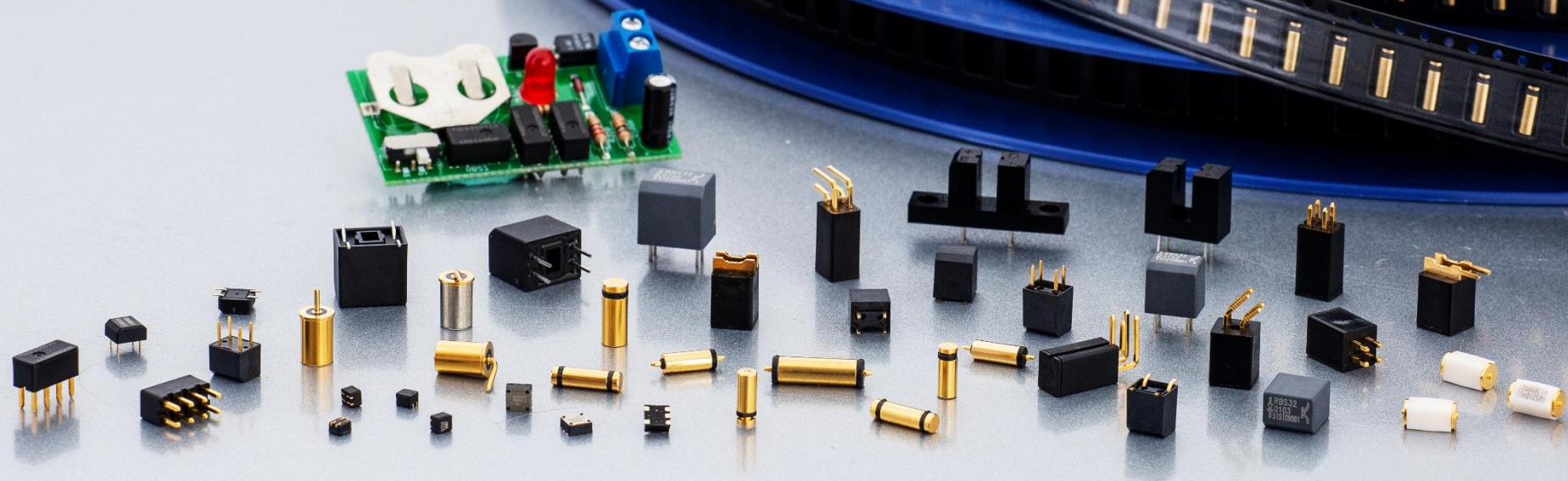
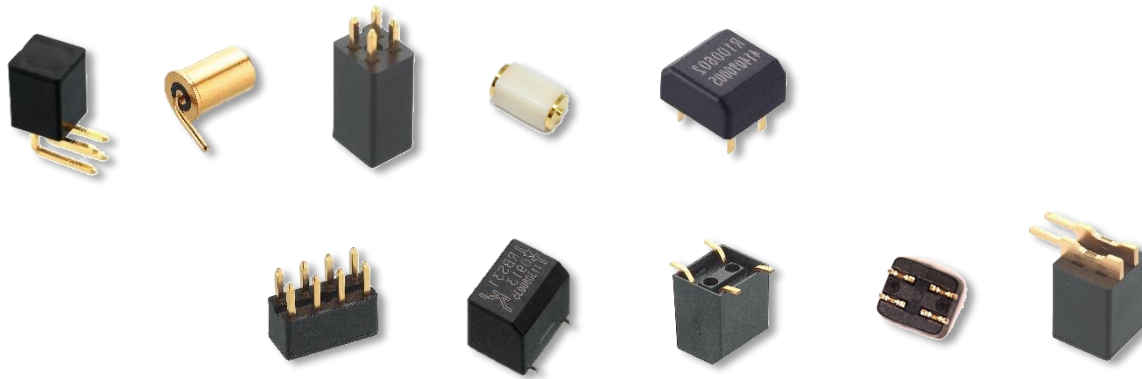


OncQue®

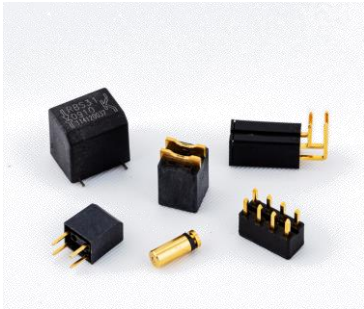


Roll Ball Sensor Switch

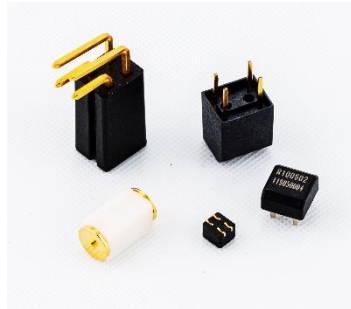
- Replacement for mercury switch
- Simple ON/OFF signal
- Easy for design
- Trigger function depends on how customer designs



