Surface Mountable PTC Resettable Fuse: FSMD Series

1. Summary

(a) **RoHS Compliant (Lead Free) Product**
(b) **Applications: All high-density boards**
(c) **Product Features: Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices**
(d) **Operation Current: 0.10mA~3.0A**
(e) **Maximum Voltage: 6V~60V**
(f) **Temperature Range : -40℃ to 85℃**

2. Agency Recognition

UL: File No. E211981
C-UL: File No. E211981
TÜV: File No. R50004084

Note: FSMD010 , FSMD200R, FSMD260R & FSMD300R UL, C-UL and TÜV: Pending

3. Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Rated Voltage	Max Current	Typical Power	Max Time to Trip		Resistance Tolerance	
						Current	Time	R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	V_{MAX}, Vdc	I_{MAX}, A	Pd, W	Amp	Sec	Ω	Ω
FSMD010	0.10	0.30	60	10	0.8	8.0	〈0.02	1.600	15.00
FSMD014	0.14	0.30	60	10	0.8	8.0	0.008	1.200	6.500
FSMD020	0.20	0.40	30	10	0.8	8.0	0.020	0.800	5.000
FSMD035	0.35	0.70	16	40	0.8	8.0	0.100	0.320	1.500
FSMD050	0.50	1.00	16	40	0.8	8.0	0.150	0.150	1.000
FSMD075	0.75	1.50	16	40	0.8	8.0	0.200	0.110	0.450
FSMD110	1.10	2.20	8	100	0.8	8.0	0.300	0.040	0.210
FSMD110-16	1.10	1.95	16	40	0.8	8.0	0.500	0.040	0.180
FSMD125	1.25	2.50	6	40	0.8	8.0	0.400	0.050	0.140
FSMD150	1.50	3.00	6	40	0.8	8.0	0.500	0.040	0.110
FSMD160	1.60	3.20	6	40	0.8	8.0	0.500	0.030	0.100
FSMD200	2.00	3.50	8	40	0.8	8.0	2.000	0.020	0.070
FSMD200R	2.00	3.50	8	100	1.0	8.0	2.000	0.020	0.070
FSMD260R	2.60	5.00	6	100	1.0	8.0	2.500	0.015	0.047
FSMD300R	3.00	5.00	6	100	1.0	8.0	4.000	0.012	0.040

I_H=Hold current-maximum current at which the device will not trip at 23℃still air.
I_T=Trip current-minimum current at which the device will always trip at 23℃ 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℃ still air environment.
R_{MIN}=Minimum device resistance at 23℃ prior to tripping.
$R1_{MAX}$=Maximum device resistance at 23℃ measured 1 hour post trip.
Termination pad characteristics
Termination pad materials: Pure Tin

NOTE : Specification subject to change without notice.

4. FSMD Product Dimensions (Millimeters)

Figure 1

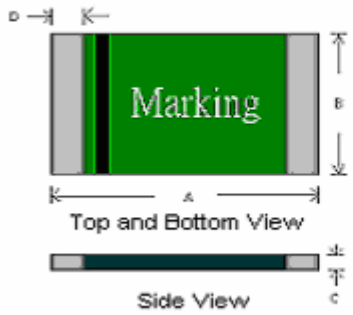
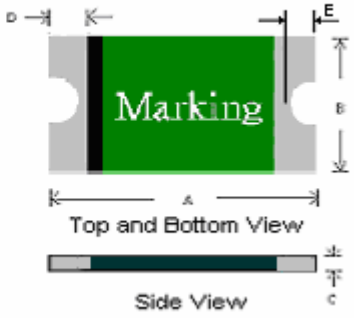
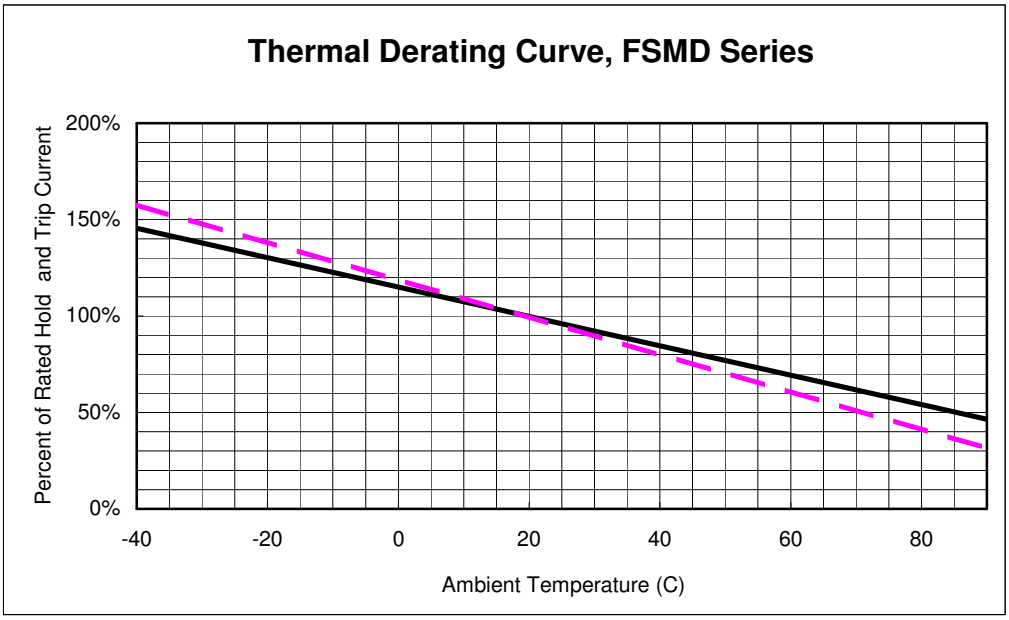


