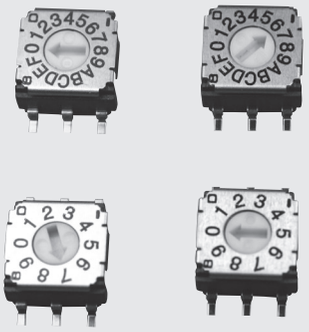
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ROTARY CODED SWITCHES (SMD) SH-7000

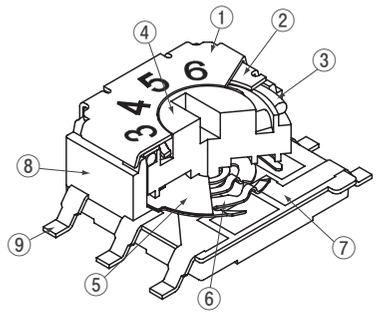
RoHS compliant



FEATURES

- RoHS compliant
- Center Common terminal pins location
- High digit visibility
- Gray code output available
- Washable

INTERNAL STRUCTURE



Part name		Material	Flammability
①	Marking cover	Stainless steel (SUS 304)	—
②	Cover	Stainless steel (SUS 301)	
③	"O" ring	Silicone rubber	UL94HB
④	Rotor	Polyphenylenesulphide	UL94V-0
⑤	Spacer	Stainless steel (SUS 304)	—
⑥	Moving contact	Copper alloy, Gold-plated	
⑦	Fixed contact		
⑧	Housing	Polyphenylenesulphide	UL94V-0
⑨	Terminal pin	Copper alloy, Gold-plated	—

PART NUMBER DESIGNATION

S H - 7 0 1 0 T A

Series name

Shape of rotor
0 : Without knob (Minus slot)

Code format
1 : 10 positions, real code
3 : 10 positions, complementary code
4 : 10 positions, gray code
5 : 16 positions, real code
7 : 16 positions, complementary code
8 : 16 positions, gray code

Setting position
0 : Top setting

Form of packaging
T : Taping (Reel)
M : Magazine

Shape of terminal
A : J-hook
B : Gull wing
C : Through hole pins

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

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ROTARY CODED SWITCHES (SMD)

CODE FORMAT

No. of positions			16 positions															
			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	$\overline{8}$	●	●	●	●	●	●	●	●								
		$\overline{4}$	●	●	●	●					●	●	●	●				
		$\overline{2}$	●	●			●	●			●	●			●	●		
		$\overline{1}$	●		●		●		●		●		●		●		●	
	Gray code	8									●	●	●	●	●	●	●	●
		4					●	●	●	●	●	●	●	●				
		2			●	●	●	●					●	●	●	●		
		1		●	●			●	●			●	●			●	●	

● ···Contact closed

LIST OF PART NUMBERS

Setting position	Shape of rotor	Shape of terminal	Form of packaging	Binary coded decimal			Binary coded hexadecimal			Pieces in package
				Real code	Complementary code	Gray code	Real code	Complementary code	Gray code	
Top setting	Minus slot	A J-hook	Taping	SH-7010TA	SH-7030TA		SH-7050TA	SH-7070TA		500 pcs./reel
			Magazine	SH-7010MA	SH-7030MA		SH-7050MA	SH-7070MA		50 pcs./stick
		B Gull wing	Taping	SH-7010TB	SH-7030TB	SH-7040TB	SH-7050TB	SH-7070TB	SH-7080TB	500 pcs./reel
			Magazine	SH-7010MB	SH-7030MB	SH-7040MB	SH-7050MB	SH-7070MB	SH-7080MB	50 pcs./stick
		C Through hole pins	Taping							
			Magazine	SH-7010MC	SH-7030MC		SH-7050MC	SH-7070MC		50 pcs./stick

⊘: Not manufactured

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

STANDARD SPECIFICATIONS

Circuit type	BCD (Real code, Complementary code, Gray code) BCH (Real code, Complementary code, Gray code)
Operating temperature range	— 40 ~ 85 °C — 40 ~ 105 °C (Gray code)
Storage temperature range	
Sealing	Washable by "O" ring ※ Please refer to page 150,151
Net weight	Approx. 0.38 g

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

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SH-7000
ROTARY CODED SWITCHES (SMD)

