

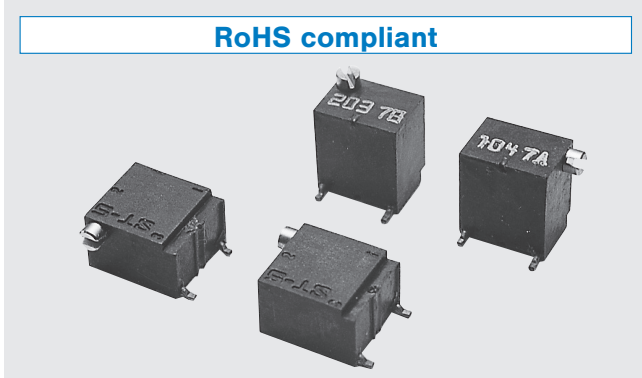


THE DATASHEET OF ST5ETW104



SURFACE MOUNT CERMET TRIMMERS (14 TURNS) **ST-5**

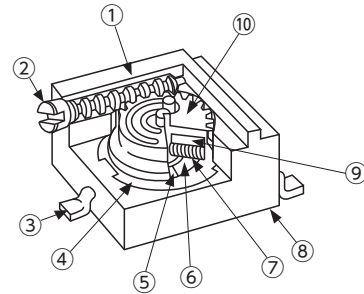
RoHS compliant



FEATURES

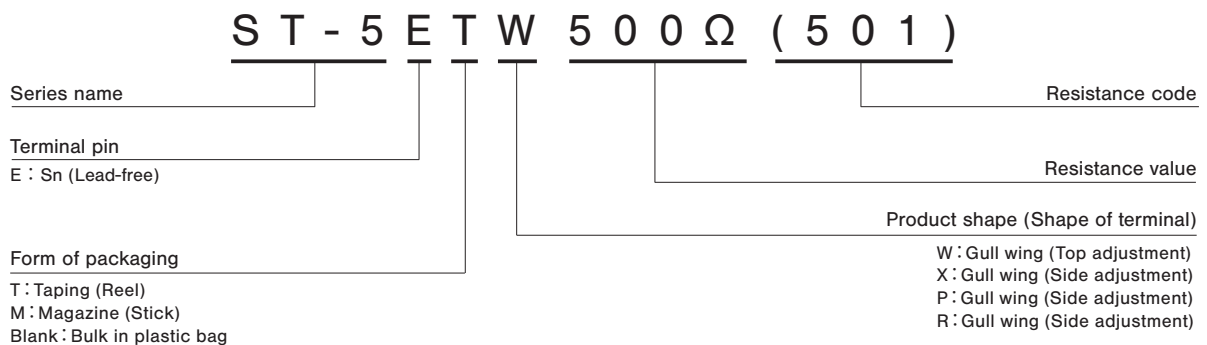
- RoHS compliant
- Precise adjustment is possible
- Automatic mounting is possible (Taping)
- Flow/reflow soldering is possible
- Sealed construction (Washable: Refer to page 628.)
- Resin material is UL Recognized 94V-0

INTERNAL STRUCTURE



| Part name | Material |
|---------------------|-----------------------------|
| ① Housing | PPS (Polyphenylenesulphide) |
| ② Shaft | Brass, Nickel-plated |
| ③ Terminal pin | Copper, Tin-plated |
| ④ Base element | Ceramic |
| ⑤ Electrode | Ag-Pd cermet |
| ⑥ Resistive element | RuO ₂ cermet |
| ⑦ Wiper | Multi metal alloy |
| ⑧ Adhesive | Epoxy |
| ⑨ Rubber cushion | Silicone rubber |
| ⑩ Rotor gear | PA (Polyamide) |

PART NUMBER DESIGNATION



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

ST-5

SURFACE MOUNT TRIMMERS

LIST OF PART NUMBERS

| Adjustment position | Shape of terminal | Form of packaging | | |
|---------------------|-------------------|-------------------|------------------|--------------|
| | | Taping (reel) | Magazine (stick) | Plastic bag |
| Top adjustment | W (Gull wing) | ST-5ETW | ST-5EMW | ST-5EW |
| Side adjustment | X (Gull wing) | ST-5ETX | ST-5EMX | ST-5EX |
| | P (Gull wing) | ST-5ETP | ST-5EMP | ST-5EP |
| | R (Gull wing) | ST-5ETR | ST-5EMR | ST-5ER |
| Pieces in package | | 500 pcs./reel | 50 pcs./stick | 50 pcs./pack |

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

◁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

※ The above part numbers are all available with the respective combination of <Nominal resistance values> (Fig. 1).

