



Product Bulletin

Surface Mount Ceramic Chip Capacitors New Extended Values in X5R Dielectric

KEMET is pleased to continue the expansion of high capacitance ratings in our X5R ceramic chip capacitors to introduce the following new high capacitance values in our base metal electrode devices.

- X5R/0603 - 0.27 μ F – 1 μ F (274 - 105) @ 10 Volts
- X5R/0805 - 1.2 μ F – 10 μ F (125 - 106) @ 6.3 Volts
- X5R/0805 - 1.2 μ F – 4.7 μ F (125 - 475) @ 10 Volts
- X5R/1206 - 2.7 μ F – 4.7 μ F (275 - 475) @ 25 Volts
- X5R/1210 - 4.7 μ F – 10 μ F (475 - 106) @ 16 Volts
- X5R/1210 - 2.7 μ F – 4.7 μ F (275 - 475) @ 25 Volts

Outline Drawing

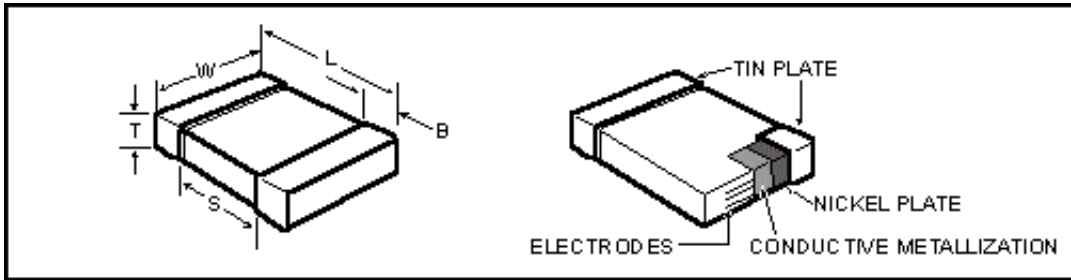


Table 1
Dimensions - Millimeters (Inches)

| Metric Size Code | EIA Size Code | L - Length | W - Width | Max. T - Thickness | B - Bandwidth | Separation |
|------------------|---------------|------------------------------|------------------------------|--------------------|-------------------------------|-------------|
| 1608 | 0603 | 1.6 (.063) \pm .15 (.006) | 0.8 (.032) \pm .10 (.004) | 0.90 (.035) | 0.35 (.014) \pm 0.15 (.006) | 0.70 (.028) |
| 2012 | 0805 | 2.00 (.079) \pm .20 (.008) | 1.25 (.049) \pm .20 (.008) | 1.45 (.057) | 0.50 (.02) \pm .25 (.010) | 0.75 (.030) |
| 3216 | 1206 | 3.20 (.126) \pm .20 (.008) | 1.6 (.063) \pm .20 (.008) | 1.8 (.071) | 0.50 (.02) \pm .25 (.010) | N/A |
| 3225 | 1210 | 3.20 (.126) \pm .20 (.008) | 2.5 (.098) \pm .20 (.008) | 2.7 (.106) | 0.50 (.02) \pm .25 (.010) | N/A |

Mounting technique for EIA sizes 0603, 0805 and 1206 is reflow or wave solder. The 1210 product should be limited to reflow soldering only.

Table 2 - X5R - Capacitance Value Extensions

| Capacitance (μ F) | KEMET Part Number | Cap Tol | Voltage | | | |
|---------------------------|----------------------|------------|---------|-----|-----|-----|
| | | | 6.3V | 10V | 16V | 25V |
| 0.27 | C0603C274(1)(2)PAC | K,M | | 274 | | |
| 0.33 | C0603C334(1)(2)PAC | K,M | | 334 | | |
| 0.39 | C0603C394(1)(2)PAC | K,M | | 394 | | |
| 0.47 | C0603C474(1)(2)PAC | K,M | | 474 | | |
| 0.56 | C0603C564(1)(2)PAC | K,M | | 564 | | |
| 0.68 | C0603C684(1)(2)PAC | K,M | | 684 | | |
| 0.82 | C0603C824(1)(2)PAC | K,M | | 824 | | |
| 1.0 | C0603C105(1)(2)PAC | K,M | | 105 | | |
| 1.2 | C0805C125(1)(2)PAC | K,M | 125 | 125 | | |
| 1.5 | C0805C155(1)(2)PAC | K,M | 155 | 155 | | |
| 1.8 | C0805C185(1)(2)PAC | K,M | 185 | 185 | | |
| 2.2 | C0805C225(1)(2)PAC | K,M | 225 | 225 | | |
| 2.7 | C0805C275(1)(2)PAC | K,M | 275 | 275 | | |
| 3.3 | C0805C335(1)(2)PAC | K,M | 335 | 335 | | |
| 3.9 | C0805C395(1)(2)PAC | K,M | 395 | 395 | | |
| 4.7 | C0805C475(1)(2)PAC | K,M | 475 | 475 | | |
| 5.6 | C0805C565(1)(2)PAC | K,M | 565 | | | |
| 6.8 | C0805C685(1)(2)PAC | K,M | 685 | | | |
| 8.2 | C0805C825(1)(2)PAC | K,M | 825 | | | |
| 10.0 | C0805C106(1)(2)PAC | K,M | 106 | | | |
| 2.7 | C1206C275(1)(2)PAC | K,M | | | | 275 |
| 3.3 | C1206C335(1)(2)PAC | K,M | | | | 335 |
| 3.9 | C1206C395(1)(2)PAC | K,M | | | | 395 |
| 4.7 | C1206C475(1)(2)PAC | K,M | | | | 475 |
| 2.7 | C1210C275(1)(2)PAC | K,M | | | | 275 |
| 3.3 | C1210C335(1)(2)PAC | K,M | | | | 335 |
| 3.9 | C1210C395(1)(2)PAC | K,M | | | | 395 |
| 4.7 | C1210C475(1)(2)PAC | K,M | | | 475 | 475 |
| 5.6 | C1210C565(1)(2)PAC | K,M | | | 565 | |
| 6.8 | C1210C685(1)(2)PAC | K,M | | | 685 | |
| 8.2 | C1210C825(1)(2)PAC | K,M | | | 825 | |
| 10.0 | C1210C106(1)(2)PAC | K,M | | | 106 | |

(1) To complete KEMET part number, insert the alpha code for the tolerance desired. K = \pm 10%; M = \pm 20%

(2) To complete KEMET part number, insert the numeric code for the voltage listed in Table 2. 9 = 6.3 volts; 8 = 10 volts; 4 = 16 volts; 3 = 25 volts

Electrical Parameters

As detailed in the KEMET Surface Mount Catalog F3102 for X5R, with following specific requirements based on room temperature (25°C) parameters:

- Operating Range: -55°C to +85°C, with no-bias capacitance shift limited to \pm 15% over that range
- Capacitance measured at 1 kHz at 1 Vrms with no bias
- Insulation Resistance (IR) measured after 2 minutes at rated voltage @ 25°C: Limit is 1000 megohm microfarads

Soldering Process

The 0603, 0805 and 1206 extended value parts are suitable for either reflow or wave soldering, while the 1210 should be restricted to reflow soldering. All parts incorporate the standard KEMET barrier layer of pure nickel, with an overplate of pure tin to provide excellent solderability as well as resistance to leaching.

Marking

These chips are normally supplied unmarked. If required, they can be laser marked as an extra cost option. More detail on the marking format is included in our Surface Mount Catalog F3102.