

To:

**Light touch switch  
and Detector switch  
Product Introduction for Mouse**

May 2025

Panasonic Industry Co., Ltd.

**Panasonic**  
INDUSTRY

**IN Your  
Innovation**

# Light touch switch for Mouse

# Light touch switch for Mouse

## Click Button, Side Button

**EVQP0**



6.2mmx6.2mm  
h=7.45mm  
Travel: 0.5mm(PT)  
0.2mm(OT)  
Life: 1000Kcycles  
5000Kcycles

**EVQPL**



4.9mmx4.9mm  
h=0.8mm, 1.5mm  
Travel: 0.25mm  
Life: 200K, 500K cycles



## Bluetooth Button, Others

**EVQQ2/EVPBT/EVQP0**



6.5mmx6.0mm  
h=2.0mm, 2.5mm,  
3.1mm, 4.3mm  
Travel: 0.2mm~0.3mm  
Life: 100K~2000K cycles

**IP67**

**EVPBK**



4.9mmx4.0mm  
h=0.63mm, 0.7mm  
Travel: 0.2mm, 0.23mm  
Life: 1000K cycles

# Needs trend for Mouse and the features of light touch switches

## Cushion feeling for less fatigue High reliability including dustproof, quietness, and longevity

### General mouse

Click, Side, Bluetooth Button



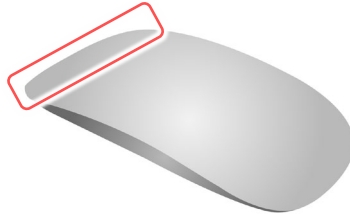
- ✓ Dustproof
- ✓ Long operating life
- ✓ Quiet operation

### 1. Dustproof, Quiet operation

- High dustproofness due to the sealing structure by laser welding.
- Silent operation due to different rubber hardness of the push plate.

### Slim mouse

Click Button



- ✓ Dustproof
- ✓ Thin profile
- ✓ Long operating life
- ✓ Quiet operation

### 2. Long operating life

- High durability due to plating structure suitable for switch keystrokes.

### High end, Game mouse, others

Click, Side, Bluetooth Button



- ✓ Dustproof
- ✓ Long operating life
- ✓ Quiet operation

### 3. Good operability, Click feel

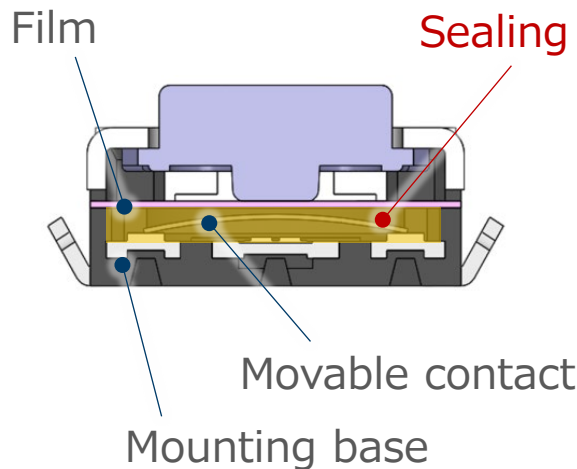
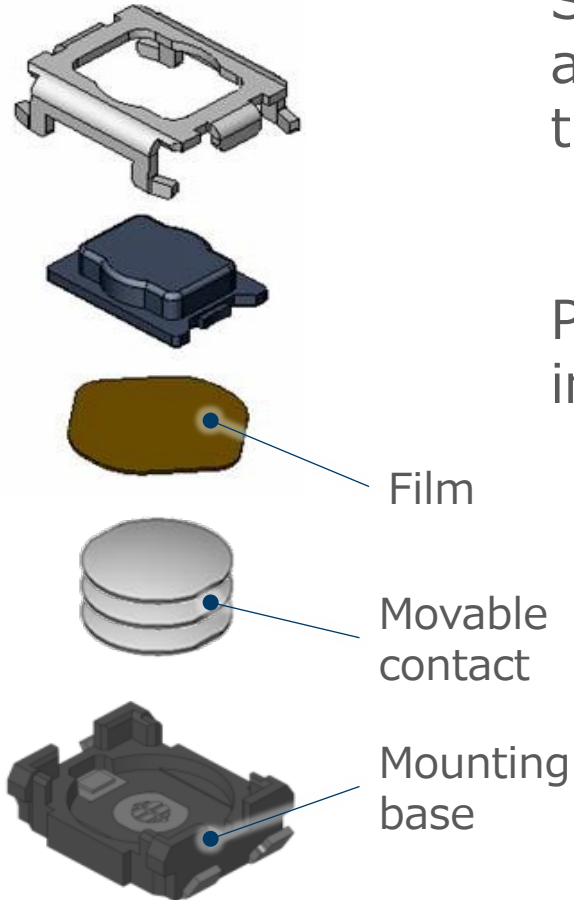
- Good operability and click feel due to the in-house metal dome.
- Overstroke feeling due to differences in rubber hardness of the push plate.

## High dust resistance due to film-sealed structure

Sealing the contact area by attaching a film to the mounting base that holds the movable contacts.



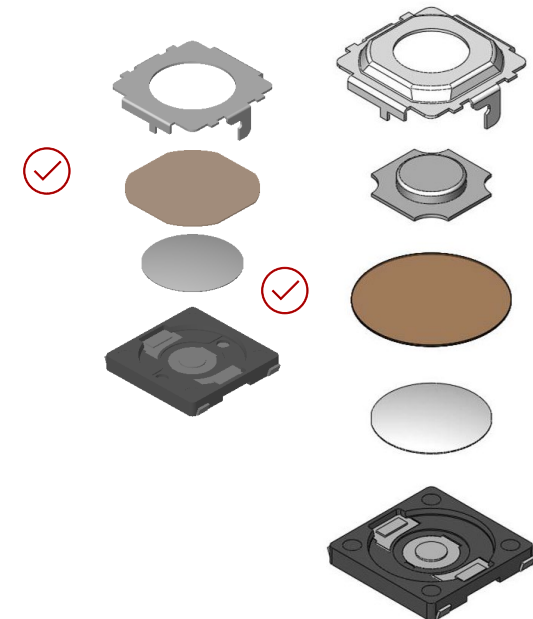
Prevents intrusion of foreign matter into the contact area



### EVQPL



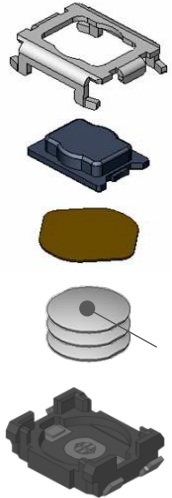
4.9mmx4.9mm  
h=0.8mm, 1.5mm  
Travel: 0.25mm  
Life: 200K, 500K cycles



