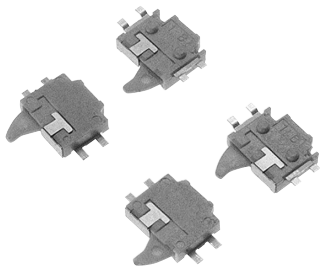
NAiS

IC CARD DETECTION SWITCHES

FT (ABC1) SWITCHES



FEATURES

• Ultra-low profile 1.4 mm .055 inch They allow products to be slimmer

• The original coil spring-activated mechanism yields a light operating force (max. 30gf) and a high overtravel to faciliate installation.

• The coil spring serves as the contact and a high contact reliability is achieved by the more than adequate contact force and wiping effect.

• Detecting from vertical and horizontal directions is possible. The actuator is rotated by the rotary shaft in the body.

• 2 types of SMD terminal is available. The low-profile type is mounted by making square holes at the edges of the printed circuit boards, resulting in a low profile.

TYPICAL APPLICATIONS

• IC card and other electronic money-related products.
• CD-ROM drivers
• Cellular phones
• MD
• Video cameras
• Digital still camera
• Headphone stereo

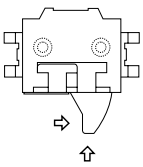
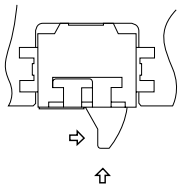
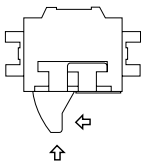
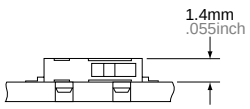
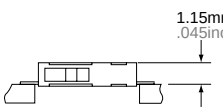
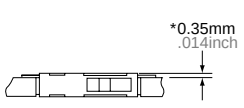
PRODUCT TYPES

Detection direction	Packing style	Contact type	Standard type	Low Profile type	
				Standard embossed tape packing	Upside-down embossed tape packing
Right angle 	Embossed tape (3000 pcs/reel)	Gold-plated	ABC1111P61	ABC1121P61	ABC1121P161
Left angle 		Gold-plated	ABC1112P61	ABC1122P61	ABC1122P161

CONTACT ARRANGEMENT

1 Form A

MOUNTING VIEW

	Standard type	Low profile type	
		Standard embossed tape packing	Upside-down embossed tape packing
TOP VIEW			
Mounting part layout			

Note) * The mounting height of 0.35 mm .014 inch indicated by the asterisk applies when the standard embossed tape packages are used, that is to say, when the switches have been mounted using embossed tape packages on which the switches are encapsulated after their fronts and backs have been reversed.

SPECIFICATIONS

1. Contact rating

Gold-plated	0.01 mA 5V DC to 10 mA 5V DC (resistive load)

2. Characteristics

Electrical life	Silver-plated	Gold-plated
	Min. 10^5 (100 µA 5V DC to 10 mA 5V DC contact opening 20 cpm)	Min. 10^5 (10 µA 5V DC to 10 mA 5V DC contact opening 20 cpm)
Insulation resistance	Min. 100 MΩ (by 100V DC insulation resistance meter)	
Dielectric strength	100 Vrms for 1 min. (Between uncontinuous terminals)	
Contact resistance (initial)	Max. 1Ω (by voltage drop at 10 mA 5V DC)	Max. 3Ω (by voltage drop at 10 mA 5V DC)
Contact resistance	14.7 m/s² {1.5G} 10 to 500Hz (Contact opening: max. 1 msec.)	
Shock resistance	294 m/s² {30G} (Contact opening: max. 1 msec.)	
Allowable operating speed	30 to 300mm/s	
Allowable operating frequency	60 times/min. (at no load)	
Ambient temperature	–25 to 60°C –13 to 140°F Not freezing nor condensing	–25 to 80°C –13 to 176°F Not freezing nor condensing

3. Operating characteristics

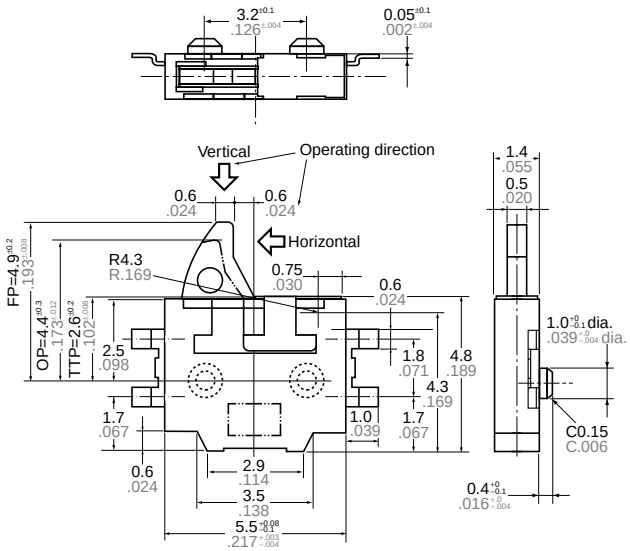
Item	Standard type	Low profile type
Free position (F.P.) (mm inch)	4.9 ± 0.2 .193±.008	7.1 ± 0.2 .280 ± .008
Operating position (O.P.) (mm inch)	4.4 ± 0.3 .173±.012	6.6 ± 0.3 .260±.012
Total travel position (T.T.P.) (mm inch)	2.6 ± 0.2 .102±.008	4.8 ± 0.2 .189±.008
Operating force, Max.	0.3N {30gf} by 2.8 mm .110 inch from the center of the positioning projection	0.3N {30gf} by 5.0 mm .197 inch from the bottom of the switch

DIMENSIONS

mm inch

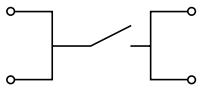
1. Standard type

Right angle

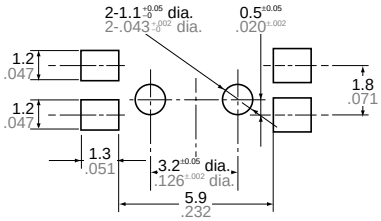


Circuit construction

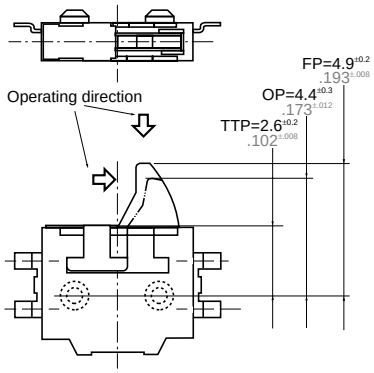
N.O.



