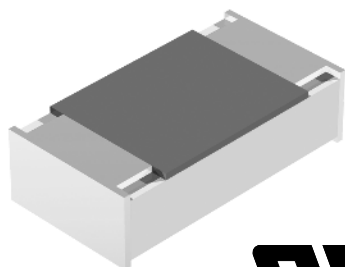




Thin Film Flat Chip Fuses

www.DataSheet4U.com



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.

FEATURES

- Advanced thin film technology
- Very quick acting fuse characteristics
- Outstanding stability of fusing characteristics
- Standard metric SMD sizes
- Compatible with (Pb)-free and lead containing soldering processes
- Lead (Pb)-free and RoHS compliant



APPLICATIONS

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

METRIC SIZE

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

TECHNICAL SPECIFICATION

DESCRIPTION		MFU 0402 ¹⁾	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 2.0 A	0.5 A to 4.0 A	0.5 A to 4.0 A	0.5 A to 5.0 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 $1 \times I_R$		170 mV to 220 mV	140 mV to 415 mV	145 mV to 430 mV	150 mV to 460 mV
Cold resistance at $0.1 \times I_R$		65 mΩ to 640 mΩ	23 mΩ to 640 mΩ	24 mΩ to 660 mΩ	24 mΩ to 670 mΩ
Climatic category (LCT/UCT/days)		55/125/56	55/125/56	55/125/56	55/125/56
Permissible continuous current rating at $\vartheta_{amb.} = 23^\circ\text{C}$		$0.7 \times I_R$	$0.7 \times I_R$	$0.7 \times I_R$	$0.7 \times I_R$
Approval	UL recognition file	n/a	E253806	E253806	E253806
	IEC 60127-4		Refer to Table: MFU 0603 RATING	IEC-Approval under preparation	Refer to Table: MFU 1206 RATING

Note:

1. MFU 0402 available on request.

MFU Series - Thin Film Fuse

Vishay Beyschlag

Thin Film Flat Chip Fuses



PART NUMBER AND PRODUCT DESCRIPTION MFU SERIES¹⁾

PART NUMBER²⁾: MFU0603FF01000PW00

M	F	U	0	6	0	3	F	F	0	1	0	0	0	P	W	0	0
MODEL/SIZE			FUSE CHARACTERISTIC				RATED CURRENT VALUE					PACKING ³⁾			SPECIAL		
MFU0402 MFU0603 MFU0805 MFU1206			FF = Very Quick Acting				Rated current value in mA. Examples: 00500 = 0.5 A 01000 = 1.0 A 05000 = 5.0 A					E1 E5 E0 P1 P5 PW			up to 2 digits 00 = standard		

PRODUCT DESCRIPTION⁴⁾: MFU 0603-FF PW 1A0

MFU	0603	-FF	PW	1A0
MODEL	SIZE	FUSE CHARACTERISTIC	PACKING ³⁾	RATED CURRENT VALUE
MFU	0402 0603 0805 1206	FF = Very Quick Acting	E1 E5 E0 P1 P5 PW	See Rating Tables Examples: 0A5 = 0.5 A 1A0 = 1.0 A 5A0 = 5.0 A

Note:

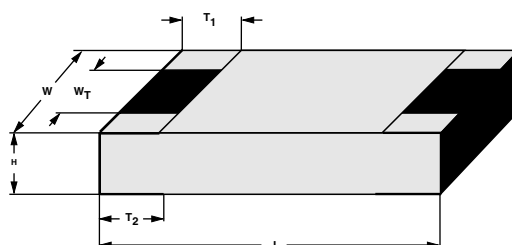
- Products can be ordered using either the PART NUMBER or the PRODUCT DESCRIPTION.
- The PART NUMBER is shown to facilitate the introduction of the unified part numbering system. Currently, this PART NUMBER is applicable in the Americas only.
- Please refer to table PACKING, see below.
- We recommend that the PRODUCT DESCRIPTION is used to minimize the possibility of errors in order handling.

