





# Series 228B

## 6.0 x 6.0mm Illuminated Tactile Switch

- Surface mount gull-wing terminal and standard through hole configurations
- Compatible with IR reflow, and manual soldering
- Single color display during illumination
- Variety of LED color options
- Variety of cap shape, color, laser etching options



### Ordering Information

Series	Terminal Type	Actuating Direction	Actuation Force	LED Color	LED Type	Cap Style	Cap Color	Laser Etching	Packaging
228B	M	V	A	R	F	AF	MS	A	R

Code	Spec.
D	Standard through hole (white actuator)
M	Surface mount gull wing (black actuator)

Code	Spec.
V	Vertical

Code	Spec.
A	160 gf

Blank – No Cap  
See table on pages 2 - 4

Code	Spec.
F	Flat
*Blank	Bulb

\*Blank is only available for no cap, through hole terminal and single color LED

Blank – No Cap  
See table on page 2

Blank – No Etching  
(only available on Natural color caps)  
See table on page.2

Code	Spec.
R	Tape & reel packaging (only available for surface mount type)
Blank	Tray packaging (only available for standard through hole type)

Code	Spec.
R	Red
Y	Yellow
G	Pure Green
B	Blue
W	White
A	Amber
RG	Red & Green
RB	Red & Blue
YG	Yellow & Green
RA	Red & Amber
AW	Amber & White

Note: Not all part number combinations are available. Please review the notes on the following pages.

Note: Caps supplied in bulk for surface mount terminal constructions and must be installed after IR reflow

### Cap Style

Code	Spec.
*AF	Square (10 x 10)
*BF	Square (12.5 x 12.5)
*CF	Round (Dia. 10)
*DF	Dome (Dia. 10)
*EF	Button (Dia. 14)
*F	Square with center dot (7.5 x 7.5)
G	Elliptical column (only available with arrow laser etching)
H	Bullet
J1	Hollow Cylinder, height 8.2mm
J2	Cylinder, height 10.3mm
K	Joystick button
L	Square (7.5 x 7.5)
M	Round (Dia.10)

- 1) AF, BF, CF, DF, EF are only available for through hole terminals
- 2) AF, BF, CF, F – etching not available for these cap styles. Cap supplied with a transparent center dot

### Cap Color

Code	Cap Color
B	Black
V	Ivory
G	Gray

Only available for cap style of AF, BF, CF, F

Code	Cap Color
MS	Misty Silver
W	White
BB	Bright Black
R	Red
MB	Misty Black
A	Orange
N	Natural

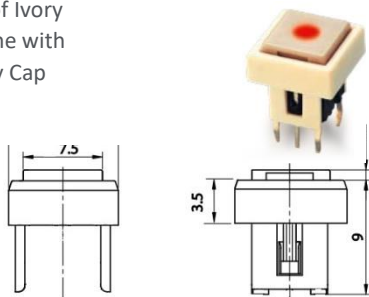
### Cap Etching

Code	Style
A	
B	
C	
D	OK
E	POWER

### Cap Style Details

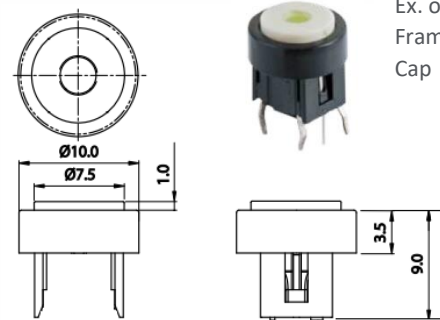
Style AF: Square in with Center Dot (10 x 10)

Ex. of Ivory  
Frame with  
Ivory Cap



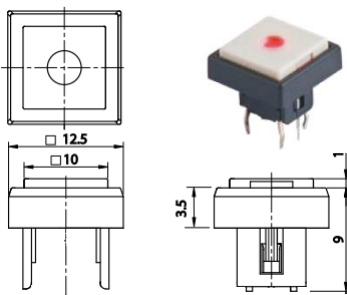
Style CF: Round with Center Dot (Dia. 10mm)

