

コストパフォーマンスに貢献するエコノミータイプ

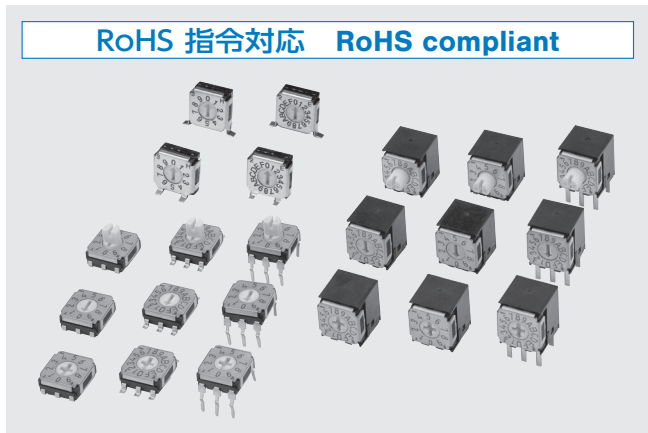
サーフェスマウントタイプ

DIP 型ロータリコードスイッチ

ROTARY CODED SWITCHES (SMD)

SA-7000

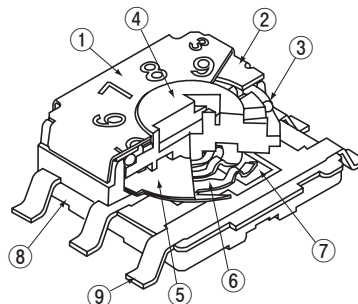
RoHS 指令対応 RoHS compliant



■特 長 FEATURES

- RoHS 指令対応
- 薄型 3.0 mm 厚
- 豊富なバリエーション
(上部 / 側部設定、10/16 ポジション、端子形状 J リード、ガル・ウィング、スルーホールピン)
- 視認性の向上
- サポート端子付薄型側部設定あり
- 樹脂材料は、UL 難燃クラス 94V-0 認証品を採用しております
- 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
- Resin material is UL Recognized 94V-0

内部構造図 INTERNAL STRUCTURE



名 称 Part name	材 料 Material
① マーキングカバー Marking cover	ステンレス Stainless steel (SUS 304)
② カバー Cover	
③ “O” リング “O” ring	シリコンゴム Silicone rubber
④ ロータ Rotor	PPS (ポリフェニレンサルファイド) Polyphenylenesulfide
⑤ スパース Spacer	ステンレス Stainless steel (SUS 304)
⑥ 可動接点 Slider contact	銅合金、金めっき Copper alloy, Gold-plated
⑦ 固定接点 Fixed contact	
⑧ ハウジング Housing	PPS (ポリフェニレンサルファイド) Polyphenylenesulfide
⑨ 端子 Terminal pin	銅合金、金めっき Copper alloy, Gold-plated

■型式表示 PART NUMBER DESIGNATION

S A - 7 0 1 0 T A

シリーズ名 Series name

ロータ形状 Shape of rotor

0 : つまみ無し (マイナス溝) Without knob (Minus slot)
1 : つまみ付き With knob
2 : つまみ無し (プラス溝) Without knob (Cross slot)

コードフォーマット Code format

1 : 10 ポジション リアルコード 10 positions, real code
3 : 10 ポジション コンプリメンタリコード 10 positions, complementary code
5 : 16 ポジション リアルコード 16 positions, real code
7 : 16 ポジション コンプリメンタリコード 16 positions, complementary code

端子形状 Shape of terminal

A : J リード J-hook
B : ガル・ウィング Gull wing
C : スルーホールピン Through hole pins
(薄型側部設定はガル・ウィングのみ)
(Only gull wing available for Low-profile side setting type)

包装形態 Form of packaging

T : テーピング (リール) Taping (Reel)
空欄 Blank : ポリ袋 Bulk in plastic bag
(薄型側部設定はテーピングのみ)
(Only taping available for Low-profile side setting type)

設定方向 Setting position

0 : 上部設定型 Top setting
1 : 側部設定型 Side setting
2 : 薄型側部設定サポート端子前方向型
Low-profile side setting & forward support terminal type
3 : 薄型側部設定サポート端子横方向型
Low-profile side setting & sideling support terminal type

※ご注文に際しては、型式一覧表をご確認ください。

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

SA-7000

ROTARY CODED SWITCHES (SMD)

型式一覧表 LIST OF PART NUMBERS

設定方向 Setting position	ロータ Shape of rotor	端子形状 Shape of terminal	包装形態 Form of packaging	2 進化 10 進 Binary coded decimal		2 進化 16 進 Binary coded hexadecimal		包装数量 Packaging quantity	
				リアルコード Real code	コンプリメンタリコード Complementary code	リアルコード Real code	コンプリメンタリコード Complementary code		
上部設定 Top setting	マイナス溝 Minus slot	A(Jリード) J-hook	テーピング Taping	SA-7010TA	SA-7030TA	SA-7050TA	SA-7070TA	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7010A	SA-7030A	SA-7050A	SA-7070A	50 pcs./pack	
		B(ガル・ウイング) Gull wing	テーピング Taping	SA-7010TB	SA-7030TB	SA-7050TB	SA-7070TB	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7010B	SA-7030B	SA-7050B	SA-7070B	50 pcs./pack	
		C(スルーホールピン) Through hole pins	テーピング Taping						
			ポリ袋 Plastic bag	SA-7010C	SA-7030C	SA-7050C	SA-7070C	50 pcs./pack	
	つまみ付き With knob	A(Jリード) J-hook	テーピング Taping	SA-7110TA	SA-7130TA	SA-7150TA	SA-7170TA	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7110A	SA-7130A	SA-7150A	SA-7170A	50 pcs./pack	
		B(ガル・ウイング) Gull wing	テーピング Taping	SA-7110TB	SA-7130TB	SA-7150TB	SA-7170TB	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7110B	SA-7130B	SA-7150B	SA-7170B	50 pcs./pack	
		C(スルーホールピン) Through hole pins	テーピング Taping						
			ポリ袋 Plastic bag	SA-7110C	SA-7130C	SA-7150C	SA-7170C	50 pcs./pack	
	プラス溝 Cross slot	A(Jリード) J-hook	テーピング Taping	SA-7210TA	SA-7230TA	SA-7250TA	SA-7270TA	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7210A	SA-7230A	SA-7250A	SA-7270A	50 pcs./pack	
		B(ガル・ウイング) Gull wing	テーピング Taping	SA-7210TB	SA-7230TB	SA-7250TB	SA-7270TB	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7210B	SA-7230B	SA-7250B	SA-7270B	50 pcs./pack	
		C(スルーホールピン) Through hole pins	テーピング Taping						
			ポリ袋 Plastic bag	SA-7210C	SA-7230C	SA-7250C	SA-7270C	50 pcs./pack	
	側部設定 Side setting	マイナス溝 Minus slot	A(Jリード) J-hook	テーピング Taping	SA-7011TA	SA-7031TA	SA-7051TA	SA-7071TA	500 pcs./reel
				ポリ袋 Plastic bag	SA-7011A	SA-7031A	SA-7051A	SA-7071A	50 pcs./pack
			B(ガル・ウイング) Gull wing	テーピング Taping	SA-7011TB	SA-7031TB	SA-7051TB	SA-7071TB	500 pcs./reel
				ポリ袋 Plastic bag	SA-7011B	SA-7031B	SA-7051B	SA-7071B	50 pcs./pack
			C(スルーホールピン) Through hole pins	テーピング Taping					
				ポリ袋 Plastic bag	SA-7011C	SA-7031C	SA-7051C	SA-7071C	50 pcs./pack
つまみ付き With knob		A(Jリード) J-hook	テーピング Taping	SA-7111TA	SA-7131TA	SA-7151TA	SA-7171TA	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7111A	SA-7131A	SA-7151A	SA-7171A	50 pcs./pack	
		B(ガル・ウイング) Gull wing	テーピング Taping	SA-7111TB	SA-7131TB	SA-7151TB	SA-7171TB	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7111B	SA-7131B	SA-7151B	SA-7171B	50 pcs./pack	
		C(スルーホールピン) Through hole pins	テーピング Taping						
			ポリ袋 Plastic bag	SA-7111C	SA-7131C	SA-7151C	SA-7171C	50 pcs./pack	
プラス溝 Cross slot		A(Jリード) J-hook	テーピング Taping	SA-7211TA	SA-7231TA	SA-7251TA	SA-7271TA	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7211A	SA-7231A	SA-7251A	SA-7271A	50 pcs./pack	
		B(ガル・ウイング) Gull wing	テーピング Taping	SA-7211TB	SA-7231TB	SA-7251TB	SA-7271TB	500 pcs./reel	
			ポリ袋 Plastic bag	SA-7211B	SA-7231B	SA-7251B	SA-7271B	50 pcs./pack	
		C(スルーホールピン) Through hole pins	テーピング Taping						
			ポリ袋 Plastic bag	SA-7211C	SA-7231C	SA-7251C	SA-7271C	50 pcs./pack	
薄型側部設定 サポート端子 前方向型 Low-profile side setting & forward support terminal type		マイナス溝 Minus slot	B(ガル・ウイング) Gull wing	テーピング Taping	SA-7012TB	SA-7032TB	SA-7052TB	SA-7072TB	500 pcs./reel
		つまみ付き With knob			SA-7112TB	SA-7132TB	SA-7152TB	SA-7172TB	500 pcs./reel
		プラス溝 Cross slot			SA-7212TB	SA-7232TB	SA-7252TB	SA-7272TB	500 pcs./reel
薄型側部設定 サポート端子 横方向型 Low-profile side setting & sideling support terminal type		マイナス溝 Minus slot			SA-7013TB	SA-7033TB	SA-7053TB	SA-7073TB	500 pcs./reel
		つまみ付き With knob			SA-7113TB	SA-7133TB	SA-7153TB	SA-7173TB	500 pcs./reel
		プラス溝 Cross slot			SA-7213TB	SA-7233TB	SA-7253TB	SA-7273TB	500 pcs./reel