PACKING

MODEL	PAPER TAPE ON REEL		
	DIAMETER	PIECES/REEL	CODE
MFU0402	180 mm/7"	1000	E1
	180 mm/7"	5000	E5
	330 mm/13"	10000	E0
MFU0603	180 mm/7"	1000	P1
MFU0805	180 mm/7"	5000	P5
MFU1206	330 mm/13"	20000	PW



DIMENSIONS



DIMENSIONS - Chip Fuse types, mass and relevant physical dimensions

TYPE	H (mm)	L (mm)	W (mm)	WT (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)¹⁾

SIZE	FUSE CHAR.	RATED CURRENT ²⁾	RATED VOLTAGE	PRE-ARCING ³⁾ I _{2t} at 10 x I _R	VOLT. DROP ³⁾ at 1 x I _R	COLD RESIS. ³⁾ at 0.1 x I _R	BREAKING CAPACITY DC	MARK.	ORDERING CODE ⁴⁾⁵⁾
0402	FF	500 mA	32 V	0.0009 A ² s	415 mV	640 mΩ	50 A at 32 V	-	MFU 0402-FF E0 0A5
		630 mA	32 V	0.0014 A ² s	334 mV	400 mΩ	50 A at 32 V	-	MFU 0402-FF E0 0A63
		750 mA	32 V	0.0020 A ² s	278 mV	280 mΩ	50 A at 32 V	-	MFU 0402-FF E0 0A75
		800 mA	32 V	0.0023 A ² s	243 mV	230 mΩ	50 A at 32 V	-	MFU 0402-FF E0 0A8
		1.0 A	32 V	0.0028 A ² s	220 mV	170 mΩ	50 A at 32 V	-	MFU 0402-FF E0 1A0
		1.25 A	32 V	0.0039 A ² s	182 mV	111 mΩ	50 A at 32 V	-	MFU 0402-FF E0 1A25
		1.5 A	32 V	0.0059 A ² s	169 mV	86 mΩ	50 A at 32 V	-	MFU 0402-FF E0 1A5
		1.6 A	32 V	0.0065 A ² s	160 mV	76 mΩ	50 A at 32 V	-	MFU 0402-FF E0 1A6
		1.75 A	32 V	0.0077 A ² s	167 mV	72 mΩ	50 A at 32 V	-	MFU 0402-FF E0 1A75
		2.0 A	32 V	0.0101 A ² s	170 mV	65 mΩ	50 A at 32 V	-	MFU 0402-FF E0 2A0

Note:

1. MFU 0402 available on request.
2. Other values of rated current are available on request.
3. Typical values.
4. For packages with 1000 pieces, please use for packing E1 instead of E0.
5. For packages with 5000 pieces, please use for packing E5 instead of E0.

MFU Series - Thin Film Fuse

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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	415 mV	640 mΩ	50 A at 32 V	F	UL/IEC	MFU 0603-FF PW 0A5
		630 mA	32 V	0.0014 A ² s	334 mV	400 mΩ	50 A at 32 V	CT	UL	MFU 0603-FF PW 0A63
		750 mA	32 V	0.0020 A ² s	278 mV	280 mΩ	50 A at 32 V	G	UL	MFU 0603-FF PW 0A75
		800 mA	32 V	0.0023 A ² s	243 mV	230 mΩ	50 A at 32 V	CV	UL	MFU 0603-FF PW 0A8
		1.0 A	32 V	0.0028 A ² s	220 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	182 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	169 mV	85 mΩ	50 A at 32 V	K	UL	MFU 0603-FF PW 1A5
		1.6 A	32 V	0.0065 A ² s	160 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	167 mV	72 mΩ	50 A at 32 V	L	UL	MFU 0603-FF PW 1A75
		2.0 A	32 V	0.0101 A ² s	170 mV	65 mΩ	50 A at 32 V	N	UL/IEC	MFU 0603-FF PW 2A0
		2.5 A	32 V	0.0157 A ² s	150 mV	45 mΩ	50 A at 32 V	O	UL	MFU 0603-FF PW 2A5
		3.0 A	32 V	0.0227 A ² s	140 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	135 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	135 mV	26 mΩ	50 A at 32 V	R	UL	MFU 0603-FF PW 3A5
		4.0 A	32 V	0.0403 A ² s	142 mV	23 mΩ	50 A at 32 V	S	UL	MFU 0603-FF PW 4A0

