

## SURFACE MOUNT CERMET TRIMMERS (14 TURNS)

ST-5

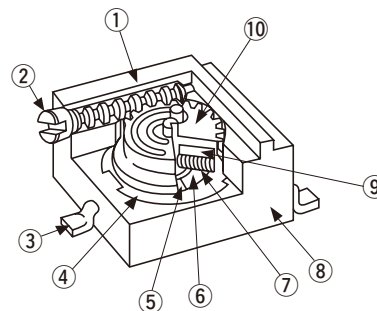
RoHS compatible



## FEATURES

- Lead-free soldering, Cadmium-free
- Precise adjustment is possible
- Automatic mounting is possible (Taping)
- Flow/reflow soldering is possible
- Sealed construction (Washable)

## INTERNAL STRUCTURE



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

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

## PART NUMBER DESIGNATION

S T - 5			T W	5 0 0 Ω	( 5 0 1 )
Series name		Resistance code			
Terminal pin		Resistance value			
Blank : Sn-Pb E : Sn (Lead-free)		Product shape (Shape of terminal)			
Form of packaging		W : Gull wing (Top adjustment) X : Gull wing (Side adjustment) P : Gull wing (Side adjustment) R : Gull wing (Side adjustment)			
T : Taping (Reel) M : Magazine (Stick) Blank : Bulk in vinyl bags					

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

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## SURFACE MOUNT TRIMMERS

### LIST OF PART NUMBERS

Adjustment position	Shape of terminal	Form of packaging					
		Taping (reel)		Magazine (stick)		Vinyl bag	
		Sn-Pb	Sn (Lead-free)	Sn-Pb	Sn (Lead-free)	Sn-Pb	Sn (Lead-free)
Top adjustment	W (Gull wing)	ST-5TW	ST-5ETW	ST-5MW	ST-5EMW	ST-5W	ST-5EW
Side adjustment	X (Gull wing)	ST-5TX	ST-5ETX	ST-5MX	ST-5EMX	ST-5X	ST-5EX
	P (Gull wing)	ST-5TP	ST-5ETP	ST-5MP	ST-5EMP	ST-5P	ST-5EP
	R (Gull wing)	ST-5TR	ST-5ETR	ST-5MR	ST-5EMR	ST-5R	ST-5ER
Pieces in package		500 pcs./reel		50 pcs./stick		50 pcs./pack	

### <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	

Fig. 1

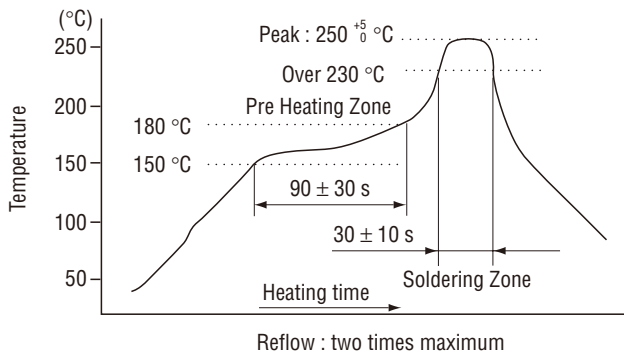
The products indicated by ↻ mark are manufactured upon receipt of order basis.

- ※ : 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.
- ※ : Taping and magazine specifications are not sold separately and must be purchased in reel or stick units.

### ELECTRICAL CHARACTERISTICS

Nominal resistance range	10 Ω ~ 2 MΩ
Resistance tolerance	±10 %
Power ratings	0.25 W (85 °C) 0 W (120 °C)
Resistance law	Linear law (B)
Maximum input voltage	DC200 V or power rating, whichever is smaller
Maximum wiper current	100 mA or power rating, whichever is smaller
Effective electrical turn	11 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 ~ 50 Ω : ± 250 10 <sup>-6</sup> /°C maximum 100 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. 0.35 g

