

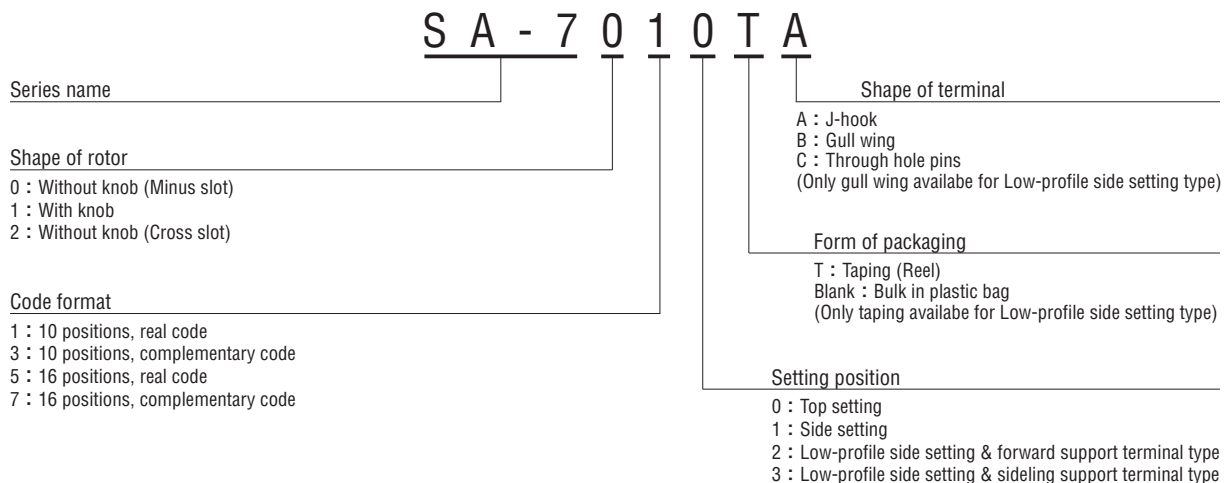
## FEATURES

- 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<br>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<br>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<br>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<br>Through hole pins | Taping            |                      |                    |                          |                    |                   |
|   |                |                        | Plastic bag       | SA-7010C             | SA-7030C           | SA-7050C                 | SA-7070C           | 50 pcs./pack      |
|   | With knob      | A<br>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<br>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<br>Through hole pins | Taping            |                      |                    |                          |                    |                   |
|   |                |                        | Plastic bag       | SA-7110C             | SA-7130C           | SA-7150C                 | SA-7170C           | 50 pcs./pack      |
|   | Cross slot     | A<br>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<br>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<br>Through hole pins                                    |                | Taping                 |                   |                      |                    |                          |                    |                   |
|   |                | Plastic bag            | SA-7210C          | SA-7230C             | SA-7250C           | SA-7270C                 | 50 pcs./pack       |                   |
| Side setting  | Minus slot     | A<br>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<br>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<br>Through hole pins | Taping            |                      |                    |                          |                    |                   |
|   |                |                        | Plastic bag       | SA-7011C             | SA-7031C           | SA-7051C                 | SA-7071C           | 50 pcs./pack      |
|   | With knob      | A<br>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<br>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<br>Through hole pins | Taping            |                      |                    |                          |                    |                   |
|   |                |                        | Plastic bag       | SA-7111C             | SA-7131C           | SA-7151C                 | SA-7171C           | 50 pcs./pack      |
|   | Cross slot     | A<br>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<br>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<br>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<br>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)<br>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)<br>Approx. 0.34 g (Top setting type with knob)<br>Approx. 0.69 g (Side setting type without knob)<br>Approx. 0.71 g (Side setting type with knob)<br>Approx. 0.42 g (Low-profile side setting type without knob)<br>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)<br>22.5° (16 positions)                               |
| Solderability                  | 245 ± 3 °C, 2 ~ 3 s  |
| Soldering heat                 | Reflow : 255 °C (Peak temperature)<br>Please refer to the profile below) |
|                                | Flow :<br>260 ± 3 °C, 5~ 6 s, two  |
|                                | Manual soldering :<br>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

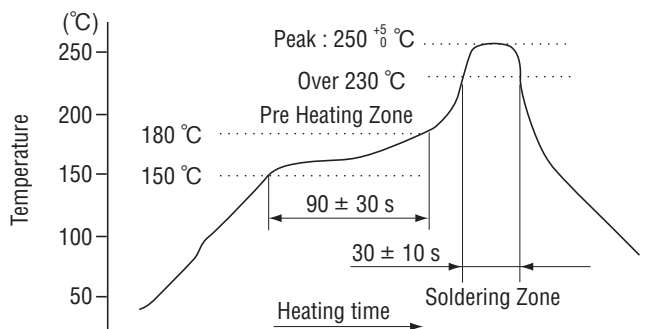
### ELECTRICAL CHARACTERISTICS

|   |   |
|---|---|
| Contact rating<br>Non-switching<br>Switching<br>Minimum | DC50 V 100 mA<br>DC5 V 100 mA<br>DC20 mV 1 μA |
| 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<br>(Acceleration) 98 m/s <sup>2</sup> ,<br>10-500-10 Hz, 3 directions for 2 h each |
| Shock                     | 490 m/s <sup>2</sup> , 11 ms<br>6 directions for 3 times each  |
| Load life                 | 10000 steps minimum, DC5 V, 100 mA   |
| Humidity (Steady state)   | 40 °C, Relative humidity 90 ~ 95 %,<br>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

# SA-7000

## ROTARY CODED SWITCHES (SMD)

### CODE FORMAT

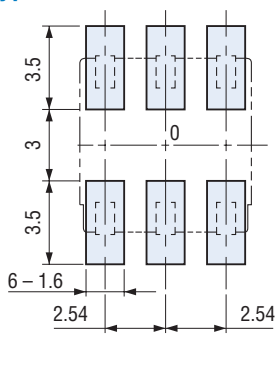
● ...Contact closed

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

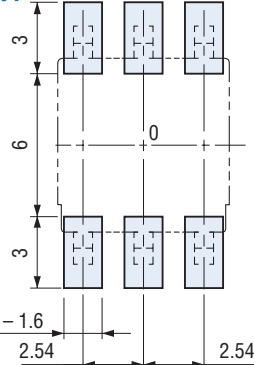
### RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

