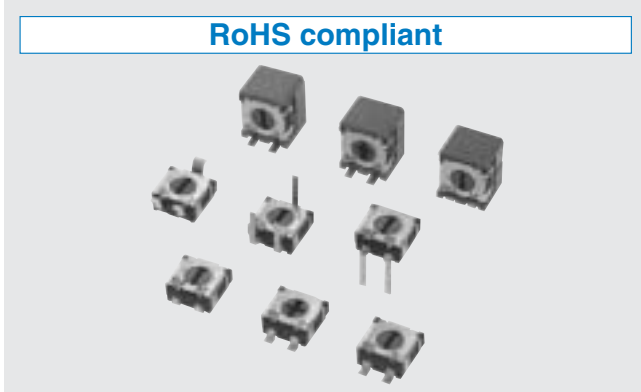


# SURFACE MOUNT CERMET TRIMMERS (SINGLE TURN)

# ST-4

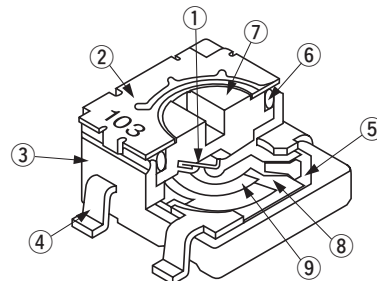
### RoHS compliant



## 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

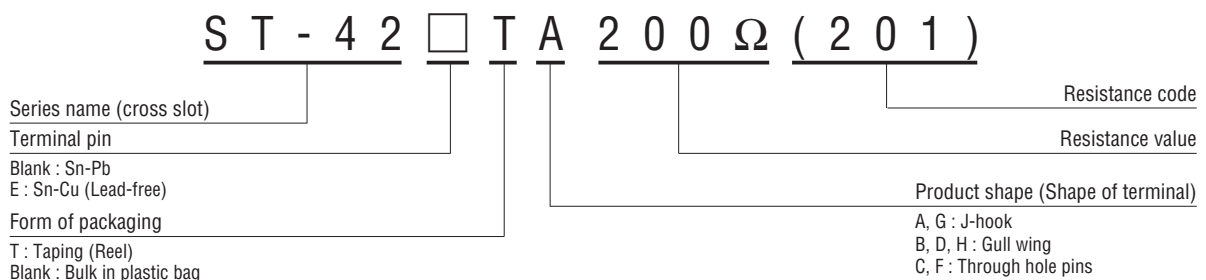
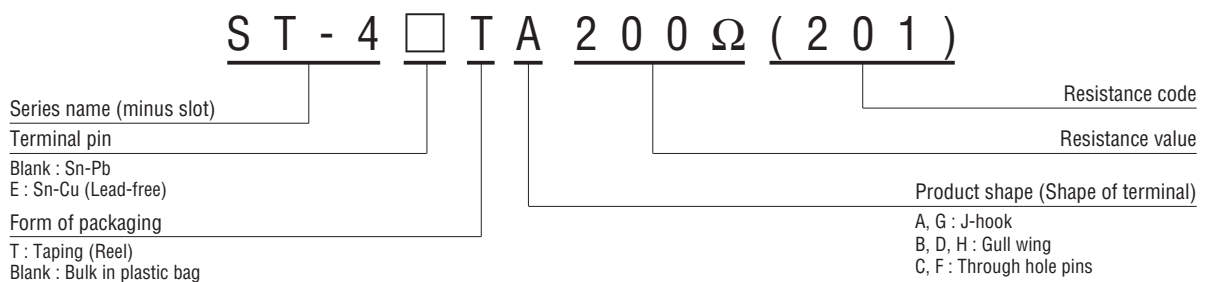
### INTERNAL STRUCTURE



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 <sub>2</sub> cermet	

CFCs, Halon, Carbon tetrachloride and designated bromic flame retardant PBBOs 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)		Plastic 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 (Gull wing)	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	

