



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



Contact us

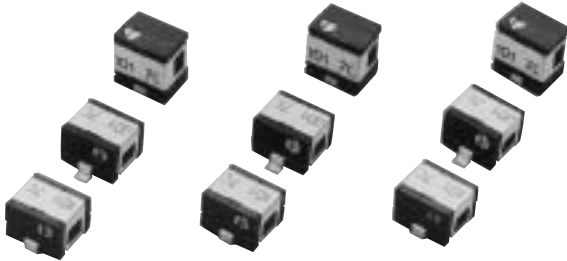
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Surface Mount Cermet Trimmers (12 Turns)

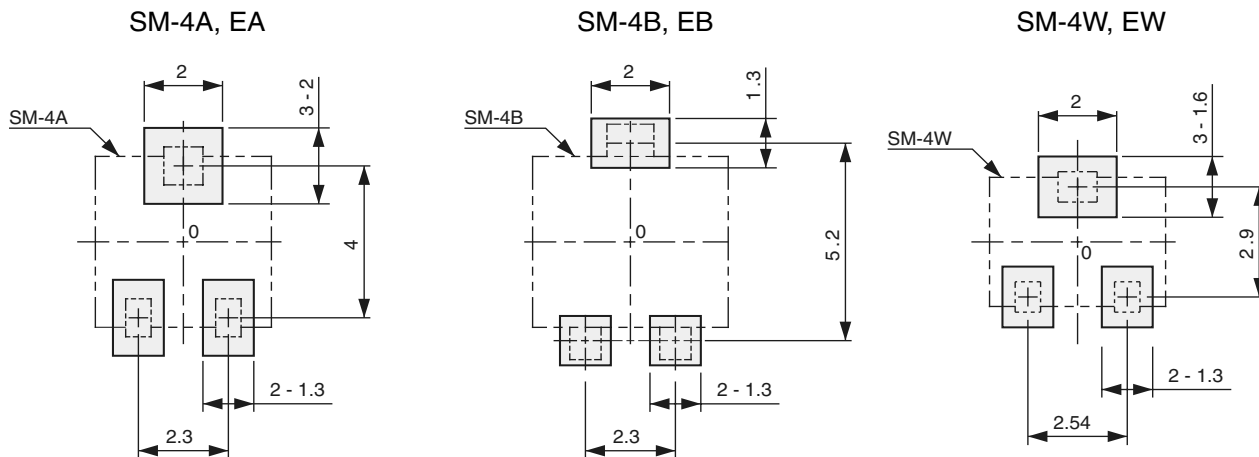


FEATURES

- Lead (Pb)-free soldering, Cadmium-free
- Fine adjustment is possible
- Automatic mounting is possible (Taping)
- Flow/reflow soldering is possible
- Sealed construction (Washable)
- RoHS compatible

DIMENSIONS in millimeters

RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

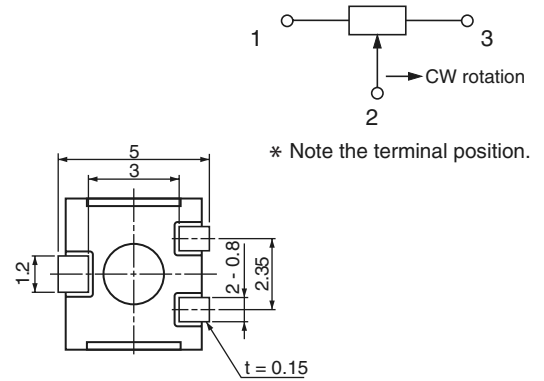
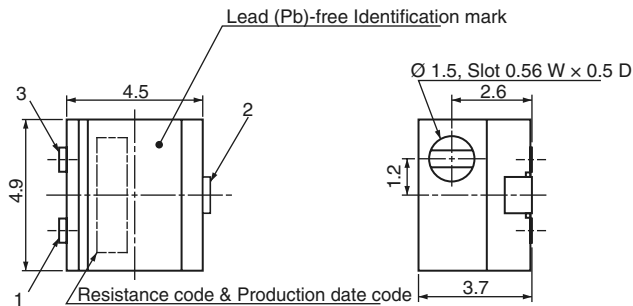


Note) The zero point is the center of mounting.

