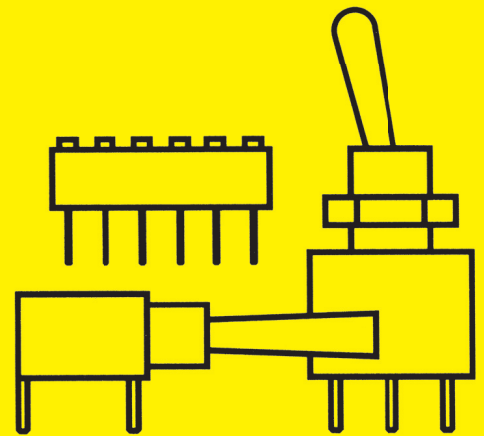
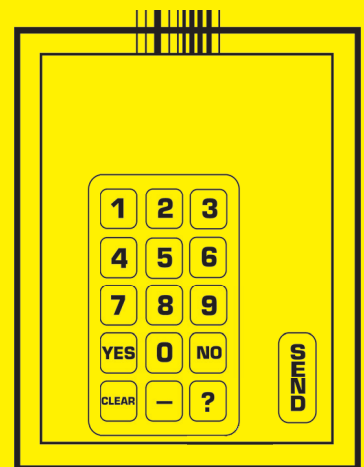


# knitter switch

Professional Switches



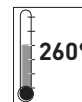
Input Systems



2023/ 2024

| Type                         | Operating |      | Terminals |     | IP 67 | wash-able | Size      | Special feature    | Page  |
|------------------------------|-----------|------|-----------|-----|-------|-----------|-----------|--------------------|-------|
|                              | top       | side | T/H       | SMT |       |           |           |                    |       |
| Takt Switches                |           |      |           |     |       |           |           |                    |       |
| TSE 21495                    | •         |      | •         |     |       |           | 12x12     | 1 Mill. operations | 66    |
| TSSE 21495                   | •         |      |           | •   |       |           | 12x12     | 1 Mill. operations | 66    |
| TS 2x                        | •         |      | •         |     |       |           | 12x12     |                    | 67    |
| TSS 2x                       | •         |      |           | •   |       |           | 12x12     |                    | 68    |
| TSE 2x                       | •         |      | •         |     | •     | •         | 12x12     | 1 Mill. operations | 69    |
| TSSE 2x                      | •         |      |           | •   | •     | •         | 12x12     | 1 Mill. operations | 70    |
| TSE 808                      | •         |      | •         |     |       |           | 8x8       | 1 Mill. operations | 71    |
| TSSE 808                     | •         |      |           | •   |       |           | 8x8       | 1 Mill. operations | 71    |
| TMP 1                        | •         |      | •         |     | •     | •         | 7.6x7.6   | 1 Mill. operations | 72    |
| TMP 1-R                      |           | •    | •         |     | •     | •         | 7.6x7.6   | 1 Mill. operations | 72    |
| TMPS 1                       | •         |      |           | •   | •     | •         | 7.6x7.6   | 1 Mill. operations | 73    |
| TME 1                        | •         |      | •         |     |       | •         | 7.5x6.5   |                    | 74    |
| TSE 6x                       | •         |      | •         |     | •     | •         | 6.2x6.3   |                    | 76    |
| TSSE 6x                      | •         |      |           | •   | •     | •         | 6.2x6.3   |                    | 77-78 |
| TSSE 6x-RA                   |           | •    |           | •   |       | •         | 6.1x7.02  |                    | 79    |
| TS 6x                        | •         |      | •         |     |       |           | 6.2x6.2   |                    | 80    |
| TS 6x-RA                     |           | •    | •         |     |       |           | 7.4x7.2   |                    | 81    |
| TS 637-RA                    |           | •    | •         |     |       |           | 7.4x4.3   |                    | 82    |
| TSS 6x                       | •         |      |           | •   |       |           | 6.2x6.2   |                    | 83    |
| TSS 650-J                    | •         |      |           | •   |       |           | 6.0x6.0   | 1.3 mm travel      | 84    |
| TSS 507                      | •         |      |           | •   |       |           | 4.9x4.9   | extreme flat       | 85    |
| TMSE 10                      | •         |      |           | •   |       | •         | 4.9x4.5   | −55 °C to +125 °C  | 86    |
| TMSE 10 J-RA                 |           | •    |           | •   |       | •         | 5.0x5.44  | −55 °C to +125 °C  | 86    |
| TSS 300                      | •         |      |           | •   |       |           | 3.8x6.0   | 1 Mill. operations | 87    |
| TSSE 300                     | •         |      |           | •   | •     |           | 3.8x6.0   | 1 Mill. operations | 87    |
| TS 3x                        | •         |      | •         |     |       |           | 3.5x6.0   |                    | 88    |
| TSS 3x                       | •         |      |           | •   |       |           | 3.5x6.0   |                    | 88    |
| TSS 313-RA                   |           | •    |           | •   |       |           | 4.0x2.0   |                    | 89    |
| TSS 4-RA                     |           | •    |           | •   |       |           | 7.2x3.5   | 250 000 operations | 90    |
| Multi-Function Tact Switches |           |      |           |     |       |           |           |                    |       |
| PLSJ 1                       | •         | •    |           | •   |       |           | 9.3x11.3  | Navigation         | 91    |
| TSSJ 4                       | •         |      |           | •   |       |           | 7.4x7.7   | Navigation         | 92    |
| TSSJ 5                       | •         |      |           | •   |       |           | 7.4x7.7   | Navigation         | 93    |
| TSSJ 30                      | •         |      |           | •   |       |           | 12.4x12.4 | Navigation         | 94    |
| TSJ 31                       | •         |      | •         |     |       |           | 12.4x12.4 | Navigation         | 94    |
| TSSJ 55                      | •         |      |           | •   |       |           | 9.8x9.8   | Navigation         | 95    |

# Tact Switches

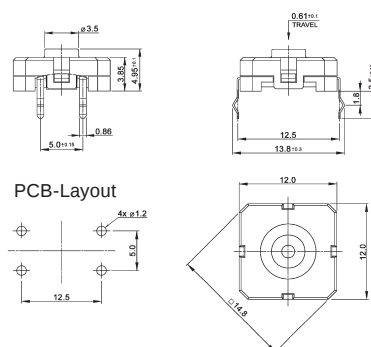


## Specifications:

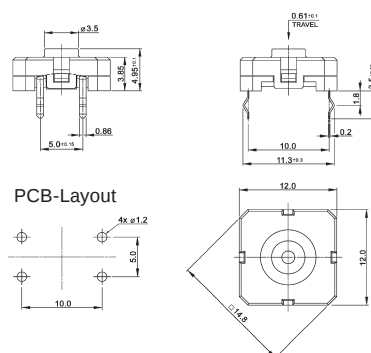
|                        |                                                                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 42 V DC, 100 mA                                                                                                                             |
| Contact resistance:    | <100 mΩ                                                                                                                                     |
| Insulation resistance: | >100 MΩ                                                                                                                                     |
| Dielectric strength:   | 150 V, 50 Hz for the duration of 1 minute                                                                                                   |
| Operating temperature: | -40 °C to +90 °C                                                                                                                            |
| Operating force:       | 3.6 N ± 0.7 N                                                                                                                               |
| Mechanical life:       | > 5 000 000 operations                                                                                                                      |
| Material:              | Contacts: stainless steel, gold-plated      Terminals: brass, tin-plated<br>Cover: PA 46, grey      Base: PPS, grey<br>Stem: natural rubber |
| Protection:            | Contact system sealed by rubber actuator                                                                                                    |
| Mounting:              | on pc-board, TSSE 21495 S: SMD                                                                                                              |
| Soldering conditions:  | wave soldering, max. 5 s, max. 260 °C, pre-heat max. 120 s, max. 140 °C<br>TSSE 21495 S: Jedec STD-020 D (peak 10 s, 260 °C)                |

## Models:      Switching functions

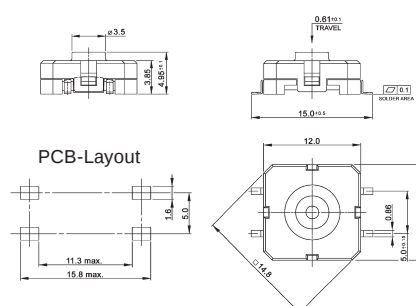
TSE 21495 S      off – mom



TSE 21495 S-1      off – mom



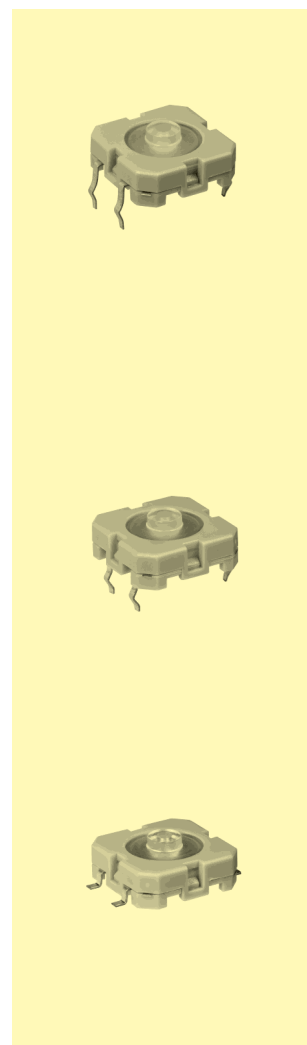
TSSE 21495 S-T      off – mom



## Packing:

|                            |                    |
|----------------------------|--------------------|
| TSE 21495 S, TSE 21495 S-1 | 30 pieces in stick |
| TSSE 21495 S-T             | 600 pieces/reel    |

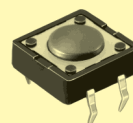
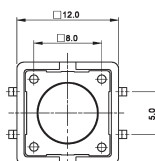
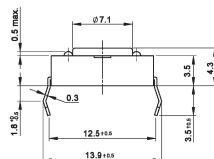
Circuit diagram:



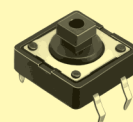
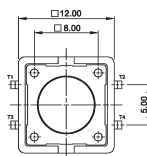
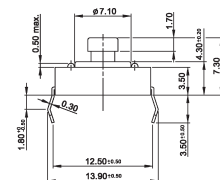
|                        |                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                                                        |
| Contact resistance:    | < 100 mΩ                                                                                                              |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                                                  |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                             |
| Operating temperature: | −25 °C to +70 °C                                                                                                      |
| Electrical life:       | 2.6 N: minimum 100 000 cycles<br>1.6 N: minimum 200 000 cycles                                                        |
| Operating force:       | see ordering code                                                                                                     |
| Contacts:              | phosphor bronze, silver-plated                                                                                        |
| Terminals:             | PC terminals, brass, silver-plated                                                                                    |
| Material:              | cover: stainless steel<br>base and stem: nylon meets UL 94 V-0                                                        |
| Mounting:              | on pc-board                                                                                                           |
| Soldering conditions:  | hand-soldering – max.: 30 W, 2 sec, 320 °C<br>wave-soldering – max.: 5 sec, 260 °C<br>subject to PCB 1.6 mm thickness |
| Travel:                | 0.35 mm ± 0.1 mm                                                                                                      |

5

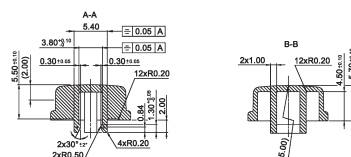
## PCB-Layout



### Circuit diagram



Technical drawing of a mechanical part with dimensions and section lines A-A and B-B. The drawing includes a cross-section A-A showing a cylindrical part with a central hole. Dimensions include a total height of 3.00 ± 0.10, a central hole diameter of 2xR0.50, and a central hole length of 1.50. The outer diameter is 12xR0.20. The drawing also shows a cross-section B-B, which is a side view of the part, showing a total width of 2x1.00 and a central hole diameter of 12xR0.20. The drawing includes various tolerances and surface finish symbols.

KTSC-21 ☐KTSC-22 ☐

**Colour of stem**  
- **for operating force:**

|                            |              |
|----------------------------|--------------|
| <input type="checkbox"/> N | 1.6 N, brown |
| <input type="checkbox"/> R | 2.6 N, red   |

**Dimension:**

|   |        |
|---|--------|
| 1 | 4.3 mm |
| 4 | 7.3 mm |

**Cap type:** ☐ square ☐ round

**Cap colour:** ☐ Y yellow ☐ B blue ☐ R red ☐ I ivory ☐ K black ☐ G green

- 1 square
- 2 round

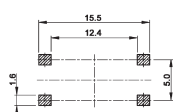
☐ Y yellow  
☐ B blue  
☐ R red  
☐ I ivory  
☐ K black  
☐ G green

## Specifications:

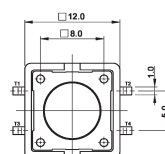
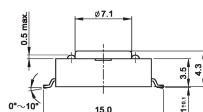
|                        |                                                                                     |
|------------------------|-------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                      |
| Contact resistance:    | < 100 mΩ                                                                            |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                           |
| Operating temperature: | -25 °C to +70 °C                                                                    |
| Electrical life:       | 2.6 N: minimum 100 000 cycles<br>1.6 N: minimum 200 000 cycles                      |
| Operating force:       | see ordering code                                                                   |
| Contacts:              | phosphor bronze, silver-plated                                                      |
| Terminals:             | brass, silver-plated                                                                |
| Material:              | cover: stainless steel<br>base and stem: high-temp. nylon meets UL 94 V-0; caps ABS |
| Mounting:              | on pc-board – SMD                                                                   |
| Soldering conditions:  | hand-soldering – max.: 30 W, 2 sec, 320 °C                                          |
| Packing:               | on tapes – see ordering code                                                        |
| Travel:                | 0.35 mm ± 0.1 mm                                                                    |

## Models:

TSS 21 ☐



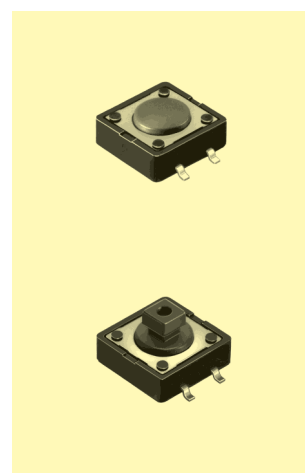
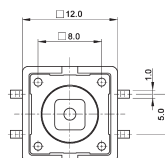
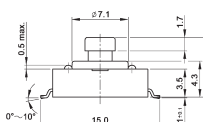
PCB Layout



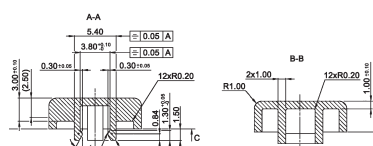
TSS 24 ☐



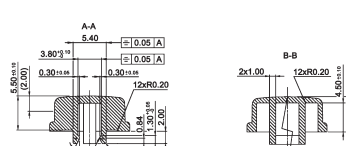
Circuit diagram



Caps for TSS 24 ☐



KTSC-21 ☐



KTSC-22 ☐

## Ordering code:

Switches

TSS 2 ☐ ☐

Dimension H / Packing:

- ☐ 1 4.3 mm / 700 pcs/reel
- ☐ 4 7.3 mm / 500 pcs/reel

Colour of stem  
for operating force:

- ☐ N 1.6 N, brown
- ☐ R 2.6 N, red

Caps KTSC-2 ☐ ☐

Cap type:

- ☐ 1 square
- ☐ 2 round

Cap colour:

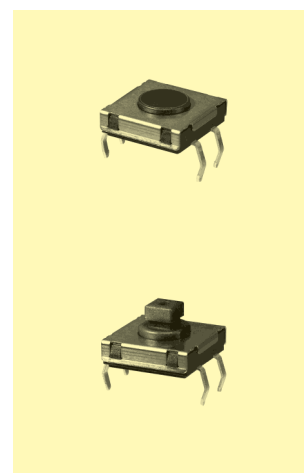
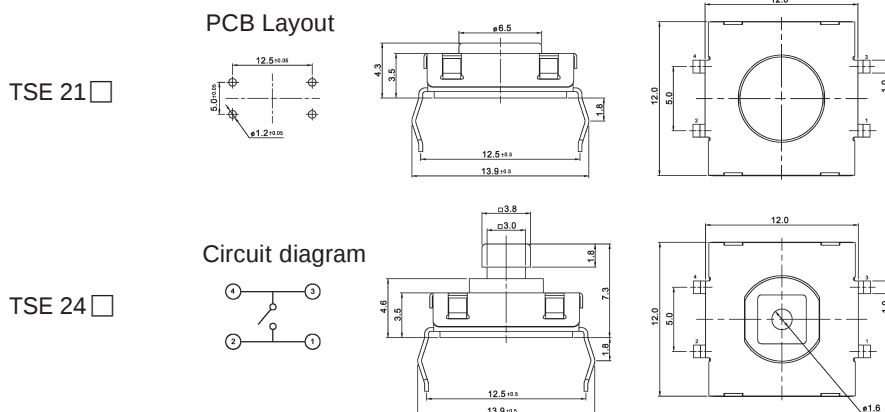
- ☐ Y yellow
- ☐ B blue
- ☐ R red
- ☐ I ivory
- ☐ K black
- ☐ G green

## Specifications:

|                        |                                                                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 50 mA                                                                                                                                                        |
| Contact resistance:    | < 100 mΩ                                                                                                                                                              |
| Insulation resistance: | > 100 MΩ                                                                                                                                                              |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                                                             |
| Operating temperature: | −40 °C to +85 °C                                                                                                                                                      |
| Operating force:       | N: 1.6 N ± 0.5 N<br>R: 2.6 N ± 0.5 N<br>W: 3.2 N ± 0.8 N<br>Y: 5.2 N ± 1.3 N                                                                                          |
| Mechanical life:       | N, R: minimum 1 000 000 operations; W, Y: minimum 300 000 operations                                                                                                  |
| Material:              | Contacts: stainless steel, silver-plated<br>Terminals: brass, silver plated<br>Cover: stainless steel<br>Base: LCP, UL 94 V-0, black, washable<br>Stem: PA, UL 94 V-0 |
| Protection:            | IP 67                                                                                                                                                                 |
| Mounting:              | on pc-board                                                                                                                                                           |
| Soldering conditions:  | wave soldering, max. 5 s max. 260 °C; pre-heat max. 60 s max. 100 °C                                                                                                  |
| Travel:                | 0.4 mm ± 0.2 mm                                                                                                                                                       |

washable

## Models:



## Caps for TSE 24



## Ordering code:

Switches **TSE 2** ☐ ☐

**Dimension:**

**Colour of stem for operating force:**

**1** 4.3 mm **N** 1.6 N, brown  
**4** 7.3 mm **R** 2.6 N, red  
**W** 3.2 N, white  
**Y** 5.2 N, yellow

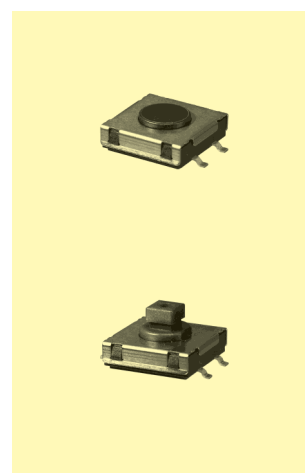
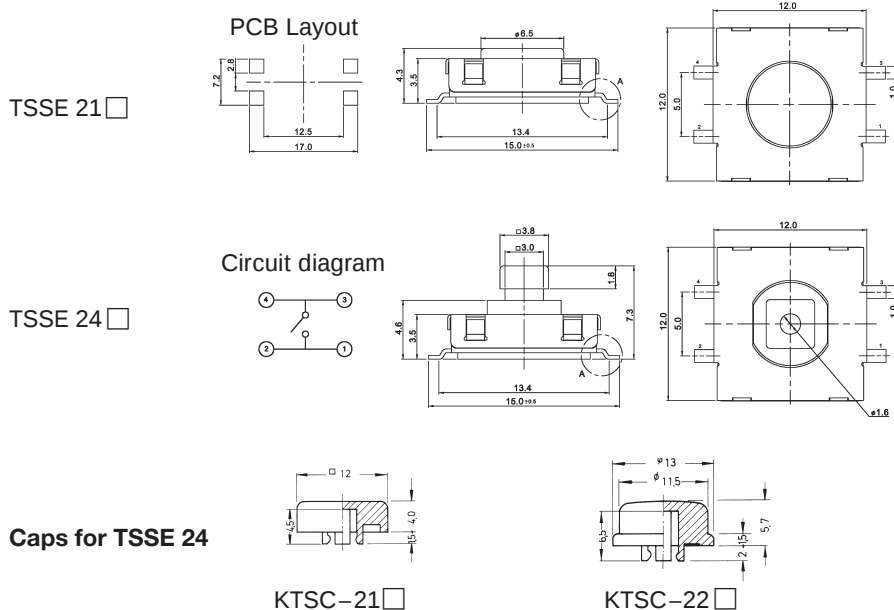
Caps **KTSC-2** ☐ ☐

**Cap type:**

**1** square **Y** yellow  
**2** round **B** blue  
**R** red  
**I** ivory  
**K** black  
**G** green

|                        |                                                                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 50 mA                                                                                                                                                        |
| Contact resistance:    | < 100 mΩ                                                                                                                                                              |
| Insulation resistance: | > 100 MΩ                                                                                                                                                              |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                                                             |
| Operating temperature: | −40 °C to +85 °C                                                                                                                                                      |
| Operating force:       | N: 1.6 N ± 0.5 N<br>R: 2.6 N ± 0.5 N<br>W: 3.2 N ± 0.8 N<br>Y: 5.2 N ± 1.3 N                                                                                          |
| Mechanical life:       | N, R: minimum 1 000 000 operations; W, Y: minimum 300 000 operations                                                                                                  |
| Material:              | Contacts: stainless steel, silver-plated<br>Terminals: brass, silver plated<br>Cover: stainless steel<br>Base: LCP, UL 94 V-0, black, washable<br>Stem: PA, UL 94 V-0 |
| Protection:            | IP 67                                                                                                                                                                 |
| Mounting:              | on pc-board – SMD                                                                                                                                                     |
| Travel:                | 0.4 mm ± 0.2 mm                                                                                                                                                       |

**washable**



## Switches

TSSE 2 ☐ ☐

**Dimension H / Packing:-**

- ☐ 1 4.3 mm / 700 pcs/reel  
☐ 4 7.3 mm / 500 pcs/reel

**Colour of stem**  
- **for operating force:**

- |   |               |
|---|---------------|
| N | 1.6 N, brown  |
| R | 2.6 N, red    |
| W | 3.2 N, white  |
| Y | 5.2 N, yellow |

Caps **KTSC-2** ☐ ☐

**Cap type:**

- ☐ 1 square  
☐ 2 round

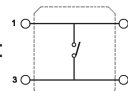
— **Cap colour:**

- Y yellow  
B blue  
R red  
I ivory  
K black  
G green



|                        |                                                                                                                                                 |
|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 42 V DC, 100 mA                                                                                                                                 |
| Contact resistance:    | <100 mΩ                                                                                                                                         |
| Insulation resistance: | >100 MΩ                                                                                                                                         |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                                       |
| Operating temperature: | −40 °C to +80 °C                                                                                                                                |
| Operating force:       | 3.5 N ± 0.6 N                                                                                                                                   |
| Mechanical life:       | > 5 000 000 operations                                                                                                                          |
| Material:              | Contacts: stainless steel, gold-plated<br>Terminals: brass, gold-plated<br>Case: thermoplastics, blue; TSSE 808: black<br>Stem: silicone rubber |
| Protection:            | IP 67                                                                                                                                           |
| Mounting:              | on pc-board, TSSE 808: SMD                                                                                                                      |
| Soldering conditions:  | wave soldering – max. 10 s, max. 260 °C<br>TSSE 808: Jedec STD-020 D (peak 10 s, 260 °C)                                                        |

TSE 808-350      off – mom



Circuit diagram:

## Specifications:

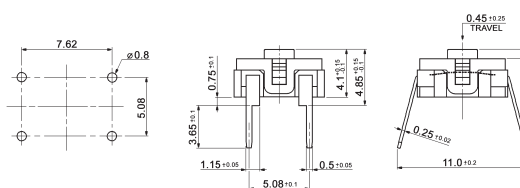
|                        |                                                                                       |
|------------------------|---------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC max., 20 mA max.; 0.5 W max.                                                  |
| Contact resistance:    | <100 mΩ                                                                               |
| Insulation resistance: | >1000 MΩ at 100 V DC                                                                  |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                             |
| Operating temperature: | -40 °C to +85 °C                                                                      |
| Mechanical life:       | minimum 1000 000 operations                                                           |
| Contacts:              | gold-plated over nickel barrier                                                       |
| Travel:                | 0.45 ±0.25 mm                                                                         |
| Operating force:       | 4.5 ±1.0 N                                                                            |
| Terminals:             | brass, tin-plated                                                                     |
| Material:              | case: thermoplastic UL 94 V-0, black, TMP 1-1: blue<br>button: silicon rubber, black; |
| Protection:            | IP 67                                                                                 |
| Mounting:              | on pc-board                                                                           |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 270 °C                                                  |

**washable**

## Models: Switching functions

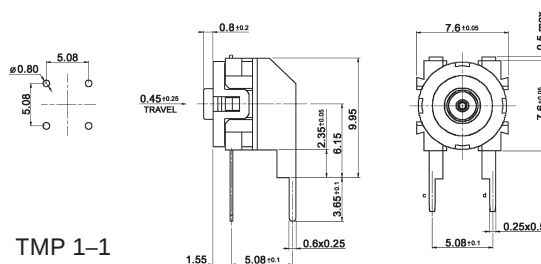
TMP 1  
TMP 1-1

off – mom



TMP 1 – R

off – mom



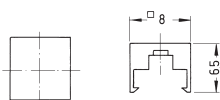
Circuit diagramm:



## Accessories and mounting dimensions:

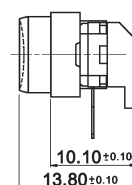
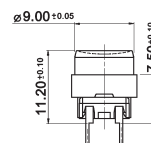
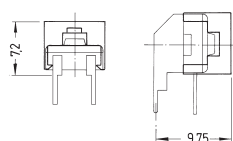
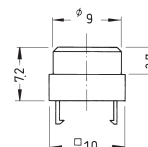
Caps

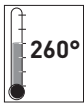
light grey KTT 107



dark grey KTT 217  
light grey KTT 227  
red KTT 209

(More colours in request, MOQ 25 K)





# Tact Switches for SMT, waterproof

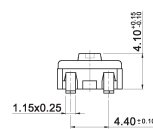
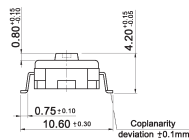
5

## Specifications:

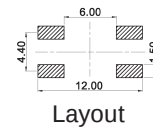
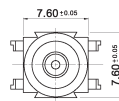
|                        |                                                                                   |
|------------------------|-----------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 20 mA; max. 0.5 W                                                        |
| Contact resistance:    | <100 mΩ                                                                           |
| Insulation resistance: | >1000 MΩ at 100 V DC                                                              |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                         |
| Operating temperature: | -40 °C to +85 °C                                                                  |
| Mechanical life:       | minimum 1000 000 operations                                                       |
| Contacts:              | gold-plated over nickel barrier                                                   |
| Travel:                | 0.75 ±0.25 mm                                                                     |
| Operating force:       | 4.5 ±1.0 N                                                                        |
| Terminals:             | tin-plated over nickel barrier                                                    |
| Material:              | case: PA meets UL 94 V-0, black, TMPS 1-1: white<br>button: silicon rubber, ivory |
| Protection:            | IP 67                                                                             |
| Mounting:              | on pc-board, SMD                                                                  |

## Models: Switching function

TMPS 1 off – mom



TMPS 1-1



Layout



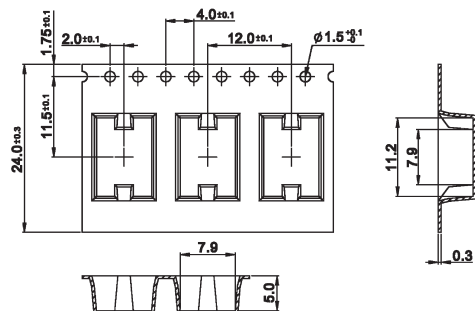
Circuit diagramm:



## Packing:

TMPS 1, TMPS 1-1 50 pieces in stick

TMPS 1T, TMPS 1-1T 1100 pieces/reel



# Tact Switches

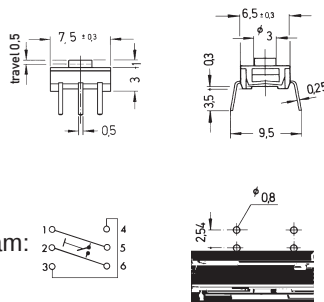
## Specifications:

|                        |                                                    |
|------------------------|----------------------------------------------------|
| Contact rating:        | 48 V DC, 50 mA, max. 1 W                           |
| Contact resistance:    | < 100 mΩ                                           |
| Insulation resistance: | > 100 MΩ at 100 V DC                               |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute          |
| Operating temperature: | -25 °C to +70 °C                                   |
| Mechanical life:       | minimum 300 000 operations                         |
| Contacts:              | phosphor bronze, silver-plated                     |
| Terminals:             | PC terminals                                       |
| Material:              | case: 6TPA resin, washable; frame: stainless steel |
|                        | button: perbunan, black                            |
| Operating force:       | 2,0 N                                              |
| Mounting:              | on pc-board                                        |
| Soldering conditions:  | wave-soldering – max.: 6 sec, 275 °C ± 10 °C       |

## Models: Switching functions

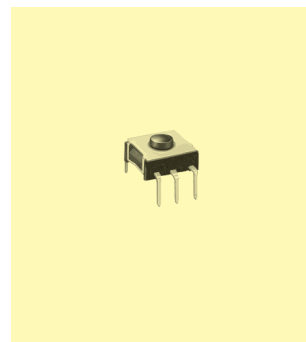
TME 1

off – mom



Circuit diagram:

washable





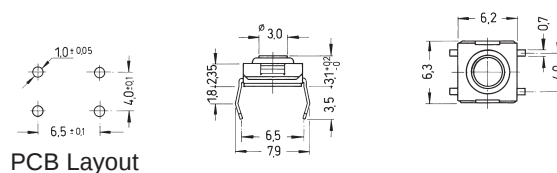
# Tact Switches

## Specifications:

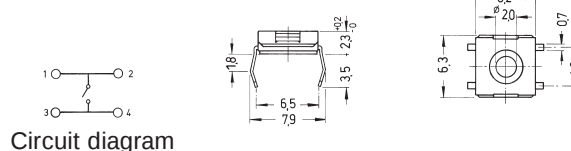
|                        |                                                                                                                                |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 32 V DC, 50 mA; max. 1 VA                                                                                                      |
| Contact resistance:    | < 100 mΩ                                                                                                                       |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                                                           |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                      |
| Operating temperature: | -40 °C to +70 °C                                                                                                               |
| Electrical life:       | TSE 66/68 minimum 100 000 cycles<br>TSE 69 minimum 500 000 cycles                                                              |
| Operating force:       | see ordering code                                                                                                              |
| Contacts:              | phosphor bronze, silver-plated                                                                                                 |
| Terminals:             | PC terminals brass, silver-plated                                                                                              |
| Material:              | cover: stainless steel<br>base: high-temp. nylon meets UL 94 V-0, washable<br>stem: TSE 66: nylon – TSE 68/69: silicone rubber |
| Protection:            | IP 67                                                                                                                          |
| Mounting:              | on pc-board                                                                                                                    |
| Soldering conditions:  | hand-soldering – max.: 30 W, 2 sec, 320 °C<br>wave-soldering – max.: 5 sec, 260 °C<br>subject to PCB 1.6 mm thickness          |
| Packing:               | 75 pcs/tube                                                                                                                    |

