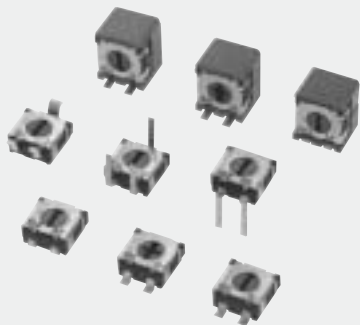


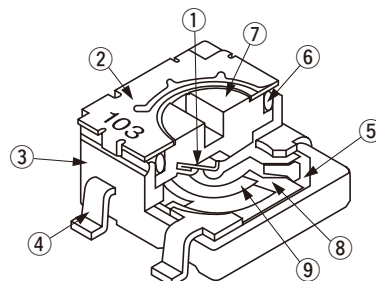
ST-4

SURFACE MOUNT CERMET TRIMMERS (SINGLE TURN)

RoHS compatible



INTERNAL STRUCTURE



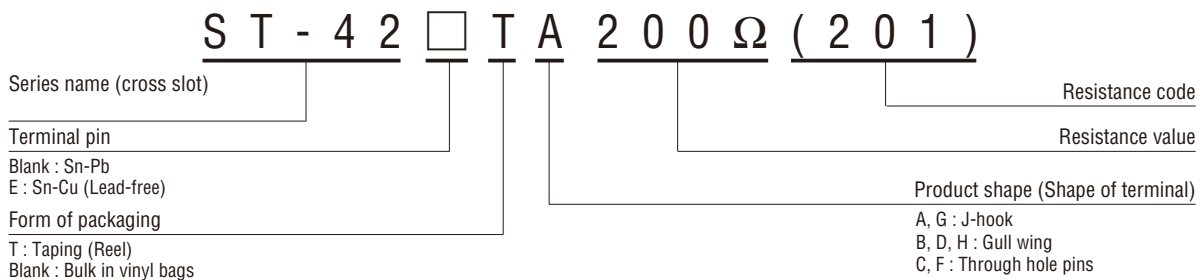
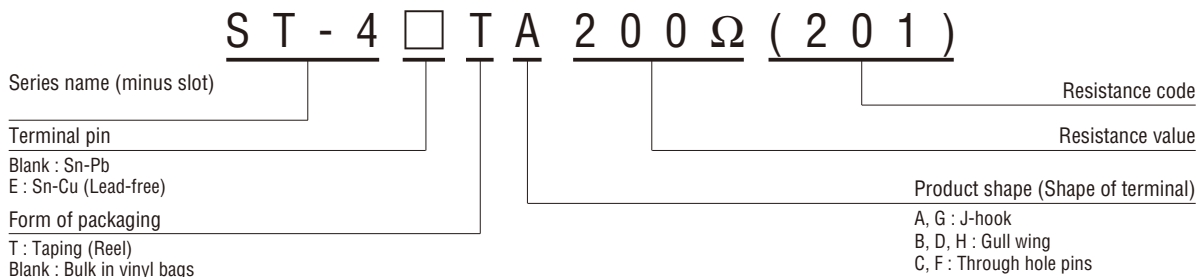
FEATURES

- Lead-free soldering, Cadmium-free
- Wide variety (7 types) to choose from
- Automatic mounting is possible (Taping)
- Flow/reflow soldering is possible
- Sealed construction (Washable)
- Stopper structure prevents terminal pin from being open.
- Cross slot rotor suitable for automatic adjustment

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	UL-94HB
⑥ "O" ring	Silicone rubber	
⑦ Rotor	PPS (Polyphenylenesulphide)	UL-94V-0
⑧ Electrode	Ag-Pd cermet	—
⑨ Resistive element	RuO ₂ cermet	

