## Selector Chart For Fuses

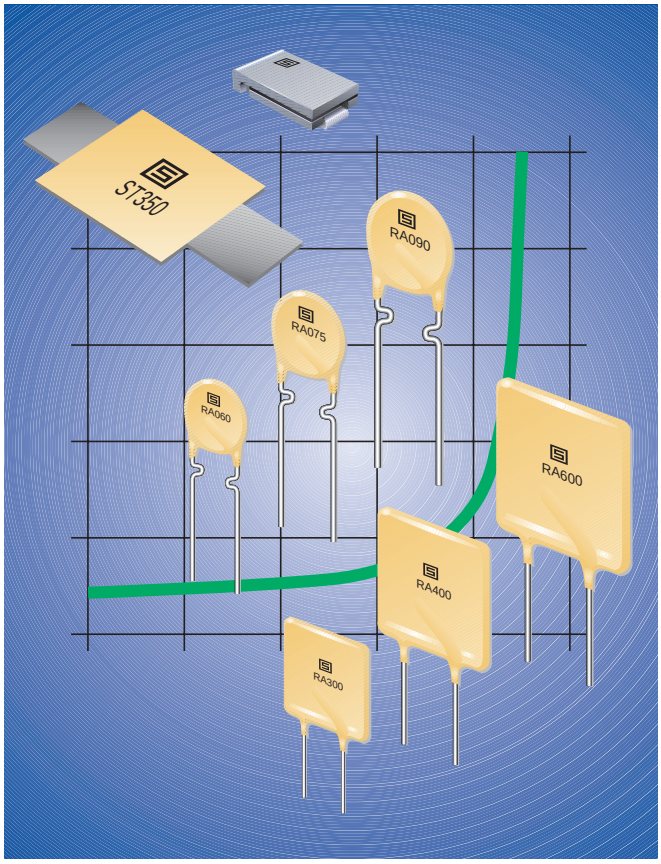
| **Resettable**<br>**Polymeric PTC** |  |  |  |  |  |
|---|---|---|---|---|---|
| | *Fuses cross to competitive resettable devices. See our online cross list at http://www.schurterinc.com/cross.htm* | | | | |
| **Series** | **PFMD** | **PFSM** | **PFRA** | **PFRX** | **PFST/PFLT** |
| Page | 106 -108 | 109 - 111 | 112 -115 | 116 -118 | 119 - 122 |
| Mounting terminals | surface mount | surface mount | radial leaded | radial leaded | strap (standard or slotted) |
| Hold current $I_H$ @ 23˚C | 200mA to 1.1A | 300mA to 2.5A | 100mA to 9A | 1.1A to 3.75A | 1A to 4.2A |

| **Non-Resettable**<br>**Surface Mount** | NEW<br>*EIA 1206*<br>  | *With or without fuse clips*<br>  |  |  | NEW<br>*Time-lag version OMT*<br>  |  <br>*New MSB / MKT Time lag versions* |
|---|---|---|---|---|---|---|
| **Series / Voltage** | **MGA 125V** | **SFP 63V; SFC 63V** | **OMF 63V** | **OMF 125** | **OMF/OMT 125/250V** | **MELF/MKF 125V** |
| Page | 127 | 128-129 | 130-131 | 132-133 | 134 | 135-136 |
| Rated current | 200mA to 5A | 1A-5A; 800mA-4A | 63mA to 10A | 63mA to 10A | 250mA to 4A | 125mA to 7A |
| Time/current action | quick-acting | quick-acting | quick-acting | quick-acting | quick-acting or time-lag | quick-acting or time-lag |

| **Through-Hole** |  | NEW<br>  <br>*Hermetically sealed* |  | NEW *UL listed versions MSF-U & MST-U*<br>  |  <br>*MXT with high breaking capacity* | NEW<br>*With radial leads*<br>  |
|---|---|---|---|---|---|---|
| **Series / Voltage** | **MSA 125V** | **MGL 125V** | **MSF 125V** | **MSF 250V** | **MST/MXT 250V** | **FRT 250V** |
| Page | 137 | 138 | 139 | 140 | 141/142 | 143 |
| Rated current | 63mA to 15A | 200mA to 5A | 100mA to 5A | 40mA to 5A | 50mA to 6.3A | 250mA to 6.3A |
| Time/current action | quick-acting | quick-acting | quick-acting | quick-acting | time-lag | quick-acting or time-lag |

| **5 x 20mm** |  |  |  |  |
|---|---|---|---|---|
| | *Quick-acting and time-lag characteristics available, with low, medium or high breaking capacities. Pigtail leads optional.* | | | |
| **Series** | **SA/SP/SPT/FSM** | **FSF/FST/FTT/FSM** | **All series** | **Fuse kits for prototypes** |
| Page | 144 -154 | 144 - 154 | 144 - 154 | 156 |

| **Telecom**<br>**Surge-Tolerant for Telecom applications** |  |  |  |  |  |  |
|---|---|---|---|---|---|---|
| **Series / Voltage** | **OSU 125V** | **OSU / OMT 250V** | **MSU 125V** | **MSU 250V** | **FRT 250V** | **FSU / SSU 250V** |
| Page | 162 | 162 | 163 | 163 | 164 | 165-166 |
| Rated current | 250mA to 3.15A | 250mA to 3.15A | 250mA to 3.15A | 250mA to 3.15A | 250mA to 3.15A | 250mA to 3.15A |
| Time/current action | quick-acting | quick-acting | quick-acting | quick-acting | quick-acting | quick-acting |




## RESETTABLE CIRCUIT PROTECTION

When it comes to Polymeric Positive Temperature Coefficient (PPTC) circuit protection, you now have a choice. If you need a reliable source, look to polymeric resettable fuses from SCHURTER.

Polymeric fuses are made from a conductive plastic formed into thin sheets, with electrodes attached to either side. The conductive plastic is manufactured from a non-conductive crystalline polymer and a highly conductive carbon black. The electrodes ensure even distribution of power through the device, and provide a surface for leads to be attached or for custom mounting.

The phenomenon that allows conductive plastic materials to be used for resettable overcurrent protection devices is that they exhibit a very large non-linear Positive Temperature Coefficient (PTC) effect when heated. PTC is a characteristic that many materials exhibit whereby resistance increases with temperature. What makes the polymeric conductive plastic material unique is the magnitude of its resistance increase. At a specific transition temperature, the increase in resistance is so great that it is typically expressed on a log scale.

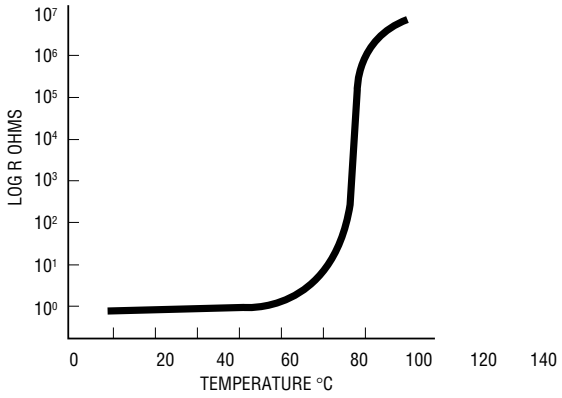
## HOW POLYMERIC RESETTABLE OVERCURRENT PROTECTORS WORK

The conductive carbon black filler material in the polymeric device is dispersed in a polymer that has a crystalline structure. The crystalline structure densely packs the carbon particles into its crystalline boundary so they are close enough together to allow current to flow through the polymer insulator via these carbon “chains.”

When the conductive plastic material is at normal room temperature, there are numerous carbon chains forming conductive paths through the material.

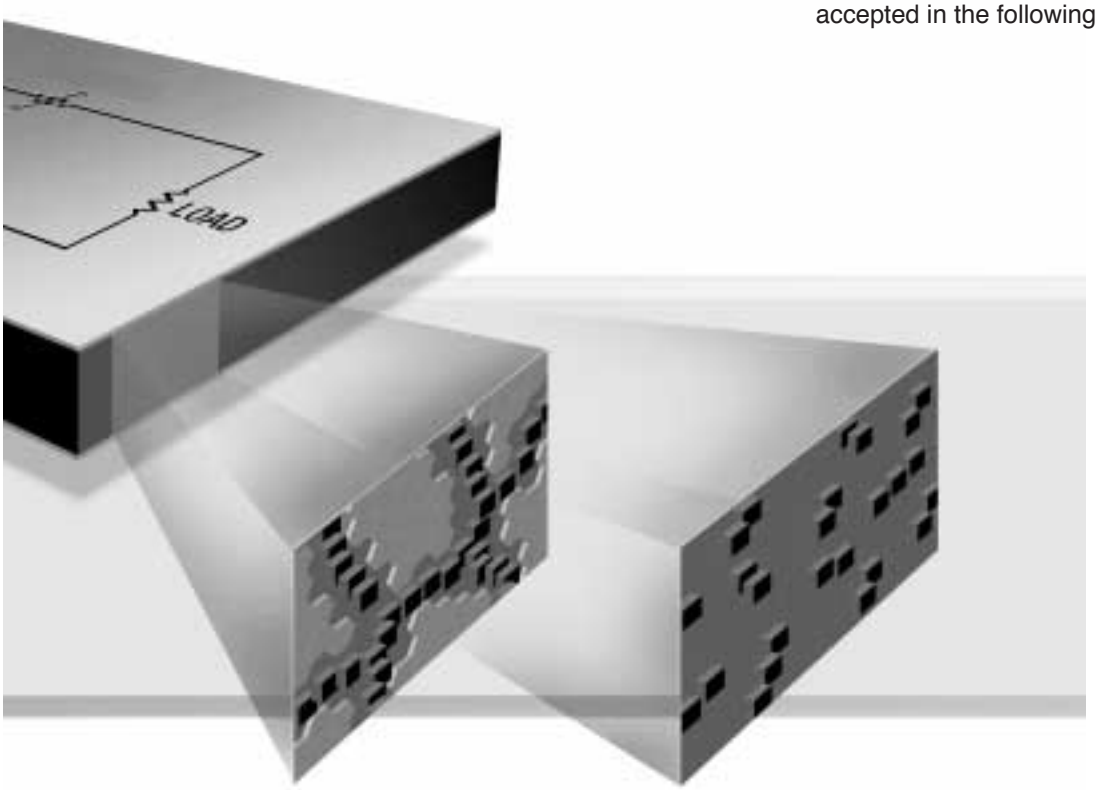
Under fault conditions, excessive current flows through the polymeric device. $I^2R$ heating causes the conductive plastic material’s temperature to rise. As this self heating continues, the material’s temperature continues to rise until it exceeds its phase transformation temperature. As the material passes through this phase transformation temperature, the densely packed crystalline polymer matrix changes to an amorphous structure. This phase change is accompanied by a small expansion. As the conductive particles move apart from each other, most of them no longer conduct current and the resistance of the device increases sharply.

The material will stay “hot,” remaining in this high resistance state as long as the power is applied. The device will remain latched, providing continuous protection, until the fault is cleared and the power is removed. Reversing the phase transformation allows the carbon chains to re-form as the polymer re-crystallizes. The resistance quickly returns to its original value.



## PRODUCT SELECTION

To select the correct polymeric circuit protection device, complete the information listed below for the application, and then refer to the resettable overcurrent protector data sheets.




1. Determine the normal operating current: _____ amps
2. Determine the maximum circuit voltage ($V_{max}$): _____ volts
3. Determine the fault current ($I_{max}$): _____ amps
4. Determine the operating temperature range:
   Minimum Temperature: _____ °C
   Maximum Temperature: _____ °C
5. Select a product family so that the maximum rating for $V_{max}$ and $I_{max}$ is higher than the maximum circuit voltage and fault current in the application.
6. Using the $I_{hold}$ vs. Temperature Table on the product family data sheet, select the polymeric device at the maximum operating temperature with an $I_{hold}$ greater than or equal to the normal operating current.
7. Verify that the selected device will trip under fault conditions by checking in the $I_{trip}$ table that the fault current is greater than $I_{trip}$ for the selected device, at the lowest operating temperature.
8. Order samples and test in application.

## APPLICATIONS

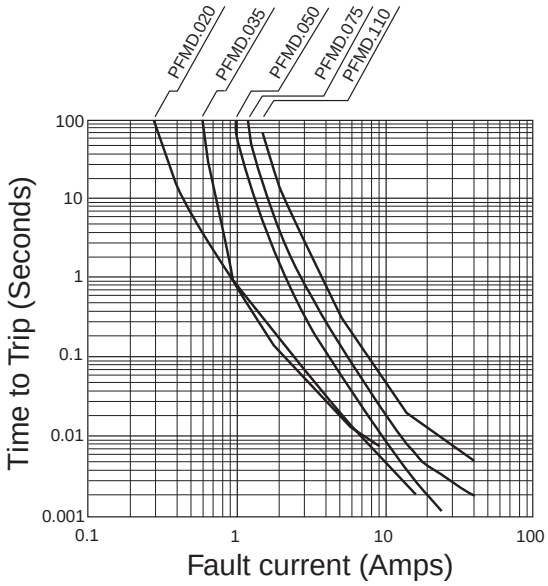
The benefits of polymeric Resettable Overcurrent Protectors are being recognized by more and more design engineers, and new applications are being discovered every day.
The use of polymeric types of devices have been widely accepted in the following applications and industries:

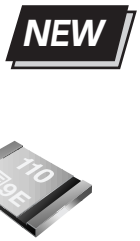
- Personal computers
- Laptop computers
- Personal digital assistants
- Transformers
- Small and medium electric motors
- Audio equipment and speakers
- Test and measurement equipment
- Security and fire alarm systems
- Medical electronics
- Personal care products
- Point-of-sale equipment
- Industrial controls
- Automotive electronics and harness protection
- Marine electronics
- Battery-operated toys

Schurter's resettable fuses cross to many like products already on the market. See our online cross list at www.schurterinc.com/cross.htm.

# PFMD Polymeric PTC Resettable Fuse – Surface Mount

Typical Time to Trip at 23 °C



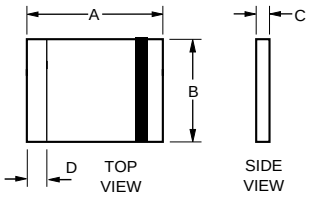




- High Density Circuit Board Application:
  Hard disk drives,
  PC motherboards
  PC peripherals
  Point-of-sale (POS) equipment
  PCMCIA cards
- Packaged per EIA 481-2 standard

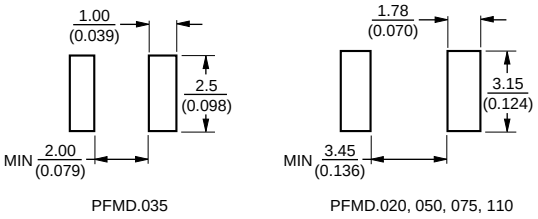
**Approvals:**

| | |
|---|---|
| UL | recognition |
| CSA | pending |
| TÜV | approval |

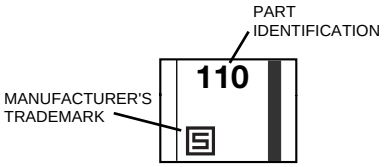
Dimensions




Solder Pad Layouts




Typical Part Marking
Represents total content. Layout may vary.




Dimentions in mm / (inch)

| Technical Data | | |
|---|---|---|
| Operating/Storage Temperature | -40°C to +85°C | |
| Maximum Device Surface Temperature in Tripped State | 125°C | |
| Passive Aging | +85°C, 1000 hours | ±5% typical resistance change |
| Humidity Aging | +85°C, 85% R.H. 1000 hours | ±5% typical resistance change |
| Thermal Shock | +125°C/-40°C 10 times | ±10% typical resistance change |
| Mechanical Shock | MIL-STD-202, Method 213, Condition 1 (100g, 6 seconds) | No resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 | No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |
| Terminal material | Solder-plated copper | |
| Termination pad solderability | Meets EIA Specification RS-186-9E, ANSI/J-STD-002 Cat.3 | |

| Test Procedures And Requirements | | |
|---|---|---|
| Test | Test Conditions | Accept/Reject Criteria |
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23°C | Rmin ≤ R ≤ Rmax |
| Time to Trip | At 8 Amps , Vmax, 23°C | T ≤ max. time to trip (seconds) |
| Hold Current | 30 min. at Ihold | No trip |
| Trip Cycle Life | Vmax, Imax, 100 cycles | No arcing or burning |
| Trip Endurance | Vmax, 48 hours | No arcing or burning |

# PFMD Technical Data, continued

Electrical Characteristics

| Model | I max. Amps | V max. Volts | $I_{hold}$ | $I_{trip}$ | Initial Resistance | | Max. Time To Trip at 23°C | | Tripped Power Dissipation |
|---|---|---|---|---|---|---|---|---|---|
| | | | Amperes at 23°C | | Ohms at 23°C | | Amps | Seconds | Watts at 23°C |
| | | | Hold | Trip | $R_{Min.}$ | $R_{1Max.}$ | | | |
| PFMD.020.2 | 10 | 30.0 | 0.20 | 0.40 | 0.40 | 5.00 | 8.0 | 0.02 | 0.8 |
| PFMD.035.2 | 40 | 6.0 | 0.35 | 0.70 | 0.32 | 1.30 | 8.0 | 0.10 | 0.6 |
| PFMD.050.2 | 40 | 15.0 | 0.50 | 1.00 | 0.15 | 1.00 | 8.0 | 0.15 | 0.8 |
| PFMD.075.2 | 40 | 13.2 | 0.75 | 1.50 | 0.11 | 0.45 | 8.0 | 0.20 | 0.8 |
| PFMD.110.2 | 40 | 6.0 | 1.10 | 2.20 | 0.04 | 0.21 | 8.0 | 0.30 | 0.8 |

Product Dimensions

| Model | A | | B | | C | | D |
|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| PFMD.020.2 | 4.37 | 4.73 | 3.07 | 3.41 | 0.56 | 0.81 | 0.30 |
| PFMD.035.2 | 3.00 | 3.43 | 2.35 | 2.80 | 0.38 | 0.62 | 0.35 |
| PFMD.050.2 | 4.37 | 4.73 | 3.07 | 3.41 | 0.38 | 0.62 | 0.30 |
| PFMD.075.2 | 4.37 | 4.73 | 3.07 | 3.41 | 0.38 | 0.62 | 0.30 |
| PFMD.110.2 | 4.37 | 4.73 | 3.07 | 3.41 | 0.38 | 0.62 | 0.30 |

**How to Order** **P F M D . 0 2 0 . 2**

Product Designator

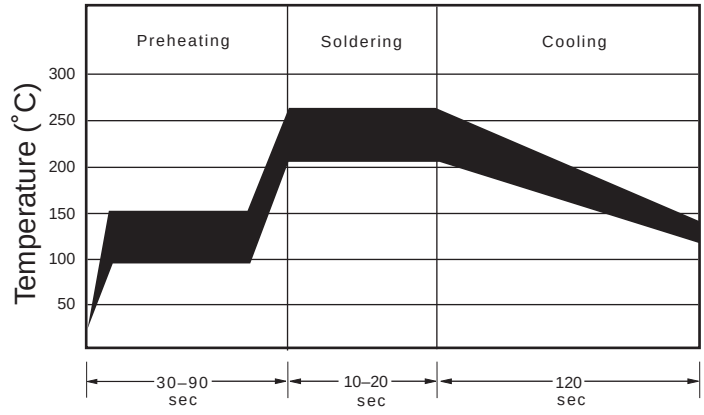
Style
MD = 4.5mm SMD

Hold Current, $I_{hold}$
020-110 (0.20 Amps - 1.10 Amps)

Packaging
.2 = 1,500 pcs. tape & reel

- Packaging options:
- TAPE & REEL: PFMD.035.2 = 3000 pcs per reel
  All other models = 1500 pcs. per reel.

Solder Reflow And Rework Recommendations




**NOTE:**
- PFMD models can be waved soldered and reworked.
- If reflow temeratures exceed the recommended profile, devices may not meet the performance requirements.

Thermal Derating Chart - $I_{hold}$ (Amps)*

| Part No. | Ambient Operating Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40˚C | -20˚C | 0˚C | 23˚C | 40˚C | 50˚C | 60˚C | 70˚C | 85˚C |
| PFMD.020.2 | 0.29 / 0.58 | 0.26 / 0.52 | 0.23 / 0.46 | 0.20 / 0.40 | 0.17 / 0.34 | 0.15 / 0.30 | 0.14 / 0.28 | 0.12 / 0.24 | 0.10 / 0.20 |
| PFMD.035.2 | 0.47 / 0.94 | 0.45 / 0.90 | 0.40 / 0.80 | 0.35 / 0.70 | 0.30 / 0.60 | 0.28 / 0.56 | 0.24 / 0.48 | 0.21 / 0.42 | 0.18 / 0.36 |
| PFMD.050.2 | 0.77 / 1.54 | 0.68 / 1.36 | 0.59 / 1.18 | 0.50 / 1.00 | 0.44 / 0.88 | 0.40 / 0.80 | 0.37 / 0.74 | 0.33 / 0.66 | 0.29 / 0.58 |
| PFMD.075.2 | 1.15 / 2.30 | 1.01 / 2.02 | 0.88 / 1.76 | 0.75 / 1.50 | 0.65 / 1.30 | 0.60 / 1.20 | 0.55 / 1.10 | 0.49 / 0.98 | 0.43 / 0.86 |
| PFMD.110.2 | 1.59 / 3.18 | 1.43 / 2.86 | 1.26 / 2.52 | 1.10 / 2.20 | 0.95 / 1.90 | 0.87 / 1.74 | 0.80 / 1.60 | 0.71 / 1.42 | 0.60 / 1.20 |

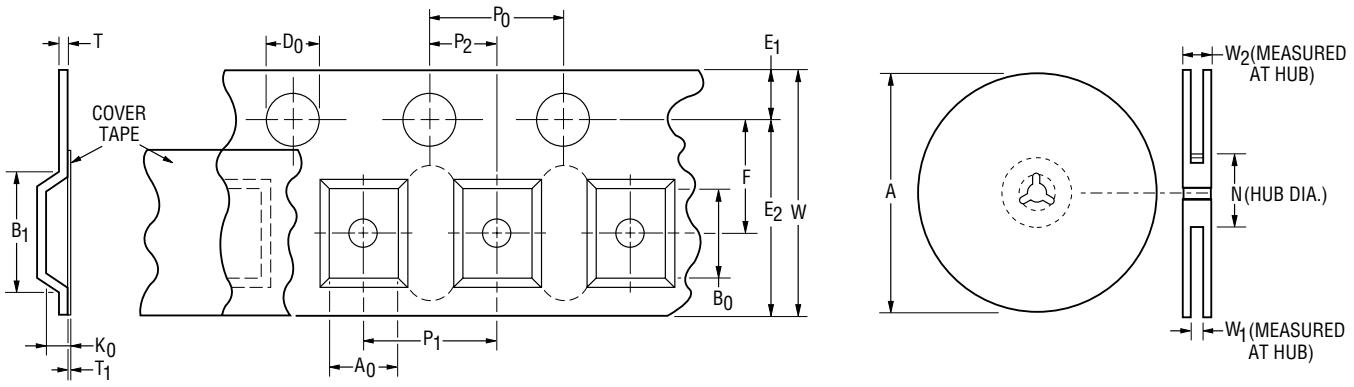
*$I_{trip} = 2 \cdot I_{hold}$

Schurter's resettable fuses cross to many like products already on the market. See our online cross list at www.schurterinc.com/cross.htm

# PFMD Tape and Reel Specifications

| Tape Dimension Identifiers | PFMD 020, 050, 075, 110, per EIA-481-2 | PFMD 035 per EIA 481-2 |
|---|---|---|
| W | 12 ± 0.3 | 8 ± 0.3 |
| $P_0$ | 4.0 ± 0.10 | 4.0 ± 0.10 |
| $P_1$ | 8.0 ± 0.10 | 4.0 ± 0.10 |
| $P_2$ | 2.0 ± 0.05 | 2.0 ± 0.05 |
| $A_0$ | 3.5 ± 0.23 | 2.8 ± 0.1 |
| $B_0$ | 5.1 ± 0.15 | 3.5 ± 0.1 |
| $B_1$ max. | 5.9 | 4.35 |
| $D_0$ | 1.5 + 0.1/ - 0 | 1.5 + 0.1/ -0 |
| F | 5.5 ± 0.05 | 3.5 ± 0.05 |
| $E_1$ | 1.75 ± 0.10 | 1.75 ± 0.10 |
| $E_2$ min. | 10.25 | 6.25 |
| T max. | 0.6 | 0.6 |
| $T_1$ max. | 0.1 | 0.1 |
| $K_0$ | 0.9 ± 0.15 | 1.1 ± 0.05 |
| Leader min. | 390 | 390 |
| Trailer min. | 160 | 160 |
| **Reel Dimension Identifiers** | | |
| A max. | 185 | 185 |
| N min. | 50 | 50 |
| $W_1$ | 12.4 + 2.0/ -0 | 8.4 + 1.5/ -0 |
| $W_2$ max. | 18.4 | 14.4 |

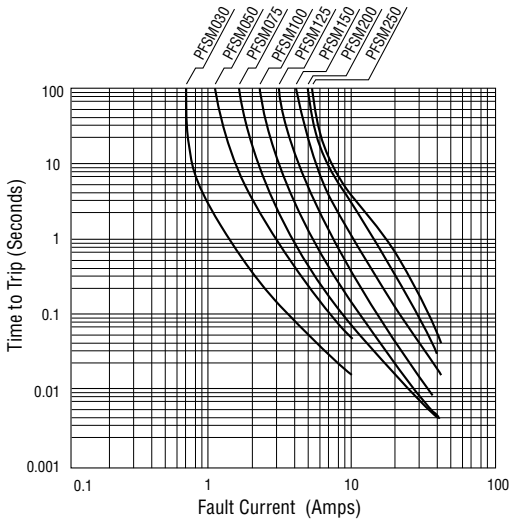
DIMENSIONS: MM




Specifications are subject to change without notice.

# PFSM Polymeric PTC Resettable Fuse – Surface Mount

Typical Time to Trip at 23˚C

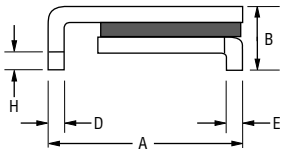



NEW

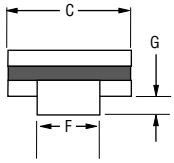
- Fully compatible with current industry standards
- Packaged per EIA 481-2 standard
- Applications: Almost anywhere there is a low voltage power supply and a load to be protected, including: computers & peripherals, general electronics, automotive applications

**Approvals:**

| | | |
|---|---|---|
| UL | recognition | File #E172175 |
| CSA | acceptance | File #CA702083 |
| TÜV | certification | File #R9872200 |

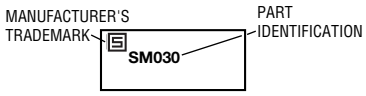



*Side View*

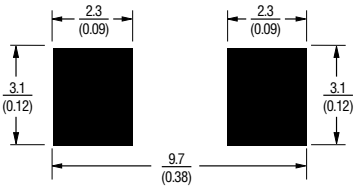



*End View*

Typical Part Marking
Represents total content. Layout may vary.

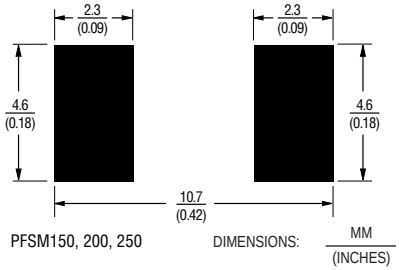



*Recommended Pad Layout*




PFSM030, 050, 075, 100, 125

*Recommended Pad Layout*




PFSM150, 200, 250

DIMENSIONS: MM (INCHES)

| Technical Data | | |
|---|---|---|
| Operating/Storage Temperature | -40°C to +85°C | |
| Maximum Device Surface Temperature in Tripped State | 125°C | |
| Passive Aging | +85°C, 1000 hours | ±5% typical resistance change |
| Humidity Aging | +85°C, 85% R.H. 1000 hours | ±5% typical resistance change |
| Thermal Shock | +125°C/-40°C 10 times | ±10% typical resistance change |
| Mechanical Shock | MIL-STD-202, Method 213, Condition 1 (100g, 6 seconds) | No resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 | No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |

| Test Procedures And Requirements | | |
|---|---|---|
| Test | Test Conditions | Accept/Reject Criteria |
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23°C | Rmin ≤ R ≤ Rmax |
| Time to Trip | At specified current, Vmax, 23°C | T ≤ max. time to trip (seconds) |
| Hold Current | 30 min. at Ihold | No trip |
| Trip Cycle Life | Vmax, Imax, 100 cycles | No arcing or burning |
| Trip Endurance | Vmax, 48 hours | No arcing or burning |

# PFSM Technial Data, continued

Electrical Characteristics

| Model | I max. Amps | V max. Volts | $I_{hold}$ | $I_{trip}$ | Initial Resistance | | 1 Hour (R1) Post-Reflow Resistance | Max. Time To Trip at 23°C | | Tripped Power Dissipation |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Amperes at 23°C | | Ohms at 23°C | | Ohms at 23°C | Amps | Seconds | Watts at 23°C |
| | | | Hold | Trip | Min. | Max. | Max. | | Max. | Nom. |
| PFSM030.2 | 10 | 60 | 0.30 | 0.60 | 0.90 | - | 4.80 | 1.5 | 3.0 | 1.7 |
| PFSM050.2 | 10 | 30 | 0.50 | 1.00 | 0.35 | - | 1.40 | 2.5 | 4.0 | 1.7 |
| PFSM075.2 | 40 | 30 | 0.75 | 1.50 | 0.27 | - | 1.00 | 8.0 | 0.30 | 1.7 |
| PFSM100.2 | 40 | 15 | 1.10 | 2.20 | 0.12 | - | 0.48 | 8.0 | 0.50 | 1.7 |
| PFSM125.2 | 40 | 15 | 1.25 | 2.50 | 0.07 | - | 0.25 | 8.0 | 2.0 | 1.7 |
| PFSM150.2 | 40 | 15 | 1.50 | 3.00 | 0.06 | - | 0.25 | 8.0 | 5.0 | 1.9 |
| PFSM200.2 | 40 | 15 | 2.00 | 4.00 | 0.05 | - | 0.125 | 8.0 | 12.0 | 1.9 |
| PFSM250.2 | 40 | 15 | 2.50 | 5.00 | 0.035 | - | 0.085 | 8.0 | 25.0 | 1.9 |

Packaging options:

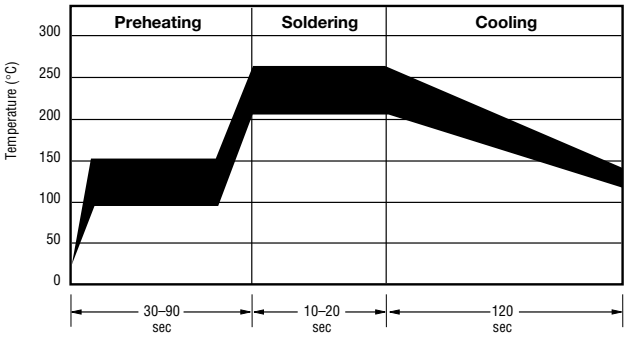
TAPE & REEL: PFSM.030 to PFSM.125 = 2000 pcs. per reel; PFSM.150 to PFSM.250 = 1500 pcs. per reel.

Product Dimensions

| Model | A | | B | | C | | D | | E | | F | | G | | H | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| PFSM030.2 | 6.73 | 7.98 | | 3.18 | | 5.44 | 0.56 | 0.71 | 0.56 | 0.71 | 2.16 | 2.41 | 0.66 | 1.37 | 0.43 | |
| PFSM050.2 | 6.73 | 7.98 | | 3.18 | | 5.44 | 0.56 | 0.71 | 0.20 | 0.30 | 2.16 | 2.41 | 0.66 | 1.37 | 0.43 | |
| PFSM075.2 | 6.73 | 7.98 | | 3.18 | | 5.44 | 0.56 | 0.71 | 0.56 | 0.71 | 2.16 | 2.41 | 0.66 | 1.37 | 0.43 | |
| PFSM100.2 | 6.73 | 7.98 | | 3.00 | | 5.44 | 0.56 | 0.71 | 0.56 | 0.71 | 2.16 | 2.41 | 0.66 | 1.37 | 0.43 | |
| PFSM125.2 | 6.73 | 7.98 | | 3.00 | | 5.44 | 0.56 | 0.71 | 0.56 | 0.71 | 2.16 | 2.41 | 0.66 | 1.37 | 0.43 | |
| PFSM150.2 | 8.00 | 9.50 | | 3.00 | | 6.71 | 0.56 | 0.71 | 0.56 | 0.71 | 3.68 | 3.94 | 0.66 | 1.37 | 0.43 | |
| PFSM200.2 | 8.00 | 9.50 | | 3.00 | | 6.71 | 0.56 | 0.71 | 0.56 | 0.71 | 3.68 | 3.94 | 0.66 | 1.37 | 0.43 | |
| PFSM250.2 | 8.00 | 9.50 | | 3.00 | | 6.71 | 0.56 | 0.71 | 0.56 | 0.71 | 3.68 | 3.94 | 0.66 | 1.37 | 0.43 | |

DIMENSIONS = MM

Solder Reflow And Rework Recommendations




Solder reflow

- Recommended reflow methods: IR, vapor phase oven, hot air oven.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Gluing the devices is not recommended.
- Recommended maximum paste thickness is 0.25 mm (.010 inch).
- Devices can be cleaned using standard industry methods and solvents.

Note: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

Rework

- A device should not be reworked.

Thermal Derating Chart - $I_{hold}$ (Amps)*

| Model | Ambient Operating Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40˚C | -20˚C | 0˚C | 23˚C | 40˚C | 50˚C | 60˚C | 70˚C | 85˚C |
| PFSM030.2 | 0.45 | 0.40 | 0.35 | 0.30 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 |
| PFSM050.2 | 0.76 | 0.67 | 0.59 | 0.50 | 0.42 | 0.38 | 0.33 | 0.29 | 0.23 |
| PFSM075.2 | 1.13 | 1.01 | 0.88 | 0.75 | 0.62 | 0.56 | 0.50 | 0.44 | 0.34 |
| PFSM100.2 | 1.66 | 1.47 | 1.29 | 1.10 | 0.91 | 0.83 | 0.73 | 0.64 | 0.50 |
| PFSM125.2 | 1.89 | 1.68 | 1.46 | 1.25 | 1.04 | 0.94 | 0.83 | 0.73 | 0.56 |
| PFSM150.2 | 2.27 | 2.01 | 1.76 | 1.50 | 1.25 | 1.13 | 0.99 | 0.87 | 0.68 |
| PFSM200.2 | 3.02 | 2.68 | 2.34 | 2.00 | 1.66 | 1.50 | 1.32 | 1.16 | 0.90 |
| PFSM250.2 | 3.78 | 3.35 | 2.93 | 2.50 | 2.08 | 1.88 | 1.65 | 1.45 | 1.13 |

*$I_{trip} = 2 \cdot I_{hold}$

**How To Order**

PF SM . 030 . 2

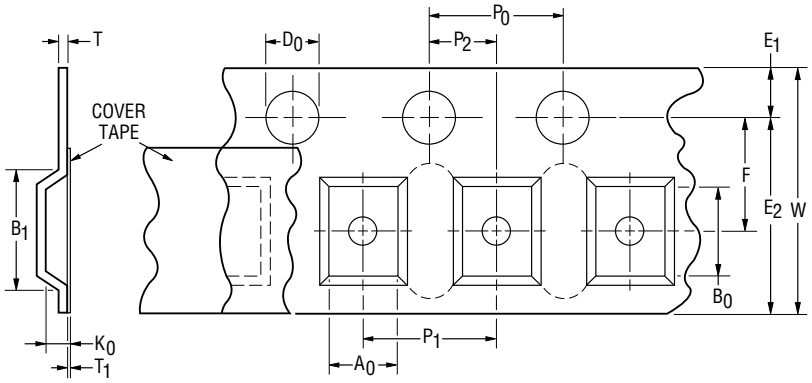
- PF — Product Designator
- SM — Style
  - SM = Surface Mount Component
- 030 — Hold Current, $I_{hold}$
  - 030-250 (0.30 Amps - 2.50 Amps)
- 2 — Packaging Options
  - Packaged per EIA 481-2
  - .2 = Tape and Reel

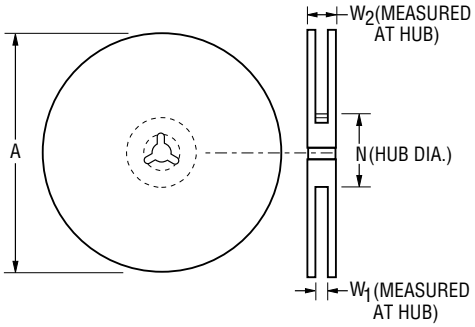
Schurter's resettable fuses cross to many like products already on the market. See our online cross list at www.schurterinc.com/cross.htm

# PFSM Tape and Reel Specifications

| Tape Dimension Identifiers | PFSM 030, 050, 075, 100, 125 per EIA-481-2 | PFSM 150, 200, 250 per EIA 481-2 |
|---|---|---|
| W | 16 ± 0.3 | 16 ± 0.3 |
| $P_0$ | 4.0 ± 0.10 | 4.0 ± 0.10 |
| $P_1$ | 8.0 ± 0.10 | 12.0 ± 0.10 |
| $P_2$ | 2.0 ± 0.10 | 2.0 ± 0.10 |
| $A_0$ | 5.7 ± 0.10 | 6.9 ± 0.10 |
| $B_0$ | 8.1 ± 0.15 | 10.0 ± 0.10 |
| $B_1$ max. | 9.1 | 11.0 |
| $D_0$ | 1.5 + 0.1/ - 0 | 1.5 + 0.1/ -0 |
| F | 7.5 ± 0.10 | 7.5 ± 0.10 |
| $E_1$ | 1.75 ± 0.10 | 1.75 ± 0.10 |
| $E_2$ min. | 14.25 | 14.25 |
| T max. | 0.4 | 0.4 |
| $T_1$ max. | 0.1 | 0.1 |
| $K_0$ | 3.4 ± 0.15 | 3.5 ± 0.10 |
| Leader min. | 390 | 390 |
| Trailer min. | 160 | 160 |
| **Reel Dimension Identifiers** | | |
| A max. | 360 | 360 |
| N min. | 50 | 50 |
| $W_1$ | 16.4 + 2.0/ -0 | 16.4 + 2.0/ -0 |
| $W_2$ max. | 22.4 | 22.4 |

DIMENSIONS:

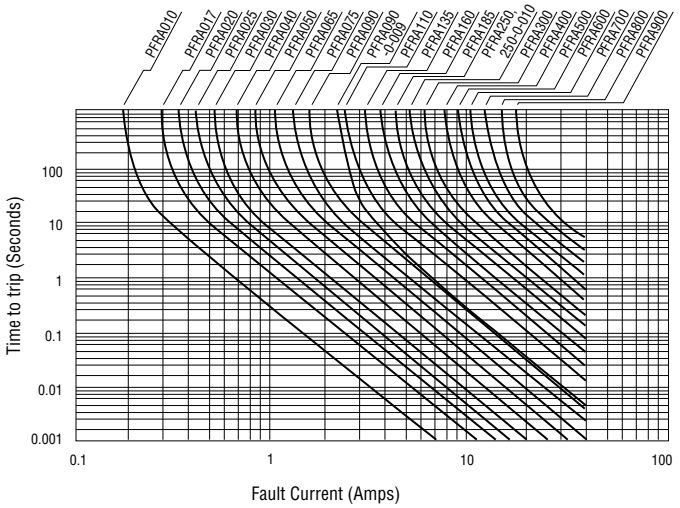


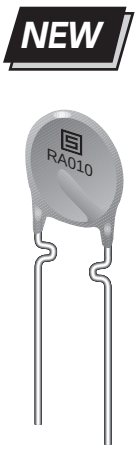




Specifications are subject to change without notice.

# PFRA Polymeric PTC Resettable Fuse - Radial Leaded

Typical Time to Trip at 23˚C



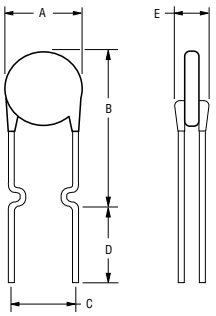

- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Bulk packaging, tape and reel and Ammo-Pak available on most models
- Applications: Almost anywhere there is a low voltage power supply and a load to be protected, including: computers & peripherals, general electronics, automotive applications

**Approvals** *

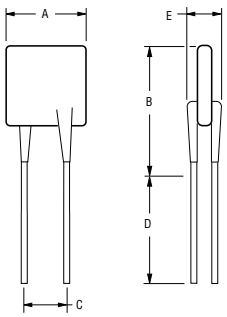
| | |
|---|---|
| UL | recognition, file #E172175<br>.1A - 9A/30V (.1A-9A/60V pending) |
| CSA | acceptance, file #CA702083<br>[.1A - .9A/60V; .9A(.009) to 9A/30V] |
| TÜV | certification, file #R9872200<br>[.1A - .9A/60V; .9A(.009) to 9A/30V] |

* rated amps at hold current $I_{hold}$

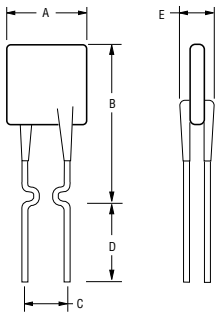
**Package 1**




**Package 2**

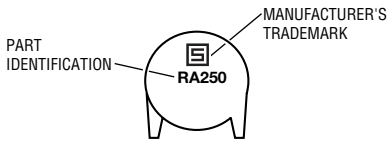



**Package 3**




NOTE: Kinked lead option is available for board standoff. Contact factory for details.
Shape changes from round to square starting with PFRA.250.

Typical Part Marking
Represents total content. Layout may vary.




| Technical Data | | |
|---|---|---|
| Operating/Storage Temperature | -40°C to +85°C | |
| Maximum Device Surface Temperature in Tripped State | 125°C | |
| Passive Aging | +85°C, 1000 hours | ±5% typical resistance change |
| Humidity Aging | +85°C, 85% R.H. 1000 hours | ±5% typical resistance change |
| Thermal Shock | +125°C/-40°C 10 times | ±10% typical resistance change |
| Mechanical Shock | MIL-STD-202, Method 213, Condition 1 (100g, 6 seconds) | No resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 | No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |

| Test Procedures And Requirements | | |
|---|---|---|
| Test | Test Conditions | Accept/Reject Criteria |
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23°C | Rmin ≤ R ≤ Rmax |
| Time to Trip | 5 times Ihold, Vmax, 23°C | T ≤ max. time to trip (seconds) |
| Hold Current | 30 min. at Ihold | No trip |
| Trip Cycle Life | Vmax, Imax, 100 cycles | No arcing or burning |
| Trip Endurance | Vmax, 48 hours | No arcing or burning |
| UL File Number | See above | |
| CSA File Number | See above | |
| TÜV File Number | See above | |

Specifications are subject to change without notice.

