

## SolidMatrix® Surface Mount Fuses

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



#### Features:

- Very fast acting at 200% and 300% overloads
- Excellent inrush current withstanding capability at high overloads
- Thin body for space limiting applications
- Glass 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 +150°C (with de-rating)

#### Clearing Time Characteristics:

% of Current Rating	Clearing Time at 25°C	
100%	4 hours min.	
200%	0.01 seconds min.	5 seconds max.
300%	0.001 seconds min.	0.2 seconds max.

#### Agency Approval:

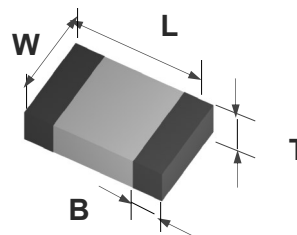
Recognized Under the Components Program of UL.  
File Number: E232989.

#### Patents:

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

#### Shape and Dimensions:

Unit	Inch	mm
<b>L</b>	0.063 ± 0.006	1.60 ± 0.15
<b>W</b>	0.031 ± 0.006	0.80 ± 0.15
<b>T</b>	0.012 + 0.007 / -0.003	0.30 + 0.18 / -0.08
<b>B</b>	0.014 ± 0.006	0.36 ± 0.15



#### 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 (Optional) <sup>3</sup>
F0603FF0500V032TM	0.5	32	50 A at rated voltage	1.000	0.0093	C
F0603FF0750V032TM	0.75	32		0.450	0.0191	D
F0603FF1000V032TM	1.0	32		0.280	0.036	E
F0603FF1250V032TM	1.25	32	35 A at rated voltage	0.205	0.063	F
F0603FF1500V032TM	1.5	32		0.143	0.095	G
F0603FF1750V032TM	1.75	32		0.095	0.14	H
F0603FF2000V032TM	2.0	32		0.073	0.21	I
F0603FF2500V032TM	2.5	32		0.046	0.30	J
F0603FF3000V032TM	3.0	32		0.039	0.46	K
F0603FF3500V032TM	3.5	32		0.028	0.73	L
F0603FF4000V032TM	4.0	32		0.023	1.15	M
F0603FF4500V032TM	4.5	32		0.019	1.68	T
F0603FF5000V032TM	5.0	32		0.015	2.62	N

