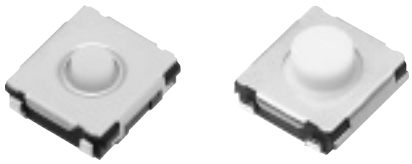
6.0 mm Square Reflow Light Touch Switches

Japan

Type: **EVQP0**
EVQQ2



■ Features

- Easy operation with push plate
- Wide product variety: With or without ground terminal, height, operating force
- Overstroke travel

■ Recommended Applications

- Control panels of home electrical appliances
- Operation switches for PC mouse

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
E	V	Q	P/Q	0/2				

Product Code — Design No.

4th & 5th	Type
P0	Overstroke travel
Q2	Short push travel

■ Specifications

Type			Snap action/Push-on type SPST	
Electrical	Rating		20 mA 15 Vdc max. (Resistive load)	
	Contact Resistance		100 mΩ max.	
	Insulation Resistance		100 MΩ min. (at 100 Vdc)	
	Dielectric Withstanding Voltage		250 Vac for 1 minute	
	Bouncing		10 ms max. (ON, OFF)	
Mechanical	Operating Force	EVQP0	0.6 N, 1.0 N	
		EVQQ2	0.5 N, 1.0 N, 1.3 N, 1.6 N, 2.6 N, 3.5 N, 5.0 N	
	Travel		Short push travel 0.25 mm, Overstroke travle 0.35 mm	
Endurance	Operating Life	EVQP0	0.6 N : 2000000 cycles min. 1.0 N : 1000000 cycles min.	
		EVQQ2	0.5 N : 2000000 cycles min. 1.0 N, 1.3 N, 1.6 N : 1000000 cycles min. 2.6 N : 200000 cycles min. 3.5 N : 100000 cycles min. 5.0 N : 30000 cycles min.	
	Operating Temperature		–20 °C to +70 °C (45 % to 85 % RH)	
	Storage Temperature		–40 °C to +85 °C (Bulk) –20 °C to +60 °C (Taping)	
Minimum Quantity/Packing Unit			H=2.0 mm	4000 pcs. Embossed Taping (Reel Pack)
			H=2.5 mm, 3.1 mm	2000 pcs. Embossed Taping (Reel Pack)
Quantity/Carton			H=2.0 mm	20000 pcs.
			H=2.5 mm, 3.1 mm	10000 pcs.

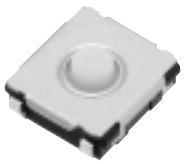
Note: Non washable

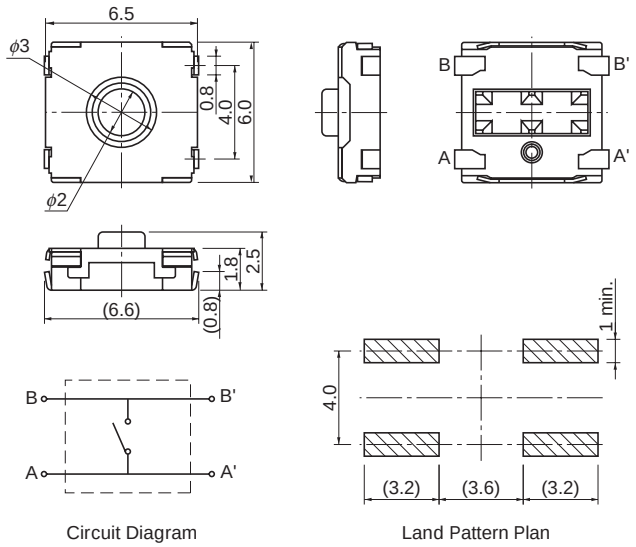
■ Dimensions in mm (not to scale)

No. 1

EVQP0

Overstroke travel : 0.35 mm
With J-bent terminals





Circuit Diagram

Land Pattern Plan

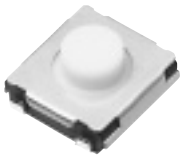
Part Numbers	Operating Force	Height	Push Plate Color	Ground Terminal	Operating Life
EVQP0N02B	0.6 N	2.5 mm	Blue	Without	2000000 cycles
EVQP0P02B	0.6 N	2.5 mm	Blue	With	2000000 cycles
EVQP0Q02Q	1.0 N	2.5 mm	Blue	Without	1000000 cycles
EVQP0S02Q	1.0 N	2.5 mm	Blue	With	1000000 cycles

