

### Tilt Sensor Switch

Item No.	RBS330310	Description	Photoelectric	Version	14
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● **FUNCTION**

1. Tilt Angles: 45° within a 360° radius.
2. Suitable for horizontal PCB.
3. Vibration Detecting



● **APPLICATIONS**

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

● **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.



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## ● PATENTS

1. Taiwan Patent No. I 310952
2. Taiwan Patent No. M 450817
3. Japan Patent No. 4384217
4. Japan Patent No. 3148127
5. U.S.A. Patent No. US 6,800,841 B1
6. U.S.A. Patent No. US 7,402,791 B2
7. China Patent No. ZL 200610083013.5
8. China Patent No. ZL 200820126206.9
9. China Patent No. ZL 201220539712.7

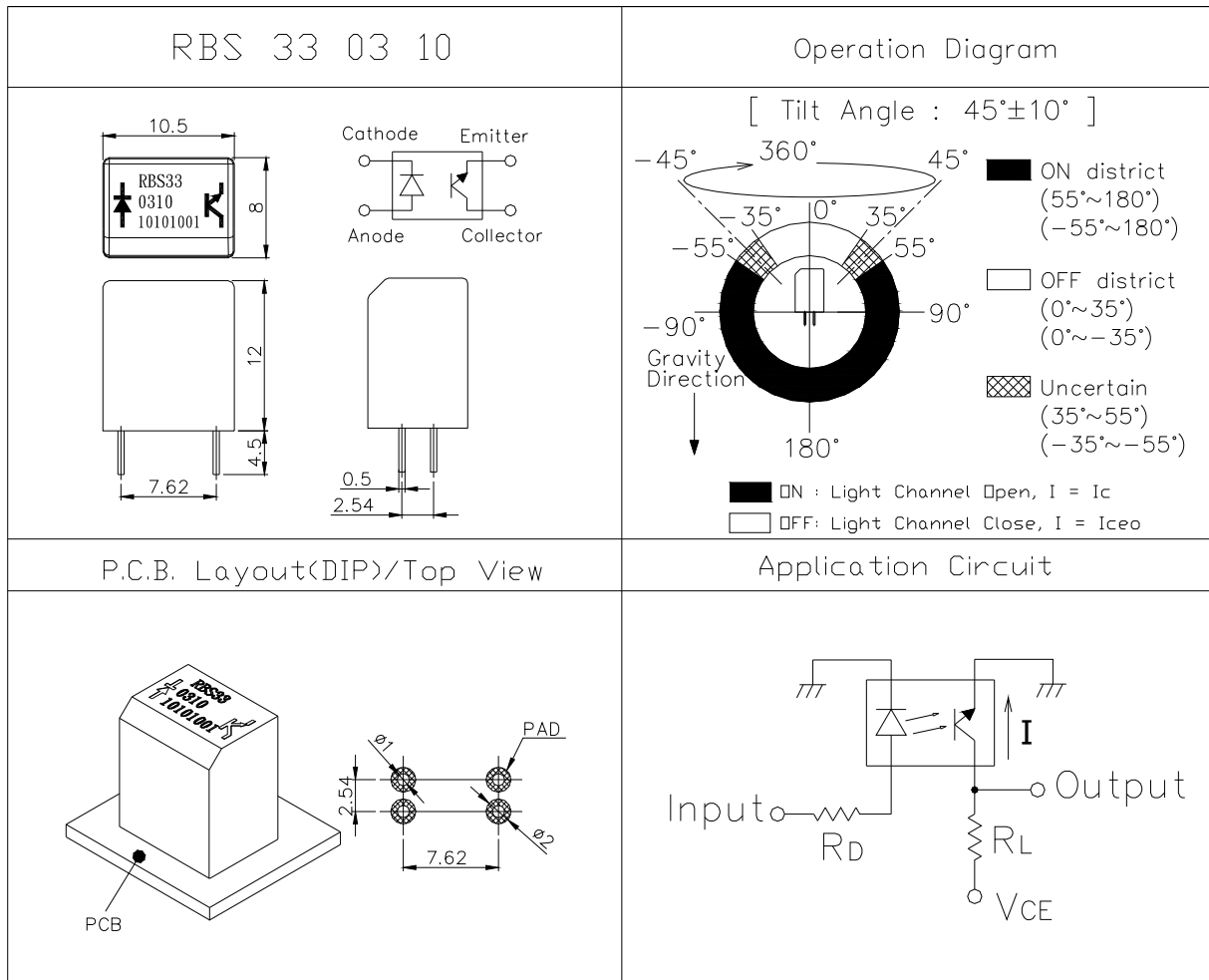


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● DIMENSIONS / OPERATION / P.C.B. LAYOUT (Unit: mm, Tolerance: ±0.25mm)

Fig. 1



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● Current/Voltage Suggested

Input Current (mA)	Operating Voltage (V)	Condition
10	3.3	V <sub>CE</sub> =3.3V R <sub>D</sub> =200 ohm R <sub>L</sub> =100K ohm
10	5	V <sub>CE</sub> =5V R <sub>D</sub> =390 ohm R <sub>L</sub> =100K ohm

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

● Absolute Maximum Rating ( Ta=25°C )

Item		Symbol	Rating	Unit
Input	Power Dissipation	P <sub>d</sub>	75	mW
	Reverse Voltage	V <sub>R</sub>	5	V
	Forward Current	I <sub>F</sub>	50	mA
	Peak Forward Current (*1)	I <sub>FP</sub>	1	A
Output	Collector Power Dissipation	P <sub>C</sub>	100	mW
	Collector Current	I <sub>C</sub>	20	mA
	C-E Voltage	V <sub>CEO</sub>	30	V
	E-C Voltage	V <sub>ECO</sub>	5	V
Operating Temperature		Topr	-25~+85	°C
Storage Temperature		Tstg	-40~+85	°C
Soldering Temperature (*2)		Tsol	260	°C

(\*1) tw=100 uSec. 、 T=10 mSec.

