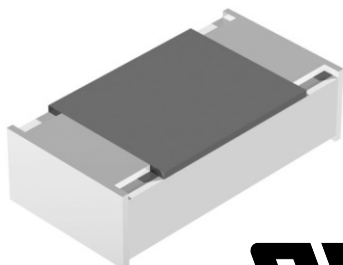


Thin Film Flat Chip Fuses



FEATURES

- Advanced thin film technology
- Very quick acting fuse characteristics
- Outstanding stability of fusing characteristics
- Standard metric SMD sizes
- Green product, supports lead (Pb)-free soldering

APPLICATIONS

- Information technology
- Industrial electronics
- Automotive electronics
- Telecommunication
- Medical equipment
- Audio/video electronics

MFU Thin Film Flat Chip Fuses are the perfect choice for the most fields of modern electronics. The highly controlled manufacturing thin film process guarantees an outstanding stability of fusing characteristics. Typical applications include information technology, telecommunication, medical equipment, industrial, audio/video, and automotive electronics.

METRIC SIZE

| INCH: | 0402 | 0603 | 0805 | 1206 |
|---------|----------|----------|----------|----------|
| METRIC: | RR 1005M | RR 1608M | RR 2012M | RR 3216M |

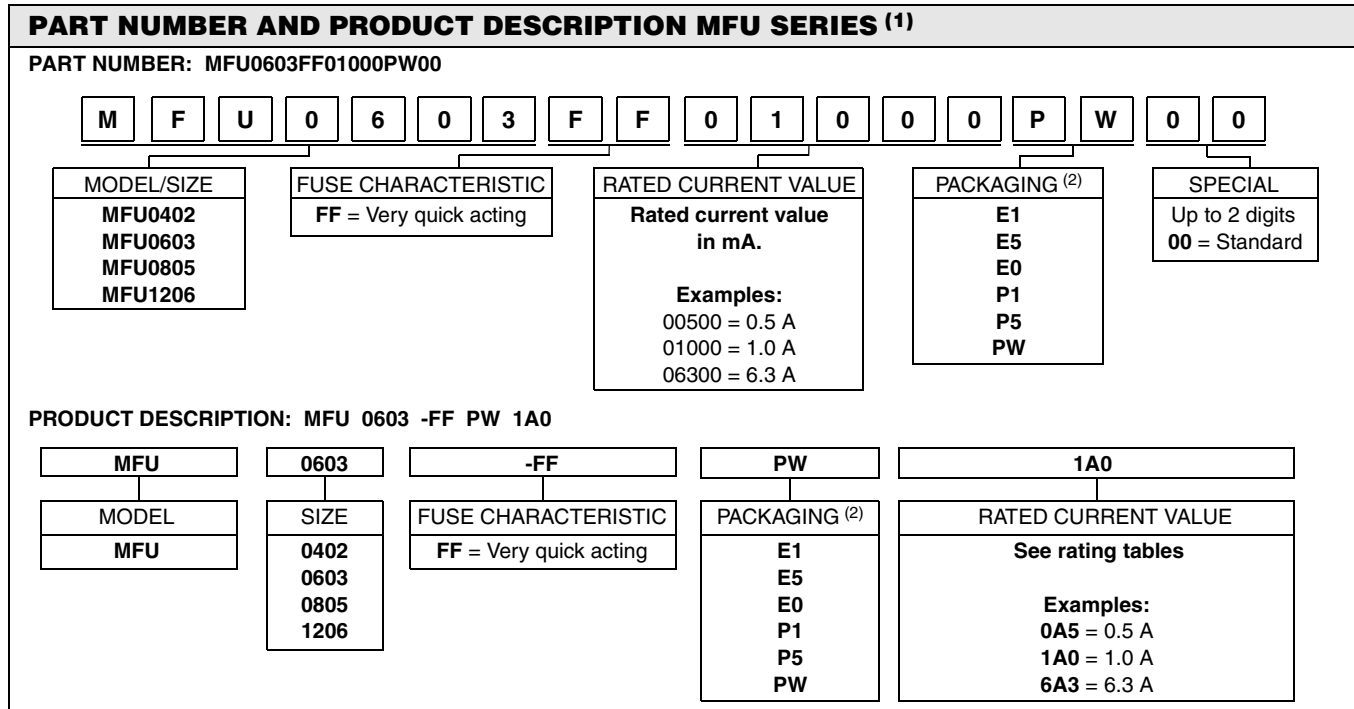
TECHNICAL SPECIFICATION

| DESCRIPTION | | MFU 0402 | MFU 0603 | MFU 0805 | MFU 1206 |
|---|---------------------|---------------------------------|------------------------------------|---------------------------------|------------------------------------|
| Metric size | | RR 1005M | RR 1608M | RR 2012M | RR 3216M |
| Rated Current range I_R | | 0.5 A to 3.15 A | 0.5 A to 5.0 A | 0.5 A to 5.0 A | 0.5 A to 6.3 A |
| Rated voltage, U_{max} , DC | | 32 V | 32 V | 32 V | 63 V |
| Breaking Capacity, I_{max} , at U_{max} , DC | | 50 A at 32 V | 50 A at 32 V | 50 A at 32 V | 50 A at 63 V |
| Voltage drop at $1 \times I_R$ | | 90 mV to 420 mV | 85 mV to 361 mV | 98 mV to 374 mV | 116 mV to 433 mV |
| Cold resistance at $0.1 \times I_R$ | | 22 m Ω to 640 m Ω | 13 m Ω to 550 m Ω | 15 m Ω to 570 m Ω | 14 m Ω to 660 m Ω |
| Climatic category (LCT/UCT/days) | | 55/125/56 | 55/125/56 | 55/125/56 | 55/125/56 |
| Permissible continuous current rating at $\vartheta_{amb.} = 23 \text{ }^\circ\text{C}$ | | $0.7 \times I_R$ | $0.7 \times I_R$ | $0.7 \times I_R$ | $0.7 \times I_R$ |
| Approval | UL recognition file | E253806 | E253806 | E253806 | E253806 |
| | IEC 60127-4 | n/a | Refer to table: MFU 0603 RATING | | Refer to table: MFU 1206 RATING |
| FIT _{observed} | | $\leq 0.2 \times 10^{-9}/h$ | $\leq 0.2 \times 10^{-9}/h$ | $\leq 0.2 \times 10^{-9}/h$ | $\leq 0.2 \times 10^{-9}/h$ |