MECHANICAL CHARACTERISTICS

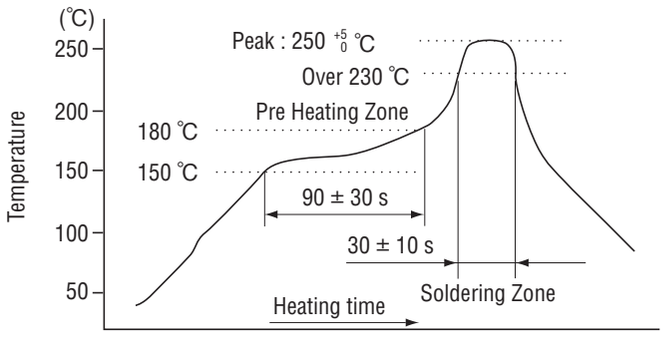
No. of positions	10, 16
Adjustment torque	3 ~ 20 mN·m { 3~ 204 gf·cm}
Stepping angle	36° (10 positions) 22.5° (16 positions)
Solderability	245 ± 3 °C, 2 ~ 3 s
Soldering heat	Reflow : 255 °C (Peak temperature) Reflow : Peak temperature 255 °C (Please refer to the profile below.)
	Flow : 260 ± 3 °C as 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 : 350 ± 10 °C, 3 ~ 4 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} 10s

{ } : Reference only

ENVIRONMENTAL CHARACTERISTICS

Vibration	Amplitude 1.5 mmor 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
Load life	10000 steps minimum, DC5 V, 100 mA
Humidity	40 °C, Relative humidity 90 ~ 95 %, 240 h
High temperature exposure	85 °C, 96 h 105 °C, 96 h (Gray code)
Low temperature exposure	− 40 °C, 96 h
Thermal shock	− 40 (0.5 h) ~ 85 °C (0.5 h), 5 cycles − 40 (0.5 h) ~ 105 °C (0.5 h), 5 cycles (Gray code)

〈Reflow profile for soldering heat evaluation〉

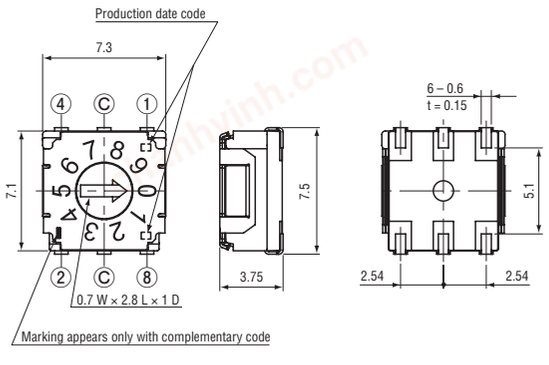


Reflow : two times maximum

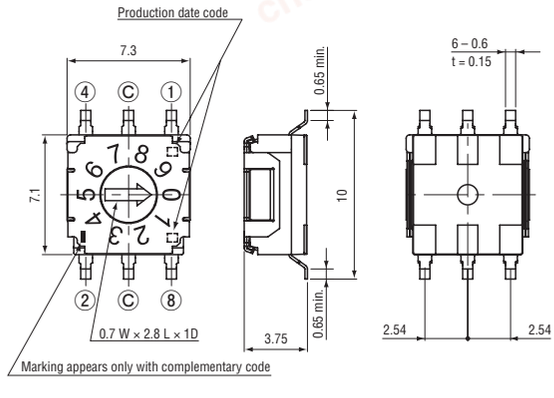
OUTLINE DIMENSIONS

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

● SH-7010A (Real code)
● SH-7030A (Complementary code)



● SH-7010B (Real code)
● SH-7030B (Complementary code)



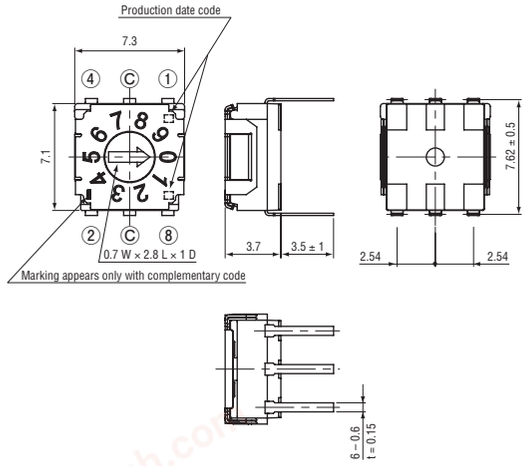
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ROTARY CODED SWITCHES (SMD)