### <Reflow profile for soldering heat evaluation>



### MECHANICAL CHARACTERISTICS

Mechanical turn	14 turns
Operating torque	20 mN·m {204 gf·cm} maximum
Mechanical stop	Clutch action
Rotational life	200 cycles 10 Ω ~ 200 Ω [Δ R/R ≤ ± (0.5 Ω + 3 %)] 500 Ω ~ 2 MΩ [Δ R/R ≤ ± (0.5 Ω + 2 %)]
Thrust to shaft	5 N {0.51 kgf} minimum
Solderability	Sn-Pb : 235 °C, 2 s Sn (Lead-free) : 245 ± 3 °C, 2 ~ 3 s
Shear (Adhesion)	5 N {0.51 kgf} 10 s
Substrate bending	Width 90 mm, bend 3 mm, 5 s, 1 time
Pull-off strength	5 N {0.51 kgf} 10 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 (Relative humidity 80 ~ 98 %), 10 cycles, 240 h	[Δ R/R ≤ 1 %]
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	85 °C, 0.25 W, 1000 h	[Δ R/R ≤ 2 %] [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 ≤ 2 %] [S.S. ≤ 2 %]
Immersion seal	85 °C, 60 s	No leaks (No continuous bubbles)
Soldering heat	Sn-Pb 260 °C, 10 s or 215 °C, 35 s	[Δ R/R ≤ 1 %]
	Sn Flow : 260 ± 3 °C as the temperature in a pot of molten solder, immersion from head of terminal to backside of board, 5 ~ 6 s, two times maximum Reflow : Peak temperature 255 °C (Please refer to the profile below.) Manual soldering : 350 ± 10 °C, 3 ~ 4 s	

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

# ST-5

## SURFACE MOUNT TRIMMERS

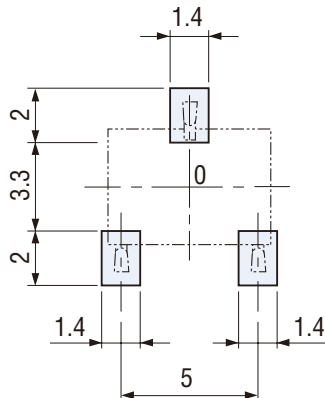
### ■ MAXIMUM INPUT RATINGS

Nominal resistance values ( $\Omega$ )	Resistance code	Maximum input voltage (V)	Maximum wiper current (mA)
$\rightarrow$ 10 $\rightarrow$ 20 50 100 200 500	100 200 500 101 201 501	1.00 2.00 3.53 5.00 7.07 11.2	100 100 70.7 50.0 35.4 22.4
1 k 2 k 5 k 10 k 20 k 50 k	102 202 502 103 203 503	15.8 22.4 35.4 50.0 70.7 112	15.8 11.2 7.07 5.00 3.54 2.24
100 k 200 k 500 k 1 M 2 M	104 204 504 105 205	158 200 200 200 200	1.58 1.00 0.40 0.20 0.10

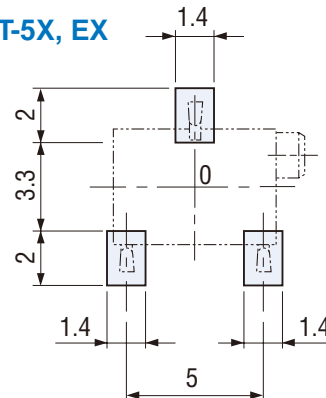
The products indicated by  $\rightarrow$  mark are manufactured upon receipt of order basis.

### ■ RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

#### ● ST-5W, EW

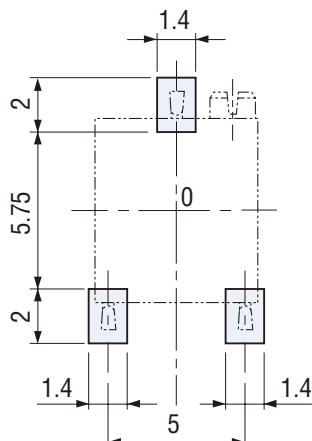


#### ● ST-5X, EX

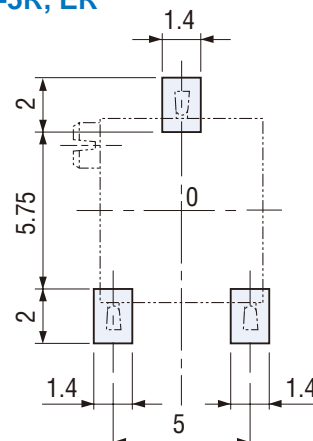


(Unit: mm)

#### ● ST-5P, EP



#### ● ST-5R, ER



Note) The zero point is the center of mounting.

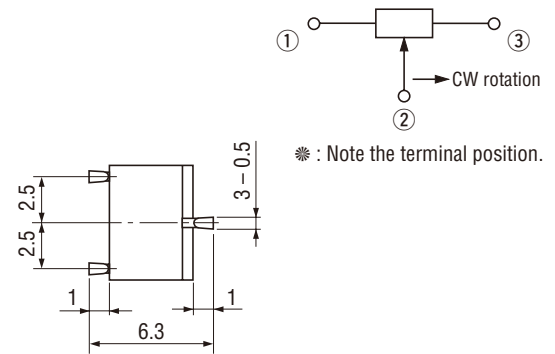
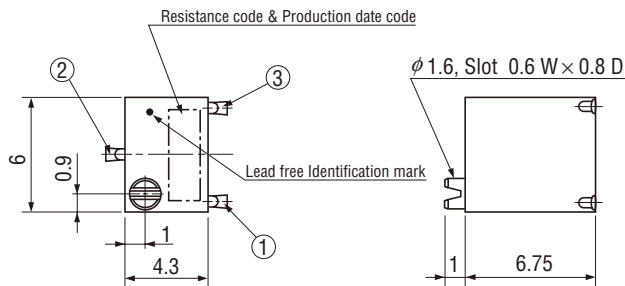
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## SURFACE MOUNT TRIMMERS

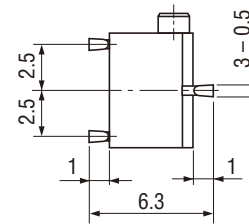
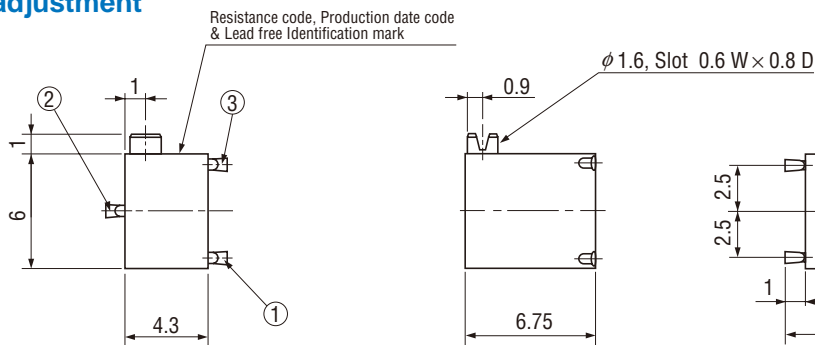
### OUTLINE DIMENSIONS

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

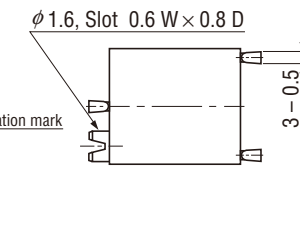
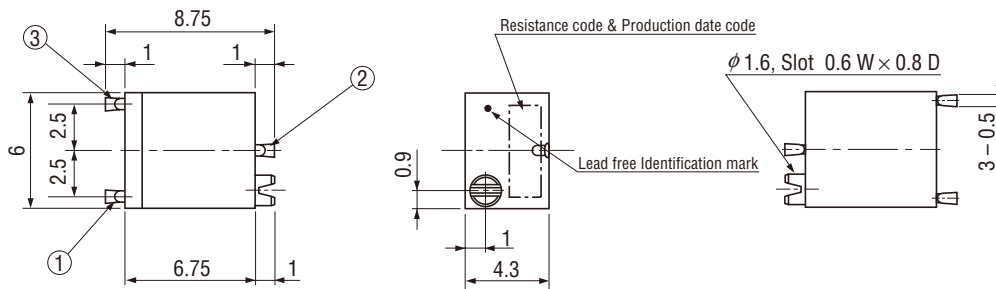
#### ST-5W, ST-5EW Top adjustment



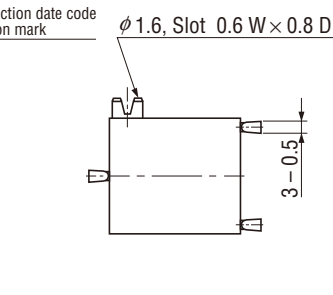
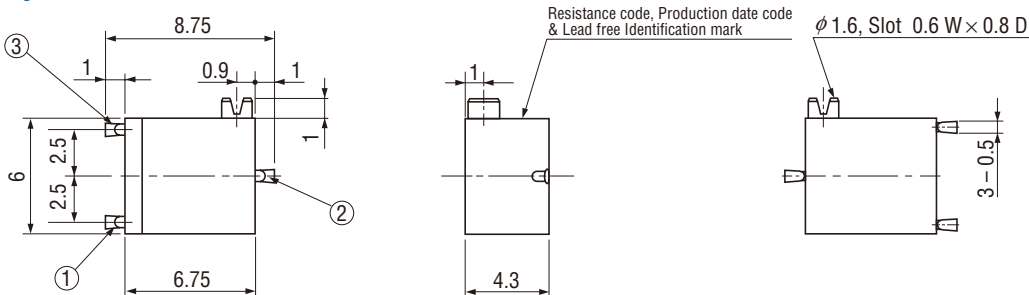
#### ST-5X, ST-5EX Side adjustment



#### ST-5P, ST-5EP Side adjustment



#### ST-5R, ST-5ER Side adjustment



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## SURFACE MOUNT TRIMMERS

### PACKAGING SPECIFICATIONS

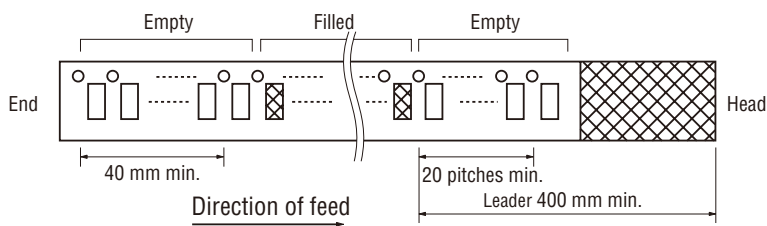
#### <Taping packaging specifications>

- Taping version is packaged in 500 pcs. per reel.  
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500 pcs., etc.
- Taping version is boxed with one reel (500 pcs.).

Maximum number of consecutive missing pieces = 2

Leader length and reel dimension are shown in the dia-grams below.

#### EMBOSED TAPE DIMENSIONS

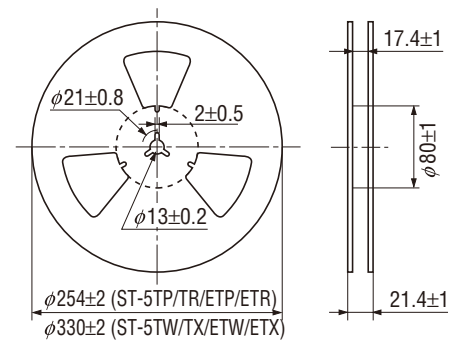


#### REEL DIMENSIONS

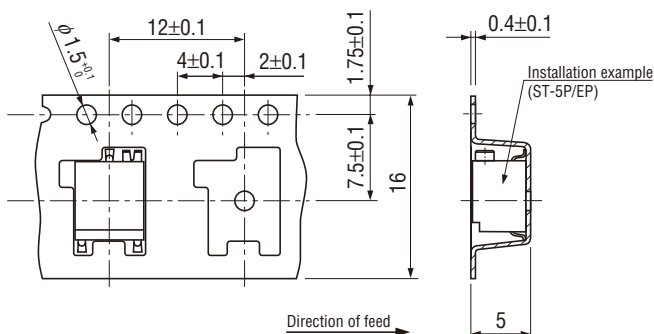
(Conforms to JIS C 0806-3)

(In accordance with EIAJ ET-7200A)

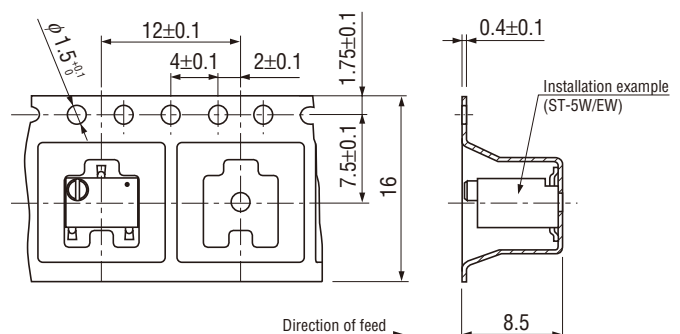
(Unit: mm)



#### ST-5TP/TR/ETP/ETR



#### ST-5TW/TX/ETW/ETX



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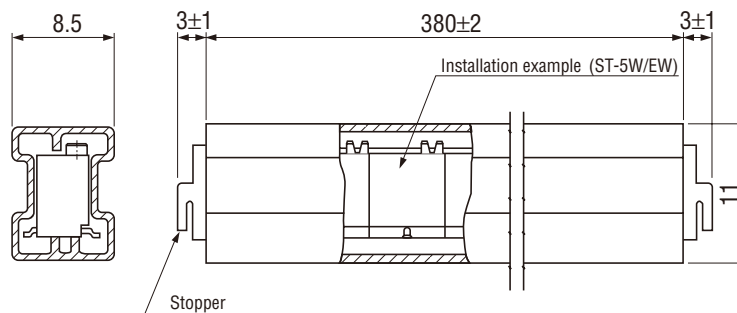
## SURFACE MOUNT TRIMMERS

### <Magazine packaging specifications>

- Magazine is packed 50 pcs. per stick.  
Orders will be accepted for units of 50 pcs., i.e., 50, 100, 150 pcs., etc.
- Magazines are packed 2000 pcs. per box.

### ● Magazine dimensions

(Unit: mm)



### <Vinyl bag packaging specifications>

- Unit of bulk in vinyl bag packaging is 50 pcs. per pack.
- Boxing of bulk in vinyl bags is performed with 200 pcs. per box.