

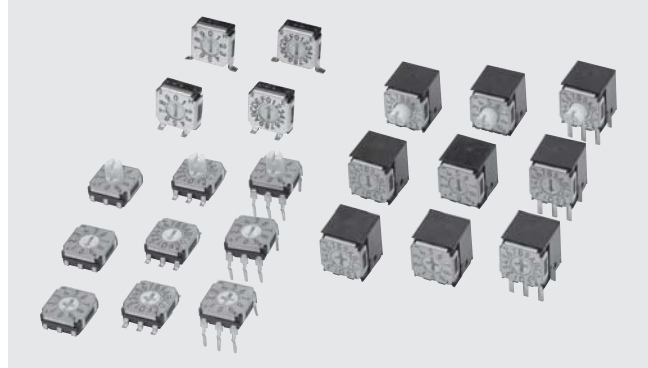
コストパフォーマンスに貢献するエコノミータイプ

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、ガルウイング、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
- 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

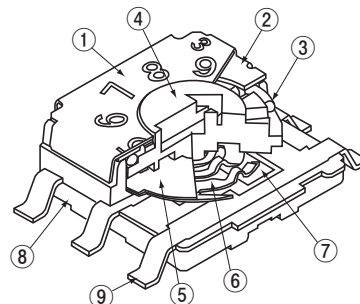
■型式表示 PART NUMBER DESIGNATION

シリーズ名 Series name		端子形状 Shape of terminal	
ロータ形状 Shape of rotor		A: J-リード J-hook	
0: つまみ無し(マイナス溝) Without knob (Minus slot)		B: ガル・ウイング Gull wing	
1: つまみ付き With knob		C: スルーホールピン Through hole pins	
2: つまみ無し(プラス溝) Without knob (Cross slot)		(薄型側部設定はガル・ウイングのみ) (Only gull wing available for Low-profile side setting type)	
コードフォーマット Code format		包装形態 Form of packaging	
1: 10 ポジション リアルコード 10 positions, real code		T: テーピング(リール) Taping (Reel)	
3: 10 ポジション コンプリメンタリコード 10 positions, complementary code		空欄 Blank: ポリ袋 Bulk in plastic bag	
5: 16 ポジション リアルコード 16 positions, real code		(薄型側部設定はテーピングのみ) (Only taping available for Low-profile side setting type)	
7: 16 ポジション コンプリメンタリコード 16 positions, complementary code		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.

内部構造図 INTERNAL STRUCTURE



	名 称 Part name	材 料 Material	燃焼性 Flammability
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	UL94HB
④	ロータ Rotor	PPS (ポリフェニレンサルファイド) Polyphenylenesulphide	UL94V-0
⑤	スペーサ Spacer	ステンレス Stainless steel (SUS 304)	—
⑥	可動接点 Moving 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) Polyphenylenesulphide	UL94V-0
⑨	端子 Terminal pin	銅合金、金めっき Copper alloy, Gold-plated	—

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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10進 Binary coded decimal		2進16進 Binary coded hexadecimal		包装数量 Pieces in package
				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・ウィング) 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
	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・ウィング) 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
	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・ウィング) 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
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・ウィング) 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
	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・ウィング) 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
	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・ウィング) 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
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・ウィング) 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
	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致します。

☐ : 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 temperature range	-40 ~ 85 °C
保存温度範囲 Storage temperature range	
シール性 Sealing	洗浄不可 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 フロー Flow : 260 ± 3 °C, 5 ~ 6 s, two
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} 10s
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

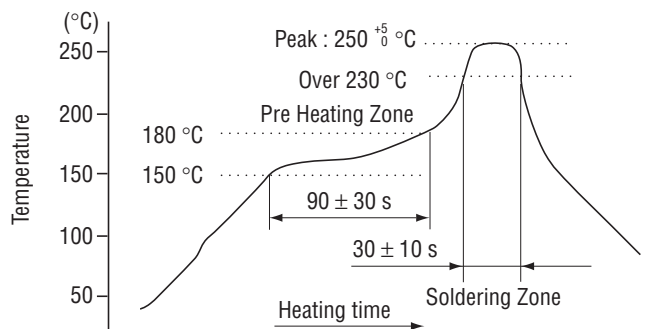
電気的特性 ELECTRICAL CHARACTERISTICS

接点定格 Contact rating	DC50 V 100 mA DC5 V 100 mA DC20 mV 1 μA
Non-switching	
Switching	
Minimum	
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 temperature exposure	85 °C, 96 h
耐寒性 Low temperature 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



リフロー回数 : 2 回 Reflow : two times maximum

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ROTARY CODED SWITCHES (SMD)

コードフォーマット CODE FORMAT

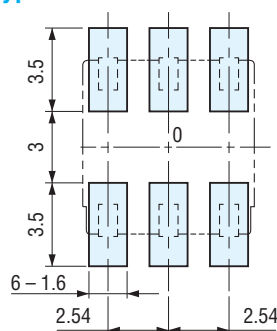
● ...Contact closed

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	●		●					●		●		●		●	

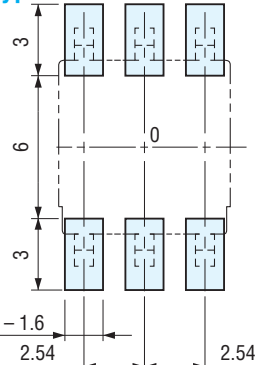
推奨ランドパターン RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

<Top setting>

● A type

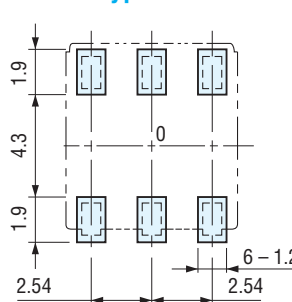


● B type

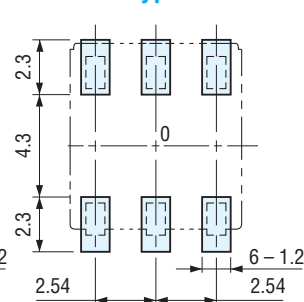


<Side setting>

● A type



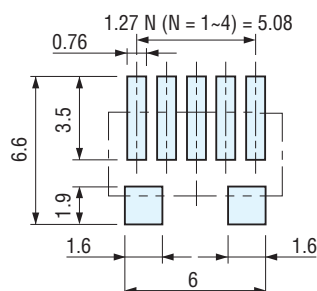
● B type



(Unit: mm)

