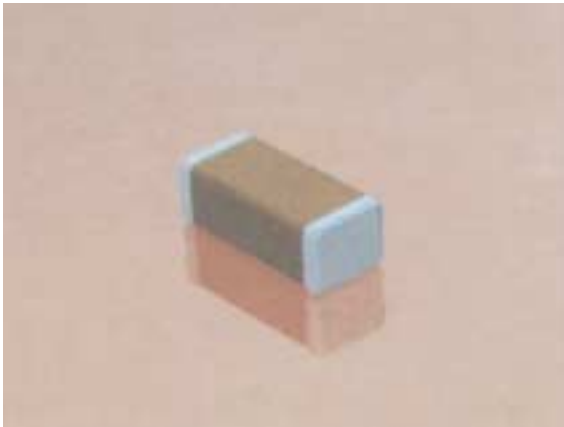


High Voltage MLC Chips



For 600V to 5000V Application



High value, low leakage and small size are difficult parameters to obtain in capacitors for high voltage systems. AVX special high voltage MLC chips capacitors meet these performance characteristics and are designed for applications such as snubbers in high frequency power converters, resonators in SMPS, and high voltage coupling/DC blocking. These high voltage chip designs exhibit low ESRs at high frequencies.

Larger physical sizes than normally encountered chips are used to make high voltage chips. These larger sizes require that special precautions be taken in applying these chips in surface mount assemblies. This is due to differences in the coefficient of thermal expansion (CTE) between the substrate materials and chip capacitors. Apply heat at less than 4°C per second during the preheat. Maximum preheat temperature must be within 50°C of the soldering temperature. The solder temperature should not exceed 230°C. Chips 1808 and larger to use reflow soldering only.

Capacitors with X7R Dielectrics are not intended for AC line filtering applications. Contact plant for recommendations.

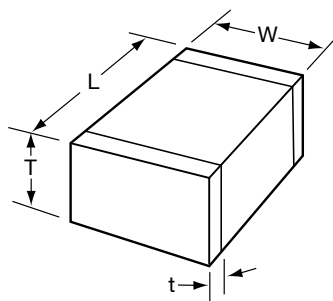
Capacitors may require protective surface coating to prevent external arcing.

HOW TO ORDER

| 1808 | A | A | 271 | K | A | 1 | 1A |
|------------------|---|--------------------------------|---|---|---|---|--|
| AVX Style | Voltage | Temperature Coefficient | Capacitance Code (2 significant digits + no. of zeros) Examples: 10 pF = 100 100 pF = 101 1,000 pF = 102 22,000 pF = 223 220,000 pF = 224 1 μF = 105 | Capacitance Tolerance COG: J = ±5% K = ±10% M = ±20% X7R: K = ±10% M = ±20% Z = +80%, -20% | Failure Rate A = Not Applicable | Termination* 1 = Pd/Ag T = NiGuard Nickel Barrier Solder Plate | Packaging/Marking** ME = 7" Reel Marked RE = 13" Reel Marked BE = Bulk/Marked 1A = 7" Reel Unmarked 3A = 13" Reel Unmarked 9A = Bulk/Unmarked |
| 1206 | 600V = C 1000V = A 1210 1500V = S 1808 2000V = G 1812 2500V = W 1825 3000V = H 2220 4000V = J 2225 5000V = K 3640 | COG = A X7R = C | | | | | |

***Note:** Leaded terminations are available.
Styles 1825, 2225, & 3640 are available with "N", "L" or "J" leads as seen on page 9.
"V" denotes uncoated leaded units similar to SM0 product.
"W" denotes leaded epoxy coated units similar to SM5 product.
IE 1825AA103KAV00J would be uncoated leaded part with "J" style leads.

****Note:** Style 1808 cannot have the marking oriented in tape & reel packaging due to square cross-section of chip.
Unmarked product is standard.



