

Automotive Surface Mount Fuses

Features:

AEM Components' AEC-Q200 qualified and ISO IATF16949 certificated fuses are setting a new standard for reliable performance in demanding automotive applications. Choose from AirMatrix wire-in-air fuses and SolidMatrix solid body fuses for optimum performance under the hood or in the cabin.

AirMatrix® Platform

QA Series

- Excellent inrush current withstanding capability
- Fiberglass enforced epoxy fuse body
- Copper or copper alloy composite fuse link
- Copper termination with nickel and tin plating
- Operating temperature range:
-55°C to +125°C (with de-rating)

SolidMatrix® Platform

QF Series

- 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:
QF1206F/QF1206H: -55°C to +150°C (with de-rating)
QF0603F/QF0603H: -55°C to +125°C (with de-rating)

Applications:

- Communications & Networks
- Battery Management Systems
- Infotainment Systems
- Under-the-hood Applications

Quick Index:

| Series | Size | Current Rating (A) | Voltage Rating | Page |
|---------|------|--|----------------|------|
| QA2410F | 2410 | 0.5, 0.63, 0.75, 1.0, 1.5, 2.0, 2.5, 3.0, 3.15, 3.5, 4.0, 5.0, 6.3, 7.0, 8.0, 10.0 | 125VDC | 4 |
| | | 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 | 7 |
| | | 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 | 10 |
| | | 2.5, 3.0, 4.0, 5.0, 6.0, 7.0, 8.0 | 32VDC | |
| QF0603F | 0603 | 1.0, 1.5 | 63VDC | 13 |
| | | 2.0, 2.5, 3.0, 3.5, 4.0, 5.0 | 32VDC | |
| | | 6.0 | 24VDC | |
| QF1206H | 1206 | 0.5, 0.75 | 65VDC | 16 |
| | | 1.0, 1.5, 2.0 | 63VDC | |
| | | 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 | 19 |

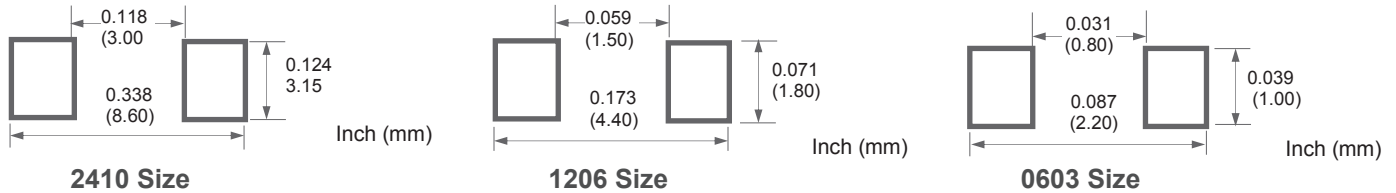
Automotive Surface Mount Fuses

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:



Fuse Selection and Temperature De-rating Guideline:

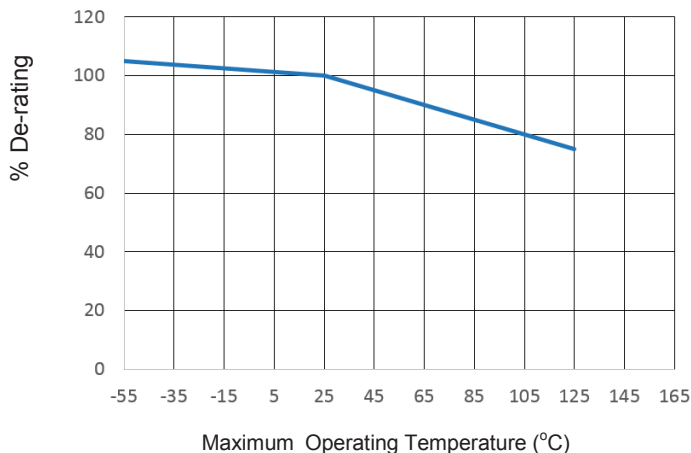
The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25°C, the fuse shall be “de-rated”.

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.

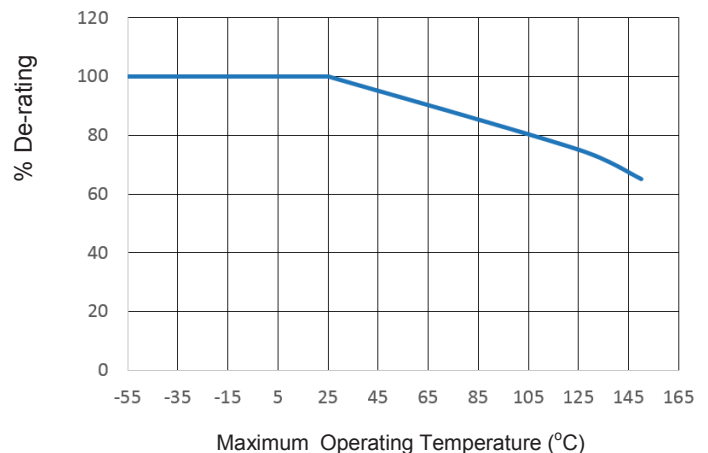
Example: At maximum operating temperature of 65°C, % De-rating is 90%. The nominal operating current is 4 A. The current rating for fuse selected from the catalog shall be: $4 / 0.75 / 90\% = 5.9$ or 6 A. Specifications and descriptions in this literature are as accurate as known at the time of publish,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

Effect of Ambient Temperature on Current Rating of QA2410 and QA1210 Series.



Effect of Ambient Temperature on Current Rating of QF1206 and QF0603 Series.

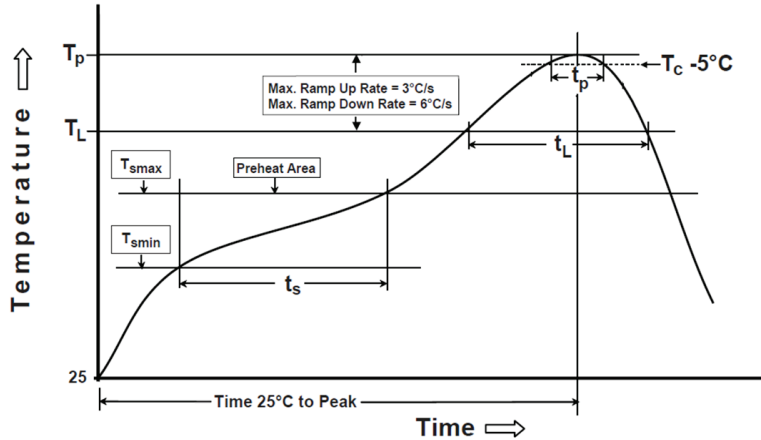
Notice: QF0603's operating temperature is up to 125°C.



