OVERVIEW

Radial Leaded PTC Resettable Fuse : FRX Series

1. Summary

(a) RoHS Compliant (Lead Free) Product
(b) Applications : Wide variety of electronic equipment
(c) Product Features : Low hold current, Solid state, Radial leaded product ideal for up to 60V
(d) Operation Current : 50mA~3.75A
(e) Maximum Voltage : 60V
(f) Temperature Range : -40℃ to 85℃

2. Agency Recognition

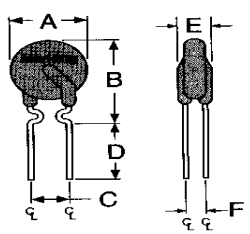
UL : File No. E211981
C-UL: File No. E211981
TÜV: File No. R 50004084

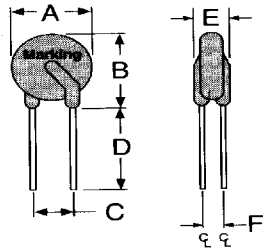
3. Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Maximum Current	Rated Voltage	Typical Power	Resistance Tolerance	
							R_{MIN}	$R1_{MAX}$
	I_H,A	I_T,A	at 5xI_H	I_{MAX},A	V_{MAX},V_{DC}	Pd, W	ohms	ohms
FRX005-60F	0.05	0.10	5.0	40	60	0.26	7.30	20.0
FRX010-60F	0.10	0.20	4.0	40	60	0.38	2.50	7.50
FRX017-60F	0.17	0.34	3.0	40	60	0.48	2.00	8.00
FRX020-60F	0.20	0.40	2.2	40	60	0.41	1.83	4.40
FRX025-60F	0.25	0.50	2.5	40	60	0.45	1.25	3.00
FRX030-60F	0.30	0.60	3.0	40	60	0.49	0.88	2.10
FRX040-60F	0.40	0.80	3.8	40	60	0.56	0.55	1.29
FRX050-60F	0.50	1.00	4.0	40	60	0.77	0.50	1.17
FRX065-60F	0.65	1.30	5.3	40	60	0.88	0.31	0.72
FRX075-60F	0.75	1.50	6.3	40	60	0.92	0.25	0.60
FRX090-60F	0.90	1.80	7.2	40	60	0.99	0.20	0.47
FRX110-60F	1.10	2.20	8.2	40	60	1.50	0.15	0.38
FRX135-60F	1.35	2.70	9.6	40	60	1.70	0.12	0.30
FRX160-60F	1.60	3.20	11.4	40	60	1.90	0.09	0.22
FRX185-60F	1.85	3.70	12.6	40	60	2.10	0.08	0.19
FRX250-60F	2.50	5.00	15.6	40	60	2.50	0.05	0.13
FRX300-60F	3.00	6.00	19.8	40	60	2.80	0.04	0.10
FRX375-60F	3.75	7.50	24.0	40	60	3.20	0.03	0.08

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 its rated current.
I_{MAX}= Maximum fault current device can withstand without damage at rated voltage (V_{MAX}).
Pd=Typical power dissipated from device when in tripped state in 23℃ still air environment.
R_{MIN}=Minimum device resistance at 23℃.
$R1_{MAX}$=Maximum device resistance at 23℃, 1 hour after tripping .

4. Production Dimensions (millimeter)



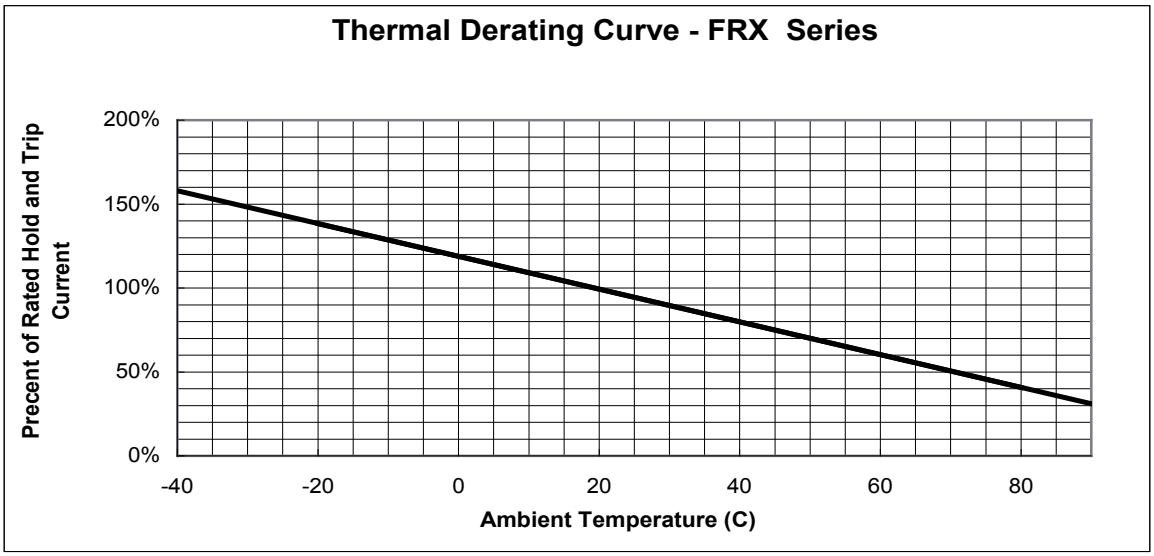


FRX 005-60F ~ FRX 090-60F
Lead Size : 24AWG
Φ 0.51 mm Diameter

FRX 110-60F ~ FRX 375-60F
Lead Size : 20AWG
Φ 0.81 mm Diameter

Part Number	A	B	C	D	E	F
	Maximum	Maximum	Typical	Minimum	Maximum	Typical
FRX005-60F	7.4	12.7	5.1	7.6	3.1	1.1
FRX010-60F	7.4	12.7	5.1	7.6	3.1	1.1
FRX017-60F	7.4	12.7	5.1	7.6	3.1	1.1
FRX020-60F	7.4	12.7	5.1	7.6	3.1	1.1
FRX025-60F	7.4	12.7	5.1	7.6	3.1	1.1
FRX030-60F	7.4	13.0	5.1	7.6	3.1	1.1
FRX040-60F	7.6	13.5	5.1	7.6	3.1	1.1
FRX050-60F	7.9	13.7	5.1	7.6	3.1	1.1
FRX065-60F	9.7	14.5	5.1	7.6	3.1	1.1
FRX075-60F	10.4	15.2	5.1	7.6	3.1	1.1
FRX090-60F	11.7	15.8	5.1	7.6	3.1	1.1
FRX110-60F	13.0	18.0	5.1	7.6	3.1	1.4
FRX135-60F	14.5	19.6	5.1	7.6	3.1	1.4
FRX160-60F	16.3	21.3	5.1	7.6	3.1	1.4
FRX185-60F	17.8	22.9	5.1	7.6	3.1	1.4
FRX250-60F	21.3	26.4	10.2	7.6	3.1	1.4
FRX300-60F	24.9	30.0	10.2	7.6	3.1	1.4
FRX375-60F	28.5	33.5	10.2	7.6	3.1	1.4

