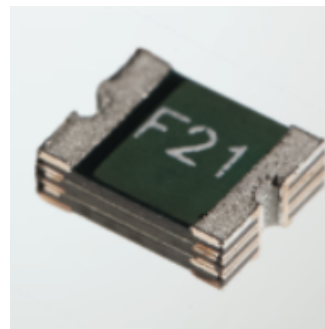


## Surface Mount PPTC Resettable Fuse: **FSMD1210 Series**

### 1. Summary

- (a) **RoHS Compliant & Halogen Free**
- (b) Applications: All high-density boards
- (c) 1210 Dimension, Surface mountable, Solid state
- (d) Fast trip time.
- (e) Operation Current: 0.05A~2.00A
- (f) Maximum Voltage: 6V~ 60V<sub>DC</sub>
- (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 <sub>DC</sub>	$I_{MAX}$ , A	$P_d$ , W	Current	Time	$R_{MIN}$	$R1_{MAX}$
						A	Sec.	Ohm	Ohm
FSMD005-1210-R	0.05	0.15	60	100	0.60	0.25	1.50	3.600	50.000
FSMD010-1210-R	0.10	0.25	60	100	0.60	0.50	1.50	1.600	15.000
FSMD020-1210-R	0.20	0.40	30	100	0.60	8.00	0.02	0.800	5.000
FSMD035-1210-R	0.35	0.70	16	100	0.60	8.00	0.20	0.320	1.300
FSMD050-1210-R	0.50	1.00	16	100	0.60	8.00	0.10	0.250	0.900
FSMD075-1210-R	0.75	1.50	8	100	0.60	8.00	0.10	0.130	0.400
FSMD075-24-1210R	0.75	1.50	24	100	0.60	8.00	0.10	0.130	0.400
FSMD110-1210R	1.10	2.20	8	100	0.80	8.00	0.30	0.060	0.210
FSMD110-16-1210R	1.10	2.20	16	100	0.80	8.00	0.30	0.060	0.210
FSMD150-1210R	1.50	3.00	6	100	0.80	8.00	0.50	0.040	0.110
FSMD175-1210R	1.75	3.50	6	100	0.80	8.00	0.60	0.020	0.080
FSMD200-1210R	2.00	4.00	6	100	0.80	8.00	1.00	0.015	0.070

$I_H$ =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 ( $V_{MAX}$ ).

$P_d$ =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.

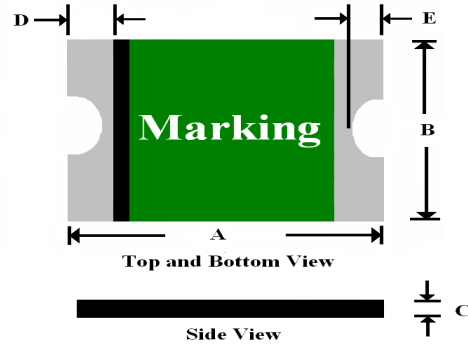
$R1_{MAX}$ =Maximum device resistance at 23°C measured 1 hour after tripping or reflow soldering of 260°C for 20 seconds.

Termination pad characteristics

Termination pad materials: Pure Tin

Surface Mount PPTC Resettable Fuse: **FSMD1210 Series**

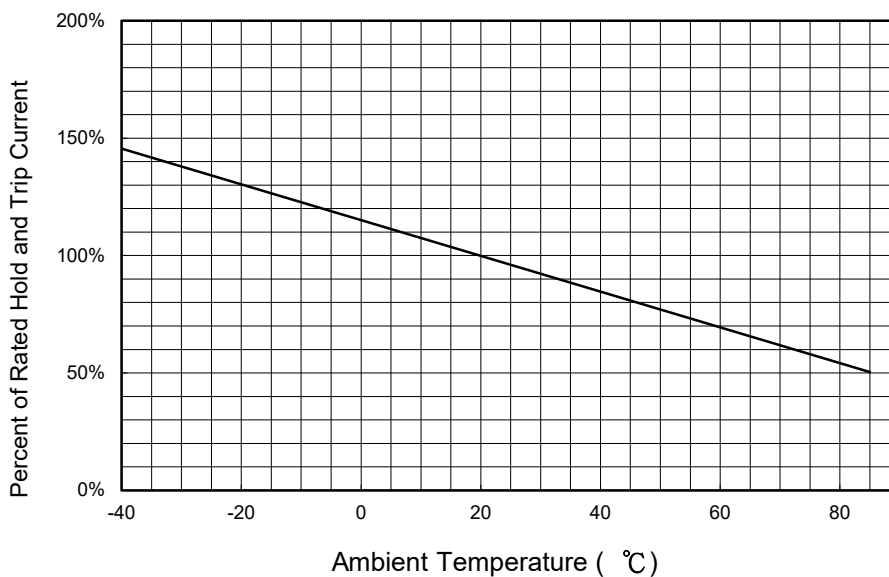
4. FSMD Product Dimensions (Millimeters)