## Models:

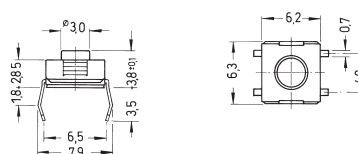
TSE 66 □



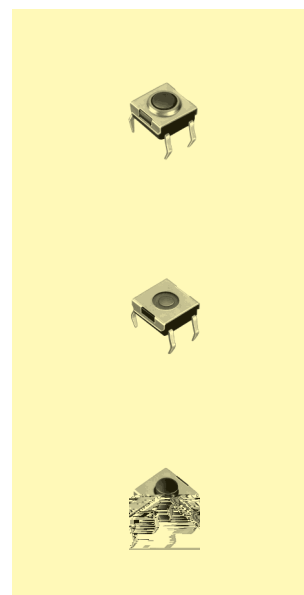
TSE 68 □



TSE 69 □



washable



## Ordering code:

TSE □ □ □

### Dimension

|    |                                  |            |
|----|----------------------------------|------------|
| 66 | 3.1 mm, travel: 0.25 + 0.2/- 0.1 | brown (N)  |
| 68 | 2.3 mm, travel: 0.25 + 0.2/- 0.1 | silver (S) |
| 69 | 3.8 mm, travel: 0.45 ± 0.2       | red (R)    |
| 69 | 3.8 mm, travel: 0.45 ± 0.2       | brown (N)  |

Further types on request

### Colour of stem for operating force:

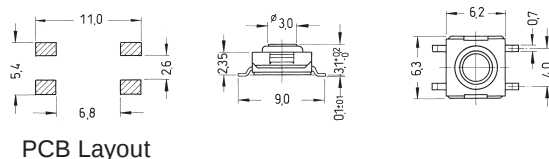
|   |               |
|---|---------------|
| S | 1.6 N, silver |
| N | 1.6 N, brown  |
| R | 2.6 N, red    |

## Specifications:

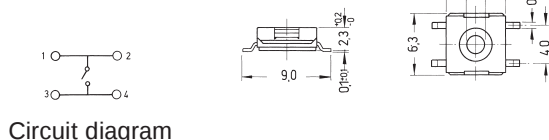
|                        |                                                                                                                                        |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 32 V DC, 50 mA; max. 1 VA                                                                                                              |
| Contact resistance:    | < 100 mΩ                                                                                                                               |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                                                                   |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                              |
| Operating temperature: | −40 °C to +85 °C                                                                                                                       |
| Electrical life:       | TSSE 66/68 minimum 100 000 cycles<br>TSSE 65/67/69 minimum 500 000 cycles                                                              |
| Operating force:       | see ordering code                                                                                                                      |
| Contacts:              | phosphor bronze, silver-plated                                                                                                         |
| Terminals:             | brass, silver-plated                                                                                                                   |
| Material:              | cover: stainless steel<br>base: high-temp. nylon meets UL 94 V-0, washable<br>stem: TSSE 66: nylon – TSSE 65/67/68/69: silicone rubber |
| Protection:            | IP 67                                                                                                                                  |
| Mounting:              | on pc-board – SMD                                                                                                                      |
| Packing:               | on tapes – see ordering code                                                                                                           |

## Models:

TSSE 66 ☐



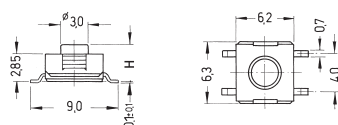
TSSE 68 ☐



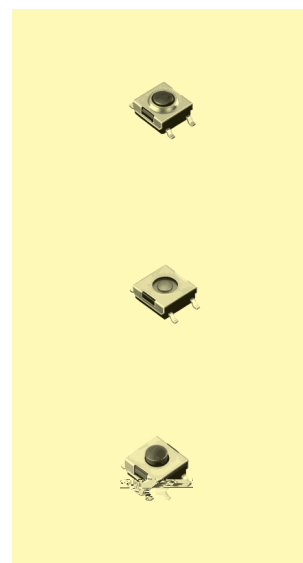
TSSE 65 ☐

TSSE 67 ☐

TSSE 69 ☐



washable



## Ordering code:

TSSE ☐ ☐

### Dimension H

|                             |                                  |             |                        |
|-----------------------------|----------------------------------|-------------|------------------------|
| <input type="checkbox"/> 65 | 3.5 mm, travel: 0.45 ± 0.2       | brown       | (N) / 1900 pieces/reel |
| <input type="checkbox"/> 65 | 3.5 mm, travel: 0.45 ± 0.2       | red         | (R) / 1900 pieces/reel |
| <input type="checkbox"/> 65 | 3.5 mm, travel: 0.45 ± 0.2       | transparent | (T) / 1900 pieces/reel |
| <input type="checkbox"/> 66 | 3.1 mm, travel: 0.25 + 0.2/− 0.1 | brown       | (N) / 2000 pieces/reel |
| <input type="checkbox"/> 67 | 5.2 mm, travel: 0.45 ± 0.2       | brown       | (N) / 900 pieces/reel  |
| <input type="checkbox"/> 67 | 5.2 mm, travel: 0.45 ± 0.2       | red         | (R) / 900 pieces/reel  |
| <input type="checkbox"/> 67 | 5.2 mm, travel: 0.6 ± 0.2        | transparent | (T) / 900 pieces/reel  |
| <input type="checkbox"/> 68 | 2.3 mm, travel: 0.25 + 0.2/− 0.1 | silver      | (S) / 2000 pieces/reel |
| <input type="checkbox"/> 69 | 3.8 mm, travel: 0.45 ± 0.2       | red         | (R) / 1900 pieces/reel |
| <input type="checkbox"/> 69 | 3.8 mm, travel: 0.45 ± 0.2       | brown       | (N) / 1900 pieces/reel |
| <input type="checkbox"/> 69 | 3.8 mm, travel: 0.6 ± 0.2        | transparent | (T) / 1900 pieces/reel |

### Colour of stem

#### for operating force:

|                            |                    |
|----------------------------|--------------------|
| <input type="checkbox"/> S | 1.6 N, silver      |
| <input type="checkbox"/> N | 1.6 N, brown       |
| <input type="checkbox"/> R | 2.6 N, red         |
| <input type="checkbox"/> T | 3.6 N, transparent |

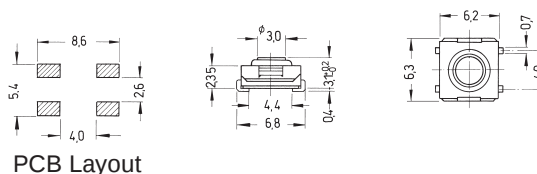
Further types on request

## Specifications:

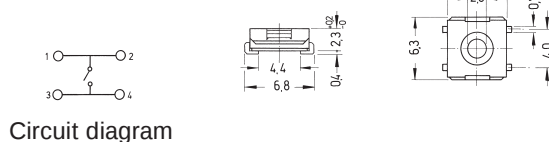
|                        |                                                                                                                                            |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 32 V DC, 50 mA; max. 1 VA                                                                                                                  |
| Contact resistance:    | < 100 mΩ                                                                                                                                   |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                                                                       |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                                  |
| Operating temperature: | -40 °C to +85 °C                                                                                                                           |
| Electrical life:       | TSSE 66-J/68-J: minimum 100 000 cycles<br>TSSE 65-J/67-J/69-J: minimum 500 000 cycles                                                      |
| Operating force:       | see ordering code                                                                                                                          |
| Contacts:              | phosphor bronze, silver-plated                                                                                                             |
| Terminals:             | brass, silver-plated                                                                                                                       |
| Material:              | cover: stainless steel<br>base: high-temp. nylon meets UL 94 V-0, washable<br>stem: TSSE 66 J: nylon – TSSE 65/67/68/69 J: silicone rubber |
| Protection:            | IP 67                                                                                                                                      |
| Mounting:              | on pc-board – SMD                                                                                                                          |
| Packing:               | on tapes – see ordering code                                                                                                               |

## Models:

TSSE 66 □ - J



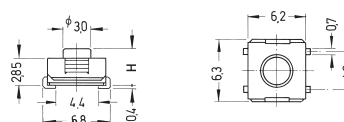
TSSE 68 □ - J



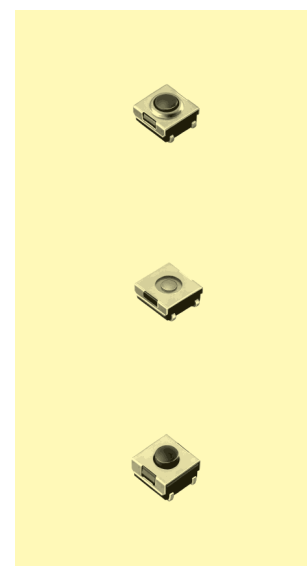
TSSE 65 □ - J

TSSE 67 □ - J

TSSE 69 □ - J



washable



## Ordering code:

TSSE □ □ - J

### Dimension H

|    |                                 |             |                        |
|----|---------------------------------|-------------|------------------------|
| 65 | 3.5 mm, travel: 0.45 ± 0.2      | brown       | (N) / 1800 pieces/reel |
| 65 | 3.5 mm, travel: 0.45 ± 0.2      | red         | (R) / 1800 pieces/reel |
| 65 | 3.5 mm, travel: 0.45 ± 0.2      | transparent | (T) / 1800 pieces/reel |
| 66 | 3.1 mm, travel: 0.25 + 0.2/-0.1 | brown       | (N) / 1900 pieces/reel |
| 67 | 5.2 mm, travel: 0.45 ± 0.2      | brown       | (N) / 900 pieces/reel  |
| 67 | 5.2 mm, travel: 0.45 ± 0.2      | red         | (R) / 900 pieces/reel  |
| 67 | 5.2 mm, travel: 0.6 ± 0.2       | transparent | (T) / 900 pieces/reel  |
| 68 | 2.3 mm, travel: 0.25 + 0.2/-0.1 | silver      | (S) / 2700 pieces/reel |
| 69 | 3.8 mm, travel: 0.45 ± 0.2      | red         | (R) / 1800 pieces/reel |
| 69 | 3.8 mm, travel: 0.45 ± 0.2      | brown       | (N) / 1800 pieces/reel |
| 69 | 3.8 mm, travel: 0.6 ± 0.2       | transparent | (T) / 1800 pieces/reel |

### Colour of stem

#### for operating force:

|   |                    |
|---|--------------------|
| S | 1.6 N, silver      |
| N | 1.6 N, brown       |
| R | 2.6 N, red         |
| T | 3.6 N, transparent |

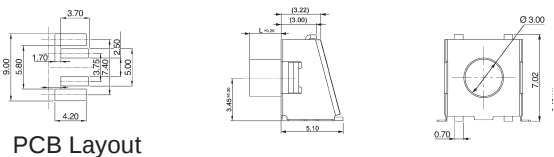
Further types on request

## Specifications:

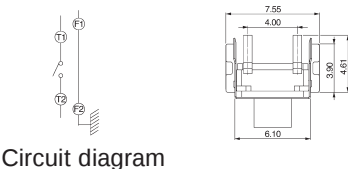
|                        |                                                                                           |
|------------------------|-------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                            |
| Contact resistance:    | < 100 mΩ                                                                                  |
| Insulation resistance: | > 100 MΩ                                                                                  |
| Dielectric strength:   | 250 V AC (50 Hz or 60 Hz) for 1 minute                                                    |
| Operating temperature: | −40 °C to +85 °C                                                                          |
| Operating force:       | see ordering code                                                                         |
| Mechanical life:       | minimum 500 000 cycles                                                                    |
| Material:              | cover: nickel, silver-plated<br>case: high-temp. PA 9T UL 94 V-0, black<br>stem: silicone |
| Contacts:              | phosphor bronze, silver-plated                                                            |
| Terminals:             | brass, silver-plated                                                                      |
| Protection:            | IP 57                                                                                     |
| Packing:               | on tapes – see ordering code                                                              |

## Models:

TSSE 6 ☐ ☐ -RA

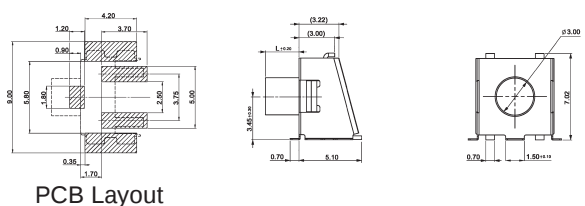


PCB Layout



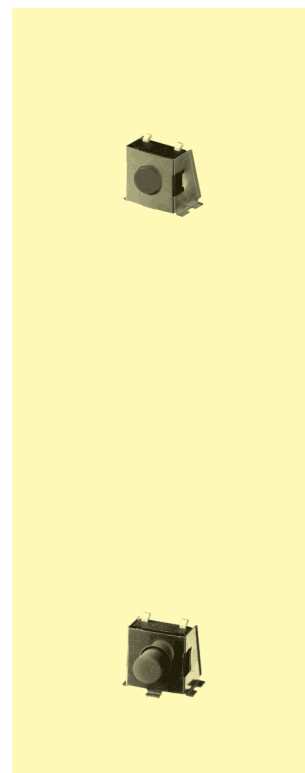
Circuit diagram

TSSE 6 ☐ ☐ -RA-1



PCB Layout

washable



## Ordering code:

TSSE 6 ☐ ☐ -RA ☐

### Actuator height (L):

|                             |         |                |
|-----------------------------|---------|----------------|
| <input type="checkbox"/> 00 | 0 mm    | 700 pcs / reel |
| <input type="checkbox"/> 08 | 0.8 mm  | 700 pcs / reel |
| <input type="checkbox"/> 10 | 1.0 mm  | 700 pcs / reel |
| <input type="checkbox"/> 23 | 2.35 mm | 700 pcs / reel |
| <input type="checkbox"/> 33 | 3.3 mm  | 500 pcs / reel |

### Operating force:

|                             |               |
|-----------------------------|---------------|
| <input type="checkbox"/> N  | 1.8 N (brown) |
| <input type="checkbox"/> R  | 2.6 N (red)   |
| <input type="checkbox"/> NK | 1.8 N (black) |
| <input type="checkbox"/> RK | 2.6 N (black) |

☐ No support terminals

☒ With support terminals

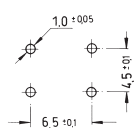
# Tact Switches

## Specifications:

|                        |                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                                                        |
| Contact resistance:    | < 100 mΩ                                                                                                              |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                                                  |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                             |
| Operating temperature: | −40 °C to +85 °C                                                                                                      |
| Electrical life:       | 1.0 N/1.6 N: minimum 200 000 cycles<br>2.6 N: minimum 100 000 cycles<br>3.2 N/5.2 N: minimum 50 000 cycles            |
| Operating force:       | see ordering code                                                                                                     |
| Contacts:              | phosphor bronze, silver-plated                                                                                        |
| Terminals:             | PC terminals, brass, silver-plated                                                                                    |
| Material:              | cover: stainless steel<br>base and stem: nylon meets UL 94 V-0; caps ABS                                              |
| Mounting:              | on pc-board                                                                                                           |
| Soldering conditions:  | hand-soldering – max.: 30 W, 2 sec, 320 °C<br>wave-soldering – max.: 5 sec, 260 °C<br>subject to PCB 1.6 mm thickness |
| Travel:                | 0.25 mm + 0.2/− 0.1 mm                                                                                                |

## Models:

TS 6□□



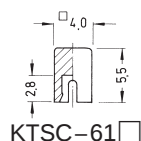
PCB Layout

TS 644□

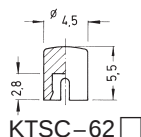
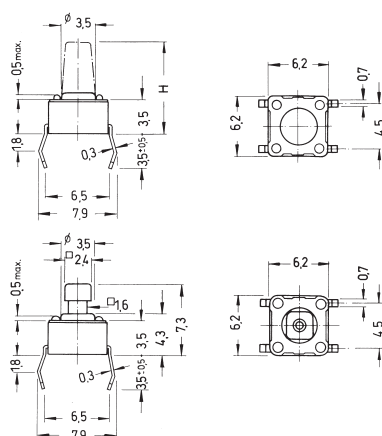


Circuit diagram

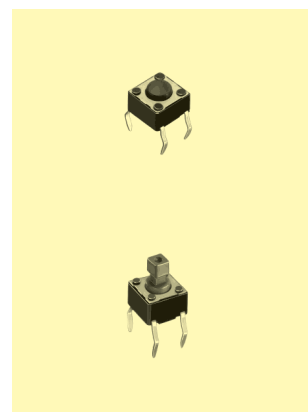
Caps for TS 644□



KTSC-61□



KTSC-62□



## Ordering code:

Switches TS 6□□

### Dimension H

- 1 4.3 mm
- 2 5.0 mm
- 3 7.0 mm
- 44 7.3 mm\*
- 5 9.5 mm
- 6 13.0 mm
- 8 11.3 mm
- 9 19.5 mm

\* only with square stem

### Colour of stem for operating force:

- K 1.0 N, black
- N 1.6 N, brown
- R 2.6 N, red
- S 3.2 N, salmon
- Y 5.2 N, yellow

Caps KTSC-6□□

### Cap type:

- 1 square
- 2 round

### Cap colour:

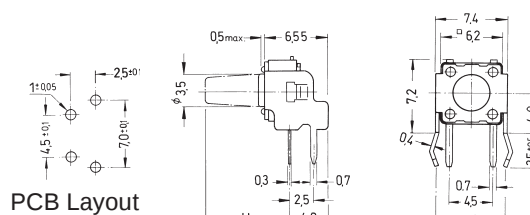
- Y yellow
- B blue
- R red
- I ivory
- K black
- G green

## Specifications:

|                        |                                                                                                                       |
|------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                                                        |
| Contact resistance:    | < 100 mΩ                                                                                                              |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                                                  |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                             |
| Operating temperature: | −40 °C to +85 °C                                                                                                      |
| Electrical life:       | 1.0 N/1.6 N: minimum 200 000 cycles<br>2.6 N: minimum 100 000 cycles<br>3.2 N/5.2 N: minimum 50 000 cycles            |
| Operating force:       | see ordering code                                                                                                     |
| Contacts:              | phosphor bronze, silver-plated                                                                                        |
| Terminals:             | PC terminals, brass, silver-plated                                                                                    |
| Material:              | cover: steel, tin-plated<br>base and stem: nylon meets UL 94 V-0; caps ABS                                            |
| Mounting:              | on pc-board                                                                                                           |
| Soldering conditions:  | hand-soldering – max.: 30 W, 2 sec, 320 °C<br>wave-soldering – max.: 5 sec, 260 °C<br>subject to PCB 1.6 mm thickness |
| Travel:                | 0.25 mm + 0.2/− 0.1 mm                                                                                                |

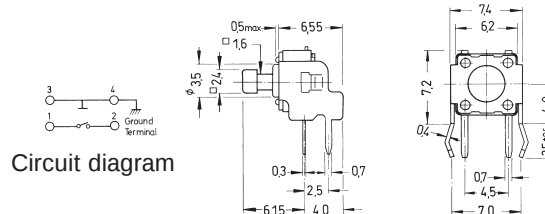
## Models:

TS 6□□-RA



PCB Layout

TS 644□-RA



Circuit diagram

Caps for TS 644 □-RA



KTSC-61□

KTSC-62□

## Ordering code:

Switches TS 6□□-RA

Dimension H

|    |          |
|----|----------|
| 1  | 3.15 mm  |
| 2  | 3.85 mm  |
| 3  | 5.85 mm  |
| 44 | 6.15 mm* |
| 5  | 8.35 mm  |
| 6  | 11.85 mm |

\* only with square stem

Colour of stem  
for operating force:

|   |               |
|---|---------------|
| K | 1.0 N, black  |
| N | 1.6 N, brown  |
| R | 2.6 N, red    |
| S | 3.2 N, salmon |
| Y | 5.2 N, yellow |

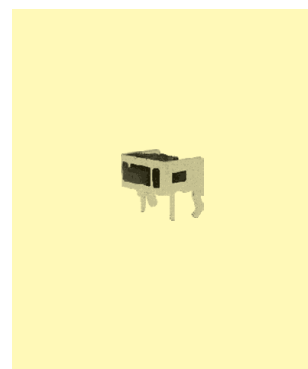
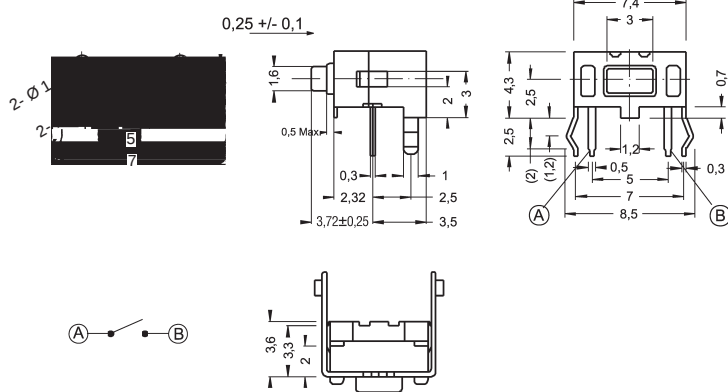
Caps KTSC-6□□

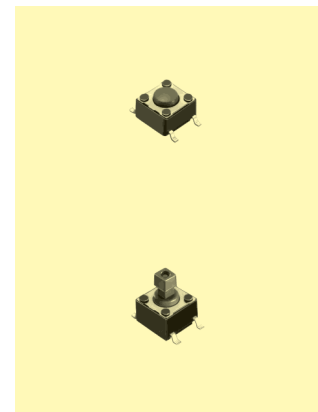
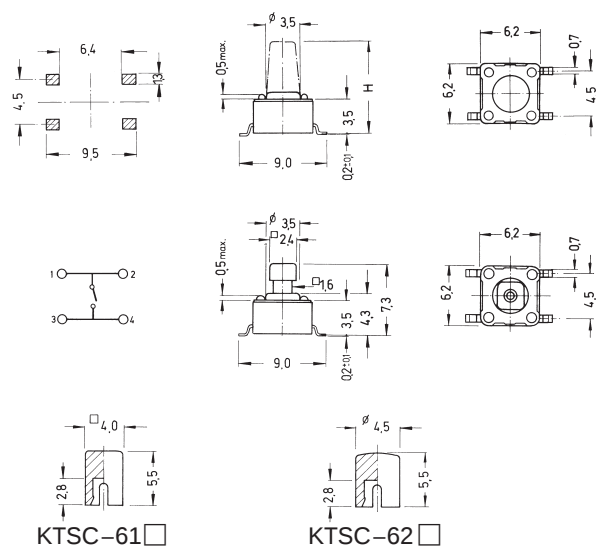
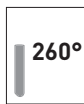
Cap type:

|   |        |
|---|--------|
| 1 | square |
| 2 | round  |

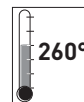
Cap colour:

|   |        |
|---|--------|
| Y | yellow |
| B | blue   |
| R | red    |
| I | ivory  |
| K | black  |
| G | green  |





# Long Travel Tact switch for SMT

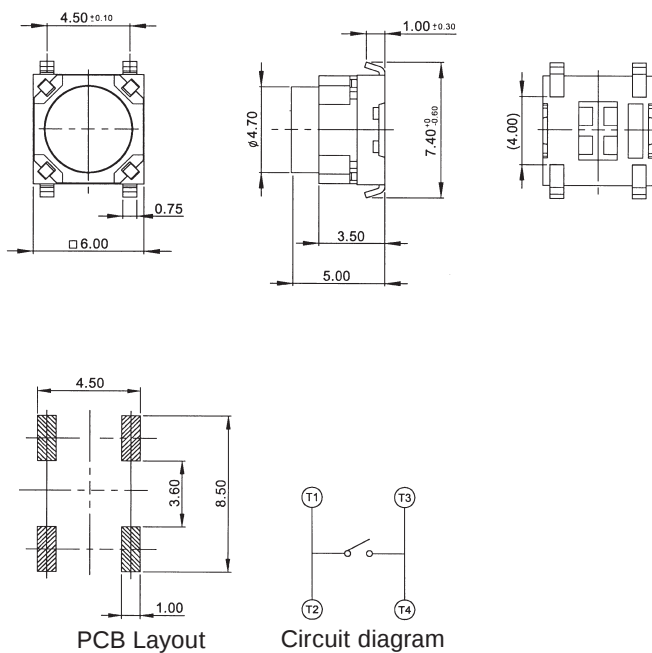


## Specifications:

|                        |                                           |
|------------------------|-------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA,                           |
| Contact resistance:    | <100 mΩ                                   |
| Insulation resistance: | >100 MΩ                                   |
| Dielectric strength:   | 300 V, 50 Hz for the duration of 1 minute |
| Operating temperature: | -40 °C to +85 °C                          |
| Mechanical life:       | minimum 100 000 cycles                    |
| Operating force:       | R: 200 gf ± 50 gf<br>S: 350 gf ± 100 gf   |
| Contacts:              | gold-plated                               |
| Terminals:             | silver-plated                             |
| Material:              | case and actuator: Nylon meets UL 94V-0   |
| Mounting:              | on pc-board – SMD                         |
| Travel:                | 1.3 mm + 0.1/-0.3 mm                      |
| Packing:               | 900 pieces/reel                           |

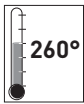
## Models:

TSS 650 □-J



Ordering code: TSS 650 □-J

Operating force: R 2.0 N  
S 3.5 N



# Tact Switches for SMT

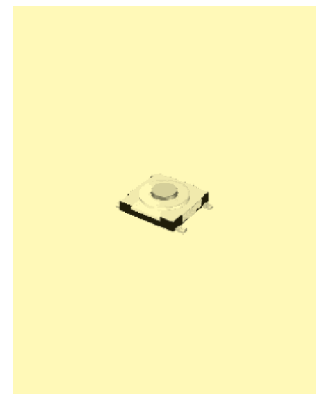
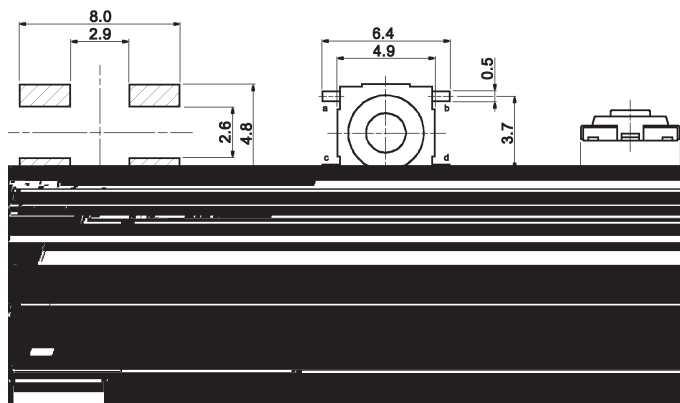
## Specifications:

|                        |                                                  |
|------------------------|--------------------------------------------------|
| Contact rating:        | 42 V DC max., 50 mA max., 0.6 VA max.            |
| Contact resistance:    | < 100 mΩ                                         |
| Insulation resistance: | > 100 MΩ                                         |
| Dielectric strength:   | 500 V (50/60 Hz)<br>for the duration of 1 minute |
| Operating temperature: | -25 °C to +80 °C                                 |
| Operating force:       | 2.5 N ± 0.7 N                                    |
| Mechanical life:       | 100 000 cycles                                   |
| Contacts:              | silver-plated                                    |
| Mounting:              | on pc-board – SMD                                |
| Travel:                | 0.25 mm + 0.1/-0,2 mm                            |
| Packing:               | 4000 pcs/reel                                    |

5

## Model:

TSS 507



## Specifications:

|                        |                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 100 mA max.                                                                        |
| Contact resistance:    | < 100 mΩ                                                                                    |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                        |
| Dielectric strength:   | 250 V AC, 50 Hz for the duration of 1 minute                                                |
| Operating temperature: | -55 °C to +125 °C                                                                           |
| Electrical life:       | minimum 100 000 cycles                                                                      |
| Operating force:       | 3.0 ± 1.0 N                                                                                 |
| Contacts/terminals:    | gold-plated/silver-plated                                                                   |
| Material:              | cover: stainless steel,<br>base: high-temp. nylon meets UL 94 V-0,<br>stem: silicone rubber |
| Mounting:              | on pc-board – SMD                                                                           |
| Soldering conditions:  | max.: 5 sec, 260 °C                                                                         |
| Travel:                | max. 1.27 mm                                                                                |

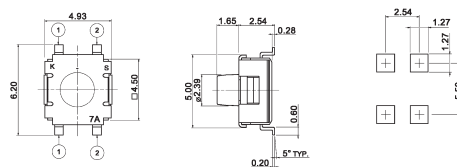
## Models:

Switching functions:

washable

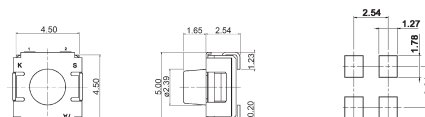
TMSE 10

off – mom



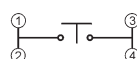
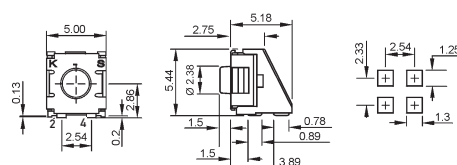
TMSE 10 J

off – mom



TMSE 10 J-RA

off – mom



Packing:

|               |               |
|---------------|---------------|
| TMSE 10:      | 1000 pcs/reel |
| TMSE 10 J:    | 1000 pcs/reel |
| TMSE 10 J-RA: | 900 pcs/reel  |

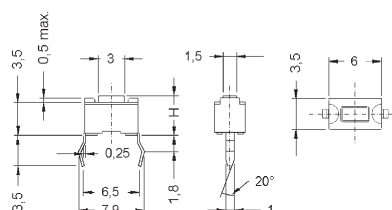
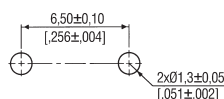