MFU Series - Thin Film Fuse

Vishay Beyschlag

Thin Film Flat Chip Fuses

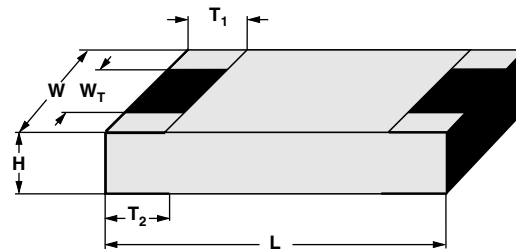


Notes

- (1) Products can be ordered using either the PART NUMBER or the PRODUCT DESCRIPTION
- (2) Please refer to table PACKAGING

| PACKAGING | | | |
|-----------|------------|-------------|------|
| MODEL | REEL | | |
| | DIAMETER | PIECES/REEL | CODE |
| MFU0402 | 180 mm/7" | 1000 | E1 |
| | 180 mm/7" | 5000 | E5 |
| | 180 mm/7" | 10 000 | E0 |
| MFU0603 | 180 mm/7" | 1000 | P1 |
| | 180 mm/7" | 5000 | P5 |
| | 330 mm/13" | 20 000 | PW |
| MFU0805 | 180 mm/7" | 1000 | P1 |
| | 180 mm/7" | 5000 | P5 |
| | 330 mm/13" | 20 000 | PW |
| MFU1206 | 180 mm/7" | 1000 | P1 |
| | 180 mm/7" | 5000 | P5 |
| | 330 mm/13" | 20 000 | PW |

DIMENSIONS



| DIMENSIONS - Chip Fuse types, mass and relevant physical dimensions | | | | | | | |
|---|-------------------|-----------------|-------------|---------------------|---------------------|---------------------|-----------|
| TYPE | H (mm) | L (mm) | W (mm) | W _T (mm) | T ₁ (mm) | T ₂ (mm) | MASS (mg) |
| MFU 0402 | 0.32 ± 0.05 | 1.0 ± 0.05 | 0.5 ± 0.05 | > 75 % of W | 0.2 + 0.1/- 0.15 | 0.2 ± 0.1 | 0.65 |
| MFU 0603 | 0.45 + 0.1/- 0.05 | 1.55 ± 0.05 | 0.85 ± 0.1 | > 75 % of W | 0.3 + 0.15/- 0.2 | 0.3 + 0.15/- 0.2 | 1.9 |
| MFU 0805 | 0.45 + 0.1/- 0.05 | 2.0 ± 0.1 | 1.25 ± 0.15 | > 75 % of W | 0.4 + 0.1/- 0.2 | 0.4 + 0.1/- 0.2 | 4.7 |
| MFU 1206 | 0.55 ± 0.1 | 3.2 + 0.1/- 0.2 | 1.6 ± 0.15 | > 75 % of W | 0.5 ± 0.25 | 0.5 ± 0.25 | 9.5 |

| MFU 0402 RATING - very quick acting (FF) | | | | | | | | | | |
|--|------------|-------------------------|---------------|--|--|--|-------------------------|---------------------|----------|-----------------------|
| SIZE | FUSE CHAR. | RATED CURRENT (1) | RATED VOLTAGE | PRE-ARCING (2) I ² t at 10 x I _R | VOLT. DROP (2) at 1 x I _R | COLD RESIS (2) at 0.1 x I _R | BREAKING CAPACITY DC | MARK. | APPROVAL | ORDERING CODE (3) (4) |
| 0402 | FF | 500 mA | 32 V | 0.0009 A ² s | 420 mV | 640 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 0A5 |
| | | 630 mA | 32 V | 0.0014 A ² s | 331 mV | 400 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 0A63 |
| | | 750 mA | 32 V | 0.0020 A ² s | 275 mV | 280 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 0A75 |
| | | 800 mA | 32 V | 0.0023 A ² s | 231 mV | 220 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 0A8 |
| | | 1.0 A | 32 V | 0.0028 A ² s | 184 mV | 140 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 1A0 |
| | | 1.25 A | 32 V | 0.0039 A ² s | 159 mV | 97 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 1A25 |
| | | 1.5 A | 32 V | 0.0059 A ² s | 146 mV | 74 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 1A5 |
| | | 1.6 A | 32 V | 0.0065 A ² s | 136 mV | 65 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 1A6 |
| | | 1.75 A | 32 V | 0.0077 A ² s | 124 mV | 54 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 1A75 |
| | | 2.0 A | 32 V | 0.0101 A ² s | 115 mV | 44 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 2A0 |
| | | 2.5 A | 32 V | 0.0157 A ² s | 107 mV | 33 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 2A5 |
| | | 3.0 A | 32 V | 0.0227 A ² s | 95 mV | 24 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 3A0 |
| 3.15 A | 32 V | 0.0250 A ² s | 90 mV | 22 mΩ | 50 A at 32 V | - | UL | MFU 0402-FF E0 3A15 | | |

Notes

- (1) Other values of rated current are available on request
- (2) Typical values
- (3) For packages with 1000 pieces, please use for packaging E1 instead of E0
- (4) For packages with 5000 pieces, please use for packaging E5 instead of E0

