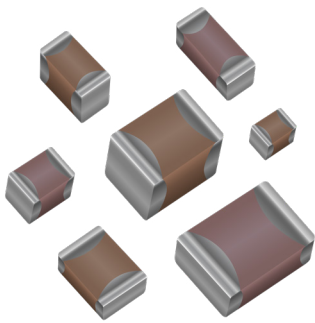


MLCC Tin/Lead Termination "B" (LD Series)

C0G (NP0) – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

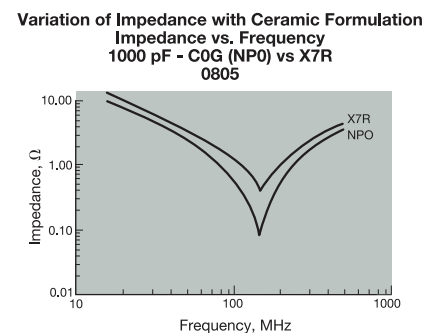
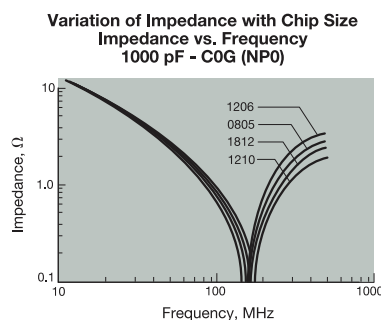
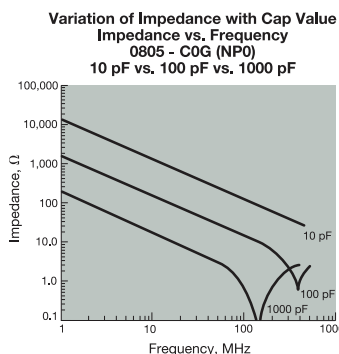
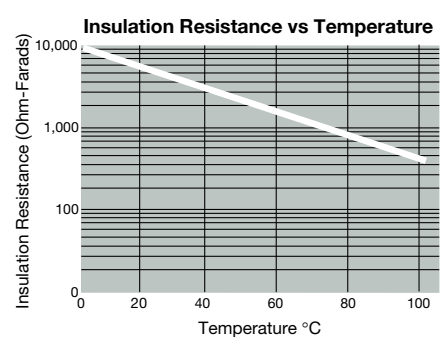
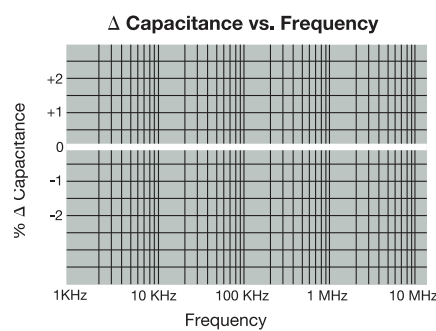
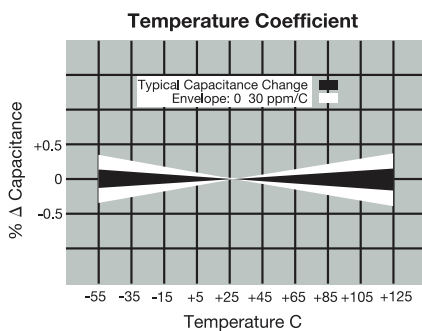
PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

| LD05 | 5 | A | 101 | J | A | B | 2 | A |
|---|---|--|---------------------------------|---|--------------------------------------|--|--|---------------------|
| Size | Voltage | Dielectric | Capacitance Code (In pF) | Capacitance Tolerance | Failure Rate | Terminations | Packaging | Special Code |
| LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220 | 6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7 | C0G (NP0) = A X7R = C X5R = D X8R = F | 2 Sig. Digits + Number of Zeros | B = ± 10 pF (< 10 pF) C = ± 25 pF (< 10 pF) D = ± 50 pF (< 10 pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$ | A = Not Applicable 4 = Automotive | B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only | 2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples* | A = Std. Product |

*LD04 has the same CV ranges as LD03.

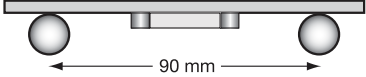
See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.



MLCC Tin/Lead Termination “B”

C0G (NP0) – Specifications and Test Methods

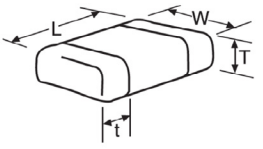
| Parameter/Test | | NP0 Specification Limits | Measuring Conditions | |
|--------------------------------|-----------------------|---|--|--------------------|
| Operating Temperature Range | | -55°C to +125°C | Temperature Cycle Chamber | |
| Capacitance | | Within specified tolerance | Freq.: 1.0 MHz \pm 10% for cap \leq 1000 pF 1.0 kHz \pm 10% for cap $>$ 1000 pF Voltage: 1.0Vrms \pm .2V | |
| Q | | <30 pF: $Q \geq 400+20 \times$ Cap Value ≥ 30 pF: $Q \geq 1000$ | | |
| Insulation Resistance | | 100,000M Ω or 1000M Ω - μ F, whichever is less | Charge device with rated voltage for 60 \pm 5 secs @ room temp/humidity | |
| Dielectric Strength | | No breakdown or visual defects | Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices. | |
| Resistance to Flexure Stresses | Appearance | No defects | Deflection: 2mm Test Time: 30 seconds 1mm/sec  | |
| | Capacitance Variation | $\pm 5\%$ or ± 5 pF, whichever is greater | | |
| | Q | Meets Initial Values (As Above) | | |
| | Insulation Resistance | \geq Initial Value $\times 0.3$ | | |
| Solderability | | $\geq 95\%$ of each terminal should be covered with fresh solder | Dip device in eutectic solder at 230 \pm 5°C for 5.0 \pm 0.5 seconds | |
| Resistance to Solder Heat | Appearance | No defects, $<25\%$ leaching of either end terminal | Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 \pm 2 hours before measuring electrical properties. | |
| | Capacitance Variation | $\leq \pm 2.5\%$ or $\pm .25$ pF, whichever is greater | | |
| | Q | Meets Initial Values (As Above) | | |
| | Insulation Resistance | Meets Initial Values (As Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Thermal Shock | Appearance | No visual defects | Step 1: -55°C \pm 2° | 30 \pm 3 minutes |
| | Capacitance Variation | $\leq \pm 2.5\%$ or $\pm .25$ pF, whichever is greater | Step 2: Room Temp | ≤ 3 minutes |
| | Q | Meets Initial Values (As Above) | Step 3: +125°C \pm 2° | 30 \pm 3 minutes |
| | Insulation Resistance | Meets Initial Values (As Above) | Step 4: Room Temp | ≤ 3 minutes |
| | Dielectric Strength | Meets Initial Values (As Above) | Repeat for 5 cycles and measure after 24 hours at room temperature | |
| Load Life | Appearance | No visual defects | Charge device with twice rated voltage in test chamber set at 125°C \pm 2°C for 1000 hours (+48, -0). Remove from test chamber and stabilize at room temperature for 24 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 3.0\%$ or $\pm .3$ pF, whichever is greater | | |
| | Q | ≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275+5C/2$ <10 pF: $Q \geq 200+10C$ | | |
| | Insulation Resistance | \geq Initial Value $\times 0.3$ (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Load Humidity | Appearance | No visual defects | Store in a test chamber set at 85°C \pm 2°C/ 85% \pm 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 5.0\%$ or $\pm .5$ pF, whichever is greater | | |
| | Q | ≥ 30 pF: $Q \geq 350$ ≥ 10 pF, <30 pF: $Q \geq 275+5C/2$ <10 pF: $Q \geq 200+10C$ | | |
| | Insulation Resistance | \geq Initial Value $\times 0.3$ (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |

MLCC Tin/Lead Termination “B”
C0G (NP0) – Capacitance Range



PREFERRED SIZES ARE SHADED

| SIZE | | LD02 | | | | LD03 | | | | LD05 | | | | | LD06 | | | | | |
|--------------|-------|-----------------|----|----|----|-----------------|----|-----|----|-----------------|----|-----|-----|----|-----------------|----|-----|-----|-----|--|
| Soldering | | Reflow/Wave | | | | Reflow/Wave | | | | Reflow/Wave | | | | | Reflow/Wave | | | | | |
| Packaging | | All Paper | | | | All Paper | | | | Paper/Embossed | | | | | Paper/Embossed | | | | | |
| (L) Length | mm | 1.00 ± 0.10 | | | | 1.60 ± 0.15 | | | | 2.01 ± 0.20 | | | | | 3.20 ± 0.20 | | | | | |
| | (in.) | (0.040 ± 0.004) | | | | (0.063 ± 0.006) | | | | (0.079 ± 0.008) | | | | | (0.126 ± 0.008) | | | | | |
| (W) Width | mm | 0.50 ± 0.10 | | | | 0.81 ± 0.15 | | | | 1.25 ± 0.20 | | | | | 1.60 ± 0.20 | | | | | |
| | (in.) | (0.020 ± 0.004) | | | | (0.032 ± 0.006) | | | | (0.049 ± 0.008) | | | | | (0.063 ± 0.008) | | | | | |
| (t) Terminal | mm | 0.25 ± 0.15 | | | | 0.35 ± 0.15 | | | | 0.50 ± 0.25 | | | | | 0.50 ± 0.25 | | | | | |
| | (in.) | (0.010 ± 0.006) | | | | (0.014 ± 0.006) | | | | (0.020 ± 0.010) | | | | | (0.020 ± 0.010) | | | | | |
| WVDC | | 16 | 25 | 50 | 16 | 25 | 50 | 100 | 16 | 25 | 50 | 100 | 200 | 16 | 25 | 50 | 100 | 200 | 500 | |
| Cap (pF) | 0.5 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 1.0 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 1.2 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 1.5 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 1.8 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 2.2 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 2.7 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 3.3 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 3.9 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 4.7 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 5.6 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 6.8 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 8.2 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 10 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 12 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 15 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 18 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 22 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 27 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 33 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 39 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 47 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 56 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 68 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 82 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 100 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 120 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 150 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 180 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | J | |
| | 220 | C | C | C | G | G | G | G | J | J | J | J | J | J | J | J | J | J | M | |
| | 270 | C | C | C | G | G | G | G | J | J | J | J | M | J | J | J | J | J | M | |
| | 330 | C | C | C | G | G | G | G | J | J | J | J | M | J | J | J | J | J | M | |
| | 390 | C | C | C | G | G | G | G | J | J | J | J | M | J | J | J | J | J | M | |
| | 470 | C | C | C | G | G | G | | J | J | J | J | M | J | J | J | J | J | M | |
| | 560 | | | | G | G | G | | J | J | J | J | M | J | J | J | J | J | M | |
| | 680 | | | | G | G | G | | J | J | J | J | | J | J | J | J | J | P | |
| | 820 | | | | G | G | G | | J | J | J | J | | J | J | J | J | M | | |
| | 1000 | | | | G | G | G | | J | J | J | J | | J | J | J | J | Q | | |
| | 1200 | | | | | G | | | J | J | J | | | J | J | J | J | Q | | |
| | 1500 | | | | | | | | J | J | J | J | | J | J | J | M | Q | | |
| | 1800 | | | | | | | | J | J | J | | | J | J | M | M | | | |
| | 2200 | | | | | | | | J | J | | N | | J | J | M | P | | | |
| | 2700 | | | | | | | | J | J | | N | | J | J | M | P | | | |
| | 3300 | | | | | | | | J | J | | | | J | J | M | P | | | |
| | 3900 | | | | | | | | J | J | | | | J | J | M | P | | | |
| | 4700 | | | | | | | | J | J | | | | J | J | M | P | | | |
| | 5600 | | | | | | | | | | | | | J | J | | | | | |
| | 6800 | | | | | | | | | | | | | M | M | | | | | |
| | 8200 | | | | | | | | | | | | | M | M | | | | | |
| | 0.010 | | | | | | | | | | | | | M | M | | | | | |
| | 0.012 | | | | | | | | | | | | | | | | | | | |
| | 0.015 | | | | | | | | | | | | | | | | | | | |
| | 0.018 | | | | | | | | | | | | | | | | | | | |
| | 0.022 | | | | | | | | | | | | | | | | | | | |
| | 0.027 | | | | | | | | | | | | | | | | | | | |
| | 0.033 | | | | | | | | | | | | | | | | | | | |
| | 0.039 | | | | | | | | | | | | | | | | | | | |
| | 0.047 | | | | | | | | | | | | | | | | | | | |
| | 0.068 | | | | | | | | | | | | | | | | | | | |
| | 0.082 | | | | | | | | | | | | | | | | | | | |
| 0.1 | | | | | | | | | | | | | | | | | | | | |
| WVDC | | 16 | 25 | 50 | 16 | 25 | 50 | 100 | 16 | 25 | 50 | 100 | 200 | 16 | 25 | 50 | 100 | 200 | 500 | |
| SIZE | | LD02 | | | | LD03 | | | | LD05 | | | | | LD06 | | | | | |



| Letter | A | C | E | G | J | K | M | N | P | Q | X | Y | Z |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Max. Thickness | 0.33 (0.013) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78 (0.070) | 2.29 (0.090) | 2.54 (0.100) | 2.79 (0.110) |
| PAPER | | | | | | EMBOSSED | | | | | | | |

MLCC Tin/Lead Termination “B”

