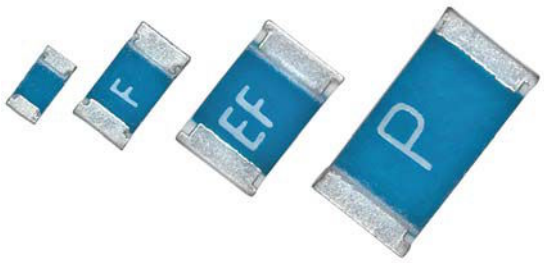
Thin Film Chip Fuses



MFU Thin Film 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
- Green product, supports lead (Pb)-free soldering
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE

APPLICATIONS

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

SIZE				
INCH	0402	0603	0805	1206
METRIC	1005M	1608M	2012M	3216M

TECHNICAL SPECIFICATIONS				
DESCRIPTION	**MFU 0402**	**MFU 0603**	**MFU 0805**	**MFU 1206**
Metric size	1005M	1608M	2012M	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 x I_R	90 mV to 368 mV	85 mV to 361 mV	98 mV to 374 mV	116 mV to 433 mV
Cold resistance at 0.1 x I_R	22 mΩ to 560 mΩ	13 mΩ to 550 mΩ	15 mΩ to 570 mΩ	14 mΩ to 660 mΩ
Permissible film temperature, $\vartheta_{F\ max.}$	125 °C			
Operating temperature range	- 55 °C to 125 °C			
Permissible continuous current rating at ϑ_{amb} = 23 °C	0.7 x I_R			
Approval UL recognition file	E253806			
Approval IEC 60127-4	n/a	Refer to table: MFU 0603 RATING		Refer to table: MFU 1206 RATING
$FIT_{observed}$	≤ 0.2 x 10^{-9}/h			

PART NUMBER AND PRODUCT DESCRIPTION (1)

Part Number: MFU0603FF01000PW00

M	F	U	0	6	0	3	F	F	0	1	0	0	0	P	W	0	0

MODEL/SIZE	FUSING CHARACTERISTIC	RATED CURRENT	PACKAGING (2)	SPECIAL
MFU0402 **MFU0603** **MFU0805** **MFU1206**	**FF** = Very quick acting	Examples: 0.5 A = **00500** 1.0 A = **01000** 6.3 A = **06300**	**E1** **E5** **E0** **P1** **P5** **PW**	Up to 2 digits **00** = Standard

Product Description: MFU 0603 -FF PW 1A0

MFU	0603	-FF	PW	1A0
MODEL	SIZE	FUSING CHARACTERISTIC	PACKAGING (2)	RATED CURRENT
MFU	**0402** **0603** **0805** **1206**	**FF** = Very quick acting	**E1** **E5** **E0** **P1** **P5** **PW**	Examples: 0.5 A = **0A5** 1.0 A = **1A0** 6.3 A = **6A3**

Notes

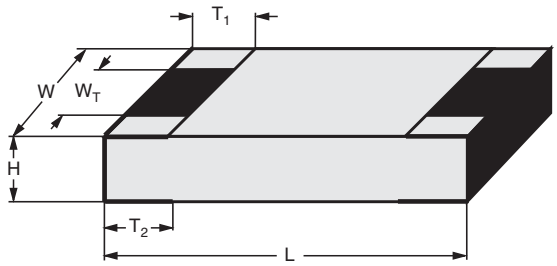
(1) Products can be ordered using either the PART NUMBER or the PRODUCT DESCRIPTION

(2) Please refer to table PACKAGING

PACKAGING

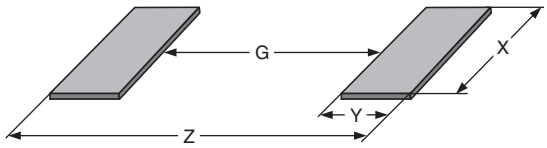
TYPE	CODE	QUANTITY	CARRIER TAPE	WIDTH	PITCH	REEL DIAMETER
MFU 0402	E1	1000	Card board tape acc. IEC 60286-3 Type I	8.0	2.0	180 mm/7"
	E5	5000				
	E0	10 000				
MFU 0603	P1	1000			4.0	180 mm/7"
	P5	5000				
	PW	20 000				330 mm/13"
MFU 0805	P1	1000				180 mm/7"
	P5	5000				
	PW	20 000				330 mm/13"
MFU 1206	P1	1000				180 mm/7"
	P5	5000				
	PW	20 000				330 mm/13"

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 ± 0.07	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

SOLDER PAD DIMENSIONS



RECOMMENDED SOLDER PAD DIMENSIONS								
TYPE	WAVE SOLDERING				REFLOW SOLDERING			
	G (mm)	Y (mm)	X (mm)	Z (mm)	G (mm)	Y (mm)	X (mm)	Z (mm)
MFU 0402	-	-	-	-	0.35	0.55	0.55	1.45
MFU 0603	0.55	1.10	1.10	2.75	0.65	0.70	0.95	2.05
MFU 0805	0.80	1.25	1.50	3.30	0.90	0.90	1.40	2.70
MFU 1206	1.40	1.50	1.90	4.40	1.50	1.15	1.75	3.80

Note

- The given solder pad dimensions reflect the considerations for board design and assembly as outlined e.g. in standards IEC 61188-5-x, or in publication IPC-7351. They do not guarantee any supposed thermal properties, particularly as these are also strongly influenced by many other parameters.