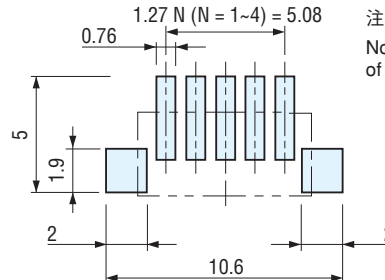
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<Low-profile side setting & forward support terminal type (B type)>



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

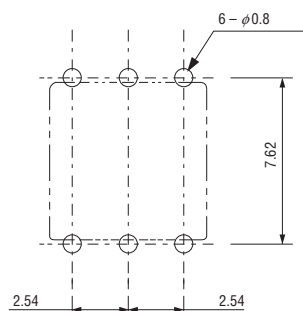


注) 0 点は搭載中心とする
Note) The zero point is the center of mounting.

プリント基板加工寸法 SIZE OF P.C.B. PROCESSING

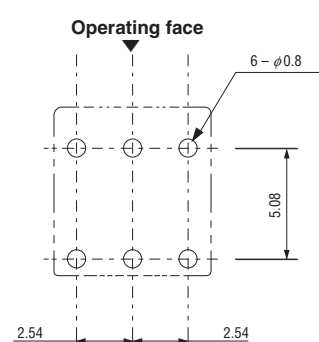
<Top setting>

● C type



<Side setting>

● C type



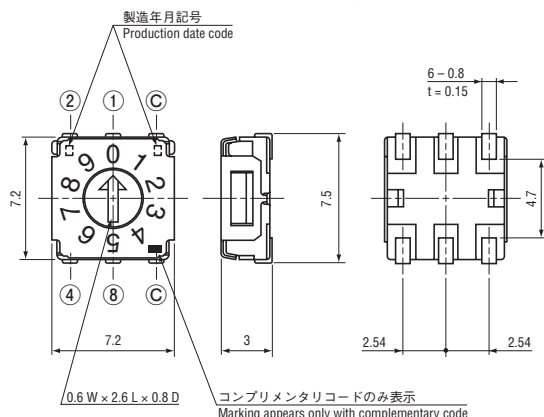
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ROTARY CODED SWITCHES (SMD)

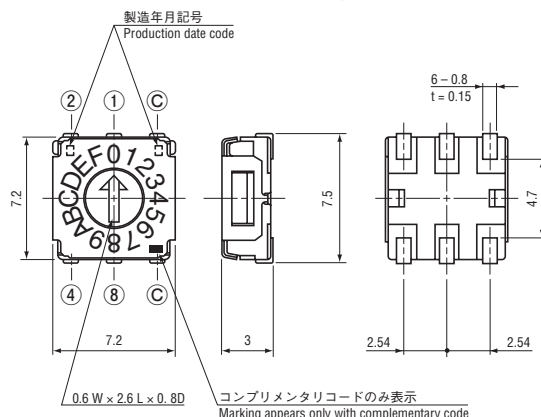
■外形寸法図 OUTLINE DIMENSIONS

<Top setting>

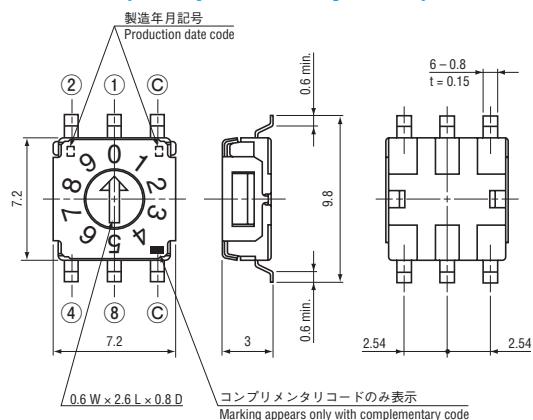
- SA-7010A (Real code)
- SA-7030A (Complementary code)



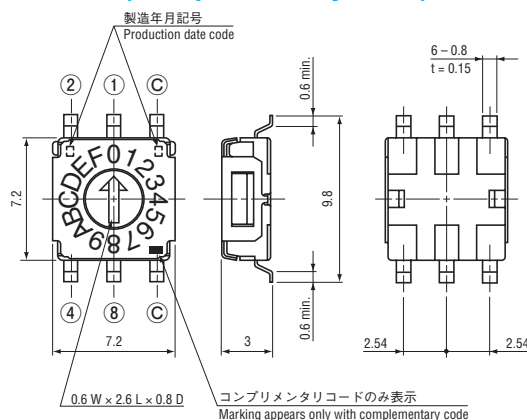
- SA-7050A (Real code)
- SA-7070A (Complementary code)



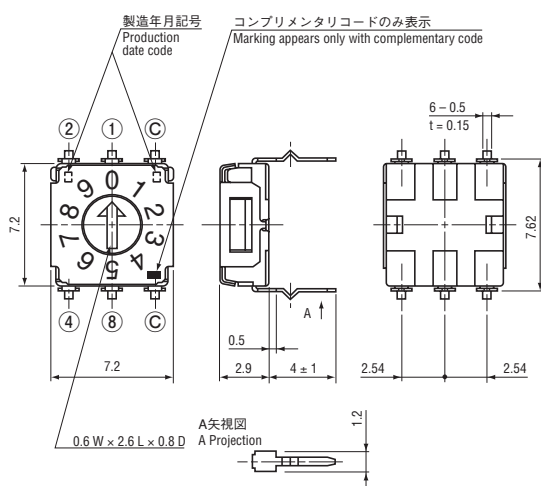
- SA-7010B (Real code)
- SA-7030B (Complementary code)



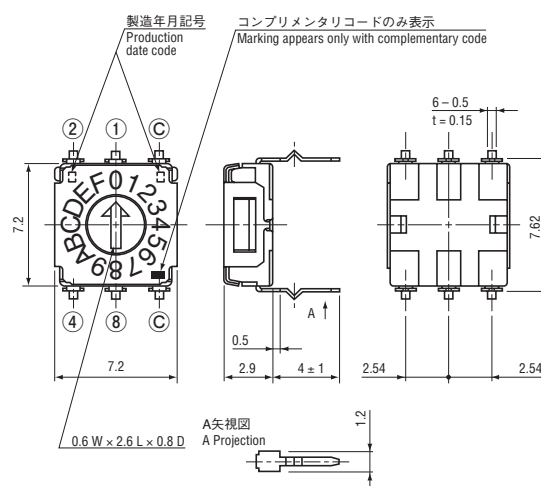
- SA-7050B (Real code)
- SA-7070B (Complementary code)