# PFRA Technical Data, continued

Electrical Characteristics

| Model | V max. Volts | I max. Amps | Ihold Amperes at 23°C Hold | Itrip Amperes at 23°C Trip | Initial Resistance Ohms at 23°C Min. | Initial Resistance Ohms at 23°C Max. | 1 Hour ($R_1$) Post-Trip Resistance Ohms at 23°C Max. | Max. Time To Trip at 5*Ih Seconds at 23°C | Tripped Power Dissipation Watts at 23°C |
|---|---|---|---|---|---|---|---|---|---|
| PFRA.010.X | 60 | 40 | 0.10 | 0.20 | 2.50 | 4.50 | 7.50 | 4.0 | 0.38 |
| PFRA.017.X | 60 | 40 | 0.17 | 0.34 | 2.00 | 3.20 | 8.00 | 3.0 | 0.48 |
| PFRA.020.X | 60 | 40 | 0.20 | 0.40 | 1.50 | 2.84 | 4.40 | 2.2 | 0.40 |
| PFRA.025.X | 60 | 40 | 0.25 | 0.50 | 1.00 | 1.95 | 3.00 | 2.5 | 0.45 |
| PFRA.030.X | 60 | 40 | 0.30 | 0.60 | 0.76 | 1.36 | 2.10 | 3.0 | 0.50 |
| PFRA.040.X | 60 | 40 | 0.40 | 0.80 | 0.52 | 0.86 | 1.29 | 3.8 | 0.55 |
| PFRA.050.X | 60 | 40 | 0.50 | 1.00 | 0.41 | 0.77 | 1.17 | 4.0 | 0.75 |
| PFRA.065.X | 60 | 40 | 0.65 | 1.30 | 0.27 | 0.48 | 0.72 | 5.3 | 0.90 |
| PFRA.075.X | 60 | 40 | 0.75 | 1.50 | 0.18 | 0.40 | 0.60 | 6.3 | 0.90 |
| PFRA.090.X | 60 | 40 | 0.90 | 1.80 | 0.14 | 0.31 | 0.47 | 7.2 | 1.00 |
| PFRA.090.X.009 | 30 | 40 | 0.90 | 1.80 | 0.07 | 0.12 | 0.22 | 5.9 | 0.60 |
| PFRA.110.X | 30 | 40 | 1.10 | 2.20 | 0.10 | 0.18 | 0.27 | 6.6 | 0.70 |
| PFRA.135.X | 30 | 40 | 1.35 | 2.70 | 0.065 | 0.115 | 0.17 | 7.3 | 0.80 |
| PFRA.160.X | 30 | 40 | 1.60 | 3.20 | 0.055 | 0.105 | 0.15 | 8.0 | 0.90 |
| PFRA.185.X | 30 | 40 | 1.85 | 3.70 | 0.04 | 0.07 | 0.11 | 8.7 | 1.00 |
| PFRA.250.X | 30 | 40 | 2.50 | 5.00 | 0.025 | 0.048 | 0.07 | 10.3 | 1.20 |
| PFRA.250.X.010 | 30 | 40 | 2.50 | 5.00 | 0.025 | 0.048 | 0.07 | 10.3 | 1.20 |
| PFRA.300.X | 30 | 40 | 3.00 | 6.00 | 0.02 | 0.05 | 0.08 | 10.8 | 2.00 |
| PFRA.400.X | 30 | 40 | 4.00 | 8.00 | 0.01 | 0.03 | 0.05 | 12.7 | 2.50 |
| PFRA.500 | 30 | 40 | 5.00 | 10.00 | 0.01 | 0.03 | 0.05 | 14.5 | 3.00 |
| PFRA.600 | 30 | 40 | 6.00 | 12.00 | 0.005 | 0.02 | 0.04 | 16.0 | 3.50 |
| PFRA.700 | 30 | 40 | 7.00 | 14.00 | 0.005 | 0.02 | 0.03 | 17.5 | 3.80 |
| PFRA.800 | 30 | 40 | 8.00 | 16.00 | 0.005 | 0.02 | 0.03 | 18.8 | 4.00 |
| PFRA.900 | 30 | 40 | 9.00 | 18.00 | 0.005 | 0.01 | 0.02 | *20.0 | 4.20 |

*Tested at 40 amps

Packaging options

BULK: (leave.X space)
PFRA.010-PFRA.185 = 500 pcs. per bag; PFRA.250-PFRA.900 = 100 pcs. per bag;
PFRA.090.X.009 & PFRA.250.X.010 = 500 pcs. per bag.

TAPE & REEL: X=.2
PFRA.010-PFRA.160 - 12.7mm device pitch = 3000 pcs. per reel;
PFRA.185-PFRA.400 - 25.4mm device pitch = 1500 pcs. per reel;
PFRA.090.X.009 & PFR.A250.X.010 = 3000 pcs. per reel.

AMMO-PACK: X=.3
PFRA.010-PFRA.160 - 12.7mm device pitch = 2000 pcs. per reel;
PFRA.185-PFRA.400 - 25.4mm device pitch = 1000 pcs. per reel;
PFRA.090.X.009 & PFRA.250.X.010 = 2000 pcs. per reel.

Product Dimension

| Model | A Max. | B Max. | C Nom. | C Tol. ± | D Min. | E Max. | Physical Characteristics Style | Lead | Material |
|---|---|---|---|---|---|---|---|---|---|
| PFRA.010.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/NiCu |
| PFRA.017.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/CuFe |
| PFRA.020.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/CuFe |
| PFRA.025.X | 7.4 | 12.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/CuFe |
| PFRA.030.X | 7.4 | 13.4 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/CuFe |
| PFRA.040.X | 7.4 | 13.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/CuFe |
| PFRA.050.X | 7.9 | 13.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.065.X | 9.7 | 15.2 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.075.X | 10.4 | 16.0 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.090.X | 11.7 | 16.7 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.090.X.009 | 7.4 | 12.2 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.51 dia. | Sn/Cu |
| PFRA.110.X | 8.9 | 14.0 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.135.X | 8.9 | 18.9 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.160.X | 10.2 | 16.8 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.185.X | 12.0 | 18.4 | 5.1 | 0.7 | 7.6 | 3.0 | 1 | 0.51 dia. | Sn/Cu |
| PFRA.250.X | 12.0 | 18.3 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.250.X.010 | 11.4 | 18.3 | 5.1 | 0.7 | 7.6 | 3.0 | 3 | 0.51 dia. | Sn/Cu |
| PFRA.300.X | 12.0 | 18.3 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.400.X | 14.4 | 24.8 | 5.1 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.500 | 17.4 | 24.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.600 | 19.3 | 31.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.700 | 22.1 | 29.8 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.800 | 24.2 | 32.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |
| PFRA.900 | 24.2 | 32.9 | 10.2 | 0.7 | 7.6 | 3.0 | 2 | 0.81 dia. | Sn/Cu |

Dimension = mm

# PFRA Technical Data, continued

Thermal Derating Chart - $I_{hold}$ (Amps)*

| Model | Ambient Operating Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40˚C | -20˚C | 0˚C | 23˚C | 40˚C | 50˚C | 60˚C | 70˚C | 85˚C |
| PFRA.010.X | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 |
| PFRA.017.X | 0.26 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.11 | 0.09 | 0.07 |
| PFRA.020.X | 0.31 | 0.27 | 0.24 | 0.20 | 0.16 | 0.14 | 0.13 | 0.11 | 0.08 |
| PFRA.025.X | 0.39 | 0.34 | 0.30 | 0.25 | 0.20 | 0.18 | 0.16 | 0.14 | 0.10 |
| PFRA.030.X | 0.47 | 0.41 | 0.36 | 0.30 | 0.24 | 0.22 | 0.19 | 0.16 | 0.12 |
| PFRA.040.X | 0.62 | 0.54 | 0.48 | 0.40 | 0.32 | 0.29 | 0.25 | 0.22 | 0.16 |
| PFRA.050.X | 0.78 | 0.68 | 0.60 | 0.50 | 0.41 | 0.36 | 0.32 | 0.27 | 0.20 |
| PFRA.065.X | 1.01 | 0.88 | 0.77 | 0.65 | 0.53 | 0.47 | 0.41 | 0.35 | 0.26 |
| PFRA.075.X | 1.16 | 1.02 | 0.89 | 0.75 | 0.61 | 0.54 | 0.47 | 0.41 | 0.30 |
| PFRA.090.X | 1.40 | 1.22 | 1.07 | 0.90 | 0.73 | 0.65 | 0.57 | 0.49 | 0.36 |
| PFRA.090.X.009 | 1.40 | 1.22 | 1.07 | 0.90 | 0.73 | 0.65 | 0.57 | 0.49 | 0.36 |
| PFRA.110.X | 1.60 | 1.43 | 1.27 | 1.10 | 0.91 | 0.85 | 0.75 | 0.67 | 0.57 |
| PFRA.135.X | 1.96 | 1.76 | 1.55 | 1.35 | 1.12 | 1.04 | 0.92 | 0.82 | 0.70 |
| PFRA.160.X | 2.32 | 2.08 | 1.84 | 1.60 | 1.33 | 1.23 | 1.09 | 0.98 | 0.83 |
| PFRA.185.X | 2.68 | 2.41 | 2.13 | 1.85 | 1.54 | 1.42 | 1.26 | 1.13 | 0.96 |
| PFRA.250.X | 3.63 | 3.25 | 2.88 | 2.50 | 2.08 | 1.93 | 1.70 | 1.53 | 1.30 |
| PFRA.250.X.010 | 3.63 | 3.25 | 2.88 | 2.50 | 2.08 | 1.93 | 1.70 | 1.53 | 1.30 |
| PFRA.300.X | 4.35 | 3.90 | 3.45 | 3.00 | 2.49 | 2.31 | 2.04 | 1.83 | 1.56 |
| PFRA.400.X | 5.80 | 5.20 | 4.60 | 4.00 | 3.32 | 3.08 | 2.72 | 2.44 | 2.08 |
| PFRA.500 | 7.25 | 6.50 | 5.75 | 5.00 | 4.15 | 3.85 | 3.40 | 3.05 | 2.60 |
| PFRA.600 | 8.70 | 7.80 | 6.90 | 6.00 | 4.98 | 4.62 | 4.08 | 3.66 | 3.12 |
| PFRA.700 | 10.15 | 9.10 | 8.05 | 7.00 | 5.81 | 5.39 | 4.76 | 4.27 | 3.64 |
| PFRA.800 | 11.60 | 10.40 | 9.20 | 8.00 | 6.64 | 6.16 | 5.44 | 4.88 | 4.16 |
| PFRA.900 | 13.05 | 11.70 | 10.35 | 9.00 | 7.47 | 6.39 | 6.12 | 5.49 | 4.68 |

See the following page for tape and reel specifications.

*$I_{trip} = 2 \cdot I_{hold}$

**How to Order**

**PF RA . 250 . X**

Product Designator

Style

RA = Radial Leaded Component

Hold Current, Ihold
010-900 (100m Amps - 9.0 Amps)

Packaging Options
Blank = Bulk Packaging
.2 = Tape and Reel*
.3 = Ammo-Pak*

NOTE: Add designator “010” after Packaging Option Code to specify Models PFRA090-0-010 or PFRA250-0-010.

*Packaged per EIA486-B

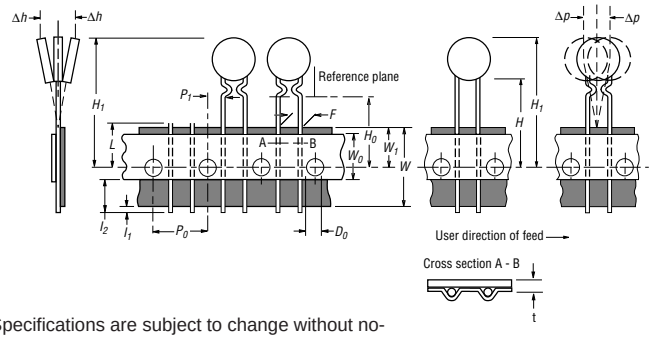
Schurter’s resettable fuses cross to many like products already on the market.
See our online cross list at www.schurterinc.com/cross.htm

# PFRA Tape and Reel Specifications

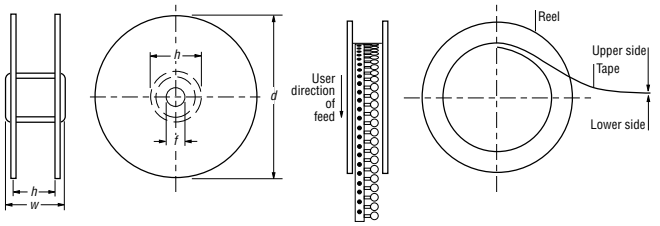
Devices taped using EIA468–B/IEC286-2 standards. See table below and Figures 1 and 2 for details.

| Dimension Description | IEC Mark | EIA Mark | Dimensions Dim. (mm) | Tol. (mm) |
|---|---|---|---|---|
| Carrier tape width | *W* | *W* | 18 | -0.5/+1.0 |
| Hold down tape width | | *W4* | 5 | min. |
| Hold down tape | *W0* | | No protrusion | |
| Top distance between tape edges | *W2* | *W6* | 3 | max. |
| Sprocket hole position | *W1* | *W5* | 9 | -0.5/+0.75 |
| Sprocket hole diameter | *D0* | *D0* | 4 | ± 0.2 |
| Abscissa to plane (straight lead) | *H* | *H* | 18.5 | ± 3.0 |
| Abscissa to plane (kinked lead) | *H0* | *H0* | 16 | ± 0.5 |
| Abscissa to top | *H1* | *H1* | 32.2 | max. |
| Overall width w/lead protrusion | | *C1* | 43.2 | max. |
| Overall width w/o lead protrusion | | *C2* | 42.5 | max. |
| Lead protrusion | *I1* | *L1* | 1.0 | max. |
| Protrusion of cutout | *L* | *L* | 11 | max. |
| Protrusion beyond hold tape | *I2* | *I2* | Not specified | |
| Sprocket hole pitch | *P0* | *P0* | 12.7 | ± 0.3 |
| Pitch tolerance | | | 20 seconds | ± 1 |
| Device pitch: PFRA.010 – PFRA.160 | | | 12.7 | |
| Device pitch: PFRA.185 – PFRA.400 | | | 25.4 | |
| Tape thickness | *t* | *t* | 0.9 | max. |
| Tape thickness with splice | | *t1* | 2.0 | max. |
| Splice sprocket hole alignment | | | 0 | ± 0.3 |
| Body lateral deviation | $\Delta h$ | $\Delta h$ | 0 | ± 1.0 |
| Body tape plane deviation | $\Delta p$ | $\Delta p$ | 0 | ± 1.3 |
| Lead seating plane deviation | $\Delta P1$ | *P1* | 0 | ± 0.7 |
| Lead spacing | *F* | *F* | 5.08 | ± 0.8 |
| Reel width | *w* | *w* | 56 | max. |
| Reel diameter | *d* | *a* | 370 | max. |
| Space between flanges less device | | | 4.75 | ± 3.25 |
| Arbor hole diameter | *f* | *c* | 26 | ± 12.0 |
| Core diameter | *h* | *n* | 80 | max. |
| Box | | | 56/372/372 | max. |
| Consecutive missing places | | | 3 maximum | |
| Empty places per reel | | | Not specified | |

Taped Component Dimensions



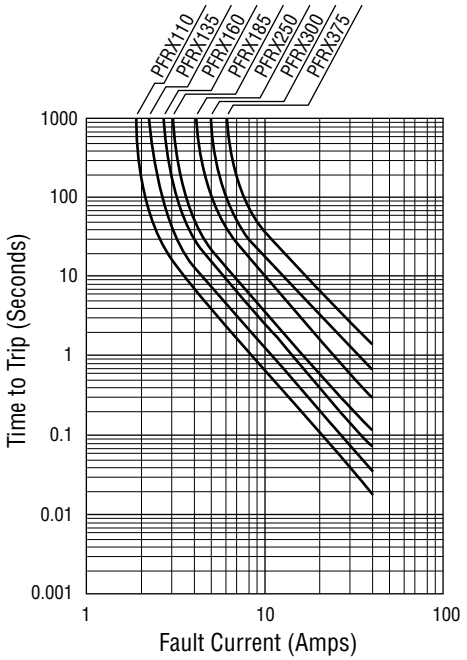

Reel Dimensions




Specifications are subject to change without notice.

# PFRX Polymeric PTC Resettable Fuse - Radial Leaded

Typical Time to Trip at 23˚C



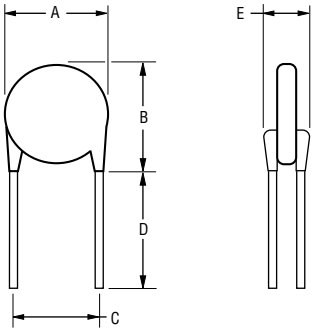

NEW


- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Bulk packaging, tape and reel and Ammo-Pak available on most models
- Applications: Almost anywhere there is a low voltage power supply, up to 60V and a load to be protected, including: computers & peripherals, general electronics, automotive applications

**Approvals:**

| | |
|---|---|
| UL | recognition, file #E172175 (60V) |
| CSA | acceptance, file #CA702083 (60V) |
| TÜV | certification, file #R9872200 (60V) |

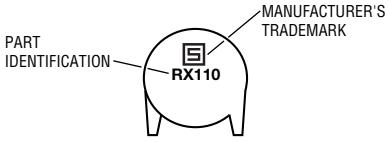
**Package 1**




Lead Material
0.81 dia. (20AWG)

NOTE: Kinked lead option is available for board standoff. Contact factory for details.

Typical Part Marking
Represents total content. Layout may vary.




| Technical Data | | |
|---|---|---|
| Operating/Storage Temperature | -40°C to +85°C | |
| Maximum Device Surface Temperature in Tripped State | 125°C | |
| Passive Aging | +85°C, 1000 hours | ±5% typical resistance change |
| Humidity Aging | +85°C, 85% R.H. 1000 hours | ±5% typical resistance change |
| Thermal Shock | +125°C/-40°C 10 times | ±10% typical resistance change |
| Mechanical Shock | MIL-STD-202, Method 213, Condition 1 (100g, 6 seconds) | No resistance change |
| Solvent Resistance | MIL-STD-202, Method 215 | No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |

| Test Procedures And Requirements | | |
|---|---|---|
| Test | Test Conditions | Accept/Reject Criteria |
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23°C | Rmin ≤ R ≤ Rmax |
| Time to Trip | 5 times Ihold, Vmax, 23°C | T ≤ max. time to trip (seconds) |
| Hold Current | 30 min. at Ihold | No trip |
| Trip Cycle Life | Vmax, Imax, 100 cycles | No arcing or burning |
| Trip Endurance | Vmax, 48 hours | No arcing or burning |

# PFRX Technical Data, continued

## Electrical Characteristics

| Model | V max. Volts | I max. Amps | $I_{hold}$ | $I_{trip}$ | Initial Resistance | | 1 Hour ($R_1$) Post-Trip Resistance | Max. Time To Trip at 5*$I_h$ | Tripped Power Dissipation |
|---|---|---|---|---|---|---|---|---|---|
| | | | Amperes at 23°C | | Ohms at 23°C | | Ohms at 23°C | Seconds at 23°C | Watts at 23°C |
| | | | Hold | Trip | Min. | Max. | Max. | | |
| PFRX.110.X | 60 | 40 | 1.10 | 2.20 | 0.15 | 0.25 | 0.38 | 8.2 | 1.50 |
| PFRX.135.X | 60 | 40 | 1.35 | 2.70 | 0.12 | 0.19 | 0.30 | 9.6 | 1.70 |
| PFRX.160.X | 60 | 40 | 1.60 | 3.20 | 0.09 | 0.14 | 0.22 | 11.4 | 1.90 |
| PFRX.185.X | 60 | 40 | 1.85 | 3.70 | 0.08 | 0.12 | 0.19 | 12.6 | 2.10 |
| PFRX.250 | 60 | 40 | 2.50 | 5.00 | 0.05 | 0.08 | 0.13 | 15.6 | 2.50 |
| PFRX.300 | 60 | 40 | 3.00 | 6.00 | 0.04 | 0.06 | 0.10 | 19.8 | 2.80 |
| PFRX.375 | 60 | 40 | 3.75 | 7.50 | 0.03 | 0.05 | 0.08 | 24.0 | 3.20 |

## Packaging options:

BULK: All models = 100 pcs. per bag.
(leave .X space empty)

TAPE & REEL: PFRX.110 – PFRX.160 = 1500 pcs. per reel; PFRX.185 = 1000 pcs. per reel
.X = 2

AMMO-PACK: PFRX.110 – PFRX.160 = 1000 pcs. per reel; PFRX.185 = 500 pcs. per reel
.X = 3

## Product Dimensions

| Model | A | B | C | | D | E | Physical Characteristics | | |
|---|---|---|---|---|---|---|---|---|---|
| | Max. | Max. | Nom. | Tol. ± | Min. | Max. | Style | Lead | Material |
| PFRX.110.X | 13.0 | 18.0 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |
| PFRX.135.X | 14.5 | 19.6 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |
| PFRX.160.X | 16.3 | 21.3 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |
| PFRX.185.X | 17.8 | 22.9 | 5.1 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |
| PFRX.250 | 21.3 | 26.4 | 10.2 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |
| PFRX.300 | 24.9 | 30.0 | 10.2 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |
| PFRX.375 | 28.4 | 33.5 | 10.2 | 0.7 | 7.6 | 3.1 | 1 | 0.81 dia. | Sn/Cu |

DIMENSIONS = MM

## Thermal Derating Chart - $I_{hold}$ (Amps)

| Part No. | Ambient Operating Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40˚C | -20˚C | 0˚C | 23˚C | 40˚C | 50˚C | 60˚C | 70˚C | 85˚C |
| PFRX.110.X | 1.71 | 1.50 | 1.31 | 1.10 | 0.89 | 0.79 | 0.69 | 0.59 | 0.44 |
| PFRX.135.X | 2.09 | 1.84 | 1.61 | 1.35 | 1.09 | 0.97 | 0.85 | 0.73 | 0.54 |
| PFRX.160.X | 2.48 | 2.18 | 1.90 | 1.60 | 1.30 | 1.15 | 1.01 | 0.86 | 0.64 |
| PFRX.185.X | 2.87 | 2.52 | 2.20 | 1.85 | 1.50 | 1.33 | 1.17 | 1.00 | 0.74 |
| PFRX.250 | 3.88 | 3.40 | 2.98 | 2.50 | 2.03 | 1.80 | 1.58 | 1.35 | 1.00 |
| PFRX.300 | 4.65 | 4.08 | 3.57 | 3.00 | 2.43 | 2.16 | 1.89 | 1.62 | 1.20 |
| PFRX.375 | 5.81 | 5.10 | 4.46 | 3.75 | 3.04 | 2.70 | 2.36 | 2.03 | 1.50 |

## How to Order

PF RX . 110 . X

Product Designator

Style

RX = Radial Leaded Component

Hold Current, $I_{hold}$
110-375 (1.10 Amps - 3.75 Amps)

blank = Bulk Packaging
.2 = Tape and Reel*
.3 = Ammo-Pak*

*Packaged per EIA 486-B

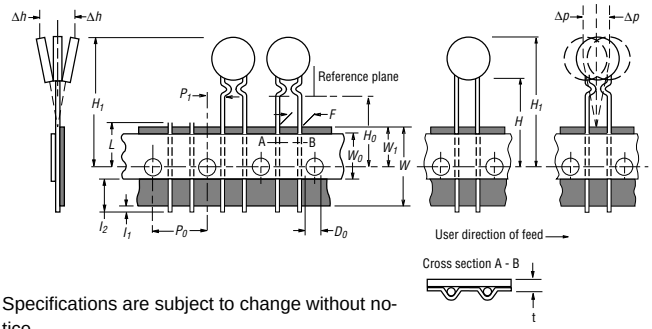
Schurter's resettable fuses cross to many like products already on the market. See our online cross list at www.schurterinc.com/cross.htm

# PFRX Tape and Reel Specifications

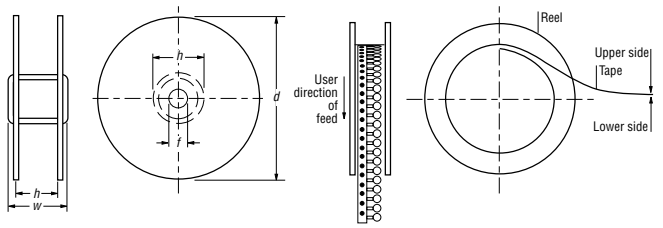
Devices taped using EIA468–B/IEC286-2 standards. See table below and Figures 1 and 2 for details.

| Dimension Description | IEC Mark | EIA Mark | Dimensions Dim. (mm) | Tol. (mm) |
|---|---|---|---|---|
| Carrier tape width | *W* | *W* | 18 | -0.5/+1.0 |
| Hold down tape width | | *W4* | 5 | min. |
| Hold down tape | *W0* | | No protrusion | |
| Top distance between tape edges | *W2* | *W6* | 3 | max. |
| Sprocket hole position | *W1* | *W5* | 9 | -0.5/+0.75 |
| Sprocket hole diameter | *D0* | *D0* | 4 | ± 0.2 |
| Abscissa to plane (straight lead) | *H* | *H* | 18.5 | ± 3.0 |
| Abscissa to plane (kinked lead) | *H0* | *H0* | 16 | ± 0.5 |
| Abscissa to top | *H1* | *H1* | 32.2 | max. |
| Overall width w/lead protrusion | | *C1* | 43.2 | max. |
| Overall width w/o lead protrusion | | *C2* | 42.5 | max. |
| Lead protrusion | *I1* | *L1* | 1.0 | max. |
| Protrusion of cutout | *L* | *L* | 11 | max. |
| Protrusion beyond hold tape | *I2* | *I2* | Not specified | |
| Sprocket hole pitch | *P0* | *P0* | 12.7 | ± 0.3 |
| Pitch tolerance | | | 20 seconds | ± 1 |
| Device pitch: PFRX.110 – PFRX.160 | | | 12.7 | |
| Device pitch: PFRX.185 – PFRX.375 | | | 25.4 | |
| Tape thickness | *t* | *t* | 0.9 | max. |
| Tape thickness with splice | | *t1* | 2.0 | max. |
| Splice sprocket hole alignment | | | 0 | ± 0.3 |
| Body lateral deviation | $\Delta h$ | $\Delta h$ | 0 | ± 1.0 |
| Body tape plane deviation | $\Delta p$ | $\Delta p$ | 0 | ± 1.3 |
| Lead seating plane deviation | $\Delta P1$ | *P1* | 0 | ± 0.7 |
| Lead spacing | *F* | *F* | 5.08 | ± 0.8 |
| Reel width | *w* | *w* | 56 | max. |
| Reel diameter | *d* | *a* | 370 | max. |
| Space between flanges less device | | | 4.75 | ± 3.25 |
| Arbor hole diameter | *f* | *c* | 26 | ± 12.0 |
| Core diameter | *h* | *n* | 80 | max. |
| Box | | | 56/372/372 | max. |
| Consecutive missing places | | | 3 maximum | |
| Empty places per reel | | | Not specified | |

Taped Component Dimensions



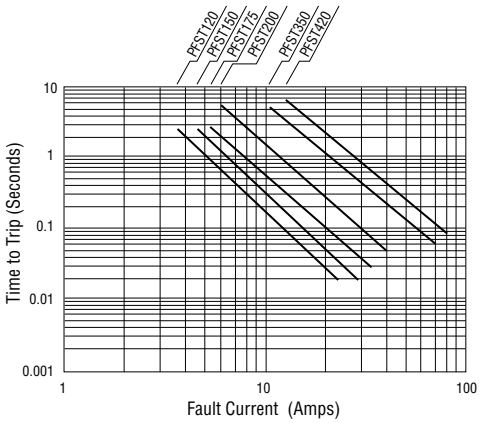

Reel Dimensions

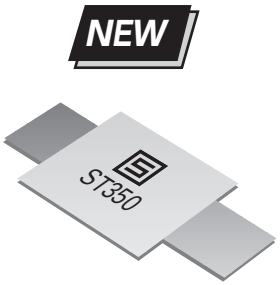



Specifications are subject to change without notice.

# PFST Polymeric PTC Resettable Fuse - Strap

Typical Time to Trip at 23˚C



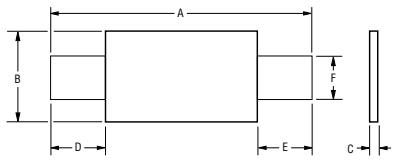

- Fully compatible with current industry standards
- Weldable nickel terminals
- Very low internal resistance
- Applications: Rechargable Battery Pack Protection

**Approvals*:**

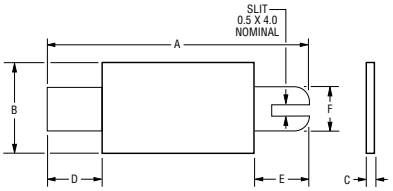
| | |
|---|---|
| UL | recognition, file #E172175 (1.2A - 1.75A/15V; 2A - 3.5A/30V) |
| CSA | acceptance, file #CA702083 (1.2A - 1.75A/15V; 2A - 4.2A/30V) |
| TÜV | certification, file #R9872200 |

* rated amps at hold current $I_{hold}$

**Standard Package**

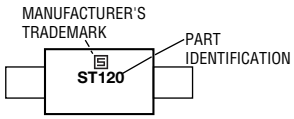



**"S" Package**




Typical Part Marking

Represents total content. Layout may vary.




| Technical Data | | |
|---|---|---|
| Operating/Storage Temperature | -40°C to +85°C | |
| Maximum Device Surface Temperature in Tripped State | 125°C | |
| Passive Aging | +85°C, 1000 hours | ±5% typical resistance change |
| Humidity Aging | +85°C, 85% R.H. 1000 hours | ±5% typical resistance change |
| Thermal Shock | +125°C/-40°C 10 times | ±10% typical resistance change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |

| Test Procedures And Requirements | | |
|---|---|---|
| Test | Test Conditions | Accept/Reject Criteria |
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23°C | Rmin ≤ R ≤ Rma |
| Time to Trip | At specified current, max. 23°C | T ≤ max. time to trip (seconds) |
| Hold Current | 30 min. at Ihold | No trip |
| Trip Cycle Life | Vmax, Imax, 100 cycles | No arcing or burning |
| Trip Endurance | Vmax, 48 hours | No arcing or burning |

Product Dimensions

| Model | A | | B | | C | | D | | F | | Material |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| PFST.120 | 19.9 | 22.1 | 4.9 | 5.2 | 0.6 | 1.0 | 5.5 | 7.5 | 3.9 | 4.1 | Nickel |
| PFST.120S | 19.9 | 22.1 | 4.9 | 5.2 | 0.6 | 1.0 | 5.5 | 7.5 | 3.9 | 4.1 | Nickel |
| PFST.150 | 21.3 | 23.4 | 10.2 | 11.0 | 0.5 | 1.1 | 4.1 | 5.5 | 4.8 | 5.4 | Nickel |
| PFST.175 | 20.9 | 23.1 | 4.9 | 5.2 | 0.6 | 1.0 | 4.1 | 5.5 | 3.9 | 4.1 | Nickel |
| PFST.175S | 20.9 | 23.1 | 4.9 | 5.2 | 0.6 | 1.0 | 4.1 | 5.5 | 3.9 | 4.1 | Nickel |
| PFST.200 | 21.3 | 23.4 | 10.2 | 11.0 | 0.5 | 1.1 | 5.0 | 7.6 | 4.8 | 5.4 | Nickel |
| PFST.350 | 28.4 | 31.8 | 13.0 | 13.5 | 0.5 | 1.1 | 6.3 | 8.9 | 6.0 | 6.6 | Nickel |
| PFST.420 | 30.6 | 32.4 | 12.9 | 13.6 | 0.5 | 1.1 | 5.0 | 7.5 | 6.0 | 6.7 | Nickel |

DIMENSIONS = MM

# PFST Technical Data, continued

Electrical Characteristics

| Model | V max. Volts | I max. Amps | $I_{hold}$ | $I_{trip}$ | Initial Resistance | | 1 Hour ($R_1$) Post-Trip Resistance | Max. Time To Trip at 5*$I_h$ | Tripped Power Dissipation |
|---|---|---|---|---|---|---|---|---|---|
| | | | Amperes at 23°C | | Ohms at 23°C | | Ohms at 23°C | Seconds at 23°C | Watts at 23°C |
| | | | Hold | Trip | Min. | Max. | Max. | | |
| PFST.120 | 15 | 100 | 1.20 | 2.7 | 0.085 | 0.160 | 0.22 | 5.0 | 1.2 |
| PFST.120S | 15 | 100 | 1.20 | 2.7 | 0.085 | 0.160 | 0.22 | 5.0 | 1.2 |
| PFST.150 | 15 | 100 | 1.50 | 3.00 | 0.05 | 0.09 | 0.11 | 5.0 | 1.30 |
| PFST.175 | 15 | 100 | 1.75 | 3.8 | 0.05 | 0.09 | 0.120 | 4.0 | 1.5 |
| PFST.175S | 15 | 100 | 1.75 | 3.8 | 0.05 | 0.09 | 0.120 | 4.0 | 1.5 |
| PFST.200 | 30 | 100 | 2.00 | 4.4 | 0.03 | 0.06 | 0.080 | 4.0 | 1.90 |
| PFST.350 | 30 | 100 | 3.50 | 6.3 | 0.017 | 0.031 | 0.040 | 3.0* | 2.50 |
| PFST.420 | 30 | 100 | 4.20 | 7.6 | 0.012 | 0.024 | 0.040 | 6.0* | 2.90 |

*Tested at 20.0 Amps

All models packaged loose.
Optional slotted leads (.S) available for 1.20 A and 1.75 A ratings

Thermal Derating Chart - $I_{hold}$ (Amps)

| Model | Ambient Operating Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40˚C | -20˚C | 0˚C | 23˚C | 40˚C | 50˚C | 60˚C | 70˚C | 85˚C |
| PFST.120 | 1.9 | 1.7 | 1.5 | 1.2 | 1.0 | 0.9 | 0.8 | 0.7 | 0.5 |
| PFST.120S | 1.9 | 1.7 | 1.5 | 1.2 | 1.0 | 0.9 | 0.8 | 0.7 | 0.5 |
| PFST.150 | 2.2 | 2.0 | 1.8 | 1.5 | 1.3 | 1.1 | 1.0 | 0.9 | 0.7 |
| PFST.175 | 2.5 | 2.3 | 2.0 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 0.9 |
| PFST.175S | 2.5 | 2.3 | 2.0 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 0.9 |
| PFST.200 | 3.2 | 2.8 | 2.5 | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 0.9 |
| PFST.350 | 5.4 | 4.8 | 4.3 | 3.5 | 3.0 | 2.8 | 2.5 | 2.2 | 1.7 |
| PFST.420 | 6.4 | 5.7 | 5.1 | 4.2 | 3.6 | 3.3 | 3.0 | 2.6 | 2.1 |

**How To Order**

**PF ST . 120 . S**

Product Designator

Style

ST = Axial Leaded “Strap” Component

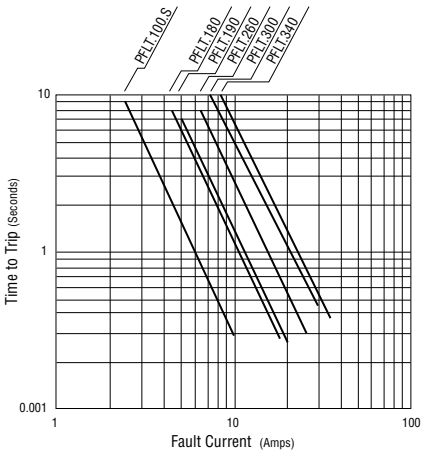
Hold Current, $I_{hold}$
120-420 (1.20 Amps - 4.20 Amps)

Slotted Lead Option
(.120S and .175S only)

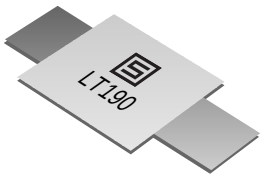
Schurter’s resettable fuses cross to many like products already on the market.
See our online cross list at www.schurterinc.com/cross.htm

# PFLT Polymeric PTC Resettable Fuse - Axial Leaded

Typical Time to Trip at 23˚C




NEW



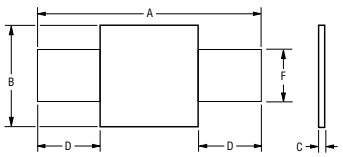

- Fully compatible with current industry standards
- Weldable nickel terminals
- Very low internal resistance
- Applications: Any application that requires extra protection at elevated ambient temperatures, which the 100ºC trip temperature provides, including rechargeable battery pack protection, cellular phones, laptop computers

**Approvals:**

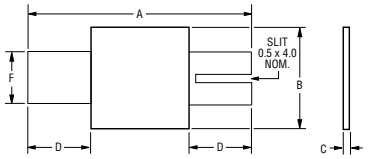
| | |
|---|---|
| UL | recognition, file #E172175 |
| CSA | acceptance, file #CA702083 |
| TÜV | certification, file #R9872200 |

PFLT models offer trip temperatures lower than PFST models for extra protection at elevated temperatures.

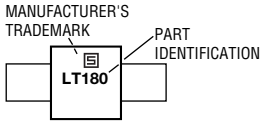
Standard Package




"S" Package




Typical Part Marking
Represents total content. Layout may vary.




| Technical Data | | |
|---|---|---|
| Operating/Storage Temperature | -40°C to +85°C | |
| Maximum Device Surface Temperature in Tripped State | 125°C | |
| Passive Aging | +85°C, 1000 hours | ±5% typical resistance change |
| Humidity Aging | +85°C, 85% R.H. 1000 hours | ±5% typical resistance change |
| Thermal Shock | +125°C/-40°C 10 times | ±10% typical resistance change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A | No change |

| Test Procedures And Requirements | | |
|---|---|---|
| Test | Test Conditions | Accept/Reject Criteria |
| Visual/Mech. | Verify dimensions and materials | Per PF physical description |
| Resistance | In still air @ 23°C | Rmin ≤ R ≤ Rmax |
| Time to Trip | At specified current, 23°C | T ≤ max. time to trip (seconds) |
| Hold Current | 30 min. at Ihold | No trip |
| Trip Cycle Life | Vmax, Imax, 100 cycles | No arcing or burning |
| Trip Endurance | Vmax, 48 hours | No arcing or burning |

Product Dimensions

| Model | A | | B | | C | | D | | F | | Package Style |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | |
| PFLT.100.S | 20.9 | 23.1 | 4.9 | 5.2 | 0.6 | 1.0 | 4.1 | 5.5 | 3.9 | 4.1 | S |
| PFLT.180 | 24.0 | 26.0 | 4.9 | 5.2 | 0.6 | 1.0 | 4.1 | 5.5 | 3.9 | 4.1 | Std. |
| PFLT.180.S | 24.0 | 26.0 | 4.9 | 5.2 | 0.6 | 1.0 | 4.1 | 5.5 | 3.9 | 4.1 | S |
| PFLT.190 | 21.3 | 23.4 | 10.2 | 11.0 | 0.5 | 1.1 | 5.0 | 7.6 | 4.8 | 5.4 | Std. |
| PFLT.260 | 24.0 | 26.0 | 10.8 | 11.9 | 0.6 | 1.0 | 5.0 | 7.0 | 5.9 | 6.1 | Std. |
| PFLT.300 | 28.4 | 31.8 | 13.0 | 13.5 | 0.5 | 1.1 | 6.3 | 8.9 | 6.0 | 6.6 | Std. |
| PFLT.340 | 24.0 | 26.0 | 14.8 | 15.9 | 0.6 | 1.0 | 4.0 | 5.0 | 5.9 | 6.1 | Std. |

DIMENSIONS = MM

# PF LT Technical Data, continued

Electrical Characteristics

| Model | V max. Volts | I max. Amps | $I_{hold}$ | $I_{trip}$ | Initial Resistance | | 1 Hour ($R_1$) Post-Trip Resistance | Max. Time To Trip at 5*$I_h$ | Tripped Power Dissipation |
|---|---|---|---|---|---|---|---|---|---|
| | | | Amperes at 23°C | | Ohms at 23°C | | Ohms at 23°C | Seconds at 23°C | Watts at 23°C |
| | | | Hold | Trip | Min. | Max. | Max. | | |
| PFLT.100.S | 24 | 100 | 1.0 | 2.5 | 0.070 | 0.130 | 0.260 | 7.0 | 1.5 |
| PFLT.180 | 24 | 100 | 1.8 | 3.8 | 0.040 | 0.068 | 0.120 | 2.9 | 2.0 |
| PFLT.180.S | 24 | 100 | 1.8 | 3.8 | 0.040 | 0.068 | 0.120 | 2.9 | 2.0 |
| PFLT.190 | 24 | 100 | 1.9 | 4.2 | 0.030 | 0.057 | 0.100 | 3.0 | 1.9 |
| PFLT.260 | 24 | 100 | 2.6 | 5.2 | 0.025 | 0.042 | 0.076 | 5.0 | 2.3 |
| PFLT.300 | 24 | 100 | 3.0 | 6.3 | 0.015 | 0.031 | 0.055 | 4.0 | 2.0 |
| PFLT.340 | 24 | 100 | 3.4 | 6.8 | 0.016 | 0.027 | 0.050 | 5.0 | 2.7 |

All models packaged loose. Optional slotted leads (.S) available for 1A and 1.8A ratings.

Thermal Derating Chart - $I_{hold}$ (Amps)

| Model | Ambient Operating Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40°C | -20°C | 0°C | 23°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| PFLT.100.S | 1.8 | 1.6 | 1.4 | 1.0 | 0.8 | 0.7 | 0.6 | 0.4 | 0.2 |
| PFLT.180 | 3.1 | 2.6 | 2.2 | 1.8 | 1.3 | 1.1 | 0.9 | 0.6 | 0.2 |
| PFLT.180.S | 3.1 | 2.6 | 2.2 | 1.8 | 1.3 | 1.1 | 0.9 | 0.6 | 0.2 |
| PFLT.190 | 3.3 | 2.8 | 2.4 | 1.9 | 1.4 | 1.2 | 1.1 | 0.7 | 0.4 |
| PFLT.260 | 4.3 | 3.7 | 3.1 | 2.6 | 1.9 | 1.6 | 1.4 | 1.1 | 0.6 |
| PFLT.300 | 5.1 | 4.4 | 3.7 | 3.0 | 2.3 | 1.9 | 1.6 | 1.2 | 0.6 |
| PFLT.340 | 5.5 | 4.7 | 4.0 | 3.4 | 2.6 | 2.2 | 1.9 | 1.5 | 0.8 |

**How To Order**

**PF LT.100. S**

Product Designator

Style

LT = Low Temperature Axial Leaded "Strap" Component

Hold Current, $I_{hold}$
100-340 (1.00 Amps - 3.40 Amps)

Slotted Lead Option
(100.s and 180.s only)

Schurter's resettable fuses cross to many like products already on the market.
See our online cross list at www.schurterinc.com/cross.htm

# About Non-Resettable Fuses

## How to Specify Fuses:

The safety of electronic and electric equipment not only depends upon the use of shock-safe primary circuit components (fuseholders, voltage selector switches, power entry modules, etc.) designed primarily for the protection of service personnel, but also on devices protecting the safe operation of the equipment itself. Since in many cases fuses are the only means of providing circuit protection in the event of overloads or fault conditions, we suggest the following considerations be observed when fuses are being selected.

## 1. Fuse Standards

There are three principal standards a fuse can be designed to:
1) UL 248-14 2) CSA 22.2 No. 59 3) IEC 127

Please note that these standards may not necessarily be compatible with each other. The main difference between the various standards are as follows:

- different blowing characteristics between UL/CSA and IEC standards
- different temperature rise requirements between UL and CSA standards

The incompatibility of these standards makes it impossible to use one and the same fuse across the world in a given application. Attention needs to be given to the fact that the governing Standard in Europe is IEC. Observation of this fact in the early design stage will save trouble and confusion during the agency approval process. Note: new fuse qualifications have been established for low-voltage fuses; reference EIA/IS-722.

## 2. Approval Agencies

National approval agencies which approve miniature type fuses conforming to either UL, CSA, or IEC standards are: UL (USA), CSA (Canada), VDE (Germany), SEMKO (Sweden), BSI (United Kingdom). It is important to understand that UL and CSA not only write standards but also issue conformance approvals. IEC, however, limits itself to writing the standards. Conformance with these IEC standards is tested by VDE, SEMKO, and BSI.

A UL approved fuse will either bear the listing (UL) or the recognized mark. A listed fuse meets all the requirements of fuse Standard UL 248-14. A fuse with the recognition mark is tested under the Component Program of UL to the fuse manufacturer's own specifications.

CSA now has an equivalent to the Recognized Component Program of UL: CSA Component Acceptance (SP). As far as fuse size is concerned, UL and CSA accept a wide range of dimensions (including the 5 x 20mm size, notably with UL/CSA blowing characteristics!) IEC has standardized around the 5 x 20mm size (notably with IEC blowing characteristics!). The only other size in IEC's document is the 1/4 x 1 1/4" fuse (only in quick acting, low breaking capacity configuration).