PC board pattern

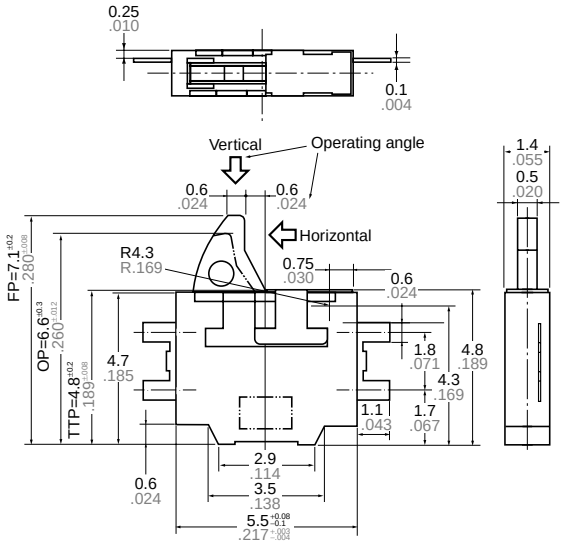


Left angle

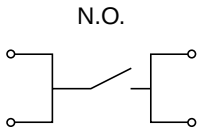


2. Low profile type mm inch

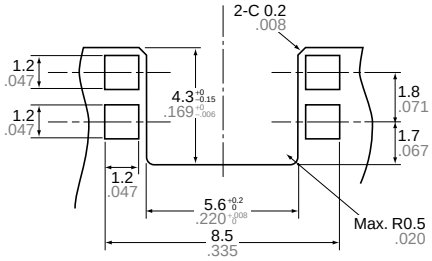
Right angle



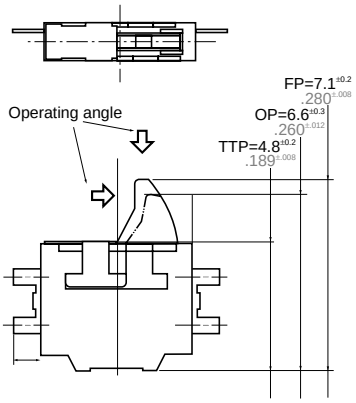
Circuit construction



PC board pattern



Left angle



NOTES

1. Mounting

1) The positioning of the switch should be such that the pushbutton for the switch should not directly apply force to the operating section in the free condition.

2) During both mounting and operation, care must be taken to protect the pushbutton from excessive stress, as this may cause malfunctioning. During mounting, the insulation distance between ground and each terminals/cover should be confirmed as sufficient.

2. Soldering

1) For manual soldering, iron tip temperature max. is 320°C 608°F and soldering should be completed within 3 seconds.

2) For reflow soldering, perform soldering reflow at a peak surface temperature of the PC board not to exceed 245°C 473°F.

3) For cream soldering, screen thickness is recommended between 0.15 to 0.20 mm .006 to .008 inch.

4) During soldering, care should be taken not to apply excessive stress to the terminals as the resulting deformation may cause malfunction.

5) Excessively high solder tab temperature and soldering iron wattage should also be avoided as these factors may harm switching performance.

6) As this switch is thin, using flux should be avoided for the reason of the flux may come inside of the switch and cause damage.

3. Switch operations

1) The installation position of the activating unit which operates the switch should be set at a distance of 2.8 to 3.9 mm .110 to .154 inch from the center of the positioning projection in the case of the standard type and at a distance of 5.0 to 6.1 mm .197 to .240 inch from the bottom of the switch in the case of the low-profile type.

2) Avoid using the switch as a stopper since it may cause trouble with the operations.

3) When using the switch to operate in the sideways direction, ensure that the corner roundness of the operating unit is more than R1.

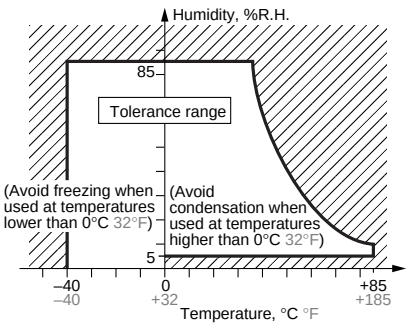
4. Environment

1) These switches do not have a sealed construction. As such, the construction of the equipment in which the switches are to be installed should be given careful consideration when the switches are to be used in locations where corrosive gases, silicon or other substances which will adversely affect the contacts are used, where there is a high concentration of dust or where the switches may be exposed to condensation or water. Using switches in locations like these may cause malfunctioning.

2) Avoid using this switch in high-temperature, high-humidity or condensation-forming environments and avoid allowing droplets of water to remain on the switch or come into contact with it. These conditions may interfere with the performance of the switch (resulting in short-circuiting, migration, etc.). Use the type with the gold contacts in applications involving trains, aircraft, motor vehicles or medical equipment where the switch must satisfy safety and high reliability requirements.

3) Because the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous operation of the switch is possible within this range, but continuous use near the limit of the range should be avoided.

• This humidity range does not guarantee permanent performance.



5. Quality check under actual loading conditions

To improve reliability, check the switch under actual loading conditions.

6. Others

Consult with us if this switch is to be used outside its ratings.

NAiS

ULTRA SMALL HIGH RELIABILITY DETECTION SWITCHES

FT-μ (ABC2) SWITCHES

FEATURES

• Ultra-low profile 1.4 mm .055 inch
(3.4 × 3.5 × 1.4 mm)
(.134 × .138 × .055 inch)

• The coil spring serves as the contact and a high contact reliability is achieved by the more than adequate contact force and wiping effect. By adopting gold-clad contact, a high contact reliability is also achieved under a small current, voltage and load.
• Horizontal and vertical mounting types are available and detecting from horizontal and vertical directions is possible.
• High overtravel (1.0 mm .039 inch) makes it easy for installation.

TYPICAL APPLICATIONS

1. Digital audio visual equipment
• DVC (digital video corder)
• DSC (digital still camera)
2. Personal computer and its peripherals
• Notebook PC
• CD-ROM/CD-R, RW
• DVD (digital versatile disc)
3. Digital compact equipment
• Mobile phone
• PDA (personal digital assistant)
• MD (Mini Disc)
4. Others
• IC card and other electronic money-related products

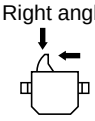
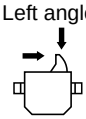
ORDERING INFORMATION

Ex. ABC 2 — □ — □ — □ — □

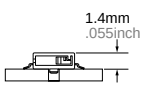
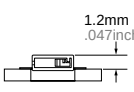
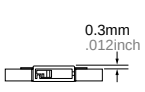
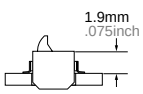
Type of switch	Contact arrangement	Terminal shape	Operating direction	Packing style
2: FT-μ switches	1: 1 Form A 2: 1 Form B	0: Standard type (without positioning boss) 1: Standard type (with positioning boss) 2: Low profile type 3: Vertical type	1: Right angle type 2: Left angle type (standard type only) 3: Vertical detection type	P : Embossed tape packing (standard type) P1: Upside-down embossed tape packing (Low profile type only) P2: Embossed tape packing (vertical type)

Remark: The actuator colors of 1 Form A type is ivory and 1 Form B type is black.