Product Range



Tilt Detection



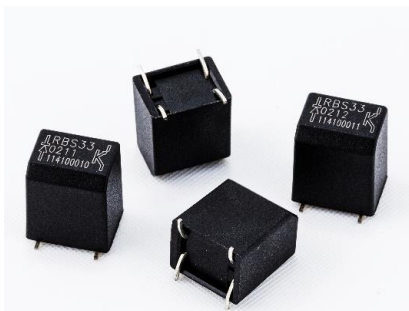
Vibration Detection



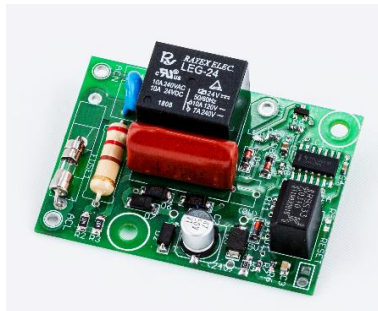
Rotation Detection



Centrifugal-force Detection



Optical Tilt Detection



Module Design

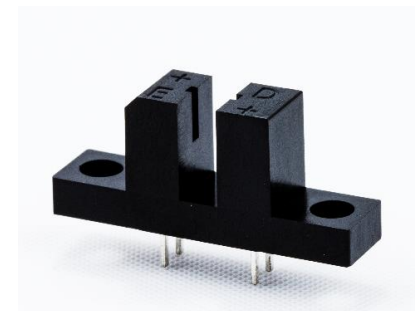
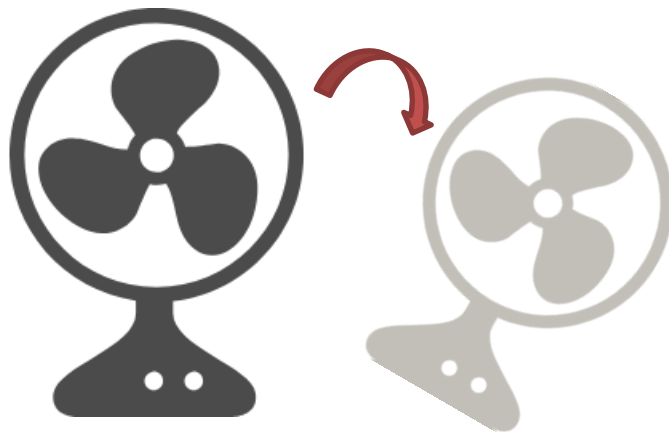


Photo Interrupter

Product Application

- **Automatically shut off**

For home appliance e.g. heater, air-purifier, dehumidifier, humidifier, fans, irons etc. While the angle changes (or not moving), the device will be turn off automatically to prevent danger.



