OncQue®

OncQue Corporation
大日科技股份有限公司

SENSOR SWITCH

Item #	RBS3110 Series	Description	TILT SWITCH	Version	V99.0
Page	1 of 10		Date	April 9, 2010	

● FUNCTIONS

1. Tilt Detecting within a 360°radius
2. Slight Vibration Detecting

● APPLICATIONS

1. LCD monitor rotation
2. Home appliance tilt-off function
3. Earthquake alarm
4. Automotive devices
5. Visual devices
6. Information devices
7. Communication devices

● 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. Suitable to vertical PCB.
6. Tilt Angles: 15°, 20°, 30°, and 45°within a 360 °radius.
7. RoHS compliance, an ideal substitute for mercury switch.
8. A more economical tilt and vibration detection option than IC design solution.
9. All made in Taiwan and examined before shipment.

● PATENTS

1. TAIWAN Patent NO. 181431
2. CHINA Patent NO. ZL 01 2 60920.X
3. U.S.A. Patent NO. US 6,800,841 B1

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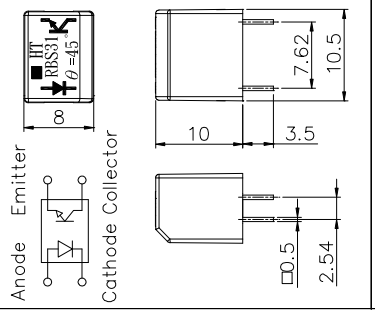
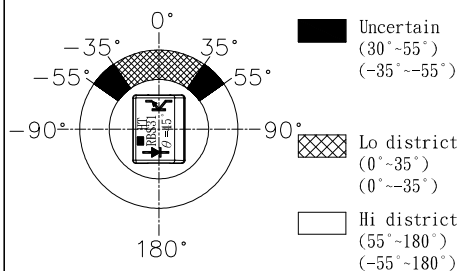
● DIMENSIONS / OPERATION / P.C.B. LAYOUT (Unit: mm, Tolerance: ±0.25mm)

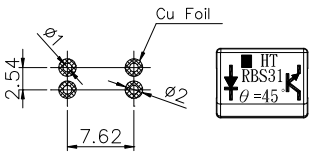
RBS 31 10 10



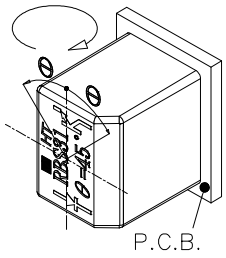
Tilt Angle 45°±10°



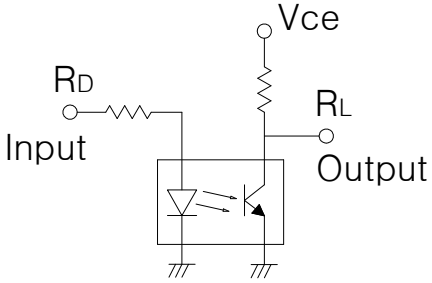
P.C.B. Layout (DIP)/Top View



Installation Position



Application Circuit



1.Vce=5V
2.RD=430ohn
3.RL=33Kohn

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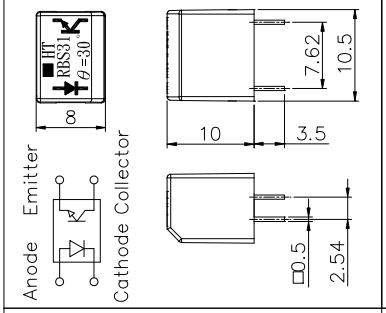
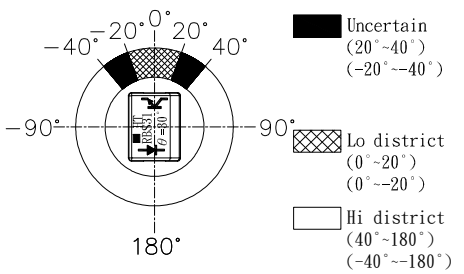
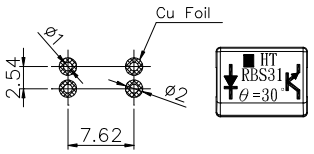
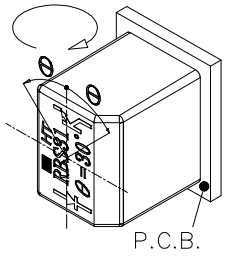
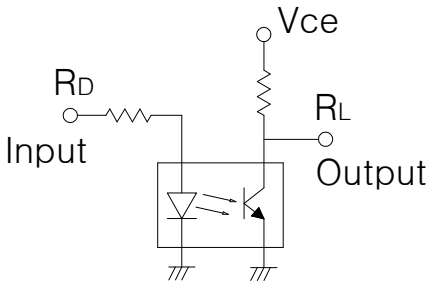
RBS 31 10 11	Tilt Angle 30°±10°	P.C.B. Layout (DIP)/Top View
		
