

Ceramic Trimmer Capacitors



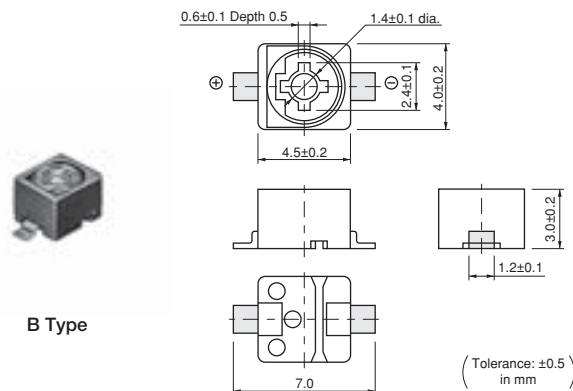
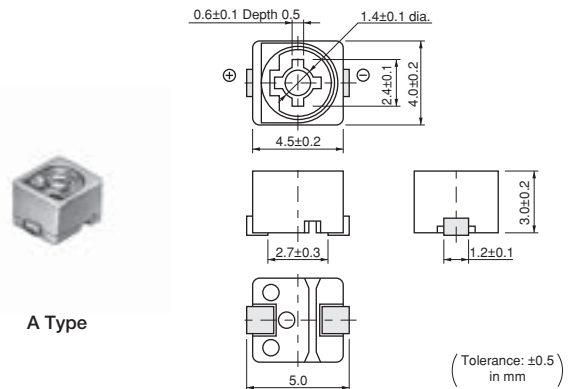
TZB4 Series

■ 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

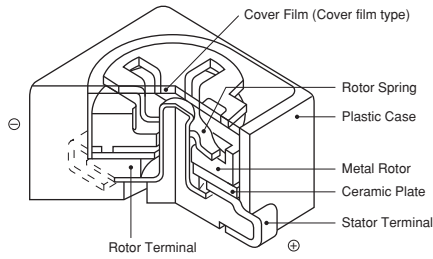
1. Car audio systems
2. Cordless telephones
3. Hybrid ICs
4. Pagers
5. Remote keyless entry systems
6. Tuner packs
7. Surveillance cameras
8. DVD
9. Burglarproof devices



Part Number	C min. (max.) (pF)	C max. (pF)	TC	Q	Rated Voltage	Withstanding Voltage	Stator/Case Color
TZB4Z030□□10	1.4	3.0 +50/-0%	NP0±200ppm/°C	300min. at 1MHz, Cmax	100Vdc	220Vdc	Brown
TZB4Z060□□10	2.0	6.0 +50/-0%	NP0±200ppm/°C	500min. at 1MHz, Cmax.	100Vdc	220Vdc	Blue
TZB4Z100□□10	3.0	10.0 +50/-0%	NP0±300ppm/°C	500min. at 1MHz, Cmax.	100Vdc	220Vdc	White
TZB4R200□□10	4.5	20.0 +50/-0%	N750±400ppm/°C	500min. at 1MHz, Cmax	100Vdc	220Vdc	Red
TZB4P300□□10	6.5	30.0 +50/-0%	N1200±500ppm/°C	300min. at 1MHz, Cmax	100Vdc	220Vdc	Green
TZB4P400□□10	8.5	40.0 +50/-0%	N1200±500ppm/°C	300min. at 1MHz, Cmax	100Vdc	220Vdc	Yellow
TZB4Z250□□10	4.0	25.0 +100/-0%	NP0±300ppm/°C	300min. at 1MHz, Cmax.	50Vdc	110Vdc	Black+Marking
TZB4R500□□10	7.0	50.0 +100/-0%	N750±300ppm/°C	300min. at 1MHz, Cmax	50Vdc	110Vdc	Black+Marking

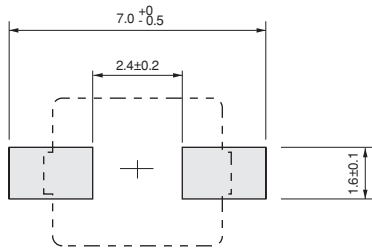
Insulation Resistance: 10000M ohm Torque: 1.5 to 9.8mNm Operating Temperature Range: -25 to +85°C
 First blank: Terminal Type Second blank: Cover film codes (A: not provided, B: provided)
 ex. TZB4Z100A□10: Terminal Type is A, and Cover film is provided.

