

SolidMatrix® Surface Mount Fuses

FA Series (Fast Acting), 0603 Size



Features:

- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +150°C (with de-rating)

Clearing Time Characteristics:

| % of current rating | Clearing time at 25°C |
|---------------------|-----------------------|
| 100% | 4 hours min. |
| 250% | 5 seconds max. |
| 400% | 0.05 seconds max. |

Shape and Dimensions:

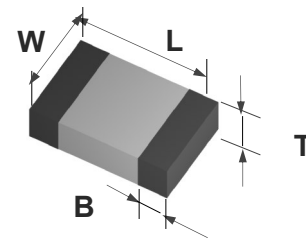
| Unit | Inch | mm |
|------|---------------|-------------|
| L | 0.063 ± 0.006 | 1.60 ± 0.15 |
| W | 0.031 ± 0.006 | 0.80 ± 0.15 |
| T | 0.031 ± 0.006 | 0.80 ± 0.15 |
| B | 0.014 ± 0.006 | 0.36 ± 0.15 |

Agency Approval:

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

Patents:

Patent numbers "US6,602,766", "US7,268,661 B2", "ZL02114719.1", "ZL200410104280.7", "ZL201020551360.8", "ZL201010299185.2", "ZL201220030614.0", "ZL201210020693.1".



Ordering Information:

| Part Number | Current Rating (A) | Voltage Rating (VDC) | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I^2t (A^2s) ² | Marking (Optional) ³ |
|-------------------|--------------------|----------------------|------------------------|--|--|---------------------------------|
| F0603FA0500V063TM | 0.5 | 63 | 35 A at rated voltages | 0.485 | 0.003 | C |
| F0603FA0750V063TM | 0.75 | 63 | | 0.254 | 0.006 | D |
| F0603FA1000V063TM | 1.0 | 63 | | 0.147 | 0.013 | E |
| F0603FA1500V063TM | 1.5 | 63 | | 0.059 | 0.030 | G |
| F0603FA2000V032TM | 2.0 | 32 | | 0.044 | 0.060 | I |
| F0603FA2500V032TM | 2.5 | 32 | | 0.032 | 0.10 | J |
| F0603FA3000V032TM | 3.0 | 32 | | 0.025 | 0.18 | K |
| F0603FA3500V032TM | 3.5 | 32 | | 0.024 | 0.30 | L |
| F0603FA4000V032TM | 4.0 | 32 | | 0.018 | 0.50 | M |
| F0603FA5000V032TM | 5.0 | 32 | | 0.013 | 0.80 | N |
| F0603FA6000V024TM | 6.0 | 24 | | 0.010 | 1.10 | O |