PRODUCT LINEUP

Detection direction	Standard type		Low Profile type		Vertical type
	With positioning boss	Without positioning boss	Standard embossed tape packing	Upside-down embossed tape packing	
Right angle						
Left angle				—	—	—

MOUNTING VIEW

	Standard type	Low Profile type		Vertical type
		Standard embossed tape packing	Upside-down embossed tape packing	
Mounting part layout				

PRODUCT TYPES

Contact arrangement	Detection direction	Packing style	Standard type		Low Profile type		Vertical type
			With positioning boss	Without positioning boss	Standard embossed tape packing	Upside-down embossed tape packing	
1 Form A	Right angle	Embossed tape *(4,000 pcs./reel)	ABC2111P	ABC2101P	ABC2121P	ABC2121P1	ABC2133P2
	Left angle		ABC2112P	ABC2102P	—	—	—
1 Form B	Right angle		ABC2211P	ABC2201P	ABC2221P	ABC2221P1	ABC2233P2
	Left angle		ABC2212P	ABC2202P	—	—	—

* Vertical type: 2,000 pcs./reel

CONTACT ARRANGEMENT: SPST-NO (1 Form A, 1 Form B)

SPECIFICATIONS

1. Contact rating

0.01 mA 5V DC to 10 mA 5V DC (resistive load)

2. Characteristics

	1 Form A type	1 Form B type
Electrical life	Min. 10^5 (10 mA 5V DC, 0.01 mA 5V DC contact opening 20 cpm)	Min. 5×10^4 (10 mA 5V DC, 0.01 mA 5V DC contact opening 20 cpm)
Insulation resistance	Min. 100 MΩ (by 100V DC insulation resistance meter)	
Dielectric strength	100 Vrms for 1 min. (Between uncontinuous terminals)	
Contact resistance (initial)	Max. 3Ω (by voltage drop at 10 mA 5V DC)	
Vibration resistance	15 m/s² {1.5G} 10 to 500Hz (Contact opening: max. 1 msec.)	
Shock resistance	300 m/s² {30G} (Contact opening: max. 1 msec.)	
Allowable operating speed	30 to 300mm/s	
Allowable operating frequency	60 times/min. (at no load)	
Ambient temperature	–25 to 80°C –13 to 176°F Not freezing nor condensing	
Ambient humidity	Max. 85% R.H.	

3. Operating characteristics

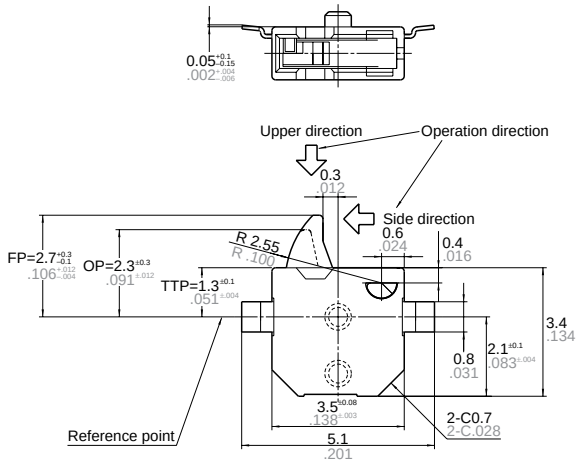
Item	Standard type	Low profile type	Low profile type	Vertical type
	With positioning boss	Without positioning boss		
Free position (F.P.) (mm inch)	2.7 .106	4.8 .189	4.8 .189	3.3 .130
Operating position (O.P.) (mm inch)	2.3±0.3 .091±.012	4.4±0.3 .173±.012	4.4±0.3 .173±.012	2.9±0.3 .114±.012
Total travel position (T.T.P.) (mm inch)	1.3±0.1 .051±.004	3.4±0.1 .134±.004	3.4±0.1 .134±.004	1.9±0.15 .075±.006
Operating force, Max. (N)	0.3	0.3	0.3	0.3

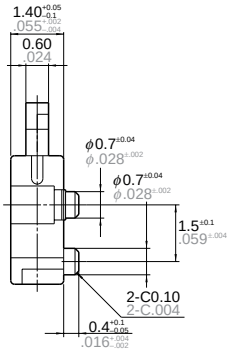
DIMENSIONS

mm inch General tolerance: ±0.15 ±.006

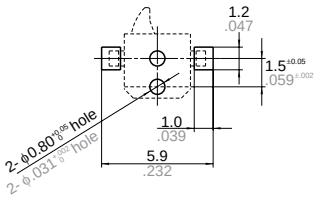
1. Standard type

(Right angle type with positioning boss)



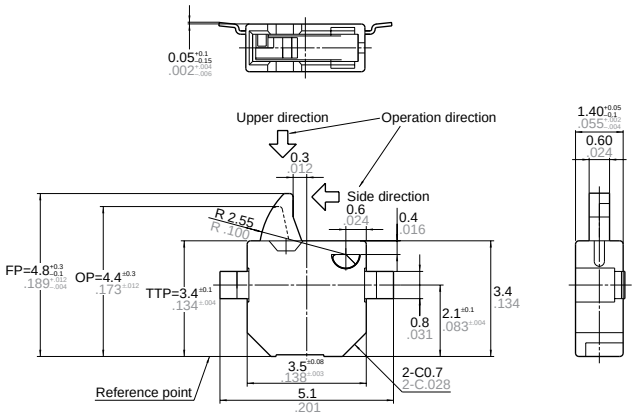


Recommended PC board pattern

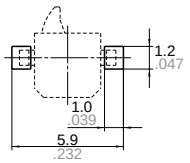


(Right angle type without positioning boss)

mm inch General tolerance: ±0.15 ±.006

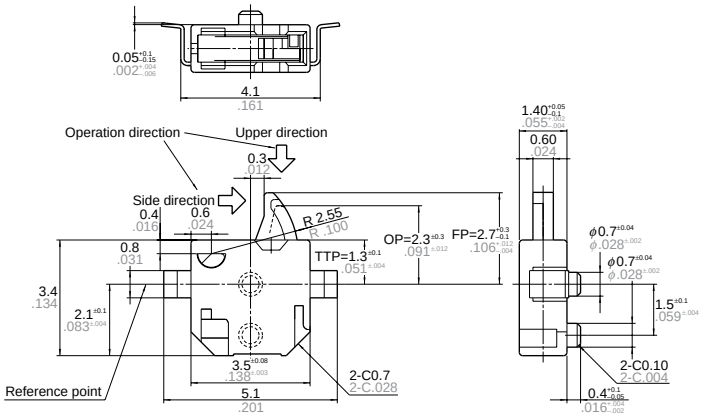


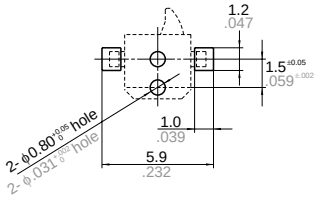
Recommended PC board pattern



(Left angle type with positioning boss)