☐ : 製作不可能

※ご注文に際しては、上記型式をご確認ください。

テーピング仕様は、切り売り致しませんので、リール単位で
ご注文をお願いします。

☐ : Not manufactured

※ Verify the above part numbers when placing orders.

Taping version can be supplied only in reel unit.

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ROTARY CODED SWITCHES (SMD)

■標準仕様 STANDARD SPECIFICATIONS

回路構成 Circuit type	BCD (Real code, complementary code) BCH (Real code, complementary code)
使用温度範囲 Operating temp. range	- 40 ~ 85 °C
保存温度範囲 Storage temp. range	
シール性 Sealing	洗浄不可能 Non-washable
質量 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 without knob) Approx. 0.44 g (Low-profile side setting type with knob)

■機械的特性 MECHANICAL CHARACTERISTICS

ポジション数 No. of positions	10, 16
回転トルク Adjustment torque	20 mN·m {204 gf·cm} maximum
ステップ角度 Stepping angle	36° (10 positions) 22.5° (16 positions)
はんだ付け性 Solderability	245 ± 3 °C, 2 ~ 3 s
はんだ耐熱性 Soldering heat	リフロー Reflow : 255 °C (Peak temperature) (詳細は下記プロファイル参照 Please refer to the profile below)
	手はんだ Manual soldering : 350 ± 10 °C, 3 ~ 4 s
固着性 Shear (adhesion)	5 N {0.51 kgf} 10 s
耐基板曲げ性 Substrate bending	Width 90 mm, bend 3 mm, 5 s, 1 time
引きはがし強さ Pull-off strength	5 N {0.51 kgf} 10 s
操作部強度(つまみ付きのみ) Stop strength (With knob only)	5 N {0.51 kgf} 10s

{ } : 参考値 Reference only

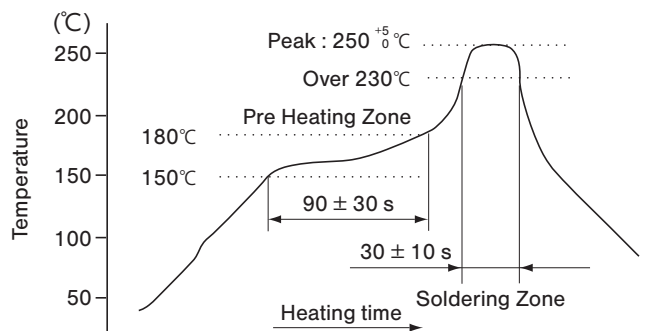
■電気的特性 ELECTRICAL CHARACTERISTICS

接点定格 Contact rating Non-switching Switching Minimum	DC50 V 100 mA DC5 V 100 mA DC20 mV 1 μA
接触抵抗 Contact resistance	100 mΩ maximum
絶縁抵抗 Insulation resistance	100 MΩ (DC100 V) minimum
耐電圧 Dielectric strength	AC250 V, 60 s

■環境特性 ENVIRONMENTAL CHARACTERISTICS

耐振性 Vibration	振幅 (Amplitude) 1.5 mm (全振幅) or 加速度 (Acceleration) 98 m/s ² , 10-500-10 Hz, 3 directions for 2 h each
耐衝撃性 Shock	490 m/s ² , 11 ms 6 directions for 3 times each
耐久性 Load life	10000 steps minimum, DC5 V, 100 mA
耐湿性(定常状態) Humidity (Steady state)	40 °C, 相対湿度 Relative humidity 90 ~ 95 %, 240 h
耐熱性 High temp. exposure	85 °C, 96 h
耐寒性 Low temp. exposure	-40 °C, 96 h
温度サイクル Thermal shock	-40 (0.5 h) ~ 85 °C (0.5 h), 5 cycles

〈はんだ耐熱性評価用リフロープロファイル〉 Reflow profile for soldering heat evaluation



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ROTARY CODED SWITCHES (SMD)

コードフォーマット CODE FORMAT

● ...Contact closed

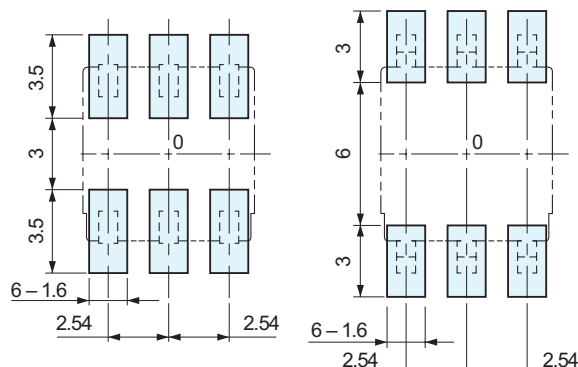
No. of positions			16 positions																
			10 positions																
Position			0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	
Code	Real code	8										●	●	●	●	●	●	●	●
		4					●	●	●	●					●	●	●	●	●
		2			●	●			●	●				●	●			●	●
		1		●		●		●		●		●		●		●		●	●
	Complementary code	8	●	●	●	●	●	●	●	●								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

推奨ランドパターン RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

<Top setting>

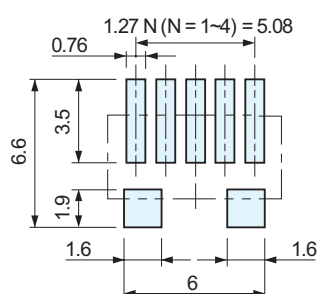
● A type

● B type



<薄型側部設定サポート端子前方向型 (B タイプ)>

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

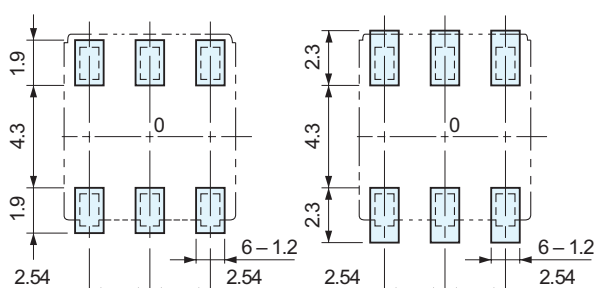


<Side setting>

● A type

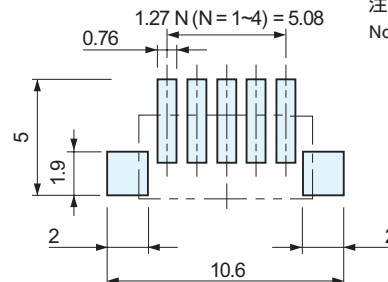
● B type

(Unit: mm)



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

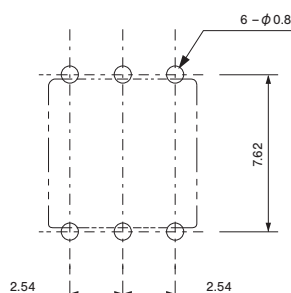


注) 0点は搭載中心とする
Note) The zero point is the center of mounting.

