

Classification	SPECIFICATION		Issue No. 20070131			
Part Name LIGHT TOUCH SWITCH	Part No. EVQP0T07T		1 / 7			
1. Notification Items						
1.1 Law and the regulation which are applied						
<p>① Ozone depleting substances specified by Montreal Protocol have not been used in the manufacturing process of the material used in this product.</p> <p>② This product complies with RoHS Directive (on the restriction of the use of certain hazardous substances in electrical and electronic equipment) (2011/65/EU).</p> <p>③ The materials used in this product contain only the substances listed in the List of Existing Chemical Substances specified in 'Act on the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc'.</p> <p>④ If this product is subject to the "Foreign Exchange and Foreign Trade Law" permission must be obtained from the Japanese government in order to export the product or take it out of Japan.</p>						
1.2 Application Limits						
The following shall be described for safety precaution:						
[Limitation of Application]						
<p>(a) This product has been designed and manufactured for general electronic devices, such as home electronics, office equipment, information devices and communication devices.</p> <p>(1) This product is not intended for use in more sophisticated applications which require a higher safety standard and more reliability, including if a failure or malfunction may cause bodily injury or property damage.</p> <p>(2) If the product is intended for more sophisticated applications prior approval must be obtained. Such applications shall include, but are not limited to, the following: aircraft equipment, aerospace equipment, disaster prevention equipment, crime prevention equipment, medical equipment, transportation equipment (such as vehicles, trains, ships, etc.), and information processing equipment that are highly publicized, and other equivalent equipment.</p>						
<p>(b) Regardless of its applications, in an event that this product is used for equipment with high safety standards, protective circuits or back up circuits must be used and safety tests must be performed.</p>						
1.3 Handling of approval specification						
<ul style="list-style-type: none"> Writings in this specification form are subject to change through precautions. In order to avoid nullification or voiding any warranty or guarantee, if the product will be used for application that is not stated in the specifications then Panasonic should be contacted in writing regarding the special application. Please return one copy of this specification form with your approval stamp or signature to us. Otherwise, it might be happened that the item can not be supplied. 						
1.4 Manufacturing Sites						
The country of manufacture : Malaysia	Panasonic Industrial Devices Malaysia Sdn. Bhd.					
The country of manufacture : China	Panasonic Industrial Devices (Qingdao) Co., Ltd.					
The country of manufacture : Japan	Input Devices Business Unit, Electromechanical Control Business Division Panasonic Corporation					
2. Summary						
2.1 This specifications applies to the following types of switch.						
Push-ON type S.P.S.T						
2.2 This specifications is a constituent document of contract for business concluded between your company and Panasonic Corporation.						
2.3 Items not particularly specified in this specifications shall be in conformance with JIS Standards.						

