

# SolidMatrix<sup>®</sup> Surface Mount Fuses

## VH Series (Voltage High), 1206 Size



### Features:

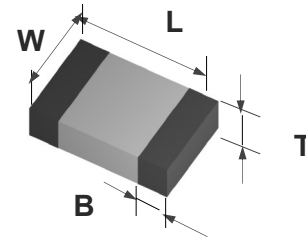
- High inrush current withstanding capability
- Ceramic Monolithic structure
- Silver fusing element and silver termination with nickel and tin plating
- Symmetrical design with marking on both sides (optional)
- Operating temperature range: -55°C to +125°C (with de-rating)

### Clearing Time Characteristics:

% of Current Rating	Clearing Time at 25°C	
	100%	4 hours min.
200% (2.5 A - 5.0 A)		60 seconds max.
350% (6.0 A - 8.0 A)		5 seconds max.
1000%	0.0002 seconds min.	0.02 seconds max.

### Shape and Dimensions:

Unit	Inch	mm
<b>L</b>	0.126 ± 0.008	3.20 ± 0.20
<b>W</b>	0.063 ± 0.008	1.60 ± 0.20
<b>T</b>	0.034 ± 0.008	0.85 ± 0.20
<b>B</b>	0.020 ± 0.010	0.51 ± 0.25



### Agency Approval:

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

### Patents:

Patent numbers "US6,034,589", "US6,602,766", "US7,268,661 B2", "ZL00134544.3", "ZL02114719.1", "ZL200410104280.7", "ZL201020551360.8", "ZL201010299185.2", "ZL201220030614.0", "ZL201210020693.1".

### Ordering Information:

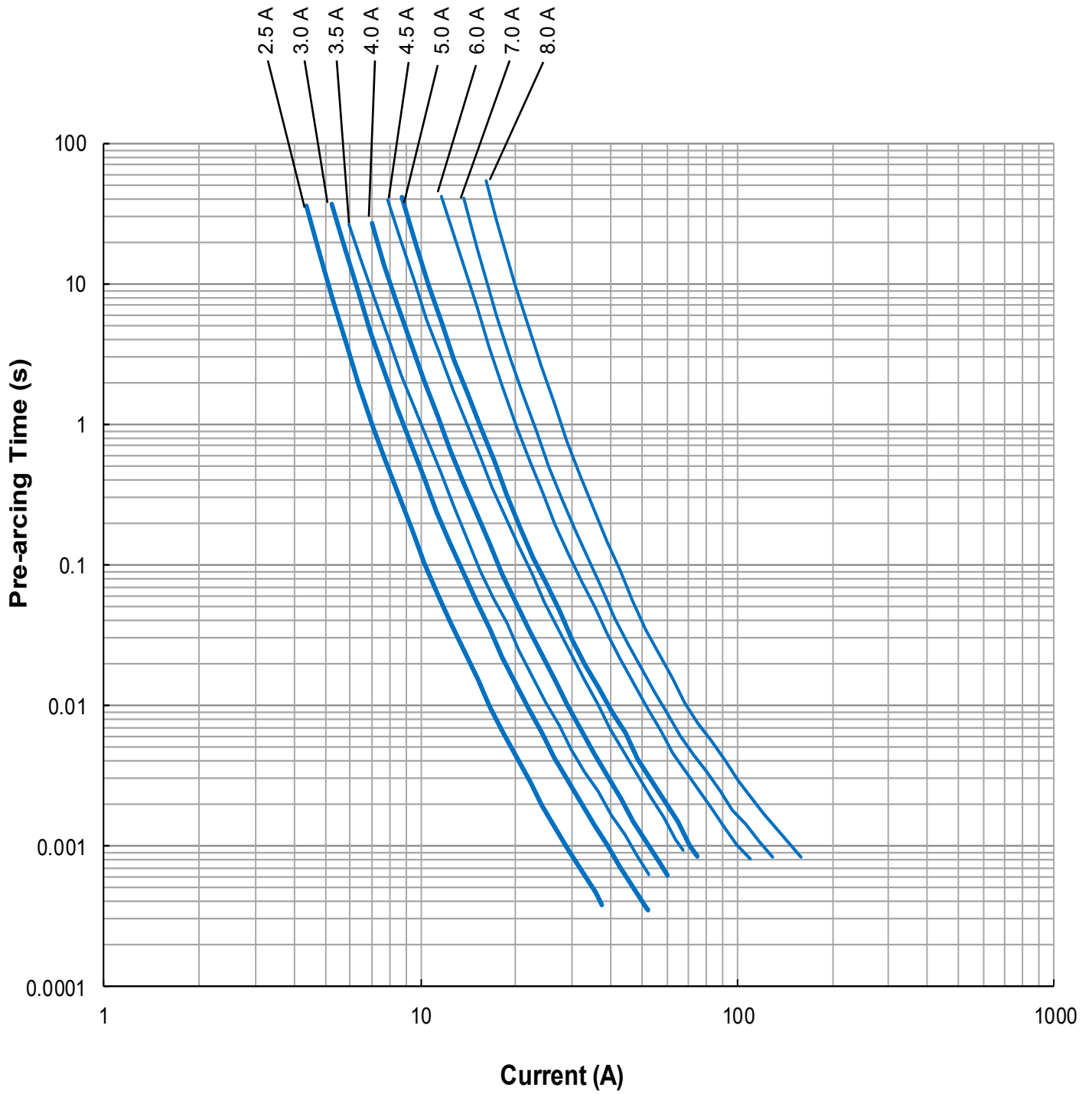
Part Number	Current Rating (A)	Voltage Rating (VDC)	Interrupting Ratings	Nominal Cold DCR(Ω) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking <sup>3</sup>
F1206VH2500TM	2.5	65V	60A@ 65VDC 80A@48VDC 100A@32VDC	0.065	1.15	J
F1206VH3000TM	3.0			0.042	2.40	K
F1206VH3500TM	3.5			0.033	2.80	L
F1206VH4000TM	4.0			0.026	3.80	M
F1206VH4500TM	4.5			0.024	3.90	T
F1206VH5000TM	5.0			0.018	4.40	N
F1206VH6000TM	6.0	48V	80A@48VDC 100A@32VDC	0.011	13.0	+
F1206VH7000TM	7.0			0.009	19.0	-
F1206VH8000TM	8.0			0.007	20.0	=

