

 FUZETEC TECHNOLOGY CO., LTD.	NO.	PQ54-05E		
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Surface Mountable PTC Resettable Fuse: FSMDH 1210 Series

1. Summary

- (a) **RoHS Compliant & Halogen Free**
- (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: 0.10A~1.10A**
- (e) **Maximum Voltage: 6V~48V**
- (f) **Temperature Range : -40°C to 125°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	
	Current	Current	Voltage	Current	Power	Current	Time	RMIN	R1MAX
	I _H , A	I _T , A	V _{MAX} , VDC	I _{MAX} , A	P _d , W	Amp	Sec	Ohms	Ohms
FSMDH010-1210-R	0.10	0.35	30	10	0.9	1.00	0.50	1.20	11.00
FSMDH010-48-1210-R	0.10	0.35	48	10	0.9	1.00	0.50	1.20	11.00
FSMDH016-1210-R	0.16	0.80	30	20	1.0	8.00	0.10	0.80	6.00
FSMDH016-48-1210-R	0.16	0.80	48	20	1.0	8.00	0.10	0.80	6.00
FSMDH020-1210-R	0.20	0.50	30	10	0.9	8.00	0.10	0.80	5.00
FSMDH020-48-1210-R	0.20	0.50	48	10	0.9	8.00	0.10	0.80	5.00
FSMDH035-1210-R	0.35	1.75	30	20	1.0	8.00	0.10	0.40	2.20
FSMDH050-1210-R	0.50	1.50	6	10	1.1	8.00	0.05	0.19	0.90
FSMDH050-12-1210-R	0.50	1.50	12	10	1.1	8.00	0.05	0.19	0.90
FSMDH050-16-1210-R	0.50	1.50	16	10	1.1	8.00	0.05	0.19	0.90
FSMDH050-30-1210R	0.50	2.50	30	20	1.0	8.00	0.10	0.30	1.60
FSMDH075-1210-R	0.75	3.75	16	20	1.0	8.00	5.00	0.10	1.00
FSMDH110-1210R	1.10	5.50	16	20	1.0	8.00	5.00	0.060	0.500

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.

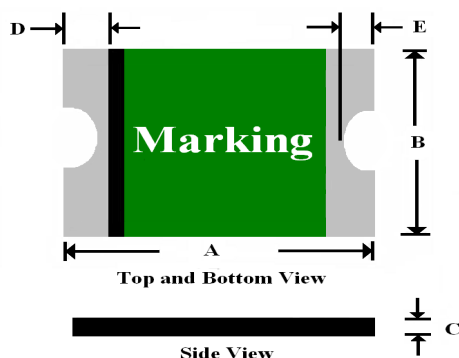
R_{1MAX}=Maximum device resistance at 23°C measured 1 hour after tripping or reflow soldering of 260°C for 20 seconds.

Termination pad characteristicsFSMDH125

Termination pad materials: Pure Tin

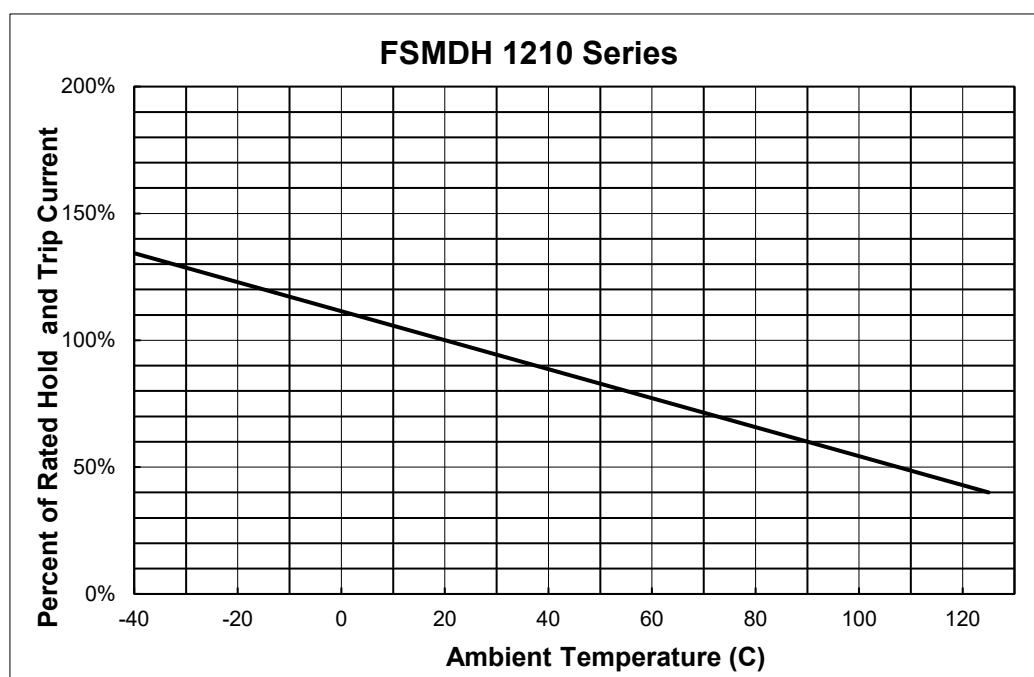
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4. FSMD Product Dimensions (Millimeters)



Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMDH010-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH010-48-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH016-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH016-48-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH020-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH020-48-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH035-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH050-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH050-12-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH050-16-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH050-30-1210R	3.00	3.43	2.35	2.80	0.30	2.00	0.25	0.75	0.10	0.45
FSMDH075-1210-R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45
FSMDH110-1210R	3.00	3.43	2.35	2.80	0.30	1.20	0.25	0.75	0.10	0.45

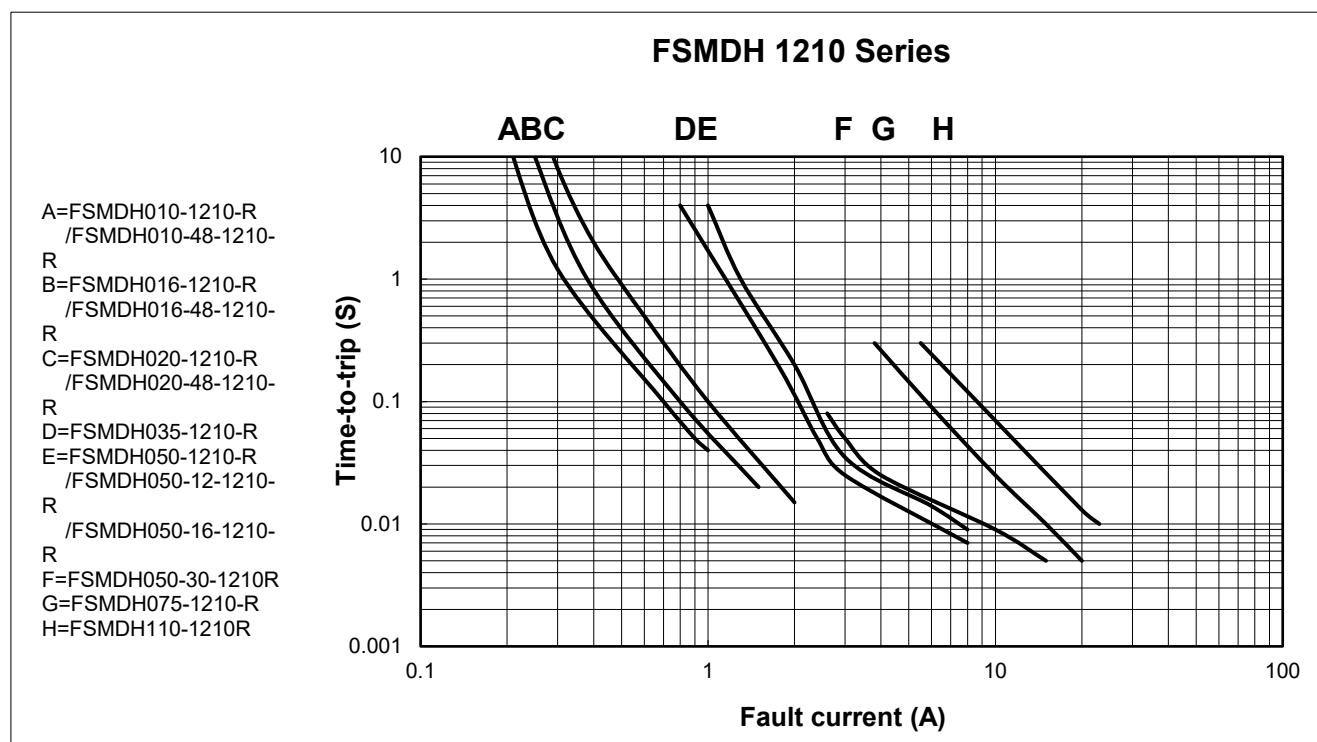
5. Thermal Derating Curve



NOTE : Specification subject to change without notice.

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6. Typical Time-To-Trip at 23°C



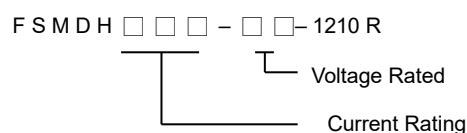
7. Material Specification

Terminal pad material: Pure Tin

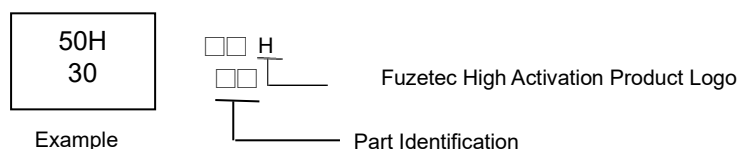
Soldering characteristics: Meets EIA specification RS 186-9E, ANSI/J-std-002 Category 3