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



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



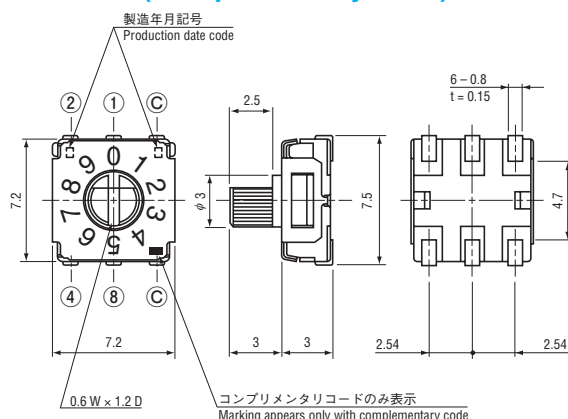
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ROTARY CODED SWITCHES (SMD)

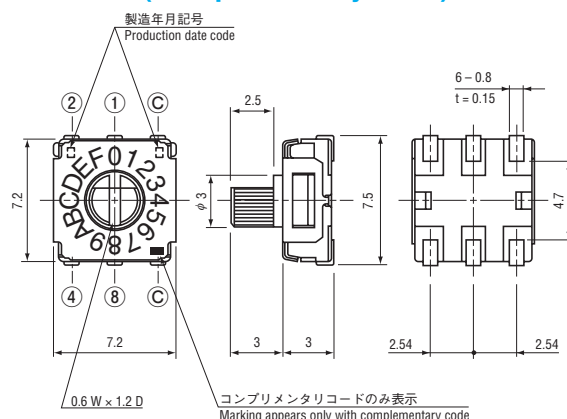
■外形寸法図 OUTLINE DIMENSIONS

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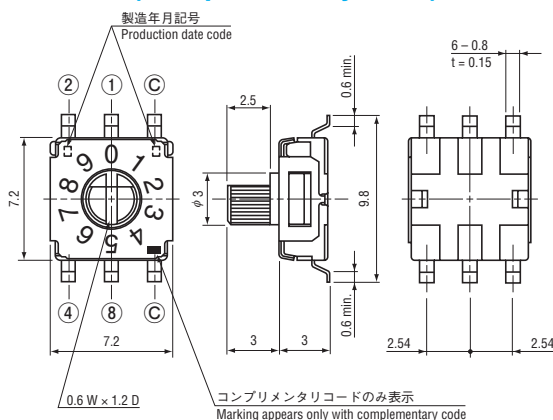
- SA-7110A (Real code)
- SA-7130A (Complementary code)



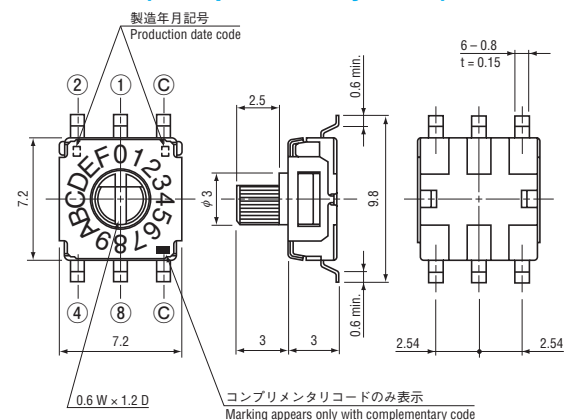
- SA-7150A (Real code)
- SA-7170A (Complementary code)



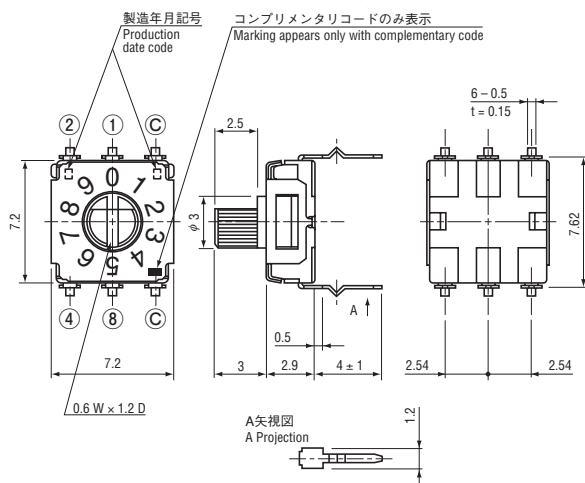
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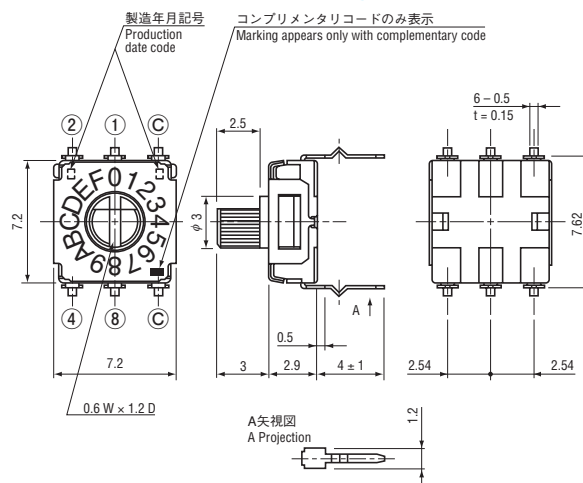
- SA-7150B (Real code)
- SA-7170B (Complementary code)



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



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



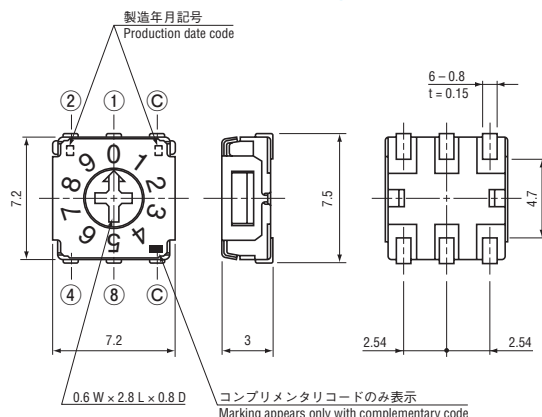
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ROTARY CODED SWITCHES (SMD)