1. Measured at ≤ 10% rated current and 25°C ambient.
2. Melting I<sup>2</sup>t at 10 times of rated current.
3. Blue Marking Character Code.

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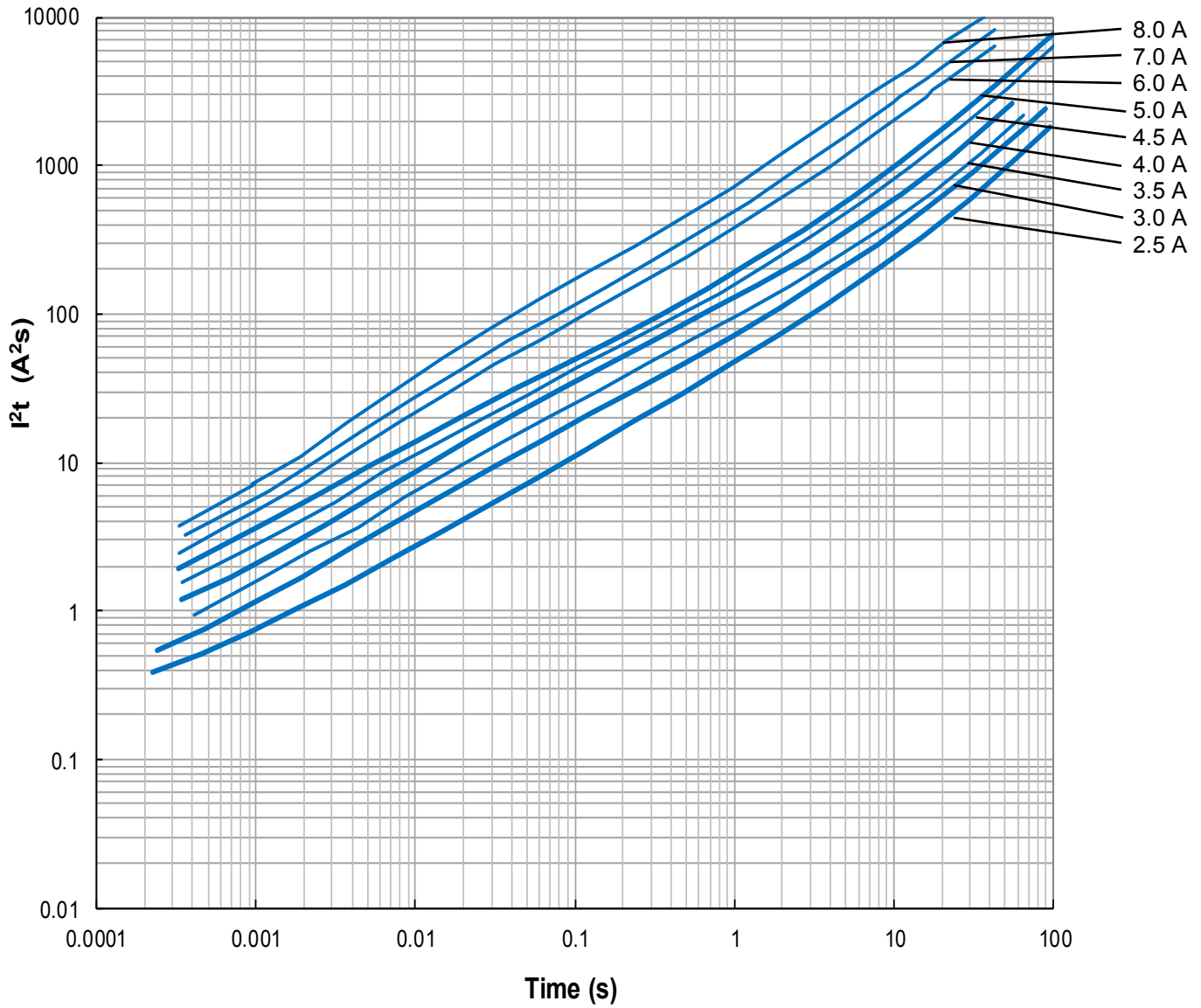
### Average Pre-arcing Time Curves:



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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)

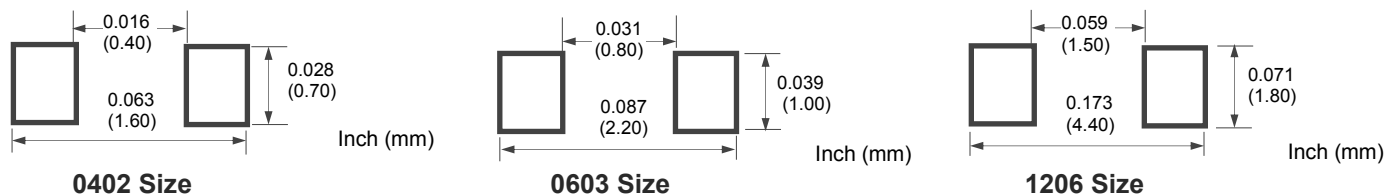
- (1) **Product Code:** F—Chip Fuse
- (2) **Size Code:** Standard EIA Chip Sizes
- (3) **Series Code:** FA - Fast Acting, SB - Slow Blow,  
HI - High Inrush, FF - Very Fast Acting, HB - High Current
- (4) **Current Rating Code:** 1000 - 1000 mA (For HB, 10 - 10A)
- (5) **Voltage Rating Code:** V032 - 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.

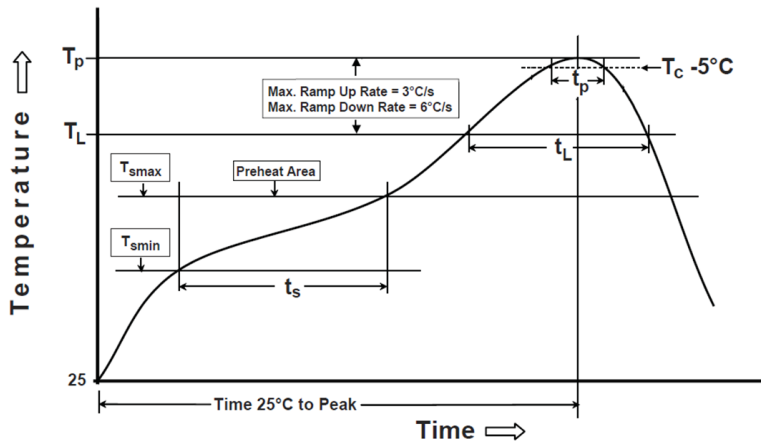
Temperature De-Rating Curve for SolidMatrix Fuses



## SolidMatrix® Surface Mount Fuses

### Soldering Temperature Profile:

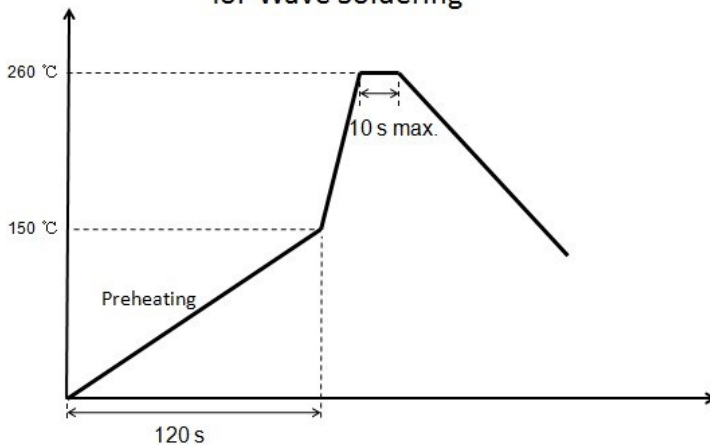
\* Recommended Temperature Profile for Reflow Soldering



Profile Feature	Pb-Free Assembly
<b>Preheat/Soak</b> 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