プリント基板加工寸法 SIZE OF P.C.B. PROCESSING

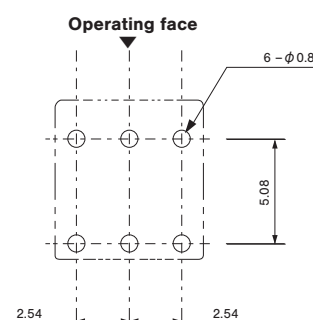
<Top setting>

● C type



<Side setting>

● C type



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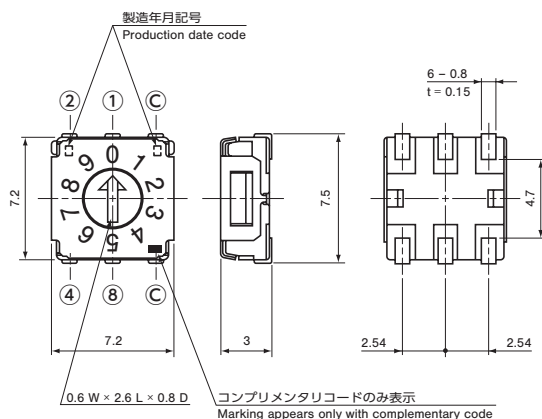
ROTARY CODED SWITCHES (SMD)

■外形寸法図 OUTLINE DIMENSIONS

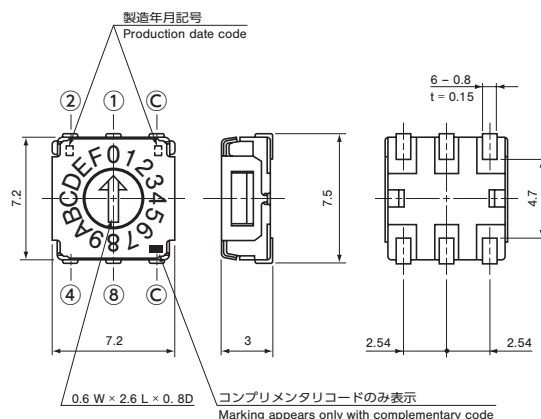
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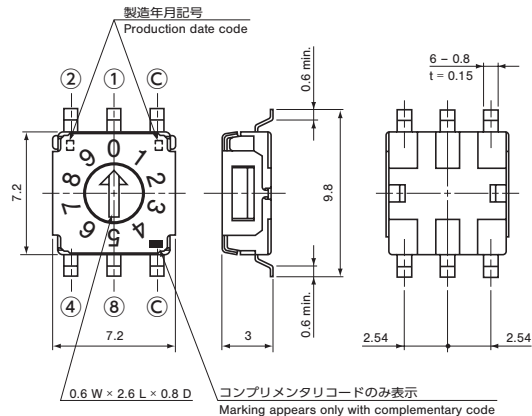
- SA-7010A (Real code)
- SA-7030A (Complementary code)



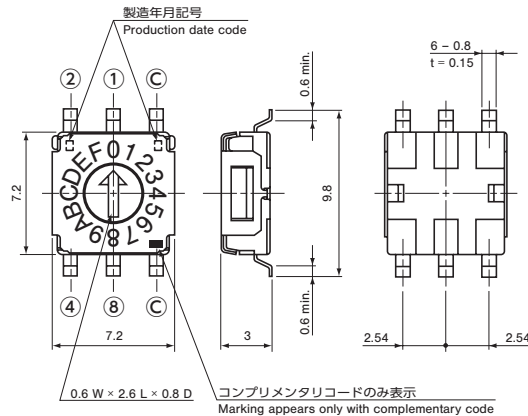
- SA-7050A (Real code)
- SA-7070A (Complementary code)



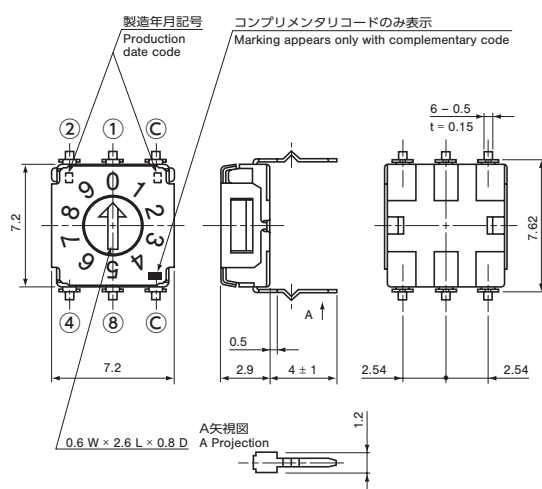
- SA-7010B (Real code)
- SA-7030B (Complementary code)



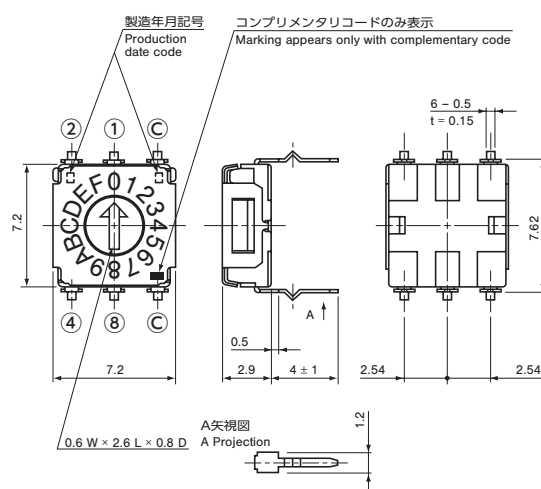
- SA-7050B (Real code)
- SA-7070B (Complementary code)



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



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



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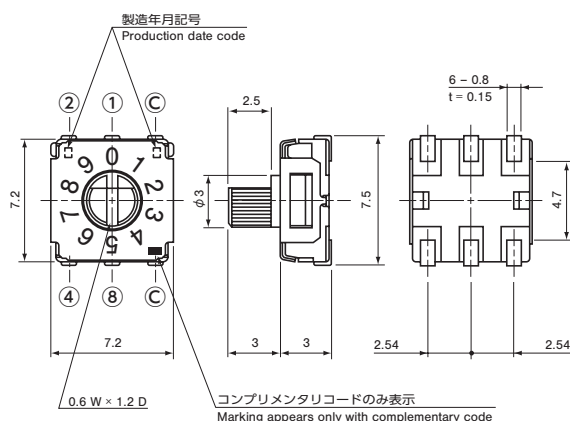
ROTARY CODED SWITCHES (SMD)

■外形寸法図 OUTLINE DIMENSIONS

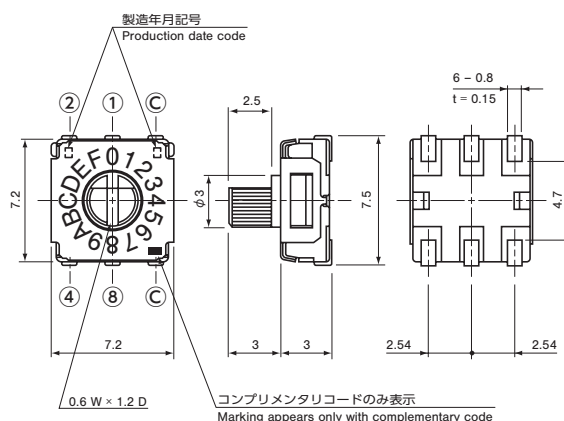
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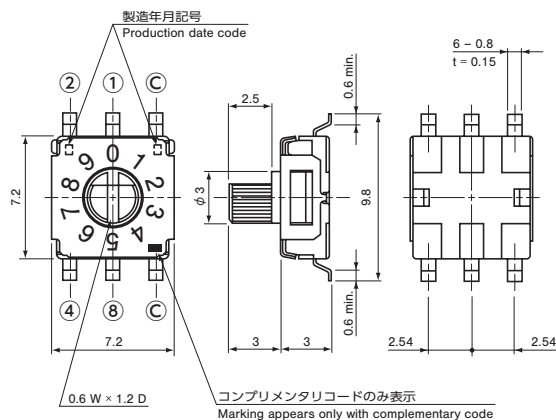
- SA-7110A (Real code)
- SA-7130A (Complementary code)



