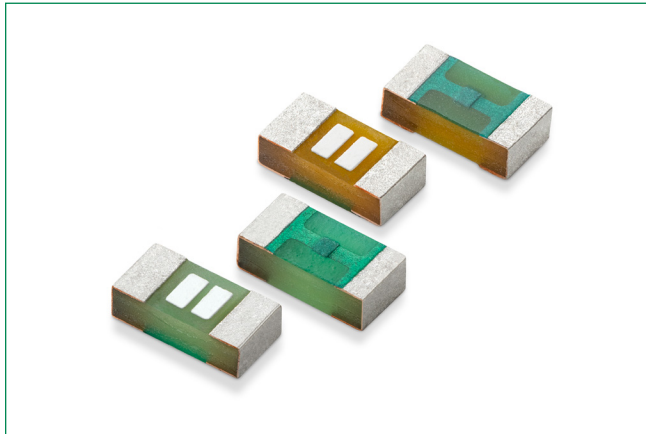


# 435 Series

## 0402 Fast-Acting Fuse



### 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<sup>2</sup>t
- 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

### Additional Information



Resources



Accessories



Samples

### 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

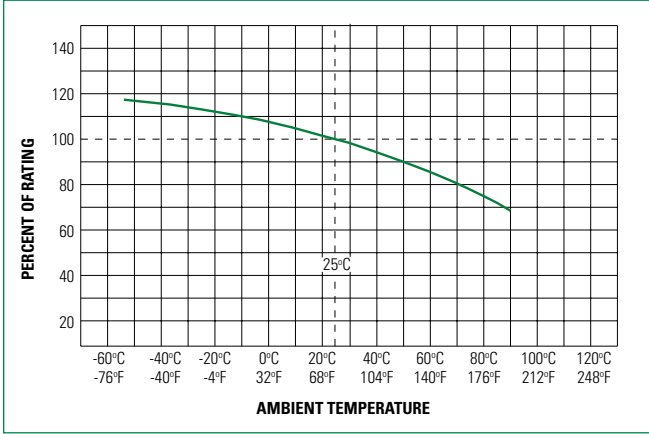
Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec)	Nom Voltage Drop (mV)	Nom Power Dissipation (W)	Agency Approvals		
0.250	.250	32	50A @32VDC <sup>2</sup>	0.3600 <sup>1</sup>	0.0025	92.49	0.0231	x	x	x
0.375	.375	32		0.1930 <sup>1</sup>	0.0035	84.64	0.03174	x	x	x
0.500	.500	32		0.1600 <sup>1</sup>	0.0053	93.35	0.04668	x	x	x
0.750	.750	32		0.1050 <sup>1</sup>	0.0120	101.84	0.07638	x	x	x
1.00	001.	32		0.0730 <sup>1</sup>	0.0200	87.45	0.08745	x	x	x
1.25	1.25	32		0.0600 <sup>1</sup>	0.0350	96.37	0.12046	x	x	x
1.50	01.5	32		0.0470 <sup>1</sup>	0.0560	86.70	0.13005	x	x	x
1.75	1.75	32		0.0390 <sup>1</sup>	0.0750	81.13	0.14198	x	x	x
2.00	002.	32		0.0300 <sup>1</sup>	0.1000	70.62	0.14120	x	x	x
2.50	02.5	32		0.0200 <sup>1</sup>	0.1560	55.25	0.13813	x	x	x
3.00	003.	32		0.0170 <sup>1</sup>	0.2032	60.58	0.18740	x	x	x
3.50	03.5	32		0.0150 <sup>1</sup>	0.3017	57.84	0.20244	x	x	x
4.00	004.	32		0.0105 <sup>1</sup>	0.3084	57.00	0.22800	x	x	x
5.00	005.	32	0.0085 <sup>1</sup>	0.5310	52.44	0.26220	x	x	x	

