

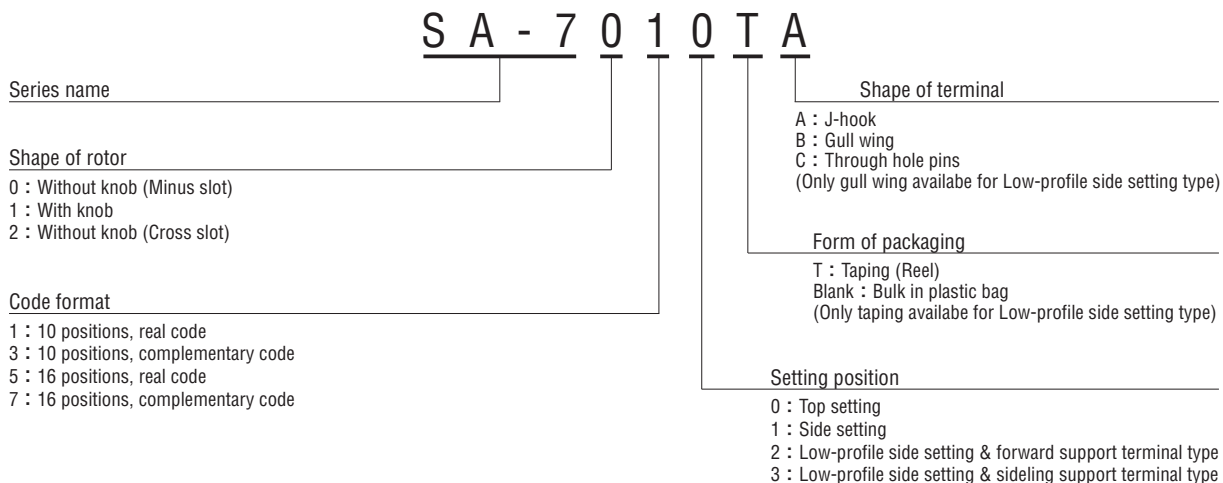
FEATURES

- 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

INTERNAL STRUCTURE

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

PART NUMBER DESIGNATION



※ 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 | | Pieces in package |
|---|----------------|------------------------|-------------------|----------------------|--------------------|--------------------------|--------------------|-------------------|
| | | | | 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 temperature range | -40 ~ 85 °C |
| Storage temperature 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) |

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) |
| | Flow : 260 ± 3 °C, 5~ 6 s, two |
| | Manual soldering : 350 ± 10 °C, 3 ~ 4 s |
| Shear (adhesion) | 5 N {0.51 kgf} 10 s |
| Substrate bending | Width 90 mm, bend 3 mm, 5 s, 1 time |
| Pull-off strength | 5 N {0.51 kgf} 10s |
| Stop strength (With knob only) | 5 N {0.51 kgf} 10s |

{ } : Reference only

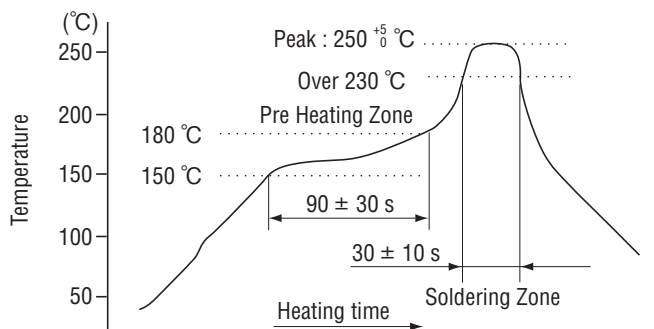
ELECTRICAL CHARACTERISTICS

| | |
|-----------------------|--------------------------|
| Contact rating | DC50 V 100 mA |
| Non-switching | DC5 V 100 mA |
| Switching | DC20 mV 1 μA |
| Minimum | |
| Contact resistance | 100 mΩ 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/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 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

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ROTARY CODED SWITCHES (SMD)

CODE FORMAT

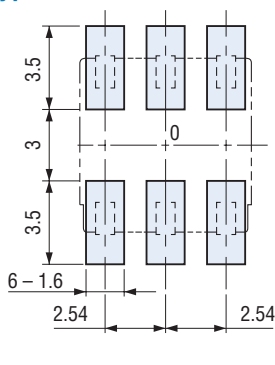
● ...Contact closed

| 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 | | | ● | ● | | | ● | ● | | | ● | ● | | | ● | ● |
| | Complementary code | 1 | | ● | | ● | | ● | | ● | | ● | | ● | | ● | | ● |
| | | 8 | ● | ● | ● | ● | ● | ● | ● | ● | | | ● | ● | | | | |
| | | 4 | ● | ● | ● | ● | | | | | ● | ● | ● | ● | | ● | | |
| | 2 | ● | ● | | | ● | ● | | | ● | ● | | | ● | ● | | | |
| | 1 | ● | | ● | | ● | | ● | | ● | | ● | | ● | | ● | | |

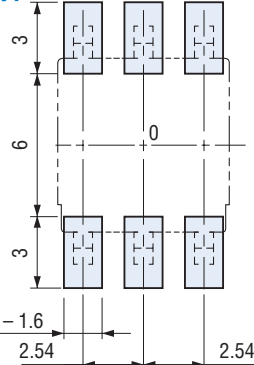
RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

<Top setting>

● A type

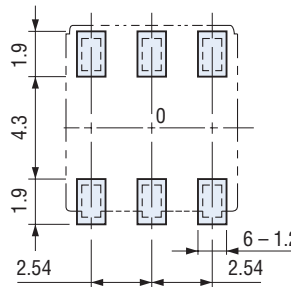


● B type

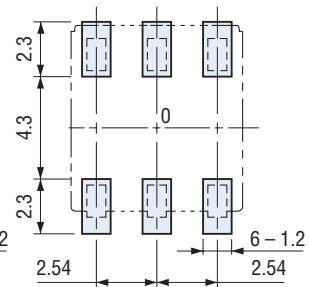


<Side setting>

● A type

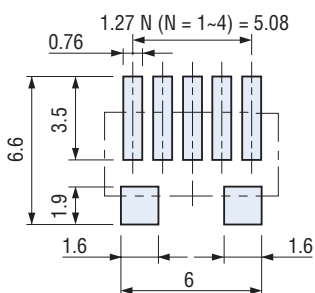


● B type

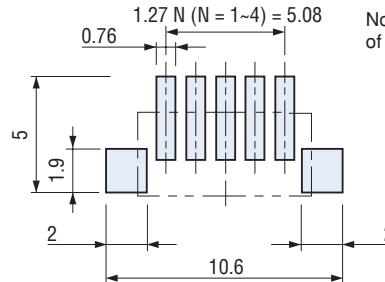


(Unit: mm)

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



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

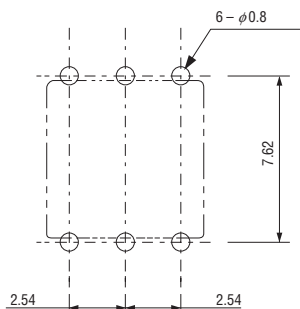


Note) The zero point is the center of mounting.