Installation Position	**Application Circuit**	
		1.Vce=5V 2.RD=430ohn 3.RL=33Kohn

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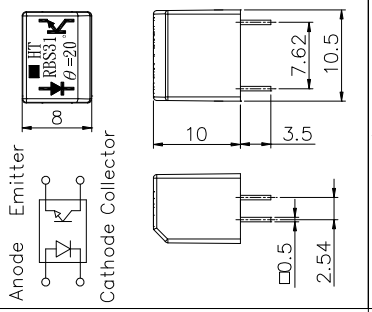
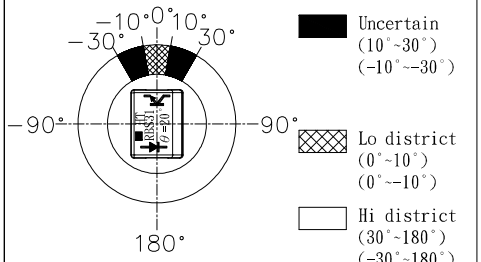
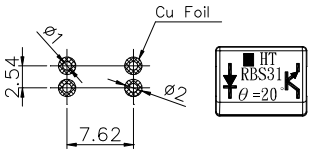
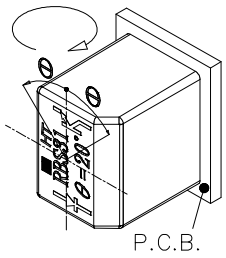
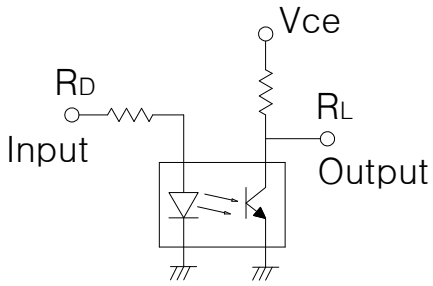
RBS 31 10 12	Tilt Angle 20°±10°	P.C.B. Layout (DIP)/Top View
		
Installation Position	**Application Circuit**	
		1.Vce=5V 2.RD=430ohn 3.RL=33Kohn

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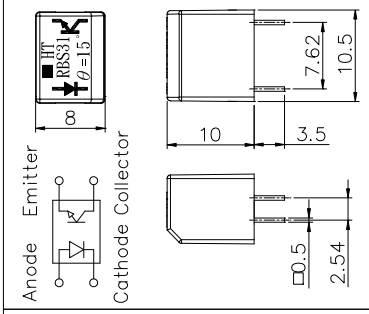
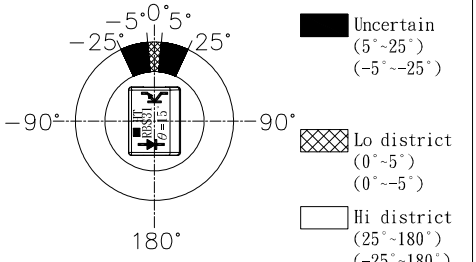
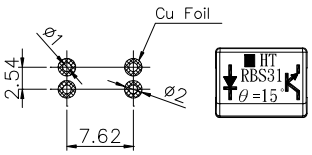
RBS 31 10 13



