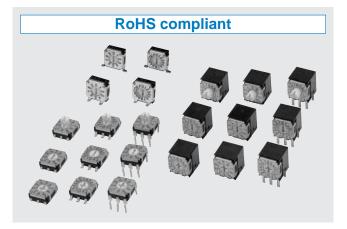
ROTARY CODED SWITCHES (SMD)





FEATURES

- RoHS compliant
- Low profile of 3.0 mm
- Wide variety (top or side setting, 10 or 16 positions, J-hook, gull wing or through hole pins) to choose from
- Easy to recognize
- Low-profile side setting type with support terminals is available

IN	INTERNAL STRUCTURE					
	Part name Material Flammability					
1	Marking cover	Stainlass steel (SUS 304)				
2	Cover	Stainless steel (SUS 304) —				
3	"O" ring	Silicone rubber UL-94H				
4	Rotor PPS(Polyphenylenesulphide) UL-94					
5	Spacer	Stainless steel (SUS 304)				
6	Moving contact					
\bigcirc	Fixed contact	Copper alloy, Gold-plated				
8	Housing	PPS(Polyphenylenesulphide) UL-94V				
9	Terminal pin Copper alloy, Gold-plated —					

PART NUMBER DESIGNATION

	SA- <u>701</u>	<u>) T A</u>
Series name		Shape of terminal
Shape of rotor		A : J-hook B : Gull wing C : Through hole pins
0 : Without knob (Minus slot) 1 : With knob 2 : Without knob (Cross slot)		(Only gull wing availabe for Low-profile side setting type) Form of packaging
Code format		T : Taping (Reel) Blank : Bulk in plastic bag (Only taping availabe for Low-profile side setting type)
 1: 10 positions, real code 3: 10 positions, complementary code 5: 16 positions, real code 		Setting position
7:16 positions, complementary code		0 : Top setting 1 : Side setting 2 : Low-profile side setting & forward support terminal type

