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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!



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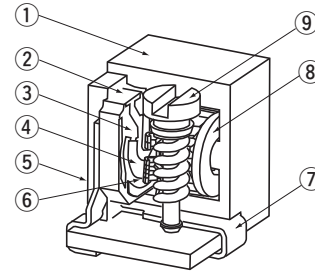
**RoHS compliant**



**FEATURES**

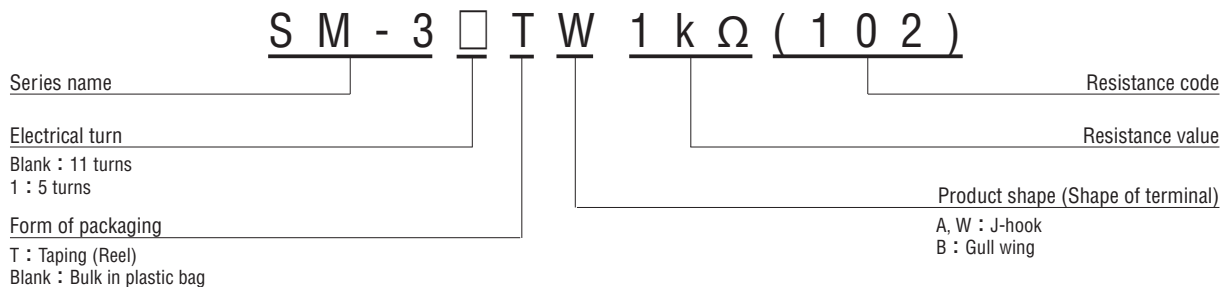
- RoHS compliant
- Fine adjustment is possible
- Automatic mounting is possible (Taping)
- Reflow soldering is possible
- Sealed construction (Washable: Refer to page 750.)

**INTERNAL STRUCTURE**



|   | Part name         | Material                   | Flammability |
|---|-------------------|----------------------------|--------------|
| ① | Housing           | Polyphenylenesulphide      | UL94V-0      |
| ② | Base element      | Ceramic                    | —            |
| ③ | Electrode         | Ag-Pd cermet               |              |
| ④ | Resistive element | RuO <sub>2</sub> cermet    |              |
| ⑤ | Adhesive          | Epoxy                      |              |
| ⑥ | Wiper             | Multi metal alloy          |              |
| ⑦ | Terminal pin      | Copper alloy, Sn-Cu-plated | UL94V-0      |
| ⑧ | Rotor gear        | Polyamide                  |              |
| ⑨ | Shaft             | Brass, Nickel-plated       |              |

**PART NUMBER DESIGNATION**



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

# SM-3/31

## SURFACE MOUNT TRIMMERS

### LIST OF PART NUMBERS

| Electrical turns  | Adjustment position | Shape of terminal | Form of packaging |              |
|-------------------|---------------------|-------------------|-------------------|--------------|
|                   |                     |                   | Taping (reel)     | Plastic bag  |
| 11                | Top adjustment      | W (J-hook)        | SM-3TW            | SM-3W        |
|                   | Side adjustment     | A (J-hook)        | SM-3TA            | SM-3A        |
|                   |                     | B (Gull wing)     | SM-3TB            | SM-3B        |
| 5                 | Top adjustment      | W (J-hook)        | SM-31TW           | SM-31W       |
|                   | Side adjustment     | A (J-hook)        | SM-31TA           | SM-31A       |
|                   |                     | B (Gull wing)     | SM-31TB           | SM-31B       |
| Pieces in package |                     |                   | 500 pcs./reel     | 50 pcs./pack |

### <Nominal resistance values>

|       |       |        |        |        |      |      |       |
|-------|-------|--------|--------|--------|------|------|-------|
| 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 specification is not sold separately and must be purchased in reel units.

### ELECTRICAL CHARACTERISTICS

|                           |   |
|---------------------------|---|
| Nominal resistance range  | 50 Ω ~ 2 MΩ                                   |
| Resistance tolerance      | ± 20 %  |
| Power ratings             | 0.125 W (70 °C) 0 W (150 °C)                  |
| Resistance law            | (B) Linear law                                |
| 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 (SM-3) / 5 turns (SM-31)             |
| End resistance            | 1 % or 3 Ω, whichever is greater              |
| C.R.V.                    | 3 % or 3 Ω, whichever is greater              |
| Operating temp. range     | -65 ~ 150 °C                                  |
| Temp. coefficient         | ±100 10 <sup>-6</sup> /°C maximum             |
| Insulation resistance     | 100 MΩ minimum (DC500 V)                      |
| Dielectric strength       | AC600 V, 60 s                                 |
| Net weight                | Approx. 0.10 g                                |

