

Surface Mount PPTC Resettable Fuse: **FSMD2920 Series**

1. Summary

- (a) RoHS Compliant & Halogen Free
- (b) Applications: All high-density boards
- (c) 2920 Dimension, Surface mountable, Solid state
- (d) Fast trip time.
- (e) Operation Current: 0.30A~5.00A
- (f) Maximum Voltage: 6V~60V_{DC}
- (g) Temperature Range: -40°C to 85°C



2. Agency Recognition

UL: File No. E211981
 C-UL: File No. E211981
 TÜV: File No. R50090556

3. Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Rated Voltage	Max. Current	Typical Power	Max. Time to Trip		Resistance	
	I_H , A	I_T , A	V_{MAX} , V _{DC}	I_{MAX} , A	Pd, W	Current	Time	R _{MIN}	R _{1MAX}
						A	Sec	Ohm	Ohm
FSMD030-2920-R	0.30	0.60	60	100	1.5	1.5	3.0	1.000	4.800
FSMD050-2920-R	0.50	1.00	60	100	1.5	2.5	4.0	0.300	1.400
FSMD075-2920-R	0.75	1.50	33	100	1.5	8.0	0.3	0.180	1.000
FSMD075-60-2920-R	0.75	1.50	60	100	1.5	8.0	0.3	0.180	1.000
FSMD100-2920-R	1.10	2.20	33	100	1.5	8.0	0.5	0.090	0.410
FSMD110-60-2920R	1.10	2.20	60	100	1.5	8.0	0.5	0.090	0.410
FSMD125-2920-R	1.25	2.50	33	100	1.5	8.0	2.0	0.050	0.250
FSMD150-2920-R	1.50	3.00	33	100	1.5	8.0	2.0	0.050	0.230
FSMD185-2920-R	1.85	3.70	33	100	1.5	8.0	2.5	0.040	0.150
FSMD200-2920-R	2.00	4.00	16	100	1.5	8.0	4.5	0.035	0.120
FSMD200-24-2920-R	2.00	4.00	24	100	1.5	8.0	5.0	0.035	0.120
FSMD250-2920-R	2.50	5.00	16	100	1.5	8.0	16.0	0.025	0.085
FSMD260-2920-R	2.60	5.20	6	100	1.5	8.0	20.0	0.020	0.075
FSMD260-24-2920R	2.60	5.20	24	100	1.5	8.0	20.0	0.020	0.075
FSMD300-2920-R	3.00	5.20	6	100	1.5	8.0	25.0	0.010	0.048
FSMD300-15-2920R	3.00	5.20	15	100	1.5	8.0	20.0	0.010	0.048
FSMD300-24-2920R	3.00	5.20	24	100	1.5	8.0	20.0	0.010	0.048
FSMD330-2920R	3.30	5.50	24	100	1.5	8.0	20.0	0.010	0.048
FSMD400-16-2920R	4.00	8.00	16	100	1.5	20.0	4.0	0.010	0.040
FSMD500-16-2920R	5.00	10.00	16	100	1.5	20.0	5.0	0.005	0.025

I_H =Hold current-maximum current at which the device will not trip at 23°C still air.

I_T =Trip current-minimum current at which the device will always trip at 23°C still air.

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

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

Pd=Typical power dissipated-type amount of power dissipated by the device when in the tripped state in 23°C still air environment.

R_{MIN}=Minimum device resistance at 23°C prior to tripping.

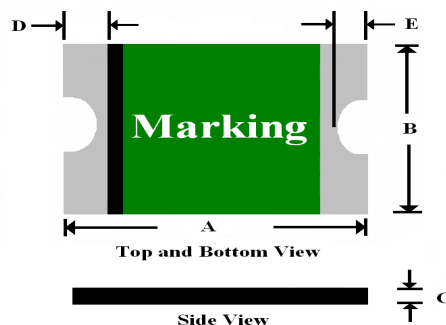
R_{1MAX}=Maximum device resistance at 23°C measured 1 hour after tripping or reflow soldering of 260°C for 20 seconds.