# Reliability

## Ensure reliability by optimal number of metal dome / our plating technology

### Metal dome



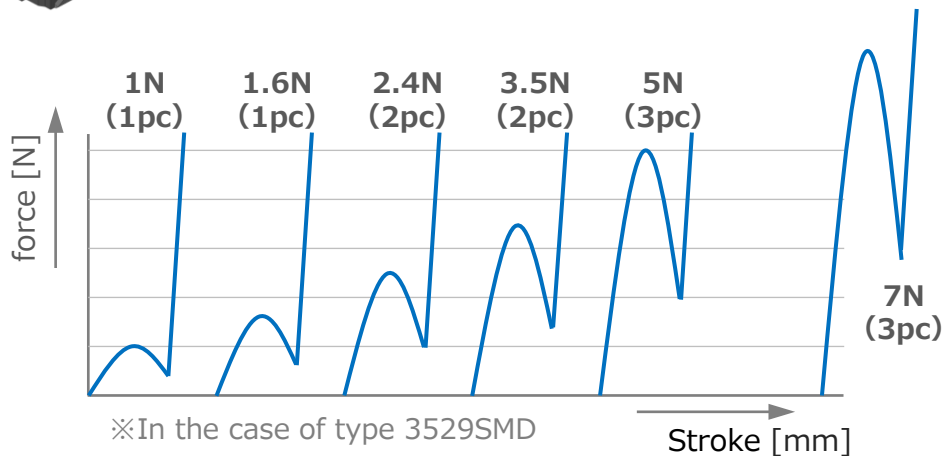
Metal dome

### Multiple metal dome

Adjust the number of metal domes based on required operation force and life cycle



Achieve high operation force / long life by dispersing stress with multiple metal dome structure.



### Plating

Our plating is more difficult to be worn down from high operation force and long push.

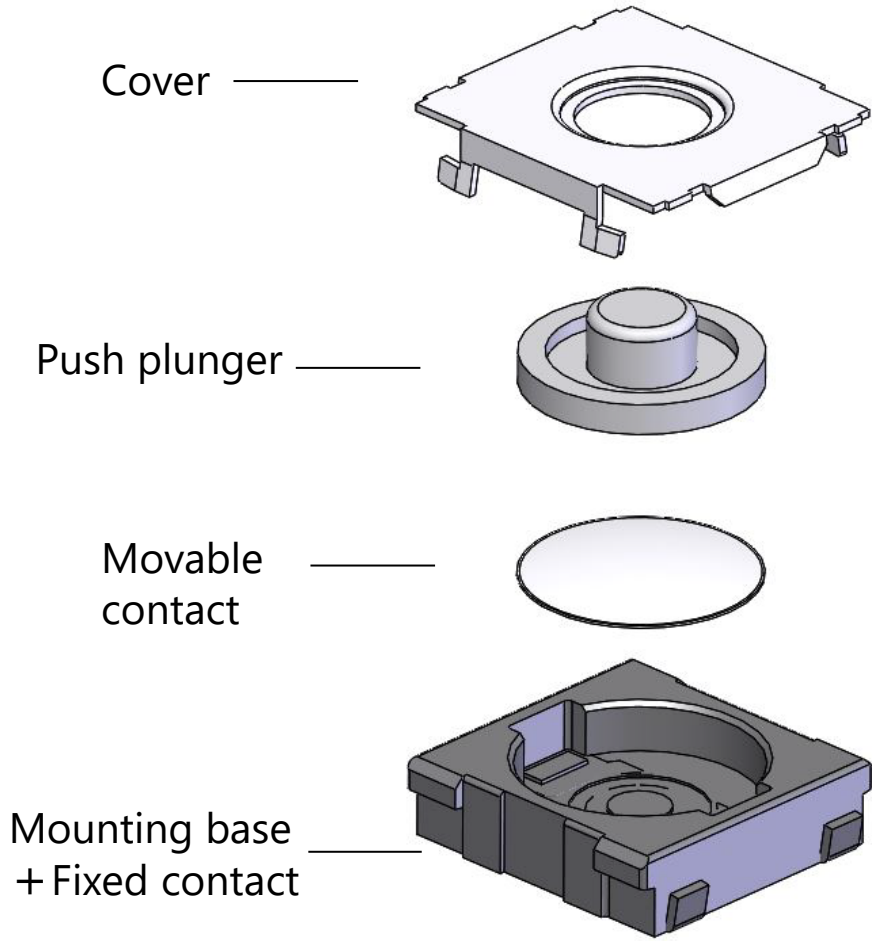
### Plating Structure

	Plating
General	<p>Stainless steel (SUS)</p> <p>Ni Plating</p> <p>Ag Plating</p>
Panasonic	<p>Stainless steel (SUS)</p> <p>Ni Plating</p> <p>Cu Plating</p> <p>Ag Plating</p>

Prevents plating worn-down by improves adhesion of plating by inserting Cu plating between Ag and Ni.

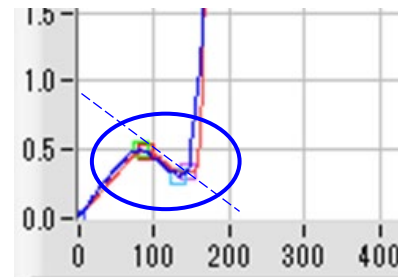
# Good operability, click feeling, and quiet operation

Overstroke feeling due to differences in rubber hardness of the push plate.



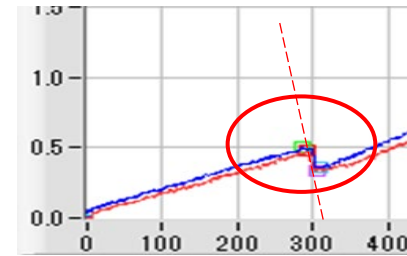
Silent noise reduction mechanism due to the difference in rubber hardness of the push plunger

Movable contact only

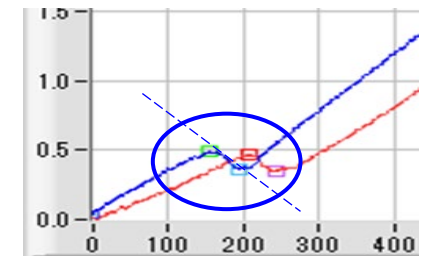


The inclination when buckling is gentle

Completed after assembly



The inclination when buckling is steep  
(rubber hardness 45°)