### MECHANICAL CHARACTERISTICS

|                   |                                     |
|-------------------|-------------------------------------|
| Operating torque  | 5 mN·m {51 gf·cm} maximum           |
| Mechanical stop   | Clutch action                       |
| Rotational life   | 200 cycles [Δ R/R ≤ ± (2 Ω + 3 %)]  |
| 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                 |

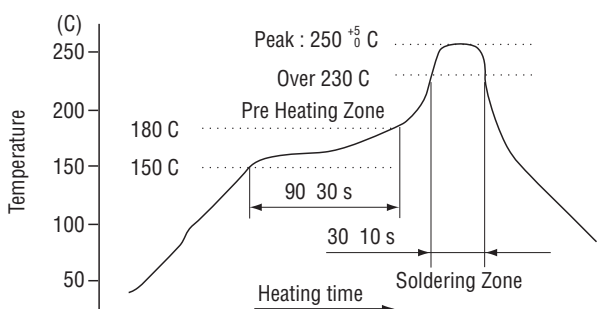
{ } : Reference only

### ENVIRONMENTAL CHARACTERISTICS

| Test item           | Test conditions   | Specifications                   |
|---------------------|---|----------------------------------|
| Thermal shock       | -65 ~ 150 °C (0.5 h), 5 cycles  | [Δ R/R ≤ 2 %]<br>[S.S. ≤ 2 %]    |
| Humidity            | -10 ~ 65 °C (80 ~ 98 %),<br>10 cycles, 240 h  | [Δ R/R ≤ 3 %]                    |
| Shock               | 981 m/s <sup>2</sup> , 6 ms<br>6 directions for 3 times each  | [Δ R/R ≤ 1 %]<br>[S.S. ≤ 1 %]    |
| Vibration           | (Amplitude) 1.52 mm or<br>(Acceleration) 196 m/s <sup>2</sup> ,<br>10 ~ 2000 Hz, 3 directions, 12 times each        |                                  |
| Load life           | 70 °C, 0.125 W, 1000 h  | [Δ R/R ≤ 3 %]<br>[S.S. ≤ 2 %]    |
| Low temp. operation | -65 °C, 2 h   | [Δ R/R ≤ 2 %]<br>[S.S. ≤ 2 %]    |
| High temp. exposure | 150 °C, 250 h   | [Δ R/R ≤ 3 %]<br>[S.S. ≤ 2 %]    |
| Immersion seal      | 85 °C, 60 s   | No leaks (No continuous bubbles) |
| Soldering heat      | Reflow : Peak temperature 255 °C<br>(Please refer to the profile below.)<br>Manual soldering : 350 ± 10 °C, 3 ~ 4 s | [Δ R/R ≤ 1 %]                    |

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

### Reflow profile for soldering heat evaluation>



# SM-3/31

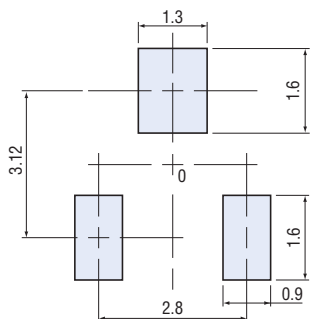
## SURFACE MOUNT TRIMMERS

### MAXIMUM INPUT RATINGS

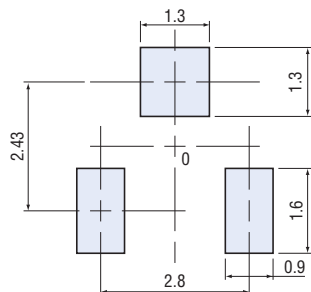
| Nominal resistance values ( $\Omega$ ) | Resistance code | Maximum input voltage (V) | Maximum wiper current (mA) |
|--|-----------------|---------------------------|----------------------------|
| 50                                     | 500             | 2.50                      | 50.0                       |
| 100                                    | 101             | 3.53                      | 35.4                       |
| 200                                    | 201             | 5.00                      | 25.0                       |
| 500                                    | 501             | 7.91                      | 15.8                       |
| 1 k                                    | 102             | 11.2                      | 11.2                       |
| 2 k                                    | 202             | 15.8                      | 7.91                       |
| 5 k                                    | 502             | 25.0                      | 5.00                       |
| 10 k                                   | 103             | 35.4                      | 3.54                       |
| 20 k                                   | 203             | 50.0                      | 2.50                       |
| 50 k                                   | 503             | 79.1                      | 1.58                       |
| 100 k                                  | 104             | 112                       | 1.12                       |
| 200 k                                  | 204             | 158                       | 0.79                       |
| 500 k                                  | 504             | 200                       | 0.40                       |
| 1 M                                    | 105             | 200                       | 0.20                       |
| 2 M                                    | 205             | 200                       | 0.10                       |

