

Radial Leaded PPTC Resettable Fuse: FRX 065-60F

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**
- (d) **Operation Current: 650mA**
- (e) **Maximum Voltage: 60V**
- (f) **Temperature Range : -40°C to 85°C**

2. Agency Recognition

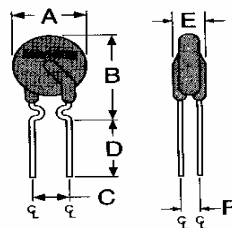
UL: File No. E211981
 C-UL: File No. E211981
 TÜV : File No. R 50004084

3. Electrical Characteristics (23°C)

| Part Number | Hold Current | Trip Current | Max.Time to Trip | Maximum Current | Rated Voltage | Typical Power | Resistance Tolerance | |
|-------------------|--------------------|--------------------|---------------------|----------------------|------------------------|--------------------|----------------------|-------------------|
| | | | | | | | R _{MIN} | R _{1MAX} |
| | I _H , A | I _T , A | at 5xI _H | I _{MAX} , A | V _{MAX} , Vdc | P _d , W | ohms | ohms |
| FRX065-60F | 0.65 | 1.30 | 5.3 | 40 | 60 | 0.88 | 0.31 | 0.72 |

I_H=Hold current-maximum current at which the device will not trip at 23°C still air.
 I_T=Trip current-minimum current at which the device will always trip at 23°C still air.
 V_{MAX}=Maximum voltage device can withstand without damage at its rated current.
 I_{MAX}= Maximum fault current device can withstand without damage at rated voltage (V_{MAX}).
 P_d=Typical power dissipated from device when in tripped state in 23°C still air environment.
 R_{MIN}=Minimum device resistance at 23°C.
 R_{1MAX}=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.

