



THE DATASHEET OF ST32ETG103



SURFACE MOUNT CERMET TRIMMERS (SINGLE TURN) **ST-32**

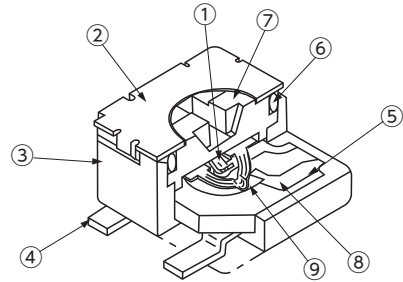
RoHS compliant



FEATURES

- RoHS compliant
- 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: Refer to page 628.)
- Resin materials are UL Recognized 94V-0 or 94V-1 equivalent

INTERNAL STRUCTURE



| | Part name | Material |
|---|-------------------|--------------------------------|
| ① | Wiper | Multi metal alloy |
| ② | Cover | Stainless steel (SUS 304) |
| ③ | Housing | Epoxy |
| ④ | Terminal pin | Copper alloy, Sn-Cu-plated |
| ⑤ | Base element | Ceramic |
| ⑥ | "O" ring | Silicone rubber |
| ⑦ | Rotor | PPS (Polyphenylenesulphide) |
| ⑧ | Electrode | Ag-Pd cermet |
| ⑨ | Resistive element | RuO ₂ cermet |

PART NUMBER DESIGNATION

S T - 3 2 E T A 1 0 0 Ω (1 2)

Series name

Resistance code

Terminal pin

E : Sn-Cu (Lead-free)

Resistance value

Form of packaging

T : Taping (Reel)

Blank : Bulk in plastic bag

Product shape (Shape of terminal)

A : J-hook(Top adjustment)

B : Gull wing(Top adjustment)

G : J-hook (Side adjustment)

H : Gull wing(Side adjustment)

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

ST-32

SURFACE MOUNT TRIMMERS

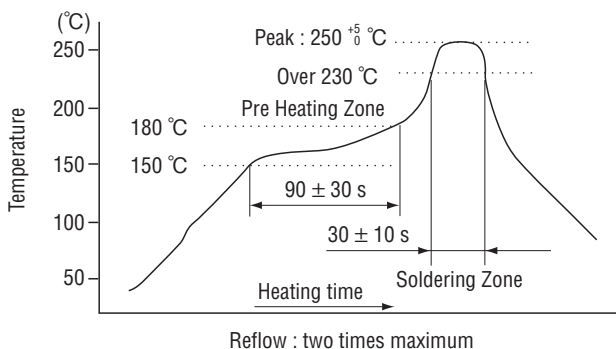
LIST OF PART NUMBERS

| Adjustment position | Shape of terminal | Form of packaging | |
|---------------------|-------------------|-------------------|---------------|
| | | Taping (reel) | Plastic bag |
| Top adjustment | A (J-hook) | ST-32ETA | ST-32EA |
| | B (Gull wing) | ST-32ETB | ST-32EB |
| Side adjustment | G (J-hook) | ST-32ETG | ST-32EG |
| | H (Gull wing) | ST-32ETH | ST-32EH |
| Pieces in package | | 500 pcs./reel | 100 pcs./pack |

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 ⁻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. 0.05 g (ST-32EA, EB) Approx. 0.11 g (ST-32EG, EH) |

Reflow profile for soldering heat evaluation



Nominal resistance values

| | | | | | | |
|--------|--------|--------|--------|-------|-------|-------|
| ⊖ 10 Ω | ⊖ 20 Ω | 50 Ω | 100 Ω | 200 Ω | 300 Ω | 500 Ω |
| 1 kΩ | 2 kΩ | 3 kΩ | 5 kΩ | 10 kΩ | 20 kΩ | 30 kΩ |
| 50 kΩ | 100 kΩ | 200 kΩ | 500 kΩ | 1 MΩ | 2 MΩ | |

Fig.1

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

※ The part numbers on the left 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.

