

TRS-STAR

electronics4U

## Samwon

Digital Switches

TRS-STAR DISTRIBUTOR OF 



# Introduction....

We, **SWK** Corporation are one of the most reputable and excellent manufacturers in Korea specializing in the fields of switch for more than 15 years.

**SWK** has meaning of three best principal of our company such as top quality, reasonable price and accurate delivery, especially our quality assurance system continuously monitors processes in accordance with ISO 9001 and ISO 14001.

All switches are available in various specification and especially SMD type with dust proof and moisture proof switches which applicable to Digital and IT fields such as Digital Camera, Smart Phone, PDA, Mp3 player, Cellular Phone, Laptop PC, DVD and OEM design.

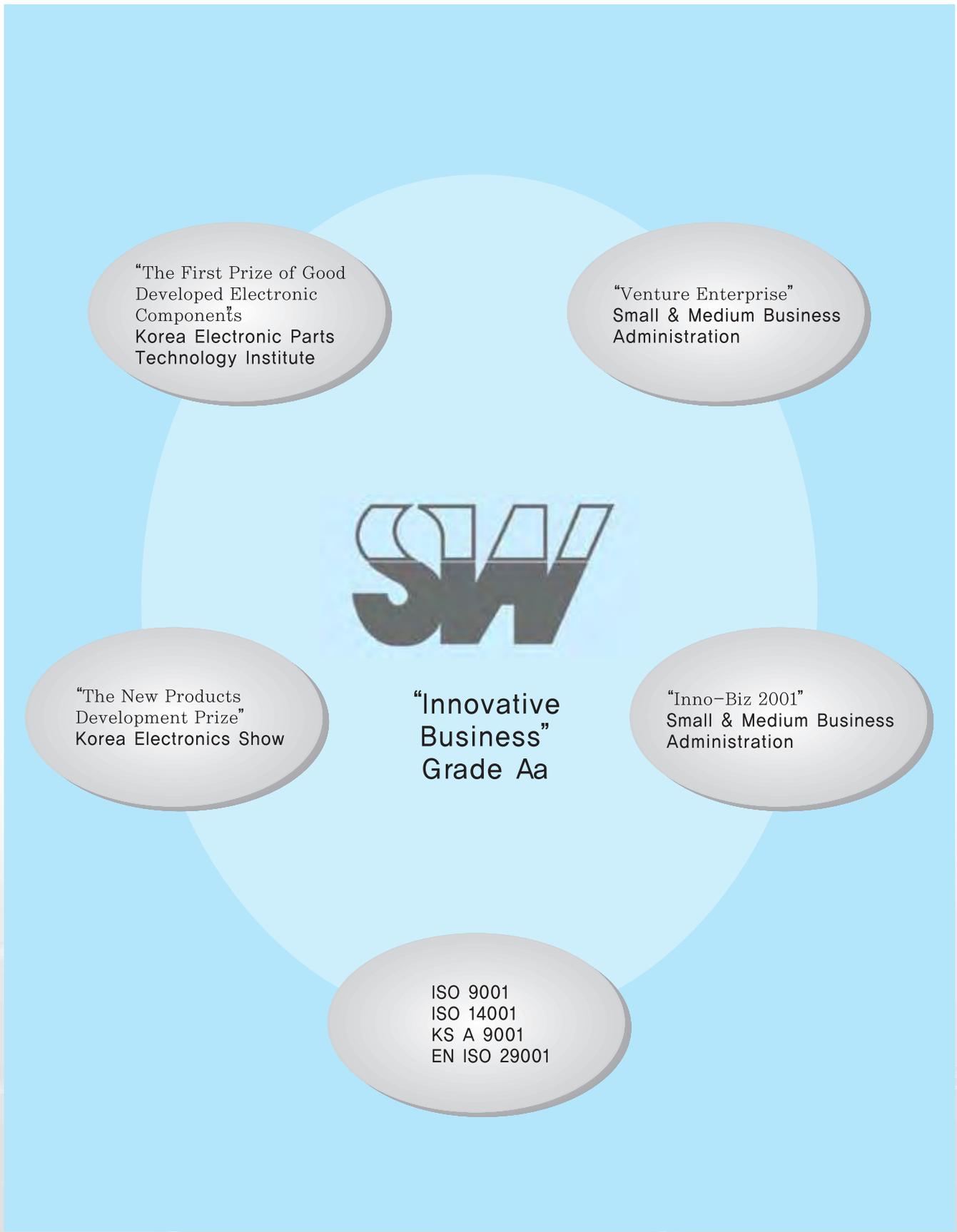
SWK has had excellent reputation for top grade of Surface Mount Technology from distinguished worldwide companies and also has become one of the major manufacturers in the field of digital components of the new millennium.

## Company History

1989

- Apr. 1989 • Established Samwon
- Feb. 1990 • Operated Cheonan Factory
- Oct. 1991 • Awarded "The New Products Development Prize" in the '91 Korea Electronics Show
- May. 1992 • Designated as a "Promising Electronics Products Manufacturer" by Kook Min Bank.
- Aug. 1992 • Established Samwon Electric (H,K) Ltd.
- Sep. 1993 • Operated Dong-Guan factory China
- Jan. 1996 • Operated Hui-Zhou factory China.
- Aug. 1996 • Designated as a "Promising enterprise with advanced technology" by Small and Medium Business Administration
- Oct. 1997 • Awarded "The First Prize of Good Developed Electronic Components" by Korea Electronic Parts Technology Institute
- Dec. 1997 • Established EG Incorporated
- Feb. 1998 • Designated as a "Promising Export Goods Manufacturer" by Small and Medium Industry Promotion Corporation
- Dec. 1998 • Designated as a "Promising Enterprise with Excellent Technology in Progress" by Korea Technology Credit Guarantee Fund
- Oct. 1999 • Awarded "The First Prize of Good Developed Electronic Components" by Korea Electronic Parts Technology Institute
- May. 2000 • Designated as a "The Best Enterprise" by Kookmin Bank
- Jul. 2000 • Operated Cheonan New factory
- Jul. 2000 • Certified ISO 9001 / KSA 9001
- Oct. 2000 • Designated as a "Venture Enterprise" by Small & Medium Business Administration
- Oct. 2001 • Designated as a "Innovative Business 2001"(Grade Aa) by Small & Medium Business Administration
- Apr. 2004 • Operated the new and enlarged factory in Heng-Yang, China
- Jun. 2004 • Increased the capital Samwon Electric (HK) Ltd., to HK\$6,000,000

## Quality Assurance



## General Specifications

### 1. Test Conditions

The standard test shall be performed at 5~35℃ in temperature with 45~85%RH.

In case of any doubtful points in judgement, the test shall be done again in the reference conditions of 20±2℃ in temperature with 65±5% RH.

### 2. Operating Temperature Range

Tact Switch : -20℃ ~ 70℃

Silde & Push Switch : -10℃ ~ 60℃

### 3. Maximum Ratings

DC □ V □ A

As per individual specifications.

### 4. Contact Arrangement

□ poles □ Throws

As per individual specifications.

### 5. Electrical Performance

No.	Item		Test Conditions	Requirements
5 - 1	Contact Resistance	Tact Switch	Applying a static load twice the operating force to the center of the stem, measurements shall be made with a 1KHz small-current contact resistance meter.	As per individual specifications.
		Silde & Push Switch	Measurements shall be with a 1KHz±200Hz (20mV max, 50mA max.) or DC5V, 1A.	
5 - 2	Insulation Resistance		Measurements shall be made following application of DC 100V for tact switch and DC500V for slide & push switch potential across terminals and across terminals and frame for one minute.	100MΩmin.
5 - 3	Dielectric Withstanding Voltage		AC250V (50Hz or 60Hz) shall be applied across terminals and across terminals and frame for one minute.	There shall be no breakdown.
5 - 4	Bounce	Tact Switch	Lightly striking the center of the stem at a rate encountered in normal use (3 to 4 operations per sec.), bounce shall be tested at ON and OFF.	As per individual specifications.

## 6. Mechanical Performance

No.	Item		Test Conditions	Requirements
6 - 1	Operating Force		Gradually increasing the load applied to the center of the stem, the maximum load required for the stem to come to a stop shall be measured.	As per individual specifications.
6 - 2	Travel		Applying a static load twice the operating force to the center of the stem, the travel distance for the stem to come to a stop shall be measured.	As per individual specifications.
6 - 3	Terminal Strength		A force of 500gf being applied in one direction on the tip of the terminal for one minute and only one time to each terminal.	The terminal may be deformed, but shall not sustain any trouble such as deviation and breaking of terminal and insulation material. Electrical performance shall be assured.
6 - 4	Stop Strength	Tact Switch	Placing the switch so that the direction of switch operation is vertical, a static load of 3kgf shall be applied in the direction of stem operation for a period of 60 seconds.	There shall be no sign of damage mechanically and electrically.
		Slide & Push Switch	A static load of 1 kgf shall be applied in the direction of stem operation for a period of 15 seconds.	
6 - 5	Stem Strength		The maximum force to withstand a pull applied opposite to the direction of stem operation shall be measured.	As per individual specifications
6 - 6	Return Force	Tact Switch	The sample switch is installed so that the direction of switch operation is vertical and, upon depression of the stem in its center to the whole travel distance, the force of the stem to return to its free position shall be measured.	40gf min.

## 7. Environmental Performance

No.	Item	Test Conditions	Requirements
7 - 1	Resistance to Low Temperatures	Switch for test being kept in the conditions at $-20 \pm 2^{\circ}\text{C}$ in temperature for 96 hours, and in a normal ambient condition for one hour, then to be measured within one hour. Waterdrops shall be removed.	Contact Resistance: As per individual specifications. Insulation Resistance: 100M $\Omega$ min.
7 - 2	Heat Resistance	Switch for test being kept in the condition at $85 \pm 2^{\circ}\text{C}$ in temperature for 96 hours, and in a normal ambient condition for one hour, then to be measured within one hour.	Withstanding Voltage: Tact Switch : 250VAC Slide&Push Switch: 500VAC SSS120,130 :100VAC Insulation unbroken
7 - 3	Moisture Resistance	Switch for test being kept in the condition at $40 \pm 2^{\circ}\text{C}$ in temperature with 90~95%RH for 96 hours, and in a normal ambient condition for one hour, then to be measured within one hour. Waterdrops shall be removed.	Operating Force: Within +10,-30% of initial force There shall be no defects in appearance or mechanical functions.

## 8. Endurance

No.	Item		Test Conditions	Requirements
8 - 1	Operating Life	Tact Switch	Measurements shall be made following the test set forth below: (1) DC 5V 5mA resistive load (2) Rate of operation : 2 to 3 operations per second (3) Depression : Maximum value of operating force (4) Cycles of operation : As per individual specifications.	Contact Resistance: As per individual specifications. Insulation Resistance: 100MΩmin. Withstanding Voltage: Tact Switch : 250VAC Slide&Push Switch: 500VAC SSS120,130 :100VAC Insulation unbroken Operating Force: Within +10, -30% of initial force There shall be no defects in appearance or mechanical functions.
		Slide & Push Switch	Measurements shall be made following the test set forth below: (1) Without load (2) Rate of operation : 15 to 20 operations per minute (3) Depression : twice the operating force (4) Cycles of operation :10,000 cycles.	
8 - 2	Vibration Resistance		Measurements shall be made following the test set forth below: (1) Range of oscillation : 10 to 55Hz (2) Amplitude, pk-to-pk : 1.5mm (3) Cycle of sweep : 10~55~10Hz in one minute approx. (4) Mode of sweep : Logarithmical sweep or uniform sweep. (5) Direction of oscillation : Three mutually perpendicular directions, including the direction of stem travel. (6) Duration of testing : 2 hours each, for a total of 6 hours.	

## 9. Soldering

### 9 - 1. Manual soldering Conditions.

Temperature : 260 ±5°C

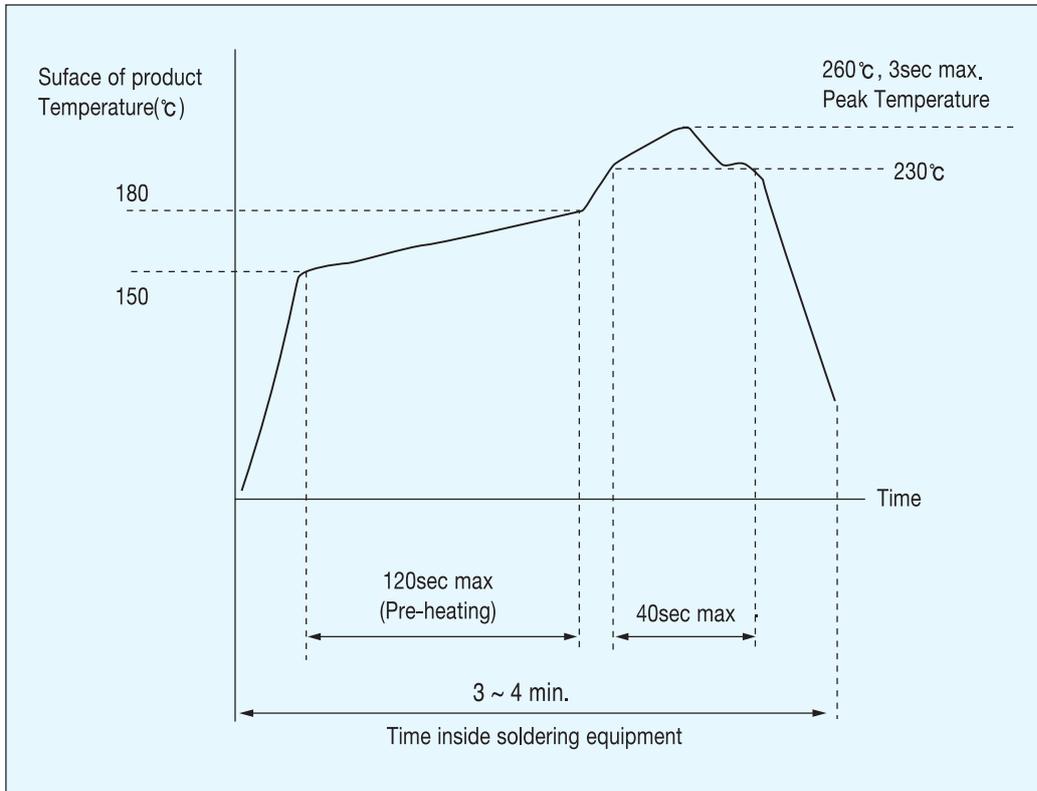
Time : 3 sec max.

### 9 - 2. Auto Soldering Conditions.

No	Item	Condition
1	Preheat Temperature	110°C max. (Ambient temperature of printed circuit board on its soldering side)
2	Preheat time	60 sec max.
3	Flux Foaming	To such an extent that flux will be kept flush with the printed circuit boards top surface on which components are mounted. Preparatory flux must not be applied to that side of printed circuit board on which components are mounted and to the area where terminals are located.
4	Soldering Temperature	255°C max.
5	Duration of solder immersion	5 sec max.
6	Allowable Frequency of soldering process	2 times max.

9 - 3. Reflow Soldering

Please practice according to below conditions.



- (1) Thickness of printed circuit board shall be 1.6mm
- (2) Switch terminals and PCB upper face shall be free from flux prior to soldering.
- (3) Safeguard the switch assembly against flux penetration from its top side.

