

October 16, 2002

**New Product**  
**CONTACT**

No.084



# Illuminated Toggle Switches

**Series G**

**World's smallest illuminated toggle switches with super bright LED**

## Visible Status Indication

Fully-Illuminated Toggle with super bright LED  
Red, Green or Amber for single color  
Red/Green for bicolor  
Wide Angle of Throw at 28°

## Sealed Body Construction

prevents contact contamination and allows automated soldering and washing.

## Sliding Twin Crossbar Contact Mechanism

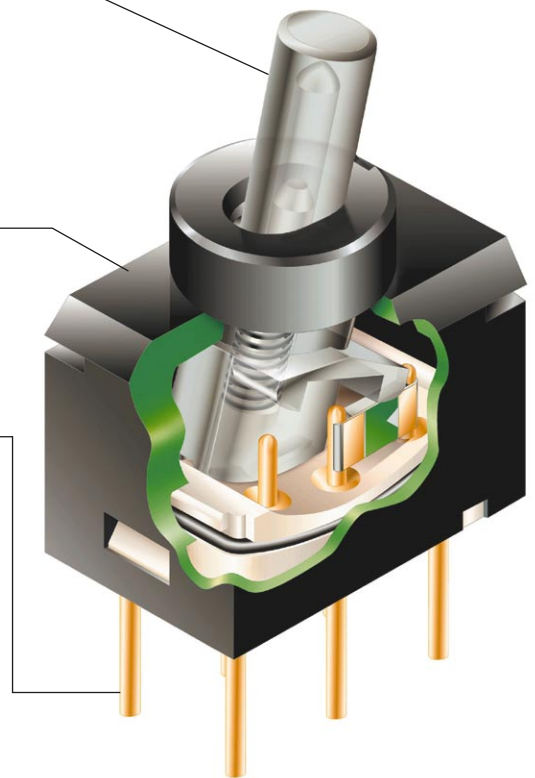
provides high contact reliability.

## 2.54mm X 2.54mm Terminal Spacing

conforms to standard PC board grid-spacing.  
Round terminals facilitate easier through-hole mounting on PC board.

## Molded in Terminals

Prevents entry of solder flux and other contaminants



### ► Applications

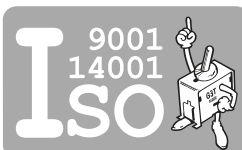
Electronic Measurement Equipment, Office Automation Equipment, Control Panel Boards  
Wireless & Tele-communications equipment,  
Exchange, etc

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► Specification

| Switch Specifications       |  |                              |  |
|-----------------------------|--|------------------------------|--|
| Electrical Capacity (AC/DC) | 0.4VA max. 28V(AC/DC) max.<br>( Applicable Range : 0.1mA to 0.1A )<br>at 20mV to 28V ) | Electrical Life              | 100,000 operations min.<br>( 10,000 operations min. )<br>at 0.1 A & 28V )                |
| Contact Resistance          | 80mΩ max.  | Toggle Angle of Throw        | 28° ± 4°   |
| Insulation Resistance       | 500 MΩ min. at 500V DC   | Soldering Time & Temperature | Manual Soldering<br>3 seconds at 350°C max.<br>Soldering Bath<br>5 seconds at 270°C max. |
| Dielectric Strength         | 500V AC  |                              |  |
| Mechanical Life             | 100,000 operations min.  |                              |  |

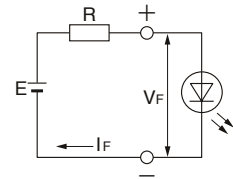
| Super Bright LED Specifications (Intensity Level 1) <small>Ta=25°C</small> |                  |              |       |       |            |       |       |
|--|------------------|--------------|-------|-------|------------|-------|-------|
| LED Type   |                  | Single Color |       |       | Bicolor    |       | Unit  |
| LED Color  |                  | C            | D     | F     | C          | F     |       |
|  |                  | Red          | Amber | Green | Red        | Green |       |
| Forward Peak Current   | I <sub>FM</sub>  | 25           |       |       | 25         |       | mA    |
| Forward Current  | I <sub>F</sub>   | 20           |       |       | 20         |       | mA    |
| Forward Voltage  | V <sub>F</sub>   | 2.0          | 2.1   | 2.1   | 2.0        | 2.1   | V     |
| Reverse Peak Voltage   | V <sub>RM</sub>  | 4            |       |       | 4          |       | V     |
| Current Reduction Rate Above 25°C  | Δ I <sub>F</sub> | 0.33         |       |       | 0.33       |       | mA/°C |
| Operating Temp. Range  |                  | -25 to +55   |       |       | -25 to +55 |       | °C    |