4. Production Dimensions (millimeter)

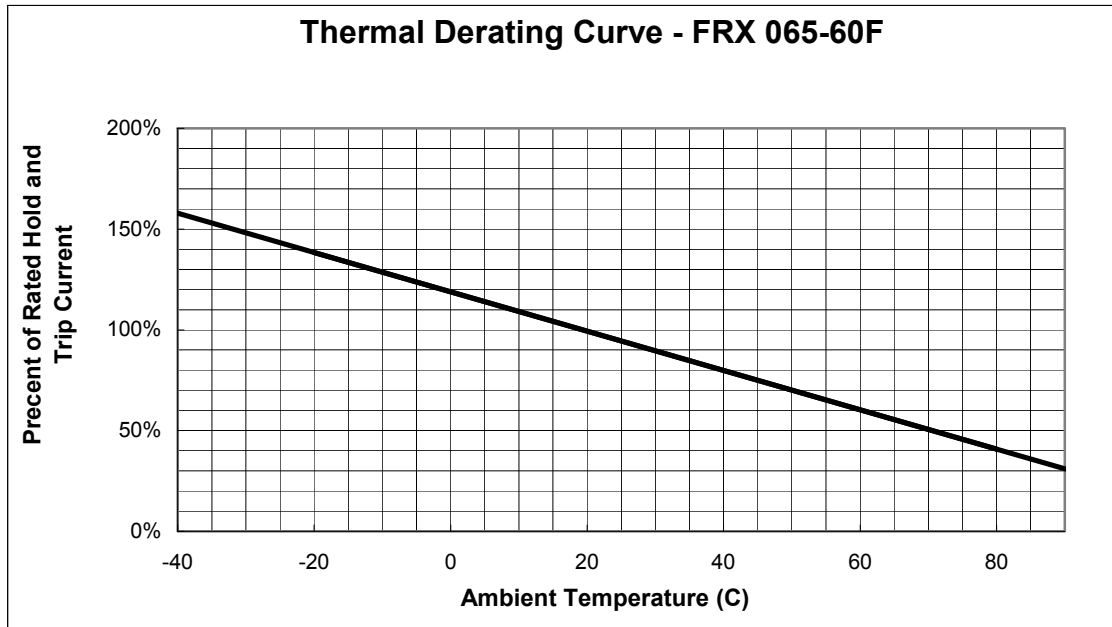


FRX065-60F
 Lead Size: 24AWG
 Φ 0.51 mm Diameter

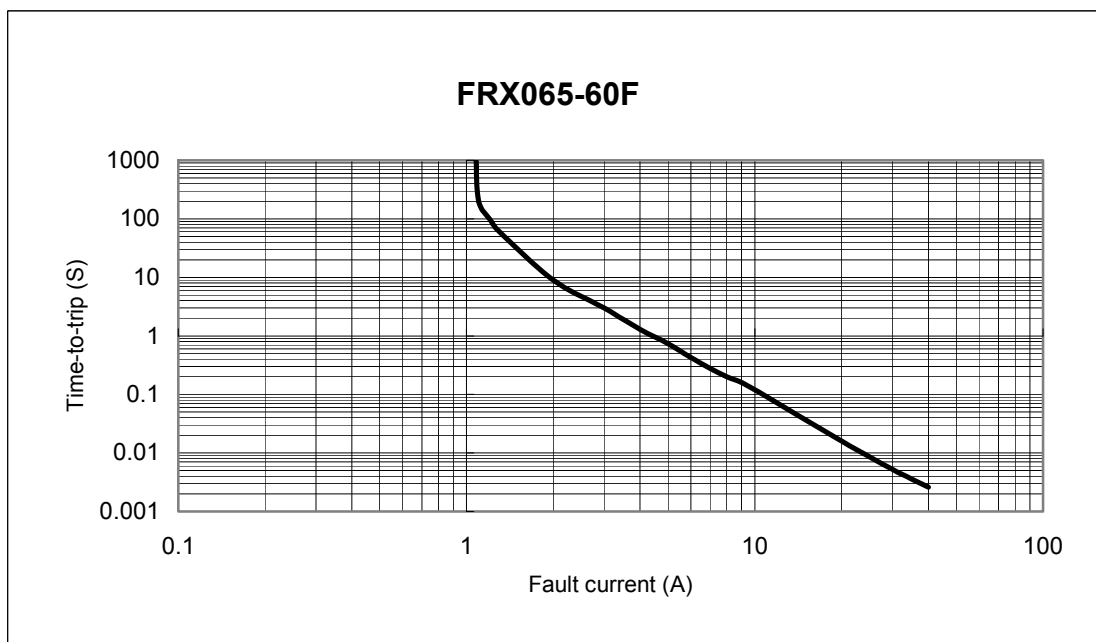
| Part Number | A | B | C | D | E | F |
|-------------------|---------|---------|---------|---------|---------|---------|
| | Maximum | Maximum | Typical | Minimum | Maximum | Typical |
| FRX065-60F | 9.7 | 14.5 | 5.1 | 7.6 | 3.1 | 1.1 |

NOTE : Specification subject to change without notice.

5. Thermal Derating Curve



6. Typical Time-To-Trip at 23°C



7. Material Specification

Lead material : Tin plated copper, 24 AWG.

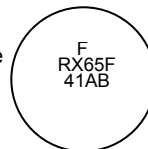
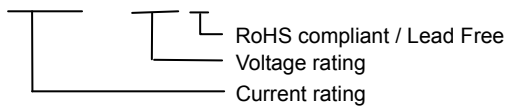
Soldering characteristics: MIL-STD-202, Method 208E.

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

8. Part Numbering and Marking System

Part Numbering System

FRX □ □ □ - □ □ F

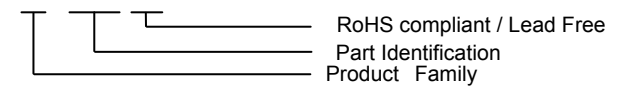


Example

Part Marking System

F

RX □ □ F



□ □ □ □

Date Code/Lot Number

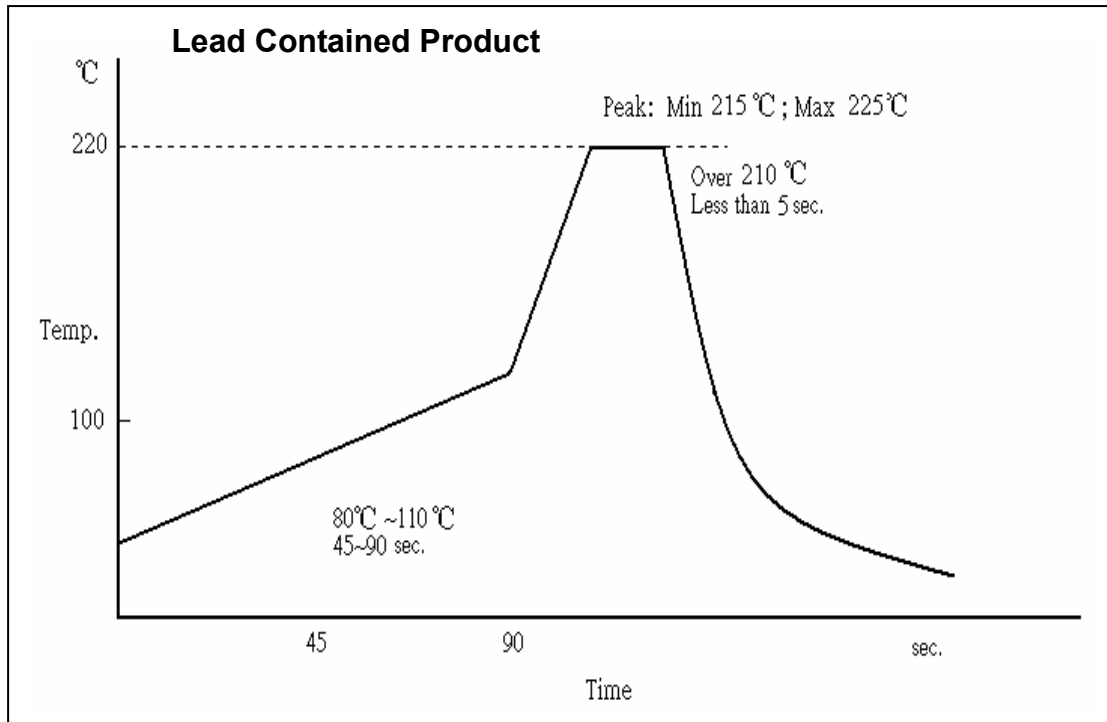
Warning: -Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.