MFU 0402 RATING - Very quick acting (FF)										
SIZE	**FUSE CHAR.**	**RATED CURRENT** [1]	**RATED VOLTAGE**	**PRE-ARCING** [2] **I^2t 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**	**PART NUMBER** [3][4]
0402	FF	500 mA [5]	32 V	0.0009 A^2s	368 mV	560 mΩ	50 A at 32 V	-	UL	MFU0402FF00500E500
		630 mA [5]	32 V	0.0014 A^2s	331 mV	400 mΩ	50 A at 32 V	-	UL	MFU0402FF00630E500
		750 mA [5]	32 V	0.0020 A^2s	275 mV	280 mΩ	50 A at 32 V	-	UL	MFU0402FF00750E500
		800 mA	32 V	0.0023 A^2s	231 mV	220 mΩ	50 A at 32 V	-	UL	MFU0402FF00800E500
		1.0 A	32 V	0.0028 A^2s	184 mV	140 mΩ	50 A at 32 V	-	UL	MFU0402FF01000E500
		1.25 A	32 V	0.0039 A^2s	159 mV	97 mΩ	50 A at 32 V	-	UL	MFU0402FF01250E500
		1.5 A	32 V	0.0059 A^2s	146 mV	74 mΩ	50 A at 32 V	-	UL	MFU0402FF01500E500
		1.6 A	32 V	0.0065 A^2s	136 mV	65 mΩ	50 A at 32 V	-	UL	MFU0402FF01600E500
		1.75 A	32 V	0.0077 A^2s	124 mV	54 mΩ	50 A at 32 V	-	UL	MFU0402FF01750E500
		2.0 A	32 V	0.0101 A^2s	115 mV	44 mΩ	50 A at 32 V	-	UL	MFU0402FF02000E500
		2.5 A	32 V	0.0157 A^2s	107 mV	33 mΩ	50 A at 32 V	-	UL	MFU0402FF02500E500
		3.0 A	32 V	0.0227 A^2s	95 mV	24 mΩ	50 A at 32 V	-	UL	MFU0402FF03000E500
		3.15 A	32 V	0.0250 A^2s	90 mV	22 mΩ	50 A at 32 V	-	UL	MFU0402FF03150E500

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 E5
(4) For packages with 10 000 pieces, please use for packaging E0 instead of E5
(5) Available on request

MFU 0603 RATING - Very quick acting (FF)										
SIZE	**FUSE CHAR.**	**RATED CURRENT** [6]	**RATED VOLTAGE**	**PRE-ARCING** [7] **I^2t at 10 x I_R**	**VOLT. DROP** [7] **at 1 x I_R**	**COLD RESIS** [7] **at 0.1 x I_R**	**BREAKING CAPACITY DC**	**MARK.**	**APPROVAL**	**PART NUMBER** [8][9]
0603	FF	500 mA	32 V	0.0009 A^2s	361 mV	550 mΩ	50 A at 32 V	F	UL/IEC	MFU0603FF00500P500
		630 mA	32 V	0.0014 A^2s	331 mV	400 mΩ	50 A at 32 V	CT	UL	MFU0603FF00630P500
		750 mA	32 V	0.0020 A^2s	258 mV	262 mΩ	50 A at 32 V	G	UL	MFU0603FF00750P500
		800 mA	32 V	0.0023 A^2s	249 mV	237 mΩ	50 A at 32 V	CV	UL	MFU0603FF00800P500
		1.0 A	32 V	0.0028 A^2s	223 mV	170 mΩ	50 A at 32 V	H	UL/IEC	MFU0603FF01000P500
		1.25 A	32 V	0.0039 A^2s	180 mV	110 mΩ	50 A at 32 V	J	UL	MFU0603FF01250P500
		1.5 A	32 V	0.0059 A^2s	155 mV	79 mΩ	50 A at 32 V	K	UL	MFU0603FF01500P500
		1.6 A	32 V	0.0065 A^2s	159 mV	76 mΩ	50 A at 32 V	EF	UL/IEC	MFU0603FF01600P500
		1.75 A	32 V	0.0077 A^2s	138 mV	60 mΩ	50 A at 32 V	L	UL	MFU0603FF01750P500
		2.0 A	32 V	0.0101 A^2s	150 mV	57 mΩ	50 A at 32 V	N	UL/IEC	MFU0603FF02000P500
		2.5 A	32 V	0.0157 A^2s	121 mV	37 mΩ	50 A at 32 V	O	UL	MFU0603FF02500P500
		3.0 A	32 V	0.0227 A^2s	126 mV	32 mΩ	50 A at 32 V	P	UL	MFU0603FF03000P500
		3.15 A	32 V	0.0250 A^2s	120 mV	29 mΩ	50 A at 32 V	EL	UL/IEC	MFU0603FF03150P500
		3.5 A	32 V	0.0308 A^2s	106 mV	23 mΩ	50 A at 32 V	R	UL	MFU0603FF03500P500
		4.0 A	32 V	0.0403 A^2s	100 mV	19 mΩ	50 A at 32 V	S	UL	MFU0603FF04000P500
		5.0 A	32 V	0.2275 A^2s	85 mV	13 mΩ	50 A at 32 V	T	UL	MFU0603FF05000P500