Construction



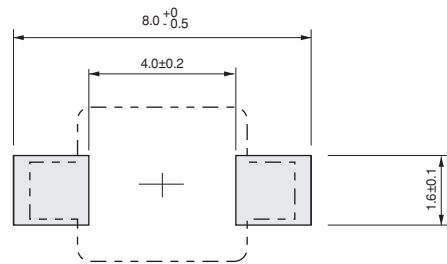
Land Pattern/Mounting Holes

A Type



(in mm)

B Type

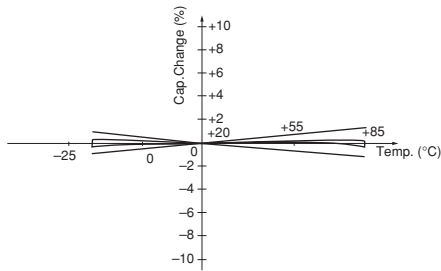


(in mm)

Temperature Characteristics

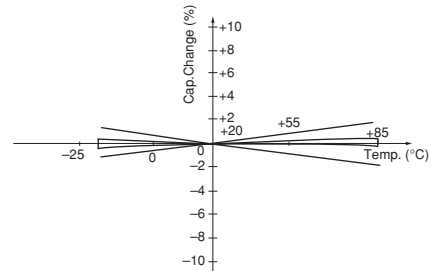
TZB4Z060

Z060 (NP0±200ppm/°C)



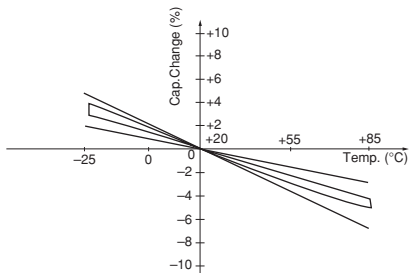
TZB4Z100

Z100 (NP0±300ppm/°C)



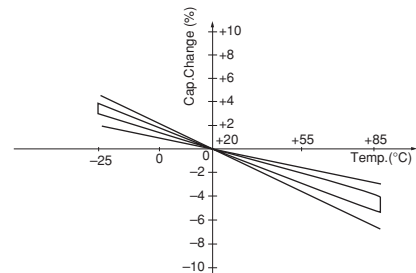
TZB4R200

R200 (N750±400ppm/°C)



TZB4R500

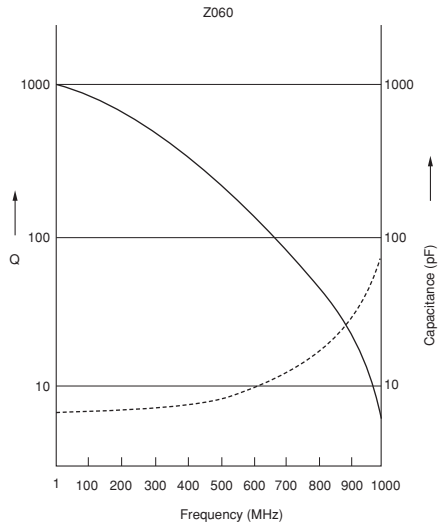
R500 (N750±300ppm/°C)



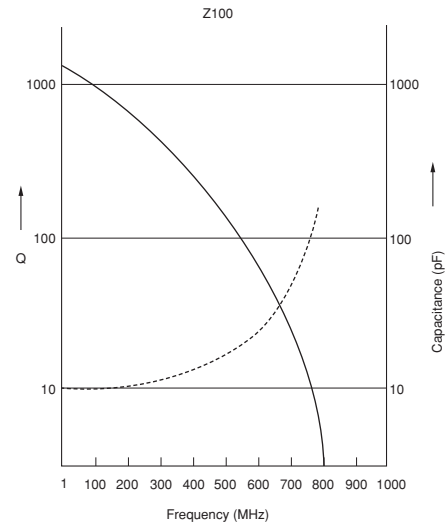
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■ Frequency Characteristics

