

SURFACE MOUNT CERMET TRIMMERS

SM-42/43



FEATURES

- RoHS compliant
- Fine adjustment is available
- Automatic mounting is available (Taping)
- Reflow soldering is available
- 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

SM-4TW100Ω(101)

Series name

Electrical turn
2 : 11 turns
3 : 5 turns

Form of packaging
T : Taping (Reel)
Blank : Bulk in plastic bag

Resistance code

Resistance value

Product shape (Shape of terminal)
W, X : Top adjustmet
A, B : Side adjustmet

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

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SURFACE MOUNT TRIMMERS

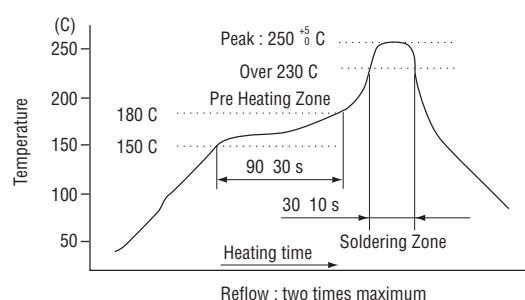
LIST OF PART NUMBERS

Electrical turn	Adjustment position	Shape of terminal	Form of packaging	
			Taping (reel)	Plastic bag
11	Top adjustment	W (J-hook)	SM-42TW	SM-42W
		X (Gull wing)	SM-42TX	SM-42X
	Side adjustment	A (J-hook)	SM-42TA	SM-42A
		B (Gull wing)	SM-42TB	SM-42B
5	Top adjustment	W (J-hook)	SM-43TW	SM-43W
		X (Gull wing)	SM-43TX	SM-43X
	Side adjustment	A (J-hook)	SM-43TA	SM-43A
		B (Gull wing)	SM-43TB	SM-43B
Pieces in package			TA, TB : 500 pcs./reel TW, TX : 250 pcs./reel	50 pcs./pack

ELECTRICAL CHARACTERISTICS

Nominal resistance range	10 Ω ~ 2 M Ω
Resistance tolerance	$\pm 10\%$
Power ratings	0.25 W (85 $^{\circ}$ C) 0 W (150 $^{\circ}$ C)
Resistance law	(B) Linear law
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	11 turns (SM-42), 5 turns (SM-43)
End resistance	1 % or 2 Ω , whichever is greater
C.R.V.	1 % or 3 Ω , whichever is greater
Operating temp. range	-65 ~ 150 $^{\circ}$ C
Temp. coefficient	$\pm 100 \times 10^{-6}/^{\circ}$ C maximum
Insulation resistance	100 M Ω minimum (DC500 V)
Dielectric strength	AC600 V, 60 s
Net weight	Approx. 0.17 g

Reflow profile for soldering heat evaluation



<Nominal resistance values>

10 Ω	20 Ω	50 Ω	100 Ω	200 Ω	500 Ω	1 k Ω	2 k Ω	5 k 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	

Fig. 1

The products indicated by $\Rightarrow$ mark are manufactured upon receipt of order basis.

※ 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.

MECHANICAL CHARACTERISTICS

Operating torque	17.6 mN·m (180 gf·cm) maximum
Mechanical stop	Clutch action
Rotational life	200 cycles [$\Delta R/R \leq \pm (3\% + 3\%)$]
Thrust to shaft	5 N (0.51 kgf) minimum
Solderability	245 $\pm$ 3 $^{\circ}$ 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 $^{\circ}$ C (0.5 h), 5 cycles	[$\Delta R/R \leq 2\%$] [S.S. $\leq 1\%$]
Humidity	-10 ~ 65 $^{\circ}$ C (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 ~ 2000 Hz, 3 directions, 12 times each	
Load life	85 $^{\circ}$ C, 0.25 W, 1000 h	[$\Delta R/R \leq 3\%$ or 3 Ω] [S.S. $\leq 2\%$]
Low temp. operation	-65 $^{\circ}$ C, 2 h	[$\Delta R/R \leq 1\%$] [S.S. $\leq 1\%$]
High temp. exposure	150 $^{\circ}$ C, 250 h	[$\Delta R/R \leq 2\%$] [S.S. $\leq 1\%$]
Immersion seal	85 $^{\circ}$ C, 60 s	No leaks (No continuous bubbles)
Soldering heat	Reflow : Peak temperature 255 $^{\circ}$ C (Please refer to the profile below.) Manual soldering : 350 $\pm$ 10 $^{\circ}$ C, 3 ~ 4 s	[$\Delta R/R \leq 1\%$]

$\Delta R/R$: Change in total resistance
S.S. : Setting stability

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SURFACE MOUNT TRIMMERS

■ MAXIMUM INPUT RATINGS

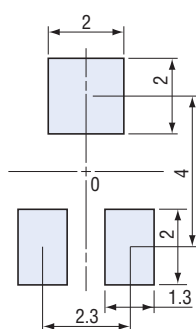
Nominal resistance values (Ω)	Resistance code	Maximum input voltage (V)	Maximum wiper current (mA)
⤵ 10	100	1.00	100
⤵ 20	200	2.00	100
50	500	3.53	70.7
100	101	5.00	50.0
200	201	7.07	35.4
500	501	11.2	22.4
1 k	102	15.8	15.8
2 k	202	22.4	11.2
5 k	502	35.4	7.07
10 k	103	50.0	5.00
20 k	203	70.7	3.54
50 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.

