

### Description

• The 600R series is designed to protect against power fault events typically found in telecom applications. This series is designed to be used in applications that need to meet the requirements of GR-1089-CORE and UL60950/EN60950/IEC60950. These resettable devices also help to meet the requirements of ITU K.20, K.21 and K.44.

### Features

- RoHS compliant and lead-free
- Fast time-to-trip
- Binned and sorted narrow resistance ranges available
- 0.15 – 0.16A Hold current range, 60VDC operating voltage
- 600VAC interrupt rating

### Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E183209
	R50082521

### Applications

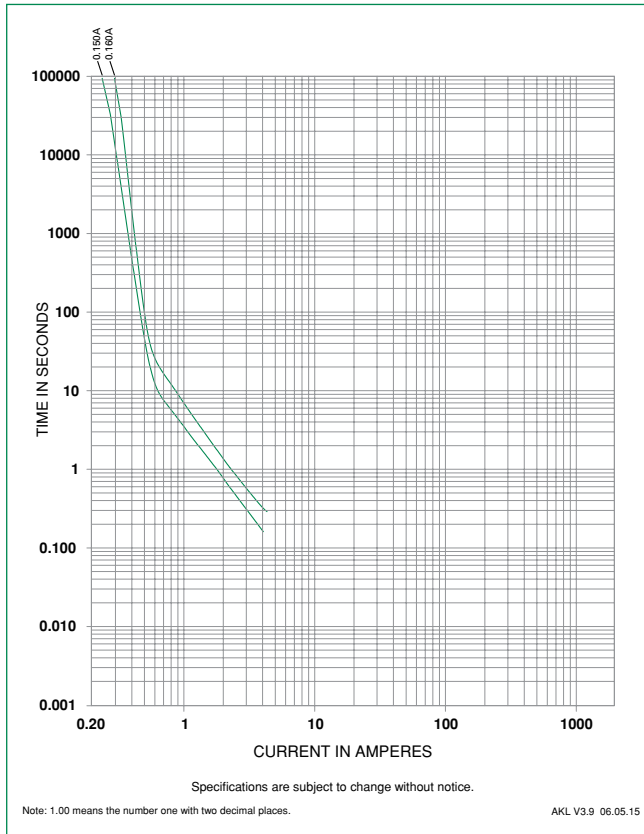
- Secondary overcurrent protection for:
- Central Office Equipment (CO)
  - Customer Premises Equipment (CE)
  - Alarm Systems
  - Set Top Boxes (STB)
  - Voice over IP (VOIP)
  - Subscriber Line Interface Circuit (SLIC)

### Electrical Characteristics

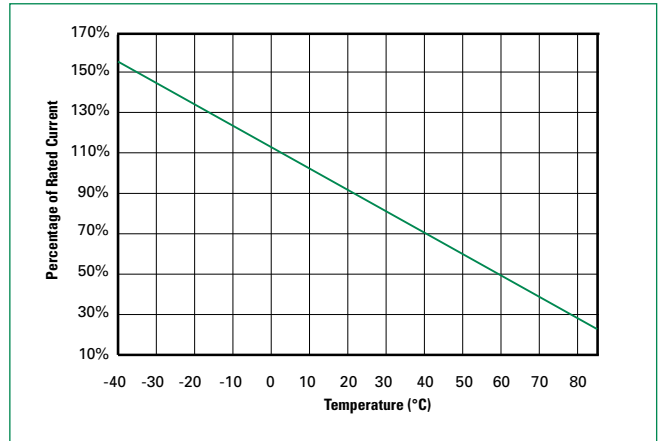
Part Number	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	P <sub>d max.</sub> (W)	Maximum Time To Trip		Resistance			Agency Approvals	
						Current (A)	Time (Sec.)	R <sub>min</sub> (Ω)	R <sub>typ</sub> (Ω)	R <sub>1max</sub> (Ω)		
600R150	0.15	0.30	600	3	1.00	5.0	8.0	6	12	22	X	X
600R150-RA	0.15	0.30	600	3	1.00	5.0	7.5	7	10	20	X	X
600R150-RB	0.15	0.30	600	3	1.00	4.5	-	9	12	22	X	X
600R160	0.16	0.32	600	3	1.00	7.5	18	4	10	18	X	X
600R160-RA	0.16	0.32	600	3	1.00	9.5	-	4	7	16	X	X
600R160-R1	0.16	0.32	600	3	1.00	9.0	-	4	8	17	X	X