MFU Series - Thin Film Fuse



Vishay Beyschlag

Thin Film Flat Chip Fuses

| MFU 0603 RATING - very quick acting (FF) | | | | | | | | | | |
|--|------------|------------------------------|---------------|---|---|---|----------------------|--------------------|----------|----------------------------------|
| SIZE | FUSE CHAR. | RATED CURRENT ⁽¹⁾ | RATED VOLTAGE | PRE-ARCING ⁽²⁾ I^2t at $10 \times I_R$ | VOLT. DROP ⁽²⁾ at $1 \times I_R$ | COLD RESIS ⁽²⁾ at $0.1 \times I_R$ | BREAKING CAPACITY DC | MARK. | APPROVAL | ORDERING CODE ^{(3) (4)} |
| 0603 | FF | 500 mA | 32 V | 0.0009 A ² s | 361 mV | 550 mΩ | 50 A at 32 V | F | UL/IEC | MFU 0603-FF PW 0A5 |
| | | 630 mA | 32 V | 0.0014 A ² s | 331 mV | 400 mΩ | 50 A at 32 V | CT | UL | MFU 0603-FF PW 0A63 |
| | | 750 mA | 32 V | 0.0020 A ² s | 258 mV | 262 mΩ | 50 A at 32 V | G | UL | MFU 0603-FF PW 0A75 |
| | | 800 mA | 32 V | 0.0023 A ² s | 249 mV | 237 mΩ | 50 A at 32 V | CV | UL | MFU 0603-FF PW 0A8 |
| | | 1.0 A | 32 V | 0.0028 A ² s | 223 mV | 170 mΩ | 50 A at 32 V | H | UL/IEC | MFU 0603-FF PW 1A0 |
| | | 1.25 A | 32 V | 0.0039 A ² s | 180 mV | 110 mΩ | 50 A at 32 V | J | UL | MFU 0603-FF PW 1A25 |
| | | 1.5 A | 32 V | 0.0059 A ² s | 155 mV | 79 mΩ | 50 A at 32 V | K | UL | MFU 0603-FF PW 1A5 |
| | | 1.6 A | 32 V | 0.0065 A ² s | 159 mV | 76 mΩ | 50 A at 32 V | EF | UL/IEC | MFU 0603-FF PW 1A6 |
| | | 1.75 A | 32 V | 0.0077 A ² s | 138 mV | 60 mΩ | 50 A at 32 V | L | UL | MFU 0603-FF PW 1A75 |
| | | 2.0 A | 32 V | 0.0101 A ² s | 150 mV | 57 mΩ | 50 A at 32 V | N | UL/IEC | MFU 0603-FF PW 2A0 |
| | | 2.5 A | 32 V | 0.0157 A ² s | 121 mV | 37 mΩ | 50 A at 32 V | O | UL | MFU 0603-FF PW 2A5 |
| | | 3.0 A | 32 V | 0.0227 A ² s | 126 mV | 32 mΩ | 50 A at 32 V | P | UL | MFU 0603-FF PW 3A0 |
| | | 3.15 A | 32 V | 0.0250 A ² s | 120 mV | 29 mΩ | 50 A at 32 V | EL | UL/IEC | MFU 0603-FF PW 3A15 |
| | | 3.5 A | 32 V | 0.0308 A ² s | 106 mV | 23 mΩ | 50 A at 32 V | R | UL | MFU 0603-FF PW 3A5 |
| 4.0 A | 32 V | 0.0403 A ² s | 100 mV | 19 mΩ | 50 A at 32 V | S | UL | MFU 0603-FF PW 4A0 | | |
| 5.0 A | 32 V | 0.2275 A ² s | 85 mV | 13 mΩ | 50 A at 32 V | T | UL | MFU 0603-FF PW 5A0 | | |

Notes

- (1) Other values of rated current are available on request
- (2) Typical values
- (3) For packages with 1000 pieces, please use for packaging P1 instead of PW
- (4) For packages with 5000 pieces, please use for packaging P5 instead of PW

| MFU 0805 RATING - very quick acting (FF) | | | | | | | | | | |
|--|------------|------------------------------|---------------|---|---|---|----------------------|--------------------|----------|----------------------------------|
| SIZE | FUSE CHAR. | RATED CURRENT ⁽¹⁾ | RATED VOLTAGE | PRE-ARCING ⁽²⁾ I^2t at $10 \times I_R$ | VOLT. DROP ⁽²⁾ at $1 \times I_R$ | COLD RESIS ⁽²⁾ at $0.1 \times I_R$ | BREAKING CAPACITY DC | MARK. | APPROVAL | ORDERING CODE ^{(3) (4)} |
| 0805 | FF | 500 mA | 32 V | 0.0009 A ² s | 374 mV | 570 mΩ | 50 A at 32 V | F | UL | MFU 0805-FF PW 0A5 |
| | | 630 mA | 32 V | 0.0014 A ² s | 347 mV | 420 mΩ | 50 A at 32 V | CT | UL | MFU 0805-FF PW 0A63 |
| | | 750 mA | 32 V | 0.0021 A ² s | 280 mV | 285 mΩ | 50 A at 32 V | G | UL | MFU 0805-FF PW 0A75 |
| | | 800 mA | 32 V | 0.0023 A ² s | 262 mV | 250 mΩ | 50 A at 32 V | CV | UL | MFU 0805-FF PW 0A8 |
| | | 1.0 A | 32 V | 0.0028 A ² s | 243 mV | 185 mΩ | 50 A at 32 V | H | UL | MFU 0805-FF PW 1A0 |
| | | 1.25 A | 32 V | 0.0040 A ² s | 205 mV | 125 mΩ | 50 A at 32 V | J | UL | MFU 0805-FF PW 1A25 |
| | | 1.5 A | 32 V | 0.0059 A ² s | 171 mV | 87 mΩ | 50 A at 32 V | K | UL | MFU 0805-FF PW 1A5 |
| | | 1.6 A | 32 V | 0.0065 A ² s | 164 mV | 78 mΩ | 50 A at 32 V | EF | UL | MFU 0805-FF PW 1A6 |
| | | 1.75 A | 32 V | 0.0077 A ² s | 161 mV | 70 mΩ | 50 A at 32 V | L | UL | MFU 0805-FF PW 1A75 |
| | | 2.0 A | 32 V | 0.0101 A ² s | 176 mV | 67 mΩ | 50 A at 32 V | N | UL | MFU 0805-FF PW 2A0 |
| | | 2.5 A | 32 V | 0.0157 A ² s | 131 mV | 40 mΩ | 50 A at 32 V | O | UL | MFU 0805-FF PW 2A5 |
| | | 3.0 A | 32 V | 0.0227 A ² s | 134 mV | 34 mΩ | 50 A at 32 V | P | UL | MFU 0805-FF PW 3A0 |
| | | 3.15 A | 32 V | 0.0250 A ² s | 128 mV | 31 mΩ | 50 A at 32 V | EL | UL | MFU 0805-FF PW 3A15 |
| | | 3.5 A | 32 V | 0.0308 A ² s | 119 mV | 26 mΩ | 50 A at 32 V | R | UL | MFU 0805-FF PW 3A5 |
| 4.0 A | 32 V | 0.0403 A ² s | 105 mV | 20 mΩ | 50 A at 32 V | S | UL | MFU 0805-FF PW 4A0 | | |
| 5.0 A | 32 V | 0.2275 A ² s | 98 mV | 15 mΩ | 50 A at 32 V | T | UL | MFU 0805-FF PW 5A0 | | |

