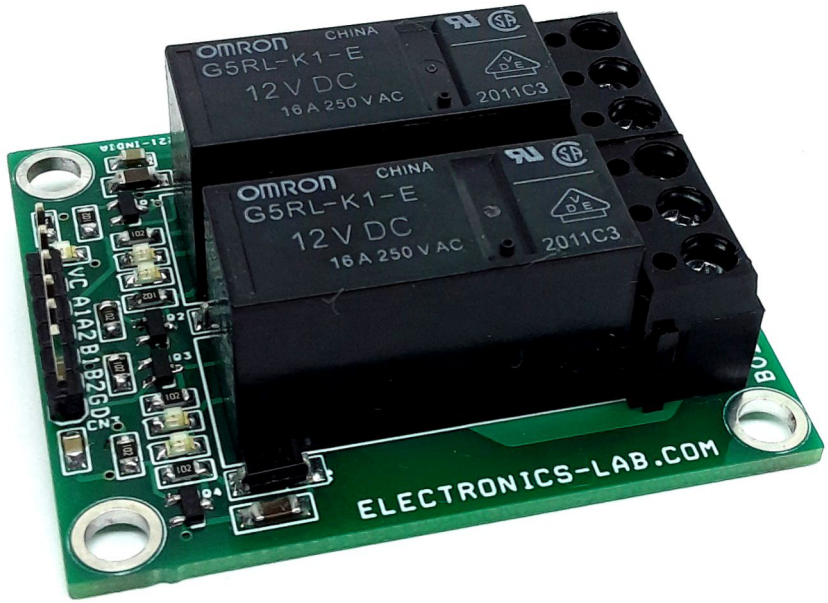
2 Channel Smart Dual Coil Latching Relay Board, 2 Channel Bistable Relay Module

This is a Smart Dual Coil Latching Relay that can control the ON/OFF power of a device by applying a short voltage pulse to Input 1 and Input 2. This project is helpful in low-power applications since the coil is not powered all the time, it only requires a short voltage pulse. Relay Coil also remains in that position even if the power is disconnected. Polarized, bi-stable, latching relays are utilized in many kinds of electronic equipment and diverse applications. These relays usually employ two coils, one to move the relay contacts(s) from the open to close position and another coil to move the contacts(s) from the close to the open position. to facilitate mechanical movement, the relay coils need to be energized for a specific time interval. Once the contact(s) have changed position, the voltage should be removed from the winding of the relay. As shown in the schematic, a dual-coil relay is connected to its supply rail at the center point of the two relay windings Each winding can be energized by applying a TTL-short pulse to input A1, A2, B1, and B2. Diode D6, D7, D8, and D9 are used as clamping diodes. Operation is very simple, apply a minimum 150mS-500mS trigger voltage to input A1/B1, this will energize relay coil -1 and the coil moves contact(s) open to close, and when the pulse applies to input A2/B2, coil-2 energized and moves the contact(s) from close to open. All inputs can be triggered using push switches, Arduino/microcontroller and other circuits, applying 150mS to 500mS TTL pulse will energize the coil.

Features

- Supply 12V DC @ 60mA
- 4 x Inputs to trigger Relay Contacts
- Relay Contacts Current Load 16A Maximum
- PCB Dimensions 54.61 x 44.45mm