<Top setting>

● A type

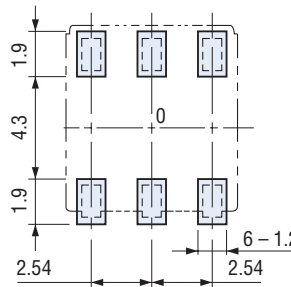


● B type

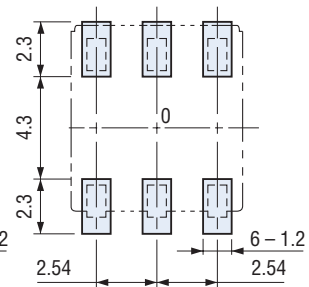


<Side setting>

● A type

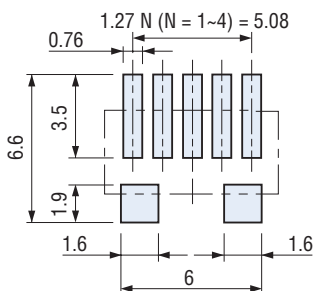


● B type

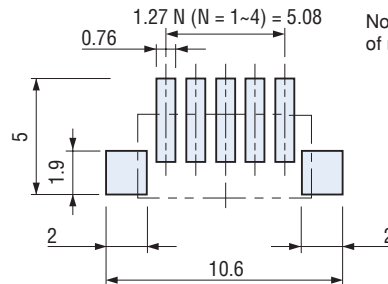


(Unit: mm)

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



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

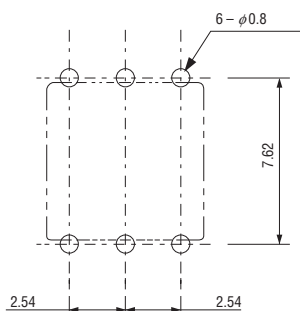


Note) The zero point is the center of mounting.

### SIZE OF P.C.B. PROCESSING

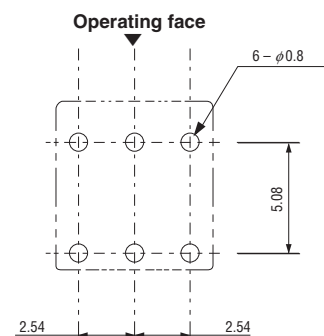
<Top setting>

● C type



<Side setting>

● C type



# SA-7000

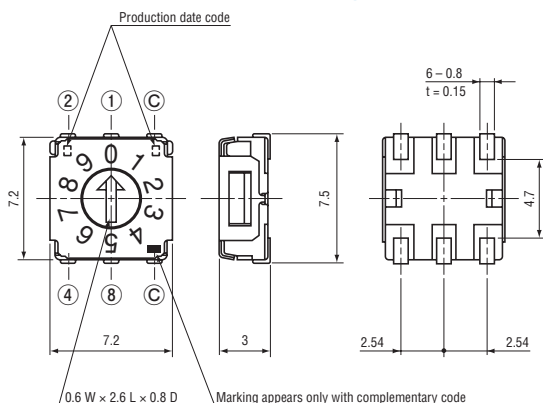
## ROTARY CODED SWITCHES (SMD)

### OUTLINE DIMENSIONS

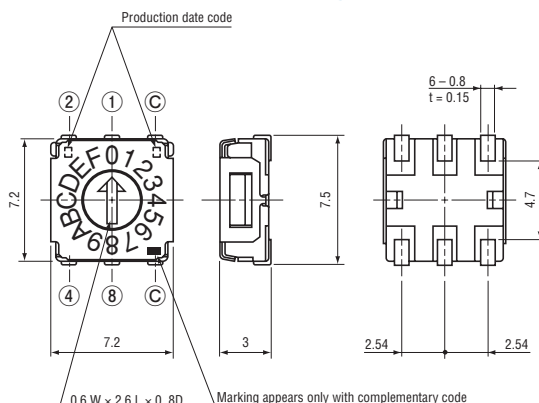
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<Top setting>

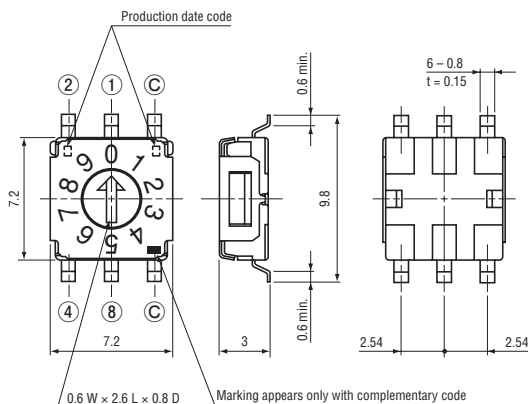
- SA-7010A (Real code)
- SA-7030A (Complementary code)



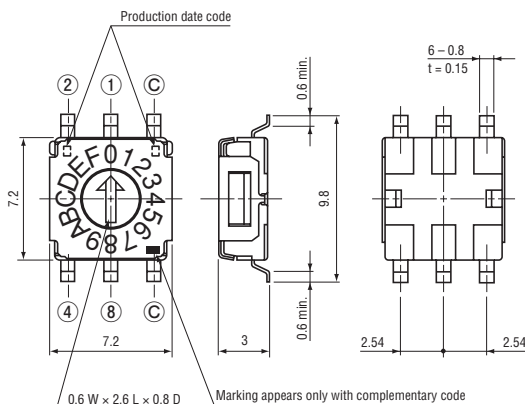
- SA-7050A (Real code)
- SA-7070A (Complementary code)



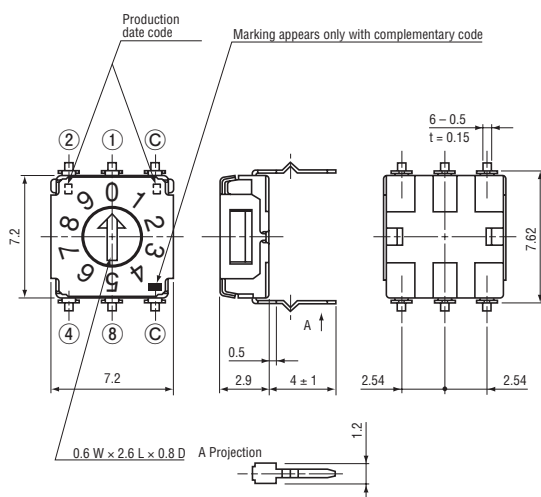
- SA-7010B (Real code)
- SA-7030B (Complementary code)



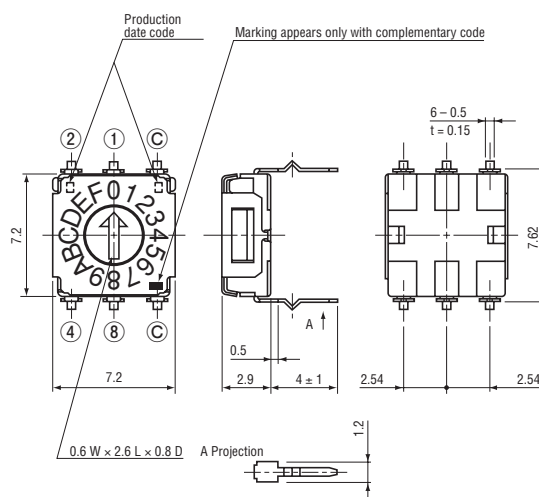
- SA-7050B (Real code)
- SA-7070B (Complementary code)



