Surface Mount Multilayer Ceramic Chip Capacitors
DSCC Qualified Type 05006

FEATURES
- US defense supply center approved
- Federal stock control number, CAGE CODE 2770A
- Case size 0805
- Stable BP, BR and BX dielectrics
- Excellent aging characteristics
- Lead (Pb)-free termination code “M”
- Tin / lead termination code “Z” and “U”
- Wet build process
- Reliable Noble Metal Electrode (NME) system
- Made with a combination of design, materials and tight process control to achieve very high field reliability
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Note
* This datasheet provides information about parts that are RoHS-compliant and / or parts that are non RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information / tables in this datasheet for details

APPLICATIONS
- Avionic application
- Sonar applications
- Satellite systems
- Missiles applications
- Geographical information systems
- Global positioning systems

ELECTRICAL SPECIFICATIONS

Note
- Electrical characteristics at +25 °C unless otherwise specified

Operating Temperature: -55 °C to +125 °C

Capacitance Range:
BP: 1.0 pF to 3.3 nF
BR: 100 pF to 220 nF
BX: 100 pF to 180 nF

Voltage Range: 10 VDC to 200 VDC

Temperature Coefficient of Capacitance (TCC):
BP: 0 ppm/°C ± 30 ppm/°C from -55 °C to +125 °C with zero (0) VDC applied
BR: ± 15 % from -55 °C to +125 °C with 100 % rated VDC applied
BR: ± 15 %, -40 % from -55 °C to +125 °C with 100 % rated VDC applied
BX: ± 15 % from -55 °C to +125 °C with zero (0) VDC applied
BX: ± 15 %, -25 % from -55 °C to +125 °C with 100 % rated VDC applied
BX: ± 15 %, -25 % from -55 °C to +125 °C with 100 % rated VDC applied

Dissipation Factor (DF):
BP:
0.15 % max. at 1.0 VRMS and 1 MHz for values ≤ 1000 pF
0.15 % max. at 1.0 VRMS and 1 kHz for values > 1000 pF

BR and BX:
≤ 25 V: 3.5 % max. at 1.0 VRMS and 1 kHz
≥ 50 V: 2.5 % max. at 1.0 VRMS and 1 kHz

Aging Rate:
BP: 0 % maximum per decade
BR, BX: 1 % maximum per decade

Insulation Resistance (IR):
at +25 °C and rated voltage 100 000 MΩ minimum or 1000 ΩF, whichever is less
at +125 °C and rated voltage 10 000 MΩ minimum or 100 ΩF, whichever is less

Dielectric Strength Test:
performed per method 103 of EIA-198-2-E.
Applied test voltages
≤ 200 VDC-rated: 250 % of rated voltage
QUICK REFERENCE DATA

<table>
<thead>
<tr>
<th>DIELECTRIC</th>
<th>CASE</th>
<th>MAXIMUM VOLTAGE (V)</th>
<th>CAPACITANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>MINIMUM</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>BP</td>
<td>0805</td>
<td>200</td>
<td>1.0 pF</td>
</tr>
<tr>
<td>BR</td>
<td>0805</td>
<td>100</td>
<td>100 pF</td>
</tr>
<tr>
<td>BX</td>
<td>0805</td>
<td>100</td>
<td>100 pF</td>
</tr>
</tbody>
</table>

Note
- Detail ratings see “Selection Chart”

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>DSCC NUMBER</th>
<th>DIELECTRIC</th>
<th>CAPACITANCE NOMINAL CODE</th>
<th>DC VOLTAGE RATING (1)</th>
<th>CAPACITANCE TOLERANCE</th>
<th>TERMINATION</th>
<th>GROUP C TESTING OPTION (2)</th>
<th>PACKAGING</th>
</tr>
</thead>
<tbody>
<tr>
<td>05006-</td>
<td>BP</td>
<td>Expressed in picofarads (pF). The first two digits are significant, the third is a multiplier. An “R” indicates a decimal point. Examples: 1R8 = 1.8 pF 101 = 100 pF</td>
<td>X = 10 V Y = 16 V Z = 25 V A = 50 V B = 100 V C = 200 V</td>
<td>C = ± 0.25 pF D = ± 0.5 pF F = ± 1 % G = ± 2 % J = ± 5 % K = ± 10 % M = ± 20 %</td>
<td>M = silver palladium Z = Ni barrier with tin / lead plate min. 4 % lead U = Ni barrier solder coated (min. of 4 % lead)</td>
<td>C = full group C</td>
<td>T = 7&quot; reel / plastic tape C = 7&quot; reel / paper tape O = 7&quot; reel / flamed paper tape J = 7&quot; reel (low quantity) R = 11 1/4&quot; / 13&quot; reel / plastic tape P = 11 1/4&quot; / 13&quot; reel / paper tape I = 11 1/4&quot; / 13&quot; reel / flamed paper tape B = bulk</td>
</tr>
<tr>
<td>05006-</td>
<td>BR</td>
<td>X = 10 pF (BP) F, G, J, K, M ≥ 10 pF (BP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>05006-</td>
<td>BX</td>
<td>X = 10 pF (BP) F, G, J, K, M ≥ 10 pF (BP)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes
(1) DC voltage rating should not be exceeded in application. Other application factors may affect the MLCC performance.
Consult for questions: mlcc@vishay.com
(2) To receive data package, add “P” to the end of the part number. For example, 05006-BP101BJZCTP.
Group C will be completed and data included with shipment.

DIMENSIONS in inches (millimeters)

<table>
<thead>
<tr>
<th>PART ORDERING NUMBER</th>
<th>LENGTH (L)</th>
<th>WIDTH (W)</th>
<th>MAXIMUM THICKNESS (T)</th>
<th>TERMINATION PAD (P)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MINIMUM</td>
<td>MAXIMUM</td>
<td>MINIMUM</td>
<td>MAXIMUM</td>
</tr>
<tr>
<td>05006-</td>
<td>0.080 ± 0.008 (2.03 ± 0.20)</td>
<td>0.050 ± 0.008 (1.27 ± 0.20)</td>
<td>0.055 (1.40)</td>
<td>0.012 (0.30)</td>
</tr>
</tbody>
</table>

Note
- Metric equivalents are given for general information only
<table>
<thead>
<tr>
<th>DIELECTRIC</th>
<th>BP</th>
<th>BR</th>
<th>BX</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYLE</td>
<td>05006</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CASE CODE</td>
<td>0805</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Voltage (V<sub>DC</sub>):**
- 10
- 16
- 25
- 50
- 100
- 200

**Voltage Code:**
- X
- Y
- Z
- A
- B
- C
- X
- Y
- Z
- A
- B
- X
- Y
- Z
- A
- B

**Cap. Code:**
- 1R0 1.0 pF
- 1R2 1.2 pF
- 1R5 1.5 pF
- 1R8 1.8 pF
- 2R2 2.2 pF
- 2R7 2.7 pF
- 3R3 3.3 pF
- 3R9 3.9 pF
- 4R7 4.7 pF
- 5R6 5.6 pF
- 6R8 6.8 pF
- 8R2 8.2 pF
- 10 10 pF
- 120 12 pF
- 150 15 pF
- 180 18 pF
- 220 22 pF
- 270 27 pF
- 330 33 pF
- 390 39 pF
- 470 47 pF
- 560 56 pF
- 680 68 pF
- 820 82 pF
- 101 100 pF
- 121 120 pF
- 151 150 pF
- 181 180 pF
- 221 220 pF
- 271 270 pF
- 331 330 pF
- 391 390 pF
- 471 470 pF
- 561 560 pF
- 681 680 pF
- 821 820 pF
- 102 1.0 nF
- 122 1.2 nF
- 152 1.5 nF
- 182 1.8 nF
- 222 2.2 nF
- 272 2.7 nF
- 332 3.3 nF
- 392 3.9 nF
- 472 4.7 nF
- 562 5.6 nF
- 682 6.8 nF
- 822 8.2 nF

**Notes:**
- RoHS-compliant except when supplied with lead (Pb)-containing terminations, codes ‘Z’ and ‘U’
- Not RoHS-compliant
- Use MIL-PRF-55681 (CDR) instead, part numbers removed from DSCC listing
**SELECTION CHART**

<table>
<thead>
<tr>
<th>DIELECTRIC</th>
<th>BP</th>
<th>BR</th>
<th>BX</th>
</tr>
</thead>
<tbody>
<tr>
<td>STYLE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VOLTAGE (V&lt;sub&gt;DC&lt;/sub&gt;)</td>
<td>10</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>VOLTAGE CODE</td>
<td>X</td>
<td>Y</td>
<td>Z</td>
</tr>
</tbody>
</table>

| CAP. CODE | 103 | 123 | 153 | 183 | 223 | 273 | 333 | 393 | 473 | 563 | 683 | 823 | 104 | 124 | 154 | 184 | 224 | 274 | 334 | 394 | 474 | 564 | 684 | 824 | 105 |
|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| CAP.      | 10 nF | 12 nF | 15 nF | 18 nF | 22 nF | 27 nF | 33 nF | 39 nF | 47 nF | 56 nF | 68 nF | 82 nF | 100 nF | 120 nF | 150 nF | 180 nF | 220 nF | 270 nF | 330 nF | 390 nF | 470 nF | 560 nF | 680 nF | 820 nF | 1.0 μF |

**Notes**

- RoHS-compliant except when supplied with lead (Pb)-containing terminations, codes “Z” and “U”
- Not RoHS-compliant
- + Use MIL-PRF-55681 (CDR) instead, part numbers removed from DSCC listing

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**DSCC PACKAGING QUANTITIES (1)(2)**

<table>
<thead>
<tr>
<th>CASE CODE</th>
<th>TAPE SIZE</th>
<th>7&quot; REEL QUANTITIES</th>
<th>11 1/4&quot; AND 13&quot; REEL QUANTITIES</th>
<th>BULK</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>PACKAGING CODE</td>
<td>PACKAGING CODE</td>
<td>VIAL PACKAGING CODE</td>
</tr>
<tr>
<td>0805</td>
<td>8 mm</td>
<td>3000</td>
<td>1000</td>
<td>10 000</td>
</tr>
</tbody>
</table>

**Notes**

(1) Vishay Vitramon uses embossed plastic carrier tape and punch paper carrier tape
(2) Reference: EIA standard RS 481 - “Taping of Surface Mount Components for Automatic Placement”

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**STORAGE AND HANDLING CONDITIONS**

(1) Store the components at 5 °C to +40 °C ambient temperature and ≤ 70 % relative humidity conditions.
(2) The product is recommended to be used within a time-frame of 2 years after shipment.
Check solderability in case extended shelf life beyond the expiry date is needed.

Precautions:
- a. Do not store products in an environment containing corrosive elements, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are present. This may cause corrosion or oxidization of the terminations, which can easily lead to poor soldering.
- b. Store products on the shelf and avoid exposure to moisture or dust.
- c. Do not expose products to excessive shock, vibration, direct sunlight and so on.
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