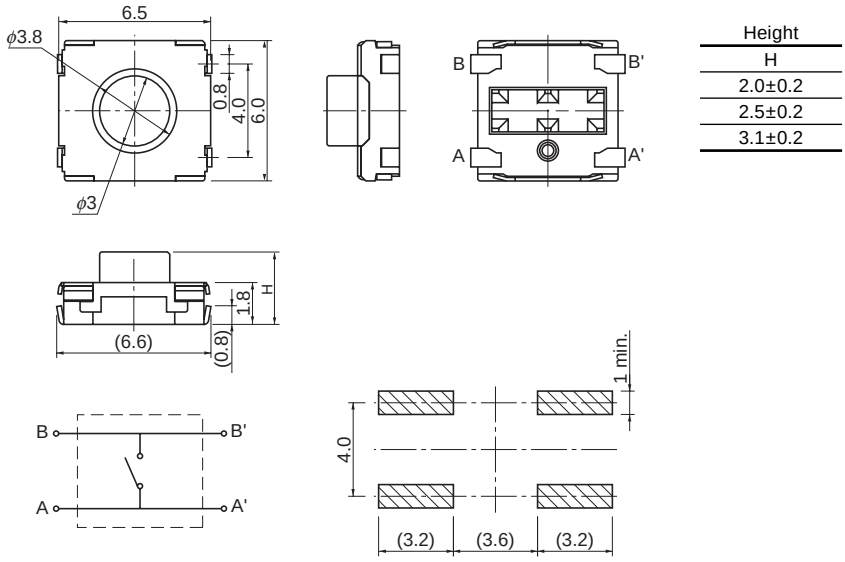
■ Dimensions in mm (not to scale)

