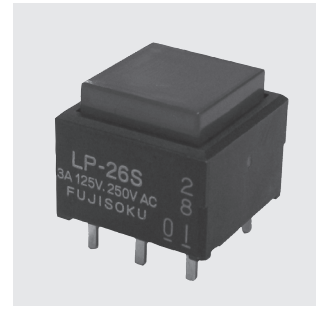


# LP

## Illuminated Pushbutton Switches

UL

CSA



RoHS Compliant

### ■ Features

#### 1. Low Profile

Ideal for low profile PC mounting or snap-in mounting with tight behind panel dimensions.

#### 2. Full Face Illumination

Bright LED provides excellent illumination

#### 3. Two Mounting Methods

PC board mount or snap-in panel mount.

#### 4. Snap-Action Mechanism

Snap-action mechanism provides tactile feel.

#### 5. UL Recognized and CSA Certified

Switches are UL recognized and CSA certified.

### ■ Approvals

UL File No.E43275

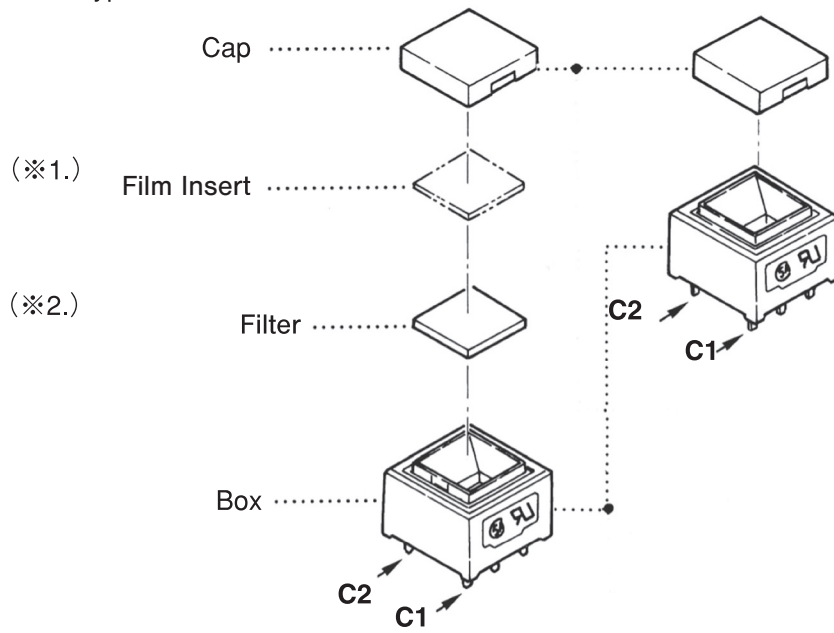
CSA File No.LR38341

### ■ Specification

Rating	(Max.) 0.4 VA AC/DC •Voltage 20 mV~48 V •Current 0.1 mA~50 mA (Min.) 20 mVAC/DC 0.1 mA	
Initial contact resistance	100 mΩ max. (1.5 mA 200 μVAC)	
Dielectric strength	1,500 VAC 1 minute	
Insulation resistance	100 MΩ min. (500 VDC)	
Contact Bounce	10 msec. max.	
Electrical life	50,000 operations (50 mA 48 VAC/DC) 200,000 operations (0.4 VA AC/DC)	
Operating force	1 pole	1.47±0.98 N
	2 poles	2.26±0.98 N
Travel	Total travel	2.3 mm
	Lock travel alternate	1.5 mm
Operating temperature range	-15~+60°C	
Storage temperature range	-25~+70°C	