SIZE OF P.C.B. PROCESSING

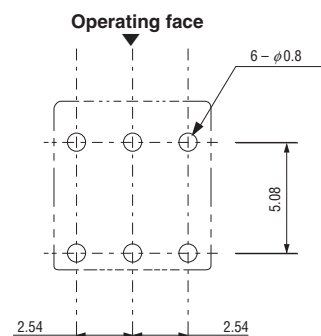
<Top setting>

● C type



<Side setting>

● C type



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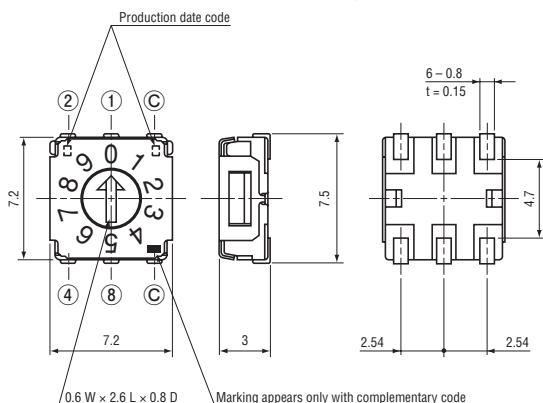
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

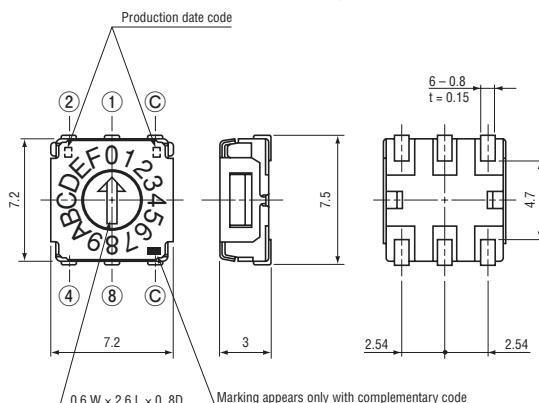
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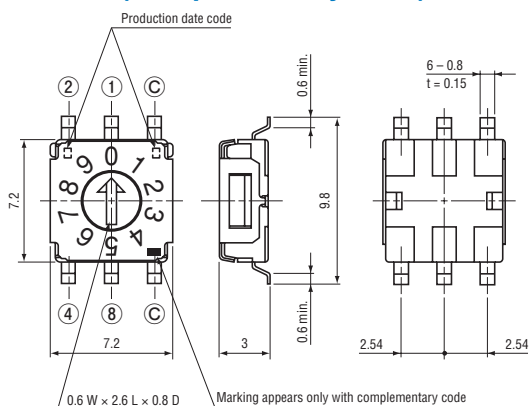
- SA-7010A (Real code)
- SA-7030A (Complementary code)



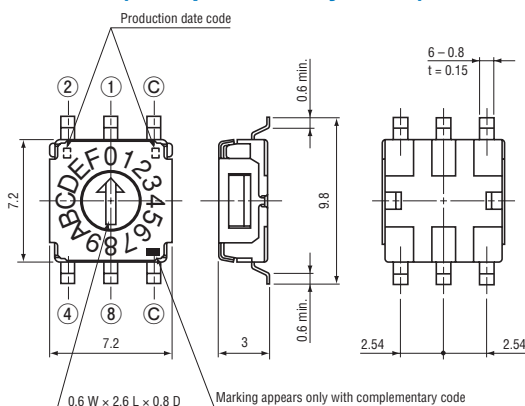
- SA-7050A (Real code)
- SA-7070A (Complementary code)



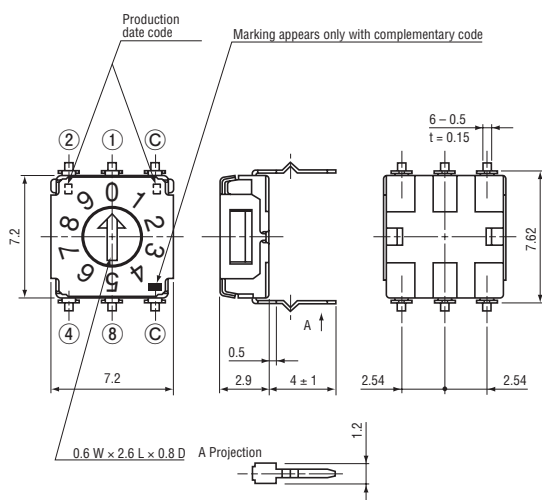
- SA-7010B (Real code)
- SA-7030B (Complementary code)



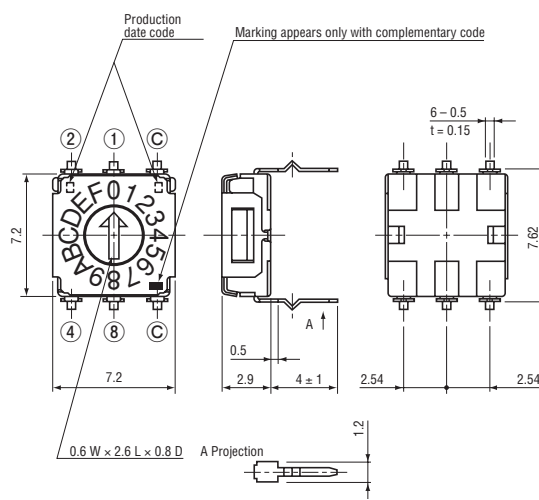
- SA-7050B (Real code)
- SA-7070B (Complementary code)



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



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



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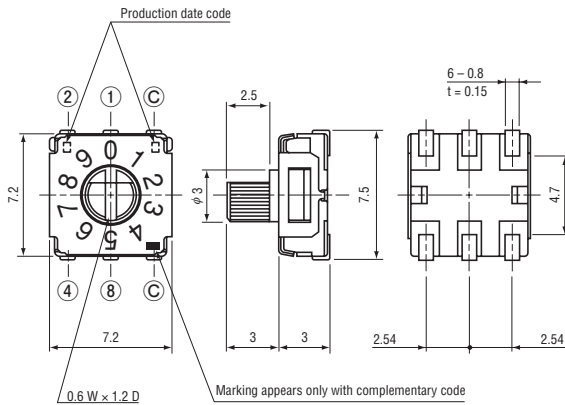
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