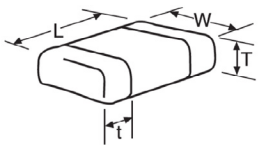
C0G (NP0) – Capacitance Range



PREFERRED SIZES ARE SHADED

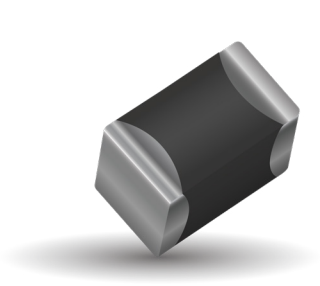
| SIZE | | LD10 | | | | | LD12 | | | | | LD13 | | | LD14 | | |
|--------------|-------|-----------------|----|-----|-----|-----|-----------------|----|-----|-----|-----|-----------------|-----|-----|-----------------|-----|-----|
| Soldering | | Reflow Only | | | | | Reflow Only | | | | | Reflow Only | | | Reflow Only | | |
| Packaging | | Paper/Embossed | | | | | All Embossed | | | | | All Embossed | | | All Embossed | | |
| (L) Length | mm | 3.20 ± 0.20 | | | | | 4.50 ± 0.30 | | | | | 4.50 ± 0.30 | | | 5.72 ± 0.25 | | |
| | (in.) | (0.126 ± 0.008) | | | | | (0.177 ± 0.012) | | | | | (0.177 ± 0.012) | | | (0.225 ± 0.010) | | |
| (W) Width | mm | 2.50 ± 0.20 | | | | | 3.20 ± 0.20 | | | | | 6.40 ± 0.40 | | | 6.35 ± 0.25 | | |
| | (in.) | (0.098 ± 0.008) | | | | | (0.126 ± 0.008) | | | | | (0.252 ± 0.016) | | | (0.250 ± 0.010) | | |
| (t) Terminal | mm | 0.50 ± 0.25 | | | | | 0.61 ± 0.36 | | | | | 0.61 ± 0.36 | | | 0.64 ± 0.39 | | |
| | (in.) | (0.020 ± 0.010) | | | | | (0.024 ± 0.014) | | | | | (0.024 ± 0.014) | | | (0.025 ± 0.015) | | |
| WVDC | | 25 | 50 | 100 | 200 | 500 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 50 | 100 | 200 |
| Cap (pF) | 0.5 | | | | | | | | | | | | | | | | |
| | 1.0 | | | | | | | | | | | | | | | | |
| | 1.2 | | | | | | | | | | | | | | | | |
| | 1.5 | | | | | | | | | | | | | | | | |
| | 1.8 | | | | | | | | | | | | | | | | |
| | 2.2 | | | | | | | | | | | | | | | | |
| | 2.7 | | | | | | | | | | | | | | | | |
| | 3.3 | | | | | | | | | | | | | | | | |
| | 3.9 | | | | | | | | | | | | | | | | |
| | 4.7 | | | | | | | | | | | | | | | | |
| | 5.6 | | | | | | | | | | | | | | | | |
| | 6.8 | | | | | | | | | | | | | | | | |
| | 8.2 | | | | | | | | | | | | | | | | |
| | 10 | | | | | J | | | | | | | | | | | |
| | 12 | | | | | J | | | | | | | | | | | |
| | 15 | | | | | J | | | | | | | | | | | |
| | 18 | | | | | J | | | | | | | | | | | |
| | 22 | | | | | J | | | | | | | | | | | |
| | 27 | | | | | J | | | | | | | | | | | |
| | 33 | | | | | J | | | | | | | | | | | |
| | 39 | | | | | J | | | | | | | | | | | |
| | 47 | | | | | J | | | | | | | | | | | |
| | 56 | | | | | J | | | | | | | | | | | |
| | 68 | | | | | J | | | | | | | | | | | |
| | 82 | | | | | J | | | | | | | | | | | |
| | 100 | | | | | J | | | | | | | | | | | |
| | 120 | | | | | J | | | | | | | | | | | |
| | 150 | | | | | J | | | | | | | | | | | |
| | 180 | | | | | J | | | | | | | | | | | |
| | 220 | | | | | J | | | | | | | | | | | |
| | 270 | | | | | J | | | | | | | | | | | |
| | 330 | | | | | J | | | | | | | | | | | |
| | 390 | | | | | M | | | | | | | | | | | |
| | 470 | | | | | M | | | | | | | | | | | |
| | 560 | J | J | J | J | M | | | | | | | | | | | |
| | 680 | J | J | J | J | M | | | | | | | | | | | |
| | 820 | J | J | J | J | M | | | | | | | | | | | |
| | 1000 | J | J | J | J | M | K | K | K | K | M | M | M | M | M | M | P |
| | 1200 | J | J | J | J | M | K | K | K | K | M | M | M | M | M | M | P |
| | 1500 | J | J | J | J | M | K | K | K | K | M | M | M | M | M | M | P |
| | 1800 | J | J | J | J | M | K | K | K | K | M | M | M | M | M | M | P |
| | 2200 | J | J | J | J | Q | K | K | K | K | P | M | M | M | M | M | P |
| | 2700 | J | J | J | J | Q | K | K | K | K | Q | M | M | M | M | M | P |
| | 3300 | J | J | J | J | | P | P | P | P | Q | M | M | M | M | M | P |
| | 3900 | J | J | J | M | | P | P | P | P | Q | M | M | M | M | M | P |
| | 4700 | J | J | J | M | | P | P | P | P | Q | M | M | M | M | M | P |
| | 5600 | J | J | J | | | P | P | P | X | Y | M | M | M | M | M | P |
| | 6800 | J | J | J | | | P | P | P | X | Y | M | M | M | M | M | P |
| | 8200 | J | J | J | | | P | P | P | X | Y | M | M | M | M | M | P |
| Cap (pF) | 0.010 | J | J | | | | P | P | Q | X | Y | M | M | | M | M | P |
| | 0.012 | J | J | | | | P | P | Q | Z | Y | M | M | | M | M | P |
| | 0.015 | | | | | | P | P | Q | Z | Y | M | M | | M | M | Y |
| | 0.018 | | | | | | P | P | X | Z | Y | P | M | | M | M | Y |
| | 0.022 | | | | | | P | P | X | Z | | P | | | M | Y | Y |
| | 0.027 | | | | | | Q | X | X | | | P | | | P | Y | Y |
| | 0.033 | | | | | | Q | X | X | | | P | | | P | | |
| | 0.039 | | | | | | X | X | Z | | | P | | | P | | |
| | 0.047 | | | | | | X | X | Z | | | P | | | P | | |
| | 0.068 | | | | | | Z | Z | Z | | | | | | P | | |
| | 0.082 | | | | | | Z | Z | Z | | | | | | Q | | |
| | 0.1 | | | | | | Z | Z | Z | | | | | | Q | | |
| WVDC | | 25 | 50 | 100 | 200 | 500 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 50 | 100 | 200 |
| SIZE | | LD10 | | | | | LD12 | | | | | LD13 | | | LD14 | | |

| Letter | A | C | E | G | J | K | M | N | P | Q | X | Y | Z |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Max. Thickness | 0.33 (0.013) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78 (0.070) | 2.29 (0.090) | 2.54 (0.100) | 2.79 (0.110) |
| PAPER | | | | | | EMBOSSD | | | | | | | |