10. Various shapes of stem for slide switches.

G	V	C	S	F	M



# 1

## OEM METAL DOME CONTACT

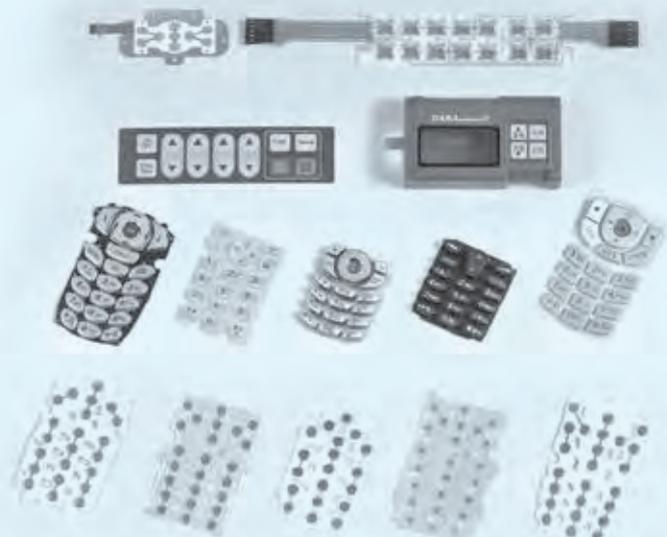
**O D S 0 1 0 0 1**

Series

User Number

01  
02  
03  
04

OPM : PCB Module  
OKP : Key Pad  
ODS : Dome Sheet

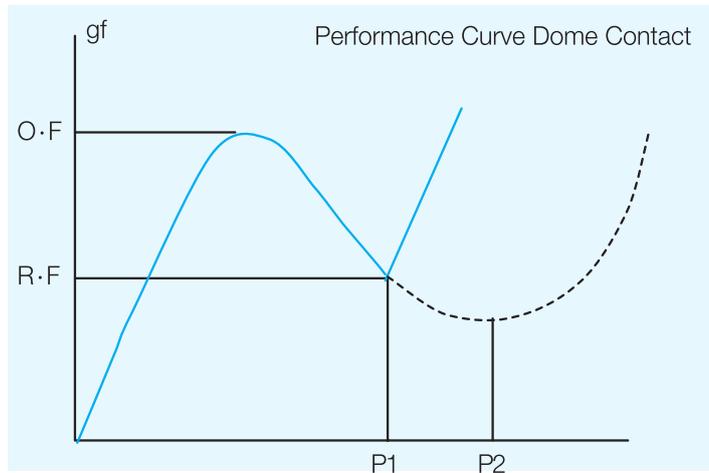


## Dome Contact

- ① O.F.(Operation Force) ..... gf
- ② R.F.(Return Force) ..... gf
- ③ C.K.(Click Rate) ..... %

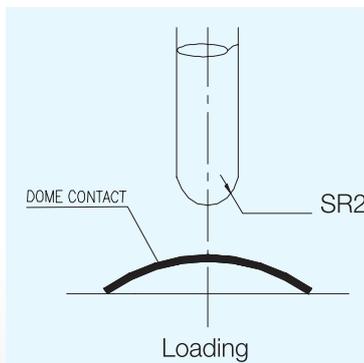
$$C.K = \frac{(O.F - R.F)}{O.F} \times 100(\%)$$

- ④ P1 : Contact Point in Travel
- ⑤ P2 : bottom Point in Travel
- ⑥ P1 < P2



## MEASUREMENT MODE

- (A) Load : Feeling load (Aiko Model-1605N)
- (B) Before Test : Push 10 times on the center of Dome Contact
- (C) Loading Tool : Spherical Radius 2mm(SR2) and Flat steel table



## LIFE

- ① Standard Life Testing Mode ..... Times
- ② Operation Force Reduction Rate ..... Inside 30% after Testing

## MEASUREMENT MODE

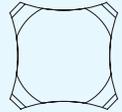
- (A) Gauge : Life Testing Machine
- (B) Testing Speed : 100 SPM
- (C) Push Button Head : Spherical Radius 2mm(SR2)

**FLAT TYPE** SDC series

Material : S STL (SUS301)

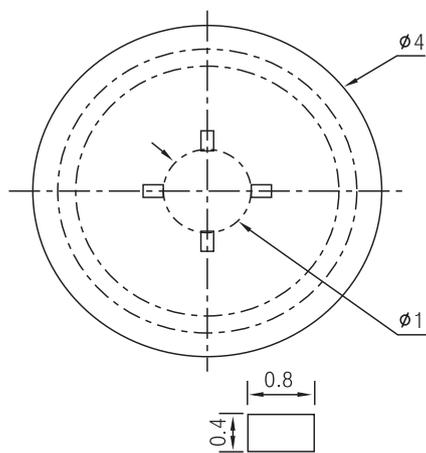
Plating : S → Silver N → Nickel

Dome Contact Configuration	Form	SIZE mm	Part Number	Operation Force gf	Click Rate %	Travel mm	Contact Life × 1000	
One-Dimple		φ 4.0	SDC-4666-S	120±20	50±10	0.15±0.03	1,000	
			SDC-4666-N					
			SDC-4661-S	160±20	50±10	0.16±0.03	1,000	
			SDC-4661-N					
		SDC-4662-S	190±20	50±10	0.18±0.03	1,000		
		SDC-4662-N						
		φ 5.0	SDC-5661-S	160±20	50±10	0.18±0.03	1,000	
			SDC-5661-N					
SDC-5662-S	190±20		50±10	0.20±0.05	1,000			
SDC-5662-N								
D-cut		φ 4.0	SDC-4061-S	160±20	50±10	0.15±0.03	1,000	
			SDC-4061-N					
			SDC-4062-S	190±25	50±15	0.18±0.03	1,000	
			SDC-4062-N					
		φ 5.0	SDC-5061-S	160±20	50±10	0.18±0.03	1,000	
			SDC-5061-N					
			SDC-5062-S	190±25	55±15	0.20±0.03	1,000	
			SDC-5062-N					
Standard Dome Contact		φ 3.0	SDC-3051-S	160±20	50±15	0.13±0.03	500	
			SDC-3051-N					
			SDC-3054-S	120±20	60±10	0.13±0.03	500	
			SDC-3054-N					
		φ 4.0	SDC-4051-S	160±20	50±10	0.15±0.03	2,000	
			SDC-4051-N					
			SDC-4058-S	190±20	50±15	0.18±0.05	500	
			SDC-4058-N					
		SDC-4052-S	250±30	50±15	0.17±0.03	150		
		SDC-4052-N						
		φ 5.0	SDC-5093-S	160±20	50±10	0.20±0.03	3,000	
			SDC-5093-N					
			SDC-5094-S	190±25	55±15	0.20±0.03	1,000	
			SDC-5094-N					
SDC-5096-S	250±40		45±15	0.20±0.05	300			
SDC-5096-N								
Cross Dome Contact		φ 4.0	SDC-4812-S	120±20	35±10	0.15±0.03	1,000	
			SDC-4812-N					
			SDC-4816-S	160±20	50±10	0.20±0.03	1,000	
			SDC-4816-N					
			SDC-5812-S	120±20	50±10	0.20±0.03	300	
			SDC-5812-N					
		φ 5.0	SDC-5816-S	160±20	50±10	0.20±0.03	2,000	
			SDC-5816-N					
			SDC-5818-S	180±20	50±10	0.20±0.03	1,000	
			SDC-5818-N					
		φ 3.0	SDC-9816-S	160±20	50±10	0.20±0.03	1,000	
			SDC-9816-N					
			φ 4.0	SDC-9826-S	160±20	50±10	0.20±0.03	1,000
				SDC-9826-N				

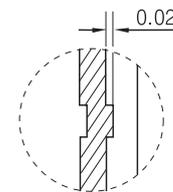
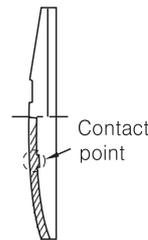
Four-legged		P4.5- $\phi$ 5.0	SDC-9090-S	$160\pm 20$	$50\pm 15$	$0.20\pm 0.05$	300
			SDC-9090-N				
		P5.5- $\phi$ 6.0	SDC-9091-S	$160\pm 20$	$50\pm 15$	$0.22\pm 0.05$	500
			SDC-9091-N				
Oblong		$2.4\times 3.4$	SDC-9080-S	$160\pm 20$	$50\pm 15$	$0.2\pm 0.05$	300
D Cut-Dimple		$\phi 5.0\times 3.7$	SDC-9092-N	$170\pm 20$	$50\pm 15$	$0.21\pm 0.05$	300
			SDC-9093-N	$200\pm 20$		$0.22\pm 0.05$	

## NEW PRODUCTS

### CROSS DOME CONTACT (Patent pending)



Half-cut



Contact point

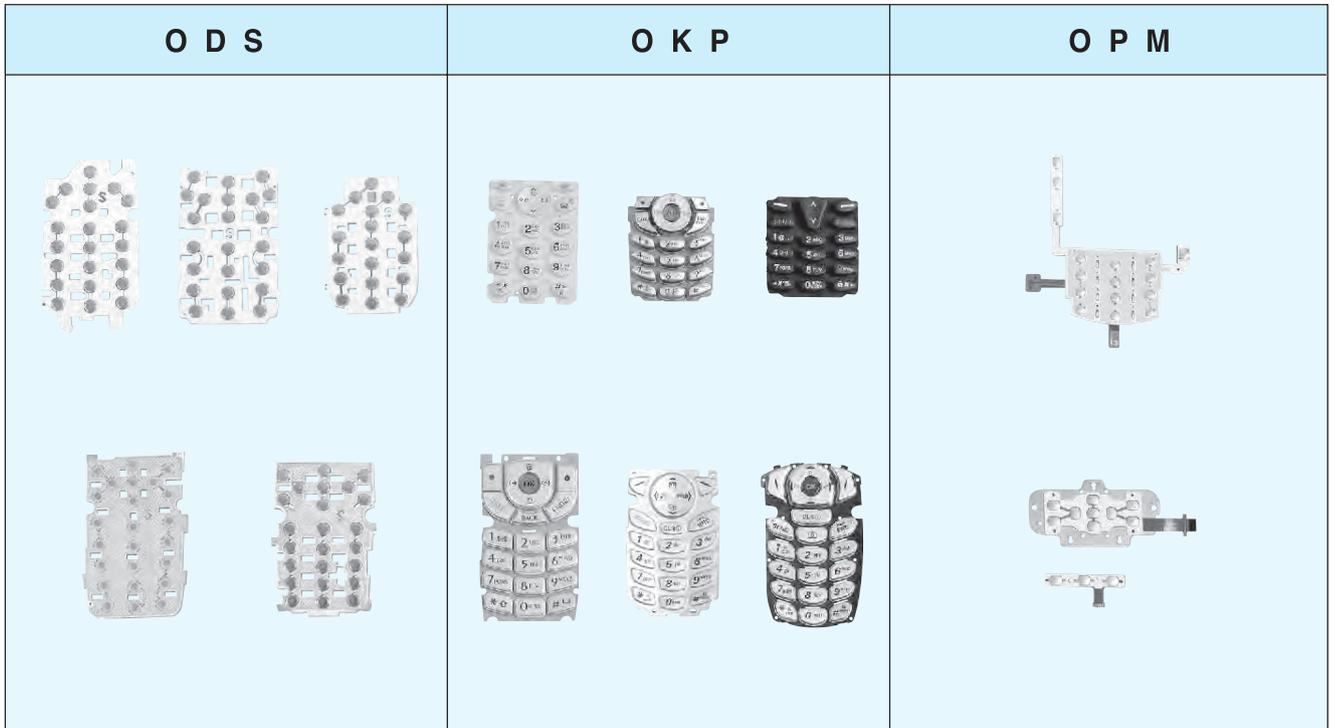
#### ■ Features

1. Anti-dust structure
2. Smoothly contacting structure onto the PCB (the smallest abrasion of Contact against general type )
3. A little distance of sliding point of contact (1/3 sliding contact compare with general type)
4. Wide range of working point compare with general type( bigger than 1.5 times than other one)
5. Long life (3 times longer than general type)
6. Low-noise (1/3 of general type)

#### ■ Typical good points

- HALF CUT type
  - (1) Powerful structure against dust
  - (2) Long life under the high power
- Double stepped bending structure of outer circle
  - (1) Wide range of working point
  - (2) Low damage of PCB due to smallest sliding point

## OEM DESIGN

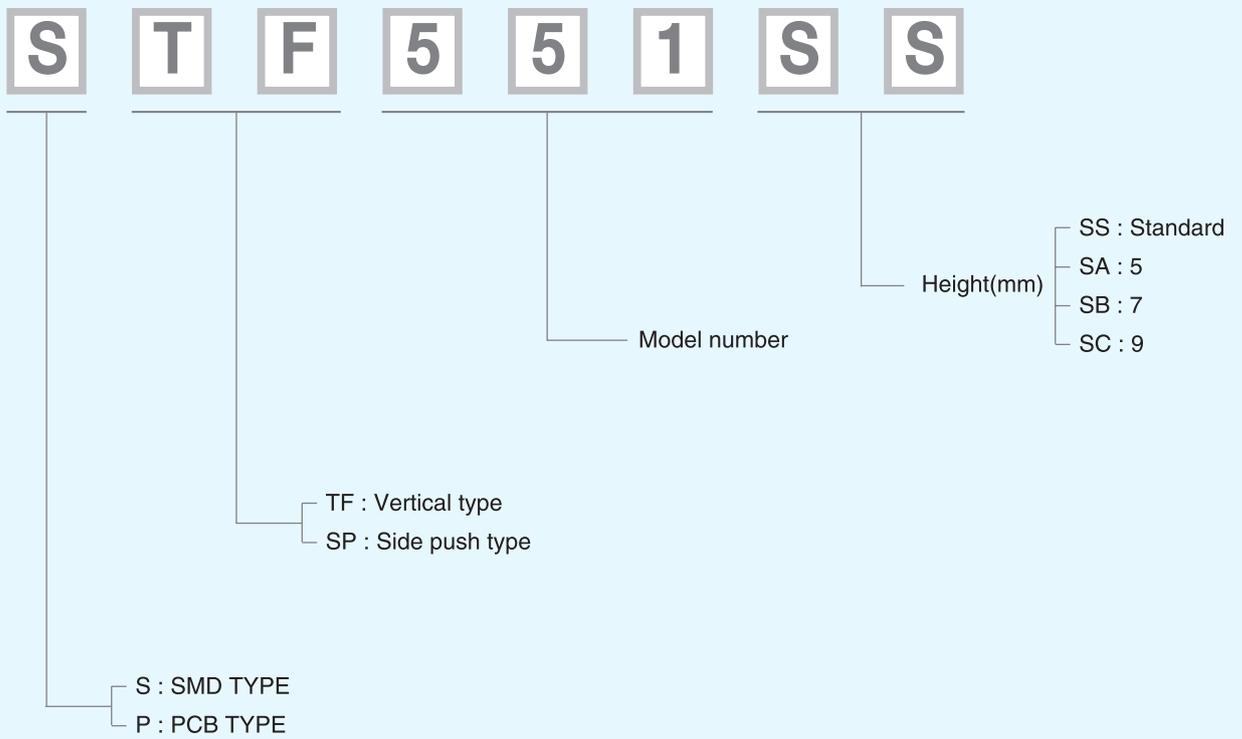


Description		Model	Application of Customer Requirement
Material	Dome		SUS ( $\phi 4$ , $\phi 5$ , $\phi 6$ )
	Sheet		Polyester film
Operating Force (gf)			160, 190, 220
Click Rate (%)			$50 \pm 10$
Life Cycle (min)			1,000,000
Rating (max)			5V DC
Stroke (mm)			0.2
Contact Resistance			1 $\Omega$ max
Features			Metal dome, Low profile, Light weight design

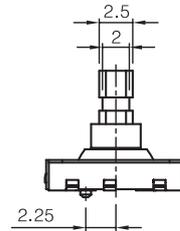
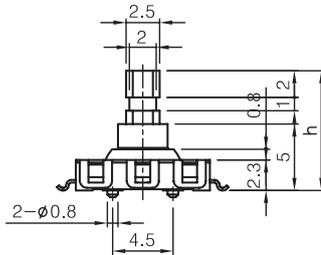
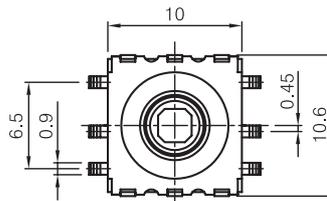
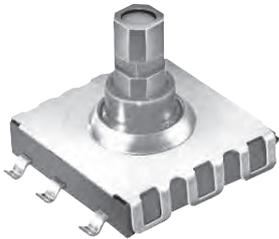


