SolidMatrix® 1206 Fast Acting Surface Mount Fuses

Features:

- Multilayer monolithic structure with glass ceramic body and silver fusing element
- Silver termination with nickel and pure-tin solder plating, providing excellent solderability
- Standard EIA 1206/EIAJ3216 size
- Compatible with both wave and reflow soldering processes
- Operating temperature range: -55°C to +125°C (with de-rating)
- RoHS compliant

Clear-Time Characteristics (Fast Acting):

% of current rating	*Clear-time at 25 °C*
100%	4 hours min.
250%	5 seconds max.
400%	0.05 seconds max.

Agency Approval: *Recognized Under the Components Program of Underwriters Laboratories. File Number: E232989*

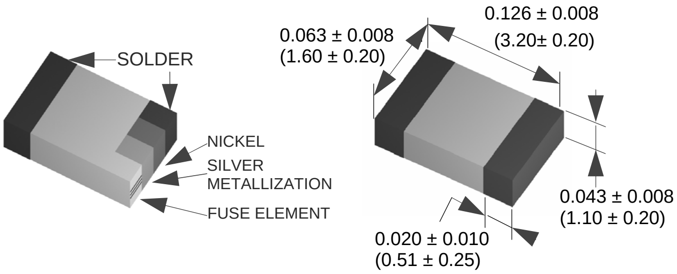
Patents: U.S. Patent numbers 6,034,589; 6,228,230; 6,602,766; 7,268,661 B2; and other pending patents.

Interrupting Ratings:

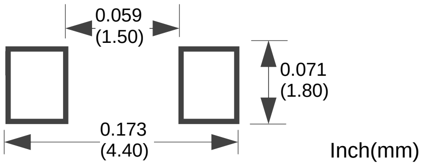
0.5A - 3A	50A at rated voltages
4A - 8A	45A at rated voltages

Marking(Optional): Black Marking Character Code
0.5A:C, 0.75A:D, 1A:E, 1.5A:G, 1.75A:H, 2A:I, 2.5A:J, 3A:K, 4A:M, 5A:N, 6A:O, 7A:P, 8A:R

Shape and Dimensions:



Recommended Land Pattern:



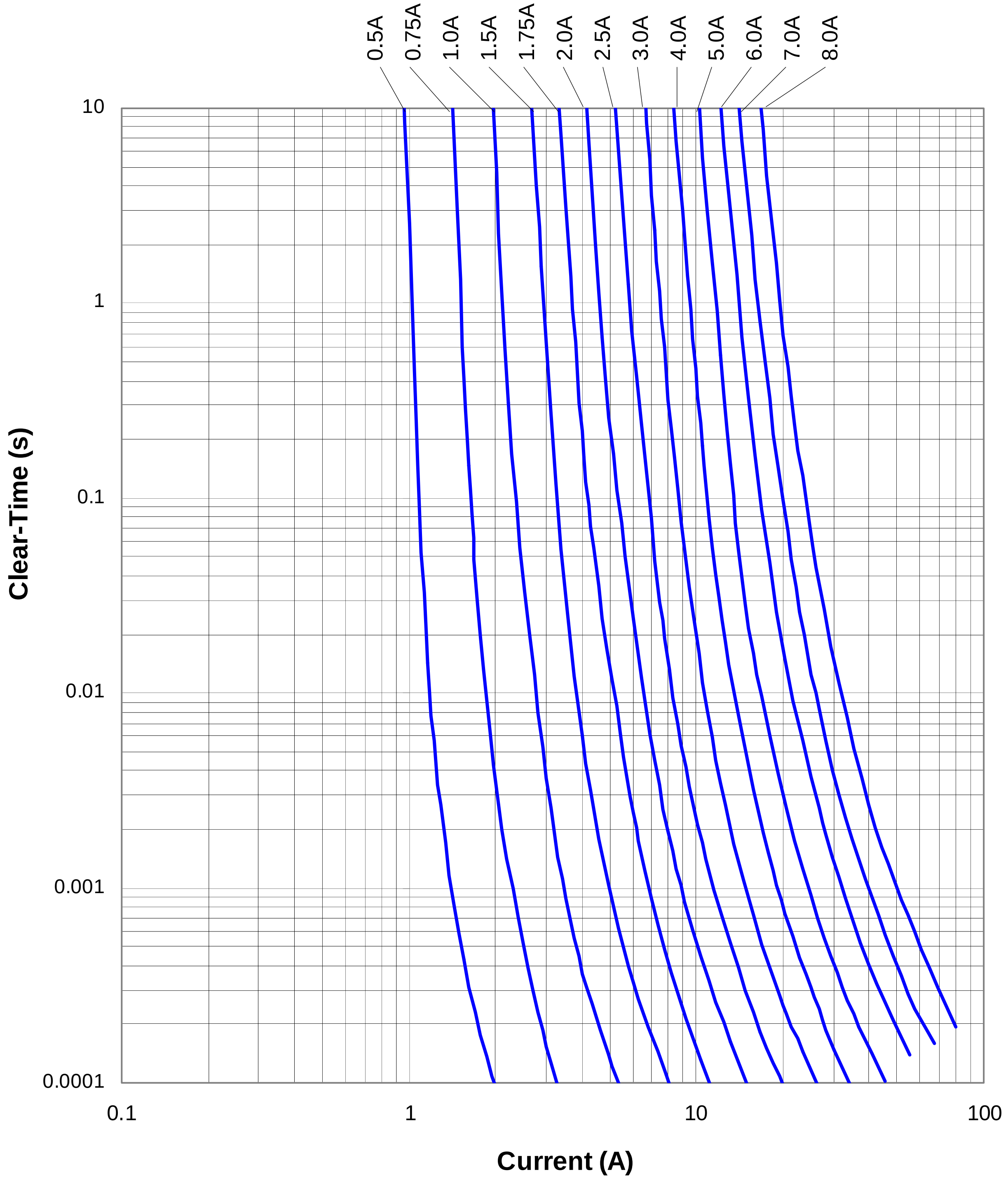
Ordering Information:

Part Number	Current Rating (A)	Voltage Rating (VDC)	Nominal Cold DCR (Ω)[1]
F1206FA0500V063T	0.5	63	0.730
F1206FA0750V063T	0.75	63	0.513
F1206FA1000V063T	1.0	63	0.220
F1206FA1500V063T	1.5	63	0.120
F1206FA1750V063T	1.75	63	0.100
F1206FA2000V063T	2.0	63	0.050
F1206FA2500V032T	2.5	32	0.035
F1206FA3000V032T	3.0	32	0.031
F1206FA4000V032T	4.0	32	0.022
F1206FA5000V032T	5.0	32	0.015
F1206FA6000V024T	6.0	24	0.013
F1206FA7000V024T	7.0	24	0.011
F1206FA8000V024T	8.0	24	0.008

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

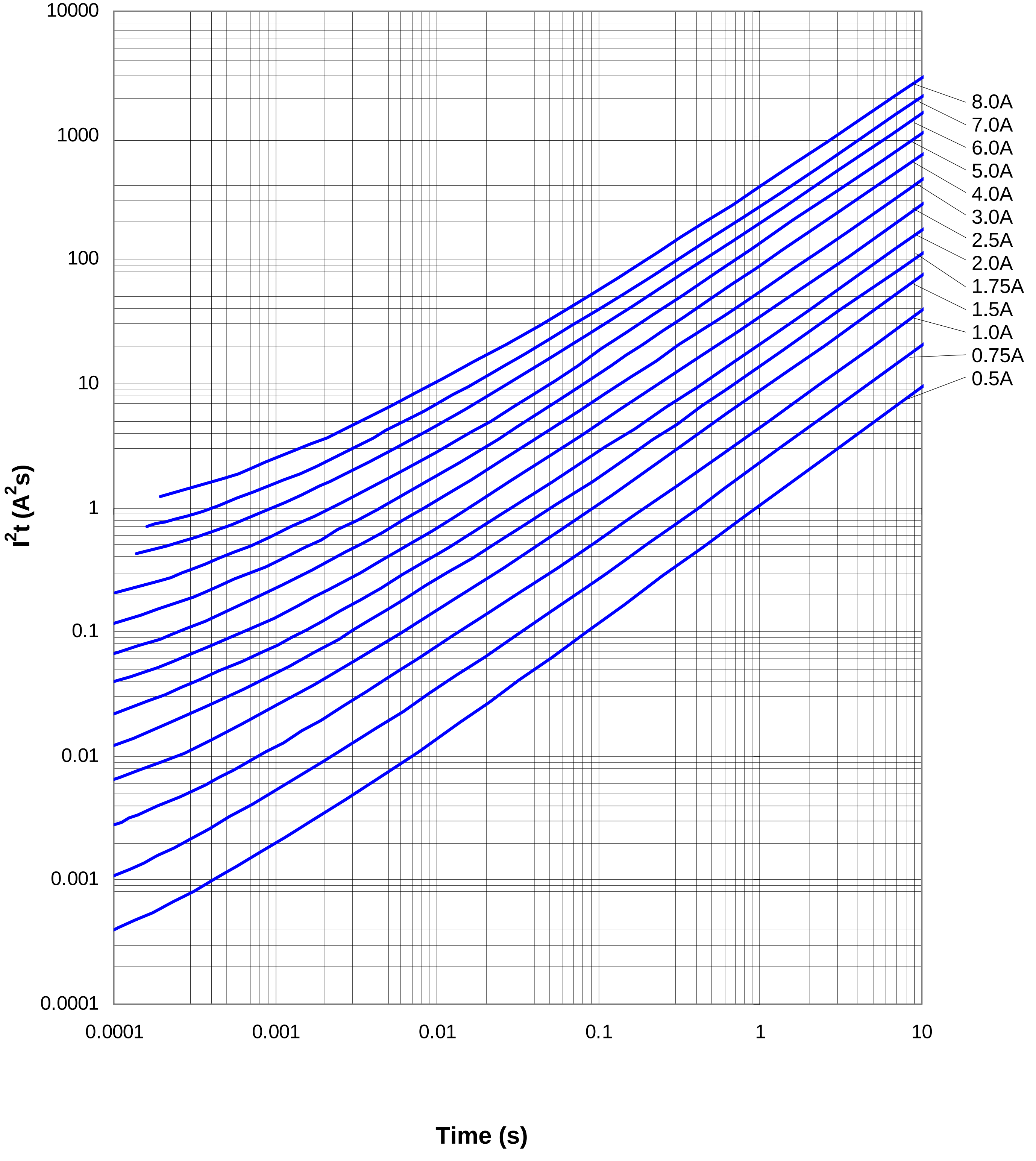
SolidMatrix® 1206 Fast Acting Surface Mount Fuses