Part Number	A		B		C		D		E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
FSMD005-1210-R	3.00	3.43	2.35	2.80	0.60	1.15	0.25	0.75	0.10	0.45
FSMD010-1210-R	3.00	3.43	2.35	2.80	0.60	1.15	0.25	0.75	0.10	0.45
FSMD020-1210-R	3.00	3.43	2.35	2.80	0.40	0.85	0.25	0.75	0.10	0.45
FSMD035-1210-R	3.00	3.43	2.35	2.80	0.40	0.80	0.25	0.75	0.10	0.45
FSMD050-1210-R	3.00	3.43	2.35	2.80	0.30	0.75	0.25	0.75	0.10	0.45
FSMD075-1210-R	3.00	3.43	2.35	2.80	0.30	0.70	0.25	0.75	0.10	0.45
FSMD075-24-1210R	3.00	3.43	2.35	2.80	0.80	1.20	0.25	0.75	0.10	0.45
FSMD110-1210R	3.00	3.43	2.35	2.80	0.60	1.00	0.25	0.75	0.10	0.45
FSMD110-16-1210R	3.00	3.43	2.35	2.80	0.60	1.00	0.25	0.75	0.10	0.45
FSMD150-1210R	3.00	3.43	2.35	2.80	0.50	0.90	0.25	0.75	0.10	0.45
FSMD175-1210R	3.00	3.43	2.35	2.80	0.80	1.40	0.25	0.75	0.10	0.45
FSMD200-1210R	3.00	3.43	2.35	2.80	0.80	1.40	0.25	0.75	0.10	0.45

5. Thermal Derating Curve

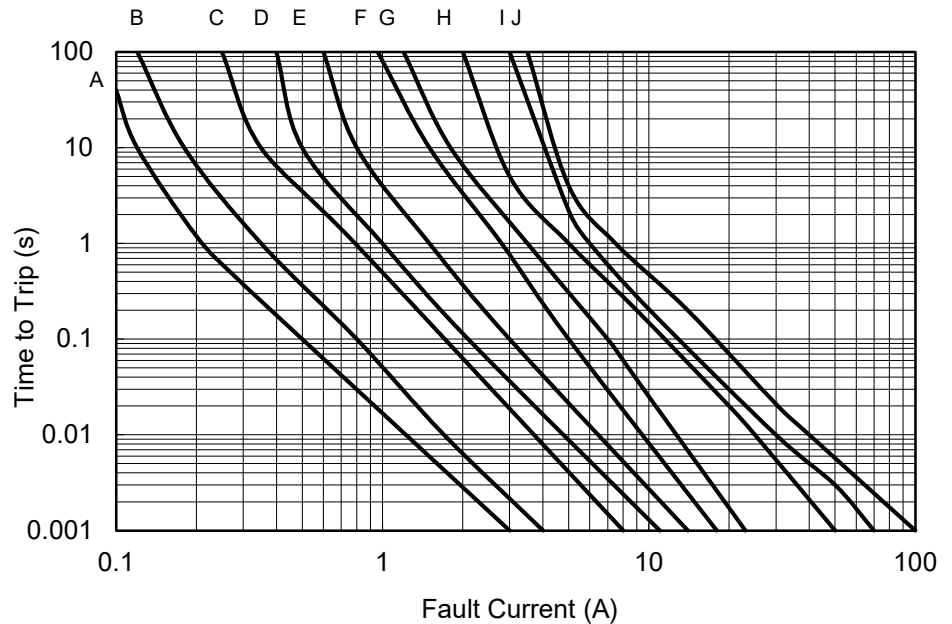
FSMD1210 Series



**Surface Mount PPTC Resettable Fuse: FSMD1210 Series**

6. Typical Time -to-Trip at 23 °C

- A =FSMD005-1210-R
- B =FSMD010-1210-R
- C =FSMD020-1210-R
- D =FSMD035-1210-R
- E =FSMD050-1210-R
- F =FSMD075-1210-R / 075-24-1210R
- G =FSMD110-1210R / 110-16-1210R
- H =FSMD150-1210R
- I =FSMD175-1210R
- J =FSMD200-1210R



