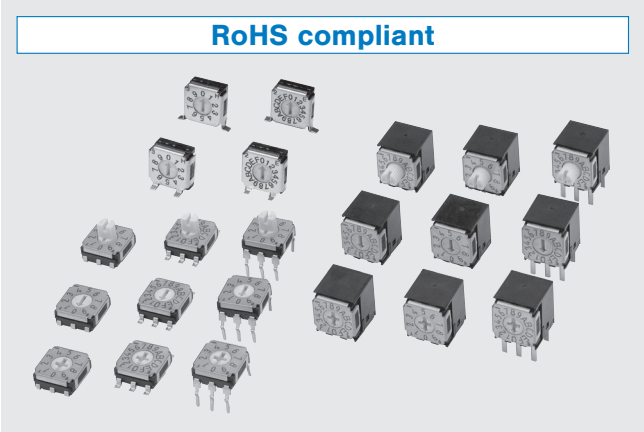


ROTARY CODED SWITCHES (SMD)

SA-7000



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
- Resin material is UL Recognized 94V-0

INTERNAL STRUCTURE

| Part name | Material |
|------------------|---------------------------|
| ① Marking cover | Stainless steel (SUS 304) |
| ② Cover | |
| ③ “O” ring | Silicone rubber |
| ④ Rotor | Polyphenylenesulfide |
| ⑤ Spacer | Stainless steel (SUS 304) |
| ⑥ Slider contact | Copper alloy, Gold-plated |
| ⑦ Fixed contact | |
| ⑧ Housing | Polyphenylenesulfide |
| ⑨ Terminal pin | Copper alloy, Gold-plated |

PART NUMBER DESIGNATION

S A - 7 0 1 0 T A

Series name

Shape of rotor

Code format

Shape of terminal

Form of packaging

Setting position

A : J-hook
B : Gull wing
C : Through hole pins
(Only gull wing available for Low-profile side setting type)

T : Taping (Reel)
Blank : Bulk in plastic bag
(Only taping available for Low-profile side setting type)

0 : Top setting
1 : Side setting
2 : Low-profile side setting & forward support terminal type
3 : Low-profile side setting & sideling support terminal type

0 : Without knob (Minus slot)
1 : With knob
2 : Without knob (Cross slot)

1 : 10 positions, real code
3 : 10 positions, complementary code
5 : 16 positions, real code
7 : 16 positions, complementary code

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

SA-7000

ROTARY CODED SWITCHES (SMD)

LIST OF PART NUMBERS

| Setting position | Shape of rotor | Shape of terminal | Form of packaging | Binary coded decimal | | Binary coded hexadecimal | | Packaging quantity |
|---|----------------|------------------------|-------------------|----------------------|--------------------|--------------------------|--------------------|--------------------|
| | | | | Real code | Complementary code | Real code | Complementary code | |
| Top setting | Minus slot | A J-hook | Taping | SA-7010TA | SA-7030TA | SA-7050TA | SA-7070TA | 500 pcs./reel |
| | | | Plastic bag | SA-7010A | SA-7030A | SA-7050A | SA-7070A | 50 pcs./pack |
| | | B Gull wing | Taping | SA-7010TB | SA-7030TB | SA-7050TB | SA-7070TB | 500 pcs./reel |
| | | | Plastic bag | SA-7010B | SA-7030B | SA-7050B | SA-7070B | 50 pcs./pack |
| | | C Through hole pins | Taping | | | | | |
| | | | Plastic bag | SA-7010C | SA-7030C | SA-7050C | SA-7070C | 50 pcs./pack |
| | With knob | A J-hook | 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 |
| | | B Gull wing | Taping | SA-7110TB | SA-7130TB | SA-7150TB | SA-7170TB | 500 pcs./reel |
| | | | Plastic bag | SA-7110B | SA-7130B | SA-7150B | SA-7170B | 50 pcs./pack |
| | | C Through hole pins | Taping | | | | | |
| | | | Plastic bag | SA-7110C | SA-7130C | SA-7150C | SA-7170C | 50 pcs./pack |
| | Cross slot | A J-hook | Taping | SA-7210TA | SA-7230TA | SA-7250TA | SA-7270TA | 500 pcs./reel |
| | | | Plastic bag | SA-7210A | SA-7230A | SA-7250A | SA-7270A | 50 pcs./pack |
| | | B Gull wing | Taping | SA-7210TB | SA-7230TB | SA-7250TB | SA-7270TB | 500 pcs./reel |
| | | | Plastic bag | SA-7210B | SA-7230B | SA-7250B | SA-7270B | 50 pcs./pack |
| | | C Through hole pins | Taping | | | | | |
| | | | Plastic bag | SA-7210C | SA-7230C | SA-7250C | SA-7270C | 50 pcs./pack |
| Side setting | Minus slot | A J-hook | 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 |
| | | B Gull wing | Taping | SA-7011TB | SA-7031TB | SA-7051TB | SA-7071TB | 500 pcs./reel |
| | | | Plastic bag | SA-7011B | SA-7031B | SA-7051B | SA-7071B | 50 pcs./pack |
| | | C Through hole pins | Taping | | | | | |
| | | | Plastic bag | SA-7011C | SA-7031C | SA-7051C | SA-7071C | 50 pcs./pack |
| | With knob | A J-hook | Taping | SA-7111TA | SA-7131TA | SA-7151TA | SA-7171TA | 500 pcs./reel |
| | | | Plastic bag | SA-7111A | SA-7131A | SA-7151A | SA-7171A | 50 pcs./pack |
| | | B Gull wing | Taping | SA-7111TB | SA-7131TB | SA-7151TB | SA-7171TB | 500 pcs./reel |
| | | | Plastic bag | SA-7111B | SA-7131B | SA-7151B | SA-7171B | 50 pcs./pack |
| | | C Through hole pins | Taping | | | | | |
| | | | Plastic bag | SA-7111C | SA-7131C | SA-7151C | SA-7171C | 50 pcs./pack |
| | Cross slot | A J-hook | 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 |
| | | B Gull wing | Taping | SA-7211TB | SA-7231TB | SA-7251TB | SA-7271TB | 500 pcs./reel |
| | | | Plastic bag | SA-7211B | SA-7231B | SA-7251B | SA-7271B | 50 pcs./pack |
| | | C Through hole pins | Taping | | | | | |
| | | | Plastic bag | SA-7211C | SA-7231C | SA-7251C | SA-7271C | 50 pcs./pack |
| Low-profile side setting & forward support terminal type | Minus slot | B Gull wing | Taping | SA-7012TB | SA-7032TB | SA-7052TB | SA-7072TB | 500 pcs./reel |
| | With knob | | | SA-7112TB | SA-7132TB | SA-7152TB | SA-7172TB | 500 pcs./reel |
| | Cross slot | | | SA-7212TB | SA-7232TB | SA-7252TB | SA-7272TB | 500 pcs./reel |
| Low-profile side setting & sideling support terminal type | Minus slot | | | SA-7013TB | SA-7033TB | SA-7053TB | SA-7073TB | 500 pcs./reel |
| | With knob | | | SA-7113TB | SA-7133TB | SA-7153TB | SA-7173TB | 500 pcs./reel |
| | Cross slot | | | SA-7213TB | SA-7233TB | SA-7253TB | SA-7273TB | 500 pcs./reel |

☐ : Not manufactured

※ Verify the above part numbers when placing orders.

Taping version can be supplied only in reel unit.

