Ceramic Trimmer Capacitors
Note: Please read rating and caution (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

EU RoHS Compliant

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment."
- For more details, please refer to our website “Murata’s Approach for EU RoHS” (http://www.murata.com/info/rohs.html).
Contents

Product specifications are as of May 2014.

Bluetooth® is a registered trademark or trademark of Bluetooth SIG, Inc. in the United States and other countries.

Part Numbering ........................................ p2
Selection Guide of Ceramic Trimmer Capacitors ........ p3

1 TZR1 Series ........................................ p4

2 TZY2 Series ........................................ p8

3 TZC3 Series ........................................ p13

4 TZW4 Series ........................................ p18

5 TZB4 Series ........................................ p21

Packaging ........................................ p26
Recommended Adjustment Tools ....................... p28
Qualified Standards ................................ p29

Please check the MURATA home page (http://www.murata.com/) if you cannot find the part number in the catalog.
## Part Numbering

### Ceramic Trimmer Capacitors

<table>
<thead>
<tr>
<th>(Part Number)</th>
<th>TZ</th>
<th>Y2</th>
<th>R</th>
<th>200</th>
<th>A</th>
<th>C01</th>
<th>R00</th>
</tr>
</thead>
</table>

### Product ID

<table>
<thead>
<tr>
<th>Product ID</th>
<th>TZ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trimmer Capacitors</td>
</tr>
</tbody>
</table>

### Series/Terminal

<table>
<thead>
<tr>
<th>Code</th>
<th>Series/Terminal</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4</td>
<td>4mm Size SMD Type</td>
</tr>
<tr>
<td>W4</td>
<td>4mm Size SMD Type</td>
</tr>
<tr>
<td>C3</td>
<td>3mm Size SMD Type</td>
</tr>
<tr>
<td>Y2</td>
<td>2mm Size SMD Type</td>
</tr>
<tr>
<td>R1</td>
<td>1mm Size SMD Type</td>
</tr>
</tbody>
</table>

### Terminal Shape

<table>
<thead>
<tr>
<th>Code</th>
<th>Terminal Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Top Adjustment: TZR1, TZY2, TZC3, TZW4, TZB4</td>
</tr>
<tr>
<td>B</td>
<td>Top Adjustment: TZB4</td>
</tr>
</tbody>
</table>

Please refer to dimensions for terminal details.

### Individual Specifications

<table>
<thead>
<tr>
<th>Code</th>
<th>Individual Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>001</td>
<td>TZR1, TZW4 Standard Type</td>
</tr>
<tr>
<td>C01</td>
<td>TZY2 Standard Type</td>
</tr>
<tr>
<td>110</td>
<td>TZC3 Standard Type</td>
</tr>
<tr>
<td>A10</td>
<td>TZB4 No-cover Film Standard Type</td>
</tr>
<tr>
<td>B10</td>
<td>TZB4 with Cover Film Standard Type</td>
</tr>
</tbody>
</table>

### Packaging

<table>
<thead>
<tr>
<th>Code</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>B00</td>
<td>Bulk</td>
</tr>
<tr>
<td>R00</td>
<td>Reel (Taping ø180mm)</td>
</tr>
<tr>
<td>R01*</td>
<td>Reel (Taping ø330mm)</td>
</tr>
</tbody>
</table>

* TZB4 only.

### Temperature Characteristics

<table>
<thead>
<tr>
<th>Code</th>
<th>Temperature Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z</td>
<td>NP0ppm/°C</td>
</tr>
<tr>
<td>R</td>
<td>N750ppm/°C</td>
</tr>
<tr>
<td>K</td>
<td>N1000ppm/°C</td>
</tr>
<tr>
<td>P</td>
<td>N1200ppm/°C</td>
</tr>
</tbody>
</table>

Please refer to ratings for tolerance of temperature characteristics.

### Maximum Capacitance

Expressed by three-digit alphanumerics. The unit is pico-farad (pF). The first and second figures are significant digits, and the third figure expresses the number of zeros that follow the two numbers. If there is a decimal point, it is expressed by the capital letter "R". In this case, all figures are significant digits.

---

**Note:** Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

- This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
## Selection Guide of Ceramic Trimmer Capacitors

### Mounting Method?

#### Surface Mount

<table>
<thead>
<tr>
<th>Height 0.90mm max.</th>
<th>Height 1.7mm max.</th>
<th>Height 3.2mm max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZR1 1.5(W) x 1.7(L)</td>
<td>TZC3 3.2(W) x 4.5(L)</td>
<td>TZW4 4.2(W) x 5.2(L)</td>
</tr>
<tr>
<td>TZY2 2.5(W) x 3.2(L)</td>
<td>TZB4_AB 4.0(W) x 4.5(L)</td>
<td>TZB4_BB 4.0(W) x 4.5(L)</td>
</tr>
</tbody>
</table>

#### Reflow

- TZC3 3.2(W) x 4.5(L)
- TZB4_AA 4.0(W) x 4.5(L)
- TZB4_BB 4.0(W) x 4.5(L) (with cover film)

#### Flow

- TSB4_AB 4.0(W) x 4.5(L) (with cover film)
- TSB4_BB 4.0(W) x 4.5(L) (with cover film)

---

*Note: Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.*

*This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.*

---

All Ceramic Trimmer Capacitor products comply with RoHS and ELV.
Ceramic Trimmer Capacitors

TZR1 Series

Features
1. Ultra-small and thin with external dimensions of 1.5(W)x1.7(L)x0.85(H)mm (80% less in volume than the current product).
2. Unique construction with no plastic material provides superior soldering heat resistance to maintain excellent characteristic performance after reflow soldering.
3. Suitable for high frequency circuit due to high self-resonant frequency (6.2GHz of TZR1Z010 at 1.0pF setting).