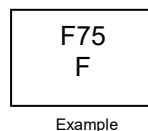
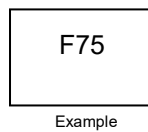
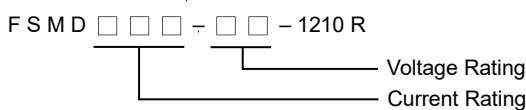
7. Material Specification

Terminal pad material: Pure Tin

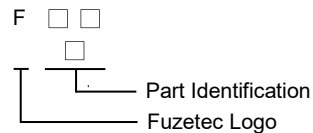
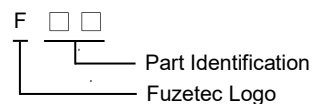
Soldering characteristics: Meets EIA specification RS 186-9E, ANSI/J-std-002 Category 3

8. Part Numbering and Marking System

Part Numbering System



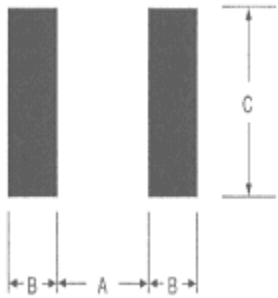
Part Marking System



**Surface Mount PPTC Resettable Fuse: FSMD1210 Series**

**9. Pad Layouts 、 Solder Reflow and Rework Recommendations**

The dimension in the table below provide the recommended pad layout for each FSMD1210 device



Pad dimensions (millimeters)			
Device	A Nominal	B Nominal	C Nominal
All 1210 Series	2.00	1.00	2.80

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

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.

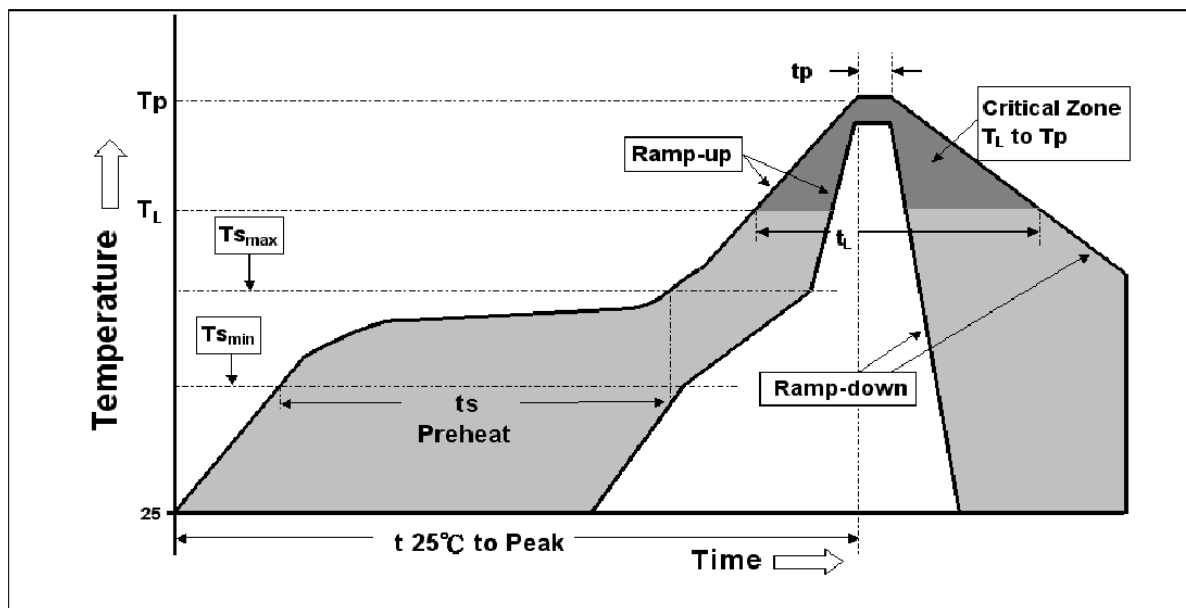
1. Recommended max past thickness > 0.25mm.
2. Devices can be cleaned using standard methods and aqueous solvent.
3. Rework use standard industry practices.
4. Storage Environment: < 30°C / 60%RH.

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.