Ex. of Black  
Frame with Gray  
Cap



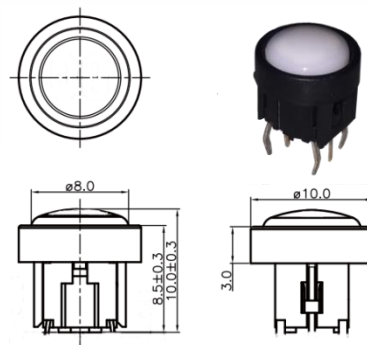
Style BF: Square with Center Dot (12.5 x 12.5)

Ex. of Black  
Frame with  
Ivory Cap



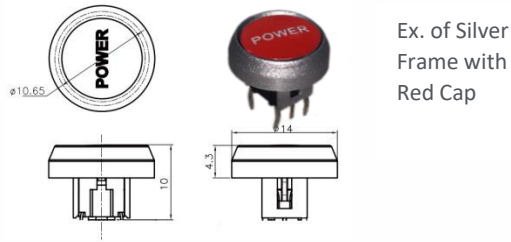
Style DF: Dome (Dia. 10mm)

Ex. of Black  
Frame with Ivory  
Cap

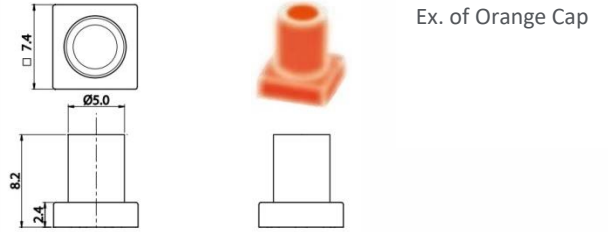


Style EF: Button with Frame (Dia. 14)

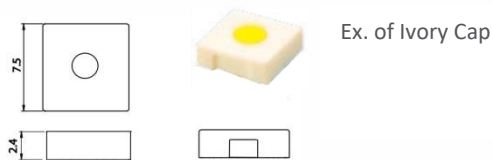
Only available with POWER etching



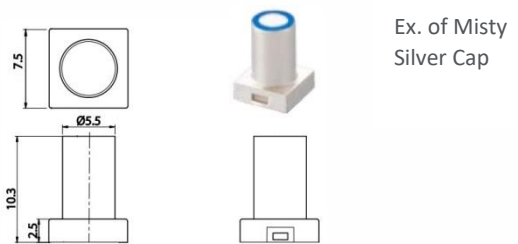
Style J1: Hollow Cylinder, 8.2mm height



Style F: Square with Center Dot (7.5 x 7.5)

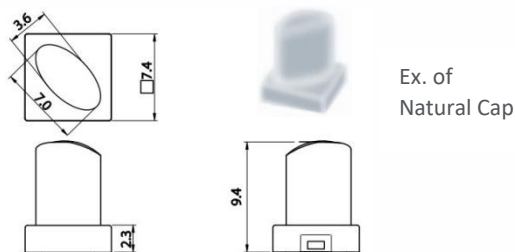


Style J2: Cylinder, 10.3mm height



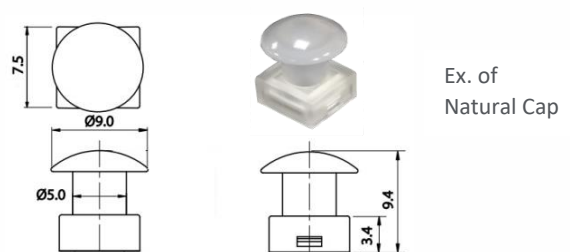
Style G: Elliptical column

(Only available with natural color and no etching)



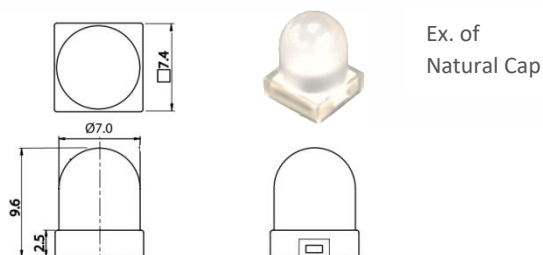
Style K: Joystick button

(Only available with natural color and no etching)



