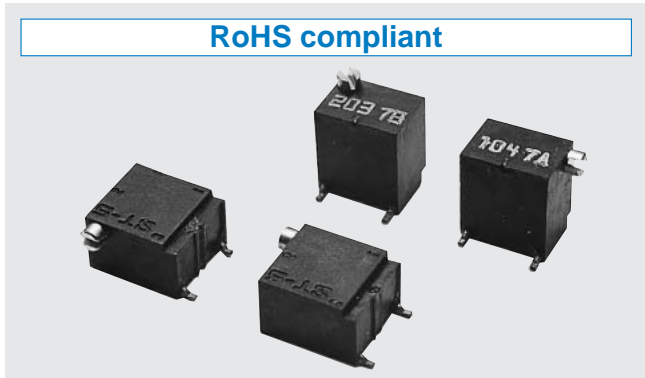
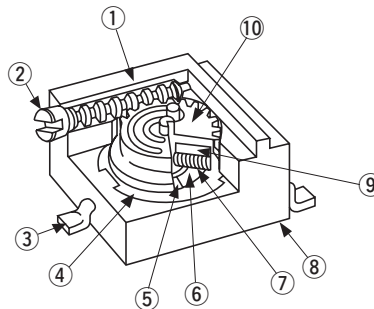


# SURFACE MOUNT CERMET TRIMMERS (14 TURNS) **ST-5**

## RoHS compliant



## INTERNAL STRUCTURE

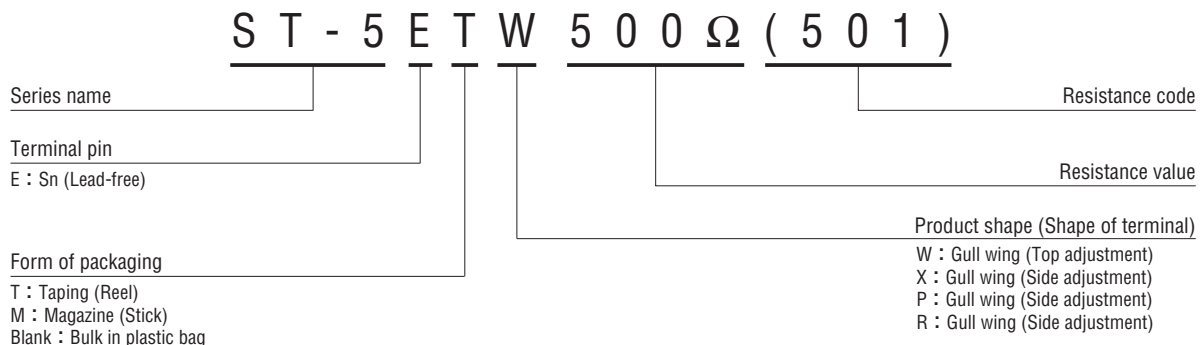


	Part name	Material	Flammability	
①	Housing	Polyphenylenesulphide	UL-94V-0	
②	Shaft	Brass, Nickel-plated	—	
③	Terminal pin	Copper, Tin-plated		
④	Base element	Ceramic		
⑤	Electrode	Ag-Pd cermet		
⑥	Resistive element	RuO <sub>2</sub> cermet		
⑦	Wiper	Multi metal alloy		
⑧	Adhesive	Epoxy		
⑨	Rubber cushion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

## FEATURES

- RoHS compliant
- Precise adjustment is possible
- Automatic mounting is possible (Taping)
- Flow/reflow soldering is possible
- Sealed construction (Washable: Refer to A-328)

## PART NUMBER DESIGNATION



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

# ST-5 SURFACE MOUNT TRIMMERS

## LIST OF PART NUMBERS

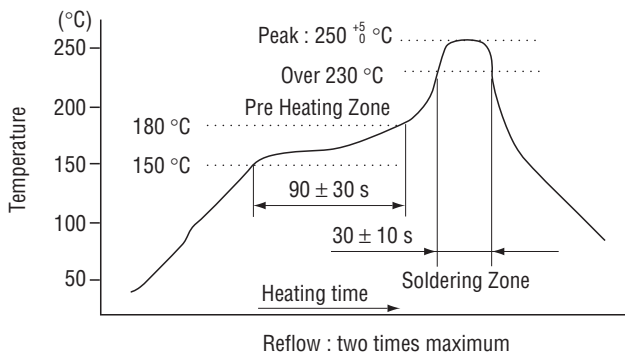
Adjustment position	Shape of terminal	Form of packaging		
		Taping (reel)	Magazine (stick)	Plastic bag
Top adjustment	W (Gull wing)	ST-5ETW	ST-5EMW	ST-5EW
Side adjustment	X (Gull wing)	ST-5ETX	ST-5EMX	ST-5EX
	P (Gull wing)	ST-5ETP	ST-5EMP	ST-5EP
	R (Gull wing)	ST-5ETR	ST-5EMR	ST-5ER
Pieces in package		500 pcs./reel	50 pcs./stick	50 pcs./pack

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

## 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
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



### ◁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 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.

## 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 [ ΔR/R ≤ ± (0.5 Ω + 3 %) ] 500 Ω ~ 2 MΩ [ ΔR/R ≤ ± (0.5 Ω + 2 %) ]
Thrust to shaft	5 N {0.51 kgf} minimum
Solderability	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	[ ΔR/R ≤ 1 % ] [ S.S. ≤ 1 % ]
Humidity	-10 ~ 65 °C (80 ~ 98 %), 10 cycles, 240 h	[ ΔR/R ≤ 1 % ]
Shock	981 m/s <sup>2</sup> , 6 ms 6 directions for 3 times each	[ ΔR/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	[ ΔR/R ≤ 2 % ] [ S.S. ≤ 1 % ]
Low temp. operation	-55 °C, 2 h	[ ΔR/R ≤ 2 % ] [ S.S. ≤ 2 % ]
High temp. exposure	120 °C, 250 h	[ ΔR/R ≤ 2 % ] [ S.S. ≤ 2 % ]
Immersion seal	85 °C, 60 s	No leaks (No continuous bubbles)
Soldering heat	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	[ ΔR/R ≤ 1 % ]

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

# ST-5

## SURFACE MOUNT TRIMMERS

### MAXIMUM INPUT RATINGS

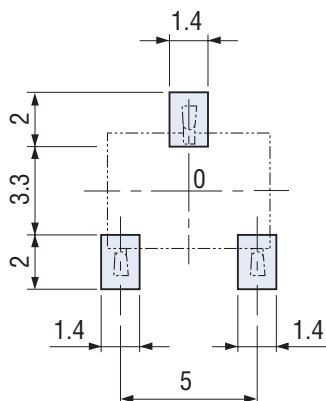
Nominal resistance values ( $\Omega$ )	Resistance code	Maximum input voltage (V)	Maximum wiper current (mA)
↻ 10	100	1.00	100
↻ 20	200	2.00	100
50	500	3.53	70.7
100	101	5.00	50.0
200	201	7.07	35.4
500	501	11.2	22.4
1 k	102	15.8	15.8
2 k	202	22.4	11.2
5 k	502	35.4	7.07
10 k	103	50.0	5.00
20 k	203	70.7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

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

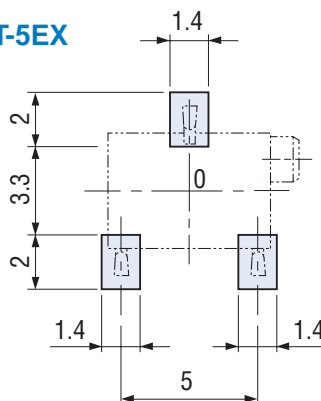
### RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

(Unit: mm)

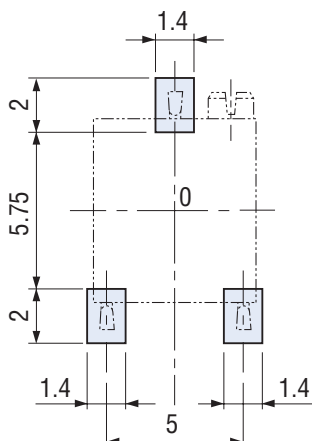
#### ST-5EW



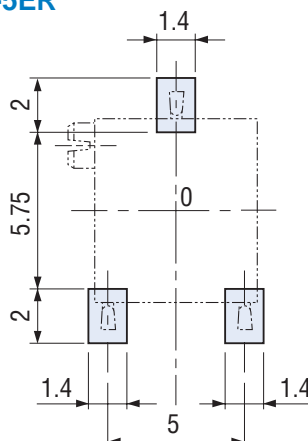
#### ST-5EX



#### ST-5EP



#### ST-5ER



Note) The zero point is the center of mounting.

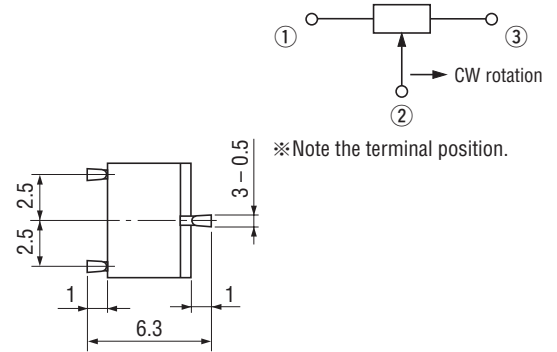
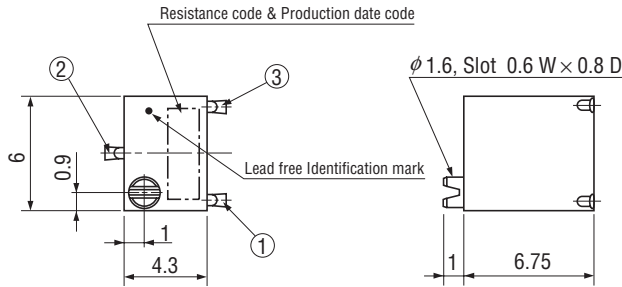
Specifications are subject to change without notice.

# ST-5 SURFACE MOUNT TRIMMERS

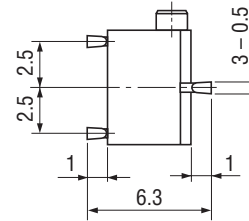
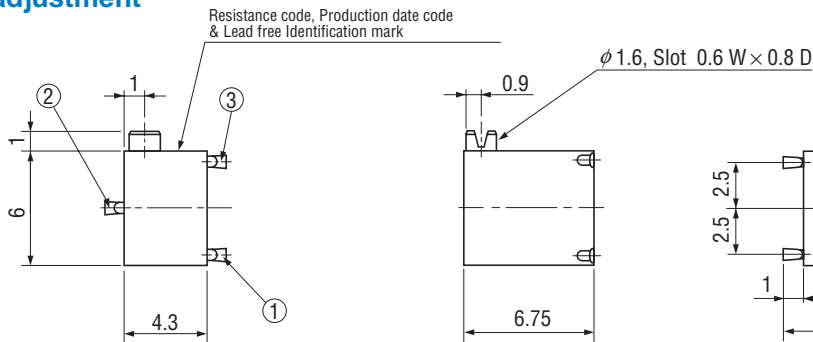
## OUTLINE DIMENSIONS

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

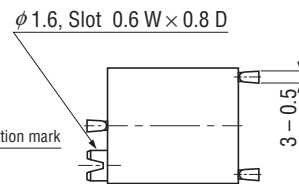
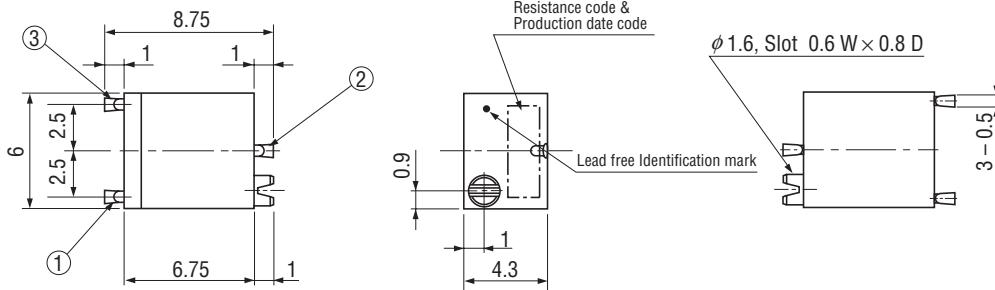
### ST-5EW Top adjustment



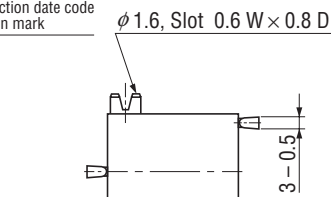
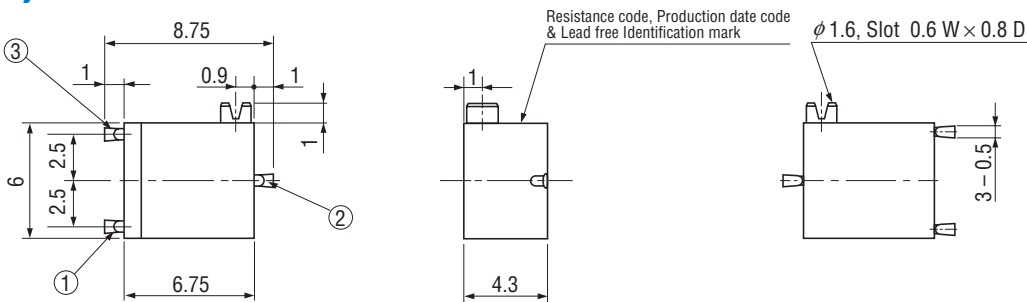
### ST-5EX Side adjustment



### ST-5EP Side adjustment



### ST-5ER Side adjustment



# ST-5 SURFACE MOUNT TRIMMERS

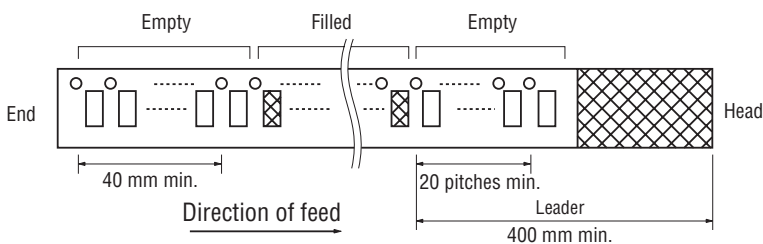
## PACKAGING SPECIFICATIONS

### <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.

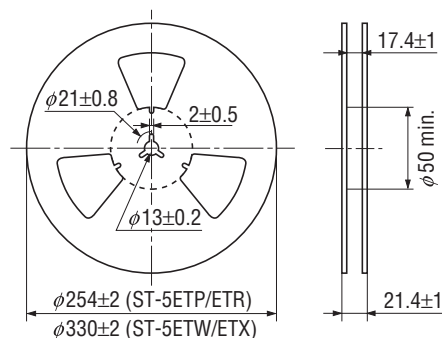
### EMBOSSED TAPE DIMENSIONS



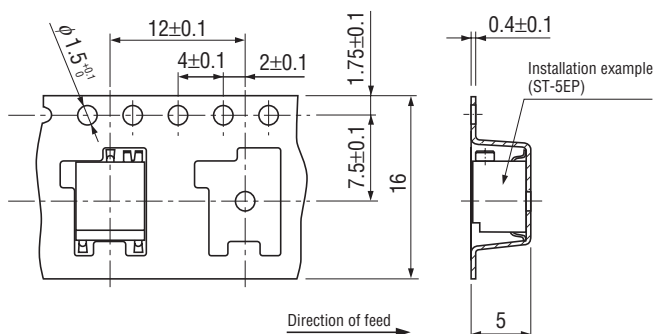
### REEL DIMENSIONS

(Conforms to JIS C 0806-3)  
 (In accordance with EIAJ ET-7200A)

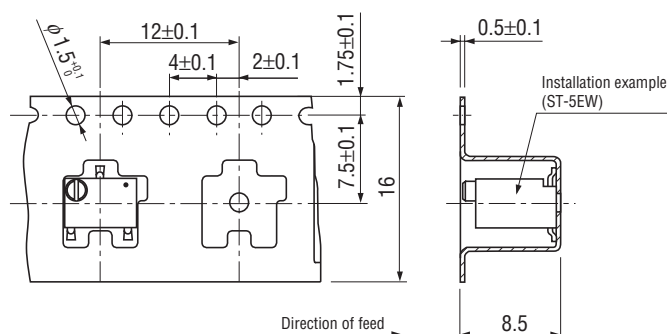
(Unit: mm)



### ST-5ETP/ETR



### ST-5ETW/ETX



# ST-5

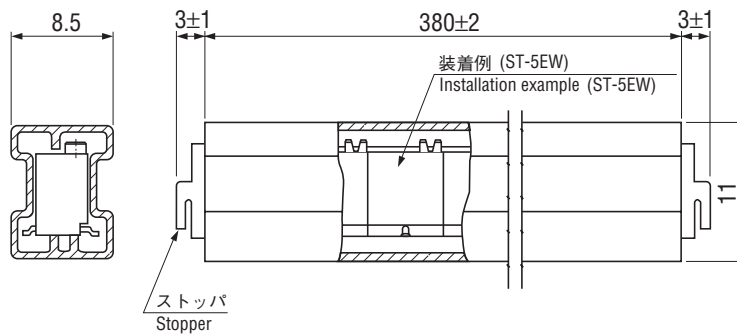
## SURFACE MOUNT TRIMMERS

### <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)



### <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.

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