

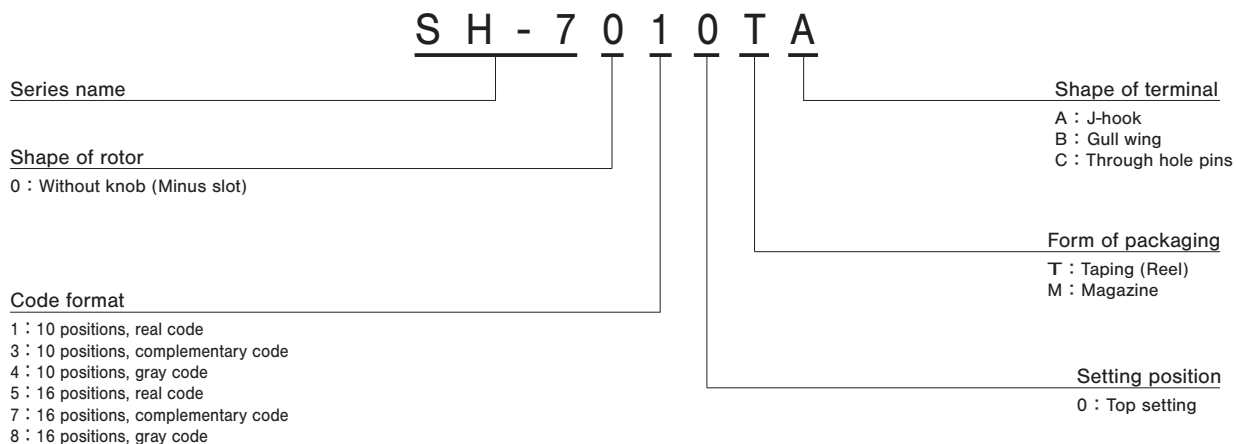
FEATURES

- RoHS compliant
- Center Common terminal pins location
- High digit visibility
- Gray code output available
- Washable
- Resin material is UL Recognized 94V0

INTERNAL STRUCTURE

| Part name | Material |
|------------------|---------------------------|
| ① Marking cover | Stainless steel (SUS 304) |
| ② Cover | Stainless steel (SUS 304) |
| 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



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

SH-7000

ROTARY CODED SWITCHES (SMD)

CODE FORMAT

| 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 | ● | | ● | | ● | | ● | | ● | | ● | | ● | | ● | |
| | Gray code | 8 | | | | | | | | | ● | ● | ● | ● | ● | ● | ● | ● |
| | | 4 | | | | ● | ● | ● | ● | ● | ● | ● | ● | ● | | | | |
| | | 2 | | | ● | ● | ● | ● | | | | | ● | ● | ● | ● | | |
| | | 1 | | ● | ● | | | ● | ● | | | | ● | ● | | ● | ● | |

● ...Contact closed

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 | Gray code | Real code | Complementary | Gray code | |
| Top setting | Minus slot | A J-hook | Taping | SH-7010TA | SH-7030TA | / | SH-7050TA | SH-7070TA | / | 500 pcs./reel |
| | | | Magazine | SH-7010MA | SH-7030MA | / | SH-7050MA | SH-7070MA | / | 50 pcs./stick |
| | | B Gull wing | Taping | SH-7010TB | SH-7030TB | SH-7040TB | SH-7050TB | SH-7070TB | SH-7080TB | 500 pcs./reel |
| | | | Magazine | SH-7010MB | SH-7030MB | SH-7040MB | SH-7050MB | SH-7070MB | SH-7080MB | 50 pcs./stick |
| | | C Through hole pins | Taping | / | / | / | / | / | / | / |
| | | | Magazine | SH-7010MC | SH-7030MC | / | SH-7050MC | SH-7070MC | / | 50 pcs./stick |

☐: Not manufactured

※ Verify the above part numbers when placing orders. Taping and magazine version can be supplied only in reel or stick unit.

STANDARD SPECIFICATIONS

| | |
|-----------------------|--|
| Circuit type | BCD (Real code, Complementary code, Gray code) BCH (Real code, Complementary code, Gray code) |
| Operating temp. range | -40 ~ 85 °C -40 ~ 105 °C (Gray code) |
| Storage temp. range | |
| Sealing | Washable by "O" ring ※ Please refer to page 150,151 |
| Net weight | Approx. 0.38 g |

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 | 1000 MΩ (DC100 V) minimum |
| Dielectric strength | AC250 V, 60 s |

SH-7000

ROTARY CODED SWITCHES (SMD)