SA-7000

ROTARY CODED SWITCHES (SMD)

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 | 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) |

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

MECHANICAL CHARACTERISTICS

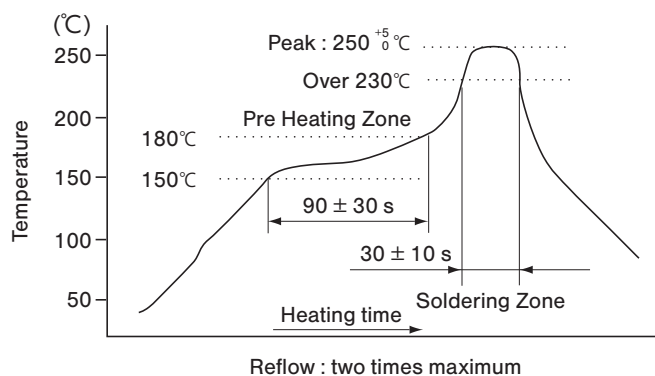
| | |
|-----------------------------------|--|
| No. of positions | 10, 16 |
| Adjustment torque | 20 mN·m {204 gf·cm} maximum |
| Stepping angle | 36° (10 positions) 22.5° (16 positions) |
| Solderability | 245 ± 3 °C, 2 ~ 3 s |
| Soldering heat | Reflow : 255 °C (Peak temperature) Please refer to the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

{ } : Reference only

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 |
| Load life | 10000 steps minimum, DC5 V, 100 mA |
| Humidity (Steady state) | 40 °C, Relative humidity 90 ~ 95 %, 240 h |
| 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 |

〈Reflow profile for soldering heat evaluation〉



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ROTARY CODED SWITCHES (SMD)

CODE FORMAT

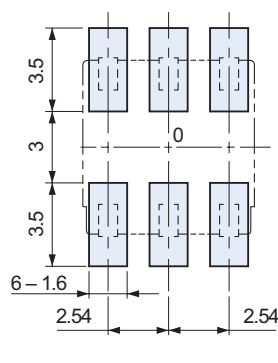
● ...Contact closed

| 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 | ● | | ● | | ● | | ● | | | ● | | ● | | ● | | ● | |

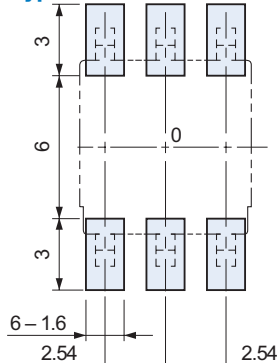
RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

<Top setting>

● A type

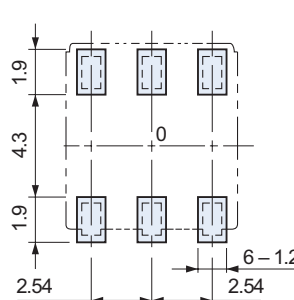


● B type

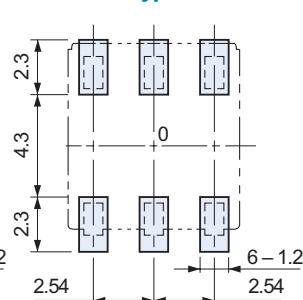


<Side setting>

● A type

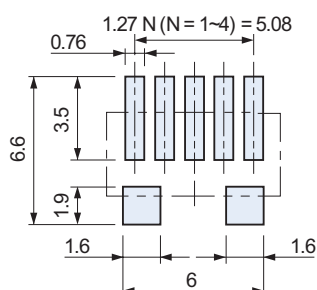


● B type

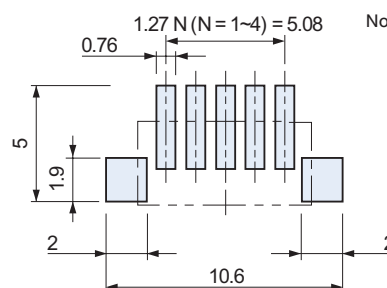


(Unit: mm)

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



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

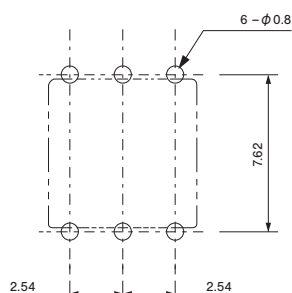


Note) The zero point is the center of mounting.

SIZE OF P.C.B. PROCESSING

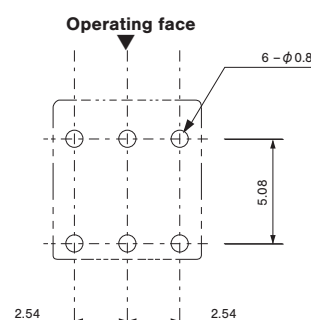
<Top setting>

● C type



<Side setting>

● C type



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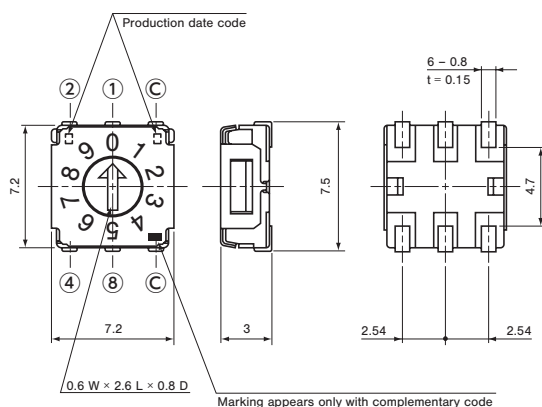
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

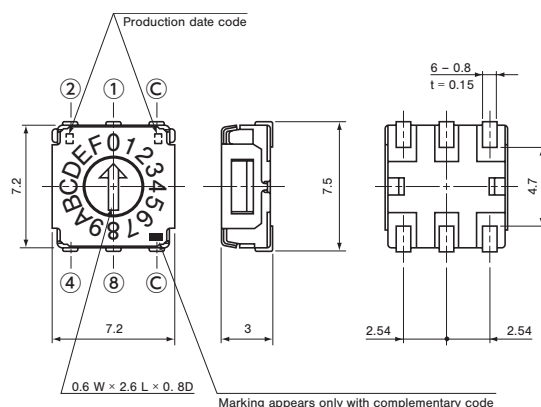
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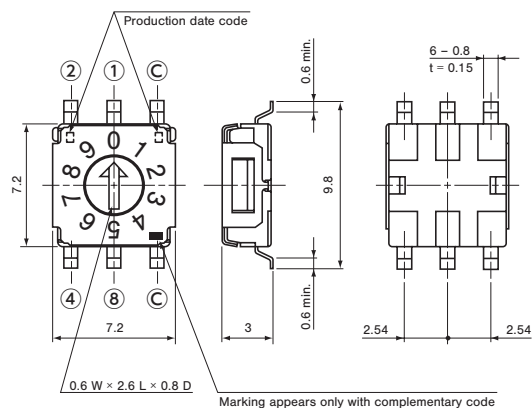
- SA-7010A (Real code)
- SA-7030A (Complementary code)



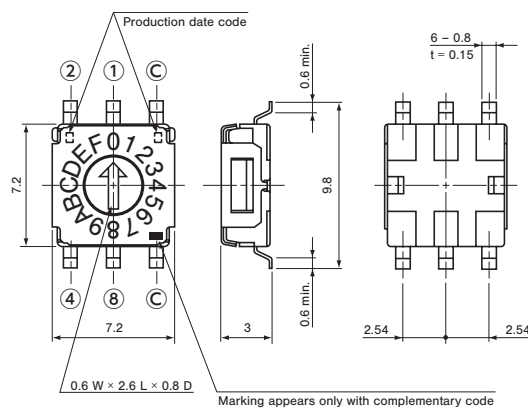
- SA-7050A (Real code)
- SA-7070A (Complementary code)