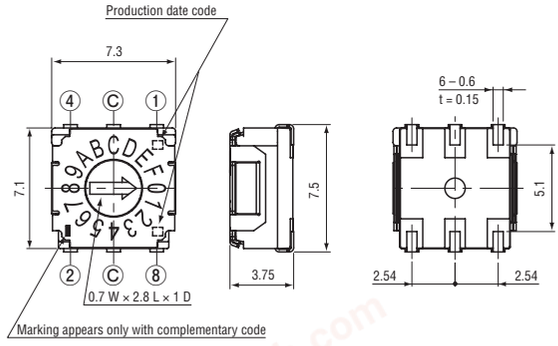
■ OUTLINE DIMENSIONS

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

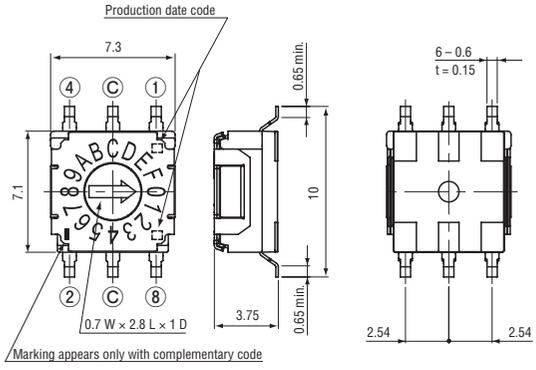
● SH-7010C (Real code)
● SH-7030C (Complementary code)



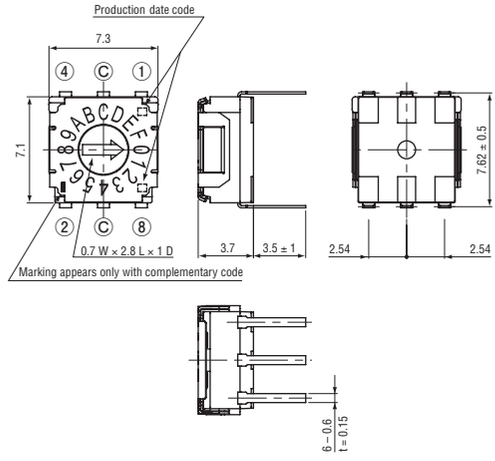
● SH-7050A (Real code)
● SH-7070A (Complementary code)



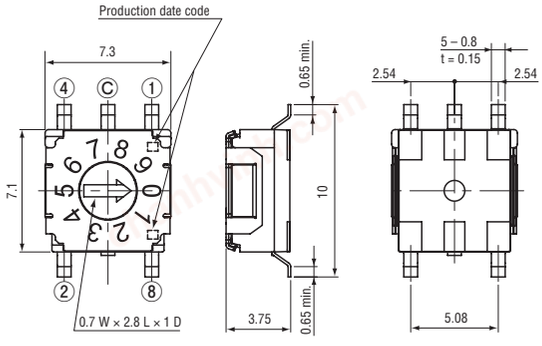
● SH-7050B (Real code)
● SH-7070B (Complementary code)



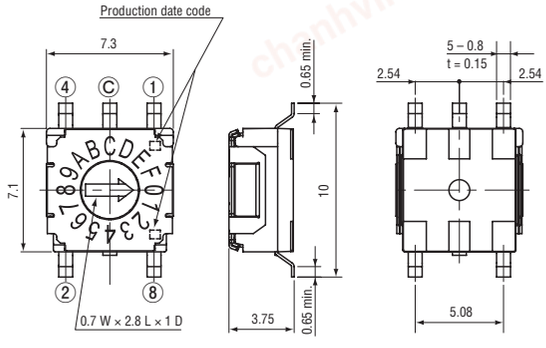
● SH-7050C (Real code)
● SH-7070C (Complementary code)



● SH-7040B (Gray code)



● SH-7080B (Gray code)

