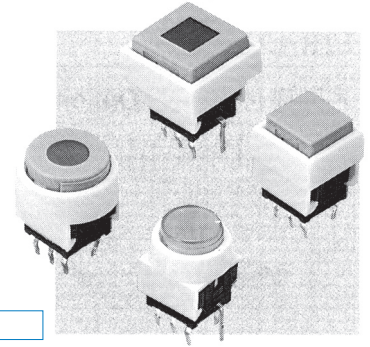


TP&TPL

Ultra-Miniature Pushbutton Switches



RoHS Compliant

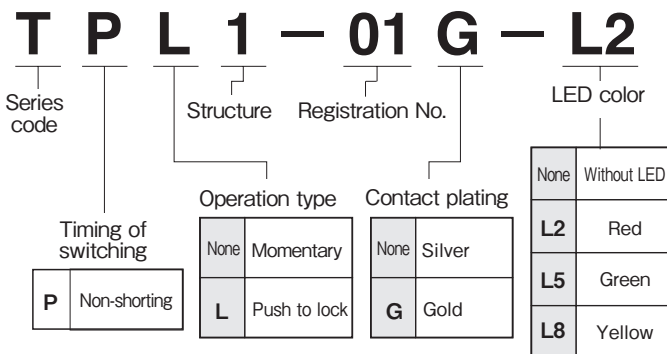
■ Features

- 1. Long Travel**
DPDT ultra-miniature switch with long travel (latch position: 1 mm, total travel: 1.5 mm).
- 2. High Contact Reliability**
Clip type contact mechanism ensures high reliability.
- 3. PC Board Mount**
Terminal pitch is in inches (multiples of 2.54 mm) for all models. The unique terminal shape prevents the terminal pins from coming loose from the PC board during dip soldering.
- 4. Epoxy Sealed Terminals**
Epoxy sealed terminals prevent ingress of flux.
- 5. Wide Variety of Accessories**
Wide selection of accessories including color buttons, mounting frames, and LED illuminations are available
- 6. Unified Mounting Height**
The mounting height of the TP/TPL series is the same as the LTR/LTM series which makes it convenient to design into the same panel.

■ Specifications

Rating	Silver plated contacts	0.1A 30VDC max.	
	Gold plated contacts	0.1A 30VDC max. 1μA min.	
Initial contact resistance	Silver plated contacts	50mΩ max.	(1.5mA 200μ VAC)
	Gold plated contacts	100mΩ max.	
Dielectric strength	500VAC 1 minute		
Insulation resistance	100MΩmin.		(500VDC)
Electrical life	10,000 operations		
Operating force	TP	1.47±0.98N	(Momentary)
	TPL	2.45±0.98N	(Push to lock)
Operating temperature range	-10~+70°C		
Storage temperature range	-25~+85°C		

■ Part Numbering

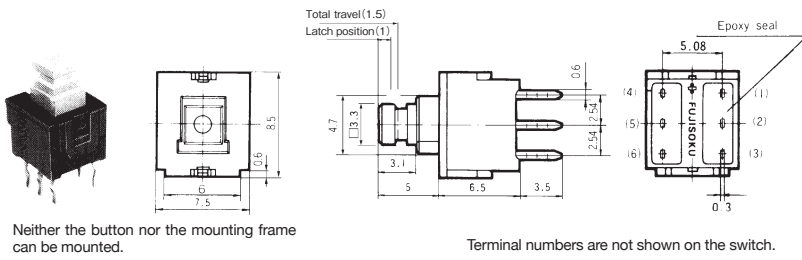


■ Construction

Fig.	1	2
Construction		
		Without LED With LED

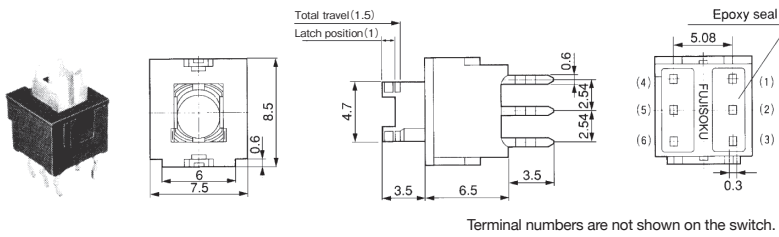
TP/TPL

TP1·TPL1 (Without LED)