-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.

DIP Type Recommendations of Wave Solder Profile

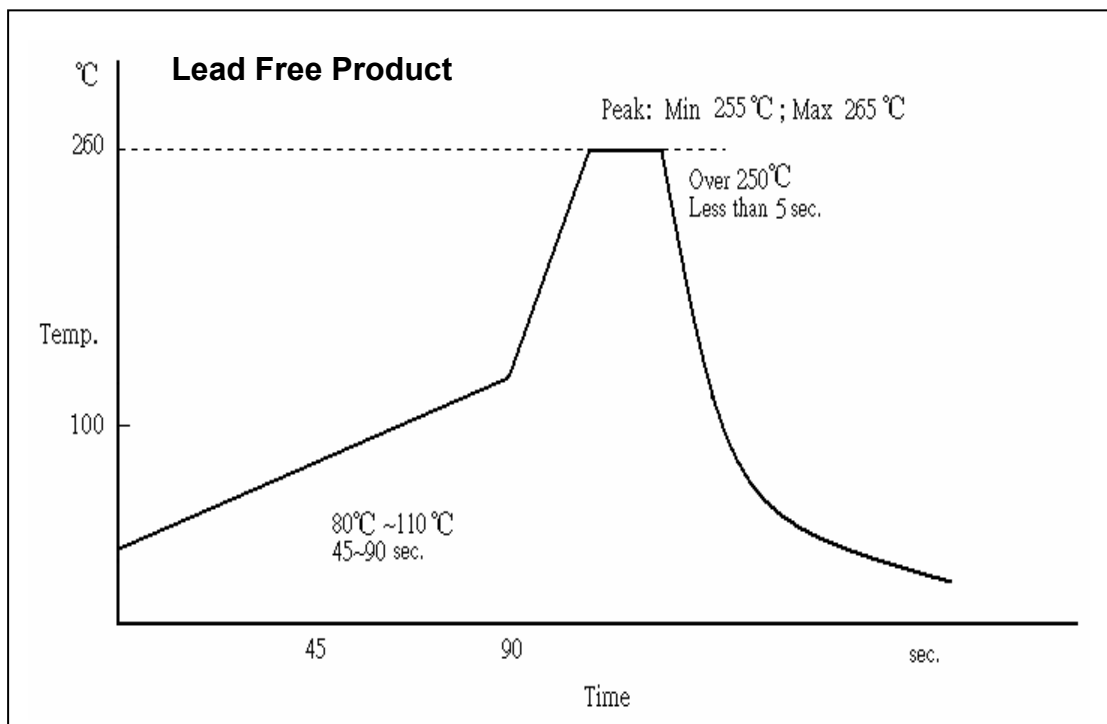


Per-heat : 80°C ~ 110°C.

Per-heat time : 45 seconds ~ 90 seconds

Lead Contained Solder Temperature : 220°C±5°C

Dwell Time : Less than 5 seconds



Per-heat : 80°C ~ 110°C.