ON

OFF



RBS050300, RBS070310, RBS070410, RBS310910T,
RBS311104, RBS311110, RBS330210T

While using



ON

After not moving for a while



OFF

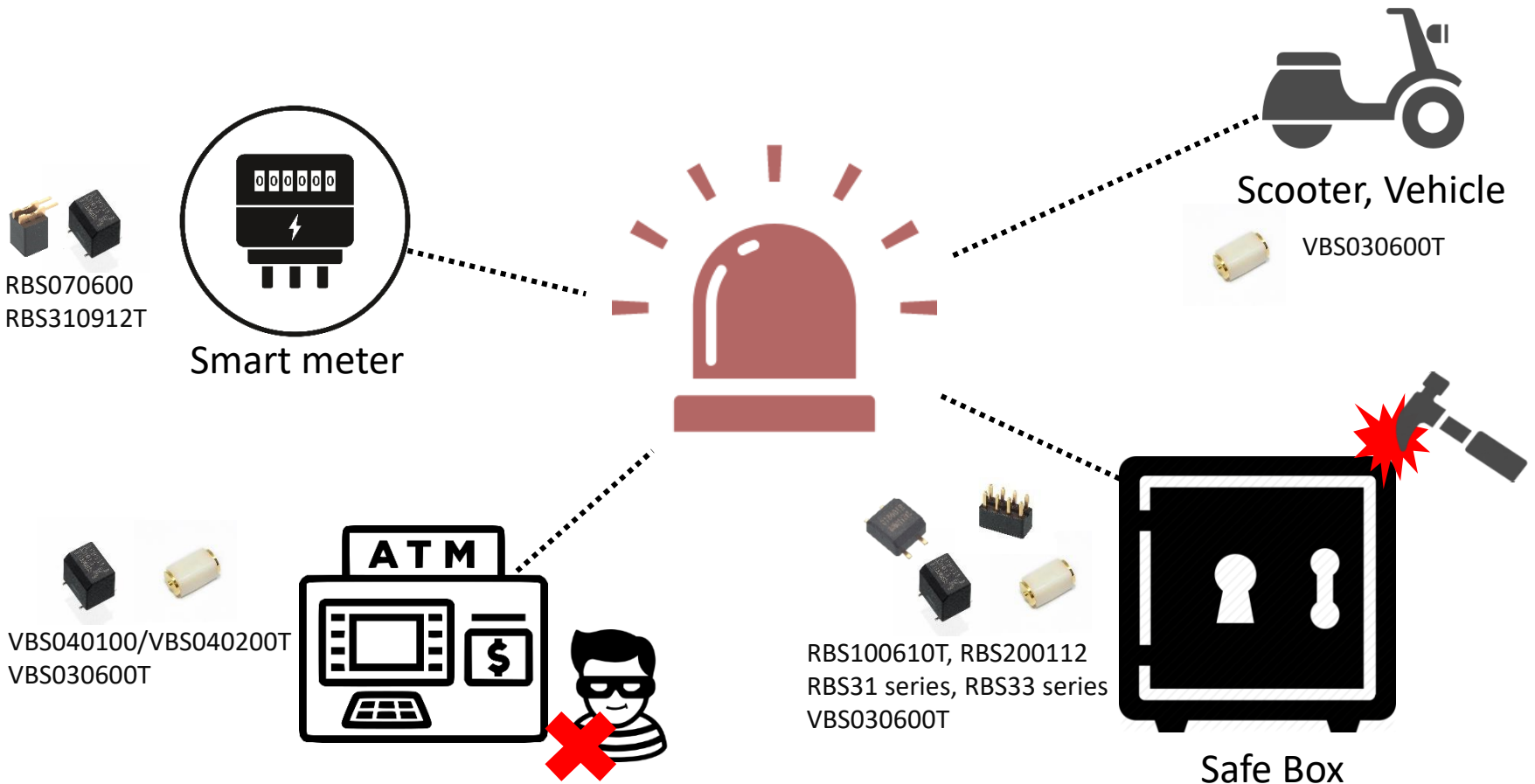


RBS020902

Product Application

- Anti-theft/Anti-tamper

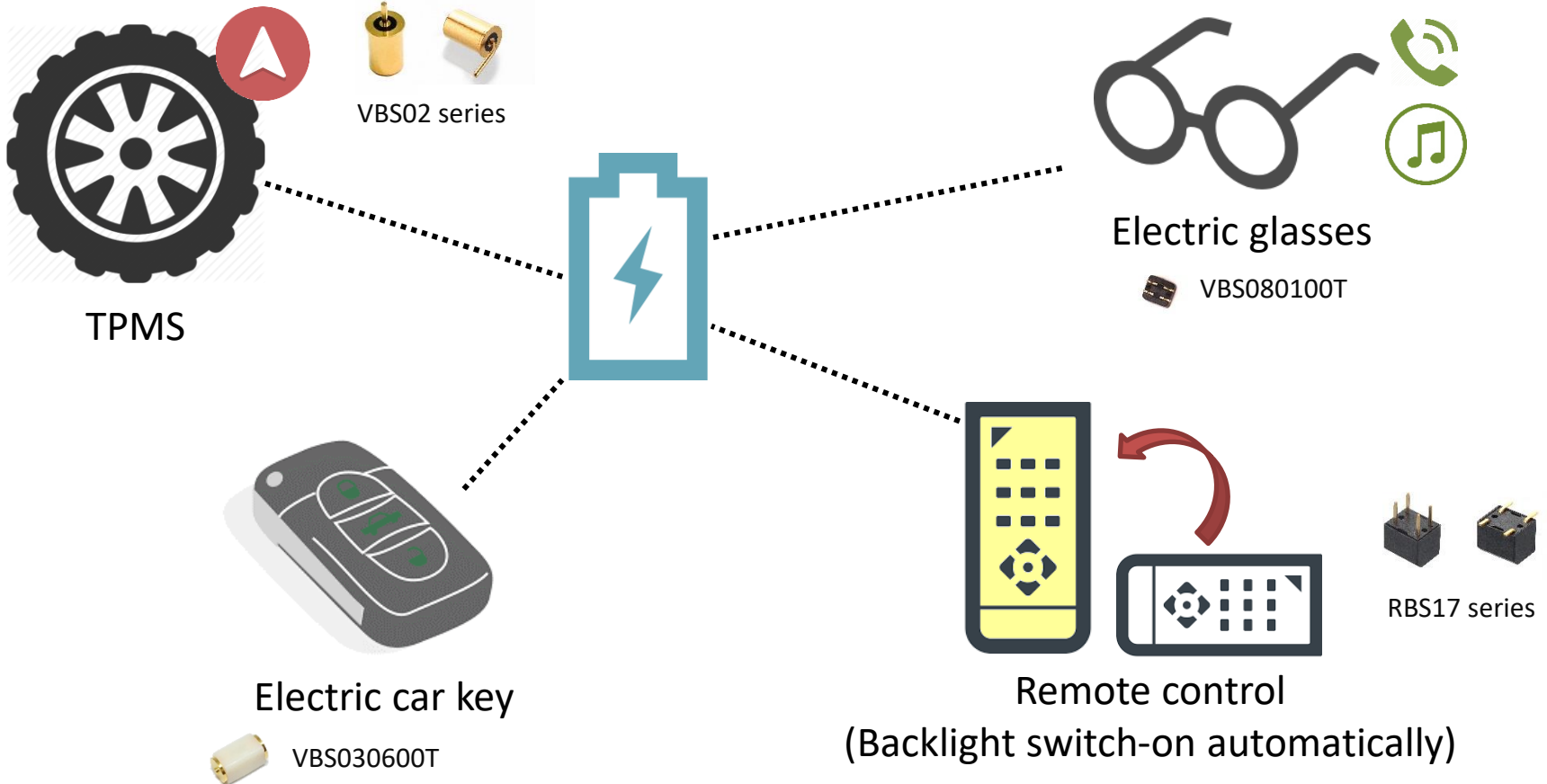
For safe box, ATM, vehicle/motorcycle/bike, smart meter, etc. When detecting vibration or shock, the alarm will be triggered, or send signal to server.



