



# 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 <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	P <sub>d</sub> Typ. (W)	Maximum Time To Trip		Resistance			Agency Approval	
						Current (A)	Time (Sec)	Ri <sub>min</sub> (Ω)	Ri <sub>max</sub> (Ω)	R1 <sub>max</sub> (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<sub>max</sub>).

**Imax** = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>).

**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
<a href="#">In case of special use, please contact our engineer</a>	

Agency Approvals :



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



R 50274672

Regulation/Standard:



2015/863/EU



EN14582



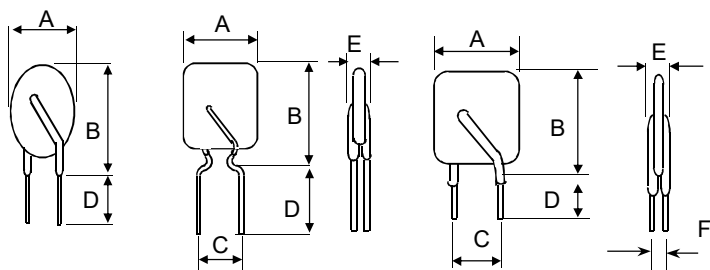
# R60 Series

Alpha-Top (Sea & Land Alliance)

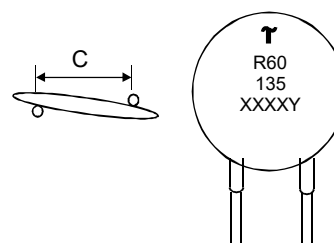
## Physical Dimensions (Unit: mm)

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



T = 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,  $0.205\text{mm}^2$  (24AWG),  $\Phi 0.51\text{mm}$ (0.020 in).

R60-017 ~ 040: Tin-plated copper-clad steel,  $0.205\text{mm}^2$  (24AWG),  $\Phi 0.51\text{mm}$ (0.020 in).

R60-050 ~ 090: Tin-plated copper,  $0.205\text{mm}^2$  (24AWG),  $\Phi 0.51\text{mm}$ (0.020 in).

R60-110 ~ 375: Tin-plated copper,  $0.52\text{mm}^2$  (20AWG),  $\Phi 0.81\text{mm}$ (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

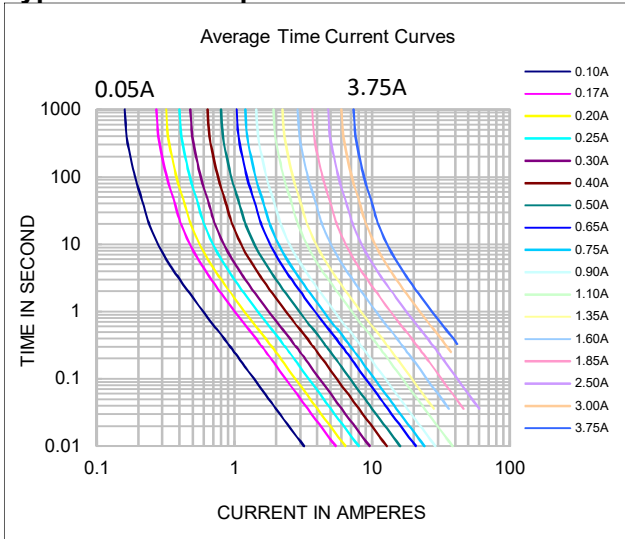
Devices taped with reference EIA468 standard.



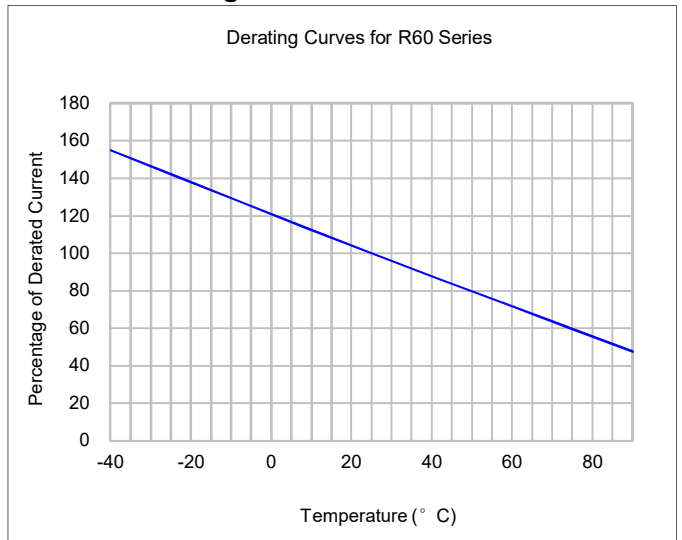
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Alpha-Top (Sea & Land Alliance)

## 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.

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