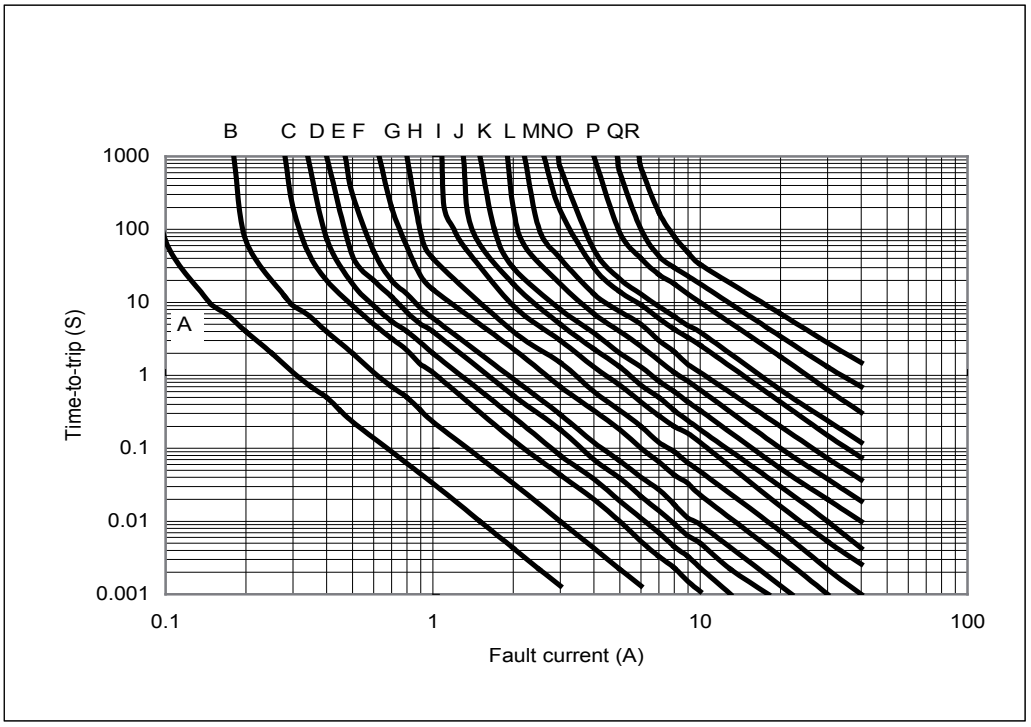
5. Thermal Derating Curve



Radial Leaded PTC Resettable Fuse : FRX Series

6. Typical Time-To-Trip at 23℃

A =FRX005-60F
B =FRX010-60F
C =FRX017-60F
D =FRX020-60F
E =FRX025-60F
F =FRX030-60F
G =FRX040-60F
H =FRX050-60F
I =FRX065-60F
J =FRX075-60F
K =FRX090-60F
L =FRX110-60F
M =FRX135-60F
N =FRX160-60F
O =FRX185-60F
P =FRX250-60F
Q=FRX300-60F
R =FRX375-60F

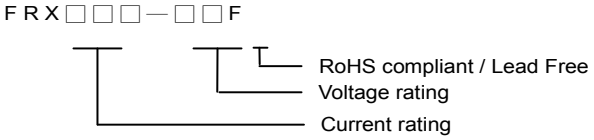


7. Material Specification

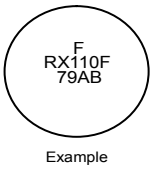
Lead material：FRX005-60F~FRX090-60F Tin plated copper,24 AWG.
FRX110-60F~FRX375-60F Tin plated copper, 20 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL-94V-O requirement

8. Part Numbering and Marking System

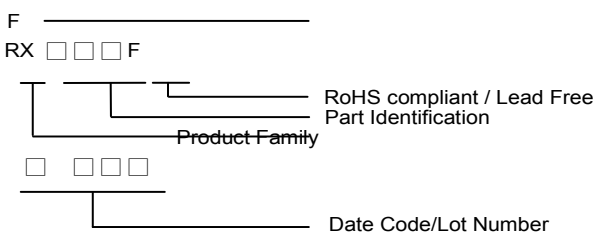
Part Numbering System



Part Marking System



Example



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.

Radial Leaded PTC Resettable Fuse: FRU Series

1. Summary

(a) RoHs Compliant (Lead Free) Product
(b) Applications: Wide variety of electronic equipment
(c) Product Features: Low resistance, High hold current, Solid state, Radial leaded product ideal for up to 30V
(d) Operation Current: 900mA~9.0A
(e) Maximum Voltage: 30V
(f) Temperature Range : -40℃ to 85℃

2. Agency Recognition

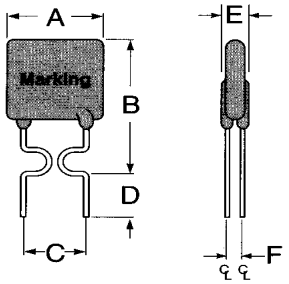
UL: File No. E211981
C-UL: File No. E211981
TÜV: File No. R 50004084

3. Electrical Characteristics (23℃)

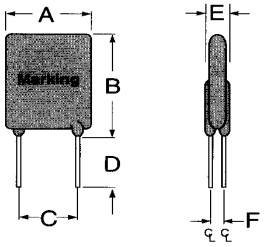
Part Number	Hold Current	Trip Current	Max.Time To Trip	Maximum Current	Rated Voltage	Typical Power	Resistance Tolerance	
							R_{MIN}	R_{1MAX}
	I_H, A	I_T, A	at 5xI_H	I_{MAX}, A	V_{MAX}, Vdc	Pd, W	ohms	ohms
FRU090-30F	0.90	1.80	5.9	40	30	0.6	0.070	0.22
FRU110-30F	1.10	2.20	6.6	40	30	0.7	0.050	0.17
FRU135-30F	1.35	2.70	7.3	40	30	0.8	0.040	0.13
FRU160-30F	1.60	3.20	8.0	40	30	0.9	0.030	0.11
FRU185-30F	1.85	3.70	8.7	40	30	1.0	0.030	0.09
FRU250-30F	2.50	5.00	10.3	40	30	1.2	0.020	0.07
FRU300-30F	3.00	6.00	10.8	40	30	2.0	0.020	0.08
FRU400-30F	4.00	8.00	12.7	40	30	2.5	0.010	0.05
FRU500-30F	5.00	10.00	14.5	40	30	3.0	0.010	0.05
FRU600-30F	6.00	12.00	16.0	40	30	3.5	0.005	0.04
FRU700-30F	7.00	14.00	17.5	40	30	3.8	0.005	0.03
FRU800-30F	8.00	16.00	18.8	40	30	4.0	0.005	0.02
FRU900-30F	9.00	18.00	20.0	40	30	4.2	0.005	0.02

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 its rated current.
I_{MAX}= Maximum fault current device can withstand without damage at rated voltage (V_{MAX}).
Pd=Typical power dissipated from device when in tripped state in 23℃ still air environment.
R_{MIN}=Minimum device resistance at 23℃.
$R1_{MAX}$=Maximum device resistance at 23℃, 1 hour after tripping.
Physical specifications:
Lead material: FRU090-30F~FRU250-30F Tin plated copper, 24 AWG.
FRU300-30F~FRU900-30F Tin plated copper, 20 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy, meets UL-94V-0 requirement.

