



AMERICAN
TECHNICAL
CERAMICS

GENERAL PURPOSE CAPACITORS



 THE
ENGINEERS'
CHOICE®

Low Cost Multilayer Ceramic Capacitors
For Surface Mount Applications

Manufactured for ATC

ISO 9001
REGISTERED
COMPANY



ATC 001-847, Rev. AA; 5/18

ATC GENERAL PURPOSE CAPACITORS: NPO (COG) DIELECTRIC

Electrical Characteristics

Capacitance Range:

0.5 pF to 0.12 μF

Temperature Coefficient of Capacitance:

0 ± 30ppm/°C

Operating Temperature Range:

-55°C to +125°C

Dissipation Factor:

0.1% (max.) for C ≥ 30 pF @ 25°C @1 MHz

0.25% (max.) for C < 30 pF @ 25°C @1 MHz

Insulation Resistance:

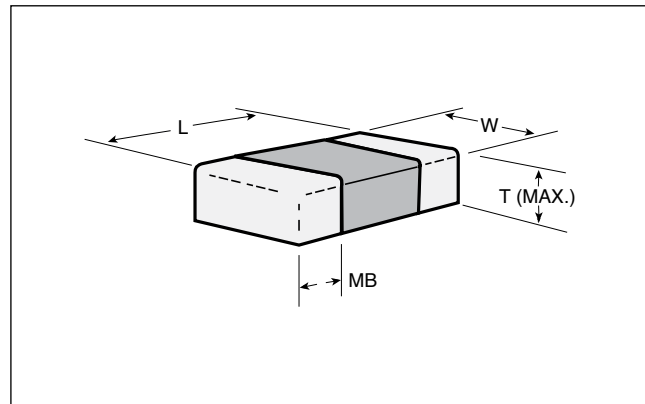
@ + 25°C and rated Vdc:100,000 megohms (min.) or

1000 ohm-farads (min.),whichever is less

Aging:

None

Dimension Drawing



Dielectric Withstanding Voltage:

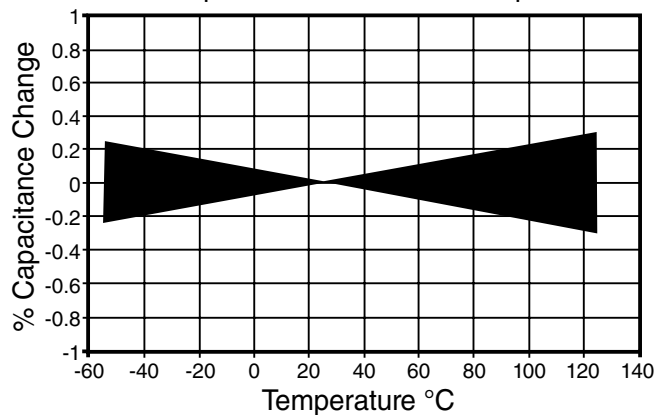
250% WVDC for WVDC < 200V

150% WVDC for 200V < WVDC ≤ 500V

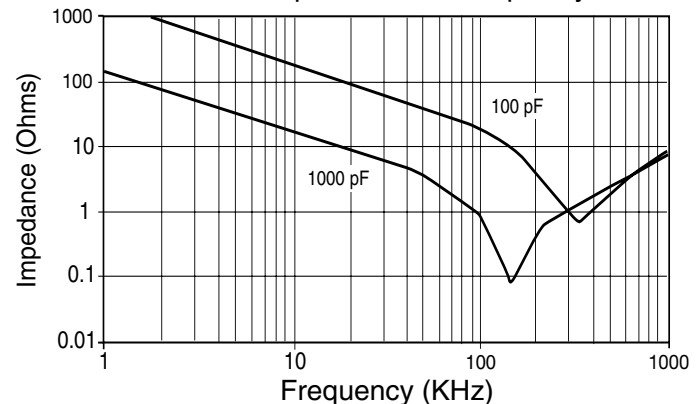
120% WVDC for WVDC > 500V Applied for 5 ± 1 sec.

Note: Unless otherwise specified all test data is at + 25°C.

NPO Temperature Coefficient of Capacitance



NPO Impedance vs. Frequency



Standard EIA Capacitance Values Reference Chart

Note: Upper capacitance value limit for NPO is .12 μF

| Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. μF | Cap. Code | Cap. μF | Cap. Code | Cap. μF |
|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-------------------|---------|-----------|---------|-----------|---------|-----------|---------|
| 0R5 | 0.5 | 8R2 | 8.2 | 820 | 82 | 821 | 820 | 822 | 8200 | 563 | .056 | 474 | .47 | 335 | 3.3 |
| 1R0 | 1.0 | 100 | 10 | 101 | 100 | 102 | 1000 | Cap. Code Cap. μF | | 683 | .068 | 564 | .56 | 395 | 3.9 |
| 1R2 | 1.2 | 120 | 12 | 121 | 120 | 122 | 1200 | 103 | .010 | 823 | .082 | 684 | .68 | 475 | 4.7 |
| 1R5 | 1.5 | 150 | 15 | 151 | 150 | 152 | 1500 | 123 | .012 | 104 | .10 | 824 | .82 | 565 | 5.6 |
| 1R8 | 1.8 | 180 | 18 | 181 | 180 | 182 | 1800 | 153 | .015 | 124 | .12 | 105 | 1.0 | 685 | 6.8 |
| 2R2 | 2.2 | 220 | 22 | 221 | 220 | 222 | 2200 | 183 | .018 | 154 | .15 | 125 | 1.2 | 825 | 8.2 |
| 2R7 | 2.7 | 270 | 27 | 271 | 270 | 272 | 2700 | 223 | .022 | 184 | .18 | 155 | 1.5 | 106 | 10.0 |
| 3R3 | 3.3 | 330 | 33 | 331 | 330 | 332 | 3300 | 273 | .027 | 224 | .22 | 185 | 1.8 | 126 | 12.0 |
| 3R9 | 3.9 | 390 | 39 | 391 | 390 | 392 | 3900 | 333 | .033 | 274 | .27 | 225 | 2.2 | 156 | 15.0 |
| 4R7 | 4.7 | 470 | 47 | 471 | 470 | 472 | 4700 | 393 | .039 | 334 | .33 | 275 | 2.7 | | |
| 5R6 | 5.6 | 560 | 56 | 561 | 560 | 562 | 5600 | 473 | .047 | 394 | .39 | | | | |
| 6R8 | 6.8 | 680 | 68 | 681 | 680 | 682 | 6800 | | | | | | | | |