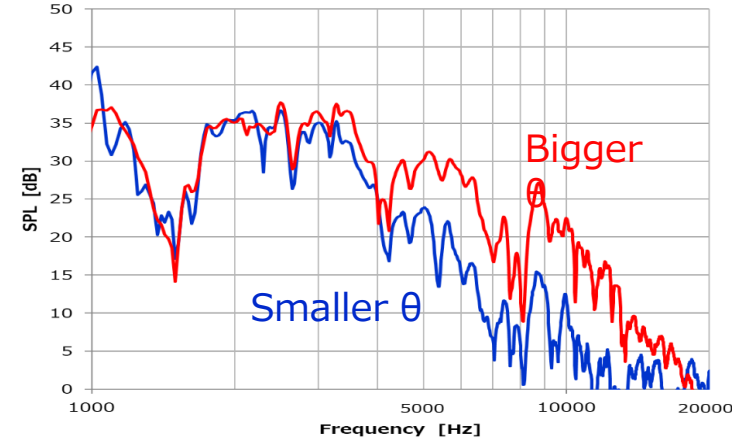
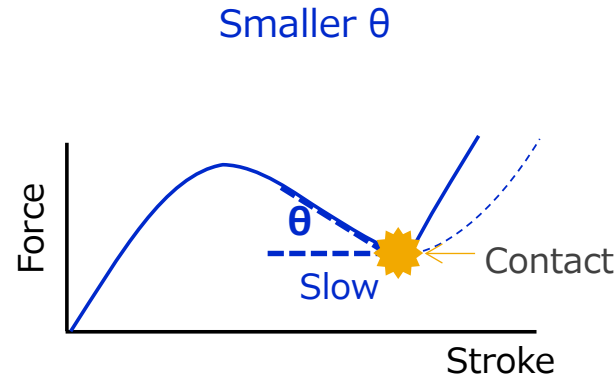
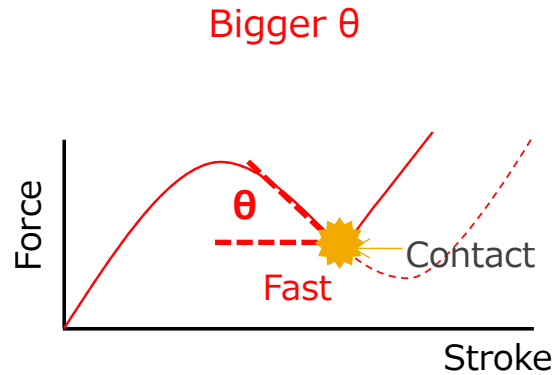
The inclination when buckling is gentle  
(rubber hardness 70°)

Increasing the rubber hardness reduces the springiness, approaching the characteristics of only movable contact.

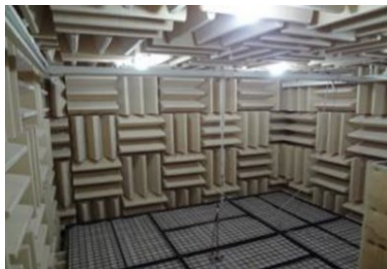
- The inclination when buckling is gentle (speed down)
- **Noise generated during buckling and collision noise with fixed contact is reduced.**

# Operational sound evaluation technology

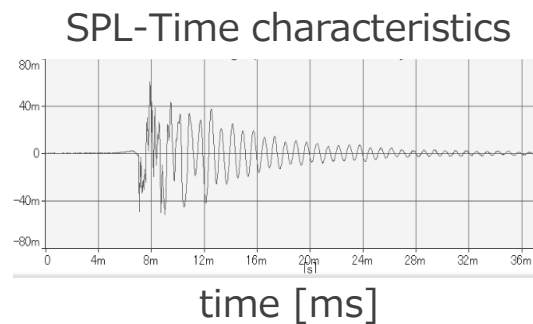
## Control the operational sound while maintaining the click feeling



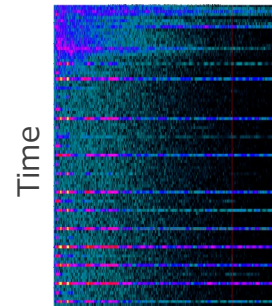
### Sound measurement environment and analysis



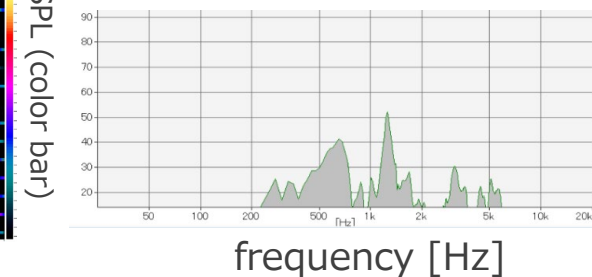
Anechoic room(<NC20)



FFT



SPL-Frequency characteristics



# Detector switch for Mouse

# Detector switch for Mouse

Wheel click button,  
switching button for dpi etc.

Mounting type that supports various set (board) structures

**ESE11**



6.4mmx3.0mmx4.9mm

**ESE22**



5.7mmx1.9mmx4.1mm



Power ON/OFF switch

Backside of mouse, space-saving detection of  
power on/off sliding operation

Space-saving arrangement by small switch

**ESE16**



2.2mmx3.35mm  
h=1.5mm

**ESE58**



3.5mmx3.0mm  
h=0.9mm

Side button

For ancillary operations, space-saving  
detection of special operating movements

Two-way automatic  
return type

**ESE23**



4.4mmx5.0mm  
h=1.5mm

Space-saving arrangement  
by small switch

**ESE16**



2.2mmx3.35mm  
h=1.5mm

**ESE58**



3.5mmx3.0mm  
h=0.9mm

Charger detection,  
other applications

Detection of chargers and charging cables

**ESE13**



4.2mmx3.6mm  
h=1.2mm

**ESE18**



4.0mmx4.4mm  
h=1.2mm

# Needs trend for Mouse and the features of Detector switches

## Detector switches supports a variety of applications

### Operating switch

Mounted on various structures  
Suitable for a variety of operations

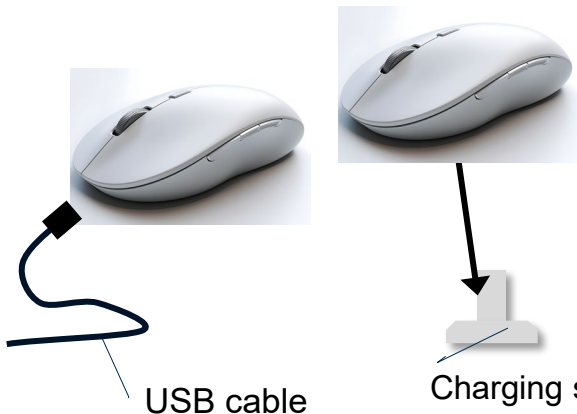


Compatible with space-saving

- ✓ Small and thin
- ✓ Lightweight
- ✓ Light operation force

- ✓ Improved operability

### Detection of charger



USB cable

Charging station

- ✓ Reduction of power consumption
- ✓ High reliability

## 1. Designability

- Compatible with various operation modes
- Plenty of substrate mounting modes

## 2. Proposal of various operation switches

- Realization of various operation switches such as rotation operation, slide operation, seesaw operation, etc.

