

# Radial Leaded PPTC Resettable Fuse : FRX 250-60F

## 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: 2.50A**
- (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 <sub>MIN</sub>	R <sub>1MAX</sub>
	I <sub>H</sub> , A	I <sub>T</sub> , A	at 5xI <sub>H</sub>	I <sub>MAX</sub> , A	V <sub>MAX</sub> , Vdc	P <sub>d</sub> , W	ohms	ohms
<b>FRX250-60F</b>	2.50	5.00	15.6	40	60	2.50	0.05	0.13

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 .

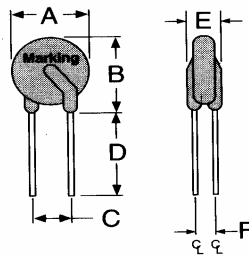
Physical specifications:

Lead material: Tin plated copper, 20 AWG.

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

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

## 4. Production Dimensions (millimeter)

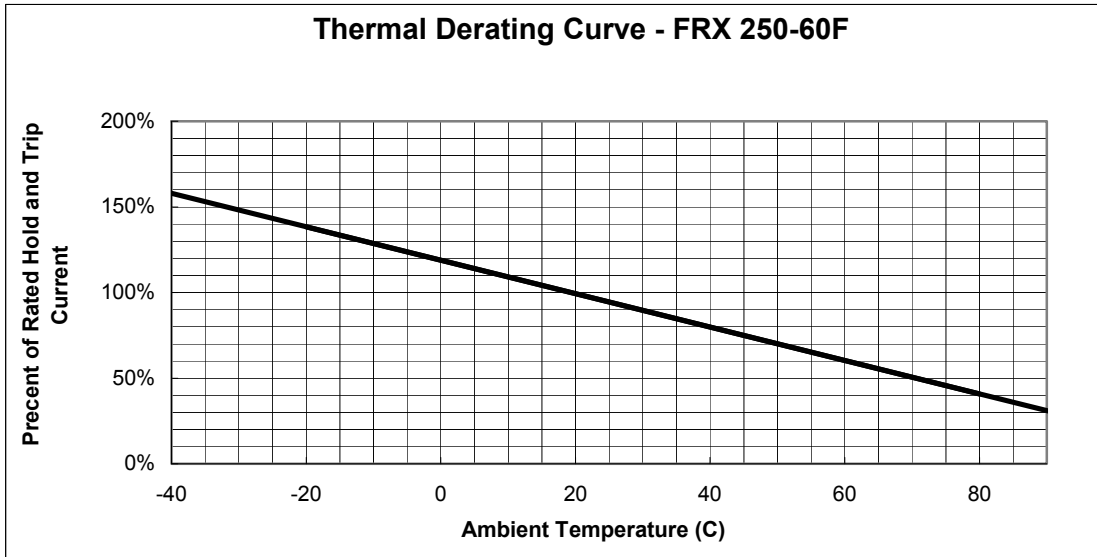


