ST-5

Vishay

Surface Mount Cermet Trimmers (14 turns)

FEATURES

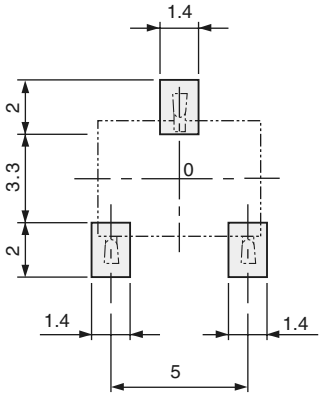
- Lead (Pb)-free soldering, Cadmium-free
- Precise adjustment is possible
- Automatic mounting is possible (Taping)
- Flow/reflow soldering is possible
- Sealed construction (Washable)
- RoHS compliant

DIMENSIONS in millimeters

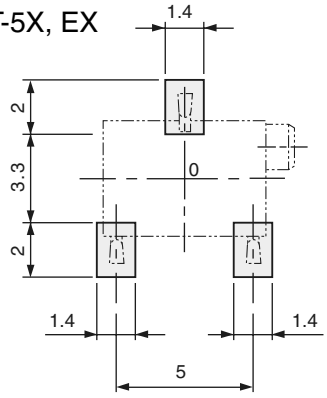
RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

(Unit: mm)

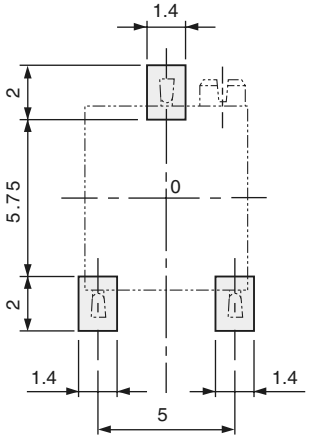
ST-5W, EW



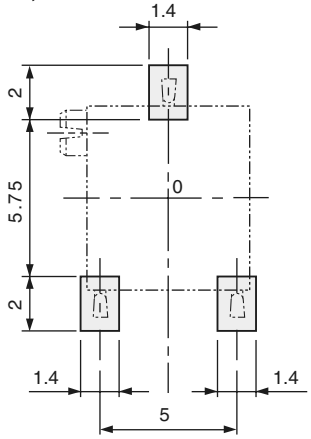
ST-5X, EX



ST-5P, EP



ST-5R, ER



Note) The zero point is the center of mounting.

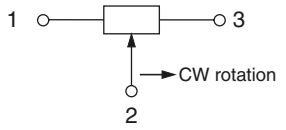
Specifications are subject to change without notice. Specifications in this catalog are for reference. The formal specification sheets will be submitted upon request.

DIMENSIONS in millimeters

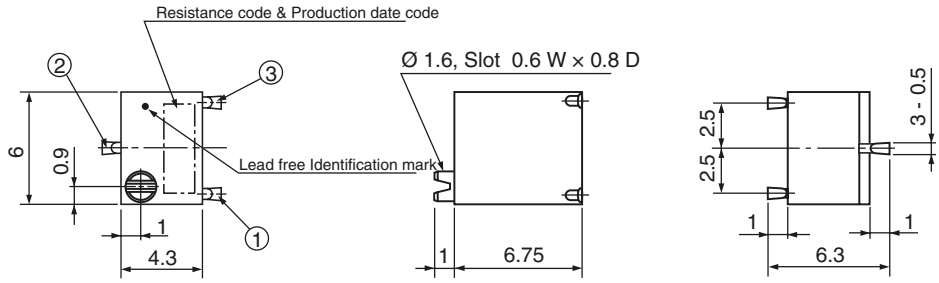
OUTLINE DIMENSIONS

Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

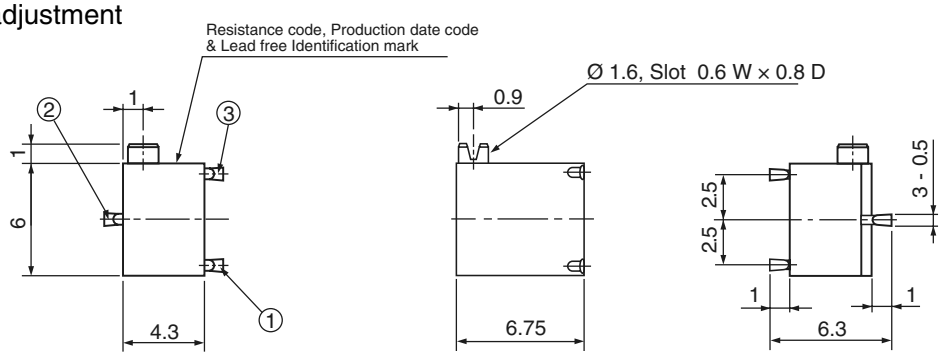
ST-5W, ST-5EW
Top adjustment



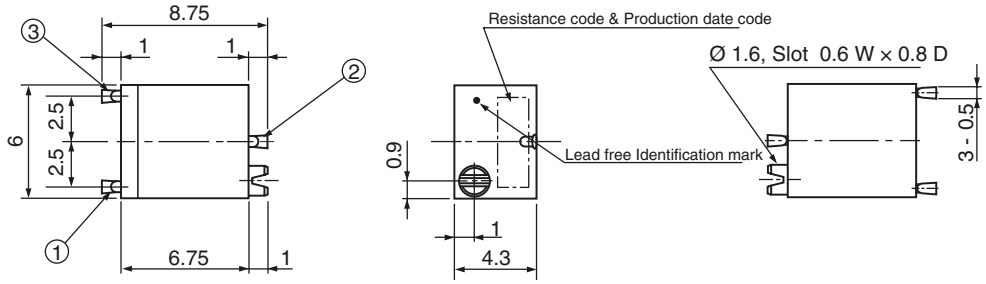
Note the terminal position.



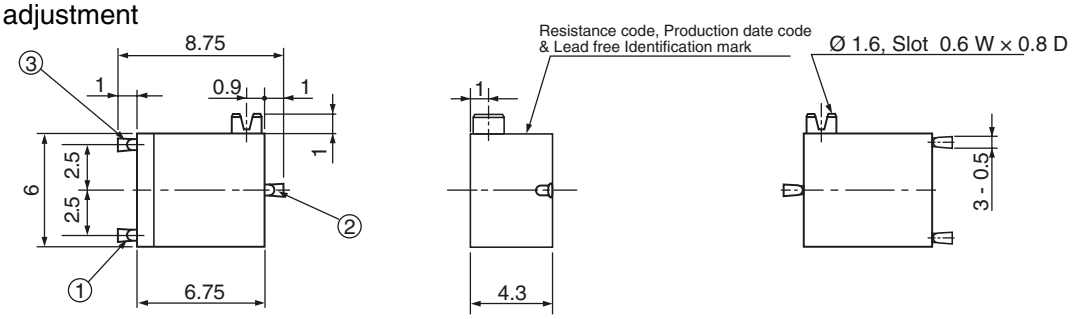
ST-5X, ST-5EX
Side adjustment



ST-5P, ST-5EP
Side adjustment



ST-5R, ST-5ER
Side adjustment



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DIMENSIONS in millimeters

PACKAGING SPECIFICATIONS

Taping packaging specifications

Taping version is packaged in 500 pcs. per reel.

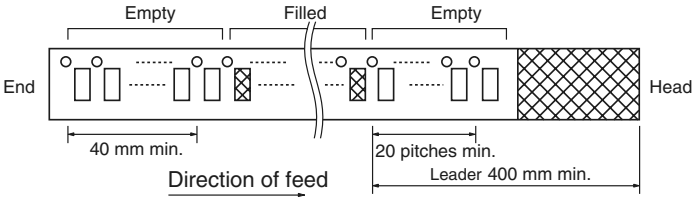
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500 pcs., etc.

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

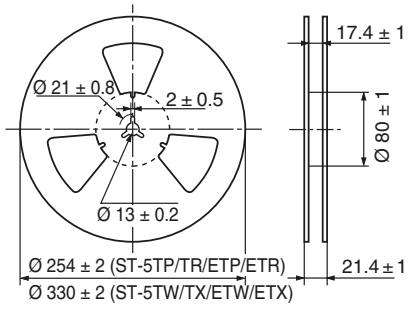


REEL DIMENSIONS

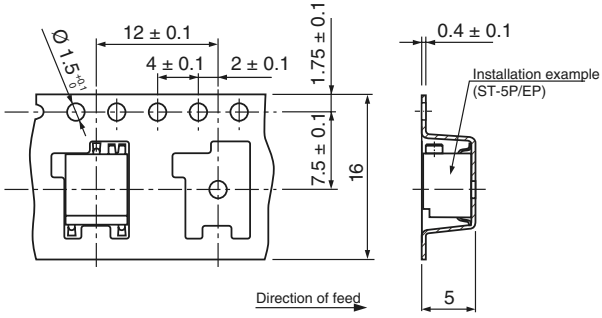
(Conforms to JIS C 0806-3)

(In accordance with EIAJ ET-7200A)

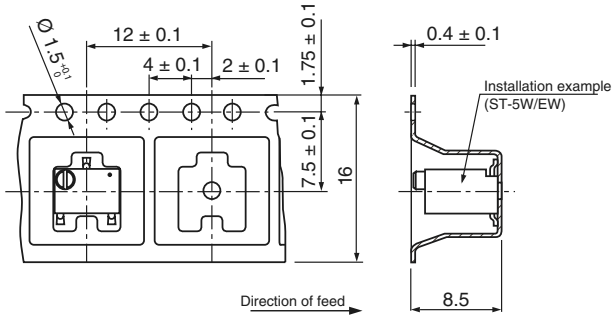
(Unit: mm)



ST-5TP/TR/ETP/ETR



ST-5TW/TX/ETW/ETX



Specifications are subject to change without notice. Specifications in this catalog are for reference. The formal specification sheets will be submitted upon request.

Magazine packaging specifications

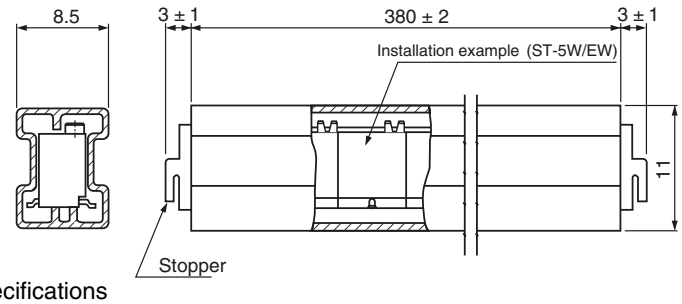
Magazine is packed 50 pcs. per stick.

Orders will be accepted for units of 50 pcs., i.e., 50, 100, 150 pcs., etc.

Magazines are packed 2000 pcs. per box.

(Unit: mm)

Magazine dimensions



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.

Specifications are subject to change without notice. Specifications in this catalog are for reference. The formal specification sheets will be submitted upon request.

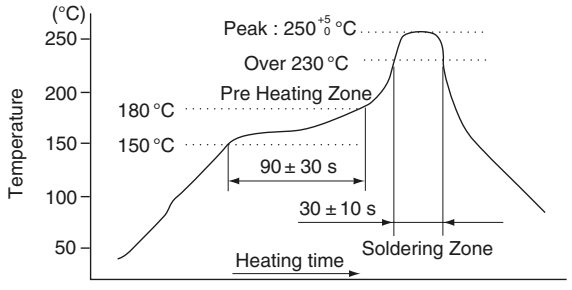
MECHANICAL SPECIFICATIONS

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	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

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^{-6} /°C maximum 100 Ω ~ 2 MΩ: ± 100 10^{-6} /°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



Reflow : two times maximum

ENVIRONMENTAL SPECIFICATIONS

Test item	Test conditions	Specifications
Thermal shock	- 65 ~ 125 °C (0.5 h), 5 cycles	[ΔR/R ≤ 2 %] [S.S. ≤ 1 %]
Humidity	- 10 ~ 65 °C (Relative humidity 80 ~ 98 %), 10 cycles, 240 h	[ΔR/R ≤ 2 %]
Shock	981 m/s², 6 ms 6 directions for 3 times each	[ΔR/R ≤ 1%] [S.S. ≤ 1 %]
Vibration	Amplitude 1.52 mm or Acceleration 196 m/s², 10 ~ 2000 Hz, 3 directions, 12 times each	
Load Life	85 °C, 0.25 W, 1000 h	[ΔR/R ≤ 3 %] [S.S. ≤ 1 %]
Low temperature operation	- 55 °C, 2 h	[ΔR/R ≤ 2 %] [S.S. ≤ 2 %]
High temperature exposure	120 °C, 250 h	[ΔR/R ≤ 3 %] [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	[ΔR/R ≤ 1 %]
	Sn Flow: 260 °C ± 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	

MAXIMUM INPUT RATINGS

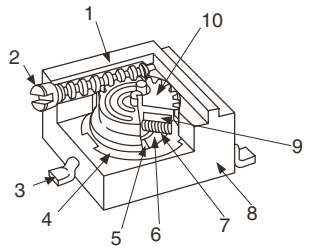
Nominal resistance values (Ω)	Resistance code	Maximum input voltage (V)	Maximum wiper current (mA)
10*	100	1.00	100
20*	200	2.00	100
50	500	3.53	70.7
100	101	5.00	50.0
200	201	7.07	35.4
500	501	11.2	22.4
1 k	102	15.8	15.8
2 k	202	22.4	11.2
5 k	502	35.4	7.07
10 k	103	50.0	5.00
20 k	203	70.7	3.54
50 k	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 oforer basis

CONSTRUCTION

	Part Name		Material	Flammability
1	Housing		Polyphenylenesulphide	UL-94V-O
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_2 cermet	-
7	Wiper		Multi metal alloy	-
8	Adhesive		Epoxy	
9	Rubber cushion		Silicone rubber	
10	Rotor gear		PA (Polyamide)	UL-94HB

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



LIST OF PART NUMBERS

Adjustment position	Shape of terminal	Form of packing					
		Taping (reel)		Magazine (stick)		Vinyl bag	
		Sn-Pb	Sn (Lead (Pb)-free)	Sn-Pb	Sn (Lead (Pb)-free)	Sn-Pb	Sn (Lead (Pb)-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./reel		50 pcs./reel	

FIG. 1: 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	-

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 resitance values> (Fig.1)

* Verify the above part numbers when placing orders.

* Taping specification is not sold seperately and must be purchased in reel units.

ORDERING INFORMATION

ST-5		T	W	204
SERIES NAME	TEMINAL PIN	FORM OF PACKAGING	PRODUCT SHAPE (SHAPE OF TERMINAL)	RESISTANCE CODE
	Blank: Sn-Pb	T: Taping (Reel)	W: Gull wing (Top adjustment)	
	E: Sn (Lead(Pb)-free)	M: Magazine (Stick)	X: Gull wing (Side adjustment)	
		Blank: Bulk in vinyl bags	P: Gull wing (Side adjustment)	
			R: Gull wing (Side adjustment)	

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