

ELECTRONICS



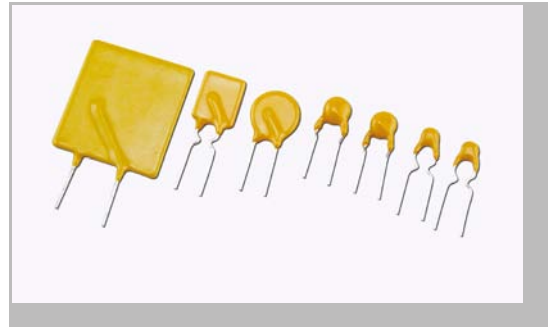
# Positive Thermal Coefficient

RL60 Series

# Positive Thermal Coefficient - RL60 Series

## Features

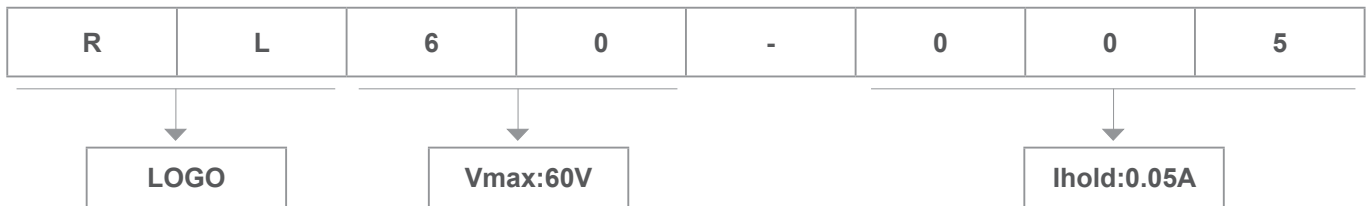
1. I(hold):005~500mA
2. 60V Operating voltages
3. Radial leaded devices.
4. Very high voltage surge capabilities.
5. Available in lead-free version.
6. Fast time-to-trip
7. RoHS compliant, Lead- Free and Halogen-Free



## Applications

1. Overcurrent and overtemperature
2. protection of automotive electronics
3. Hard disk drives
4. PC motherboards
5. PC peripherals
- Point-of-sale (POS) equipment
- PCMCIA cards
- USB port protection
- HDMI 1.4 Source protection
- Computers & peripherals
- General Electronics

## Product Name



# Positive Thermal Coefficient - RL60 Series

## Dimension

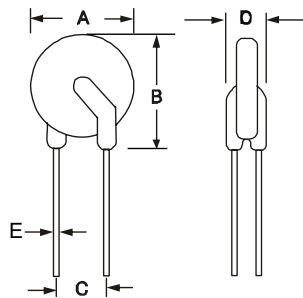


Fig.1

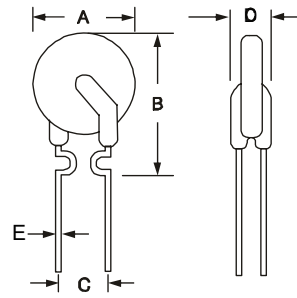


Fig.2

Type Number	Ihold	Vmax	Itrip	I <sub>max</sub>	R <sub>max</sub>	R <sub>min</sub>	Pd <sub>typ</sub>	Package Dimensions (mm)					Circuit Figure
	A	V	A	A	Ω	Ω	W	A	B	C	D	E	
RL60-005	0.05	60	0.1	40	20	7.3	0.3	5	8.5	5.1	3	0.8	Fig.1/2
RL60-010	0.1	60	0.2	40	7.5	2.5	0.38	5.5	9.5	5.1	3	0.8	Fig.1/2
RL60-017	0.17	60	0.34	40	5.21	2.84	0.48	7.4	12.7	5.1	3	0.8	Fig.1/2
RL60-020	0.2	60	0.4	40	2.84	1.83	0.41	7.4	12.7	5.1	3	0.8	Fig.1/2
RL60-025	0.25	60	0.5	40	1.95	1	0.45	7.4	12.7	5.1	3	0.8	Fig.1/2
RL60-030	0.3	60	0.6	40	1.38	0.76	0.49	7.4	13	5.1	3	0.8	Fig.1/2
RL60-040	0.4	60	0.8	40	0.88	0.55	0.56	7.8	13.5	5.1	3	0.8	Fig.2
RL60-050	0.5	60	1	40	0.79	0.5	0.77	7.8	13.5	5.1	3	0.8	Fig.2
RL60-065	0.65	60	1.3	40	0.5	0.31	0.88	9.7	14.5	5.1	3	0.8	Fig.2
RL60-075	0.75	60	1.5	40	0.42	0.25	0.92	10.4	15.2	5.1	3	0.8	Fig.2
RL60-090	0.9	60	1.8	40	0.33	0.2	0.99	11.7	15.8	5.1	3	0.8	Fig.2
RL60-110	1.1	60	2.2	40	0.27	0.15	1.5	13	18	5.1	3	0.8	Fig.1
RL60-135	1.35	60	2.7	40	0.21	0.12	1.7	14.5	19.6	5.1	3	0.8	Fig.1
RL60-160	1.6	60	3.2	40	0.16	0.09	1.9	16.3	21.3	5.1	3	0.8	Fig.1
RL60-185	1.85	60	3.7	40	0.14	0.08	2.1	17.8	22.9	5.1	3	0.8	Fig.1
RL60-250	2.5	60	5	40	0.1	0.05	2.5	21.3	26.4	10.5	3	0.8	Fig.1
RL60-300	3	60	6	40	0.08	0.04	2.8	21.3	26.4	10.5	3	0.8	Fig.1
RL60-375	3.75	60	7.5	40	0.07	0.03	3.2	28.5	33.5	10.5	3	0.8	Fig.1
RL60-500	5	60	10	40	0.02	0.03	4.2	28.5	33.5	10.5	3	0.8	Fig.1

I hold = Hold Current. Maximum current device will not trip in 25°C still air.