Termination pad characteristics

Termination pad materials: Pure Tin

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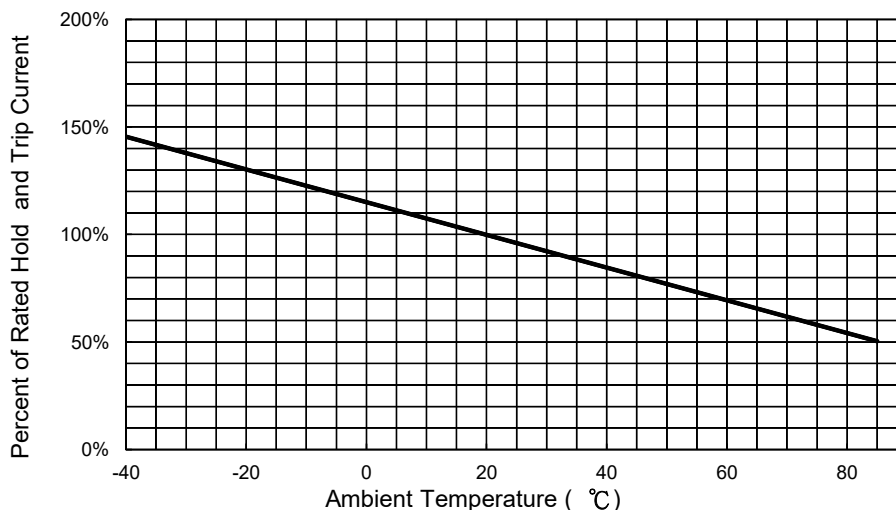
4. FSMD Product Dimensions (Millimeters)



Part Number	A		B		C		D		E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
FSMD030-2920-R	6.73	7.98	4.80	5.44	0.60	1.15	0.50	1.20	0.50	0.90
FSMD050-2920-R	6.73	7.98	4.80	5.44	0.60	1.15	0.50	1.20	0.50	0.90
FSMD075-2920-R	6.73	7.98	4.80	5.44	0.40	1.15	0.50	1.20	0.50	0.90
FSMD075-60-2920-R	6.73	7.98	4.80	5.44	0.60	1.15	0.50	1.20	0.50	0.90
FSMD100-2920-R	6.73	7.98	4.80	5.44	0.40	1.00	0.50	1.20	0.50	0.90
FSMD110-60-2920R	6.73	7.98	4.80	5.44	0.40	1.70	0.50	1.20	0.50	0.90
FSMD125-2920-R	6.73	7.98	4.80	5.44	0.40	0.90	0.50	1.20	0.50	0.90
FSMD150-2920-R	6.73	7.98	4.80	5.44	0.40	0.90	0.50	1.20	0.50	0.90
FSMD185-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD200-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD200-24-2920-R	6.73	7.98	4.80	5.44	0.20	0.80	0.50	1.20	0.50	0.90
FSMD250-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD260-2920-R	6.73	7.98	4.80	5.44	0.30	0.90	0.50	1.20	0.50	0.90
FSMD260-24-2920R	6.73	7.98	4.80	5.44	0.65	1.15	0.50	1.20	0.50	0.90
FSMD300-2920-R	6.73	7.98	4.80	5.44	0.40	0.90	0.50	1.20	0.50	0.90
FSMD300-15-2920R	6.73	7.98	4.80	5.44	0.40	1.15	0.50	1.20	0.50	0.90
FSMD300-24-2920R	6.73	7.98	4.80	5.44	0.65	1.15	0.50	1.20	0.50	0.90
FSMD330-2920R	6.73	7.98	4.80	5.44	0.65	1.15	0.50	1.20	0.50	0.90
FSMD400-16-2920R	6.73	7.98	4.80	5.44	0.40	1.50	0.50	1.20	0.50	0.90
FSMD500-16-2920R	6.73	7.98	4.80	5.44	0.40	1.50	0.50	1.20	0.50	0.90

