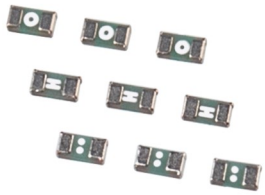
Revision of April 2022

TF-FUSE® Thin Film Surface Mount Fuses

FF Series (Very Fast Acting), 0402 Size



Features:

- Very fast acting
- Low DCR
- High inrush current withstanding capability
- Fiberglass enforced epoxy fuse body
- Copper termination with nickel and tin plating
- Halogen free, RoHS compliance and lead-free

Clearing Time Characteristics:

% of Current Rating	Ampere Rating	Opening Time at 25°C
100%	0.200A-5.00A	4 hours min.
200%	0.375A-5.00A	5 seconds max.
300%	0.200A-0.250A	5 seconds max.
	0.375A-5.00A	0.2 second max.

Shape and Dimensions:

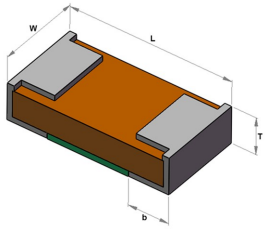
Unit	Inch	mm
Length (L)	0.039± 0.004	1.00 ± 0.10
Width (W)	0.020 ± 0.004	0.51± 0.10
Thickness (T)	0.013 ± 0.004	0.33 ± 0.10
Termination band-width (b)	0.012 ± 0.004	0.30 ± 0.10

Agency Approval:

Recognized Under the Components Program of UL.
File Number: E232989.

Applications:

- Panel
- Notebook
- Toy
- HDD
- IoT
- Finger print
- Smart lock
- Battery pack



Typical Ratings and Electric Characteristics:

Part Number	Current Rating (A)	Voltage Rating (Vdc)	Interrupting Rating	Nominal Cold DCR (Ω)[1]	Nominal I^2t (A^2s)[2]	Marking
T0402FF0200TM	0.200	35	35A@35Vdc	0.60	0.0017	··
T0402FF0250TM	0.250	35		0.33	0.0035	:
T0402FF0375TM	0.375	35		0.24	0.0036	···
T0402FF0500TM	0.50	35		0.16	0.0060	I
T0402FF0750TM	0.75	35		0.10	0.012	—
T0402FF1000TM	1.00	35		0.073	0.024	+
T0402FF1250TM	1.25	35		0.054	0.045	×
T0402FF1500TM	1.50	35		0.040	0.081	II
T0402FF1750TM	1.75	35		0.034	0.092	=
T0402FF2000TM	2.00	35		0.031	0.12	≠
T0402FF2500TM	2.50	35		0.018	0.22	H
T0402FF3000TM	3.00	35		0.015	0.27	III
T0402FF3500TM	3.50	35		0.012	0.34	HH
T0402FF4000TM	4.00	35		0.011	0.36	□
T0402FF5000TM	5.00	35		0.0090	0.55	○

[1] Measured at ≤ 10% of rated current and 25℃ ambient . [2] Melting I^2t at 0.001 second of current rating.

