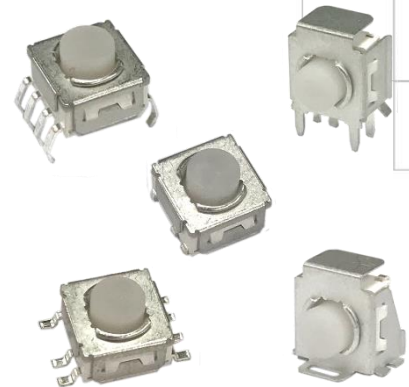


# Series 228E

## 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 & Green                                                |
| 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

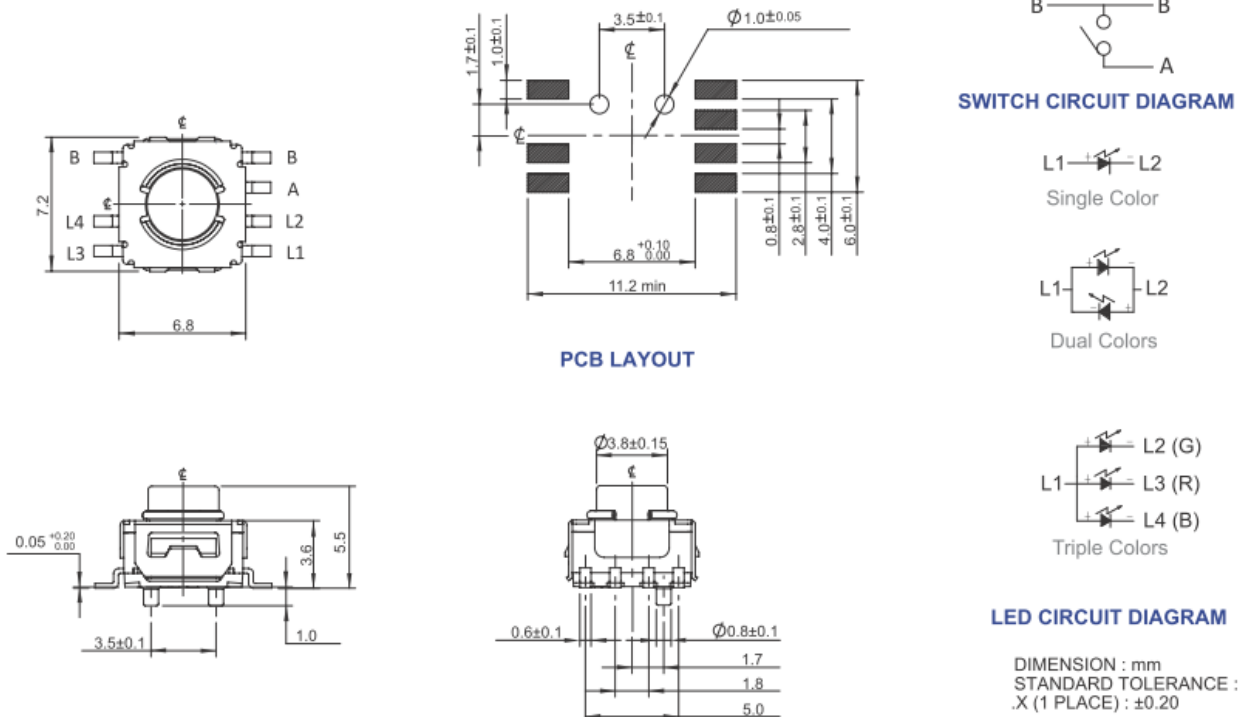
| Parameter             | Conditions & Remarks               | Min | Max            | Unit            |
|-----------------------|------------------------------------|-----|----------------|-----------------|
| Contact Resistance    |                                    |     | 100            | milliohms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

