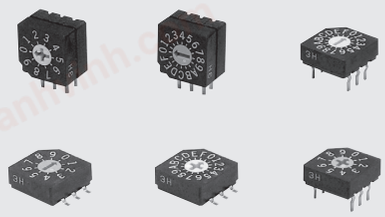
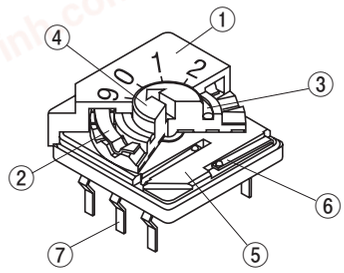
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ROTARY CODED SWITCHES SD-1000/2000

RoHS compliant



INTERNAL STRUCTURE
SD-1000 / 2000 series



	Part name	Material	Flammability
①	Housing	Polyphenylenesulphide	UL94V-0
②	Metallic spring	Stainless (SUS 301)	—
③	"O" ring	Silicone rubber	UL94HB
④	Insert rotor	Rotor : Polyamide Pattern : Copper alloy, Gold-plated	UL94V-0
⑤	Base	Polyphenylenesulphide	UL94V-0
⑥	Contact	Copper alloy, Gold-plated	—
⑦	Terminal pin		

FEATURES

- RoHS compliant
- Fine click with metallic spring
- Low profile of 3.9 mm makes perfect for high density board mounting applications
- Gold plated contact provides excellent reliability
- Cross and minus slot are available
- Terminal pin arrangement 3-3

PART NUMBER DESIGNATION

S D - 1 0 1 0 T B

Series name

No. of positions
1 : 16 positions
2 : 10 positions

Shape of rotor
0 : Without knob (Minus slot)
1 : With knob (with extended shaft)
2 : Without knob (Cross slot)

Code format
1 : Real code (Rotor color Yellow)
3 : Complementary code (Rotor color Red)

Setting position
0 : Top setting
1 : Side setting

Form of packaging
T : Taping (Gull wing type only)
W : Tray packaging
Blank : Plastic bag

Shape of terminal
B : Gull wing (Top setting type only)
Blank : Through hole pin (Snap-in terminal pin)

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

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SD-1000/2000
ROTARY CODED SWITCHES

■ LIST OF PART NUMBERS

● Binary coded decimal

Shape of rotor		Form of packaging	Real code	Complementary code	Pieces in package
Top setting (Through hole pin)	Without knob (Minus slot)	Plastic bag	SD-2010	SD-2030	25 pcs./pack
		Tray packaging	SD-2010W	SD-2030W	50 pcs./tray
	With knob	Plastic bag	SD-2110	SD-2130	25 pcs./pack
		Tray packaging	SD-2110W	SD-2130W	50 pcs./tray
	Without knob (Cross slot)	Plastic bag	SD-2210	SD-2230	25 pcs./pack
		Tray packaging	SD-2210W	SD-2230W	50 pcs./tray
Side setting (Through hole pin)	Without knob (Minus slot)	Plastic bag	SD-2011	SD-2031	25 pcs./pack
		Tray packaging	SD-2011W	SD-2031W	50 pcs./tray
	With knob	Plastic bag	SD-2111	SD-2131	25 pcs./pack
		Tray packaging	SD-2111W	SD-2131W	50 pcs./tray
	Without knob (Cross slot)	Plastic bag	SD-2211	SD-2231	25 pcs./pack
		Tray packaging	SD-2211W	SD-2231W	50 pcs./tray
Top setting (Gull wing)	Without knob (Minus slot)	Plastic bag	SD-2010B	SD-2030B	25 pcs./pack
		Tray packaging	SD-2010WB	SD-2030WB	50 pcs./tray
		Taping	SD-2010TB	SD-2030TB	500 pcs./reel
	Without knob (Cross slot)	Plastic bag	SD-2210B	SD-2230B	25 pcs./pack
		Tray packaging	SD-2210WB	SD-2230WB	50 pcs./tray
		Taping	SD-2210TB	SD-2230TB	500 pcs./reel