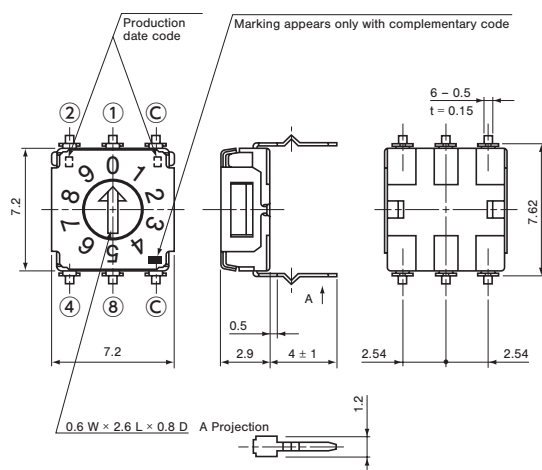
- SA-7010B (Real code)
- SA-7030B (Complementary code)



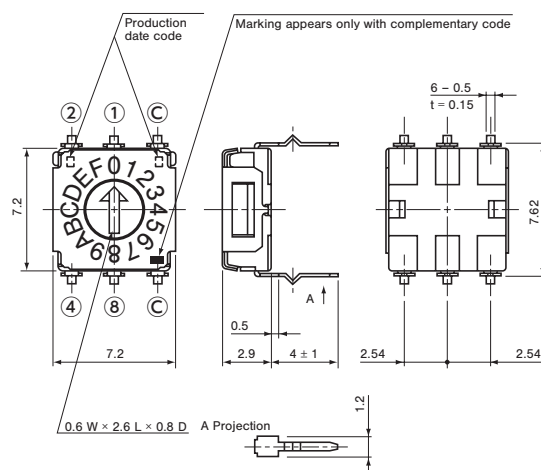
- SA-7050B (Real code)
- SA-7070B (Complementary code)



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



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



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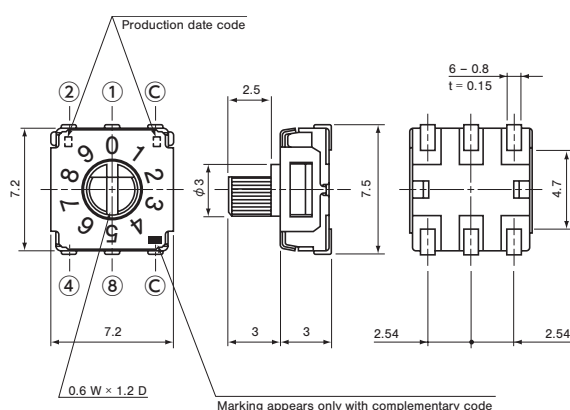
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

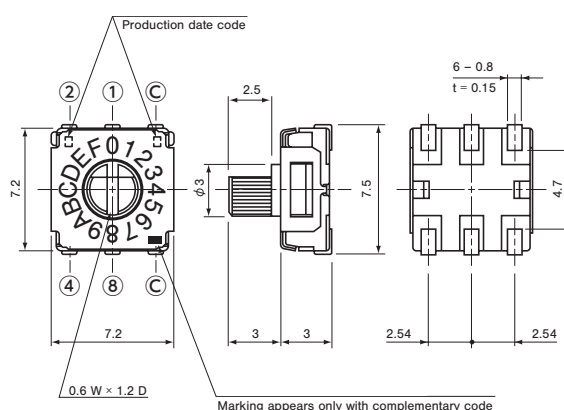
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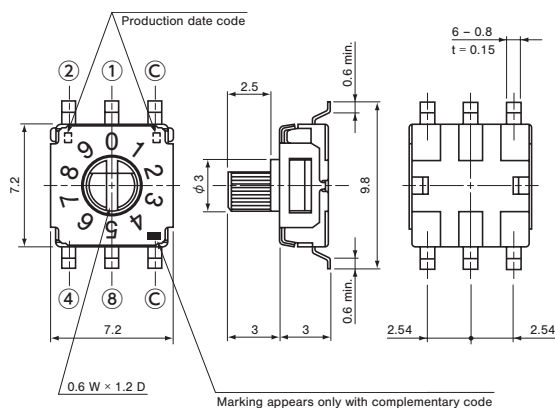
- SA-7110A (Real code)
- SA-7130A (Complementary code)



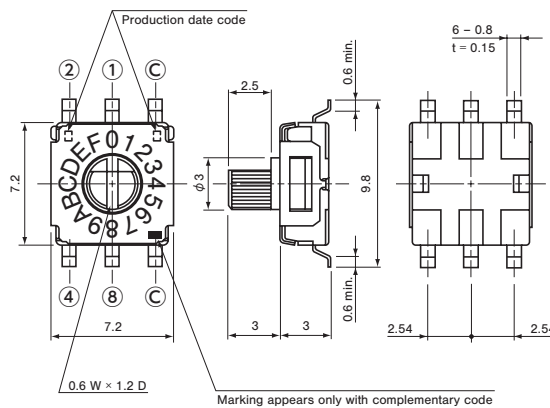
- SA-7150A (Real code)
- SA-7170A (Complementary code)



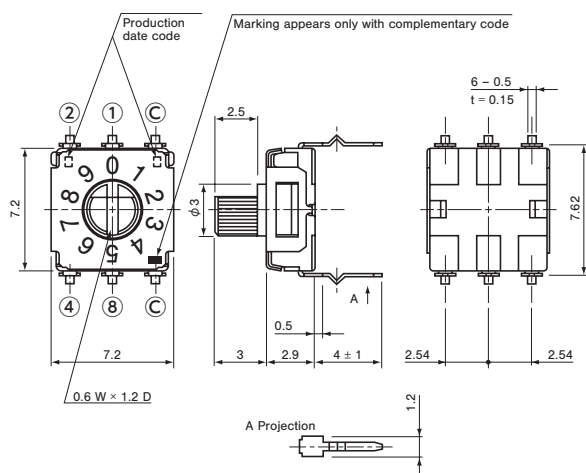
- SA-7110B (Real code)
- SA-7130B (Complementary code)



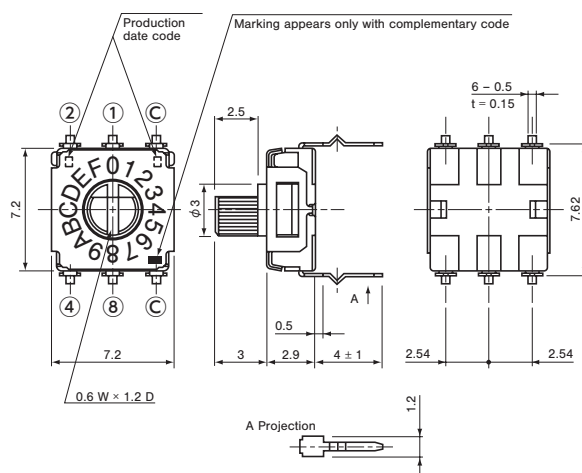
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- SA-7170B (Complementary code)



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



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



SA-7000

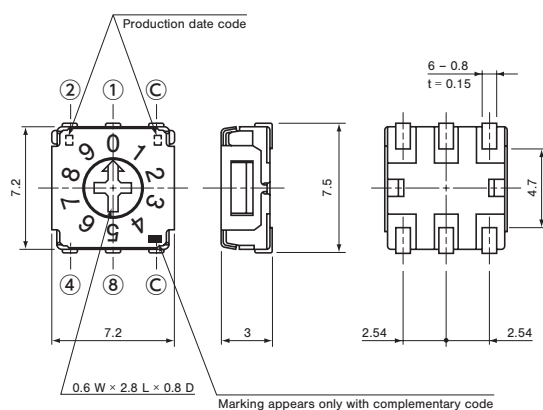
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