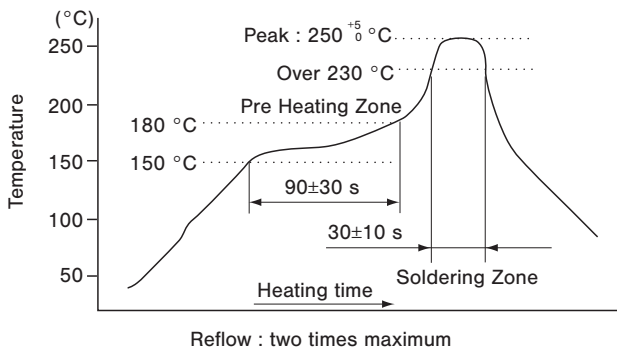
※ Verify the above part numbers when placing orders.

※ Taping and magazine specifications are not sold separately and must be purchased in reel or stick units.

ELECTRICAL CHARACTERISTICS

| | |
|---------------------------|---|
| Nominal resistance range | 10 Ω ~ 2 MΩ |
| Resistance tolerance | ± 10 % |
| Power ratings | 0.25 W (85 °C) 0 W (120 °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 turn | 11 turns |
| End resistance | 1 % or 2 Ω, whichever is greater |
| C.R.V. | 1 % or 3 Ω, whichever is greater |
| Operating temp. range | - 55 ~ 120 °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 | AC600 V, 60 s |
| Net weight | Approx. 0.35 g |

◁Reflow profile for soldering heat evaluation▷



MECHANICAL CHARACTERISTICS

| | |
|-------------------|--|
| Mechanical turn | 14 turns |
| Operating torque | 20 mN·m {204 gf·cm} maximum |
| Mechanical stop | Clutch action |
| Rotational life | 200 cycles 10 Ω ~ 200 Ω [Δ R/R ≤ ± (0.5 Ω + 3 %)] 500 Ω ~ 2 MΩ [Δ R/R ≤ ± (0.5 Ω + 2 %)] |
| Thrust to shaft | 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 ≤ 1 %] [S.S. ≤ 1 %] |
| Humidity | - 10 ~ 65 °C (Relative humidity 80 ~ 98 %), 10 cycles, 240 h | [Δ R/R ≤ 1 %] |
| 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 | [Δ R/R ≤ 1 %] [S.S. ≤ 1 %] |
| Load life | 85 °C, 0.25 W, 1000 h | [Δ R/R ≤ 2 %] [S.S. ≤ 1 %] |
| Low temp. operation | - 55 °C, 2 h | [Δ R/R ≤ 2 %] [S.S. ≤ 2 %] |
| High temp. exposure | 120 °C, 250 h | [Δ R/R ≤ 2 %] [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 %] |

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

ST-5

SURFACE MOUNT TRIMMERS

MAXIMUM INPUT RATINGS

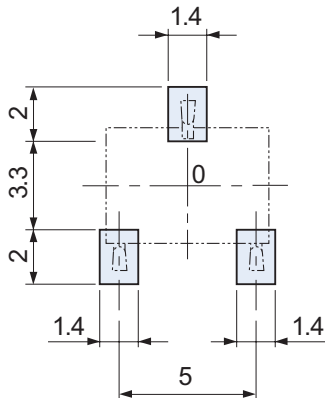
| Nominal resistance values (Ω) | Resistance code | Maximum input voltage (V) | Maximum wiper current (mA) |
|--|-----------------|---------------------------|----------------------------|
| ⊕ 10 | 100 | 1.00 | 100 |
| ⊖ 20 | 200 | 2.00 | 100 |
| 50 | 500 | 3.53 | 70.7 |
| 100 | 101 | 5.00 | 50.0 |
| 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.

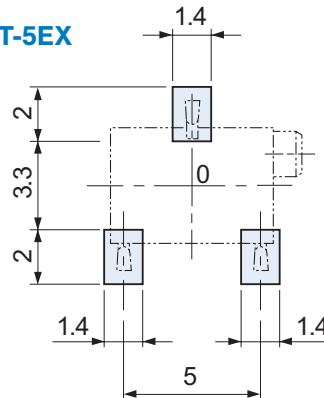
RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

(Unit: mm)