**FRX 250-60F**  
 Lead Size : 20AWG  
 Φ 0.81 mm Diameter

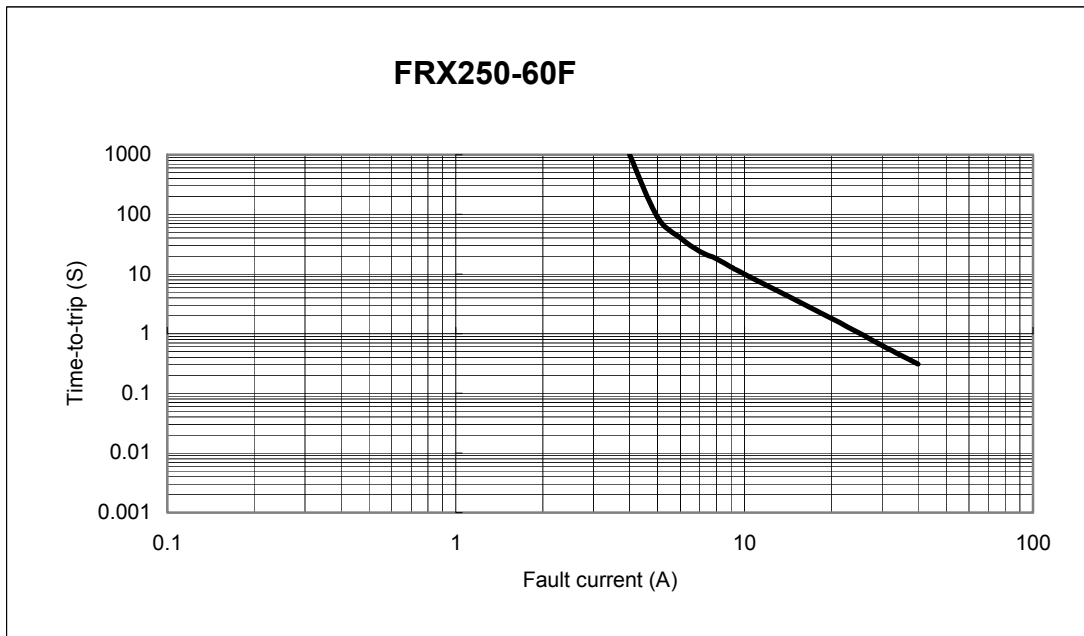
Part Number	A	B	C	D	E	F
	Maximum	Maximum	Typical	Minimum	Maximum	Typical
<b>FRX250-60F</b>	21.3	26.4	10.2	7.6	3.1	1.4

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, 20 AWG.

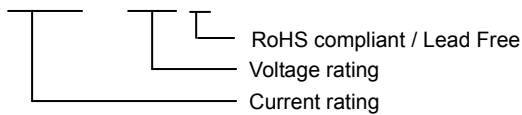
Soldering characteristics:MIL-STD-202, Method 208E.

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

## 8. Part Numbering and Marking System

### Part Numbering System

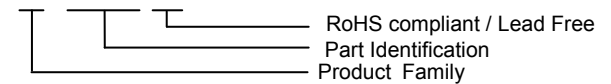
F R X □ □ □ — □ □ F



Example

### Part Marking System

F  
RX □ □ □ F



□ □ □ □

Date Code/Lot Number

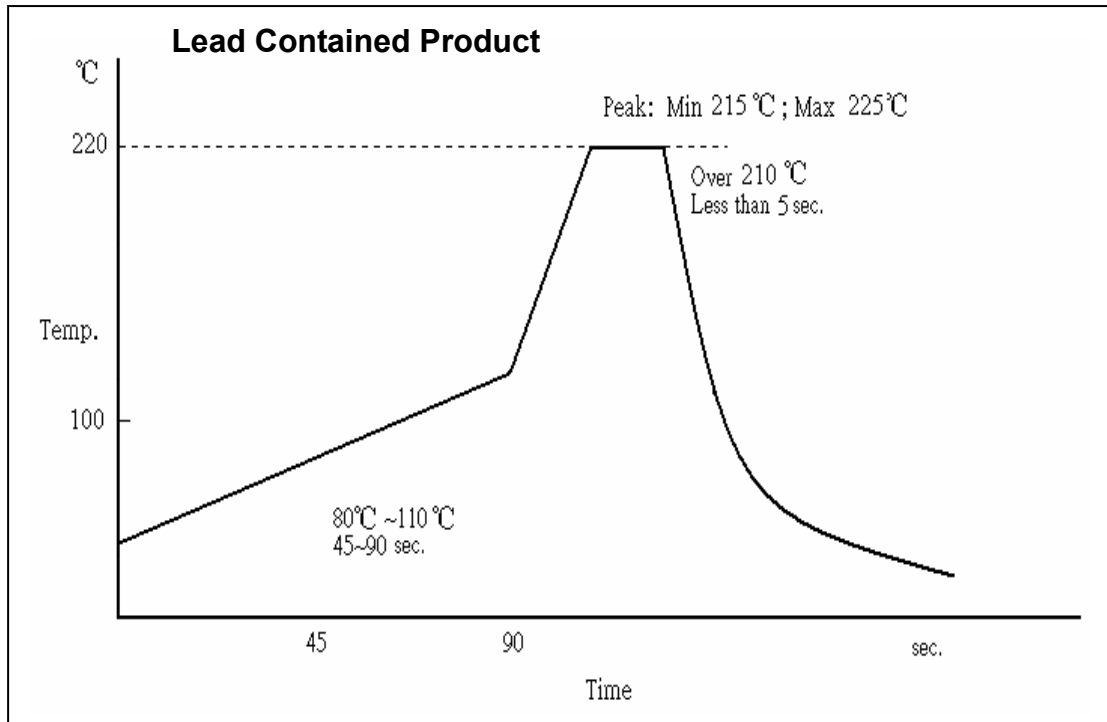
**Warning:** -Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.



