



# Series 228E

## 7.2 x 6.8mm IP67 Rated Illuminated Tactile Switch

- Surface mount gull-wing terminal and standard through hole configurations
- IP67 protection
- Compatible with IR reflow, and manual soldering
- Single or Tri-color display during illumination
- Variety of LED color options



### Ordering Information

Series	Terminal Type	Actuating Direction	Actuation Force	LED Color	LED Type	Packaging
228E	M	V	A	R	F	R

Code	Spec.
D	Standard through hole (white actuator)
M	Surface mount gull wing (white actuator)
J	"J" bend terminal (white actuator)

Code	Spec.
V	Vertical
S	Side

Code	Spec.
R	Red
Y	Yellow
G	Green
B	Blue
W	White
A	Amber
RG	Red & Oliver Gree
RB	Red & Blue
YG	Yellow & Green
RA	Red & Amber
AW	Amber & White
RGB	Red, Green, & Blue (only available for vertical actuation)



Code	Spec.
F	Flat

Code	Spec.
R	Tape & reel packaging (not available for vertical standard through hole type)
Blank	Tray packaging (only available for vertical standard through hole type)

Code	Spec.
A	200 gf

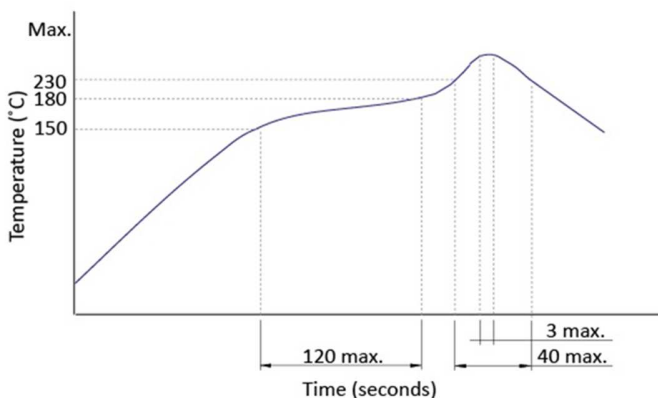
### Electrical Specifications

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 3 seconds Maximum wave temperature, 265°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	200gf ± 50gf
Actuation Life	100,000 cycles
Actuator Strength	2 Kg maximum
Travel	0.7 ± 0.2mm
Packaging	Standard tape and reel packaging for surface mount gull wing terminal Tray packaging for standard through hole
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-40°C to +85°C
Waterproof Grade	IP67
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 – 228EMV, Surface Mount Gull Wing, Vertical Actuation**