Applications
1. Bluetooth®
2. Crystal oscillators
3. Crystal filters
4. Hand radios
5. Miniature tuner packs (FM Radio, TV)
6. Remote keyless entry systems

<table>
<thead>
<tr>
<th>Part Number</th>
<th>C min. (max.) (pF)</th>
<th>C max. (pF)</th>
<th>TC</th>
<th>Q</th>
<th>Rated Voltage</th>
<th>Withstanding Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZR1Z010A001</td>
<td>0.55</td>
<td>1.0</td>
<td>+100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>200min. at 200MHz, Cmax.</td>
<td>25Vdc</td>
</tr>
<tr>
<td>TZR1Z1R5A001</td>
<td>0.7</td>
<td>1.5</td>
<td>+100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>200min. at 200MHz, Cmax.</td>
<td>25Vdc</td>
</tr>
<tr>
<td>TZR1Z040A001</td>
<td>1.5</td>
<td>4.0</td>
<td>+100/-0%</td>
<td>NP0±500ppm/°C</td>
<td>300min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
</tr>
<tr>
<td>TZR1R080A001</td>
<td>3.0</td>
<td>8.0</td>
<td>+100/-0%</td>
<td>N750±500ppm/°C</td>
<td>300min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
</tr>
</tbody>
</table>

Insulation Resistance: 10000M ohm  Torque: 0.1 to 1.0mNm  Operating Temperature Range: -25 to +85°C

Construction

Note: Please read rating and CAUTION (for storage, operating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
Temperature Characteristics

TZR1Z010

Z010 (±300 ppm/°C)

TZR1Z1R5

Z1R5 (±300 ppm/°C)

TZR1Z040

Z040 (±500 ppm/°C)

TZR1R080

R080 (±500 ppm/°C)

Frequency Characteristics

TZR1Z010

Z010

0.5pF set

1.0pF set

TZR1Z1R5

Z1R5

0.7pF set

1.5pF set

TZR1Z040

Z040

500 1000 1500 2000 2500

Frequency (MHz)

Capacitance (pF)

TZR1R080

R080

500 1000 1500 2000 2500

Frequency (MHz)

Capacitance (pF)
## Land Pattern

![Land Pattern Diagram]

Tolerance: ±0.1 mm

---

## Temperature Profile

### Reflow Soldering Profile

1. Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu)

![Reflow Soldering Profile Diagram]

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T2)</td>
<td>Time (t2)</td>
</tr>
<tr>
<td></td>
<td>150 to 180°C</td>
<td>60 to 120sec.</td>
<td>220°C</td>
<td>30 to 60sec.</td>
</tr>
<tr>
<td></td>
<td>2 times</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limit Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T4)</td>
<td>Time (t3)</td>
</tr>
<tr>
<td></td>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>230°C</td>
<td>30 to 50sec.</td>
</tr>
</tbody>
</table>

2. Soldering profile for Eutectic solder (63Sn/37Pb)

(Limit profile: refer to 1)

![Limit Profile Diagram]

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T2)</td>
<td>Time (t2)</td>
</tr>
<tr>
<td></td>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>183°C</td>
<td>30sec.</td>
</tr>
<tr>
<td></td>
<td>1 time</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

## Soldering Iron

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Temperature of soldering iron tip</th>
<th>Soldering time</th>
<th>Soldering iron power output</th>
<th>Cycle of soldering iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>350±10°C</td>
<td>3sec. max.</td>
<td>30W max.</td>
<td>1 time</td>
</tr>
</tbody>
</table>

---

## Notice (Storage and Operating Conditions)

1. Do not use the trimmer capacitor under atmosphere of RTV silicone rubber (Room Temperature Vulcanizing Silicone Rubber) except Acetone liberating silicone sealant.
2. Before using trimmer capacitors, please store under the conditions of -10 to +40°C and 30 to 85%RH.
3. Do not store in or near corrosive gasses.
4. Use within 6 months of delivery.
5. Do not store under direct sunlight.
6. Do not use the trimmer capacitor under the conditions listed below.
   - (1) Corrosive gasses atmosphere
     (ex. Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
   - (2) In liquid (ex. water, oil, medical liquid, organic solvent, etc.)
   - (3) Dusty / dirty atmosphere
   - (4) Direct sunlight
   - (5) Static voltage or electric/magnetic fields
   - (6) Direct sea breeze
   - (7) Other variations of the above
Notice (Soldering and Mounting)

1. Soldering
   (1) TZR1 series can be soldered by reflow soldering method and soldering iron. Do not use flow soldering method (dipping).
   (2) Soldering conditions
       Refer to the temperature profile. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer capacitor may deviate from the specified characteristics.
   (3) The amount of solder is critical.
   (4) The thickness of solder paste should be printed from 100 micro m to 150 micro m and the dimension of land pattern should be Murata’s standard land pattern used at reflow soldering. Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause bridging between the terminals or contact failure due to flux wicking up.
   (5) When using soldering iron, the diameter of the string solder shall be less than 0.5mm. The string solder shall be applied to the lower part of the terminal only. Do not apply flux except to the terminals. Excessive amounts of solder and/or applying solder to the upper part of the terminal may cause fixed metal rotor or contact failure due to flux invasion into the movable part and/or the contact point. The soldering iron should not come in contact with the monolithic stator of the trimmer capacitor. If such contact does occur, the trimmer capacitor may be damaged.
   (6) Our recommended chlorine content of solder is as follows.
       (a) Solder paste: 0.2wt% max.
       (b) String solder: 0.5wt% max.
   (7) Do not use water-soluble flux (for water cleaning). To prevent the deterioration of trimmer capacitor characteristics, apply flux only to terminals.

2. Mounting
   (1) Do not apply excessive force (preferably 5.0 N [Ref: 500gf] max.), when the trimmer capacitor is mounted on the PCB.
   (2) Do not warp and/or bend PCB to protect trimmer capacitor from breaking.
   (3) Use a pick-up nozzle of a suitable dimension. (1.6mm external diameter and 0.8mm bore diameter.)

3. Cleaning
   This product cannot be cleaned because of open construction.

4. Other
   Note the polarity of the trimmer capacitor to minimize influence by stray capacitance. (Refer to the dimensions concerning the polarity.)

Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot.
   *Recommended screwdriver for manual adjustment MURATA: KMDR160
2. When adjusting with a screwdriver, do not apply excessive force (preferably 0.5 N [Ref: 50gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.
3. Do not apply adhesive, lock paints, or any other substances to the trimmer capacitor to secure the rotor position. They may cause corrosion or electrical contact problems.

Notice (Other)

Before using trimmer capacitors, please test after assembly in your particular mass production system.
Ceramic Trimmer Capacitors

TZY2 Series

■ Features
1. Small and thin size with external dimensions of 2.5(W)x3.2(L)x1.25max.(H)mm.
2. New shape of cover can improve the flux invasion compared with current products.
3. Improvement of the adhesion between rotor and stator leads to superior stability.
4. Unique construction with no plastic material provides superior soldering heat resistance to maintain excellent characteristic performance after reflow soldering.
5. Suitable for high frequency circuit due to high self-resonant frequency (4.8GHz of TZY2Z010 at 1.0pF setting).

