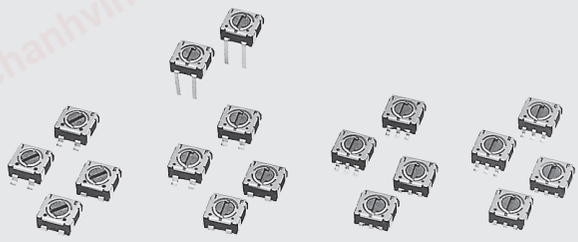
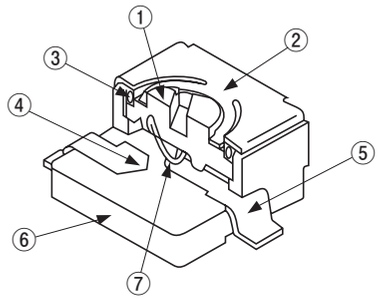
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# ROTARY SELECTOR SWITCHES (SMD) CS-4

RoHS compliant



## INTERNAL STRUCTURE




| | Part name | Material | Flammability |
|---|---|---|---|
| ① | Rotor | Polyphenylenesulphide | UL94V-0 |
| ② | Cover | Stainless steel (SUS 304) | — |
| ③ | "O" ring | Silicone rubber | UL94HB |
| ④ | Fixed contact | Copper alloy, Gold-plated | — |
| ⑤ | Terminal pin | | |
| ⑥ | Housing | Epoxy | UL94V-0 |
| | | ※ LCP (LC polymer) | |
| ⑦ | Slider contact | Multi metal alloy | — |

※ : 1 pole 4 contacts only

## FEATURES

- RoHS compliant
- Optimum for high density board mounting applications
- Compatible with most automatic pick & place machinery (J-hook and Gull wing types only)
- Compatible with reflow and wave soldering
- Protection against dust and washable after soldering
- Excellent reliability due to precious metal contact

## PART NUMBER DESIGNATION

CS-4 - 1 3 N T A

Series name

No. of poles
1 : 1 pole
2 : 2 poles

No. of contacts
2 : 2 contacts
3 : 3 contacts
4 : 4 contacts

Contact timing
N : Non-shorting (1 pole 3, 4 contacts only)
Y : Non-shorting with neutral detent (1pole 2 contacts, 2 poles 2 contacts)
X : Non-shorting without neutral detent (1 pole 2 contacts only)

Form of packaging
T : Taping (Reel)
Blank : Bulk in plastic bag

Shape of terminal
A : J-hook
B : Gull wing
C : Through hole pins

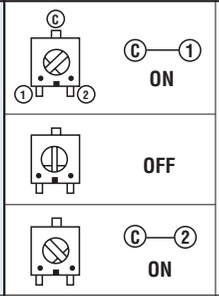
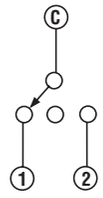
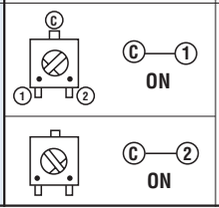
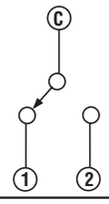
**※ Please refer to the LIST OF PART NUMBERS when placing orders.**

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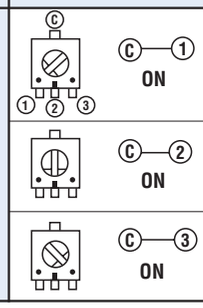
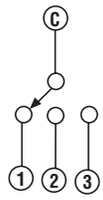
# CS-4
## ROTARY SELECTOR SWITCHES (SMD)