Product Application

- Power saving

For TPMS, GPS, remote controller, electric car key, bike accessories, etc. Detecting vibration, centrifugal force or angle changes in order to wake up the system.



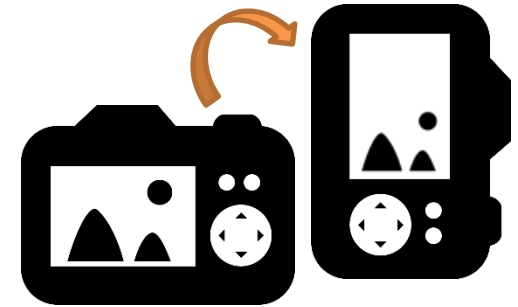
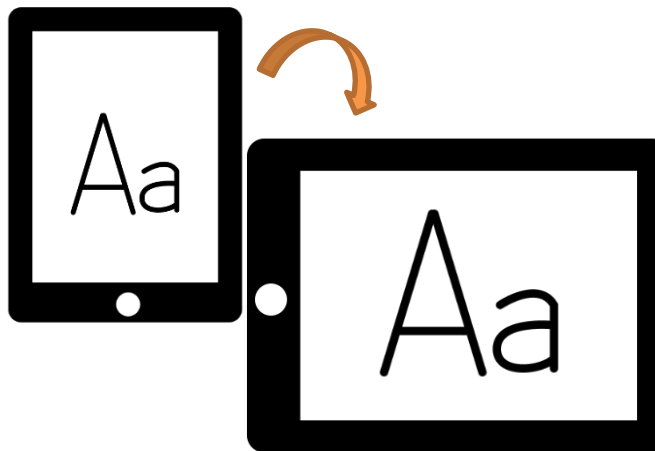
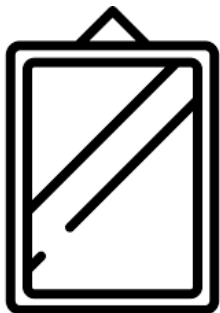
Product Application

- Screen rotation

For monitors, portable 3C products or smart mirror, etc.



