

## Automotive Surface Mount Fuses

### Quick Index:

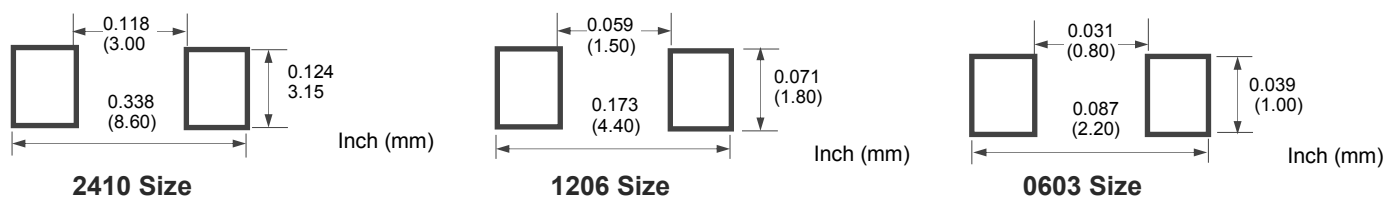
Series	Size	Current Rating (A)	Voltage Rating	Page
QA2410F	2410	0.5, 0.63, 0.75, 1.0, 1.5, 2.0	250VAC/125VDC	5
		2.5, 3.0, 3.15, 3.5, 4.0, 5.0, 6.3, 7.0, 8.0, 10.0	125VDC	
		12.0, 15.0, 20.0	65VDC	
QA1206F	1206	1.5, 1.6, 2.0, 2.5, 3.0, 3.15, 3.5, 4.0	65VDC	8
		5.0, 6.3, 7.0, 8.0, 10.0, 12.0, 15.0	32VDC	
QF1206F	1206	0.5, 0.75, 1.0, 1.5, 1.75, 2.0	63VDC	11
		2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0	32VDC	
QF0603F	0603	0.5, 0.75, 1.0, 1.5	63VDC	14
		2.0, 2.5, 3.0, 3.5, 4.0, 5.0	32VDC	
		6.0	24VDC	
QF1206H	1206	1.0, 1.5, 2.0	63VDC	17
		2.5, 3.0, 3.5, 4.0, 4.5, 5.0	32VDC	
		6.0, 7.0, 8.0	24VDC	
QF0603H	0603	1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 6.0, 7.0, 8.0	32VDC	20

### Product Identification:

**Q A 1206 F 2A00 T**  
 (1) (2) (3) (4) (5) (6)

- (1) Product type code: Q- Automotive fuse
- (2) Product code: A-AirMatrix Chip Fuse, F-SolidMatrix Chip Fuse
- (3) Dimension code: L x W (inch)  
 The first two digits - L (length)  
 The last two digits - W (width)
- (4) Characteristic code: F-fast acting, H-Slow Blow
- (5) Current rating code: 2A00-2.0A
- (6) Package code:  
 T – Tape and Reel  
 B – Bulk

### Recommended Land Pattern:



## Automotive Surface Mount Fuses

### Fuse Selection and Temperature De-rating Guideline:

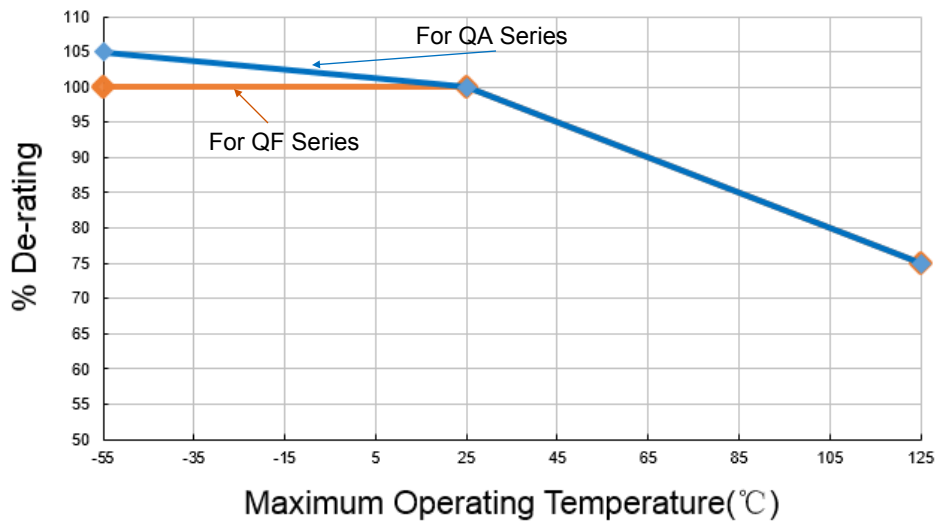
The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25°C, the fuse shall be “de-rated”.

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 Effect On Current Rating



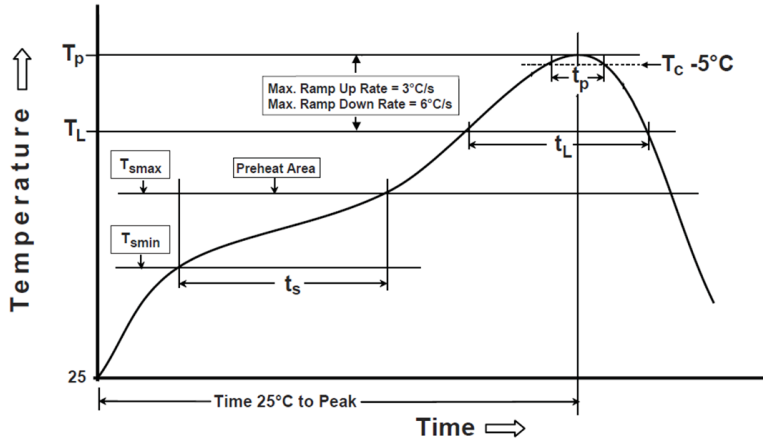
### Packaging:

Chip Size	Parts on 7 inch (178 mm) Reel
0603 (1608)	4,000
1206 (3216) (For QA1206F Series)	3,500
1206 (3216)	3,000
2410	2,000

# Automotive Surface Mount Fuses

## Soldering Temperature Profile:

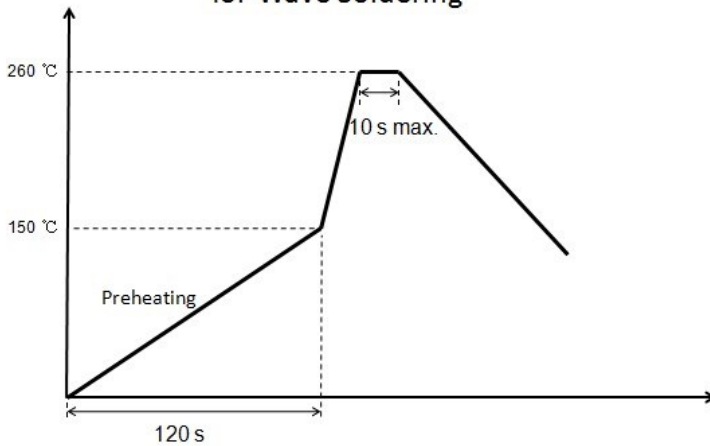
\* Recommended Temperature Profile for Reflow Soldering



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.

## AirMatrix<sup>®</sup> Automotive Surface Mount Fuses

### QA2410F Series



#### Features:

- AEC-Q200 qualified
- Fast acting at 200% overload current level
- Excellent inrush current withstanding capability
- Fiberglass enforced epoxy fuse body
- Copper or copper alloy composite fuse link
- Copper termination with nickel and tin plating
- Halogen free, RoHS compliant and 100% lead-free
- Operating temperature range: -55°C to +125°C (with de-rating)
- 100% lead-free

#### Clearing Time Characteristics:

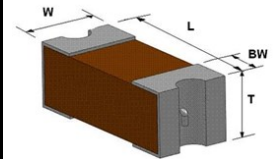
% of current rating	Clearing time at 25°C	
	Min.	Max.
100%	4 hours	
200% (0.50-10.0A)	0.01 second	5 seconds
200%	0.01 second	20 seconds

#### Agency Approval:

Agency	File NO.
UL	E232989

#### Shape and Dimensions:

Unit	Inch	mm
L	0.240 ± 0.006	6.10 ± 0.15
W	0.098 ± 0.006	2.49 ± 0.15
T	0.085 ± 0.008	2.16 ± 0.20
B	0.053 ± 0.015	1.35 ± 0.38