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

#### SM-3W/31W



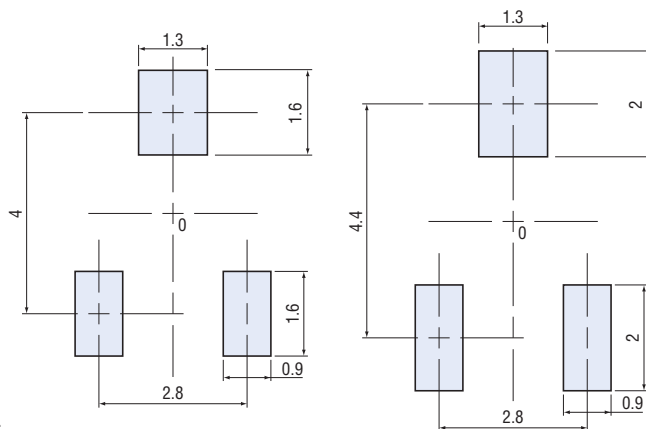
#### SM-3A/31A



※Also available to place as the above.

#### SM-3B/31B

(Unit : mm)

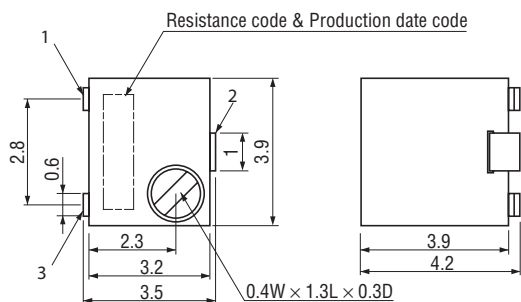


Note) The zero point is the center of mounting.

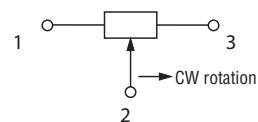
### OUTLINE DIMENSIONS

#### SM-3W/31W

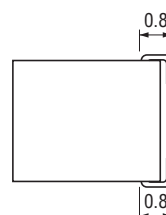
##### Top adjustment



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



※Note the terminal position.

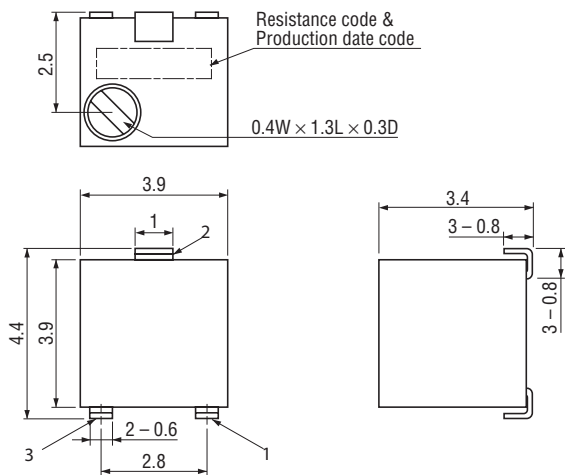


# SM-3/31

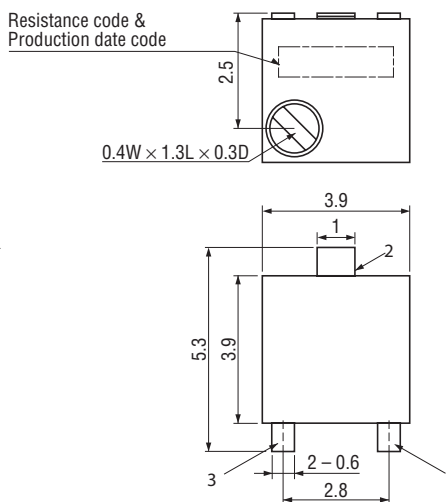
## SURFACE MOUNT TRIMMERS

### OUTLINE DIMENSIONS

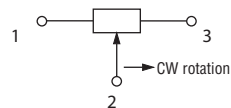
#### SM-3A/31A Side adjustment



#### SM-3B/31B Side adjustment



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



※Note the terminal position.

