

## Vibration Sensor Switch

Item No.	VBS030600T	Description	Ball-Contact	Version	13
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### ● FUNCTIONS

Omni-directional Vibration Detecting

### ● APPLICATIONS

1. Wake up systems for power saving,  
Such like remote controllers
2. GPS starting system
3. Alarm system
4. Anti-theft \ Anti-tampered devices.
5. Automatically flashing for bike lamp
6. Subsidiary night lamp flashing for car
7. RFID
8. Outsole of sporting shoes flashing
9. Toys



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### ● FEATURES

1. Both Suitable for horizontal and vertical PCB.
2. The VBS030600T acts like a normally closed switch which chatters open and closed as it is tilted or vibrated. Note that the VBS030600T is not guaranteed to be closed --- occasionally the sensing mechanism may remain open when at rest. The engineer should design his or her software to look for high-to-low and low-to-high edge transitions rather than an open or closed state of the switch.
3. Tiny size, suitable for small space.
4. Wing-shaped terminals, half body of the sensor switch can be buried into PCB to save required room for installation.
5. Gold-plated ball and terminals, low possibility of oxidization.
6. Housing made of high insulation plastic material, free from electric conduction and rust problem.
7. All plastic materials subject to industrial purpose, resist high temperature and meet fireproof function.
8. Simple ON and OFF signals, easy for design.
9. RoHS compliance, an ideal substitute for mercury switch.
10. A more economical vibration detection option than IC design solution.
11. All made in Taiwan and examined before shipment.

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### ● PATENTS

1. TAIWAN Patent No. 321798
2. TAIWAN Patent No. 204790
3. TAIWAN Patent No. 425543
4. U.S.A. Patent No. US 6,706,979 B1
5. U.S.A. Patent No. US 7,465,893 B2
6. U.S.A. Patent No. US 2008/0078660 A1
7. U.S.A. Patent No. US 8,471,161 B2
8. China Patent No. ZL 201110057101.9
9. Licensed patent: Indian Patent No. 266357, Taiwanese Patent No. I334019, Mexican Patent No. 275272, Canadian Patent No. 2,594,949, South Korean Patent No. 10-0946453, European Patent Application No. 06718558.7, and Chinese Patent application No. 201510750656.X and 200680003985.7.

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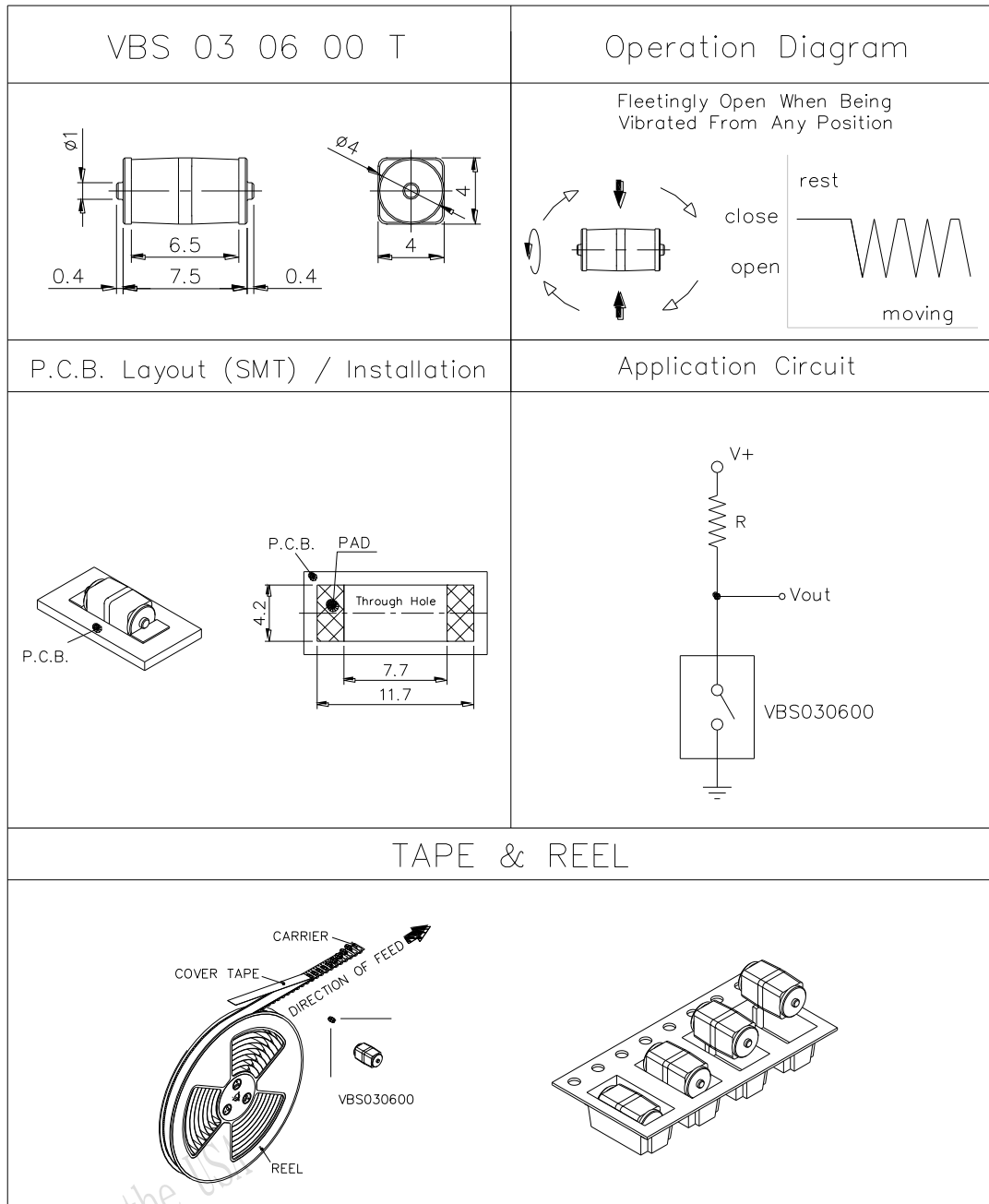
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● DIMENSIONS / OPERATION / P.C.B. LAYOUT (Unit: mm, Tolerance:  $\pm 0.25$ mm)