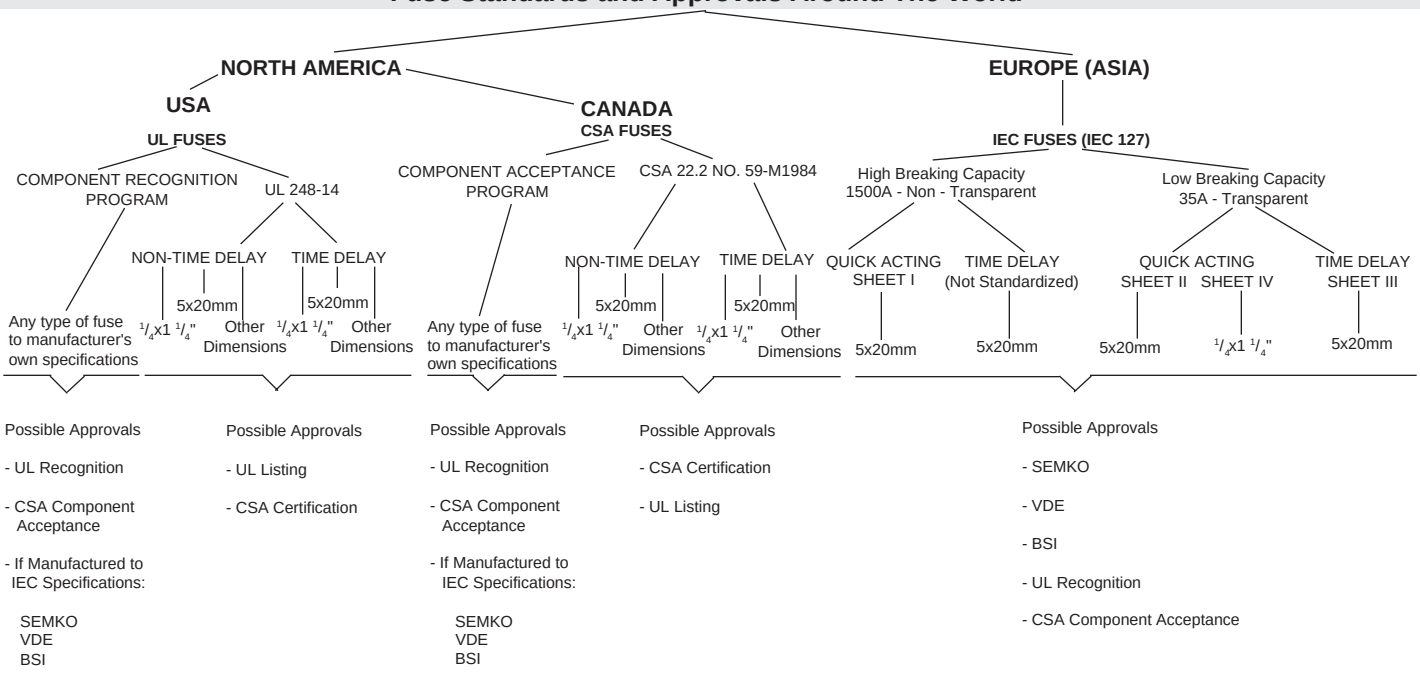
Because of overlapping dimensions between the various standards, caution has to be used when trying to categorize or identify a 5 x 20mm or 1/4 x 1 1/4" fuses. The chart below summarizes the aforementioned.

IMPORTANT: All CENELEC (European Committee for Electronic Standards) countries, including EC and EFTA nations, require a high-breaking capacity fuse-link, if the short circuit current through the fuse-link is more than 35A or 10 x $I_n$, whichever is greater, effective January 1st, 1993. Please refer to Series SP (pg. 145) and SPT (pg. 148).

## 3. Rated Current

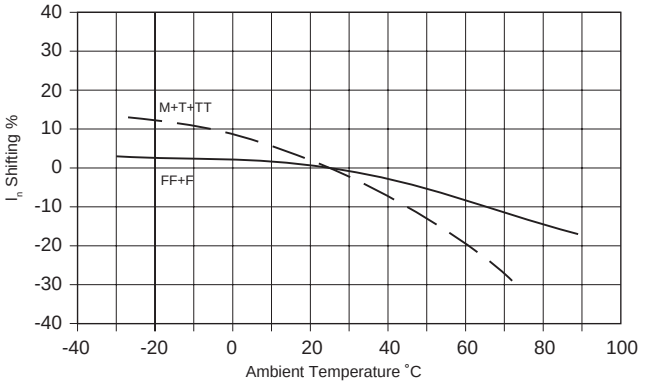
The rated current of the fuse should be in accordance with the operating current of the equipment to be protected. Consideration

### Fuse Standards and Approvals Around The World



## About Non-Resettable Fuses, continued

needs to be given to the fact that the current carrying capacity of a fuse is affected by changes in ambient temperature. IEC and UL/CSA tests are performed at 23˚C and 25˚C respectively. In practical applications the fuse's ambient temperature may be significantly higher, especially if the fuse is used in an enclosed type fuseholder or mounted near other heat generating components. The effect of changes in the ambient temperature is shown in the chart below.




In addition to the effect of ambient temperature conditions, it is recommended to also de-rate UL listed fuses by approximately 25% of the original current ratios. This is, however, not required for IEC fuses (See Para. 10).

### 4. Rated Voltage

The rated voltage of the fuse should be in no case lower than the operating voltage. At low operating voltage, the inherent resistance must be considered.

Please note that UL and CSA require the use of 250V rated fuses in Power Entry Modules.

### 5. Breaking Capacity/Short Circuit Rating

The breaking capacity is the short-circuit current which the fuse can break at the rated voltage under the advanced conditions without being destroyed or causing permanent arcing.

Under IEC, miniature type fuses are classified into two categories:

**Fuses with Low Breaking Capacity**
Typically, the fuse-element of a fuse with low breaking capacity is visible. The insulation tube consists of transparent material, normally glass. There is no extinguishing medium, the arc is quenched in air. The breaking capacity at 250 V and a power factor of 1 is 35 A.

**Fuses with High Breaking Capacity**
The fuse-element of a fuse with high breaking capacity is not visible. The insulation tube normally is of ceramic material or glass. To quench the arc, there is always an extinguishing medium. The breaking capacity at 250 V and a power factor of .7 to .8 is 1500 A.

UL's and CSA's short circuit requirements are similar, but different as relates to IEC. At 125 V a UL listed fuse has to interrupt 10,000 Amps AC, whereas at 250 V the range may vary from 35 Amps up to 1500 Amps depending on the specific current rating of the fuse.

### 6. Breaking Characteristic

The breaking characteristic is shown in the respective time-current blowing charts for each fuse type. The breaking characteristic is the melting time of a fuse given a defined load. The melting time is a function of the fuse wire length and diameter as well as its base material and alloy.

IEC fuses are classified as follows:

Quick-Acting Fuses
Application: Protection of semiconductors and for very sensitive instruments. This fuse type tolerates small overcurrents for a short period of time but breaks very quickly at higher current values. It limits short circuit currents at a very early stage.

Time-Lag Fuses
Application: Protection of devices subjected to moderate to high in-rush currents and/or overcurrent peaks, such as transformers and motors. This type of fuse also tolerates higher overcurrents during a short period of time.

UL/CSA fuses are divided into:

Non Time Delay Fuses
These fuses are sometimes also referred to as Normal Blow types.

Time Delay Fuses
These fuses are sometimes also referred to as Slow Blow or Surge Proof types.

For certain applications neither of the above described types may prove usable. Since the writing of Standards by IEC/UL/CSA does not always keep pace with the latest technological advances various fuse manufacturers have developed fuses outside the realm of such standards.

Generally the agencies allow the use of such fuses if a particular application dictates it. The OEM's risks are that it has to rely on manufacturer's own specifications that are not routinely checked by a safety agency. Schurter offers the following use types for such purposes:

Super Quick-Acting Fuses
Application: Protection of semiconductors at the base of S1 and GE (thyristors, triacs, diodes). This fuse type tolerates small overcurrents only during a short period of time and limits the current at small short-circuit currents.

Medium Time-Lag Fuses
Applications: Protection devices subjected to moderate to high in-rush currents and/or overcurrent peaks, such as transformers and motors. This fuse type also tolerates higher overcurrents during a short period of time. Due to its conformance with DIN Standard 41571, this fuse is widely used in Germany; mainly in government related applications.

Super Time-Lag Fuses
Application: Protection of devices subjected to longer lasting in-rush currents and/or high overcurrent peaks like transformers and motors. This type tolerates higher overcurrents during a longer period of time.

## About Non-Resettable Fuses, continued

### 7. Blowing Charts and Tables

This catalog differentiates between two types of blowing charts and tables: IEC and UL/CSA. Proper understanding of these differences is essential when one tries to match the fuse characteristics to the circuit requirements.

a) Chart and Table for IEC fuses: This chart is an interval graph showing a curve representing the minimum blowing times and another curve representing maximum values for a set of current ratings. The tables give the checkpoints or “gates” mandated by IEC. Please note that only the gate values are tested by the agencies. Values on the curve between two gates are geometrically arrived at and are not guaranteed by the manufacturer.

b) Chart and Table for UL/CSA listed fuses: The curves for this graph represent average values, individually for each current rating.

### 8. Fusing Integral $I^2t$

The fusing integral is the thermal energy needed to melt the fuse-element. The fusing integral $I^2t$ is used to determine:

- the blowing time for higher overcurrents
- the aging behavior of a fuse caused by in-rush currents.

The formula given below is only valid for blowing periods of less than 10 ms.

$$t = \frac{I^2t}{(\text{overcurrent})^2} = \text{seconds} + 20\%$$

To prevent aging caused by in-rush currents we recommend staying within the following limits:

| | |
|---|---|
| $I^2t$ of in-rush (to be determined by user) | less than 30% of fuse $I^2t$ for time delay fuses |
| | less than 40% of fuse $I^2t$ for normal blow fuses |

The proper selection of a fuse requires that attention be given to this subject. Often times a fuse problem can only be pinpointed after a thorough study of this issue.

### 9. Power Dissipation

Power dissipation heats up the fuse and its surroundings. Especially when selecting fuseholders, it is important to ensure that, allowing for the ambient temperature, they are capable of absorbing sufficient dissipated power. Please refer to the power dissipation sections on the individual fuse pages when selecting a fuse.

### 10. Specification of Characteristics

To quickly and easily classify the various fuse types by their time-current characteristics, the following letter codes are stamped on IEC, or other 5 x 20mm fuses.

| | | Letter Code |
|---|---|---|
| super quick-acting | = | FF |
| quick-acting | = | F |
| medium time-lag | = | M |
| time-lag | = | T |
| super time-lag | = | TT |

Example of fuse markings: T200 mA / 250 V

UL listed and CSA certified fuses are not as easily identifiable because neither any lettering nor color code is required on the fuse itself.

### 11. Dimensions

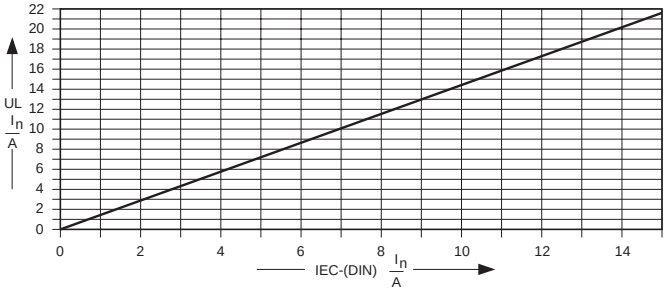
Traditionally the dimensions have been 5 x 20mm for international type fuses and $^1/_4$ x $1^1/_4$" (6.3 x 32mm) for domestic, Northern American fuses. Today however, IEC 5 x 20mm fuses with UL recognition and CSA Component Acceptance are becoming increasingly popular in North America, especially in applications where saving space is a major concern.

It should also be pointed out that the 5 x 20mm fuse is available at most over-the-counter distributors as well as radio supply shops in North America.

IEC fuses of the $^1/_4$ x $1^1/_4$" size should not be used in North America. These fuses were designed for replacement use in American made equipment located in Europe.

### 12. Interchangeability of IEC Fuses with UL Fuses and Vice Versa

For general applications the rated current of the fuse to be converted should be multiplied/divided by a factor 2 depending on whether the fuse has to be converted from the use in a 250V circuit to the use in a 125V circuit or vice versa. In this case, however, the fuse normally doesn't provide anything more than short current protection. For a more accurate correlation, the time current characteristic curves of both the IEC and UL fuse must be compared. As a rule of thumb, a factor of 2.4 to 2.6 can be used to convert an IEC fuse (used in a 250V circuit) into a UL fuse (used in a 125V circuit) with the corresponding characteristics (e.g. a 1 A IEC fuse corresponds to a 2.5 A UL fuse).




### 13. Quality Control

Details about Schurter’s strict quality control procedures are available upon request.
Should you need fuses for non-standard applications, please contact our Engineering Department.

Note: new fuse qualifications have been established for low-voltage fuses; reference EIA/IS-722.

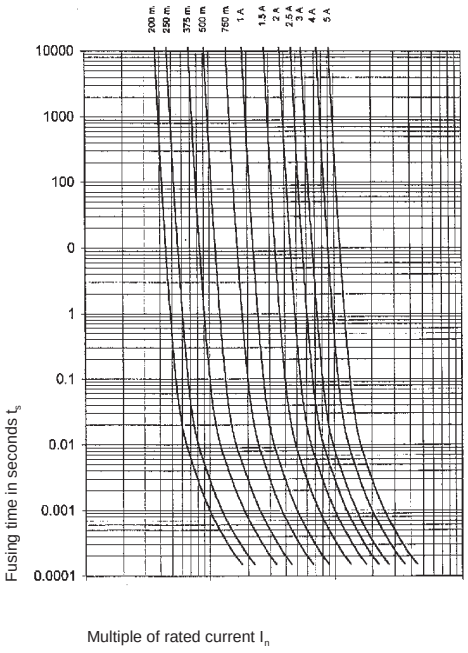
# MGA 125V 125V Quick-acting Surface Mount Fuse

Built according to EIASOCM-3216 (equivalent to 1206), meets EIA/IS-722 fuse qualification standard.

**Approvals:**

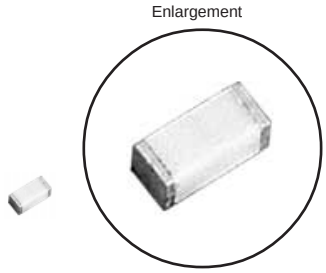
| | | | |
|---|---|---|---|
| UL | recognition | 200mA-3A[1)] | File #E153466 |
| CSA | acceptance | 200mA-3A[1)] | File #LR51172 |

1) 4A-5A approvals pending

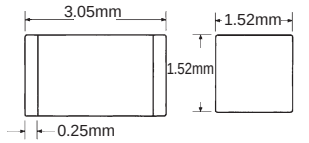



NEW

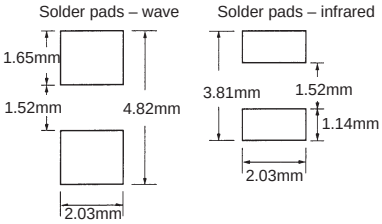
Enlargement



- "Flip chip" design mounts on any side
- Lowest resistance
- Quick-acting
- Hermetically sealed for operating temperatures in excess of 150˚C
- Low energy let-through
- Superior cycling




Note: dimensions are in mm




Reel diameter: 179mm (750 pieces & 3,000 pieces)

Time Current Characteristics

| rated current $I_n$ \ $n \cdot I_n$ | $I_n$ | $2.5 \cdot I_n$ |
|---|---|---|
| 200mA – 5A | ≥ 4 h | ≤ 5 s |

## Technical Data

| | |
|---|---|
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting |
| **Interrupt capacity** | 50 A AC, 300A DC |
| **Ambient temperature max.** | +150˚C |
| **Climatic category** | hermetically sealed |
| **Solderability** | reflow: 260˚C / 30 sec. max; wave: 260˚C / 10 sec. max. |
| **Soldering heat resistance** | 60 seconds above 200˚C, max. 260˚C |
| **Material: Housing** | ceramic |
| **Terminals** | nickel, tin-lead coated |
| **Packaging** | 8mm tape and reel per EIA-RS481 (equivalent to IEC 286-3) |

| Order Numbers – Standard<br>Series MGA 125V | Rated current / voltage<br>mA / A / V ~ | Breaking capacity<br>A ~<br>ac / dc | Voltage drop at In<br>typical mV | Resistance at 10% In<br>Ohms | Fusing Integral<br>typ. $A^2s$ | Packaging<br>Order No.Suffix |
|---|---|---|---|---|---|---|
| 3410.0021.XX | 200 mA / 125V | | 212 | 0.870 | 0.0013 | 100 pieces taped & |
| 3410.0022.XX* | 250 mA / 125V | | 176 | 0.632 | 0.0027 | bagged: .XX = .01 |
| 3410.0025.XX | 375 mA / 125V | | 140 | 0.320 | 0.0039 | |
| 3410.0027.XX | 500 mA / 125V | | 126 | 0.198 | 0.0066 | 750 pieces taped & |
| 3410.0029.XX | 750 mA / 125V | | 118 | 0.113 | 0.015 | reeled: .XX = .02 |
| 3410.0031.XX | 1 A / 125V | 50 A ac / | 135 | 0.096 | 0.0042 | |
| 3410.0033.XX | 1.5 A / 125V | 300A dc | 123 | 0.056 | 0.12 | 3,000 pieces taped |
| 3410.0035.XX | 2 A / 125V | | 117 | 0.039 | 0.20 | & reeled: .XX = .03 |
| 3410.0036.XX | 2.5 A / 125V | | 115 | 0.0295 | 0.35 | |
| 3410.0037.XX | 3 A / 125V | | 112 | 0.0235 | 0.55 | 10,000 pieces taped |
| 3410.0140.XX | 4 A / 32V† | | 110 | 0.0163 | 0.85 | & reeled: .XX = .04 |
| 3410.0141.XX | 5 A / 32V† | | 108 | 0.0125 | 1.0 | |

All ratings measured at 125V, ambient temperature 25˚C +/-3˚C

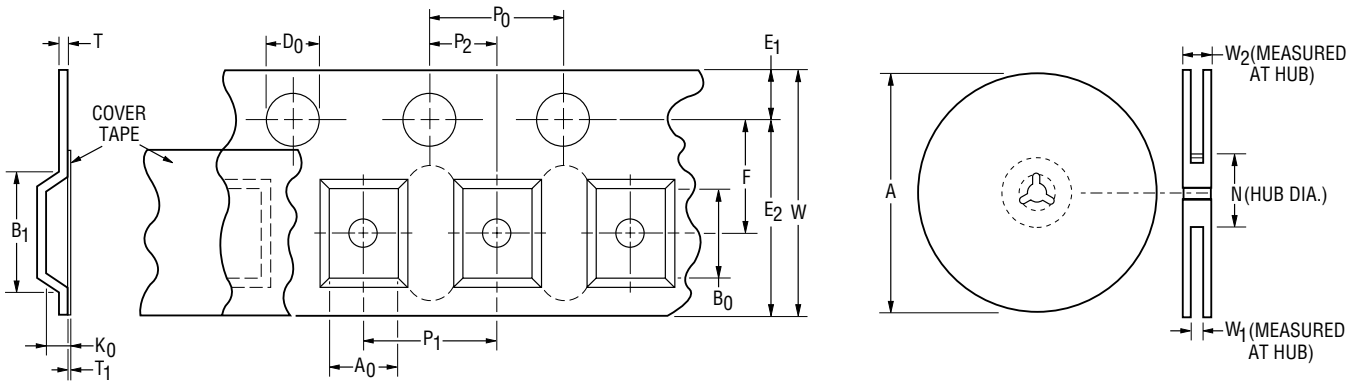
* meets UL 1459/1950

† 4A/63V = 3410.0240.XX
6A/63V = 3410.0241.XX

# MGA Tape and Reel Specifications

| Tape Dimension Identifiers | MGA per EIA 481-1 |
|---|---|
| W | 8 ± 0.3 |
| $P_0$ | 4.0 ± 0.10 |
| $P_1$ | 4.0 ± 0.10 |
| $P_2$ | 2.0 ± 0.05 |
| $A_0$ | 1.91 ± 0.1 |
| $B_0$ | 3.56 ± 0.1 |
| $B_1$ max. | 4.35 |
| $D_0$ | 1.5 + 0.1/ -0 |
| F | 3.5 ± 0.05 |
| $E_1$ | 1.75 ± 0.10 |
| $E_2$ min. | 6.25 |
| T max. | 0.6 |
| $T_1$ max. | 0.1 |
| $K_0$ | 1.65 ± 0.1 |
| Leader min. | 390 |
| Trailer min. | 160 |
| **Reel Dimension Identifiers** | |
| A max. | 330 |
| N min. | 50 |
| $W_1$ | 8.4 + 1.5/ -0 |
| $W_2$ max. | 14.4 |

DIMENSIONS: MM




Specifications are subject to change without notice.

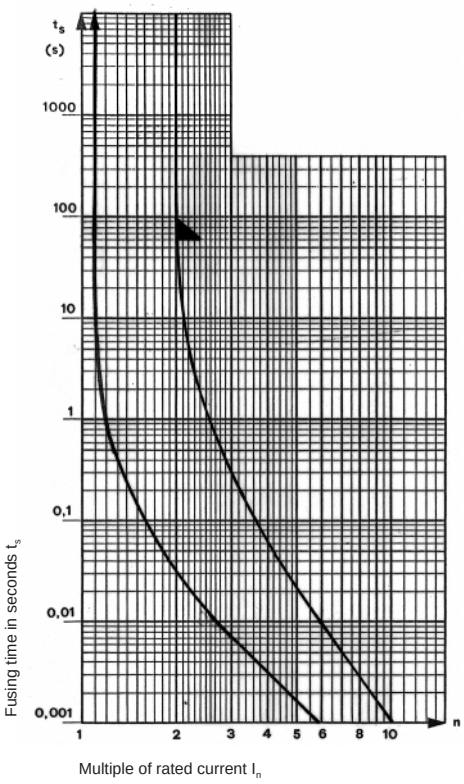
SUPRA FUSE CHIPGUARD

## SFP 63V Super Quick-acting Surface Mount Fuse and Fuse Clips

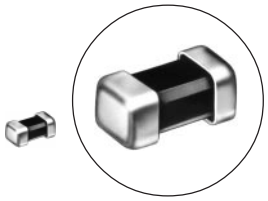
Built according to UL 248-14 (formerly 198G) and CSA C22.2 no. 248.14 (formerly 59.2M). U.S. patent pending.

**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 1A - 5A | File #E41599/39328 |
| CSA | certification | 1A - 5A | File #LR51172/38456 |




Enlargement



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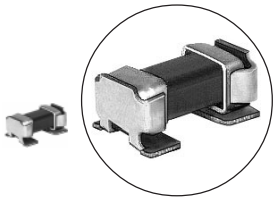
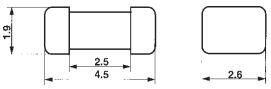
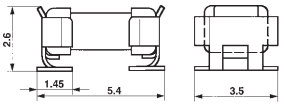


Without fuse clips

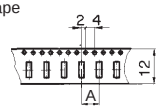



With fuse clips




Solder pads

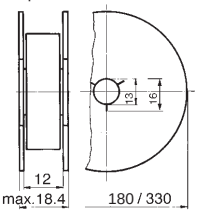

Tape




A = 4mm without fuse clips
8mm with fuse clips

according to IEC 286-3

Spool




Time Current Characteristics

| rated current $I_n$ \ $n \cdot I_n$ | $1 \cdot I_n$ | $2 \cdot I_n$ |
|---|---|---|
| 1A - 5A | ≥ 4 h | ≤ 60 s |

### Technical Data

| | |
|---|---|
| **Rated voltage $U_n$** | 63V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | super quick-acting, see chart for values |
| **Breaking capacity** | 50A/63V AC/DC p.f.1 |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. $T_{amb}$** | -40˚C to +125˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz, resp. acceleration 100 m/s² according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 m/s², 6 ms, according to IEC 68-2-27, Test Ea |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability: reflow and wave soldering for suprafuse<br>reflow soldering only for suprafuse with clips** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing<br>End caps** | temperature resistant plastic (UL 94V-0)<br>brass, gold-plated |
| **Net weight** | 5 g suprafuse; 6.5 g suprafuse with clips |

| **Order Numbers**<br>**Series SFP 63V** | **Rated current / voltage**<br>**A / V** | **Voltage drop at $I_n$**<br>**typical mV** | **Power dissipation at $I_n$**<br>**typical Watts** | **Fusing integral $I^2t$ at 10 • $I_n$**<br>**typical $A^2$ s** | **Packaging**<br>**Order Number Suffix** |
|---|---|---|---|---|---|
| 3405.2207.XX | 1 A / 63V | 120 | 0.11 | 0.10 | Without fuse clips: * |
| 3405.2208.XX | 1.25 A / 63V | 120 | 0.13 | 0.18 | 100 pcs taped & reeled: .XX = .10 |
| 3405.2209.XX | 1.5 A / 63V | 120 | 0.19 | 0.25 | 2,000 pcs taped & reeled: .XX = .11 |
| 3405.2210.XX | 2 A / 63V | 95 | 0.19 | 0.50 | 8,000 pcs taped & reeled: .XX = .12 |
| 3405.2211.XX | 2.5 A / 63V | 80 | 0.20 | 0.60 | With fuse clips: * |
| 3405.2212.XX | 3 A / 63V | 80 | 0.24 | 0.90 | 100 pcs taped & reeled: .XX = .20 |
| 3405.2213.XX | 3.5 A / 63V | 75 | 0.26 | 1.20 | 750 pcs taped & reeled: .XX = .25 |
| 3405.2214.XX | 4 A / 63V | 70 | 0.30 | 1.60 | 3,000 pcs taped & reeled: .XX = .26 |
| 3405.2215.XX | 5 A / 63V | 65 | 0.33 | 2.50 | * smaller quantities available taped, in bag |

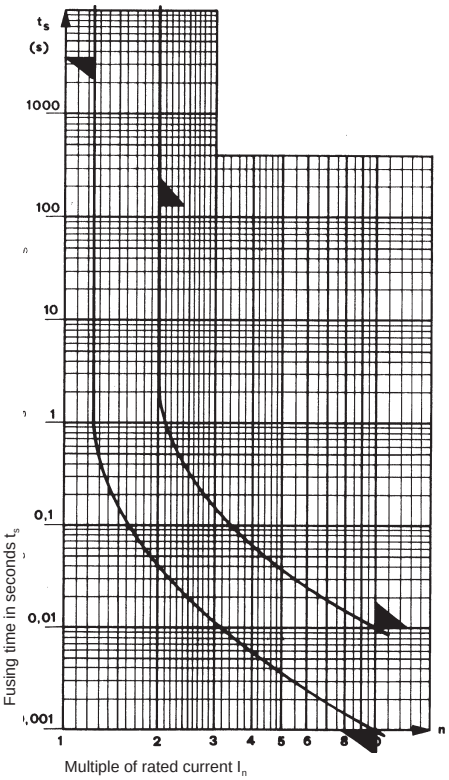
SUPRA FUSE CLASSIC

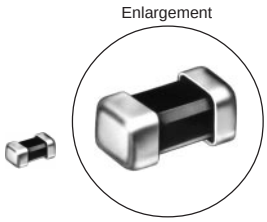
# SFC 63V Quick-acting Surface Mount Fuse and Fuse Clips

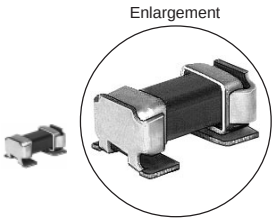
Built according to IEC 127-4/2; EN 60127-4/2; UL 248-14 (formerly 198G) and CSA C22.2 no. 248.14 (formerly 59.2M). U.S. patent pending.

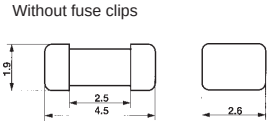
**Approvals:**

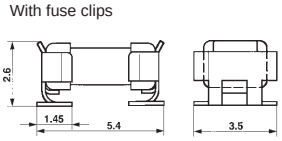
UL recognition 800mA-4A File #E41599/39328
CSA certification 800mA-4A File #LR51172/38456
* VDE approvals 800mA–1.25A and 2.5A only for version without clip

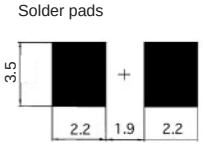


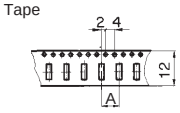



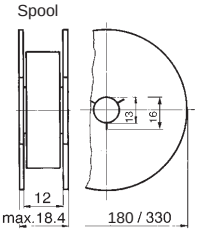




A = 4mm without fuse clips
8mm with fuse clips

according to IEC 286-3




Time Current Characteristics

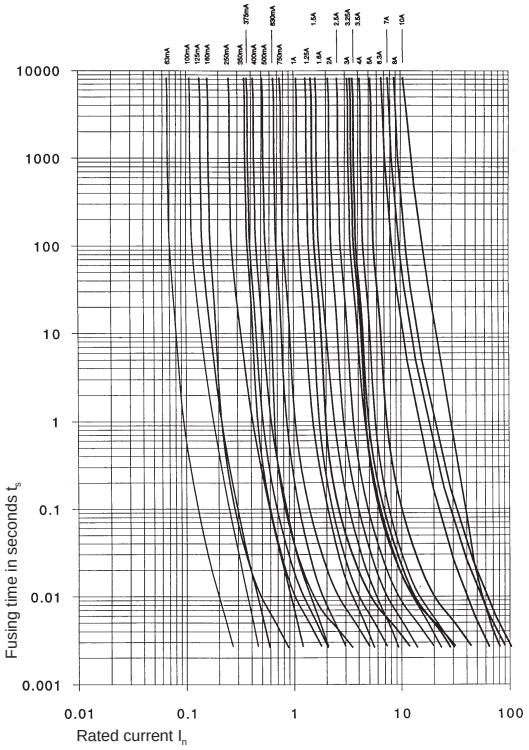
| n • $I_n$ / rated current $I_n$ | 1.25 • $I_n$ | 2 • $I_n$ | 10 • $I_n$ |
|---|---|---|---|
| 800mA – 4A | ≥ 1 h | < 120 s | 1ms-10ms |

## Technical Data

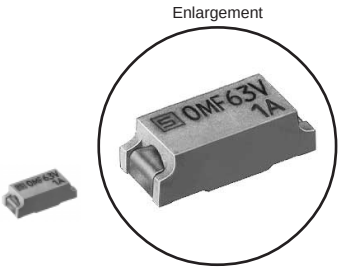
| | |
|---|---|
| **Rated voltage Un** | 63V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting, see chart for values |
| **Breaking capacity** | 100A/63V AC/DC p.f.1 |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. Tamb** | -40˚C to +125˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz, resp. acceleration 100 m/s according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 m/s , 6 ms, according to IEC 68-2-27, Test Ea |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability: reflow and wave soldering for suprafuse<br>reflow soldering only for suprafuse with clips** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing<br>End caps** | temperature resistant plastic (UL 94V-0)<br>brass, gold-plated |
| **Net weight** | 5 g suprafuse; 6.5 g suprafuse with clips |

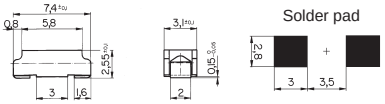
| Order Numbers<br>Series SFC 63V | Rated current / voltage<br>mA / A / V | Voltage drop at In<br>max.IEC 127 mV | <br>typical Schurter mV | Power dissipation at 1.25 • In<br>max. IEC 127 Watts | <br>typical Schurter Watts | Fusing integral $I^2t$ at 10 • In<br>typical $A^2s$ | Packaging<br>Order Number Suffix |
|---|---|---|---|---|---|---|---|
| 3405.0917.XX | 800mA / 63V | 400 | 150 | 0.5 | 0.24 | 0.16 | Without fuse clips: * |
| 3405.0918.XX | 1A / 63V | 300 | 140 | 0.5 | 0.28 | 0.20 | 100 pcs taped & reeled: .XX=.10<br>2,000 pcs taped & reeled: .XX=.11 |
| 3405.0919.XX | 1.25A / 63V | 300 | 130 | 1.0 | 0.33 | 0.40 | 8,000 pcs taped & reeled: .XX=.12 |
| 3405.0920.XX | 1.6A / 63V | 300 | 120 | 1.0 | 0.40 | 0.60 | With fuse clips: * |
| 3405.0921.XX | 2A / 63V | 300 | 120 | 1.0 | 0.48 | 0.80 | 100 pcs taped & reeled: .XX = .20<br>750 pcs taped & reeled: .XX = .25 |
| 3405.0922.XX | 2.5A / 63V | 300 | 100 | 1.0 | 0.50 | 1.90 | 3,000 pcs taped & reeled: .XX = .26 |
| 3405.0923.XX | 3.15A / 63V | 300 | 90 | 1.2 | 0.50 | 2.70 | * smaller quantities available taped, in bag |
| 3405.0924.XX | 4A / 63V | 300 | 80 | 1.5 | 0.60 | 2.10 | |

# OMF 63V Quick-acting Surface Mount Fuse




Enlargement



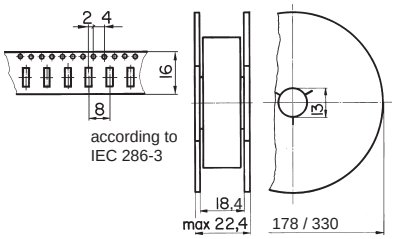




UL 248-14 (formerly 198G)
CSA C22.2 No. 248.14 (formerly 95.2M)

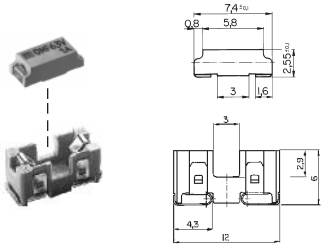
**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 63mA-10A | File #E41599 |
| CSA | certification | 63mA-10A | File #LR51172 |

Tape and Spool




**Series OMK 63V:** OMF 63 fuse available pre-installed into OMH 63 SMD fuseholder



Time Current Characteristics

| rated current $I_n$ \ $n \cdot I_n$ | $I_n$ | $2 \cdot I_n$ | $4 \cdot I_n$ |
|---|---|---|---|
| 63mA – 5A | ≥ 4 h | < 1 s | <10 ms |
| 6.3A – 8A | ≥ 4 h | < 5 s | <50 ms |
| 10A | ≥ 4 h | < 20 s | <60 ms |

See the following page for ordering information

## Technical Data

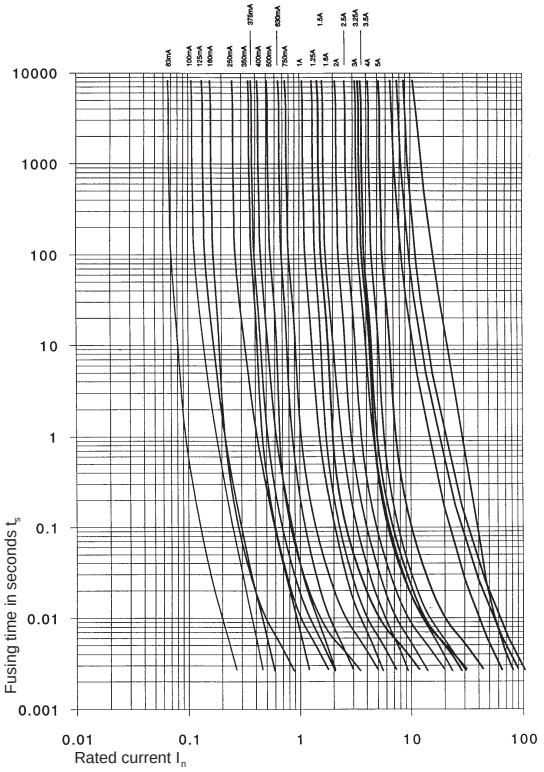
| | |
|---|---|
| **Rated voltage $U_n$** | 63 V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting, see chart for values (low $I^2t$) |
| **Marking** | OMF 63V, rated current, rated voltage, , UL, CSA |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. $T_{amb}$** | -40˚C to +85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz, resp. acceleration 100 m/s² (10g) according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 m/s², 6 ms, according to IEC 68-2-27, Test Ea |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability (reflow and wave soldering)** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing** | temperature resistant plastic (UL 94V-0) |
| **Terminals** | brass, tin-plated |
| **Net weight (per hundred)** | 10 g |

| Order Numbers | Rated curr. / voltage | Breaking capacity | Voltage Drop at In | Power diss. at In | Fusing $I^2t$ at 4 • In | | Packaging |
|---|---|---|---|---|---|---|---|
| Series OMF 63V | mA / A / V ~ | A ~ ac / dc | typ. mV | typical Watts | typical $A^2s$ | max. $A^2s$ | Order No. Suffix |
| 3402.0003.XX | 63 mA / 63V | | 2550 | 0.2 | 0.00011 | 0.00064 | |
| 3402.0004.XX | 100 mA / 63V | | 1770 | 0.2 | 0.0067 | 0.0016 | |
| 3402.0049.XX | 125 mA / 63V | | 1770 | 0.2 | 0.0011 | 0.0025 | |
| 3402.0005.XX | 160 mA / 63V | | 1700 | 0.3 | 0.0018 | 0.0041 | |
| 3402.0006.XX | 250 mA / 63V | | 430 | 0.1 | 0.0045 | 0.01 | |
| 3402.0043.XX | 350 mA / 63V | | 430 | 0.2 | 0.0084 | 0.02 | |
| 3402.0044.XX | 375 mA / 63V | | 410 | 0.2 | 0.011 | 0.023 | |
| 3402.0007.XX | 400 mA / 63V | | 360 | 0.2 | 0.0096 | 0.026 | |
| 3402.0045.XX | 500 mA / 63V | | 350 | 0.2 | 0.016 | 0.04 | OMF 63V packaged loose: .XX = .11 |
| 3402.0008.XX | 630 mA / 63V | | 350 | 0.2 | 0.023 | 0.064 | |
| 3402.0046.XX | 750 mA / 63V | | 300 | 0.2 | 0.052 | 0.09 | |
| 3402.0009.XX | 1 A / 63V | | 220 | 0.2 | 0.086 | 0.16 | |
| 3402.0010.XX | 1.25 A / 63V | | 220 | 0.3 | 0.14 | 0.25 | 750 pieces taped & reeled: .XX = .22 |
| 3402.0047.XX | 1.5 A / 63V | 50A / 63V | 200 | 0.3 | 0.24 | 0.36 | |
| 3402.0011.XX | 1.6 A / 63V | AC/DC | 200 | 0.3 | 0.27 | 0.41 | |
| 3402.0012.XX | 2 A / 63V | p.f./ | 200 | 0.4 | 0.44 | 0.64 | |
| 3402.0013.XX | 2.5 A / 63V | cos w 1 | 190 | 0.5 | 0.79 | 1.0 | 3,000 pieces taped & reeled: .XX = .24 |
| 3402.0014.XX | 3 A / 63V | | 190 | 0.6 | 1.1 | 1.4 | |
| 3402.0048.XX | 3.15 A / 63V | | 190 | 0.6 | 1.1 | 1.6 | |
| 3402.0015.XX | 3.5 A / 63V | | 140 | 0.5 | 1.6 | 2.0 | |
| 3402.0016.XX | 4 A / 63V | | 140 | 0.6 | 2.1 | 2.6 | |
| 3402.0017.XX | 5 A / 63V | | 140 | 0.7 | 2.9 | 4.0 | |
| 3402.0018.XX * | 6.3 A / 63V | | 110 * | 0.7 | 14 | 32 | |
| 3402.0019.XX * | 7 A / 63V | | 105 * | 0.7 | 16 | 39 | |
| 3402.0020.XX * | 8 A / 63V | | 100 * | 0.8 | 20 | 51 | |
| 3402.0040.XX * | 10 A / 63V | | 80 * | 0.8 | 54 | 96 | |

* Trace width of test board outlined in IEC 127-4/9: ≥5mm for 6.3A & 7A; ≥10mm for 8A & 10A. Acceptability is determined in the end use application.

# OMK 63V Quick-acting Surface Mount Fuse and Fuseholder

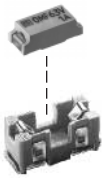
Built according to CSA 59.2-M. U.S. Patented.

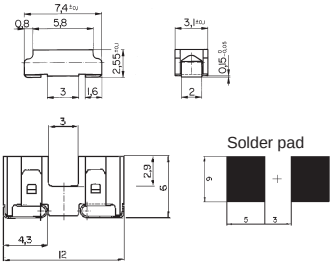


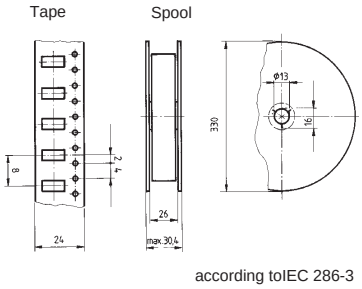

**Approvals:**

| | | | Fuse | Fuseholder |
|---|---|---|---|---|
| UL | recognition | 63mA-10A | File #E41599 | File #E39328 |
| CSA | certification | 63mA-10A | File #LR51172 | File #LR38456 |

** 6.3A-10A fuse available separately; see previous page.






according toIEC 286-3

Time Current Characteristics

| n • In / rated current In | In | 2 • In | 4 • In |
|---|---|---|---|
| 63mA – 5A | ≥ 4 h | < 1 s | <10 ms |

## Technical Data

| | |
|---|---|
| **Rated voltage $U_n$** | 63 V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting, see chart for values (low $I^2t$) |
| **Marking** | OMF 63V, rated current, rated voltage, , UL, CSA |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. $T_{amb}$** | -40˚C to +85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz, resp. acceleration 100 m/s² (10g) according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 m/s², 6 ms, according to IEC 68-2-27, Test Ea |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability (reflow and wave soldering)** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing** | temperature resistant plastic (UL 94V-0) |
| **Terminals** | brass, tin-plated |
| **Net weight (per hundred)** | 47 g |

| Order Numbers Series OMK 63V | Rated curr. / voltage mA / A / V ~ | Breaking capacity A ~ ac / dc | Voltage drop at In typical mV | Power dissipation at In typical Watts | Fusing $I^2t$ at 4 • In typical $A^2s$ | max. $A^2s$ | Packaging Order No. Suffix |
|---|---|---|---|---|---|---|---|
| 3422.0003.XX | 63 mA / 63V | | 2550 | 0.2 | 0.00011 | 0.00064 | |
| 3422.0004.XX | 100 mA / 63V | | 1770 | 0.2 | 0.0067 | 0.0016 | |
| 3422.0049.XX | 125 mA / 63V | | 1770 | 0.2 | 0.0011 | 0.0025 | |
| 3422.0005.XX | 160 mA / 63V | | 1700 | 0.3 | 0.0018 | 0.0041 | |
| 3422.0006.XX | 250 mA / 63V | | 430 | 0.1 | 0.0045 | 0.01 | |
| 3422.0043.XX | 350 mA / 63V | | 430 | 0.2 | 0.0084 | 0.02 | |
| 3422.0044.XX | 375 mA / 63V | | 410 | 0.2 | 0.011 | 0.023 | |
| 3422.0007.XX | 400 mA / 63V | | 360 | 0.2 | 0.0096 | 0.026 | |
| 3422.0045.XX | 500 mA / 63V | | 350 | 0.2 | 0.016 | 0.04 | OMK 63V packaged loose: .XX = .11 |
| 3422.0008.XX | 630 mA / 63V | | 350 | 0.2 | 0.023 | 0.064 | |
| 3422.0046.XX | 750 mA / 63V | | 300 | 0.2 | 0.052 | 0.09 | |
| 3422.0009.XX | 1 A / 63V | 50A / 63V | 220 | 0.2 | 0.086 | 0.16 | 1,500 pieces taped & reeled: .XX = .23 |
| 3422.0010.XX | 1.25 A / 63V | | 220 | 0.3 | 0.14 | 0.25 | |
| 3422.0047.XX | 1.5 A / 63V | | 200 | 0.3 | 0.24 | 0.36 | |
| 3422.0011.XX | 1.6 A / 63V | | 200 | 0.3 | 0.27 | 0.41 | |
| 3422.0012.XX | 2 A / 63V | | 200 | 0.4 | 0.44 | 0.64 | |
| 3422.0013.XX | 2.5 A / 63V | | 190 | 0.5 | 0.79 | 1.0 | |
| 3422.0014.XX | 3 A / 63V | | 190 | 0.6 | 1.1 | 1.4 | |
| 3422.0048.XX | 3.15 A / 63V | | 190 | 0.6 | 1.1 | 1.6 | |
| 3422.0015.XX | 3.5 A / 63V | | 140 | 0.5 | 1.6 | 2.0 | |
| 3422.0016.XX * | 4 A / 63V | | 140 * | 0.6 | 2.1 | 2.6 | |
| 3422.0017.XX * | 5 A / 63V | | 140 * | 0.7 | 2.9 | 4.0 | |

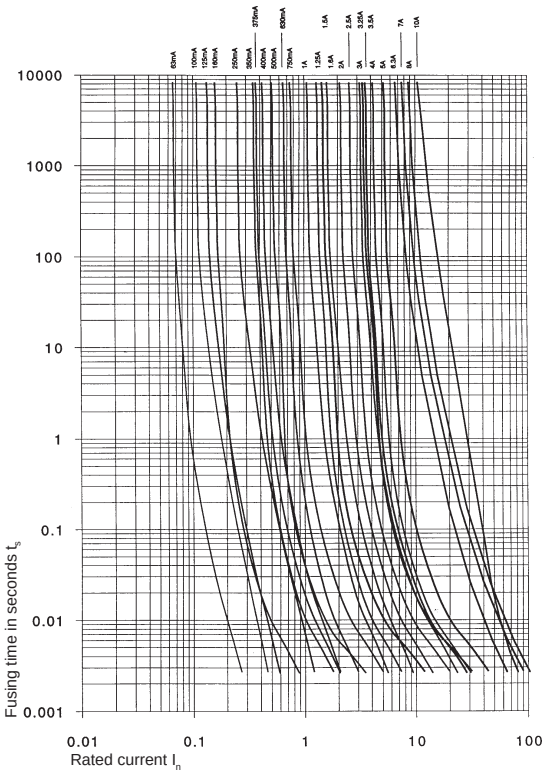
*3.5A max.recommended R MS current.5A possible at 12 (trace width 6 test board outlined in I CE 127-4/9 is 10mm). Acceptability determined in end use application.

