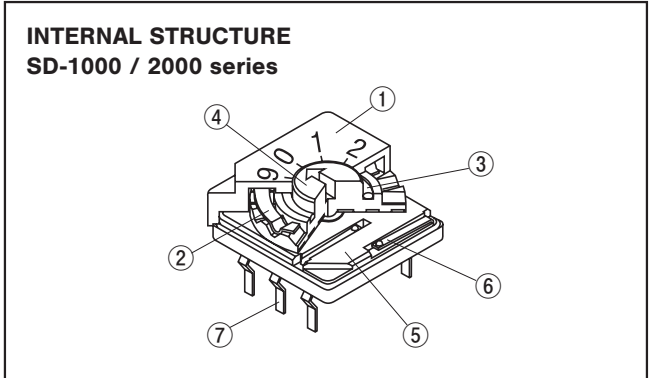
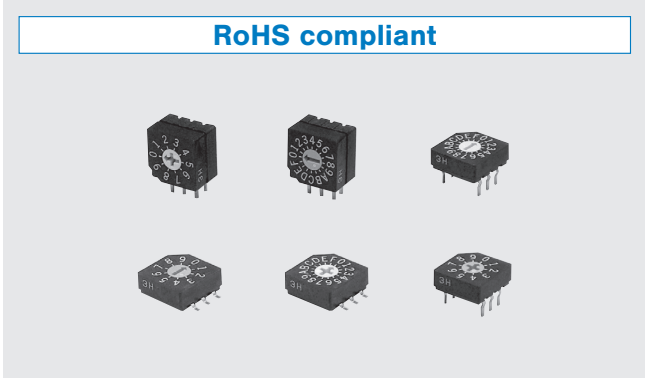




THE DATASHEET OF SD-1110



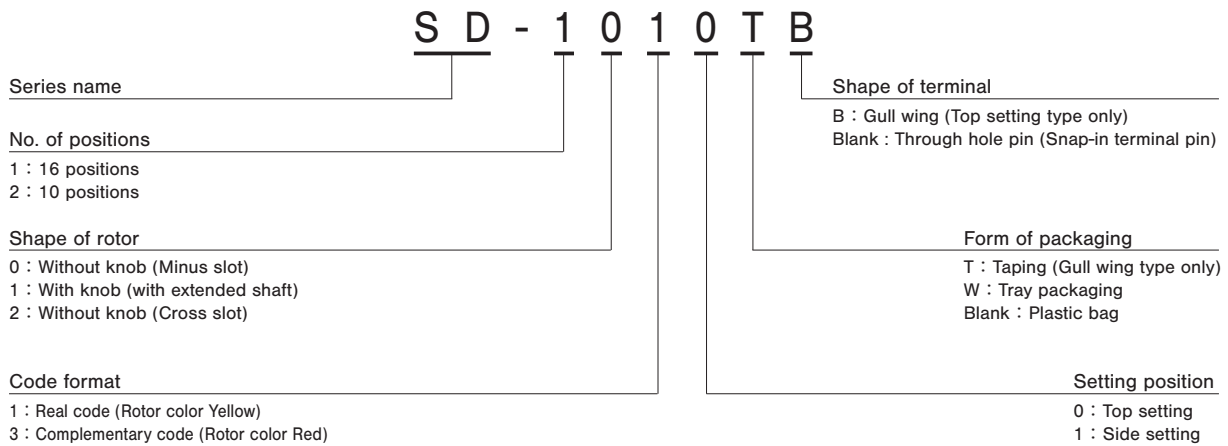


FEATURES

- 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
- Resin material is UL Recognized 94V-0

Part name		Material
①	Housing	Polyphenylenesulfide
②	Metallic	Stainless (SUS 301)
③	“O” ring	Silicone rubber
④	Insert rotor	Rotor : Polyamide Pattern : Copper alloy, Gold-plated
⑤	Base	Polyphenylenesulfide
⑥	Contact	Copper alloy, Gold-plated
⑦	Terminal pin	

PART NUMBER DESIGNATION



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

SD-1000/2000

ROTARY CODED SWITCHES

LIST OF PART NUMBERS

Binary coded decimal

Shape of rotor		Form of packaging	Real code	Complementary code	Packaging quantity
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	Packaging quantity
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.