■ Applications
1. Crystal oscillators
2. Crystal filters
3. Stylus pen
4. Cordless telephones
5. PHS
6. Hand radios
7. Cellular telephones
8. Watches
9. Remote keyless entry systems
10. W-LAN
11. Radar detectors
12. Compact radios
13. DVD
14. Burglarproof devices
15. Headphone stereos

<table>
<thead>
<tr>
<th>Part Number</th>
<th>C min. (max.) (pF)</th>
<th>C max. (pF)</th>
<th>TC</th>
<th>Q</th>
<th>Rated Voltage</th>
<th>Withstanding Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZY2Z010AC01</td>
<td>0.6</td>
<td>1.0 +100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>200min. at 200MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2Z2R5AC01</td>
<td>1.0</td>
<td>2.5 +100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>200min. at 200MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2Z030AC01</td>
<td>1.5</td>
<td>3.0 +100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>300min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2Z060AC01</td>
<td>2.5</td>
<td>6.0 +100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>500min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2Z100AC01</td>
<td>3.0</td>
<td>10.0 +100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>500min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2R200AC01</td>
<td>4.5</td>
<td>20.0 +100/-0%</td>
<td>N750±500ppm/°C</td>
<td>500min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2R250AC01</td>
<td>5.5</td>
<td>25.0 +100/-0%</td>
<td>N750±500ppm/°C</td>
<td>300min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
<tr>
<td>TZY2K450AC01</td>
<td>8.0</td>
<td>45.0 +100/-0%</td>
<td>N1000±500ppm/°C</td>
<td>300min. at 1MHz, Cmax.</td>
<td>25Vdc</td>
<td>55Vdc</td>
</tr>
</tbody>
</table>

Insulation Resistance: 10000M ohm  Torque: 0.7 to 4.9mNm  Operating Temperature Range: -25 to +85°C

Features
1. Crystal oscillators
2. Crystal filters
3. Stylus pen
4. Cordless telephones
5. PHS
6. Hand radios
7. Cellular telephones
8. Watches
9. Remote keyless entry systems
10. W-LAN
11. Radar detectors
12. Compact radios
13. DVD
14. Burglarproof devices
15. Headphone stereos
### Temperature Characteristics

#### TZY2Z010

**Z010 (NP0±300 ppm/°C)**

#### TZY2Z030

**Z030 (NP0±300 ppm/°C)**

#### TZY2Z100

**Z100 (NP0±300 ppm/°C)**

#### TZY2R200

**R200 (N750±500 ppm/°C)**

#### TZY2Z2R5

**Z2R5 (NP0±300 ppm/°C)**

#### TZY2Z060

**Z060 (NP0±300 ppm/°C)**

#### TZY2R250

**R250 (N750±500 ppm/°C)**

#### TZY2K450

**K450 (N1000±500 ppm/°C)**

---

**Note**: Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
**Frequency Characteristics**

- **TZYZ2010**
  - Frequency (GHz)
  - Capacitance (pF)
  - Q

- **TZYZ2100**
  - Frequency (GHz)
  - Capacitance (pF)
  - Q

- **TZYZ2R200**
  - Frequency (MHz)
  - Capacitance (pF)
  - Q

- **TZYZ2K450**
  - Frequency (MHz)
  - Capacitance (pF)
  - Q

**Land Pattern**

- Dimensions: 4.0 x 2.4 x 1.2 in mm
- Tolerance: ±0.1

*Note* Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

*This catalog has only typical specifications. Therefore, please approve our product specifications before ordering.*
**Temperature Profile**

**Reflow Soldering Profile**

1. Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu)

![Temperature profile diagram]

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T3)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>150 to 180°C</td>
<td>2 times</td>
<td>245±3°C</td>
<td></td>
</tr>
<tr>
<td>Time (t1)</td>
<td>60 to 120sec.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp. (T2)</td>
<td>220°C</td>
<td>30 to 60sec.</td>
<td>220°C</td>
<td></td>
</tr>
<tr>
<td>Time (t2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limit Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T4)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>150 to 180°C</td>
<td>2 times</td>
<td>260±5°C</td>
<td></td>
</tr>
<tr>
<td>Time (t1)</td>
<td>60 to 120sec.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp. (T4)</td>
<td>230°C</td>
<td>30 to 50sec.</td>
<td>230°C</td>
<td></td>
</tr>
<tr>
<td>Time (t3)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Soldering profile for Eutectic solder (63Sn/37Pb) (Limit profile: refer to 1)

![Temperature profile diagram]

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T3)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>183°C</td>
<td></td>
</tr>
<tr>
<td>Time (t1)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Temp. (T2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (t2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak temperature (T3)</td>
<td>230°C</td>
<td>30sec.</td>
<td>1 time</td>
<td></td>
</tr>
</tbody>
</table>

**Soldering Iron**

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Temperature of soldering iron tip</th>
<th>Soldering time</th>
<th>Soldering iron power output</th>
<th>Cycle of soldering iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>350±10°C</td>
<td>3sec. max.</td>
<td>30W max.</td>
<td>1 time</td>
</tr>
</tbody>
</table>

**Notice (Storage and Operating Conditions)**

1. Do not use the trimmer capacitor under atmosphere of RTV silicone rubber (Room Temperature Vulcanizing Silicone Rubber) except Acetone liberating silicone sealant.
2. Before using trimmer capacitors, please store under the conditions of -10 to +40°C and 30 to 85%RH.
3. Do not store in or near corrosive gasses.
4. Use within 6 months of delivery.
5. Do not store under direct sunlight.
6. Do not use the trimmer capacitor under the conditions listed below.
   (1) Corrosive gasses atmosphere (ex. Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
   (2) In liquid (ex. water, oil, medical liquid, organic solvent, etc.)
   (3) Dusty / dirty atmosphere
   (4) Direct sunlight
   (5) Static voltage or electric/magnetic fields
   (6) Direct sea breeze
   (7) Other variations of the above
**Notice (Soldering and Mounting)**

1. **Soldering**
   (1) TZY2 series can be soldered by reflow soldering method and soldering iron. Do not use flow soldering method (dipping).
   (2) **Soldering conditions**
       Refer to the temperature profile.
       If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer capacitor may deviate from the specified characteristics.
   (3) The amount of solder is critical.
   (4) The thickness of solder paste should be printed from 120 micro m to 170 micro m and the dimension of land pattern should be Murata's standard land pattern used at reflow soldering.
       Insufficient amounts of solder can lead to insufficient soldering strength on PCB.
       Excessive amounts of solder may cause bridging between the terminals or contact failure due to flux wicking up.
   (5) When using soldering iron, the diameter of the string solder shall be less than 0.5mm. The string solder shall be applied to the lower part of the terminal only.
       Do not apply flux except to the terminals. Excessive amounts of solder and/or applying solder to the upper part of the terminal may cause fixed metal rotor or contact failure due to flux invasion into the movable part and/or the contact point.
       The soldering iron should not come in contact with the monolithic stator of the trimmer capacitor.
       If such contact does occur, the trimmer capacitor may be damaged.