Notes

(6) Other values of rated current are available on request
(7) Typical values
(8) For packages with 1000 pieces, please use for packaging P1 instead of P5
(9) For packages with 20 000 pieces, please use for packaging PW instead of P5

MFU 0805 RATING - Very quick acting (FF)										
SIZE	**FUSE CHAR.**	**RATED CURRENT** [1]	**RATED VOLTAGE**	**PRE-ARCING** [2] **I^2t 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**	**PART NUMBER** [3][4]
0805	FF	500 mA	32 V	0.0009 A^2s	374 mV	570 mΩ	50 A at 32 V	F	UL	MFU0805FF00500P500
		630 mA	32 V	0.0014 A^2s	347 mV	420 mΩ	50 A at 32 V	CT	UL	MFU0805FF00630P500
		750 mA	32 V	0.0021 A^2s	280 mV	285 mΩ	50 A at 32 V	G	UL	MFU0805FF00750P500
		800 mA	32 V	0.0023 A^2s	262 mV	250 mΩ	50 A at 32 V	CV	UL	MFU0805FF00800P500
		1.0 A	32 V	0.0028 A^2s	243 mV	185 mΩ	50 A at 32 V	H	UL	MFU0805FF01000P500
		1.25 A	32 V	0.0040 A^2s	205 mV	125 mΩ	50 A at 32 V	J	UL	MFU0805FF01250P500
		1.5 A	32 V	0.0059 A^2s	171 mV	87 mΩ	50 A at 32 V	K	UL	MFU0805FF01500P500
		1.6 A	32 V	0.0065 A^2s	164 mV	78 mΩ	50 A at 32 V	EF	UL	MFU0805FF01600P500
		1.75 A	32 V	0.0077 A^2s	161 mV	70 mΩ	50 A at 32 V	L	UL	MFU0805FF01750P500
		2.0 A	32 V	0.0101 A^2s	176 mV	67 mΩ	50 A at 32 V	N	UL	MFU0805FF02000P500
		2.5 A	32 V	0.0157 A^2s	131 mV	40 mΩ	50 A at 32 V	O	UL	MFU0805FF02500P500
		3.0 A	32 V	0.0227 A^2s	134 mV	34 mΩ	50 A at 32 V	P	UL	MFU0805FF03000P500
		3.15 A	32 V	0.0250 A^2s	128 mV	31 mΩ	50 A at 32 V	EL	UL	MFU0805FF03150P500
		3.5 A	32 V	0.0308 A^2s	119 mV	26 mΩ	50 A at 32 V	R	UL	MFU0805FF03500P500
		4.0 A	32 V	0.0403 A^2s	105 mV	20 mΩ	50 A at 32 V	S	UL	MFU0805FF04000P500
		5.0 A	32 V	0.2275 A^2s	98 mV	15 mΩ	50 A at 32 V	T	UL	MFU0805FF05000P500

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 P5
(4) For packages with 20 000 pieces, please use for packaging PW instead of P5

MFU 1206 RATING - Very quick acting (FF)										
SIZE	**FUSE CHAR.**	**RATED CURRENT** [5]	**RATED VOLTAGE**	**PRE-ARCING** [6] **I^2t at 10 x I_R**	**VOLT. DROP** [6] **at 1 x I_R**	**COLD RESIS** [6] **at 0.1 x I_R**	**BREAKING CAPACITY DC**	**MARK.**	**APPROVAL**	**PART NUMBER** [7][8]
1206	FF	500 mA	63 V	0.0009 A^2s	433 mV	660 mΩ	50 A at 63 V	F	UL/IEC	MFU1206FF00500P500
		630 mA	63 V	0.0014 A^2s	372 mV	450 mΩ	50 A at 63 V	CT	UL	MFU1206FF00630P500
		750 mA	63 V	0.0022 A^2s	325 mV	330 mΩ	50 A at 63 V	G	UL	MFU1206FF00750P500
		800 mA	63 V	0.0023 A^2s	273 mV	260 mΩ	50 A at 63 V	CV	UL	MFU1206FF00800P500
		1.0 A	63 V	0.0028 A^2s	262 mV	200 mΩ	50 A at 63 V	H	UL/IEC	MFU1206FF01000P500
		1.25 A	63 V	0.0041 A^2s	230 mV	140 mΩ	50 A at 63 V	J	UL	MFU1206FF01250P500
		1.5 A	63 V	0.0059 A^2s	207 mV	105 mΩ	50 A at 63 V	K	UL	MFU1206FF01500P500
		1.6 A	63 V	0.0066 A^2s	168 mV	80 mΩ	50 A at 63 V	EF	UL/IEC	MFU1206FF01600P500
		1.75 A	63 V	0.0077 A^2s	174 mV	76 mΩ	50 A at 63 V	L	UL	MFU1206FF01750P500
		2.0 A	63 V	0.0102 A^2s	181 mV	69 mΩ	50 A at 63 V	N	UL/IEC	MFU1206FF02000P500
		2.5 A	63 V	0.0159 A^2s	161 mV	49 mΩ	50 A at 63 V	O	UL	MFU1206FF02500P500
		3.0 A	63 V	0.0229 A^2s	173 mV	44 mΩ	50 A at 63 V	P	UL	MFU1206FF03000P500
		3.15 A	63 V	0.0251 A^2s	153 mV	37 mΩ	50 A at 63 V	EL	UL/IEC	MFU1206FF03150P500
		3.5 A	63 V	0.0310 A^2s	161 mV	35 mΩ	50 A at 63 V	R	UL	MFU1206FF03500P500
		4.0 A	63 V	0.0404 A^2s	147 mV	28 mΩ	50 A at 63 V	S	UL	MFU1206FF04000P500
		5.0 A	63 V	0.2275 A^2s	131 mV	20 mΩ	50 A at 63 V	T	UL	MFU1206FF05000P500
		6.3 A	63 V	0.5160 A^2s	116 mV	14 mΩ	50 A at 63 V	ET	UL	MFU1206FF06300P500