MLCC Tin/Lead Termination “B”

X8R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a “B” in the 12th position of the AVX Catalog Part Number. This fulfills AVX’s commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special “B” termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination “B” products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

| LD05 | 5 | F | 101 | J | A | B | 2 | A |
|---|---|------------|---------------------------------|--|--------------------|--|--|------------------|
| Size | Voltage | Dielectric | Capacitance Code (In pF) | Capacitance Tolerance | Failure Rate | Terminations | Packaging | Special Code |
| LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220 | 6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7 | X8R = F | 2 Sig. Digits + Number of Zeros | B = ±.10 pF (<10pF) C = ±.25 pF (<10pF) D = ±.50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10% M = ±20% | A = Not Applicable | B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only | 2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples* | A = Std. Product |

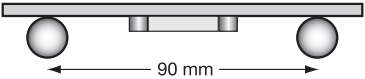
LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

MLCC Tin/Lead Termination “B”

X8R – Specifications and Test Methods

| Parameter/Test | | X8R Specification Limits | Measuring Conditions | |
|--------------------------------|-----------------------|--|---|--------------------|
| Operating Temperature Range | | -55°C to +150°C | Temperature Cycle Chamber | |
| Capacitance | | Within specified tolerance | Freq.: 1.0 kHz \pm 10% Voltage: 1.0Vrms \pm .2V | |
| Dissipation Factor | | \leq 2.5% for \geq 50V DC rating \leq 3.5% for 25V DC and 16V DC rating | | |
| Insulation Resistance | | 100,000M Ω or 1000M Ω - μ F, whichever is less | Charge device with rated voltage for 120 \pm 5 secs @ room temp/humidity | |
| Dielectric Strength | | No breakdown or visual defects | Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices. | |
| Resistance to Flexure Stresses | Appearance | No defects | Deflection: 2mm Test Time: 30 seconds  | |
| | Capacitance Variation | $\leq \pm 12\%$ | | |
| | Dissipation Factor | Meets Initial Values (As Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 | | |
| Solderability | | \geq 95% of each terminal should be covered with fresh solder | Dip device in eutectic solder at 230 \pm 5°C for 5.0 \pm 0.5 seconds | |
| Resistance to Solder Heat | Appearance | No defects, <25% leaching of either end terminal | Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 \pm 2 hours before measuring electrical properties. | |
| | Capacitance Variation | $\leq \pm 7.5\%$ | | |
| | Dissipation Factor | Meets Initial Values (As Above) | | |
| | Insulation Resistance | Meets Initial Values (As Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Thermal Shock | Appearance | No visual defects | Step 1: -55°C \pm 2° | 30 \pm 3 minutes |
| | Capacitance Variation | $\leq \pm 7.5\%$ | Step 2: Room Temp | \leq 3 minutes |
| | Dissipation Factor | Meets Initial Values (As Above) | Step 3: +125°C \pm 2° | 30 \pm 3 minutes |
| | Insulation Resistance | Meets Initial Values (As Above) | Step 4: Room Temp | \leq 3 minutes |
| | Dielectric Strength | Meets Initial Values (As Above) | Repeat for 5 cycles and measure after 24 \pm 2 hours at room temperature | |
| Load Life | Appearance | No visual defects | Charge device with 1.5 rated voltage (\leq 10V) in test chamber set at 150°C \pm 2°C for 1000 hours (+48, -0) Remove from test chamber and stabilize at room temperature for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 12.5\%$ | | |
| | Dissipation Factor | \leq Initial Value x 2.0 (See Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Load Humidity | Appearance | No visual defects | Store in a test chamber set at 85°C \pm 2°C/ 85% \pm 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 12.5\%$ | | |
| | Dissipation Factor | \leq Initial Value x 2.0 (See Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |

MLCC Tin/Lead Termination “B”

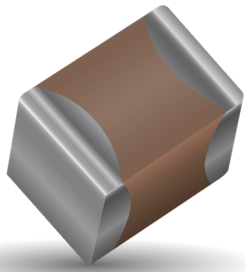
X8R – Capacitance Range

| SIZE | | | LD03 | | LD05 | | LD06 | |
|------|------|-------|------|-----|------|-----|------|-----|
| | | WVDC | 25V | 50V | 25V | 50V | 25V | 50V |
| 271 | Cap | 270 | G | G | | | | |
| 331 | (pF) | 330 | G | G | J | J | | |
| 471 | | 470 | G | G | J | J | | |
| 681 | | 680 | G | G | J | J | | |
| 102 | | 1000 | G | G | J | J | J | J |
| 152 | | 1500 | G | G | J | J | J | J |
| 182 | | 1800 | G | G | J | J | J | J |
| 222 | | 2200 | G | G | J | J | J | J |
| 272 | | 2700 | G | G | J | J | J | J |
| 332 | | 3300 | G | G | J | J | J | J |
| 392 | | 3900 | G | G | J | J | J | J |
| 472 | | 4700 | G | G | J | J | J | J |
| 562 | | 5600 | G | G | J | J | J | J |
| 682 | | 6800 | G | G | J | J | J | J |
| 822 | Cap | 8200 | G | G | J | J | J | J |
| 103 | (μF) | 0.01 | G | G | J | J | J | J |
| 123 | | 0.012 | G | G | J | J | J | J |
| 153 | | 0.015 | G | G | J | J | J | J |
| 183 | | 0.018 | G | G | J | J | J | J |
| 223 | | 0.022 | G | G | J | J | J | J |
| 273 | | 0.027 | G | G | J | J | J | J |
| 333 | | 0.033 | G | G | J | J | J | J |
| 393 | | 0.039 | G | G | J | J | J | J |
| 473 | | 0.047 | G | G | J | J | J | J |
| 563 | | 0.056 | G | | N | N | M | M |
| 683 | | 0.068 | G | | N | N | M | M |
| 823 | | 0.082 | | | N | N | M | M |
| 104 | | 0.1 | | | N | N | M | M |
| 124 | | 0.12 | | | N | N | M | M |
| 154 | | 0.15 | | | N | N | M | M |
| 184 | | 0.18 | | | N | | M | M |
| 224 | | 0.22 | | | N | | M | M |
| 274 | | 0.27 | | | | | M | M |
| 334 | | 0.33 | | | | | M | M |
| 394 | | 0.39 | | | | | M | |
| 474 | | 0.47 | | | | | M | |
| 684 | | 0.68 | | | | | | |
| 824 | | 0.82 | | | | | | |
| 105 | | 1 | | | | | | |
| | | WVDC | 25V | 50V | 25V | 50V | 25V | 50V |
| SIZE | | | LD03 | | LD05 | | LD06 | |

| Letter | A | C | E | G | J | K | M | N | P | Q | X | Y | Z |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Max. Thickness | 0.33 (0.013) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78 (0.070) | 2.29 (0.090) | 2.54 (0.100) | 2.79 (0.110) |
| PAPER | | | | | | EMBOSSSED | | | | | | | |

