

AirMatrix® Surface Mount Fuses

AF101 Series

Features:

- 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

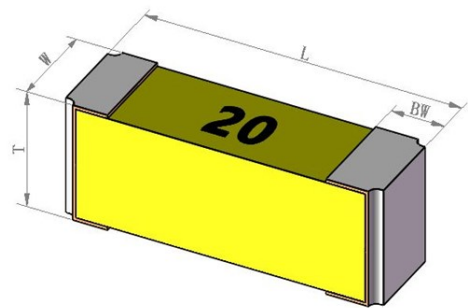
Application Fields:

- Server Systems
- Blade Servers
- UPS & Routers
- Fan
- E-bike
- Power tools
- BMS of Li-ion battery

Clearing Time Characteristics:

% of Current Rating	Clearing Time at 25°C	
	Min.	Max.
100%	4 hours min.	—
200%	—	60 seconds

Shape and Dimensions:



Product Identification:

AF 4012 H 20A0 T

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

(1) **Product type code:** AirMatrix fuse

(2) **Dimension code:** L x W (inch)

The first two digits - L (length)

The last two digits - W (width)

(3) **Characteristic code:** H - High inrush

(4) **Current rating code:** 20A0 - 20.0A

(5) **Package code:** T – Tape and Reel; B - Bulk

AF101: AF-Airmatrix Fuse 101-Series Code

Size	L	W	T	BW
4012	0.398 ± 0.012	0.129 ± 0.012	0.129 ± 0.012	0.061 ± 0.012
	(10.10 ± 0.30)	(3.30 ± 0.30)	(3.30 ± 0.30)	(1.55 ± 0.30)
4818	0.480 ± 0.012	0.175 ± 0.012	0.129 ± 0.012	0.061 ± 0.012
	(12.20 ± 0.30)	(4.50 ± 0.30)	(3.30 ± 0.30)	(1.55 ± 0.30)

Ordering Information:

Operating Temperature Range: -55°C to +125°C

AEM Part Number	Current Rating (A)	Max. Voltage Rating (V)	Interrupting Rating	Nominal Cold DCR (mΩ) ¹	Nominal I ² t (A ² s) ²	Agency Approval (UL)
AF4012H20A0T	20	75	1000A@75VDC	2.24	240	✓
AF4012H25A0T	25	75		1.68	350	✓
AF4012H30A0T	30	75		1.35	570	✓
AF4818H40A0T	40	75		1.26	1100	✓
AF4818H50A0T	50	75		1.12	1370	✓
AF4818H60A0T	60	75		0.83	1800	✓

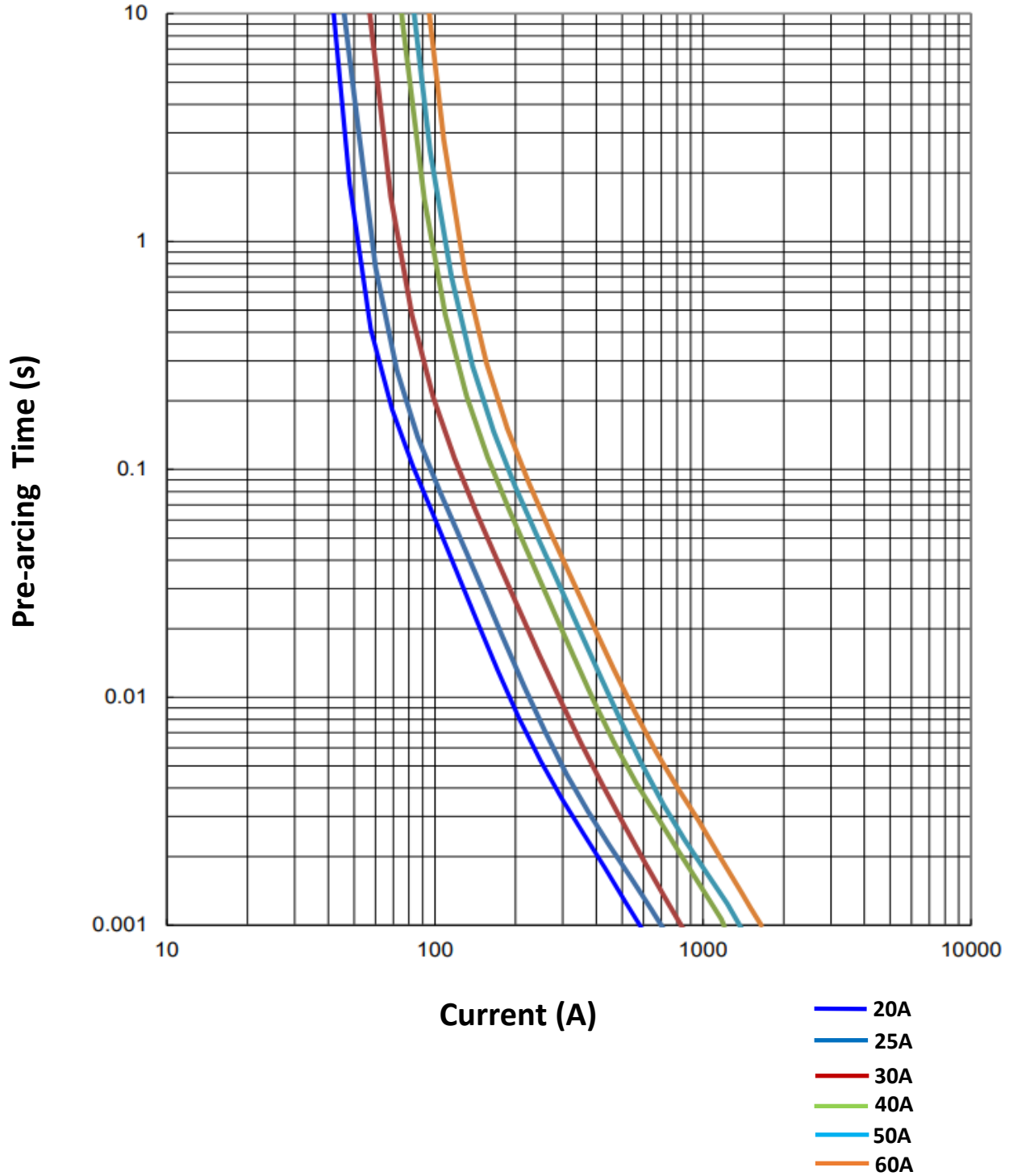
1. Measured at ≤10% of rated current and 25°C ambient.

