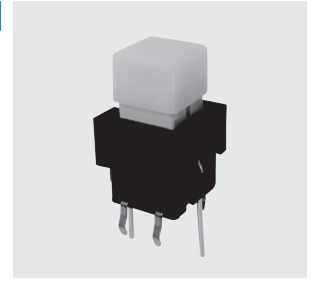


# 13AL

RoHS Compliant

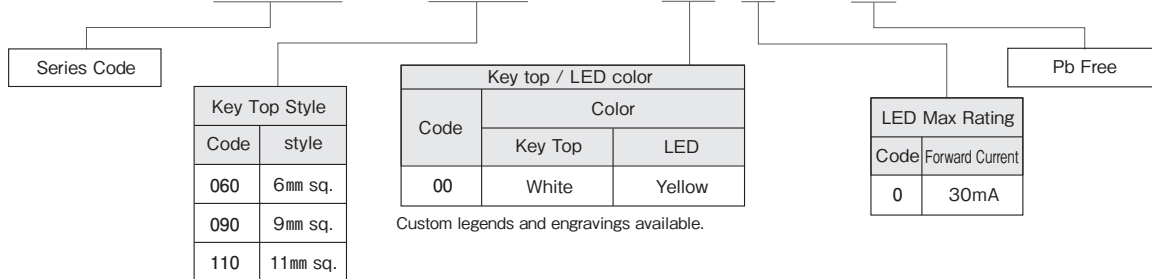


## Specification

Rating	Non-switching : 1mA, DC20V Max.or 5mA,DC5V Max. Break current : Same as Non-switching Min. rating : 1mA, DC5V
Contact Resistance	200Ω Max.
Dielectric Strength	100MΩ Min.(DC100V)
Insulation Resistance	AC250Vrms 1minute
Operating Force	060/090 : 0.883~1.57N 110 : 0.981~1.96N
Stroke	060/090 : 1.3mm,110 : 1.5mm
Operating Temperature Range	-10°C~+60°C
Storage Temperature Range	-25°C~+70°C
Electrical Life	060/090 operations : 300,000, 110 operations : 500,000
Material/Finish	Key top : Polycarbonate Housing : PBT Contact terminals : Phosphor bronze/ Gold over Nickel plating LED terminal : Iron/Silver plated

## Part Numbering

# 13AL - 060 - 0 01 0 - X



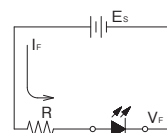
## Type and LED Specification

Part No.	Color		LED Characteristics					
	Key Top	LED	Max. Rating (25°C)		Forward Voltage (V <sub>F</sub> )		Recommended Forward Current	Ambient Temperature and Allowable Forward Current
			Reverse Voltage(V <sub>R</sub> )	Forward Current (I <sub>F</sub> )	Standard	Max		
13AL-***-0000-X	White	Yellow	4V	30mA	2.2V	2.8V	20mA	

(Note 1) \*\*\* designate Key Top Style ("060" = 6mm sq., "090" = 9mm sq., "110" = 11mm sq.).

## Precautions

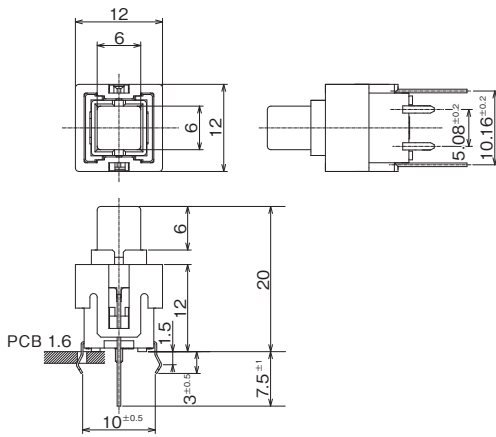
- (a) To prevent overcurrent of LED, connect a protective resistance in series.  
 (b) R: Protective resistance ES: Supply voltage VF: Forward voltage of LED IF: Forward current of LED



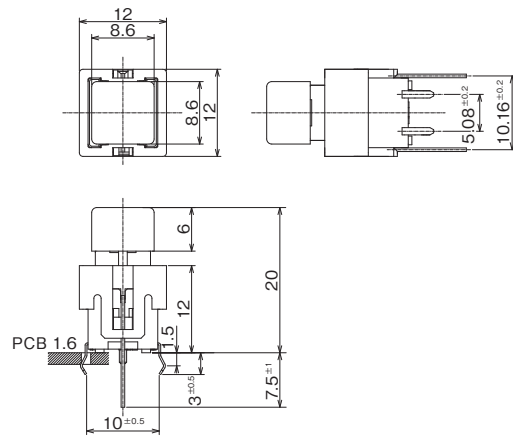
$$R = \frac{E_s - V_F}{I_F}$$

# 13AL

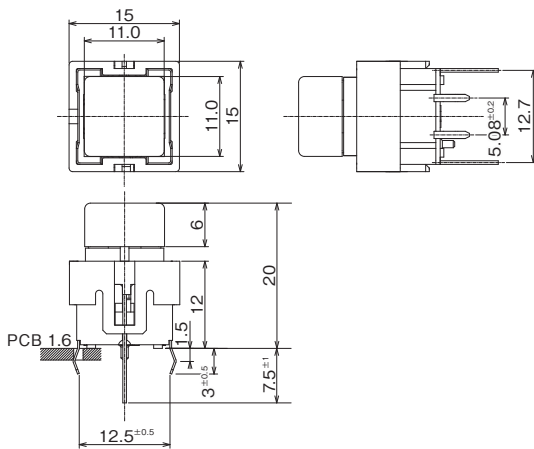
## 13AL-060 6 mm Sq. Type



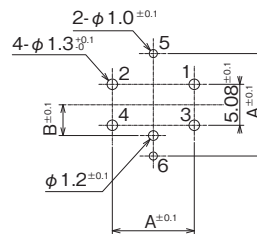
## 13AL-090 9 mm Sq. Type



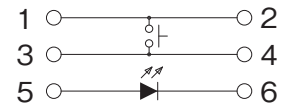
## 13AL-110 11 mm Sq. Type



### PC Hole Layouts



### Circuit



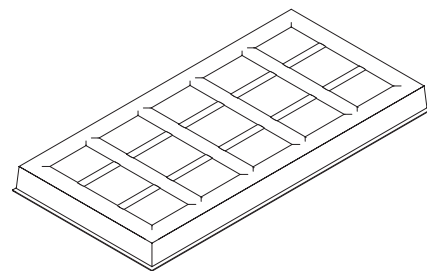
Type	A±0.1	B±0.1
13AL-060	10.16	2.54
13AL-090	10.16	2.54
13AL-110	12.7	3.81

### Table of Part Numbers

Part No.	Key Top Style	Key Top Color	LED Color	MOQ
13AL-060-0000-X	6mm sq.	White	Yellow	30
13AL-090-0000-X	9mm sq.	White	Yellow	
13AL-110-0000-X	11mm sq.	White	Yellow	

### Packaging Specifications

30pcs./tray



### Soldering

- Manual soldering  
Device : Solder iron  
350°C Max. 3sec. Max.
- Auto soldering  
Device : Jet wave or dip type  
260°C Max. 10sec. Max. Twice