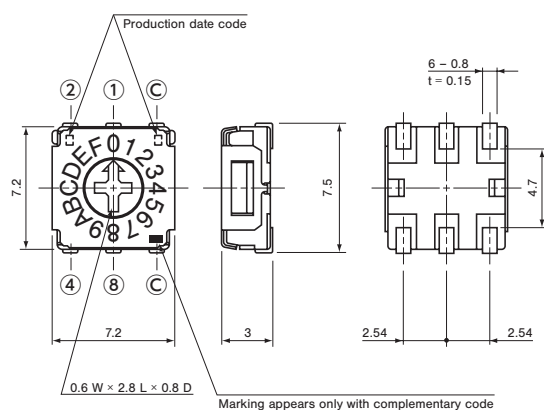
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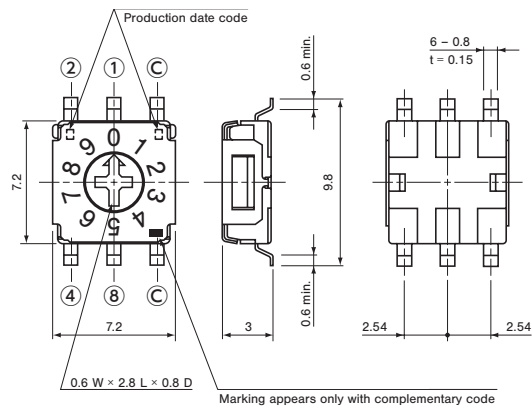
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- SA-7230A (Complementary code)



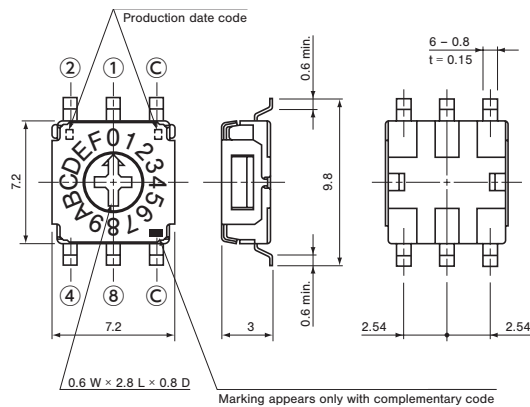
- SA-7250A (Real code)
- SA-7270A (Complementary code)



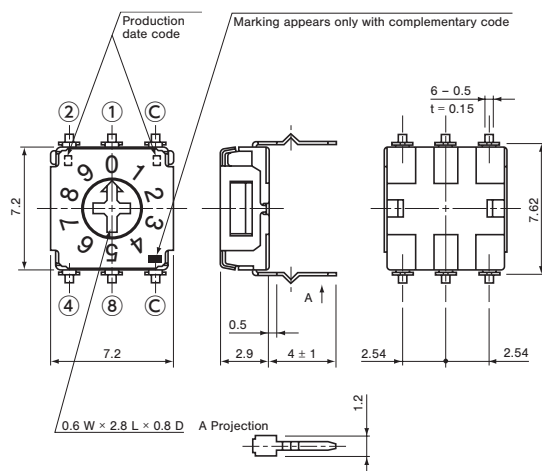
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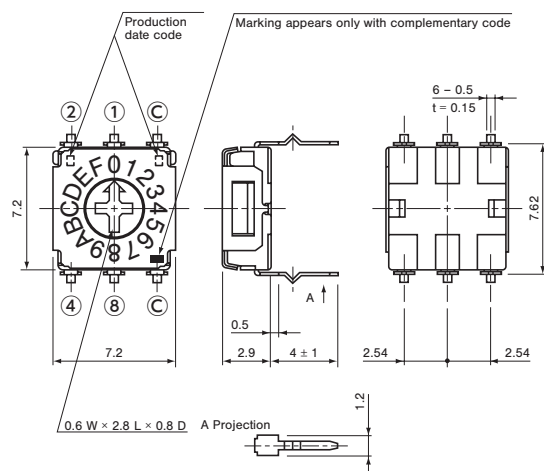
- SA-7250B (Real code)
- SA-7270B (Complementary code)



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



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



SA-7000

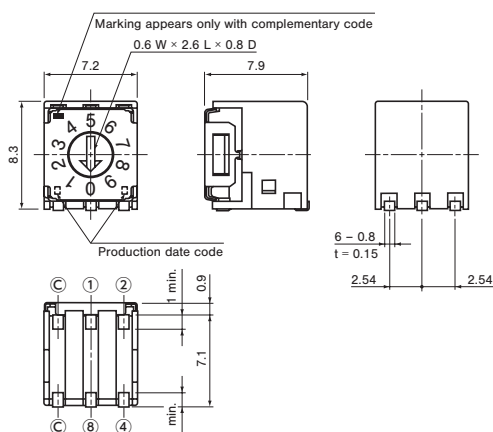
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

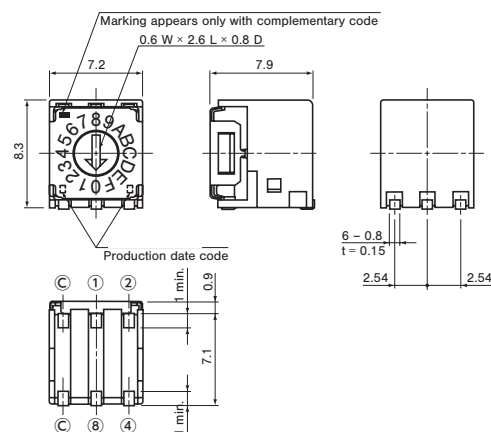
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<Side setting>

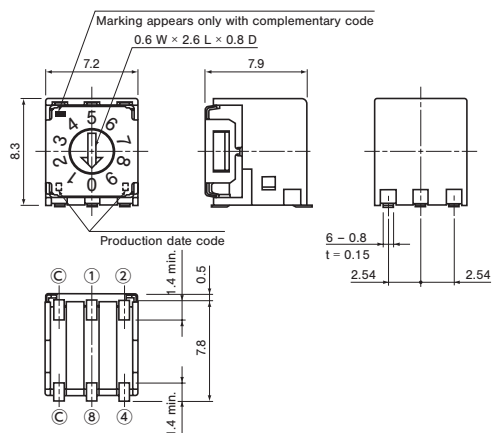
- SA-7011A (Real code)
- SA-7031A (Complementary code)



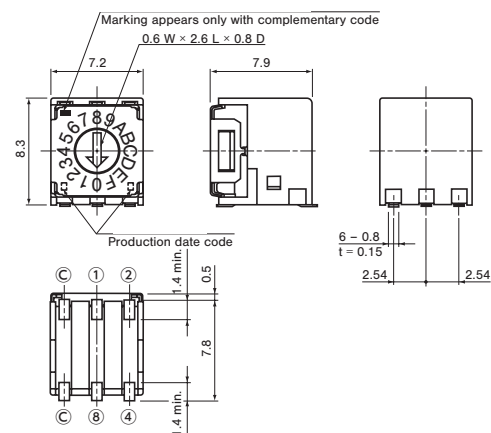
- SA-7051A (Real code)
- SA-7071A (Complementary code)