2. **Mounting**
   (1) Do not apply excessive force (preferably 5.0 N [Ref: 500gf] max.), when the trimmer capacitor is mounted on the PCB.
   (2) Do not warp and/or bend PCB to protect trimmer capacitor from breakage.
   (3) Use a pick-up nozzle of a suitable dimension.
       (2.5mm external diameter and 1.2mm bore diameter.)

3. **Cleaning**
   This product cannot be cleaned because of open construction.

4. **Other**
   Note the polarity of the trimmer capacitor to minimize influence by stray capacitance.
   (Refer to the dimensions concerning the polarity.)

**Notice (Handling)**

1. Use suitable screwdrivers that fit comfortably in driver slot.
   (1) Recommended screwdriver for manual adjustment
       MURATA: KMDR060
   (2) Recommended screwdriver bit for automatic adjustment
       MURATA: KMBT060

2. When adjusting with a screwdriver, do not apply excessive force (preferably 1.0 N [Ref: 100gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.

3. Do not apply adhesive, lock paints, or any other substances to the trimmer capacitor to secure the rotor position. They may cause corrosion or electrical contact problems.

**Notice (Other)**

Before using trimmer capacitor, please test after assembly in your particular mass production system.

---

**Note**
- Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.
- This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

---

1. Use suitable screwdrivers that fit comfortably in driver slot.
   (1) Recommended screwdriver for manual adjustment
       MURATA: KMDR060
   (2) Recommended screwdriver bit for automatic adjustment
       MURATA: KMBT060

2. When adjusting with a screwdriver, do not apply excessive force (preferably 1.0 N [Ref: 100gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.

3. Do not apply adhesive, lock paints, or any other substances to the trimmer capacitor to secure the rotor position. They may cause corrosion or electrical contact problems.

---

**Notice (Handling)**

1. Use suitable screwdrivers that fit comfortably in driver slot.
   (1) Recommended screwdriver for manual adjustment
       MURATA: KMDR060
   (2) Recommended screwdriver bit for automatic adjustment
       MURATA: KMBT060

2. When adjusting with a screwdriver, do not apply excessive force (preferably 1.0 N [Ref: 100gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.

3. Do not apply adhesive, lock paints, or any other substances to the trimmer capacitor to secure the rotor position. They may cause corrosion or electrical contact problems.
Ceramic Trimmer Capacitors

TZC3 Series

Features
1. Small size with external dimension of 3.2(W)x4.5(L)x1.6(H)mm.
2. Color coded stator permits easy identification of capacitance and reduces mounting errors.
3. Can be adjusted with conventional adjustment tools having a thickness of 0.5mm.
4. Designed for automatic placement in surface mount applications.
5. Heat resistant resin withstands reflow soldering temperatures.

Applications
1. Compact radios
2. Headphones
3. Stylus pen
4. Portable radio equipment
5. Hybrid ICs
6. Cellular telephones
7. Cordless telephones
8. Remote keyless entry systems

<table>
<thead>
<tr>
<th>Part Number</th>
<th>C min. (max.) (pF)</th>
<th>C max. (pF)</th>
<th>TC</th>
<th>Q</th>
<th>Rated Voltage</th>
<th>Withstanding Voltage</th>
<th>Stator/Case Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZC3Z030A110</td>
<td>1.4</td>
<td>3.0</td>
<td>±50/-0%</td>
<td>300min. at 1MHz, Cmax.</td>
<td>100Vdc</td>
<td>220Vdc</td>
<td>Brown</td>
</tr>
<tr>
<td>TZC3Z060A110</td>
<td>2.0</td>
<td>6.0</td>
<td>±50/-0%</td>
<td>500min. at 1MHz, Cmax.</td>
<td>100Vdc</td>
<td>220Vdc</td>
<td>Blue</td>
</tr>
<tr>
<td>TZC3R100A110</td>
<td>3.0</td>
<td>10.0</td>
<td>±50/-0%</td>
<td>500min. at 1MHz, Cmax.</td>
<td>100Vdc</td>
<td>220Vdc</td>
<td>White</td>
</tr>
<tr>
<td>TZC3P200A110</td>
<td>5.0</td>
<td>20.0</td>
<td>±50/-0%</td>
<td>500min. at 1MHz, Cmax.</td>
<td>100Vdc</td>
<td>220Vdc</td>
<td>Red</td>
</tr>
<tr>
<td>TZC3P300A110</td>
<td>6.5</td>
<td>30.0</td>
<td>±50/-0%</td>
<td>500min. at 1MHz, Cmax.</td>
<td>100Vdc</td>
<td>220Vdc</td>
<td>Green</td>
</tr>
</tbody>
</table>

Insulation Resistance: 10000M ohm  Torque: 1.5 to 9.8mNm  Operating Temperature Range: -25 to +85°C

Construction
Temperature Characteristics

TZC3Z030

Z030 (N0±300 ppm/°C)

TZC3Z060

Z060 (N0±300 ppm/°C)

TZC3R100

R100 (N750±300 ppm/°C)

TZC3P200

P200 (N1200±500 ppm/°C)

TZC3P300

P300 (N1200±500 ppm/°C)

Note: Please read rating and CAUTION (for storage, operating, rating, soldering, mounting, and handling) in this catalog to prevent smoking and/or burning, etc.

* This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
## Frequency Characteristics

**TZC3Z030**

**TZC3Z060**

**TZC3R100**

**TZC3P200**

## Land Pattern

Tolerance: ±0.1 in mm
### Temperature Profile

#### Reflow Soldering Profile

1. **Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu)**

   ![Temperature Profile Diagram](image)

<table>
<thead>
<tr>
<th>Standard Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-heating</td>
</tr>
<tr>
<td>Temp. (T1)</td>
</tr>
<tr>
<td>150 to 180°C</td>
</tr>
</tbody>
</table>

2. **Soldering profile for Eutectic solder (63Sn/37Pb)**

   ![Temperature Profile Diagram](image)

<table>
<thead>
<tr>
<th>Limit Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-heating</td>
</tr>
<tr>
<td>Temp. (T1)</td>
</tr>
<tr>
<td>150°C</td>
</tr>
</tbody>
</table>

#### Soldering Iron

<table>
<thead>
<tr>
<th>Standard Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature of soldering iron tip</td>
</tr>
<tr>
<td>350±10°C</td>
</tr>
</tbody>
</table>

