

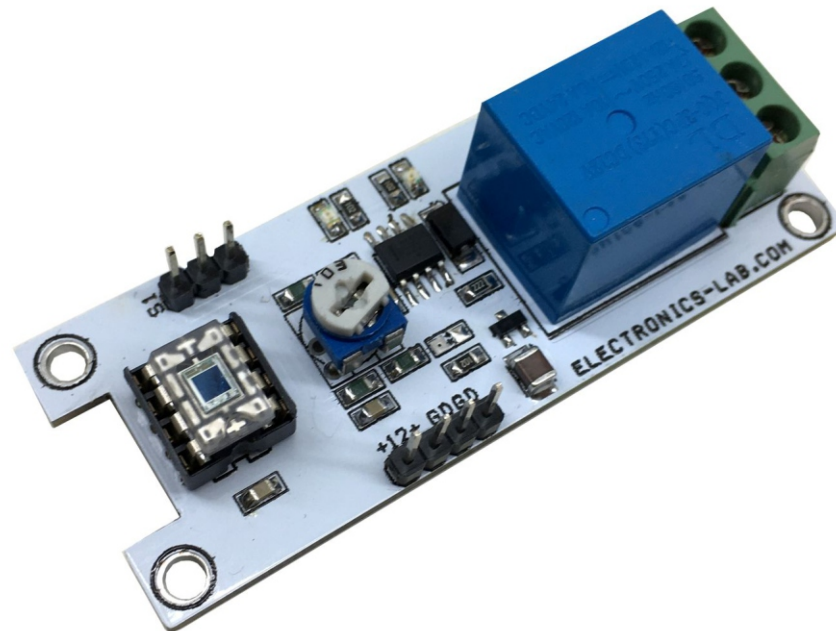
Analog Light Sensor + Light Sensitive Switch

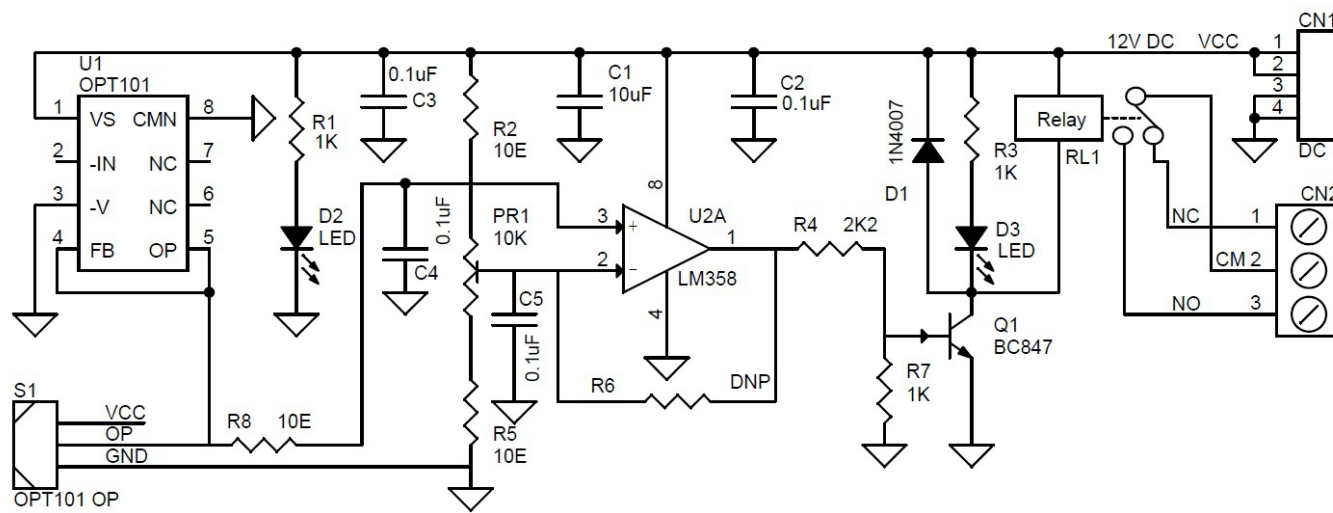
You may have seen many light-sensitive switch circuits based on an LDR sensor. Usually, the sensitivity of the LDR based light sensor is poor. We wanted a very sensitive light switch hence we decided to make a circuit based on a light sensor rather than LDR. After a little research on the internet, we found the OPT101 light sensor chip which includes a photodiode and a transimpedance amplifier in one package. The OPT101 light sensor provides an analog voltage output linearly proportional to light intensity.