Style H: Bullet

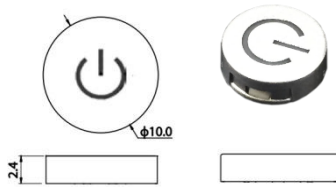
(Only available with natural color and no etching)



Style L: Square (7.5x7.5)



Style M: Round (Dia.10)



Ex. of Misty  
Silver Cap

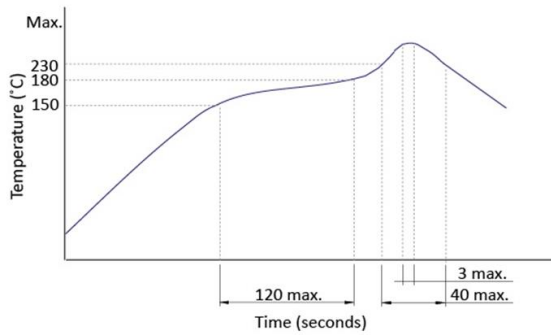
### Electrical Specifications

Parameter	Conditions & Remarks	Min	Max	Unit
Contact Resistance			100	milliohms
Insulation Resistance	Between insulated terminals	100		megohms
Dielectric Strength	1 minute between adjacent switches		250	VAC
Nonswitching Rating			50 or 12	mA or VDC

### Mechanical and Environmental

Soldering	Maximum reflow temperature, 260°C for 5 seconds Maximum manual temperature, 350°C for 3 seconds
RoHS	Lead-Free. Fully compliant to RoHS Directive 2011/65/EU and 2015/863/EU
Operating Force	160±50 gf
Actuation Life	100,000 cycles
Actuator Strength	2 Kgf maximum
Travel	0.25 ±0.1mm
Packaging	Standard tape and reel packaging for surface mount gull wing terminal Tray packaging for standard through hole
Operating Temperature Range	-20°C to +70°C
Storage Temperature Range	-30°C to +80°C
MSL Level	1 for tray packaging 3 for tape and reel packaging

### Soldering Profile



### LED Specifications

Color	Reversed Voltage	Forward Current	Recommended Operating Current	Forward Voltage	
				Nor	Max
Red	5 Vdc	20 mA	20 mA	1.7V	2.4V
Green	5 Vdc	20 mA	20 mA	1.9V	2.4V
Yellow	5 Vdc	20 mA	20 mA	1.9V	2.4V
Blue	5 Vdc	20 mA	20 mA	3.0V	3.6V
White	5 Vdc	20 mA	20 mA	3.0V	3.6V