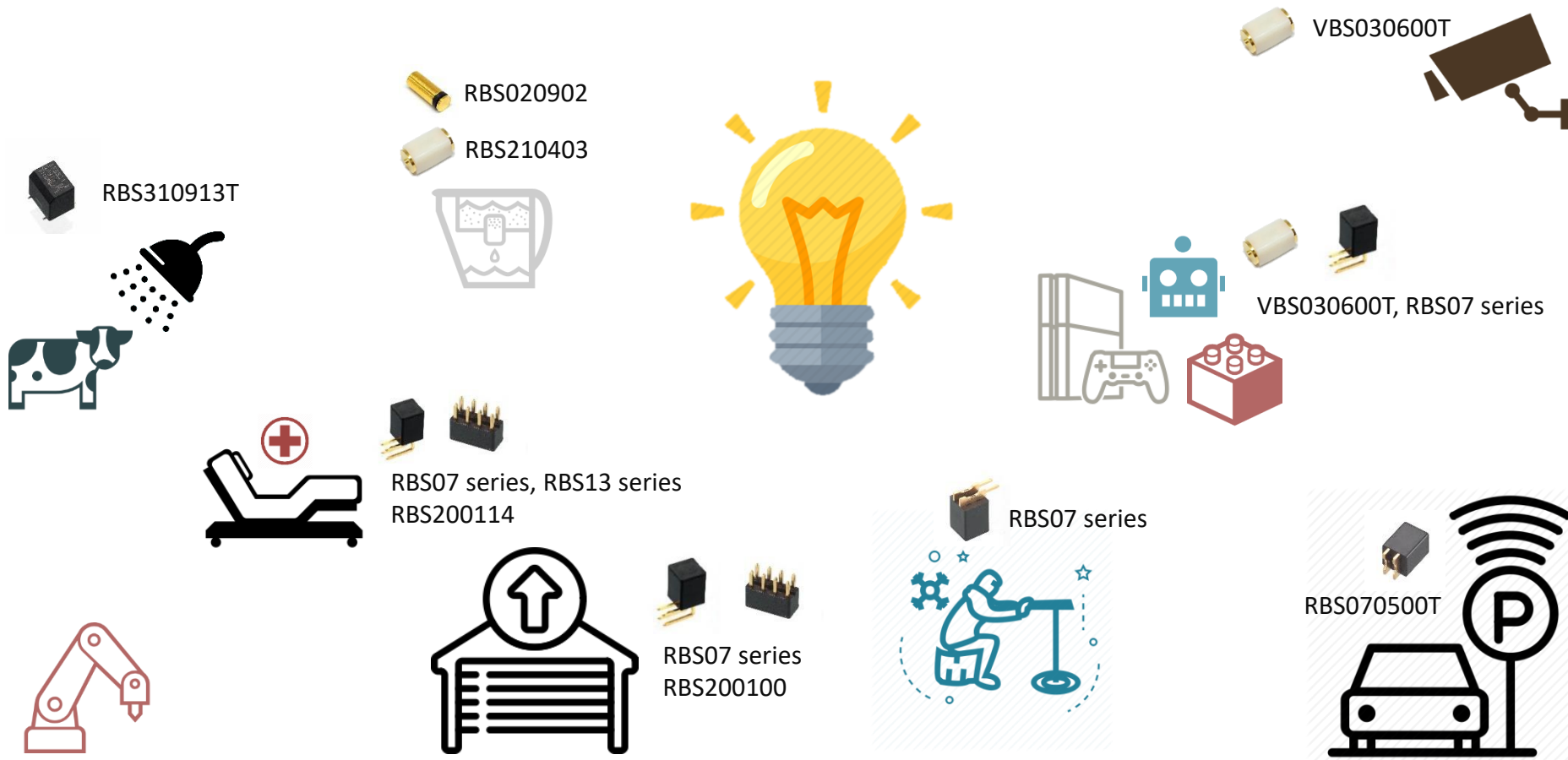
RBS13 series, RBS100601/RBS100611T, RBS350100T



Product Application

● Others

Smart parking system, Garage door open/close detecting, filter cartridge life-cycle detecting, smart fishing tackle, new animal husbandry equipment, LED Driver, toys, entertainment devices, heating pad, Medical bed, automation equipment, etc.



Design & Made in Taiwan!

Liability
Insurance

USD 5 million



Patent

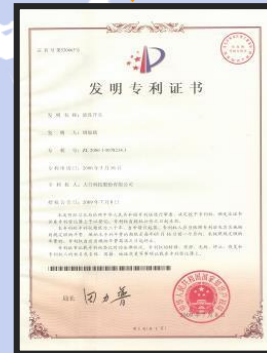
USA



Europe



China



Japan



Taiwan



Over 157 patents
including 149 patents of
Sensor Switch products

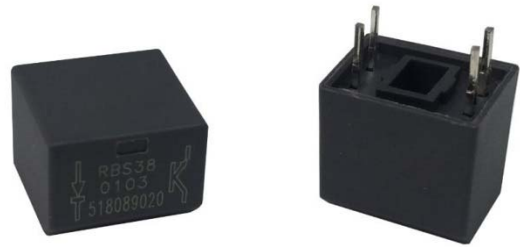


Tilt Sensor Switch

Item No.	RBS380103	Description	Photoelectric	Version	1
Page	1 of 9		Publish Date	Jan. 31, 2019	

● FUNCTIONS

1. Tilt Angles: 15° within a 360° radius
2. Suitable to vertical PCB
3. Vibration Detecting



● APPLICATIONS

1. Rotation detection for LCD monitor
2. Automatically shut off for home appliances
3. Automatically shut off for Sporting equipment
4. Automatically shut off for motorbike
5. Alarm system
6. Anti-theft / Anti-tamper devices
7. Being motion detection (personal locator)
8. Wake up systems for power saving, such like remote controllers
9. Earthquake Detecting