# OMF 125V Quick-acting Surface Mount Fuse - High Breaking Capacity

UL 248-14 (formerly 198G)
CSA C22.2 No 248.14 (formerly 59.2M)

**Approvals:**

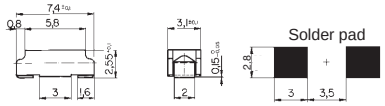
| | | | |
|---|---|---|---|
| UL | recognition | 63mA-10A | File #E41599 |
| CSA | certification | 63mA-10A | File #LR51172 |



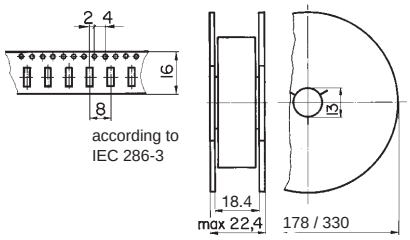

**NEW**

*Surge tolerant version for telecom: see page 162*

Enlargement

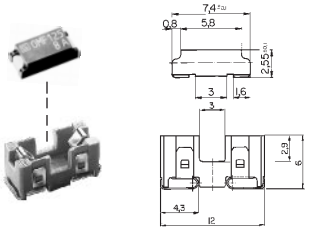

Tape and Spool




Time Current Characteristics

| rated current $I_n$ \ $n \cdot I_n$ | $I_n$ | $2 \cdot I_n$ | $4 \cdot I_n$ |
|---|---|---|---|
| 63mA – 5A | ≥ 4 h | < 1 s | <10ms |
| 6.3A - 8A | ≥ 4 h | < 5 s | <50ms |
| 10A | ≥ 4 h | < 20 s | <60ms |

**Series OMK 125V:** OMF 125 fuse available pre-installed into OMH 125 SMD fuseholder



See the following page for ordering information

## Technical Data

| | |
|---|---|
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting, see chart for values (low $I^2t$) |
| **Marking** | OMF 125, rated current, rated voltage, , UL, CSA |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. $T_{amb}$** | -40˚C to +125˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over freq. 60 Hz, amplitude 0.75 mm, resp. acceleration 100 m/s$^2$ (10g) according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 m/s$^2$, 6 ms, according to IEC 68-2-27, Test Ea |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability (reflow and wave soldering)** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing** | temperature resistant plastic (UL 94V-0) |
| **Terminals** | brass, tin-plated |
| **Net weight (per hundred)** | 10 g |

| Order Numbers | Rated Current / Voltage | Breaking Capacity | Volt. drop at In | Power Diss. at In | Fusing $I^2t$ at 4 • In | | Packaging |
|---|---|---|---|---|---|---|---|
| **Series OMF 125V** | **mA / A / V ~** | **A ~ AC / DC** | **typ. mV** | **typical Watts** | **typical A$^2$s** | **max. A$^2$s** | **Order No. Suffix** |
| 3404.0003.XX | 63 mA /125V | | 2550 | 0.160 | 0.00011 | 0.00064 | |
| 3404.0004.XX | 100 mA /125V | | 1770 | 0.180 | 0.0067 | 0.0016 | |
| 3404.0049.XX | 125 mA /125V | | 1770 | 0.220 | 0.0011 | 0.0025 | |
| 3404.0005.XX | 160 mA /125V | | 1700 | 0.270 | 0.0018 | 0.0041 | |
| 3404.0006.XX | 250 mA /125V | | 990 | 0.250 | 0.0045 | 0.01 | |
| 3404.0043.XX | 350 mA /125V | | 990 | 0.347 | 0.0084 | 0.02 | |
| 3404.0044.XX | 375 mA /125V | 63mA-7A: | 990 | 0.371 | 0.0011 | 0.023 | packaged loose: .XX = .11 |
| 3404.0007.XX | 400 mA /125V | 300 A AC | 960 | 0.384 | (0.011 | 0.026 | |
| 3404.0045.XX | 500 mA /125V | 400A DC | 300 | 0.150 | 0.016 | 0.04 | |
| 3404.0008.XX | 630 mA /125V | 125V pf 1 | 290 | 0.183 | 0.023 | 0.064 | |
| 3404.0046.XX | 750 mA /125V | | 260 | 0.195 | 0.052 | 0.09 | 750 pieces taped & reeled: .XX = .22 |
| 3404.0009.XX | 1 A /125V | 8A: | 220 | 0.220 | 0.086 | 0.16 | |
| 3404.0010.XX | 1.25 A /125V | 200A AC | 220 | 0.280 | 0.14 | 0.25 | |
| 3404.0047.XX | 1.5 A /125V | 300A DC | 200 | 0.320 | 0.24 | 0.36 | |
| 3404.0011.XX | 1.6 A /125V | 125V pf 1 | 200 | 0.3 | 0.27 | 0.41 | 3,000 pieces taped & reeled: .XX = .24 |
| 3404.0012.XX | 2 A /125V | | 200 | 0.4 | 0.44 | 0.64 | |
| 3404.0013.XX | 2.5 A /125V | 10A: | 190 | 0.480 | 0.79 | 1.0 | |
| 3404.0014.XX | 3 A /125V | 100A AC | 190 | 0.570 | 1.1 | 1.4 | |
| 3404.0048.XX | 3.15 A /125V | 300A DC | 190 | 0.6 | 1.1 | 1.6 | |
| 3404.0015.XX | 3.5 A /125V | 125V pf 1 | 140 | 0.490 | 1.6 | 2.0 | |
| 3404.0016.XX | 4 A /125V | | 140 | 0.560 | 2.1 | 2.6 | |
| 3404.0017.XX | 5 A /125V | | 140 | 0.7 | 2.9 | 4.0 | |
| 3404.0018.XX * | 6.3 A /125V | | 110 * | 0.690 | 14 | 32 | |
| 3404.0019.XX * | 7 A /125V | | 105 * | 0.740 | 16 | 39 | |
| 3404.0020.XX * | 8 A /125V | | 100 * | 0.8 | 20 | 51 | |
| 3404.0021.XX * | 10 A /125V | | 80 * | 0.8 | 54 | 96 | |

* Trace width of test board outlined in IEC 127-4/9: ≥5mm for 6.3A & 7A; ≥10mm for 8A & 10A. Acceptability determined in end use application.

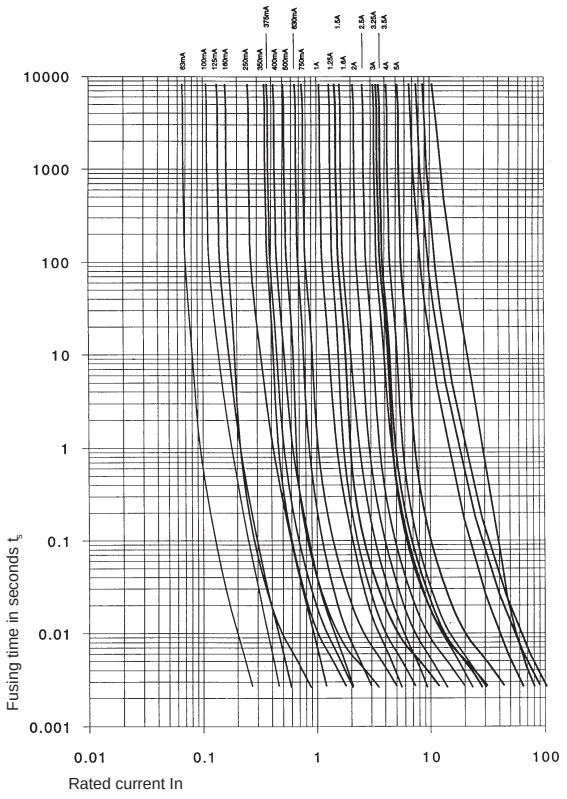
# OMK 125V Quick-acting Surface Mount Fuse and Fuseholder - High Breaking Capacity

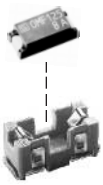
Built according to CSA 59.2-M. U.S. Patented. UL, CSA approval tests according to manufacturer specifications.

**Approvals:**

| | | | Fuse | Fuseholder |
|---|---|---|---|---|
| UL | recognition | 63mA-5A** | File #E41599 | File #E39328 |
| CSA | certification | 63mA-5A** | File #LR51172 | File #LR38456 |

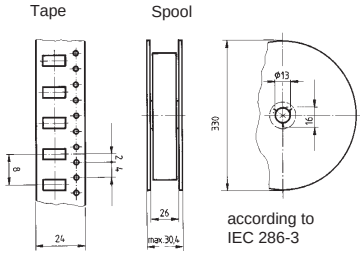
** 6.3A-10A fuse available separately; see previous page.

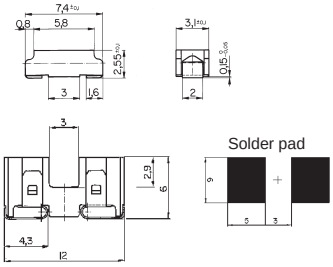


**NEW**

*Surge tolerant version for telecom; see page 162*




Time Current Characteristics

| n • In / rated current In | In | 2 • In | 4 • In |
|---|---|---|---|
| 63mA – 5A | ≥ 4 h | < 1 s | <10ms |

## Technical Data

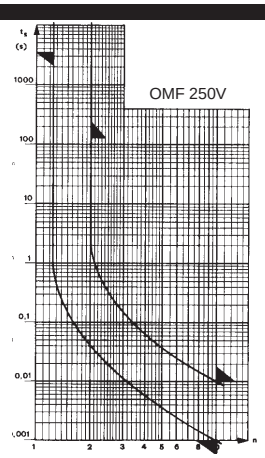
| | |
|---|---|
| **Rated voltage Un** | 125 V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting, see chart for values (low $I^2t$) |
| **Marking** | OMF 125V, rated current, rated voltage, , UL, CSA |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. Tamb** | -40˚C to +85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz, resp. acceleration 100 $m/s^2$ (10g) according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 $m/s^2$, 6 ms, according to IEC 68-2-27, Test Ea |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability (reflow and wave soldering)** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing** | temperature resistant plastic (UL 94V-0) |
| **Terminals** | brass, tin-plated |
| **Net weight (per hundred)** | 58 g |

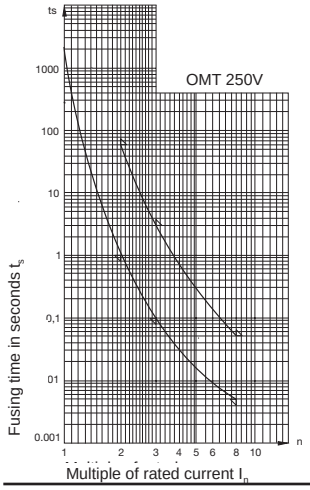
| Order Numbers<br>Series OMK 125V | Rated current / voltage<br>mA / A / V ~ | Breaking capacity<br>A ~ ac / dc | Voltage drop at In<br>typical mV | Power dissipation at In<br>typical Watts | Fusing $I^2$ t at 4 • In<br>typical $A^2$ s | <br>max. $A^2$ s | Packaging<br>Order No.Suffix |
|---|---|---|---|---|---|---|---|
| 3404.2303.XX | 63 mA / 125V | | 2550 | 0.2 | 0.00011 | 0.00064 | |
| 3404.2304.XX | 100 mA / 125V | | 1770 | 0.2 | 0.00067 | 0.0016 | |
| 3404.2349.XX | 125 mA / 125V | | 1770 | | 0.0011 | 0.0025 | |
| 3404.2305.XX | 160 mA / 125V | | 1700 | 0.2 | 0.0018 | 0.0041 | |
| 3404.2306.XX | 250 mA / 125V | | 430 | 0.2 | 0.0045 | 0.01 | |
| 3404.2343.XX | 350 mA / 125V | | 430 | 0.27 | 0.0084 | 0.02 | |
| 3404.2344.XX | 375 mA / 125V | | 410 | 0.3 | 0.011 | 0.023 | |
| 3404.2307.XX | 400 mA / 125V | | 360 | 0.1 | 0.0096 | 0.026 | |
| 3404.2345.XX | 500 mA / 125V | | 350 | 0.3 | 0.016 | 0.04 | OMK 125V packaged loose: .XX = .11<br>1,500 pieces taped & reeled: .XX = .23 |
| 3404.2308.XX | 630 mA / 125V | 300 A ac / 400A dc | 350 | 0.2 | 0.023 | 0.064 | |
| 3404.2346.XX | 750 mA / 125V | | 300 | 0.3 | 0.052 | 0.09 | |
| 3404.2309.XX | 1 A / 125V | | 220 | 0.2 | 0.086 | 0.16 | |
| 3404.2310.XX | 1.25 A / 125V | 125V pf 1 | 220 | 0.3 | 0.14 | 0.25 | |
| 3404.2347.XX | 1.5 A / 125V | | 200 | 0.45 | 0.24 | 0.36 | |
| 3404.2311.XX | 1.6 A / 125V | | 200 | 0.3 | 0.27 | 0.41 | |
| 3404.2312.XX | 2 A / 125V | | 200 | 0.4 | 0.44 | 0.64 | |
| 3404.2313.XX | 2.5 A / 125V | | 190 | 0.4 | 0.79 | 1.0 | |
| 3404.2314.XX | 3 A / 125V | | 190 | 0.4 | 1.1 | 1.4 | |
| 3404.2348.XX | 3.15 A / 125V | | 190 | | 1.1 | 1.6 | |
| 3404.2315.XX | 3.5 A / 125V | | 140 | | 1.6 | 2.0 | |
| 3404.2316.XX * | 4 A / 125V | | 140 * | | 2.1 | 2.6 | |
| 3404.2317.XX * | 5 A / 125V | | 140 * | | 2.9 | 4.0 | |

*3.5A max.recommended RMS current.5A RMS possible at 12V (trace width of test board outlined in IEC 127-4/9 is 10mm).Acceptability determined in end use application

# OMF/OMT 125V/250V

## OMF Quick-acting, OMT Time Lag Surface Mount Fuses




IEC 127-4/2; EN 60127-4/2
UL 248-14 (formerly 198.G)
CSA C22.2 No. 248.14 (formerly 59.2M)

**NEW**

*Surge tolerant / telecom version for OMF: see page 162*





**OMF Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 250mA-4A | File #E41599 |
| CSA | certification | 250mA-4A | File #LR51172 |
| VDE | approval | 250mA-4A* | File #6079, expert report |

* 250mA-4A using wave solder process
250mA-2.5A using reflow solder process

**OMT Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 750mA-2A/250V | File #E41599 |
| | | 2.5A-5A/125V | File #E41599 |
| CSA | certification | 750mA-2A/250V | File #E41599 |
| | | 2.5A-5A/125V | File #E41599 |

OMF Pre-arcing time/current characteristics (at Tamb 23˚C)

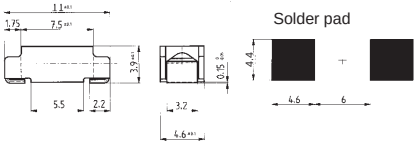
| rated current In \ n • In | | 1.25 • In * | 2 • In | 10 • In |
|---|---|---|---|---|
| 250mA - 4A | IEC / UL | > 1 h | < 120s | 1 ms - 10 ms |
| | CSA | > 1 h | < 60s | 1 ms - 10 ms |

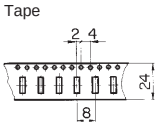
*non-fusing current Inf

OMT Pre-arcing time/current characteristics (at Tamb 23˚C)

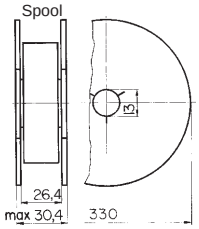
| rated current In \ n • In | 1• In* UL | 2 • In UL | | 3 • In | | 8 • In | |
|---|---|---|---|---|---|---|---|
| | min. | min. | max. | min. | max. | min. | max. |
| 750mA - 5A | 4 h | 1 s | 60 s | 100 ms | 3 s | 5 ms | 50 ms |

*non-fusing current Inf




according to IEC 286-3




## Technical Data

| | |
|---|---|
| **Rated voltage Un** | OMF: 250V AC/DC, OMT: 125V/250V AC |
| **Rated current** | see chart |
| **Time current characteristic** | OMF quick-acting, see chart for values (low $I^2t$)<br>OMT time-lag, see chart for values (low $I^2t$) |
| **Marking** | OMF 250 / OMT 250 / OMT 125, rated current, rated voltage, logo , UL |
| **Breaking capacity** | see chart |
| **Max. storage temperature** | 40˚C / 70% relative humidity |
| **Ambient temperature max. Tamb** | OMF: -40˚C to +125˚C<br>OMT: -40˚C to + 85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz, resp. acceleration 198 $m/s^2$(OMF), 196 $m/s^2$(OMT); according to IEC 68-2-6, Test Fc |
| **Shock resistance** | 981 $m/s^2$, 6 ms, according to IEC 68-2-27 |
| **Climatic category** | OMF: HPF according to DIN 40040<br>OMT: GPF according to DIN 40040 |
| **Solderability (reflow and wave soldering)** | 235˚C / 2 sec. according to IEC 68-2-58 / Td |
| **Soldering heat resistance** | 260˚C / 10 sec. according to IEC 68-2-58 / Td |
| **Material: Housing** | temperature resistant plastic (UL 94V-0) |
| **Terminals** | brass, tin-plated |
| **Net weight (per hundred)** | 35 g |

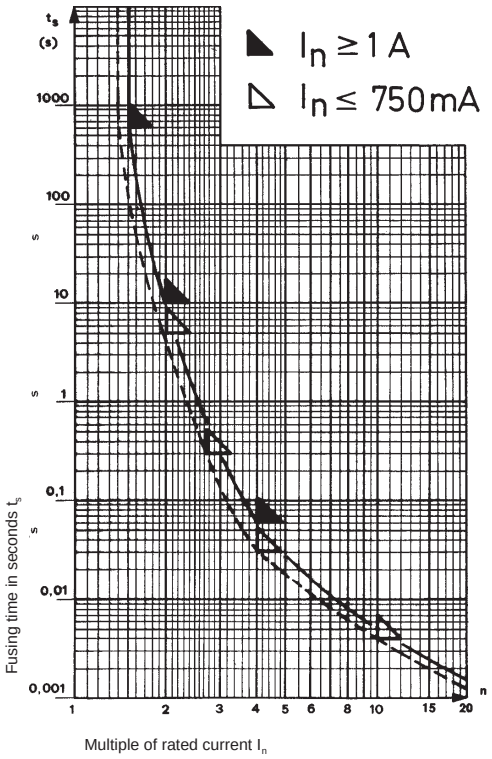
| Order Numbers Series OMF 250V | Rated curr. / voltage mA / A / V ~ | Breaking Capacity A ~ ac / dc | Volt. drop @ $I_n$ max. mV | Power diss.@$I_n$ typical Watts | Fusing $I^2t$ at 4 • $I_n$ typical $A^2s$ | max. $A^2s$ |
|---|---|---|---|---|---|---|
| 3403.0010.XX | 250 mA / 250V | | 800 | 0.109 | 0.009 | 0.063 |
| 3403.0011.XX | 315 mA / 250V | | 750 | 0.125 | 0.017 | 0.099 |
| 3403.0012.XX | 400 mA / 250V | | 700 | 0.19 | 0.02 | 0.16 |
| 3403.0013.XX | 500 mA / 250V | | 600 | 0.19 | 0.04 | 0.25 |
| 3403.0014.XX | 630 mA / 250V | 100A / 250V AC p.f. = 1 | 500 | 0.23 | 0.08 | 0.4 |
| 3403.0015.XX | 800 mA / 250V | | 400 | 0.33 | 0.13 | 0.64 |
| 3403.0016.XX | 1 A / 250V | | 300 | 0.39 | 0.23 | 1 |
| 3403.0017.XX | 1.25 A / 250V | | 300 | 0.39 | 0.47 | 1.53 |
| 3403.0018.XX | 1.6 A / 250V | 100A / 250V DC | 300 | 0.49 | 0.84 | 2.56 |
| 3403.0019.XX | 2 A / 250V | | 300 | 0.6 | 1.4 | 4 |
| 3403.0020.XX | 2.5 A / 250V | | 300 | 0.67 | 2.6 | 6.3 |
| 3403.0021.XX | 3.15 A / 250V | | 300 | 0.87 | 4.3 | 9.9 |
| 3403.0022.XX | 4 A / 250V | | 300 | 0.95 | 8.6 | 16 |

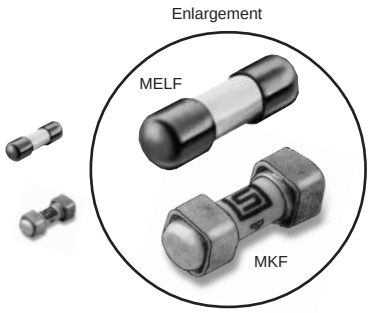
| Order Numbers Series OMT 250V | Rated curr. / voltage mA / A / V ~ | Breaking capacity A ~ ac / dc | Volt. drop at $I_n$ typical mV | Power diss. at 4 • $I_n$ typical mW | Pre-arcing $I^2t$ at 8 • $I_n$ typical $A^2s$ |
|---|---|---|---|---|---|
| 3403.0129.XX | 750 mA / 250V | 100A / 250V AC p.f. = 1 | 107 | 80 | 0.3 |
| 3403.0116.XX | 1 A / 250V | | 90 | 90 | 0.6 |
| 3403.0117.XX | 1.25 A / 250V | | 89 | 111 | 1 |
| 3403.0130.XX | 1.5 A / 250V | 50A / 250V AC p.f. = 1 | 74 | 111 | 2 |
| 3403.0119.XX | 2 A / 250V | | 69 | 138 | 4 |
| 3403.0120.XX | 2.5 A / 125V | 100A / 125V AC p.f. =1 | 68 | 170 | 7 |
| 3403.0131.XX | 3 A / 125V | | 62 | 186 | 12 |
| 3403.0132.XX | 3.5 A / 125V | | 60 | 210 | 19 |
| 3403.0122.XX | 4 A / 125V | | 60 | 240 | 23 |
| 3403.0123.XX | 5 A / 125V | | 57 | 285 | 37 |

| Packaging Order No. Suffix |
|---|
| OMF 250V packaged loose: .XX = .11 |
| 2,000 pieces taped & reeled: .XX = .24 |
| OMT 250V packaged loose: .XX = .11 |
| 2,000 pieces taped & reeled: .XX = .24 |

# MELF/MKF 125V Quick-acting Surface Mount Fuses - High Breaking Capacity

NEW



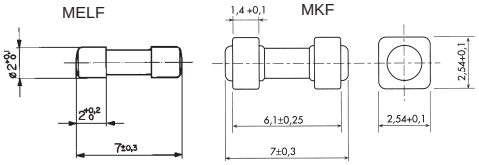

UL 248-14 (formerly 198.G)
CSA C22.2 No. 248.14 (formerly 59.2M)

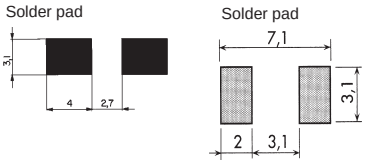
**MELF Approvals:** (reference series 172876)

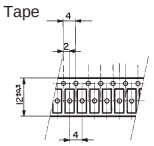
| | | | |
|---|---|---|---|
| UL | recognition | 125mA-7A/125V | File #E42088 |
| CSA | certification | 125mA-7A/125V | File #LR34549 |

**MKF Approvals**

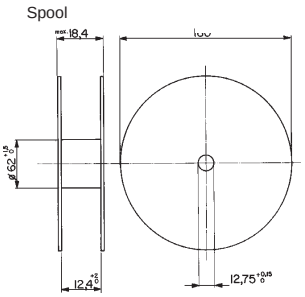
| | | | |
|---|---|---|---|
| UL | recognition | 125mA-4A/125V; 5A-7A/63V | File #E42088 |
| CSA | certification | 125mA-7A/125V | File #LR34549 |




according toIEC 286-3




Time Current Characteristics (Tamb = 25˚C)

| n • In / rated current In | In | 1.5 • In | 2 • In | 2.75 • In | 4 • In | 10 • In |
|---|---|---|---|---|---|---|
| | min. | max. | max. | max. | max. | max. |
| 125mA – 750mA | 4 h | – | 5 s | 300 ms | 30 ms | 4 ms |
| 1A – 7A | 4 h | 600 s | 10 s | – | 60 ms | – |

For informaton about Melf miniature SMD and through-hole mount fuseholders, see page 87

## Technical Data

| | |
|---|---|
| **Rated voltage Un** | 125 V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting, see chart for values |
| **Marking** | on fuse: rated current, logo; on smallest package: type, rated current, volts, breaking capacity, logo, UL, CSA |
| **Ambient temperature max. Tamb** | -55˚C to +85˚C |
| **Solderability (reflow and vapor phase)** | 235˚C/2 sec. (IEC 68-2-58/Td) |
| **Soldering heat resistance** | 235˚C/5 sec. (IEC 68-2-58/Td) |
| **Material: Housing** | ceramic |
| **End caps** | brass, tin-plated |
| **Net weight (per hundred)** | MELF 7g<br>MKF 14.5g |

| Order Numbers<br>Series<br>MELF 125V | Rated curr. / voltage<br>mA / A / V ~ | Breaking Capacity<br>A ~<br>ac / dc | Volt. drop @ In<br>max. mV | Power diss. @ In<br>max. mW | Pre-arcing I2t at 10 • In<br>A2s |
|---|---|---|---|---|---|
| 7010.9760.XX* | 125 mA /125V | on printed boards 300A /125V AC cos w=1 300A / 125V DC, L/R = 1 ms<br>inserted into fuseholder In 125mA-4A: 300A / 125V AC cos w =1 300A/125V DC, L/R = 1 ms<br>In 5A-7A: 300A/125V AC cos = 1 50A/125V DC, L/R = 1 ms | 810 | 105 | 0.0036 |
| 7010.9770.XX | 250 mA /125V | | 295 | 74 | 0.0094 |
| 7010.9780.XX | 375 mA /125V | | 225 | 85 | 0.019 |
| 7010.9790.XX | 500 mA /125V | | 235 | 120 | 0.07 |
| 7010.9800.XX | 750 mA /125V | | 225 | 170 | 0.18 |
| 7010.9810.XX | 1 A /125V | | 190 | 190 | 0.3 |
| 7010.9820.XX | 1.5 A /125V | | 210 | 315 | 0.38 |
| 7010.9830.XX | 2 A /125V | | 175 | 350 | 1.1 |
| 7010.9840.XX | 2.5 A /125V | | 160 | 400 | 1.4 |
| 7010.9850.XX | 3 A /125V | | 155 | 465 | 2 |
| 7010.9860.XX | 3.5 A /125V | | 145 | 510 | 2.6 |
| 7010.9870.XX | 4 A /125V | | 165 | 660 | 4 |
| 7010.9880.XX | 5 A /125V | | 155 | 775 | 6.2 |
| 7010.9890.XX** | 7 A /125V | | 125 | 875 | 13 |

| Order Numbers<br>Series<br>MKF 125V | Rated curr. / voltage<br>mA / A / V ~ | Breaking capacity<br>A ~<br>ac / dc | Volt. drop at In<br>max. mV | Power diss. at In<br>mW | Pre-arcing I2t at 10 • In<br>A2s |
|---|---|---|---|---|---|
| 7010.9901.XX | 125 mA /125V | 300A / 125V AC/DC p.f. = 1 300A / 125V DC L/R = 1 ms | 750 | 94 | 0.0024 |
| 7010.9902.XX | 250 mA /125V | | 320 | 80 | 0.0094 |
| 7010.9903.XX | 375 mA /125V | | 240 | 90 | 0.021 |
| 7010.9904.XX | 500 mA /125V | | 250 | 125 | 0.038 |
| 7010.9905.XX | 750 mA /125V | | 220 | 165 | 0.085 |
| 7010.9906.XX | 1 A /125V | | 180 | 180 | 0.15 |
| 7010.9907.XX | 1.5 A /125V | | 210 | 315 | 0.45 |
| 7010.9908.XX | 2 A /125V | | 170 | 340 | 0.95 |
| 7010.9909.XX | 2.5 A /125V | | 165 | 413 | 1.4 |
| 7010.9910.XX | 3 A /125V | | 160 | 480 | 2.2 |
| 7010.9911.XX | 3.5 A /125V | | 160 | 560 | 2.8 |
| 7010.9912.XX | 4 A /125V | | 180 | 720 | 4 |
| 7010.9913.XX | 5 A /125V | | 170 | 850 | 6.8 |
| 7010.9914.XX | 7 A /125V | | 180 | 1260 | 10 |

| Packaging<br>Order No. Suffix |
|---|
| MELF 125V<br>100 pieces packaged loose: .XX = .63<br>500 pieces packaged loose: .XX = .55<br>1,500 pieces taped & reeled: .XX = .57<br><br>MKF 125V<br>packaged loose: .XX = .03<br>500 pieces packaged loose: .XX = .55<br>1,500 pieces taped & reeled: .XX = .57 |

* 125mA fuse: clearing times should be determined in the end use application, according to UL Conditions of Acceptability
**7A fuse: when used in conjunction with Melf holder, UL acceptability is determined in the end use application

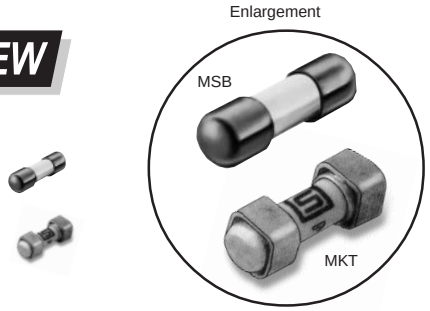
# MSB/MKT 125V Time-lag Surface Mount Fuses - Low Breaking Capacity

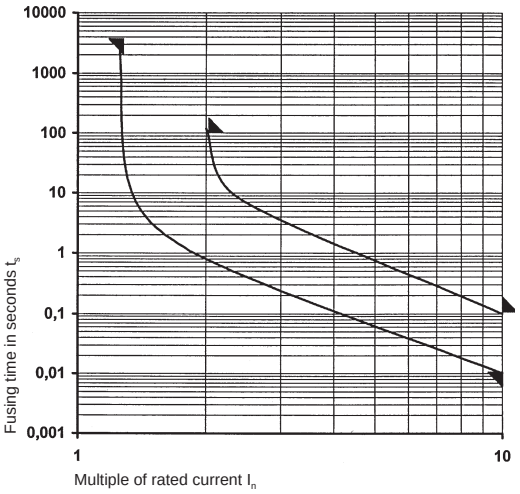
IEC 60127-4/2, EN 60127-4/2
CSA C22.2 No. 248.14 (formerly 59.2M)

**MSB Approvals:**
c-UL-us recognition, 2A-6.3A/125V
File #E42088

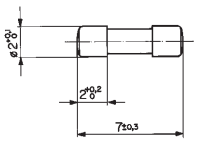
**MKT Approvals pending**
UL CSA

NEW

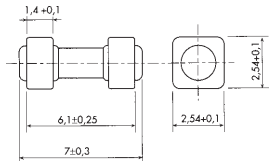


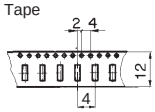

MSB




MKT

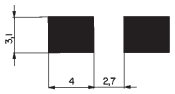



Tape

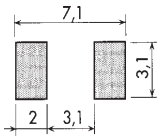



according to IEC 286-3

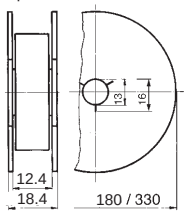
Solder pad




Solder pad




Spool




| Pre-arcing Time/Current Characteristic | | | (Tamb = 23˚C) | |
|---|---|---|---|---|
| n • In / rated current In | 1.25 • I n | 2 • In | 10 • I | |
| | min. | max. | min. | max. |
| 2A - 6.3A | 1 h | 120 s | 10 ms | 100 ms |

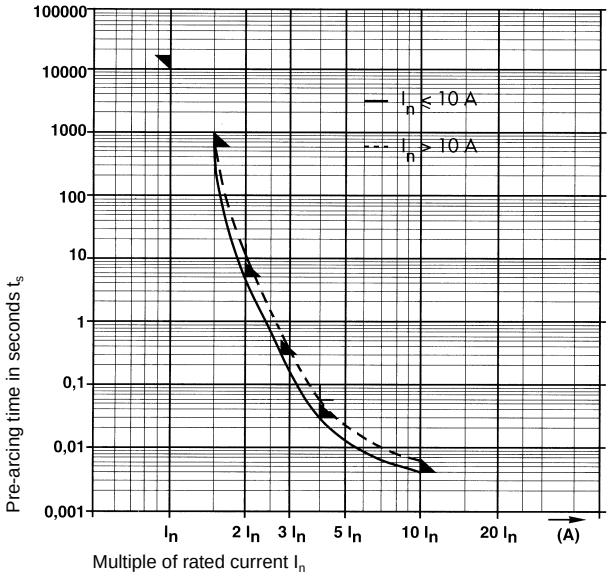
For informaton about Melf miniature SMD and through-hole mount fuseholders, see page 87

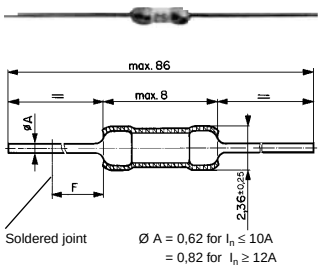
## Technical Data

| | |
|---|---|
| **Rated voltage Un** | 125 V AC/DC |
| **Rated current** | see chart |
| **Time current characteristic** | time-lag, see chart for values |
| **Marking** | rated current, logo |
| **Ambient temperature max. Tamb** | -55˚C to +85˚C |
| **Solderability (reflow and vapor phase)** | 235˚C / 2 sec. (IEC 68-2-58/Td) |
| **Soldering heat resistance** | 235˚C / 5 sec. (IEC 68-2-58/Td) |
| **Material: Housing** | ceramic |
| **End caps** | brass, tin-plated |
| **Net weight (per hundred)** | MSB 7g<br>MKT 14.5g |

| Order Numbers<br>Series<br>MSB 125V | Order Numbers<br>Series<br>MKT 125V | Rated current / voltage<br>mA / A / V ~ | Breaking Capacity<br>A ~<br>ac / dc | Voltage drop @$I_n$<br>max. mV | Sustained Power dissipation @$I_n$<br>max. Watts | Fusing $I^2t$ at 10 • $I_n$<br>A2s | Packaging<br>Order No.<br>Suffix |
|---|---|---|---|---|---|---|---|
| 7010.9963.XX | 7010.9513.XX | 2 A /125V | 50A / 125V AC/DC | 90 | | 5.1 | MSB 125V |
| 7010.9964.XX | 7010.9514.XX | 2.5 A /125V | 50A / 125V AC/DC | 90 | | 8.7 | packaged loose: .XX = .63 |
| 7010.9965.XX | 7010.9515.XX | 3.15 A /125V | 50A / 125V AC/DC | 85 | | 15 | 1,500 pieces taped & reeled:.XX = .57 |
| 7010.9966.XX | 7010.9516.XX | 3.5 A /125V | 50A / 125V AC/DC | 85 | | 19 | 5,000 pieces taped & reeled:.XX = .59 |
| 7010.9967.XX | 7010.9517.XX | 4 A /125V | 50A / 125V AC/DC | 80 | on request | 27 | |
| 7010.9968.XX | 7010.9518.XX | 5 A /125V | 50A / 125V AC/DC | 105 | | 30 | MKT 125V |
| 7010.9969.XX | 7010.9519.XX | 6.3 A /125V | 63A / 125V AC/DC | 85 | | 81 | packaged loose: .XX = .03 |
| | | | | | | | 500 pieces taped & reeled: .XX = .55 |
| | | | | | | | 1,500 pieces taped & reeled:.XX = .57 |

# MSA 125V/250V Quick-acting Miniature Fuse - High Breaking Capacity




IEC 127-3/2; EN 60127-3/2
UL 248-14 (formerly 198.G)
CSA C22.2 No. 248.14 (formerly 59.2 M)

Approvals (series reference 172322)

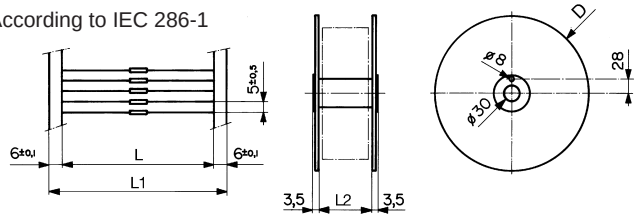
| | | |
|---|---|---|
| UL | 63mA-15A | File #E41599 |
| CSA | 63mA-15A | File #LR74944 |

Approvals (series reference 172593; 250V versions)

| | |
|---|---|
| UL/CSA | File # C-UL-US E 42088 |

| L | L1 | L2 |
|---|---|---|
| 73 ± 2 | 85 ± 2 | 90 |
| 53 ± 2 | 65 ± 2 | 70 |
| 63 ± 2 | 75 ± 2 | 80 |

According to IEC 286-1




Diameter D of spool: 1500 pcs. = 192 mm; 5000 pcs. = 360 mm

## Technical data

| | | |
|---|---|---|
| **Ambient temperature max. $T_a$** | | – 55 °C to + 85 °C |
| **Solderability and soldering conditions acc. to IEC 68-2-20 by thermal shield 1,5 mm thickness** | | Wave bath: 260°C/10 sec., body Spaced ≥ 3 mm from solder joint F<br><br>Soldering icon: 350°C/3,5 sec., body Spaced ≥ 6 mm from solder joint F |
| **Materials:** | Insulated tube | Ceramic |
| | Insulated shroud | Hot resistant plastic |
| | Caps | Brass, tin plated |
| | Terminals | Copper, tin-plated |

Pre-arcing time/current characteristic (at $T_a$ 23 °C)

| Rated current $I_n$ \ $n \cdot I_n$ | 1 · $I_n$* | 1,5 · $I_n$** | 2 · $I_n$ | 2,75 · $I_n$ | 3 · $I_n$ | 4 · $I_n$ | 10 · $I_n$ |
|---|---|---|---|---|---|---|---|
| min. | max. | max | max. | max. | max. | max. | max. |
| ≤ 10 A4 h | 600 s | 5 s | 300 ms | 30 ms | | 4 ms | |
| > 10 A | 4 h | 600 s | 10 s | | | 60 ms | |
| 250 V version | > 4 h | | ≤ 60 s | | ≤ 0.1 s | | |

* Non fusing current $I_{nf}$

** Only according to UL

| Order No. /† Loose | Order No. /† Tape and Reel | Rated current $I_n$ Rated voltage $U_n$ | Breaking capacity | Voltage drop at $I_n$ max. IEC 127 | Voltage drop at $I_n$ max. | Max. sustained power dissipation at 1,5 $I_n$ max. IEC 127 mW | Max. sustained power dissipation at 1,5 $I_n$ max. mW | Pre-arcing $I^2t$ 10 · $I_n$ mW | Approvals UL | CSA | GAMT1 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0034.4807 | 0034.4857 | 63 mA*/ 125 V | 63 mA – 10 A: 300 A / 125 V AC cos w 1<br>300 A / 125 V DC L/R ≤ 1 ms<br>$I_n$ > 10 A: 50 A / 32 V AC cos w 1<br>300 A / 32 V DC L/R ≤ 1 ms | 2230 | 1050 | 154 | 66.5 | 0,0008 | • | • | |
| 0034.4810 | 0034.4860 | 125 mA*/ 125 V | | 1500 | 900 | 206 | 115 | 0,0036 | • | • | • |
| 0034.4813 | 0034.4863 | 250 mA*/ 125 V | | 1000 | 325 | 275 | 82.5 | 0,0094 | • | • | • |
| 0034.4815 | 0034.4865 | 375 mA / 125 V | | | 245 | | 92 | 0,019 | • | • | • |
| 0034.4817 | 0034.4867 | 500 mA*/ 125 V | | 1000 | 280 | 550 | 130 | 0,07 | • | • | • |
| 0034.4820 | 0034.4870 | 750 mA / 125 V | | | 245 | | 185 | 0,18 | • | • | • |
| 0034.4822 | 0034.4872 | 1 A*/ 125 V | | 275 | 210 | 303 | 210 | 0,3 | • | • | • |
| 0034.4824 | 0034.4874 | 1.5 A / 125 V | | | 230 | | 345 | 0,38 | • | • | • |
| 0034.4826 | 0034.4876 | 2 A*/ 125 V | | 250 | 190 | 550 | 380 | 1,1 | • | • | • |
| 0034.4827 | 0034.4877 | 2.5 A*/ 125 V | | 250 | 175 | 668 | 440 | 1,4 | • | • | • |
| 0034.4828 | 0034.4878 | 3 A / 125 V | | | 170 | | 510 | 2 | • | • | • |
| 0034.4830 | 0034.4880 | 3.5 A / 125 V | | | 160 | | 560 | 2,6 | • | • | • |
| 0034.4831 | 0034.4881 | 4 A*/ 125 V | | 225 | 180 | 990 | 720 | 4 | • | • | • |
| 0034.4832 | 0034.4882 | 5 A*/ 125 V | | 225 | 170 | 1238 | 850 | 6,2 | • | • | • |
| 0034.4833 | 0034.4883 | 7 A / 125 V | | | 135 | | 945 | 13 | • | • | • |
| 0034.4834 | 0034.4884 | 10 A / 125 V | | | 130 | | 1300 | 39 | • | • | • |
| 0034.4835 | 0034.4885 | 12 A / 32 V | | | 120 | | 1450 | 57 | • | • | • |
| 0034.4836 | 0034.4886 | 15 A / 32 V | | | 120 | | 1800 | 90 | • | • | • |

Color coded sleeves available on request

* Rated currents of IEC

† for part numbers and ordering data for the 250V version, contact Schurter Inc.