No. 2

EVQQ2

Short push travel : 0.25 mm
With J-bent terminals





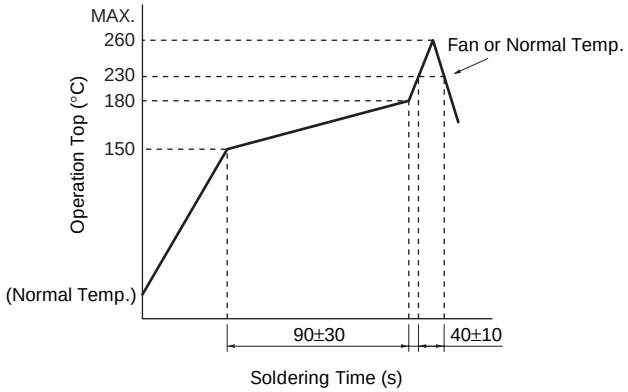
Height
H
2.0±0.2
2.5±0.2
3.1±0.2

Circuit Diagram

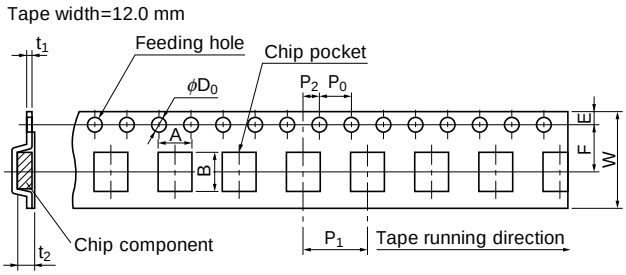
Land Pattern Plan

Part Numbers	Operating Force	H=Height	Push Plate Color	Ground Terminal	Operating Life
EVQQ2B01W	0.5 N	2.0 mm	White	Without	2000000 cycles
EVQQ2B02W	0.5 N	2.5 mm	White	Without	2000000 cycles
EVQQ2B03W	0.5 N	3.1 mm	White	Without	2000000 cycles
EVQQ2D01W	0.5 N	2.0 mm	White	With	2000000 cycles
EVQQ2D02W	0.5 N	2.5 mm	White	With	2000000 cycles
EVQQ2D03W	0.5 N	3.1 mm	White	With	2000000 cycles
EVQQ2F01W	1.0 N	2.0 mm	White	Without	1000000 cycles
EVQQ2F02W	1.0 N	2.5 mm	White	Without	1000000 cycles
EVQQ2F03W	1.0 N	3.1 mm	White	Without	1000000 cycles
EVQQ2H01W	1.0 N	2.0 mm	White	With	1000000 cycles
EVQQ2H02W	1.0 N	2.5 mm	White	With	1000000 cycles
EVQQ2H03W	1.0 N	3.1 mm	White	With	1000000 cycles
EVQQ2K01W	1.3 N	2.0 mm	White	Without	1000000 cycles
EVQQ2K02W	1.3 N	2.5 mm	White	Without	1000000 cycles
EVQQ2K03W	1.3 N	3.1 mm	White	Without	1000000 cycles
EVQQ2M01W	1.3 N	2.0 mm	White	With	1000000 cycles
EVQQ2M02W	1.3 N	2.5 mm	White	With	1000000 cycles
EVQQ2M03W	1.3 N	3.1 mm	White	With	1000000 cycles
EVQQ2P01W	1.6 N	2.0 mm	White	Without	1000000 cycles
EVQQ2P02W	1.6 N	2.5 mm	White	Without	1000000 cycles
EVQQ2P03W	1.6 N	3.1 mm	White	Without	1000000 cycles
EVQQ2S01W	1.6 N	2.0 mm	White	With	1000000 cycles
EVQQ2S02W	1.6 N	2.5 mm	White	With	1000000 cycles
EVQQ2S03W	1.6 N	3.1 mm	White	With	1000000 cycles
EVQQ2U01W	2.6 N	2.0 mm	White	Without	200000 cycles
EVQQ2U02W	2.6 N	2.5 mm	White	Without	200000 cycles
EVQQ2U03W	2.6 N	3.1 mm	White	Without	200000 cycles
EVQQ2W01W	2.6 N	2.0 mm	White	With	200000 cycles
EVQQ2W02W	2.6 N	2.5 mm	White	With	200000 cycles
EVQQ2W03W	2.6 N	3.1 mm	White	With	200000 cycles
EVQQ2Y01W	3.5 N	2.0 mm	White	Without	100000 cycles
EVQQ2Y02W	3.5 N	2.5 mm	White	Without	100000 cycles
EVQQ2Y03W	3.5 N	3.1 mm	White	Without	100000 cycles
EVQQ2201W	3.5 N	2.0 mm	White	With	100000 cycles
EVQQ2202W	3.5 N	2.5 mm	White	With	100000 cycles
EVQQ2203W	3.5 N	3.1 mm	White	With	100000 cycles

■ Recommended Reflow Soldering Conditions



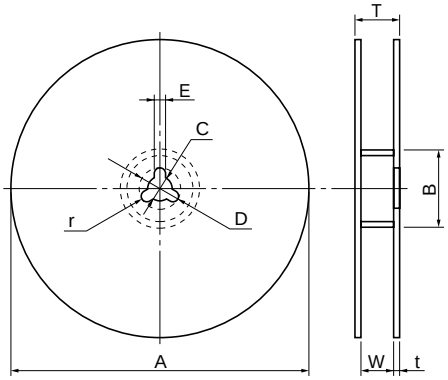
● Embossed Carrier Taping



Unit: mm

Part No.	Height	A	B	W	F	E	P1	P2	P0	D0 Dia	t1	t2
EVQP0, EVQQ2	2.0	6.7±0.2	7.5±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	$1.5^{+0.1}_{-0}$	0.30±0.05	2.2±0.2
	2.5/3.1											3.2±0.2

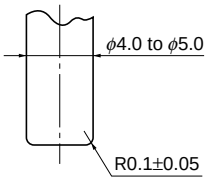
● Standard Reel Dimensions in mm (not to scale)



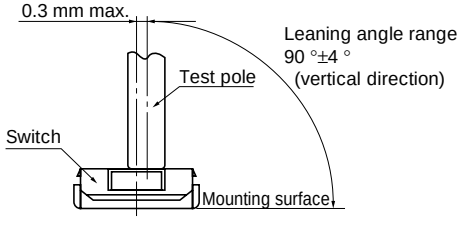
Item	A	B	C	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.2	φ21.0±0.8	2.0±0.5

Item	W	T	t	r
Rate (mm)	13.5±1.0	17.5±1.0	—	—

■ Recommended Shape of Test Pole



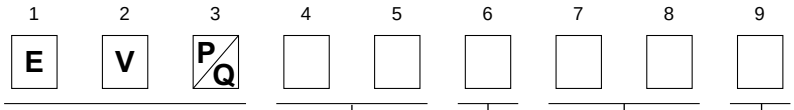
■ Recommended Operating Conditions



■ Explanation of Part Numbers

● Surface Mount Light Touch Switches

Low current momentary push-on switches for signal control in the electronic equipment



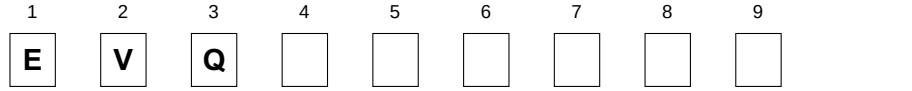
4th & 5th	Type
AA	3.5 mm×2.9 mm Square
P0, Q2	6 mm Square Reflow Soldering
P1, 9P	6 mm Square Long Travel for Reflow Soldering
P2, 3P2	4.7 mm×3.5 mm Square
P4, P8	4.7 mm×3.5 mm Square Side-operation
P6	4 mm Square Thin Surface Mount
P7	3.5 mm×2.9 mm Square Side-operation
PH, QX	2 mm Thick SMD (With Push Plate)
PL	Super Thin Surface Mount
PQ	Super Small-sized Surface Mount
PR, 3PR	Thin Double-action
PS	Side-operation Type Slim
PU	Super Small-sized Side-operation Type Surface Mount
PW	Double-action
Q0	Thin Double-action
	Double-action Side-operation Type
Q1	8 mm Square Long Travel for Reflow Soldering
QF	2 mm Thick SMD (Without Push Plate)