## SCHEMATICS DIAGRAMS

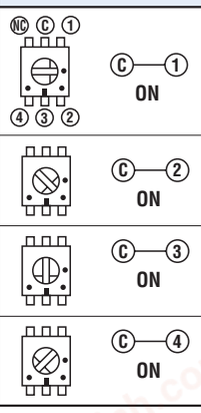
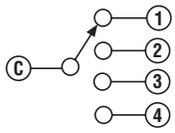
### ● 1 pole 2 contacts

| Series | Switching specifications | Schematic |
|---|---|---|
| CS-4-12YA<br>〃 YTA<br>〃 YB<br>〃 YTB<br>〃 YC |  |  |
| CS-4-12XA<br>〃 XTA<br>〃 XB<br>〃 XTB<br>〃 XC |  |  |

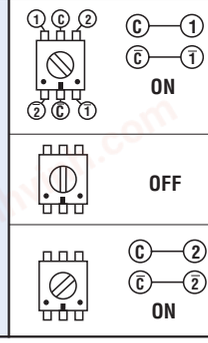
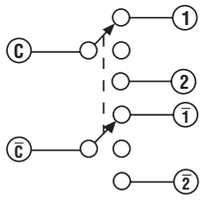
### ● 1 pole 3 contacts

| Series | Switching specifications | Schematic |
|---|---|---|
| CS-4-13NA<br>〃 NTA<br>〃 NB<br>〃 NTB |  |  |

### ● 1 pole 4 contacts

| Series | Switching specifications | Schematic |
|---|---|---|
| CS-4-14NA<br>〃 NTA<br>〃 NB<br>〃 NTB |  |  |

### ● 2 poles 2 contacts

| Series | Switching specifications | Schematic |
|---|---|---|
| CS-4-22YA<br>〃 YTA<br>〃 YB<br>〃 YTB |  |  |

## LIST OF PART NUMBERS

| Circuit type | | Form of packaging | A<br>J-hook | B<br>Gull wing | C<br>Through hole pin | Pieces in package |
|---|---|---|---|---|---|---|
| 1 pole<br>2 contacts | With neutral detent | Taping | CS-4-12YTA | CS-4-12YTB | ☑ | 500 pcs. /reel |
| | | Plastic bag | CS-4-12YA | CS-4-12YB | CS-4-12YC | 50 pcs./pack |
| | Without neutral detent | Taping | CS-4-12XTA | CS-4-12XTB | ☑ | 500 pcs./reel |
| | | Plastic bag | CS-4-12XA | CS-4-12XB | CS-4-12XC | 50 pcs./pack |
| 1 pole 3 contacts | | Taping | CS-4-13NTA | CS-4-13NTB | ☑ | 500 pcs./reel |
| | | Plastic bag | CS-4-13NA | CS-4-13NB | ☑ | 50 pcs./pack |
| 1 pole 4 contacts | | Taping | CS-4-14NTA | CS-4-14NTB | ☑ | 500 pcs./reel |
| | | Plastic bag | CS-4-14NA | CS-4-14NB | ☑ | 50 pcs./pack |
| 2 poles 2 contacts | | Taping | CS-4-22YTA | CS-4-22YTB | ☑ | 500 pcs./reel |
| | | Plastic bag | CS-4-22YA | CS-4-22YB | ☑ | 50 pcs./pack |

☑ : Not manufactured

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

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# CS-4
# ROTARY SELECTOR SWITCHES (SMD)

## STANDARD SPECIFICATIONS

| | |
|---|---|
| Circuit type | 1 pole 2 contacts 2 poles 2 contacts<br>1 pole 3 contacts<br>1 pole 4 contacts |
| Operating temperature range | –25 ~ 70 °C |
| Storage temperature range | –40 ~ 70 °C |
| Sealing | Washable by “O” ring<br>※ Please refer to page 150, 151 |
| Net weight | Approx. 0.08 g (CS-4-12, CS-4-13)<br>Approx. 0.1 g (CS-4-14, CS-4-22) |

## MECHANICAL CHARACTERISTICS

| | |
|---|---|
| No. of positions | 2, 3, 4 |
| Adjustment torque | 10 mN·m {102 gf·cm} maximum |
| Stopper strength | 25 mN·m {255 gf·cm} minimum |
| Stepping angle | 45°<br>90° (CS-4-12X only) |
| Solderability | 245 ± 3 °C, 2 ~ 3 s |
| Soldering heat | 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<br>Reflow : Peak temperature 255 °C (Please refer to the profile below.)<br>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