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

PART NUMBER DESIGNATION



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

ST-4 SURFACE MOUNT TRIMMERS

LIST OF PART NUMBERS

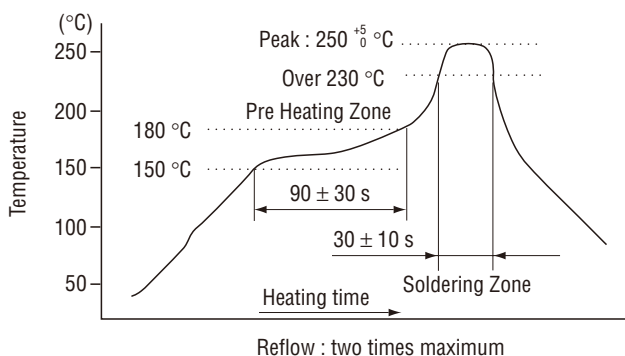
Adjustment position	Shape of terminal	Form of packaging			
		Taping (reel)		Vinyl bag	
		Sn-Pb	Sn-Cu (Lead-free)	Sn-Pb	Sn-Cu (Lead-free)
Top adjustment	A (J-hook)	ST-4/42TA	ST-4/42ETA	ST-4/42A	ST-4/42EA
	B (Gull wing)	ST-4/42TB	ST-4/42ETB	ST-4/42B	ST-4/42EB
	C (Through hole pins)	/	/	ST-4/42C	ST-4/42EC
Rear adjustment	D (Gull wing)	↻ ST-4/42TD	↻ ST-4/42ETD	↻ ST-4/42D	↻ ST-4/42ED
	F (Through hole pins)	/	/	↻ ST-4/42F	↻ ST-4/42EF
Side adjustment	G (J-hook)	ST-4/42TG	ST-4/42ETG	ST-4/42G	ST-4/42EG
	H (Gull wing)	ST-4/42TH	ST-4/42ETH	ST-4/42H	ST-4/42EH
Pieces in package		500 pcs./reel		100 pcs./pack	

The products indicated by ↻ mark are manufactured upon receipt of order basis.
 ※ Slot : ST-4□□, Slot : ST-42□□

ELECTRICAL CHARACTERISTICS

Nominal resistance range	10 Ω ~ 2 MΩ
Resistance tolerance	± 20 %
Power ratings	0.25 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 ⁻⁶ /°C maximum 100 Ω ~ 2 MΩ : ± 100 10 ⁻⁶ /°C maximum
Insulation resistance	1000 MΩ minimum (DC500 V)
Dielectric strength	AC500 V, 60 s
Net weight	Approx. 0.12 g (ST-4A, B, C, D, F, EA, EB, EC, ED, EF) Approx. 0.22 g (ST-4G, H, EG, EH)

<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

↻ : Not manufactured

※ : 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.

※ : Cross slot available : ST-42□□

MECHANICAL CHARACTERISTICS

Mechanical angle	240° (1 turn)
Operating torque	10 mN·m {102 gf·cm} maximum
Stop strength	30 mN·m {306 gf·cm} minimum
Rotational life	100 cycles [Δ R/R ≤ ± (2 Ω + 3 %)]
Thrust to rotor	5 N {0.51 kgf} minimum
Solderability	Sn-Pb : 235 °C, 2 s Sn-Cu (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 ≤ 2 %] [S.S. ≤ 1 %]
Humidity	-10 ~ 65 °C (Relative humidity 80 ~ 98 %), 10 cycles, 240 h	[Δ R/R ≤ 2 %]
Shock	981 m/s ² , 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 ² , 10 ~ 2000 Hz, 3 directions, 12 times each	
Load life	70 °C, 0.25 W 1000 h	[Δ R/R ≤ 3 %] [S.S. ≤ 1 %]
Low temp. operation	-55 °C, 2 h	[Δ R/R ≤ 2 %] [S.S. ≤ 2 %]
High temp. exposure	125 °C, 250 h	[Δ R/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	[Δ R/R ≤ 1 %]
	Sn-Cu 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-4 SURFACE MOUNT TRIMMERS

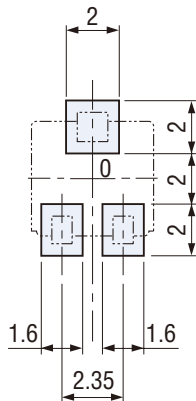
MAXIMUM INPUT RATINGS

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

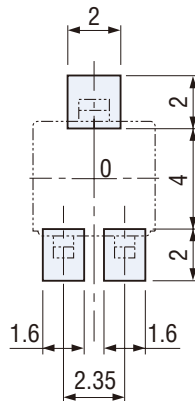
The products indicated by ↻ mark are manufactured upon receipt of order basis.

RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

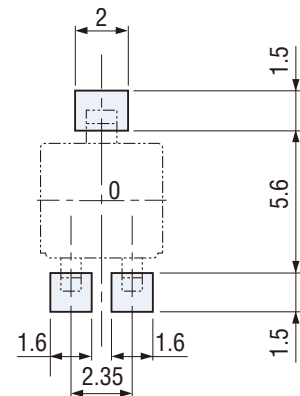
ST-4A, 4EA



ST-4B, 4EB

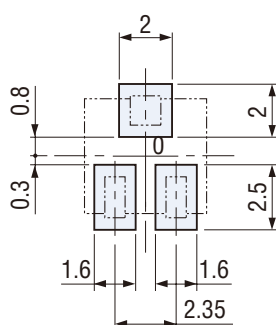


ST-4D, 4ED

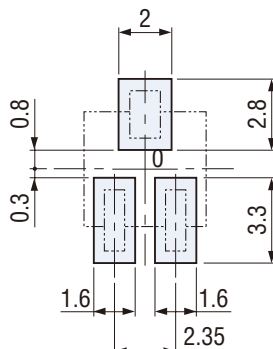


(Unit: mm)

ST-4G, 4EG



ST-4H, 4EH



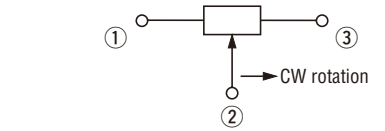
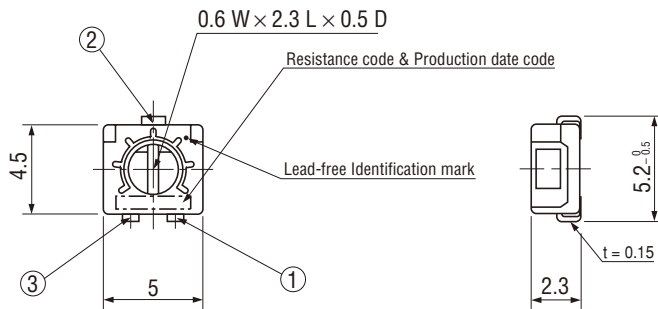
Note) The zero point is the center of mounting.

ST-4 SURFACE MOUNT TRIMMERS

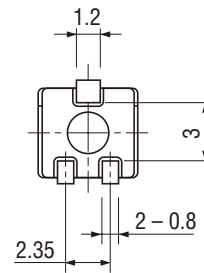
OUTLINE DIMENSIONS

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

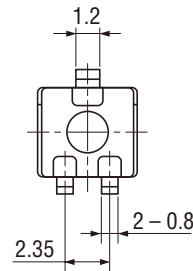
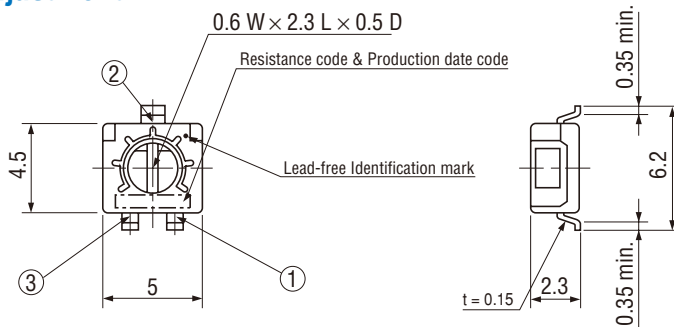
● ST-4A, 4EA Top adjustment



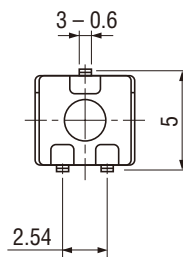
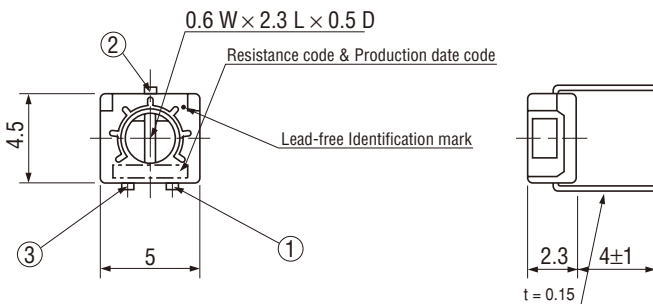
※ : Note the terminal position.



