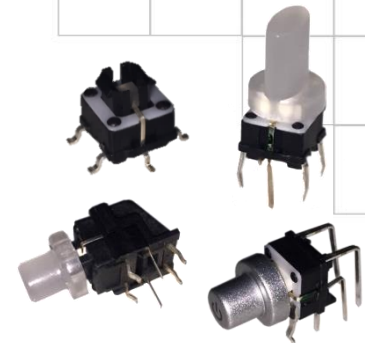




Series 228A

7.2 x 6.8mm 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 styles, colors, and laser etching options



Ordering Information

Series	Terminal Type	Actuating Direction	Actuation Force	LED Color	LED Type	Cap Style	Cap Color	Laser Etching	Packaging																																																						
228A	M	V	A	R	F	A	MS	A	R																																																						
<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>D</td><td>Standard through hole (white actuator)</td></tr><tr><td>M</td><td>Surface mount gull wing (black actuator)</td></tr></table>		Code	Spec.	D	Standard through hole (white actuator)	M	Surface mount gull wing (black actuator)	<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>V</td><td>Vertical</td></tr><tr><td>*S1</td><td>Side, with 4 pairs of terminals</td></tr><tr><td>*S2</td><td>Side, with 3 pairs of terminals</td></tr></table> *S1 and S2 are only available with Cap Style. C, Flat LED, and through hole terminals		Code	Spec.	V	Vertical	*S1	Side, with 4 pairs of terminals	*S2	Side, with 3 pairs of terminals	<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>R</td><td>Red</td></tr><tr><td>Y</td><td>Yellow</td></tr><tr><td>G</td><td>Pure Green</td></tr><tr><td>B</td><td>Blue</td></tr><tr><td>W</td><td>White</td></tr><tr><td>A</td><td>Amber</td></tr><tr><td>L</td><td>Olive Green</td></tr><tr><td>RG</td><td>Red & Green</td></tr><tr><td>RB</td><td>Red & Blue</td></tr><tr><td>YG</td><td>Yellow & Green</td></tr><tr><td>RA</td><td>Red & Amber</td></tr><tr><td>AW</td><td>Amber & White</td></tr></table>		Code	Spec.	R	Red	Y	Yellow	G	Pure Green	B	Blue	W	White	A	Amber	L	Olive Green	RG	Red & Green	RB	Red & Blue	YG	Yellow & Green	RA	Red & Amber	AW	Amber & White	<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>F</td><td>Flat</td></tr><tr><td>*Blank</td><td>Bulb</td></tr></table> *Blank is only available for no cap, vertical through hole terminal with single color LED		Code	Spec.	F	Flat	*Blank	Bulb	Blank – No Etching (only available on Natural color caps) See table on page.2 Blank – No Cap See table on page 2 See table on pages 2 - 4		<table><tr><th>Code</th><th>Spec.</th></tr><tr><td>R</td><td>Tape & reel packaging (only available for surface mount type)</td></tr><tr><td>Blank</td><td>Tray packaging (only available for standard through hole type)</td></tr></table>		Code	Spec.	R	Tape & reel packaging (only available for surface mount type)	Blank	Tray packaging (only available for standard through hole type)
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Note: Caps supplied in bulk for surface mount terminal constructions and must be installed after IR reflow soldering.

Cap Style

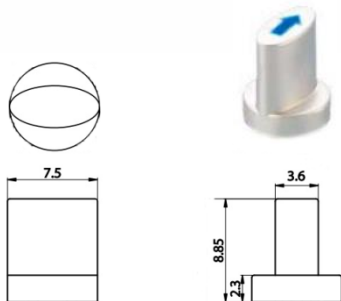
Code	Spec.
A	Elliptical column on round
B	45° Elliptical column on round
C	Cylinder on 3/4 circle