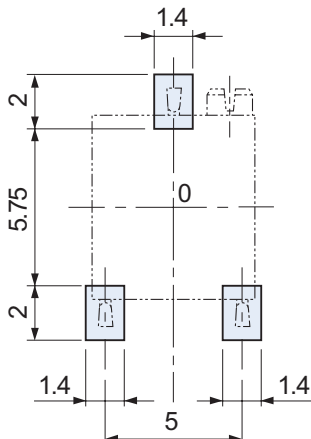
● ST-5EW



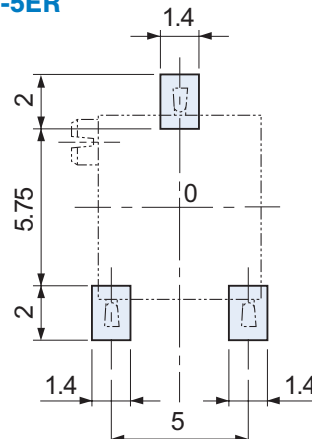
● ST-5EX



● ST-5EP



● ST-5ER



Note) The zero point is the center of mounting.

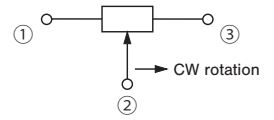
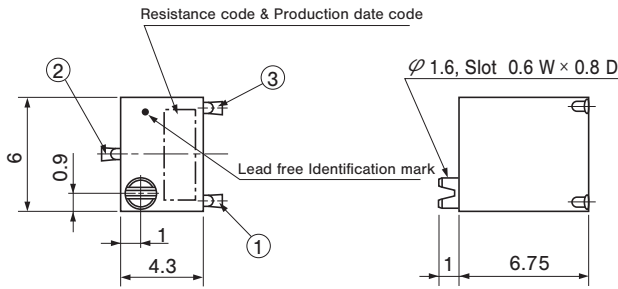
ST-5

SURFACE MOUNT TRIMMERS

OUTLINE DIMENSIONS

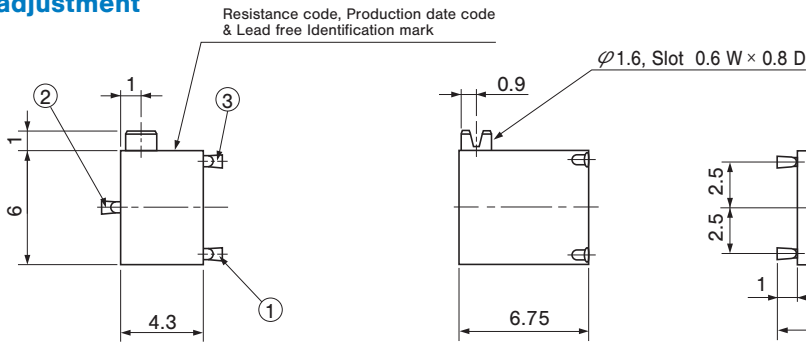
Unless otherwise specified, tolerance : ± 0.3 (Unit: mm)

ST-5EW Top adjustment

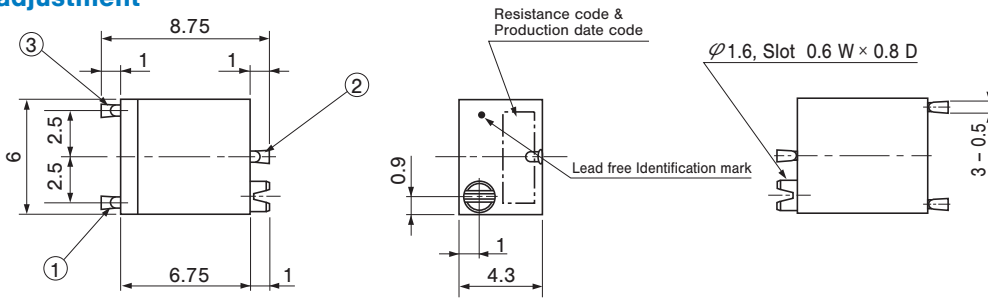


※ Note the terminal position.