### Notice (Storage and Operating Conditions)

1. Do not use the trimmer capacitor under atmosphere of RTV silicone rubber (Room Temperature Vulcanizing Silicone Rubber) except Acetone liberating silicone sealant.
2. Before using trimmer capacitors, please store under the conditions of -10 to +40°C and 30 to 85%RH.
3. Do not store in or near corrosive gasses.
4. Use within 6 months of delivery.
5. Do not store under direct sunlight.
6. Do not use the trimmer capacitor under the conditions listed below.
   - (1) Corrosive gasses atmosphere (ex. Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
   - (2) In liquid (ex. water, oil, medical liquid, organic solvent, etc.)
   - (3) Dusty / dirty atmosphere
   - (4) Direct sunlight
   - (5) Static voltage or electric/magnetic fields
   - (6) Direct sea breeze
   - (7) Other variations of the above
Notice (Soldering and Mounting)

1. Soldering
   (1) TZC3 series can be soldered by reflow soldering method and soldering iron. Do not use flow soldering method (dipping).
   (2) Soldering conditions
       Refer to the temperature profile. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer capacitor may deviate from the specified characteristics.
   (3) The amount of solder is critical.
   (4) The thickness of solder paste should be printed from 150 micro m to 200 micro m and the dimension of land pattern should be Murata’s standard land pattern used at reflow soldering. Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause bridging between the terminals or contact failure due to flux wicking up.
   (5) When using soldering iron, the diameter of the string solder shall be less than 0.5mm. The string solder shall be applied to the lower part of the terminal only. Do not apply flux except to the terminals. Excessive amounts of solder and/or applying solder to the upper part of the terminal may cause fixed metal rotor or contact failure due to flux invasion into the movable part and/or the contact point. The soldering iron should not come in contact with the stator of the trimmer capacitor. If such contact does occur, the trimmer capacitor may be damaged.
   (6) Our recommended chlorine content of solder is as follows.
       (a) Solder paste: 0.2wt% max.
       (b) String solder: 0.5wt% max.
   (7) Do not use water-soluble flux (for water cleaning). To prevent the deterioration of trimmer capacitor characteristics, apply flux only to terminals.
   (8) When soldering the TZC3 series, the solder should not flow into the staking part of the substrate. If such flow does occur, driver slot rotation will be damaged.

2. Mounting
   (1) Do not apply excessive force (preferably 5.0 N [Ref: 500gf] max.), when the trimmer capacitor is mounted on the PCB.
   (2) Do not warp and/or bend PCB to protect trimmer capacitor from breakage.
   (3) Use a pick-up nozzle of a suitable dimension.
       (2.5mm external diameter and 1.5mm bore diameter.)

3. Cleaning
   This product cannot be cleaned because of open construction.

4. Other
   Note the polarity of the trimmer capacitor to minimize influence by stray capacitance.
   (Refer to the dimensions concerning the polarity.)

Notice (Handling)

1. Use suitable screwdrivers that fit comfortably in driver slot.
   (1) Recommended screwdriver for manual adjustment
       Standard type --> MURATA: KMDR010
   (2) Recommended screwdriver bit for automatic adjustment
       Standard type --> MURATA: KMBT010
   2. When adjusting with a screwdriver, do not apply excessive force (preferably 1.0 N [Ref: 100gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.

Notice (Other)

Before using trimmer capacitors, please test after assembly in your particular mass production system.
Ceramic Trimmer Capacitors

TZW4 Series

■ Features
1. To meet high power application due to withstanding voltage 550Vdc.
2. Extremely high self-resonant frequency.
   (More than 3GHz at rated C max.)
3. Typical application: Impedance matching for Cellular Base Station.
4. High Q value in more than VHF, UHF and Microwave bands.
   (More than 200 in 500MHz, C max.)
5. Available for pick and place machine. Possible thinner design due to 2.6mm low profile.
6. Non-electrical contact construction (rotor as middle electrode) provides high reliability.
7. Compact size: 4.2(W)x5.2(L)x2.6max.(H)mm.

■ Applications
1. Transmitting power amplifier for Cellular base station
2. Transmitting amplifier for PHS base station
3. High frequency electric circuit
4. High power radio transmission
5. Transponder amplifier for cable TV

<table>
<thead>
<tr>
<th>Part Number</th>
<th>C min. (max.) (pF)</th>
<th>C max. (pF)</th>
<th>TC</th>
<th>Q</th>
<th>Rated Voltage</th>
<th>Withstanding Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZW4Z010A001</td>
<td>0.4</td>
<td>1.0 ±50/-0%</td>
<td>NP0±150ppm/°C</td>
<td>200min. at 500MHz, Cmax.</td>
<td>250Vdc</td>
<td>550Vdc</td>
</tr>
<tr>
<td>TZW4Z1R5A001</td>
<td>0.4</td>
<td>1.5 ±100/-0%</td>
<td>NP0±150ppm/°C</td>
<td>200min. at 500MHz, Cmax.</td>
<td>250Vdc</td>
<td>550Vdc</td>
</tr>
</tbody>
</table>

Insulation Resistance: 10000M ohm Torque: 1.5 to 10.0mNm Operating Temperature Range: -55 to +125°C

■ Construction
### Temperature Characteristics

**TZW4Z010**

- Z010 (NP0 ±150 ppm/°C)

- Temp.(°C): -55 to 125
- Cap. Change (%): -12 to 12

**TZW4Z1R5**

- Z1R5 (NP0 ±300 ppm/°C)

- Temp.(°C): -55 to 125
- Cap. Change (%): -12 to 12

### Frequency Characteristics

**TZW4Z1R5**

- Frequency Characteristics

- Frequency (MHz): 500, 1000, 1500, 2000, 2500, 3000
- Q: 10, 100, 1000
- 1.5pF set

### Land Pattern

- Land Pattern

- Dimensions: 7.0, 4.4, 2.5 in mm

### Temperature Profile

#### Reflow Soldering Profile

1. Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu)

- Standard Profile
  - Pre-heating: Temp. (T1) 150 to 180°C, Time (t1) 60 to 120 sec.
  - Heating: Temp. (T2) 220°C, Time (t2) 30 to 60 sec.
  - Peak temperature (T3) 245 ±3°C, Time (t3) 220°C, Time (t4) 30 to 60 sec.
  - Cycle of reflow: 2 times

- Limit Profile
  - Pre-heating: Temp. (T1) 150 to 180°C, Time (t1) 60 to 120 sec.
  - Heating: Temp. (T4) 230°C, Time (t2) 30 to 50 sec.
  - Peak temperature (T5) 260 ±5°C, Time (t3) 230°C, Time (t4) 30 to 50 sec.
  - Cycle of reflow: 2 times

2. Soldering profile for Eutectic solder (63Sn/37Pb)

- Standard Profile
  - Pre-heating: Temp. (T1) 150°C, Time (t1) 60 to 120 sec.
  - Heating: Temp. (T2) 183°C, Time (t2) 30 sec.
  - Peak temperature (T3) 230 ±5°C, Time (t3) 230°C, Time (t4) 30 to 50 sec.
  - Cycle of reflow: 1 time

#### Soldering Iron

- Standard Profile

<table>
<thead>
<tr>
<th>Temperature of soldering iron tip</th>
<th>Soldering time</th>
<th>Soldering iron power output</th>
<th>Cycle of soldering iron</th>
</tr>
</thead>
<tbody>
<tr>
<td>350 ±10°C</td>
<td>3 sec. max.</td>
<td>30W max.</td>
<td>1 time</td>
</tr>
</tbody>
</table>
1. Do not use the trimmer capacitor under atmosphere of RTV silicone rubber (Room Temperature Vulcanizing Silicone Rubber) except Acetone liberating silicone sealant.

2. Before using trimmer capacitors, please store under the conditions of -10 to +40°C and 30 to 85%RH.

3. Do not store in or near corrosive gasses.

4. Use within 6 months of delivery.

5. Do not store under direct sunlight.

6. Do not use the trimmer capacitor under the conditions listed below.
   (1) Corrosive gasses atmosphere
       (Ex. Chlorine gas, Hydrogen sulfide gas,
        Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
   (2) In liquid (Ex. water, oil, medical liquid,
        organic solvent, etc.)
   (3) Dusty/dirty atmosphere
   (4) Direct sunlight
   (5) Static voltage or electric/magnetic fields
   (6) Direct sea breeze
   (7) Other variations of the above

---

**Notice (Soldering and Mounting)**

1. Soldering
   (1) TZW4 series can be soldered by reflow soldering method and soldering iron. Do not use flow soldering method (dipping).
   (2) Soldering conditions
       Refer to the temperature profile. If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer capacitor may deviate from the specified characteristics.
   (3) The amount of solder is critical.
   (4) The thickness of solder paste should be printed from 150 micro m to 200 micro m and the dimension of land pattern should be Murata's standard land pattern used at reflow soldering. Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause bridging between the terminals or contact failure due to flux wicking up.
   (5) When using soldering iron, the diameter of the string solder shall be less than 0.5mm. The string solder shall be applied to the lower part of the terminal only. Do not apply flux except to the terminals. Excessive amounts of solder and/or applying solder to the upper part of the terminal may cause fixed metal rotor or the contact failure due to flux invasion into the movable part and/or the contact point. The soldering iron should not come in contact with the monolithic stator of the trimmer capacitor. If such contact does occur, the trimmer capacitor may be damaged.
   (6) Our recommended chlorine content of solder is as follows.
       (a) Solder paste: 0.2wt% max.
       (b) String solder: 0.5wt% max.
   (7) Do not use water-soluble flux (for water cleaning). To prevent the deterioration of trimmer capacitor characteristics, apply flux only to terminals.

2. Mounting
   (1) Do not apply excessive force (preferably 5.0 N [Ref: 500gf] max.), when the trimmer capacitor is mounted on the PCB.
   (2) Do not warp and/or bend PCB to protect trimmer capacitor from breaking.
   (3) Use a pick-up nozzle of a suitable dimension.
       (4.0mm external diameter and 1.2mm bore diameter.)

---

**Notice (Handling)**

1. Use suitable screwdrivers that fit comfortably in driver slot.
   -Recommended screwdriver for manual adjustment VESSEL : No.9000 -1.3x30
     (Murata P/N is KMDSR130)
   2. When adjusting with a screwdriver, do not apply excessive force (preferably 1.0 N [Ref: 100gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.

---

**Notice (Other)**

Before using trimmer capacitors, please test after assembly in your particular mass production system.

---

Note: * Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.
   * This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
Ceramic Trimmer Capacitors
TZB4 Series

Features
1. Miniature rectangular shape: 4.0(W)x4.5(L)x3.0(H)mm.
2. Color coded case facilitates identification of capacitance range.
3. Designed for automatic placement in surface mount applications.
4. Designed to withstand flux baths and solder baths (with cover film type).
5. Can be temporarily attached to PCB with adhesives (Terminal style A and B).
6. Can be reflow and flow (with cover film type) soldering method.
7. Stable characteristics over a wide frequency range.
   (Resonant frequency: 1000MHz min. / 6pF)

Applications
1. Car audio systems
2. Cordless telephones
3. Hybrid ICs
4. Remote keyless entry systems
5. Tuner packs
6. Surveillance cameras
7. DVD
8. Burglarproof devices
9. Entry phone

<table>
<thead>
<tr>
<th>Part Number</th>
<th>C min. (max.) (pF)</th>
<th>C max. (pF)</th>
<th>TC</th>
<th>Q</th>
<th>Rated Voltage</th>
<th>Withstanding Voltage</th>
<th>Stator/Case Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZB4Z030</td>
<td>1.4</td>
<td>3.0</td>
<td>+50/-0%</td>
<td>NP0±200ppm/°C</td>
<td>300min. at 1MHz, Cmax 100Vdc</td>
<td>220Vdc</td>
<td>Brown</td>
</tr>
<tr>
<td>TZB4Z060</td>
<td>2.0</td>
<td>6.0</td>
<td>+50/-0%</td>
<td>NP0±200ppm/°C</td>
<td>500min. at 1MHz, Cmax. 100Vdc</td>
<td>220Vdc</td>
<td>Blue</td>
</tr>
<tr>
<td>TZB4Z100</td>
<td>3.0</td>
<td>10.0</td>
<td>+50/-0%</td>
<td>NP0±300ppm/°C</td>
<td>500min. at 1MHz, Cmax. 100Vdc</td>
<td>220Vdc</td>
<td>White</td>
</tr>
<tr>
<td>TZB4R200</td>
<td>4.5</td>
<td>20.0</td>
<td>+50/-0%</td>
<td>N750±400ppm/°C</td>
<td>500min. at 1MHz, Cmax 100Vdc</td>
<td>220Vdc</td>
<td>Red</td>
</tr>
<tr>
<td>TZB4P300</td>
<td>6.5</td>
<td>30.0</td>
<td>+50/-0%</td>
<td>N1200±500ppm/°C</td>
<td>300min. at 1MHz, Cmax 100Vdc</td>
<td>220Vdc</td>
<td>Green</td>
</tr>
<tr>
<td>TZB4P400</td>
<td>8.5</td>
<td>40.0</td>
<td>+50/-0%</td>
<td>N1200±500ppm/°C</td>
<td>300min. at 1MHz, Cmax 100Vdc</td>
<td>220Vdc</td>
<td>Yellow</td>
</tr>
<tr>
<td>TZB4Z500</td>
<td>10.0</td>
<td>50.0</td>
<td>+100/-0%</td>
<td>NP0±300ppm/°C</td>
<td>300min. at 1MHz, Cmax 50Vdc</td>
<td>110Vdc</td>
<td>Black+Marking</td>
</tr>
<tr>
<td>TZB4R500</td>
<td>10.0</td>
<td>50.0</td>
<td>+100/-0%</td>
<td>N750±300ppm/°C</td>
<td>300min. at 1MHz, Cmax 50Vdc</td>
<td>110Vdc</td>
<td>Black+Marking</td>
</tr>
</tbody>
</table>

Insulation Resistance: 10000M ohm   Torque: 1.5 to 9.8mNm   Operating Temperature Range: -25 to +85°C
First blank: Terminal Type   Second blank: Cover film codes (A: not provided, B: provided)
Ex. TZB4Z100A10: Terminal Type is A, and Cover film is provided.