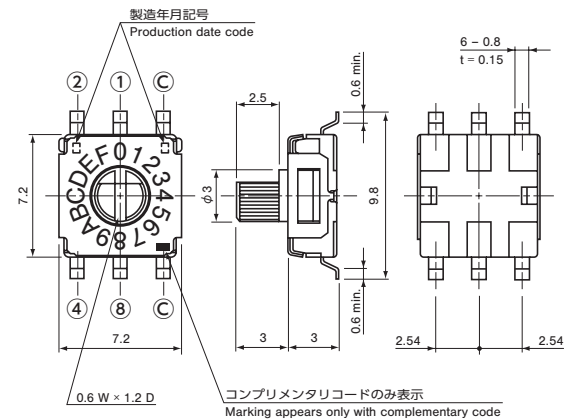
- SA-7150A (Real code)
- SA-7170A (Complementary code)



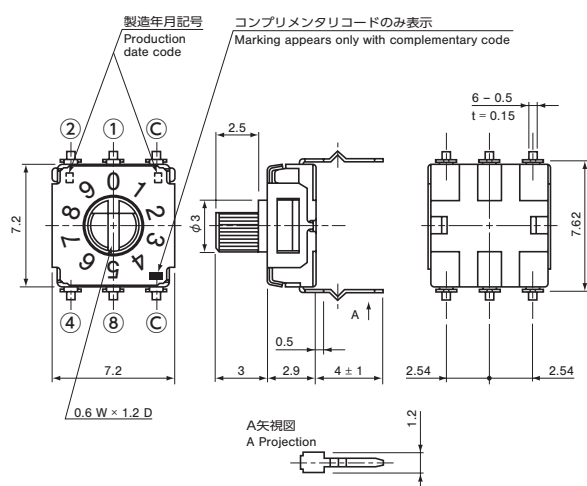
- SA-7110B (Real code)
- SA-7130B (Complementary code)



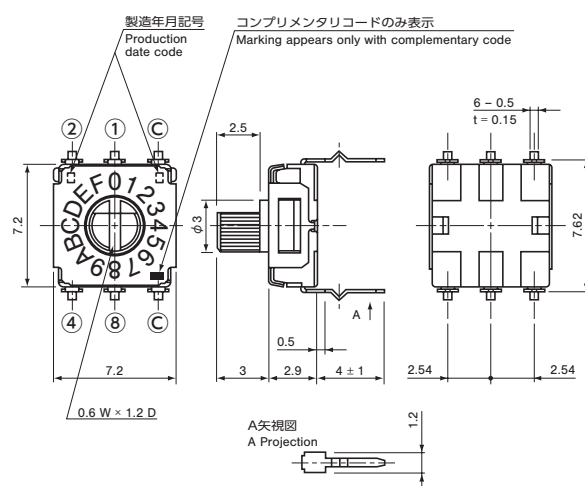
- SA-7150B (Real code)
- SA-7170B (Complementary code)



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



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



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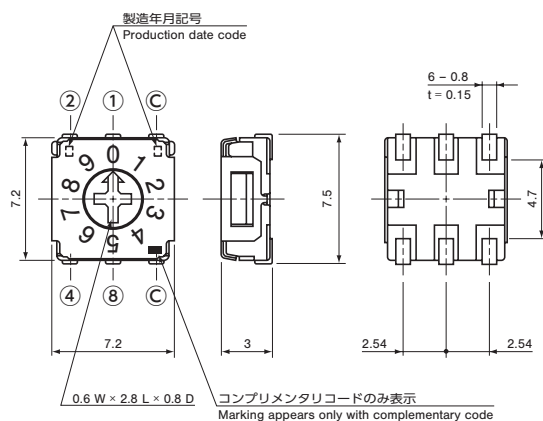
ROTARY CODED SWITCHES (SMD)

■外形寸法図 OUTLINE DIMENSIONS

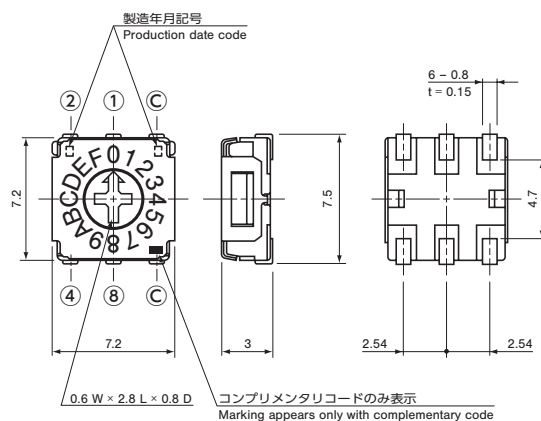
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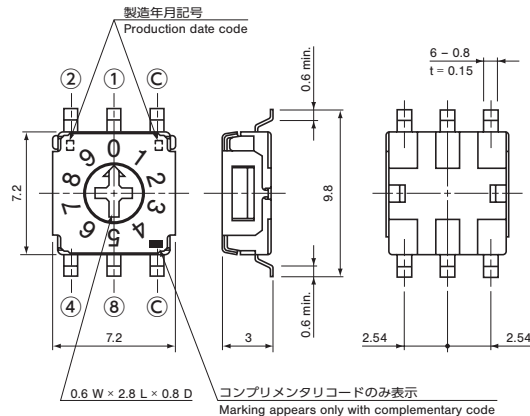
- SA-7210A (Real code)
- SA-7230A (Complementary code)



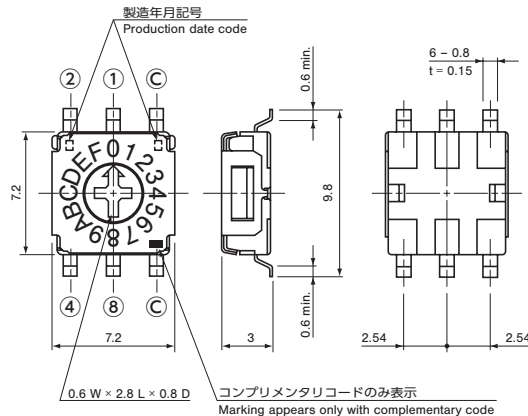
- SA-7250A (Real code)
- SA-7270A (Complementary code)



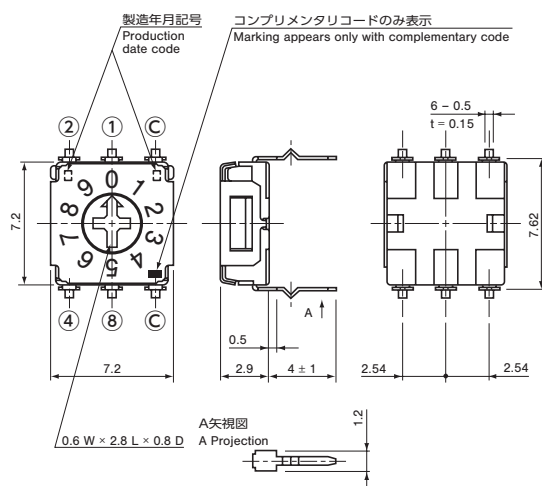
- SA-7210B (Real code)
- SA-7230B (Complementary code)



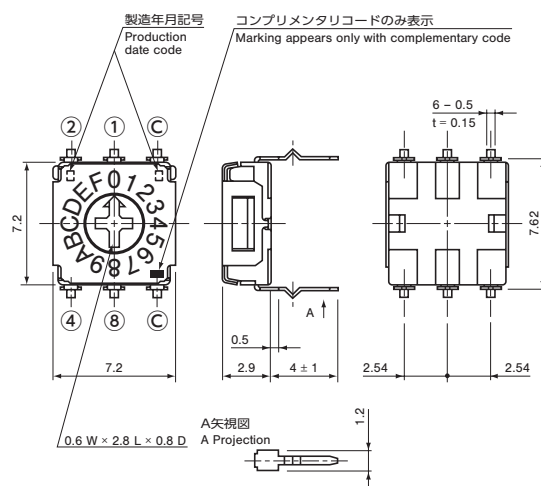
- SA-7250B (Real code)
- SA-7270B (Complementary code)