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

# 435 Series

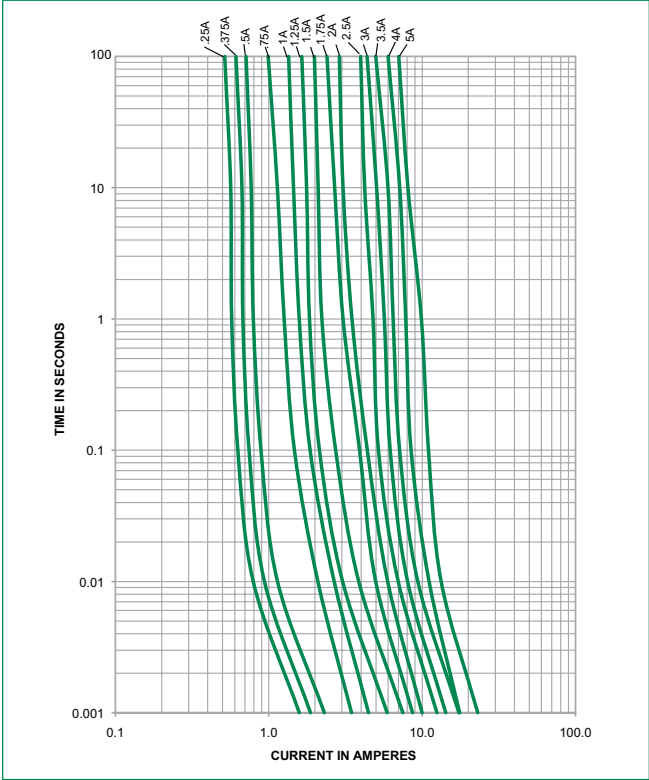
## 0402 Fast-Acting Fuse

Temperature Re-rating Curve



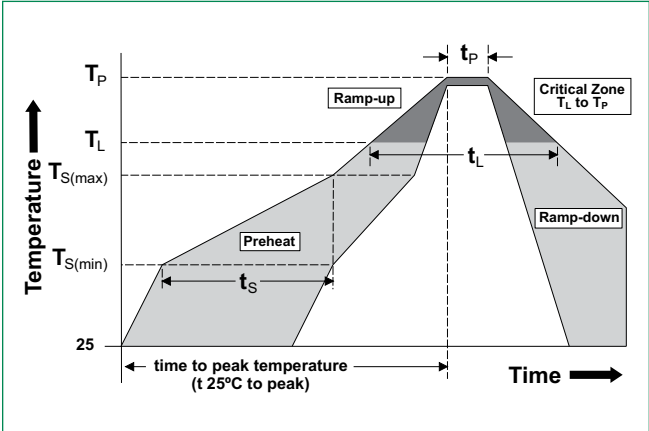
**Notes:**  
 1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.  
**Example:**  
 For continuous operation at 70 degrees celsius, the fuse should be derated as follows:  
 $I = (0.75)(0.80)_{\text{RAT}} = (0.60)_{\text{RAT}}$   
 2. The temperature 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

<b>Reflow Condition</b>	Pb – Free assembly	
<b>Pre Heat</b>	- Temperature Min ( $T_{s(\text{min})}$ )	150°C
	- Temperature Max ( $T_{s(\text{max})}$ )	200°C
	- Time (Min to Max) ( $t_s$ )	60 – 120 secs
<b>Average ramp up rate (Liquidus Temp (<math>T_L</math>) to peak</b>	5°C/second max	
<b><math>T_{s(\text{max})}</math> to <math>T_L</math> - Ramp-up Rate</b>	5°C/second max	
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $t_L$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>	250 <sup>+0/-5</sup> °C	
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>	20 – 40 seconds	
<b>Ramp-down Rate</b>	5°C/second max	
<b>Time 25°C to peak Temperature (<math>T_p</math>)</b>	8 minutes Max.	
<b>Do not exceed</b>	260°C	
<b>Wave Soldering</b>	260°C, 10 seconds max.	



# 435 Series

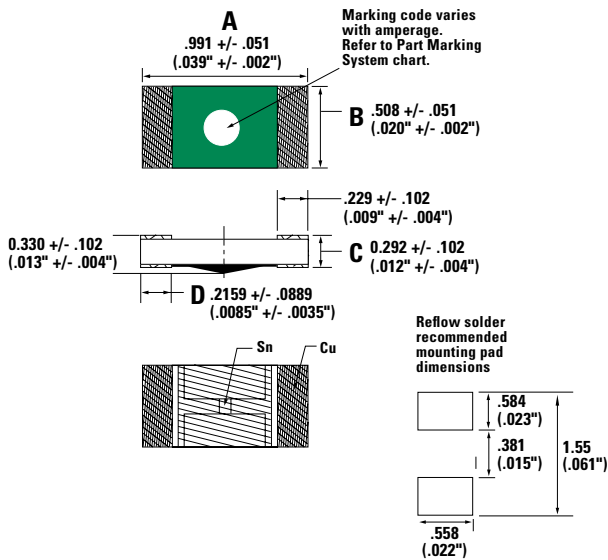
## 0402 Fast-Acting Fuse

### Product Characteristics

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

<b>Operating Temperature</b>	-55°C to 90°C. Consult temperature re-rating curve chart. For operation above 90°C please contact Littelfuse.
<b>Thermal Shock</b>	Withstands 5 cycles of -55°C to 125°C
<b>Vibration</b>	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

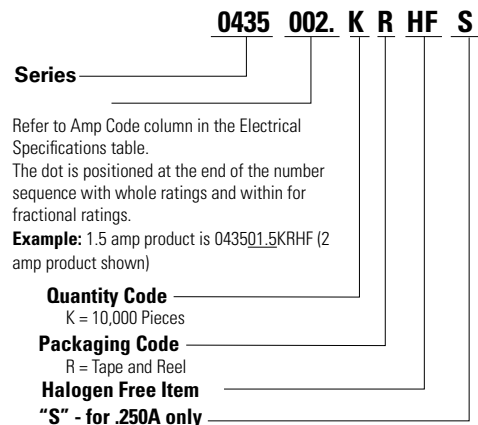
### Packaging

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

### Part Marking System

Amp Code	Marking Code
0.250	□X□
0.375	□▪□
0.500	□•□
0.750	□▤□
001.	□  □
1.25	□i□
01.5	□□
1.75	□X□
002.	□•□
02.5	□▤□
003.	□  □
03.5	□i□
004.	□  □
005.	□-□

### Part Numbering System



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