

## TF-FUSE® Thin Film Surface Mount Fuses

### FF Series (Very Fast Acting), 0603 Size



#### Features:

- Very fast acting at 200% overload current levels
- 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

#### Applications:

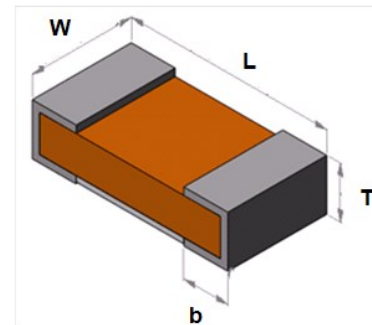
- Notebook computers and tablets
- Digital cameras
- Memory cards
- Toys
- Bluetooth earphones
- Portable electronic devices

#### Shape and Dimensions:

Unit	Inch	mm
Length (L)	0.063 ± 0.004	1.60 ± 0.10
Width (W)	0.032 ± 0.004	0.81 ± 0.10
Thickness (T)	0.012 ± 0.004	0.30 ± 0.10
Termination bandwidth (b)	0.014 ± 0.004	0.36 ± 0.10

#### Clearing Time Characteristics:

% of Current Rating	Opening Time at 25°C
100%	4 hours min.
200%	5 seconds max.
300%	0.2 second max.



#### Agency Approval:

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