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



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



# SA-7000

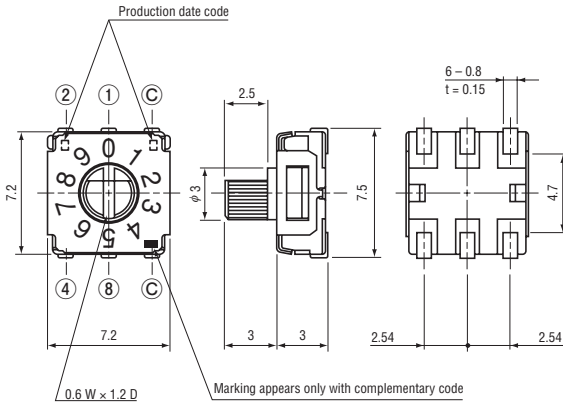
## ROTARY CODED SWITCHES (SMD)

### OUTLINE DIMENSIONS

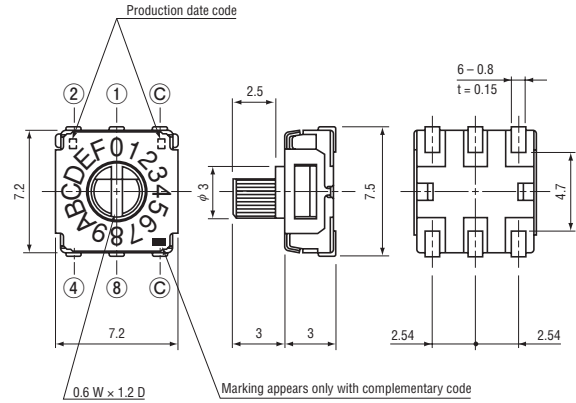
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#### <Top setting>

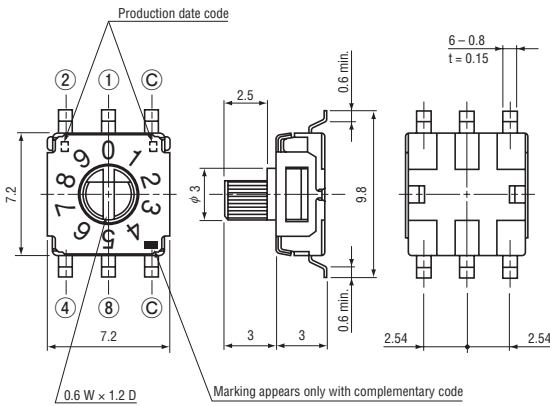
- SA-7110A (Real code)
- SA-7130A (Complementary code)



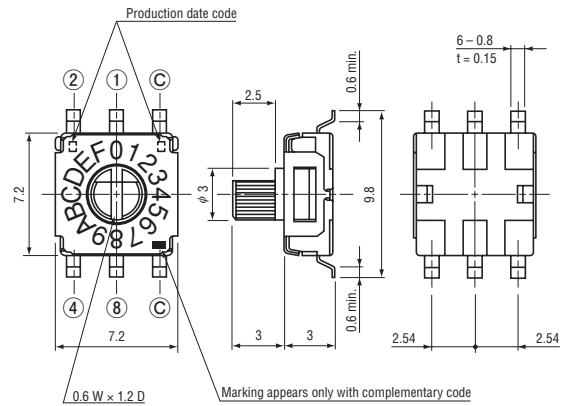
- SA-7150A (Real code)
- SA-7170A (Complementary code)



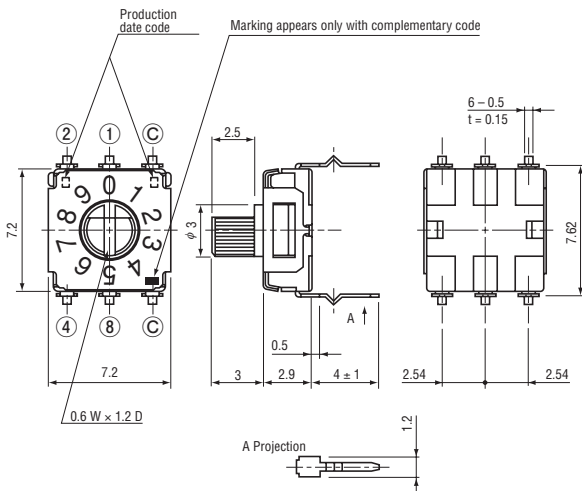
- SA-7110B (Real code)
- SA-7130B (Complementary code)



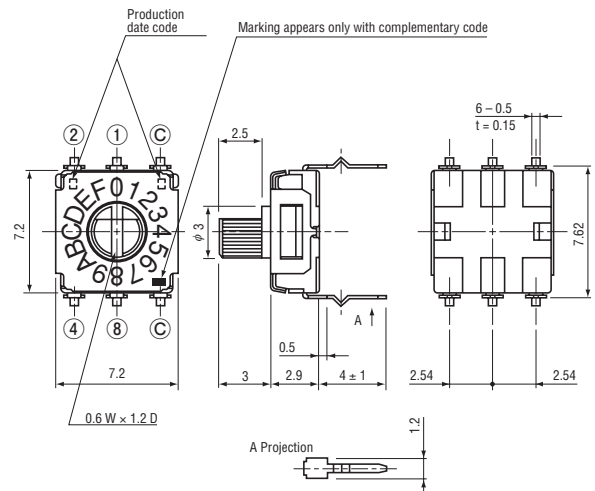
- SA-7150B (Real code)
- SA-7170B (Complementary code)



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



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



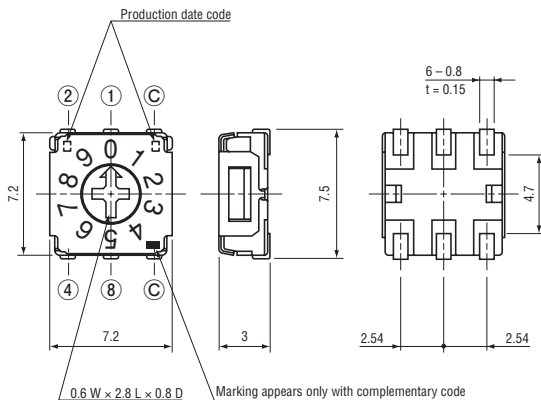
# SA-7000

## ROTARY CODED SWITCHES (SMD)

### OUTLINE DIMENSIONS

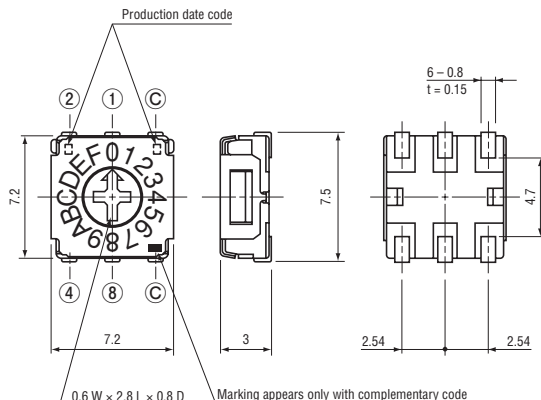
<Top setting>

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

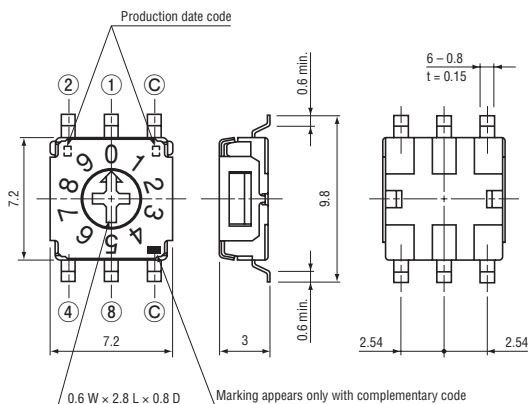


Unless otherwise specified, tolerance: ± 0.3 (Unit: mm)

