Tilt Sensor Switch

Item No.	RBS380100	Description	Photoelectric	Version	1
Page	1 of 9		Publish Date	Jan. 31, 2019	

● FUNCTIONS

1. Tilt Angles: 45° within a 360° radius
2. Suitable for 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

● 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.

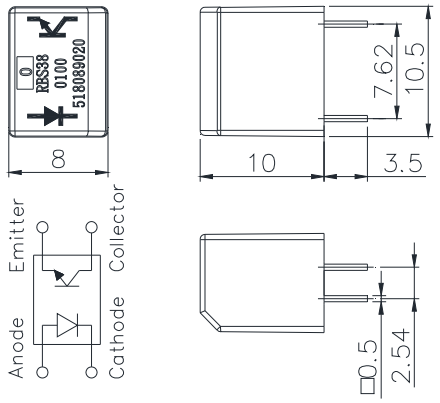
● PATENTS

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

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

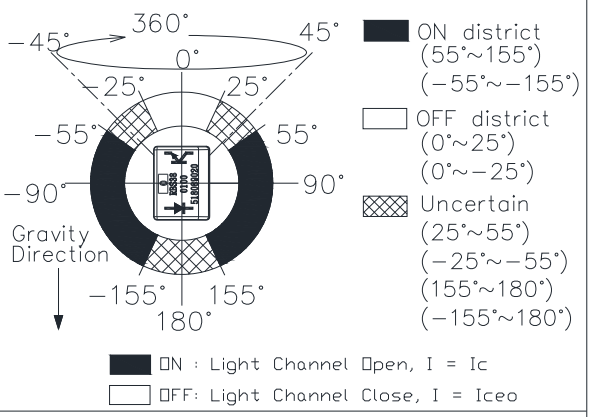
Fig. 1

RBS 38 01 00

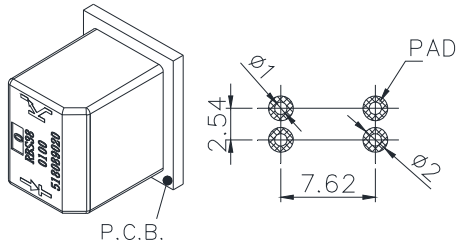


Operation Diagram

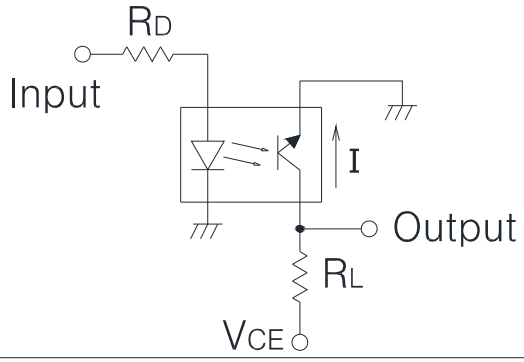
[Tilt Angle : 45°+10°/−20°]



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



Application Circuit



● Current/Voltage Suggested

Input Current (mA)	Operating Voltage (V)	Conditions
10	3.3	V_{CE}=3.3V R_D=200 ohm R_L=75K ohm
10	5	V_{CE}=5V R_D=390 ohm R_L=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	Pd	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		Topr	-25~+85	°C
Storage Temperature		Tstg	-40~+85	°C
Soldering Temperature (*1)		Tsol	260	°C

(*1) t=5 Sec

● 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	λp	I_F=10mA		940		nm
Dark Current	Iceo	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	Tr	I_C=0.8mA V_{CC}=30V R_L=1KΩ	-	5	-	μsec
Fall Time	Tf		-	5	-	μsec
Operation Diagram	θ	Fig.1	25	45	55	°