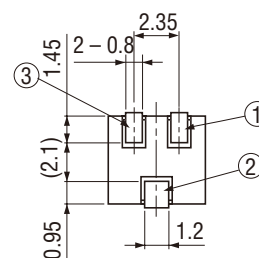
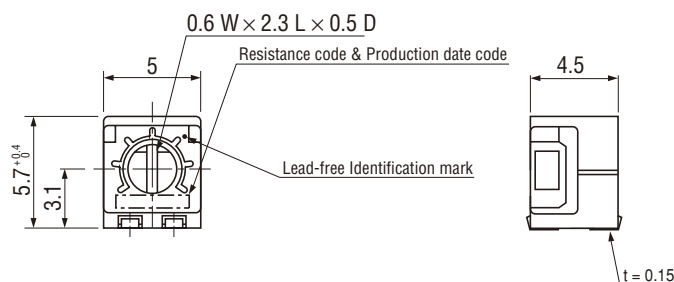
● ST-4B, 4EB Top adjustment



● ST-4C, 4EC Top adjustment



● ST-4G, 4EG Side adjustment

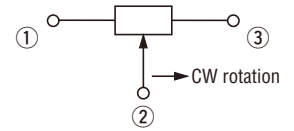
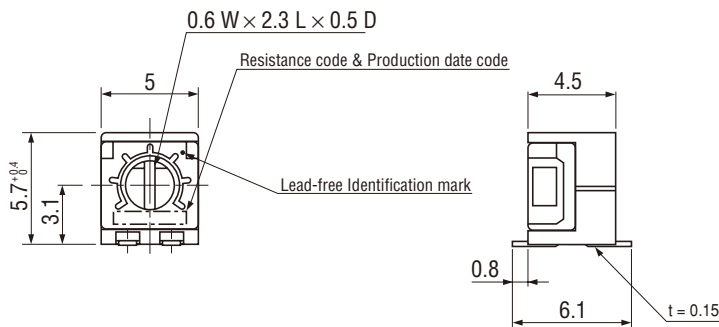


ST-4 SURFACE MOUNT TRIMMERS

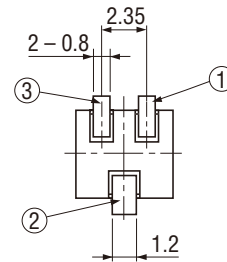
OUTLINE DIMENSIONS

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

ST-4H, 4EH Side adjustment

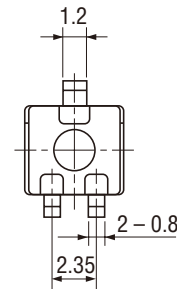
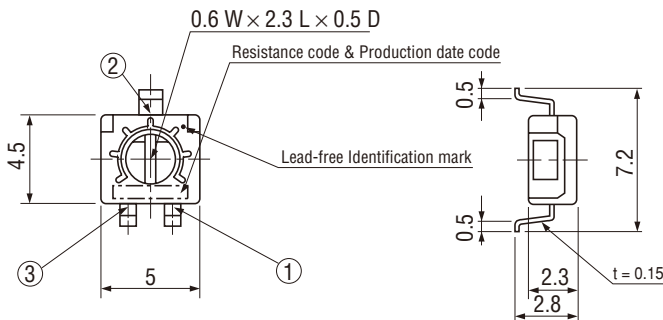


* : Note the terminal position.



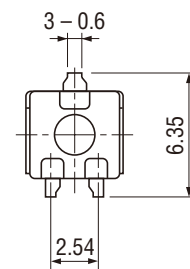
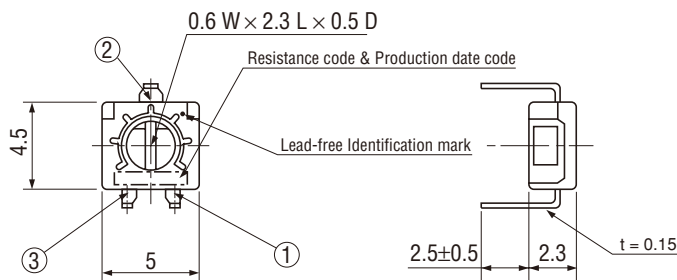
ST-4D, 4ED Rear adjustment

