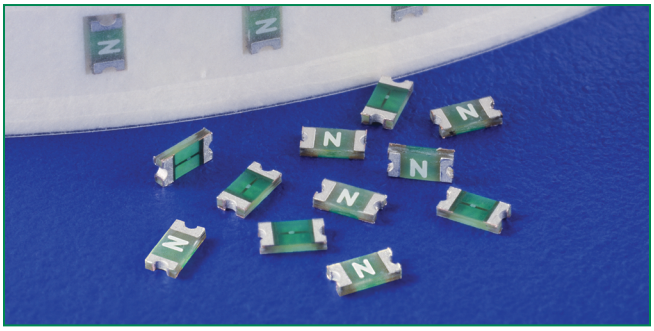
Surface Mount Fuses

Thin Film > 0603 Size > Fast-Acting > 494 Series

Littelfuse
Expertise Applied | Answers Delivered

494 Series Fuse, NRA Special Series Integrated Circuit Protector



Agency Approvals

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

Electrical Characteristics for Series

% of Ampere Rating	Opening Time at 25°C
100%	4 hours, Minimum
200%	5 sec., Maximum
300%	0.2 sec., Maximum

Additional Information

Datasheet | **Resources** | **Samples**

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 lead-free 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 pick-and-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 (I^2t) over ceramic or glass-based 0603 fuse products

Applications

Secondary protection for space constrained applications:

- Cell phones
- Battery packs
- Digital cameras
- DVD players
- Hard disk drives

Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I^2t (A^2sec)	Nom Voltage Drop (mV)	Nom Power Dissipation (W)	Agency Approvals	
0.250	.250	32	50A @32V AC/DC	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		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	35A @32V AC/DC	0.0530	0.0518	84.32	0.1054	x	x
1.40	01.4	32		0.049	0.05529	74.84	0.1048	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	x
2.00	002.	32		0.0300	0.1103	78.22	0.1564	x	x
2.50	02.5	32		0.0220	0.1440	76.10	0.1903	x	x
3.00	003.	32		0.0180	0.2403	75.04	0.2251	x	x
3.15	3.15	32		0.017	0.27405	63.78	0.2009	x	x
3.50	03.5	32		0.0150	0.4306	74.25	0.2599	x	x
4.00	004.	32		0.0130	0.5760	73.72	0.2949	x	x
5.00	005.	32		0.0090	0.9000	72.71	0.3635	x	x

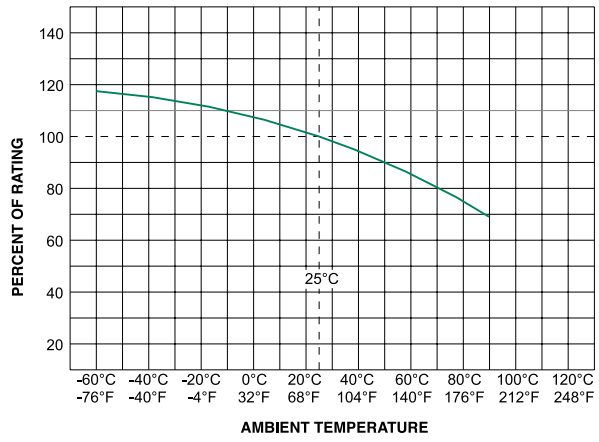
1. Measured at 10% of rated current, 25°C. 2. Measured at rated voltage.