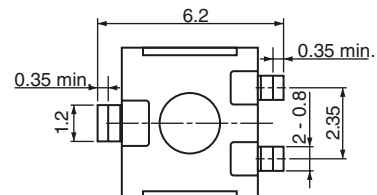
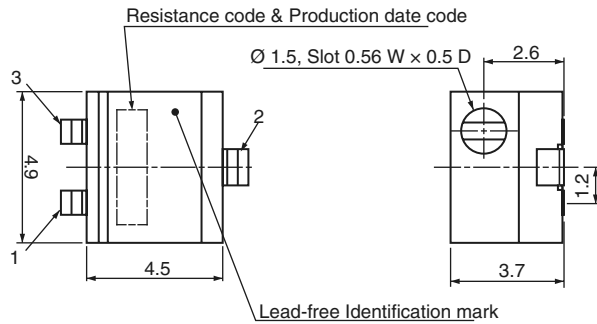
OUTLINE DIMENSIONS

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

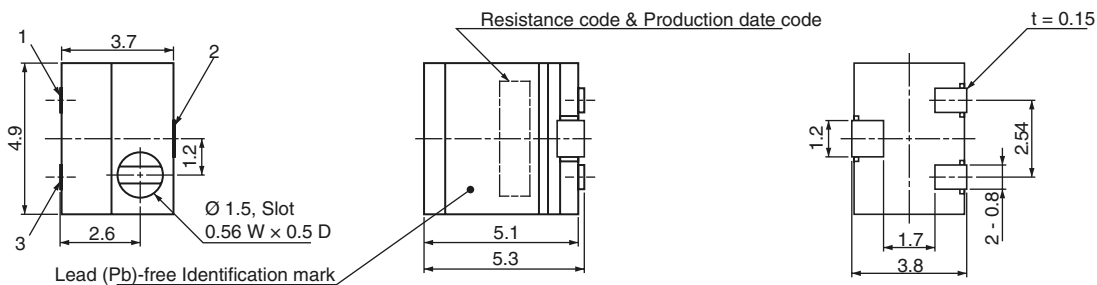
SM-4A, SM-4EA Side adjustment



SM-4B, SM-4EB Side adjustment



SM-4W, SM-4EW Top adjustment



PACKAGING SPECIFICATIONS

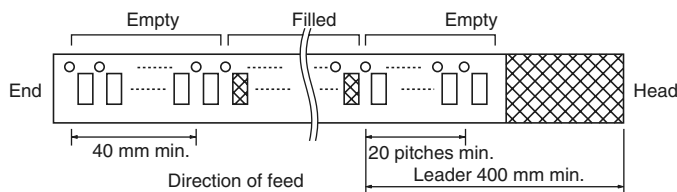
Taping packaging specifications

- Taping version (SM-4TA, TB, ETA, ETB types) are packaged in 500 pcs. per reel.
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500 pcs., etc.
SM-4TW, ETW types are packaged in 250 pcs. per reel.
Orders will be accepted for units of 250 pcs., i.e., 500, 750 pcs., etc.
- Taping version is boxed with one reel.

Maximum number of consecutive missing pieces = 2

Leader length and reel dimension are shown in the dia-grams below.

EMBOSSED TAPE DIMENSIONS

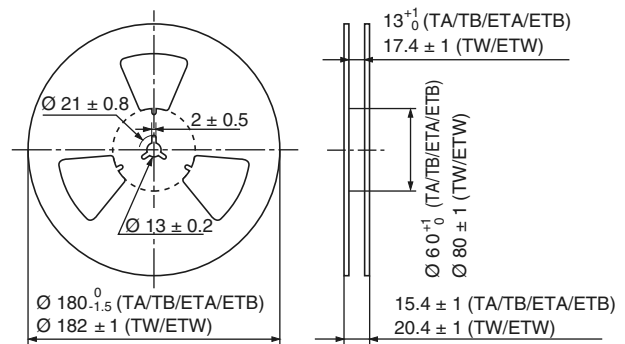


REEL DIMENSIONS

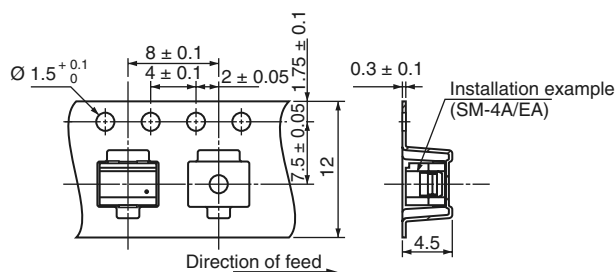
(Conforms to JIS C 0806-3)

