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 Operation Voltage : 60V
(f) Maximum Interrupt Voltage : 250V/600V
(g) Temperature Range : -40℃ to 85℃

2. Agency Recognition

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

3. Electrical Characteristics (23℃)

Part Number	Hold Current	Trip Current	Max. Time To Trip		Maximum Current	Max Oper. Voltage	Max Int. Voltage	Typical Power	Resistance Tolerance	
			Current	Time					R_{MIN}	$R1_{MAX}$
	I_H, A	I_T, A	A	Sec	I_{MAX}, A	V_{MAX}, Vdc	V_{I-MAX},V	Pd, W	Ω	Ω
FRH080-250UF	0.08	0.16	0.35	4.0	3.0	60	250	1.0	14.0	33.0
FRH080-250F	0.08	0.16	0.35	4.0	3.0	60	250	1.0	14.0	33.0
FRH110-250UF	0.11	0.22	1.00	2.0	3.0	60	250	1.0	5.0	16.0
FRH110-250F	0.11	0.22	1.00	2.0	3.0	60	250	1.0	5.0	16.0
FRH120-250UF	0.12	0.24	1.00	2.0	3.0	60	250	1.0	6.0	16.0
FRH120-250F	0.12	0.24	1.00	2.0	3.0	60	250	1.0	4.0	16.0
FRH145-250UF	0.15	0.29	1.00	2.5	3.0	60	250	1.0	3.5	12.0
FRH145-250F	0.15	0.29	1.00	2.5	3.0	60	250	1.0	3.0	12.0
FRH180-250UF	0.18	0.65	1.50	10.0	10.0	60	250	1.5	0.8	4.0
FRH180-250F	0.18	0.65	1.50	11.0	10.0	60	250	1.5	0.8	4.0
FRH150-600F	0.15	0.30	1.00	5.0	3.0	60	600	1.6	6.0	22.0
FRH160-600F	0.16	0.32	1.00	7.0	3.0	60	600	1.6	4.0	18.0

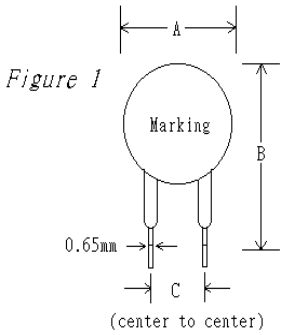
I_H=Hold current-maximum current at which the device will not trip at 23℃ still air.
I_T=Trip current-maximum current at which the device will always trip at 23℃ still air.
V_{MAX}=Maximum operating voltage at which the device can withstand without damage at its rated current.
V_{I-MAX} = Maximum interrupt 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}).
Pd=Typical power dissipated from device when in the 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: 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.

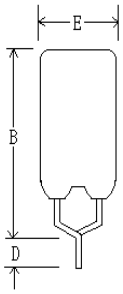
NOTE : All FRH products are designed to assist equipment to pass ITU, UL1950 or GR1089 specification.

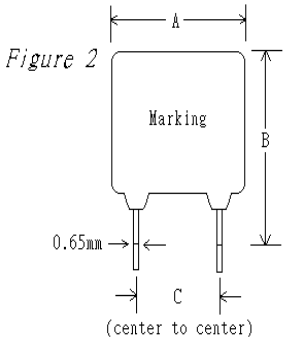
CAUTION : FRH devices are not intended for continous use of Line Voltage such as 120 VAC ~ 600VAC and above.

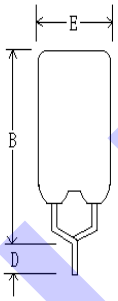
NOTE : Specification subject to change without notice.