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

Fig.1 Power Dissipation vs. Ambient Temperature

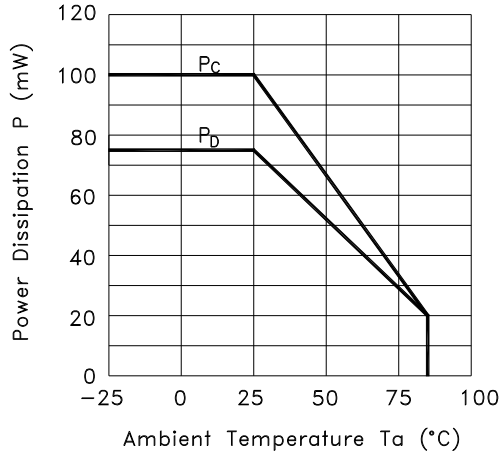


Fig.2 Forward Current vs. Forward Voltage

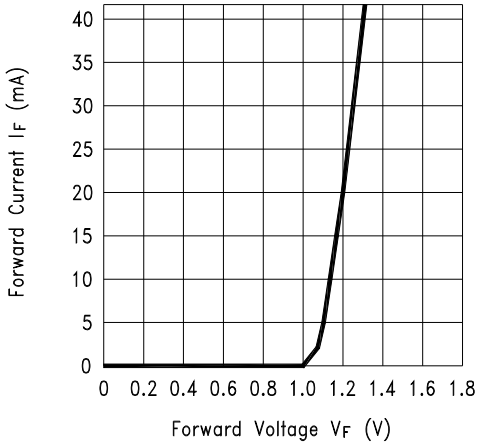


Fig.3 Collector Current vs. Collector−emitter Voltage

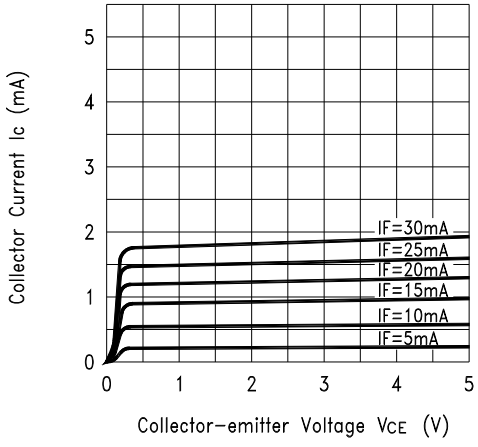


Fig.4 Collector Current vs. Ambient Temperature

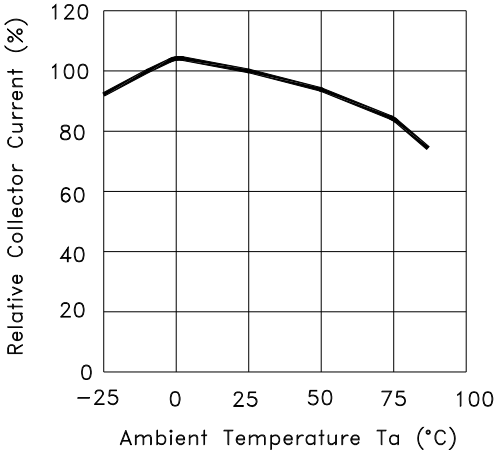
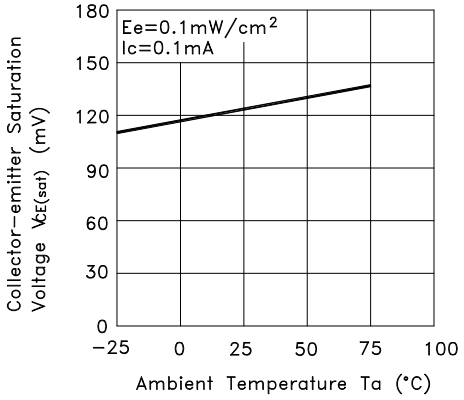


Fig.5 Collector-emitter Saturation Voltage vs. Ambient Temperature



● RELIABLE TEST ITEMS

Reliable Test for RBS380100

	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 mA, V_{CE}=5 V TIME: 30,000 hrs

● SOLDERING CONDITION

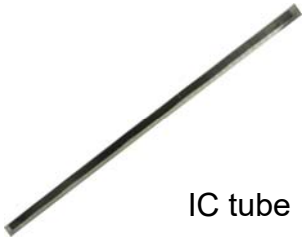
Following soldering conditions are for reference only, please use soldering information that solder paste manufacturer recommends.

Condition / Suitable Production Process	Soldering Temperature	Soldering Time	Wattage of Manual Soldering	Type
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.	RBS380100	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.



IC tube

Inner box

Carton

● 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.