



Radial Leaded PTC Resettable Fuse : FRH 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/250V/600V**
- (d) **Operation Current : 80mA~180mA**
- (e) **Maximum Voltage : 60V/250V/600V**
- (f) **Temperature Range : -40°C to 85°C**

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2. Agency Recognition

UL : File No. E211981
C-UL: File No. E211981
TÜV: File No. R 50021651

3. Electrical Characteristics (23°C)

| Part Number | Hold Current | Maximum Current | Max Oper. Voltage | Max Int. Voltage | Resistance Tolerance | |
|---------------------|--------------------|----------------------|------------------------|------------------------|----------------------|-------------------|
| | | | | | R _{MIN} | R _{1MAX} |
| | I _H , A | I _{MAX} , A | V _{MAX} , Vdc | V _{I-MAX} , V | Ω | Ω |
| FRH080-250UF | 0.08 | 3.0 | 60 | 250 | 14.0 | 33.0 |
| FRH080-250F | 0.08 | 3.0 | 60 | 250 | 14.0 | 33.0 |
| FRH110-250UF | 0.11 | 3.0 | 60 | 250 | 5.0 | 16.0 |
| FRH110-250F | 0.11 | 3.0 | 60 | 250 | 5.0 | 16.0 |
| FRH120-250UF | 0.12 | 3.0 | 60 | 250 | 6.0 | 16.0 |
| FRH120-250F | 0.12 | 3.0 | 60 | 250 | 4.0 | 16.0 |
| FRH145-250UF | 0.15 | 3.0 | 60 | 250 | 3.5 | 12.0 |
| FRH145-250F | 0.15 | 3.0 | 60 | 250 | 3.0 | 12.0 |
| FRH180-250UF | 0.18 | 10.0 | 60 | 250 | 0.8 | 4.0 |
| FRH180-250F | 0.18 | 10.0 | 60 | 250 | 0.8 | 4.0 |
| FRH150-600F | 0.15 | 3.0 | 60 | 600 | 6.0 | 22.0 |
| FRH160-600F | 0.16 | 3.0 | 60 | 600 | 4.0 | 18.0 |

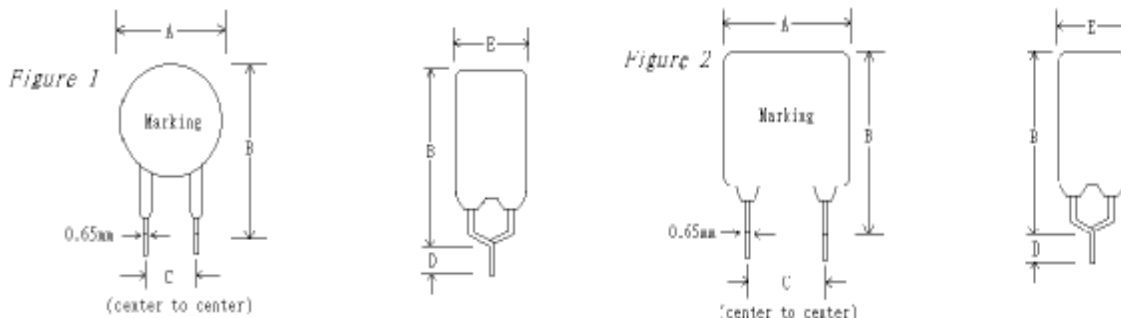
I_H=Hold current-maximum current at which the device will not trip at 23°C still air.
V_{MAX}=Maximum operating voltage at which the device can withstand without damage at its rated current.
V_{I-MAX} = Maximum interrupt voltage device can withstand for short period of time. (Not for long term.)
I_{MAX}= Maximum fault current device can withstand without damage at rated voltage (V_{MAX}).
R_{MIN}=Minimum device resistance at 23°C.
R_{1MAX}=Maximum device resistance at 23°C 1 hour after tripping .
Physical specifications:
Lead material: FRH080-250F ~ FRH180-250F Tin plated copper,22 AWG.
FRH150-600F ~ FRH160-600F Tin plated copper,22 AWG.
Soldering characteristics:MIL-STD-202, Method 208E.
Insulating coating:Flame retardant epoxy ,meet UL-94V-0 requirement.

NOTE : All FRH products are designed to assist equipment to pass ITU, UL1950 or GR1089 specification.

CAUTION : FRH devices are not intended for continuous use of Line Voltage such as 120 VAC ~ 600VAC and above.

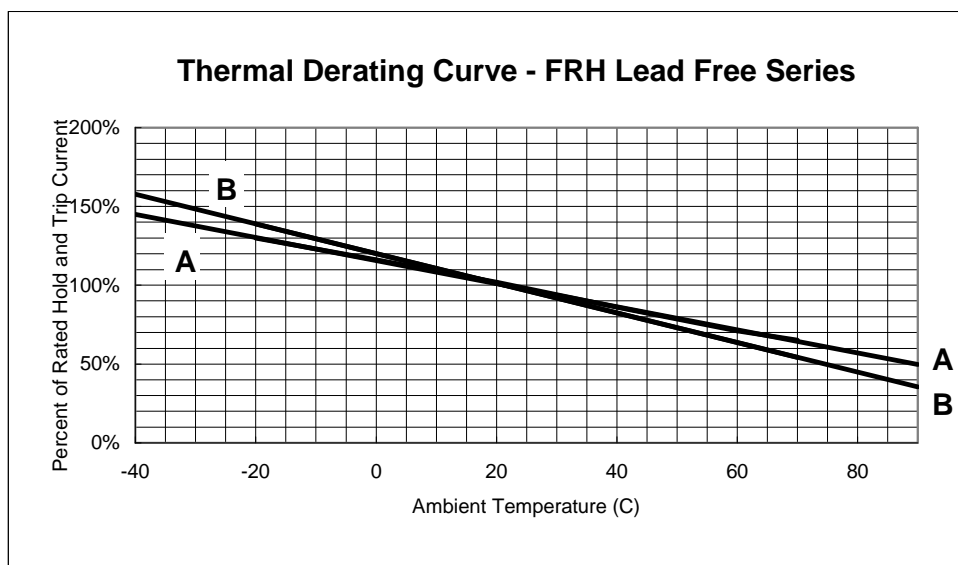
NOTE : Specification subject to change without notice.