3. Production Dimensions (millimeter)



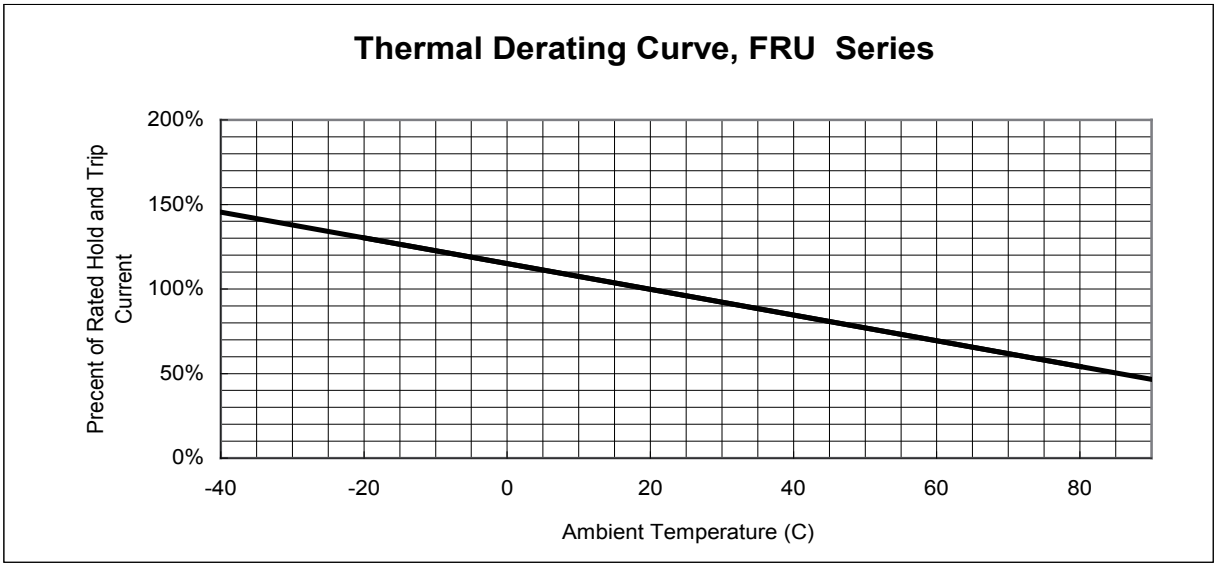
FRU 090-30F ~ FRU 250-30F
Lead Size: 24AWG
Φ 0.51 mm Diameter



FRU 300-30F ~ FRU 900-30F
Lead Size: 20AWG
Φ 0.81 mm Diameter

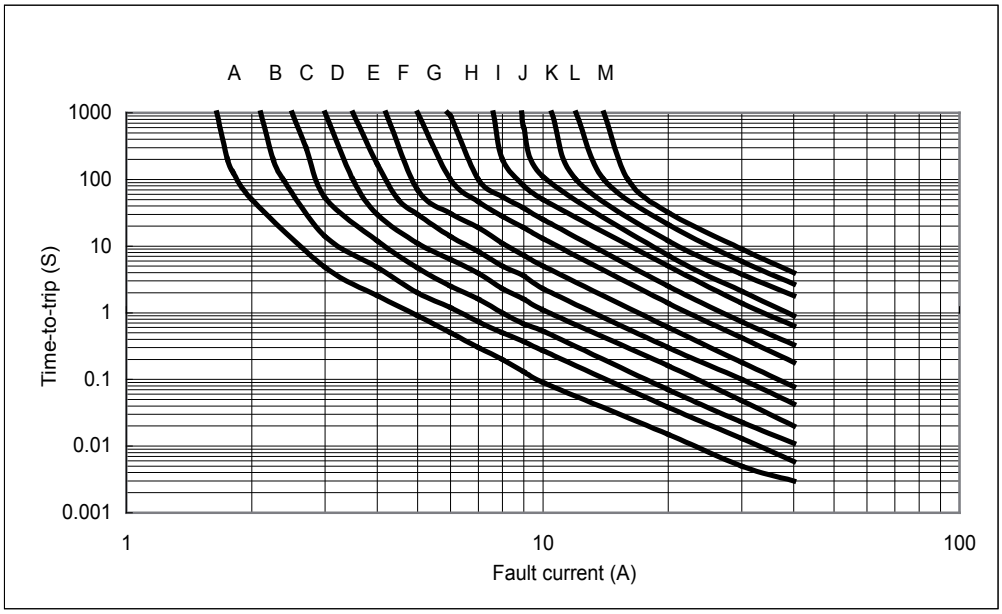
Part Number	A Maximum	B Maximum	C Typical	D Minimum	E Maximum	F Typical
FRU090-30F	7.4	12.2	5.1	7.6	3.0	0.9
FRU110-30F	7.4	14.2	5.1	7.6	3.0	0.9
FRU135-30F	8.9	13.5	5.1	7.6	3.0	0.9
FRU160-30F	8.9	15.2	5.1	7.6	3.0	0.9
FRU185-30F	10.2	15.7	5.1	7.6	3.0	0.9
FRU250-30F	11.4	18.3	5.1	7.6	3.0	0.9
FRU300-30F	11.4	17.3	5.1	7.6	3.0	1.2
FRU400-30F	14.0	20.1	5.1	7.6	3.0	1.2
FRU500-30F	14.0	24.9	10.2	7.6	3.0	1.2
FRU600-30F	16.5	24.9	10.2	7.6	3.0	1.2
FRU700-30F	19.1	26.7	10.2	7.6	3.0	1.2
FRU800-30F	21.6	29.2	10.2	7.6	3.0	1.2
FRU900-30F	24.1	29.7	10.2	7.6	3.0	1.2

5. Thermal Derating Curve



6. Typical Time-To-Trip at 23℃

A =FRU090-30F
B =FRU110-30F
C =FRU135-30F
D =FRU160-30F
E =FRU185-30F
F =FRU250-30F
G =FRU300-30F
H =FRU400-30F
I = FRU500-30F
J = FRU600-30F
K =FRU700-30F
L =FRU800-30F



7. Material Specification

Lead material：FRU090-30F~FRU250-30F Tin plated copper, 24 AWG.
FRU300-30F~FRU900-30F Tin plated copper, 20 AWG.

Soldering characteristics: MIL-STD-202, Method 208E.

Insulating coating:Flame retardant epoxy, meets UL-94V-0 requirement.

8. Part Numbering and Marking System

Part Numbering System

FRU□□□—□□F

RoHS Compliant / Lead Free
Voltage rating
Current rating

Example

F
RU110F
09AB

Part Marking System

F
RU □□□F

RoHS Compliant / Lead Free
Part Identification
Product Family

□ □□□

Date Code/Lot Number

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.

Surface Mountable PTC Resettable Fuse : FSMD2920 Series

1. Summary

(a) RoHS Compliant (Lead Free) Product
(b) Applications : All high-density boards
(c) Product Features : 2920 Dimension, Surface mountable, Solid state, Faster time to trip than standard SMD devices.
(d) Operation Current : 300mA~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
TUV: File No. R50090556

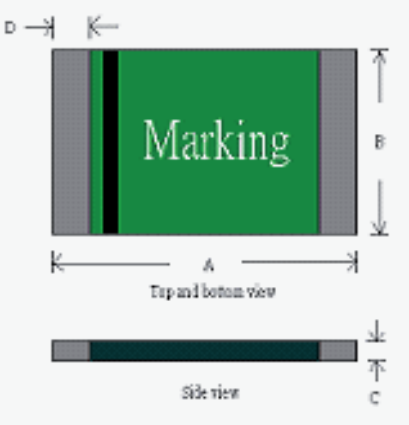
Note: FSMD300-2920 TUV Pending

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	A	Sec	Ω	Ω
FSMD030-2920	0.30	0.60	60	10	1.5	1.5	3.0	1.000	4.800
FSMD050-2920	0.50	1.00	60	10	1.5	2.5	4.0	0.300	1.400
FSMD075-2920	0.75	1.50	33	40	1.5	8.0	0.3	0.180	1.000
FSMD100-2920	1.10	2.20	33	40	1.5	8.0	0.5	0.090	0.410
FSMD125-2920	1.25	2.50	33	40	1.5	8.0	2.0	0.050	0.250
FSMD150-2920	1.50	3.00	33	40	1.5	8.0	2.0	0.050	0.230
FSMD185-2920	1.85	3.70	33	40	1.5	8.0	2.5	0.040	0.150
FSMD200-2920	2.00	4.00	16	40	1.5	8.0	4.5	0.035	0.120
FSMD250-2920	2.50	5.00	16	40	1.5	8.0	16.0	0.025	0.085
FSMD260-2920	2.60	5.20	6	40	1.5	8.0	20.0	0.020	0.075
FSMD300-2920	3.00	5.20	6	40	1.5	8.0	25.0	0.010	0.048