Construction

---

Note: Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
### Land Pattern/Mounting Holes

**A Type**

![Diagram of A Type Land Pattern/Mounting Holes](image)

**B Type**

![Diagram of B Type Land Pattern/Mounting Holes](image)

### Temperature Characteristics

**TZB4Z030**

Z030 (NP0±200 ppm/°C)

![Graph of TZB4Z030 Temperature Characteristics](image)

**TZB4Z060**

Z060 (NP0±200 ppm/°C)

![Graph of TZB4Z060 Temperature Characteristics](image)

**TZB4Z100**

Z100 (NP0±300 ppm/°C)

![Graph of TZB4Z100 Temperature Characteristics](image)

**TZB4R200**

R200 (N750±400 ppm/°C)

![Graph of TZB4R200 Temperature Characteristics](image)

**TZB4P300**

P300 (N1200±500 ppm/°C)

![Graph of TZB4P300 Temperature Characteristics](image)

**TZB4P400**

P400 (N200±500 ppm/°C)

![Graph of TZB4P400 Temperature Characteristics](image)

---

*Note* Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

*This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.*

Continued on the following page.
### Temperature Characteristics

**TZB4Z250**

- **Z250** (N0±300 ppm/°C)

**TZB4R500**

- **R500** (N750±300 ppm/°C)

### Frequency Characteristics

**TZB4Z060**

- **Z060**

**TZB4Z100**

- **Z100**

**TZB4R200**

- **R200**

**TZB4R500**

- **R500**

---

**Note**: Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

*This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.*
## Temperature Profile
### Flow Soldering Profile
Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu), Eutectic solder (63Sn/37Pb)

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T3)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T2)</td>
<td>Time (t2)</td>
<td></td>
</tr>
<tr>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>250°C</td>
<td>5sec. max.</td>
<td>1 time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T3)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T3)</td>
<td>Time (t2)</td>
<td></td>
</tr>
<tr>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>265±3°C</td>
<td>5sec. max.</td>
<td>2 times</td>
</tr>
</tbody>
</table>

- Immerse the body in solder bath, available for cover film type.

### Reflow Soldering Profile
1. Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu)

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T3)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T2)</td>
<td>Time (t2)</td>
<td></td>
</tr>
<tr>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>220°C</td>
<td>60 to 60sec.</td>
<td>245±3°C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Pre-heating</th>
<th>Heating</th>
<th>Peak temperature (T3)</th>
<th>Cycle of reflow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp. (T1)</td>
<td>Time (t1)</td>
<td>Temp. (T4)</td>
<td>Time (t3)</td>
<td></td>
</tr>
<tr>
<td>150°C</td>
<td>60 to 120sec.</td>
<td>230°C</td>
<td>30 to 50sec.</td>
<td>260 ±5/-0°C</td>
</tr>
</tbody>
</table>

- Available for terminal shape A, B, and E.

### Soldering Iron

<table>
<thead>
<tr>
<th>Standard Profile</th>
<th>Temperature of soldering iron tip</th>
<th>Soldering time</th>
<th>Soldering iron power output</th>
<th>Cycle of soldering iron</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>350±10°C</td>
<td>3sec. max.</td>
<td>30W max.</td>
<td>1 time</td>
</tr>
</tbody>
</table>

### Notice (Storage and Operating Conditions)
1. Do not use the trimmer capacitor under atmosphere of RTV silicone rubber (Room Temperature Vulcanizing Silicone Rubber) except Acetone liberating silicone sealant.
2. Before using trimmer capacitors, please store under the conditions of -10 to +40°C and 30 to 85%RH.
3. Do not store in or near corrosive gasses.
4. Use within 6 months of delivery.
5. Do not store under direct sunlight.

- Do not use the trimmer capacitor under the conditions listed below.
  1. Corrosive gasses atmosphere (ex. Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
  2. In liquid (ex. water, oil, medical liquid, organic solvent, etc.)
  3. Dusty / dirty atmosphere
  4. Direct sunlight
  5. Static voltage or electric/magnetic fields
  6. Direct sea breeze
  7. Other variations of the above

---

*Note: Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.
* This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
**Notice (Soldering and Mounting)**

1. **Soldering**
   (1) Can be soldered by reflow soldering method, flow soldering method, and soldering iron.
   (2) **Soldering conditions**
       Refer to the temperature profile.
       If the soldering conditions are not suitable, e.g., excessive time and/or excessive temperature, the trimmer capacitor may deviate from the specified characteristics.
   (3) The amount of solder is critical.
   (4) The thickness of solder paste should be printed from 150 micro m to 200 micro m and the dimension of land pattern should be Murata's standard land pattern used at reflow soldering. Insufficient amounts of solder can lead to insufficient soldering strength on PCB. Excessive amounts of solder may cause bridging between the terminals or contact failure due to flux wicking up.
   (5) When using soldering iron, the string solder shall be applied to the lower part of the terminal only. Do not apply flux except to the terminals. Excessive amounts of solder and/or applying solder to the upper part of the terminal may cause fixed rotor or contact failure due to flux invasion into the movable part and/or the contact point. The soldering iron should not come in contact with the plastic case of the trimmer capacitor. If such contact does occur, the trimmer capacitor may be damaged.
   (6) Our recommended chlorine content of solder is as follows.
       (a) Solder paste: 0.2wt% max.
       (b) String solder: 0.5wt% max.
   (7) Do not use water-soluble flux (for water cleaning). To prevent the deterioration of trimmer capacitor characteristics, apply flux only to terminals.

2. **Mounting**
   (1) Do not apply excessive force (preferably 5.0N [Ref: 500gf] max.), when the trimmer capacitor is mounted on the PCB.
   (2) Do not warp and/or bend PCB to protect trimmer capacitor from breakage.
   (3) When bending the terminals, do not apply excessive force to the body of the product to protect the terminal fixing part from damage.
   (4) Use a pick-up nozzle of a suitable dimension.
       > Without cover film type
           - External dimensions of 4.5x4.0mm and 2.5mm bore diameter.
       > With cover film type
           - 4.0mm external diameter and 2.0mm bore diameter.