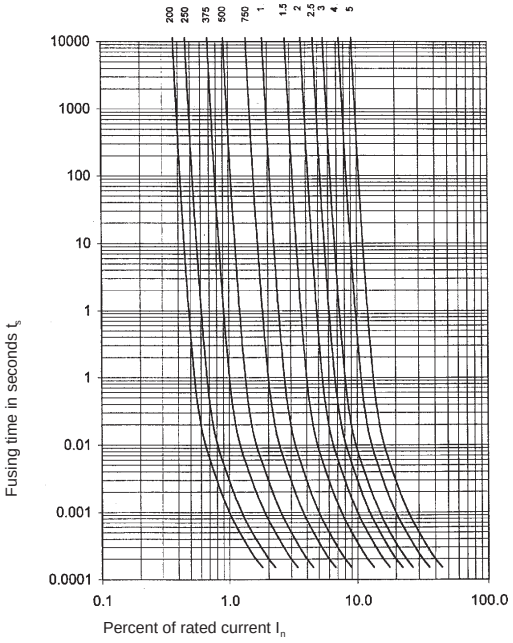
# MGL 125V Quick-acting Miniature Fuse

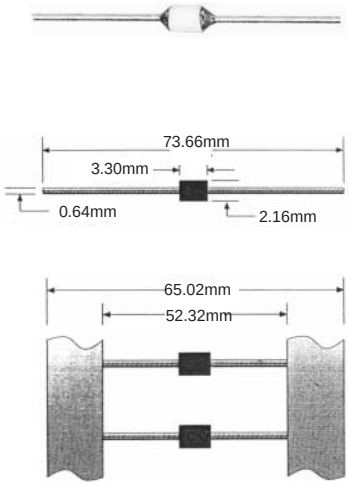
**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition[1] | 200mA-3A[2] | File #E153466 |
| CSA | acceptance | 200mA-3A[2] | File #LR51172 |

1) reference series 1020 2) 4A-5A approvals pending

NEW




Note: dimensions are in mm

- Mounting holes as close as .2 inch
- Lowest resistance
- Quick-acting
- Hermetically sealed for operating temperatures in excess of 150˚C
- Superior cycling

Time Current Characteristics

| n • In / rated current In | In | 2.5 • In |
|---|---|---|
| 200mA – 5A | ≥ 4 h | ≤ 5 s |

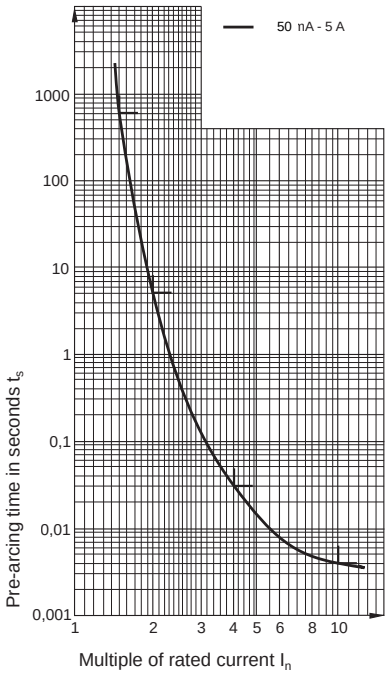
## Technical Data

| | |
|---|---|
| **Rated current** | see chart |
| **Time current characteristic** | quick-acting |
| **Breaking capacity** | 50A AC, 300 A DC |
| **Ambient temperature max.** | +150°C |
| **Climatic category** | hermetically sealed |
| **Solderability** | reflow: 260˚C / 30 sec. max; wave: 260˚C / 10 sec. max. |
| **Soldering heat resistance** | 60 seconds above 200˚C, max. 260˚C |
| **Material: Housing** | ceramic |
| **Terminals** | copper, nickel-gold plated |

| Order Numbers<br>Series MGL 125V | Rated current / voltage<br>mA / A / V ~ | Breaking capacity A ~<br>ac / dc | Voltage drop at In<br>typical mV | Resistance at ≤10% In<br>Ohms | Pre-arcing $I^2t$ at 4 • $I_n$<br>$A^2s$ | Packaging<br>Order No. Suffix |
|---|---|---|---|---|---|---|
| 3411.0021.XX | 200 mA / 125V | | 197 | 0.87 | 0.0013 | |
| 3411.0022.XX | 250 mA / 125V | | 168 | 0.63 | 0.0027 | |
| 3411.0025.XX | 375 mA / 125V | | 130 | 0.32 | 0.0039 | packaged loose: .XX = .05 |
| 3411.0027.XX | 500 mA / 125V | | 115 | 0.20 | 0.0066 | |
| 3411.0029.XX | 750 mA / 125V | | 106 | 0.11 | 0.015 | 2,500 pieces taped & reeled: .XX = .06 |
| 3411.0031.XX | 1 A / 125V | 50 A ac / 300A dc | 119 | 0.10 | 0.042 | |
| 3411.0033.XX | 1.5 A / 125V | | 106 | 0.06 | 0.12 | |
| 3411.0035.XX | 2 A / 125V | | 101 | 0.04 | 0.20 | |
| 3411.0036.XX | 2.5 A / 125V | | 98 | 0.03 | 0.35 | 5,000 pieces taped & reeled: .XX = .07 |
| 3411.0037.XX | 3 A / 125V | | 96 | 0.02 | 0.55 | |
| 3411.0140.XX | 4 A / 32V | | 94 | 0.02 | 0.85 | |
| 3411.0141.XX | 5 A / 32V | | 92 | 0.01 | 1.0 | |

All ratings measured at 125V, ambient temperature 25˚C +/-3˚C. AC with unity power factor; DC with time constant < 1 ms.

# MSF 125V Quick-acting Microfuse



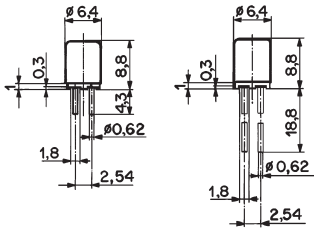

NEW

Surge tolerant version for telecom available; see page 163.

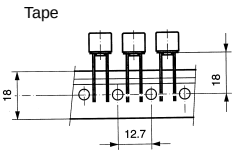
IEC 127-3/1; EN 60127-3/1
UL 248-14 (formerly 198.G)
CSA C22.2 No. 248.14 (formerly 59.2-M)

**Approvals:**

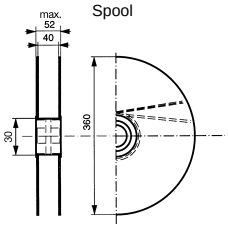
| | | | |
|---|---|---|---|
| UL | recognition | 100mA – 5A | File #E41599 |
| CSA | certification | 100mA – 5A | File #LR51172 |
| | (transparent cap: file #E67006) | | |




Directly solderable into printed circuit boards or plugable into fuseholders. Wave solderable and washable in aqueous solutions.




according to IEC 286-2




Time current characteristic

| Rated current $I_n$ \ $n \cdot I_n$ | $1 \cdot I_n$ [1] | $1{,}5 \cdot I_n$ | $2{,}0 \cdot I_n$ | $2{,}75 \cdot I_n$ | $4 \cdot I_n$ | $10 \cdot I_n$ |
|---|---|---|---|---|---|---|
| | UL/IEC | UL | UL/IEC | IEC | IEC | IEC |
| 0,05 – 5 A | contin. | <10 min. | <5 s | < 300 ms | <30 ms | <4 ms |

Optional 125V microfuse holder, order number: FMS 0031.7501 (vertical mount) or FMR 0031.7505 (horizontal mount). See page 90 for more information.

## Technical data

| | |
|---|---|
| **Ambient temperature max. $T_{amb}$** | – 25 °C to + 85 °C |
| **Capacity at different $T_{amb}$** | 1 · $I_n$ up to max. 40 °C<br>0,9 · $I_n$ up to max. 85 °C |
| **Vibration resistance** | Frequency 10 ÷ 2000 Hz, amplitude of 0,75 mm, constant acceleration<br>100 m/s² (10 g) acc. to IEC 68-2-6, test Fc |
| **Shock resistance** | 490 m/s² (50 g), 11 ms (IEC 68-2-27) |
| **Climate category** | HPF according to DIN 40040 |
| **Solderability** | 235 °C / 2 sec. according to IEC 68-2-20, test Ta (DIN 40046) |
| **Soldering heat resistance** | 260 °C / 10 sec. according to IEC 68-2-20, test Tb (DIN 40046) |
| **Materials** | Socket and cap made of temperature resistant plastic (UL 94V-0) |
| **Terminals** | Copper tin-plated |

| Order No., MSF 125 transparent cap | | black cap | | metal cap*** | | Rated curr. / rated voltage | Breaking capacity | Voltage drop at In | | Power dissipation at 1 • In | | Fusing I²t | Appr. | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Short leads | Long (A) leads | Short leads | Long (B) leads | Short leads | Long leads | mA / A / V ~ | A ~ | max. IEC 127 mV | typical Schurter mV | max. IEC 127 Watts | typical Schurter Watts | t<10ms A²s | | |
| | | 0034.4707* | 0034.4708* | | | 50 mA / 125V | 50A/125V AC | | 800 | | | 0.00007 | • | |
| 0034.4909 | 0034.6339 | 0034.4209 | 0034.4239 | 0034.4269 | 0034.4299 | 100 mA / 125V | IEC: 50A/125V AC/DC p.f. 1<br>UL/CSA: 300A/125V AC/DC p.f. 1 | 1000 | 690 | 0.11 | 0.1 | 0.0007 | • | • |
| 0034.4910 | 0034.6340 | 0034.4210 | 0034.4240 | 0034.4270 | 0034.4300 | 125 mA / 125V | | 1000 | 960 | 0.14 | 0.1 | 0.0015 | • | • |
| 0034.4911 | 0034.6341 | 0034.4211 | 0034.4241 | 0034.4271 | 0034.4301 | 160 mA / 125V | | 1000 | 850 | 0.18 | 0.1 | 0.0036 | • | • |
| 0034.4912 | 0034.6342 | 0034.4212 | 0034.4242 | 0034.4272 | 0034.4302 | 200 mA / 125V | | 700 | 680 | 0.14 | 0.1 | 0.0033 | • | • |
| 0034.4913 | 0034.6343 | 0034.4213 | 0034.4243 | 0034.4273 | 0034.4303 | 250 mA / 125V | | 700 | 620 | 0.19 | 0.1 | 0.0055 | • | • |
| 0034.4914 | 0034.6344 | 0034.4214 | 0034.4244 | 0034.4274 | 0034.4304 | 315 mA / 125V | | 700 | 680 | 0.24 | 0.2 | 0.025 | • | • |
| 0034.4915 | 0034.6345 | 0034.4215 | 0034.4245 | 0034.4275 | 0034.4305 | 400 mA / 125V | | 400 | 180 | 0.18 | 0.1 | 0.013 | • | • |
| 0034.4916 | 0034.6346 | 0034.4216 | 0034.4246 | 0034.4276 | 0034.4306 | 500 mA / 125V | | 400 | 180 | 0.22 | 0.1 | 0.020 | • | • |
| 0034.4917 | 0034.6347 | 0034.4217 | 0034.4247 | 0034.4277 | 0034.4307 | 630 mA / 125V | | 400 | 180 | 0.28 | 0.1 | 0.045 | • | • |
| 0034.4918** | 0034.6348** | 0034.4218** | 0034.4248** | 0034.4278** | 0034.4308** | 710 mA / 125V | | | 140 | | 0.1 | 0.045 | • | • |
| 0034.4919** | 0034.6349** | 0034.4219** | 0034.4249** | 0034.4279** | 0034.4309** | 750 mA / 125V | | | 170 | | 0.1 | 0.020 | • | • |
| 0034.4920 | 0034.6350 | 0034.4220 | 0034.4250 | 0034.4280 | 0034.4310 | 800 mA / 125V | | 400 | 150 | 0.37 | 0.1 | 0.040 | • | • |
| 0034.4921 | 0034.6351 | 0034.4221 | 0034.4251 | 0034.4281 | 0034.4311 | 1 A / 125V | | 190 | 150 | 0.21 | 0.1 | 0.070 | • | • |
| 0034.4922 | 0034.6352 | 0034.4222 | 0034.4252 | 0034.4282 | 0034.4312 | 1.25 A / 125V | | 190 | 150 | 0.26 | 0.2 | 0.120 | • | • |
| 0034.4923 | 0034.6353 | 0034.4223 | 0034.4253 | 0034.4283 | 0034.4313 | 1.6 A / 125V | | 190 | 150 | 0.33 | 0.2 | 0.290 | • | • |
| 0034.4924 | 0034.6354 | 0034.4224 | 0034.4254 | 0034.4284 | 0034.4314 | 2 A / 125V | | 190 | 130 | 0.42 | 0.2 | 0.430 | • | • |
| 0034.4925 | 0034.6355 | 0034.4225 | 0034.4255 | 0034.4285 | 0034.4315 | 2.5 A / 125V | | 190 | 120 | 0.52 | 0.3 | 0.600 | • | • |
| 0034.4926 | 0034.6356 | 0034.4226 | 0034.4256 | 0034.4286 | 0034.4316 | 3.15 A / 125V | | 190 | 120 | 0.66 | 0.4 | 1.110 | • | • |
| 0034.4927 | 0034.6357 | 0034.4227 | 0034.4257 | 0034.4287 | 0034.4317 | 4 A / 125V | | 190 | 120 | 0.84 | 0.5 | 1.890 | • | • |
| 0034.4928 | 0034.6358 | 0034.4228 | 0034.4258 | 0034.4288 | 0034.4318 | 5 A / 125V | | 190 | 120 | 1.0 | 0.6 | 3.040 | • | • |

* Deviations
- Time current characteristics: In > 4h
- Permissible continuous operating current; ≤ 0,7 • In
- Vibration and shock resistance: on request
- Cap: metal

** Not mentioned in the standards
*** 1,000 pieces minimum order required for metal cap
Variable terminal lengths between 3 and 25,4 mm on request

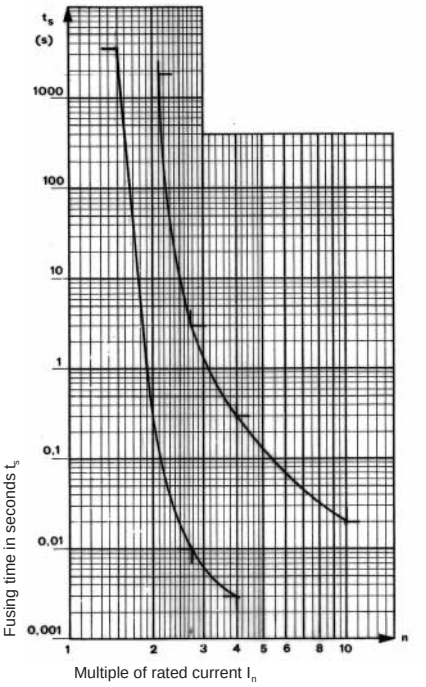
(A) change sixth digit from "3" to "5" for tape and reel part number (e.g. 0034.6539, 1,000 pieces)
(B) change sixth digit from "2" to "5" for tape and reel part number (e.g. 0034.4539, 1,000 pieces)

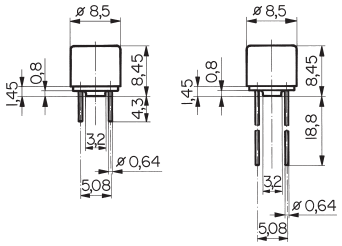
# MSF 250V Quick Acting Microfuse

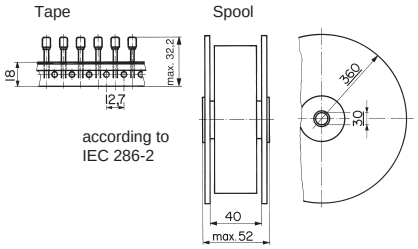
IEC 127-3/1; EN 60127-3/1
UL 248-14 (formerly 198.G)
CSA C22.2 No. 248-14 (formerly 59.2M)

**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 40mA – 5A | File #E41599 |
| CSA | acceptance | 40mA – 5A | File #LR51172 |
| VDE | approval | 50mA – 3.15A | File #62460 |
| SEMKO | approval | 50mA – 3.15A | File numbers on request |
| SEV | approval | 50mA – 3.15A | |




Time Current Characteristics

| rated current $I_n$ \ n • $I_n$ | 1.5 • $I_n$ | 2.1 • $I_n$ | 2.75 • $I_n$ | | 4 • $I_n$ | | 10 • $I_n$ |
|---|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. | max. |
| 40mA - 5A | 60 min. | 30 min. | 10 ms | 3 s | 3 ms | 300 ms | 20 ms |

Optional 250V microfuse holder, order number FMS 0031.7601. See page 90.

## Technical Data

| | |
|---|---|
| **Ambient temperature max. $T_{amb}$** | -40˚C to +85˚C |
| **Capacity at different $T_{amb}$** | 1 • $I_n$ up to max. 40˚C<br>0.9 • $I_n$ up to max. 85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz<br>< 60 Hz, constant amplitude 1.5mm<br>> 60 Hz, constant acceleration 100 m/s $^2$(10g) acc. to IEC 68-2-6 / Fc |
| **Shock resistance** | 490 m/s$^2$, 11 ms (IEC 68-2-27) |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability** | 235˚C / 2s according to IEC 68-2-20 / Ta (DIN 40046) |
| **Soldering heat resistance** | 260˚C / 10s according to IEC 68-2-20 / Tb (DIN 40046) |
| **Materials** | Socket and cap made of temperature resistant plastic (UL 94 V-0) |
| **Terminals** | Copper, tin-plated |

| Order Numbers Series MSF 250 | | | Rated current / rated voltage | Breaking capacity | Voltage drop at In | | Power dissipation at 1.5 • In | | Fusing $I^2$ t $t_s$ < 10ms at 10 • In | Approvals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Short leads black | Long leads black | Taped/reeledl-ong leads black | mA / A / V ~ | A ~ | max. IEC 127 mV | typical Schurter mV | max. IEC 127 Watts | typical Schurter Watts | $A^2$ s | UL | CSA | VDE | SEMKO | SEV |
| 0034.6000 | 0034.6030 | 0034.6060 | 40 mA / 250V | | 850 | 400 | | | | • | • | | | |
| 0034.6001 | 0034.6031 | 0034.6061 | 50 mA / 250V | | 850 | 460 | 0.11 | 0.1 | 0.004 | • | • | • | • | • |
| 0034.6002 | 0034.6032 | 0034.6062 | 63 mA / 250V | | 750 | 330 | 0.12 | 0.1 | 0.001 | • | • | • | • | • |
| 0034.6003 | 0034.6033 | 0034.6063 | 80 mA / 250V | | 650 | 280 | 0.14 | 0.1 | 0.001 | • | • | • | • | • |
| 0034.6004 | 0034.6034 | 0034.6064 | 100 mA / 250V | | 600 | 300 | 0.16 | 0.1 | 0.002 | • | • | • | • | • |
| 0034.6005 | 0034.6035 | 0034.6065 | 125 mA / 250V | | 550 | 210 | 0.18 | 0.1 | 0.006 | • | • | • | • | • |
| 0034.6006 | 0034.6036 | 0034.6066 | 160 mA / 250V | | 500 | 460 | 0.21 | 0.2 | 0.014 | • | • | • | • | • |
| 0034.6007 | 0034.6037 | 0034.6067 | 200 mA / 250V | | 480 | 470 | 0.25 | 0.2 | 0.024 | • | • | • | • | • |
| 0034.6008 | 0034.6038 | 0034.6068 | 250 mA / 250V | | 440 | 360 | 0.29 | 0.2 | 0.058 | • | • | • | • | • |
| 0034.6009 | 0034.6039 | 0034.6069 | 315 mA / 250V | 35A / 250V AC (p.f. = 1) | 400 | 345 | 0.33 | 0.3 | 0.104 | • | • | • | • | • |
| 0034.6010 | 0034.6040 | 0034.6070 | 400 mA / 250V | | 370 | 80 | 0.39 | 0.1 | 0.044 | • | • | • | • | • |
| 0034.6011 | 0034.6041 | 0034.6071 | 500 mA / 250V | | 350 | 75 | 0.46 | 0.1 | 0.090 | • | • | • | • | • |
| 0034.6012 | 0034.6042 | 0034.6072 | 630 mA / 250V | | 320 | 70 | 0.53 | 0.1 | 0.150 | • | • | • | • | • |
| 0034.6013 | 0034.6043 | 0034.6073 | 800 mA / 250V | | 300 | 70 | 0.63 | 0.1 | 0.220 | • | • | • | • | • |
| 0034.6014 | 0034.6044 | 0034.6074 | 1 A / 250V | | 280 | 70 | 0.74 | 0.2 | 0.330 | • | • | • | • | • |
| 0034.6015 | 0034.6045 | 0034.6075 | 1.25 A / 250V | | 280 | 65 | 0.92 | 0.2 | 0.680 | • | • | • | • | • |
| 0034.6016 | 0034.6046 | 0034.6076 | 1.6 A / 250V | | 250 | 70 | 1.0 | 0.3 | 0.940 | • | • | • | • | • |
| 0034.6017 | 0034.6047 | 0034.6077 | 2 A / 250V | | 240 | 70 | 1.36 | 0.3 | 1.330 | • | • | • | • | • |
| 0034.6018 | 0034.6048 | 0034.6078 | 2.5 A / 250V | | 200 | 65 | 1.31 | 0.4 | 1.940 | • | • | • | • | • |
| 0034.6019 | 0034.6049 | 0034.6079 | 3.15 A / 250V | | 180 | 65 | 1.49 | 0.5 | 5.400 | • | • | • | • | • |
| 0034.6020 | 0034.6050 | 0034.6080 | 4 A / 250V | 10•$I_n$/250V AC p.f.=1 | 160 | 60 | 1.68 | 1 | 7.900 | • | • | | | |
| 0034.6021 | 0034.6051 | 0034.6081 | 5 A / 250V | | 150 | 60 | 1.97 | 1 | 11.190 | • | • | | | |

*Not included in the standards

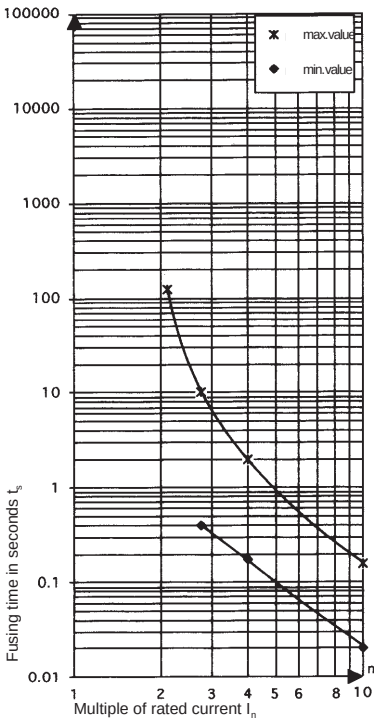
**Packaging:** Loose, or taped and reeled 750 pcs.

# MST 250V Time-lag Microfuse - Low Breaking Capacity

IEC 127-3/1; EN 60127-3/1
UL 248-14 (formerly 198.G)
CSA C22.2 No. 248-14 (formerly 59.2M)

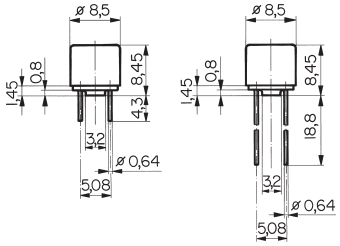
**Approvals:**

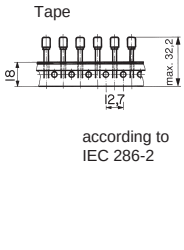
| | | | |
|---|---|---|---|
| UL | recognition | 50mA – 6.3A | File #E41599 |
| CSA | acceptance | 50mA – 6.3A | File #LR51172 |
| VDE | approval | 50mA – 4A | File #85616 |
| SEMKO | approval | 50mA – 4A | File numbers on request |
| SEV | approval | 50mA – 6.3A | |




**NEW**

*Surge tolerant version for telecom available; see page 163.*




Time Current Characteristics

| rated current $I_n$ \ $n \cdot I_n$ | 2.1 • $I_n$ | 2.75 • $I_n$ | | 4 • $I_n$ | | 10 • $I_n$ | |
|---|---|---|---|---|---|---|---|
| | max. | min. | max. | min. | max. | min. | max. |
| continuous | 2 min. | 400 ms | 10 s | 150 ms | 3 s | 20 ms | 150 ms |

Optional 250V microfuse holder, order number FMS 0031.7601. See page 90 for more information.

## Technical Data

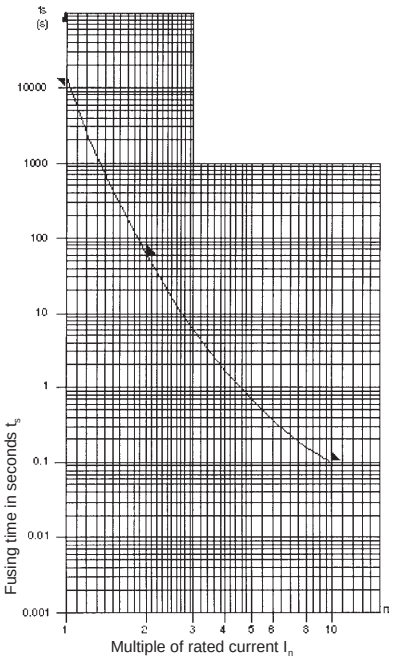
| | |
|---|---|
| **Ambient temperature max. $T_{amb}$** | -40˚C to +85˚C |
| **Capacity at different $T_{amb}$** | 1 x $I_n$ up to max. 40˚C<br>0.9 x $I_n$ up to max. 85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz<br>< 60 Hz, constant amplitude 1.5mm<br>> 60 Hz, constant acceleration at 100 m/s² (10g) acc. to IEC 68-2-6 / Fc |
| **Shock resistance** | 490 m/s², 11 ms (IEC 68-2-27) |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability** | 235˚C / 2s according to IEC 68-2-20 / Ta (DIN 40046) |
| **Soldering heat resistance** | 260˚C / 10s according to IEC 68-2-20 / Tb (DIN 40046) |
| **Materials** | Socket and cap made of temperature resistant plastic (UL 94 V-0) |
| **Terminals** | Copper, tin-plated |

| Order Numbers Series MST | | | Rated current / rated voltage | Breaking capacity | Voltage drop at In | | Power dissipation at 1.5 • In | | Fusing $I^2t$ $t_s$ < 10ms | Approvals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Short leads black | Long leads black | Taped/reeled long leads black | mA / A / V ~ | A ~ | max. IEC 127 mV | typical Schurter mV | max. IEC 127 Watts | typical Schurter Watts | $A^2$ s | UL | CSA | VDE | SEMKO | SEV |
| 0034.6602 | 0034.6702 | 0034.6802 | 50 mA / 250V | 35 A / 250V AC p.f. = 1 | 550 | 415 | 0.15 | 0.055 | 0.03 | • | • | • | • | • |
| 0034.6603 | 0034.6703 | 0034.6803 | 63 mA / 250V | | 480 | 420 | 0.16 | 0.07 | 0.05 | • | • | • | • | • |
| 0034.6604 | 0034.6704 | 0034.6804 | 80 mA / 250V | | 400 | 360 | 0.16 | 0.08 | 0.07 | • | • | • | • | • |
| 0034.6605 | 0034.6705 | 0034.6805 | 100 mA / 250V | | 350 | 320 | 0.17 | 0.09 | 0.08 | • | • | • | • | • |
| 0034.6606 | 0034.6706 | 0034.6806 | 125 mA / 250V | | 300 | 270 | 0.18 | 0.09 | 0.12 | • | • | • | • | • |
| 0034.6607 | 0034.6707 | 0034.6807 | 160 mA / 250V | | 280 | 190 | 0.19 | 0.08 | 0.24 | • | • | • | • | • |
| 0034.6608 | 0034.6708 | 0034.6808 | 200 mA / 250V | | 260 | 150 | 0.20 | 0.08 | 0.35 | • | • | • | • | • |
| 0034.6609 | 0034.6709 | 0034.6809 | 250 mA / 250V | | 240 | 120 | 0.22 | 0.08 | 0.6 | • | • | • | • | • |
| 0034.6610 | 0034.6710 | 0034.6810 | 315 mA / 250V | | 220 | 120 | 0.25 | 0.1 | 0.8 | • | • | • | • | • |
| 0034.6611 | 0034.6711 | 0034.6811 | 400 mA / 250V | | 200 | 110 | 0.28 | 0.1 | 1.1 | • | • | • | • | • |
| 0034.6612 | 0034.6712 | 0034.6812 | 500 mA / 250V | | 190 | 100 | 0.31 | 0.1 | 2.5 | • | • | • | • | • |
| 0034.6613 | 0034.6713 | 0034.6813 | 630 mA / 250V | | 180 | 90 | 0.36 | 0.1 | 4 | • | • | • | • | • |
| 0034.6614 | 0034.6714 | 0034.6814 | 800 mA / 250V | | 160 | 80 | 0.43 | 0.2 | 8 | • | • | • | • | • |
| 0034.6615 | 0034.6715 | 0034.6815 | 1 A / 250V | | 140 | 70 | 0.5 | 0.2 | 12 | • | • | • | • | • |
| 0034.6616 | 0034.6716 | 0034.6816 | 1.25 A / 250V | | 130 | 70 | 0.6 | 0.3 | 15 | • | • | • | • | • |
| 0034.6617 | 0034.6717 | 0034.6817 | 1.6 A / 250V | | 120 | 60 | 0.73 | 0.3 | 30 | • | • | • | • | • |
| 0034.6618 | 0034.6718 | 0034.6818 | 2 A / 250V | | 100 | 60 | 0.87 | 0.3 | 34 | • | • | • | • | • |
| 0034.6619 | 0034.6719 | 0034.6819 | 2.5 A / 250V | | 100 | 50 | 1.0 | 0.4 | 55 | • | • | • | • | • |
| 0034.6620 | 0034.6720 | 0034.6820 | 3.15 A / 250V | | 100 | 50 | 1.2 | 0.5 | 76 | • | • | • | • | • |
| 0034.6621 | 0034.6721 | 0034.6821 | 4 A / 250V | 10•$I_n$ / 250V AC p.f.=1 | 100 | 50 | 1.4 | 0.6 | 80 | • | • | • | • | • |
| 0034.6622* | 0034.6722* | 0034.6822* | 5 A / 250V | | 60 | | | 0.9 | 230 | • | • | | | • |
| 0034.6623* | 0034.6723* | 0034.6823* | 6.3 A / 250V | | 50 | | | 1.1 | 360 | • | • | | | • |

* Built according to manufacturer's specifications. Not mentioned in IEC standards.
**Packaging:** Loose, or taped and reeled 750 pcs.

FOLDOUT PAGE 141

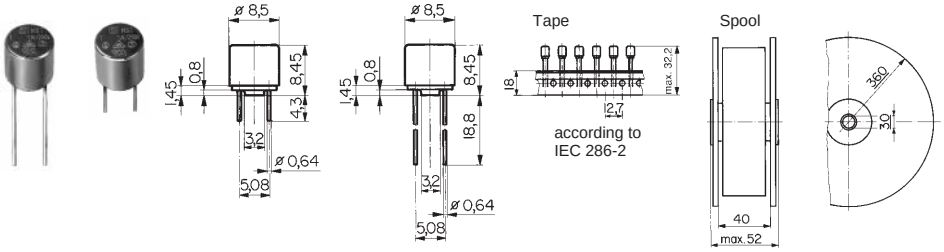
# MST-U 250V Time-lag Microfuse




NEW

**Approvals:** UL 248-14 (formerly 198.G)

| | | | |
|---|---|---|---|
| UL | listing | 50mA – 6.3A | File #E41599 |
| CSA | acceptance | 50mA – 6.3A | File #LR51172-34 |




Time Current Characteristics

| rated current $I_n$ \ $n \cdot I_n$ | $1 \cdot I_n$ | $2 \cdot I_n$ |
|---|---|---|
| | max. | max. |
| 50 mA - 6.3 A | > 4h | < 60s |

Optional 250V microfuse holder, order number FMS 0031.7601. See page 90 for more information.

## Technical Data

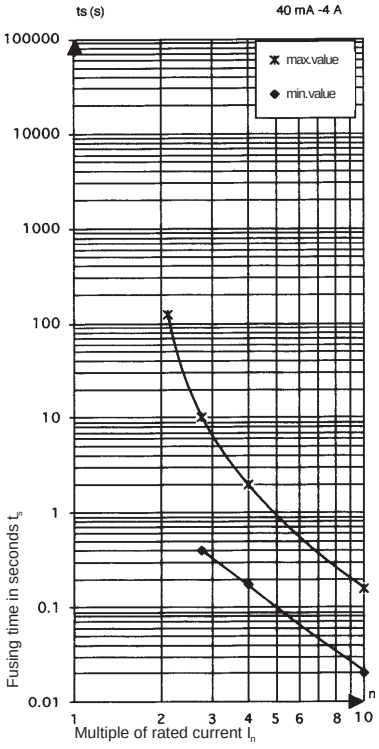
| | |
|---|---|
| **Ambient temperature max. $T_{amb}$** | -40°C to +85°C |
| **Capacity at different $T_{amb}$** | $1 \cdot I_n$ up to max. 40°C<br>$0.9 \cdot I_n$ up to max. 85°C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 60 Hz<br>< 60 Hz, constant amplitude 1.5mm<br>> 60 Hz, constant acceleration at 100 m/s$^2$ (10g) acc. to IEC 68-2-6 / Fc |
| **Shock resistance** | 490 m/s$^2$, 11 ms (IEC 68-2-27) |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability** | 235°C / 2s according to IEC 68-2-20 / Ta (DIN 40046) |
| **Soldering heat resistance** | 260°C / 10s according to IEC 68-2-20 / Tb (DIN 40046) |
| **Materials** | Socket and cap made of temperature resistant plastic (UL 94 V-0) |
| **Terminals** | Copper, tin-plated |

| **Order Numbers Series MST-U** | | | **Rated current / rated voltage** | **Breaking capacity** | **Voltage drop at $I_n$** | **Power dissipation at 1 x$I_n$** | **Pre-arcing $I^2t$ at 10 x $I_n$** | **Approvals** | |
|---|---|---|---|---|---|---|---|---|---|
| **Short leads black** | **Long leads black** | **Taped/reeled long leads black** | **mA / A / V ~** | **A ~** | **typical Schurter mV** | **typical Schurter mW** | **$A_2$ s** | **UL** | **CSA** |
| 0034.7102 | 0034.7202 | 0034.7302 | 50 mA / 250V | | | | | • | • |
| 0034.7103 | 0034.7203 | 0034.7303 | 63 mA / 250V | | | | | • | • |
| 0034.7104 | 0034.7204 | 0034.7304 | 80 mA / 250V | | | | | • | • |
| 0034.7105 | 0034.7205 | 0034.7305 | 100 mA / 250V | | | | | • | • |
| 0034.7106 | 0034.7206 | 0034.7306 | 125 mA / 250V | | | | | • | • |
| 0034.7107 | 0034.7207 | 0034.7307 | 160 mA / 250V | | | | | • | • |
| 0034.7108 | 0034.7208 | 0034.7308 | 200 mA / 250V | | | | | • | • |
| 0034.7109 | 0034.7209 | 0034.7309 | 250 mA / 250V | | 205 | 54 | 0.23 | • | • |
| 0034.7110 | 0034.7210 | 0034.7310 | 315 mA / 250V | | | | | • | • |
| 0034.7111 | 0034.7211 | 0034.7311 | 400 mA / 250V | | | | | • | • |
| 0034.7112 | 0034.7212 | 0034.7312 | 500 mA / 250V | 50 A/ 250V AC (p.f. = 1) | | | | • | • |
| 0034.7113 | 0034.7213 | 0034.7313 | 630 mA / 250V | | | | | • | • |
| 0034.7114 | 0034.7214 | 0034.7314 | 800 mA / 250V | | | | | • | • |
| 0034.7115 | 0034.7215 | 0034.7315 | 1 A / 250V | | 100 | 107 | 6.44 | • | • |
| 0034.7116 | 0034.7216 | 0034.7316 | 1.25 A / 250V | | | | | • | • |
| 0034.7117 | 0034.7217 | 0034.7317 | 1.6 A / 250V | | 85 | 142 | 16.9 | • | • |
| 0034.7118 | 0034.7218 | 0034.7318 | 2 A / 250V | | | | | • | • |
| 0034.7119 | 0034.7219 | 0034.7319 | 2.5 A / 250V | | | | | • | • |
| 0034.7120 | 0034.7220 | 0034.7320 | 3.15 A / 250V | | 73 | 241 | 53 | • | • |
| 0034.7121 | 0034.7221 | 0034.7321 | 4 A / 250V | | | | | • | • |
| 0034.7122 | 0034.7222 | 0034.7322 | 5 A / 250V | | | | | • | • |
| 0034.7123 | 0034.7223 | 0034.7323 | 6.3 A / 250V | | 68 | 490 | 262 | • | • |

**Packaging:** Loose, or taped and reeled 750 pcs.

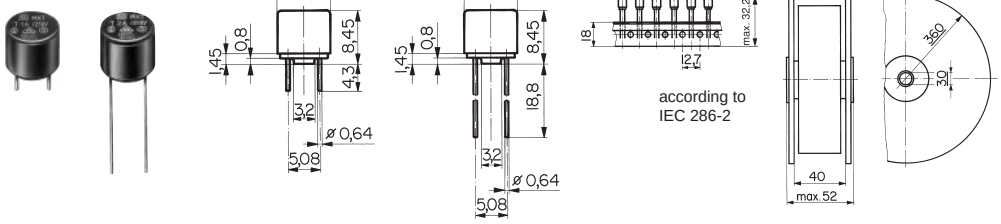
# MXT 250V Time-lag Microfuse - High Breaking Capacity

IEC 127-3/4; EN 60127-3/4 however with a higher breaking capacity
UL 248-14 (formerly 198G)
CSA C22.2 No. 248.14 (formerly 59.2M)




**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 800mA – 6.3A | File #E41599 |
| CSA | acceptance | 800mA – 6.3A | File #LR51172 |
| VDE | approval | 800mA – 4A | File #77566 |
| SEMKO | approval | 800mA – 4A | File numbers on request |
| SEV | approval | 800mA – 6.3A | |




Time Current Characteristics

| n • In / rated current In | 2.1 • In | 2.75 • In | | 4 • In | | 10 • In | |
|---|---|---|---|---|---|---|---|
| | max. | min. | max. | min. | max. | min. | max. |
| continuous | 2 min. | 400 ms | 10 s | 150 ms | 3 s | 20 ms | 150 ms |

Optional 250V microfuse holder, order number FMS 0031.7601. See page 90 for more information.

## Technical Data

| | |
|---|---|
| **Ambient temperature max. $T_{amb}$** | -25˚C to +85˚C |
| **Capacity at different $T_{amb}$** | 1 • $I_n$ up to max. 40˚C<br>0.9 • $I_n$ up to max. 85˚C |
| **Vibration resistance** | Frequency 10-2000 Hz, cross-over frequency 40 Hz<br>< 60 Hz, constant amplitude 1.5mm<br>> 60 Hz, constant acceleration 100 m/s² (10g) acc. to IEC 68-2-6 / Fc |
| **Shock resistance** | 490 m/s², 11 ms (IEC 68-2-27) |
| **Climatic category** | HPF according to DIN 40040 |
| **Solderability** | 235˚C / 2s according to IEC 68-2-20 / Ta (DIN 40046) |
| **Soldering heat resistance** | 260˚C / 10s according to IEC 68-2-20 / Tb (DIN 40046) |
| **Materials** | Socket and cap made of temperature resistant plastic (UL 94 V-0) |
| **Terminals** | Copper, tin-plated |

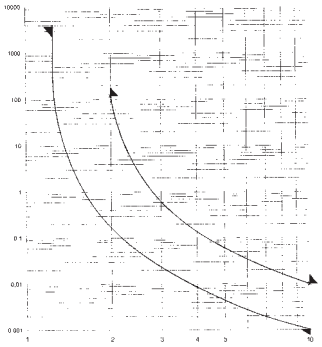
| Order Numbers Series MXT | | | Rated current / rated voltage | Breaking capacity | Voltage drop at In | | Power dissipation at 1.5 • In | | Fusing $I^2t$ at 10 • $I_n$ | Approvals | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Short leads black | Long leads black | Taped/reeled long leads black | mA/A/V~ | A~ | max. IEC 127-3 mV | typical Schurter mV | max. IEC 127-3 Watts | typical Schurter Watts | $A^2S$ | UL | CSA | VDE | SEMKO | SEV |
| 0034.6914 | 0034.6944 | 0034.6974 | 800 mA / 250V | | 160 | 150 | 0.43 | 0.3 | 2.2 | • | • | • | • | • |
| 0034.6915 | 0034.6945 | 0034.6975 | 1 A / 250V | | 140 | 130 | 0.5 | 0.35 | 4.4 | • | • | • | • | • |
| 0034.6916 | 0034.6946 | 0034.6976 | 1.25 A / 250V | 100A | 130 | 120 | 0.6 | 0.4 | 6.3 | • | • | • | • | • |
| 0034.6917 | 0034.6947 | 0034.6977 | 1.6 A / 250V | 250V / AC | 120 | 110 | 0.73 | 0.5 | 10 | • | • | • | • | • |
| 0034.6918 | 0034.6948 | 0034.6978 | 2 A / 250V | (p.f. = 1) | 100 | 85 | 0.87 | 0.5 | 16 | • | • | • | • | • |
| 0034.6919 | 0034.6949 | 0034.6979 | 2.5 A / 250V | acc. to | 100 | 85 | 1 | 0.65 | 32 | • | • | • | • | • |
| 0034.6920 | 0034.6950 | 0034.6980 | 3.15 A / 250V | IEC | 100 | 75 | 1.2 | 0.67 | 57 | • | • | • | • | • |
| 0034.6921 | 0034.6951 | 0034.6981 | 4 A / 250V | 127-3/4 | 100 | 75 | 1.4 | 0.9 | 77 | • | • | • | • | • |
| 0034.6922* | 0034.6952* | 0034.6982* | 5 A / 250V | | | 70 | | 1.1 | 155 | • | • | | | • |
| 0034.6923* | 0034.6953* | 0034.6983* | 6.3 A / 250V | | | 65 | | 1.15 | 262 | • | • | | | • |

* Built according to manufacturer's specifications. Not mentioned in IEC standards.
**Packaging:** Loose, or taped and reeled 750 pcs.