#### Ordering Information:

Part Number	Current Rating (A)	Voltage Rating	Interrupting Ratings	Nominal Cold DCR (Ω) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking Code <sup>3</sup>
QA2410FA500T	0.50	250VAC 125VDC	0.5-2A: 100A @ 250VAC	0.225	0.1	C
QA2410FA630T	0.63			0.170	0.16	S
QA2410FA750T	0.75			0.143	0.23	D
QA2410F1A00T	1.00			0.093	0.59	E
QA2410F1A25T	1.25			0.070	0.96	F
QA2410F1A50T	1.50			0.060	1.19	G
QA2410F2A00T	2.00			0.042	2.75	I
QA2410F2A50T	2.50	125VDC	0.5-10A: 50A @ 125VDC 300A @ 32VDC	0.031	1.21	J
QA2410F3A00T	3.00			0.0249	1.73	K
QA2410F3A15T	3.15			0.0230	2.2	V
QA2410F3A50T	3.50			0.0210	2.5	L
QA2410F4A00T	4.00			0.0175	3.3	M
QA2410F5A00T	5.00			0.0146	5.9	N
QA2410F6A30T	6.30			0.0100	12.5	O
QA2410F7A00T	7.00			0.0097	14.2	P
QA2410F8A00T	8.00			0.0085	16.5	R
QA2410F10A0T	10.0			0.0068	29.2	Q
QA2410F12A0T	12.0	65VDC	20.0A: 100A @ 65VDC 300A @ 32VDC	0.0053	39.3	X
QA2410F15A0T	15.0			0.0037	102.5	Y
QA2410F20A0T	20.0			0.0029	126.2	Z

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

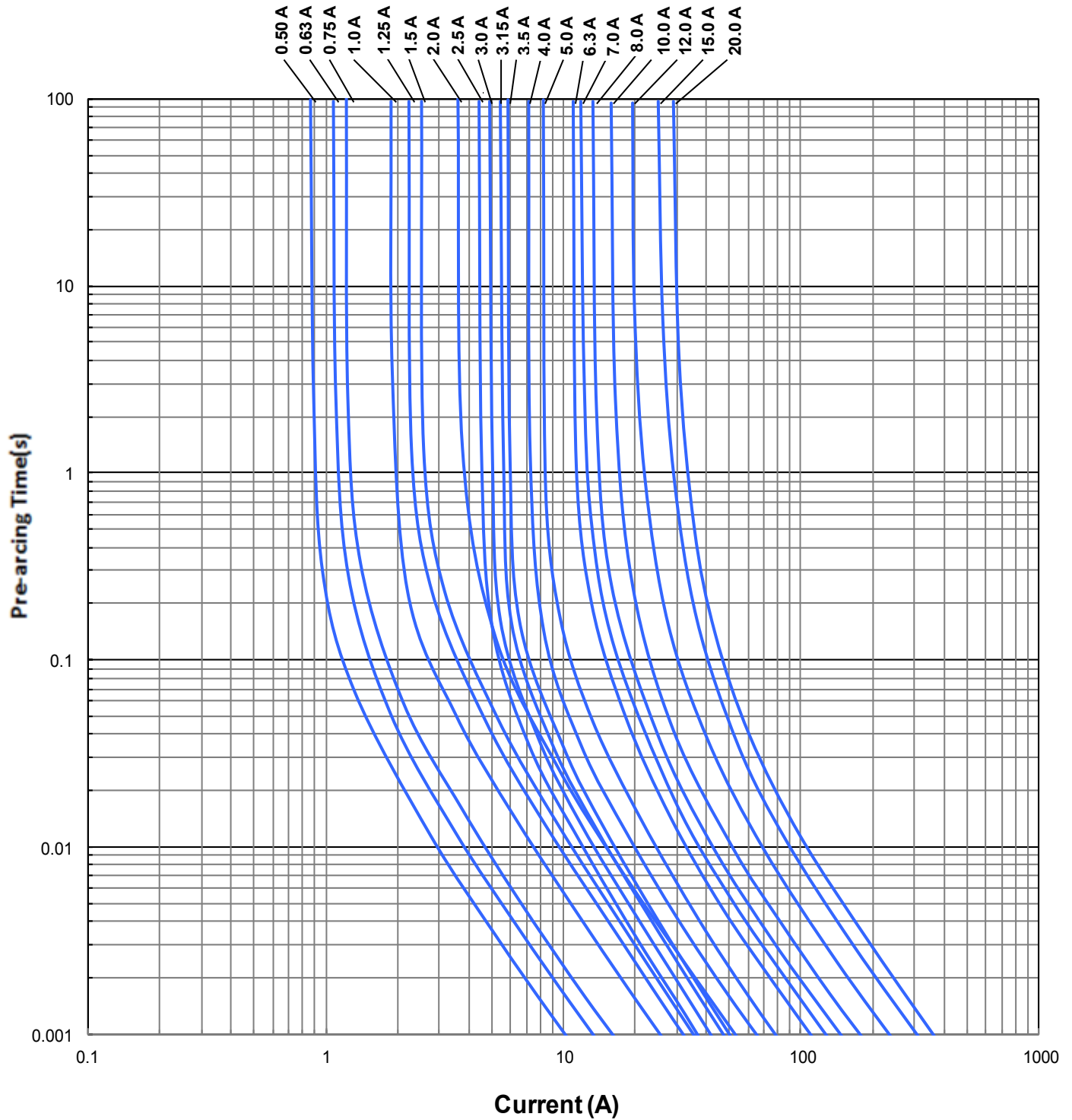
 2. Melting I<sup>2</sup>t at 0.001 second pre-arcing time.

3. Blue Marking Character Code.

# AirMatrix<sup>®</sup> Automotive Surface Mount Fuses

## QA2410F Series

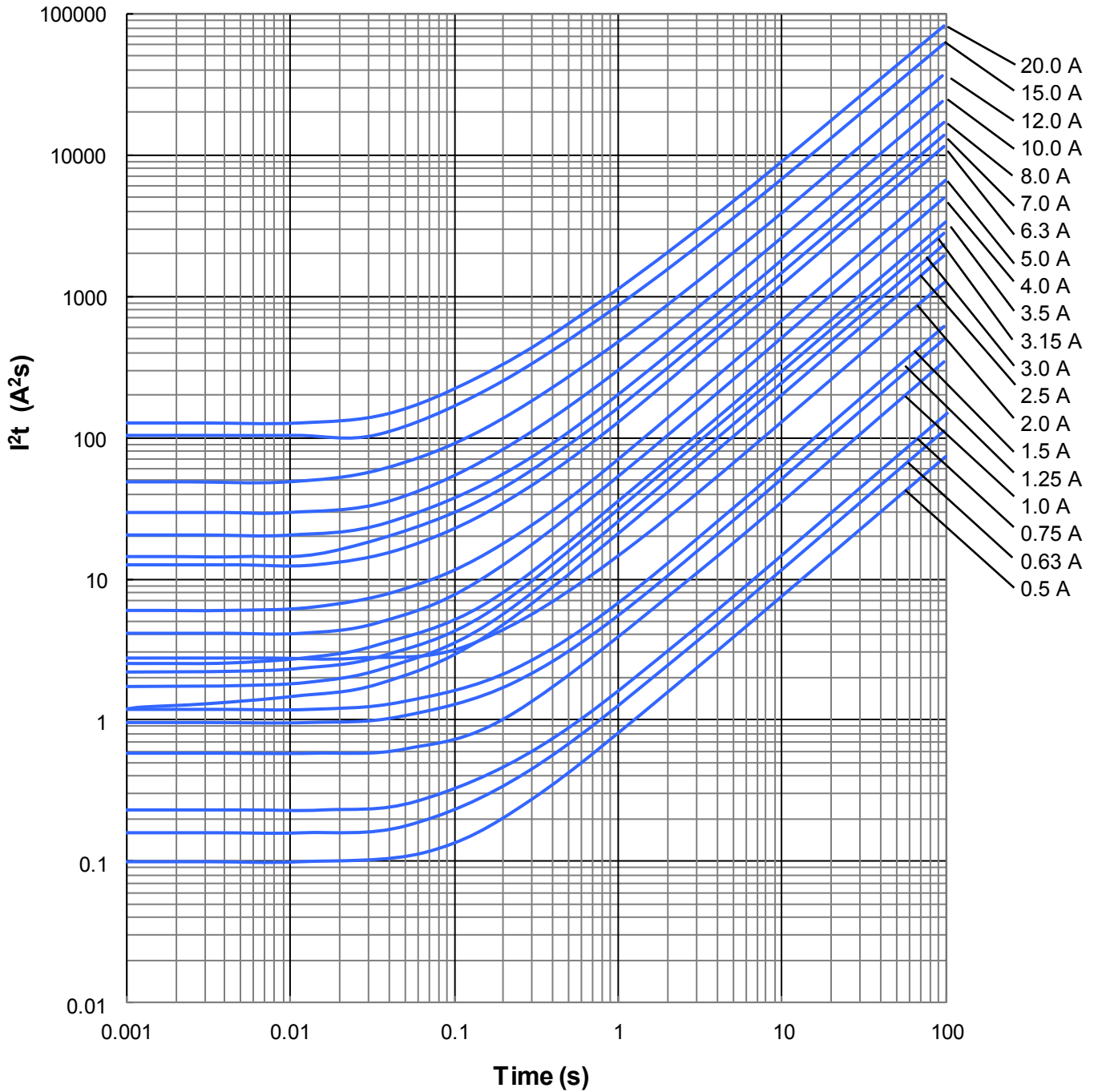
### Average Pre-arcing Time Curves:



# AirMatrix<sup>®</sup> Automotive Surface Mount Fuses

## QA2410F Series

### Average $I^2t$ vs. $t$ Curves:



## AirMatrix<sup>®</sup> Automotive Surface Mount Fuses

### QA1206F Series



#### Features:

- AEC-Q200 qualified
- Fast acting at 250% overload current level
- Excellent inrush current withstanding capability
- Extremely thin body for space saving
- Fiberglass enforced epoxy fuse body
- Copper or copper alloy composite fuse link
- Copper termination with nickel and tin plating
- Halogen free, RoHS compliant and 100% lead-free
- Operating temperature range: -55°C to +125°C (with de-rating)
- 100% lead-free

#### Clearing Time Characteristics:

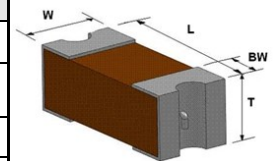
% of current rating	Clearing time at 25°C	
	Min.	Max.
100%	4 hours	
250%		5 seconds

#### Agency Approval:

Agency	File NO.
UL	E232989

#### Shape and Dimensions:

Unit	Inch	mm
L	0.126 ± 0.008	3.20 ± 0.20
W	0.063 + 0.012 / -0.004	1.60 + 0.30 / -0.10
T	0.042 ± 0.006	1.08 ± 0.15
B	0.033 ± 0.012	0.85 ± 0.30



#### 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 Code <sup>3</sup>
QA1206F1A50T	1.50	65	50 A @ 65VDC	0.050	0.37	G
QA1206F1A60T	1.60			0.043	0.52	T
QA1206F2A00T	2.00			0.032	0.88	I
QA1206F2A50T	2.50			0.028	1.1	J
QA1206F3A00T	3.00			0.0224	1.9	K
QA1206F3A15T	3.15			0.0203	2.2	V
QA1206F3A50T	3.50			0.0180	2.6	L
QA1206F4A00T	4.00			0.0161	3.3	M
QA1206F5A00T	5.00	32	50 A @ 32VDC	0.0129	5.4	N
QA1206F6A30T	6.30			0.0100	8.9	O
QA1206F7A00T	7.00			0.0094	10.4	P
QA1206F8A00T	8.00			0.0084	13.5	R
QA1206F10A0T	10.0			0.0050	11.2	Q
QA1206F12A0T	12.0			0.0041	15.0	X
QA1206F15A0T	15.0			0.0035	24.5	Y

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

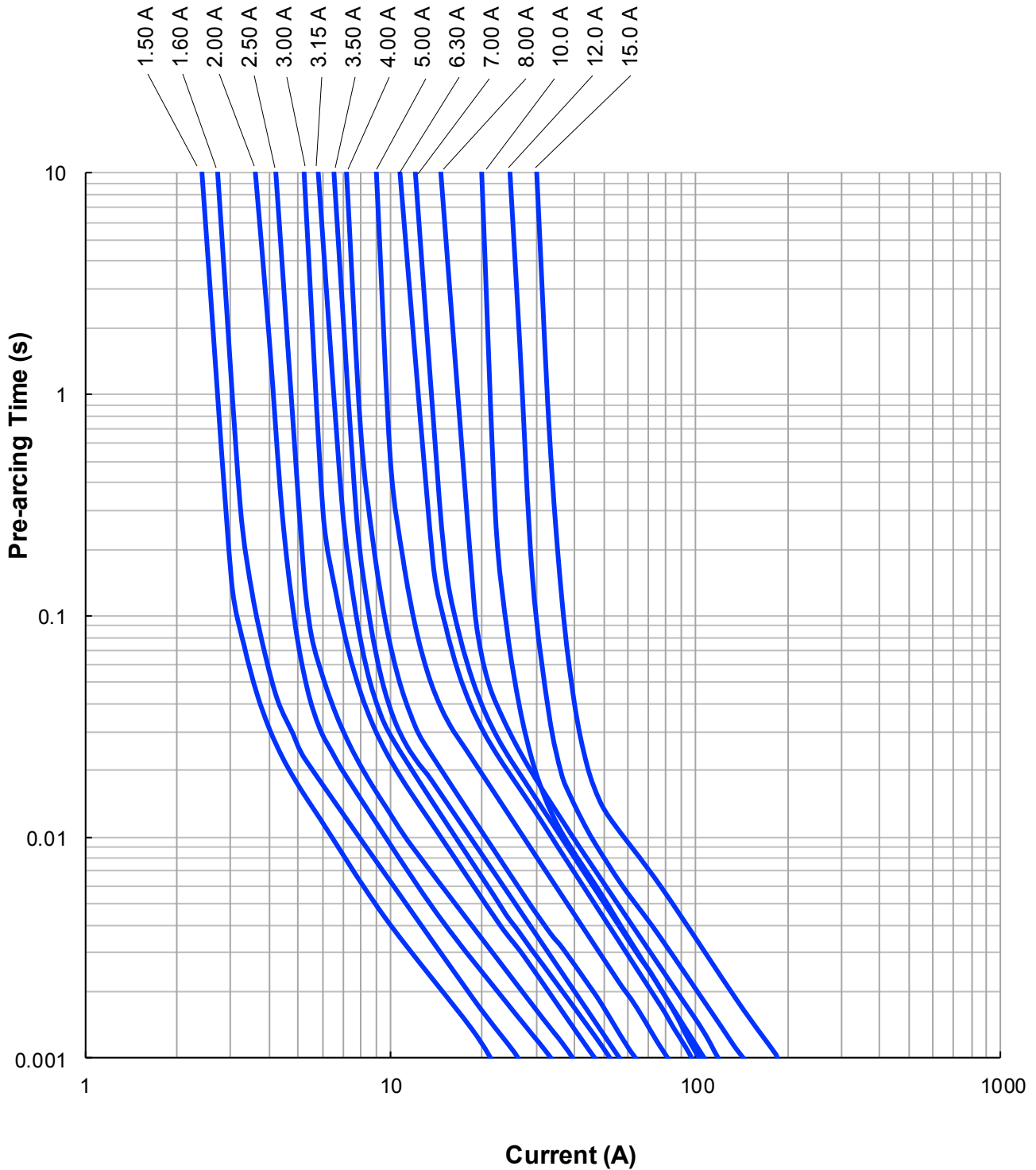
 2. Melting I<sup>2</sup>t at 0.001 second pre-arcing time.