Notes

- (1) Other values of rated current are available on request
- (2) Typical values
- (3) For packages with 1000 pieces, please use for packaging P1 instead of PW
- (4) For packages with 5000 pieces, please use for packaging P5 instead of PW

| MFU 1206 RATING - very quick acting (FF) | | | | | | | | | | |
|--|------------|-------------------------|---------------|--|--|--|----------------------|--------------------|----------|-----------------------|
| SIZE | FUSE CHAR. | RATED CURRENT (1) | RATED VOLTAGE | PRE-ARCING (2) I^2t at $10 \times I_R$ | VOLT. DROP (2) at $1 \times I_R$ | COLD RESIS (2) at $0.1 \times I_R$ | BREAKING CAPACITY DC | MARK. | APPROVAL | ORDERING CODE (3) (4) |
| 1206 | FF | 500 mA | 63 V | 0.0009 A ² s | 433 mV | 660 mΩ | 50 A at 63 V | F | UL/IEC | MFU 1206-FF PW 0A5 |
| | | 630 mA | 63 V | 0.0014 A ² s | 372 mV | 450 mΩ | 50 A at 63 V | CT | UL | MFU 1206-FF PW 0A63 |
| | | 750 mA | 63 V | 0.0022 A ² s | 325 mV | 330 mΩ | 50 A at 63 V | G | UL | MFU 1206-FF PW 0A75 |
| | | 800 mA | 63 V | 0.0023 A ² s | 273 mV | 260 mΩ | 50 A at 63 V | CV | UL | MFU 1206-FF PW 0A8 |
| | | 1.0 A | 63 V | 0.0028 A ² s | 262 mV | 200 mΩ | 50 A at 63 V | H | UL/IEC | MFU 1206-FF PW 1A0 |
| | | 1.25 A | 63 V | 0.0041 A ² s | 230 mV | 140 mΩ | 50 A at 63 V | J | UL | MFU 1206-FF PW 1A25 |
| | | 1.5 A | 63 V | 0.0059 A ² s | 207 mV | 105 mΩ | 50 A at 63 V | K | UL | MFU 1206-FF PW 1A5 |
| | | 1.6 A | 63 V | 0.0066 A ² s | 168 mV | 80 mΩ | 50 A at 63 V | EF | UL/IEC | MFU 1206-FF PW 1A6 |
| | | 1.75 A | 63 V | 0.0077 A ² s | 174 mV | 76 mΩ | 50 A at 63 V | L | UL | MFU 1206-FF PW 1A75 |
| | | 2.0 A | 63 V | 0.0102 A ² s | 181 mV | 69 mΩ | 50 A at 63 V | N | UL/IEC | MFU 1206-FF PW 2A0 |
| | | 2.5 A | 63 V | 0.0159 A ² s | 161 mV | 49 mΩ | 50 A at 63 V | O | UL | MFU 1206-FF PW 2A5 |
| | | 3.0 A | 63 V | 0.0229 A ² s | 173 mV | 44 mΩ | 50 A at 63 V | P | UL | MFU 1206-FF PW 3A0 |
| | | 3.15 A | 63 V | 0.0251 A ² s | 153 mV | 37 mΩ | 50 A at 63 V | EL | UL/IEC | MFU 1206-FF PW 3A15 |
| | | 3.5 A | 63 V | 0.0310 A ² s | 161 mV | 35 mΩ | 50 A at 63 V | R | UL | MFU 1206-FF PW 3A5 |
| | | 4.0 A | 63 V | 0.0404 A ² s | 147 mV | 28 mΩ | 50 A at 63 V | S | UL | MFU 1206-FF PW 4A0 |
| 5.0 A | 63 V | 0.2275 A ² s | 131 mV | 20 mΩ | 50 A at 63 V | T | UL | MFU 1206-FF PW 5A0 | | |
| 6.3 A | 63 V | 0.5160 A ² s | 116 mV | 14 mΩ | 50 A at 63 V | ET | UL | MFU 1206-FF PW 6A3 | | |

Notes

- (1) Other values of rated current are available on request
 (2) Typical values
 (3) For packages with 1000 pieces, please use for packaging P1 instead of PW
 (4) For packages with 5000 pieces, please use for packaging P5 instead of PW

DESCRIPTION

Production is strictly controlled and follows an extensive set of instructions established for reproducibility. A homogeneous film of metal alloy is deposited on a high grade ceramic body. The fuse elements are covered by a protective coating designed for electrical, mechanical and climatic protection. The terminations receive a final pure tin on nickel plating.

The result of the determined production is verified by an extensive testing procedure performed on 100 % of the individual fuses. Only accepted products are laid directly into the paper tape in accordance with **IEC 60286-3**.

APPROVALS

The fuses are tested in accordance with **IEC 60127-4** and **UL 248-14** which refers to **UL 248-1**, **IEC 60127-1** and **IEC 60068** series. VDE-approval of conformity is indicated by the **UMF** Logo on the package label. Recognition by Underwriter Laboratories Inc. is indicated by the **UL** logo on the package label.



**Pb-free Identification
on the Package Label**

ASSEMBLY

The fuses are suitable for processing on automatic SMD assembly systems. They are suitable for automatic soldering using wave, reflow or vapour phase. The encapsulation is resistant to all cleaning solvents commonly used in the electronics industry, including alcohols, esters and aqueous solutions. The fuses are RoHS compliant, the pure tin plating provides compatibility with lead (Pb)-free and lead-containing soldering processes. The immunity of the plating against tin whisker growth has been proven under extensive testing. All products comply with the CEFIC-EECA-EICTA list of legal restrictions on hazardous substances.