# 2

## MULTI FUNCTION SWITCH



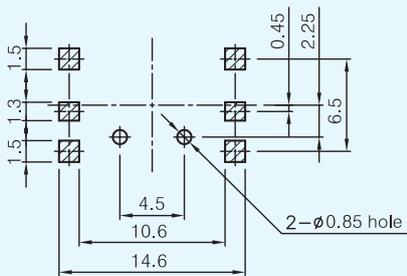
**STF551**



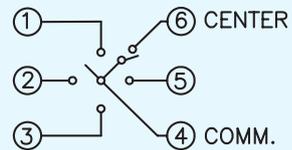
Type	h	Stem
A	5	
B	7	
C	9	

Description	Model	STF551SA	STF551SB	STF551SC
	<b>Operating Force (gf)</b>		4 - Direction : 220±70 Center Push : 320±70	4 - Direction : 180±50 Center Push : 320±70
<b>Life Cycle (min)</b>		100,000		
<b>Rating (max)</b>		50mA, 12V DC		
<b>Angle</b>		4° <sup>+3°</sup> <sub>-2°</sub>		
<b>Stroke (mm)</b>		Center Push : 0.2±0.1		
<b>Contact Resistance</b>		100 mΩ max		
<b>Features</b>		Multi function, Thin type, Reflow soldering		
<b>Packaging</b>	<b>Bulk</b>	500 pcs / Bag		
	<b>Reel</b>	650 pcs / Reel	550 pcs / Reel	300 pcs / Reel

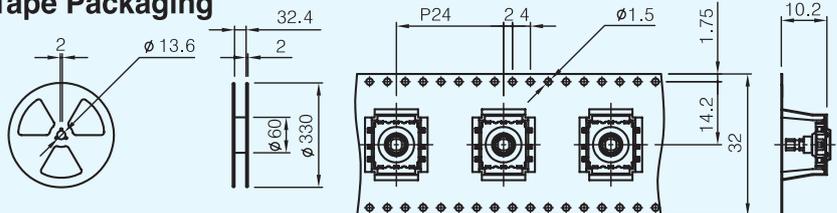
**P.C.B Layout**



**Circuit Diagram**



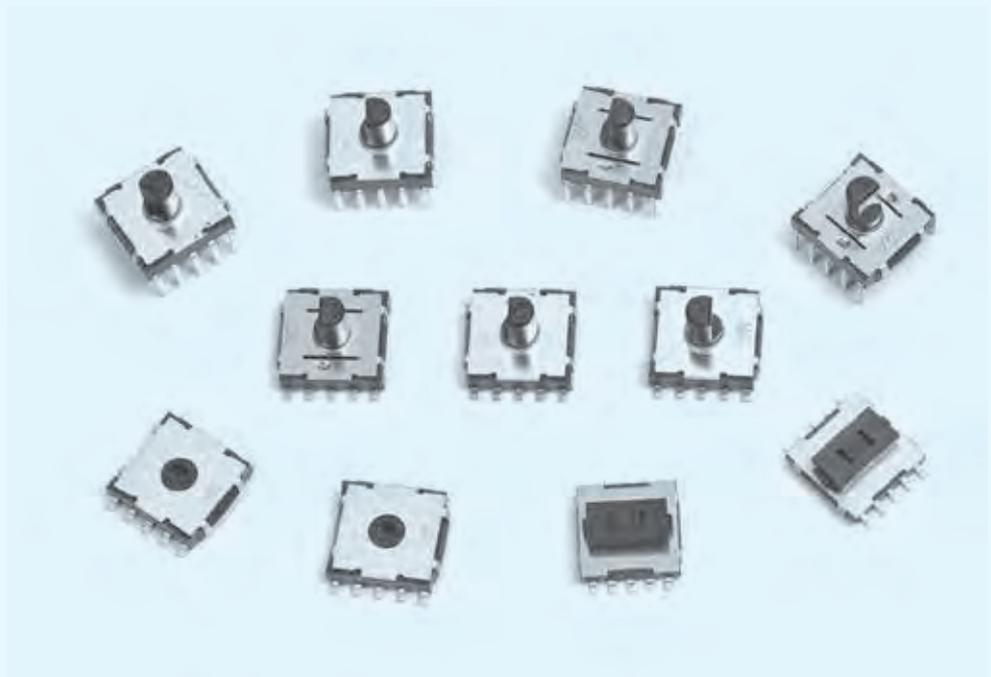
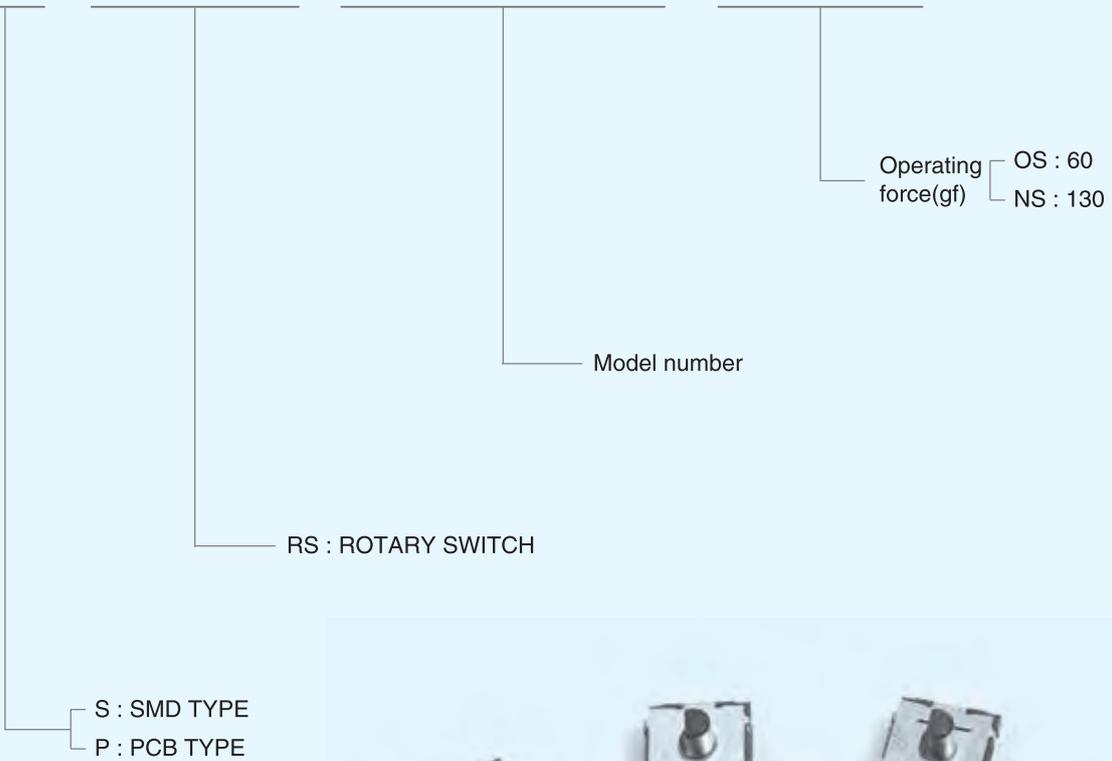
**Tape Packaging**



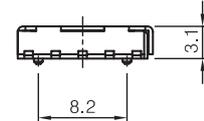
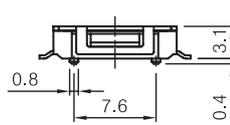
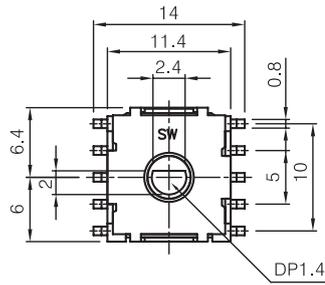
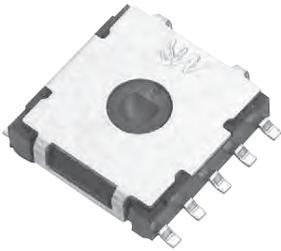


# ROTARY SWITCH 3

**S R S 1 9 1 0 S**

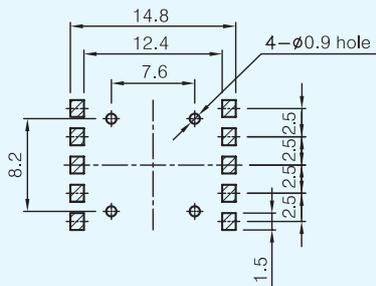


**SRS191**

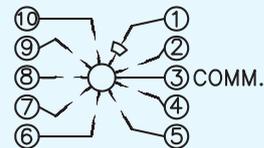


Description		Model	SRS191OS	SRS191NS
Rotational Torque(gf.cm)			60±30	130±50
Poles - Throws			1C - 9P	
Stem Color			Black	Gray
Life Cycle (min)			10,000	
Rating (max)			0.1A, 16V DC	
Step Angle			40°	
Contact Resistance			50 mΩ max	
Features			Signal changer, Low profile, Reflow soldering	
Packaging	Bulk		500 pcs / Bag	
	Reel		1,000 pcs / Reel	

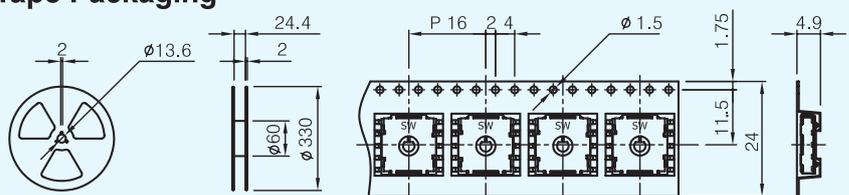
**P.C.B Layout**



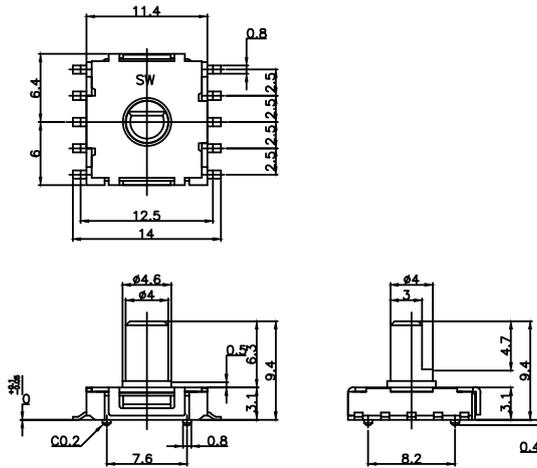
**Circuit Diagram**



**Tape Packaging**

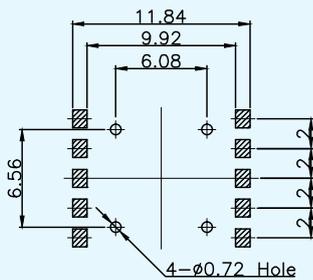


## SRS192

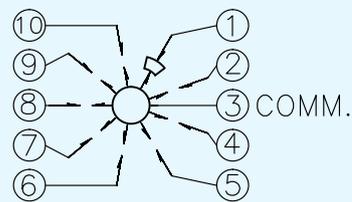


Description		Model	SRS192OS	SRS191NS
Rotational Torque (gf.cm)			60±30	130±50
Poles - Throws			1C - 9P	
Stem Color			Black	Gray
Life Cycle (min)			10,000	
Rating (max)			0,1A, 16V DC	
Step Angle			40°	
Contact Resistance			50 mΩ max	
Features			Signal changer, Low profile, Reflow soldering	
Packaging	Bulk			
	Reel			

### P.C.B Layout



### Circuit Diagram



### Tape Packaging



# DOUBLE ACTION... 4

**S** **T** **D** **6** **5** **4** **A** **F**



S : SMD TYPE  
P : PCB TYPE



TD : Vertical type



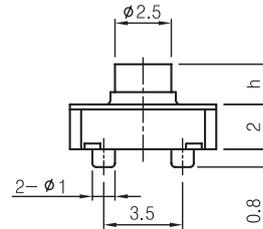
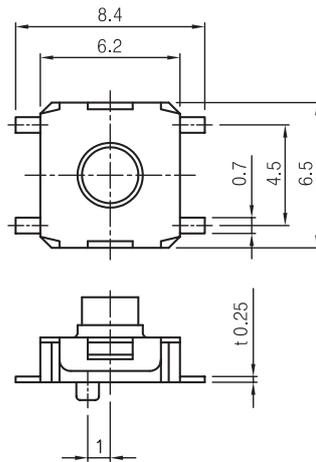
Model number



Operating force(gf)  
SS : Standard  
AS : F1→100, F2→300  
BS : F1→60, F2→150



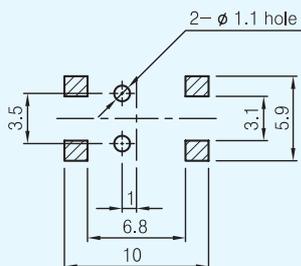
## STD654



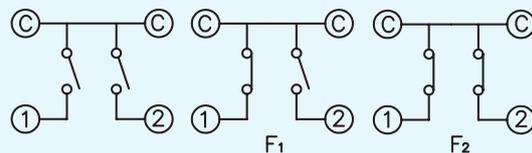
Type	h
557	0
654	1.8
668	1.1

Description	Model	STD557		STD654		STD668	
		557AS	557BS	654AS	654BS	668AS	668BS
Operating Force (gf)		F1 : 100±40 F2 : 300±80	F1 : 60±40 F2 : 150±80	F1 : 100±40 F2 : 300±80	F1 : 60±40 F2 : 150±80	F1 : 100±40 F2 : 300±80	F1 : 60±40 F2 : 150±80
Stem Color		-		Beige	Gray	Beige	Gray
Life Cycle (min)		10,000					
Rating (max)		50mA, 12V DC					
Stroke (mm)		S1 : 0.3±0.1, S2 : 0.55±0.15					
Contact Resistance		200 mΩ max					
Features		Shutter switch, Double action, Reflow soldering					
Packaging	Bulk	1,000 pcs / Bag					
	Reel	2,500 pcs / Reel		1,000 pcs / Reel		1,000 pcs / Reel	

