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# Radial Leaded PTC Resettable Fuse: FRT Series

## Preliminary



### 1. Summary

- (a) **RoHS Compliant (Lead Free) Product**
- (b) **Applications: IEEE 1394 FireWire, Computers & Consumer electronics**
- (c) **Product Features: Fast trip time, Lower Trip-to-hold Ratio, Radial-leaded product ideal for up to 36V**
- (d) **Operation Current: 500mA~2.50A**
- (e) **Maximum Voltage: 36V**
- (f) **Temperature Range : -40°C to 85°C**

### 2. Agency Recognition

- UL: Pending
- C-UL: Pending
- TÜV: Pending

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

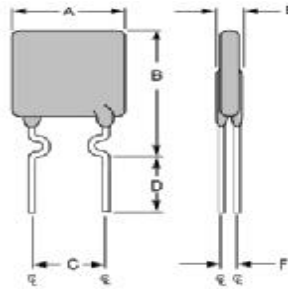
Part Number	Hold Current	Trip Current	Maximum Current	Rated Voltage	Typical Power	Resistance Tolerance	
						R <sub>MIN</sub>	R <sub>1MAX</sub>
	I <sub>H</sub> ,A	I <sub>T</sub> ,A	I <sub>MAX</sub> ,A	V <sub>MAX</sub> ,V <sub>dc</sub>	P <sub>d</sub> , W	Ω	Ω
<b>FRT050-33F</b>	0.50	1.10	40	36	0.67	0.140	0.448
<b>FRT075-33F</b>	0.75	1.50	40	36	0.71	0.115	0.368
<b>FRT090-33F</b>	0.90	1.80	40	36	0.74	0.090	0.288
<b>FRT120-33F</b>	1.20	2.30	40	36	0.78	0.074	0.180
<b>FRT135-33F</b>	1.35	2.50	40	36	0.84	0.059	0.143
<b>FRT160-33F</b>	1.60	2.75	40	36	0.86	0.041	0.131
<b>FRT190-33F</b>	1.90	3.00	40	36	0.90	0.045	0.092
<b>FRT220-33F</b>	2.20	3.50	40	36	0.95	0.025	0.080
<b>FRT250-33F</b>	2.50	4.00	40	36	0.99	0.020	0.064

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: Tin plated copper, 24 AWG.  
Soldering characteristics:MIL-STD-202, Method 208E.  
Insulating coating:Flame retardant epoxy, meets UL-94V-0 requirement.



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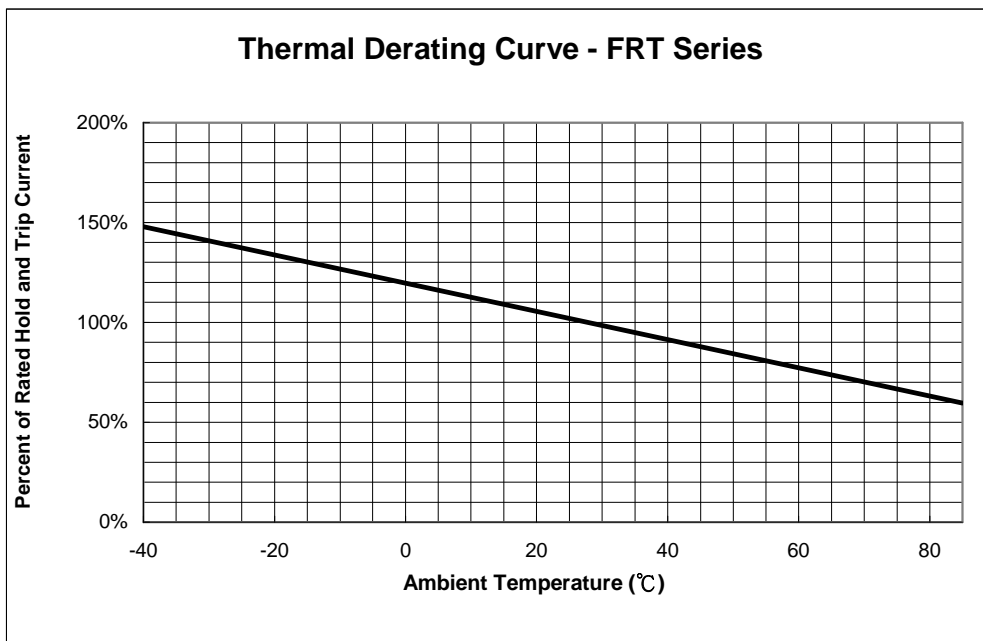
**4. Production Dimensions (millimeter)**



