SN-SHK
Shock Sensor

User's Manual

V1.1

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1. INTRODUCTION AND OVERVIEW

Shock and impact sensors are devices that detect sudden or severe impact at a predetermined level and indicate whether the level has been exceeded. Shock sensors are a type of transducer that responds to shock energy by producing another type of energy signal, usually electrical. Shock sensors are essentially seismic detectors which pick up vibrations. Shock indicators are employed to check the adverse effect of excess shock on an item being monitored. Shock sensors should be sensitive to shock, insensitive to any other property, and should not influence the measured property. Shock and impact sensors are commonly used in heavy industries.

Shock and impact sensors are used in many applications. Examples include automobile security systems, military applications, and laboratory test equipment. Shock and impact sensors are also used in industrial manufacturing equipment.

The product features include:

- Single bit output
- Small size makes it easy to conceal
- Plastic housing to provide protection for the electronic circuitry
- Indicator LED for indication of a shock
- Compatible with all types of microcontrollers
- High sensitivity to shock and impact

2. PRODUCT SPECIFICATION

2.1 Pin Definitions and Ratings

Pin	Name	Function
Black	GND	Connects to Ground
White	Output	Connects to an I/O pin set to INPUT mode (or transistor/MOSFET)
Red	Vcc	Connects to Vcc (+5V to + 12V)

Table 2.1

3. PRODUCT LAYOUT

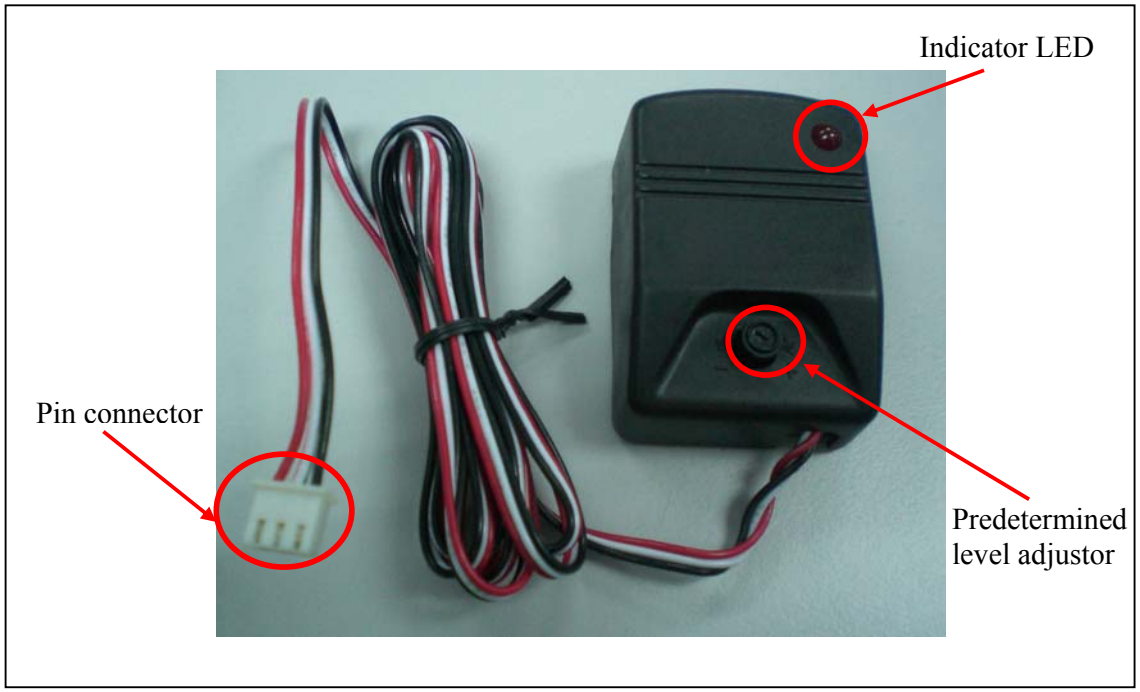

Figure 3.1

Part	Description
Indicator LED	The indicator LED will be ON when a shock is detected.
Predetermined level adjustor	The predetermined level of the shock sensor can be adjust by the adjustor, turning clockwise will increase sensitivity and turning anticlockwise will reduce the sensitivity of the sensor.
Pin connector	The pin connectors need to be connecting to GND, Vcc and I/O pin of microcontroller. Please refer the product specification for the connection.

Table 3.1

4. GETTING STARTED

4.1 Connecting and Testing

Connect the 3-pin header to your circuit so that the black colour pin connects to ground, the red color pin connects to Vcc and the white colour pin connects to your output signal pin. The unit output is LOW whenever there is shock detected. The output voltage of shock sensor followed the voltage supplied to the sensor (Vcc) when there is no shock detected. Please refer schematic in Figure 4.1 and Figure 4.2 for example application.