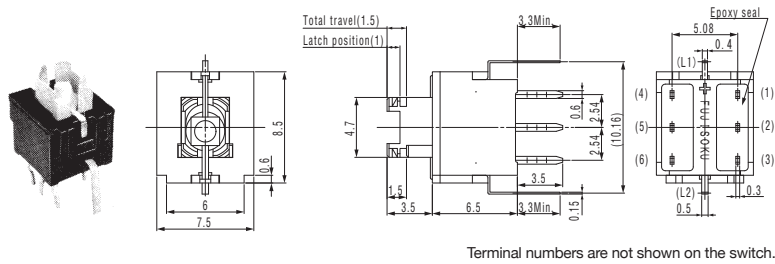
Part No.	Switching function		Circuit diagrams
TP1-01□	ON	(ON)	
TPL1-01	ON	ON	
Connecting terminals	2-1 5-4	2-3 5-6	

TP2·TPL2 (Without LED)



Part No.	Switching function		Circuit diagrams
TP2-01□	ON	(ON)	
TPL2-01□	ON	ON	
Connecting terminals	2-1 5-4	2-3 5-6	

TP2·TPL2 (With LED)



Part No.	Switching function		Circuit diagrams
TP2-01□-L■	ON	(ON)	
TPL2-01□-L■	ON	ON	
Connecting terminals	2-1 5-4	2-3 5-6	
LED circuit			

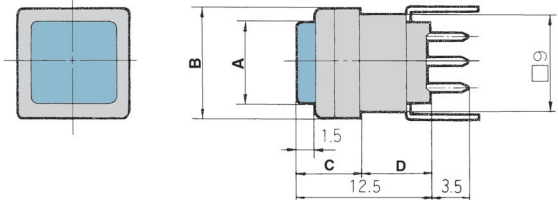
□ : Contact plating code (Silver/Gold) ■ : LED color code

LED Specifications (TP2·TPL2)

Symbol	Color	Forward Current (IF)	Forward V (VF)		Reverse Voltage (VR)
			nom.	max.	
L2	Red	30mA	2.0V	2.5V	DC5V
L5	Green	25mA	2.2V	2.5V	DC5V
L8	Yellow	30mA	2.1V	2.5V	DC5V

Dimensions with color button and mounting frame

(TP2
TPL2)



PC Hole Layouts

(Top view)

タイプ/Type	LEDなし (without LED)	LED付き (with LED)
寸法図 Dimensions		

The blue line represents the switch outline.

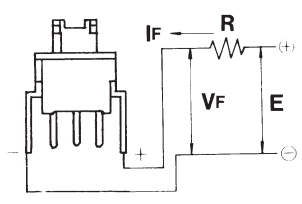
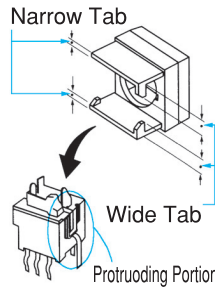
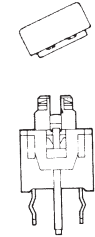
Button	Dimension A	Dimension B	Dimension C	Dimension D
□10	□10	□12.5	6	6.5
φ10	φ10	φ12.5	6	6.5
□7.5	□7.5	□10	6	6.5
φ7.5	φ7.5	φ10	5.3	7.2

Note: Neither the button nor the mounting frame can be mounted on to TP1 and TPL1.

(ON) : Momentary

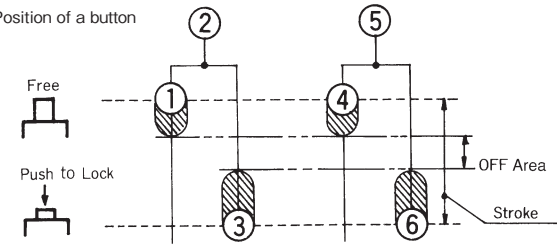
■ : Refer to "Table of Part Numbers" on P.181 for a full list of part numbers.

