



R60 Series

Features

- Radial Leaded Devices
- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Bulk packaging, or tape and reel available on most models

Applications

- Almost anywhere there is a low voltage power supply, up to 60V and a load to be protected, including:
- Industrial controls
 - Automotive electronics
 - Medical products

Alpha-Top (Sea & Land Alliance)

Electrical Properties

| Model | V _{max} (Vdc) | I _{max} (A) | I _{hold} (A) | I _{trip} (A) | P _d Typ. (W) | Maximum Time To Trip | | Resistance | | | Agency Approval | |
|---------|---------------------------|-------------------------|--------------------------|--------------------------|-------------------------------|----------------------|---------------|--------------------------|--------------------------|--------------------------|-----------------|-----|
| | | | | | | Current (A) | Time (Sec) | Ri _{min} (Ω) | Ri _{max} (Ω) | R1 _{max} (Ω) | UL | TUV |
| R60-005 | 60 | 40 | 0.05 | 0.10 | 0.38 | 0.25 | 5.0 | 7.30 | 18.00 | 30.00 | | |
| R60-010 | 60 | 40 | 0.10 | 0.20 | 0.38 | 0.50 | 4.0 | 2.00 | 4.50 | 7.50 | ✓ | ✓ |
| R60-017 | 60 | 40 | 0.17 | 0.34 | 0.48 | 0.85 | 3.0 | 2.50 | 5.21 | 8.00 | ✓ | ✓ |
| R60-020 | 60 | 40 | 0.20 | 0.40 | 0.41 | 1.00 | 2.2 | 1.25 | 2.75 | 4.40 | ✓ | ✓ |
| R60-025 | 60 | 40 | 0.25 | 0.50 | 0.45 | 1.25 | 2.5 | 0.65 | 1.95 | 3.00 | ✓ | ✓ |
| R60-030 | 60 | 40 | 0.30 | 0.60 | 0.49 | 1.50 | 3.0 | 0.45 | 1.33 | 2.10 | ✓ | ✓ |
| R60-040 | 60 | 40 | 0.40 | 0.80 | 0.56 | 2.00 | 3.8 | 0.40 | 0.86 | 1.29 | ✓ | ✓ |
| R60-050 | 60 | 40 | 0.50 | 1.00 | 0.77 | 2.50 | 4.0 | 0.35 | 0.77 | 1.17 | ✓ | ✓ |
| R60-065 | 60 | 40 | 0.65 | 1.30 | 0.88 | 3.25 | 5.3 | 0.25 | 0.48 | 0.72 | ✓ | ✓ |
| R60-075 | 60 | 40 | 0.75 | 1.50 | 0.92 | 3.75 | 6.3 | 0.20 | 0.40 | 0.60 | ✓ | ✓ |
| R60-090 | 60 | 40 | 0.90 | 1.80 | 0.99 | 4.50 | 7.2 | 0.15 | 0.31 | 0.47 | ✓ | ✓ |
| R60-110 | 60 | 40 | 1.10 | 2.20 | 1.50 | 5.50 | 8.2 | 0.13 | 0.25 | 0.38 | ✓ | ✓ |
| R60-135 | 60 | 40 | 1.35 | 2.70 | 1.70 | 6.75 | 9.6 | 0.10 | 0.19 | 0.30 | ✓ | ✓ |
| R60-160 | 60 | 40 | 1.60 | 3.20 | 1.90 | 8.00 | 11.4 | 0.07 | 0.14 | 0.22 | ✓ | ✓ |
| R60-185 | 60 | 40 | 1.85 | 3.70 | 2.10 | 9.25 | 12.6 | 0.06 | 0.12 | 0.19 | ✓ | ✓ |
| R60-250 | 60 | 40 | 2.50 | 5.00 | 2.50 | 12.50 | 15.6 | 0.04 | 0.08 | 0.13 | ✓ | ✓ |
| R60-300 | 60 | 40 | 3.00 | 6.00 | 2.80 | 15.00 | 19.8 | 0.03 | 0.06 | 0.10 | ✓ | ✓ |
| R60-375 | 60 | 40 | 3.75 | 7.50 | 3.20 | 18.75 | 24.0 | 0.02 | 0.05 | 0.08 | ✓ | ✓ |

Ihold = Hold Current : maximum current device will sustain for 4 hours without tripping in 25°C still air.