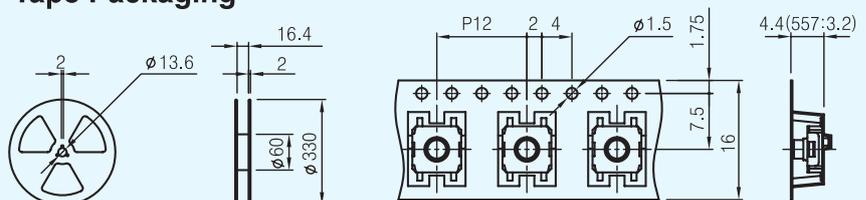
### P.C.B Layout



### Circuit Diagram

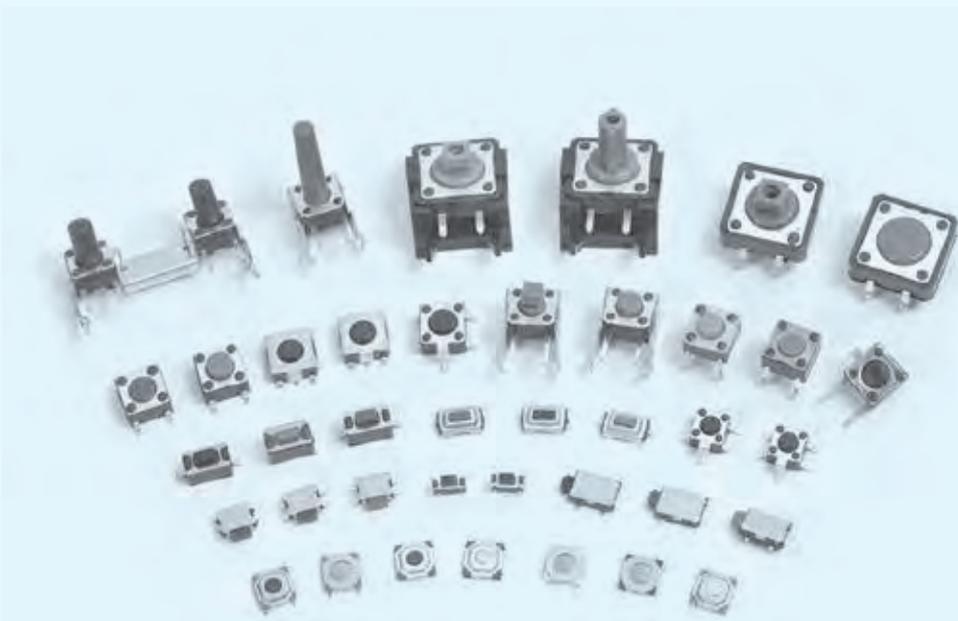
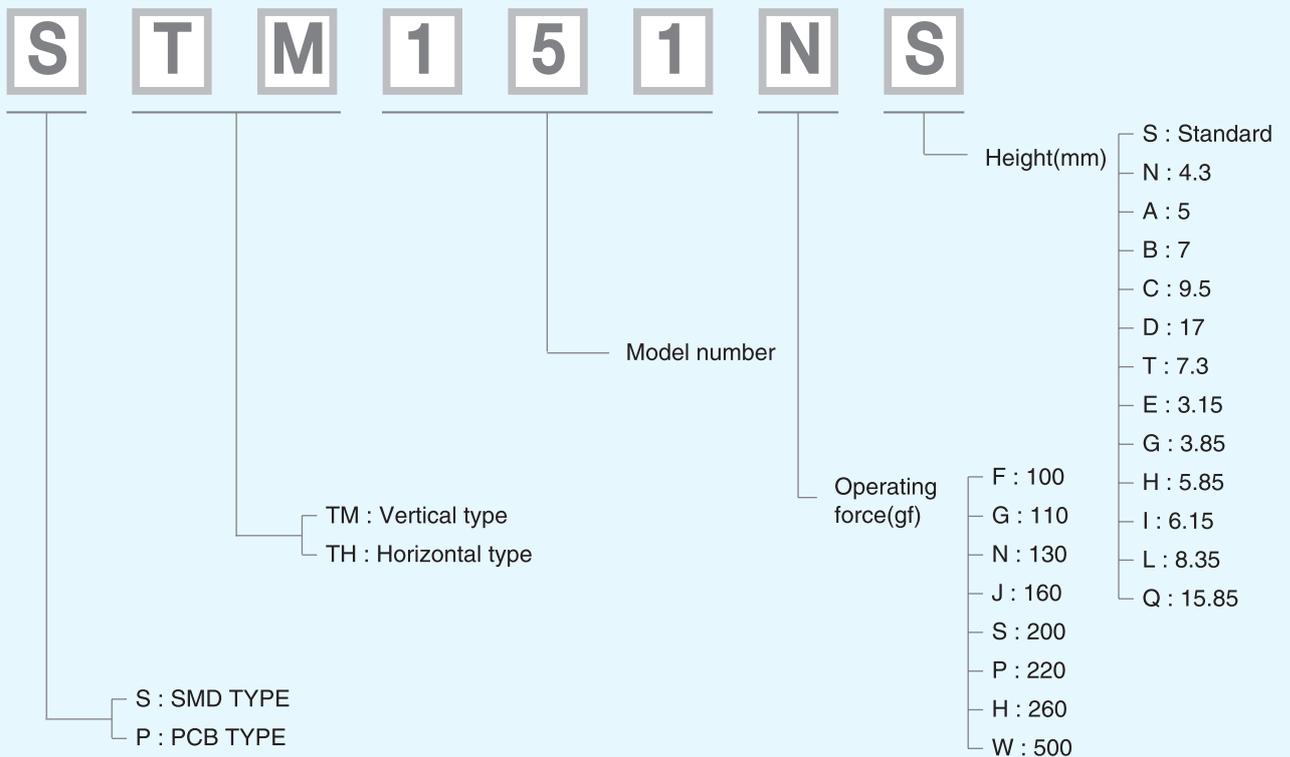


### Tape Packaging

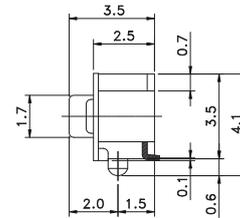
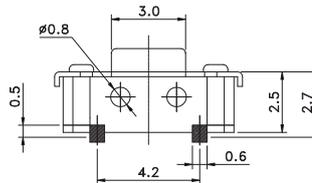
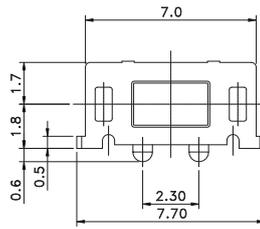




# TACT SWITCH 5

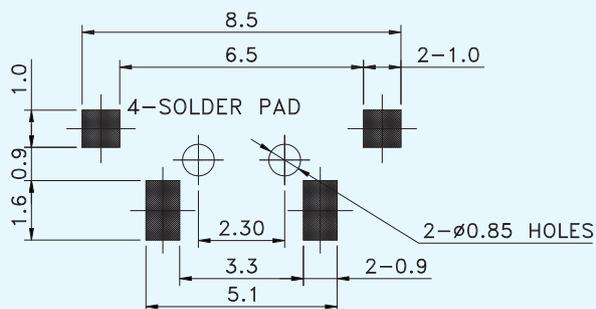


## STH112A

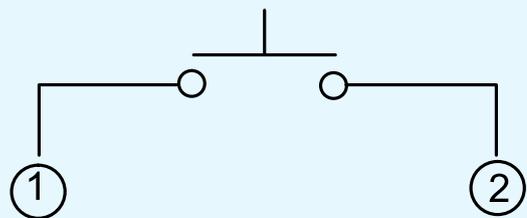


Description		Model	STH112A
Operating Force (gf)			260±50
Stem Color			Black
Life Cycle (min)			30,000
Rating (max)			50mA, 12V DC
Stroke (mm)			0,25±0,1
Contact Resistance			100 mΩ max
Features			Economical SMD, Reflow Solering
Packaging	Bulk		2,000pcs/Bag
	Reel		2,000pcs/Reel

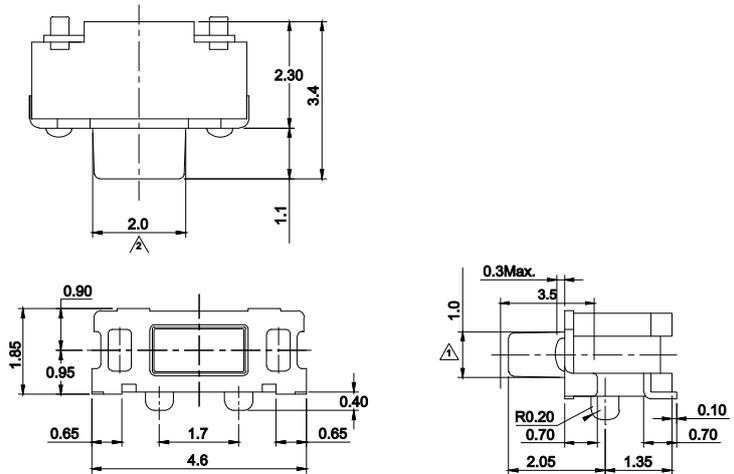
### P.C.B Layout



### Circuit Diagram

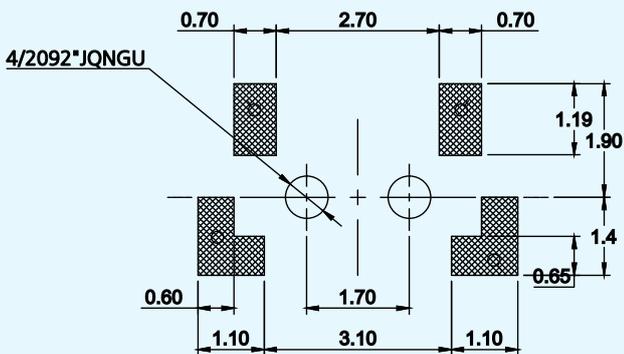


# STH114A

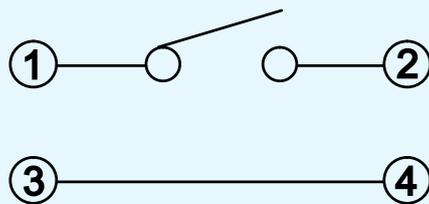


Description		Model	STH114A
Operating Force (gf)			180±50
Stem Color			Black
Life Cycle (min)			100,000
Rating (max)			50mA, 12V DC
Stroke (mm)			0.2±0.1
Contact Resistance			100 mΩ max
Features			Economical SMD, Reflow Solering
Packaging	Bulk		3,000pcs/Bag
	Reel		3,000pcs/Reel

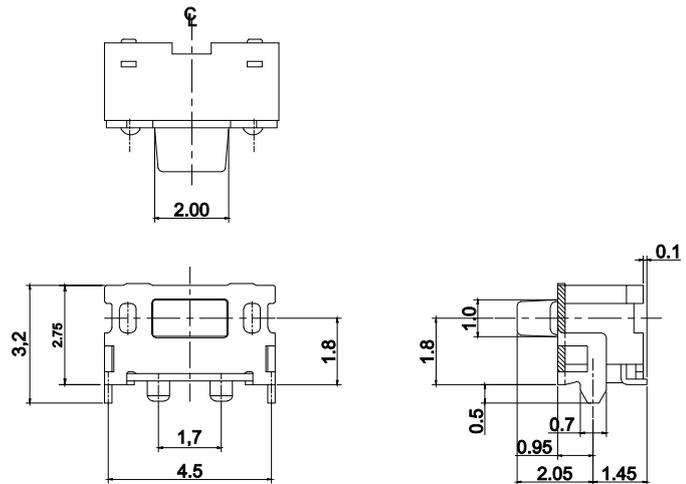
## P.C.B Layout



## Circuit Diagram

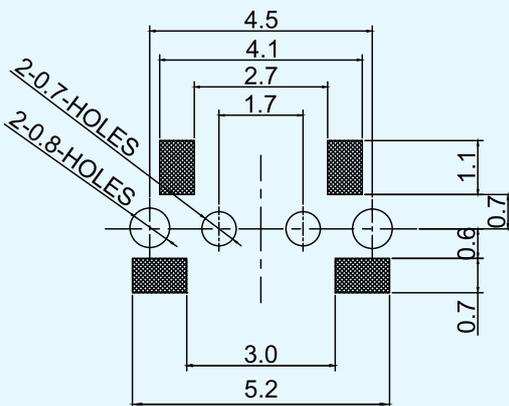


## STH116JS



Description		Model	STH116JS
Operating Force (gf)			180±50
Stem Color			Black
Life Cycle (min)			50,000
Rating (max)			50mA, 12V DC
Stroke (mm)			0.2±0.1
Contact Resistance			100 mΩ max
Features			Economical SMD, Reflow Solering
Packaging	Bulk		2,500pcs/Bag
	Reel		2,500pcs/Reel

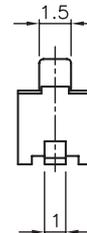
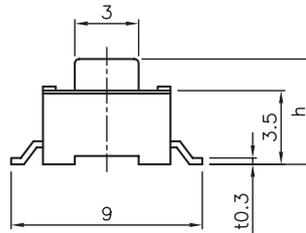
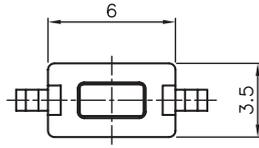
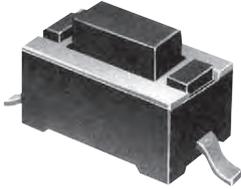
### P.C.B Layout



### Circuit Diagram



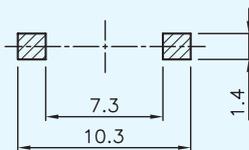
## STM141



Type	h
N	4.3
A	5

Description		Model	STM141NN	STM141JN	STM141SN	STM141HN
Operating Force (gf)			130±30	160±30	200±50	260±50
Stem Color			Black	Blue	Gray	Red
Life Cycle (min)			50,000	50,000	30,000	30,000
Rating (max)			50mA, 12V DC			
Stroke (mm)			0,25±0.1			
Contact Resistance			100 mΩ max			
Features			Economical SMD, Reflow Soldering			
Packaging	Bulk		1,000 pcs / Bag			
	Reel		1,700 pcs / Reel			

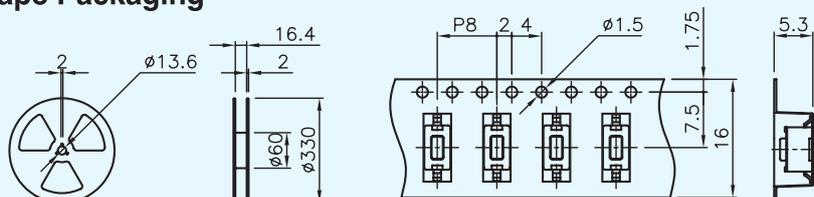
### P.C.B Layout



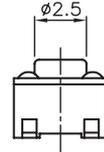
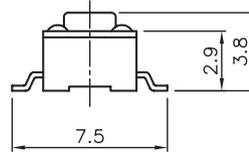
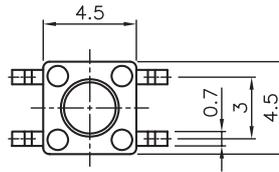
### Circuit Diagram



### Tape Packaging

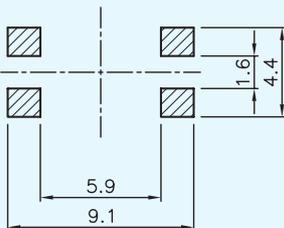


## STM142

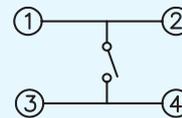


Description		Model	STM142NS
Operating Force (gf)			130±30
Stem Color			Black
Life Cycle (min)			50,000
Rating (max)			50mA, 12V DC
Stroke (mm)			0,25±0,1
Contact Resistance			100 mΩ max
Features			Economical SMD, Miniature type, Reflow soldering
Packaging	Bulk		1,000 pcs / Bag
	Reel		2,200 pcs / Reel

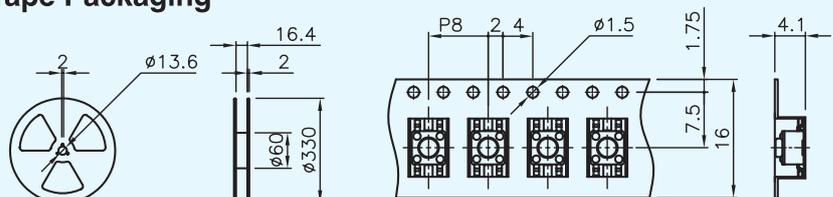
### P.C.B Layout



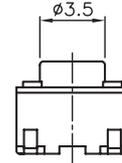
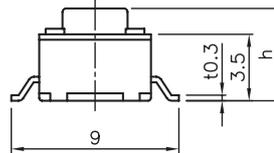
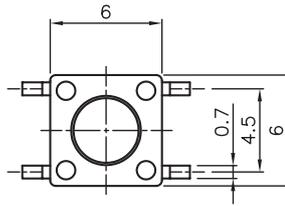
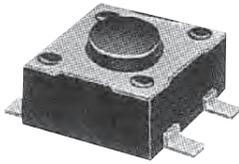
### Circuit Diagram



### Tape Packaging



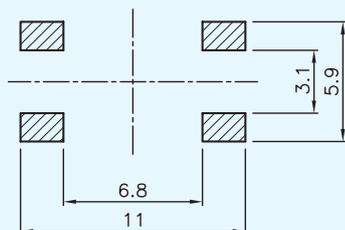
## STM144



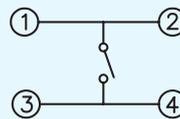
Type	h
N	4.3
A	5

Description		Model	STM144NN	STM144JN	STM144SN	STM144HN
Operating Force (gf)			130±30	160±30	200±50	260±50
Stem Color			Black	Blue	Gray	Red
Life Cycle (min)			300,000	150,000	100,000	100,000
Rating (max)			50mA, 12V DC			
Stroke (mm)			0,25±0.1			
Contact Resistance			100 mΩ max			
Features			Economical SMD, Reflow Soldering			
Packaging	Bulk		1,000 pcs / Bag			
	Reel		1,200 pcs / Reel			

