

448 Series Fuse



Agency Approvals

| Agency | Agency File Number | Ampere Range |
|--------|--------------------|--------------|
| | E10480 | 0.062A - 15A |
| | 29862 | 0.062A - 15A |
| | NBK030205-E10480A | 1A - 1.6A |
| | NBK030205-E10480B | 2A - 5A |
| | NBK101105-E184655 | 6.3A - 10A |

Electrical Characteristics for Series

| % of Ampere Rating | Ampere Rating | Opening Time |
|--------------------|---------------|------------------|
| 100% | 0.062A -15 | 4 hours, Minimum |
| 200% | 0.062A -10 | 5 sec., Maximum |
| | 12 -15 | 20 sec., Maximum |

Description

The lead-free Nano² SMF Fuse is a very small, square surface mount fuse that is RoHS compliant, Halogen Free and 100% lead-free. This product is fully compatible with lead-free solder alloys and higher temperature profiles associated with lead-free assembly.

Features

- RoHS compliant, Lead-free and Halogen Free
- Very fast-acting
- Small size
- Wide range of current rating available (0.062A to 15A)
- Wide operating temperature range
- UL Recognized to UL/CSA/NMX UL 248-1 and UL/CSA/NMX UL 248-14
- Conforms to DENAN's Appendix 3

Applications

- Notebook PC
- LCD/PDP TV
- LCD monitor
- LCD/PDP panel
- LCD backlight inverter
- Portable DVD player
- Power supply
- Networking
- PC server
- Cooling fan system
- Storage system
- Telecom system
- Wireless basestation
- White goods
- Game console
- Office Automation equipment
- Battery charging circuit protection
- Industrial equipment

Additional Information



Datasheet



Resources



Samples

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) | Agency Approvals | | |
|-------------------|----------|------------------------|--|--------------------------------|---|---|---|---|
| | | | | | |  |  |  |
| 0.062 | .062 | 125 | 50A @125VAC/ VDC 300A @32 VDC PSE: 100A @100VAC | 5.50 | 0.00023 | x | x | |
| 0.080 | .080 | 125 | | 4.42 | 0.00043 | x | x | |
| 0.100 | .100 | 125 | | 2.90 | 0.00082 | x | x | |
| 0.125 | .125 | 125 | | 2.58 | 0.00130 | x | x | |
| 0.160 | .160 | 125 | | 1.76 | 0.00280 | x | x | |
| 0.200 | .200 | 125 | | 1.65 | 0.00380 | x | x | |
| 0.250 | .250 | 125 | | 0.95 | 0.01520 | x | x | |
| 0.315 | .315 | 125 | | 0.7015 | 0.02650 | x | x | |
| 0.375 | .375 | 125 | | 0.6155 | 0.02400 | x | x | |
| 0.400 | .400 | 125 | | 0.4895 | 0.04160 | x | x | |
| 0.500 | .500 | 125 | | 0.3800 | 0.10000 | x | x | |
| 0.630 | .630 | 125 | | 0.3125 | 0.121 | x | x | |
| 0.750 | .750 | 125 | | 0.2290 | 0.206 | x | x | |
| 0.800 | .800 | 125 | | 0.1907 | 0.272 | x | x | |
| 1.00 | .001. | 125 | | 0.08630 | 0.441 | x | x | x |
| 1.25 | 1.25 | 125 | | 0.06619 | 0.900 | x | x | x |
| 1.50 | 01.5 | 125 | | 0.06514 | 0.900 | x | x | x |
| 1.60 | 01.6 | 125 | | 0.06261 | 1.122 | x | x | x |
| 2.00 | 002. | 125 | | 0.03529 | 0.812 | x | x | x |
| 2.50 | 02.5 | 125 | | 0.02934 | 1.156 | x | x | x |
| 3.00 | 003. | 125 | | 0.02445 | 1.720 | x | x | x |
| 3.15 | 3.15 | 125 | | 0.02300 | 1.810 | x | x | x |
| 3.50 | 03.5 | 125 | | 0.02100 | 2.300 | x | x | x |
| 4.00 | 004. | 125 | | 0.01577 | 3.970 | x | x | x |
| 5.00 | 005. | 125 | | 0.01531 | 4.490 | x | x | x |
| 6.30 | 06.3 | 125 | | 0.01044 | 12.10 | x | x | x |
| 7.00 | 007. | 125 | | 0.00900 | 13.92 | x | x | x |
| 8.00 | 008. | 125 | | 0.00780 | 18.33 | x | x | x |
| 10.00 | 010. | 125 | 35A @125 VAC 50A @125 VDC 300A @32 VDC PSE: 100A @100VAC | 0.00700 | 28.00 | x | x | x |
| 12.00 | 012. | 85 | 50A @65 VAC/ VDC | 0.00533 | 47.59 | x | x | |
| 15.00 | 015. | 85 | 300A @24 VDC 200A @85 VDC | 0.00394 | 78.4 | x | x | |

Notes:

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

Temperature Re-rating Curve



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

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 - 180 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) | | 260 ^{+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 Parameters 260°C Peak Temperature, 10 seconds max.



Product Characteristics

| | |
|--|---|
| Materials | Body: Ceramic Terminations: Gold-plated Caps |
| Product Marking | Brand, Amperage 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 to 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



Recommended pad layout

Part Numbering System



***Example:**
1.5 amp product is 044801.5MR (1 amp product shown above).

Packaging

| Packaging Option | Packaging Specification | Quantity | Quantity & Packaging Code |
|--------------------|-----------------------------|----------|---------------------------|
| 12mm Tape and Reel | EIA RS-481-1 (IEC 600286-3) | 1000 | MR |

Disclaimer Notice - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse. Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.

Компания «Океан Электроники» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Компания «Океан Электроники» является официальным дистрибьютором и эксклюзивным представителем в России одного из крупнейших производителей разъемов военного и аэрокосмического назначения «JONHON», а так же официальным дистрибьютором и эксклюзивным представителем в России производителя высокотехнологичных и надежных решений для передачи СВЧ сигналов «FORSTAR».



JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели, кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



Телефон: 8 (812) 309-75-97 (многоканальный)

Факс: 8 (812) 320-03-32

Электронная почта: ocean@oceanchips.ru

Web: <http://oceanchips.ru/>

Адрес: 198099, г. Санкт-Петербург, ул. Калинина, д. 2, корп. 4, лит. А