1. Measured at $\leq 10\%$ rated current and 25°C ambient.

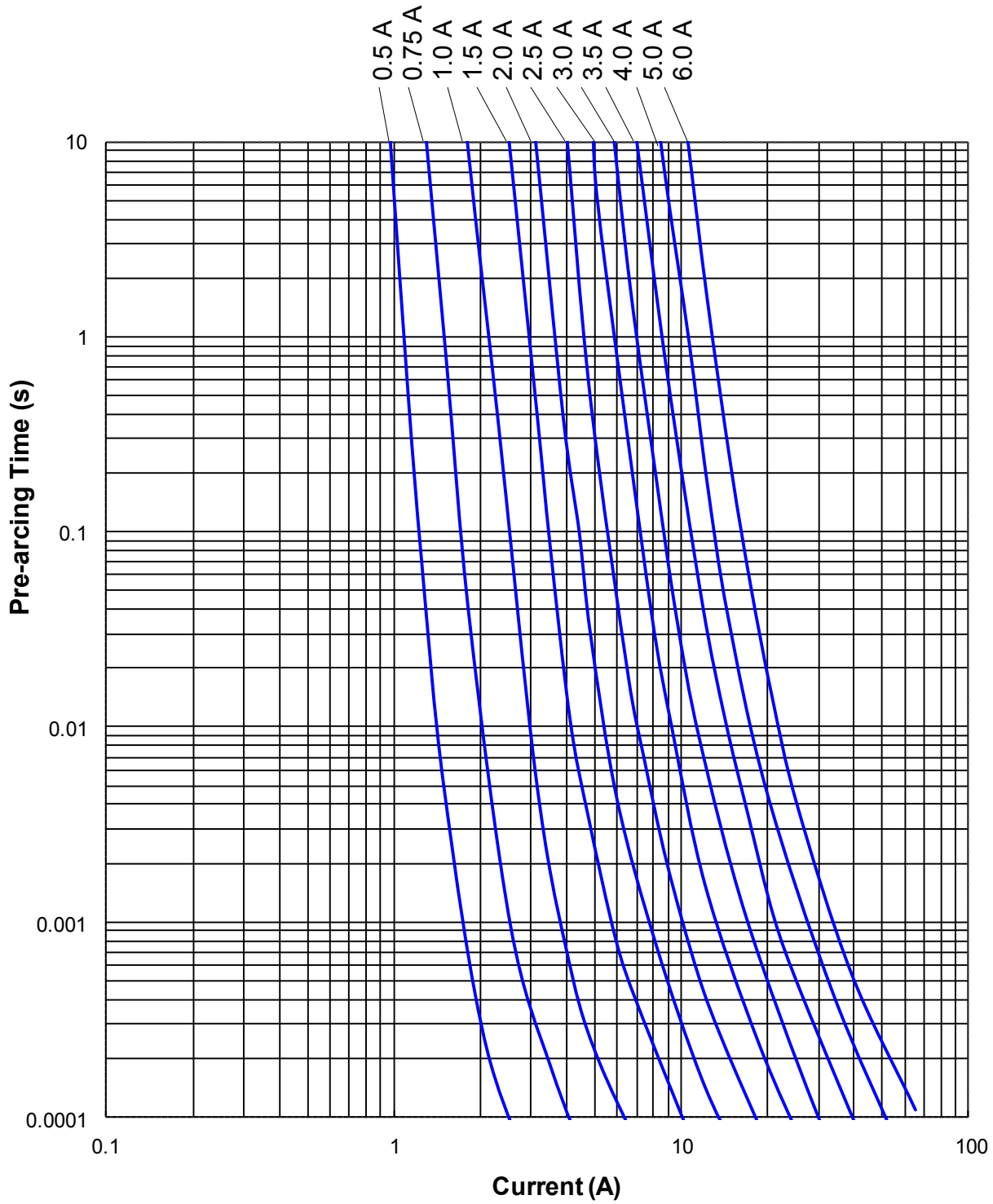
2. Melting I^2t at 0.001 second pre-arcing time.

3. Black Marking Character Code.

SolidMatrix[®] Surface Mount Fuses

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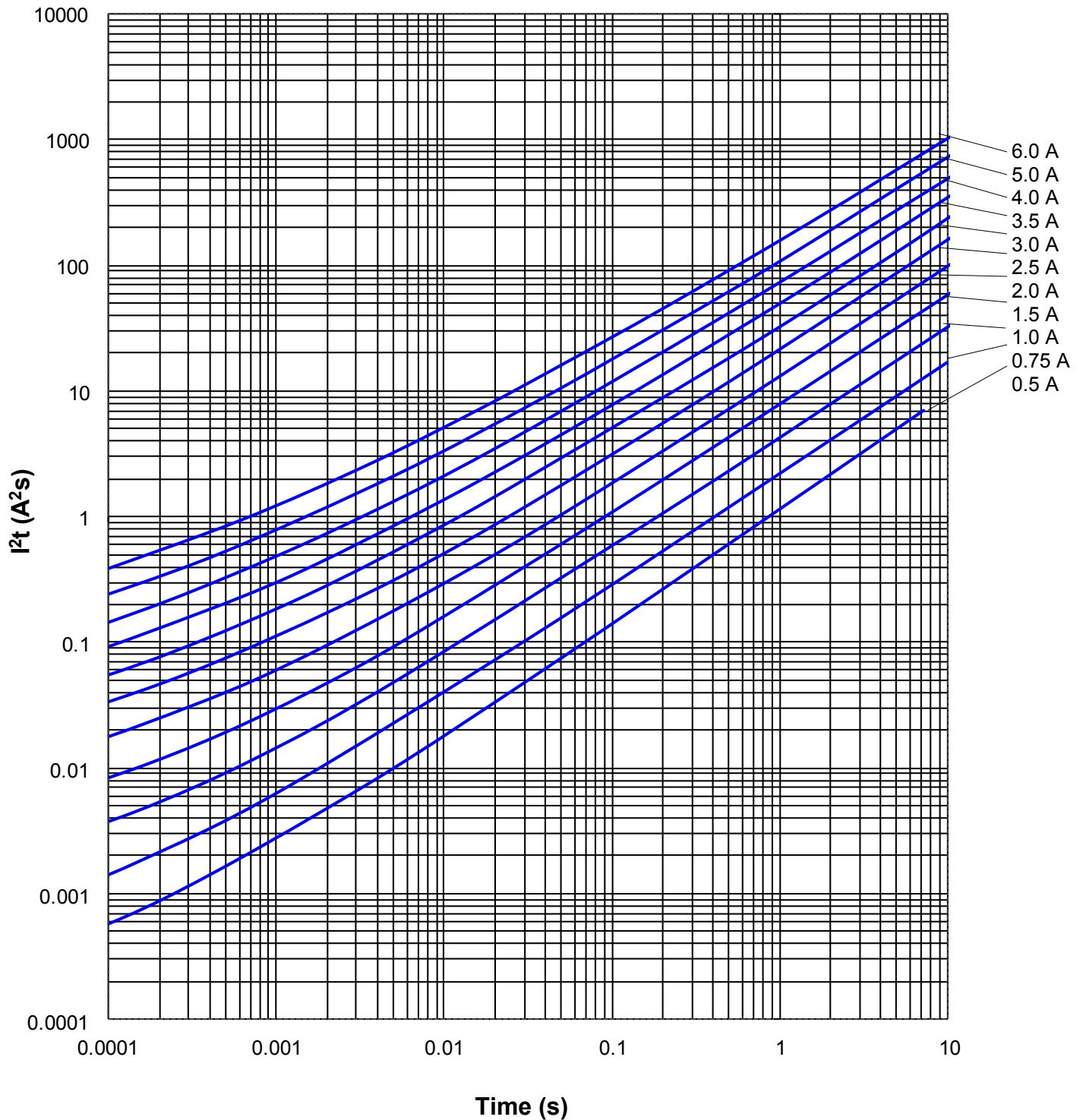
Average Pre-arcing Time Curves:



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Average I^2t vs. t Curves:



SolidMatrix® Surface Mount Fuses

Product Identification:

F 0603 FA 1000 V032 T M

(1) (2) (3) (4) (5) (6) (7)

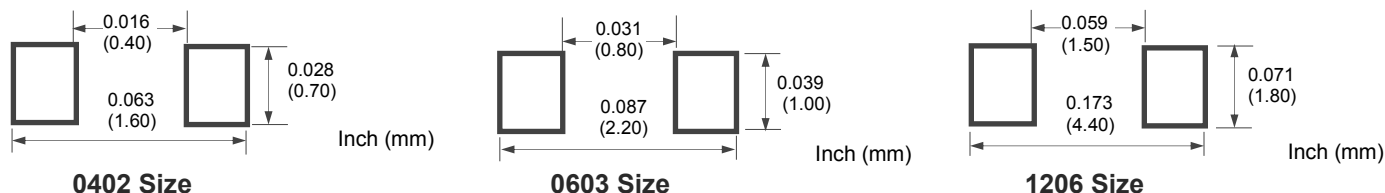
- (1) **Product Code:** F—Chip Fuse
- (2) **Size Code:** Standard EIA Chip Sizes
- (3) **Series Code:** FA - Fast Acting, SB - Slow Blow,
HI - High Inrush, FF - Very Fast Acting, HB - High Current
- (4) **Current Rating Code:** 1000 - 1000 mA (For HB, 10 - 10A)
- (5) **Voltage Rating Code:** V032 - 32 VDC
- (6) **Package Code:** T - Tape & Reel, B - Bulk
- (7) **Marking Code:** M - With Marking

F 1206 HC 20A0 T M

(1) (2) (3) (4) (5) (6)

- (1) **Product Code:** F—Chip Fuse
- (2) **Size Code:** L x W (inch),
the first two digits-L (length),
the last two digits-W (width)
- (3) **Series Code:** HC Series
- (4) **Current Rating Code:** 20A0—20.0A
- (5) **Package Code:** T - Tape & Reel, B - Bulk

Recommended Land Pattern:



Environmental Tests:

| No. | Test | Requirement | Test condition | Test reference |
|-----|---------------------------|--|---|---------------------------|
| 1 | Soldering heat resistance | DCR change $\leq \pm 10\%$ No mechanical damage | One dip at 260°C for 60 seconds | MIL-STD-202 Method 210 |
| 2 | Solderability | Minimum 95% coverage | One dip at 245°C for 5 seconds | MIL-STD-202 Method 208 |
| 3 | Thermal shock | DCR change $\leq \pm 10\%$ No mechanical damage | 100 cycles between -65°C and +125°C | MIL-STD-202 Method 107 |
| 4 | Moisture resistance | DCR change $\leq \pm 15\%$ No excessive corrosion | 10 cycles | MIL-STD-202 Method 106 |
| 5 | Salt spray | DCR change $\leq \pm 10\%$ No excessive corrosion | 48 hour exposure | MIL-STD-202 Method 101 |
| 6 | Mechanical vibration | DCR change $\leq \pm 10\%$ No mechanical damage | 0.4 " D.A. or 30 G between 5 – 3000 Hz | MIL-STD-202 Method 204 |
| 7 | Mechanical shock | DCR change $\leq \pm 10\%$ No mechanical damage | 1500 G, 0.5 ms, half-sine shocks | MIL-STD-202 Method 213 |
| 8 | Life | No electrical "opens" during testing voltage drop change shall be less than $\pm 20\%$ of initial value | 80% rated current (75% for < 1 A fuses) for 2000 hours at ambient temperature between +20°C and +30°C | Refer to AEM QIQ106 |