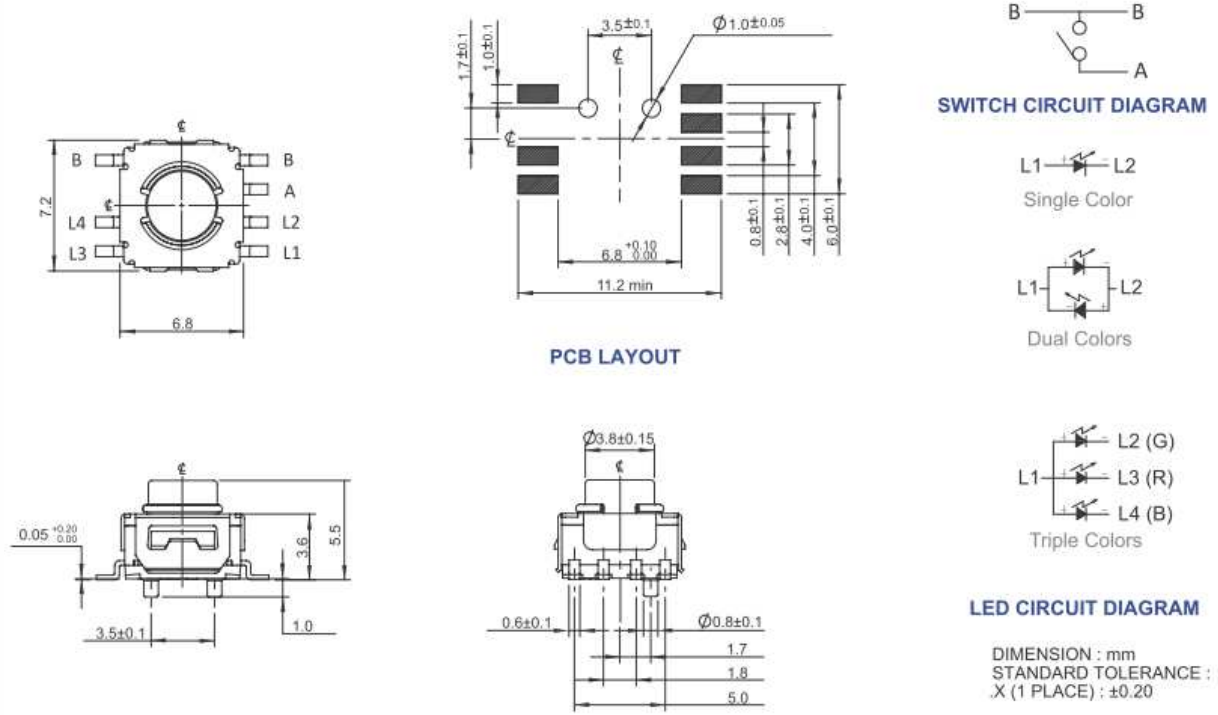


Figure 2 – 228EJV, “J” Bend Terminal, Vertical Actuation

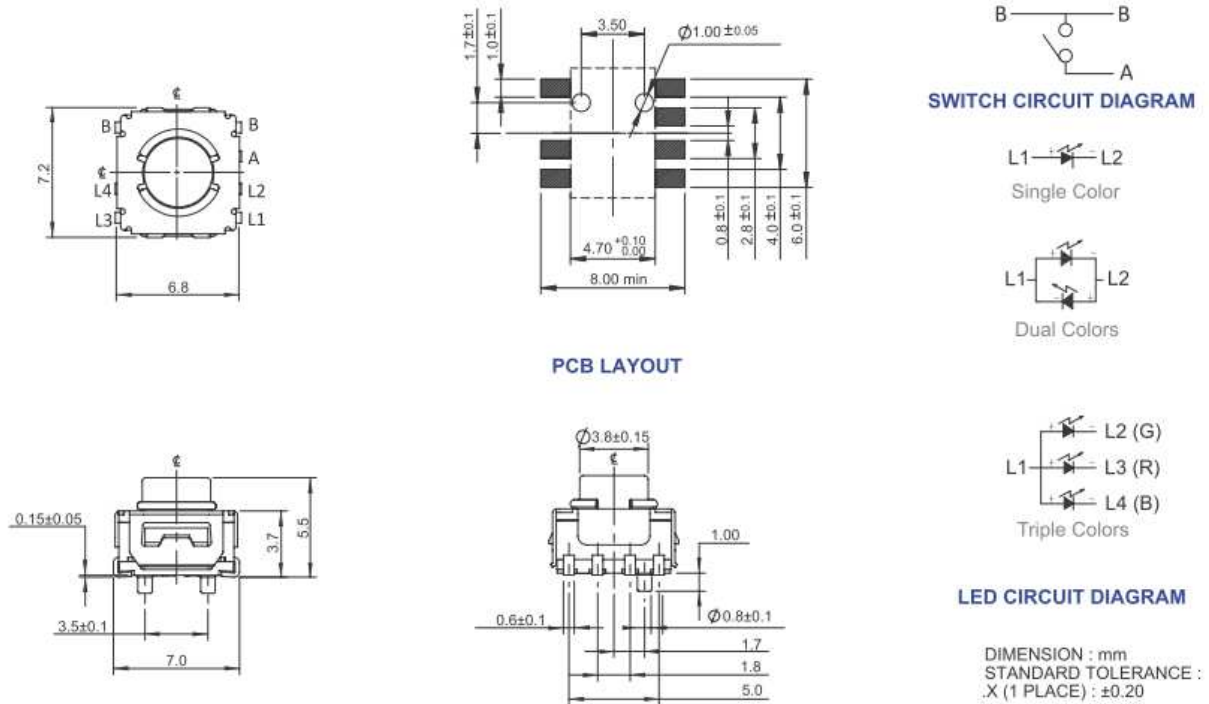