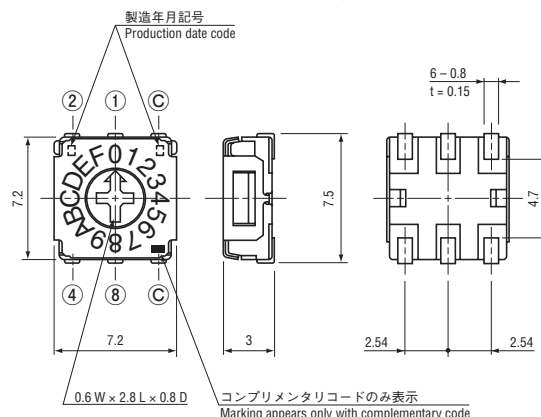
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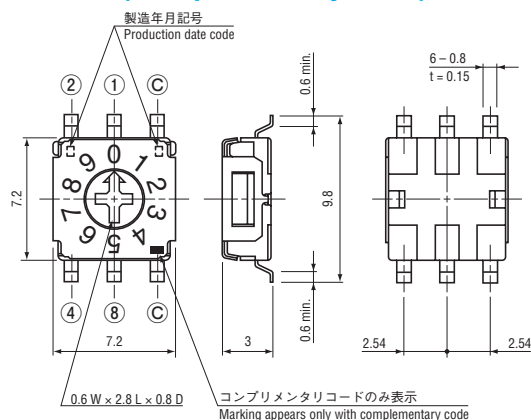
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- SA-7230A (Complementary code)



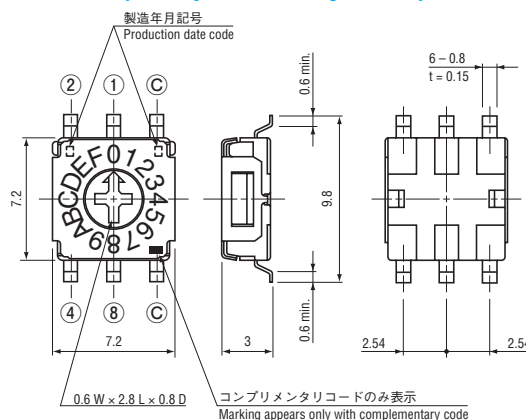
- SA-7250A (Real code)
- SA-7270A (Complementary code)



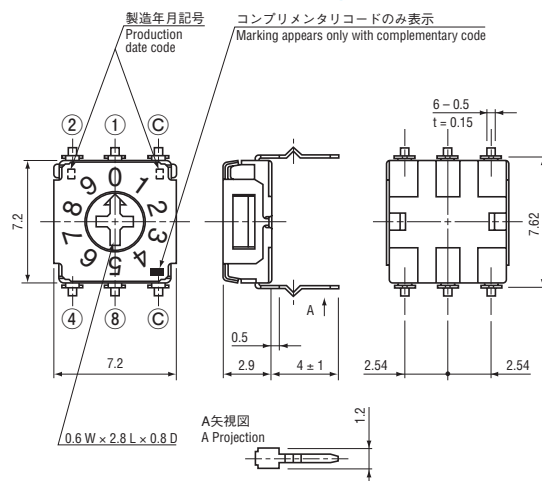
- SA-7210B (Real code)
- SA-7230B (Complementary code)



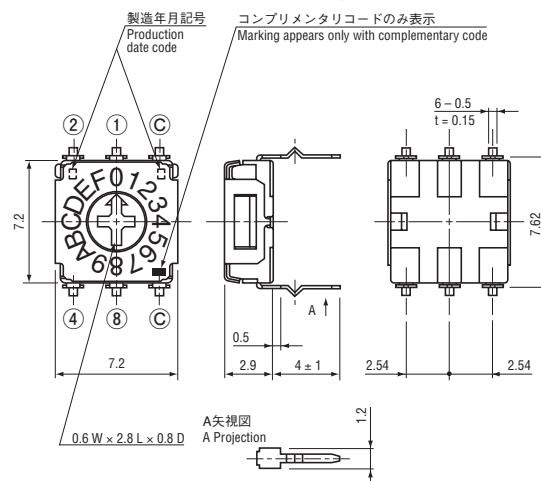
- SA-7250B (Real code)
- SA-7270B (Complementary code)



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



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



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

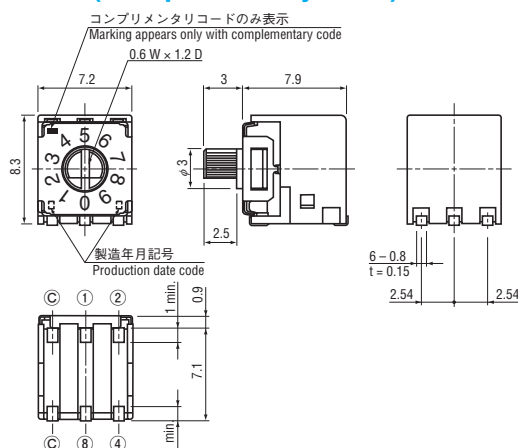
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ROTARY CODED SWITCHES (SMD)

