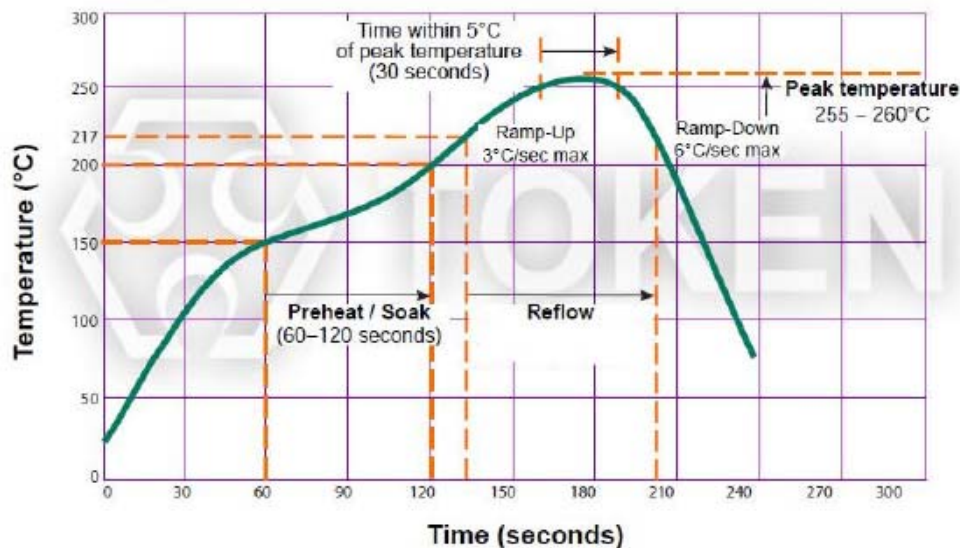
Model	V max (Vdc)	I max (Amps)	I hold (Amps)	I trip (Amps)	R _i min (Ω)	R1 max (Ω)	Max Time To Trip		P (d) (Watts)
							Amps	Sec.	
2920SMD030	60.0	100	0.30	0.60	0.600	4.800	1.5	3.0	1.50
2920SMD050	60.0	100	0.50	1.00	0.180	1.400	2.5	4.0	1.50
2920SMD075	33.0	100	0.75	1.50	0.100	1.000	8.0	0.3	1.50
2920SMD100	33.0	100	1.10	2.20	0.065	0.410	8.0	0.5	1.50
2920SMD125	33.0	100	1.25	2.50	0.050	0.250	8.0	2.0	1.50
2920SMD150/16	16.0	100	1.50	3.00	0.035	0.230	8.0	2.0	1.50
2920SMD150/33	33.0	100	1.50	3.00	0.035	0.230	8.0	2.0	1.50
2920SMD185	33.0	100	1.85	3.70	0.030	0.150	8.0	2.5	1.50
2920SMD200/16	16.0	100	2.00	4.00	0.020	0.120	8.0	4.5	1.50
2920SMD200/24	24.0	100	2.00	4.00	0.020	0.120	8.0	4.5	1.50
2920SMD250	16.0	100	2.50	5.00	0.020	0.085	8.0	16.0	1.50
2920SMD260/6	6.0	100	2.60	5.20	0.014	0.075	8.0	10.0	1.50
2920SMD260/16	16.0	100	2.60	5.20	0.014	0.075	8.0	10.0	1.50
2920SMD300/6	6.0	40	3.00	6.00	0.012	0.048	8.0	20.0	1.50
2920SMD300/16	16.0	100	3.00	6.00	0.012	0.048	80.	20.0	1.50

RESETTABLE FUSE (PPTC)

Environmental Specification

ITEM	TEST METHOD	SPECIFICATION (ΔR)
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202,Method 215	No change
Vibration	MIL-STD-202,Method 201	No change
Ambient operating conditions : - 40 °C to +85 °C		
Maximum surface temperature of the device in the tripped state is 125 °C		

