

<b>RFE</b>  <b>FUZETEC</b>	<b>NO.</b>	<b>PQ33-101E</b>		
<b>Product Specification and Approval Sheet</b>	<b>Version</b>	<b>1</b>	<b>Page</b>	<b>1/4</b>

## Radial Leaded PTC Resettable Fuse: FRHV 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/100V/250V/600V**
- (d) **Operation Current: 0.08A~0.40A**
- (e) **Maximum Operation Voltage: 60V/100V/250V<sub>DC</sub>**
- (f) **Maximum Interrupt Voltage: 250V/600V<sub>AC</sub>**
- (g) **Temperature Range: -40°C to 85°C**

### 2. Agency Recognition

UL: File No. E211981  
 C-UL: File No. E211981  
 TÜV: \*File No. R50138901

\*FRH160-600MF and FRH200-600VF~FRH400-600F TÜV In Process.

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

Part Number	Hold Current	Trip Current	Max. Time to Trip		Max. Current	Max. Oper. Voltage	Max. Int. Voltage	Typ. Power	Resistance	
			Current	Time					R <sub>MIN</sub>	R <sub>1MAX</sub>
			I <sub>H</sub> , A	I <sub>T</sub> , A					A	Sec.
FRH080-250VF	0.08	0.16	0.35	4.0	3.0	100	250	1.0	14.00	33.00
FRH110-250VF	0.11	0.22	1.00	2.0	3.0	100	250	1.0	5.00	16.00
FRH120-250VF	0.12	0.24	1.00	2.0	3.0	100	250	1.0	4.00	16.00
FRH145-250VF	0.15	0.29	1.00	2.5	3.0	100	250	1.0	3.00	12.00
FRH180-250XF	0.18	0.65	3.00	2.0	10.0	100	250	1.0	0.80	4.00
FRH150-600MF	0.15	0.30	1.00	4.0	3.0	250	600	1.0	6.00	17.00
FRH160-600MF	0.16	0.32	1.00	7.0	3.0	250	600	1.0	4.00	16.00
FRH160-600VF	0.16	0.32	1.00	7.0	3.0	250	600	1.0	4.00	18.00
FRH200-600VF	0.20	0.40	1.00	12.0	3.0	250	600	1.0	4.00	13.50
FRH250-600VF	0.25	0.85	3.00	1.0	3.0	250	600	1.0	1.00	7.00
FRH400-600F	0.40	1.00	3.00	4.0	3.0	60	600	1.0	0.95	1.90

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-maximum current at which the device will always trip at 23°C still air.

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

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

V<sub>I-MAX</sub> = Maximum interrupt voltage device can withstand for short period of time. (Not for long term)

Pd=Typical power dissipated from device when in the 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, 22 AWG.

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

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

\*NOTE: All FRHV products are designed to assist equipment to pass ITU, UL60950 or GR1089 specification.

\*FRH150-600MF, FRH160-600VF meet UL497A Overvoltage and Endurance Conditioning requirements for Thermistor type component.

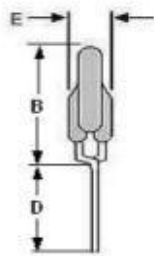
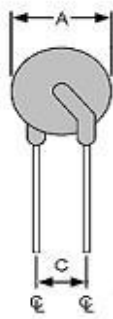
**CAUTION: FRHV devices are not intended for continuous use of Line Voltage such as 120V<sub>AC</sub>~600V<sub>AC</sub> and above.**

Designed and manufactured by Fuzetec Technology Co., Ltd., offered by RFE International, Inc.

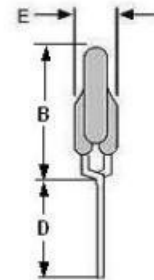
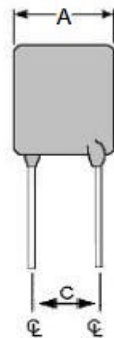
NOTE: Specification subject to change without notice.

