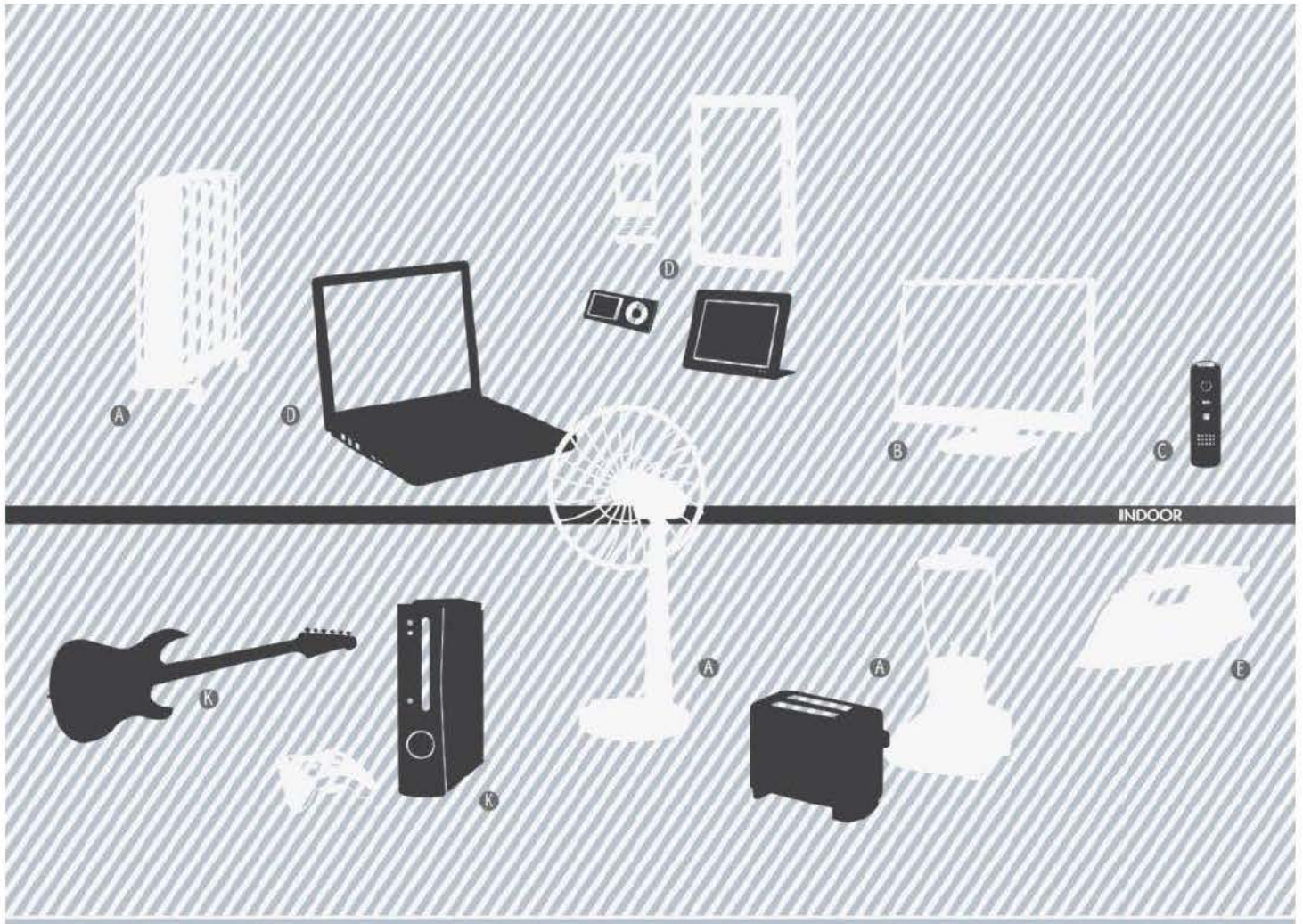


# OnQue Products



## Sensor Switches

Tilt/Vibration Detecting

**A**

**Safety Protection of Household Appliances (Tilt Power-Off), such as automatic power-off function for electric fan, electric heater, humidifier, air cleaner, toaster, blender, and so on.**

RBS07, RBS20, RBS31, RBS33



**B**

**Orientation Adjustment of LCD Monitor (to landscape/portrait)**

RBS13, RBS20, RBS31, RBS3201,



RBS35







**C**

**Tilt Detection of the Remote Control**

RBS12, RBS13, RBS17, RBS20



**D**

**Rotation Detection of The Portable 3C Products, such as digital cameras, cell phones, MP3, e-books**

RBS02, RBS07, RBS12, RBS20,



RBS35



**E**

**Iron**

RBS04, RBS3201



**F**

**Earthquake Detection to Power-Off Gas**

RBS20, RBS31, RBS33, VBS06,



VBS07



**G**

**Step Counter**

RBS02, VBS02



**H**

**Wheelchair Tilt Detection**

RBS07, RBS20, RBS31, RBS33



**I**

**Home Security Systems**

RBS20, RBS31, RBS33, VBS01,



VBS02, VBS04, VBS06, VBS07



**J**

**Anti-theft Function for Security Cameras**

RBS07, RBS20, RBS31, RBS33,



VBS04



**K**

**Entertainment devices, such as video game consoles, toys.**

RBS04, RBS07, RBS12, RBS13,



RBS15, RBS20, RBS35, VBS01



**L**

**Motorcycle Tilt Detection & Theft Detection (Tilt Power-Off)**

RBS3201, RBS31, RBS33



**M**

**Bicycle Lighting Systems**

RBS20, VBS01,



**N**

**Meter Tampering and Theft Detection**

RBS20, RBS31



# Tilt Sensor Switch



*RBS 02*

*RBS 04*

Dimensions  
(without terminals)

various types  
(7.8~13.6) ×  $\phi$  3~4  
(mm)

11 × 6 × 5 (mm)

Functions

Horizontal Tilt Detection  
Vertical Rotation Detection  
Shock Detection

Horizontal Tilt Detection

Normal Open/Close

—

—

Contact Rating

10mA · 5VDC

10mA · 5VDC

Contact Resistance

10Ω max.

10Ω max.

Operating Temperature Range

-25°C to +85°C

-25°C to +85°C

Storage Temperature Range

-40°C to +85°C

-40°C to +85°C

Pull Force of Terminal

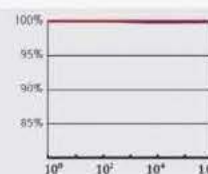
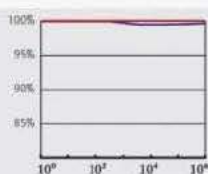
500gf for one minute

500gf for one minute

Curve of Operation Life



→ AVG of Open  
→ AVG of Close



Humidity

95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

Solder Ability

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

Reflow Soldering Heat  
for SMT Type

Reflow zone 260 ± 5°C  
for 20 ± 0.5 seconds max.

—

Solder Type

SMD

DIP

Package

Bulk, Reel

Bulk

Patents

Taiwan

Taiwan, U.S.A.



*RBS 06*

*RBS 07*

*RBS 12*

12.5 × 5 × 5 (mm)

8.5 × 6.5 × 6.5 (mm)

5 × 5 × 4.05 (mm)

Horizontal Tilt Detection  
Up-side Down Detection

45° Tilt Detection within  
a 360° Radius  
Up-side Down Detection

Rotation Detection  
Tilt Detection

—

NC

NC

10mA, 5VDC

10mA, 5VDC

10mA, 5VDC

100Ω max.

10Ω max.

10Ω max.

-25°C to +85°C

-25°C to +85°C

-25°C to +85°C

-40°C to +85°C

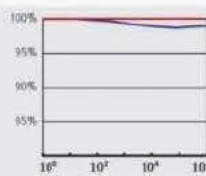
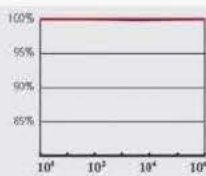
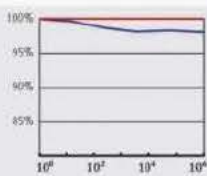
-40°C to +85°C

-40°C to +85°C

500gf for one minute

500gf for one minute

500gf for one minute



95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

After flux 245 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

—

—

Reflow zone 260 ± 5°C for  
20 ± 0.5 seconds max.