SD-1000/2000

ROTARY CODED SWITCHES

STANDARD SPECIFICATIONS

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

ELECTRICAL CHARACTERISTICS

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

ENVIRONMENTAL CHARACTERISTICS

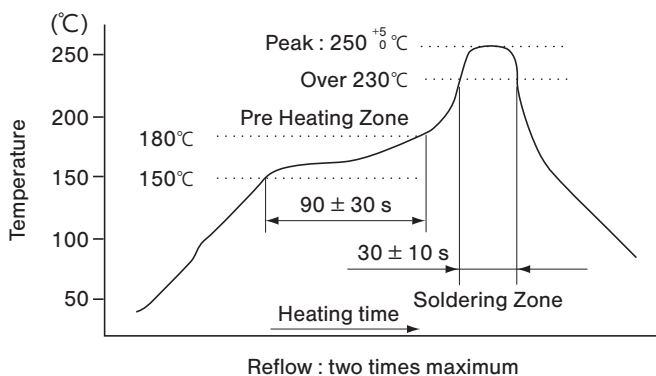
Vibration	Amplitude 1.5 mm or Acceleration 98 m/s ² , 10-500-10 Hz, 3 directions for 2 h each
Shock	490 m/s ² , 11 ms 6 directions for 3 times each
Humidity	Resistance load DC50V 100mA 40 °C, Relative humidity 90 ~ 95 %, 240 h
Load life	20000 steps DC5 V, 100 mA
High temp. exposure	85 °C, 96 h
Low temp.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

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.)
	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

Reflow profile for soldering heat evaluation



SD-1000/2000

ROTARY CODED SWITCHES

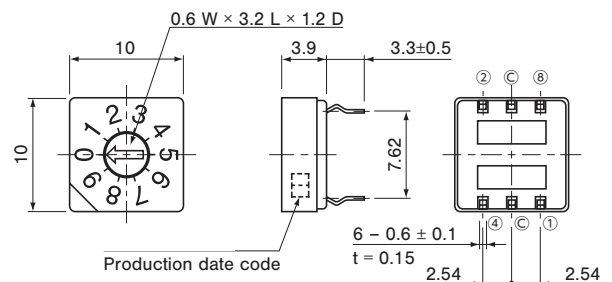
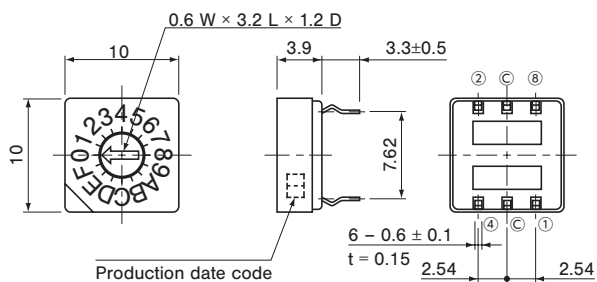
OUTLINE DIMENSIONS

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

<Through hole pin, Top setting>

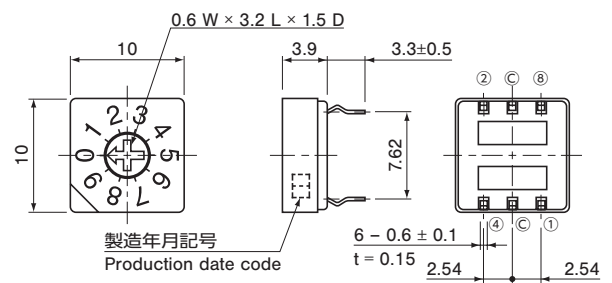
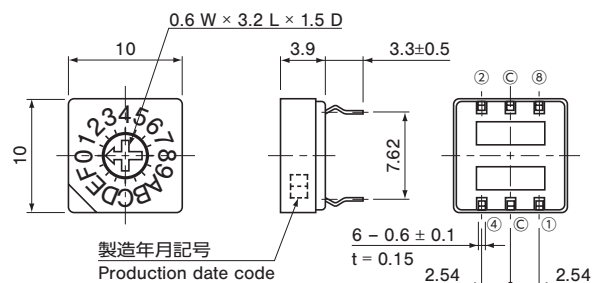
- SD-1010 (Real code)
- SD-1030 (Complementary code)