Fig. 1



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● Current/Voltage Suggested

Input Current (mA)	Operating Voltage (V)	Condition
1.0	5	--

● ELECTRICAL CHARACTERISTICS

1.	Contact Rating	10mA, 5VDC
2.	Operation Diagram	Refer to Fig .1
3.	Insulation Resistance	1,000 MΩ min., 100VDC
4.	Dielectric Strength	500 VDC min. for 1 minute
5.	Capacitance	5 pF max.
6.	Conductive Rate	90% min.

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● RELIABLE TEST ITEMS

Reliable Test for VBS030600T

	Test Item	Contents
1	IR Reflow	Peak temp.=255~260°C
2	Operating Temperature	-25°C ~ 85°C
3	Storage Temperature	-40°C ~ 85°C
4	Humidity	40 °C / 95 %RH
5	Mechanical Life	2 Hz · horizontal 1,000,000 times
6	Electrical Life	100,000 times

● SOLDERING CONDITION

Following soldering conditions are for reference only, please use soldering information that solder paste manufacturer recommends.

Condition	Soldering Temperature	Soldering Time	Wattage of Manual Soldering	Type
Suitable Production Process				
IR Reflow	Please refer to following < Table of classification Reflow profile > and Fig. 2		-	SMD
Manual Soldering	300±5°C	< 3 seconds max.	20W or Temperature-controlled manual soldering	SMD

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< Table of classification Reflow profile >

Item	Pb process	Pb free process
Pre-heat and Soak Temperature min.(T <sub>min</sub> ) Temperature max.(T <sub>max</sub> ) Time (T <sub>min</sub> to T <sub>max</sub> )(t <sub>s</sub> )	100°C 150°C 60-120 seconds	150°C 200°C 60-120 seconds
Average Rate of temperature rising up (T <sub>max</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Liquidous Temperature (TL) Time at Liquidous (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak package body Temperature (T <sub>p</sub> )*	230°C ~235°C *	255°C ~260°C *
Classification temperature(T <sub>c</sub> )	235°C	260°C
Time(tp)** within 5 °C of the specified classification temperature (T <sub>c</sub> )	20** seconds	30** seconds
Average ram-down Rate (T <sub>p</sub> to T <sub>max</sub> )	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.
* Tolerance for peak profile temperature (T <sub>p</sub> ) is defined as a supplier minimum and a user maximum. ** Tolerance for time at peak profile temperature (tp) is defined as a supplier minimum and a user maximum.		

