

## 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

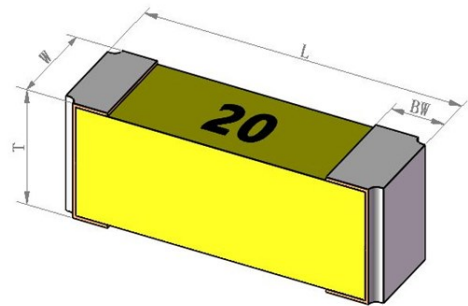
#### Application Fields:

- 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

Size	L	W	T	BW
4012	0.398 ± 0.012 (10.10 ± 0.30)	0.129 ± 0.012 (3.30 ± 0.30)	0.129 ± 0.012 (3.30 ± 0.30)	0.061 ± 0.012 (1.55 ± 0.30)
4818	0.476 ± 0.012 (12.10 ± 0.30)	0.175 ± 0.012 (4.45 ± 0.30)	0.129 ± 0.012 (3.30 ± 0.30)	0.061 ± 0.012 (1.55 ± 0.30)

AF101: AF-Airmatrix Fuse 101-Series Code

#### Ordering Information:

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

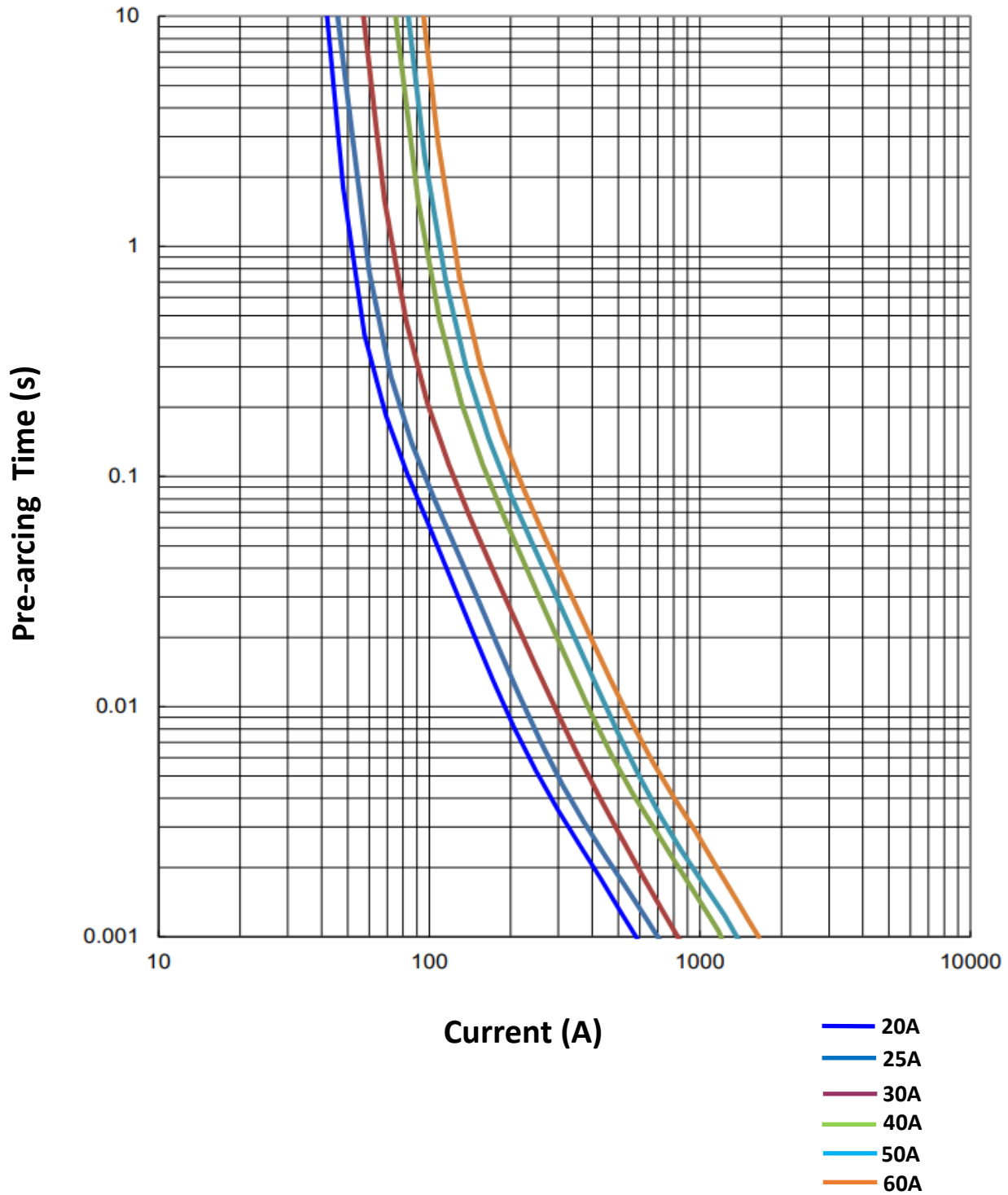
AEM Part Number	Current Rating (A)	Max. Voltage Rating (V)	Interrupting Rating	Nominal Cold DCR (mΩ) <sup>1</sup>	Nominal I <sup>2</sup> t (A <sup>2</sup> s) <sup>2</sup>
AF4012H20A0T	20	75	1000A@75VDC	2.24	240
AF4012H25A0T	25	75		1.68	350
AF4012H30A0T	30	75		1.35	570
AF4818H40A0T	40	75		1.26	1100
AF4818H50A0T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

