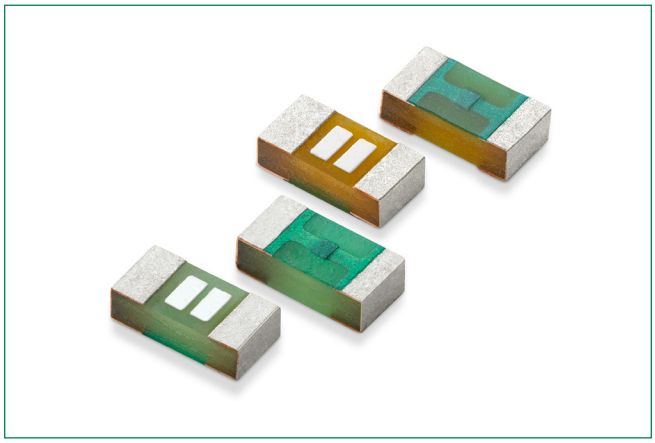
435 Series
0402 Fast-Acting Fuse



Additional Information

Resources | Accessories | Samples

Description

The 435 Series are fast-acting surface mount thin-film fuses. Their ultra-small size (0402 size) makes them ideal for secondary protection of circuits used in space constrained applications such as hand-held portable electronic devices.

This series is 100% lead-free and meet the requirements of the RoHS directive. New Halogen-Free 435 Series fuses are available– to order use the "HF" suffix. See Part Numbering section for additional information.

Features & Benefits

- 50A interrupt rating at 32VDC
- Small size with current ratings of 0.25 to 5.0 amperes
- RoHS compliant, Lead-Free and Halogen-Free
- Enhanced Breaking Capacity, High I^2t
- Maximum protection of sensitive circuits as fuses are designed to open consistently in <5sec at 200% overload.
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14

Applications

Secondary protection for space constrained applications such as:

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

Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	0.250 A - 5.0 A
	29862	0.250 A - 5.0 A
	J50481982	0.250 A - 5.0 A

Electrical Characteristics

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	0.250A - 5A	4 hours, Minimum
200%	0.375A - 5A	5 secs., Maximum
300%	0.250A	5 secs., Maximum
300%	0.375A - 5A	0.2 sec., Maximum

Electrical Specifications

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 @32VDC[2]	0.3600[1]	0.0025	92.49	0.0231	x	x	x
0.375	.375	32		0.1930[1]	0.0035	84.64	0.03174	x	x	x
0.500	.500	32		0.1600[1]	0.0053	93.35	0.04668	x	x	x
0.750	.750	32		0.1050[1]	0.0120	101.84	0.07638	x	x	x
1.00	001.	32		0.0730[1]	0.0200	87.45	0.08745	x	x	x
1.25	1.25	32		0.0600[1]	0.0350	96.37	0.12046	x	x	x
1.50	01.5	32		0.0470[1]	0.0560	86.70	0.13005	x	x	x
1.75	1.75	32		0.0390[1]	0.0750	81.13	0.14198	x	x	x
2.00	002.	32		0.0300[1]	0.1000	70.62	0.14120	x	x	x
2.50	02.5	32		0.0200[1]	0.1560	55.25	0.13813	x	x	x
3.00	003.	32		0.0170[1]	0.2032	60.58	0.18740	x	x	x
3.50	03.5	32		0.0150[1]	0.3017	57.84	0.20244	x	x	x
4.00	004.	32		0.0105[1]	0.3084	57.00	0.22800	x	x	x
5.00	005.	32		0.0085[1]	0.5310	52.44	0.26220	x	x	x

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

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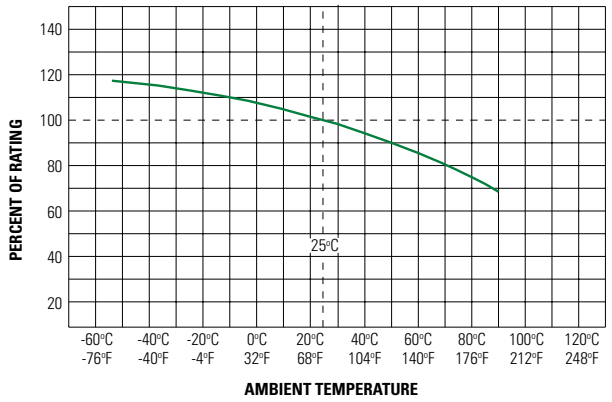
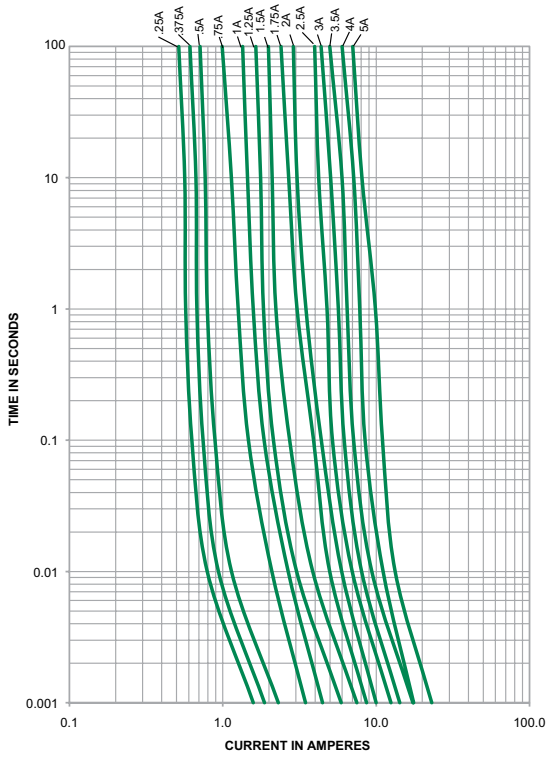
Temperature Re-rating Curve