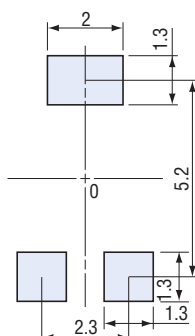
■ RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

(Unit: mm)

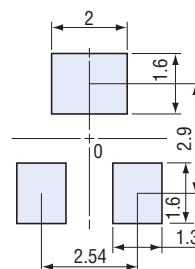
● SM-42/43A



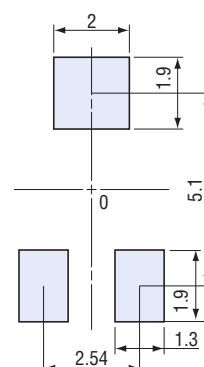
● SM-42/43B



● SM-42/43W



● SM-42/43X



Note) The zero point is the center of mounting.

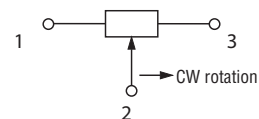
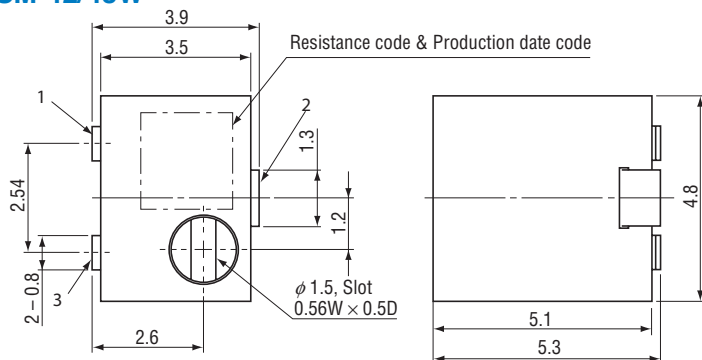
SM-42/43

SURFACE MOUNT TRIMMERS

OUTLINE DIMENSIONS

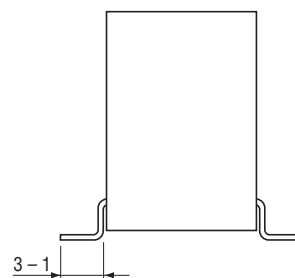
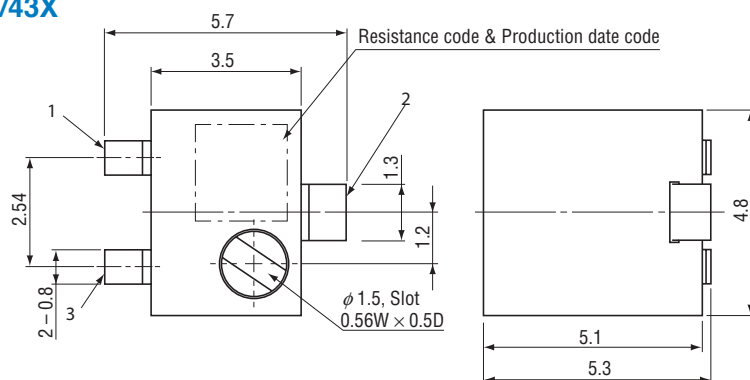
Unless otherwise specified, tolerance : ± 0.3 (Unit : mm)

● SM-42/43W

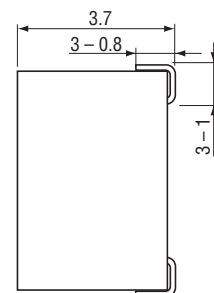
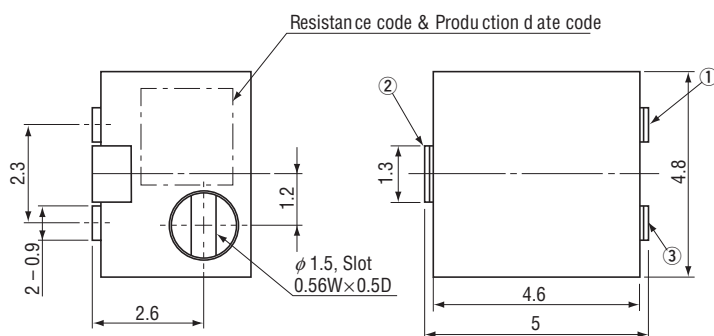


※Note the terminal position.