Cap Color

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

Cap Style Details

Style A: Elliptical column on round



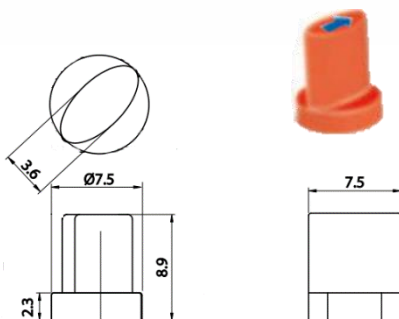
Ex. of Misty Silver

Cap with “↑” etching

Cap Etching

Code	Style
A	↑
B	○
C	↑
D	OK
E	⊙

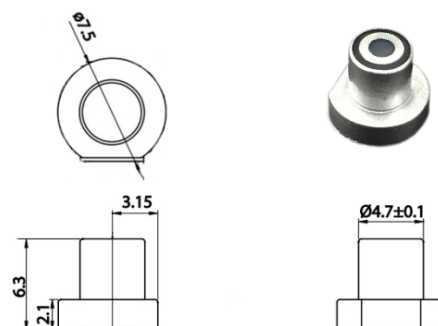
Style B: Elliptical column on round



Ex. of Orange

Cap with “↑” etching

Style C: Cylinder on 3/4 circle



Ex. of Misty Silver

Cap with “⊙” etching

Electrical Specifications

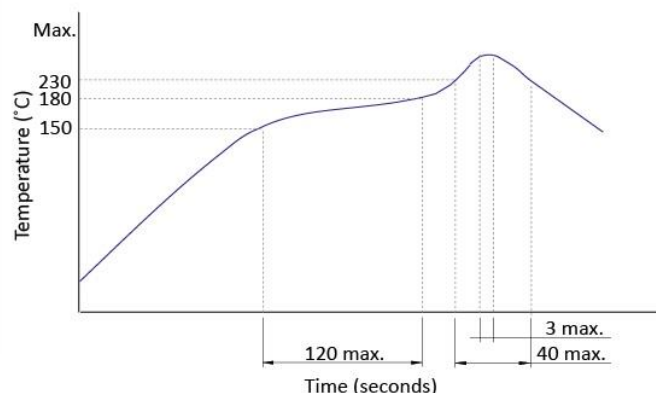
Parameter	Conditions & Remarks	Min	Max	Unit
Contact Resistance			100	milliohms
Insulation Resistance	Between insulated terminals	100		megohms
Dielectric Strength	250 VAC between adjacent switches		1	minute
Nonswitching Rating			50 or 12	mA or VDC

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
Operating Force	160±50 gf
Actuation Life	100,000 cycles
Actuator Strength	2 Kgf maximum
Travel	0.25±0.1 mm
Packaging	Standard tape and reel packaging for surface mount gull wing terminal Tray packaging for standard through hole
Operating Temperature Range	-25°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 – 228ADV..., Standard Though Hole, Vertical Actuation