● Binary coded hexadecimal

Shape of rotor		Form of packaging	Real code	Complementary code	Pieces in package
Top setting (Through hole pin)	Without knob (Minus slot)	Plastic bag	SD-1010	SD-1030	25 pcs./pack
		Tray packaging	SD-1010W	SD-1030W	50 pcs./tray
	With knob	Plastic bag	SD-1110	SD-1130	25 pcs./pack
		Tray packaging	SD-1110W	SD-1130W	50 pcs./tray
	Without knob (Cross slot)	Plastic bag	SD-1210	SD-1230	25 pcs./pack
		Tray packaging	SD-1210W	SD-1230W	50 pcs./tray
Side setting (Through hole pin)	Without knob (Minus slot)	Plastic bag	SD-1011	SD-1031	25 pcs./pack
		Tray packaging	SD-1011W	SD-1031W	50 pcs./tray
	With knob	Plastic bag	SD-1111	SD-1131	25 pcs./pack
		Tray packaging	SD-1111W	SD-1131W	50 pcs./tray
	Without knob (Cross slot)	Plastic bag	SD-1211	SD-1231	25 pcs./pack
		Tray packaging	SD-1211W	SD-1231W	50 pcs./tray
Top setting (Gull wing)	Without knob (Minus slot)	Plastic bag	SD-1010B	SD-1030B	25 pcs./pack
		Tray packaging	SD-1010WB	SD-1030WB	50 pcs./tray
		Taping	SD-1010TB	SD-1030TB	500 pcs./reel
	Without knob (Cross slot)	Plastic bag	SD-1210B	SD-1230B	25 pcs./pack
		Tray packaging	SD-1210WB	SD-1230WB	50 pcs./tray
		Taping	SD-1210TB	SD-1230TB	500 pcs./reel

※ Verify the above part numbers when placing orders.
※ Taping and tray version can be supplied only in reel or tray units.

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SD-1000/2000
ROTARY CODED SWITCHES

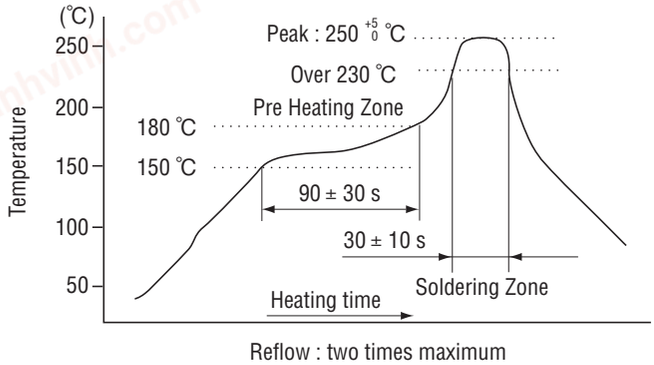
STANDARD SPECIFICATIONS

Circuit type	BCD (Real code, complementary code) BCH (Real code, complementary code)
Operating temperature range	— 40 ~ 85 °C
Storage temperature range	
Sealing	Non-washable
Net weight	0.65 g Without knob Top setting 0.76 g With knob Top setting 0.95 g Without knob Side setting 1.05 g With knob Side setting

ENVIRONMENTAL CHARACTERISTICS

Vibration	Amplitude 1.5 mm or Acceleration 98 m/s^2, 10-500-10 Hz, 3 directions for 2 h each
Shock	490 m/s^2, 11 ms 6 directions for 3 times each
Humidity	Resistance load DC50V 100mA 40 °C, Relative humidity 90 ~ 95 %, 240 h
Load life	20000 steps DC5 V, 100 mA
High temperature exposure	85 °C, 96 h
Low temperature exposure	— 40 °C, 96 h
Thermal shock	— 40 (0.5 h) ~ 85 °C (0.5 h), 5 cycles

〈Reflow profile for soldering heat evaluation〉



Reflow : two times maximum

ELECTRICAL CHARACTERISTICS

Contact rating Non-switching Switching Minimum	DC50 V 100 mA DC5 V 100 mA DC20 mV 1 μA
Contact resistance	100 m Ω maximum
Insulation resistance	1000 M Ω (DC100 V) minimum
Dielectric strength	AC250 V, 60 s

MECHANICAL CHARACTERISTICS

No. of positions		16 (SD-1000), 10 (SD-2000)
Adjustment torque		4 ~ 25 mN·m {41 ~ 255 gf·cm}
Stepping angle		22.5° (SD-1000), 36° (SD-2000)
Terminal strength (Through hole pin only)		10 N {1.02 kgf} minimum
Stop strength (With knob only)		10 N {1.02 kgf}, 10 s
Solderability		245 ± 3 °C, 2 ~ 3 s
Soldering heat	Gull wing	Reflow : Peak temperature 255 °C (Please refer to the profile below.)
		Manual soldering : 350 ± 10 °C, 3 ~ 4 s
	Through hole pin	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
		Manual soldering : 380 ± 10 °C, 3 ~ 4 s
Shear (Gull wing only)		5 N {0.51 kgf}, 10 s
Substrate bending (Gull wing only)		Width 90 mm, bend 3 mm, 5 s, 1 time
Pull-off strength (Gull wing only)		5 N {0.51 kgf}, 10 s