Automotive Surface Mount Fuses

Soldering Temperature Profile:

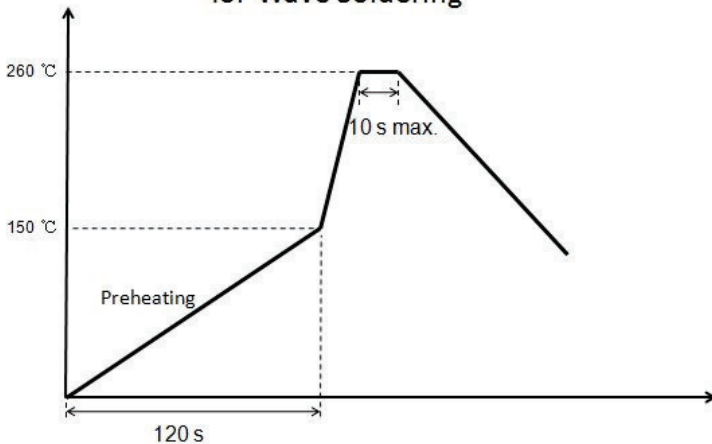
* Recommended Temperature Profile for Reflow Soldering



| 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 |
|----------------------------------|-------------------------------|
| 0603 (1608) | 4,000 |
| 1206 (3216) (For QA1206F Series) | 3,500 |
| 1206 (3216) | 3,000 |
| 2410 | 2,000 |

AirMatrix[®] Automotive Surface Mount Fuses

QA2410F Series

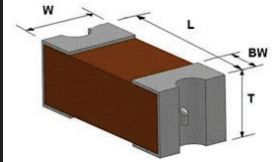


Agency Approval:

| 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 |



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 |

Ordering Information:

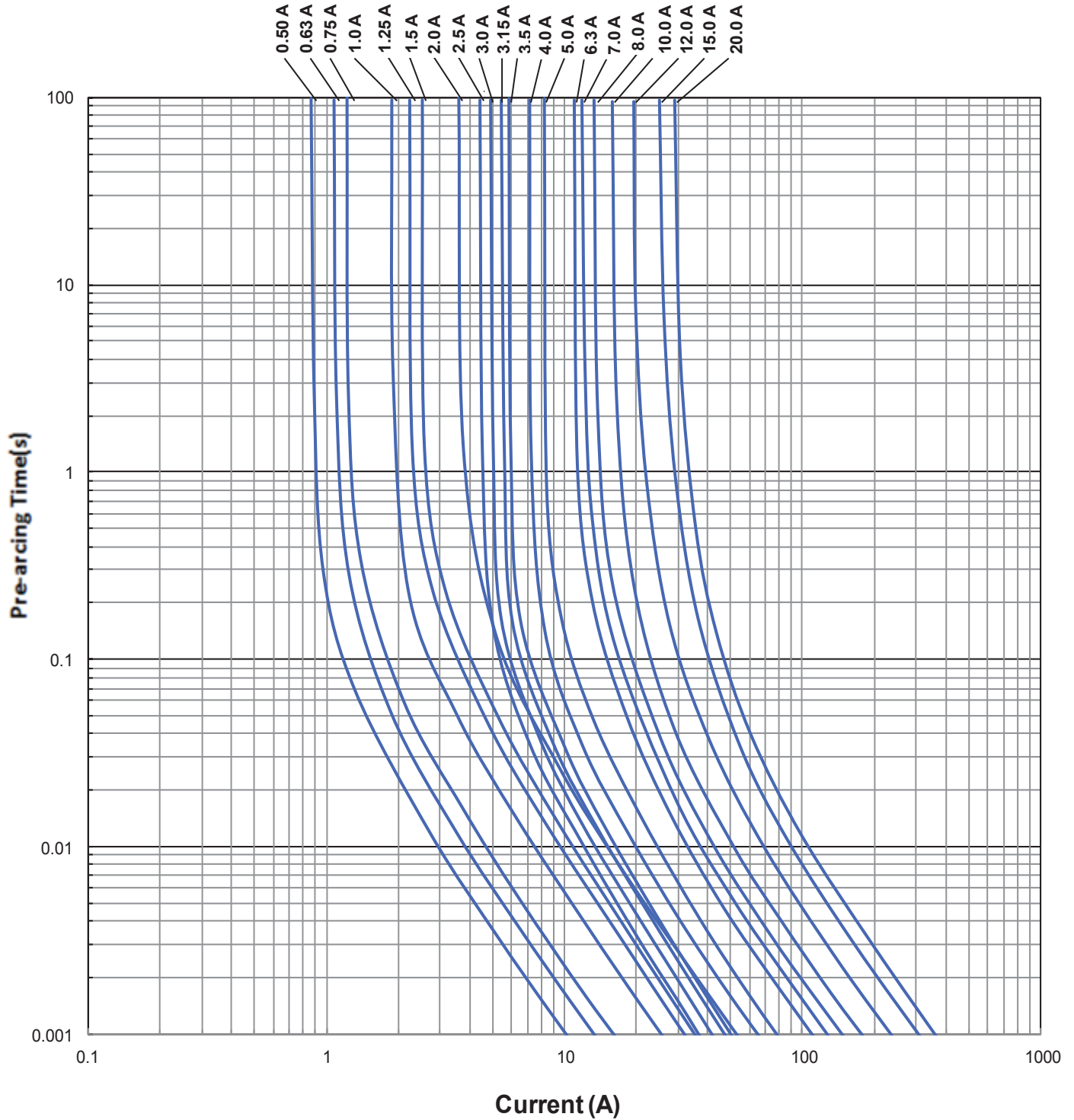
| Part Number | Current Rating (A) | Voltage Rating | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I ² t (A ² s) ² | Marking Code ³ |
|--------------|--------------------|----------------|--|-----------------------------------|--|---------------------------|
| QA2410FA500T | 0.50 | 125VDC | 0.5-10A: 50A @ 125VDC 300A @ 32VDC | 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 | | | 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 | 0.0053 | 39.3 | X | | |
| QA2410F15A0T | 15.0 | 65VDC | 20.0A: 100A @ 65VDC 300A @ 32VDC | 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 I²t at 0.001 second pre-arcing time. 3. Blue Marking Character Code.