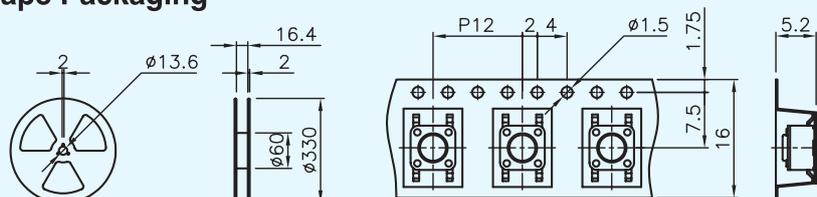
### P.C.B Layout



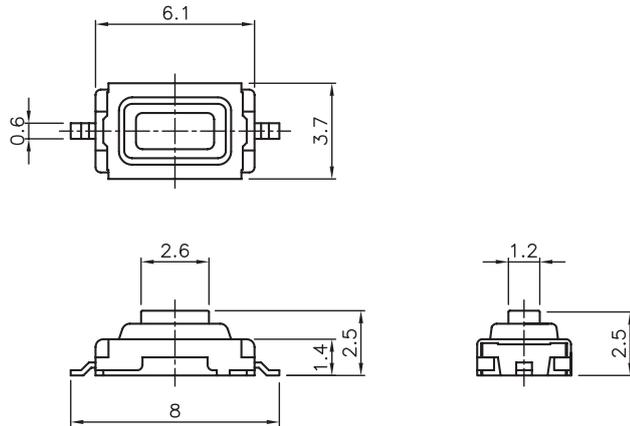
### Circuit Diagram



### Tape Packaging

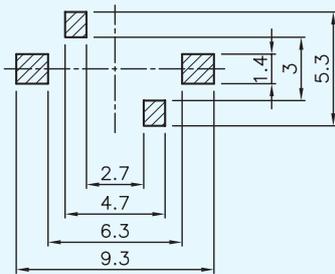


## STM151

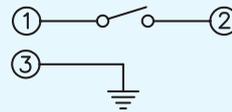


Description		Model	STM151NS	STM151JS	STM151SS	STM151HS
<b>Operating Force (gf)</b>			130±30	160±30	200±50	260±50
<b>Stem Color</b>			Black	Blue	Gray	Red
<b>Life Cycle (min)</b>			50,000	50,000	30,000	30,000
<b>Rating (max)</b>			50mA, 12V DC			
<b>Stroke (mm)</b>			0,25±0.1			
<b>Contact Resistance</b>			100 mΩ max			
<b>Ground Terminal</b>			With & Without			
<b>Features</b>			Dust proof, Thin type, Reflow soldering			
<b>Packaging</b>	<b>Bulk</b>		1,000 pcs / Bag			
	<b>Reel</b>		3,000 pcs / Reel			

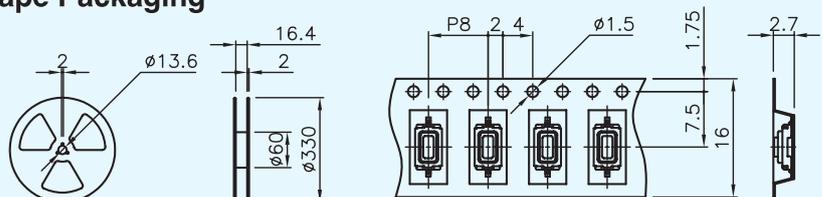
### P.C.B Layout



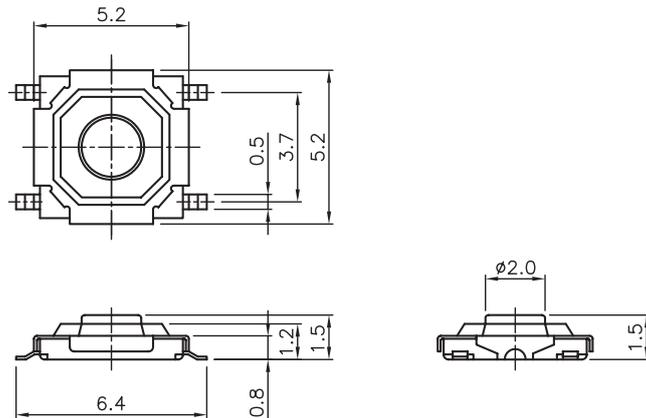
### Circuit Diagram



### Tape Packaging

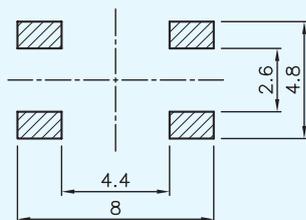


## STM152

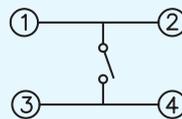


Description		Model	STM152JS-K	STM152JS	STM152HS
Operating Force (gf)			160±30	160±30	260±50
Case Color			Gray	Ivory	Black
Life Cycle (min)			1,000,000	300,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0.25±0.1		
Contact Resistance			100 mΩ max		
Features			Long life, Dust proof, Thin type, Reflow soldering		
Packaging	Bulk		1,000 pcs / Bag		
	Reel		3,000 pcs / Reel		

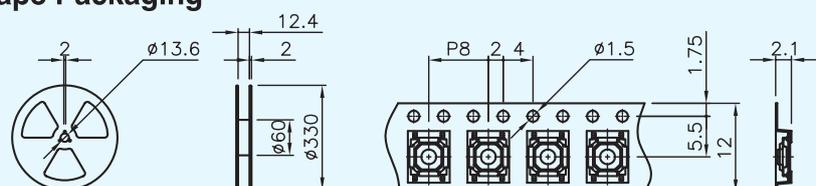
### P.C.B Layout



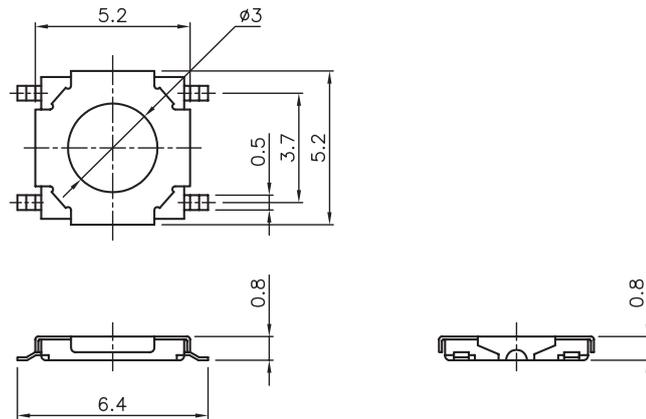
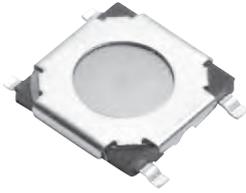
### Circuit Diagram



### Tape Packaging

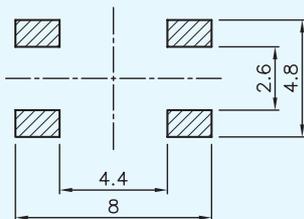


## STM153

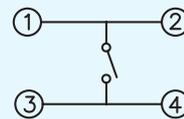


Description		Model	STM153JS-K	STM153JS	STM153HS
Operating Force (gf)			160±30	160±30	260±50
Case Color			Gray	Ivory	Black
Life Cycle (min)			1,000,000	300,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0,25±0.1		
Contact Resistance			100 mΩ max		
Features			Long life, Dust proof, Thin type, Reflow soldering		
Packaging	Bulk		1,000 pcs / Bag		
	Reel		3,000 pcs / Reel		

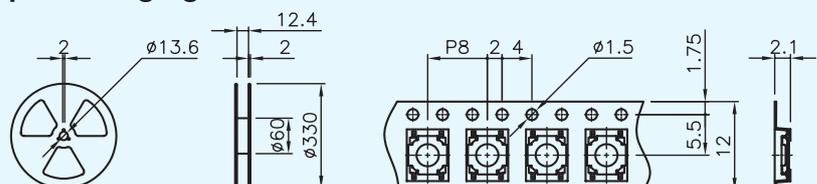
### P.C.B Layout



### Circuit Diagram

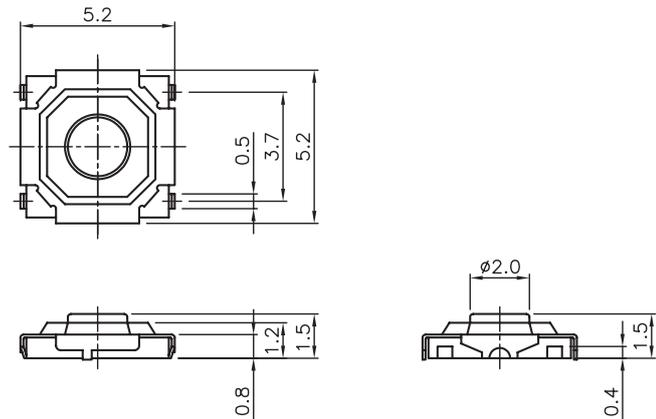
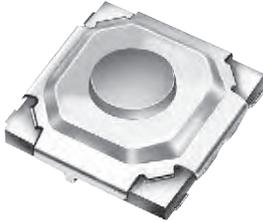


### Tape Packaging



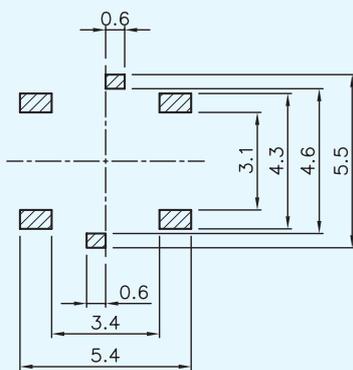


## STM157

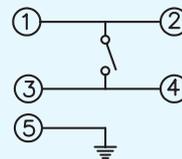


Description		Model	STM157JS-K	STM157JS	STM157HS
Operating Force (gf)			160±30	160±30	260±50
Case Color			Gray	Ivory	Black
Life Cycle (min)			1,000,000	300,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0,25±0.1		
Contact Resistance			100 mΩ max		
Features			Ground, Long life, Dust proof, Thin type, Reflow soldering		
Packaging	Bulk		1,000 pcs / Bag		
	Reel		3,500 pcs / Reel		

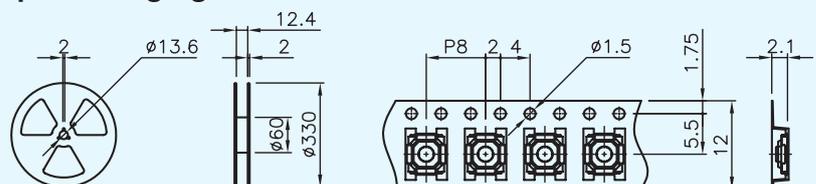
### P.C.B Layout



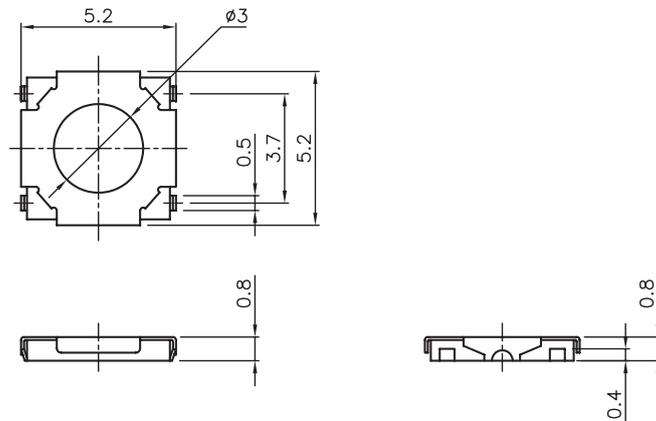
### Circuit Diagram



### Tape Packaging

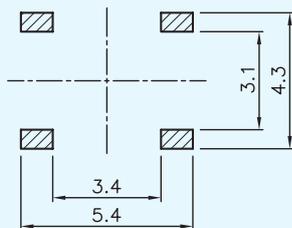


## STM158

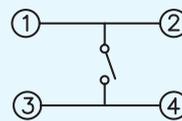


Description		Model	STM158JS-K	STM158JS	STM158HS
Operating Force (gf)			160±30	160±30	260±50
Case Color			Gray	Ivory	Black
Life Cycle (min)			1,000,000	300,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0,25±0.1		
Contact Resistance			100 mΩ max		
Features			Long life, Dust proof, Thin type, Reflow soldering		
Packaging	Bulk		1,000 pcs / Bag		
	Reel		3,500 pcs / Reel		

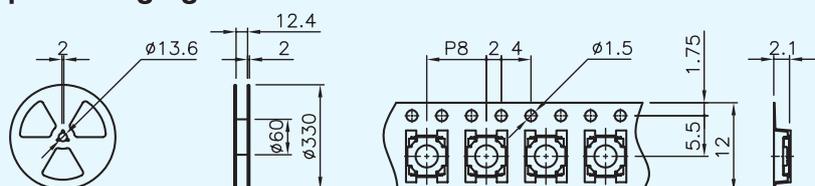
### P.C.B Layout



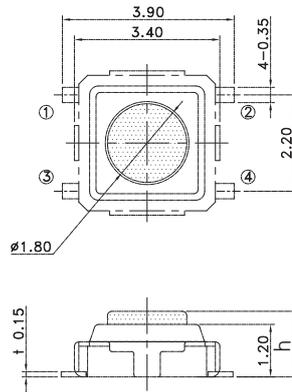
### Circuit Diagram



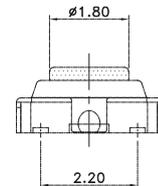
### Tape Packaging



## STM177

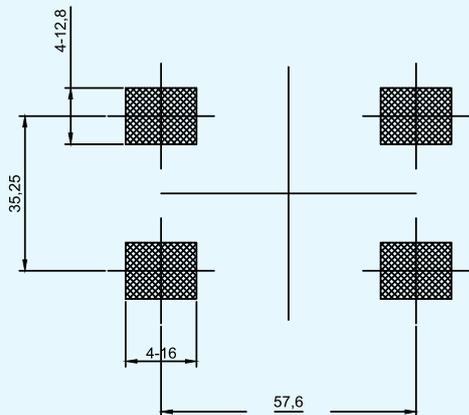


TYPE	h
S	1.5
A	2.0

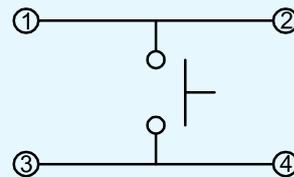


Description	Model	STM177JS	STM177JA	STM177HS	STM177HA
Operating Force (gf)		180±50	180±50	260±50	260±50
Stem Color		Black			
Life Cycle (min)		100,000	100,000	100,000	100,000
Rating (max)		50mA, 12V DC			
Stroke (mm)		0.25±0.1			
Contact Resistance		100 mΩ max			
Ground Terminal		With			
Features		Dust Proof, Thin Type, Reflow Soldering			
Packaging	Reel	4,000 pcs / Reel			

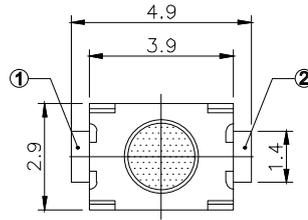
### P.C.B Layout



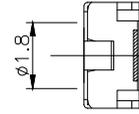
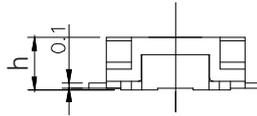
### Circuit Diagram



## STM185J

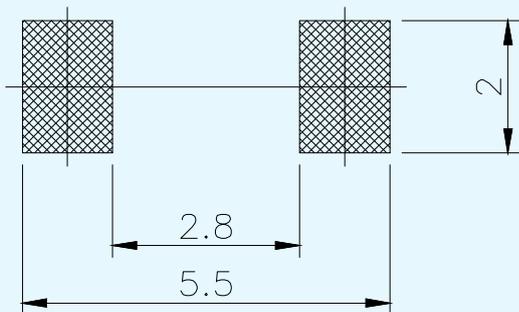


TYPE	h
S	1.5
A	2.0
B	2.5

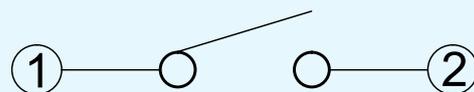


Description		Model	STM185JS	STM185JA	STM185JB
Operating Force (gf)			180±50	180±50	180±50
Case Color			Black		
Life Cycle (min)			100,000	100,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0.20±0.1		
Contact Resistance			100 mΩ max		
Features			Dust Proof, Thin Type, Reflow Soldering		
Packaging	Reel		3,000 pcs / Reel		

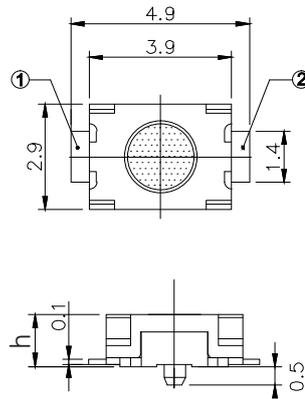
### P.C.B Layout



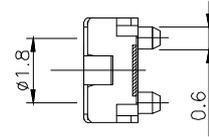
### Circuit Diagram



## STM185J-E

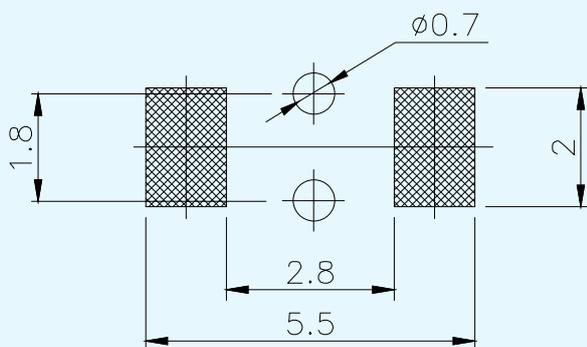


TYPE	h
S	1.5
A	2.0
B	2.5



Description		Model	STM185JS	STM185JA	STM185JB
Operating Force (gf)			180±50	180±50	180±50
Case Color			Black		
Life Cycle (min)			100,000	100,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0.20±0.1		
Contact Resistance			100 mΩ max		
Features			Dust Proof, Thin Type, Reflow Soldering		
Packaging	Reel		3,000 pcs / Reel		