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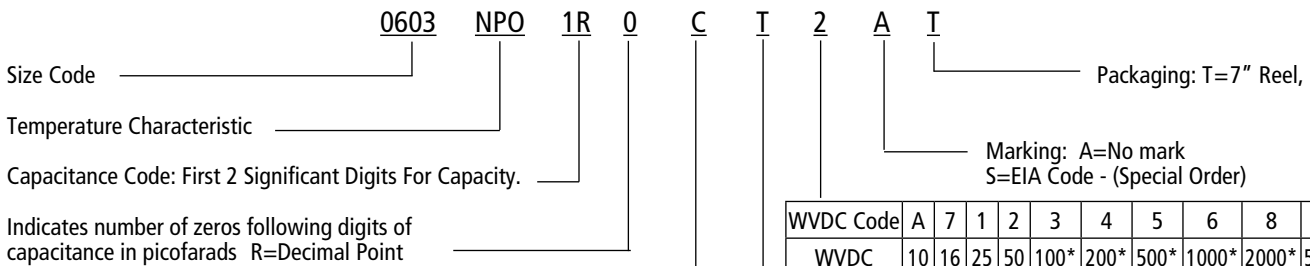
ATC GENERAL PURPOSE CAPACITORS: NPO (COG) DIELECTRIC

Selection Guide

| Case Size | 0402 | 0504 | 0603 | 0805 | 1206 | 1210 | 1812 | 2225 |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Length (L) | .040 (1.02) | .050 (1.27) | .063 (1.60) | .079 (2.00) | .125 (3.18) | .125 (3.18) | .180 (4.57) | .220 (5.59) |
| Width (W) | .020 (0.51) | .040 (1.02) | .031 (0.80) | .049 (1.25) | .063 (1.60) | .100 (2.54) | .125 (3.18) | .250 (6.35) |
| Tol. L & W | ±.004 (0.10) | ±.006 (.152) | ±.005 (0.12) | ±.008 (0.2) | ±.008 (0.2) | ±.008 (0.2) | ±.012 (.305) | ±.015 (0.38) |
| T Max. | .024 (0.61) | .044 (1.12) | .035 (0.89) | .054 (1.37) | .064 (1.63) | .070 (1.78) | .100 (2.54) | .150 (3.81) |
| Term. (MB) Min. Max. | .004 (.10) .014 (.36) | .005 (.12) .015 (.38) | .004 (.10) .015 (.38) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) |
| Min. Cap. | 0R5 | 0R5 | 0R5 | 0R5 | 0R5 | 3R0 | 100 | 270 |
| Max. Cap. (code) & WVDC | | | | | | | | |
| 10V | | | | | | | | |
| 16V | 331 | 182 | 152 | 103 | 223 | 273 | 393 | 124 |
| 25V | 331 | 122 | 102 | 103 | 223 | 223 | 393 | 124 |
| 50V | 331 | 102 | 102 | 103 | 104 | 223 | 333 | 124 |
| 100V | 181 | 561 | 102 | 392 | 562 | 183 | 273 | 683 |
| 200V | 101 | 391 | 561 | 182 | 392 | 103 | 183 | 563 |
| 500V | | | | 821 | 182 | 472 | 103 | 273 |
| 1000V | | | | 471 | 102 | 222 | 472 | 153 |
| 200 | | | | | | | | 392 |
| 5000V | | | | | | | | |

Dimensions in inches (mm)
Higher voltages available upon request.

Part Number Code



| WVDC Code | A | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 |
|-----------|----|----|----|----|------|------|------|-------|-------|-------|
| WVDC | 10 | 16 | 25 | 50 | 100* | 200* | 500* | 1000* | 2000* | 5000* |

*Special Order - Consult Factory

| CAPACITANCE TOLERANCE | | | | | |
|-----------------------|---------------------|----------|--------------------|-----|-----|
| Code | B* | C | F | G | J |
| Tol. | ±0.1 pF | ±0.25 pF | ±1% | ±2% | ±5% |
| | pF (Values < 10 pF) | | % (Values ≥ 10 pF) | | |

*Tighter tolerances available.



Termination Code

T = Tin plated over Nickel Barrier (Standard), RoHS Compliant
 C = Palladium Silver, (non-magnetic), RoHS Compliant
 Solder and Conductive Epoxy Attachment**
 W = Tin/Lead, Solder Plated over Nickel Barrier**

**Consult ATC for availability

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ATC GENERAL PURPOSE CAPACITORS: X7R DIELECTRIC

Electrical Characteristics

Capacitance Range:

120 pF to 10 μ F

Temperature Coefficient of Capacitance:

$\pm 15\%$ with 0 Vdc applied

Operating Temperature Range:

-55°C to +125°C

Dissipation Factor:

2.5% (max.) @ + 25°C, @1 MHz

≤ 1000 pF; @1 KHz >1000 pF

See Page 9 for DF Exceptions for X7R

Insulation Resistance:

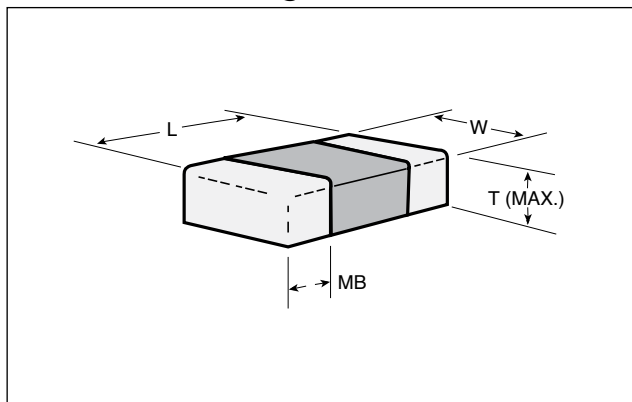
@ + 25°C and rated Vdc:10,000 megohms (min.) or

500 ohm-farads (min.), whichever is less

Aging:

3% (max.) per decade hr.

