



Radial Leaded PTC Resettable Fuse : FRA Series

1. Summary

- (a) **RoHS Compliant (Lead Free) product**
- (b) **Applications : Wide variety of electronic equipment**
- (c) **Product Features : Solid state, Radial leaded product ideal for up to 120VAC/VDC**
- (d) **Operation Current : 100mA~3.75A**
- (e) **Maximum Voltage : 120VAC/VDC**
- (f) **Temperature Range : -40°C to 85°C**

2. Agency Recognition

UL : File No. Pending

C-UL: File No. Pending

TÜV: File No. Pending

3. Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Max. Time to Trip	Maximum Current	Rated Voltage	Typical Power	Resistance	
	I _H , A	I _T , A	at 5xI _H	I _{MAX} , A	V _{MAX} , V	P _d , W	R _{MIN} ohms	R _{1MAX} ohms
FRA010-120F	0.10	0.20	4.0	2.0	120	0.57	2.50	7.50
FRA017-120F	0.17	0.34	3.0	2.0	120	0.59	2.00	7.00
FRA020-120F	0.20	0.40	2.2	2.0	120	0.62	1.83	4.40
FRA025-120F	0.25	0.50	2.5	3.0	120	0.68	1.25	3.00
FRA030-120F	0.30	0.60	3.0	3.0	120	0.74	0.88	2.10
FRA040-120F	0.40	0.80	3.8	3.0	120	0.84	0.55	1.29
FRA050-120F	0.50	1.00	4.0	3.0	120	1.16	0.50	1.17
FRA065-120F	0.65	1.30	5.3	3.0	120	1.32	0.31	0.72
FRA075-120F	0.75	1.50	6.3	5.0	120	1.38	0.25	0.60
FRA090-120F	0.90	1.80	7.2	5.0	120	1.49	0.20	0.47
FRA110-120F	1.10	2.20	8.2	5.0	120	2.25	0.15	0.38
FRA135-120F	1.35	2.70	9.6	8.0	120	2.55	0.12	0.30
FRA160-120F	1.60	3.20	11.4	8.0	120	2.85	0.09	0.22
FRA185-120F	1.85	3.70	12.6	8.0	120	3.15	0.08	0.19
FRA250-120F	2.50	5.00	15.6	12.0	120	3.75	0.05	0.13
FRA300-120F	3.00	6.00	19.8	15.0	120	4.20	0.04	0.10
FRA375-120F	3.75	7.50	24.0	15.0	120	4.80	0.03	0.08

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 its rated current.

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

P_d=Typical power dissipated from device when in tripped state in 23°C still air environment.

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

R_{1MAX}=Maximum device resistance at 23°C, 1 hour after tripping .

Physical specifications:

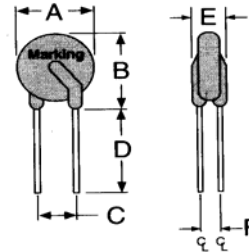
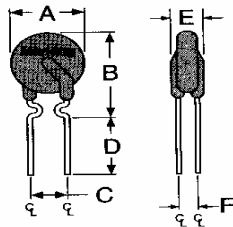
Lead material: FRA010-120F~FRA090-120F Tin plated copper,22AWG.

FRA110-120F~FRA375-120F Tin plated copper,20AWG.

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

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

NOTE : Specification subject to change without notice.

**4. Production Dimensions (millimeter)**

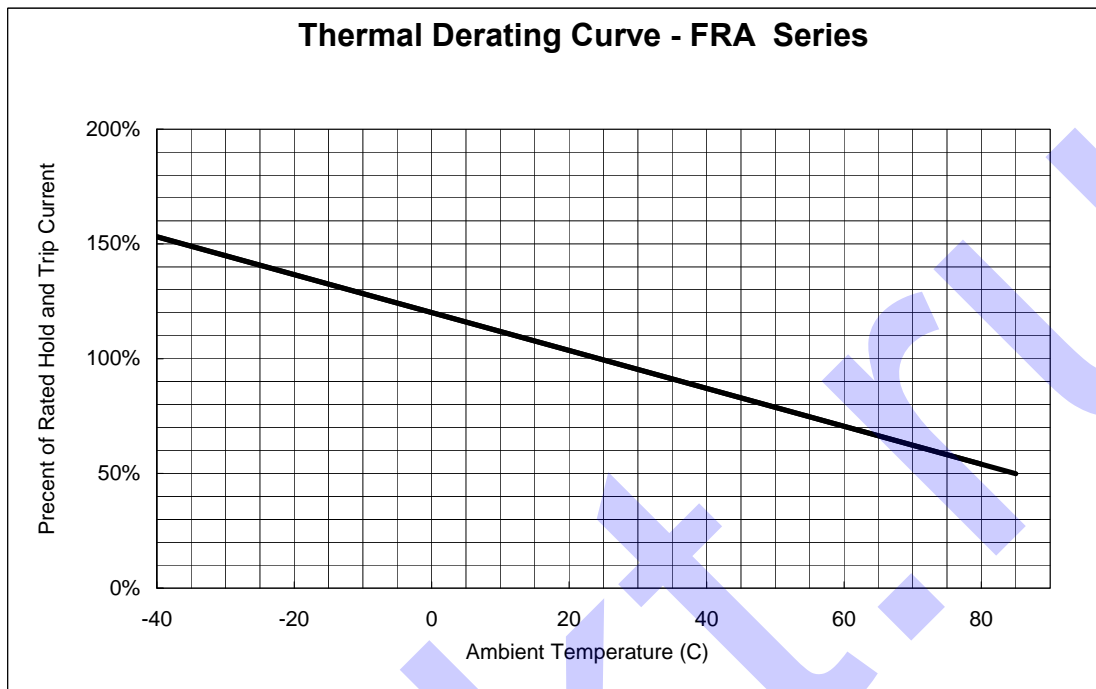
FRA010-120F ~ FRA090-120F
 Lead Size :22AWG
 Φ 0.65 mm Diameter

FRA110-120F ~ FRA375-120F
 Lead Size : 20AWG
 Φ 0.81 mm Diameter

Part Number	A	B	C	D	E	F
	Maximum	Maximum	Typical	Minimum	Maximum	Typical
FRA010-120F	7.9	12.7	5.1	7.6	5.0	3.0
FRA017-120F	7.9	12.7	5.1	7.6	5.0	3.0
FRA020-120F	7.9	12.7	5.1	7.6	5.0	3.0
FRA025-120F	7.9	12.7	5.1	7.6	5.0	3.0
FRA030-120F	7.9	13.0	5.1	7.6	5.0	3.0
FRA040-120F	8.2	14.2	5.1	7.6	5.0	3.0
FRA050-120F	9.2	14.9	5.1	7.6	5.0	3.0
FRA065-120F	9.7	14.9	5.1	7.6	5.0	3.0
FRA075-120F	10.6	15.5	5.1	7.6	5.0	3.0
FRA090-120F	11.9	15.9	5.1	7.6	5.0	3.0
FRA110-120F	13.3	18.3	5.1	7.6	5.0	3.0
FRA135-120F	15.5	20.6	5.1	7.6	5.0	3.0
FRA160-120F	17.5	22.5	5.1	7.6	5.0	3.0
FRA185-120F	19.9	24.9	5.1	7.6	5.0	3.0
FRA250-120F	22.5	27.5	10.2	7.6	5.0	3.0
FRA300-120F	25.5	30.0	10.2	7.6	5.0	3.0
FRA375-120F	29.5	34.0	10.2	7.6	5.0	3.0

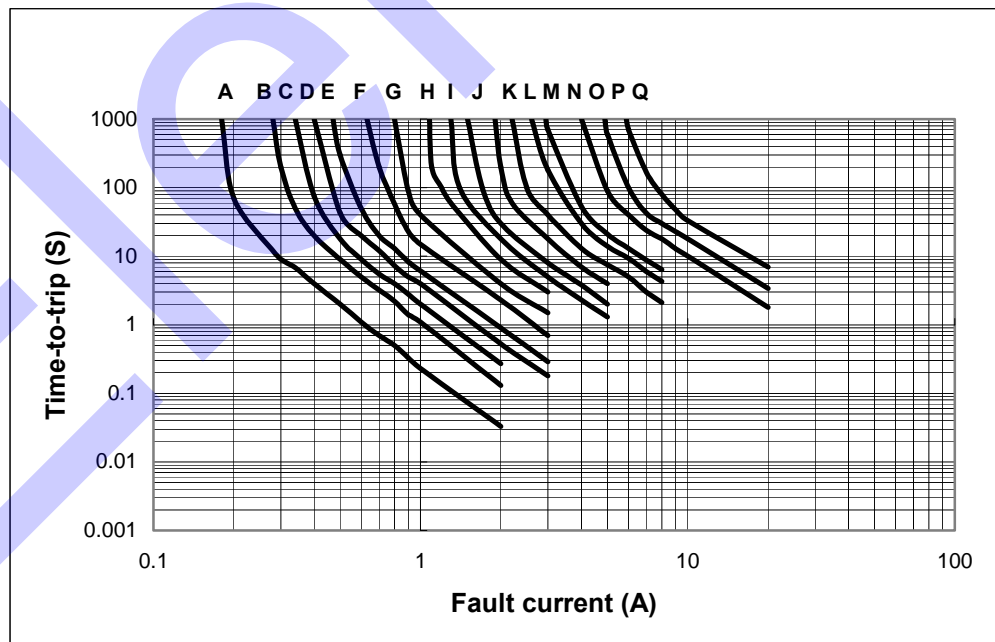


5. Thermal Derating Curve



6. Typical Time-To-Trip at 23°C

- A=FRA010-120F
- B=FRA017-120F
- C=FRA020-120F
- D=FRA025-120F
- E=FRA030-120F
- F=FRA040-120F
- G=FRA050-120F
- H=FRA065-120F
- I=FRA075-120F
- J=FRA090-120F
- K=FRA110-120F
- L=FRA135-120F
- M=FRA160-120F
- N=FRA185-120F
- O=FRA250-120F
- P=FRA300-120F
- Q=FRA375-120F



7. Material Specification

Lead material : FRA010-120F~FRA090-120F Tin plated copper, 22 AWG.

FRA110-120F~FRA300-120F Tin plated copper, 20 AWG.

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

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

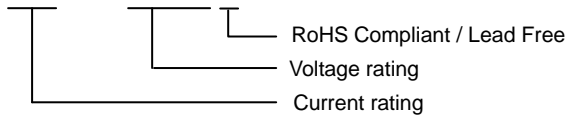
NOTE : Specification subject to change without notice.



8. Part Numbering and Marking System

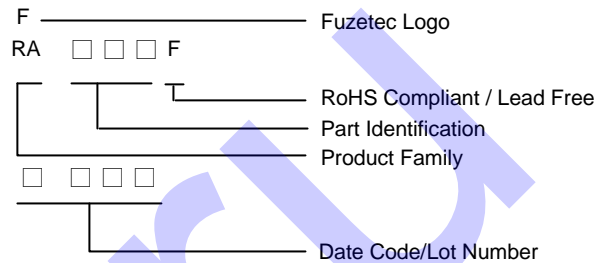
Part Numbering System

F R A □ □ □ - □ □ □ F



Example

Part Marking System



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.