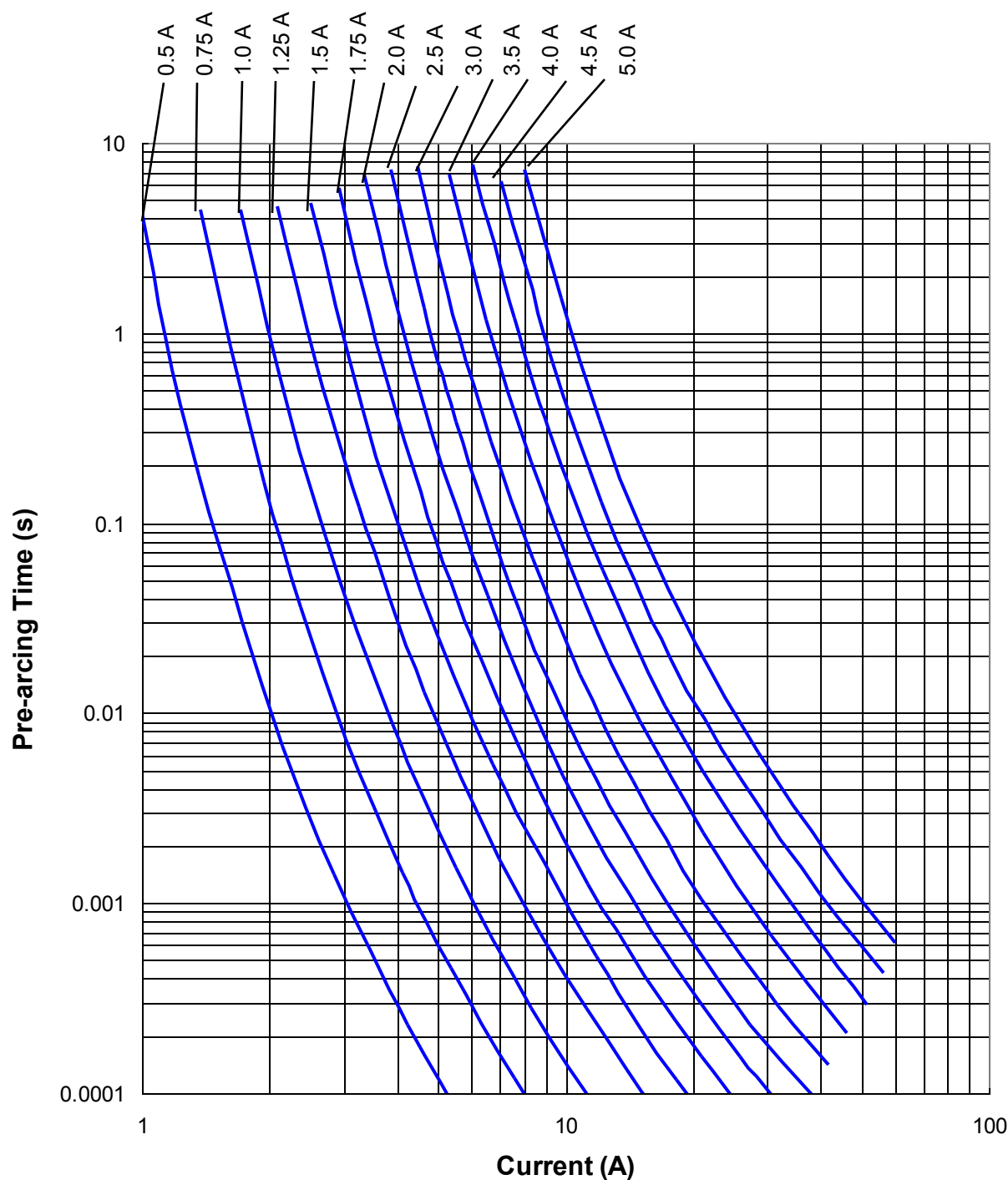
1. Measured at ≤ 10% rated current and 25°C ambient.

2. Melting I<sup>2</sup>t at 0.001 second pre-arcing time.

3. Blue Marking Character Code.

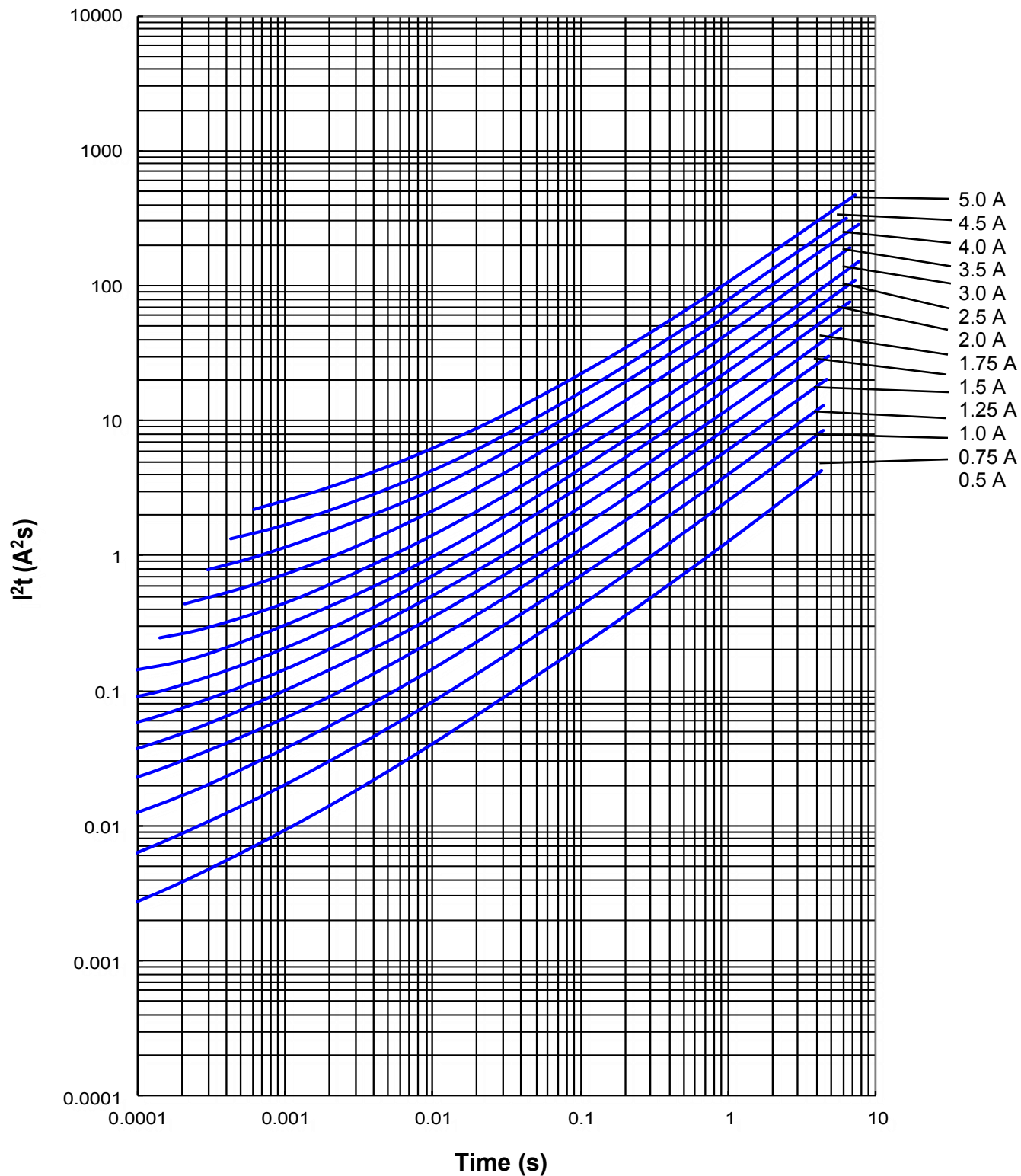
# SolidMatrix® Surface Mount Fuses FF Series (Very Fast Acting), 0603 Size