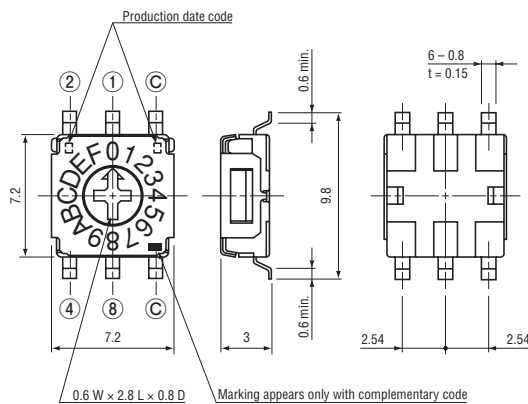
- SA-7250A (Real code)
- SA-7270A (Complementary code)



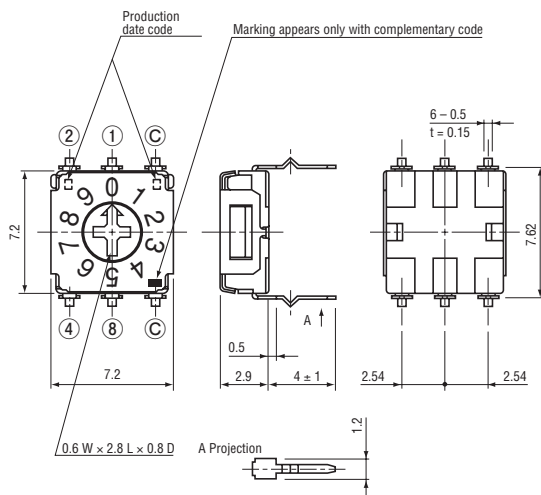
- SA-7210B (Real code)
- SA-7230B (Complementary code)



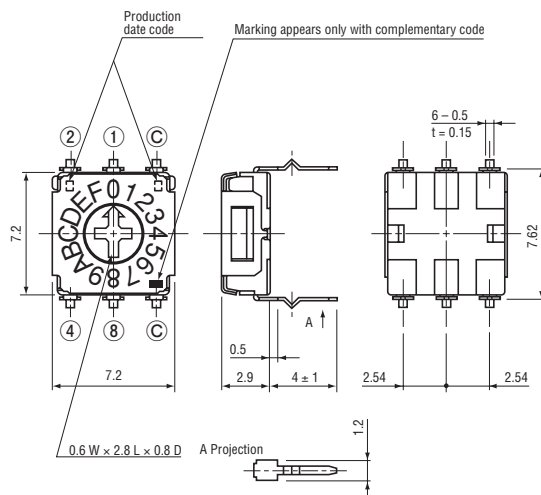
- SA-7250B (Real code)
- SA-7270B (Complementary code)



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



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



# SA-7000

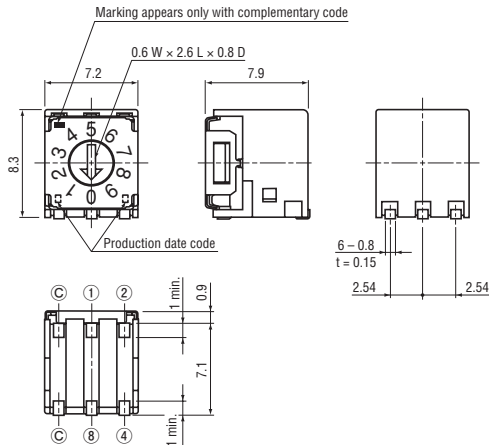
## ROTARY CODED SWITCHES (SMD)

### OUTLINE DIMENSIONS

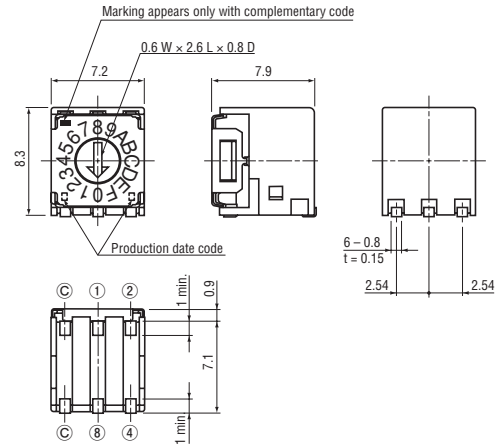
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#### <Side setting>

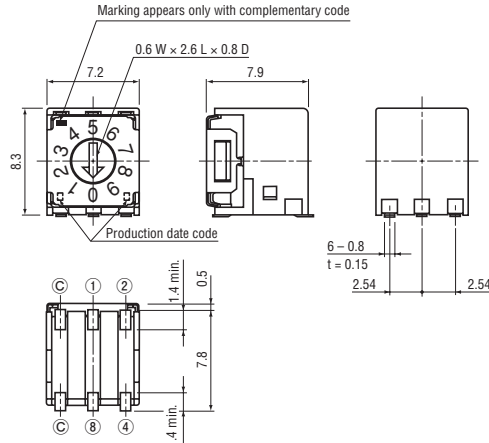
- SA-7011A (Real code)
- SA-7031A (Complementary code)



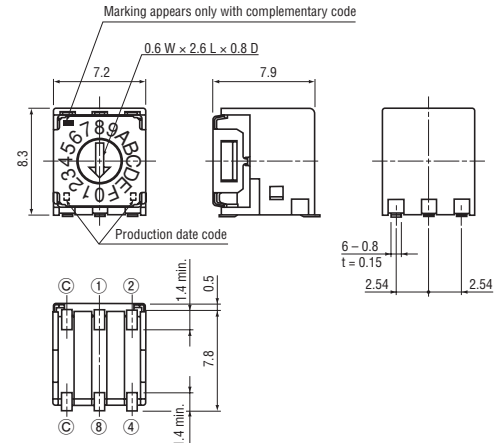
- SA-7051A (Real code)
- SA-7071A (Complementary code)



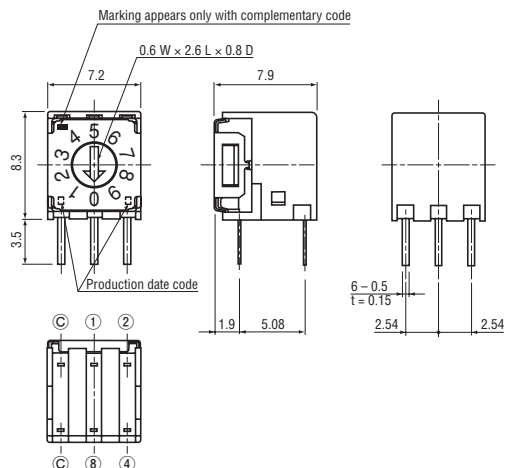
- SA-7011B (Real code)
- SA-7031B (Complementary code)