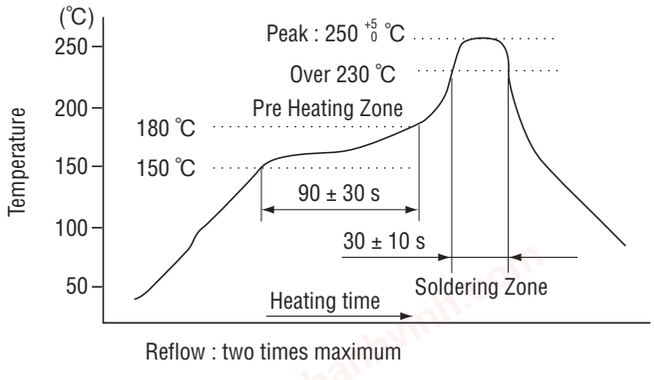
## ELECTRICAL CHARACTERISTICS

| | |
|---|---|
| Contact rating<br>Maximum current<br>Minimum current<br>Maximum voltage<br>Minimum voltage | 0.5 VA<br>100 mA<br>1 µA<br>16 V<br>20 mV |
| Contact timing | Non-shorting |
| Contact resistance | 100 mΩ maximum |
| Insulation resistance | 100 MΩ (DC500 V) minimum |
| Dielectric strength | AC500 V, 60 s |

## ENVIRONMENTAL CHARACTERISTICS

| | |
|---|---|
| Vibration | (Amplitude) 1.5 mmor<br>(Acceleration) 98 m/s$^2$,<br>10-500-10 Hz,<br>3 directions for 2 h each |
| Shock | 490 m/s$^2$, 11 ms<br>6 directions for 3 times each |
| Load life | 200 cycles minimum<br>DC16 V, 30 mA |
| Humidity (Steady state) | 40 °C, Relative humidity 90 ~ 95 %, 48 h |
| High temperature exposure | 70 °C, 16 h |
| Low temperature exposure | –40 °C, 16 h |
| Thermal shock | –40 (0.5 h) ~ 70 °C (0.5 h), 5 cycles |

### 〈Reflow profile for soldering heat evaluation〉




Reflow : two times maximum

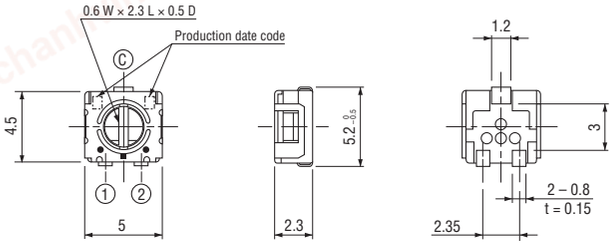
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# CS-4
## ROTARY SELECTOR SWITCHES (SMD)