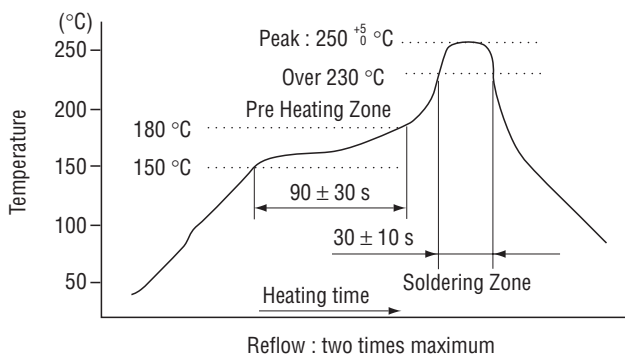
The products indicated by ↻ mark are manufactured upon receipt of order basis.

\* ⊖ 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 <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. 0.12 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 [ $\Delta R/R \leq \pm (2 \Omega + 3 \%)$ ]
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	$[\Delta R/R \leq 2 \%]$ [S.S. $\leq 1 \%$ ]
Humidity	-10 ~ 65 °C (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. $\leq 1 \%$ ]
Vibration	Amplitude 1.52 mm or Acceleration 196 m/s <sup>2</sup> , 10 ~ 2000 Hz, 3 directions, 12 times each	$[\Delta R/R \leq 1 \%]$ [S.S. $\leq 1 \%$ ]
Load life	70 °C, 0.25 W 1000 h	$[\Delta R/R \leq 3 \%]$ [S.S. $\leq 1 \%$ ]
Low temp. operation	-55 °C, 2 h	$[\Delta R/R \leq 2 \%]$ [S.S. $\leq 2 \%$ ]
High temp. exposure	125 °C, 250 h	$[\Delta R/R \leq 3 \%]$ [S.S. $\leq 2 \%$ ]
Immersion seal	85 °C, 60 s	No leaks (No continuous bubbles)
Soldering heat	Sn-Pb 260 °C, 10 s or 215 °C, 35 s 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	$[\Delta R/R \leq 1 \%]$

$\Delta R/R$  : Change in total resistance  
S.S. : Setting stability

# ST-4 SURFACE MOUNT TRIMMERS

## MAXIMUM INPUT RATINGS

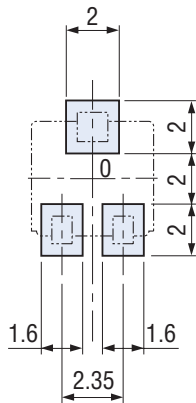
Nominal resistance values ( $\Omega$ )	Resistance code	Maximum input voltage (V)	Maximum wiper current (mA)
↻ 10 ↻ 20 50 100 200 500	100 200 500 101 201 501	1.00 2.00 3.53 5.00 7.07 11.2	100 100 70.7 50.0 35.4 22.4
1 k 2 k 5 k 10 k 20 k 50 k	102 202 502 103 203 503	15.8 22.4 35.4 50.0 70.7 112	15.8 11.2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

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

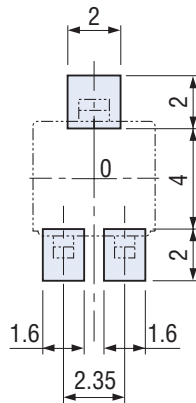
## RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

(Unit: mm)