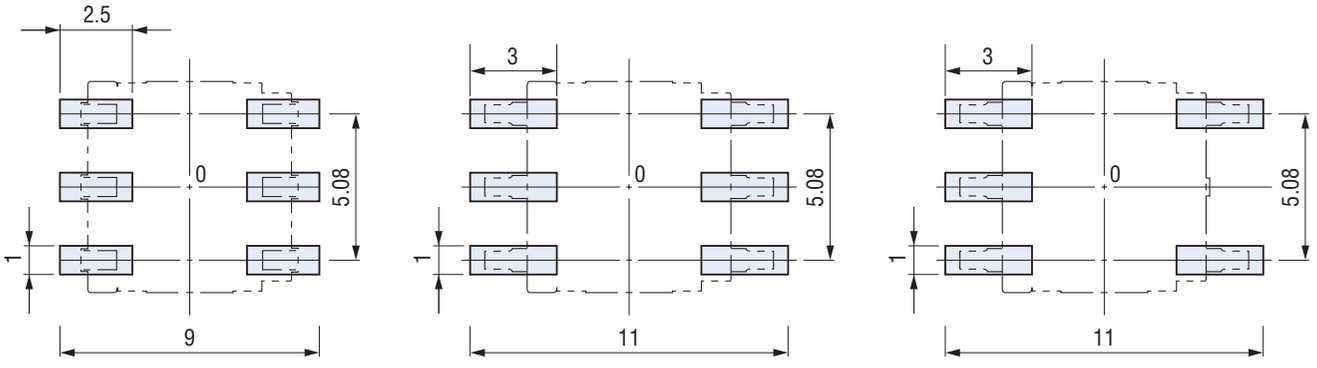


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ROTARY CODED SWITCHES (SMD)

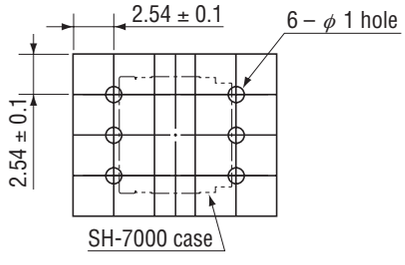
■ RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

● A type ● B type ● Gray code (Unit: mm)



注） 0 点は搭載中心とする
Note) The zero point is the center of mounting.

■ TERMINAL CONNECTION / P.C.B. THROUGH HOLE DIMENSIONS (Unit: mm)

	Through hole
Terminal pin layout (Bottom view)	Top setting (Through hole) Real code: 8 C 2 / 1 C 4 Complementary code: $\overline{8}$ C $\overline{2}$ / $\overline{1}$ C $\overline{4}$
P.C.B. dimensions (Bottom view)	

■ PACKAGING SPECIFICATIONS

<Taping packaging specifications>

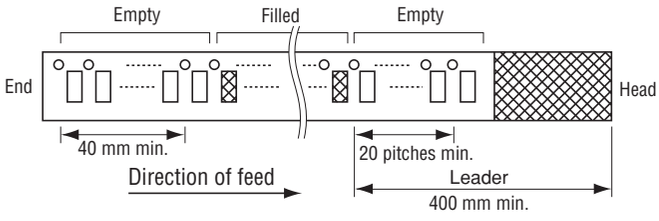
- Taping version is packaged in 500 pcs. per reel. Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500, pcs., etc.
- Taping version is boxed with one reel (500 pcs.).

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

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SH-7000
ROTARY CODED SWITCHES (SMD)

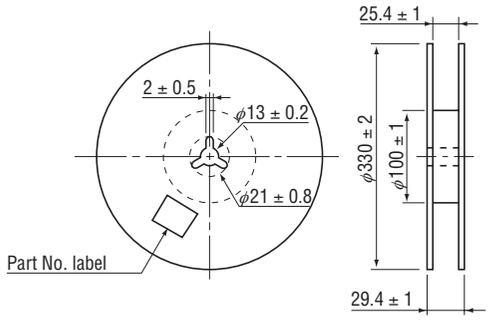
● Embossed tape dimensions



● Reel dimensions

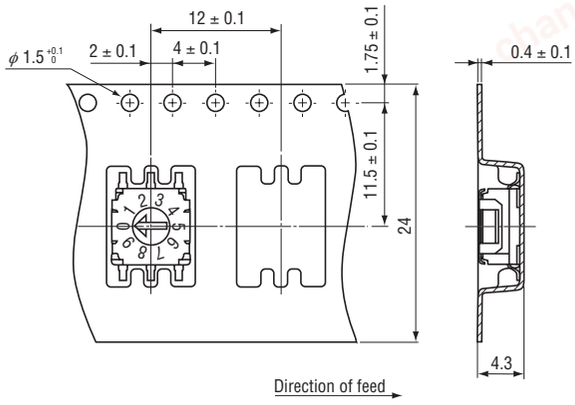
(Unit: mm)

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



● SH-70 □ 0TA
● SH-70 □ 0TB

(Unit: mm)



■ PACKAGING SPECIFICATIONS

<Magazine packaging specifications>

● Please order the multiple numbers of the specific packing quantities.

Pieces in package : 50 pcs./stick

● Magazine dimensions

(Unit : mm)