6th	Structure, Packing

7th, 8th	Height of the switch from mounting surface Unit : mm (02=2 mm)

9th	Color of the body (Push Plate)

● 6.0 mm×3.5 mm Square Light Touch Switches

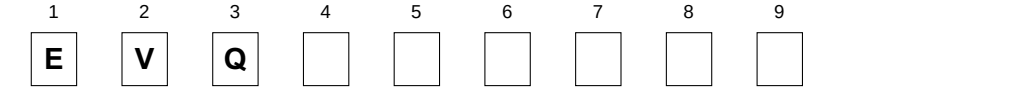


4th & 5th	Type
PE, PJ, PN, 5P	6.0 mm×3.5 mm
PP	Thin Type

7th, 8th	Height of the switch from mounting surface

9th	Push Plate Color

● Light Touch Switches



4 th & 5 th	Type
2□ P□	5N Type
11	Round Type
P0	Over Travel Type
PV	6 mm Square Long Travel for Radial Taping
QJ	8 mm Square Long Travel for Radial Taping

7 th & 8 th		Height of the switch from mounting surface
Side-operation	Top-push	
03	04	4.3 mm
04	05	5.0 mm
06	07	7.0 mm
08	09	9.5 mm

9 th	Push Plate Color

■ Common Features of Light Touch Switches

- Short push-travel, clear click operation feeling
- Low contact resistance
- Advantageous circuit design by short bouncing of less than 1 ms
- Reliable switching operation by our own metal disk spring

■ Recommended Applications

- Electronic tuning system
- Operating button (switch) of Tape recorders, Video appliances
- Transmission button (switch) of Remote controls
- Time control for Digital clocks
- Operation for Measurement instruments and Communication equipment

