Panasonic

CATALOG

Switches
Potentiometers
Encoders



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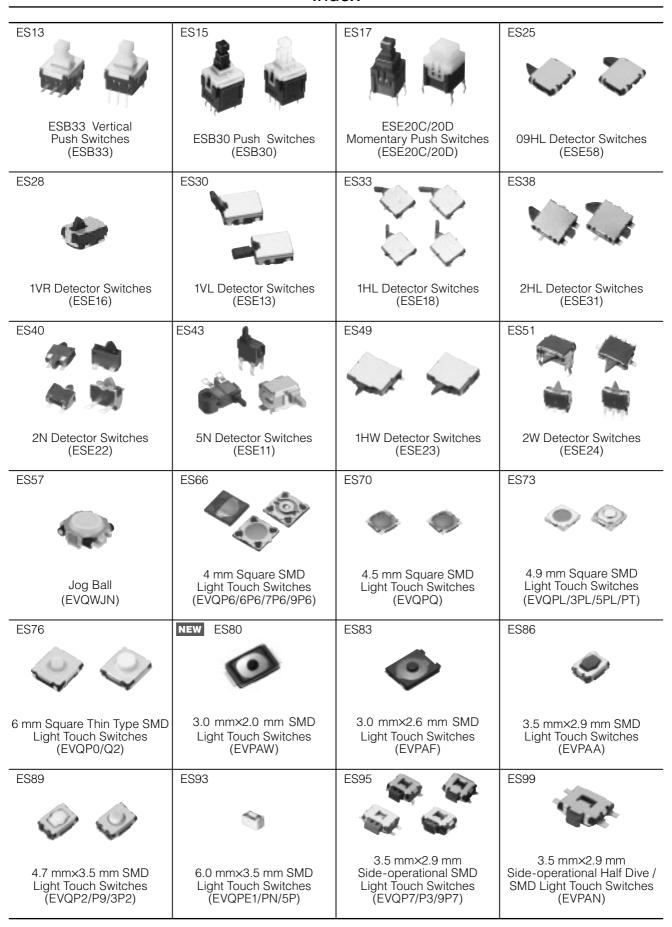
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	4 mm Square SMD Light Touch Switches	EVQP6/6P6/7P6/9P6	ES66			
	4.5 mm Square SMD Light Touch Switches	EVQPQ	ES70			
	4.9 mm Square SMD Light Touch Switches	EVQPL/3PL/5PL/PT	ES73			
	6 mm Square Thin Type SMD Light Touch Switches	EVQP0/Q2	ES76			
	3.0 mmx2.0 mm SMD Light Touch Switches	EVPAW	ES80			
	3.0 mm×2.6 mm SMD Light Touch Switches	EVPAF	ES83			
	3.5 mm×2.9 mm SMD Light Touch Switches	EVPAA	ES86			
	4.7 mm×3.5 mm SMD Light Touch Switches	EVQP2/P9/3P2	ES89			
	6.0 mm×3.5 mm SMD Light Touch Switches	EVQPE1/PN/5P	ES93			
	3.5 mm×2.9 mm Side-operational SMD Light Touch Switches	EVQP7/P3/9P7	ES95			
	3.5 mmx2.9 mm Side-operational Half Dive / SMD Light Touch Switches	EVPAN	ES99			
	Small-sized Side-operational SMD Light Touch Switches	EVQPU	ES102			
	2.8 mmx2.3 mm Side-operational Edge Mount Light Touch Switches	EVPAV	ES106			
	4.5 mmx2.2 mm Side-operational Edge Mount Light Touch Switches	EVPAE	ES108			
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	6.0 mmx3.5 mm Light Touch Switches	EVQPE	ES128			
	6.0 mm×3.5 mm 2R Light Touch Switches	EVQPJ	ES130			
	Over Travel Light Touch Switches	EVQP0	ES132			
	4 mm Square Double-action SMD Light Touch Switches	EVPAH	ES134			
	6 mm Square Thin Type Double-actionI SMD Light Touch Switches	EVQPR/Q0/3PR	ES137			
	4.7 mmx3.5 mm Double-action Side-operational SMD Light Touch Switches	EVPAJ	ES140			
	6.2 mmx3.7 mm Double-action Side-operational Edge Mount / SMD Light Touch Switches	EVQQ0	ES143			
	6 mm Square Long Travel SMD Light Touch Switches	EVQP0/P1/9P	ES146			
	6 mm Square Long Travel 2 terminals SMD Light Touch Switches	EVPAS	ES149			
	6 mm Square Long Travel 2R Light Touch Switches	EVQPV	ES152			
	8 mm Square Long Travel SMD Light Touch Switches	EVQQ1	ES154			
	8 mm Square Long Travel 2R Light Touch Switches	EVQQJ	ES156			
	10 mm Square Center Space Long Travel SMD Light Touch Switches	EVPAD	ES158			

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■ Glossary of Words and Terms

Rating

Maximum working voltage and current of switches

Contact resistance

Resistance value of contact position, included specific resistance of material and usually measured by voltage drop at 1 A 5 Vdc.

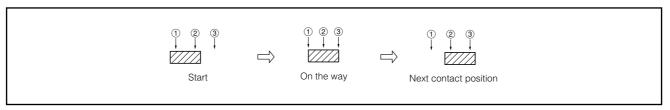
Switching timing

Two timing modes: shorting and non-shorting.

The change-over sequence of each circuit for two or more circuits is expressed by this timing.

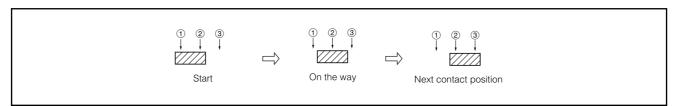
1 Shorting

Common terminals are connected with the other one or more terminals when switching.



2 Non-shorting

Common terminals are connected with none of the other terminals.



■ RoHS Directive

RoHS Directive: The restriction of the use of certain hazardous substances in electrical and electronic equipment

The products introduced in this catalog conform to the RoHS Directive* (enforced in July 2006).

(Newly ordered products will conform to the RoHS Directive.)

Please contact our sales staff for inquiries about the RoHS compliance of currently used products.

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■ Quick Selection Guide

		Lock Travel				Poles			
Type, Series	Country of origin	1.5 mm	2.45 mm	2.5 mm	2.8 mm	Term. Pitch (mm)	1	2	Page
ESB33 Vertical Push Switches (H=6.0)	China	0				2.5		0	ES13
ESB30 Push Switches (H=12.5)	Japan			0		2.5		0	ES15
ESE20C/20D Momentary Push Switches (H=8.9)	China					6.0×8.0	0		ES17

Country of origin: As of April 2013

■ Checklist Before Inquiry

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

Item			Information (Requirements)	
	C-1	Inquiry purpo	se	New use, Modification, Others (
			Previous supplier	
_	C-2	Modification	Conventional part No.	
Common			Purpose	
ŏ			Equipment	
	C-3	Application	Environment	Indoor/Outdoor use, Stationary/Portable set, High humidity, SO2, NaCl
			Temperature	(°C) to (°C)
		Ratin	g	0.1 A 12 Vdc, 0.1 A 24 Vdc, 0.2 A 24 Vdc, 0.3 A 30 Vdc, 1.0 A 30 Vdc
	M-1	Operation	Operation type	Vertical, Horizontal
	101-1	Орегалоп	Operating force	When specially requested (N)
			Number of poles	1-pole, 2-pole
SU	M-2	Circuit Diagram	Number of contacts	1-contact, 2-contact
ensio			Switching mode (timing)	Not requested, Non-shorting (NS)
Shapes/Dimensions	M-3	Travel	Lock travel	0.8 mm, 1.3 mm, 1.5 mm, 2.4 mm, 2.5 mm, 2.8 mm
hapes	IVI O	Haver	Full travel	1.5 mm, 2.0 mm, 2.3 mm, 2.5 mm, 3.2 mm, 3.5 mm, 4.5 mm
$\overline{\mathbf{o}}$	M-4	Terminals	Shape	PWB, Forming shape: ()
	141 -	reminais	Pitch	2.0 mm, 5.0 mm
	M-5	Lever	Top dimensions	Width (mm) × Height (mm) × Length (mm)
	101 0	Lovoi	Material	UL filed (Flame retardant: 94HB, 94V-0)
	L-1	Anti-electrostatic		When specially requested ()
S	L-2	Soldering conditions		Temp. (°C), Time (s), Specific gravity of flux (), Preheat condition ()
Others	L-3	Special requirements for endurance		
J	L-4	Special requi	rements for safety	
	L-5	Other question	nnaires	-

^{1.}When you specify custom types (custom-made), new tooling and jigs, and/or equipment may be required. It will be necessary to confirm your estimates of quantity and development schedule as accurately as possible.

2. Please inform us if you designate your own part number.

■ ⚠ Application Notes

When using our Push 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. Prohibited items and notes on mounting

- 1. When soldering (including preheating), do not solder in the locked condition.
- When soldering using a soldering iron, soldering conditions vary with the tip shape of the soldering iron, wattage, and PWB thickness. Thoroughly check the conditions in advance, including the heat resistance rating of the solder.
- 3. Do not apply a load to terminals when soldering. Care should be taken in this regard because a load may deteriorate electric and mechanical characteristics.
- 4. Since the push switches are not sealed, do not wash them.
- When mounting a push switch to a through-hole type PWB, the influence of thermal stress on the switch is greater than that on one-sided PWB. Be sure to check the influence as well as the heat resistance rating of the solder.

2. Notes on circuit conditions

- To ensure reliability, use switches within the rated range, as designated in "Product Specifications for Information."
- To avoid malfunction of a set due to bounce generated by turning the switch ON and OFF, and/or due to chatter generated by external vibrations, etc., take the following into consideration in design.
 - Read contact multiple times.
 (In Case of microcomputer Processing)
 - Set a delay time. (Recommendation: 3 or more times of reading with the cycle of 3 ms or over)
 - Prepare a CR integrating circuit. (Recommendation: A time constant of 6 ms or over)
- 3. When circuits of a two-circuit type are connected in parallel, switching timing (non-shorting, etc.) described in the specifications is not assured.

3. Prohibited items and notes on mounting and operating conditions

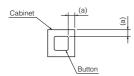
1. In principle, operate the center of the lever.



- 2. For mounting an operation button:
 - 1) Design so that the button is mounted to the center of the lever.



2) Design a set so that the gap (a) between the cabinet and the button is as small as possible. (a)=0.1 to 0.3 mm

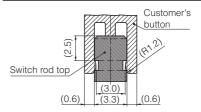


- 3) Design so that the load in removal and mounting of the button is within the range of the switch's strength rating of the operational part.
- 3. If multiple switches are placed side by side, or a switch is placed near another part, the gap between the switch and the adjacent switch/part must be at least 1mm to prevent affect of flux and to ensure proper insulation distance.

- 4. Design and use so that external stress is not continuously applied to the soldering parts in a set. External stress
- may cause pattern peeling and solder cracks on a PWB. 5. When mounting a switch, check the ON/OFF position.
- 6. Contact lubricant, which is used in push switches, may flow out to the exterior of the switch due to the structure. For design review, sufficiently check the operating conditions.
- Do not pull the switch rod while it is locked. Otherwise, the self-locking function may be broken, resulting in a locking failure or malfunction. Make sure that the switch is released especially when attaching/detaching a button to the rod and assembling/disassembling the target product. (This applies to the self-locking switches) Set the strength for detaching your button (knob) from our switch rod to a maximum of 10 N in order to minimize the possibility of a breakdown of the locking function. When designing your button, refer to the following shape and dimensions.

Before adopting our switches, check the requirements carefully.

Reference of Customer's button design



- 8. Design to avoid operation with continuous lateral pressure (more than 500 mN on the lever).

 9. Do not mount a switch by bending switch terminals.
- 10. Avoid the following ambient surroundings and other conditions because they may affect performance: ●Under an atmosphere of corrosive gas such as Cl₂, H₂S, NO₃, or SO₂

 - In atmospheres of residual water drops, dew condensation, or adhesive water drops
 - In liquids such as water, salt solution, oil, chemicals, and organic solvents
 - In direct sunlight
 - In dusty locations
- 11. Do not apply a shock to the switch lever during mounting of the switch on the printed circuit board and installation in the target product.

4. Prohibited items and notes on storage conditions

Since contact characteristics and soldering quality may deteriorate due to sulfuration and oxidation of contacts and terminals, pay heed to the following items.

- 1. For storage and transport of the switches, avoid unpacking them, and store them at room temperature and room humidity. Use them as soon as possible, generally within 3 months, or within a maximum of
- 6 months after delivery.
 2. Do not store the switches under conditions of high temperature and/or high humidity, or in a location where corrosive gas may be generated.
- If some units remain after unpacking, store them after applying adequate moisture-proof and gas-proof treatment.

5. 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:

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

■ Common Specifications(Standard)

Mechanical	Lever Strength	To withstand 80 N push	force applied in operating	direction for 15 seconds			
Specifications	Terminal Strength	To withstand 5 N push force applied on the end of terminal in any direction for 1 minute without damage and/or loosening					
	Voltage drop	0.1 V max. between terminals after 4 or 5 switching operations under the rated load					
Electrical Specifications	Insulation Resistance		nd Terminal to Frame: 100 insulation resistance during	,			
	Dielectric Withstanding Voltage	Terminal to Termina	I and Terminal to Frame: 50	00 Vac for 1 minute			
	Temperature Range	_	-10 °C to +70 °C (Standard)			
	Heat Resistance	+70 °C for 96 hours (Standard)					
	Low Temperature Resistance	-10 °C for 96 hours (Standard)					
	Humidity Resistance	40 °C, 90 % to 95 % RH for 96 hours					
Environmental Specifications	Non-loaded Life	Number of operations : 10000 cycles	Voltage drop : 0.5V max. (Voltage drop : 0.2V max. (
			T				
			No. of operations	Voltage drop			
	Loaded Life	ESB33	30000 cycles	0.5 V max.			
		ESB30	30000 cycles	0.2 V max			
		ESE20	30000 cycles	0.2 V max.			

■ Minimum Quantity/Packing Unit

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

Type, Series	Part No.	Packaging	Quantity/Carton (Export)	Min. Q'ty/ Packing Unit
ESB33 Vertical Push Switches	ESB33□□□	Polyethylene Bag (Bulk)	2000 pcs. (8000 pcs.)	100 pcs.
ESB33 Vertical Push Switches	ESBSSLILL	Embossed Taping (Reel Pack)	1800 pcs. (7200 pcs.)	300 pcs.
ESB30 Push Switches	ESB30 🗆 🗆 🗆	Tray Pack	2400 pcs. (9600 pcs.)	480 pcs.
ESE20C/20D Momentary Push Switches	ESE20□□□□	Polyethylene Bag (Bulk)	1200 pcs. (4800 pcs.)	60 pcs.

ESB33 Vertical Push Switches

Type: **ESB33 (H=6.0 mm)**

■ Features

- Low profile (H=6.0 mm)
- 3 N and 5 N operating force availables

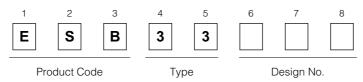
■ Recommended Applications

- Operation switches for automobiles (heater control switches etc.)
- Secondary power switches for lower voltage in consumer electronic equipment and different types of mode switches





■ Explanation of Part Numbers



■ Specifications

Rating	50 μA 3 Vdc to 0.2 A 14 Vdc (Resistive load)	
Travel	Lock travel=1.5 mm Full travel=2.3 mm	
Mounting Height	6.0 mm	
Poles and Throws	2-poles 2-throws	
Operating Mode	Self-lock, Non-lock	
Switching Mode	Non-shorting	
Minimum Quantity/Packing Unit	100 pcs. Polyethylene Bag (Bulk) / 300 pcs. Embossed Taping (Reel Pack)	
Quantity/Carton	2000 pcs. Polyethylene Bag (Bulk) / 1800 pcs. Embossed Taping (Reel Pack)	

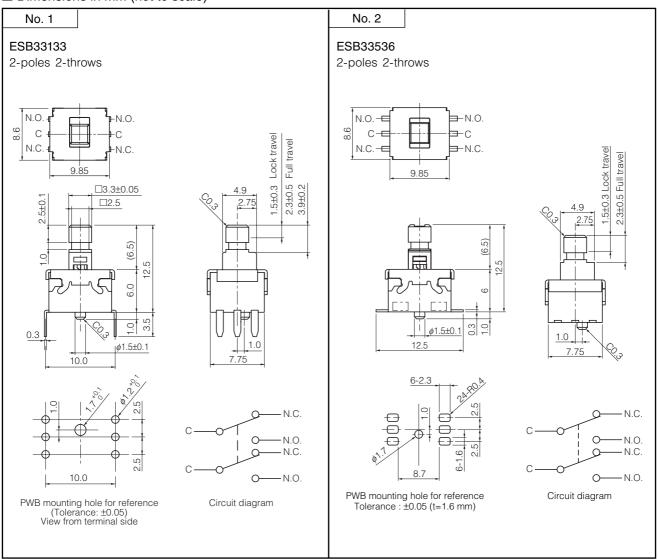
■ Standard Products

Operating Mode	Terminals	Packaging	Operating Force	Part Numbers	Lever Color
PP	Wave	Polyethylene Bag	20 N. 10 N	ESB33133	Light Vallous
NL	Soldering	(Bulk)	3.0 N±1.0 N	ESB33134	Light Yellow
PP	Surface	Embossed Taping	3.0 N±1.0 N	ESB33535	Light Vollow
NL	Mount	(Reel)	3.0 N±1.0 N	ESB33536	Light Yellow

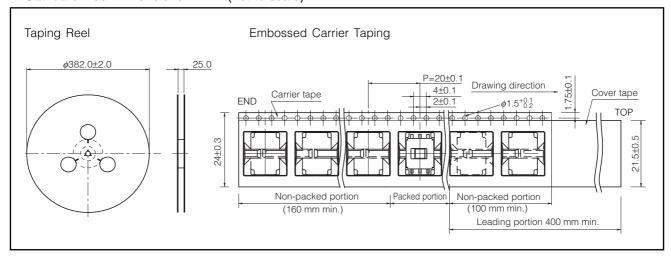
Note: PP=Self-lock NL=Non-lock

Panasonic Push Switches/ESB33

■ Dimensions in mm (not to scale)



■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



■ Application Notes:

Operating force should be applied at the center of the lever.

ESB30 Push Switches

Type: ESB30 (H=12.5 mm)





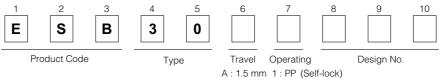
■ Features

- Reduced interlock operation switching noise (-10 dB compared to the current value)
- Simultaneous locking prevention mechanism

■ Recommended Applications

- Operation switches for automobiles (air conditioners switches, Hazard switches, etc.)
- Secondary power switches for lower voltage in consumer electronic equipment and different types of mode switches

■ Explanation of Part Numbers



B: 2.5 mm 3: NL (Non-lock)

■ Specifications

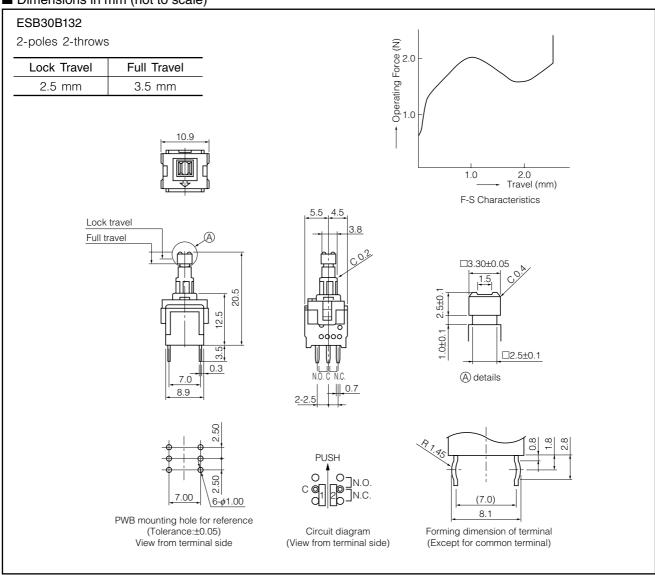
Rating	50 μA 3 Vdc to 0.2 A 14 Vdc (Resistive load)	
Travel	Lock Travel=2.5 mm Full Travel=3.5 mm	
Mounting Height	12.5 mm	
Poles and Throws	2-poles 2-throws	
Operating Mode	Self-lock, Non-lock	
Switching Mode	Non-shorting	
Operating Force	2.0 N±1.0 N, 3.5 N±1.5 N	
Minimum Quantity/Packing Unit	480 pcs. (Tray Pack)	
Quantity/Carton	2400 pcs.	

■ Standard Products

Operating Force	Lever	Lock Travel	Operating Mode	Terminal Shape		
	Height			Straight	Formed	
2 N±1.0 N	20.5 mm	2.5 mm	PP	ESB30B132	ESB30B102	
			NL	ESB30B304	ESB30B305	
3.5 N±1.5 N	20.5 mm	2.5 mm	PP	ESB30B103	ESB30B133	
			NL	ESB30B332	ESB30B333	

Note: PP=Self-lock, NL=Non-lock

■ Dimensions in mm (not to scale)



■ Application Notes:

• Operating force should be applied at the center of the lever.

ESE20C/20D Momentary Push Switches

Type: **ESE20C/ESE20D** (H=8.9 mm)





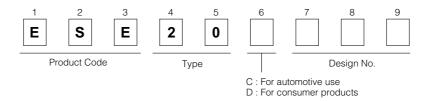
■ Features

- User-friendly tactile feedback when operated
- Long over-travel

■ Recommended Applications

- Operation switches for automobiles (switches for heater controls, overdrive, steering, etc.)
- Secondary power switches for lower voltage in consumer electronic equipment and different types of mode switches

■ Explanation of Part Numbers



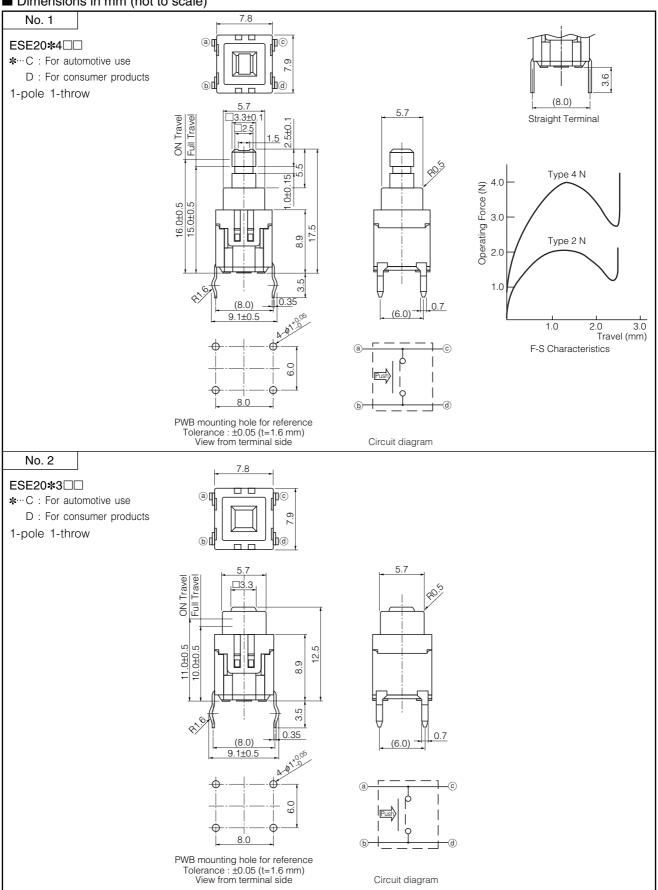
■ Specifications

Rating	0.01 A 5 Vdc to 0.1 A 14 Vdc (Resistive load)
Full Travel	2.5 mm
Mounting Height	8.9 mm
Poles and Throws	1-pole 1-throw
Operating Mode	Non-lock Non-lock
Operating Force	2.0 N±1.0 N, 4.0 N±1.5 N
Minimum Quantity/Packing Unit	60 pcs. Polyethylene Bag (Bulk)
Quantity/Carton	1200 pcs.

■ Standard Products

Full Travel	Operating	Lever	Terminal Shape		
	Force	Height	Straight	Formed	
	0.0 N. 1.0 N.	12.5 mm	ESE20*323	ESE20*321	
2.5 mm	2.0 N±1.0 N	17.5 mm	ESE20*423	ESE20*421	
	40 11 4 5 11	12.5 mm	ESE20*343	ESE20*341	
	4.0 N±1.5 N	17.5 mm	ESE20*443	ESE20*441	

 $[\]hbox{$\rlap{\star}$}\cdots C : For \ automotive \ use \quad D : For \ consumer \ products$



Application Notes:

Operating force should be applied at the center of the lever.

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Detector Switches

■ Quick Selection Guide

Type, Series	Appearance	Part No.	Country of origin	Poles & Throws	Page
09HL Detector Switches	\$	ESE58	Japan	1-1	ES25
1VR Detector Switches	*	ESE16	Japan	1-1	ES28
1VL Detector Switches	-	ESE13	Japan	1-1	ES30
1HL Detector Switches	***	ESE18	Japan	1-1	ES33
2HL Detector Switches		ESE31	Japan/China	1-1	ES38
2N Detector Switches	伊輸等	ESE22	Japan	1-1	ES40
5N Detector Switches		ESE11	Japan/China	1-1	ES43
1HW Detector Switches	₩	ESE23	Japan	1-2	ES49
2W Detector Switches	向	ESE24	Japan	1-2	ES51

Country of origin: As of April 2013

Panasonic Detector Switches

■ Checklist Before Inquiry

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

Item					Information (Requirements)	
	C-1	Inquiry purpose			New use, Modification, Others (
C-2			Previous supplier			
	C-2	Modification	Convention	nal part No.		
			Purpose			
			Equipment			
Common			Design standard of pushing distance of lever		At switching on (when not pushing): Pushing distance (Pushing the point of lever mm) At switching off (when not pushing): Object of detection is apart from the point of lever not apart from the point of lever (Pushing about mm)	
C-3	C-3	B Application	Operation frequency		Operate the switches every day. (times a day) Almost everytime, the switches are stayed in the released condition. (times a week / month / year) Almost everytime, the switches are pushed in the designed position. (times a week / month / year)	
	Temperature		re	(°C) to (°C)		
Rating			mAVdcmAVac Do you give "inrush current" to switches ? :YESNO			
ions	M-1	Operation	Operation t	type	Vertical, Horizontal	
mens			Mounting	Vertical	PWB to upper suface of housing: (mm)	
Shapes/Dimensions	M-2 Moun		height	Horizontal	PWB to center rod: (mm)	
Shap	M-3	Terminals			PWB, Solder lug	
L.d. Confees Mann		Surface Mount	Connection		Manual soldering, Wave soldering, Reflow Soldering	
L-1	L-1	Surface Mount	Packing Unit		Polyethylene Bag (Bulk), Embossed Taping (Reel Pack)	
Others	L-2 Special requirements for endurance		durance			
)	L-3	Special requirements for safety				
	L-4	Other questionnaires				

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

^{*} The Electrical Appliance and Material Safety Law (Japan) was revised on March 1st. 1988. Power switches described here are not under jurisdiction of this law, but comply with its technical requirements.

Panasonic Detector Switches

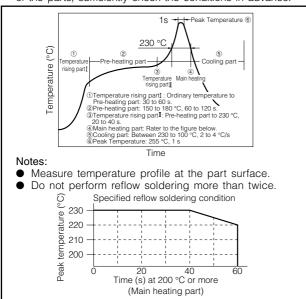
■ ⚠ Application Notes

When using our Slide 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. Prohibited items and notes on mounting

- When soldering (including preheating), set the lever to the release position.
- When soldering using a soldering iron, soldering conditions vary with the tip shape of the soldering iron, wattage, and PWB thickness. Thoroughly check the conditions in advance, including the heat resistance rating of the solder.
- Do not apply a load to terminals when soldering. Care should be taken in this regard because a load may deteriorate electric and mechanical characteristics.
- Since the detector switches are not sealed, do not wash them.
- 5. When mounting a detector switch to a through-hole type PWB, the influence of thermal stress on the switch is greater than that on one-sided PWB. Be sure to check the influence as well as the heat resistance rating of the solder.
- 6. 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.



2. Notes on circuit conditions

- To ensure reliability, use detector switches within the rated range, as designated in "Product Specifications for Information."
- To avoid malfunction of a set due to bounce generated by turning the switch ON and OFF, and/or due to chatter generated by external vibrations, etc., take the following into consideration in design.
 - Read contact multiple times.
 - (In Case of microcomputer Processing)
 - Set a delay time.
 - (Recommendation: 3 or more times of reading with the cycle of 3 ms or over)
 - Prepare a CR integrating circuit. (Recommendation: A time constant of 6 ms or over)

Prohibited items and notes on mounting and operating conditions

1. Design so that the load applied to the lever when a set is used is within the rated range of the switch's lever strength.

- If multiple switches are placed side by side, or a switch is placed near another part, the gap between the switch and the adjacent switch/part must be at least 1 mm to prevent affect of flux and to ensure proper insulation distance.
- Design and use so that external stress is not continuously applied to the soldering parts in a set in any direction. External stress may cause pattern peeling and solder cracks on a PWB.
- When mounting a switch (mounting to chassis or button mounting), take care so that no foreign matter enters the switch.
- Contact lubricant, which is used in detector switches, may flow out to the exterior of the switch due to the structure. For design review, sufficiently check the operating conditions.
- 6. Avoid the following ambient surroundings and other conditions because they may affect performance:
 - Under an atmosphere of corrosive gas such as Cl₂, H₂S, NO_x, or SO₂
 - In atmospheres of residual water drops, dew condensation, or adhesive water drops
 - In liquids such as water, salt solution, oil, chemicals, and organic solvents
 - In direct sunlight
 - In dusty locations

4. Prohibited items and notes on storage conditions Since contact characteristics and soldering quality may deteriorate due to sulfuration and oxidation of contacts and

deteriorate due to sulfuration and oxidation of contacts and terminals, pay heed to the following items.

- For storage and transport of the switches, avoid unpacking them, and store them at room temperature and room humidity. Use them as soon as possible, generally within 3 months, or within a maximum of 6 months after delivery.
- Do not store the switches under conditions of high temperature and/or high humidity, or in a location where corrosive gas may be generated.
- If some units remain after unpacking, store them after applying adequate moisture-proof and gas-proof treatment

5. For use in equipment for which safety is 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:

- preparing a protective circuit or a protective device to improve system safety, and
- preparing a redundant circuit to improve system safety so that the single fault of a switch does not cause a dangerous situation.
- For actual use, be sure to refer to "Product Specifications for Information."



■ Common Specifications (Standard)

	pecifications (Stand	
Mechanical	Lever Strength	To withstand 10 N push force applied in operating direction for 15 seconds (ESE11, 22, 24, 31) To withstand 2 N push force applied in operating direction for 15 seconds (ESE13, 16, 18, 23) To withstand 1 N push force applied in operating direction for 15 seconds (ESE58)
Specifications	Terminal Strength	To withstand 3 N push force applied on the end of terminal in any direction for 1 minute [0.5 N : ESE13, 16, 18, 23, 58]
	Contact Resistance	500 m $Ω$ max.
Electrical Specifications	Insulation Resistance	Terminal to Terminal and Terminal to Outer Metal Part: 100 $\text{M}\Omega$ min. (at 100 Vdc)
	Dielectric Withstanding Voltage	Terminal to Terminal and Terminal to Outer Metal Part: 100 Vac for 1 minute
	Operating Temperature Range	-10 °C to +70 °C (ESE11, 22, 24, 31) -10 °C to +60 °C (ESE13, 16, 18, 23, 58)
	Heat Resistance	+80 °C for 96 hours (ESE11, 22, 24) +85 °C for 96 hours (ESE31) +70 °C for 96 hours (ESE13, 16, 18, 23, 58)
Environmental	Low Temperature Resistance	-25 °C for 96 hours -40 °C for 96 hours (ESE31)
Specifications	Humidity Resistance	40 °C, 90 % to 95 % RH for 96 hours 60 °C, 90 % to 95 % RH for 96 hours (ESE31)
	Non-loaded Life	$\begin{array}{c} \text{Contact resistance} : 1 \ \Omega \ \text{max.} \ (\text{ESE11, 13, 24}) \\ \text{Number of operations} & \text{Contact resistance} : 3 \ \Omega \ \text{max.} \ (\text{ESE22, 31}) \\ \text{50000 cycles} & \text{Voltage drop} & : 1.5 \ \text{V max.} \ (\text{ESE16, 18, 58}) \\ \text{Voltage drop} & : 1.0 \ \text{V max.} \ (\text{ESE23}) \\ \end{array}$
	Loaded Life	Contact resistance : 1 Ω max. (ESE11, 13, 24) Number of operations Contact resistance : 3 Ω max. (ESE22, 31) Voltage drop : 1.5 V max. (ESE16, 18, 58) Voltage drop : 1.0 V max. (ESE23)

■ Minimum Quantity/Packing Unit
Please place an order by an integer multiple of the Quantity/Carton.

Type, Series Part No. Packaging		Packaging	Quantity/Carton (Export)	Min. Q'ty/ Packing Unit
09HL Detector Switches Type: ESE58	ESE58□	Embossed Taping (Reel Pack)	30000 pcs. (120000 pcs.)	5000 pcs.
1VR Detector Switches Type: ESE16	ESE16□	Embossed Taping (Reel Pack)	24000 pcs. (96000 pcs.)	4000 pcs.
1VL Detector Switches	ESE13V□	Embossed Taping	18000 pcs. (72000 pcs.)	3000 pcs.
Type: ESE13	ESE13H□	(Reel Pack)	30000 pcs. (120000 pcs.)	5000 pcs.
1HL Detector Switches Type: ESE18	ESE18□	Embossed Taping (Reel Pack)	30000 pcs. (120000 pcs.)	5000 pcs.
2HL Detector Switches Type: ESE31	ESE31□	Embossed Taping (Reel Pack)	15000 pcs. (60000 pcs.)	2500 pcs.
	ESE22MV21T		6000 pcs. (24000 pcs.)	1000 pcs.
	ESE22MH22 ESE22MH24	Embossed Taping	24000 pcs. (96000 pcs.)	4000 pcs.
2N Detector Switches	ESE22MH27T ESE22MH28T ESE22MH52 ESE22MH54	(Reel Pack)	18000 pcs. (72000 pcs.)	3000 pcs.
Type: ESE22	ESE22MH51 ESE22MH53 ESE22MH57 ESE22MH58 ESE22MV21 ESE22MH21 ESE22MH23 ESE22MH27 ESE22MH28	Polyethylene Bag (Bulk)	10000 pcs. (40000 pcs.)	500 pcs.
	ESE11SV	Polyethylene Bag (Bulk)	10000 pcs. (40000 pcs.)	200 pcs.
5N Detector Switches Type: ESE11	ESE11MV2		8000 pcs	200 pcs.
	ESE11MV□T (Excluding : ESE11MV2)	Embossed Taping	4800 pcs. (19200 pcs.)	800 pcs.
	ESE11MH□T	(Reel Pack)	9000 pcs. (36000 pcs.)	1500 pcs.
1HW Detector Switches Type: ESE23	ESE 23□	Embossed Taping (Reel Pack)	24000 pcs. (96000 pcs.)	4000 pcs.
	ESE24SH□ ESE24SV□ ESE24MH□ ESE24MV□	Polyethylene Bag	10000 pcs. (50000 pcs.)	200 pcs.
2W Detector Switches Type: ESE24			8000 pcs. (40000 pcs.)	[160 pcs.]
	ESE24MH□T	Embossed Taping	6000 pcs. (24000 pcs.)	1000 pcs.
	ESE24MV□T	(Reel Pack)	3000 pcs. (12000 pcs.)	500 pcs.

09HL Detector Switches

Type: **ESE58**

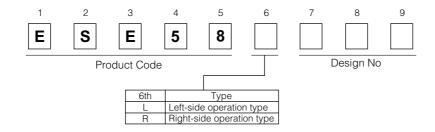


- Features
- Thin body: 0.9 mm.
- Circuit type: Normally-open and normally-closed

types are available.

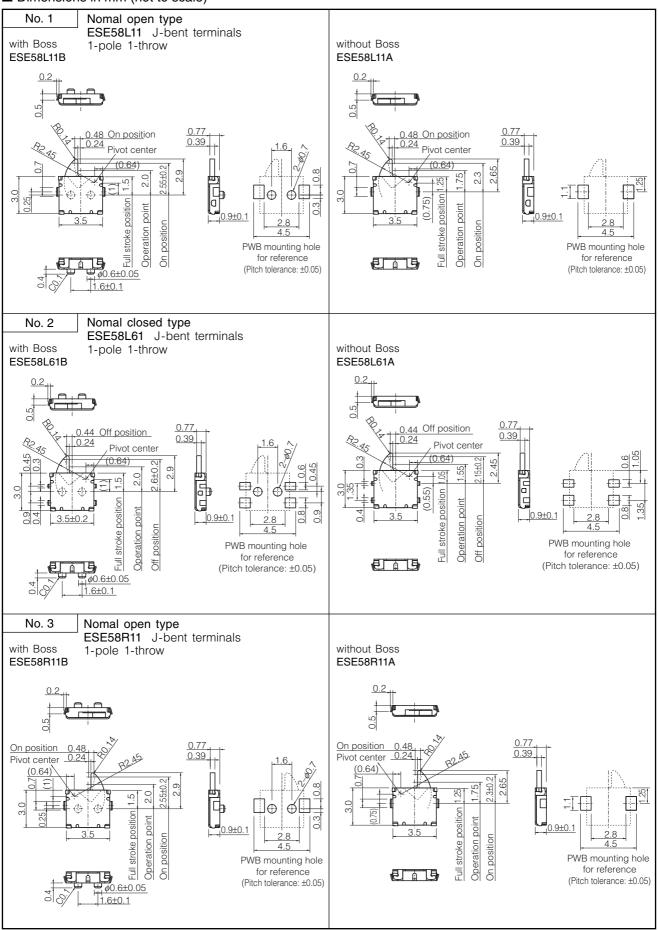
- Lineup with variations in right-left operations.
- Recommended Applications
- Detection of media in portable electronic equipment (Mobile phones/Digital still cameras/DVCs, etc.)

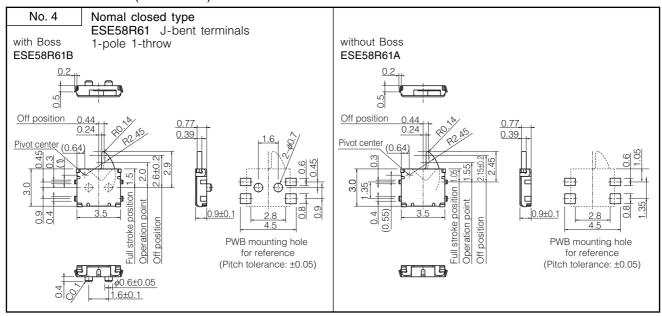
■ Explanation of Part Numbers



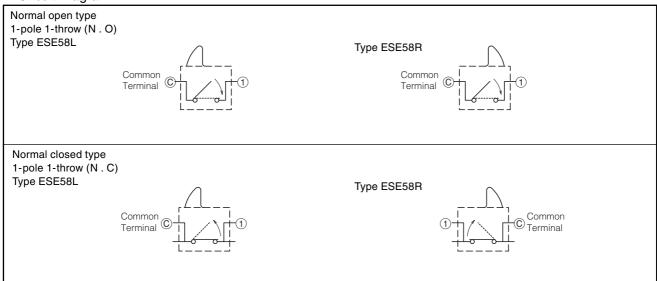
■ Specifications

Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)		
Contact Resistance	500 m Ω max. (Initial)		
Insulation Resistance	100 M Ω min. (100 Vdc)		
Dielectric Withstanding Voltage	100 Vac for 1 minute		
Operating Force	300 mN max.		
Mounting Height	0.9 mm		
Poles and Throws	1-pole 1-throw		
Full Travel (Pushing distance)	With boss : 1.5 mm (1.5 mm) Without boss : 1.25 mm (1.5 mm)		
Operating Life	50000 cycles min.		
Temperature Range	−10 °C to +60 °C		
Heat Resistance	+70 °C for 96 hours		
Low Temperature Resistance	−25 °C for 96 hours		
Humidity Resistance	+40 °C 90 % to 95 % RH for 96 hours		
Minimum Quantity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)		
Quantity/Carton	30000 pcs.		

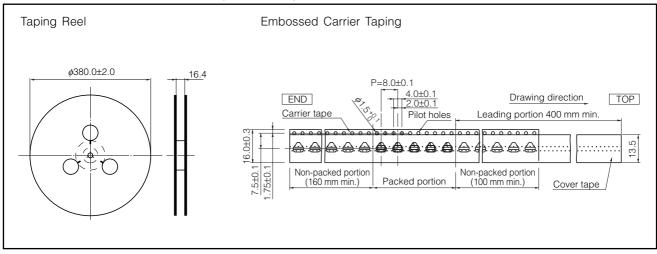




■ Circuit Diagram



■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



1VR Detector Switches

Type: **ESE16**



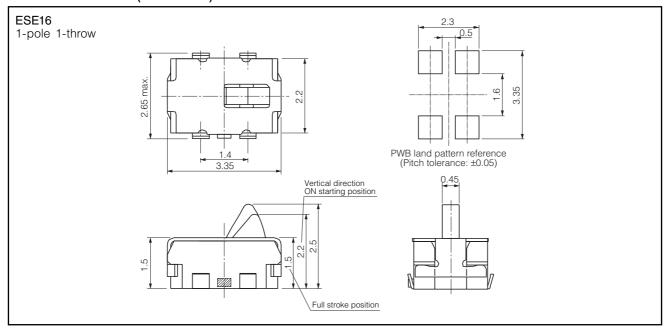
- Features
- External Dimensions: 2.2 mmx3.35 mm (Height:1.5 mm)
- Light operating force: 250 mN or less
- Auto mounting supported: Can be mounted by standard nozzles
- Recommended Applications
- Detection of media in portable electronic equipment (Mobile phones / Digital still cameras / Camcorders)

■ Explanation of Part Numbers

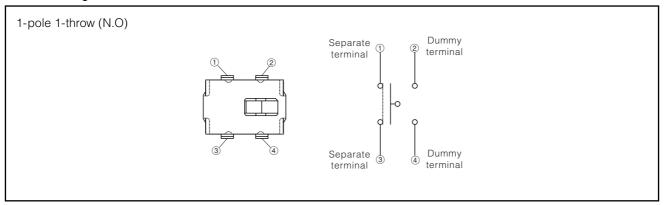
1	2	3	4	5	6	7	8	9
E	S	E	1	6				
-	Pro	oduct Cod	de	Type	Desic	n No		

■ Specifications

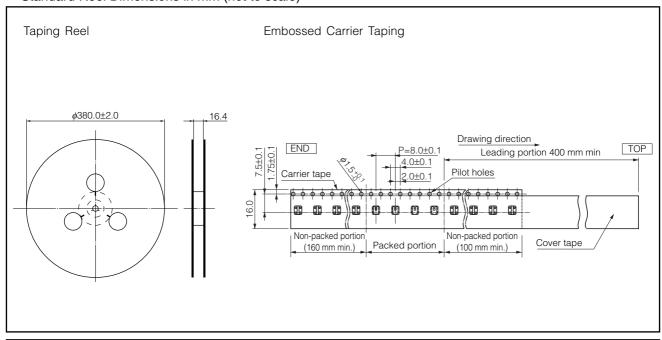
Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)
Contact Resistance	500 m Ω max. (Initial)
Insulation Resistance	10 MΩ max. (100 Vdc)
Dielectric Withstanding Voltage	100 Vac for 1 minute
Operating Force	250 mN max.
Mounting Height	1.5 mm
Poles and Throws	1-pole 1-throw
Full Travel (Pushing distance)	1.5 mm (1.0 mm)
Operating Life	50000 cycles min.
Temperature Range	−10 °C to +60 °C
Heat Resistance	+70 °C for 96 hours
Low Temperature Resistance	−25 °C for 96 hours
Humidity Resistance	+40 °C 90 % to 95 % RH for 96 hours
Minimum Quantity/Packing Unit	4000 pcs. Embossed Taping (Reel Pack)
Quantity/Carton	24000 pcs.



■ Circuit Diagram



■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



1VL Detector Switches

Type: **ESE13**



■ Features

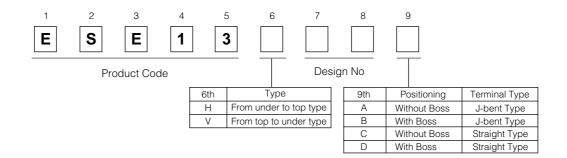
Thin type : Height=1.2 mmHighly reliable contact

SMD type (Embossed taping, Reflow soldering)

■ Recommended Applications

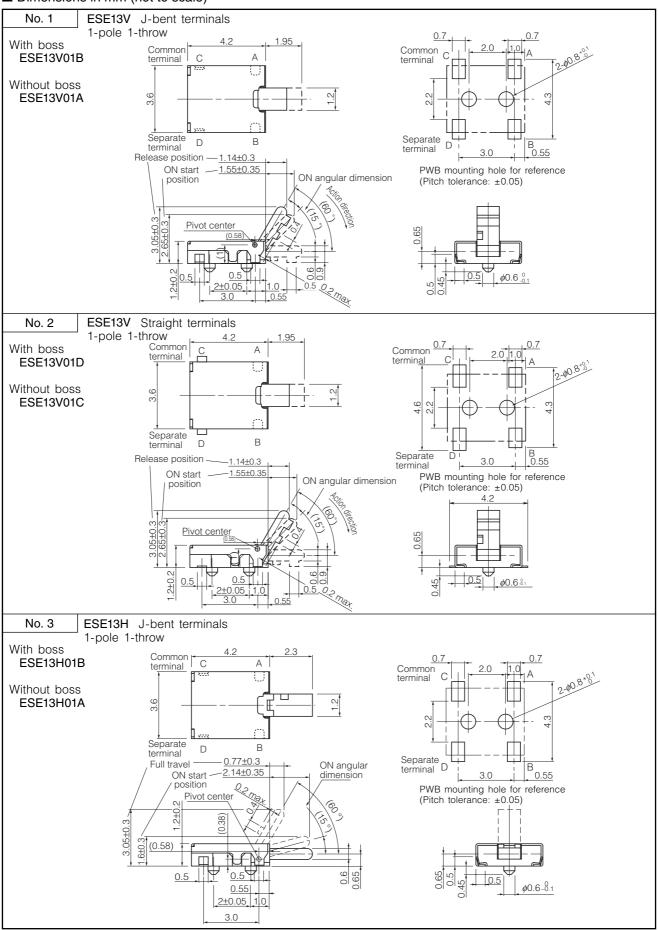
 Detection of media in portable electronic equipment (Mobile phones / Digital still cameras / Camcorders)

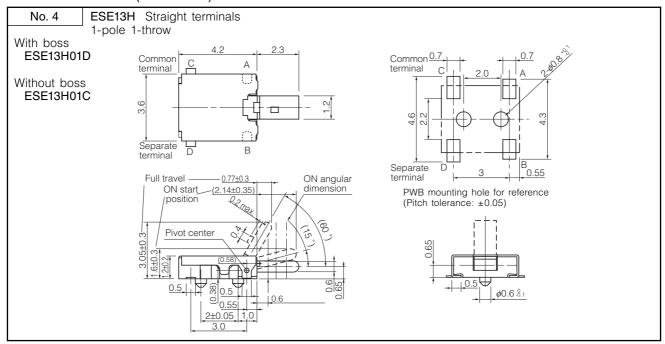
■ Explanation of Part Numbers



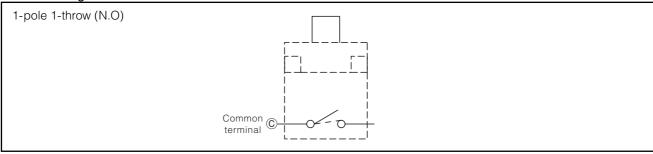
■ Specifications

Rating		50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)
Contact Resistance		500 m Ω max. (Initial)
Insulation Resistance		100 M Ω min. (100 Vdc)
Dielectric Withstanding Voltage		100 Vac for 1 minute
Operating Force		300 mN max.
Mounting Height		1.2 mm
Poles and Throws		1-pole 1-throw
Full Travel (Pushing distance)		Type V : 2.15 mm (2.15 mm) Type H : 3.05 mm (2.15 mm)
Operating Life		50000 cycles min.
Temperature Range		−10 °C to +60 °C
Heat Resistance		+70 °C for 96 hours
Low Temperature Resistance		−25 °C for 96 hours
Humidity Resistance		+40 °C 90 % to 95 % RH for 96 hours
Minimum Quantity/Packing Unit	ESE13H	5000 pcs. Embossed Taping (Reel Pack)
Minimum Quantity/Packing Unit	ESE13V	3000 pcs. Embossed Taping (Reel Pack)
Quantity/Carton	ESE13H	30000 pcs.
Quantity/Carton	ESE13V	18000 pcs.