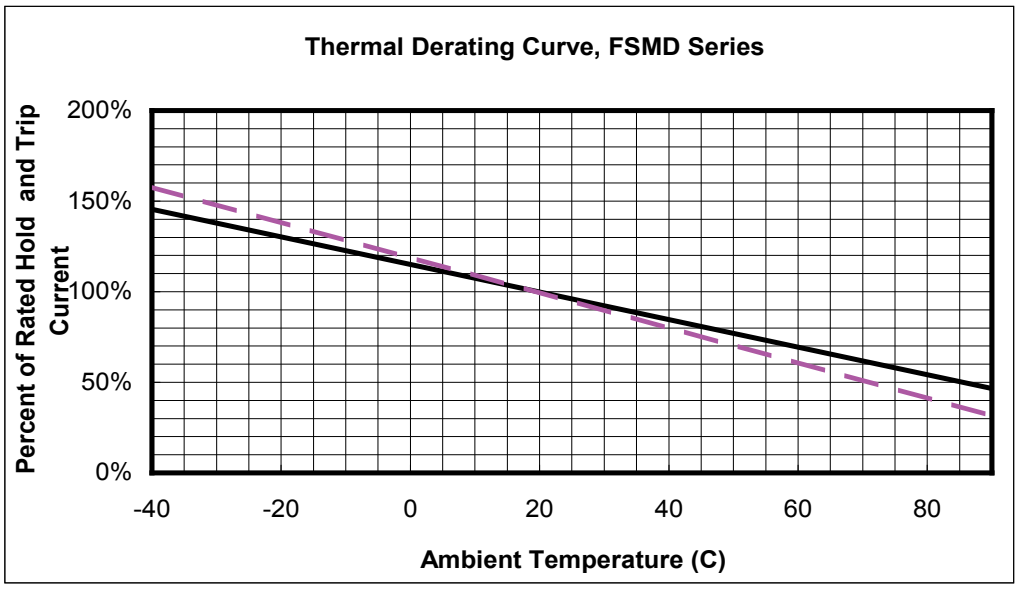
I_H=Hold current-maximum current at which the device will not trip at 23℃still air.
I_T=Trip current-minimum current at which the device will always trip at 23℃ still air.
V_{MAX}=Maximum voltage device can withstand without damage at it rated current.(I_{MAX})
I_{MAX}= Maximum fault current device can 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

3. FSMD Product Dimensions (Millimeters)



Part Number	A		B		C		D
	Min	Max	Min	Max	Min	Max	Min
FSMD030-2920	6.73	7.98	4.80	5.44	0.60	1.15	0.35
FSMD050-2920	6.73	7.98	4.80	5.44	0.60	1.15	0.35
FSMD075-2920	6.73	7.98	4.80	5.44	0.35	1.15	0.35
FSMD100-2920	6.73	7.98	4.80	5.44	0.40	1.00	0.35
FSMD125-2920	6.73	7.98	4.80	5.44	0.40	0.90	0.35
FSMD150-2920	6.73	7.98	4.80	5.44	0.40	0.90	0.35
FSMD185-2920	6.73	7.98	4.80	5.44	0.30	0.90	0.35
FSMD200-2920	6.73	7.98	4.80	5.44	0.30	0.90	0.35
FSMD250-2920	6.73	7.98	4.80	5.44	0.30	0.90	0.35
FSMD260-2920	6.73	7.98	4.80	5.44	0.30	0.90	0.35
FSMD300-2920	6.73	7.98	4.80	5.44	0.40	0.90	0.35

4. Thermal Derating Curve



A= FSMD125-2920 ~ FSMD300-2920

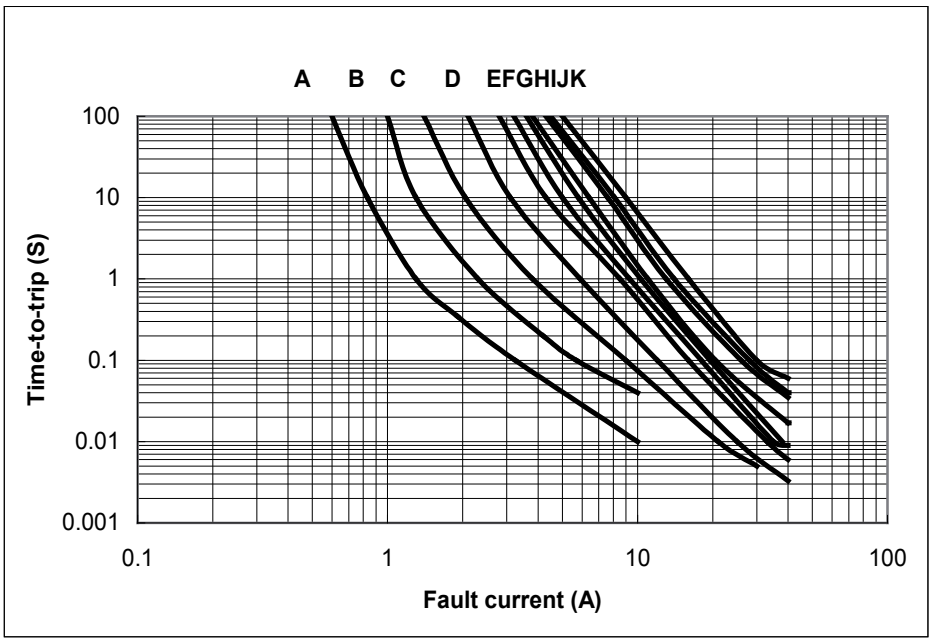
B= FSMD030-2920 ~ FSMD100-2920

A

B

3. Typical Time-To-Trip at 23℃

A =FSMD030-2920
B =FSMD050-2920
C =FSMD075-2920
D =FSMD100-2920
E =FSMD125-2920
F =FSMD150-2920
G =FSMD185-2920
H =FSMD200-2920
I = FSMD250-2920
J = FSMD260-2920
K= FSMD300-2920



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

F S M D □ □ □ - 2920

Current rating

Example

Part Marking System

F200L

F □ □ □ L

Part Identification

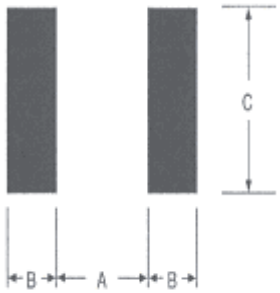
Warning: -Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

-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.

