

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

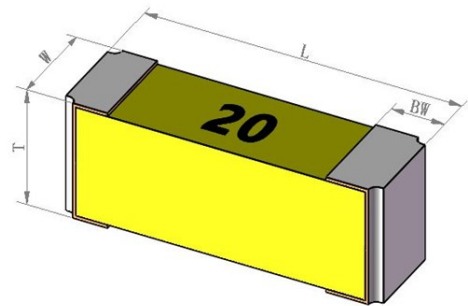
Application Fields:

- 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
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

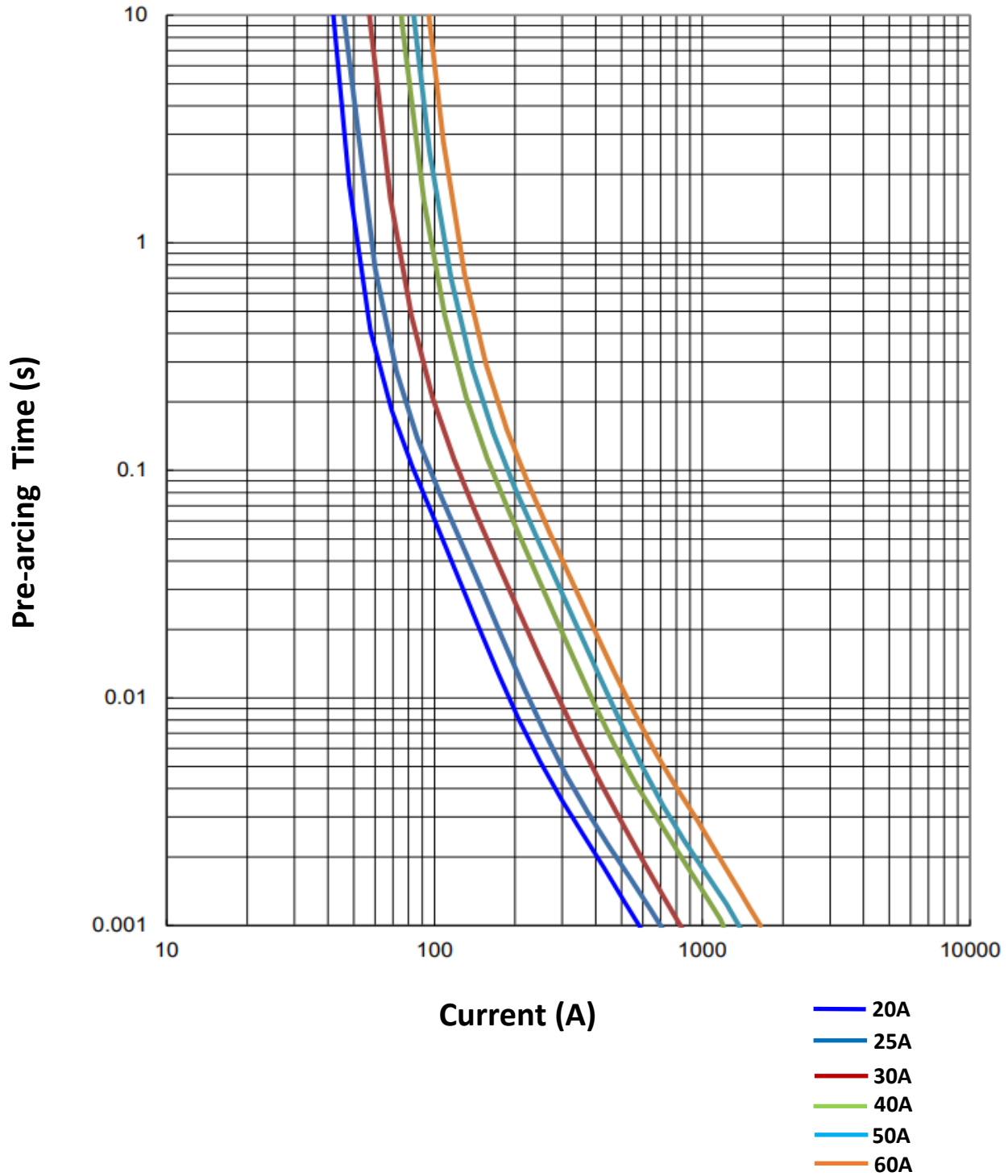
1. Measured at ≤10% of rated current and 25°C ambient.