AirMatrix[®] Automotive Surface Mount Fuses

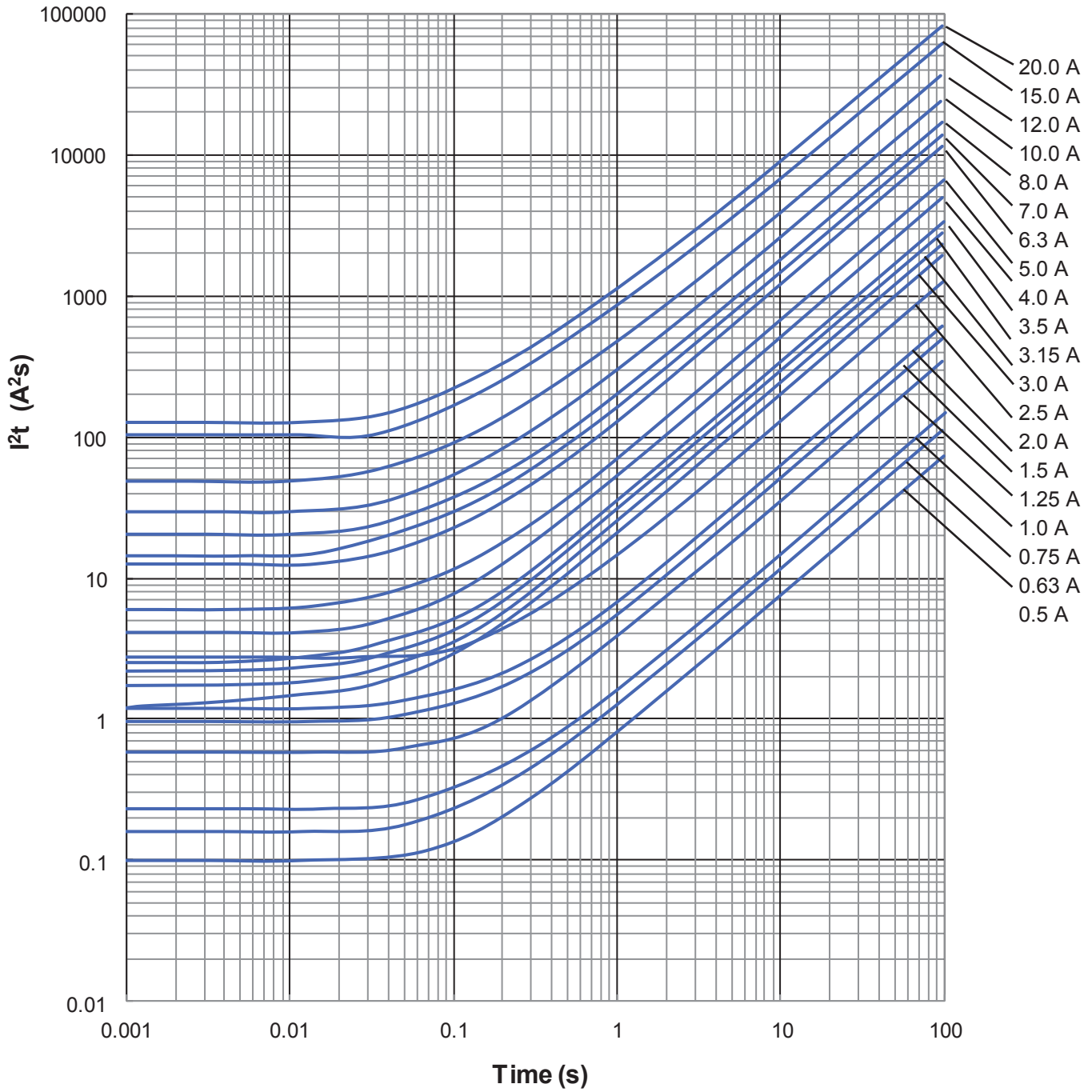
QA2410F Series

Average Pre-arcing Time Curves:



AirMatrix[®] Automotive Surface Mount Fuses QA2410F Series

Average I^2t vs. t Curves:



AirMatrix[®] Automotive Surface Mount Fuses

QA1206F Series

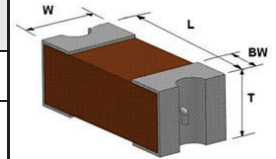


Agency Approval:

| 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 |



Clearing Time Characteristics:

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

Ordering Information:

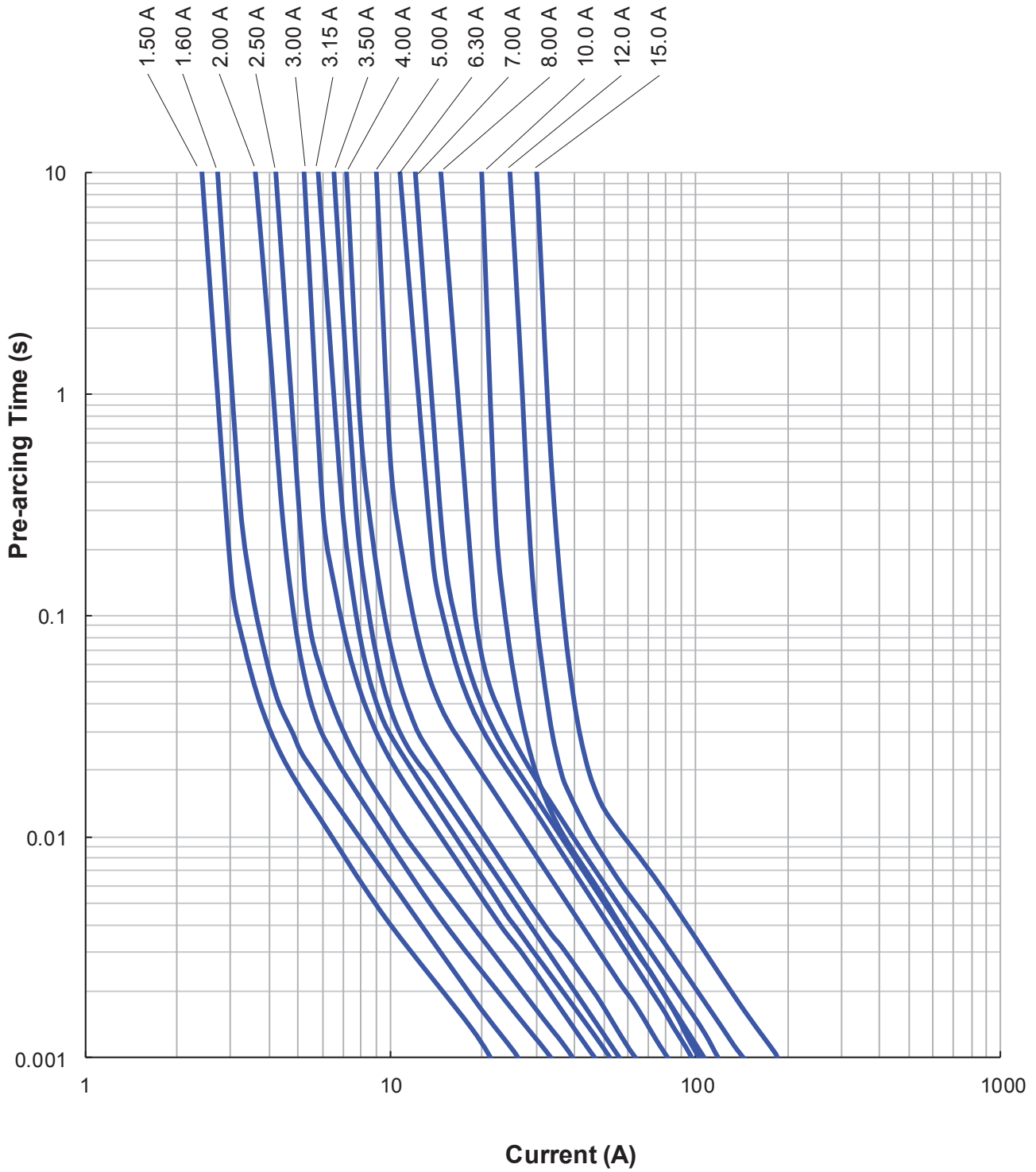
| Part Number | Current Rating (A) | Voltage Rating (VDC) | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I ² t (A ² s) ² | Marking Code ³ |
|--------------|--------------------|----------------------|----------------------|--|--|---------------------------|
| QA1206F1A50T | 1.50 | 65 | 50 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 I²t at 0.001 second pre-arcing time.
3. Blue Marking Character Code.