2. Melting I²t at 1ms pre-arcing time

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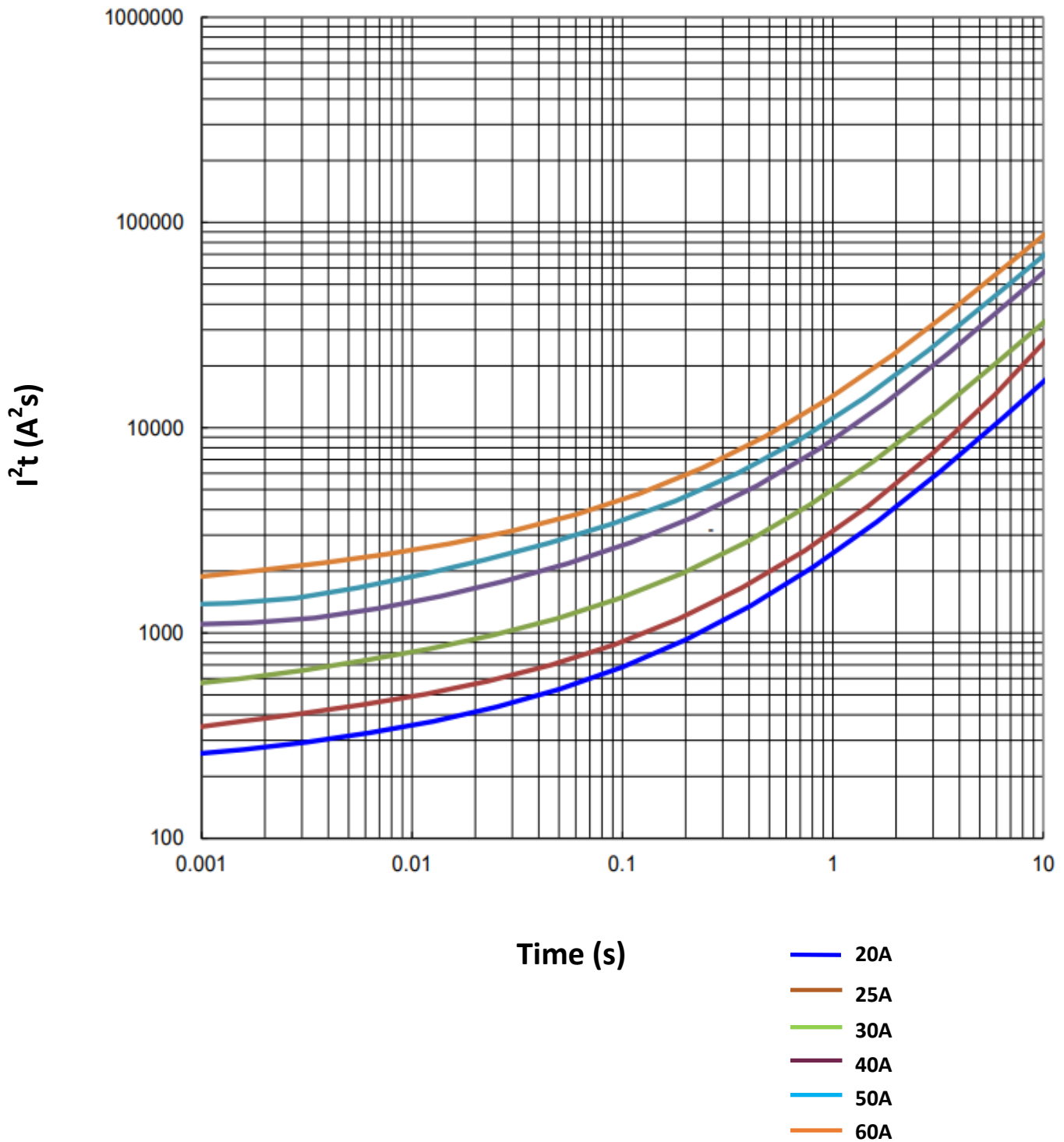
Clearing Time vs. Current Curve :