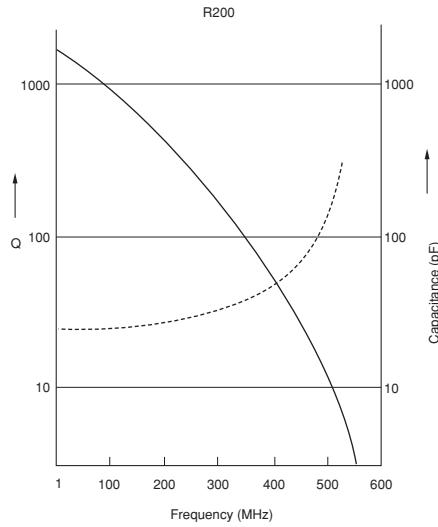
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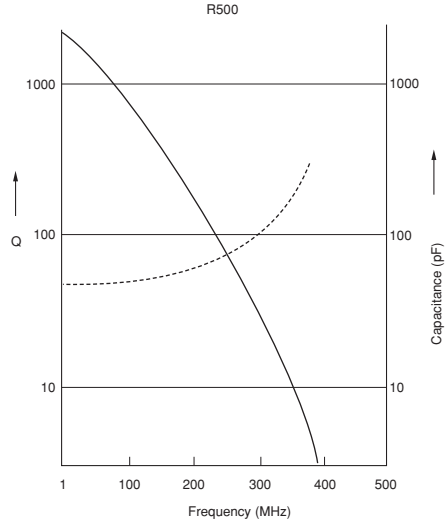
TZB4Z100



TZB4R200



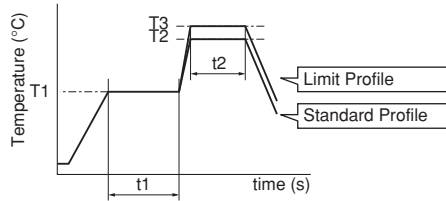
TZB4R500



Temperature Profile

Flow Soldering Profile

Soldering profile for Lead-free solder (96.5Sn/3Ag/0.5Cu), Eutectic solder (63Sn/37Pb)



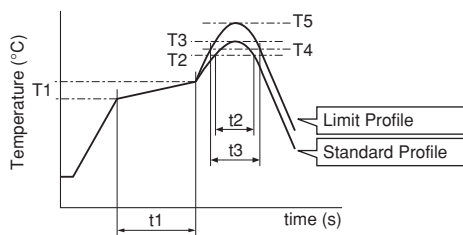
• Immerse the body in solder bath, available for cover film type.

Standard Profile				
Pre-heating		Heating		Cycle of reflow
Temp. (T1)	Time (t1)	Temp. (T2)	Time (t2)	
150°C	60 to 120sec.	250°C	5sec. max.	1 time

Limit Profile				
Pre-heating		Heating		Cycle of reflow
Temp. (T1)	Time (t1)	Temp. (T3)	Time (t2)	
150°C	60 to 120sec.	265±3°C	5sec. max.	2 times

Reflow Soldering Profile

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



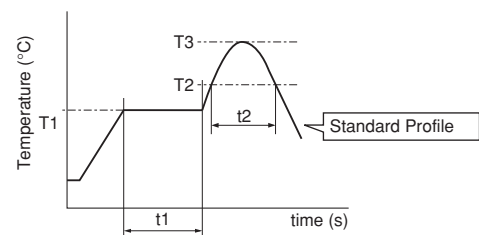
Standard Profile					
Pre-heating		Heating		Peak temperature (T3)	Cycle of reflow
Temp. (T1)	Time (t1)	Temp. (T2)	Time (t2)		
150 to 180°C	60 to 120sec.	220°C	30 to 60sec.	245±3°C	2 times

Limit Profile					
Pre-heating		Heating		Peak temperature (T5)	Cycle of reflow
Temp. (T1)	Time (t1)	Temp. (T4)	Time (t3)		
150 to 180°C	60 to 120sec.	230°C	30 to 50sec.	260 +5/-0°C	2 times

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

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

(Limit profile: refer to ①)



Standard Profile					
Pre-heating		Heating		Peak temperature (T3)	Cycle of reflow
Temp. (T1)	Time (t1)	Temp. (T2)	Time (t2)		
150°C	60 to 120sec.	183°C	30sec.	230 +5/-0°C	1 time

Soldering Iron

Standard Profile			
Temperature of soldering iron tip	Soldering time	Soldering iron power output	Cycle of soldering iron
350±10°C	3sec. max.	30W max.	1 time

Notice (Storage and Operating Conditions)

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

■ 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.

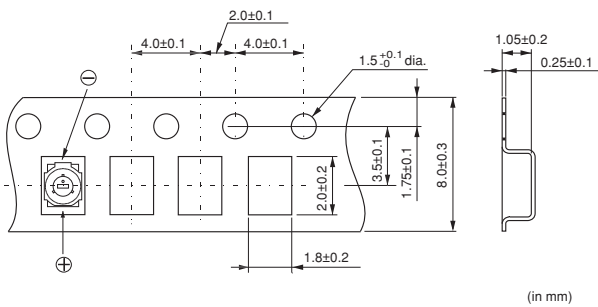
Packaging

Minimum Quantity

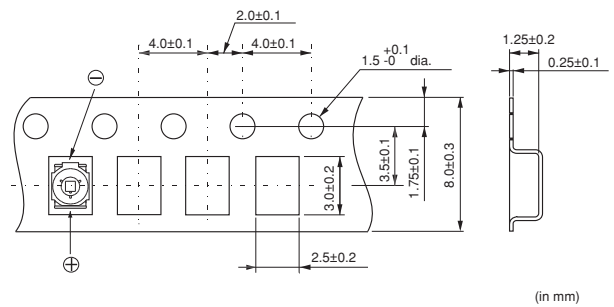
Part Number	Minimum Quantity (pcs.)		
	ø180mm Reel	ø330mm Reel	Bulk
TZR1	3000	-	500
TZS2	3000	-	500
TZY2	2000	-	500
TZV2	2000	-	500
TZC3	1000	-	500
TZW4	500	-	100
TZB4	500	2500	500

Tape Dimensions

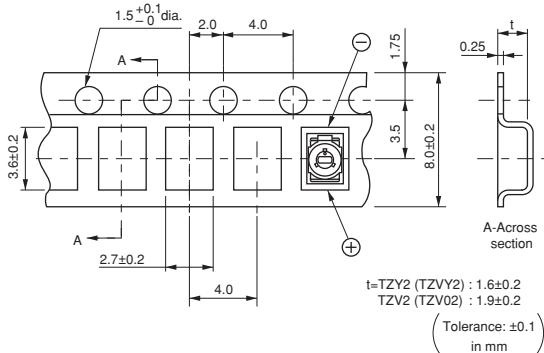
TZR1 Series



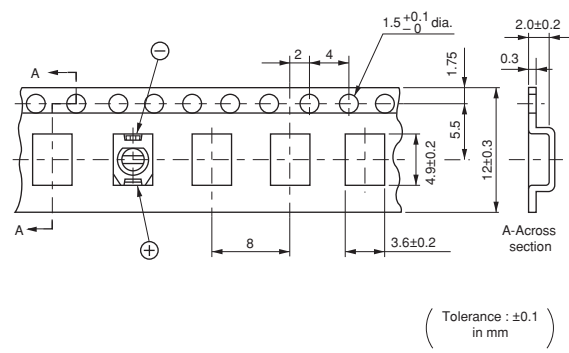
TZS2 Series



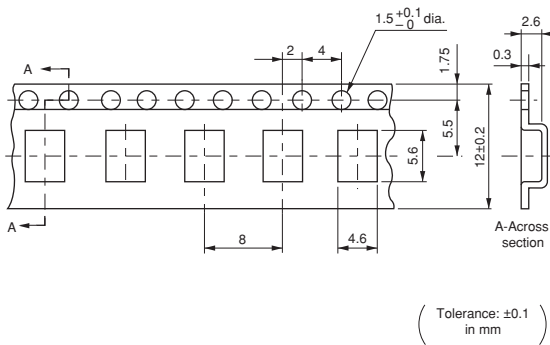
TZY2/TZV2 Series



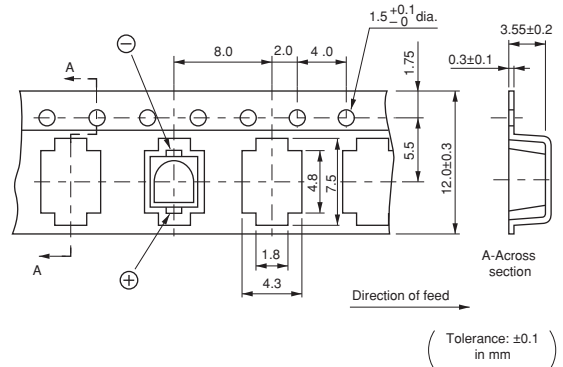
TZC3 Series



TZW4 Series



TZB4 Series



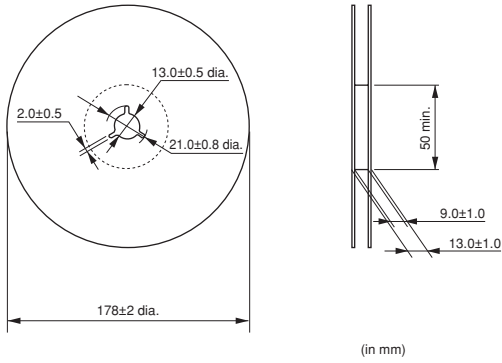
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Packaging