## 3. Reduction of power consumption

- Power ON/OFF switching and circuit protection when charging
- Reduce power consumption of sets by using normal close specifications

- ※ Please check the standard durability of the switch before considering.
- ※ For operation switch applications, please use a mouse to establish the click feeling and return force.

# Detector switches | Designability

- ◆ Small and abundant detection direction, operation mode and mounting method improve design freedom.
- ◆ Overstroke (through operation) allows detection of large movement amount even though it is small SW.

▶ Contribute to downsizing of device.

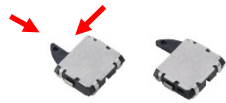
Size **2.2×3.35mm**      Mounting height **0.9mm**

ESE16type



circuits: N.O circuits  
direction of operation:  
vertical, horizontal  
(Horizontal can be operated through)

ESE58type



Circuit: N.O & N.C Circuit  
Operating direction: Horizontal,  
each two directions  
(Horizontal operation can be  
performed through)

▶ Contribute to customer's design flexibility.

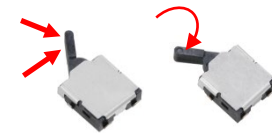
	Top/Bottom	Right/Left	Bidirectional
Operation			
	DIP	SMD	Screw clamp
Mounting method			

ESE13type



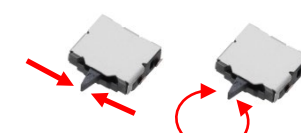
Vertical detection  
on PCB

ESE18type



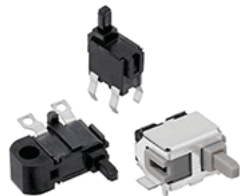
Horizontal  
detection on PCB

ESE23type



Two-way  
detection

ESE11type



ESE22type



ESE24type

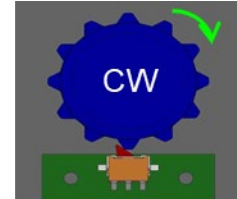
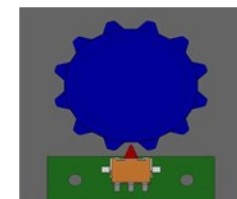
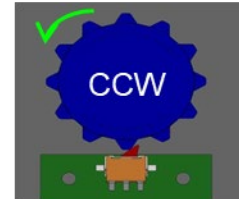
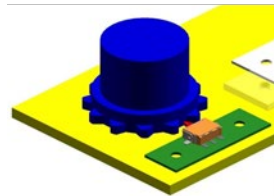


N.O= Normally open type, N.C= Normally Closed Type

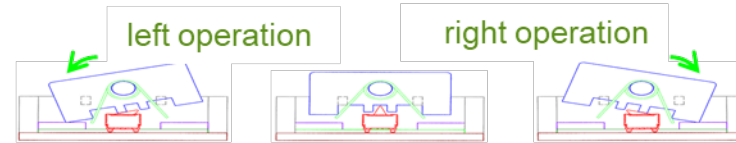
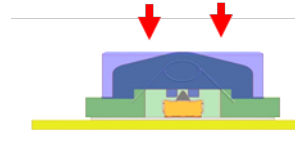
# Detector switches | Various operation

## Enables set rotation, sliding, and seesaw operations

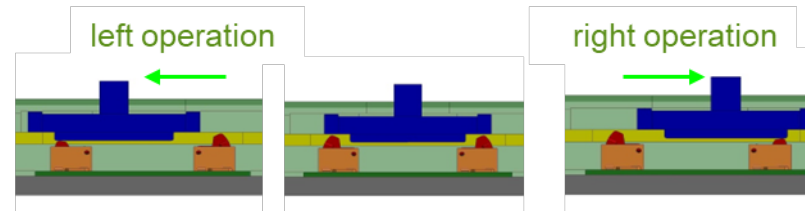
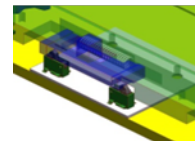
rotational operation



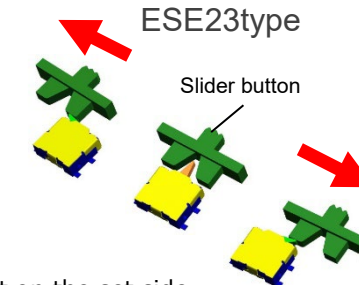
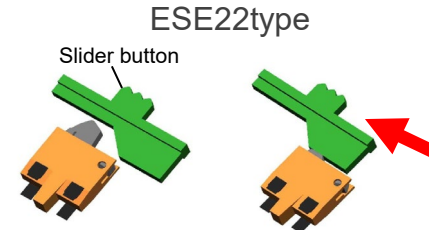
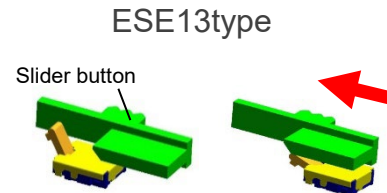
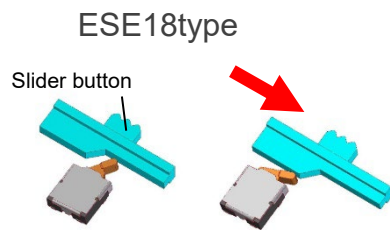
seesaw operation



slide operation



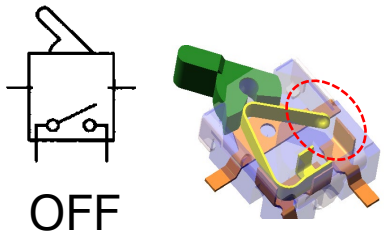
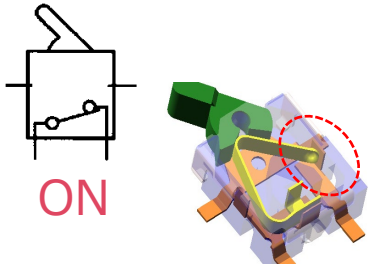
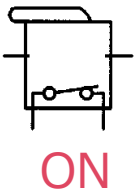

Slide operations (example)



\*The click feel of the operation button and the recovery force are not provided by the switch. Please set it on the set side.  
\*The switch is not dustproof or waterproof. Please set it on the set side.