Dimension Drawing



Dielectric Withstanding Voltage:

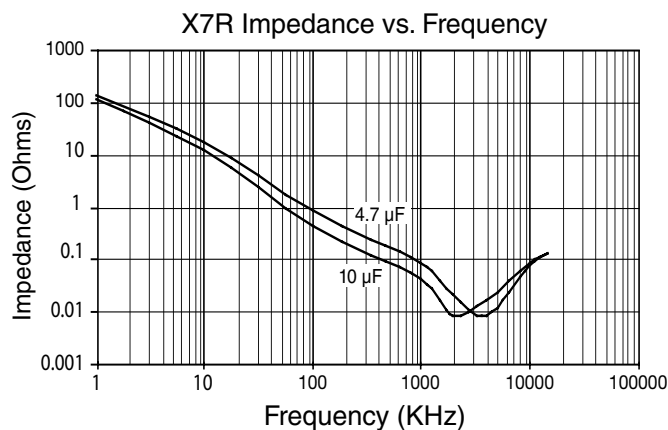
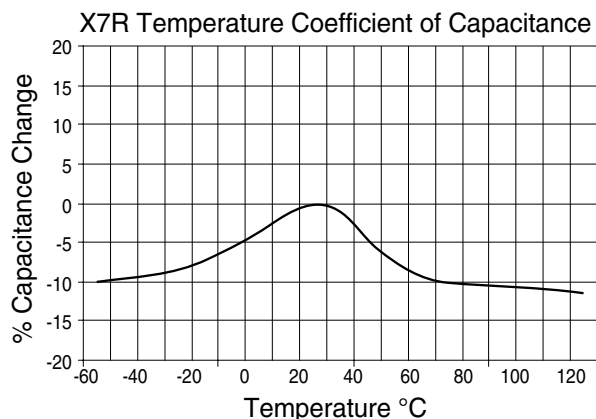
250% WVDC for WVDC < 200V

150% WVDC for 200V < WVDC \leq 500V

120% WVDC for WVDC > 500V

Applied for 5 \pm 1 sec.

Note: Unless otherwise specified all test data is at + 25°C.



Standard EIA Capacitance Values Reference Chart

Note: Upper capacitance value limit for X7R is 10.0 μ F

| Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. μ F | Cap. Code | Cap. μ F | Cap. Code | Cap. μ F |
|-----------|---------|-----------|---------|-----------|---------|-----------|---------|------------------------|---------|-----------|--------------|-----------|--------------|-----------|--------------|
| 0R5 | 0.5 | 8R2 | 8.2 | 820 | 82 | 821 | 820 | 822 | 8200 | 563 | .056 | 474 | .47 | 335 | 3.3 |
| 1R0 | 1.0 | 100 | 10 | 101 | 100 | 102 | 1000 | Cap. Code Cap. μ F | | 683 | .068 | 564 | .56 | 395 | 3.9 |
| 1R2 | 1.2 | 120 | 12 | 121 | 120 | 122 | 1200 | 103 | .010 | 823 | .082 | 684 | .68 | 475 | 4.7 |
| 1R5 | 1.5 | 150 | 15 | 151 | 150 | 152 | 1500 | 104 | .10 | 104 | .10 | 824 | .82 | 565 | 5.6 |
| 1R8 | 1.8 | 180 | 18 | 181 | 180 | 182 | 1800 | 123 | .012 | 124 | .12 | 105 | 1.0 | 685 | 6.8 |
| 2R2 | 2.2 | 220 | 22 | 221 | 220 | 222 | 2200 | 153 | .015 | 154 | .15 | 125 | 1.2 | 825 | 8.2 |
| 2R7 | 2.7 | 270 | 27 | 271 | 270 | 272 | 2700 | 183 | .018 | 184 | .18 | 155 | 1.5 | 106 | 10.0 |
| 3R3 | 3.3 | 330 | 33 | 331 | 330 | 332 | 3300 | 223 | .022 | 224 | .22 | 185 | 1.8 | 126 | 12.0 |
| 3R9 | 3.9 | 390 | 39 | 391 | 390 | 392 | 3900 | 273 | .027 | 274 | .27 | 225 | 2.2 | 156 | 15.0 |
| 4R7 | 4.7 | 470 | 47 | 471 | 470 | 472 | 4700 | 333 | .033 | 334 | .33 | 275 | 2.7 | | |
| 5R6 | 5.6 | 560 | 56 | 561 | 560 | 562 | 5600 | 393 | .039 | 394 | .39 | | | | |
| 6R8 | 6.8 | 680 | 68 | 681 | 680 | 682 | 6800 | 473 | .047 | | | | | | |