2021/04/07

#### 4. Production Dimensions (millimeter)



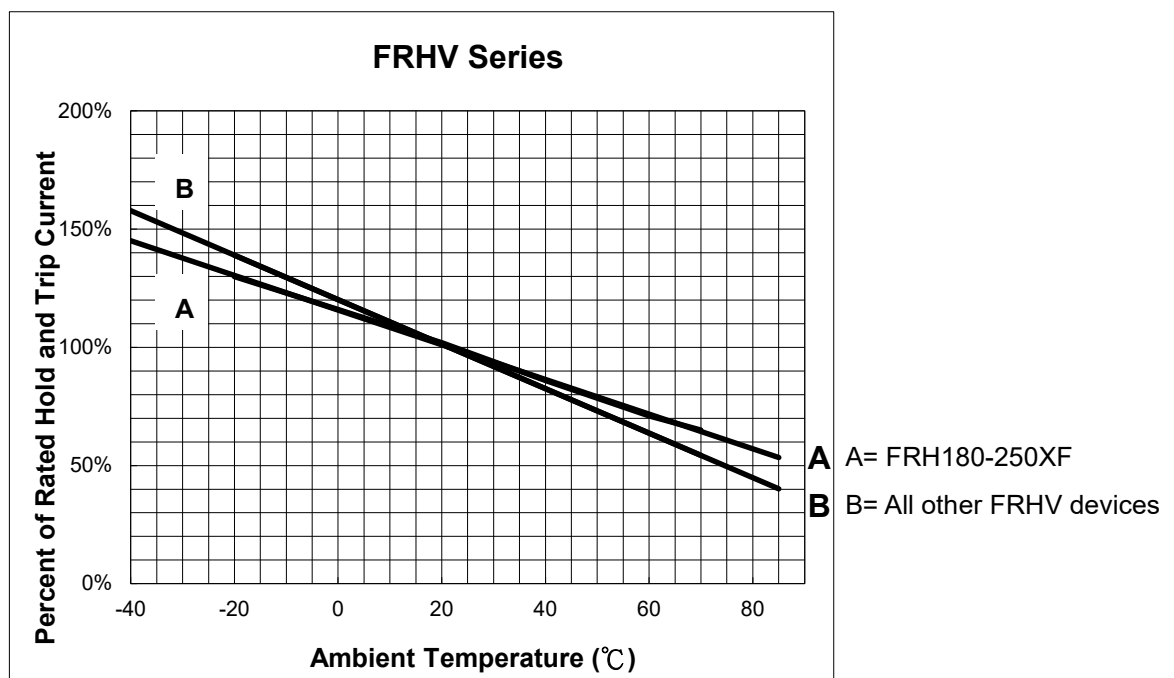
**Fig. 1**  
Lead Size: 22AWG  
φ0.65 mm Diameter



**Fig. 2**  
Lead Size: 22AWG  
φ0.65 mm Diameter

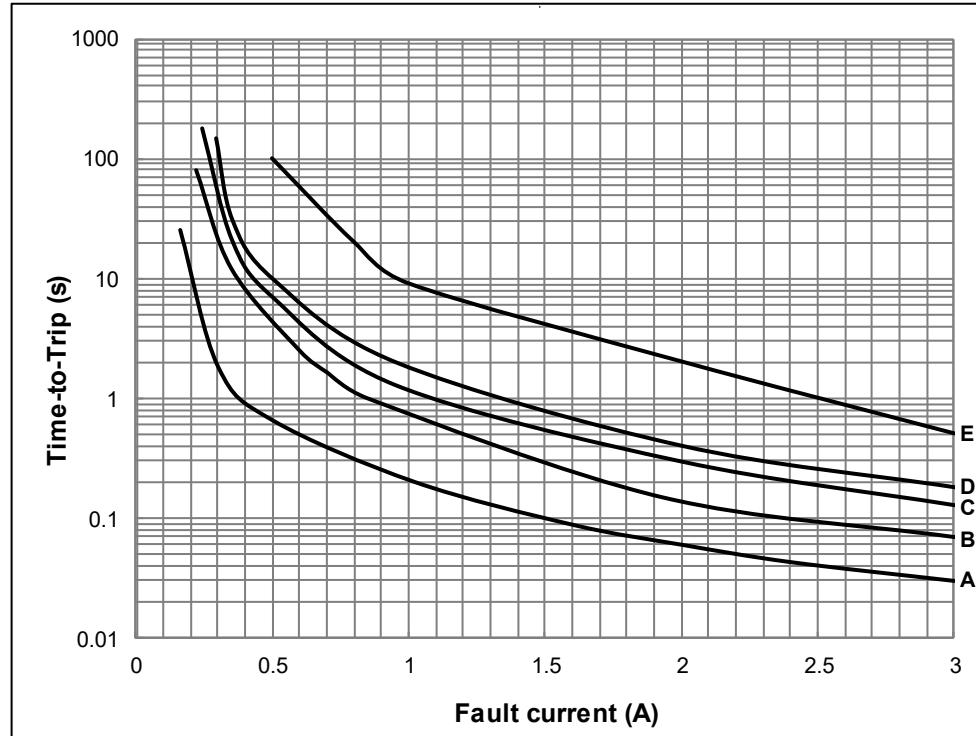
Part Number	Fig.	A	B	C	D	E
		Maximum	Maximum	Typical	Minimum	Maximum
FRH080-250VF	1	5.8	9.6	5.0	4.7	4.6
FRH110-250VF	1	6.8	9.9	5.0	4.7	4.6
FRH120-250VF	2	6.5	11.0	5.0	4.7	4.6
FRH145-250VF	2	6.5	11.0	5.0	4.7	4.6
FRH180-250XF	1	9.0	12.0	5.0	4.7	3.8
FRH150-600MF	2	9.0	12.5	5.0	4.7	4.6
FRH160-600MF	2	9.0	12.5	5.0	4.7	4.6
FRH160-600VF	2	16.0	12.6	5.0	4.7	6.0
FRH200-600VF	2	12.0	14.0	5.0	4.7	6.0
FRH250-600VF	2	12.0	15.0	5.0	4.7	6.0
FRH400-600F	2	15.0	18.0	5.0	4.7	6.0