Figure 3 – 228EDV, Standard Though Hole, Vertical Actuation

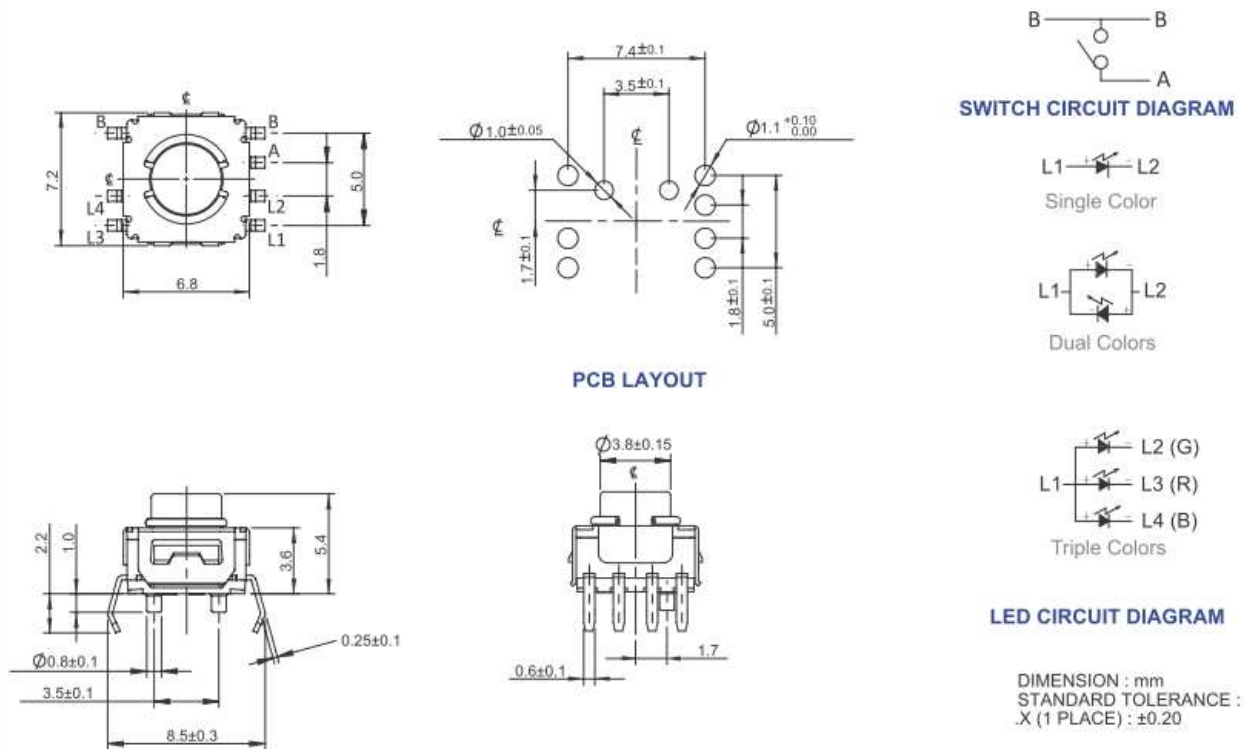