## Specifications:

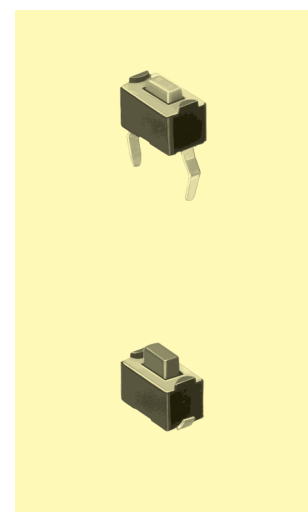
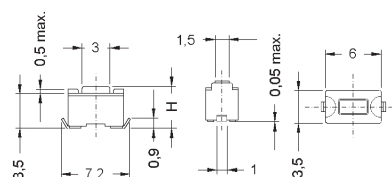
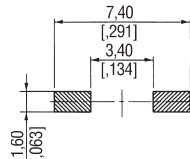
|                        |                                                                                                                                                                    |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                                                                                                     |
| Contact resistance:    | <100 mΩ                                                                                                                                                            |
| Insulation resistance: | >100 MΩ at 500 V DC                                                                                                                                                |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                                                                                          |
| Operating temperature: | -25 °C to +70 °C                                                                                                                                                   |
| Electrical life:       | 1.6 N: minimum 50 000 cycles<br>2.6 N / 3.2 N / 5.2 N: minimum 30 000 cycles                                                                                       |
| Operating force:       | see ordering code                                                                                                                                                  |
| Contacts:              | stainless steel, silver-plated                                                                                                                                     |
| Terminals:             | brass, silver-plated                                                                                                                                               |
| Material:              | cover: stainless steel<br>base and stem: high-temp. nylon meets UL 94 V-0 or PPA                                                                                   |
| Mounting:              | TS 3: on pc-board<br>TSS 3: on pc-board – SMD                                                                                                                      |
| Soldering conditions:  | TS 3: hand-soldering – max.: 30 W, 2 sec, 320 °C<br>wave-soldering – max.: 5 sec, 260 °C<br>subject to PCB 1.6 mm thickness<br>TSS 3: reflow-soldering, see page 5 |
| Travel:                | 0.25 mm + 0.2/- 0.1 mm                                                                                                                                             |

## Models:

TS 3 □ □



TSS 3 □ □



Ordering Code: TS 3 / TSS 3 □ □

Dimension H

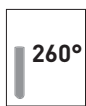
- 1 4.3 mm
- 2 5.0 mm

Colour of stem

for operating force:

- N brown, 1.6 N
- R red, 2.6 N
- S salmon, 3.2 N
- Y yellow, 5.2 N

|          |        |                             |
|----------|--------|-----------------------------|
| Packing: | TS 3   | in tubes, 135 pieces / tube |
|          | TSS 31 | on tape, 1800 pieces / reel |
|          | TSS 32 | on tape, 1600 pieces / reel |



5

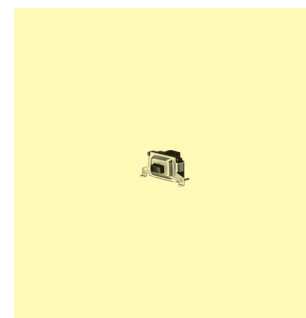
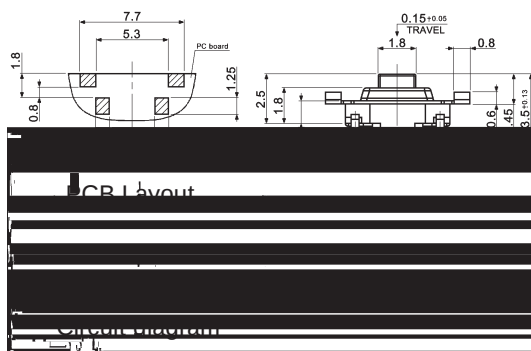


## Specifications:

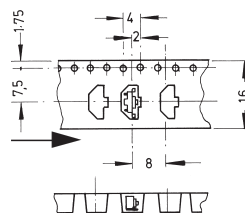
|                        |                                               |
|------------------------|-----------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA / 1 V DC, 0.5 mA               |
| Contact resistance:    | < 100 mΩ                                      |
| Insulation resistance: | > 2 GΩ at 100 V DC                            |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute     |
| Operating temperature: | -40 °C to +85 °C                              |
| Electrical life:       | minimum 250 000 cycles                        |
| Operating force:       | 2.16 N ± 0.59 N                               |
| Contacts:              | metal contact, stainless steel, silver-plated |
| Terminals:             | phosphor bronze, silver-plated                |
| Material:              | case: PA9T                                    |
|                        | button: PA9T                                  |
|                        | frame: phosphor bronze, tin-plated            |
| Mounting:              | on pc-board – SMD                             |
| Travel:                | 0.15 mm ± 0.05 mm                             |

## Model:

TSS 4-RA



Packing: 2000 pcs/reel





# Multi-Function Tact Switches for SMT

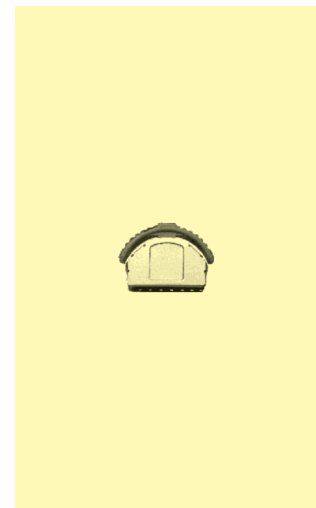
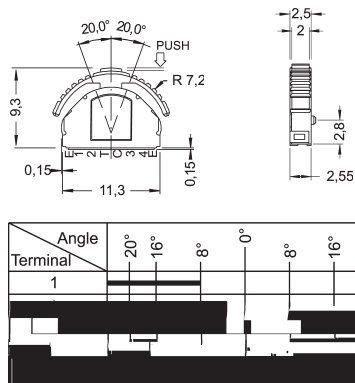
5

## Specification:

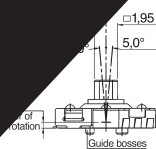
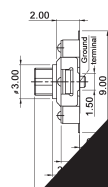
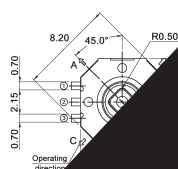
|                        |                                              |
|------------------------|----------------------------------------------|
| Contact rating:        | 5 V DC, 10 mA                                |
| Contact resistance:    | < 500 mΩ                                     |
| Insulation resistance: | > 100 MΩ                                     |
| Dielectric strength:   | 100 V, 50 Hz for the duration of 1 minute    |
| Operating temperature: | −10 °C to +70 °C                             |
| Storage temperature:   | −25 °C to +85 °C                             |
| Mechanical life:       | minimum 100 000 cycles                       |
| Contacts:              | phosphor bronze silver-plated                |
| Mounting:              | on pc-board – SMD                            |
| Soldering conditions:  | reflow-soldering – max.: 260 °C, 10 sec max. |

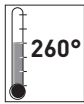
## Models:

PLSJ 1



Packing unit: 1000 pieces per reel





# Miniature Tact Switches for SMT

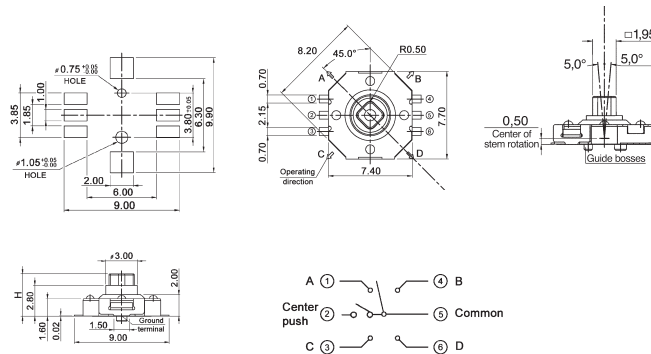
## Specifications:

|                        |                                                                                                                                                     |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                                                                                      |
| Contact resistance:    | < 100 mΩ                                                                                                                                            |
| Insulation resistance: | > 100 MΩ                                                                                                                                            |
| Dielectric strength:   | 250 V AC (50 Hz or 60 Hz) for 1 minute                                                                                                              |
| Operating temperature: | -40 °C to +85 °C                                                                                                                                    |
| Operating force:       | center: 3.6 N ± 0.6 N; 4 directions: 1.6 N ± 0.5 N                                                                                                  |
| Mechanical life:       | minimum 100 000 cycles                                                                                                                              |
| Material:              | Cover: nickel plated<br>Stem: high-temp. LCP<br>Contact: stainless steel<br>Terminal: phosphor bronze, silver-plated<br>Base: high-temp. LCP, black |
| Packing:               | 850 pcs/reel                                                                                                                                        |

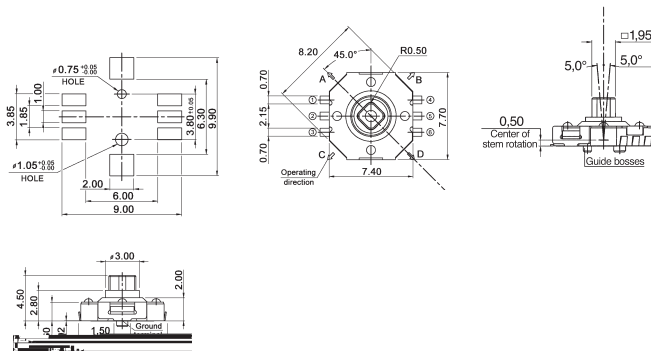
5

## Models:

TSSJ 5

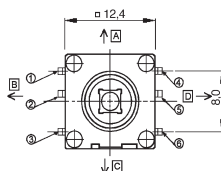
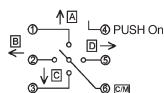
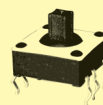
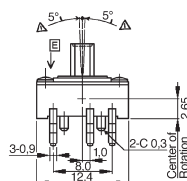
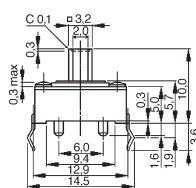
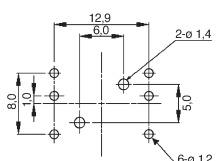


TSSJ 5-J

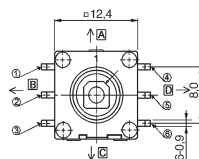
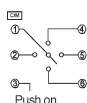
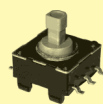
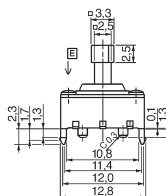
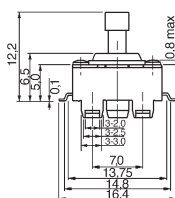
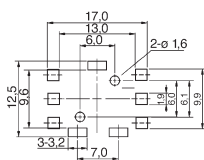


|                        |                                                                                               |
|------------------------|-----------------------------------------------------------------------------------------------|
| Contact rating:        | 15 V DC, 20 mA                                                                                |
| Contact resistance:    | <100 mΩ                                                                                       |
| Insulation resistance: | >100 MΩ                                                                                       |
| Dielectric strength:   | 100 V, 50 Hz for the duration of 1 minute                                                     |
| Operating temperature: | -25 °C to +70 °C                                                                              |
| Mechanical life:       | minimum 50 000 cycles per direction                                                           |
| Contacts:              | phosphor bronze silver-plated                                                                 |
| Mounting:              | TSJ 31: on pc-board<br>TSSJ 30: on pc-board – SMD                                             |
| Soldering conditions:  | TSJ 31: auto-soldering: 255 °C, 5 sec max.<br>TSSJ 30: reflow-soldering: 245 °C, 2.5 sec max. |
| Packing:               | 300 pcs/tray                                                                                  |

## TSJ 31



| Direction | Connection |
|-----------|------------|
| A         | 1 - 6      |
| B         | 2 - 6      |
| C         | 3 - 6      |
| D         | 5 - 6      |
| E (push)  | 4 - 6      |

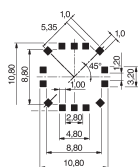
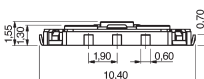
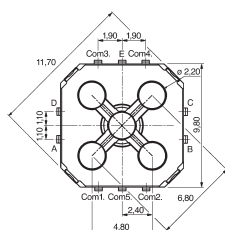


| Direction | Connection |
|-----------|------------|
| A         | 1 = 4      |
| B         | 1 = 2      |
| C         | 1 = 6      |
| D         | 1 = 5      |
| E (push)  | 1 = 3      |

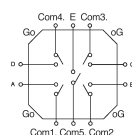


|                        |                                                                                                                                                      |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 50 mA                                                                                                                                       |
| Contact resistance:    | < 100 mΩ                                                                                                                                             |
| Insulation resistance: | > 100 MΩ                                                                                                                                             |
| Dielectric strength:   | 250 V AC (50–60 Hz) for 1 minute                                                                                                                     |
| Operating temperature: | –20 °C to +70 °C                                                                                                                                     |
| Mechanical life:       | minimum 200 000 cycles                                                                                                                               |
| Operating force:       | Center: 3.6 N ± 0.7 N, four directions: 1.8 N ± 0.6 N                                                                                                |
| Material:              | Case and stem: Nylon UL 94 V–0, black<br>Cover: nickel, silver-plated<br>Contacts: stainless steel, silver-plated<br>Terminals: brass, silver-plated |
| Travel:                | 0.25 + 0.15 / – 0.1 mm                                                                                                                               |
| Packing:               | 2500 pcs/reel                                                                                                                                        |

## TSSJ 55



## PCB Layout



### Circuit diagram





# 6

## Slide Switches

### 6.1 Professional Slide Switches



| Type        | Operating |      | Case    |       | Operating positions | Poles | Page    |
|-------------|-----------|------|---------|-------|---------------------|-------|---------|
|             | top       | side | Plastic | Metal |                     |       |         |
| ASE         | •         |      | •       |       | 2-3                 | 1-2   | 98-99   |
| ASE-RA      |           | •    | •       |       | 2-3                 | 1-2   | 98-99   |
| MFP/MFS 106 | •         |      | •       |       | 2                   | 1     | 100     |
| MFP/MFS 126 | •         | •    |         | •     | 2-3                 | 1-2   | 101     |
| MSS 3000    | •         | •    | •       |       | 2                   | 1-2   | 102     |
| MFP 100     | •         |      |         | •     | 2-5                 | 1     | 103     |
| MFP 100-R   |           | •    |         | •     | 2-5                 | 1     | 103     |
| MFP 200     | •         |      |         | •     | 2-6                 | 2     | 103     |
| MFP 1000    | •         |      |         | •     | 2-6                 | 1     | 104     |
| MFP 1000-R  |           | •    |         | •     | 2-6                 | 1     | 104     |
| MFP 2000    | •         |      |         | •     | 2-6                 | 2     | 105     |
| MFP 2000-R  |           | •    |         | •     | 2-3                 | 2     | 105     |
| MFP x6x     | •         |      | •       |       | 1-3                 | 1-6   | 106     |
| MFP x6x-RA  |           | •    | •       |       | 1-3                 | 2-4   | 107     |
| other       | •         | •    |         | •     | 1-3                 | 1-2   | 108-114 |

### 6.2 Microminiature Slide Switches



| Type        | Operating |      | Terminals |     | Operating positions | Poles | Page |
|-------------|-----------|------|-----------|-----|---------------------|-------|------|
|             | top       | side | T/H       | SMD |                     |       |      |
| MMSP 100    |           | •    |           | •   | 3+ push             | 1     | 115  |
| MMP 100     | •         |      | •         |     | 2-3                 | 1     | 116  |
| MMP 200     | •         |      | •         |     | 2-3                 | 2     | 116  |
| MMP 100-R   |           | •    | •         |     | 2-3                 | 1     | 117  |
| MMP 200-R   |           | •    | •         |     | 2-3                 | 2     | 118  |
| MMS 100/200 |           | •    |           | •   | 2-3                 | 1-2   | 119  |
| MMS 200 T   | •         |      |           | •   | 2-3                 | 2     | 120  |
| MMP 1010    | •         |      | •         |     | 2                   | 1     | 121  |
| MMP 1010-R  |           | •    | •         |     | 2                   | 1     | 121  |
| MMS 1010-R  |           | •    |           | •   | 2                   | 1     | 122  |





Switching function – the closed contacts correspond to the slide position

6

on off on



knitter-switch | 99

# Miniature Slide Switches

## Specifications:

|                        |                                             |
|------------------------|---------------------------------------------|
| Contact rating:        | 250 V AC, 2A / 120 V AC, 5 A / 28 V DC, 4 A |
| Contact resistance:    | < 20 mΩ                                     |
| Insulation resistance: | > 1000 MΩ                                   |
| Dielectric strength:   | 1000 V, 50 Hz for the duration of 1 minute  |
| Operating temperature: | -10 °C to +60 °C                            |
| Mechanical life:       | min. 20 000 operations                      |
| Contacts:              | copper alloy, silver plated                 |
| also available:        | gold-plated, version G                      |
| Terminals:             | MFP PC terminals, MFS solder tags           |

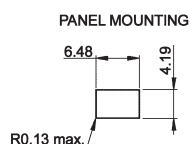
6

## Models: Switching functions

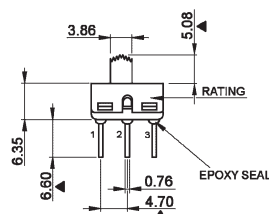
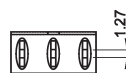
S P D T

MFP 106 D

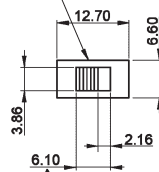
on - on



P.C. MOUNTING



DATE CODE

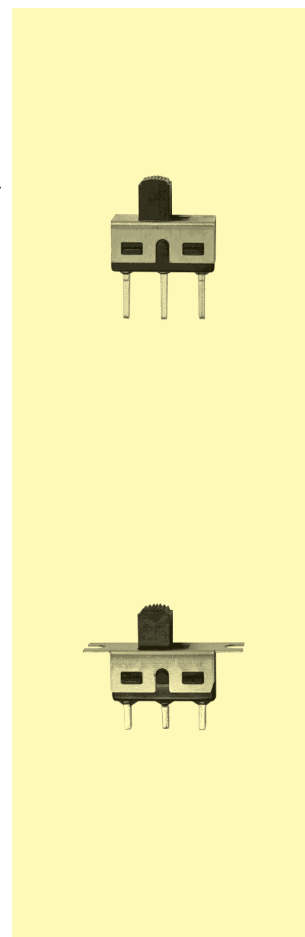
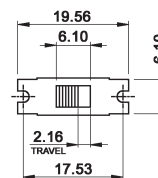
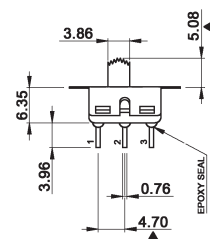
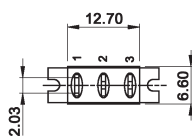
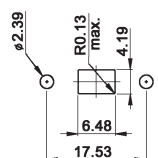


S P D T

MFS 106 D

on - on

PANEL MOUNTING

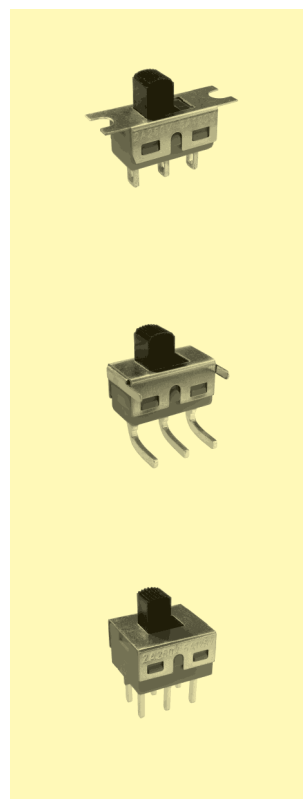


## Specifications:

|                        |                                                                       |
|------------------------|-----------------------------------------------------------------------|
| Contact rating:        | 250 V AC, 2 A / 120 V AC, 5 A / 28 V DC, 5 A                          |
| Contact resistance:    | < 10 mΩ                                                               |
| Insulation resistance: | > 1000 MΩ                                                             |
| Dielectric strength:   | 1000 V, 50 Hz for the duration of 1 minute                            |
| Operating temperature: | – 30 °C to + 85 °C                                                    |
| Mechanical life:       | min. 30 000 operations                                                |
| Contacts:              | copper alloy, silver plated or gold plated or gold over silver plated |
| Terminals:             | MFP, MFS: solder lugs, MFP-PC: PC terminals                           |

## Models: Switching functions

|              |           |  |
|--------------|-----------|--|
| MFS 126 E    | on off on |  |
| MFP 126 D-RA | on – on   |  |
| MFP 226 N-PC | on – on   |  |



## Ordering code: MF□□□□ - □

### Housing:

- ☐ P Standard
- ☐ S with ears

### Poles:

- ☐ 126 single
- ☐ 226 double

### Function:

- ☐ F on-mom, SP
- ☐ D on-on, SP
- ☐ E on-off-on, SP
- ☐ N on-on, DP
- ☐ P on-off-on, DP

### Surface:

- ☐ silver
- ☐ B gold
- ☐ G gold over silver

### Mounting:

- ☐ straight, solder-lugs
- ☐ PC straight, PCB-terminals
- ☐ RA right angle
- ☐ VM vertical mount

# Miniature Slide Switches

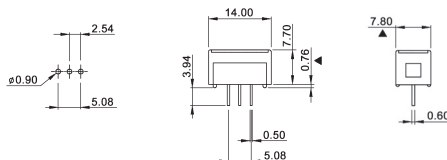
## Specifications:

|                        |                                                                    |
|------------------------|--------------------------------------------------------------------|
| Contact rating:        | 250 V AC, 1 A / 120 V AC or 28 V DC, 3 A                           |
| Contact resistance:    | < 50 mΩ                                                            |
| Insulation resistance: | > 1000 MΩ                                                          |
| Dielectric strength:   | 1000 V, 50 Hz for the duration of 1 minute                         |
| Operating temperature: | -40 °C to +85 °C                                                   |
| Mechanical life:       | minimum 20 000 operations                                          |
| Material:              | Actuator: nylon, black<br>Case: nylon, black<br>Base: nylon, white |
| Contacts/Terminals:    | copper alloy, silver-plating                                       |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C                        |

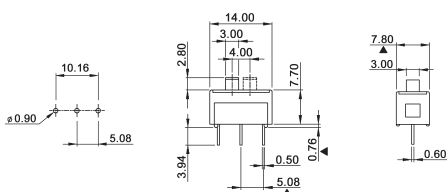
6

## Models: Switching functions

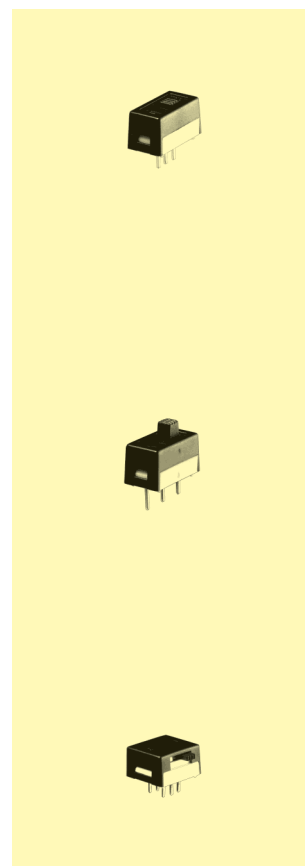
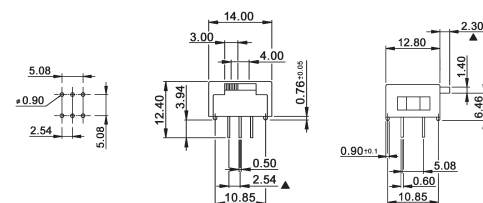
MSS 3011 D on – on



MSS 3112 D on – on



MSS 3121 N-R on – on



## Ordering code:

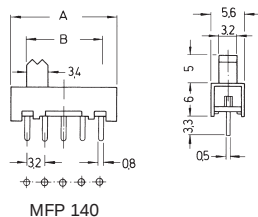
|                  |  |                   |  |                     |  |                 |  |  |
|------------------|--|-------------------|--|---------------------|--|-----------------|--|--|
| MSS 3            |  |                   |  |                     |  |                 |  |  |
| Actuator:        |  | Terminal spacing: |  | Switching function: |  | Top actuated    |  |  |
| 0 Recessed       |  | 1 2,54 mm         |  | D SP, ON – ON       |  | R Side actuated |  |  |
| 1 Raised         |  | 2 5,08 mm         |  | N DP, ON – ON       |  |                 |  |  |
| Number of Poles: |  |                   |  |                     |  |                 |  |  |
| 1 Single pole    |  |                   |  |                     |  |                 |  |  |
| 2 Double pole    |  |                   |  |                     |  |                 |  |  |

## Specifications:

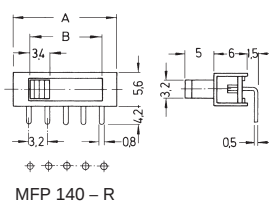
|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 30 V DC, 350 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | –10 °C to +85 °C                                |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Contact timing:        | non-shorting                                    |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | wave-soldering – max.: 3 sec, 260 °C ± 5 °C     |

| Models: | Operating positions | Length (mm) |   |
|---------|---------------------|-------------|---|
|         |                     | A           | B |

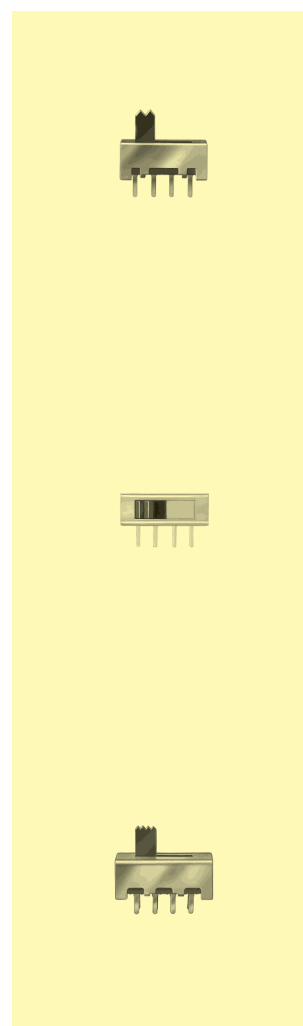
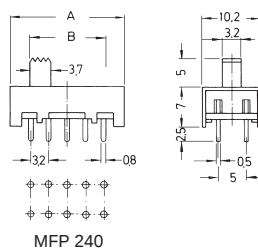
|         |   |      |      |
|---------|---|------|------|
| MFP 120 | 2 | 11.0 | 6.7  |
| MFP 130 | 3 | 15.0 | 10.0 |
| MFP 140 | 4 | 18.2 | 13.2 |
| MFP 150 | 5 | 21.4 | 16.4 |



|             |   |      |      |
|-------------|---|------|------|
| MFP 120 – R | 2 | 11.0 | 6.7  |
| MFP 130 – R | 3 | 15.0 | 10.0 |
| MFP 140 – R | 4 | 18.2 | 13.2 |



|         |   |      |      |
|---------|---|------|------|
| MFP 220 | 2 | 13.6 | 6.9  |
| MFP 230 | 3 | 16.8 | 10.1 |
| MFP 240 | 4 | 20.0 | 13.3 |
| MFP 250 | 5 | 23.2 | 16.5 |
| MFP 260 | 6 | 26.4 | 19.7 |



# Miniature Slide Switches

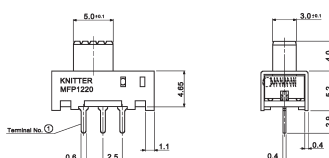
## Specifications:

|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 30 V DC, 350 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | – 10 °C to + 85 °C                              |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Contact timing:        | shorting (non-shorting only if specified)       |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C     |

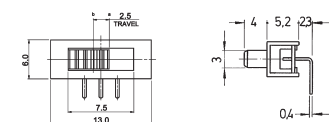
6

| Models: | Operating positions |  | Length (mm) |   |
|---------|---------------------|--|-------------|---|
|         |                     |  | A           | B |

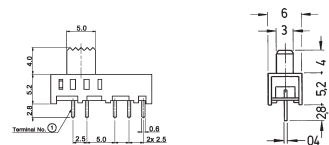
|          |   |  |      |      |
|----------|---|--|------|------|
| MFP 1220 | 2 |  | 13.0 | 7.5  |
| MFP 1320 | 3 |  | 15.5 | 10.0 |
| MFP 1620 | 6 |  | 23.0 | 17.5 |



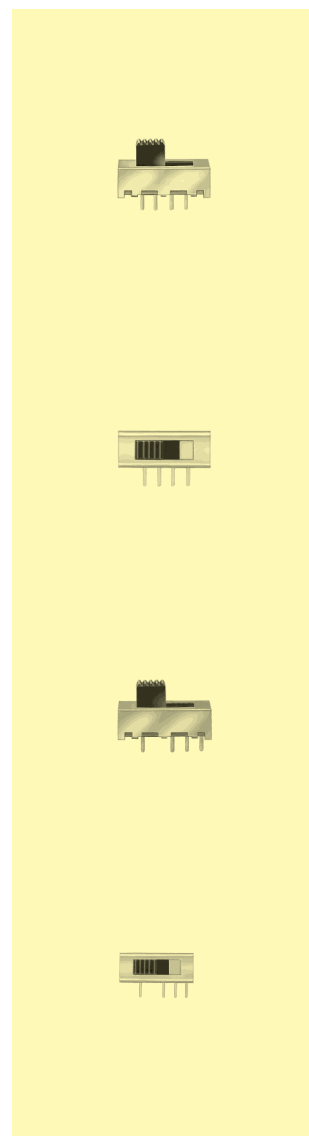
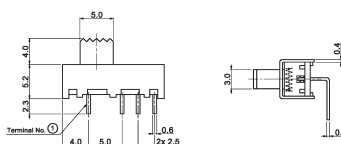
|              |   |  |      |      |
|--------------|---|--|------|------|
| MFP 1220 – R | 2 |  | 13.0 | 7.5  |
| MFP 1320 – R | 3 |  | 15.5 | 10.0 |



|          |   |  |      |      |
|----------|---|--|------|------|
| MFP 1323 | 3 |  | 15.5 | 10.2 |
| MFP 1424 | 4 |  | 18.0 | 12.5 |



|              |   |  |      |      |
|--------------|---|--|------|------|
| MFP 1323 – R | 3 |  | 15.5 | 10.1 |
|--------------|---|--|------|------|





| Models: | Operating positions | Length (mm) |   |
|---------|---------------------|-------------|---|
|         |                     | A           | B |

| Model    | Number of Terminals | Terminal Pitch (mm) | Terminal Width (mm) | Terminal Height (mm) | Terminal Spacing (mm) | Terminal Mounting Hole Diameter (mm) | Terminal Mounting Hole Spacing (mm) | Terminal Mounting Hole Position (mm) | Terminal Mounting Hole Diameter (mm) | Terminal Mounting Hole Spacing (mm) | Terminal Mounting Hole Position (mm) |
|----------|---------------------|---------------------|---------------------|----------------------|-----------------------|--------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|
| MFP 2220 | 2                   | 13.0                | 7.5                 | 4.0                  | 5.0 ± 0.1             | 8.0                                  | 4.7                                 | 1.0                                  | 0.6                                  | 2 × 2.5                             | 0.4                                  |
| MFP 2320 | 3                   | 15.5                | 10.0                | 4.7                  | 5.0 ± 0.1             | 8.0                                  | 4.7                                 | 1.0                                  | 0.6                                  | 2 × 2.5                             | 0.4                                  |
| MFP 2520 | 5                   | 20.5                | 15.0                | 4.7                  | 5.0 ± 0.1             | 8.0                                  | 4.7                                 | 1.0                                  | 0.6                                  | 2 × 2.5                             | 0.4                                  |

|          |   |                                                                                   |      |      |                                                                                   |                                                                                   |
|----------|---|-----------------------------------------------------------------------------------|------|------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|
| MFP 2323 | 3 |  | 16.0 | 10.1 |  |  |
| MFP 2424 | 4 |                                                                                   | 18.0 | 12.6 |                                                                                   |                                                                                   |