Notes

(5) Other values of rated current are available on request
(6) Typical values
(7) For packages with 1000 pieces, please use for packaging P1 instead of P5
(8) For packages with 20 000 pieces, please use for packaging PW instead of P5

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 the following standards:

- IEC 60127-1
- IEC 60127-4
- UL 248-14
- IEC 60068 series

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.

ASSEMBLY

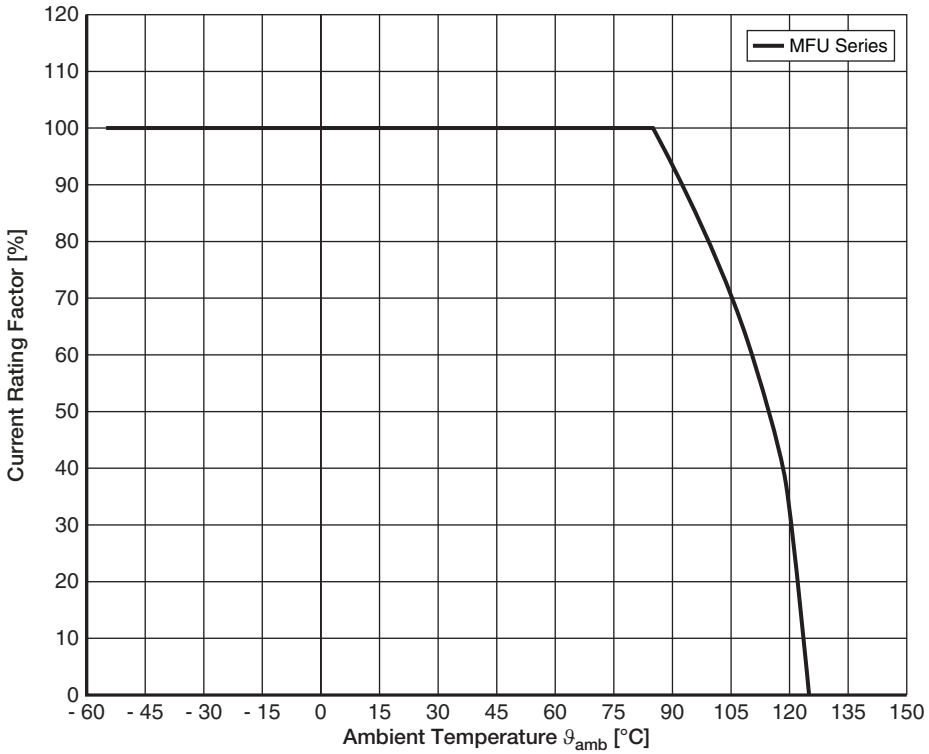
The fuses are suitable for processing on automatic SMD assembly systems. They are suitable for automatic soldering using wave, reflow or vapour phase. The encapsulation is resistant to all cleaning solvents commonly used in the electronics industry, including alcohols, esters and aqueous solutions. The 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. Solderability is specified for 2 years after production or re-qualification. The permitted storage time is 20 years.

All products comply with the **JIG 101** list of legal restrictions on hazardous substances.

This includes full compliance with the following directives:

- 2000/53/EC End of Vehicle life Directive (ELV) and Annex II (ELV II)
- 2011/65/EU Restriction of the use of Hazardous Substances Directive (RoHS)
- 2002/96/EC Waste Electrical and Electronic Equipment Directive (WEEE)

