

Fig. 3: Component layout for the PCB

PARTS LIST

Semiconductors:

IC1	- NE555 timer
T1, T2	- BC548 npn transistor
LED1	- 5mm LED
D1	- 1N4148 diode
D2	- 1N4007 rectifier diode

Resistors (all 1/4-watt, $\pm 5\%$ carbon):

R1	- 100-ohm
R2, R3, R5	- 4.7-kilo-ohm
R4	- 1-mega-ohm
R6	- 1-kilo-ohm
VR1	- 4.7-mega-ohm preset

Capacitors:

C1	- 100nF ceramic disk
C2	- 470 μ F, 35V electrolytic
C3	- 0.01 μ F ceramic disk
C4	- 100 μ F, 35V electrolytic

Miscellaneous:

RL1	- 12V, 1C/O relay
S1	- On/off switch
Wireless doorbell	- Transmitter and receiver

Diode D1 clamps negative excursions of the signal to about 0.6V below ground to prevent damage to transistor T1, which is configured as a common-emitter amplifier with a

4.7-kilo-ohm collector load.

When the doorbell rings, it produces an AC signal, which is rectified by diode D1. Transistor T2 conducts, pulling its collector low. This high-to-low transition triggers timer IC1, which is configured in monostable mode. The output of IC1 goes high for a time period that can be set between 8 and 50 minutes using trimpot VR1. This high output triggers relay RL1 to switch on the appliance.

Working of the circuit is simple. Press the wireless transmitter button to switch on the appliance for the preset time period. LED1 glows to indicate that the appliance is 'on.' The appliance will automatically turn off after the preset time period.

Construction and testing

An actual-size, single-side PCB for the remote control using wireless doorbell is shown in Fig. 2 and its component layout in Fig. 3. Assemble the circuit on a PCB and connect LED1 and switch S1

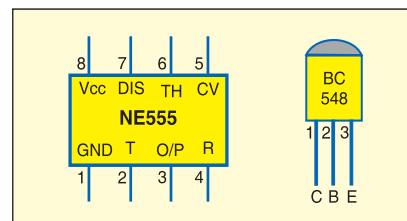


Fig. 4: Pin configurations of NE555 and BC548

at suitable place. Use a suitable 8-pin IC socket for mounting timer NE555 IC.

Use relay RL1 with contact current rating capable of carrying the load current.

Push switch S1 to 'on' position and verify 12V at TP1 with respect to TP0. Press transmitter button and verify high-to-low triggering pulse at TP2 with an oscilloscope. Also verify whether TP3 is high for the preset time period. ●

The author is a regular contributor to EFY and has many articles published to his credit in India and abroad

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