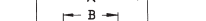


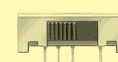
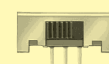
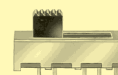
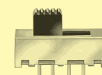




MFP 2424

|              |   |                                                                                     |      |     |                                                                                     |
|--------------|---|-------------------------------------------------------------------------------------|------|-----|-------------------------------------------------------------------------------------|
| MFP 2220 – R | 2 |  | 17.0 | 6.5 |  |
| MFP 2320 – R | 3 |  | 19.5 | 9.0 |                                                                                     |

MFP 2323 – R      3            19.5      9.0      



# Miniature Slide Switches

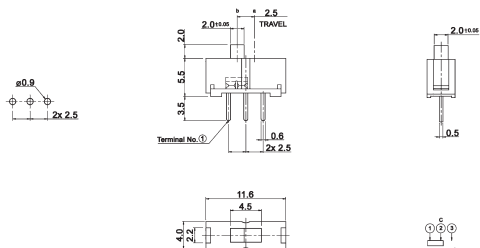
**Specifications:** see page 104

**Material:** plastic housing, terminals sealed

**Models:** Switching functions

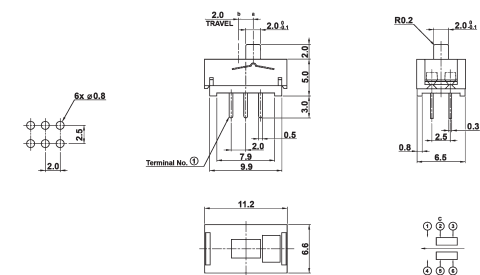
MFP 161 D  
non-shorting

on on



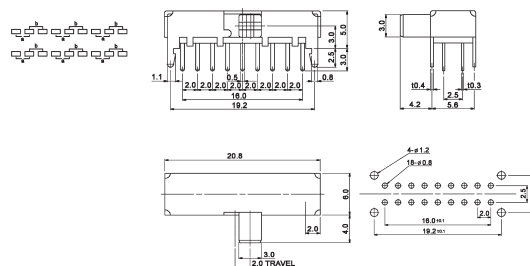
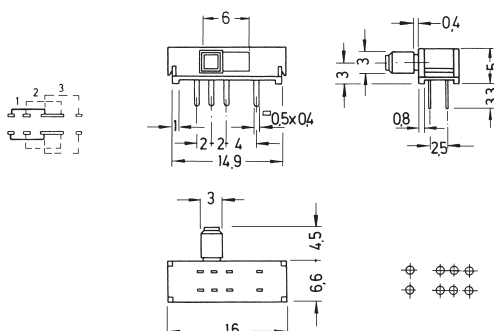
MFP 261 N  
non-shorting

on on





Material: plastic housing, terminals sealed



# Miniature Slide Switches

## Specifications:

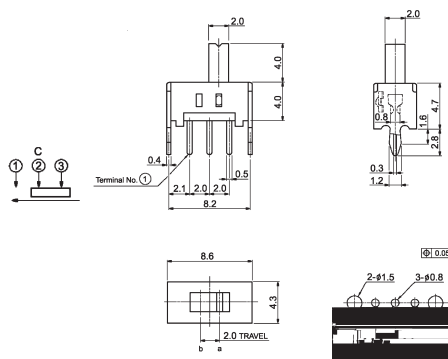
|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 12 V DC, 100 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | -20 °C to +85 °C / MFP 213x: -25 °C to +85 °C   |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C     |

## Models:

Switching  
functions

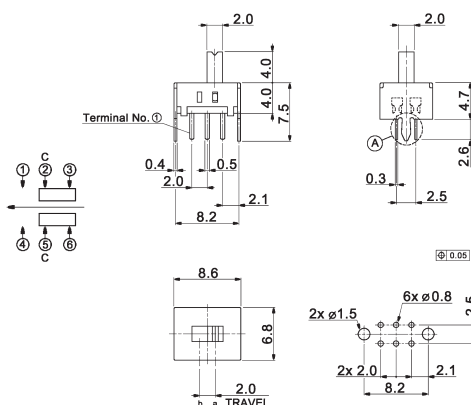
MFP 113 D  
non-shorting

on on



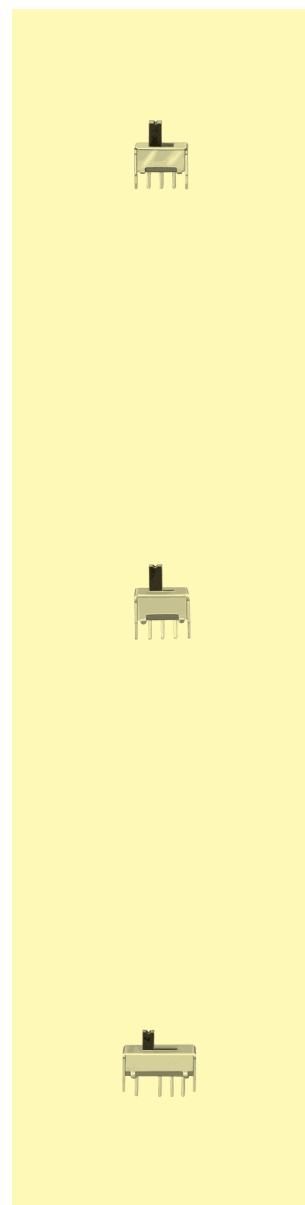
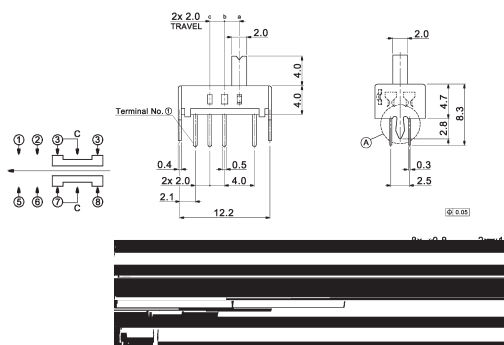
MFP 213 N  
non-shorting

on on



MFP 213 P  
shorting

on on on



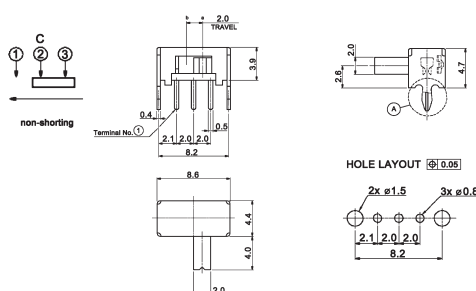
## Specifications:

|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 12 V DC, 100 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | –20 °C to +85 °C / MFP 213x: –25 °C to +85 °C   |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C     |

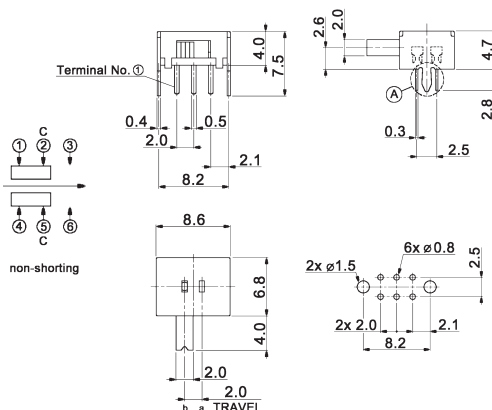
## Models:

Switching  
functions

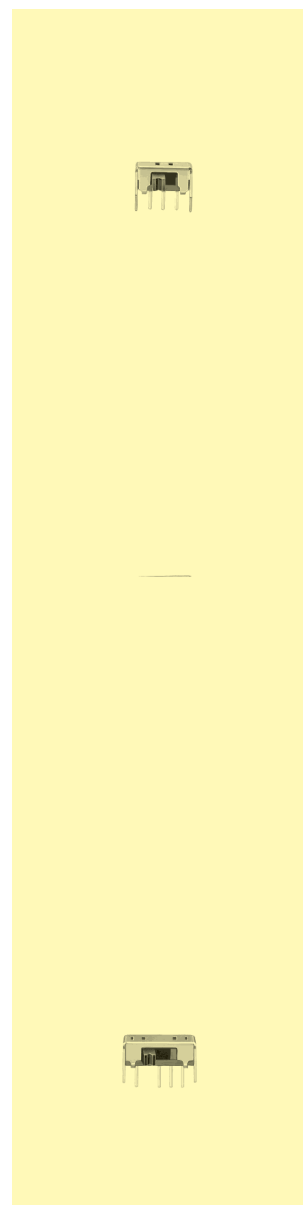
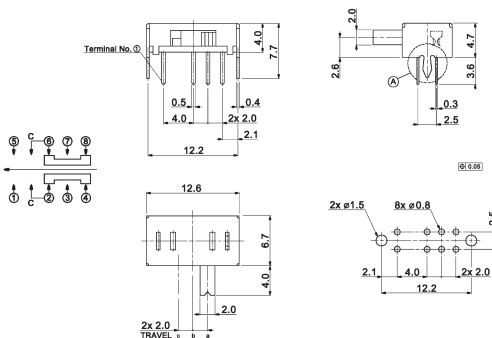
MFP 113 D – RA on on  
non-shorting



MFP 213 N – RA on on  
non-shorting



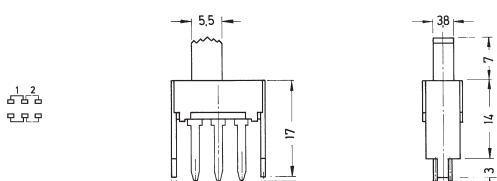
MFP 213 P – RA on on on  
shorting



|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 30 V DC, 350 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | – 20 °C to + 85 °C                              |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Contact timing:        | non-shorting                                    |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C     |

## Switching functions

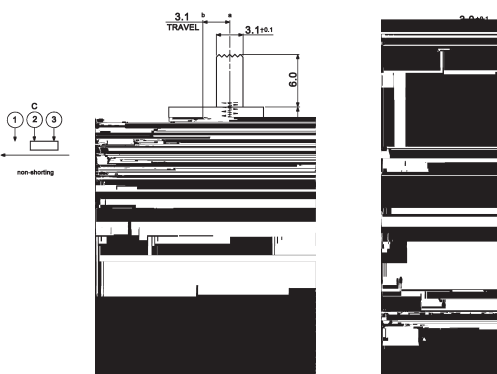
on on

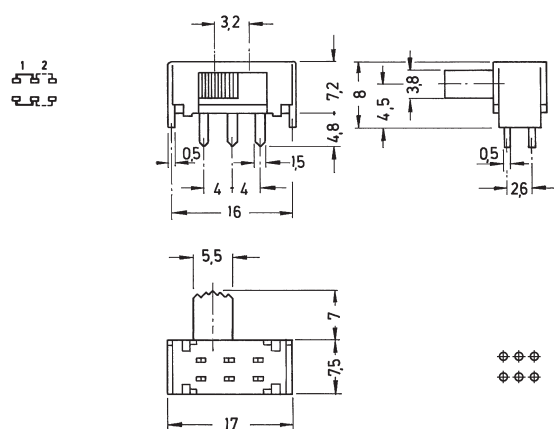


on on



on on





# Miniature Slide Switches

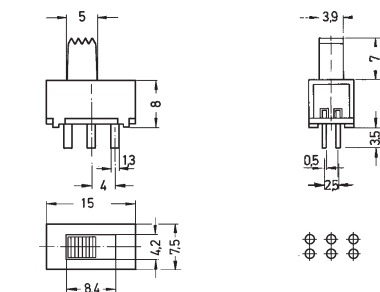
## Specifications:

|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 30 V DC, 350 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | –20 °C to +85 °C / MFP 223 P: –10 °C to +60 °C  |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C     |

## Models: Switching functions

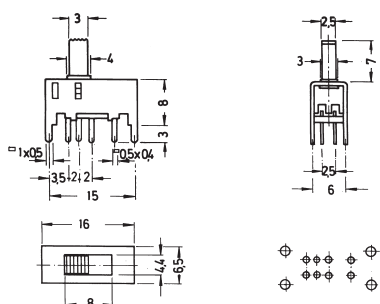
MFP 221 N  
non-shorting

on on



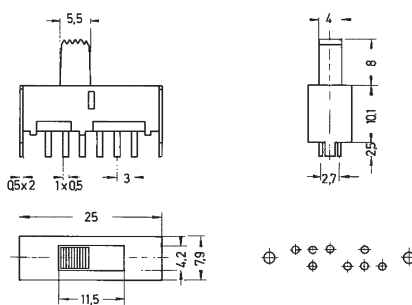
MFP 223 P  
shorting

on on on



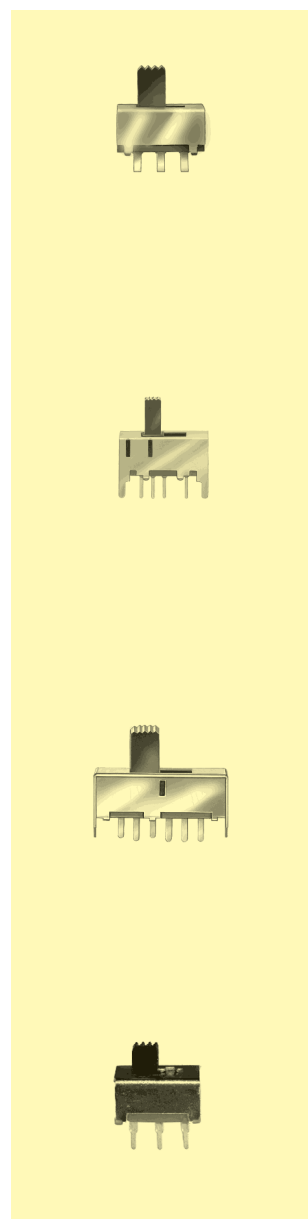
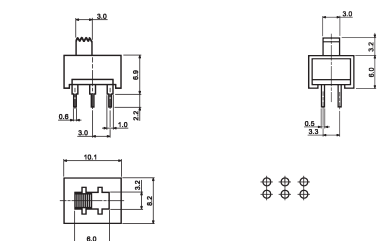
MFP 231 P  
shorting

on on on



MFP 291 N  
non-shorting

on on



## Specifications:

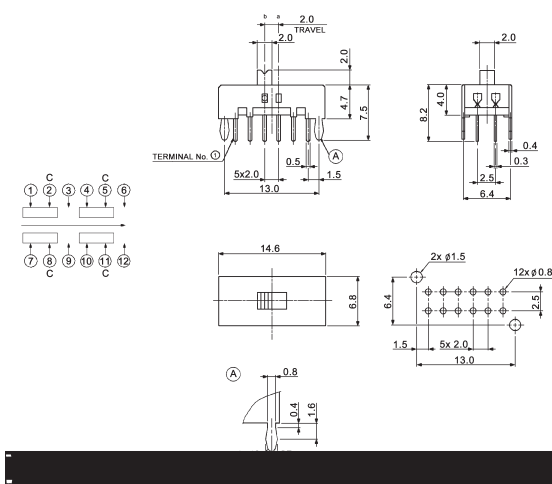
|                        |                                                 |                              |
|------------------------|-------------------------------------------------|------------------------------|
| Contact rating:        | MFP 421 N: 30 V DC, 0.35 A                      | MFP 421 N-RA: 30 V DC, 0.2 A |
| Contact resistance:    | MFP 421 N: < 20 mΩ                              | MFP 421 N-RA: < 30 mΩ        |
| Insulation resistance: | > 100 MΩ at 500 V DC for 1 minute               |                              |
| Dielectric strength:   | 500 V AC (50/60 Hz, 2 mA) for 1 minute          |                              |
| Operating temperature: | -10 °C to +70 °C                                |                              |
| Mechanical life:       | minimum 10 000 cycles                           |                              |
| Contacts:              | copper alloy, silver-plated over nickel barrier |                              |
| Slide colour:          | black, further colours on request               |                              |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C     |                              |

## Models:

Switching  
functions

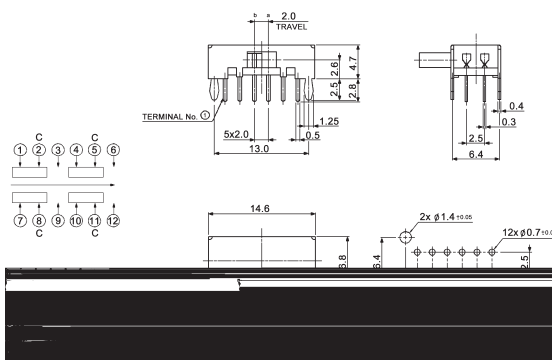
MFP 421 N  
non-shorting

on on



MFP 421 N-RA  
non-shorting

on on



# Miniature Slide Switches

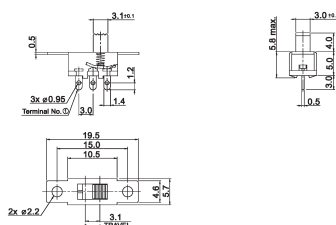
## Specifications:

|                        |                                                 |
|------------------------|-------------------------------------------------|
| Contact rating:        | 30 V DC, 350 mA                                 |
| Contact resistance:    | < 20 mΩ                                         |
| Insulation resistance: | > 100 MΩ at 500 V DC                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute       |
| Operating temperature: | –40 °C to +85 °C                                |
| Mechanical life:       | minimum 10 000 operations                       |
| Contacts:              | copper alloy, silver-plated over nickel barrier |
| Slide colour:          | black, further colours on request               |
| Soldering conditions:  | hand-soldering – max.: 5 sec, 270 °C            |

## Models: Switching functions

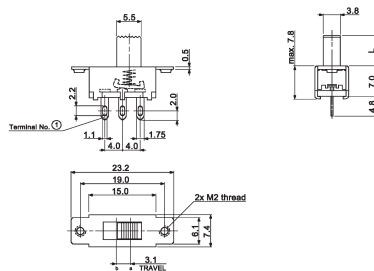
MFS 121 D – N  
non-shorting

on on



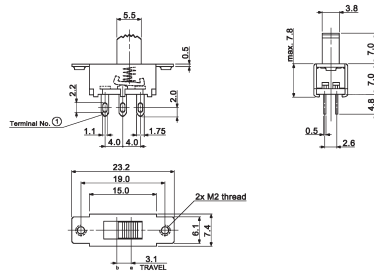
MFS 131 D  
non-shorting

on on



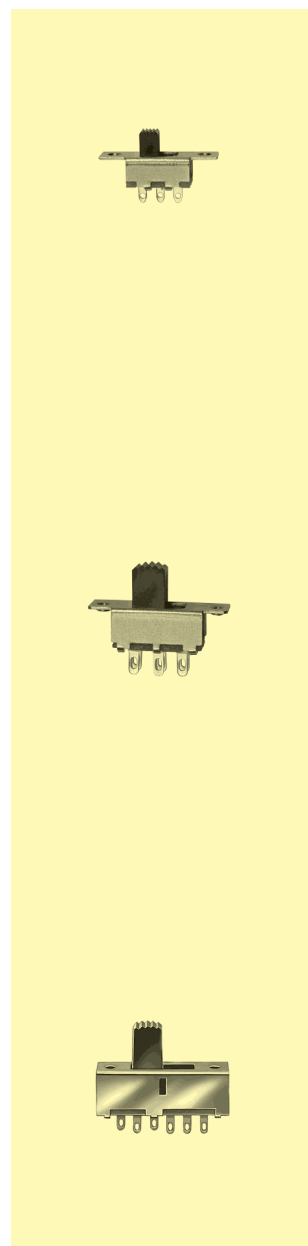
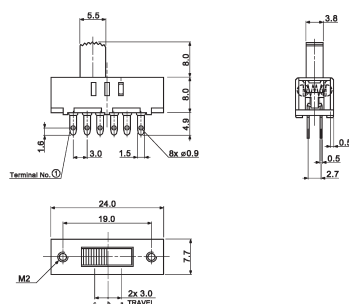
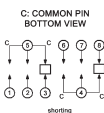
MFS 201 N SW  
non-shorting

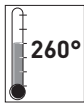
on on



MFS 231 P  
shorting

on on on





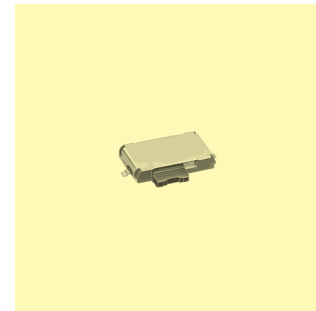
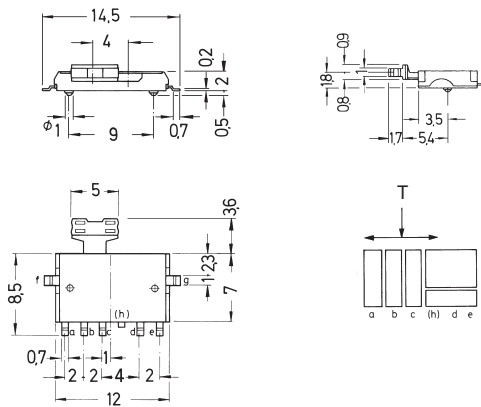
# Microminiature Slide Switches for SMT

## Specifications:

|                        |                                           |
|------------------------|-------------------------------------------|
| Contact rating:        | 12 V DC, 200 mA / 4 V DC, 300 mA          |
| Contact resistance:    | < 70 mΩ                                   |
| Insulation resistance: | > 100 MΩ at 100 V DC                      |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute |
| Operating temperature: | -10 °C to +60 °C                          |
| Mechanical life:       | minimum 10 000 operations                 |
| Contacts:              | phosphor bronze, gold-plated              |
| Terminals:             | brass, gold-plated                        |
| Contact timing:        | non-shorting                              |

## Models: Switching function

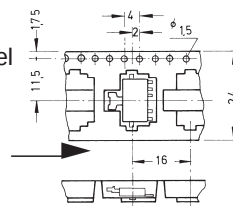
MMSP 132      on on on  
with pushbutton function



## Packing:

1000 pcs/reel

Ø 330 mm



# Microminiature Slide Switches

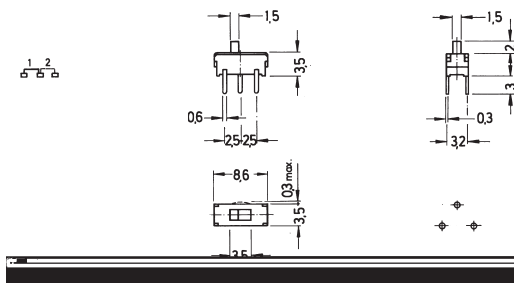
## Specifications:

|                        |                                             |
|------------------------|---------------------------------------------|
| Contact rating:        | 12 V DC, 200 mA                             |
| Contact resistance:    | < 50 mΩ                                     |
| Insulation resistance: | > 100 MΩ at 500 V DC                        |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute   |
| Operating temperature: | -10 °C to +60 °C                            |
| Mechanical life:       | minimum 5000 operations                     |
| Contacts:              | phosphor bronze, silver-plated              |
| Terminals:             | brass silver-plated                         |
| Contact timing:        | non-shorting                                |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C |

## Models: Switching functions

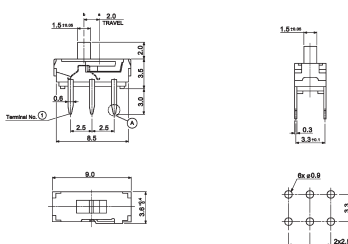
MMP 121

on on



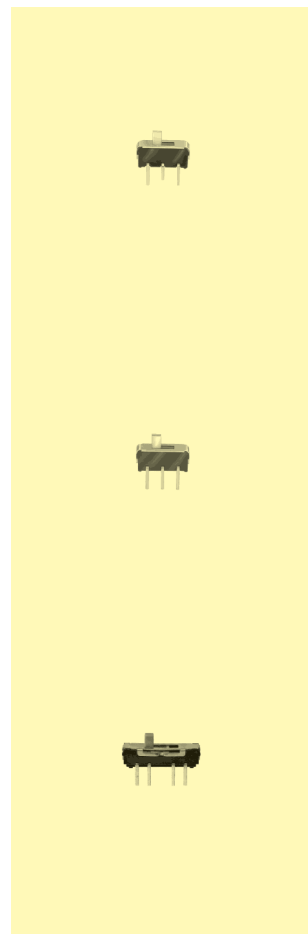
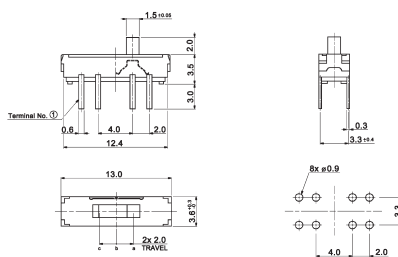
MMP 221

on on



MMP 238

on on on





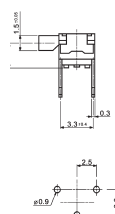
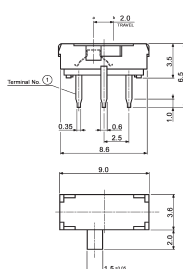
# Microminiature Slide Switches

## Specifications:

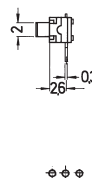
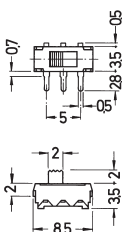
|                        |                                             |
|------------------------|---------------------------------------------|
| Contact rating:        | 12 V DC, 200 mA                             |
| Contact resistance:    | < 50 mΩ                                     |
| Insulation resistance: | > 100 MΩ at 500 V DC                        |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute   |
| Operating temperature: | −40 °C to +85 °C                            |
| Mechanical life:       | minimum 5000 operations                     |
| Contacts:              | phosphor bronze, silver-plated              |
| Terminals:             | brass, silver-plated                        |
| Contact timing:        | non-shorting                                |
| Slide colour:          | white                                       |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C ± 5 °C |

## Models: Switching functions

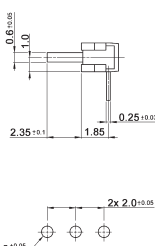
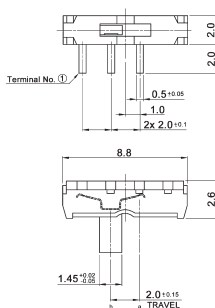
MMP 121 – R on on



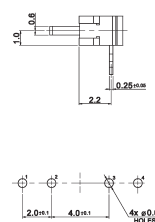
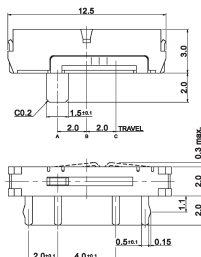
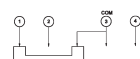
MMP 122 – R on on



MMP 124 – RN on on



MMP 134 – R on on on



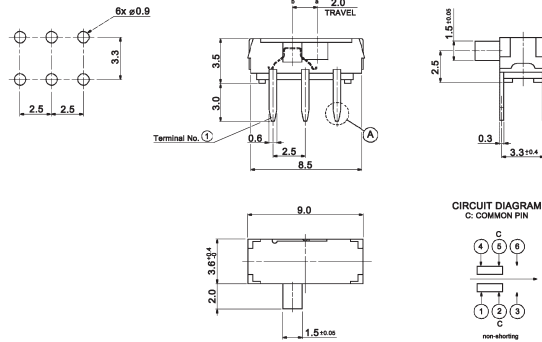
# Microminiature Slide Switches



**Models:**            Switching  
                         functions

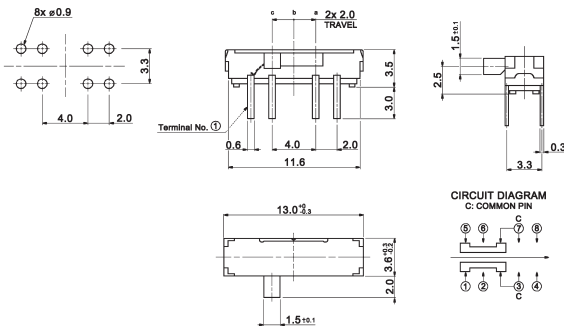
MMP 221 – R

on    on



MMP 238 – R

on on on





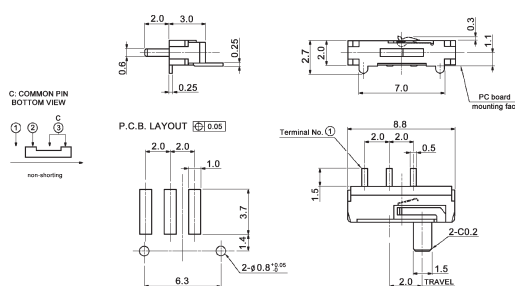
# Microminiature Slide Switches for SMT

## Specifications:

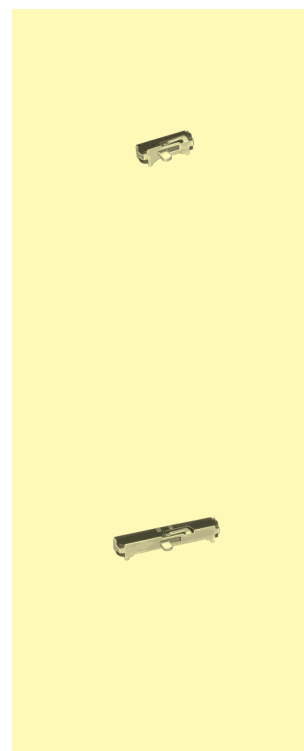
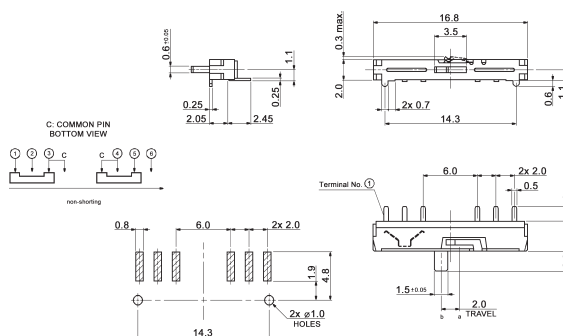
|                        |                                           |
|------------------------|-------------------------------------------|
| Contact rating:        | 12 V DC, 200 mA                           |
| Contact resistance:    | < 70 mΩ                                   |
| Insulation resistance: | > 100 MΩ at 500 V DC                      |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute |
| Operating temperature: | −40 °C to +85 °C                          |
| Storage temperature:   | −40 °C to +85 °C                          |
| Mechanical life:       | minimum 5000 operations                   |
| Contacts:              | phosphor bronze, silver-plated            |
| Terminals:             | brass, silver-plated                      |
| Contact timing:        | non-shorting                              |
| Slide colour:          | black                                     |