Per-heat time : 45 seconds ~ 90 seconds

Lead Free Solder Temperature : 260°C±5°C

Dwell Time : Less than 5 seconds

FRX Series tape and reel specifications (dimensions in millimeters)
Product availability : FRX005-60F ~ FRX185-60F

| Dimension Description | MARK | Dimension | |
|--|------------|---------------|------------|
| | | Dim (mm) | Tol. (mm) |
| Carrier tape width | W | 18 | ± 1.0 |
| Hold down tape width | W4 | 11 | min |
| Top distance between tape edges | | 3 | max |
| Sprocket hold position | W5 | 9 | ± 0.75 |
| Sprocket hold diameter | D0 | 4 | ± 0.2 |
| Abscissa to plane (straight lead) | H | 18.5 | ± 3.0 |
| Abscissa to plane (kinked lead) | H0 | 16 | ± 1.0 |
| Abscissa to top | H1 | 32.2 | max |
| Overall width with lead protrusion FRX005-60F~FRX185-60F | C1 | 45.0 | max |
| Overall width without lead protrusion FRX005-60F~FRX185-60F | C2 | 44.3 | max |
| Lead protrusion | L1 | 1.0 | max |
| Protrusion of cutout | L | 8~10 | max |
| Protrusion beyond hold-down tape | l2 | not specified | |
| Sprocket hold pitch | P0 | 12.7 | ± 0.3 |
| Device pitch : FRX005-60F ~ FRX090-60F | | 12.7 | ± 0.3 |
| Device pitch : FRX110-60F ~ FRX185-60F | | 25.4 | ± 0.61 |
| Type thickness | t | 0.9 | max |
| Type thickness with splice | | 2.0 | max |
| Body lateral deviation | Δh | 0 | ± 2.0 |
| Body tape plane deviation | ΔP | 0 | ± 2.0 |
| Ordinate to adjacent component lead FRX005-60F ~ FRX090-60F | P1 | 3.81 | ± 0.7 |
| Ordinate to adjacent component lead FRX110-60F ~ FRX185-60F | P1 | 7.62 | ± 0.7 |
| Lead spacing : FRX005-60F ~ FRX090-60F | F | 5.1 | ± 0.6 |
| Lead spacing : FRX110-60F ~ FRX185-60F | F | 5.1 | ± 1.0 |
| Reel width | W2 | 56 | max |
| Reel diameter | a | 370 | max |
| Space between flanges less device | W1 | 54 | max |
| Arbor hold diameter | c | 26 | ± 12 |
| Core diameter | n | 91 | max |

FRX Series tape and reel specifications (dimensions in millimeters)
Product availability : FRX005-60F ~ FRX185-60F