DIMENSIONS

| SIZE | 1206 | 1210 | 1808* | 1812* | 1825* | 2220* | 2225* | 3640* |
|------------------------------|-------------------------------|-------------------------------|--------------------------------|-------------------------------|-------------------------------|------------------------------|--------------------------------|--------------------------------|
| (L) Length | 3.20 ± 0.2 (0.126 ± 0.008) | 3.20 ± 0.2 (0.126 ± 0.008) | 4.57 ± 0.25 (0.180 ± 0.010) | 4.50 ± 0.3 (0.177 ± 0.012) | 4.50 ± 0.3 (0.177 ± 0.012) | 5.7 ± 0.4 (0.224 ± 0.016) | 5.72 ± 0.25 (0.225 ± 0.010) | 9.14 ± 0.25 (0.360 ± 0.010) |
| (W) Width | 1.60 ± 0.2 (0.063 ± 0.008) | 2.50 ± 0.2 (0.098 ± 0.008) | 2.03 ± 0.25 (0.080 ± 0.010) | 3.20 ± 0.2 (0.126 ± 0.008) | 6.40 ± 0.3 (0.252 ± 0.012) | 5.0 ± 0.4 (0.197 ± 0.016) | 6.35 ± 0.25 (0.250 ± 0.010) | 10.2 ± 0.25 (0.400 ± 0.010) |
| (T) Thickness Max. | 1.52 (0.060) | 1.70 (0.067) | 2.03 (0.080) | 2.54 (0.100) | 2.54 (0.100) | 3.3 (0.130) | 2.54 (0.100) | 2.54 (0.100) |
| (t) terminal min. max. | 0.25 (0.010) 0.75 (0.030) | 0.25 (0.010) 0.75 (0.030) | 0.25 (0.010) 1.02 (0.040) | 0.25 (0.010) 1.02 (0.040) | 0.25 (0.010) 1.02 (0.040) | 0.25 (0.010) 1.02 (0.040) | 0.25 (0.010) 1.02 (0.040) | 0.76 (0.030) 1.52 (0.060) |

*Reflow Soldering Only



High Voltage MLC Chips



For 600V to 5000V Applications

C0G Dielectric

Performance Characteristics

| | |
|--|--|
| Capacitance Range | 10 pF to 0.047 μ F (25°C, 1.0 \pm 0.2 Vrms at 1kHz, for \leq 1000 pF use 1 MHz) |
| Capacitance Tolerances | \pm 5%, \pm 10%, \pm 20% |
| Dissipation Factor | 0.1% max. (+25°C, 1.0 \pm 0.2 Vrms, 1kHz, for \leq 1000 pF use 1 MHz) |
| Operating Temperature Range | -55°C to +125°C |
| Temperature Characteristic | 0 \pm 30 ppm/°C (0 VDC) |
| Voltage Ratings | 600, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C) |
| Insulation Resistance (+25°C, at 500 VDC) | 100K M Ω min. or 1000 M Ω - μ F min., whichever is less |
| Insulation Resistance (+125°C, at 500 VDC) | 10K M Ω min. or 100 M Ω - μ F min., whichever is less |
| Dielectric Strength | 120% rated voltage for 5 seconds at 50 mA max. current |

HIGH VOLTAGE C0G CAPACITANCE VALUES

| VOLTAGE | 1206 | 1210 | 1808 | 1812 | 1825 | 2220 | 2225 | 3640 |
|-----------|--------|---------|---------|---------|---------------|---------------|---------------|---------------|
| 600 min. | 100 pF | 100 pF | 100 pF | 100 pF | 1000 pF | 1000 pF | 1000 pF | 1000 pF |
| 600 max. | 680 pF | 1500 pF | 2700 pF | 5600 pF | 0.012 μ F | 0.012 μ F | 0.015 μ F | 0.047 μ F |
| 1000 min. | 10 pF | 100 pF | 100 pF | 100 pF | 100 pF | 1000 pF | 1000 pF | 1000 pF |
| 1000 max. | 470 pF | 820 pF | 1500 pF | 2700 pF | 6800 pF | 0.010 μ F | 0.010 μ F | 0.018 μ F |
| 1500 min. | 10 pF | 100 pF | 10 pF | 10 pF | 100 pF | 1000 pF | 1000 pF | 100 pF |
| 1500 max. | 150 pF | 330 pF | 470 pF | 1000 pF | 2700 pF | 2700 pF | 3300 pF | 8200 pF |
| 2000 min. | 10 pF | 10 pF | 10 pF | 10 pF | 100 pF | 1000 pF | 1000 pF | 100 pF |
| 2000 max. | 68 pF | 150 pF | 270 pF | 680 pF | 1800 pF | 2200 pF | 2200 pF | 5600 pF |
| 2500 min. | — | — | 10 pF | 10 pF | 10 pF | 100 pF | 100 pF | 100 pF |
| 2500 max. | — | — | 150 pF | 390 pF | 1000 pF | 1000 pF | 1200 pF | 3900 pF |
| 3000 min. | — | — | 10 pF | 10 pF | 10 pF | 10 pF | 10 pF | 100 pF |
| 3000 max. | — | — | 100 pF | 330 pF | 680 pF | 680 pF | 820 pF | 2200 pF |
| 4000 min. | — | — | 10 pF | 10 pF | 10 pF | 10 pF | 10 pF | 100 pF |
| 4000 max. | — | — | 39 pF | 100 pF | 220 pF | 220 pF | 330 pF | 1000 pF |
| 5000 min. | — | — | — | — | — | — | — | 10 pF |
| 5000 max. | — | — | — | — | — | — | — | 680 pF |