Average Clear-Time Curves



SolidMatrix® 1206 Fast Acting Surface Mount Fuses

Average I^2t vs. t Curves



SolidMatrix® Surface Mount Fuses

Product Identification:

F 0603 FA 1000 V024 T M
(1) (2) (3) (4) (5) (6) (7)

(1) **Series code:** F－Chip Fuse
(2) **Size code**: Standard EIA Chip Sizes
(3) **Action code:** FA －Fast Acting; SB －Slow Blow; HI －High Inrush; FF－Very Fast Acting; HA－High Current
(4) **Current rating code:** 1000 — 1000 mA （ For HA, 10－10A）
(5) **Voltage rating code:** V024 — 24 VDC
(6) **Package code:** T — Tape & Reel, B — Bulk
(7) Marking code: M－With marking（Optional)

Environmental Tests:

No.	Test	Requirement	Test condition	Test reference
1	Soldering heat resistance	DCR change ≤ ±10% No mechanical damage	One dip at 260°C for 60 sec.	MIL-STD-202 Method 210
2	Solderability	Minimum 95% coverage	One dip at 255°C for 5 sec.	MIL-STD-202 Method 208
3	Thermal shock	DCR change ≤ ±10% No mechanical damage	100 cycles between -65°C and +125°C	MIL-STD-202 Method 107
4	Moisture resistance	DCR change ≤ ±15% No excessive corrosion	10 cycles	MIL-STD-202 Method 106
5	Salt spray	DCR change ≤ ±10% No excessive corrosion	48 hour exposure	MIL-STD-202 Method 101
6	Mechanical vibration	DCR change ≤ ±10% No mechanical damage	0.4” D.A. or 30 G between 5 – 3000 Hz	MIL-STD-202 Method 204
7	Mechanical shock	DCR change ≤ ±10% No mechanical damage	1500 G, 0.5 ms, half-sine shocks	MIL-STD-202 Method 213
8	Terminal strength	No mechanical damage	30 sec. hanging for 1206 (1.5kg) and 0603 (0.5kg), 2 lb pushing for 0402	Refer to AEM QIQ007
9	Life	No electrical “opens” during testing voltage drop change shall be less than ±20% of initial value	80% rated current (75% for <1A fuses) for 2000 hours at ambient temperature between +20°C and +30°C	Refer to AEM QIQ106

Electrical Specifications:

Clear-Time Characteristics: Same as specified on the Short Form Data Sheet
Insulation Resistance after Opening: 20,000 ohms typical when cleared with rated voltage applied. Fuse clearing under low voltage conditions may result in lower after clearing insulation resistance values. (Note: Under normal fault conditions (low or rated voltage conditions), AEM SolidMatrix fuses provide sufficient after clearing insulation resistance values for circuit protection.)
Current Carrying Capacity: 100% rated current at +25ºC ambient for 4 hours minimum when evaluated per MIL-PRF-23419
Interrupt Ratings: as specified in this catalog.

