SENSOR SWITCH

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● FUNCTIONS

1. Centrifugal Force Detecting
2. Single Axis Vibration Detecting

● APPLICATIONS

1. Step counters
2. Tire Pressure Monitoring System (TPMS)
3. Laser marker
4. Toys

● FEATURES

1. Suitable for horizontal and vertical PCB.
2. Switch State: Normal Open.
3. Tiny size, suitable for small space.
4. Gold-plated ball and terminals, low possibility of oxidization.
5. Use of high quality springs, vibration sensitivity is good.
6. Using the technology of insert molding to withstand the force between the base and the terminal.
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. Suitable for IC trigger for signal.
10. RoHS compliance, an ideal substitute for mercury switch.
11. All made in Taiwan and examined before shipment.

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- PATENTS

1. U.S.A. Patent No. US 6,555,772 B1
2. U.S.A. Patent No. US 7,332,685 B1

- DIMENSIONS / OPERATION / P.C.B. LAYOUT (Unit: mm, Tolerance: ±0.25mm)

Fig. 1

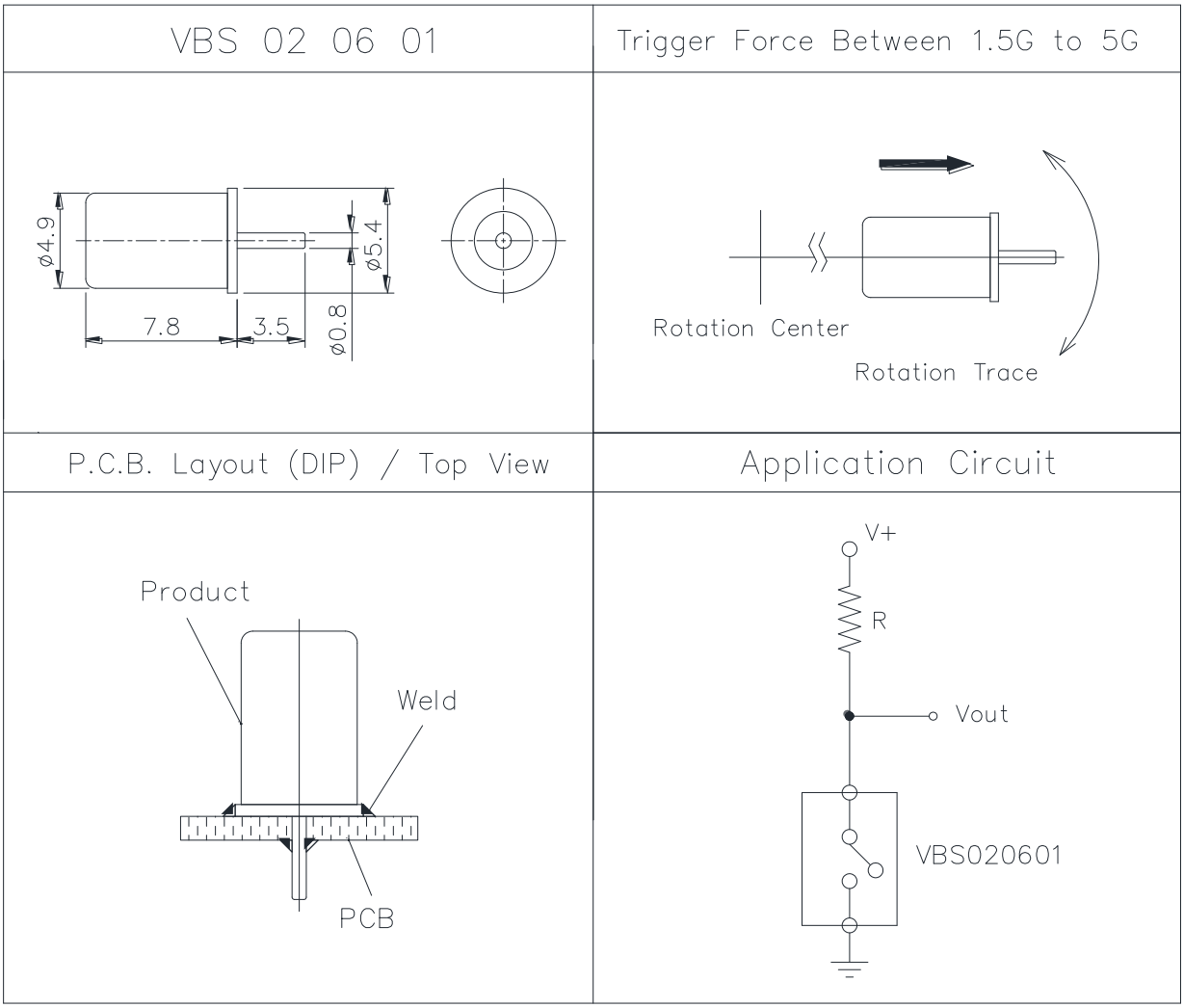

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Fig. 2

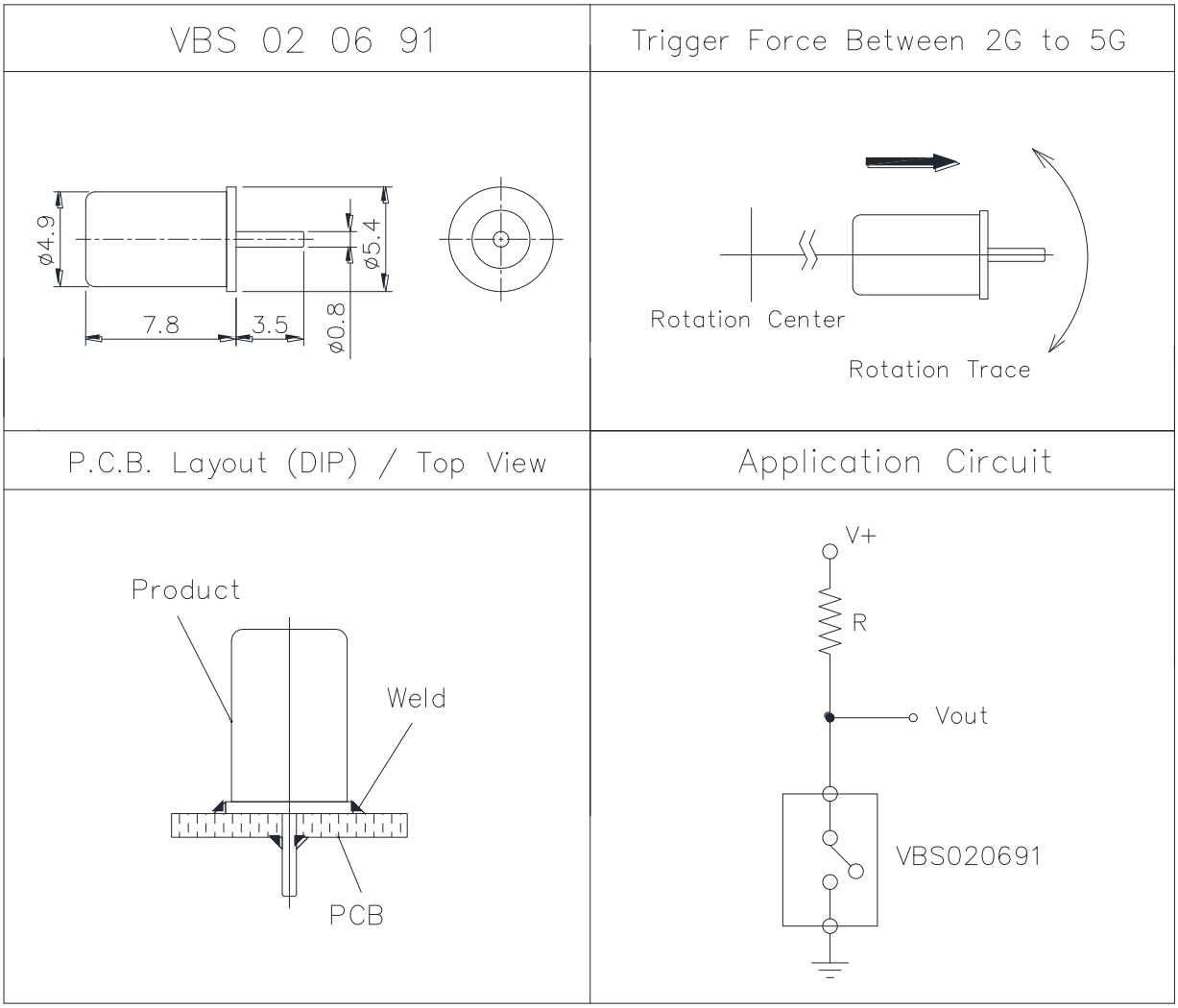

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Fig. 3

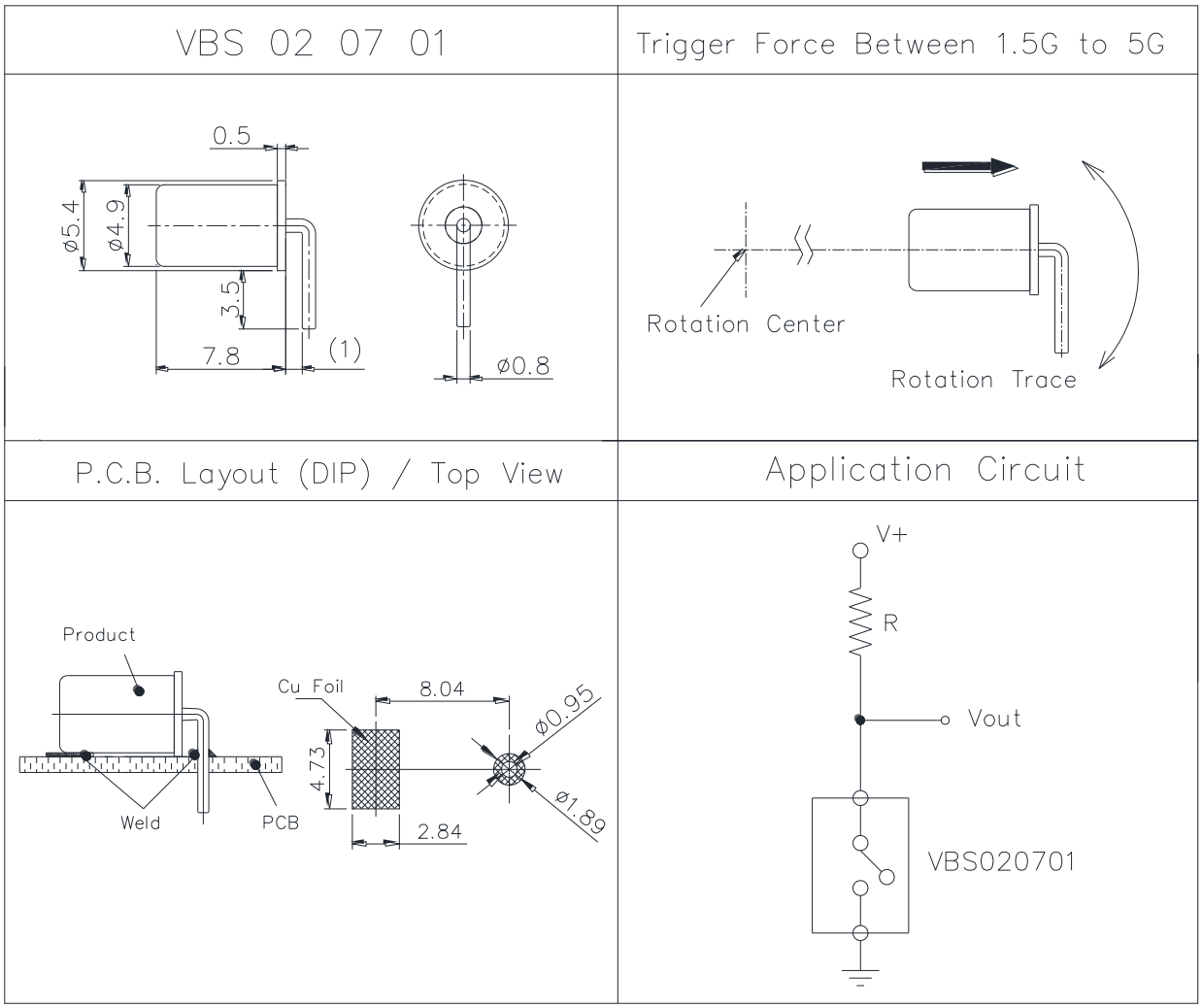