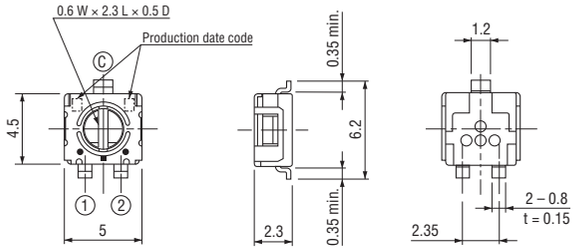
## OUTLINE DIMENSIONS

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

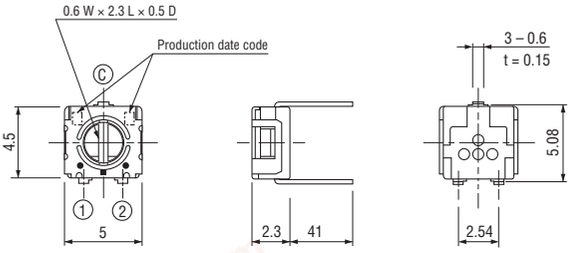
### ● CS-4-12YA



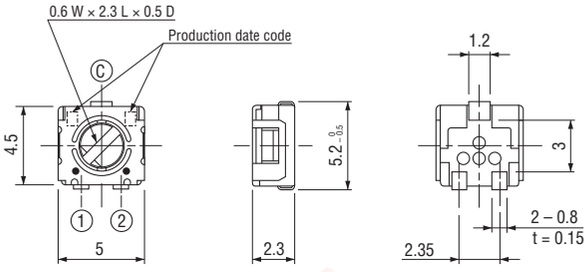

### ● CS-4-12YB



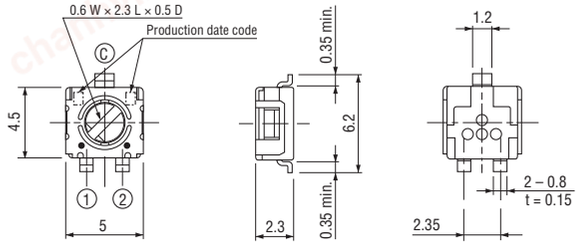

### ● CS-4-12YC



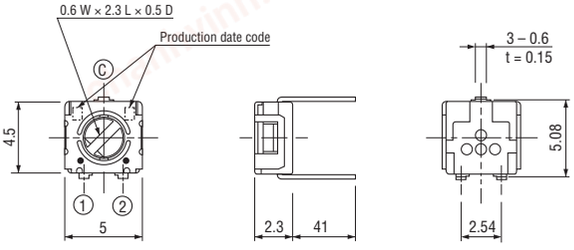

### ● CS-4-12XA



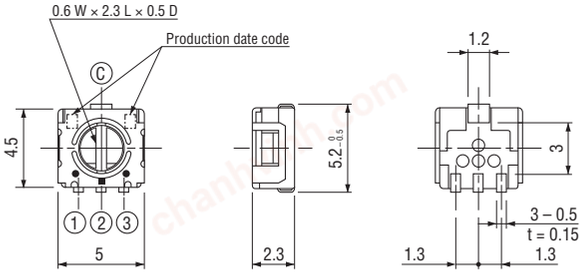

### ● CS-4-12XB



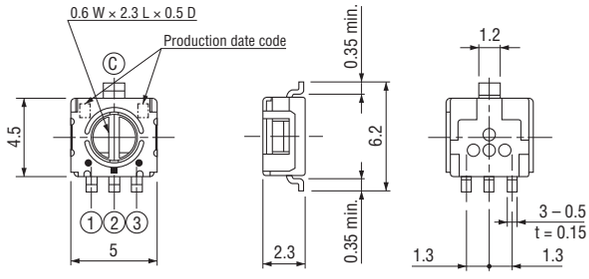

### ● CS-4-12XC



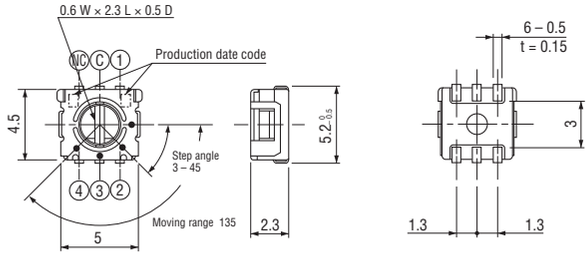

### ● CS-4-13NA



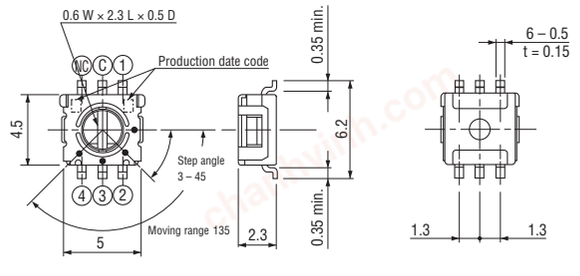

### ● CS-4-13NB




### ● CS-4-14NA




### ● CS-4-14NB



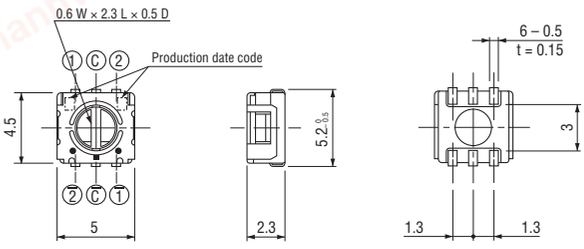
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# CS-4
## ROTARY SELECTOR SWITCHES (SMD)

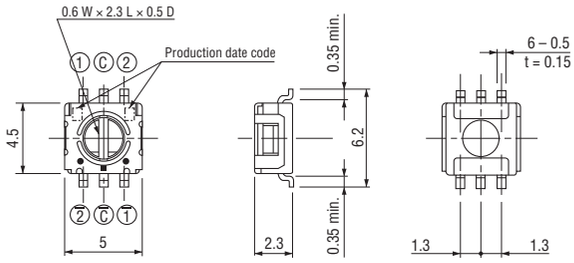