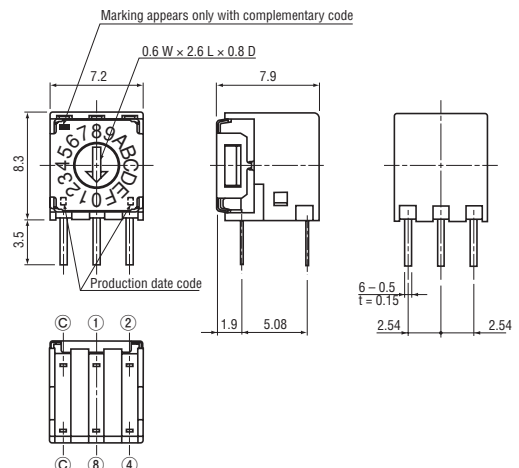
- SA-7051B (Real code)
- SA-7071B (Complementary code)



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



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





# SA-7000

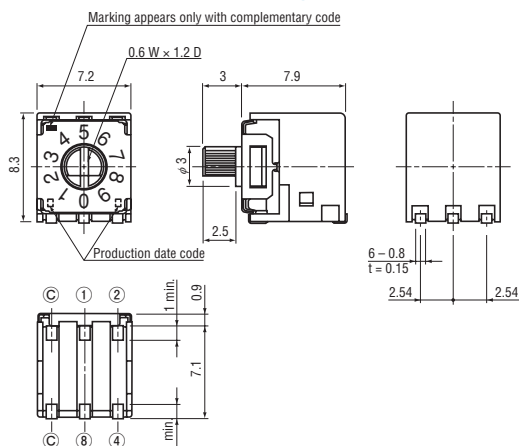
## ROTARY CODED SWITCHES (SMD)

### OUTLINE DIMENSIONS

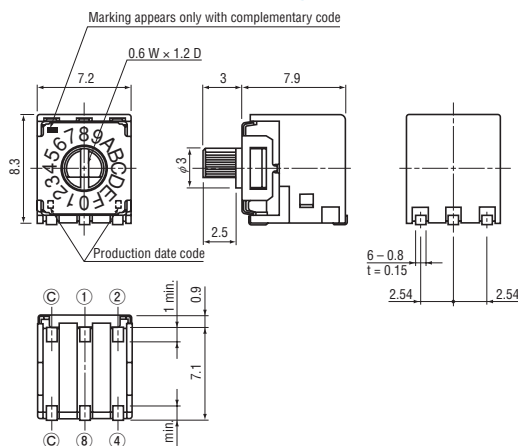
Unless otherwise specified, tolerance:  $\pm 0.3$  (Unit: mm)

#### <Side setting>

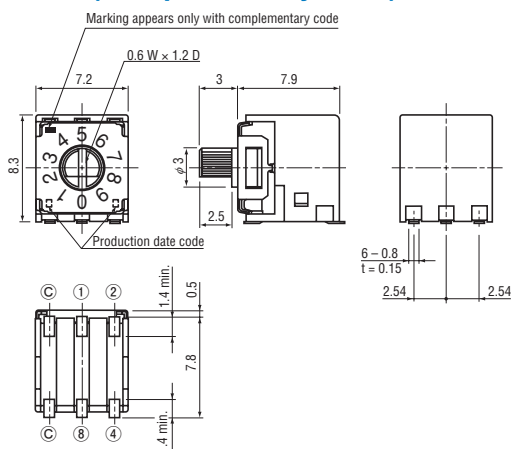
- SA-7111A (Real code)
- SA-7131A (Complementary code)



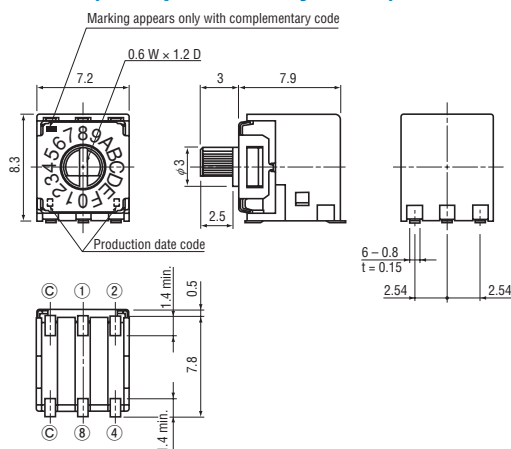
- SA-7151A (Real code)
- SA-7171A (Complementary code)



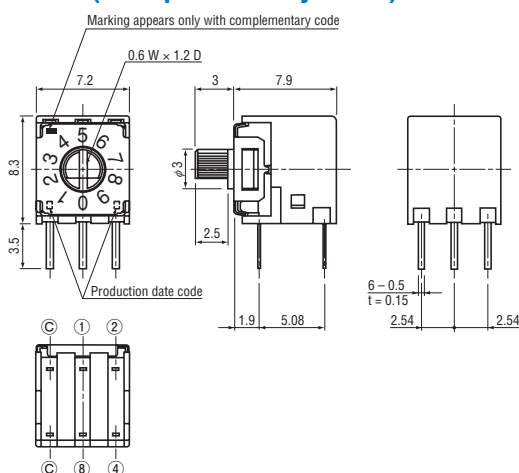
- SA-7111B (Real code)
- SA-7131B (Complementary code)



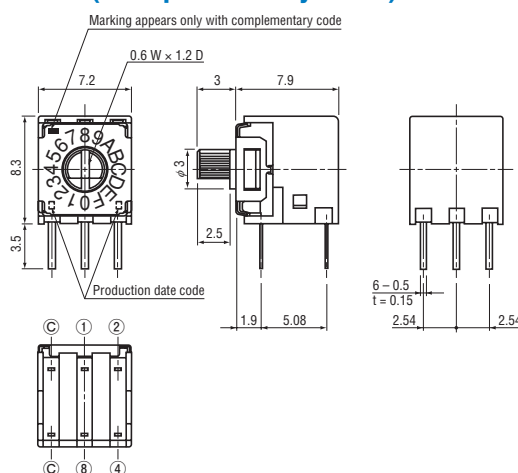
- SA-7151B (Real code)
- SA-7171B (Complementary code)



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



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



# SA-7000

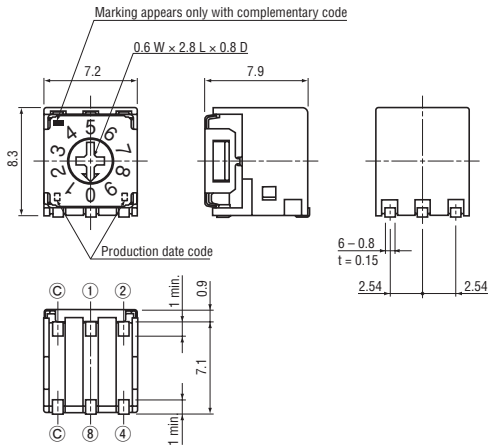
## ROTARY CODED SWITCHES (SMD)

### OUTLINE DIMENSIONS

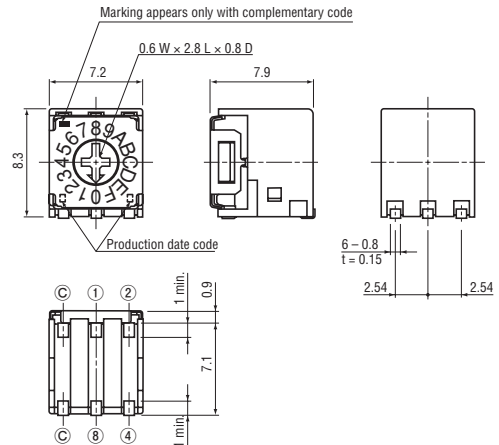
Unless otherwise specified, tolerance:  $\pm 0.3$  (Unit: mm)

#### <Side setting>

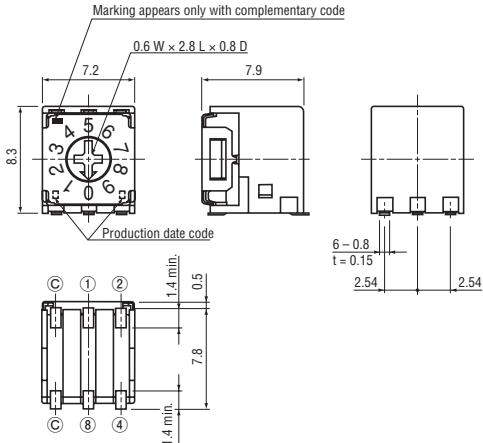
- SA-7211A (Real code)
- SA-7231A (Complementary code)



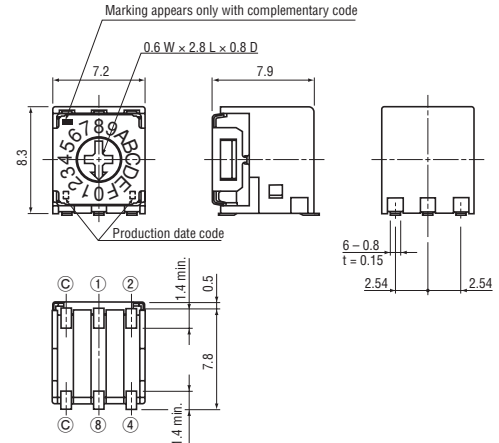
- SA-7251A (Real code)
- SA-7271A (Complementary code)



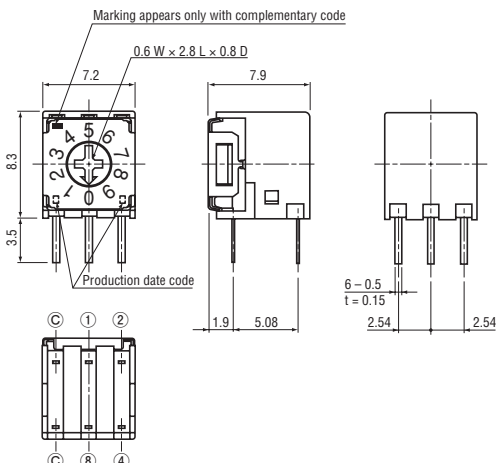
- SA-7211B (Real code)
- SA-7231B (Complementary code)



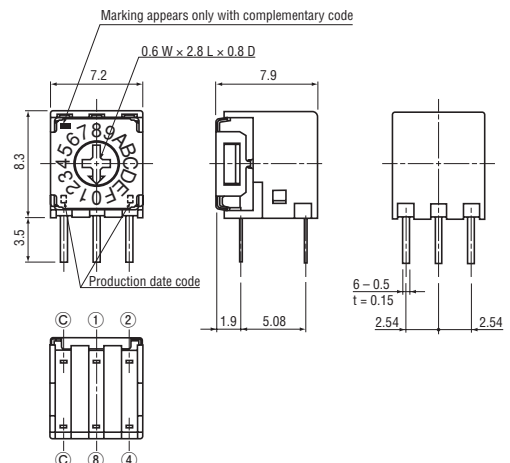
- SA-7251B (Real code)
- SA-7271B (Complementary code)



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



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



# SA-7000

## ROTARY CODED SWITCHES (SMD)

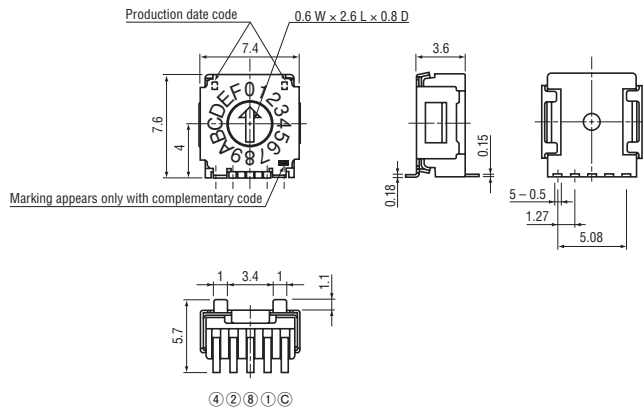
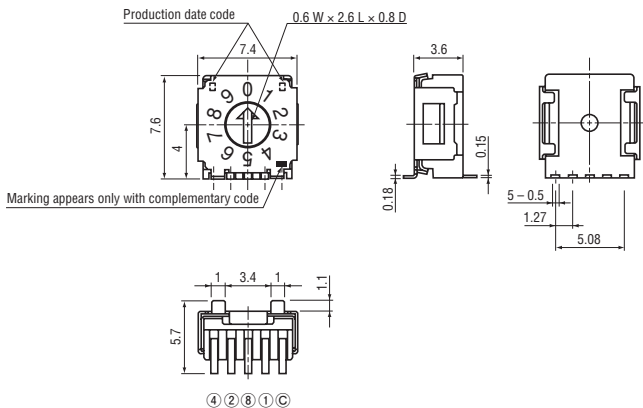
### OUTLINE DIMENSIONS