-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

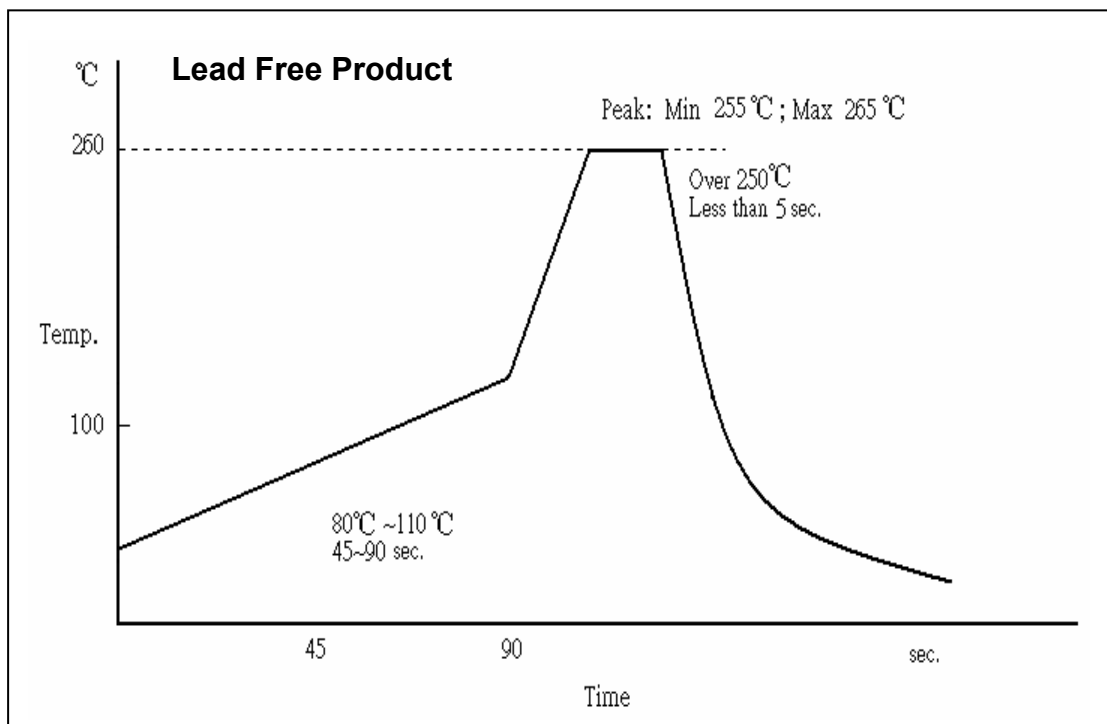


Per-heat : 80°C ~ 110°C.