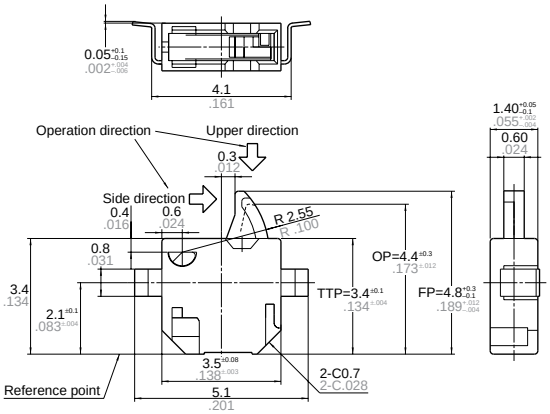
Recommended PC board pattern

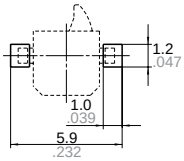




(Left angle type without positioning boss)

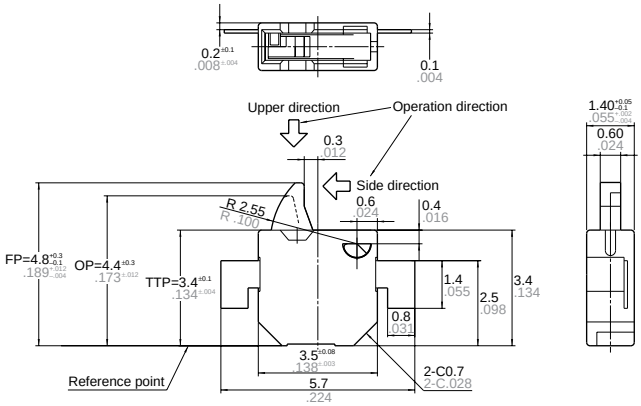
Recommended PC board pattern

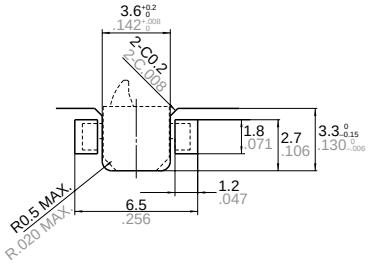




2. Low profile type

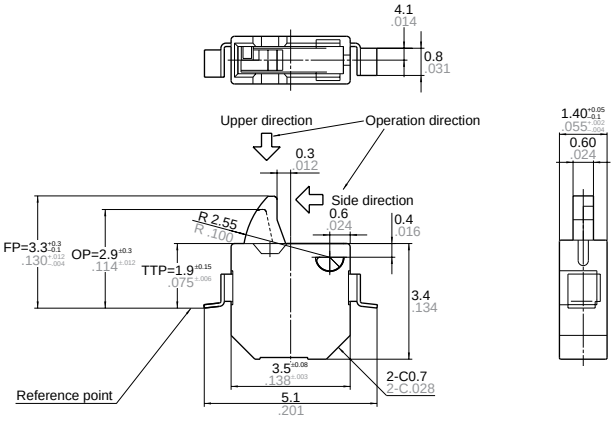
Recommended PC board pattern



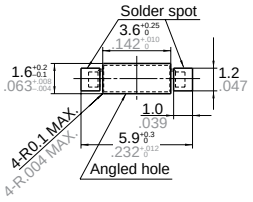


3. Vertical type

mm inch General tolerance: ±0.15 ±.006



Recommended PC board pattern



NOTES

1. Mounting

1) The positioning of the switch should be such that the pushbutton for the switch should not directly apply force to the operating section in the free condition.
2) During both mounting and operation, care must be taken to protect the pushbutton from excessive stress, as this may cause malfunctioning.
3) During mounting, the insulation distance between ground and each terminals/cover should be confirmed as sufficient.

2. Soldering

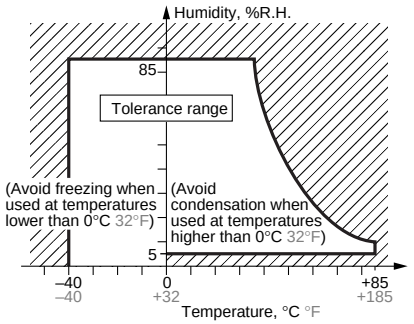
1) For manual soldering; Iron tip temperature max. is 320°C 608°F and soldering should be completed within 3 seconds.
2) For reflow soldering; Perform soldering reflow at a peak surface temperature of the PC board not to exceed 245°C 473°F.
3) For cream soldering; Screen thickness is recommended between 0.10 to 0.15 mm .004 to .006 inch.
4) During soldering, care should be taken not to apply excessive stress to the terminals as the resulting deformation may cause malfunction.
5) Excessively high solder tab temperature and soldering iron wattage should also be avoided as these factors may harm switching performance.
6) As this switch is thin, using flux should be avoided for the reason of the flux may come inside of the switch and cause damage.

3. Switch operations

1) The installation position of the activating unit which operates the switch should be set at a distance of 1.4 to 1.9 mm .055 to .075 inch from the center of the positioning projection in the case of the with positioning boss type.
2) For 1 Form B contact type operation, set the pushbutton so it returns to the free position.
3) Avoid using the switch as a stopper since it may cause trouble with the operations.
4) When using the switch to operate in the sideways direction, ensure that the corner roundness of the operating unit is more than R1.

4. Environment

1) These switches do not have a sealed construction. As such, the construction of the equipment in which the switches are to be installed should be given careful consideration when the switches are to be used in locations where corrosive gases, silicon or other substances which will adversely affect the contacts are used, where there is a high concentration of dust or where the switches may be exposed to condensation or water. Using switches in locations like these may cause malfunctioning.
2) Avoid using this switch in high-temperature, high-humidity or condensation-forming environments and avoid allowing droplets of water to remain on the switch or come into contact with it. These conditions may interfere with the performance of the switch (resulting in short-circuiting, migration, etc.). Use the type with the gold contacts in applications involving trains, aircraft, motor vehicles or medical equipment where the switch must satisfy safety and high reliability requirements. Please consult with us for the applications required high reliability.
3) Because the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous operation of the switch is possible within this range, but continuous use near the limit of the range should be avoided.
• This humidity range does not guarantee permanent performance.



5. Quality check under actual loading conditions

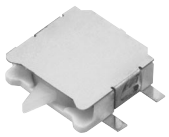
1) Consult with us if this switch is to be used outside its ratings.
2) To improve reliability, check the switch under actual loading conditions.

6. Breakdown mode

1) For the switch breakdown mode, shorts, open circuits, or rises in temperature should be considered. For a device to be safe so that it does not create any adverse effect, ensure that a protection circuit or protection device is in place to protect against a possible switch failure. Also, please make sure that sufficient redundancy is built into the system in order to ensure safety.
2) The temperature and humidity range during use is one that allows repeated operation. Endurance and the ability to withstand the environment are not guaranteed.

1.4 MM ULTRA SLIM HIGH RELIABLE 2-DIRECTIONAL DETECTION SWITCHES

FT-2Way (ABC3) SWITCHES



FEATURES

• Detect laterally in two directions with a single switch
With two 1a type contacts built-in to one switch, it is possible to detect laterally in two directions.