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



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



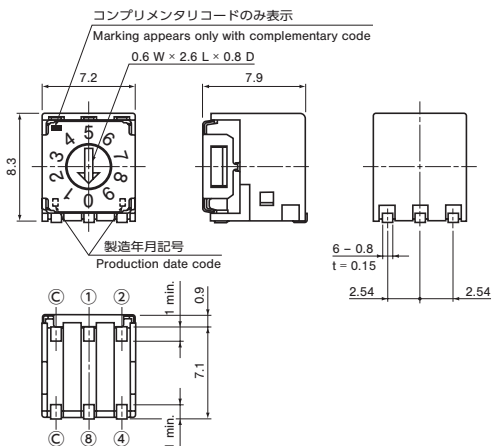
SA-7000

■外形寸法図

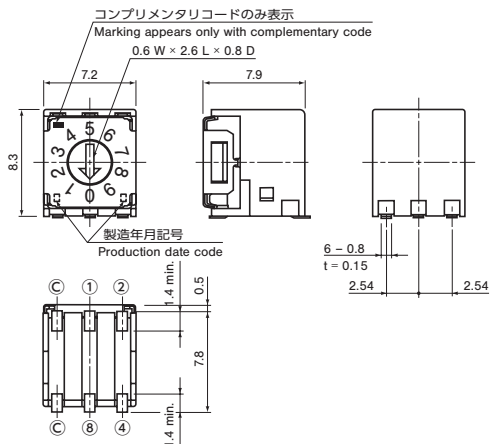
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

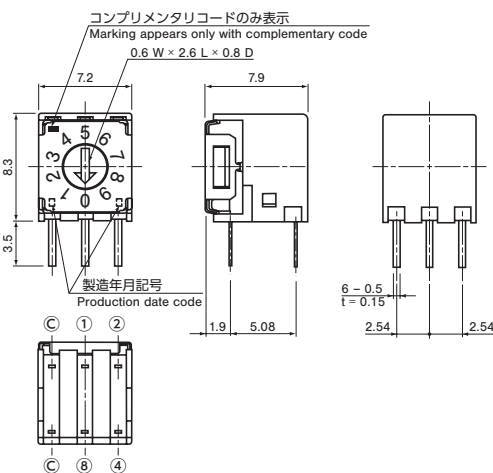
- SA-7011A (Real code)
- SA-7031A (Complementary code)



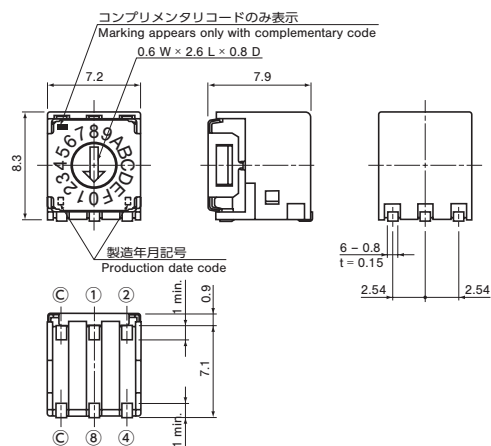
- SA-7011B (Real code)
- SA-7031B (Complementary code)



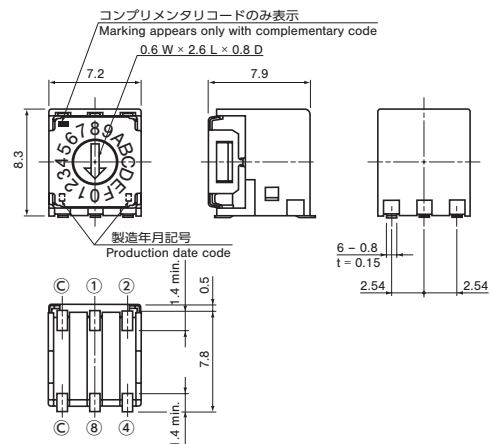
- SA-7011C (Real code)
- SA-7031C (Complementary code)



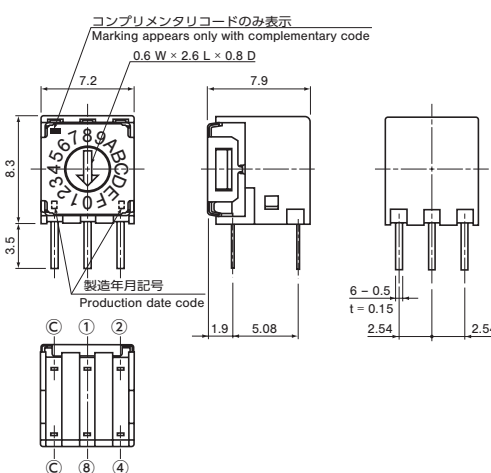
- SA-7051A (Real code)
- SA-7071A (Complementary code)



- SA-7051B (Real code)
- SA-7071B (Complementary code)



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



SA-7000

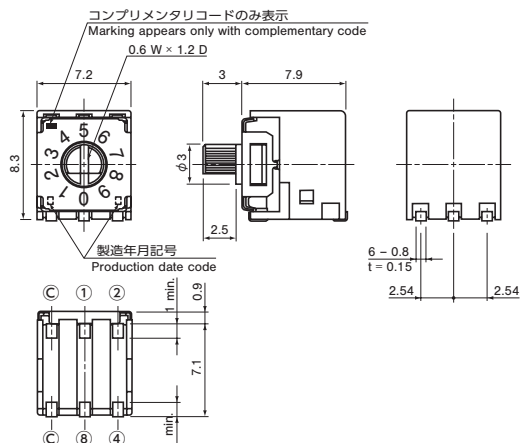
ROTARY CODED SWITCHES (SMD)

■外形寸法図 OUTLINE DIMENSIONS

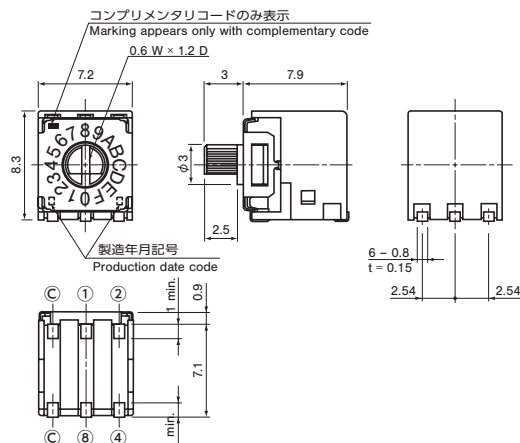
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

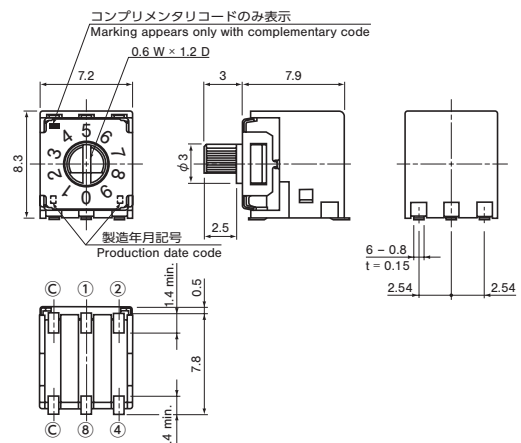
- SA-7111A (Real code)
- SA-7131A (Complementary code)



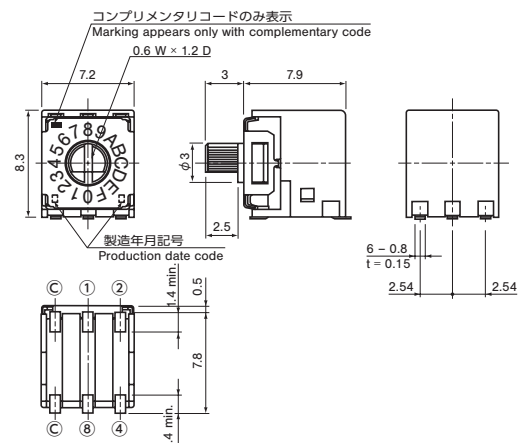
- SA-7151A (Real code)
- SA-7171A (Complementary code)



