

# **Additional Information**







Resources

**Accessories** 

Samples

#### **Agency Approvals**

Agency	Agency File Number	Ampere Range
<i>71</i>	E10480	0.250 A - 5.0 A
<b>⊕</b> ;	29862	0.250 A - 5.0 A
$\triangle$	J50481982	0.250 A - 5.0 A

# **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.</li>
- 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.

# **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**

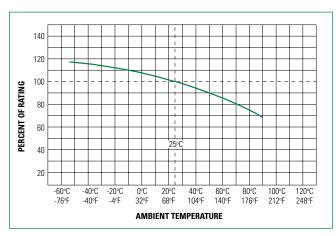
Ampere	· Amn Way Voltage		Interrunting	Nominal Cold	Nominal Melting	Nom	Nom Power	Agency Approvals		
Rating (A)	Code	Rating (V)	Rating	Resistance (Ohms)	I <sup>2</sup> t (A <sup>2</sup> sec)	Voltage Drop (mV)	Dissipation (W)	<b>A</b>	<b>M</b> .	<b>®</b> ;
0.250	.250	32		0.3600 <sup>1</sup>	0.0025	92.49	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 <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	Х
1.00	001.	32		$0.0730^{1}$	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	50A @32VDC <sup>2</sup>	0.04701	0.0560	86.70	0.13005	X	X	X
1.75	1.75	32	50A @32VDC-	$0.0390^{1}$	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 <sup>1</sup>	0.1560	55.25	0.13813	X	X	X
3.00	003.	32		0.01701	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	Х
4.00	004.	32		0.01051	0.3084	57.00	0.22800	X	X	X
5.00	005.	32		0.00851	0.5310	52.44	0.26220	X	X	Х

<sup>1.</sup> Measured at 10% of rated current, 25°C.

<sup>2.</sup> Measured at rated voltage



# **Temperature Re-rating Curve**



#### Notes:

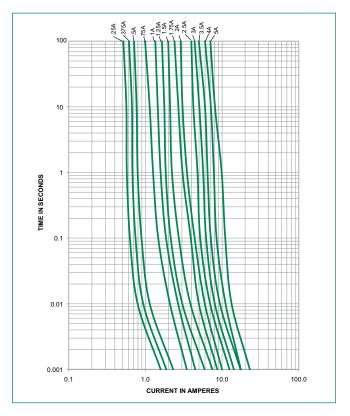
Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

Example:

**Example:** For continuous operation at 70 degrees celsius, the fuse should be derated as follows:  $I = (0.75)(0.80)I_{\rm pat} = (0.60)I_{\rm pat}$ 

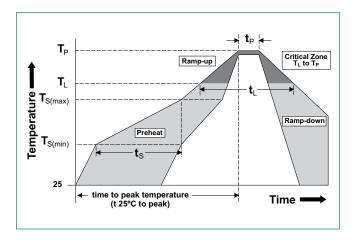
2. The temperature derating curve represents the nominal conditions. For questions about temperature derating curve, please consult Littelfuse technical support for assistance.

# **Average Time Current Curves**



# **Soldering Parameters**

Reflow Condition			Pb – Free assembly	
	-Temperature Min (T <sub>s(min)</sub> )		150°C	
Pre Heat		-Temperature Max (T <sub>s(max)</sub> )		
	-Time (Min to Max) (t <sub>s</sub> )		60 – 120 secs	
Average ramp up rate (Liquidus Temp (T <sub>1</sub> ) to peak			5°C/second max	
$T_{S(max)}$ to $T_L$ -	T <sub>S(max)</sub> to T <sub>L</sub> - Ramp-up Rate			
Reflow	- Temperature (T <sub>L</sub> ) (Liquidus)		217°C	
	- Temperature (t <sub>L</sub> )		60 – 150 seconds	
Peak Temperature (T <sub>p</sub> )			250+0/-5 °C	
Time within 5°C of actual peak Temperature (t <sub>p</sub> ) 20 – 40 secon			20 - 40 seconds	
Ramp-down Rate 5°C/second m			5°C/second max	
Time 25°C to peak Temperature (T <sub>p</sub> ) 8 minutes N		8 minutes Max.		
Do not exceed 260°C		260°C		
Wave Soldering 260°C, 10 seconds max.			max.	





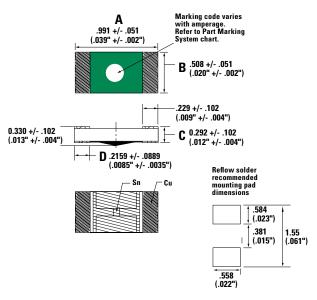
# **435 Series** 0402 Fast-Acting Fuse

# **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	Α	В	С	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

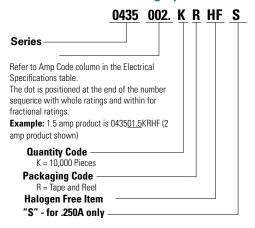
#### **Packaging**

Packaging	Packaging	Quantity	Quantity &
Option	Specification		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	
0.375	□
0.500	
0.750	
001.	
1.25	
01.5	
1.75	
002.	•
02.5	
003.	ОШО
03.5	
004.	00
005.	[-]

## **Part Numbering System**



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