**Component**

LP1S type

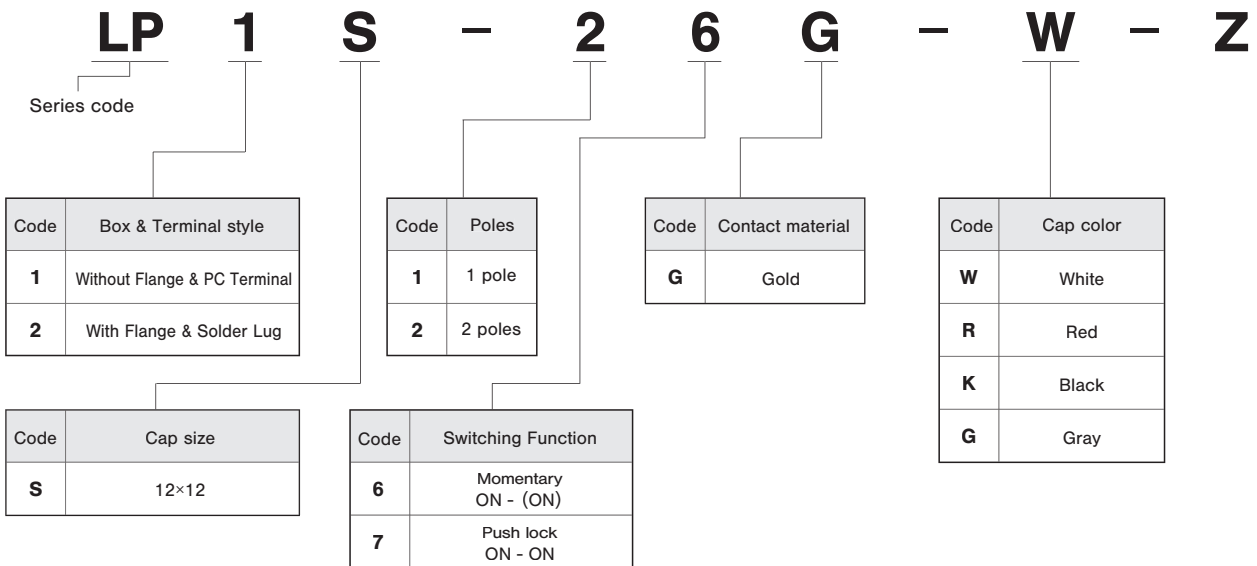


(※1.) : Optional film insert is provided by the customer.

(※1.) (※2.) : Legending instructions shown.

**Part Numbering**

**1. Nonilluminated**



■ Part Numbering

2. Illuminated

**LP 1 S - 2 6 G - 2 - 2 9 - Z**

Series code

Code	Box & Terminal style
<b>1</b>	Without Flange & PC Terminal
<b>2</b>	With Flange & Solder Lug

Code	Poles
<b>1</b>	1 pole
<b>2</b>	2 poles

Code	Contact material
<b>G</b>	Gold

Code	Filter
<b>9</b>	White clear
<b>2</b>	Red clear
<b>5</b>	Green clear

Code	Cap size
<b>S</b>	12×12

Code	Circuit Function
<b>6</b>	ON - (ON)
<b>7</b>	ON - ON

Combination	LED color		Cap color	
<b>22</b>	<b>2</b>	Red	<b>2</b>	Red clear
<b>20</b>	<b>2</b>		<b>0</b>	Clear
<b>50</b>	<b>5</b>	Green	<b>0</b>	Clear
<b>80</b>	<b>8</b>	Yellow	<b>0</b>	Clear

**Terminal Style**

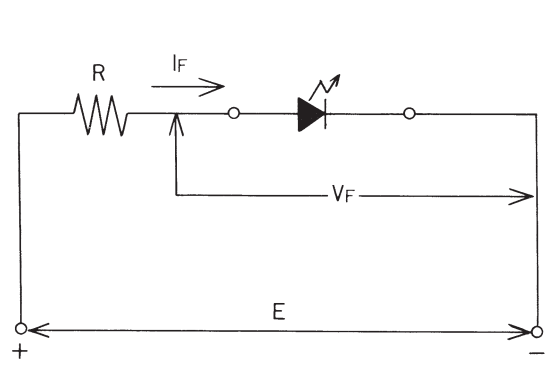
	LP1	LP2
Terminal style		
LED terminal style		

**LED Specification**

Type	LED Q'ty	Internal LED wiring
LP1S LP2S	Single	

Symbol	Color	I <sub>F</sub>	V <sub>F</sub>		V <sub>R</sub>
			Nom.	Max.	
2	Red	30mA	2.0V	2.5V	DC5V
5	Green	25mA	2.2V	2.5V	DC5V
8	Yellow	30mA	2.1V	2.5V	DC5V

Current to be applied to the LED must be lower than the forward current (I<sub>F</sub>) indicated in the LED Specifications of each switches. Resistance value R should be calculated using the following formula.



- Case of static lighting system.  