Revised: 10/25/14

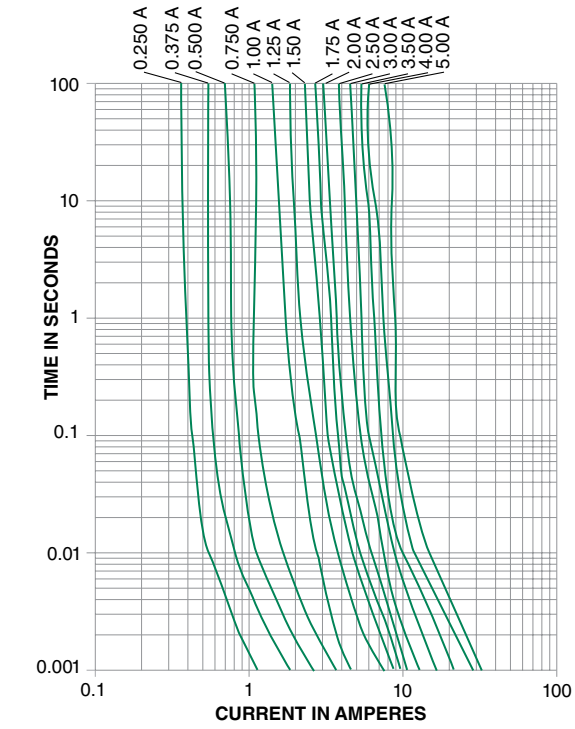
Surface Mount Fuses

Thin Film > 0603 Size > Fast-Acting > 494 Series

Temperature Rerating Curve

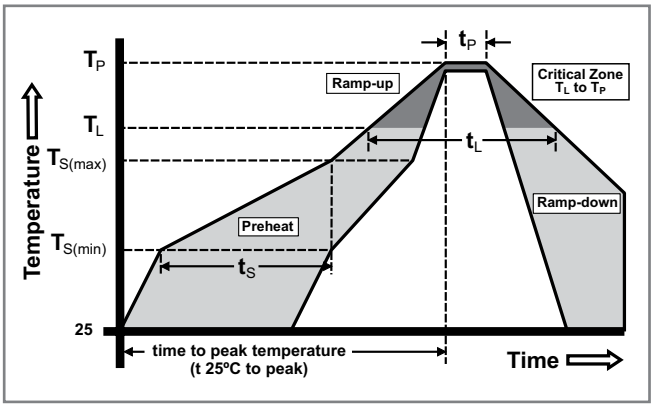


Average Time Current Curves



Soldering Parameters

Reflow Condition		Pb – free assembly
Pre Heat	-Temperature Min ($T_{s(min)}$)	150°C
	-Temperature Max ($T_{s(max)}$)	200°C
	-Time (Min to Max) (t_s)	60 – 180 seconds
Average Ramp-up Rate (Liquidus Temp (T_L) to peak)		5°C/second max.
$T_{S(max)}$ to T_L - Ramp-up Rate		5°C/second max.
Reflow	-Temperature (T_L) (Liquidus)	217°C
	-Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		$250^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max.
Time 25°C to peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C



Revised: 10/25/14

Surface Mount Fuses

Thin Film > 0603 Size > Fast-Acting > 494 Series

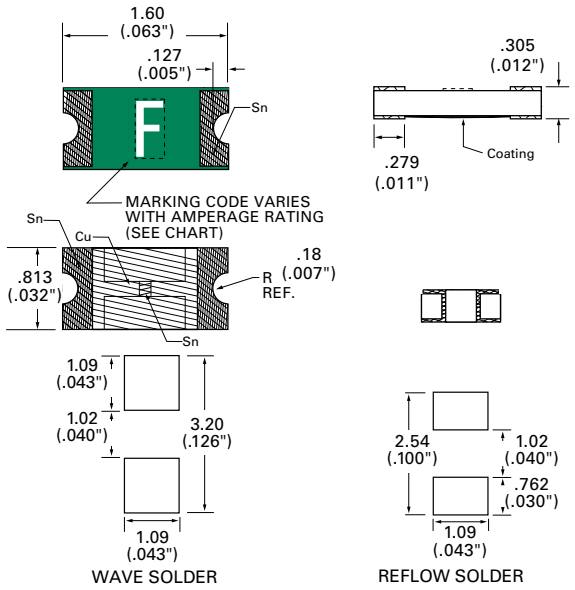
Littelfuse
Expertise Applied | Answers Delivered

Product Characteristics

Materials	**Body:** Advanced High Temperature Substrate **Terminations:** 100% Tin over Nickel over Copper **Element Cover Coat:** Conformal Coating
Operating Temperature	– 55°C to 90°C. Consult temperature rerating curve chart. For operation above 90°C contact 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.	H
1.25	J
01.4	
01.5	K
1.75	L
002.	N
02.5	O
003.	P
3.15	
03.5	R
004.	S
005.	T

Packaging

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

Part Numbering System

0494002.NRHF

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

Revised: 10/25/14