2. Melting I²t at 1ms pre-arcing time

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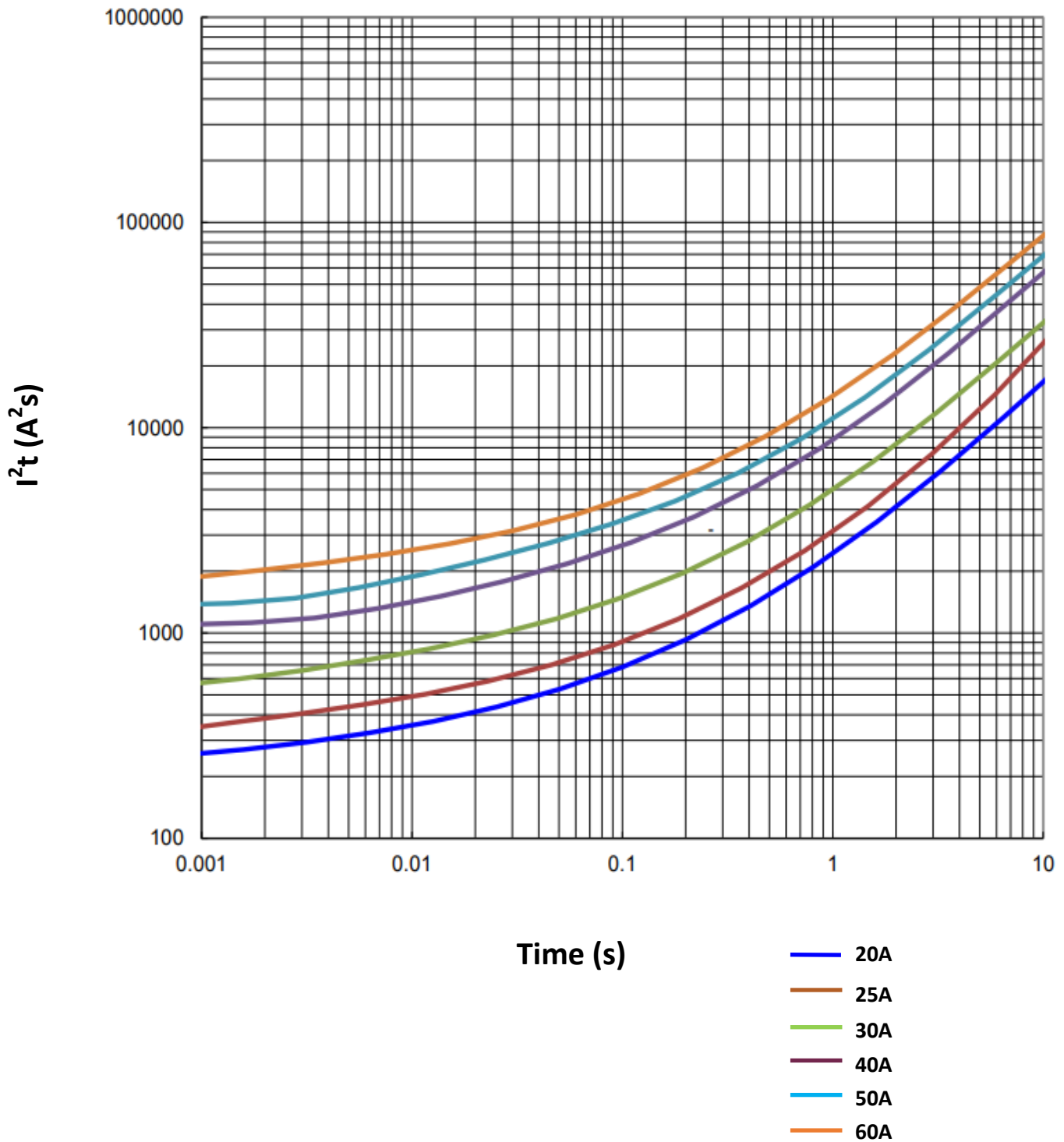
Clearing Time vs. Current Curve :



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I²t vs .t Curves:



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Temperature De-rating Guideline:

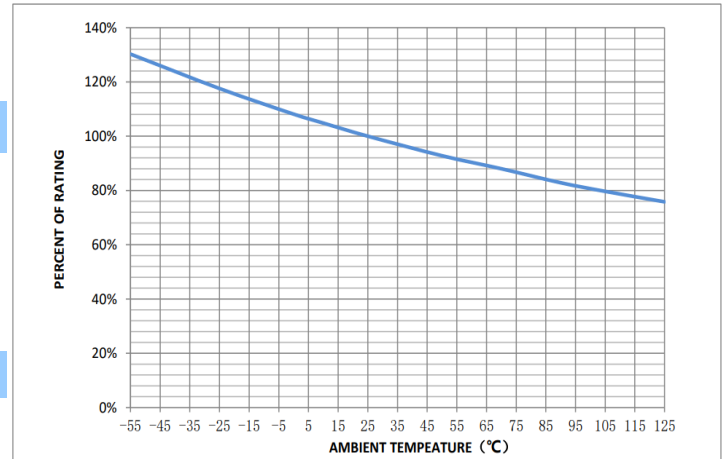
The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25 °C, the fuse shall be “derated” according to the de-rating curve.