## Mechanical and Environmental

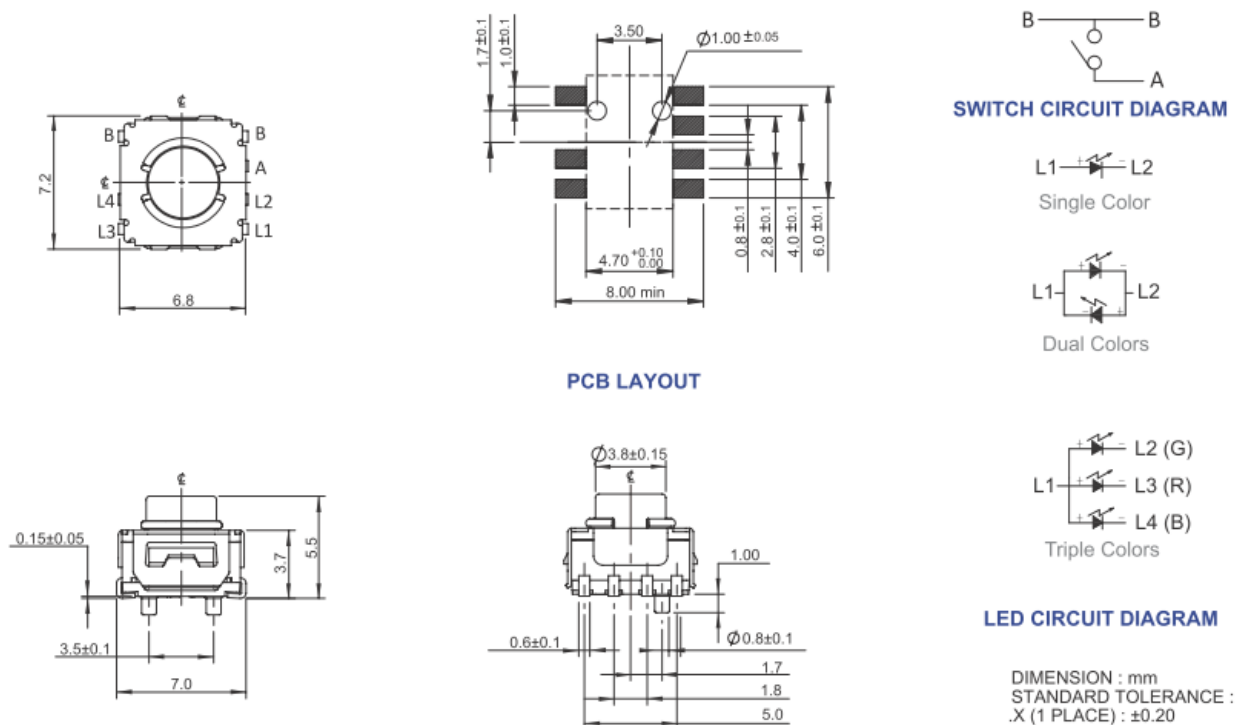
|                             |                                                                                                                                                     |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Soldering                   | Maximum reflow temperature, 260°C for 3 seconds<br>Maximum wave temperature, 265°C for 5 seconds<br>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 $\pm$ 50gf                                                                                                                                    |
| Actuation Life              | 100,000 cycles                                                                                                                                      |
| Actuator Strength           | 2 Kgf maximum                                                                                                                                       |
| Travel                      | 0.7 $\pm$ 0.2mm                                                                                                                                     |
| Packaging                   | Standard tape and reel packaging for surface mount gull wing terminal<br>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                                                                                                                                                |