{ } : Reference only

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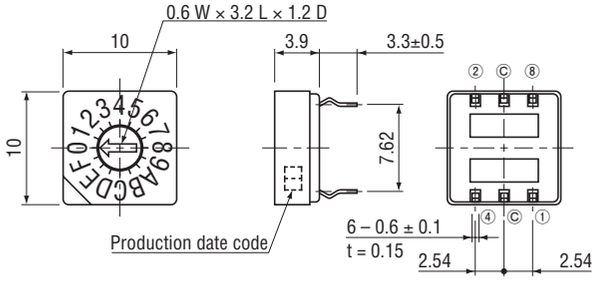
SD-1000/2000
ROTARY CODED SWITCHES

■ OUTLINE DIMENSIONS

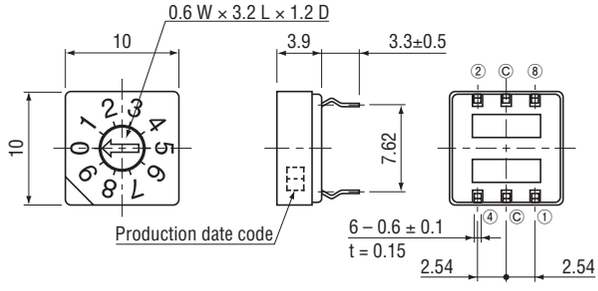
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Through hole pin, Top setting>

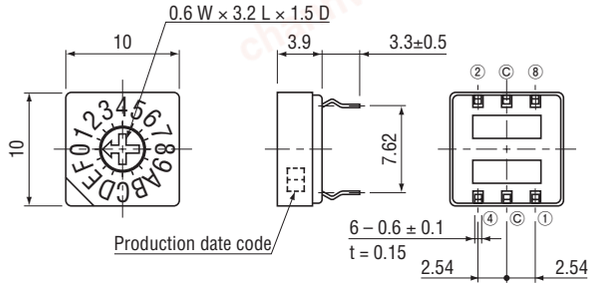
● SD-1010 (Real code)
● SD-1030 (Complementary code)



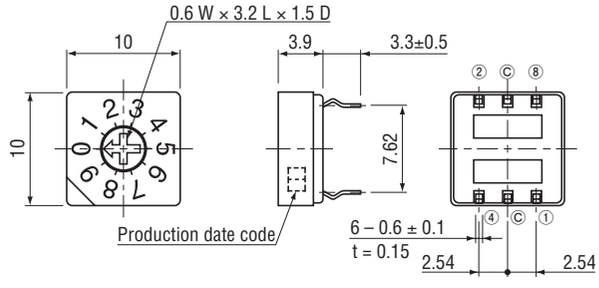
● SD-2010 (Real code)
● SD-2030 (Complementary code)



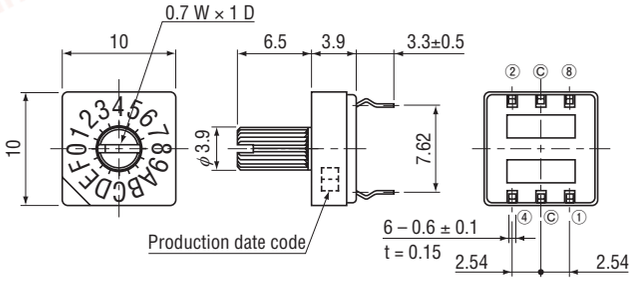
● SD-1210 (Real code)
● SD-1230 (Complementary code)



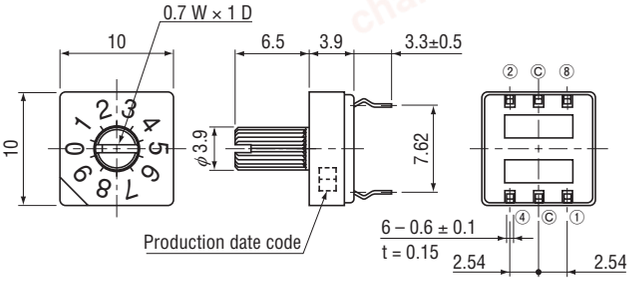
● SD-2210 (Real code)
● SD-2230 (Complementary code)