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Fig. 4

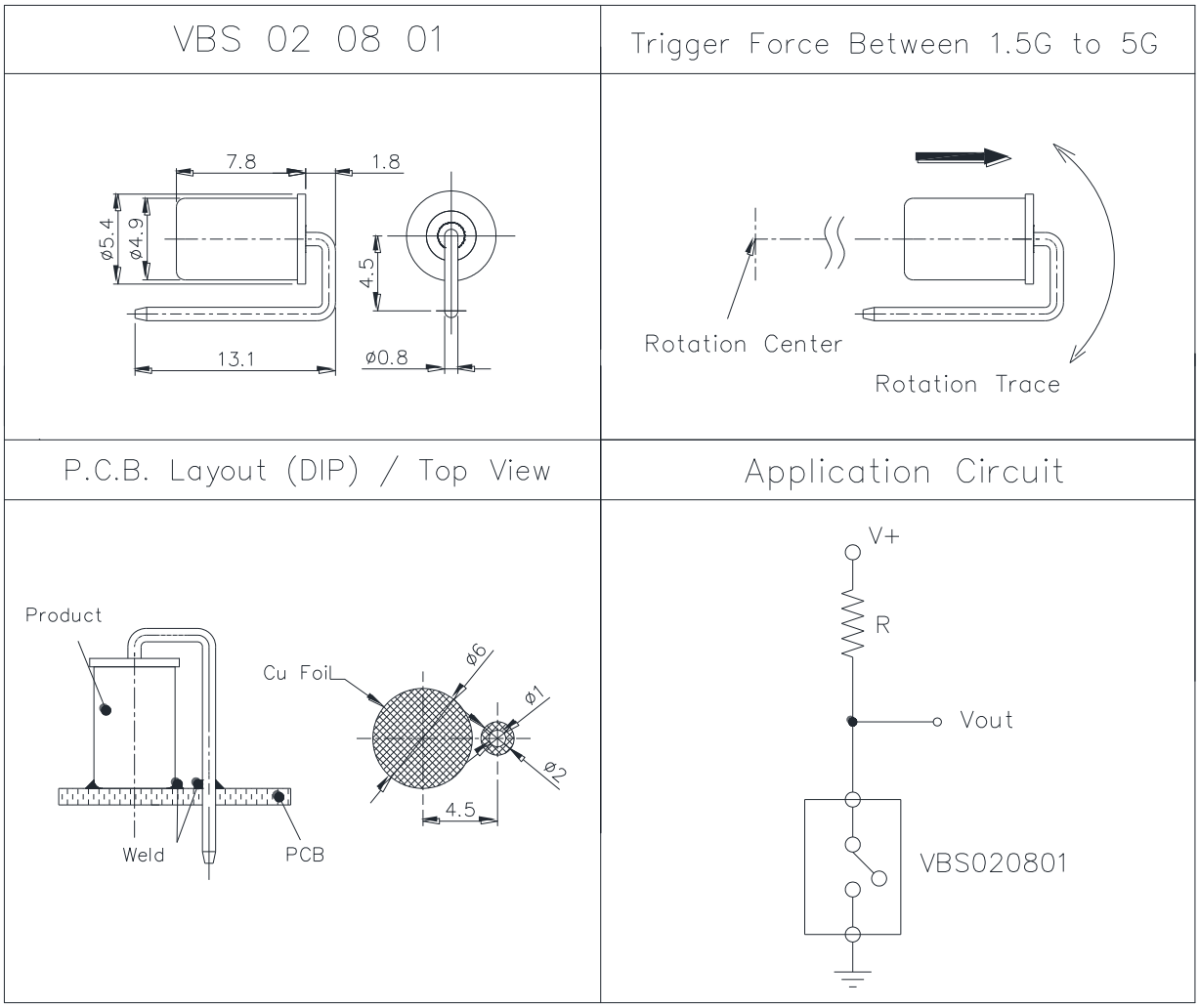

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Fig. 5

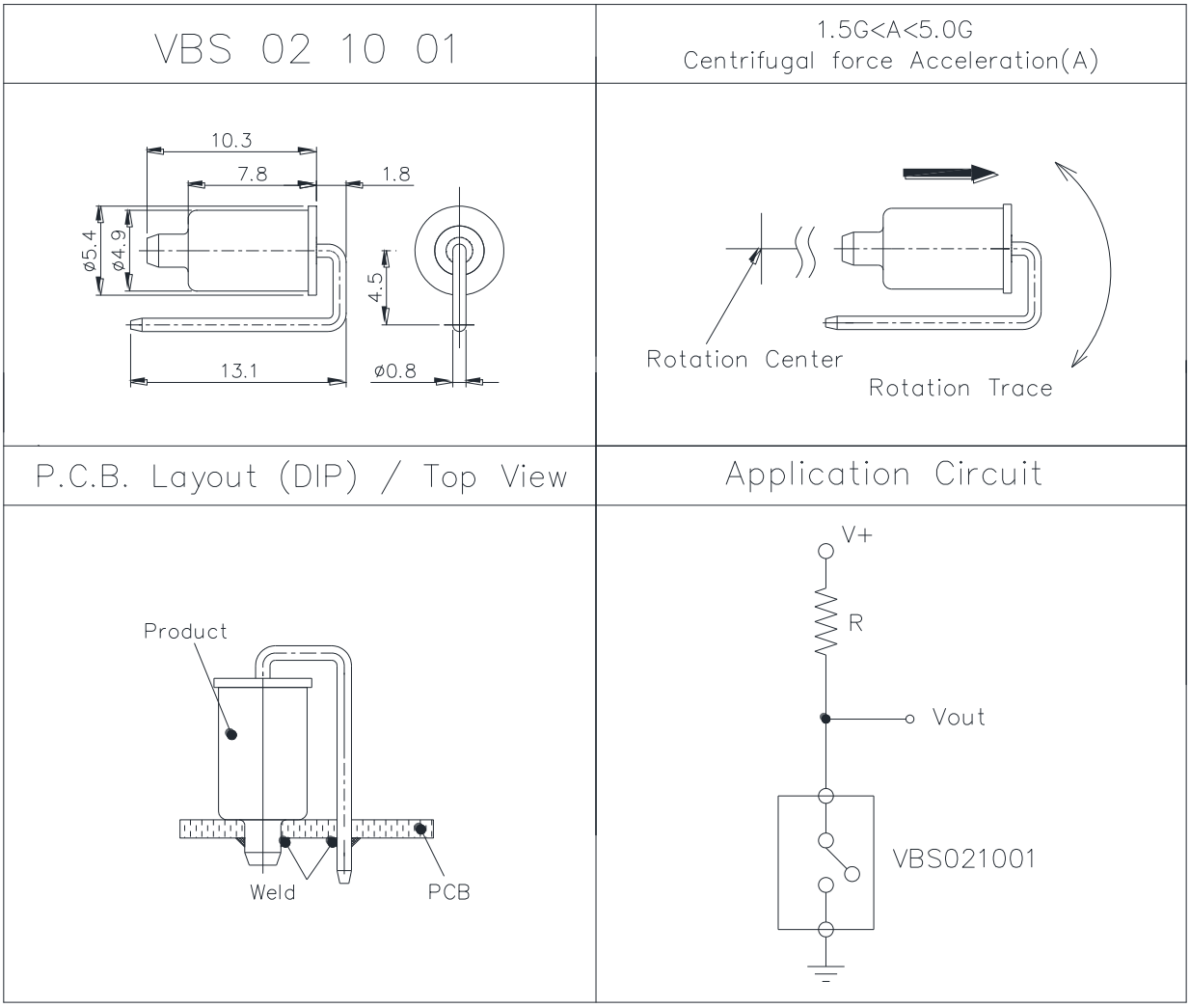

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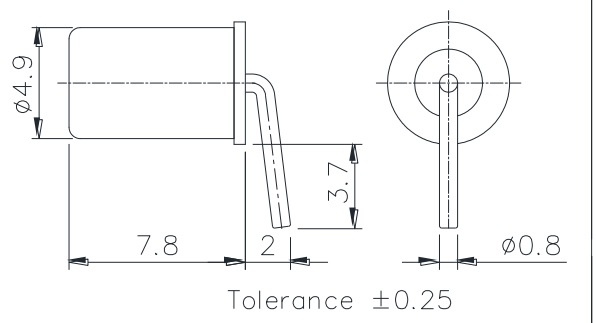
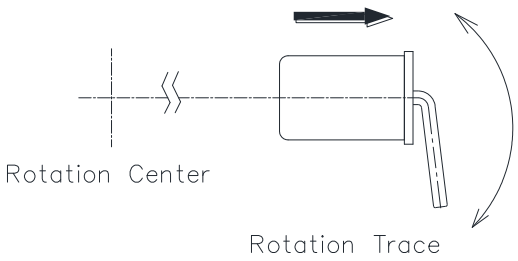
Fig. 6