5. Thermal Derating Curve

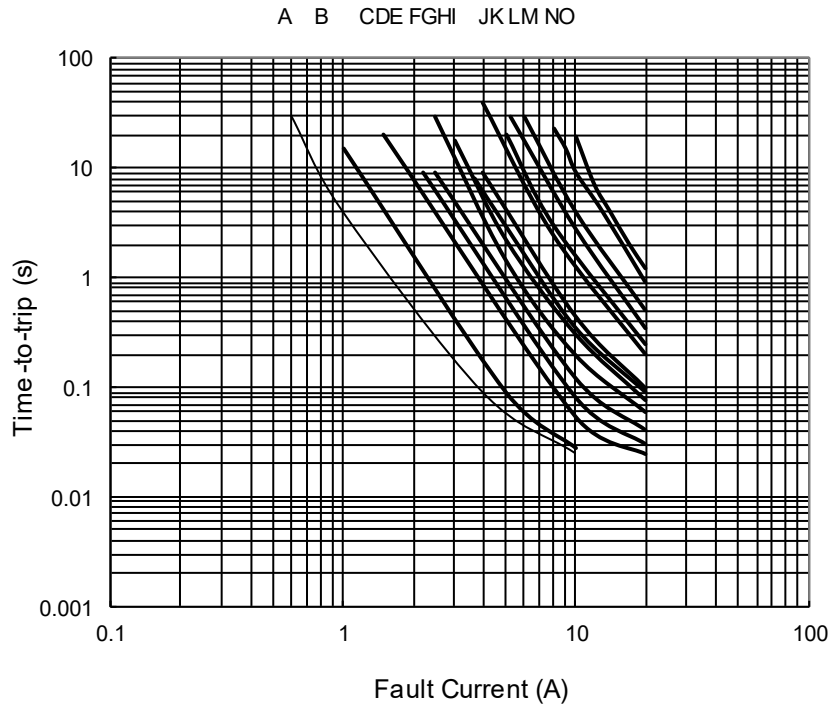
FSMD2920 Series



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6. Typical Time -To-Trip at 23 °C

- A = FSMD030-2920-R
- B = FSMD050-2920-R
- C = FSMD075-2920-R / 075-60-2920-R
- D = FSMD100-2920-R
- E = FSMD110-60-2920R
- F = FSMD125-2920-R
- G = FSMD150-2920-R
- H = FSMD185-2920-R
- I = FSMD200-2920-R / 200-24-2920-R
- J = FSMD250-2920-R
- K = FSMD260-2920-R / 260-24-2920R
- L = FSMD300-2920-R / 300-15-2920R / 300-24-2920R
- M = FSMD330-2920R
- N = FSMD400-16-2920R
- O = FSMD500-16-2920R



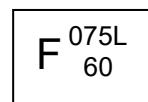
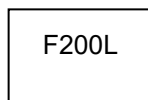
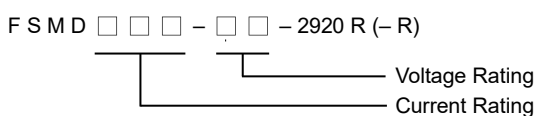
7. Material Specification

Terminal pad material: Pure Tin

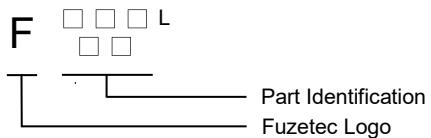
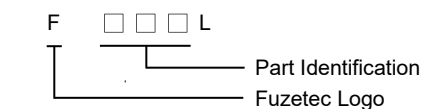
Soldering characteristics: Meets EIA specification RS 186-9E, ANSI/J-std-002 Category 3

8. Part Numbering and Marking System

Part Numbering System



Part Marking System



Warning: - Each product should be carefully evaluated and tested for their suitability of application.

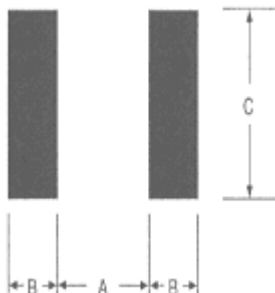


- Operation beyond the specified maximum rating or improper use may result in damage and possible electrical arcing and/or flame.
- PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- Avoid contact of PPTC device with chemical solvent, including some inert material such as silicone based oil, lubricant and etc. Prolonged contact will damage the device performance.
- Additional protection mechanism are strongly recommended to be used in conjunction with the PPTC device for protection against abnormal or failure conditions.
- Avoid use of PPTC device in a constrained space such as potting material, housing and containers where have limited space to accommodate device thermal expansion and/or contraction.

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9. Pad Layouts · Solder Reflow and Rework Recommendations

The dimension in the table below provide the recommended pad layout for each FSMD2920 device



Pad dimensions (millimeters)

Device	A Nominal	B Nominal	C Nominal
All 2920 Series	5.10	2.30	5.60

Profile Feature	Pb-Free Assembly
Average Ramp -Up Rate (T _{smax} to T _p)	3 °C/second max.
Preheat:	
Temperature Min (T _{smin})	150 °C
Temperature Max (T _{smax})	200 °C
Time (t _{smin} to t _{smax})	60-180 seconds
Time maintained above:	
Temperature(T _L)	217 °C
Time (t _L)	60-150 seconds
Peak/Classification Temperature(T _p)	: 260 °C
Time within 5 °C of actual Peak:	
Temperature (t _p)	20-40 seconds
Ramp-Down Rate :	6 °C/second max.
Time 25 °C to Peak Temperature :	8 minutes max.