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I²t vs .t Curves:



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Temperature De-rating Guideline:

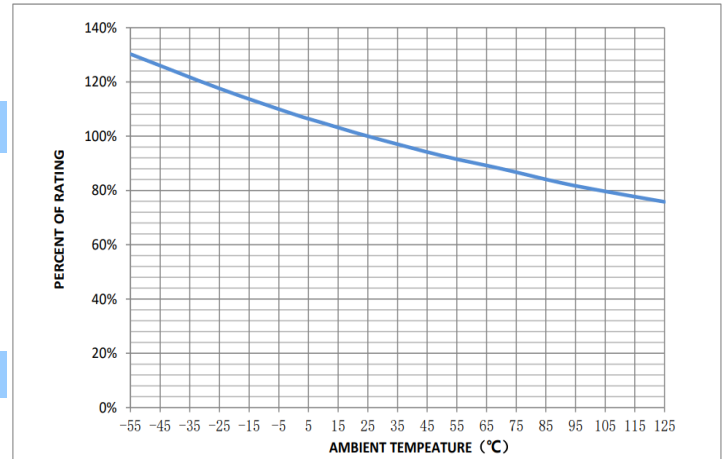
The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25 °C, the fuse shall be “derated” according to the de-rating curve.

Special Measuring Equipment:

1. Clear Time: Clear time is measured with clear time tester.
2. DC Resistance: DC resistance is measured with HIOKI RM3545.
3. Interrupting Capability: Interrupting capability is measured with short circuit tester.

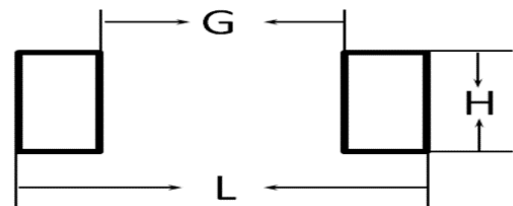
Packaging:

Chip Size	Parts on 13 inch (330 mm) Reel
4012	2,000
4818	2,000



Recommended PC Board Land Pattern:

Chip Size	4012	4818
L	0.496	0.63
INCH (mm)	(12.6)	(16.0)
G	0.225	0.225
INCH (mm)	(5.72)	(5.72)
H	0.135	0.213
INCH (mm)	(3.43)	(5.40)



Reliability Tests:

Reliability Test	Test Condition and Requirement
Reflow & Bend	3 reflows at 245°C followed by a 2 mm bend, ±20% DCR change max. (10% for ≤1A), no mechanical damage
Solderability	245°C, 5 seconds, new solder coverage ≥90%
Soldering Heat Resistance	260°C, 10 seconds, ±20% DCR change max. (10% for ≤ 1 A), new solder coverage 75% minimum
Life	25°C, 2000 hours, 80% rated current (75% for <1A), voltage drop changes ≤±20%
Thermal Shock	-65°C to +125°C, 100 cycles, ±20% DCR change max., no mechanical damage
Mechanical Vibration	5–3000 Hz, 0.4 inch double amplitude or 30 G peak, ±20% DCR change max., no mechanical damage
Mechanical Shock	1500 G, 0.5 milliseconds, half-sine shocks, ±20% DCR change max., no mechanical damage
Salt Spray	5% salt solution, 48 hour exposure, ±20% DCR change max., no excessive corrosion
Moisture Resistance	10 cycles, ±20% DCR change max., no excessive corrosion

