

13AL



RoHS Compliant



Illuminated Pushbutton Switches

■ 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>Code</th> <th>Forward Current</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>30mA</td> </tr> </tbody> </table>	Code	Forward Current	0	30mA	
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Custom legends and engravings available.

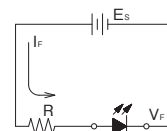
■ Type and LED Specification

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

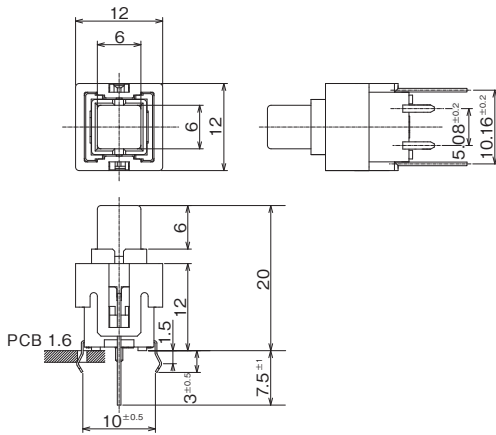
- (a) To prevent overcurrent of LED, connect a protective resistance in series.
 (b) R: Protective resistance ES: Supply voltage VF: Forward voltage of LED IF: Forward current of LED



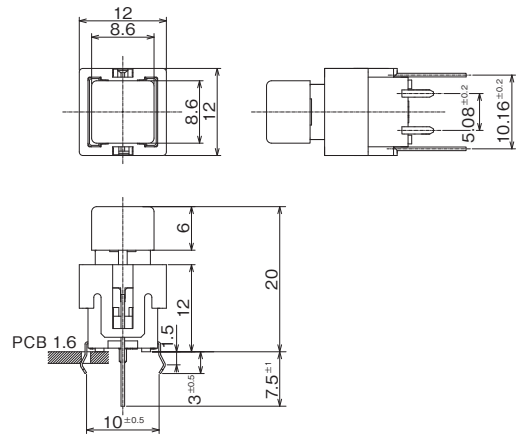
$$R = \frac{E_S - V_F}{I_F}$$

13AL

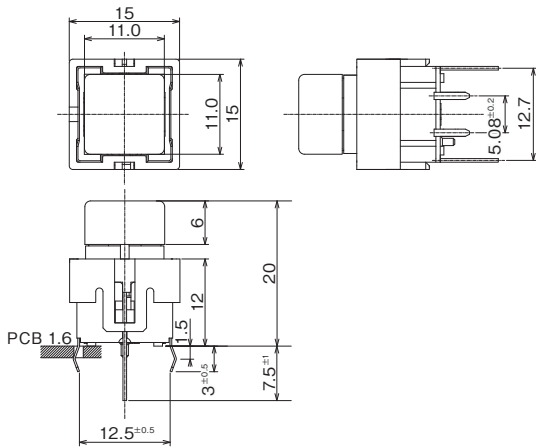
13AL-060 □ 6 mm Sq. Type



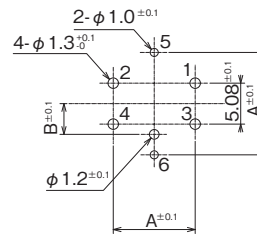
13AL-090 □ 99 mm Sq. Type



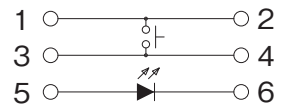
13AL-110 □ 11 mm Sq. Type



■ PC Hole Layouts



■ Circuit



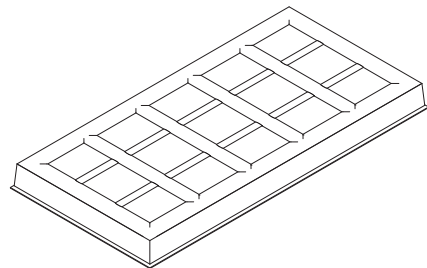
Type	A±0.1	B±0.1
13AL-060	10.16	2.54
13AL-090	10.16	2.54
13AL-110	12.7	3.81

■ 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

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