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

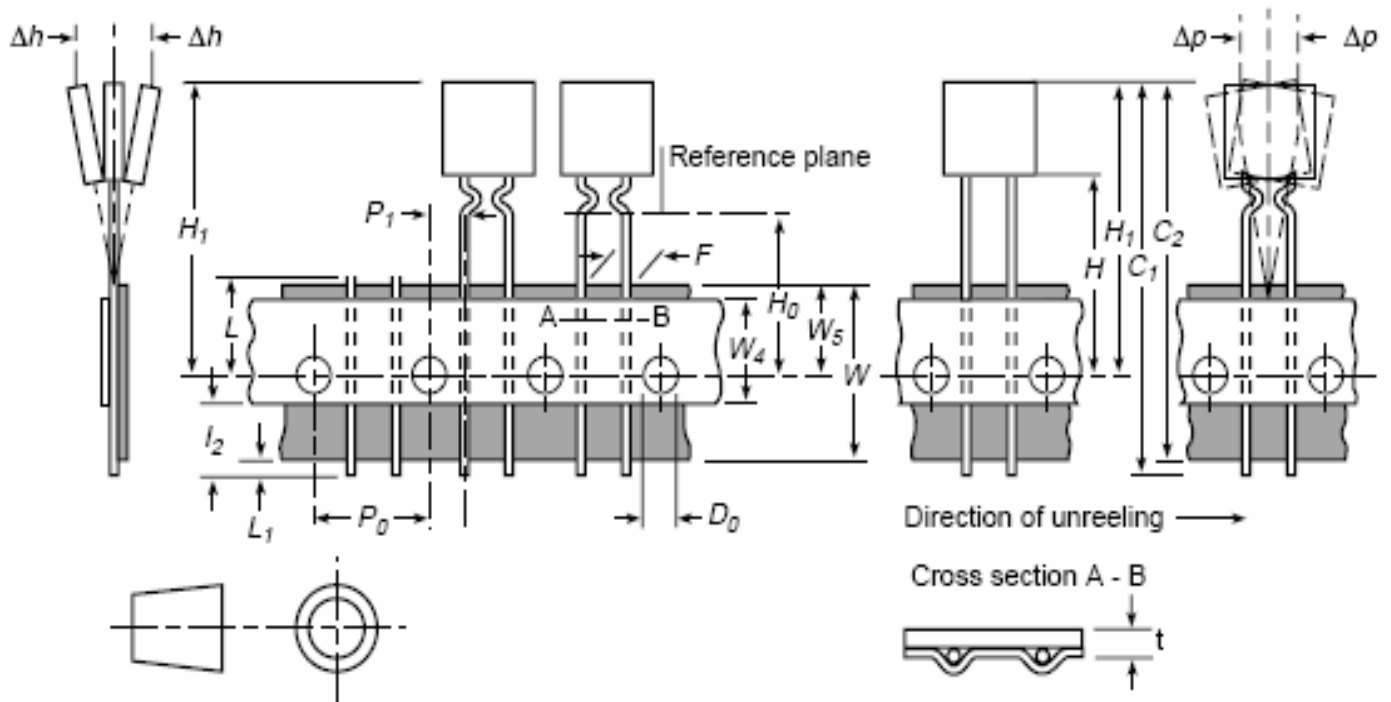
Lead Free Solder Temperature : 260°C±5°C

