

FUSES

Resettable fuses

PFRA

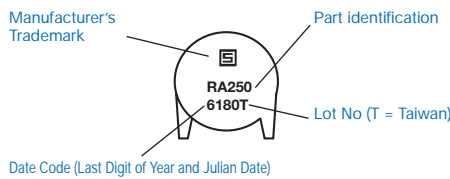
Wire leaded PTC-Fuses Type PFRA

Cured, flame retardant epoxy
Polymer insulating material
meets UL 94V-0
requirements
Bulk packaging and tape
and reel available on most
models
Agency recognition:
**UL, CSA, TÜV



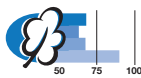
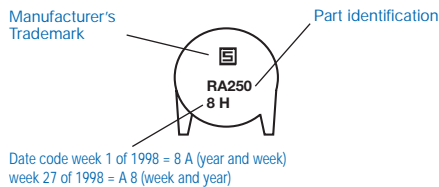
Typical Part Marking PFRA.030-900

Layout may vary

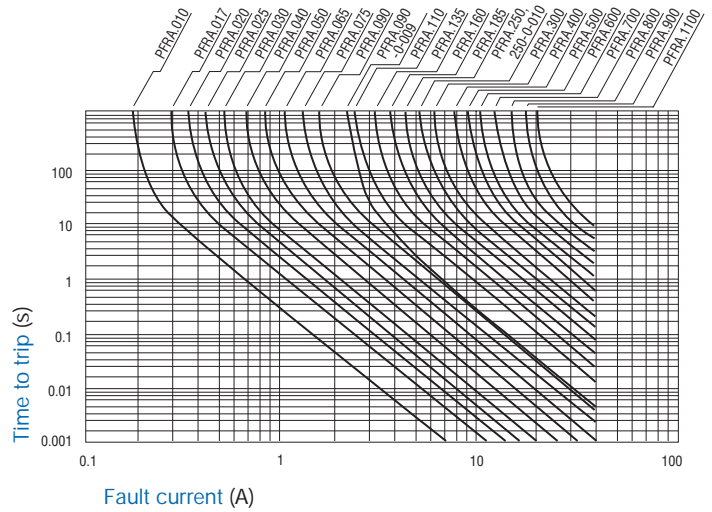


Typical Part Marking PFRA.010-025

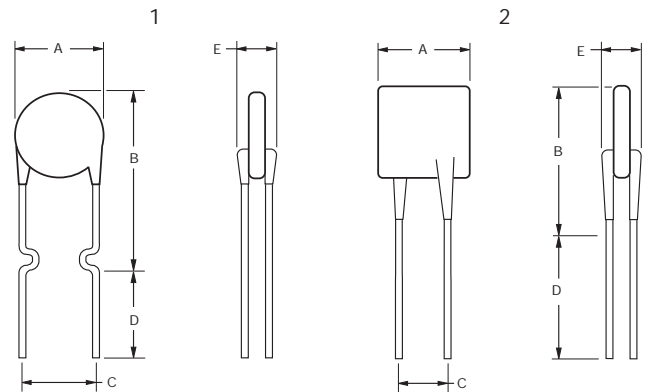
Layout may vary



Typical Time to Trip at 23 °C



Package



Applications

Almost anywhere there is a low voltage power supply and a load to be protected, including:

- Computers and peripherals
- Transformer for toys
- Motors/fans

Kinked lead options available for board standoff

** PFRA.010-050 rated at 30 V

Environmental Characteristics

| | | |
|---|--|--------------------------|
| Operating/Storage Temperature | -40 °C to +85 °C | |
| Maximum Device Surface Temperature in Tripped State | 125 °C | |
| Passive Aging | +85 °C, 1000 hours | ±5% typ. resist. change |
| Humidity Aging | +85 °C, 85% R.H. 1000 hours | ±5% typ. resist. change |
| Thermal Shock*) | +85 °C/-40 °C 10 times | ±10% typ. resist. change |
| Mechanical Shock | MIL-STD-202, Method 213, Condition 1 (100 g, 6 sec.) | No resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 | No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |

*) MIL-STD-202F, Method 107G

Test Procedures And Requirements For Model PFRA Series

| Test | Test Conditions | Accept/Reject Criteria |
|-----------------|--|--|
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23 °C | $R_{min} \leq R \leq R_{max}$ |
| Time to Trip | At specified current V_{max} , 23 °C | $T \leq \text{max. time to trip (sec.)}$ |
| Hold Current | 30 min. at I_{hold} | No trip |
| Trip Cycle Life | V_{max} , I_{max} , 100 cycles | No arcing or burning |
| Trip Endurance | V_{max} , 48 hours | No arcing or burning |