AirMatrix[®] Automotive Surface Mount Fuses

QA1206F Series

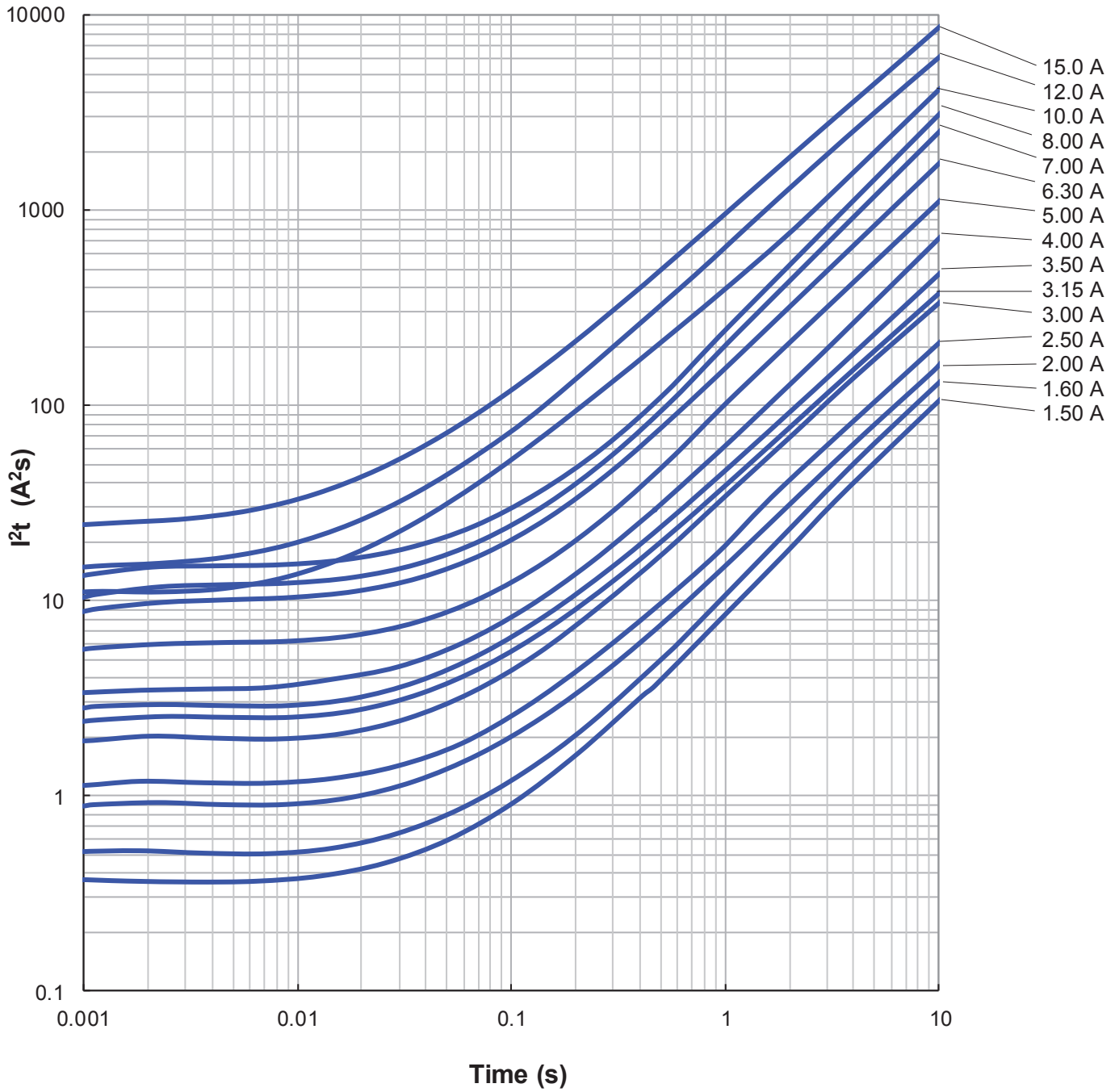
Average Pre-arcing Time Curves:



AirMatrix[®] Automotive Surface Mount Fuses

QA1206F Series

Average I^2t vs. t Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF1206F Series

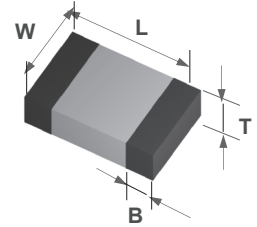


Agency Approval:

| Agency | File NO. |
|--------|----------|
| UL | E232989 |

Shape and Dimensions:

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



Clearing Time Characteristics:

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

Ordering Information:

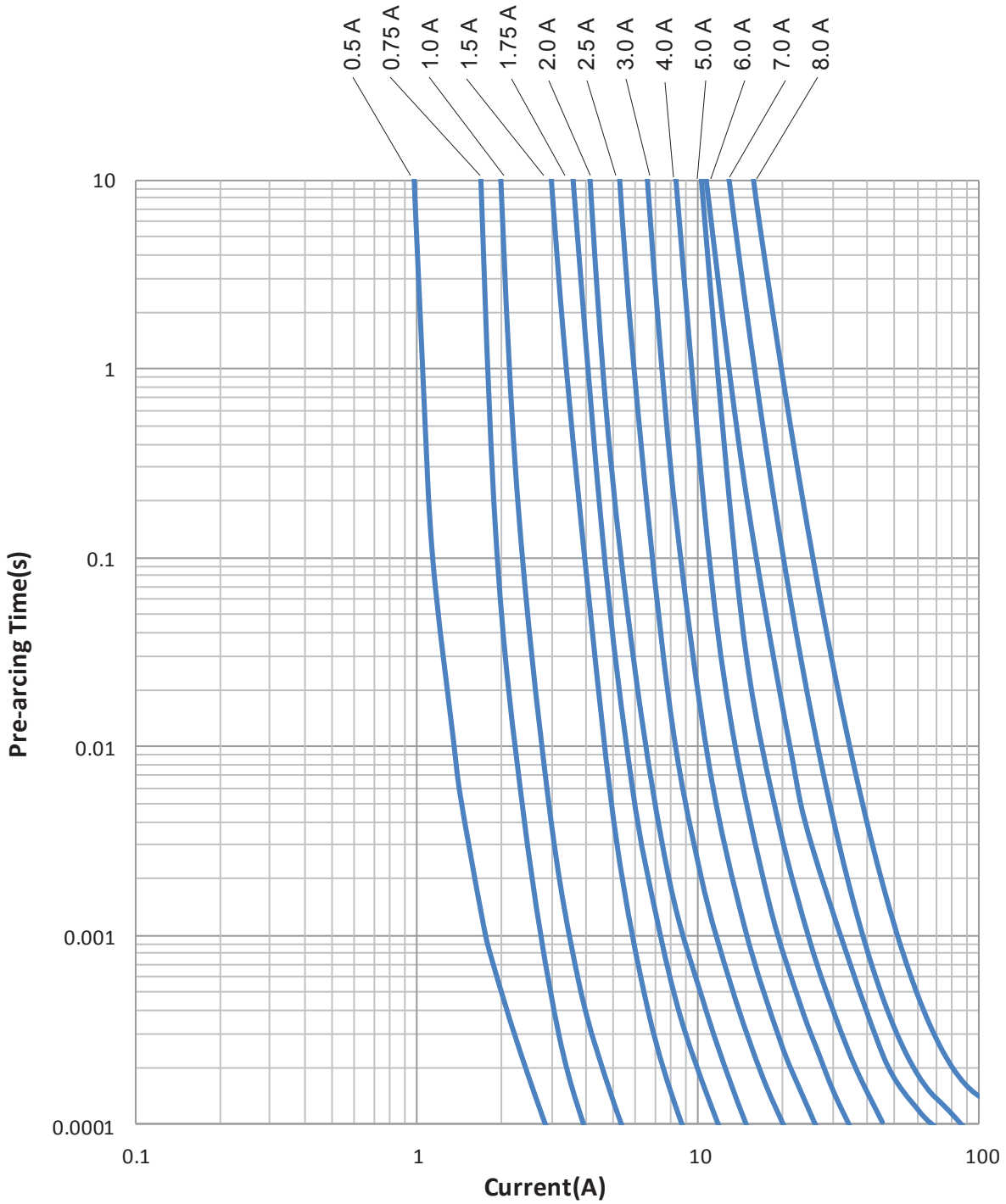
| Part Number | Current Rating (A) | Voltage Rating (VDC) | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I^2t (A^2s) ² | Marking Code ³ |
|--------------|--------------------|----------------------|----------------------|--|--|---------------------------|
| QF1206FA500T | 0.5 | 63 | 50A @ 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^2t at 0.001 second pre-arcing time.
3. Black Marking Character Code.