X7R Dielectric

Performance Characteristics

| | |
|--|---|
| Capacitance Range | 10 pF to 0.56 μ F (25°C, 1.0 \pm 0.2 Vrms at 1kHz) |
| Capacitance Tolerances | \pm 10%; \pm 20%; +80%, -20% |
| Dissipation Factor | 2.5% max. (+25°C, 1.0 \pm 0.2 Vrms, 1kHz) |
| Operating Temperature Range | -55°C to +125°C |
| Temperature Characteristic | \pm 15% (0 VDC) |
| Voltage Ratings | 600, 1000, 1500, 2000, 2500, 3000, 4000 & 5000 VDC (+125°C) |
| Insulation Resistance (+25°C, at 500 VDC) | 100K M Ω min. or 1000 M Ω - μ F min., whichever is less |
| Insulation Resistance (+125°C, at 500 VDC) | 10K M Ω min. or 100 M Ω - μ F min., whichever is less |
| Dielectric Strength | 120% rated voltage for 5 seconds at 50 mA max. current |

HIGH VOLTAGE X7R MAXIMUM CAPACITANCE VALUES

| VOLTAGE | 1206 | 1210 | 1808 | 1812 | 1825 | 2220 | 2225 | 3640 |
|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| 600 min. | 1000 pF | 1000 pF | .01 μ F | .01 μ F | .01 μ F | .01 μ F | .01 μ F | .01 μ F |
| 600 max. | 0.015 μ F | 0.027 μ F | 0.033 μ F | 0.068 μ F | 0.15 μ F | 0.15 μ F | 0.22 μ F | 0.56 μ F |
| 1000 min. | 1000 pF | 1000 pF | 1000 pF | 1000 pF | 1000 pF | .01 μ F | .01 μ F | .01 μ F |
| 1000 max. | 4700 pF | 0.010 μ F | 0.015 μ F | 0.027 μ F | 0.068 μ F | 0.068 μ F | 0.082 μ F | 0.22 μ F |
| 1500 min. | 100 pF | 100 pF | 100 pF | 100 pF | 1000 pF | 1000 pF | 1000 pF | .01 μ F |
| 1500 max. | 1200 pF | 2700 pF | 3900 pF | 8200 pF | 0.018 μ F | 0.022 μ F | 0.027 μ F | 0.068 μ F |
| 2000 min. | 10 pF | 100 pF | 100 pF | 100 pF | 100 pF | 1000 pF | 1000 pF | 1000 pF |
| 2000 max. | 470 pF | 1000 pF | 1800 pF | 4700 pF | 8200 pF | 0.010 μ F | 0.012 μ F | 0.027 μ F |
| 2500 min. | — | — | 10 pF | 10 pF | 100 pF | 1000 pF | 1000 pF | 1000 pF |
| 2500 max. | — | — | 1200 pF | 2200 pF | 5600 pF | 6800 pF | 8200 pF | 0.022 μ F |
| 3000 min. | — | — | 10 pF | 10 pF | 100 pF | 1000 pF | 1000 pF | 1000 pF |
| 3000 max. | — | — | 560 pF | 1200 pF | 2700 pF | 3300 pF | 4700 pF | 0.018 μ F |
| 4000 min. | — | — | — | — | — | — | — | 100 pF |
| 4000 max. | — | — | — | — | — | — | — | 6800 pF |
| 5000 min. | — | — | — | — | — | — | — | 100 pF |
| 5000 max. | — | — | — | — | — | — | — | 3300 pF |