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



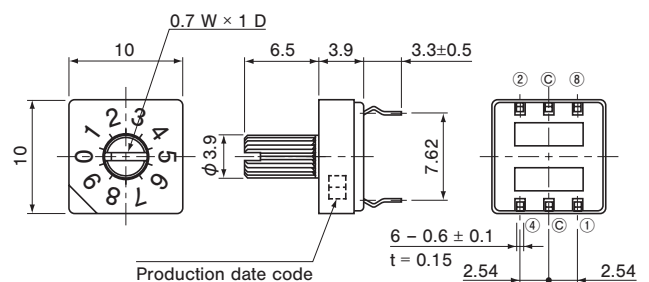
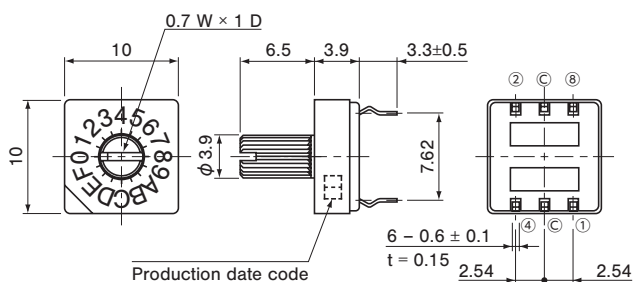
- SD-1210 (Real code)
- SD-1230 (Complementary code)

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



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

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



SD-1000/2000

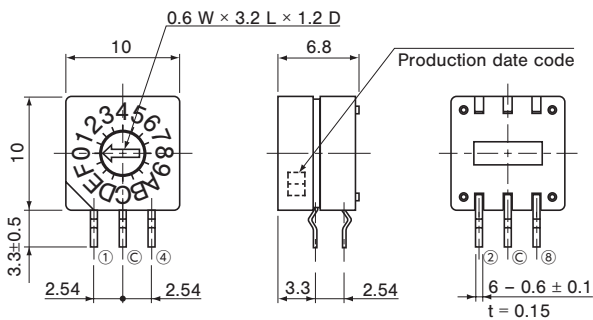
ROTARY CODED SWITCHES

OUTLINE DIMENSIONS

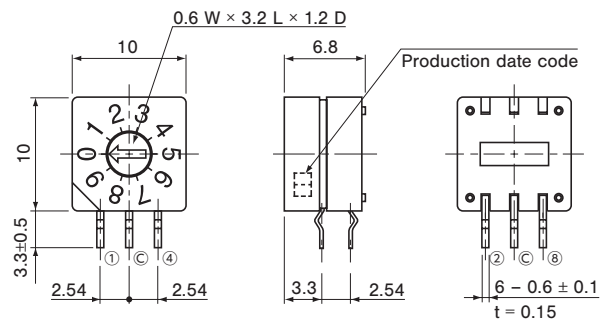
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Through hole pin, Side setting>

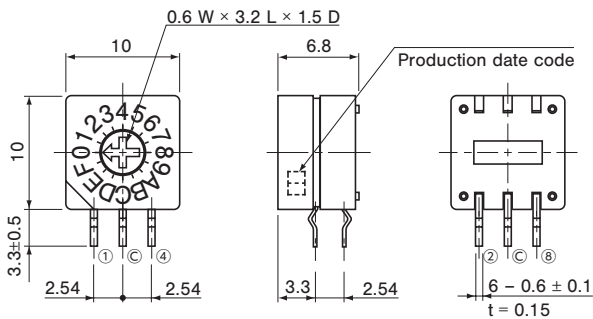
- SD-1011 (Real code)
- SD-1031 (Complementary code)