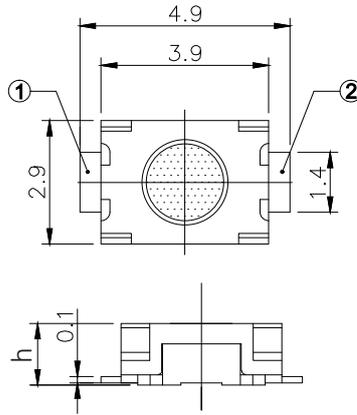
### P.C.B Layout



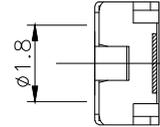
### Circuit Diagram



## STM185H

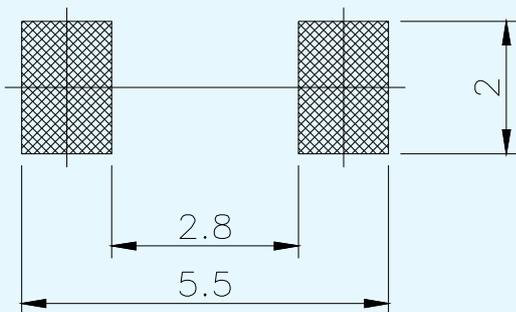


TYPE	h
S	1.5
A	2.0
B	2.5

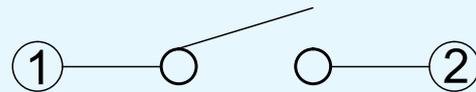


Description		Model	STM185HS	STM185HA	STM185HB
Operating Force (gf)			250±50	250±50	250±50
Case Color			Black		
Life Cycle (min)			100,000	100,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0.20±0.1		
Contact Resistance			100 mΩ max		
Features			Dust Proof, Thin Type, Reflow Soldering		
Packaging	Reel		3,000 pcs / Reel		

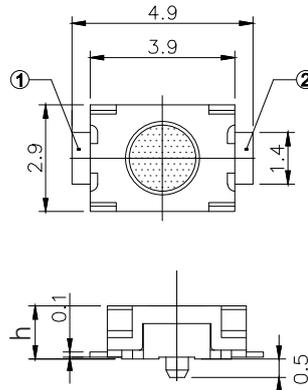
### P.C.B Layout



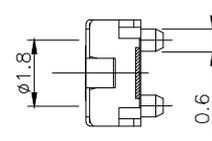
### Circuit Diagram



## STM185H-E

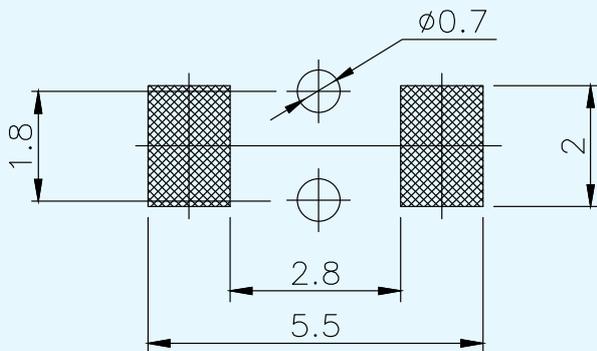


TYPE	h
S	1.5
A	2.0
B	2.5



Description		Model	STM185HS-E	STM185HA-E	STM185HB-E
Operating Force (gf)			250±50	250±50	250±50
Case Color			Black		
Life Cycle (min)			100,000	100,000	100,000
Rating (max)			50mA, 12V DC		
Stroke (mm)			0.20±0.1		
Contact Resistance			100 mΩ max		
Features			Dust Proof, Thin Type, Reflow Soldering		
Packaging	Reel		3,000 pcs / Reel		

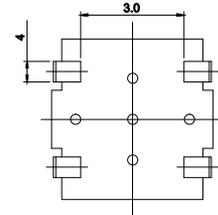
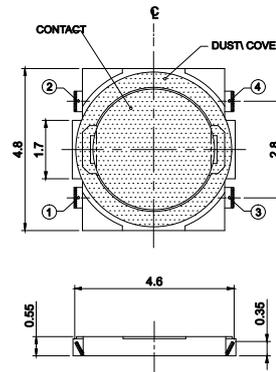
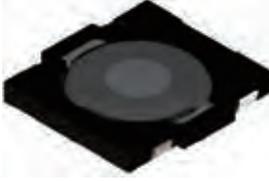
### P.C.B Layout



### Circuit Diagram

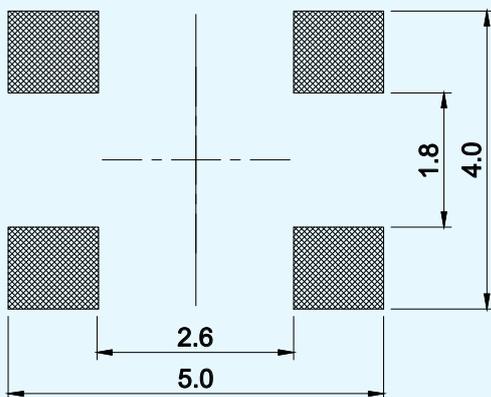


## STM197

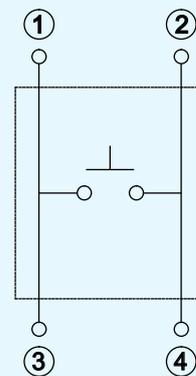


Model		STM197JS	STM197HS
Description			
Rotational Torque(gf)		180±50	260±50
Life Cycle (min)		50,000	
Rating (max)		50mA, 12V DC	
Contact Resistance		100 mΩ max	
Features		Dust Proof, Thin Type, Reflow Soldering	
Packaging	Reel	7,000 pcs / Reel	

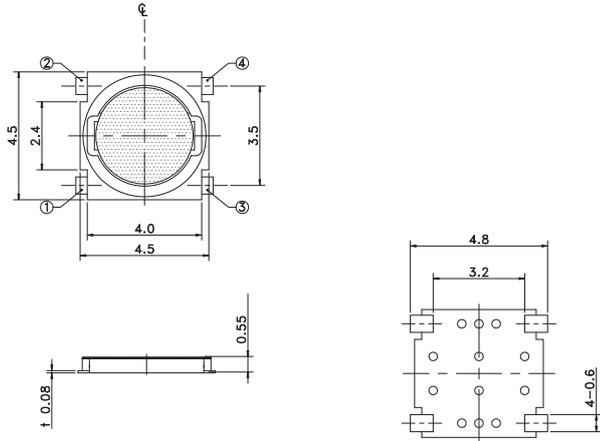
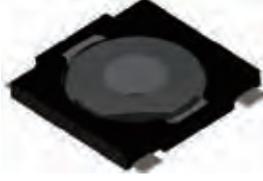
### P.C.B Layout



### Circuit Diagram

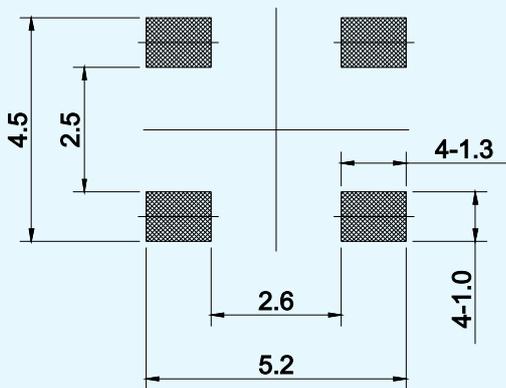


## STM198

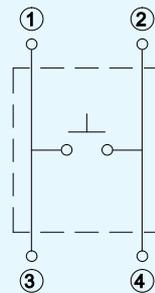


Model		STM198JS	STM198HS
Description			
Rotational Torque(gf)		180±50	260±50
Life Cycle (min)		100,000	
Rating (max)		50mA, 12V DC	
Contact Resistance		100 mΩ max	
Features		Dust Proof, Thin Type, Reflow Soldering	
Packaging	Reel	7,000 pcs / Reel	

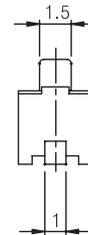
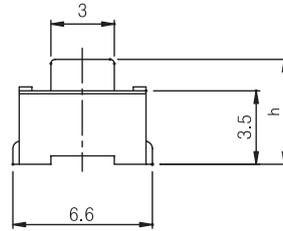
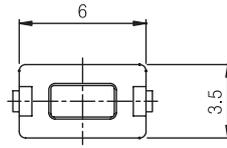
### P.C.B Layout



### Circuit Diagram



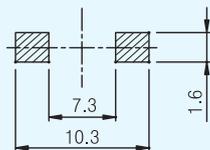
## STM241



Type	h
N	4.3
A	5

Description		Model	STM241NN	STM241JN	STM241SN	STM241HN
<b>Operating Force (gf)</b>			130±30	160±30	200±50	260±50
<b>Stem Color</b>			Black	Blue	Gray	Red
<b>Life Cycle (min)</b>			50,000	50,000	30,000	30,000
<b>Rating (max)</b>			50mA, 12V DC			
<b>Stroke (mm)</b>			0,25±0.1			
<b>Contact Resistance</b>			100 mΩ max			
<b>Features</b>			Economical SMD, Reflow soldering			
<b>Packaging</b>	<b>Bulk</b>		1,000 pcs / Bag			
	<b>Reel</b>		1,700 pcs / Reel			

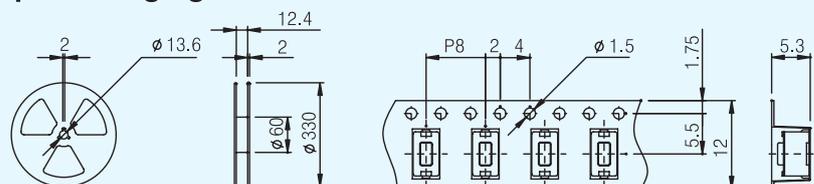
### P.C.B Layout



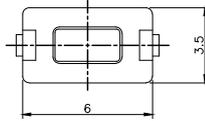
### Circuit Diagram



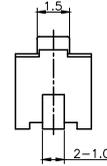
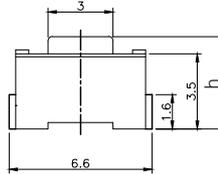
### Tape Packaging



## STM242

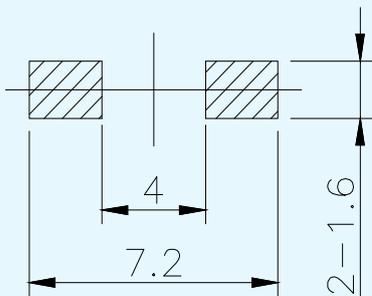


TYPE	h
N	4.3
A	5.0

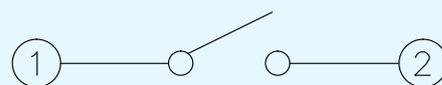


Description		Model	STM242JN	STM242JA	STM242HN	STM242HA
Operating Force (gf)			160±50	160±50	250±50	250±50
Case Color			Black		Red	
Life Cycle (min)			50,000	50,000	50,000	50,000
Rating (max)			50mA, 12V DC			
Stroke (mm)			0.25±0.1			
Contact Resistance			100 mΩ max			
Features			Economical SMD, Reflow Soldering			
Packaging	Reel		1,500 pcs / Reel			

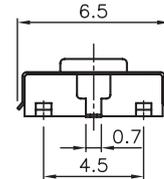
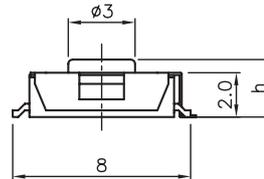
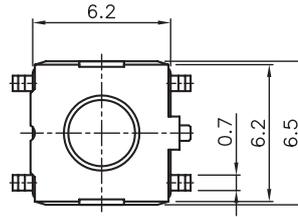
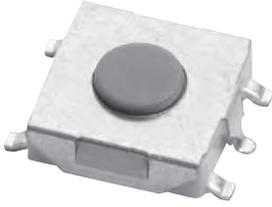
### P.C.B Layout



### Circuit Diagram



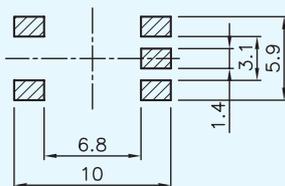
## STM255



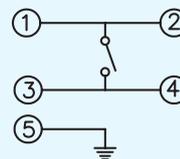
Type	h
W	2.5
X	3.1

Description		Model	STM255NW	STM255JW-K	STM255JW	STM255SW	STM255HW
<b>Operating Force (gf)</b>			130±30	160±30	160±30	200±50	260±50
<b>Stem Color</b>			Black	Bule / Gray	Blue	Gray	Red
<b>Life Cycle (min)</b>			300,000	1,000,000	150,000	100,000	100,000
<b>Rating (max)</b>			50mA, 12V DC				
<b>Stroke (mm)</b>			0,25±0.1				
<b>Contact Resistance</b>			100 mΩ max				
<b>Features</b>			Long life, Ground, Reflow soldering, Low profile				
<b>Packaging</b>	<b>Bulk</b>		1,000 pcs / Bag				
	<b>Reel</b>		2,000 pcs / Reel				

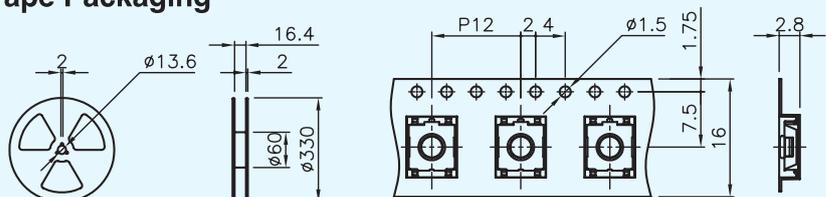
### P.C.B Layout



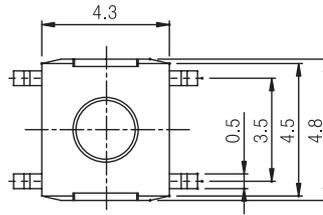
### Circuit Diagram



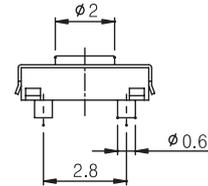
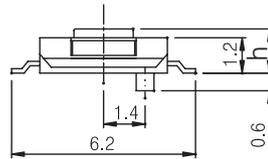
### Tape Packaging



## STM260

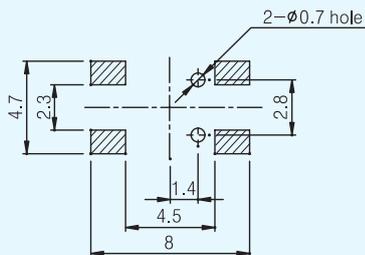


Type	h
S	1.5
A	4.3

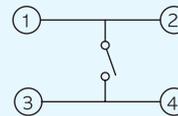


Description		Model	STM260JS	STM260HS
Operating Force (gf)			160±30	260±50
Stem Color			Blue	Red
Life Cycle (min)			300,000	100,000
Rating (max)			50mA, 12V DC	
Stroke (mm)			0.25±0.1	
Contact Resistance			100 mΩ max	
Features			Low profile, Thin type, Reflow soldering	
Packaging	Bulk		1,000 pcs / Bag	
	Reel		3,500 pcs / Reel	