## ■ OUTLINE DIMENSIONS

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

### ● CS-4-22YA



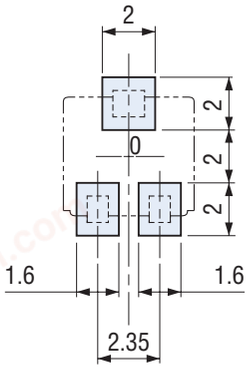

### ● CS-4-22YB



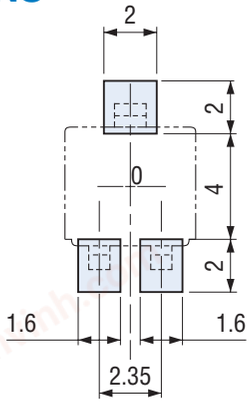

## ■ RECOMMENDED P.C.B. PAD OUTLINE DIMENSIONS

(Unit: mm)

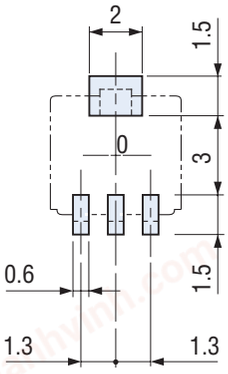
### ● CS-4-12YA
### ● CS-4-12XA



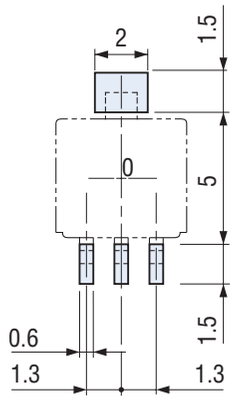

### ● CS-4-12YB
### ● CS-4-12XB



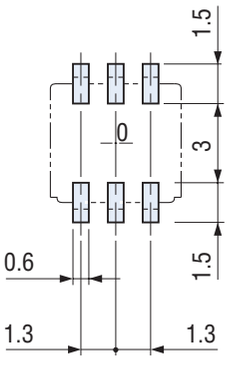

### ● CS-4-13NA



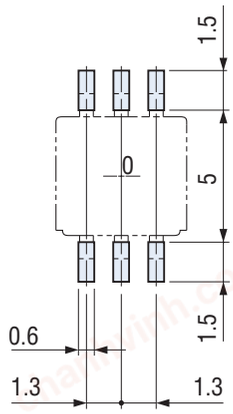

### ● CS-4-13NB




### ● CS-4-14NA
### ● CS-4-22YA




### ● CS-4-14NB
### ● CS-4-22YB



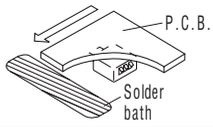
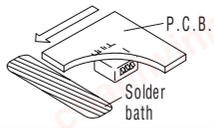
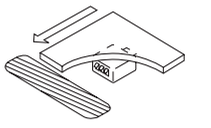
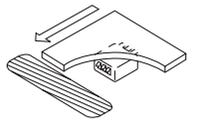
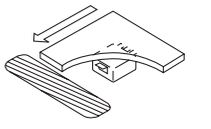

Note) The zero point is the center of mounting.