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

2. Melting I<sup>2</sup>t at 1ms pre-arcing time

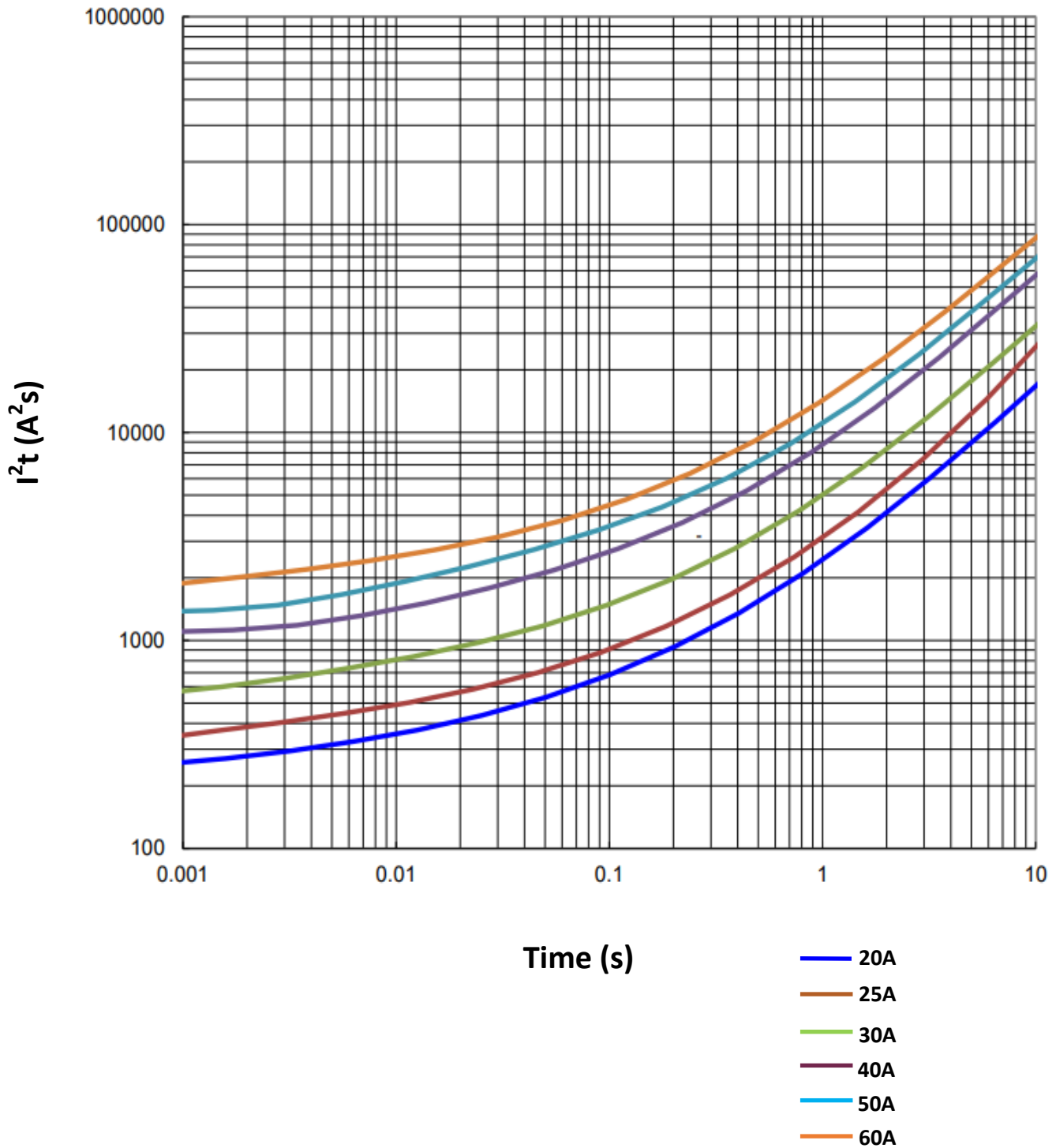
**AirMatrix<sup>®</sup> Surface Mount Fuses**  
**AF101 Series**