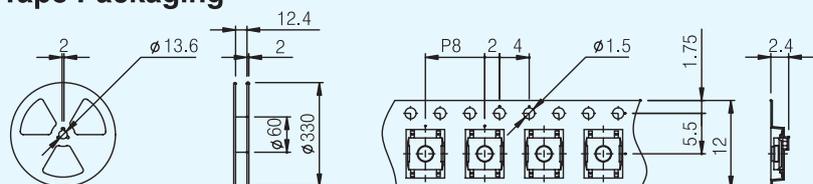
### P.C.B Layout



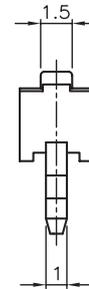
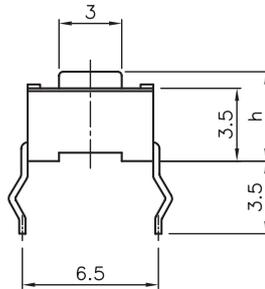
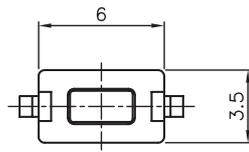
### Circuit Diagram



### Tape Packaging



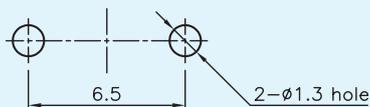
**PTM111**



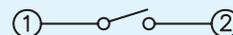
Type	h
N	4.3
A	5

Description	Model	PTM111NN	PTM111JN	PTM111SN	PTM111HN
<b>Operating Force (gf)</b>		130±30	160±30	200±50	260±50
<b>Stem Color</b>		Black	Blue	Gray	Red
<b>Life Cycle (min)</b>		50,000	50,000	30,000	30,000
<b>Rating (max)</b>		50mA, 12V DC			
<b>Stroke (mm)</b>		0,25±0,1			
<b>Contact Resistance</b>		100 mΩ max			
<b>Features</b>		Economical type, Low profile			
<b>Packaging</b>	<b>Bulk</b>	1,000 pcs / Bag			

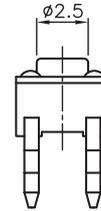
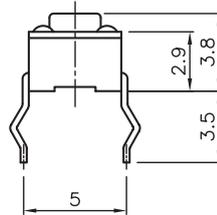
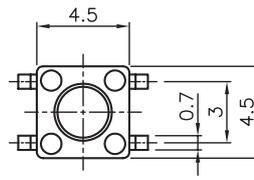
**P.C.B Layout**



**Circuit Diagram**

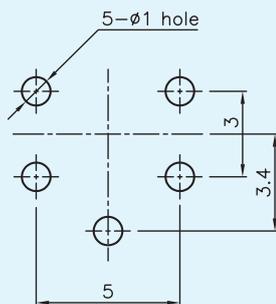


## PTM112

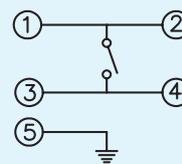


Description		Model	PTM112NS	PTM113NS
Operating Force (gf)			130±30	
Stem Color			Black	
Life Cycle (min)			50,000	
Rating (max)			50mA, 12V DC	
Stroke (mm)			0.25±0.1	
Contact Resistance			100 mΩ max	
Ground Terminal			Without	With
Features			Miniature type, Economical design, Ground terminal(PTM113)	
Packaging	Bulk		1,000 pcs / Bag	

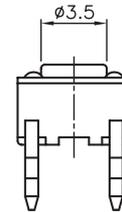
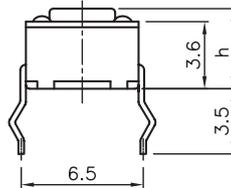
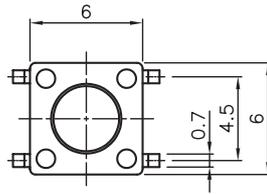
### P.C.B Layout



### Circuit Diagram



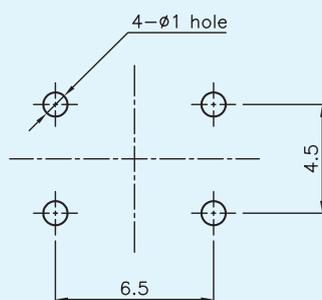
## PTM114



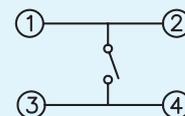
Type	h	Stem
N	4.3	
A	5	
B	7	
C	9.5	
D	17	
T	7.3	

Description	Model	PTM114NN	PTM114JN	PTM114SN	PTM114HN
<b>Operating Force (gf)</b>		130±30	160±30	200±50	260±50
<b>Stem Color</b>		Black	Blue	Gray	Red
<b>Life Cycle (min)</b>		300,000	150,000	100,000	100,000
<b>Rating (max)</b>		50mA, 12V DC			
<b>Stroke (mm)</b>		0,25±0.1			
<b>Contact Resistance</b>		100 mΩ max			
<b>Features</b>		Economical design			
<b>Packaging</b>	<b>Bulk</b>	1,000 pcs / Bag			

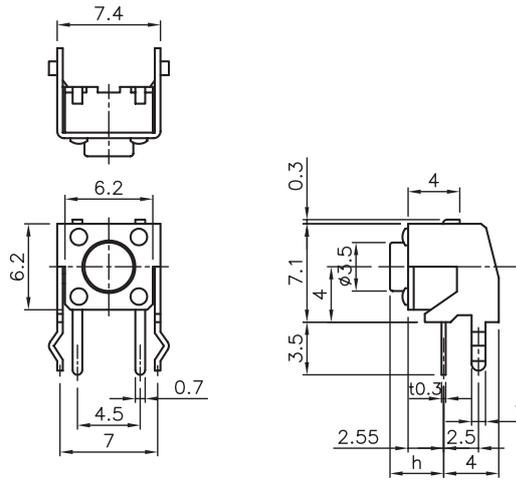
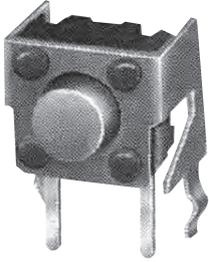
### P.C.B Layout



### Circuit Diagram



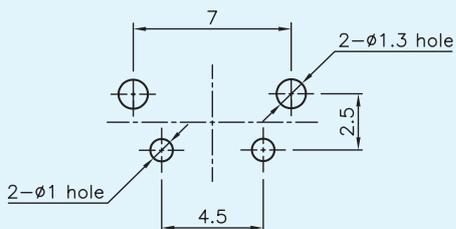
## PTH116



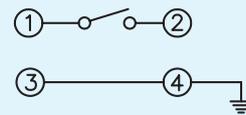
Type	h	Stem
E	3.15	
G	3.85	
H	5.85	
L	3.15	
Q	15.85	
I	6.15	

Description	Model	PTH116NE	PTH116JE	PTH116SE	PTH116HE
Operating Force (gf)		130±30	160±30	200±50	260±50
Stem Color		Black	Blue	Gray	Red
Life Cycle (min)		300,000	150,000	100,000	100,000
Rating (max)		50mA, 12V DC			
Stroke (mm)		0.25±0.1			
Contact Resistance		100 mΩ max			
Features		Economical design			
Packaging	Bulk	1,000 pcs / Bag			

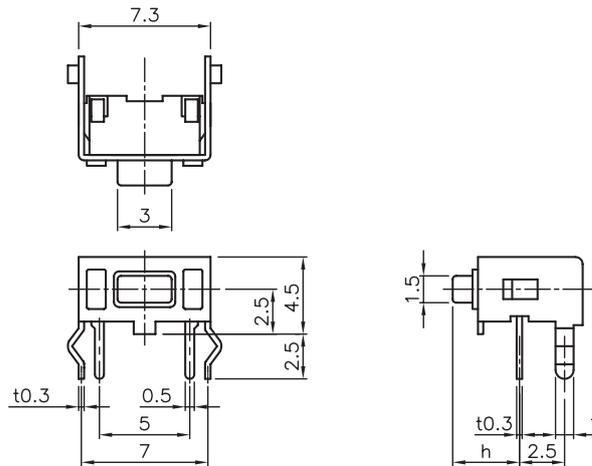
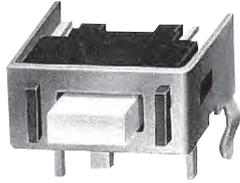
### P.C.B Layout



### Circuit Diagram



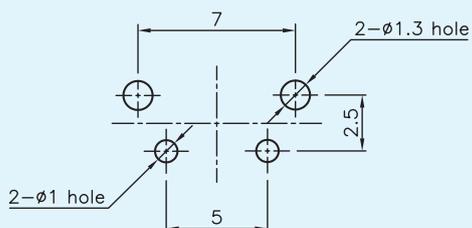
## PTH117



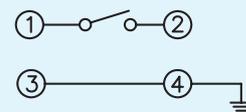
Type	h
E	3.15
F	3.72

Description	Model	PTH117NE	PTH117JE	PTH117SE	PTH117HE
Operating Force (gf)		130±30	160±30	200±50	260±50
Stem Color		Black	Blue	Gray	Red
Life Cycle (min)		50,000	50,000	30,000	30,000
Rating (max)		50mA, 12V DC			
Stroke (mm)		0.25±0.1			
Contact Resistance		100 mΩ max			
Features		Right angle, Ground			
Packaging	Bulk	1,000 pcs / Bag			

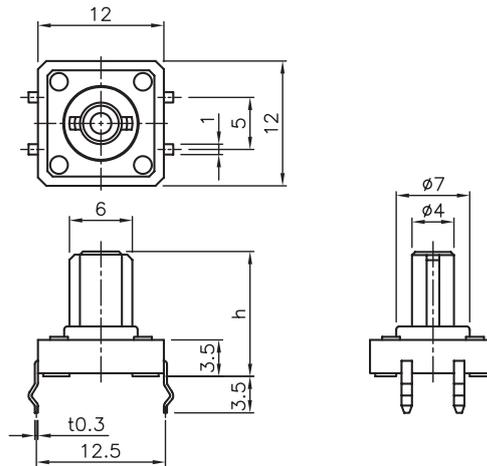
### P.C.B Layout



### Circuit Diagram



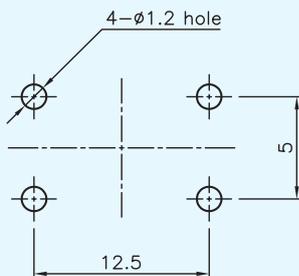
## PTM118



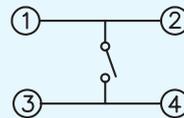
Type	h	Stem
P	12	
N	4.3	
T	7.3	
M	8.5	

Description		Model	PTM118JP	PTM118HP
Operating Force (gf)			160±30	260±50
Stem Color			Gray	Red
Life Cycle (min)			500,000	100,000
Rating (max)			50mA, 12V DC	
Stroke (mm)			0,3±0,1	
Contact Resistance			100 mΩ max	
Features			Long life, Economical design	
Packaging	Bulk		500 pcs / Bag	
	Tube		40 pcs / Tube	

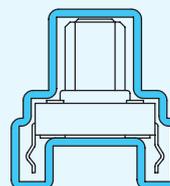
### P.C.B Layout



### Circuit Diagram



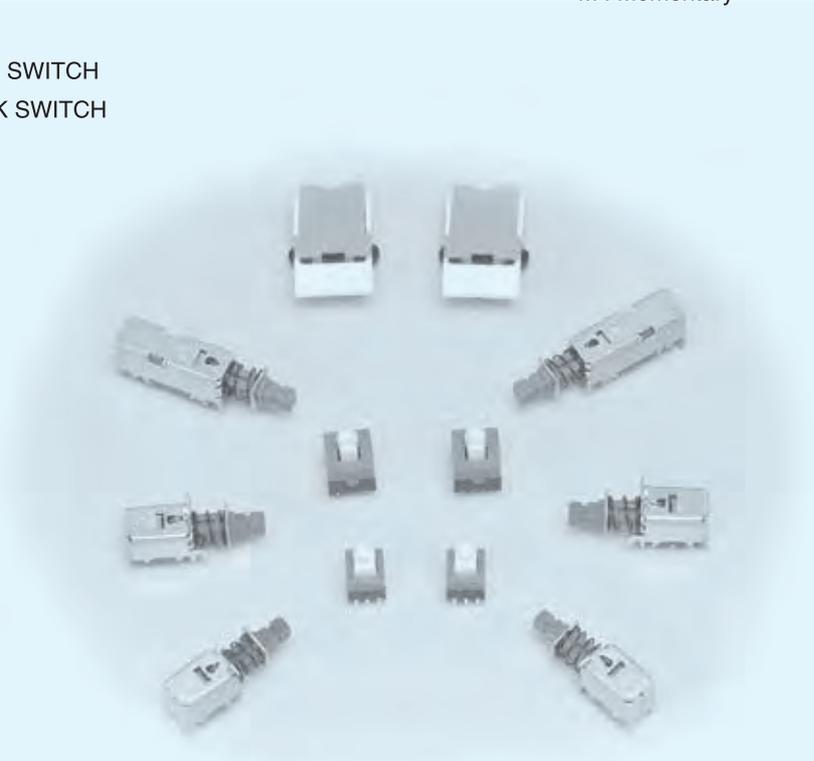
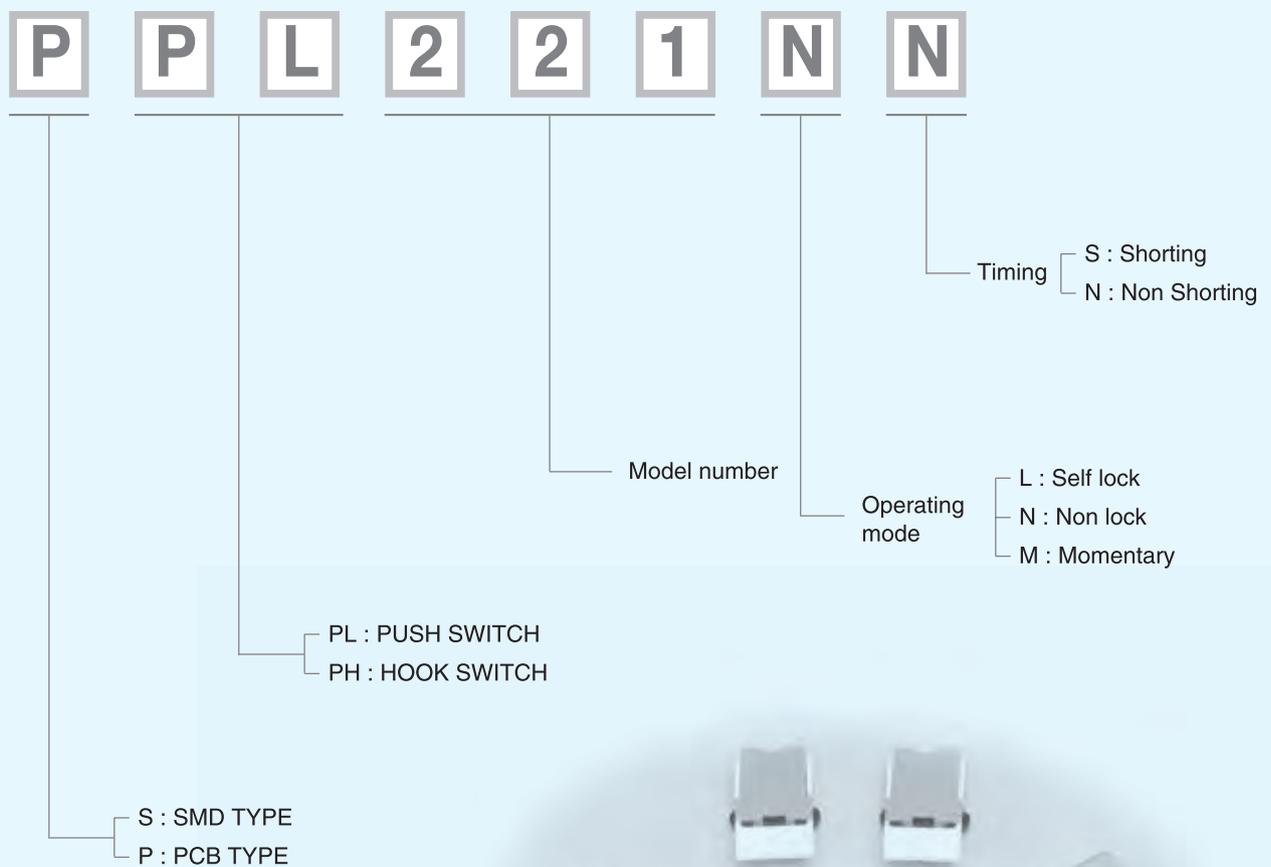
### Tube Packaging