### Mechanical Specifications

Figure 1 – 228BDV, Standard Though Hole, Vertical Actuation

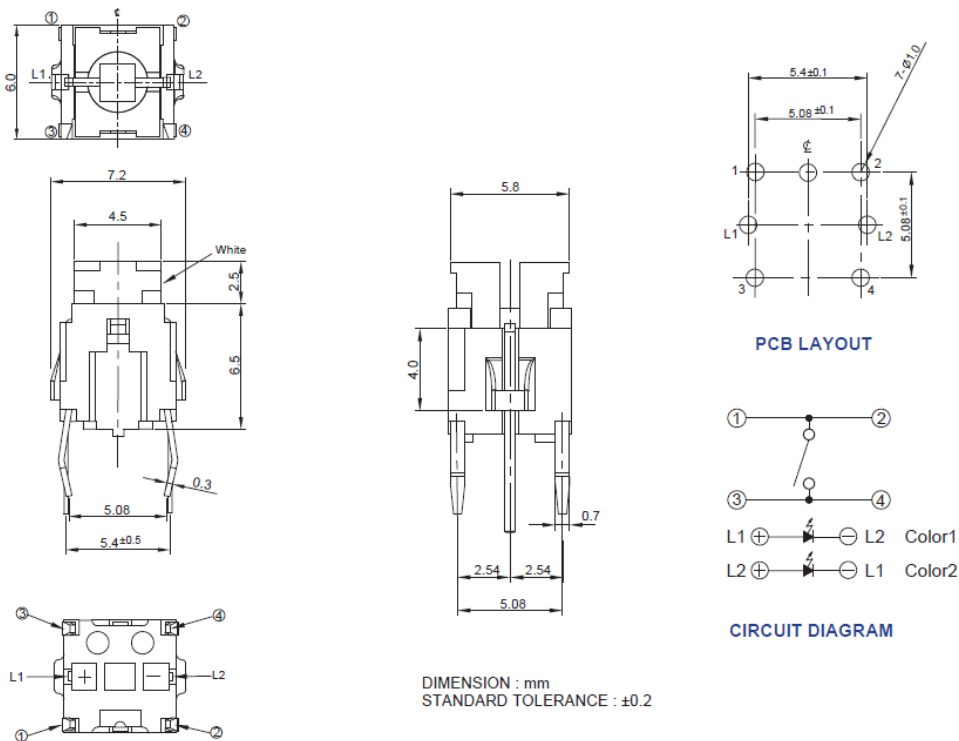


Figure 2 – 228BMV, Surface Mount Gull Wing, Vertical Actuation