**Clearing Time vs. Current Curve :**



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**I<sup>2</sup>t vs .t Curves:**



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#### Temperature De-rating Guideline:

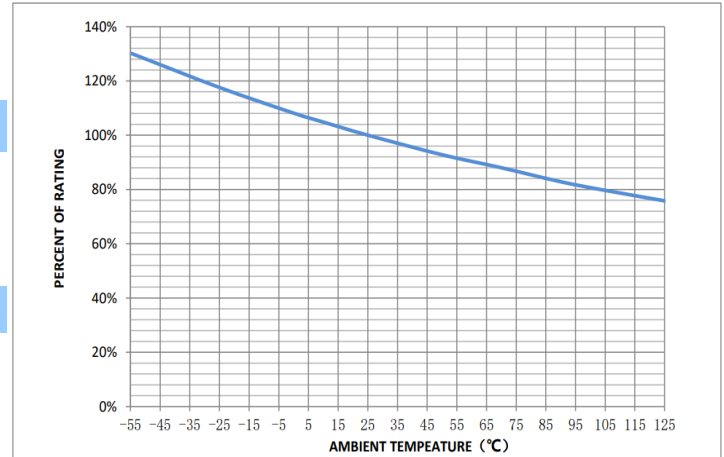
The ambient temperature affects the current carrying capacity of fuses. When a fuse is operating at a temperature higher than 25 °C, the fuse shall be “derated” according to the de-rating curve.

#### 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.

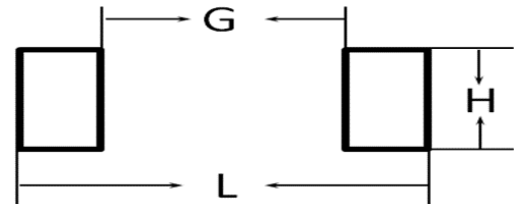
#### Packaging:

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

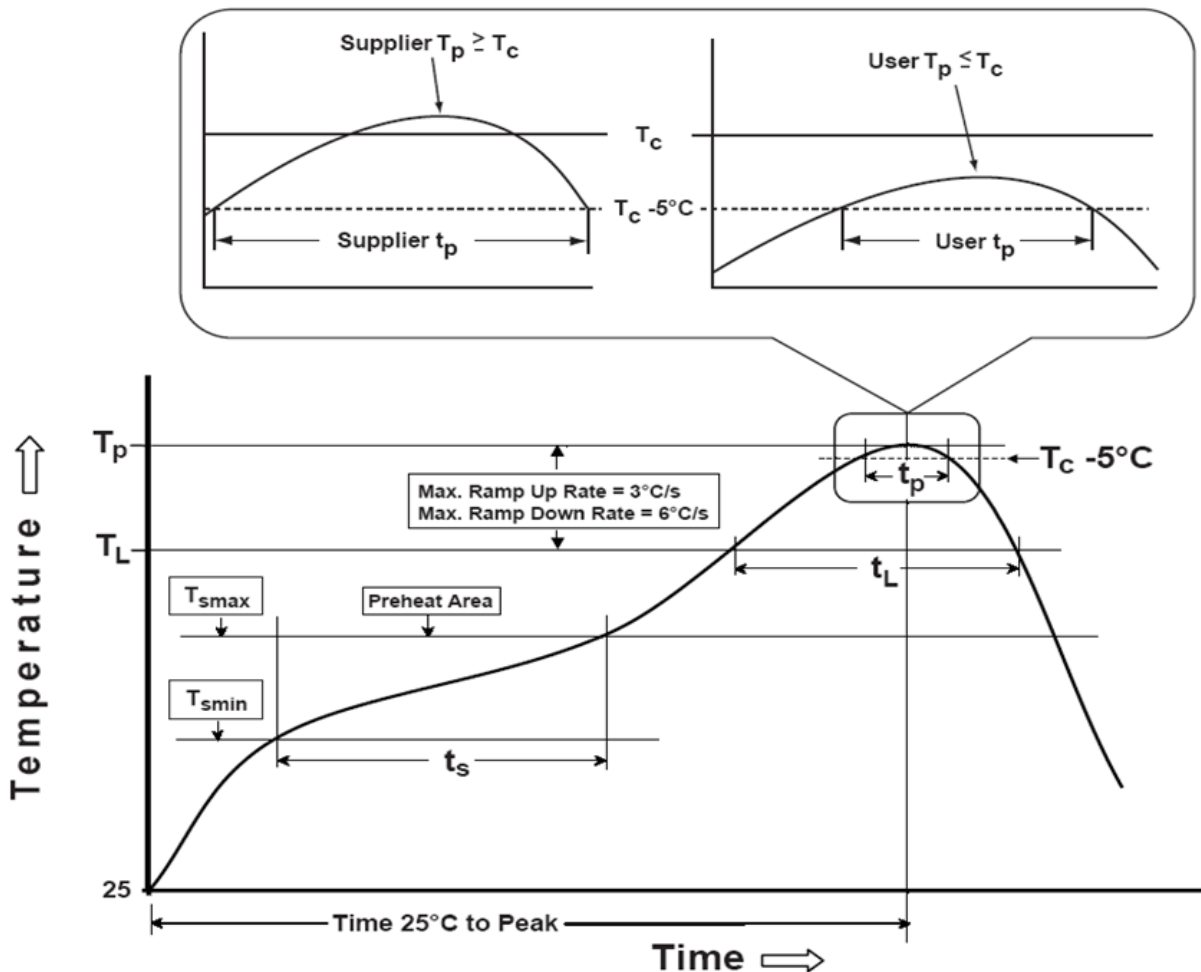
# AirMatrix<sup>®</sup> Surface Mount Fuses

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### Recommended Temperature Profile for Reflow Soldering:

Profile Feature	Pb-Free Assembly
<b>Preheat/Soak</b>	
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.

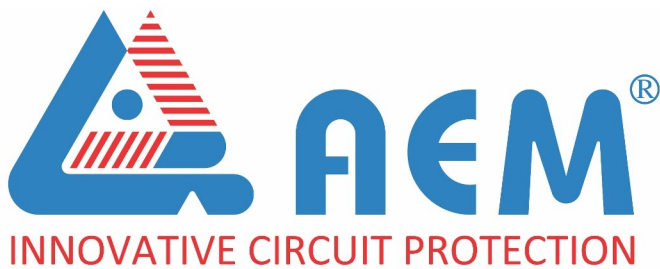


Recommended conditions for hand soldering:

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

*Specifications are subject to change without notice. AEM products are designed for specific applications and should not be used for any purpose (including, without limitation, automotive, aerospace, medical, life-saving applications, or any other application which requires especially high reliability for the prevention of such defect as may directly cause damage to the third party's life, body or property) not expressly set forth in applicable AEM product documentation. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Warranties granted by AEM shall be deemed void for products used for any purpose not expressly set forth in applicable AEM product documentation. AEM shall not be liable for any claims or damages arising out of products used in applications not expressly intended by AEM as set forth in applicable AEM product documentation. The sale and use of AEM products is subject to AEM terms and conditions of sale. Please refer to AEM's website for updated catalog and terms and conditions of sale.*



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