#### Typical Ratings and Characteristics:

Operating temperature: -55 to +90°C

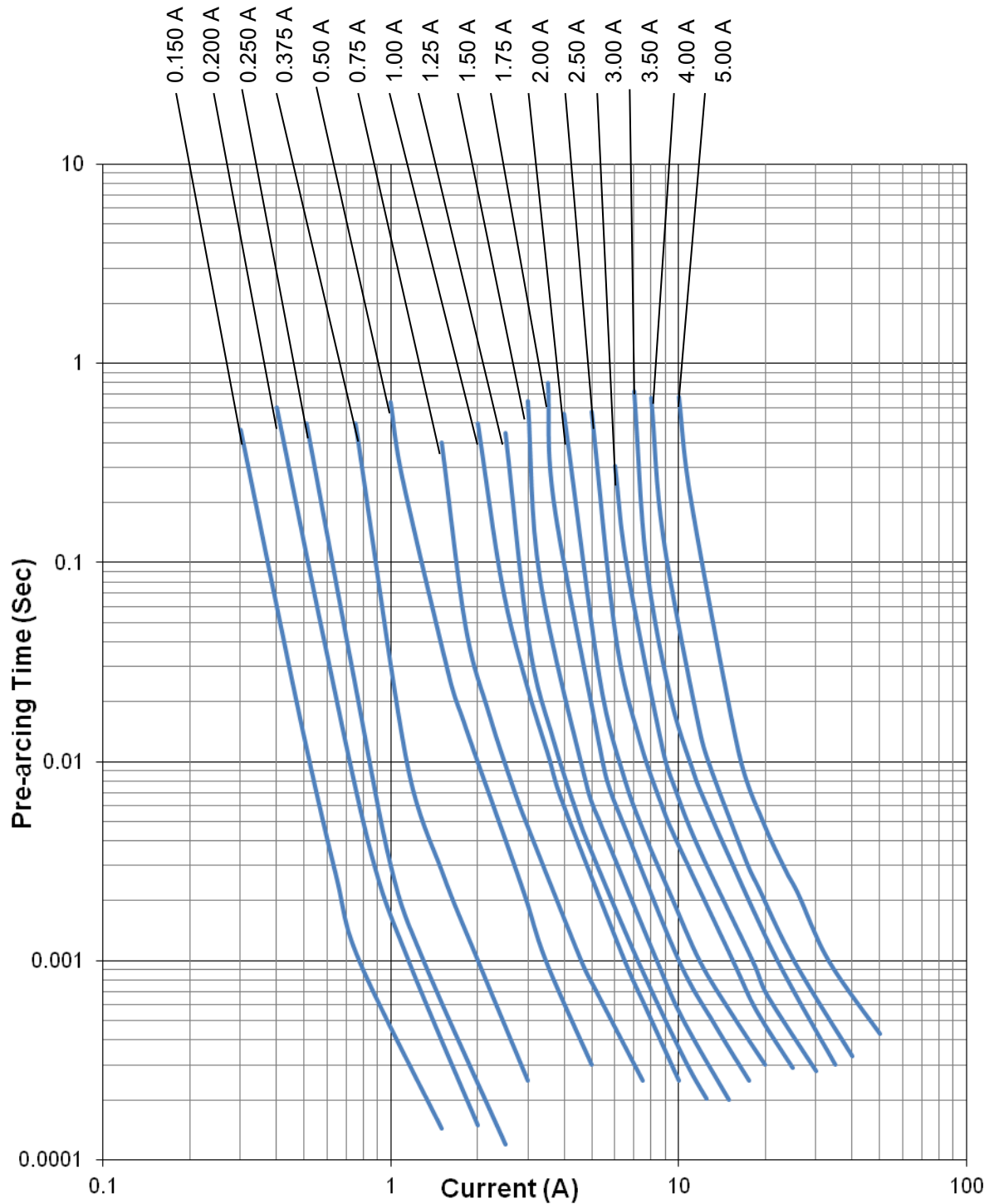
Part Number	Current Rating (A)	Voltage Rating (VDC)	Interrupting Rating	Nominal Cold DCR (Ω) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking
T0603FF0150TM	0.15	65	50A@35V DC/AC 13A@65V DC	2.2	0.0006	·
T0603FF0200TM	0.2	65		...		
T0603FF0250TM	0.25	65		:		
T0603FF0375TM	0.375	65		...		
T0603FF0500TM	0.5	65		I		
T0603FF0750TM	0.75	65		-		
T0603FF1000TM	1	65		+		
T0603FF1250TM	1.25	65	35A@35V DC/AC 13A@65V DC	0.048	0.052	×
T0603FF1500TM	1.5	65				
T0603FF1750TM	1.75	35	35A@35V DC/AC 50A@24V DC/AC	0.031	0.1	=
T0603FF2000TM	2	35		=		
T0603FF2500TM	2.5	35		H		
T0603FF3000TM	3	35		III		
T0603FF3500TM	3.5	35		HH		
T0603FF4000TM	4	35		□		
T0603FF5000TM	5	35		○		
					0.0095	1.1