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

Reflow Profile



## Surface Mount PPTC Resettable Fuse: **FSMD1210 Series**

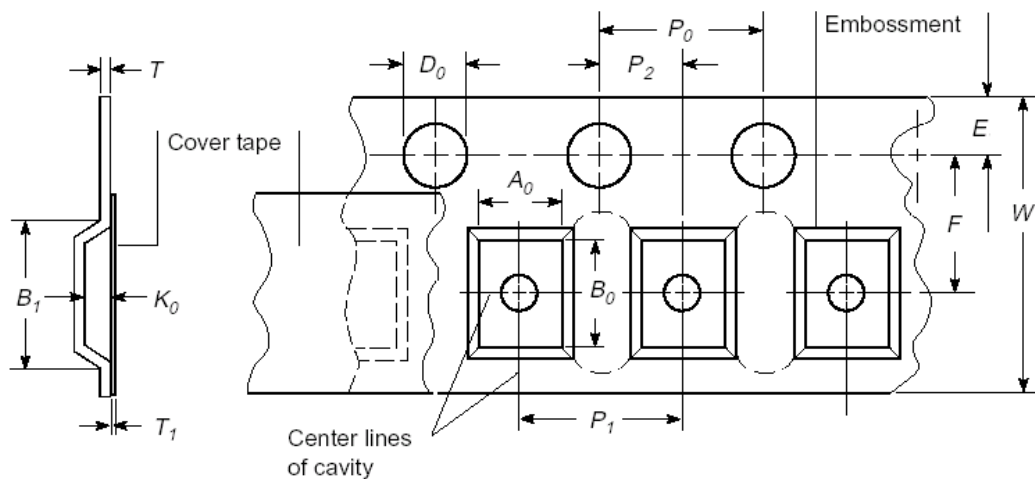
### 10. Tape & Reel Specifications (mm)

EIA MARK	Dimension	
	Dim(mm)	Tol.(mm)
W	8.0	$\pm 0.20$
P <sub>0</sub>	4.0	$\pm 0.10$
P <sub>1</sub>	4.0	$\pm 0.10$
P <sub>2</sub>	2.0	$\pm 0.10$
A <sub>0</sub>	3.15	$\pm 0.10$
B <sub>0</sub>	3.65	$\pm 0.10$
B <sub>1max</sub>	4.35	
D <sub>0</sub>	1.50	+0.1/-0
F	3.50	$\pm 0.05$
E	1.75	$\pm 0.10$
T max.	0.60	
T <sub>1</sub> max.	0.10	
K <sub>0</sub> (All FSMD1210 series except FSMD200-1210R)	0.90	$\pm 0.10$
K <sub>0</sub> (FSMD200-1210R)	1.30	$\pm 0.10$
Leader min.	390	
Trailer min.	160	
Reel Dimensions		
A max	185	max
N min.	50	
W <sub>1</sub>	8.4	+1.5/-0.0
W <sub>2</sub> max.	14.4	

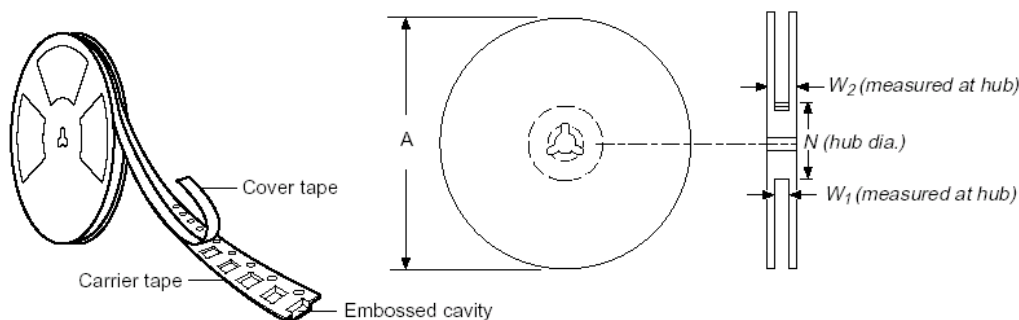
### 11. Packaging

P/N	Reel/Tape	P/N	Reel/Tape
FSMD005-1210	3000	FSMD050-1210-R	4000
FSMD005-1210-R	3000	FSMD075-1210	4000
FSMD010-1210	3000	FSMD075-1210-R	4000
FSMD010-1210-R	3000	FSMD075-24-1210R	3000
FSMD020-1210	3000	FSMD110-1210R	3000
FSMD020-1210-R	3000	FSMD110-16-1210R	3000
FSMD035-1210	4000	FSMD150-1210R	3000
FSMD035-1210-R	4000	FSMD175-1210R	3000
FSMD050-1210	4000	FSMD200-1210R	3000

**Surface Mount PPTC Resettable Fuse: FSMD1210 Series**



**Figure 1: EIA Taped Component Dimensions**



**Figure 2: EIA Reel Dimensions**

**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