

RoHS  HF 435 Series 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

- 35A interrupt rating at 32VDC
- Small size with current ratings of 0.25 to 5.0 amperes
- RoHS compliant, lead-free and halogen-free
- Maximum protection of sensitive circuits as fuses are designed to open consistently in <5sec at 200% overload.
- Enhanced Breaking Capacity, High I²t

Agency Approvals

| AGENCY | AGENCY FILE NUMBER | AMPERE RANGE |
|---|--------------------|--------------|
|  | E10480 | 0.250 - 5.0A |
|  | LR 29862 | 0.250 - 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 |

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 Rating (A) | Amp Code | Max Voltage Rating (V) | Interrupting Rating | Nominal Cold Resistance (Ohms) | Nominal Melting I ² t (A ² sec) | Nom Voltage Drop (mV) | Nom Power Dissipation (W) | Agency Approvals | |
|-------------------|----------|------------------------|---------------------|--------------------------------|---|-----------------------|---------------------------|---|---|
| | | | | | | | |  |  |
| 0.250 | .250 | 32 | 35A @32V DC | 0.2265 | 0.0025 | 60.67 | 0.01517 | x | x |
| 0.375 | .375 | 32 | | 0.1930 | 0.0035 | 84.64 | 0.03174 | x | x |
| 0.500 | .500 | 32 | | 0.1600 | 0.0053 | 93.35 | 0.04668 | x | x |
| 0.750 | .750 | 32 | | 0.1050 | 0.0120 | 101.84 | 0.07638 | x | x |
| 1.00 | 001. | 32 | | 0.0730 | 0.0200 | 87.45 | 0.08745 | x | x |
| 1.25 | 1.25 | 32 | | 0.0600 | 0.0350 | 96.37 | 0.12046 | x | x |
| 1.50 | 01.5 | 32 | | 0.0470 | 0.0560 | 86.70 | 0.13005 | x | x |
| 1.75 | 1.75 | 32 | | 0.0390 | 0.0750 | 81.13 | 0.14198 | x | x |
| 2.00 | 002. | 32 | | 0.0300 | 0.1000 | 70.62 | 0.14120 | x | x |
| 2.50 | 02.5 | 32 | | 0.0185 | 0.1560 | 55.25 | 0.13813 | x | x |
| 3.00 | 003. | 32 | | 0.0165 | 0.2032 | 60.58 | 0.18740 | x | x |
| 3.50 | 03.5 | 32 | | 0.0135 | 0.3017 | 57.84 | 0.20244 | x | x |
| 4.00 | 004. | 32 | | 0.0115 | 0.3084 | 57.00 | 0.22800 | x | x |
| 5.00 | 005. | 32 | | 0.0085 | 0.5310 | 52.44 | 0.26220 | x | x |

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

2. Measured at rated voltage.

Temperature Derating Curve



Note:

1. Derating 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:

$$I = (0.75)(0.80)I_{RAT} = (0.60)I_{RAT}$$

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 |



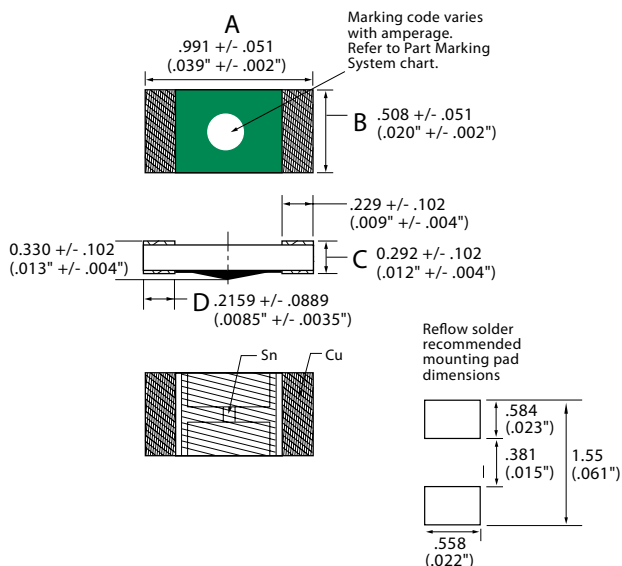
| | |
|----------------|------------------------|
| Wave Soldering | 260°C, 10 seconds max. |
|----------------|------------------------|

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-202F, Method 211A, Test Condition A |
| Insulation Resistance | After Opening: Greater than 10,000Ohms |

| | |
|------------------------------|--|
| Operating Temperature | -55°C to 90°C. Consult temperature derating curve chart. For operation above 90°C please contact Littelfuse. |
| Thermal Shock | Withstands 5 cycles of -55°C to 125°C |
| Vibration | MIL-STD-202F |

Dimensions

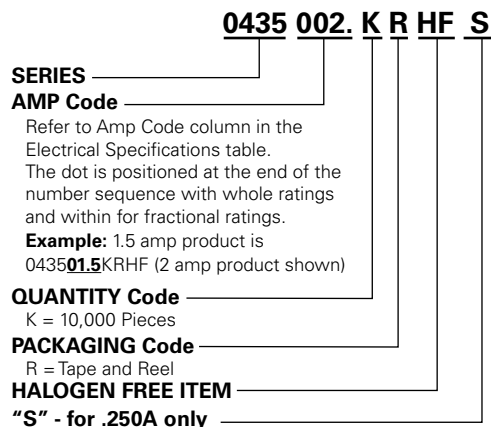


| | A | B | C | D |
|----------|-------|-------|-------|-------|
| inch min | 0.037 | 0.018 | 0.008 | 0.005 |
| inch max | 0.041 | 0.022 | 0.016 | 0.012 |
| mm min | 0.94 | 0.457 | 0.190 | 0.127 |
| mm max | 1.04 | 0.559 | 0.394 | 0.305 |

Part Marking System

| Amp Code | Marking Code |
|----------|--------------|
| .250 | ⊠X⊠ |
| .375 | ⊠⊠⊠ |
| .500 | ⊠·⊠ |
| .750 | ⊠⊠⊠ |
| 001. | ⊠⊠⊠ |
| 1.25 | ⊠·⊠ |
| 01.5 | ⊠⊠⊠ |
| 1.75 | ⊠⊠⊠ |
| 002. | ⊠·⊠ |
| 02.5 | ⊠⊠⊠ |
| 003. | ⊠⊠⊠ |
| 03.5 | ⊠⊠⊠ |
| 004. | ⊠⊠⊠ |
| 005. | ⊠⊠⊠ |

Part Numbering System



Packaging

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

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- Оценку стоимости проекта по компонентам.
- Изготовление тестовой платы монтаж и пусконаладочные работы.



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