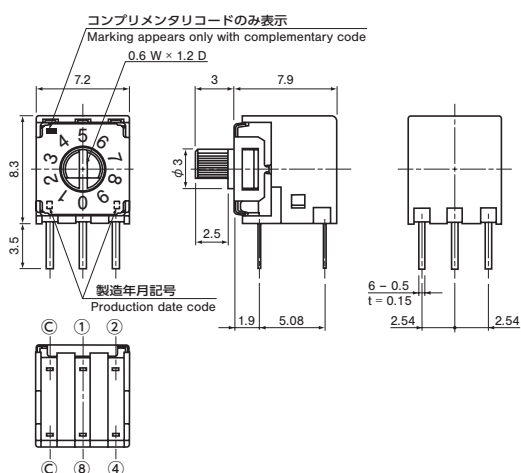
- SA-7111B (Real code)
- SA-7131B (Complementary code)



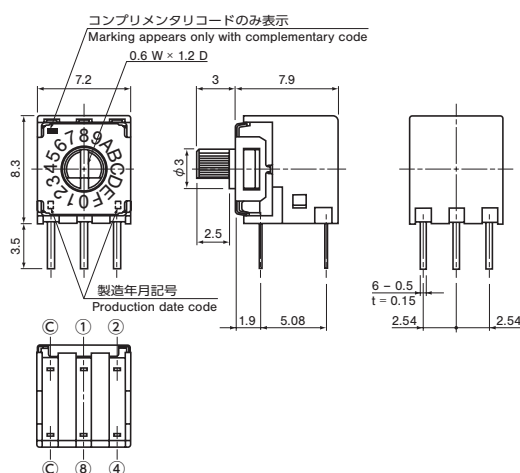
- SA-7151B (Real code)
- SA-7171B (Complementary code)



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



- SA-7151C (Real code)
- SA-7171C (Complementary code)



SA-7000

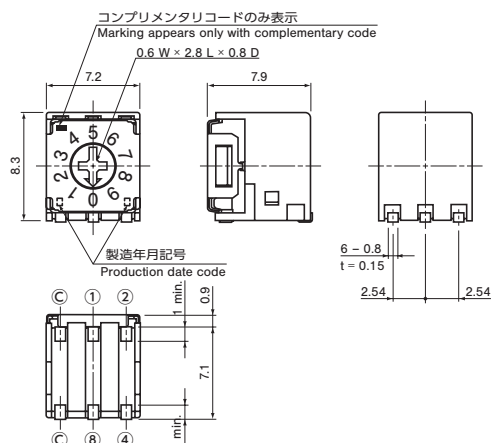
ROTARY CODED SWITCHES (SMD)

外形寸法図 OUTLINE DIMENSIONS

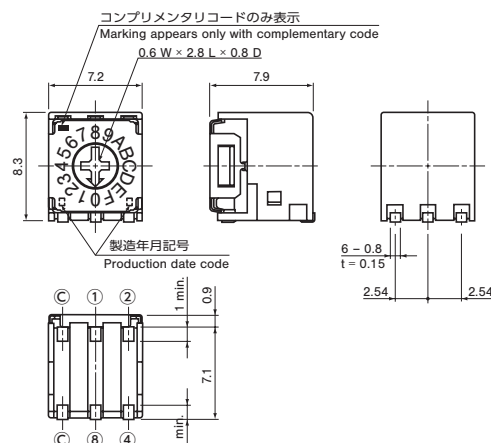
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

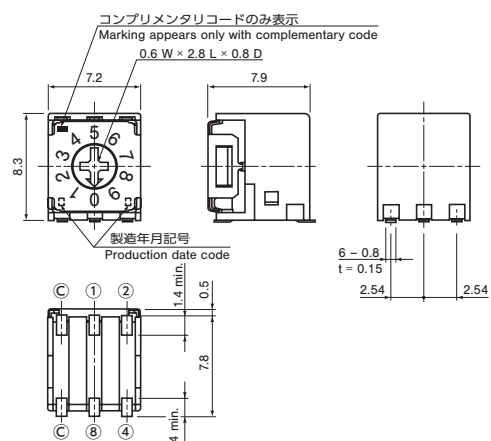
- SA-7211A (Real code)
- SA-7231A (Complementary code)



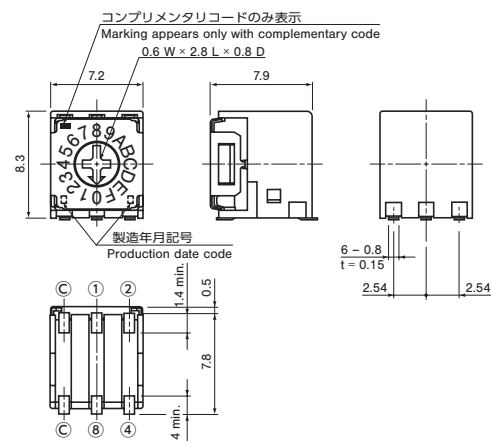
- SA-7251A (Real code)
- SA-7271A (Complementary code)



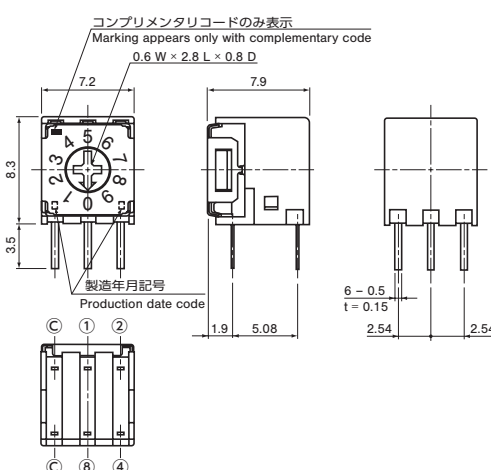
- SA-7211B (Real code)
- SA-7231B (Complementary code)



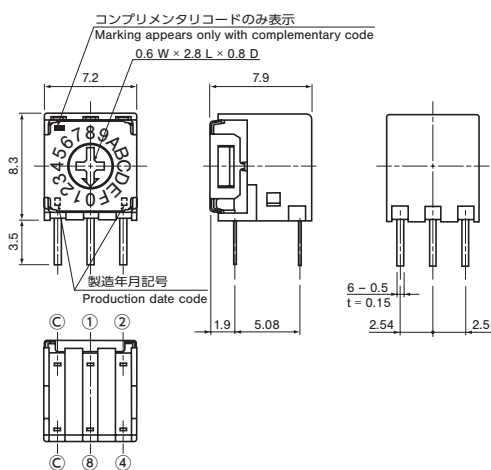
- SA-7251B (Real code)
- SA-7271B (Complementary code)



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



- SA-7251C (Real code)
- SA-7271C (Complementary code)



SA-7000

ROTARY CODED SWITCHES (SMD)

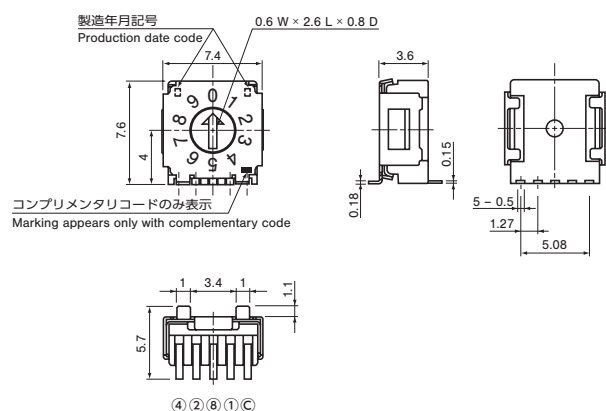
■外形寸法図 OUTLINE DIMENSIONS

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

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

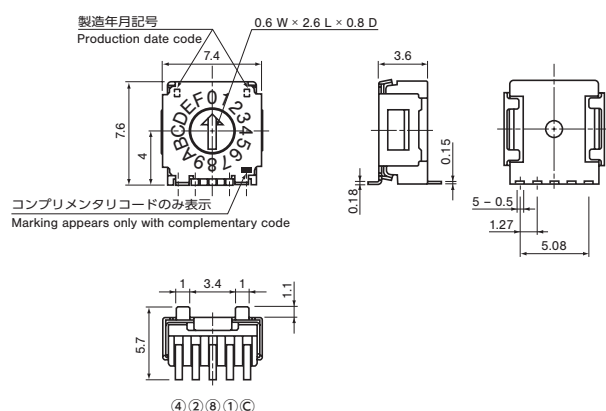
● SA-7012B (Real code)

● SA-7032B (Complementary code)