# Detector switches | Reduction of power consumption

## Switch with several circuit choices helps save power to the set

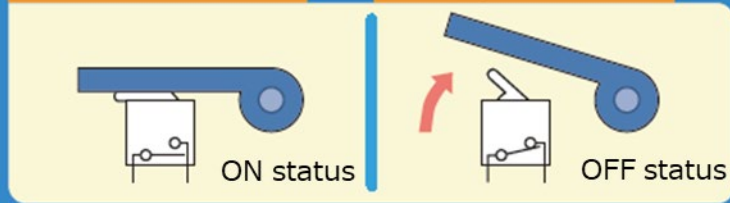
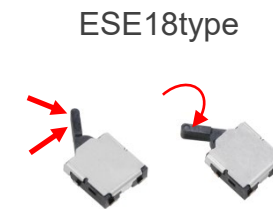
	N.O. (Normally Open type)	N.C. (Normally Closed type)
Normal position	 <p>OFF</p>	 <p>ON</p>
Lever Pressing	 <p>ON</p>	 <p>OFF</p>

<Compatible with normally closed (N.C.) specification>  
 Type that **turns ON when operated (Normally open)**  
 Type that **turns OFF when operated (Normally closed)**

▶ **Contribute to reduce power consumption.**  
 Example/ Detection of an opening-closing cover

Cover closed state

Cover open state

Body Size (mm) : 4.0×4.4×H1.2



Body Size (mm) : 3.5×3.0×H0.9

Circuit: N.O Circuit & N.C Circuit  
 Operation direction: PCB in two horizontal directions  
 (through operation is possible for horizontal operation)

## Self-cleaning structure ensures high reliability of contacts

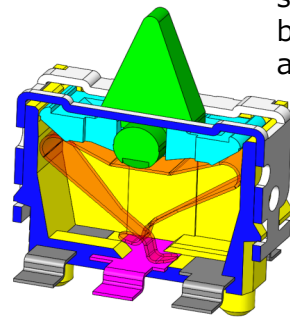
▶ Ensure high contact reliability with Original structure of plate spring wiping contacts.



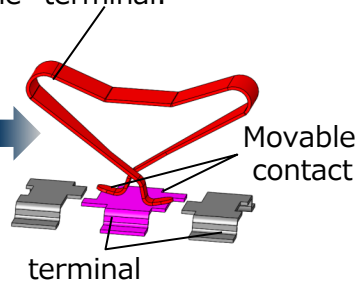
- Quality stability with simple structure
- Long life
- Stable manufacturing

### Structure (example)

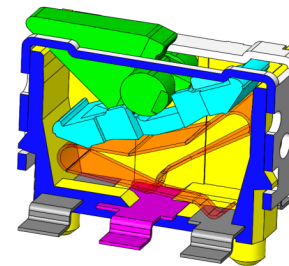
ESE24type  
normal state



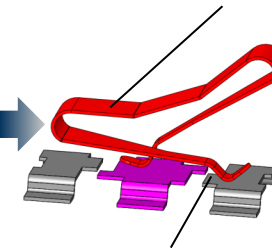
The spring force of the leaf spring makes stable contact between the "movable contact" and the "terminal."



Example of lever  
left operation



The "movable contact" of the operated leaf spring slides on the "terminal" and makes stable contact



Leaf springs (movable contacts) provide stable quality and manufacturing through integrated automatic assembly from mold processing to assembly of raw materials.

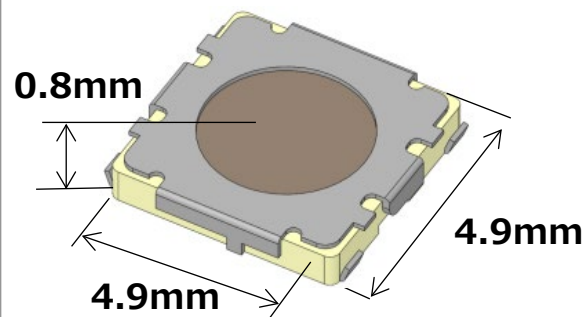
# Product leaflet

# Light Touch Switch | 4.9mm Square SMD

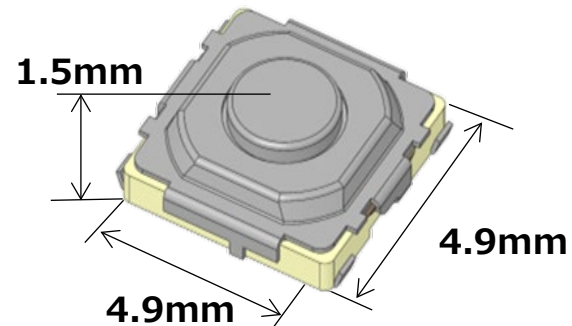
## Compact and highly dustproof vertical light touch switch

### Dimension

without push plate



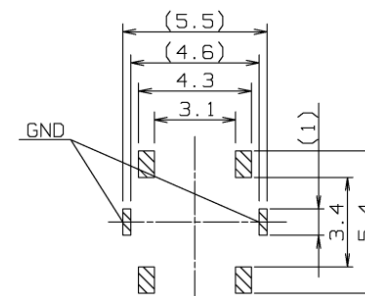
with push plate



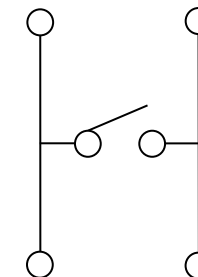
### Features

- \*High dust resistance due to film-sealed structure
- \*Wide range of variations with high press force products are available.
- \*Structure with push plate improves operability (Automotive application is possible only with push plate)

### Land Pattern



### Circuit diagram

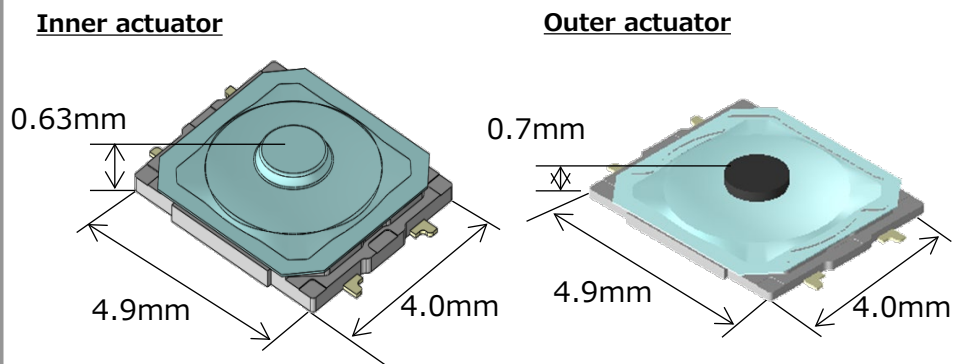


### Major specifications

- \* Operating force : 1.0N, 1.6N, 2.6N, 3.5N
- \* Travel : 0.25mm
- \* Life cycle
  - [Without push plate]  
500K (1.6N), 200K(2.6N,3.5N)
  - [With push plate]  
2,000K(1.0N,1.6N), 500K(1.0N,1.6N),  
200K(2.6N,3.5N)