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.

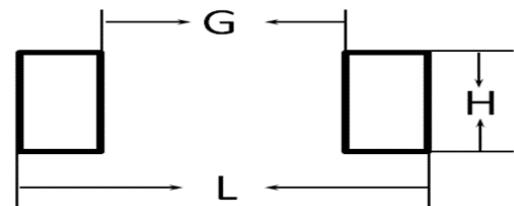
Packaging:

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

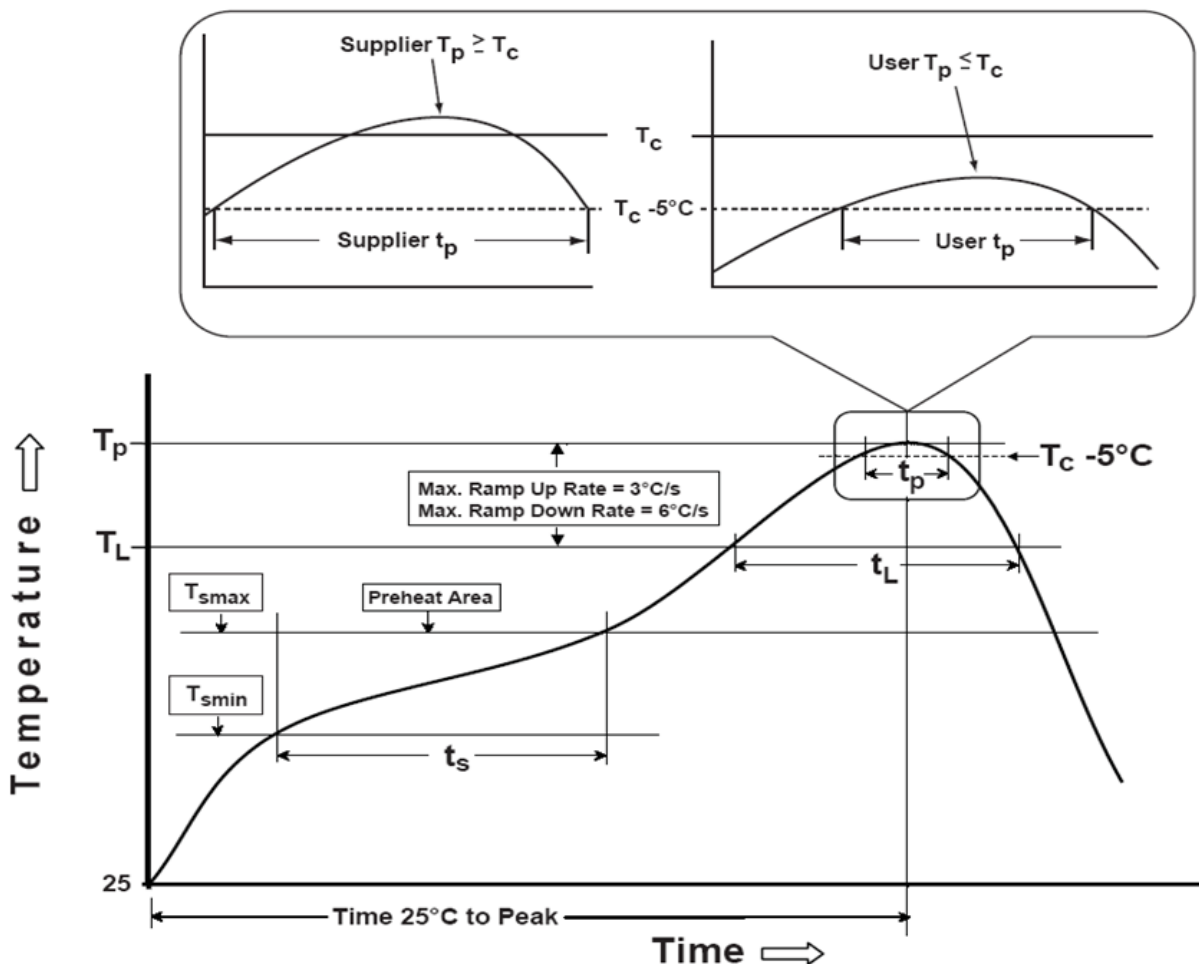
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Recommended Temperature Profile for Reflow Soldering:

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 contact the chip termination with the tip of soldering iron.

Disclaimer

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