

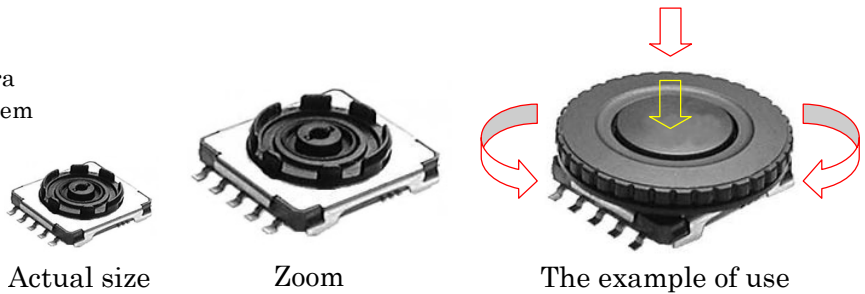
Multi-Functional Switch
(Double Action Tactile + Rotary Encoder)
TSW-12 Series

Features

- ◇Double action tactile switch and rotary encoder combined switch.
- ◇With 12.2x13.0mm dimension and 1.5mm 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.
- ◇2nd operating force with 2.6N and 3.5N are available.
- ◇A sharp click feeling of key touch is provided utilizing the tactile feedback characteristic.
- ◇A small encoder for setting the program codes of various digital circuits.
- ◇With solderable metal covered ground terminal effective for electrostatic discharge.
- ◇Permits reflow soldering.
- ◇This switch can be used also as single action tactile switch.
- ◇Switches are packaged in 24mm wide embossed taping.

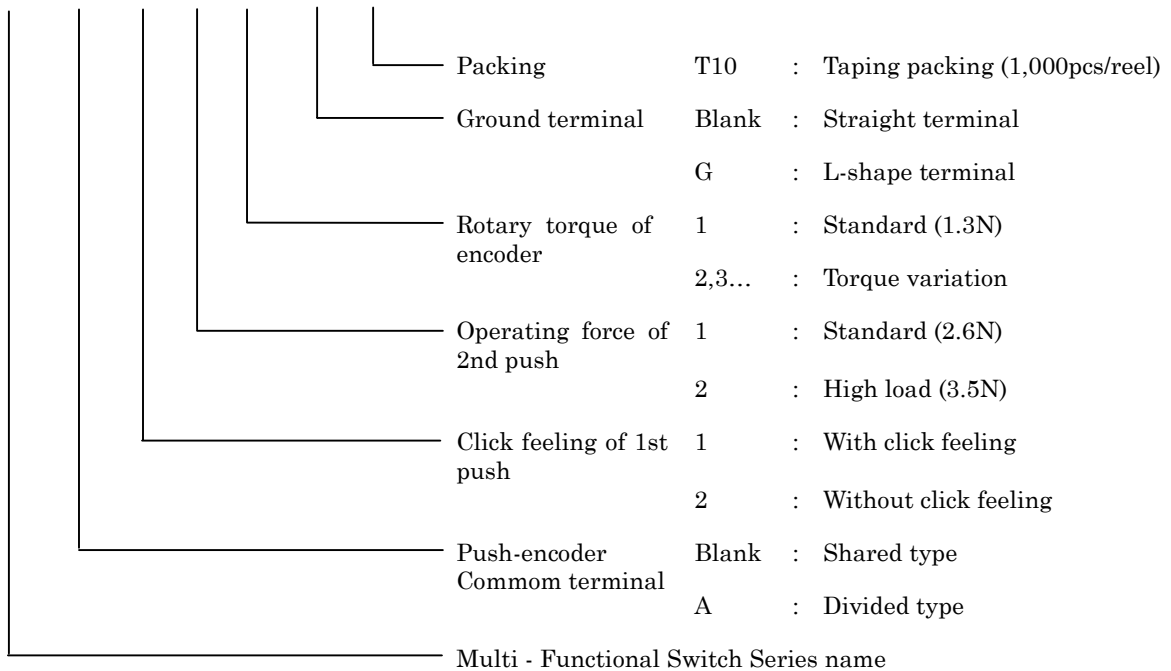
Applications

- ◇Digital still camera and digital video camera
- ◇Portable audio devices, Car navigation system
- ◇Cellular phone, Personal digital assistance