Itrip = Trip Current : minimum current at which the device will trip in 25°C still air.

Vmax = Maximum voltage device can withstand without damage at rated current (I_{max}).

Imax = Maximum fault current device can withstand without damage at rated voltage (V_{max}).

Pd = Power dissipated from device when in the tripped state at 25°C still air.

Ri min/max = Minimum/Maximum resistance of device in initial (un-soldered) state.

R1 max = Maximum resistance of device at 25°C measured one hour after tripping.

CAUTION : Operation beyond the specified ratings may result in damage and possible arcing and flame.

Environmental Specifications

| Test | Conditions |
|---------------------------------------------------------------------|---------------------------|
| Passive aging | +85°C, 1000 hrs |
| Humidity aging | +85°C, 85% R.H., 1000 hrs |
| Thermal shock | +85°C to -40°C, 20 times |
| Resistance to solvent | MIL-STD-202, Method 215 |
| Vibration | MIL-STD-202, Method 201 |
| Ambient operating /storage conditions | : - 40 °C to +85 °C |
| Maximum surface temperature of the device in the tripped state | is 125 °C |
| In case of special use, please contact our engineer | |

Agency Approvals :



E201504(Alpha-Top)/E319079(Sea&Land)



R 50274672

Regulation/Standard:



2015/863/EU



EN14582



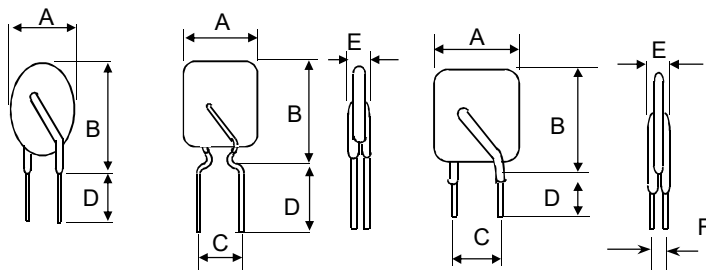
R60 Series

Alpha-Top (Sea & Land Alliance)

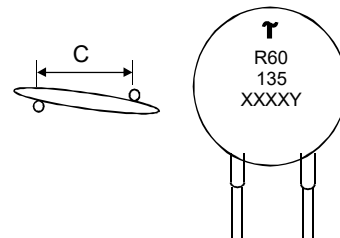
Physical Dimensions (Unit: mm)

| Model | A Max. | B Max. | C Typ. | D Min. | E Max. | F Max. | Lead Style |
|---------|-----------|-----------|-----------|-----------|-----------|-----------|---------------|
| R60-005 | 7.4 | 12.7 | 5.1 | 7.6 | 3.1 | 1.0 | Kink |
| R60-010 | 7.4 | 12.7 | 5.1 | 7.6 | 3.1 | 1.0 | Kink |
| R60-017 | 7.4 | 12.7 | 5.1 | 7.6 | 3.1 | 1.7 | Kink |
| R60-020 | 7.4 | 12.7 | 5.1 | 7.6 | 3.1 | 1.0 | Kink |
| R60-025 | 7.4 | 12.7 | 5.1 | 7.6 | 3.1 | 1.0 | Kink |
| R60-030 | 7.4 | 13.0 | 5.1 | 7.6 | 3.1 | 1.0 | Kink |
| R60-040 | 7.6 | 13.5 | 5.1 | 7.6 | 3.1 | 1.2 | Kink |
| R60-050 | 7.9 | 13.7 | 5.1 | 7.6 | 3.1 | 1.2 | Kink |
| R60-065 | 9.7 | 14.5 | 5.1 | 7.6 | 3.1 | 1.5 | Kink |
| R60-075 | 10.4 | 15.2 | 5.1 | 7.6 | 3.1 | 1.5 | Kink |
| R60-090 | 11.7 | 15.8 | 5.1 | 7.6 | 3.1 | 1.5 | Kink |
| R60-110 | 13.0 | 18.0 | 5.1 | 7.6 | 3.1 | 1.2 | Straight |
| R60-135 | 14.5 | 19.6 | 5.1 | 7.6 | 3.1 | 1.2 | Straight |
| R60-160 | 16.3 | 21.3 | 5.1 | 7.6 | 3.1 | 1.5 | Straight |
| R60-185 | 17.8 | 22.9 | 5.1 | 7.6 | 3.1 | 1.5 | Straight |
| R60-250 | 21.3 | 26.4 | 10.2 | 7.6 | 3.1 | 1.7 | Straight |
| R60-300 | 24.9 | 30.0 | 10.2 | 7.6 | 3.1 | 2.0 | Straight |
| R60-375 | 28.5 | 33.5 | 10.2 | 7.6 | 3.1 | 2.0 | Straight |

