# Body Height 1.5mm, Compact-sized Double Action Type Tactile Switches <br> TSW-3 Series 

## [] Features

<>With 6.0 x 6.4 mm dimension and 1.5 mm height, surface-mounting type switches are ideal for high-density mounting.
<>A double action type with 2 contacts in 1 circuit turning on the first push and the second step by pushing further.
$<>2$ types of switches with or without click feeling are available.
$<>2$ nd operating force with 2.5 N and 3.5 N are available.
<> Available with ground terminal for electrostatic discharge.
<>A sharp click feeling of key touch is provided utilizing the tactile feedback characteristic.
$<>$ J-bent terminal and straight terminal are standardized. Permits reflow soldering.
<>Switches are packaged in 16 mm wide embossed taping.
[ Applications
<>Digital still camera and digital video camera
<>Portable audio devices, Car navigation system
<>Cellular phone, Personal digital assistance
Actual size


Zoom
[] Product number

[ Products Line
<>With 1st click feeling type

| No | Products No. | Operating force | Operating position (Distance from P.C. Board mounting face) | Ground terminal | $\begin{aligned} & \text { Terminal } \\ & \text { style } \end{aligned}$ | Variety |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | TSW-3A-T50 | $\begin{array}{ll} 1^{\text {st }} & 980 \mathrm{mN} \\ 2^{\text {nd }} & 2548 \mathrm{mN} \end{array}$ | $\begin{array}{cc} 1 \mathrm{st} & 1.0 \mathrm{~mm} \\ 2 \mathrm{nd} & 0.8 \mathrm{~mm} \end{array}$ | Without ground terminal | Straight | With guide bosses |
| 2 | TSW-3B-T50 |  |  |  | J-bent |  |
| 1 | TSW-3C-T50 |  |  |  | Straight | Without guide bosses |
| 2 | TSW-3D-T50 |  |  |  | J-bent |  |
| 3 | TSW-3A-GT50 |  |  | With ground terminal | Straight | With guide bosses |
| 4 | TSW-3B-GT50 |  |  |  | J-bent |  |
| 3 | TSW-3C-GT50 |  |  |  | Straight | Without guide bosses |
| 4 | TSW-3D- GT50 |  |  |  | J-bent |  |
| 1 | TSW-3AS2-T50 | $\begin{aligned} & 1^{\text {st }} 1000 \mathrm{mN} \\ & 2^{\text {nd }} 3500 \mathrm{mN} \end{aligned}$ |  | Without ground terminal | Straight | With guide bosses |
| 2 | TSW-3BS2-T50 |  |  |  | J-bent |  |
| 1 | TSW-3CS2-T50 |  |  |  | Straight | Without guide bosses |
| 2 | TSW-3DS2-T50 |  |  |  | J-bent |  |
| 3 | TSW-3AS2-GT50 |  |  | With ground terminal | Straight | With guide bosses |
| 4 | TSW-3BS2-GT50 |  |  |  | J-bent |  |
| 3 | TSW-3CS2-GT50 |  |  |  | Straight | Without guide bosses |
| 4 | TSW-3DS2-GT50 |  |  |  | J-bent |  |


| No | Products No. | Operating force | Operating position (Distance from P.C. Board mounting face) | Ground terminal | Terminal style | Variety |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 5 | TSW-3E-T50 | $\begin{aligned} & \text { 1st }<588 \mathrm{mN} \\ & \text { 2nd } 2352 \mathrm{mN} \end{aligned}$ | $\begin{array}{ll} \text { 1st } & 0.9 \mathrm{~mm} \\ \text { 2nd } & 0.7 \mathrm{~mm} \end{array}$ | Without ground terminal | Straight | With guide bosses |
| 6 | TSW-3F-T50 |  |  |  | J-bent |  |
| 5 | TSW-3G-T50 |  |  |  | Straight | Without guide bosses |
| 6 | TSW-3H-T50 |  |  |  | J-bent |  |
| 7 | TSW-3E-GT50 |  |  | With ground terminal | Straight | With guide bosses |
| 8 | TSW-3F-GT50 |  |  |  | J-bent |  |
| 7 | TSW-3G-GT50 |  |  |  | Straight | Without guide bosses |
| 8 | TSW-3H-GT50 |  |  |  | J-bent |  |
| 5 | TSW-3ES2-T50 | $\begin{aligned} & \text { 1st }<686 \mathrm{mN} \\ & \text { 2nd } 3038 \mathrm{mN} \end{aligned}$ |  | Without ground terminal | Straight | With guide bosses |
| 6 | TSW-3FS2-T50 |  |  |  | J-bent |  |
| 5 | TSW-3GS2-T50 |  |  |  | Straight | Without guide bosses |
| 6 | TSW-3HS2-T50 |  |  |  | J-bent |  |
| 7 | TSW-3ES2-GT50 |  |  | With ground terminal | Straight | With guide bosses |
| 8 | TSW-3FS2-GT50 |  |  |  | J-bent |  |
| 7 | TSW-3GS2-GT50 |  |  |  | Straight | Without guide bosses |
| 8 | TSW-3HS2-GT50 |  |  |  | J-bent |  |