## Models: Switching functions

MMS 124 on on

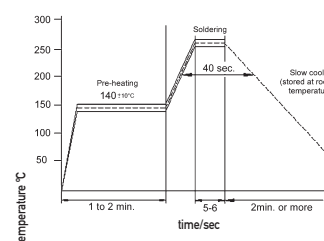


MMS 224 on on



Soldering conditions: reflow-soldering: 40 sec, 220° C  
peak temperature: 5-6 sec, 260° C

Packing: cardboard boxes, on tapes on request



# Microminiature Slide Switches for SMT

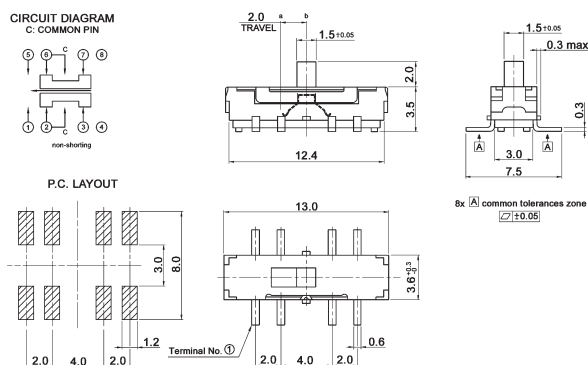
## Specifications:

|                        |                                                                             |
|------------------------|-----------------------------------------------------------------------------|
| Contact rating:        | 12 V DC, 200 mA / 6 V DC, 300 mA                                            |
| Contact resistance:    | < 70 mΩ                                                                     |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                        |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                   |
| Operating temperature: | -40 °C to +85 °C                                                            |
| Mechanical life:       | MMS 228 T: minimum 10 000 operations<br>MMS 238 T: minimum 5 000 operations |
| Contacts/Terminals:    | stainless steel, silver-plated                                              |
| Contact timing:        | non-shorting                                                                |
| Slide colour:          | black                                                                       |
| Soldering conditions:  | reflow-soldering                                                            |

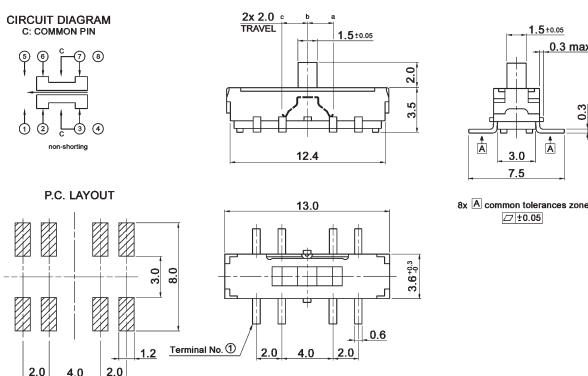
6

## Models: Switching functions

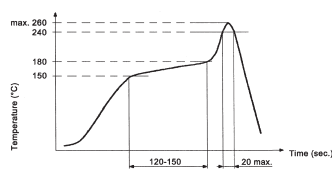
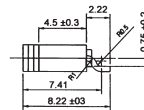
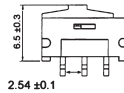
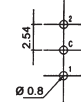
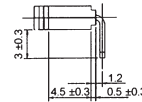
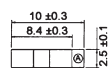
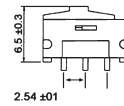
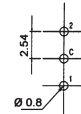
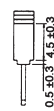
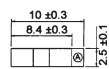
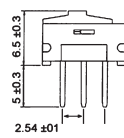
MMS 228 T on on



MMS 238 T on on on



Packing: on tapes, 900 pieces / tape



# Microminiature Slide Switches

## Specifications:

|                        |                                           |
|------------------------|-------------------------------------------|
| Contact rating:        | 0.5 A, 12 V DC; 0.3 A, 24 V (AC/DC)       |
| Contact resistance:    | < 30 mΩ                                   |
| Insulation resistance: | > 10 MΩ at 500 V DC                       |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute |
| Operating temperature: | –40 °C to +85 °C                          |
| Storage temperature:   | –40 °C to +85 °C                          |
| Mechanical life:       | minimum 10 000 operations                 |
| Contacts:              | brass, gold plated                        |
| Terminals:             | brass, gold plated                        |
| Case:                  | PA                                        |
| Soldering conditions:  | wave-soldering – max.: 5 sec., 270 °C     |

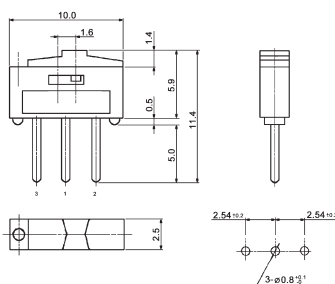
6

## Models

## Switching functions

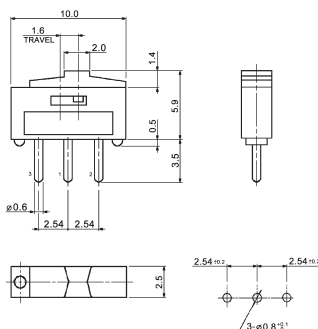
MMP 1010 D – 1

on on



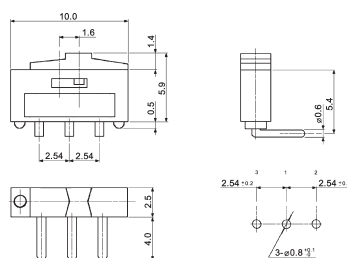
MMP 1010 D-1A

on on



MMP 1010 D-RA – 1

on on



# 7

## Dual-in-line Switches

| Type            | Poles               | Gold plating | Actuator | SMT | Description                                   | Page |
|-----------------|---------------------|--------------|----------|-----|-----------------------------------------------|------|
| Box-Type        |                     |              |          |     |                                               |      |
| DSS 200 N       | 1 – 10 / 12         | 0.2 µm       | raised   |     |                                               | 124  |
| DBS 2000        | 1 – 10 / 12         | 0.1 µm       | recessed |     | washable                                      | 125  |
| DBS 2100        | 1 – 10 / 12         | 0.1 µm       | raised   |     |                                               |      |
| DBS 6000        | 2 – 10 / 12 / 15    | 0.1 µm       | recessed |     | washable                                      | 126  |
| DBS 6100        | 2 – 10 / 12 / 15    | 0.1 µm       | raised   |     |                                               |      |
| Piano-Type      |                     |              |          |     |                                               |      |
| DBP 2000 N      | 2–10 / 12           | 0.1 µm       | recessed |     |                                               | 127  |
| DBP 2100 N      | 2–10 / 12           | 0.1 µm       | raised   |     |                                               |      |
| SBP 8000 T      | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | recessed | ●   | end-stackable                                 | 128  |
| SBP 8100 T      | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | raised   | ●   | end-stackable                                 |      |
| DBP 8000        | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | recessed |     | end-stackable                                 | 129  |
| DBP 8100        | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | raised   |     | end-stackable                                 |      |
| SBP 9100        | 2 – 8 / 10 / 12     | 0.025 µm     | raised   | ●   |                                               | 130  |
| SBP 61000       | 2 – 6 / 8 / 10      | 0.1 µm       | raised   | ●   |                                               | 131  |
| IC-Type         |                     |              |          |     |                                               |      |
| SMS 500         | 2 / 4 / 6 / 8 / 10  | 0.3 µm       | recessed | ●   | ultra flat, washable                          | 132  |
| DBS 5000 G      | 1 – 10 / 12         | 0.3 µm       | recessed |     | end-stackable, washable                       | 133  |
| DBS 5100 G      | 1 – 10 / 12         | 0.3 µm       | raised   |     | end-stackable                                 |      |
| SBS 5000 TG     | 1 – 10 / 12         | 0.3 µm       | recessed | ●   | end-stackable, washable                       | 134  |
| SBS 9000 JTK    | 2 – 10 / 12         | 0.025 µm     | recessed | ●   |                                               | 135  |
| DBS 1000        | 1 – 10 / 12         | 0.1 µm       | recessed |     | washable                                      | 136  |
| DBS 1100        | 1 – 10 / 12         | 0.1 µm       | raised   |     |                                               |      |
| SBS 1000        | 1 – 10 / 12         | 0.1 µm       | recessed | ●   | washable                                      | 137  |
| DBS 60000       | 1 – 10 / 12         | 0.1 µm       | recessed |     | tin-plated terminals, washable                | 138  |
| DBS 61000       | 1 – 10 / 12         | 0.1 µm       | raised   |     | tin-plated terminals                          |      |
| SBS 60000       | 1 – 10 / 12         | 0.1 µm       | recessed | ●   | tin-plated terminals, end-stackable, washable | 139  |
| SBS 60000 J     | 2 – 10 / 12         | 0.1 µm       | recessed | ●   | J-hooks/tin-plated terminals, washable        | 140  |
| DBS 5000        | 1 – 10 / 12         | 0.1 µm       | recessed |     | end-stackable, washable                       | 141  |
| DBS 5100        | 1 – 10 / 12         | 0.1 µm       | raised   |     | end-stackable                                 |      |
| SBS 5000 T      | 1 – 10 / 12         | 0.1 µm       | recessed | ●   | end-stackable, washable                       | 142  |
| SBS 5100 T      | 1 – 10 / 12         | 0.1 µm       | raised   | ●   | end-stackable                                 |      |
| Half-Pitch-Type |                     |              |          |     |                                               |      |
| DHP 600         | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | raised   | ●   |                                               | 143  |
| DHS 100 N       | 4 / 6 / 8 / 10      | 0.025 µm     | recessed | ●   | washable                                      | 144  |
| DHS 600         | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | recessed | ●   | washable                                      | 145  |
| DHS 600-J       | 2 / 4 / 6 / 8 / 10  | 0.1 µm       | recessed | ●   | J-hooks                                       |      |
| DHS 900         | 1 – 6 / 8 / 10 / 12 | 0.025 µm     | recessed | ●   | washable                                      | 146  |

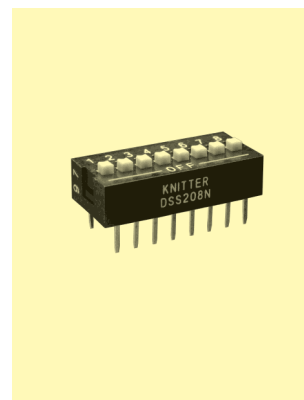
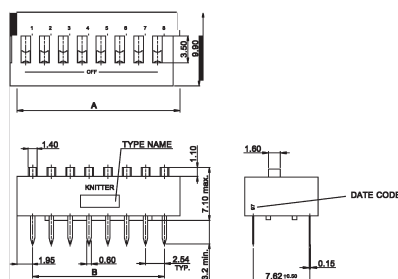
# Dual-in-line Switches

## Specifications:

|                        |                                                                                                                                   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA                                                                                                                   |
| Contact resistance:    | < 50 mΩ                                                                                                                           |
| Insulation resistance: | > 1000 MΩ at 500 V DC                                                                                                             |
| Capacity:              | < 5 pF between 2 poles                                                                                                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                                                                         |
| Operating temperature: | –40 °C to +85 °C                                                                                                                  |
| Mechanical life:       | minimum 10 000 operations per pole                                                                                                |
| Shock resistance:      | contact interruption < 10 μsec with triple shock in all 6 directions<br>shock conditions: 20 G, 11 msec duration (sine half wave) |
| Vibration:             | contact interruption < 10 μsec at vibration test in accordance with<br>MIL-STD-202 D, method 204, condition C                     |
| Contact/Terminals:     | PC terminals, phosphor bronze,<br>0.2 μm gold-plated over 1 μm nickel                                                             |
| Material:              | case: PBT, slide: PA                                                                                                              |
| Construction:          | case sealed                                                                                                                       |
| Slide position:        | OFF                                                                                                                               |
| Mounting:              | on pc-board                                                                                                                       |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C                                                                                              |

## Models:

| Type      | Poles | Length (A) |
|-----------|-------|------------|
| DSS 201 N | 1     | 3.90 mm    |
| DSS 202 N | 2     | 6.44 mm    |
| DSS 203 N | 3     | 8.98 mm    |
| DSS 204 N | 4     | 11.52 mm   |
| DSS 205 N | 5     | 14.06 mm   |
| DSS 206 N | 6     | 16.60 mm   |
| DSS 207 N | 7     | 19.14 mm   |
| DSS 208 N | 8     | 21.68 mm   |
| DSS 209 N | 9     | 24.22 mm   |
| DSS 210 N | 10    | 26.76 mm   |
| DSS 212 N | 12    | 31.84 mm   |



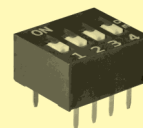
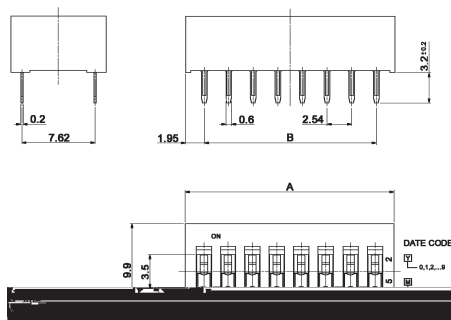
## Specifications:

|                        |                                                                              |
|------------------------|------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA / 6 V DC, 100 mA                                              |
| Contact resistance:    | < 50 mΩ                                                                      |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                         |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                    |
| Operating temperature: | –40 °C to +85 °C                                                             |
| Mechanical life:       | minimum 2000 operations per pole                                             |
| Material:              | PBT meets UL 94 V-0                                                          |
| Contacts:              | gold-plated over nickel                                                      |
| Construction:          | case sealed                                                                  |
|                        | Series DBS 2000 slide recessed, sealed with protective tape, <b>washable</b> |
| Mounting:              | on pc-board                                                                  |
| Slide position:        | OFF                                                                          |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C                                         |

## Models:

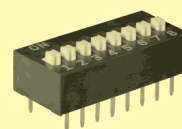
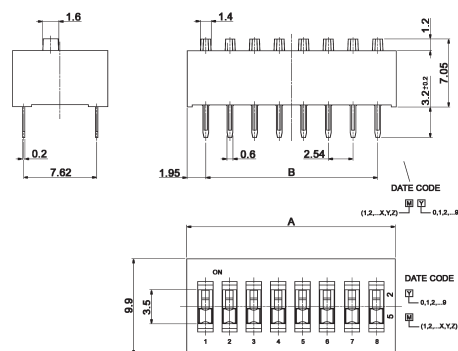
### Series DBS 2000

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 2001 | 1     | 3.90 mm    |
| DBS 2002 | 2     | 6.44 mm    |
| DBS 2003 | 3     | 8.98 mm    |
| DBS 2004 | 4     | 11.52 mm   |
| DBS 2005 | 5     | 14.06 mm   |
| DBS 2006 | 6     | 16.60 mm   |
| DBS 2007 | 7     | 19.14 mm   |
| DBS 2008 | 8     | 21.68 mm   |
| DBS 2009 | 9     | 24.22 mm   |
| DBS 2010 | 10    | 26.76 mm   |
| DBS 2012 | 12    | 31.84 mm   |



### Series DBS 2100

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 2101 | 1     | 3.90 mm    |
| DBS 2102 | 2     | 6.44 mm    |
| DBS 2103 | 3     | 8.98 mm    |
| DBS 2104 | 4     | 11.52 mm   |
| DBS 2105 | 5     | 14.06 mm   |
| DBS 2106 | 6     | 16.60 mm   |
| DBS 2107 | 7     | 19.14 mm   |
| DBS 2108 | 8     | 21.68 mm   |
| DBS 2109 | 9     | 24.22 mm   |
| DBS 2110 | 10    | 26.76 mm   |
| DBS 2112 | 12    | 31.84 mm   |



# Dual-in-line Switches

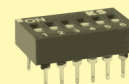
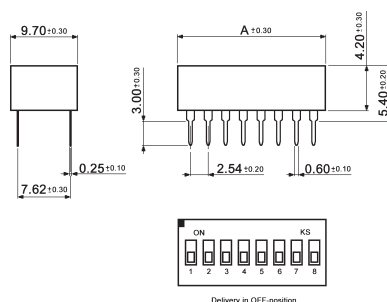
## Specifications:

|                        |                                                             |
|------------------------|-------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching) |
| Contact resistance:    | < 50 mΩ                                                     |
| Insulation resistance: | > 1000 MΩ                                                   |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                   |
| Operating temperature: | –40 °C to +85 °C                                            |
| Mechanical life:       | minimum 5 000 operations per pole                           |
| Material:              | Thermoplastic meets UL 94 V-0, case: blue, slide: white     |
| Contacts:              | gold-plated over nickel                                     |
| Terminals:             | tin-plated; DBS 6101: gold-plated over nickel               |
| Construction:          | Terminals sealed                                            |
|                        | DBS 60xx: sealed with protective tape, washable             |
| Slide position:        | OFF                                                         |
| Mounting:              | on pc-board                                                 |
| Soldering conditions:  | wave-soldering – max.: 10 sec, 260 °C                       |

## Models:

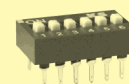
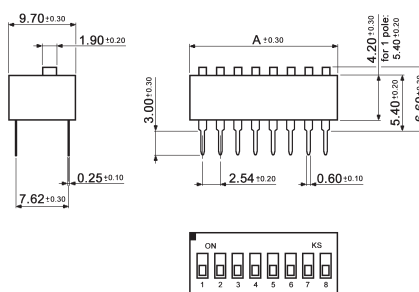
### Series DBS 6000

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 6002 | 2     | 6.70 mm    |
| DBS 6003 | 3     | 9.20 mm    |
| DBS 6004 | 4     | 11.70 mm   |
| DBS 6005 | 5     | 14.20 mm   |
| DBS 6006 | 6     | 16.70 mm   |
| DBS 6007 | 7     | 19.20 mm   |
| DBS 6008 | 8     | 21.70 mm   |
| DBS 6009 | 9     | 24.20 mm   |
| DBS 6010 | 10    | 26.70 mm   |
| DBS 6012 | 12    | 31.80 mm   |
| DBS 6015 | 15    | 39.50 mm   |



### Series DBS 6100

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 6102 | 2     | 6.70 mm    |
| DBS 6103 | 3     | 9.20 mm    |
| DBS 6104 | 4     | 11.70 mm   |
| DBS 6105 | 5     | 14.20 mm   |
| DBS 6106 | 6     | 16.70 mm   |
| DBS 6107 | 7     | 19.20 mm   |
| DBS 6108 | 8     | 21.70 mm   |
| DBS 6109 | 9     | 24.20 mm   |
| DBS 6110 | 10    | 26.70 mm   |
| DBS 6112 | 12    | 31.80 mm   |
| DBS 6115 | 15    | 39.50 mm   |



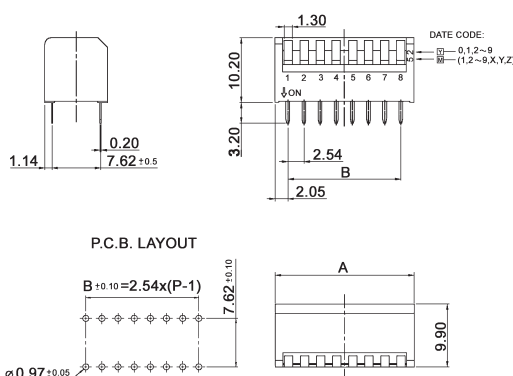
## Specifications:

|                        |                                                  |
|------------------------|--------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA / 6 V DC, 100 mA                  |
| Contact resistance:    | < 50 mΩ                                          |
| Insulation resistance: | > 100 MΩ at 500 V DC                             |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute        |
| Operating temperature: | –40 °C to +85 °C                                 |
| Mechanical life:       | minimum 2000 operations per pole                 |
| Material:              | PBT meets UL 94 V–0                              |
| Contacts:              | gold-plated over nickel                          |
| Construction:          | case sealed;<br>Series DBP 2000 N lever recessed |
| Mounting:              | on pc-board                                      |
| Slide position:        | OFF                                              |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C             |

## Models:

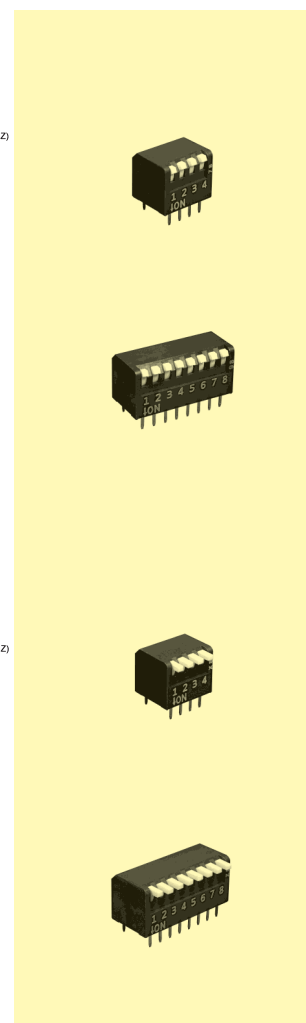
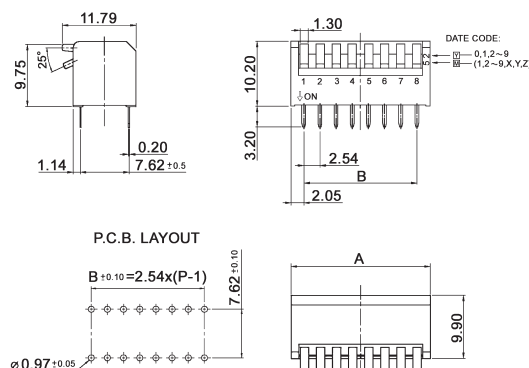
### Series DBP 2000 N

| Type       | Poles | Length (A) |
|------------|-------|------------|
| DBP 2002 N | 2     | 6.64 mm    |
| DBP 2003 N | 3     | 9.18 mm    |
| DBP 2004 N | 4     | 11.72 mm   |
| DBP 2005 N | 5     | 14.26 mm   |
| DBP 2006 N | 6     | 16.80 mm   |
| DBP 2007 N | 7     | 19.34 mm   |
| DBP 2008 N | 8     | 21.88 mm   |
| DBP 2009 N | 9     | 24.42 mm   |
| DBP 2010 N | 10    | 26.96 mm   |
| DBP 2012 N | 12    | 32.04 mm   |

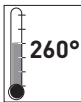


### Series DBP 2100 N

| Type       | Poles | Length (A) |
|------------|-------|------------|
| DBP 2102 N | 2     | 6.64 mm    |
| DBP 2103 N | 3     | 9.18 mm    |
| DBP 2104 N | 4     | 11.72 mm   |
| DBP 2105 N | 5     | 14.26 mm   |
| DBP 2106 N | 6     | 16.80 mm   |
| DBP 2107 N | 7     | 19.34 mm   |
| DBP 2108 N | 8     | 21.88 mm   |
| DBP 2109 N | 9     | 24.42 mm   |
| DBP 2110 N | 10    | 26.96 mm   |
| DBP 2112 N | 12    | 32.04 mm   |



# Dual-in-line Switches end-stackable



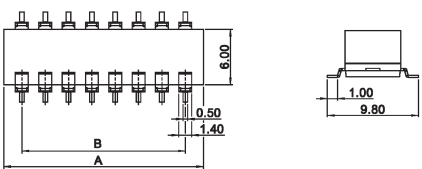
## Specifications:

|                        |                                                                               |
|------------------------|-------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA / non-switching: 100 mA, 50 V DC                               |
| Contact resistance:    | < 100 mΩ                                                                      |
| Insulation resistance: | > 100 MΩ                                                                      |
| Dielectric strength:   | 100 V AC (50 Hz or 60 Hz) for 1 minute                                        |
| Operating temperature: | – 40 °C to + 85 °C                                                            |
| Mechanical life:       | minimum 2 000 operations per pole                                             |
| Material:              | cover/base: high-temp. PA-9T UL 94 V-0, black; actuator: LCP UL 94 V-0, white |
| Contact:               | copper; gold-plated at contact area                                           |
| Terminal:              | brass, gold-plated                                                            |
| Construction:          | case sealed                                                                   |
| Mounting:              | on pc-board – SMD                                                             |
| Slide position:        | OFF                                                                           |

## Models:

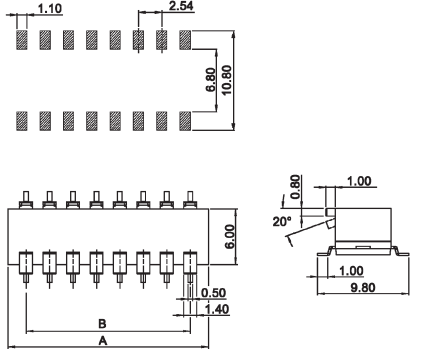
### Series SBP 8000 T

| Type       | Poles | Length (A) |
|------------|-------|------------|
| SBP 8002 T | 2     | 6.48 mm    |
| SBP 8004 T | 4     | 11.56 mm   |
| SBP 8006 T | 6     | 16.64 mm   |
| SBP 8008 T | 8     | 21.72 mm   |
| SBP 8010 T | 10    | 26.80 mm   |



### Series SBP 8100

| Type       | Poles | Length (A) |
|------------|-------|------------|
| SBP 8102 T | 2     | 6.48 mm    |
| SBP 8104 T | 4     | 11.56 mm   |
| SBP 8106 T | 6     | 16.64 mm   |
| SBP 8108 T | 8     | 21.72 mm   |
| SBP 8110 T | 10    | 26.80 mm   |



Packing: on tapes

| Type       | Tape        | Reel     | Tape width (A) |
|------------|-------------|----------|----------------|
| SBP 8002 T | 700 pieces; | Ø 300 mm | 16.0 mm        |
| SBP 8004 T | 700 pieces; | Ø 300 mm | 24.0 mm        |
| SBP 8006 T | 700 pieces; | Ø 300 mm | 24.0 mm        |
| SBP 8008 T | 700 pieces; | Ø 300 mm | 32.0 mm        |
| SBP 8010 T | 700 pieces; | Ø 300 mm | 44.0 mm        |
| SBP 8102 T | 700 pieces; | Ø 300 mm | 16.0 mm        |
| SBP 8104 T | 700 pieces; | Ø 300 mm | 24.0 mm        |
| SBP 8106 T | 700 pieces; | Ø 300 mm | 24.0 mm        |
| SBP 8108 T | 700 pieces; | Ø 300 mm | 32.0 mm        |
| SBP 8110 T | 700 pieces; | Ø 300 mm | 44.0 mm        |





# Dual-in-line Switches end-stackable

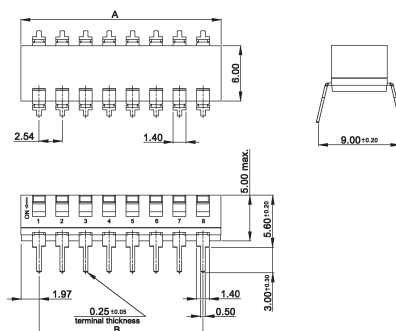
## Specifications:

|                        |                                                                    |
|------------------------|--------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA                                                     |
| Contact resistance:    | < 100 mΩ                                                           |
| Insulation resistance: | > 100 MΩ                                                           |
| Dielectric strength:   | 500 V AC (50 Hz or 60 Hz) for 1 minute                             |
| Operating temperature: | – 40 °C to + 85 °C                                                 |
| Mechanical life:       | minimum 2 000 operations per pole                                  |
| Material:              | cover/base: PA-9T UL 94 V–0, black; actuator: LCP UL 94 V–0, white |
| Contacts:              | copper, gold-plated at contact area                                |
| Terminals:             | brass, gold-plated                                                 |
| Construction:          | case sealed                                                        |
| Mounting:              | on pc-board                                                        |
| Slide position:        | OFF                                                                |
| Soldering conditions:  | wave soldering – max.: 5 sec, 260 °C                               |

## Models:

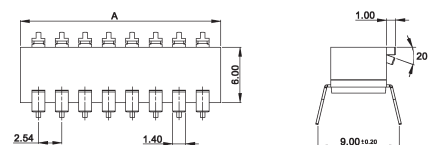
### Series DBP 8000

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBP 8002 | 2     | 6.48 mm    |
| DBP 8004 | 4     | 11.56 mm   |
| DBP 8006 | 6     | 16.64 mm   |
| DBP 8008 | 8     | 21.72 mm   |
| DBP 8010 | 10    | 26.80 mm   |



### Series DBP 8100

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBP 8102 | 2     | 6.48 mm    |
| DBP 8104 | 4     | 11.56 mm   |
| DBP 8106 | 6     | 16.64 mm   |
| DBP 8108 | 8     | 21.72 mm   |
| DBP 8110 | 10    | 26.80 mm   |

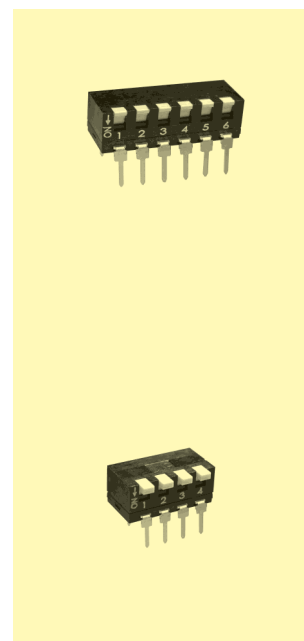


## Circuit diagram

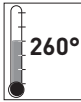


Packing: Sticks

| Type            | Stick     |
|-----------------|-----------|
| DBP 8002 / 8102 | 70 pieces |
| DBP 8004 / 8104 | 40 pieces |
| DBP 8006 / 8106 | 28 pieces |
| DBP 8008 / 8108 | 20 pieces |
| DBP 8010 / 8110 | 16 pieces |



# Dual-in-line Switches for SMT



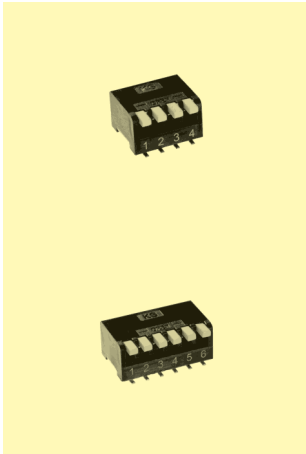
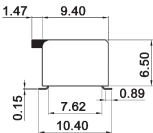
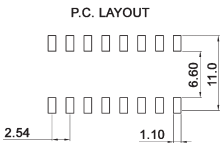
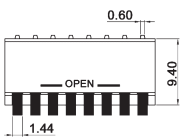
## Specifications:

|                        |                                  |
|------------------------|----------------------------------|
| Contact rating:        | 24 V DC, 25 mA                   |
| Contact resistance:    | 100 mΩ                           |
| Insulation resistance: | 1000 MΩ at 100 V DC              |
| Dielectric strength:   | 500 V, 50 Hz for 1 minute        |
| Operating temperature: | – 20 °C to +70 °C                |
| Mechanical life:       | minimum 3000 operations per pole |
| Material:              | PA66/PBT, UL 94 V–0              |
| Contacts:              | copper alloy, gold-plated        |
| Terminals:             | copper alloy, tin-plated         |
| Construction:          | case sealed                      |
| Mounting:              | on pc-board – SMD                |
| Slide position:        | OFF                              |