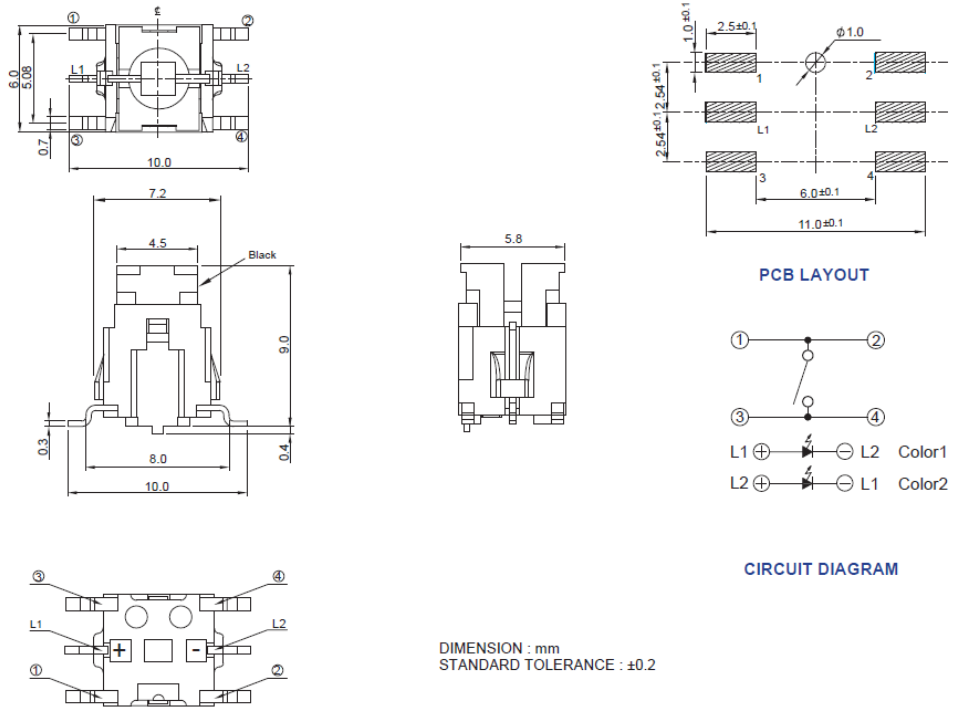
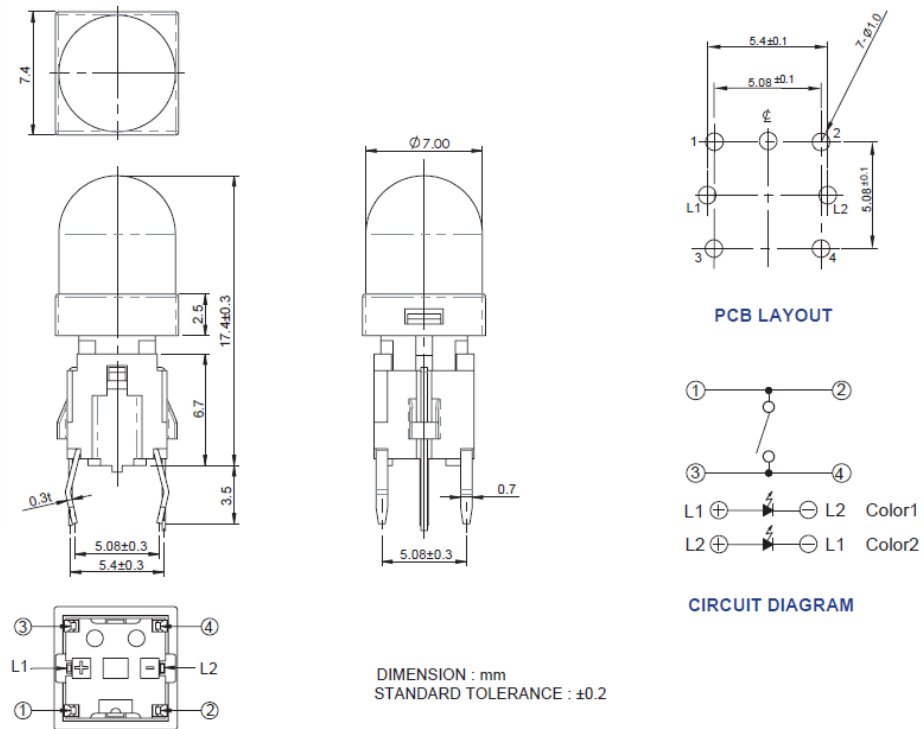
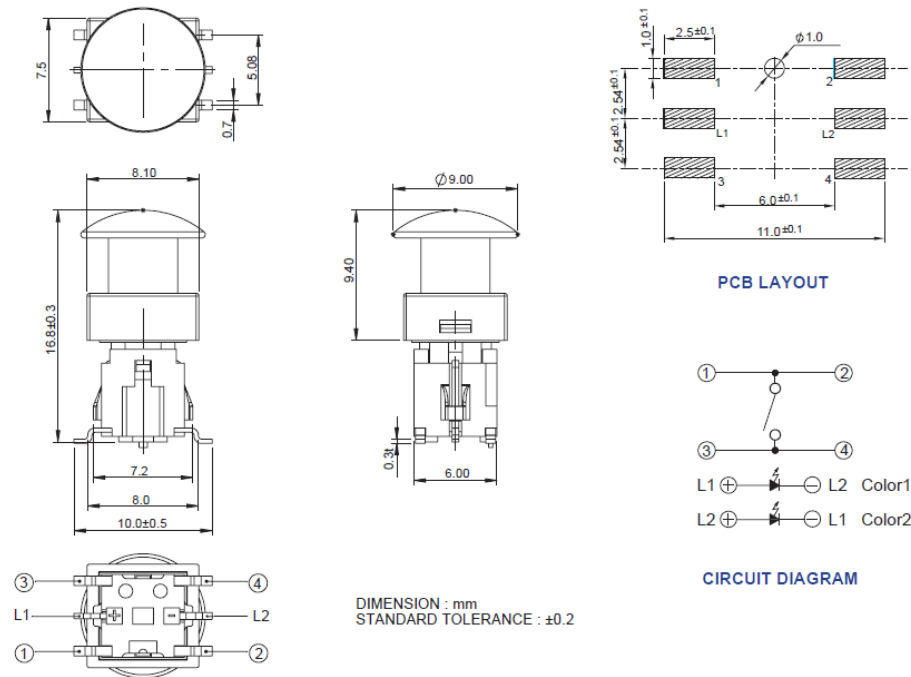


Figure 3 – 228BDVA...HN, Standard Though Hole, Vertical Actuation, Bullet on Square, Natural Color Cap