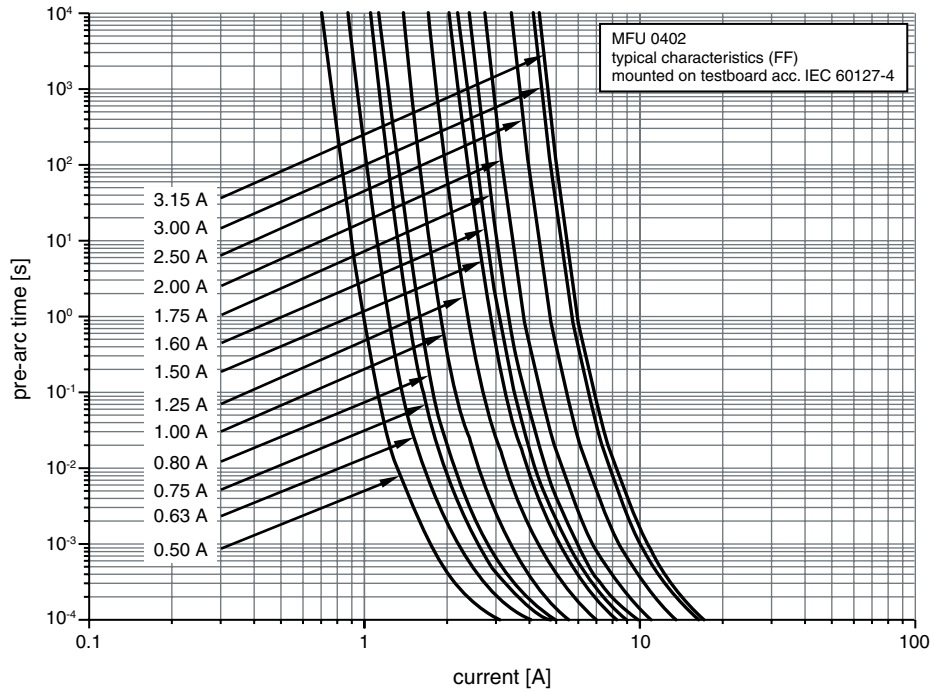
This includes full compliance with the following directives:

- 2000/53/EC End of Vehicle life Directive (ELV)
- 2000/53/EC Annex II to End of Vehicle Life Directive (ELV II)
- 2002/95/EC Restriction of the use of Hazardous Substances Directive (RoHS)
- 2002/96/EC Waste Electrical and Electronic Equipment Directive (WEEE)

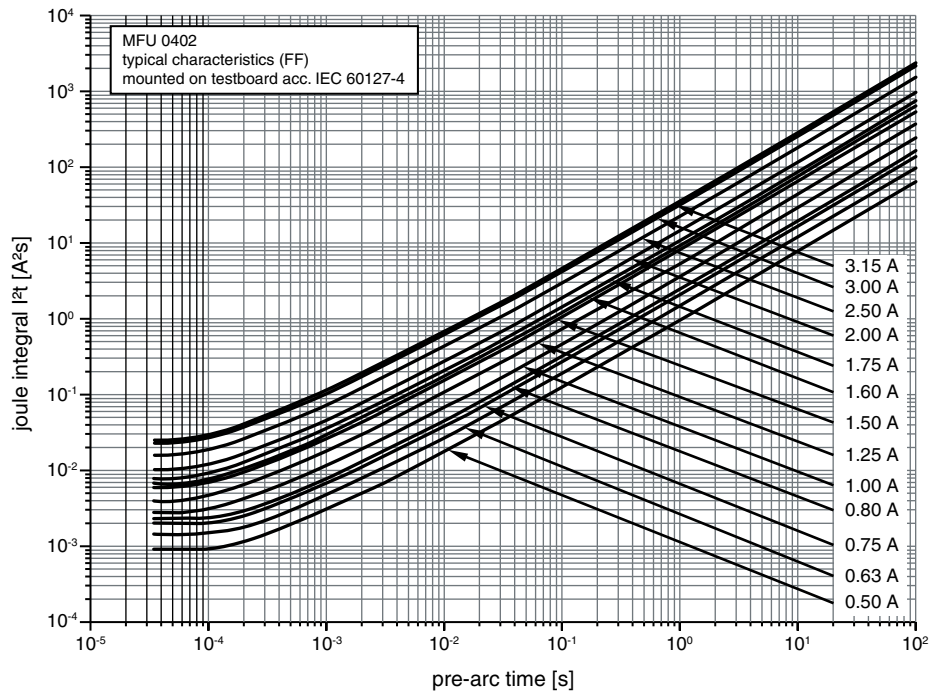
Solderability is specified for 2 years after production or requalification. The permitted storage time is 20 years.