4. Production Dimensions (millimeter)


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**Lead Size :22AWG,
Φ 0.65 mm Diameter**
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Φ 0.65 mm Diameter**

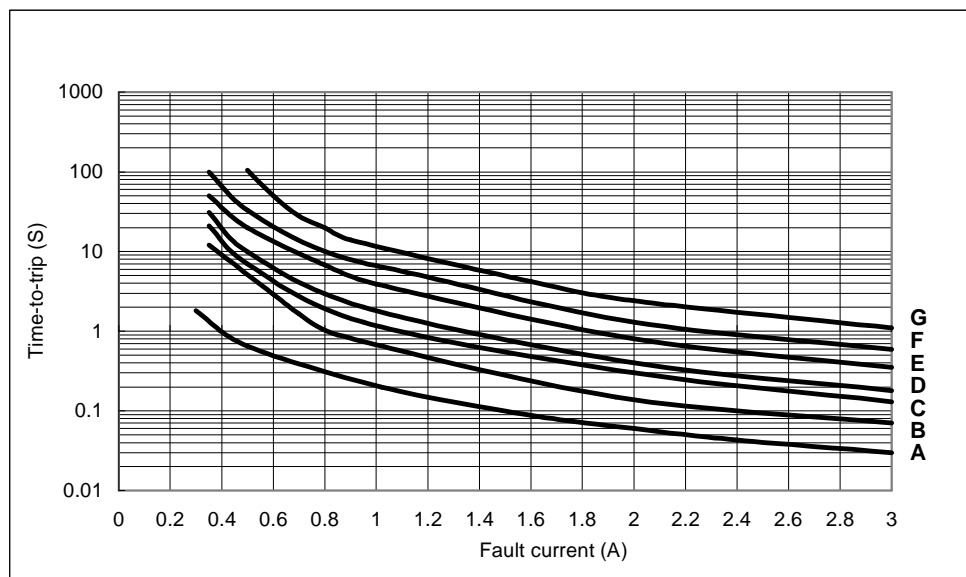
| Part Number | Fig | A | B | C | D | E |
|--------------|-----|---------|---------|---------|---------|---------|
| | | Maximum | Maximum | Typical | Minimum | Maximum |
| FRH080-250UF | 1 | 5.1 | 9.1 | 5.0 | 4.7 | 3.8 |
| FRH080-250F | 1 | 5.8 | 9.6 | 5.0 | 4.7 | 4.6 |
| FRH110-250UF | 1 | 5.9 | 9.4 | 5.0 | 4.7 | 3.8 |
| FRH110-250F | 1 | 6.8 | 9.9 | 5.0 | 4.7 | 4.6 |
| FRH120-250UF | 2 | 6.0 | 10.0 | 5.0 | 4.7 | 3.8 |
| FRH120-250F | 2 | 6.5 | 11.0 | 5.0 | 4.7 | 4.6 |
| FRH145-250UF | 2 | 6.0 | 10.0 | 5.0 | 4.7 | 3.8 |
| FRH145-250F | 2 | 6.5 | 11.0 | 5.0 | 4.7 | 4.6 |
| FRH180-250UF | 2 | 10.4 | 12.6 | 5.0 | 4.7 | 3.8 |
| FRH180-250F | 2 | 10.9 | 12.6 | 5.0 | 4.7 | 4.6 |
| FRH150-600F | 2 | 13.5 | 12.6 | 5.0 | 4.7 | 6.0 |
| FRH160-600F | 2 | 16.0 | 12.6 | 5.0 | 4.7 | 6.0 |

5. Thermal Derating Curve



6. Typical Time-To-Trip at 23°C

A=FRH080-250UF
 & FRH080-250F
 B=FRH110-250UF
 & FRH110-250F
 C=FRH120-250UF
 & FRH120-250F
 D=FRH145-250UF
 & FRH145-250F
 E=FRH180-250UF
 & FRH180-250F
 F=FRH150-600F
 G=FRH160-600F



7. Material Specification

Lead material : Tin plated copper, 22 AWG.

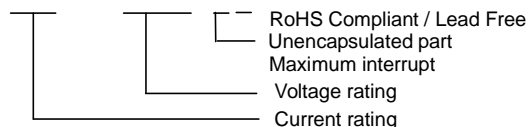
Soldering characteristics:MIL-STD-202, Method 208E.

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

8. Part Numbering and Marking System

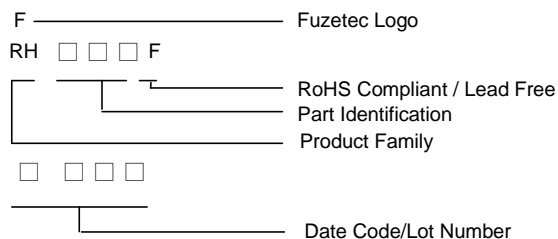
Part Numbering System

FRH □ □ □ - □ □ □ UF



Example

Part Marking System



* FRH150-600F Marking : RH6150F

* FRH160-600F Marking : RH6160F

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.

NOTE : Specification subject to change without notice.