<Semi-standard products>

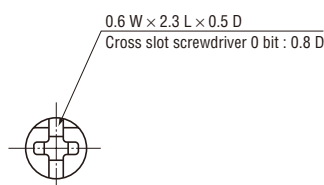


ST-4F, 4EF Rear adjustment

<Semi-standard products>



ST-42, 42E CROSS SLOT DIMENSION



ST-4 SURFACE MOUNT TRIMMERS

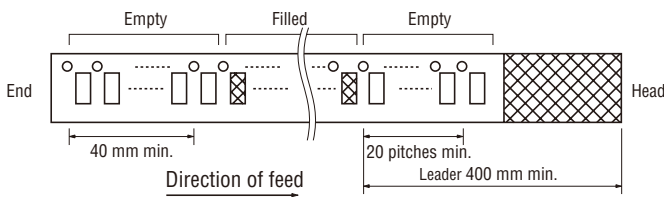
■ PACKAGING SPECIFICATIONS

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

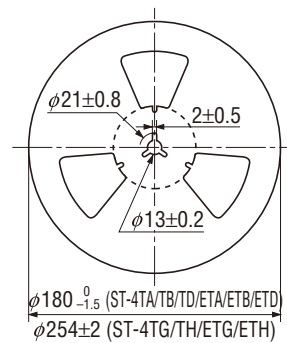
Maximum number of consecutive missing pieces=2
Leader length and reel dimension are shown in the dia-diagrams below.

● EMBOSSED TAPE DIMENSIONS

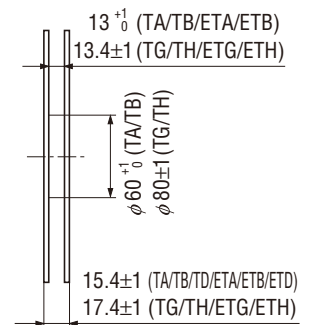


● REEL DIMENSIONS

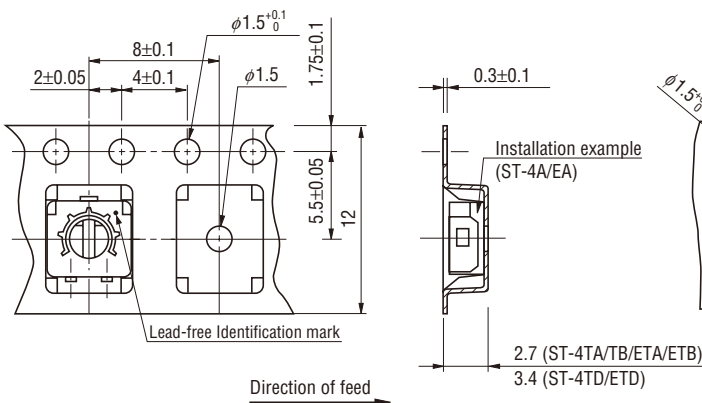
(Conforms to JIS C 0806-3)
(In accordance with EIAJ ET-7200A)



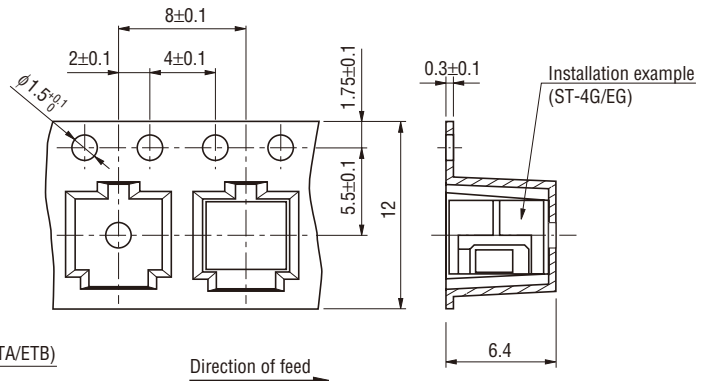
(Unit: mm)



● ST-4TA/TB/TD/ETA/ETB/ETD



● ST-4TG/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.