• Ultra compact and slim for space saving
The size, at 5.0 mm (W)×5.0 mm (L)×1.4 mm (H) .197 inch (W)×.197 inch (L)×.055 inch (H), is ultra compact and slim.
By using an FT-2Way switch to replace where two 1a type contact switches were used up to now, it is possible to reduce mounting space.
(Move from having two switches to having one.)

• Supports low level loads with twin gold plate contacts
The use of twin gold plate contacts means that low level loads of even 5µA 5V DC can be handled.
Contact reliability is also very high. Also, its ability to withstand ambient conditions has been greatly improved (anti-corrosiveness and resistance to humidity), so it will contribute to the performance of, especially, mobile equipments.

TYPICAL APPLICATIONS

1. Digital audio visual equipment
DVC (digital video camera)
DSC (digital still camera)

2. Digital compact equipment
Mobile phone, PDA, IC recorder, MD silicon audio

3. Personal computer and its peripherals
Notebook PC, CD-R/RW, DVD

4. Others
IC card and other electronic moneyrelated products

ORDERING INFORMATION

Ex. ABC 3 – □ – □ – □ – □

Type of switch	Contact arrangement	Positioning boss	Terminal shape	Packing style
3: FT-2Way switches	1: Right (1 Form A) 2: Left (1 Form A)	0: Without positioning boss 1: With positioning boss	1: Straight terminal type 2: J bent terminal type	P: Embossed tape packing

PRODUCT LINEUP

Detection direction	Packing style	Straight terminal type		J bent terminal type	
		With positioning boss	Without positioning boss	With positioning boss	Without positioning boss
	Emboss tape (3,000 pcs./reel)	ABC3111P	ABC3101P	ABC3112P	ABC3102P

SPECIFICATIONS

1. Contact rating
5µA to 10mA 5V DC (resistive load)

2. Characteristics

Item	Specifications
Electrical life	Min. 10^5 (5 μA 5V DC to 10 mA 5V DC contact opening 20 cpm)
Insulation resistance	Min. 100 MΩ (by 100V DC insulation resistance meter)
Dielectric strength	100 Vrms for 1 min. (Between uncontinuous terminals)
Contact resistance (initial)	Max. 1Ω (by voltage drop at 10 mA 5V DC)
Vibration resistance	15 m/s² 10 to 500Hz (Contact opening: max. 1 msec.)
Shock resistance	300 m/s² (Contact opening: max. 1 msec.)
Allowable operating speed	1 to 300mm/s
Allowable operating frequency	60 times/min. (at no load)
Ambient temperature	–25 to 80°C –13 to 176°F Not freezing nor condensing

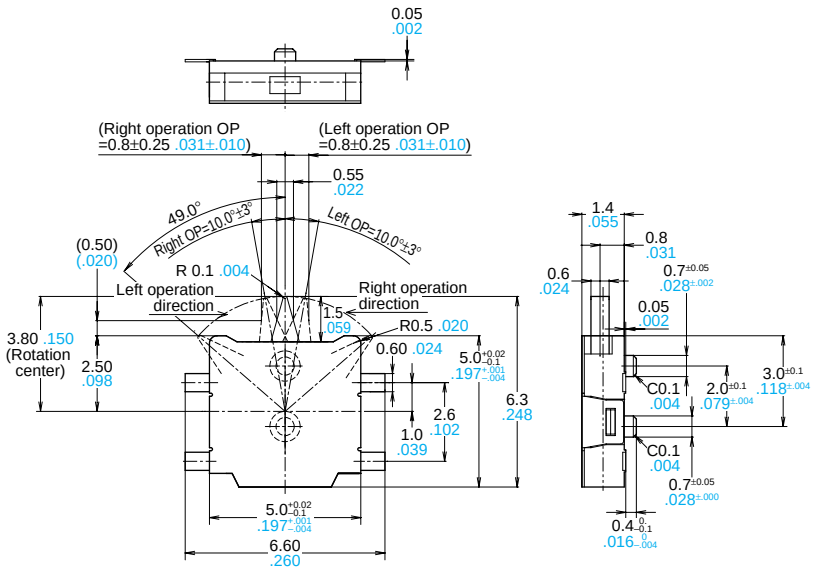
3. Operating characteristics

Item	Straight terminal/J bent terminal type	
	With positioning boss	Without positioning boss
Free position (F.P.) (mm inch)	0° ± 0.5° 0° ± .020°	0° ± 0.5° 0° ± .020°
Operating position (O.P.) (mm inch)	10.0° ± 3.0° .394° ± .118°	10.0° ± 3.0° .394° ± .118°
Total travel position (T.T.P.) (mm inch)	49.0° ± 1.0° 1.929° ± .039°	49.0° ± 1.0° 1.929° ± .039°
Operating force (N)	0.3 max.	0.3 max.

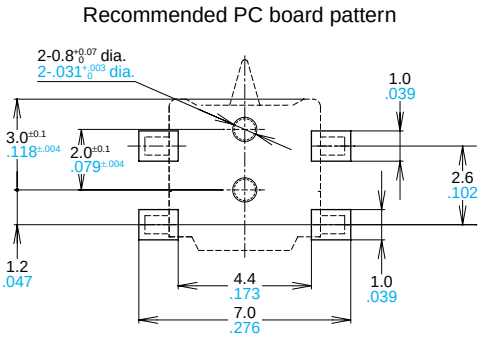
DIMENSIONS

mm inch
General tolerance: ±0.15 ±.006

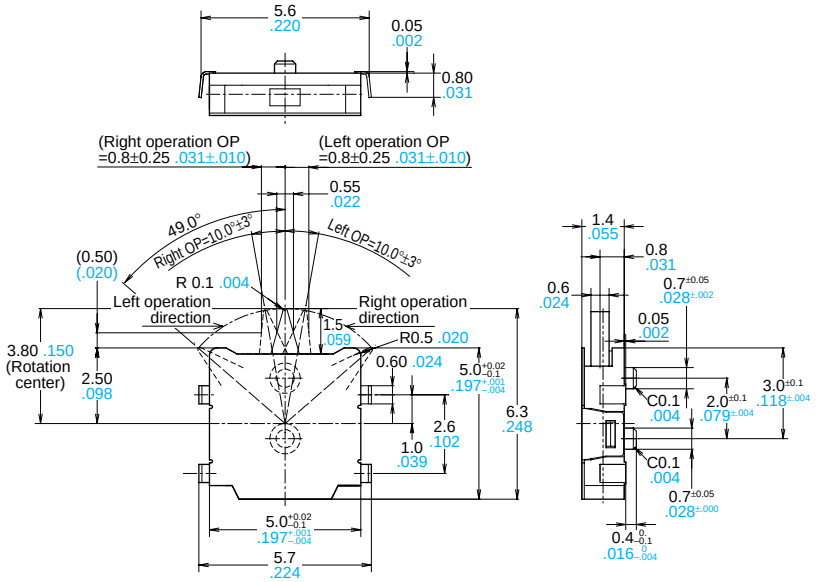
1. Straight terminal type (with positioning boss)



