Multilayer Ceramic Chip Capacitor
MIL-PRF-55681

KEY BENEFITS
• Broad capacitance range: 1.0 pF to 0.47 µF
• Voltages: 50 WVDC and 100 WVDC
• Military established reliability failure rates: M, P, R and S
• Federal stock control number, CAGE CODE SHV71
• Available in ten military packages: CDR01, CDR02, CDR03, CDR04, CDR06, CDR31, CDR32, CDR33, CDR34, CDR35
• Wet build process with reliable Noble Metal Electrode (NME) system
• Tin/lead (min. 4 % lead) termination finish available. Termination codes “Z” and “U”
• Lead (Pb)-free termination codes “W”, “Y” and “M”

APPLICATIONS
• Military and high-reliability designs
• Avionic systems
• Sonar systems
• Satellite systems
• Geographical information systems
• Global positioning systems

RESOURCES
• For technical questions contact mlcc@vishay.com
• Material categorization: For definitions of compliance please see http://www.vishay.com/doc?99912

Note
(1) Pb containing terminations are not RoHS compliant, exemptions may apply
Multilayer Ceramic Chip Capacitors, Qualified, Type CDR

**Electrical Specifications**

- **Note**: • Electrical characteristics at +25 °C unless otherwise specified
  - **Operating Temperature**: -55 °C to +125 °C
  - **Capacitance Range**: 1.0 pF to 470 nF
  - **Voltage Range**: 50 VDC to 100 VDC

- **Temperature Coefficient of Capacitance (TCC)**:
  - **BP**: 0 ppm%/°C from -55 °C to +125 °C, with 0 VDC applied
  - **BX**: ± 15 % from -55 °C to +125 °C, with 0 VDC applied
  - **BX**: ± 15 %, -25 % from -55 °C to +125 °C, with 100 % rated VDC applied

- **Dissipation Factor (DF)**:
  - **BP**: 0.15 % maximum
  - **BX**: 2.50 % maximum
  - Test frequency: 1 MHz or 50 kHz for BP capacitors ≤ 1000 pF and for BX capacitors ≤ 100 pF

- **Aging Rate**:
  - **BP**: 0 % maximum per decade
  - **BX**: 1 % maximum per decade

- **Insulation Resistance (IR)**:
  - At +25 °C and rated voltage 100 000 MΩ minimum or 1000 GΩ, whichever is less

- **Dielectric Strength Test**:
  - Performed per method 103 of EA/198-2-E. Applied test voltages: ≤ 100 VDC rated: 250 % of rated voltage

**Ordering Information - Military**

<table>
<thead>
<tr>
<th>STYLE</th>
<th>LENGTH (L)</th>
<th>WIDTH (W)</th>
<th>MAXIMUM THICKNESS (T)</th>
<th>TERM. (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>0.080 ± 0.015 (2.03 ± 0.38)</td>
<td>0.050 ± 0.010 (1.27 ± 0.38)</td>
<td>0.055 (1.40)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>BX</td>
<td>0.180 ± 0.015 (4.57 ± 0.38)</td>
<td>0.050 ± 0.010 (1.27 ± 0.38)</td>
<td>0.055 (1.40)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>CDRO2</td>
<td>0.180 ± 0.015 (4.57 ± 0.38)</td>
<td>0.080 ± 0.010 (2.03 ± 0.38)</td>
<td>0.080 (2.03)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>CDRO4</td>
<td>0.180 ± 0.015 (4.57 ± 0.38)</td>
<td>0.125 ± 0.015 (3.20 ± 0.38)</td>
<td>0.125 (3.20)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>/3</td>
<td>0.225 ± 0.020 (5.72 ± 0.51)</td>
<td>0.250 ± 0.020 (6.35 ± 0.51)</td>
<td>0.250 (6.35)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>/7</td>
<td>0.078 ± 0.008 (2.00 ± 0.20)</td>
<td>0.049 ± 0.008 (1.27 ± 0.20)</td>
<td>0.051 (1.30)</td>
<td>0.012 (0.30) 0.038 (0.95)</td>
</tr>
<tr>
<td>/R</td>
<td>0.125 ± 0.008 (3.20 ± 0.20)</td>
<td>0.062 ± 0.008 (1.60 ± 0.20)</td>
<td>0.051 (1.30)</td>
<td>0.012 (0.30) 0.038 (0.95)</td>
</tr>
<tr>
<td>/9</td>
<td>0.125 ± 0.010 (3.20 ± 0.25)</td>
<td>0.098 ± 0.010 (2.50 ± 0.25)</td>
<td>0.059 (1.50)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>/10</td>
<td>0.176 ± 0.010 (4.50 ± 0.25)</td>
<td>0.125 ± 0.010 (3.20 ± 0.25)</td>
<td>0.059 (1.50)</td>
<td>0.010 (0.25) 0.030 (0.75)</td>
</tr>
<tr>
<td>/11</td>
<td>0.176 ± 0.012 (4.50 ± 0.32)</td>
<td>0.150 ± 0.012 (3.81 ± 0.32)</td>
<td>0.150 (3.81)</td>
<td>0.008 (0.25) 0.032 (0.80)</td>
</tr>
</tbody>
</table>

**Dimensions** in inches (millimeters)

- **ML-PRF-55681**
  - **W**
  - **L**
  - **T MAX**

**Quick Reference Data**

<table>
<thead>
<tr>
<th>DIELECTRIC</th>
<th>STYLE (CASE)</th>
<th>MAXIMUM VOLTAGE (V)</th>
<th>CAPACITANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BP</td>
<td>CDRO1 (0805)</td>
<td>100</td>
<td>10 pF</td>
</tr>
<tr>
<td>BP</td>
<td>CDRO2 (0805)</td>
<td>100</td>
<td>120 pF</td>
</tr>
<tr>
<td>BP</td>
<td>CDRO3 (1206)</td>
<td>100</td>
<td>200 pF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO1 (0805)</td>
<td>100</td>
<td>39 nF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO2 (0805)</td>
<td>100</td>
<td>120 pF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO3 (1206)</td>
<td>100</td>
<td>470 pF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO3 (1210)</td>
<td>100</td>
<td>100 pF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO4 (1212)</td>
<td>100</td>
<td>22 nF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO5 (1212)</td>
<td>100</td>
<td>47 nF</td>
</tr>
<tr>
<td>BX</td>
<td>CDRO5 (1215)</td>
<td>100</td>
<td>22 nF</td>
</tr>
</tbody>
</table>

**Notes**

- DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance. Consult for questions: mlcc@vishay.com
- Available tolerances please see rating chart
- ML-PRF-55681 “U” termination part number have increased dimensions

**Dimensions** in inches (millimeters)

- **W**
- **L**
- **T MAX**

**Quick Reference Data**

- **Dielectric**
  - **Style (Case)**
  - **Maximum Voltage (V)**
  - **Capacitance**

**Notes**

- Details ratings see selection chart