## Top operational switch with small height dimension

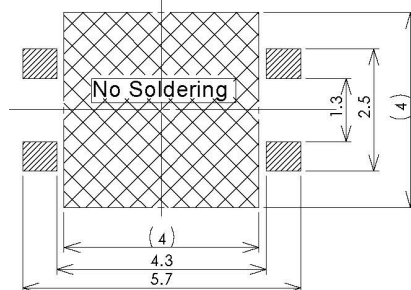
### Dimension



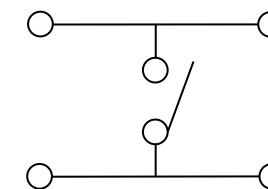
### Features

- \* Small height dimension
- \* Good feeling  
(Click ratio ability target 50%)
- \* High resistance against coating  
by laser welding

### Land Pattern



### Circuit diagram



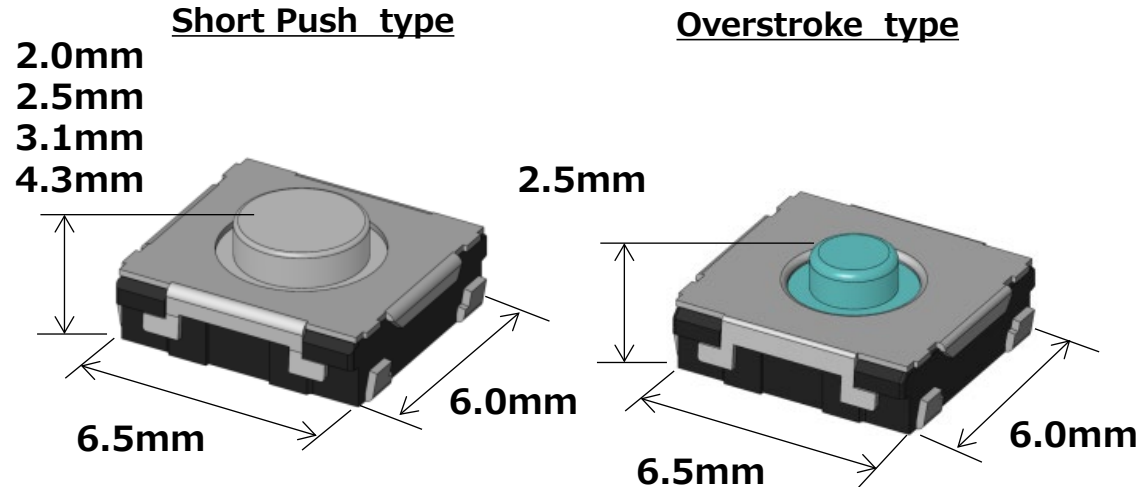
### Major specifications

- \* Operating force : 1.65N, 2.5N
- \* Click ratio : 40% min.
- \* Travel : 0.2mm(1.65N),0.23mm(2.5N)
- \* Life cycle : 1,000K
- \* IP67

# Light Touch Switch | 6mm Square Thin Type SMD

## High design versatility switch

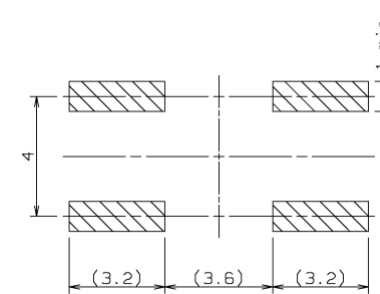
### Dimension



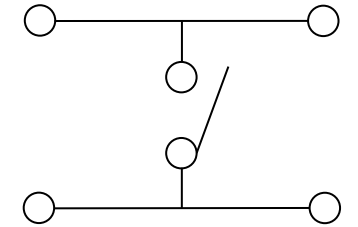
### Features

- \* Wide range of variations with high operating force products are available.
- \* Overstroke type for mouse feel can also be supported.
- \* Structure with push plate improves operability.

### Land Pattern



### Circuit diagram



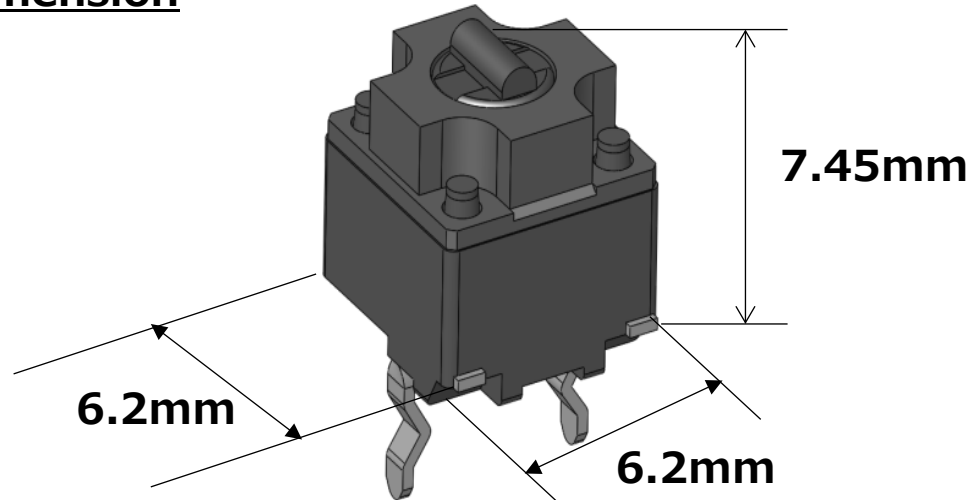
### Major specifications

- \* Operating force :  
0.5N,0.8N,1.0N,1.3N, 1.6N, 2.6N, 3.5N(Short Push)  
0.6N,1.0N(Overstroke)
- \* Travel :  
Short Push 0.20 mm (0.5N,0.8N,1.0N) ,  
0.25 mm (1.3N,1.6N,2.6N,3.5N)  
Overstroke 0.30 mm
- \* Life cycle :  
Short Push 2,000K(0.5N,0.8N), 1,000K(1.0N,1.3N,1.6N),  
200K(2.6N) , 100K(3.5N)  
Overstroke 2,000K(0.6N), 1,000K(1.0N)