I trip = Trip Current. Minimum current at which the device will always trip in 25°C still air.

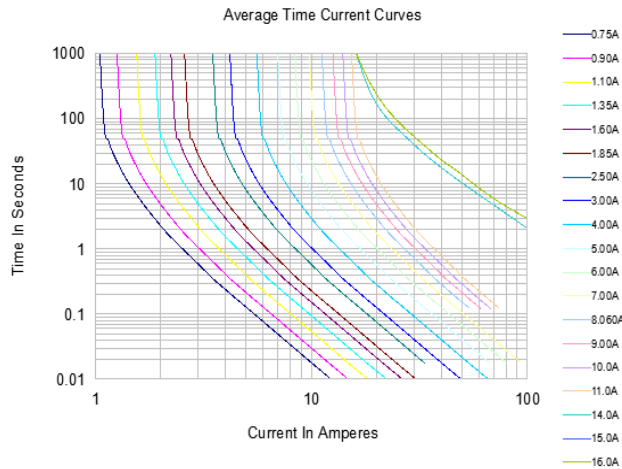
V max = Maximum operating voltage device can withstand without damage at rated current (I<sub>max</sub>).

I max = Maximum fault current device can withstand without damage at rated voltage (V max).

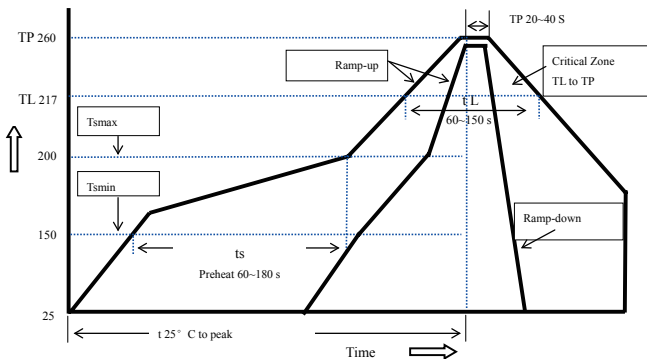
R min/max = Minimum/Maximum device resistance prior to tripping at 25°C.

# Positive Thermal Coefficient - RL60 Series

## Average Time Current Curves



## Soldering Parameters



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate(Ts max to T p)	3°C/second max.
<b>Preheat</b>	
-Temperature Min(Ts min)	150°C
-Temperature Max(Ts max)	200°C
-Time(Ts min to Ts max)	60~180 seconds
<b>Time maintained above:</b>	
-Temperature(TL)	+217°C
-Time(tL)	60~150 seconds
<b>Peak Temperature(Tp)</b>	260°C
<b>Ramp-Down Rate</b>	6°C/second max.
<b>Time 25°C to Peak Temperature</b>	8 minutes max
<b>Storage Condition</b>	0°C~35°C,70%RH

Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free

Recommended maximum paste thickness is 0.25mm  
 Devices can be cleaned using standard industry methods and solvents.

Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

## Positive Thermal Coefficient - RL60 Series

### Ihold Versus Temperature

Type Number	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
RL60-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.04
RL60-017	0.26	0.23	0.20	0.17	0.14	0.12	0.11	0.09	0.07
RL60-020	0.31	0.27	0.24	0.20	0.16	0.14	0.13	0.11	0.08
RL60-025	0.39	0.34	0.30	0.25	0.20	0.18	0.16	0.14	0.10
RL60-030	0.47	0.41	0.36	0.30	0.24	0.22	0.19	0.16	0.12
RL60-040	0.62	0.54	0.48	0.40	0.32	0.29	0.25	0.22	0.16
RL60-050	0.78	0.68	0.60	0.50	0.41	0.36	0.32	0.27	0.20
RL60-065	1.01	0.88	0.77	0.65	0.53	0.47	0.41	0.35	0.26
RL60-075	1.16	1.02	0.89	0.75	0.61	0.54	0.47	0.41	0.30
RL60-090	1.40	1.22	1.07	0.90	0.73	0.65	0.57	0.49	0.36
RL60-110	1.71	1.50	1.31	1.10	0.89	0.79	0.69	0.59	0.44
RL60-135	2.09	1.84	1.61	1.35	1.09	0.97	0.85	0.73	0.54
RL60-160	2.48	2.18	1.90	1.60	1.30	1.15	1.01	0.86	0.64
RL60-185	2.87	2.52	2.20	1.85	1.50	1.33	1.17	1.00	0.74
RL60-250	3.88	3.40	2.98	2.50	2.03	1.80	1.58	1.35	1.00
RL60-300	4.65	4.08	3.57	3.00	2.43	2.16	1.89	1.62	1.20
RL60-375	5.81	5.10	4.46	3.75	3.04	2.70	2.36	2.03	1.50

### Warehouse Storage Conditions of Products

- Storage Conditions:
  1. Storage Temperature: -10°C~+40°C
  2. Relative Humidity: ≤75%RH
  3. Keep away from corrosive atmosphere and sunlight.
- Period of Storage: 1 year

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