

# 3 TURNS CERMET TRIMMERS

# TM-7

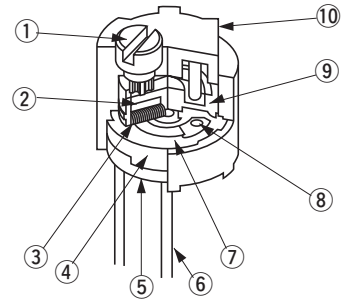
RoHS compliant



## FEATURES

- RoHS compliant
- Fine setting is possible
- Extremely small backlash (In house comparison)

## INTERNAL STRUCTURE



Part name	Material	Flammability
① Shaft	Zinc alloy, Nickel-plated	—
② Rubber cushion	Silicone rubber	
③ Wiper	Multi metal alloy	
④ Base element	Ceramic	
⑤ Adhesive	Epoxy	UL94V-0
⑥ Terminal pin	Copper, Tin-plated	—
⑦ Resistive element	RuO <sub>2</sub> cermet	
⑧ Electrode	Ag-Pd cermet	
⑨ Rotor gear	Polyamide	UL94HB
⑩ Housing	Polybutyleneterephthalate	UL94V-0

## PART NUMBER DESIGNATION

TM - 7 EP 50 k Ω ( 503 )

Series name

Terminal pin

E : Sn (Lead-free)

Product shape

P : Top adjustment  
W : Top adjustment

S : Side adjustment  
X : Side adjustment

Resistance code






Resistance value

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

# TM-7

## CERMET TRIMMERS

### LIST OF PART NUMBERS

Adjustment position	Shape of terminal (Top view)	Form of packaging	Pieces in package
		Plastic bag	
Top adjustment 		TM-7EP	50 pcs./pack
		TM-7EW	
Side adjustment (↑ Adjustment direction)		TM-7ES	
		TM-7EX	

### ELECTRICAL CHARACTERISTICS

Nominal resistance range	50 Ω ~ 2 MΩ
Resistance tolerance	± 10 %
Power ratings	0.5 W (70 °C) 0 W (120 °C)
Resistance law	(B) Linear law
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	2.5 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	± 100 10 <sup>-6</sup> /°C maximum
Insulation resistance	1000 MΩ minimum (DC500 V)
Dielectric strength	AC900 V, 60 s
Net weight	Approx. 0.50 g (TM-7EP, EW) Approx. 0.69 g (TM-7ES, EX)

### <Nominal resistance values>

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	

Fig. 1

※ The above part numbers are all available as the standard item respectively with the combination of <Nominal resistance values> (Fig. 1).  
 ※ Verify the above part numbers when placing orders.

### MECHANICAL CHARACTERISTICS

Mechanical turn	3 turns
Operating torque	20 mN·m {204 gf·cm} maximum
Mechanical stop	Clutch action
Rotational life	200 cycles Δ R/R ≤ ± (2 Ω + 3 %)
Terminal strength	10 N {1.02 kgf} minimum (Tensile strength)
Thrust to shaft	10 N {1.02 kgf} minimum
Solderability	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 %] [S.S. ≤ 1 %]
Humidity	-10 ~ 65 °C (80 ~ 98 %), 10 cycles, 240 h	[ Δ R/R ≤ 2 %]
Shock	981 m/s <sup>2</sup> , 6 ms 6 directions for 3 times each	[ Δ R/R ≤ 1 %] [S.S. ≤ 1 %]
Vibration	(Amplitude) 1.52 mm or (Acceleration) 196 m/s <sup>2</sup> , 10 ~ 2000 Hz, 3 directions, 12 times each	
Load life	70 °C, 0.5 W, 1000 h	[ Δ R/R ≤ 3 %] [S.S. ≤ 1 %]
Low temp. operation	-55 °C, 2 h	[ Δ R/R ≤ 2 %] [S.S. ≤ 2 %]
High temp. exposure	120 °C, 250 h	[ Δ R/R ≤ 3 %] [S.S. ≤ 2 %]
Immersion seal	85 °C, 60 s	No leaks (No continuous bubbles)
Soldering heat	Flow 260 ± 3 °C, 5 ~ 6 s, two times maximum Manual soldering 380 ± 10 °C, 3 ~ 4 s	[ Δ R/R ≤ 1 %]

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

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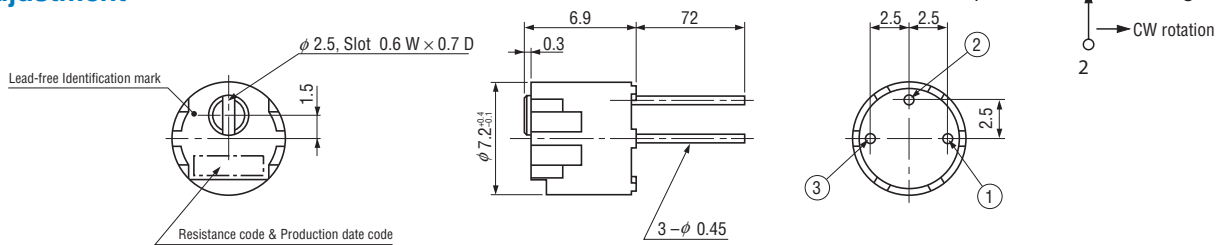
### MAXIMUM INPUT RATINGS

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

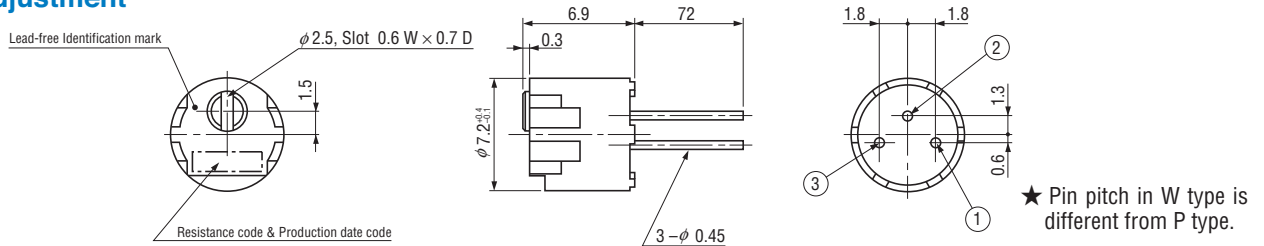
### OUTLINE DIMENSIONS

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

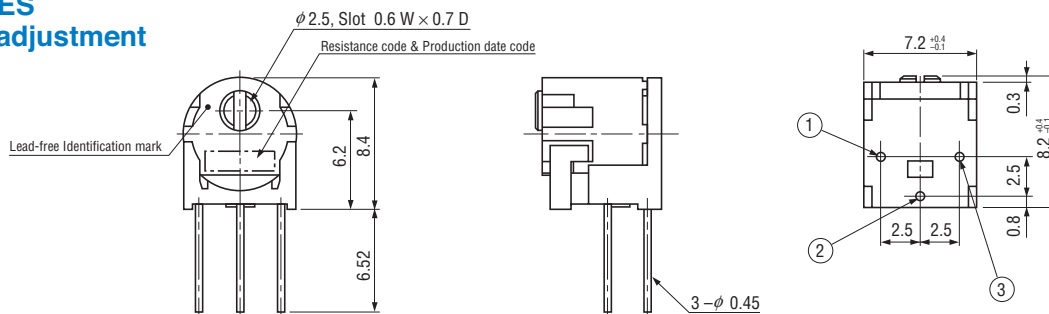
#### TM-7EP Top adjustment



#### TM-7EW Top adjustment



#### TM-7ES Side adjustment

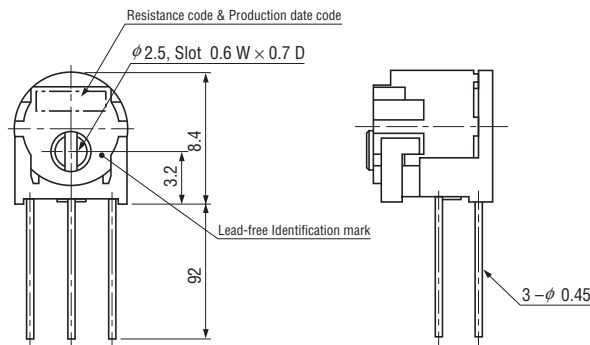


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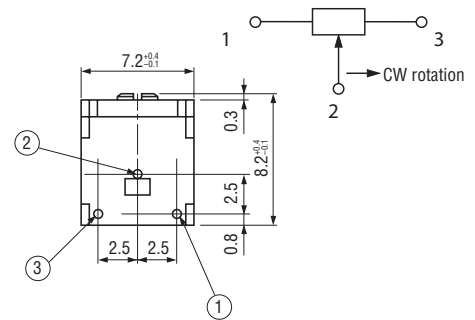
## CERMET TRIMMERS

### OUTLINE DIMENSIONS

#### ● TM-7EX Side adjustment



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



★ Pin position & shaft position of X type are different from S type.

### PACKAGING SPECIFICATIONS

#### <Bulk pack specifications>

- Unit of bulk in a plastic bag is 50 pcs. per pack.
- Boxing of bulk in a plastic bag is performed with 200 pcs. per box.