**Ballast Resistor Calculations**

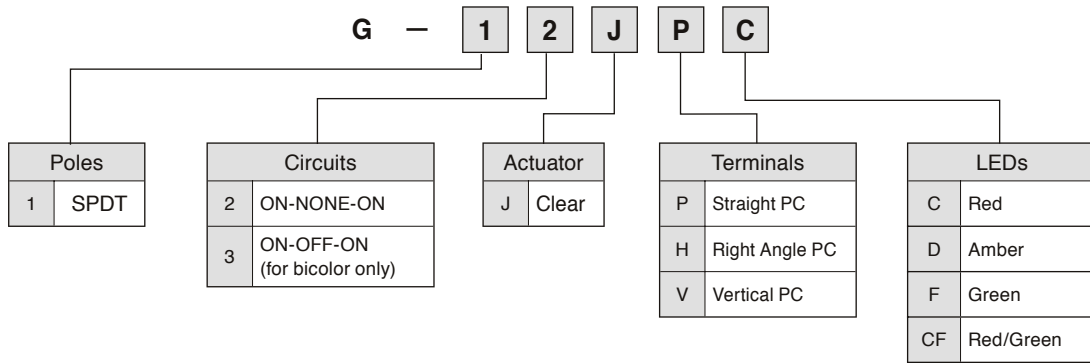
A ballast resistor must be connected in series with LED. The following circuit diagram and formula will assist in calculating the value of the required ballast resistor.

$$R = \frac{E - V_F}{I_F}$$

- R = Resistor Value (Ω)
- E = Source Voltage (V)
- V<sub>F</sub> = Forward Voltage (V)
- I<sub>F</sub> = Forward Current (mA)

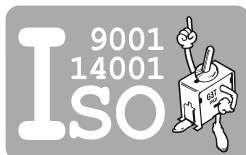


► Part Number Structure



**Part Number List**

| ON-NONE-ON type |                |             | ON-OFF-ON type |
|-----------------|----------------|-------------|----------------|
| Straight PC     | Right Angle PC | Vertical PC |                |
| G-12J P C       | G-12J H C      | G-12J V C   | G-13J P CF     |
| G-12J P D       | G-12J H D      | G-12J V D   | G-13J H CF     |
| G-12J P F       | G-12J H F      | G-12J V F   | G-13J V CF     |
| G-12J P CF      | G-12J H CF     | G-12J V CF  |                |



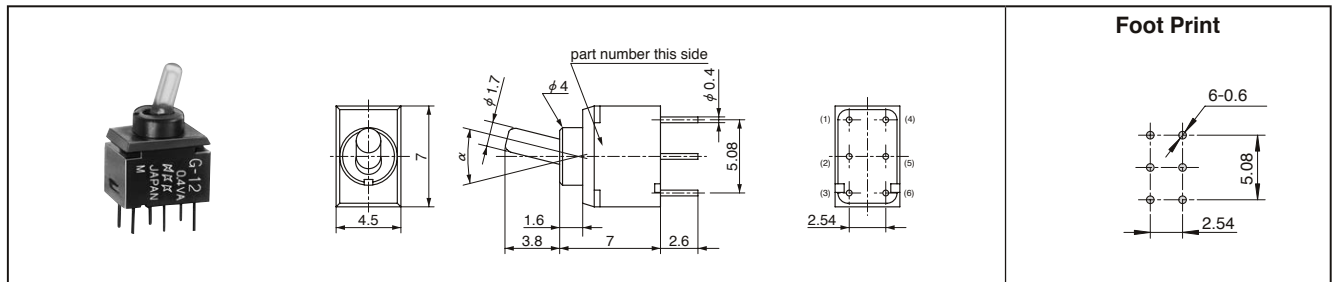
### Poles & Circuit

| Pole | Model | Toggle Position |        |      | Connected Terminals |        |      | Throw & Schematics |
|------|-------|-----------------|--------|------|---------------------|--------|------|--------------------|
|      |       | Up              | Center | Down | Up                  | Center | Down |                    |
|      |       |                 |        |      |                     |        |      |                    |
| SP   | G12   | ON              | NONE   | ON   | 2-3                 | NONE   | 1-2  |                    |
|      | G13   | ON              | OFF    | ON   | 2-3                 | OPEN   | 1-2  |                    |

### Switch Dimensions

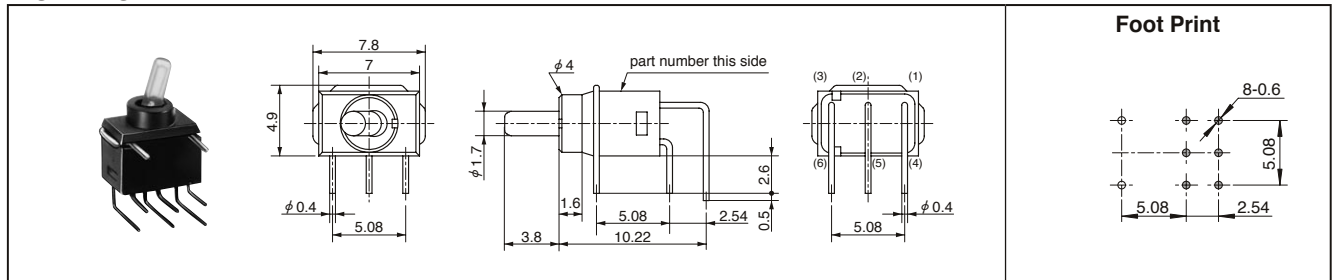
#### Straight PC

Terminal numbers are not actually on a switch.



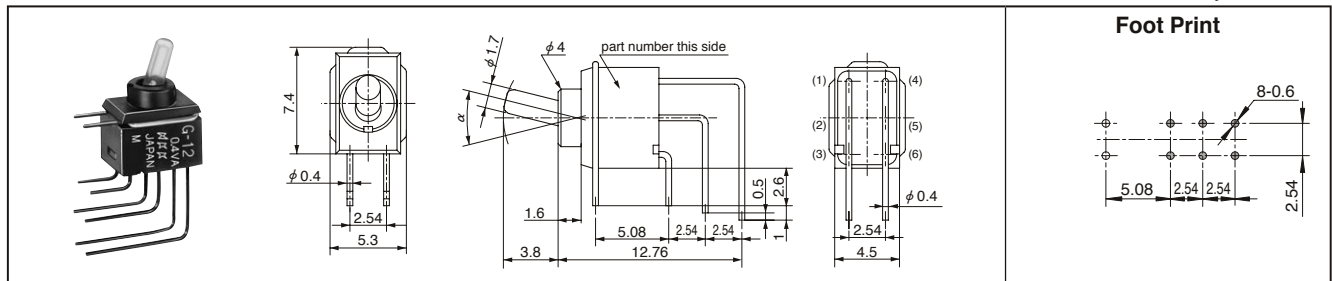
#### Right Angle PC

Terminal numbers are not actually on a switch.



#### Vertical PC

Terminal numbers are not actually on a switch.



(Note)

On single color models, terminal 4 is a support pin.

▶ LED circuit

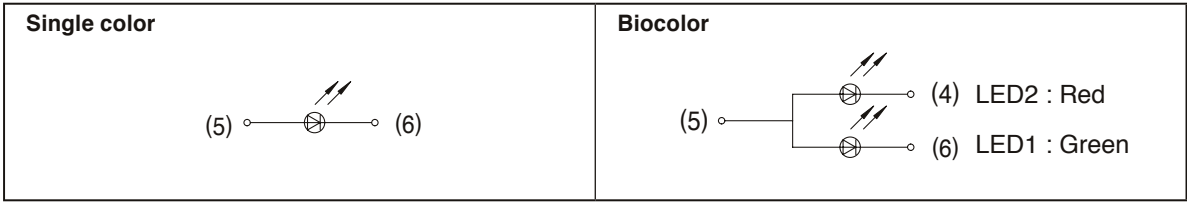


Figure in parentheses shows terminal number.

(Note) LED circuit is isolated and requires external power source.

▶ Release

October 16th, 2002