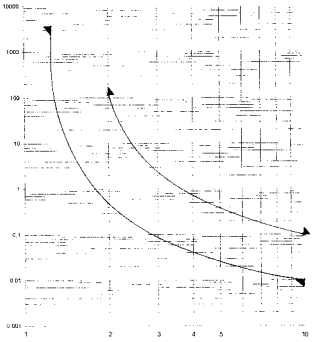
# FRT 250 F Quick-acting; FRT 250 T Time-lag, Fuse with Radial Leads

IEC 127-4/1

FRT250F

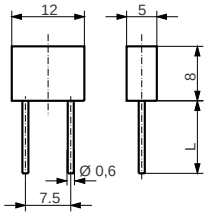


FRT250T



**NEW**

*Surge tolerant version for telecom available; see page 164*



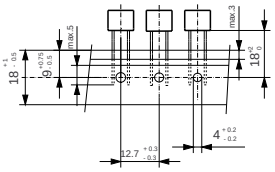

L: short ≙ 4.3 mm
long ≙ 19 mm
Ø = 0.6 mm

directly solderable into printed circuit boards or plugable into fuseholders

Approvals:

UL listing pending
CSA certification pending

Tape

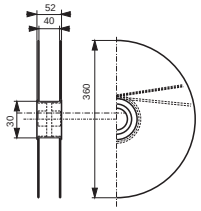


Pre-arcing time/current Characteristic temps (at $T_a$ 23 °C)

| Rated current $I_n$ \ $n \cdot I_n$ | 1,25 · $I_n$* | 2 · $I_n$ | 10 · $I_n$ | |
|---|---|---|---|---|
| | min. | max. | min. | max. |
| FRT250F 250 mA–6.3A | 60 min. | 120 s | 1 ms | 10 ms |
| FRT250T 250 mA–6.3A | 60 min. | 120 s | 10 ms | 100 ms |

* Non fusing current $I_{nf}$

Reel




Tape and reel according to IEC 286-2

## Technical data

| | |
|---|---|
| Ambient temperature max. $T_a$ | -40°C to +85°C |
| Capacity at different $T_a$ | 1 · $I_n$ up to max. 40°C<br>0,9 · $I_n$ up to max. 85°C |
| Resistance to vibration | Frequency 10 ÷ 2000Hz, cross-over frequency 60 Hz<br>< 60 Hz constant amplitude of 1,5 mm<br>> 60 Hz constant acceleration of 100m/s² (10g)<br>according to IEC 68-2-6, test Fc |
| Resistance to shock | 490 m/s² (50g), 11 ms according to IEC 68-2-27 |
| Climate category | according to DIN 40040 |
| Solderability | 235°C / 2 sec. according to IEC 68-2-20, test Ta |
| Soldering heat resistance | 260°C / 10 sec. according to IEC 68-2-20, test Tb |
| Materials Socket and cap | temperature resistant plastic, UL 94V-0 |
| Terminals | Copper tin-plated |

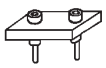
| **FRT 250 F** Order No., Quick-acting | | | Rated current $I_n$ Rated voltage $U_n$ | Breaking Capacity | Voltage drop $I_n$ | | Max. sustained power diss. | | Pre-arcing $I^2t$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | max. | typ | 1.25 $I_n$ max. | typ | |
| Terminals | | Taped | | | IEC 127 | | IEC157 | | |
| short | long | and reeled | | | mV | mV | mW | mW | $A^2s$ |
| 7100.1059.XX | 7100.1159.XX | 7100.1159.XX | 250 mA / 250V | | 800 | 460 | 500 | 300 | 0.019 |
| 7100.1060.XX | 7100.1160.XX | 7100.1160.XX | 315 mA / 250V | | 750 | 160 | 500 | 150 | 0.028 |
| 7100.1061.XX | 7100.1161.XX | 7100.1161.XX | 400 mA / 250V | | 700 | 140 | 500 | 150 | 0.040 |
| 7100.1062.XX | 7100.1162.XX | 7100.1162.XX | 500 mA / 250V | | 600 | 125 | 500 | 200 | 0.060 |
| 7100.1063.XX | 7100.1163.XX | 7100.1163.XX | 630 mA / 250V | | 500 | 180 | 500 | 250 | 0.075 |
| 7100.1064.XX | 7100.1164.XX | 7100.1164.XX | 800 mA / 250V | | 400 | 170 | 500 | 300 | 0.135 |
| 7100.1065.XX | 7100.1165.XX | 7100.1165.XX | 1 A / 250V | | 300 | 160 | 500 | 300 | 0.200 |
| 7100.1066.XX | 7100.1166.XX | 7100.1166.XX | 1.25 A / 250V | | 300 | 140 | 1000 | 300 | 0.320 |
| 7100.1067.XX | 7100.1167.XX | 7100.1167.XX | 1.6 A / 250V | 100A /250V | 300 | 140 | 1000 | 400 | 0.600 |
| 7100.1068.XX | 7100.1168.XX | 7100.1168.XX | 2 A / 250V | cos w≥0,95 | 300 | 130 | – | 500 | 1.1 |
| 7100.1069.XX | 7100.1169.XX | 7100.1169.XX | 2.5 A / 250V | | 300 | 125 | 1000 | 500 | 1.9 |
| 7100.1070.XX | 7100.1170.XX | 7100.1170.XX | 3.15 A / 250V | | 300 | 120 | 1200 | 650 | 3.3 |
| 7100.1071.XX | 7100.1171.XX | 7100.1171.XX | 4 A / 250V | | 300 | 120 | 1500 | 900 | 5.9 |
| 7100.1072.XX | 7100.1172.XX | 7100.1172.XX | 5 A / 250V | | 300 | 125 | 1875 | 1200 | 11 |
| 7100.1073.XX | 7100.1173.XX | 7100.1173.XX | 6.3 A / 250V | | 300 | 130 | – | 1600 | 18 |

| **FRT 250 T** Order No., Time-lag | | | Rated current $I_n$ Rated voltage $U_n$ | Breaking Capacity | Voltage drop $I_n$ | | Max. sustained power diss. | | Pre-arcing $I^2t$ |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | max. | typ | 1.25 $I_n$ max. | typ | |
| Terminals | | Taped | | | IEC127 | | IEC157 | | |
| short | long | and reeled | | | mV | mV | mW | mW | $A^2s$ |
| 7100.1009.XX | 7100.1109.XX | 7100.1109.XX | 250 mA / 250V | | 800 | 170 | 500 | 150 | 0.032 |
| 7100.1010.XX | 7100.1110.XX | 7100.1110.XX | 315 mA / 250V | | 750 | 160 | 500 | 200 | 0.05 |
| 7100.1011.XX | 7100.1111.XX | 7100.1111.XX | 400 mA / 250V | | 700 | 135 | 500 | 200 | 0.08 |
| 7100.1012.XX | 7100.1112.XX | 7100.1112.XX | 500 mA / 250V | | 600 | 125 | 500 | 200 | 1.25 |
| 7100.1013.XX | 7100.1113.XX | 7100.1113.XX | 630 mA / 250V | | 500 | 130 | 500 | 200 | 2 |
| 7100.1014.XX | 7100.1114.XX | 7100.1114.XX | 800 mA / 250V | | 400 | 200 | 500 | 300 | 3.2 |
| 7100.1015.XX | 7100.1115.XX | 7100.1115.XX | 1 A / 250V | | 300 | 180 | 500 | 400 | 5 |
| 7100.1016.XX | 7100.1116.XX | 7100.1116.XX | 1.25 A / 250V | | 300 | 145 | 1000 | 400 | 7.9 |
| 7100.1017.XX | 7100.1117.XX | 7100.1117.XX | 1.6 A / 250V | 100A /250V | 300 | 110 | 1000 | 400 | 12.8 |
| 7100.1018.XX | 7100.1118.XX | 7100.1118.XX | 2 A / 250V | cos w≥0,95 | 300 | 105 | – | 400 | 20 |
| 7100.1019.XX | 7100.1119.XX | 7100.1119.XX | 2.5 A / 250V | | 300 | 140 | 1000 | 700 | 32 |
| 7100.1020.XX | 7100.1120.XX | 7100.1120.XX | 3.15 A / 250V | | 300 | 115 | 1200 | 700 | 50 |
| 7100.1021.XX | 7100.1121.XX | 7100.1121.XX | 4 A / 250V | | 300 | 120 | 1500 | 900 | 80 |
| 7100.1022.XX | 7100.1122.XX | 7100.1122.XX | 5 A / 250V | | 300 | 125 | 1875 | 1200 | 125 |
| 7100.1023.XX | 7100.1123.XX | 7100.1123.XX | 6.3 A / 250V | | 300 | 120 | – | 1400 | 200 |

XX = Packaging index

**Packaging**

| | |
|---|---|
| Loose | 7100.XXXX.13 |
| Tape and reeled 500 pieces | 7100.XXXX.95 |
| Tape and reeled 1000 pieces | 7100.XXXX.96 |



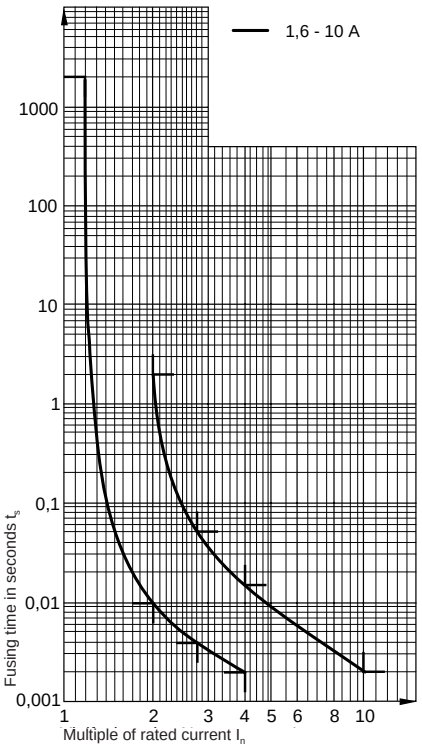
Suitable fuseholder on request

# SA 5 x 20mm Super Quick-acting Fuses – High Breaking Capacity

Built according to SEMKO 104-1976

**Approvals:**
SEMKO approval 1.6A-6.3A File #8738128

**FF**

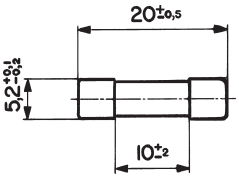


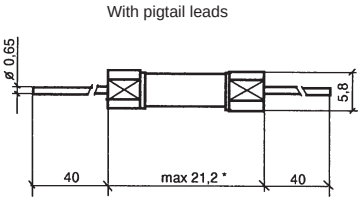


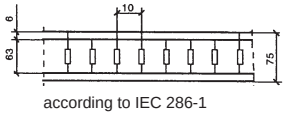
Fuse with pigtail leads (factory assembled only)

Time Current Characteristics

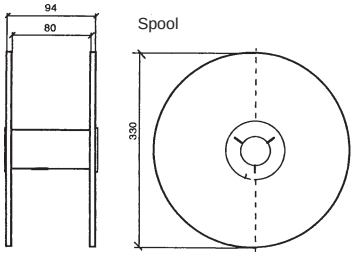
| n • In / rated current In | 1.2 • In | 2 • In | | 2.75 • In | | 4 • In | | 10 • In |
|---|---|---|---|---|---|---|---|---|
| | min. | min. | max. | min. | max. | min. | max. | max. |
| 1.6A – 10A | 60min. | 10ms | 2s | 4ms | 50ms | 2ms | 15ms | 2ms |




according to IEC 286-1



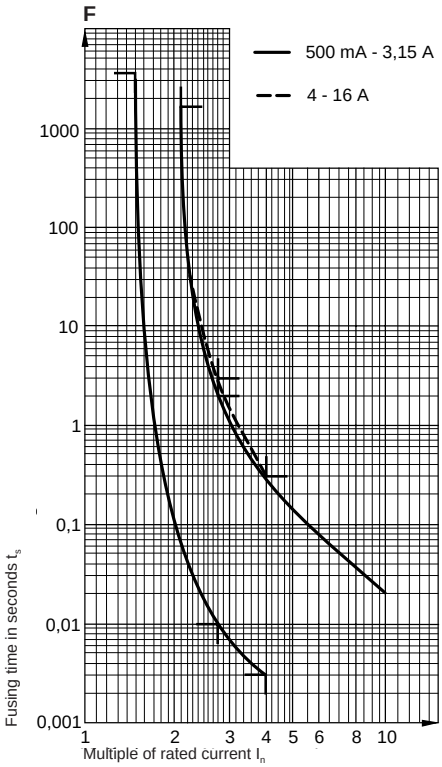

| Order Numbers / Series SA | Rated current / rated voltage A / V~ | Breaking capacity A~ | Voltage drop at In max. Schurter mV | Voltage drop at In typical Schurter mV | Power dissipation at 1.2 • In max. Schurter Watts | Power dissipation at 1.2 • In typical Schurter Watts | Operating $I^2t$ $A^2s$ | Approvals SEMKO |
|---|---|---|---|---|---|---|---|---|
| 0034.0903 | 1.6 A / 250V | 1500A at 250 V, 50 Hz p.f. 0.7 - 0.8 | 400 | 250 | 1.0 | 0.6 | 1.8 | • |
| 0034.0904 | 2 A / 250V | | 370 | 200 | 1.1 | 0.6 | 4.2 | • |
| 0034.0905 | 2.5 A / 250V | | 340 | 200 | 1.3 | 0.8 | 6.6 | • |
| 0034.0906 | 3.15 A / 250V | | 310 | 180 | 1.5 | 1.0 | 8.2 | • |
| 0034.0907 | 4 A / 250V | | 280 | 180 | 1.7 | 1.2 | 19 | • |
| 0034.0908 | 5 A / 250V | | 250 | 160 | 1.9 | 1.4 | 20 | • |
| 0034.0909 | 6.3 A / 250V | | 250 | 170 | 2.3 | 2.0 | 23 | • |
| 0034.0910 | 8 A / 250V | | 250 | 190 | 3.0 | 2.8 | 32 | |
| 0034.0911 | 10 A / 250V | | 250 | 160 | 3.7 | 2.9 | 43 | |

For protection of semiconductors, ask for special catalog (reference super quick-acting fuse series D GLD II / III 0034.1101 - .1115, 2A-6A/500V)

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.0903.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.0903.TR)**

# SP 5 x 20mm Quick-acting Fuses – High Breaking Capacity

Built according to IEC 127-2/1, EN 60127, SEV 1064, DIN/VDE 0820 part 1, DIN 41660, BS 4265, and SEMKO 104-1976. Recommended if the short circuit current through the fuse-link is more than 35A or 10 x $I_n$ , whichever is greater (CENELEC Jan 1, 1993).




**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 500mA-16A* | File #E41599 |
| CSA | acceptance | 500mA-16A* | File #LR51172 |
| VDE | approval | 500mA-6.3A | File #51959 |
| SEMKO | approval | 500mA-6.3A | File numbers on request |
| SEV | approval | 500mA-6.3A | |
| CB | certified | 800mA-1.6A, 2.5A, 5A | |

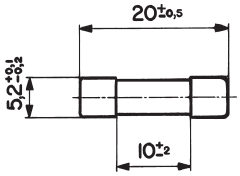
* fuses with pigtail leads approved up to 8A (factory assembled only)

sand filled

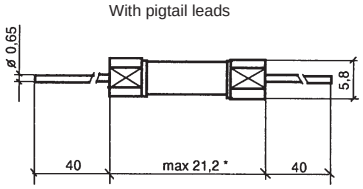
Time Current Characteristics

| n • In / rated current In | 1.5 • In | 2.1 • In | 2.75 • In | | 4 • In | | 10 • In |
|---|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. | max. |
| 500mA – 16A | 60 min. | 30 min. | 10 ms | 2 s* | 3 ms | 300ms | 20 ms |

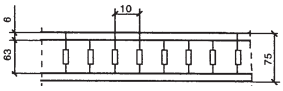
* 1.25A – 16A max. 3 s



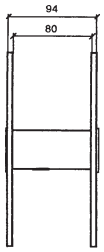

With pigtail leads



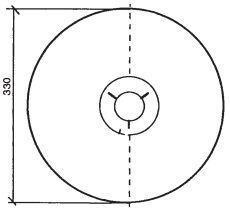

Tape




according to IEC 286-1




Spool

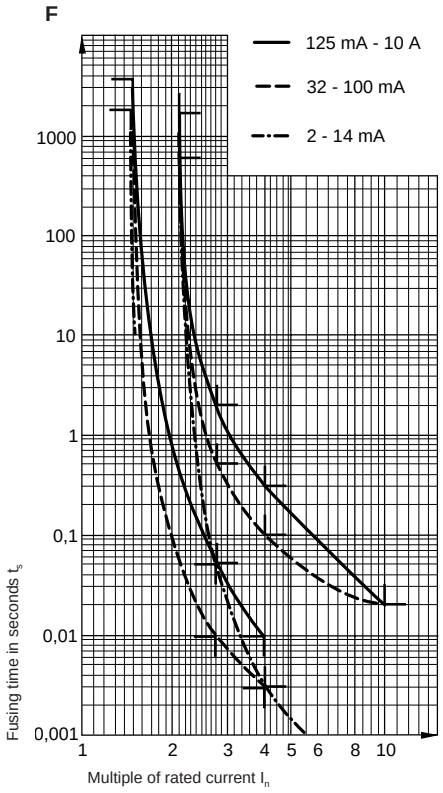



| Order Numbers Series SP | Rated current / rated voltage mA / A / V~ | Breaking capacity A~ ac | Voltage drop at In max. IEC 127 mV | Voltage drop at In typical Schurter mV | Power dissipation at 1.5 • In max. IEC 127 Watts | Power dissipation at 1.5 • In typical Schurter Watts | Operating $I^2t$ $A^2s$ | Approvals UL | CSA | VDE | SEMKO | SEV | CB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0001.1001 | 500 mA / 250V | | 1800 | 830 | 2.5 | 2.4 | 0.08 | • | • | • | • | • | |
| 0001.1002 | 630 mA / 250V | | 1500 | 800 | 2.5 | 2.4 | 0.22 | • | • | • | • | • | |
| 0001.1003 | 800 mA / 250V | | 1200 | 580 | 2.5 | 2.4 | 0.47 | • | • | • | • | • | • |
| 0001.1004 | 1 A / 250V | UL: 10,000A / 125 V, p.f. 0.7 - 0.8 | 1000 | 600 | 2.5 | 2.5 | 0.84 | • | • | • | • | • | • |
| 0001.1005 | 1.25 A / 250V | | 800 | 270 | 4 | 1.0 | 0.92 | • | • | • | • | • | • |
| 0001.1006 | 1.6 A / 250V | | 600 | 350 | 4 | 1.6 | 0.94 | • | • | • | • | • | • |
| 0001.1007 | 2 A / 250V | IEC / UL: 1,500A / 250 V, p.f. 0.7 - 0.8 | 500 | 260 | 4 | 1.6 | 2.7 | • | • | • | • | • | |
| 0001.1008 | 2.5 A / 250V | | 400 | 260 | 4 | 1.9 | 4.0 | • | • | • | • | • | • |
| 0001.1009 | 3.15 A / 250V | | 350 | 210 | 4 | 1.9 | 8.3 | • | • | • | • | • | |
| 0001.1010 | 4 A / 250V | | 300 | 200 | 4 | 2.4 | 14 | • | • | • | • | • | |
| 0001.1011 | 5 A / 250V | | 250 | 160 | 4 | 2.4 | 37 | • | • | • | • | • | • |
| 0001.1012 | 6.3 A / 250V | | 200 | 150 | 4 | 3.2 | 42 | • | • | • | • | • | |
| 0001.1013 | 8 A* / 250V | | | 140 | | 3.9 | 100 | • | • | | | • | |
| 0001.1014 | 10 A* / 250V | | | 130 | | 4.7 | 167 | • | • | | | • | |
| 0001.1015 | 12.5 A* / 250V | 1,000A / 125V, p.f. 1.0 | | 110 | | 6.9 | 286 | • | • | | | | |
| 0001.1016 | 16 A* / 250V | 500A / 125V, p.f. 0.7 - 0.8 | | 120 | | 7.4 | 504 | • | • | | | | |

* Not addressed in the standards

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0001.1001.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0001.1001.TR)**

# FSF 5 x 20mm Quick-acting Fuses – Low Breaking Capacity




Built according to IEC 127-2/2, EN 60127, ASE 1064, DIN/VDE 0820 part 1, DIN 41661, BS 4265, and SEMKO 104-1976. Series SP & SPT recommended if the short circuit current through the fuse-link is more than 35A or 10 x $I_n$, whichever is greater (CENELEC Jan 1, 1993).

**Approvals:**

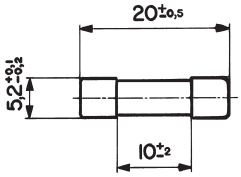
| | | | |
|---|---|---|---|
| UL | recognition | 32mA-10A* | File #E41599 |
| CSA | acceptance | 32mA-10A* | File #LR51172 |
| VDE | approval | 32mA-6.3A | File #50911 |
| SEMKO | approval | 32mA-6.3A | File numbers on request |
| SEV | approval | 32mA-6.3A | |
| BEAB | approval | 32mA-6.3A | |

* fuses with pigtail leads approved up to 8A (factory assembled only)

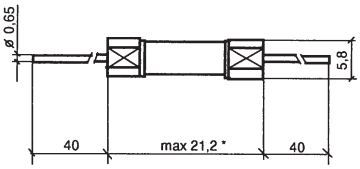
Time Current Characteristics

| n • In / rated current In | 1.5 • In | 2.1 • In | 2.75 • In | | 4 • In | | 10 • In |
|---|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. | max. |
| 2mA – 14mA | ~ 30 min. | ~ 10min.* | | = 10 min. ~ 50 ms | | ~ 3 ms | ~ 0.3 ms |
| 32mA – 100mA | 60 min. | 30 min. | 10 ms | 500 ms | 3 ms | 100 ms | 20 ms |
| 125mA – 10A | 60 min. | 30 min. | 50 ms | 2 s | 10 ms | 300 ms | 20 ms |

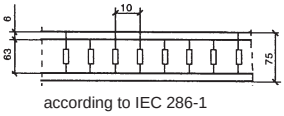
* This value is not guaranteed for DC



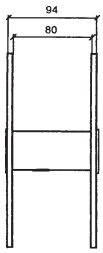

With pigtail leads



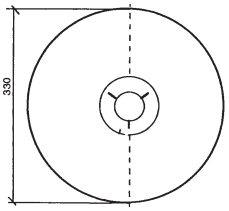

Tape




according to IEC 286-1




Spool



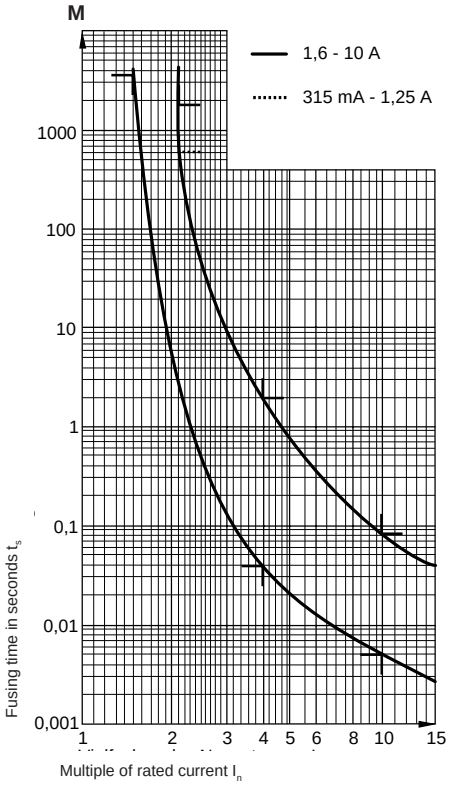

| Order Numbers / Series FSF | Rated current / rated voltage mA / A / V~ | Breaking capacity A~ | Voltage drop at In max. IEC 127 mV | Voltage drop at In typical Schurter mV | Power dissipation at 1.5 • In max. IEC 127 Watts | Power dissipation at 1.5 • In typical Schurter Watts | Operating $I^2t$ $A^2s$ | Approvals UL | CSA | VDE | SEMKO | SEV | BEAB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0034.1501 | 2 mA* / 250V | | | 1600 | | 0.01 | 0.000009 | | | | | | |
| 0034.1502 | 4 mA* / 250V | | | 540 | | 0.01 | 0.00001 | | | | | | |
| 0034.1503 | 7 mA* / 250V | | | 640 | | 0.01 | 0.00002 | | | | | | |
| 0034.1504 | 10 mA* / 250V | | | 500 | | 0.01 | 0.00002 | | | | | | |
| 0034.1505 | 14 mA* / 250V | | | 380 | | 0.01 | 0.00003 | | | | | | |
| 0034.1527 | 32 mA / 250V | | 10000 | 9300 | 1.6 | 0.7 | 0.00006 | • | • | • | • | • | • |
| 0034.1528 | 40 mA / 250V | | 8000 | 7400 | 1.6 | 0.7 | 0.00013 | • | • | • | • | • | • |
| 0034.1529 | 50 mA / 250V | | 7000 | 6400 | 1.6 | 0.7 | 0.00024 | • | • | • | • | • | • |
| 0034.1530 | 63 mA / 250V | | 5000 | 940 | 1.6 | 0.3 | 0.00054 | • | • | • | • | • | • |
| 0034.1531 | 80 mA / 250V | | 4000 | 750 | 1.6 | 0.3 | 0.0016 | • | • | • | • | • | • |
| 0034.1506 | 100 mA / 250V | | 3500 | 840 | 1.6 | 0.4 | 0.0023 | • | • | • | • | • | • |
| 0034.1507 | 125 mA / 250V | 35A / 250 V / 50 Hz / p.f. 1 | 2000 | 610 | 1.6 | 0.4 | 0.0067 | • | • | • | • | • | • |
| 0034.1508 | 160 mA / 250V | | 2000 | 550 | 1.6 | 0.5 | 0.018 | • | • | • | • | • | • |
| 0034.1509 | 200 mA / 250V | | 1700 | 540 | 1.6 | 0.5 | 0.03 | • | • | • | • | • | • |
| 0034.1510 | 250 mA / 250V | | 1400 | 240 | 1.6 | 0.2 | 0.021 | • | • | • | • | • | • |
| 0034.1511 | 315 mA / 250V | | 1300 | 210 | 1.6 | 0.2 | 0.044 | • | • | • | • | • | • |
| 0034.1512 | 400 mA / 250V | | 1200 | 200 | 1.6 | 0.2 | 0.088 | • | • | • | • | • | • |
| 0034.1513 | 500 mA / 250V | | 1000 | 150 | 1.6 | 0.2 | 0.15 | • | • | • | • | • | • |
| 0034.1514 | 630 mA / 250V | | 650 | 140 | 1.6 | 0.3 | 0.37 | • | • | • | • | • | • |
| 0034.1515 | 800 mA / 250V | | 240 | 110 | 1.6 | 0.3 | 5.3 | • | • | • | • | • | • |
| 0034.1516 | 1 A / 250V | | 200 | 110 | 1.6 | 0.3 | 5.1 | • | • | • | • | • | • |
| 0034.1517 | 1.25 A / 250V | | 200 | 100 | 1.6 | 0.4 | 5.6 | • | • | • | • | • | • |
| 0034.1518 | 1.6 A / 250V | | 190 | 100 | 1.6 | 0.5 | 6.5 | • | • | • | • | • | • |
| 0034.1519 | 2 A / 250V | | 170 | 90 | 1.6 | 0.6 | 7.6 | • | • | • | • | • | • |
| 0034.1520 | 2.5 A / 250V | | 170 | 90 | 1.6 | 0.8 | 9.8 | • | • | • | • | • | • |
| 0034.1521 | 3.15 A / 250V | | 150 | 90 | 2.5 | 0.6 | 20 | • | • | • | • | • | • |
| 0034.1522 | 4 A / 250V | | 130 | 90 | 2.5 | 1.0 | 29 | • | • | • | • | • | • |
| 0034.1523 | 5 A / 250V | 10 • In | 130 | 80 | 2.5 | 1.3 | 38 | • | • | • | • | • | • |
| 0034.1524 | 6.3 A / 250V | 250V / 50 Hz / | 130 | 80 | 2.5 | 2.0 | 62 | • | • | • | • | • | • |
| 0034.1525 | 8 A* / 250V | p.f. 1 | | 80 | | 2.3 | 103 | • | • | | | | |
| 0034.1526 | 10 A* / 250V | | | 70 | | 2.5 | 184 | • | • | | | | |

*Not addressed in the standards

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.1501.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.1501.TR)**

# FSM 5 x 20mm Medium Time Lag Fuses – Low and Medium Breaking Capacity

Built according to DIN 41571, data sheet 2 (June 1984)




Glass tube

0034.2511 – .2517

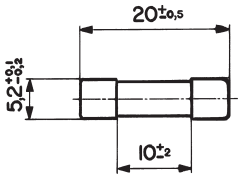
Ceramic tube
Sand filled

0034.2518 – .2527

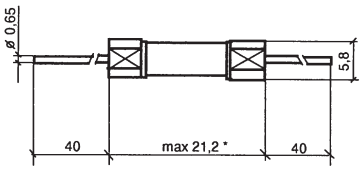
Fuse with pigtail leads (factory assembled only)

Time Current Characteristics

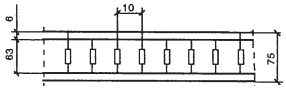
| n • In / rated current In | 1.5 • In | 2.1 • In | 4 • In | | 10 • In | |
|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. |
| 315mA – 1.25A | 60 min. | 10 min. | 40 ms | 2 s | 5 ms | 90 ms |
| 1.6A – 10A | 60 min. | 30 min. | 40 ms | 2 s | 5 ms | 90 ms |



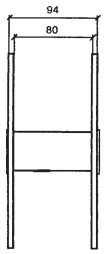

With pigtail leads



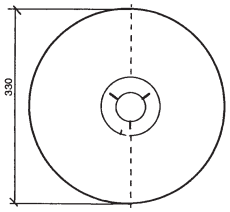

Tape




according to IEC 286-1




Spool



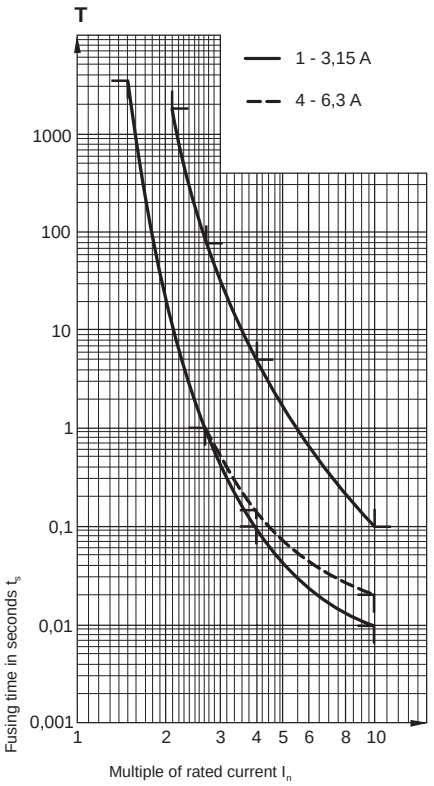

| Order Numbers<br>Series FSM | Rated current / rated voltage<br>mA /A / V~ | Breaking capacity<br>C, E, D p.f. 1<br>G p.f. 0.7-0.8 A~ | Voltage drop at In<br>max. DIN 41571 mV | <br>typical Schurter mV | Power dissipation at 1.5 • In<br>max. Schurter Watts | <br>typical Schurter Watts | Operating $I^2t$<br>$A^2s$ |
|---|---|---|---|---|---|---|---|
| 0034.2511 | 315 mA / 250V | | 250 | 200 | 0.4 | 0.2 | 0.33 |
| 0034.2512 | 400 mA / 250V | | 230 | 160 | 0.4 | 0.2 | 0.41 |
| 0034.2513 | 500 mA / 250V | 80A / 125V- C | 210 | 140 | 0.4 | 0.2 | 1.5 |
| 0034.2514 | 630 mA / 250V | 80A / 250V~ C | 190 | 140 | 0.4 | 0.2 | 12 |
| 0034.2515 | 800 mA / 250V | | 170 | 130 | 0.4 | 0.2 | 11 |
| 0034.2516 | 1 A / 250V | | 160 | 70 | 0.4 | 0.2 | 15 |
| 0034.2517 | 1.25 A / 250V | | 160 | 70 | 0.6 | 0.2 | 23 |
| 0034.2518 | 1.6 A / 250V | 1000A / E | 160 | 150 | 0.8 | 0.6 | 3.5 |
| 0034.2519 | 2 A / 250V | 125V- E | 160 | 140 | 0.9 | 0.7 | 5.0 |
| 0034.2520 | 2.5 A / 250V | | 160 | 130 | 1.0 | 0.8 | 13 |
| 0034.2521 | 3.15 A / 250V | 1000A / E | 160 | 120 | 1.2 | 1.0 | 21 |
| 0034.2522 | 4 A / 250V | 250V~ E | 160 | 120 | 1.5 | 1.3 | 37 |
| 0034.2523 | 5 A / 250V | | 150 | 100 | 1.7 | 1.4 | 95 |
| 0034.2524 | 6.3 A / 250V | 300A / 125V- D | 140 | 100 | 2.0 | 1.7 | 165 |
| 0034.2525 | 8 A / 250V | 300A / 250V~ D | 140 | 90 | 2.6 | 2.3 | 240 |
| 0034.2526 | 10 A / 250V | | 120 | 80 | 2.8 | 2.3 | 455 |
| 0034.2527 | 10 A* / 250V | 1500A / G<br>250V~ G | 120 | 80 | 2.8 | 2.5 | 255 |

*Not mentioned in DIN 41571. Check temperature rise if fuses are used in closed type fuseholders.

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.2511.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.2511.TR)**

# SPT 5 x 20mm Time Lag Fuses – High Breaking Capacity

Built according to IEC 127-2/5, EN 60127, SEV 1064, and SEMKO 104-1976. Recommended if the short circuit current through the fuse-link is more than 35A or 10 x $I_n$, whichever is greater (CENELEC Jan 1, 1993).




**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 500mA-16A* | File #E41599 |
| CSA | acceptance | 500mA-16A* | File #LR51172 |
| VDE | approval | 1A-6.3A | File #75036 |
| SEMKO | approval | 1A-6.3A | File numbers on request |
| SEV | approval | 1A-6.3A | |

* fuses with pigtail leads approved up to 8A (factory assembled only)

Ceramic or glass tube
Sand filled

**NEW**

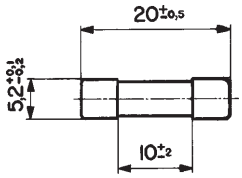
New version with gold plated caps for direct pcb mounting

| | | | |
|---|---|---|---|
| cUL | recognition | 1A-16A/250V** | pending |
| VDE | approval | 1A-6.3A/250V** | pending |

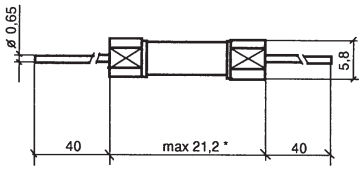
**Contact Schurter for part numbers

## Time Current Characteristics

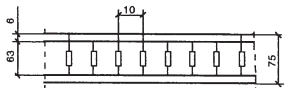
| rated current In \ n • In | | 1.5 • In | | 2.1 • In | | 2.75 • In | | 4 • In | | 10 • In | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | min. | | max. | | min. | max. | min. | max. | min. | max. |
| SCHURTER IEC | 500mA – 800mA<br>1A – 3.15A | 60 min. | | 30 min. | | 1 s | 80 s | 95 ms | 5 s | 10 ms | 100 ms |
| IEC SCHURTER | 4A – 6.3A<br>8A – 16A | 60 min. | | 30 min. | | 1 s | 80 s | 150 ms | 5 s | 20 ms | 100 ms |



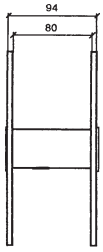

With pigtail leads



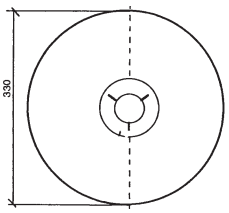

Tape




according to IEC 286-1




Spool

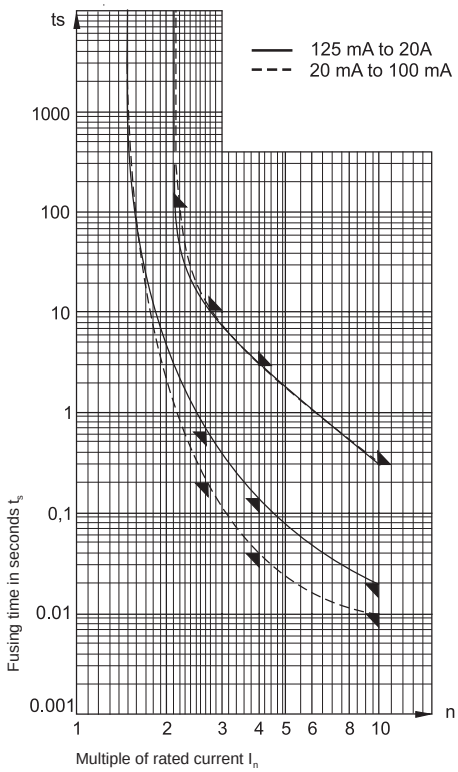



| Order Numbers<br>Series SPT | Rated current / rated voltage<br>mA / A / V~ | Breaking capacity<br>A~ ac | Voltage drop at In<br>max. IEC 127 mV | <br>typical Schurter mV | Power dissipation at 1.5 • In<br>max. IEC 127 Watts | <br>max. Schurter Watts | <br>typical Schurter Watts | Pre-arcing $I^2t$ at 10 • In<br>$A^2s$ | Approvals<br>UL | <br>CSA | <br>VDE | <br>SEMKO | <br>SEV |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0001.2501 | 500 mA*/ 250V | | | 360 | | | 0.5 | 0.50 | • | • | | | |
| 0001.2502 | 630 mA*/ 250V | | | 330 | | | 0.5 | 1.55 | • | • | | | |
| 0001.2503 | 800 mA*/ 250V | | | 260 | | | 0.5 | 2.30 | • | • | | | |
| 0001.2504 | 1 A / 250V | UL: | 250 | 180 | 2.5 | 0.7 | 0.5 | 1.10 | • | • | • | • | • |
| 0001.2505 | 1.25 A / 250V | 10,000A / 125V, | 250 | 150 | 2.5 | 0.7 | 0.5 | 1.86 | • | • | • | • | • |
| 0001.2506 | 1.6 A / 250V | p.f. 0.7-0.8 | 200 | 130 | 2.5 | 0.7 | 0.5 | 4.35 | • | • | • | • | • |
| 0001.2507 | 2 A / 250V | | 190 | 120 | 2.5 | 0.8 | 0.6 | 9.20 | • | • | • | • | • |
| 0001.2508 | 2.5 A / 250V | IEC: | 180 | 100 | 2.5 | 0.9 | 0.6 | 11.7 | • | • | • | • | • |
| 0001.2509 | 3.15 A / 250V | 1,500A / 250V, | 140 | 100 | 4.0 | 1.1 | 0.8 | 33.7 | • | • | • | • | • |
| 0001.2510 | 4 A / 250V | p.f. 0.7-0.8 | 100 | 90 | 4.0 | 1.2 | 0.9 | 62.4 | • | • | • | • | • |
| 0001.2511 | 5 A / 250V | | 100 | 90 | 4.0 | 1.5 | 1.2 | 97.5 | • | • | • | • | • |
| 0001.2512 | 6.3 A / 250V | | 100 | 70 | 4.0 | 1.7 | 1.2 | 171 | • | • | • | • | • |
| 0001.2513 | 8 A*/ 250V | UL:1,000A / 250V, | | 70 | | 1.9 | 1.3 | 268 | • | • | | | |
| 0001.2514 | 10 A*/ 250V | p.f. 1 | | 70 | | 2.8 | 2.1 | 400 | • | • | | | |
| 0001.2515 | 12.5 A*/ 250V | UL:1,000A / 125V | | 70 | | | 3.1 | 563 | • | • | | | |
| 0001.2516 | 16 A*/ 250V | & 500A/250V, p.f. 1 | | 70 | | | 4.0 | 1272 | • | • | | | |

*Not addressed in the standards

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0001.2501.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0001.2501.TR)**

# FST 5 x 20mm Time Lag Fuses – Low Breaking Capacity




Built according to IEC 127-2/3, EN 60127, SEV 1064, DIN/VDE 0820 part 1, DIN 41662, BS 4265, and SEMKO 104-1976, with support by UL 198G. Series SP & SPT recommended if the short circuit current through the fuse- link is more than 35A or 10 x $I_n$, whichever is greater (CENELEC Jan 1, 1993).

**Approvals:**

| | | | |
|---|---|---|---|
| UL | recognition | 32mA-16A* | File #E41599 |
| CSA | acceptance | 32mA-16A* | File #LR51172 |
| VDE | approval | 32mA-6.3A | File #50910 |
| SEMKO | approval | 32mA-6.3A | File #51550 |
| SEV | approval | 32mA-6.3A | File numbers on request |
| BSI | license | 125mA-6.3A | |
| CB | certification | 32-40mA, 125mA-6.3A | |
| BEAB | approval | 32-40mA, 125mA-6.3A | |

* fuses with pigtail leads approved up to 8A (factory assembled only)

**NEW**

New version with gold plated caps for direct pcb mounting

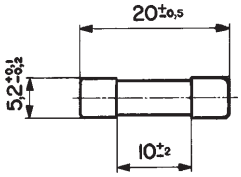
| | | | |
|---|---|---|---|
| cUL | recognition | 1A-16A/250V** | pending |
| VDE | approval | 1A-16A/250V** | pending |

**Contact Schurter for part numbers

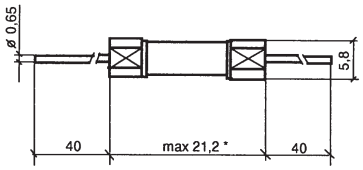
Time Current Characteristics

| n • In / rated current In | 1.5 • In | 2.1 • In | 2.75 • In | | 4 • In | | 10 • In | |
|---|---|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. | min. | max. |
| 20mA – 100mA | 60 min. | 2 min.* | 200 ms* | 10 s* | 40 ms | 3 s | 10 ms | 300 ms |
| 125mA – 20A | 60 min. | 2 min. | 600 ms | 10 s | 150 ms | 3 s | 20 ms | 300 ms |

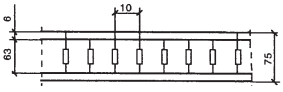
* These values are not guaranteed at 20mA



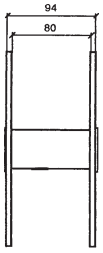

With pigtail leads



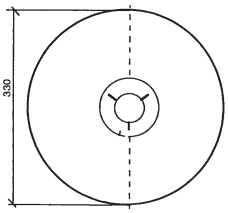

Tape




according to IEC 286-1




Spool



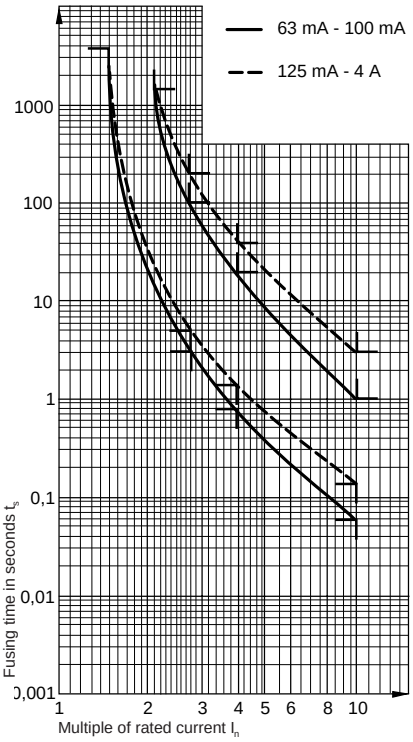

| Order Numbers / Series FST | Rated current / rated voltage | Breaking capacity | Voltage drop at In | | Power dissipation at 1.5 • In | | | Pre-arcing $I^2t$ at 10 • In | Approvals | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | max. IEC 127 | typical Schurter | max. IEC 127 | max. Schurter | typical Schurter | | | | | | | | | |
| | mA / A / V~ | A~ | mV | mV | Watts | Watts | Watts | $A^2s$ | UL | CSA | VDE | SEMKO | SEV | BSI | CB | BEAB |
| 0034.3101 | 20 mA*/ 250V | | | 2700 | | | 0.1 | 0.0012 | | | | | | | | |
| 0034.3102 | 32 mA / 250V | | 5000 | 3000 | 1.6 | | 0.2 | 0.0019 | • | • | • | • | • | | • | • |
| 0034.3103 | 40 mA / 250V | | 4000 | 2100 | 1.6 | | 0.2 | 0.0027 | • | • | • | • | • | | • | • |
| 0034.3104 | 50 mA / 250V | | 3500 | 950 | 1.6 | | 0.125 | 0.0363 | • | • | • | • | | | | |
| 0034.3105 | 63 mA / 250V | | 3000 | 1300 | 1.6 | | 0.2 | 0.0401 | • | • | • | • | | | | |
| 0034.3106 | 80 mA / 250V | | 3000 | 1100 | 1.6 | | 0.3 | 0.0570 | • | • | • | • | | | | |
| 0034.3107 | 100 mA / 250V | | 2500 | 1000 | 1.6 | | 0.155 | 0.107 | • | • | • | • | | | | |
| 0034.3108 | 125 mA / 250V | 35A / 250 | 2000 | 565 | 1.6 | | 0.2 | 0.064 | • | • | • | • | • | • | • | • |
| 0034.3109 | 160 mA / 250V | V / 50 Hz / | 1900 | 415 | 1.6 | | 0.185 | 0.230 | • | • | • | • | • | • | • | • |
| 0034.3110 | 200 mA / 250V | p.f. 1 | 1500 | 270 | 1.6 | | 0.2 | 0.256 | • | • | • | • | • | • | • | • |
| 0034.3111 | 250 mA / 250V | | 1300 | 210 | 1.6 | | 0.2 | 0.238 | • | • | • | • | • | • | • | • |
| 0034.3112 | 315 mA / 250V | | 1100 | 170 | 1.6 | | 0.2 | 0.544 | • | • | • | • | • | • | • | • |
| 0034.3113 | 400 mA / 250V | | 1000 | 150 | 1.6 | | 0.2 | 0.768 | • | • | • | • | • | • | • | • |
| 0034.3114 | 500 mA / 250V | | 900 | 160 | 1.6 | | 0.2 | 3.0 | • | • | • | • | • | • | • | • |
| 0034.3115 | 630 mA / 250V | | 300 | 160 | 1.6 | | 0.3 | 4.35 | • | • | • | • | • | • | • | • |
| 0034.3116 | 800 mA / 250V | | 250 | 120 | 1.6 | | 0.3 | 3.85 | • | • | • | • | • | • | • | • |
| 0034.3117 | 1 A / 250V | | 150 | 60 | 1.6 | 0.4 | 0.2 | 3.30 | • | • | • | • | • | • | • | • |
| 0034.3118 | 1.25 A / 250V | | 150 | 60 | 1.6 | 0.5 | 0.3 | 5.50 | • | • | • | • | • | • | • | • |
| 0034.3165* | 1.4 A*/ 250V | | | 60 | | | 0.3 | 7.45 | | | | • | | | | |
| 0034.3119 | 1.6 A / 250V | | 150 | 60 | 1.6 | 0.5 | 0.3 | 10.5 | • | • | • | • | • | • | • | • |
| 0034.3120 | 2 A / 250V | | 150 | 60 | 1.6 | 0.6 | 0.3 | 16 | • | • | • | • | • | • | • | • |
| 0034.3121 | 2.5 A / 250V | | 120 | 60 | 1.6 | 0.7 | 0.4 | 21.9 | • | • | • | • | • | • | • | • |
| 0034.3122 | 3.15 A / 250V | | 100 | 60 | 1.6 | 0.8 | 0.5 | 47 | • | • | • | • | • | • | • | • |
| 0034.3123 | 4 A / 250V | | 100 | 60 | 1.6 | 1.1 | 0.8 | 68.3 | • | • | • | • | • | • | • | • |
| 0034.3124 | 5 A / 250V | 10 • In | 100 | 60 | 1.6 | 1.2 | 0.9 | 102 | • | • | • | • | • | • | • | • |
| 0034.3125 | 6.3 A / 250V | 250V / 50 | 100 | 60 | 1.6 | 1.3 | 1.0 | 190 | • | • | • | • | • | • | • | • |
| 0034.3126 | 8 A* / 250V | Hz / | | 60 | | 1.6 | 1.3 | 275 | • | • | | | | | | |
| 0034.3127 | 10 A* / 250V | p.f. 1 | | 60 | | 1.8 | 1.3 | 520 | • | • | | | | | | |
| 0034.3128 | 12.5 A* / 250V | | | 60 | | | 2.5 | 750 | • | • | | | | | | |
| 0034.3129 | 16 A* / 250V | | | 60 | | | 3.3 | 1638 | • | • | | | | | | |
| 0034.3130 | 20 A* / 250V | | | 60 | | | 4.2 | 3057 | | | | | | | | |

*Not addressed in the standards; 1.4A SEMKO approved only.