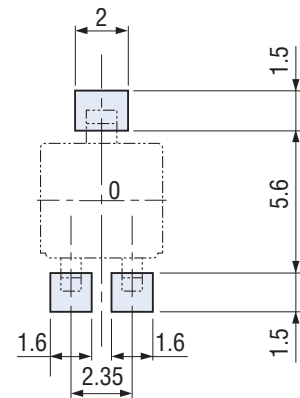
### ST-4A, 4EA



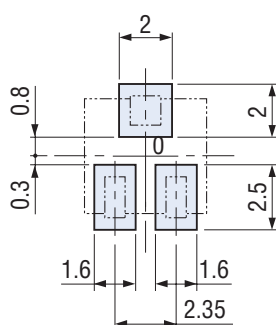
### ST-4B, 4EB



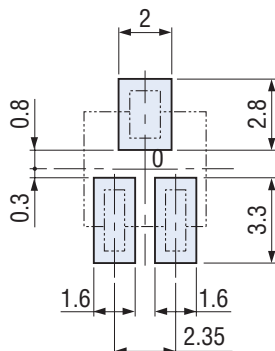
### ST-4D, 4ED



### ST-4G, 4EG



### ST-4H, 4EH

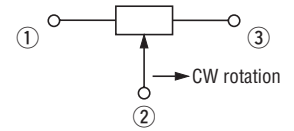


Note) The zero point is the center of mounting.

# ST-4 SURFACE MOUNT TRIMMERS

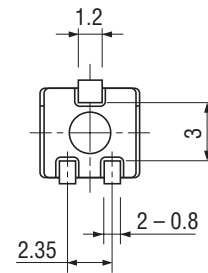
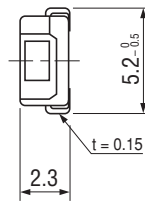
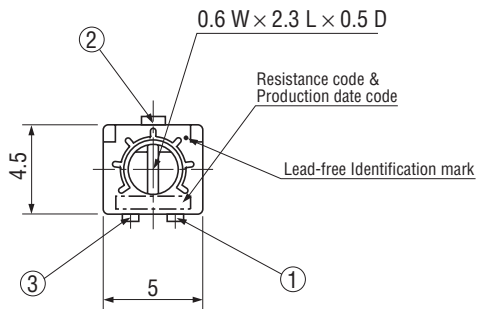
## OUTLINE DIMENSIONS

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

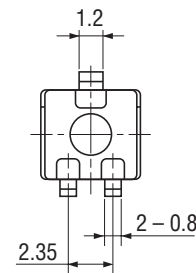
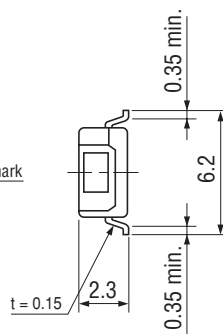
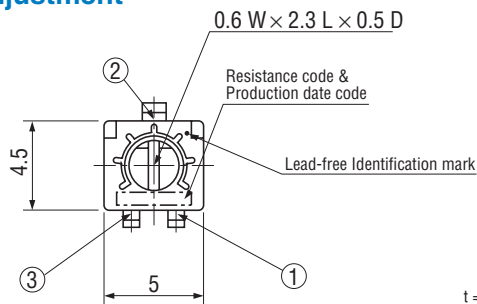


\* Note the terminal position.

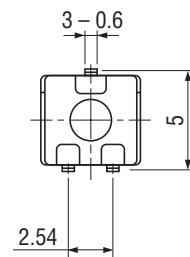
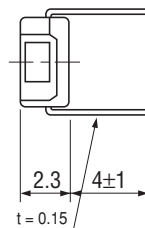
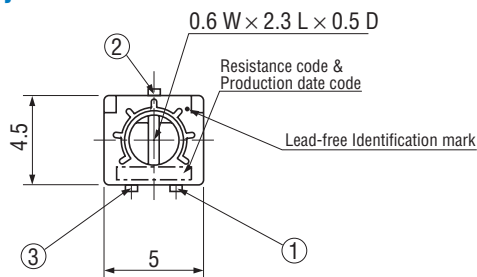
### ST-4A, 4EA Top adjustment