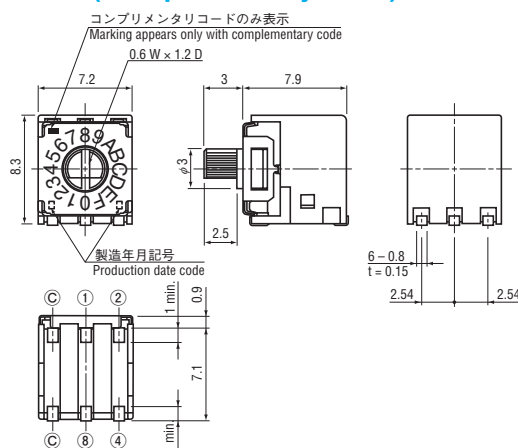
■外形寸法図 OUTLINE DIMENSIONS

<Side setting>

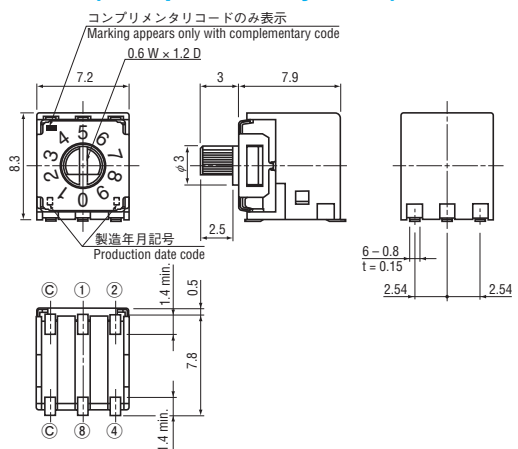
- SA-7111A (Real code)
- SA-7131A (Complementary code)



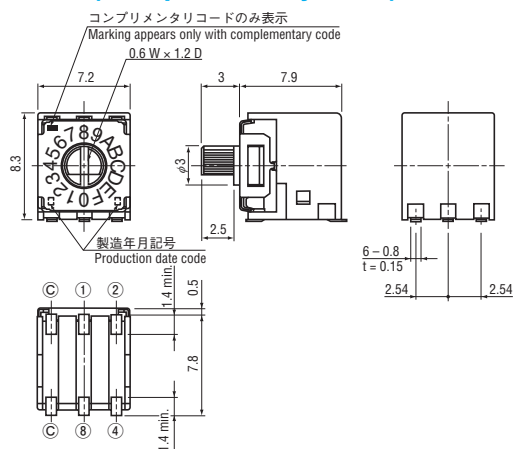
- SA-7151A (Real code)
- SA-7171A (Complementary code)



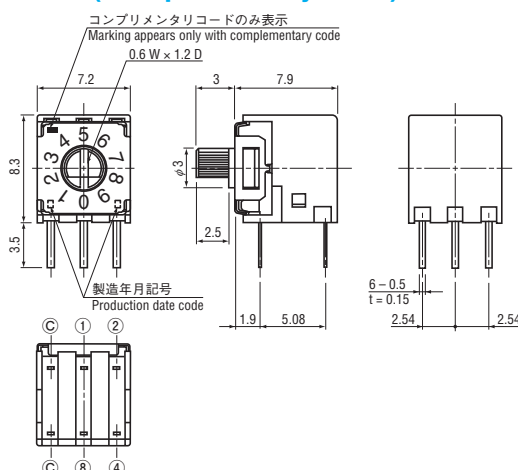
- SA-7111B (Real code)
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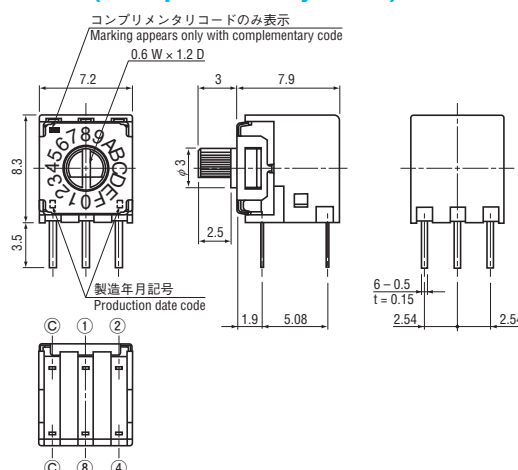
- SA-7151B (Real code)
- SA-7171B (Complementary code)



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



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



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

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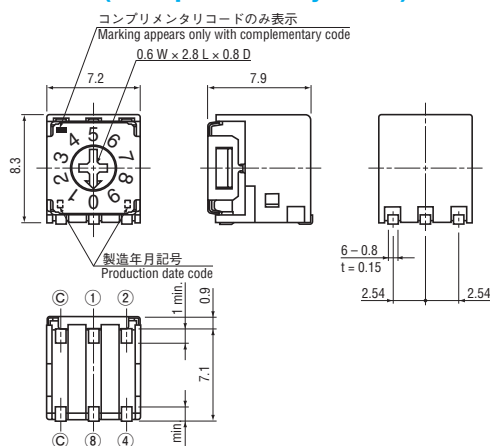
ROTARY CODED SWITCHES (SMD)

■外形寸法図 OUTLINE DIMENSIONS

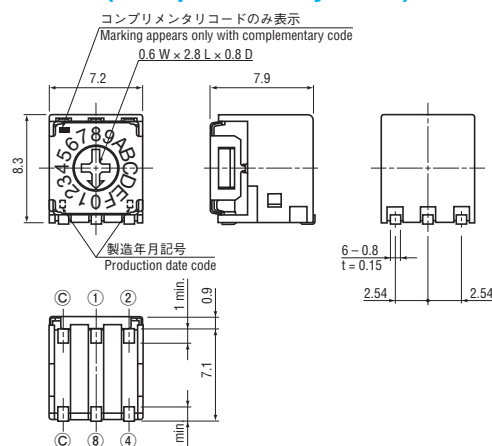
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

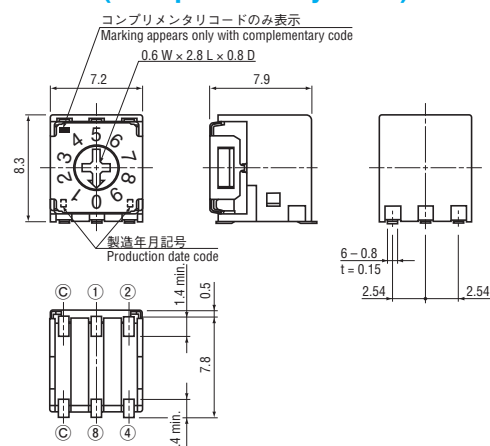
- SA-7211A (Real code)
- SA-7231A (Complementary code)