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.3101.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.3101.TR)**

# FTT 5 x 20mm Super Time Lag Fuses – Low Breaking Capacity

TT




**Approvals:**
UL recognition 63mA-4A/250V File #E41599

Fuse with pigtail leads (factory assembled only)

**NEW**

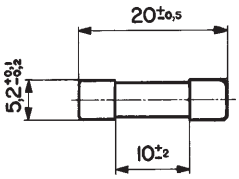
New version with gold plated caps for direct pcb mounting

cUL recognition 50mA-4A/250V** pending

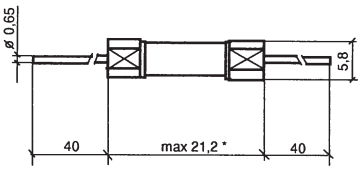
**Contact Schurter for part numbers

Time Current Characteristics

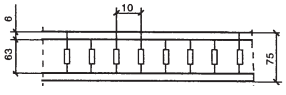
| rated current In \ n • In | 1.5 • In | | 2.1 • In | | 2.75 • In | | 4 • In | | 10 • In | |
|---|---|---|---|---|---|---|---|---|---|---|
| | min. | | max. | | min. | max. | min. | max. | min. | max. |
| 63mA – 100mA | 60 min. | | 30 min. | | 3 s | 100 s | 800 ms | 20 s | 0.06 s | 1 s |
| 125mA – 4A | 60 min. | | 30 min. | | 5 s | 200 s | 1.5 s | 40 s | 0.15 s | 3 s |



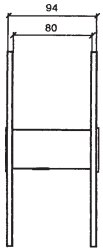

With pigtail leads



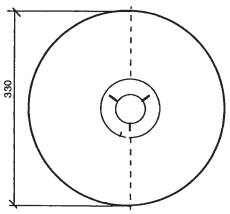

Tape




according to IEC 286-1




Spool




| Order Numbers<br>Series FTT | Rated current / rated voltage<br>mA / A / V~ | Breaking capacity<br>A~ | Voltage drop at In<br>max. Schurter mV | <br>typical Schurter mV | Power dissipation at 1.5 • In<br>max. Schurter Watts | <br>typical Schurter Watts | Operating $I^2t$<br>$A^2s$ |
|---|---|---|---|---|---|---|---|
| 0034.5001 | 63 mA / 250V | | 5000 | 1000 | 1.6 | 0.22 | 2.4 |
| 0034.5002 | 80 mA / 250V | | 4500 | 980 | 1.6 | 0.27 | 2.5 |
| 0034.5003 | 100 mA / 250V | | 4000 | 870 | 1.6 | 0.30 | 2.8 |
| 0034.5004 | 125 mA / 250V | | 3000 | 500 | 1.6 | 0.27 | 2.2 |
| 0034.5035 | 160 mA / 250V | | 2000 | 450 | 1.6 | 0.30 | 3.7 |
| 0034.5036 | 200 mA / 250V | | 1500 | 400 | 1.6 | 0.33 | 3.7 |
| 0034.5037 | 250 mA / 250V | | 1200 | 330 | 1.6 | 0.35 | 3.7 |
| 0034.5038 | 315 mA / 250V | | 1000 | 300 | 1.6 | 0.36 | 4.2 |
| 0034.5039 | 400 mA / 250V | 35A / 250 V / | 1200 | 225 | 1.6 | 0.40 | 5.6 |
| 0034.5040 | 500 mA / 250V | 50 Hz / | 800 | 250 | 1.6 | 0.44 | 8.0 |
| 0034.5041 | 630 mA / 250V | p.f. 1 | 700 | 200 | 1.6 | 0.47 | 9.0 |
| 0034.5042 | 800 mA / 250V | | 500 | 160 | 1.6 | 0.54 | 18 |
| 0034.5043 | 1 A / 250V | | 250 | 150 | 1.6 | 0.54 | 20 |
| 0034.5044 | 1.25 A / 250V | | 200 | 130 | 1.6 | 0.57 | 31 |
| 0034.5045 | 1.6 A / 250V | | 200 | 100 | 1.6 | 0.65 | 71 |
| 0034.5046 | 2 A / 250V | | 200 | 100 | 1.6 | 0.80 | 113 |
| 0034.5047 | 2.5 A / 250V | | 150 | 90 | 1.6 | 0.85 | 230 |
| 0034.5048 | 3.15 A / 250V | | 100 | 90 | 1.6 | 1.0 | 405 |
| 0034.5049 | 4 A / 250V | | 100 | 80 | 1.6 | 1.15 | 476 |

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.5001.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.5001.TR)**

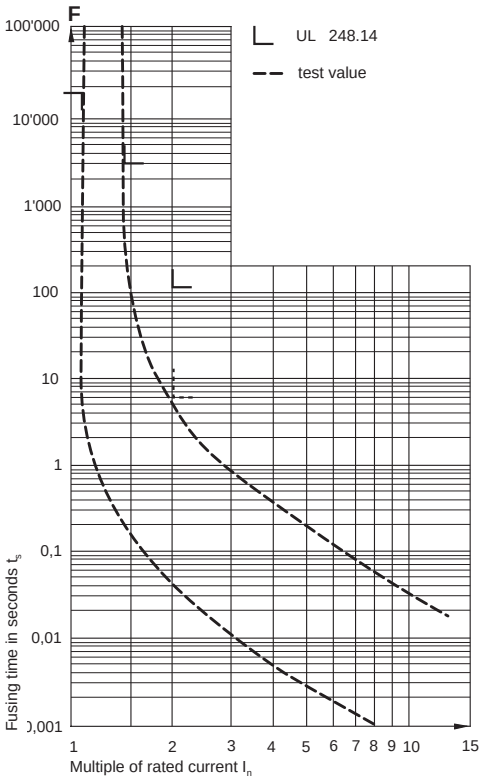
# FSQ 5 x 20mm Quick-acting Fuses

Built according to UL 248.14 and CSA 22.2 (recommended over 1/4 x 1 1/4" fuses for domestic use in UL/CSA approved fuseholders and/or power entry modules where space is a limiting factor).

**Approvals:**

| | | | |
|---|---|---|---|
| UL | listing | 400mA-3.5A | File #E41599 |
| CSA | certification | 400mA-3.5A | File #LR51172 |

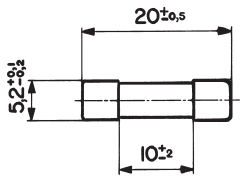
**Replaces Series FNB**

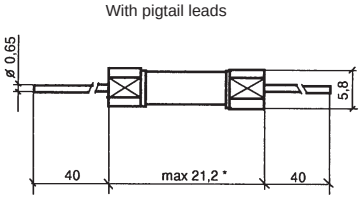


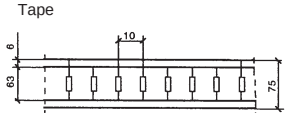

Fuse with pigtail leads (factory assembled only)

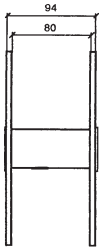
Time Current Characteristics

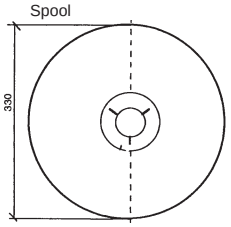
| n • In / rated current In | 1.1 • In | 1.35 • In | 2 • In |
|---|---|---|---|
| | min. | max. | max. |
| 400mA – 3.5A | 4 h | 1 hr | 2 min. |



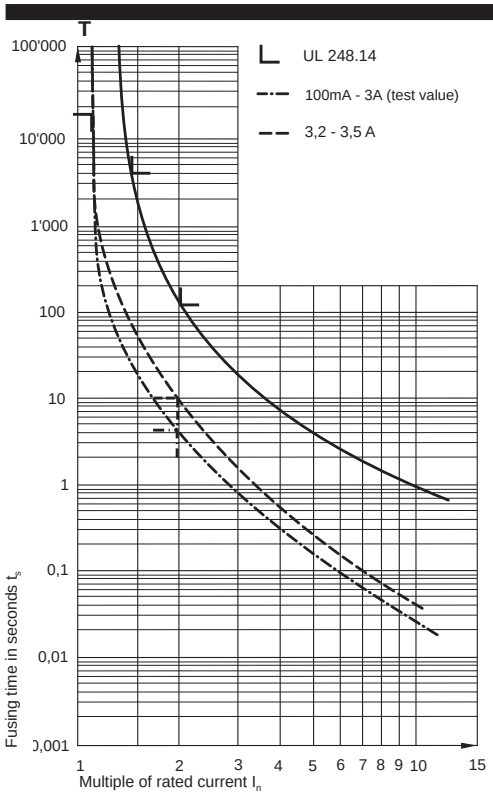




| Order Numbers<br>Series FSQ | Rated current / rated voltage<br>mA / A / V | Breaking capacity<br>A~ | Voltage drop at In<br>typical mV | Power dissipation at 1.1 • In<br>max. Watts | Operating $I^2t$<br>$A^2s$ | Approvals<br>UL | <br>CSA |
|---|---|---|---|---|---|---|---|
| 0034.3951 | 400 mA / 250V | | 170 | 0.1 | 0.1 | • | • |
| 0034.3952 | 500 mA / 250V | 10,000A / 125V | 140 | 0.1 | 0.2 | • | • |
| 0034.3953 | 600 mA / 250V | p.f. 0.7 – 0.8 | 150 | 0.1 | 0.26 | • | • |
| 0034.3954 | 700 mA / 250V | | 150 | 0.2 | 0.4 | • | • |
| 0034.3955 | 750 mA / 250V | 35A / 250V | 150 | 0.2 | 0.6 | • | • |
| 0034.3956 | 800 mA / 250V | p.f. 0.7 – 0.8 | 140 | 0.2 | 0.7 | • | • |
| 0034.3957 | 1 A / 250V | | 120 | 0.2 | 1.2 | • | • |
| 0034.3958 | 1.2 A / 250V | | 110 | 0.2 | 1.8 | • | • |
| 0034.3959 | 1.25 A / 250V | | 110 | 0.2 | 1.8 | • | • |
| 0034.3960 | 1.5 A / 250V | | 110 | 0.3 | 3 | • | • |
| 0034.3961 | 1.6 A / 250V | | 110 | 0.3 | 3.8 | • | • |
| 0034.3962 | 1.8 A / 250V | 10,000A / 125V | 100 | 0.3 | 4.0 | • | • |
| 0034.3963 | 2 A / 250V | p.f. 0.7 – 0.8 | 100 | 0.3 | 4.5 | • | • |
| 0034.3964 | 2.25 A / 250V | | 100 | 0.3 | 6.8 | • | • |
| 0034.3965 | 2.5 A / 250V | 100A / 250V | 100 | 0.4 | 11 | • | • |
| 0034.3966 | 2.8 A / 250V | p.f. 0.7 – 0.8 | 100 | 0.5 | 13 | • | • |
| 0034.3967 | 3 A / 250V | | 100 | 0.5 | 15 | • | • |
| 0034.3968 | 3.2 A / 250V | | 100 | 0.5 | 20 | • | • |
| 0034.3969 | 3.5 A / 250V | | 90 | 0.5 | 26 | • | • |

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.3951.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.3951.TR)**

# FSD 5 x 20mm Time Delay Fuses




Built according to UL 248.14 (formerly 198G) and CSA C22.2 (formerly 59.2-M). Recommended over 1/4 x 1 1/4" fuses for domestic use in UL/CSA approved fuseholders and/or power entry modules where space is a limiting factor.

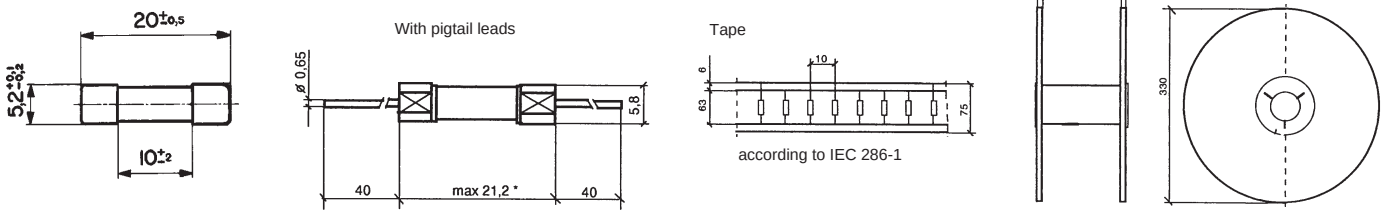
**Approvals:**

| | | | |
|---|---|---|---|
| UL | listing | 100mA-2A | File #E41599 |
| CSA | certification | 100mA-2A | File #LR51172 |

**Replaces Series FSP**

Time Current Characteristics

| n • In / rated current In | 1.1 • In | 1.35 • In | 2 • In | |
|---|---|---|---|---|
| | min. | max. | min. | max. |
| 100mA – 2A | 4 h | 1 h | 5 s | 2 min. |




| Order Numbers<br>Series FSD | Rated current / rated voltage<br>mA / A / V | Breaking capacity<br>A~ | Voltage drop at In<br>typ. mV | Power dissipation at 1.1 • In<br>typ. Watts | Pre-arcing $I^2t$ at 10 • In<br>typ. $A^2s$ | Approvals<br>UL | <br>CSA |
|---|---|---|---|---|---|---|---|
| 0034.3972 | 100 mA / 250V | | 1550 | 0.16 | .044 | • | • |
| 0034.3973 | 125 mA / 250V | | 1240 | 0.15 | .084 | • | • |
| 0034.3974 | 150 mA / 250V | | 1240 | 0.19 | .131 | • | • |
| 0034.3975 | 175 mA / 250V | | 1000 | 0.18 | .239 | • | • |
| 0034.3976 | 187 mA / 250V | | 910 | 0.17 | .335 | • | • |
| 0034.3977 | 200 mA / 250V | 10,000A / | 890 | 0.18 | .337 | • | • |
| 0034.3978 | 250 mA / 250V | 125V | 770 | 0.19 | .486 | • | • |
| 0034.3979 | 300 mA / 250V | p.f. 0.7 – 0.8 | 700 | 0.21 | .621 | • | • |
| 0034.3980 | 375 mA / 250V | | 510 | 0.19 | 1.18 | • | • |
| 0034.3981 | 400 mA / 250V | 35A / 250V | 540 | 0.21 | 3.5 | • | • |
| 0034.3982 | 500 mA / 250V | p.f. 0.7 – 0.8 | 470 | 0.23 | 2 | • | • |
| 0034.3983 | 600 mA / 250V | | 380 | 0.23 | 6.19 | • | • |
| 0034.3984 | 700 mA / 250V | | 360 | 0.25 | 6.32 | • | • |
| 0034.3985 | 750 mA / 250V | | 270 | 0.21 | 7.99 | • | • |
| 0034.3986 | 800 mA / 250V | | 330 | 0.26 | 8.06 | • | • |
| 0034.3987 | 1 A / 250V | | 270 | 0.27 | 10.6 | • | • |
| 0034.3988 | 1.2 A / 250V | 10,000A / | 240 | 0.30 | 18.9 | • | • |
| 0034.3989 | 1.25 A / 250V | 125V | 240 | 0.31 | 20.8 | • | • |
| 0034.3990 | 1.5 A / 250V | p.f. 0.7 – 0.8 | 210 | 0.32 | 21.9 | • | • |
| 0034.3991 | 1.6 A / 250V | | 200 | 0.32 | 30 | • | • |
| 0034.3992 | 1.8 A / 250V | 100A / 250V | 190 | 0.34 | 34.7 | • | • |
| 0034.3993 | 2 A / 250V | p.f. 0.7 – 0.8 | 180 | 0.37 | 56 | • | • |

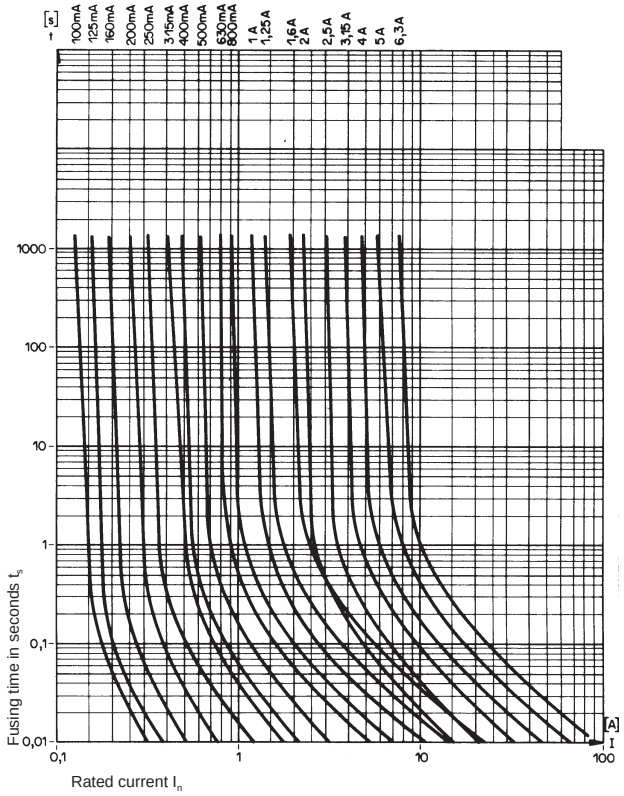
**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.3972.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.3972.TR)**

# FNB 5 x 20mm Normal Blow Fuses

Built according to UL 248.14 and CSA C22.2.

**Approvals:**

| | | | |
|---|---|---|---|
| UL | listing | 100mA-5A | File #E41599 |
| CSA | certification (listed as series GGS) | 100mA-5A | File #LR36410 |

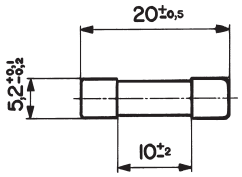


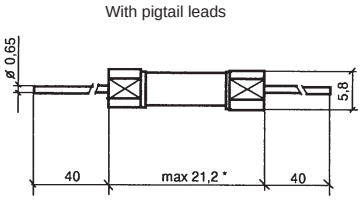

Fuse with pigtail leads (factory assembled only)

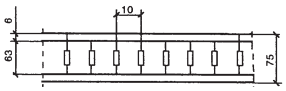
**Note: Not recommended for new designs. Refer to FSQ, pg. 151**

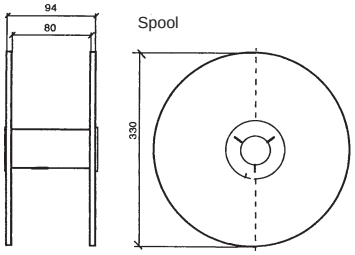
FNB Time Current Characteristics

| n • In / rated current In | 1.1 • In | 1.35 • In | 2 • In |
|---|---|---|---|
| | | max. | max. |
| 100mA – 6.3A | continuous | 1 h | 2 min. |



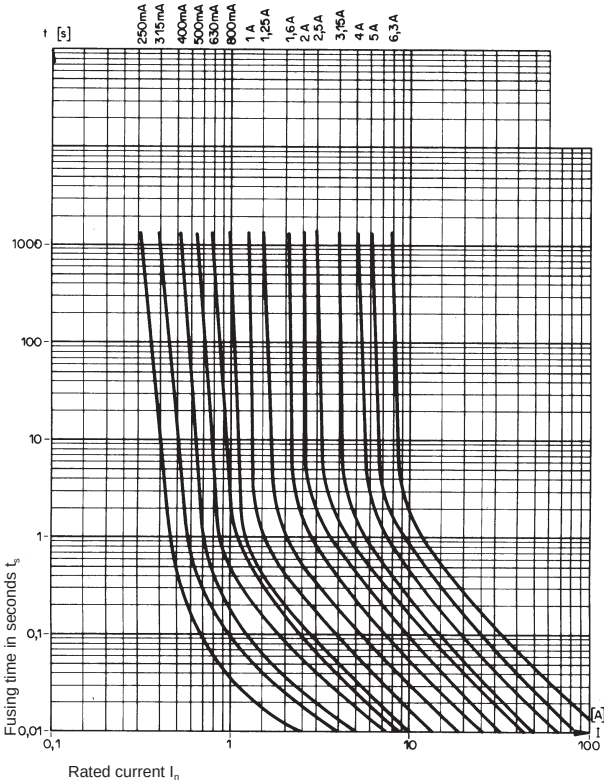

| Order Numbers<br>Series FNB | Rated current / voltage<br>mA / A / V | Breaking capacity<br>A | Voltage drop<br>mV | Fusing $I^2t$ t < 10ms<br>$A^2s$ | Approvals<br>UL | <br>CSA |
|---|---|---|---|---|---|---|
| 0034.3920 | 100 mA / 250V | According to UL 198.G | N / A | N / A | • | • |
| 0034.3921 | 125 mA / 250V | | | | • | • |
| 0034.3922 | 160 mA / 250V | | | | • | • |
| 0034.3923 | 200 mA / 250V | | | | • | • |
| 0034.3924 | 250 mA / 250V | | | | • | • |
| 0034.3925 | 315 mA / 250V | | | | • | • |
| 0034.3926 | 400 mA / 250V | | | | • | • |
| 0034.3927 | 500 mA / 250V | | | | • | • |
| 0034.3928 | 630 mA / 250V | | | | • | • |
| 0034.3929 | 800 mA / 250V | | | | • | • |
| 0034.3930 | 1 A / 250V | | | | • | • |
| 0034.3931 | 1.25 A / 125V | | | | • | • |
| 0034.3932 | 1.6 A / 125V | | | | • | • |
| 0034.3933 | 2 A / 125V | | | | • | • |
| 0034.3934 | 2.5 A / 125V | | | | • | • |
| 0034.3935 | 3.15 A / 125V | | | | • | • |
| 0034.3936 | 4 A / 125V | | | | • | • |
| 0034.3937 | 5 A / 125V | | | | • | • |
| 0034.3938 | 6.3 A / 125V | | | | | |

**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.3920.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.3920.TR)**

# FSP 5 x 20mm Surge Proof Fuses

Built according to UL 248.14 (formerly 198G) and CSA C22.2 (formerly 59.2-M)

**Approvals:**
UL listing (250mA-6.3A) File #E41599
(listed as series SB)
CSA certification (250mA-6.3A) File #LR51172
(listed as series SB, File #LR36410)

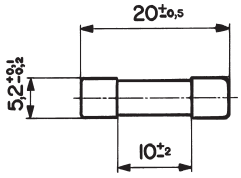


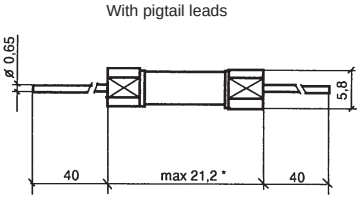

Fuse with pigtail leads (factory assembled only)

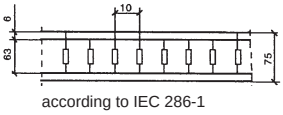
**Note: Not recommended for new designs. Refer to FSD, pg. 152**

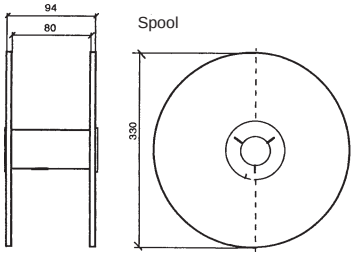
Time Current Characteristics

| n • In / rated current In | 1.1 • In | 1.35 • In | 2 • In |
|---|---|---|---|
| | | max. | max. |
| 250mA – 6.3A | continuous | 1 h | 2 min. |




| Order Numbers<br>Series FSP | Rated current / rated voltage<br>mA / A / V | Breaking capacity<br>A~ | Voltage drop at In<br>max. mV | Power dissipation at 1.1 • In<br>max. Watts | Fusing $I^2t$ at 10 • In<br>$A^2s$ | Approvals<br>UL | <br>CSA |
|---|---|---|---|---|---|---|---|
| 0034.3901 | 250 mA / 250V | | | | | • | • |
| 0034.3902 | 315 mA / 250V | | | | | • | • |
| 0034.3903 | 400 mA / 250V | | | | | • | • |
| 0034.3904 | 500 mA / 250V | | | | | • | • |
| 0034.3905 | 630 mA / 250V | | | | | • | • |
| 0034.3906 | 800 mA / 250V | | | | | • | • |
| 0034.3907 | 1 A / 250V | | | | | • | • |
| 0034.3908 | 1.25 A / 125V | According to UL 198.G | N/A | | N/A | • | • |
| 0034.3909 | 1.6 A / 125V | | | | | • | • |
| 0034.3910 | 2 A / 125V | | | | | • | • |
| 0034.3911 | 2.5 A / 125V | | | | | • | • |
| 0034.3912 | 3.15 A / 125V | | | | | • | • |
| 0034.3913 | 4 A / 125V | | | | | • | • |
| 0034.3914 | 5 A / 125V | | | | | • | • |
| 0034.3915 | 6.3 A / 125V | | | | | • | • |

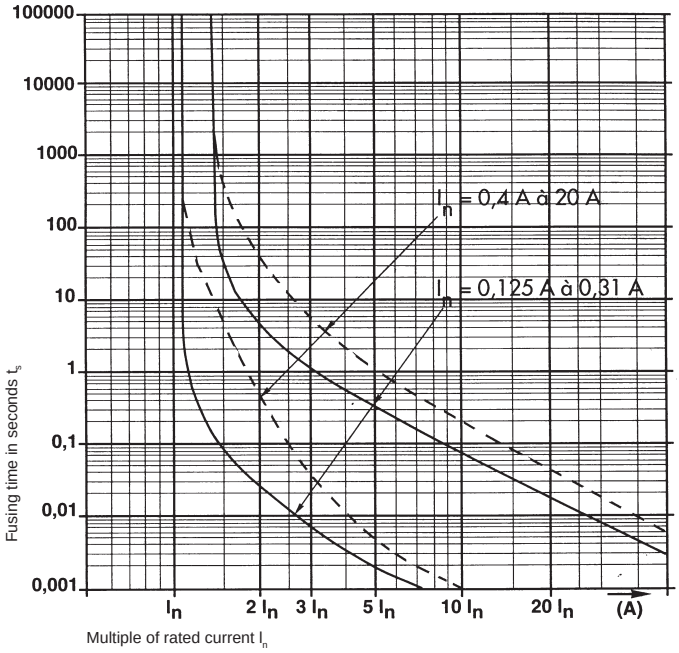
**For pigtail fuses packaged loose: reference .PT after part number (e.g. 0034.3901.PT)**
**For pigtail fuses on 1,000-piece tape and reel: reference .TR after part number (e.g. 0034.3901.TR)**

# A3BK 10.3 x 38mm Quick-acting Fuses - High Breaking Capacity

Built according to UL 248.14 (formerly 198G)

**Approvals:**

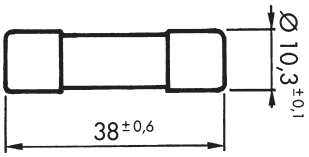
| | | | |
|---|---|---|---|
| UL | listing | 1A-15A | File #E42088 |
| CSA | certification | 1A-15A | File #LR34549 |

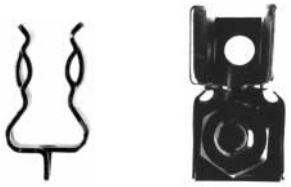



Time Current Characteristics

| Rated Current | 1.1 • In min. | 1.35 • In max. | 2 • In max. |
|---|---|---|---|
| 125mA-20A | 1 h | 1 h | 120 s |

Ceramic Tube



For information about printed circuit board or screw mount 10.3 x 38mm fuse clips, please see page 92

| Order Number Type A3BK | Rated Current mA/A~ | Rated Voltage V~ | Breaking Capacity A | Voltage Drop mV | Approvals UL | Approvals CSA |
|---|---|---|---|---|---|---|
| 7024.9110 | 125mA | | | 2370 | | |
| 7024.9120 | 160mA | | | 2600 | | |
| 7024.9130 | 200mA | | | 2200 | | |
| 7024.9140 | 250mA | | | 1760 | | |
| 7024.9150 | 310mA | | | 1600 | | |
| 7024.9160 | 400mA | | | 2380 | | |
| 7024.9170 | 500mA | | | 2750 | | |
| 7024.9180 | 630mA | | | 2500 | | |
| 7024.9190 | 800mA | | | 580 | | |
| 7024.9210 | 1A | 300 | 10,000 A/300V AC p.f. = 0.7-0.8 | 900 | • | • |
| 7024.9220 | 1.25A | | | 1100 | • | • |
| 7024.9230 | 1.60A | | | 460 | • | • |
| 7024.9240 | 2A | | | 400 | • | • |
| 7024.9250 | 2.50A | | | 380 | • | • |
| 7024.9260 | 3.15A | | | 350 | • | • |
| 7024.9270 | 4A | | | 260 | • | • |
| 7024.9310 | 8A | | | 270 | • | • |
| 7024.9320 | 10A | | | | • | • |
| 7024.9330 | 12.5A | | | | • | • |
| 7024.9340 | 15A | | | | • | • |

# Fuse Kits

**FSF**
5x20 mm

Quick-acting, low-breaking
Built to IEC 127-2/2. UL, VDE, SEMKO, SEV. 270 pieces: 15 each, 100mA-10A
**Order no. 0034.9856**

**FST**
5x20 mm

Time-delay, low-breaking
Built to IEC 127-2/3. UL, VDE, SEMKO, SEV, BSI, CB. 270 pieces: 15 each, 100mA-10A
**Order no. 0034.9857**

**FST / SP**
5x20 mm

Time-delay, low-breaking / fast-acting, high-breaking
Built to IEC 127-2/3 and 2/1. UL, VDE, SEMKO, SEV, CB. 270 pieces: 15-30 each, 500mA-10A
**Order no. 0034.9858**

**SP / SPT**
5x20 mm

Quick-acting, high-breaking / time-delay, high-breaking
Built to IEC 127-2/1 and 2/5. UL, VDE, SEMKO, SEV. 180 pieces: 10 each, 800mA-10A
**Order no. 0034.9871**

**MSF 125**
Microfuse

Quick-acting, low-breaking
Built to IEC 127-3/1, CSA 59.2-M. UL, CSA. 180 pieces: 10 each, 50mA-5A, 10 each MSF holder
**Order no. 0034.9875**

**MSF / MST 250**
Microfuse

Quick-acting, low breaking
Built to IEC 127-3/3 and 3/4. UL, VDE, SEMKO, SEV. 180 pieces: 10 each, 63mA-5A,
10 each MSF holder
**Order no. 0034.9876**

**OMF63 / OMF250**
Surface mount

OMF 63: Quick-acting, low-breaking
Built to CSA 59.2-M. UL, CSA. 90 pieces: 10 each, 100mA-5A, 10 each OMF 63 holder
OMF 250: Quick-acting, medium-breaking
Built to IEC 127-4 trend document. 90 pieces: 10 each, 500mA-4A, 10 each OMF 250 holder
**Order no. 0034.9877**

| FSF | FST | FST / SP | SP / SPT | MSF 125 | MSF / MST 250 | OMF 63 / OMF 250 |
|---|---|---|---|---|---|---|
| FSF 160 mA | FST 160 mA | FST 500 mA | SP 800 mA | MSF 50 mA | MSF 50 mA | OMF63 100 mA |
| FSF 200 mA | FST 200 mA | FST 1 A | SP 1 A | MSF 100 mA | MSF 80 mA | OMF63 250 mA |
| FSF 250 mA | FST 250 mA | FST 1.25 A | SP 1.6 A | MSF 125 mA | MSF 315 mA | OMF63 630 mA |
| FSF 315 mA | FST 315 mA | FST 1.6 A | SP 2 A | MSF 200 mA | MSF 500 mA | OMF63 1 A |
| FSF 400 mA | FST 400 mA | FST 2 A | SP 2.5 A | MSF 250 mA | MSF 1 A | OMF63 1.25 A |
| FSF 500 mA | FST 500 mA | FST 2.5 A | SP 3.15 A | MSF 315 mA | MSF 2 A | OMF63 1.6 A |
| FSF 630 mA | FST 630 mA | FST 3.15 A | SP 5 A | MSF 400 mA | MSF 3.15 A | OMF63 2 A |
| FSF 800 mA | FST 800 mA | FST 6.3 A | SP 6.3 A | MSF 500 mA | MSF 5 A | OMF63 3.5 A |
| FSF 1 A | FST 1 A | FST 10 A | SP 10 A | MSF 630 mA | | OMF63 5 A |
| FSF 1.25 A | FST 1.25 A | | | MSF 800 mA | MST 63 mA | |
| FSF 1.6 A | FST 1.6 A | SP 500 mA | SPT 800 mA | MSF 1 A | MST 80 mA | OMF250 500 mA |
| FSF 2 A | FST 2 A | SP 1 A | SPT 1 A | MSF 1.25 A | MST 160 mA | OMF250 800 mA |
| FSF 2.5 A | FST 2.5 A | SP 3.15 A | SPT 1.6 A | MSF 1.6 A | MST 315 mA | OMF250 1 A |
| FSF 4 A | FST 4 A | SP 6.3 A | SPT 2 A | MSF 2 A | MST 500 mA | OMF250 1.25 A |
| FSF 5 A | FST 5 A | SP 10 A | SPT 2.5 A | MSF 3.15 A | MST 1 A | OMF250 1.6 A |
| FSF 6.3 A | FST 6.3 A | | SPT 3.15 A | MSF 4 A | MST 1.25 A | OMF250 2 A |
| FSF 10 A | FST 10 A | | SPT 5 A | MSF 5 A | MST 2 A | OMF250 3.15 A |
| | | | SPT 6.3 A | MSF 10 A | MST 3.15 A | OMF250 4 A |
| | | | SPT 10 A | | | |

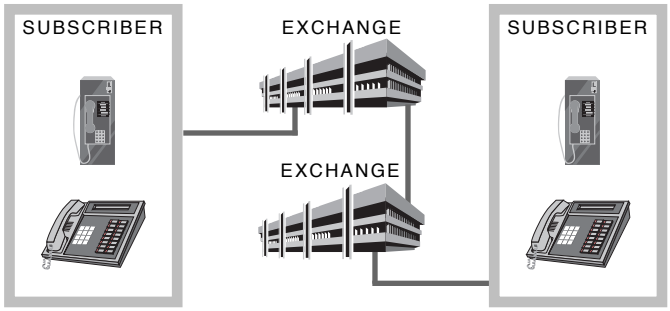
**Please refer to the catalog page for each fuse type for exact approval information**

# Surge Tolerant Fuses

## Application Notes

### Introduction

Telecommunication equipment acts as a source for data exchange between subscribers. Communication takes place in various ways, e. g. telephone, FAX etc.

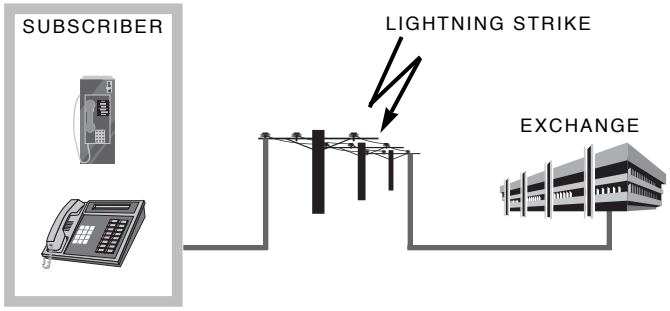



Distances between individual subscribers (man, machine) can vary significantly thereby subjecting network connections (overhead lines, signal cables) to various interferences caused by:

- Atmospheric interference, (lightning strike, switching operations)
- Interference by power induction (equalizing currents, vicinity of power cables)
- Direct contact with energy network (short-circuits)

### Interference sources

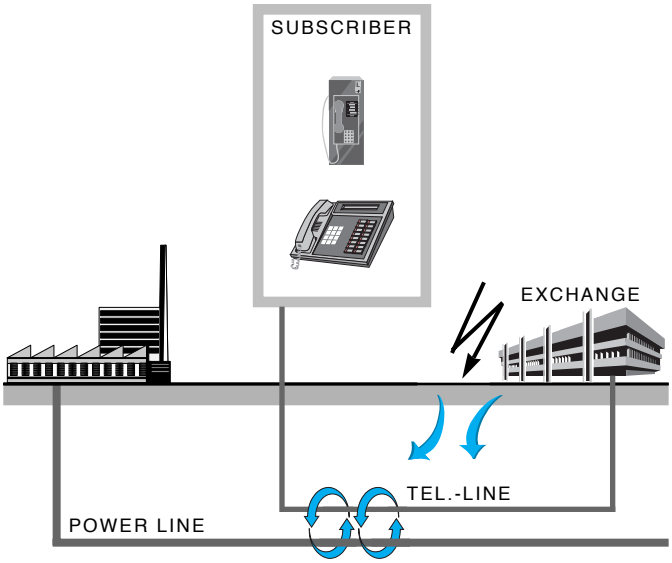
#### Atmospheric interference (Lightning Strike)



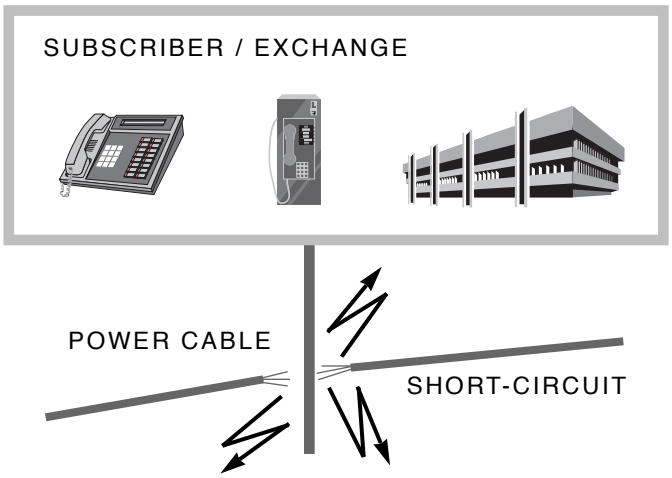

Interference due to lightning strikes occurs frequently on exposed overhead telephone lines. Voltages as a result of this atmospheric discharge can be 100 kV with discharge currents up to 150 kA.

#### Interference by induction (Power Induction)

Induction voltages occurring as interference on telecom lines are usually a result of circulating or equalizing currents in the earth or are produced by strong currents in adjacent power cables.




#### Direct contact with the power network (Power Contact)




Interference of unusually high intensity and long duration (a few seconds to several minutes) on a telephone line occurs when there is direct contact with a power network (e.g. short-circuit with an adjacent power cable).

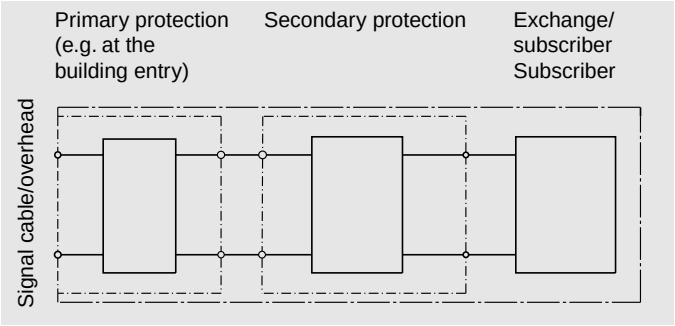
# Surge Tolerant Fuses

### Protection of equipment

Regardless of the type of interference affecting telecom equipment, it is imperative that no damage occurs, or only limited damage whose effects can be calculated.

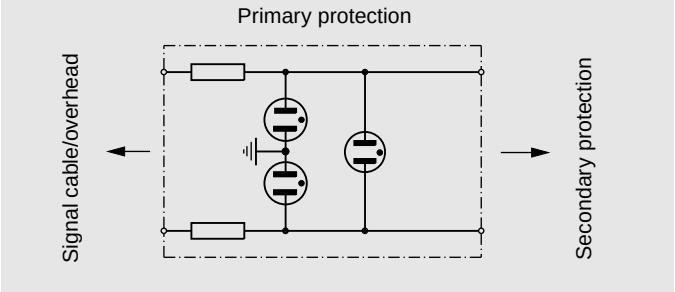
As shown below, this requirement can be satisfied by the use of appropriate protection circuits.

Protection circuits in the telecom branch are usually designed on the two-stage principle. They comprise of primary and secondary protection.




### Primary protection

Primary protection is frequently comprised of a combination of resistors and surge arrestors and is usually located at the «building entry» interface.




The task of the illustrated primary protection circuit is to sufficiently reduce the high-energy interference distortion so that it can be safely absorbed by the following secondary protection.

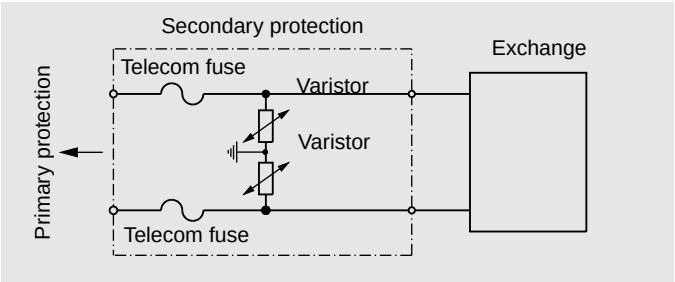
### Secondary protection

The secondary protection is normally located directly at the appliance entry of the telecom equipment and has two objectives.

1. It operates as a voltage limiter which ensures that interference up to a defined amplitude, not yet capable of activating the primary protection, is absorbed or reduced to a harmless level for the telecom equipment.

2. It effectively suppresses high energy level interferences, which can no longer be adequately absorbed by the primary protection (e.g. in case of direct contact between the signal lines and the power network), by galvanic decoupling of the circuit. This prevents the occurrence of serious damage, even fire, in the telecom equipment.

The following diagram shows a frequently used, extremely reliable protection circuit for this purpose.




The circuit, which in its simplest form is comprised of two fuses and two varistors, is characterized by an extremely attractive cost-benefit ratio. The varistors limit the interference voltage peaks to a level compatible for the telephone exchange, and respectively, the subscriber circuit. Under normal conditions, the fuses remain intact.

Under worst-case conditions, e.g. direct contact with the power network, where both the telecom equipment components and the varistors in the protection circuit would be seriously damaged or destroyed, the fuses interrupt the circuit thereby effectively and reliably protecting the telecom equipment.