4. Production Dimensions (millimeter)









Lead Size :22AWG,
Φ 0.65 mm Diameter

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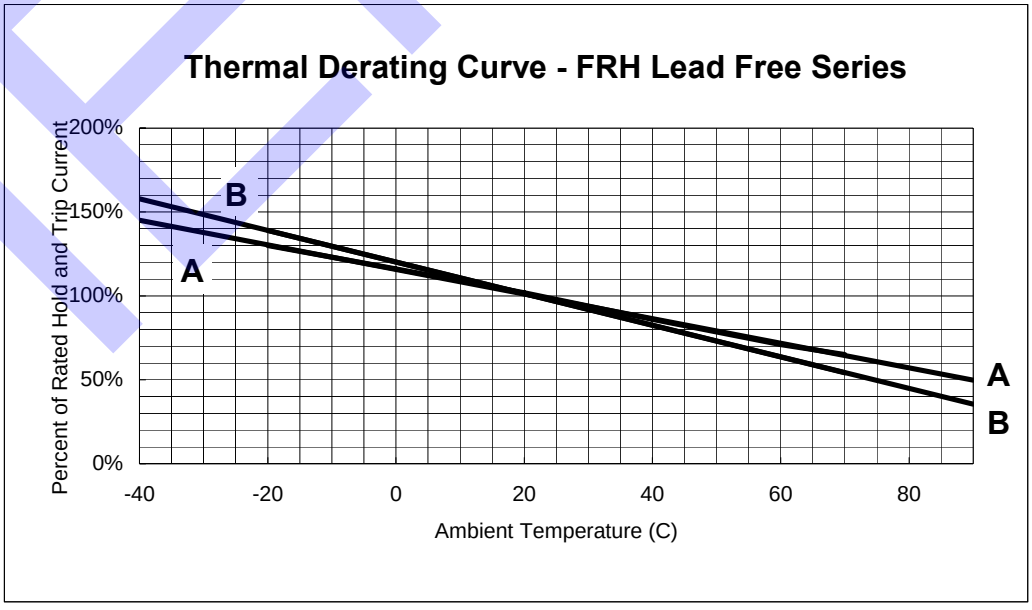
Part Number	Fig	A	B	C	D	E
		Maximum	Maximum	Typical	Minimum	Maximum
FRH080-250UF	1	5.1	9.1	5.0	4.7	3.8
FRH080-250F	1	5.8	9.6	5.0	4.7	4.6
FRH110-250UF	1	5.9	9.4	5.0	4.7	3.8
FRH110-250F	1	6.8	9.9	5.0	4.7	4.6
FRH120-250UF	2	6.0	10.0	5.0	4.7	3.8
FRH120-250F	2	6.5	11.0	5.0	4.7	4.6
FRH145-250UF	2	6.0	10.0	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	14.0	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

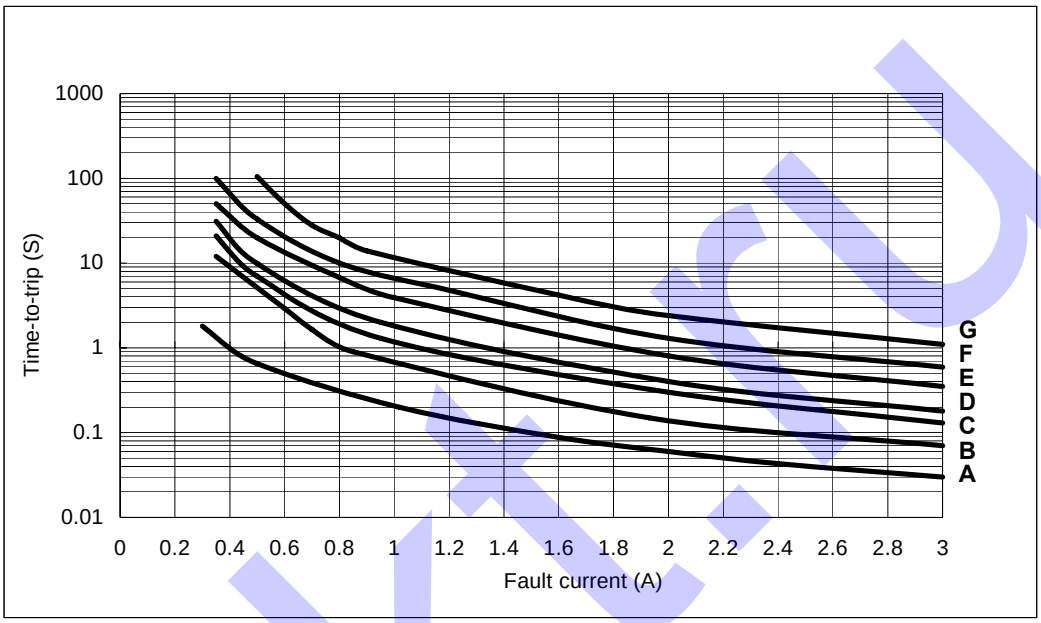


A= FRH180-250UF
FRH180-250F
B= All other FRH devices

NOTE : Specification subject to change without notice.

6. Typical Time-To-Trip at 23℃

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.

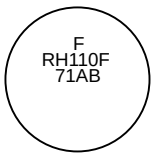
Insulating coating:Flame retardant epoxy, meets UL-94V-0 requirement

8. Part Numbering and Marking System

Part Numbering System

FRH □□□—□□□UF

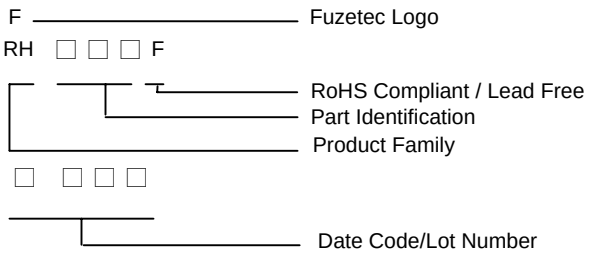
- RoHS Compliant / Lead Free
- Unencapsulated part
- Maximum interrupt Voltage rating
- Current rating



Example

*** FRH150-600F Marking : RH6150F**
*** FRH160-600F Marking : RH6160F**

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.

NOTE : Specification subject to change without notice.