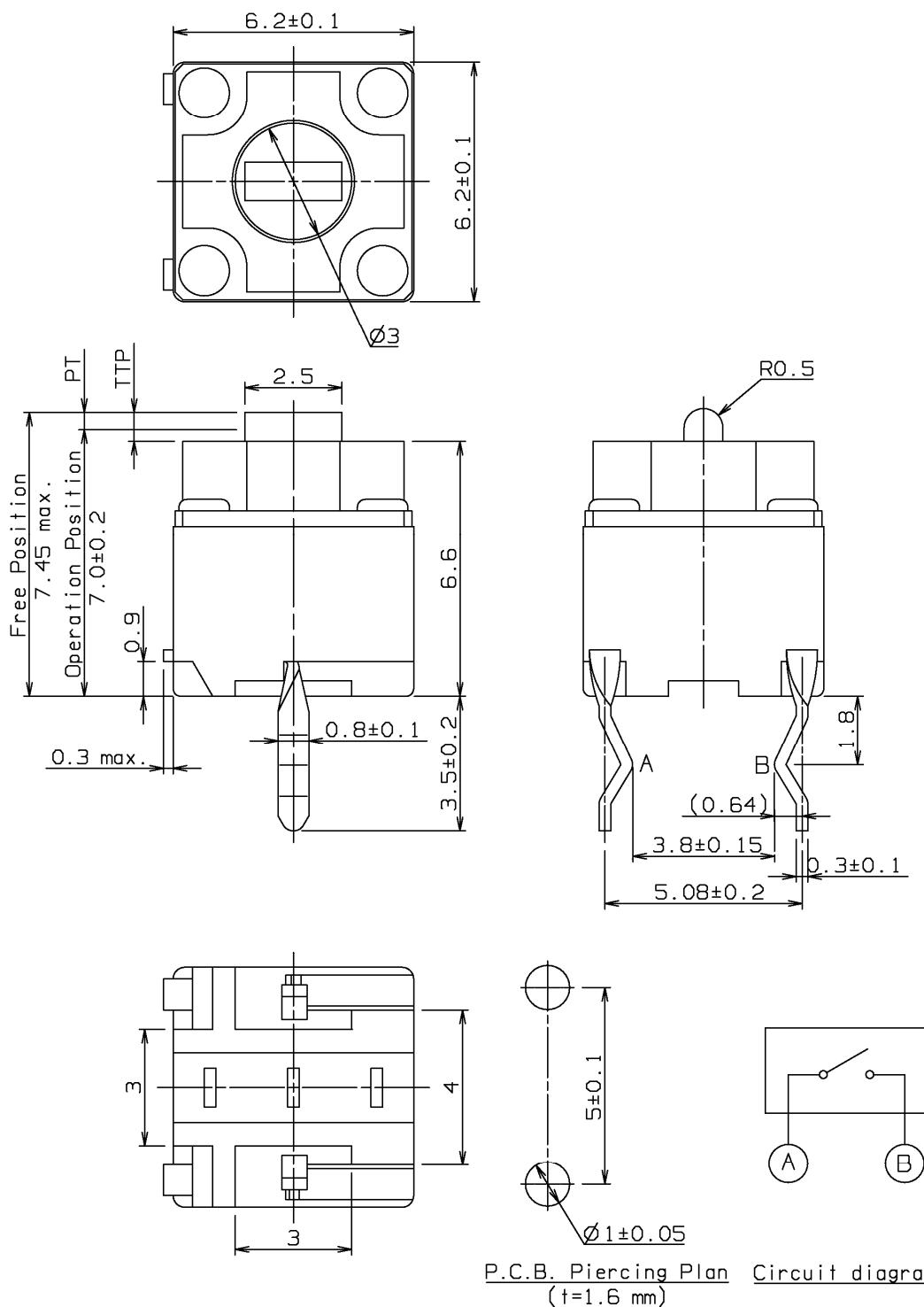
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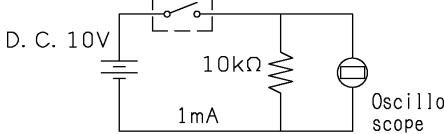
3. Dimension•Marking•Circuit diagram

Date code are indicated in the product.

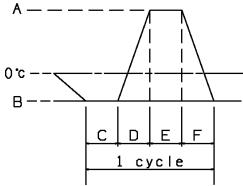
General dimension tolerance : ± 0.5

()dimensions are reference dimensions.



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4. General specification			
4.1 Switch rating	DC 30 V 50 mA(max.)	DC 2 V 10 μ A(min.)	
4.2 Operation temperature range	-20 ~ + 70 °C		
4.3 Preservative temperature range	Single condition : - 40 ~ + 85 °C		
4.4 Standard conditions			
Unless otherwise specified, the test and measurements shall be carried out as follows.			
Ambient temperature	5 ~ 35 °C		
Relative humidity	45 ~ 85 %		
Atmospheric pressure	86 ~ 106 kPa		
However, if doubt arises on the decision based on the measured values under the above-mentioned conditions, the following conditions shall be employed.			
Ambient temperature	20 ± 2 °C		
Relative humidity	65 ± 5 %		
Atmospheric pressure	86 ~ 106 kPa		
5. Performance			
5.1 Electrical characteristics			
No.	ITEM	TEST CONDITION	PERFORMANCE
5.1.1	Contact resistance	Push force : {Operation force} × 2 Measurement tool : Contact resistance meter (Capable of 10 μ A ~ 10 mA)	100 mΩ max.
5.1.2	Insulation resistance	DC 100 V (Between terminals)	100 MΩ min.
5.1.3	Withstand voltage	AC 600 V for 1 minute. (Between terminals)	No insulation destruction
5.1.4	Bouncing	Operation speed : 3~4 times/s  <u>Switch Bouncing Test Circuit</u>	ON 3 ms max. OFF 8 ms max.

