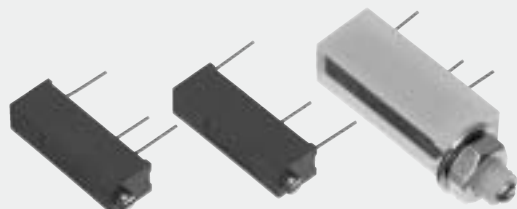


## 15 TURNS CERMET TRIMMERS

## CT-20

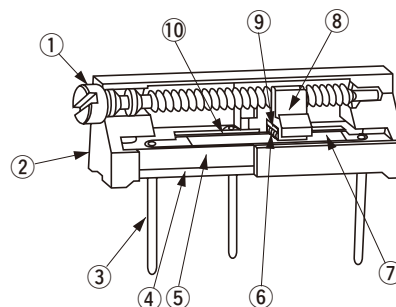
RoHS compatible



## FEATURES

- Lead-free soldering, Cadmium-free
- General use type
- Wide resistance range from 10  $\Omega$  to 5 M $\Omega$

## INTERNAL STRUCTURE



| Part name |                   | Material                           | Flammability |
|-----------|-------------------|------------------------------------|--------------|
| ①         | Shaft             | Brass, Nickel-plated               | —            |
| ②         | Housing           | PBT<br>(Polybutyleneterephthalate) | UL-94V-0     |
| ③         | Terminal pin      | Sn-Pb<br>Copper, Solder-plated     | —            |
|           |                   | Sn<br>Copper, Tin-plated           |              |
| ④         | Adhesive          | Epoxy                              | UL-94V-0     |
| ⑤         | Base element      | Ceramic                            | —            |
| ⑥         | Wiper             | Multi metal alloy                  |              |
| ⑦         | Resistive element | RuO <sub>2</sub> cermet            |              |
| ⑧         | Slider block      | PBT<br>(Polybutyleneterephthalate) | UL-94HB      |
| ⑨         | Rubber cushion    | Silicone rubber                    | —            |
| ⑩         | Electrode         | Ag-Pd cermet                       |              |

CFCs, Halon, Carbon tetrachloride and designated bromic flame retardant PBBOs and PBBs are not used in our products.

## PART NUMBER DESIGNATION

CT - 20 □ P 200 k  $\Omega$  ( 204 )

Series name

Terminal pin

Blank : Sn-Pb

E : Sn (Lead-free)

Product shape

P : Side adjustment

X : Side adjustment

PB : Panel mount

Resistance code

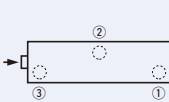
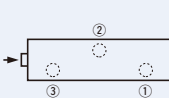
Resistance value

✳ Please refer to the LIST OF PART NUMBERS when placing orders.

# CT-20

## CERMET TRIMMERS

### LIST OF PART NUMBERS

| Adjustment position                         | Shape of terminal<br>(Top view)                                                   | Form of packaging |                | Pieces in package |
|---------------------------------------------|-----------------------------------------------------------------------------------|-------------------|----------------|-------------------|
|                                             |                                                                                   | Vinyl bag         |                |                   |
|                                             |                                                                                   | Sn-Pb             | Sn (Lead-free) |                   |
| Side adjustment<br>(↑ Adjustment direction) |  | CT-20P            | CT-20EP        | 50 pcs./pack      |
|                                             |  | CT-20X            | CT-20EX        |                   |
|                                             |  | CT-20PB           | CT-20EPB       | 25 pcs./pack      |

### ELECTRICAL CHARACTERISTICS

|                           |                                                                                                           |
|---------------------------|-----------------------------------------------------------------------------------------------------------|
| Nominal resistance range  | 10 Ω ~ 5 MΩ                                                                                               |
| Resistance tolerance      | ± 10 %                                                                                                    |
| Power ratings             | 0.5 W (70 °C) 0 W (120 °C)                                                                                |
| Resistance law            | Linear law (B)                                                                                            |
| Maximum input voltage     | DC300 V or power rating, whichever is smaller                                                             |
| Maximum wiper current     | 100 mA or power rating, whichever is smaller                                                              |
| Effective electrical turn | 12 turns                                                                                                  |
| End resistance            | 1 % or 2 Ω, whichever is greater                                                                          |
| C.R.V.                    | 1 % or 3 Ω, whichever is greater                                                                          |
| Operating temp. range     | −55 ~ 120 °C                                                                                              |
| Temp. coefficient         | 10 Ω, 20 Ω, 5 MΩ : ± 250 10 <sup>-6</sup> /°C maximum<br>50 Ω ~ 2 MΩ : ± 100 10 <sup>-6</sup> /°C maximum |
| Insulation resistance     | 1000 MΩ minimum (DC500 V)                                                                                 |
| Dielectric strength       | AC600 V, 60 s                                                                                             |
| Net weight                | Approx. 1.08 g (CT-20P, X, EP, EX)<br>Approx. 3.7 g (CT-20PB, EPB)                                        |