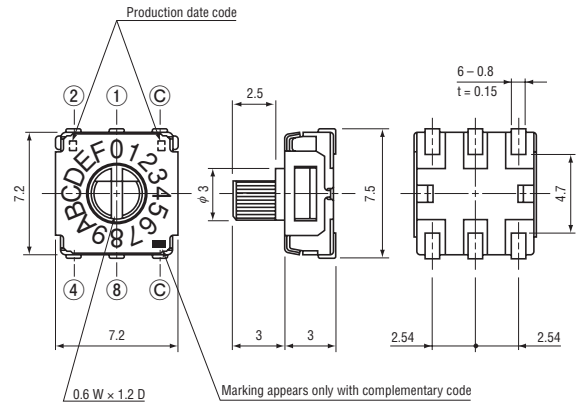
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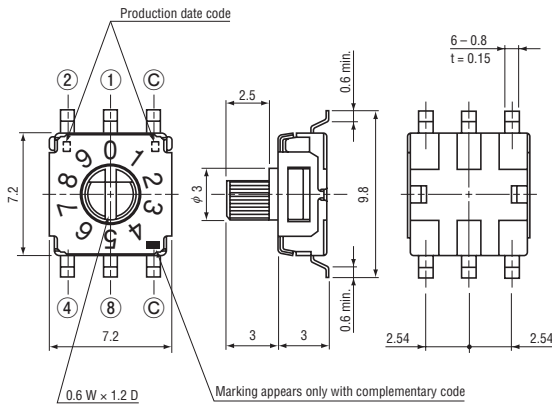
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- SA-7130A (Complementary code)



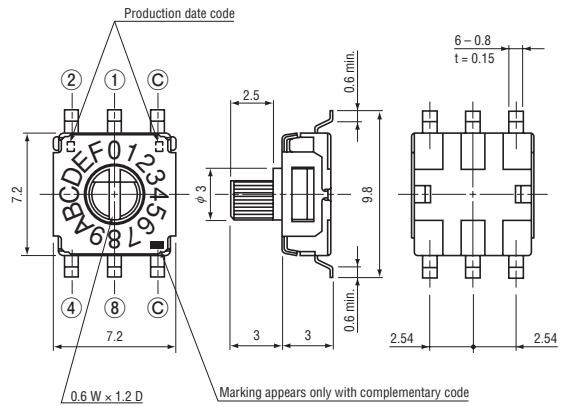
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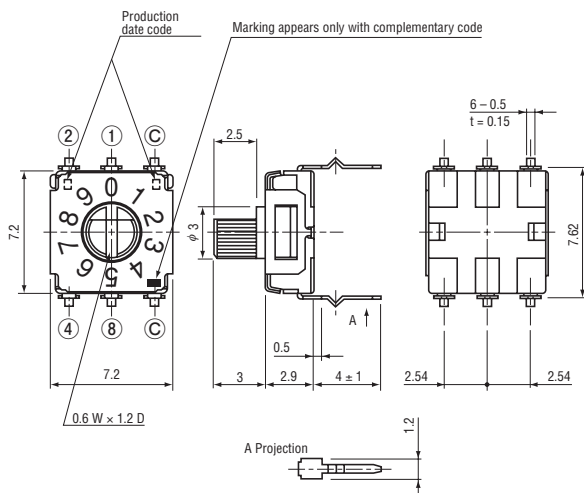
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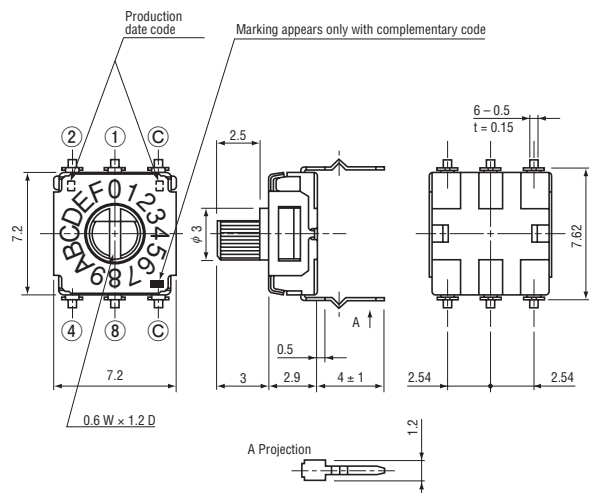
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- SA-7170B (Complementary code)



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



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



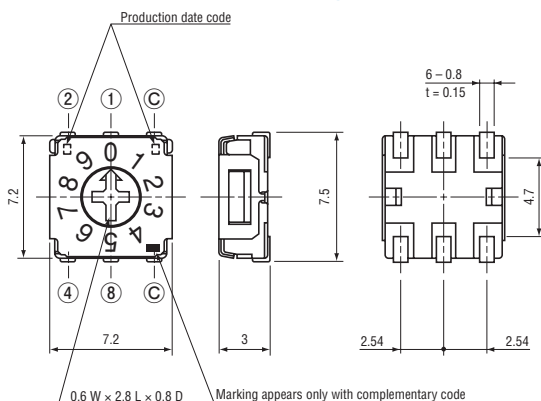
SA-7000

ROTARY CODED SWITCHES (SMD)

OUTLINE DIMESIONS

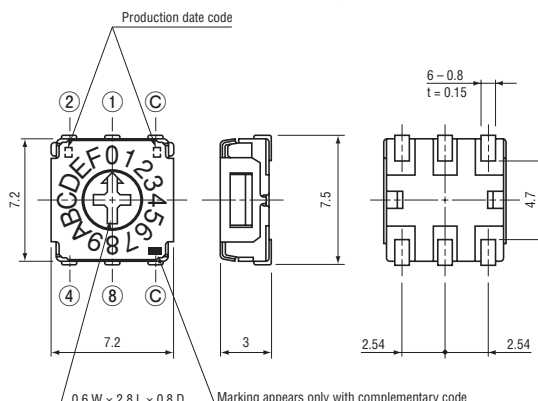
<Top setting>

- SA-7210A (Real code)
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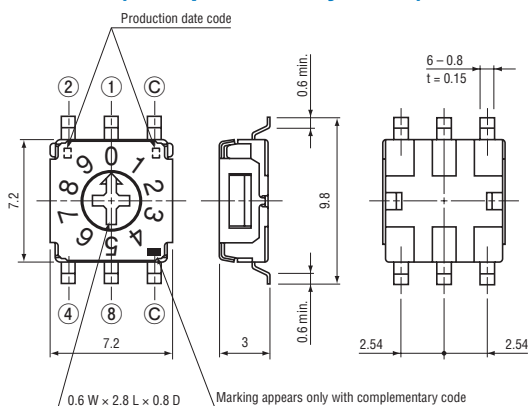