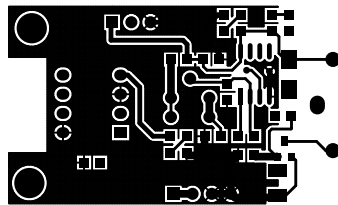
This board has a dual function, it can act as a Light Sensor and a Light Sensitive switch. The operating supply of the circuit is 12V DC and draws 45mA current when Relay is ON. When light falls on the OPT101 sensor and the intensity of light reaches above the set point it triggers the relay. A separate header connector is provided to output the sensor analog value. The output of the sensor is almost 0 (Zero) when it's in a dark area and goes high till 11.25V when it has access to full light. The sensitivity of the switch is adjustable using the onboard trimmer pot. LM358 op-amp acts as a comparator, BC847 transistor helps to drive the relay, diode D1 protects the transistor from back-EMF of inductive load (Relay). D2 is the power LED and D3 LED indicates the relay ON/OFF function. Relay has SPDT switch with NO (normally open)/NC (Normally Closed) contacts. The contact rating of the relay is 10A and the switching voltage 277V AC, 28V DC Max.

Features

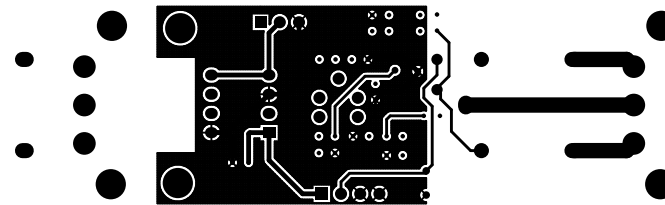
- Operating Power Supply 12V DC
- Current Consumption 45Ma (When Relay is in ON)
- SPDT Relay
- Contact Rating of Relay 10Amps and Switching Voltage 28V DC or 277V AC Max
- CN3 Sensor Direct Output (0 to 11.25V + 12V DC Supply + GND)
- D3 LED Relay Operations
- D1 Power LED
- PR1 Sensitivity Adjust
- PCB Dimensions 69.85MM X 26.67MM



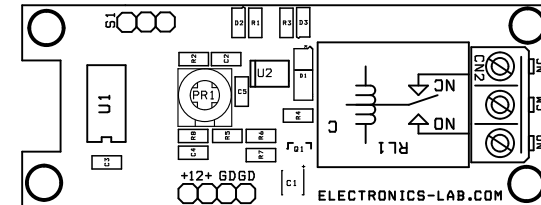




TOP LAYER



BOTTOM LAYER



SILK SCREEN TOP

PCB DIMENSIONS 69.85MM X 26.67MM

BOM				
SR.	QNTY.	REF.	DESC.	VENDOR/DIGIKEY/Mouser
1	1	CN1	4 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
2	1	CN2	3 PIN SCREW TERMINAL 5.08MM PITCH	DIGIKEY 277-1248-ND
3	1	C1	10uF/16V SMD SIZE 1206/1210	YAGEO
4	4	C2,C3,C4,C5	0.1uF/50V SMD SIZE 0805	YAGEO
5	1	D1	1N4007 SMD	DIGIKEY 1655-1N4007FLCT-ND
6	2	D2,D3	LED SMD SIZE 0805	DIGIKEY 475-1415-2-ND
7	1	PR1	10K TRIMMER POT	DIGIKEY 3306P-103-ND
8	1	Q1	BC847 NXP	DIGIKEY 1727-2924-2-ND
9	1	RL1	12V Relay SPDT	DIGIKEY PB2029-ND
10	3	R1,R3,R7	1K 5% SMD SIZE 0805	YAGEO
11	3	R2,R5,R8	10E 5% SMD SIZE 0805	YAGEO
12	1	R4	2K2 5% SMD SIZE 0805	YAGEO
13	1	R6	DNP	
14	1	S1	3 PIN MALE HEADER 2.54MM PITCH	DIGIKEY S1011EC-40-ND
15	1	U1	OPT101 SENSOR DIP8	DIGIKEY 296-23090-5-ND
16	1	U2	LM358 SMD SOIC 8	DIGIKEY LM358DR2GOSCT-ND