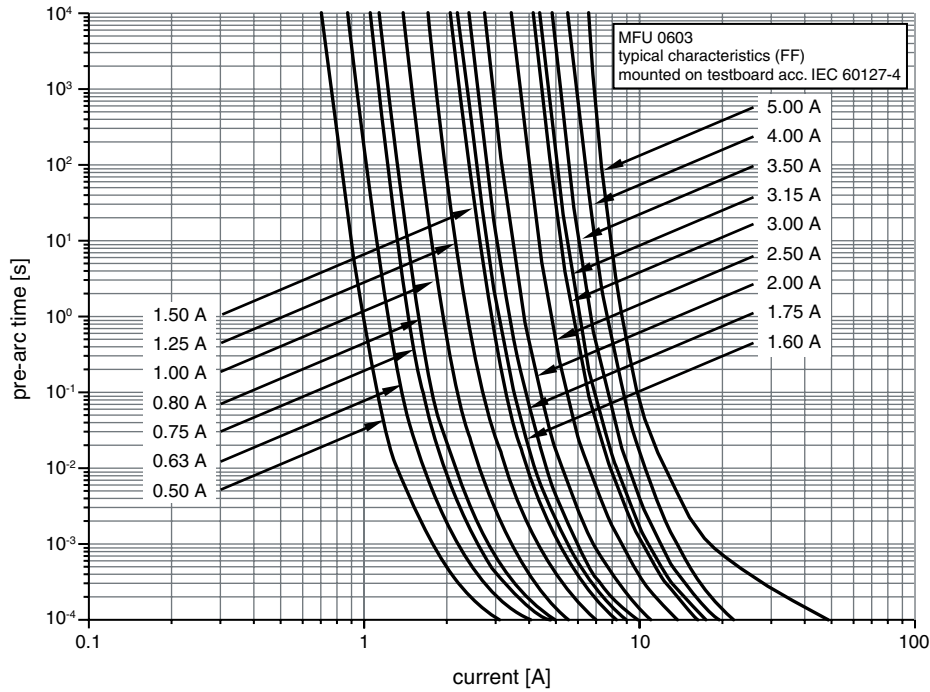
FUNCTIONAL PERFORMANCE



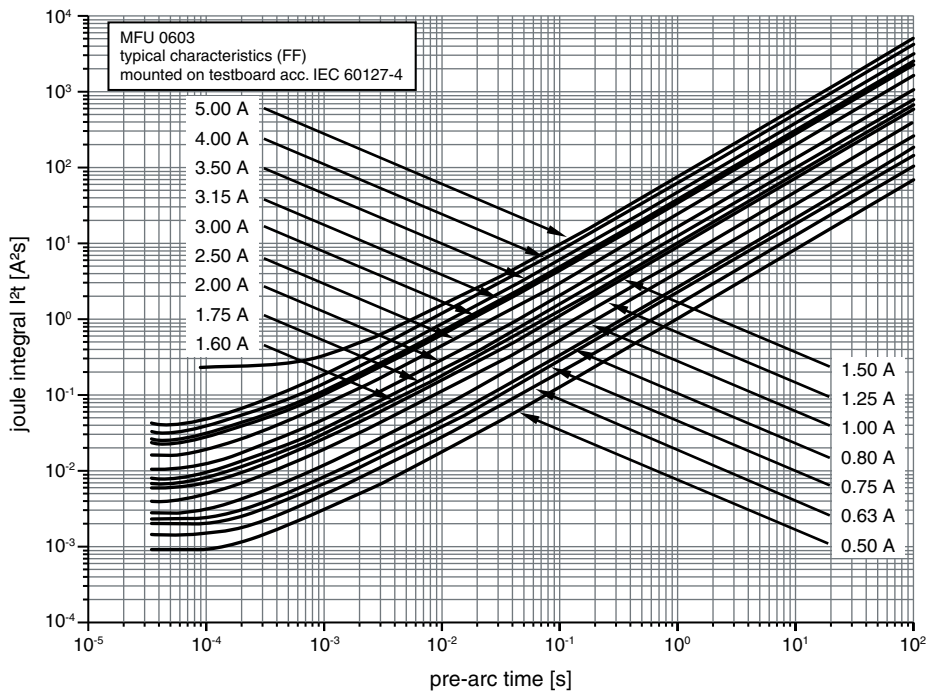
Typical I-t Characteristic of MFU 0402



Typical I²t vs. t Characteristic of MFU 0402



Typical I-t Characteristic of MFU 0603

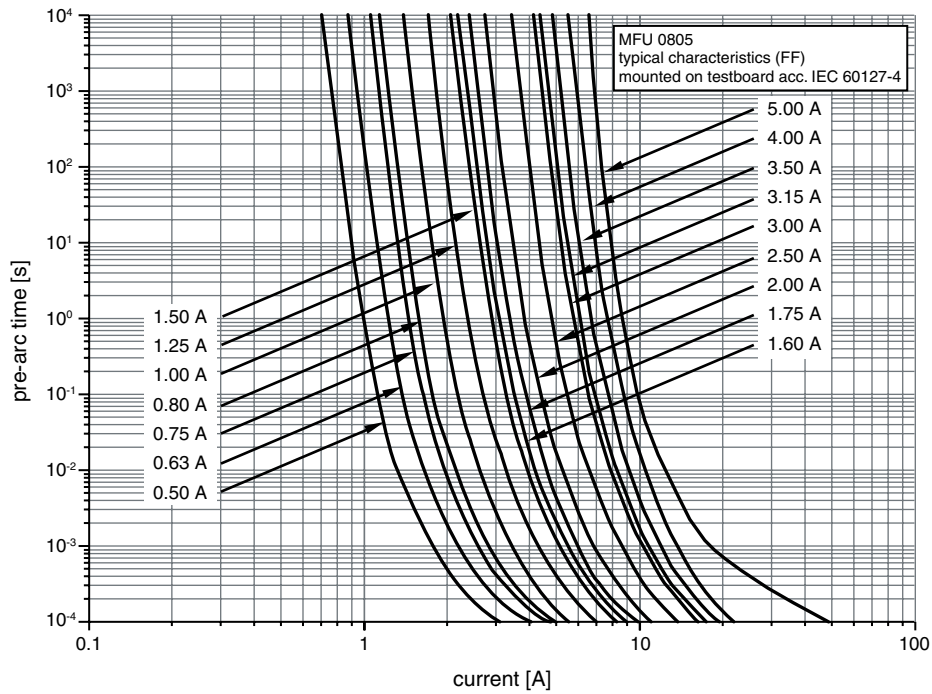


Typical I²t vs. t Characteristic of MFU 0603

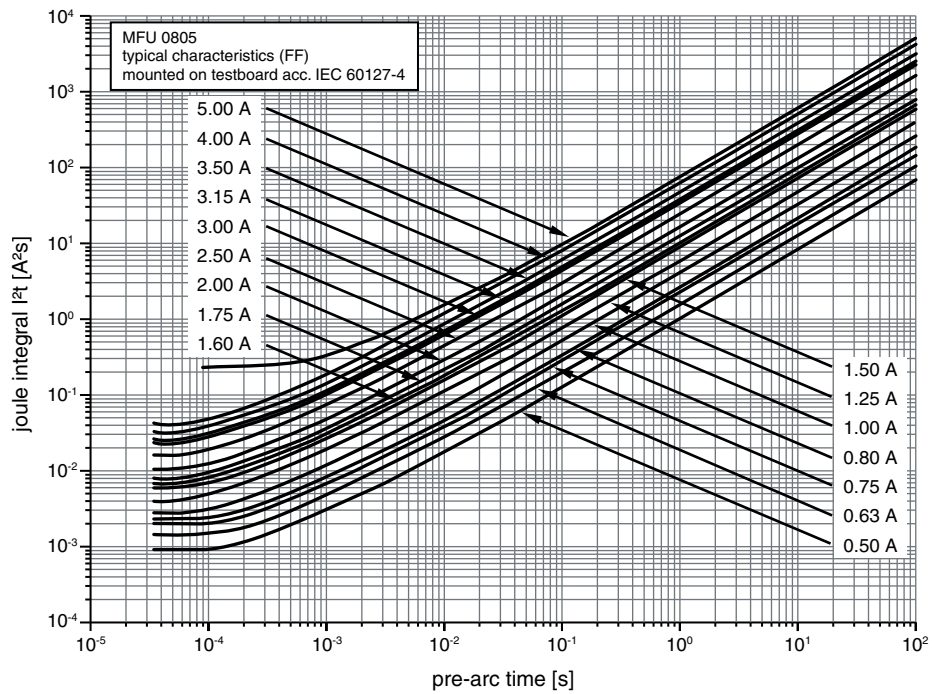
MFU Series - Thin Film Fuse

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Thin Film Flat Chip Fuses



Typical I-t Characteristic of MFU 0805



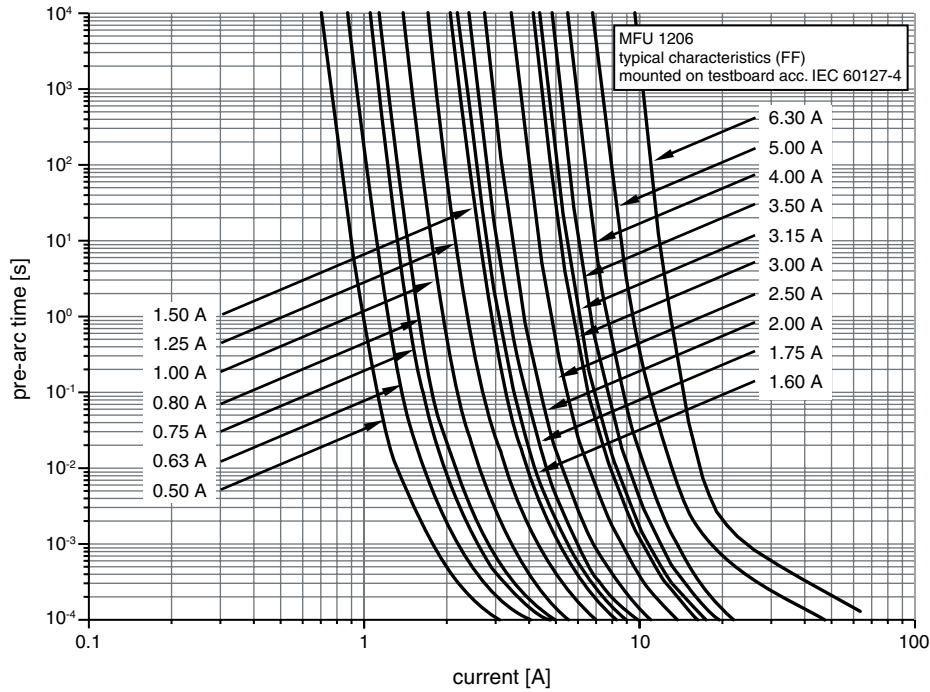
Typical I²t vs. t Characteristic of MFU 0805



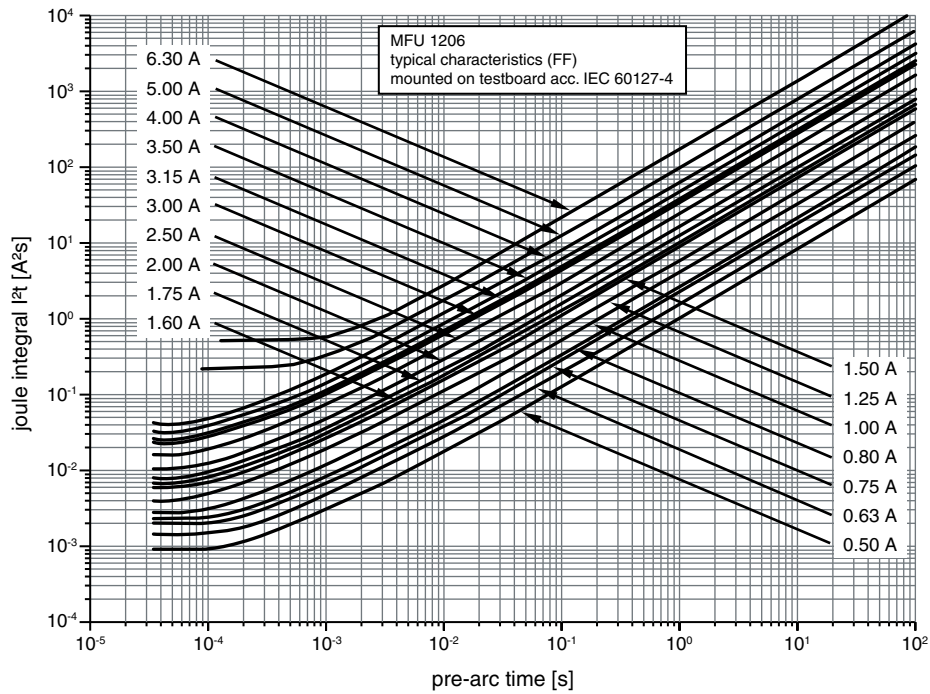
MFU Series - Thin Film Fuse

Thin Film Flat Chip Fuses

Vishay Beyschlag



Typical I-t Characteristic of MFU 1206



Typical I²t vs. t Characteristic of MFU 1206

MFU Series - Thin Film Fuse

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Thin Film Flat Chip Fuses



TEST AND REQUIREMENTS

All tests are carried out in accordance with the following specifications:

IEC 60127-1, Miniature fuse - Part 1: Definitions for miniature fuses and general requirements for miniature fuse-links

IEC 60127-4, Universal Modular Fuse Links (UMF)

UL 248-1, Low voltage fuses - Part 1: General Requirements

UL 248-14, Low voltage fuses - Part 14: Supplemental Fuses

For the full test schedule refer to the documents listed above. The testing also covers most of the requirements specified by METI and CCC.

The tests are carried out in accordance with IEC 60068 and under standard atmospheric conditions in accordance with IEC 60068-1, 5.3. Climatic category LCT/UCT/56 (rated temperature range: Lower Category Temperature, Upper Category Temperature; damp heat, long term, 56 days) is valid.

Unless otherwise specified the following values apply:

Temperature: 15 °C to 35 °C

Relative humidity: 45 % to 75 %

Air pressure: 86 kPa to 106 kPa (860 mbar to 1060 mbar).

The components are mounted for testing on printed-circuit boards in accordance with IEC 60127-4, unless otherwise specified.