3 : Low-profile side setting & forward support terminal type

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

Setting position	Shape of rotor	Shape of terminal	Form of packaging	Binary coded decimal		Binary coded hexadecimal		Pieces in	
				Real code	Complementary code	Real code	Complementary code	package	
		J-hook	Taping	SA-7010TA	SA-7030TA	SA-7050TA	SA-7070TA	500 pcs./reel	
		A	Plastic bag	SA-7010A	SA-7030A	SA-7050A	SA-7070A	50 pcs./pack	
	Minue elet	Gull wing	Taping	SA-7010TB	SA-7030TB	SA-7050TB	SA-7070TB	500 pcs./reel	
	Minus slot	B	Plastic bag	SA-7010B	SA-7030B	SA-7050B	SA-7070B	50 pcs./pack	
		Through hole pins	Taping						
		C	Plastic bag	SA-7010C	SA-7030C	SA-7050C	SA-7070C	50 pcs./pack	
		J-hook A	Taping	SA-7110TA	SA-7130TA	SA-7150TA	SA-7170TA	500 pcs./reel	
			Plastic bag	SA-7110A	SA-7130A	SA-7150A	SA-7170A	50 pcs./pack	
Ton ootting	With knob	Gull wing	Taping	SA-7110TB	SA-7130TB	SA-7150TB	SA-7170TB	500 pcs./reel	
Top setting	With knob	B	Plastic bag	SA-7110B	SA-7130B	SA-7150B	SA-7170B	50 pcs./pack	
		Through hole pins	Taping						
		C	Plastic bag	SA-7110C	SA-7130C	SA-7150C	SA-7170C	50 pcs./pack	
		J-hook	Taping	SA-7210TA	SA-7230TA	SA-7250TA	SA-7270TA	500 pcs./reel	
		A	Plastic bag	SA-7210A	SA-7230A	SA-7250A	SA-7270A	50 pcs./pack	
		Gull wing	Taping	SA-7210TB	SA-7230TB	SA-7250TB	SA-7270TB	500 pcs./reel	
	Cross slot	B	Plastic bag	SA-7210B	SA-7230B	SA-7250B	SA-7270B	50 pcs./pack	
		Through hole nine	Taping	ONTIE TOD	ON TEOD	GATIZOOD	GITTETOD	oo pool/puok	
		Through hole pins C	Plastic bag	SA-7210C	SA-7230C	SA-7250C	SA-7270C	50 pcs./pack	
		J-hook A	Taping	SA-7011TA	SA-7031TA	SA-7051TA	SA-7071TA	500 pcs./reel	
			Plastic bag	SA-7011A	SA-7031A	SA-7051A	SA-7071A	50 pcs./pack	
		Gull wing	Taping	SA-7011TB	SA-7031TB	SA-7051TB	SA-7071TB	500 pcs./reel	
	Minus slot		Plastic bag	SA-7011B	SA-7031B	SA-70511B	SA-7071B	50 pcs./pack	
			-	JA-TUTTD	3A-7031D	JA-70JTD	JA-TOTTB	JU pcs./pack	
		Through hole pins C	Taping Plastic bag	SA-7011C	SA-7031C	SA-7051C	SA-7071C	50 pcs./pack	
			-	SA-7011C SA-7111TA	SA-70310 SA-7131TA	SA-70510 SA-7151TA	SA-70710 SA-7171TA	500 pcs./pack	
		B Through hole pins C	Taping Plastic bag						
	With knob		-	SA-7111A	SA-7131A	SA-7151A	SA-7171A	50 pcs./pack	
Side setting			Taping Disatis has	SA-7111TB	SA-7131TB	SA-7151TB	SA-7171TB	500 pcs./reel	
			Plastic bag	SA-7111B	SA-7131B	SA-7151B	SA-7171B	50 pcs./pack	
			Taping Disatis has	04 71110	04 71010	04 71510	04 71710	50 noo /nool/	
			Plastic bag	SA-7111C	SA-7131C	SA-7151C	SA-7171C	50 pcs./pack	
	Cross slot	J-hook A	Taping	SA-7211TA	SA-7231TA	SA-7251TA	SA-7271TA	500 pcs./reel	
			Plastic bag	SA-7211A	SA-7231A	SA-7251A	SA-7271A	50 pcs./pack	
			Gull wing	Taping	SA-7211TB	SA-7231TB	SA-7251TB	SA-7271TB	500 pcs./reel
		B	Plastic bag	SA-7211B	SA-7231B	SA-7251B	SA-7271B	50 pcs./pack	
		Through hole pins C	Taping						
			Plastic bag	SA-7211C	SA-7231C	SA-7251C	SA-7271C	50 pcs./pack	
Low-profile side	Minus slot	- Gull wing		SA-7012TB	SA-7032TB	SA-7052TB	SA-7072TB	500 pcs./reel	
etting & forward support terminal	With knob			SA-7112TB	SA-7132TB	SA-7152TB	SA-7172TB	500 pcs./reel	
type	Cross slot		Tarian	SA-7212TB	SA-7232TB	SA-7252TB	SA-7272TB	500 pcs./reel	
Low-profile side	Minus slot		Taping	SA-7013TB	SA-7033TB	SA-7053TB	SA-7073TB	500 pcs./reel	
etting & sideling support terminal	With knob			SA-7113TB	SA-7133TB	SA-7153TB	SA-7173TB	500 pcs./reel	
type	Cross slot			SA-7213TB	SA-7233TB	SA-7253TB	SA-7273TB	500 pcs./reel	

LIST OF PART NUMBERS

 $\hfill \square$: Not manufactured

% Verify the above part numbers when placing orders. Taping version can be supplied only in reel unit.

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 ※Please refer to A-218, A-219		
Net weight	Approx. 0.32 g (Top setting type without knob) Approx. 0.34 g (Top setting type with knob) Approx. 0.69 g (Side setting type without knob) Approx. 0.71 g (Side setting type with knob) Approx. 0.42 g (Low-profile side setting type with knob) Approx. 0.44 g (Low-profile side setting type with knob)		

MECHANICAL CHARACTERISTICS

No. of positions	10, 16		
Adjustment torque	20 mN·m {204 gf·cm} maximum		
Stepping angle	36° (10 positions) 22.5° (16 positions)		
Solderability	245 ± 3 °C, 2 ~ 3 s		
	Reflow: 255 °C (Peak temperature) Please refer to the profile below)		
Soldering heat	Manual soldering : 350 ± 10 °C, 3 ~ 4 s Flow : 260 ± 3 °C, 5~ 6 s, two		
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		
Stop strength (With knob only)	5 N {0.51 kgf} 10s		