Figure 4 – 228EMS, Surface Mount Gull Wing, Side Actuation

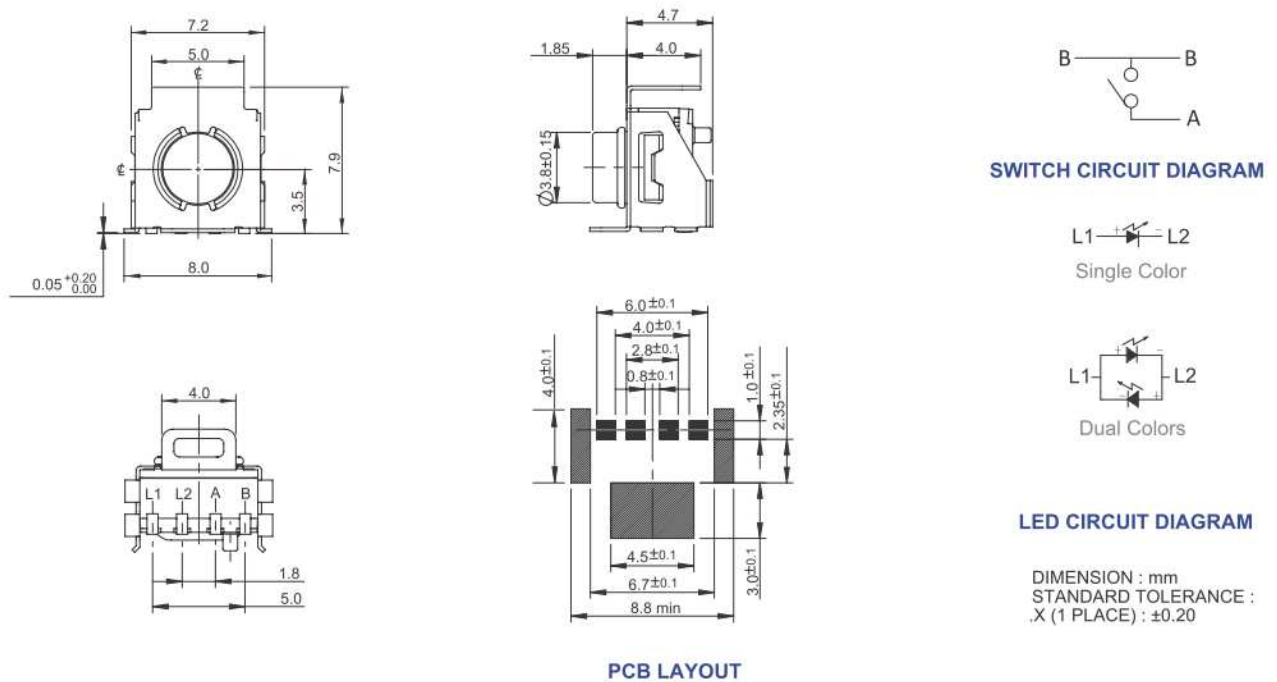
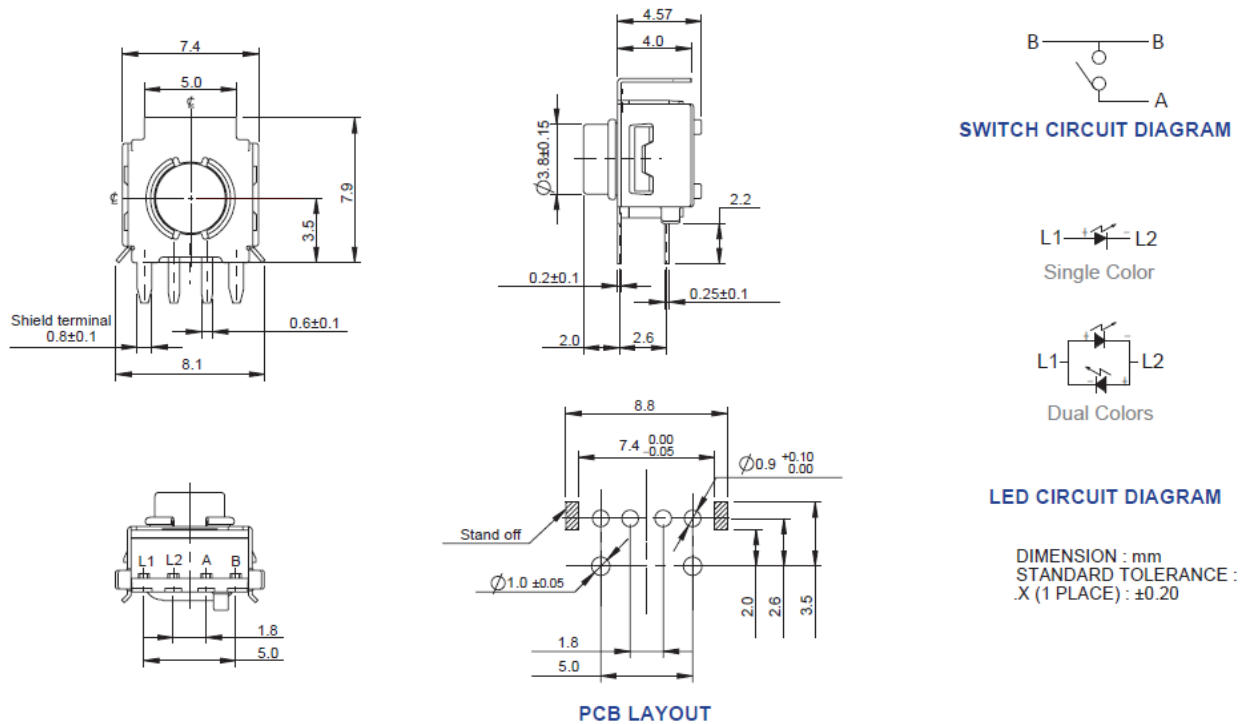