Figure 2



Part Number	Figure	A		B		C		D		E	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD010	1	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	——	——
FSMD014	1	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	——	——
FSMD020	1	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	——	——
FSMD035	1	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	——	——
FSMD050	1	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	——	——
FSMD075	1	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	——	——
FSMD110	1	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	——	——
FSMD110-16	1	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	——	——
FSMD125	1	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	——	——
FSMD150	1	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	——	——
FSMD160	1	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	——	——
FSMD200	1	4.37	4.73	3.07	3.41	0.50	0.90	0.30	0.95	——	——
FSMD200R	2	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
FSMD260R	2	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
FSMD300R	2	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65

5. Thermal Derating Curve

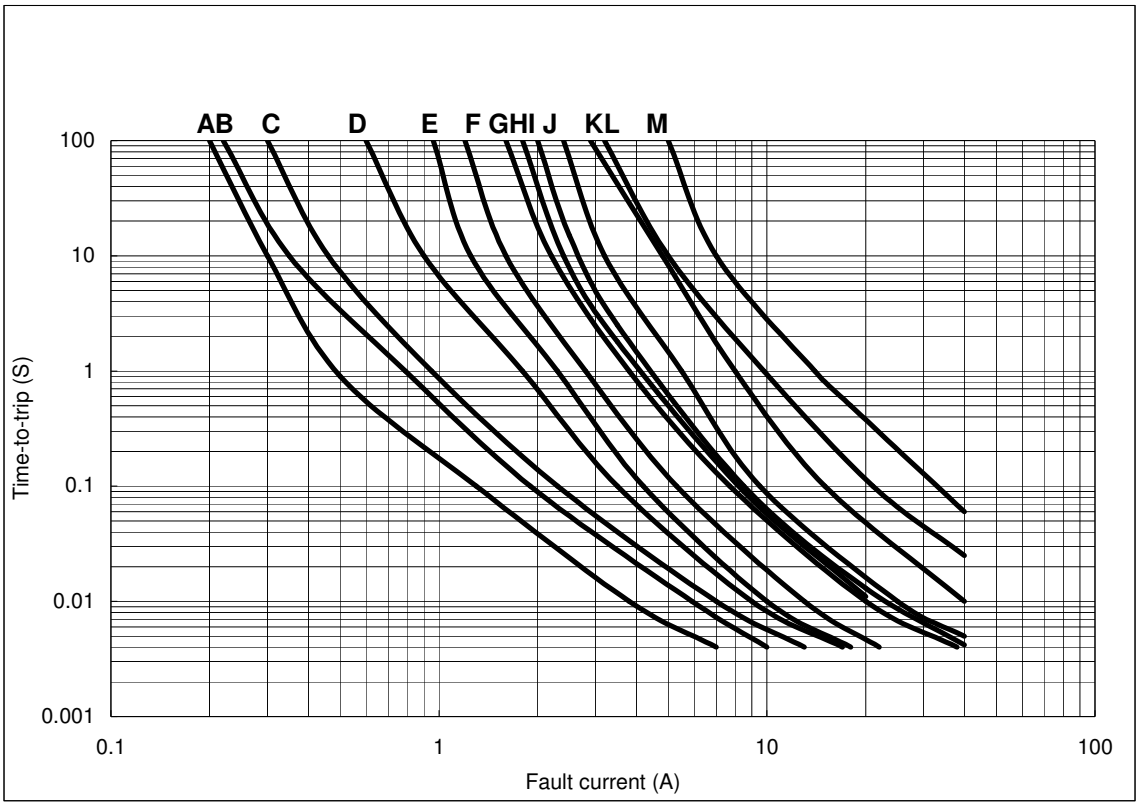


A= FSMD 075, 110, 110-16, 125,150, 160, 200, 200R, 260R & 300R
B= FSMD010, 014, 020, 035, 050

NOTE : Specification subject to change without notice.