SolidMatrix® Surface Mount Fuses

Electrical Specification:

Clearing Time Characteristics:

Same as specified on the Short Form Data Sheet

Insulation Resistance after Opening:

20,000 ohms typical when cleared with rated voltage applied. Fuse clearing under low voltage conditions may result in lower after clearing insulation resistance values. (Note: Under normal fault conditions (low or rated voltage conditions), AEM SolidMatrix fuses provide sufficient after clearing insulation resistance values for circuit protection.)

Current Carrying Capacity:

100% rated current at +25°C ambient for 4 hours minimum when evaluated per MIL-PRF-23419

Interrupt Ratings:

Fuse Selection and Temperature De-rating Guideline:

The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25°C, the fuse shall be “de-rated”.

To select a fuse from the catalog, the following rule may be followed:

Catalog Fuse Current Rating = Nominal Operating Current / 0.75 / % De-rating at the maximum operating temperature.

Example: At maximum operating temperature of 65°C, % De-rating is 90%. The nominal operating current is 4 A. The current rating for fuse selected from the catalog shall be: $4 / 0.75 / 90\% = 5.9$ or 6 A. Specifications and descriptions in this literature are as accurate as known at the time of publish, but are subject to change without notice.

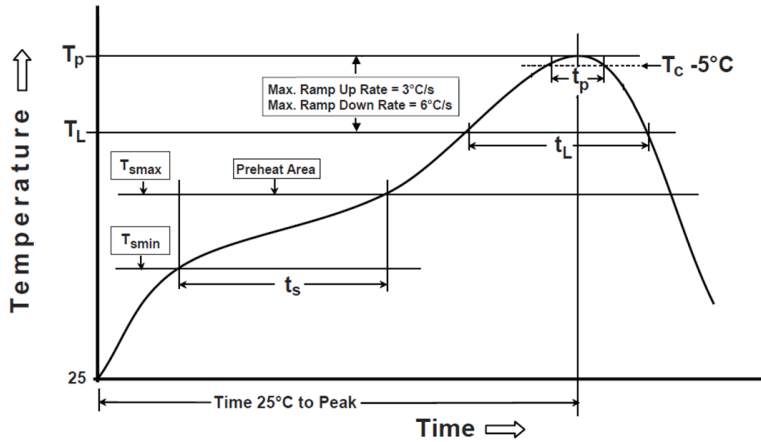
Temperature De-Rating Curve for SolidMatrix Fuses



SolidMatrix® Surface Mount Fuses

Soldering Temperature Profile:

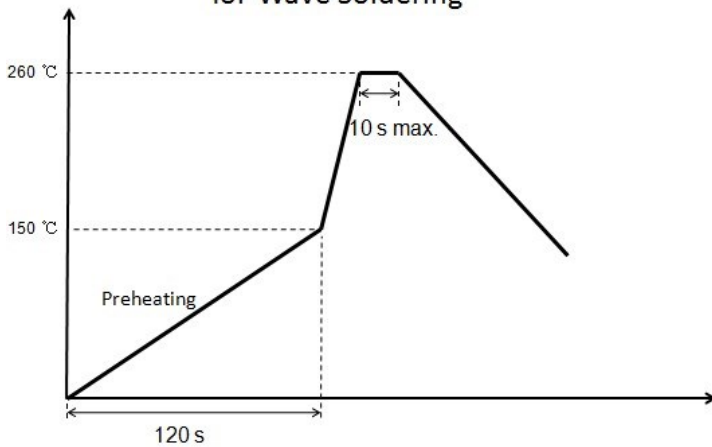
* Recommended Temperature Profile for Reflow Soldering



| 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-up rate (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 | |

* Recommended Temperature Profile for Wave Soldering

Recommended Temperature Profile for Wave Soldering



Notice: Wave Soldering is suitable for 1206 and 0603 size.

Packaging:

| Chip Size | Parts on 7 inch (178 mm) Reel |
|---------------|-------------------------------|
| 0402 (1005) | 10,000 |
| 0603 (1608) | 4,000 |
| 0603FF (1608) | 6,000 |
| 1206 (3216) | 3,000 |

Disclaimer

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