### Temperature Derating

Part Number	Ambient Operation Temperature						
	-40°C	-20°C	0°C	23°C	40°C	60°C	85°C
	Hold Current (A)						
600R150	0.26	0.23	0.19	0.15	0.124	0.062	0.03
600R160	0.27	0.24	0.20	0.16	0.13	0.07	0.05

**Average Time Current Curves**


The average time current curves and temperature rerating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

**Temperature Rerating Curve**

**Agency Specification Selection Guide For Telecom and Networking Applications**

Part Number	Lightning	Power Cross
600R150 600R160	TIA-968-A – 1.5kV 10/160µs 800V 10/560µs Telcordia GR –1089–1.0kV 10/1000µs 2.5kV 2/10µs	UL60950, 3rd Ed – 600Vac, 40A Telcordia GR – 1089 – 600Vac, 60A

Devices should be independently evaluated and tested for use in any specific application

**Protection Application Guide**

Region/Specification	Application	Device Selection
North America Telcordia GR-1089	*Access network equipment Remote terminal Repeaters WAN equipment Cross -connect	600R150 600R160
North America TIA-968-A, UL60950	Customer and IT equipment Analog modems ADSL, XDSL modems Phone sets, PBX systems Internet appliances POS terminals	600R150 600R160
North America Telcordia GR-1089	Central Office POTS/ISDN linecards T1/E1/J1 linecards ADSL/VDSL splitters CSU/DSU	600R150 600R160
North America Telcordia GR-1089 South America/Asia/Europe ITU K.20 and K.21	*Intrabuilding communication systems LAN, VOIP cards Local loop handsets	600R150 600R160

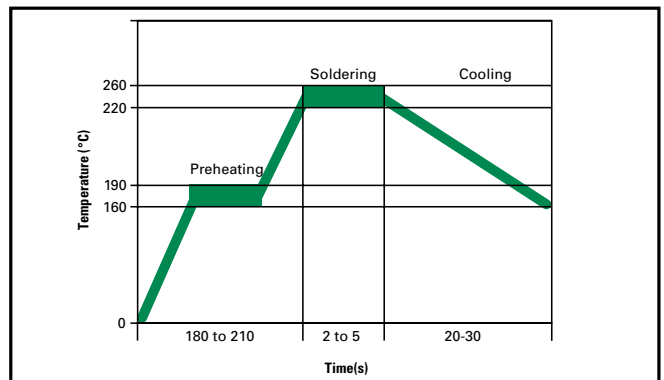
\*Resistance binned parts are recommended

**Soldering Parameters - Wave Soldering**

Condition	Wave Soldering
Peak Temp/ Duration Time	260°C ≤ 5 Sec
≥ 220°C	2 Sec ~ 20 Sec
Preheat 140°C~ 180°C	180 Sec ~ 210 Sec
Storage Condition	0°C~35°C, ≤ 70%RH

- Recommended soldering methods: heat element oven or N<sub>2</sub> environment for lead-free
- Devices are designed to be wave soldered to the bottom side of the board.
- Devices can be cleaned using standard industry methods and solvents.
- This profile can be used for lead-free device

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

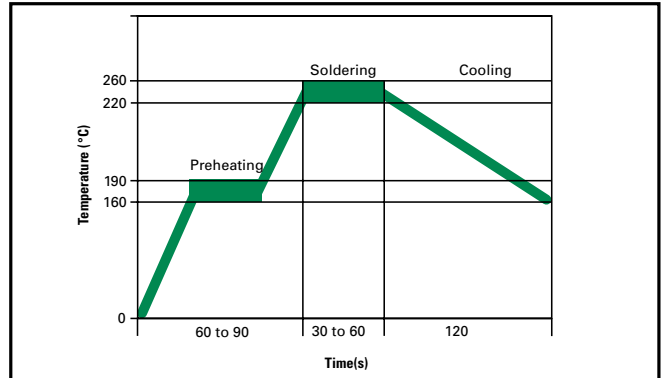


**Soldering Parameters - Solder Reflow**

Condition	Reflow
Peak Temp/ Duration Time	260°C ≥ 5 Sec
≥ 220°C	30 Sec ~ 60 Sec
Preheat 160°C~ 190°C	60 Sec ~ 90 Sec
Storage Condition	0°C~35°C, ≤ 70%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N<sub>2</sub> environment for lead-free.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Devices can be cleaned using standard industry methods and solvents.