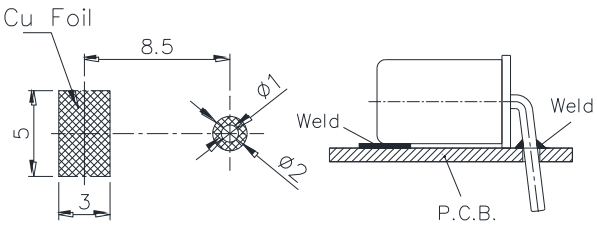
VBS 02 11 00



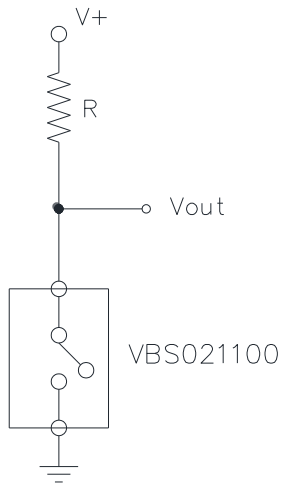
1.5G<A<5.0G
Centrifugal force Acceleration(A)



P.C.B. Layout (DIP) / Top View



Application Circuit



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● Current/Voltage Suggested

Input Current (mA)	Operating Voltage (V)	Condition
10	5	--

● ELECTRICAL CHARACTERISTICS

1.	Contact Rating	10 mA · 5 VDC
2.	Contact Resistance	10 Ω max.
3.	Angle Tolerance	Refer to Fig. 1~Fig. 6
4.	Insulation Resistance	1000 MΩ min. · 100 VDC
5.	Dielectric Strength	500 VDC min. · 1 minute
6.	Capacitance	5 pF max.

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● RELIABLE TEST ITEMS

Reliable Test for VBS02 Series

Test Item	Standard	Contents
IR Reflow	--	--
Operating Temperature VBS020701、VBS021001、VBS021100	MIL-STD-202G, TEST METHOD 107G, TEST A	-25°C~85°C
Operating Temperature VBS020601、VBS020691、VBS020801	MIL-STD-202G, TEST METHOD 107G, TEST A	-40°C~125°C
Storage Temperature VBS020701、VBS021001、VBS021100	MIL-STD-202G, TEST METHOD 107G, TEST A	-40℃~85℃
Storage Temperature VBS020601、VBS020691、VBS020801	MIL-STD-202G, TEST METHOD 107G, TEST A	-50℃~150℃
Humidity	MIL-STD-202G, TEST METHOD 103B	40℃/95%RH
Mechanical Life	--	2Hz, horizontal 1,000,000 times
Electrical Life	--	100,000 times

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● SOLDERING CONDITION

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

Condition / Operation Method	Soldering Temperature	Soldering Time	Wattage of Manual Soldering	Suitable Production Process
IR Reflow	Please refer to following < Table of classification Reflow profile > and Fig. 7		-	SMT
Wave Soldering	260±5℃	< 5 seconds max.	-	DIP
Manual Soldering	260±5℃	< 5 seconds max.	20W or Temperature-controlled manual soldering	DIP、SMT

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< Table of classification Reflow profile >