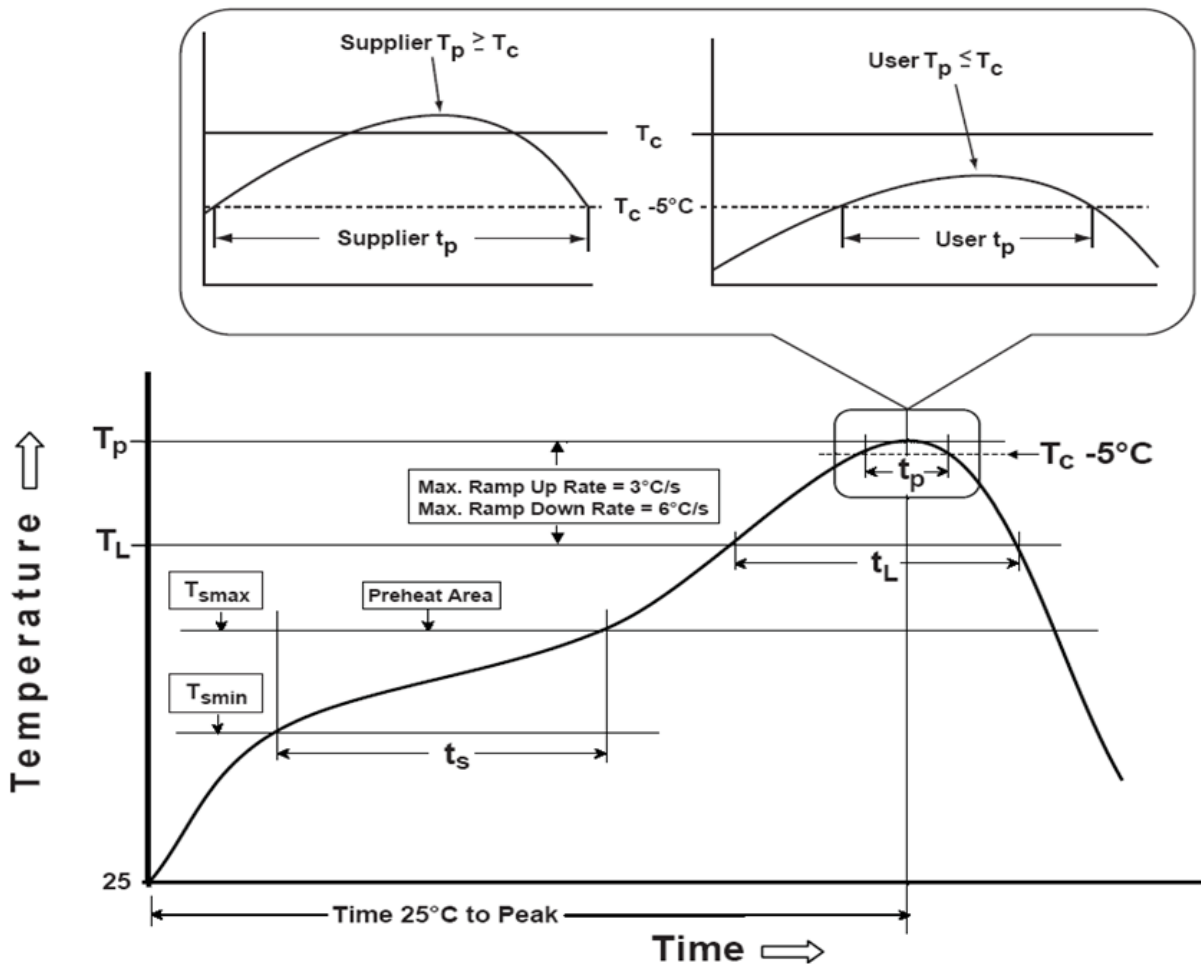
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Recommended Temperature Profile for Reflow Soldering:

Profile Feature	Pb-Free Assembly
Preheat/Soak	
Temperature Min (T_{smin})	150°C
Temperature Max (T_{smax})	200°C
Time (t_s) from (T_{smin} to T_{smax})	60-120 seconds
Ramp-up rate (T_L to T_p)	3°C/ second max.
Liquidous temperature (T_L)	217°C
Time (t_L) maintained above T_L	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 auser maximum.



Recommended conditions for hand soldering:

1. Appropriate temperature (max.) of soldering iron tip/soldering time (max.): 280°C / 10 s or 350°C / 3 s
2. Using hot air rework station with tip that can melt the solder on both terminations at the same time is strongly recommended. Do not directly

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