DIP

DIP

SMD

Bulk

Bulk

Reel

Taiwan

Taiwan, U.S.A., China

Taiwan, U.S.A., China



## Tilt Sensor Switch



RBS 13

RBS 15

Dimensions  
(without terminals)

8.5 × 6.5 × 6.5 (mm)

7 × 6 × 5 (mm)

Functions

Rotation Detection

One Way 15° Tilt Detection

Tilt Detection

Omni-directional Vibration Detection

Normal Open/Close

NC

NO

Contact Rating

10mA, 5VDC

10mA, 5VDC

Contact Resistance

10Ω max.

10Ω max.

Operating Temperature Range

-25°C to +85°C

-25°C to +85°C

Storage Temperature Range

-40°C to +85°C

-40°C to +85°C

Pull Force of Terminal

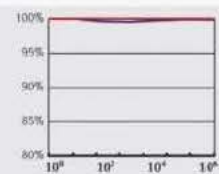
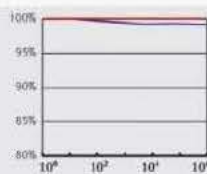
500gf for one minute

500gf for one minute

Curve of Operation Life



AVG of Open  
AVG of Close



Humidity

95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

Solder Ability

After flux 260 ± 5°C for 5 ± 0.5 seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5 seconds, 95% coverage

Reflow Soldering Heat for SMT Type

—

Reflow zone 260 ± 5°C for 20 ± 0.5 seconds max.

Solder Type

DIP

DIP, SMD

Package

Bulk

IC Tube, Reel

Patents

Taiwan, U.S.A., China

Taiwan, U.S.A.

# Centrifugal Force Sensor Switch



**RBS 17**

6 × 5 × 5 (mm)

**RBS 20**

9.58 × 4.5 × 4.5 (mm)

**VBS 02**

7.8 × 5.4 × 4.9 (mm)

**One Way 15° Tilt Detection**

**45° Tilt Detection within a  
360° Radius  
/Rotation Detection**

**Single Axis Vibration Detection  
Centrifugal Force Detection**

NO

NO / NC

NO

10mA · 5VDC

10mA, 5VDC

10mA · 5VDC

100Ω max.

—

-25°C to +85°C

-25°C to +85°C

-25°C to +85°C

-40°C to +85°C

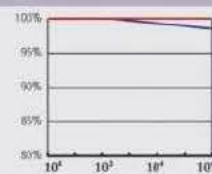
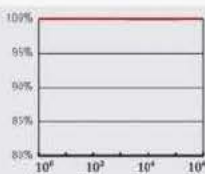
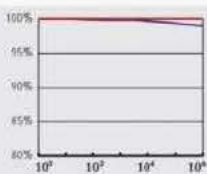
-40°C to +85°C

-40°C to +85°C

500gf for one minute

500gf for one minute

500gf for one minute



95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

Reflow zone 260 ± 5°C for  
20 ± 0.5 seconds max.

—

—

DIP, SMD

DIP

DIP

IC Tube, Reel

Bulk

Bulk

Taiwan, U.S.A.

Taiwan, U.S.A., China

Taiwan, U.S.A., China

# Vibration Sensor Switch



**VBS 01**

**Dimensions**  
(without terminals)

12.5 × 5 × 5 (mm)

**Functions**

**Two Axes Vibration Detection**

**Normal Open/Close**

NO

**Contact Rating**

10mA, 5VDC

**Contact Resistance**

—

**Operating Temperature Range**

-25°C to +85°C

**Storage Temperature Range**

-40°C to +85°C

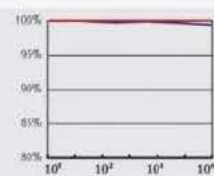
**Pull Force of Terminal**

500gf for one minute

**Curve of Operation Life**



◆ AVG of Open  
◆ AVG of Close



**Humidity**

95% RH, 40°C for 96 hours

**Solder Ability**

After flux 245 ± 5°C for 5 ± 0.5 seconds, 95% coverage

**Reflow Soldering Heat for SMT Type**

—

**Solder Type**

DIP

**Package**

Bulk

**Patents**

Taiwan, U.S.A., China

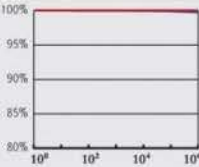
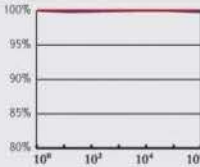
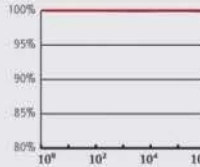