Recommended reflow profile



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

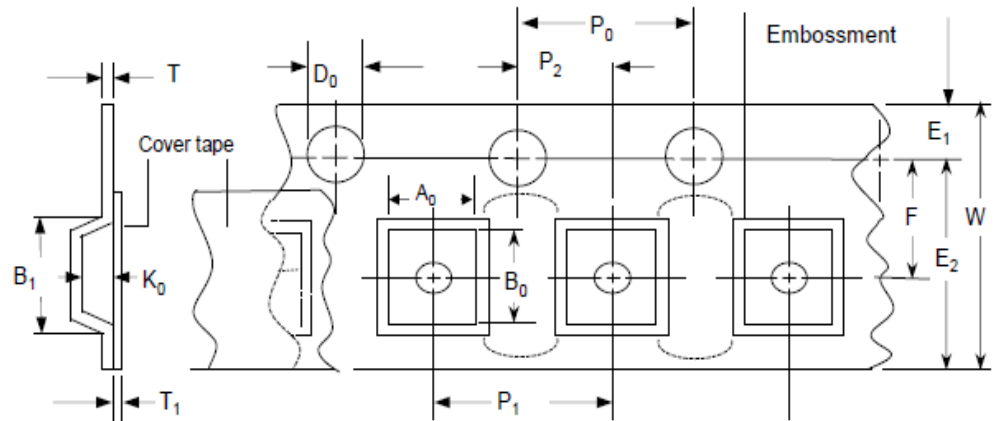
Note : If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

RESETTABLE FUSE (PPTC)

Tape & Reel Specification (EIA 481-1)

W	12±0.3
P ₀	4.0±0.10
P ₁	8.0±0.10
P ₂	2.0±0.05
A ₀	3.5±0.23
B ₀	5.1±0.15
B _{1max}	5.90
D ₀	1.5+0.1-0
F	5.5±0.05
E ₁	1.75±0.10
E _{2min}	10.25
T _{max}	0.60
T _{1max}	0.10
K ₀	0.9±0.15
Leader _{min}	390
Trailer _{min}	160

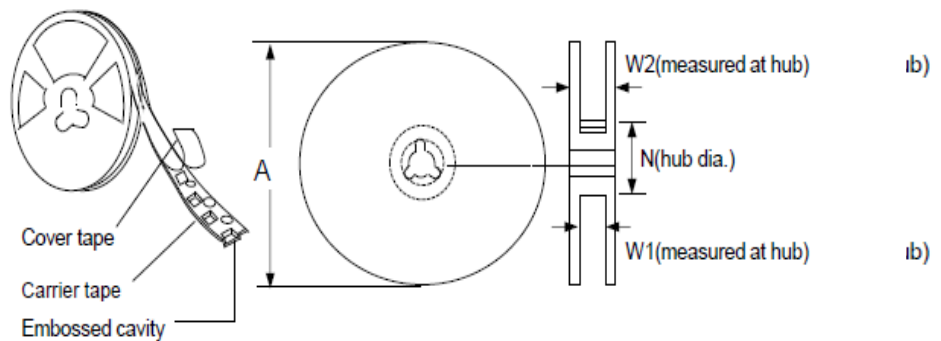
EIA Tape Component Dimensions



Reel Dimension

A max	178
N min	60
W1	12.4+2.0-0
W2 max	18.4

EIA Reel Dimensions



Storage

- Storage conditions : 40°C max,
70% R.H.

WARNING:

- Use PPTC beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- PPTC 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.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- Use PPTC with a large inductance in circuit will generate a circuit voltage ($L \frac{di}{dt}$) above the rated voltage of the PPTC.
- Avoid impact PPTC device its thermal expansion like placed under pressure or installed in limited space.
- Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices. PPTC SMD can be cleaned by standard methods.
- Requests that customers comply with our recommended solder pad layouts and recommended reflow profile. Improper board layouts or reflow profile could negatively impact solderability