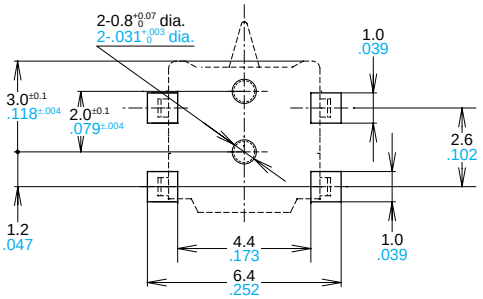
Recommended PC board pattern



2. J bent terminal (with positioning boss)



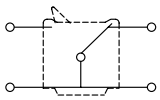
Recommended PC board pattern



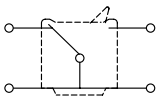
CIRCUIT CONSTRUCTION

• N.O. (1 Form A)

Left operating direction

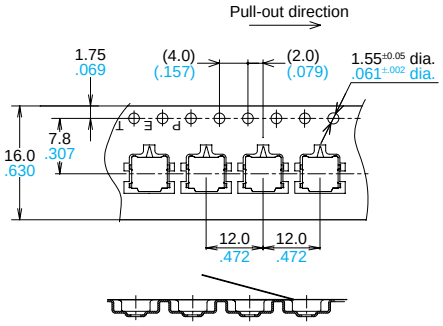


Right operating direction

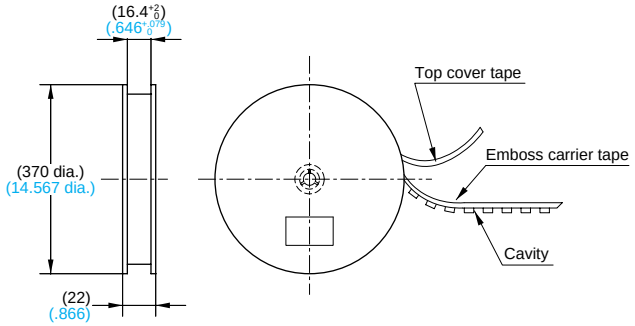


EMBOSS TAPE AND REEL

• Tape dimensions (Conforming to JIS C 0806-1995)



• Reel dimensions (Conforming to JIS C 0806-1995)



NOTES

1. Mounting

1) The positioning of the switch should be such that the pushbutton for the switch should not directly apply force to the operating section in the free condition.

2) During both mounting and operation, care must be taken to protect the pushbutton from excessive stress, as this may cause malfunctioning.

3) During mounting, the insulation distance between ground and each terminals/cover should be confirmed as sufficient.

2. Soldering

1) Reflow soldering

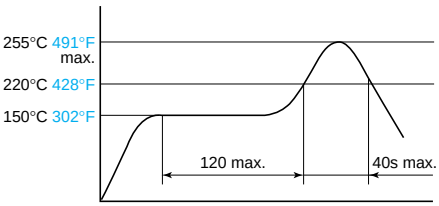
• Please use our recommended land pattern when cream-solder printing.

• For cream soldering; Screen thickness is recommended between 0.15 to 0.20 mm .006 to .008 inch.

• As this switch is thin, using flux should be avoided for the reason of the flux may come inside of the switch and cause damage.

• Please use the reflow temperature profile conditions recommended below for reflow soldering.

(The temperature is the one measured on the surface of the PCB.)



• Please keep the number of reflows to no more than two.

• Please consult us if you plan to use N_2 reflow.

• Please avoid excessive oven temperatures and long reflow times as this can lead to deterioration of switch characteristics.

(Reworking of soldered sections)

• Please complete reworking in one session.

• Keeping contact to within 3 s, use an 18 W soldering iron at a temperature of 320°C 608°F maximum.

• Please avoid using a soldering iron of excessive wattage and tip temperature, and avoid excessive soldering times, because this may lead to deterioration of switch characteristics.

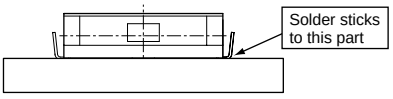
• Please be careful and avoid applying force on the terminals while soldering. This can cause deformation that may lead to improper operation.

2) Hand soldering

• If hand soldering will be one of the processes, choose the J-bend terminal type, if at all possible. This type is constructed to make it difficult for the flux to enter the unit when hand soldering.

• For land patterns, please use the ones recommended by us.

J-bend terminal type



• Keeping contact to within three seconds, use an 18 W soldering iron at a temperature of 320°C 608°F maximum.

• Please avoid using a soldering iron of excessive wattage and tip temperature, and avoid excessive soldering times, because this may lead to deterioration of switch characteristics.

• Please be careful and avoid applying force on the terminals while soldering. This can cause deformation that may lead to improper operation.

3. Switch operations

1) When setting the activating unit that will operate the switch so that it will operate laterally 13° to 48° from the center position or when converting the distance, please set so that pressing will be 1.1 mm or more from the center position.

2) Avoid using the switch as a stopper since it may cause trouble with the operations.

3) Please make the angle dimensions of the switch activating unit the same or greater than R1.

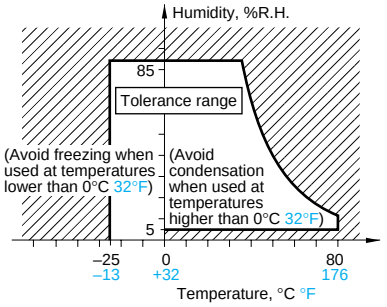
4) Regarding ON-OFF operation timing, please push all the way to the set position without lingering in the OP vicinity.

4. Environment

1) These switches do not have a sealed construction. As such, the construction of the equipment in which the switches are to be installed should be given careful consideration when the switches are to be used in locations where corrosive gases, silicon or other substances which will adversely affect the contacts are used,

where there is a high concentration of dust or where the switches may be exposed to condensation or water. Using switches in locations like these may cause malfunctioning.
2) Avoid using this switch in high-temperature, high-humidity or condensation-forming environments and avoid allowing droplets of water to remain on the switch or come into contact with it. These conditions may interfere with the performance of the switch (resulting in short-circuiting, etc.). Use the type with the gold contacts in applications involving trains, aircraft, motor vehicles or medical equipment where the switch must satisfy safety and high reliability requirements. Please consult with us for the applications required high reliability.

3) Because the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous operation of the switch is possible within this range, but continuous use near the limit of the range should be avoided.
4) This humidity range does not guarantee permanent performance.



5. Breakdown mode
For the switch breakdown mode, shorts, open circuits, or rises in temperature should be considered. For a device to be safe so that it does not create any adverse effect, ensure that a protection circuit or protection device is in place to protect against a possible switch failure. Also, please make sure that sufficient redundancy is built into the system in order to ensure safety.

