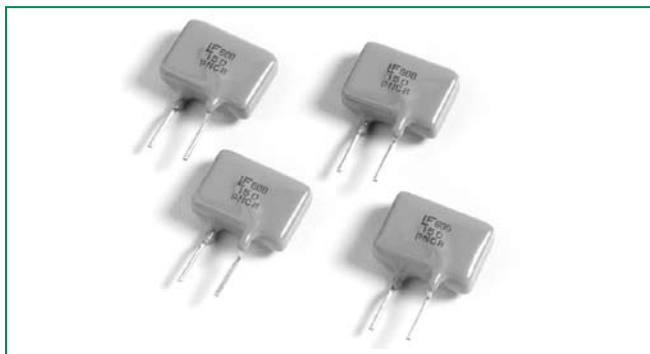




Agency Approvals

AGENCY AGENCY FILE NUMBER



E183209



R50082521

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

Applications

Secondary overcurrent protection for:

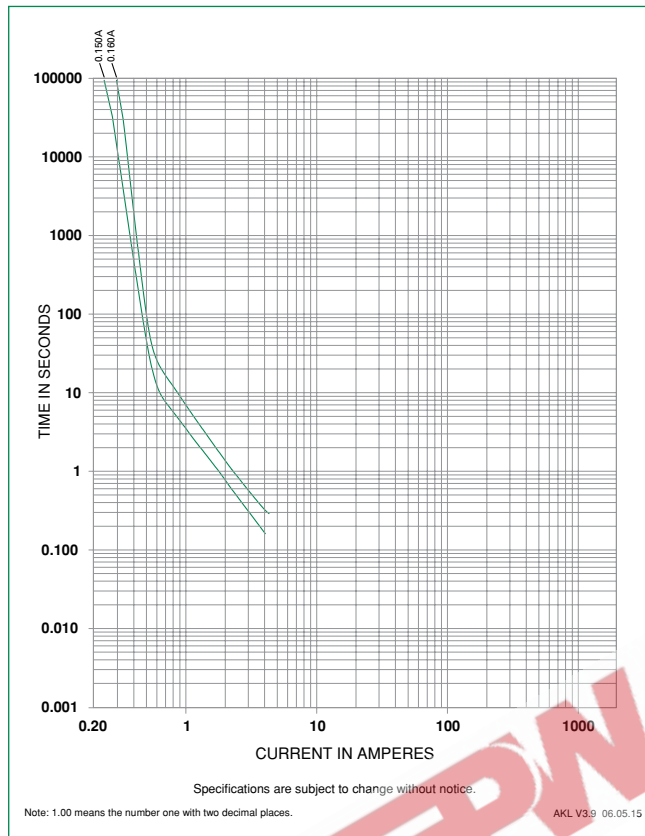
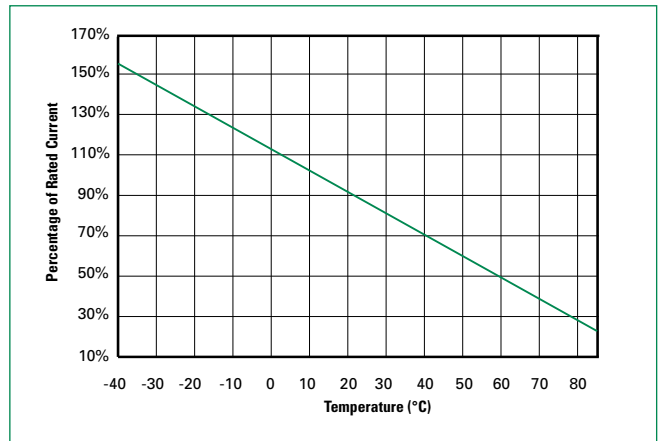
- Central Office Equipment (CO)
- Customer Premises Equipment (CE)
- Alarm Systems
- Set Top Boxes (STB)
- Voice over IP (VOIP)
- Subscriber Line Interface Circuit (SLIC)

