SMD CERAMIC RESONATORS

ZTACC/CS/CV series without built-in capacitors
ZTTCC/CS/CV series with built-in capacitors

FEATURES

- High temperature withstanding ceramic case, available in wide frequency range
- Rectangular shape allows easy pick and placement
- Small & low profile less than 2.0mm height max
- Reflow Solderable

TECHNICAL CHARACTERISTICS:

<table>
<thead>
<tr>
<th>ZTACC/CS/CV series without built-in capacitors</th>
<th>ZTTCC/CS/CV series with built-in capacitors</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part Number</strong></td>
<td><strong>Part Number</strong></td>
</tr>
<tr>
<td>ZTACC MG</td>
<td>ZTTCC MG</td>
</tr>
<tr>
<td>ZTACS/CV MT</td>
<td>ZTTCS/CV MT</td>
</tr>
<tr>
<td>ZTACS/CV MX</td>
<td>ZTTCS/CV MX</td>
</tr>
<tr>
<td><strong>Freq. Range (MHz)</strong></td>
<td><strong>Freq. Range (MHz)</strong></td>
</tr>
<tr>
<td>2.00 ~ 6.99</td>
<td>2.00 ~ 6.99</td>
</tr>
<tr>
<td>7.00 ~ 13.00</td>
<td>7.00 ~ 13.00</td>
</tr>
<tr>
<td>13.01 ~ 50.00</td>
<td>13.01 ~ 50.00</td>
</tr>
<tr>
<td><strong>Freq. Accuracy at 25°C (%)</strong></td>
<td><strong>Freq. Accuracy at 25°C (%)</strong></td>
</tr>
<tr>
<td>± 0.5</td>
<td>± 0.5</td>
</tr>
<tr>
<td>± 0.5</td>
<td>± 0.5</td>
</tr>
<tr>
<td>± 0.5</td>
<td>± 0.5</td>
</tr>
<tr>
<td><strong>Stability In Temp. -20°C ~ +80°C</strong></td>
<td><strong>Stability In Temp. -20°C ~ +80°C</strong></td>
</tr>
<tr>
<td>± 0.3%</td>
<td>± 0.3%</td>
</tr>
<tr>
<td>± 0.4%</td>
<td>± 0.3%</td>
</tr>
<tr>
<td>± 0.3%</td>
<td>± 0.3%</td>
</tr>
<tr>
<td><strong>Aging For Ten Yrs (%)</strong></td>
<td><strong>Aging For Ten Yrs (%)</strong></td>
</tr>
<tr>
<td>± 0.3%</td>
<td>± 0.3%</td>
</tr>
<tr>
<td><strong>Equivalent Murata Series</strong></td>
<td><strong>Equivalent Murata Series</strong></td>
</tr>
<tr>
<td>CSACC MG</td>
<td>CSTCC MG</td>
</tr>
<tr>
<td>CSACV MT</td>
<td>CSTCV MT</td>
</tr>
<tr>
<td>CSACV MX</td>
<td>CSTCV MX</td>
</tr>
</tbody>
</table>

U.S. Electronics Inc.
Ph: (314)423 7550
Fax: (314) 423 0585

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CERAMIC RESONATOR-SMD...

**DIMENSIONS:** (No middle terminal for ZTACC series.)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>W</td>
</tr>
<tr>
<td>ZTACC MG</td>
<td>7.4 ± 0.3</td>
</tr>
<tr>
<td>ZTACS MT/MX</td>
<td>4.7 ± 0.2</td>
</tr>
<tr>
<td>ZTACV MT/MX</td>
<td>3.7 ± 0.2</td>
</tr>
</tbody>
</table>

**ZTCC/CV/CS DIMENSIONS (Unit: mm)**

<table>
<thead>
<tr>
<th>Part Number</th>
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<tbody>
<tr>
<td>L</td>
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<tr>
<td>ZTCC MG</td>
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</tr>
<tr>
<td>ZTCS MT/MX</td>
<td>4.7 ± 0.2</td>
</tr>
<tr>
<td>ZTCCV MT/MX</td>
<td>3.7 ± 0.2</td>
</tr>
</tbody>
</table>

1. Input
2. Ground
3. Output

---

U.S Electronics Inc, ph: (314)423 7550, fax: (314)423 0585, url: www.us-electronics.com
### ZTACC/CS/CV Series:

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Frequency</th>
<th>Frequency Accuracy</th>
<th>Stability in Temperature</th>
<th>Aging for Ten Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZTACC2.00MG</td>
<td>2.00</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACC3.58MG</td>
<td>3.58</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACC4.00MG</td>
<td>4.00</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACC4.19MG</td>
<td>4.19</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACC6.00MT</td>
<td>6.00</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACC8.00MT</td>
<td>8.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACV10.00MT</td>
<td>10.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACS10.00MT</td>
<td>10.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACV12.00MT</td>
<td>12.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACS12.00MT</td>
<td>12.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACV16.00MX</td>
<td>16.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACS16.00MX</td>
<td>16.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACV20.00MX</td>
<td>20.00</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTACS20.00MX</td>
<td>20.00</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
</tbody>
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<tr>
<td>ZTTCC2.00MG</td>
<td>2.00</td>
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<td>ZTTCC3.58MG</td>
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<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
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<td>±0.3%</td>
</tr>
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<td>ZTTCC6.00MT</td>
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<td>±0.3%</td>
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<td>8.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTTCS10.00MT</td>
<td>10.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTTCS12.00MT</td>
<td>12.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTTCS16.00MX</td>
<td>16.00</td>
<td>±0.5%</td>
<td>±0.4%</td>
<td>±0.3%</td>
</tr>
<tr>
<td>ZTTCS20.00MX</td>
<td>20.00</td>
<td>±0.5%</td>
<td>±0.3%</td>
<td>±0.3%</td>
</tr>
</tbody>
</table>

**ZTTCC/CS/CV TEST CIRCUIT**

- IC: 1/6TC4069UBPX2 (8.0-12.99 MHz)
- IC: 1/6TC74HC04 (13.0-50.0 MHz)
- X: SMD RESONATOR
- CL1 = CL2 = 30pF ± 20%

**ZTACC/CS/CV TEST CIRCUIT**

- IC
- 1MΩ
- X: Ceramic Resonator
- VDD(MG,MX): +5V, (MT): +12V
- IC(MG,MT): 1/6TC4069UBPzx2
- (MX): 1/6TC74HC04x2
RECOMMENDED REFLOW SOLDERING: Tape & Reel Dimensions (click here)
SMD CERAMIC RESONATORS

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ZTTCC/CS/CV series with built-in capacitors

FEATURES

- Highly reliability, high temperature withstanding ceramic case, available in wide frequency range
- Rectangular shape allows easy pick and placement
- Small & low profile less than 2.0mm height max
- Reflow Solderable

Packaging Method:

Blank Pocket
10 Pitches

Loaded Pocket
10 Pitches

Blank Pocket
200mm Maximum

Leader

Reel

Tape
## Tape and Reel Dimensions

### Reel Dimensions (mm)

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>W</th>
<th>T</th>
<th>Pieces per reel</th>
<th>Carrier tape size</th>
</tr>
</thead>
<tbody>
<tr>
<td>179±2</td>
<td>60 typ</td>
<td>12.4 min</td>
<td>19.4max</td>
<td>1000typ.</td>
<td>12</td>
</tr>
<tr>
<td>179±2</td>
<td>60 typ</td>
<td>16.4 min</td>
<td>22.4max</td>
<td>1000typ.</td>
<td>16</td>
</tr>
<tr>
<td>330±3</td>
<td>80 min</td>
<td>12.4 min</td>
<td>19.4max</td>
<td>4000typ.</td>
<td>12</td>
</tr>
<tr>
<td>330±3</td>
<td>80 min</td>
<td>16.4 min</td>
<td>22.4max</td>
<td>4000typ.</td>
<td>16</td>
</tr>
</tbody>
</table>

### Tape Dimensions (mm)

<table>
<thead>
<tr>
<th>Code / Tolerance</th>
<th>A±0.2</th>
<th>B±0.2</th>
<th>C±0.3</th>
<th>D±0.1</th>
<th>E±0.1</th>
<th>F±0.1</th>
<th>G±0.1</th>
<th>H±0.1</th>
<th>J±0.1</th>
<th>N±0.1</th>
<th>Mmax</th>
<th>Rmax</th>
<th>K±0.2</th>
<th>T±0.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZTACC MG</td>
<td>3.8</td>
<td>7.8</td>
<td>16.0</td>
<td>7.5</td>
<td>1.75</td>
<td>8.0</td>
<td>4.0</td>
<td>2.0</td>
<td>1.5</td>
<td>1.6</td>
<td>10°</td>
<td>0.3</td>
<td>2.1</td>
<td>0.3</td>
</tr>
<tr>
<td>ZTTCC MG</td>
<td>5.0</td>
<td>4.4</td>
<td>12.0</td>
<td>5.5</td>
<td>1.75</td>
<td>8.0</td>
<td>4.0</td>
<td>2.0</td>
<td>1.5</td>
<td>1.6</td>
<td>10°</td>
<td>0.3</td>
<td>1.8</td>
<td>0.3</td>
</tr>
<tr>
<td>ZTACV MT/MX</td>
<td>3.4</td>
<td>4.0</td>
<td>12.0</td>
<td>5.5</td>
<td>1.75</td>
<td>8.0</td>
<td>4.0</td>
<td>2.0</td>
<td>1.5</td>
<td>1.6</td>
<td>10°</td>
<td>0.3</td>
<td>1.3</td>
<td></td>
</tr>
<tr>
<td>ZTTCV MT/MX</td>
<td></td>
<td></td>
<td></td>
<td></td>
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