Notes:
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.
Example:
For continuous operation at 70 degrees celsius, the fuse should be deratedas follows:
$I = (0.75)(0.80)I_{RAT} = (0.60)I_{RAT}$
2. The temperature derating curve represents the nominal conditions. For questions about temperature derating curve, please consult Littelfuse technical support for assistance.

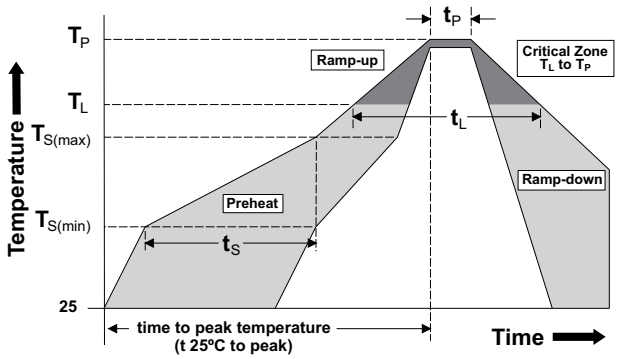
Average Time Current Curves



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 – 120 secs
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

Wave Soldering	260°C, 10 seconds max.



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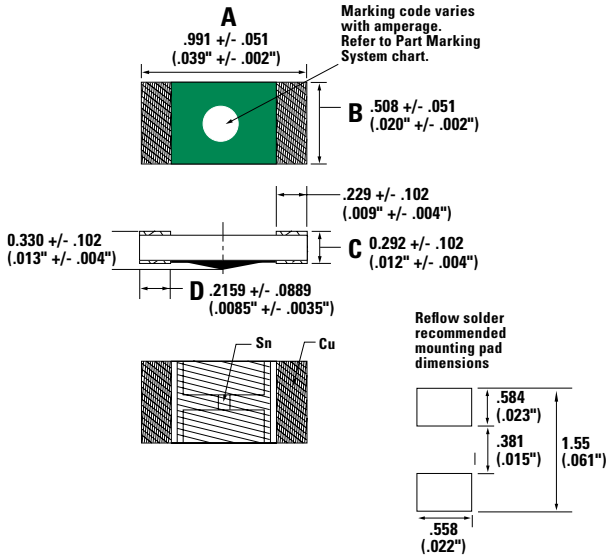
Product Characteristics

Materials	**Body:** Epoxy / Glass Substrate; Parts with 'HF' suffix: Halogen Free Epoxy / Glass **Terminations:** 100% Tin over Nickel over Copper **Device Weight:** 0.316mg
Terminal Strength	MIL-STD-202, Method 211, Test Condition A
Insulation Resistance	After Opening: Greater than 10,000Ohms

Operating Temperature	–55°C to 90°C. Consult temperature re-rating curve chart. For operation above 90°C please contact Littelfuse.
Thermal Shock	Withstands 5 cycles of –55°C to 125°C
Vibration	MIL-STD-202, Method 201

Dimensions



Unit	A	B	C	D
inch min	0.037	0.018	0.008	0.005
inch max	0.041	0.022	0.016	0.012
mm min	0.94	0.457	0.190	0.127
mm max	1.04	0.559	0.394	0.305

Part Marking System

Amp Code	Marking Code
0.250	
0.375	
0.500	
0.750	
001.	
1.25	
01.5	
1.75	
002.	
02.5	
003.	
03.5	
004.	
005.	

Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
8mm Tape and Reel	EIA-481 Rev. D (IEC 60286, part 3)	10000	KR

Part Numbering System

0435 002. K R HF S

Series

Refer to Amp Code column in the Electrical Specifications table.
The dot is positioned at the end of the number sequence with whole ratings and within for fractional ratings.
Example: 1.5 amp product is 043501.5KRHF (2 amp product shown)

Quantity Code
K = 10,000 Pieces

Packaging Code
R = Tape and Reel

Halogen Free Item

"S" - for .250A only

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