Note:

- Other values of rated current are available on request.
- Typical values.
- For packages with 1000 pieces, please use for packing P1 instead of PW.
- For packages with 5000 pieces, please use for packing 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	430 mV	660 mΩ	50 A at 32 V	F	UL	MFU 0805-FF PW 0A5
		630 mA	32 V	0.0014 A ² s	350 mV	420 mΩ	50 A at 32 V	CT	UL	MFU 0805-FF PW 0A63
		750 mA	32 V	0.0021 A ² s	297 mV	300 mΩ	50 A at 32 V	G	UL	MFU 0805-FF PW 0A75
		800 mA	32 V	0.0023 A ² s	259 mV	245 mΩ	50 A at 32 V	CV	UL	MFU 0805-FF PW 0A8
		1.0 A	32 V	0.0028 A ² s	240 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	210 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	180 mV	90 mΩ	50 A at 32 V	K	UL	MFU 0805-FF PW 1A5
		1.6 A	32 V	0.0065 A ² s	175 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	174 mV	74 mΩ	50 A at 32 V	L	UL	MFU 0805-FF PW 1A75
		2.0 A	32 V	0.0101 A ² s	173 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	159 mV	47 mΩ	50 A at 32 V	O	UL	MFU 0805-FF PW 2A5
		3.0 A	32 V	0.0227 A ² s	149 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	145 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	144 mV	27 mΩ	50 A at 32 V	R	UL	MFU 0805-FF PW 3A5
		4.0 A	32 V	0.0403 A ² s	145 mV	24 mΩ	50 A at 32 V	S	UL	MFU 0805-FF PW 4A0

Note:

- Other values of rated current are available on request.
- Typical values.
- For packages with 1000 pieces, please use for packing P1 instead of PW.
- For packages with 5000 pieces, please use for packing P5 instead of PW.



MFU Series - Thin Film Fuse

Thin Film Flat Chip Fuses

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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	440 mV	670 mΩ	50 A at 63 V	F	UL/IEC	MFU 1206-FF PW 0A5
		630 mA	63 V	0.0014 A ² s	366 mV	440 mΩ	50 A at 63 V	CT	UL	MFU 1206-FF PW 0A63
		750 mA	63 V	0.0022 A ² s	327 mV	330 mΩ	50 A at 63 V	G	UL	MFU 1206-FF PW 0A75
		800 mA	63 V	0.0023 A ² s	290 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	264 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	231 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	208 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	180 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	176 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	182 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	162 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	143 mV	36 mΩ	50 A at 63 V	P	UL	MFU 1206-FF PW 3A0
		3.15 A	63 V	0.0251 A ² s	137 mV	33 mΩ	50 A at 63 V	EL	UL/IEC	MFU 1206-FF PW 3A15
		3.5 A	63 V	0.0310 A ² s	129 mV	30 mΩ	50 A at 63 V	R	UL	MFU 1206-FF PW 3A5
		4.0 A	63 V	0.0404 A ² s	132 mV	28 mΩ	50 A at 63 V	S	UL	MFU 1206-FF PW 4A0
		5.0 A	63 V	0.0631 A ² s	180 mV	24 mΩ	50 A at 63 V	T	-	MFU 1206-FF PW 5A0

Note:

- Other values of rated current are available on request.
- Typical values.
- For packages with 1000 pieces, please use for packing P1 instead of PW.
- For packages with 5000 pieces, please use for packing 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**.

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 lead (Pb)-free (category **e3**), 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.

