

SURFACE MOUNT CERMET TRIMMERS **SM-3/31**

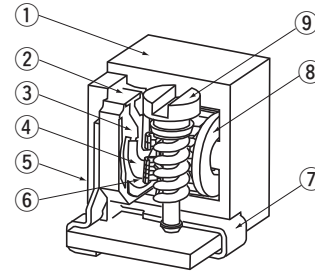
RoHS compliant



FEATURES

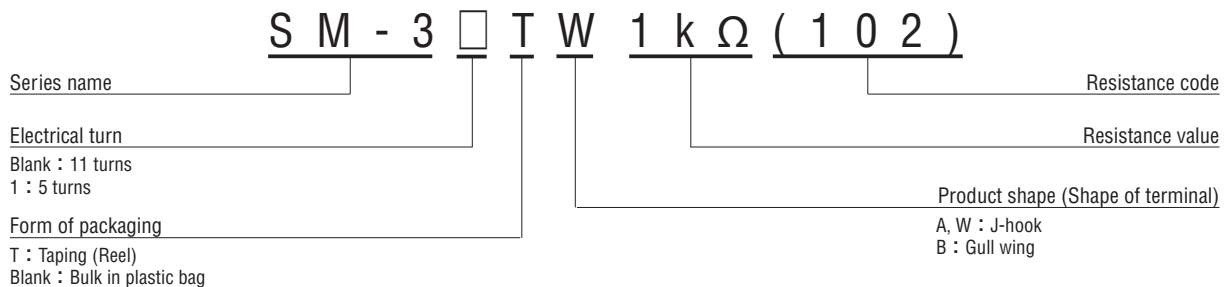
- RoHS compliant
- Fine adjustment is possible
- Automatic mounting is possible (Taping)
- Reflow soldering is possible
- Sealed construction (Washable: Refer to page 750.)

INTERNAL STRUCTURE



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

PART NUMBER DESIGNATION



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

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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 ⁻⁶ /°C maximum
Insulation resistance	100 MΩ minimum (DC500 V)
Dielectric strength	AC600 V, 60 s
Net weight	Approx. 0.10 g

MECHANICAL CHARACTERISTICS

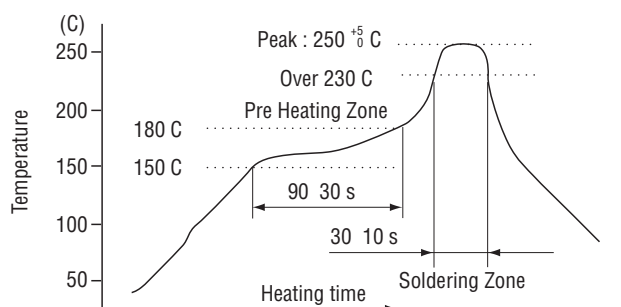
Operating torque	5 mN·m {51 gf·cm} maximum
Mechanical stop	Clutch action
Rotational life	200 cycles [Δ R/R ≤ ± (2 Ω + 3 %)]
Thrust to shaft	5 N {0.51 kgf} minimum
Solderability	245 ± 3 °C, 2 ~ 3 s
Shear (Adhesion)	5 N {0.51 kgf} 10 s
Substrate bending	Width 90 mm, bend 3 mm, 5 s, 1 time
Pull-off strength	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 %] [S.S. ≤ 2 %]
Humidity	-10 ~ 65 °C (80 ~ 98 %), 10 cycles, 240 h	[Δ R/R ≤ 3 %]
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. ≤ 2 %]
Low temp. operation	-65 °C, 2 h	[Δ R/R ≤ 2 %] [S.S. ≤ 2 %]
High temp. exposure	150 °C, 250 h	[Δ R/R ≤ 3 %] [S.S. ≤ 2 %]
Immersion seal	85 °C, 60 s	No leaks (No continuous bubbles)
Soldering heat	Reflow : Peak temperature 255 °C (Please refer to the profile below.) Manual soldering : 350 ± 10 °C, 3 ~ 4 s	[Δ R/R ≤ 1 %]