## Models:

### Series SBP 9100 T

| Type       | Poles | Length (A) |
|------------|-------|------------|
| SBP 9102 T | 2     | 6.08 mm    |
| SBP 9103 T | 3     | 8.62 mm    |
| SBP 9104 T | 4     | 11.16 mm   |
| SBP 9105 T | 5     | 13.70 mm   |
| SBP 9106 T | 6     | 16.24 mm   |
| SBP 9108 T | 8     | 21.32 mm   |
| SBP 9110 T | 10    | 26.40 mm   |
| SBP 9112 T | 12    | 31.48 mm   |



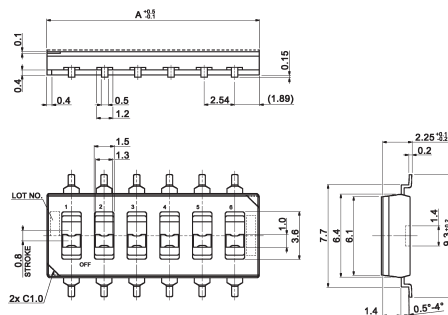
Packing: on tapes

| Models     | Tape        | Reel     | Tape width (A) |
|------------|-------------|----------|----------------|
| SBP 9102 T | 700 pieces; | Ø 330 mm | 24.0 mm        |
| SBP 9103 T | 500 pieces; | Ø 330 mm | 24.0 mm        |
| SBP 9104 T | 500 pieces; | Ø 330 mm | 24.0 mm        |
| SBP 9105 T | 500 pieces; | Ø 330 mm | 24.0 mm        |
| SBP 9106 T | 500 pieces; | Ø 330 mm | 24.0 mm        |
| SBP 9108 T | 500 pieces; | Ø 330 mm | 44.0 mm        |
| SBP 9110 T | 500 pieces; | Ø 330 mm | 44.0 mm        |
| SBP 9112 T | 500 pieces; | Ø 330 mm | 44.0 mm        |

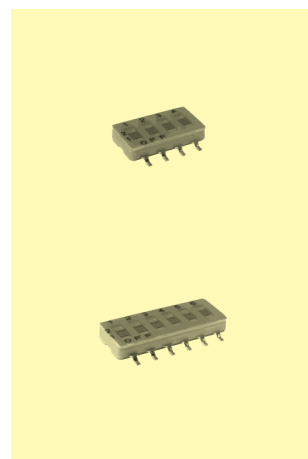


|                        |                                                                                                                                   |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA                                                                                                                   |
| Contact resistance:    | < 50 mΩ                                                                                                                           |
| Insulation resistance: | > 1000 MΩ at 100 V DC                                                                                                             |
| Capacity:              | maximum 5 pF between 2 poles                                                                                                      |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                                                                         |
| Operating temperature: | –40 °C to +105 °C                                                                                                                 |
| Mechanical life:       | minimum 1 000 operations per pole                                                                                                 |
| Shock resistance:      | contact interruption < 10 μsec with triple shock in all 6 directions<br>shock conditions: 20 G, 11 msec duration (sine half wave) |
| Vibration:             | contact interruption: < 10 μsec at vibration test in accordance with<br>MIL-STD-202 D, method 204, condition C                    |
| Contacts:              | copper beryllium, gold-plated over nickel                                                                                         |
| Terminals:             | nickel silver, gold-plated                                                                                                        |
| Material:              | case: PPS, slided: PA                                                                                                             |
| Construction:          | case sealed, slide recessed, sealed with protective tape                                                                          |
| Mounting:              | on pc-board – SMD                                                                                                                 |
| Slide position:        | OFF                                                                                                                               |
| Soldering conditions:  | reflow-soldering                                                                                                                  |

| Type    | Poles | Length (A) |
|---------|-------|------------|
| SMS 502 | 2     | 6.30 mm    |
| SMS 504 | 4     | 11.40 mm   |
| SMS 506 | 6     | 16.50 mm   |
| SMS 508 | 8     | 21.55 mm   |
| SMS 510 | 10    | 26.65 mm   |

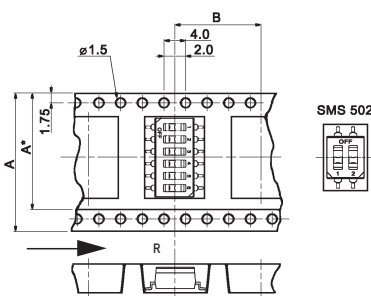


**washable**



Packing: sticks or tapes  
for order on tape: additional to type number: T  
example of order: SMS 502 T

| Models  | Stick               | Tape        | Reel     | Tape width<br>(A) | Rapport<br>(R) |
|---------|---------------------|-------------|----------|-------------------|----------------|
| SMS 502 | 72 pieces; L 507 mm | 2000 pieces | Ø 330 mm | 16.0 mm           | 8.0 mm         |
| SMS 504 | 40 pieces; L 507 mm | 1000 pieces | Ø 330 mm | 24.0 mm           | 12.0 mm        |
| SMS 506 | 28 pieces; L 507 mm | 1000 pieces | Ø 330 mm | 24.0 mm           | 12.0 mm        |
| SMS 508 | 20 pieces; L 507 mm | 1000 pieces | Ø 330 mm | 32.0 mm           | 12.0 mm        |
| SMS 510 | 16 pieces; L 507 mm | 1000 pieces | Ø 330 mm | 44.0 mm           | 12.0 mm        |



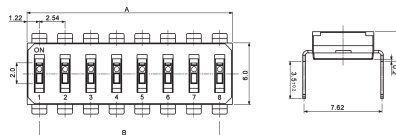
## Specifications:

|                        |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching)                                                                  |
| Contact resistance:    | <100 mΩ                                                                                                                      |
| Insulation resistance: | >100 MΩ                                                                                                                      |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                                                                    |
| Operating temperature: | –40 °C to +85 °C                                                                                                             |
| Mechanical life:       | minimum 5 000 operations per pole                                                                                            |
| Electrical life:       | minimum 1 000 operations per pole                                                                                            |
| Shock resistance:      | contact interruption <10 μs with triple shock in all 6 directions,<br>shock conditions: 40 G, 11 ms duration (sin half wave) |
| Vibration:             | contact interruption <10 μs at vibration test in accordance with<br>MIL-STD 202 G, method 204, condition C                   |
| Materials:             | Case: PA-9T, UL 94 V-0, black<br>Slide: LCP, UL 94 V-0, white<br>Contacts and Terminals: 0.3 μm gold-plated over nickel      |
| Construction:          | Case sealed<br>Series 5000 G: slide recessed, sealed with protective tape, washable                                          |
| Mounting:              | on pc-board                                                                                                                  |
| Slide position:        | OFF                                                                                                                          |
| Soldering conditions:  | wave soldering – max. 10 sec, max. 260 °C; pre-heat – max. 60 sec, max. 100 °C                                               |

## Models:

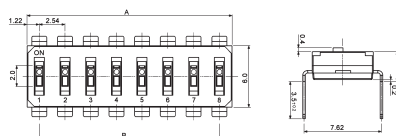
### Series DBS 5000 G

| Type       | Poles | Length (A) |
|------------|-------|------------|
| DBS 5001 G | 1     | 2.44 mm    |
| DBS 5002 G | 2     | 4.98 mm    |
| DBS 5003 G | 3     | 7.52 mm    |
| DBS 5004 G | 4     | 10.06 mm   |
| DBS 5005 G | 5     | 12.60 mm   |
| DBS 5006 G | 6     | 15.14 mm   |
| DBS 5007 G | 7     | 17.68 mm   |
| DBS 5008 G | 8     | 20.22 mm   |
| DBS 5009 G | 9     | 22.76 mm   |
| DBS 5010 G | 10    | 25.30 mm   |
| DBS 5012 G | 12    | 30.38 mm   |



### Serie DBS 5100 G

|            |    |          |
|------------|----|----------|
| DBS 5101 G | 1  | 2.44 mm  |
| DBS 5102 G | 2  | 4.98 mm  |
| DBS 5103 G | 3  | 7.52 mm  |
| DBS 5104 G | 4  | 10.06 mm |
| DBS 5105 G | 5  | 12.60 mm |
| DBS 5106 G | 6  | 15.14 mm |
| DBS 5107 G | 7  | 17.68 mm |
| DBS 5108 G | 8  | 20.22 mm |
| DBS 5109 G | 9  | 22.76 mm |
| DBS 5110 G | 10 | 25.30 mm |
| DBS 5112 G | 12 | 30.38 mm |



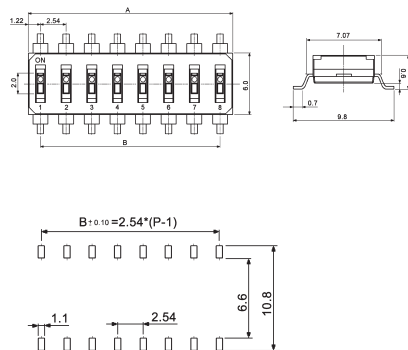
Packing: sticks



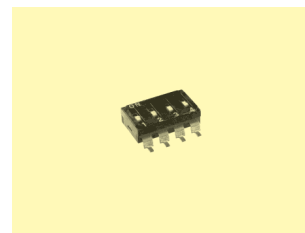
|                        |                                                                                                                              |
|------------------------|------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching)                                                                  |
| Contact resistance:    | <100 mΩ                                                                                                                      |
| Insulation resistance: | >100 MΩ                                                                                                                      |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                                                                    |
| Operating temperature: | −40 °C to +85 °C                                                                                                             |
| Mechanical life:       | minimum 5 000 operations per pole                                                                                            |
| Electrical life:       | minimum 1 000 operations per pole                                                                                            |
| Shock resistance:      | contact interruption <10 μs with triple shock in all 6 directions,<br>shock conditions: 40 G, 11 ms duration (sin half wave) |
| Vibration:             | contact interruption <10 μs at vibration test in accordance with<br>MIL-STD 202 G, method 204, condition C                   |
| Materials:             | Case: PA-9T, UL 94 V-0, black<br>Slide: LCP, UL 94 V-0, white<br>Contacts and Terminals: 0.3 μm gold-plated over nickel      |
| Construction:          | Case sealed, slide recessed, sealed with protective tape                                                                     |
| Mounting:              | on pc-board – SMD                                                                                                            |
| Slide position:        | OFF                                                                                                                          |

## Series SBS 5000 TG

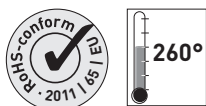
| Type        | Poles | Length (Å) |
|-------------|-------|------------|
| SBS 5001 TG | 1     | 2.44 mm    |
| SBS 5002 TG | 2     | 4.98 mm    |
| SBS 5003 TG | 3     | 7.52 mm    |
| SBS 5004 TG | 4     | 10.06 mm   |
| SBS 5005 TG | 5     | 12.60 mm   |
| SBS 5006 TG | 6     | 15.14 mm   |
| SBS 5007 TG | 7     | 17.68 mm   |
| SBS 5008 TG | 8     | 20.22 mm   |
| SBS 5009 TG | 9     | 22.76 mm   |
| SBS 5010 TG | 10    | 25.30 mm   |
| SBS 5012 TG | 12    | 30.38 mm   |



**washable**



Packing: on tapes – 900 pieces; Ø 300 mm



# Dual-in-line Switches for SMT

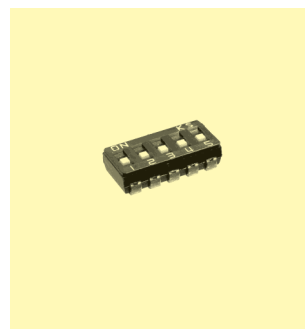
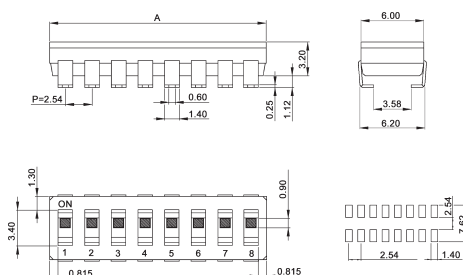
## Specifications:

|                        |                                                                   |
|------------------------|-------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA                                                    |
| Contact resistance:    | < 50 mΩ                                                           |
| Insulation resistance: | > 100 MΩ at 500 V DC                                              |
| Dielectric strength:   | 500 V, 50 Hz for 1 minute                                         |
| Operating temperature: | – 40 °C to + 85 °C                                                |
| Mechanical life:       | minimum 5000 operations per pole                                  |
| Material:              | cover/base: PPS UL 94 V–0, black; actuator: PA66 UL 94 V–0, white |
| Contacts/Terminals:    | brass, tin-plated                                                 |
| Construction:          | case sealed, slide recessed, front sealed with protective tape    |
| Mounting:              | on pc-board – SMD                                                 |
| Slide position:        | OFF                                                               |

## Models:

### Series SBS 9000 JTK

| Type         | Poles | Length (A) |
|--------------|-------|------------|
| SBS 9002 JTK | 2     | 5.52 mm    |
| SBS 9003 JTK | 3     | 8.06 mm    |
| SBS 9004 JTK | 4     | 10.60 mm   |
| SBS 9005 JTK | 5     | 13.14 mm   |
| SBS 9006 JTK | 6     | 15.68 mm   |
| SBS 9007 JTK | 7     | 18.22 mm   |
| SBS 9008 JTK | 8     | 20.76 mm   |
| SBS 9009 JTK | 9     | 23.30 mm   |
| SBS 9010 JTK | 10    | 25.84 mm   |
| SBS 9012 JTK | 12    | 30.92 mm   |



Packing: on tapes

| Models       | Tape         | Reel     | Tape width (A) |
|--------------|--------------|----------|----------------|
| SBS 9002 JTK | 1100 pieces; | Ø 330 mm | 16.0 mm        |
| SBS 9003 JTK | 1100 pieces; | Ø 330 mm | 16.0 mm        |
| SBS 9004 JTK | 1100 pieces; | Ø 330 mm | 24.0 mm        |
| SBS 9005 JTK | 1100 pieces; | Ø 330 mm | 24.0 mm        |
| SBS 9006 JTK | 1100 pieces; | Ø 330 mm | 24.0 mm        |
| SBS 9007 JTK | 1100 pieces; | Ø 330 mm | 32.0 mm        |
| SBS 9008 JTK | 1100 pieces; | Ø 330 mm | 32.0 mm        |
| SBS 9009 JTK | 1100 pieces; | Ø 330 mm | 44.0 mm        |
| SBS 9010 JTK | 1100 pieces; | Ø 330 mm | 44.0 mm        |
| SBS 9012 JTK | 1100 pieces; | Ø 330 mm | 44.0 mm        |

# Dual-in-line Switches

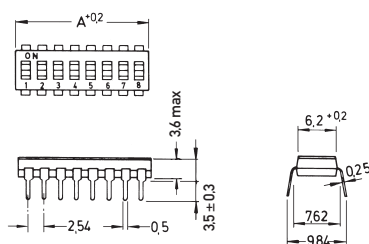
## Specifications:

|                        |                                                                                     |
|------------------------|-------------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA / 6 V DC, 100 mA                                                     |
| Contact resistance:    | < 50 mΩ                                                                             |
| Insulation resistance: | > 100 MΩ at 500 V DC                                                                |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                           |
| Operating temperature: | −40 °C to +85 °C                                                                    |
| Mechanical life:       | minimum 2 000 operations per pole                                                   |
| Material:              | PPS meets UL 94 V-0                                                                 |
| Contacts:              | gold-plated over nickel                                                             |
| Construction:          | case sealed                                                                         |
|                        | Series DBS 1000: slide recessed, front sealed with protective tape, <b>washable</b> |
| Mounting:              | on pc-board                                                                         |
| Slide position:        | OFF                                                                                 |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C                                                |

## Models:

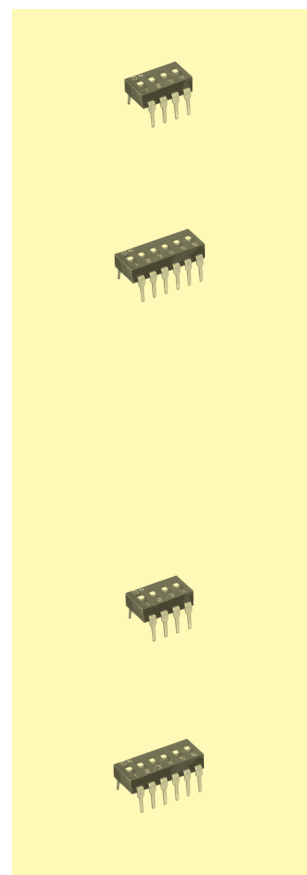
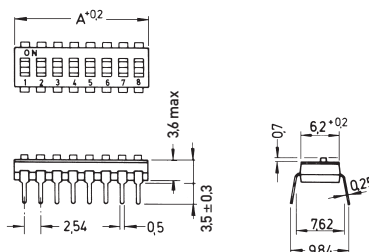
### Series DBS 1000

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 1001 | 1     | 3.48 mm    |
| DBS 1002 | 2     | 6.02 mm    |
| DBS 1003 | 3     | 8.56 mm    |
| DBS 1004 | 4     | 11.10 mm   |
| DBS 1005 | 5     | 13.64 mm   |
| DBS 1006 | 6     | 16.18 mm   |
| DBS 1007 | 7     | 18.72 mm   |
| DBS 1008 | 8     | 21.26 mm   |
| DBS 1009 | 9     | 23.80 mm   |
| DBS 1010 | 10    | 26.34 mm   |
| DBS 1012 | 12    | 31.42 mm   |



### Series DBS 1100

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 1101 | 1     | 3.48 mm    |
| DBS 1102 | 2     | 6.02 mm    |
| DBS 1103 | 3     | 8.56 mm    |
| DBS 1104 | 4     | 11.10 mm   |
| DBS 1105 | 5     | 13.64 mm   |
| DBS 1106 | 6     | 16.18 mm   |
| DBS 1107 | 7     | 18.72 mm   |
| DBS 1108 | 8     | 21.26 mm   |
| DBS 1109 | 9     | 23.80 mm   |
| DBS 1110 | 10    | 26.34 mm   |
| DBS 1112 | 12    | 31.42 mm   |



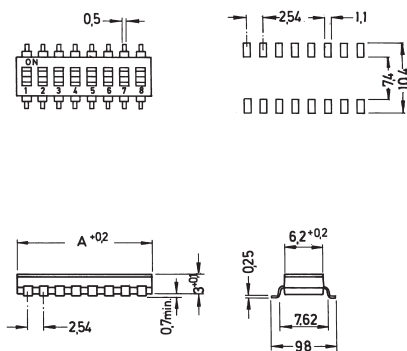
## Specifications:

|                        |                                                                   |
|------------------------|-------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA / 6 V DC, 100 mA                                   |
| Contact resistance:    | < 50 mΩ                                                           |
| Insulation resistance: | > 100 MΩ at 500 V DC                                              |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                         |
| Operating temperature: | –40 °C to +85 °C                                                  |
| Mechanical life:       | minimum 2000 operations per pole                                  |
| Material:              | PPS meets UL 94 V–0                                               |
| Contacts:              | gold-plated over nickel                                           |
| Construction:          | case sealed, slide recessed,<br>front sealed with protective tape |
| Mounting:              | on pc-board – SMD                                                 |
| Slide position:        | OFF                                                               |

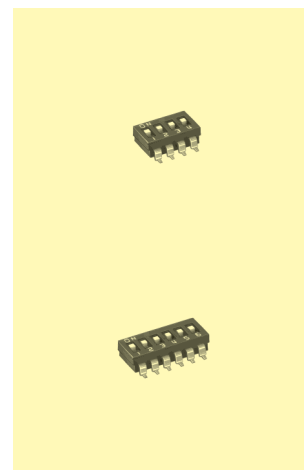
## Models:

### Series SBS 1000

| Type     | Poles | Length (A) |
|----------|-------|------------|
| SBS 1001 | 1     | 3.48 mm    |
| SBS 1002 | 2     | 6.02 mm    |
| SBS 1003 | 3     | 8.56 mm    |
| SBS 1004 | 4     | 11.10 mm   |
| SBS 1005 | 5     | 13.64 mm   |
| SBS 1006 | 6     | 16.18 mm   |
| SBS 1007 | 7     | 18.72 mm   |
| SBS 1008 | 8     | 21.26 mm   |
| SBS 1009 | 9     | 23.80 mm   |
| SBS 1010 | 10    | 26.34 mm   |
| SBS 1012 | 12    | 31.42 mm   |

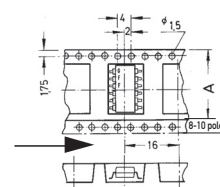


washable



Packing: sticks or tapes  
for order on tapes: additional to type number: T  
example of order: SBS 1002 T

| Models:  | Stick     | Tape/Reel            | Tape width (A) |
|----------|-----------|----------------------|----------------|
| SBS 1001 | –         | 800 pieces; Ø 330 mm | 16.0 mm        |
| SBS 1002 | 76 pieces | 900 pieces; Ø 330 mm | 16.0 mm        |
| SBS 1003 | 55 pieces | 900 pieces; Ø 330 mm | 24.0 mm        |
| SBS 1004 | 42 pieces | 900 pieces; Ø 330 mm | 24.0 mm        |
| SBS 1005 | 35 pieces | 900 pieces; Ø 330 mm | 24.0 mm        |
| SBS 1006 | 28 pieces | 900 pieces; Ø 330 mm | 24.0 mm        |
| SBS 1007 | 25 pieces | 900 pieces; Ø 330 mm | 32.0 mm        |
| SBS 1008 | 22 pieces | 900 pieces; Ø 330 mm | 32.0 mm        |
| SBS 1009 | 20 pieces | 900 pieces; Ø 330 mm | 44.0 mm        |
| SBS 1010 | 18 pieces | 900 pieces; Ø 330 mm | 44.0 mm        |
| SBS 1012 | 15 pieces | 900 pieces; Ø 330 mm | 44.0 mm        |



# Dual-in-line Switches

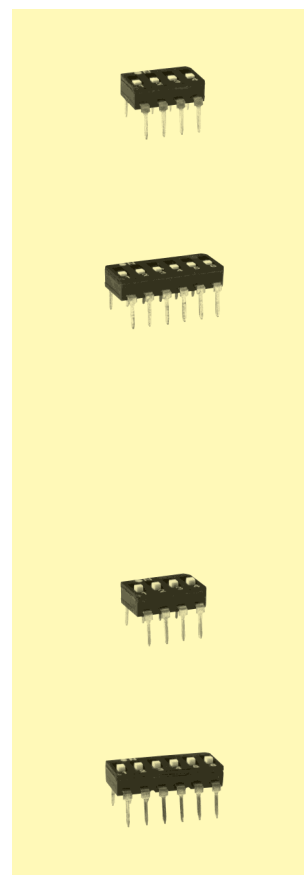
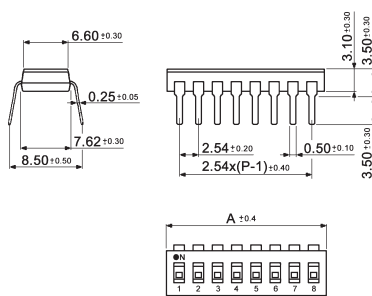
## Specifications:

|                        |                                                                               |
|------------------------|-------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching)                   |
| Contact resistance:    | < 50 mΩ                                                                       |
| Insulation resistance: | > 1000 MΩ at 100 V DC                                                         |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                                     |
| Operating temperature: | –40 °C to +85 °C                                                              |
| Mechanical life:       | minimum 5 000 operations per pole                                             |
| Material:              | PA9T meets UL 94 V-0                                                          |
| Contacts:              | gold-plated over nickel                                                       |
| Terminals:             | tin-plated                                                                    |
| Construction:          | case sealed                                                                   |
|                        | Series DBS 600xx: slide recessed, front sealed with protective tape, washable |
| Mounting:              | on pc-board                                                                   |
| Slide position:        | OFF                                                                           |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C                                          |

## Models:

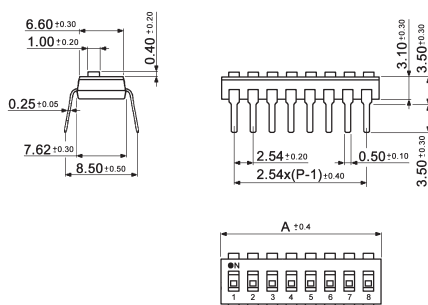
### Series DBS 600xx

| Type      | Poles | Length (A) |
|-----------|-------|------------|
| DBS 60001 | 1     | 2.50 mm    |
| DBS 60002 | 2     | 5.04 mm    |
| DBS 60003 | 3     | 7.58 mm    |
| DBS 60004 | 4     | 10.12 mm   |
| DBS 60005 | 5     | 12.66 mm   |
| DBS 60006 | 6     | 15.20 mm   |
| DBS 60007 | 7     | 17.74 mm   |
| DBS 60008 | 8     | 20.28 mm   |
| DBS 60009 | 9     | 22.82 mm   |
| DBS 60010 | 10    | 25.36 mm   |
| DBS 60012 | 12    | 30.43 mm   |



### Series DBS 610xx

| Type      | Poles | Length (A) |
|-----------|-------|------------|
| DBS 61001 | 1     | 2.50 mm    |
| DBS 61002 | 2     | 5.04 mm    |
| DBS 61003 | 3     | 7.58 mm    |
| DBS 61004 | 4     | 10.12 mm   |
| DBS 61005 | 5     | 12.66 mm   |
| DBS 61006 | 6     | 15.20 mm   |
| DBS 61007 | 7     | 17.74 mm   |
| DBS 61008 | 8     | 20.28 mm   |
| DBS 61009 | 9     | 22.82 mm   |
| DBS 61010 | 10    | 25.36 mm   |
| DBS 61012 | 12    | 30.43 mm   |



## Specifications:

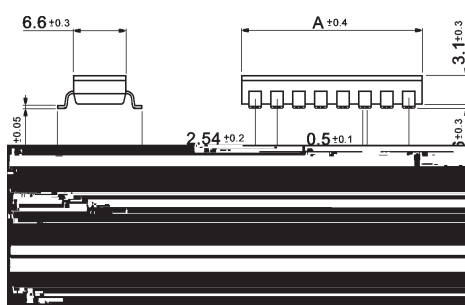
|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching)      |
| Contact resistance:    | < 50 mΩ                                                          |
| Insulation resistance: | > 1000 MΩ at 100 V DC                                            |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                        |
| Operating temperature: | –40 °C to +85 °C                                                 |
| Mechanical life:       | minimum 5 000 operations per pole                                |
| Material:              | PA9T meets UL 94 V-0                                             |
| Contacts:              | gold-plated over nickel                                          |
| Terminals:             | tin-plated                                                       |
| Construction:          | case sealed, slide recessed<br>front sealed with protective tape |
| Mounting:              | on pc-board – SMD                                                |
| Slide position:        | OFF                                                              |

## Models:

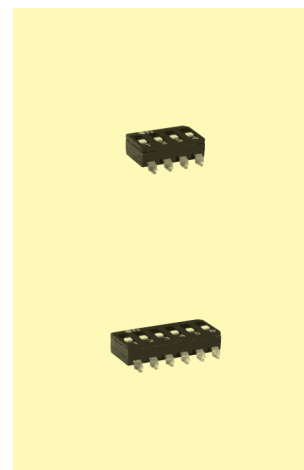
### Series SBS 600xx

**Type**      Poles      Length (A)

|           |    |          |
|-----------|----|----------|
| SBS 60001 | 1  | 2.50 mm  |
| SBS 60002 | 2  | 5.04 mm  |
| SBS 60003 | 3  | 7.58 mm  |
| SBS 60004 | 4  | 10.12 mm |
| SBS 60005 | 5  | 12.66 mm |
| SBS 60006 | 6  | 15.20 mm |
| SBS 60007 | 7  | 17.74 mm |
| SBS 60008 | 8  | 20.28 mm |
| SBS 60009 | 9  | 22.82 mm |
| SBS 60010 | 10 | 25.36 mm |
| SBS 60012 | 12 | 30.43 mm |



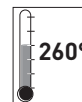
washable



Packing: sticks or tapes  
for order on tapes: additional to type number: T  
example of order: SBS 60006 T

| Models:   | Stick      | Tape/Reel             | Tape width (e) |
|-----------|------------|-----------------------|----------------|
| SBS 60001 | 100 pieces | 2000 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60002 | 100 pieces | 1300 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60003 | 68 pieces  | 1000 pieces; Ø 330 mm | 16.0 mm        |
| SBS 60004 | 51 pieces  | 1000 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60005 | 40 pieces  | 1000 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60006 | 34 pieces  | 1000 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60007 | 29 pieces  | 1000 pieces; Ø 330 mm | 32.0 mm        |
| SBS 60008 | 26 pieces  | 1000 pieces; Ø 330 mm | 32.0 mm        |
| SBS 60009 | 22 pieces  | 1000 pieces; Ø 330 mm | 44.0 mm        |
| SBS 60010 | 20 pieces  | 1000 pieces; Ø 330 mm | 44.0 mm        |
| SBS 60012 | 17 pieces  | 1000 pieces; Ø 330 mm | 44.0 mm        |

# Dual-in-line Switches for SMT



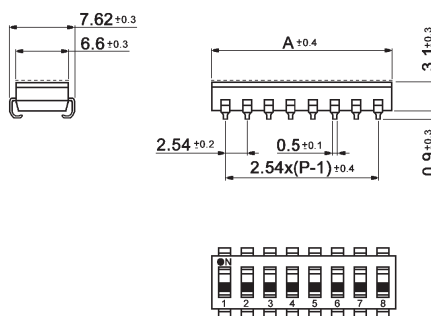
## Specifications:

|                        |                                                                  |
|------------------------|------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching)      |
| Contact resistance:    | <50 mΩ                                                           |
| Insulation resistance: | >1000 MΩ at 100 V DC                                             |
| Dielectric strength:   | 500 V, 50 Hz for the duration of 1 minute                        |
| Operating temperature: | –40 °C to +85 °C                                                 |
| Mechanical life:       | minimum 5 000 operations per pole                                |
| Material:              | PA9T meets UL 94 V-0                                             |
| Contacts:              | gold-plated over nickel                                          |
| Terminals:             | tin-plated                                                       |
| Construction:          | case sealed, slide recessed<br>front sealed with protective tape |
| Mounting:              | on pc-board – SMD                                                |
| Slide position:        | OFF                                                              |

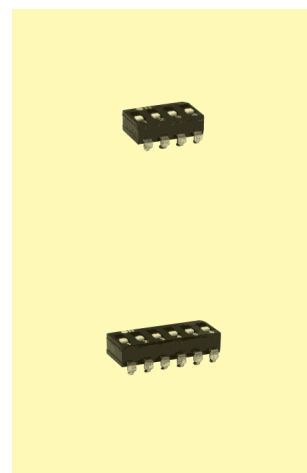
## Models:

### Series SBS 600xx J

| Type        | Poles | Length (A) |
|-------------|-------|------------|
| SBS 60002 J | 2     | 5.04 mm    |
| SBS 60003 J | 3     | 7.58 mm    |
| SBS 60004 J | 4     | 10.12 mm   |
| SBS 60005 J | 5     | 12.66 mm   |
| SBS 60006 J | 6     | 15.20 mm   |
| SBS 60007 J | 7     | 17.74 mm   |
| SBS 60008 J | 8     | 20.28 mm   |
| SBS 60009 J | 9     | 22.82 mm   |
| SBS 60010 J | 10    | 25.36 mm   |
| SBS 60012 J | 12    | 30.43 mm   |



washable



Packing: sticks or tapes  
for order on tapes: additional to type number: T  
example of order: SBS 60006 JT

| Models:     | Stick      | Tape/Reel             | Tape width (e) |
|-------------|------------|-----------------------|----------------|
| SBS 60002 J | 100 pieces | 1300 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60003 J | 68 pieces  | 1000 pieces; Ø 330 mm | 16.0 mm        |
| SBS 60004 J | 51 pieces  | 1000 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60005 J | 40 pieces  | 1000 pieces; Ø 330 mm | 24.0 mm        |
| SBS 60006 J | 34 pieces  | 1000 pieces; Ø 330 mm | 32.0 mm        |
| SBS 60007 J | 29 pieces  | 1000 pieces; Ø 330 mm | 32.0 mm        |
| SBS 60008 J | 26 pieces  | 1000 pieces; Ø 330 mm | 32.0 mm        |
| SBS 60009 J | 22 pieces  | 1000 pieces; Ø 330 mm | 44.0 mm        |
| SBS 60010 J | 20 pieces  | 1000 pieces; Ø 330 mm | 44.0 mm        |
| SBS 60012 J | 17 pieces  | 1000 pieces; Ø 330 mm | 44.0 mm        |



# Dual-in-line Switches end-stackable

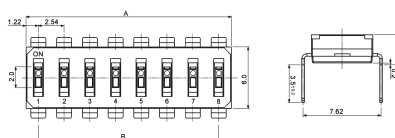
## Specifications:

|                        |                                                                                                    |
|------------------------|----------------------------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA                                                                                     |
| Contact resistance:    | < 100 mΩ                                                                                           |
| Insulation resistance: | > 100 MΩ                                                                                           |
| Dielectric strength:   | 500 V AC (50 Hz or 60 Hz) for 1 minute                                                             |
| Operating temperature: | –40 °C to +90 °C                                                                                   |
| Mechanical life:       | minimum 2000 operations per pole                                                                   |
| Material:              | cover/base: PA-9T UL 94 V–0, black; actuator: LCP UL 94 V–0, white                                 |
| Contacts:              | copper, gold-plated at contact area                                                                |
| Terminals:             | brass, gold-plated                                                                                 |
| Construction:          | case sealed<br>Series DBS 5000: slide recessed, front sealed with protective tape, <b>washable</b> |
| Mounting:              | on pc-board                                                                                        |
| Slide position:        | OFF                                                                                                |
| Soldering conditions:  | wave soldering – max.: 5 sec, 260 °C                                                               |

## Models:

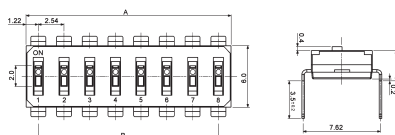
### Series DBS 5000

| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 5001 | 1     | 2.44 mm    |
| DBS 5002 | 2     | 4.98 mm    |
| DBS 5003 | 3     | 7.52 mm    |
| DBS 5004 | 4     | 10.06 mm   |
| DBS 5005 | 5     | 12.60 mm   |
| DBS 5006 | 6     | 15.14 mm   |
| DBS 5007 | 7     | 17.68 mm   |
| DBS 5008 | 8     | 20.22 mm   |
| DBS 5009 | 9     | 22.76 mm   |
| DBS 5010 | 10    | 25.30 mm   |
| DBS 5012 | 12    | 30.38 mm   |

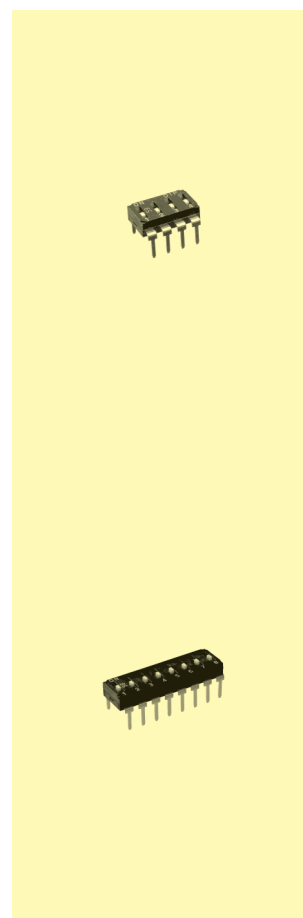


### Series DBS 5100

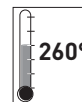
| Type     | Poles | Length (A) |
|----------|-------|------------|
| DBS 5101 | 1     | 2.44 mm    |
| DBS 5102 | 2     | 4.98 mm    |
| DBS 5103 | 3     | 7.52 mm    |
| DBS 5104 | 4     | 10.06 mm   |
| DBS 5105 | 5     | 12.60 mm   |
| DBS 5106 | 6     | 15.14 mm   |
| DBS 5107 | 7     | 17.68 mm   |
| DBS 5108 | 8     | 20.22 mm   |
| DBS 5109 | 9     | 22.76 mm   |
| DBS 5110 | 10    | 25.30 mm   |
| DBS 5112 | 12    | 30.38 mm   |



Packing: sticks



# Dual-in-line Switches end-stackable, for SMT



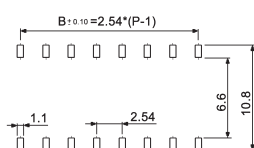
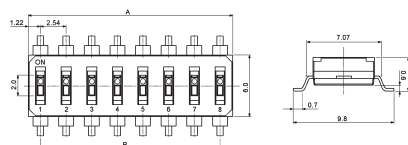
## Specifications:

|                        |                                                                                       |
|------------------------|---------------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA                                                                        |
| Contact resistance:    | < 100 mΩ                                                                              |
| Insulation resistance: | > 100 MΩ                                                                              |
| Dielectric strength:   | 500 V AC (50 Hz or 60 Hz) for 1 minute                                                |
| Operating temperature: | –40 °C to +90 °C                                                                      |
| Mechanical life:       | minimum 2 000 operations per pole                                                     |
| Material:              | cover/base: high-temp. PA-9T UL 94 V–0, black; actuator: LCP UL 94 V–0, white         |
| Contact:               | copper; gold-plated at contact area                                                   |
| Terminal:              | brass, gold-plated                                                                    |
| Construction:          | case sealed                                                                           |
| Mounting:              | Series SBS 5000 T: slide recessed, front sealed with protective tape, <b>washable</b> |
| Slide position:        | on pc-board – SMD                                                                     |
|                        | OFF                                                                                   |

## Models:

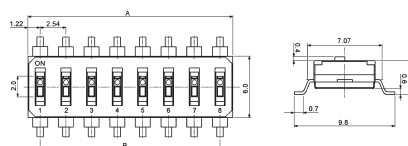
### Series SBS 5000 T

| Type       | Poles | Length (A) |
|------------|-------|------------|
| SBS 5001 T | 1     | 2.44 mm    |
| SBS 5002 T | 2     | 4.98 mm    |
| SBS 5003 T | 3     | 7.52 mm    |
| SBS 5004 T | 4     | 10.06 mm   |
| SBS 5005 T | 5     | 12.60 mm   |
| SBS 5006 T | 6     | 15.14 mm   |
| SBS 5007 T | 7     | 17.68 mm   |
| SBS 5008 T | 8     | 20.22 mm   |
| SBS 5009 T | 9     | 22.76 mm   |
| SBS 5010 T | 10    | 25.30 mm   |
| SBS 5012 T | 12    | 30.38 mm   |

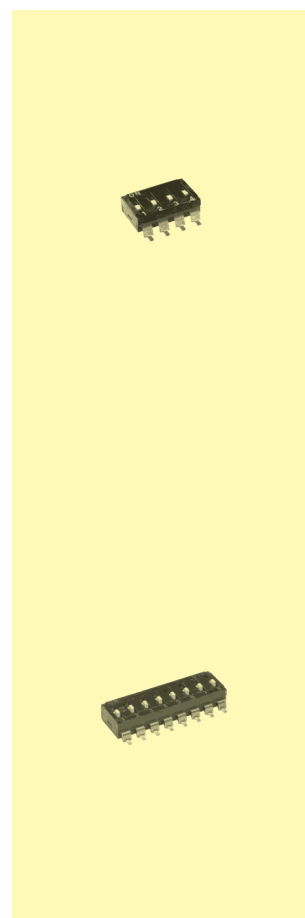


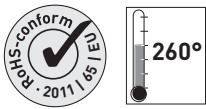
### Series SBS 5100 T

| Type       | Poles | Length (A) |
|------------|-------|------------|
| SBS 5101 T | 1     | 2.44 mm    |
| SBS 5102 T | 2     | 4.98 mm    |
| SBS 5103 T | 3     | 7.52 mm    |
| SBS 5104 T | 4     | 10.06 mm   |
| SBS 5105 T | 5     | 12.60 mm   |
| SBS 5106 T | 6     | 15.14 mm   |
| SBS 5107 T | 7     | 17.68 mm   |
| SBS 5108 T | 8     | 20.22 mm   |
| SBS 5109 T | 9     | 22.76 mm   |
| SBS 5110 T | 10    | 25.30 mm   |
| SBS 5112 T | 12    | 30.38 mm   |



Packing: on tapes (900 pieces; Ø 300 mm)





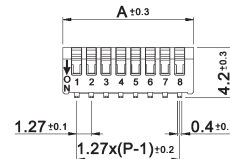
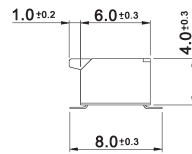
# Half-pitch Dual-in-line Switches

## Specifications:

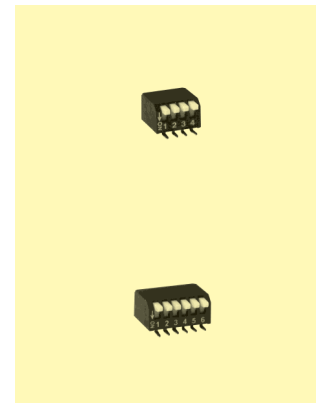
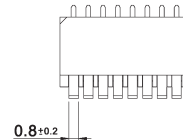
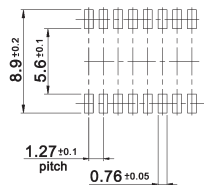
|                        |                                                                                                                            |
|------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching)                                                                |
| Contact resistance:    | < 100 mΩ                                                                                                                   |
| Insulation resistance: | > 100 MΩ                                                                                                                   |
| Dielectric strength:   | 300 V, 50 Hz for the duration of 1 minute                                                                                  |
| Operating temperature: | –25 °C to +70 °C                                                                                                           |
| Mechanical life:       | minimum 1000 operations per pole                                                                                           |
| Materials:             | Case: PA, UL 94 V-0, black<br>Slide: PA, UL 94 V-0, ivory<br>Contacts and Terminals: copper-alloy, gold-plated over nickel |
| Mounting:              | on pc-board – SMD                                                                                                          |
| Slide position:        | OFF                                                                                                                        |

## Model:

| Type    | Poles | Length (A) |
|---------|-------|------------|
| DHP 602 | 2     | 3.68 mm    |
| DHP 604 | 4     | 6.22 mm    |
| DHP 606 | 6     | 8.76 mm    |
| DHP 608 | 8     | 11.30 mm   |
| DHP 610 | 10    | 13.84 mm   |



Actuator top side "off"



## Packing:

| Type    | Tape       | Stick      |
|---------|------------|------------|
| DHP 602 | 900 pieces | 146 pieces |
| DHP 604 | 900 pieces | 85 pieces  |
| DHP 606 | 900 pieces | 60 pieces  |
| DHP 608 | 900 pieces | 47 pieces  |
| DHP 610 | 900 pieces | 39 pieces  |

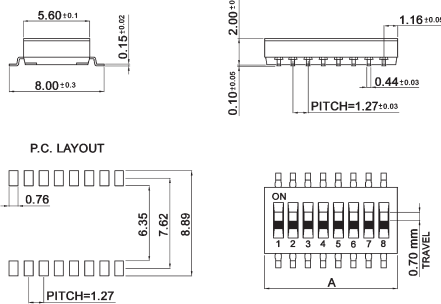
# Half-Pitch Dual-in-line Switches for SMT



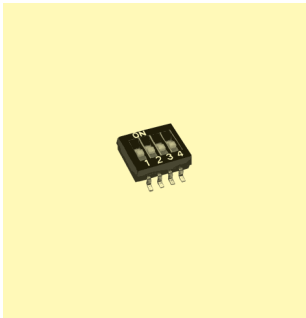
## Specifications:

|                        |                                                              |
|------------------------|--------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA                                               |
| Contact resistance:    | < 50 mΩ                                                      |
| Insulation resistance: | 100 MΩ at 500 V DC                                           |
| Dielectric strength:   | 300 V AC for of 1 minute                                     |
| Operating temperature: | −40 °C to +105 °C                                            |
| Mechanical life:       | 2000 operations per pole                                     |
| Contacts/Terminals:    | copper alloy, gold-plated over nickel                        |
| Material:              | case: PPS, UL 94 V-0, black<br>slide: PA46, UL 94 V-0, white |
| Mounting:              | on pc-board – SMD – 1.27 mm                                  |
| Construction:          | case sealed, slide recessed, sealed with protective tape     |
| Slide position:        | OFF                                                          |

| Models:   | Poles | Length (A) |
|-----------|-------|------------|
| DHS 104 N | 4     | 6.12 mm    |
| DHS 106 N | 6     | 8.66 mm    |
| DHS 108 N | 8     | 11.20 mm   |
| DHS 110 N | 10    | 13.74 mm   |

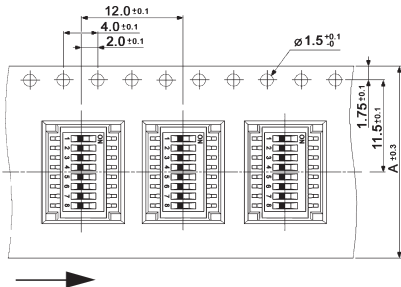


washable



Packing: on tapes

| Models    | Tape        | Reel     | Tape width (A) | Rapport (R) |
|-----------|-------------|----------|----------------|-------------|
| DHS 104 N | 2000 pieces | Ø 330 mm | 16.0 mm        | 12.0 mm     |
| DHS 106 N | 2000 pieces | Ø 330 mm | 16.0 mm        | 12.0 mm     |
| DHS 108 N | 2000 pieces | Ø 330 mm | 24.0 mm        | 12.0 mm     |
| DHS 110 N | 2000 pieces | Ø 330 mm | 24.0 mm        | 12.0 mm     |



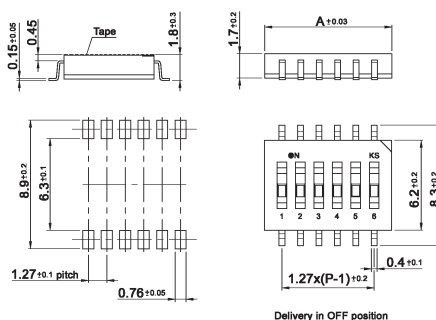
## Specifications:

|                        |                                                             |
|------------------------|-------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA (non-switching), 24 V DC, 25 mA (switching) |
| Contact resistance:    | < 100 mΩ                                                    |
| Insulation resistance: | > 500 MΩ                                                    |
| Dielectric strength:   | 300V, 50Hz for the duration of 1 minute                     |
| Operating temperature: | –40 °C to +85 °C                                            |
| Storage temperature:   | –40 °C to +85 °C                                            |
| Mechanical life:       | minimum 1000 operations per pole                            |
| Contacts/Terminals:    | copper-alloy, gold-plated over nickel                       |
| Material:              | PA9T/PA, UL 94 V-0                                          |
| Construction:          | case sealed, slide recessed, sealed with protective tape    |
| Mounting:              | on pc-board – SMD – 1.27 mm                                 |
| Slide position:        | OFF                                                         |

## Models:

### Series DHS 600

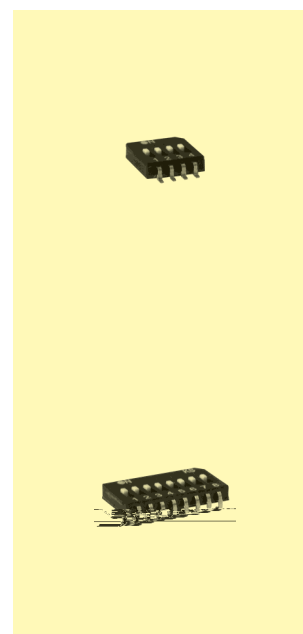
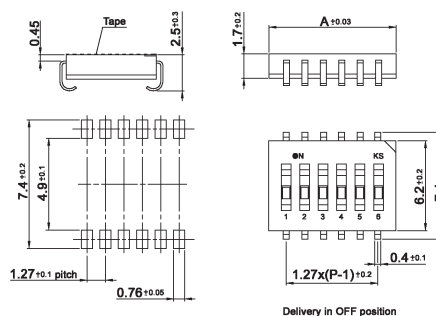
| Type    | Poles | Length (A) |
|---------|-------|------------|
| DHS 602 | 2     | 3.70 mm    |
| DHS 604 | 4     | 6.20 mm    |
| DHS 606 | 6     | 8.75 mm    |
| DHS 608 | 8     | 11.30 mm   |
| DHS 610 | 10    | 13.80 mm   |



washable

### Series DHS 600-J

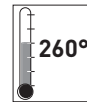
| Type      | Poles | Length (A) |
|-----------|-------|------------|
| DHS 602-J | 2     | 3.70 mm    |
| DHS 604-J | 4     | 6.20 mm    |
| DHS 606-J | 6     | 8.75 mm    |
| DHS 608-J | 8     | 11.30 mm   |
| DHS 610-J | 10    | 13.80 mm   |



Packing: on tapes

| Models              | Tape                  | Reel | Tape width (A) | Rapport (R) |
|---------------------|-----------------------|------|----------------|-------------|
| DHS 602 / DHS 602-J | 2000 pieces; Ø 330 mm |      | 16.0 mm        | 12.0 mm     |
| DHS 604 / DHS 604-J | 2000 pieces; Ø 330 mm |      | 16.0 mm        | 12.0 mm     |
| DHS 606 / DHS 606-J | 2000 pieces; Ø 330 mm |      | 16.0 mm        | 12.0 mm     |
| DHS 608 / DHS 608-J | 2000 pieces; Ø 330 mm |      | 24.0 mm        | 12.0 mm     |
| DHS 610 / DHS 610-J | 2000 pieces; Ø 330 mm |      | 24.0 mm        | 12.0 mm     |

# Half-Pitch Dual-in-line Switches for SMT



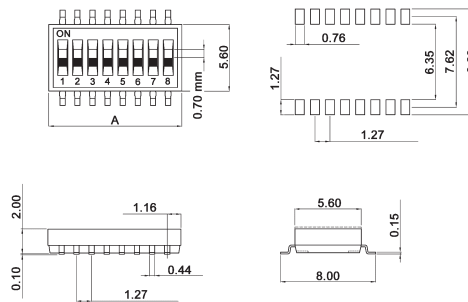
## Specifications:

|                        |                                                                                  |
|------------------------|----------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA                                                                   |
| Contact resistance:    | < 50 mΩ                                                                          |
| Insulation resistance: | 100 MΩ at 100 V DC                                                               |
| Dielectric strength:   | 300 V AC for of 1 minute                                                         |
| Operating temperature: | –40 °C to +85 °C                                                                 |
| Mechanical life:       | minimum 1000 operations per pole                                                 |
| Contacts/Terminals:    | copper alloy, gold-plated over nickel                                            |
| Material:              | case: thermoplastic, UL 94 V-0, black; actuator: thermoplastic, UL 94 V-0, white |
| Mounting:              | on pc-board – SMD – 1.27 mm                                                      |
| Construction:          | case sealed, slide recessed, sealed with protective tape                         |
| Slide position:        | OFF                                                                              |

## Models:

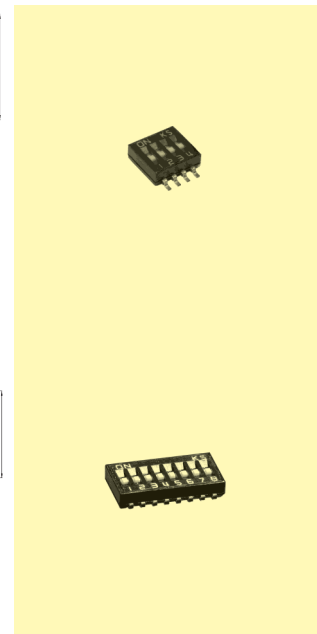
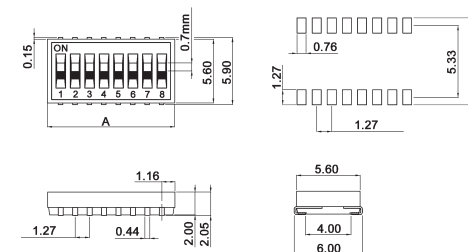
### Series DHS 900

| Type    | Poles | Length (A) |
|---------|-------|------------|
| DHS 902 | 2     | 3.58 mm    |
| DHS 904 | 4     | 6.12 mm    |
| DHS 906 | 6     | 8.66 mm    |
| DHS 908 | 8     | 11.20 mm   |
| DHS 910 | 10    | 13.74 mm   |
| DHS 912 | 12    | 16.28 mm   |



### Series DHS 900-J

| Type      | Poles | Length (A) |
|-----------|-------|------------|
| DHS 902-J | 2     | 3.58 mm    |
| DHS 904-J | 4     | 6.12 mm    |
| DHS 906-J | 6     | 8.66 mm    |
| DHS 908-J | 8     | 11.20 mm   |
| DHS 910-J | 10    | 13.74 mm   |
| DHS 912-J | 12    | 16.28 mm   |

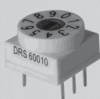
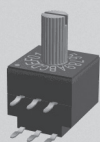
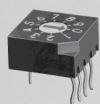


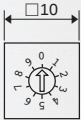
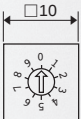
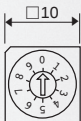
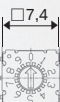
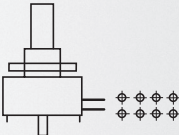
Packing: on tapes

| Models              | Tape         | Reel     | Tape width (A) |
|---------------------|--------------|----------|----------------|
| DHS 902 / DHS 902-J | 3000 pieces; | Ø 330 mm | 16.0 mm        |
| DHS 904 / DHS 904-J | 2000 pieces; | Ø 330 mm | 16.0 mm        |
| DHS 906 / DHS 906-J | 2000 pieces; | Ø 330 mm | 16.0 mm        |
| DHS 908 / DHS 908-J | 2000 pieces; | Ø 330 mm | 24.0 mm        |
| DHS 910 / DHS 910-J | 2000 pieces; | Ø 330 mm | 24.0 mm        |
| DHS 912 / DHS 912-J | 2000 pieces; | Ø 330 mm | 24.0 mm        |

# 8

## Rotary Coded Switches



| Series                       | Size / Foot print                                                                   | Shaft |      | Mounting      |                |                 | SMT | IP 67 | Page       |
|------------------------------|-------------------------------------------------------------------------------------|-------|------|---------------|----------------|-----------------|-----|-------|------------|
|                              |                                                                                     | w     | w.o. | stan-<br>dard | right<br>angle | front-<br>panel |     |       |            |
| DRS 3000/4000                |    | •     | •    | •             |                |                 |     |       | 148        |
| DRR 3000/4000                |                                                                                     | •     | •    |               | •              |                 |     |       | 148        |
| SMR 5000                     |                                                                                     |       | •    | •             |                |                 | •   |       | 149        |
| DRS 20 000/21 000            |    | •     | •    | •             |                |                 |     |       | 150        |
| DRR 20 000/21 000            |                                                                                     | •     | •    |               | •              |                 |     |       | 150        |
| SMR 20 000                   |                                                                                     |       | •    | •             |                |                 | •   |       | 151        |
| DRS/DRR/SMR<br>60 000/61 000 |  | •     | •    | •             | •              |                 | •   | •     | 152<br>153 |
| DRS 7000                     |  | •     | •    | •             |                |                 |     |       | 154        |
| DRR 7000                     |                                                                                     | •     | •    |               | •              |                 |     |       | 154        |
| SMR 7000-1                   |                                                                                     | •     | •    | •             |                |                 | •   |       | 155        |
| SMRR 7000-1                  |                                                                                     | •     | •    |               | •              |                 | •   |       | 155        |
| DRS 13 000/14 000            |  | •     | •    | •             |                |                 |     |       | 156        |
| SMR 13 000/14 000            |                                                                                     | •     | •    | •             |                |                 | •   |       | 157        |
| DRS 15 000/16 000            |  | •     | •    | •             |                |                 |     | •     | 158        |
| SMR 15 000/16 000            |                                                                                     | •     | •    | •             |                |                 | •   | •     | 159        |
| DRS 20                       |  | •     |      | •             |                | •               |     |       | 160        |

All types available with the codes BCD, Hexadecimal, BCD inverse, Hexadecimal inverse.

# Subminiature Rotary Coded Switches

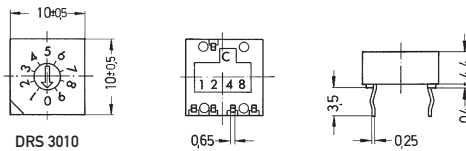


## Specifications:

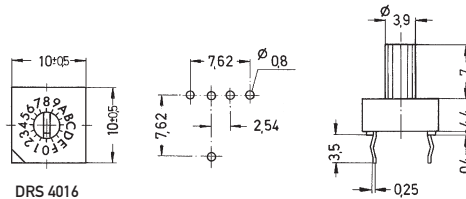
|                        |                                                                                 |
|------------------------|---------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA, non switching<br>15 V DC, 30 mA, switching                     |
| Contact resistance:    | < 100 mΩ                                                                        |
| Insulation resistance: | > 1000 MΩ at 250 V DC                                                           |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                       |
| Operating temperature: | -40 °C to +85 °C                                                                |
| Mechanical life:       | minimum 20 000 operations                                                       |
| Contacts:              | gold-plated                                                                     |
| Terminals:             | PC terminals, phosphor bronze, gold-plated                                      |
| Case material:         | PBT black, rotor: standard types yellow; inverse types red                      |
| Construction:          | case totally sealed, suitable for washing by immersion                          |
| Mounting:              | on pc-board                                                                     |
| Soldering conditions:  | wave-soldering – max. 6 sec, 260 °C<br>through hole reflow – 4-6 sec, 260 ±5 °C |

washable

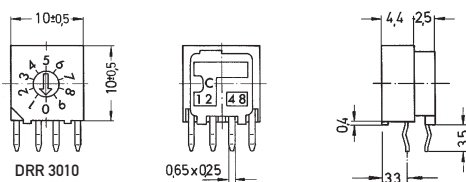
| Models:  | Code                |
|----------|---------------------|
| DRS 3010 | BCD                 |
| DRS 3110 | BCD Inverse         |
| DRS 3016 | Hexadecimal         |
| DRS 3116 | Hexadecimal Inverse |



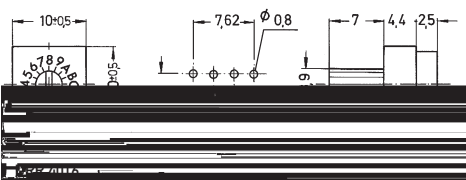
|          |                     |
|----------|---------------------|
| DRS 4010 | BCD                 |
| DRS 4110 | BCD Inverse         |
| DRS 4016 | Hexadecimal         |
| DRS 4116 | Hexadecimal Inverse |



|          |                     |
|----------|---------------------|
| DRR 3010 | BCD                 |
| DRR 3110 | BCD Inverse         |
| DRR 3016 | Hexadecimal         |
| DRR 3116 | Hexadecimal Inverse |



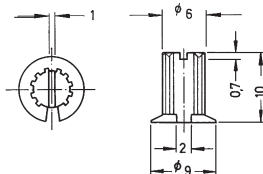
|          |                     |
|----------|---------------------|
| DRR 4010 | BCD                 |
| DRR 4110 | BCD Inverse         |
| DRR 4016 | Hexadecimal         |
| DRR 4116 | Hexadecimal Inverse |



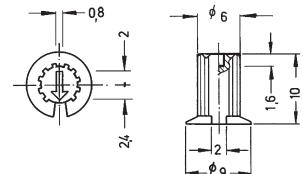
## Accessories:

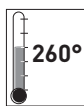
Caps

|        |        |
|--------|--------|
| yellow | KR 108 |
| red    | KR 109 |



grey KR 207





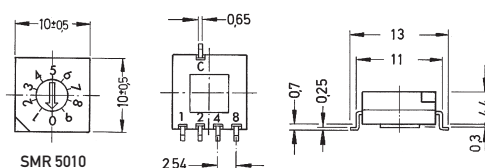
# Subminiature Rotary Coded Switches for SMT

## Specifications:

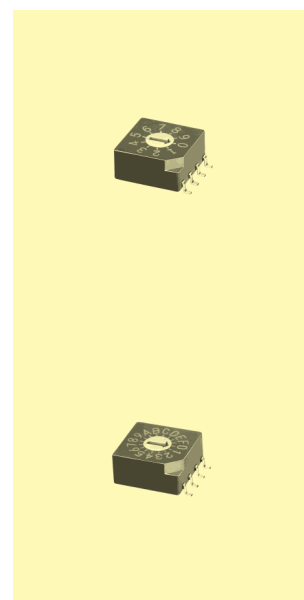
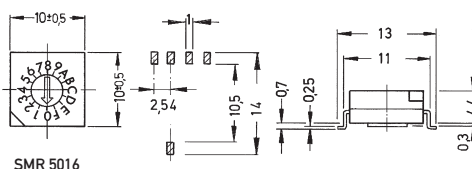
|                        |                                                             |
|------------------------|-------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA, non switching<br>15 V DC, 30 mA, switching |
| Contact resistance:    | < 100 mΩ                                                    |
| Insulation resistance: | > 1000 MΩ at 250 V DC                                       |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                   |
| Operating temperature: | –40 °C to +85 °C                                            |
| Mechanical life:       | minimum 20 000 operations                                   |
| Contacts:              | phosphor bronze, gold-plated                                |
| Terminals:             | phosphor bronze, gold-plated                                |
| Case material:         | PPS black, rotor: standard types yellow; inverse types red  |
| Construction:          | case totally sealed with protective tape                    |
| Mounting:              | on pc-board – SMD                                           |

washable

| Models:  | Code        |
|----------|-------------|
| SMR 5010 | BCD         |
| SMR 5110 | BCD Inverse |