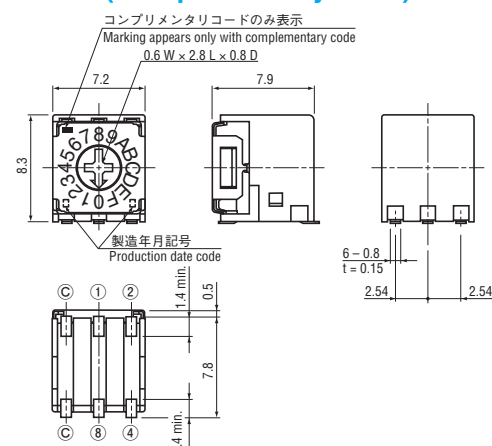
- SA-7251A (Real code)
- SA-7271A (Complementary code)



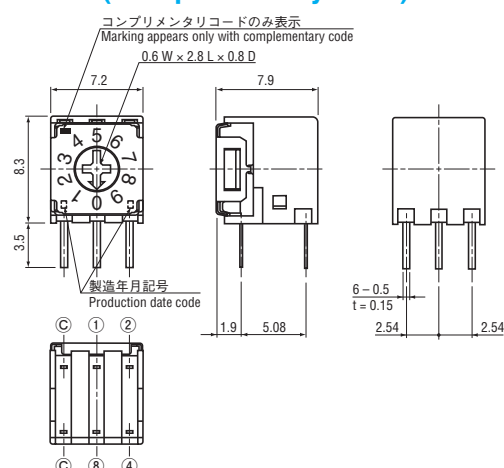
- SA-7211B (Real code)
- SA-7231B (Complementary code)



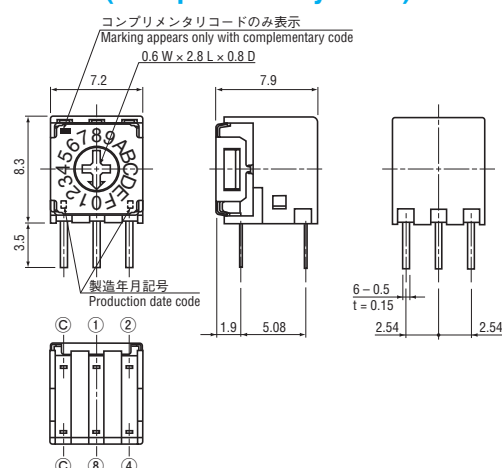
- SA-7251B (Real code)
- SA-7271B (Complementary code)



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



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



SA-7000

ROTARY CODED SWITCHES (SMD)

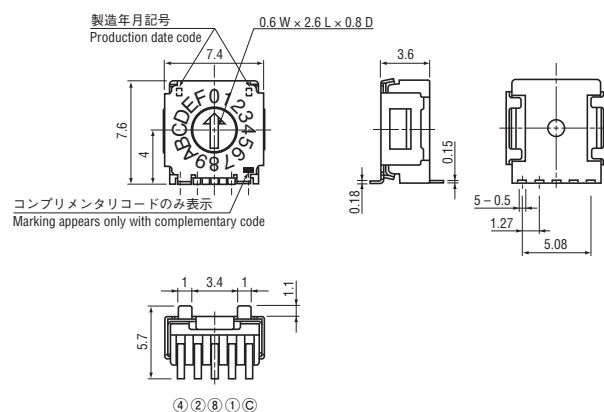
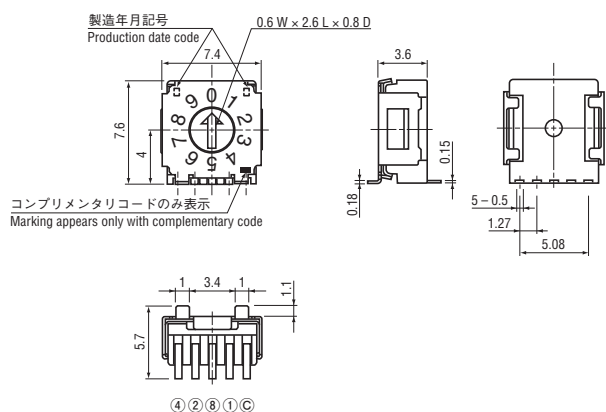
■外形寸法図 OUTLINE DIMENSIONS

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

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

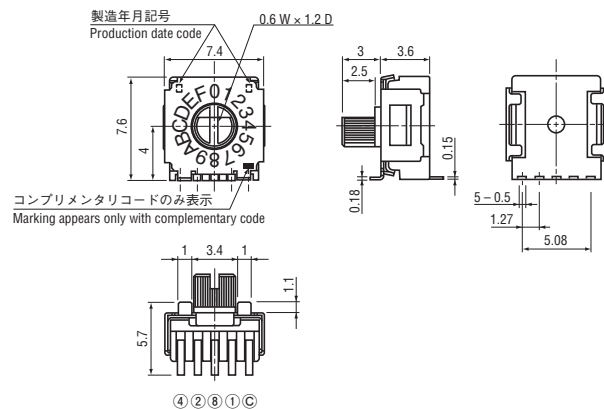
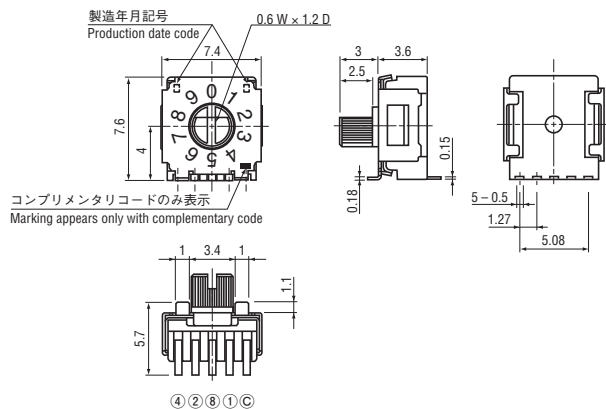
- SA-7012B (Real code)
- SA-7032B (Complementary code)

- SA-7052B (Real code)
- SA-7072B (Complementary code)