Reflow profile for soldering heat evaluation>



Reflow : two times maximum

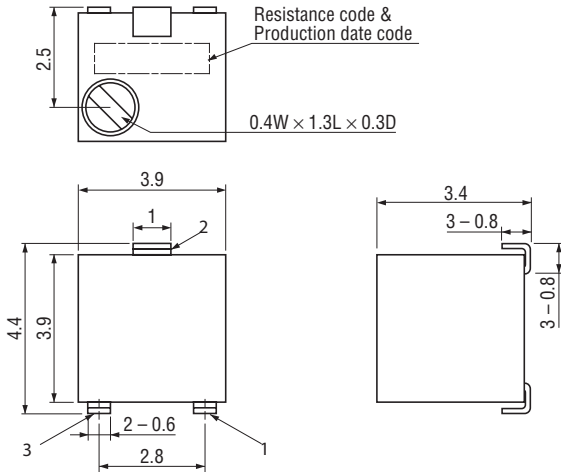
Δ R/R : Change in total resistance
S.S. : Setting stability

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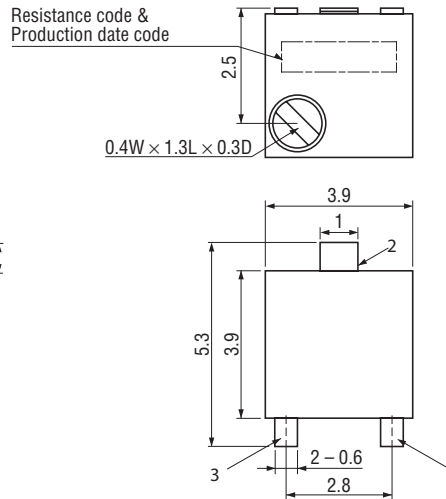
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OUTLINE DIMENSIONS

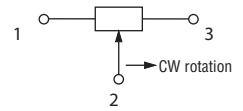
SM-3A/31A Side adjustment



SM-3B/31B Side adjustment



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



※Note the terminal position.

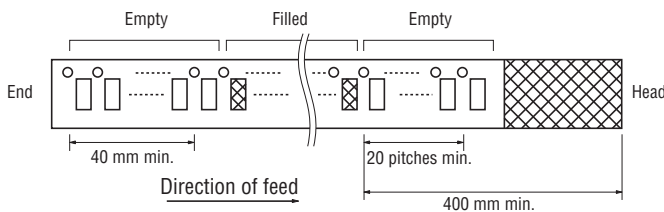
PACKAGING SPECIFICATIONS

<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

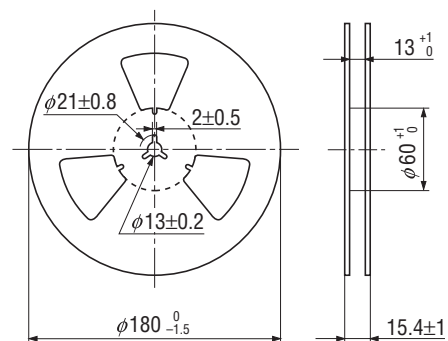


REEL DIMENSIONS

(Conforms to JIS C 0806-3)

(In accordance with EIAJ ET-7200A)