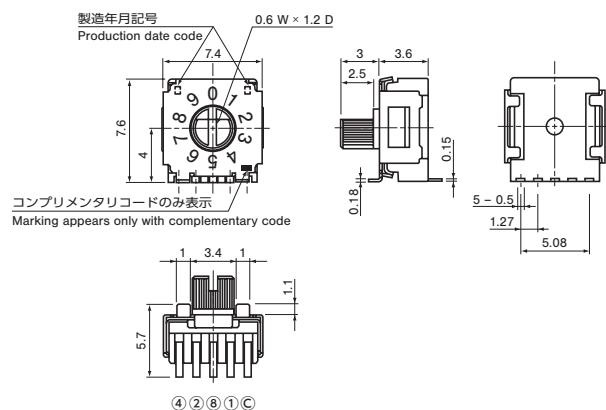
● SA-7052B (Real code)

● SA-7072B (Complementary code)



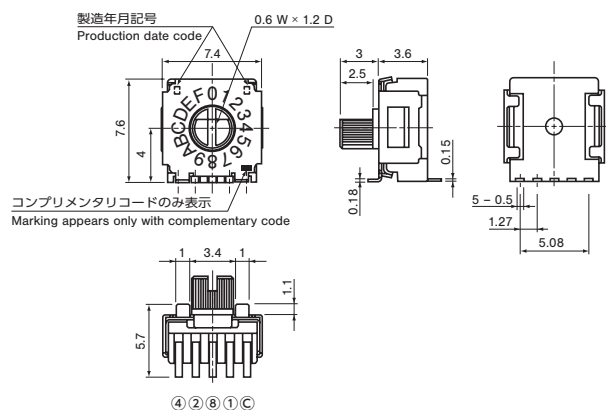
● SA-7112B (Real code)

● SA-7132B (Complementary code)



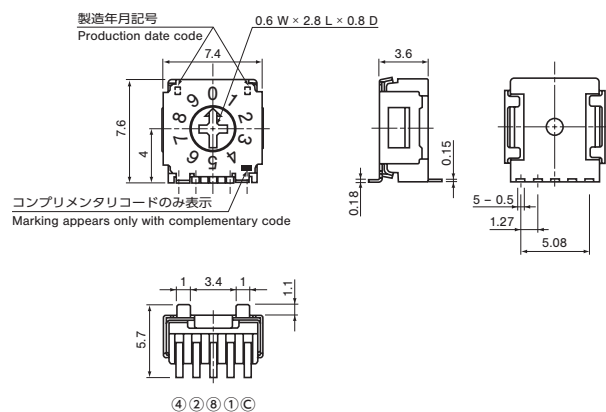
● SA-7152B (Real code)

● SA-7172B (Complementary code)



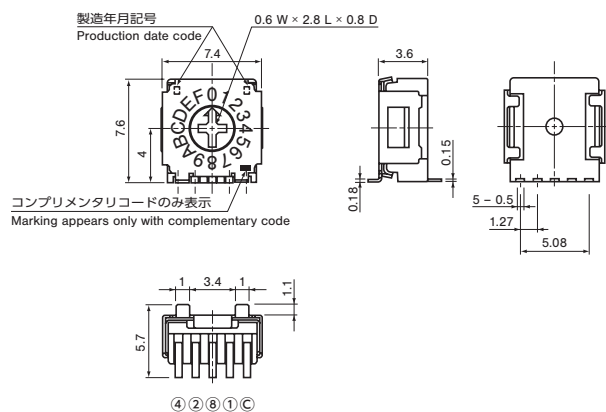
● SA-7212B (Real code)

● SA-7232B (Complementary code)



● SA-7252B (Real code)

● SA-7272B (Complementary code)



SA-7000

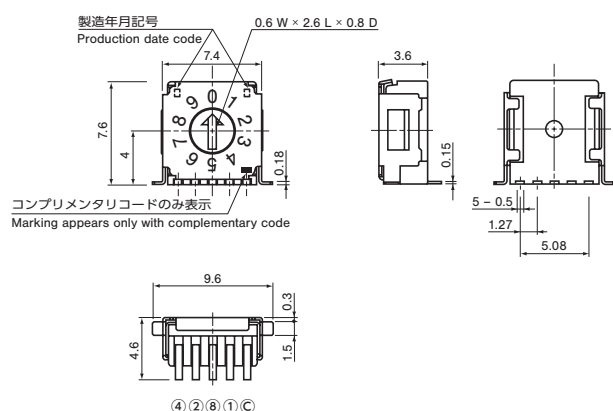
ROTARY CODED SWITCHES (SMD)

外形寸法図 OUTLINE DIMENSIONS

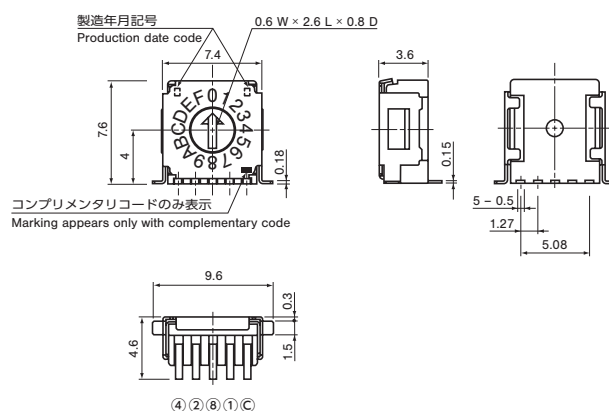
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

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

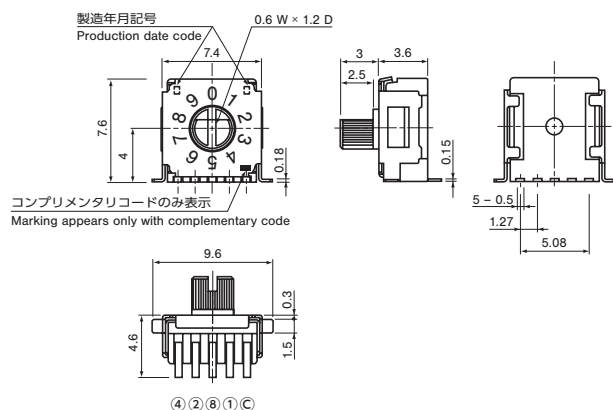
- SA-7013B (Real code)
- SA-7033B (Complementary code)



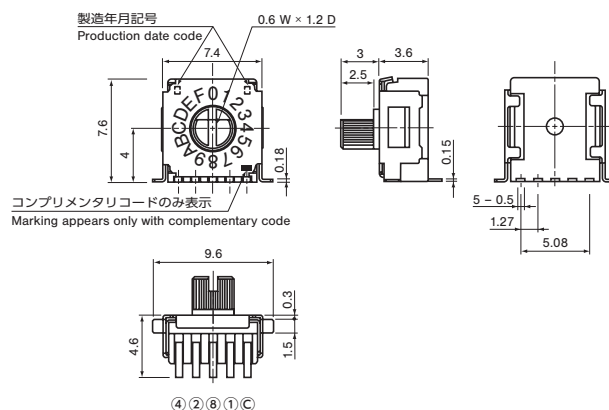
- SA-7053B (Real code)
- SA-7073B (Complementary code)



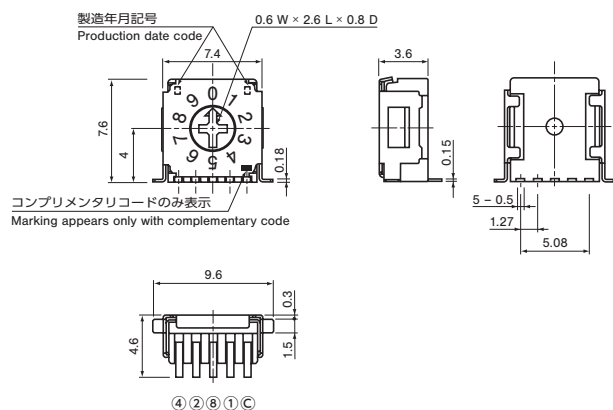
- SA-7113B (Real code)
- SA-7133B (Complementary code)