{ }: Reference only

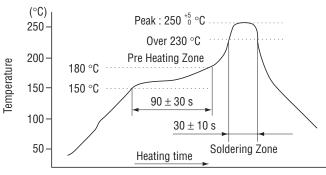
ELECTRICAL CHARACTERISTICS

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	100 MΩ (DC100 V) minimum		
Dielectric strength	AC250 V, 60 s		

ENVIRONMENTAL CHARACTERISTICS

Vibration	(Amplitude) 1.5 mm or (Acceleration) 98 m/s², 10-500-10 Hz, 3 directions for 2 h each			
Shock	490 m/s², 11 ms 6 directions for 3 times each			
Load life	10000 steps minimum, DC5 V, 100 mA			
Humidity (Steady state)	40 °C, Relative humidity 90 ~ 95 %, 240 h			
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

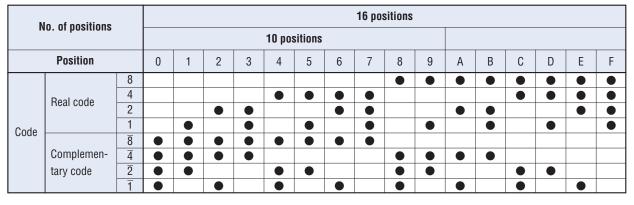
A Middee: Group Company COPAL ELECTRONICS

SA-7000 ROTARY CODED SWITCHES (SMD)

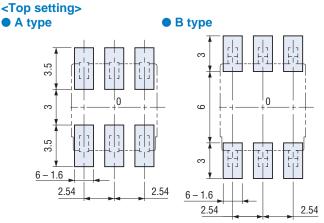
CODE FORMAT

…Contact closed

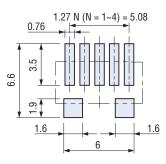
B type



RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

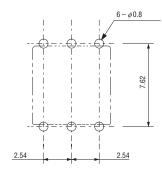


<Low-profile side setting & forward support terminal type (B type)>



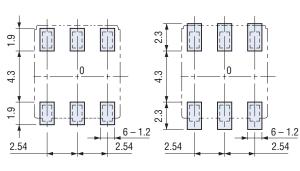
SIZE OF P.C.B. PROCESSING



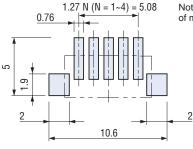




(Unit: mm)

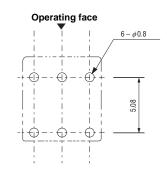


<Low-profile side setting & sideling support terminal type (B type)>



Note) The zero point is the center of mounting.

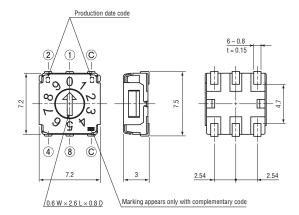




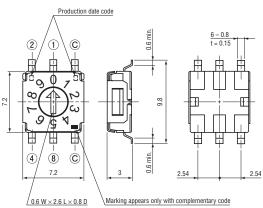
OUTLINE DIMESIONS

<Top setting>

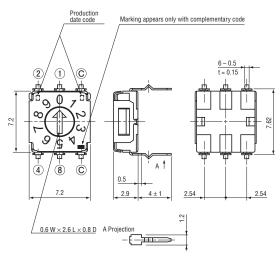
SA-7010A (Real code) SA-7030A (Complementary code)



SA-7010B (Real code) SA-7030B (Complementary code)

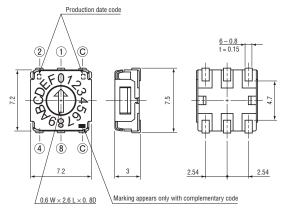


SA-7010C (Real code) SA-7030C (Complementary code)

