

## Surface Mount Cermet Trimmers (single turn)



### FEATURES

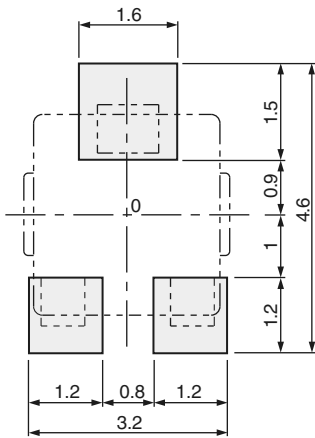
- Lead (Pb)-free soldering, Cadmium-free
- Top and side adjustment styles
- Rotor with a cross slot for ease of adjustment
- Leaded terminals provide strong adhesive strength against P.C.B. bending
- J-hook, Gull wing and leaded terminal configurations
- Sealed / Washable
- RoHS compliant



**DIMENSIONS** in millimeters

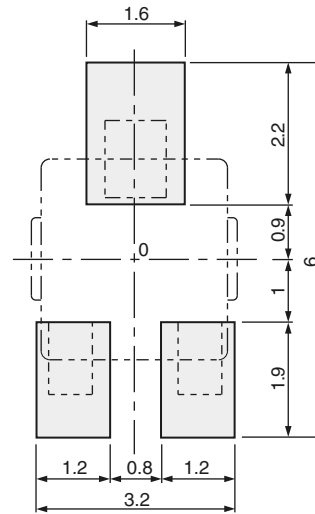
### RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

ST-32A, G, EA, EG



For reflow soldering

ST-32B, H, EB, EH

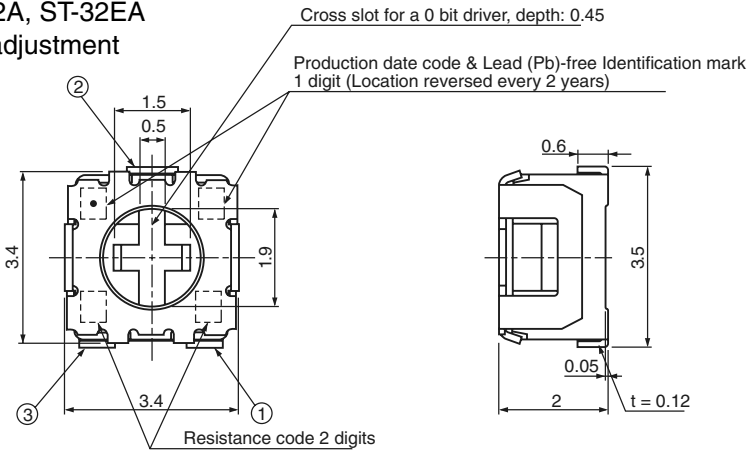


(Unit: mm)

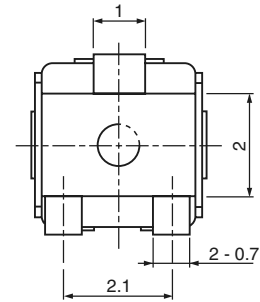
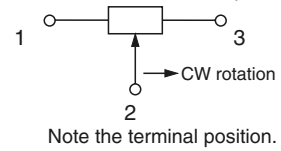
Note) The zero point is the center of mounting.

**DIMENSIONS** in millimeters  
**OUTLINE DIMENSIONS**

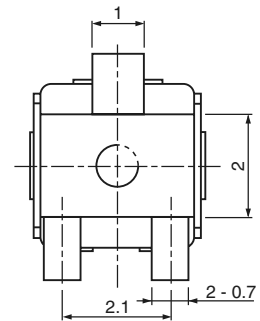
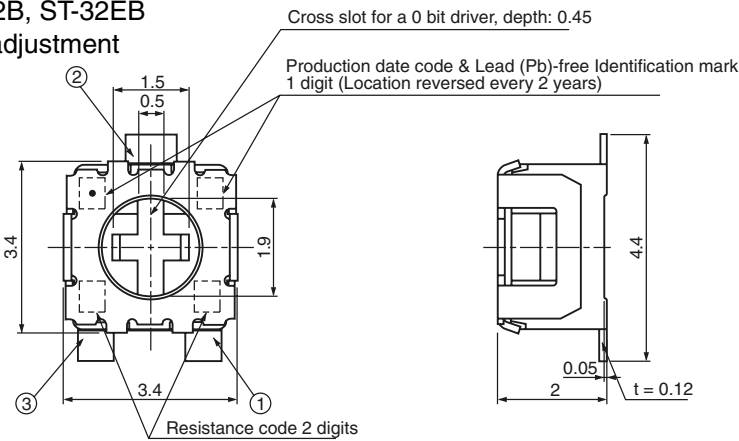
ST-32A, ST-32EA  
Top adjustment



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

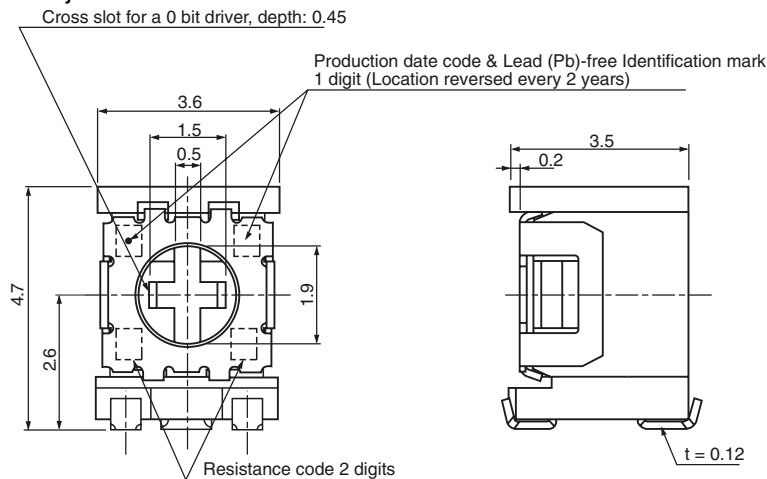


ST-32B, ST-32EB  
Top adjustment

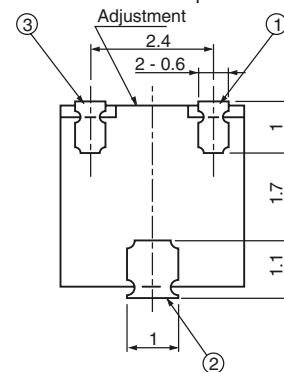
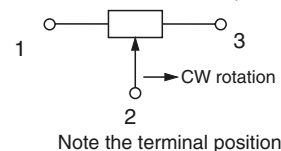


Specifications are subject to change without notice. Specifications in this catalog are for reference. The formal specification sheets will be submitted upon request.

ST-32G, ST-32EG  
Side adjustment

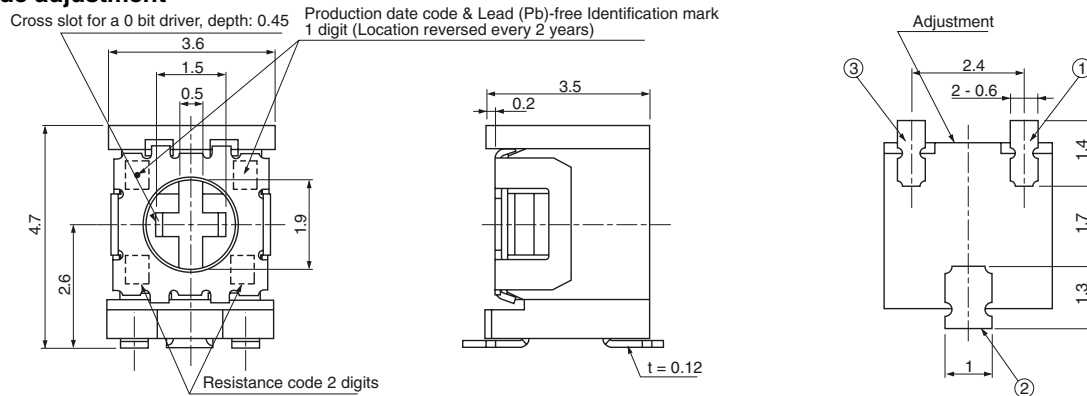


Unless otherwise specified, tolerance:  $\pm 0.3$  (Unit: mm)



**DIMENSIONS** in millimeters

**ST-32H, ST-32EH**  
**Side adjustment**



**PACKAGING SPECIFICATIONS**

Taping packaging specifications

Taping version is packaged in 500 pcs. per reel.

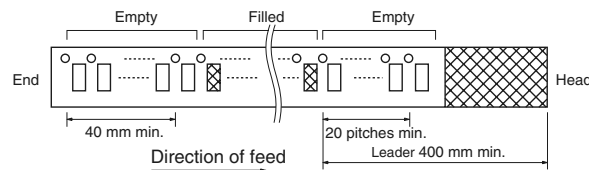
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500 pcs., etc.

ST-32TA, ETA, TB and ETB versions are boxed with 4 reels (2000 pcs.). ST-32TG, ETG, TH and ETH versions are boxed with one reel (500 pcs.).

Maximum number of consecutive missing pieces = 2

Leader length and reel dimension are shown in the diagrams below.

**EMBOSSED TAPE DIMENSIONS**

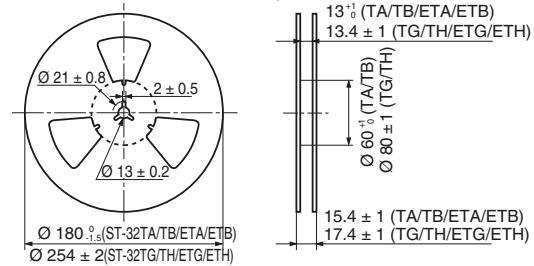


**REEL DIMENSIONS**

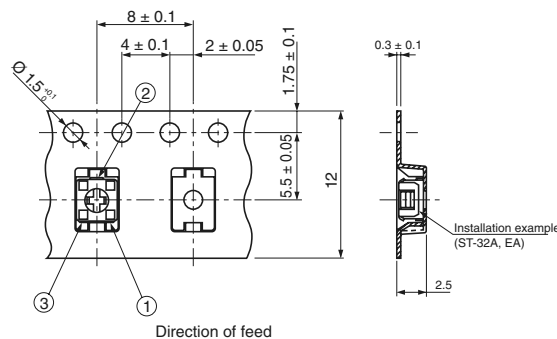
(Conforms to JIS C 0806-3)

(Unit: mm)

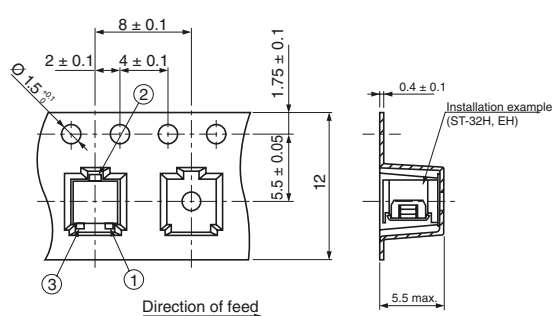
(In accordance with EIAJ ET-7200A)



**ST-32TA, TB, ETA, ETB**



**ST-32TG, TH, ETG, ETH**



**Vinyl bag packaging specifications**

Unit of bulk in vinyl bag packaging is 100 pcs. per pack.

Boxing of bulk in vinyl bags is performed with 500 pcs. per box.

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**MECHANICAL SPECIFICATIONS**

<b>Mechanical turn</b>	250 ° (1 turn)
<b>Operating torque</b>	5 mN m {51 gf cm} maximum
<b>Stop Strength</b>	20 mN m {204 gf cm} minimum
<b>Rotational life</b>	100 cycles [ $\Delta R/R \leq \pm (2 \Omega + 3 \%)$ ]
<b>Thrust to rotor</b>	5 N {0.51 kgf} minimum
<b>Solderability</b>	Sn-Pb: 235 °C, 2 s Sn-Cu (Lead (Pb)-free): 245 ± 3 °C, 2 ~ 3 s
<b>Shear (Adhesion)</b>	5 N {0.51 kgf} 10 s
<b>Substrate bending</b>	Width 90 mm, bend 3 mm, 5 s, 1 time
<b>Pull-off strength</b>	5 N {0.51 kgf} 10 s

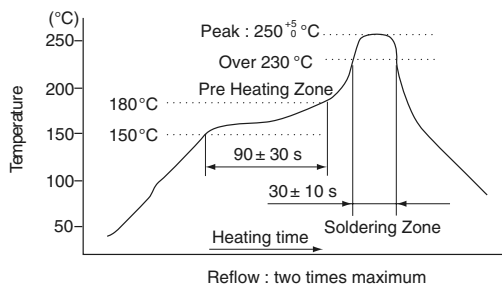
**ELECTRICAL CHARACTERISTICS**

Nominal resistance range	10 Ω ~ 2 MΩ
Resistance tolerance	± 20 %
Power ratings	0.125 W (70 °C) 0 W (125 °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 angle	210 ° (1 turn)
End resistance	1 % or 2 Ω, whichever is greater
C.R.V.	1 % or 3 Ω, whichever is greater
Operating temp. range	- 55 ~ 125 °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	AC500 V, 60 s
Net weight	Approx. 0.05 g (ST-32A, B, EA, EB) Approx. 0.11 g (ST-32G, H, EG, EH)

**ENVIRONMENTAL SPECIFICATIONS**

Test item	Test conditions	Specifications
Thermal shock	- 65 ~ 125 °C (0.5 h), 5 cycles	[ $\Delta R/R \leq 2 \%$ ] [S.S. ≤ 1 %]
Humidity	- 10 ~ 65 °C (Relative humidity 80 ~ 98 %), 10 cycles, 240 h	[ $\Delta R/R \leq 2 \%$ ]
Shock	981 m/s <sup>2</sup> , 6 ms 6 directions for 3 times each	[ $\Delta R/R \leq 1 \%$ ] [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, 0.125 W, 1000 h	[ $\Delta R/R \leq 3 \%$ ] [S.S. ≤ 1 %]
Low temperature operation	- 55 °C, 2 h	[ $\Delta R/R \leq 2 \%$ ] [S.S. ≤ 2 %]
High temperature exposure	125 °C, 250 h	[ $\Delta R/R \leq 3 \%$ ] [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  S-Cu 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	[ $\Delta R/R \leq 1 \%$ ]

Reflow profile for soldering heat evaluation

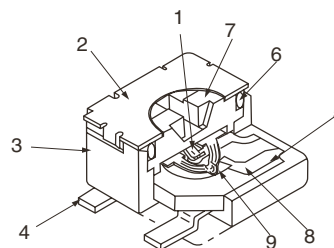


MAXIMUM INPUT RATINGS			
Nominal resistance values ( $\Omega$ )	Resistance code	Maximum input voltage (V)	Maximum wiper current (mA)
10*	11	1.00	100
20*	21	1.58	79.1
50	51	2.50	50.0
100	12	3.53	35.4
200	22	5.00	25.0
300	32	6.12	20.4
500	52	7.91	15.8
1 k	13	11.2	11.2
2 k	23	15.8	7.91
3 k	33	19.4	6.45
5 k	53	25.0	5.00
10 k	14	35.4	3.54
20 k	24	50.0	2.50
30 k	34	61.2	2.04
50 k	54	79.1	1.58
100 k	15	112	1.12
200 k	25	158	0.79
500 k	55	200	0.40
1 M	16	200	0.20
2 M	26	200	0.10

The products indicated by \* mark are manufactured upon receipt of order basis

CONSTRUCTION			
Part Name	Material		Flammability
1 Wiper	Multi metal alloy		-
2 Cover	Stainless steel (SUS 304)		
3 Housing	Epoxy		UL-94V-0
4 Terminal pin	Sn-Pb	Copper alloy, Solder-plated	-
	Sn-Cu	Copper alloy, Sn-Cu-plated	
5 Base element	Ceramic		
6 "O" ring	Silicone rubber		UL-94HB
7 Rotor	PPS (Polyphenylenesulphide)		UL-94V-0
8 Electrode	Ag-Pd cermet		-
9 Resistive element	RuO <sub>2</sub> cermet		

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



LIST OF PART NUMBERS					
Adjustment position	Shape of terminal	Form of packing			
		Taping (reel)		Vinyl bag	
		Sn-Pb	Sn-Cu (Lead (Pb)-free)	Sn-Pb	Sn-Cu (Lead (Pb)-free)
Top adjustment	A (J-hook)	ST-32TA	ST-32ETA	ST-532A	ST-32EA
	B (Gull-wing)	ST-32TB	ST-32ETB	ST-32B	ST-32EB
Side adjustment	G (J-hook)	ST-32TG	ST-32ETG	ST-32G	ST-32EG
	H (Gull-wing)	ST-32TH	ST-32ETH	ST-32H	ST-32EH
Pieces in package		500 pcs./reel		100 pcs./reel	

FIG. 1: NOMINAL RESISTANCE VALUES						
10 $\Omega$ *	20 $\Omega$ *	50 $\Omega$	100 $\Omega$	200 $\Omega$	300 $\Omega$	500 $\Omega$
1 k $\Omega$	2 k $\Omega$	3 k $\Omega$	5 k $\Omega$	10 k $\Omega$	20 k $\Omega$	30 k $\Omega$
50 k $\Omega$	100 k $\Omega$	200 k $\Omega$	500 k $\Omega$	1 M $\Omega$	2 M $\Omega$	-

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 specification is not sold separately and must be purchased in reel units.



**ORDERING INFORMATION**

ST-32		T	A	204
SERIES NAME	TERMINAL PIN	FORM OF PACKAGING	PRODUCT SHAPE (SHAPE OF TERMINAL)	RESISTANCE CODE
	Blank: Sn-Pb E: Sn-Cu (Lead (Pb)-free)	T: Taping (Reel) Blank: Bulk in vinyl bags	A, G: J-hook B, H: Gull wing	

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