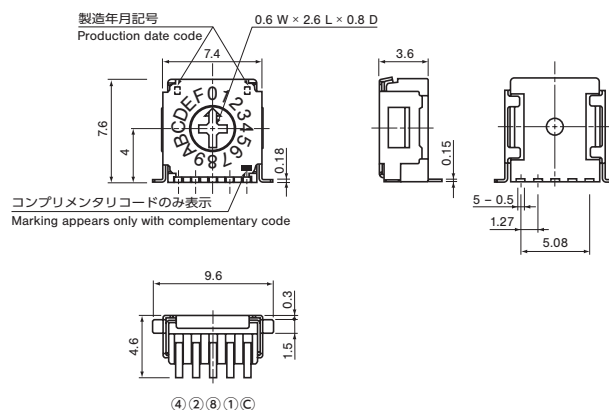
- SA-7153B (Real code)
- SA-7173B (Complementary code)



- SA-7213B (Real code)
- SA-7233B (Complementary code)



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



SA-7000

ROTARY CODED SWITCHES (SMD)

■包装仕様

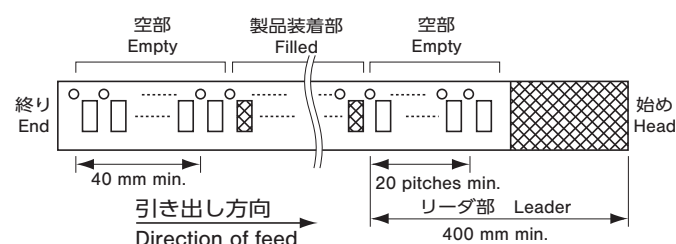
〈テーピングの包装仕様〉

- テーピングは 500 個 / リール単位の包装になりますので、500 個単位 (500 個、1000 個、1500 個…) でのご注文をお願い致します。
- テーピングリールの箱詰めは、1 リール (500 個) ごとに製品箱に包装致します。

製品の脱落は、連続 2 個以内と致します。

テープのリーダ部、空部およびリール寸法は図に示します。

● テープのリーダ部および空部 Embossed tape dimensions



■ 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.).

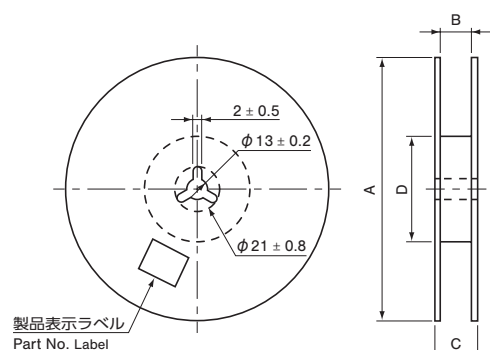
Maximum number of consecutive missing pieces=2
Leader length and reel dimension are shown in the diagrams below:

● リールの寸法図 Reel dimensions

(Unit: mm)

(JIS C 0806-3 に一致 Conforms to JIS C 0806-3)

(EIAJ ET-7200A に準拠 In accordance with EIAJ ET-7200A)

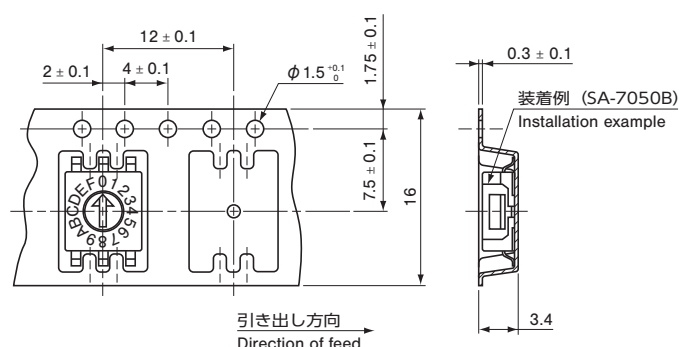


Part number	A	B	C	D
SA-70□0 • SA-72□0TA/TB	$\phi 254 \pm 2$	17.4 ± 1	21.4 ± 1	$\phi 50 \text{ min.}$
SA-71□0TA/TB	$\phi 330 \pm 2$	17.4 ± 1	21.4 ± 1	$\phi 80 \pm 1$
SA-70□1 • SA-72□1TA/TB	$\phi 330 \pm 2$	17.4 ± 1	21.4 ± 1	
SA-71□1TA/TB	$\phi 330 \pm 2$	17.4 ± 1	21.4 ± 1	
SA-7□□2 • SA-7□□3 TB	$\phi 330 \pm 2$	25.4 ± 1	29.4 ± 1	

● SA-70□0T□

● SA-72□0T□

〈Top setting without knob〉

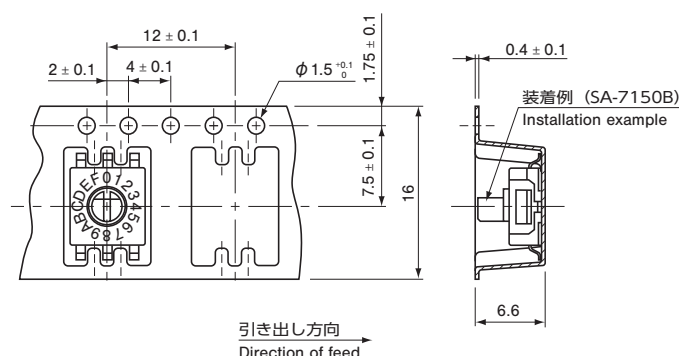


● SA-71□0T□

〈Top setting with knob〉

(Unit: mm)

(JIS C 0806 に一致 Conforms to JIS C 0806)



SA-7000

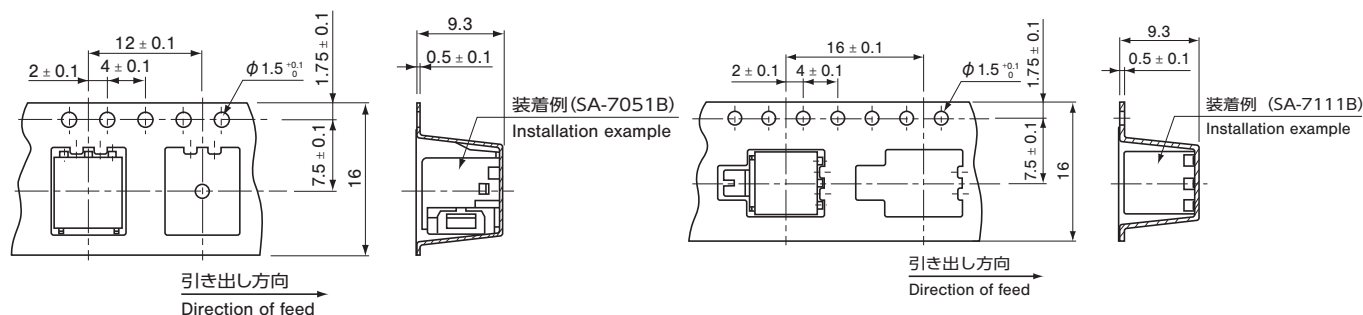
ROTARY CODED SWITCHES (SMD)

- SA-70□1T□
 - SA-72□1T□
- <Side setting without knob>

- SA-71□1T□
- <Side setting with knob>

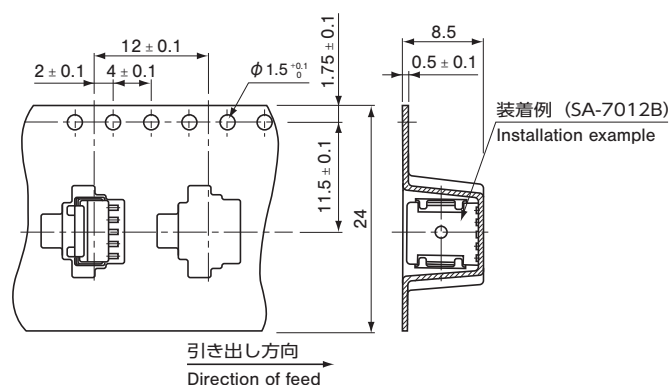
(Unit: mm)

(JIS C 0806-3 に一致 Conforms to JIS C 0806-3)



- SA-7□□2TB
 - SA-7□□3TB
- <Low-profile side setting>

(JIS C 0806-3 に一致 Conforms to JIS C 0806-3)



<ポリ袋の包装仕様>

- ポリ袋での最小包装は、10 個 / 袋となりますので、10 個単位 (10 個、20 個、30 個、...) でのご注文をお願い致します。
- ポリ袋の箱詰めは、50 個以上 (上部設定型が 200 個、側部設定型が 100 個) を製品箱に包装致します。

<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.