MECHANICAL CHARACTERISTICS

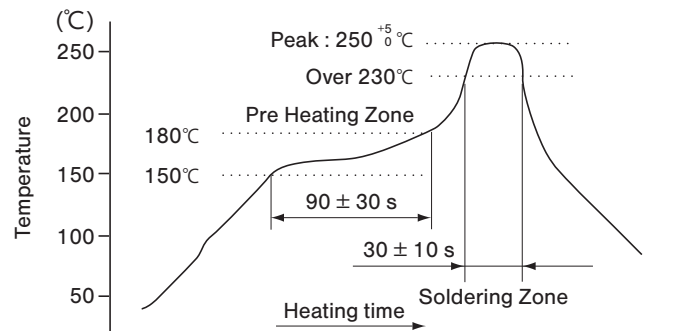
| | |
|-------------------|--|
| No. of positions | 10, 16 |
| Adjustment torque | 3 ~ 20 mN·m { 3 ~ 204 gf·cm } |
| Stepping angle | 36° (10 positions) 22.5° (16 positions) |
| Solderability | 245 ± 3 °C, 2 ~ 3 s |
| Soldering heat | Reflow : 255 °C (Peak temperature) Reflow : Peak temperature 255 °C (Please refer to the profile below.) |
| | Flow : 260 ± 3 °C as the temperature in a pot of molten solder, immersion from head of terminal to backside of board, 5 ~ 6 s, two times maximum |
| | 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 |

{ } : 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 | 40 °C, Relative humidity 90 ~ 95 %, 240 h |
| High temp. exposure | 85 °C, 96 h 105 °C, 96 h (Gray code) |
| Low temp. exposure | -40 °C, 96 h |
| Thermal shock | -40 (0.5 h) ~ 85 °C (0.5 h), 5 cycles -40 (0.5 h) ~ 105 °C (0.5 h), 5 cycles (Gray code) |

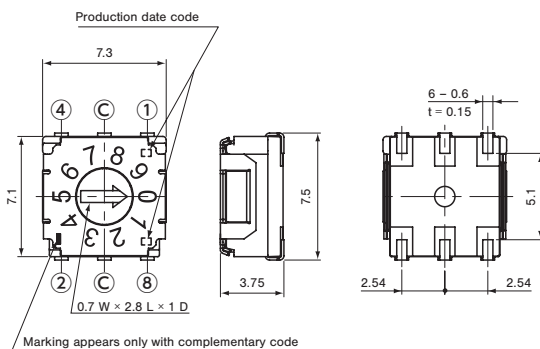
<Reflow profile for soldering heat evaluation>



Reflow : two times maximum

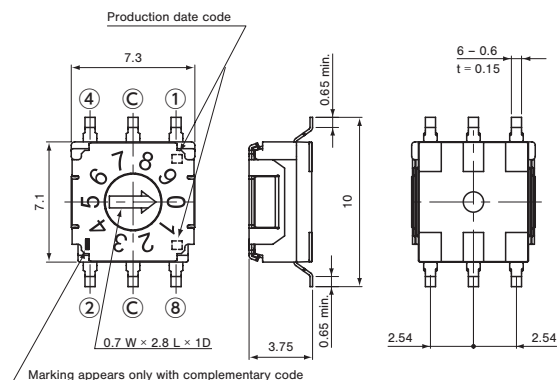
OUTLINE DIMENSIONS

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



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

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



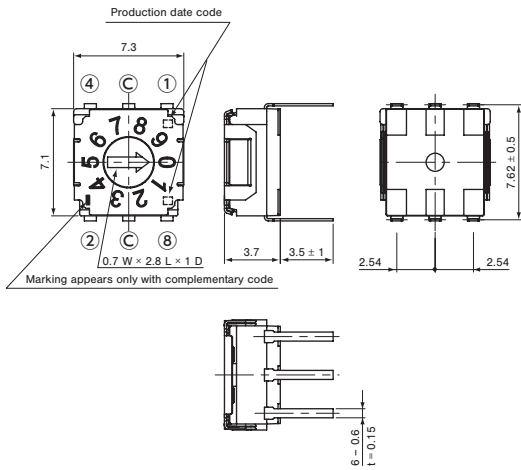
SH-7000

ROTARY CODED SWITCHES (SMD)

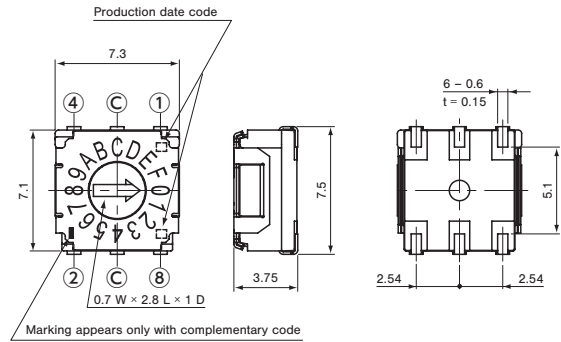
OUTLINE DIMENSIONS

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

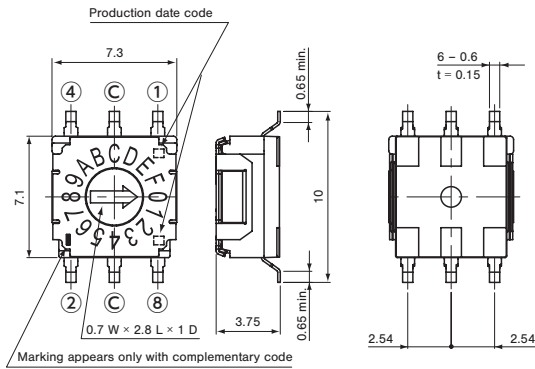
- SH-7010C (Real code)
- SH-7030C (Complementary code)