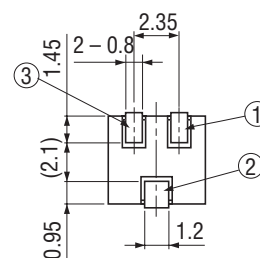
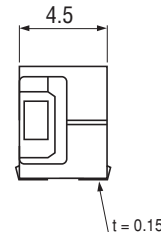
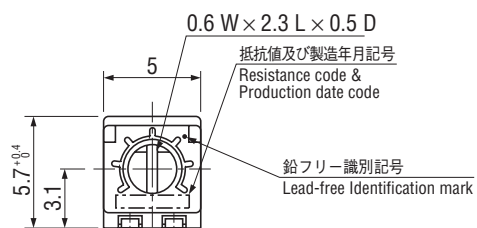
### ST-4B, 4EB Top adjustment



### ST-4C, 4EC Top adjustment



### ST-4G, 4EG Side adjustment

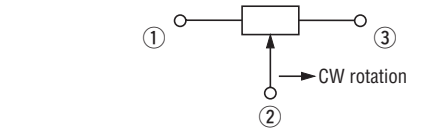
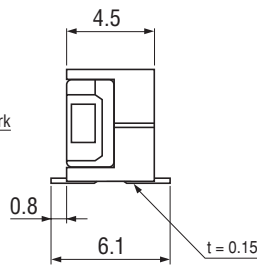
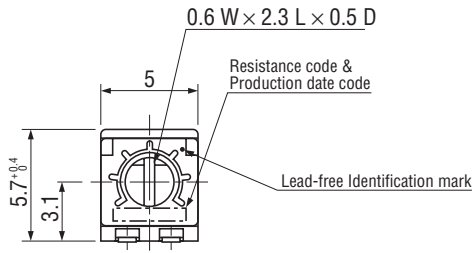


# ST-4 SURFACE MOUNT TRIMMERS

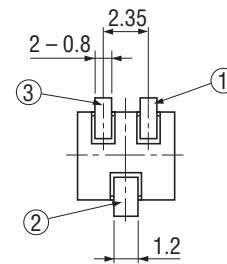
## OUTLINE DIMENSIONS

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

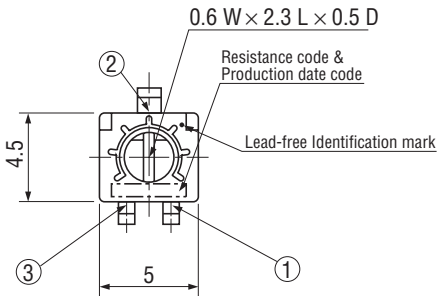
### ● ST-4H, 4EH Side adjustment



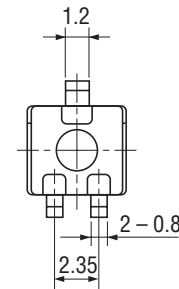
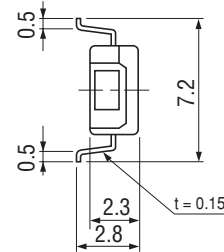
\* Note the terminal position.



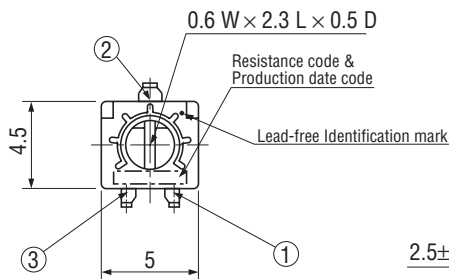
### ● ST-4D, 4ED Rear adjustment



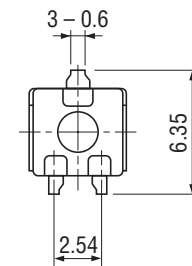
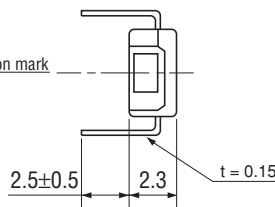
<Semi-standard products>