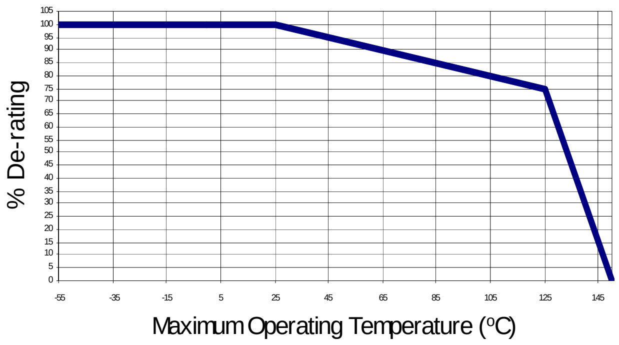
Fuse Selection and Temperature De-rating Guideline:

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 4A. The current rating for fuse selected from the catalog shall be:
4 / 0.75 / 90% = 5.9 or 6A.

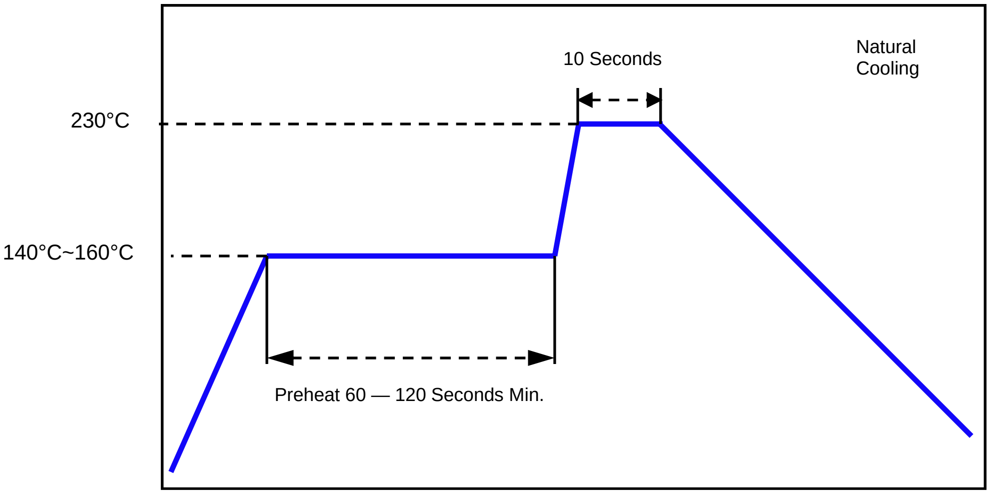
Temperature Effect on Current Rating



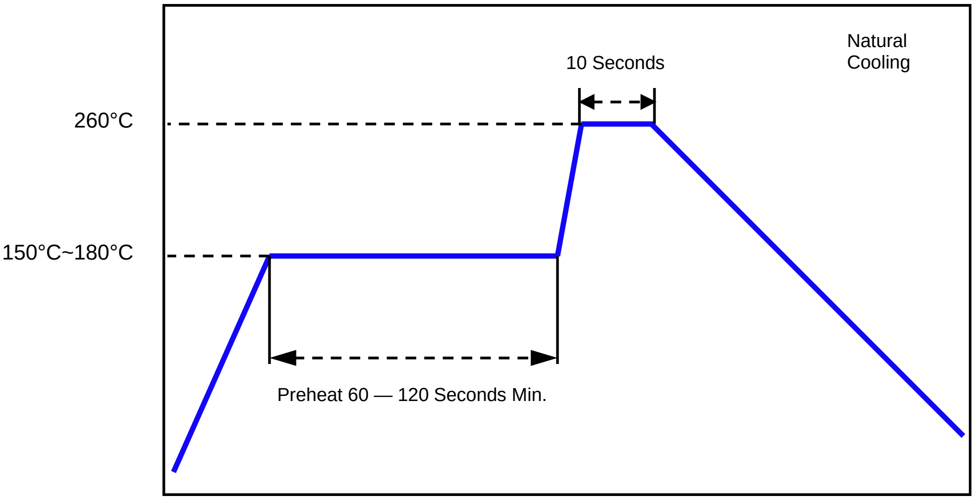
SolidMatrix® Surface Mount Fuses

Soldering Temperature Profiles

Recommended Temperature Profile for Sn/Pb Solder



Recommended Temperature Profile for Lead-free Solder



Recommended conditions for hand soldering:

1. Appropriate temperature (max.) of soldering iron tip/soldering time (max.): 280°C /10s or 350°C / 3s
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.