MLCC Tin/Lead Termination "B"

X7R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

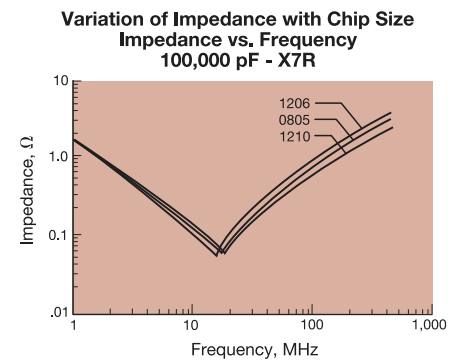
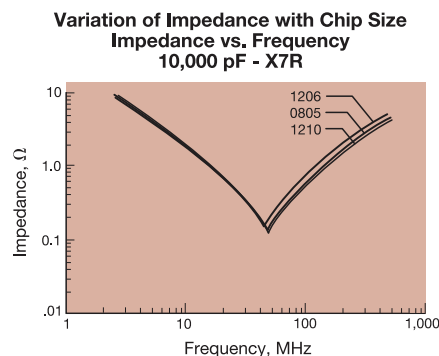
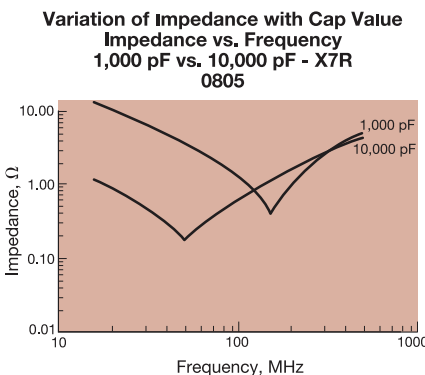
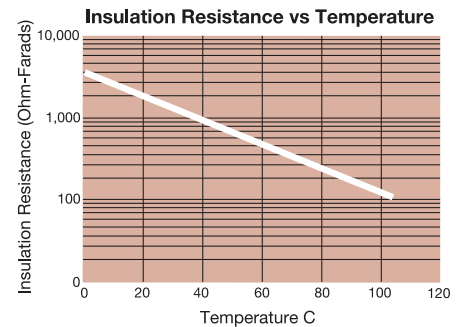
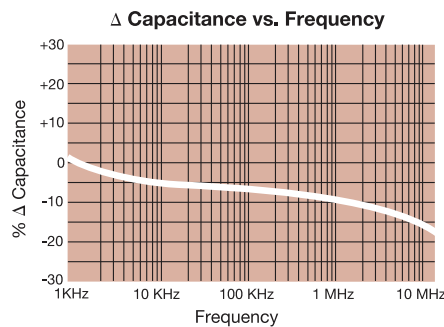
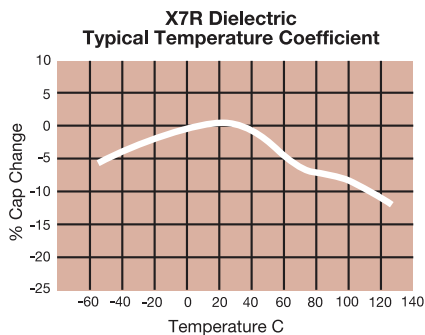
| LD05 | 5 | C | 101 | J | A | B | 2 | A |
|--------------|----------------|-------------------|---------------------------------|--|---------------------|--|-----------------------------|---------------------|
| Size | Voltage | Dielectric | Capacitance Code (In pF) | Capacitance Tolerance | Failure Rate | Terminations | Packaging | Special Code |
| LD03 - 0603 | 6.3V = 6 | X7R = C | 2 Sig. Digits + Number of Zeros | B = ± 10 pF (<10pF) C = ± 25 pF (<10pF) D = ± 50 pF (<10pF) F = $\pm 1\%$ (≥ 10 pF) G = $\pm 2\%$ (≥ 10 pF) J = $\pm 5\%$ K = $\pm 10\%$ M = $\pm 20\%$ | A = Not Applicable | B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only | 2 = 7" Reel 4 = 13" Reel | A = Std. Product |
| LD04 - 0504* | 10V = Z | | | | | | | |
| LD05 - 0805 | 16V = Y | | | | | | | |
| LD06 - 1206 | 25V = 3 | | | | | | | |
| LD10 - 1210 | 35V = D | | | | | | | |
| LD12 - 1812 | 50V = 5 | | | | | | | |
| LD13 - 1825 | 100V = 1 | | | | | | | |
| LD14 - 2225 | 200V = 2 | | | | | | | |
| LD20 - 2220 | 500V = 7 | | | | | | | |

Contact Factory For Multiples*

*LD04 has the same CV ranges as LD03.

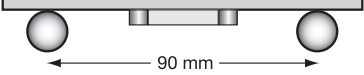
See FLEXITERM® section for CV options

NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.



MLCC Tin/Lead Termination “B”

X7R – Specifications and Test Methods

| Parameter/Test | | X7R Specification Limits | Measuring Conditions | |
|--------------------------------------|-----------------------|--|---|--------------------|
| Operating Temperature Range | | -55°C to +125°C | Temperature Cycle Chamber | |
| Capacitance | | Within specified tolerance | Freq.: 1.0 kHz \pm 10% Voltage: 1.0Vrms \pm .2V | |
| Dissipation Factor | | \leq 10% for \geq 50V DC rating \leq 12.5% for 25V DC rating \leq 12.5% for 25V and 16V DC rating \leq 12.5% for \leq 10V DC rating | | |
| Insulation Resistance | | 100,000M Ω or 1000M Ω - μ F, whichever is less | Charge device with rated voltage for 120 \pm 5 secs @ room temp/humidity | |
| Dielectric Strength | | No breakdown or visual defects | Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) Note: Charge device with 150% of rated voltage for 500V devices. | |
| Resistance to Flexure Stresses | Appearance | No defects | Deflection: 2mm Test Time: 30 seconds 1mm/sec  | |
| | Capacitance Variation | $\leq \pm 12\%$ | | |
| | Dissipation Factor | Meets Initial Values (As Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 | | |
| Solderability | | \geq 95% of each terminal should be covered with fresh solder | Dip device in eutectic solder at 230 \pm 5°C for 5.0 \pm 0.5 seconds | |
| Resistance to Solder Heat | Appearance | No defects, <25% leaching of either end terminal | Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 \pm 2 hours before measuring electrical properties. | |
| | Capacitance Variation | $\leq \pm 7.5\%$ | | |
| | Dissipation Factor | Meets Initial Values (As Above) | | |
| | Insulation Resistance | Meets Initial Values (As Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Thermal Shock | Appearance | No visual defects | Step 1: -55°C \pm 2° | 30 \pm 3 minutes |
| | Capacitance Variation | $\leq \pm 7.5\%$ | Step 2: Room Temp | \leq 3 minutes |
| | Dissipation Factor | Meets Initial Values (As Above) | Step 3: +125°C \pm 2° | 30 \pm 3 minutes |
| | Insulation Resistance | Meets Initial Values (As Above) | Step 4: Room Temp | \leq 3 minutes |
| | Dielectric Strength | Meets Initial Values (As Above) | Repeat for 5 cycles and measure after 24 \pm 2 hours at room temperature | |
| Load Life | Appearance | No visual defects | Charge device with 1.5 rated voltage (\leq 10V) in test chamber set at 125°C \pm 2°C for 1000 hours (+48, -0) Remove from test chamber and stabilize at room temperature for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 12.5\%$ | | |
| | Dissipation Factor | \leq Initial Value x 2.0 (See Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Load Humidity | Appearance | No visual defects | Store in a test chamber set at 85°C \pm 2°C/ 85% \pm 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 12.5\%$ | | |
| | Dissipation Factor | \leq Initial Value x 2.0 (See Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |

MLCC Tin/Lead Termination “B”

X7R – Capacitance Range



PREFERRED SIZES ARE SHADED

| SIZE | | LD02 | | | | LD03 | | | | | | LD05 | | | | | | LD06 | | | | | | | | |
|--------------|-------|-----------------|----|----|------|-----------------|----|----|----|-----|------|-----------------|----|----|----|----|------|-----------------|-----|----|----|----|----|-----|-----|-----|
| Soldering | | Reflow/Wave | | | | Reflow/Wave | | | | | | Reflow/Wave | | | | | | Reflow/Wave | | | | | | | | |
| Packaging | | All Paper | | | | All Paper | | | | | | Paper/Embossed | | | | | | Paper/Embossed | | | | | | | | |
| (L) Length | mm | 1.00 ± 0.10 | | | | 1.60 ± 0.15 | | | | | | 2.01 ± 0.20 | | | | | | 3.20 ± 0.20 | | | | | | | | |
| | (in.) | (0.040 ± 0.004) | | | | (0.063 ± 0.006) | | | | | | (0.079 ± 0.008) | | | | | | (0.126 ± 0.008) | | | | | | | | |
| (W) Width | mm | 0.50 ± 0.10 | | | | 0.81 ± 0.15 | | | | | | 1.25 ± 0.20 | | | | | | 1.60 ± 0.20 | | | | | | | | |
| | (in.) | (0.020 ± 0.004) | | | | (0.032 ± 0.006) | | | | | | (0.049 ± 0.008) | | | | | | (0.063 ± 0.008) | | | | | | | | |
| (t) Terminal | mm | 0.25 ± 0.15 | | | | 0.35 ± 0.15 | | | | | | 0.50 ± 0.25 | | | | | | 0.50 ± 0.25 | | | | | | | | |
| | (in.) | (0.010 ± 0.006) | | | | (0.014 ± 0.006) | | | | | | (0.020 ± 0.010) | | | | | | (0.020 ± 0.010) | | | | | | | | |
| WVDC | | 16 | 25 | 50 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 500 |
| Cap (pF) | 100 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 150 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 220 | | | C | | | | | | | | | | | | | | | | | | | | | | |
| | 330 | | | C | | | | G | G | G | | J | J | J | J | J | J | | | | | | | | | K |
| | 470 | | | C | | | | G | G | G | | J | J | J | J | J | J | | | | | | | | | K |
| Cap (pF) | 680 | | | C | | | | G | G | G | | J | J | J | J | J | J | | | | | | | | | K |
| | 1000 | | | C | | | | G | G | G | | J | J | J | J | J | J | | | | | | | | | K |
| | 1500 | | | C | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | J | M | |
| | 2200 | | | C | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | J | M | |
| | 3300 | | C | C | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | J | M | |
| Cap (μF) | 4700 | | C | C | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | J | M | |
| | 6800 | C | C | | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | J | P | |
| | 0.010 | C | C | | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | J | P | |
| | 0.015 | C | | | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | M | | |
| | 0.022 | C | | | | | | G | G | G | | J | J | J | J | J | J | | J | J | J | J | J | M | | |
| Cap (μF) | 0.033 | C | | | | | | G | G | G | | J | J | J | J | N | | | J | J | J | J | J | M | | |
| | 0.047 | | | | | | | G | G | G | | J | J | J | J | N | | | J | J | J | J | J | M | | |
| | 0.068 | | | | | | | G | G | G | | J | J | J | J | N | | | J | J | J | J | J | P | | |
| | 0.10 | | C* | | | | | G | G | G | | J | J | J | J | N | | | J | J | J | J | P | P | | |
| | 0.15 | | | | | | | G | G | G | | J | J | J | N | N | | | J | J | J | J | Q | | | |
| Cap (μF) | 0.22 | | | | | | | G | G | G | | J | J | N | N | N | | | J | J | J | J | Q | | | |
| | 0.33 | | | | | | | | | | | N | N | N | N | N | | | J | J | M | P | Q | | | |
| | 0.47 | | | | | | | J* | | | | N | N | N | N | N | | | M | M | M | P | Q | | | |
| | 0.68 | | | | | | | | | | | N | N | N | N | N | | | M | M | Q | Q | Q | | | |
| | 1.0 | | | | | | | J* | J* | | | N | N | N* | | | | | M | M | Q | Q | Q | | | |
| Cap (μF) | 1.5 | | | | | | | | | | | | | | | | | | P | Q | Q | Q | | | | |
| | 2.2 | | | | | | | J* | | | | | | P* | | | | | Q | Q | Q | Q | | | | |
| | 3.3 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 4.7 | | | | | | | | | | | P* | P* | P* | | | | | Q* | Q* | Q* | Q | | | | |
| | 10 | | | | | | | | | | | P* | P | | | | | | | | | | | | | |
| Cap (μF) | 22 | | | | | | | | | | | | | | | | | | Q* | | | | | | | |
| | 47 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | | | | | | | |
| | WVDC | 16 | 25 | 50 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 6.3 | 10 | 16 | 25 | 50 | 100 | 200 | 500 |
| SIZE | | LD02 | | | LD03 | | | | | | LD05 | | | | | | LD06 | | | | | | | | | |

| Letter | A | C | E | G | J | K | M | N | P | Q | X | Y | Z |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Max. Thickness | 0.33 (0.013) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78 (0.070) | 2.29 (0.090) | 2.54 (0.100) | 2.79 (0.110) |
| PAPER | | | | | | EMBOSSED | | | | | | | |

