



## 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 60VDC**
- (d) **Operation Current : 0.05A~3.75A**
- (e) **Maximum Voltage : 60VDC**
- (f) **Temperature Range : -40°C to 85°C**

### 2. Agency Recognition

UL : File No. E211981

C-UL: File No. E211981

TÜV: File No. R50004084

### 3. Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Max.Time to Trip	Maximum Current	Rated Voltage	Typical Power	Resistance	
	I <sub>H</sub> ,A	I <sub>T</sub> ,A	at 5X I <sub>H</sub> ,s	I <sub>MAX</sub> ,A	V <sub>MAX</sub> ,VDC	P <sub>d</sub> , W	R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> Ohms
FRX005-60F	0.05	0.10	5.0	40	60	0.26	7.30	20.00
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<sub>H</sub>=Hold current-maximum current at which the device will not trip at 23°C still air.

I<sub>T</sub>=Trip current-minimum current at which the device will always trip at 23°C still air.

V<sub>MAX</sub>=Maximum voltage device can withstand without damage at its rated current.

I<sub>MAX</sub>= Maximum fault current device can withstand without damage at rated voltage (V<sub>MAX</sub>).

P<sub>d</sub>=Typical power dissipated from device when in tripped state in 23°C still air environment.

R<sub>MIN</sub>=Minimum device resistance at 23°C.

R<sub>1MAX</sub>=Maximum device resistance at 23°C, 1 hour after tripping .

Physical specifications:

Lead material: FRX005-60F~FRX040-60F Tin plated copper clad steel, 24 AWG.

FRX050-60F~FRX090-60F Tin plated copper, 24 AWG.

FRX110-60F~FRX375-60F Tin plated copper, 20 AWG.

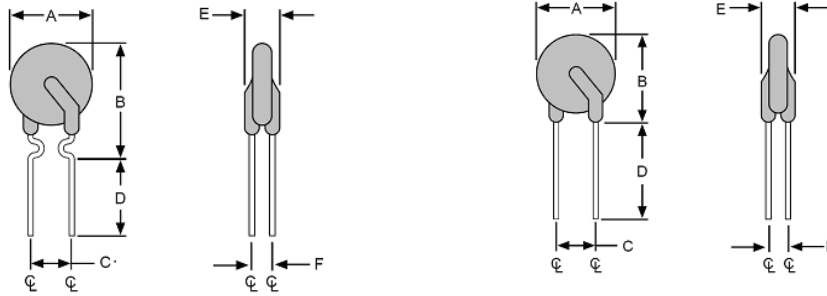
Soldering characteristics:MIL-STD-202, Method 208E.