■ Product Consolidation

● **5 mm Square Top-push Type**

EVQQS

● **5N Top-push Type**

EVQPA/PB

● **5 mm Square Side-operation Type**

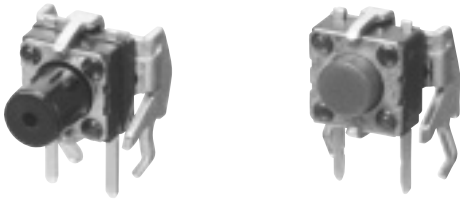
EVQQK

● **5N Side-operation Type**

EVQPF0/1/2

● **5N II Side-operation Type**

EVQPFC/D/EG

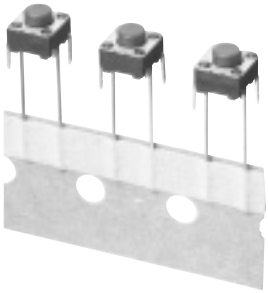


● **5N Side-operation Type**

EVQPF0/1/2

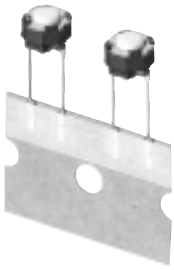
● **5N4R**

EVQQT



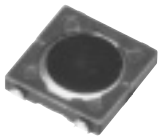
● **Round Type Radial**

EVQ11



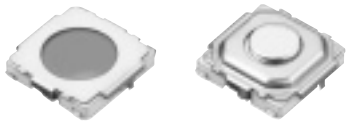
● **Thin-type, Reflow**

EVQPA1



● **Super thin type Reflow**

EVQPL

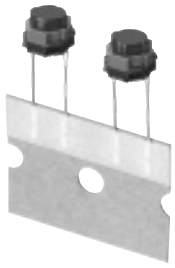


● **6 mm Square Long Travel, Bulk**

EVQPM

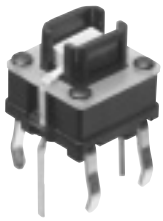
● **6 mm Square Long Travel, Radial**

EVQPV



● **6 mm Square with LED**

EVQQL1



● **5N Top-push Type**

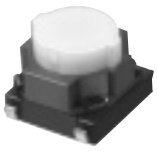
EVQPA/PB

● **6 mm Square Long Travel, Reflow**

EVQPM

● **6 mm Square Long Travel, Reflow**

EVQP1

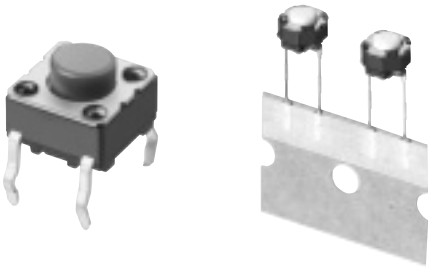


● **8 mm Square**

EVQQJ

● **5N or Round Type Radial**

EVQPA/PB/11

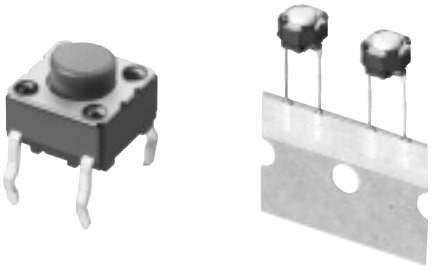


● **12 mm Square**

EVQP

● **5N or Round Type Radial**

EVQPA/PB/11



● **8 mm Square Long Travel, Side-operation**

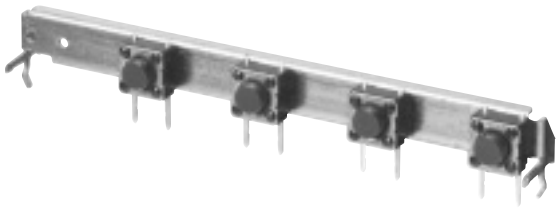
EVQQJ

● **5N Square Side-operation Type**

EVQPF0/1/2

● **Block Type**

EVQQN



● **5N Square Side-operation Type**

EVQPF0/1/2

■ Checklist Before Inquiry

When specifying Light Touch Switches, please take advantage of our standard products for better price and delivery. Please inquire about the following items before ordering.

Item				Information (Requirements)
Common	C-1	Inquiry purpose		New use, Modification, Others ( )
	C-2	Modification	Previous supplier	
			Conventional part No.	
			Purpose	
	C-3	Application	Equipment	
			Environment	Indoor/Outdoor use, Stationary/Portable set, Car installation High humidity, SO_2, NaCl
			Temperature	(°C) to (°C)
Electrical Specifications	E-1	Circuit Configurations		1-Pole, 2-Poles
	E-2	Ratings		(mA), (V dc)
Shapes/Dimensions	M-1	Operation	Operation type	· Vertical (The push plate operation is perpendicular to the printed circuit board) · Horizontal (The push plate operation is parallel to the printed circuit board)
			Mounting height	(mm) Height of the switch from mounting surface unit · Vertical (From the push plate tip to mounting serface of the printed circuit board) · Horizontal (From the push plate tip to the terminal on the push plate side)
			Operating force	(N)
			Travel	(mm)
	M-2	Anti-electrostatic		Ground Terminal: With, Without
	M-3	SMD	Terminal Type	· Reflow: Flat Terminal,J-bent Terminal
				· Flow : Straight Terminal
			Positioning	Positioning Boss: with, without
Others	L-1	Soldering	Soldering	Manual, Flow, Reflow
			Soldering Conditions	Temp.(°C), Time (s)
	L-2	Packing Unit		Polyethylene Bag (Bulk), Embossed Taping (Reel Pack), Raial Taping (Reel Pack), Stick
	L-3	Special requirements for endurance		
	L-4	Special requirements for safety		
	L-5	Other questionnaires		

Notes:
1. When selecting Switches, please consider using our standard products for better prices and short delivery times.
2. Please inform the following items when ordering.

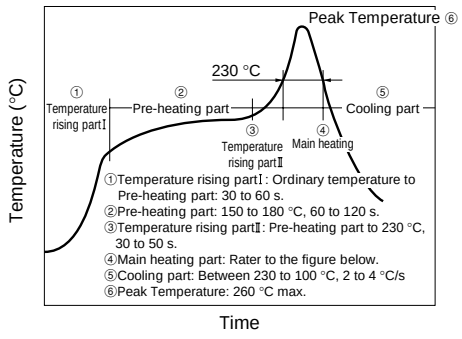
■ ⚠ Application Notes

When using our Light Touch Switches, please observe the following items ("prohibited items") and be cautious of the following in order to prevent dangerous accidents and deterioration of performance.

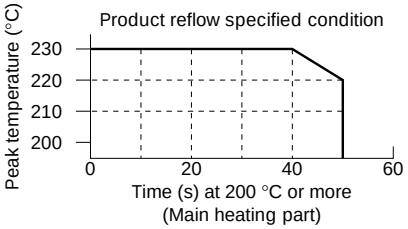
1. Notes on soldering conditions

When performing solder dipping, check the soldering conditions according to the "Product Specification for Information," because the conditions vary with the product. Do not wash the switch after solder dipping because flux may enter the switch, resulting in contact failure. Avoid use of jumper cables near the switches because flux may attach to them.