 = Under Development

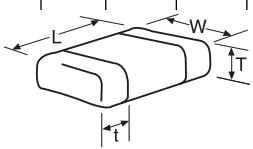
MLCC Tin/Lead Termination “B”

X7R – Capacitance Range



PREFERRED SIZES ARE SHADED

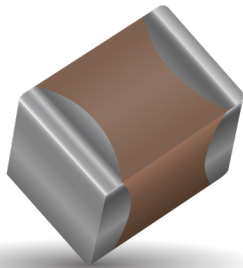
| SIZE | | LD10 | | | | | | LD12 | | | | LD13 | | LD20 | | | | LD14 | | |
|--------------|-------------|--------------------------------|----|----|----|-----|-----|--------------------------------|----|-----|-----|--------------------------------|----|--------------------------------|----|----|-----|--------------------------------|----|-----|
| Soldering | | Reflow Only | | | | | | Reflow Only | | | | Reflow Only | | Reflow Only | | | | Reflow Only | | |
| Packaging | | Paper/Embossed | | | | | | All Embossed | | | | All Embossed | | All Embossed | | | | All Embossed | | |
| (L) Length | mm (in.) | 3.20 ± 0.20 (0.126 ± 0.008) | | | | | | 4.50 ± 0.30 (0.177 ± 0.012) | | | | 4.50 ± 0.30 (0.177 ± 0.012) | | 5.70 ± 0.50 (0.224 ± 0.020) | | | | 5.72 ± 0.25 (0.225 ± 0.010) | | |
| (W) Width | mm (in.) | 2.50 ± 0.20 (0.098 ± 0.008) | | | | | | 3.20 ± 0.20 (0.126 ± 0.008) | | | | 6.40 ± 0.40 (0.252 ± 0.016) | | 5.00 ± 0.40 (0.197 ± 0.016) | | | | 6.35 ± 0.25 (0.250 ± 0.010) | | |
| (t) Terminal | mm (in.) | 0.50 ± 0.25 (0.020 ± 0.010) | | | | | | 0.61 ± 0.36 (0.024 ± 0.014) | | | | 0.61 ± 0.36 (0.024 ± 0.014) | | 0.64 ± 0.39 (0.025 ± 0.015) | | | | 0.64 ± 0.39 (0.025 ± 0.015) | | |
| WVDC | | 10 | 16 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 500 | 50 | 100 | 25 | 50 | 100 | 200 | 50 | 100 |
| Cap (pF) | 100 | | | | | | | | | | | | | | | | | | | |
| | 150 | | | | | | | | | | | | | | | | | | | |
| | 220 | | | | | | | | | | | | | | | | | | | |
| | 330 | | | | | | | | | | | | | | | | | | | |
| | 470 | | | | | | | | | | | | | | | | | | | |
| | 680 | | | | | | | | | | | | | | | | | | | |
| | 1000 | | | | | | | | | | | | | | | | | | | |
| | 1500 | J | J | J | J | J | J | M | | | | | | | | | | | | |
| | 2200 | J | J | J | J | J | J | M | | | | | | | | | | | | |
| | 3300 | J | J | J | J | J | J | M | | | | | | | | | | | | |
| | 4700 | J | J | J | J | J | J | M | | | | | | | | | | | | |
| | 6800 | J | J | J | J | J | J | M | | | | | | | | | | | | |
| Cap (µF) | 0.010 | J | J | J | J | J | J | M | K | K | K | K | M | M | | X | X | X | M | P |
| | 0.015 | J | J | J | J | J | J | P | K | K | K | P | M | M | | X | X | X | M | P |
| | 0.022 | J | J | J | J | J | J | Q | K | K | K | P | M | M | | X | X | X | M | P |
| | 0.033 | J | J | J | J | J | J | Q | K | K | K | X | M | M | | X | X | X | M | P |
| | 0.047 | J | J | J | J | J | J | | K | K | K | Z | M | M | | X | X | X | M | P |
| | 0.068 | J | J | J | J | J | M | | K | K | K | Z | M | M | | X | X | X | M | P |
| | 0.10 | J | J | J | J | J | M | | K | K | K | Z | M | M | | X | X | X | M | P |
| | 0.15 | J | J | J | J | M | Z | | K | K | P | | M | M | | X | X | X | M | P |
| | 0.22 | J | J | J | J | P | Z | | K | K | P | | M | M | | X | X | X | M | P |
| | 0.33 | J | J | J | J | Q | | | K | M | X | | M | M | | X | X | X | M | P |
| | 0.47 | M | M | M | M | Q | | | K | P | | | M | M | | X | X | X | M | P |
| | 0.68 | M | M | P | X | X | | | M | Q | | | M | P | | X | X | | M | P |
| | 1.0 | N | N | P | X | Z | | | M | X | | | M | P | | X | X | | M | P |
| | 1.5 | N | N | Z | Z | Z | | | Z | Z | | | M | | | X | X | | M | X |
| | 2.2 | X | X | Z | Z | Z | | | Z | Z | | | | | | X | X | | M | |
| | 3.3 | X | X | Z | Z | | | | Z | | | | | | | X | Z | | | |
| | 4.7 | X | X | Z | Z | | | | Z | | | | | | | X | Z | | | |
| | 10 | Z | Z | Z | Z | | | | | | | | | | | Z | Z | | | |
| | 22 | Z | Z | | | | | | | | | | | | Z | | | | | |
| | 47 | | | | | | | | | | | | | | | | | | | |
| | 100 | | | | | | | | | | | | | | | | | | | |
| WVDC | | 10 | 16 | 25 | 50 | 100 | 200 | 500 | 50 | 100 | 200 | 500 | 50 | 100 | 25 | 50 | 100 | 200 | 50 | 100 |
| SIZE | | LD10 | | | | | | LD12 | | | | LD13 | | LD20 | | | | LD14 | | |



| Letter | A | C | E | G | J | K | M | N | P | Q | X | Y | Z |
|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Max. Thickness | 0.33 (0.013) | 0.56 (0.022) | 0.71 (0.028) | 0.90 (0.035) | 0.94 (0.037) | 1.02 (0.040) | 1.27 (0.050) | 1.40 (0.055) | 1.52 (0.060) | 1.78 (0.070) | 2.29 (0.090) | 2.54 (0.100) | 2.79 (0.110) |
| PAPER | | | | | | EMBOSSED | | | | | | | |

MLCC Tin/Lead Termination "B"

X5R – General Specifications



AVX Corporation will support those customers for commercial and military Multilayer Ceramic Capacitors with a termination consisting of 5% minimum lead. This termination is indicated by the use of a "B" in the 12th position of the AVX Catalog Part Number. This fulfills AVX's commitment to providing a full range of products to our customers. AVX has provided in the following pages a full range of values that we are currently offering in this special "B" termination. Please contact the factory if you require additional information on our MLCC Tin/Lead Termination "B" products.