Electrical Characteristics

| Type | V _{max} V | I _{max} A | I _{hold} | | I _{trip} | | Initial Resistance | | 1 Hour (R1) Post-Trip Resistance | Max. Time to trip at 23 °C | Tripped Power Dissipation |
|------------|-----------------------|-----------------------|-------------------|----------|-------------------|---------------|--------------------|---------------|----------------------------------|----------------------------|---------------------------|
| | | | Amperes | at 23 °C | at 23 °C | Ohms at 23 °C | Ohms at 23 °C | Ohms at 23 °C | Seconds at 23 °C | Watts at 23 °C | |
| | | | | | | | | | | | Hold |
| PFRA.010.X | 60 | 40 | 0.10 | 0.20 | 2.50 | 4.50 | 7.50 | 4.0 | 0.38 | | |
| PFRA.017.X | 60 | 40 | 0.17 | 0.34 | 3.30 | 5.21 | 8.00 | 3.0 | 0.48 | | |
| PFRA.020.X | 60 | 40 | 0.20 | 0.40 | 1.50 | 2.84 | 4.40 | 2.2 | 0.40 | | |
| PFRA.025.X | 60 | 40 | 0.25 | 0.50 | 1.00 | 1.95 | 3.00 | 2.5 | 0.45 | | |
| PFRA.030.X | 60 | 40 | 0.30 | 0.60 | 0.76 | 1.36 | 2.10 | 3.0 | 0.50 | | |
| PFRA.040.X | 60 | 40 | 0.40 | 0.80 | 0.52 | 0.86 | 1.29 | 3.8 | 0.55 | | |
| PFRA.050.X | 60 | 40 | 0.50 | 1.00 | 0.41 | 0.77 | 1.17 | 4.0 | 0.75 | | |
| PFRA.065.X | 60 | 40 | 0.65 | 1.30 | 0.27 | 0.48 | 0.72 | 5.3 | 0.90 | | |
| PFRA.075.X | 60 | 40 | 0.75 | 1.50 | 0.18 | 0.40 | 0.60 | 6.3 | 0.90 | | |
| PFRA.090.X | 60 | 40 | 0.90 | 1.80 | 0.14 | 0.31 | 0.47 | 7.2 | 1.00 | | |
| PFRA.110.X | 30 | 40 | 1.10 | 2.20 | 0.10 | 0.18 | 0.27 | 6.6 | 0.70 | | |
| PFRA.135.X | 30 | 40 | 1.35 | 2.70 | 0.065 | 0.115 | 0.17 | 7.3 | 0.80 | | |
| PFRA.160.X | 30 | 40 | 1.60 | 3.20 | 0.055 | 0.105 | 0.15 | 8.0 | 0.90 | | |
| PFRA.185.X | 30 | 40 | 1.85 | 3.70 | 0.04 | 0.07 | 0.11 | 8.7 | 1.00 | | |
| PFRA.250.X | 30 | 40 | 2.50 | 5.00 | 0.025 | 0.048 | 0.07 | 10.3 | 1.20 | | |
| PFRA.300.X | 30 | 40 | 3.00 | 6.00 | 0.02 | 0.05 | 0.08 | 10.8 | 2.00 | | |
| PFRA.400.X | 30 | 40 | 4.00 | 8.00 | 0.01 | 0.03 | 0.05 | 12.7 | 2.50 | | |
| PFRA.500 | 30 | 40 | 5.00 | 10.00 | 0.01 | 0.03 | 0.05 | 14.5 | 3.00 | | |
| PFRA.600 | 30 | 40 | 6.00 | 12.00 | 0.005 | 0.02 | 0.04 | 16.0 | 3.50 | | |
| PFRA.700 | 30 | 40 | 7.00 | 14.00 | 0.005 | 0.02 | 0.03 | 17.5 | 3.80 | | |
| PFRA.800 | 30 | 40 | 8.00 | 16.00 | 0.005 | 0.02 | 0.03 | 18.8 | 4.00 | | |
| PFRA.900 | 30 | 40 | 9.00 | 18.00 | 0.005 | 0.01 | 0.02 | 20.0 | 4.20 | | |
| PFRA.1100 | 16 | 100 | 11.00 | 22.00 | 0.003 | 0.01 | 0.014 | 20.0 | 4.50 | | |

Packaging

Bulk
(leave.X space)

500 per bag

Tape and reel
X=.2

PFRA.010–PFRA.160 – 12.7 mm device pitch = 3000 pcs. per reel ;
PFRA.185–PFRA.400 – 25.4 mm device pitch = 1500 pcs. per reel

Dimensions

| Type | A | B | C | | D | E | Style | Lead | Material |
|------------|------|------|---------|--------|------|------|-------|--------------|----------|
| | max. | max. | nominal | Tol. ± | min. | max. | | | |
| PFRA.010.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/NiCu |
| PFRA.017.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/NiCu |
| PFRA.020.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/CuFe |
| PFRA.025.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/CuFe |
| PFRA.030.X | 7.4 | 13.4 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/CuFe |
| PFRA.040.X | 7.4 | 13.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/CuFe |
| PFRA.050.X | 7.9 | 13.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.065.X | 9.7 | 15.2 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.075.X | 10.4 | 16.0 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.090.X | 11.7 | 16.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.090.X | 7.4 | 12.2 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.110.X | 8.9 | 14.0 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.135.X | 8.9 | 18.9 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.160.X | 10.2 | 16.8 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.185.X | 12.0 | 18.4 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.250.X | 12.0 | 18.3 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.250.X | 12.0 | 18.3 | 5.9 | 0.7 | 7.6 | 3.1 | 2 | 0.51 dia./ Ø | Sn/Cu |
| PFRA.300.X | 12.0 | 18.3 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.400.X | 14.4 | 24.8 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.500 | 17.4 | 24.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.600 | 19.3 | 31.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.700 | 22.1 | 29.8 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.800 | 24.2 | 32.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.900 | 24.2 | 32.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |
| PFRA.1100 | 24.2 | 32.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia./ Ø | Sn/Cu |