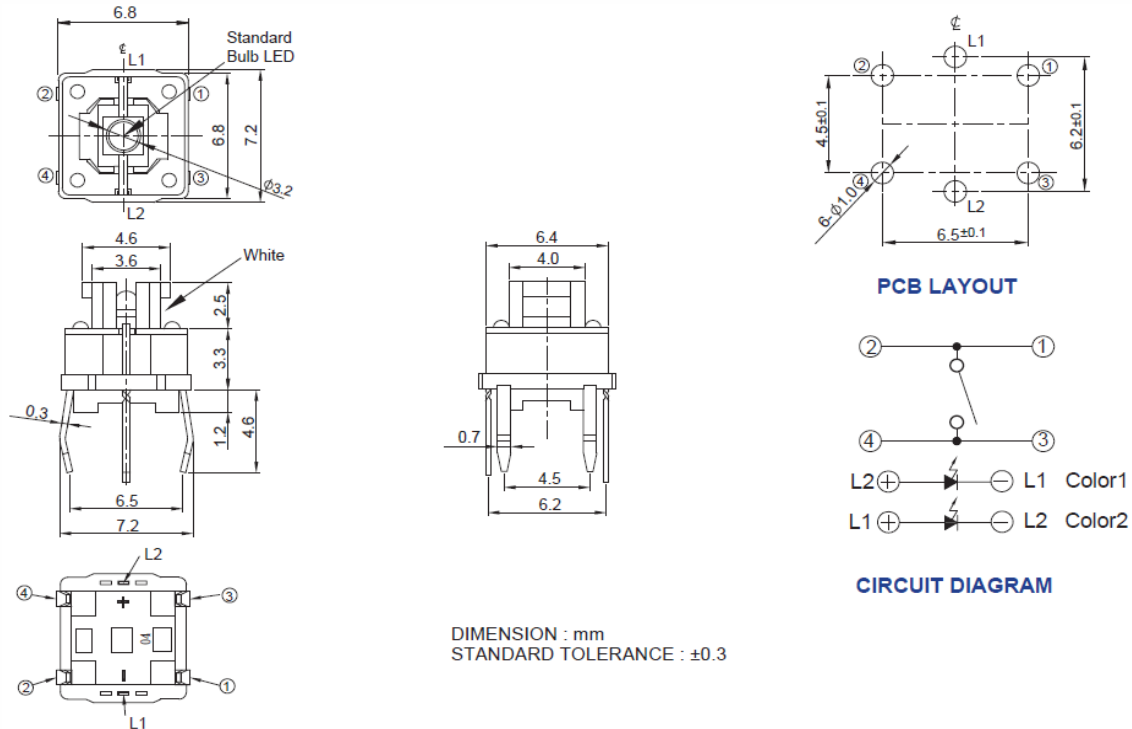


Figure 2 – 228AMV..., Surface Mount Gull Wing, Vertical Actuation

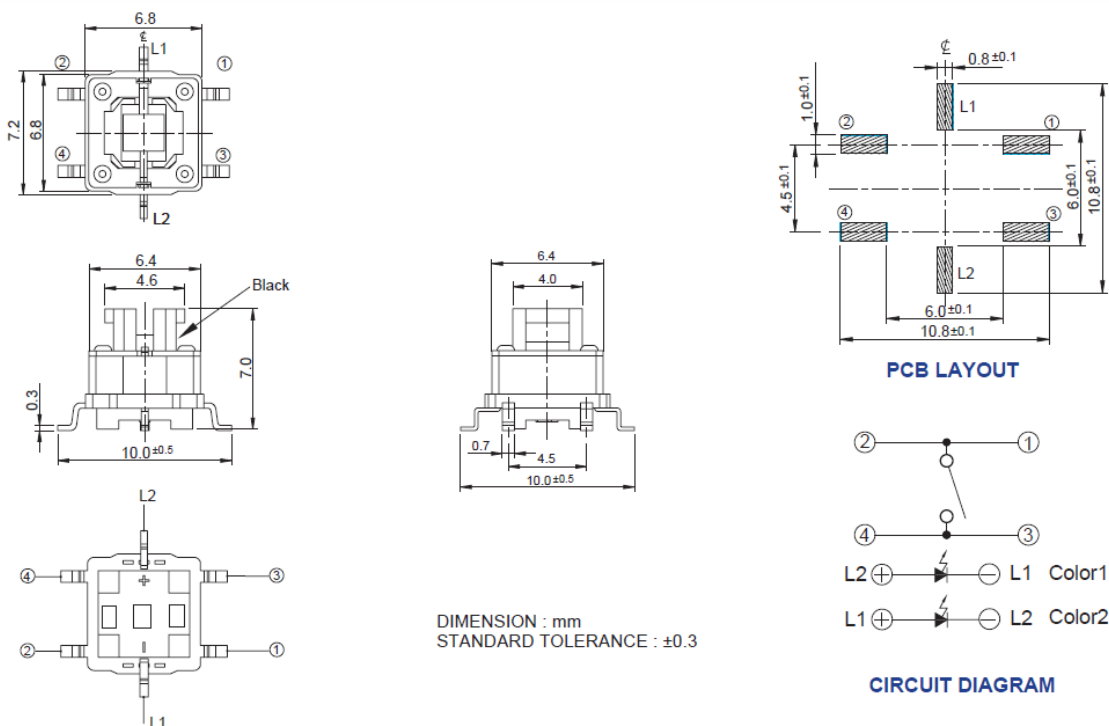


Figure 3 – 228ADS1..., Standard Though