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_{DC}**
(d) **Operation Current: 0.9A~9.0A**
(e) **Maximum Voltage: 30V_{DC}**
(f) **Temperature Range: -40℃ to 85℃**

2. Agency Recognition

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

3. Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max. Time To Trip	Maximum Current	Rated Voltage	Typical Power	Resistance	
							R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	at 5xI_H, s	I_{MAX}, A	V_{MAX}, V_{DC}	Pd, W	Ohm	Ohm
FRU090-30F	0.90	1.80	5.9	100	30	0.6	0.070	0.220
FRU110-30F	1.10	2.20	6.6	100	30	0.7	0.050	0.170
FRU135-30F	1.35	2.70	7.3	100	30	0.8	0.040	0.130
FRU160-30F	1.60	3.20	8.0	100	30	0.9	0.030	0.110
FRU185-30F	1.85	3.70	8.7	100	30	1.0	0.030	0.090
FRU250-30F	2.50	5.00	10.3	100	30	1.2	0.020	0.070
FRU300-30F	3.00	6.00	10.8	100	30	2.0	0.020	0.080
FRU400-30F	4.00	8.00	12.7	100	30	2.5	0.010	0.050
FRU500-30F	5.00	10.00	14.5	100	30	3.0	0.010	0.050
FRU600-30F	6.00	12.00	16.0	100	30	3.5	0.005	0.040
FRU700-30F	7.00	14.00	17.5	100	30	3.8	0.005	0.030
FRU800-30F	8.00	16.00	18.8	100	30	4.0	0.005	0.020
FRU900-30F	9.00	18.00	20.0	100	30	4.2	0.005	0.020

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

4. Production Dimensions (millimeter)

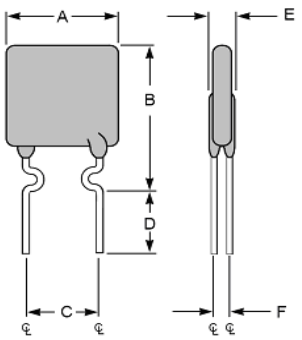


Fig. 1
Lead Size: 24AWG
φ 0.51 mm Diameter

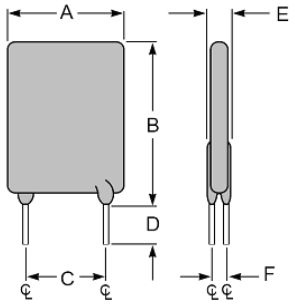
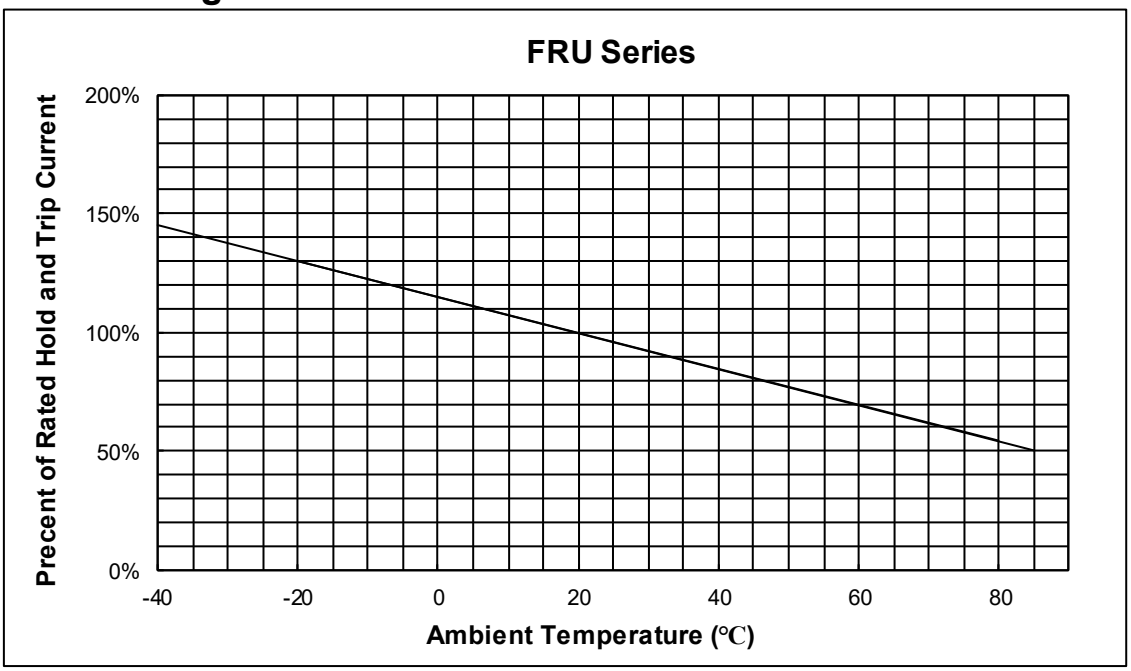


Fig. 2
Lead Size: 20AWG
φ 0.81 mm Diameter

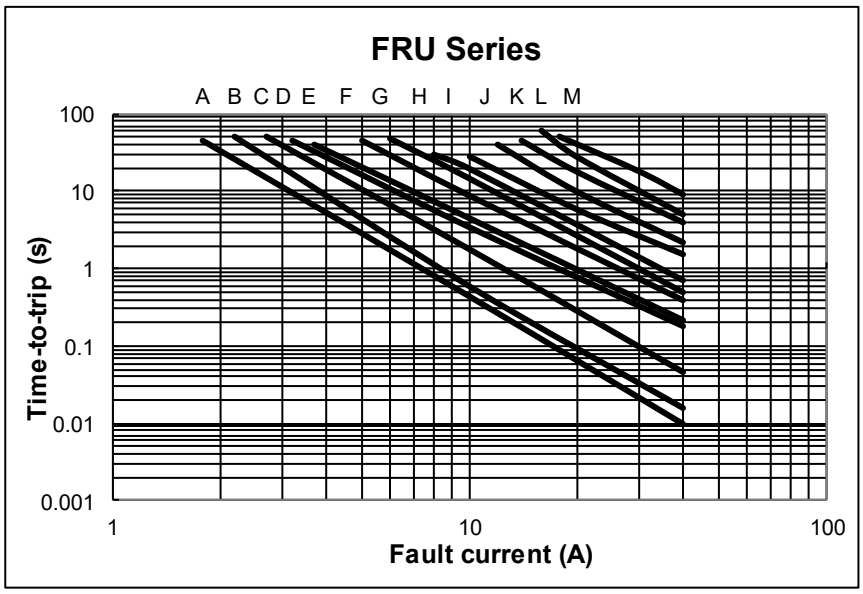
Part Number	Fig	A	B	C	D	E	F
		Maximum	Maximum	Typical	Minimum	Maximum	Typical
FRU090-30F	1	7.4	12.2	5.1	7.6	3.0	0.9
FRU110-30F	1	7.4	14.2	5.1	7.6	3.0	0.9
FRU135-30F	1	8.9	13.5	5.1	7.6	3.0	0.9
FRU160-30F	1	8.9	15.2	5.1	7.6	3.0	0.9
FRU185-30F	1	10.2	15.7	5.1	7.6	3.0	0.9
FRU250-30F	1	11.4	18.3	5.1	7.6	3.0	0.9
FRU300-30F	2	11.4	17.3	5.1	7.6	3.0	1.2
FRU400-30F	2	14.0	20.1	5.1	7.6	3.0	1.2
FRU500-30F	2	14.0	24.9	10.2	7.6	3.0	1.2
FRU600-30F	2	16.5	24.9	10.2	7.6	3.0	1.2
FRU700-30F	2	19.1	26.7	10.2	7.6	3.0	1.2
FRU800-30F	2	21.6	29.2	10.2	7.6	3.0	1.2
FRU900-30F	2	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
M =FRU900-30F



7. Material Specification

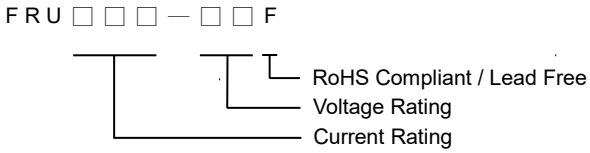
Lead material: FRU090-30F~FRU250-30F Tin plated copper clad steel, 24 AWG.
FRU300-30F~FRU900-30F Tin plated copper, 20 AWG.

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

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

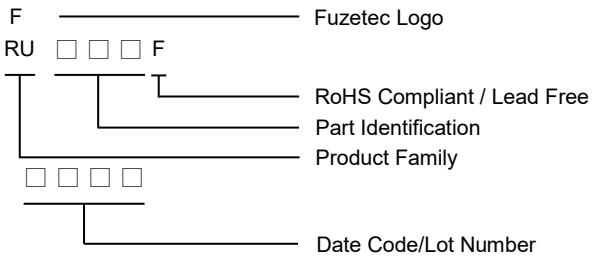
8. Part Numbering and Marking System

Part Numbering System



Part Marking System

Example



Note: Font on Marking may look slightly different due to fine turnings of each Marking printer.

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.