### Mechanical Specifications

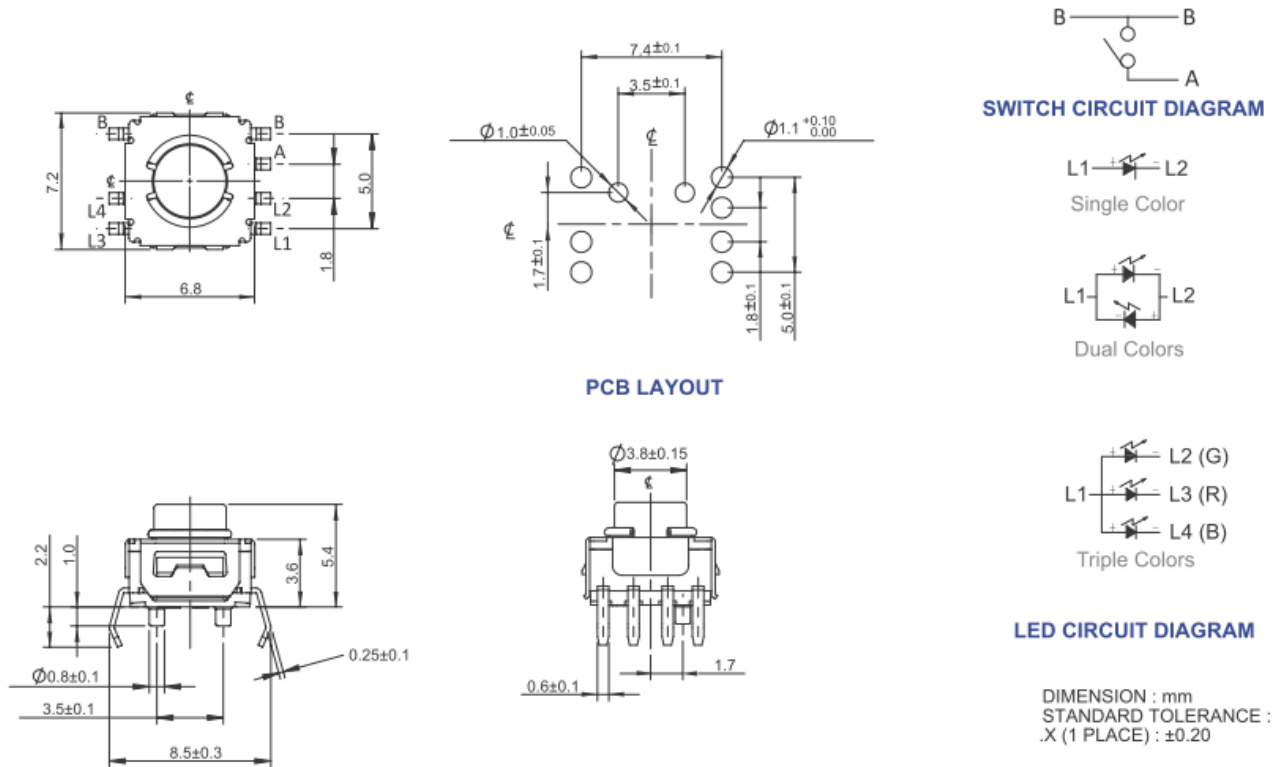
**Figure 1 – 228EMV, Surface Mount Gull Wing, Vertical Actuation**