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ATC GENERAL PURPOSE CAPACITORS: X7R DIELECTRIC

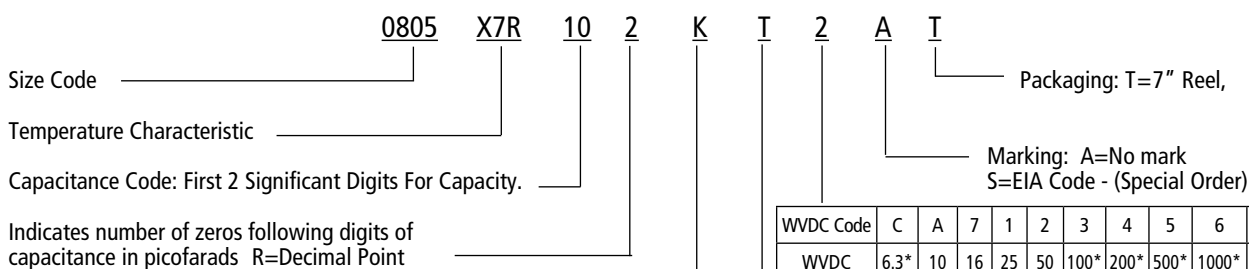
Selection Guide

| Case Size | 0402 | 0504 | 0603 | 0805 | 1206 | 1210 | 1812 | 2225 |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Length (L) | .040 (1.02) | .050 (1.27) | .063 (1.60) | .079 (2.00) | .125 (3.18) | .125 (3.18) | .180 (4.57) | .220 (5.59) |
| Width (W) | .020 (0.51) | .040 (1.02) | .031 (0.80) | .049 (1.25) | .063 (1.60) | .100 (2.54) | .125 (3.18) | .250 (6.35) |
| Tol. L & W | ±.004 (0.10) | ±.006 (.152) | ±.005 (0.12) | ±.008 (0.2) | ±.008 (0.2) | ±.008 (0.2) | ±.012 (.305) | ±.015 (0.38) |
| T Max. | .024 (0.61) | .044 (1.12) | .035 (0.89) | .059 (1.50) | .071 (1.80) | .110 (2.79) | .118 (3.00) | .150 (3.81) |
| Term. (MB) Min. Max. | .004 (.10) .014 (.36) | .005 (.12) .015 (.38) | .004 (.10) .015 (.38) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) |
| Min. Cap. | 121 | 121 | 121 | 121 | 121 | 121 | 151 | 471 |
| Max. Cap. (code) & WVDC | | | | | | | | |
| 6.3V | 105 | | | | | | | |
| 10V | | | 225 | 105 | 106 | | | |
| 16V | 104 | 393 | 105 | 105 | 685 | 226 | 106 | 106 |
| 25V | 273 | 333 | 225 | 105 | 475 | 106 | 106 | 106 |
| 50V | 103 | 273 | 104 | 334 | 334 | 105 | 225 | 225 |
| 100V | 472 | 153 | 104 | 104 | 154 | 105 | 225 | 225 |
| 200V | 222 | 103 | 103 | 333 | 104 | 184 | 474 | 105 |
| 500V | | | | 123 | 223 | 563 | 104 | 334 |
| 1000V | | | | 272 | 682 | 153 | 273 | 104 |
| 2000V | | | | | 102 | 222 | 472 | 153 |
| 5000V | | | | | | | | |

Dimensions in inches (mm)

Higher voltages available upon request.

Part Number Code



| WVDC Code | C | A | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 |
|-----------|------|----|----|----|----|------|------|------|-------|-------|-------|
| WVDC | 6.3* | 10 | 16 | 25 | 50 | 100* | 200* | 500* | 1000* | 2000* | 5000* |

*Special Order - Consult Factory

| CAPACITANCE TOLERANCE | | |
|-----------------------|-----|------|
| Code | J | K |
| Tol. | ±5% | ±10% |



Termination Code

T = Tin plated over Nickel Barrier (Standard), RoHS Compliant
 C = Palladium Silver, (non-magnetic) solderable, RoHS Compliant**
 W = Tin/Lead, Solder Plated over Nickel Barrier**

**Consult ATC for availability

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ATC GENERAL PURPOSE CAPACITORS: X5R DIELECTRIC

Electrical Characteristics

Capacitance Range:

0.1 μF to 33 μF

Temperature Coefficient of Capacitance:

$\pm 15\%$ with 0 Vdc applied

Operating Temperature Range:

-55°C to +85°C

Dissipation Factor:

5% (max.) @ + 25°C, @1 KHz @1.0 +/- 0.2 VRMS

See Page 9 for DF Exceptions for X5R

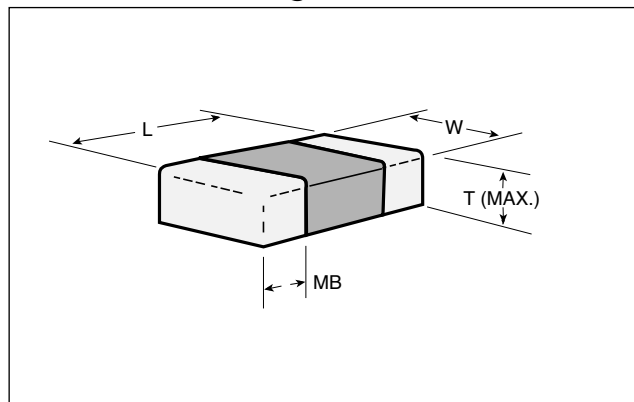
Insulation Resistance:

@ + 25°C and rated Vdc: 10,000 megohms (min.) or 500 ohm-farads (min.), whichever is less

Aging:

3% (max.) per decade hr.

Dimension Drawing



Dielectric Withstanding Voltage:

250% WVDC for WVDC < 200V

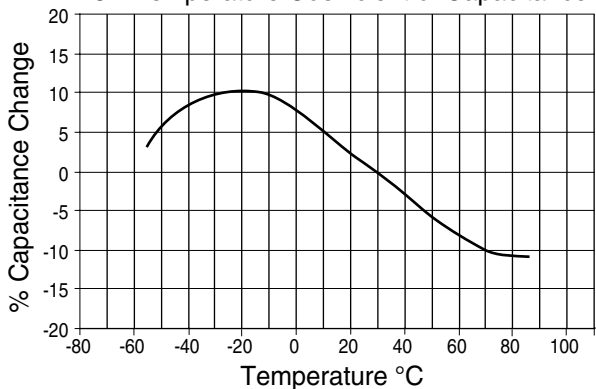
150% WVDC for 200V < WVDC \leq 500V

120% WVDC for WVDC > 500V

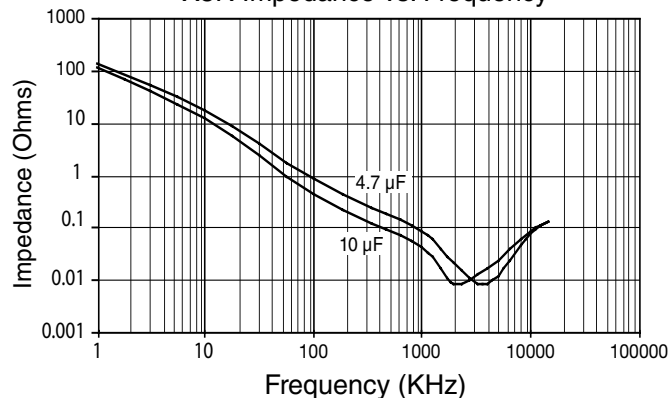
Applied for 5 \pm 1 sec.

Note: Unless otherwise specified all test data is at + 25°C.

X5R Temperature Coefficient of Capacitance



X5R Impedance vs. Frequency



Standard EIA Capacitance Values Reference Chart

| Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. μF | Cap. Code | Cap. μF | Cap. Code | Cap. μF |
|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|--------------------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| 0R5 | 0.5 | 8R2 | 8.2 | 820 | 82 | 821 | 820 | 822 | 8200 | 563 | .056 | 564 | .56 | 565 | 5.6 |
| 1R0 | 1.0 | 100 | 10 | 101 | 100 | 102 | 1000 | Cap. Code | Cap. μF | 683 | .068 | 684 | .68 | 685 | 6.8 |
| 1R2 | 1.2 | 120 | 12 | 121 | 120 | 122 | 1200 | | | 823 | .082 | 824 | .82 | 825 | 8.2 |
| 1R5 | 1.5 | 150 | 15 | 151 | 150 | 152 | 1500 | 103 | .010 | 104 | .10 | 105 | 1.0 | 106 | 10.0 |
| 1R8 | 1.8 | 180 | 18 | 181 | 180 | 182 | 1800 | 123 | .012 | 124 | .12 | 125 | 1.2 | 126 | 12.0 |
| 2R2 | 2.2 | 220 | 22 | 221 | 220 | 222 | 2200 | 153 | .015 | 154 | .15 | 155 | 1.5 | 156 | 15.0 |
| 2R7 | 2.7 | 270 | 27 | 271 | 270 | 272 | 2700 | 183 | .018 | 184 | .18 | 185 | 1.8 | 186 | 18.0 |
| 3R3 | 3.3 | 330 | 33 | 331 | 330 | 332 | 3300 | 223 | .022 | 224 | .22 | 225 | 2.2 | 226 | 22.0 |
| 3R9 | 3.9 | 390 | 39 | 391 | 390 | 392 | 3900 | 273 | .027 | 274 | .27 | 275 | 2.7 | 276 | 27.0 |
| 4R7 | 4.7 | 470 | 47 | 471 | 470 | 472 | 4700 | 333 | .033 | 334 | .33 | 335 | 3.3 | 336 | 33.0 |
| 5R6 | 5.6 | 560 | 56 | 561 | 560 | 562 | 5600 | 393 | .039 | 394 | .39 | 395 | 3.9 | | |
| 6R8 | 6.8 | 680 | 68 | 681 | 680 | 682 | 6800 | 473 | .047 | 474 | .47 | 475 | 4.7 | | |

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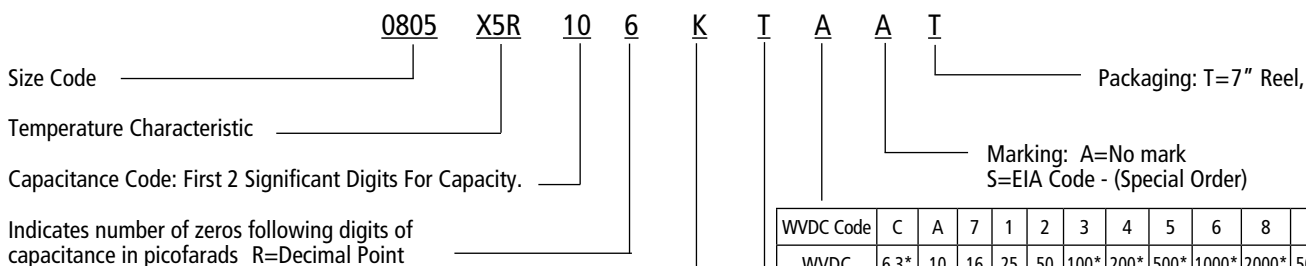
ATC GENERAL PURPOSE CAPACITORS: X5R DIELECTRIC

Selection Guide

| Case Size | 0402 | 0603 | 0805 | 1206 | 1210 | 1812 |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Length (L) | .040 (1.02) | .063 (1.60) | .079 (2.00) | .125 (3.18) | .125 (3.18) | .180 (4.57) |
| Width (W) | .020 (0.51) | .031 (0.80) | .049 (1.25) | .063 (1.60) | .100 (2.54) | .125 (3.18) |
| Tol. L & W | ±.004 (0.10) | ±.005 (0.12) | ±.008 (0.2) | ±.008 (0.2) | ±.008 (0.2) | ±.012 (.305) |
| T Max. | .024 (0.61) | .035 (0.89) | .059 (1.50) | .072 (1.83) | .110 (2.79) | .118 (3.00) |
| Term. (MB) Min. Max. | .004 (.10) .014 (.36) | .004 (.10) .015 (.38) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) |
| Min. Cap. | 104 | 474 | 224 | 105 | 335 | 106 |
| Max. Cap. (code) & WVDC | | | | | | |
| 6.3V | | | | 107 | 107 | |
| 10V | 105 | 225 | 106 | 106 | 226 | 336 |
| 16V | 104 | 105 | 106 | 106 | 106 | 336 |
| 25V | | 564 | 225 | 476 | 106 | 106 |
| 50V | | | 224 | | | |

Dimensions shown in inches (mm)
Higher voltages available upon request.

Part Number Code




| CAPACITANCE TOLERANCE | | |
|-----------------------|------|------|
| Code | K | M |
| Tol. | ±10% | ±20% |

| WVDC Code | C | A | 7 | 1 | 2 | 3 | 4 | 5 | 6 | 8 | 9 |
|-----------|------|----|----|----|----|------|------|------|-------|-------|-------|
| WVDC | 6.3* | 10 | 16 | 25 | 50 | 100* | 200* | 500* | 1000* | 2000* | 5000* |

*Special Order - Consult Factory

Termination Code

 T = Tin plated over Nickel Barrier (Standard),
RoHS Compliant
W = Tin/Lead, Solder Plated over Nickel Barrier**
**Consult ATC for availability

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ATC GENERAL PURPOSE CAPACITORS: Z5U/Y5V DIELECTRIC

Electrical Characteristics

Capacitance Range:

0.1 μF to 22 μF

Temperature Coefficient of Capacitance:

Z5U: + 22%, -56%

Y5V: + 22%, -82%

Operating Temperature Range:

Z5U: +10°C to +85°C

Y5V: -30°C to +85°C

Dissipation Factor:

3.5% (max.) @ + 25°C, @1 KHz

See Page 9 for DF Exceptions for Y5V

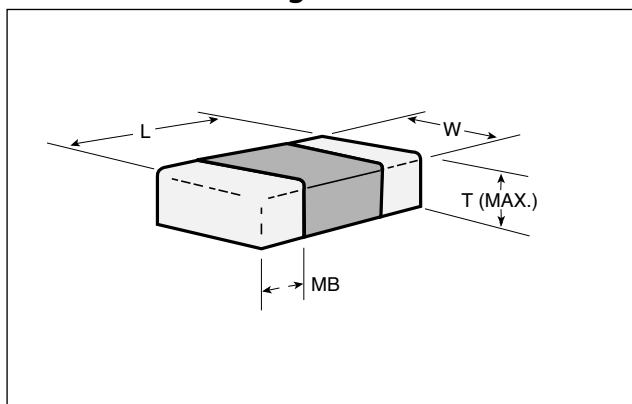
Insulation Resistance:

@ + 25°C and rated Vdc: 1000 megohms (min.) or 100 ohm-farads (min.) whichever is less

Aging:

3% (max.) per decade hr.