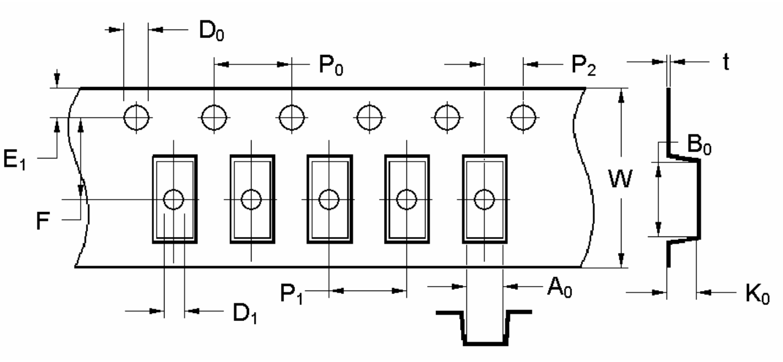
Packaging and Storage

Packaging

AEM's multilayer components are provided on tape-and-reel for use in pick-and-place machines or in bulk for special applications. Both tape-and-reel and bulk products are sealed in plastic bags with desiccant. The reel size can be 7 inches or 13 inches, depending on customers' preference.

Dimensions of Tape in Inches (mm)

Size	***Ao***	***Bo***	***Ko***	***Type***
0402 (1005)	0.026 ± 0.004 (0.67 ± 0.10)	0.046 ± 0.004 (1.17 ± 0.10)	0.025 ± 0.004 (0.63 ± 0.10)	Paper
0603 (1608)	0.039 ± 0.004 (0.98± 0.10)	0.071 ± 0.004 (1.80 ± 0.10)	0.037 ± 0.003 (0.95 ± 0.08)	Paper
	0.039± 0.004 (1.00± 0.10)	0.071± 0.004 (1.80± 0.10)	0.024± 0.003 (0.60± 0.08)	Paper (for FF)
	0.036 ± 0.004 (0.92 ± 0.10)	0.071 ± 0.004 (1.80 ± 0.10)	0.033 ± 0.004 (0.85 ± 0.10)	Plastic
0805	0.063 ± 0.004	0.093 ± 0.004	0.047 ± 0.004	Plastic
1206	0.071 ± 0.004	0.138 ± 0.004	0.050 ± .004	Plastic
1210	0.106 ± 0.004	0.137 ± 0.004	0.056 ± 0.004	Plastic
1812	0.144 ± 0.004	0.195 ± 0.004	0.072 ± 0.004	Plastic
2220	0.201 ± 0.004	0.235 ± 0.004	0.110 ± 0.004	Plastic



Size	***E_1***	***F***	***W***	***P_1***	***P_o***	***P_2***	***D_o***	***D_1***	***t***
0402(1005)	0.069 ± 0.004 (1.75 ± 0.10)	0.138 ± 0.002 (3.50 ± 0.05)	0.318 ± 0.004 (8.00 ± 0.10)	0.079 ± 0.004(2.00 ± 0.10)	0.157 ± 0.004 (4.00 ± 0.10)	0.040 ± 0.002 (1.00 ± 0.05)	0.059 + 0.004/-0.00 (1.50 + 0.10/-0.00)	N/A	0.009 ± 0.001 (0.23 ± 0.02)
0603(1608)				0.157 ± 0.004(4.00 ± 0.10)		0.079 ± 0.002 (2.00 ± 0.05)			
0805(2012)								0.039 max. (1.00 max.)	
1206(3216)									
1210(3225)									
1812(4532)									
2220(5750)			0.472 ± 0.004 (12.00 ± 0.10)	0.318 ± 0.004(8.00 ± 0.10)				0.059 max. (1.50 max.)	

Packaging Data

Chip Size	***Parts on 7 inch (178 mm) Reel***
0402(1005)	**10,000**
0603(1608)	**4,000**
0805(2012)	**3,000**
1206(3216)	**3,000**
1210(3225)	**2,000**
1812(4532)	**1,000**
2220(5750)	**1,000**

Packaging and Storage

Storage

The maximum ambient temperature shall not exceed 40^{o}C. Storage temperatures higher than 40^{o}C could result in the deformation of packaging materials. The maximum relative humidity recommended for storage is 70%. High humidity with high temperature can accelerate the oxidation of the solder plating on the termination and reduce the solderability of the components. Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and should only be opened prior to use. The products should not be stored in areas where harmful gases containing sulfur or chlorine are present.