● SD-1110 (Real code)
● SD-1130 (Complementary code)



● SD-2110 (Real code)
● SD-2130 (Complementary code)



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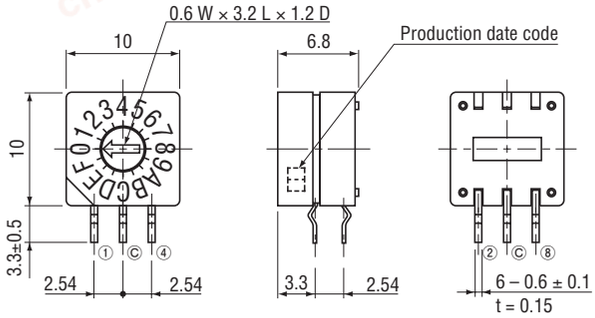
SD-1000/2000
ROTARY CODED SWITCHES

■ OUTLINE DIMENSIONS

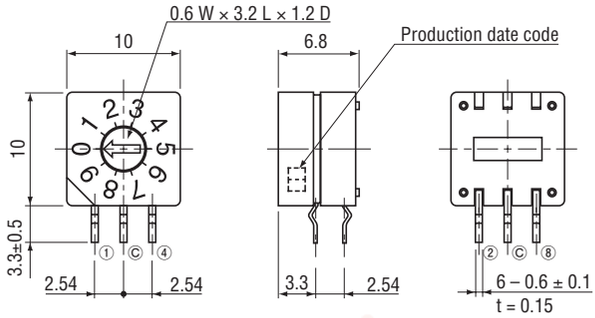
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Through hole pin, Side setting>

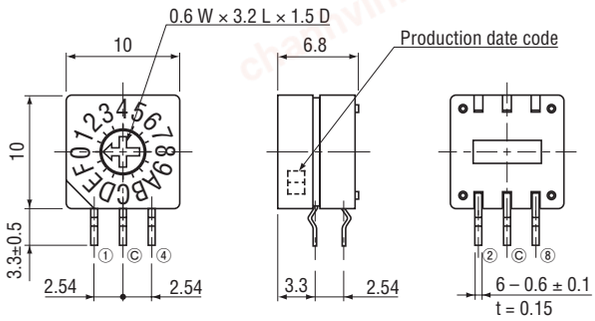
● SD-1011 (Real code)
● SD-1031 (Complementary code)



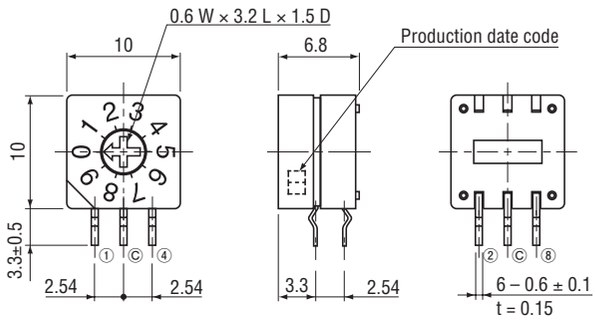
● SD-2011 (Real code)
● SD-2031 (Complementary code)



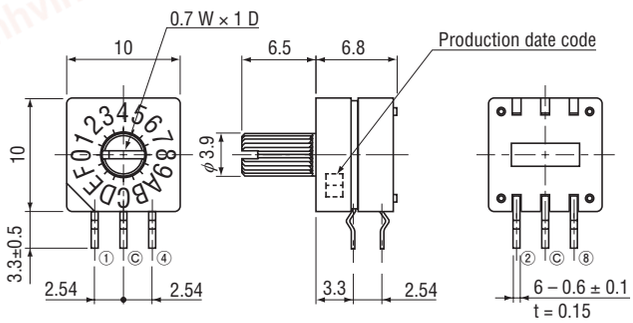
● SD-1211 (Real code)
● SD-1231 (Complementary code)