3. Blue Marking Character Code.

# AirMatrix<sup>®</sup> Automotive Surface Mount Fuses

## QA1206F Series

### Average Pre-arcing Time Curves:

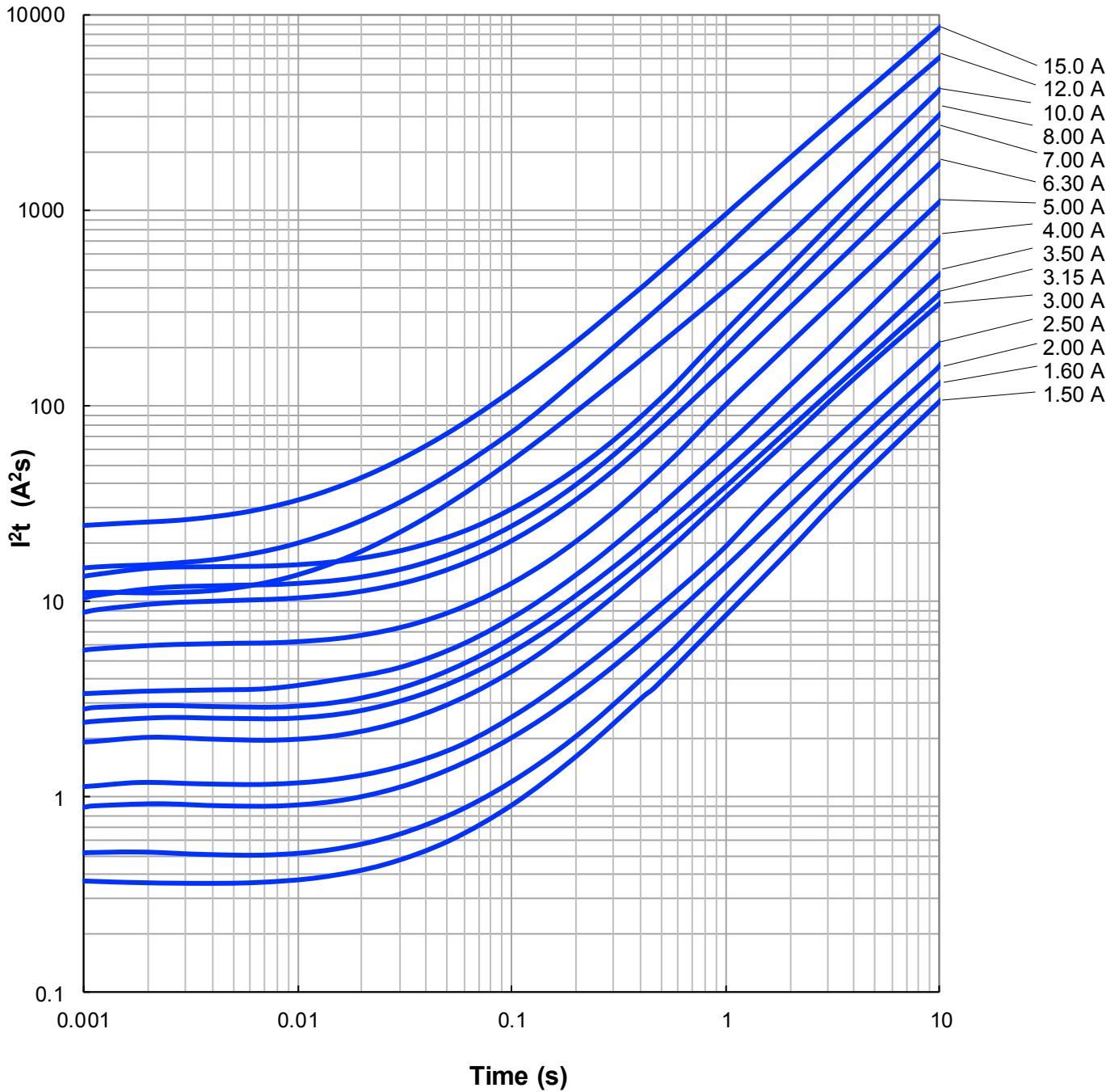




# AirMatrix<sup>®</sup> Automotive Surface Mount Fuses

## QA1206F Series

### Average $I^2t$ vs. $t$ Curves:



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

### QF1206F Series



#### Features:

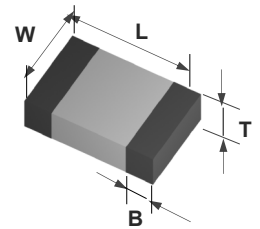
- AEC-Q200 qualified
- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C (with de-rating)

#### Clearing Time Characteristics:

% of current rating	Clearing time at 25°C	
	Min.	Max.
100%	4 hours	
250%		5 seconds
400%		0.05 second

#### Shape and Dimensions:

Unit	Inch	mm
L	0.126 ± 0.008	3.20 ± 0.20
W	0.063 ± 0.008	1.60 ± 0.20
T	0.033 ± 0.008	0.85 ± 0.20
B	0.020 ± 0.010	0.51 ± 0.25



#### Agency Approval:

Agency	File NO.
UL	E232989

#### Ordering Information:

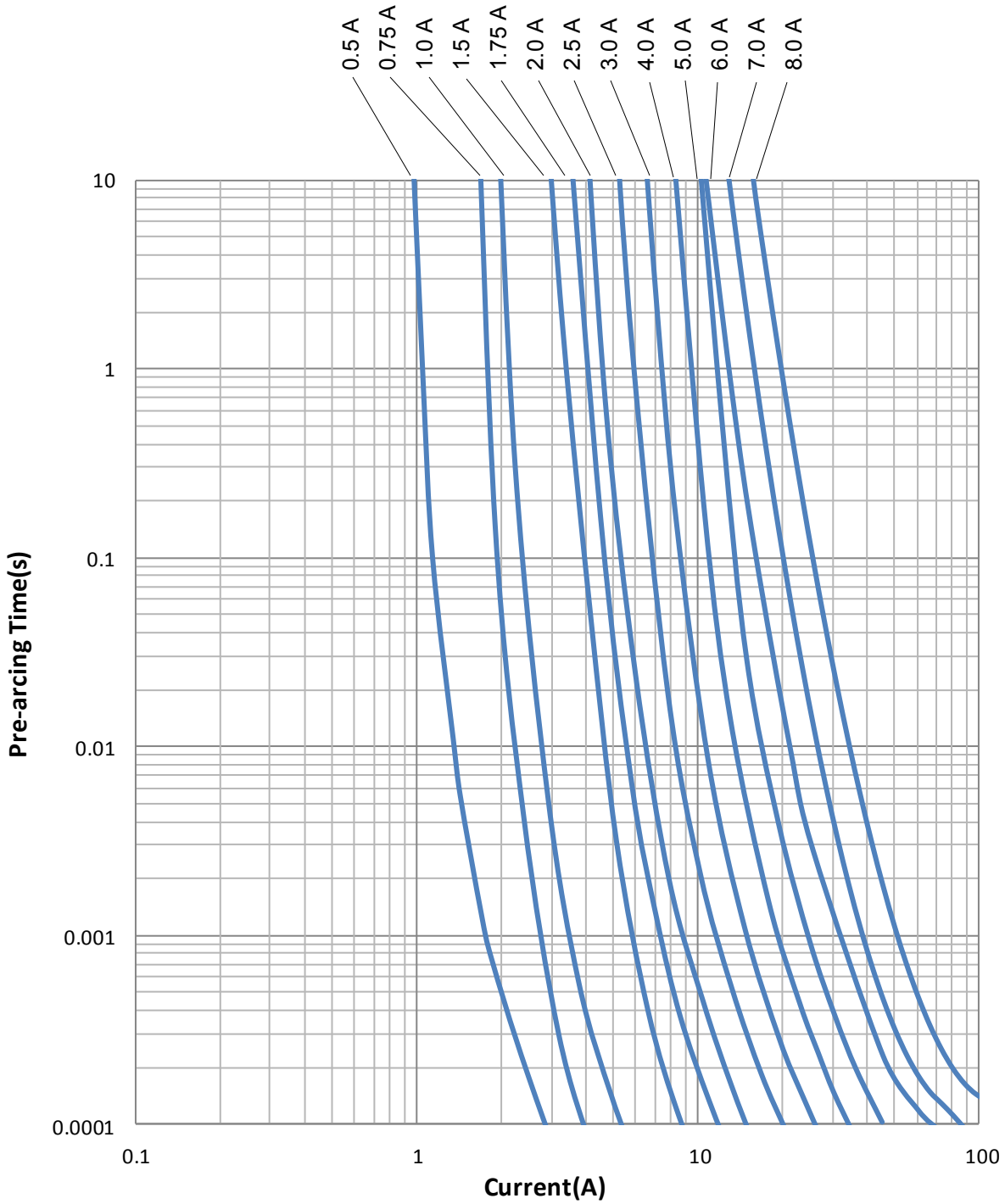
Part Number	Current Rating (A)	Voltage Rating (VDC)	Interrupting Ratings	Nominal Cold DCR ( $\Omega$ ) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking Code <sup>3</sup>
QF1206FA500T	0.5	63	50A @ 63VDC	0.780	0.003	C
QF1206FA750T	0.75			0.530	0.008	D
QF1206F1A00T	1.0			0.250	0.012	E
QF1206F1A50T	1.5			0.110	0.026	G
QF1206F1A75T	1.75			0.098	0.046	H
QF1206F2A00T	2.0			0.054	0.076	I
QF1206F2A50T	2.5	32	50A @ 32VDC	0.040	0.115	J
QF1206F3A00T	3.0		0.036	0.220	K	
QF1206F4A00T	4.0		45A @ 32VDC	0.022	0.360	M
QF1206F5A00T	5.0		0.015	0.620	N	
QF1206F6A00T	6.0		50A @ 32VDC	0.013	0.850	+
QF1206F7A00T	7.0			0.011	1.030	-
QF1206F8A00T	8.0			0.008	2.040	=

1. Measured at  $\leq 10\%$  rated current and 25°C ambient.
2. Melting I<sup>2</sup>t at 0.001 second pre-arcing time.
3. Black Marking Character Code.