Note 1: All temperatures refer to of the package, measured on the package body surface.

Solder reflow

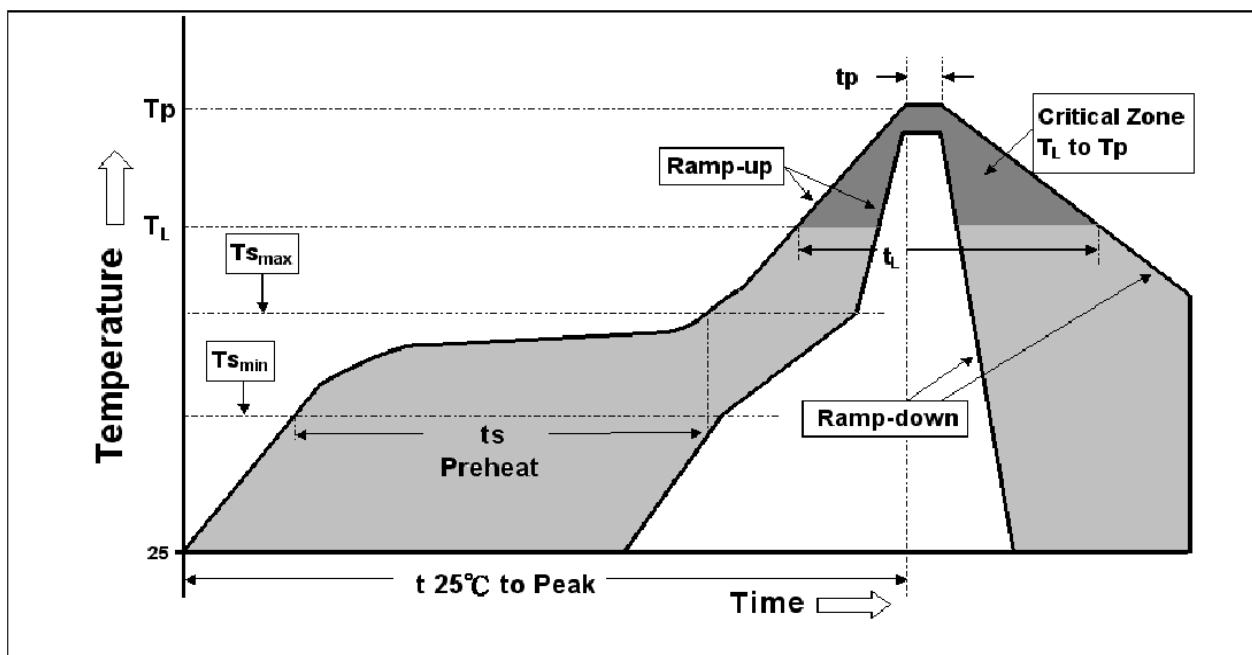
※ Due to “Lead Free” nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.

1. Recommended max paste thickness is 0.25mm.(Nominal)
2. Devices can be cleaned using standard methods and aqueous solvent.
3. Rework use standard industry practices.
4. Storage Environment: < 30°C / 60%RH

Caution:

1. If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
2. Devices are not designed to be wave soldered to the bottom side of the board.

Reflow Profile



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10. Tape & Reel Specifications

EIA MARK	Dimension	
	Dim(mm)	Tol.(mm)
W	16.0	±0.3
P ₀	4.0	±0.10
P ₁	8.0	±0.10
P ₂	2.0	±0.10
A ₀	5.6	±0.23
B ₀	8.1	±0.15
B _{1max}	12.1	
D ₀	1.5	+0.10/-0.0
F	7.5	±0.10
E ₁	1.75	±0.10
E _{2 min.}	14.25	
T min.	0.6	
T _{1 max.}	0.1	
K ₀	1.25	±0.10
K ₀ (FSMD110-60-2920R/ FSMD400-16-2920R/ FSMD500-16-2920R)	1.70	±0.10
Leader min.	400	
Trailer min.	160	
Reel Dimensions		
A max	185	max
N min.	50	
W ₁	16.4	+2.0/-0.0
W _{2 max.}	22.4	

