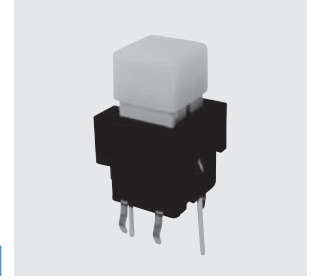


13AL

Illuminated Pushbutton Switches



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

Series Code	Key Top Style	Key top / LED color	LED Max Rating	Pb Free																																																
	<table border="1"> <thead> <tr> <th>Code</th> <th>style</th> </tr> </thead> <tbody> <tr> <td>060</td> <td>6mm sq.</td> </tr> <tr> <td>090</td> <td>9mm sq.</td> </tr> <tr> <td>110</td> <td>11mm sq.</td> </tr> </tbody> </table>	Code	style	060	6mm sq.	090	9mm sq.	110	11mm sq.	<table border="1"> <thead> <tr> <th colspan="6">Key top / LED color</th> </tr> <tr> <th rowspan="2">Code</th> <th colspan="2">Color</th> <th rowspan="2">Code</th> <th colspan="2">Color</th> </tr> <tr> <th>Key Top</th> <th>LED</th> <th>Key Top</th> <th>LED</th> </tr> </thead> <tbody> <tr> <td>00</td> <td>White</td> <td>Yellow</td> <td>03</td> <td>Green</td> <td>Green</td> </tr> <tr> <td>01</td> <td>Red</td> <td>Red</td> <td>04</td> <td>Orange</td> <td>Orange</td> </tr> <tr> <td>02</td> <td>Blue</td> <td>Green</td> <td>05</td> <td>Yellow</td> <td>Green</td> </tr> </tbody> </table>	Key top / LED color						Code	Color		Code	Color		Key Top	LED	Key Top	LED	00	White	Yellow	03	Green	Green	01	Red	Red	04	Orange	Orange	02	Blue	Green	05	Yellow	Green	<table border="1"> <thead> <tr> <th colspan="2">LED Max Rating</th> </tr> <tr> <th>Code</th> <th>Forward Current</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>30mA</td> </tr> </tbody> </table>	LED Max Rating		Code	Forward Current	0	30mA	
Code	style																																																			
060	6mm sq.																																																			
090	9mm sq.																																																			
110	11mm sq.																																																			
Key top / LED color																																																				
Code	Color		Code	Color																																																
	Key Top	LED		Key Top	LED																																															
00	White	Yellow	03	Green	Green																																															
01	Red	Red	04	Orange	Orange																																															
02	Blue	Green	05	Yellow	Green																																															
LED Max Rating																																																				
Code	Forward Current																																																			
0	30mA																																																			

Custom legends and engravings available.

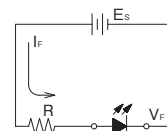
Type and LED Specification

Part No.	Color		LED Characteristics					
	Key Top	LED	Max. Rating (25°C)		Forward Voltage (V _F)		Recommended Forward Current	Ambient Temperature and Allowable Forward Current
			Reverse Voltage (V _R)	Forward Current (I _F)	Standard	Max		
13AL-***-0000-X	White	Yellow	4V	30mA	2.2V	2.8V	20mA	
13AL-***-0010-X	Red	Red			2.0V			
13AL-***-0020-X	Blue	Green			2.1V			
13AL-***-0030-X	Green	Green		2.1V	25mA			
13AL-***-0040-X	Orange	Orange		2.2V				
13AL-***-0050-X	Yellow	Green		2.1V				

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

Precautions

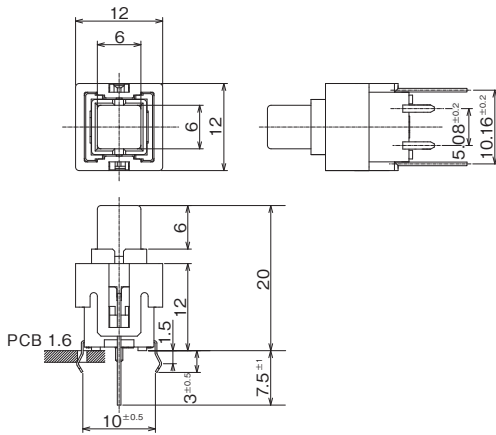
- (a) To prevent overcurrent of LED, connect a protective resistance in series.
 (b) R: Protective resistance ES: Supply voltage VF: Forward voltage of LED IF: Forward current of LED