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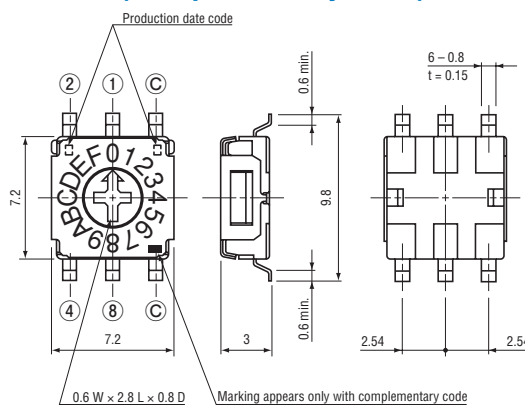
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- SA-7270A (Complementary code)



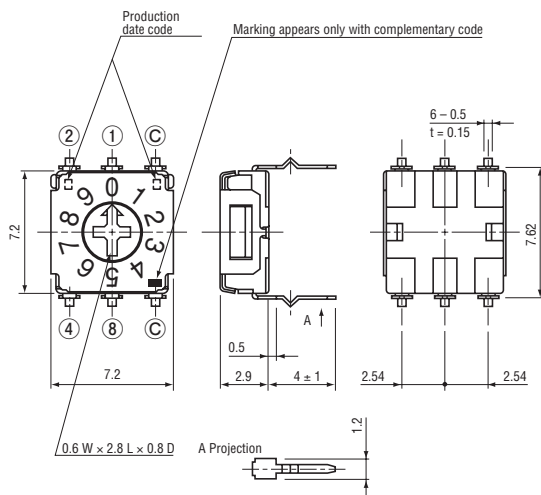
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- SA-7230B (Complementary code)



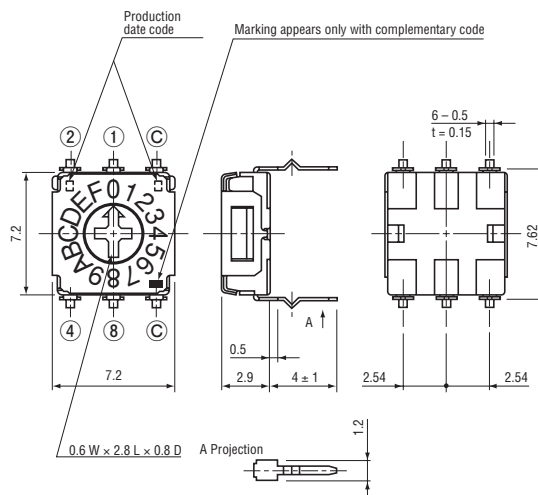
- SA-7250B (Real code)
- SA-7270B (Complementary code)



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



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



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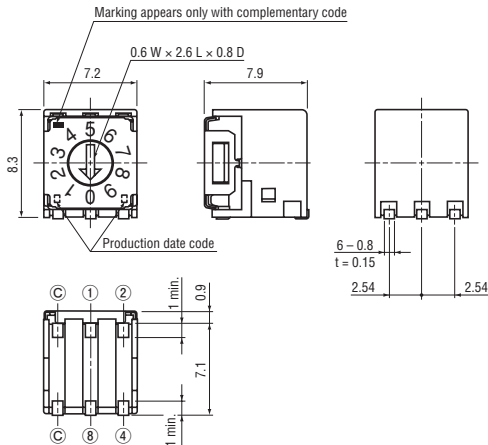
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

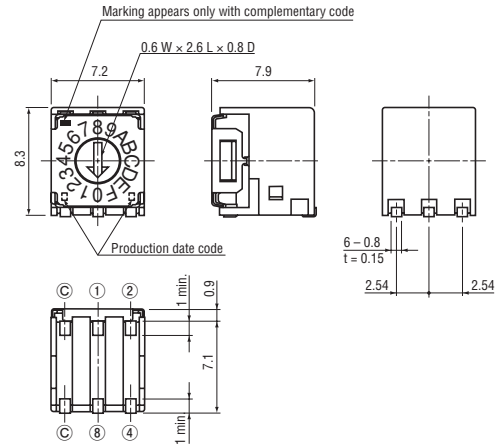
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

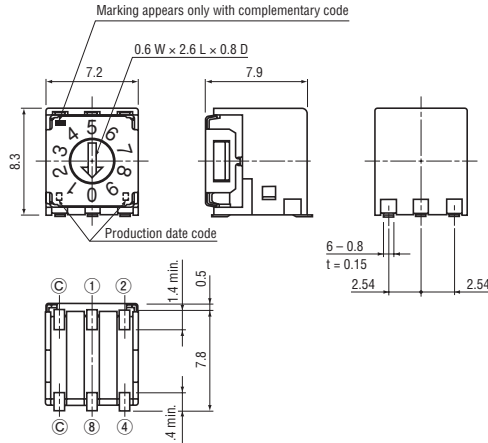
- SA-7011A (Real code)
- SA-7031A (Complementary code)



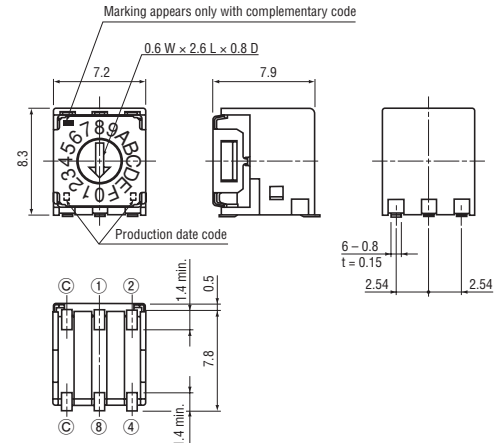
- SA-7051A (Real code)
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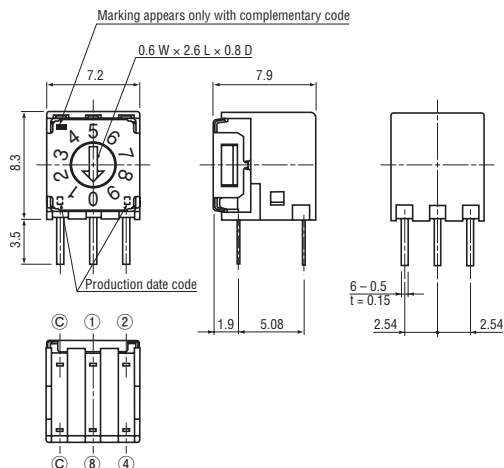
- SA-7011B (Real code)
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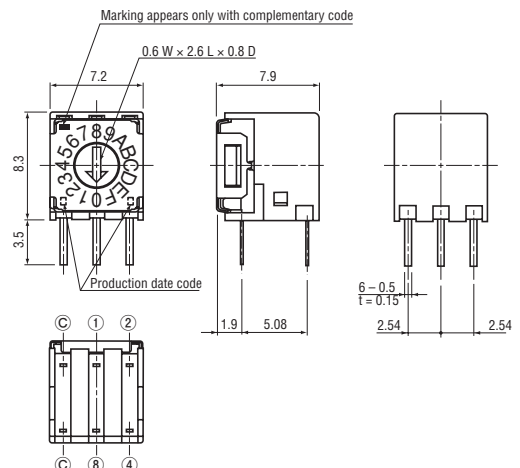
- SA-7051B (Real code)
- SA-7071B (Complementary code)