#### 5. Thermal Derating Curve

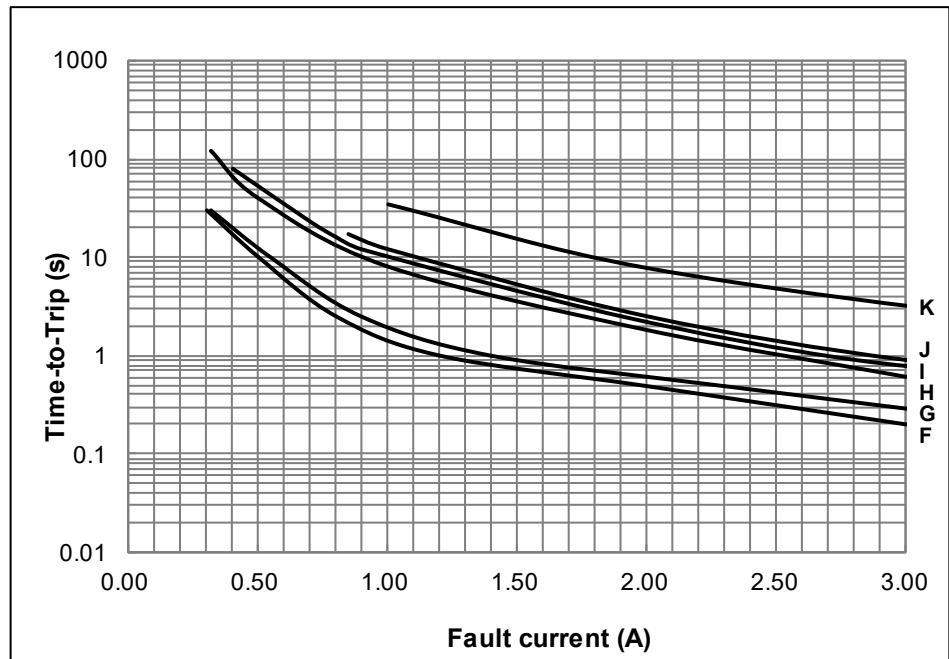


6. Typical Time-to-Trip at 23°C

- A= FRH080-250VF
- B= FRH110-250VF
- C= FRH120-250VF
- D= FRH145-250VF
- E= FRH180-250XF



- F = FRH150-600MF
- G = FRH160-600MF
- H = FRH160-600VF
- I = FRH200-600VF
- J = FRH250-600VF
- K = FRH400-600F



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## 7. Material Specification

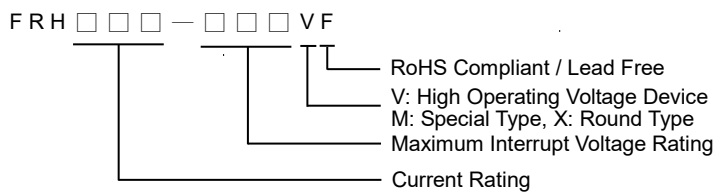
Lead material: Tin plated copper, 22 AWG.

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

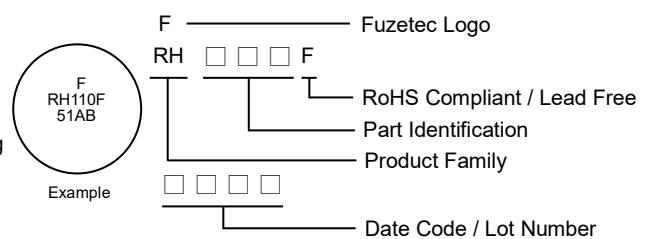
Insulating coating: Flame retardant epoxy, meets UL-94V-0 requirement.

## 8. Part Numbering and Marking System

### Part Numbering System



### Part Marking System



\* FRH150-600MF Marking: RH6150F, FRH160-600MF Marking: RH6160F, FRH160-600VF Marking: RH6160F

\* FRH200-600VF Marking: RH6200F, FRH250-600VF Marking: RH6250F, FRH400-600F Marking: RH6400F

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.