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5.2 Mechanical characteristics			
No.	ITEM	TEST CONDITION	PERFORMANCE
5.2.1	Operation force	<p>Graph illustrating Force vs Travel for operation force characteristics:</p> <ul style="list-style-type: none"> Y-axis: Force X-axis: Travel Key points and dimensions labeled on the graph: <ul style="list-style-type: none"> OF (Operation Force) RF (Release Force) CF (Click Force) PT (Pre Travel) MD (Movement Difference) OT (Over Travel) 	<p>Operation Force (OF) 0.41 ~ 0.74 N</p> <p>Release Force (RF) 0.1 N min.</p> <p>Click Force (CF) 0.13 N min</p> <p>Pre Travel (PT) 0.5 mm max.</p> <p>Movement Difference (MD) 0.12 mm max.</p> <p>Over Travel (OT) 0.2 mm min.</p>
5.2.2	Push strength	<p>7.35 N for 1 minute to the actuator vertically 10 times.</p>	<p>No damage (Electrical and mechanical)</p>
5.2.3	Vibration test	<p>1) Amplitude : 1.5 mm</p> <p>2) Sweep rate : 10-55-10Hz for 1 minute</p> <p>3) Sweep method : Logarithmic frequency sweep rate</p> <p>4) Vibration direction : X,Y,Z(3 directions)</p> <p>5) Time : Each direction 2 hours (Total 6 hours)</p>	<p>No.5.1 and 5.2.1 shall be satisfied.</p>
5.2.4	Soldering heat test	<p>Soldering area : 1/2 of P.W.B. thickness (P.W.B. : t=1.6)</p> <p>Soldering temperature : 260±5°C</p> <p>Soldering time : 5±1 sec.</p>	<p>No damage (Electrical and mechanical)</p>
5.2.5	Solderability	<p>After spreading flux, the terminal is immersed in solder with following condition.</p> <p>Solder bar : M705/Sn-3.0Ag-0.5Cu (Senju Metal Indusry Co.,Ltd.)</p> <p>Flux : CF-110VH-2A (tamura kaken)</p> <p>Soldering temperture : 260±5 °C</p> <p>Soldering time : 2±0.5 sec.</p>	<p>shall be satisfied. area(Excluding ruptured surface)where is immersed in solder shall be covered by new solder.</p>

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5.3 Climatic characteristics			
No.	ITEM	TEST CONDITION	PERFORMANCE
5.3.1	Cold test	1) Temperature : -40 ± 2 °C 2) Duration of test : 250h 3) Take off a drop water. 4) Standard conditions after test : 1 h	Contact resistance 200 mΩ max. No.5.1.2 to 5.1.4 and No.5.2.1 shall be satisfied.
5.3.2	Heat test	1) Temperature : 85 ± 2 °C 2) Duration of test : 250h 3) Standard conditions after test : 1 h	Contact resistance 200 mΩ max. No.5.1.2 to 5.1.4 and No.5.2.1 shall be satisfied.
5.3.3	Heat shock test	1) Test cycles : 20 cycles 2) Standard conditions after test : 1 h  A:+85±2 °C B:-40±2 °C C:1 hour D:5 minutes max. E:1 hour F:5 minutes max.	Contact resistance 200 mΩ max. No.5.1.2 to 5.1.4 and No.5.2.1 shall be satisfied.
5.3.4	Humidity test	1) Temperature : 60 ± 2 °C 2) Relative humidity : 90~95 % 3) Duration of test : 250 h 4) Take off a drop water. 5) Standard conditions after test : 1 h	Contact resistance 200 mΩ max. No.5.1.2 to 5.1.4 and No.5.2.1 shall be satisfied.
5.3.5	Endurance (Switching action)	1) DC 5 V 1 mA Resistance load 2) Operation speed : 2~3 times/s 3) Travel : TTP (=Total Travel Position) 4) Operation number : 10,000,000 times	Contact resistance 100 Ω max. Bouncing : 10 ms max. (ON & OFF) Variation rate of operation force shall be within ± 30 % to the value before testing No.5.1.2 shall be satisfied.
5.3.6	Withstand H ₂ S	1) Density : 3±1ppm 2) Temperature : 40 ± 2 °C 3) Relative humidity : 80~85 % 4) Duration of test : 24 h 5) Standard conditions after test : 1 h	Contact resistance 200 mΩ max. No.5.1.2 to 5.1.4 and No.5.2.1 shall be satisfied.

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6. Prohibitions and precaution for handling

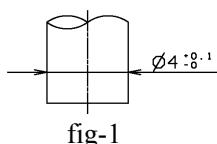
6.1 Soldering condition

ITEM	CONDITION
Preheat temperature	120°C max.(Environmental temperature of soldering surface of P.W.B.)
Preheat time	60 sec. max.
Area of flux	1/2 max. of P.W.B. thickness
Temperature of solder	260±5 °C
Time of immersion	Within 5 sec.
Soldering number	Within 2 times (But should bring down heat of the first soldering.)
Printed wiring board	Single sided copper-clad laminates

- 1) After switches were soldered, please be careful not to clean switches with solvent.
- 2) Please flux don't into over the switch.
- 3) In the case of using soldering iron, soldering conditions shall be 350 °C max. 3 sec. max.
1 time only and the tip of iron must not touch to terminals.
Soldering iron for re-soldering have to be 60 W max.
- 4) Right after switches were soldered, please be carefull not to load on the knobs of switches.

6.2 Design instructions

- 1) Please refer to the land pattern plan Panasonic recommends on the 2nd page.
- 2) Design key top as fig-1. Tip point shall be kept vertically at center-line the switch.



6.3 Note

- 1) Please be cautions not to give excessive static load or shock to switches.
- 2) Please be careful not to pile up P.W.B. after switches were soldered.
- 3) A product shall be mounted properly by insert machine.
- 4) Preservation under high temperature and high humidity or corrosive gas should be avoided especially. When you need to preserve for a long period, do not open the carton.
- 5) Avoid the use of the switch under pushed ON condition is continued for a long time.

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<Prohibitions and precaution for handling>		
【Prohibited items on fire and smoking】		
<ul style="list-style-type: none"> • Absolutely avoid use of a product beyond its rated range because doing so may cause a fire. If misuse or abnormal use may result under conditions in which the product 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 product 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. 		
【For use in equipment for which safety is requested】		
<ul style="list-style-type: none"> • Although care is taken to ensure product quality, inferior characteristics, short circuits, and open circuits are some problems that might be generated. To design an equipment which places maximum emphasis on safety, review the effect of any single fault of a product in advance and perform virtually fail-safe design to ensure maximum safety by: <ul style="list-style-type: none"> • Preparing a protective circuit or a protective device to improve system safety, and equipment. • Preparing a redundant circuit to improve system safety so that the single fault of a product does not cause a dangerous situation. 		
【Attentions required for storage condition】		
<ul style="list-style-type: none"> • When this product is to be stored in the following circumstances and conditions, it may affect on the performance deteriorations and solderability etc., avoid storing in the following conditions. <ul style="list-style-type: none"> (1) A place where the temperature is -10°C max., +40°C min. and the humidity is 85% min. (2) In the corrosive gas atmosphere. (3) Long-term storage for 6 months min. (4) A place where the product is exposed to direct sunlight. • Store in packed condition so that the load stress is not applied. • Please use this product as soon as possible, our recommendation is within 3 months and the limitation is 6 months. • If any remainder left after packing is opened, store it with proper moistureproofing and gasproofing, etc., 		