9. Pad Layouts、Solder Reflow and Rework Recommendations

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



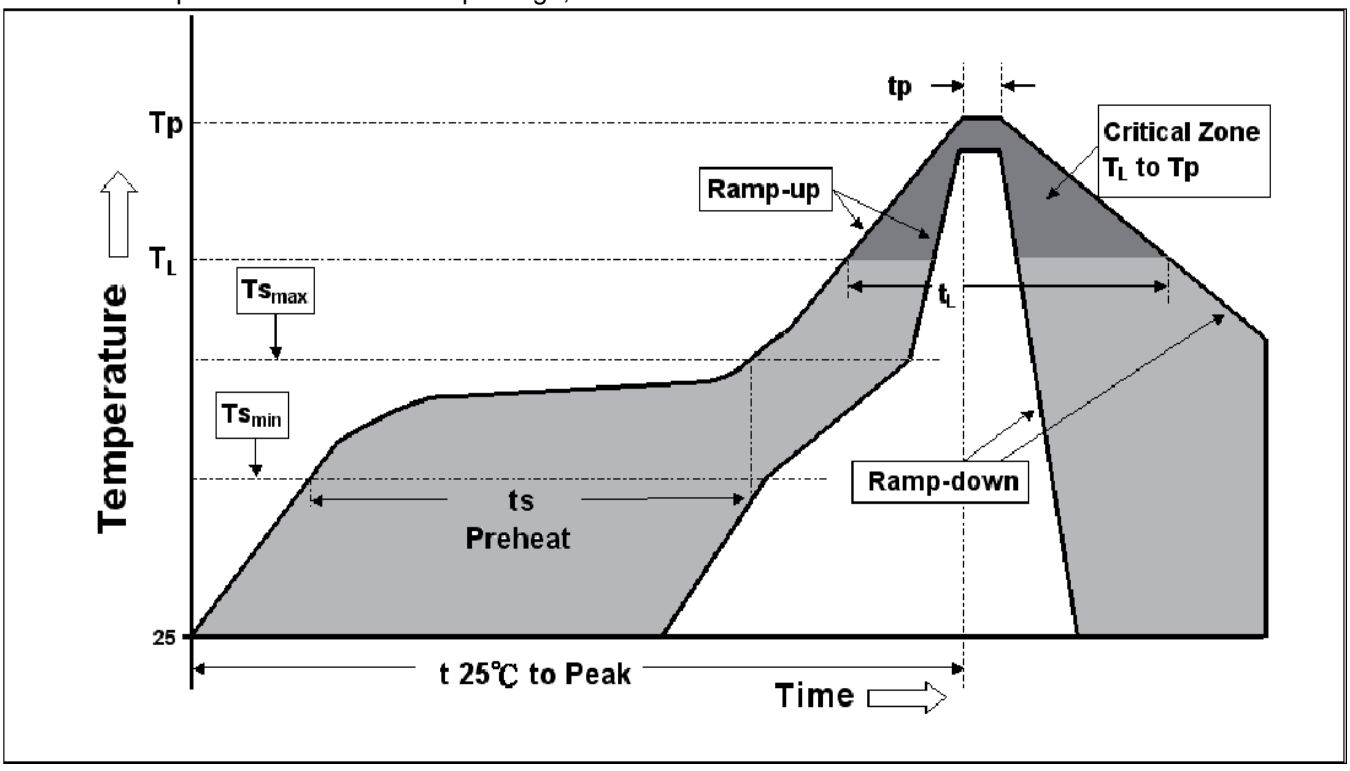
Pad dimensions (millimeters)			
Device	A Nominal	B Nominal	C Nominal
All 2920 Series	5.1	2.3	5.6

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,

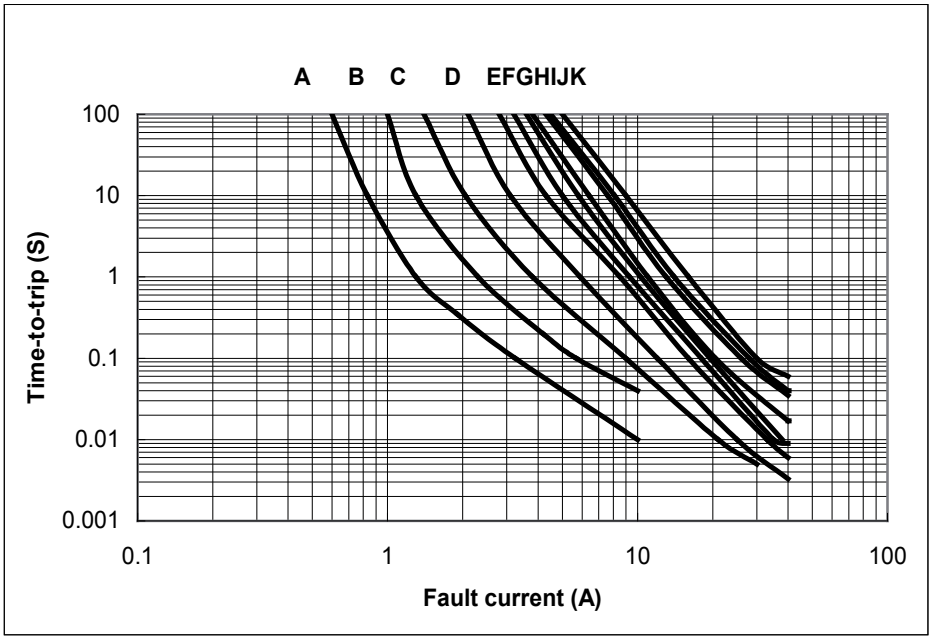
Due to "Lead Free" nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.

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



3. Typical Time-To-Trip at 23℃

A =FSMD030-2920
B =FSMD050-2920
C =FSMD075-2920
D =FSMD100-2920
E =FSMD125-2920
F =FSMD150-2920
G =FSMD185-2920
H =FSMD200-2920
I = FSMD250-2920
J = FSMD260-2920
K= FSMD300-2920



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

F S M D □ □ □ - 2920

Current rating

Example

Part Marking System

F200L

F □ □ □ L

Part Identification

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.

Surface Mountable PTC Resettable Fuse: FSMD1210 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: 0.05A~1.5A
(e) Maximum Voltage: 6V~60V
(f) Temperature Range : -40℃ to 85℃

2. Agency Recognition

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

Note: FSMD110-1210R & FSMD150-1210R UL & C-UL and TUV 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
SMD005-1210	0.05	0.15	60	10	0.60	0.25	1.50	3.600	50.000
SMD010-1210	0.10	0.25	60	10	0.60	0.50	1.50	1.600	15.000
SMD020-1210	0.20	0.40	30	10	0.60	8.00	0.02	0.800	5.000
SMD035-1210	0.35	0.70	16	40	0.60	8.00	0.20	0.320	1.300
SMD050-1210	0.50	1.00	16	40	0.60	8.00	0.10	0.250	0.900
SMD075-1210	0.75	1.50	8	40	0.60	8.00	0.10	0.130	0.400
SMD110-1210R	1.10	2.20	6	100	0.80	8.00	0.30	0.060	0.210
SMD150-1210R	1.50	3.00	6	100	0.80	8.00	0.50	0.040	0.110

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

3. FSMD Product Dimensions (Millimeters)

Figure 1

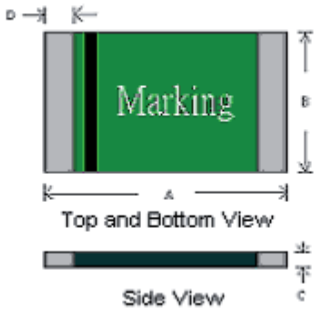
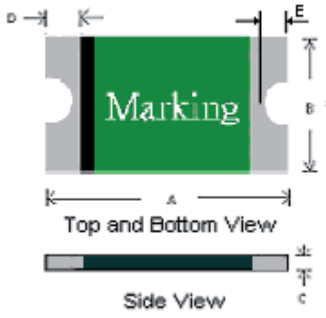
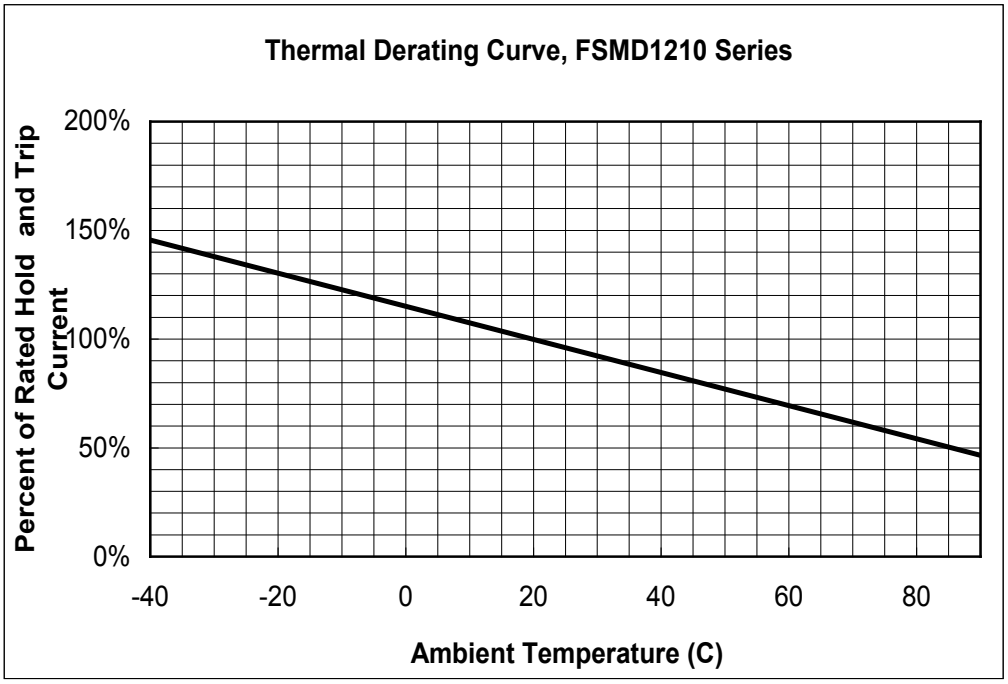