Dwell Time : Less than 5 seconds

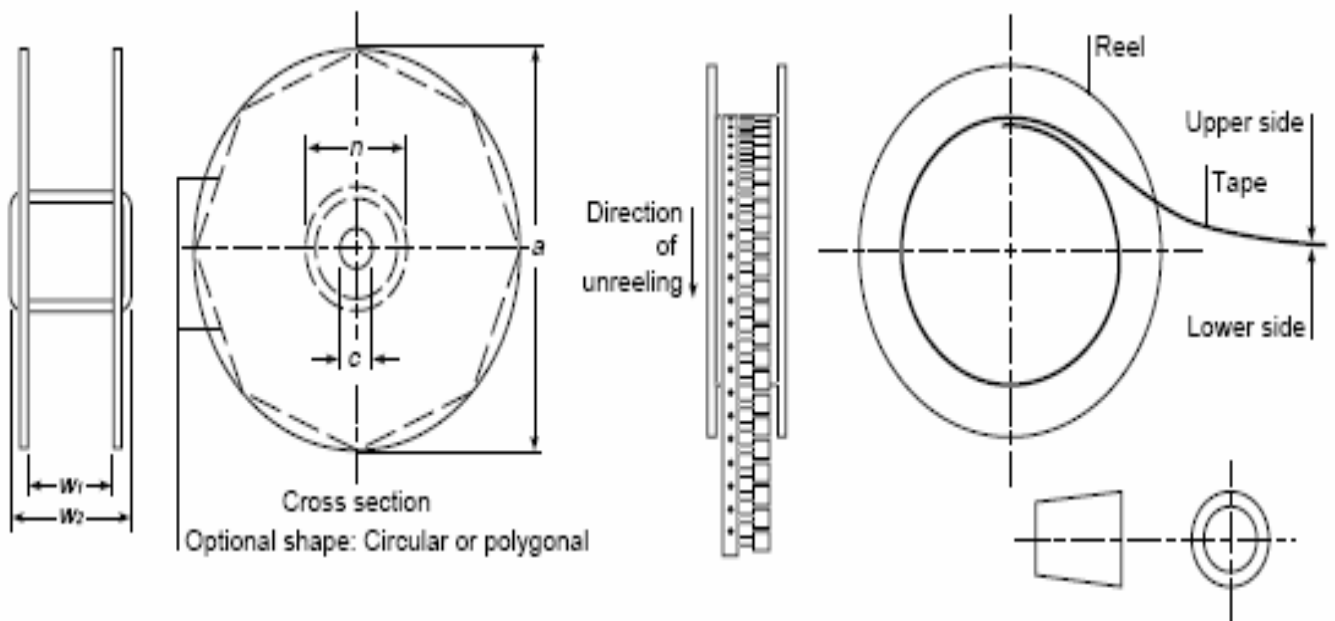
**FRX Series tape and reel specifications (dimensions in millimeters)**  
**Product availability : FRX005-60F ~ FRX185-60F**

Dimension Description	MARK	Dimension	
		Dim (mm)	Tol. (mm)
Carrier tape width	W	18	$\pm 1.0$
Hold down tape width	W4	11	min
Top distance between tape edges		3	max
Sprocket hold position	W5	9	$\pm 0.75$
Sprocket hold diameter	D0	4	$\pm 0.2$
Abscissa to plane (straight lead)	H	18.5	$\pm 3.0$
Abscissa to plane (kinked lead)	H0	16	$\pm 1.0$
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	$\pm 0.3$
Device pitch : FRX005-60F ~ FRX090-60F		12.7	$\pm 0.3$
Device pitch : FRX110-60F ~ FRX185-60F		25.4	$\pm 0.61$
Type thickness	t	0.9	max
Type thickness with splice		2.0	max
Body lateral deviation	$\Delta h$	0	$\pm 2.0$
Body tape plane deviation	$\Delta P$	0	$\pm 2.0$
Ordinate to adjacent component lead FRX005-60F ~ FRX090-60F	P1	3.81	$\pm 0.7$
Ordinate to adjacent component lead FRX110-60F ~ FRX185-60F	P1	7.62	$\pm 0.7$
Lead spacing : FRX005-60F ~ FRX090-60F	F	5.1	$\pm 0.6$
Lead spacing : FRX110-60F ~ FRX185-60F	F	5.1	$\pm 1.0$
Reel width	W2	56	max
Reel diameter	a	370	max
Space between flanges less device	W1	54	max
Arbor hold diameter	c	26	$\pm 12$
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
<b>FRX005-60F</b>	500	3000
<b>FRX010-60F</b>	500	3000
<b>FRX017-60F</b>	500	3000
<b>FRX020-60F</b>	500	3000
<b>FRX025-60F</b>	500	3000
<b>FRX030-60F</b>	500	3000
<b>FRX040-60F</b>	500	3000
<b>FRX050-60F</b>	500	3000
<b>FRX065-60F</b>	300	3000

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