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

**NOTE : Specification subject to change without notice.**



**4. Production Dimensions (millimeter)**

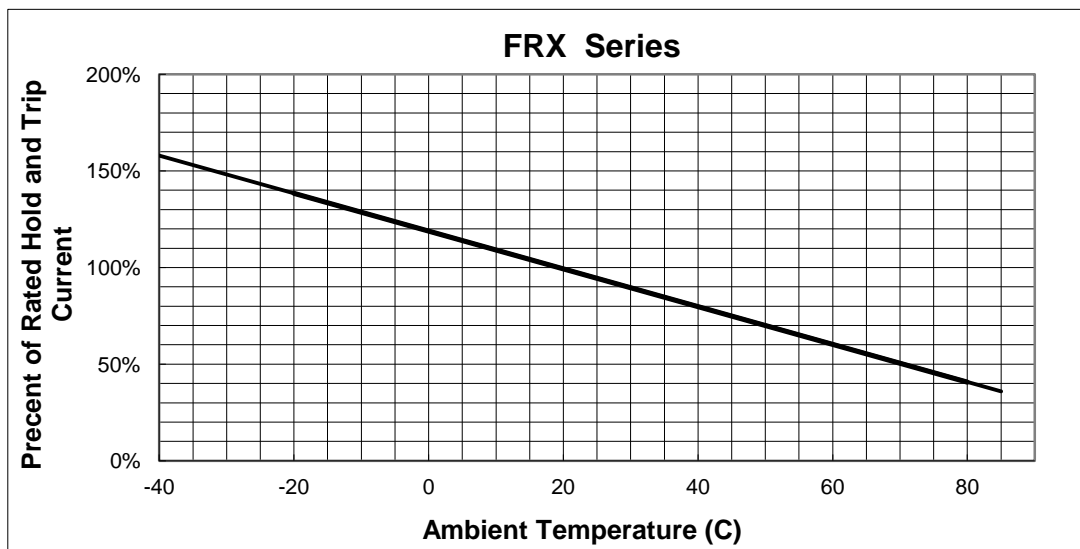


**FRX 005-60F ~ FRX 090-60F**  
Lead Size : 24AWG  
Φ 0.51 mm Diameter

**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	12.7	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**

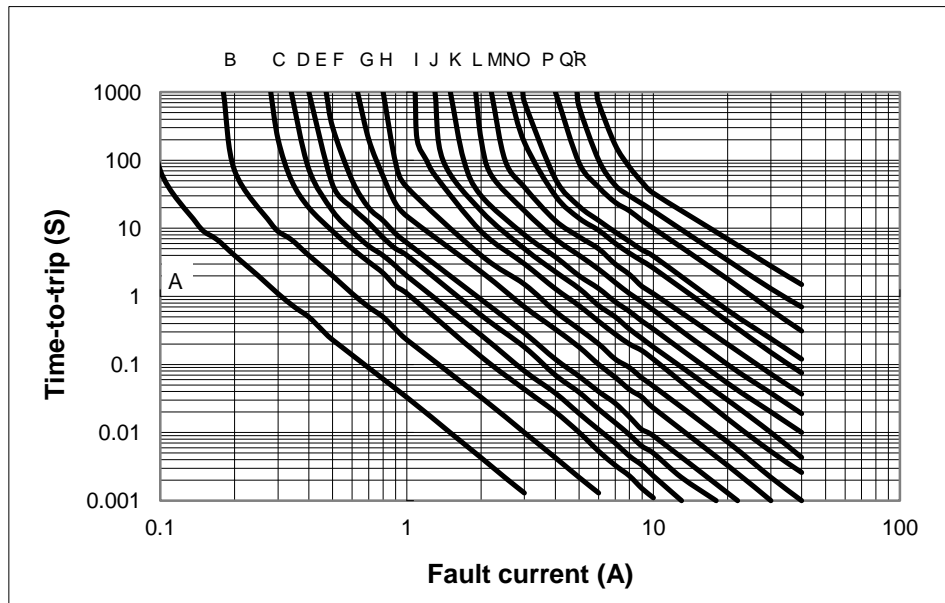


NOTE : Specification subject to change without notice.



### 6. Typical Time-To-Trip at 23°C

- 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~FRX040-60F Tin plated copper clad steel, 24 AWG.

FRX050-60F~FRX090-60F Tin plated copper, 24 AWG.

FRX110-60F~FRX375-60F Tin plated copper, 20 AWG.

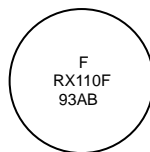
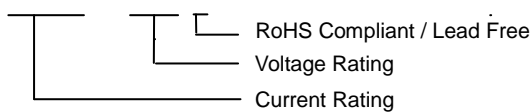
Soldering characteristics:MIL-STD-202, Method 208E.

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

### 8. Part Numbering and Marking System

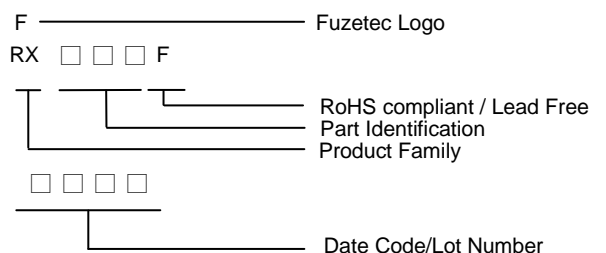
#### Part Numbering System

FRX □ □ □ - □ □ F



Example

#### Part Marking System



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.

**NOTE :** Specification subject to change without notice.

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