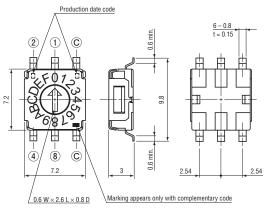


Unless otherwise specified, tolerance: \pm 0.3 (Unit: mm)

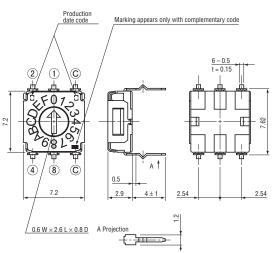
SA-7050A (Real code) SA-7070A (Complementary code)



SA-7050B (Real code) SA-7070B (Complementary code)



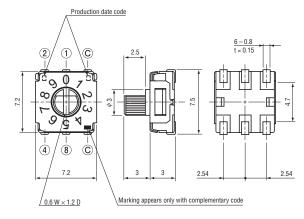
SA-7050C (Real code) SA-7070C (Complementary code)



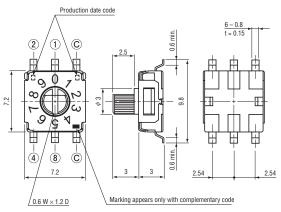
OUTLINE DIMESIONS

<Top setting>

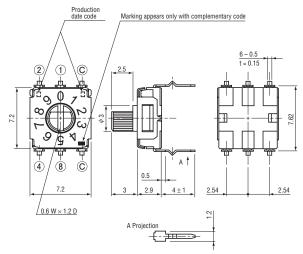
SA-7110A (Real code) SA-7130A (Complementary code)



SA-7110B (Real code) SA-7130B (Complementary code)

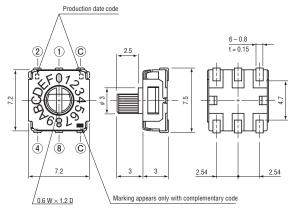


SA-7110C (Real code) SA-7130C (Complementary code)

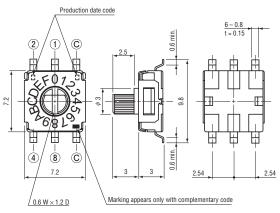


Unless otherwise specified, tolerance: \pm 0.3 (Unit: mm)

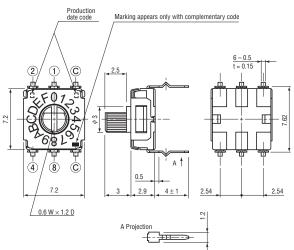
SA-7150A (Real code) SA-7170A (Complementary code)



SA-7150B (Real code) SA-7170B (Complementary code)



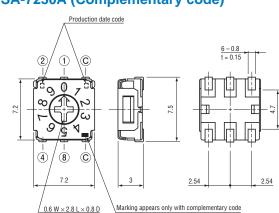
SA-7150C (Real code) SA-7170C (Complementary code)



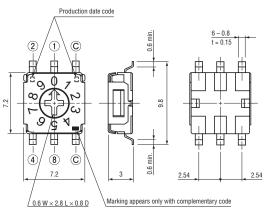
OUTLINE DIMESIONS

<Top setting>

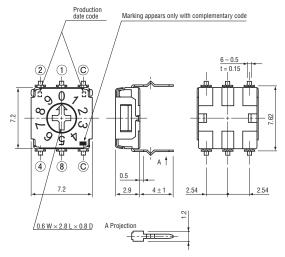
SA-7210A (Real code) SA-7230A (Complementary code)



SA-7210B (Real code) SA-7230B (Complementary code)

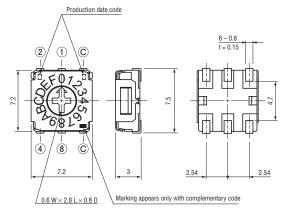


SA-7210C (Real code) SA-7230C (Complementary code)

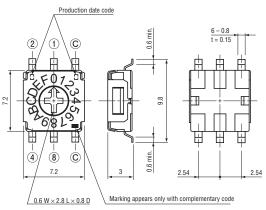


Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

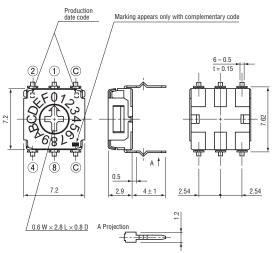
SA-7250A (Real code) SA-7270A (Complementary code)