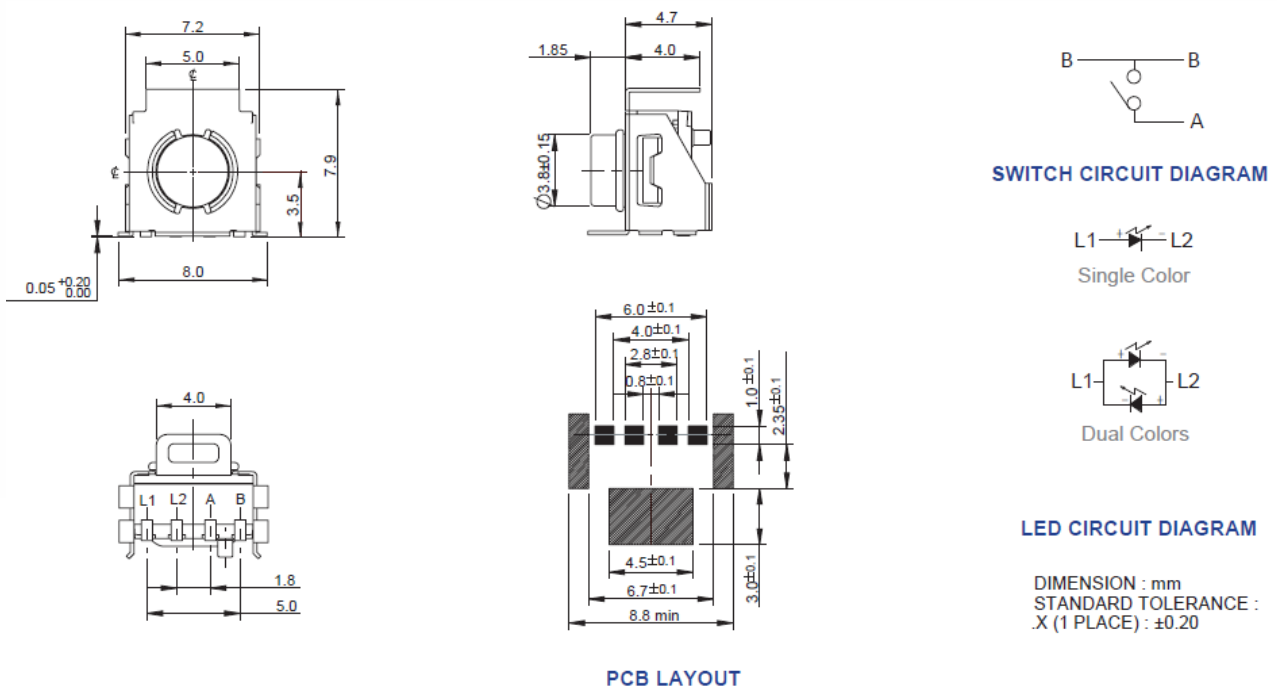
**Figure 2 – 228EJV, “J” Bend Terminal, Vertical Actuation**



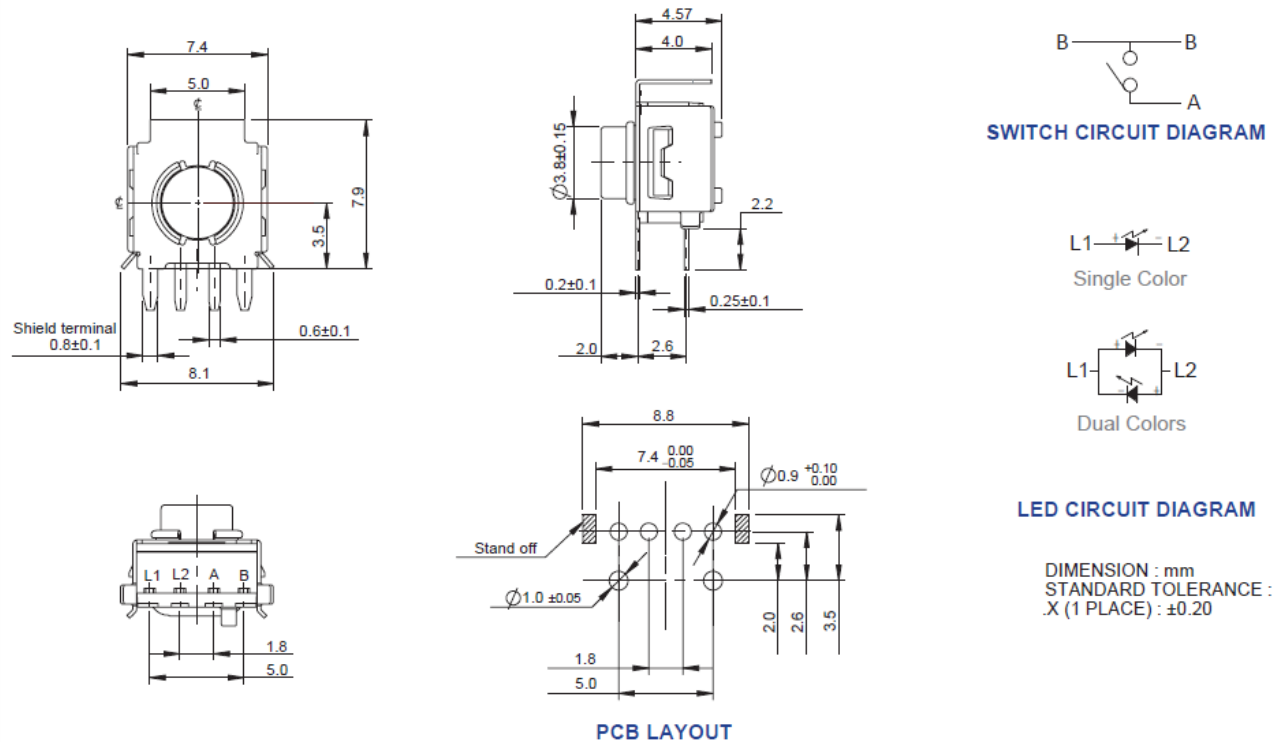
### Figure 3 – 228EDV, Standard Though Hole, Vertical Actuation