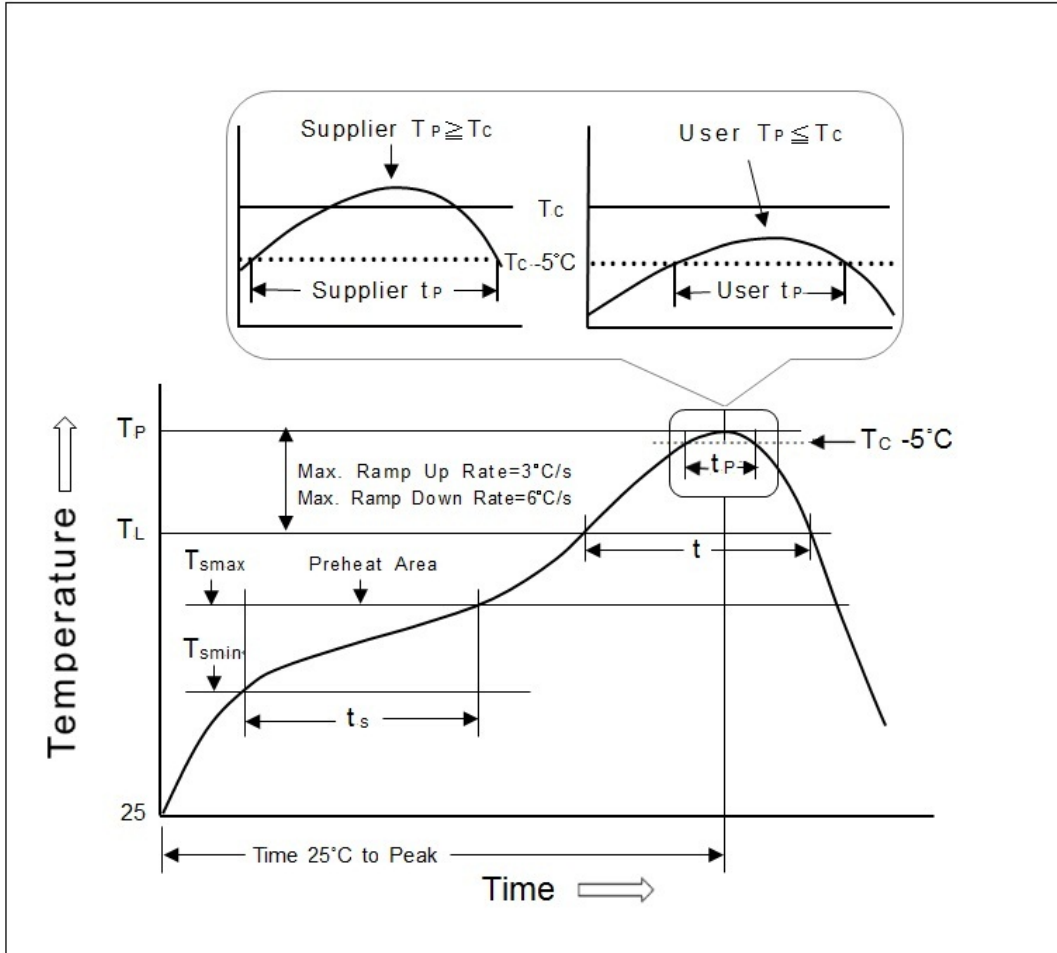
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Fig. 2



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### ● PACKAGE

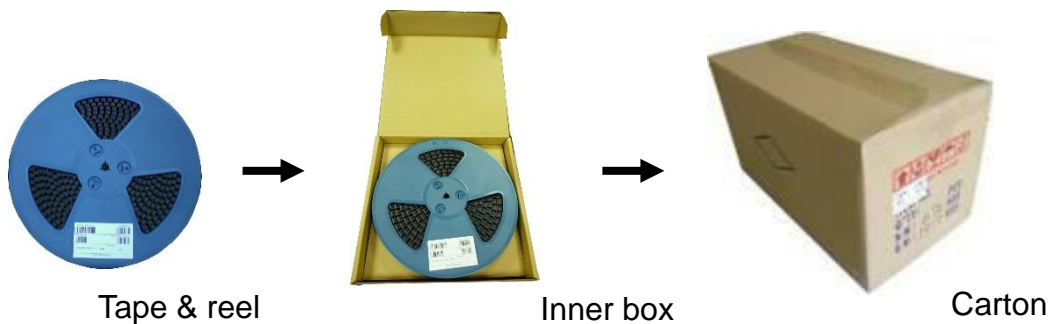
	Part Number	Package	Quantity	Total	Dimension (mm)
1.	VBS030600	PE Bag	1,000 pcs	1,000 pcs	205L*145W
		Inner Box	10 PE bags	10,000 pcs	348L*191W*85H
		Carton	3 Boxes	30,000 pcs	364L*278W*213H

※ Package 1 shown as below for reference.



	Part Number	Package	Quantity	Total	Dimension (mm)
2.	VBS030600T	Tape & Reel	2,000 pcs	2,000 pcs	φ330*17H
		Inner Box	2 reels	4,000 pcs	355L*340W*68H
		Carton	10 boxes	40,000 pcs	703L*364W*380H

※ Package 2 shown as below for reference.



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### ● NOTE

1. Suggestion for usage: For vibration usage or application, we suggest to add hysteresis for IC; if vibration is heavy, optical type of sensor switch is recommended.
2. For the continued product improvement as one of the company policy, specifications may change or update without notice. The latest information can be obtained through our sales offices. Normally, all products are supplied under our standard conditions.
3. If buyer's products will stay in power supply for a long time which needs very high stability, optical sensor switch is strongly recommended.

### ● PRECAUTIONS FOR USE

1. If the product is intended to be used for other endurance equipment requiring higher safety and reliability such as life support system, space and aviation devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.
2. Do not try to clean the switch with a solvent or similar substance after the soldering process.
3. Use water-soluble flux may damage the switch.
4. Please follow the soldering instruction accordingly, otherwise might lead to defective.
5. Do not use switch in the environment of high humidity, because such an environment may cause the leakage current between the terminals.
6. Please do not exceed the rated load as there will be a risk of disabling the product function.
7. In the circuit, switch should not be near or directly connected with the magnetic component solder joints (for example: relays, transformers, etc.).

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