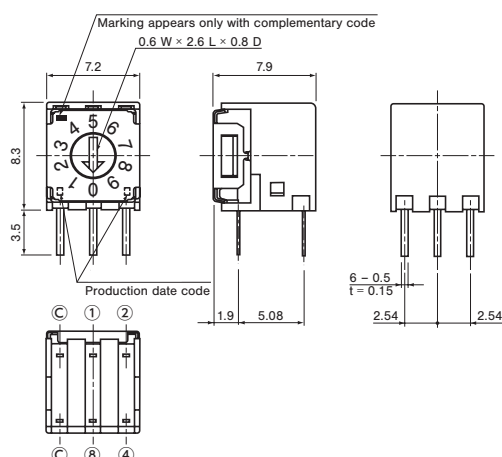
- SA-7011B (Real code)
- SA-7031B (Complementary code)



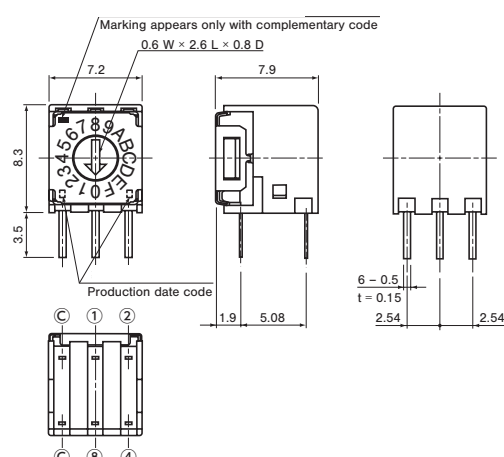
- SA-7051B (Real code)
- SA-7071B (Complementary code)



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



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



SA-7000

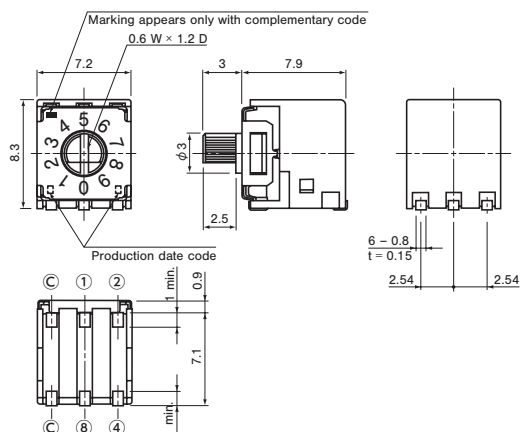
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

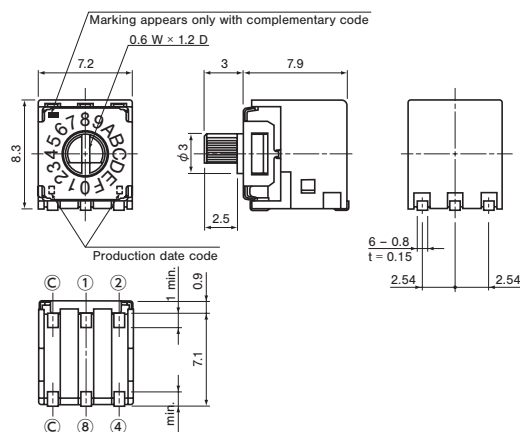
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<Side setting>

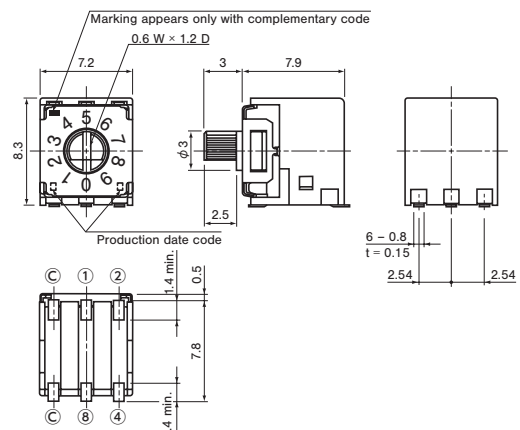
- SA-7111A (Real code)
- SA-7131A (Complementary code)



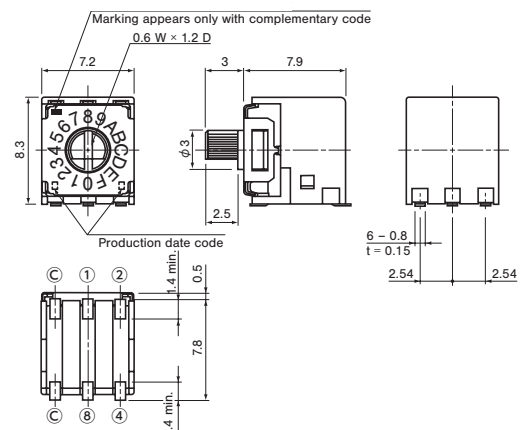
- SA-7151A (Real code)
- SA-7171A (Complementary code)



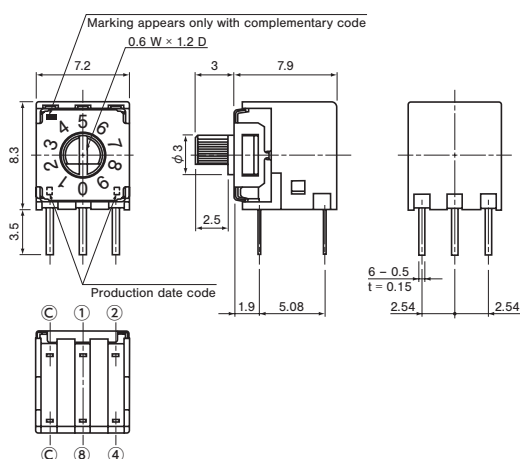
- SA-7111B (Real code)
- SA-7131B (Complementary code)



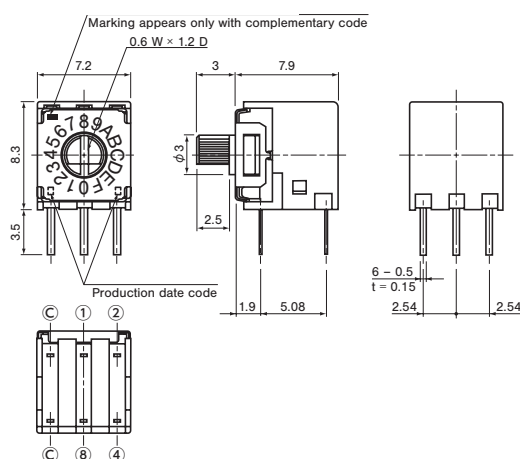
- SA-7151B (Real code)
- SA-7171B (Complementary code)



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



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



SA-7000

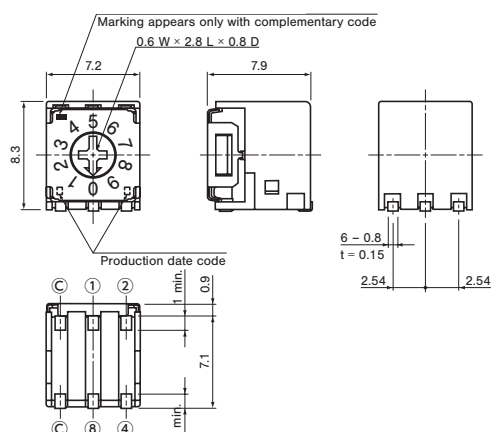
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

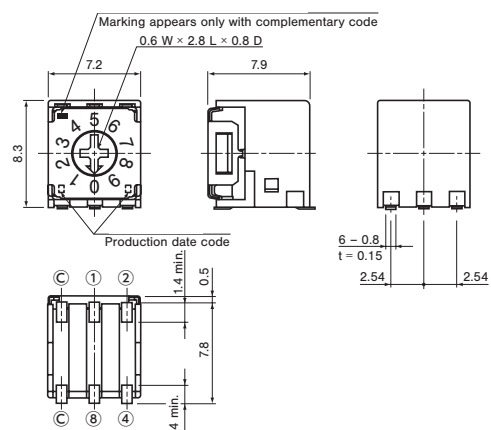
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