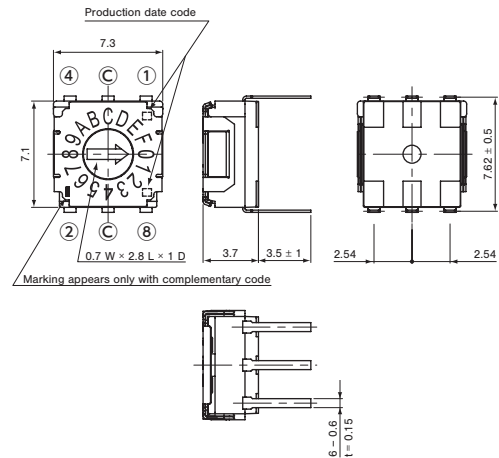
- SH-7050A (Real code)
- SH-7070A (Complementary code)



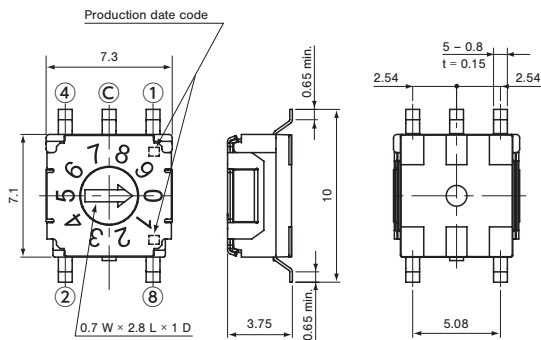
- SH-7050B (Real code)
- SH-7070B (Complementary code)



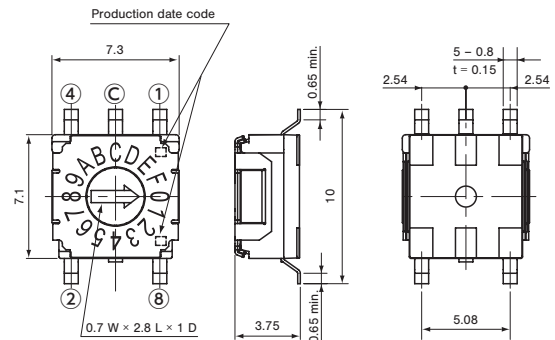
- SH-7050C (Real code)
- SH-7070C (Complementary code)



- SH-7040B (Gray code)



- SH-7080B (Gray code)



SH-7000

ROTARY CODED SWITCHES (SMD)

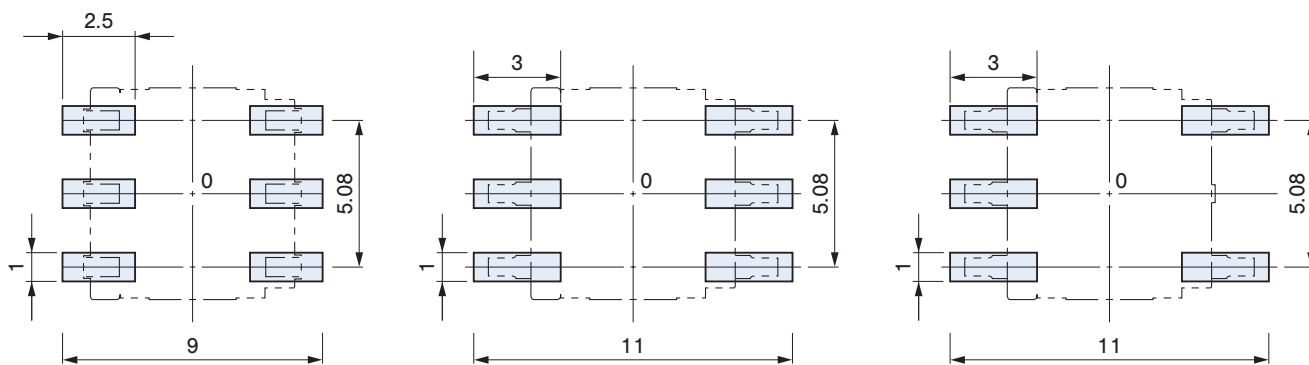
RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

● A type

● B type

● Gray code

(Unit: mm)



Note) The zero point is the center of mounting.

