

ROHS 199 494 Series Fuse, NRA Special Series Integrated Circuit Protector







Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
. 71	E10480	250mA - 5A
(LR29862	250mA - 5A

Electrical Characteristics for Series

% of Ampere Rating	Opening Time at 25°C	
100%	4 hours, Minimum	
200%	15 sec., Maximum	
300%	0.2 sec., Maximum	

Description

The 494 Series Fast-Acting SMF is an ultra small (0603 size) thin-film device designed for secondary protection of circuits used in space constrained applications such as hand-held portable electronic devices. This series is 100% lead-free and meets the requirements of the RoHS directive. New Halide-Free 494 Series fuses are available to order using the "HF" suffix. See Part Numbering section for additional information.

Features

- Compatible with leadfree solders and higher temperature profiles
- High performance materials provide improved performance in elevated ambient temperature applications
- Marked on top surface with code to allow ampere rating identification without testing
- Low profile for height sensitive applications
- Flat top surface for pickand-place operations

- Element-covering material is resistant to industry standard cleaning operations
- Mounting pad and electrical performance are identical to Littelfuse 431 and 434 Series products
- Alloy-based element construction provides superior inrush withstand characteristics (I2t) over ceramic or glass-based 0603 fuse products

Applications

Secondary protection for space constrained applications:

- Cell phones
- Digital cameras •
- Hard disk drives

- Battery packs
- DVD players

Electrical Specifications by Item

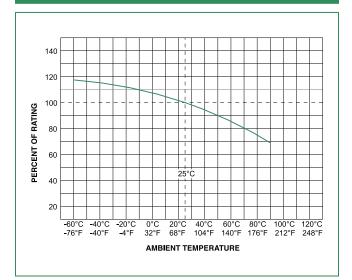
Ampere	Ampere		Non	Nominal Cold	Cold Nominal	Nom	Nom	Agency Approvals	
Rating (A)	Code Rat	Voltage Rating (V)	Interrupting Rating	Resistance (Ohms)	Melting I ² t (A ² sec)	Voltage Drop (mV)	Power Dissipation (W)	!R ®	(
0.250	.250	32		0.5450	0.0030	158.56	0.0396	X	X
0.375	.375	32		0.2900	0.0053	128.03	0.0480	x	X
0.500	.500	32	50A @32V AC/DC	0.1870	0.0087	115.71	0.0579	X	X
0.750	.750	32		0.1170	0.0171	107.33	0.0805	x	X
1.00	001.	32		0.0710	0.0212	89.10	0.0891	X	X
1.25	1.25	32		0.0530	0.0518	84.32	0.1054	x	X
1.50	01.5	32		0.0410	0.0766	81.14	0.1217	X	X
1.75	1.75	32		0.0320	0.0903	78.75	0.1378	×	X
2.00	002.	32		0.0300	0.1103	78.22	0.1564	X	X
2.50	02.5	32	35A @32V AC/DC	0.0220	0.1440	76.10	0.1903	×	X
3.00	003.	32		0.0180	0.2403	75.04	0.2251	Х	X
3.50	03.5	32		0.0150	0.4306	74.25	0.2599	×	X
4.00	004.	32		0.0130	0.5760	73.72	0.2949	×	Х
5.00	005.	32]	0.0090	0.9000	72.71	0.3635	х	х

^{1.} Measured at 10% of rated current, 25°C. 2. Measured at rated voltage.

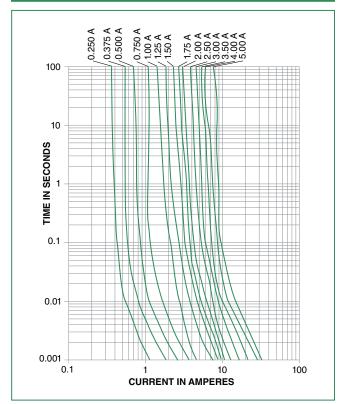
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Temperature Rerating Curve

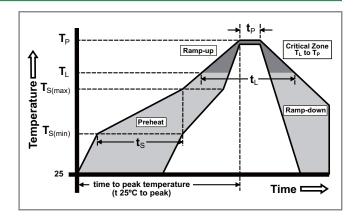


Average Time Current Curves



Soldering Parameters

Reflow Co	ndition	Pb – free assembly	
	-Temperature Min (T _{s(min)})	150°C	
Pre Heat	-Temperature Max (T _{s(max)})	200°C	
	-Time (Min to Max) (t _s)	60 – 180 seconds	
Average R (T _L) to pea	amp-up Rate (Liquidus Temp k)	5°C/second max.	
T _{S(max)} to T _L	- Ramp-up Rate	5°C/second max.	
Dofland	-Temperature (T _L) (Liquidus)	217°C	
Reflow	-Temperature (t _L)	60 – 150 seconds	
PeakTemp	erature (T _P)	250 ^{+0/-5} °C	
Time within 5°C of actual peak Temperature (t,)		20 – 40 seconds	
Ramp-dov	vn Rate	5°C/second max.	
Time 25°C to peakTemperature (T _P)		8 minutes max.	
Do not exceed		260°C	



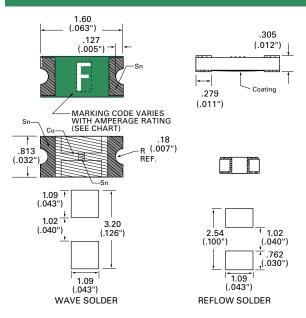


Product Characteristics

Materials	Body: Advanced High Temperature Substrate Terminations: 100% Tin over Nickel over Copp Element Cover Coat: Conformal Coating	
Operating Temperature - 55°C to 90°C. Consult temperature reratin curve chart. For operation above 90°C conta Littelfuse.		
Humidity	MIL-STD-202F, Method 103B, Condition D	

Thermal Shock	Withstands 5 cycles of – 55°C to 125°C		
Vibration Per MIL-STD-202F			
Insulation Resistance (After Opening)	Greater than 10,000 ohms		
Resistance to Soldering Heat	Withstands 60 seconds above 200°C and up to 260°C, maximum		

Dimensions



Part Marking System

Amp Code	Marking Code
.250	D
.375	E
.500	F
.750	G
001.	Н
1.25	J
01.5	К
1.75	L
002.	N
02.5	0
003.	Р
03.5	R
004.	S
005.	Т

Part Numbering System

SERIES AMP Code Refer to Amp Code column in the Electrical Specifications table. NOTE: The dot is poisitioned before the Packaging Suffix with whole ratings and within the numbering sequence for fractional ratings. PACKAGING Code NR = Tape and Reel, 5000 pcs 'HF' SUFFIX HALIDE FREE ITEM

Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
8mm Tape and Reel	EIA RS-481-2 (IEC 286, part 3)	5000	NR