8. Part Numbering and Marking System

Part Numbering System



Part Marking System



10H=FSMD010-1210-R	35H=FSMDH035-1210-R
10H 48 =FSMDH010-48-1210-R	50H=FSMDH050-1210-R
16H=FSMDH016-1210-R	50H 12 =FSMDH050-12-1210-R
16H 48 =FSMDH016-48-1210-R	50H 16 =FSMDH050-16-1210-R
20H=FSMDH020-1210-R	50H 30 =FSMDH050-30-1210R
20H 48 =FSMDH020-48-1210-R	75H=FSMDH075-1210-R
	110H=FSMDH110-1210R

※Note : This Product is Top-Sided Marking

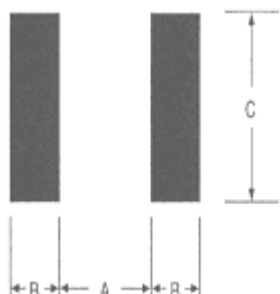
NOTE : Specification subject to change without notice.

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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 FSMDH1210 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 _{max} to T _p)	3 °C/second max.
Preheat :	
Temperature Min (T _{min})	150 °C
Temperature Max (T _{max})	200 °C
Time (t _{min} to t _{max})	60-180 seconds
Time maintained above:	
Temperature(T _L)	217 °C
Time (t _L)	60-150 seconds
Peak/Classification	260 °C
Temperature(T_p) :	
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.

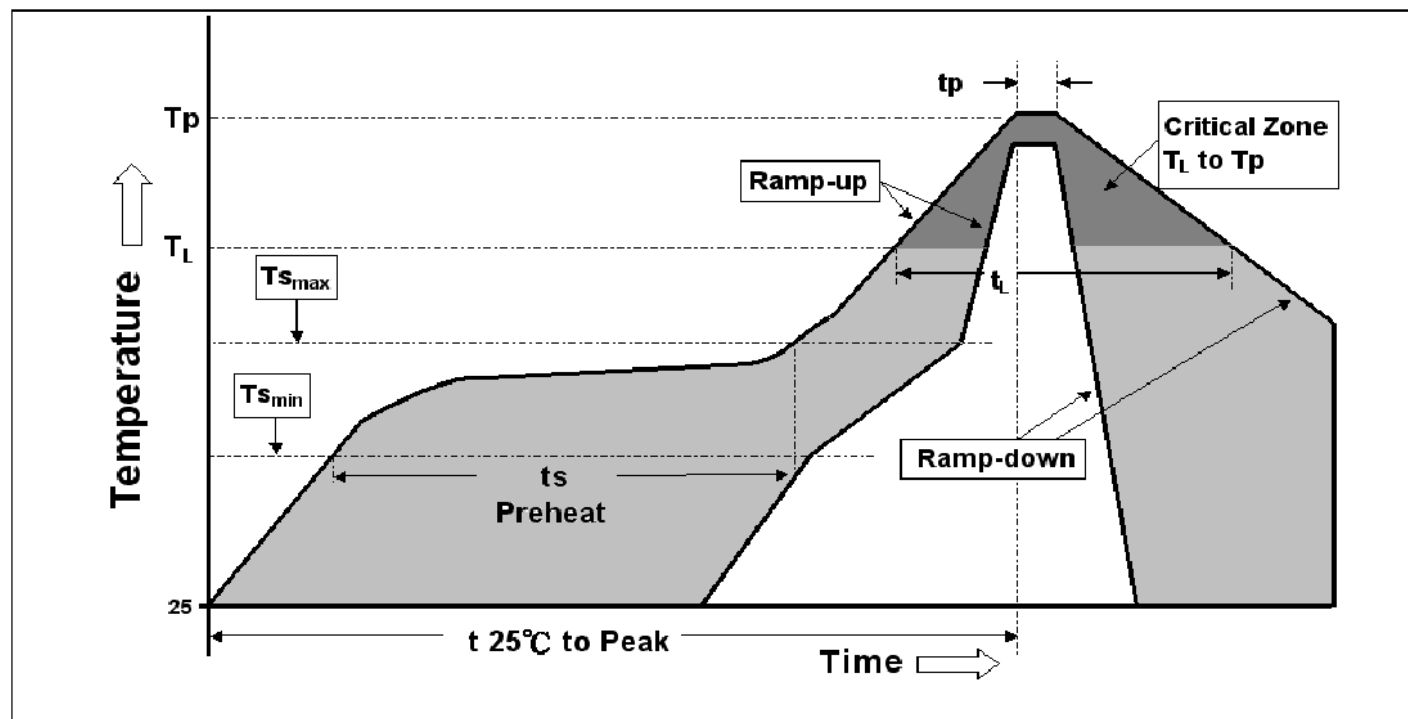
Note 1: All temperatures refer to of the package,
measured on the package body surface.

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 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.

**Reflow Profile**

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.