TERMINAL CONNECTION / P.C.B. THROUGH HOLE DIMENSIONS

(Unit: mm)

| | | | | | | | | | | | | | | | | | |
|---|---|-----------|--------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <p>Terminal pin layout (Bottom view)</p> | <p>Top setting (Through hole)</p> <table border="0" style="width: 100%;"> <tr> <td style="text-align: center;">Real code</td> <td style="text-align: center;">Complementary code</td> </tr> <tr> <td style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 50px; height: 50px;"> <tr><td style="text-align: center;">8</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> </table> </td> <td style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 50px; height: 50px;"> <tr><td style="text-align: center;">8</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> </table> </td> </tr> </table> | Real code | Complementary code | <table border="1" style="border-collapse: collapse; width: 50px; height: 50px;"> <tr><td style="text-align: center;">8</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> </table> | 8 | 1 | C | C | 2 | 4 | <table border="1" style="border-collapse: collapse; width: 50px; height: 50px;"> <tr><td style="text-align: center;">8</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> </table> | 8 | 1 | C | C | 2 | 4 |
| Real code | Complementary code | | | | | | | | | | | | | | | | |
| <table border="1" style="border-collapse: collapse; width: 50px; height: 50px;"> <tr><td style="text-align: center;">8</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> </table> | 8 | 1 | C | C | 2 | 4 | <table border="1" style="border-collapse: collapse; width: 50px; height: 50px;"> <tr><td style="text-align: center;">8</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">C</td><td style="text-align: center;">C</td></tr> <tr><td style="text-align: center;">2</td><td style="text-align: center;">4</td></tr> </table> | 8 | 1 | C | C | 2 | 4 | | | | |
| 8 | 1 | | | | | | | | | | | | | | | | |
| C | C | | | | | | | | | | | | | | | | |
| 2 | 4 | | | | | | | | | | | | | | | | |
| 8 | 1 | | | | | | | | | | | | | | | | |
| C | C | | | | | | | | | | | | | | | | |
| 2 | 4 | | | | | | | | | | | | | | | | |
| <p>P.C.B. dimensions (Bottom view)</p> | <p style="text-align: center;">SH-7000 case</p> | | | | | | | | | | | | | | | | |

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.).

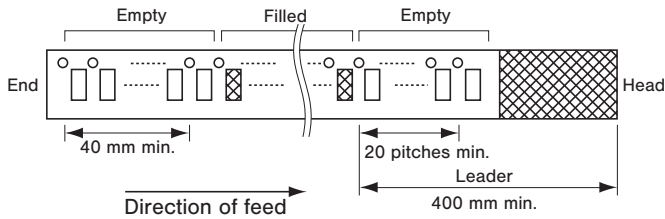
Maximum number of consecutive missing pieces = 2

Leader length and reel dimension are shown in the diagrams below:

SH-7000

ROTARY CODED SWITCHES (SMD)

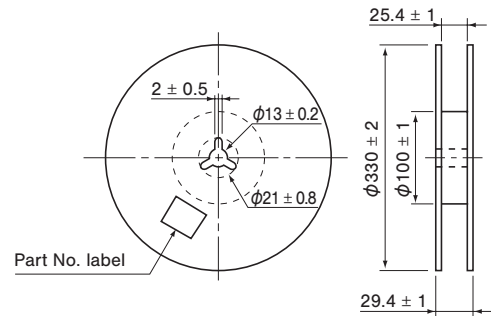
● Embossed tape dimensions



● Reel dimensions

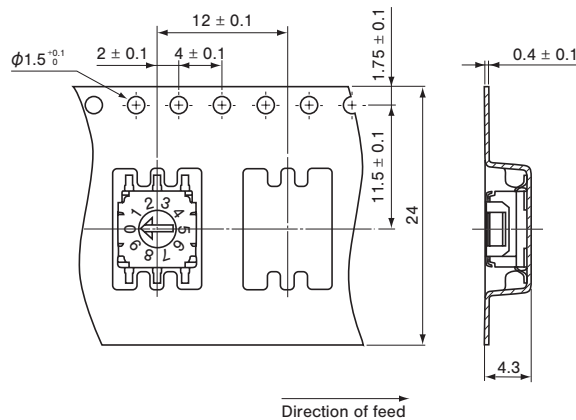
(Conforms to JIS C 0806-3)
(In accordance with EIAJ ET-7200A)

(Unit: mm)



- SH-70 □ 0TA
- SH-70 □ 0TB

(Unit: mm)



■ PACKAGING SPECIFICATIONS

<Magazine packaging specifications>

- Please order the multiple numbers of the specific packing quantities.

Pieces in package : 50 pcs./stick

● Magazine dimensions

(Unit : mm)