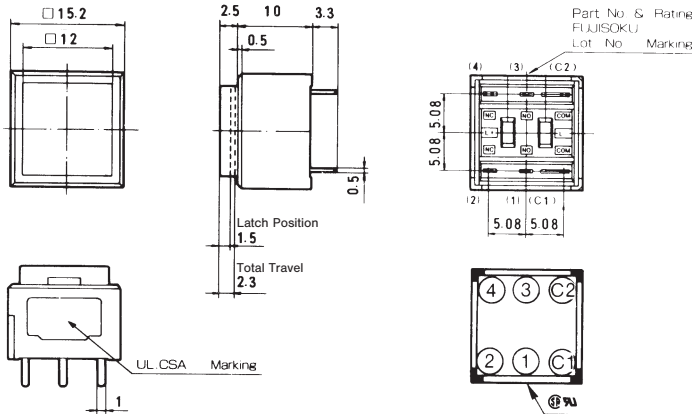
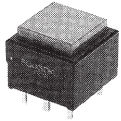
$$R = \frac{E - V_F}{I_F}$$
- Case of dynamic lighting system.  

$$R = \frac{E - V_F}{I_{FM}}$$
- When LEDs are used by a pulse lighting system
  - P<sub>w</sub> : 0.1 msec.
  - D<sub>r</sub> : 1/10
  - I<sub>FM</sub> : 50mA (All colors)
  - E : 5V
  - V<sub>F</sub> : 2V
- Calculation Example  

$$R = \frac{5 - 2}{0.05} = 60 (\Omega)$$

# LP (Nonilluminated)

## LP1S (SPDT•DPDT)



**PC  
PC Mount**

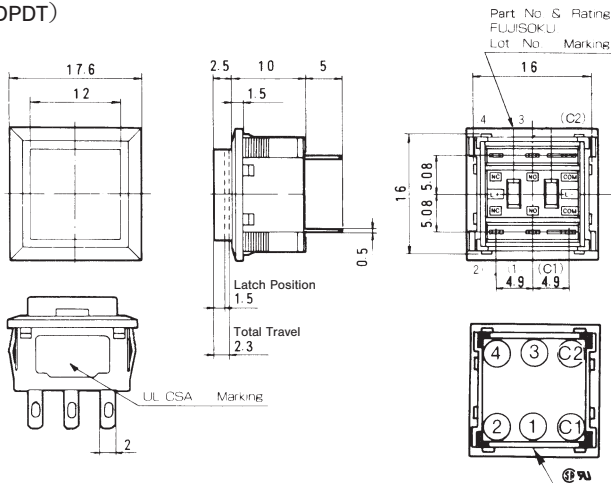
● 1 pole versions do not have terminals (3), (4), and (C2).

Part No.	Switching function	
<b>LP1S-16G-□-Z</b>	ON	(ON)
<b>LP1S-17G-□-Z</b>	ON	ON
Connected Terminals	(C1) - (2)	(C1) - (1)
<b>LP1S-26G-□-Z</b>	ON	(ON)
Connected Terminals	(C1) - (2) (C2) - (4)	(C1) - (1) (C2) - (3)

### Table of Part Numbers

Cap color	Gold contacts	
	1 pole	2 poles
White	☆LP1S-16G-W-Z	LP1S-26G-W-Z
Red	☆LP1S-16G-R-Z	-
Black	☆LP1S-16G-K-Z	-
Gray	☆LP1S-16G-G-Z	-
Black	☆LP1S-17G-K-Z	-

## LP2S (SPDT•DPDT)



**Snap-in Mount**

● 1 pole versions do not have Terminals (3), (4), and (C2).

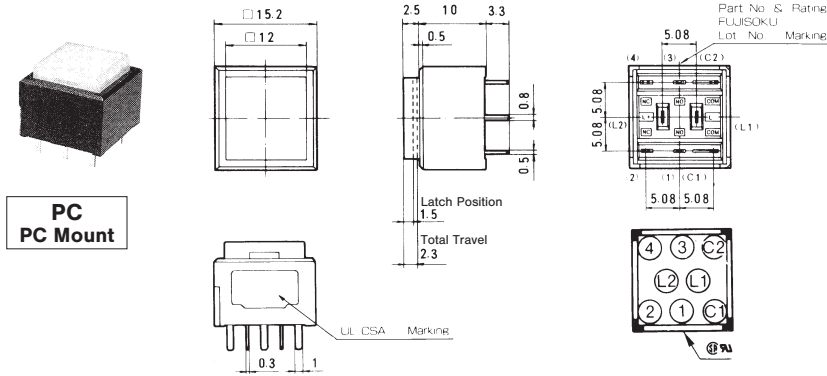
Part No.	Switching function	
<b>LP2S-16G-□-Z</b>	ON	(ON)
Connected Terminals	(C1) - (2)	(C1) - (1)
<b>LP2S-26G-□-Z</b>	ON	(ON)
Connected Terminals	(C1) - (2) (C2) - (4)	(C1) - (1) (C2) - (3)

### Table of Part Numbers

Cap color	Gold contacts	
	1 pole	2 poles
White	LP2S-16G-W-Z	☆LP2S-26G-W-Z
Red	☆LP2S-16G-R-Z	-

LP (Illuminated)

LP1S (SPDT·DPDT)



Part No.	Switching function	
LP1S-16G-■■■-Z	ON	(ON)
Connected Terminals	(C1) - (2)	(C1) - (1)
LED circuit		
LP1S-26G-■■■-Z	ON	(ON)
LP1S-27G-■■■-Z	ON	ON
Connected Terminals	(C1) - (2) (C2) - (4)	(C1) - (1) (C2) - (3)
LED circuit		

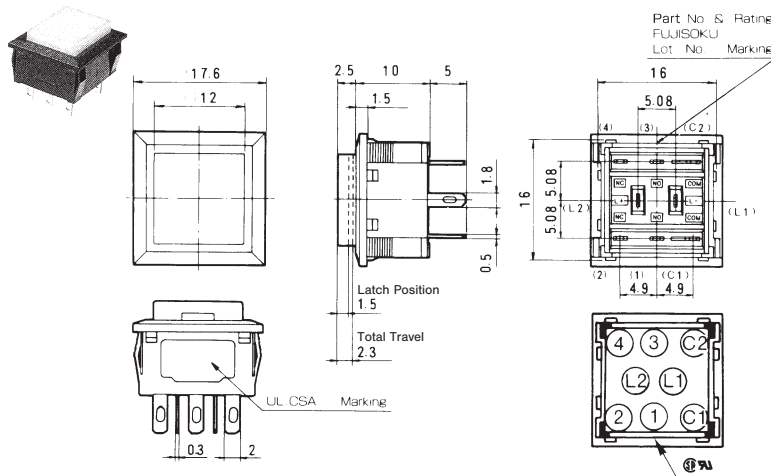
● 1 pole versions do not have Terminals (3), (4), and (C2).

Table of Part Numbers

LED and Cap color		Red
Gold contacts	2 Poles	☆LP1S-27G-229-Z

LED color	Red	Green	Yellow	Red	Green
Cap color	clear				
Filter color	White clear	White clear	White clear	Red clear	Green clear
Gold contacts	1 Pole	—	★LP1S-16G-509-Z	★LP1S-16G-809-Z	★LP1S-16G-202-Z
	2 Poles	★LP1S-27G-209-Z	—	—	—
					★LP1S-26G-505-Z

LP2S (SPDT·DPDT)



Part No.	Switching function	
LP2S-16G-■■■-Z	ON	(ON)
Connected Terminals	(C1) - (2)	(C1) - (1)
LED circuit		
LP2S-26G-■■■-Z	ON	(ON)
LP2S-27G-■■■-Z	ON	ON
Connected Terminals	(C1) - (2) (C2) - (4)	(C1) - (1) (C2) - (3)
LED circuit		

● 1 pole versions do not have Terminals (3), (4), and (C2).

Table of Part Numbers

<LP2S>

LED and Cap color		Red
Gold contacts	2 Poles	☆LP2S-26G-229-Z

LED color	Green	Red	Green
Cap color	clear		
Filter color	White clear	Red clear	Green clear
Gold contacts	1 Pole	—	★LP2S-16G-505-Z
	2 Poles	★LP2S-27G-509-Z	★LP2S-26G-202-Z

● Terminal numbers are shown on the bottom of the switch.

(ON) : Momentary

☆ : Semi-standard products. ★ : Made to order products.

■ PC Hole Layouts

(Top view)

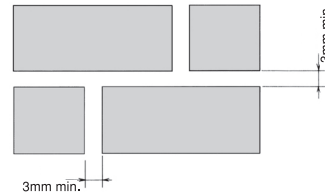
Part No.	No. of pole	Single	Pilot Light	Side by Side Mounting
LP1S	1 pole			
	2 poles			

The blue line represents the switch outline.

■ Panel Cut-Out Dimensions

Part No.	Single	Side by Side Mounting	Panel thickness
LP2S			1~2.5mm

Note) When the switches are mounted in two or more blocks, the spacing of the cutout hole between each block should be 3mm minimum.



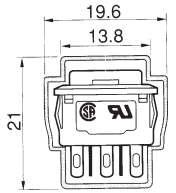
■ Optional Accessories

Part Name	Type	Dimensions	Panel cut out dimensions	Panel thickness
Switch Guard	LP2S type	140007250011 		1~1.9mm
		Switch guard LP-2S (Spring reverse type) 		

● The switch guard cannot be used with the PC mount versions.

: Optional Accessories.

**■ Packaging Specifications**

Stick			Series	(pcs/stick)	Stick Length
				LP1S	25
			LP2S	25	460

● If the order quantity is below the above packaging quantities, the packing style may be in trays.

**■ Precautions**

1. Soldering

(1) Manual soldering

Device : Solder iron

① 270°Cmax. 5 sec. max.

(2) Auto soldering

Device : Jet wave or dip type

① 245±10°C 5 sec. max.

●Preheat time shall be 30 seconds max. at 100°C max.

●For the alternate action switches, soldering should be done with the switch in the up position.

2. Flux Cleaning

(1) Solvent : Fluorine or Alcohol type.

(2) The LP 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.

3. Acuator(Cap)

●To activate the switch, press the cap as far as it goes. If the cap is not fully actuated, switching and/or locking may not occur. The pressing force of the cap should be 9.8 N or less.

●Use a soft cloth with alcohol to clean the cap surface. Do not allow the liquid to enter the switch body. Do not use thinner, acid, organic solvent, etc., since the caps and filter are made of a polycarbonate resin.

●Engraving or printing is possible on the cap and the filter. The engraving depth should be 0.3 mm maximum and the enamel-based paint should be within the coating thickness of 0.1 mm maximum.

●A film insert should be the size of the dimensions as shown in the figure on the left (t=0.1mm).

The film inserts are provided by the customer.

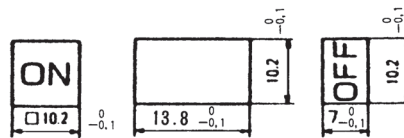
●The cap and the filter are two distinct parts. Removal of the cap should be done with the in the up position to avoid damages to the switch.

4. LED's

●The polarity of the LED is marked on the bottom of the switch. Connection should be made as marked.

●Protective resistors are not built into illuminated switches. Protective resistors must be integrated by the customer.

●For the current flowing through the LED, refer LED specification.



Legend sheet dimensions

(Fig.1)

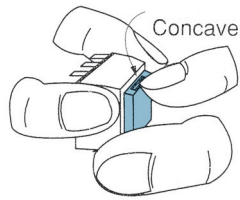


**Precautions**

5. Mounting Procedures

(1) Removal of the cap

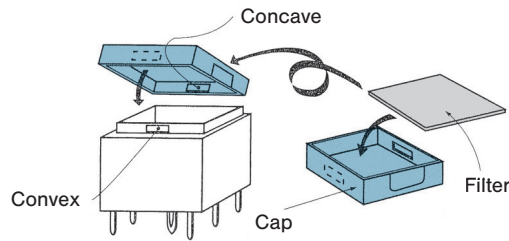
Use the notch on the side of the cap and pull up.  
 Remove the cap with the switch in the up position.



(Fig.2)

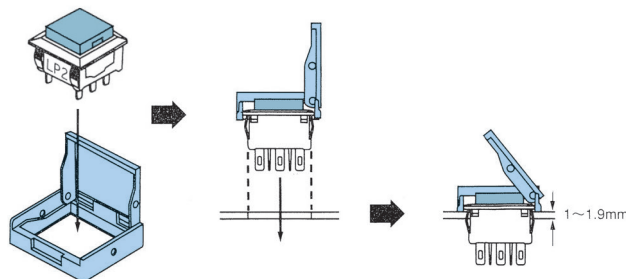
(2) Mounting the cap

- A) Insert the filter into the cap. The filter is reversible.
- B) Mate and snap in the two recesses on the inner side of the cap to the tabs on the side of the actuator of the switch.



(Fig.3)

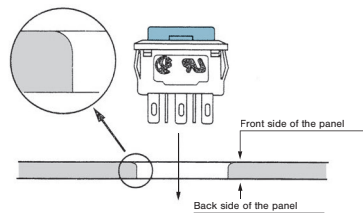
(3) Mounting the Switch Guard



(Fig.4)

(4) Panel cutout

When cutting out the panel, press through the panel from the front side. Also make sure to mount the switch from the front side of the panel as shown in the figure below. This will help the mount spring on both sides of the switch latch on to the edge of the hole. Note that the vertical play of the switch when mounted is 0.3 mm max..



(Fig.5)