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

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

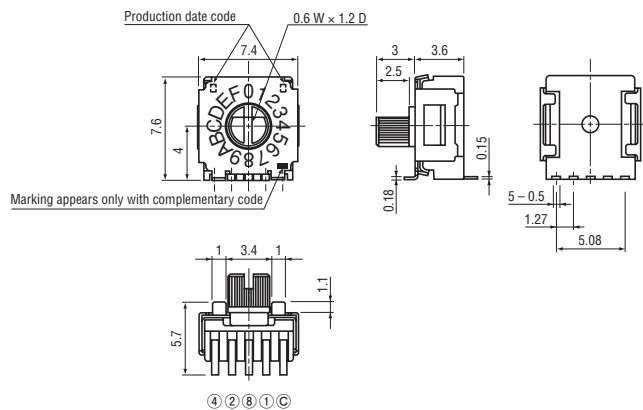
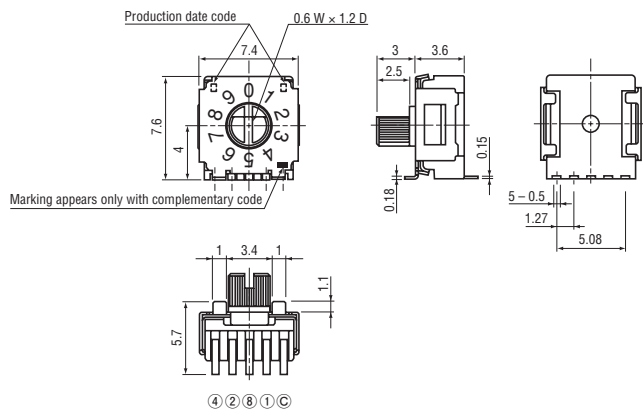
- SA-7012B (Real code)
- SA-7032B (Complementary code)

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



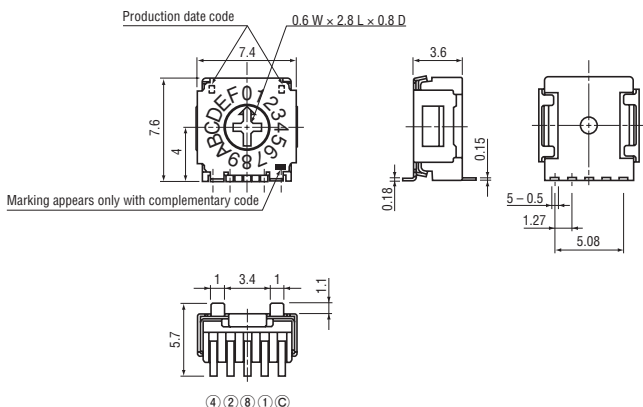
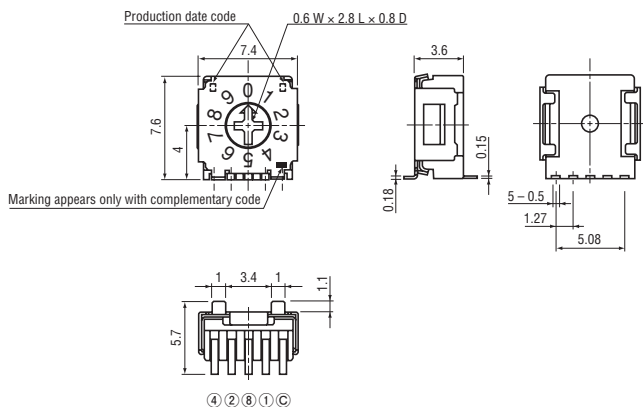
- SA-7112B (Real code)
- SA-7132B (Complementary code)

- 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)

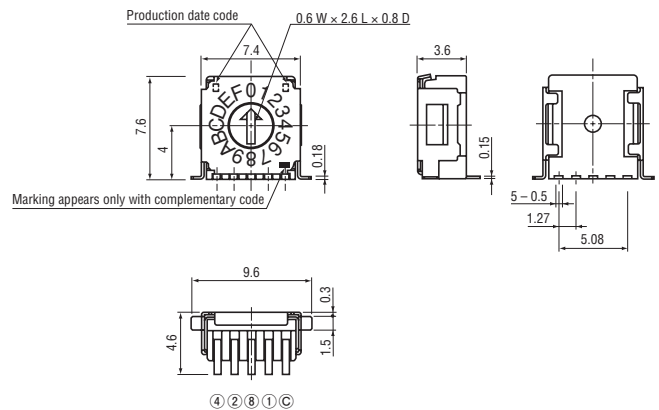
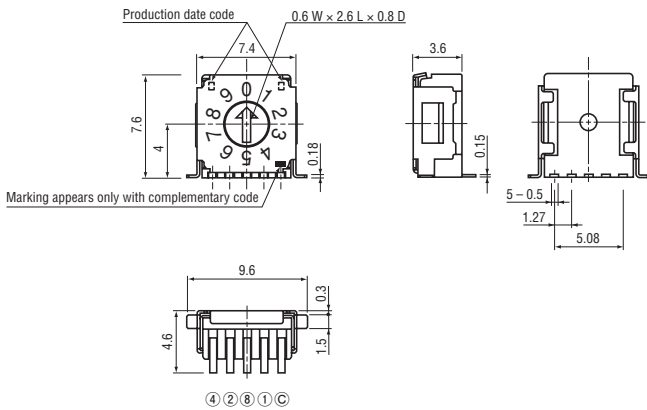
### OUTLINE DIMENSIONS

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

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

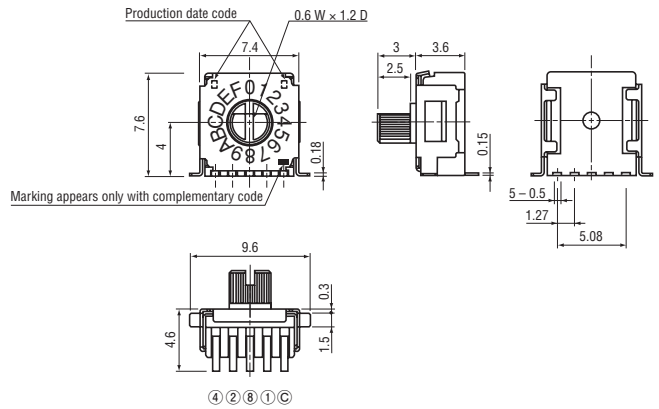
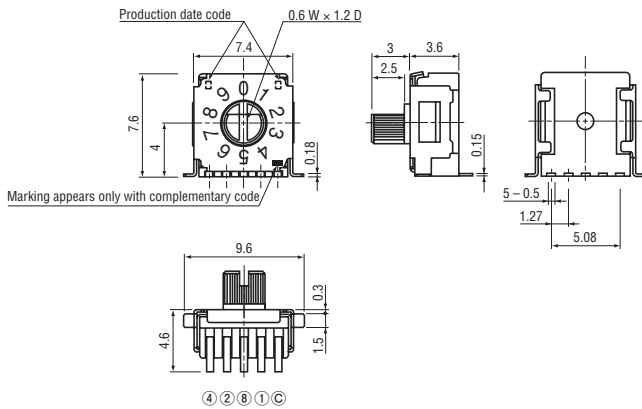
- SA-7013B (Real code)
- SA-7033B (Complementary code)