■ Handling Precautions

LED circuit	<p>Current to be applied to the LED must be lower than the forward current (IF) indicated in the LED Specifications of each switches. Resistance value R should be calculated using the formula on the right.</p>		<p>Calculation Example : E=6 V IF=10mA</p> $R = \frac{E - V_F}{I_F} = \frac{6 - 2.1}{0.01} = 390\Omega$ <p>Use VF=2.1V to calculate.</p>
Accessories mounting		<p>1. Installing the mounting frame Install the mounting frame so that the tab on the frame is in the same direction as the switch groove.</p> <p>2. Installing the color button Install the color button so that the protrusions on the switch actuator fit in the square buttonhole.</p>	 <p>● The mounting frame cannot be installed when the color button is already mounted on the switch.</p>

Do not remove the button when a switch is locked.

■ Contact method

Code	Item	Contact method
P	Non-shorting	<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;"> <p>Position of a button</p>  </div> <div> <p>There is a range of complete OFF time in the transit process from Terminal ① (or ④) to ③ (or ⑥).</p> </div> </div>

◐ : ON area

■ Table of Part Numbers

Contact plating		Series	TP1	TPL1	TP2	TPL2
Non-illuminated	Silver		TP1-01	TPL1-01	TP2-01	TPL2-01
	Gold		★TP1-01G	—	★TP2-01G	★TPL2-01G
Illuminated	Series		TP2		TPL2	
	Silver	Red	☆TP2-01-L2		☆TPL2-01-L2	
		Green	TP2-01-L5		TPL2-01-L5	
		Yellow	☆TP2-01-L8		☆TPL2-01-L8	
	Gold	Red	★TP2-01G-L2		★TPL2-01G-L2	
		Green	★TP2-01G-L5		★TPL2-01G-L5	
Yellow		★TP2-01G-L8		★TPL2-01G-L8		

■ Optional Accessories

《Sold separately》

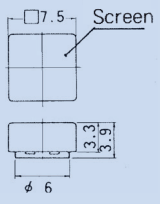
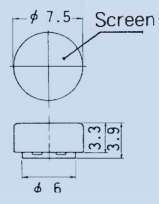
Part Name	Color Button (Non-illuminated)			
Dimensions				
Dark gray	140007480234	140007480272	140007480244	140007480282
Gray	140007480235	140007480273	140007480245	140007480283
White	140007480236	140007480274	140007480246	140007480284
Ivory	140007480237	140007480275	140007480247	140007480285
Red	140007480231	140007480269	140007480241	140007480279

Part Name	Color Button (Illuminated)			
Dimensions				
①Color / ②Screen color	Clear	Red Clear	Green Clear	Yellow Clear
Dark gray	140007480468	140007480251	140007480258	140007480265
Gray	140007480469	140007480252	140007480259	140007480266
White	140007480470	140007480253	—	140007480267
Ivory	140007480471	—	140007480261	140007480268
Red	140007480472	140007480248	—	—

Part Name	Mounting Frame			
Dimensions				
Dark gray	140000340191	140000340195	140000340187	140000340199
Gray	140000340192	140000340196	140000340188	140000340200
White	140000340193	140000340197	140000340189	140000340201
Ivory	140000340194	140000340198	140000340190	140000340202

Optional Accessories

(Sold separately)

Color Button (Illuminated)		
Dimensions		
	Clear	140007480466
Red Clear	140007480238	140007480276
Green Clear	140007480239	140007480277
Yellow clear	140007480240	140007480278

Packaging Specifications



Soldering Specifications

- (1) Manual Soldering
 - Device: Soldering iron
 - ① 380°C, Max.; 3 seconds, Max.
- (2) Wave Soldering
 - Device: Jet wave type or dip type
 - ① 245°C; 3 seconds, Max.
 - Pre-heating should be done at temperatures below 80°C to 120°C and within 120 seconds.
 - For **TPL** type, soldering should be done with the lock released.
 - Do not dip solder the switches with color buttons or mounting frames attached. Soldering heat may deform the accessories or cause ingress of flux.

Flux Cleaning

- (1) Solvents : Fluorine or Alcohol type
- (2) The **TP/TPL** series are not washable. To wash the PC board, clean the soldering surface of the PC board with a brush so that the switch is not exposed to the cleaning solution.
- (3) After soldering, wait until the temperature of the terminals cool down to 90°C or below or until the parts are exposed to room temperature for more than 5 min. before washing.

Switch Operation (TM/TR/LTM/LTR/TP/TPL Series)

- (1) Operating force should be 9.8 N or less.
- (2) Do not operate the switch right after soldering.
- (3) Do not solder the switch with the actuator pressed down.