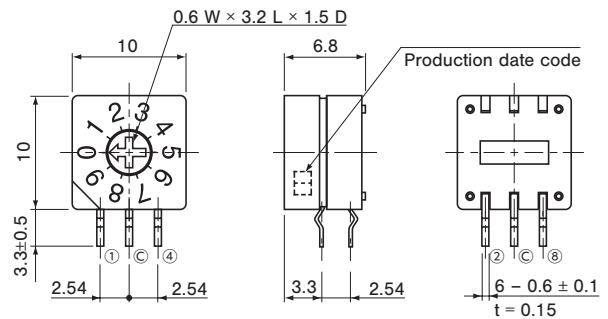
- SD-2011 (Real code)
- SD-2031 (Complementary code)



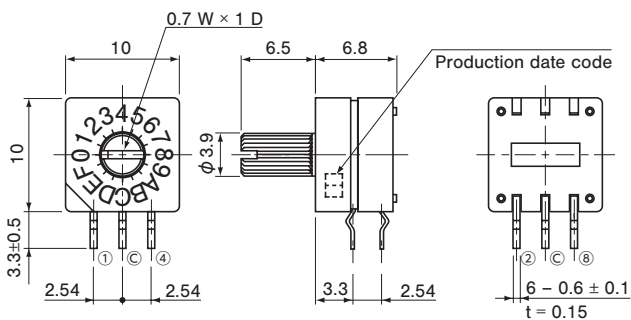
- SD-1211 (Real code)
- SD-1231 (Complementary code)



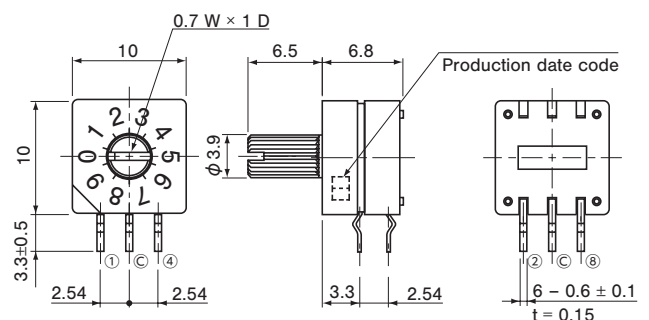
- SD-2211 (Real code)
- SD-2231 (Complementary code)



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



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



SD-1000/2000

ROTARY CODED SWITCHES

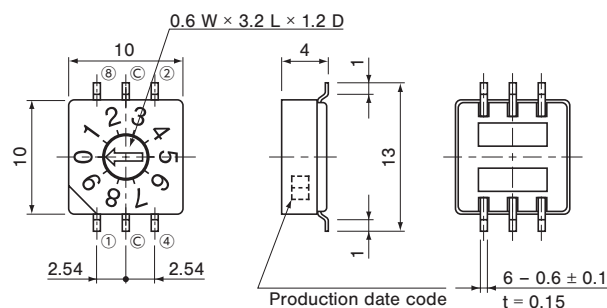
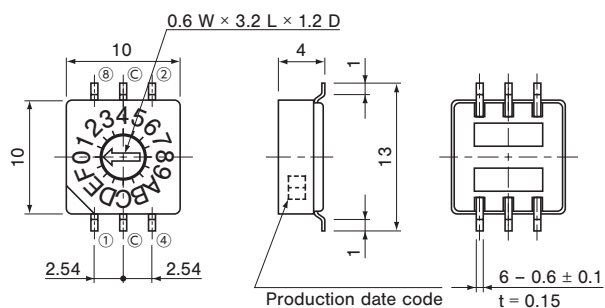
OUTLINE DIMENSIONS