FUNCTIONAL PERFORMANCE

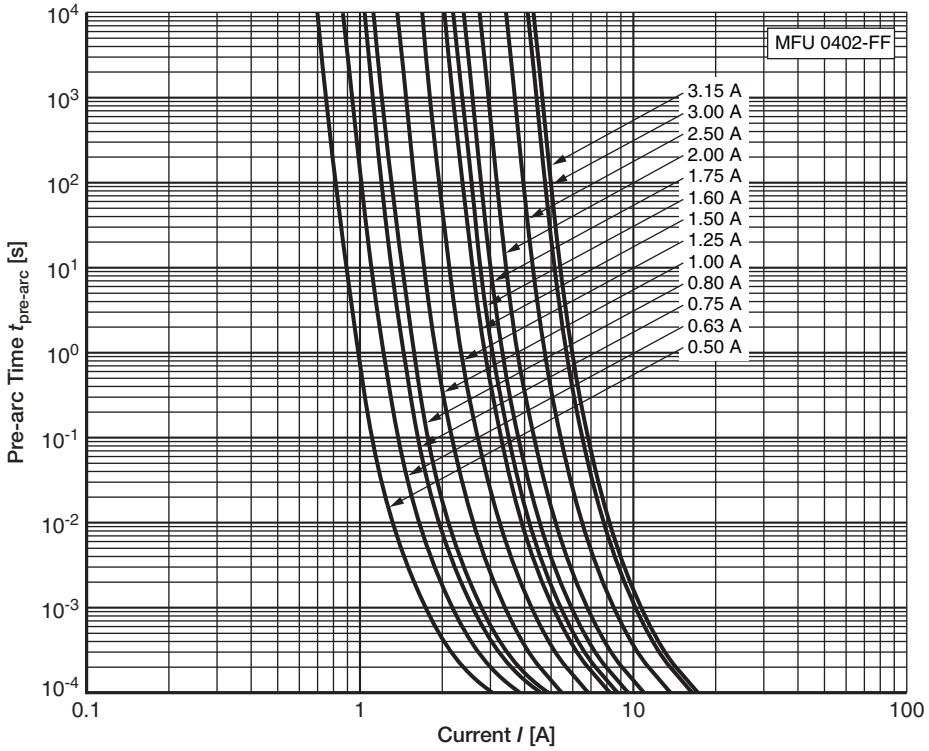


Current Rating Factor (1) vs. Ambient Temperature ϑ_{amb}

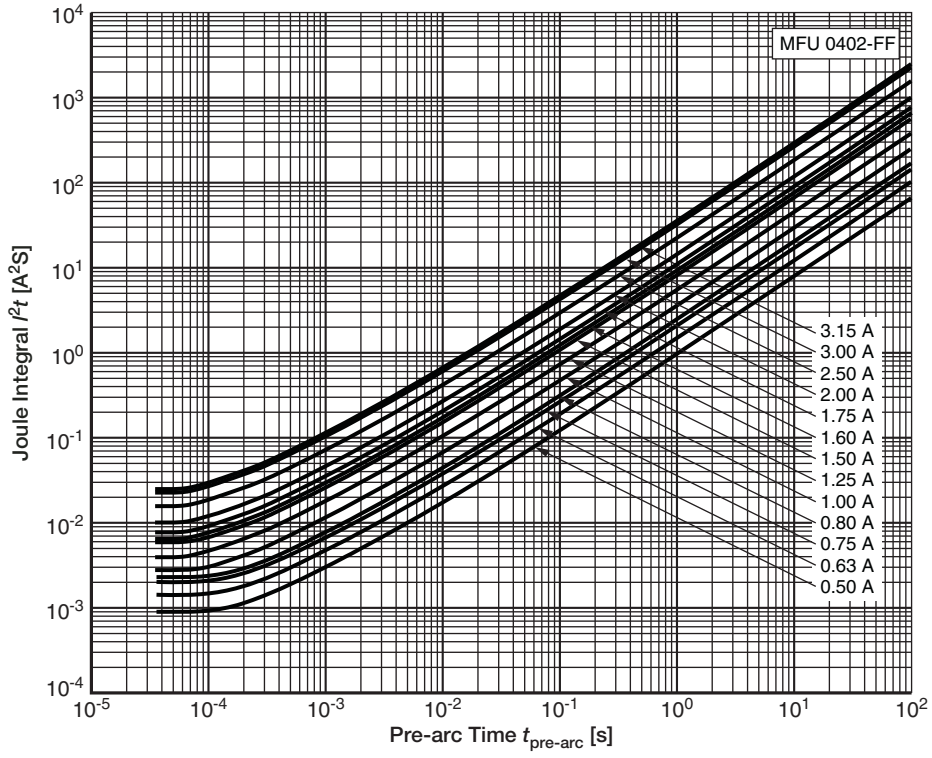
Note

(1) Current rating factor is in addition to the given permissible continuous current rating of 0.7

FUNCTIONAL PERFORMANCE



Typical $t_{pre-arc}$ vs. I characteristic of MFU 0402 (1)