<sup>1</sup> Measured at ≤ 10% of rated current and 25°C ambient. <sup>2</sup> Melting I<sup>2</sup>t at 0.001 sec.

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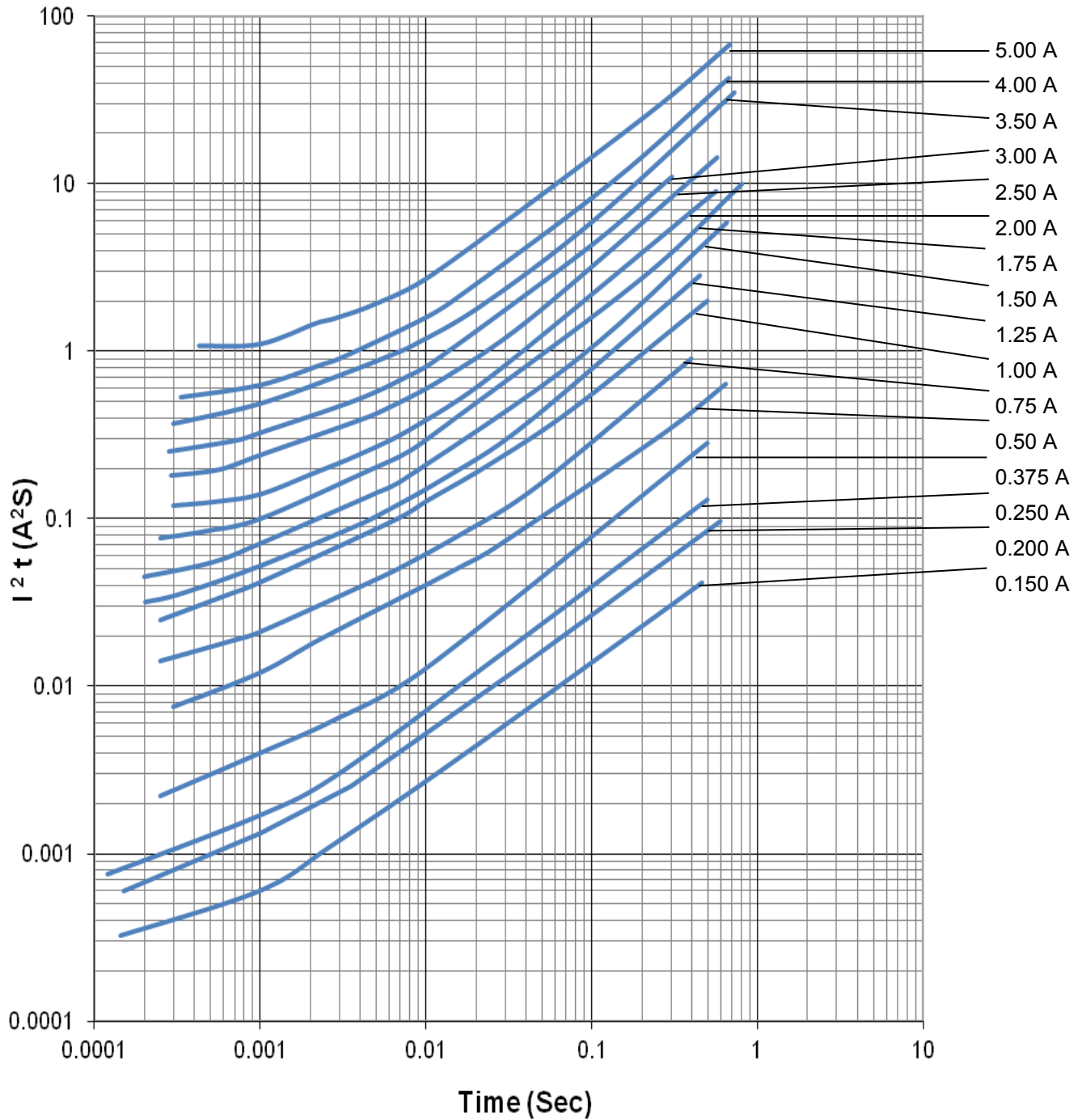
## FF Series (Very Fast Acting), 0603 Size

### Average Pre-arcing Time Curves:



**TF-FUSE® Thin Film Surface Mount Fuses**  
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**Average  $I^2t$  vs.  $t$  Curves:**