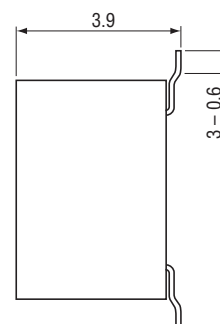
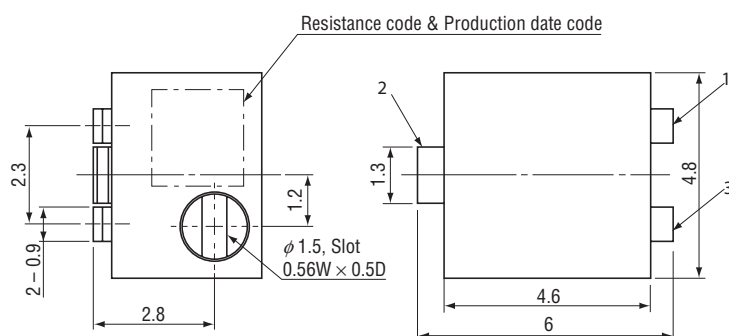
● SM-42/43X



● SM-42/43A



● SM-42/43B



SM-42/43

SURFACE MOUNT TRIMMERS

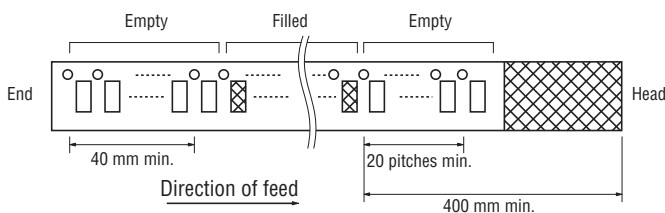
PACKAGING SPECIFICATIONS

<Taping packaging specifications>

- Taping version (SM-42/43TA, TB) is packaged in 500 pcs. per reel.
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500 pcs., etc.
- SM-42/43TW, TX is packaged in 250 pcs. per reel.
Orders will be accepted for units of 250 pcs., i.e., 500, 750 pcs., etc.

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

EMBOSSED TAPE DIMENSIONS

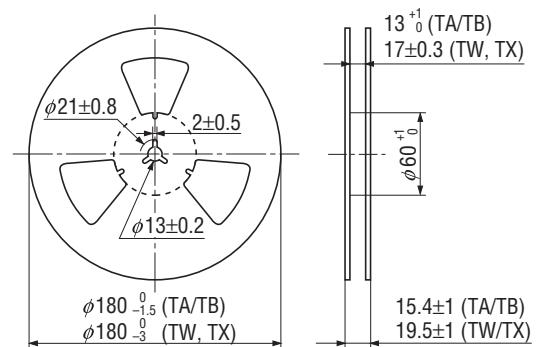


REEL DIMENSIONS

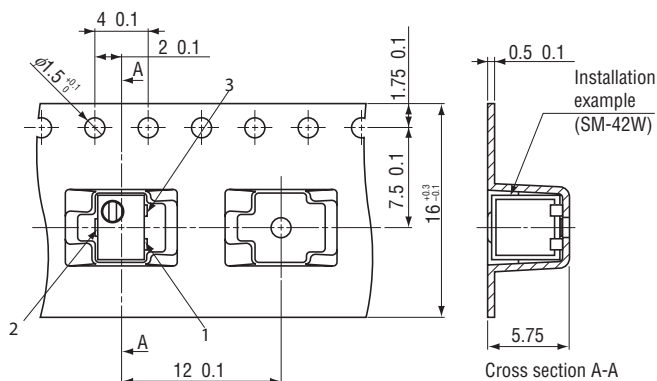
(Conforms to JIS C 0806-3)

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

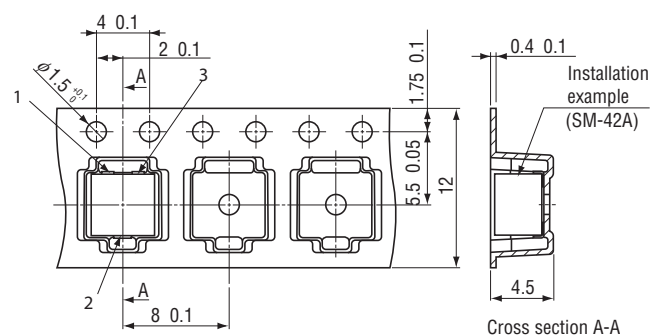
(Unit: mm)



SM-42/43TW/TX



SM-42/43TA/TB



<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.