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



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

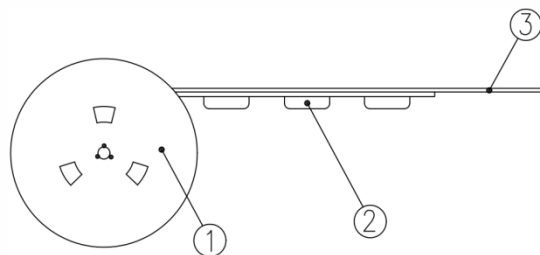


## Packing: Tape and Reel

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

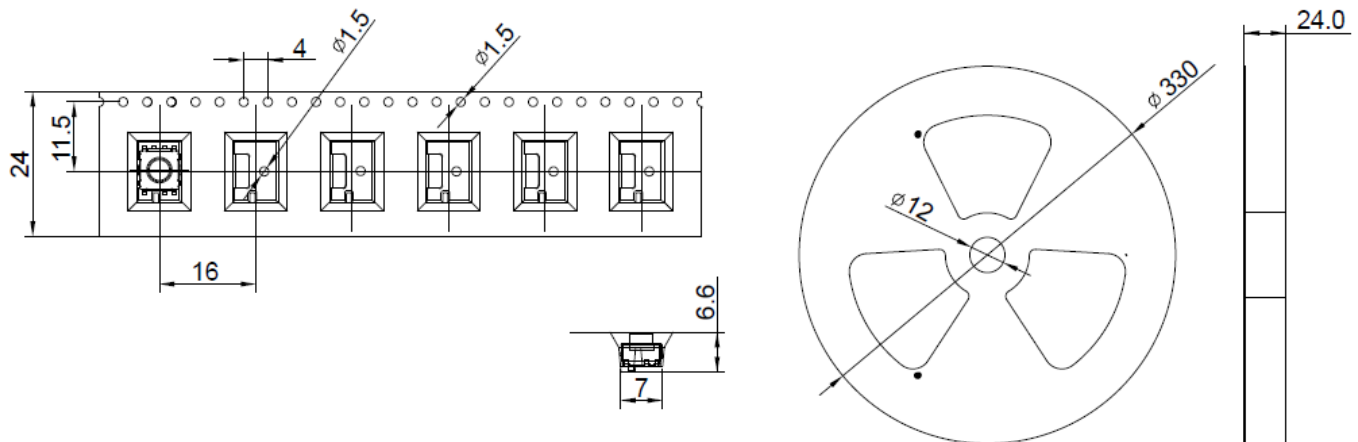
The packing specifications:

1. Structure and materials:



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

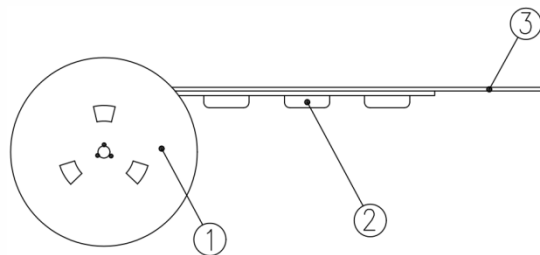
2. Packing quantity: 600 pcs/reel
3. More than 15 empty pockets should remain at each end of the carrier tape for each reel.
4. Shortage of less than 10 pcs a reel is acceptable but no more than 3 consecutive empty pockets are allowed.
5. Stripping strength of cover tape is between 10 gf to 130 gf and 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:



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

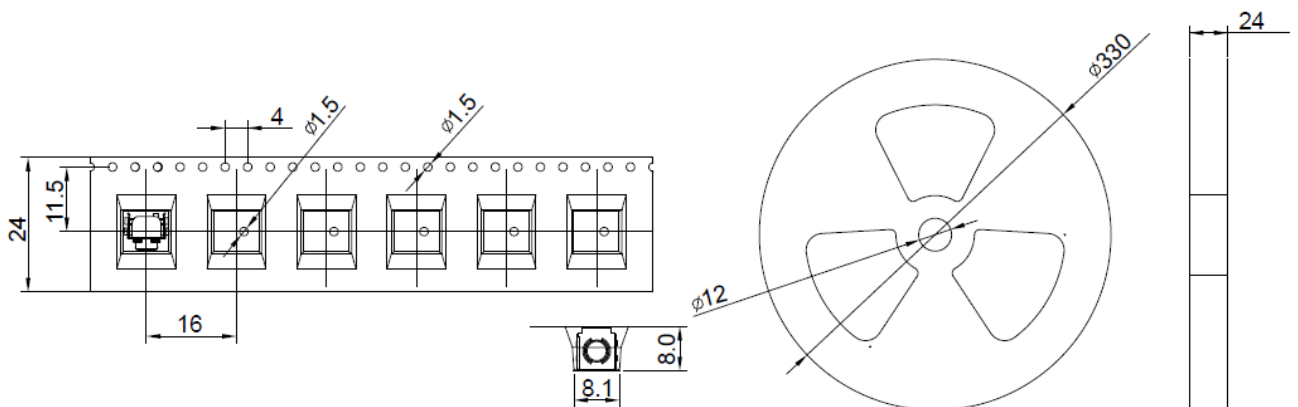
The packing specifications:

#### 1. Structure and materials:



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

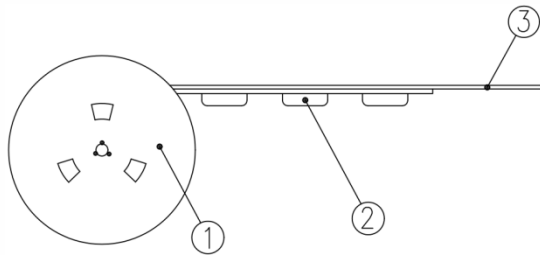
- Packing quantity: 700 pcs/reel
- More than 15 empty pockets should remain at each end of the carrier tape for each reel.
- Shortage of less than 10 pcs a reel is acceptable but no more than 3 consecutive empty pockets are allowed.
- Stripping strength of cover tape is between 10 gf to 130 gf and stripping angle should be within 165°~180°.
- The product in the pocket of carrier tape should be placed in a specified correct position.
- Tape and reel per EIA-481.
- Dimensions:



### Standard Through Hole, Side Actuation, 228EDS...

The packing specifications:

#### 9. Structure and materials:



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

10. Packing quantity: 450 pcs/reel

11. More than 15 empty pockets should remain at each end of the carrier tape for each reel.

12. Shortage of less than 10 pcs a reel is acceptable but no more than 3 consecutive empty pockets are allowed.

13. Stripping strength of cover tape is between 10 gf to 130 gf and stripping angle should be within 165°~180°.

14. The product in the pocket of carrier tape should be placed in a specified correct position.

15. Tape and reel per EIA-481.

16. Dimensions:

