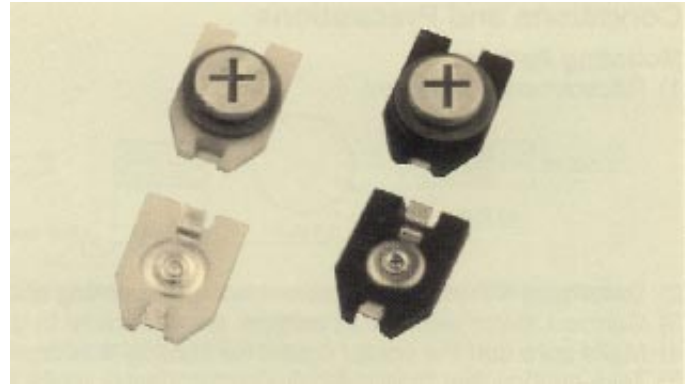


## CTZ3 Series

### Four Basic Types:

- CTZ3-P — [ CTZ3S-P  
CTZ3E-P ] — Philips Adjust.
- CTZ3-A — [ CTZ3S-A  
CTZ3E-A ] — Setting drift 1%  
w/ Philips Adjust.
- CTZ3-1.5 — [ CTZ3S-P1.5  
CTZ3E-P1.5 ] — Low profile  
w/ Philips Adjust.
- CTZ3-PR — [ CTZ3S-PR  
CTZ3E-PR ] — Reverse ultra thin  
w/ Philips Adjust.



### How To Order:

**CTZ3 E - 03 A - W 1 - P F**

#### Optional:

- Blank = Straight Lead
- F = Lead Form

#### Optional:

- A = Setting drift ±1% (Philips adjust)
- P = Philips adjust
- P1.5 = Product height 1.5mm max. (Philips adjust)
- PR = Reverse type (Bottom adjust)

#### Quantity Per Reel

- 1 = 1000 pcs
- 5 = 5000 pcs

#### Packaging Method

- B = Bulk
- W = Taping (W direction)
- X = Taping (X direction option)

#### Temperature Characteristic

- A = NPO ± 500 ppm/°C
- B = N400 ± 500 ppm/°C
- C = N750 ± 500 ppm/°C

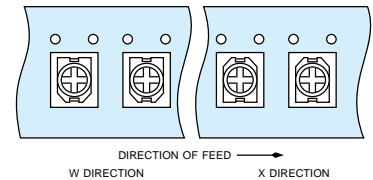
#### Maximum Capacitance

- 03 = 3pF, +100, -0%
- 05 = 5pF, +100, -0%
- 10 = 10pF, +100, -0%
- 20 = 20pF, +100, -0%
- 30 = 30pF, +100, -0%
- 40 = 40pF, +100, -0%
- 50 = 50pF, +100, -0%

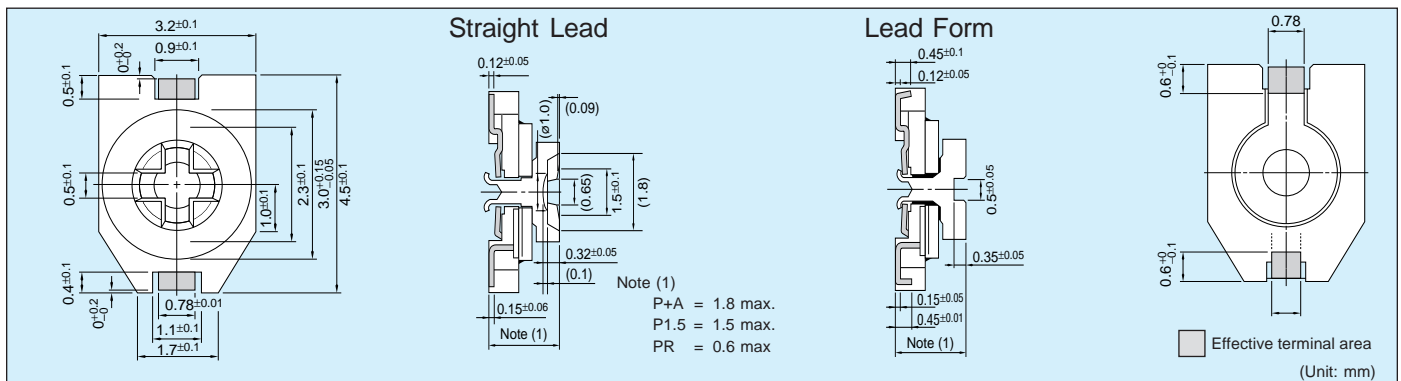
#### Type

- S = Reflow non-washable type
- E = Reflow washable type

#### CTZ3 Series



### Philips Adjustment Dimensions



## CTZ3 Series

### Specifications

#### Type CTZ3-A (max. height=1.8mm, 1% setting drift)

Part number	Min. cap. value (pF)	Max. cap. value (pF)	TC (ppm/°C)
CTZ3□-03A	1.5	3	NP0±500
CTZ3□-05A	2	5	NP0±500
CTZ3□-05C	3	5	N750±500
CTZ3□-10A	4	10	NP0±500
CTZ3□-10B	2	10	N400±500
CTZ3□-10C	3	10	N750±500
CTZ3□-20C	7.5	20	N750±500
CTZ3□-30C	7.5	30	N750±500
CTZ3□-40C	7.5	40	N750±500
CTZ3□-50C	12.5	50	N750±500

#### Type CTZ3-P (max. height=1.8mm)

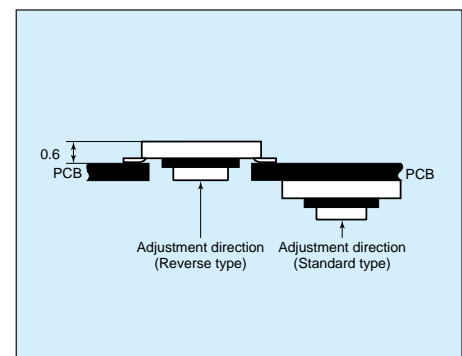
Part number	Min. cap. value (pF)	Max. cap. value (pF)	TC (ppm/°C)
CTZ3□-03A	1	3	NP0±500
CTZ3□-05A	1.5	5	NP0±500
CTZ3□-05C	2	5	N750±500
CTZ3□-10A	2.5	10	NP0±500
CTZ3□-10B	1.5	10	N400±500
CTZ3□-10C	3	10	N750±500
CTZ3□-20C	5	20	N750±500
CTZ3□-30C	5	30	N750±500
CTZ3□-40C	5	40	N750±500
CTZ3□-50C	7	50	N750±500

#### Type CTZ3-P1.5 (max. height=1.5mm)

Part number	Min. cap. value (pF)	Max. cap. value (pF)	TC (ppm/°C)
CTZ3□-03A	1	3	NP0±500
CTZ3□-05A	1.5	5	NP0±500
CTZ3□-05C	2	5	N750±500
CTZ3□-10A	2.5	10	NP0±500
CTZ3□-10B	1.5	10	N400±500
CTZ3□-10C	3	10	N750±500
CTZ3□-20C	5	20	N750±500
CTZ3□-30C	5	30	N750±500
CTZ3□-40C	5	40	N750±500
CTZ3□-50C	7	50	N750±500

#### Type CTZ3-PR (max. height=0.6mm, reverse type)

Part number	Min. cap. value (pF)	Max. cap. value (pF)	TC (ppm/°C)
CTZ3□-03A	1	3	NP0±500
CTZ3□-05A	1.5	5	NP0±500
CTZ3□-05C	2	5	N750±500
CTZ3□-10A	2.5	10	NP0±500
CTZ3□-10B	1.5	10	N400±500
CTZ3□-10C	3	10	N750±500
CTZ3□-20C	5	20	N750±500
CTZ3□-30C	5	30	N750±500
CTZ3□-40C	5	40	N750±500
CTZ3□-50C	7	50	N750±500

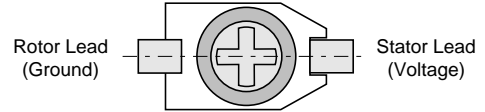
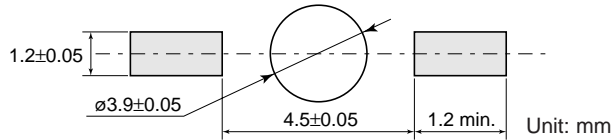


## CTZ3-PR Series

### Conditions and Precautions

#### Mounting Pattern:

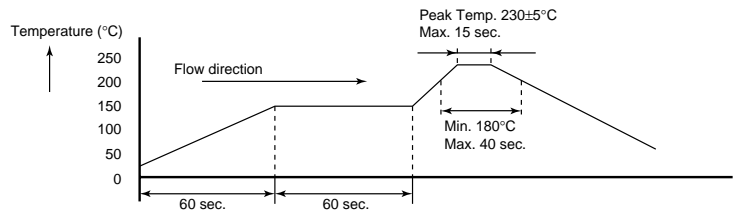
1) Recommended pattern:



- Determine if there is adequate room for mounting according to pattern dimensions and set pattern dimensions.
- Connect stator terminal to voltage, rotor terminal to ground.
- Make sure that the solder cream for coating is sufficient. (We recommend  $150\mu\text{m}$ .)
- Take caution that the solder flux and adhesive paste does not flow in between rotor and stator.

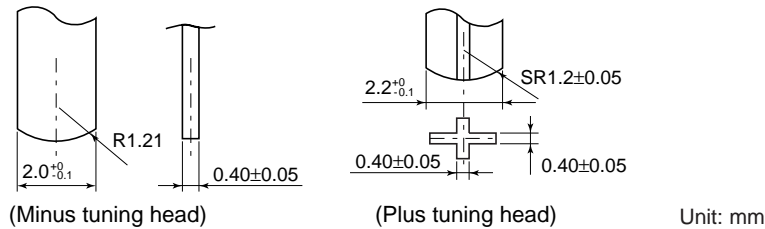
#### Soldering:

- Recommended reflow temperature curve.
- Recommended hand soldering conditions: tip temperature  $270 \pm 5^\circ$ , soldering time less than 5 seconds.



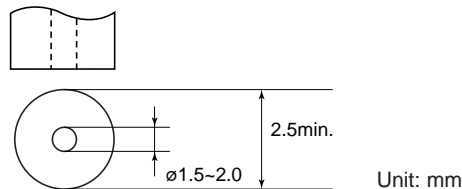
#### Adjustment:

- After removing from reflow, let cool to room temperature (at least 4 hrs.) before adjustment.
- Maximum pressure of screwdriver should be less than 100g.
- Recommended screwdriver head dimensions:

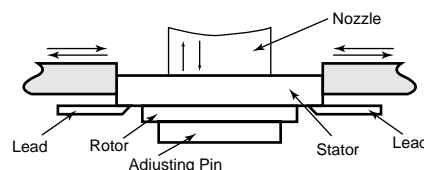


#### Mounting:

1) Recommended adhesive nozzle procedure:



2) Mechanical centering method: when mounting automatically with mechanical centering method, adjust so that the centering hook touches the stator (take caution that centering hook does not touch lead).

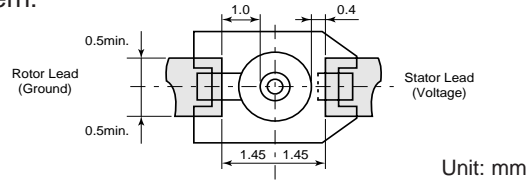


## CTZ3-P/A/P1.5 Series

### Conditions and Precautions

#### Mounting Pattern:

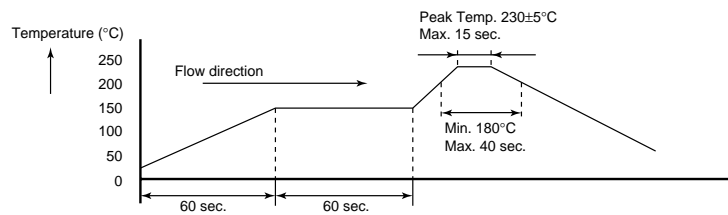
1) Recommended pattern:



- 2) Determine if there is adequate room for mounting according to pattern dimensions and set pattern dimensions.
- 3) Connect stator terminal to voltage, rotor terminal to ground.
- 4) Make sure that the solder cream for coating is sufficient. (We recommend 150 $\mu$ m.)
- 5) Take caution that the solder flux and adhesive paste does not flow in between rotor and stator.

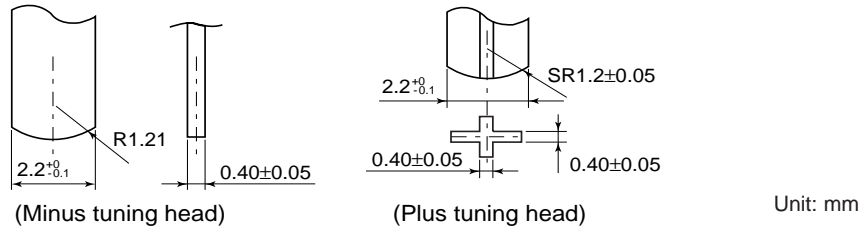
#### Soldering:

- 1) Recommended reflow temperature curve:
- 2) Recommended hand soldering conditions: tip temperature 270 $\pm$ 5 $^{\circ}$ , soldering time less than 5 seconds.



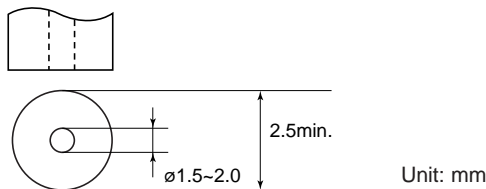
#### Adjustment:

- 1) After removing from reflow, let cool to room temperature (at least 4 hrs.) before adjustment.
- 2) Maximum pressure of screwdriver should be less than 100g.
- 3) Recommended screwdriver head dimensions:



#### Mounting:

1) Recommended adhesive nozzle procedure:



2) Mechanical centering method: when mounting automatically with mechanical centering method, adjust so that the centering hook touches the stator (take caution that centering hook does not touch lead).

## CTZ2/CTZ3 Series

### Test Methods

Item	Specification	Measuring Condition
Humidity Test	$\Delta C$ : $\pm 10\%$ Max Q : 150 Min IR : 103M $\Omega$ Min	Expose at 40 $\pm 2^\circ\text{C}$ , 90~95% RH for 96 $\pm 4$ hours and keep at normal conditions for 1 hour
High Temperature Load Test	$\Delta C$ : $\pm 5\%$ Max. Q : 200 Min. IR : 103M $\Omega$ Min.	Apply 2 $\times$ rated voltage at 85 $\pm 3^\circ\text{C}$ in high temperature chamber for 96 $\pm 4$ hours and keep at normal conditions for 24 hours
Temperature Cycling Test	$\Delta C$ : $\pm 7\%$ Max. Q : 200 Min. IR : 103 M $\Omega$ Min	Perform 5 cycles as follows: -25 $^\circ\text{C}$ (30 min.) $\rightarrow$ room temperature (5 min.) $\rightarrow$ +85 $^\circ\text{C}$ (30 min.) and keep at normal conditions for 24 $\pm 1$ hour
Vibration Test	$\Delta C$ : $\pm 5\%$ Max. Q : 250 Min. IR : 103M $\Omega$ Min.	Vibration frequency range: 10~55Hz Time: 2 hours each in three different vertical directions (X, Y and Z axes, total 6 hours) Amplitude: 1.5 mm
Shock Resistance Test	no problem observed	Fix on 50 gram metal case and drop onto the concrete floor from a height of 1 meter
Solderability	coverage $\geq 75\%$ ea. termination end	Immerse in Pb-Sn solder at 230 $\pm 5^\circ\text{C}$ for 5 +1/-0 seconds
Resistance to Solder Heat Test	$\Delta C$ : $\pm 10\%$ Max. Q : 250 Min. IR : 103M $\Omega$ Min.	Put on a hot plate at 270 $\pm 5^\circ\text{C}$ for 5 $\pm 1$ seconds and keep at normal conditions for 24 hours
Low Temperature Exposure	$\Delta C$ : $\pm 5\%$ Max. Q : 250 Min. IR : 103M $\Omega$ Min.	Expose in low temperature chamber at -25 $^\circ\text{C}$ for 96 $\pm 4$ hours and keep at normal conditions for 1 hour
Mechanical Load	$\Delta C$ : $\pm 5\%$ Max.	Apply a 100 gram load in the axis of the rotor
Setting Drift	$\Delta C$ : $\pm 5\%$ Max.	Rotate rotor 3 times until rotor slot is perpendicular to mounting pads, at 10 rpm. After that, take an initial reading of capacitance after 5 seconds. Measure again after 1 hour

### Recommended Washing Conditions

Solvent	Maker	Measuring Condition	Results
AK225	Asahi Glass Company	Immerse 50 ~ 55 $^\circ\text{C}$ 5 min.	O.K.
AK14lb	Asahi Glass Company	Immerse 32 $\pm 1^\circ\text{C}$ 5 min.	O.K.
Pine Alph (ST100S)	Arakawa Chemical Industries, Ltd.	Immerse 70 $\pm 1^\circ\text{C}$ Immerse into water 60 $\pm 1^\circ\text{C}$ 3 min.	O.K.
Clean slough (750H)	KAO Corporation	Immerse 60 $^\circ\text{C}$ . 5 min. Rinse with pure water. Dry 85 $^\circ\text{C}$	O.K.
San Elec (FS813D)	Sanyo Chemical Industries, Ltd.	Immerse 60 $^\circ\text{C}$ 5 min. Dry 85 $^\circ\text{C}$ 10min.	O.K.
Techno Care	Toshiba	Immerse into FRW17 (ultrasonic 10 min) Rinse out of FRW1 (ultrasonic 3 min)	O.K.
Terpene Cleaner (EC-7R)	Alpha Metals	Immerse room temperature 10 min. and ultrasonic 2 min. Rinse with water 40~50 $^\circ\text{C}$	O.K.
IPA		Immerse room temperature 1 min.	O.K.
Methylene Chloride		Immerse room temperature 10 min.	O.K.
Hot Water		Immerse 65 $^\circ\text{C}$ 10 min.	O.K.

### Recommended Cleaning Precautions for CTZ-E types only

- When washing with solution (IPA), follow conditions below:
  - Ultrasound wave washing under 1 minute.
  - Soak washing under 5 minutes. However, if using both ultrasound and soak washing, the total washing time should be under 3 minutes.
- When revolving, the silicon coating will break and the torque will increase. This is not irregular. Once the silicon coating breaks, the torque will return to normal value.

## CTZ2 / CTZ3 Series

### Carrier Tape Dimensions

(Unit: mm)

Items	A	B	W	F
CTZ3	3.35 ± 0.1	4.60 ± 0.1	12.00 ± 0.3	5.50 ± 0.05
CTZ2	2.70 ± 0.1	3.20 ± 0.1	12.00 ± 0.3	5.50 ± 0.05
Items	E	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>
CTZ3	1.75 ± 0.1	4.00 ± 0.1	8.00 ± 0.1	2.00 ± 0.05
CTZ2	1.75 ± 0.1	4.00 ± 0.1	4.00 ± 0.1	2.00 ± 0.05
Items	∅Do	M	R	t <sub>1</sub>
CTZ3	1.50 ± 0.1	3° + 0	0.30 + 0	0.30 ± 0.1
CTZ2	1.50 ± 0.1	3° + 0	0.30 + 0	0.30 ± 0.1
Items	t <sub>2</sub>	t <sub>3</sub>	t <sub>4</sub>	C
CTZ3	2.50 ± 0.1	2.00 ± 0.1	0.30 ± 0.05	1.50 ± 0.1
CTZ2	2.00 ± 0.1	1.30 ± 0.1	0.30 ± 0.1	1.03 ± 0.1

### Reel Dimensions

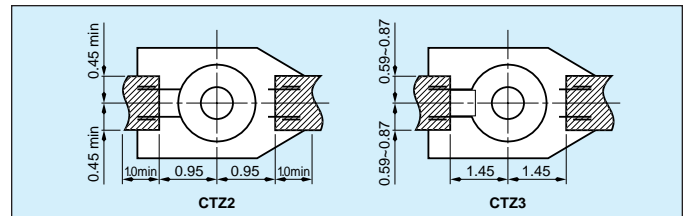
(Unit: mm)

CTZ3		Items	A	B	C	D∅	E	W	t	R
	1000 pcs		178 ± 2.0	>50	13.0 ± 0.5	21.0 ± 0.8	2.0 ± 0.5	14.0 ± 2.0	2.5 ± 0.5	1.0
	5000 pcs		420 ± 2.0	80.0 ± 2.0	13.0 ± 0.5	21.0 ± 1.0	2.0 ± 0.5	14.0 ± 2.0	2.0 ± 0.5	5.0
CTZ2		Items	A	B	C	D∅	E	W	t	R
	2000 pcs		178 ± 2.0	>50	13.0 ± 0.5	21.0 ± 0.8	2.0 ± 0.5	14.0 ± 2.0	2.5 ± 0.5	1.0

### Application Cautions

#### Mounting:

- 1) Solder reflow temperature should not exceed 240°C.
- 2) Prevent flux or wax from flowing between rotor and stator.
- 3) Do not run conductor patterns underneath the mounted trimmer capacitor.



#### Adjustment:

- 1) Any capacitance adjustments should be executed 12 hours after reflow soldering has been completed.
- 2) Maximum load on rotor by adjusting screw driver should not exceed 100 grams (3.53 ounces).
- 3) For critical and/or accurate capacitance adjustments rotate 360° before finding setting. When tight tolerance of a CTZ's setting is needed in a circuit add a fixed capacitor as a "stray capacitor" in series or parallel with the CTZ to tighten the tolerance of the CTZ's setting drift.

#### Application cautions, inclusive for CTZ3 E and CTZ2 E series:

- 1) Maintain the following conditions when washing with solvents such as freon etc.
  - (1) Ultrasonic wave wash within 1 minute
  - (2) Immersion wash within 5 minutes
 When using ultrasonic wave wash with immersion wash total time should remain under 3 minutes.
- 2) Do not wash after rotating the rotor.
- 3) When rotation is started, torque is temporarily high (maximum 200 g•cm) due to the silicon coating. Torque should be normal after first rotation.

**Store in normal ambient conditions.**  
**Avoid high temperatures, humid air, and dust.**

NOTE: For CTZ2 S and CTZ3 S series avoid the use of solvent washes.