Tilt Sensor Switch

Item No.	RBS380103	Description	Photoelectric	Version	1
Page	2 of 9		Publish Date	Jan. 31, 2019	

● FEATURES

1. Housing made of high insulation plastic material, free from electric conduction and rust problem.
2. Detecting with photo transistors, generating highly reliable and stable signals.
3. All plastic materials subject to industrial purpose, resist high temperature and meet fireproof function.
4. Simple ON and OFF signals, easy for design.
5. RoHS compliance, an ideal substitute for mercury switch.
6. A more economical tilt and vibration detection option than IC design solution.
7. All made in Taiwan and examined before shipment.

● PATENTS

1. Taiwan Patent No. M 450817
2. Taiwan Patent No. M 529259
3. Taiwan Patent No. I 553684
4. Taiwan Patent No. I 359430
5. Taiwan Patent No. I 584326
6. Taiwan Patent No. I 451463
7. Europe Patent No. EP 2157591
8. U.S.A Patent No.US 9,863,802 B2
9. China Patent No. ZL 200820126206.9
10. China Patent No. ZL 201620373881.6
11. China Patent No. ZL 201220539712.7
12. Japan Patent No. 3148127

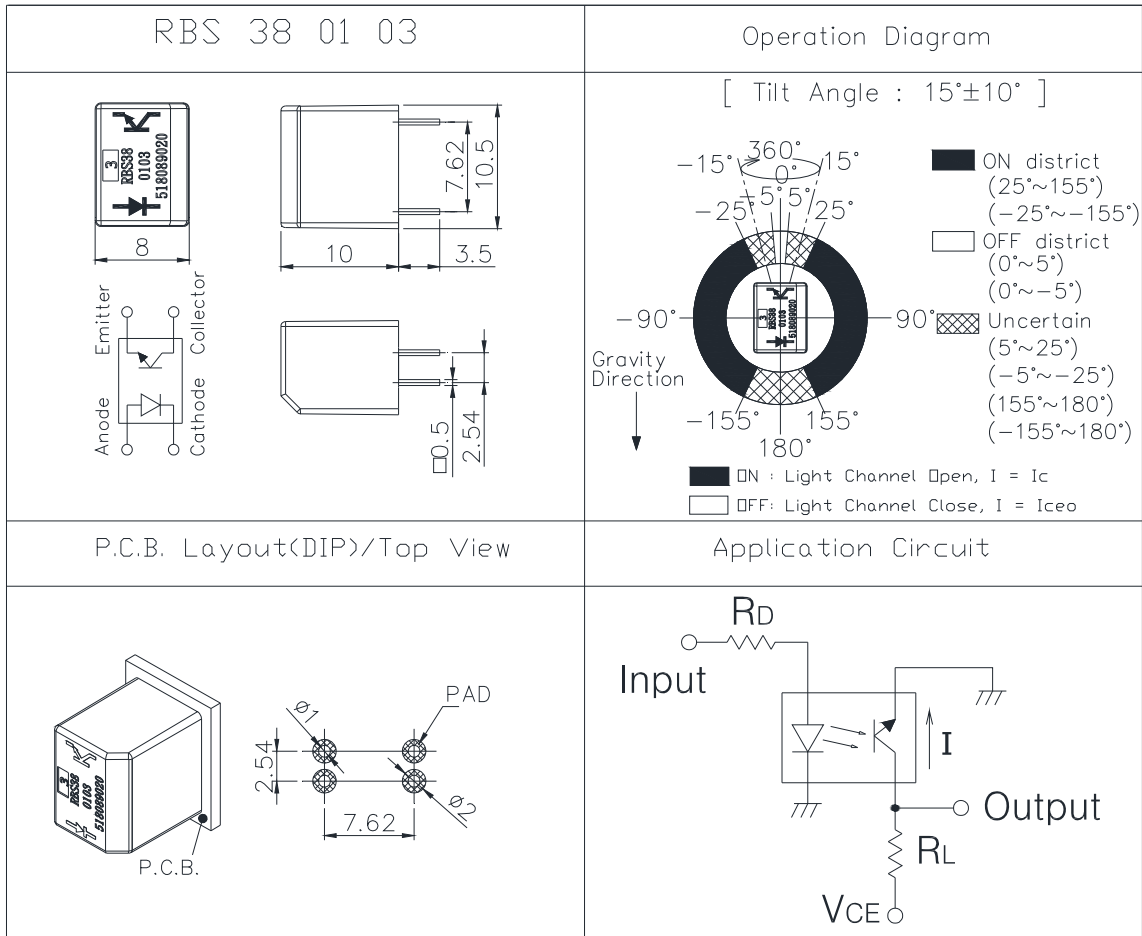


Tilt Sensor Switch

Item No.	RBS380103	Description	Photoelectric	Version	1
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● DIMENSIONS / OPERATION / P.C.B. LAYOUT (Unit: mm, Tolerance: ± 0.25 mm)