(TA/TB type : In accordance with EIAJ ET-7200A)

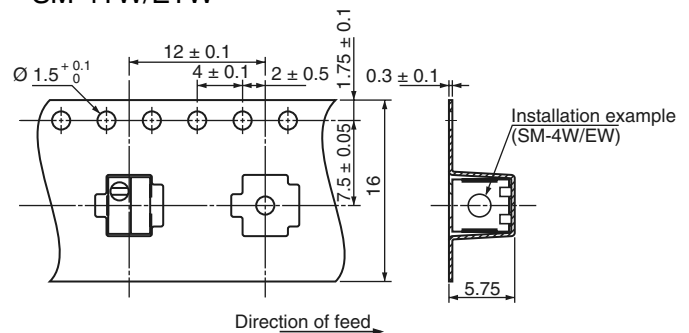
(Unit: mm)



SM-4TA/TB/ETA/ETB



SM-4TW/ETW



Vinyl bag packaging specifications

- Unit of bulk in vinyl bag packaging is 50 pcs. per pack.
- Boxing of bulk in vinyl bags is performed with 200 pcs. per box.

MECHANICAL SPECIFICATIONS

| | |
|--------------------------|---|
| Mechanical turn | 12 turns |
| Operating torque | 20 mN m {204 gf cm} maximum |
| Mechanical stop | Clutch action |
| Rotational life | 200 cycles [$\Delta R/R \leq \pm (3 \Omega + 3 \%)$] |
| Thrust to shaft | 5 N {0.51 kgf} minimum |
| Solderability | Sn-Pb: 235 °C, 2 s Sn-Cu (Lead (Pb)-free): 245 \pm 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 |

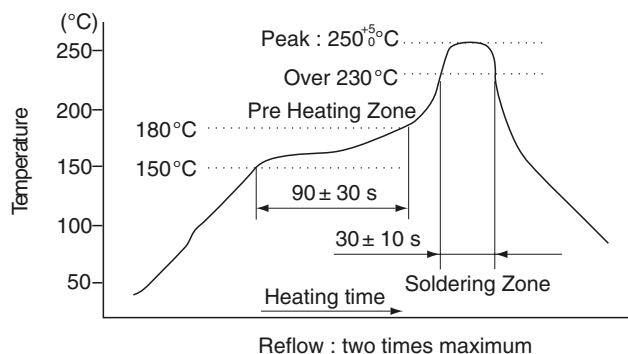
ELECTRICAL CHARACTERISTICS

| | |
|---------------------------|--|
| Nominal resistance range | 10 Ω ~ 2 M Ω |
| Resistance tolerance | $\pm 10 \%$ |
| Power ratings | 0.25 W (85 °C) 0 W (150 °C) |
| Resistance law | Linear law (B) |
| Maximum input voltage | DC300 V or power rating, whichever is smaller |
| Maximum wiper current | 100 mA or power rating, whichever is smaller |
| Effective electrical turn | 10 turns |
| End resistance | 1 % or 2 Ω , whichever is greater |
| C.R.V. | 1 % or 3 Ω , whichever is greater |
| Operating temp. range | - 6 ~ 150 °C |
| Temp. coefficient | $\pm 100 \cdot 10^{-6} / ^\circ\text{C}$ maximum |
| Insulation resistance | 1000 M Ω minimum (DC500 V) |
| Dielectric strength | AC600 V, 60 s |
| Net weight | Approx. 0.2 g |

ENVIRONMENTAL SPECIFICATIONS

| Test item | Test conditions | Specifications |
|---------------------------|---|---|
| Thermal shock | - 65 ~ 150 °C (0.5 h), 5 cycles | [$\Delta R/R \leq 2 \%$] [S.S. $\leq 1 \%$] |
| Humidity | - 10 ~ 65 °C (Relative humidity 80 ~ 98 %), 10 cycles, 240 h | [$\Delta R/R \leq 2 \%$] |
| Shock | 981 m/s ² , 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 ² , 10 ~ 2000Hz, 3 directions, 12 times each | |
| Load Life | 85 °C, 0.25 W, 1000 h | [$\Delta R/R \leq 2 \%$] [S.S. $\leq 1 \%$] |
| Low temperature operation | - 65 °C, 2 h | [$\Delta R/R \leq 1 \%$] [S.S. $\leq 1 \%$] |
| High temperature exposure | 150 °C, 250 h | [$\Delta R/R \leq 2 \%$] [S.S. $\leq 1 \%$] |
| Immersion seal | 85 °C, 60 s | No leaks (No continuous bubbles) |
| Soldering heat | Sn-Pb 260 °C, 10 s or 215 °C, 35 s | [$\Delta R/R \leq 1 \%$] |
| | Sn-Cu Flow: 260 °C \pm 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 \pm 10 °C, 3 ~ 4 s | |