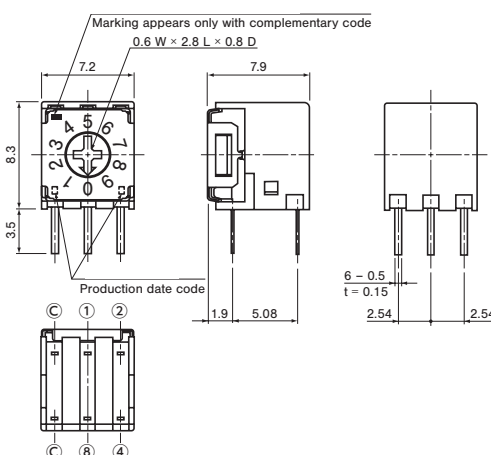
- SA-7211A (Real code)
- SA-7231A (Complementary code)



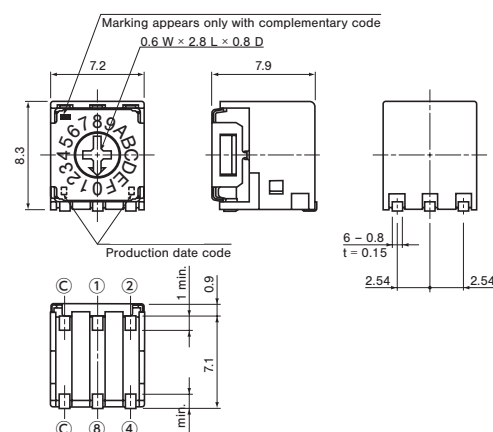
- SA-7211B (Real code)
- SA-7231B (Complementary code)



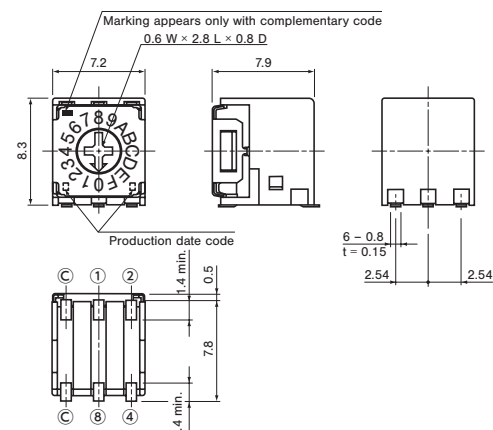
- SA-7211C (Real code)
- SA-7231C (Complementary code)



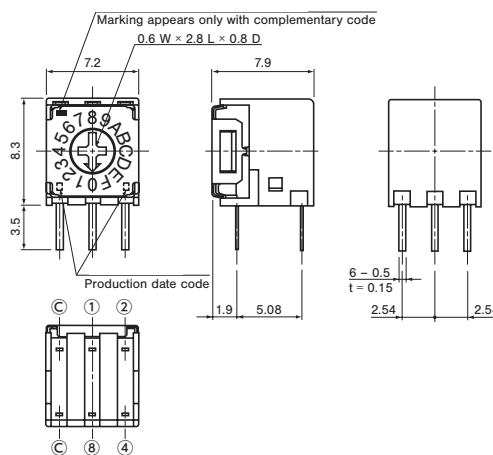
- SA-7251A (Real code)
- SA-7271A (Complementary code)



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



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



SA-7000

ROTARY CODED SWITCHES (SMD)

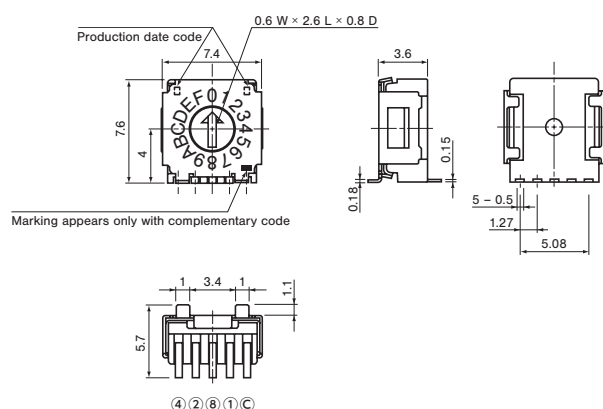
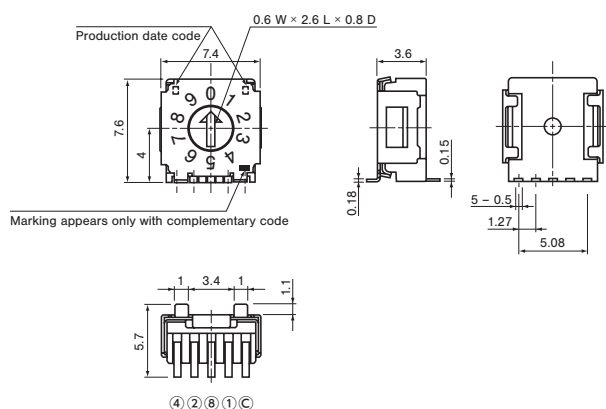
OUTLINE DIMENSIONS

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

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

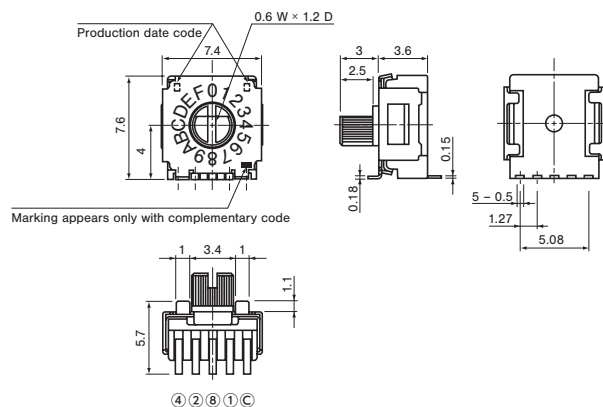
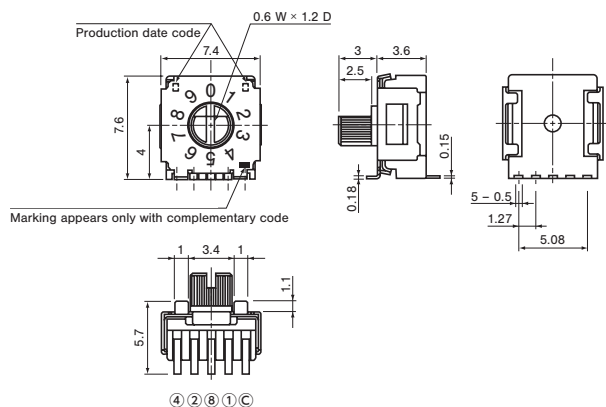
- SA-7012B (Real code)
- SA-7032B (Complementary code)