**Figure 4 – 228BDVA...KN, Standard Though Hole, Vertical Actuation, Joystick Button on Square, Natural Color Cap**

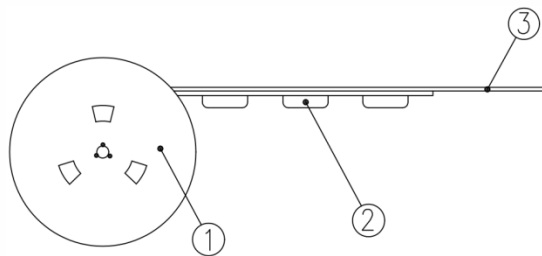


**Packing: Tape and Reel**

Surface Mount Gull Wing, Actuator Height 9.0mm

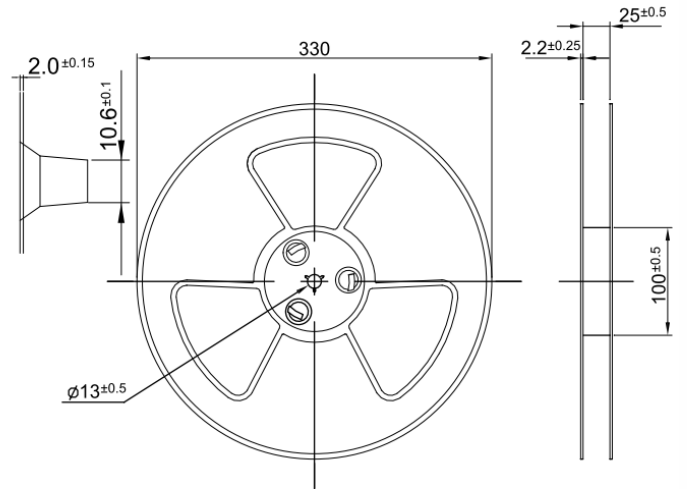
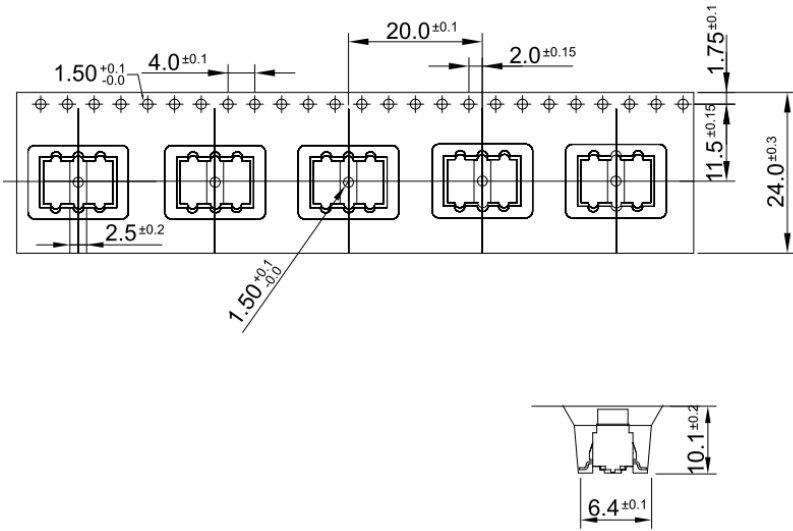
The packing specifications:

1. Structure and materials:



No	PART NAME	MATERIAL
①	REEL	POLYSTYRENE
②	CARRIER TAPE	POLYSTYRENE
③	COVER TAPE	POLYESTER

2. Packing quantity: 300 pcs/reel
3. More than 15 empty pockets should remain at each end of the carrier tape for each reel.
4. Shortage of less than 10 pcs a reel is acceptable but no more than 3 consecutive empty pockets are allowed.
5. Stripping strength of cover tape is between 10 gf to 130 gf and stripping angle should be within 165°~180°.
6. The product in the pocket of carrier tape should be placed in a specified correct position.
7. Tape and reel per EIA-481.
8. Dimensions:



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