SolidMatrix[®] Automotive Surface Mount Fuses

QF1206F Series

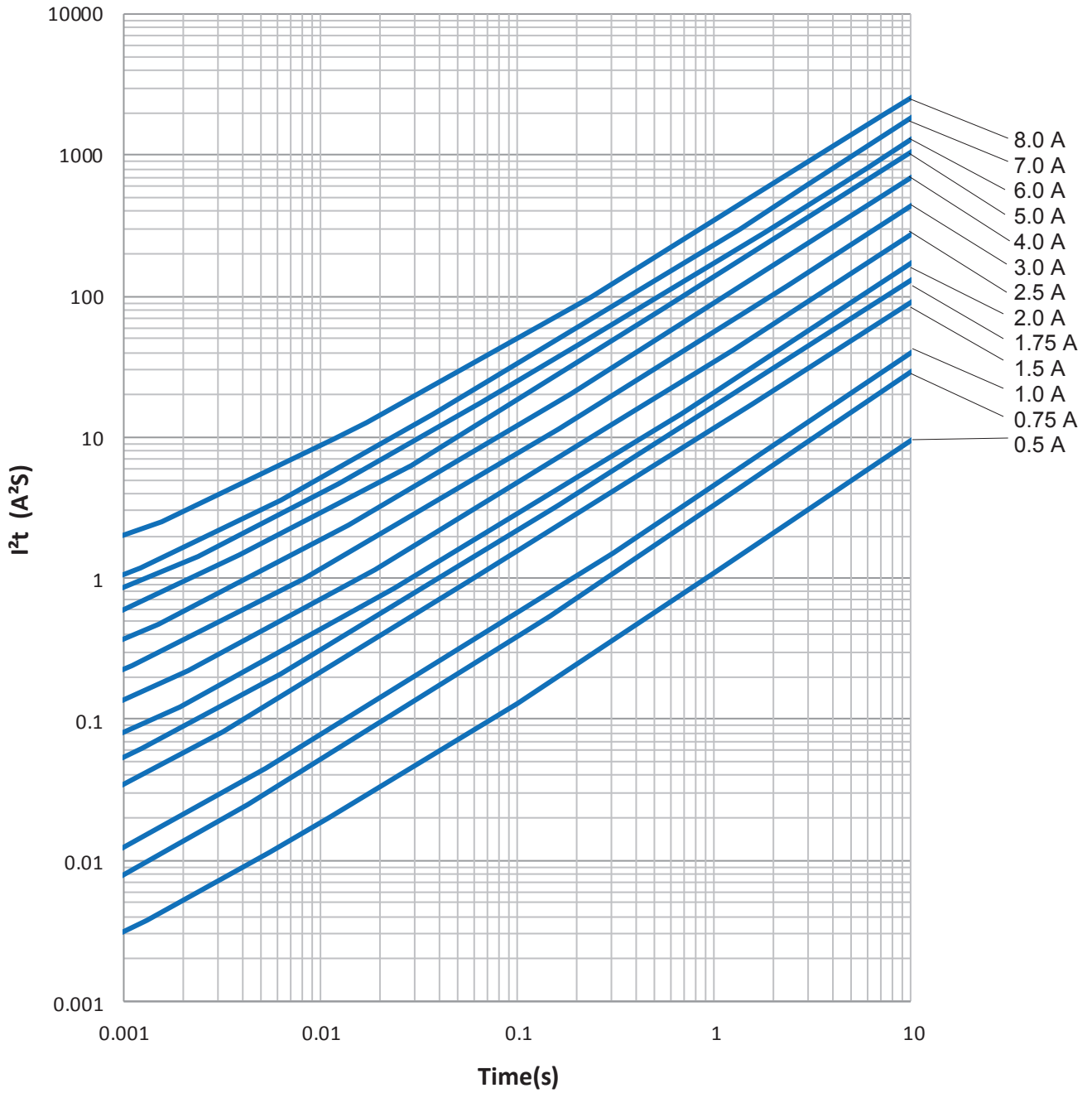
Average Pre-arcing Time Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF1206F Series

Average I^2t vs. t Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF0603F Series

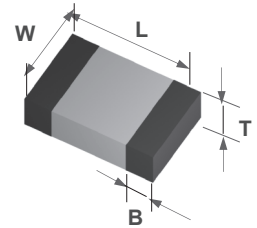


Agency Approval:

| Agency | File NO. |
|--------|----------|
| UL | E232989 |

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 |



Clearing Time Characteristics:

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

Ordering Information:

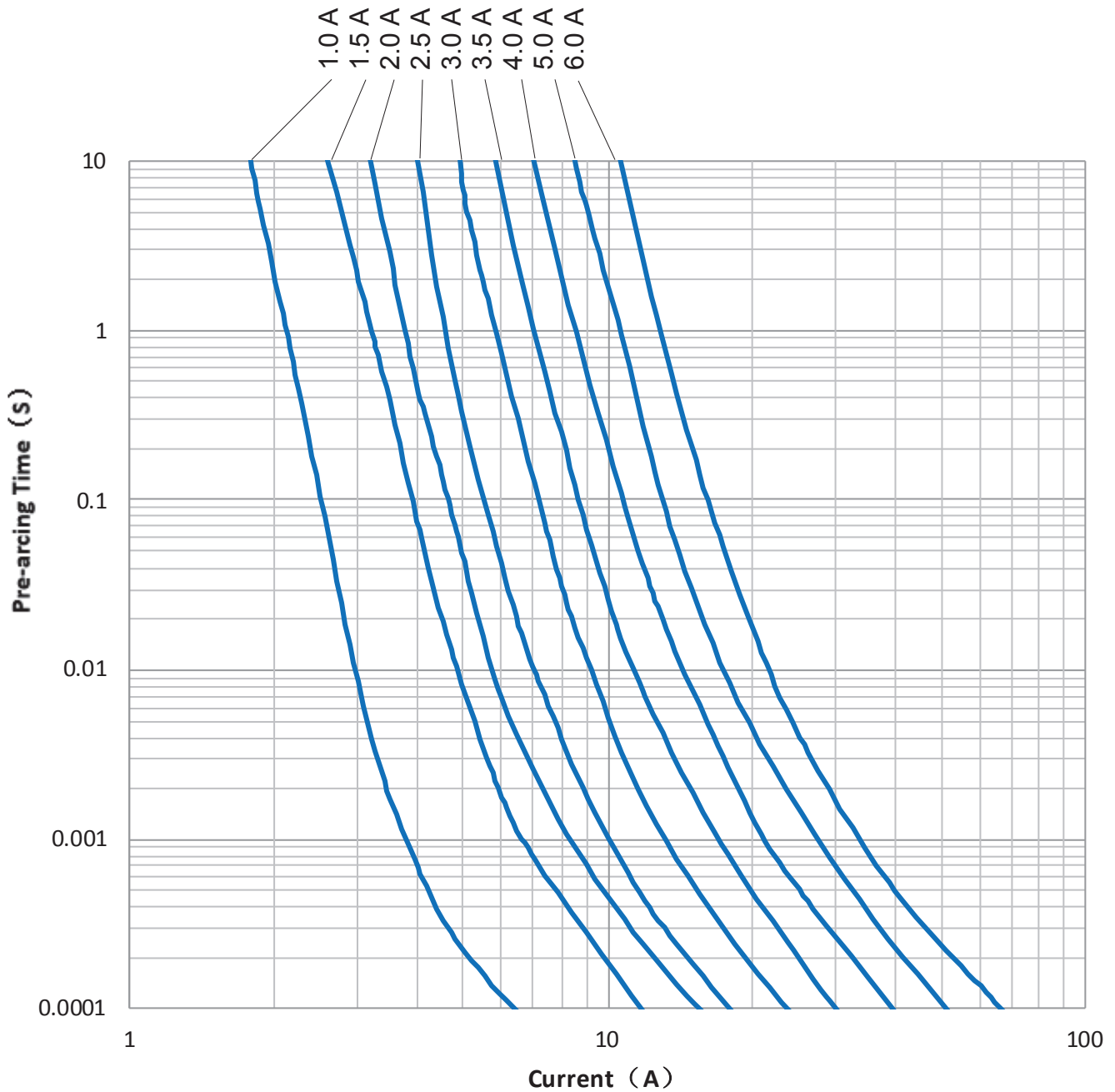
| Part Number | Current Rating (A) | Voltage Rating (VDC) | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I ² t (A ² s) ² | Marking Code ³ |
|--------------|--------------------|----------------------|----------------------|--|--|---------------------------|
| QF0603F1A00T | 1.0 | 63 | 35A @ 63VDC | 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 $\leq 10\%$ rated current and 25°C ambient.
2. Melting I²t at 0.001 second pre-arcing time.
3. Black Marking Character Code.

SolidMatrix[®] Automotive Surface Mount Fuses

QF0603F Series

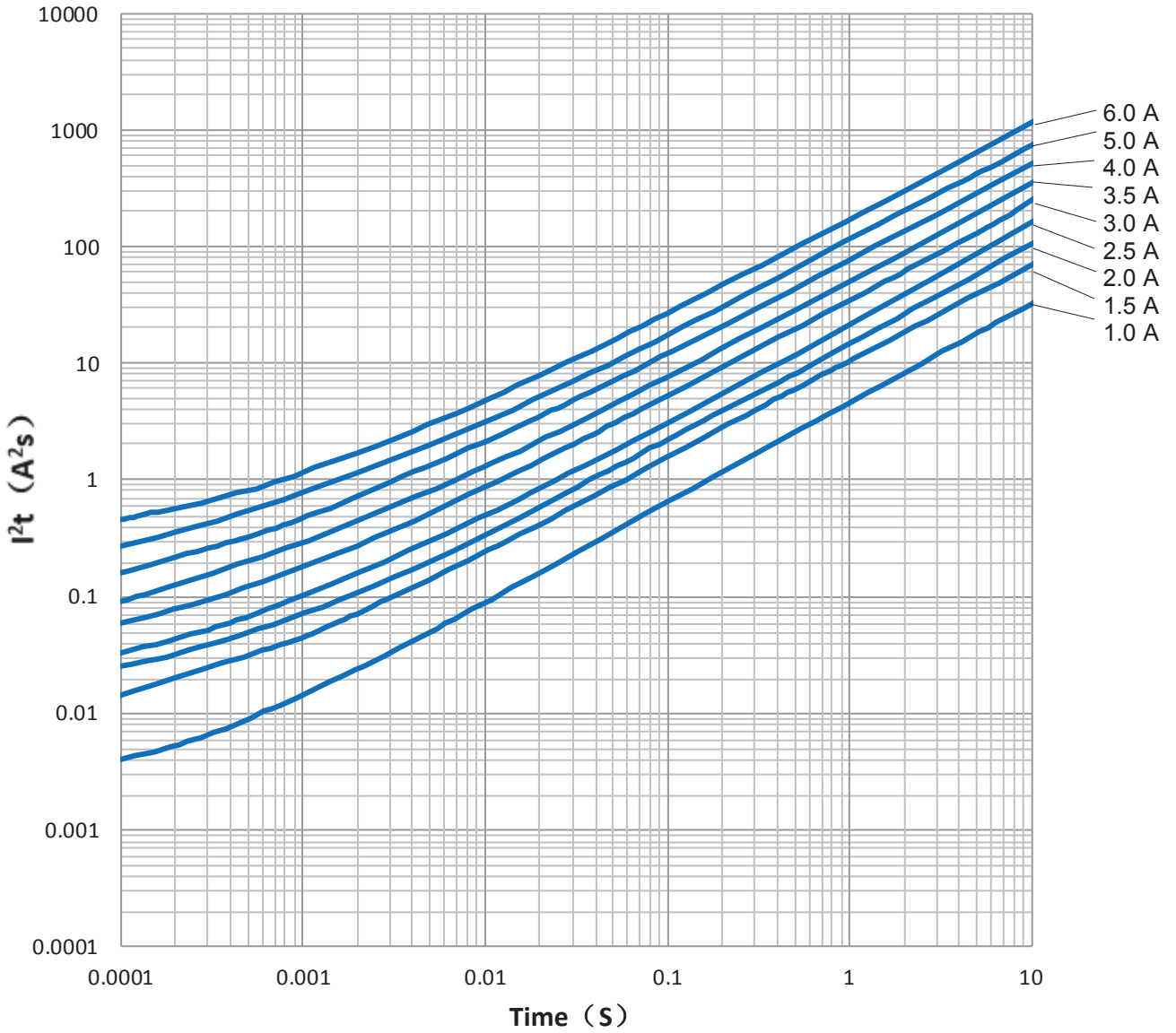
Average Pre-arcing Time Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF0603F Series

Average I^2t vs. t Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF1206H Series