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



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



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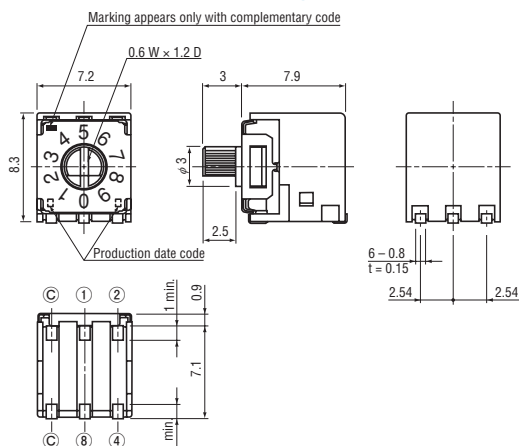
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

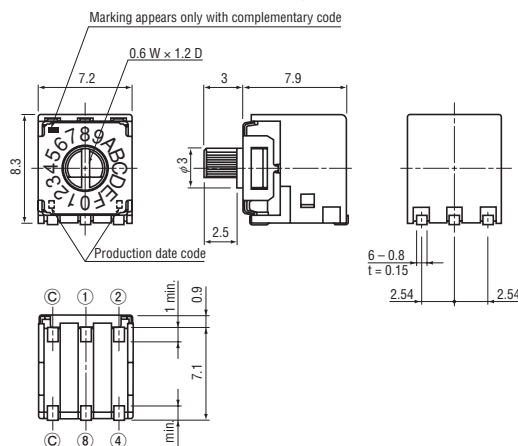
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

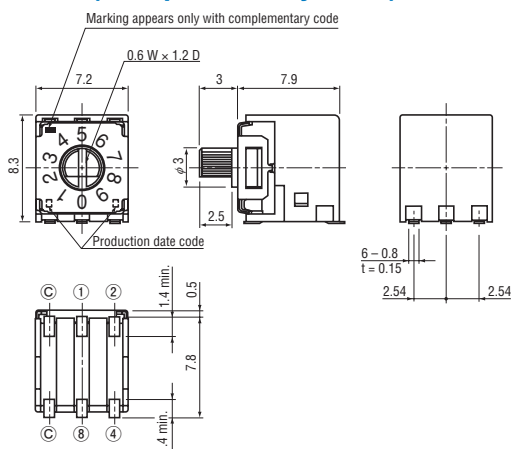
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- SA-7131A (Complementary code)



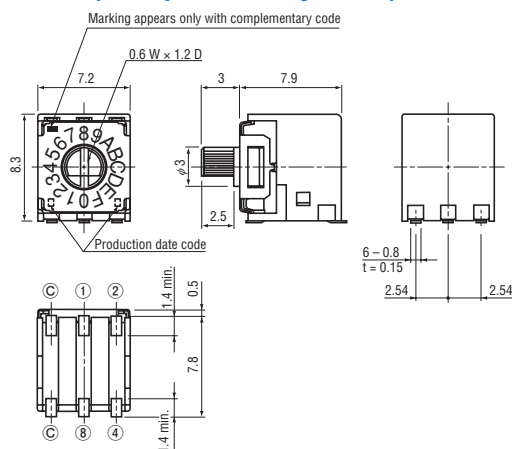
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- SA-7171A (Complementary code)



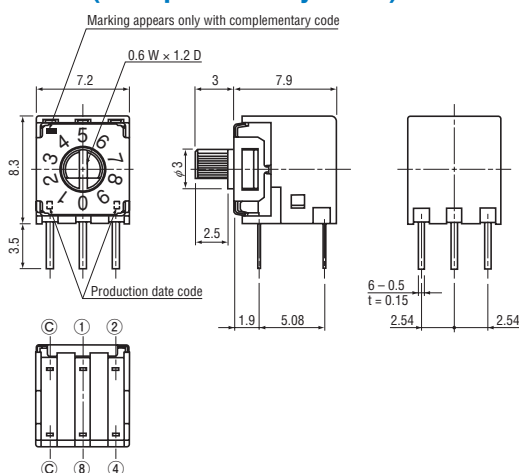
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- SA-7131B (Complementary code)



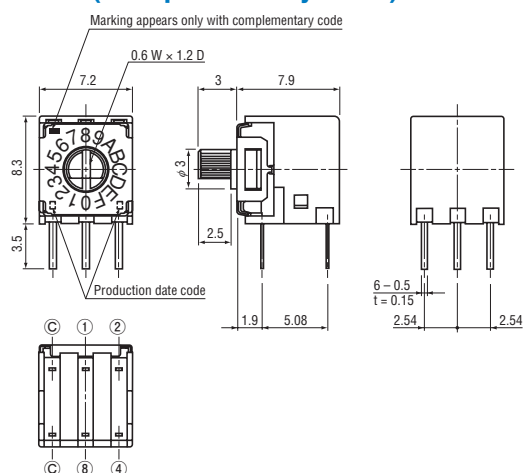
- SA-7151B (Real code)
- SA-7171B (Complementary code)



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



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



SA-7000

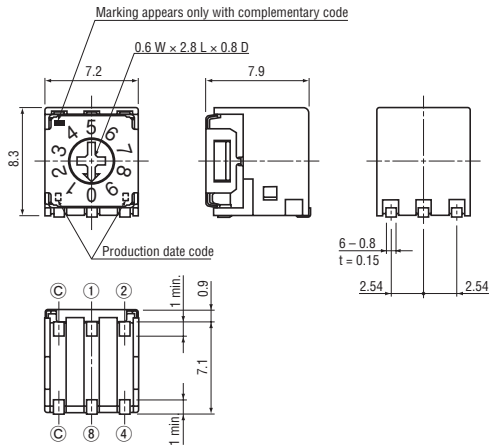
ROTARY CODED SWITCHES (SMD)