Dimensions



Marking



™ = Trademark

R60 = Radial type 60 Vrms

135 = 1.35A hold current

XXXX = Date code

Y = Factory code

Physical Characteristics

Lead Material :

R60-010: Tin-plated nickel-copper alloy, 0.205mm² (24AWG), Φ0.51mm(0.020 in).

R60-017 ~ 040: Tin-plated copper-clad steel, 0.205mm² (24AWG), Φ0.51mm(0.020 in).

R60-050 ~ 090: Tin-plated copper, 0.205mm² (24AWG), Φ0.51mm(0.020 in).

R60-110 ~ 375: Tin-plated copper, 0.52mm² (20AWG), Φ0.81mm(0.032 in).

Lead Solderability : MIL-STD-202, Method 208

Order information

Packing

| R60 | 185 | K or S | R or U | Model | Reel Q'ty | Bag Q'ty |
|-------------|---------|--------------|-----------|-------------------|-----------|----------|
| Radial type | Hold | K=Kink leads | R= Tape & | R60-005 ~ R60-090 | 3000 | 500 |
| 60 V | Current | | Reel | R60-017 | 2500 | 500 |
| | (A) | S=Straight | U= Bulk | R60-110 ~ R60-185 | 1500 | 500 |
| | | leads | packaged | R60-250 ~ R60-375 | - | 500 |

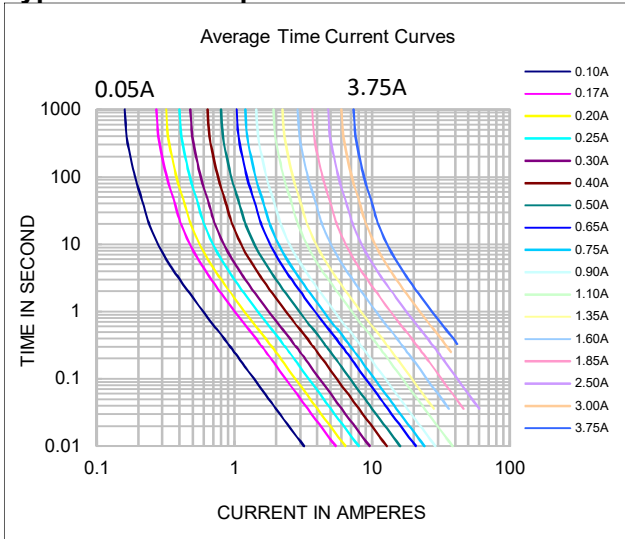
Devices taped with reference EIA468 standard.