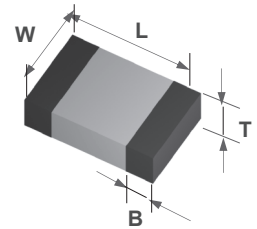


Agency Approval:

| Agency | File NO. |
|--------|----------|
| UL | E232989 |

Shape and Dimensions:

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



Clearing Time Characteristics:

| % of current rating | Clearing time at 25°C | |
|---------------------|-----------------------|------------|
| | Min. | Max. |
| 100% | 4 hours | |
| 200% (1-8A) | 1 second | 60 seconds |
| 350% (0.5-0.75A) | | 5 seconds |

Ordering Information:

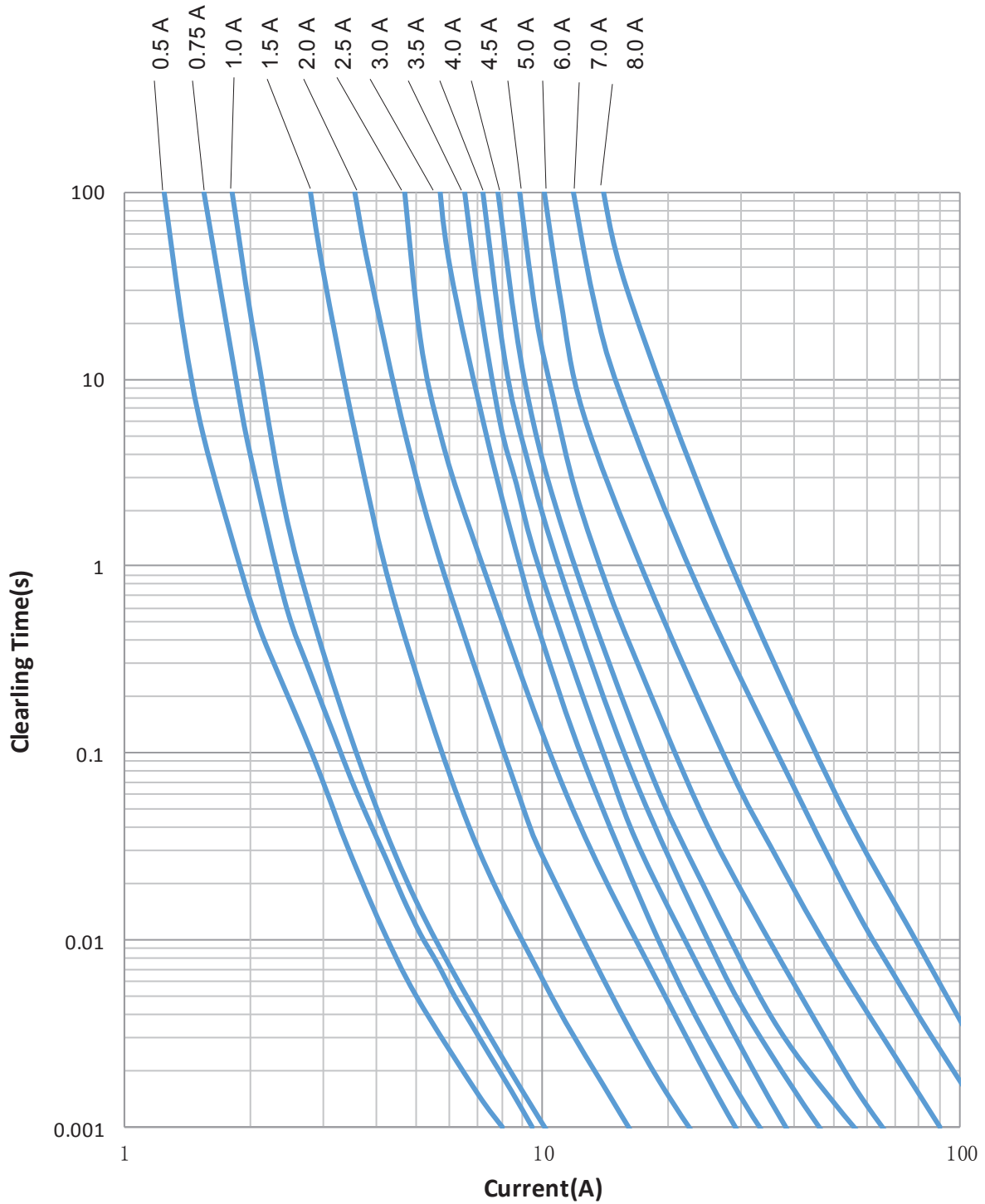
| Part Number | Current Rating (A) | Voltage Rating (VDC) | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I^2t (A^2s) ² | Marking Code ³ |
|--------------|--------------------|----------------------|----------------------|--|--|---------------------------|
| QF1206HA500T | 0.5 | 65 | 50A @ 65VDC | 0.980 | 0.035 | C |
| QF1206HA750T | 0.75 | | | 0.420 | 0.100 | D |
| 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 $\leq 10\%$ rated current and 25°C ambient.
2. Melting I^2t at 1000% of current rating.
3. Green Marking Character Code.

SolidMatrix[®] Automotive Surface Mount Fuses

QF1206H Series

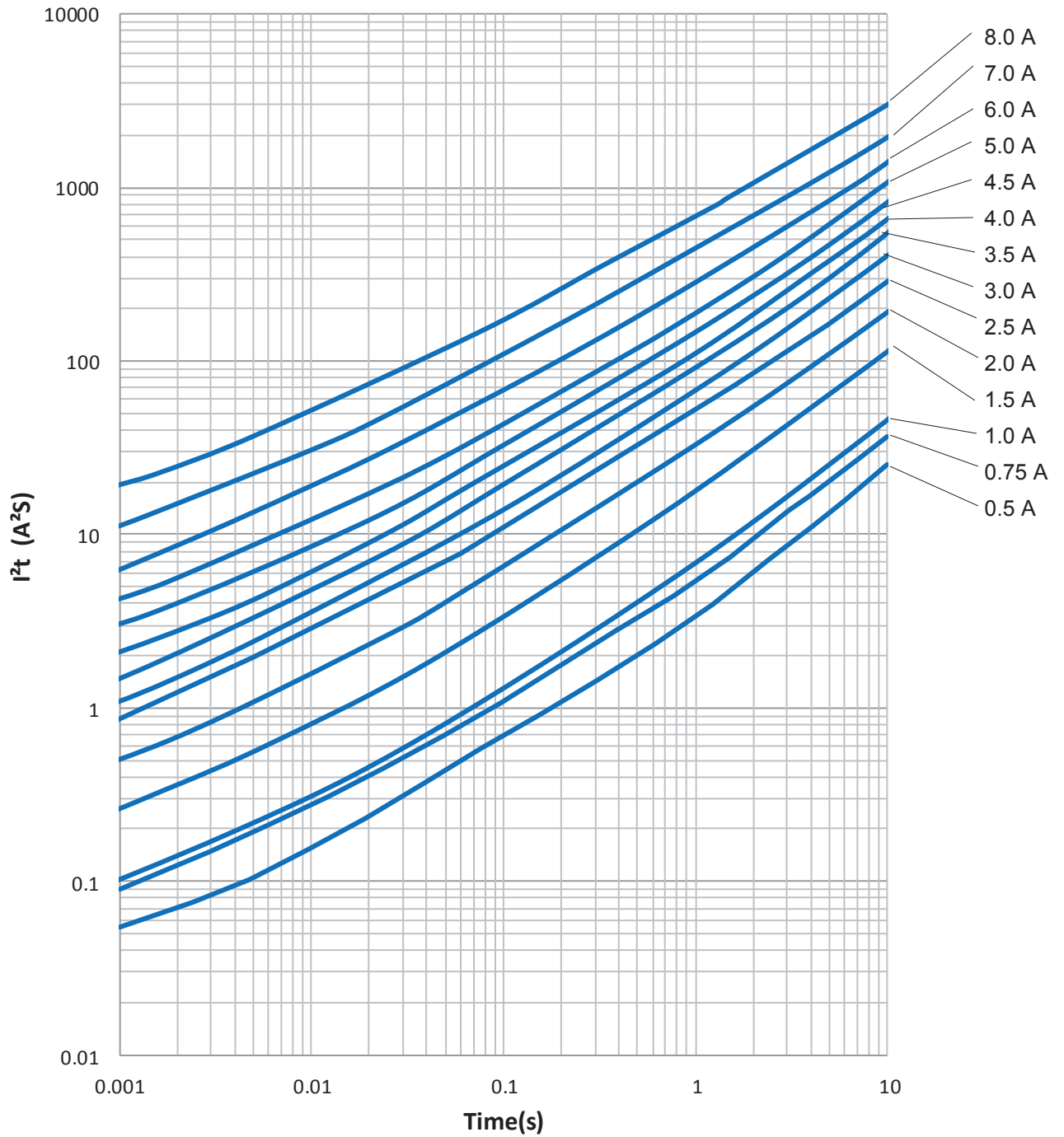
Average Pre-arcing Time Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF1206H Series