# Light Touch Switch | Over Travel

## Switch with quiet and over travel feel

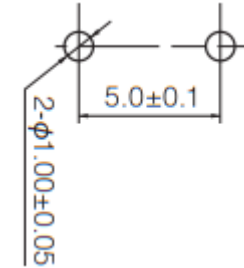
### Dimension



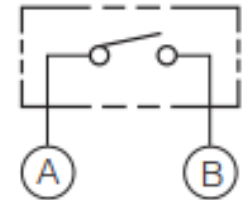
### Features

- \* Comfortable for long-time operation
- \* Quiet
- \* Long operating life

### PWB mounting hole

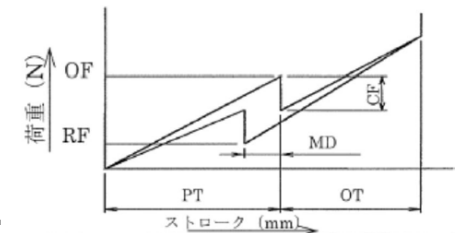


### Circuit diagram



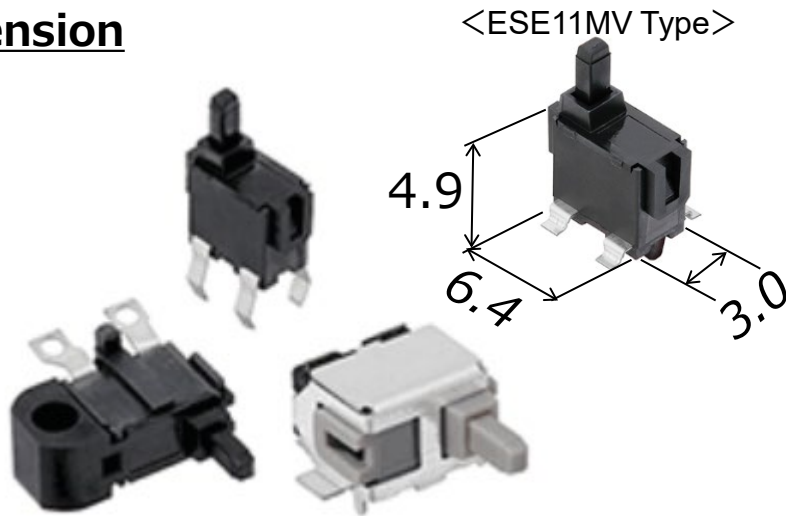
### Major specifications

- \* Operating force : 0.41~0.74N
- \* CF : 0.1N min.
- \* Pre-travel (PT) : 0.30mm max.
- \* Over Travel (OT) : 0.20mm min.
- \* Operating Life : 5,000K(0.74N), 1,000K(1.30N)



## Variety of mounting forms

### Dimension



### Features

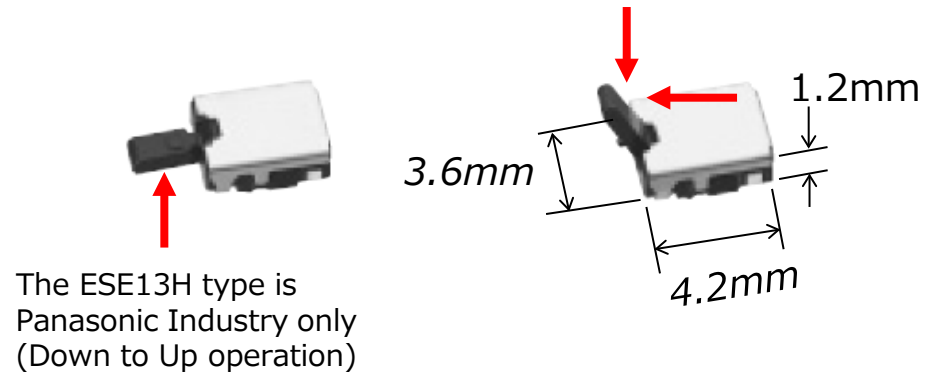
- \* Variety of mounting forms available
- \* Plenty of Operation Forms
- \* Reflow solder type also available

### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA 5 V DC (resistive load)
- \* Full stroke (indentation):
  - ESE11SV Type 6.1 mm (2.4 mm)
  - ESE11MV Type 6.1 mm (2.4 mm)
  - ESE11SH Type 3.0 mm (2.4 mm)
  - ESE11MH Type 1.7 mm (2.4 mm)
  - ESE11HS Type 6.3 mm (2.4 mm)
- \* Operating force: 350 mN or less
- \* Life: 50 K or more
- \* Number of circuits and contacts:  
1 circuit 1 contact
- \* Circuit type: Normally open type (N.O.)

## Thin and Long Stroke

### Dimension



### Features

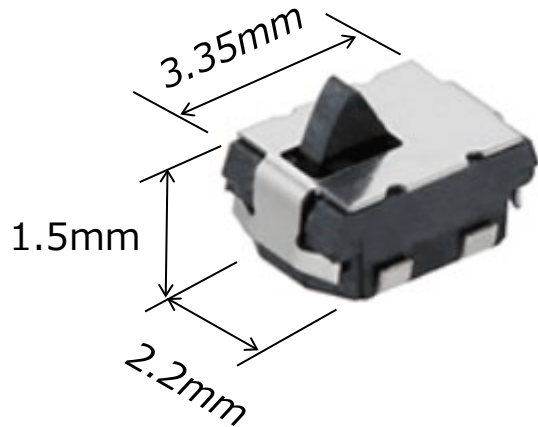
- \* Compact and Thin Compatible  
(Body Thickness 1.2 mm)
- \* Plenty of Operation Forms  
(Only Panasonic can handle ESE13H type operations)
- \* Halogen Free Compatible

### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA 5 V DC  
(resistive load)
- \* Full stroke (indentation):  
ESE13V Type 0.95 mm (2.1 mm)  
ESE13H Type 3.05 mm (2.1 mm)
- \* Operating force: 300 mN or less
- \* Life: 50 k or more
- \* Number of circuits and contacts:  
1 circuit 1 contact
- \* Circuit type: Normally open type (N.O.)