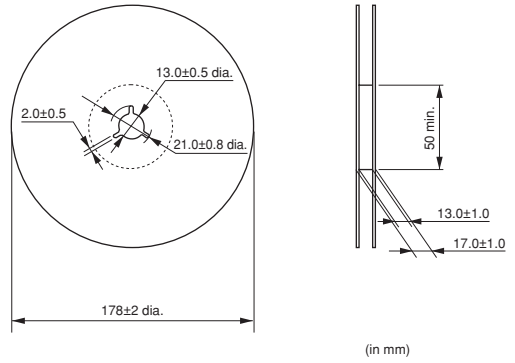
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■ Reel Dimensions (180mm diameter)

TZR1/TZS2/TZY2/TZV2 Series

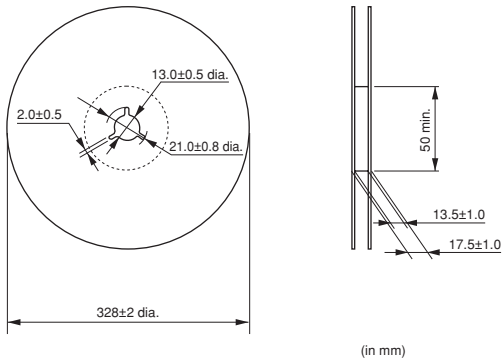


TZC3/TZW4/TZB4 Series



■ Reel Dimensions (330mm diameter)

TZB4 Series



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

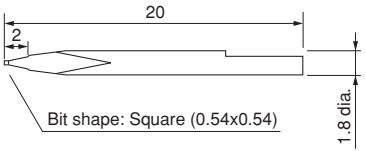
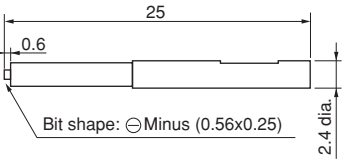

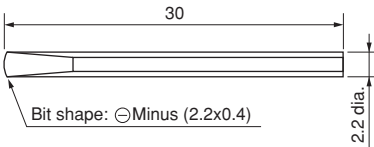
Series	MURATA Model Number	Manufacturer's Model Number	Shape
TZR1	KMDR160	MURATA MFG. KMDR160	<p>80 1.5 Bit shape: ⊖ Minus (0.3x0.13)</p> <p>(in mm)</p>
TZS2	KMDR050	MURATA MFG. KMDR050	<p>80 1.5 Bit shape: Square (0.54x0.54)</p> <p>(in mm)</p>
TZY2	KMDR060	ENGINEER INC. DA-89	<p>108 18 Bit shape: ⊖ Minus (0.8x0.35)</p> <p>(in mm)</p>
TZV2	KMDR020	VESSEL MFG. NO.9000 -0.9×30	<p>125 15 Bit shape: ⊖ Minus (0.9x0.4)</p> <p>(in mm)</p>
TZC3 TZB4	KMDR010	MURATA MFG. KMDR010	<p>122 20 50 Bit shape: ⊖ Minus (2.2x0.4)</p> <p>(in mm)</p>
TZW4	KMDR130	VESSEL MFG. NO.9000 -1.3×30	<p>125 15 Bit shape: ⊖ Minus (1.3x30)</p> <p>(in mm)</p>

Continued on the following page.

Recommended Adjustment Tools

☐ Continued from the preceding page.

■ For Automatic Adjustment

Series	MURATA Model Number	Manufacturer's Model Number	Shape
TZS2	KMBT050	MURATA MFG. KMBT050	 <p style="text-align: right;">(in mm)</p>
TZY2	KMBT060	MURATA MFG. KMBT060	 <p style="text-align: right;">(in mm)</p>
TZV2	KMBT020	MURATA MFG. KMBT020	 <p style="text-align: right;">(in mm)</p>
TZC3 TZB4	KMBT010	MURATA MFG. KMBT010	 <p style="text-align: right;">(in mm)</p>

Qualified Standards

The products listed herein have been produced
by a ISO9001 certified factory

MURATA FACTORY

Sabae Murata Mfg. Co., Ltd.

* No ODCs (Ozone Depleting Chemicals) are used on
any Murata trimmer potentiometers.

⚠Note:

1. 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 contribution 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.

2. 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 |

3. Product specifications in this catalog are as of September 2013. 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.

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

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

6. 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.

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