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

## QF1206F Series

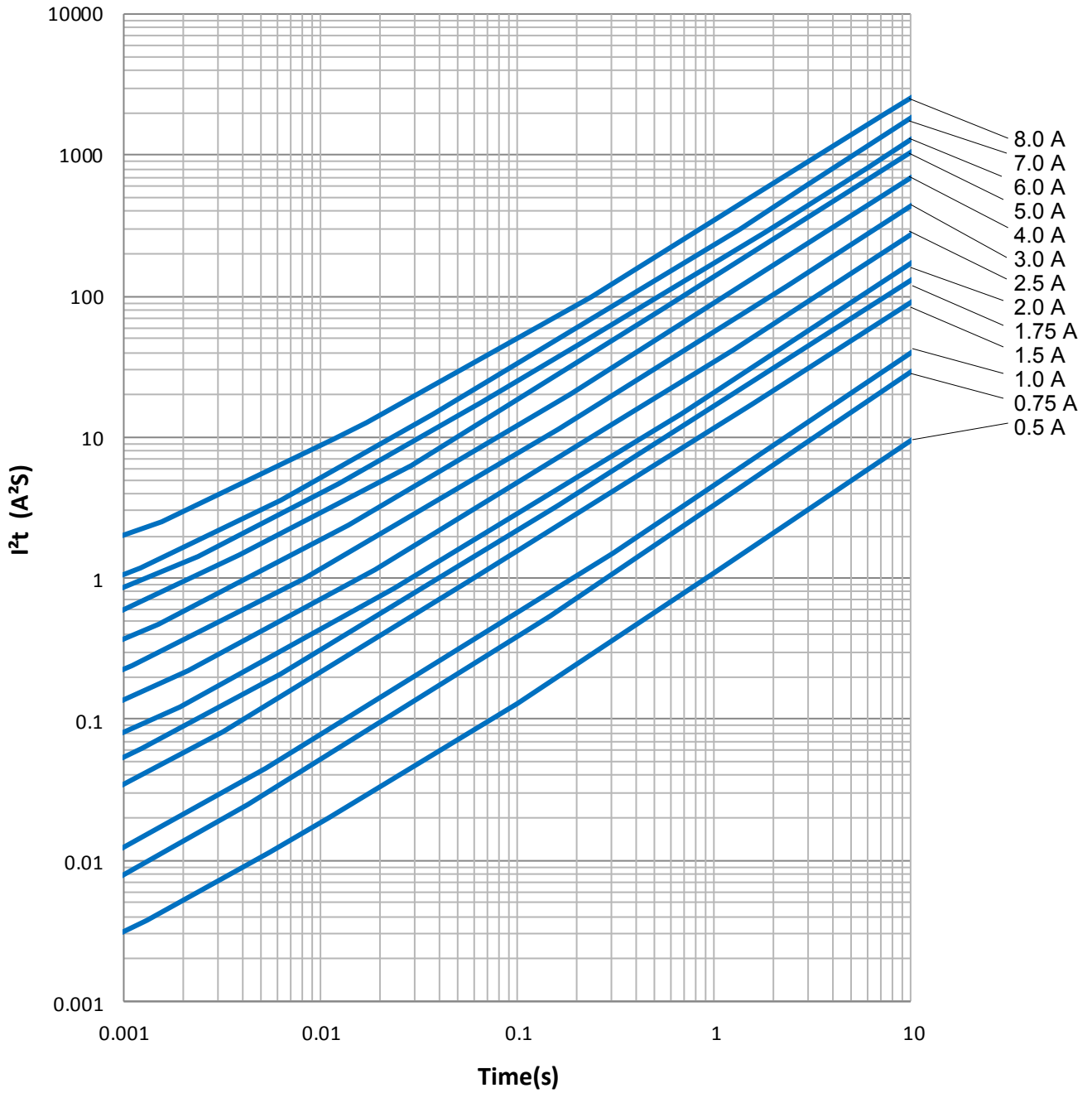
### Average Pre-arcing Time Curves:



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

## QF1206F Series

### Average $I^2t$ vs. $t$ Curves:



## SolidMatrix® Automotive Surface Mount Fuses

### QF0603F Series



#### Features:

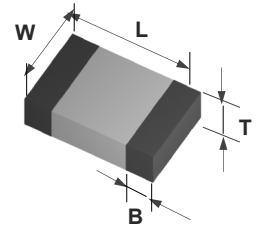
- AEC-Q200 qualified
- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C (with de-rating)

#### Clearing Time Characteristics:

% of current rating	Clearing time at 25°C	
	Min.	Max.
100%	4 hours	
250%		5 seconds
400%		0.05 second

#### 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:

Agency	File NO.
UL	E232989

#### Ordering Information:

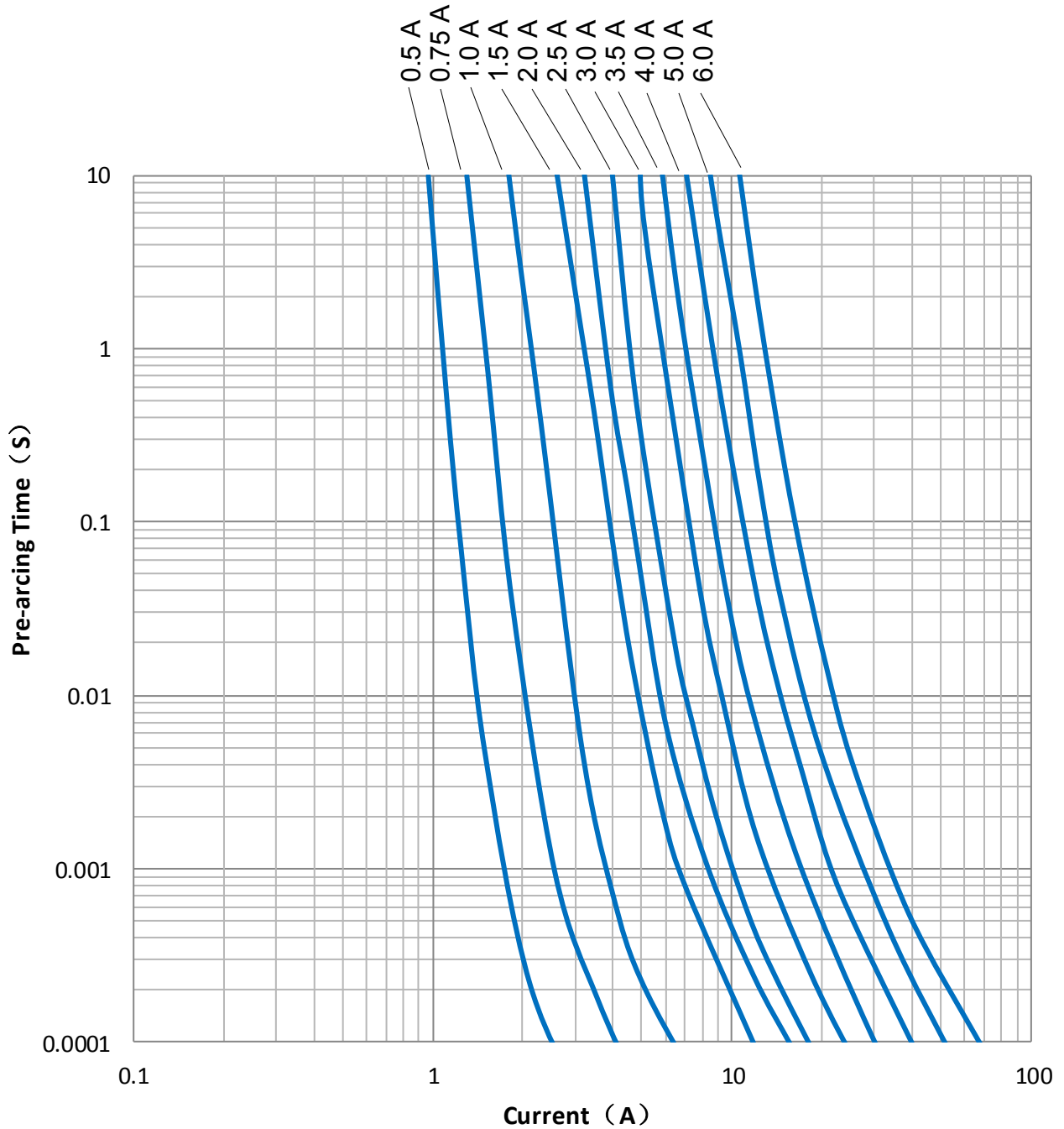
Part Number	Current Rating (A)	Voltage Rating (VDC)	Interrupting Ratings	Nominal Cold DCR (Ω) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking Code <sup>3</sup>
QF0603FA500T	0.5	63	35A @ 63VDC	0.500	0.0031	C
QF0603FA750T	0.75			0.270	0.0062	D
QF0603F1A00T	1.0			0.150	0.0132	E
QF0603F1A50T	1.5			0.063	0.043	G
QF0603F2A00T	2.0	32	35A @ 32VDC	0.044	0.070	I
QF0603F2A50T	2.5			0.034	0.103	J
QF0603F3A00T	3.0			0.025	0.183	K
QF0603F3A50T	3.5			0.024	0.306	L
QF0603F4A00T	4.0			0.019	0.508	M
QF0603F5A00T	5.0			0.013	0.810	N
QF0603F6A00T	6.0	24	35A @ 24VDC	0.010	1.120	O

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. Black Marking Character Code.