## Small

### Dimension



### Features

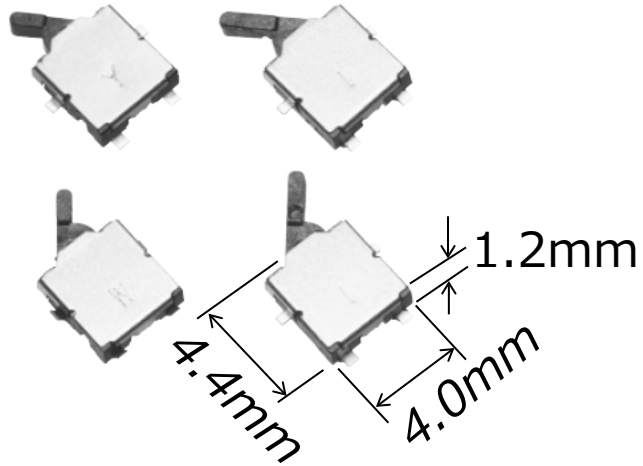
- \* Compact and Thin Compatible  
(Body Thickness 1.2 mm)
- \* Plenty of Operation Forms  
(Only Panasonic can handle ESE13H type operations)
- \* Halogen Free Compatible

### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA 5 V DC  
(resistive load)
- \* Full stroke (indentation):  
1.5 mm (1.0 mm)
- \* Operating force: 250 mN or less
- \* Life: 50 k or more
- \* Number of circuits and contacts:  
1 circuit 1 contact
- \* Circuit type: Normally open type (N.O.)

## Thin and N.O./N.C. compatible

### Dimension



### Features

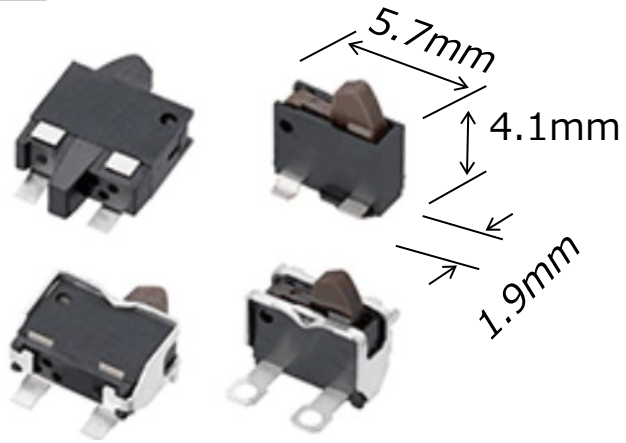
- \* Compact and Thin Compatible (Body Thickness 1.2 mm)
- \* Plenty of Variations (Right or left operation, N.O. or N.C. circuit compatible, lever length (Standard or Long), Terminal type)
- \* Halogen Free Compatible

### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA 5 V DC (resistive load)
- \* Full stroke (indentation):
  - Standard stroke type
    - With boss 1.4 mm (1.5 mm)
    - Without boss 2.1 mm (1.5 mm)
  - Long stroke type
    - With boss 1.4 mm (2.15 mm)
    - Without boss 2.1 mm (2.15 mm)
- \* Working force: 300 mN or less
- \* Life: 50 K or more
- \* Number of circuits and contacts:
  - 1 circuit 1 contact
- \* Circuit type: Normally open type (N.O.)  
Normally closed type (N.C.)

## Variety of mounting forms and operating directions

### Dimension



### Features

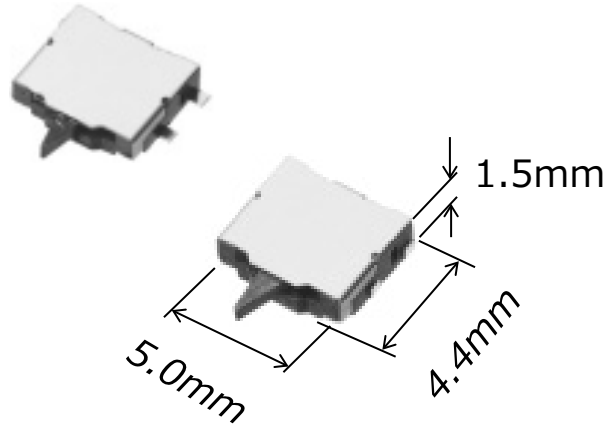
- \* Several operating directions  
(Horizontal, Vertical)
- \* Support for reflow solder
- \* Light operating force

### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA 5V DC(resistive load)
- \* Full stroke (indentation):
  - ESE22MV-type 4.25 mm (2.05 mm)
  - ESE22MH-with Frame 0.6 mm (2.0 mm)
  - ESE22MH-type 1.2 mm (2.0 mm)
- \* Operating force: 290 mN or less
- \* Life: 50 K or more
- \* Number of circuits and contacts:  
1 circuit 1 contact
- \* Circuit type: Normally open type (N.O.)

## A switch that can detect in two directions with a single switch

### Dimension



### Features

- \* Compact and Thin Compatible (Body Thickness 1.5 mm)
- \* Long Overstroke
- \* Thin, Two-Way Operation, and Automatic Midway Return Type
- \* Halogen Free Compatible

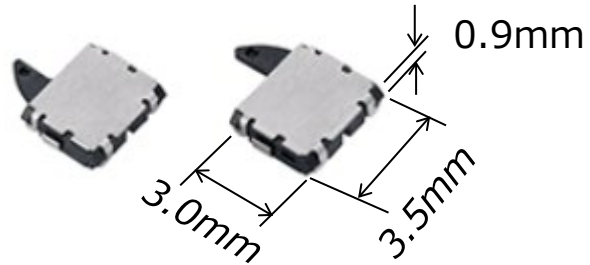
### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA 5V DC (resistive load)
- \* Full stroke (indentation):  
With boss 1.0 mm (1.5 mm)  
Without boss 2.2 mm (1.5 mm)
- \* Working force: 300 mN or less
- \* Life: 50 K or more
- \* Number of circuits and contacts:  
1 circuit 2 contacts (midpoint OFF)
- \* Circuit type: Normally open type (N.O.)

## Industry's Thinnest Level \*

(\* According to our own research, as of March 2025)

### Dimension



### Features

- \* Compact and Thin Compatible  
(Body Thickness 0.9 mm)
- \* Right or left operation, N.O. or N.C. circuit,  
With Boss or Without Boss
- \* Allows horizontal and vertical manipulation

### Major specifications

- \* Rated: 50  $\mu$ A 3 V DC to 10 mA5V DC  
(resistive load)
- \* Full stroke (indentation):  
With boss 1.5 mm (1.4 mm)  
Without boss 1.25 mm (1.4 mm)
- \* Working force: 300 mN or less
- \* Life: 50 K or more
- \* Number of circuits and contacts:  
1 circuit 2 contacts (midpoint OFF)
- \* Circuit type: Normally open type (N.O.)  
Normally closed type (N.C.)

**Panasonic**  
INDUSTRY