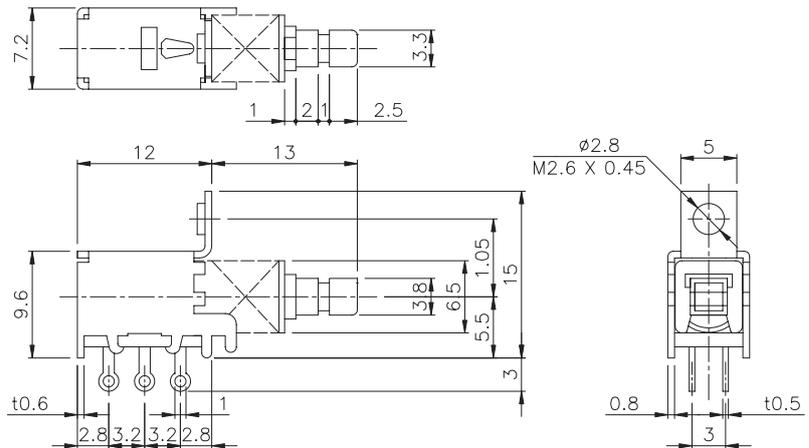
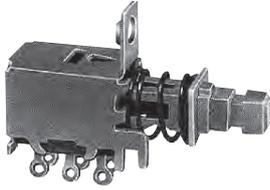
16.8×h18.2× ℓ 510



# PUSH SWITCH & HOOK SWITCH 6

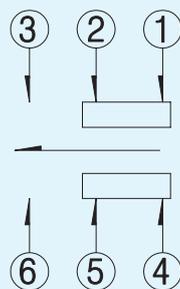


## PPL222

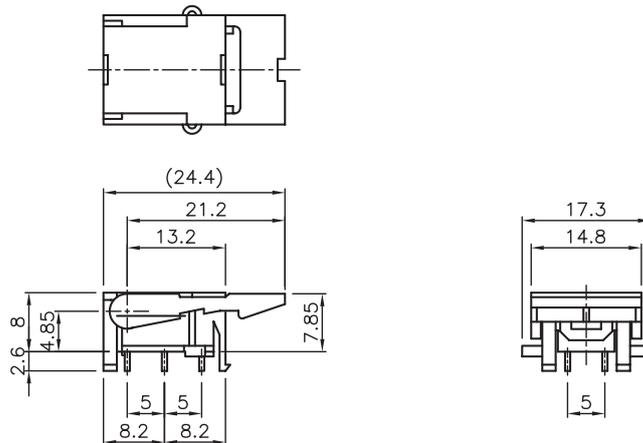


Description		Model	PPL222LN
Operating Force (gf)			300±100
Poles – Throws			2C - 2P
Life Cycle (min)			10,000
Rating (max)			0,2A, 30V DC
Stroke (mm)			Full : 3,5, Lock : 2,5
Contact Resistance			30 mΩ max
Operation Mode			Self lock, Non lock
Timing			Shorting or Non shorting
Packaging	Bulk		300 pcs / Bag

### Circuit Diagram

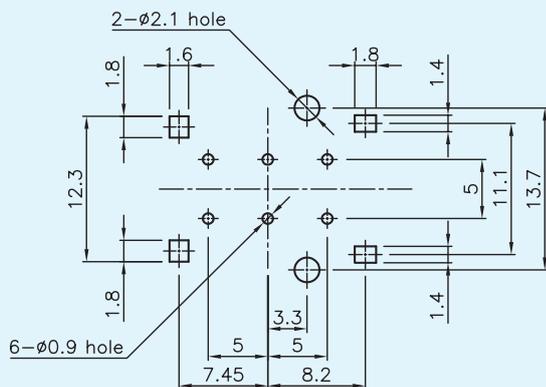


## PPH221

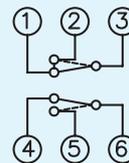


Description		Model	PPH221SS	PPH221RV
Operating Force (max)			80gf	
Operation Type			Normal	Reverse
Poles – Throws			2C - 2P	
Life Cycle (min)			300,000	
Rating (max)			0.2A, 48V DC	
Contact Resistance			50 mΩ max	
Features			Low profile	
Packaging	Bulk		150 pcs / Bag	

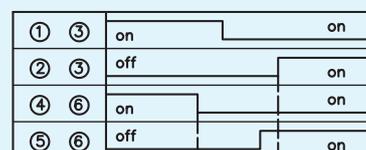
### P.C.B Layout



### Circuit Diagram



### Time Lag Diagram





# 7

## SIDE SWITCH

P S T 2 2 0 G 9

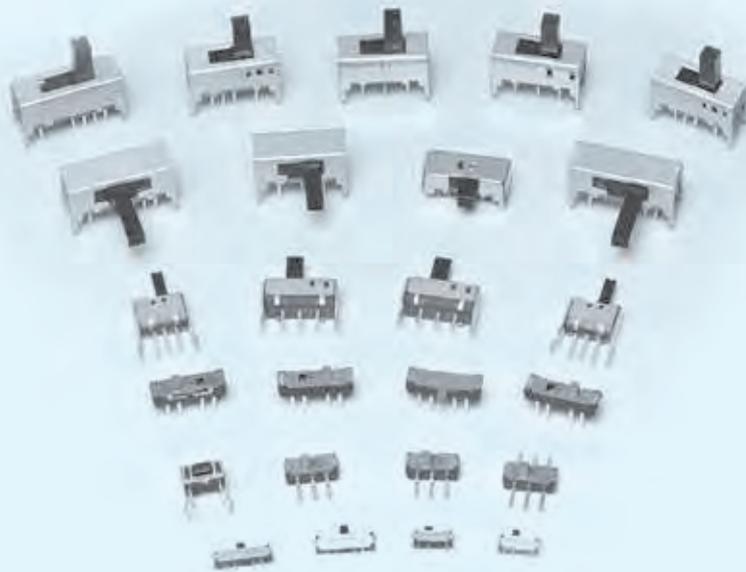
Model number

SS : Horizontal type  
ST : Vertical type

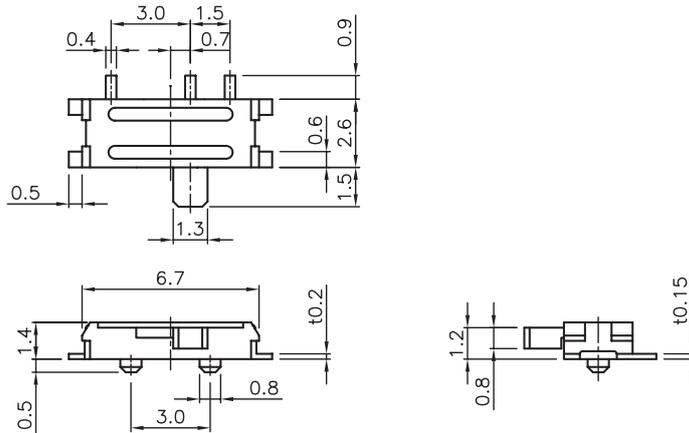
Knob  
shape &  
Length  
(mm)

- SS : standard
- G3
- G6
- G9
- GA(G12)
- V4
- V6
- FA(F7.5)

S : SMD TYPE  
P : PCB TYPE

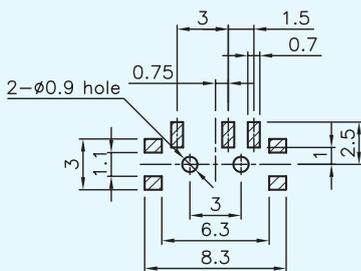


## SSS120

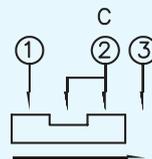


Description		Model	SSS120SS
Operating Force (gf)			150±100
Poles – Throws			1C - 2P
Life Cycle (min)			10,000
Rating (max)			0.3A, 6V DC
Stroke (mm)			1.5
Timing			Not specified
Contact Resistance			70 mΩ max
Features			Miniature side SMD, Reflow soldering, Ground
Packaging	Bulk		1,000 pcs / Bag
	Reel		3,500 pcs / Reel

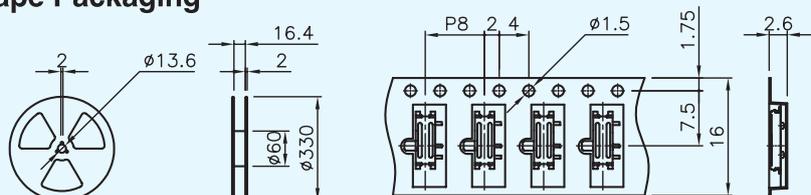
### Layout



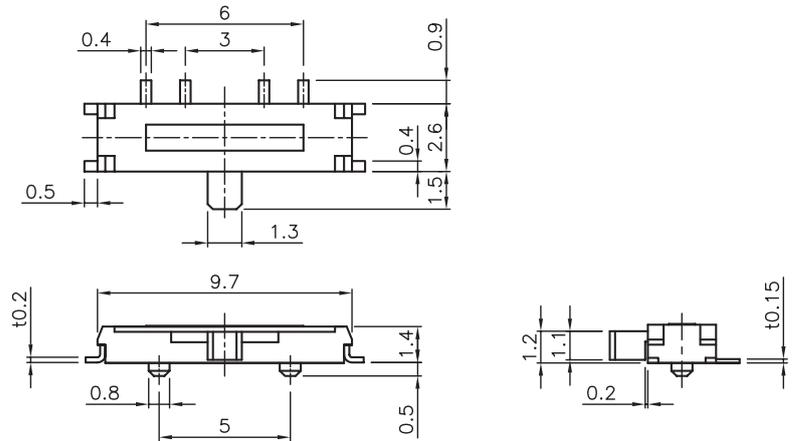
### Circuit Diagram



### Tape Packaging

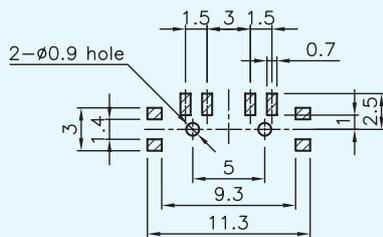


## SSS130

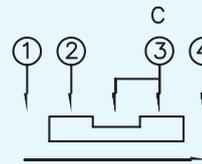


Description		Model	SSS130SS
Operating Force (gf)			Side → Center : $150 \pm 100$ , Center → Side : $200 \pm 150$
Poles – Throws			1C - 3P
Life Cycle (min)			10,000
Rating (max)			0,3A, 6V DC
Stroke (mm)			1,5 + 1,5
Timing			Not specified
Contact Resistance			70 mΩ max
Features			Miniature side SMD, Reflow soldering, Ground
Packaging	Bulk		1,000 pcs / Bag
	Reel		3,500 pcs / Reel

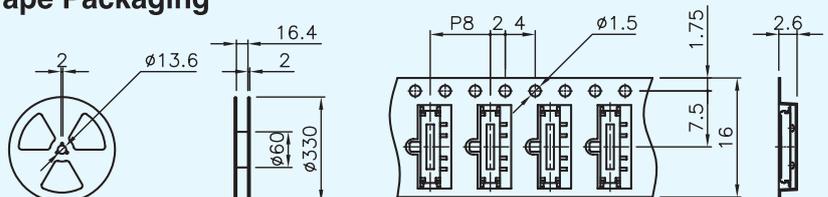
### P.C.B Layout



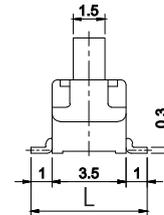
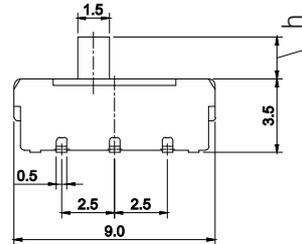
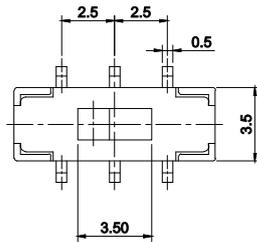
### Circuit Diagram



### Tape Packaging



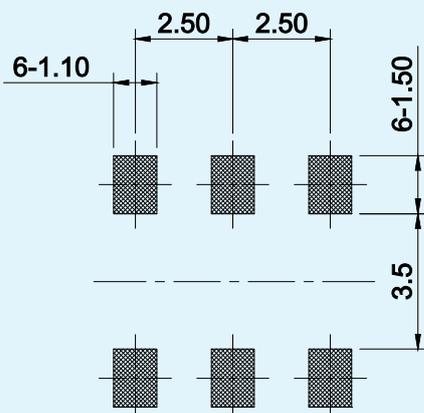
## SST235



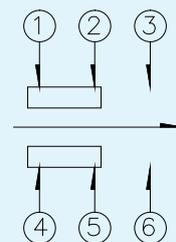
TYPE	h	TYPE	L
F2	2	-	5.5
F4	4	-1	7.5

Description		Model	SST235F2	SST235F2-1	SST235F4	SST235F4-1
Operating Force (gf)			250±150	250±150	250±150	250±150
Stem Color			White			
Life Cycle (min)			10,000			
Rating (max)			0.1A, 15V DC			
Stroke (mm)			2mm			
Contact Resistance			70 mΩ max			
Packaging	Bluk		1,000 pcs / Bag			
	Reel		1,000 pcs / Reel			

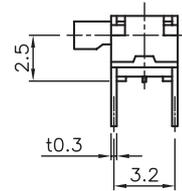
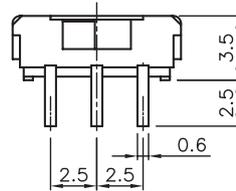
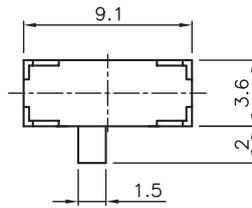
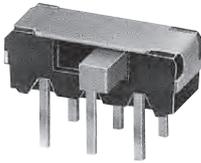
### P.C.B Layout



### Circuit Diagram

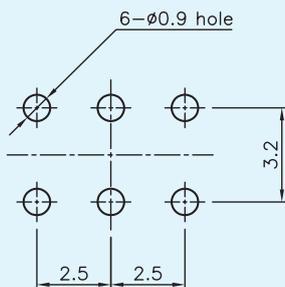


## PSS220

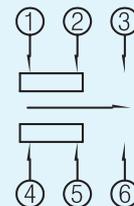


Description		Model	PSS220F2
Operating Force (gf)			250±150
Poles – Throws			2C - 2P
Life Cycle (min)			10,000
Rating (max)			0.1A, 15V DC
Stroke (mm)			2
Contact Resistance			70 mΩ max
Timing			Non shorting
Packaging	Bulk		1,000 pcs / Bag

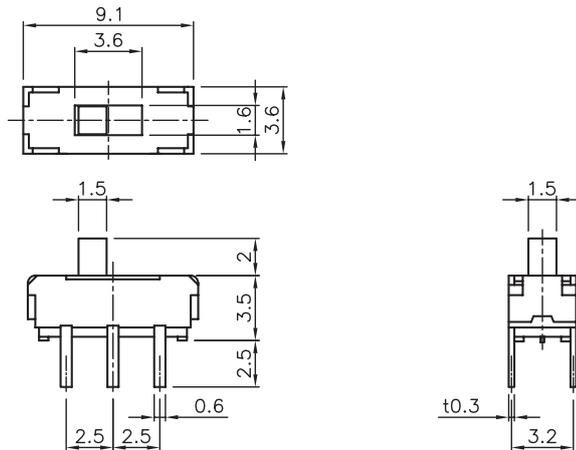
### P.C.B Layout



### Circuit Diagram

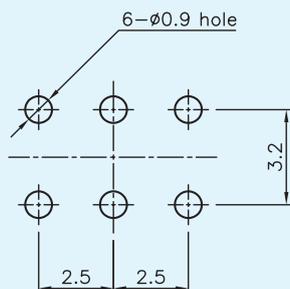


## PST220

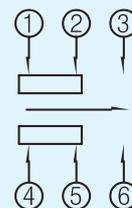


Description		Model	PST220F2
Operating Force (gf)			250±150
Poles – Throws			2C - 2P
Life Cycle (min)			10,000
Rating (max)			0.1A, 15V DC
Stroke (mm)			2
Contact Resistance			70 mΩ max
Timing			Non shorting
Packaging	Bulk		1,000 pcs / Bag

### P.C.B Layout



### Circuit Diagram





# TRS-STAR

## electronics4U

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