The requirements stated in the Test Procedures and Requirements table are based on the required tests and permitted limits of IEC 60127-1 and IEC 60127-4 respectively. However, some additional tests and a number of improvements against those minimum requirements have been included.

| TEST PROCEDURES AND REQUIREMENTS | | | | | | |
|----------------------------------|-------------------------|---|---|---|--|--|
| IEC 60127-4 CLAUSE | IEC 60068-2 TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$) | | |
| 8.3.2 | 21 (U_{e1}) | Substrate bending | Depth 1 mm; rate 1 mm/s 1 times | No visible damage $\Delta R/R \leq \pm 10\%$ | | |
| 8.6.2 | 58 (Td) | Solderability | Solder bath method; SnPb40; non-activated flux; (215 ± 3) °C; (3 ± 0.3) s | Good tinning (≥ 95 % covered); no visible damage | | |
| | | | Solder bath method; SnAg3Cu0.5 or SnAg3.5; non-activated flux; (235 ± 3) °C; (2 ± 0.2) s | Good tinning (≥ 95 % covered); no visible damage | | |
| 8.7.2 | 58 (Td) | Resistance to soldering heat | Solder bath method; (260 ± 5) °C; (10 ± 1) s | No visible damage $\Delta R/R \leq \pm 10\%$ | | |
| | | | Reflow method 2 (IR/forced gas convection); (260 ± 5) °C; (10 ± 1) s | No visible damage $\Delta R/R \leq \pm 10\%$ | | |
| 9.2.1 | - | Time/current characteristics at nominal temperature | Cold resistance at 0.1 x I_R ; destructive testing under overcurrent conditions (DC-Current) | MFU 0402 | $I_R \leq 0.75\text{ A}$ | At 1.25 x I_R , $t_{pre-arc} > 1\text{ h}$ at 2.0 x I_R , $t_{pre-arc} < 10\text{ s}$ at 10 x I_R , $t_{pre-arc} < 0.001\text{ s}$ |
| | | | | MFU 0402 | $0.8\text{ A} \leq I_R \leq 3.15\text{ A}$ | |
| | | | | MFU 0603 | $I_R \leq 5.0\text{ A}$ | At 1.25 x I_R , $t_{pre-arc} > 1\text{ h}$ at 2.0 x I_R , $t_{pre-arc} < 10\text{ s}$ at 10 x I_R , $t_{pre-arc} < 0.001\text{ s}$ |
| | | | | MFU 0805 | $I_R \leq 5.0\text{ A}$ | |
| | | | | MFU 1206 | $I_R \leq 6.3\text{ A}$ | |



| TEST PROCEDURES AND REQUIREMENTS | | | | | | |
|----------------------------------|-------------------------|--|---|---|---------------------------|--|
| IEC 60127-4 CLAUSE | IEC 60068-2 TEST METHOD | TEST | PROCEDURE | REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$) | | |
| 9.3.2 | - | Breaking capacity | 50 A at rated voltage acc. to UL 248-14 | Optical inspection with naked eye no visible damage | | |
| 9.3.3 | - | Residual resistance | 50 A at rated voltage acc. to UL 248-14 | Insulation resistance at $2.0 \times U_R$ (DC) higher than $0.1 \text{ M}\Omega$ | | |
| 9.4 | - | Endurance test acc. to IEC 60127-1 | a) $I = 1.0 \times I_R$ (DC) 1.0 h ON; 0.25 h OFF; 23 °C; 100 times b) $I = 1.25 \times I_R$ (DC) 1.0 h ON 23 °C; 1 time | MFU 0402 | $I_R \leq 3.15 \text{ A}$ | No visible damage $\Delta R/R \leq \pm 10 \%$ |
| | | | | MFU 0603 | $I_R \leq 3.15 \text{ A}$ | |
| | | | | MFU 0805 | $I_R \leq 3.15 \text{ A}$ | |
| | | | | MFU 1206 | $I_R \leq 3.15 \text{ A}$ | |
| - | - | Verification of temp.-rise and current- carrying capacity acc. to UL 248-14 clause 8.2.3 | $I = 1.0 \times I_R$ (DC) | MFU 0402 | $I_R \leq 5.0 \text{ A}$ | Temperature rise of hot spot $\leq 75 \text{ K}$ acc. to UL 248-14 clause 8.2.4 |
| | | | | MFU 0603 | $I_R \leq 5.0 \text{ A}$ | |
| | | | | MFU 0805 | $I_R \leq 5.0 \text{ A}$ | |
| | | | | MFU 1206 | $I_R \leq 6.3 \text{ A}$ | |
| 9.5 | - | Maximum sustained dissipation acc. to IEC 60127-1 | Calculation in accordance with results of clause 9.4 b) | Dissipation \leq acc. to IEC 60127-4 table 2 | | |
| 9.7 | - | Fuse-link temperature | The test is performed during the final 5 min of clause 9.4 b) | MFU 0402 | $I_R \leq 3.15 \text{ A}$ | Temperature rise of terminals $\leq 85 \text{ K}$ |
| | | | | MFU 0603 | $I_R \leq 3.15 \text{ A}$ | |
| | | | | MFU 0805 | $I_R \leq 3.15 \text{ A}$ | |
| | | | | MFU 1206 | $I_R \leq 3.15 \text{ A}$ | |
| - | 78 (Cab) | Damp heat, steady state | (40 ± 2) °C; 56 days; (93 ± 3) % RH | $\Delta R/R \leq \pm 10 \%$ I-t characteristic | | |
| - | 14 (Na) | Rapid change of temperature | 30 min at LCT; 30 min at UCT; LCT = - 55 °C; UCT = 125 °C; 5 cycles | $\Delta R/R \leq \pm 10 \%$ | | |
| - | 6 (Fc) | Vibration | Endurance by sweeping; 10 to 2000 Hz; no resonance; amplitude $\leq 1.5 \text{ mm}$ or $\leq 200 \text{ m/s}^2$; 6 h | $\Delta R/R \leq \pm 10 \%$ | | |
| - | 45 (XA) | Component solvent resistance | Isopropyl alcohol; 50 °C; method 2 | No visible damage | | |
| - | 45 (XA) | Solvent resistance of marking | Isopropyl alcohol; 50 °C; method 1, toothbrush | Marking legible, no visible damage | | |
| - | 21 (Ue ₃) | Shear (adhesion) | RR 1608M; 9 N | No visible damage | | |
| | | | RR 2012M and RR 3216M; 45 N | | | |
| - | - | Flammability | IEC 60695-2-2, needle flame test; 10 s | No burning after 30 s | | |

MFU Series - Thin Film Fuse

Vishay Beyschlag

Thin Film Flat Chip Fuses



REVISION HISTORY

Compared to the prior revision of this datasheet, 29-Jun-07, the following changes have been applied:

- Rated current range extension of MFU 0402
- Additional information of failure rate (FIT)
- Test Procedures and Requirements extended for MFU 0402
- No other change of technical contents
- No product change



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