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

## QF0603F Series

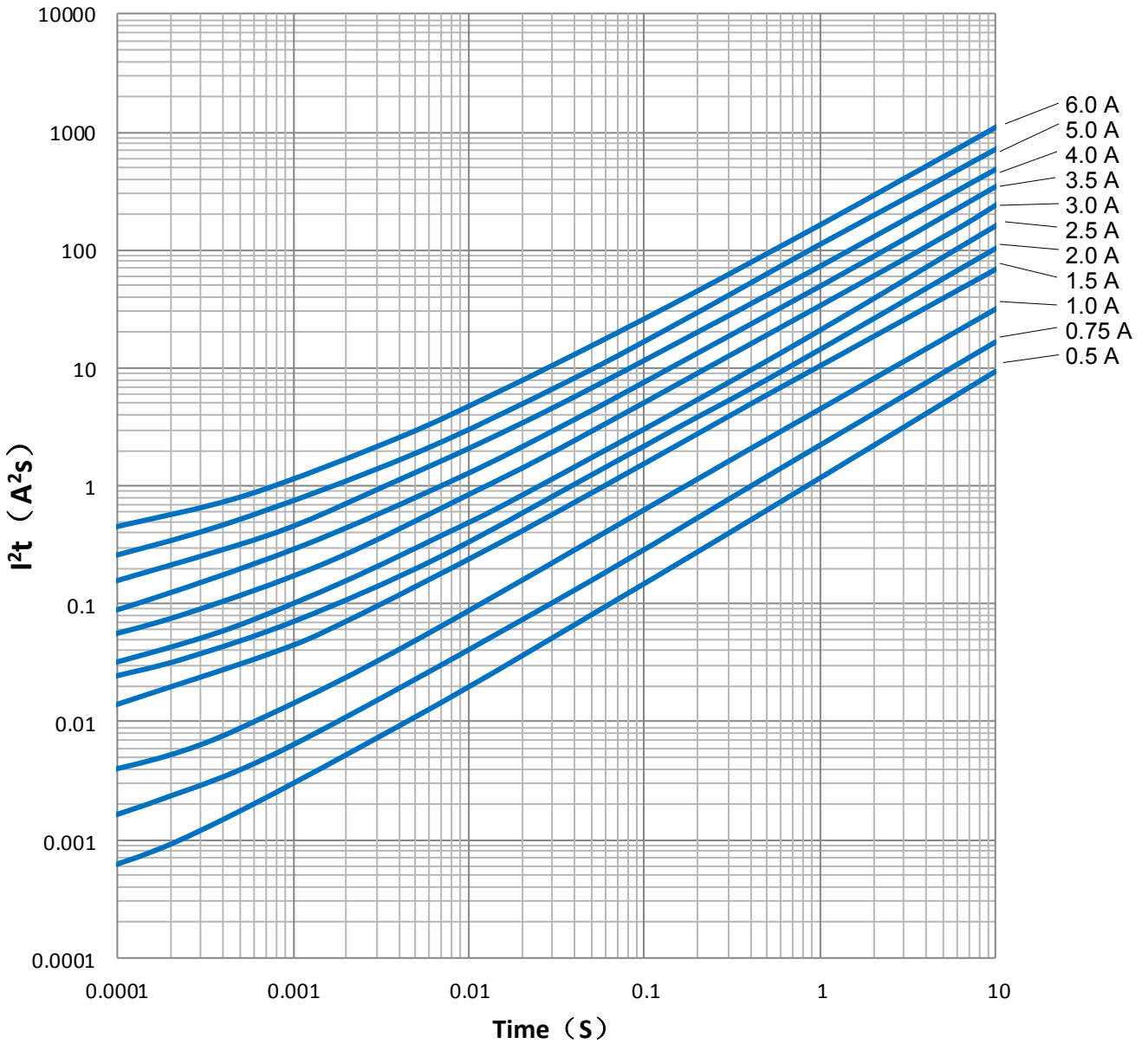
### Average Pre-arcing Time Curves:



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

## QF0603F Series

### Average $I^2t$ vs. $t$ Curves:



# SolidMatrix® Automotive Surface Mount Fuses

## QF1206H Series



### Features:

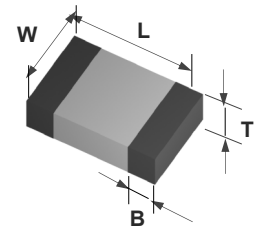
- AEC-Q200 qualified
- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- High inrush melting energy (high I<sup>2</sup>t)
- Operating temperature range: -55°C to +125°C (with de-rating)

### Clearing Time Characteristics:

% of current rating	Clearing time at 25°C	
	Min.	Max.
100%	4 hours	
200%	1 second	60 seconds

### Shape and Dimensions:

Unit	Inch	mm
L	0.126 ± 0.008	3.20 ± 0.20
W	0.063 ± 0.008	1.60 ± 0.20
T	0.038 ± 0.008	0.97 ± 0.20
B	0.020 ± 0.010	0.51 ± 0.25



### Agency Approval:

Agency	File NO.
UL	E232989

### Ordering Information:

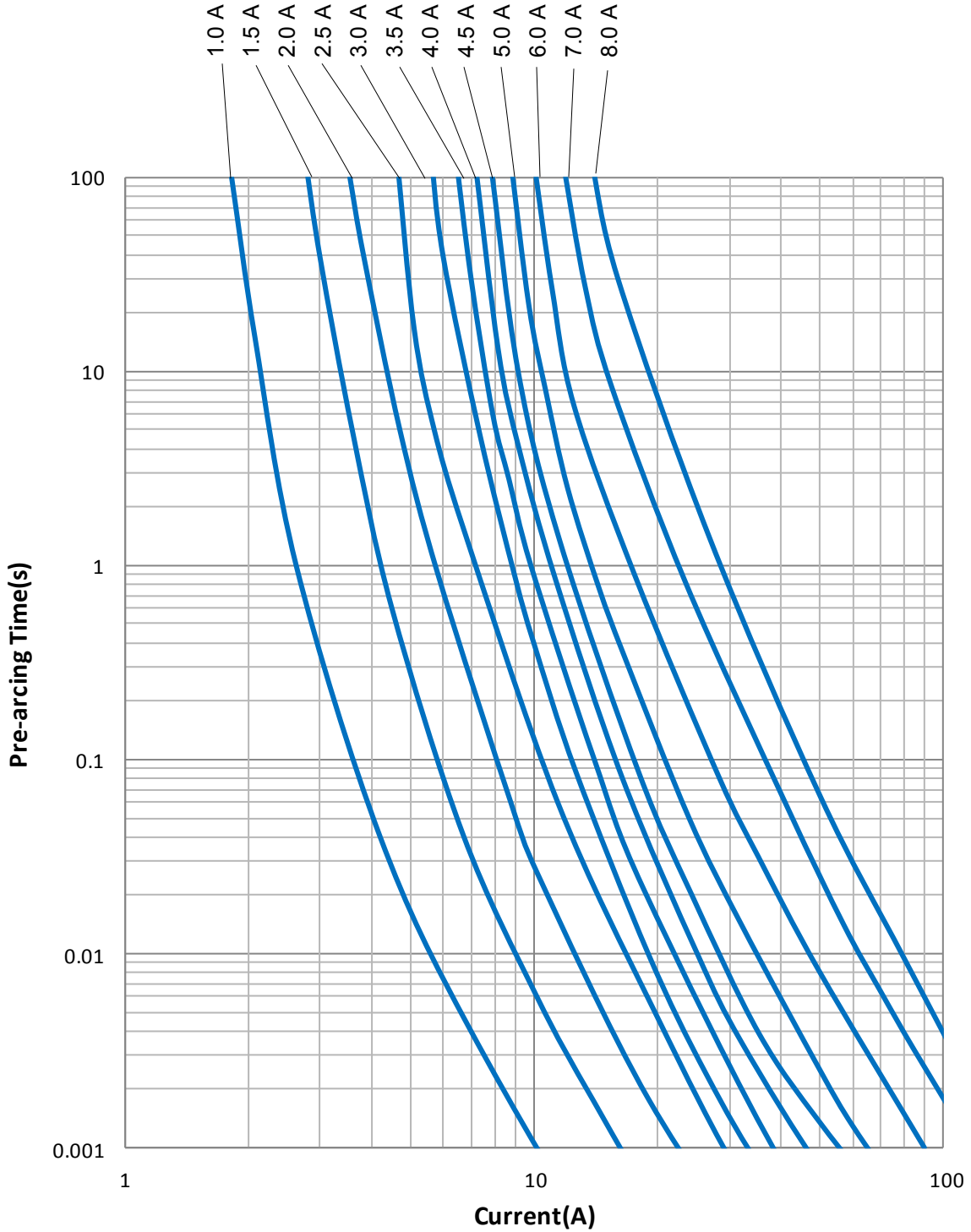
Part Number	Current Rating (A)	Voltage Rating (VDC)	Interrupting Ratings	Nominal Cold DCR (Ω) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking Code <sup>3</sup>
QF1206H1A00T	1.0	63	50A @ 63VDC	0.370	0.112	E
QF1206H1A50T	1.5			0.165	0.336	G
QF1206H2A00T	2.0			0.089	0.820	I
QF1206H2A50T	2.5	32	50A @ 32VDC	0.067	1.210	J
QF1206H3A00T	3.0			0.039	1.360	K
QF1206H3A50T	3.5			0.030	1.890	L
QF1206H4A00T	4.0			0.025	2.780	M
QF1206H4A50T	4.5			0.023	3.250	T
QF1206H5A00T	5.0			0.020	7.500	N
QF1206H6A00T	6.0	24	80A @ 24VDC	0.013	12.80	O
QF1206H7A00T	7.0			0.010	30.50	P
QF1206H8A00T	8.0			0.009	61.20	R