OUTLINE DIMENSIONS

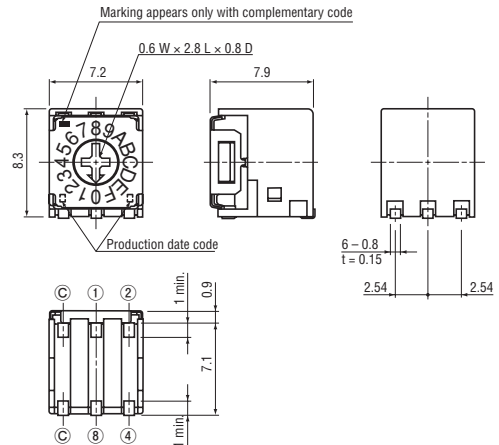
Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

<Side setting>

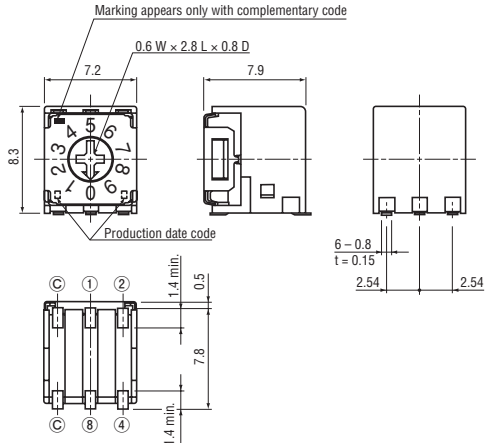
- SA-7211A (Real code)
- SA-7231A (Complementary code)



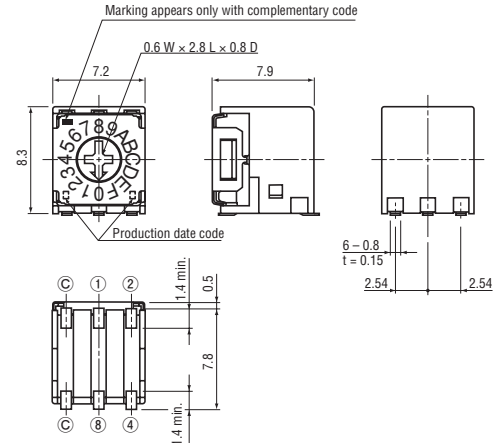
- SA-7251A (Real code)
- SA-7271A (Complementary code)



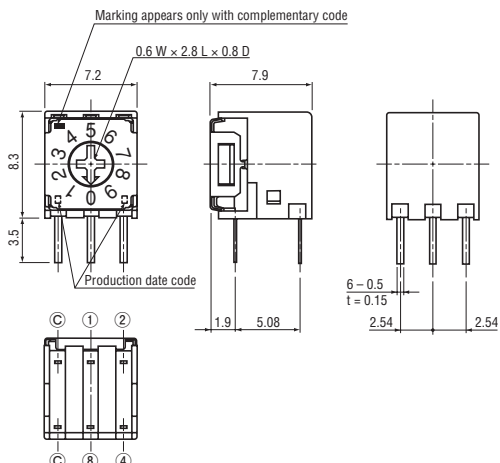
- SA-7211B (Real code)
- SA-7231B (Complementary code)



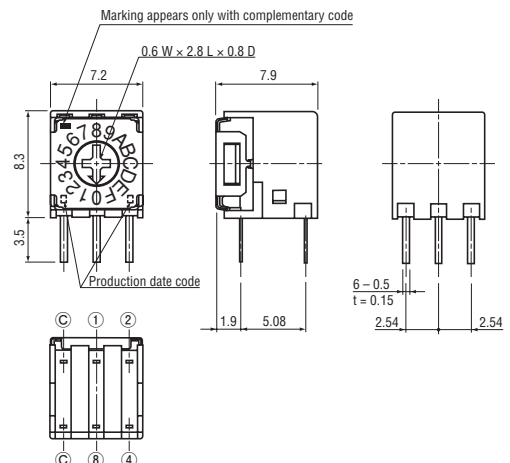
- SA-7251B (Real code)
- SA-7271B (Complementary code)



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



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



SA-7000

ROTARY CODED SWITCHES (SMD)

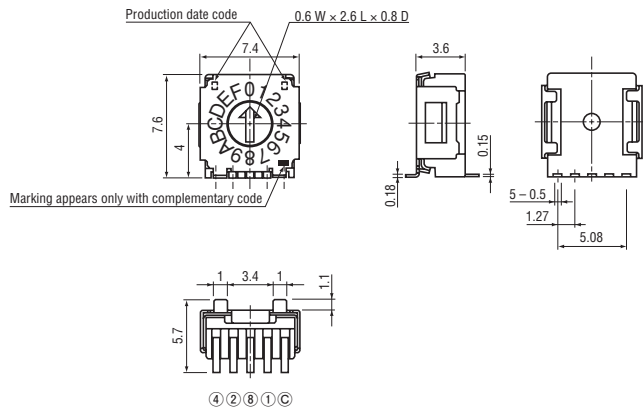
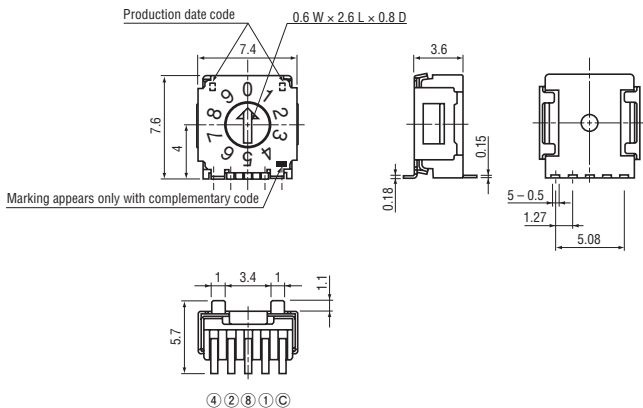
OUTLINE DIMENSIONS

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

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

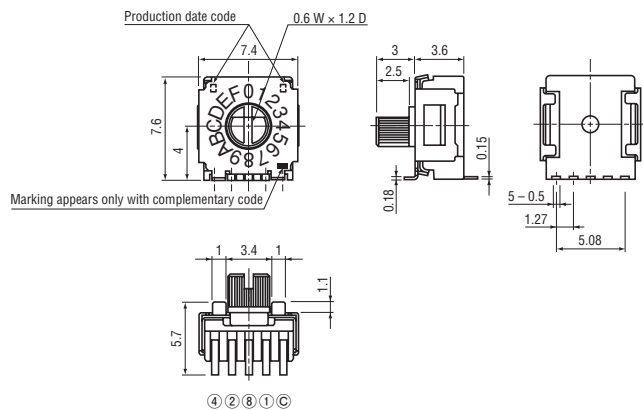
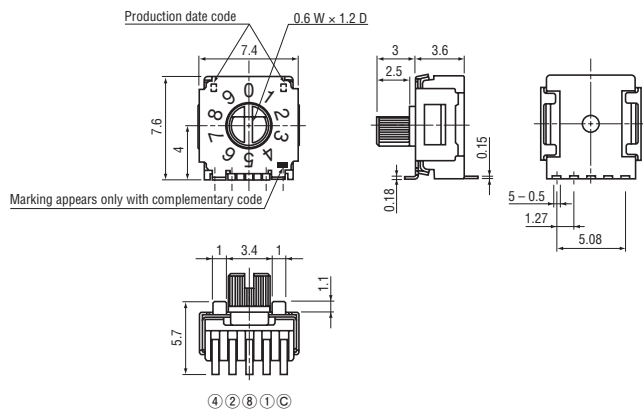
- SA-7012B (Real code)
- SA-7032B (Complementary code)