FUSES

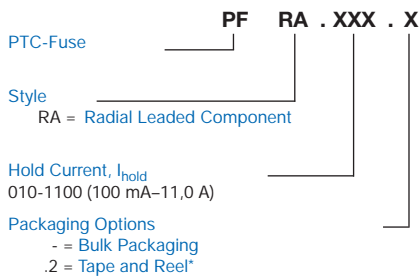
Resettable fuses

PFRA

Thermal Derating Chart-I_{hold} (Amps)

| Type | Ambient Operating Temperature | | | | | | | | |
|------------|-------------------------------|--------|-------|-------|-------|-------|-------|-------|-------|
| | -40 °C | -20 °C | 0 °C | 23 °C | 40 °C | 50 °C | 60 °C | 70 °C | 85 °C |
| PFRA.010.X | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 |
| PFRA.017.X | 0.26 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.11 | 0.09 | 0.07 |
| PFRA.020.X | 0.31 | 0.27 | 0.24 | 0.20 | 0.16 | 0.14 | 0.13 | 0.11 | 0.08 |
| PFRA.025.X | 0.39 | 0.34 | 0.30 | 0.25 | 0.20 | 0.18 | 0.16 | 0.14 | 0.10 |
| PFRA.030.X | 0.47 | 0.41 | 0.36 | 0.30 | 0.24 | 0.22 | 0.19 | 0.16 | 0.12 |
| PFRA.040.X | 0.62 | 0.54 | 0.48 | 0.40 | 0.32 | 0.29 | 0.25 | 0.22 | 0.16 |
| PFRA.050.X | 0.78 | 0.68 | 0.60 | 0.50 | 0.41 | 0.36 | 0.32 | 0.27 | 0.20 |
| PFRA.065.X | 1.01 | 0.88 | 0.77 | 0.65 | 0.53 | 0.47 | 0.41 | 0.35 | 0.26 |
| PFRA.075.X | 1.16 | 1.02 | 0.89 | 0.75 | 0.61 | 0.54 | 0.47 | 0.41 | 0.30 |
| PFRA.090.X | 1.40 | 1.22 | 1.07 | 0.90 | 0.73 | 0.65 | 0.57 | 0.49 | 0.36 |
| PFRA.110.X | 1.60 | 1.43 | 1.27 | 1.10 | 0.91 | 0.85 | 0.75 | 0.67 | 0.57 |
| PFRA.135.X | 1.96 | 1.76 | 1.55 | 1.35 | 1.12 | 1.04 | 0.92 | 0.82 | 0.70 |
| PFRA.160.X | 2.32 | 2.08 | 1.84 | 1.60 | 1.33 | 1.23 | 1.09 | 0.98 | 0.83 |
| PFRA.185.X | 2.68 | 2.41 | 2.13 | 1.85 | 1.54 | 1.42 | 1.26 | 1.13 | 0.96 |
| PFRA.250.X | 3.63 | 3.25 | 2.88 | 2.50 | 2.08 | 1.93 | 1.70 | 1.53 | 1.30 |
| PFRA.300.X | 4.35 | 3.90 | 3.45 | 3.00 | 2.49 | 2.31 | 2.04 | 1.83 | 1.56 |
| PFRA.400.X | 5.80 | 5.20 | 4.60 | 4.00 | 3.32 | 3.08 | 2.72 | 2.44 | 2.08 |
| PFRA.500 | 7.25 | 6.50 | 5.75 | 5.00 | 4.15 | 3.85 | 3.40 | 3.05 | 2.60 |
| PFRA.600 | 8.70 | 7.80 | 6.90 | 6.00 | 4.98 | 4.62 | 4.08 | 3.66 | 3.12 |
| PFRA.700 | 10.15 | 9.10 | 8.05 | 7.00 | 5.81 | 5.39 | 4.76 | 4.72 | 3.64 |
| PFRA.800 | 11.60 | 10.40 | 9.20 | 8.00 | 6.64 | 6.16 | 5.44 | 4.88 | 4.16 |
| PFRA.900 | 13.05 | 11.70 | 10.35 | 9.00 | 7.47 | 6.39 | 6.12 | 5.49 | 4.68 |
| PFRA.1100 | 16.10 | 14.60 | 13.10 | 11.00 | 9.40 | 8.80 | 7.80 | 6.90 | 5.20 |

How To Order



*Packaged per E1486-B