NAiS

A PIERCED EARRING SIZE DETECTION SWITCH

FP (ABP8) SWITCHES

ABP111P

ABP112P

- Ultra-miniature size (3.4×3.4×2.4mm .134×.134×.094 inch)
Meet the market requirements of FDD miniaturization
- Low operating force Max. 0.3 N {30 gf}
- SMD type available

ORDERING INFORMATION

Type	Part No.
Type I	ABP811161P
Type II	ABP811261P

Remarks: Standard packaging
1 reel: 2,000 pcs.
1 case: 5 reels (10,000 pcs.)

TYPICAL APPLICATIONS

- Floppy Disk Drivers
- Optical Disk Drivers
- CD-ROM Drivers
- Notebook Personal Computers
- Portable Handy Phones
- VCR
- Printers

SPECIFICATIONS

1. Contact rating

Standard rating	0.1A 10V DC
Low-level circuit rating	0.1mA 5V DC

2. Characteristics

Expected electrical life (Min. operations)	0.1A 10V DC resistive	Min. 5×10^4
	0.1mA 5V DC resistive	Min. 10^5
Insulation resistance (by 100V DC insulation resistance meter)		Min. 100MΩ
Dielectric Strength		100Vrms for 1 min.
Vibration resistance		14.7m/s² {1.5G} 8 to 500Hz (contact opening: Max. 10μsec.)
Shock resistance		Min. 294 m/s² {30G} (contact opening: Max. 10μsec.)
Ambient temperature		–25°C to +80°C –13°F to +176°F (not freezing below 0°C 32°F)
Ambient humidity		Max. 85% R.H.
Initial contact resistance		Max. 3Ω (by HP4328A)

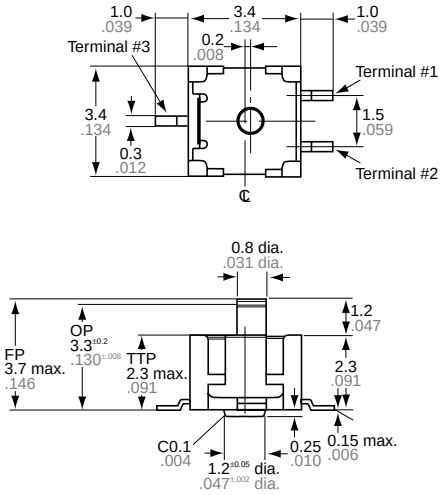
3. Operating characteristics

		Type I	Type II
Operating force Max.		0.3 N {30 gf}	
Free position Max.	mm inch	3.7 .146	4.9 .193
Operating position	mm inch	3.3±0.2 .130 ±.008	4.5±0.2 .177 ±.008
Total travel position Max.	mm inch	2.3 .091	3.5 .138
Total stroke	mm inch	1.2 .047	

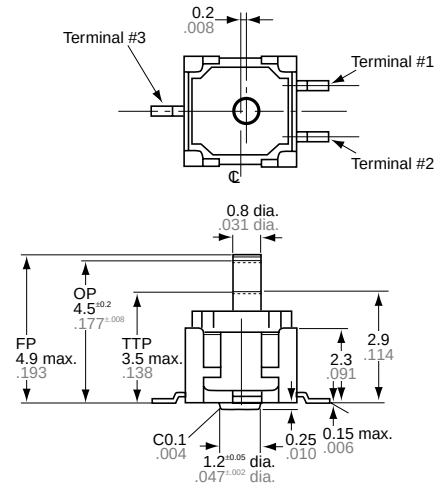
DIMENSIONS

mm inch

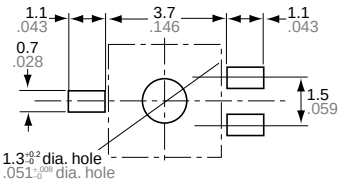
Type I
(ABP111P)



Type II
(ABP112P)

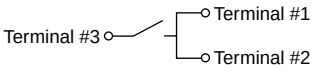


Recommended PC board pattern
(Top view)



Schematic

SPST-NO

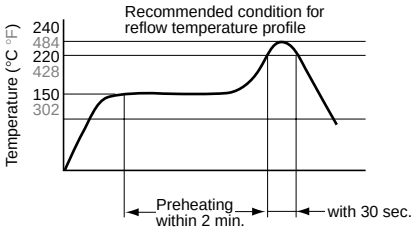


NOTES

1. Soldering operations

1) For manual soldering;
By using 18W Max. (iron tip temperature: 320°C 608°F Max.) soldering should be completed within 3 seconds.

2) For reflow soldering;
Perform soldering reflow at a peak surface temperature of the PC board not to exceed 240°C 464°F. See the below recommended temperature profile.



3) During soldering, care should be taken not to apply excessive stress to the terminals as the resulting deformation may cause malfunction. Excessively high solder tab temperature and soldering iron wattage should also be avoided as these factors may harm switching performance.

2. Setting of the operation object

In setting the operation object; keep the following distance between the switch bottom and the operation object at T.T.P. (Total Travel Position)

ABP811161P: 2.3 to 2.9mm
.091 to .114 inch
ABP811261P: 3.5 to 4.1mm
.138 to .161 inch

3. Quality Check under Actual Loading Conditions

To assure reliability, check the switch under actual loading conditions. Avoid any situation that may adversely affect switching performance.

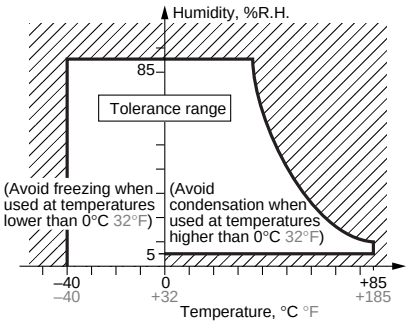
4. Environment

1) These switches do not have a sealed construction. As such, the construction of the equipment in which the switches are to be installed should be given careful consideration when the switches are to be used in locations where corrosive gases, silicon or other substances which will adversely affect the contacts are used, where there is a high concentration of dust or where the switches may be exposed to condensation or water. Using switches in locations like these may cause malfunctioning.

2) Avoid using this switch in high-temperature, high-humidity or condensation-forming environments and avoid allowing droplets of water to remain on the switch or come into contact with it. These conditions may interfere with the performance of the switch (resulting in short-circuiting, migration, etc.). Use the type with the gold contacts in applications involving trains, aircraft, motor vehicles or medical equipment where the switch must satisfy safety and high reliability requirements. Please consult with us for the applications required high reliability.

3) Because the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous operation of the switch is possible within this range, but continuous use near the limit of the range should be avoided.

• This humidity range does not guarantee permanent performance.



NAiS

A ULTRA MINIATURE SIZED DETECTION SWITCH

NEW FD (ABU8) SWITCHES

ABU8112S

- Low operating force Max. 0.34 N {35gf}
- High contact reliability in a low-level load by sliding crossbar contacts
- Reflow soldering is availableb by custom ordered

ORDERING INFORMATION

Contact arrangement	Number of terminals	Part No.	Packing quantity	
			Inner	Outer
1 Form A	2	ABU811261S	100	5,000
	4	ABU810261S		
1 Form B	2	ABU831261S		
	4	ABU830261S		

Remarks: Standard packaging; Tube 100 pcs.
Please consult us for vinyl bag (200 pcs.). In this case, please change the suffix S to V.