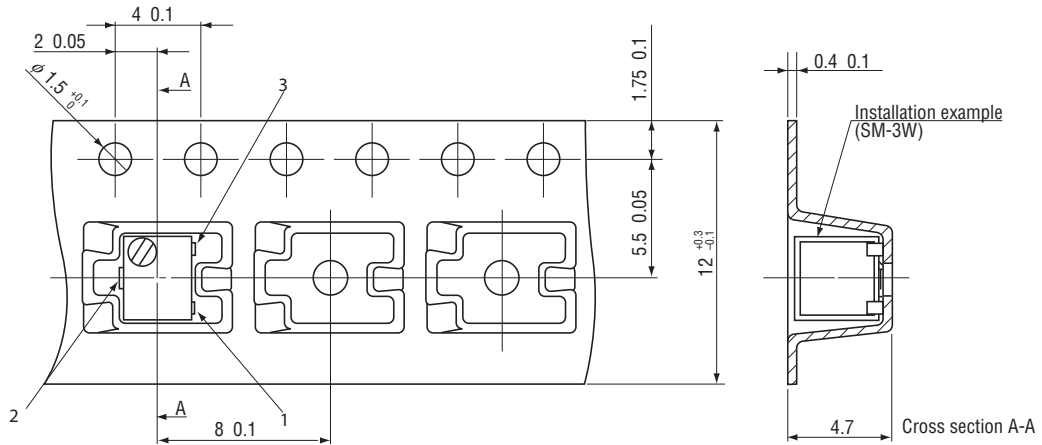
(Unit: mm)



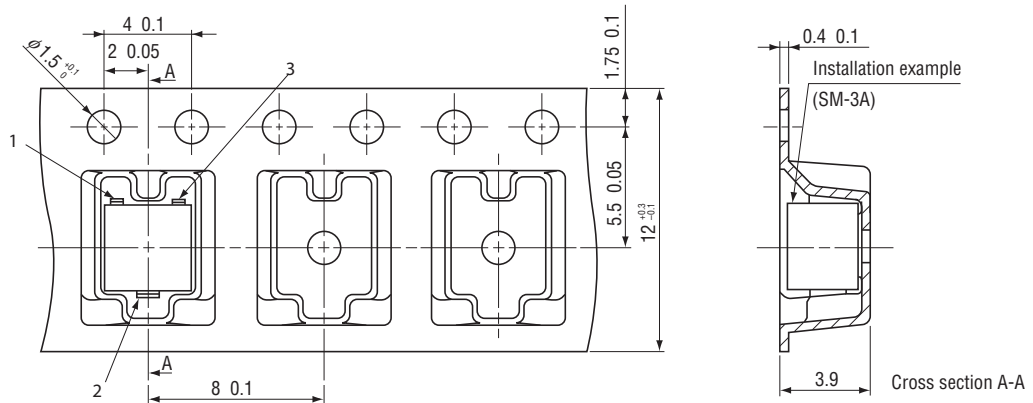
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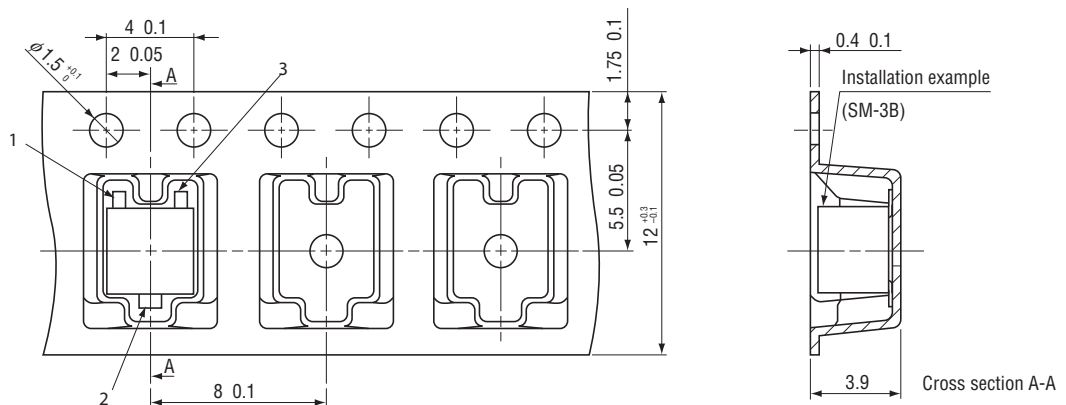
● SM-3TW/31TW



● 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.