Hole, Side Actuation, 4 Pairs Terminals

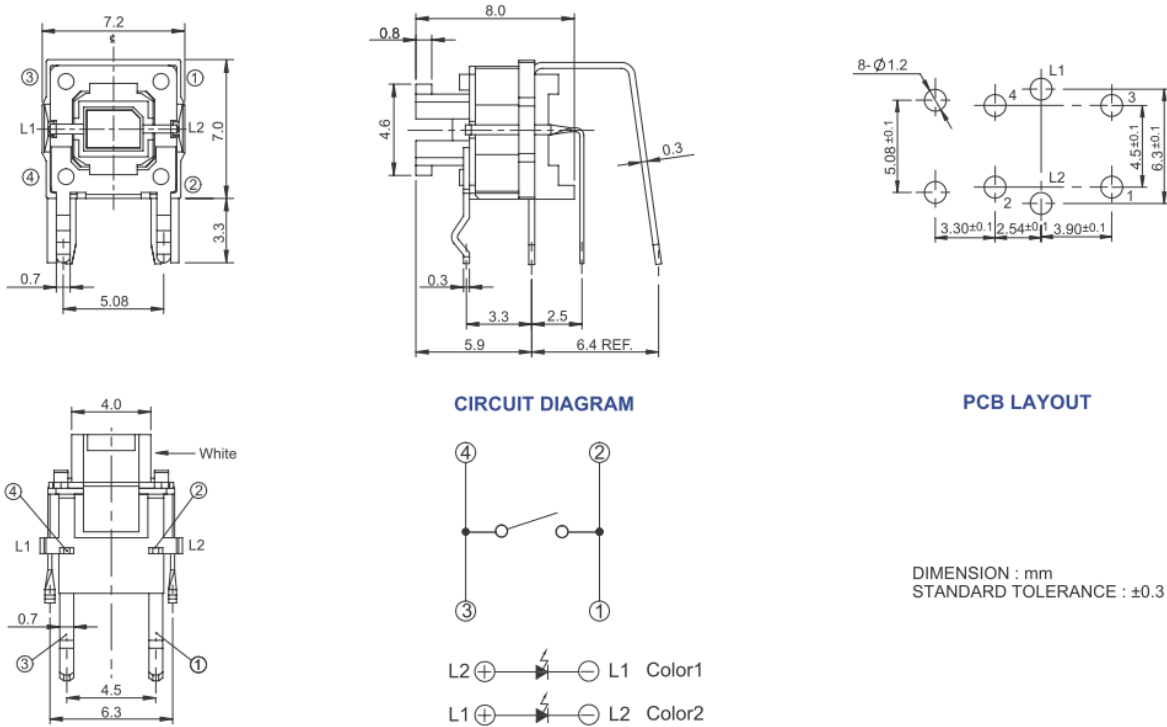


Figure 4 – 228ADVA...A..., Standard Though Hole, Vertical Actuation, Elliptical Column on Round Cap in Natural Color