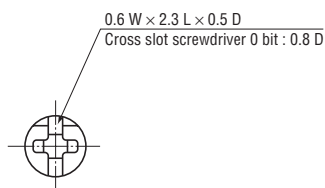
### ● ST-4F, 4EF Rear adjustment



<Semi-standard products>



### ● ST-42, 42E CROSS SLOT DIMENSION



# ST-4 SURFACE MOUNT TRIMMERS

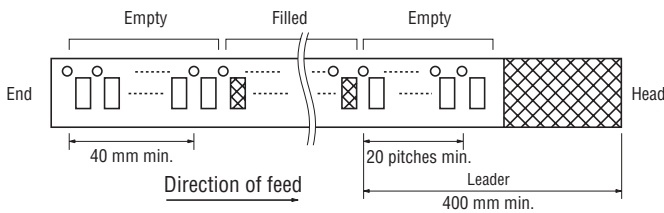
## PACKAGING SPECIFICATIONS

### <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.

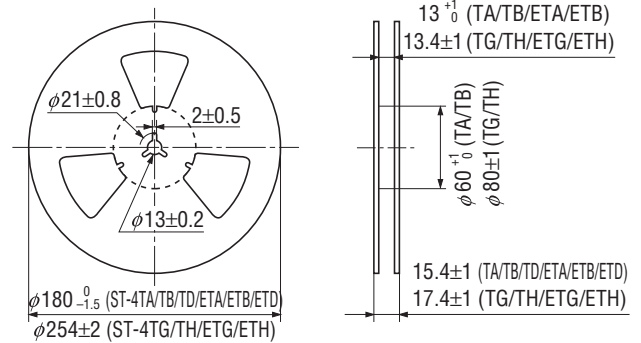
### EMBOSED TAPE DIMENSIONS



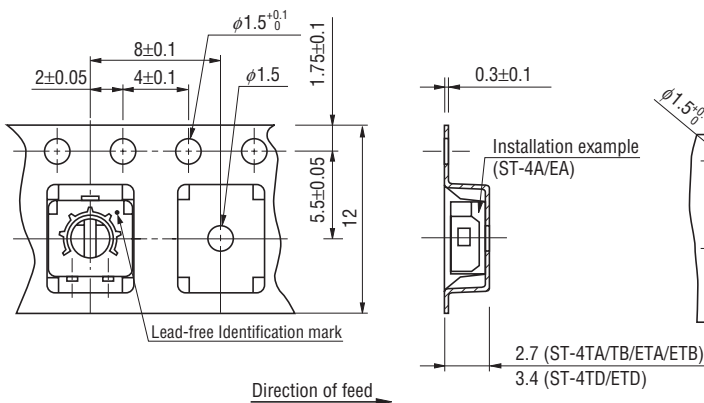
### REEL DIMENSIONS

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

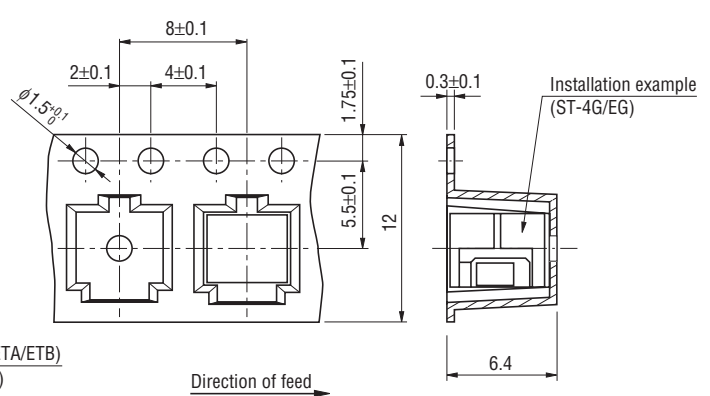
(Unit: mm)



### ST-4TA/TB/TD/ETA/ETB/ETD



### ST-4TG/TH/ETG/ETH



### <Bulk pack specifications>

- Unit of bulk in a plastic bag is 100 pcs. per pack.
- Boxing of bulk in a plastic bag is performed with 500 pcs. per box.