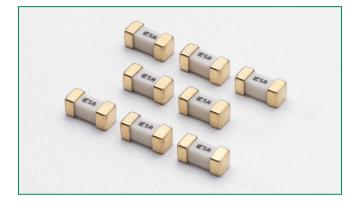
451/453 Series Fuse



| Agency Approvals | | | | |
|-----------------------------|--|-----------------------|--|--|
| AGENCY | AGENCY FILE NUMBER | AMPERE RANGE | | |
| c PL [®] us | E10480 | 6.3A - 20A | | |
| (Sft) | 29862 | 0.062A - 15A | | |
| PSE | NBK030205-E10480A/B NBK101105-E184655 | 1A - 5A 6.3A - 10A | | |
| c Uus | E10480 | 0.062A - 5A | | |

| Electrical Characteristics for Series | | | | |
|---------------------------------------|-----------------------------|------------------|--|--|
| % of Ampere Rating | OpeningTime | | | |
| 100% | 0.062 – 20 4 hours, Minimur | | | |
| 200% | 0.062 – 10 | 5 sec., Maximum | | |
| | 12 – 20 | 20 sec., Maximum | | |

Additional Information



Datasheet 451 Series



Datasheet 453 Series

Resources 451 Series



Resources 453 Series





Samples 453 Series

Description

The Nano^{2®} SMF Fuse is a very small, Wire-in-Air (WIA) square shape surface mount fuse that was designed for secondary side circuit over-current protection applications. These fuses are designed for PCB using surface mount technology.

Features

- Very fast-acting
- Small size
- Wide range of current rating available (0.062A to 20A)
- Wide operating temperature range

Applications

- Notebook PC
- LCD/PDPTV
- LCD monitor
- LCD/PDP panel
- LCD backlight inverter
- Portable DVD player
- Power supply
- Networking
- PC server
- Cooling fan system

• Low temperature rerating

ROHS HF OW US CALUS OF CE

- RoHS compliant and Halogen Free
- Storage system
- Telecom system
- Wireless basestation
- White goods
- Game console
- Office Automation equipment
- Battery charging circuit protection
- Industrial equipment

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| Sample: 451 Serie |
|----------------------|
| |

Surface Mount Fuses $NAN0^{2^{(8)}}$ > Very Fast-Acting Fuse > 451/453 Series



Electrical Specifications by Item

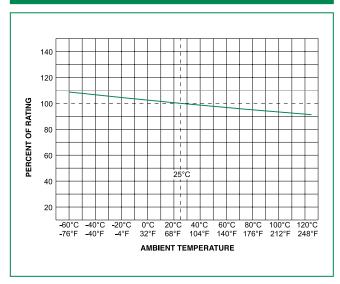
| Ampere Max | | | | Nominal Cold | Nominal | Agency Approvals | | | |
|---------------|-------------|--------------------------|--|--------------------------|------------------------|------------------|-----------|------|-----------|
| Rating (A) | Amp Code | Voltage Rating (V) | Rating | ing Rating Resistance 12 | Melting I²t (A²sec) | c 🔊 us | () | PS E | c (ŲL) us |
| 0.062 | .062 | 125 | | 5.5000 | 0.00019 | | х | | x |
| 0.080 | .080 | 125 | | 4.0500 | 0.00033 | | х | | x |
| 0.100 | .100 | 125 | | 3.1000 | 0.00138 | | х | | x |
| 0.125 | .125 | 125 | | 1.7000 | 0.00286 | | х | | x |
| 0.160 | .160 | 125 | | 1.2157 | 0.0048 | | х | | x |
| 0.200 | .200 | 125 | | 0.8372 | 0.0089 | | х | | x |
| 0.250 | .250 | 125 | | 0.5765 | 0.0158 | | х | Ì | x |
| 0.315 | .315 | 125 | 50A @125VAC/VDC | 0.3918 | 0.0311 | | х | | x |
| 0.375 | .375 | 125 | 300A @32VDC | 0.4541 | 0.0442 | | х | Ì | x |
| 0.400 | .400 | 125 | PSE: 100A @100VAC | 0.4233 | 0.0551 | | х | | x |
| 0.500 | .500 | 125 | | 0.3046 | 0.0824 | | х | Ì | x |
| 0.630 | .630 | 125 | | 0.2022 | 0.1381 | | х | | x |
| 0.750 | .750 | 125 | | 0.1444 | 0.2143 | | х | | x |
| 0.800 | .800 | 125 | | 0.1355 | 0.2654 | | х | 1 | x |
| 1.00 | 001. | 125 | | 0.0780 | 0.6029 | | х | x | x |
| 1.25 | 1.25 | 125 | | 0.0780 | 0.664 | | х | x | x |
| 1.50 | 01.5 | 125 | | 0.0630 | 0.853 | | х | x | x |
| 1.60 | 01.6 | 125 | | 0.0580 | 1.060 | | х | x | x |
| 2.00 | 002. | 125 | | 0.0367 | 0.530 | | х | x | x |
| 2.50 | 02.5 | 125 | | 0.0286 | 1.029 | | х | x | x |
| 3.00 | 003. | 125 | 50A @125VAC/VDC | 0.0227 | 1.650 | | х | x | x |
| 3.15 | 3.15 | 125 | 10,000A @75VDC 300A @32VDC | 0.0215 | 1.920 | | х | x | x |
| 3.50 | 03.5 | 125 | PSE: 100A @100VAC | 0.0200 | 2.469 | | х | x | x |
| 4.00 | 004. | 125 | | 0.0160 | 3.152 | | х | x | x |
| 5.00 | 005. | 125 | | 0.0125 | 5.566 | | х | x | x |
| 6.30 | 06.3 | 125 | 50A @125VAC/VDC | 0.0096 | 9.170 | x | х | x | |
| 7.00 | 007. | 125 | 400A @32VDC | 0.0090 | 10.32 | X | х | x | |
| 8.00 | 008. | 125 | PSE: 100A @100VAC | 0.0077 | 20.23 | x | x | x | |
| 10.0 | 010. | 125 | 35A @125 VAC/ 50A @125 VDC 400A @32 VDC PSE: 100A @100VAC | 0.0056 | 26.46 | x | x | x | |
| 12.0 | 012. | 65 | 150A @65VDC | 0.0049 | 47.97 | x | x | | |
| 15.0 | 015. | 65 | 100A @65VAC | 0.0037 | 97.82 | x | х | | |
| 20.0 | 020. | 65 | 400A @32VDC | 0.00244 | 154 | x | | | |