1. Control the liquid level so that flux does not enter the switch from the top.
2. When performing manual soldering, perform it at a temperature of 280 °C within 3 seconds.
3. Do not apply a load to the switch lever after soldering.
4. For reflow soldering
   When performing reflow soldering using a hot-air oven or an infrared oven, observe the following conditions. Since the temperature applied to a switch and its terminals varies with the type and size of the PWB and the mounting density of the parts, sufficiently check the conditions in advance.
5. When a board with double-sided through holes is used, do not make through holes immediately under the switch case. Otherwise, the switch case may fuse.



Notes:
- Measure temperature profile at the part surface.
- Do not perform reflow soldering more than twice.



2. Notes on design of a set

1. For switch mounting holes, refer to the "Recommended PWB piercing plan" as described in "Dimensions."
2. For shapes of operating parts in a set, refer to recommended shapes described in "Product Specifications for Information."

3. Other prohibited items and notes

1. Take care not to apply excessive load to a switch. Doing so may cause terminal deformation, contact failure, and/or malfunction.
2. Sufficiently check any generation of corrosive gas from the components in a set under actual operating conditions. Corrosive gas may cause contact failure and corrosive stress cracking of metal.
3. To prevent contact failure due to foreign matter (such as chips of a PWB and flux) entering a switch, take care when handling a PWB after mounting. Do not stack the PWB's.

4. Prohibited items and notes on storage conditions

Do not store the switches under high temperatures and/or high humidity, or in a location where corrosive gas may be generated. Store the switches at room temperature and room humidity in a packed condition. Use them within a maximum of 6 months after delivery. Check the date of manufacture on the package box and apply the "first-in-first-out" rule. If unpacked switches must be stored as inventory, store them in a polyethylene bag to keep out air.

5. Prohibited items on fire and smoking

1. Absolutely avoid use of a switch beyond its rated range because doing so may cause a fire.
   If misuse or abnormal use may result in conditions in which the switch is used out of its rated range, take proper measures such as current interruption using a protective circuit.
2. The grade of nonflammability for resin used in Light Touch Switches is "94HB", which is based on UL94 Standards (flammability test for plastic materials). Prohibit use in a location where a spreading fire may be generated or prepare against a spreading fire.

6. For use in equipment for which safety requested

Although care is taken to ensure switch quality, variation of contact resistance (increase), short circuits, open circuits, and temperature rise are some problems that might be generated.
To design a set which places maximum emphasis on safety, review the affect of any single fault of a switch in advance and perform virtually fail-safe design to ensure maximum safety by:

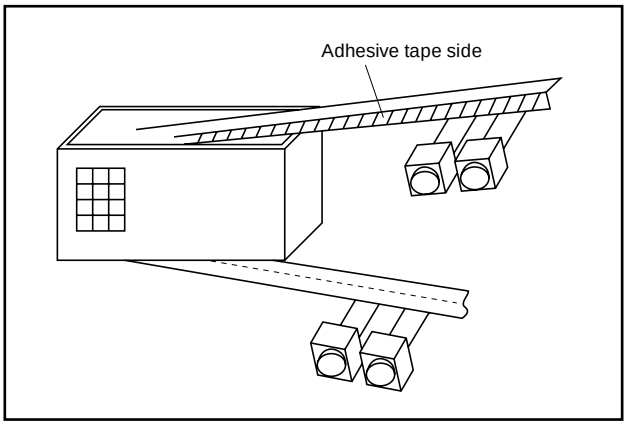
1. preparing a protective circuit or a protective device to improve system safety, and
2. preparing a redundant circuit to improve system safety so that the single fault of a switch does not cause a dangerous situation.

7. For actual use, be sure to refer to "Product Specifications for Information."

■ Common Specifications

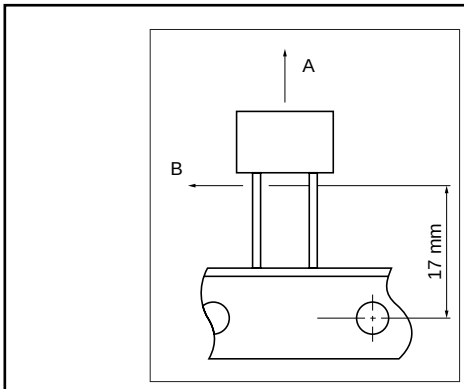
■ Packaging Methods for Radial Taping

● Drawing-out of taped products



Drawing-out can be done from top or bottom of an inner carton.

● Pull-strength of taped products



- Taped products shall not be fully drawn-out from the tape when pulling in direction A at 5.0 N max.
- Taped products shall not be drawn-out from the tape when pulling in direction B at 1.0 N for 3 seconds.

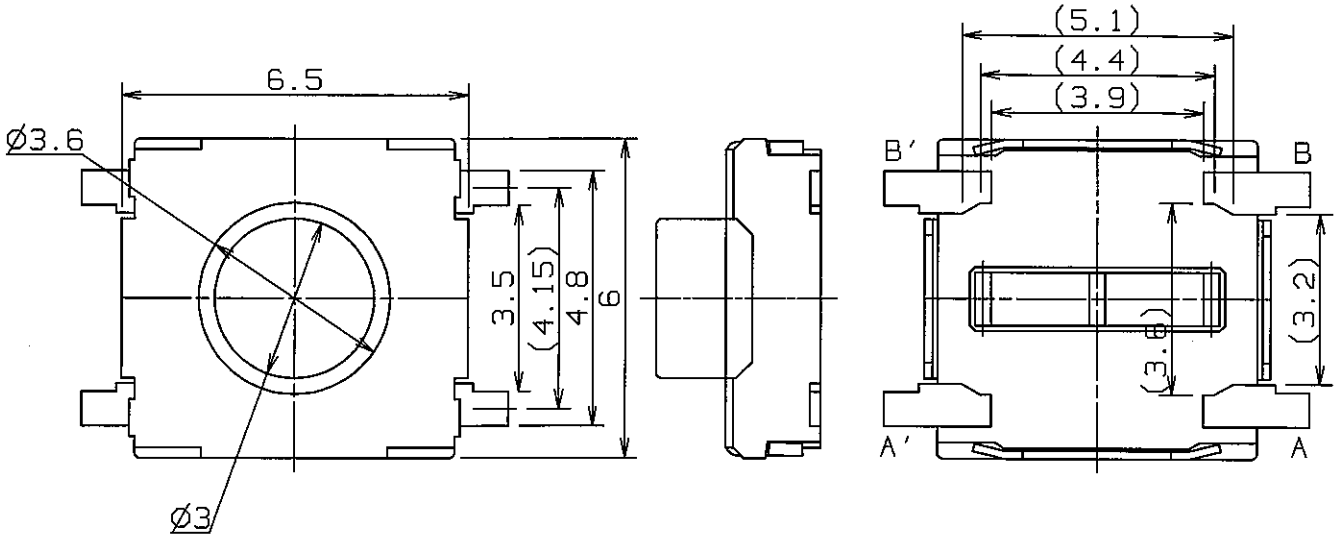
■ Minimum Quantity/Packing Unit

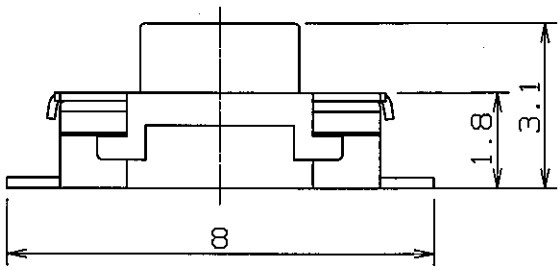
Please place an order by an integer multiple of the Quantity/Carton.