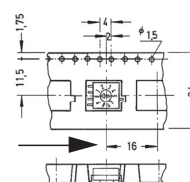
|          |                     |
|----------|---------------------|
| SMR 5016 | Hexadecimal         |
| SMR 5116 | Hexadecimal Inverse |



8

|          |                                                                                                    |
|----------|----------------------------------------------------------------------------------------------------|
| Packing: | sticks or tapes<br>for order on tape: additional to type number: T<br>example of order: SMR 5010 T |
|----------|----------------------------------------------------------------------------------------------------|

|           |            |          |
|-----------|------------|----------|
| Stick     | Tape       | Reel     |
| 48 pieces | 500 pieces | Ø 330 mm |



# Subminiature Rotary Coded Switches



## Specifications:

|                        |                                                                              |
|------------------------|------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA switching                                                     |
| Contact resistance:    | < 100 mΩ                                                                     |
| Insulation resistance: | > 1000 MΩ                                                                    |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                    |
| Operating temperature: | -25 °C to +70 °C                                                             |
| Mechanical life:       | minimum 2000 operations                                                      |
| Terminals:             | phosphor bronze, gold-plated over nickel barrier                             |
| Material:              | case: PBT blue, meets UL 94 V-0, washable,<br>rotor: white; inverse type red |
| Mounting:              | on pc-board                                                                  |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 °C                                         |

washable

## Models: Code

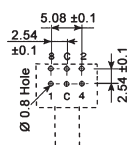
|           |                     |  |
|-----------|---------------------|--|
| DRS 20010 | BCD                 |  |
| DRS 20110 | BCD Inverse         |  |
| DRS 20016 | Hexadecimal         |  |
| DRS 20116 | Hexadecimal Inverse |  |

|           |                     |  |
|-----------|---------------------|--|
| DRS 21010 | BCD                 |  |
| DRS 21110 | BCD Inverse         |  |
| DRS 21016 | Hexadecimal         |  |
| DRS 21116 | Hexadecimal Inverse |  |

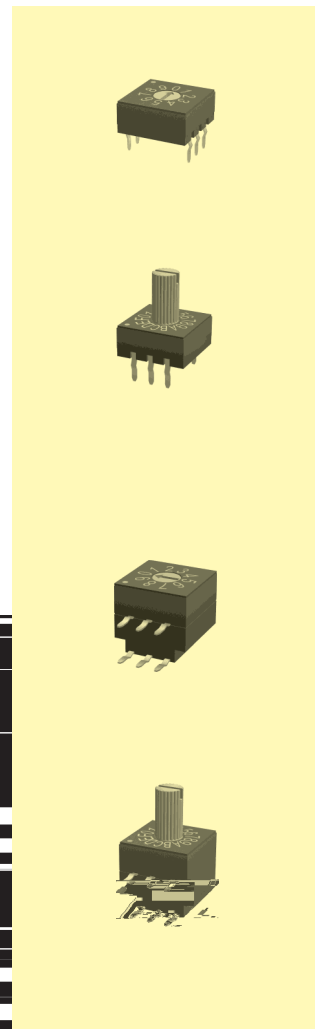
|           |                     |  |
|-----------|---------------------|--|
| DRR 20010 | BCD                 |  |
| DRR 20110 | BCD Inverse         |  |
| DRR 20016 | Hexadecimal         |  |
| DRR 20116 | Hexadecimal Inverse |  |

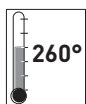
|           |                     |  |
|-----------|---------------------|--|
| DRR 21010 | BCD                 |  |
| DRR 21110 | BCD Inverse         |  |
| DRR 21016 | Hexadecimal         |  |
| DRR 21116 | Hexadecimal Inverse |  |

## Special version:



Spacing 2.54 mm  
Additional to type number: -1  
Example of order: DRR 20010-1





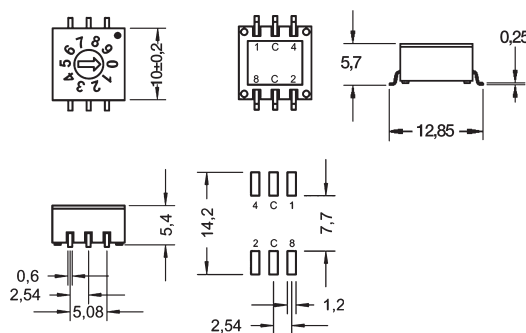
# Subminiature Rotary Coded Switches for SMT

## Specifications:

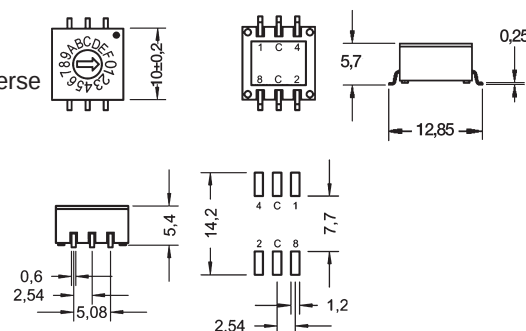
|                        |                                                                               |
|------------------------|-------------------------------------------------------------------------------|
| Contact rating:        | 24 V DC, 25 mA switching                                                      |
| Contact resistance:    | < 100 mΩ                                                                      |
| Insulation resistance: | > 1000 MΩ                                                                     |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                     |
| Operating temperature: | -25 °C to +70 °C                                                              |
| Mechanical life:       | minimum 2000 operations                                                       |
| Terminals:             | phosphor bronze, gold-plated over nickel barrier                              |
| Material:              | case: PBT black, meets UL 94 V-0, washable,<br>rotor: white; inverse type red |
| Mounting:              | on pc-board                                                                   |

## Models: Code

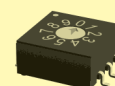
|           |             |
|-----------|-------------|
| SMR 20010 | BCD         |
| SMR 20110 | BCD Inverse |



|           |                     |
|-----------|---------------------|
| SMR 20016 | Hexadecimal         |
| SMR 20116 | Hexadecimal Inverse |



washable



Packing: 700 pieces per reel

# Subminiature Rotary Coded Switches waterproof

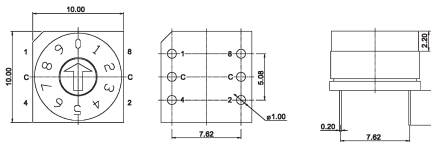


## Specifications:

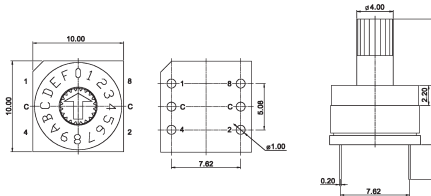
|                        |                                                                                             |
|------------------------|---------------------------------------------------------------------------------------------|
| Contact rating:        | switching: 150 mA, 42 V<br>non-switching: 200 mA, 42 V                                      |
| Contact resistance:    | < 80 mΩ                                                                                     |
| Insulation resistance: | > 100 MΩ                                                                                    |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                   |
| Operating temperature: | – 40 °C to + 85 °C                                                                          |
| Storage temperature:   | – 40 °C to + 85 °C                                                                          |
| Mechanical life:       | minimum 10 000 operations                                                                   |
| Terminals:             | phosphor bronze, gold-plated over nickel barrier                                            |
| Material:              | case: PA6T meets UL 94 V-0, cover light grey, base black<br>rotor: grey, inverse type beige |
| Protection:            | IP 67                                                                                       |
| Mounting:              | on pc-board with spacing 2.54 mm                                                            |
| Soldering conditions:  | wave-soldering – max. 10 sec, 260 °C<br>pre-heat – max. 70 sec, max. 120 °C                 |

## Models: Code

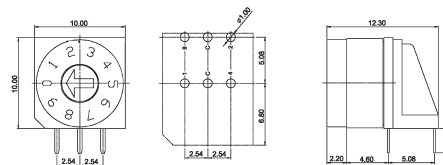
|           |                     |
|-----------|---------------------|
| DRS 60010 | BCD                 |
| DRS 60110 | BCD Inverse         |
| DRS 60016 | Hexadecimal         |
| DRS 60116 | Hexadecimal Inverse |



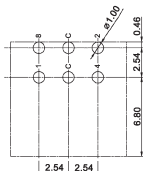
|           |                     |
|-----------|---------------------|
| DRS 61010 | BCD                 |
| DRS 61110 | BCD Inverse         |
| DRS 61016 | Hexadecimal         |
| DRS 61116 | Hexadecimal Inverse |



|           |                     |
|-----------|---------------------|
| DRR 60010 | BCD                 |
| DRR 60110 | BCD Inverse         |
| DRR 60016 | Hexadecimal         |
| DRR 60116 | Hexadecimal Inverse |



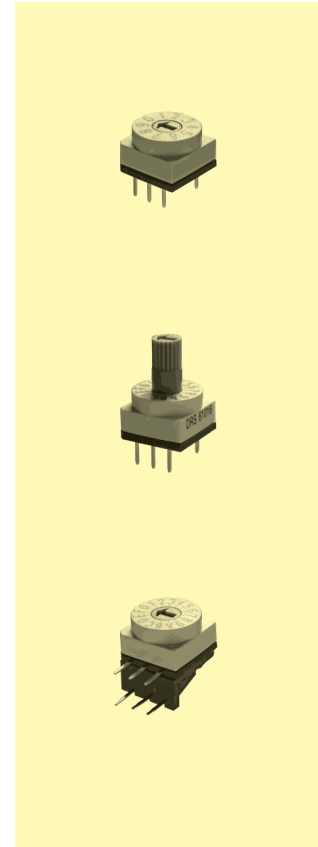
## Special version:

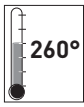


Spacing 2.54 mm

Additional to type number: –1

Example for order: DRR 60010-1





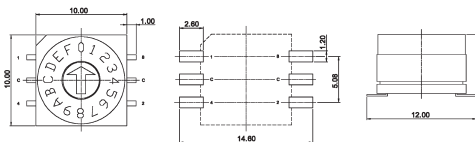
# Subminiature Rotary Coded Switches for SMT, waterproof

## Specifications:

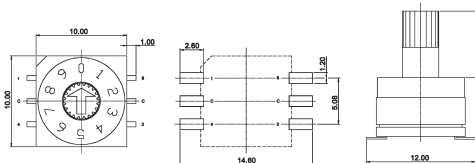
|                        |                                                                         |
|------------------------|-------------------------------------------------------------------------|
| Contact rating:        | switching: 150 mA, 42 V<br>non-switching: 200 mA, 42 V                  |
| Contact resistance:    | <80 mΩ                                                                  |
| Insulation resistance: | >100 MΩ                                                                 |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                               |
| Operating temperature: | –60 °C to +125 °C                                                       |
| Storage temperature:   | –60 °C to +125 °C                                                       |
| Mechanical life:       | minimum 10 000 operations                                               |
| Terminals:             | phosphor bronze, gold-plated over nickel barrier                        |
| Material:              | case: PA6T grey meets UL 94 V–0<br>rotor: PA 66 grey, inverse type blue |
| Protection:            | IP 67                                                                   |
| Mounting:              | on pc-board                                                             |
| Packing:               | 600 pcs/reel                                                            |

## Models: Code

|           |                     |
|-----------|---------------------|
| SMR 60010 | BCD                 |
| SMR 60110 | BCD Inverse         |
| SMR 60016 | Hexadecimal         |
| SMR 60116 | Hexadecimal Inverse |



|           |                     |
|-----------|---------------------|
| SMR 61010 | BCD                 |
| SMR 61110 | BCD Inverse         |
| SMR 61016 | Hexadecimal         |
| SMR 61116 | Hexadecimal Inverse |



washable



# Microminiature Rotary Coded Switches

## Specifications:

|                        |                                                                                                   |
|------------------------|---------------------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA, non-switching<br>15 V DC, 30 mA, switching                                       |
| Contact resistance:    | < 200 mΩ                                                                                          |
| Insulation resistance: | > 1000 MΩ at 250 V DC                                                                             |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                                         |
| Operating temperature: | –25 °C to +85 °C                                                                                  |
| Mechanical life:       | minimum 20 000 operations                                                                         |
| Contacts:              | gold-plated                                                                                       |
| Terminals:             | PC terminals, phosphor bronze, gold-plated                                                        |
| Material:              | case: PPS, black<br>frame: stainless steel<br>rotor: PA, standard types yellow; inverse types red |
| Construction:          | case totally sealed, suitable for washing by immersion                                            |
| Mounting:              | on pc-board                                                                                       |
| Soldering conditions:  | wave-soldering – max.: 5 sec, 260 ±3 °C                                                           |

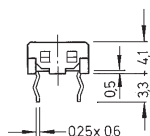
washable

## Models: Code

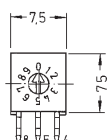
|          |                     |
|----------|---------------------|
| DRS 7010 | BCD                 |
| DRS 7110 | BCD Inverse         |
| DRS 7016 | Hexadecimal         |
| DRS 7116 | Hexadecimal Inverse |



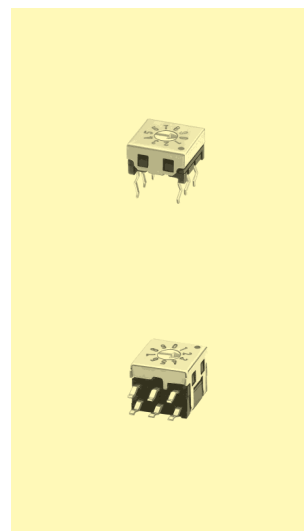
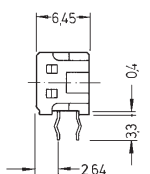
DRS 7010

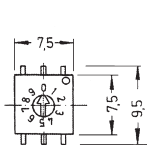
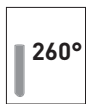


|          |                     |
|----------|---------------------|
| DRR 7010 | BCD                 |
| DRR 7110 | BCD Inverse         |
| DRR 7016 | Hexadecimal         |
| DRR 7116 | Hexadecimal Inverse |

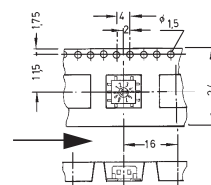
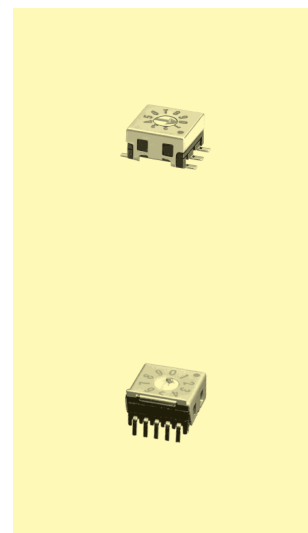
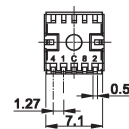
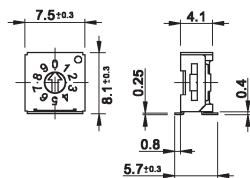
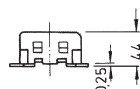
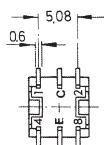


DRR 7010





SMR 7010



# Microminiature Rotary Coded Switches

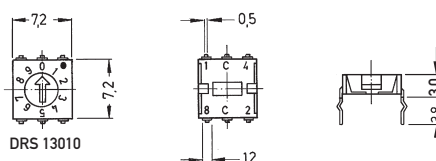
## Specifications:

|                        |                                                               |
|------------------------|---------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA, non-switching<br>5 V DC, 100 mA, switching   |
| Contact resistance:    | < 200 mΩ                                                      |
| Insulation resistance: | > 1000 MΩ                                                     |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                     |
| Operating temperature: | –25 °C to +75 °C                                              |
| Mechanical life:       | minimum 10 000 operations                                     |
| Contacts:              | gold-plated                                                   |
| Terminals:             | PC terminals, phosphor bronze, gold-plated                    |
| Case material:         | thermoplastic; rotor: standard types ivory; inverse types red |
| Construction:          | case totally sealed, suitable for washing by immersion        |
| Mounting:              | on pc-board                                                   |
| Soldering conditions:  | wave-soldering – max.: 3 sec, 250 °C                          |

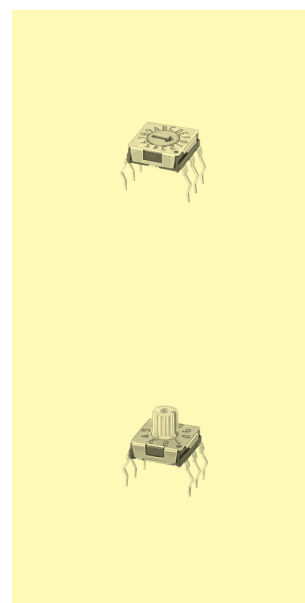
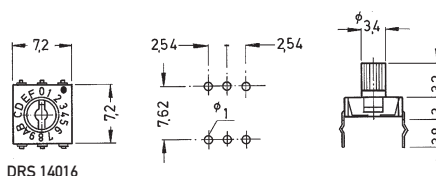
**washable**

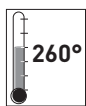
## Models: Code

|           |                     |
|-----------|---------------------|
| DRS 13010 | BCD                 |
| DRS 13110 | BCD Inverse         |
| DRS 13016 | Hexadecimal         |
| DRS 13116 | Hexadecimal Inverse |



|           |                     |
|-----------|---------------------|
| DRS 14010 | BCD                 |
| DRS 14110 | BCD Inverse         |
| DRS 14016 | Hexadecimal         |
| DRS 14116 | Hexadecimal Inverse |





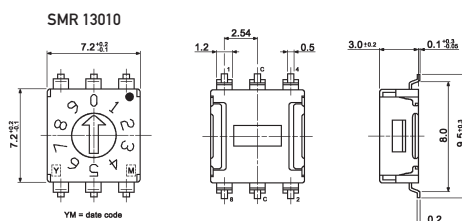
# Microminiature Rotary Coded Switches for SMT

## Specifications:

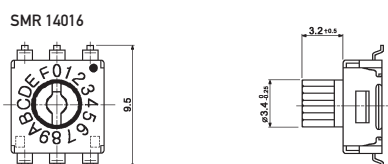
|                        |                                                                                         |
|------------------------|-----------------------------------------------------------------------------------------|
| Contact rating:        | 50 V DC, 100 mA, non-switching<br>5 V DC, 100 mA, switching                             |
| Contact resistance:    | < 200 mΩ                                                                                |
| Insulation resistance: | > 1000 MΩ at 100 V DC                                                                   |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                                               |
| Operating temperature: | –40 °C to +85 °C                                                                        |
| Mechanical life:       | minimum 20 000 operations                                                               |
| Contacts:              | phosphor bronze, gold-plated                                                            |
| Material:              | case: LCP; frame: stainless steel<br>rotor: PA, standard types ivory; inverse types red |
| Construction:          | case totally sealed, suitable for washing by immersion                                  |
| Mounting:              | on pc-board – SMD                                                                       |
| Soldering conditions:  | reflow-soldering                                                                        |

## Models: Code

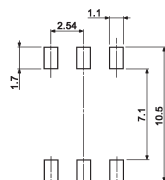
|           |                     |
|-----------|---------------------|
| SMR 13010 | BCD                 |
| SMR 13110 | BCD Inverse         |
| SMR 13016 | Hexadecimal         |
| SMR 13116 | Hexadecimal Inverse |



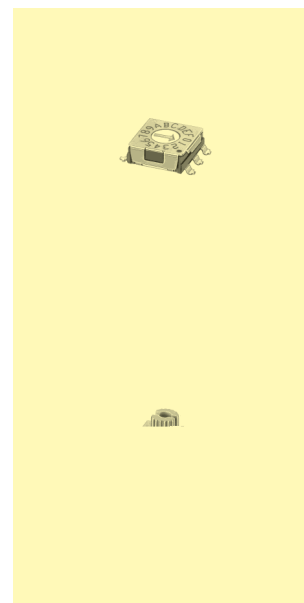
|           |                     |
|-----------|---------------------|
| SMR 14010 | BCD                 |
| SMR 14110 | BCD Inverse         |
| SMR 14016 | Hexadecimal         |
| SMR 14116 | Hexadecimal Inverse |



SURFACE MOUNT PAD LAYOUT



washable



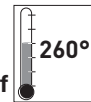
8

Packing: sticks or tapes  
for order on tapes: additional to type number: T  
example of order: SMR 13010 T

| Models     | Stick               | Tape        | Reel     |
|------------|---------------------|-------------|----------|
| SMR 13 000 | 65 pieces; L 510 mm | 1000 pieces | Ø 330 mm |
| SMR 14 000 | 65 pieces; L 510 mm | 500 pieces  | Ø 330 mm |

# Microminiature Rotary Coded Switches

waterproof



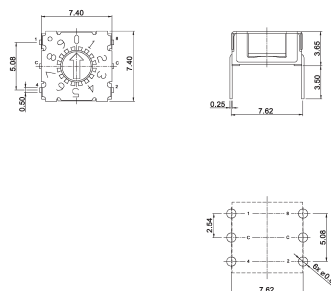
## Specifications:

|                        |                                                                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 42 V DC, 400 mA non-switching<br>42 V DC, 100 mA switching                                                                                                             |
| Contact resistance:    | < 80 mΩ                                                                                                                                                                |
| Insulation resistance: | > 100 MΩ at 250 V DC for 1 minute ± 5 sec.                                                                                                                             |
| Dielectric strength:   | 250 V (50/60 Hz) for 1 minute                                                                                                                                          |
| Operating temperature: | –50 °C to +125 °C                                                                                                                                                      |
| Storage temperature:   | –55 °C to +135 °C                                                                                                                                                      |
| Mechanical life:       | minimum 25 000 cycles                                                                                                                                                  |
| Material:              | Cover/spring plate/guide plate: stainless steel<br>Contact/terminal: phosphor bronze, >0,07 µm gold-plated over >0.3 µm nickel<br>Rotor/base: PA66<br>O-ring: silicone |
| Actuator colour:       | BCD real: pink; BCD inverse: orange; Hex real: grey; Hex inverse: ivory                                                                                                |
| Protection:            | IP 67                                                                                                                                                                  |
| Operating force:       | 120 ± 30 gf/cm                                                                                                                                                         |
| Soldering conditions:  | wave-soldering – max.: 260 °C ±5 °C, 5 ±1 sec., IR reflow soldering                                                                                                    |

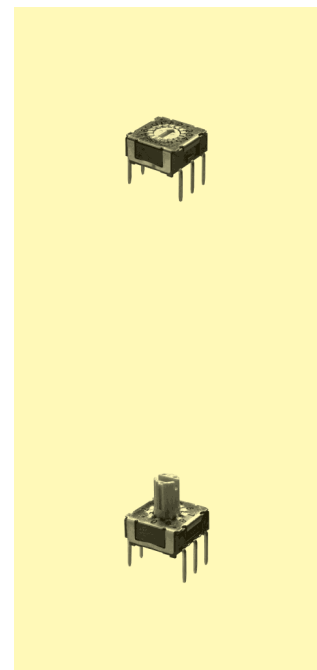
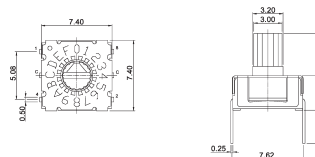
washable

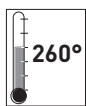
## Models: Code

|           |                     |
|-----------|---------------------|
| DRS 15010 | BCD                 |
| DRS 15110 | BCD Inverse         |
| DRS 15016 | Hexadecimal         |
| DRS 15116 | Hexadecimal Inverse |



|           |                     |
|-----------|---------------------|
| DRS 16010 | BCD                 |
| DRS 16110 | BCD Inverse         |
| DRS 16016 | Hexadecimal         |
| DRS 16116 | Hexadecimal Inverse |



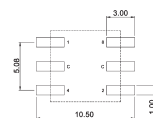
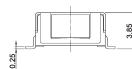
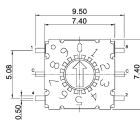


# Microminiature Rotary Coded Switches for SMT

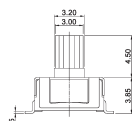
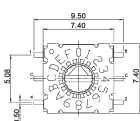
## Specifications:

|                        |                                                                                                                                                                        |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Contact rating:        | 42 V DC, 400 mA non-switching<br>42 V DC, 100 mA switching                                                                                                             |
| Contact resistance:    | < 80 mΩ                                                                                                                                                                |
| Insulation resistance: | > 100 MΩ at 250 V DC for 1 minute ± 5 sec.                                                                                                                             |
| Dielectric strength:   | 250 V (50/60 Hz) for 1 minute                                                                                                                                          |
| Operating temperature: | –50 °C to +125 °C                                                                                                                                                      |
| Storage temperature:   | –55 °C to +135 °C                                                                                                                                                      |
| Mechanical life:       | minimum 25 000 cycles                                                                                                                                                  |
| Material:              | Cover/spring plate/guide plate: stainless steel<br>Contact/terminal: phosphor bronze, >0.07 µm gold-plated over >0.3 µm nickel<br>Rotor/base: PA66<br>O-ring: silicone |
| Actuator colour:       | BCD real: pink; BCD inverse: orange; Hex real: grey; Hex inverse: ivory                                                                                                |
| Protection:            | IP 67                                                                                                                                                                  |
| Operating force:       | 120 ± 30 gf/cm                                                                                                                                                         |

| Models:   | Code                |
|-----------|---------------------|
| SMR 15010 | BCD                 |
| SMR 15110 | BCD Inverse         |
| SMR 15016 | Hexadecimal         |
| SMR 15116 | Hexadecimal Inverse |



|           |                     |
|-----------|---------------------|
| SMR 16010 | BCD                 |
| SMR 16110 | BCD Inverse         |
| SMR 16016 | Hexadecimal         |
| SMR 16116 | Hexadecimal Inverse |



washable



8

## Packing:

|        |                                                   |                 |
|--------|---------------------------------------------------|-----------------|
| SMR 15 | <input type="checkbox"/> <input type="checkbox"/> | 70 pieces/stick |
| SMR 16 | <input type="checkbox"/> <input type="checkbox"/> | 70 pieces/stick |

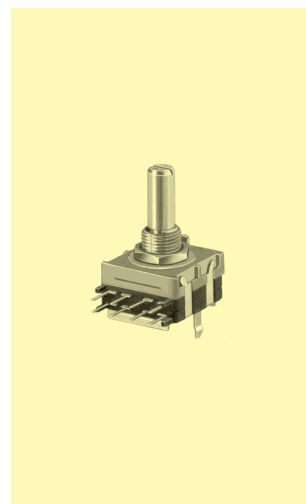
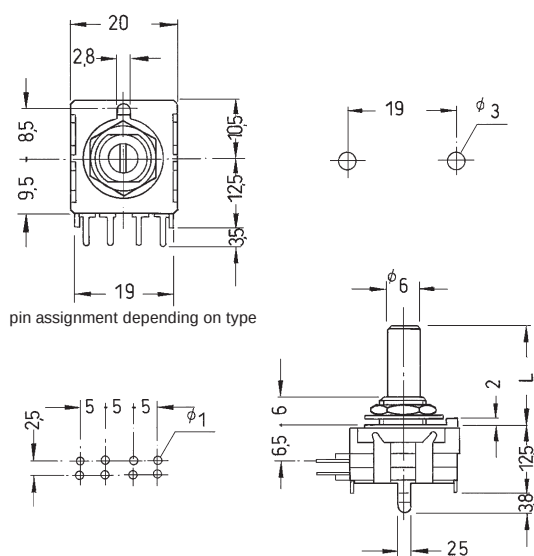
# Miniature Rotary Coded Switches

## Specifications:

|                        |                                                           |
|------------------------|-----------------------------------------------------------|
| Contact rating:        | 15 V DC, 100 mA                                           |
| Contact resistance:    | < 50 mΩ                                                   |
| Insulation resistance: | > 100 MΩ at 500 V DC                                      |
| Dielectric strength:   | 250 V, 50 Hz for the duration of 1 minute                 |
| Operating temperature: | -20 °C to +80 °C                                          |
| Mechanical life:       | minimum 10 000 operations                                 |
| Contacts:              | combination of silver- and gold-plated                    |
| Material:              | case: PBT with glass fibre 30%; shaft: aluminium          |
| Mounting:              | on pc-board or front panel, bushing M 9 x 0.75, key 12 mm |
| Soldering conditions:  | max.: 3 sec, 230 °C ± 5 °C                                |

## Models:

DRS 20



## Ordering code:

\* **DRS 20 - 108 - R 20 - 1**

|                                           |                          |
|-------------------------------------------|--------------------------|
| Series                                    | Code                     |
| number of poles                           | Binary                   |
| 1 - 3                                     | Binary inverse           |
|                                           | BCD                      |
|                                           | BCD inverse              |
|                                           | Gray                     |
| number of positions / angle of changeover | 1                        |
| 8                                         | 2                        |
| 10                                        | 3                        |
| 16                                        | 4                        |
| 18                                        | 5                        |
| 24                                        |                          |
| 32                                        |                          |
| 40                                        |                          |
| 45°                                       |                          |
| 36°                                       |                          |
| 22.5°                                     |                          |
| 20°                                       |                          |
| 15°                                       |                          |
| 11.25°                                    |                          |
| 9°                                        |                          |
|                                           | shaft length (mm)        |
|                                           | 15                       |
|                                           | 20                       |
|                                           | 25                       |
|                                           | 30                       |
|                                           | shaft style              |
|                                           | 18-tooth serration shaft |
|                                           | S                        |
|                                           | round shaft with groove  |
|                                           | R                        |
|                                           | flat shaft               |
|                                           | F                        |

\* Non-stock item; minimum quantity and delivery time on request

## BCD

|   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 8 |   |   |   |   |   |   |   |   | X | X |
| 4 |   |   |   |   | X | X | X | X |   |   |
| 2 |   |   | X | X |   |   | X | X |   |   |
| 1 |   | X |   | X |   | X |   | X |   | X |

## Hexadecimal

|   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 |   |   |   |   |   |   |   |   | X | X | X | X | X | X | X | X |
| 4 |   |   |   |   | X | X | X | X |   |   |   |   | X | X | X | X |
| 2 |   |   | X | X |   |   | X | X |   |   | X | X |   |   | X | X |
| 1 |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |

## BCD Inverse

|           | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|-----------|---|---|---|---|---|---|---|---|---|---|
| $\bar{8}$ | X | X | X | X | X | X | X | X |   |   |
| $\bar{4}$ | X | X | X | X |   |   |   |   | X | X |
| $\bar{2}$ | X | X |   |   | X | X |   |   | X | X |
| $\bar{1}$ | X |   | X |   | X |   | X |   | X |   |

## Hexadecimal Inverse

|           | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|-----------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| $\bar{8}$ | X | X | X | X | X | X | X | X |   |   |   |   |   |   |   |   |
| $\bar{4}$ | X | X | X | X |   |   |   |   | X | X | X | X |   |   |   |   |
| $\bar{2}$ | X | X |   |   | X | X |   |   | X | X |   |   | X | X |   |   |
| $\bar{1}$ | X |   | X |   | X |   | X |   | X |   | X |   | X |   | X |   |