Figure 2



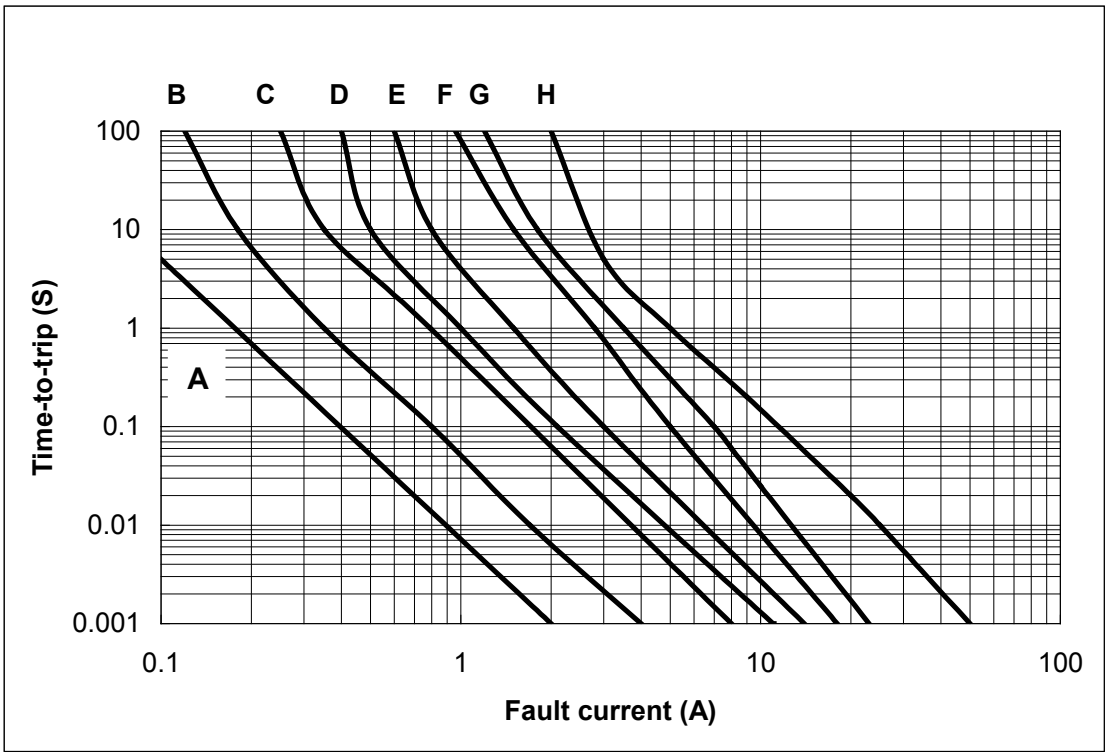
Part Number	Figure	A		B		C		D		E	
		Min	Max	Min	Max	Min	Min	Min	Max	Min	Max
SMD005-1210	1	3.00	3.43	2.35	2.80	0.60	1.15	0.25	0.75	——	——
SMD010-1210	1	3.00	3.43	2.35	2.80	0.60	1.15	0.25	0.75	——	——
SMD020-1210	1	3.00	3.43	2.35	2.80	0.40	0.85	0.25	0.75	——	——
SMD035-1210	1	3.00	3.43	2.35	2.80	0.40	0.80	0.25	0.75	——	——
SMD050-1210	1	3.00	3.43	2.35	2.80	0.30	0.75	0.25	0.75	——	——
SMD075-1210	1	3.00	3.43	2.35	2.80	0.30	0.70	0.25	0.75	——	——
SMD110-1210R	2	3.00	3.43	2.35	2.80	0.60	1.00	0.25	0.75	0.10	0.45
SMD150-1210R	2	3.00	3.43	2.35	2.80	0.50	0.90	0.25	0.75	0.10	0.45

4. Thermal Derating Curve



3. Typical Time-To-Trip at 23℃

A =FSMD005-1210
B =FSMD010-1210
C =FSMD020-1210
D =FSMD035-1210
E =FSMD050-1210
F =FSMD075-1210
G =FSMD110-1210R
H =FSMD150-1210R



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

F S M D □ □ □ - 1210 R

Current rating

Example

Part Marking System

F75

F □ □

Part Identification

F05 =FSMD005-1210
F10 =FSMD010-1210
F20 =FSMD020-1210
F35 =FSMD035-1210
F50 =FSMD050-1210
F75 =FSMD075-1210
F11 =FSMD110-1210R
F15 =FSMD150-1210R

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.

Surface Mountable PTC Resettable Fuse: FSMD1206 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: 0.05A~2.0A
(e) Maximum Voltage: 6V~60V
(f) Temperature Range : -40℃ to 85℃

2. Agency Recognition

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

Note:(1) FSMD075-1206 TUV Pending
(2) FSMD100-1206R , FSMD110-1206R, FSMD150-1206R & FSMD200-1206R UL , C-UL and TUV 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
SMD005-1206	0.05	0.15	60	10	0.4	0.25	1.50	3.600	50.0
SMD010-1206	0.10	0.25	60	10	0.4	0.50	1.00	1.600	15.0
SMD020-1206	0.20	0.40	30	10	0.4	8.00	0.05	0.600	2.500
SMD035-1206	0.35	0.75	16	40	0.4	8.00	0.10	0.300	1.200
SMD050-1206	0.50	1.00	8	40	0.4	8.00	0.10	0.150	0.700
SMD075-1206R	0.75	1.50	6	100	0.6	8.00	0.20	0.090	0.290
SMD100-1206R	1.00	1.80	6	100	0.6	8.00	0.30	0.055	0.210
SMD110-1206R	1.10	2.20	6	100	0.8	8.00	0.30	0.040	0.180
SMD150-1206R	1.50	3.00	6	100	0.8	8.00	1.00	0.040	0.120
SMD200-1206R	2.00	3.50	6	100	0.8	8.00	1.50	0.018	0.080