6. Typical Time-To-Trip at 23℃

A = FSMD010
B = FSMD014
C = FSMD020
D = FSMD035
E = FSMD050
F = FSMD075
G = FSMD110/110-16
H = FSMD125
I = FSMD150
J = FSMD160
K = FSMD200/200R
L = FSMD260R
M = FSMD300R



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

FSMD014~FSMD300R

F S M D □ □ □ R

Current rating

FSMD110-16

F S M D □ □ □ - □ □

Voltage rating

Current rating

Part Marking System

F110

Example

F □ □ □

Part Identification

Fuzetec Logo

F 110 16

Example

F □ □ □ □ □

Part Identification

Fuzetec Logo

Warning: -Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

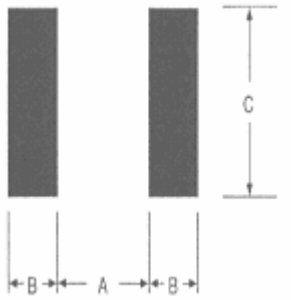
-PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.

-Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

NOTE : Specification subject to change without notice.

9. Pad Layouts、Solder Reflow and Rework Recommendations

The dimension in the table below provide the recommended pad layout for each FSMD1812 device



Pad dimensions (millimeters)			
Device	A Nominal	B Nominal	C Nominal
All 1812 Series	3.45	1.78	3.50

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (Tsmax to Tp)	3 ℃/second max.
Preheat : Temperature Min (Tsmin) Temperature Max (Tsmax) Time (tsmin to tsmax)	 150 ℃ 200 ℃ 60-180 seconds
Time maintained above: Temperature(T_L) Time (t_L)	 217 ℃ 60-150 seconds
Peak/Classification Temperature(Tp) :	260 ℃
Time within 5℃ of actual Peak : Temperature (tp)	 20-40 seconds
Ramp-Down Rate :	6 ℃/second max.
Time 25 ℃ to Peak Temperature :	8 minutes max.

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

Solder reflow

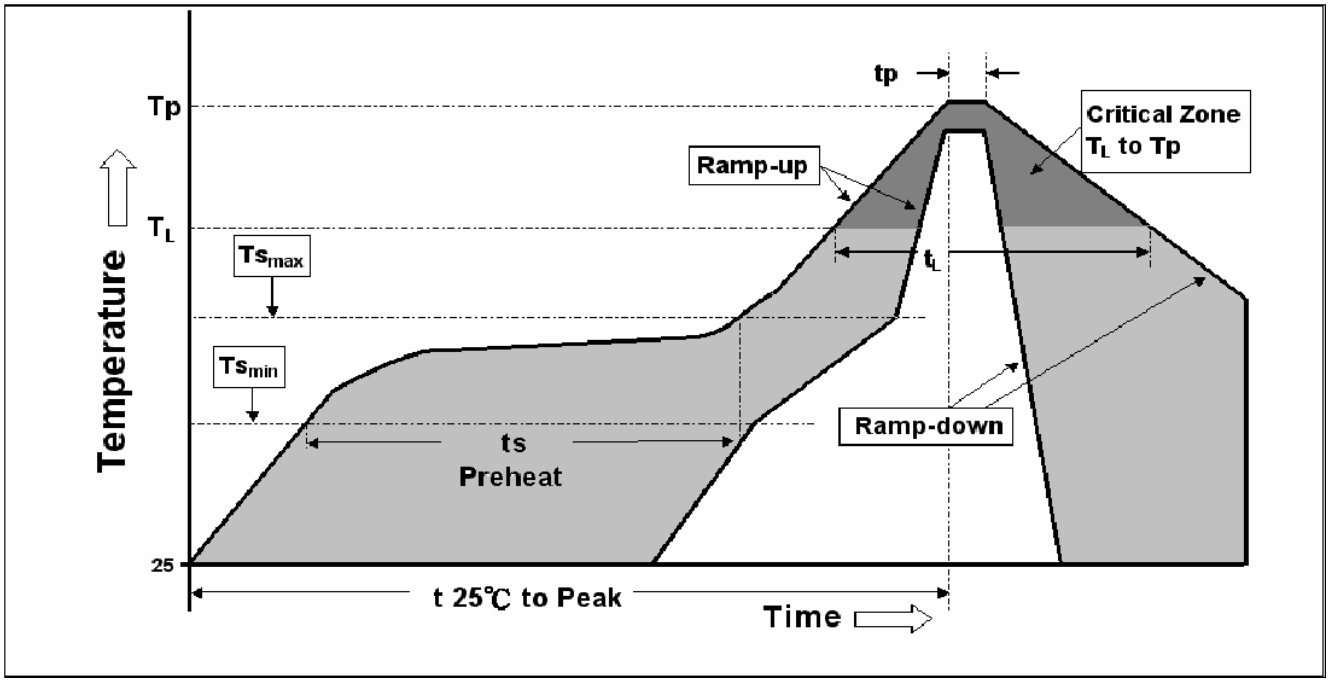
※ Due to “Lead Free” nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.

1. Recommended max past thickness > 0.25mm.
2. Devices can be cleaned using standard methods and aqueous solvent.
3. Rework use standard industry practices.
4. Storage Envorinment : < 30℃ / 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



NOTE : Specification subject to change without notice.