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



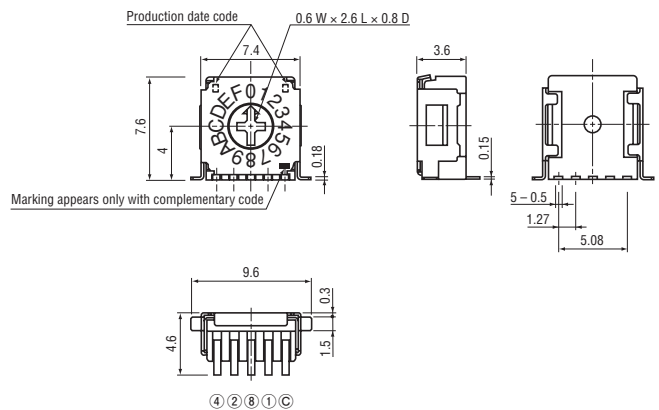
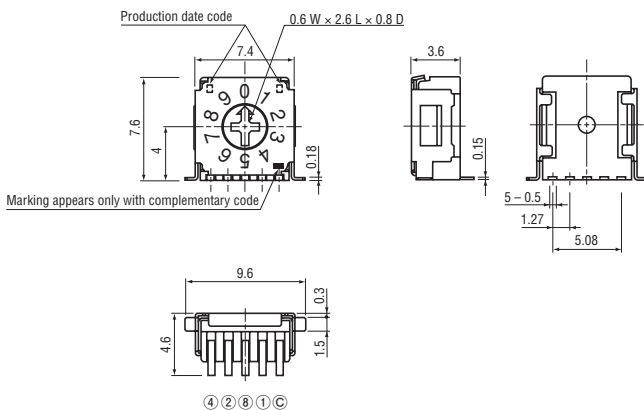
- SA-7113B (Real code)
- SA-7133B (Complementary code)

- 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

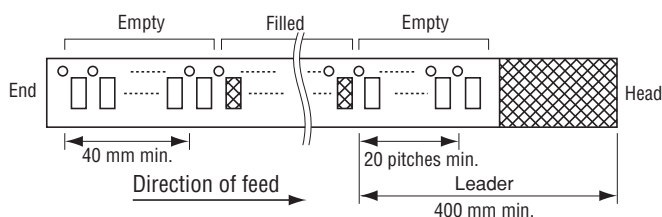
#### <Taping packaging specifications>

- 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.).

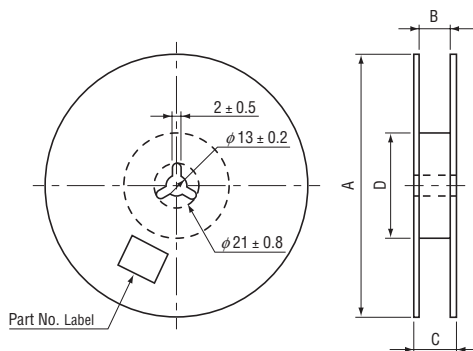
Maximum number of consecutive missing pieces=2  
Leader length and reel dimension are shown in the diagrams below:

#### ● Embossed tape dimensions



#### ● Reel dimensions (Unit: mm)

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

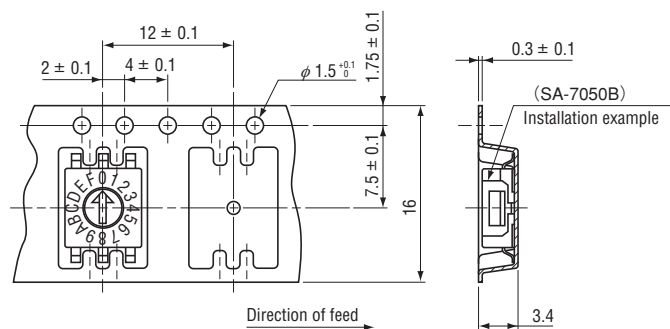


| Part number            | A         | B        | C        | D         |
|------------------------|-----------|----------|----------|-----------|
| SA-70□0 • SA-72□0TA/TB | φ 254 ± 2 | 17.4 ± 1 | 21.4 ± 1 | φ 50 min. |
| SA-71□0TA/TB           | φ 330 ± 2 | 17.4 ± 1 | 21.4 ± 1 | φ 80 ± 1  |
| SA-70□1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

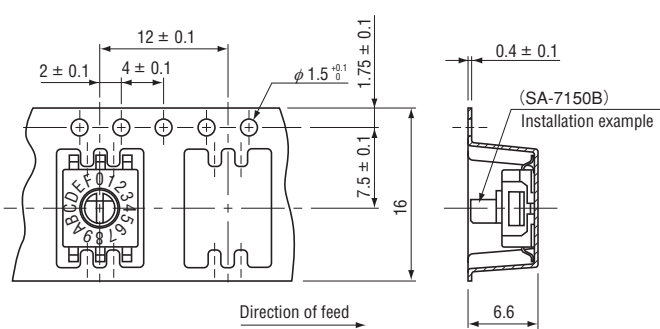


#### ● SA-71□0T□

#### <Top setting with knob>

(Unit: mm)

(Conforms to JIS C 0806)



# SA-7000

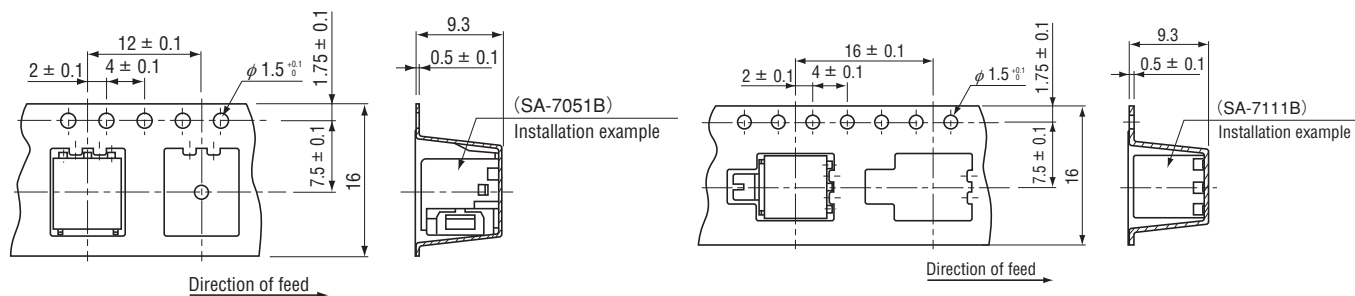
## ROTARY CODED SWITCHES (SMD)

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

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

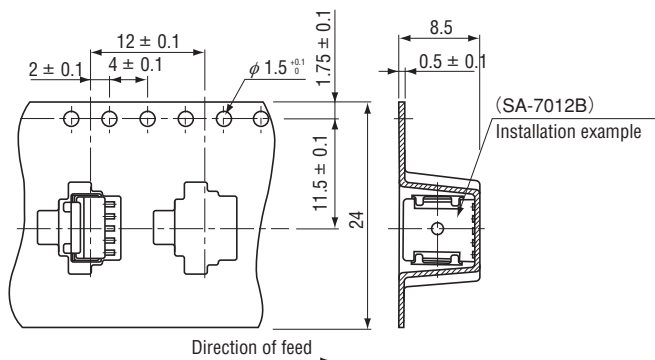
(Unit: mm)

(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.