Products Number system

TSW - 12 [] - [] [] [] - [] T10



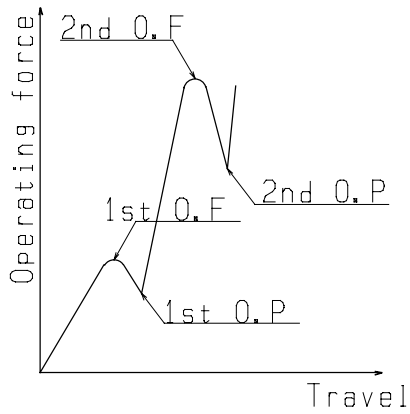
□ Typical Specifications

Item		Specifications
Ratings (max.) (Resistive load)		50mA 12V DC
Contact resistance		200 milliohm max. (Initial)
Insulation resistance		100 megohm min. 500V DC
Withstanding voltage		100V AC for 1min.
Operating force	Push	With 1st click ; 1st 1.0N , 2nd 2.6N or 3.5N Without 1st click ; 1st <0.7N , 2nd 2.4N or 3.0N
	Rotary torque	1.3N
Operating life	Push	With 1st click ; 30,000 cycles Without 1st click ; 100,000 cycles
	Rotary	10,000 cycles (1 rotation = 1 cycle)
Operating temperature range		-20 to +70 degree Celsius
Storage temperature range		-30 to +80 degree Celsius (except carrier tape)

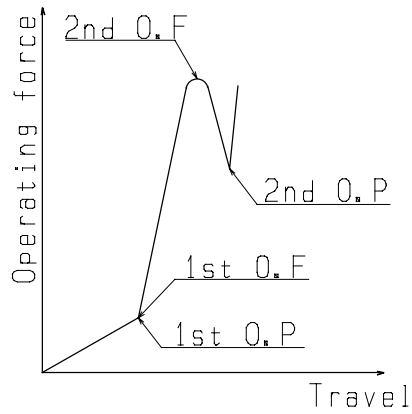
□ Products Line

No	Products No.	Click feeling of 1st push	Operating position (Distance from P.C. Board mounting face)	Operating force of push		Ground terminal	Common terminal
				1st	2nd		
1	TSW-12-111-T10	With	1st 1.15mm	1.0N	2.6N	Straight terminal	Shared type
1	TSW-12-121-T10		2nd 0.95mm		3.5N		
1	TSW-12-211-T10	Without	1st 1.05mm	<0.7N	2.4N		
1	TSW-12-221-T10		2nd 0.85mm		3.0N		
2	TSW-12-111-GT10	With	1st 1.15mm	1.0N	2.6N	L-shape terminal	
2	TSW-12-121-GT10		2nd 0.95mm		3.5N		
2	TSW-12-211-GT10	Without	1st 1.05mm	<0.7N	2.4N		
2	TSW-12-221-GT10		2nd 0.85mm		3.0N		
3	TSW-12A-111-T10	With	1st 1.15mm	1.0N	2.6N	Straight terminal	Divided type
3	TSW-12A-121-T10		2nd 0.95mm		3.5N		
3	TSW-12A-211-T10	Without	1st 1.05mm	<0.7N	2.4N		
3	TSW-12A-221-T10		2nd 0.85mm		3.0N		
4	TSW-12A-111-GT10	With	1st 1.15mm	1.0N	2.6N	L-shape terminal	
4	TSW-12A-121-GT10		2nd 0.95mm		3.5N		
4	TSW-12A-211-GT10	Without	1st 1.05mm	<0.7N	2.4N		
4	TSW-12A-221-GT10		2nd 0.85mm		3.0N		