SA-7250B (Real code) SA-7270B (Complementary code)



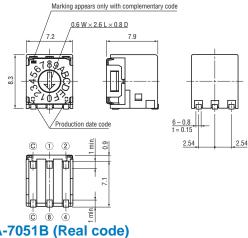
SA-7250C (Real code) SA-7270C (Complementary code)



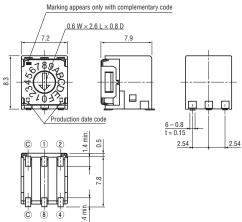
Marking appears only with complementary code 0.6 W × 2.6 L × 0.8 D 7.9 833 க்கி l EI $\frac{6-0.8}{t=0.15}$ oduction date code 2.54 2.54 Ē (C) 1 2 1 0.9 © (2) ГĨ min min Ċ (8) (4) SA-7051B (Real code) SA-7031B (Complementary code) Marking appears only with complementary code 0.6 W × 2.6 L × 0.8 D 7.9 roduction date code $\frac{6 - 0.8}{t = 0.15}$ min. t min. 0.5 2.54 (C) (1) (2) 2.54 C 1 2 ЦŊ Ġ (8) (Å) 8 4 Ċ. Marking appears only with complementary code $0.6~W \times 2.6~L \times 0.8~D$ 7 Q 833

Unless otherwise specified, tolerance: \pm 0.3 (Unit: mm)

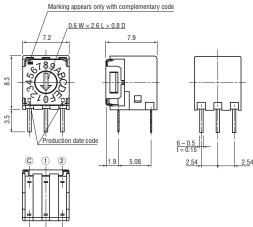
• SA-7051A (Real code) SA-7071A (Complementary code)



SA-7071B (Complementary code)



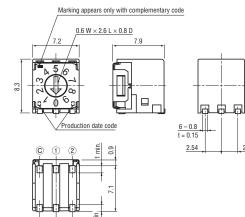
• SA-7051C (Real code) SA-7071C (Complementary code)



OUTLINE DIMESIONS

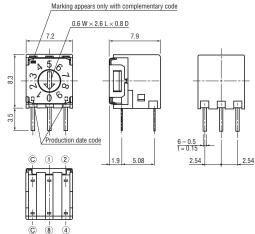
<Side setting>

SA-7011A (Real code) SA-7031A (Complementary code)



SA-7011B (Real code)

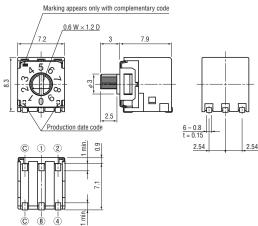
SA-7011C (Real code) SA-7031C (Complementary code)



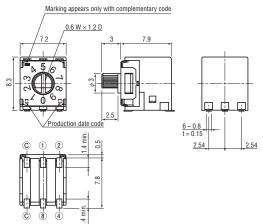
OUTLINE DIMESIONS

<Side setting>

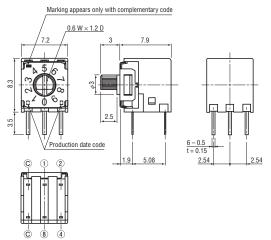
SA-7111A (Real code) SA-7131A (Complementary code)



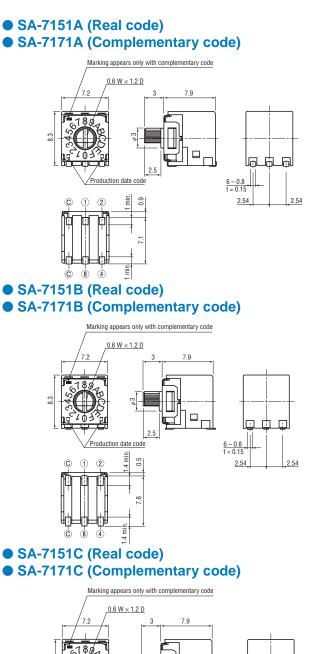
SA-7111B (Real code) SA-7131B (Complementary code)