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


**Physical Specifications**

<b>Lead Material</b>	Tin-plated copper
<b>Soldering Characteristics</b>	Solderability per MIL-STD-202, Method 208E
<b>Insulating Material</b>	Cured, flame retardant epoxy polymer meets UL94V-0 requirements.
<b>Device Labeling</b>	Marked with LF, voltage, current rating, and date code.

**Environmental Specifications**

<b>Operating/Storage Temperature</b>	-40°C to +85°C
<b>Maximum Device Surface Temperature in Tripped State</b>	125°C
<b>Passive Aging</b>	85°C/85°C, 1000 hours
<b>Humidity Aging</b>	+85°C, 85%R.H. 1000 hours
<b>Thermal Shock</b>	MIL-STD-202F Method 107G +125°C to -55°C 10 times
<b>Solvent Resistance</b>	MIL-STD-202, Method 215F

### Dimensions

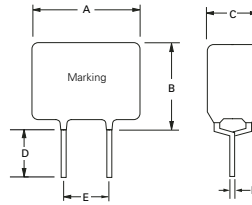
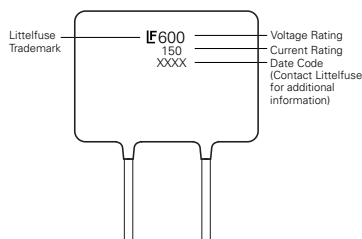


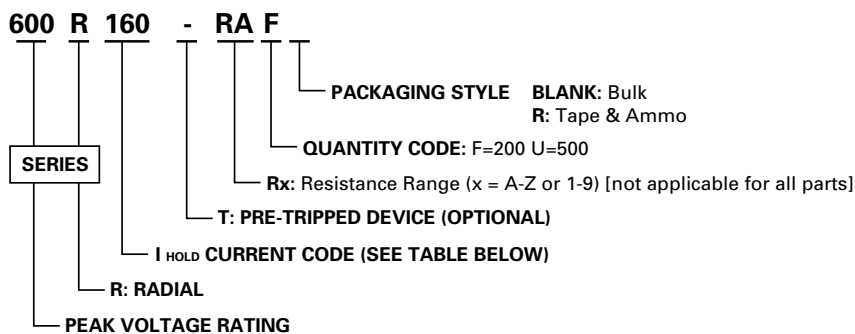
Figure 1

Part Number	A		B		C		D		E		Physical Characteristics			
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Lead (dia)		Material	Figure
	Max.	Max.	Max.	Max.	Max.	Max.	Min.	Min.	Typ.	Typ.	Inches	mm		
600R150	0.53	13.5	0.50	12.6	0.24	6	0.19	4.7	0.20	5.1	0.026	0.65	Sn/Cu	1
600R150-RA	0.53	13.5	0.50	12.6	0.24	6	0.19	4.7	0.20	5.1	0.026	0.65	Sn/Cu	1
600R150-RB	0.53	13.5	0.50	12.6	0.24	6	0.19	4.7	0.20	5.1	0.026	0.65	Sn/Cu	1
600R160	0.63	16	0.50	12.6	0.24	6	0.19	4.7	0.20	5.1	0.026	0.65	Sn/Cu	1
600R160-RA	0.63	16	0.50	12.6	0.24	6	0.19	4.7	0.20	5.1	0.026	0.65	Sn/Cu	1
600R160-R1	0.63	16	0.50	12.6	0.24	6	0.19	4.7	0.20	5.1	0.026	0.65	Sn/Cu	1

### Part Marking System



### Part Numbering System



### Packaging

I <sub>hold</sub> (A)	I <sub>hold</sub> Code	Packaging Option	Quantity	Quantity & Packaging Codes
0.15	150	Bulk	200	F
		Tape and Ammo	600	ZR
0.16	160	Bulk	200	F
		Tape and Ammo	500	UR