▣ Feeling chart



With 1st click feeling type



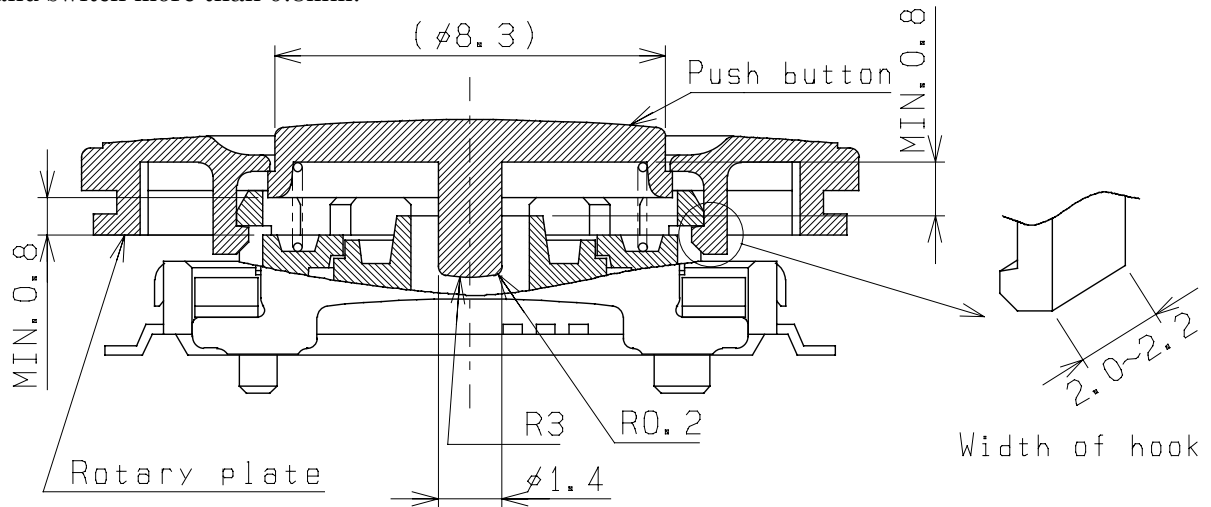
Without 1st click feeling type

▣ Cautions for designing the push button and its recommendable dimension.

Characteristics of this switch may change due to the shape of push button.

Please refer to the recommendable dimension as below.

To have the necessary stroke of push button, please keep the clearance between push-button and switch more than 0.8mm.



Dimensions

Unit : mm

No	Style
1	<p>PC Board mounting face</p> <p>RD.05</p> <p>12-C0.3</p> <p>2-C0.15</p> <p>2nd Operating position</p> <p>1st Operating position</p> <p>Free position</p> <p>Ground terminal</p>
<p align="center">P.C.B reference Land Dimensions and Circuit Diagram (TOP VIEW)</p>	
<p>PC Board land dimensions</p> <p>CIRCUIT</p> <p>2nd Operating</p> <p>1st Operating</p> <p>Push Circuit diagram</p>	

Dimensions

Unit : mm

No	Style
2	<p>Technical drawing of the TSW-12 Series switch. The drawing includes a top view, a side view, and a cross-sectional view. Key dimensions and features are labeled: <ul style="list-style-type: none"> Top View: Shows a circular switch with a diameter of 10.8. It features six terminals labeled P:1 through P:6. Dimensions include 8.8 for the central diameter, 13 for the outer diameter, and various radii and offsets for the terminals. Side View: Shows the profile of the switch with a total height of 13.2. It indicates the 'PC Board mounting face' and shows the thickness of the switch body. Cross-sectional View: Shows the internal mechanism with a ground terminal. Dimensions include 15.5 for the base diameter, 9.95 for the internal diameter, and various heights for the operating positions: 2nd Operating Position (0.95), 1st Operating Position (1.15), and Free position (1.55). </p>
<p align="center">P.C.B reference Land Dimensions and Circuit Diagram (TOP VIEW)</p>	
<p>PC Board land dimensions and circuit diagrams. The top view shows the layout of the six terminals (P:1 to P:6) on the PCB with dimensions such as 16.8, 13, 11.1, 6.5, 5.5, 4, 5.5, 1.6, 9-1.5, 4-2, 1.3, and 0.9. The circuit diagram shows the internal switch mechanism with terminals 1 through 6. To the right, three push circuit diagrams are shown: <ul style="list-style-type: none"> 2nd Operating: Shows terminals 1, 2, and 3 connected in a specific configuration. 1st Operating: Shows terminals 1, 2, and 3 connected in a different configuration. Push Circuit diagram: Shows terminals 1, 2, and 3 connected in a third configuration. </p>	

Dimensions

Unit : mm

No	Style
3	
<p align="center">PC.B reference Land Dimensions and Circuit Diagram (TOP VIEW)</p>	
<p>PC Board land dimensions</p>	<p align="center">CIRCUIT</p> <p align="right">Push Circuit diagram</p>

Dimensions

Unit : mm

No	Style
4	
<p align="center">P.C.B reference Land Dimensions and Circuit Diagram (TOP VIEW)</p>	
<p>PC Board land dimensions</p>	<p align="center">CIRCUIT</p> <p align="center">2nd Operating 1st Operating Push Circuit diagram</p>

□ Standard codes

Output-code by 6 terminals

The **O** marks show the ON position.

	Position									
	0	1	2	3	4	5	6	7	8	9
C-1			O	O	O					
C-2					O	O				
C-3						O	O			
C-4							O	O	O	
C-5									O	O
C-6		O	O							

Output-code by 5 terminals

Connect output terminal No.2 and No.3 at PC Board land pattern

The **O** marks show the ON position.

	Position									
	0	1	2	3	4	5	6	7	8	9
C-1			O	O	O					
C-2,3					O	O	O			
C-4							O	O	O	
C-5									O	O
C-6		O	O							

□ 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. 5,000pcs/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. Pressure to the push button shall be applied to the whole surface equally and avoid the pressure to the specific one portion.
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 of the cover.
14. Consideration shall be taken to the chattering and bouncing in circuit design and soft setting.
15. Please confirm the performance on actual operation by simulation with actual environments for high reliability.