Fig. 1



Tilt Sensor Switch

Item No.	RBS380103	Description	Photoelectric	Version	1
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● Current/Voltage Suggested

Input Current (mA)	Operating Voltage (V)	Conditions
10	3.3	$V_{CE}=3.3V$ $R_D=200\text{ ohm}$ $R_L=75K\text{ ohm}$
10	5	$V_{CE}=5V$ $R_D=390\text{ ohm}$ $R_L=100K\text{ ohm}$

* Please refer to above Application Circuit for designing electrical circuit.

● Absolute Maximum Rating ($T_a=25^{\circ}C$)

Item		Symbol	Rating	Unit
Input	Power Dissipation	P_d	75	mW
	Reverse Voltage	V_R	5	V
	Forward Current	I_F	50	mA
	Peak Forward Current	I_{FP}	1	A
Output	Collector Power Dissipation	P_C	100	mW
	Collector Current	I_c	20	mA
	C-E Voltage	V_{CEO}	30	V
	E-C Voltage	V_{ECO}	5	V
Operating Temperature		T_{opr}	-25~+85	$^{\circ}C$
Storage Temperature		T_{stg}	-40~+85	$^{\circ}C$
Soldering Temperature (*1)		T_{sol}	260	$^{\circ}C$

(*1) t=5 Sec



Tilt Sensor Switch

Item No.	RBS380103	Description	Photoelectric	Version	1
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● Electrical Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	V_F	$I_F=20mA$	-	1.2	1.5	V
Reverse Current	I_R	$V_R=5V$	-	-	10	μA
Peak Wavelength	λ_p	$I_F=10mA$		940		nm
Dark Current	I_{ceo}	$V_{CE}=10V$	-	-	2	μA
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=0.25mA$ $I_F=20mA$	-	-	0.4	V
Light Current	I_C	$V_{CE}=5V$ $I_F=20mA$	0.5	5	-	mA
Rise Time	T_r	$I_C=0.8mA$ $V_{CC}=30V$	-	5	-	μsec
Fall Time	T_f	$R_L=1K\Omega$	-	5	-	μsec
Operation Diagram	θ	Fig.1	5	15	25	$^\circ$



Tilt Sensor Switch

Item No.	RBS380103	Description	Photoelectric	Version	1
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● Typical Electrical / Optical Characteristics Curves (Ta=25°C)