VBS 0302

VBS 06

12.5 × 5 × 5 (mm)

7 × 6 × 5 (mm)

Omni-directional Vibration Detection	Omni-directional Vibration Detection	Omni-directional Vibration Detection
NC	NC	NC
10mA, 5VDC	10mA, 5VDC	10mA, 5VDC
—	—	—
-25°C to +85°C	-25°C to +85°C	-25°C to +85°C
-40°C to +85°C	-40°C to +85°C	-40°C to +85°C
500gf for one minute	500gf for one minute	500gf for one minute
		
95% RH, 40°C for 96 hours	95% RH, 40°C for 96 hours	95% RH, 40°C for 96 hours
After flux 245 ± 5°C for 5 ± 0.5 seconds, 95% coverage	After flux 260 ± 5°C for 5 ± 0.5 seconds, 95% coverage	After flux 260 ± 5°C for 5 ± 0.5 seconds, 95% coverage
—	Reflow zone 260 ± 5°C for 20 ± 0.5 seconds max.	Reflow zone 260 ± 5°C for 20 ± 0.5 seconds max.
DIP	SMD	DIP, SMD
Bulk	Bulk	IC Tube, Reel
Taiwan, U.S.A., China	Taiwan, U.S.A., China	Taiwan, U.S.A.



# Optical Sensor Switch

## Tilt & Vibration



**RBS 3109**

**RBS 3110**

Dimensions (without terminals)	10 × 10 × 8 (mm)	10 × 10 × 8 (mm)
Functions	15°, 20°, 30°, 45° Tilt Detection within a 360° Radius /Slight Vibration Detection	15°, 20°, 30°, 45° Tilt Detection within a 360° Radius /Slight Vibration Detection
Normal Open/Close (Hi/Lo)	Normal Lo ( For Vertical PCB )	Normal Lo ( For Vertical PCB )
Absolute Maximum Rating	Pd=75mW, If=50mA, Vr=5V, Pc=100mW, Ic=20mA, Vceo=30V, Veco=5V	Pd=75mW, If=50mA, Vr=5V, Pc=100mW, Ic=20mA, Vceo=30V, Veco=5V
Operating Temperature Range	-25°C to +85°C	-25°C to +85°C
Storage Temperature Range	-40°C to +85°C	-40°C to +85°C
Pull Force of The Terminal	500gf for one minute	500gf for one minute
Curve of Operation Life		
Humidity	95% RH, 40°C for 96 hours	95% RH, 40°C for 96 hours
Solder Ability	After flux 260 ± 5°C for 5 ± 0.5 seconds, 95% coverage	After flux 260 ± 5°C for 5 ± 0.5 seconds, 95% coverage
Reflow Soldering Heat for SMT Type	Reflow zone 260 ± 5°C for 20 ± 0.5 seconds max.	—
Solder Type	SMD	DIP
Package	Reel	Bulk, IC Tube
Patents	Taiwan, U.S.A., China	Taiwan, U.S.A., China



**RBS 3201**

**RBS 3302**

**RBS3303**

8 × 7.4 × 6 (mm)

12 × 10.6 × 8.05 (mm)

12 × 10.6 × 8.05 (mm)

Horizontal Tilt Detection (One Way & Two Way)  
Vertical Rotation Detection  
Up-side Down Detection

15°, 20°, 30°, 45° Tilt Detection  
within a 360° Radius  
Slight Vibration Detection

15°, 20°, 30°, 45° Tilt Detection  
within a 360° Radius  
Slight Vibration Detection

—

Normal Lo ( For Vertical PCB )

Normal Lo ( For Vertical PCB )

Pd=75mW, If=50mA, Vr=5V,  
Pc=100mW, Ic=20mA,  
Vceo=30V, Veco=5V

Pd=75mW, If=50mA, Vr=5V,  
Pc=100mW, Ic=20mA,  
Vceo=30V, Veco=5V

Pd=75mW, If=50mA, Vr=5V,  
Pc=100mW, Ic=20mA,  
Vceo=30V, Veco=5V

-25°C to +85°C

-25°C to +85°C

-25°C to +85°C

-40°C to +85°C

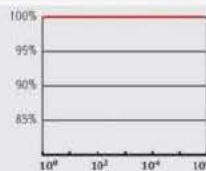
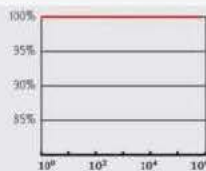
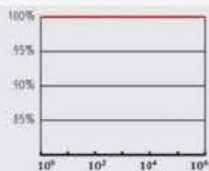
-40°C to +85°C