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

3. FSMD Product Dimensions (Millimeters)

Figure 1

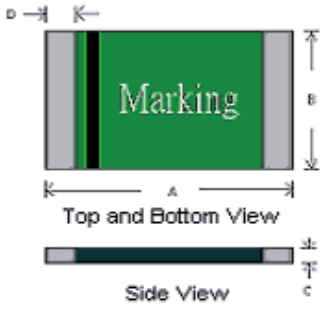
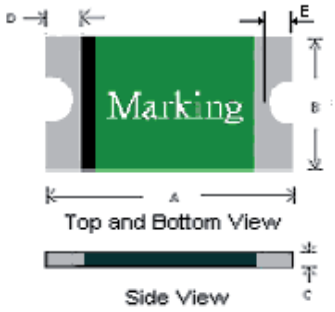
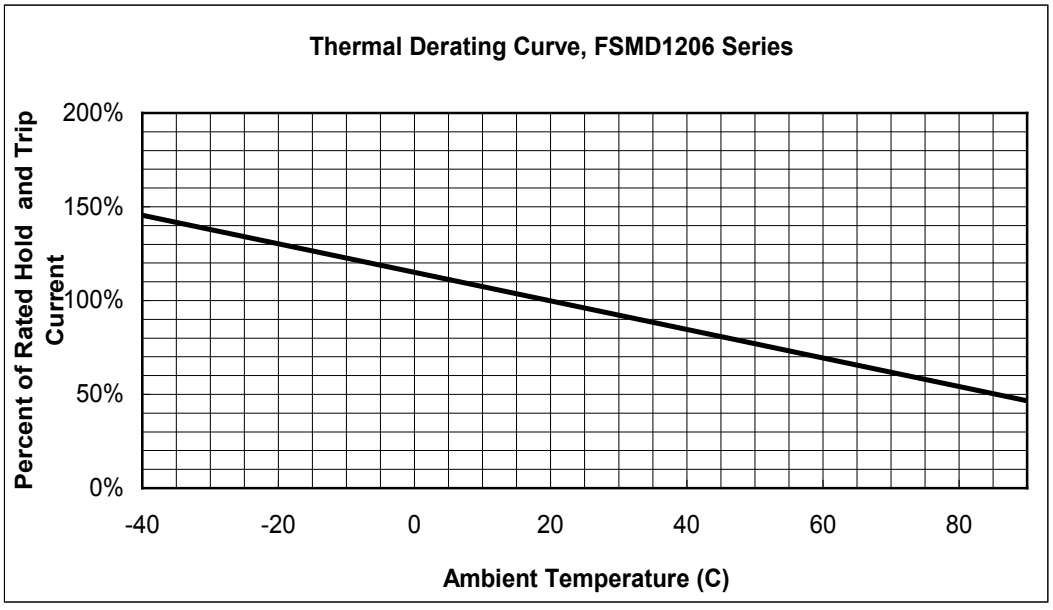


Figure 2



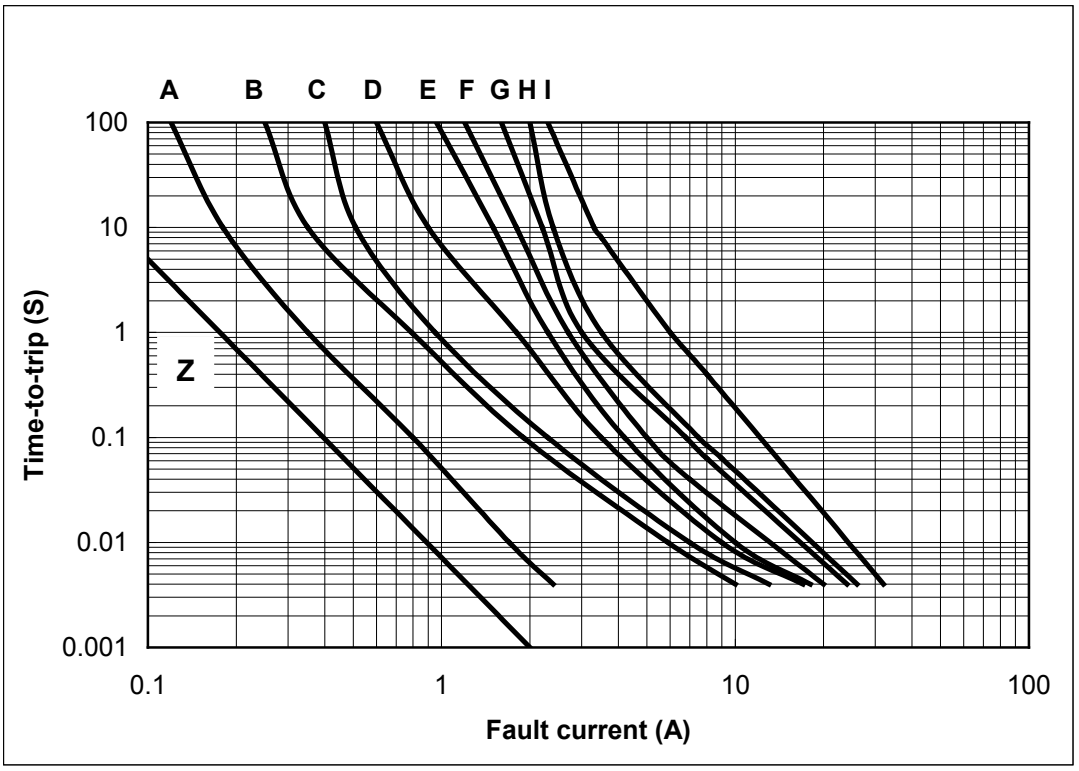
Part Number	Figure	A		B		C		D		E	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
MD005-1206	1	3.00	3.50	1.50	1.80	0.45	0.85	0.10	0.75	——	——
MD010-1206	1	3.00	3.50	1.50	1.80	0.45	0.85	0.10	0.75	——	——
MD020-1206	1	3.00	3.50	1.50	1.80	0.45	0.75	0.10	0.75	——	——
MD035-1206	1	3.00	3.50	1.50	1.80	0.45	0.75	0.10	0.75	——	——
MD050-1206	1	3.00	3.50	1.50	1.80	0.25	0.55	0.10	0.75	——	——
MD075-1206R	2	3.00	3.50	1.50	1.80	0.45	1.25	0.25	0.75	0.10	0.45
MD100-1206R	2	3.00	3.50	1.50	1.80	0.45	1.00	0.25	0.75	0.10	0.45
MD110-1206R	2	3.00	3.50	1.50	1.80	0.45	1.00	0.25	0.75	0.10	0.45
MD150-1206R	2	3.00	3.50	1.50	1.80	0.80	1.40	0.25	0.75	0.10	0.45
MD200-1206R	2	3.00	3.50	1.50	1.80	0.85	1.60	0.25	0.75	0.10	0.45

4. Thermal Derating Curve



3. Typical Time-To-Trip at 23℃

Z =FSMD005-1206
A =FSMD010-1206
B =FSMD020-1206
C =FSMD035-1206
D =FSMD050-1206
E =FSMD075-1206R
F =FSMD100-1206R
G =FSMD110-1206R
H =FSMD150-1206R
I = FSMD200-1206R



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

F S M D □ □ □ – 1206 R

Current rating

Example

Part Marking System

FA

F □

Part Identification

FZ =FSMD005-1206
FA =FSMD010-1206
FB =FSMD020-1206
FC =FSMD035-1206
FD =FSMD050-1206
FE =FSMD075-1206R
FF =FSMD100-1206R
FG =FSMD110-1206R
FH =FSMD150-1206R
FI = FSMD200-1206R

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.