Electrical Characteristics

Part Number	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	$P_{dmax.}$ (W)	Maximum Time To Trip		Resistance			Agency Approvals	
						Current (A)	Time (Sec.)	R_{min} (Ω)	R_{typ} (Ω)	R_{1max} (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
Part Number	Hold Current (A)						
	0.26	0.23	0.19	0.15	0.124	0.062	0.03
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

Temperature Derating Curve


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

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	*Intrabuilding communication systems LAN, VOIP cards Local loop handsets	600R150 600R160
South America/Asia/Europe ITU K.20 and K.21		

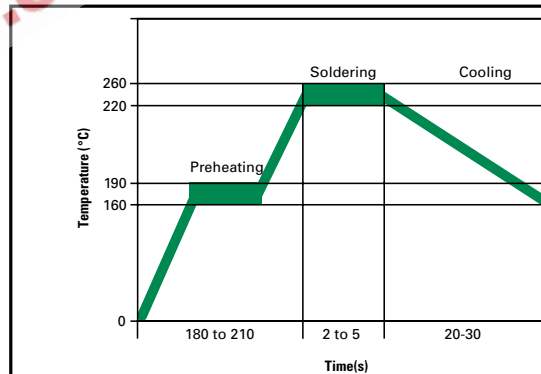
*Resistance binned parts are recommended

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 N₂ 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.

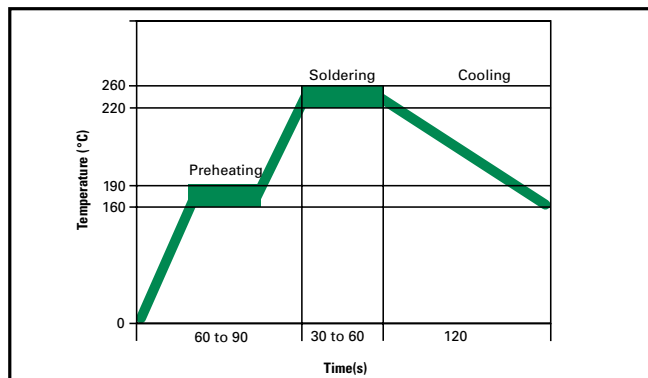


Soldering Parameters - Solder Reflow

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, N₂ 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

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

Environmental Specifications

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

Dimensions

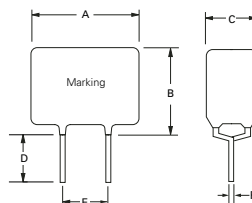
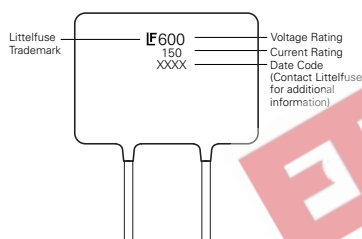


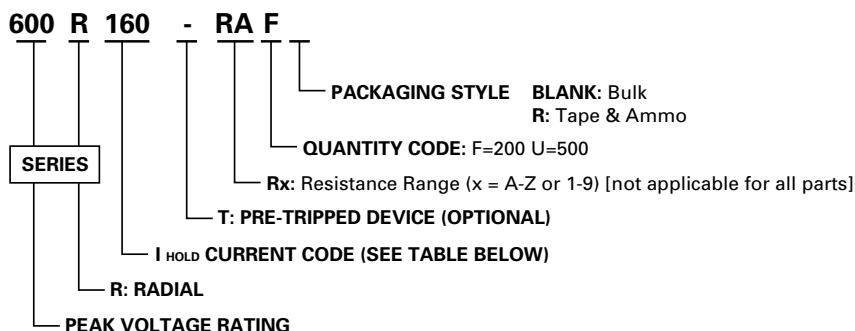
Figure 1

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 _{hold} (A)	I _{hold} 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