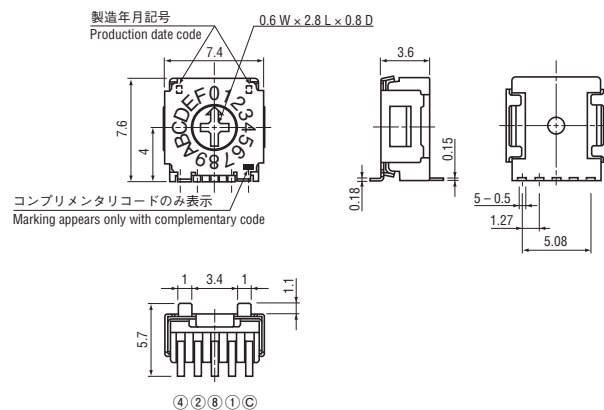
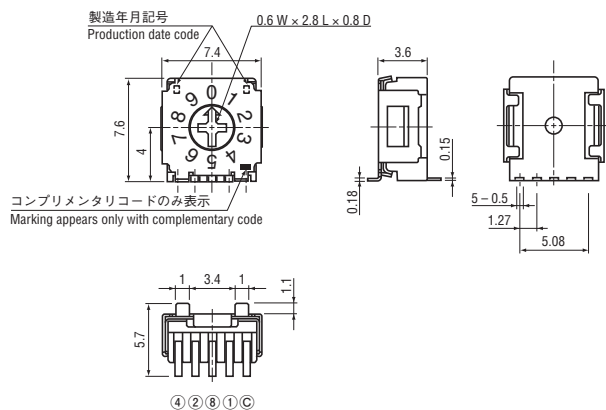
- SA-7112B (Real code)
- SA-7132B (Complementary code)

- 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)

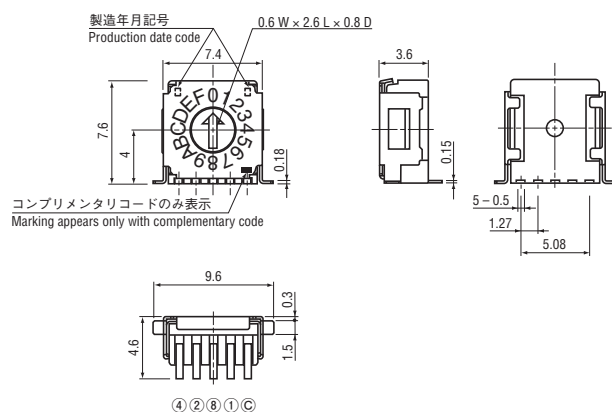
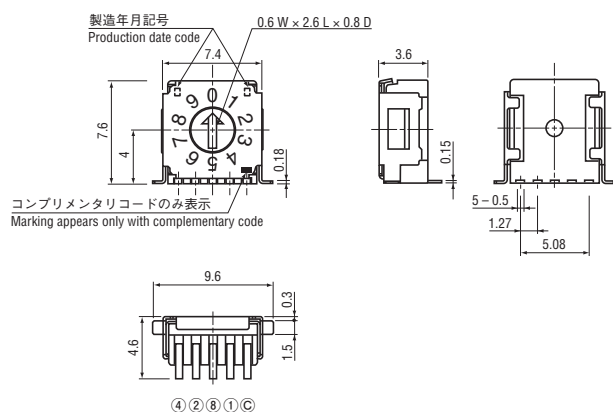
■外形寸法図 OUTLINE DIMENSIONS

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

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

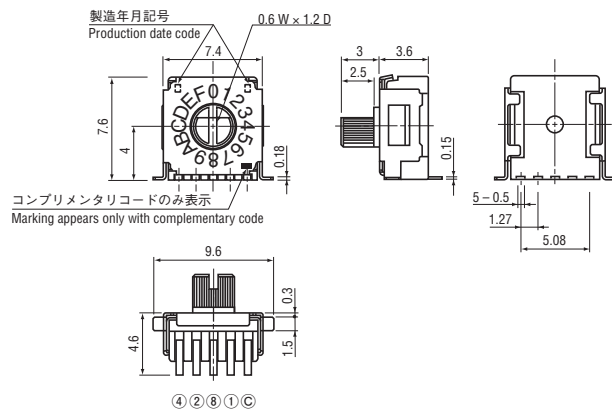
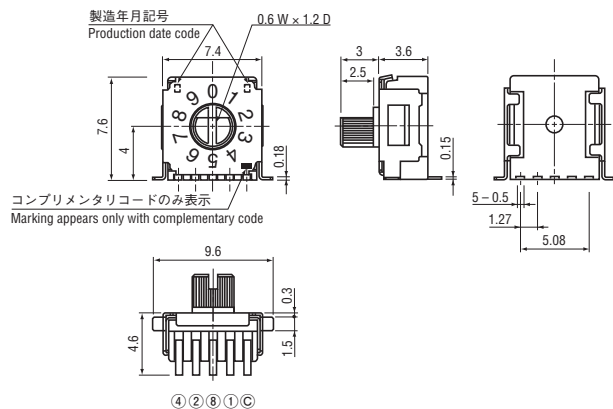
- SA-7013B (Real code)
- SA-7033B (Complementary code)

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



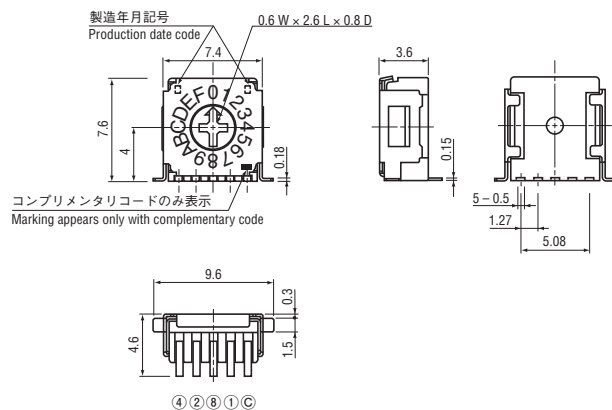
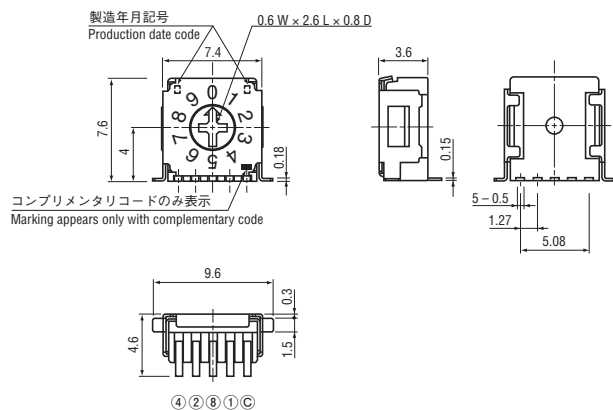
- SA-7113B (Real code)
- SA-7133B (Complementary code)