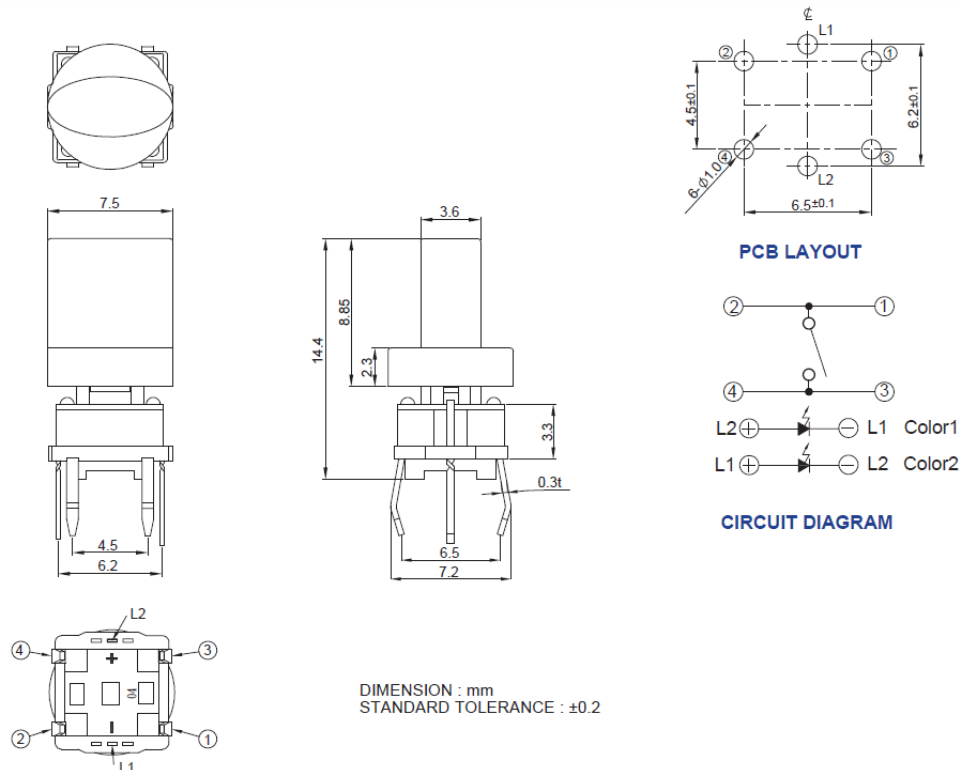
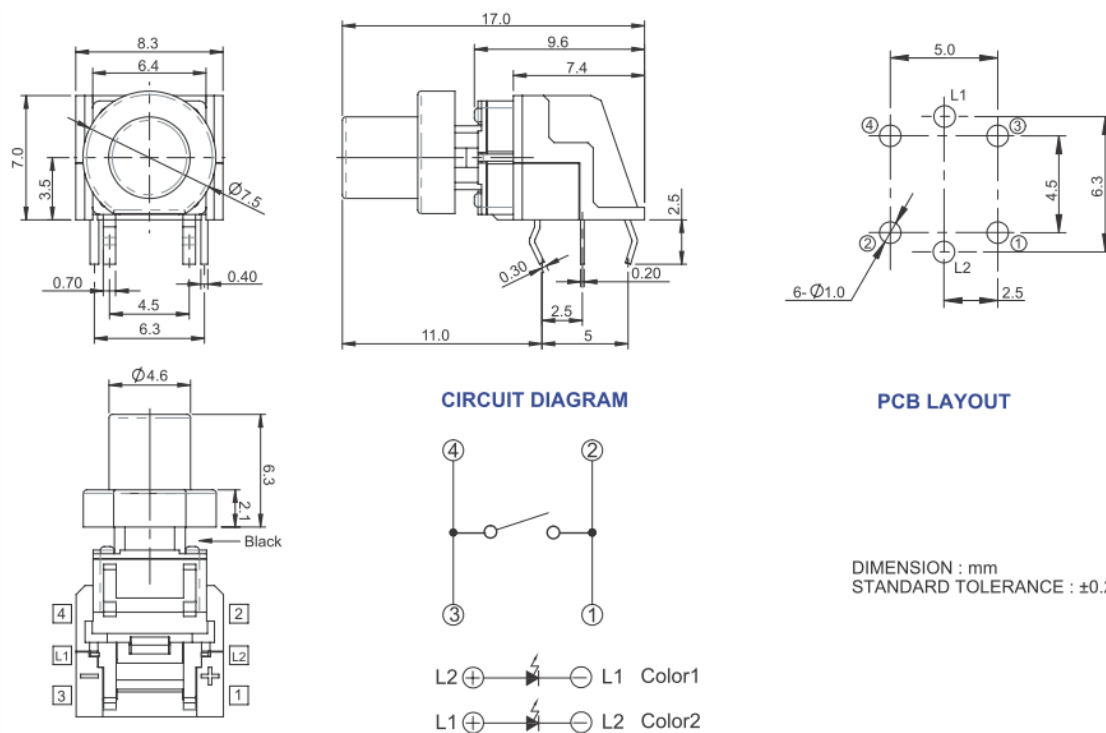


Figure 5 – 228ADS2...C..., Standard Though Hole, Side Actuation with 3 Pairs Terminals, & Cylinder on Round Cap

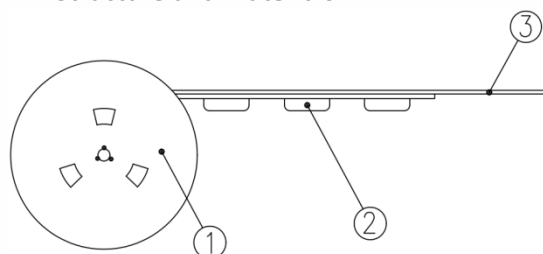


Packing: Tape and Reel

Surface Mount Gull Wing, Actuator Height 7.0mm

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: 450 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:

