

435 Series 0402 Fast-Acting Fuse



Agency Approvals

| Agency | Agency File Number | Ampere Range |
|-----------|--------------------|---------------|
| 91 | E10480 | 0.250A - 5.0A |
| ۹. | 29862 | 0.250A - 5.0A |

Electrical Characteristics for Series

| % 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 |

Additional Information





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

- 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 I²t
- Maximum protection of sensitive circuits as fuses are designed to open consistently in <5sec at 200% overload.

RoHS 🔊 H F FL 🛞

 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 Specifications by Item | | | | | | | | | |
|-----------------------------------|----------|---------------|-------------------------|----------------------|------------------------|----------------------|--------------------|----|-----|
| Ampere | | Max Voltage | | | Nom Power | Agency Approvals | | | |
| Rating (A) | Amp Code | Rating (V) | Rating | Resistance (Ohms) | Melting I²t (A²sec) | Voltage Drop (mV) | Dissipation (W) | 71 | SP, |
| 0.250 | .250 | 32 | | 0.3600 ¹ | 0.0025 | 92.49 | 0.0231 | x | х |
| 0.375 | .375 | 32 | | 0.1930 ¹ | 0.0035 | 84.64 | 0.03174 | X | х |
| 0.500 | .500 | 32 | | 0.1600 ¹ | 0.0053 | 93.35 | 0.04668 | X | х |
| 0.750 | .750 | 32 | | 0.1050 ¹ | 0.0120 | 101.84 | 0.07638 | X | х |
| 1.00 | 001. | 32 | | 0.0730 ¹ | 0.0200 | 87.45 | 0.08745 | X | х |
| 1.25 | 1.25 | 32 | | 0.0600 ¹ | 0.0350 | 96.37 | 0.12046 | X | х |
| 1.50 | 01.5 | 32 | FOA @22//DC2 | 0.0470 ¹ | 0.0560 | 86.70 | 0.13005 | X | х |
| 1.75 | 1.75 | 32 | 50A @32VDC ² | 0.0390 ¹ | 0.0750 | 81.13 | 0.14198 | X | х |
| 2.00 | 002. | 32 | | 0.0300 ¹ | 0.1000 | 70.62 | 0.14120 | X | х |
| 2.50 | 02.5 | 32 | | 0.0200 ¹ | 0.1560 | 55.25 | 0.13813 | X | х |
| 3.00 | 003. | 32 | | 0.0170 ¹ | 0.2032 | 60.58 | 0.18740 | X | х |
| 3.50 | 03.5 | 32 | | 0.0150 ¹ | 0.3017 | 57.84 | 0.20244 | X | х |
| 4.00 | 004. | 32 | | 0.0105 ¹ | 0.3084 | 57.00 | 0.22800 | x | х |
| 5.00 | 005. | 32 | | 0.0085 ¹ | 0.5310 | 52.44 | 0.26220 | X | х |

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 derated s follows: I = (0.75)(0.80)|_{SMT} = (0.60)|_{SMT} 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 Mir | - Temperature Min (T _{s(min)}) | | |
| Pre Heat | - Temperature Ma | x (T _{s(max)}) | 200°C | |
| | -Time (Min to Ma | x) (t _s) | 60 – 120 secs | |
| Average ram | np 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 | |
| nellow | - Temperature (t _L) | | 60 – 150 seconds | |
| Peak Temper | rature (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 | |
| | | 1 | | |
| Wave Soldering | | 260°C, 10 seconds | max. | |





Product Characteristics

Dimensions

| 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 |

A .991 +/- .051 (.039" +/- .002") Marking code varies with amperage. Refer to Part Marking System chart.

B .508 +/- .051 (.020" +/- .002")

| 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 |

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. | |

| 0.330 +/102 [—] (.013" +/004" <u>)</u> | | (.009 | | 84 023") 81 1.55 015") (.061") |
|--|-------|-------|-------|---|
| Unit | А | В | С | D |
| inch min | 0.037 | 0.018 | 0.008 | 0.005 |

| А | В | С | D |
|-------|------------------------|--|--|
| 0.037 | 0.018 | 0.008 | 0.005 |
| 0.041 | 0.022 | 0.016 | 0.012 |
| 0.94 | 0.457 | 0.190 | 0.127 |
| 1.04 | 0.559 | 0.394 | 0.305 |
| | 0.037 0.041 0.94 | 0.037 0.018 0.041 0.022 0.94 0.457 | 0.037 0.018 0.008 0.041 0.022 0.016 0.94 0.457 0.190 |

| 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

| <u>0435</u> <u>002.</u> <u>K</u> <u>R</u> <u>HF</u> <u>S</u> | 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 0435 <u>01.5</u> KRHF (2 amp product shown) | |
| Cuantity Code K = 10,000 Pieces | |
| Packaging Code R = Tape and Reel Halogen Free Item "S" - for . 250A only | |

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