Product Item (Series, Type)		Part No.	Packaging	Quantity/Carton	Min. Q'ty Packing Unit	Notes
4 mm Square Thin SMD		EVQP6	Embossed Taping (Reel Pack)	50000 pcs.	10000 pcs.	
Super Small-sized SMD		EVQPQ		50000 pcs.	10000 pcs.	
Super Thin SMD		EVQPL		25000 pcs.	5000 pcs.	
2 mm Thick SMD without Push Plate		EVQQF		20000 pcs.	4000 pcs.	
2 mm Thick SMD with Push Plate		EVQPH		10000 pcs.	2000 pcs.	
		EVQQX		10000 pcs.	2000 pcs.	H=3.1mm, 2.5 mm
		EVQQX□01W		20000 pcs.	4000 pcs.	H=2.0mm
3.5 mm×2.9 mm Square		EVPAA		25000 pcs.	5000 pcs.	
3.5 mm×2.9 mm Square Side-operation Type		EVQP7		25000 pcs.	5000 pcs.	
Super Small-sized Side-operation Type SMD		EVQPU		20000 pcs.	4000 pcs.	
4.7 mm×3.5 mm Square		EVQP2/EVQ3P2		20000 pcs.	4000 pcs.	
4.7 mm×3.5 mm Square Side-operation Type		EVQP4/P8		12500 pcs.	2500 pcs.	
6.0 mm×3.5 mm Square		EVQPE1/PN/5P	Embossed Taping (Reel Pack)	10000 pcs.	2000 pcs.	H=5.0 mm
				12500 pcs.	2500 pcs.	H=4.3 mm
		EVQPE	Polyethylene Bag (Bulk)	10000 pcs.	1000 pcs.	
		EVQPJG/H/J	Radial Taping (Reel Pack)	20000 pcs.	2000 pcs.	
6.0 mm×3.5 mm Square Thin type		EVQPP	Embossed Taping (Reel Pack)	20000 pcs.	4000 pcs.	
Side-operation Type Slim		EVQPS		16000 pcs.	4000 pcs.	
5N Type		EVQPA EVQPB EVQPF	Polyethylene Bag (Bulk)	10000 pcs.	500 pcs.	
		EVQ2	Radial Taping (Reel Pack)	10000 pcs.	1000 pcs.	
		EVQPC		7000 pcs.	700 pcs.	
Round Type		EVQ11		25000 pcs.	2500 pcs.	
6 mm Square Reflow		EVQP0	Embossed Taping (Reel Pack)	20000 pcs.	4000 pcs.	H=2.0 mm
		EVQQ2		10000 pcs.	2000 pcs.	H=2.5 mm, 3.1 mm
Over Travel		EVQP0	Polyethylene Bag (Bulk)	10000 pcs.	500 pcs.	
Thin Double-action		EVQPR/EVQQ0/EVQ3PR	Embossed Taping (Reel Pack)	25000 pcs.	5000 pcs.	
Double-action		EVQPW	Polyethylene Bag (Bulk)	10000 pcs.	1000 pcs.	
			Embossed Taping (Reel Pack)	25000 pcs.	5000 pcs.	
Double-action Side-operation Type		EVQQ0		12500 pcs.	2500 pcs.	
6 mm Square Long Travel	Radial	EVQPV	Radial Taping (Reel Pack)	25000 pcs.	2500 pcs.	
	Reflow	EVQP1/9P	Embossed Taping (Reel Pack)	10000 pcs.	2000 pcs.	
8 mm Square Long Travel	Radial	EVQQJ	Radial Taping (Reel Pack)	10000 pcs.	1000 pcs.	
	Reflow	EVQQ1	Embossed Taping (Reel Pack)	10000 pcs.	1000 pcs.	

THIRD ANGLE PROJECTION | ALL DIMENSIONS ARE IN MILLIMETERS. | DO NOT SCALE DRAWING

General dimension toleranace : ±0.2

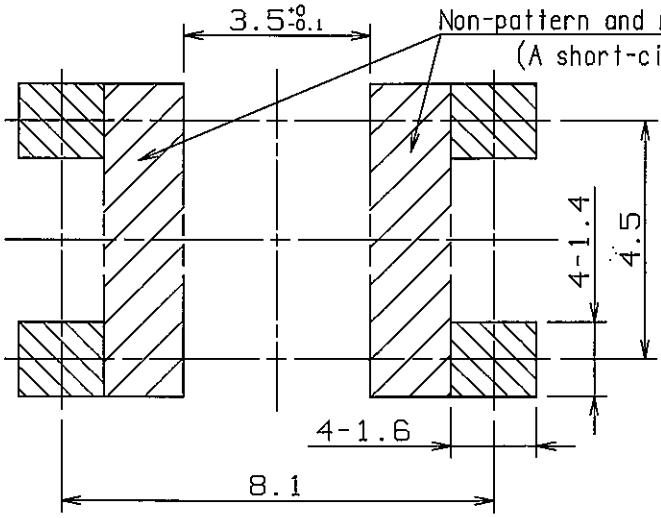




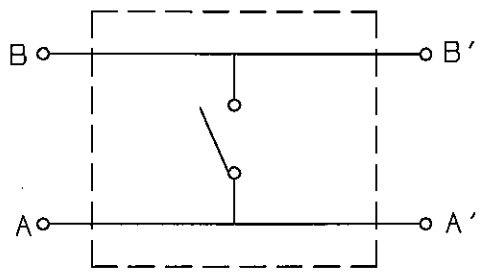
Knob color : WHITE

Piece weight : *.**g

Solder thickness : t=0.15±0.03



Land Pattern Plan



Circuit Diagram

DESIN	M.Takeuchi	Jul.23.2004	NAME			
DRAW	M.Takeuchi	Jul.23.2004	LIGHT TOUCH SWITCH	ISSUE	REVISIONS	DATE
CHECK			TYPE NO.	DRAWING NO.		
APPROVAL	M.Watanabe	Jul.23.'04	EVQ Q23 03W	RV-H-		

Tsuyama Matsushita Electric Co.,Ltd.