MECHANICAL CHARACTERISTICS

| | |
|-------------------|--------------------------------------|
| Mechanical angle | 250 ° (1 turn) |
| Operating torque | 5 mN·m {51 gf·cm} maximum |
| Stop strength | 20 mN·m {204 gf·cm} minimum |
| Rotational life | 100 cycles [Δ R/R ≤ ± (2 Ω + 3 %)] |
| Thrust to rotor | 5 N {0.51 kgf} minimum |
| Solderability | 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, 0.125 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 | 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 ≤ 1 %] |

Δ R/R : Change in total resistance
S.S. : Setting stability

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SURFACE MOUNT TRIMMERS

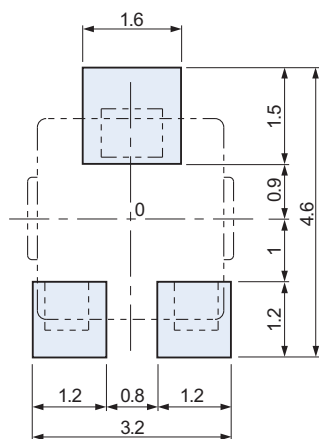
MAXIMUM INPUT RATINGS

| Nominal resistance values (Ω) | 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 |

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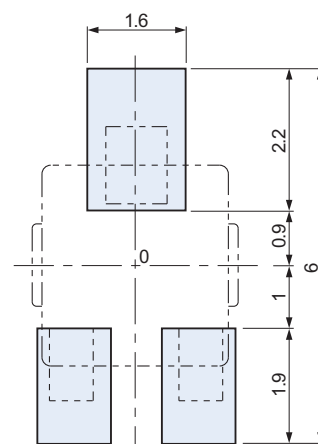
RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

● ST-32EA, EG



For reflow soldering

● ST-32EB, EH



(Unit : mm)

Note) The zero point is the center of mounting.

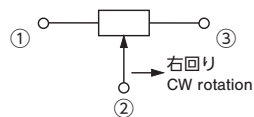
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SURFACE MOUNT TRIMMERS

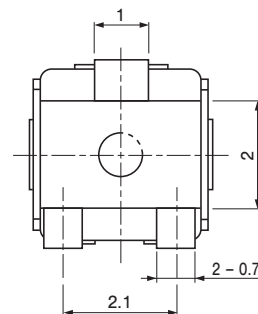
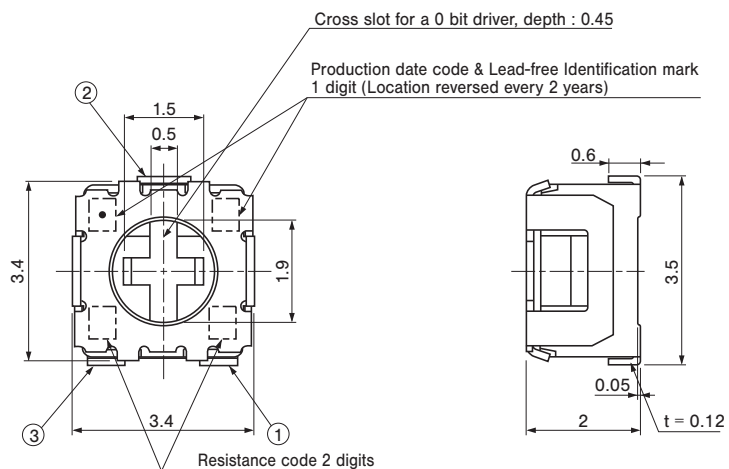
OUTLINE DIMENSIONS