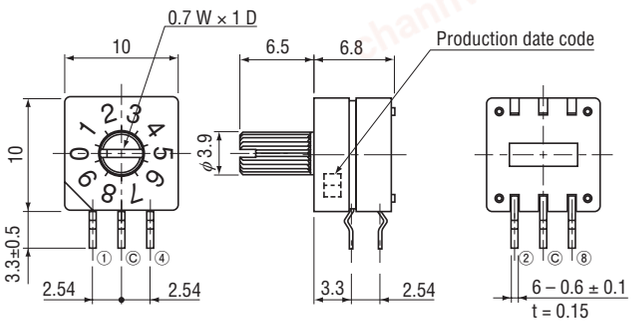
● SD-2211 (Real code)
● SD-2231 (Complementary code)



● SD-1111 (Real code)
● SD-1131 (Complementary code)



● SD-2111 (Real code)
● SD-2131 (Complementary code)



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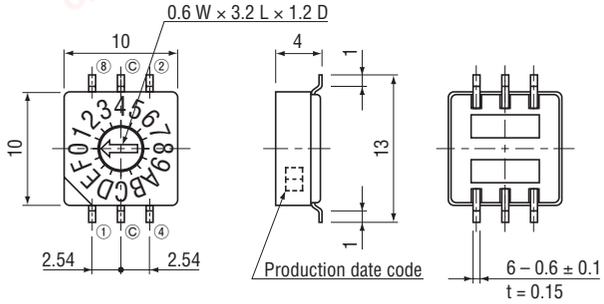
SD-1000/2000
ROTARY CODED SWITCHES

■ OUTLINE DIMENSIONS

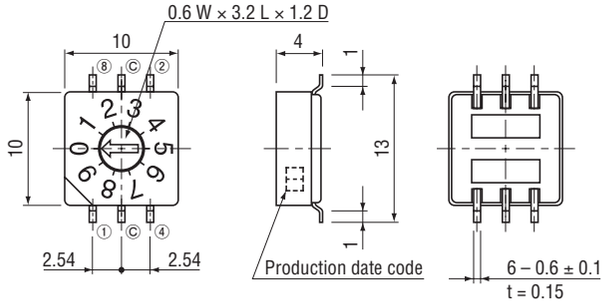
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<Gull wing, Top setting>

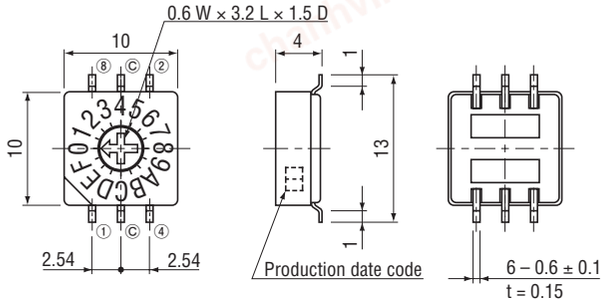
● SD-1010B (Real code)
● SD-1030B (Complementary code)



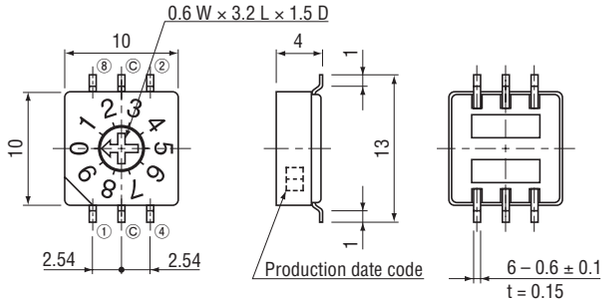
● SD-2010B (Real code)
● SD-2030B (Complementary code)



● SD-1210B (Real code)
● SD-1230B (Complementary code)



● SD-2210B (Real code)
● SD-2230B (Complementary code)



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SD-1000/2000
ROTARY CODED SWITCHES

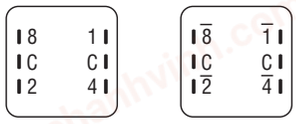
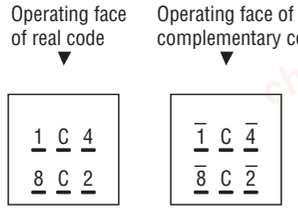
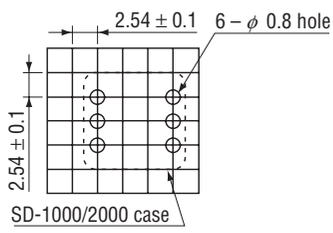
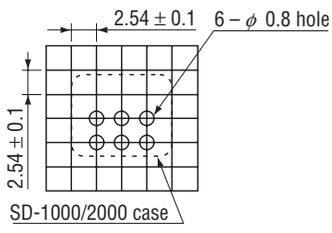
■ CODE FORMAT