## TF-FUSE<sup>®</sup> Thin Film Surface Mount Fuses

### 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

### Environmental Tests:

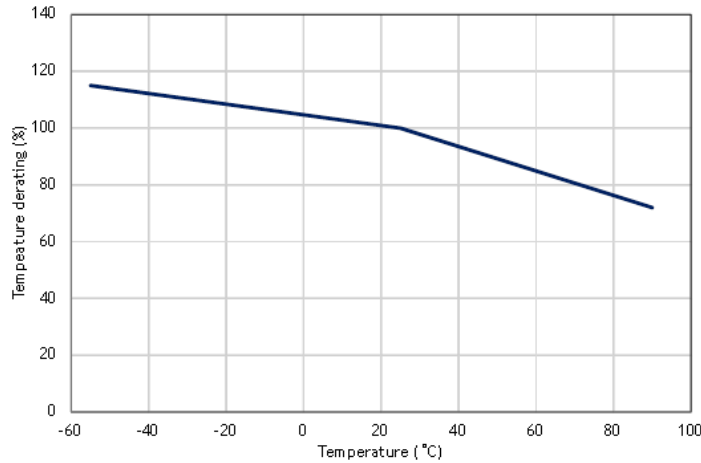
No.	Test item	Requirement	Test condition	Reference
1	Bending	≤1A: 10% DCR change max. >1A: 20% DCR change max.	2mm	Refer to AEM QIQ034
2	Solderability	95% coverage min.	One dip at 255°C for 5 seconds	MIL-STD-202 Method 208
3	Thermal shock	DCR change within ±10% No mechanical damage	100 cycles between -55°C and +125°C	MIL-STD-202 Method 107
4	Moisture resistance	DCR change within ±10% No excessive corrosion	10 cycles	MIL-STD-202 Method 106
5	Salt spray	DCR change within ≤ ±10% No excessive corrosion	5% salt solution, 48 hour exposure	MIL-STD-202 Method 101
6	Mechanical vibration	DCR change within ≤ ±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 within ≤ ±10% No mechanical damage	1500G, 0.5 ms, half sine shocks	MIL-STD-202 Method 213
8	Life	Change of voltage drop within ±10%, no open circuit	75% rated current, 2000 hours, ambient temperature +20°C to 30°C	Refer to AEM QIQ106

### Packaging:

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

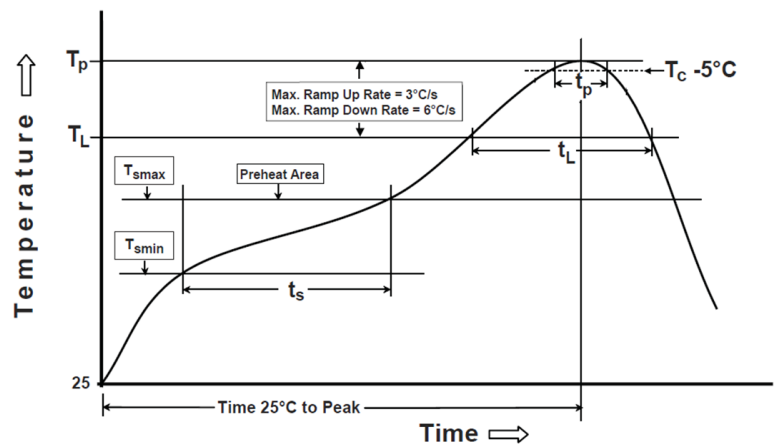
## TF-FUSE® Thin Film Surface Mount Fuses

### Temperature Effect on Current Rating:



### Recommended Reflow Soldering Profile:

Profile Feature	Pb-Free Assembly
<b>Preheat/Soak</b>	
Temperature Min ( $T_{smin}$ )	150°C
Temperature Max ( $T_{smax}$ )	200°C
Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60~120 seconds
Ramp-up rate ( $T_L$ to $T_p$ )	3°C/second max.
Liquidous temperature ( $T_L$ )	217°C
Time ( $t_L$ ) maintained above $T_L$	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. The soldering iron tip should not directly touch the top side termination of the component.

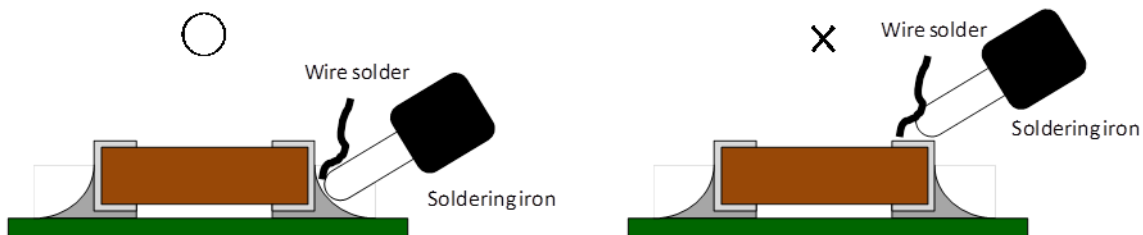


Fig 3 Correct handling method of soldering iron

## Disclaimer

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