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

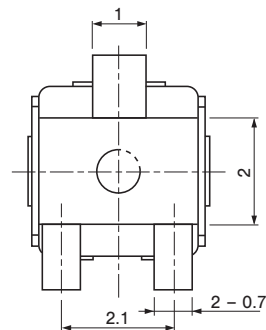
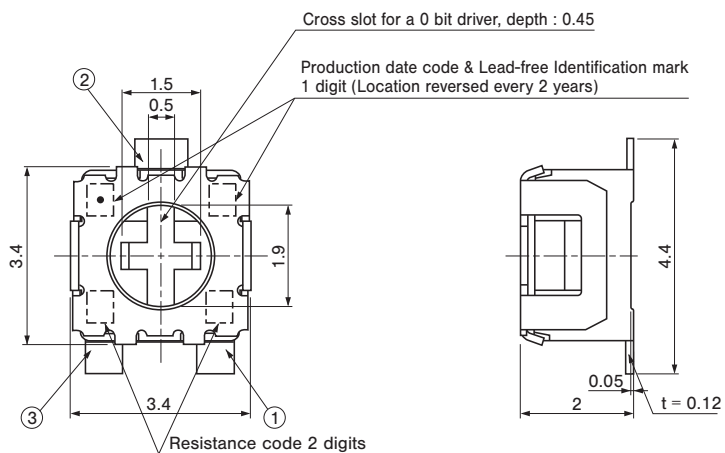
ST-32EA Top adjustment



※ Note the terminal position.



ST-32EB Top adjustment



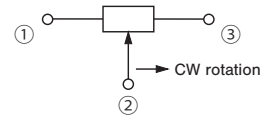
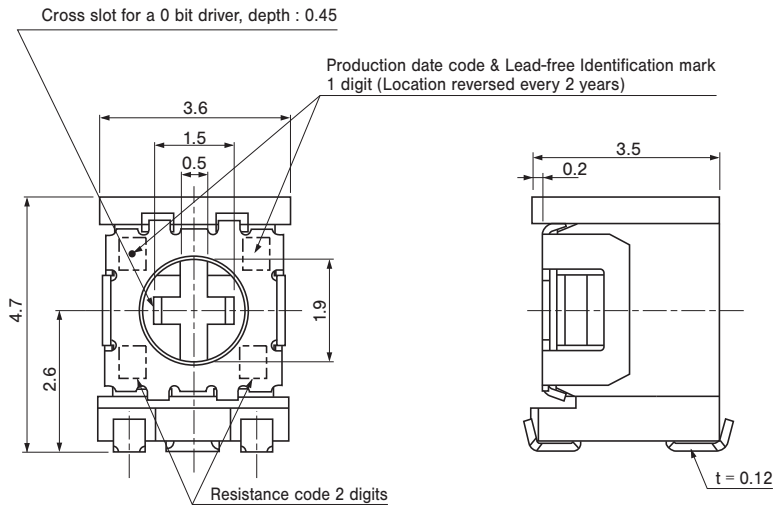
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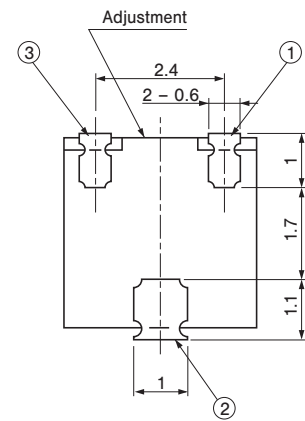
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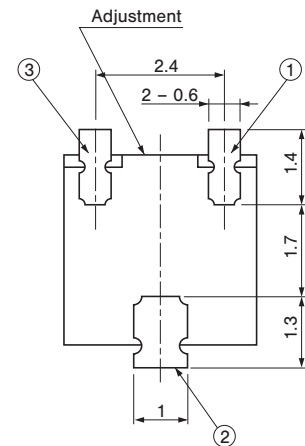
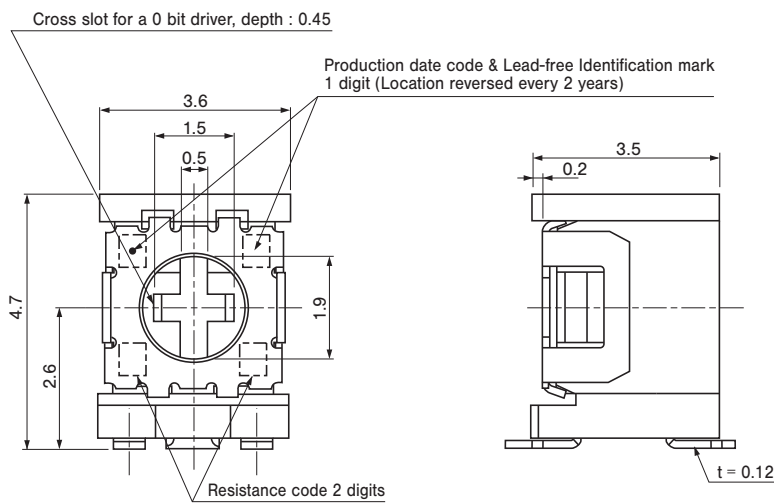
ST-32EG Side adjustment



