



SENSOR SWITCH

Item #	RBS3201 Series	Description	TILT SWITCH	Version	V99.0
Page	1 of 9		Date	April 9, 2010	

● FUNCTIONS

1. One Way Tilt Detecting
2. Up-Side Down Detecting
3. Vertical Rotation Detecting



● APPLICATIONS

1. Automotive devices
2. Visual devices
3. Home electrical appliances
4. Information devices
5. 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. RoHS compliance, an ideal substitute for mercury switch.
6. A more economical tilt and rotation detection option than IC design solution.
7. 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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Page	3 of 9		Date	April 9, 2010	

<p>RBS 32 01 02</p> <p>Anode Emitter Cathode Collector</p>	<p>Tilt Angle $\theta=0^{\circ}\pm 10^{\circ}$</p> <p> $I=I_c$ (Hi) 90° $I=I_c$ (Hi) $I=I_{ceo}$ (Lo) -90° $I=I_{ceo}$ (Lo) $I=$Output Current </p> <ul style="list-style-type: none"> Uncertain ($10^{\circ}\sim-10^{\circ}$) ($170^{\circ}\sim-170^{\circ}$) Lo district ($-10^{\circ}\sim-170^{\circ}$) Hi district ($10^{\circ}\sim170^{\circ}$) 	<p>P.C.B. Layout (DIP)/Top View</p>
<p>Installation Position</p>	<p>Application Circuit</p>	
	<ul style="list-style-type: none"> 1. $V_{ce}=5V$ 2. $R_D=200\Omega$ 3. $R_L=1K\Omega$ 	

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Page	4 of 9		Date	April 9, 2010	

RBS 32 01 10	Tilt Angle $\theta=45^{\circ}\pm 10^{\circ}$	P.C.B. Layout (DIP)/Top View
<p>Anode Emitter Cathode Collector</p>		
Installation Position	Stabe Angle $\theta < 45^{\circ}$	Application Circuit
		<p>1. Vce=5V 2. RD=200ohm 3. RL=1Kohm</p>

● Device Selection Guide

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

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Page	5 of 9		Date	April 9, 2010	

● Absolute Maximum Rating (Ta=25°C)

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	°C
Storage Temperature		Tstg	-40~+100	°C
Soldering Temperature (*2)		Tsol	260	°C

(*1) tw=100 uSec. · T=10 mSec.

(*2) t=5 Sec

● MECHANICAL CHARACTERISTICS

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

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Page	6 of 9		Date	April 9, 2010	

● Electrical 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	μA
Peak Wavelength	λ_p	$I_F=10mA$		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	T_r	$I_C=0.8mA$ $V_{CC}=30V$	—	5	—	μsec
Fall Time	T_f	$R_L=1K\Omega$	—	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	

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Page	7 of 9		Date	April 9, 2010	