■ Typical Specifications

| Item | Specifications |
| :--- | :--- |
| Ratings (max.) (Resistive load) | 50 mA 12 V DC |
| Contact resistance | 100 milliohm max. (Initial) |
| Insulation resistance | 100 megohm min. 100V DC |
| Withstanding voltage | 250 V AC for 1min. |
| Operating force | With 1st click feeling type ; 1st $980 \mathrm{mN}, 2 \mathrm{nd} 2548 \mathrm{mN} / 1 \mathrm{st} 1000 \mathrm{mN}, 2 \mathrm{nd} 3500 \mathrm{mN}$ <br> Without 1st click feeling type ; 1st $<588 \mathrm{mN}, 2 \mathrm{nd} 2352 \mathrm{mN} / 1 \mathrm{st}<686 \mathrm{mN}, 2 \mathrm{nd} 3038 \mathrm{mN}$ |
| Operating life | With 1st click feeling type ; 30,000 cycles <br> Without 1st click feeling type ; 100,000 cycles |
| Operating temperature range | -20 to +70 degree Celsius |
| Storage temperature range | -30 to +80 degree Celsius (except carrier tape) |

[] Feeling chart

[] Recommended actuator style / Inclination of the actuator


Operating area: Within 0.3 mm from the center of the switch
Allowable incline of operating: Less than 3 degree

| No | Style | P.C.B reference Land Dimensions Circuit Diagram (TOP VIEW) |
| :---: | :---: | :---: |
| 1 | With 1st click feeling / Straight terminal / Without ground terminal TSW-3A-T50 / TSW-3C-T50 <br> TSW-3AS2-T50 / TSW-3CS2-T50 <br> Above is the drawing of TSW-3 with guide bosses. | 2nd Operating <br> 1st Operating |
| 2 | With 1st click feeling / J-bent terminal / Without ground terminal TSW-3B-T50 / TSW-3D-T50 <br> TSW-3BS2-T50 / TSW-3DS2-T50 <br> Above is the drawing of TSW-3 with guiding bosses. | 2nd Operating <br> 1st Operating <br> Circuit di agram |


| No | Style | P.C.B reference Land Dimensions Circuit Diagram (TOP VIEW) |
| :---: | :---: | :---: |
| 3 | With 1st click feeling / Straight terminal / With ground terminal TSW-3A-GT50 / TSW-3C-GT50 <br> TSW-3AS2-GT50 / TSW-3CS2-GT50 <br> Above is the drawing of TSW-3 with guide bosses. | (C) (A) (B) 몬 <br> 2nd Operating <br> 1st Operating <br> Circuit diagram |
| 4 | With 1st click feeling / J-bent terminal / With ground terminal <br> TSW-3B-GT50 / TSW-3D-GT50 <br> TSW-3BS2-GT50 / TSW-3DS2-GT50 <br> Above is the drawing of TSW-3 with guiding bosses. |  <br> (-1) (B) <br> 2nd Operating <br> © (8) (B) © <br> 1st Operating <br> (1) (1) (B) © <br> Circuit diagram |


| No | Style | P.C.B reference Land Dimensions Circuit Diagram (TOP VIEW) |
| :---: | :---: | :---: |
| 5 | Without 1st click feeling / Straight terminal / Without ground terminal TSW-3E-T50 / TSW-3G-T50 <br> TSW-3ES2-T50 / TSW-3GS2-T50 <br> Above is the drawing of TSW-3 with guide bosses. | 2nd Operating <br> 1st Operating <br> Circuit diagram |
| 6 | Without 1st click feeling / J-bent terminal / Without ground terminal TSW-3F-T50 / TSW-3H-T50 <br> TSW-3FS2-T50 / TSW-3HS2-T50 <br> Above is the drawing of TSW-3 with guiding bosses. | 2nd Operating <br> 1st Operating |


| No | Style | P.C.B reference Land Dimensions Circuit Diagram (TOP VIEW) |
| :---: | :---: | :---: |
| 7 | Without 1st click feeling / Straight terminal / With ground terminal TSW-3E-GT50 / TSW-3G-GT50 <br> TSW-3ES2-GT50 / TSW-3GS2-GT50 <br> Above is the drawing of TSW-3 with guide bosses. | 2nd Operating <br> 1st Operating <br> Circuit diagram |
| 8 | Without 1st click feeling / J-bent terminal / With ground terminal TSW-3F-GT50 / TSW-3H-GT50 <br> TSW-3FS2-GT50 / TSW-3HS2-GT50 <br> Above is the drawing of TSW-3 with guiding bosses. |  <br> © (4) (3) 2nd Operating st Operating <br> Circuit diagram |

## [] Notes

1. The appearance and specifications of the product may be modified to improve its performance without prior notice.
2. This catalog shows only outline specifications. When using the product, please obtain formal specifications.
3. Please see appendix [Cautions in Using Switches].
4. $5,000 \mathrm{pcs} /$ one reel is the minimum packing unit. It is requested that the quantity of order shall be an integer multiple of the minimum packing unit.
5. Please set the reflow soldering condition confirming under the actual conditions of mass-production.
6. Characteristics of switch may change due to the warping of the circuit writing board. Consideration shall be given to the pattern design and layout.
7. This push switch is not washable.
8. This push switch permits reflow soldering and the switch has the possibility to be mounted on the edge of the PC board. But auto-dip shall not be done after the mounting of the switch because of the big possibility of the penetration of the soldering flux into the contacts sliding portion.
9. Larger stress than specified and/ or shock shall not be applied during switch operation.
10. Do not press the portion of the film by the sharp edged object.
11. In manual soldering, consider that the abnormal pressure of the soldering iron shall not be applied to the tip of the terminal as well do not apply any pressure for more than 1 minute after soldering.
12. Care shall be taken so that the flux shall not penetrate into the terminal portion.
13. The operating characteristic may change if force is exerted to the top the cover.