TYPICAL APPLICATION

- Floppy Disk Drivers
- Optical Disk Drivers
- CD-ROM Drivers
- Notebook Personal Computers
- VCR
- Audio Equipments
- Microprocessor-controlled Rice Cookers
- Burglar alarms & Fire alarms

SPECIFICATIONS

1. Contact rating

0.1A 30V DC

2. Characteristics

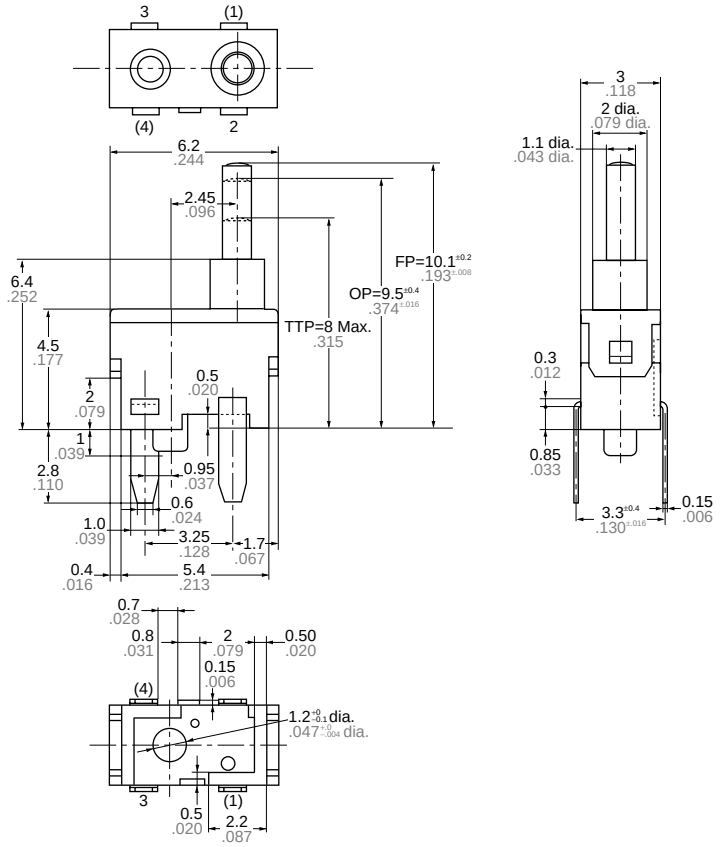
Expected electrical life (Min. operations)	0.1A 30V DC resistive	Min. 5×10^4
	10mA 5V DC resistive	Min. 10^5
Insulation resistance (by 100V DC insulation resistance meter)		Min. 100MΩ
Dielectric Strength		1,000Vrms for 1 min.
Vibration resistance		14.7ms^2 {1.5G}10 to 500Hz (contact opening: Max. 10μsec.)
Shock resistance		Min. 294 m/s^2 {30G} (contact opening: Max. 10μsec.)
Ambient temperature		–25°C to +80°C –13°F to +176°F (not freezing below 0°C 32°F)
Ambient humidity		Max. 85% R.H.
Initial contact resistance		Max. 1Ω (by HP4328A)

3. Operating characteristics

Operating force Max.		0.34 N {35gf}
Free position Max.	mm inch	10.1±0.2 .398 ±.008
Operating position	mm inch	9.5±0.4 .374 ±.016
Total travel position Max.	mm inch	8.0 .315
Total stroke	mm inch	2.1 .083

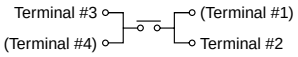
DIMENSIONS

mm inch

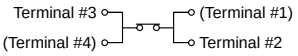


Schematic

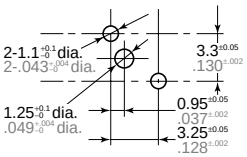
1 Form A



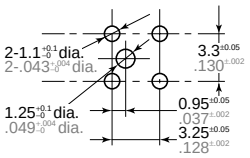
1 Form B



PC board pattern (Top view)



4 terminal



NOTES

1. Soldering operations

1) For manual soldering;
By using 18W Max. (iron tip temperature: 350°C 662°F Max.) soldering should be completed within 3 seconds.
2) For reflow soldering;
Perform soldering reflow at a peak surface temperature of the PC board not to exceed 240°C 464°F.
3) For automatic soldering tub;
260°C 500°F immersion, completed within 5 seconds.
4) During soldering, care should be taken not to apply excessive stress to the terminals as the resulting deformation may cause malfunction. Excessively high solder tab temperature and soldering iron wattage should also be avoided as these factors may harm switching performance.

2. Mounting

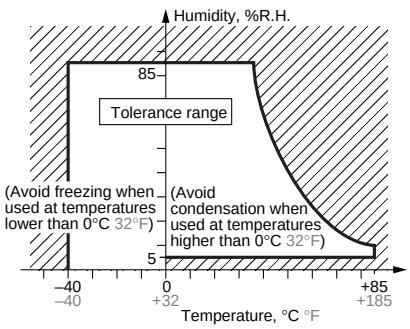
1) When the operation object is in the free position, force should not be applied to the pin plunger. Also force should be applied to the pin plunger from vertical direction to the switch. During both mounting and operation, care must be taken to protect the pushbutton from excessive stress, as this may cause malfunctioning.
2) After mounting and wiring, the insulation distance between ground and each terminals/cover should be confirmed as sufficient.
3) When using adhesive, make sure it does not come into contact with moving parts. If the internal contacts are contaminated with adhesive, they may not function properly.

3. Setting of the operation object

In setting the operation object, keep the following distance between the switch bottom and the operation object at T.T.P. (Total Travel Position) 8.0 to 8.8mm .315 to .346 inch

4. Environment

1) These switches do not have a sealed construction. As such, the construction of the equipment in which the switches are to be installed should be given careful consideration when the switches are to be used in locations where corrosive gases, silicon or other substances which will adversely affect the contacts are used, where there is a high concentration of dust or where the switches may be exposed to condensation or water. Using switches in locations like these may cause malfunctioning.
2) Avoid using this switch in high-temperature, high-humidity or condensation-forming environments and avoid allowing droplets of water to remain on the switch or come into contact with it. These conditions may interfere with the performance of the switch (resulting in short-circuiting, migration, etc.). Use the type with the gold contacts in applications involving trains, aircraft, motor vehicles or medical equipment where the switch must satisfy safety and high reliability requirements. Please consult with us for the applications required high reliability.
3) Because the humidity range differs depending on the ambient temperature, the humidity range indicated below should be used. Continuous operation of the switch is possible within this range, but continuous use near the limit of the range should be avoided.
• This humidity range does not guarantee permanent performance.



5. Quality Check under Actual Loading Conditions

To assure reliability, check the switch under actual loading conditions. Avoid any situation that may adversely affect switching performance.