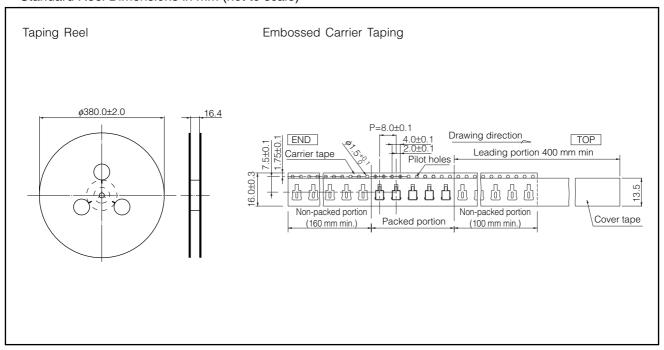




■ Circuit Diagram



■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



1HL Detector Switches

Type: **ESE18**



■ Features

• Thin body: 1.2 mm

Circuit type: Normally-open and normally-closed

types are available.

• Travel: Standard stroke type: 1.5 mm

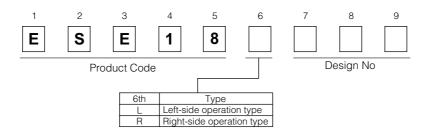
Long stroke type: 2.15 mm

Surface mounted type: Packed with embossed tape.
 Supports reflow soldering.

■ Recommended Applications

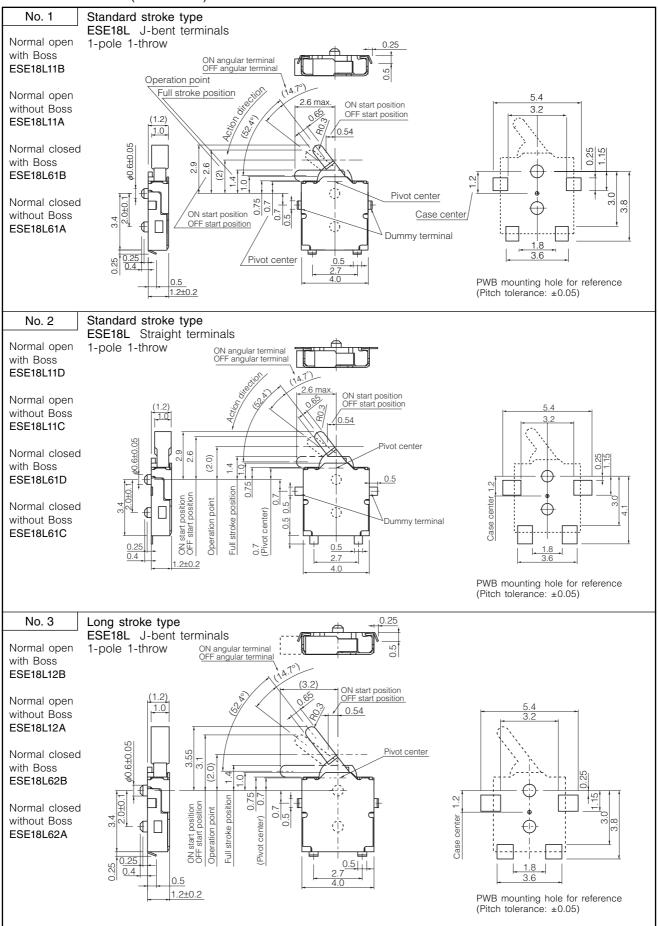
 Detection of media in portable electronic equipment (Mobile phones/CD-ROM/DVD players, Digital still cameras)

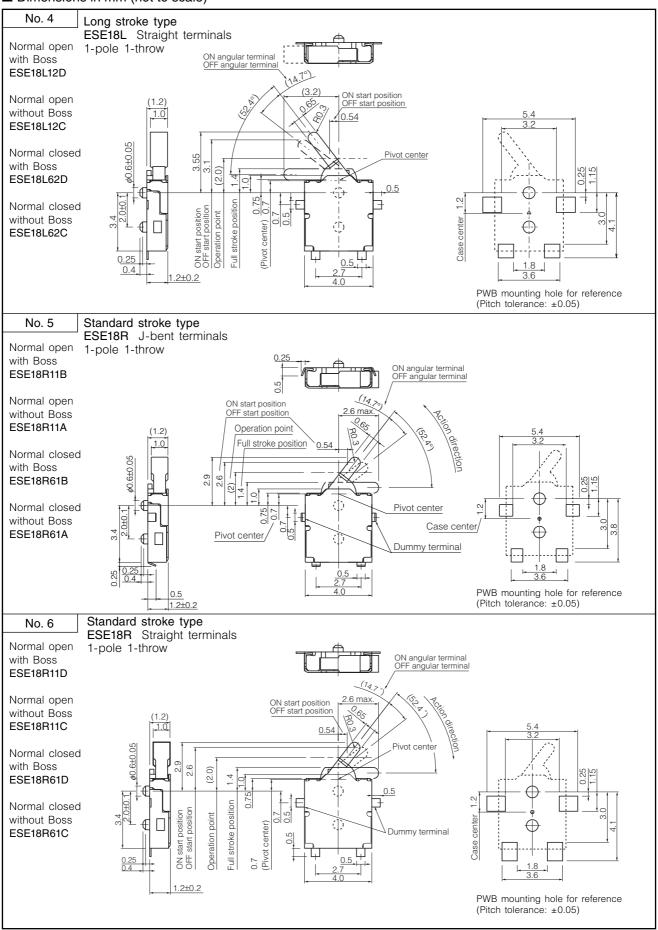
■ Explanation of Part Numbers

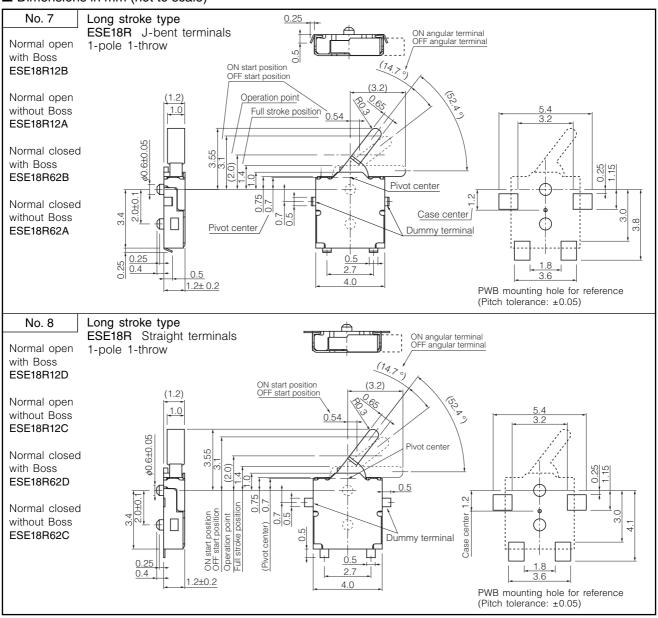


■ Specifications

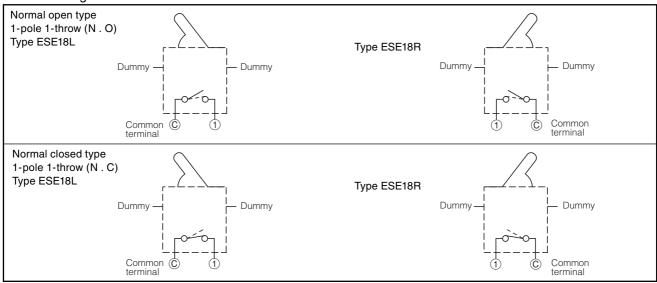
•	
Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)
Contact Resistance	500 m Ω max. (Initial)
Insulation Resistance	100 MΩ min. (100 Vdc)
Dielectric Withstanding Voltage	100 Vac for 1 minute
Operating Force	300 mN max.
Mounting Height	1.2 mm
Poles and Throws	1-pole 1-throw
Full Travel (Pushing distance)	· Standard stroke type · Long stroke type With boss : 1.4 mm (1.5 mm) With boss : 1.4 mm (2.15 mm) Without boss : 2.1 mm (1.5 mm) Without boss : 2.1 mm (2.15 mm)
Operating Life	50000 cycles min.
Temperature Range	−10 °C to +60 °C
Heat Resistance	+70 °C for 96 hours
Low Temperature Resistance	-25 °C for 96 hours
Humidity Resistance	+40 °C 90 % to 95 % RH for 96 hours
Minimum Quantity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)
Quantity/Carton	30000 pcs.



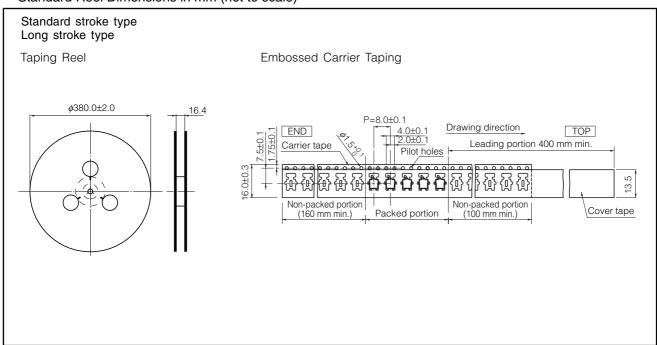




■ Circuit Diagram

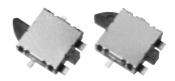


■ Packaging Specifications
Standard Reel Dimensions in mm (not to scale)



2HL Detector Switches

Type: **ESE31**



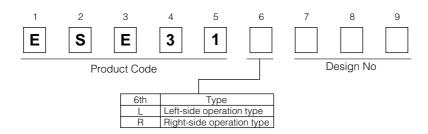
■ Features

- Increased the mounting strength Mounting strength: 80 N
- Decreased the profile of the switch body Height: 1.7 mm
- Increased the contact reliability and lifespan.
 Lifespan: 100,000 operations or more

■ Recommended Applications

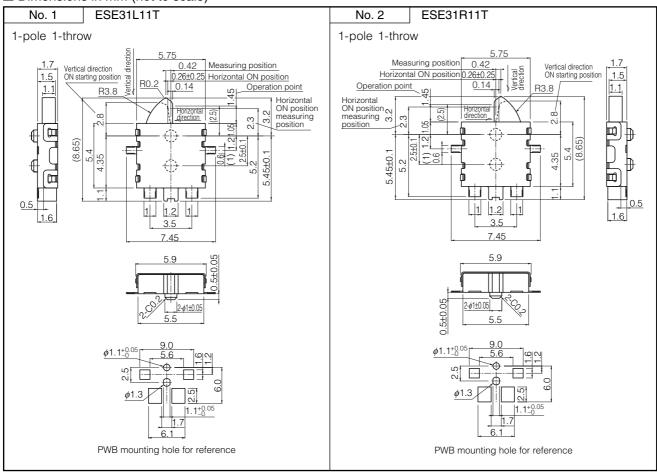
• Detection of media in portable electronic equipment

■ Explanation of Part Numbers

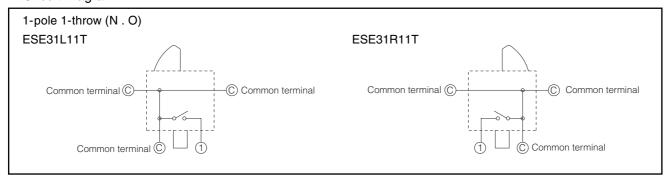


■ Specifications

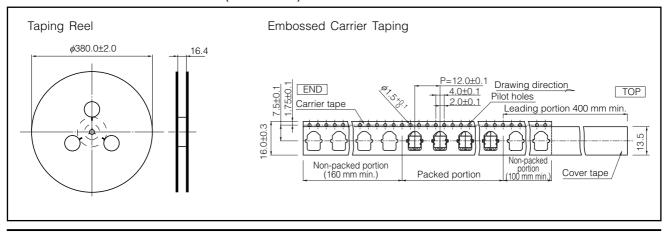
Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)
Contact Resistance	500 m Ω max. (Initial)
Insulation Resistance	100 M Ω min. (100 Vdc)
Dielectric Withstanding Voltage	100 Vac for 1 minute
Operating Force	390 mN max.
Mounting Height	1.7 mm
Poles and Throws	1-pole 1-throw
Full Travel (Pushing distance)	3.2 mm (2.15 mm)
Operating Life	50000 cycles min.
Temperature Range	−10 °C to +70 °C
Heat Resistance	+85 °C for 96 hours
Low Temperature Resistance	-40 °C for 96 hours
Humidity Resistance	+60 °C 90 % to 95 % RH for 96 hours
Minimum Quantity/Packing Unit	2500 pcs. Embossed Taping (Reel Pack)
Quantity/Carton	15000 pcs.



■ Circuit Diagram



■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



2N Detector Switches

Type: **ESE22**



- Features
- Can be operated with different actuation angles (horizontally and vertically)
- Reflow soldering
- Light operating force

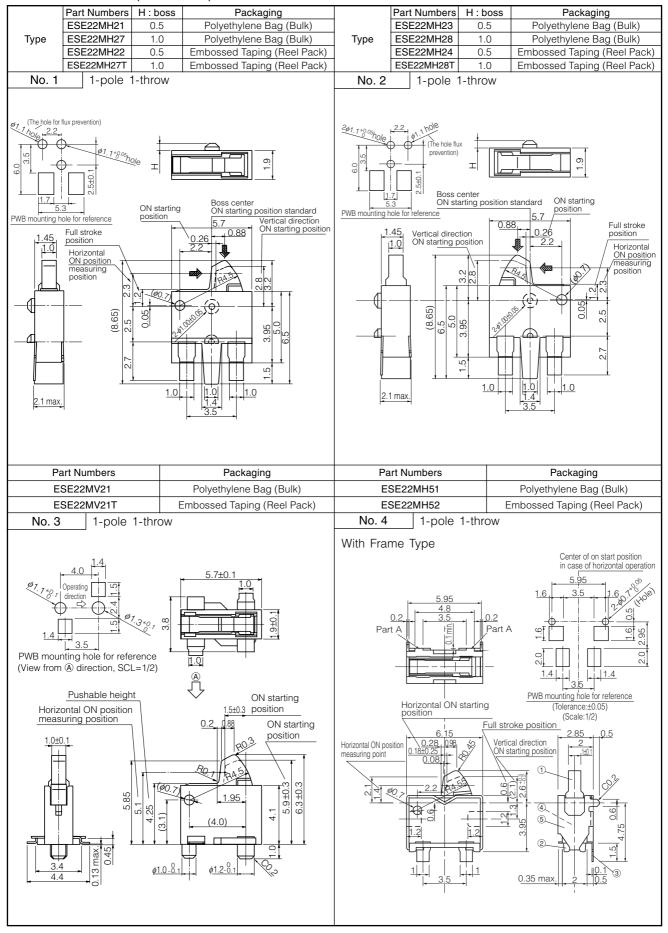
- Recommended Applications
- Detection of media in portable electronic equipment

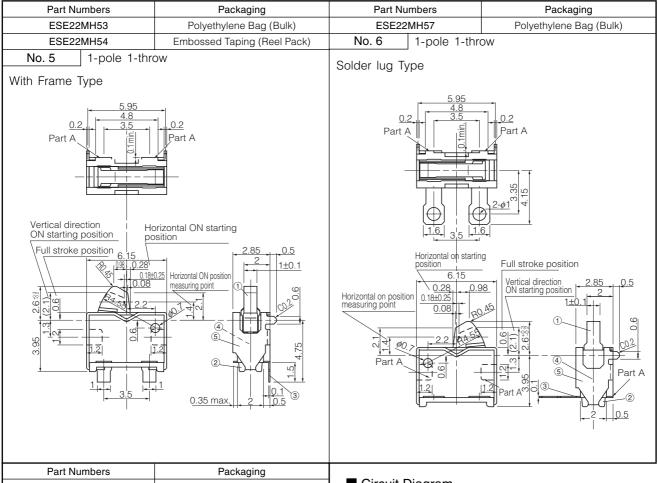
■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
E	S	E	2	2				
P	roduct Code	e	Тур	oe oe	St	yle	Design	n No.

■ Specifications

Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)				
Contact Resistance	500 m Ω max. (Initial)				
Insulation Resistance	100 M Ω min. (100 Vdc)				
Dielectric Withstanding Voltage	100 Vac for 1 minute				
Operating Force	300 mN max.				
Mounting Height	· Type MV 4.1 mm · Type MH 2.1 mm · Type MH with Frame 2.85 mm				
Poles and Throws	1-pole 1-throw				
Full Travel (Pushing distance)	· Type MV 4.25 mm(2.05 mm) · Type MH 1.2 mm(2.0 mm) · Type MH with Frame 0.6 mm(2.0 mm)				
Operating Life	50000 cycles min.				
Temperature Range	−10 °C to +70 °C				
Heat Resistance	+80 °C for 96 hours				
Low Temperature Resistance	−25 °C for 96 hours				
Humidity Resistance	+40 °C 90 % to 95 % RH for 96 hours				
	500 pcs. Polyethylene Bag (Bulk)				
Minimum Quantity/Packing Unit	 Type MV Type MH with Frame Type MH Typ				
	10000 pcs. Polyethylene Bag (Bulk)				
Quantity/Carton	 Type MV Type MH with Frame Type MH Type MH Type MH Embossed Taping (Reel Pack) Type MH Embossed Taping (Reel Pack) Type MH 				

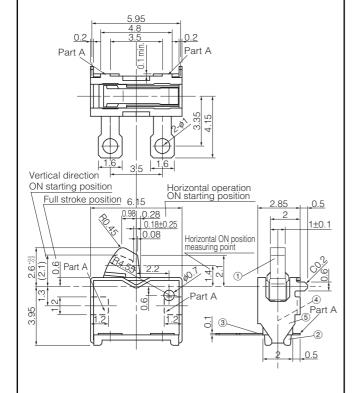




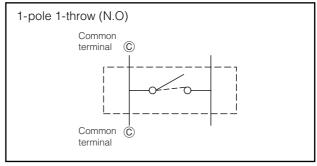
ESE22MH58 Polyethylene Bag (Bulk)

No. 7 1-pole 1-throw

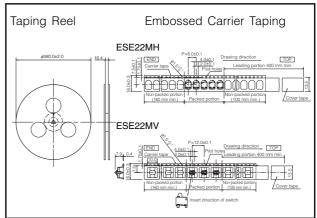
Solder lug Type



■ Circuit Diagram

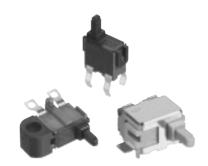


■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



5N Detector Switches

Type: **ESE11**



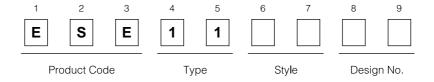
■ Features

- Wide range of customizable features including operational directions
- Light operating force
- Wide available range for reflow soldering

■ Recommended Applications

Detection of media in portable electronic equipment

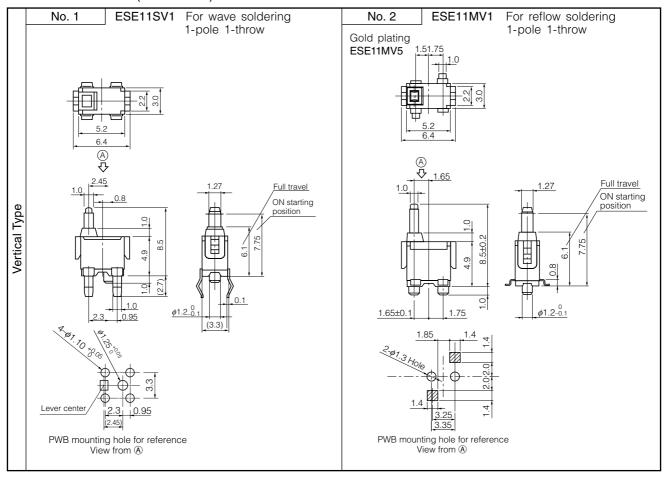
■ Explanation of Part Numbers

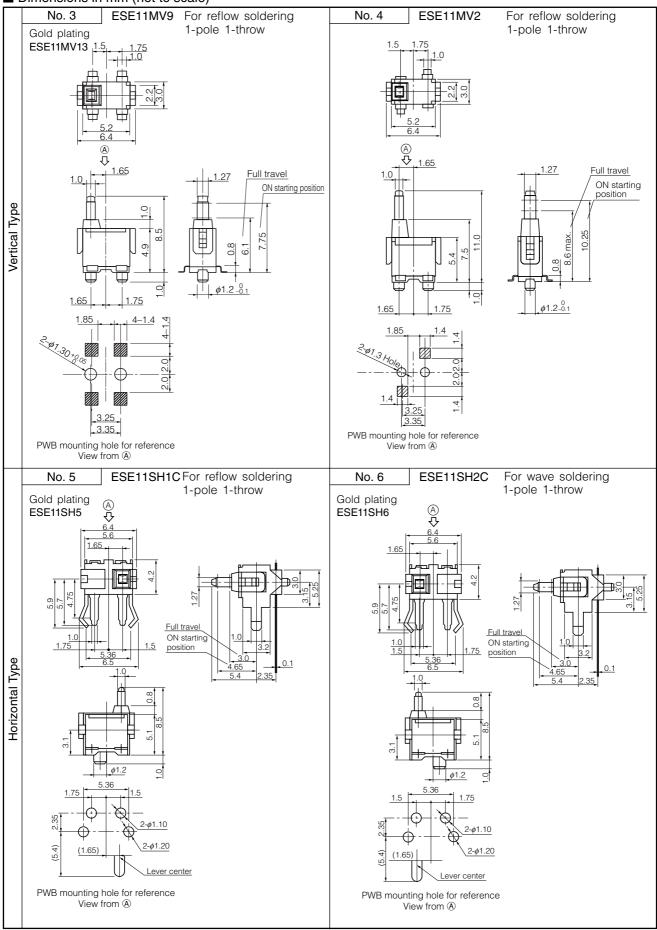


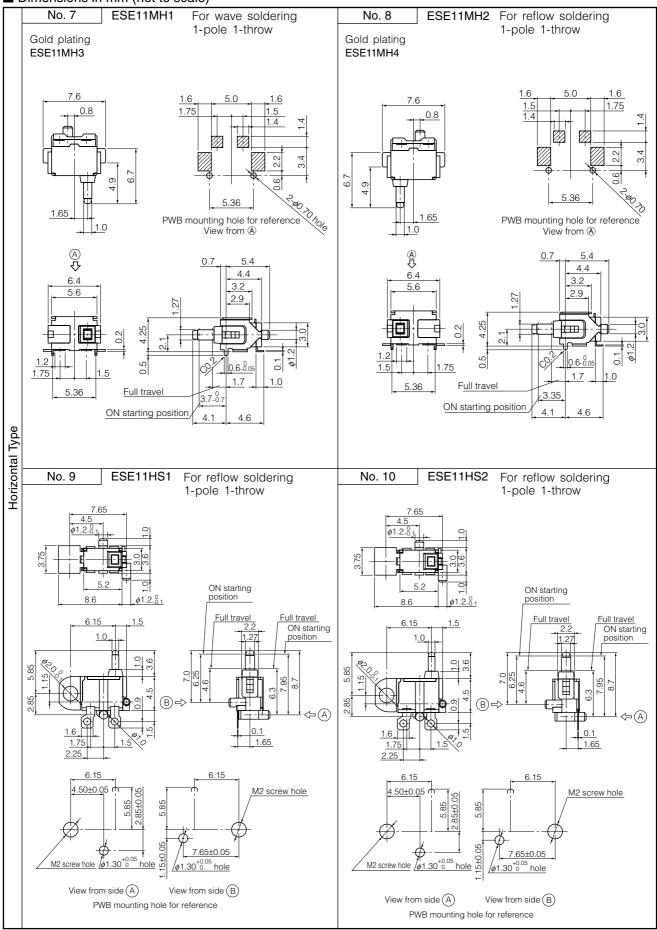
■ Specifications

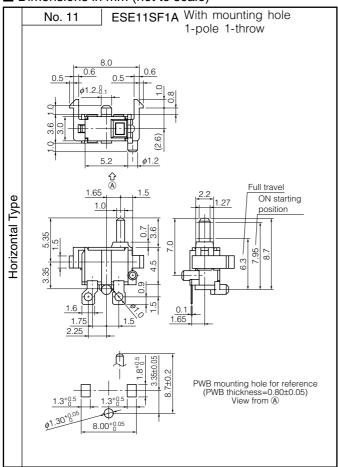
Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)
Contact Resistance	500 mΩ max. (Initial)
Insulation Resistance	100 MΩ min. (100 Vdc)
Dielectric Withstanding Voltage	100 Vac for 1 minute
Operating Force	350 mN max. (Full Travel)
Mounting Height	· Type SV 4.9 mm · Type MV 4.9 mm (MV2, 7 : 5.4 mm) · Type SH 5.25 mm · Type MH 4.25 mm · Type HS, SF 3.6 mm
Poles and Throws	1-pole 1-throw
Full Travel (Pushing distance)	 Type SV 1 mm (2.4 mm) Type MV 1 mm (2.4 mm) Type SH 10 mm (2.4 mm) Type MH 1 mm (2.4 mm) Type HS, SF 10 mm (2.4 mm) 10 mm (
Operating Life	50000 cycles min.
Temperature Range	−10 °C to +70 °C
Heat Resistance	+80 °C for 96 hours
Low Temperature Resistance	-25 °C for 96 hours
Humidity Resistance	+40 °C 90 % to 95 % RH for 96 hours

Minimum Quantity/Packing Unit	ESE11SV ESE11MV ESE11SH ESE11MH ESE11HS ESE11HS ESE11SF ESE11S	200 pcs. Polyethylene Bag (Bulk)
	ESE11MV□T (Excluding : ESE11MV2)	800 pcs. Embossed Taping (Reel Pack)
	ESE11MH□T	1500 pcs. Embossed Taping (Reel Pack)
Quantity/ Carton	ESE11SV ESE11MV ESE11SH ESE11MH ESE11HS ESE11HS ESE11SF	10000 pcs. Polyethylene Bag (Bulk)
	ESE11MV2	8000 pcs. Polyethylene Bag (Bulk)
	ESE11MV□T (Excluding : ESE11MV2)	4800 pcs. Embossed Taping (Reel Pack)
	ESE11MH□T	9000 pcs. Embossed Taping (Reel Pack)

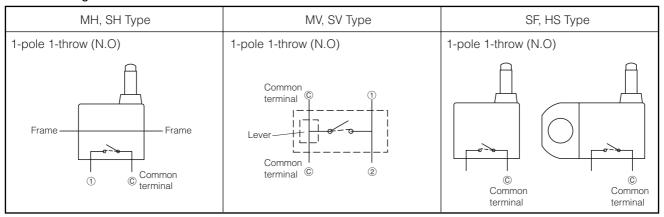




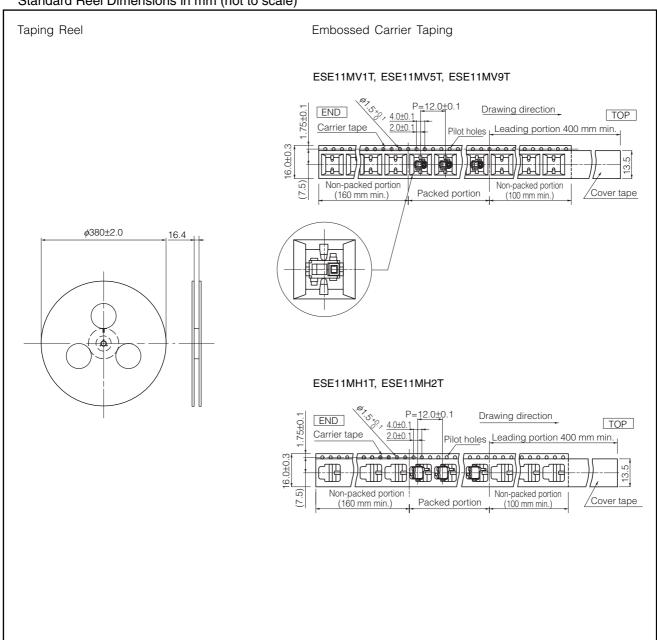




■ Circuit Diagram



■ Packaging Specifications Standard Reel Dimensions in mm (not to scale)



1HW Detector Switches

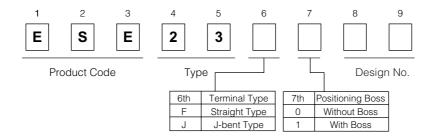
Type: **ESE23**



Bidirectional operation, midpoint auto-return Type

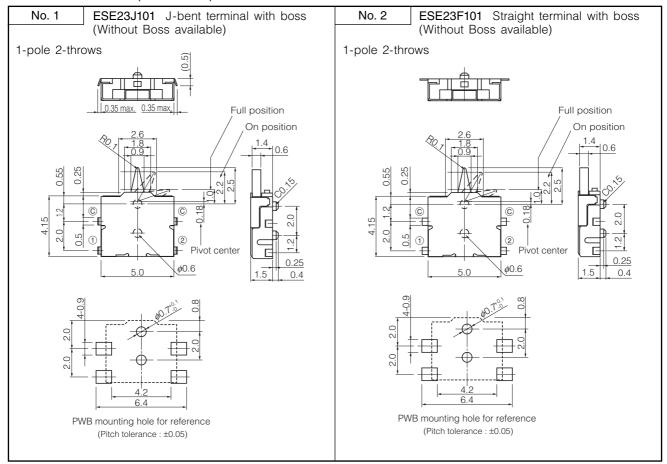
- Features
- External dimensions: 4.1 mm×5.0 mm, Height 1.5 mm
- Long over-travel (through-operation available)
- Usable as an operation switch (an input device)
- Recommended Applications
- Detection of media in portable electronic equipment (CD-ROM, DVD, Digital still cameras, etc.)
- Operating switches for other electronic equipment.

■ Explanation of Part Numbers

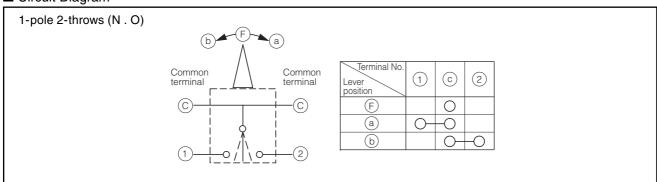


■ Specifications

Rating	50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)
Contact Resistance	500 mΩ max. (Initial)
Insulation Resistance	100 MΩ min. (100 Vdc)
Dielectric Withstanding Voltage	100 Vac for 1 minute
Operating Force	300 mN max.
Mounting Height	1.5 mm
Poles and Throws	1-pole 2-throws (OFF at midpoint)
Full Travel (Pushing distance)	With Boss 1.0 mm (1.5 mm) Without Boss 2.2 mm (1.5 mm)
Operating Life	50000 cycles min.
Temperature Range	−10 °C to +60 °C
Heat Resistance	+70 °C for 96 hours
Low Temperature Resistance	-25 °C for 96 hours
Humidity Resistance	+40 °C 90 % to 95 % RH for 96 hours
Minimum Quantity/Packing Unit	4000 pcs. Embossed Taping (Reel Pack)
Quantity/Carton	24000 pcs.

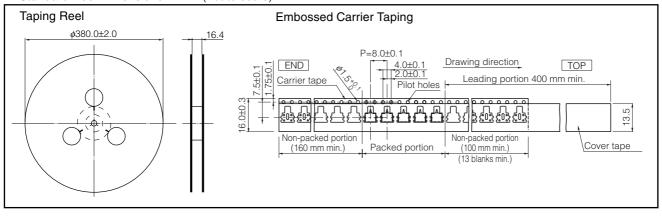


■ Circuit Diagram



■ Packaging Specifications

Standard Reel Dimensions in mm (not to scale)



2W Detector Switches

Type: **ESE24**

Bidirectional operation, auto-return to midpoint type.







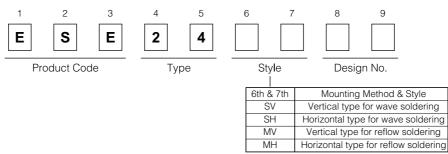
■ Features

- A lever-type detector switch with high reliability using sliding mechanical contacts
- Long over-travel (through-operation available)
- Used as an operation switch (an input device)

■ Recommended Applications

- Detection of media in portable electronic equipment (CD-ROM, DVD, Digital still cameras, etc.)
- Operating switches for other electronic equipment.

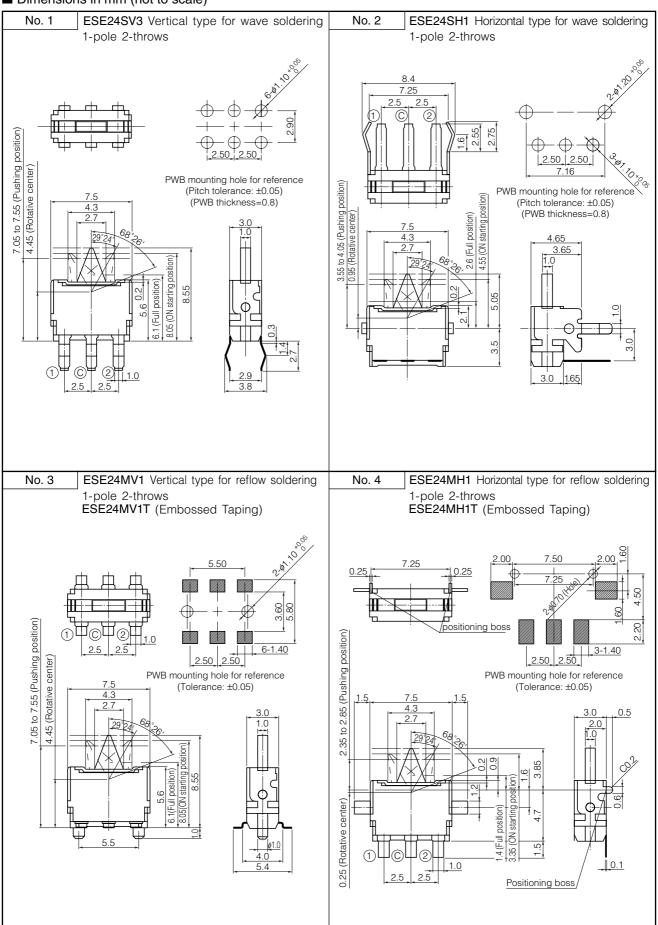
■ Explanation of Part Number



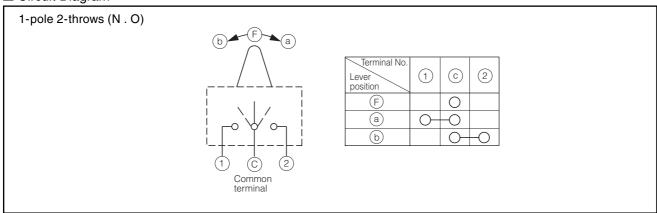
■ Specifications

Rating		50 μA 3 Vdc to 10 mA 5 Vdc (Resistive load)		
Contact Resistance		500 m Ω max. (Initial)		
Insulation Resistance		100 MΩ min. (100 Vdc)		
Dielectric Withstanding Voltage		100 Vac for 1 minute		
Operating Force		350 mN max.		
Mounting Height		· Type SV 5.6 mm · Type SH 4.65 mm · Type MV 5.6 mm · Type MH 3.0 mm		
Poles and Throws		1-pole 2-throws (OFF at midpoint)		
Full Travel (Pushing distance)		 Type SV 6.1 mm (2.45 mm) Type SH 2.6 mm (2.45 mm) Type MV 6.1 mm (2.45 mm) Type MH 1.4 mm (2.45 mm) 		
Operating Life		50000 cycles min.		
Temperature Range		−10 °C to +70 °C		
Heat Resistance		+80 °C for 96 hours		
Low Temperature Resistance		-25 °C for 96 hours		
Humidity Resistance		+40 °C 90 % to 95 % RH for 96 hours		
	ESE24MH, MV, SV, SH	200 pcs. Polyethylene Bag (Bulk) *1		
Minimum Quantity/Packing Unit	ESE24MH□T	1000 pcs. Embossed Taping (Reel Pack)*2		
	ESE24MV□T	500 pcs. Embossed Taping (Reel Pack)		
	ESE24MH, MV, SV, SH	10000 pcs. Polyethylene Bag (Bulk)		
Quantity/Carton	ESE24MH□T	6000 pcs. Embossed Taping (Reel Pack)		
	ESE24MV□T	3000 pcs. Embossed Taping (Reel Pack)		

*1 ESE24SH type: 160 pcs. (Polyethylene Bag), 8000 pcs. (Reel Pack) *2 ESE24SH, ESE24SH are excluded

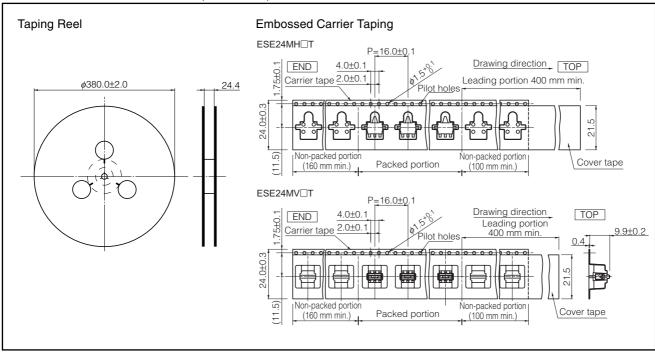


■ Circuit Diagram



■ Packaging Specifications

Standard Reel Dimensions in mm (not to scale)



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■ Quick Selection Guide

Type, Series	Appearance	Part Numbers	Country of origin	External Dimensions L×W×H (mm)	Operating Force	Applicable Soldering * SMD	Page
Jog Ball		EVQWJN	China	10.7×9.3×6.0	Push : 1.0 N, 1.3 N, 1.6 N (Use of EVQP6 Type)	* Reflow Soldering	ES57

Country of origin: As of April 2013

Panasonic

■ Minimum Quantity/Packing Unit

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

Type, Series	Part Numbers	Packaging	Quantity/Carton	Min.Q'ty/ Packing Unit
Jog Ball	EVQWJN	Tray Pack	1000 pcs.	200 pcs.

Jog Ball

Type: **EVQWJN**



■ Features

• External dimensions: 10.7 mm×9.3 mm, Height: 6.0 mm,

Ball diameter : ϕ 5.5 mm

● Long life : 1 million operations (each direction)

Magnetic detection method.

(Non-contact type)

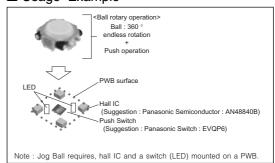
High resolution : 11 pulses/360 °

The ball rotation and push operation provide superior

operability

Light transmitting type (LED mounted on a PWB)

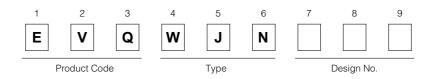
■ Usage Example



■ Recommended Applications

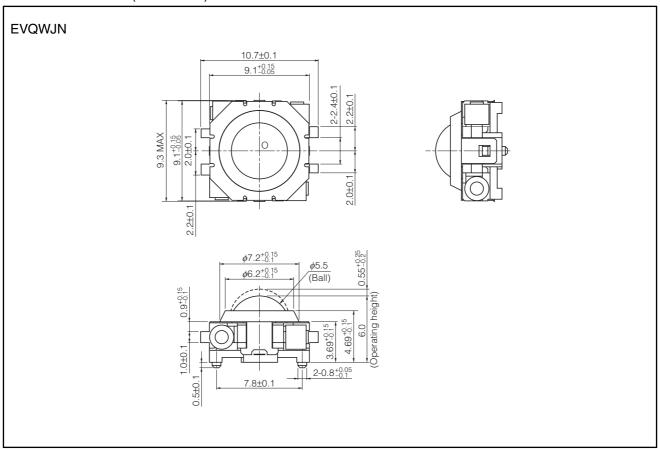
 Menu selection and confirmation operations of portable electronic equipment (Mobile phones, Digital cameras, Portable audio players, PDAs, and HPCs), car navigation systems, remote controllers, etc.

■ Explanation of Part Numbers

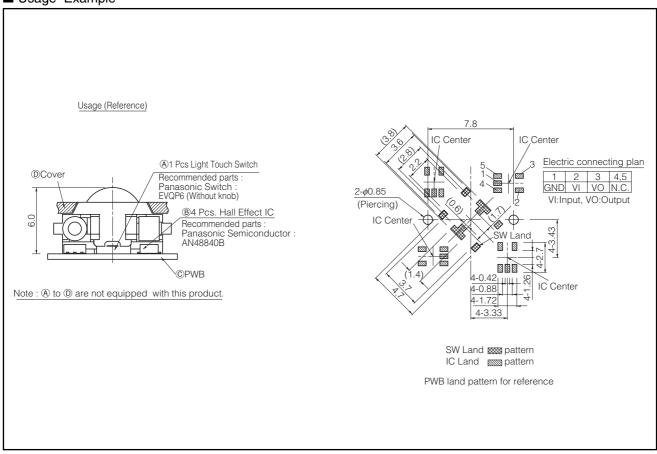


■ Specifications

Electrical	Rating		· 20 mA 15 Vdc (Use of EVQP6 Type) · 3 Vdc (Use of AN48840B Type)
	Operating Force	Push	1.0 N, 1.3 N, 1.6 N (Use of EVQP6 Type)
Mechanical	Resolution	Rotate	11 pulses/ 360 °
	Travel		0.9 mm
Endurance	Operating life	Rotate	1000000 cycles min.
Endurance	Operating me	Push	1000000 cycles min. (Use of EVQP6 Type)
Temperature Range		·	−20 °C to +70 °C
Minimum Quantity/Packing Unit			200 pcs. (Tray Pack)
Quantity / Carton			1000 pcs.