### <Nominal resistance values>

|        |        |       |        |        |        |      |      |        |
|--------|--------|-------|--------|--------|--------|------|------|--------|
| ⊕ 10 Ω | ⊕ 20 Ω | 50 Ω  | 100 Ω  | 200 Ω  | 500 Ω  | 1 kΩ | 2 kΩ | 5 kΩ   |
| 10 kΩ  | 20 kΩ  | 50 kΩ | 100 kΩ | 200 kΩ | 500 kΩ | 1 MΩ | 2 MΩ | ⊕ 5 MΩ |

Fig. 1

The products indicated by ⊕ mark are manufactured upon receipt of order basis.

※ : The above part numbers are all available with the respective combination of <Nominal resistance values> (Fig. 1).

※ : Verify the above part numbers when placing orders.

### MECHANICAL CHARACTERISTICS

|                   |                                                                                                |
|-------------------|------------------------------------------------------------------------------------------------|
| Mechanical turn   | 15 turns                                                                                       |
| Operating torque  | 35 mN·m {357 gf·cm} maximum                                                                    |
| Mechanical stop   | Clutch action                                                                                  |
| Rotational life   | 200 cycles<br>10 Ω ~ 200 Ω [Δ R/R ≤ ± (0.5 Ω + 3 %)]<br>500 Ω ~ 5 MΩ [Δ R/R ≤ ± (0.5 Ω + 2 %)] |
| Terminal strength | 9 N {917 gf} minimum<br>(Tensile strength)                                                     |
| Thrust to rotor   | 10 N {1.02 kgf} minimum                                                                        |
| Solderability     | Sn-Pb : 235 °C, 2 s<br>Sn (Lead-free) : 245 ± 3 °C, 2 ~ 3 s                                    |

{ } : Reference only

### ENVIRONMENTAL CHARACTERISTICS

| Test item           | Test conditions                                                                                                | Specifications                   |
|---------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------|
| Thermal shock       | −65 ~ 125 °C (0.5 h), 5 cycles                                                                                 | [Δ R/R ≤ 1 %]<br>[S.S. ≤ 1 %]    |
| Humidity            | −10 ~ 65 °C (Relative humidity 80 ~ 98 %),<br>10 cycles, 240 h                                                 | [Δ R/R ≤ 1 %]                    |
| Shock               | 981 m/s <sup>2</sup> , 6 ms<br>6 directions for 3 times each                                                   | [Δ R/R ≤ 1 %]<br>[S.S. ≤ 1 %]    |
| Vibration           | Amplitude 1.52 mm or<br>Acceleration 196 m/s <sup>2</sup> ,<br>10 ~ 2000 Hz, 3 directions, 12 times each       |                                  |
| Load life           | 70 °C, 0.5 W, 1000 h                                                                                           | [Δ R/R ≤ 2 %]<br>[S.S. ≤ 1 %]    |
| Low temp. operation | −55 °C, 2 h                                                                                                    | [Δ R/R ≤ 1 %]<br>[S.S. ≤ 2 %]    |
| High temp. exposure | 120 °C, 250 h                                                                                                  | [Δ R/R ≤ 2 %]<br>[S.S. ≤ 2 %]    |
| Immersion seal      | 85 °C, 60 s                                                                                                    | No leaks (No continuous bubbles) |
| Soldering heat      | Sn-Pb<br>350 °C, 3 s                                                                                           | [Δ R/R ≤ 1 %]                    |
|                     | Sn<br>Flow soldering :<br>260 ± 3 °C, 5 ~ 6 s, two times maximum<br>Manual soldering :<br>380 ± 10 °C, 3 ~ 4 s |                                  |

Δ R/R : Change in total resistance  
S.S. : Setting stability

# CT-20

## CERMET TRIMMERS

### MAXIMUM INPUT RATINGS

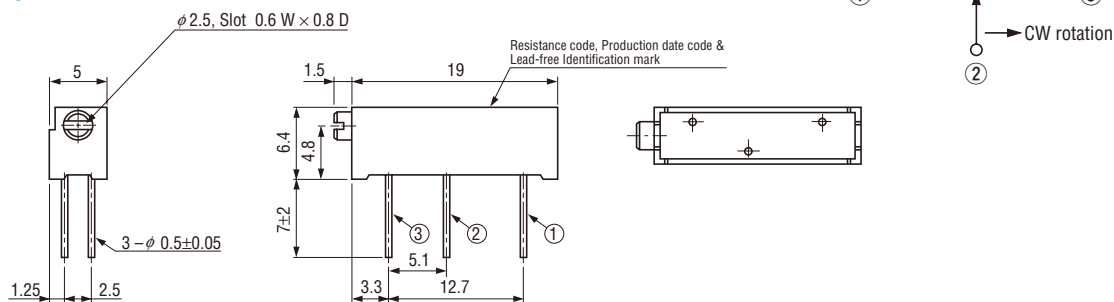
| Nominal resistance values ( $\Omega$ )                          | Resistance code                        | Maximum input voltage (V)                    | Maximum wiper current (mA)                   |
|-----------------------------------------------------------------|----------------------------------------|----------------------------------------------|----------------------------------------------|
| $\rightarrow$ 10<br>$\rightarrow$ 20<br>50<br>100<br>200<br>500 | 100<br>200<br>500<br>101<br>201<br>501 | 1.00<br>2.00<br>5.00<br>7.07<br>10.0<br>15.8 | 100<br>100<br>100<br>70.7<br>50.0<br>31.6    |
| 1 k<br>2 k<br>5 k<br>10 k<br>20 k<br>50 k                       | 102<br>202<br>502<br>103<br>203<br>503 | 22.4<br>31.6<br>50.0<br>70.7<br>100<br>158   | 22.4<br>15.8<br>10.0<br>7.07<br>5.00<br>3.16 |
| 100 k<br>200 k<br>500 k<br>1 M<br>2 M<br>5 M<br>$\rightarrow$   | 104<br>204<br>504<br>105<br>205<br>505 | 224<br>300<br>300<br>300<br>300<br>300       | 2.24<br>1.50<br>0.60<br>0.30<br>0.15<br>0.06 |

The products indicated by  $\rightarrow$  mark are manufactured upon receipt of order basis.

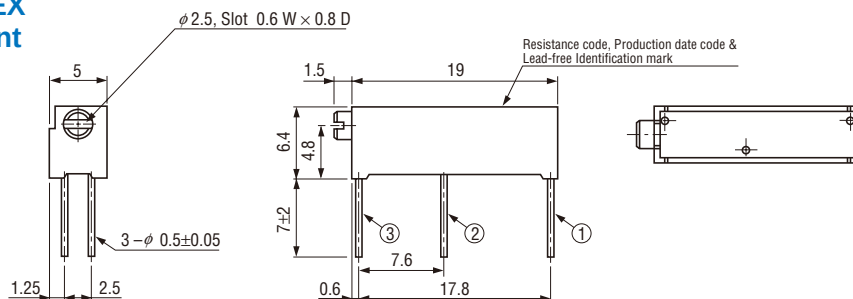
### OUTLINE DIMENSIONS

Unless otherwise specified, tolerance:  $\pm 0.3$  (Unit: mm)

#### CT-20P, CT-20EP Side adjustment



#### CT-20X, CT-20EX Side adjustment



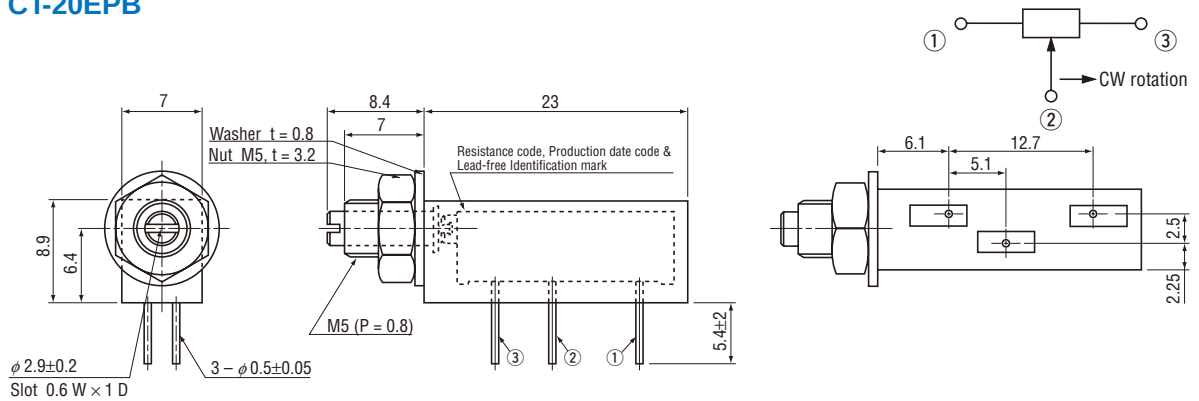
# CT-20

## CERMET TRIMMERS

### OUTLINE DIMENSIONS

#### CT-20PB, CT-20EPB

Unless otherwise specified, tolerance:  $\pm 0.3$  (Unit: mm)



### PACKAGING SPECIFICATIONS

#### <Vinyl bag packaging specifications>

- Unit of bulk in vinyl bag packaging is 50 pcs. (CT-20PB, CT-20EPB is 25 pcs.) per pack.
- Boxing of bulk in vinyl bags is performed with 100 pcs. (CT-20PB, CT-20EPB is 50 pcs.) per box.