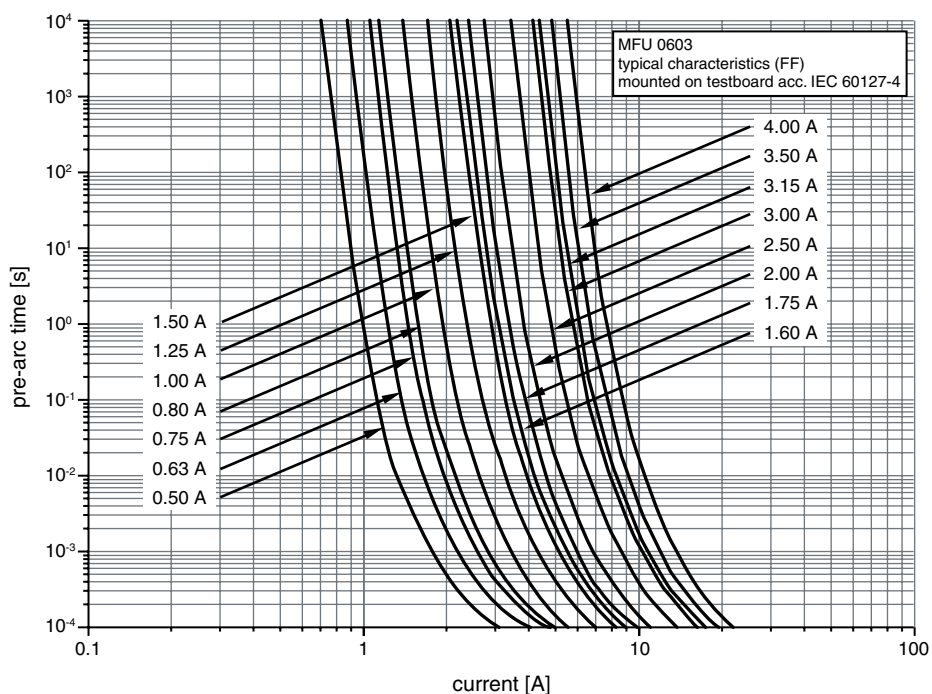
APPROVALS

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.