Item	Pb process	Pb free process
Pre-heat and Soak Temperature min.(Tsmin) Temperature max.(Tsmax) Time (Tsmin to Tsmax)(ts)	 100 °C 150 °C 60-120 seconds	 150 °C 200 °C 60-120 seconds
Average Rate of temperature rising up (Tsmax to Tp)	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 (Tp)*	230 °C ~235 °C *	255 °C ~260 °C *
Classification temperature(Tc)	235 °C	260 °C
Time(tp)** within 5 °C of the specified classification temperature (Tc)	20** seconds	30** seconds
Average ram-down Rate (Tp toTsmax)	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 (Tp) 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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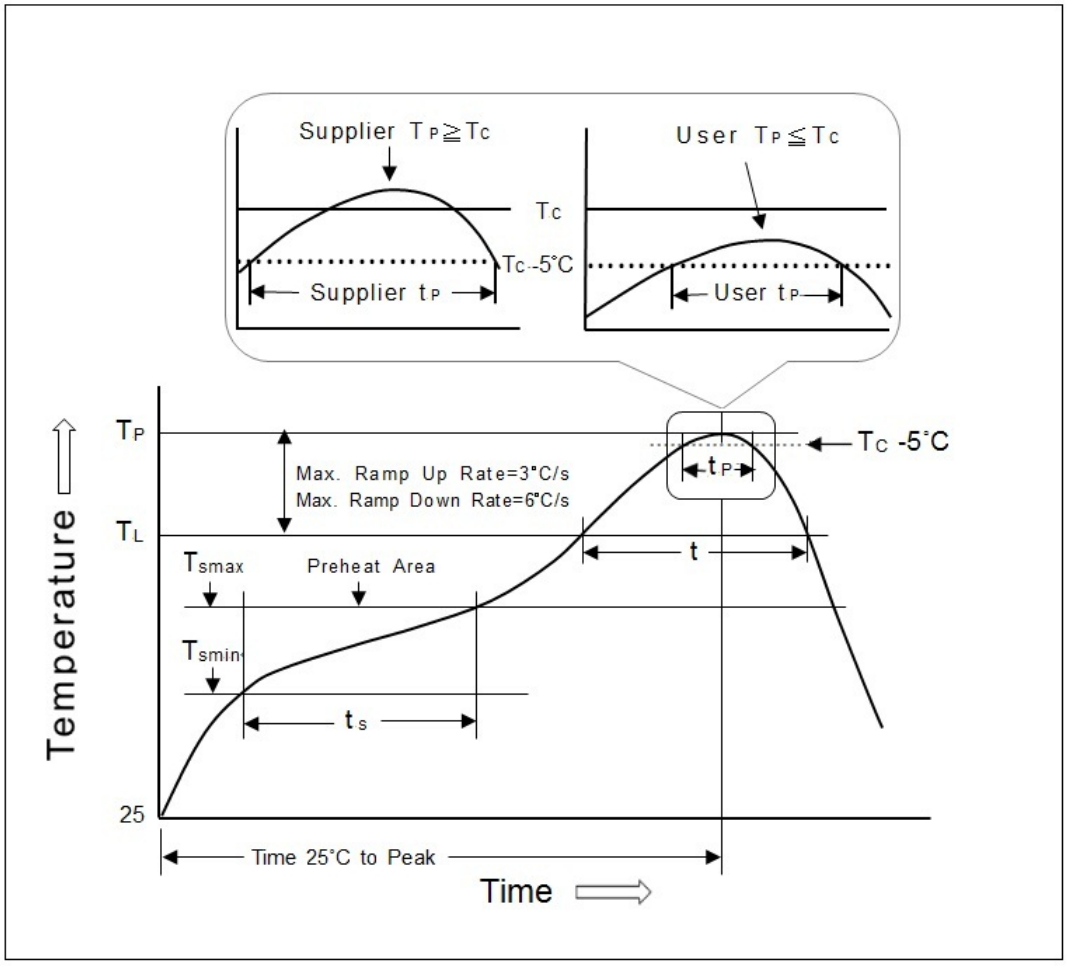
Fig. 7


Supplier TP≧TC
User TP≦TC
TC
TC -5°C
Supplier tP
User tP
TP
TL
Tsmax
Tsmin
Preheat Area
Max. Ramp Up Rate=3°C/s
Max. Ramp Down Rate=6°C/s
tP
t
ts
TC -5°C
25
Temperature
Time 25°C to Peak
Time

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● PACKAGE

	Part Number	Package	Quantity	Total Q'ty	Packing Dimension
1.	VBS020601 VBS020691 VBS020701 VBS020801 VBS021001 VBS021100	PE bag	1,000 pcs	1,000 pcs	12.7 x 17.8 (cm)
		Inner box	10 PE bags	10,000 pcs	36 x 20 x 9 (cm)
		Carton	3 Boxes	30,000 pcs	36 x 28 x 23 (cm)

※ Package shown as below for reference.

PE bag　　Inner box　　Carton

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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 products 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. If soldering temperature exceeds our specification, sensor switch could get apart.
5. Do not use switch in the environment of high humidity，because such an environment may cause the leakage current between the terminals.
6. More than the rated load may cause fire, so do not use more than the load.
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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