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



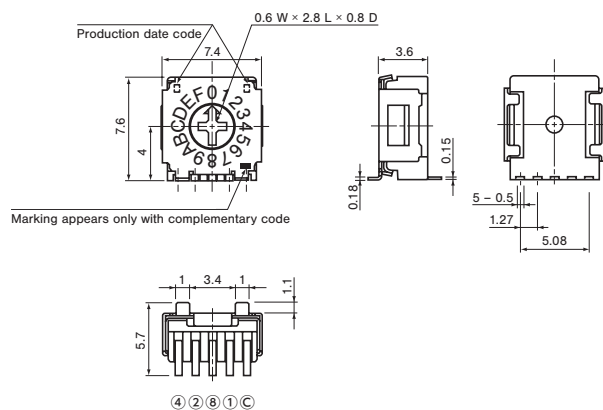
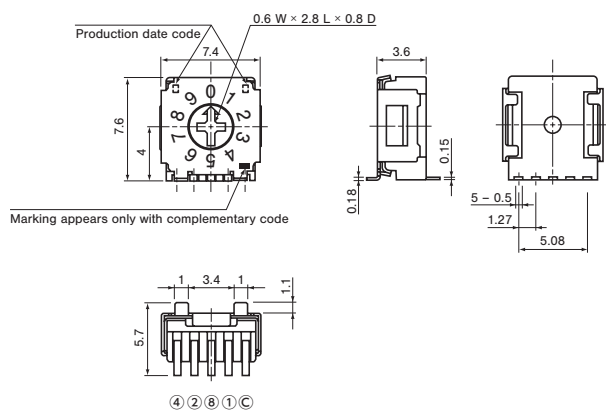
- SA-7112B (Real code)
- SA-7132B (Complementary code)

- 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)

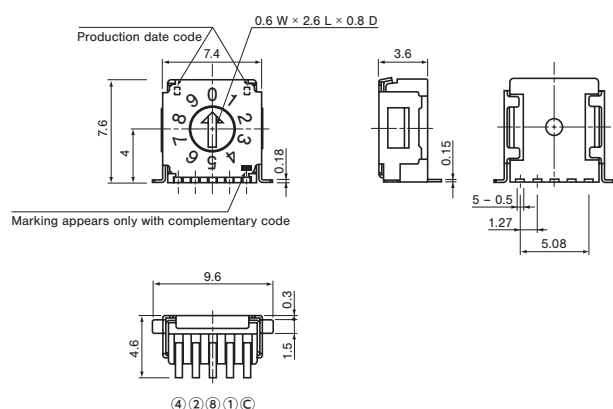
OUTLINE DIMENSIONS

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

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

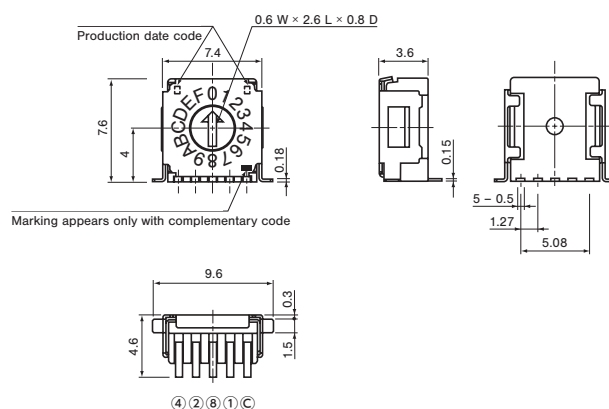
SA-7013B (Real code)

SA-7033B (Complementary code)



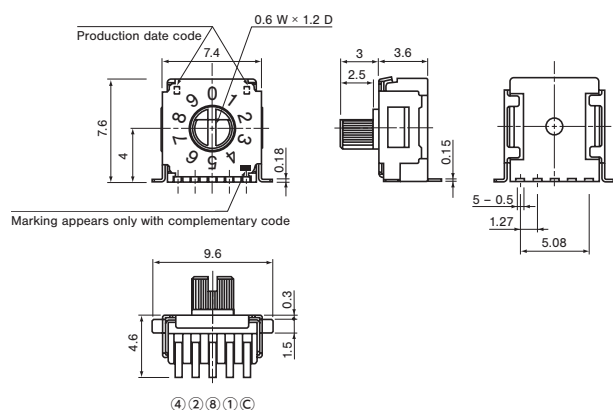
SA-7053B (Real code)

SA-7073B (Complementary code)



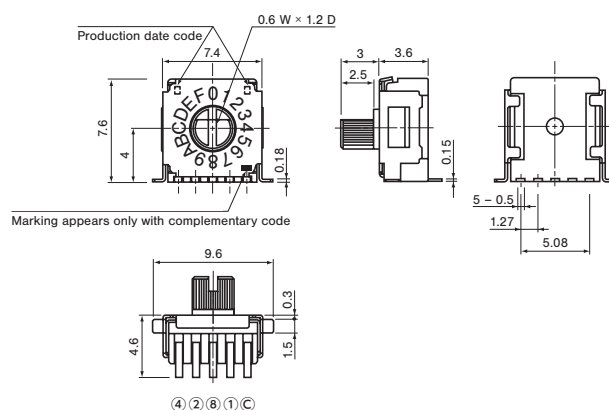
SA-7113B (Real code)

SA-7133B (Complementary code)



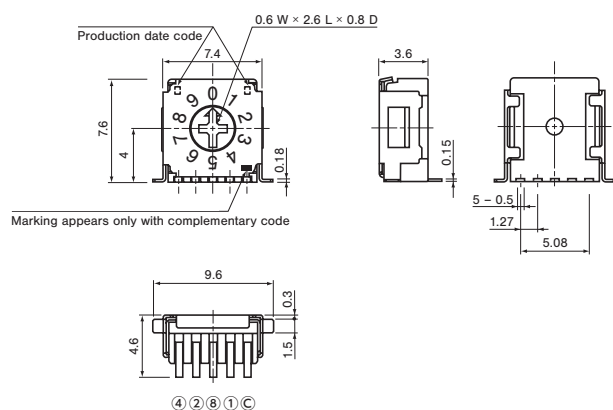
SA-7153B (Real code)

SA-7173B (Complementary code)



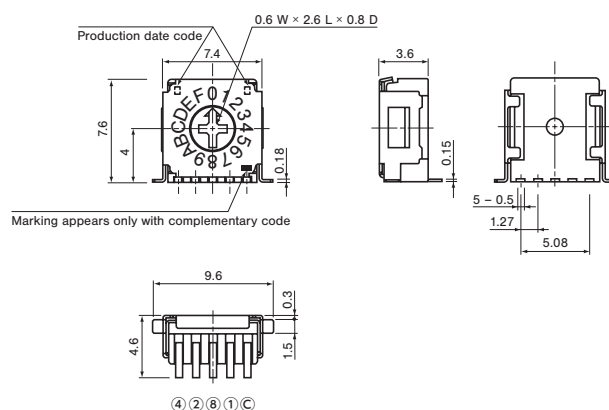
SA-7213B (Real code)

SA-7233B (Complementary code)



SA-7253B (Real code)

SA-7273B (Complementary code)



SA-7000

ROTARY CODED SWITCHES (SMD)

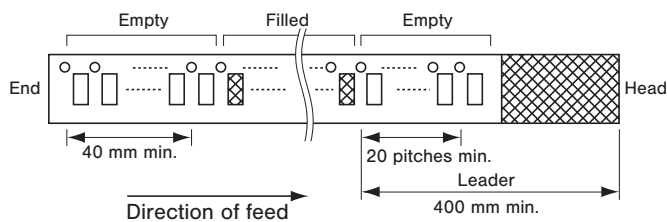
PACKAGING SPECIFICATIONS

<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

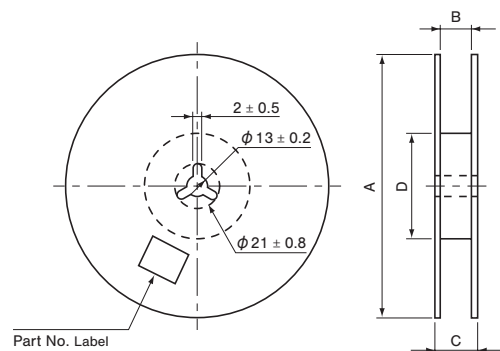


● Reel dimensions

(Unit: mm)