Surface Mountable PTC Resettable Fuse: FSMD0805 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: 0.1A~1.0A
(e) Maximum Voltage: 6V~15V
(f) Temperature Range : -40℃ to 85℃

2. Agency Recognition

UL : Pending
C-UL: Pending
TUV: 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
FSMD010-0805	0.10	0.30	15	100	0.5	0.50	1.50	0.700	6.000
FSMD020-0805	0.20	0.50	9	100	0.5	8.00	0.02	0.400	3.500
FSMD035-0805	0.35	0.75	6	100	0.5	8.00	0.10	0.250	1.200
FSMD050-0805R	0.50	1.00	6	100	0.5	8.00	0.10	0.150	0.850
FSMD075-0805R	0.75	1.50	6	40	0.6	8.00	0.20	0.090	0.350
FSMD100-0805R	1.00	1.95	6	40	0.6	8.00	0.30	0.060	0.210

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 after tripping or reflow soldering of 260℃ for 20 seconds.
Termination pad characteristics
Termination pad materials: Pure Tin

3. FSMD Product Dimensions (Millimeters)

Figure 1

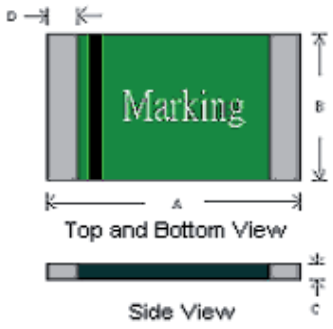
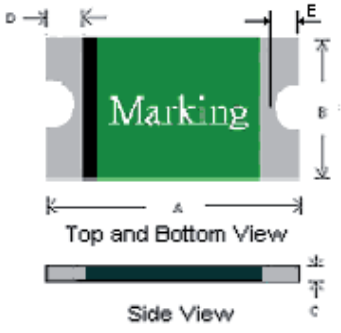
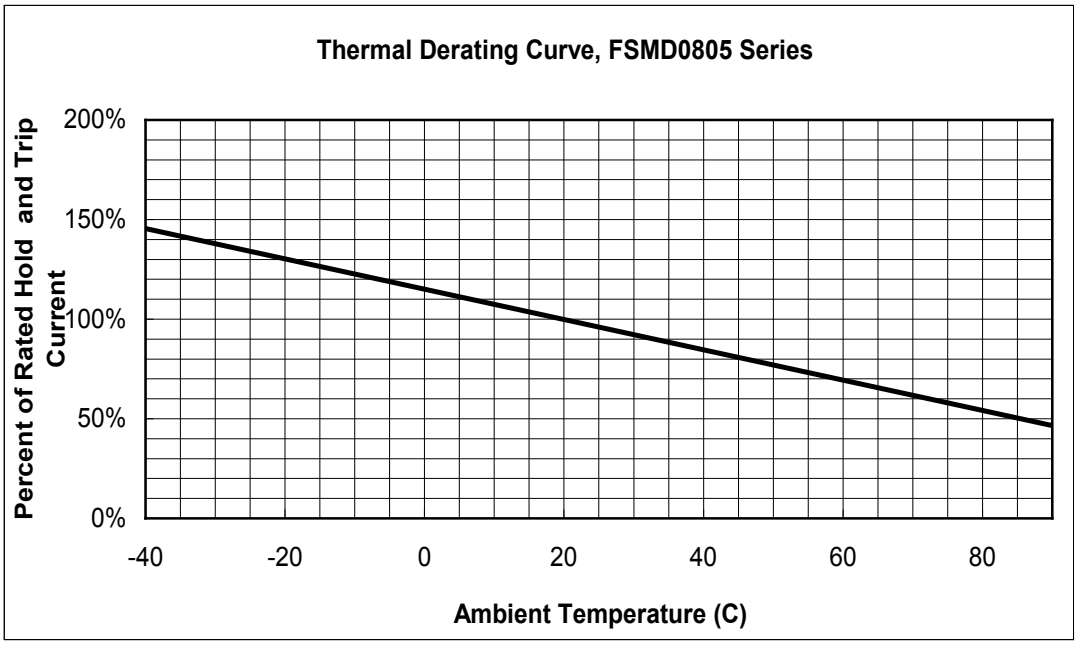


Figure 2



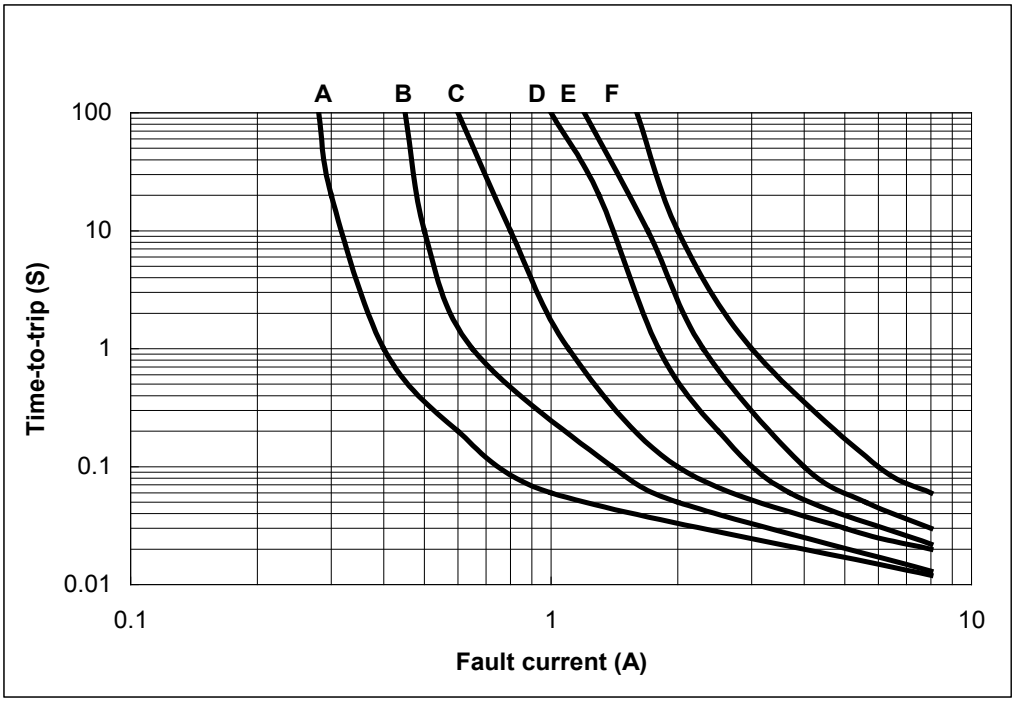
Part Number	Figure	A		B		C		D		E	
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
FSMD010-0805	1	2.00	2.30	1.20	1.50	0.55	1.00	0.20	0.60	____	____
FSMD020-0805	1	2.00	2.30	1.20	1.50	0.55	1.00	0.20	0.60	____	____
FSMD035-0805	1	2.00	2.30	1.20	1.50	0.45	0.75	0.20	0.60	____	____
FSMD050-0805R	2	2.00	2.20	1.20	1.50	0.55	1.25	0.20	0.60	0.10	0.45
FSMD075-0805R	2	2.00	2.20	1.20	1.50	0.55	1.25	0.20	0.60	0.10	0.45
FSMD100-0805R	2	2.00	2.20	1.20	1.50	0.75	1.80	0.20	0.60	0.10	0.45

4. Thermal Derating Curve



3. Typical Time-To-Trip at 23℃

A =FSMD010-0805
B =FSMD020-0805
C =FSMD035-0805
D =FSMD050-0805R
E =FSMD075-0805R
F =FSMD100-0805R



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

F S M D □ □ □ – 0805 R

Current rating

Example

Part Marking System

F1

F □

Part Identification

F1 =FSMD010-0805
F2 =FSMD020-0805
F3 =FSMD035-0805
F5 =FSMD050-0805R
F7 =FSMD075-0805R
F0 =FSMD100-0805R

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.

RESETABLE FUSES

Änderungen der technischen Daten
und Liefermöglichkeiten bleiben ohne Ankündigung vorbehalten.

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