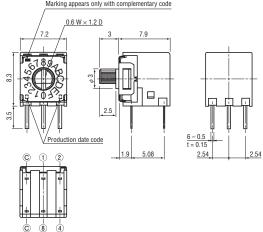


SA-7111C (Real code) SA-7131C (Complementary code)



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

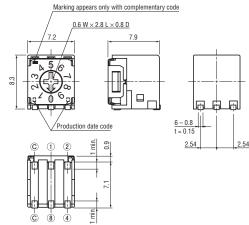




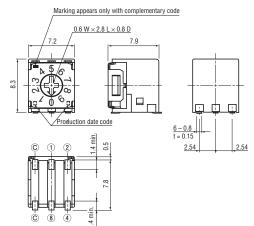
OUTLINE DIMESIONS

<Side setting>

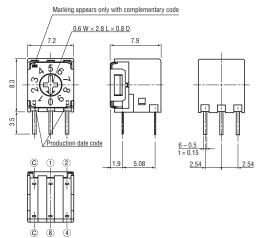
SA-7211A (Real code) SA-7231A (Complementary code)



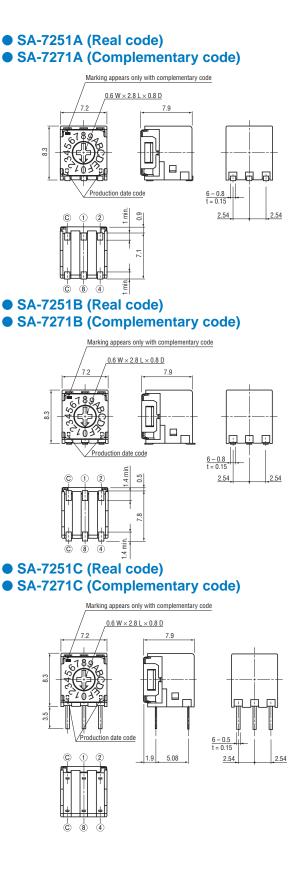
SA-7211B (Real code) SA-7231B (Complementary code)



SA-7211C (Real code) SA-7231C (Complementary code)



Unless otherwise specified, tolerance: \pm 0.3 (Unit: mm)



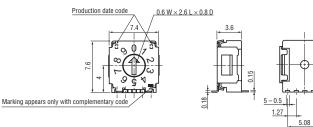
OUTLINE DIMESIONS

Unless otherwise specified, tolerance: \pm 0.3 (Unit: mm)

<Low-profile side setting & forward support terminal type>

SA-7012B (Real code)

SA-7032B (Complementary code)



4281C

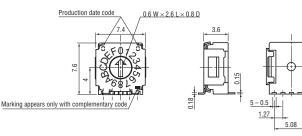
SA-7132B (Complementary code)

4281C

SA-7232B (Complementary code)

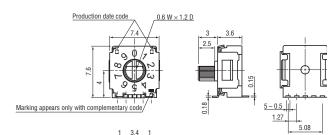
SA-7212B (Real code)



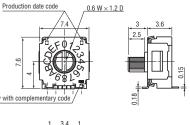


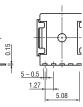


SA-7152B (Real code) SA-7172B (Complementary code)



Marking appears only with complementary code

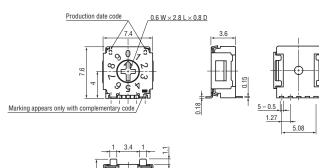


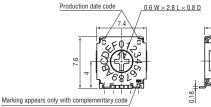


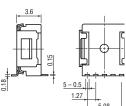


4281C SA-7252B (Real code)

SA-7272B (Complementary code)











SA-7112B (Real code)

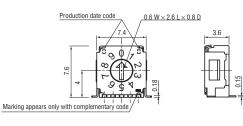
4281C

<Low-profile side setting & sideling support terminal type>

1.27

SA-7013B (Real code)

SA-7033B (Complementary code)





SA-7113B (Real code) SA-7133B (Complementary code)

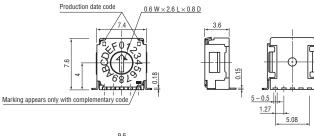
4281C

SA-7233B (Complementary code)

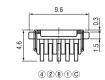
SA-7213B (Real code)