High Voltage MLC Chips



Packaging of Chip Components

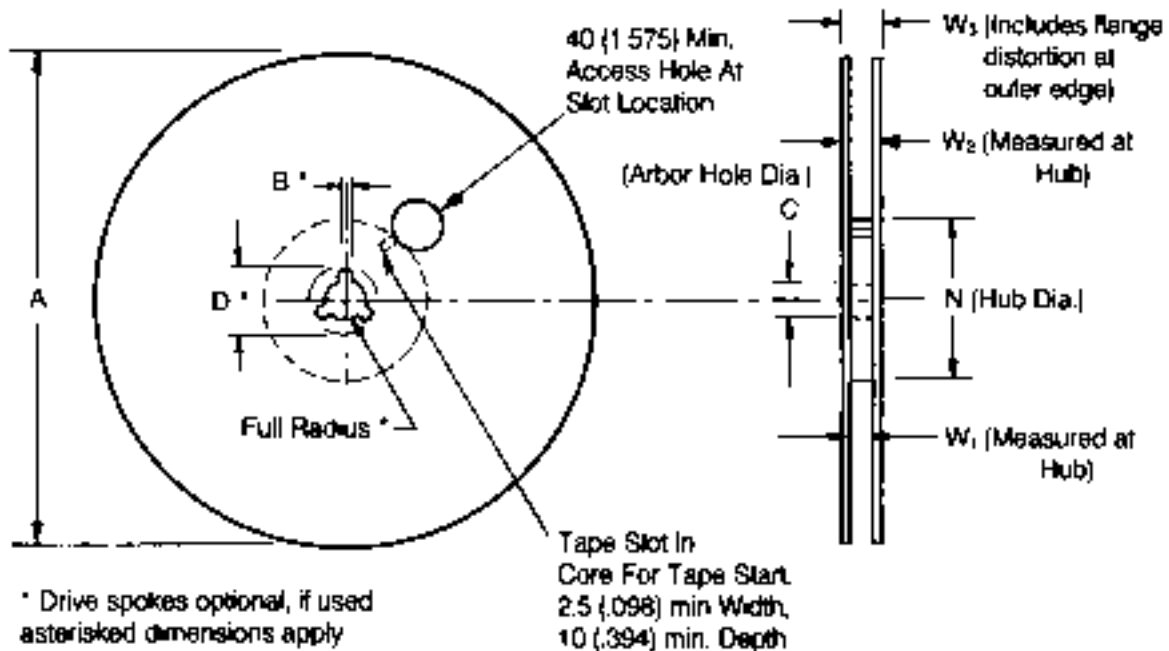
AUTOMATIC INSERTION PACKAGING

TAPE & REEL QUANTITIES

All tape and reel specifications are in compliance with EIA481 & IEC-286-3.

| | 8mm | 12mm | | 24mm |
|------------------------|--------------|------|--------------------------|------|
| | 1206 1210 | 1808 | 1812, 1825 2220, 2225 | 3640 |
| Qty. per Reel/7" Reel | 2000 | 2000 | 1000 | N/A |
| Qty. per Reel/13" Reel | 10,000 | 4000 | 4000 | 1000 |

REEL DIMENSIONS



DIMENSIONS

millimeters (inches)

| Tape Size | A Max. | B* Min. | C | D* Min. | N Min. | W ₁ | W ₂ Max. | W ₃ |
|-----------|-----------------|----------------|--|-----------------|---------------|--|---------------------|--|
| 8mm | 330 (12.992) | 1.5 (0.059) | 13.0±0.20 (0.512±0.008) | 20.2 (0.795) | 50 (1.969) | 8.4 ^{+1.5} _{-0.0} (0.331 ^{+0.060} _{-0.0}) | 14.4 (0.567) | 7.9 Min. (0.311) 10.9 Max. (0.429) |
| 12mm | 330 (12.992) | 1.5 (0.059) | 13.0±0.20 (0.512±0.008) | 20.2 (0.795) | 50 (1.969) | 12.4 ^{+2.0} _{-0.0} (0.488 ^{+0.079} _{-0.0}) | 18.4 (0.724) | 11.9 Min. (0.469) 15.4 Max. (0.607) |
| 24mm | 360 (14.173) | 1.5 (0.059) | 13.0 ^{+0.5} _{-0.2} (0.512 ^{+0.020} _{-0.008}) | 20.2 (0.795) | 60 (2.362) | 24.4 ^{+2.0} _{-0.0} (0.961 ^{+0.079} _{-0.0}) | 30.4 (1.197) | 23.9 Min. (0.941) 27.4 Max. (1.079) |