Fig.1 Power Dissipation vs. Ambient Temperature

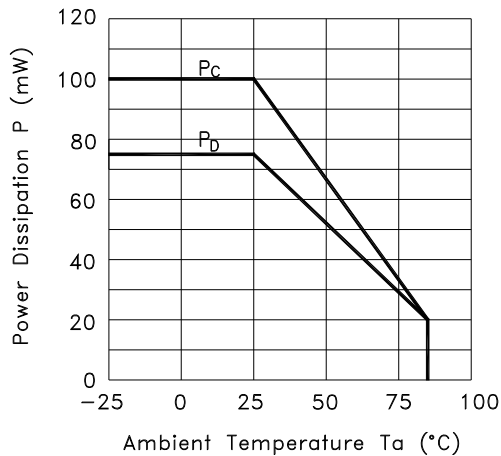


Fig.2 Forward Current vs. Forward Voltage

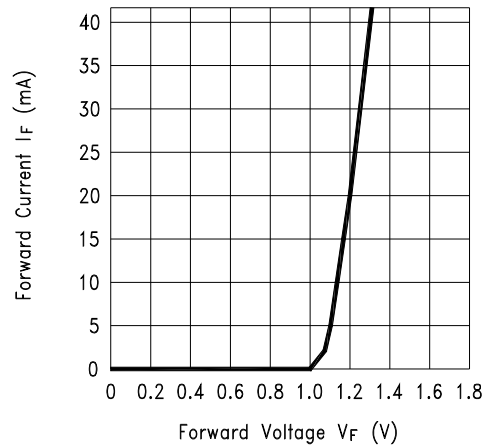


Fig.3 Collector Current vs. Collector-emitter Voltage

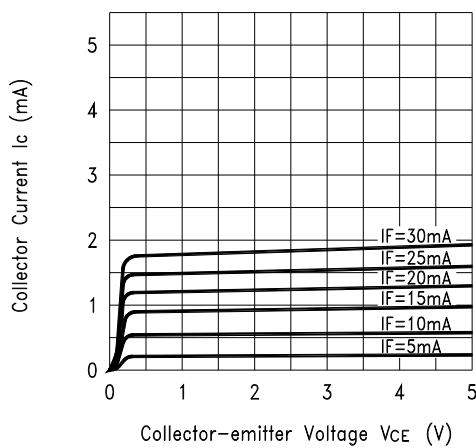
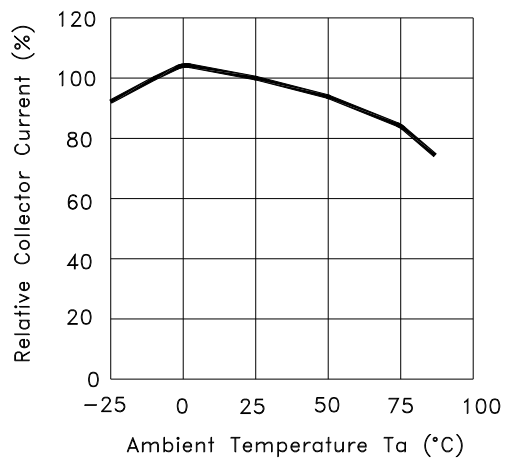


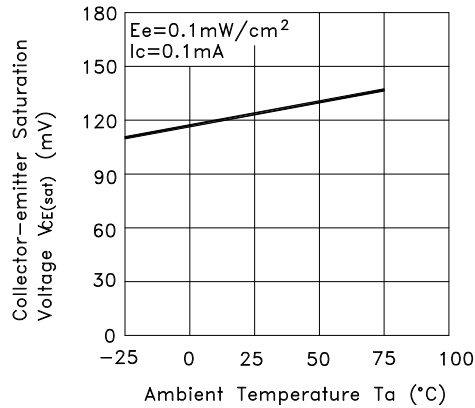
Fig.4 Collector Current vs. Ambient Temperature



Tilt Sensor Switch

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Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature



● RELIABLE TEST ITEMS

Reliable Test for RBS380103

	Test Item	Test Content
1	Operation Temperature	-25°C ~ 85°C
2	Storage Temperature	-40°C ~ 85°C
3	Humidity	40 °C / 95 %RH
4	Mechanical Life	2Hz, horizontal 1,000,000 times
5	Electrical Life	$I_F=20\text{ mA}$, $V_{CE}=5\text{ V}$ TIME: 30,000 hrs



Tilt Sensor Switch

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● SOLDERING CONDITION

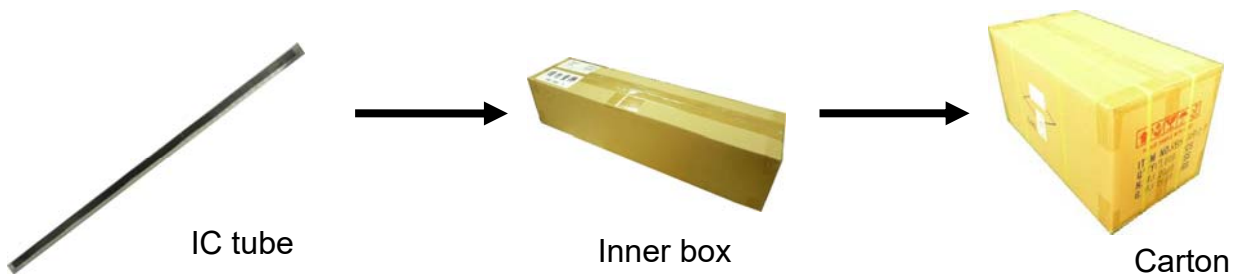
Following soldering conditions are for reference only, please use soldering information that solder paste manufacturer recommends.

Condition	Soldering Temperature	Soldering Time	Wattage of Manual Soldering	Type
Suitable Production Process				
Wave Soldering	260±5°C	< 5 seconds max.	-	DIP
Manual Soldering	300±5°C	< 3 seconds max.	30W or Temperature-controlled manual soldering	DIP

● PACKAGE

	Part Number	Package	Quantity	Total	Dimension(mm)
1.	RBS380103	IC tube	48 pcs	48 pcs	525L*10W*17.5H
		Inner box	84 tubes	4,032 pcs	539L*130W*130H
		Outer carton	4 boxes	16,128 pcs	551L*285W*288H

※ Package shown as below for reference.



Tilt Sensor Switch

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● NOTES

1. Suggestion for usage: For vibration usage or application, we suggest to add hysteresis for IC.
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.

● 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. 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.).
8. To prevent damaging IR and PT, please make electrostatic protective treatment, for example: wearing a conductive wrist strap or antistatic gloves during production process, and grounding machinery etc.