(Conforms to JIS C 0806-3)

(In accordance with EIAJ ET-7200A)

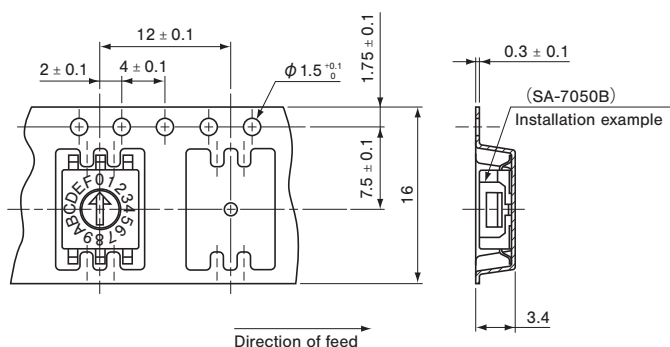


| Part number | A | B | C | D |
|------------------------|-----------|----------|----------|-----------|
| SA-70□0 • SA-72□0TA/TB | φ 254 ± 2 | 17.4 ± 1 | 21.4 ± 1 | φ 50 min. |
| SA-71□0TA/TB | φ 330 ± 2 | 17.4 ± 1 | 21.4 ± 1 | φ 80 ± 1 |
| SA-70□1 • SA-72□1TA/TB | φ 330 ± 2 | 17.4 ± 1 | 21.4 ± 1 | |
| SA-71□1TA/TB | φ 330 ± 2 | 17.4 ± 1 | 21.4 ± 1 | |
| 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>

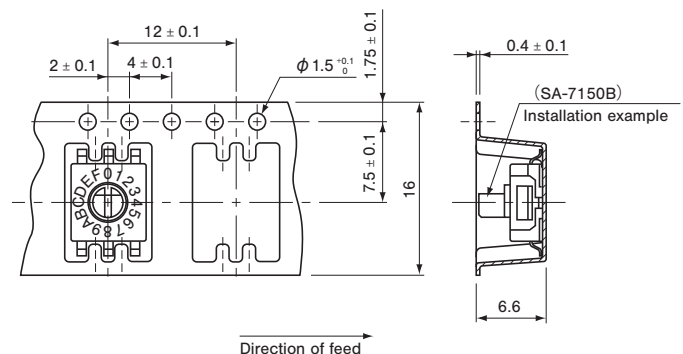


● SA-71□0T□

<Top setting with knob>

(Unit: mm)

(Conforms to JIS C 0806)



SA-7000

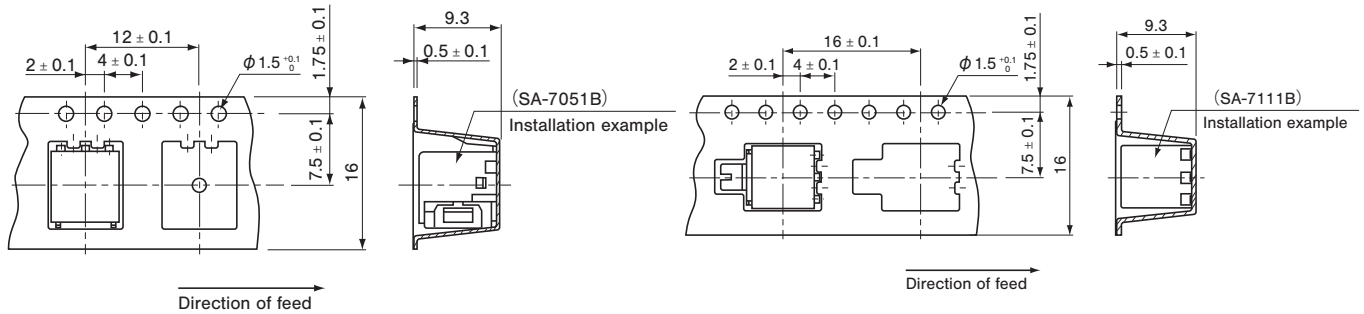
ROTARY CODED SWITCHES (SMD)

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

● SA-71□1T□
<Side setting with knob>

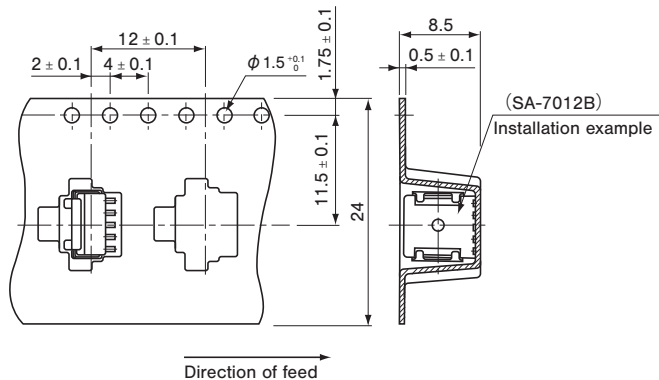
(Unit: mm)

(Conforms to JIS C 0806-3)



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

(Conforms to JIS C 0806-3)



<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.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Nidec:](#)

[SA-7013TB](#) [SA-7113TB](#) [SA-7213TB](#) [SA-7050TB](#) [SA-7050B](#) [SA-7010TA](#) [SA-7050TA](#) [SA-7110TB](#) [SA-7010A](#) [SA-7011A](#) [SA-7011B](#) [SA-7011C](#) [SA-7011TA](#) [SA-7011TB](#) [SA-7272TB](#) [SA-7270TB](#) [SA-7271A](#) [SA-7271B](#) [SA-7271C](#) [SA-7271TA](#) [SA-7271TB](#) [SA-7251TB](#) [SA-7252TB](#) [SA-7270A](#) [SA-7270B](#) [SA-7270C](#) [SA-7270TA](#) [SA-7250TA](#) [SA-7250TB](#) [SA-7251A](#) [SA-7251B](#) [SA-7251C](#) [SA-7251TA](#) [SA-7231TA](#) [SA-7231TB](#) [SA-7232TB](#) [SA-7250A](#) [SA-7250B](#) [SA-7250C](#) [SA-7230C](#) [SA-7230TA](#) [SA-7230TB](#) [SA-7231A](#) [SA-7231B](#) [SA-7231C](#) [SA-7211C](#) [SA-7211TA](#) [SA-7211TB](#) [SA-7212TB](#) [SA-7230A](#) [SA-7230B](#) [SA-7210B](#) [SA-7210C](#) [SA-7210TA](#) [SA-7210TB](#) [SA-7211A](#) [SA-7211B](#) [SA-7171B](#) [SA-7171C](#) [SA-7171TA](#) [SA-7171TB](#) [SA-7172TB](#) [SA-7210A](#) [SA-7170A](#) [SA-7170B](#) [SA-7170C](#) [SA-7170TA](#) [SA-7170TB](#) [SA-7171A](#) [SA-7151A](#) [SA-7151B](#) [SA-7151C](#) [SA-7151TA](#) [SA-7151TB](#) [SA-7152TB](#) [SA-7132TB](#) [SA-7150A](#) [SA-7150B](#) [SA-7150C](#) [SA-7150TA](#) [SA-7150TB](#) [SA-7130TB](#) [SA-7131A](#) [SA-7131B](#) [SA-7131C](#) [SA-7131TA](#) [SA-7131TB](#) [SA-7111TB](#) [SA-7112TB](#) [SA-7130A](#) [SA-7130B](#) [SA-7130C](#) [SA-7130TA](#) [SA-7110C](#) [SA-7110TA](#) [SA-7111A](#) [SA-7111B](#) [SA-7111C](#) [SA-7111TA](#) [SA-7071C](#)