- 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

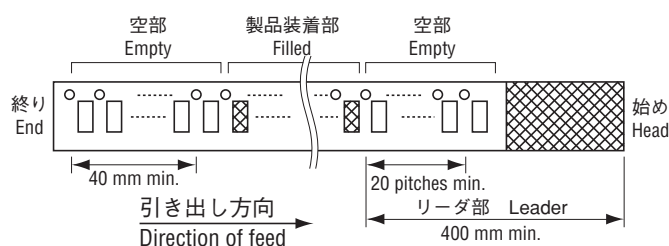
<テーピングの包装仕様>

- 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>

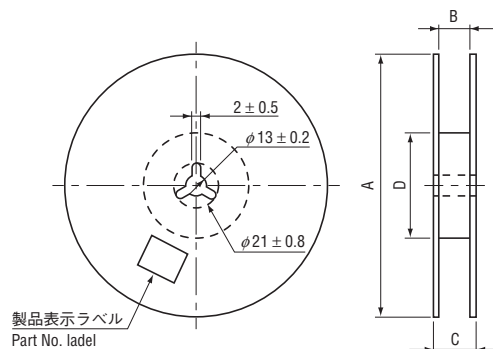
- Taping version is packaged in 500 pcs. per reel.
Orders will be accepted for units of 500 pcs., i.e., 500, 1000, 1500, pcs., etc.
- Taping version is boxed with one reel (500 pcs.).

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)

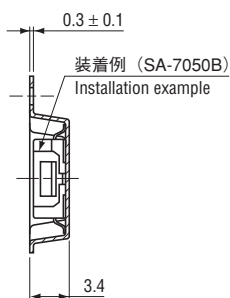
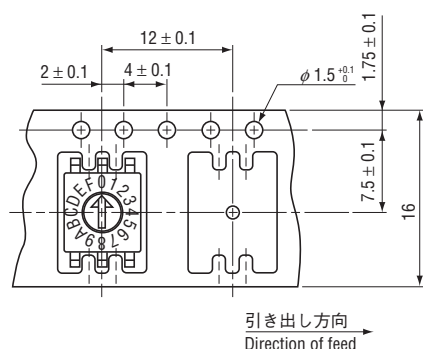


Part number	A	B	C	D
SA-70□0・SA-72□0TA/TB	$\varnothing 254 \pm 2$	17.4 ± 1	21.4 ± 1	$\varnothing 50 \text{ min.}$
SA-71□0TA/TB	$\varnothing 330 \pm 2$	17.4 ± 1	21.4 ± 1	$\varnothing 80 \pm 1$
SA-70□1・SA-72□1TA/TB	$\varnothing 330 \pm 2$	17.4 ± 1	21.4 ± 1	
SA-71□1TA/TB	$\varnothing 330 \pm 2$	17.4 ± 1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

● SA-70□0T□

● SA-72□0T□

<Top setting without knob>

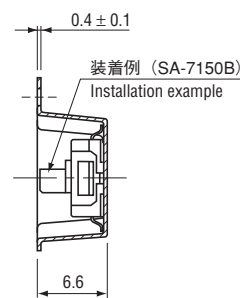
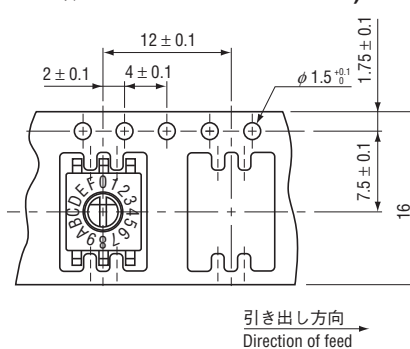


● SA-71□0T□

<Top setting with knob>

(Unit: mm)

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



SA-7000

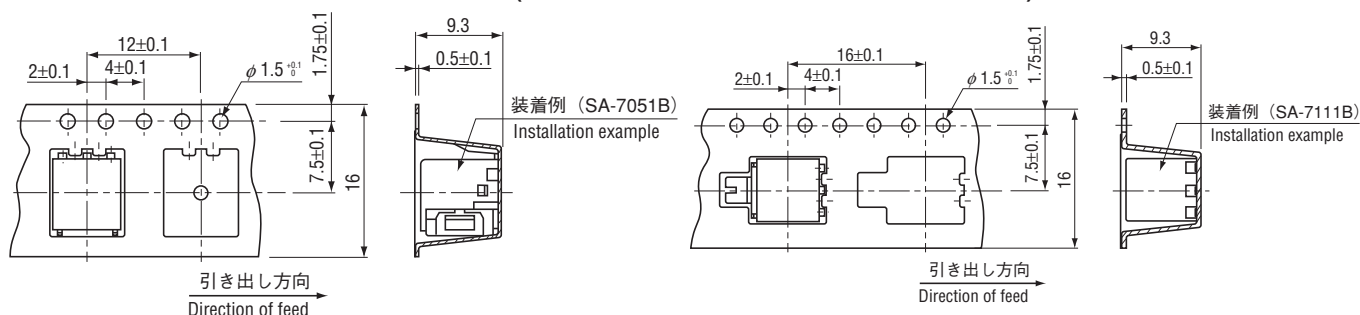
ROTARY CODED SWITCHES (SMD)

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

● SA-71□1T□ <Side setting with knob>

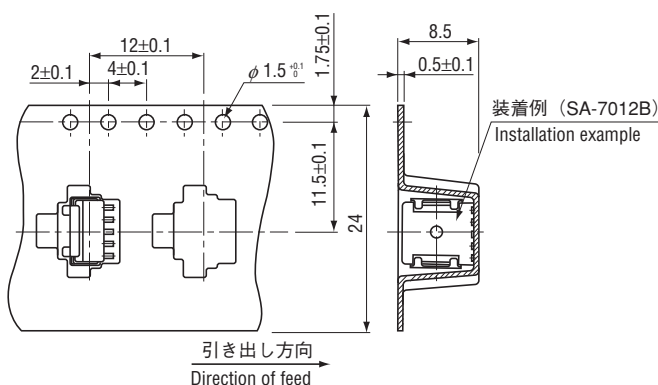
(Unit: mm)

(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.