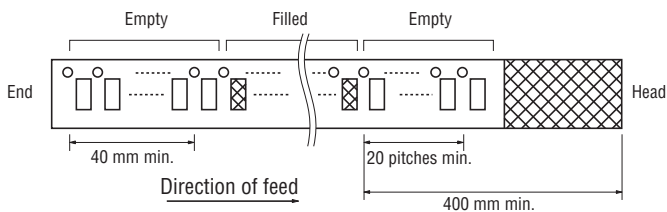
### PACKAGING SPECIFICATIONS

#### <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.

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

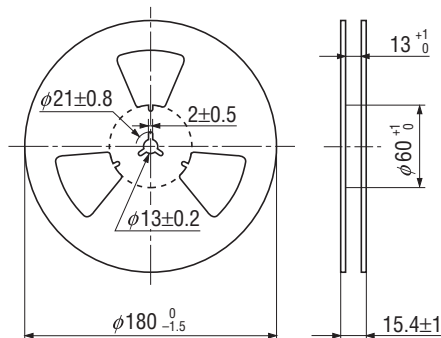
#### EMBOSSED TAPE DIMENSIONS



#### REEL DIMENSIONS

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

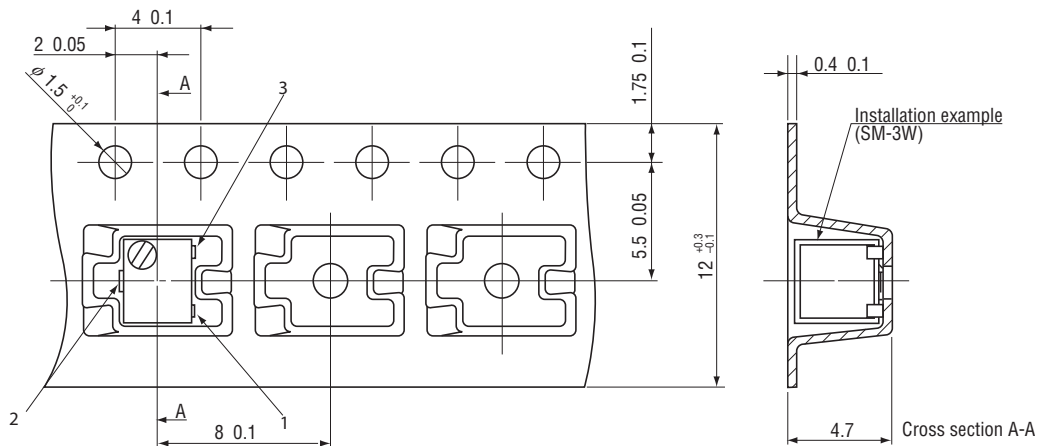
(Unit: mm)



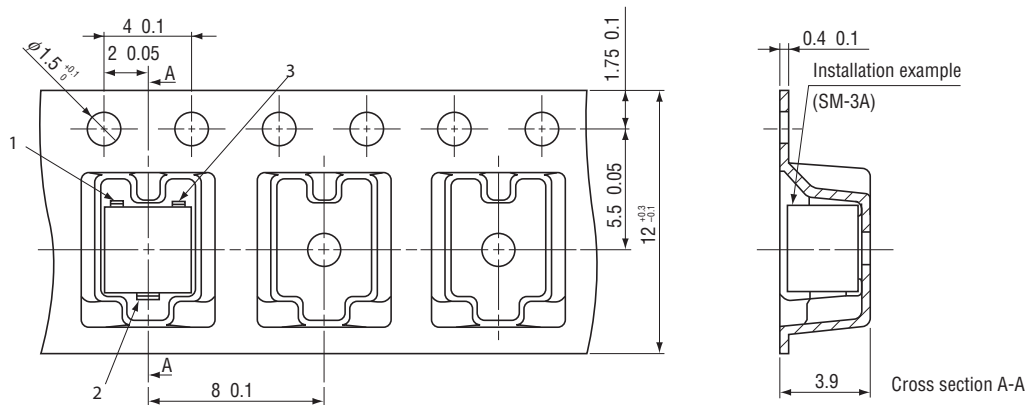
# SM-3/31

## SURFACE MOUNT TRIMMERS

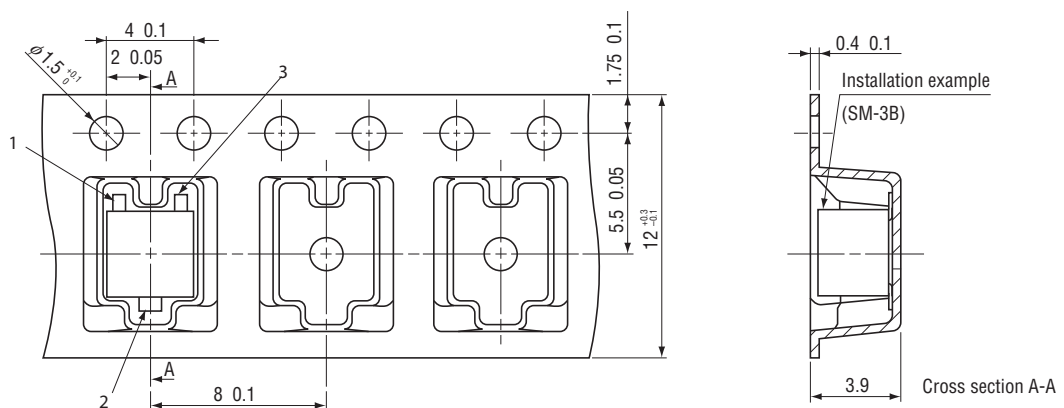
### ● SM-3TW/31TW



### ● SM-3TA/31TA



### ● SM-3TB/31TB



### <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.