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# CS-4
## ROTARY SELECTOR SWITCHES (SMD)

## ■ SOLDERING CONDITIONS

When dip-soldering CS-4-13NA, NB or CS-4-22YA, YB, solder bridges may occur between terminals depending upon soldering conditions.
In order to prevent such bridges,vertical flow direction is recommended as shown in the below figure.
For dip-soldering,preheating should be done after applying flux.
Handle carefully in case of parallel flow direction in which solder bridges occur more often because solder flow moves toward the vertical direction against the terminals.
In addition, other soldering conditions such as soldering temperature, preheating temperature, specific gravity of flux, and belt speed affect the occurrence of bridges.
Depending on flux to be applied, markings may, though at rare case, disappear or fade out at soldering. Please make sure before its use.

| Flow direction | CS-4-13NA, NB | CS-4-22YA, YB |
|---|---|---|
| Vertical |  |  |
| Parallel |  |  |
| |  | |

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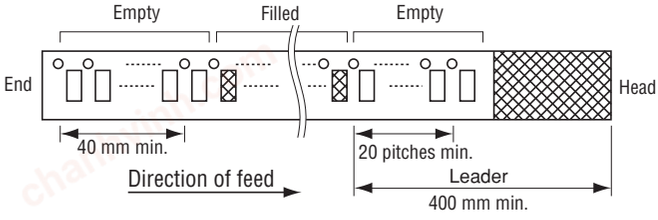
## PACKAGING SPECIFICATIONS

### <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 4 reels (2000 pcs.).

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

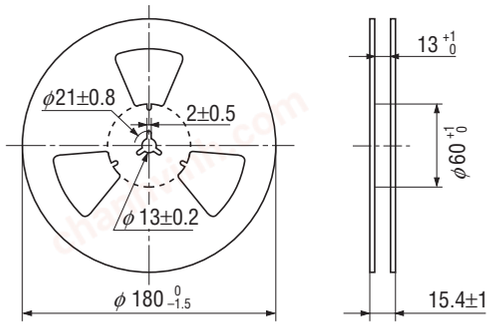
### ● Embossed tape dimensions




### ● Reel dimensions

(Unit: mm)

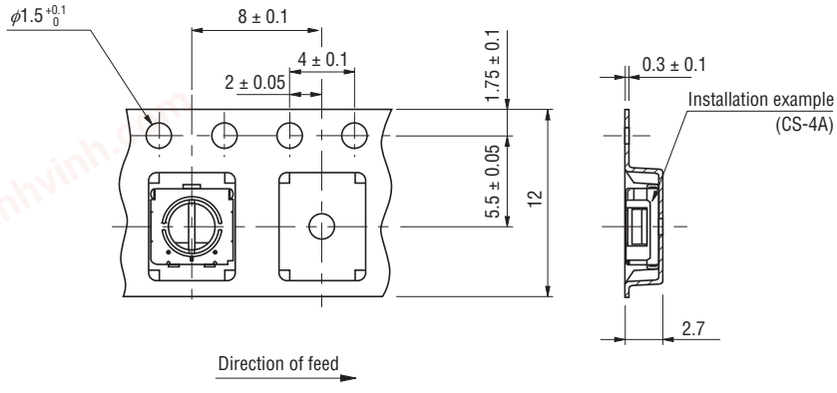
**(Conforms to JIS C 0806-3)**
**(In accordance with EIAJ ET-7200A)**




### ● CS-4- □□□ TA/CS-4- □□□ TB

**(Conforms to JIS C 0806)**

(Unit: mm)




### <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 in a plastic bag is performed with 50 pcs. (standard 500 pcs.) per box.