3. **Cleaning [with cover film type]**
   Isopropyl alcohol and ethyl alcohol are available material for cleaning. If you use any other type of solvent, please evaluate performance in your application. Moreover, please confirm that no damage has occurred to the trimmer capacitor after cleaning in your conditions.

4. **Other**
   Note the polarity of the trimmer capacitor to minimize influence by stray capacitance.
   (Refer to the dimensions concerning the polarity.)

**Notice (Handling)**

1. Use suitable screwdrivers that fit comfortably in driver slot.
   (1) **Recommended screwdriver for manual adjustment**
       MURATA: KMDR010
   (2) **Recommended screwdriver bit for automatic adjustment**
       MURATA: KMBT010
   2. When adjusting with a screwdriver, do not apply excessive force (preferably 1.0 N [Ref: 100gf] max.) to minimize capacitance drift. Excessive force applied to the screwdriver slot may cause deformation of the products.
   3. Do not apply adhesive, lock paints, or any other substances to the trimmer capacitor to secure the rotor position. They may cause corrosion or electrical contact problems.
   4. Do not break the cover film before the completion of PCB mounting, soldering, and cleaning.
   5. Do not clean the trimmer capacitor after the cover film has been broken.
   6. To break the cover film, first turn the screwdriver more than 360°, and set the capacitance value. (Inserting the screwdriver only will not break the cover film.)

**Notice (Other)**

Before using trimmer capacitors, please test after assembly in your particular mass production system.
Packaging

## Minimum Quantity

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Minimum Quantity (pcs.)</th>
<th>ø180mm Reel</th>
<th>ø330mm Reel</th>
<th>Bulk</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZR1</td>
<td>3000</td>
<td>-</td>
<td>-</td>
<td>500</td>
</tr>
<tr>
<td>TZY2</td>
<td>2000</td>
<td>-</td>
<td>-</td>
<td>500</td>
</tr>
<tr>
<td>TZC3</td>
<td>1000</td>
<td>-</td>
<td>-</td>
<td>500</td>
</tr>
<tr>
<td>TZW4</td>
<td>500</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>TZB4</td>
<td>500</td>
<td>2500</td>
<td>-</td>
<td>100</td>
</tr>
</tbody>
</table>

## Tape Dimensions

### TZR1 Series

![Tape Dimensions Diagram]

- **Tolerance:** ±0.1 in mm

### TZY2 Series

![Tape Dimensions Diagram]

- **Tolerance:** ±0.1 in mm

### TZC3 Series

![Tape Dimensions Diagram]

- **Tolerance:** ±0.1 in mm

### TZW4 Series

![Tape Dimensions Diagram]

- **Tolerance:** ±0.1 in mm

### TZB4 Series

![Tape Dimensions Diagram]

- **Tolerance:** ±0.1 in mm

---

*Note* Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

*This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.*

Continued on the following page.
Continued from the preceding page.

Reel Dimensions (180mm diameter)

**TZR1/TZY2 Series**

![Diagram](image1)

- 13.0±0.5 dia.
- 21.0±0.8 dia.
- 2.0±0.5
- 178±2 dia.
- 9.0±1.0 50 min.
- 17.0±1.0

**TZC3/TZW4/TZB4 Series**

![Diagram](image2)

- 13.0±0.5 dia.
- 21.0±0.8 dia.
- 2.0±0.5
- 178±2 dia.
- 9.0±1.0 50 min.
- 17.0±1.0

Reel Dimensions (330mm diameter)

**TZB4 Series**

![Diagram](image3)

- 13.0±0.5 dia.
- 21.0±0.8 dia.
- 2.0±0.5
- 328±2 dia.
- 13.5±1.0 50 min.
- 17.5±1.0

---

**Note:** Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
Recommended Adjustment Tools

Please use the following recommended screwdrivers. You can order these drivers using the part numbers below. Although you can also adjust the capacitance value using commercial products, please use one with the same head size as the driver listed below.

### For Manual Adjustment

<table>
<thead>
<tr>
<th>Series</th>
<th>MURATA Model Number</th>
<th>Manufacturer’s Model Number</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZR1</td>
<td>KMDR160</td>
<td>MURATA MFG. KMDR160</td>
<td>![Shape](in mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit shape: Minus (0.3x0.13)</td>
</tr>
<tr>
<td>TZY2</td>
<td>KMDR060</td>
<td>ENGINEER INC. DA-89</td>
<td>![Shape](in mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit shape: Minus (0.8x0.35)</td>
</tr>
<tr>
<td>TZC3</td>
<td>KMDR010</td>
<td>MURATA MFG. KMDR010</td>
<td>![Shape](in mm)</td>
</tr>
<tr>
<td>TZB4</td>
<td></td>
<td></td>
<td>Bit shape: Minus (2.2x0.4)</td>
</tr>
<tr>
<td>TZW4</td>
<td>KMDR130</td>
<td>VESSEL MFG. NO.9000 -1.3 X30</td>
<td>![Shape](in mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit shape: Minus (1.3x30)</td>
</tr>
</tbody>
</table>

### For Automatic Adjustment

<table>
<thead>
<tr>
<th>Series</th>
<th>MURATA Model Number</th>
<th>Manufacturer’s Model Number</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>TZY2</td>
<td>KMBT060</td>
<td>MURATA MFG. KMBT060</td>
<td>![Shape](in mm)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bit shape: Minus (0.56x0.25)</td>
</tr>
<tr>
<td>TZC3</td>
<td>KMBT010</td>
<td>MURATA MFG. KMBT010</td>
<td>![Shape](in mm)</td>
</tr>
<tr>
<td>TZB4</td>
<td></td>
<td></td>
<td>Bit shape: Minus (2.2x0.4)</td>
</tr>
</tbody>
</table>

---

**Note** Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.
The products listed herein have been produced by a ISO9001 certified factory.

* No ODCs (Ozone Depleting Chemicals) are used on any Murata trimmer capacitors.
Export Control

For customers outside Japan:

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribute to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

For customers in Japan:

For products which are controlled items subject to the “Foreign Exchange and Foreign Trade Law” of Japan, the export license specified by the law is required for export.

Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party’s life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

1. Aircraft equipment
2. Aerospace equipment
3. Undersea equipment
4. Power plant equipment
5. Medical equipment
6. Transportation equipment (vehicles, trains, ships, etc.)
7. Traffic signal equipment
8. Disaster prevention / crime prevention equipment
9. Data-processing equipment
10. Application of similar complexity and/or reliability requirements to the applications listed above

Product specifications in this catalog are as of May 2014. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

Please read rating and CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party’s intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.