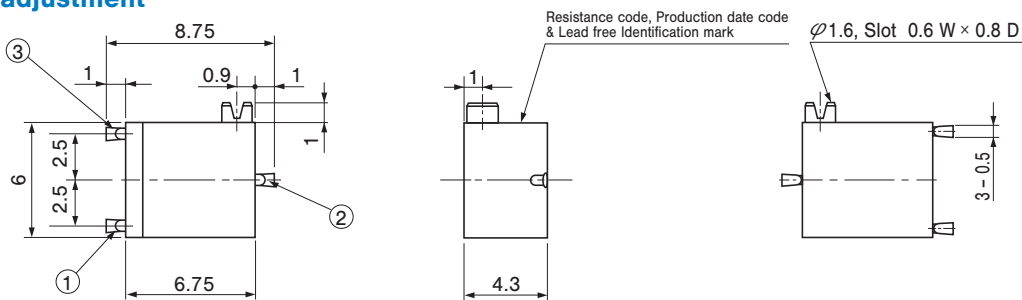
ST-5EX Side adjustment



ST-5EP Side adjustment



ST-5ER Side adjustment



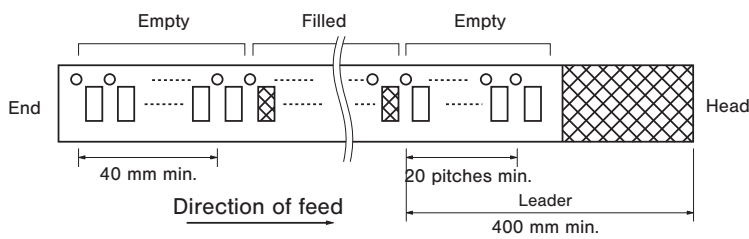
ST-5 SURFACE MOUNT TRIMMERS

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.
- Taping version is 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

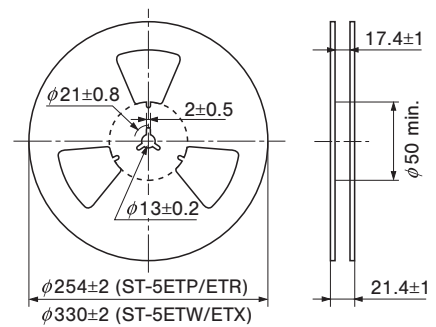


REEL DIMENSIONS

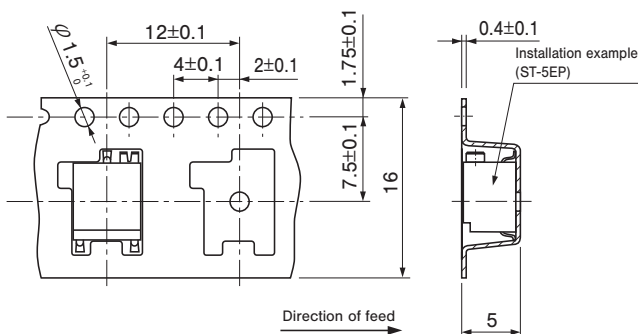
(Conforms to JIS C 0806-3)

(In accordance with EIAJ ET-7200A)

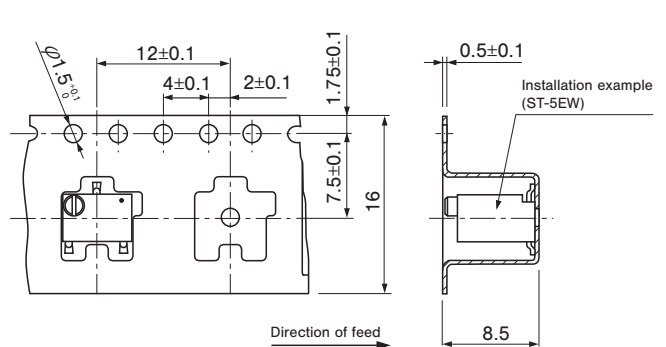
(Unit: mm)



ST-5ETP/ETR



ST-5ETW/ETX



ST-5

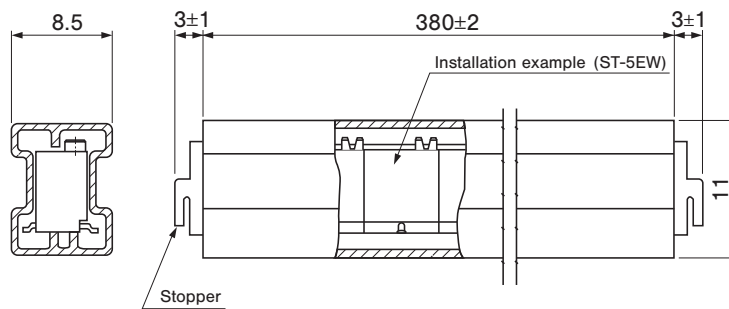
SURFACE MOUNT TRIMMERS

<Magazine packaging specifications>

- Magazine is packed 50 pcs. per stick.
Orders will be accepted for units of 50 pcs., i.e., 50, 100, 150 pcs., etc.
- Magazines are packed 2000 pcs. per box.

● Magazine dimensions

(Unit: mm)





<Bulk pack specifications>

- Unit of bulk in a plastic bag is 50 pcs. per pack.
- Boxing of bulk in a plastic bag is performed with 200 pcs. per box.

Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

-  [View ST5ETW104](#) on WIN SOURCE
-  [Nidec Copal Electronics](#) Information

Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management