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



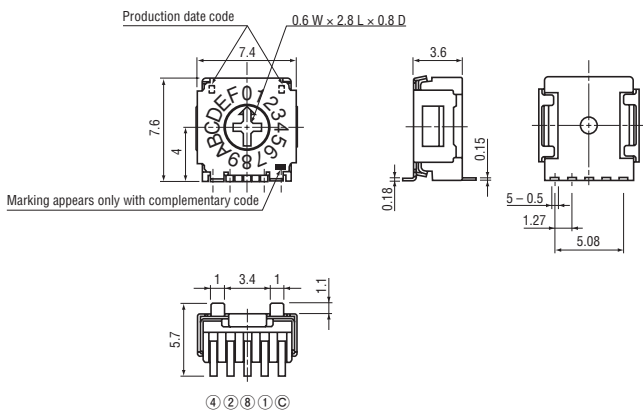
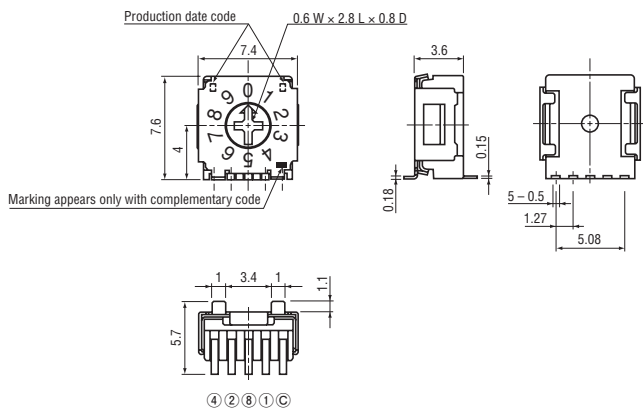
- SA-7112B (Real code)
- SA-7132B (Complementary code)

- 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)

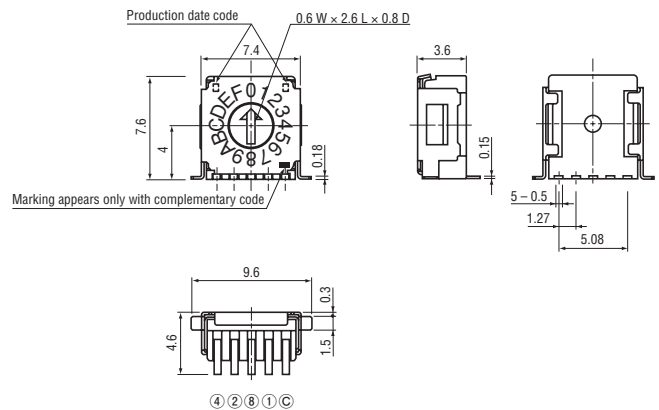
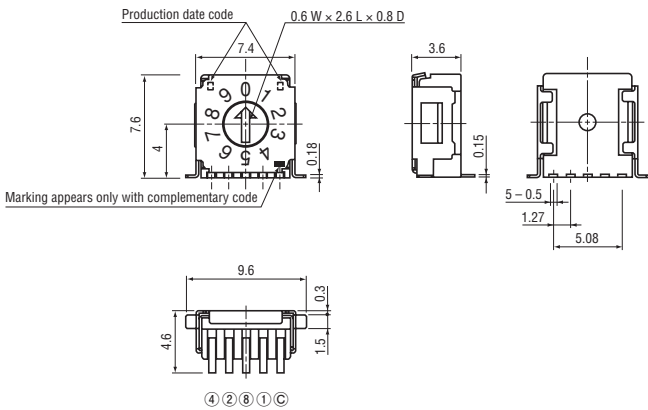
OUTLINE DIMENSIONS

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

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

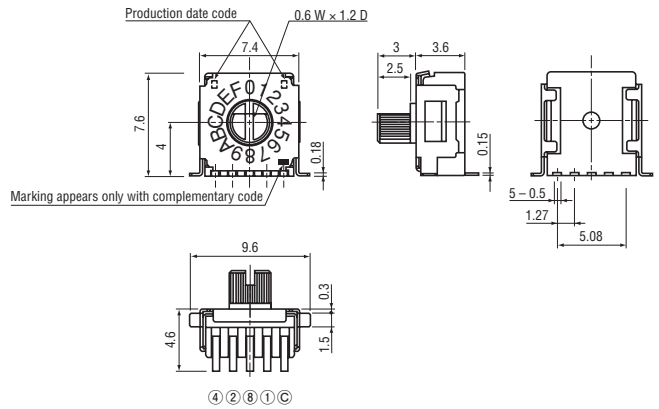
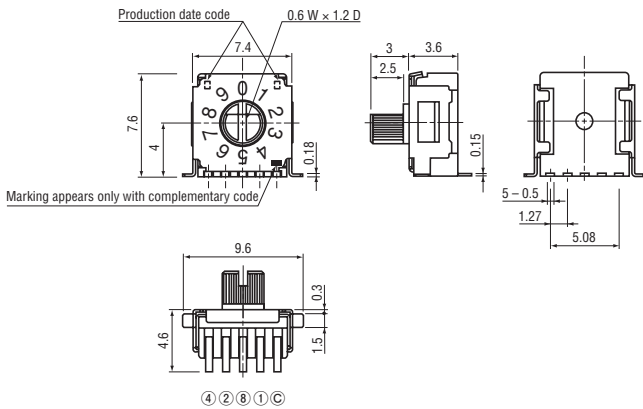
- SA-7013B (Real code)
- SA-7033B (Complementary code)