Lead Size :24AWG,  
 $\Phi$  0.51 mm Diameter

Part Number	A	B	C	D	E	F
	Maximum	Maximum	Typical	Minimum	Maximum	Typical
FRT050-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT075-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT090-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT120-33F	7.4	12.2	5.1	7.6	3.0	1.1
FRT135-33F	7.4	14.2	5.1	7.6	3.0	1.1
FRT160-33F	7.4	14.0	5.1	7.6	3.0	1.1
FRT190-33F	9.0	13.5	5.1	7.6	3.0	1.1
FRT220-33F	10.0	17.0	5.1	7.6	3.0	1.1
FRT250-33F	10.0	19.5	5.1	7.6	3.0	1.1

**5. Thermal Derating Curve**

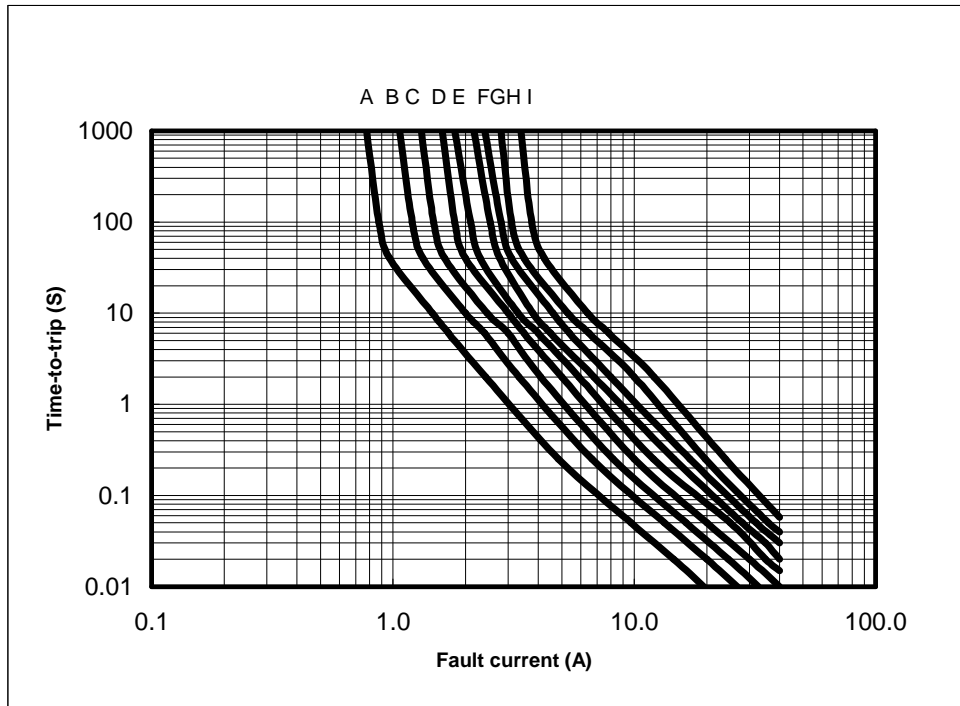




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## 6. Typical Time-To-Trip at 23°C

- A= FRT050-33F
- B= FRT075-33F
- C= FRT090-33F
- D= FRT120-33F
- E= FRT135-33F
- F= FRT160-33F
- G= FRT190-33F
- H= FRT220-33F
- I = FRT250-33F

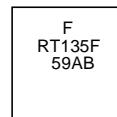
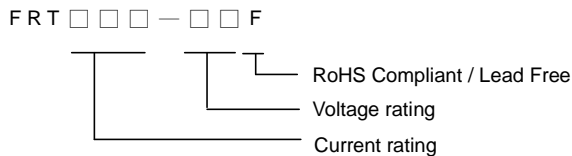


## 7. Material Specification

- Lead material : Tin plated copper, 24 AWG.
- Soldering characteristics: MIL-STD-202, Method 208E.
- Insulating coating: Flame retardant epoxy, meets UL-94V-0 requirement.

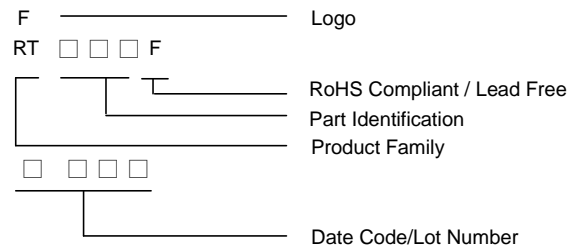
## 8. Part Numbering and Marking System

### Part Numbering System



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.