Notes: - I²t calculated at 8ms. - Resistance is measured at 10% of rated current, 25°C



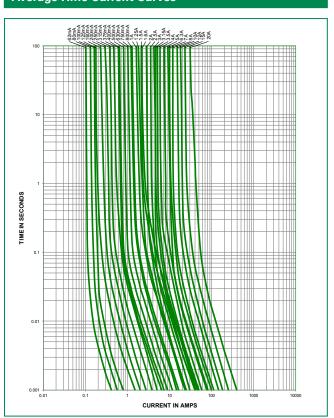
Surface Mount Fuses NANO^{2®} > Very Fast-Acting Fuse > 451/453 Series

Temperature Re-rating Curve



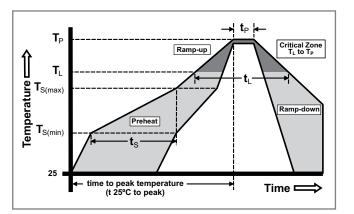
Note:

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



Soldering Parameters

| Reflow Co | ndition | Pb – Free assembly | |
|--|--|---|--|
| | -Temperature Min (T _{s(min)}) | 150°C | |
| Pre Heat | -Temperature Max (T _{s(max)}) | 200°C | |
| | -Time (Min to Max) (t _s) | 60 – 120 secs | |
| Average ra (T _L) to pea | amp up rate (LiquidusTemp k | 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 – 90 seconds | |
| PeakTemperature (T _P) | | 260 ^{+0/-5} °C | |
| Time withi Temperatu | in 5°C of actual peak ıre (t _p) | 20 – 40 seconds | |
| Ramp-dow | vn Rate | 5°C/second max. | |
| Time 25°C | to peakTemperature (T _P) | 8 minutes max. | |
| Do not exc | ceed | 260°C | |
| Wave Sold | lering Parameters | 260°C Peak Temperature, 10 seconds max. | |



Average Time Current Curves

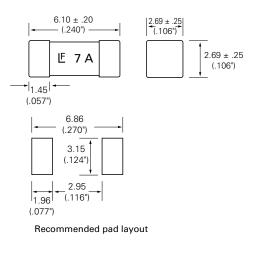


Product Characteristics

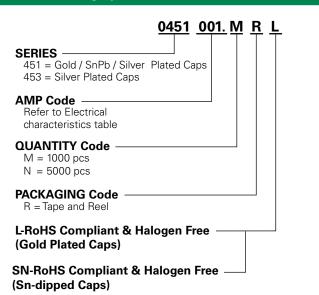
| | Body: Ceramic | | |
|---|---|--|--|
| | Terminations: | | |
| Materials | Gold-Plated Caps / Sn-dipped Silver Plated Caps (451 RoHS/HF series) SnPb Plated Caps (for 451 Non-RoHS series, | | |
| | 375mA-15A) | | |
| | Silver-plated Caps (451MR RoHS ratings below 375mA and 453 RoHS Series) | | |
| Product Marking | Brand, Ampere Rating | | |
| Operating Temperature | –55°C to 125°C | | |
| Moisture Sensitivity Level | Level 1, J-STD-020 | | |
| Solderability | MIL-STD-202, Method 208 | | |
| Insulation Resistance (after Opening) | MIL-STD-202, Method 302, Test Condition A (10,000 ohms minimum) | | |

| Thermal Shock | MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C / +125°C, 15 minutes @ each extreme | | |
|---------------------------------|--|--|--|
| Mechanical Shock | MIL-STD-202, Method 213, Test I: Deenergized. 100G's pk amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks | | |
| Vibration | MIL-STD-202, Method 201: 0.03" amplitude, 10-55 Hz in 1 min. 2hrs each XYZ=6hrs | | |
| Moisture Resistance | MIL-STD-202, Method 106, 10 cycles | | |
| Salt Spray | MIL-STD-202, Method 101, Test Condition B (48hrs) | | |
| Resistance to Soldering Heat | MIL-STD-202, Method 210, Test condition B (10 sec at 260°C) | | |

Dimensions



Part Numbering System



NOTE: "L" suffix applies to 451 series only

- 451 series may be ordered as either "RoHS and HF" ("L" suffix) or non-RoHS (no suffix) version.
- 453 series is available only as RoHS compliant version and does not require "L" suffix. Please do not include "L" suffix within 453 series ordering instructions.

| Packaging | | | | | |
|--------------------|--------------------------------|----------|------------------------------|--|--|
| Packaging Option | Packaging Specification | Quantity | Quantity & Packaging Code | | |
| 12mm Tape and Reel | EIA RS-481-2 (IEC 286, part 3) | 5000 | NR | | |
| 12mm Tape and Reel | EIA RS-481-2 (IEC 286, part 3) | 1000 | MR | | |

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