No. of positions			SD-1000 series (16 positions) / SD-2000 series (10 positions)															
Position			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Code	Real code	8									●	●	●	●	●	●	●	●
		4					●	●	●	●					●	●	●	●
		2			●	●			●	●			●	●			●	●
		1		●		●		●		●		●		●		●		●
	Complementary code	$\overline{8}$	●	●	●	●	●	●	●	●								
		$\overline{4}$	●	●	●	●					●	●	●	●				
		$\overline{2}$	●	●			●	●			●	●			●	●		
		$\overline{1}$	●		●		●		●		●		●		●		●	

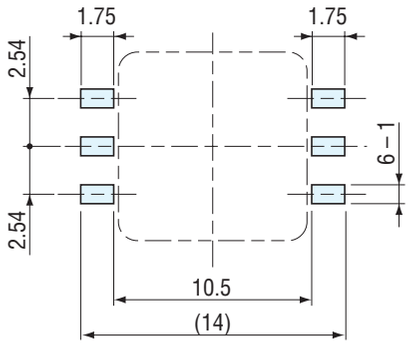
● ···Contact closed

■ TERMINAL CONNECTION / P.C.B. THROUGH HOLE DIMENSIONS

(Unit: mm)

	Top setting	Side setting
Terminal pin layout (Bottom view)		
P.C.B. dimensions (Bottom view)		

■ RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS



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SD-1000/2000
ROTARY CODED SWITCHES

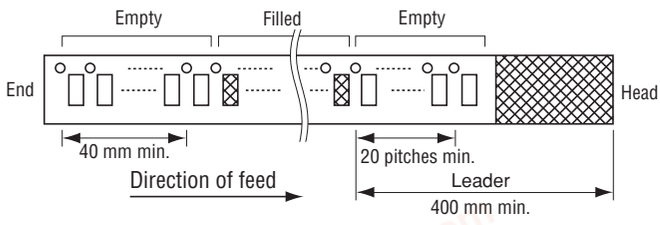
■ PACKAGING SPECIFICATIONS

<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:

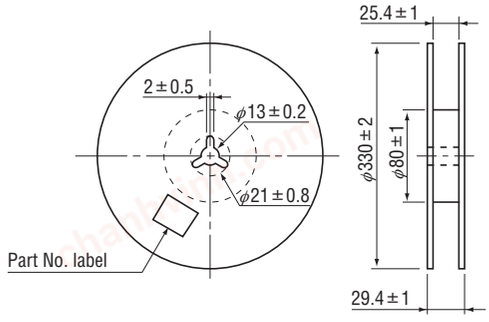
● Embossed tape dimensions



● Reel dimensions

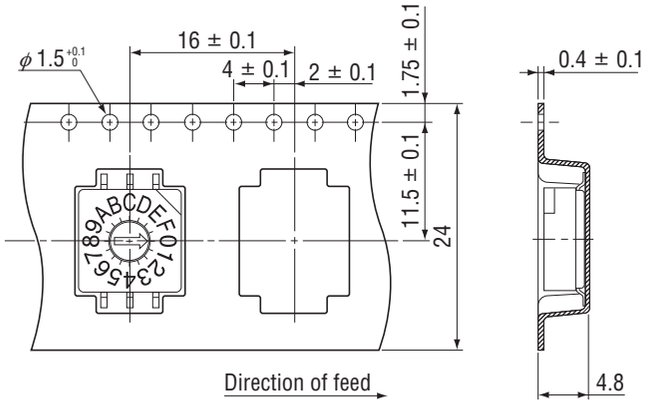
(Unit: mm)

(In accordance with EIAJ ET-7200A)



(Unit: mm)

(In accordance with EIAJ RC-1009B)



<Tray packaging specifications>

- Tray version is packaged in 50 pcs. per tray. Orders will be accepted for units of 50 pcs., i. e., 50, 100, 150 pcs. etc.
- Tray version is boxed with 10 trays.

<Bulk pack specifications>

- The smallest unit of bulk pack in a plastic bag is 10 pcs. per pack. Orders will be accepted for unit of minimum 10 pcs., i.e., 10, 20, 30 pcs. , etc.
- Boxing of bulk in a plastic bag is performed with 25 pcs. (standard 50 pcs.) per box.