Figure 5 – 228EDS, Standard Through Hole, Side Actuation

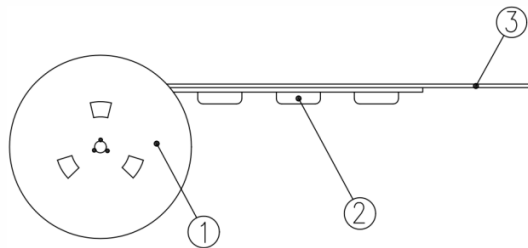


### Packing: Tape and Reel

Surface Mount Gull Wing/J Bend Terminal, Vertical Actuation, 228EMV..., 228EJV...

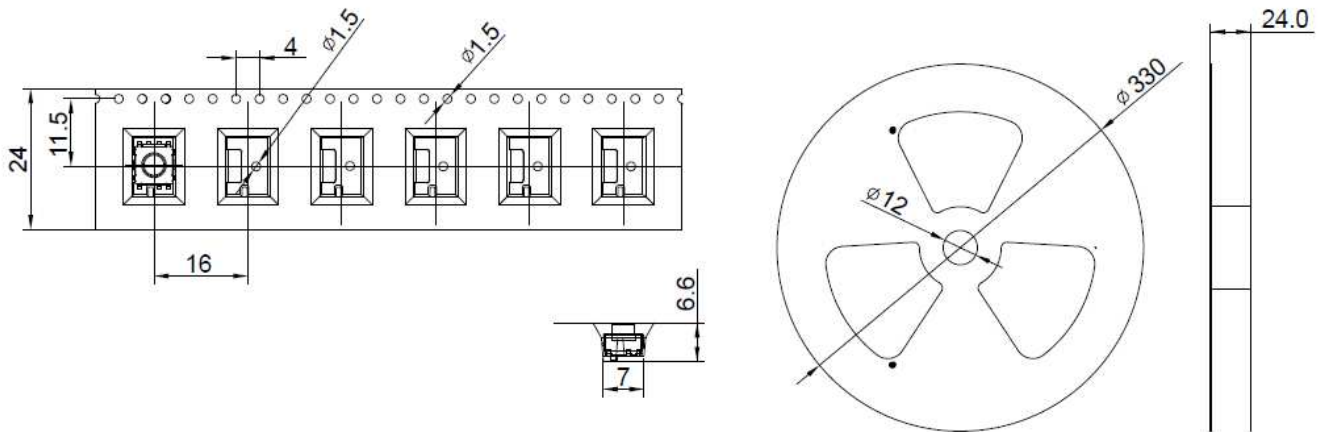
The packing specifications:

1. Structure and materials:



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

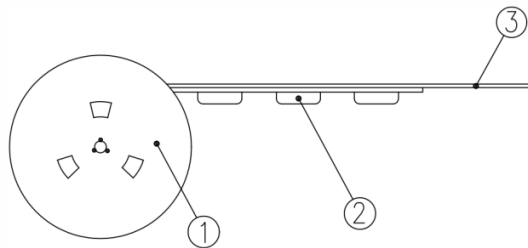
2. Packing quantity: 800 pcs/reel (Gull Wing); 600 pcs/reel (J Bend)
3. More than 15 empty pockets should remain at each end of the carrier tape for each reel.
4. Shortage of less than 10 pcs a reel is acceptable but no more than 3 consecutive empty pockets are allowed.
5. Stripping strength of cover 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:



Surface Mount Gull Wing, Side Actuation, 228EMS...

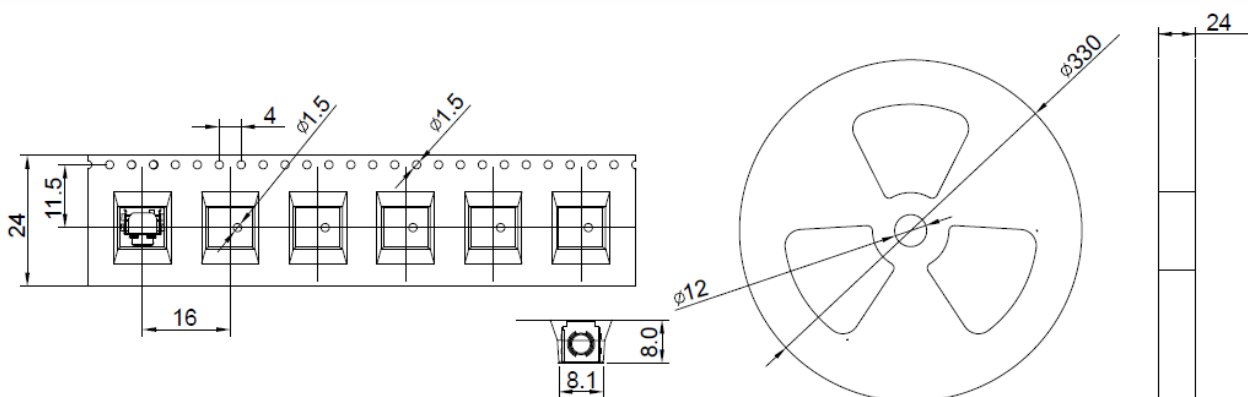
The packing specifications:

1. Structure and materials:



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

- Packing quantity: 500 pcs/reel
- More than 15 empty pockets should remain at each end of the carrier tape for each reel.
- Shortage of less than 10 pcs a reel is acceptable but no more than 3 consecutive empty pockets are allowed.
- Stripping strength of cover tape is between 10 gf to 130 gf and stripping angle should be within  $165^{\circ}\sim 180^{\circ}$ .
- The product in the pocket of carrier tape should be placed in a specified correct position.
- Tape and reel per EIA-481.
- Dimensions:



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