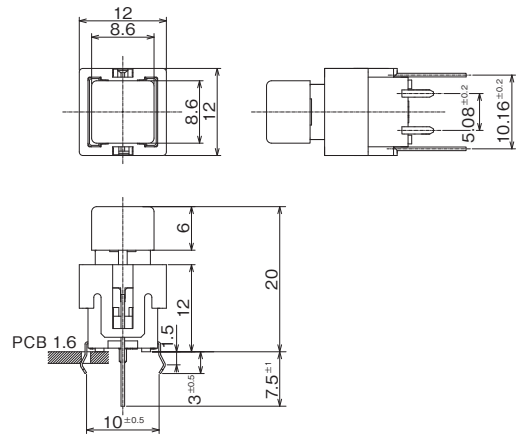
$$R = \frac{E_S - V_F}{I_F}$$

13AL

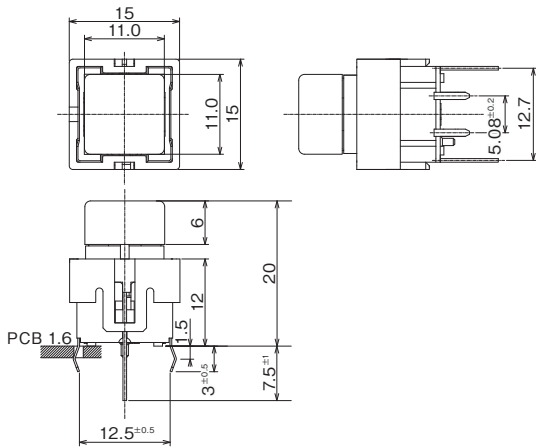
13AL-060 □ 6 mm Sq. Type



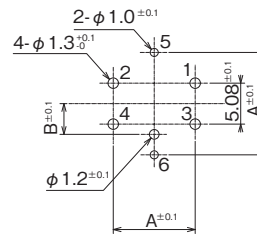
13AL-090 □ 99 mm Sq. Type



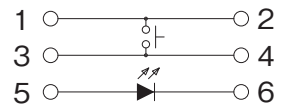
13AL-110 □ 11 mm Sq. Type



■ PC Hole Layouts



■ Circuit



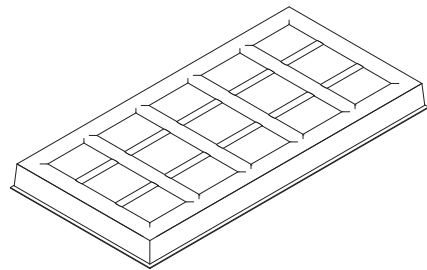
Type	A±0.1	B±0.1
13AL-060	10.16	2.54
13AL-090	10.16	2.54
13AL-110	12.7	3.81

■ Table of Part Numbers

Part No.	Key Top Style	Key Top Color	LED Color	MOQ
13AL-060-0000-X	□ 6mm 6mm sq.	White	Yellow	30
13AL-060-0010-X		Red	Red	
13AL-060-0020-X		Blue	Green	
13AL-060-0030-X		Green	Green	
13AL-060-0040-X		Orange	Orange	
13AL-060-0050-X	Yellow	Green		
13AL-090-0000-X	□ 9mm 9mm sq.	White	Yellow	
13AL-090-0010-X		Red	Red	
13AL-090-0020-X		Blue	Green	
13AL-090-0030-X		Green	Green	
13AL-090-0040-X		Orange	Orange	
13AL-090-0050-X	Yellow	Green		
13AL-110-0000-X	□ 11mm 11mm sq.	White	Yellow	
13AL-110-0010-X		Red	Red	
13AL-110-0020-X		Blue	Green	
13AL-110-0030-X		Green	Green	
13AL-110-0040-X		Orange	Orange	
13AL-110-0050-X	Yellow	Green		

■ Packaging Specifications

30pcs/tray



■ Soldering

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