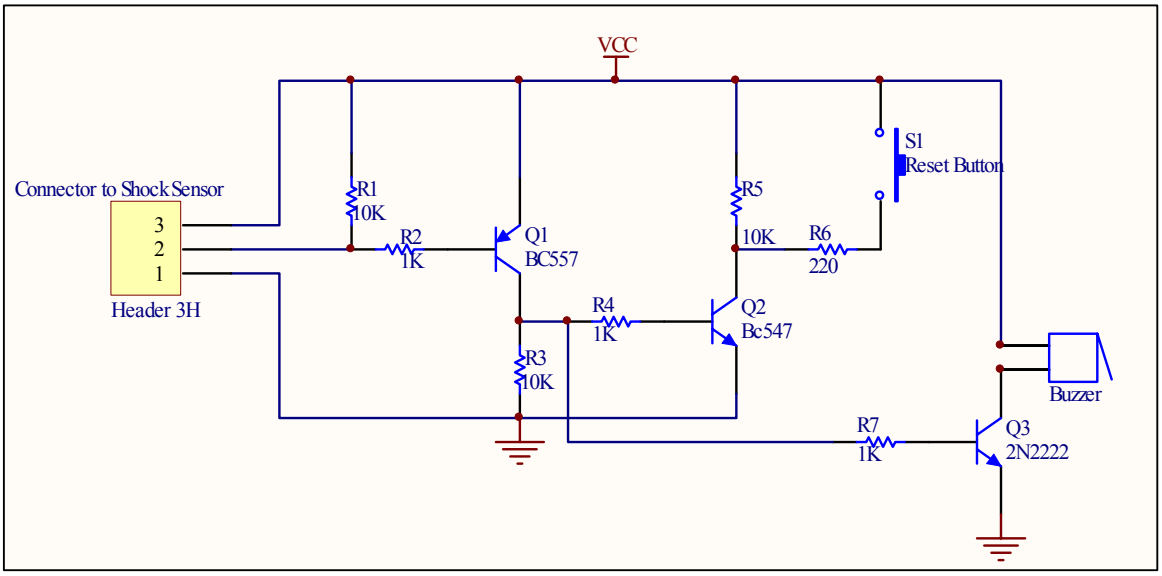

Figure 4.1: Example application for Shock Sensor (Without microcontroller).

Part	Description
Header 3H	Connects to Shock Sensor, pin 1 to GND (Black color), pin 2 to output (White color) and pin 3 to Vcc (Red color).
Vcc	Connects to Vcc (+5V to + 12V)
Buzzer	Connects to buzzer (+5V to + 12V)
S1	Reset button for the circuit.
R1, R3, R5	10kΩ Resistor
R2, R4, R7	1kΩ Resistor
R6	220Ω Resistor
Q1	PNP transistor (BC557)
Q2	NPN transistor (BC547)
Q3	NPN transistor (2N2222)

Table 4.1

With reference to Figure 4.1, the buzzer will be ON when there is a shock detected, and the buzzer will only OFF when the reset button being press. The buzzer is chosen depends on the value of Vcc. 5V buzzer will be choose when Vcc is connect to 5V whereas 12V buzzer is chosen when Vcc is connected to 12V.

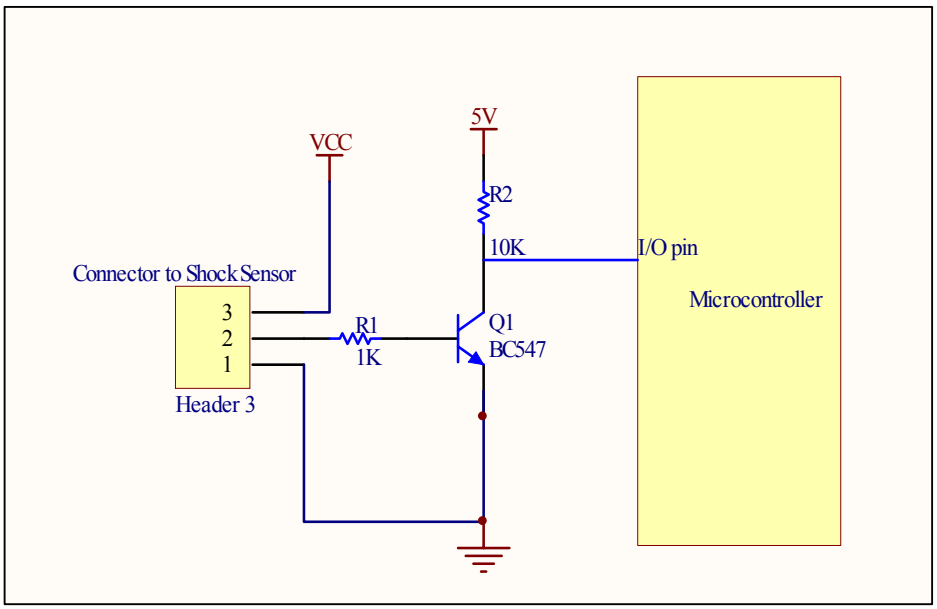

Figure 4.2: Example application for Shock Sensor (With microcontroller).

Part	Description
Header 3H	Connects to Shock Sensor, pin 1 to GND (Black color), pin 2 to output (White color) and pin 3 to Vcc (Red color).
Vcc	Connects to Vcc (+5V to + 12V)
R1	1kΩ Resistor
R2	10kΩ Resistor
Q1	NPN transistor (BC547)
I/O pin of Microcontroller	The output of the circuit need to connect to the I/O pin microcontroller which set to 'INPUT' mode.

Figure 4.2

The application of shock sensor with microcontroller is shown in Figure 4.2. The function of the transistor, Q1 is to protect the microcontroller in case the voltage supply to shock sensor is higher than 5V. With refer to the schematic, the output signal which send to microcontroller after Q1 will be HIGH wherever there is a shock detected. It is invert of the original output signal of shock sensor.

5. WARRANTY

- Product warranty is valid for 6 months.
- Warranty only applies to manufacturing defect.
- Damage caused by miss-use is not covered under warranty.
- Warranty does not cover freight cost for both ways.

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