(\*2) Please refer to soldering condition.



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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	$\mu A$
Peak Wavelength	$\lambda_p$	$I_F=10mA$		940		nm
Dark Current	$I_{ceo}$	$V_{CE}=10V$	-	-	2	$\mu A$
C-E Saturation Voltage	$V_{CE(sat)}$	$I_C=0.25mA$ $I_F=20mA$	-	-	0.4	V
Light Current	$I_C$	$V_{CE}=5V$ $I_F=20mA$	0.5	5	-	mA
Rise Time	$T_r$	$I_C=0.8mA$ $V_{CC}=30V$ $R_L=1K\Omega$	-	5	-	$\mu sec$
Fall Time	$T_f$		-	5	-	$\mu sec$
Operation Diagram	$\theta$	Fig. 1	35	45	55	°



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● Typical Electrical / Optical Characteristics Curves (Ta=25°C)

Fig.1 Power Dissipation vs. Ambient Temperature

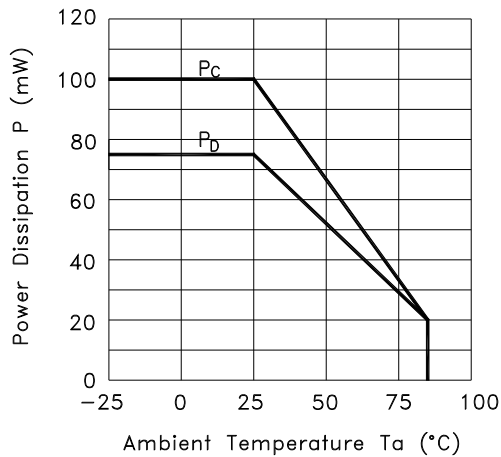


Fig.2 Forward Current vs. Forward Voltage

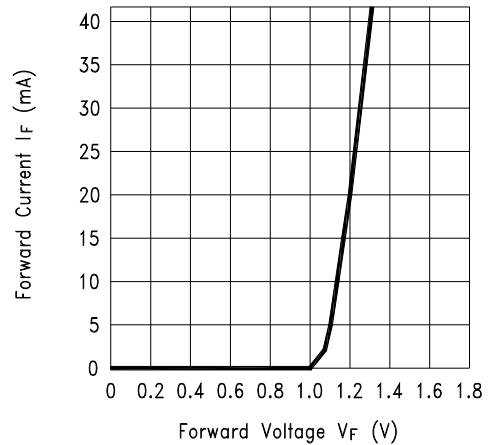


Fig.3 Collector Current vs. Collector-emitter Voltage

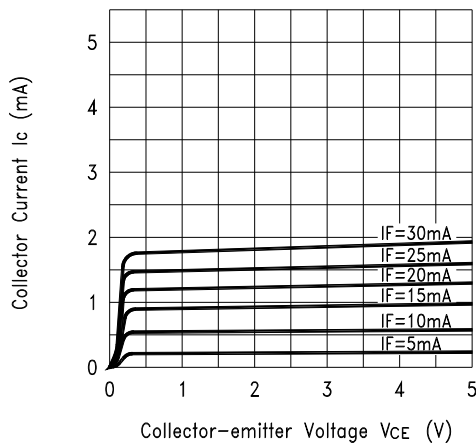
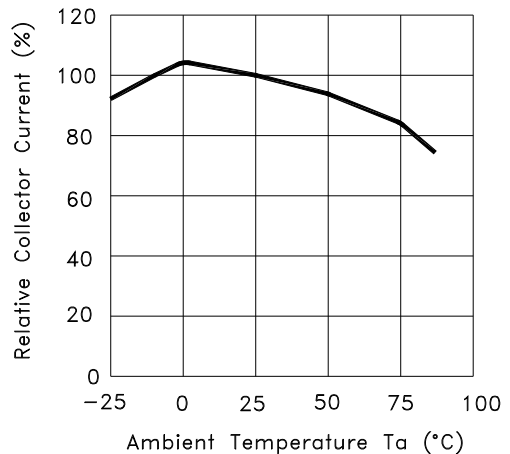


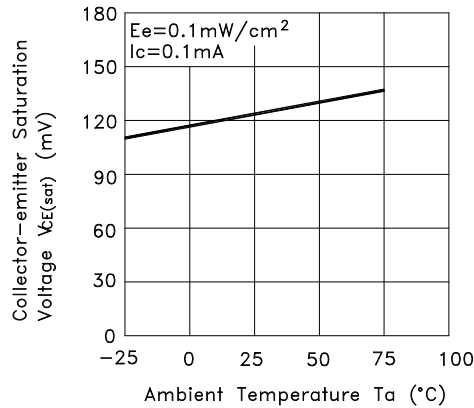
Fig.4 Collector Current vs. Ambient Temperature



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



● RELIABLE TEST ITEMS

Reliable Test for RBS330310

	Test Item	Contents
1	Operating 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 <sub>F</sub> =20 mA, V <sub>CE</sub> =5 V TIME: 30,000 hrs



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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
1.	RBS330310	IC tube	48 pcs	48 pcs	525L*10W*17.5H
		Inner box	72 tubes	3,456 pcs	539L*130W*130H
		Carton	4 boxes	13,824 pcs	551L*285W*288H

※ Package shown as below for reference.