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



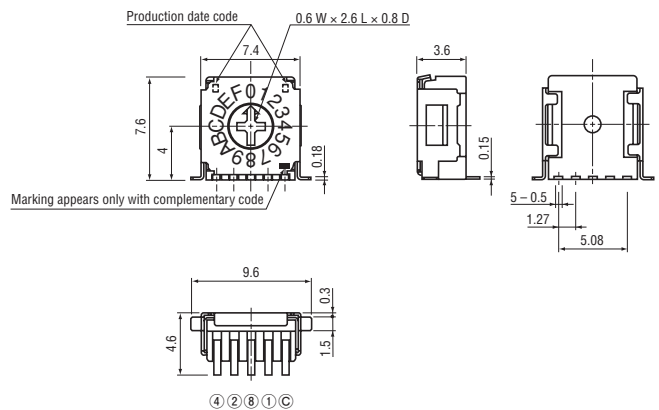
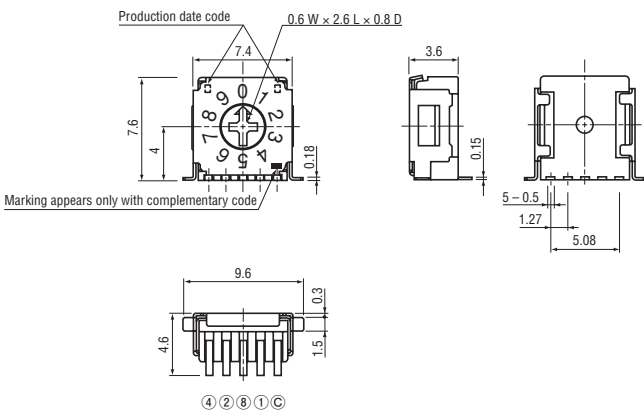
- SA-7113B (Real code)
- SA-7133B (Complementary code)

- 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

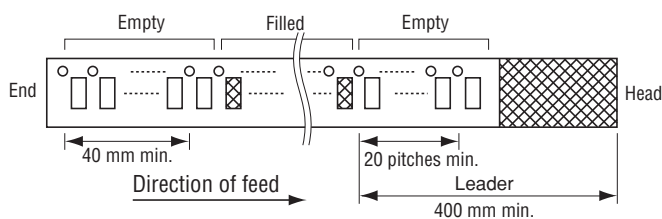
<Taping packaging specifications>

- 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.).

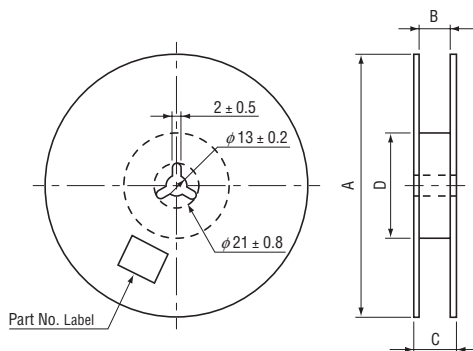
Maximum number of consecutive missing pieces=2
Leader length and reel dimension are shown in the diagrams below:

● Embossed tape dimensions



● Reel dimensions (Unit: mm)

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

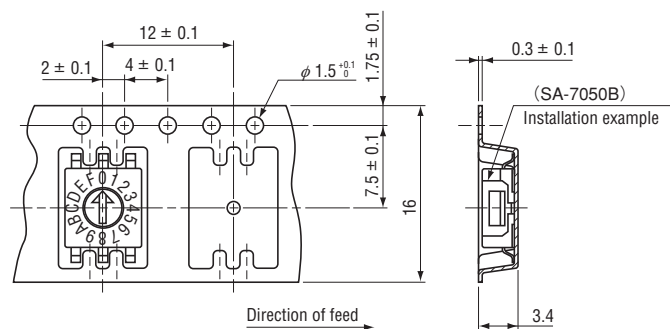


| Part number | A | B | C | D |
|------------------------|------------------|--------------|--------------|------------------------|
| SA-70□0 • SA-72□0TA/TB | $\phi 254 \pm 2$ | 17.4 ± 1 | 21.4 ± 1 | $\phi 50 \text{ min.}$ |
| SA-71□0TA/TB | $\phi 330 \pm 2$ | 17.4 ± 1 | 21.4 ± 1 | $\phi 80 \pm 1$ |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

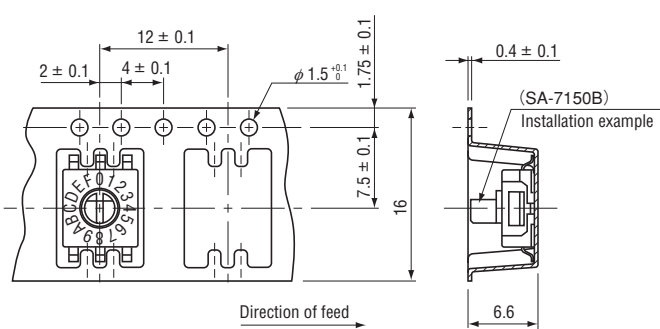


● SA-71□0T□

<Top setting with knob>

(Unit: mm)

(Conforms to JIS C 0806)



SA-7000

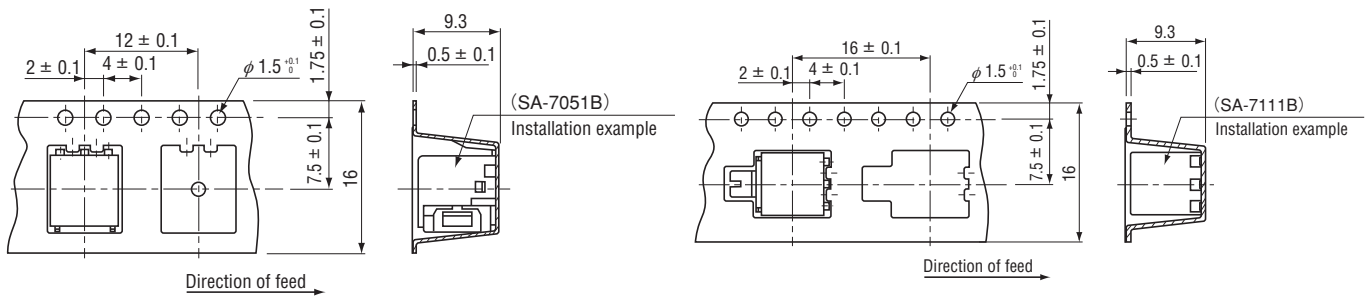
ROTARY CODED SWITCHES (SMD)

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

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

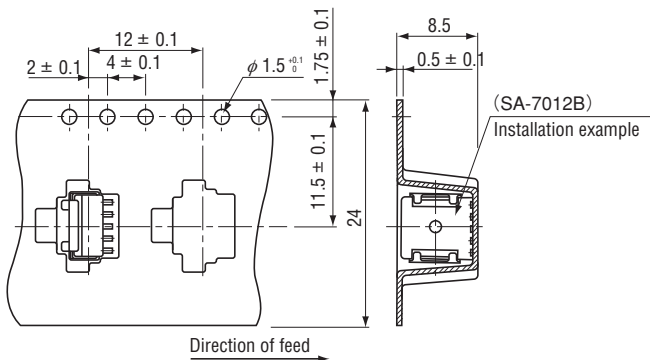
(Unit: mm)

(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.

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