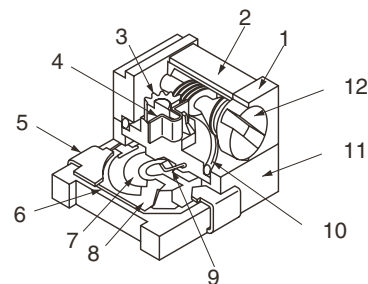
Reflow profile for soldering heat evaluation



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 | 223 | 1.12 |
| 500 k | 504 | 300 | 0.60 |
| 1 M | 105 | 300 | 0.30 |
| 2 M | 205 | 300 | 0.15 |

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

**CONSTRUCTION**

| | Part Name | Material | Flammability |
|----|-------------------|--------------------------------------|--------------|
| 1 | Housing | PPS (Polyphenylenesulfide) | UL-94V-O |
| 2 | Cover | Stainless steel | - |
| 3 | Rotor gear | PPS (Polyphenylenesulfide) | UL-94V-O |
| 4 | Clutch spring | Stainless steel | - |
| 5 | Terminal pin | Sn-Pb Copper alloy, Solder-plated | - |
| | | Sn-Cu Copper, Sn-Cu-plated | - |
| 6 | Base element | Ceramic | - |
| 7 | Resistive element | RuO ₂ cermet | - |
| 8 | Electrode | Ag-Pd cermet | - |
| 9 | Wiper | Multi metal alloy | - |
| 10 | "O" ring | Silicone rubber | UL-94HB |
| 11 | Base | Epoxy | UL-94V-O |
| 12 | Shaft | Metal | - |

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

LIST OF PART NUMBERS

| Adjustment position | Shape of terminal | Form of packing | | | |
|---------------------|-------------------|--|------------------------|--------------|------------------------|
| | | Taping (reel) | | Vinyl bag | |
| | | Sn-Pb | Sn-Pb (Lead (Pb)-free) | Sn-Pb | Sn-Pb (Lead (Pb)-free) |
| Top adjustment | W (J-hook) | SM-4TW | SM-4ETW | SM-4W | SM-4EW |
| Side adjustment | A (J-hook) | SM-4TA | SM-4ETA | SM-4A | SM-4EA |
| | B (Gull wing) | SM-4TB | SM-4ETB | SM-4B | SM-4EB |
| Pieces in package | | TW, ETW: 250 pcs./reel TA, ETA: 500 pcs./reel TB, ETB: 500 pcs./reel | | 50 pcs./pack | |

**FIG. 1: NOMINAL RESISTANCE VALUES**

| | | | | | | | | |
|---------------|---------------|---------------|----------------|----------------|----------------|--------------|--------------|-------------|
| * 10 Ω | * 20 Ω | 50 Ω | 100 Ω | 200 Ω | 500 Ω | 1 k Ω | 2 k Ω | 5k Ω |
| 10 k Ω | 20 k Ω | 50 k Ω | 100 k Ω | 200 k Ω | 500 k Ω | 1 M Ω | 2 M Ω | - |

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>.

* Verify the above part numbers when placing orders.

* Taping specification is not sold separately and must be purchased in reel units.

ORDERING INFO

| SM-4 | | T | A | 204 |
|-------------|---------------------------|---------------------------|-----------------------------------|-----------------|
| SERIES NAME | TERMINAL PIN | FORM OF PACKAGING | PRODUCT SHAPE (SHAPE OF TERMINAL) | RESISTANCE CODE |
| | Blank: Sn-Pb | T: Taping (Reel) | A: J-hook | |
| | E: Sn-Cu (Lead (Pb)-free) | Blank: Bulk in vinyl bags | B: Gull wing | |
| | | | W: J-hook | |

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