## Average Pre-arcing Time Curves:



# SolidMatrix<sup>®</sup> Surface Mount Fuses FF Series (Very Fast Acting), 0603 Size

## 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)

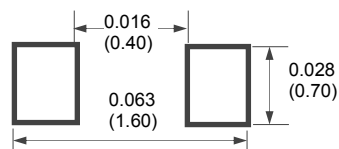
- (1) **Product Code:** F—Chip Fuse
- (2) **Size Code:** Standard EIA Chip Sizes
- (3) **Series Code:** FA - Fast Acting, SB - Slow Blow, HI - High Inrush, FF - Very Fast Acting, HB - High Current
- (4) **Current Rating Code:** 1000 - 1000 mA (For HB, 10 - 10A)
- (5) **Voltage Rating Code:** V032 - 32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

**F 1206 HC 20A0 T M**

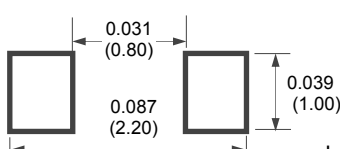
(1) (2) (3) (4) (5) (6)

- (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

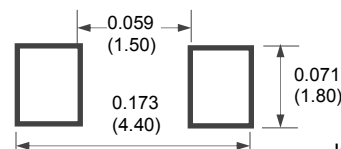
### Recommended Land Pattern:



**0402 Size**



**0603 Size**



**1206 Size**

### 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:

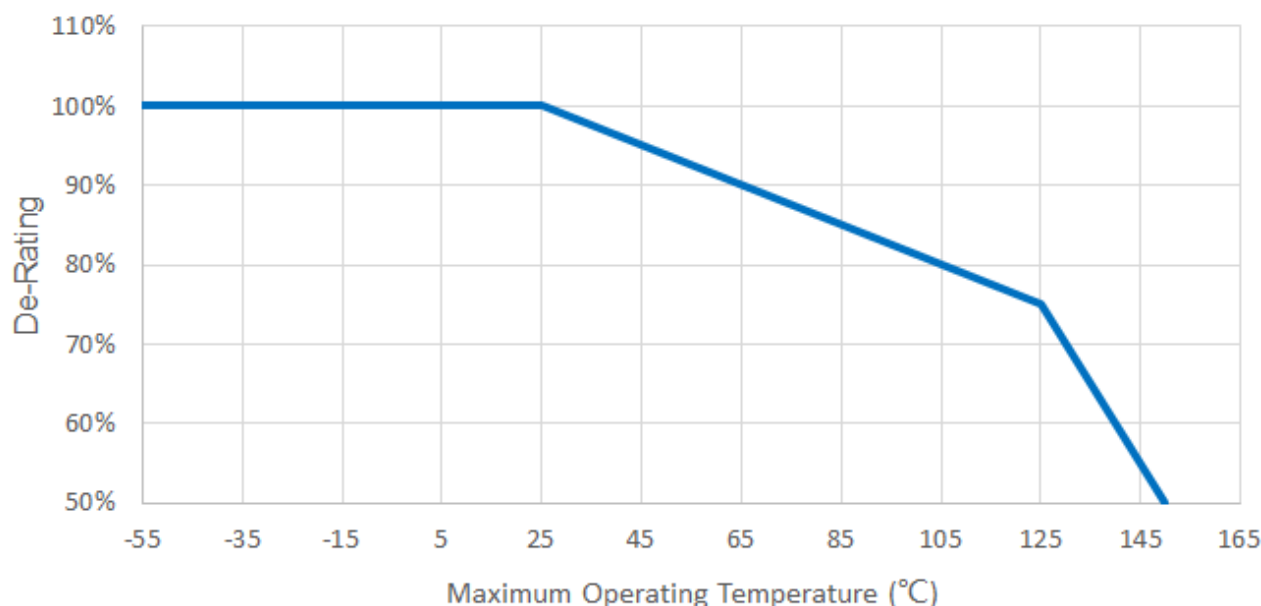
The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25°C, the fuse shall be “de-rated”.

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.

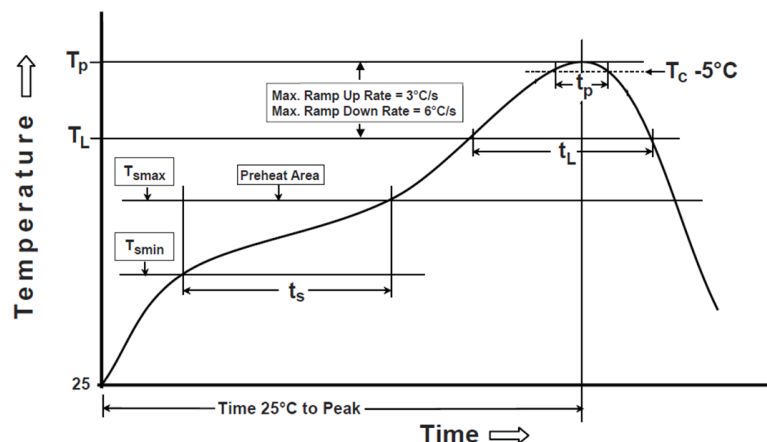
Temperature De-Rating Curve for SolidMatrix Fuses



## SolidMatrix® Surface Mount Fuses

### Soldering Temperature Profile:

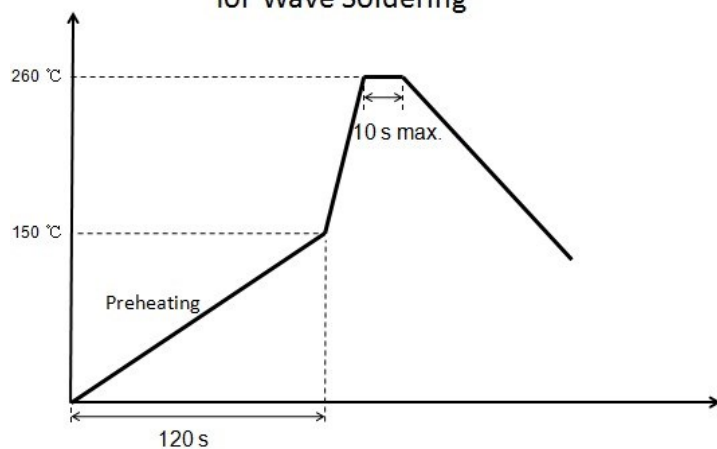
\* Recommended Temperature Profile for Reflow Soldering



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

## Disclaimer

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