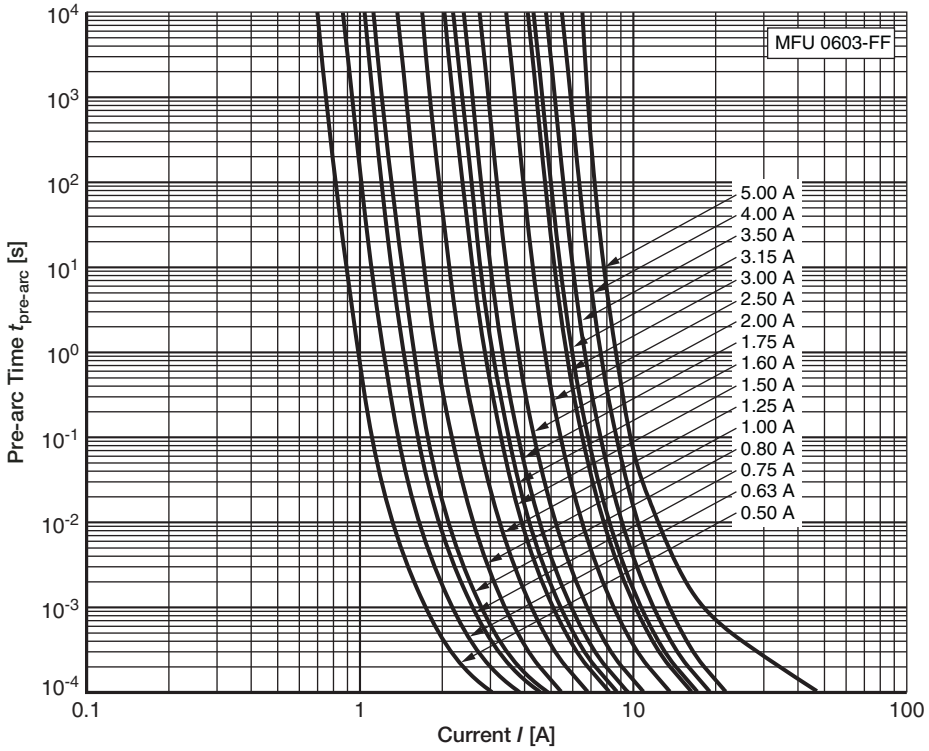


Typical I^2t vs. $t_{pre-arc}$ characteristic of MFU 0402 (1)

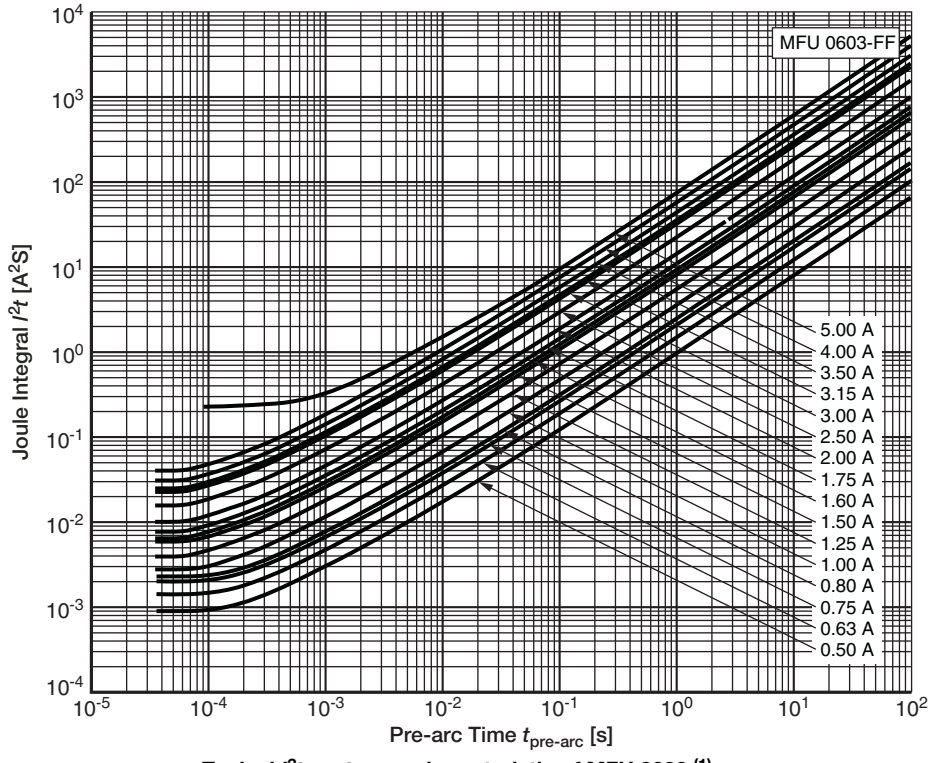
Note

(1) Fuses mounted on a test board according to IEC 60127-4

FUNCTIONAL PERFORMANCE



Typical $t_{pre-arc}$ vs. *I* characteristic of MFU 0603 (1)