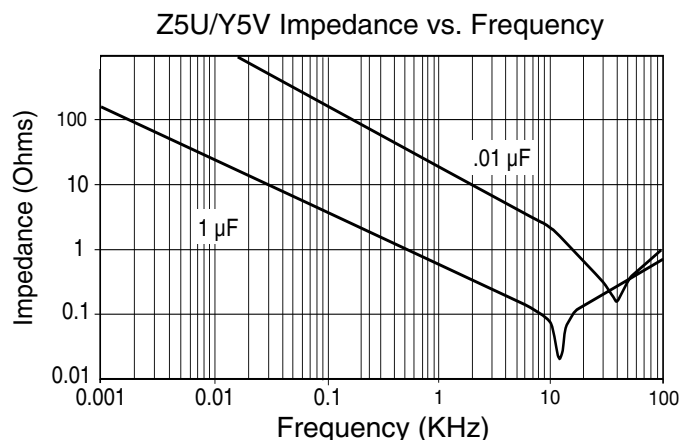
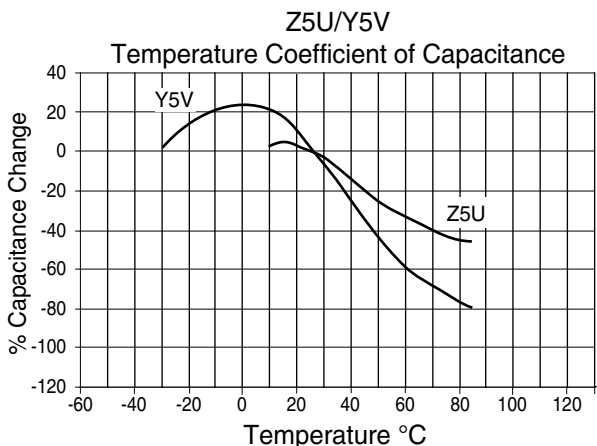
Dimension Drawing



Dielectric Withstanding Voltage:

50% of rated voltage for 5 ± 1 seconds, 50 milliamps (max)

Note: Unless otherwise specified all test data is at + 25°C.



Standard EIA Capacitance Values Reference Chart

| Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. pF | Cap. Code | Cap. μF | Cap. Code | Cap. μF | Cap. Code | Cap. μF |
|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|---------|-----------|--------------------|-----------|--------------------|-----------|--------------------|
| 0R5 | 0.5 | 8R2 | 8.2 | 820 | 82 | 821 | 820 | 822 | 8200 | 563 | .056 | 474 | .47 | 395 | 3.9 |
| 1R0 | 1.0 | 100 | 10 | 101 | 100 | 102 | 1000 | 683 | .068 | 564 | .56 | 475 | 4.7 | 475 | 4.7 |
| 1R2 | 1.2 | 120 | 12 | 121 | 120 | 122 | 1200 | 823 | .082 | 684 | .68 | 565 | 5.6 | 565 | 5.6 |
| 1R5 | 1.5 | 150 | 15 | 151 | 150 | 152 | 1500 | 103 | .010 | 104 | .10 | 824 | .82 | 685 | 6.8 |
| 1R8 | 1.8 | 180 | 18 | 181 | 180 | 182 | 1800 | 123 | .012 | 124 | .12 | 105 | 1.0 | 825 | 8.2 |
| 2R2 | 2.2 | 220 | 22 | 221 | 220 | 222 | 2200 | 153 | .015 | 154 | .15 | 125 | 1.2 | 106 | 10.0 |
| 2R7 | 2.7 | 270 | 27 | 271 | 270 | 272 | 2700 | 183 | .018 | 184 | .18 | 155 | 1.5 | 126 | 12.0 |
| 3R3 | 3.3 | 330 | 33 | 331 | 330 | 332 | 3300 | 223 | .022 | 224 | .22 | 185 | 1.8 | 156 | 15.0 |
| 3R9 | 3.9 | 390 | 39 | 391 | 390 | 392 | 3900 | 273 | .027 | 274 | .27 | 225 | 2.2 | 186 | 18.0 |
| 4R7 | 4.7 | 470 | 47 | 471 | 470 | 472 | 4700 | 333 | .033 | 334 | .33 | 275 | 2.7 | 156 | 15.0 |
| 5R6 | 5.6 | 560 | 56 | 561 | 560 | 562 | 5600 | 393 | .039 | 394 | .39 | 335 | 3.3 | 186 | 18.0 |
| 6R8 | 6.8 | 680 | 68 | 681 | 680 | 682 | 6800 | 473 | .047 | 394 | .39 | 335 | 3.3 | 226 | 22.0 |

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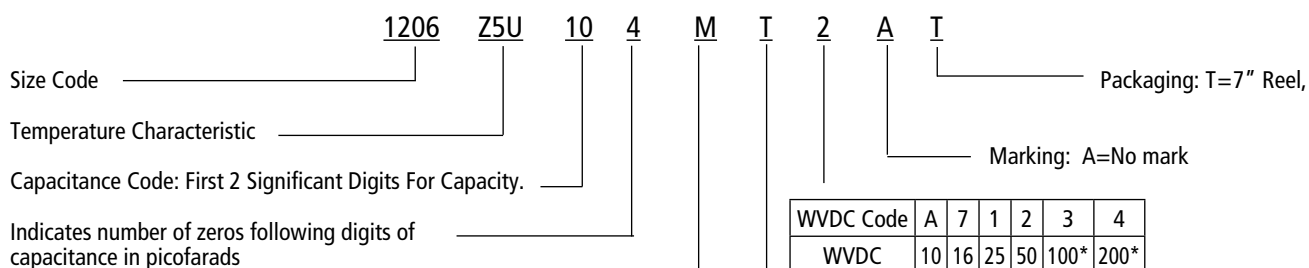
ATC GENERAL PURPOSE CAPACITORS: Z5U/Y5V DIELECTRIC