-40°C to +85°C

500gf for one minute

500gf for one minute

500gf for one minute



95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

—

Reflow zone 260 ± 5°C for  
20 ± 0.5 seconds max.

—

DIP

SMD

DIP

Bulk, IC Tube

Reel

Bulk, IC Tube

Taiwan, U.S.A., China

Taiwan, U.S.A., China

Taiwan, U.S.A., China

# Optical Sensor Switch

Tilt & Vibration



**VBS 04**

**VBS 07**

Dimensions  
(without terminals)

10.5 × 10 × 8 (mm)

5.9 × 4 × 1.7 (mm)

Functions

Omni-directional Vibration Detection

Omni-directional Vibration Detection

Normal Open/Close (Hi/Lo)

—

—

Absolute Maximum Rating

$P_d=75\text{mW}$ ,  $I_f=50\text{mA}$ ,  $V_r=5\text{V}$ ,  
 $P_c=100\text{mW}$ ,  $I_c=20\text{mA}$ ,  
 $V_{ce0}=30\text{V}$ ,  $V_{eco}=5\text{V}$

$P_d=75\text{mW}$ ,  $I_f=50\text{mA}$ ,  $V_r=5\text{V}$ ,  
 $P_c=100\text{mW}$ ,  $I_c=20\text{mA}$ ,  
 $V_{ce0}=30\text{V}$ ,  $V_{eco}=5\text{V}$

Operating Temperature Range

-25°C to +85°C

-25°C to +85°C

Storage Temperature Range

-40°C to +85°C

-40°C to +85°C

Pull Force of the Terminal

500gf for one minute

500gf for one minute

Humidity

95% RH, 40°C for 96 hours

95% RH, 40°C for 96 hours

Solder Ability

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

After flux 260 ± 5°C for 5 ± 0.5  
seconds, 95% coverage

Reflow Soldering Heat  
for SMT Type

—

Reflow zone 260 ± 5°C for  
20 ± 0.5 seconds max.

Solder Type

DIP

SMD

Package

Bulk, IC Tube

Reel

Patents

Taiwan, U.S.A., China

Taiwan, U.S.A., China





### RBS 3501

4.0 × 3.8 × 1.8(mm)

**Tiny**

Rotation Detection

Tilt Detection

Applying to RBS31, RBS32, RBS33, RBS35, VBS04, and VBS07.

### Electro-Optical Characteristics (Ta=25°C)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Forward Voltage	$V_f$	$I_f=20mA$	—	—	1.5	V
Reverse Current	$I_R$	$V_R=5V$	—	—	10	$\mu A$
Peak Wavelength	$\lambda_p$	$I_f=10mA$		940		nm
Dark Current	$I_D$	$V_{CE}=10V$	—	—	2	$\mu A$
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=0.25mA$ $I_f=20mA$	—	—	0.4	V
Light Current	$I_L$	$V_{CE}=5V$ $I_f=20mA$	0.5	5	—	mA
Rise Time	$T_r$	$I_C=0.8mA$ $V_{CE}=30V$	—	5	—	$\mu sec$
Fall Time	$T_f$	$R_L=1K\Omega$	—	5	—	$\mu sec$

— (For Vertical PCB)

$P_d=75mW$ ,  $I_f=50mA$ ,  $V_R=5V$ ,  
 $P_c=100mW$ ,  $I_c=20mA$ ,  
 $V_{ceo}=30V$ ,  $V_{eco}=5V$

-25°C to +85°C

-40°C to +85°C

—

95% RH, 40°C for 96 hours

After flux  $260 \pm 5^\circ C$  for  $5 \pm 0.5$   
seconds, 95% coverage

Reflow zone  $260 \pm 5^\circ C$   
for  $20 \pm 0.5$  seconds max.

SMD

Reel

Under application