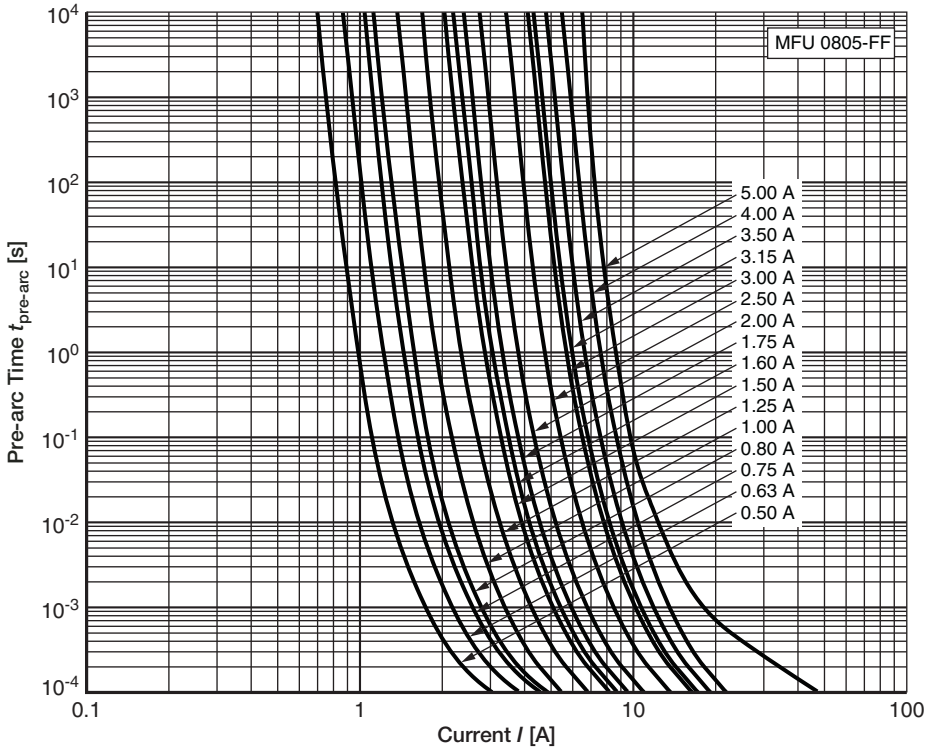


Typical I^2t vs. $t_{pre-arc}$ characteristic of MFU 0603 (1)

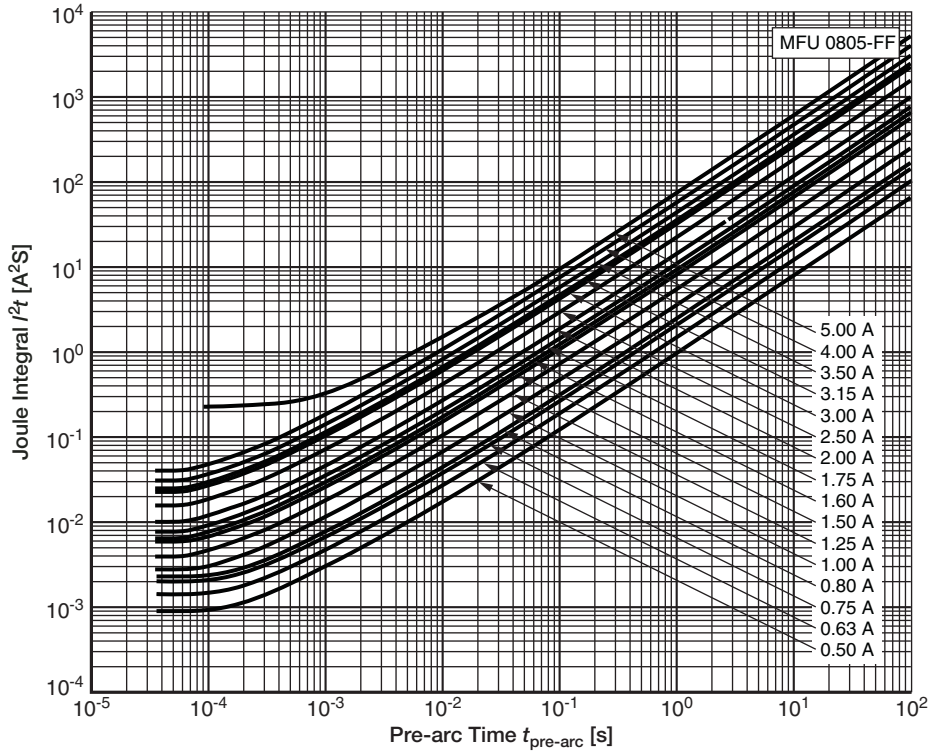
Note

(1) Fuses mounted on a test board according to IEC 60127-4

FUNCTIONAL PERFORMANCE



Typical $t_{pre-arc}$ vs. *I* characteristic of MFU 0805 (1)

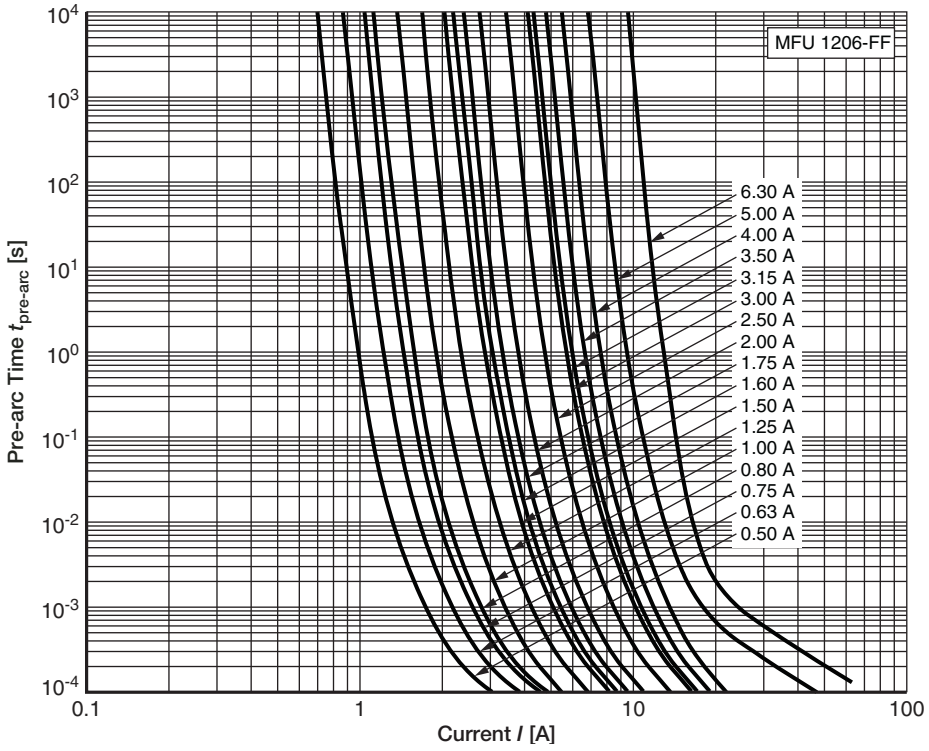


Typical I^2t vs. $t_{pre-arc}$ characteristic of MFU 0805 (1)