Selection Guide

| Case Size | 0603 | 0805 | 1206 | 1210 | 1812 | 2225 |
|----------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Length (L) | .063 (1.60) | .079 (2.00) | .125 (3.18) | .125 (3.18) | .180 (4.57) | .220 (5.59) |
| Width (W) | .031 (0.80) | .049 (1.25) | .063 (1.60) | .100 (2.54) | .125 (3.18) | .250 (6.35) |
| Tol. L & W | ±.005 (0.12) | ±.008 (0.2) | ±.008 (0.2) | ±.008 (0.2) | ±.012 (.305) | ±.015 (0.38) |
| T Max. | .039 (0.10) | .054 (1.37) | .064 (1.63) | .070 (1.78) | .070 (1.78) | .080 (2.03) |
| Term. (MB) Min. Max. | .004 (.10) .015 (.38) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) | .010 (.25) .030 (.76) |
| Min. Cap. | 222 | 103 | 123 | 123 | 473 | 823 |
| Max. Cap. (code) & WVDC | | | | | | |
| 10V | | | | | | |
| 16V | 564 | 225 | 685 | 106 | 106 | 226 |
| 25V | 334 | 105 | 335 | 106 | 565 | 226 |
| 50V | 154 | 684 | 185 | 335 | 475 | 186 |
| 100V | 563 | 224 | 474 | 105 | 185 | 475 |
| 200V | 153 | 563 | 154 | 334 | 564 | 185 |

Dimensions shown in inches (mm)
Higher voltages available upon request

Part Number Code



*Special Order - Consult Factory

| CAPACITANCE TOLERANCE | | |
|-----------------------|------|----------|
| Code | M | Z |
| Tol. | ±20% | +80 -20% |



Termination Code

T = Tin plated over Nickel Barrier (Standard), RoHS Compliant
W = Tin/Lead, Solder Plated over Nickel Barrier**

**Consult ATC for availability

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DF Exceptions – X7R and X5R Dielectric

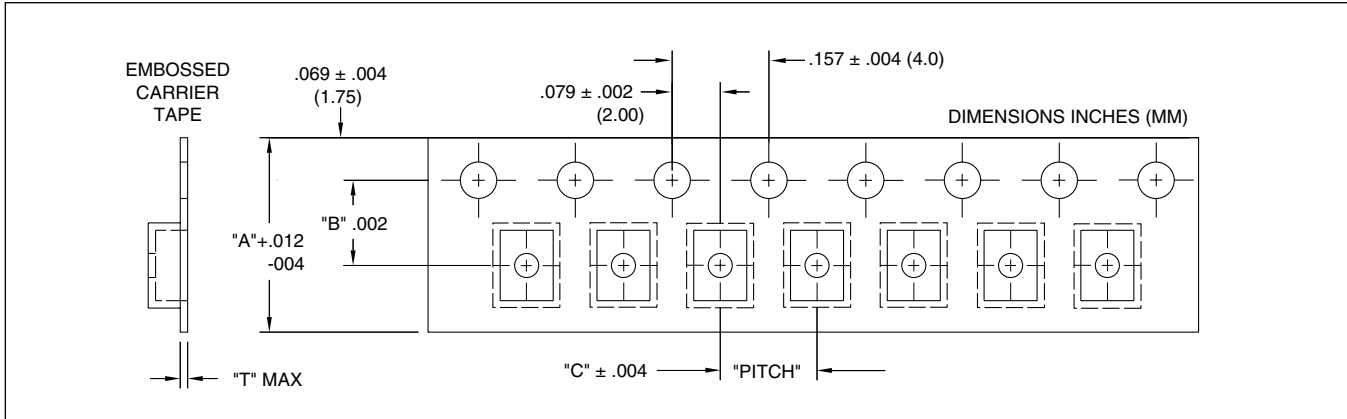
| Rated WVDC | D.F. | DF Exceptions | |
|------------|--------|---------------|--|
| ≥ 100 V | ≤ 2.5% | ≤ 3% | 1206 ≥ 0.47 μF |
| | | ≤ 5% | 0805 ≥ 0.1 μF, 0603 ≥ 0.068 μF, 1206 > 1 μF, 1210 ≥ 2.2 μF |
| 50 V | ≤ 2.5% | ≤ 3% | 0201 (50V), 0603 ≥ 0.047 μF, 0805 > 0.18 μF, 1206 ≥ 0.47 μF |
| | | ≤ 5% | 1210 ≥ 4.7 μF |
| | | ≤ 10% | 0402 ≥ 0.1 μF, 0603 > 0.1 μF, 0805 ≥ 1 μF, 1206 ≥ 2.2 μF, 1210 ≥ 10 μF |
| 35 V | ≤ 3.5% | ≤ 10% | 0603 ≥ 1 μF, 0805 ≥ 2.2 μF, 1210 ≥ 10 μF |
| 25 V | ≤ 3.5% | ≤ 5% | 0201 ≥ 0.01 μF, 0805 ≥ 1 μF, 1210 ≥ 10 μF |
| | | ≤ 7% | 0603 ≥ 0.33 μF, 1206 ≥ 4.7 μF |
| | | ≤ 10% | 0201 ≥ 0.1 μF, 0402 ≥ 0.10 μF, 0603 ≥ 0.47 μF, 0805 ≥ 2.2 μF, 1206 ≥ 6.8 μF, 1210 ≥ 22 μF |
| | | ≤ 12.5% | 0402 ≥ 1 μF |
| 16 V | ≤ 3.5% | ≤ 5% | 0201 ≥ 0.01 μF, 0402 ≥ 0.033 μF, 0603 ≥ 0.15 μF, 0805 ≥ 0.68 μF, 1206 ≥ 2.2 μF, 1210 ≥ 4.7 μF |
| | | ≤ 10% | 0201 ≥ 0.1 μF, 0402 ≥ 0.22 μF, 0603 ≥ 0.68 μF, 0805 ≥ 2.2 μF, 1206 ≥ 4.7 μF, 1210 ≥ 22 μF |
| 10 V | ≤ 5% | ≤ 10% | 0201 ≥ 0.012 μF, 0402 ≥ 0.33 μF (0402/X7R ≥ 0.22 mF), 0603 ≥ 0.33 μF, 0805 ≥ 2.2 μF, 1206 ≥ 4.7 μF, 1210 ≥ 22 μF |
| | | ≤ 15% | 0201 ≥ 0.1 μF, 0402 ≥ 1 μF |
| 6.3 V | ≤ 10% | ≤ 15% | 0201 ≥ 0.1 μF, 0402 ≥ 1 μF, 0603 ≥ 10 μF, 0805 ≥ 4.7 μF, 1206 ≥ 47 μF, 1210 ≥ 100 μF |
| | | ≤ 20% | 0402 ≥ 2.2 μF |
| 4 V | ≤ 15% | — | — |