SA-7073B (Complementary code)

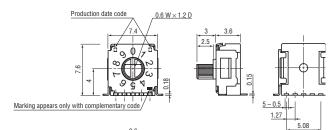


0.6 W × 1.2 D

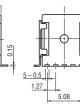


SA-7153B (Real code) • SA-7173B (Complementary code)

Production date code



2 6 Marking appears only with complementary code



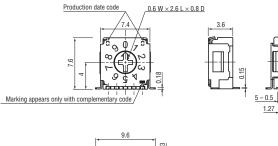


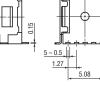
- 0.5

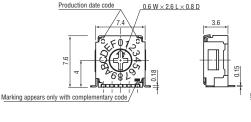
1.27

4281C

SA-7253B (Real code) SA-7273B (Complementary code)











4281C



PACKAGING SPECIFICATIONS

<Taping packaging specifications>

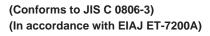
- Taping version is packaged in 500 pcs. per reel.
- Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500, pcs., etc.
- Taping version is boxed with one reel (500 pcs.).

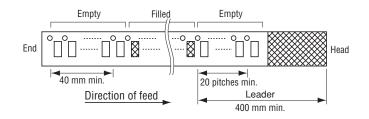
Maximum number of consecutive missing pieces=2 Leader length and reel dimension are shown in the diagrams below:

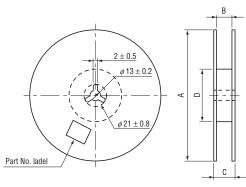
Embossed tape dimensions

• Reel dimensions

(Unit: mm)







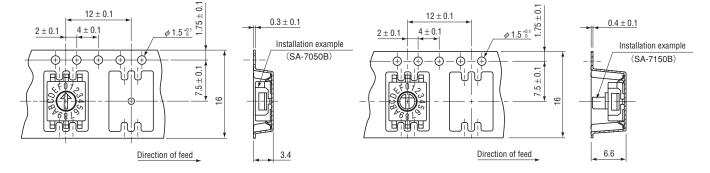
Part number	Α	В	С	D
SA-70 0 • SA-72 0TA/TB	φ 254 ± 2	17.4 ± 1	21.4 ± 1	ϕ 50 min.
SA-71□0TA/TB	φ 330 ± 2	17.4 ± 1	21.4 ± 1	
SA-70 1 • SA-72 1TA/TB	φ 330 ± 2	17.4 ± 1	21.4 ± 1	φ 80 ± 1
SA-71□1TA/TB	φ 330 ± 2	17.4 ± 1	21.4 ± 1	φουτι
SA-7 2 • SA-7 3 TB	φ 330 ± 2	25.4 ± 1	29.4 ± 1	

SA-70_0T_ SA-72_0T_ <Top setting without knob>

• SA-71 0T <Top setting with knob>

(Unit: mm)

(Conforms to JIS C 0806)



● SA-70□1T□ ● SA-71□1T□ (Unit: mm) ● SA-72□1T□ <Side setting with knob> <Side setting without knob> (Conforms to JIS C 0806-3) 9.3 1.75±0.1 9.3 1.75±0.1 12±0.1 16±0.1 0.5±0.1 0.5±0.1 4±0.1 2±0. 1.5 +0. 4±0.1 $\phi \, 1.5^{+0.1}_{-0.1}$ 2±0.1 Installation example Installation example \ominus θ ď Ð ÷ ሐ Φ -0 ⇔ Φ ÷ ď (SA-7051B) (SA-7111B) 7.5±0.1 7.5±0. 9 Direction of feed Direction of feed ● SA-7□□2TB ● SA-7□□3TB <Low-profile side setting> (JConforms to JIS C 0806-3) 1.75±0.1 8.5 12±0.1 0.5±0.1 4±0.1 $\phi \, 1.5 \, {}^{+0.1}_{0}$ 2±0.1 Installation example Ć Ć (SA-7012B) 11.5±0.1 24 n

_____/ ____ Direction of feed

<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 pack in a plastic bag is performed with 50 pcs. (Top setting type is 200 pcs., side setting type is 100 pcs.) per box.