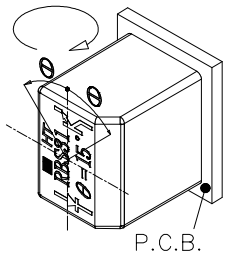
Tilt Angle 15°±10°



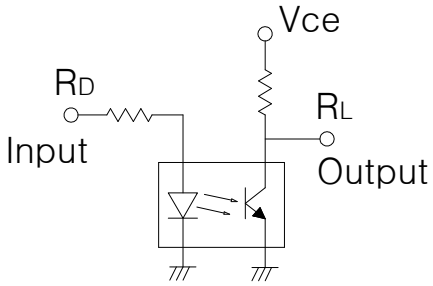
P.C.B. Layout (DIP)/Top View



Installation Position



Application Circuit



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● Device Selection Guide

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

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● Absolute Maximum Rating （Ta=25℃）

Item		Symbol	Rating	Unit
Input	Power Dissipation	Pd	75	mW
	Reverse Voltage	Vr	5	V
	Forward Current	I_F	50	mA
	Peak Forward Current (*1)	I_{FP}	1	A
Output	Collector Power Dissipation	Pc	100	mW
	Collector Current	Ic	20	mA
	C-E Voltage	V_{CEO}	30	V
	E-C Voltage	V_{ECO}	5	V
Operating Temperature		Topr	-25~+85	℃
Storage Temperature		Tstg	-40~+100	℃
Soldering Temperature (*2)		Tsol	260	℃

(*1) tw=100 uSec.、T=10 mSec.　　(*2) t=5 Sec

● MECHANICAL CHARACTERISTICS

1.	Temperature Range	Operating: -25℃ to +85℃ Storage: -40℃ to +85℃
2.	Pull Force of Terminal	500 gf for 1 minute
3.	Operation Life	30,000 hrs.
4.	Humidity	95% RH, 40℃ for 96 hrs.
5.	Solder Ability	After flux 260±5℃ for 5±0.5 seconds 95% coverage

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● Electrical Optical Characteristics (Ta=25℃)

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	μA
Peak Wavelength	λp	I_F=10mA		940		nm
Dark Current	I_D	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_L	V_{CE}=5V I_F=20mA	0.5	5	—	mA
Rise Time	Tr	I_C=0.8mA Vcc=30v R_L=1KΩ	—	5	—	μsec
Fall Time	Tf		—	5	—	μsec

● BILL OF MATERIAL

1.	Housing	Polyamide + Glass-Fiber
2.	Base	Polyamide + Glass-Fiber
3.	Ball	Stainless Steel
4.	Infrared Emitting Diodes	
5.	Silicon Photo Transistors	
6.	Inside Part	Copper Alloy, Nickel Plated

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

Fig.1 Power Dissipation vs. Ambient Temperature

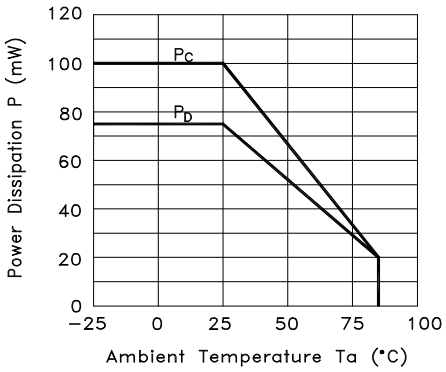

Fig.2 Forward Current vs. Forward Voltage

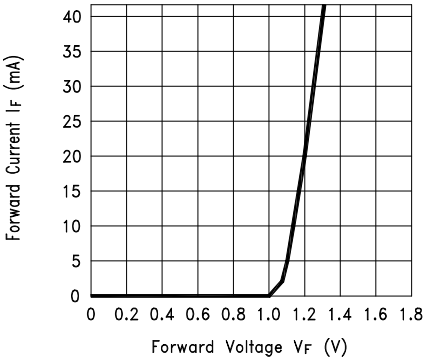

Fig.3 Collector Current vs. Collector−emitter Voltage

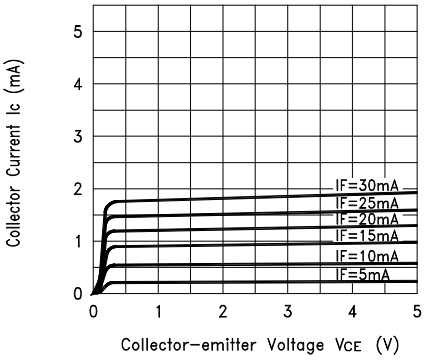

Fig.4 Collector Current vs. Ambient Temperature

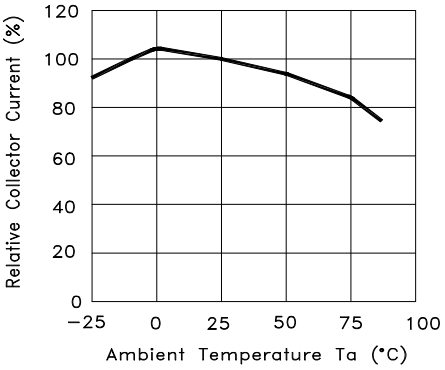

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Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature

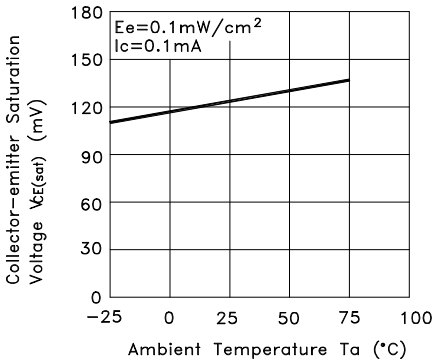


Fig.6 Response Time vs. Load Resistance

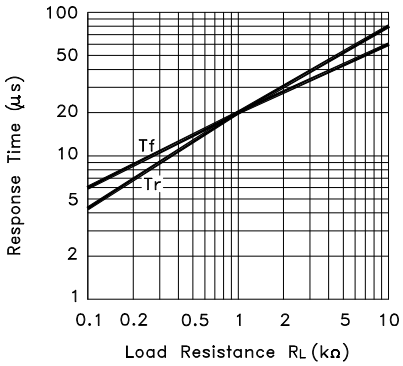
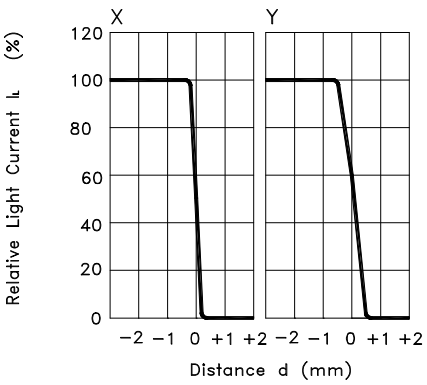
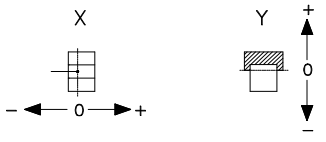


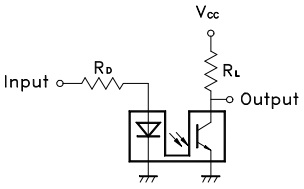
Fig.7 Sensing Position Characteristics (Typical)

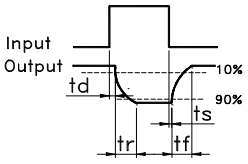


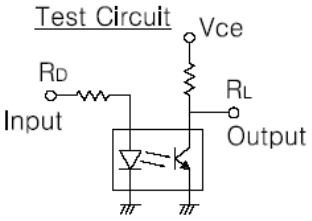
(Center of Optical axis)



Test Circuit for Response Time







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● PACKAGE

	Part Number	Package	Quantity	Total	Size
1.	RBS311110 RBS311111 RBS311112 RBS311113	PE Bag	250 pcs	250 pcs	12.7 x 17.8 (cm)
		Inner Box	8 PE Bag	2,000 pcs	36 x 20 x 9 (cm)
		Carton	3 Boxes	6,000 pcs	36 x 28 x 23 (cm)
2.	RBS311110 RBS311111 RBS311112 RBS311113	IC tube	48 pcs	48 pcs	52.5 x 1 x 1.75 (cm)
		Inner Box	84 tubes	4,032 pcs	54 x 13 x 13 (cm)
		Carton	4 Boxes	16,128 pcs	55 x 29 x 29 (cm)

* Minimum Order Quantity: One Bag / One Box (84 tubes)

● NOTE

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 equipments requiring higher safety and reliability such as life support system, space and aviations devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.
2. Don't try to clean the switch with a solvent or similar substance after the soldering process.
3. The switch might be damaged if using the water-soluble flux.

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