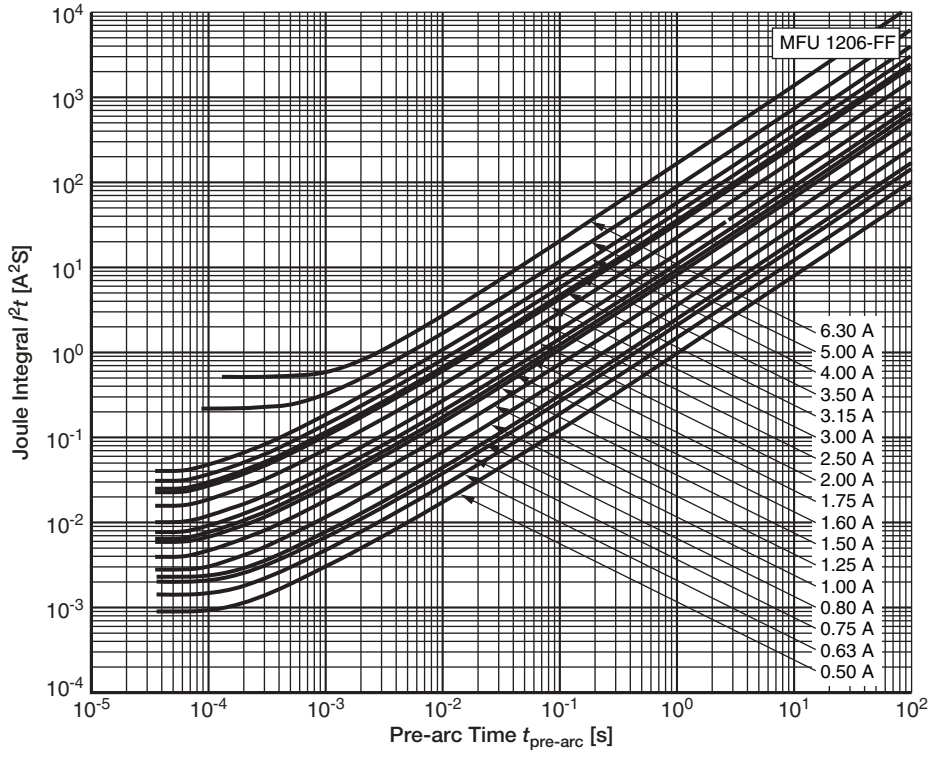
Note

(1) Fuses mounted on a test board according to IEC 60127-4

FUNCTIONAL PERFORMANCE



Typical $t_{pre-arc}$ vs. I characteristic of MFU 1206 (1)



Typical I^2t vs. $t_{pre-arc}$ characteristic of MFU 1206 (1)

Note

(1) Fuses mounted on a test board according to IEC 60127-4

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 248-14, 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 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
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; (245 ± 3) °C; (2 ± 0.2) s			
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			
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**	$I_R \leq 0.75$ A	At 1.25 x I_R, $t_{pre\text{-}arc} > 1$ h at 2.0 x I_R, $t_{pre\text{-}arc} < 60$ s at 10 x I_R, $t_{pre\text{-}arc} < 0.001$ s
				MFU 0402	0.8 A ≤ $I_R \leq 3.15$ A	At 1.25 x I_R, $t_{pre\text{-}arc} > 1$ h at 2.0 x I_R, $t_{pre\text{-}arc} < 5$ s at 10 x I_R, $t_{pre\text{-}arc} < 0.001$ s
				MFU 0603	$I_R \leq 5.0$ A	
				MFU 0805	$I_R \leq 5.0$ A	
				MFU 1206	$I_R \leq 6.3$ A	
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 MΩ

TEST PROCEDURES AND REQUIREMENTS

IEC 60127-4 CLAUSE	IEC 60068-2 TEST METHOD	TEST	PROCEDURE			REQUIREMENTS PERMISSIBLE CHANGE
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 0402**	$I_R \leq 3.15$ A	No visible damage $\Delta R/R \leq \pm 10$ %
				MFU 0603	$I_R \leq 3.15$ A	
				MFU 0805	$I_R \leq 3.15$ A	
				MFU 1206	$I_R \leq 3.15$ 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 0402**	$I_R \leq 3.15$ A	Temperature rise of terminals ≤ 85 K
				MFU 0603	$I_R \leq 3.15$ A	
				MFU 0805	$I_R \leq 3.15$ A	
				MFU 1206	$I_R \leq 3.15$ 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 0402**	$I_R \leq 3.15$ A	Temperature rise of hot spot ≤ 75 K acc. to UL 248-14 clause 8.2.4
				MFU 0603	$I_R \leq 5.0$ A	
				MFU 0805	$I_R \leq 5.0$ A	
				MFU 1206	$I_R \leq 6.3$ 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 Hz 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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