Average I^2t vs. t Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF0603H Series

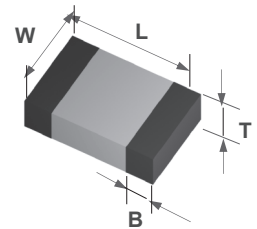


Agency Approval:

| Agency | File NO. |
|--------|----------|
| UL | E232989 |

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 |



Clearing Time Characteristics:

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

Ordering Information:

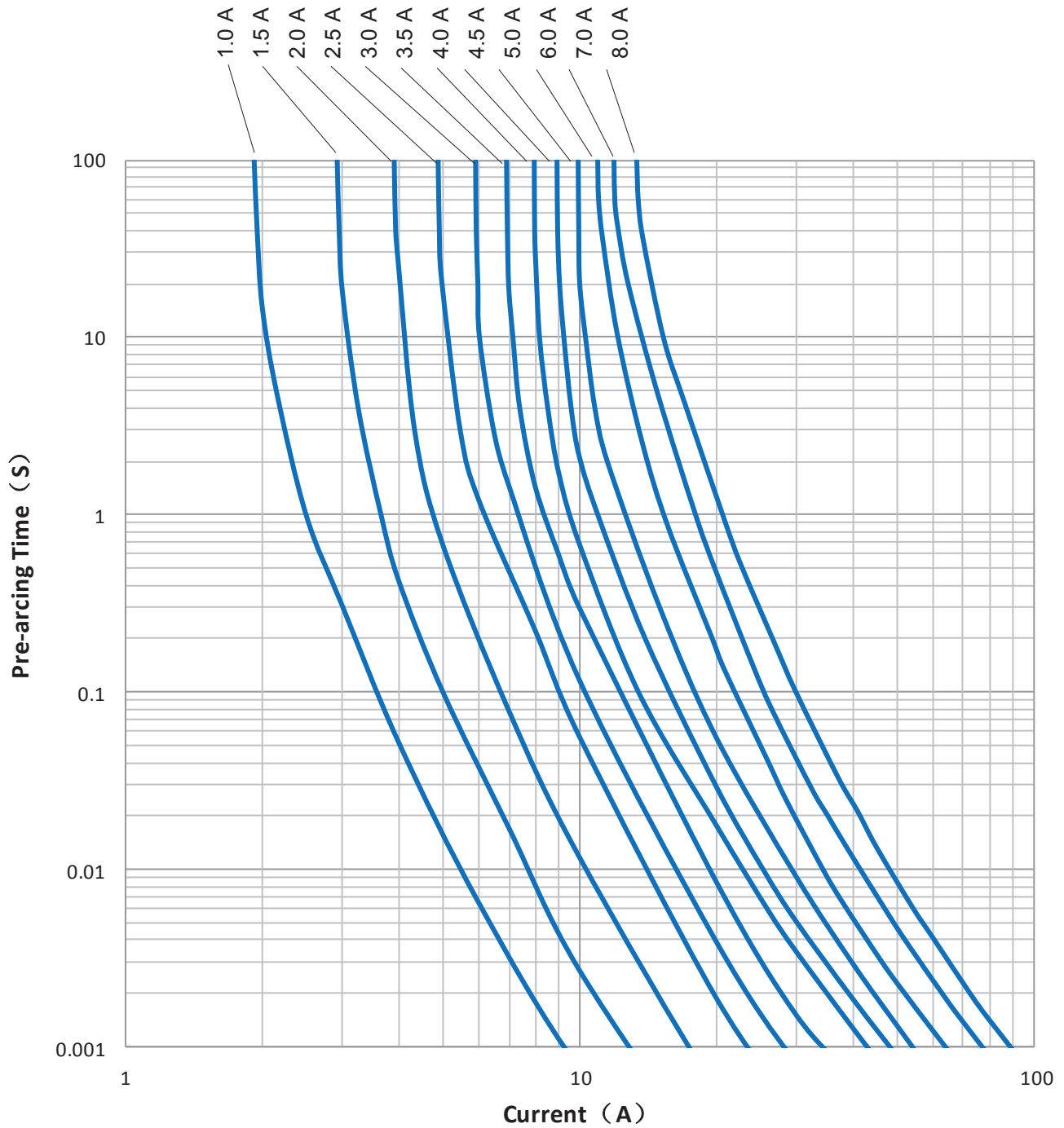
| Part Number | Current Rating (A) | Voltage Rating (VDC) | Interrupting Ratings | Nominal Cold DCR (Ω) ¹ | Nominal I ² t (A ² s) ² | Marking Code ³ |
|--------------|--------------------|----------------------|----------------------|--|--|---------------------------|
| QF0603H1A00T | 1.0 | 32 | 50A @ 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 | | 70A @ 32VDC | 0.010 | 4.10 | O |
| QF0603H7A00T | 7.0 | | 80A @ 32VDC | 0.008 | 5.20 | P |
| QF0603H8A00T | 8.0 | | | 0.006 | 7.20 | R |

1. Measured at $\leq 10\%$ rated current and 25°C ambient.
2. Melting I²t at 1000% of current rating.
3. Green Marking Character Code.

SolidMatrix[®] Automotive Surface Mount Fuses

QF0603H Series

Average I^2t vs. t Curves:



SolidMatrix[®] Automotive Surface Mount Fuses

QF0603H Series

Average I^2t vs. t Curves:

