

## Surface Mount Cermet Trimmers (single turn)



### FEATURES

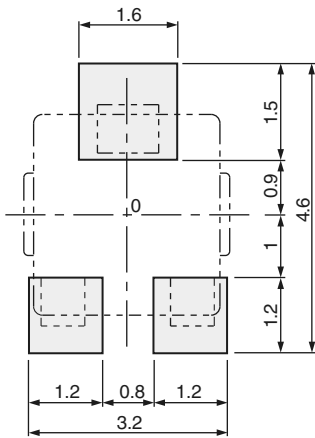
- Lead (Pb)-free soldering, Cadmium-free
- Top and side adjustment styles
- Rotor with a cross slot for ease of adjustment
- Leaded terminals provide strong adhesive strength against P.C.B. bending
- J-hook, Gull wing and leaded terminal configurations
- Sealed / Washable
- RoHS compliant



**DIMENSIONS** in millimeters

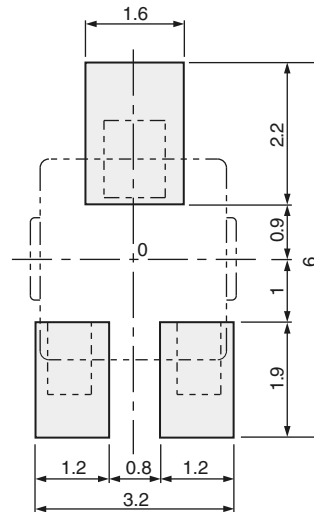
### RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

ST-32A, G, EA, EG



For reflow soldering

ST-32B, H, EB, EH

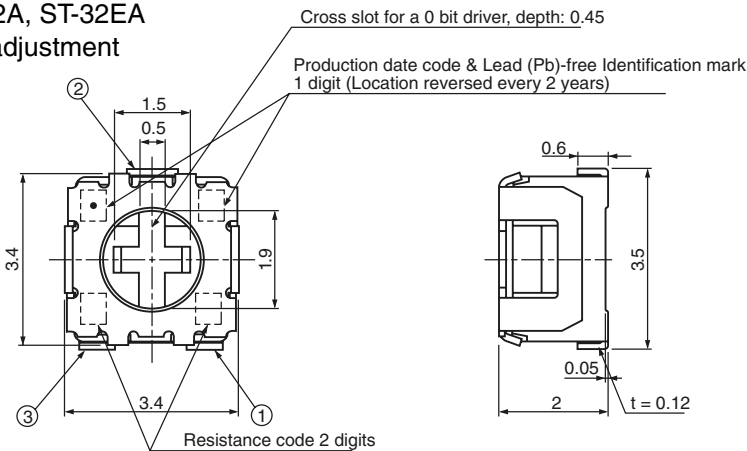


(Unit: mm)

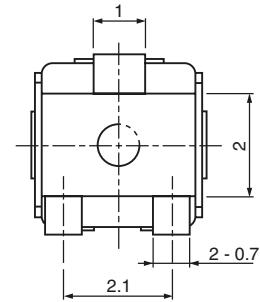
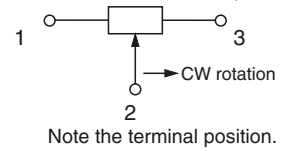
Note) The zero point is the center of mounting.

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

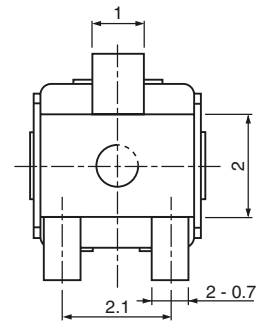
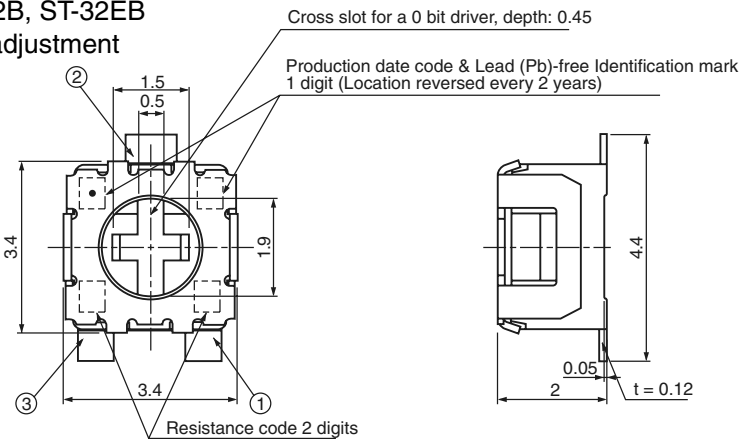
ST-32A, ST-32EA  
Top adjustment



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

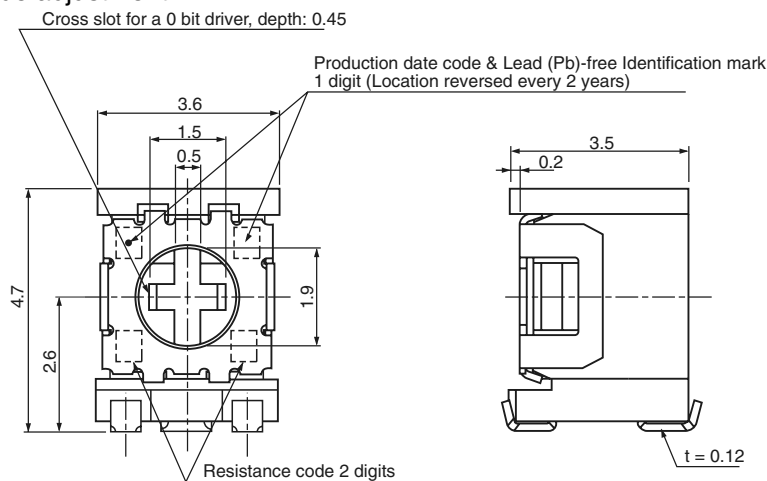


ST-32B, ST-32EB  
Top adjustment

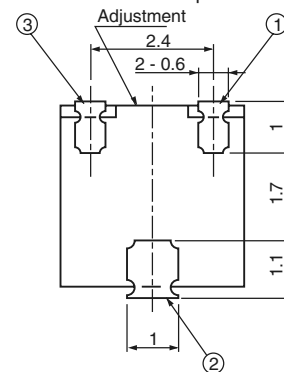
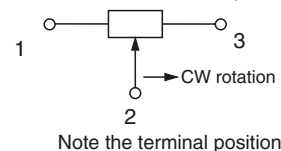


Specifications are subject to change without notice. Specifications in this catalog are for reference. The formal specification sheets will be submitted upon request.

ST-32G, ST-32EG  
Side adjustment

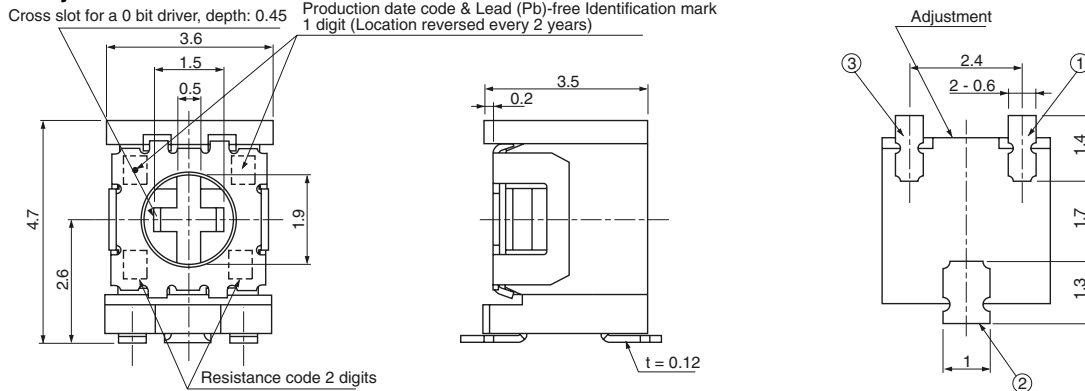


Unless otherwise specified, tolerance:  $\pm 0.3$  (Unit: mm)



**DIMENSIONS** in millimeters

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



**PACKAGING SPECIFICATIONS**

Taping packaging specifications

Taping version is packaged in 500 pcs. per reel.

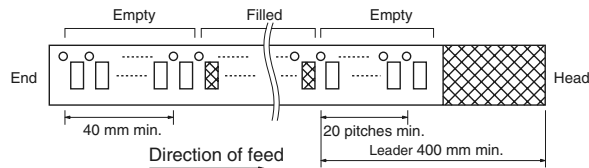
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500 pcs., etc.

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**

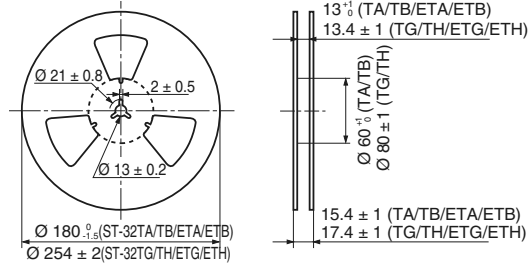


**REEL DIMENSIONS**

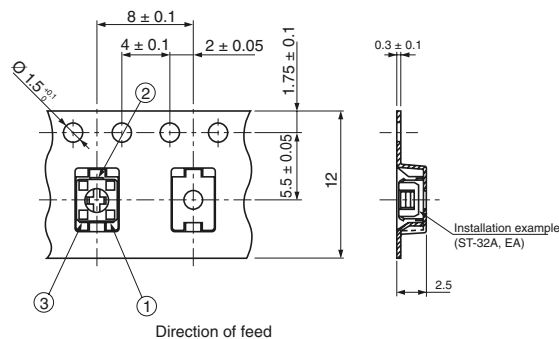
(Conforms to JIS C 0806-3)

(Unit: mm)

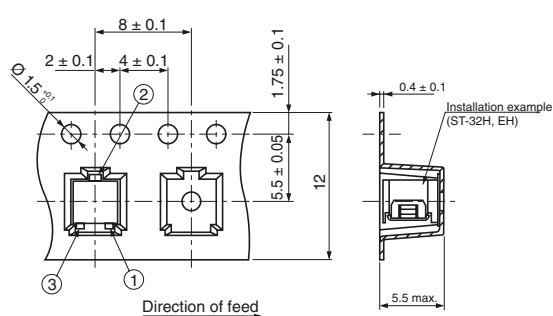
(In accordance with EIAJ ET-7200A)



**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

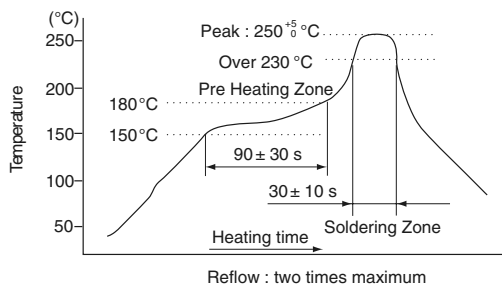
**ELECTRICAL CHARACTERISTICS**

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	[ $\Delta R/R \leq 1 \%$ ]

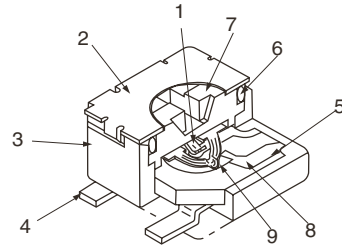
Reflow profile for soldering heat evaluation



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

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.



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

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.



<b>ORDERING INFORMATION</b>				
<b>ST-32</b>		<b>T</b>	<b>A</b>	<b>204</b>
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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