Operating temperature: -55 to +90°C

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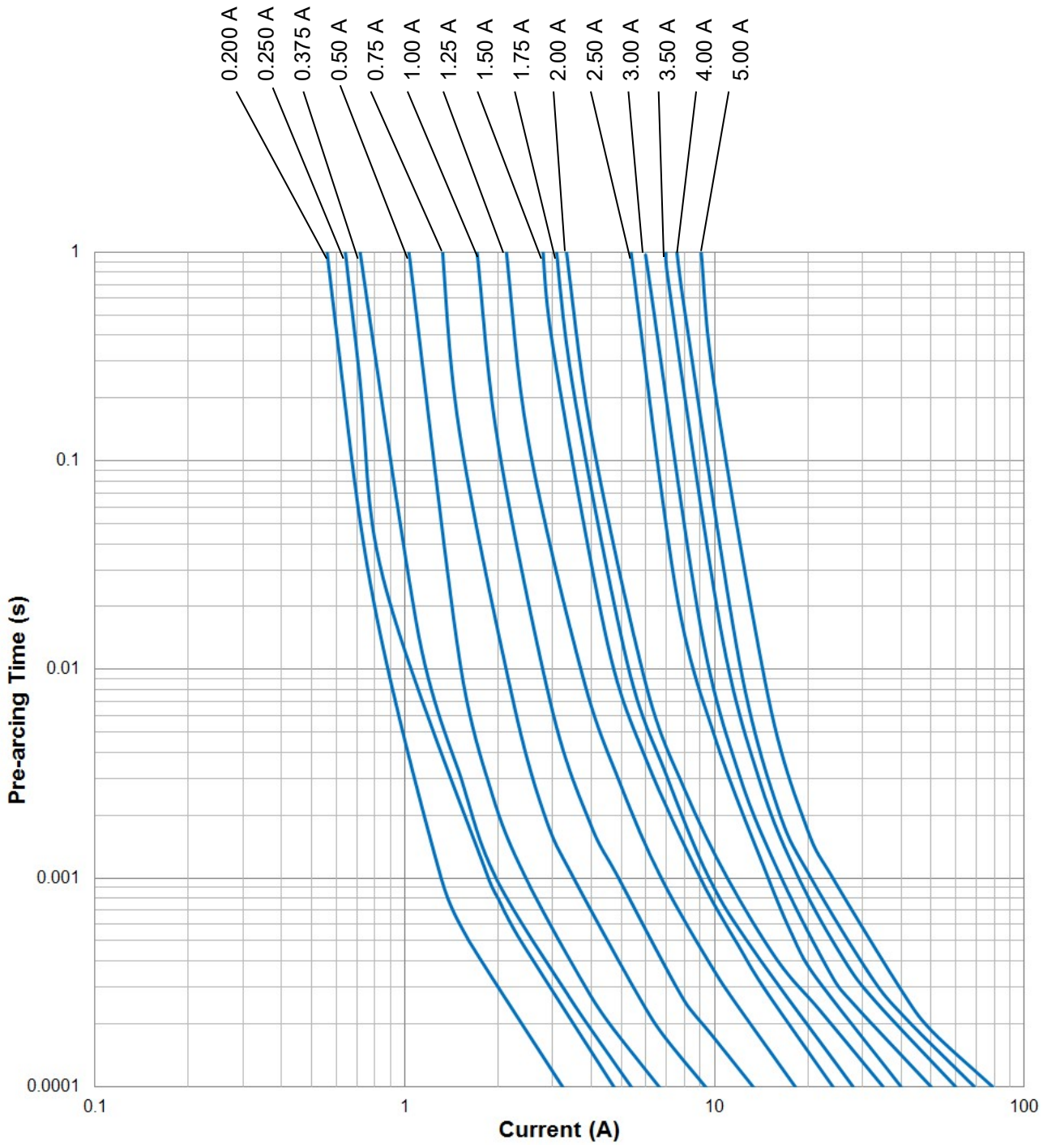
Average Pre-arcing Time Curves:



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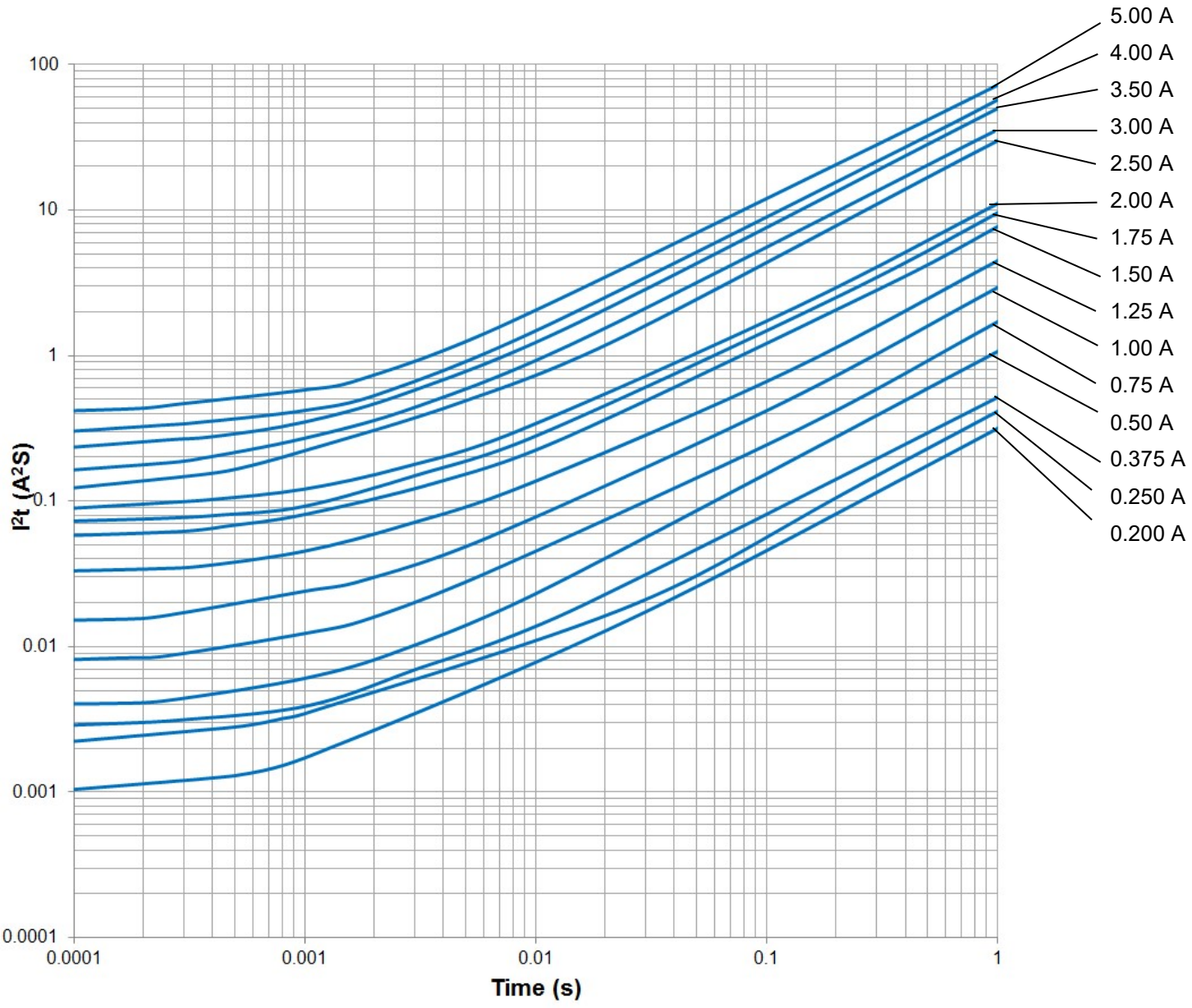
Average I^2t vs. t Curves:



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Product Identification:

T 0603 FF 1000 T M
(1) (2) (3) (4) (5) (6)

(1) Product Code: T-Thin Film
(2) Size Code: Standard EIA chip sizes
(3) Series Code: FF—Very Fast Acting, HI—High Inrush
(4) Current Rating Code: 0500—0.5A, 1000—1.0A
(5) Package Code: T—Tape & Reel; B—Bulk
(6) Marking Code: M—With mark (optional)

Environmental Tests:

No.	Test item	Test Condition and Requirement	Reference
1	Bend	2 mm bend, DCR change within ±20%. (±10% for ≤1A), no mechanical damage	IEC60068-2-21
2	Solderability	245°C, 5 seconds, new solder coverage ≥95%	MIL-STD-202 Method 208
3	Thermal shock	DCR change ≤ ±10%. No mechanical damage. 100 cycles between -55°C and +125°C	MIL-STD-202 Method 107
4	Moisture resistance	10 cycles, DCR change within ±10%, no excessive corrosion	MIL-STD-202 Method 106
5	Salt spray	DCR change ≤ ±10%. No excessive corrosion. 5% salt solution, 48 hour exposure	MIL-STD-202 Method 101
6	Mechanical vibration	DCR change ≤ ±10%. No mechanical damage. 0.4" D.A. or 30G between 5 and 3000 Hz	MIL-STD-202 Method 204
7	Mechanical shock	DCR change ≤ ±10%. No mechanical damage. 1500G, 0.5 ms, half sine shocks	MIL-STD-202 Method 213
8	Life	75% rated current, 2000 hours at ambient temperature from +20°C to 30 °C, no open circuit, voltage drop change within ±10%	Refer to AEM QIQ106

Moisture Sensitivity Level 1

Packaging:

Chip Size	Parts on 7 inch (178mm) Reel
0603 (1608)	8,000
0402 (1005)	20,000

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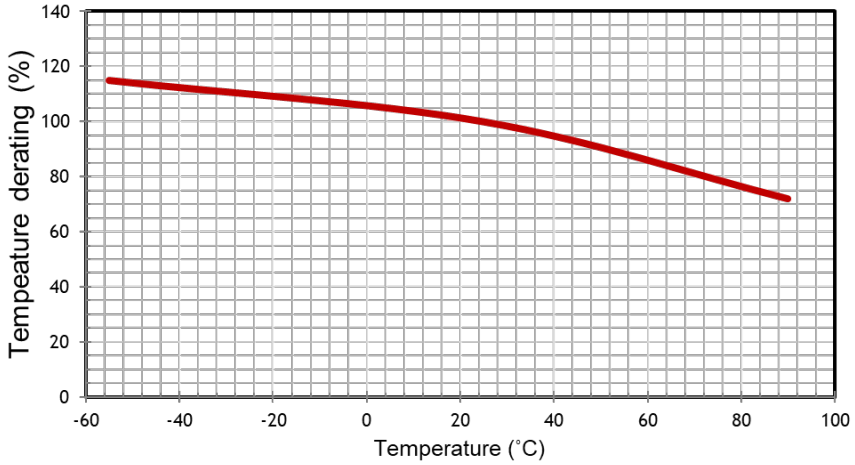
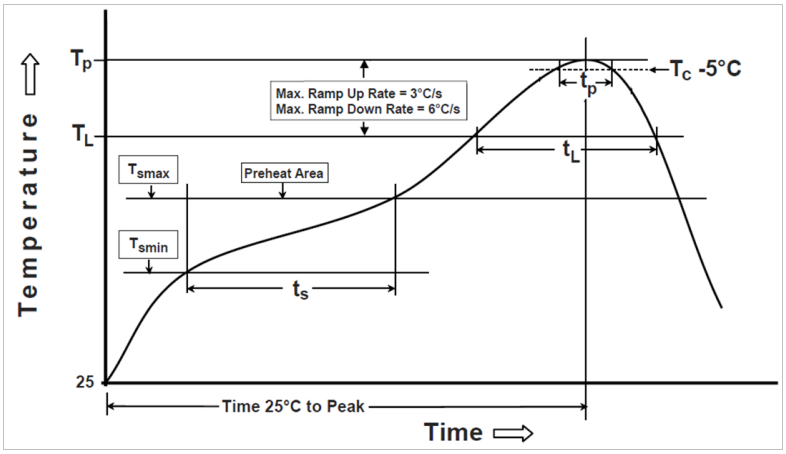
Temperature Effect on Current Rating:



Recommended Reflow Soldering Profile:

Profile Feature	Pb-Free Assembly
Preheat/Soak Temperature Min (T_{smin}) Temperature Max (T_{smax}) Time (t_s) from (T_{smin} to T_{smax})	 150°C 200°C 60~120 seconds
Ramp-uprate (T_L to T_p)	3°C/second max.
Liquidous temperature (T_L) Time (t_L) maintained above T_L	217°C 60~150 seconds
Peak package body temperature (T_p)	260°C
Time (t_p)*within 5°C of the specified classification temperature (T_c)	30 seconds *
Ramp-down rate (T_p to T_L)	6°C/second max.
Time 25°C to peak temperature	8 minutes max.
* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum	



Thermal Shock When Making Correction with a Soldering Iron:

The temperature of solder iron tip should be controlled under 350˚C and soldering time should be less than 3 sec.

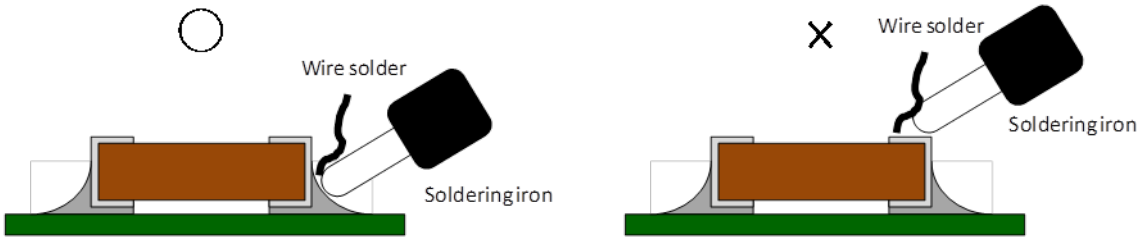


Fig 3 Correct handling method of soldering iron

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