1. Measured at ≤ 10% rated current and 25°C ambient.
2. Melting I<sup>2</sup>t at 1000% of current rating.
3. Green Marking Character Code.



**SolidMatrix<sup>®</sup> Automotive Surface Mount Fuses**  
**QF1206H Series**

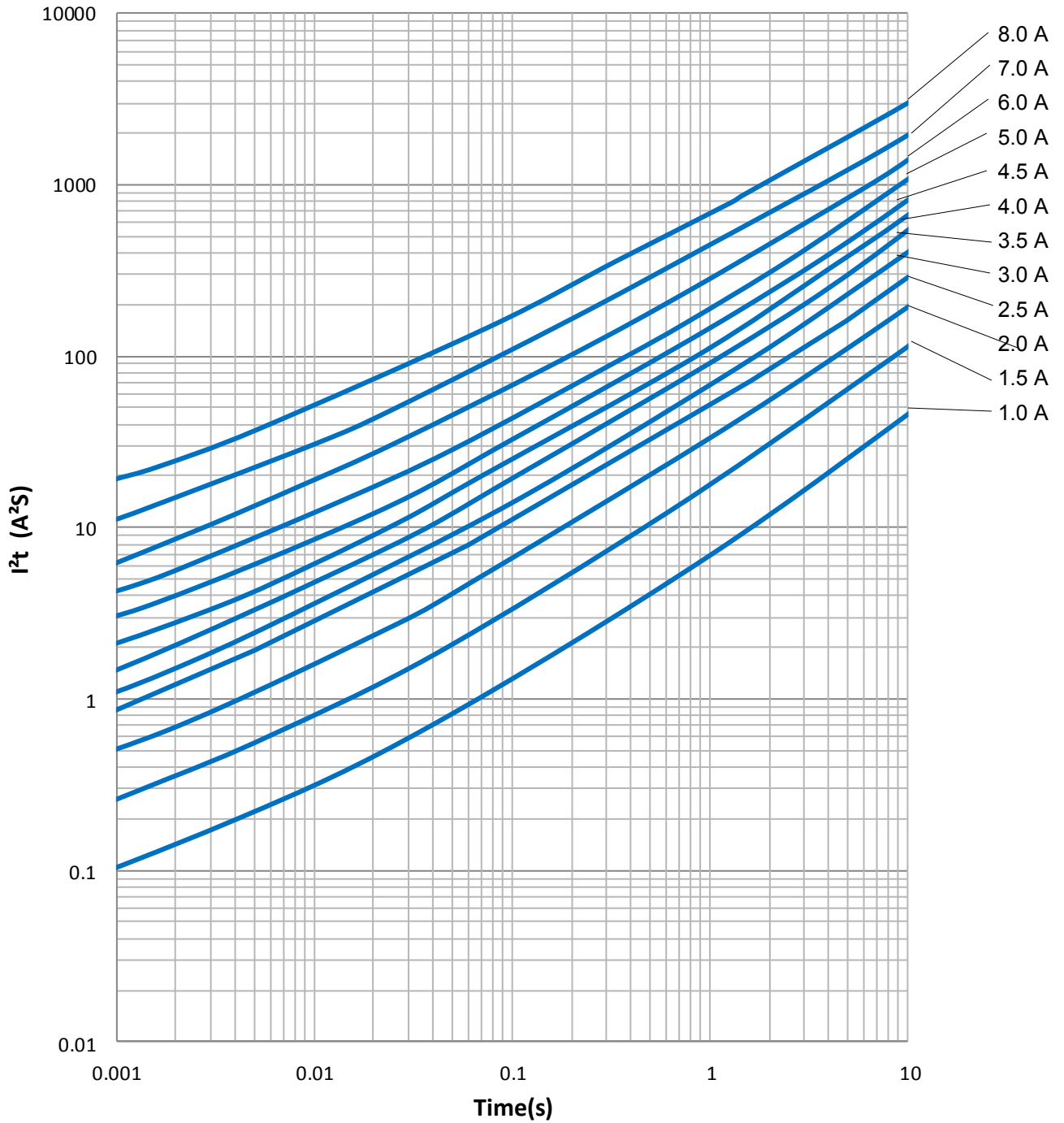
**Average Pre-arcing Time Curves:**



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

## QF1206H Series

### Average $I^2t$ vs. $t$ Curves:



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

### QF0603H Series



#### Features:

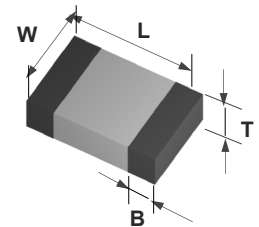
- AEC-Q200 qualified
- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Compatible with both wave and reflow soldering processes
- High inrush melting energy (high I<sup>2</sup>t)
- Operating temperature range: -55°C to +125°C (with de-rating)

#### Clearing Time Characteristics:

% of current rating	Clearing time at 25°C	
	Min.	Max.
100%	4 hours	
200%	1 second	60 seconds