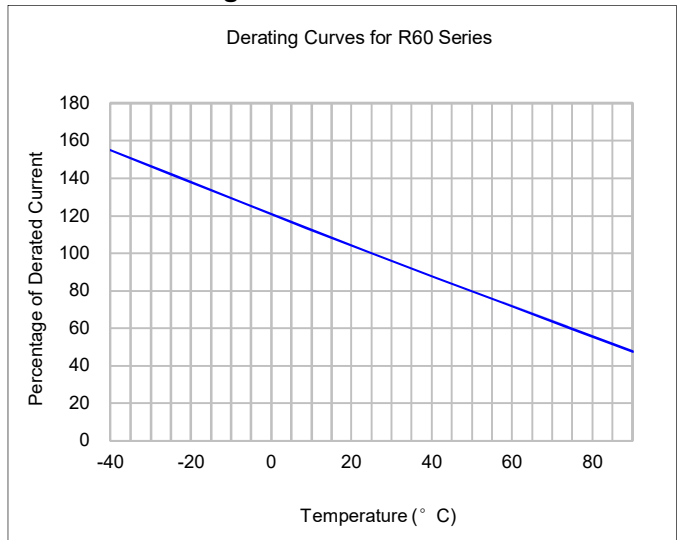
R60 Series

Alpha-Top (Sea & Land Alliance)

Typical time-to-trip curve at 25°C



Thermal derating curve



I_{hold} versus temperature

| Model | Maximum ambient operating temperature (T _{mao}) vs. hold current (I _{hold}) | | | | | | | | |
|---------|-------------------------------------------------------------------------------------------------|-------|------|------|------|-------|-------|-------|------|
| | -40°C | -20°C | 0°C | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| R60-005 | 0.08 | 0.068 | 0.06 | 0.05 | 0.04 | 0.036 | 0.032 | 0.027 | 0.02 |
| R60-010 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 |
| R60-017 | 0.26 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.11 | 0.09 | 0.07 |
| R60-020 | 0.31 | 0.27 | 0.24 | 0.20 | 0.16 | 0.14 | 0.13 | 0.11 | 0.08 |
| R60-025 | 0.39 | 0.34 | 0.30 | 0.25 | 0.20 | 0.18 | 0.16 | 0.14 | 0.10 |
| R60-030 | 0.47 | 0.41 | 0.36 | 0.30 | 0.24 | 0.22 | 0.19 | 0.16 | 0.12 |
| R60-040 | 0.62 | 0.54 | 0.48 | 0.40 | 0.32 | 0.29 | 0.25 | 0.22 | 0.16 |
| R60-050 | 0.78 | 0.68 | 0.60 | 0.50 | 0.41 | 0.36 | 0.32 | 0.27 | 0.20 |
| R60-065 | 1.01 | 0.88 | 0.77 | 0.65 | 0.53 | 0.47 | 0.41 | 0.35 | 0.26 |
| R60-075 | 1.16 | 1.02 | 0.89 | 0.75 | 0.61 | 0.54 | 0.47 | 0.41 | 0.30 |
| R60-090 | 1.40 | 1.22 | 1.07 | 0.90 | 0.73 | 0.65 | 0.57 | 0.49 | 0.36 |
| R60-110 | 1.71 | 1.50 | 1.31 | 1.10 | 0.89 | 0.79 | 0.69 | 0.59 | 0.44 |
| R60-135 | 2.09 | 1.84 | 1.61 | 1.35 | 1.09 | 0.97 | 0.85 | 0.73 | 0.54 |
| R60-160 | 2.48 | 2.18 | 1.90 | 1.60 | 1.30 | 1.15 | 1.01 | 0.86 | 0.64 |
| R60-185 | 2.87 | 2.52 | 2.20 | 1.85 | 1.50 | 1.33 | 1.17 | 1.00 | 0.74 |
| R60-250 | 3.88 | 3.40 | 2.98 | 2.50 | 2.03 | 1.80 | 1.58 | 1.35 | 1.00 |
| R60-300 | 4.65 | 4.08 | 3.57 | 3.00 | 2.43 | 2.16 | 1.89 | 1.62 | 1.20 |
| R60-375 | 5.81 | 5.10 | 4.46 | 3.75 | 3.04 | 2.70 | 2.36 | 2.03 | 1.50 |



WARNING:

- Use PPTC beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- PPTC are intended for protection against occasional over current or over temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- Use PPTC with a large inductance in circuit will generate a circuit voltage (L di/dt) above the rated voltage of the PPTC.
- Avoid impact PPTC device its thermal expansion like placed under pressure or installed in limited space.