※ Note the terminal position.



ST-32EH Side adjustment



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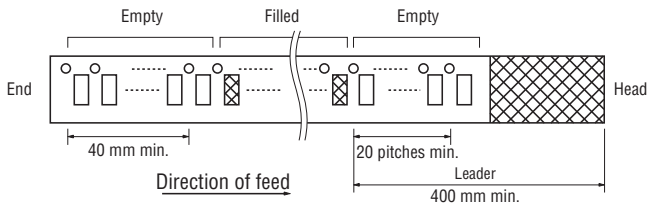
SURFACE MOUNT TRIMMERS

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-32ETA, ETB versions are boxed with 4 reels (2000 pcs.). ST-32ETG, 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

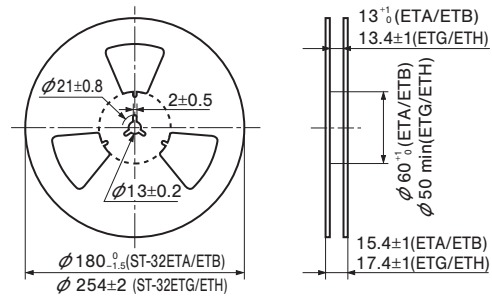


REEL DIMENSIONS

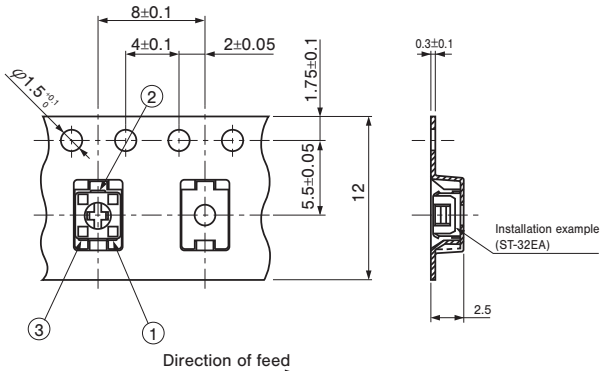
(Conforms to JIS C 0806-3)

(In accordance with EIAJ ET-7200A)

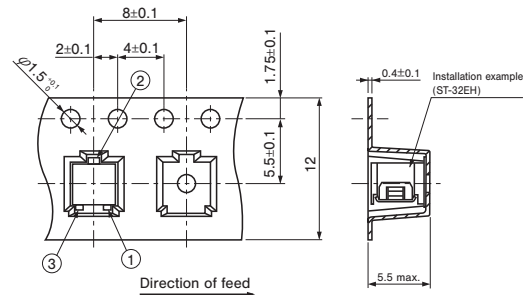
(Unit: mm)



ST-32ETA, ETB



ST-32ETG, 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.

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