DF Exceptions – Y5V Dielectric

| Rated WVDC | D.F. | DF Exceptions | |
|----------------------|---------|---------------|--|
| ≥ 50 V | ≤ 5% | ≤ 7% | 0603 ≥ 0.1 μF, 0805 ≥ 0.47 μF, 1206 ≥ 4.7 μF |
| 35 V | ≤ 7% | — | — |
| 25 V | ≤ 5% | ≤ 7% | 0402 ≥ 0.047 μF, 0603 ≥ 0.1 μF, 0805 ≥ 0.33 μF, 1206 ≥ 1 μF, 1210 ≥ 4.7 μF |
| | | ≤ 9% | 0402 ≥ 0.068 μF, 0603 ≥ 0.47 μF, 1206 ≥ 4.7 μF, 1210 ≥ 22 mF, Cap ≥ 1 μF |
| 16 V (C < 1.0 μF) | ≤ 7% | ≤ 9% | 0402 ≥ 0.068 μF, 0603 ≥ 0.68 μF |
| | | ≤ 12.5% | 0402 ≥ 0.22 μF |
| 16 V (C ≥ 1.0 μF) | ≤ 3.5% | ≤ 12.5% | 0603 ≥ 2.2 μF, 0805 ≥ 3.3 μF, 1206 ≥ 10 μF, 1210 ≥ 22 μF, 1812 ≥ 47 μF |
| 10 V | ≤ 12.5% | ≤ 20% | 0402 ≥ 0.47 μF |
| 6.3 V | ≤ 20% | — | — |

ATC GENERAL PURPOSE CAPACITORS:

General Purpose SMT Tape and Reel Packaging Specifications

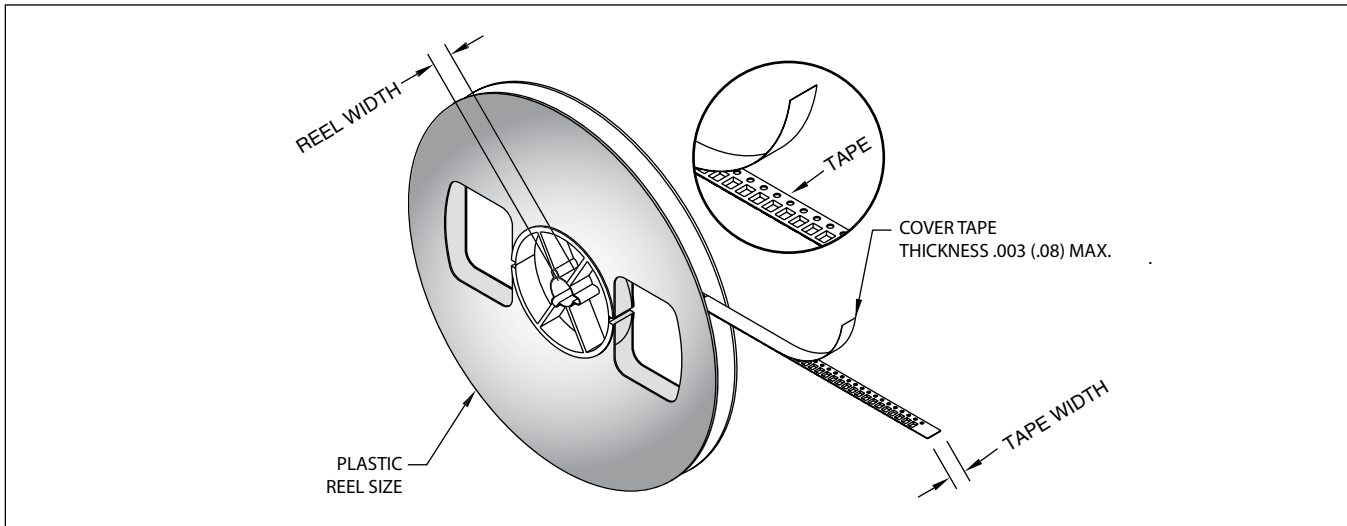


| CHIP CASE SIZE | "A" DIM. MAX. | "B" DIM. | "C" DIM. | "T" DIM. MAX. | REEL WIDTH MAX. | QTY. MAX PER REEL TYP. |
|----------------|---------------|---------------------------|---------------------------|---------------|-----------------|------------------------|
| 0402* | .327 (8.30) | .138 (3.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .567 (14.4) | 10,000 |
| 0603 | .327 (8.30) | .138 (3.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .567 (14.4) | 4,000 |
| 0805 | .327 (8.30) | .138 (3.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .567 (14.4) | 4,000 |
| 1206 | .327 (8.30) | .138 (3.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .567 (14.4) | 4,000 |
| 1210 | .327 (8.30) | .138 (3.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .567 (14.4) | 2,000 to 4,000 |
| 1812 | .484 (12.3) | .217 (5.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .724 (18.4) | 1,000 |
| 2225 | .484 (12.3) | .217 (5.50) ±.002 (±0.05) | .157 (4.00) ±.004 (±0.10) | .024 (0.60) | .724 (18.4) | 1,000 |

*0402 uses paper carrier tape; all other sizes use embossed carrier tape

inches (mm)

NOTE: Reel size is 7.0 (177.8)



NOTE: Part orientation is horizontal for all chip case sizes.

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