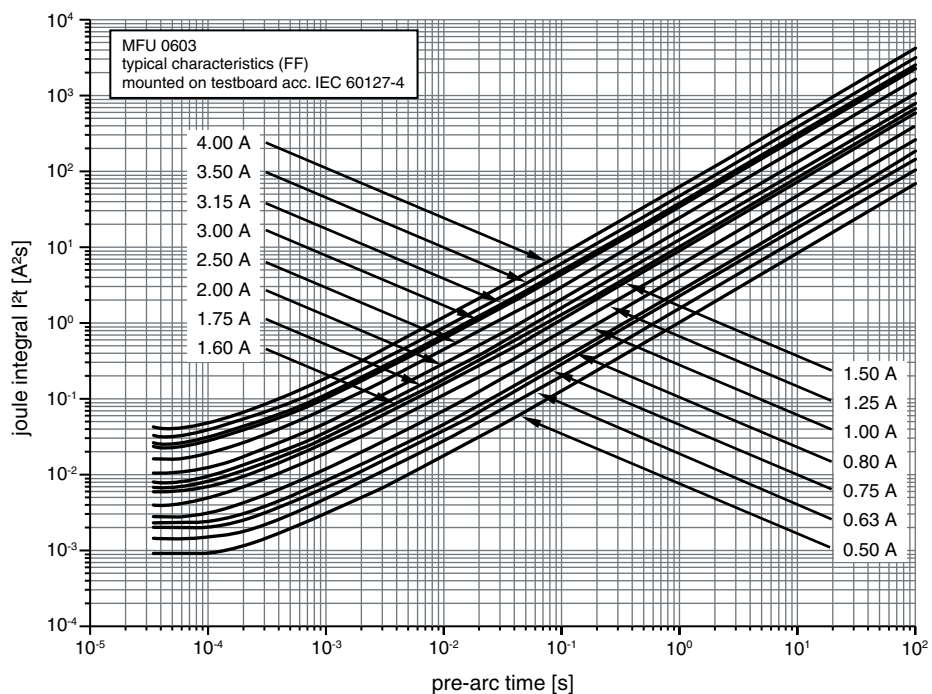


**Pb-free Identification
on the Package Label**

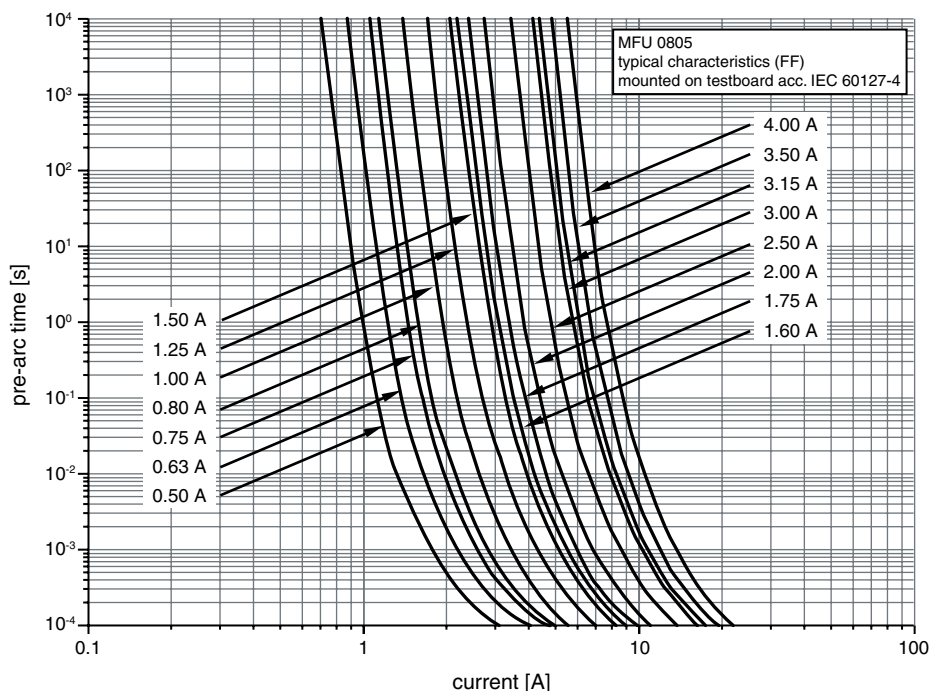
FUNCTIONAL PERFORMANCE



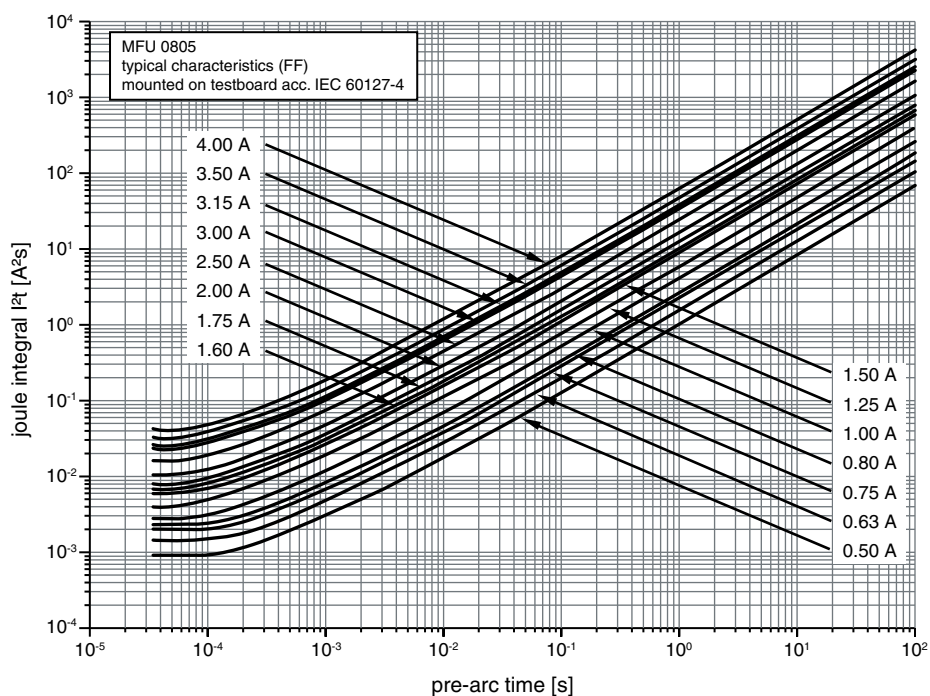
Typical I-t Characteristic of MFU 0603



Typical I^2t vs. t Characteristic of MFU 0603



Typical I-t Characteristic of MFU 0805

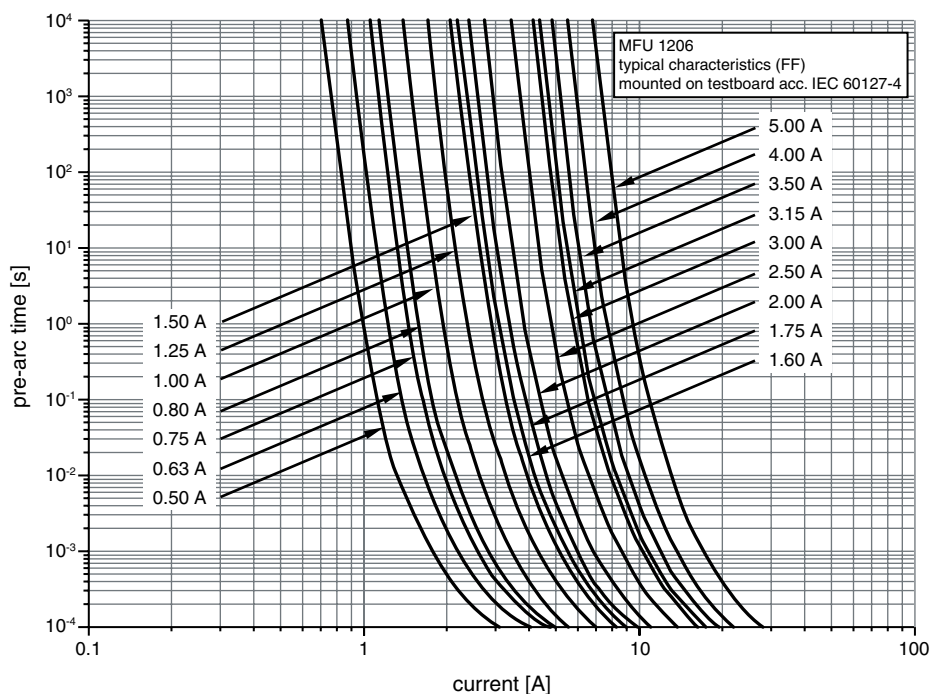


Typical I^2t vs. t Characteristic of MFU 0805

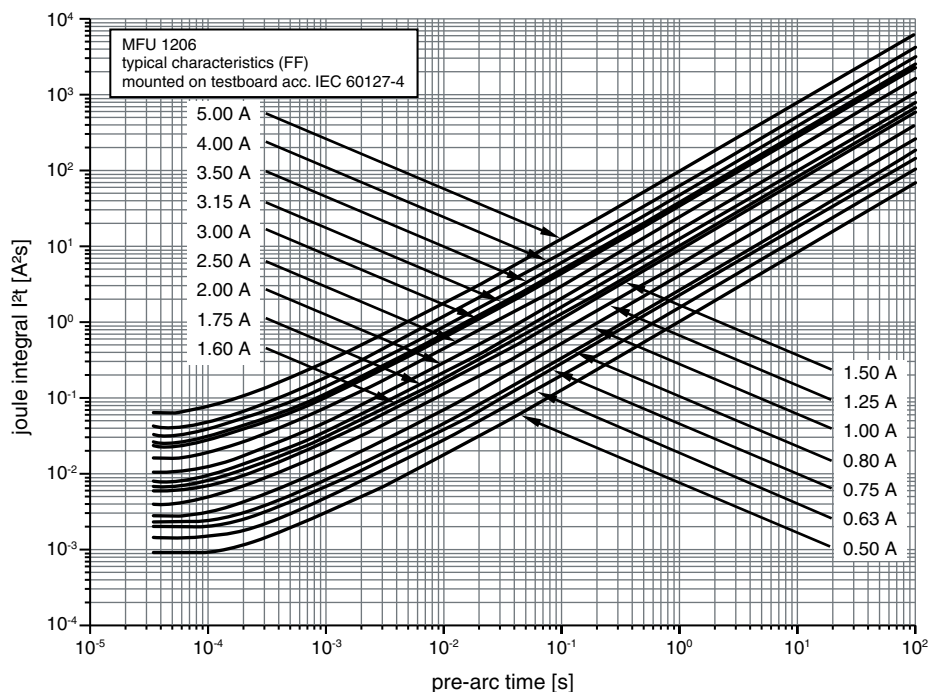
MFU Series - Thin Film Fuse

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Thin Film Flat Chip Fuses



Typical I-t Characteristic of MFU 1206



Typical I²t vs. t Characteristic of MFU 1206



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 $\pm$ 3) °C; (3 $\pm$ 0.3) s	good tinning ($\geq 95 \%$ covered); no visible damage
			solder bath method; SnAg3Cu0.5 or SnAg3.5; non-activated flux; (235 $\pm$ 3) °C; (2 $\pm$ 0.2) s	good tinning ($\geq 95 \%$ covered); no visible damage