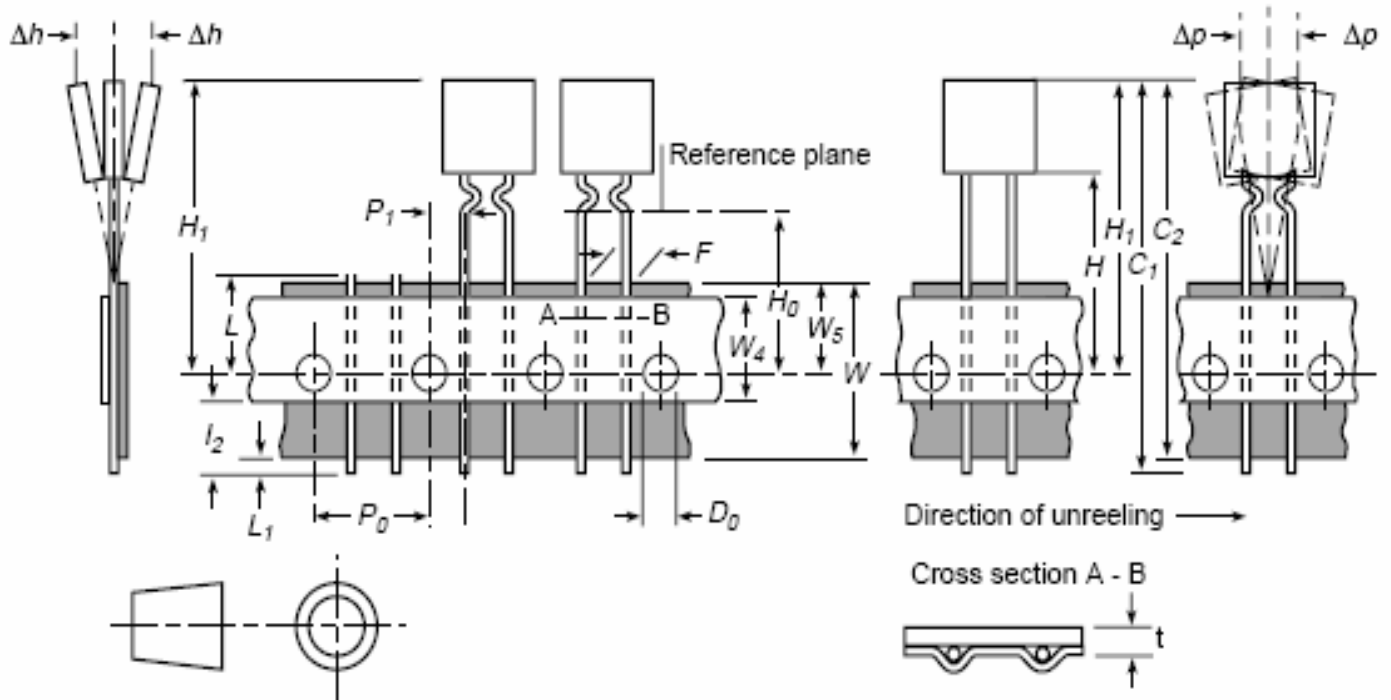


Figure 1 Taped Component Dimensions

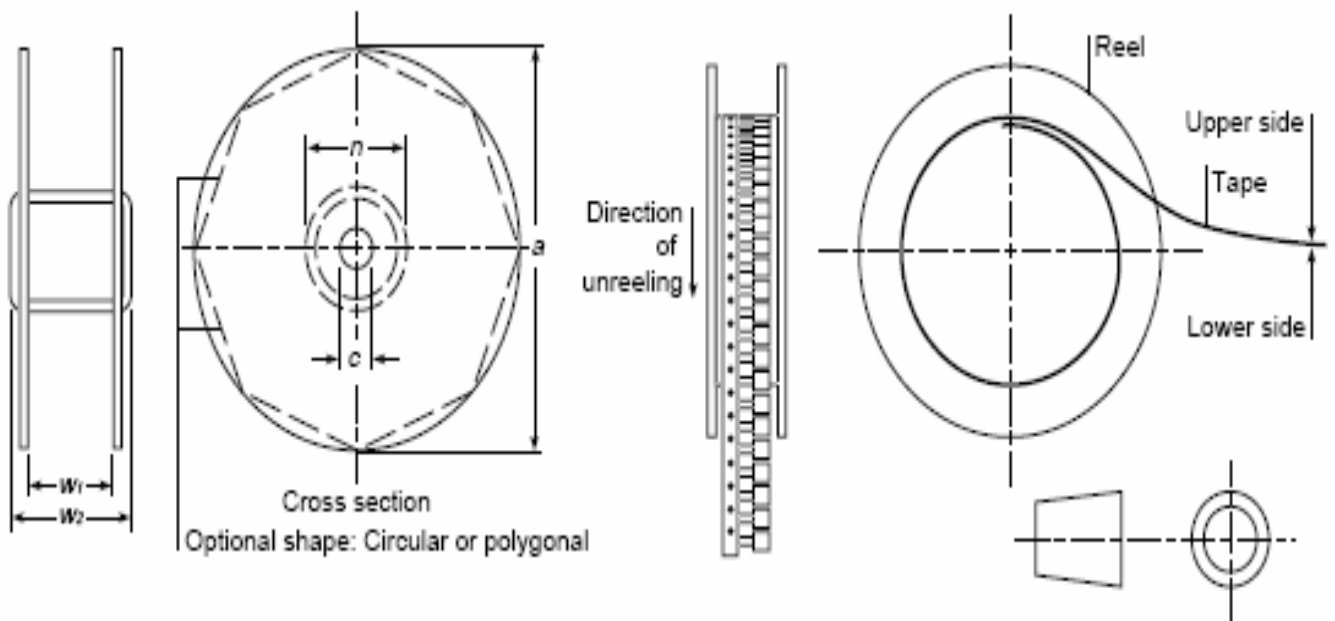


Figure 2 Reel Dimensions

Standard Package

| P/N | Pcs /Bag | Reel/Tape |
|-------------------|----------|-----------|
| FRX005-60F | 500 | 3000 |
| FRX010-60F | 500 | 3000 |
| FRX017-60F | 500 | 3000 |
| FRX020-60F | 500 | 3000 |
| FRX025-60F | 500 | 3000 |
| FRX030-60F | 500 | 3000 |
| FRX040-60F | 500 | 3000 |
| FRX050-60F | 500 | 3000 |
| FRX065-60F | 300 | 3000 |

| P/N | Pcs /Bag | Reel/Tape |
|-------------------|----------|-----------|
| FRX075-60F | 300 | 3000 |
| FRX090-60F | 300 | 3000 |
| FRX110-60F | 300 | 1500 |
| FRX135-60F | 200 | 1500 |
| FRX160-60F | 200 | 1500 |
| FRX185-60F | 200 | 1500 |
| FRX250-60F | 100 | 1000 |
| FRX300-60F | 100 | 1000 |
| FRX375-60F | 100 | 1000 |