Not RoHS Compliant

PART NUMBER (SEE PAGE 4 FOR COMPLETE PART NUMBER EXPLANATION)

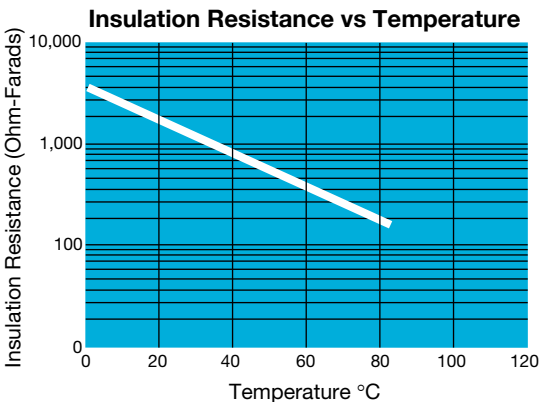
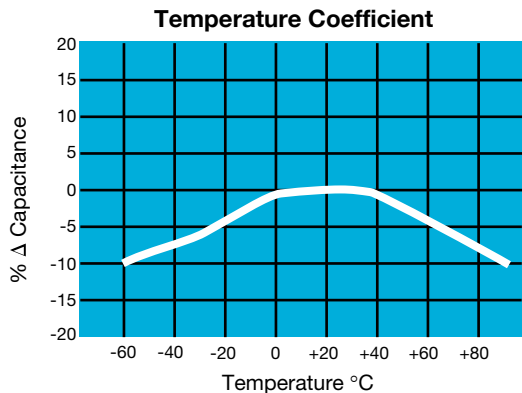
| LD05 | 5 | D | 101 | J | A | B | 2 | A |
|---|---|------------|---------------------------------|---|--------------------|--|---|------------------|
| Size | Voltage | Dielectric | Capacitance Code (In pF) | Capacitance Tolerance | Failure Rate | Terminations | Packaging | Special Code |
| LD02 - 0402 LD03 - 0603 LD04 - 0504* LD05 - 0805 LD06 - 1206 LD10 - 1210 LD12 - 1812 LD13 - 1825 LD14 - 2225 LD20 - 2220 | 6.3V = 6 10V = Z 16V = Y 25V = 3 35V = D 50V = 5 100V = 1 200V = 2 500V = 7 | X5R = D | 2 Sig. Digits + Number of Zeros | B = ±10 pF (<10pF) C = ±25 pF (<10pF) D = ±50 pF (<10pF) F = ±1% (≥ 10 pF) G = ±2% (≥ 10 pF) J = ±5% K = ±10% M = ±20% | A = Not Applicable | B = 5% min lead X = FLEXITERM® with 5% min lead** **X7R only | 2 = 7" Reel 4 = 13" Reel Contact Factory For Multiples* | A = Std. Product |

*LD04 has the same CV ranges as LD03.

See FLEXITERM® section for CV options

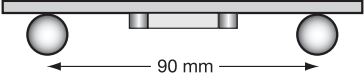
NOTE: Contact factory for availability of Tolerance Options for Specific Part Numbers.
Contact factory for non-specified capacitance values.

TYPICAL ELECTRICAL CHARACTERISTICS



MLCC Tin/Lead Termination “B”

X5R – Specifications and Test Methods

| Parameter/Test | | X5R Specification Limits | Measuring Conditions | |
|--------------------------------|-----------------------|---|---|--------------------|
| Operating Temperature Range | | -55°C to +85°C | Temperature Cycle Chamber | |
| Capacitance | | Within specified tolerance | Freq.: 1.0 kHz \pm 10% Voltage: 1.0Vrms \pm .2V For Cap > 10 μ F, 0.5Vrms @ 120Hz | |
| Dissipation Factor | | \leq 2.5% for \geq 50V DC rating \leq 3.0% for 25V, 35V DC rating \leq 12.5% Max. for 16V DC rating and lower Contact Factory for DF by PN | | |
| Insulation Resistance | | 10,000M Ω or 500M Ω - μ F, whichever is less | Charge device with rated voltage for 120 \pm 5 secs @ room temp/humidity | |
| Dielectric Strength | | No breakdown or visual defects | Charge device with 250% of rated voltage for 1-5 seconds, w/charge and discharge current limited to 50 mA (max) | |
| Resistance to Flexure Stresses | Appearance | No defects | Deflection: 2mm Test Time: 30 seconds 1mm/sec  | |
| | Capacitance Variation | $\leq \pm 12\%$ | | |
| | Dissipation Factor | Meets Initial Values (As Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 | | |
| Solderability | | \geq 95% of each terminal should be covered with fresh solder | Dip device in eutectic solder at 230 \pm 5°C for 5.0 \pm 0.5 seconds | |
| Resistance to Solder Heat | Appearance | No defects, <25% leaching of either end terminal | Dip device in eutectic solder at 260°C for 60 seconds. Store at room temperature for 24 \pm 2 hours before measuring electrical properties. | |
| | Capacitance Variation | $\leq \pm 7.5\%$ | | |
| | Dissipation Factor | Meets Initial Values (As Above) | | |
| | Insulation Resistance | Meets Initial Values (As Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Thermal Shock | Appearance | No visual defects | Step 1: -55°C \pm 2° | 30 \pm 3 minutes |
| | Capacitance Variation | $\leq \pm 7.5\%$ | Step 2: Room Temp | \leq 3 minutes |
| | Dissipation Factor | Meets Initial Values (As Above) | Step 3: +85°C \pm 2° | 30 \pm 3 minutes |
| | Insulation Resistance | Meets Initial Values (As Above) | Step 4: Room Temp | \leq 3 minutes |
| | Dielectric Strength | Meets Initial Values (As Above) | Repeat for 5 cycles and measure after 24 \pm 2 hours at room temperature | |
| Load Life | Appearance | No visual defects | Charge device with 1.5X rated voltage in test chamber set at 85°C \pm 2°C for 1000 hours (+48, -0). Note: Contact factory for *optional specification part numbers that are tested at < 1.5X rated voltage. Remove from test chamber and stabilize at room temperature for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 12.5\%$ | | |
| | Dissipation Factor | \leq Initial Value x 2.0 (See Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |
| Load Humidity | Appearance | No visual defects | Store in a test chamber set at 85°C \pm 2°C/ 85% \pm 5% relative humidity for 1000 hours (+48, -0) with rated voltage applied. Remove from chamber and stabilize at room temperature and humidity for 24 \pm 2 hours before measuring. | |
| | Capacitance Variation | $\leq \pm 12.5\%$ | | |
| | Dissipation Factor | \leq Initial Value x 2.0 (See Above) | | |
| | Insulation Resistance | \geq Initial Value x 0.3 (See Above) | | |
| | Dielectric Strength | Meets Initial Values (As Above) | | |