#### 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:

Agency	File NO.
UL	E232989

#### Ordering Information:

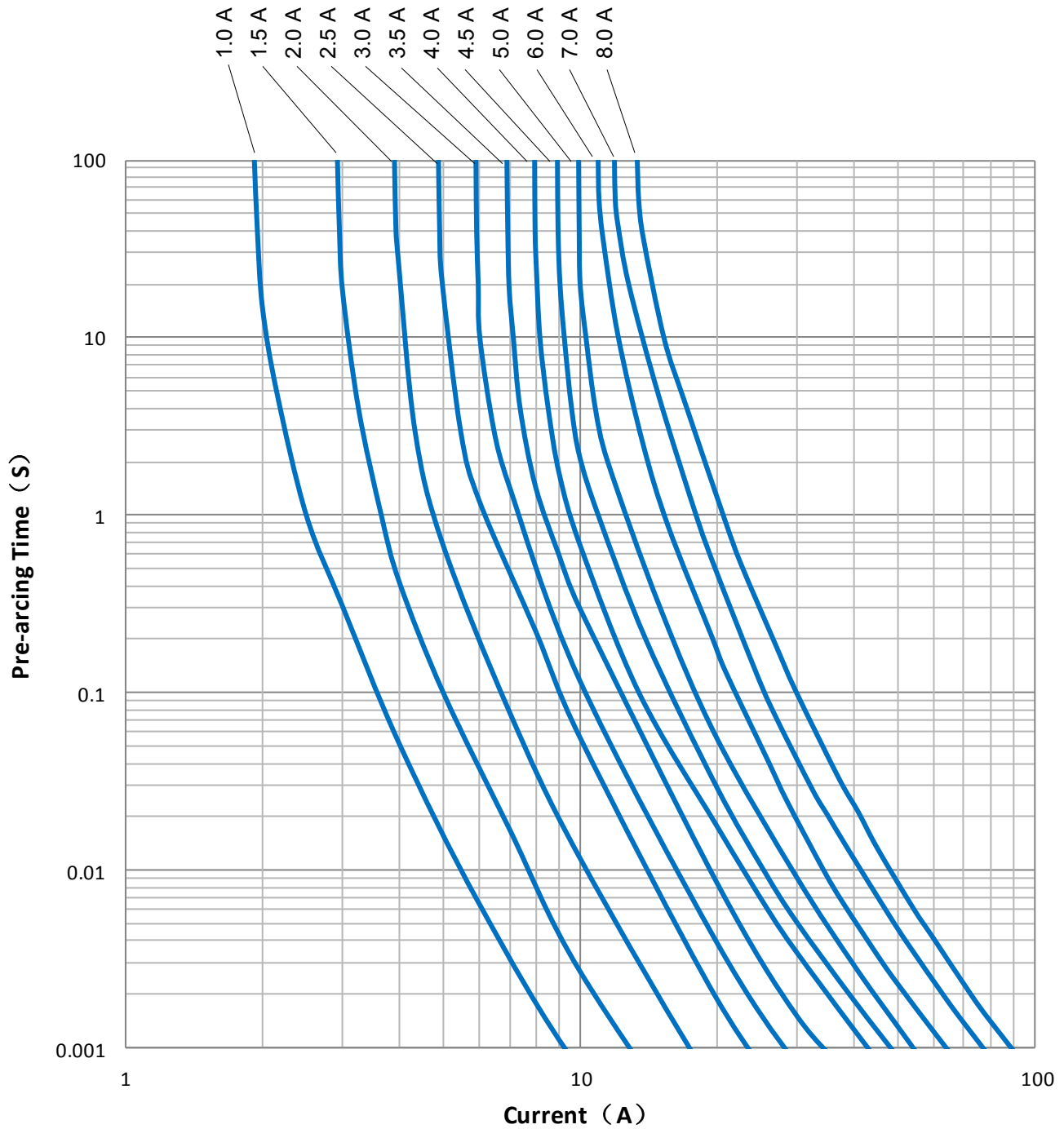
Part Number	Current Rating (A)	Voltage Rating (VDC)	Interrupting Ratings	Nominal Cold DCR (Ω) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>	Marking Code <sup>3</sup>
QF0603H1A00T	1.0	32	50A @ 32VDC	0.240	0.082	E
QF0603H1A50T	1.5			0.115	0.112	G
QF0603H2A00T	2.0			0.060	0.245	I
QF0603H2A50T	2.5			0.042	0.570	J
QF0603H3A00T	3.0			0.032	0.740	K
QF0603H3A50T	3.5			0.022	1.120	L
QF0603H4A00T	4.0			0.018	2.10	M
QF0603H4A50T	4.5			0.015	2.68	T
QF0603H5A00T	5.0			0.013	3.30	N
QF0603H6A00T	6.0			80A @ 32VDC		0.010
QF0603H7A00T	7.0	0.008	5.20			P
QF0603H8A00T	8.0	0.006	7.20			R

1. Measured at ≤ 10% rated current and 25°C ambient.
2. Melting I<sup>2</sup>t at 1000% of current rating.
3. Green Marking Character Code.

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

## QF0603H Series

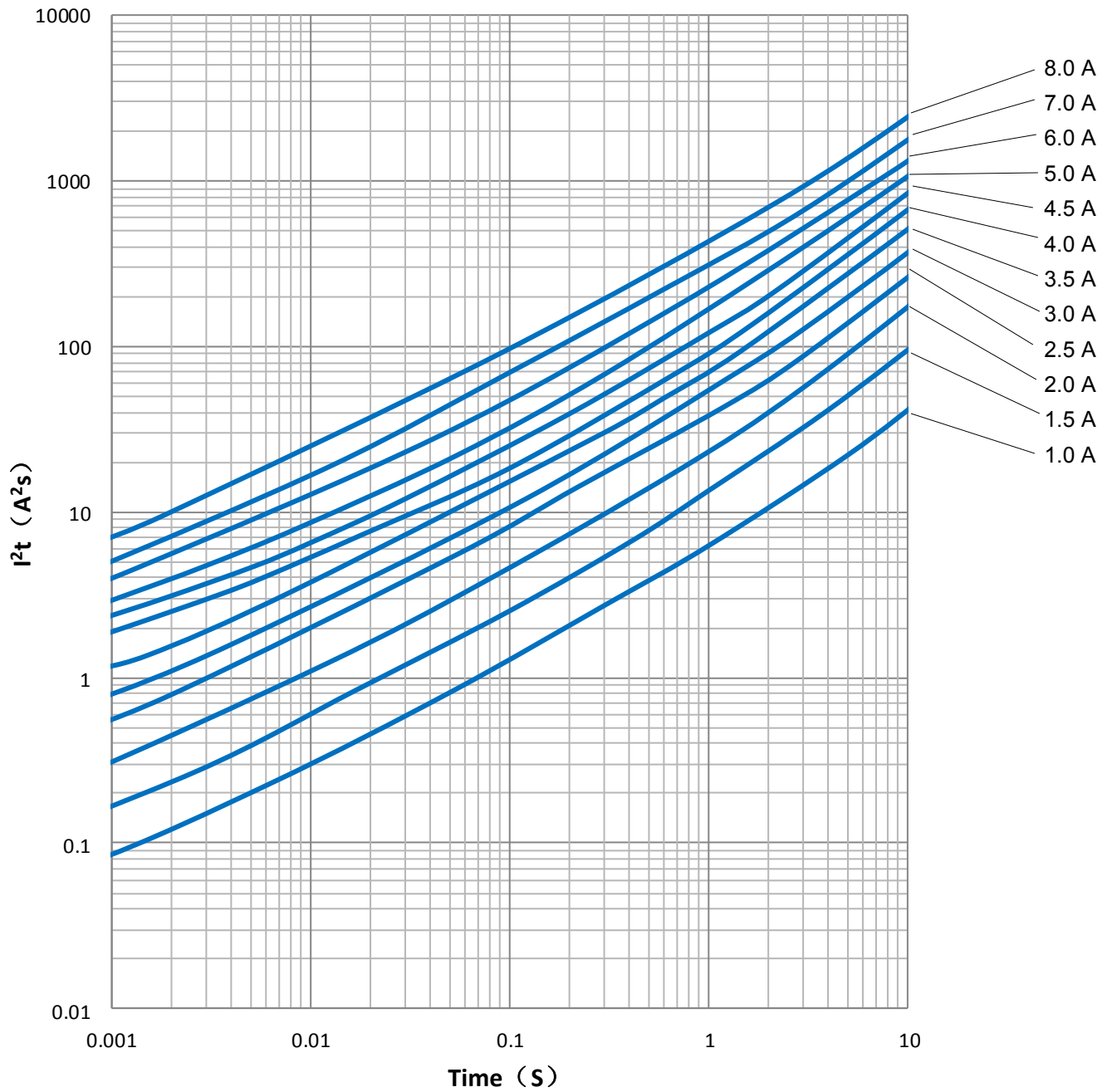
### Average $I^2t$ vs. $t$ Curves:



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

## QF0603H Series

### Average $I^2t$ vs. $t$ Curves:



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[QF1206F4A00T](#) [QF0603F3A50T](#) [QF1206F7A00T](#) [QA2410FA500T](#) [QF0603F4A00T](#) [QA2410F8A00T](#)  
[QF1206F1A00T](#) [QA2410F2A50T](#) [QF0603F1A50T](#) [QA1206F1A50T](#) [QA1206F15A0T](#) [QA1206F12A0T](#)  
[QA2410F5A00T](#) [QA1206F4A00T](#) [QA2410F1A25T](#) [QF1206F1A50T](#) [QF1206F2A00T](#) [QA2410FA630T](#)  
[QF0603F3A00T](#) [QA2410F3A00T](#) [QA1206F6A30T](#) [QA1206F2A50T](#) [QF1206F6A00T](#) [QA2410F1A00T](#)  
[QA1206F3A00T](#) [QA1206F5A00T](#) [QF0603F6A00T](#) [QA2410F6A30T](#) [QF1206F3A00T](#) [QF0603F2A50T](#)  
[QA2410FA750T](#) [QA2410F4A00T](#) [QA1206F8A00T](#) [QF1206F1A75T](#) [QF1206FA500T](#) [QF1206F2A50T](#)  
[QA1206F10A0T](#) [QA2410F1A50T](#) [QA2410F10A0T](#) [QA2410F3A50T](#) [QA1206F3A15T](#) [QA1206F1A60T](#)  
[QA2410F15A0T](#) [QA1206F2A00T](#) [QF1206FA750T](#) [QF1206F8A00T](#) [QF1206F5A00T](#) [QA2410F12A0T](#)  
[QF0603F2A00T](#) [QA1206F7A00T](#) [QF0603F5A00T](#) [QF0603FA500T](#) [QA2410F20A0T](#) [QA2410F3A15T](#)  
[QF0603FA750T](#) [QA1206F3A50T](#) [QF0603F1A00T](#) [QA2410F2A00T](#) [QA2410F7A00T](#)