■ Usage Example



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■6 mm Square Long Travel SMD Light Touch Switches (EVQP0/P1/9P)····································	····ES146
■6 mm Square Long Travel 2 terminals SMD Light Touch Switches (EVPAS) ····································	····ES149
■6 mm Square Long Travel 2R Light Touch Switches (EVQPV)·······	····ES152
■8 mm Square Long Travel SMD Light Touch Switches (EVQQ1)······	··· ES154
■8 mm Square Long Travel 2R Light Touch Switches (EVQQJ)·······	··· ES156
■10 mm Square Center Space Long Travel SMD Light Touch Switches (EVPAD) ·······	··· ES158

Panasonic

■ Quick Selection Guide

Type, Series	Appearance	Part Numbers	Country of origin	External Dimensions L×W×H (mm)	Operating Force	Applicable Soldering *SMD	Variety	Page	
4 mm Causes CMD	\$	EVQP6	Japan	4.1×4.1×0.35 4.1×4.1×0.58	1.6 N 2.4 N	#Doflay	Push Plate:With, Without Ground Terminal:With, Without Positioning Boss:Without	ES66	
4 mm Square SMD	•	EVQ6P6 EVQ7P6 EVQ9P6	Malaysia	4.1×4.1×0.43	1.0 N 1.6 N 2.4 N	*Reflow	Push Plate:Without Ground Terminal:With Positioning Boss:Without	2000	
4.5 mm Square SMD	•	EVQPQ	Japan	4.5×4.5×0.55	1.6 N 2.4 N	*Reflow	Push Plate:Without Ground Terminal:Without Positioning Boss:Without	ES70	
4.9 mm Square SMD	•	EVQPL EVQ3PL EVQ5PL EVQPT	Japan Malaysia	4.9×4.9×0.8 4.9×4.9×1.5	1.0 N 1.6 N 2.6 N 3.5 N	*Reflow	Push Plate:With, Without Ground Terminal:With Positioning Boss:Without	ES73	
6 mm Square Thin Type SMD	\$ \$	EVQP0 EVQQ2	Malaysia	6.5×6.0×2.0 6.5×6.0×2.5 6.5×6.0×3.1	0.5 N, 0.6 N 1.0 N, 1.3 N 1.6 N, 2.6 N 3.5 N	*Reflow	Push Plate:With Ground Terminal:With, Without Positioning Boss:Without	ES76	
3.0 mm×2.0 mm SMD	0	EVPAW	Japan China	3.0×2.0×0.6	1.6 N 2.4 N 3.3 N	*Reflow	Push Plate:With	ES80	
2.0 mm/2.0 mm CMD		EVDAE	Japan	3.0×2.6×0.65	1.3 N 1.6 N	*Reflow	Dueb Plete Mith	FCOO	
3.0 mm×2.6 mm SMD	•	EVPAF	Malaysia China	3.0×2.6×0.7	2.4 N 3.4 N	*Heriow	Push Plate:With	ES83	
3.5 mm×2.9 mm SMD		EVPAA	Japan China	3.5×2.9×1.7	1.0 N, 1.6 N 2.4 N, 3.5 N 5.0 N	*Reflow	Push Plate:With Ground Terminal:With, Without Positioning Boss:Without	ES86	
4.7 mm×3.5 mm SMD	0	EVQP2 EVQP9 EVQ3P2	Japan	4.7×3.5×2.1 4.7×3.5×2.5	1.0 N, 1.6 N 2.4 N, 2.5 N 3.5 N, 5.0 N	*Reflow	Push Plate:With Push Travel:Middele, Short Ground Terminal:With, Without Positioning Boss:Without	ES89	
6.0 mm×3.5 mm SMD	9	EVQPE1 EVQPN EVQ5P	Japan	6.0×3.5×4.3 6.0×3.5×5.0	1.0 N 1.6 N 2.4 N	*Reflow	Push Platel:With Embossed Taping Ground Terminal:Without Positioning Boss:Without	ES93	
3.5 mm×2.9 mm Side-operational SMD	•	EVQP7 EVQP3 EVQ9P7	Japan China Malaysia	3.5×2.9×1.35	1.6 N 2.2 N	*Reflow	Terminal:Straight, J-bent, L-shape Ground Terminal:With, Without Positioning Boss:With, Without	ES95	
3.5 mm×2.9 mm Side-operational Half Dive / SMD	1	EVPAN	Japan Malaysia	3.5×2.9×1.2	1.6 N 2.2 N	*Reflow	Terminal:Straight L-shape	ES99	
Small-sized Side-operational SMD	5	EVQPU	Japan China	4.7×3.5×1.65	1.6 N 2.2 N	*Reflow	Terminal:Straight, J-bent Ground Terminal:With, Without Positioning Boss:With, Without	ES102	
2.8 mm×2.3 mm Side-operational Edge Mount	6	EVPAV	Japan China	2.8×2.3×1.95	1.6 N	*Reflow	Ground Terminal:With (Cover Plate)	ES106	
4.5 mm×2.2 mm Side-operational Edge Mount	=	EVPAE	Japan	4.5×2.25×2.9	1.6 N 3.0 N	*Reflow	Ground Terminal:With (Cover Plate)	ES108	
6.2 mm×2.5 mm Side-operational Edge Mount	6	EVQP4	Japan	6.2×2.55×3.5	1.0 N, 1.6 N 2.4 N, 2.5 N 3.5 N, 5.0 N	*Reflow Mounted on pc board edge	Push Plate:With Push Travel:Middele, Short Ground Terminal:With (Cover Plate)	ES110	
6.1 mm×4.0 mm Side-operational SMD	00	EVQPS	Japan	6.1×4.0×1.8	1.6 N 2.2 N	*Reflow	Terminal : Straight, J-bent Ground Terminal:With, Without Positioning Boss:With, Without	ES113	

Country of origin: As of April 2013

Type, Series	Appearance	Part Numbers	Country of origin	External Dimensions L×W×H (mm)	Operating Force	Applicable Soldering *SMD	Variety	Page
5N Type		EVQPA EVQPB	Japan Malaysia China Japan	6.0×6.0×4.3 6.0×6.0×5.0 6.0×6.0×7.0 6.0×6.0×9.5	1.0 N 1.3 N 1.6 N 2.6 N	Manual Wave Soldering	Push Pla te:With Ground Terminal:With, Without	ES117
5N Type Side-operational		EVQPF	China Japan	7.5×7.1×7.15 7.5×7.1×7.85 7.5×7.1×9.85 7.5×7.1×12.35	1.0 N 1.3 N 1.6 N 2.6 N	Manual Wave Soldering	Push Plate:With	ES120
5N Type 2R		EVQ2	Japan Malaysia	6.0×6.0×4.3 6.0×6.0×5.0 6.0×6.0×7.0 6.0×6.0×9.5	1.0 N 1.3 N 1.6 N 2.6 N	Wave Soldering	Push Plate:With Ground Terminal:With, Without	ES122
5N Type Side-operational 4R		EVQPC	Japan	7.5×7.1×9.25	1.0 N 1.3 N 1.6 N 2.6 N	Wave Soldering	Push Plate:With	ES124
Round Type 2R		EVQ11	Japan Malaysia China	6.0×6.0×4.3 6.0×6.0×5.0 6.0×6.0×7.0 6.0×6.0×9.5	1.0 N 1.3 N 1.6 N 2.6 N	Wave Soldering	Push Plate:With Ground Terminal:Without	ES126
6.0 mm×3.5 mm		EVQPE	Japan	6.0×3.5×4.3 6.0×3.5×5.0	1.0 N 1.6 N 2.4 N	Wave Soldering	Push Plate:With Bulk Ground Terminal:Without Positioning Boss:Without	ES128
6.0 mm×3.5 mm 2R		EVQPJ	Japan	6.0×3.5×4.3 6.0×3.5×5.0	1.0 N 1.6 N 2.4 N	Wave Soldering	Push Platel:With Radial Taping Ground Terminal:Without Positioning Boss:Without	ES130
Over Travel		EVQP0	Japan China	6.2×6.2×7.45	0.74 N 1.3 N	Wave Soldering	Push Plate:With Ground Terminal:Without	ES132
4 mm Square Double-action SMD	\$	EVPAH	Japan	4.0×4.1×0.59	① 0.8 N,0.9 N,1.0 N ② 1.6 N,2.0 N,2.6 N	*Reflow	Push Plate:With Terminal:J-bent Ground Terminal:With (Cover Plate)	ES134
6 mm Square Thin Type Double-action SMD	•	EVQPR EVQQ0 EVQ3PR	Japan	6.0×6.0×0.9 6.0×6.0×0.95	①0.7 N,1.0 N ②2.6 N	*Reflow	Push Plate:With, Without Ground Terminal:With, Without Positioning Boss:With, Without	ES137
4.7 mm×3.5 mm Double-action Side-operational SMD	4	EVPAJ	Japan	4.7×3.5×1.2	① 1.6 N ② 2.6 N	*Reflow	Straight L-shape	ES140
6.2 mm×3.7 mm Double-action Side-operational Edge Mount / SMD	*	EVQQ0	Japan	6.2×3.75×3.5	① 1.0 N ② 2.6 N	*Reflow Mounted on pc board edge/Reflow	Push Plate:With Ground Terminal:With (Cover Plate)	ES143
6 mm Square Long Travel SMD	-	EVQP0 EVQP1 EVQ9P	Japan	6.0×6.1×5.0	1.6 N, 2.0 N 2.2 N, 2.5 N 3.0 N, 3.5 N	*Reflow	Push Plate:With Push Travel: 1.0 mm, 1.3 mm Ground Terminal:Without	ES146
6 mm Square Long Travel 2 terminals SMD		EVPAS	Japan	6.0×6.1×5.0	1.6 N, 2.0 N 2.2 N, 2.5 N 3.0 N, 3.5 N	*Reflow	Push Plate:With Push Travel: 1.0 mm, 1.3 mm Ground Terminal:Without	ES149
6 mm Square Long Travel 2R		EVQPV	Japan	6.0×6.1×5.0	1.6 N 2.0 N 2.2 N 2.5 N 3.5 N	Wave Soldering	Push Plate:With Push Travel: 1.0 mm, 1.3 mm Ground Terminal:Without	ES152
8 mm Square Long Travel SMD		EVQQ1	Japan	8.5×8.5×6.5	4.0 N 5.0 N	*Reflow	Push Plate:With Ground Terminal:Without	ES154
8 mm Square Long Travel 2R		EVQQJ	Japan	8.0×8.0×5.0 8.0×8.0×5.5 8.0×8.0×6.1	0.8 N 1.3 N 2.5 N 3.0 N	Wave Soldering	Push Plate:With Push Travel: 1.0 mm, 1.2 mm, 1.75mm Ground Terminal:Without	ES156
10 mm Square Center Space Long Travel SMD	0	EVPAD	Japan	9.8×9.8×4.7	4.0 N	*Reflow	Push Plate:With Push Travel:1.0 mm Ground Terminal:Without	ES158

Country of origin : As of April 2013

■ 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)				
	C-1	Inquiry purpos	e	New use, Modification, Others (
			Previous supplier					
_	1 - 1	Modification	Conventional part No.					
Common			Purpose					
Ö			Equipment					
	C-3	Application	Environment	Indoor/Outdoor use, Stationary/Portable set, Car installation High humidity, SO ₂ , NaCl				
			Temperature	(°C) to (°C)				
Electrical Specifications	E-1	Ratings		(mA), (V dc)				
<i>•</i>	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)					
nsions			Operating force	(N)				
Shapes/Dimensions			Travel	(mm)				
l/sədı	M-2	Anti-electrosta	atic	Ground Terminal: With, Without				
Sha			Dimensions	() mm × () mm, hight() mm				
	M-3	Shapes	Terminal Type (Reflow)	Flat Terminal, J-bent Terminal				
			Positioning	Positioning Boss: with, without				
	L-1	Soldering Soldering Conditions		Manual, Flow, Reflow				
				Temp.(°C), Time(s)				
Others	L-2	Packing Unit		Polyethylene Bag (Bulk), Embossed Taping (Reel Pack), Raial Taping (Reel Pack), Stick				
ğ	L-3	Special requirements for endurance						
	L-4	4 Special requirements for safety						
	L-5	Other question	nnaires					

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

Panasonic Light Touch Switches

■ ⚠ 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 350 °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.

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.
- 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.
- 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

- 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

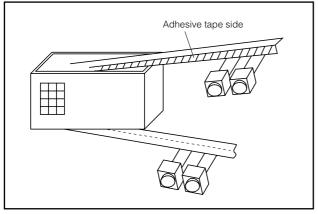
Although care is taken to ensure switch quality, variation of contact resistance (increase), short circuits, open circuits, and temperature rise are some problems that might be generated.

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."

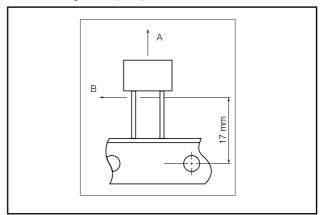
■ Common Specifications

- 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 1.0N for 3 seconds.



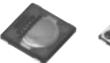
■ Minimum Quantity/Packing Unit

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

Type, Series	Part No.	Packaging	Quantity/ Carton	Min. Q'ty Packing Unit	Notes
4 mm Square SMD Light Touch Switches	th Touch Switches EVQP6/6P6/7P6/9P6		50000 pcs.	10000 pcs.	
4.5 mm Square SMD Light Touch Switches	EVQPQ		50000 pcs.	10000 pcs.	
4.9 mm Square SMD Light Touch Switches	EVQPL/3PL/5PL/PT		25000 pcs.	5000 pcs.	
6 mm Square Thin Type SMD	EVQP0		20000 pcs.	4000 pcs.	H=2.0 mm
Light Touch Switches	EVQQ2]	10000 pcs.	2000 pcs.	H=2.5 mm, 3.1 mm
3.0 mm×2.0 mm SMD Light Touch Switches	EVPAW	1	50000 pcs.	10000 pcs.	
3.0 mm×2.6 mm SMD Light Touch Switches	EVPAF		40000 pcs.	8000 pcs.	
3.5 mm×2.9 mm SMD Light Touch Switches	EVPAA		25000 pcs.	5000 pcs.	
4.7 mm×3.5 mm SMD Light Touch Switches	EVQP2/P9/3P2	Embossed Taping (Reel Pack)	20000 pcs.	4000 pcs.	
6.0 mmx3.5 mm SMD			10000 pcs.	2000 pcs.	H=5.0 mm
Light Touch Switches	EVQPE1/PN/5P		12500 pcs.	2500 pcs.	H=4.3 mm
3.5 mm×2.9 mm Side-operational SMD Light Touch Switches	EVQP7/P3/9P7		25000 pcs.	5000 pcs.	
3.5 mm×2.9 mm Side-operational Half Dive / SMD Light Touch Switches	EVPAN		35000 pcs.	7000 pcs.	
Small-sized Side-operational SMD Light Touch Switches	EVQPU	-	20000 pcs.	4000 pcs.	
2.8 mm×2.3 mm Side-operational Edge Mount Light Touch Switches	EVPAV	1	40000 pcs.	8000 pcs.	
4.5 mmx2.2 mm Side-operational Edge Mount Light Touch Switches	EVPAE		17500 pcs.	3500 pcs.	
6.2 mm×2.5 mm Side-operational Edge Mount Light Touch Switches	EVQP4	1	12500 pcs.	2500 pcs.	
6.1 mmx4.0 mm Side-operational SMD Light Touch Switches	EVQPS	Embossed Taping (Reel Pack)	16000 pcs.	4000 pcs.	
5N Type Light Touch Switches	EVQPA/PB	Polyethylene Bag	10000 pcs.	500 pcs.	
5N Type Side-operational Light Touch Switches	EVQPF	(Bulk)	10000 pcs.	500 pcs.	
5N Type 2R Light Touch Switches	EVQ2		10000 pcs.	1000 pcs.	
5N Type Side-operational 4R Light Touch Switches	EVQPC	Radial Taping (Reel Pack)	7000 pcs.	700 pcs.	
Round Type 2R Light Touch Switches	EVQ11	(1.001.1.001.)	25000 pcs.	2500 pcs.	
6.0 mm×3.5 mm Light Touch Switches	EVQPE	Polyethylene Bag (Bulk)	10000 pcs.	1000 pcs.	
6.0 mm×3.5 mm 2R Light Touch Switches	EVQPJ	Radial Taping (Reel Pack)	20000 pcs.	2000 pcs.	
Over Travel Light Touch Switches	EVQP0	Polyethylene Bag (Bulk)	10000 pcs.	500 pcs.	
4 mm Square Double-action SMD Light Touch Switches	EVPAH	Embossed Taping (Reel Pack)	40000 pcs.	8000 pcs.	
6 mm Square Thin Type Double-action SMD Light Touch Switches	EVQPR/Q0/3PR	Embossed Taping (Reel Pack)	25000 pcs.	5000 pcs.	
4.7 mmx3.5 mm Double-action Side-operational SMD Light Touch Switches	EVPAJ	Embossed Taping (Reel Pack)	25000 pcs.	5000 pcs.	
6.2 mmx3.7 mm Double-action Side-operational Edge Mount / SMD Light Touch Switches	EVQQ0	Embossed Taping (Reel Pack)	12500 pcs.	2500 pcs.	
6 mm Square Long Travel SMD Light Touch Switches	EVQP0/P1/9P	Embossed Taping (Reel Pack)	10000 pcs.	2000 pcs.	
6 mm Square Long Travel 2 terminals SMD Light Touch Switches	EVPAS	Embossed Taping (Reel Pack)	10000 pcs.	2000 pcs.	
6 mm Square Long Travel 2R Light Touch Switches	EVQPV	Radial Taping (Reel Pack)	25000 pcs.	2500 pcs.	
8 mm Square Long Travel SMD Light Touch Switches	EVQQ1	Embossed Taping (Reel Pack)	10000 pcs.	1000 pcs.	
8 mm Square Long Travel 2R Light Touch Switches	EVQQJ	Radial Taping (Reel Pack)	10000 pcs.	1000 pcs.	
10 mm Square Center Space Long Travel SMD Light Touch Switches	EVPAD	Embossed Taping (Reel Pack)	5000 pcs.	1000 pcs.	

4 mm Square SMD Light Touch Switches

Type: EVQP6/EVQ6P6/EVQ7P6/EVQ9P6







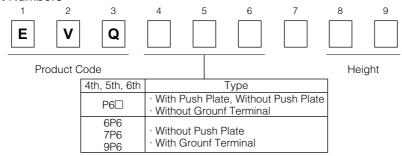
Features

- External dimensions: 4.1 mm×4.1 mm
 Height: Without Push Plate 0.35 mm, With Push Plate 0.58 mm
 :Without Push Plate·With Ground Terminal 0.43 mm
- Long-life :1000000 cycles min. (Operating Force 1.6 N Type)
- Dust-proof structure

■ Recommended Applications

 Operating switches for portable electronic equipment (Mobile phones, Camcorders, Portable audio players, etc.).

■ Explanation of Part Numbers



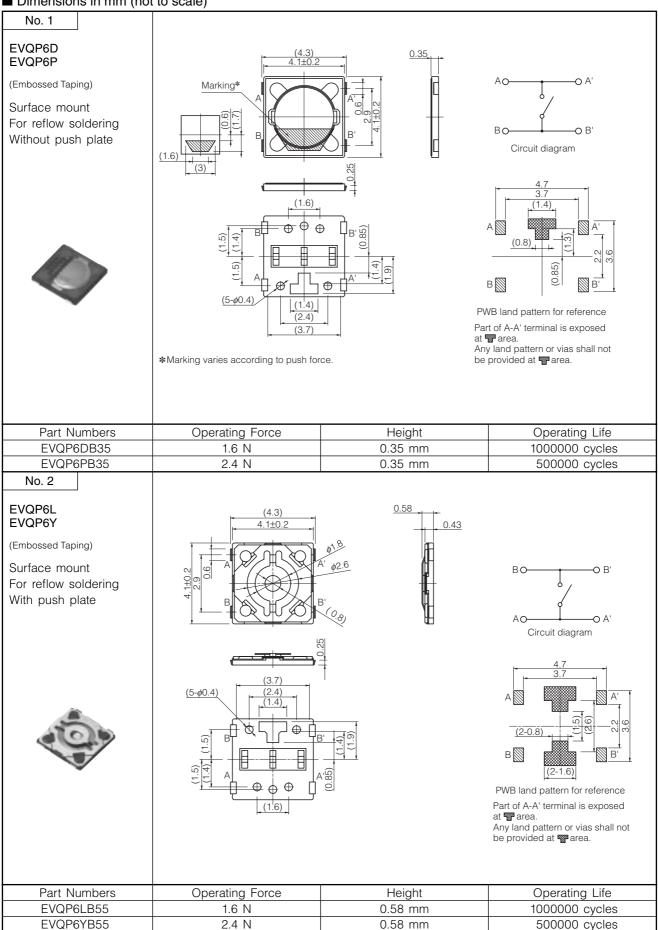
■ Product Chart

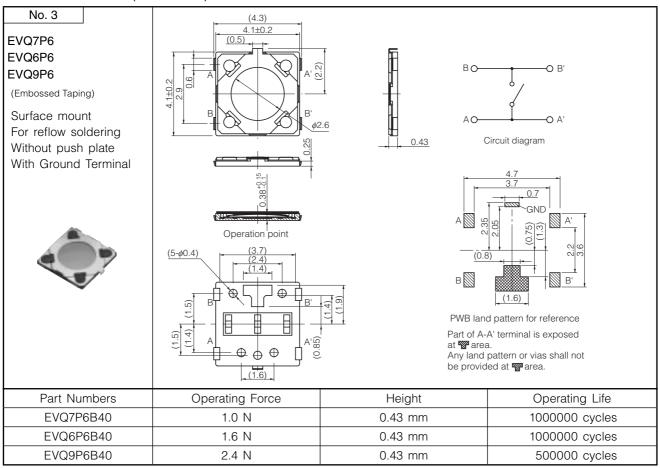
Height	Without Push Plate H=0.35 mm	With Push Plate H=0.58 mm	Without Push Plate With Ground Terminal H=0.43 mm		
Packaging Operating Force	Embossed	Embossed	Embossed		
1.0 N	_	_	EVQ7P6		
1.6 N	EVQP6D	EVQP6L	EVQ6P6		
2.4 N	EVQP6P	EVQP6Y	EVQ9P6		

■ Specifications

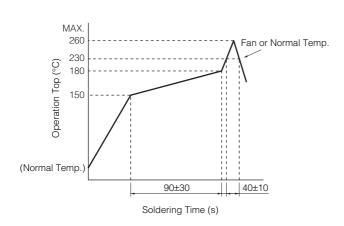
Туре		Snap action / Pu	sh-on type SPST			
туре		Without Push Plate	With Push Plate			
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)				
	Contact Resistance	500 ms	Ω max.			
Electrical	Insulation Resistance	50 Mg	Ω min.			
	Dielectric Withstanding Voltage	100 Vac fo	or 1 minute			
	Bouncing	3 ms max. (ON) 10 ms max. (OFF)				
Mechanical	Operating Force	1.0 N, 1.6 N, 2.4 N				
Mechanicai	Travel	0.2 mm (EVQ7P6 : 0.15 mm)				
Endurance	Operating Life	1.0 N, 1.6 N : 1000000 cycles min. 2.4 N : 500000 cycles min.				
Operating Tem	perature	−20 °C to +70 °C				
Storage Temperature			o +85 °C (Bulk) o +60 °C (Taping)			
Minimum Quar	ntity/Packing Unit	10000 pcs. Embossed Taping (Reel Pack)				
Quantity/Carto	n	50000 pcs.				

Note: Non washable

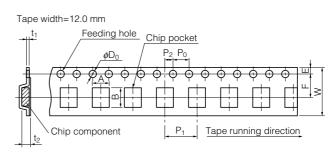




■ Recommended Reflow Soldering Conditions



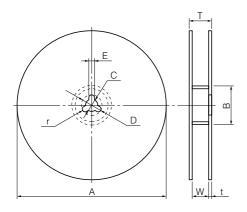
Embossed Carrier Taping



Unit: mm

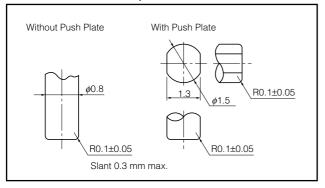
Part No.	Height	А	В	W	F	E	P ₁	P ₂	P ₀	D₀ Dia.	t ₁	t ₂
EVQP6	0.35/0.58											
EVQ6P6 EVQ7P6 EVQ9P6	0.43	4.0±0.2	5.0±0.2	12.0+0.3	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5 ^{+0.1}	0.30±0.05	0.5/0.7 ^{+0.2} _{-0.1}

Standard Reel Dimensions in mm (not to scale)

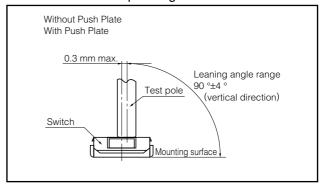


Item	Α	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	13.5±1.5	17.5±1.0	1.0 to 3.0	1.0±0.5	

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



4.5 mm Square SMD Light Touch Switches

Type: **EVQPQ**





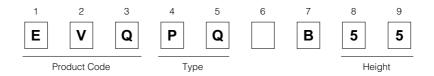
■ Features

- External dimensions: 4.5 mm×4.5 mm, Height 0.55 mm
- Lightweight: 20 mg (1/2 compared with coventional type)

■ Recommended Applications

 Operation switches for portable electronic equipment (Camcorders, Portable audio players, etc.)

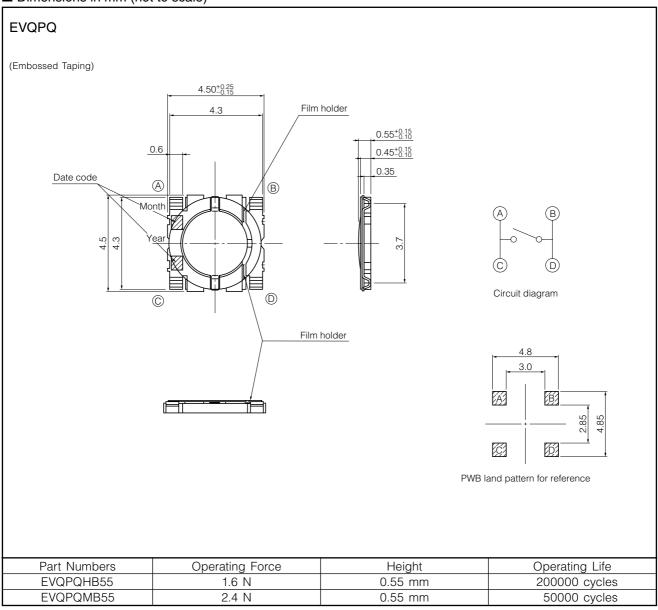
■ Explanation of Part Numbers



■ Specifications

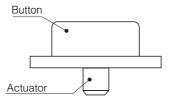
Туре		Snap action/Push-on type SPST
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)
	Contact Resistance	100 m Ω max.
Electrical	Insulation Resistance	50 MΩ min. (at 100 Vdc)
Lioutioa	Dielectric Withstanding Voltage	250 Vac for 1 minute
	Bouncing	3 ms max. (ON) 10 ms max. (OFF)
Mechanical	Operating Force	1.6 N±0.5 N 2.4 N±0.6 N
	Travel	0.2 mm±0.1 mm
Endurance	Operating Life	200000 cycles min. (1.6 N), 50000 cycles min. (2.4 N)
Operating Ter	nperature	−20 °C to +70 °C
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)
Minimum Qua	ntity/Packing Unit	10000 pcs. Embossed Taping (Reel Pack)
Quantity/Carto	on	50000 pcs.

Note: Non washable

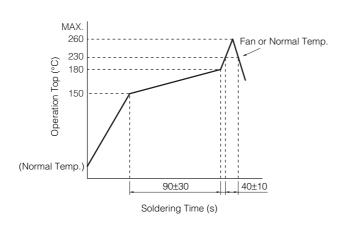


■ Before using this product

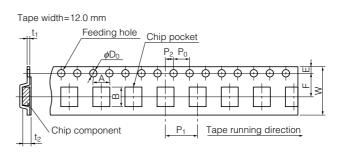
• If the inclination of the actuator is widened by using soft materials, such as rubber, for the setting side of the operation section (connecting area between button and acturator), it may cause functional problems.



■ Recommended Reflow Soldering Conditions



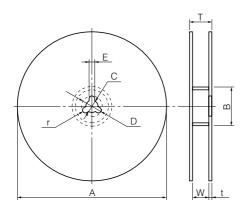
Embossed Carrier Taping



Unit: mm

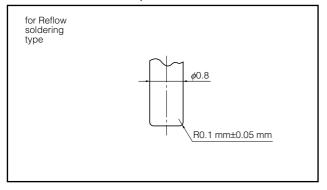
Part No.	Height	Α	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVQPQ	0.55	5.0+0.30	4.6+0.3	12.0±0.1	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.30±0.05	$0.65^{+0.2}_{-0.1}$

Standard Reel Dimensions in mm (not to scale)

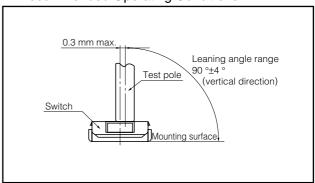


Item	А	В	С	D	E
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	T	t	r	
Rate (mm)	14.0±1.5		1.0 to 3.0	1.0±0.5	

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



4.9 mm Square SMD Light Touch Switches

Type: EVQPL/EVQ3PL EVQ5PL/EVQPT





- Features
- External dimensions: 4.9 mm×4.9 mm, Height: 0.8 mm(Without push plate), 1.5 mm(With push plate)
- Recommended Applications
- Operation switches for portable electronic equipment (Notebook PC, Camcorders, Portable audio players, etc.)
- Operation switches for car audio systems

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
E	V	Q	Р	L		Α		
Pro	oduct Cod	de	Ту	ре			He	ight

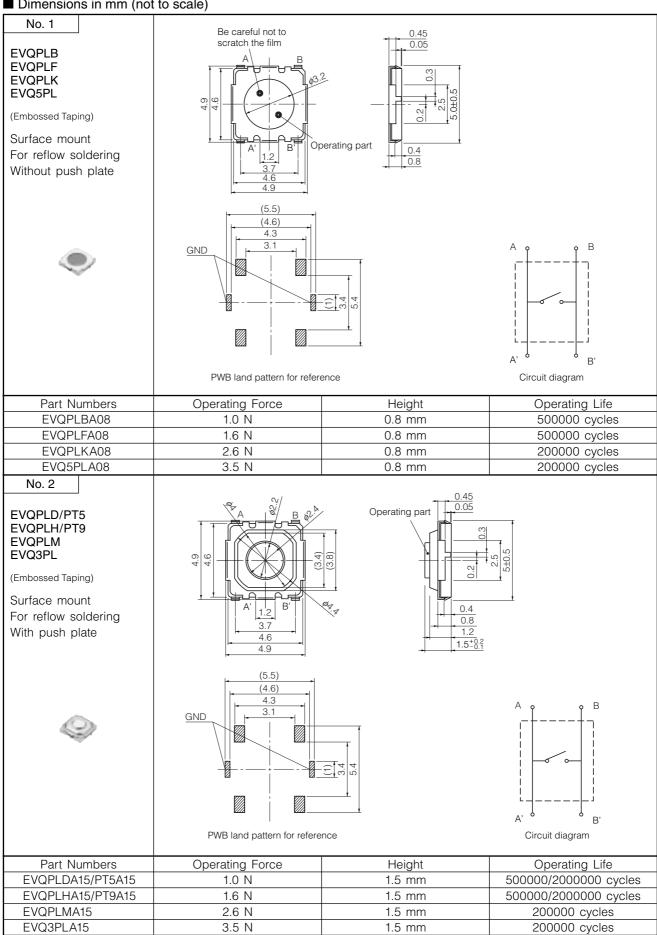
■ Product Chart

Height	H=0.8 mm	H=1.5 mm (With Push Plate)
Packaging Operating Force	Embossed	Embossed
1.0 N	EVQPLB	EVQPLD, EVQPT5
1.6 N	EVQPLF	EVQPLH, EVQPT9
2.6 N	EVQPLK	EVQPLM
3.5 N	EVQ5PL	EVQ3PL

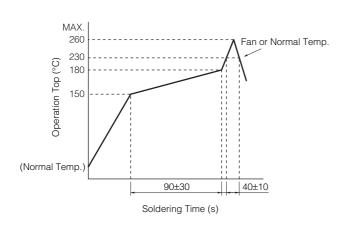
■ Specifications

Туре		Snap action/Push	n-on type SPST			
	Rating	10 μA 2 Vdc to 20 mA 1	5 Vdc (Resistive load)			
	Contact Resistance	50 m Ω max.				
Electrical	Insulation Resistance	50 MΩ min. (a	at 100 Vdc)			
	Dielectric Withstanding Voltage	250 Vac for	1 minute			
	Bouncing	3 ms max. (ON) 8 ms max. (OFF)				
Mechanical	Operating Force	1.0 N±0.5 N 1.6 N±0.5 N	2.6 N±0.6 N 3.5 N±1.0 N			
	Travel	0.25 mm ^{+0.10} _{-0.20} mm				
Endurance	Operating Life	500000 cycles min.	200000 cycles min.			
Operating Ter	mperature	−20 °C to	+70 °C			
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)				
Minimum Qua	ntity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)				
Quantity/Carto	on	25000 pcs.				

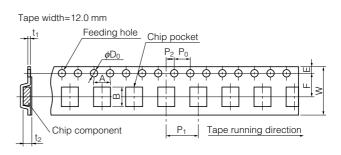
Note: Non washable



■ Recommended Reflow Soldering Conditions



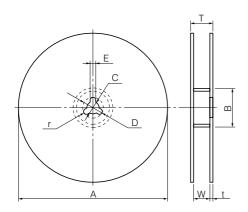
Embossed Carrier Taping



Unit: mm

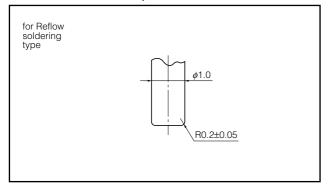
Part No.	Height	А	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVQPL EVQ3PL EVQ5PL EVQPT	0.8/1.5	5.0±0.2	5.0±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.35±0.05	1.0/1.7±0.2

Standard Reel Dimensions in mm (not to scale)

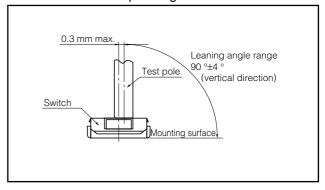


Item	А	В	С	D	E
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	14.0±1.5	_	1.0 to 3.0	1.0±0.5	

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



6 mm Square Thin Type SMD Light Touch Switches

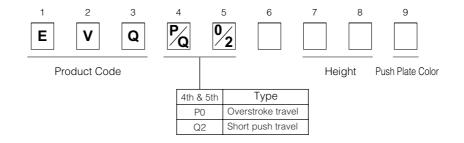
Type: **EVQP0 EVQQ2**



- Features
- External dimensions : 6.5 mm×6.0 mm, Height 1.8 mm (Excluding the push plate)
- With or without ground terminal, height, operating force
- Overstroke travel

- Recommended Applications
- Operating switches for other electronic equipment
- Operation switches for PC mouse
- Car audio systems

■ Explanation of Part Numbers



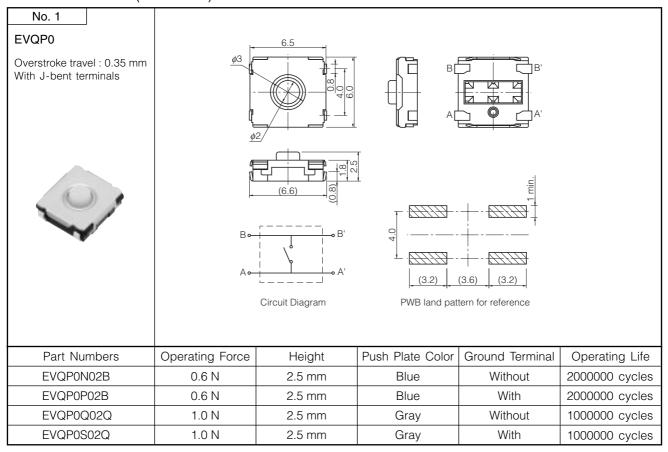
Specifications

Travel Type		Short Push Travel	Overstroke Travel			
Туре		Snap action/Pus	sh-on type SPST			
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)				
	Contact Resistance	100 m Ω max.				
Electrical	Insulation Resistance	100 MΩ min.	(at 100 Vdc)			
Dielectric Withstanding Voltage		250 Vac fo	or 1 minute			
	Bouncing	10 ms max	. (ON, OFF)			
Mechanical	Operating Force	0.5 N, 1.0 N, 1.3 N, 1.6 N, 2.6 N, 3.5 N	0.6 N, 1.0 N			
Woorlanda	Travel	0.25 mm (0.2 mm : 0.5N, 1.0N)	0.3 mm			
Endurance	Operating Life	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.	0.6 N: 2000000 cycles min. 1.0 N: 1000000 cycles min.			
Operating Ter	mperature	-40 °C to	o +85 °C			
Storage Temperature			85 °C (Bulk) 60 °C (Taping)			
Minimum Quantity/Packing Unit		H=2.0 mm H=2.5 mm, 3.1 mm	4000 pcs. Embossed Taping (Reel Pack) 2000 pcs. Embossed Taping (Reel Pack)			
Quantity/Cart	on	H=2.0 mm H=2.5 mm, 3.1 mm	20000 pcs. 10000 pcs.			
Note: Non washal	ble	,	1			

Design and specifications are each subject to change without notice. Ask factory for the current technical specifications before purchase and/or use. Should a safety concern arise regarding this product, please be sure to contact us immediately.

Light Touch Switches/EVQP0/Q2

Panasonic

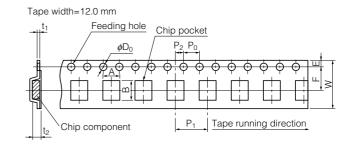


■ Dimensions in mm (no	ot to scale)				
No. 2					
	40.0	6.5			Height
EVQQ2	φ3.8		The BE	B'	H
Short push travel : 0.25 mm		0.04			2.0±0.2
With J-bent terminals					2.5±0.2
	1			7 P	3.1±0.2
		-	UP T		
	<u>φ</u>	3 3/			
	ı a⊨				
1	Į T				
		(6.6)		mi.	
		9	[XXXXXI	-	
	5.5		T :	 	
	В • +	B'	0	 '	
	1	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \			
	Α •	A'			
			(3.2)	3.6) (3.2)	
		Circuit Diagram	PWB land patte	ern for reference	
			· 		
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 1.3 N	3.1 mm	White White	Without	1000000 cycles
EVQQ2M01W EVQQ2M02W	1.3 N	2.0 mm 2.5 mm	White	With With	1000000 cycles 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
		0 -	1 1471 1	\ \ \ / i+ b	100000 avalas
EVQQ2202W EVQQ2203W	3.5 N 3.5 N	2.5 mm 3.1 mm	White White	With With	100000 cycles 100000 cycles

■ Recommended Reflow Soldering Conditions

MAX. 260 Fan or Normal Temp. 230 Operation Top (°C) 180 150 (Normal Temp.) 90±30 40±10 Soldering Time (s)

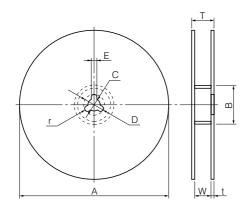
Embossed Carrier Taping



Unit: mm

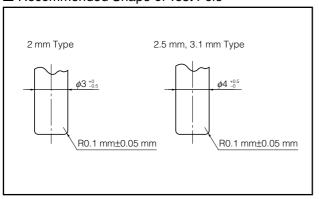
Part No.	Height	Α	В	W	F	E	P1	P2	P ₀	D0 Dia	t1	t2
EV000	2.0											2.2±0.2
EVQQ2	2.5/3.1	6.7±0.2	7.4±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.30±0.05	3.2±0.2
EVQP0	2.5											2.8±0.2

Standard Reel Dimensions in mm (not to scale)

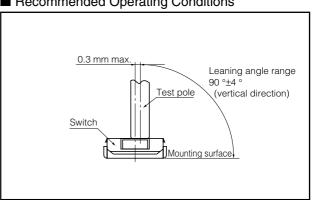


Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	_		

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



3.0 mm×2.0 mm SMD Light Touch Switches

Type: **EVPAW**

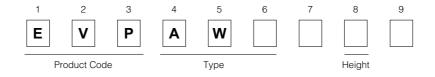


- Features
- External dimensions: 3.0 mm×2.0 mm, Height 0.6 mm
- High operability
 Equipped with an actuator (push plate)

■ Recommended Applications

 Operation switches for portable electronic equipment (Mobile phone, Portable audio)

■ Explanation of Part Numbers



■ Specifications

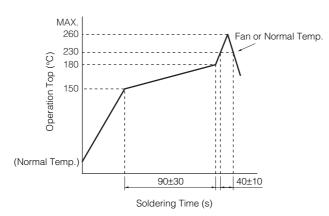
Type		Snap action/Push-on type SPST			
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)			
	Contact Resistance	500 m Ω max.			
Electrical	Insulation Resistance	50 M Ω min. (at 100 Vdc)			
Dielectric Withstanding Voltage Bouncing		250 Vac for 1 minute			
		10 ms max. (ON, OFF)			
Operating Force		1.6 N, 2.4 N, 3.3 N			
Mechanical	Travel	1.6 N, 2.4 N : 0.13 mm 3.3 N : 0.15 mm			
Endurance	Operating Life	300000 cycles min.			
Operating Tem	perature	−40 °C to +85 °C			
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)			
Minimum Quantity/Packing Unit		10000 pcs. Embossed Taping (Reel Pacl			
Quantity/Carto	n	50000 pcs.			

Note: Non washable

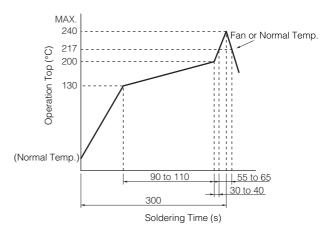
■ Dimensions in mm (not to scale)

EVPAW (Embossed Taping) General dimension tolerance: ± 0.05 () dimensions are reference dimensions. This reference specifications are subject to change. 0.6±0.1 (0.385) $(\phi 0.85)$ А о----Circuit diagram 2-3.69 (0.04)2-2.85 0.1 max. Without film Stencil mask plan Ø × 3.8 Ø PWB land pattern for reference Soldering thickness t=0.08±0.01 * If you design different stencil mask and land pattern, or apply different soldering thickness compared with our recommended pattern as described above, please ask us in advance. Part Numbers Operating Force Height Operating Life EVPAWBA2A 1.6 N 0.6 mm 300000 cycles EVPAWCA2A 2.4 N 0.6 mm 300000 cycles EVPAWEA2A 300000 cycles 3.3 N 0.6 mm

■ Recommended Reflow Soldering Conditions

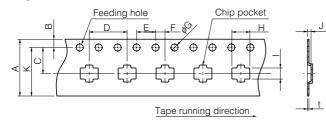


*Reflow temperature may vary by location even in the same reflow condition. Please check the reflow temperature at terminals and at the top of a switch to make sure the both temperatures are withiin the specification. If even one of them is out of the specifications, please adjust.



Embossed Carrier Taping

Tape width=12.0 mm



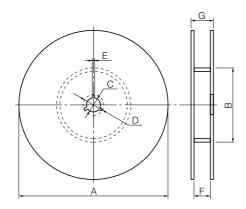
Taping condition: Lack of products in the middle of taping should be one MAX, but total quantity specified in the specifications should be secured.

Peeling off strength of top tape: It should be within 0.2N to 1. ON at 165 degree in peeling off angle.

Joint of carrier tape : One joint per one reel may exist.

													Unit: mm
Part No.	Height	Α	В	С	D	Е	F	G	Н	1	J	K	t
EVPAW	0.6	12.0±0.3	1.75±0.10	5.5±0.1	8.0±0.1	4.0±0.1	2.0±0.1	1.5±0.3	3.8±0.2	2.3±0.2	0.75±0.20	(10.25)	0.3+0.15

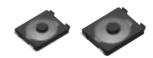
• Standard Reel Dimensions in mm (not to scale)



Rate (mm) φ380.0±2.0 φ80.0±1.0 φ13.0±0.5 φ21.0±1.0 2.0±0 Item F G	Item	А	В	С	D	Е
Item F G	Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
THE TOTAL CONTRACTOR OF THE PROPERTY OF THE PR	Item	F	G	•		
		'	u u			
Rate (mm) 13.5±1.0 17.5±1.0	Rate (mm)	13.5±1.0	17.5±1.0			

3.0 mm×2.6 mm SMD Light Touch Switches

Type: **EVPAF**

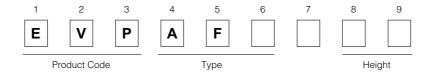


- Features
- External dimensions: 3.0 mm×2.6 mm, Height 0.65 mm
- High operability
 Equipped with an actuator (push plate)
- Low temperature use

■ Recommended Applications

 Operation switches for portable electronic equipment (Mobile phone, Portable audio)

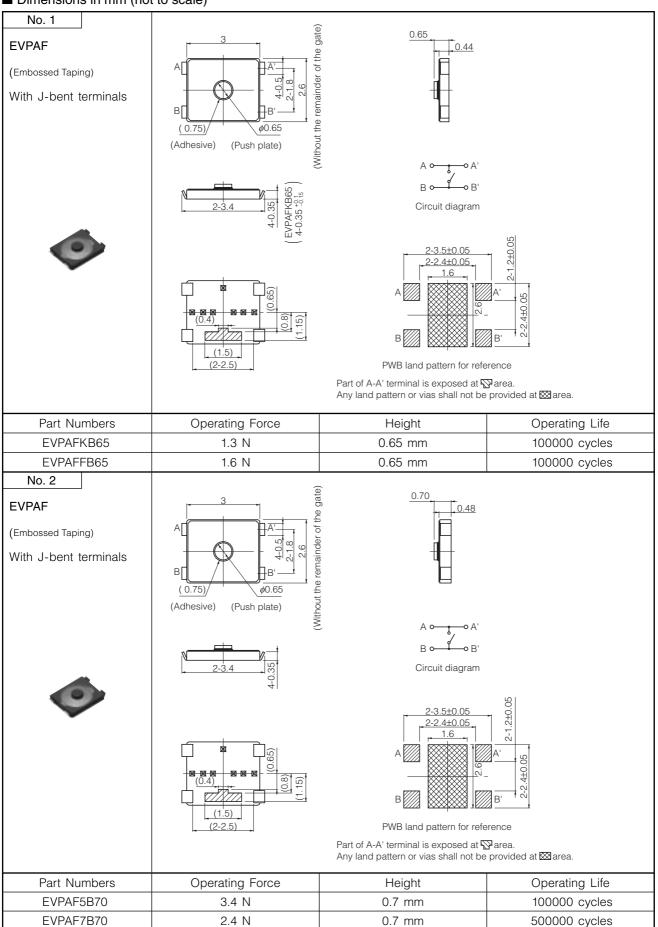
■ Explanation of Part Numbers

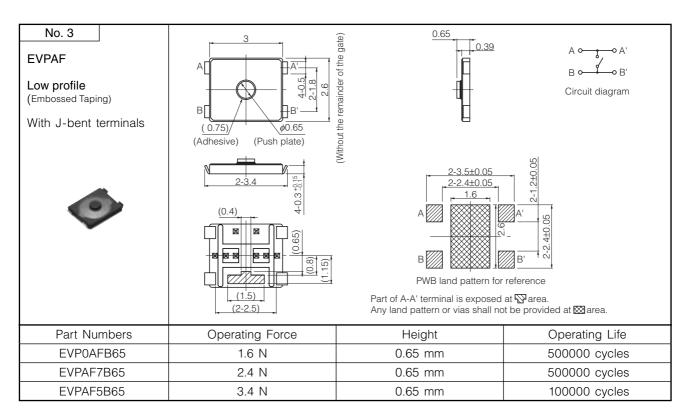


■ Specifications

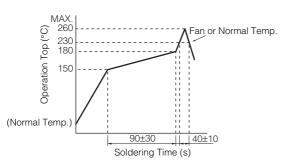
Туре		Snap action/Push-on type SPST
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)
	Contact Resistance	500 m $Ω$ max.
Electrical	Insulation Resistance	50 MΩ min. (at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac for 1 minute
	Bouncing	10 ms max. (ON, OFF)
Maalaaniaal	Operating Force	1.3 N, 1.6 N, 2.4 N, 3.4 N
Mechanical	Travel	0.15 mm
Endurance	Operating Life	1.3 N, 1.6 N, 3.4 N : 100000 cycles min., 2.4 N : 500000 cycles min.
Operating Tem	nperature	−40 °C to +85 °C
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)
Minimum Quantity/Packing Unit		8000 pcs. Embossed Taping (Reel Pack)
Quantity/Carto	on	40000 pcs.
Note: Non washable		•

Note: Non washable

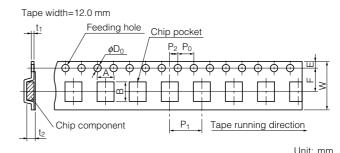




■ Recommended Reflow Soldering Conditions

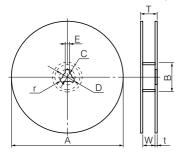


Embossed Carrier Taping



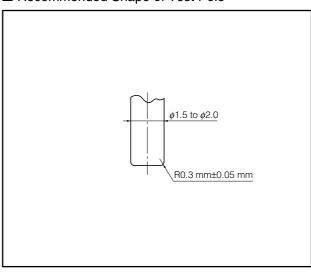
												OTHE. ITHII
Part No.	Height	Α	В	W	F	E	Pί	P2	P ₀	D0 Dia	t1	t2
EVPAF EVP0AF	0.65/0.70	3.75±0.2	2.95±0.2	12.0±0.3	5.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1	1.5±0.3	0.3±0.1	0.8±0.2

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
		_			
Item	W	ı	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	-	-	

■ Recommended Shape of Test Pole



3.5 mm×2.9 mm SMD Light Touch Switches

Type: **EVPAA**

0

■ Features

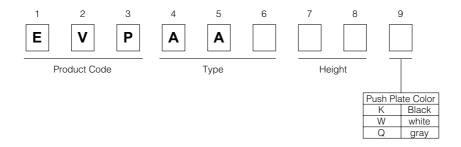
• External dimensions: 3.5 mm×2.9 mm, Height 1.7 mm

High operating force available (Operating force : 5.0 N max.)Optional ground terminal

■ Recommended Applications

- Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, etc.)
- Operating switches for keyless entry systems

■ Explanation of Part Numbers



Specifications

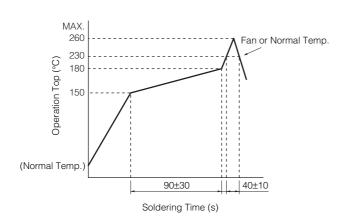
Туре		Snap action/Push-on type SPST
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)
	Contact Resistance	100 m Ω max.
Electrical	Insulation Resistance	100 MΩ min. (at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac for 1 minute
	Bouncing	10 ms max. (ON, OFF)
NA - de - de - de	Operating Force	1.0 N, 1.6 N, 2.4 N, 3.5 N, 5.0 N
Mechanical	Travel	0.15 mm±0.1 mm
Endurance	Operating Life	1000000 cycles min. (1.0 N) 200000 cycles min. (1.6 N, 2.4 N, 3.5 N) 100000 cycles min. (5.0 N)
Operating Tem	perature	-40 °C to +85 °C
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)
Minimum Quar	ntity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)
Quantity/Carto	n	25000 pcs.
Quantity/Carto	11	23000 μcs.

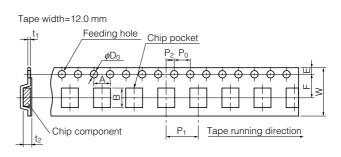
Note: Non washable

EVPAA (Embossed Taping) Thickness: 1.7 mm With J-bent terminals (Tolerance ±0.2) Operating part 3.5 **-0** ①' 100 0 ②' Circuit diagram 4.3 +0 4.5±0.1 2.2±0.1 (2.8)PWB land pattern for reference Part Numbers **Ground Terminal** Operating Force Push Plate Color Operating Life EVPAA002K Without 1.0 N Black 1000000 cycles With Black EVPAA102K 1.0 N 1000000 cycles EVPAA202K Without 1.6 N Black 200000 cycles EVPAA302K With 1.6 N Black 200000 cycles Without EVPAA402W 2.4 N White 200000 cycles EVPAA502W With 2.4 N White 200000 cycles EVPAA602W Without 3.5 N White 200000 cycles EVPAA702W With 3.5 N White 200000 cycles EVPAA802Q Without 5.0 N 100000 cycles Grey Grey EVPAA902Q With 5.0 N 100000 cycles

■ Recommended Reflow Soldering Conditions

Embossed Carrier Taping

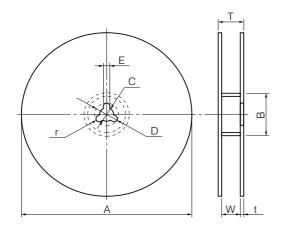




Unit: mm

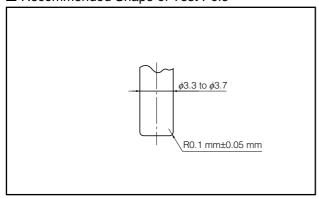
Part No.	Height	Α	В	W	F	E	Pi	P2	P ₀	D0 Dia	t1	t2
EVPAA	1.7	4.5±0.2	3.8±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.3±0.1	1.85±0.20

Standard Reel Dimensions in mm (not to scale)

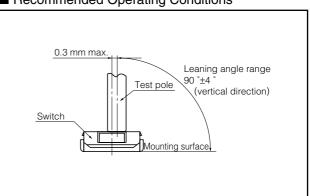


Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	T	t	r	
Rate (mm)	13.5±1.0	17.5±1.0			

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



4.7 mm×3.5 mm SMD Light Touch Switches

Type: EVQP2/EVQP9/EVQ3P2



● External dimensions: 4.7 mm×3.5 mm,

Height: Middle Push Travel 2.5 mm

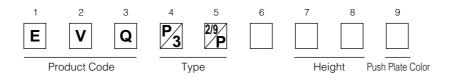
Short Push Travel 2.1 mm, 2.5 mm

- High operating force and long operational life
- High mountability with J-bent (4 terminals)



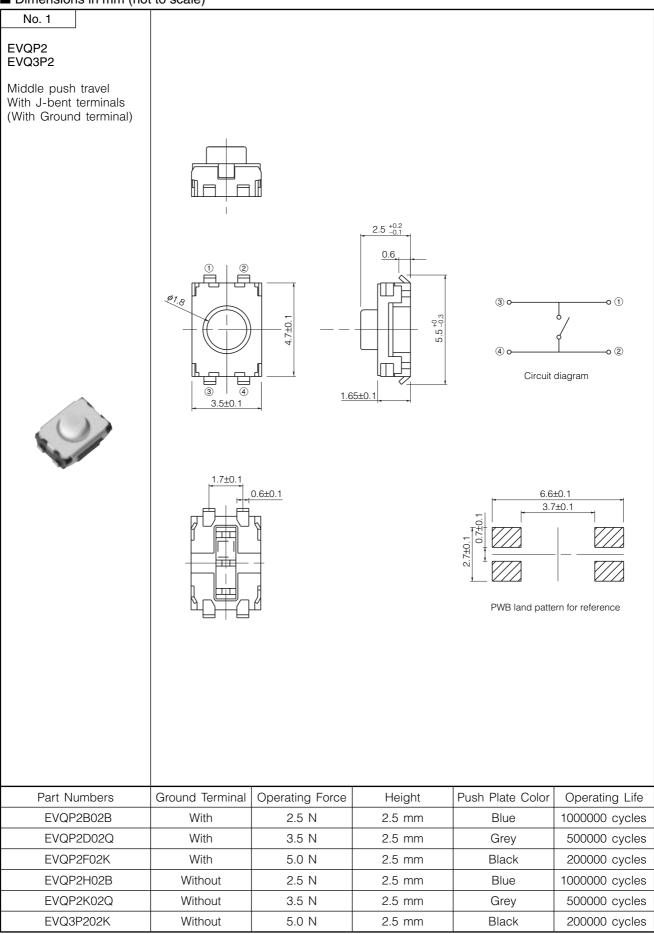
- Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders, Portable audio players, etc.)
- Keyless entry systems (automotive)
- Car audio equipment

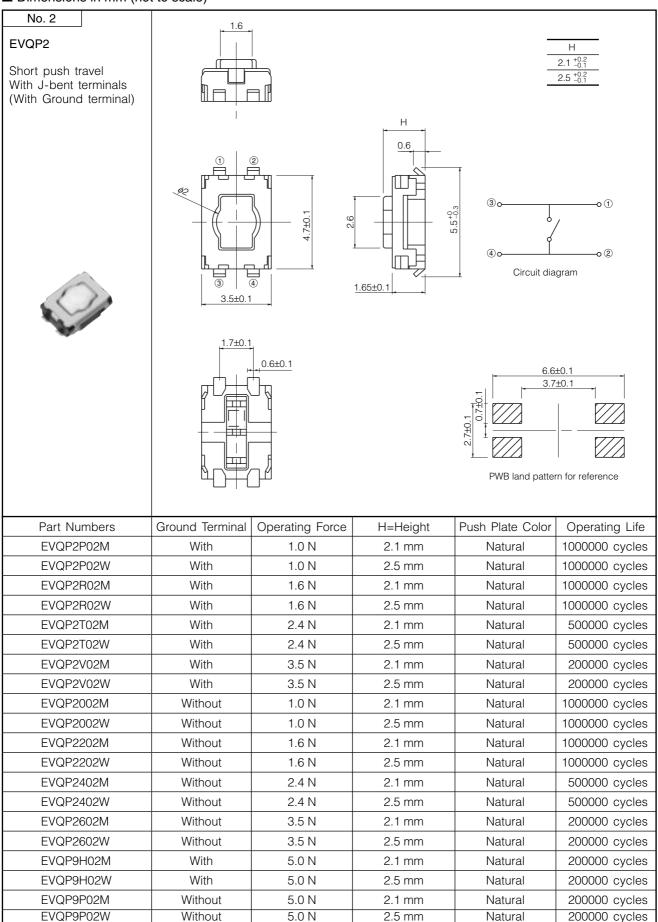
■ Explanation of Part Numbers



■ Specifications

	Middle Push Travel Short Push Travel				
	Snap action / Pu	sh-on type SPST			
Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)				
Contact Resistance	100 m Ω max.				
Insulation Resistance	100 M	Ω min.			
Dielectric Withstanding Voltage	250 Vac (1 minute)				
Bouncing	10 ms max. (ON, OFF)				
Operating Force	2.5 N, 3.5 N, 5.0 N	1.0 N, 1.6 N, 2.4 N, 3.5 N, 5.0 N			
Travel	0.70 mm±0.20 mm	0.25 mm ^{+0.05} _{-0.15} mm			
Operating Life	2.5 N:1000000 cycles min. 3.5 N: 500000 cycles min. 5.0 N: 200000 cycles min.	1.0 N, 1.6 N: 1000000 cycles min. 2.4 N: 500000 cycles min. 3.5 N: 200000 cycles min. 5.0 N: 200000 cycles min.			
erature	-40 °C to +85 °C				
ature	-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)				
y/Packing Unit	4000 pcs. Embossed Taping (Reel Pack)				
	20000 pcs.				
	Contact Resistance Insulation Resistance Dielectric Withstanding Voltage Bouncing Operating Force Travel Operating Life erature	Rating 10 μA 2 Vdc to 20 mA Contact Resistance 100 ms Insulation Resistance 100 M Dielectric Withstanding Voltage 250 Vac Bouncing 10 ms max Operating Force 2.5 N, 3.5 N, 5.0 N Travel 0.70 mm±0.20 mm Operating Life 3.5 N: 500000 cycles min. So N: 200000 cycles min. 5.0 N: 200000 cycles min. Ferature -40 °C to + Liture -40 °C to + <t< td=""></t<>			

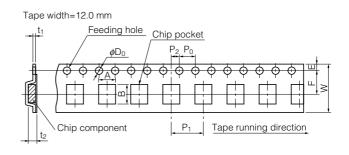




■ Recommended Reflow Soldering Conditions

MAX. 260 Fan or Normal Temp. 230 Operation Top (°C) 180 150 (Normal Temp.) 90±30 40±10 Soldering Time (s)

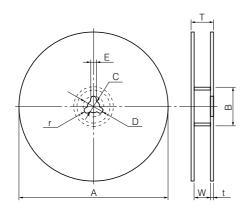
Embossed Carrier Taping



Unit: mm

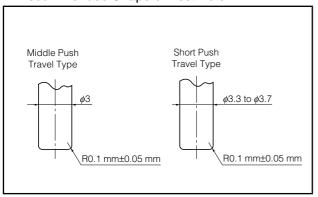
Part No.	Height	А	В	W	F	E	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVQP2 EVQP9 EVQ3P2	2.1 2.5	6.0±0.2	4.7±0.2	12.0±0.3	5.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.3±0.1	2.7±0.2

Standard Reel Dimensions in mm (not to scale)

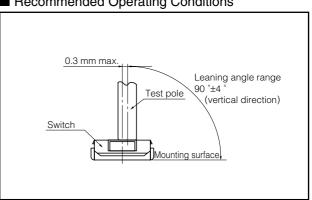


Item	Α	В	С	D	Е
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
	14.0±1.5		1.0 to 3.0	1.0+0.5	
nate (IIIII)	14.0±1.0	_	1.0 10 3.0	1.0±0.0	

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



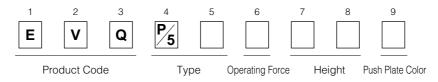
6.0 mm×3.5 mm SMD Light Touch Switches

Type: EVQPE1/EVQPN/EVQ5P



- Features
- External dimensions: 6.0 mm×3.5 mm, Height 4.3 mm, 5.0 mm
- Recommended Applications
- Operating switches for other electronic equipment

■ Explanation of Part Numbers

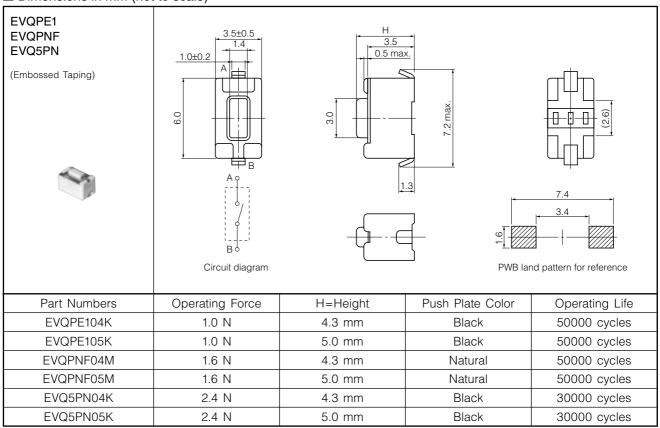


■ Product Chart

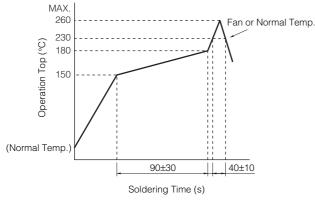
Type Operating Force	SMD	Height
1.0 N±0.5 N	EVQPE1	
1.6 N±0.5 N	EVQPNF	H=4.3 mm H=5.0 mm
2.4 N±0.6 N	EVQ5PN	11-0.0 11111

■ Specifications

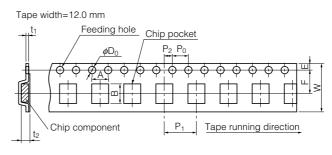
Туре		Snap action/Pus	sh-on type SPST
	Circuit Diagram	A 0	о В
Electrical	Rating	10 μA 2 Vdc to 50 mA	12 Vdc (Resistive load)
	Contact Resistance	100 m	Ω max.
	Insulation Resistance	100 MΩ min.	. (at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac fo	or 1 minute
	Bouncing	10 ms max	. (ON, OFF)
Mechanical	Operating Force	1.0 N±0.5N (Low force type) 1.6 N±0.5 N (Standard)	2.4 N±0.6 N
	Travel	0.25 mm ^{+0.}	20 10 mm
Endurance	Operating Life	50000 cycles min.	30000 cycles min.
Operating Tempera	ature	−30 °C t	o +85 °C
Storage Temperatu	re	-40 °C to +85 °C -20 °C to +60 °C	
Minimum Quantity/	Packing Unit	2000 pcs. Embossed Taping(Reel Pack) (H = 5.0 mm)	2500 pcs. Embossed Taping(Reel Pack) (H = 4.3 mm)
Quantity/Carton		10000 pcs. (H = 5.0 mm)	12500 pcs. (H = 4.3 mm)



■ Recommended Reflow Soldering Conditions

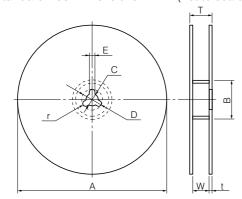


Embossed Carrier Taping



	001401	9 (0	-,									Unit: mm
Part No.	Height	А	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVQPE1 EVQPN EVQ5P	4.3/5.0	5.8±0.2	7.9±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	0.4±0.05	4.5/5.2±0.2

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	Е
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	,
Rate (mm)			1.0 to 3.0	1.0±0.5	

3.5 mm×2.9 mm Side-operational SMD Light Touch Switches

Type: EVQP7/EVQP3/EVQ9P7



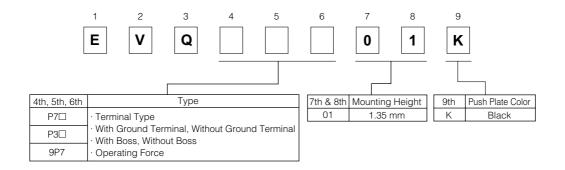
■ Features

- External dimensions: 3.5 mm×2.9 mm, Height 1.35 mm
 A wide range of terminal type: L-shape, J-bent, Straight
- High mount ability
- Push plate strength enhanced type

■ Recommended Applications

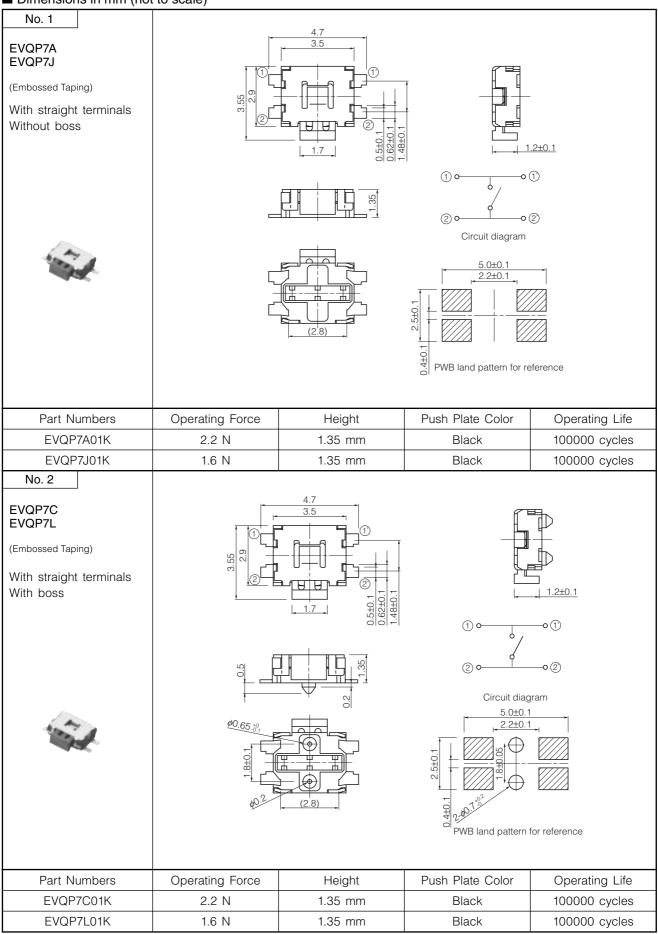
 Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders, Portable audio players, etc.)

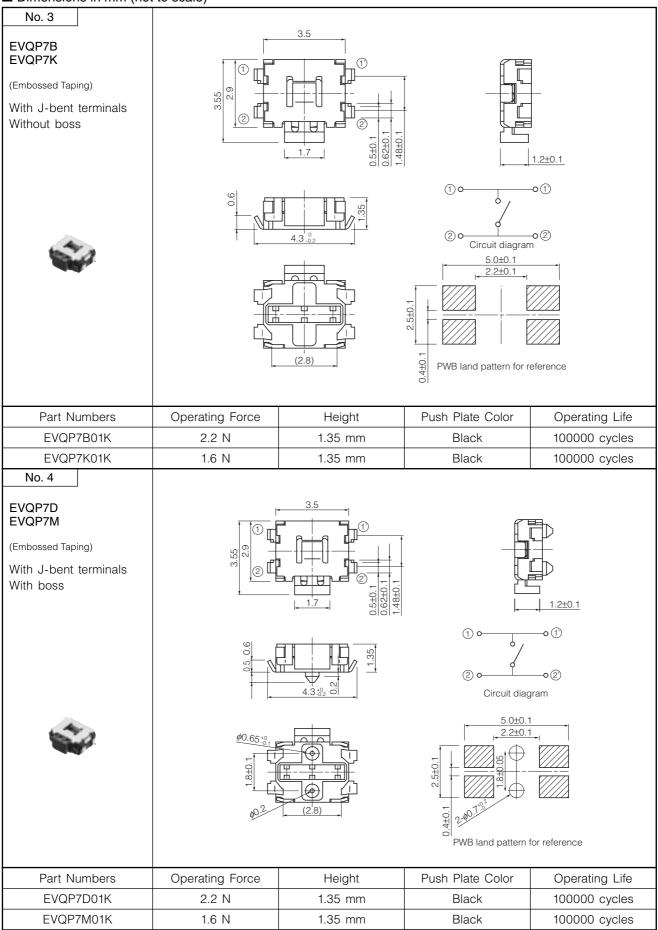
■ Explanation of Part Numbers

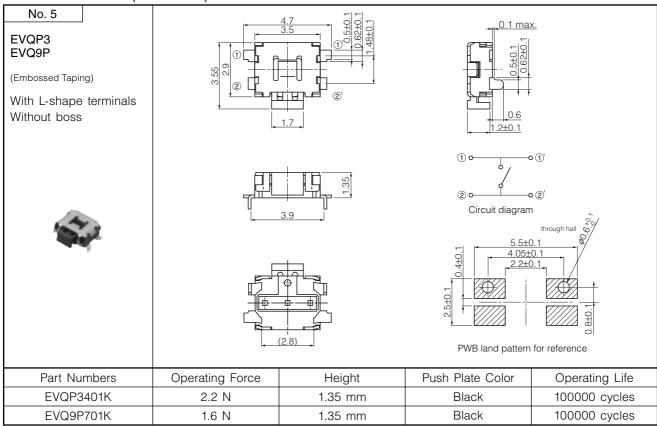


Specifications

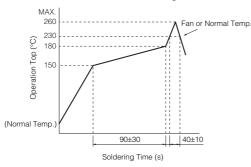
Туре		Snap action / Push-on type SPST					
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)					
	Contact Resistance	500 m Ω max.					
Electrical	Insulation Resistance	100 M Ω min. (at 100 Vdc)					
	Dielectric Withstanding Voltage	250 Vac (1 minute)					
	Bouncing	10 ms max. (ON, OFF)					
	Operating Force	1.6 N, 2.2 N					
Mechanical	Push Travel	0.2 mm					
	Push Strength	30 N (1 minute)					
Endurance	Operating Life	100000 cycles min.					
Operating Ter	nperature	−20 °C to +70 °C					
Otomoria Tomori		-40 °C to +85 °C (Bulk)					
Storage Temp	perature	-20 °C to +60 °C (Taping)					
Minimum Qua	ntity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)					
Quantity/Carto	on	25000 pcs.					



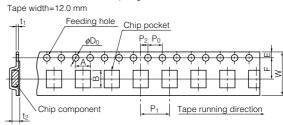




■ Recommended Reflow Soldering Conditions



Embossed Carrier Taping

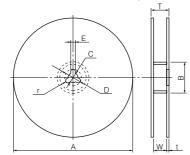


Straight terminals, L-shape terminals type

• Straight termina	Ottaight terminals, E-shape terminals type												
Part No.	Height	А	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t2	
EVQP7, EVQP3 EVQ9P7	1.35	5.2±0.2	4.5±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	0.3±0.1	1.5±0.2	

J-bent type												Unit: mm
Part No.	Height	А	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t2
EVQP7, EVQP3	1.35	4.5±0.2	4.5±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}	0.3±0.1	1.5±0.2

Standard Reel Dimensions in mm (not to scale)



Item	Α	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	1.0 to 3.0	1.0±0.5	

Unit: mm

3.5 mm×2.9 mm Side-operational Half Dive /SMD Light Touch Switches

Type: **EVPAN**

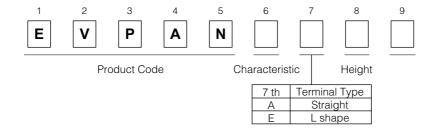


- Features
- External dimensions : 3.5 mm×2.9 mm, Height 1.2 mm
- Printed circuit board on height: 0.7 mm
- High mount ability

■ Recommended Applications

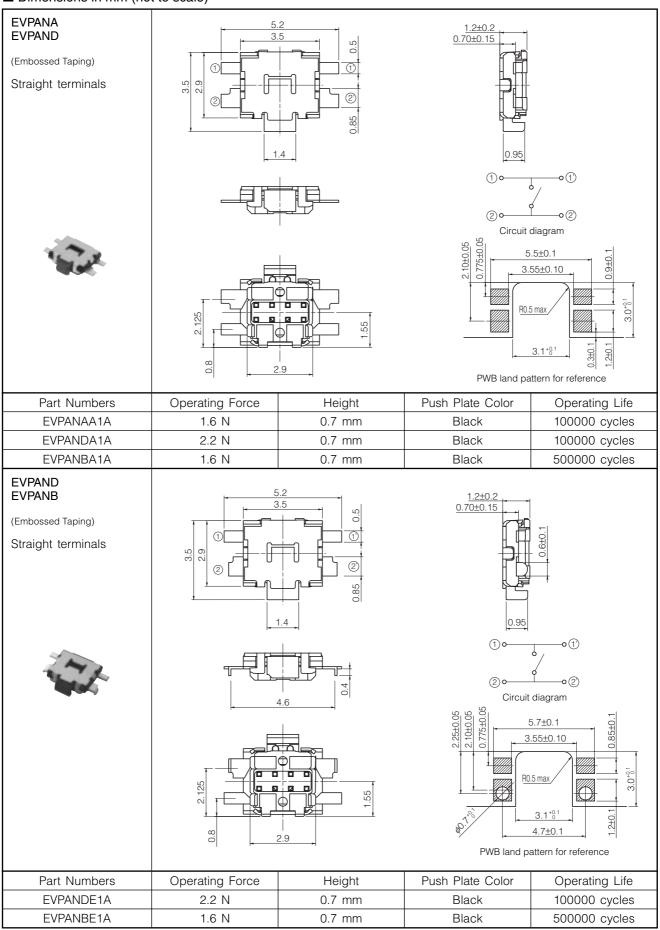
 Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders, Portable audio players, etc.)

■ Explanation of Part Numbers

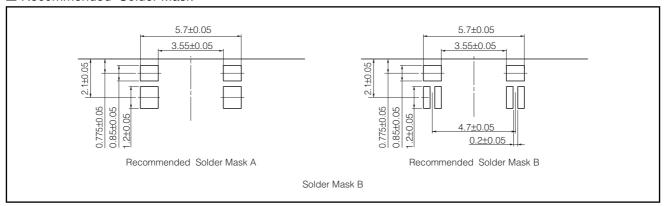


■ Specifications

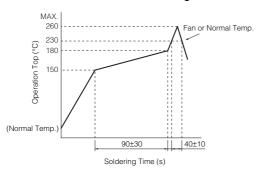
Туре		Snap action / Push-on type SPST					
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)					
	Contact Resistance	500 mΩ max.					
Electrical	Insulation Resistance	100 M Ω min. (at 100 Vdc)					
	Dielectric Withstanding Voltage	250 Vac (1 minute)					
	Bouncing	10 ms max. (ON, OFF)					
	Operating Force	1.6 N, 2.2 N					
Mechanical	Push Travel	0.2 mm					
	Push Strength	70 N (1 minute)					
Endurance	Operating Life	100000 cycles min.					
Operating Ter	nperature	−20 °C to +70 °C					
Ctorogo Tomo	a cratura	-40 °C to +85 °C (Bulk)					
Storage Temp	perature	-20 °C to +60 °C (Taping)					
Minimum Qua	ntity/Packing Unit	7000 pcs. Embossed Taping (Reel Pack)					
Quantity/Carto	on	35000 pcs.					



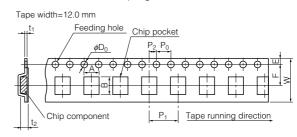
■ Recommended Solder Mask



■ Recommended Reflow Soldering Conditions



Embossed Carrier Taping

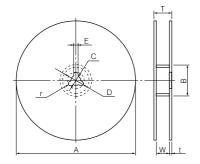


Straight terminals

Unit: mm

Part No.	Height	А	В	W	F	E	P ₁	P ₂	P ₀	D₀ Dia.	ţ1	t ₂
EVPAN	1.2	5.6±0.2	4.5±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	0.3±0.1	1.35±0.20

• Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	1.0~3.0	1.0±0.5	

Small-sized Side-operational SMD Light Touch Switches

Type: **EVQPU**





■ Features

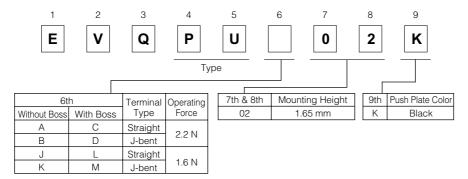
● External dimensions: 4.7 mm×3.5 mm, Height 1.65 mm

A wide range of terminal type : J-bent, Straight

■ Recommended Applications

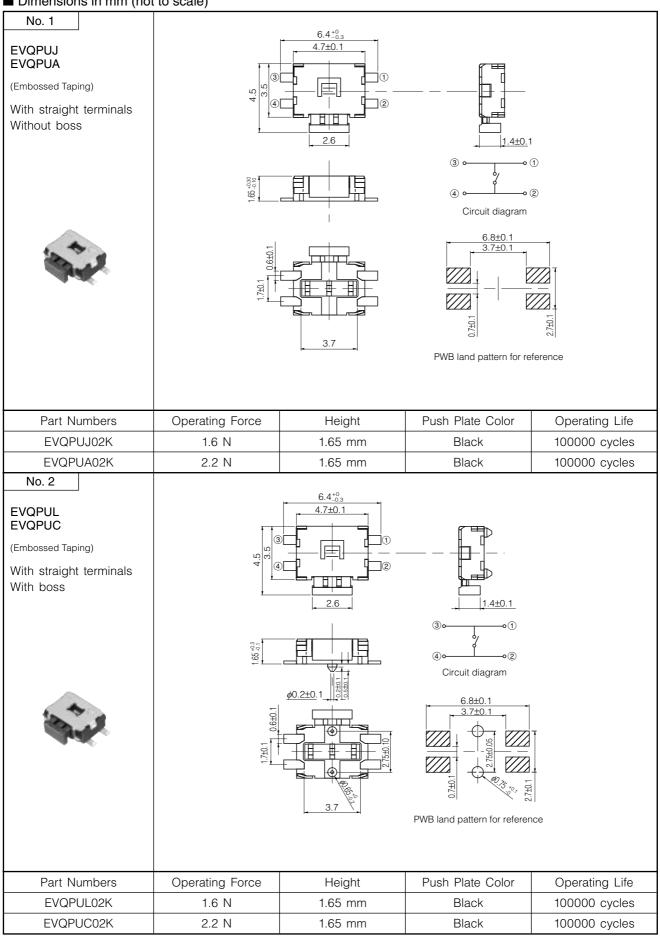
 Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders, Portable audio players, etc.)

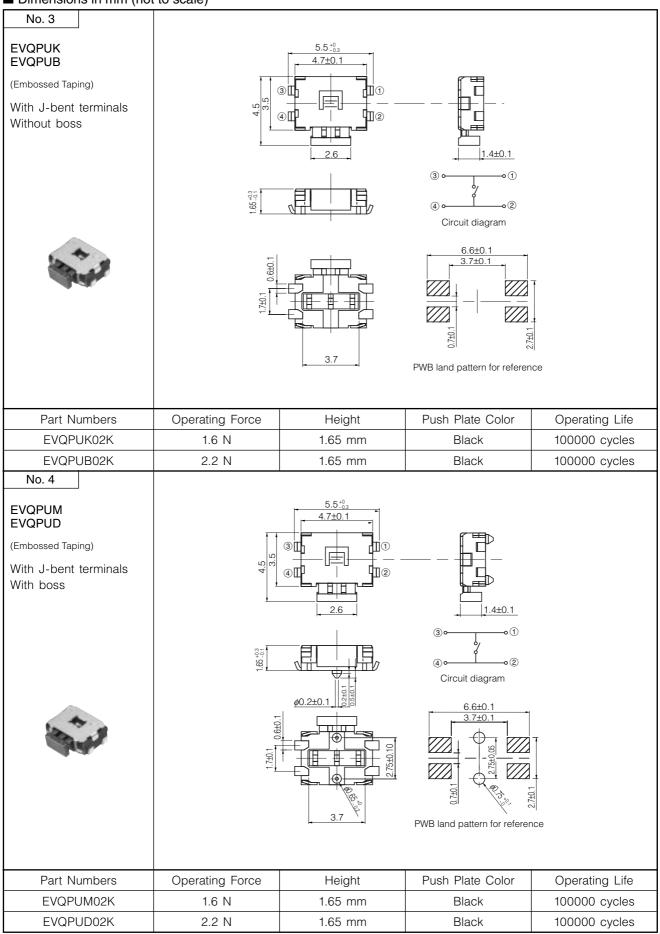
■ Explanation of Part Numbers



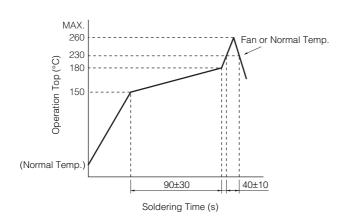
■ Specifications

Type		Snap action / Pus	sh-on type SPST					
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)						
	Contact Resistance	500 m Ω max.						
Electrical	Insulation Resistance	100 M Ω min.	(at 100 Vdc)					
	Dielectric Withstanding Voltage	250 Vac fo	r 1 minute					
	Bouncing	10 ms max.	(ON, OFF)					
	Operating Force	1.6 N ^{+0.7} _{-0.4} N	2.2 N ^{+0.8} _{-0.7} N					
Mechanical	Travel	0.3 mm ^{+0.1} _{-0.2} mm						
	Push Strength	30 N (1	minute)					
Endurance	Operating Life	100000 cy	cles min.					
Operating Ter	nperature	−20 °C to) +70 °C					
Ctorono Torono		−40 °C to +8	35 °C (Bulk)					
Storage Temp	perature	−20 °C to +6	60 °C (Taping)					
Minimum Qua	ntity/Packing Unit	4000 pcs. Embossed Taping (Reel Pack)						
Quantity/Carto	on	20000 pcs.						

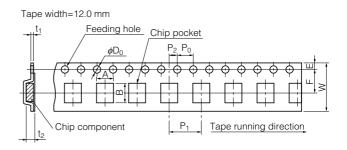




■ Recommended Reflow Soldering Conditions



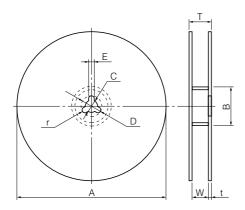
Embossed Carrier Taping



Unit: mm

Part No.	Height	А	В	W	F	E	P ₁	P ₂	Po	D₀ Dia.	t1	t2
EVQPU	1.65	7.0±0.2	5.75±0.20	12.0±0.3	5.78±0.20	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.35±0.05	2.4±0.2

Standard Reel Dimensions in mm (not to scale)

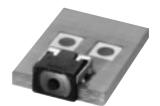


Item	А	В	С	D	Е
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	14.0±1.5	_	1.0 to 3.0	1.0±0.5	

2.8 mm×2.3 mm Side-operational Edge Mount Light Touch Switches

Type: **EVPAV**





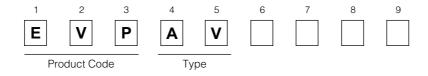
■ Features

- External dimensions: 2.8 mm×2.3 mm (Excluding the push plate), Height 1.95 mm (Printed circuit board being as low as 0.975 mm)
- Improved soldering strength in the operating direction

■ Recommended Applications

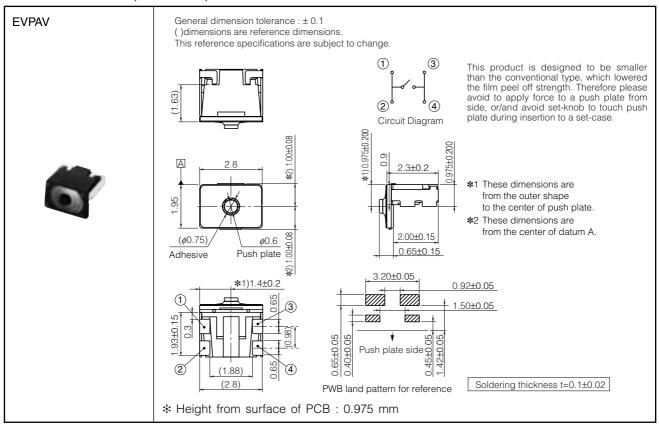
 Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders Portable audio players, etc.)

■ Explanation of Part Numbers

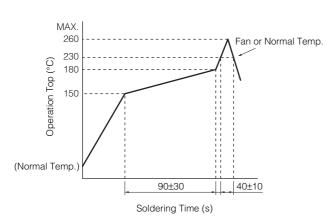


■ Specifications

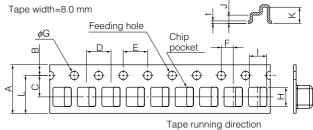
Туре		Snap action / Push-on type SPST				
Electrical	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)				
	Contact Resistance	500 m $Ω$ max.				
	Insulation Resistance	50 M Ω min. (at 100 Vdc)				
	Dielectric Withstanding Voltage	250 Vac (1 minute)				
	Bouncing	10 ms max. (ON, OFF)				
	Operating Force	1.6 N				
Mechanical	Push Travel	0.13 mm				
	Push Strength	50 N (15 seconds)				
Endurance	Operating Life	300000 cycles min.				
Operating Temperature		−40 °C to +85 °C				
Storage Temperature		-40 °C to +85 °C (Bulk)				
		-20 °C to +60 °C (Taping)				
Minimum Quantity/Packing Unit		8000 pcs. Embossed Taping (Reel Pack)				
Quantity/Carton		40000 pcs.				



■ Recommended Reflow Soldering Conditions



Embossed Carrier Taping



Taping condition: Lack of products in the middle of taping should be one MAX, but total quantity specified in the

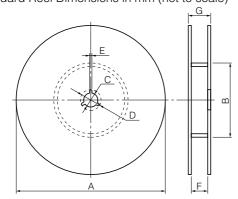
specifications should be secured.

Peeling off strength of top tape: It should be within 0.2N to 1. ON at 165 degree in peeling off angle.

Joint of carrier tape : One joint per one reel may exist.

														Unit: mm
Part No.	Height	Α	В	С	D	Е	F	G	Н	I	J	K	L	t
EVPAV	1.95	8.0±0.3	1.75±0.10	3.5±0.1	4.0±0.1	4.0±0.1	2.0±0.1	1.5+0.1	3.1±0.2	2.8±0.2	1.35±0.20	2.7±0.2	(6.25)	0.3±0.1

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E	
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5	
Item	F	G				
Rate (mm)	9.4±1.0	13.4±1.0	•			

4.5 mm×2.2 mm Side-operational Edge Mount Light Touch Switches

Type: **EVPAE**





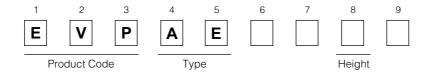
■ Features

- External dimensions: 4.5 mm×2.25 mm (Excluding the push plate), Height 2.9 mm (Printed circuit board being as low as 0.95 mm)
- Improved soldering strength in the operating direction
- Long operational life
- Measure against electro static discharge(ESD)

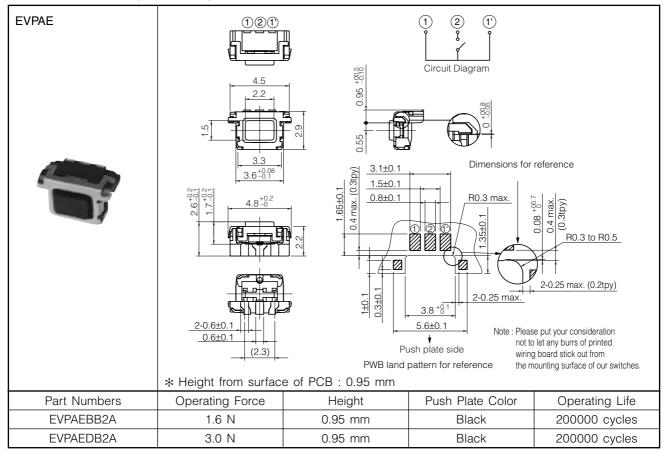
■ Recommended Applications

 Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders Portable audio players, etc.)

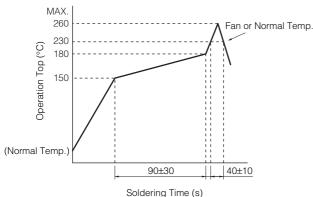
■ Explanation of Part Numbers



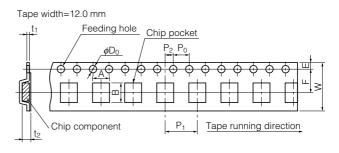
Туре		Snap action / Push-on type SPST
	Rating	10 µA 2 Vdc to 20 mA 15 Vdc (Resistive load)
	Contact Resistance	1000 mΩ max.
Electrical	Insulation Resistance	100 M Ω min. (at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac (1 minute)
	Bouncing	10 ms max. (ON, OFF)
	Operating Force	1.6 N, 3.0 N
Mechanical	Push Travel	0.15 mm
	Push Strength	50 N (1 minute)
Endurance	Operating Life	200000 cycles min.
Operating Ten	nperature	−40 °C to +85 °C
Otomoro Tomor	a vatura	-40 °C to +85 °C (Bulk)
Storage Temp	erature	-20 °C to +60 °C (Taping)
Minimum Quar	ntity/Packing Unit	3500 pcs. Embossed Taping (Reel Pack)
Quantity/Carto	on	17500 pcs.



■ Recommended Reflow Soldering Conditions



Embossed Carrier Taping



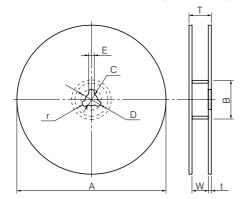
 2.0 ± 0.1

Standard Reel Dimensions in mm (not to scale)

2.9

Part No.

EVPAE



 5.5 ± 0.2

Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	_	-	

 4.0 ± 0.1

1.5+0

 0.3 ± 0.1

3.3±0.20

2.9±0.2 | 12.0±0.3 | 5.5±0.1 | 1.75±0.10 | 8.0±0.1

6.2 mm×2.5 mm Side-operational Edge Mount Light Touch Switches

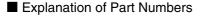
Type: **EVQP4**

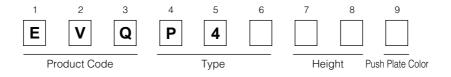
■ Features

- External dimensions: 6.2 mm×2.55 mm (Excluding the push plate), Height 3.5 mm (EVQP4 Type: Printed circuit board being as low as 1.35 mm)
- Side-operational middle stroke type (0.7 mm) with a high operating force (5.0 N)
- Improved soldering strength in the operating direction when mounted on PC board edge

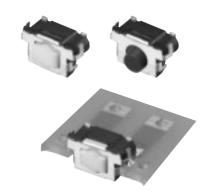
■ Recommended Applications

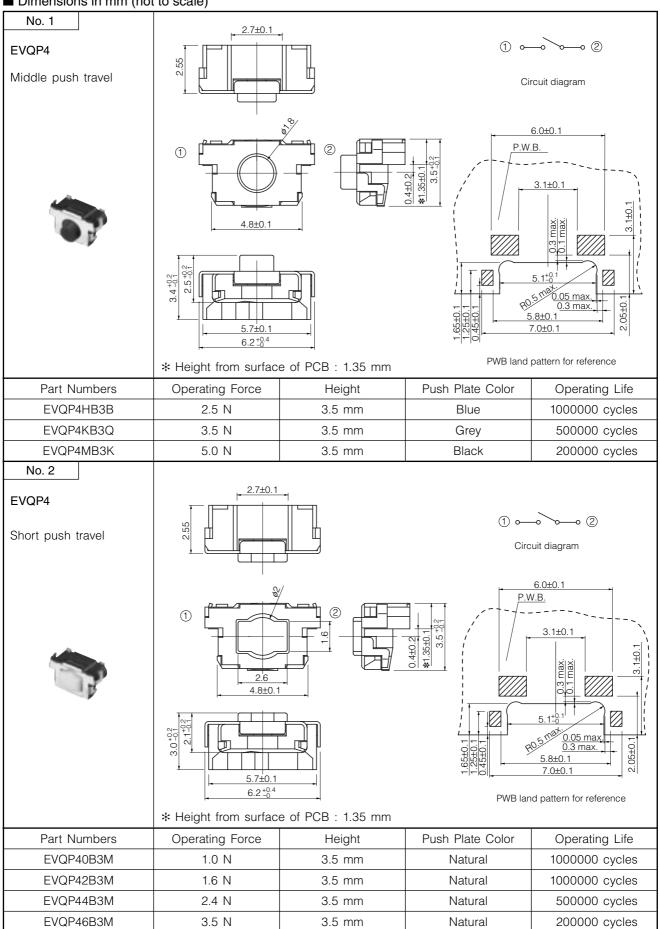
- Operation switches for portable electronic equipment (Mobile phones, Digital still cameras, Camcorders Portable audio players, etc.)
- Keyless entry (car electronics)
- Car audio equipment





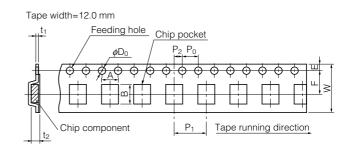
Travel Type		Middle Push Travel	Short Push Travel
Туре		Snap action / Pu	sh-on type SPST
	Rating	10 μA 2 Vdc to 20 mA	15 Vdc (Resistive load)
	Contact Resistance	100 ms	Ω max.
Electrical	Insulation Resistance	100 MΩ min.	(at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac	(1 minute)
	Bouncing	10 ms max	. (ON, OFF)
	Operating Force	2.5 N, 3.5 N, 5.0 N	1.0 N, 1.6 N, 2.4 N, 3.5 N
Mechanical	Travel	0.70 mm±0.2 mm	0.25 mm ^{+0.05} _{-0.15} mm
	Push Strength	50 N (1	minute)
		2.5 N:1000000 cycles min.	1.0 N, 1.6 N: 1000000 cycles min.
Endurance	Operating Life	3.5 N: 500000 cycles min.	2.4 N: 500000 cycles min.
		5.0 N: 200000 cycles min.	3.5 N: 200000 cycles min.
Operating Ten	nperature	−40 °C to	o +85 °C
Ctorogo Tomo	oroturo	-40 °C to +	85 °C (Bulk)
Storage Temp	erature	−20 °C to +	60 °C (Taping)
Minimum Quar	ntity/Packing Unit	2500 pcs. Embosse	ed Taping (Reel Pack)
Quantity/Carto	n	12500	pcs.





■ Recommended Reflow Soldering Conditions

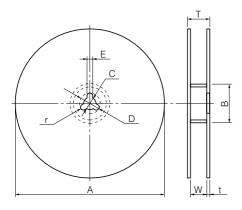
Embossed Carrier Taping



Unit: mm

Part No.	Height	Α	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t2
EVQP4	3.5	6.5±0.2	3.9±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}	0.4±0.1	3.75±0.20

• Standard Reel Dimensions in mm (not to scale)



Item	Α	В	С	D	Е
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	14.0±1.5	_	1.0 to 3.0	1.0±0.5	

6.1 mm×4.0 mm Side-operational SMD Light Touch Switches

Type: **EVQPS**



■ Features

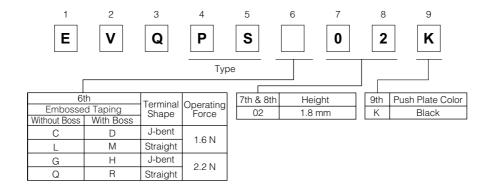
● External dimensions: 6.1 mm×4.0 mm, Height 1.8 mm

Terminal shapes : straight, J-bent

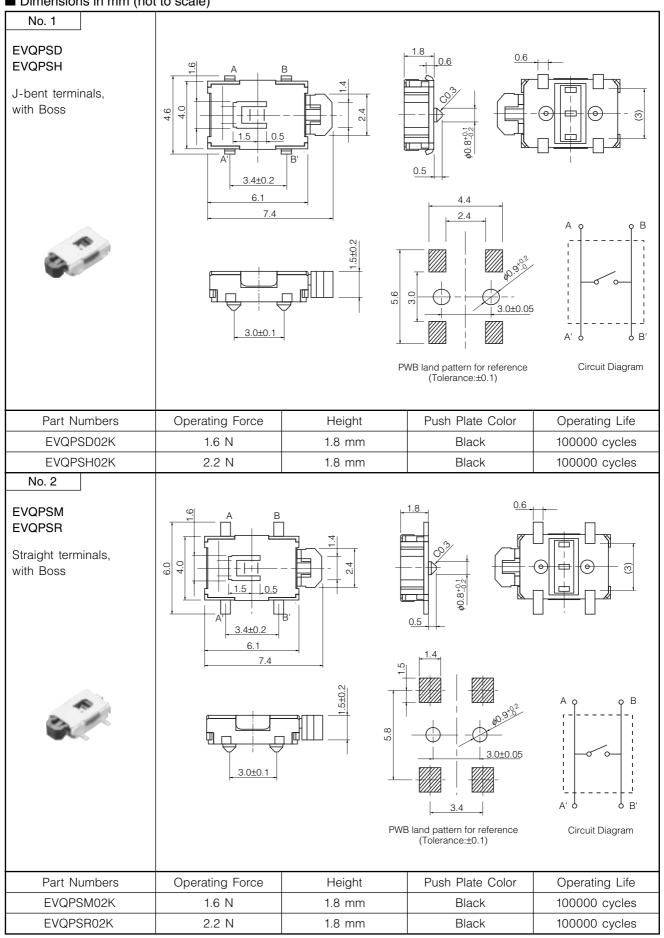
■ Recommended Applications

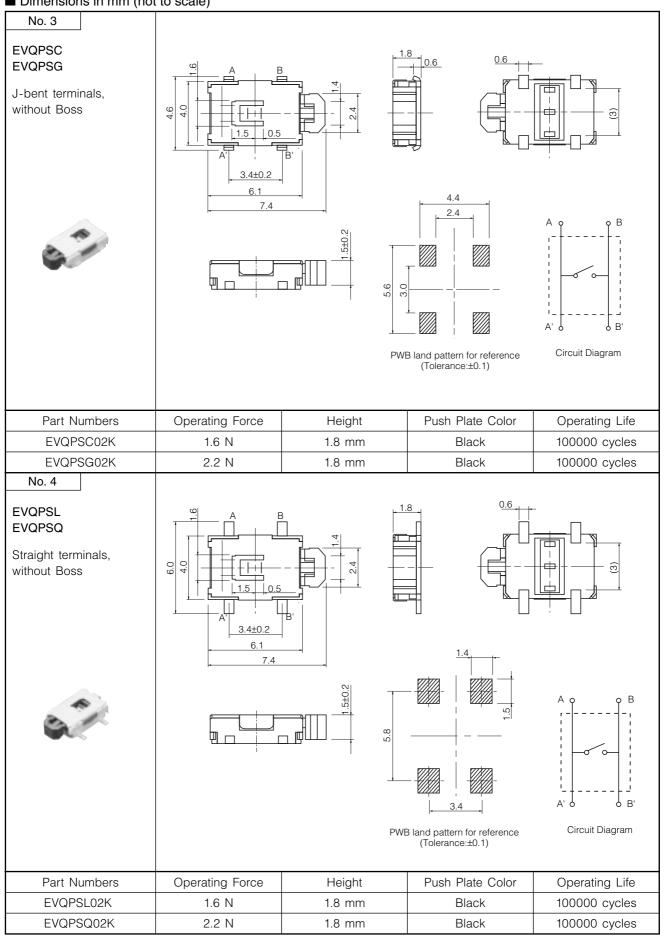
Operating switches for other electronic equipment

■ Explanation of Part Numbers

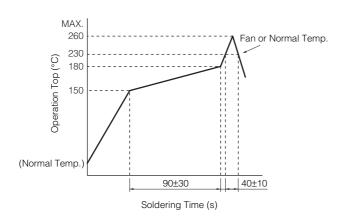


Туре		Snap action / Pu	sh-on type SPST
	Rating	10 μA 2 Vdc to 50 mA	12 Vdc (Resistiv load)
	Contact Resistance	500 mg	Ω max.
Electrical	Insulation Resistance	100 MΩ min.	(at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac for 1 minute	
	Bouncing	10 ms max.	(ON, OFF)
	Operating Force	1.6 N ^{+0.7} _{-0.4} N	2.2 N ^{+0.8} _{-0.7} N
Mechanical	Travel	0.3 mm	+0.1 -0.2 mm
	Push Strength	30 N for	1 minute
Endurance	Operating Life	100000 c	ycles min.
Operating Ter	nperature	−20 °C to +7	70 °C
Ctorono Torono		-40 °C to +	85 °C (Bulk)
Storage Temp	erature	−20 °C to +6	60 °C (Taping)
Minimum Qua	ntity/Packing Unit	4000 pcs. Embosse	d Taping (Reel Pack)
Quantity/Carto	on	16000	pcs.

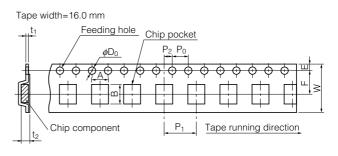




■ Recommended Reflow Soldering Conditions



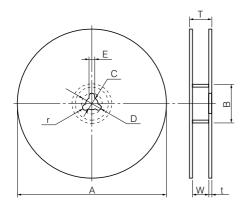
Embossed Carrier Taping



Unit: mm

Part No.	Height	А	В	W	F	E	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVQPS	1.8	6.8±0.2	8.0±0.2	16.0±0.3	7.5±0.1	1.75±0.10	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.30±0.05	2.7±0.2

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	Е
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	T	t	r	
Rate (mm)	18.0±1.5		1.0 to 3.0	1.0±0.5	

5N Type Light Touch Switches

Type: **EVQPA/EVQPB**



■ Features

- Wealth of product types: With or without a ground terminal, vertical type, snap-in terminals, etc.
- Can be automatically dip-soldered: Integral molding of the terminals and main body prevents the escape of flux.

■ Recommended Applications

• Operating switches for other electronic equipment

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
E	V	Q	Р	A/B				
Pr	oduct Co	de	Ту	pe		Hei	ght	Push Plate Colo

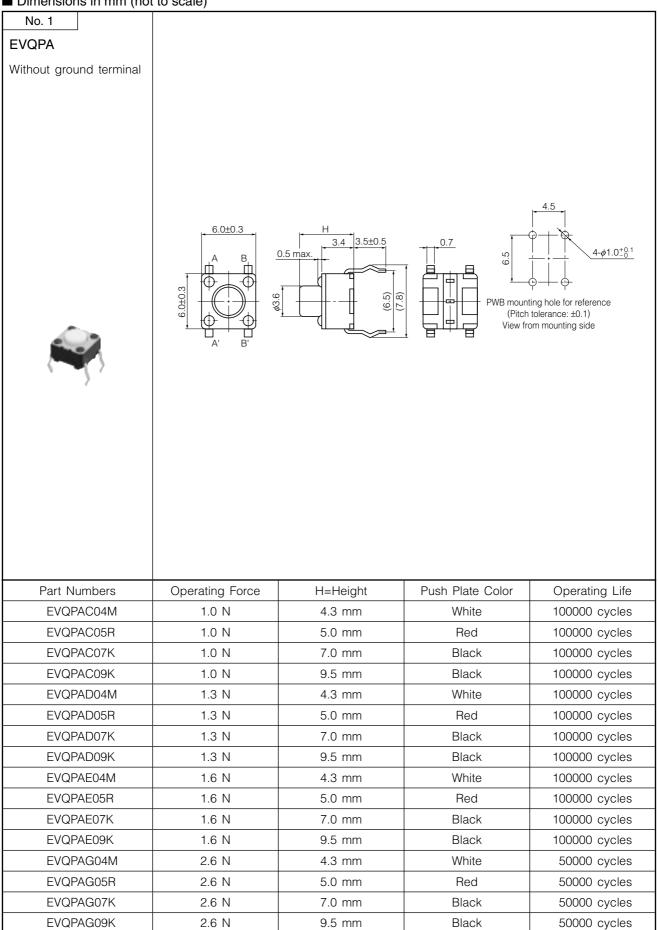
■ Product Chart ○=In production

Operating	Docitioning Din	Ground Terminal		Hei	ight	
Force	Positioning Pin	Ground Terminal	4.3 mm	5.0 mm	7.0 mm	9.5 mm
1.0 N	Mithaut positioning pin	With ground terminal	0	0	0	0
1.0 IN	Without positioning pin	Without ground terminal	0	0	0	0
1.3 N	Mithaut positioning pin	With ground terminal	0	0	0	0
1.3 IV	Without positioning pin	Without ground terminal	0	0	0	0
1.6 N	Mithaut positioning pin	With ground terminal	0	0	0	0
I.O IN	Without positioning pin	Without ground terminal	0	0	0	0
0.6 N	Mithaut positioning pin	With ground terminal	0	0	0	0
2.6 N	Without positioning pin	Without ground terminal	0	0	0	0

■ Specifications

Туре		Snap action/Pus	h-on type SPST		
	Circuit Diagram	A	B. B.		
E	Rating	10 μA 2 Vdc to 20 mA	15 Vdc (Resistiv load)		
Electrical	Contact Resistance	50 mΩ	2 max.		
	Insulation Resistance	50 M Ω min.	(at 100 Vdc)		
	Dielectric Withstanding Voltage	250 Vac for 1 minute			
	Bouncing	3 ms max. (ON) 8 ms max. (OFF)			
Mechanical	Operating Force	1.0 N±0.4 N 1.3 N±0.4 N 1.6 N±0.5 N	2.6 N±0.6 N		
	Travel	0.25 mm±	±0.10 mm		
Endurance	Operating Life	100000 cycles min.*	50000 cycles min.		
Operating Temperati	ure	−20 °C to	-70 °C		
Storage Temperature	9	-40 °C to +8	85 °C (Bulk)		
Minimum Quantity/ Packing Unit	Top-push	500 pcs. Polyet	hylene Bag (Bulk)		
Quantity/Carton	Top-push	10000 pcs.			

*1 million cycles also available, consult our salesmen.



	t to scale)			
No. 2				
EVQPB				
With ground terminal	6.0±0.3 A B 0.5 © Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q	H 3.4 3.5 (G) (G) (G) (D)	PWB r	4.5 5-φ1.0 ^{+0.1} 4.1 ^{+0.1} 4.1 ^{+0.1} mounting hole for reference (Pitch tolerance: ±0.1) iew from mounting side
Part Numbers	Operating Force	H=Height	Push Plate Color	Operating Life
Part Numbers EVQPBC04M	Operating Force	H=Height 4.3 mm	Push Plate Color White	Operating Life 100000 cycles
EVQPBC04M	1.0 N	4.3 mm	White	100000 cycles
EVQPBC04M EVQPBC05R	1.0 N 1.0 N	4.3 mm 5.0 mm	White Red	100000 cycles 100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K	1.0 N 1.0 N 1.0 N	4.3 mm 5.0 mm 7.0 mm	White Red Black	100000 cycles 100000 cycles 100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K	1.0 N 1.0 N 1.0 N 1.0 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm	White Red Black Black	100000 cycles 100000 cycles 100000 cycles 100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm	White Red Black Black White	100000 cycles 100000 cycles 100000 cycles 100000 cycles 100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm	White Red Black Black White Red	100000 cycles 100000 cycles 100000 cycles 100000 cycles 100000 cycles 100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm	White Red Black Black White Red Black	100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K EVQPBD07K	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N 1.3 N 1.3 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm	White Red Black Black White Red Black Black	100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K EVQPBD07K EVQPBD09K	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N 1.3 N 1.3 N 1.6 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm	White Red Black Black White Red Black Black White	100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K EVQPBD07K EVQPBD09K EVQPBD09K EVQPBD09K	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N 1.3 N 1.3 N 1.6 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm	White Red Black Black White Red Black Black White Red Black Red	100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K EVQPBD07K EVQPBD09K EVQPBE04M EVQPBE05R EVQPBE05R EVQPBE07K EVQPBE09K	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N 1.3 N 1.6 N 1.6 N 1.6 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm	White Red Black Black White Red Black Black White Red Black Black White Red Black	100000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K EVQPBD07K EVQPBD09K EVQPBE04M EVQPBE04M EVQPBE05R EVQPBE05R EVQPBE07K EVQPBE09K EVQPBG04M	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N 1.3 N 1.6 N 1.6 N 1.6 N 1.6 N 1.6 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm	White Red Black Black White Red Black Black White Red Black Black White Red Black Black	100000 cycles 50000 cycles
EVQPBC04M EVQPBC05R EVQPBC07K EVQPBC09K EVQPBD04M EVQPBD05R EVQPBD07K EVQPBD07K EVQPBD09K EVQPBE04M EVQPBE05R EVQPBE05R EVQPBE07K EVQPBE09K	1.0 N 1.0 N 1.0 N 1.0 N 1.3 N 1.3 N 1.3 N 1.6 N 1.6 N 1.6 N	4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm 7.0 mm 9.5 mm 4.3 mm 5.0 mm	White Red Black Black White Red Black Black White Red Black White Red Black White Red Black White Red Black	100000 cycles

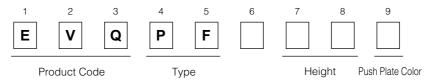
5N Type Side-operational Light Touch Switches

Type: **EVQPF**



- Features
- Wealth of product types: Horizontal type, snap-in terminals, etc.
- Can be automatically dip-soldered: Integral molding of the terminals and main body prevents the escape of flux.
- Recommended Applications
- Operating switches for other electronic equipment

■ Explanation of Part Numbers



Туре		Snap action/Pus	h-on type SPST	
	Circuit Diagram	A 0 B		
Electrical	Rating	10 μA 2 Vdc to 20 mA	15 Vdc (Resistiv load)	
	Contact Resistance	50 mΩ	2 max.	
	Insulation Resistance	50 MΩ min. (at 100 Vdc)		
	Dielectric Withstanding Voltage	250 Vac for 1 minute		
	Bouncing	3 ms max. (ON) 8 ms max. (OFF)		
Mechanical	Operating Force	1.0 N±0.4 N 1.3 N±0.4 N 1.6 N±0.5 N	2.6 N±0.6 N	
	Travel	0.25 mm±0.10 mm		
Endurance	Operating Life	100000 cycles min.*	50000 cycles min.	
Operating Temperate	ure	−20 °C to +70 °C		
Storage Temperature	9	-40 °C to +85 °C (Bulk)		
Minimum Quantity/ Packing Unit	Top-push	500 pcs. Polyethylene Bag (Bulk)		
Quantity/Carton	Top-push	10000 pcs.		

^{*1} million cycles also available, consult our salesmen.

EVQPF 0.5 max 7.0±0.5 7.0±0.1 -φ1.3^{+0.1} ÓΒ PWB mounting hole for reference Circuit diagram (PWB thickness=1.6 mm) View from mounting side Part Numbers Operating Force ℓ = Push Plate Place
 Push Plate Color Operating Life EVQPF003M 1.0 N 3.15 mm White 100000 cycles EVQPF004R 1.0 N 3.85 mm Red 100000 cycles EVQPF006K 1.0 N 5.85 mm Black 100000 cycles EVQPF008K 1.0 N 8.35 mm Black 100000 cycles EVQPF103M 1.3 N White 3.15 mm 100000 cycles EVQPF104R 1.3 N 3.85 mm Red 100000 cycles EVQPF106K 1.3 N 5.85 mm Black 100000 cycles EVQPF108K 1.3 N 8.35 mm Black 100000 cycles EVQPF203M 1.6 N 3.15 mm White 100000 cycles EVQPF204R 1.6 N 3.85 mm Red 100000 cycles EVQPF206K 1.6 N 5.85 mm Black 100000 cycles EVQPF208K 1.6 N 8.35 mm Black 100000 cycles EVQPF303M 2.6 N 3.15 mm White 50000 cycles EVQPF304R 2.6 N 3.85 mm Red 50000 cycles EVQPF306K 2.6 N 5.85 mm Black 50000 cycles EVQPF308K 2.6 N 8.35 mm Black 50000 cycles

5N Type 2R Light Touch Switches

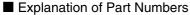
Type: **EVQ2**

■ Features

- Wealth of product types: With or without a ground terminal, vertical type, snap-in terminals, etc.
- Can be automatically dip-soldered: Integral molding of the terminals and main body prevents the escape of flux.

■ Recommended Applications

Operating switches for electronic equipment





Product Code

Type

Height

Push Plate Color

■ Product Chart

○=Standard

Operating	Desitioning Din	Ground Terminal		He	ight	
Force	Positioning Pin	Ground Terminal	4.3 mm	5.0 mm	7.0 mm	9.5 mm
1 O N	Without positioning pin	With ground terminal	0	0	0	0
1.0 10	1.0 N Without positioning pin	Without ground terminal	0	0	0	0
1 2 N	1.3 N Without positioning pin	With ground terminal	0	0	0	0
1.3 IV VVI		Without ground terminal	0	0	0	0
1.6 N	Without positioning pin	With ground terminal	0	0	0	0
1.6 N Without positioning pin		Without ground terminal	0	0	0	0
2.6 N	Without positioning nin	With ground terminal	0	0	0	0
	Without positioning pin	Without ground terminal	0	0	0	0

■ Specifications

Type		Snap action/Push-on type SPST		
	Circuit Diagram	A Q B B		
E	Rating	10 μA 2 Vdc to 20 mA	15 Vdc (Resistiv load)	
Electrical	Contact Resistance	50 mΩ	max.	
	Insulation Resistance	50 MΩ min. (at 100 Vdc)		
	Dielectric Withstanding Voltage	250 Vac for 1 minute		
	Bouncing	3 ms max. (ON) 8 ms max. (OFF)		
Mechanical	Operating Force	1.0 N±0.4 N 1.3 N±0.4 N 1.6 N±0.5 N	2.6 N±0.6 N	
	Travel	0.25 mm±0.10 mm		
Endurance	Operating Life	100000 cycles min.*	50000 cycles min.	
Operating Temperatu	ure	-20 °C to +70 °C		
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +40 °C (Taping)		
Minimum Quantity/ Packing Unit	Top-push	1000 pcs. Radial Taping (Reel Pack)		
Quantity/Carton	Top-push	10000 pcs.		

*1 million cycles also available, consult our salesmen.

EVQ22709K

■ Dimensions in mm (not to scale)

EVQ2 With ground terminal 2-terminals type Without ground terminal The direction of Por Q side is randomly settled. 1.3 max. 6.0±0.3 1.0 max 12.7±1.0 1.3 max. E-E' Section 8.0 Adhesive tape shall not extend beyond 0.6 0.3 (A) 0.5 base paper 3.85±0.70 18.0^{+1}_{-0} 6.0±0.5 9.0±0.6 Ε 18.0+0 Circuit diagram φ4.0±0.3 6.35±0.70 12.7±0.3 JIS C0806-2 shall be applied to the items not specified here. φ1.00±0.05 PWB mounting hole for reference (Pitch tolerance: ±0.1) View from mounting side Part Numbers Operating Force Push Plate Color Operating Life H=Height EVQ21304M 1.0 N 4.3 mm White 100000 cycles EVQ21305R 1.0 N 5.0 mm Red 100000 cycles EVQ21307K 1.0 N 7.0 mm Black 100000 cycles EVQ21309K 1.0 N 9.5 mm Black 100000 cycles EVQ21404M 1.3 N White 4.3 mm 100000 cycles EVQ21405R 1.3 N Red 5.0 mm 100000 cycles EVQ21407K 1.3 N 7.0 mm Black 100000 cycles EVQ21409K 1.3 N Black 100000 cycles 9.5 mm EVQ21504M 1.6 N 4.3 mm White 100000 cycles EVQ21505R 1.6 N 5.0 mm Red 100000 cycles EVQ21507K 1.6 N 7.0 mm Black 100000 cycles EVQ21509K 1.6 N 9.5 mm Black 100000 cycles EVQ22704M 2.6 N 4.3 mm White 50000 cycles EVQ22705R 2.6 N 5.0 mm Red 50000 cycles EVQ22707K 2.6 N 7.0 mm Black 50000 cycles

2.6 N

50000 cycles

9.5 mm

Black

5N Type Side-operational 4R Light Touch Switches

Type: **EVQPC**

- Features
- Wealth of product types: Horizontal type,

snap-in terminals, etc.

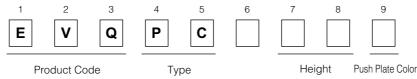
 Can be automatically dip-soldered: Integral molding of the terminals and main body prevents the escape of flux.



■ Recommended Applications

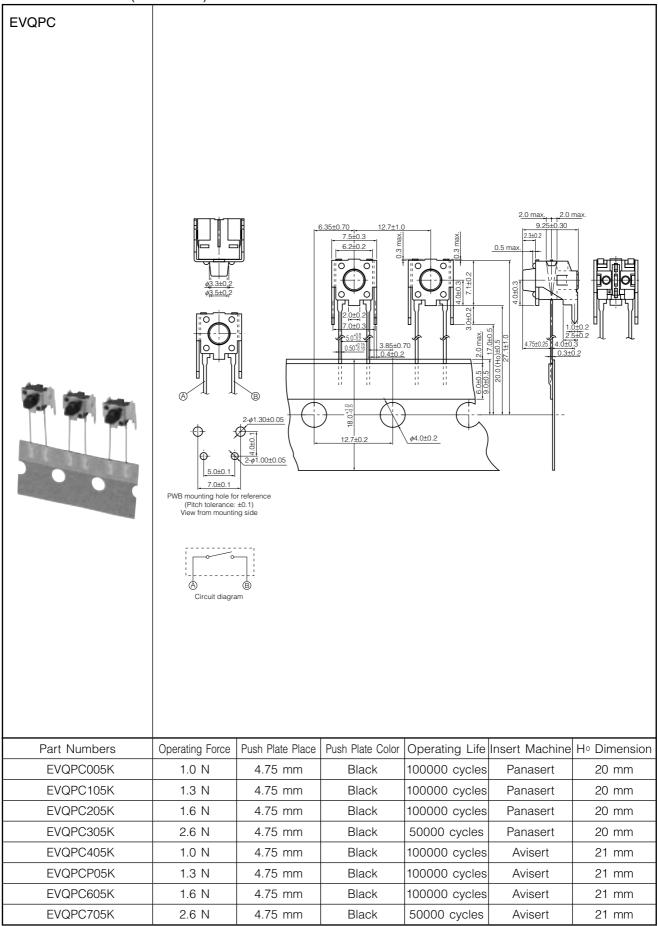
Operating switches for electronic equipment

■ Explanation of Part Numbers



Туре		Snap action/Push-on type SPST		
	Circuit Diagram	A 0 B		
Electrical	Rating	10 μA 2 Vdc to 20 mA	15 Vdc (Resistiv load)	
	Contact Resistance	50 m (nax.	
	Insulation Resistance	50 MΩ min. (at 100 Vdc)		
	Dielectric Withstanding Voltage	250 Vac for 1 minute		
	Bouncing	3 ms max. (ON) 8 ms max. (OFF)		
Mechanical	Operating Force	1.0 N±0.4 N 1.3 N±0.4 N 1.6 N±0.5 N	2.6 N±0.6 N	
	Travel	0.25 mm±0.10 mm		
Endurance	Operating Life	100000 cycles min.*	50000 cycles min.	
Operating Temp	erature	−20 °C to +70 °C		
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +40 °C (Taping)		
Minimum Quanti	ty/Packing Unit	700 pcs. Radial Taping (Reel Pack)		
Quantity/Carton		7000 pcs.		

 $^{\+\+1}$ million cycles also available, consult our salesmen.

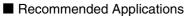


Round Type 2R Light Touch Switches

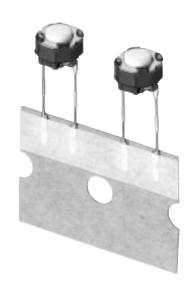
Type: **EVQ11**

■ Features

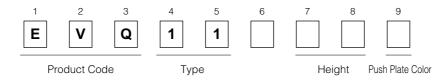
- External dimensions: 6.0 mm×6.0 mm, Height 3.9 mm (Excluding the push plate)
- The cast-processed terminals improve the mountability



Operating switches for electronic equipment



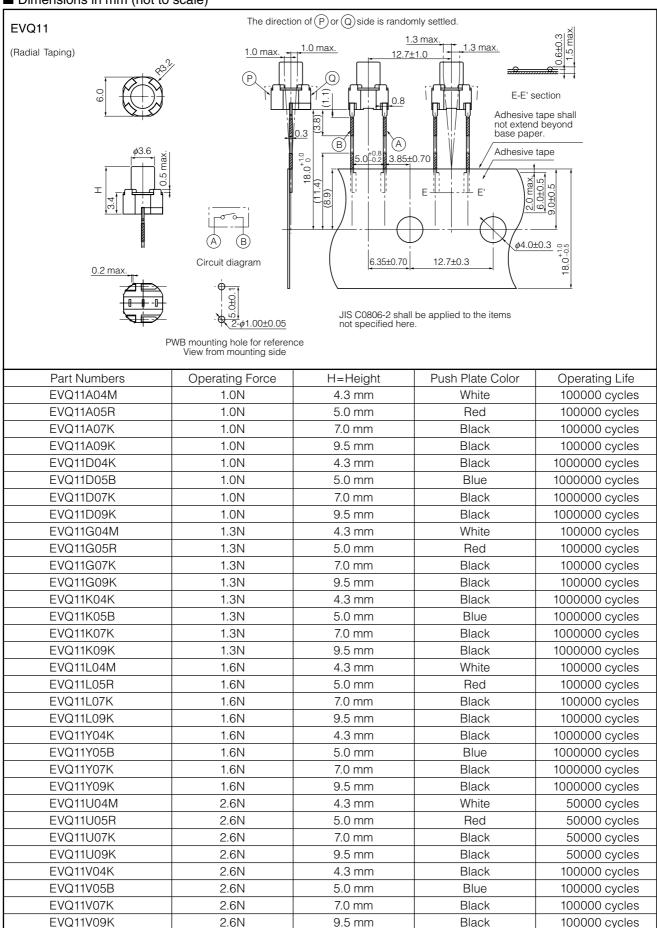
■ Explanation of Part Numbers



Туре		Snap action/Pusl	h-on type SPST	
	Circuit Diagram	A 0 0 B		
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)		
Electrical	Contact Resistance	50 mΩ	max.	
	Insulation Resistance	50 MΩ min. (at 100 Vdc)		
	Dielectric Withstanding Voltage	250 Vac for 1 minute		
	Bouncing	3 ms max. (ON) 8 ms max. (OFF)		
Mechanical	Operating Force	1.0 N±0.4 N 1.3 N±0.4 N 1.6 N±0.5 N		
	Travel	0.25 mm±	:0.10 mm	
Endurance	Operating Life	100000 cycles min. *	50000 cycles min.	
Operating Tem	perature	−20 °C to +70 °C		
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +40 °C (Taping)		
Minimum Qua	ntity/Packing Unit	2500 pcs. Radial Taping (Reel Pack)		
Quantity/Carto	on	25000 pcs.		

^{* 1} million cycles also available, consult our salesmen.

Panasonic



6.0 mm×3.5 mm Light Touch Switches

Type: **EVQPE**



- Features
- External dimensions: 6.0 mm×3.5 mm, Height 4.3 mm, 5.0 mm
- Wave soldering available

- Recommended Applications
- Operating switches for other electronic equipment

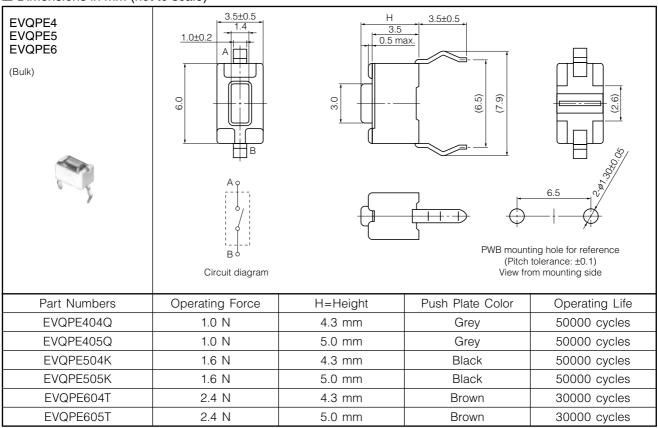
■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
E	V	Q	Р	E				
Pro	oduct Coc	de	Ту	ре	Operating Force	He	eight	Push Plate Color

■ Product Chart

Type Operating Force	Bulk Type	Height
1.0 N±0.5 N	EVQPE4	
1.6 N±0.5 N	EVQPE5	H=4.3 mm H=5.0 mm
2.4 N±0.6 N	EVQPE6	11-0.0 111111

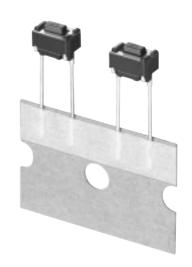
Type		Snap action/Pu	sh-on type SPST	
	Circuit Diagram	A 0 0 B		
Electrical	Rating	10 μA 2 Vdc to 50 mA	A 12 Vdc (Resistive load)	
Licotifical	Contact Resistance	100 m	nΩ max.	
	Insulation Resistance	100 MΩ mir	n. (at 100 Vdc)	
	Dielectric Withstanding Voltage	250 Vac for 1 minute		
	Bouncing	10 ms max. (ON, OFF)		
Mechanical	Operating Force	1.0 N±0.5N (Low force type) 1.6 N±0.5 N (Standard)	2.4 N±0.6 N	
	Travel	0.25 mm ^{+0.20} _{-0.10} mm		
Endurance	Operating Life	50000 cycles min.	30000 cycles min.	
Operating Temper	erature	−30 °C to +85 °C		
Storage Temperature		-40 °C to +85 °C (Bulk)		
Minimum Quantit	ty/Packing Unit	1000 pcs. Polyethylene Bag (Bulk)		
Quantity/Carton		10000 pcs.		



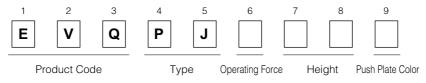
6.0 mm×3.5 mm 2R Light Touch Switches

Type: **EVQPJ**

- Features
- External dimensions: 6.0 mm×3.5 mm, Height 4.3 mm, 5.0 mm
- Wave soldering available
- Recommended Applications
- Operating switches for other electronic equipment



■ Explanation of Part Numbers

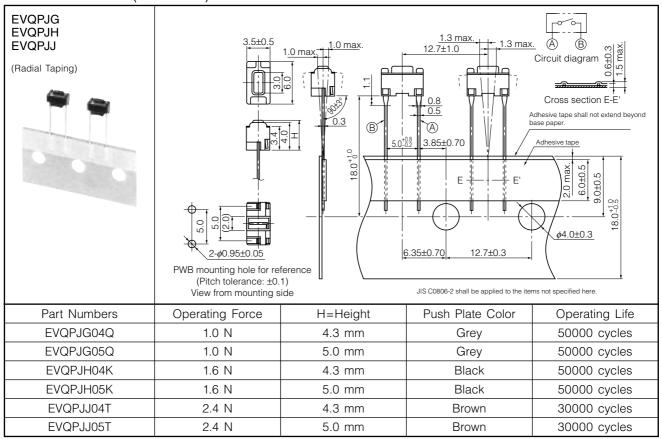


■ Product Chart

Type Operating Force	Radial Taping	Height
1.0 N±0.5 N	EVQPJG	
1.6 N±0.5 N	EVQPJH	H=4.3 mm H=5.0 mm
2.4 N±0.6 N	EVQPJJ	11=0.0 11111

Type	_	Snap action/Push-on type SPST		
	Circuit Diagram	A 0 0 B		
Electrical	Rating	10 μA 2 Vdc to 50 mA	12 Vdc (Resistive load)	
	Contact Resistance	100 m	Ω 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	1.0 N±0.5N (Low force type) 1.6 N±0.5 N (Standard)		
	Travel	0.25 mm ^{+0.20} _{-0.10} mm		
Endurance	Operating Life	50000 cycles min.	30000 cycles min.	
Operating Temp	erature	−30 °C to +85 °C		
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +40 °C (Taping)		
Minimum Quanti	ty/Packing Unit	2000 pcs. Radial Taping (Reel Pack)		
Quantity/Carton		20000 pcs.		

Panasonic



Over Travel Light Touch Switches

Type: **EVQP0**



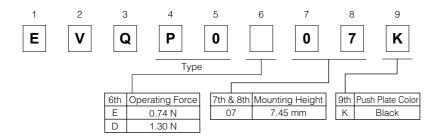
- External dimensions: 6.2 mm×6.2 mm, Height 7.45 mm
- Comfortable for long-time operation due to over-travel
- Excellent light-touch operational feel

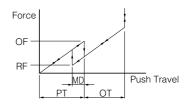


■ Recommended Applications

- Operating switches for other electronic equipment
- Operation switches for PC mouse

■ Explanation of Part Numbers



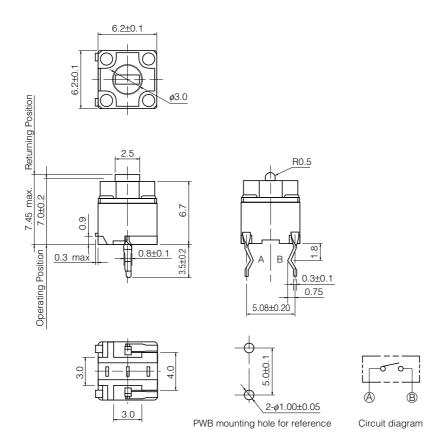


Туре		Snap action / Push-on type SPST		
	Rating	10 μA 2 Vdc to 50 mA	A 30 Vdc (Resistive load)	
	Contact Resistance	100 m Ω max. (1 Ω max. after life test)		
Electrical	Insulation Resistance	100 MΩ min.	(at 100 Vdc)	
Dielectric Withstanding Voltage		600 Vac fo	or 1 minute	
	Bouncing	3 ms max. (ON),	8 ms max. (OFF)	
	Operating Force	EVQP0E : 0.74 N max.	EVQP0D: 1.3 N max.	
	Returning Force	0.1 N min.		
Mechanical	Pre-travel	0.5 mm max.		
	Movement Differential (MD)	0.12 mm max.		
	Over Travel	0.2 mm max.		
Endurance	Operating Life	EVQP0E : 5000000 cycles min.	EVQP0D : 1000000 cycles min.	
Operating Te	emperature	−20 °C to +70 °C		
Storage Temperature		-45 °C to +85 °C		
Minimum Qua	antity/Packing Unit	500 pcs. Polyethylene Bag (Bulk)		
Quantity/Cart	ton	10000 pcs.		

(Bulk)

■ Dimensions in mm (not to scale)

EVQP0



Part Numbers	Operating Force	Height	Push Plate Color	Operating Life
EVQP0E07K	0.74 N	7.45 mm	Black	5000000 cycles
EVQP0D07K	1.30 N	7.45 mm	Black	1000000 cycles

4 mm Square Double-action SMD Light Touch Switches

Type: **EVPAH**



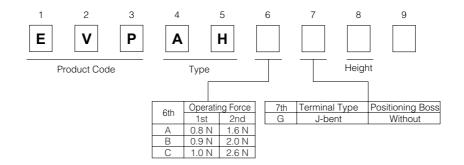
■ Features

- External dimensions: 4.0 mm×4.1 mm, Height 0.59 mm
- Long operation life
- Wide selection of double action operating variations

■ Recommended Applications

 Camera function (Digital still cameras, Camcorders, Mobile phones, etc.) for shutter switches.

■ Explanation of Part Numbers



Type		Snap action/Push-on type SPDT					
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)					
	Contact Resistance	500 m Ω max.					
Electrical	Insulation Resistance	100 MΩ min. (at 100 Vdc)					
	Dielectric Withstanding Voltage	250 Vac for 1 minute					
	Bouncing	3 ms max. (ON), 20 ms max. (OFF)					
	Operating Force	1st: 0.8 N, 0.9 N, 1.0 N					
Mechanical Operation	Operating Force	2nd: 1.6 N, 2.0 N, 2.6 N					
	Travel	1st: 0.15 mm 2nd: 0.3 mm					
		1.6 N : 100000 cycles min.					
Endurance	Operating Life	2.0 N : 100000 cycles min.					
		2.6 N: 30000 cycles min.					
Operating Ter	nperature	−20 °C to +70 °C					
Otomore Tomor		-40 °C to +85 °C (Bulk)					
Storage Temperature		-20 °C to +60 °C (Taping)					
Minimum Qua	antity/Packing Unit	8000 pcs. Embossed Taping (Reel Pack)					
Quantity/Carto	on	40000 pcs.					

EVPAHCG6A

■ Dimensions in mm (not to scale)

EVPAH With J-bent terminals (3.4)C' С 4.10.2 В В D 0.59 4.55 +0.3 (0.63)Washer D terminal Ground terminal (Washer to D terminal) 2nd operation 1st operation Co--₀ B' Вο D (Washer) Circuit Diagram PWB land pattern for reference (View from mounting side) * C or/and C' shall be used as common/ground terminal. (2.7)(2.8)D Please do not Provide any Land pattern in this area. Operating Force Part Numbers Boss Ground Terminal Height Operating Life 2 th 1 th 100000 cycles **EVPAHAG6A** Without With 0.8 N 1.6 N 0.59 EVPAHBG6A 0.59 100000 cycles Without With 0.9 N 2.0 N With 0.59

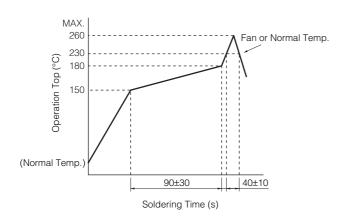
Without

30000 cycles

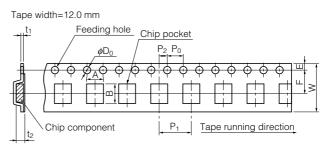
1.0 N

2.6 N

■ Recommended Reflow Soldering Conditions



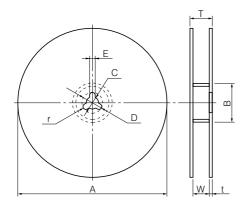
Embossed Carrier Taping



Unit: mm

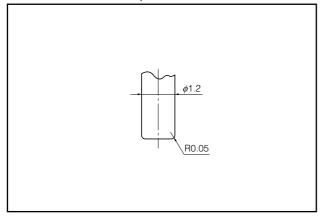
Part No.	Height	А	В	W	F	E	P ₁	P ₂	Po	D₀ Dia.	t1	t ₂
EVPAH	0.59	4.36±0.2	4.4±0.2	12.0+0.3	5.5±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.3±0.05	1.25 ^{+0.2} _{-0.1}

Standard Reel Dimensions in mm (not to scale)

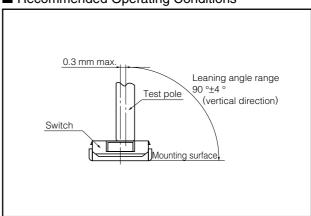


Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	T	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	1.0 to 3.0	1.0±0.5	

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



6 mm Square Thin Type Double-action SMD Light Touch Switches

Type: EVQPR/EVQQ0/EVQ3PR





■ Features

● External dimensions: 6.0 mm×6.0 mm,

Height: 0.9 mm (Without push plate) 0.95 mm (With push plate)

Wide selection of double action operating variations

With push plate : 1st 0.7 N, 2nd 2.6 N Without push plate : 1st 1.0 N, 2nd 2.6 N

Wide selection of double action operating variations

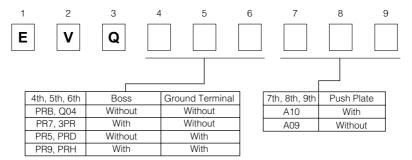
■ Recommended Applications

Camera function

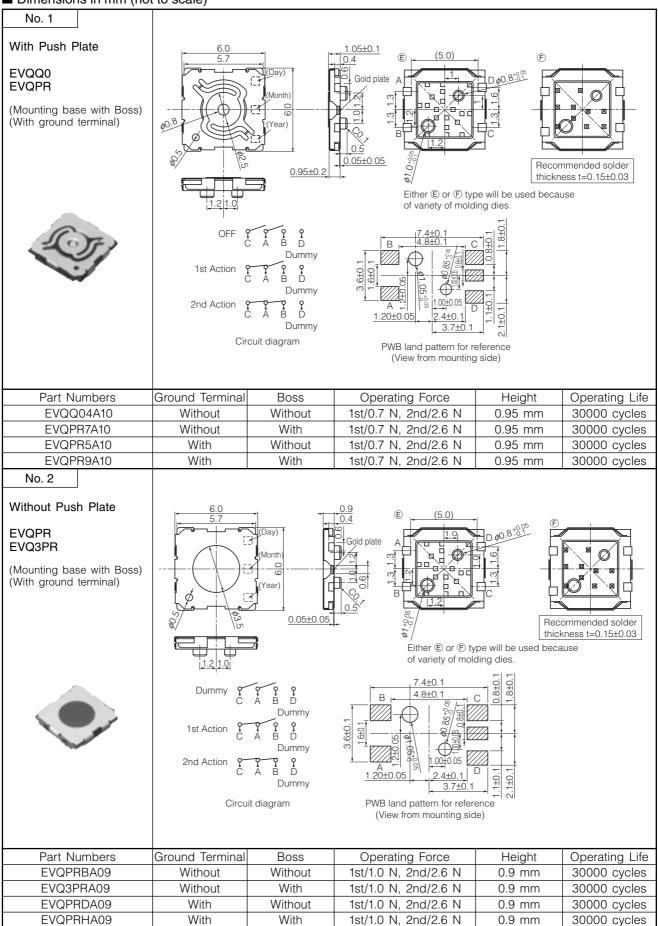
(Digital still cameras, Camcorders, Mobile phones, etc.)

 Operating switches for menu scrolling and confirmation for portable equipment.

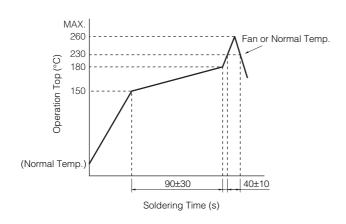
■ Explanation of Part Numbers



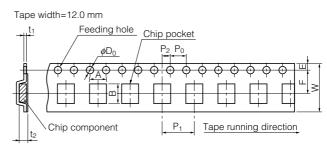
Type		Snap action/Pus	h-on type SPDT				
Push Plate ty	ре	With Push Plate	Without Push Plate				
	Rating	10 μA 2 Vdc to 20 mA	15 Vdc (Resistive load)				
	Contact Resistance	100 m <u>s</u>	n max.				
Electrical	Insulation Resistance	50 M <u>(</u>) min.				
Liootiioai	Dielectric Withstanding Voltage	100 Vac for 1 minute					
	Bouncing	3 ms max. (ON) 20 ms max. (OFF)					
	Operating Force	1st : 0.7 N	1st : 1.0 N				
Mechanical	Operating Force	2nd : 2.6 N	2nd : 2.6 N				
	Travel	1st: 0.4 mm 2nd: 0.6 mm					
Endurance	Operating Life	30000 cy	cles min.				
Operating Ter	nperature	−20 °C to) +70 °C				
Storage Temperature		-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)					
Minimum Qua	antity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)					
Quantity/Carto	on	25000 pcs.					



■ Recommended Reflow Soldering Conditions



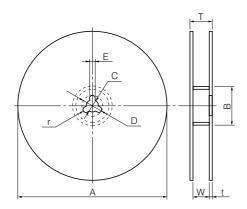
Embossed Carrier Taping



Unit: mm

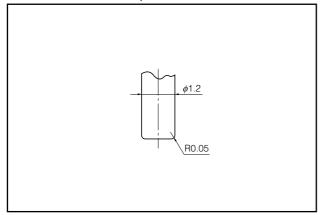
Part No.	Height	Α	В	W	F	E	P ₁	P ₂	Po	D₀ Dia.	t1	t ₂
EVQPR/Q0/3PR	0.9, 0.95	6.3±0.3	6.3±0.3	12.0±0.3	5.50±0.15	1.75±0.15	8.00±0.15	2.00±0.15	4.00±0.15	1.5+0.1	0.30±0.05	1.7 ^{+0.2}

Standard Reel Dimensions in mm (not to scale)

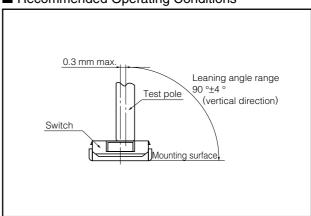


Item	Α	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.2	φ21.0±0.8	2.0±0.5
Item	W	T	t	r	
Rate (mm)	13.5±1.0	17.5±1.0	1.0 to 3.0	1.0±0.5	

■ Recommended Shape of Test Pole



■ Recommended Operating Conditions



4.7 mm×3.5 mm Double-action Side-operational SMD Light Touch Switches

Type: **EVPAJ**



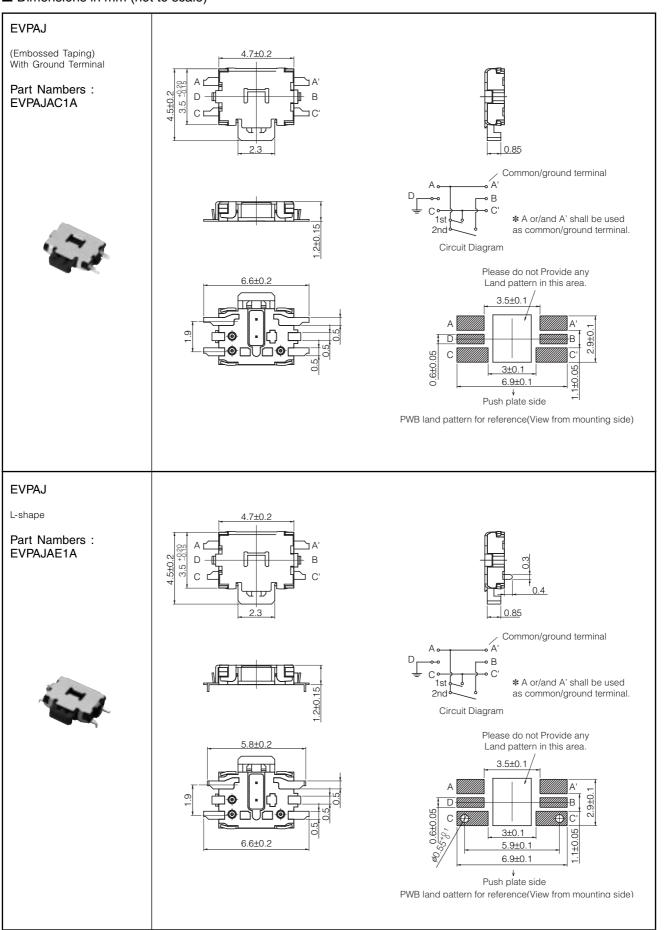
- Features
- External dimensions: 4.7 mm×3.5 mm (Without push plate), Height: 1.2 mm
- With ground terminal

- Recommended Applications
- Camera function
 (Digital still cameras, Camcorders, Mobile phones, etc.)
- Operating switches for menu scrolling and confirmation for portable equipment.

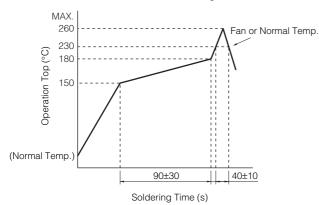
■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9
Е	V	Р	Α	J				
	Product cod	de		Туре		He	eight	

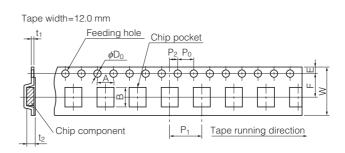
Туре		Snap action/Push-on type SPDT			
	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)			
	Contact Resistance	500 m Ω max.			
	Insulation Resistance	100 MΩ min. (at 100 Vdc)			
	Dielectric Withstanding Voltage	250 Vac for 1 minute			
	Bouncing	3 ms max. (ON) 20 ms max. (OFF)			
	Operating Force (1st Action)	1.6 N			
	Operating Force (2nd Action)	2.6 N			
Mechanical	Travel (1st Action)	0.15 mm			
	Travel (2nd Action)	0.4 mm			
	Push Strength	30 N for 15 seconds			
Endurance	Operating Life	100000 cycles min.			
Operating Ter	nperature	−20 °C to +70 °C			
O. T		-40 °C to +85 °C (Bulk)			
Storage Temperature		-20 °C to +60 °C (Taping)			
Minimum Qua	antity/Packing Unit	5000 pcs. Embossed Taping (Reel Pack)			
Quantity/Carto	on	25000 pcs.			



■ Recommended Reflow Soldering Conditions



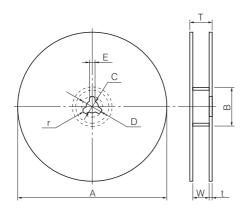
Embossed Carrier Taping



Unit: mm

Part No.	Height	А	В	W	F	E	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVPAJ	1.2	6.8±0.2	4.9±0.2	12.0+0.3	5.78±0.1	1.75±0.1	8.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.3±0.05	1.95+0.3

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	•
Rate (mm)	13.5±1.0	17.5±1.0	_	_	

6.2 mm×3.7 mm Double-action
Side-operational Edge Mount / SMD
Light Touch Switches

Type: **EVQQ0**





■ Features

- External dimensions: 6.2 mm×3.75 mm (Excluding the push plate), Height: 3.5 mm (EVQQ0C Type: Printed circuit board being as low as 1.35 mm)
- Good operability due to long stroke: 1st 0.4 mm, 2nd 0.5 mm
- Improved soldering strength in the operating direction when mounted on PC board edge

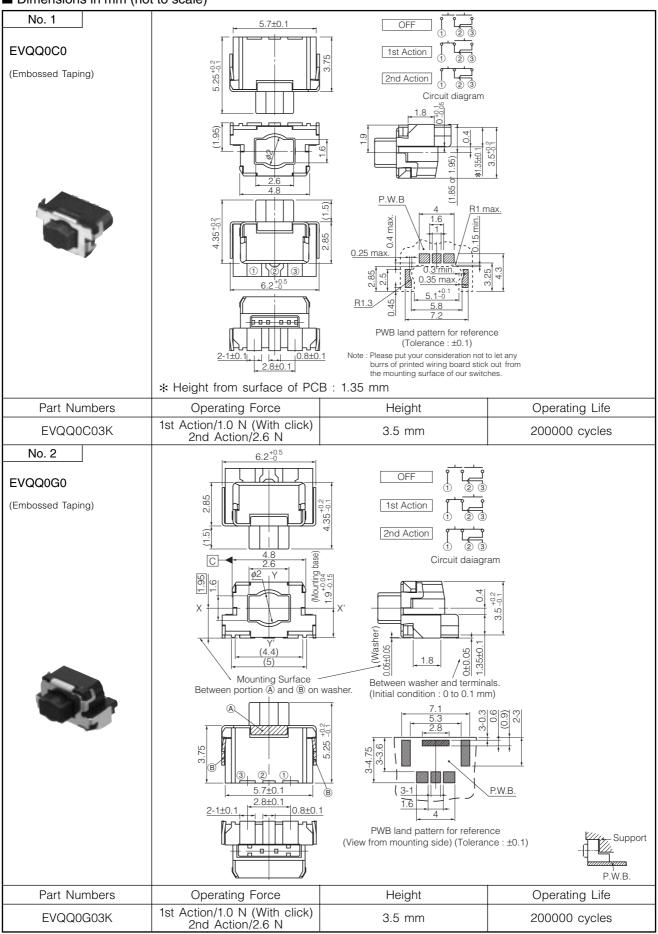
■ Recommended Applications

- Camera function (Digital still cameras, Camcorders, Mobile phones, etc.)
- Operating switches for menu scrolling and confirmation for portable equipment.

■ Explanation of Part Numbers

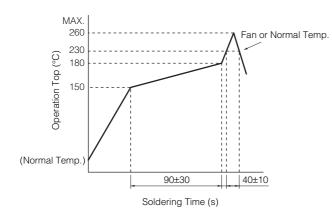
1	2	3	4	5	6	7	8	9
E	V	Q	Q	0				
Pı	oduct code	9	-	Type		He	ight	

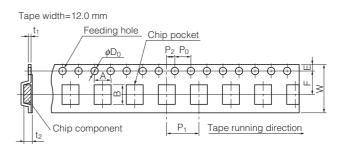
Type		Snap action/Push-on type SPDT					
	Circuit Diagram	OFF C A B D					
Electrical	Rating	10 μA 2 Vdc to 20 mA 15 Vdc (Resistive load)					
Liectrical	Contact Resistance	500 m Ω max.					
	Insulation Resistance	100 MΩ min. (at 100 Vdc)					
	Dielectric Withstanding Voltage	100 Vac for 1 minute					
	Bouncing	5 ms max. (ON) 20 ms max. (OFF)					
	Operating Force (1st Action)	1.0 N					
	Operating Force (2nd Action)	2.6 N					
Mechanical	Travel (1st Action)	0.4 mm					
	Travel (2nd Action)	0.5 mm					
	Push Strength	30 N for 1 minute					
Endurance	Operating Life	1st Action with click: 200000 cycles min.					
Operating Ter	nperature	−20 °C to +70 °C					
Ctorogo Toro	a cratura	-40 °C to +85 °C (Bulk)					
Storage Temperature		-20 °C to +60 °C (Taping)					
Minimum Qua	antity/Packing Unit	2500 pcs. Embossed Taping (Reel Pack)					
Quantity/Carto	on	12500 pcs.					



■ Recommended Reflow Soldering Conditions

Embossed Carrier Taping

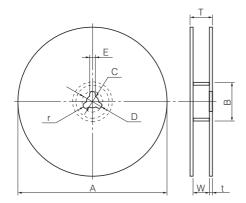




Unit: mm

Part No.	Height	А	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t1	t ₂
EVQQ0C	0.5	6.6±0.2	5.7±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	4 E+0.1	0.4±0.1	3.8±0.2
EVQQ0G	3.5	0.0±0.2	5.8±0.2	12.0±0.3	5.5±0.1	1.75±0.10	6.0±0.1	2.0±0.1	4.0±0.1	1.5-0	0.4±0.1	3.7±0.2

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	Е
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	13.5+1.0	17.5+1.0	1.0 to 3.0	10+05	

6 mm Square Long Travel SMD Light Touch Switches

Type: EVQP0/EVQP1/EVQ9P



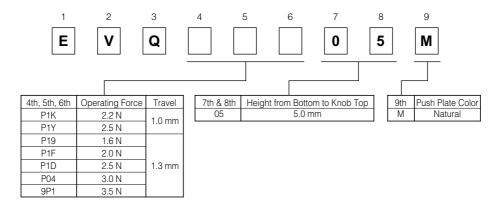
■ Features

- External dimensions: 6.0 mm×6.1 mm, Height 5.0 mm (Including the push plate)
- Steady and low contact resistance (100 m Ω max.)
- Excellent solderability (J-bent-type terminals)

■ Recommended Applications

- Operating switches for car electronic equipment.
- Input on operating switches for telephones, electronic musical instruments, etc.

■ Explanation of Part Numbers



■ Specifications

Type		Snap action/Pus	sh-on type SPST			
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)				
	Contact Resistance	100 mΩ max.				
Electrical	Insulation Resistance	100 MΩ min.	(at 100 Vdc)			
	Dielectric Withstanding Voltage	250 Vac fo	r 1 minute			
	Bouncing	10 ms max.	(ON, OFF)			
Mechanical	Operating Force	1.6 N±0.5 N, 2.0 N±0.6 N 2.5 N±0.6 N 3.0 N±0.8 N 3.5 N±1.0 N	2.2 N±0.6 N 2.5 N±0.6 N			
	Travel	1.3 mm±0.2 mm	1.0 mm±0.2 mm			
Endurance	Operating Life	3.5 N type: 300 1.6 N, 2.0 N, 2.2 N, 2.5 N, 3.0	•			
Operating Ter	mperature	-40 °C to	+85 °C			
Storage Temperature -40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)		• •				
Minimum Qua	antity/Packing Unit	2000 pcs. Embossed Taping (Reel Pack)				
Quantity/Carto	on	10000 pcs.				

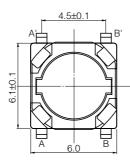
■ Dimensions in mm (not to scale)

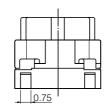
EVQP0

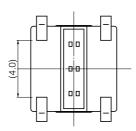
EVQP1

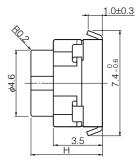
EVQ9P

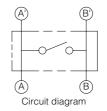
(Embossed Taping)

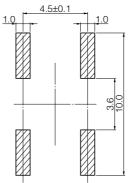










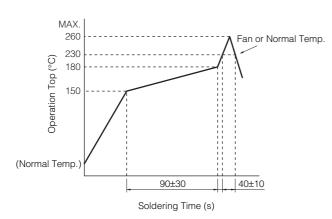


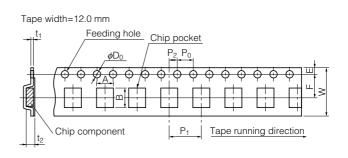
PWB land pattern for reference

Part Numbers	Operating Force	Travel	H=Height	Push Plate Color	Operating Life
EVQP1K05M	2.2 N	1.0 mm	5.0 mm	Natural	100000 cycles
EVQP1Y05M	2.5 N	1.0 mm	5.0 mm	Natural	100000 cycles
EVQP1905M	1.6 N	1.3 mm	5.0 mm	Natural	100000 cycles
EVQP1F05M	2.0 N	1.3 mm	5.0 mm	Natural	100000 cycles
EVQP1D05M	2.5 N	1.3 mm	5.0 mm	Natural	100000 cycles
EVQP0405M	3.0 N	1.3 mm	5.0 mm	Natural	100000 cycles
EVQ9P105M	3.5 N	1.3 mm	5.0 mm	Natural	30000 cycles

■Recommended Reflow Soldering Conditions

Embossed Carrier Taping

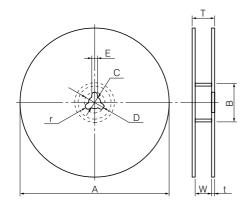




Unit: mm

Part No.	Height	А	В	W	F	Е	P ₁	P ₂	P ₀	D₀ Dia.	t ₁	t ₂
EVQP0 EVQP1 EVQ9P	5.0	6.4±0.2	7.9±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	0.4±0.1	5.25±0.20

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E
Rate (mm)	φ370.0±2.0	φ50.0 min.	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Pata (mm)	14.0+1.5		1 0 to 3 0	10+05	

6 mm Square Long Travel 2 terminals SMD Light Touch Switches

Type: **EVPAS**



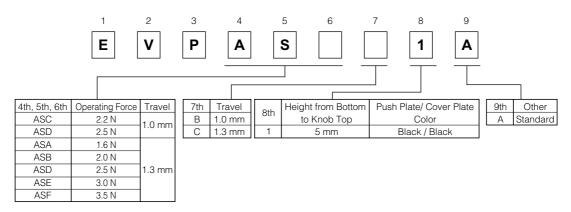
■ Features

- External dimensions: 6.0 mm×6.1 mm, Height 5.0 mm (Including the push plate)
- Steady and low contact resistance (100 m Ω max.)
- Excellent solderability (J-bent-type terminals)

■ Recommended Applications

- Operating switches for car electronic equipment.
- Input on operating switches for telephones, electronic musical instruments, etc.

■ Explanation of Part Numbers



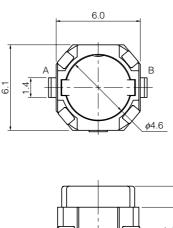
■ Specifications

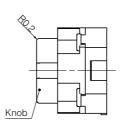
Туре		Snap action/Push-on type SPST				
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)				
	Contact Resistance	100 m Ω max.				
Electrical	Insulation Resistance	100 M Ω min.	(at 100 Vdc)			
	Dielectric Withstanding Voltage	250 Vac fo	r 1 minute			
	Bouncing	10 ms max.	(ON, OFF)			
Mechanical	Operating Force	1.6 N±0.5 N, 2.0 N±0.6 N 2.5 N±0.6 N 3.0 N±0.8 N 3.5 N±1.0 N	2.2 N±0.6 N 2.5 N±0.6 N			
	Travel	1.3 mm±0.2 mm	1.0 mm±0.2 mm			
Endurance	Operating Life	3.5 N type: 300 1.6 N, 2.0 N, 2.2 N, 2.5 N, 3.0	•			
Operating Ter	nperature	−40 °C to) +90 °C			
Storage Temp	perature	-40 °C to +90 °C (Bulk) -20 °C to +60 °C (Taping)				
Minimum Qua	antity/Packing Unit	2000 pcs. Embossed Taping (Reel Pack)				
Quantity/Carto	on	10000 pcs.				

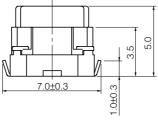
■ Dimensions in mm (not to scale)

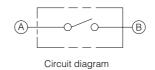
EVPASP

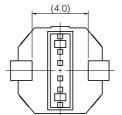
(Embossed Taping)

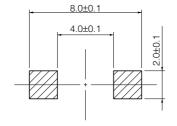










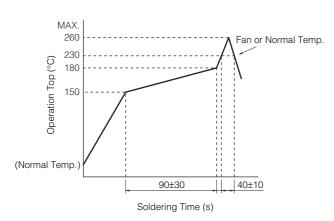


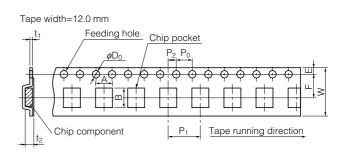
PWB land pattern for reference

Part Numbers	Operating Force	Travel	H=Height	Push Plate Color	Operating Life
EVPASCB1A	2.2 N	1.0 mm	5.0 mm	Black	100000 cycles
EVPASDB1A	2.5 N	1.0 mm	5.0 mm	Black	100000 cycles
EVPASAC1A	1.6 N	1.3 mm	5.0 mm	Black	100000 cycles
EVPASBC1A	2.0 N	1.3 mm	5.0 mm	Black	100000 cycles
EVPASDC1A	2.5 N	1.3 mm	5.0 mm	Black	100000 cycles
EVPASEC1A	3.0 N	1.3 mm	5.0 mm	Black	100000 cycles
EVPASFC1A	3.5 N	1.3 mm	5.0 mm	Black	30000 cycles

■Recommended Reflow Soldering Conditions

Embossed Carrier Taping

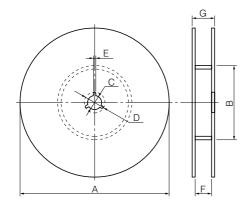




Unit: mm

Part No.	Height	А	В	W	F	Е	P ₁	P ₂	Po	D₀ Dia.	t ₁	t ₂
EVPAS	5.0	6.8±0.2	7.7±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	0.4±0.1	5.25±0.20

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E
Rate (mm)	φ380.0±2.0	φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5

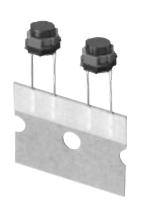
Item	F	G		
Rate (mm)	13.5±1.0	17.5±1.0		

6 mm Square Long Travel 2R Light Touch Switches

Type: **EVQPV**



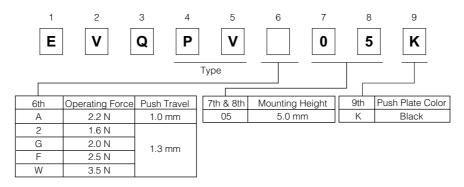
- External dimensions: 6.0 mm×6.1 mm, Height 5.0 mm (Including the push plate)
- High mountability, section terminals and radial taping package
- Low contact resistance and steady contact characteristics



■ Recommended Applications

- Operating switches for car electronic equipment.
- Input on operating switches for telephones, electronic musical instruments, etc.

■ Explanation of Part Numbers



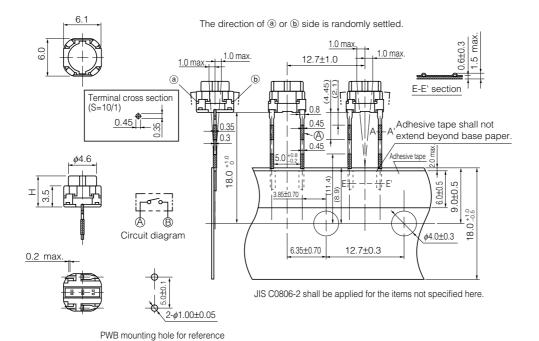
■ Specifications

Туре		Snap action/Pus	sh-on type SPST			
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)				
	Contact Resistance	100 mΩ max.				
Electrical	Insulation Resistance	100 M Ω min. (at 100 Vdc)				
	Dielectric Withstanding Voltage	250 Vac fo	or 1 minute			
	Bouncing	10 ms max	ms max. (ON, OFF)			
Mechanical	Operating Force	2.2 N	1.6 N, 2.0 N, 2.5 N, 3.5 N			
Mechanicai	Travel	1.0 mm±0.2 mm	1.3 mm±0.2 mm			
Endurance	Operating Life	100000 c	ycles min.			
	operating Life	(3.5 N type : 30	000 cycles min.)			
Operating Ten	nperature	−30 °C to	o +85 °C			
Ctorogo Tomo	oroturo	-40 °C to	+85 °C (Bulk)			
Storage Temp	erature	−20 °C to	+40 °C (Taping)			
Minimum Qua	ntity/Packing Unit	2500 pcs. Radial Taping (Reel Pack)				
Quantity/Carto	on	25000 pcs.				
Quantity/Carto	on					

■ Dimensions in mm (not to scale)

EVQPV

(Radial Taping)



Part Numbers	Operating Force	Travel	H=Height	Push Plate Color	Operating Life
EVQPVA05K	2.2 N	1.0 mm	5.0 mm	Black	100000 cycles
EVQPV205K	1.6 N	1.3 mm	5.0 mm	Black	100000 cycles
EVQPVG05K	2.0 N	1.3 mm	5.0 mm	Black	100000 cycles
EVQPVF05K	2.5 N	1.3 mm	5.0 mm	Black	100000 cycles
EVQPVW05K	3.5 N	1.3 mm	5.0 mm	Black	30000 cycles

View from mounting side

8 mm Square Long Travel SMD Light Touch Switches

Type: **EVQQ1**



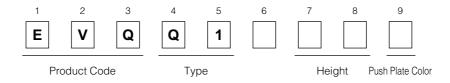
- External dimensions: 8.5 mm×8.5 mm, Height 6.5 mm (Including the push plate)
- High operating force which prevents incorrect operation
- Reliable contact (dust-proof design)



■ Recommended Applications

- Operating switches for car electronic equipment, car audio systems, etc.
- Steering switches

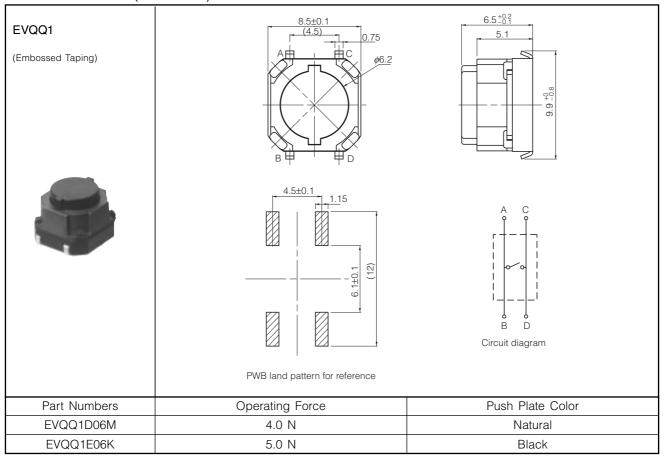
■ Explanation of Part Numbers



■ Specifications

Type		Snap action/Push-on 1-pole 1-throw SPST		
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)		
Electrical	Contact Resistance	100 m Ω max.		
	Insulation Resistance	100 M Ω min. (at 100 Vdc)		
	Dielectric Withstanding Voltage	250 Vac for 1 minute		
	Bouncing	10 ms max. (ON, OFF)		
Mechanical	Operating Force	4 N, 5 N		
Mechanicai	Travel	1.0 mm		
Endurance	Operating Life	100000 cycles min.		
Operating Tem	perature	-40 °C to +85 °C		
Storage Tempe	pratura	-40 °C to +85 °C (Bulk)		
	siature	-20 °C to +60 °C (Taping)		
Minimum Quar	ntity/Packing Unit	1000 pcs. Embossed Taping (Reel Pack)		
Quantity/Cartor	า	10000 pcs.		

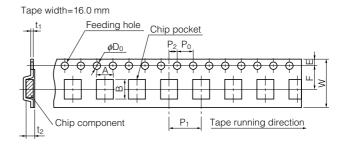
■ Dimensions in mm (not to scale)



■ Recommended Reflow Soldering Conditions

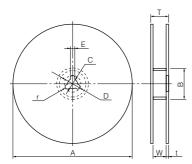
MAX. 260 Fan or Normal Temp. 230 180 (Normal Temp.) 90±30 40±10 Soldering Time (s)

Embossed Carrier Taping



												Unit: mm
Part No.	Height	А	В	W	F	E	P ₁	P ₂	Po	D₀ Dia.	tı .	t ₂
EVQQ1	6.5	8.9±0.2	10.1±0.2	16.0±0.3	7.5±0.1	1.75±0.10	12.0±0.1	2.0±0.1	4.0±0.1	1.5+0.1	0.40±0.05	6.8±0.2

Standard Reel Dimensions in mm (not to scale)



Item	Α	В	С	D	E
Rate (mm) ø380.0±2.0		φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	17.5±0.5	21.5±1.0	1.0 to 3.0	1.0±0.5	

8 mm Square Long Travel 2R Light Touch Switches

Type: **EVQQJ**



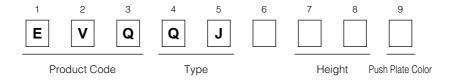
- External dimensions: 8.0 mm×8.0 mm,
 Height 5.0 mm, 5.5 mm, 6.1 mm (Including the push plate)
- Long life (self-cleaning)
- Low contact resistance with metal contacts
- Small bouncing



■ Recommended Applications

- Operating Switches for car air conditioners, car audio systems, etc.
- Push switches for camcorders
- Ten-key switches for telephones

■ Explanation of Part Numbers

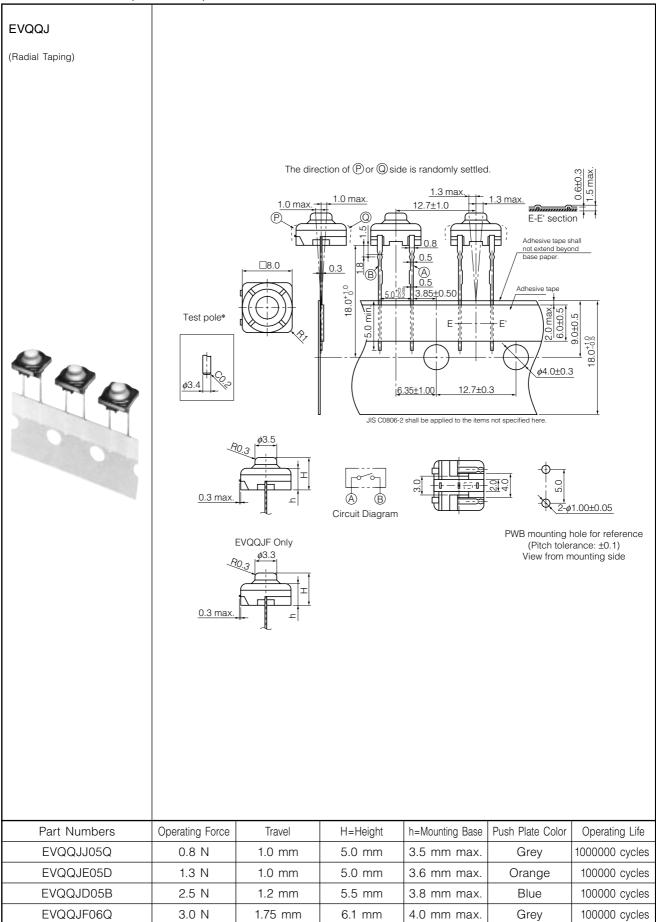


■ Specifications

Туре		Snap action/Push-on 1-pole 1-throw SPST						
	Rating	10 μA 2 Vdc to 5 mA 12 Vdc. (Resistive load)						
	Contact Resistance		200 m	Ω max.				
Electrical	Insulation Resistance		50 M Ω min.	(at 100 Vdc)				
	Dielectric Withstanding Voltage		250 Vac fo	or 1 minute				
	Bouncing		10 ms max	. (ON, OFF)				
Maalaaniaal	Operating Force	0.8 N±0.4 N	1.3 N±0.6 N	2.5 N±0.6 N	3.0 N±0.6 N			
Mechanical	Travel	1.0 mm	1.0 mm	1.2 mm	1.75 mm			
Endurance	Operating Life	1000000 cycles min.	100000 cycles min.	100000 cycles min.	100000 cycles min.			
Operating Te	emperature	−20 °C to +70 °C						
Storage Tem	nerature	-40 °C to +85 °C (Bulk)						
	perature	-20 °C to +40 °C (Taping)						
Minimum Qu	antity/Packing Unit	1000 pcs. Radial Taping (Reel Pack)						
Quantity/Car	ton		10000 pcs.					

■ Application Notes:

- Washing is not allowed.
- Inclination of pushing knob shall be 3 ° max.



10 mm Square Center Space Long Travel SMD Light Touch Switches

Type: **EVPAD**

0

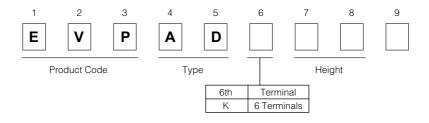
■ Features

- The open center space allows for flexibility in choosing a LED Up to a 4.2-mm diameter chip LED can be mounted.
- Provides an excellent operational feel.
 - Crisp tactile feedback
 - Long stroke (1 mm)
- Supports auto reflow soldering.

■ Recommended Applications

 Operating switches for car electronic equipment (car audio systems, car air conditioners, etc.)

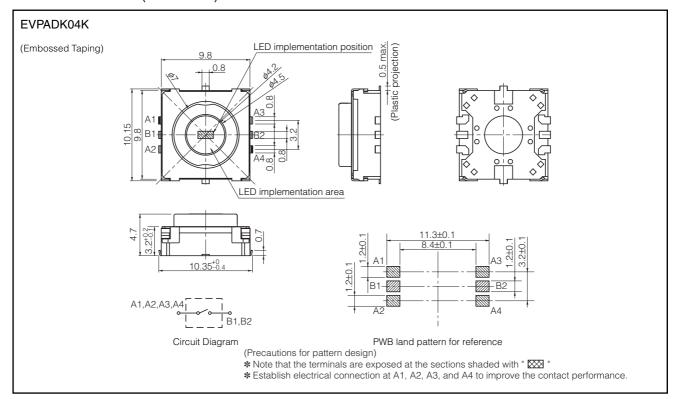
■ Explanation of Part Numbers



■ Specifications

Туре		Snap action/Push-on type SPST
	Rating	10 μA 2 Vdc to 50 mA 12 Vdc (Resistive load)
	Contact Resistance	100 m Ω max.
Electrical	Insulation Resistance	100 M Ω min. (at 100 Vdc)
	Dielectric Withstanding Voltage	250 Vac for 1 minute
	Bouncing	10 ms max. (ON, OFF)
	Operating Force	4.0 N±0.8 N
Mechanical	Travel	1.0 mm±0.15 mm
Endurance	Contact Resistance Insulation Resistance Dielectric Withstanding Voltage Bouncing Operating Force Travel Operating Life atture -40 °C to +85 -20 °C to +60 /Packing Unit	100000 cycles min.
Operating Tem	perature	−40 °C to +85 °C
Storage Tempe	erature	-40 °C to +85 °C (Bulk) -20 °C to +60 °C (Taping)
Minimum Quar	ntity/Packing Unit	1000 pcs. Embossed Taping (Reel Pack)
Quantity/Carto	n	5000 pcs.

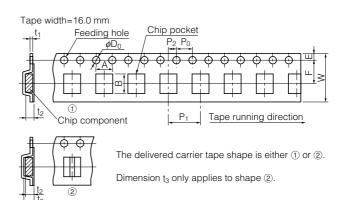
■ Dimensions in mm (not to scale)



■ Recommended Reflow Soldering Conditions

MAX. 260 Fan or Normal Temp. (Normal Temp.) 90 to 30 40 to 10 Soldering Time (s)

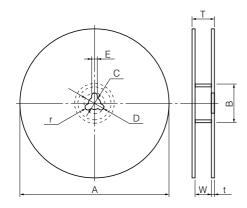
Embossed Carrier Taping



Unit: mm

Part No.	Height	Α	В	W	F	E	P1	P2	P ₀	D0 Dia	t1	t 2	tз
EVPAD	4.6	10.7±0.2	10.7±0.2	16.0±0.3	7.5±0.1	1.75±0.10	12.0±0.1	2.0±0.1	4.0±0.1	1.5 ^{+0.1}	0.40±0.05	4.8±0.2	5.8±2.0

Standard Reel Dimensions in mm (not to scale)



Item	А	В	С	D	E
Rate (mm) ϕ 380.0±2.0		φ80.0±1.0	φ13.0±0.5	φ21.0±1.0	2.0±0.5
Item	W	Т	t	r	
Rate (mm)	17.5±0.5	21.5±1.0	_	_	

CONTENTS

Products	Type/Series	Part Numbers	Page					
Common	Index / RoHs Directives		EV2					
	Contents / Quick Selection Guide							
Datama	Checklist / Application Notes / Common Specifications / Minimum Quantity/Packing Unit							
Rotary Potentiometers	18 mm Square Rotary Potentiometers (High Rotational Torque)	EVCX	EV12					
Fotentiometers	39/20 mm Center Space Rotary Potentiometers	EWVYE/K/M	EV13					
	44/25 mm Center Space Rotary Potentiometers	EWVYG/H/J/L	EV14					
	Contents / Quick Selection Guide		EV15					
Carbon Composition Trimmer Potentiometers	Application Notes / Common Specifications / Minimum Quantity	y/Packing Unit	EV17					
	6FF Square Trimmer Potentiometers	EVNCYA	EV20					
	6FE Square Trimmer Potentiometers	EVND	EV22					
	Contents / Quick Selection Guide		EV25					
	Checklist / Application Notes / Minimum Quantity/Packing Unit		EV27					
Position Sensors	10 mm GS Sensors	EVWAE/D	EV30					
	Linear Position Sensors	EVAW7	EV32					
	15 mm Position Sensors	EVWBE	EV34					
	Contents / Quick Selection Guide							
	Checklist / Application Notes / Minimum Quantity/Packing Unit							
	10 mm Square GS Encoders	EVQVX	EV40					
	10 mm Square SMD Encoders	EVQVV	EV42					
	Edge Drive Jog Encoders	EVQWK	EV44					
	11 mm Square GS Encoders	EVER/U/V/Y	EV46					
	12 mm Square GS Encoders	EVEG/H/K/L	EV49					
Encoders	12 mm Square GS Encoders with Push-on Switch	EVEJB	EV52					
	16 mm Square Encoders	EVEP/Q	EV54					
	18 mm Square Encoders (High Rotational Torque)	EVQW	EV56					
	20/12 mm Center Space Encoders	EVQV6	EV57					
	27/17 mm Center Space Encoders	EVQWF/VP	EV58					
	27/18 mm Center Space Encoders	EVQV5	EV59					
	38/25 mm Center Space Encoders	EVQVN	EV60					
	60/40 mm Center Space Encoders	EVQV0	EV61					

Index



12 mm Square GS Encoders

with Push-on Switch

(EVEJB)

12 mm Square GS Encoders

(EVEG, EVEH, EVEK, EVEL)

18 mm Square Encoders

(High Rotational Torque)

(EVQW)

16 mm Square Encoders

(EVEP, EVEQ)

Index EV57 EV58 EV59 EV60 20/12 mm 27/17 mm 27/18 mm 38/25 mm Center Space Encoders (EVQWF, EVQVP) Center Space Encoders Center Space Encoders Center Space Encoders (EVQV6) (EVQV5) (ĖVQVN) EV61 60/40 mm Center Space Encoders (ĖVQV0)

■ RoHS Directives

RoHS Directives: The restriction of the use of certain hazardous substances in electrical and electronic equipment

The products introduced in this catalog conform to the RoHS Directives* (enforced in July 2006).

(Newly ordered products will conform to the RoHS Directive.)

Please contact our sales staff for inquiries about the RoHS compliance of currently used products.

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■Application Notes·····	EV7
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■18 mm Square Rotary Potentiometers (High Rotational Torque / EVCX)····································	·· EV12
■39/20 mm Center Space Rotary Potentiometers (EWVYE, EWVYK, EWVYM)·············	·· EV13
■44/25 mm Center Space Rotary Potentiometers (EWVYG, EWVYH, EWVYJ, EWVYL) ······	·· EV14

■ Quick Selection Guide

Type, Series	Appearance	Part Numbers	Country of origin	Nominal Total Resistance	Taper	Rotation Angle	Page
18 mm Square (High Rotational Torque)		EVCX	Japan	5 k Ω to 100 k Ω ±20 %	Custom design	280°	EV12
39/20 mm Center Space	9	EWVYE EWVYK EWVYM	Malaysia	10 kΩ ±20 %	В	300°	EV13
44/25 mm Center Space		EWVYG EWVYH EWVYJ EWVYL	Malaysia	10 kΩ ±20 %	В	300 °	EV14

Country of origin: As of April 2013

■ Checklist Before Inquiry

When you specify Potentiomters, please take advantages of our standard products for better price and delivery. Please provide the following items before ordering.

					Checklist				
		Item			Information (Requirements)				
	C-1	Inquiry purpo	se		New use, Modification, Others ()			
			Previous su	pplier					
	C-2	Modification	Convention	al part No.					
			Purpose						
			Equipment						
	C-3	Application	Environmen		Indoor/Outdoor use, Stationary/Portable set, High humidity, S	O ₂ , NaCl			
'n		/ Application	Temperatur	е	(°C) to (°C)				
Ĕ			Operation		General use, Edge drive, Low torque				
Common	_		Method		Manual, Automatic				
0	C-4	Adjustment	Direction		Top, Bottom, Vertical, Horizontal				
			Driver shap	e	Plus/Minus screw slot, Hexagonal driver, Knob (Shape;)			
	C-5	Mounting	Method		Manual, Automatic				
			Mounter		Panasert (Model:), Other mounter (Maker/Model: /), Parts feeder			
			Method		Manual soldering, Flow soldering, Reflow soldering	`			
	C-6	Soldering	Conditions		Temp. (°C), Time (s), Dipping times()			
			Washing		Machine, Soaking, Applied solvent (
	E-1	Application	Circuit		Volume, Tone, Balance, Circuit regulation, Others ()			
			Stereo tone	use	General tone, High-cut tone, Bass, Treble				
			Current		ac, dc				
=	E-2	Conditions	Rating		Max. operating power (W), Operating voltage (V)			
ri Si		5	Applied current		Small current use, Applying current (mA)				
Electrical	E-3	Resistance	Total value/Torelance		(Ω) / ±20 %, ±30 %, Others (± %)				
Ш	E-4	Taper	Danga		A, B, C, D, G, BH, 15A, 1B, 15C, 10A, 4B, H, Others ()			
	E-5	1	Tracking Range		(dB) to (dB)				
	F 6	error	Specification Necessity/F		±(dB)				
	E-6 E-7	Tap Other require		OSILION	Necessary, Unnecessary / 40 %, 50 %, 60 %, Others ()			
	E-7	Other require	Size		ø14, ø16, ø18				
	M-1	Shape	Size	Units	ψ14, ψ10, ψ16 Single, 1-shaft 2 gang, 1-shaft 3 gang, 1-shaft 4 gang, 2-shaft 2 gang, 2-shaft 3 gang, 2-shaft 4 gang, 2-shaft 5 gang, 2-shaft 5 gang, 2-shaft 4 gang, 2-shaft 5 gang, 2-shaft 5 gang, 2-shaft 4 gang, 2-shaft 5 gang, 2-shaft 5 gang, 2-shaft 5 gang, 2-shaft 4 gang, 2-shaft 5 gang, 2-shaf	rana Othore ()			
	101-1	Shape	Structure	Shape*	Side Adjustment type, Top Adjustment type	gariy, Others ()			
	M-2	Shaft/Lever	Shape		F type (flat), S type (slotted), P type (18 teeth serrations)				
	101-2	Onany Level	Туре		Bushing, Soldering, Screw mounting, Others (١			
Ø			Турс		Screw dia.: M6, M7, M9, M10, 3/8" Screw pitch: 0.75 mm, 1.0 r	, nm 20NEE			
io	M-3	Mounting	(Type with b	oushina)	Bushing length: 5 mm, 7 mm, 10 mm, 15 mm, 17.5 mm, 20 mm,				
ens			(1) 0	, 40	25 mm, 27.5 mm, 30 mm, 32.5 mm, 35 mm, 37 mm, 39 mm, 4				
Shapes/Dimensions			Туре		Solder lug, PWB				
]/s;	M-4	Terminals	(PWB termi	nals)	Length from mounting surface: (mm), Layout pattern: ()			
аре	Additio	onal functions	1 .	· · · · · · · · · · · · · · · · · · ·		•			
Sh			Туре		Rotary, Pull-Push, Push-ON, Others ()			
			Function		SPST, SPDT, DPST, DPDT				
	M-5	Switch	Rating		Voltage: (V), Current: (A), Inrush current: (A)			
			Terminal typ	е	Solder lug, PWB (Height from PWB to shaft center:	mm)			
		D	Detents		1 point, 11 points, 41 points, Others (points)				
	M-6	Detents	Position		Midpoint, at 180 °, at 200 °, Others (at)			
rs.	L-1	Special requi	rements for e	ndurance					
Others									
0	L-2	Other question	onnaires						
		<u> </u>							

^{1.} When you specify custom types (custom-made), new tooling and jigs, and/or equipment may be required. It will be necessary to confirm your estimates of quantity and development schedule as accurately as possible. 2. Please inform us if you designate your own part number.

^{*} Previous notations for potentiometer shape "Stand-up type" (Shaft is parallel to PWB.) and "Lay-down type" (Shaft is vertical to PWB.) – have been changed in this edition to "Horizontal type" or "Side-adjust type" (Shaft or knob is parallel to PWB.) and "Vertical type" or "Top-adjust type" (Shaft or knob is vertical to PWB.).

■ ♠ Application Notes

When using our Rotary Potentiometers, please observe the following items to prevent dangerous accidents and deterioration of performance.

1. Prohibited items and notes in design stage

1. Use within the rating

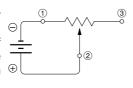
The Power Rating or Maximum Voltage varies with the size and type of a product. Also, the Power Rating must be reduced according to a Power Derating Curve. When a potentiometer is used with a current of less than a few micro-amperes, the influence of contact resistance increases because of the circuit diagram. Check the potentiometer under actual operating conditions.

2. Migration

Some potentiometers cannot be used with dc voltage. If a potentiometer is to be used with dc voltage, specify this when ordering, or check the availability referring to the "Product Specifications for Information."

3. Anodization

When a potentiometer is used with dc voltage under conditions of high humidity, \ominus the terminal at the side of the wiper (terminal 2) must be a positive electrode, as shown \oplus in the figure at right.



4. Recommended Circuit Configuration

It is recommended that you use the variable resistor for voltage adjustments. If it is used for current adjustments, then it may be influenced by the contact resistance between the resistor body and the slide, depending on the target circuit conditions. Conducting a test under actual operating conditions is highly recommended.

5. Soldering conditions

When performing solder dipping, check the soldering conditions according to the "Product Specifications for Information," because the conditions vary with the product.

Do not wash a potentiometer after solder dipping because flux may invade the potentiometer, resulting in contact failure. Avoid use of jumper cables near the potentiometers because flux may attach to them.

6. Shaft rotation wobble

If the shaft is long, the rotation wobble increases in proportion to its length. To secure the quality of a set, we recommend use of the types with a bushing.

7. Operating temperature conditions

Tactile feeling in operation is given serious consideration, and rotation torque increases under low temperatures (below -10 °C) depending on the product. If a potentiometer is expected to be used under low temperatures, specify this in advance.

2. Prohibited items and notes on handling

1. Terminal clinch

Bending and unbending of terminals after mounting to a PWB must be one cycle or less. More than one bending/unbending cycle may result in damage.

2. Stress on the terminals

Do not apply excessive stress to terminals during handling. Set soldering conditions with consideration given to stress on the terminals.

3. Chemical resistance

Before using a potentiometer with an insulated shaft, be sure to check the reactivity of the shaft with any chemicals to be used.

4. Potentiometers with a push lock type switch Handle the potentiometer with the shaft locked. If a lateral pressure above 0.4 N·m (4 kg·cm) is applied to the shaft when it is unlocked, the shaft may be bent.

5. Storage conditions

Do not store the potentiometers under high temperatures and/or high humidity, or in a location where corrosive gas may be generated. Store the potentiometers at room temperature and room humidity in a packed condition. Use them within a maximum of 6 months. Check the date of manufacture on the package box and apply the "first-in-first-out" rule.

If unpacked potentiometers must be stored as inventory, store them in a polyethylene bag to keep out air.

3. Prohibited items on fire and smoking

- Absolutely avoid use of a potentiometer beyond its rated range because doing so may cause a fire. If misuse or abnormal use may result under conditions in which the potentiometer is used out of its rated range, take proper measures such as current interruption using a protective circuit.
- The grade of nonflammability for resin used in potentiometers 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.

4. For use in equipment for which safety is requested

Although care is taken to ensure potentiometer quality, inferior characteristics, short circuits, and open circuits 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 potentiometer in advance and perform virtually fail-safe design to ensure maximum safety by:

- 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 potentiometer does not cause a dangerous situation.

For notes on use, the following sources were referred:

Technical report EIAJ RCR-2191A "Guideline of Notabilia for potentiometers for Use in Electronic Equipment" issued by the Japan Electronics and Information Technology Industries Association (Issued by March 2002)

Refer to this Technical Report for additional details.

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

■ Common Specifications

Electrical Specifications

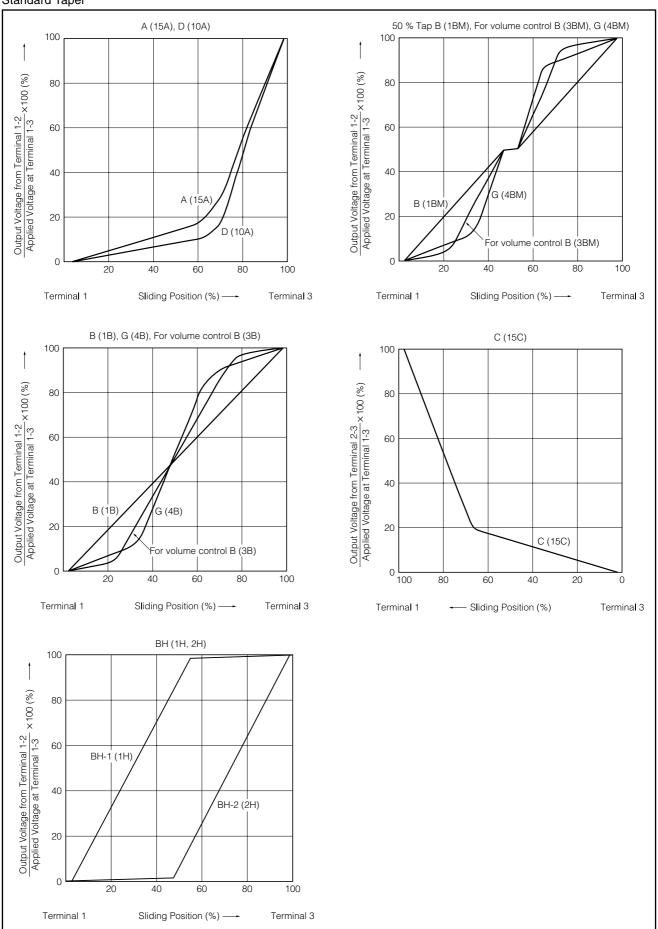
1. Taper

Measurin	g Method	Out-put Voltage between Terminal 1 & 2 Operating Voltage between Terminal 1 & 3 Operating Voltage between Terminal 1 & 3 Out-put Voltage between Terminal 2 & 3 Operating Voltage between Terminal 1 & 3					
Та	per	Effective Ro	tation Angle				
EIAJ	Panasonic	sonic 50 % 50 %*					
15A	А	10 to 25	_				
1B	В	40 to 60	_				
15C	С	_	10 to 25				
10A	D	6 to 15	_				
4B	G	40 to 60	_				
Н	ВН	Linear	Linear taper				

Notes:

 ^{*} Angle from terminal 3 side.
 () is per JIS (Japanese Industrial Standard). Unless otherwise specified, we consider it at 50 % rotation, however, upon request above JIS can be applied.
 [] is only reference value.

Standard Taper



2. Tracking

The tracking should be calculated as follows.

Tracking (dB)=20 log (VR₂/VR₁)

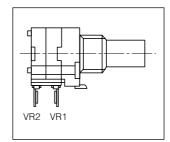
Where:

 $VR_1 {=}\, Voltage \ between \ terminal \ 1 \ \& \ 2 \ of \ section \ R_1$

VR₂=Voltage between terminal 1 & 2 of section R₂

Test voltage between terminal 1 & 3

shall be 2 V to 5 V (1000±200 Hz).



In case of a potentiometer with a tap, the measurement should be made by connecting a fixed resistor between tap terminal and terminal 1. Unless otherwise specified, tolerance of the fixed resistor shall be ± 10 %. If your requirements different, inform us of your specifications.

Mechanical Specifications

1. Shaft Angle

Shaft angle against mounting surface shall be 90 °. Shaft bend and shaft wobble shall be axL/30 (mm) max. when 50 mN·m moment applied to the measuring point of shaft.

Where:

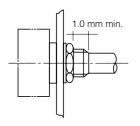
a= Constant Value as shown below

L= Distance between mounting surface and measuring point on the shaft

Size	Shaft material		Shape & Type	Shaft wobble (a)	Bending moment
	Metal shaft	Without switch	1 aboft tupo	0.3 mm	
14 mm square		With push switch	1-shaft type	0.5 mm	50 mN·m
18 mm square (Common)	Insulated	With bushing	Single	0.5 mm	30 11110-111
	shaft		Snap-in	0.7 mm	

2. Nut Tightening Torque

When nut is tightened as specified below, unevenness of shaft rotation shall not occur.



Recommended chassis piercing plan

Bushing Dia., etc.	Tightening Strength
M7 to M9	1.0 N·m

Mounted State

φD +0.4

■ Minimum Quantity/Packing Unit

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

Type, Series	Part No.	Packaging	Quantity/ Carton	Minimum Quantity/ Packing Unit	Notes
18 mm Square Rotary Potentiometers (High Rotational Torque)	EVCX	Tray Pack	800 pcs.	80 pcs.	
39/20 mm Center Space Rotary Potentiometers	EWVYE EWVYK EWVYM	Tray Pack	250 pcs.	50 pcs.	
44/25 mm Center Space Rotary Potentiometers	EWVYG EWVYH EWVYJ EWVYL	Tray Pack	250 pcs.	50 pcs.	

lpha: With bushing : L=L+7.5 mm

18 mm Square Rotary Potentiometers (High Rotational Torque)

Type: **EVCX**





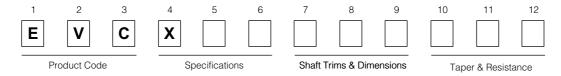
■ Features

- External dimensions: 18.0 mm×18.0 mm, Height 8.0 mm
- Output accuracy (±3 %)
- Potentiometers and encoders available in the same shape and dimensions

■ Recommended Applications

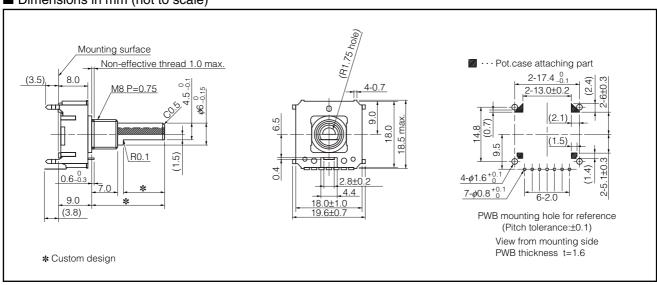
- Function switching/adjusting for control panels of car air conditioners
- Signal input for monitors, audio/visual equipment

■ Explanation of Part Numbers



■ Specifications

Type	Top Adjustment type, with or without bushing							
	Rotation Angle	280 °						
Mechanical	Rotation Torque	20 mN·m to 100 mN·m						
	Detent Pitch	10 ° to 30 °						
	Shaft Stopper Strength	0.8 N·m min.						
	Nominal Total Resistance	5 k Ω to 100 k Ω (Tolerance ±20 %)						
	Power Rating	0.05 W						
Electrical	Potentiometers Type	Single, Dual						
Electrical	Insulation Resistance	100 M Ω min. at 250 Vdc						
	Dielectric Withstand Voltage	300 Vac for 1 minute						
	Noise Level	100 mV max.						
Endurance	Operating Life	15000 cycles min.						
Minimum Quantity/ F	Packing Unit	80 pcs. (Tray Pack)						
Quantity/ Carton		800 pcs.						



39/20 mm Center Space Rotary Potentiometers

Type: **EWVYE/EWVYK/EWVYM**



- Features
- Outer diameter: 39 mm, Center space diameter: 20 mm
- Can have a built-in LED
- Smooth operation feel

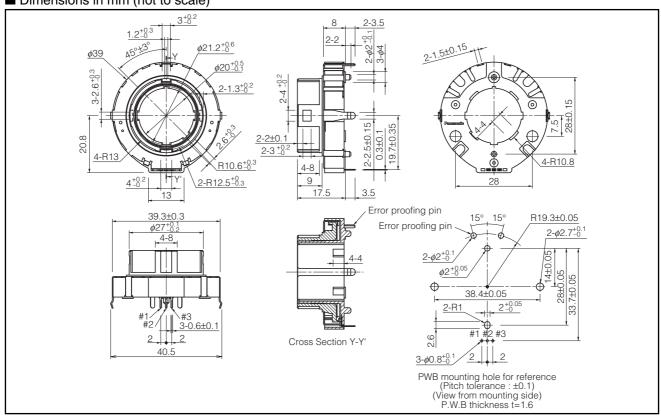
- Recommended Applications
- Temperature/blower control or mode switching for car air conditioners
- Volume control for car audio equipment

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	W	V	Y								
Pı	roduct Co	de		Type			Design N	O.	Tap	er & Resis	stance

■ Specifications

- Specification	110						
Mechanical	Rotation Angle	300 °					
Mechanical	Rotation Torque (Detents Torque)	15 mN·m to 50 mN·m					
	Nominal Total Resistance	10 kΩ (Tolerance ±20 %)					
	Taper	В					
	Power Rating	0.1 W					
Electrical	Residual Resistance	100 Ω max.					
Electrical	Insulation Resistance	50 M Ω min. (250 Vdc)					
	Linearity	±3 % max.					
	Dielectric Withstand Voltage	250 Vac for 1 minute					
	Noise Level	47 mV max.					
Endurance	Operating Life	30000 cycles min.					
Minimum Qua	antity/Packing Unit	50 pcs. (Tray Pack)					
Quantity/Carte	on	250 pcs.					



44/25 mm Center Space Rotary Potentiometers

Type: EWVYG/EWVYH/EWVYJ/EWVYL



- Features
- Outer diameter: 44 mm, Center space diameter: 25 mm
- Can have a built-in LED
- Smooth operation feel

■ Recommended Applications

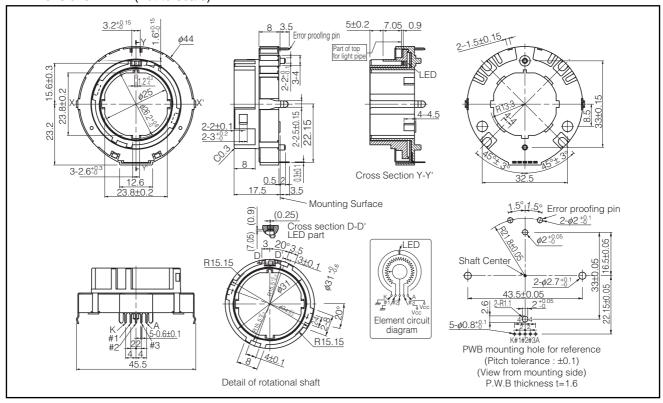
- Temperature/blower control or mode switching for car air conditioners
- Volume control for car audio equipment

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	W	V	Y								
Pr	oduct Co	de	-	Туре			Design N	O.	Tape	er & Resis	stance

■ Specifications

•	Rotation Angle	300 °					
Mechanical	Rotation Torque (Detents Torque)	15 mN·m to 60 mN·m					
	Nominal Total Resistance	10 kΩ (Tolerance ±20 %)					
	Taper	В					
	Power Rating	0.1 W					
Electrical	Residual Resistance	100 Ω max.					
Liectrical	Insulation Resistance	50 M Ω min. (250 Vdc)					
	Linearity	±3 % max.					
	Dielectric Withstand Voltage	250 Vac for 1 minute					
	Noise Level	47 mV max.					
Endurance	Operating Life	30000 cycles min.					
Minimum Quant	tity/Packing Unit	50 pcs. (Tray Pack)					
Quantity/Carton		250 pcs.					



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■ Quick Selection Guide

Type, Series	Appearance	Part Numbers	Country of origin	Nominal Total Resistance	Taper	Rotation Angle	Page
6FF Square		EVNCYA	Malaysia	1 kΩ 2 kΩ 5 kΩ 10 kΩ 20 kΩ	D	210°	EV20
6FE Square		EVND	20 kΩ 50 kΩ 100 kΩ 200 kΩ 500 kΩ	100 kΩ 200 kΩ 500 kΩ	В	210	EV22

Country of origin : As of April 2013

■ ⚠ Application Notes

When using our Trimmer Potentiometers, please observe the following cautionary items to prevent dangerous accidents and deterioration of device performance.

1. Prohibited items and notes in design stage

1. Use within the rating

The affect of the ambient temperature on trimmer potentiometers cannot be ignored. When using under a high temperature, reduce the load according to the Power Derating Curve.

Handling trimmer potentiometers
 Do not apply excessive stress to a trimmer potentiometer after mounting to a PWB.

3. Anodization

When dc is applied to a wiper (terminal 2), anodization may occur at the contact part of the wiper with the resistive \oplus element, resulting in abnormal resistance variation. When dc is used, to prevent anodization, the resistive element should be connected to the negative side and the wiper should be connected to the positive side, as shown in the figure at right.

4. Recommended Circuit Configuration
It is recommended that you use the variable resistor
for voltage adjustments. If it is used for current
adjustments, then it may be influenced by the
contact resistance between the resistor body and
the slide, depending on the target circuit conditions.
Conducting a test under actual operating conditions
is highly recommended.

- 5. Soldering conditions
- Perform soldering for a short time on a trimmer potentiometer. Extended soldering time, particularly under high temperature, may result in deterioration of the device.
 - The soldering temperature must be below 260°C, and soldering time within 5 seconds, and the load on a terminal must be less than 5 N.
- 2) When performing solder dipping of PWB piercing type trimmer potentiometers, dry the flux sufficiently before solder dipping. (If the flux is not dried, it may contaminate the trimmer and affect characteristics.)
- 3) Do not wash a trimmer potentiometer after solder dipping because flux may invade it, resulting in contact failure. Avoid a placement of a jumper cable where flux remains near the main body of a trimmer potentiometer.

2. Cautionary notes regarding handling

1. Storage

Do not store trimmer potentiometers under high temperatures and /or conditions of high humidity, or in a location where corrosive gas may be generated. In particular, when storing for long periods, do not unpack the trimmer potentiometers Store in its original packaging.

2. Operational direction

Since the stopper strength at the rear side is 35 mN·m, which is smaller than at the front side, operation for adjustment from the front side is recommended.

- 3. Operating temperature range
 Use in the range of -20 °C to +70 °C.
- 4. Storage temperature

 Store in the range of -40 °C to +75 °C.

3. Prohibited items on fire and smoking

- Absolutely avoid use of a trimmer potentiometer beyond its rated range because doing so may cause a fire. If improperly used, the trimmer potentiometer may be operated 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 trimmer potentiometers 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

4. For use in equipment for which safety is requested

Although care is taken to ensure trimmer potentiometer quality, short and open circuit are some problems that may occur. Design a circuit which places maximum emphasis on safety, review the affect of any single fault of a trimmer potentiometer 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 trimmer potentiometer does not cause a dangerous situation.

For notes on use, the following sources were referred:

Technical report EIAJ RCR-2191A "Guideline of Notabilia for potentiometers for Use in Electronic Equipment" issued by the Japan Electronics and Information Technology Industries Association

(Issued by March 2002)

Refer to this Technical Report for additional details.

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

■ Common Specifications

Electrical Specifications

1. Nominal Total Resistance and Tolerance

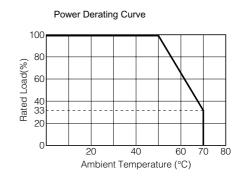
Туре	Nominal Total Resistance										Tolerance
туре	1 k	2 k	5 k	10 k	20 k	50 k	100 k	200 k	500 k	1 M	(%)
6 mm Square Carbon Composition	0	0	0	0	0	0	0	0	0	0	±30

2. Power Rating and Voltage Rating

2-1. Power Rating

When the ambient temperature is within the following parameter (see table below), the maximum operating voltage which can be applied between terminal 1 and 3 is as follows. For potentiometers operated in ambient temperatures above 50 °C, Power Rating shall be derated in accordance with the figure below.

Туре	Power Rating (W)	Max. Operating Voltage (V)	Ambient Temperature (°C)	
6 mm Square Carbon Composition	0.1	R ≤ 500 kΩ: 50, R > 500 kΩ: 25	50 max.	



2-2. Voltage Rating

 $E=\sqrt{P \cdot R}$ E=Voltage rating (V)

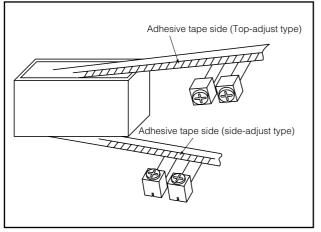
P=Power rating (W)

R=Nominal total resistance (Ω)

The voltage rating should be maximum operating voltage when E shall exceed maximum operating voltage shown in the table.

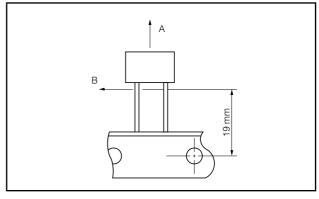
■ Packaging Specifications for Radial Taping

Drawing-out of taped products



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

Pull-strength of taped products



- Taped products shall not be fully drawn-out from the tape when pulling off in direction A at 5.0 N max.
- Taped products shall not be drawn-out from the tape when pulling off 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.

Type, Series	Part No.	Packaging	Quantity/ Carton	Minimum Quantity/ Packing Unit	Notes
6FF Square Trimmer Potentiometers Type: EVNCYA	EVNCYA	Radial Taping (Reel Pack)	10000 pcs.	1000 pcs.	
6FE Square Trimmer Potentiometers Type: EVND	EVND2A EVND8A	Polyethylene Bag (Bulk)	5000 pcs.	500 pcs.	
	EVNDJA EVNDXA EVNDCA	Radial Taping (Reel Pack)	10000 pcs.	1000 pcs.	

6FF Square Trimmer Potentiometers

Type: **EVNCYA**

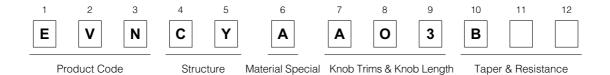
- Features
- Box-shaped, automatic mounting
- Radial taping supported
- High reliability (dustproof structure)



■ Recommended Applications

Audio Visual Equipment, Home Electrical Appliances

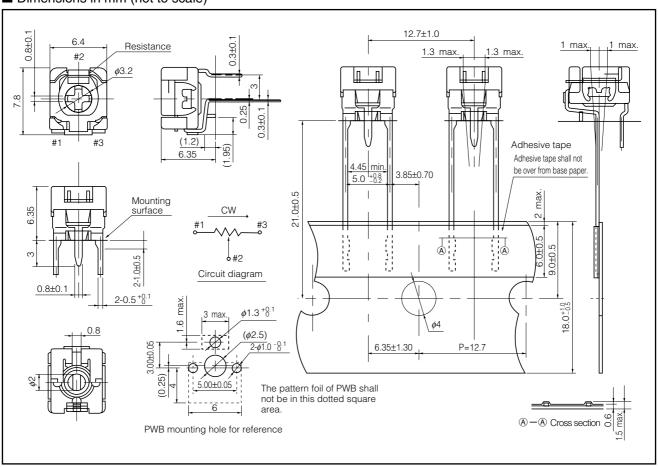
■ Explanation of Part Numbers



■ Specifications

Electrical Specifications	Nominal Total Resistance	1 k Ω , 2 k Ω , 5 k Ω , 10 k Ω , 20 k Ω , 50 k Ω , 100 k Ω , 200 k Ω , 500 k Ω , 1 M Ω			
	Taper	В			
	Rating	R≦500 kΩ : 0.1 W 50 V (50 °C) R>500 kΩ : 0.1 W 25 V (50 °C)			
	Residual Resistance	1 k Ω \leq R \leq 2 k Ω : 60 Ω max. 2 k Ω < R \leq 1 M Ω : 3 % max., or 200 Ω max. whichever smaller			
Mechanical Specifications	Rotation Angle	210 °±20 °			
	Rotation Torque	2 mN·m to 25 mN·m			
	Stopper Strength	Surface : 50 mN·m, reverse side : 35 mN·m			
Endurance E	Operating Life	100 cycles			
	Resistance to Soldering Heat	240 °C to 280 °C : 5 s max., 280 °C to 300 °C : 3 s max.			
	Resistance to Damp	After 350 hours : R≦100 kΩ+15 % −0 %, : 100 kΩ <r≦1 %="" %<="" mω+20="" td="" −0=""></r≦1>			
	Endurance under Damp	After 350 hours:1.5 h ON 0.5 h OFF :R≦100 kΩ±15 %, :100 kΩ <r≦1 %<="" mω±20="" td=""></r≦1>			
	Endurance under High Temperature	70 °C±3 °C After 250 hours +5 %, –15 %			
Minimum Quantity/Packing Unit		1000 pcs. Radial Taping (Reel Pack)			
Quantity/Carton		10000 pcs.			

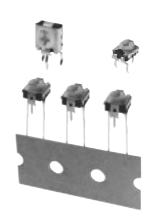
Note: R=Nominal Total Resistance



6FE Square Trimmer Potentiometers

Type: **EVND**

- Features
- Top-adjust or side-adjust available
- Radial taping supported
- High reliability (dustproof construction)



■ Recommended Applications

Audio Visual Equipment, Home Electrical Appliances

■ Explanation of Part Numbers

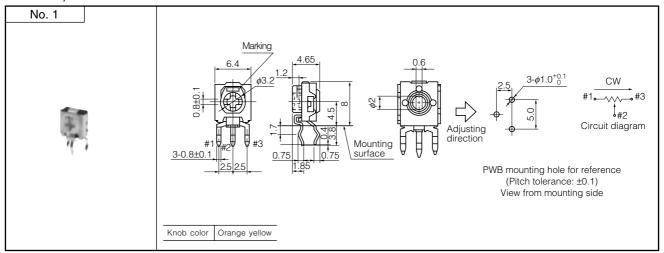
1	2	3	4	5	6	7	8	9	10	11	12
E	V	N	D			Α	0	3	В		
	Product Cod	e	Struc	ture	Material Special	Knob T	rims & Kno	ob Lenath	Tape	r & Resist	ance

■ Specifications

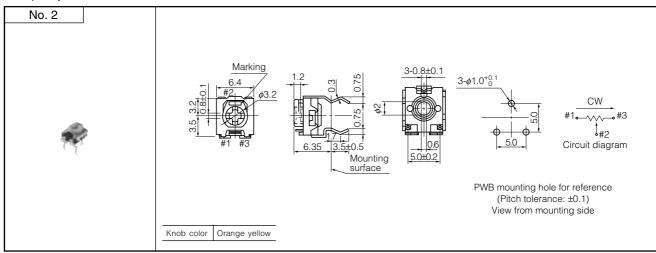
	Nominal Total Resistance	1 k Ω , 2 k Ω , 5 k Ω , 10 k Ω , 20 k Ω , 50 k Ω , 100 k Ω , 200 k Ω , 500 k Ω , 1 M Ω
	Taper	В
Electrical Specifications	Rating	R≦500 kΩ : 0.1 W 50 V (50 °C) R>500 kΩ : 0.1 W 25 V (50 °C)
	Residual Resistance	1 k Ω \leq R \leq 2 k Ω : 60 Ω max. 2 k Ω < R \leq 1 M Ω : 3 % max., or 200 Ω max. whichever smaller
	Rotation Angle	210 °±20 °
Mechanical Specifications	Rotation Torque	2 mN·m to 25 mN·m
opeomeations	Stopper Strength	Surface : 75 mN·m, reverse side : 35 mN·m
	Operating Life	100 cycles
	Resistance to Soldering Heat	240 °C to 280 °C : 5 s max., 280 °C to 300 °C : 3 s max.
Findurana	Resistance to Damp	After 350 hours : R≦100 kΩ+15 % −0 %, : 100 kΩ <r≦1 %="" %<="" mω+20="" td="" −0=""></r≦1>
Endurance	Endurance under Damp	After 350 hours:1.5 h ON 0.5 h OFF :R≦100 kΩ±15 %, :100 kΩ <r≦1 %<="" mω±20="" td=""></r≦1>
	Endurance under High Temperature	70 °C±3 °C After 250 hours +5 %, -15 %
Minimum Quant	ity/Packing Unit	EVND2A, EVND8A: 500 pcs. Polyethylene Bag (Bulk) EVNDJA, EVNDXA, EVNDCA: 1000 pcs. Radial Taping (Reel Pack)
Quantity/Carton		EVND2A, EVND8A: 5000 pcs. EVNDJA, EVNDXA, EVNDCA: 10000 pcs.

Note: R=Nominal Total Resistance

- Dimensions in mm (not to scale)
- Side-adjust
 EVND2A

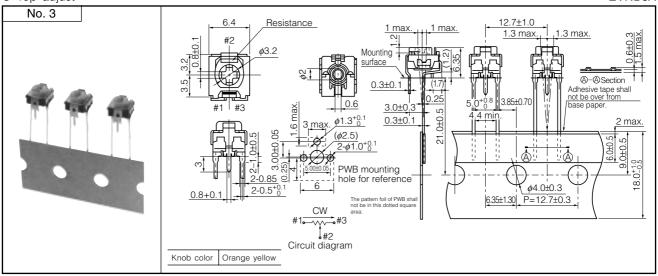


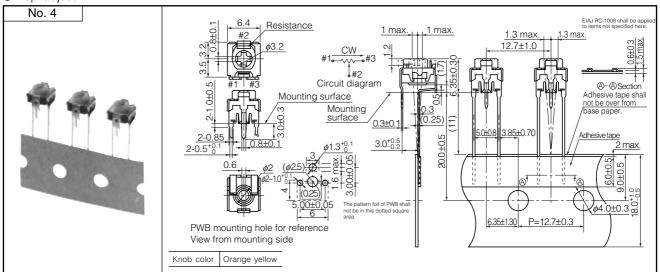
● Top-adjust EVND8A



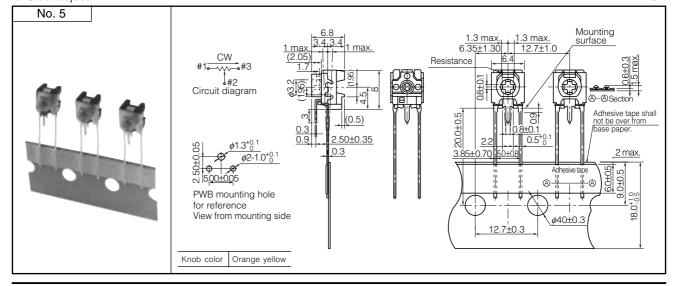
■ Radial Taping Products

● Top-adjust EVNDJA





Side-adjust
 EVNDCA



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■Linear Position Sensors (EVAW7)·····	· EV32
■15 mm Position Sensors (EVWBE)······	· EV34

■ Quick Selection Guide

Type, Series	Appearance	Part Numbers	Country of origin	Total Resistance	Linearity	Life	Page
10 mm GS Sensors		EVWAE EVWAD	Japan	5 kΩ ±30 % 10 kΩ ±30 %	±2 %	1000000 cycles	EV30
Linear Position Sensors		EVAW7	Malaysia	4.7 kΩ ±30 % 10 kΩ ±30 %	±1 % ±2 %	10000 cycles	EV32
15 mm Position Sensors	2	EVWBE	Vietnam	10.5 kΩ ±30 % 21 kΩ ±30 %	±2 %	100000 cycles	EV34

Country of origin: As of April 2013

■ Checklist Before Inquiry

When specifying Position Sensors, please take advantage of our standard products for better price and delivery. Please provide the following items before ordering.

				Checklist			
	C-1	Inquiry purpos	е	New use, Modification, Others	()		
			Current supplier				
	C-2	Modification	Current part No.				
_			Purpose				
Common			Equipment				
mo;	C-3	Application	Environment	Indoor/Outdoor use, Stationary/Po	rtable set, High humidity, SO2, NaCl		
O			Temperature	(°C)	to(°C)		
	C-4	Mounting	Method	Manual,	Automatic		
	C-5	Soldering	Method	Manual soldering, Flow soldering			
			Conditions	Temp. (°C), Time (s), Dipping times()		
	E-1	Conditions	Current	ac	, dc		
	E-2	Resistance	Total value/Torelance	(Ω) / ±20 %, ±30 %, Others (± %)			
Electrical			Taper		В		
ec	E-3	Taper	Linearity	1 %, 0.5 %, Ot	hers (± %)		
ш			Hysteresis	(%)		
	E-4	Other requirem	nents				
"	M-1	Shape	Туре	Rotary	Slide		
ss/ ions	IVI-I	Shape	Size	10.0 mm, 15 mm	8.0 mm, 9.0 mm		
Shapes/ imensior	M-2	Shaft	Shape				
Shapes/ Dimensions	M-3	Mounting	Туре	PWB Soldering, Screw			
	M-4	Terminals	Туре	PI	WB		
Others	L-1	Special require	ements for endurance				
g	L-2	Other question	naires				

Notes:

^{1.} When you specify custom types (custom-made), new tooling and jigs, and/or equipment may be required. It will be necessary to confirm your estimates of quantity and development schedule as accurately as possible.

^{2.} Please inform us if you designate your own part number.

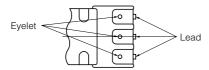
^{*} Previous notations for potentiometer shape "Stand-up type" (Shaft is parallel to PWB.) and "Lay-down type" (Shaft is vertical to PWB.) – have been changed in this edition to "Horizontal type" or "Side-adjust type" (Shaft or knob is parallel to PWB.) and "Vertical type" or "Top-adjust type" (Shaft or knob is vertical to PWB.).

Panasonic Position Sensors

When using our Position Sensors, please observe the following cautionary items to prevent dangerous accidents and deterioration of device performance.

1. Prohibited items and notes in design stage

- 1. Soldering conditions
- 1) Soldering must be performed to the lead of the terminals. Do not solder on the center (eyelet part) of the terminals.



- 2) Perform soldering only one time. When a product for which soldering has been completed is removed from PWB by sodering iron, etc., the product shall not be used again.
- 3) Do not wash a position sensor after soldering because flux may invade the position sensor, resulting in contact failure, Avoid use of jumper cables near the position sensors because flux may get attached to them.
- 4) Any soldering iron used must be 20 W to 30 W, the temperature must be less than 300 °C, and within 3 seconds.

2. Prohibited items and notes on handling

- 1. Operating temperature range
 Use in the range of -10 °C to +70 °C
- 2. Storage temperature

 Store in the range of -40 °C to +70 °C
- 3. Storage conditions

Do not store the position sensors under high temperatures and/or high humidity, or in a location where corrosive gas may be present. Store the mounted sensors at a room temperature and humidity in its original packaging. Use them within 6 months. Check the date of manufacture on the package box and apply the "first-in-first-out" rule. If unpacked position sensors must be stored as inventory, store them in a polyethylene bag to keep out air.

3. Cautionary notes regarding fire and smoking

- Absolutely avoid use of a position sensor beyond its rated range, it could cause a fire and abnormality. Take proper measures such as current interruption using a protective circuit.
- 2. The grade of nonflammability for resin used in position sensors 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.

4. For use in equipment requiring high degrees of safety

Although care is taken to ensure position sensor quality, short circuits, or open circuits are some problems that may occur. To design a circuit which places maximum emphasis on safety, review the affect of any single fault of a position sensor 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 position sensor does not cause a dangerous situation.
- 5. For actual use, be sure to refer to "Product Specifications for additional information."

■ Minimum Quantity/Packing Unit

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

Type, Series	Part No.	Packaging	Quantity/ Carton	Minimum Quantity/ Packing Unit	Notes
10 mm GS Sensors	EVWAE EVWAD	Embossed Taping (Reel Pack)	6000 pcs.	1500 pcs.	
Linear Position Sensors	EVAW7		2000 pcs. 3000 pcs.	200 pcs. 300 pcs.	(8 mm Type) (9 mm Type)
15 mm Position Sensors	EVWBE	Tray Pack	500 pcs.	50 pcs.	

10 mm GS Sensors

Type: **EVWAE/EVWAD**

Low profile, long life sensor, which is suitable for detecting the angles of rotating axes.



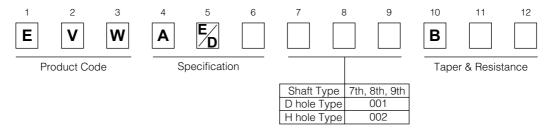
■ Features

- Low profile (H=2.2 mm), Shaft hole diameters of up to 4 mm are available.
- Long operation life: 1 million operation cycles.
- A wide electrical output angle of a maximum 343°, ready for SMDs

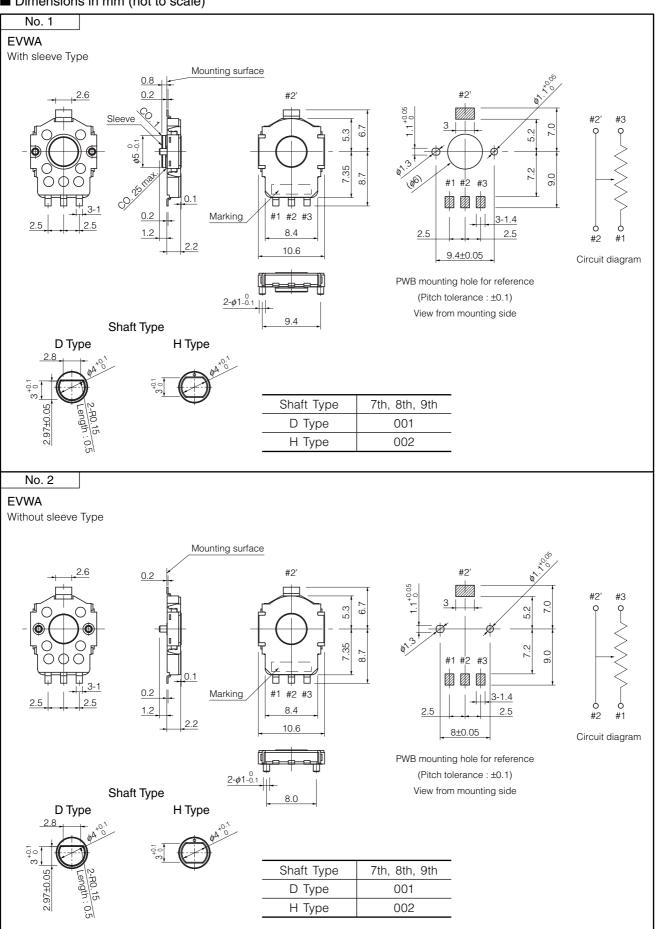
■ Recommended Applications

- Detection of robot joint angles
- Detection of air conditioner damper angles
- Detection of various control unit angles

■ Explanation of Part Numbers



Maglagiagi	Rating	0.05 W, 5V
Mechanical	Operating Force	3 mN·m max.
Electrical	Total Resistance	5 kΩ±30 %, 10 kΩ±30 %
Electrical	Linearity	±2 % max.
Endurance	Operating Life	1000000 cycles min. (operation Angle ±30 °)
Minimum Quantity/P	acking Unit	1500 pcs. Embossed Taping (Reel Pack)
Quantity/Carton		6000 pcs.



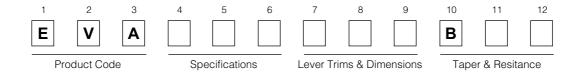
Linear Position Sensors (for reference only)

Type: **EVAW7**

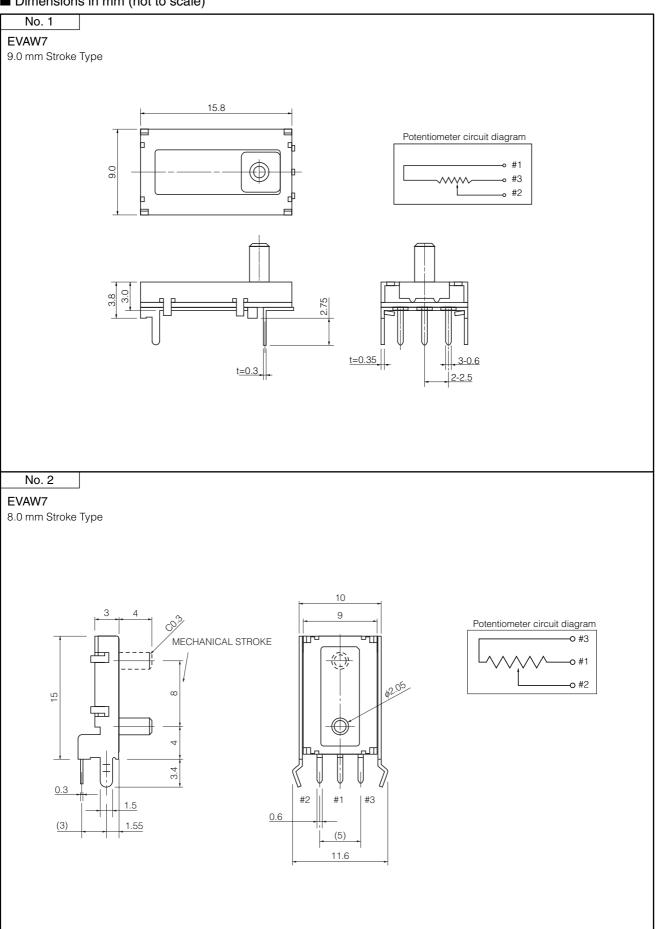


- Features
- A wide variety of operation strokes
- Long life and high resolution
- Recommended Applications
- Car headlight angle detection sensor

■ Explanation Part Numbers



		EV	AW7
	Stroke	9.0 mm±0.5 mm	8.0 mm±0.5 mm
Mechanical	Operating Force	2 N max.	1 N max.
	Linearity	±2 %	±1 %
Electrical	Total Resistance	10 kΩ±30 %	4.7 kΩ±30 %
Electrical	Voltage Rating	5 Vdc max.	12 Vdc max.
	Taper	E	3
Endurance	Operating Life	10000 cycles min.	10000 cycles min.
Minimum Quantity/Pa	acking Unit	300 pcs. (Tray Pack)	200 pcs. (Tray Pack)
Quantity/Carton		3000 pcs.	2000 pcs.



15 mm Position Sensors (for reference only)

Type: **EVWBE**

■ Features

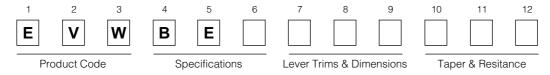
- Simple dustproof structure achieved by insert molding of the resistor element
- Connector terminals
- Long life and high resolution

■ Recommended Applications

 Temperature and air flow and mode control for automotive climate control systems

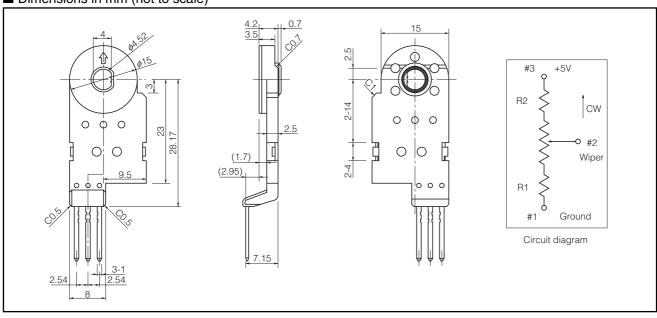


■ Explanation Part Numbers



■ Specifications

		EVWBE1	EVWBE2	EVWBE3	
Mechanical	Rotation Angle		Endless		
Mechanica	Rotation Torque		15 m·Nm max.		
	Voltage Rating		5 Vdc		
	Total Resistance	10.5 kΩ±30 %	10.5 kΩ±30 %	21 kΩ±30 %	
Electrical	Rotation Angle	100 °	150 °	250 °	
	Taper		В		
	Linearity		±2 % max.		
Endurance	Operating Life		100000 cycles min.		
Minimum Qua	ntity/Packing Unit		50 pcs. (Tray	Pack)	
Quantity/Carto	on		B ±2 % max.		



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■Edge Drive Jog Encoders (EVQWK)······	EV44
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■12 mm Square GS Encoders with Push-on Switch (EVEJB)······	EV52
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■18 mm Square Encoders (High Rotational Torque / EVQW)····································	EV56
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■38/25 mm Center Space Encoders (EVQVN)······	EV60
■60/40 mm Center Space Encoders (EVQV0)······	EV61

Panasonic Encoders

■ Quick Selection Guide

Type, Series	Appearance	Part Numbers	Country of origin	Resolution	Detents	Operating Life	Page
10 mm Square GS		EVQVX	China	12 Pulses/360 °	24 Points	200000 Cycles	EV40
10 mm Square SMD		EVQVV	Japan	3 Pulses/360 °	Without detents	70000 Cycles	EV42
Edge Drive Jog	-	EVQWK	Japan	15 Pulses/360 °	15 Points	100000 Cycles	EV44
11 mm Square GS	111	EVER EVEU EVEV EVEY	Japan Vietnam	8, 12, 15, 16 Pulses/360 °	16 Points, 24 Points, 30 Points, 32 Points	30000 Cycles	EV46
12 mm Square GS	444	EVEG EVEH EVEK EVEL	Malaysia	12, 20, 24 Pulses/360 °	12 Points, 20 Points, 24 Points, Without detents	30000 Cycles (Heavy-rotation torque 15000 cycles)	EV49
12 mm square GS (with Push-on Switch)	* *	EVEJB	Vietnam	20 Pulses/360 °	20 Points	30000 Cycles	EV52
16 mm Square		EVEP EVEQ	Japan Vietnam	8, 16 Pulses/360 °	16 Points, 32 Points	1000000 Cycles 30000 Cycles	EV54
18 mm square (High Rotational Torque)		EVQW	Japan	Absolute 5 bit	Custom	15000 Cycles	EV56
20/12 mm Center Space		EVQV6	Vietnam	9 Pulses/360 °	18 Points	30000 Cycles	EV57
27/17 mm Center Space	9	EVQWF EVQVP	Japan	9, 15 Pulses/360 °	18 Points, 30 Points	30000 Cycles	EV58
27/18 mm Center Space		EVQV5	Vietnam	9, 15 Pulses/360 °	18 Points, 30 Points	30000 Cycles	EV59
38/25 mm Center Space		EVQVN	Malaysia	15 Pulses/360 °	30 Points	30000 Cycles	EV60
60/40 mm Center Space		EVQV0	Japan	15 Pulses/360 °	30 Points	30000 Cycles	EV61

Country of origin: As of April 2013

■ Checklist Before Inquiry

When specifying Encoders, please take advantage of our standard products for better price and delivery. Please provide the following items before ordering.

				Checklist	
	C-1	Inquiry purpos	е	New use, Modification, Others()
			Current supplier		
	C-2	Modification	Current Part No.		
			Purpose		
			Equipment		
_	C-3	Application	Environment	Indoor/Outdoor use, Stationary/Portable set, High humidity, So	O2, Nacl
Common	0-3	Application	Temperature	(°C) to (°C)	
mo			Operation	General use, Edge drive, Low torque, High torque	
O	C-4	Adjustmemt	Method	Manual, Automatic	
	C-5	Mounting	Method	Manual, Automatic	
	U-5	Mounting	Mounter	Panasert(Model:), Other mounter(Maker/Model:),Parts feed	er Magazine
			Method	Manual soldering, Flow soldering, Reflow soldering	
	C-6	Soldering	Conditions	Temp. (°C), Time (s), Dipping times()
			Washing	Machine, Soaking, Applied solvent()
	E-1	Application	Circuit	Volume, Tone, Balance, Circuit regulation, Others()
=	E-2	Conditions	Rating	Max. operating power(W), Operating voltage(V)
rica			Applied current	Small current use, Applying current(mA)	
Electrical	E-3	Encoders	Output Signal	2 phase system(Phase A or B), Others()
ш	E-3	Encoders	Resolution	8, 9, 12, 15, 16, 20, 24, Pulse, Others/360 °	
	E-4	Other requirements			
		Shape	Туре	Rotary, Others()	
	M-1		Size	10.0 mm, 11.0 mm, 12.0 mm, 16.0 mm, 18 mm, Others()
			Shape*	Side Adjustment, Top Adjustment	
	M-2	Shaft	Shape	Metal Shaft(F type, S type, P type), Insulated Shaft(F type, S	Stype)
Suc	M-3	Mounting	Туре	Bushing, Soldering	
nsic	101-3	Mounting	(Type with bushing)	Screw dia.: M7, M9, Screw pitch: 0.75 mm, Bushing length: 5.0 mm, 7.0 r	nm, 10.0 mm
ime	M-4	Terminals	Туре	Solder lug, PWB	
g/D	101-4	Terrilliais	(PWB terminals)	Length from mounting surface(mm), Layout pattern()
Shapes/Dimensions	M-5	Additional fund	ction		
S			Туре	Push-On, Others()	
	M-6	Switch	Poles & Throws	1 pole 1 throw	
	IVI-0	SWILCH	Rating	Voltage:(V), Current:(A), Inrush current:(A)
			Terminal Type	PWB terminal, Others()	
	M-7	Detents		16 points, 18 points, 20 points, 24 points, 30 points, 32 points, Others(point)
ers	L-1	Special require	ements for endurance		
Others	L-2	Other question	nnaires		
		1			

Notes:

^{1.} When you specify custom types (custom-made), new tooling and jigs, and/or equipment may be required. It will be necessary to confirm your estimates of quantity and development schedule as accurately as possible.

^{2.} Please inform us if you designate your own part number.

^{*} Previous notations for potentiometer shape "Stand-up type" (Shaft is parallel to PWB.) and "Lay-down type" (Shaft is vertical to PWB.) – have been changed in this edition to "Horizontal type" or "Side-adjust type" (Shaft or knob is parallel to PWB.) and "Vertical type" or "Top-adjust type" (Shaft or knob is vertical to PWB.).

Panasonic Encoders

When using our Encoders, please observe the following cautionary items to prevent dangerous accidents and deterioration of performance.

1. Prohibited items and notes in design stage

1. Soldering conditions

When performing solder dipping, check the soldering conditions according to the Individual "Product Specifications," because the conditions vary from product to product.

Do not wash an encoder after solder dipping because flux may invade the encoder, resulting in contact failure. Avoid use of jumper cables near the encoders because flux may get to them.

2. Shaft rotation wobble

If the shaft is long, the rotation wobble increases in proportion to its length. To secure the quality of a set, we recommend use of the types with a bushing.

3. Operating temperature conditions

Tactile feeling in operation is given serious consideration, and rotation torque increases under low temperatures (below -10 °C) depending on the product. If a encoder is expected to be used under low temperatures, specify this in advance.

2. Prohibited items and notes on handling

1. Chemical resistance

Before using a potentiometer with an insulated shaft, be sure to check the reactivity of the shaft with any chemicals to be used.

2. Storage conditions

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

3. Prohibited items on fire and smoking

1. Absolutely avoid use of a encoder beyond its rated range because it may cause a fire.

If misuse or abnormal use may result in conditions in which the encoder is used out of its rated range, take proper measures such as current interruption using a protective circuit.

 The grade of nonflammability for resin used in encoders 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

4. For use in equipment for which safety is requested

Although care is taken to ensure encoder quality, inferior characteristics, short circuits, and open circuits 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 encoder 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 encoder does not cause a dangerous situation.
- 5. For actual use, be sure to refer to "Product Specifications for information."



■ Minimum Quantity/Packing Unit

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

Type, Series	Part No.	Packaging	Quantity/ Carton	Minimum Quantity/ Packing Unit	Notes
10 mm Square GS Encoders	EVQVX	Tray Pack	3000 pcs.	300 pcs.	
10 mm Square SMD Encoders	EVQVV	Embossed Taping (Reel Pack)	6000 pcs.	1500 pcs.	
Edge Drive Jog Encoders	EVQWK	Embossed Taping (Reel Pack)	1600 pcs.	400 pcs.	
Eage Drive Jog Encoders	EVQVIK	Tray Pack	1000 pcs.	100 pcs.	
11 mm Square GS Encoders	EVER EVEU	Tray Pack	250 pcs. or 300 pcs.	50 pcs.	
	EVEV EVEY	/		100 pcs.	
10 mm Cauara CC Facadara	EVEG EVEH EVEK EVEL	Polyethylene Bag (Bulk)	1000 pcs.	100 pcs.	L≦25.0 mm
12 mm Square GS Encoders			2000 pcs.	200 pcs.	L>26.0 mm
12 mm Square GS Encoders (with Push-on Switch)	EVEJB	Polyethylene Bag (Bulk)	500 pcs.	100 pcs.	
16 mm Square Encoders	EVEP EVEQ	Tray Pack	200 pcs.	50 pcs.	
18 mm Square Encoders (High Rotational Torque)	EVQW	Tray Pack	800 pcs.	80 pcs.	
20/12 mm Center Space Encoders	EVQV6	Tray Pack	2000 pcs.	100 pcs.	
27/17 mm Center Space Encoders	EVQWF EVQVP	Tray Pack	800 pcs.	80 pcs.	
27/18 mm Center Space Encoders	EVQV5	Tray Pack	1600 pcs.	80 pcs.	
38/25 mm Center Space Encoders	EVQVN	Tray Pack	250 pcs.	50 pcs.	
60/40 mm Center Space Encoders	EVQV0	Tray Pack	100 pcs.	20 pcs.	

Panasonic Encoders/EVQVX

10 mm Square GS Encoders

Type: **EVQVX**



- Compact and thin design (Body thickness: 4 mm)
- Good rotational feel
- Supports vertical self-standing mounting onto printed circuit boards

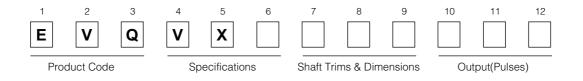




■ Recommended Applications

- Computer peripherals (Mouse)
- Information & communications equipment
- For input devices of measuring instruments and various electronic equipment

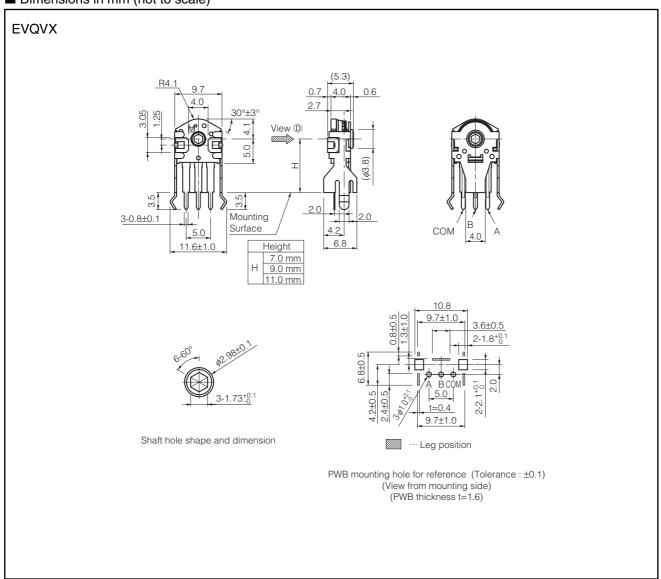
■ Explanation of Part Numbers



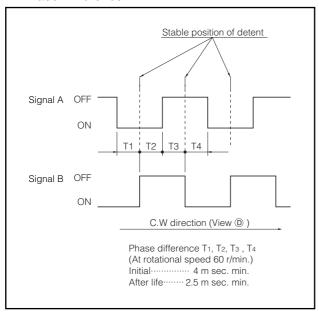
	Rotation Angle	360 ° (Endless)
Mechanical	Rotation Torque	1 mN·m to 10 mN·m
	Detents	24 points
	Output Signals	Phase A and B
	Resolution	12 pulses/360 °
	Rating	1 mA 10 Vdc (at each bit)
Electrical	Contact Resistance	10 Ω max.
	Insulation Resistance	50 M Ω min. (at 50 Vdc)
	Dielectric Withstanding Voltage	50 Vac for 1 minute
	Bouncing	5 ms max.
Endurance	Rotation Life	200000 cycles min.
Minimum Quant	ity/Packing Unit	300 pcs. (Tray Pack)
Quantity/Carton		3000 pcs.

Panasonic Encoders/EVQVX

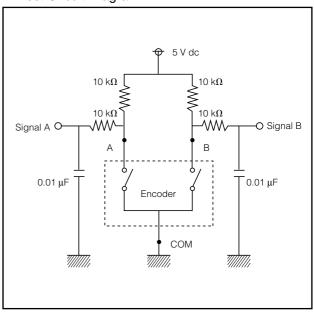
■ Dimensions in mm (not to scale)



■ Phase Difference



■ Test Circuit Diagram



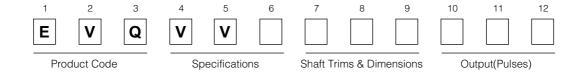
10 mm Square SMD Encoders

Type: **EVQVV**



- Features
- Low profile(H=2.2 mm),
 Shaft hole diameters of up to 4 mm.
- Light operation with a rotation torque of 2 mN·m
- Automatic mounting and SMDs.
- Recommended Applications
- Air conditioning temperature controls
- Input of operation units
- Computer peripherals

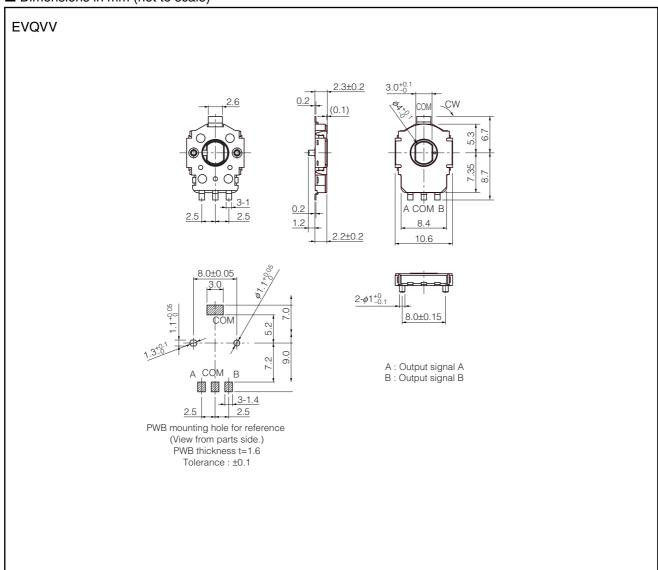
■ Explanation of Part Numbers



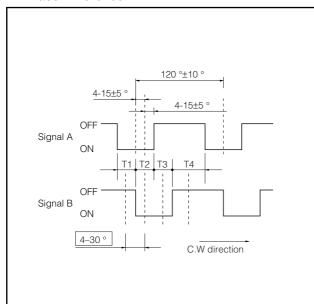
Mechanical	Rotation Angle	360 ° (Endless)
Mechanicai	Rotation Torque	2 mN·m max.
	Output Signals	Phase A and B
	Resolution	3 pulses/360 °
	Rating	1 mA 10 Vdc (at each bit)
Electrical	Contact Resistance	10 Ω max.
	Insulation Resistance	50 M Ω min. (at 50 Vdc)
	Dielectric Withstanding Voltage	50 Vac for 1 minute
	Bouncing	5 ms max.
Endurance	Rotation Life	70000 cycles min.
Minimum Quanti	ity/Packing Unit	1500 pcs. Embossed Taping (Reel Pack)
Quantity/Carton		6000 pcs.

Panasonic Encoders/EVQVV

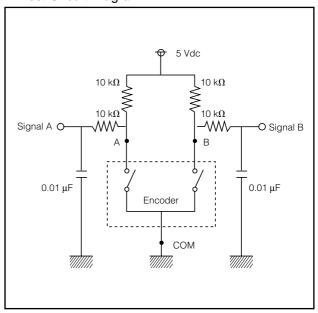
■ Dimensions in mm (not to scale)



■ Phase Difference



■ Test Circuit Diagram



Panasonic Encoders/EVQWK

Edge Drive Jog Encoders

Type: **EVQWK**

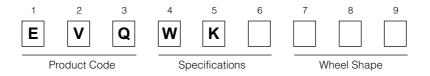
- Features
- Tactile rotary operation and push operation
- Reflow soldering type available
- Anti-electrostatic measures available





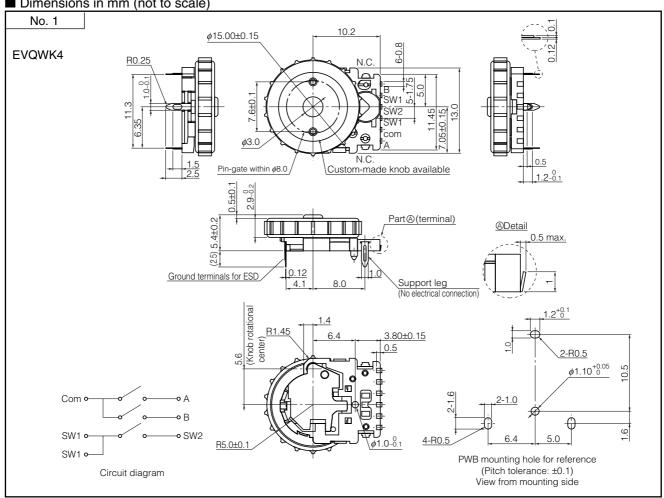
- Recommended Applications
- Memory paging and transmitting
- Menu selection and input for Portable Electronic Equipment

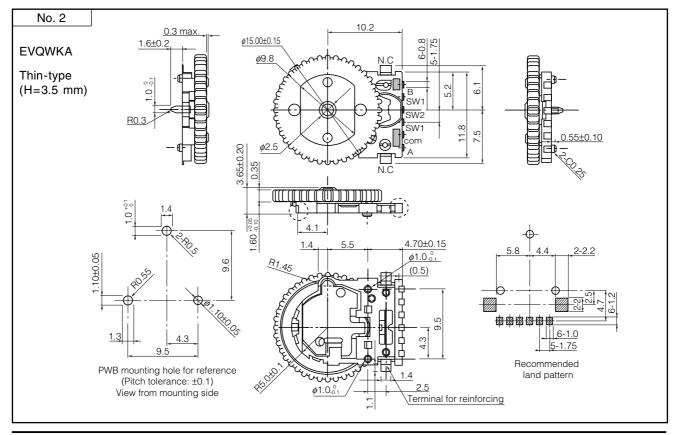
■ Explanation of Part Numbers



	Encoder	Detents	15 points		
Maalaaniaal	Encoder	Rotation Torque	1 mN·m to 10 mN·m		
Mechanical	Encoder Rotation Torque Travel Operating Force Resolution Output Signals Contact Resistance Push-on Switch Contact Resistance Encoder Rotation Life Push-on Switch Operating Life	0.3 mm (Thin-Type : 0.2 mm)			
	Push-on Switch		4.5 N±1.5 N		
			15 pulses/360 °		
Electrical	Encoder	Output Signals	2-Phases (A and B)		
Electrical		Resolution Output Signals Contact Resistance Oush-on Switch Contact Resistance Rotation Life	1 Ω max.		
	Push-on Switch	Rotation Torque Travel 0.3 Operating Force Resolution Output Signals Contact Resistance Contact Resistance Rotation Life Operating Life	100 mΩ		
Endurance	Encoder	Rotation Life	100000 avalas min		
Endurance	Push-on Switch	Operating Life	100000 cycles min.		
Minimo una Outana	itte/De alcie a I leit		100 pcs. (Tray Pack)		
Minimum Quani	illy/Packing Unit		400 pcs. Embossed Taping (Reel Pack)		
Ougantity/Costs			1000 pcs.		
Quantity/Carton			1600 pcs.		

Panasonic Encoders/EVQWK





11 mm Square GS Encoders

Type: EVER/EVEU/EVEV/EVEY

■ Features

• Low Profile : Reflow Type 3.5 mm,

Wave Soldering Type 4 mm

- Minimized shaft wobble type is also available
- The reflow type allows the product to be automatically mounted and reflow-soldered



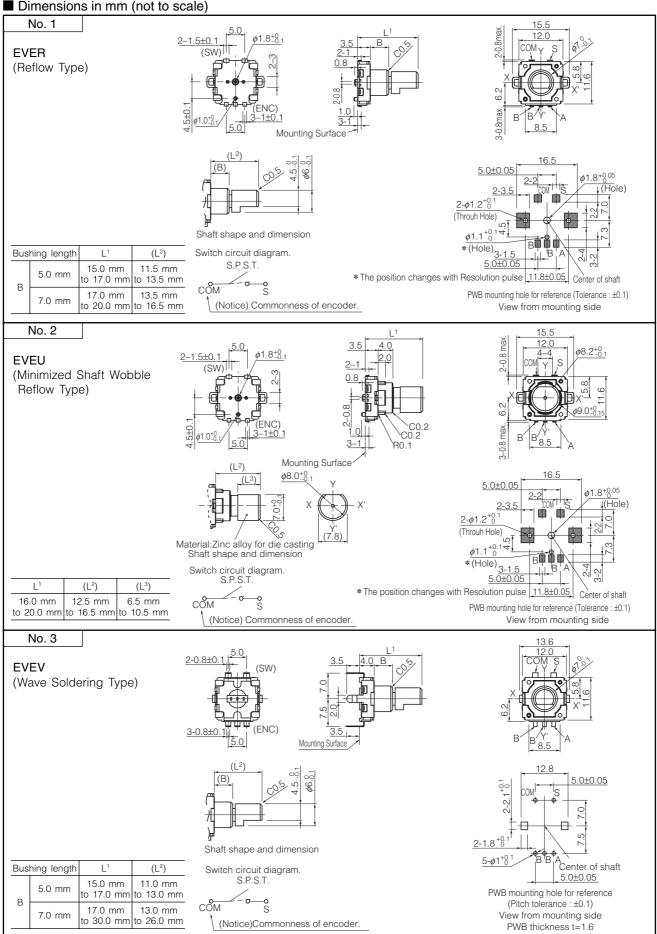
■ Recommended Applications

Car audio, car navigation, car air conditioners

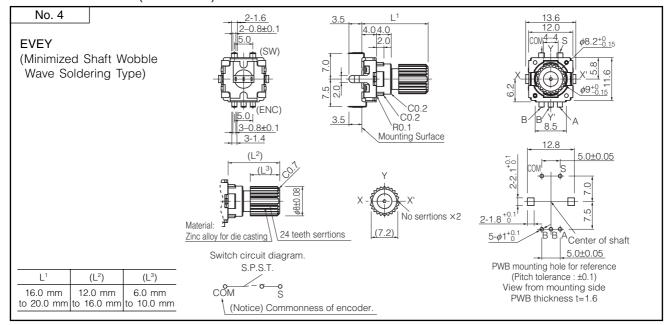
■ Explanation of Part Numbers

1 2 3 E V E	4	5	6	7	8	9	10	11	12
Product Code	$\overline{\top}$	Specific	cations	Shaft T	rims & Dime	ensions	Oı	ıtput(Puls	es)
	4 th		Ту	ре					
	R	Reflow Type)						
	U	Minimized S	Shaft Wobb	le Reflow	Гуре				
	V	Wave Solde	ring Type						
	Υ	Minimized S	Shaft Wobb	ole Wave S	oldering Ty	pe			

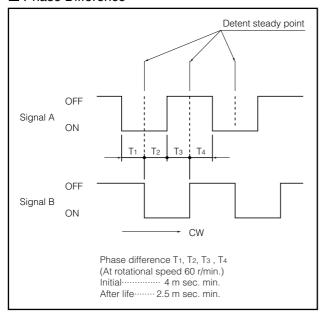
Rotation Angle	- орсошоа								
Shaft Pull/Push Strength 100 N min. Shaft Wobble 0.6xL/30 (mm) max. 0.35xL/30 (mm) max. Rotation Torque 3 mN·m to 20 mN·m Detents 16 points, 24 points, 30 points, 32 points Shaft Length Range Li=15 to 20 mm Li=15 to 30 mm Li=16 to 20				(Wave Soldering	EVEU (Minimized Shaft Wobble Reflow Type)	EVEY (Minimized Shaft Wobble Wave Soldering Type)			
Mechanical Rotation Torque 0.6xL/30 (mm) max. 0.35xL/30 (mm) max. Botation Torque 3 mN-m to 20 mN·m 0.35xL/30 (mm) max. Betation Torque 3 mN·m to 20 mN·m Detents 16 points, 24 points, 30 points, 32 points Shaft Length Range Li=15 to 20 mm Li=15 to 30 mm Li=16 to 20 mm Phase A and B Resolution 8, 12, 15, 16 pulses/360 ° Rating 1 mA 10 Vdc (at each bit) Contact Resistance 1 mA 10 Vdc (at each bit) Chattering 3 ms max. Insulation Resistance 50 MΩ min. (at 250 Vdc) Dielectric Withstanding Voltage 300 Vac for 1 minute Bouncing 5 ms max. Type SPST Push-on Rating 20 mA 16 Vdc Contact Resistance 100 mΩ max. Operating Force 1.5 mm travel type : 3 N, 4 N , 6 N		Rotation Angle	360 ° (Endless)						
Rotation Torque		Shaft Pull/Push Strength		100 N	l min.				
Rotation Torque	Machaniaal	Shaft Wobble	0.6×L/30	(mm) max.	0.35×L/30	(mm) max.			
Shaft Length Range	Mechanicai	Rotation Torque		3 mN·m to	20 mN·m				
Output Signals		Detents	16	points, 24 points,	30 points, 32 points	nts			
Resolution		Shaft Length Range	L ₁ =15 to 20 mm	L ₁ =15 to 30 mm	L1=16 to	20 mm			
Rating		Output Signals		Phase A	A and B				
Electrical Contact Resistance 1 Ω max. Chattering 3 ms max. Insulation Resistance 50 MΩ min. (at 250 Vdc) Dielectric Withstanding Voltage 300 Vac for 1 minute Bouncing 5 ms max. Switch Part Type SPST Push-on Rating 20 mA 16 Vdc Contact Resistance 100 mΩ max. Operating Force 0.4 mm travel type : 3 N, 4 N, 6 N 1.5 mm travel type : 2.5 N, 4 N, 5 N Travel 0.4 mm, 1.5 mm Botation Life (Encoder) 30000 cycles min. Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 50 pcs. (Tray Pack) 50 pcs. (Tray Pack) 100 pcs. (Tray Pack)		Resolution		8, 12, 15, 16	pulses/360 °				
Chattering 3 ms max. Insulation Resistance 50 MΩ min. (at 250 Vdc) Dielectric Withstanding Voltage 300 Vac for 1 minute Bouncing 5 ms max. Type SPST Push-on Rating 20 mA 16 Vdc Contact Resistance 100 mΩ max. Operating Force 0.4 mm travel type : 3 N, 4 N, 6 N 1.5 mm travel type : 2.5 N, 4 N, 5 N Travel 0.4 mm, 1.5 mm Brodurance Rotation Life (Encoder) 30000 cycles min. Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100		Rating	1 mA 10 Vdc (at each bit)						
Chattering 3 ms max. Insulation Resistance 50 MΩ min. (at 250 Vdc) Dielectric Withstanding Voltage 300 Vac for 1 minute Bouncing 5 ms max. Type SPST Push-on Rating 20 mA 16 Vdc Contact Resistance 100 mΩ max. Operating Force 0.4 mm travel type : 3 N, 4 N, 6 N Travel 0.4 mm, 1.5 mm Travel 0.4 mm, 1.5 mm Rotation Life (Encoder) 30000 cycles min. Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) Tray Pack 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) Tray Pack 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) Tray Pack 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) Tray Pack 100 pcs. (Tray Pack) Tray Pa	Electrical	Contact Resistance	1 Ω max.						
Dielectric Withstanding Voltage 300 Vac for 1 minute		Chattering	3 ms max.						
Bouncing 5 ms max.		Insulation Resistance	50 M Ω min. (at 250 Vdc)						
Type		Dielectric Withstanding Voltage	300 Vac for 1 minute						
Switch Part Hating 20 mA 16 Vdc Contact Resistance 100 mΩ max. Operating Force 0.4 mm travel type : 3 N, 4 N, 6 N Travel 0.4 mm, 1.5 mm Travel Rotation Life (Encoder) 30000 cycles min. Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 100 pcs. (Tray Pack) 50 pcs. (Tray Pack) 100 pcs		Bouncing		5 ms	max.				
Switch Part Contact Resistance 100 mΩ max. Operating Force 1.5 mm travel type : 3 N, 4 N , 6 N 1.5 mm travel type : 2.5 N, 4 N , 5 N Travel 0.4 mm, 1.5 mm Botation Life (Encoder) 30000 cycles min. Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 100 pcs. (Tray Pack) 50 pcs. (Tray Pack) 100 pcs. (Tray Pack)		Туре		SPST F	Push-on				
Switch Part Operating Force 0.4 mm travel type : 3 N, 4 N , 6 N 1.5 mm travel type : 2.5 N, 4 N , 5 N Travel 0.4 mm, 1.5 mm Output 0.4 mm, 1.5 mm 30000 cycles min. Operating Life (Switch) Minimum Quantity/Packing Unit 0.4 mm travel type : 3 N, 4 N , 6 N 1.5 mm 30000 cycles min. 30000 cycles min. 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack) 100 pcs. (Tray Pack)		Rating		20 mA	16 Vdc				
Operating Force Operating Force Output Operating Force Output Operating Force Output Output Operating Force Output Output Output Output Operating Life (Encoder) Operating Life (Switch) Operating Unit Output Output	Switch Part	Contact Resistance		100 ms	Ω max.				
Endurance Rotation Life (Encoder) 30000 cycles min. Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 100 pcs. (Tray Pack) 50 pcs. (Tray Pack) 100 pcs. (Tray Pack)	Owiton Fair	Operating Force							
Endurance Operating Life (Switch) 30000 cycles min. Minimum Quantity/Packing Unit 50 pcs. (Tray Pack) 100 pcs. (Tray Pack) 50 pcs. (Tray Pack) 100 pcs. (Tray Pack)		Travel		0.4 mm,	1.5 mm				
Operating Life (Switch) 30000 cycles min.		Rotation Life (Encoder)	30000 cycles min.						
	Endurance	Operating Life (Switch)		·					
Quantity/Carton 250 pcs. or 300 pcs. 500 pcs. 250 pcs. or 300 pcs. 500 pcs.	Minimum Qu	uantity/Packing Unit	50 pcs. (Tray Pack)	100 pcs. (Tray Pack)	50 pcs. (Tray Pack)	100 pcs. (Tray Pack)			
2.	Quantity/Car	rton	250 pcs. or 300 pcs.	500 pcs.	250 pcs. or 300 pcs.	500 pcs.			



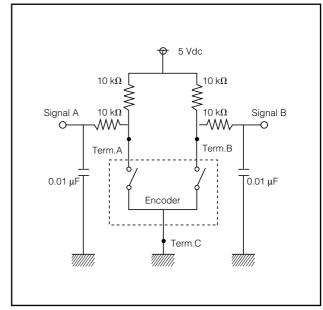
■ Dimensions in mm (not to scale)



■ Phase Difference



■ Test Circuit Diagram



12 mm Square GS Encoders

Type: **EVEG/EVEH/EVEK/EVEL**

■ Features

- Lineup of high rotation-torque-type (50 mN·m)
- A wide range of standard products

■ Recommended Applications

- Volume for audio/visual equipment
- Tuner for communication units
- Mode selection for measurement instruments



■ Explanation of Part Numbers

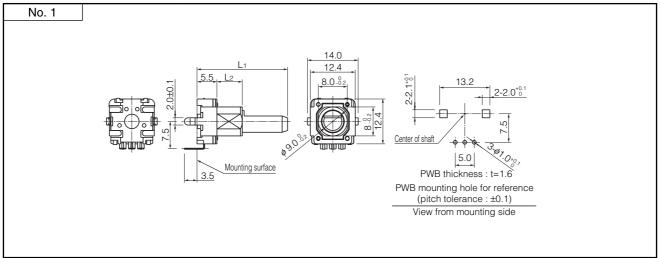
1	2	3	4	5	6	7	8	9	10	11	12
E	V	E									
Pro	oduct Code	€	Sp	ecificatio	ns	Comb	ination of	Shaft	Oı	utput (Pul	ses)

■ Product Chart

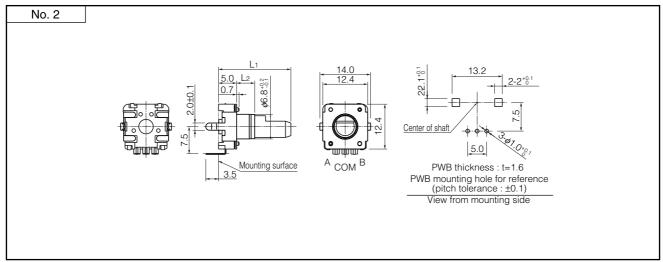
	Combination of					He	ight			Detents (Resolution/Pulses)			
Torque type		shing	Thickness	15.0 mm	17.5 mm	20.0 mm	22.5 mm	25.0 mm	30.0 mm	12 points (12 pulses)	24 points (24 pulses)	Without detents (12 pulses, 24 pulses)	
Heavy-rotation		(7.0,12.0 mm)	5.5 mm					0	0			0	
torque (10 mN·m to 50 mN·m)	Sleeve	(7.0,12.0 mm)	5.5 mm					0	0			0	
	Barling	(5.0 mm)	5.0 mm		0	0	0	0		0	0	0	
Standard type	Barling	(1.6 mm)	5.0 mm	0						0	0	0	
(3 mN·m to 20 mN·m)	Die-cast	(7.0 mm)	5.5 mm			0	0	0		0	0	0	
	Sleeve	(7.0 mm)	5.5 mm			0	0	0		0	0	0	

- openingations							
Rotation Angle			360 ° (I	Endless)			
Shaft Pull/Push S	Strength	80 N min.					
Shaft Wobble			0.7×L/30	mm max.			
Datation Tonous	Standard Type		1				
Rotation Torque	Heavy Rotation Torque		10 mN·m t	o 50 mN·n	n		
Detents		12					
Output Signals			Phase A	A and B			
Resolution			12, 20, 24 pulses/360 °				
Rating	Rating		1 mA 5 Vdc, 1 mA 10 Vdc				
Contact Resistar	ontact Resistance		1 Ω max.				
Chattering			2 ms	max.			
Insulation Resista	ance	10 MΩ min. (at 50 Vdc)					
Dielectric Withsta	anding Voltage		50 Vac fo	r 1 minute			
Bouncing			5 ms	max.			
Operating Life	Standard Type		30000 cy	cles min.			
Operating Life	Heavy Rotation Torque		15000 cy	cles min.			
Operating Temper	erature	−10 °C to +60 °C					
Storage Tempera	ature	-40 °C to +85 °C					
ntity/Packing Unit		L≦25.0 mm 100 pcs. Polyethylene Bag(Bulk) L>26.0 mm 200 pcs. Polyethylene			200 pcs. Polyethylene Bag(Bulk)		
n		L≦25.0 mm	1000 pcs.	L>26.0 mm	2000 pcs.		
	Shaft Pull/Push S Shaft Wobble Rotation Torque Detents Output Signals Resolution Rating Contact Resistan Chattering Insulation Resista Dielectric Withsta Bouncing Operating Life Operating Temperantity/Packing Unit	Shaft Pull/Push Strength Shaft Wobble Rotation Torque Beavy Rotation Torque Detents Output Signals Resolution Rating Contact Resistance Chattering Insulation Resistance Dielectric Withstanding Voltage Bouncing Operating Life Standard Type Heavy Rotation Torque Operating Temperature Storage Temperature Intity/Packing Unit	Shaft Pull/Push Strength Shaft Wobble Rotation Torque	Shaft Pull/Push Strength 80 N Shaft Wobble 0.7×L/30 Rotation Torque 3 mN·m to the standard Type theavy Rotation Torque 3 mN·m to theavy Rotation Torque Detents 12 points, 20 points, 24 (Heavy rotation-torder) Output Signals Phase A Resolution 12, 20, 24 grader Rating 1 mA 5 Vdc, Contact Resistance 1 Ω MΩ min. Insulation Resistance 10 MΩ min. Dielectric Withstanding Voltage 50 Vac forms Bouncing 5 ms Operating Life Standard Type 30000 cy Heavy Rotation Torque 15000 cy Operating Temperature -10 °C to Storage Temperature -40 °C to ntity/Packing Unit L≤25.0 mm 100 pcs. Polyethylene Bag(Bulk)	Shaft Pull/Push Strength 80 N min. Shaft Wobble 0.7xL/30 mm max. Rotation Torque Standard Type 3 mN·m to 20 mN·m Heavy Rotation Torque 10 mN·m to 50 mN·m Detents 12 points, 20 points, 24 points, w (Heavy rotation-torque withou Output Signals Phase A and B Resolution 12, 20, 24 pulses/360 Rating 1 mA 5 Vdc, 1 mA 10 max. Contact Resistance 1 Ω max. Chattering 2 ms max. Insulation Resistance 10 MΩ min. (at 50 Vd Dielectric Withstanding Voltage 50 Vac for 1 minute Bouncing 5 ms max. Operating Life Heavy Rotation Torque 15000 cycles min. Operating Temperature -10 °C to +60 °C Storage Temperature -40 °C to +85 °C ntity/Packing Unit L≤25.0 mm 100 pcs. Polyethylene Bag(Bulk) L>26.0 mm		

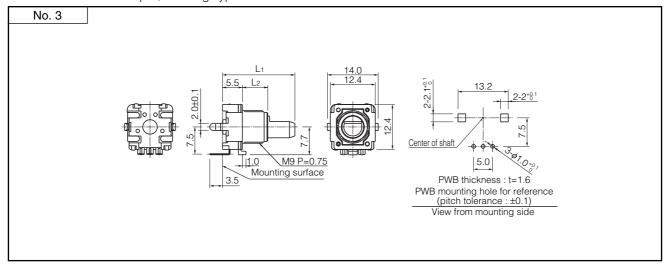
- Dimensions in mm (not to scale)



With detents : EVEGA1

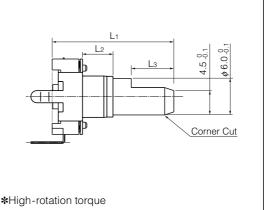


With detents : EVEGC1

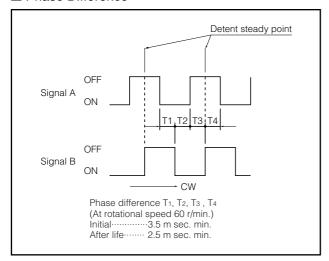


■ Shaft Trims and Dimensions in mm

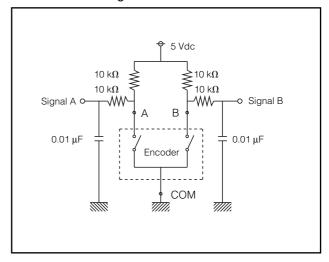
Duahina Tuna		Dimer	nsions	
Bushing Type	L ₁	L ₂	Lз	Corner Cut
	15.0 mm	1.6 mm	7.0 mm	1.5 mm
	17.5 mm	5.0 mm	5.0 mm	1.5 mm
Barling	20.0 mm	5.0 mm	7.0 mm	1.5 mm
	22.5 mm	5.0 mm	7.0 mm	1.5 mm
	25.0 mm	5.0 mm	12.0 mm	1.5 mm
	20.0 mm	7.0 mm	7.0 mm	1.5 mm
Sleeve	22.5 mm	7.0 mm	7.0 mm	1.5 mm
Sieeve	25.0 mm	7.0 mm	12.0 mm	1.5 mm
	* 30.0 mm	7.0 mm	* 12.0 mm	* 1.5 mm
	20.0 mm	7.0 mm	7.0 mm	1.5 mm
Die-cast	22.5 mm	7.0 mm	7.0 mm	1.5 mm
Die-Cast	25.0 mm	7.0 mm	12.0 mm	1.5 mm
	* 30.0 mm	12.0 mm	* 12.0 mm	* 1.5 mm



■ Phase Difference



■ Test Circuit Diagram



Panasonic Encoders/EVEJB

12 mm Square GS Encoders with Push-on Switch

Type: **EVEJB**

■ Features

- Thin type encoder with vertical push-on switch
- Insulated shaft or metal shaft types are available

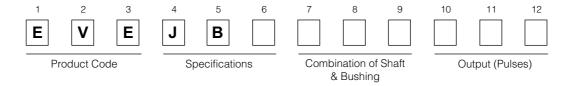




■ Recommended Applications

- Volume and tone control for audio/visual and car audio equipment
- Tuner for communication units
- Mode selection for measurement instruments

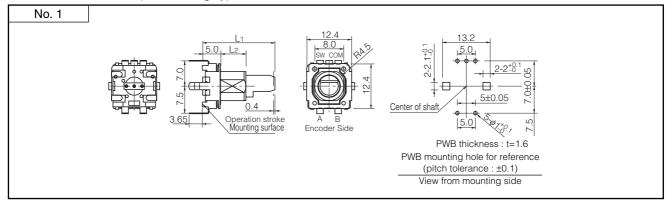
■ Explanation of Part Numbers

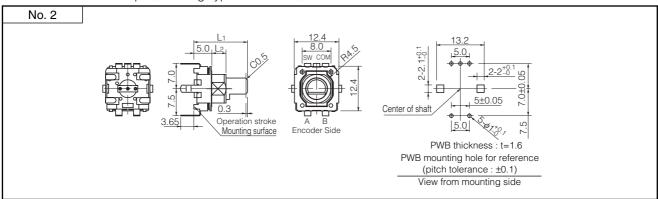


■ Specification	113		
	Rotation Angle		360 ° (Endless)
	Shaft Pull/Push S	Strength	80 N min.
Mechanical	Shaft Wobble		0.7×L/30 mm max.
	Rotation Torque		3 mN·m to 20 mN·m
	Detents		20 points
	Output Signals		Phase A and B
	Resolution		20 pulses/360 °
	Rating		1 mA 10 Vdc
Electrical	Contact Resistar	nce	1 Ω max.
Electrical	Chattering		2 ms max.
	Insulation Resist	ance	10 M Ω min. (at 50 Vdc)
	Dielectric Withsta	anding Voltage	50 Vac for 1 minute
	Bouncing		5 ms max.
	Туре		SPST Push-on
	Rating		20 mA 16 Vdc
Switch Part	Contact Resistar	nce	100 m Ω max.
	Operating Force		3 N, 6 N
	Travel		0.4 mm
	Operating Life	Encoder	30000 cycles min.
Endurance	Operating Life	Switch	15000 cycles min.
Endurance	Operating Temporating	erature	−10 °C to +60 °C
	Storage Tempera	ature	−40 °C to +85 °C
Minimum Qua	ntity/Packing Unit		100 pcs. Polyethylene Bag(Bulk)
Quantity/Carto	n		500 pcs.

Panasonic Encoders/EVEJB

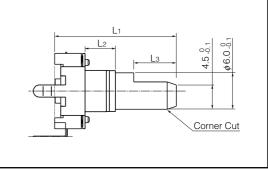
- Dimensions in mm (not to scale)
- Standard rotation-torque / Bushing Type with Sleeve / with SwitchesWith detents : EVEJBB



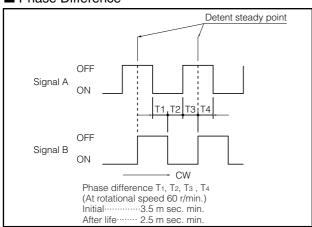


■ Shaft Trims and Dimensions in mm

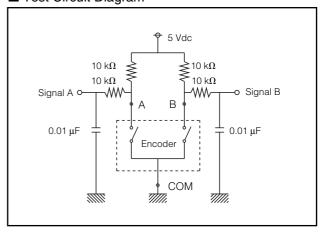
Chaft Tuna	Dimensions						
Shaft Type	Lı	L ₂	Lз	Corner Cut			
Metal	15.0 mm	4.0 mm	5.0 mm	0.5 mm			
lo evilete el	20.0 mm	7.0 mm	6.0 mm	1.5 mm			
Insulated	25.0 mm	9.0 mm	10.0 mm	1.5 mm			



■ Phase Difference



■ Test Circuit Diagram



Panasonic Encoders/EVEP/Q

16 mm Square Encoders

Type: **EVEP/EVEQ**



- Features
- Good operational feel
- Long life due to high click torque
- Shaft wobble : 0.1 mm max.

- Recommended Applications
- Centralized control of automotive audio equipment, navigation systems, and air conditioners.

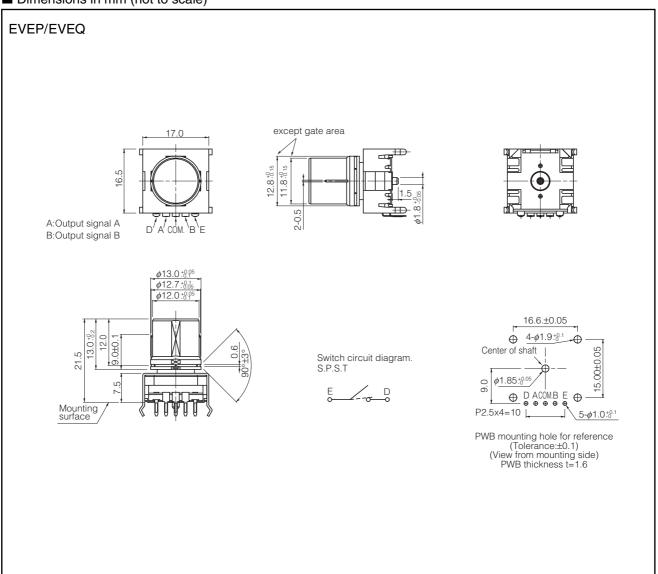
■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	V	E	$P_{\mathbf{Q}}$								
	Produc	t Code		Function		Combinat	ion of Shaft	& Bushing	0	utput (Pul	ses)
						Switch C	lassificati	on			

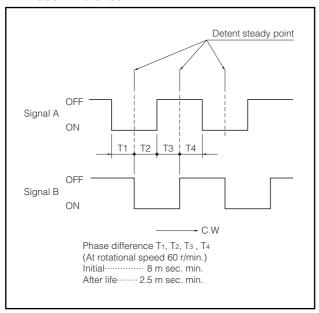
		EVEP	EVEQ			
	Rotation Angle	360 ° (Endless)				
	Shaft Pull/Push Strength	100 N min.				
Mechanical	Shaft Wobble	0.1 mm max.(Length form mounting surface : 21.5 mm) (50 mN·m is applied on the point 2 mm from the shaft tip)				
	Rotation Torque	25 mN·	m max.			
	Detents	16 points	32 points			
	Output Signals	Phase A	A and B			
	Resolution	8 pulses/ 360 °	16 pulses/ 360 °			
	Rating	1 mA 10 Vdc (at each bit)				
Flootviool	Contact Resistance	1 Ω	max.			
Electrical	Chattering	5 ms	max.			
	Insulation Resistance	50 MΩ min.	(at 250 Vdc)			
	Dielectric Withstanding Voltage	300 Vac for 1 minute				
	Bouncing	5 ms max.				
	Туре	SPST Push-on				
	Rating	20 mA 16 Vdc				
Switch Part	Contact Resistance	100 ms	Ω max.			
	Operating Force	6 N				
	Travel	0.5	mm			
	Rotation Life (Encoder)	1000000 cycles min.	30000 cycles min.			
Endurance	Operating Life (Switch)	1000000 cycles min.	30000 cycles min.			
Minimum Quanti	ty/Packing Unit	50 pcs. (Tray Pack)				
Quantity/Carton		200	0 pcs.			

Panasonic Encoders/EVEP/Q

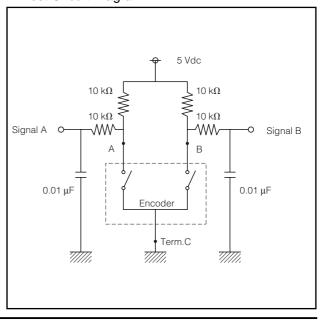
■ Dimensions in mm (not to scale)



■ Phase Difference



■ Test Circuit Diagram



18 mm Square Encoders (High Rotational Torque)

Type: **EVQW**

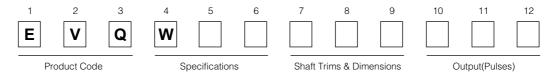




- Features
- External dimensions: 18.0 mm×18.0 mm, Height 8.0 mm
- Absolute 5 bit available

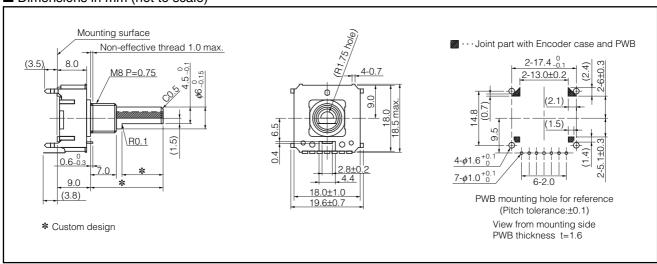
- Recommended Applications
- Function switching/adjusting for control panels of car air conditioners
- Signal input for monitors and audio/visual equipment

■ Explanation of Part Numbers



■ Specifications

Туре	Top Adju	justment type, with or without bushing				
	Rotation Angle	360 ° (Endless)				
	Shaft Pull/Push Strength	80 N min.				
Mechanical	Shaft Wobble	0.7×L/30 (mm) max.				
	Rotation Torque	20 mN·m to 100 mN·m				
	Detent Pitch	10 ° to 30 °				
	Output Signals	Gray code				
	Resolution	Absolute 5 bit (Custom design of 6 bit max. available)				
	Rating	5 mA 10 Vdc				
Electrical	Contact Resistance	1 Ω max.				
Electrical	Chattering	2 ms max.				
	Insulation Resistance	100 M Ω min. (at 250 Vdc)				
	Dielectric Withstanding Voltage	300 Vac for 1 minute				
	Bouncing	5 ms max.				
Endurance	Rotation Life	15000 cycles min.				
Minimum Quanti	ty / Packing Unit	80 pcs. (Tray Pack)				
Quantity / Carto	n	800 pcs.				



20/12 mm Center Space Encoders

Type: **EVQV6**



■ Features

- Multiple unit construction (achieved by mounting switches, LEDs, etc.)
 (center space) on the printed wiring board
- Good operability and high reliability

■ Recommended Applications

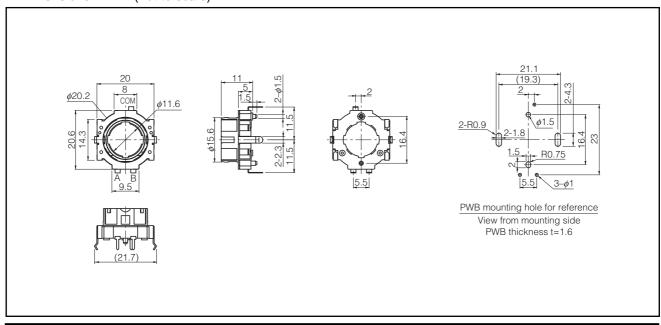
- Car audio products (adjustment of volume, tone, tuners, etc.)
- AV equipment (control of edit functions of VCRs, CD players, etc.)

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	V	Q	V	6							
————Pro	oduct Cod	de		Type			Desian N		Ou	itout(Puls	es)

■ Specifications

	Rotation Angle	360 ° (Endless)					
Mechanical	Rotation Torque (Detents Torque)	11 mN·m, 18 mN·m					
	Detents	18 points					
	Output Signal	Phase A and B					
	Resolution	9 pulses/360 °					
	Rating	1 mA 10 Vdc					
Electrical	Contact Resistance	1 Ω max.					
	Chattering	5 ms max.					
	Insulation Resistance	50 m Ω min. (at 250 Vdc)					
	Dielectric Withstanding Voltage	300 Vac for 1 minute					
Endurance	Rotation Life	30000 cycles min.					
Minimum Qu	uantity/Packing Unit	100 pcs. (Tray Pack)					
Quantity/Car	ton	2000 pcs.					



27/17 mm Center Space Encoders

Type: **EVQWF/EVQVP**



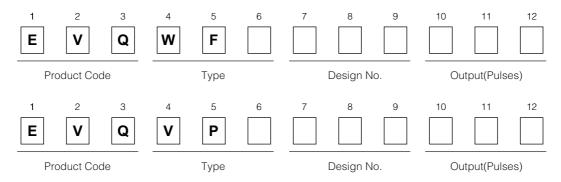
■ Features

- Multiple unit construction (achieved by mounting switches, LEDs, etc.)
 - (center space) on the printed wiring board
- Good operability and high reliability

■ Recommended Applications

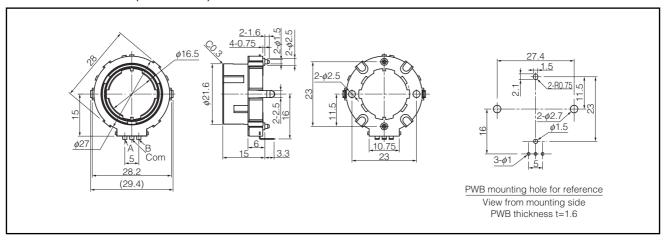
- Car audio products (adjustment of volume, tone, tuners, etc.)
- AV equipment (control of edit functions of VCRs, CD players, etc.)

■ Explanation of Part Numbers



■ Specifications

	Rotation Angle	360 ° (Endless)				
Mechanical	Rotation Torque (Detents Torque)	3 mN·m to 20 mN·m				
	Detents	18 points, 30 points				
	Output Signal	Phase A and B				
	Resolution	9 pulses/360 °, 15 pulses/360 °				
	Rating	1 mA 10 Vdc				
Electrical	Contact Resistance	1 Ω max.				
	Chattering	5 ms max.				
	Insulation Resistance	50 m Ω min. (at 250 Vdc)				
	Dielectric Withstanding Voltage	300 Vac for 1 minute				
Endurance	Rotation Life	30000 cycles min.				
Minimum Quantity/Packing Unit		80 pcs. (Tray Pack)				
Quantity/Car	ton	800 pcs.				



27/18 mm Center Space Encoders

Type: **EVQV5**



■ Features

- Multiple unit construction (achieved by mounting switches, LEDs, etc.)
 - (center space) on the printed wiring board
- Good operability and high reliability

■ Recommended Applications

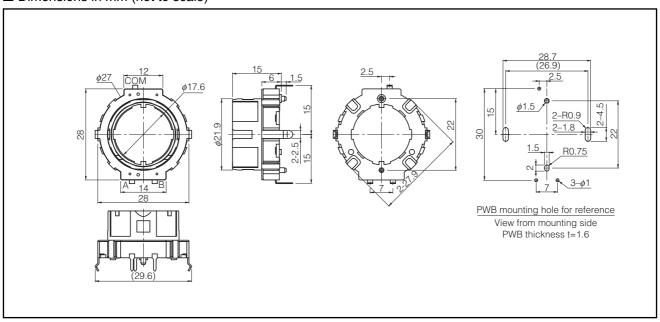
- Car audio products (adjustment of volume, tone, tuners, etc.)
- AV equipment (control of edit functions of VCRs, CD players, etc.)

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	V	Q	V	5							
Pro	oduct Co	de		Туре			Design N	 lo.	Ou	ıtput(Puls	es)

■ Specifications

	Rotation Angle	360 ° (Endless)					
Mechanical	Rotation Torque (Detents Torque)	9 mN·m, 13.5 mN·m, 18 mN·m					
	Detents	18 points, 30 points					
	Output Signal	Phase A and B					
	Resolution	9 pulses/360 °, 15 pulses/360 °					
	Rating	1 mA 10 Vdc					
Electrical	Contact Resistance	1 Ω max.					
	Chattering	5 ms max.					
	Insulation Resistance	50 m Ω min. (at 250 Vdc)					
	Dielectric Withstanding Voltage	300 Vac for 1 minute					
Endurance	Rotation Life	30000 cycles min.					
Minimum Quantity/Packing Unit		80 pcs. (Tray Pack)					
Quantity/Car	rton	1600 pcs.					



38/25 mm Center Space Encoders

Type: **EVQVN**



■ Features

- Multiple unit construction (achieved by mounting switches, LEDs, etc.)
 - (center space) on the printed wiring board
- Good operability and high reliability

■ Recommended Applications

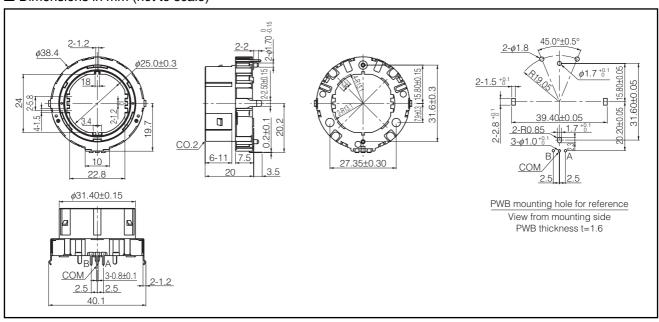
- Car audio products (adjustment of volume, tone, tuners, etc.)
- AV equipment (control of edit functions of VCRs, CD players, etc.)

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	V	Q	V	N							
Pr	oduct Cod	de		Туре			Design N	lo.	Ou	tput(Puls	es)

■ Specifications

	Rotation Angle	360 ° (Endless)					
Mechanical	Rotation Torque (Detents Torque)	20 mN·m					
	Detents	30 points					
	Output Signal	Phase A and B					
	Resolution	15 pulses/360 °					
	Rating	1 mA 10 Vdc					
Electrical	Contact Resistance	1 Ω max.					
	Chattering	5 ms max.					
	Insulation Resistance	50 m Ω min. (at 250 Vdc)					
	Dielectric Withstanding Voltage	300 Vac for 1 minute					
Endurance	Rotation Life	30000 cycles min.					
Minimum Quantity/Packing Unit		50 pcs. (Tray Pack)					
Quantity/Car	ton	250 pcs.					



60/40 mm Center Space Encoders

Type: **EVQV0**

■ Features

- Multiple unit construction (achieved by mounting switches, LEDs, etc.)
 - (center space) on the printed wiring board
- Good operability and high reliability

■ Recommended Applications

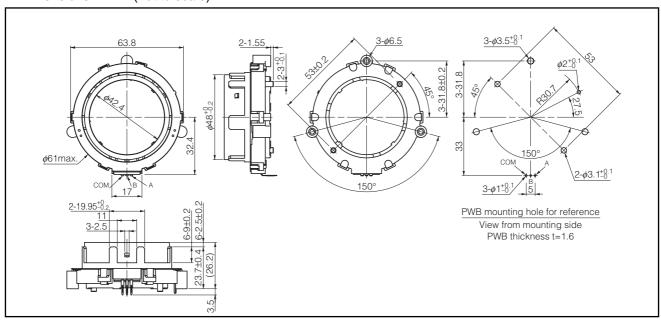
- Car audio products (adjustment of volume, tone, tuners, etc.)
- AV equipment (control of edit functions of VCRs, CD players, etc.)

■ Explanation of Part Numbers

1	2	3	4	5	6	7	8	9	10	11	12
E	V	Q	V	0							
Pro	oduct Coc	de		Type			Design N	lo.	Ou	ıtput(Puls	es)

■ Specifications

	Rotation Angle	360 ° (Endless)					
Mechanical	Rotation Torque (Detents Torque)	35 mN·m					
	Detents	30 points					
	Output Signal	Phase A and B					
	Resolution	15 pulses/360 °					
	Rating	1 mA 10 Vdc					
Electrical	Contact Resistance	1 Ω max.					
	Chattering	5 ms max.					
	Insulation Resistance	50 m Ω min. (at 250 Vdc)					
	Dielectric Withstanding Voltage	300 Vac for 1 minute					
Endurance	Rotation Life	30000 cycles min.					
Minimum Quantity/Packing Unit		20 pcs. (Tray Pack)					
Quantity/Car	ton	100 pcs.					



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