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

Fig.1 Power Dissipation vs. Ambient Temperature

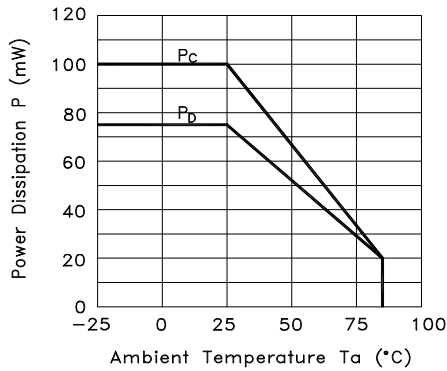


Fig.2 Forward Current vs. Forward Voltage

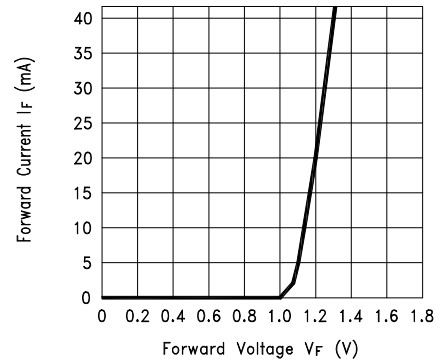


Fig.3 Collector Current vs. Collector-emitter Voltage

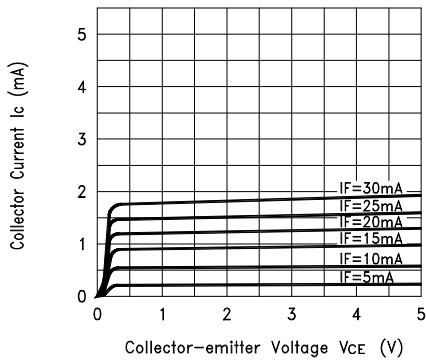
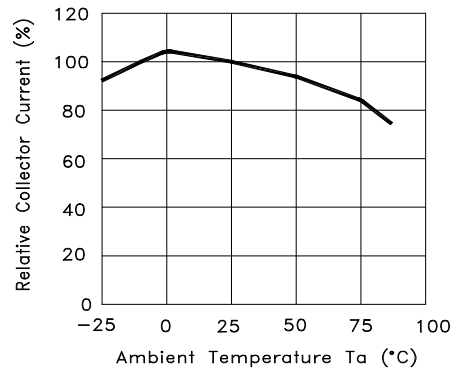


Fig.4 Collector Current vs. Ambient Temperature



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Page	8 of 9		Date	April 9, 2010	

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

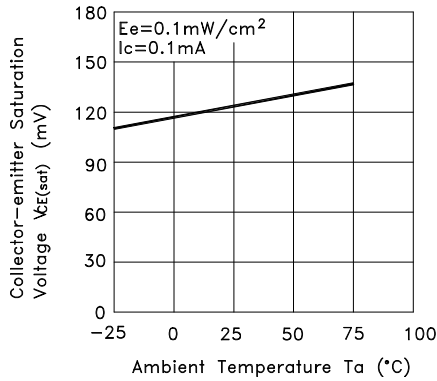


Fig.6 Response Time vs. Load Resistance

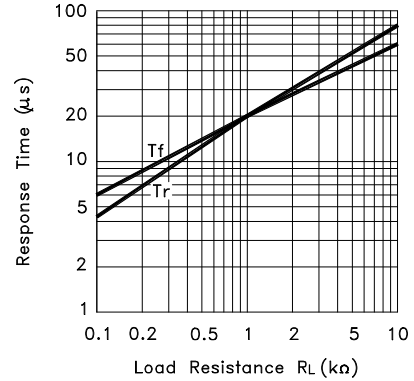
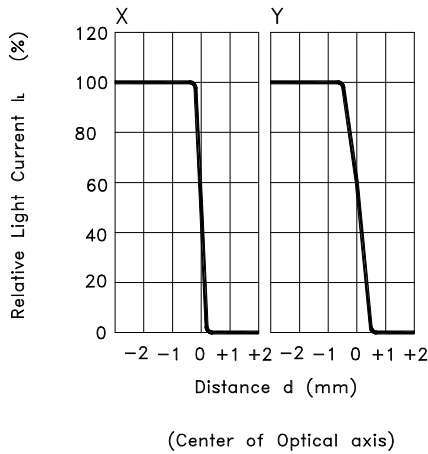
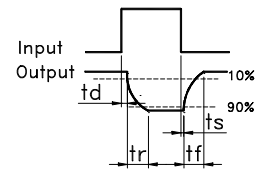
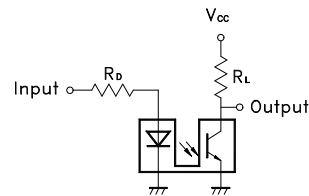


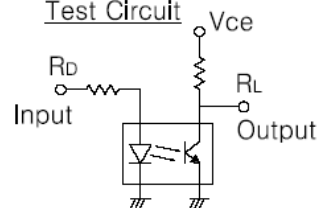
Fig.7 Sensing Position Characteristics (Typical)



Test Circuit for Response Time



Test Circuit



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Page	9 of 9		Date	April 9, 2010	

● PACKAGE

	Part Number	Package	Quantity	Total	Size
1.	RBS320100	PE Bag	500 pcs	500 pcs	12.7 x 17.8 (cm)
	RBS320102	Inner Box	8 PE Bag	4,000 pcs	36 x 20 x 9 (cm)
	RBS320110	Carton	3 Boxes	12,000 pcs	36 x 28 x 23 (cm)
2.	RBS320100	IC tube	62 pcs	62 pcs	52.5 x 0.84 x 1.55 (cm)
	RBS320102	Inner Box	120 tubes	7,440 pcs	54 x 13 x 13 (cm)
	RBS320110	Carton	4 Boxes	29,760 pcs	55 x 29 x 29 (cm)

*Minimum Order Quantity: One Bag / One Box (120 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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