8.7.2	58 (Td)	resistance to soldering heat	solder bath method; (260 $\pm$ 5) °C; (10 $\pm$ 1) s	no visible damage $\Delta R/R \leq \pm 10 \%$
			reflow method 2 (IR/forced gas convection); (260 $\pm$ 5) °C; (10 $\pm$ 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)	at 1.25 x I _R , t _{pre-arc} > 1 h at 2.0 x I _R , t _{pre-arc} < 5 s at 10 x I _R , t _{pre-arc} < 0.001 s
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 x U _R (DC) higher than 0.1 M Ω

MFU Series - Thin Film Fuse

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Thin Film Flat Chip Fuses



TEST PROCEDURES AND REQUIREMENTS - continued

IEC 60127-4 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE			REQUIREMENTS PERMISSIBLE CHANGE ($\Delta R/R$)
9.4	-	endurance test acc. to IEC 60127-1	a) I = 1.0 x I _R (DC) 1.0 h on; 0.25 h off; 23 °C; 100 times b) I = 1.25 x I _R (DC) 1.0 h on 23 °C; 1 time	MFU 0603	I _R ≤ 3.15 A	no visible damage $\Delta R/R \leq \pm 10 \%$
				MFU 0805	I _R ≤ 3.15 A	
				MFU 1206	I _R ≤ 3.15 A	
-	-	verification of temp.-rise and current- carrying capacity acc. to UL 248-14 clause 8.2.3	I = 1.0 x I _R (DC)	MFU 0603	I _R ≤ 4.0 A	temperature rise of hot spot ≤ 75 K acc. to UL 248-14 Clause 8.2.4
				MFU 0805	I _R ≤ 4.0 A	
				MFU 1206	I _R ≤ 5.0 A	
9.5	-	maximum sustained dissipation acc. to IEC 60127-1	calculation in accordance with results of clause 9.4 b)	dissipation ≤ 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 0603	I _R ≤ 3.15 A	temperature rise of terminals ≤ 85 K
				MFU 0805	I _R ≤ 3.15 A	
				MFU 1206	I _R ≤ 3.15 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 ≤ 1.5 mm or ≤ 200 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		



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