11. Standard Packaging

P/N	Reel/Tape	P/N	Reel/Tape	P/N	Reel/Tape
FSMD030-2920	2000	FSMD125-2920	2000	FSMD250-2920-R	2000
FSMD030-2920-R	2000	FSMD125-2920-R	2000	FSMD260-2920	2000
FSMD050-2920	2000	FSMD150-2920	2000	FSMD260-2920-R	2000
FSMD050-2920-R	2000	FSMD150-2920-R	2000	FSMD260-24-2920R	2000
FSMD075-2920	2000	FSMD185-2920	2000	FSMD300-2920	2000
FSMD075-2920-R	2000	FSMD185-2920-R	2000	FSMD300-2920-R	2000
FSMD075-60-2920-R	2000	FSMD200-2920	2000	FSMD300-15-2920R	2000
FSMD100-2920	2000	FSMD200-2920-R	2000	FSMD300-24-2920R	2000
FSMD100-2920-R	2000	FSMD200-24-2920-R	2000	FSMD330-2920R	2000
FSMD110-60-2920R	1000	FSMD250-2920	2000	FSMD400-16-2920R	1000
				FSMD500-16-2920R	1000

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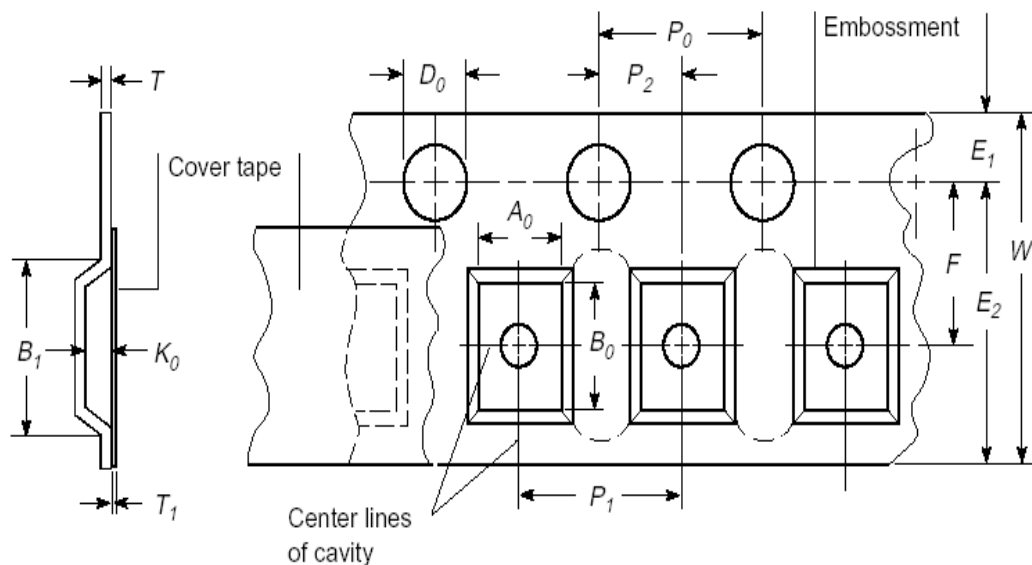


Figure 1: EIA Taped Component Dimensions

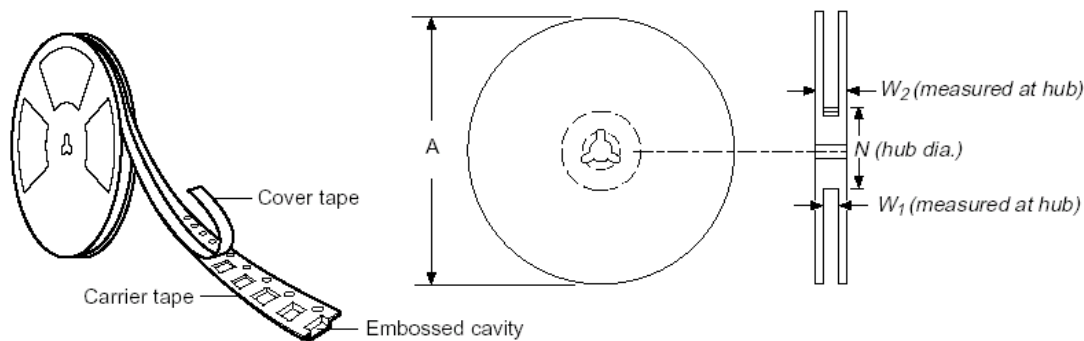


Figure 2: EIA Reel Dimensions