# Surge Tolerant Fuses

## Testing: Introduction

Several standards have been established for the Telecom industry, all of which are aimed at combining the interference influences of Lightning Surge, Power Induction and Power Contact, together with the associated safety aspects, and to derive suitable testing methods for the components in question.

Various kinds of loads have been defined and standardised as testing criteria. They can be simulated with the aid of an appropriate test circuit. This provides circuit designers with the facility for optimally adapting the stages of a protection circuit to one another.

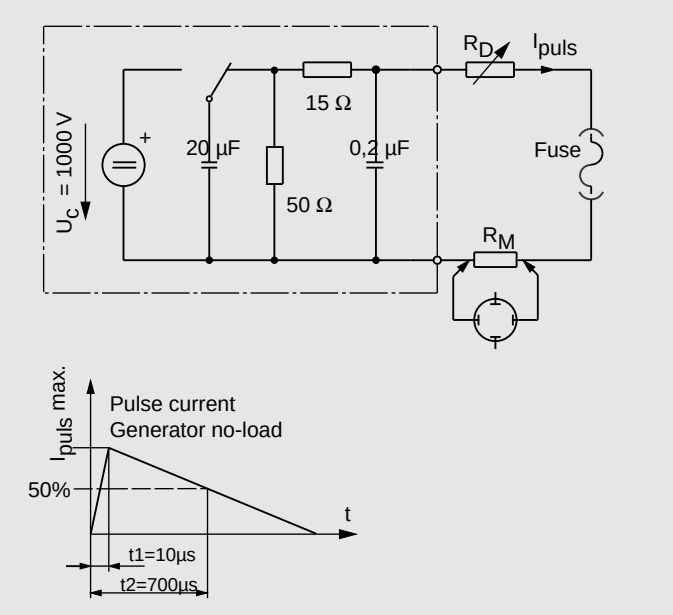
Current relevant standards are:

| | |
|---|---|
| **ITU-T K.20** | International Telecommunication Union, Standardisation Sector of ITU |
| **UL 1459/1950** | Standard for Safety, Telephone Equipment (USA) |
| **GR 1089 Core** | Bell Communications Research (USA) |

**Tests :**
Schurter fuses have been tested according to the following standards and testing criteria(this list is not exhaustive):

## 1. ITU-T K.20

**Lightning Surge:** Test circuit
Fig. 1




Test:

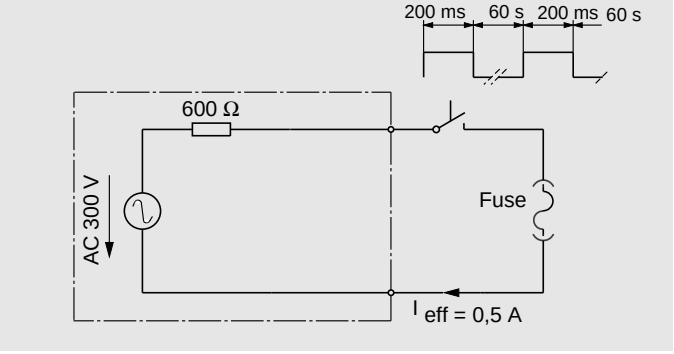
1. The pulse amplitude (generator no-load) is set to 1000 V and the pulse shape to 10 µs / 700 µs.
2. The pulse current $I_{puls}$ is set to the value $I_{puls}$ max. stated in the data sheet with limiting resistor $R_D$.
3. Test mode : 10 single pulses, at an interval of 60 sec. alternating polarity.

*Requirement: The fuse shall not interrupt the circuit.*

**1) Note:**

With a charge voltage of $U_C$ = 1000 V, the standardized pulse generator in Fig. 1 supplies a maximum pulse current $I_{puls}$ = 67 A, providing the current limiting resistor is $R_D$ = 0Ω. The shunt $R_M$ for the current monitoring has a very low resistance and has therefore no notable influence to the current amplitude. This means that the data sheet current 67 A (1) does not represent the maximum permissible pulse amplitude of the fuse in question, but the maximum current amplitude which can be supplied by the pulse generator. If a max. current higher than 67 A is to be expected in a circuit, the $I^2t$-values of the fuse can be calculated using the formula $I^2t = 0{,}72 \times i^2peak \times t2$, as a good approximation in order that the selected fuse can accept the expected current pulse without interrupting the circuit.

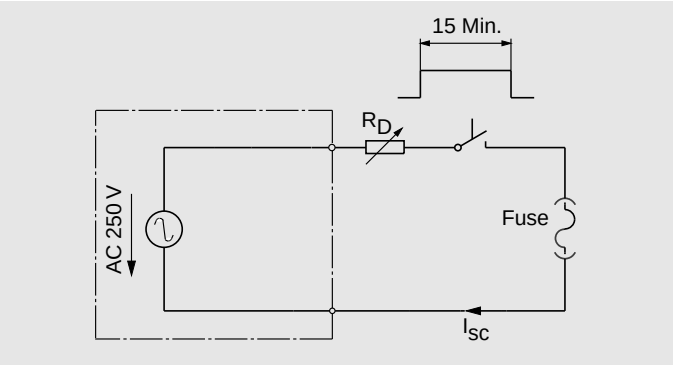
**Power induction:** Test circuit
Fig. 2
Test: The fuse in the test circuit AC 300 V / 50 Hz is loaded 5




times with $I_{eff}$ = 0,5 A for 200 ms at intervals of 60 sec.

*Requirement: The fuse shall not interrupt the circuit.*

**Power Contact:** Test circuit
Fig. 3
Test: The fuse in the test circuit AC 250 V / 50 Hz is loaded with the current value $I_{SC}$ stated in the data sheet. The supply




voltage is maintained for 15 minutes.

*Requirement: The fuse shall interrupt the circuit.*

# Surge Tolerant Fuses

## 2. UL1459/1950

**Test circuit**

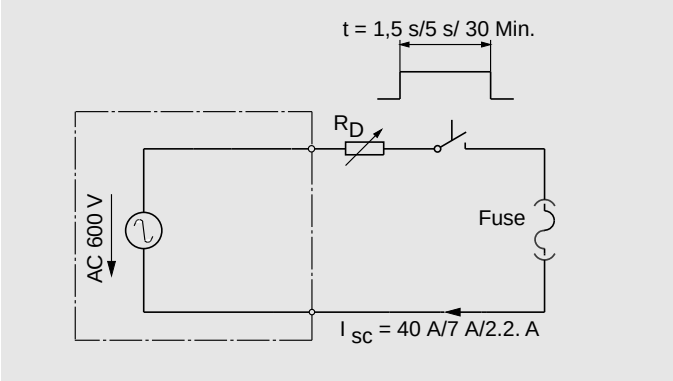



Fig. 4

**Test 1:**
The fuse in the test current circuit is loaded with a test current of $I_{SC}$ = 40 A .
The AC 600 V / 50 Hz source voltage is applied for a total of 1.5 sec.

*Requirement: The fuse shall interrupt the circuit.*

**Test 2:**
The fuse in the test current circuit is loaded with a test current of $I_{SC}$ = 7 A .
The AC 600 V / 50 Hz source voltage is applied for a total of 5 sec.

Requirement: The fuse shall interrupt the circuit.

**Test 3**
The fuse in the test current circuit is loaded with a test current of $I_{SC}$ = 2,2 A .
The AC 600 V / 50Hz source voltage is applied for at least 30 minutes, or until stable thermal conditions are achieved in the telecom unit or until the fuse interrupts the circuit.
This test is performed together with the equipment in which the fuse is installed.

## 3. GR 1089

**Test circuit**

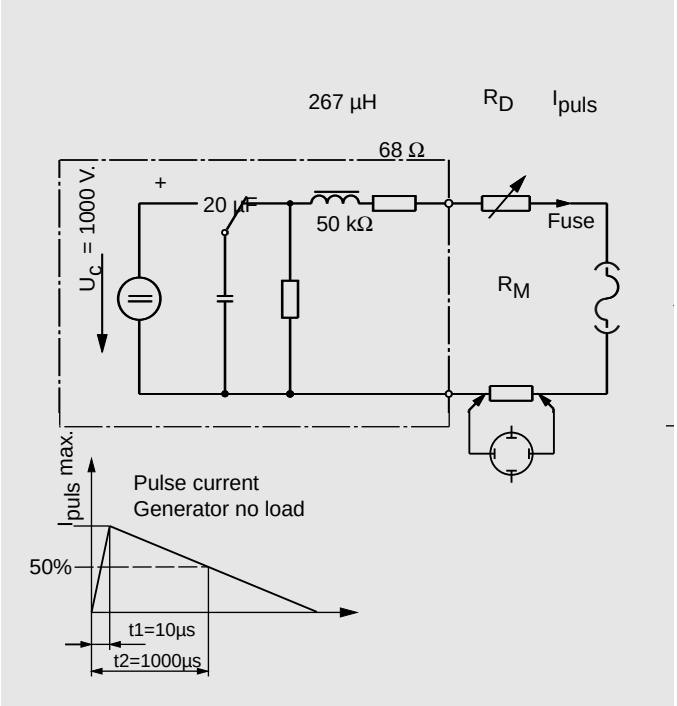



Fig. 5

**Test:**

1. The pulse amplitude (generator no-load) is set to 1000 V and the pulse shape to 10 µs / 1000 µs.
2. The pulse current $I_{puls}$ is set to the value $I_{puls}$ max. stated in the data sheet with limiting resistor $R_D$.
3. Test mode: 50 single pulses, at an interval of 60 sec. alternating polarity.

*Requirement: The fuse shall not interrupt the circuit.*

5) **Note:** With a charge voltage of $U_C$ = 1000 V, the standardized pulse generator in Fig. 5 supplies a maximum pulse current $I_{puls}$ = 14 A, providing the current limiting resistor is $R_D$ = 0Ω. The shunt $R_M$ for the current monitoring has a very low resistance and has no notable influence to the current amplitude. This means that the data sheet current 14 A [5] does not represent the maximum permissible pulse amplitude of the fuse in question, but the maximum current amplitude which can be supplied by the pulse generator. If a max. current higher than 14 A is to be expected in a circuit, the $I^2t$- values of the fuse can be calculated using the formula $I^2t$ = 0,72 x $i^2$peak x t2, as a good approximation in order that the selected fuse can accept the expected current pulse without interrupting the circuit.

# Surge Tolerant Surface Mount Fuses

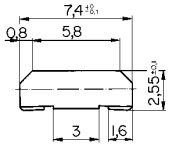
## OSU 125 V fuses for surface mounting

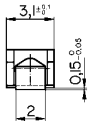
can be soldered directly onto printed circuit board or inserted into surface mount fuseholder

**especially for telecom applications**

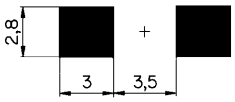
1:1

NEW




Solder pads



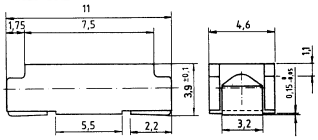

## OSU 250 V fuses for surface mounting

can be soldered directly onto printed circuit board or inserted into surface mount fuseholder

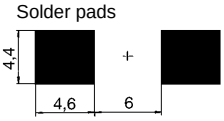
**especially for telecom applications**

1:1

NEW




Solder pads




### 1. Technical data

| Series | Pre-arcing time/current characteristic (at $T_a$ 23 °C) | | | | | | | Breaking capacity | Standards |
|---|---|---|---|---|---|---|---|---|---|
| | Rated current $I_n$ | 1 · $I_n$ | 1,25 · $I_n$ | 2 · $I_n$ | | 4 · $I_n$ | 10 · $I_n$ | | |
| | | min. | min. | max. | | max. | min. | max. | |
| OSU 125 V | 250 mA–3,15 A | 4 h | – | 1 s | | 10 ms | – | – | AC 300 A / 125 V p. f. 1<br>DC 400 A / 125 V | UL 248-14<br>CSA C.22.2 No. 248.14 |
| OSU 250 V | 250 mA–3,15 A | – | 1 h | IEC/UL 120 s | CSA 60 s | | 1 ms | 10 ms | IEC: L<br>AC 100 A / 250 V p. f. 1<br>DC 100 A / 250 V | IEC 127-4/2<br>UL 248-14<br>CSA C.22.2 No. 248.14 |

### 2. Order No.

**OSU 125 V**

| Order No. | Rated current $I_n$ Rated voltage $U_n$ | Voltage drop at $I_n$, typ. mV | Pre-arcing $I^2t$, typ. $A^2s$ | ITU-T K.20 Fig. 1 Lightning Surge 10x1kV/10/700 µs $I_{puls}$ max. | ITU-T K.20 Fig. 2 Power Induction AC 300 V / 0,5 A 5 x 200 ms | ITU-T K.20 Fig. 3 Power Contact AC 250 V 15 min $I_{SC}$ max. | UL 1459 Fig. 4 AC 600 V 40A / 1,5s 7A / 5s 2,2A / 30 min | GR 1089 Fig. 5 1000 V 50 x 10/1000 µs $I_{puls}$ max. |
|---|---|---|---|---|---|---|---|---|
| 2060.0006.XX | 250 mA / 125 V | 990 | 0,0058 | 2,5 A | | 50 A | | < 1,5 A |
| 2060.0043.XX | 350 mA / 125 V | 990 | 0,0076 | 4 A | | 25 A | | < 1,5 A |
| 2060.0044.XX | 375 mA / 125 V | 990 | 0,0130 | 4.6 A | • | 25 A | | < 1,5 A |
| 2060.0007.XX | 400 mA / 125 V | 960 | 0,016 | 5,8 A | • | 25 A | | < 1,5 A |
| 2060.0045.XX | 500 mA / 125 V | 300 | 0,010 | 7,7 A | • | 25 A | | 2,5 A |
| 2060.0008.XX | 630 mA / 125 V | 290 | 0,020 | 10 A | • | 25 A | | 4,6 A |
| 2060.0046.XX | 750 mA / 125 V | 260 | 0,031 | 13 A | • | 25 A | | 7 A |
| 2060.0009.XX | 1 A / 125 V | 220 | 0,086 | 16 A | • | 25 A | | 9,3 A |
| 2060.0010.XX | 1,25 A / 125 V | 220 | 0,14 | 25 A | • | 25 A | | 14 A (5) |
| 2060.0047.XX | 1,5 A / 125 V | 200 | 0,24 | 30 A | • | 8,3 A | | 14 A (5) |
| 2060.0011.XX | 1,6 A / 125 V | 200 | 0,27 | 33 A | • | 12,5 A | | 14 A (5) |
| 2060.0012.XX | 2 A / 125 V | 200 | 0,44 | 45 A | • | 8,3 A | | 14 A (5) |
| 2060.0013.XX | 2,5 A / 125 V | 190 | 0,79 | 67 A (1) | • | 8,3 A | | 14 A (5) |
| 2060.0014.XX | 3 A / 125 V | 190 | 1,1 | 67 A (1) | • | 8,3 A | | 14 A (5) |
| 2060.0048.XX | 3,15 A / 125 V | 190 | 1,1 | 67 A (1) | • | 8,3 A | | 14 A (5) |

**OSU 250 V**

| Order No. | Rated current $I_n$ Rated voltageg $U_n$ | Voltage drop at $I_n$, typ. mV | Pre-arcing $I^2t$, typ. $A^2s$ | ITU-T K.20 Fig. 1 Lightning Surge 10x1kV/10/700 µs $I_{puls}$ max. | ITU-T K.20 Fig. 2 Power Induction AC 300 V / 0,5 A 5 x 200 ms | ITU-T K.20 Fig. 3 Power Contact AC 250 V 15 min $I_{SC}$ max. | UL 1459 Fig. 4 AC 600 V 40A / 1,5s 7A / 5s 2,2A / 30 min | GR 1089 Fig. 5 1000 V 50 x 10/1000 µs $I_{puls}$ max. |
|---|---|---|---|---|---|---|---|---|
| 2070.0010.XX | 250 mA / 250 V | 435 | 0,009 | 3,9 A | | 100 A | • | < 1,9 A |
| 2070.0011.XX | 315 mA / 250 V | 395 | 0,017 | 4,3 A | • | 100 A | • | < 1,9 A |
| 2070.0012.XX | 400 mA / 250 V | 230 | 0,02 | 5 A | • | 100 A | • | 3,1 A |
| 2070.0013.XX | 500 mA / 250 V | 190 | 0,04 | 10 A | • | 100 A | • | 5,1 A |
| 2070.0014.XX | 630 mA / 250 V | 170 | 0,08 | 16 A | • | 100 A | | 9,2 A |
| 2070.0015.XX | 800 mA / 250 V | 200 | 0,13 | 22 A | • | 100 A | | 14 A (5) |
| 2070.0016.XX | 1 A / 250 V | 170 | 0,23 | 27 A | • | 100 A | | 14 A (5) |
| 2070.0017.XX | 1,25 A / 250 V | 150 | 0,47 | 43 A | • | 100 A | | 14 A (5) |
| 2070.0018.XX | 1,6 A / 250 V | 150 | 0,84 | 67 A (1) | • | 100 A | | 14 A (5) |
| 2070.0019.XX | 2 A / 250 V | 140 | 1,4 | 67 A (1) | • | 100 A | | 14 A (5) |
| 2070.0020.XX | 2,5 A / 250 V | 130 | 2,6 | 67 A (1) | • | 100 A | | 14 A (5) |
| 2070.0021.XX | 3,15 A / 250 V | 130 | 4,3 | 67 A (1) | • | 100 A | | 14 A (5) |

Explanation for fig. 1–5 and index (1) / (5): see page 160/161

Packaging see page 167

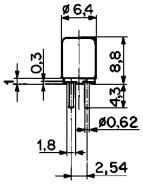
# Surge Tolerant Radial Leaded Fuses

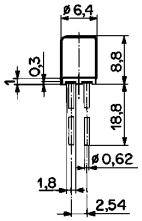
## MSU 125 V microfuses

can be soldered directly into printed circuit boards or plugged into fuseholders

**especially for telecom applications**

NEW



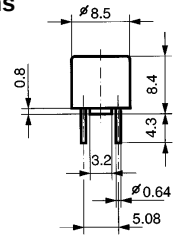



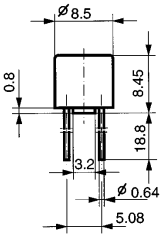

## MSU 250 V microfuses

can be soldered directly into printed circuit boards or plugged into fuseholders

**especially for telecom applications**

NEW




### 1. Technical data

| Series | Pre-arcing time/current characteristic (at $T_a$ 23 °C) | | | | | | | | | | | Breaking capacity | Standards |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated current $I_n$ | 1 · $I_n$ | 1,5 · $I_n$ | | 2 · $I_n$ | 2,1 · $I_n$ | 2,75 · $I_n$ | | 4 · $I_n$ | | 10 · $I_n$ | | |
| | | | min. | max. | max. | max. | min. | max. | min. | max. | min. | max | |
| MSU 125 V | 250 mA–3,15 A | perm. | – | 10 min | 5 s | – | – | 300 ms | – | 30 ms | – | 4 ms | IEC AC/DC 50 A/125 V p. f. 1<br>UL/CSA: AC/DC 300 A/125 V p. f. 1 | IEC 127-3/1<br>EN 60127-3/1<br>UL 248-14<br>CSA C22.2 No 248.14 |
| MSU 250 V | 250 mA–3,15 A | – | 60 min | – | – | 2 min | 400 ms | 10 s | 150 ms | 3 s | 20 ms | 150 ms | AC 35 A/250 V p. f. 1 | IEC 127-3/4<br>EN 60127-3/4<br>UL 248-14<br>CSA C22.2 No 248.14 |

### 2. Order No.

| MSU 125 V | | | | | | ITU-T K.20 | | | UL 1459/1950 | GR 1089 |
|---|---|---|---|---|---|---|---|---|---|---|
| Order No. Terminals short | long | Taped and reeled | Rated current $I_n$ Rated voltage $U_n$ | Voltage drop at $I_n$, typ. mV | Pre-arcing $I^2t$, typ. $A^2s$ | Fig. 1 Lightning Surge 10x1kV/ 10/700 µs $I_{puls}$ max. | Fig. 2 Power Induction AC 300 V/0,5 A 5 x 200 ms | Fig. 3 Power Contact AC 250 V 15 min $I_{SC}$ max. | Fig. 4 AC 600 V 40A / 1,5s 7A / 5s 2,2A / 30 min | Fig. 5 1000 V 50 x 10/ 1000 µs $I_{puls}$ max. |
| 2030.0013 | 2030.0243 | 2030.0543 | 250 mA / 125 V | 620 | 0,006 | 4,5 A | • | 300 A | • | < 1,5 A |
| 2030.0014 | 2030.0244 | 2030.0544 | 315 mA / 125 V | 680 | 0,025 | 5,6 A | • | 300 A | • | < 1,5 A |
| 2030.0015 | 2030.0245 | 2030.0545 | 400 mA / 125 V | 180 | 0,013 | 5,9 A | • | 300 A | • | 1,6 A |
| 2030.0016 | 2030.0246 | 2030.0546 | 500 mA / 125 V | 180 | 0,02 | 6,4 A | • | 300 A | • | 2,4 A |
| 2030.0017 | 2030.0247 | 2030.0547 | 630 mA / 125 V | 180 | 0,045 | 7,2 A | • | 300 A | • | 2,7 A |
| 2030.0018 | 2030.0248 | 2030.0548 | 710 mA / 125 V | 140 | 0,045 | 7,8 A | • | 300 A | • | 2,9 A |
| 2030.0019 | 2030.0249 | 2030.0549 | 750 mA / 125 V | 170 | 0,02 | 8,5 A | • | 300 A | • | 3 A |
| 2030.0020 | 2030.0250 | 2030.0550 | 800 mA / 125 V | 150 | 0,04 | 11 A | • | 300 A | • | 5 A |
| 2030.0021 | 2030.0251 | 2030.0551 | 1 A / 125 V | 150 | 0,07 | 16 A | • | 300 A | • | 6 A |
| 2030.0022 | 2030.0252 | 2030.0552 | 1,25 A / 125 V | 150 | 0,12 | 21 A | • | 300 A | • | 9,3 A |
| 2030.0023 | 2030.0253 | 2030.0553 | 1,6 A / 125 V | 150 | 0,29 | 35 A | • | 300 A | • | 14 A (5) |
| 2030.0024 | 2030.0254 | 2030.0554 | 2 A / 125 V | 130 | 0,43 | 38 A | • | 300 A | • | 14 A (5) |
| 2030.0025 | 2030.0255 | 2030.0555 | 2,5 A / 125 V | 120 | 0,60 | 57 A | • | 300 A | • | 14 A (5) |
| 2030.0026 | 2030.0256 | 2030.0556 | 3,15 A / 125 V | 120 | 1,11 | 65 A | • | | | 14 A (5) |

| MSU 250 V | | | | | | ITU-T K.20 | | | UL 1459/1950 | GR 1089 |
|---|---|---|---|---|---|---|---|---|---|---|
| Order No. Terminals short | long | Taped and reeled | Rated current $I_n$ Rated voltage $U_n$ | Voltage drop at $I_n$, typ. mV | Pre-arcing $I^2t$, typ. $A^2s$ | Fig. 1 Lightning Surge 10x1kV/ 10/700 µs $I_{puls}$ max. | Fig. 2 Power Induction AC 300 V/0,5 A 5 x 200 ms | Fig. 3 Power Contact AC 250 V 15 min $I_{SC}$ max. | Fig. 4 AC 600 V 40A / 1,5s 7A / 5s 2,2A / 30 min | Fig. 5 1000 V 50 x 10/ 1000 µs $I_{puls}$ max. |
| 2040.0609 | 2040.0709 | 2040.0809 | 250 mA / 250 V | 120 | 0,6 | 25,3 A | • | 35 A | | 14 A (5) |
| 2040.0610 | 2040.0710 | 2040.0810 | 315 mA / 250 V | 120 | 0,8 | 29,2 A | • | 35 A | | 14 A (5) |
| 2040.0611 | 2040.0711 | 2040.0811 | 400 mA / 250 V | 110 | 1,1 | 39,5 A | • | 35 A | | 14 A (5) |
| 2040.0612 | 2040.0712 | 2040.0812 | 500 mA / 250 V | 100 | 2,5 | 57 A | • | 35 A | | 14 A (5) |
| 2040.0613 | 2040.0713 | 2040.0813 | 630 mA / 250 V | 90 | 4 | 67 A (1) | • | 35 A | | 14 A (5) |
| 2040.0614 | 2040.0714 | 2040.0814 | 800 mA / 250 V | 80 | 8 | 67 A (1) | • | 35 A | • | 14 A (5) |
| 2040.0615 | 2040.0715 | 2040.0815 | 1 A / 250 V | 70 | 12 | 67 A (1) | • | 35 A | • | 14 A (5) |
| 2040.0616 | 2040.0716 | 2040.0816 | 1,25 A / 250 V | 70 | 15 | 67 A (1) | • | 35 A | • | 14 A (5) |
| 2040.0617 | 2040.0717 | 2040.0817 | 1,6 A / 250 V | 60 | 30 | 67 A (1) | • | 50 A | • | 14 A (5) |
| 2040.0618 | 2040.0718 | 2040.0818 | 2 A / 250 V | 60 | 34 | 67 A (1) | • | 50 A | • | 14 A (5) |
| 2040.0619 | 2040.0719 | 2040.0819 | 2,5 A / 250 V | 50 | 55 | 67 A (1) | • | 50 A | • | 14 A (5) |
| 2040.0620 | 2040.0720 | 2040.0820 | 3,15 A / 250 V | 50 | 76 | 67 A (1) | • | 50 A | • | 14 A (5) |

Explanation for fig. 1–5 and index (1) / (5): see page 160/161

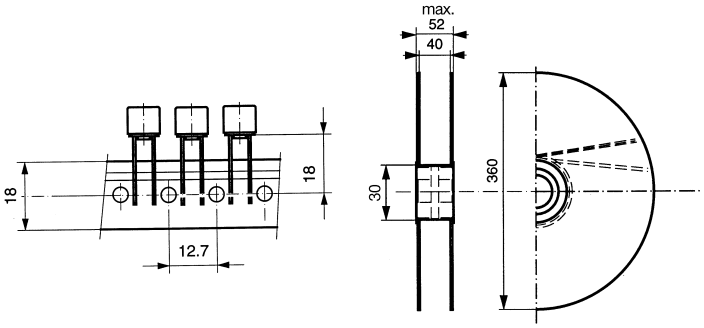
Packaging see page 167

# Packaging Information

## MSU 125 V / MSU 250 V

Packing style
- Packaged loose
- Taped and reeled 750 pieces
  MSU 125 V 1000 pieces

Tape and reel
according to IEC 286-2

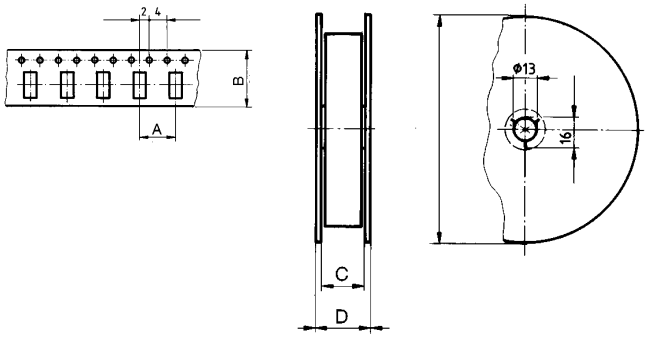



## OSU 125 V / OSU 250 V

| Packaged loose or blistertaped | **OSU 125V** | **OSU 250V** |
|---|---|---|
| Packaged loose | 2060.XXXX.11 | 2070.XXXX.11 |
| Blistertape reeled 750 pieces | 2060.XXXX.22 | |
| Blistertape reeled 2000 pieces | | 2070.XXXX.24 |
| Blistertape reeled 3000 pieces | 2060.XXXX.24 | |

| Type | Dimensions in mm | | | |
|---|---|---|---|---|
| | A | B | C (max.) | D (max.) |
| OSU 125 V | 8 | 16 | 18,4 | 22,4 |
| OSU 250 V | 8 | 24 | 26,4 | 30,4 |

Tape and reel
according to IEC 286-3

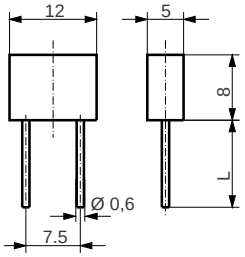


# Surge Tolerant Radial Leaded Fuses

## FRT 250 T universal modular fuses

**especially for telecom applications**

NEW




L: short ≙ 4,3 mm
long ≙ 19 mm
Ø = 0,6 mm

### 1. Technical data

| Series | Pre-arcing time/current characteristic (at $T_a$ 23 °C) | | | | | Breaking capacity | Standards |
|---|---|---|---|---|---|---|---|
| | Rated current $I_n$ | 1,25 · $I_n$ | 2 · $I_n$ | 10 · $I_n$ | | | |
| | | min. | max. | min. | max. | | |
| FRT 250 T | 250 mA–3,15 A | 1 h | 120 s | 10 ms | 100 ms | IEC: L<br>AC 100 A/250 V<br>p. f. 0,95 | IEC 127-4/1 |

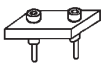
### 2. Order No. / Rated currents / Rated voltage Technical data for telecom applications

| FRT 250 T | | | | | | | ITU-T K.20 | | | UL 1459/1950 | GR 1089 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Order No. | | | Rated current $I_n$<br>Rated voltage $U_n$ | Voltage drop at $I_n$. | | Pre-arcing $I^2t$, typ. | Fig. 1<br>Lightning Surge<br>10x1kV/<br>5 x 200 ms | Fig. 2<br>Power Induction<br>AC 300 V/0,5A<br>15 min | Fig. 3<br>Power Contact<br>AC 250 V<br>7A / 5s | Fig. 4<br>AC 600 V<br>40A / 1,5s<br>1000 µs<br>2,2A / 30 min | Fig. 5<br>1000 V<br>50 x 10/ |
| Terminals<br>short | long | Taped and reeled | | IEC 127<br>mV | typ.<br>mV | 10/700 µs<br>$A^2s$ | $I_{puls}$ max. | | $I_{SC}$ max. | | $I_{puls}$ max. |
| 7100.1009.XX | 7100.1109.XX | 7100.1109.XX | 250 mA / 250 V | 800 | 170 | 0,32 | pend. | pend. | pend. | pend. | pend. |
| 7100.1010.XX | 7100.1110.XX | 7100.1110.XX | 315 mA / 250 V | 750 | 160 | 0,50 | 20 A | • | 100 A | • | 14 A |
| 7100.1011.XX | 7100.1111.XX | 7100.1111.XX | 400 mA / 250 V | 700 | 135 | 0,80 | 24 A | • | 100 A | • | 14 A (5) |
| 7100.1012.XX | 7100.1112.XX | 7100.1112.XX | 500 mA / 250 V | 600 | 125 | 1,25 | 30 A | • | 100 A | pend. | 14 A (5) |
| 7100.1013.XX | 7100.1113.XX | 7100.1113.XX | 630 mA / 250 V | 500 | 130 | 2 | 46 A | • | 100 A | • | 14 A (5) |
| 7100.1014.XX | 7100.1114.XX | 7100.1114.XX | 800 mA / 250 V | 400 | 200 | 3,20 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 7100.1015.XX | 7100.1115.XX | 7100.1115.XX | 1 A / 250 V | 300 | 180 | 5 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 7100.1016.XX | 7100.1116.XX | 7100.1116.XX | 1,25 A / 250 V | 300 | 145 | 7,9 | pend. | pend. | pend. | pend. | pend. |
| 7100.1017.XX | 7100.1117.XX | 7100.1117.XX | 1,6 A / 250 V | 300 | 110 | 12,80 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 7100.1018.XX | 7100.1118.XX | 7100.1118.XX | 2 A / 250 V | 300 | 105 | 20 | 67 A (1) | • | 100 A | • | 14 A (5)) |
| 7100.1019.XX | 7100.1119.XX | 7100.1119.XX | 2,5 A / 250 V | 300 | 140 | 32 | pend. | pend. | pend. | pend. | pend. |
| 7100.1020.XX | 7100.1120.XX | 7100.1120.XX | 3,15 A / 250 V | 300 | 115 | 50 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 7100.1021.XX | 7100.1121.XX | 7100.1121.XX | 4 A / 250 V | 300 | 120 | 80 | • | • | • | • | • |
| 7100.1022.XX | 7100.1122.XX | 7100.1122.XX | 5 A / 250 V | 300 | 125 | 125 | • | • | • | • | • |
| 7100.1023.XX | 7100.1123.XX | 7100.1123.XX | 6.3 A / 250 V | 300 | 120 | 200 | • | • | • | • | • |

Explanation for fig. 1–5 and index (1) / (5): see page 160/161

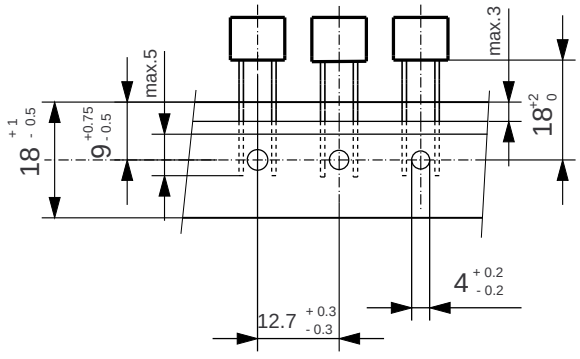
### Packaging

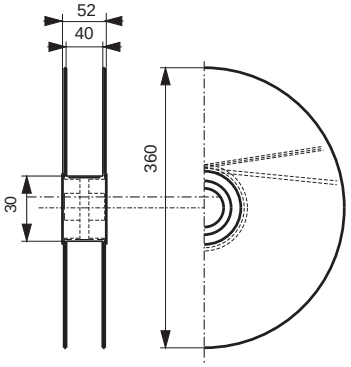
| | |
|---|---|
| Packaged loose | 7100.XXXX.13 |
| Tape and reeled 500 pieces | 7100.XXXX.95 |
| Tape and reeled 1000 pieces | 7100.XXXX.96 |



Suitable fuseholder on request

Tape and reel according to IEC 286-2



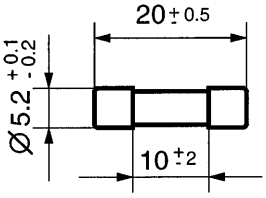
# Surge Tolerant Cartridge Fuses

## FSU 5 x 20mm fuses

low breaking capacity L

**especially for telecom applications**

NEW

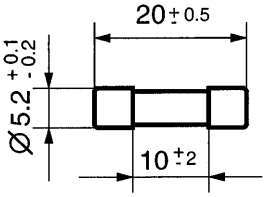



## SSU 5 x 20 mm fuses

high breaking capacity H

**especially for telecom applications**

NEW




### 1. Technical data

| Series | Pre-arcing time/current characteristic (at $T_a$ 23 °C) | | | | | | | | | Breaking capacity | Standards |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Rated current $I_n$ | 1,5 · $I_n$ | | 2,1 · $I_n$ | | 2,75 · $I_n$ | | 4 · $I_n$ | | 10 · $I_n$ | | | |
| | | min. | | max. | | min. | max. | min. | max. | min. | max. | | |
| FSU 5 x 20 | 250 mA–3,15 A | 60 min | | 2 min | | 600 ms | 10 s | 150 ms | 3 s | 20 ms | 300 ms | IEC/EN: L<br>AC 35 A / 250 V<br>p. f. 1 | IEC 127-2/3<br>EN 60127-2/3 |
| SSU 5 x 20 | 500 mA–3,15 A | 60 min | | 30 min | | 1 s | 80 s | 95 ms | 5 s | 10 ms | 100 ms | IEC/EN: H<br>AC 1500 A / 250 V<br>p. f. 0,7–0,8<br>UL:<br>AC 10 000 A / 125 V<br>p. f. 0,7–0,8<br>AC 1500 A / 250 V<br>p. f. 0,7–0,8 | IEC 127-2/5<br>EN 60127-2/5 |

### 2. Order No.

| **FSU 5 x 20** | | | | ITU-T K.20 | | | UL 1459/1950 | GR 1089 |
|---|---|---|---|---|---|---|---|---|
| Order No. | Rated current $I_n$<br>Rated voltage $U_n$ | Voltage drop at $I_n$, typ.<br>mV | Operating $I^2t$, typ.<br>$A^2s$ | Fig. 1<br>Lightning Surge<br>10x1kV/10/700 µs<br>$I_{puls}$ max. | Fig. 2<br>Power Induction<br>AC 300 V / 0,5 A<br>5 x 200 ms | Fig. 3<br>Power Contact<br>AC 250 V 15 min<br>$I_{SC}$ max. | Fig. 4<br>AC 600 V<br>40A / 1,5s<br>7A / 5s<br>2,2A / 30 min | Fig. 5<br>1000 V<br>50 x 10/1000 µs<br>$I_{puls}$ max. |
| 2010.0011 | 250 mA / 250 V | 210 | 0,13 | 16 A | • | 100 A | • | 14 A (5) |
| 2010.0012 | 315 mA / 250 V | 170 | 0,35 | 27 A | • | 100 A | • | 14 A (5) |
| 2010.0013 | 400 mA / 250 V | 150 | 0,48 | 35 A | • | 100 A | • | 14 A (5) |
| 2010.0014 | 500 mA / 250 V | 160 | 4,90 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0015 | 630 mA / 250 V | 160 | 6,10 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0016 | 800 mA / 250 V | 120 | 5,30 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0017 | 1 A / 250 V | 60 | 6,70 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0018 | 1,25 A / 250 V | 60 | 8,20 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0065 | 1,4 A / 250 V | 60 | 7,60 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0019 | 1,6 A / 250 V | 60 | 11 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0020 | 2 A / 250 V | 60 | 20 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0021 | 2,5 A / 250 V | 60 | 24 | 67 A (1) | • | 100 A | • | 14 A (5) |
| 2010.0022 | 3,15 A / 250 V | 60 | 48 | 67 A (1) | • | 100 A | • | 14 A (5) |

| **SSU 5 x 20** | | | | ITU-T K.20 | | | UL 1459/1950 | GR 1089 |
|---|---|---|---|---|---|---|---|---|
| Order No. | Rated current $I_n$<br>Rated voltage $U_n$ | Voltage drop at $I_n$, typ.<br>mV | Operating $I^2t$, typ.<br>$A^2s$ | Fig. 1<br>Lightning Surge<br>10x1kV/10/700 µs<br>$I_{puls}$ max. | Fig. 2<br>Power Induction<br>AC 300 V / 0,5 A<br>5 x 200 ms | Fig. 3<br>Power Contact<br>AC 250 V 15 min<br>$I_{SC}$ max. | Fig. 4<br>AC 600 V<br>40A / 1,5s<br>7A / 5s<br>2,2A / 30 min | Fig. 5<br>1000 V<br>50 x 10/1000 µs<br>$I_{puls}$ max. |
| 2020.0001 | 500 mA / 250 V | 360 | 0,54 | 27,7 A | • | 1500 A | • | 14 A (5) |
| 2020.0002 | 630 mA / 250 V | 330 | 1,1 | 57 A | • | 1500 A | • | 14 A (5) |
| 2020.0003 | 800 mA / 250 V | 260 | 2 | 67 A | • | 1500 A | • | 14 A (5) |
| 2020.0004 | 1 A / 250 V | 180 | 1,4 | 57 A | • | 1500 A | • | 14 A (5) |
| 2020.0005 | 1,25 A / 250 V | 150 | 1,8 | 67 A (1) | • | 1500 A | • | 14 A (5) |
| 2020.0006 | 1,6 A / 250 V | 130 | 4,7 | 67 A (1) | • | 1500 A | • | 14 A (5) |
| 2020.0007 | 2 A / 250 V | 120 | 9,7 | 67 A (1) | • | 1500 A | • | 14 A (5) |
| 2020.0008 | 2,5 A / 250 V | 100 | 21 | 67 A (1) | • | 1500 A | • | 14 A (5) |
| 2020.0009 | 3,15 A / 250 V | 100 | 36 | 67 A (1) | • | 1500 A | • | 14 A (5) |

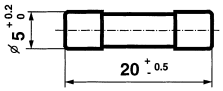
Explanation for fig. 1–5 and index (1) / (5): see page 160/161

• VDE, SEMKO, SEV Approved (1A-3.15A)

Optional pigtail leads

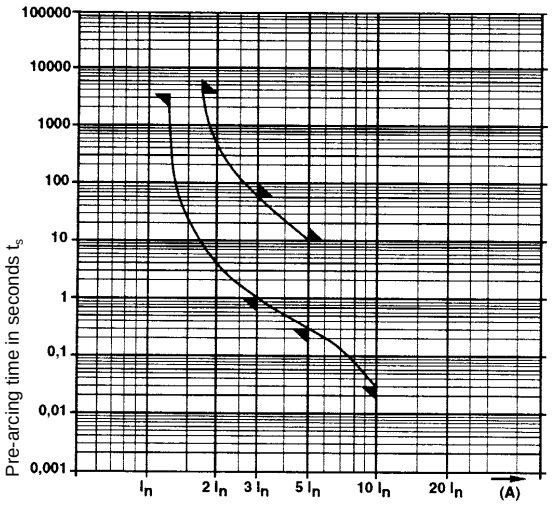
# Surge Tolerant Cartridge Fuses

## TH1 5x20mm Thermofuses
**for telecom applications**




Standards / Approvals

none




Multiple of rated current $I_n$

**Pre-arcing time/current characteristic (at $T_a$ 23 °C)**

| Rated current $I_n$ \ $n \cdot I_n$ | 1,15 · $I_n$ | 1,65 · $I_n$ | 3 · $I_n$ | | 5 · $I_n$ | | 10 · $I_n$ |
|---|---|---|---|---|---|---|---|
| | min. | max. | min. | max. | min. | max. | min. |
| 2,5 A | 1 h | 1 h | 1s | 60 s | 0,3 s | 10 s | 30 ms |

**Wave characteristic 8 x 20 µs according to IEC 60-2**

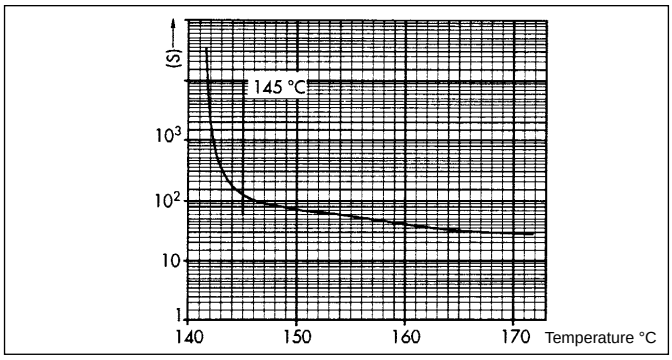
| Type | Peak current admissible | |
|---|---|---|
| | 1 Shock | 10 Shocks |
| Thermolink TH1 / 2,50 A | 2,5 kA | 2 kA |

**Technical data**

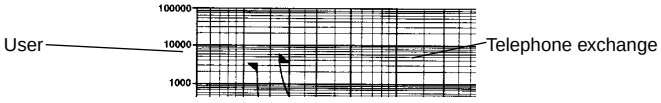
- Resistance up to 8 x 20 µs current waves (IEC 60-2) of approx 1000 · $I_n$ without degradation
- Interrupting a short-circuit current of approx 1 · $I_n$
- Thermal function: breaking the circuit from 145 °C

| | |
|---|---|
| Construction | Glass tube |
| Weight | 1,4 g |
| Climatic range | 40 / 070 / 56 |
| Majoration | 1,45 · $I_n$ at 40 °C |
| Minoration | 0,7 · $I_n$ at 70 °C |
| Vibrations | NF C 20-706 / IEC 68-2-6<br>10-55 Hz / 0,35 mm / 5 cycles |
| Shocks | NF C 20-727 / IEC 68-2-27, 50 g |
| Sinusoidal vibrations | NF C 20-729 / IEC 68-2-29, 40 g |
| Thermical function | 160 °C / 100 mA / t ≤ 4000 s |

**Thermal characteristics without current**




**Telecom application example**




(1) Parallel protector (discharger-varistor)

| Order No. | Rated current $I_n$<br>Rated voltage $U_n$ | Breaking capacity | Voltage drop at $I_n$<br>mV |
|---|---|---|---|
| 7040.2120 | AC 2,5 A / 220 V | AC 40 A / 220 V | 200 |