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

<Gull wing, Top setting>

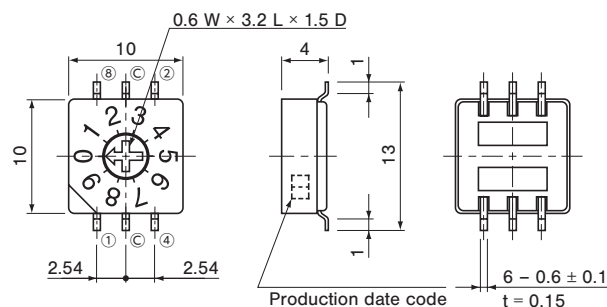
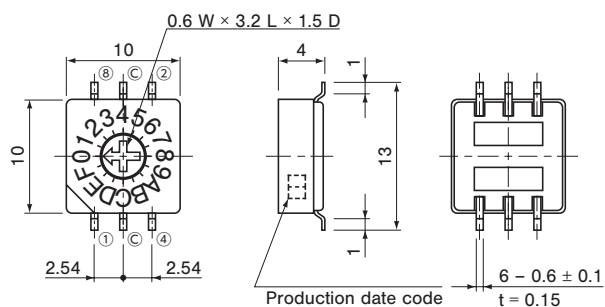
- SD-1010B (Real code)
- SD-1030B (Complementary code)

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



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

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



SD-1000/2000

ROTARY CODED SWITCHES

CODE FORMAT

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

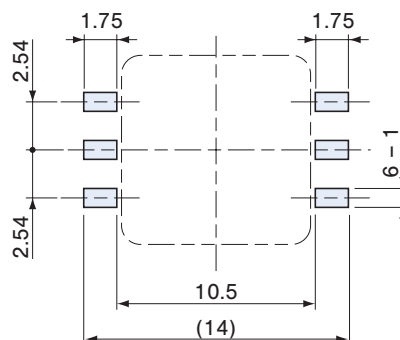
● ...Contact closed

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

(Unit: mm)

	Top setting	Side setting
Terminal pin layout (Bottom view)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Real code</p> </div> <div style="text-align: center;"> <p>Complementary code</p> </div> </div>	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Operating face of real code</p> </div> <div style="text-align: center;"> <p>Operating face of complementary code</p> </div> </div>
P.C.B. dimensions (Bottom view)		

RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS



SD-1000/2000

ROTARY CODED SWITCHES

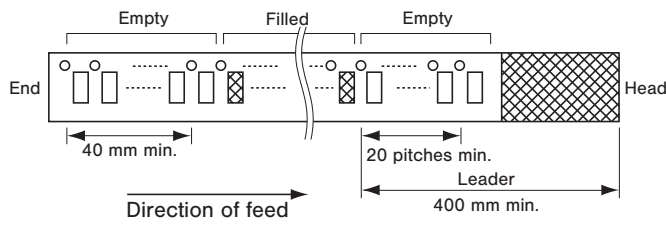
PACKAGING SPECIFICATIONS

<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:

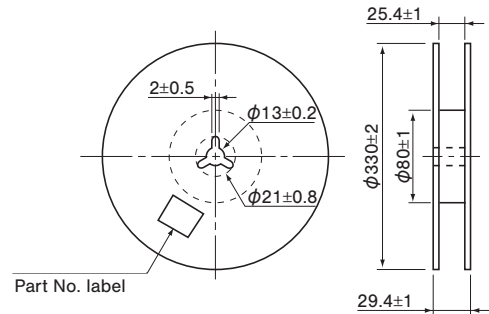
● Embossed tape dimensions



● Reel dimensions

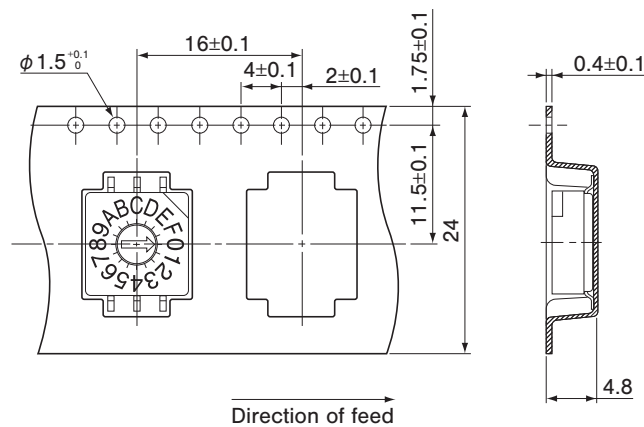
(In accordance with EIAJ ET-7200A)

(Unit: mm)



(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.

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