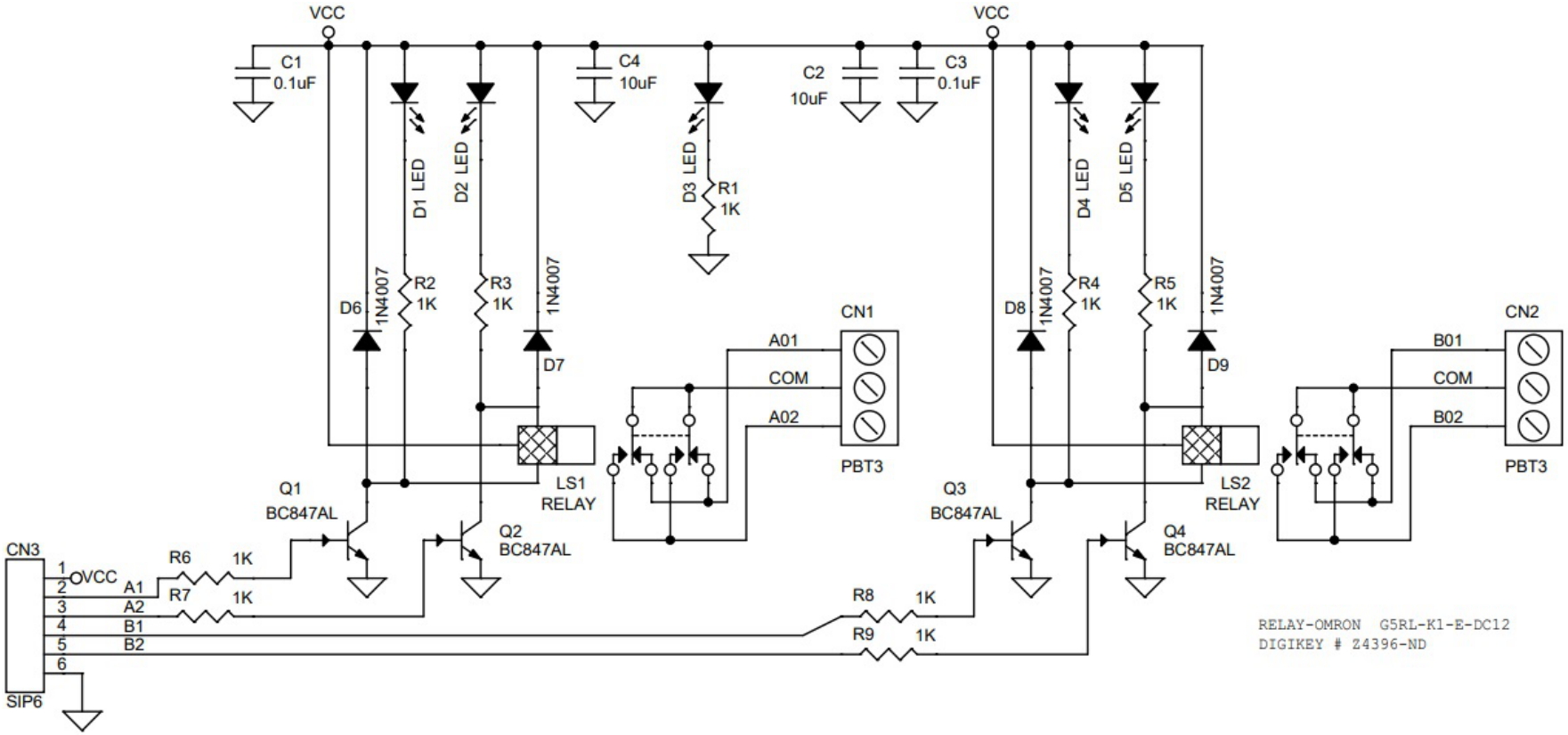
Connector Cn1

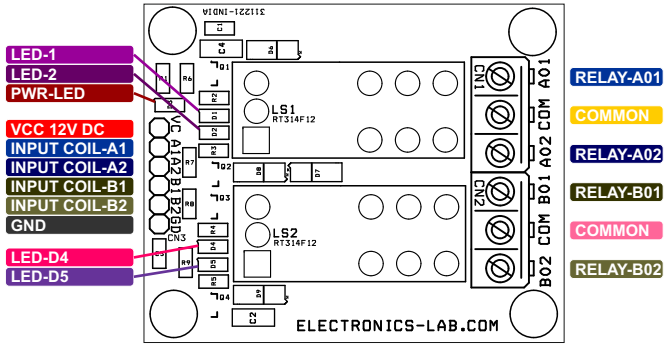
- Pin1: VCC 12V DC @ 40mA
- Pin2: Relay 1 Coil-1 A1 Trigger Input
- Pin3: Relay 1 Coil-2 A2 Trigger Input
- Pin4: Relay 2 Coil-1 B1 Trigger Input
- Pin5: Relay 2 Coil-2 B2 Trigger Input
- Pin6: GND

Connector CN1: Relay 1 Connections Open, Common, Closed
Connector CN2: Relay 2 Connections Open, Common, Closed
LED D1, D2, D4, D5: Relay Operations
LED D3: Power LED

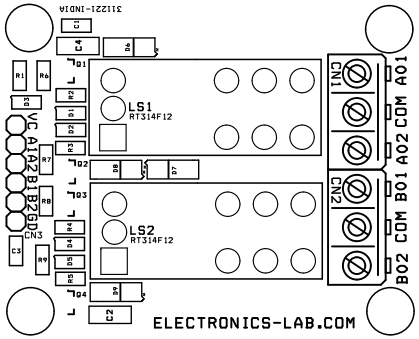
What is Latching Relay/Dual Coil Relay

Latching relays are commonly used in low-power consumption or high-temperature applications where applying coil power for a long time cannot be afforded due to power consumption or self-heating of the coil. Instead of a continuous voltage applied to the coil, they are operated with short voltage pulses instead. Latching relays change contact position when a coil voltage is applied and remain in that position even if the voltage is disconnected. (It is common to use the term SET for operating a latching relay). To reset a latching relay another voltage pulse needs to be applied to another coil.

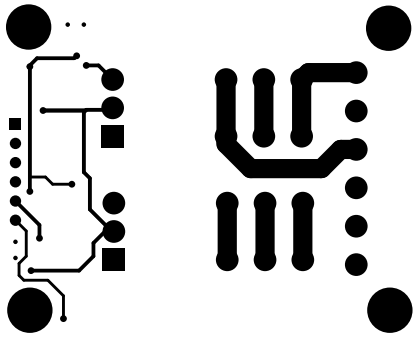

VCC
C1
0.1uF
C4
10uF
C2
10uF
C3
0.1uF
VCC
D1 LED
D2 LED
D3 LED
R1
1K
D4 LED
D5 LED
D6
1N4007
R2
1K
R3
1K
1N4007
D7
D8
1N4007
R4
1K
R5
1K
1N4007
D9
CN1
A01
COM
A02
PBT3
CN2
B01
COM
B02
PBT3
LS1
RELAY
LS2
RELAY
Q1
BC847AL
Q2
BC847AL
Q3
BC847AL
Q4
BC847AL
CN3
1
2
3
4
5
6
VCC
A1
A2
B1
B2
SIP6
R6
1K
R7
1K
R8
1K
R9
1K
RELAY-OMRON G5RL-K1-E-DC12
DIGIKEY # Z4396-ND

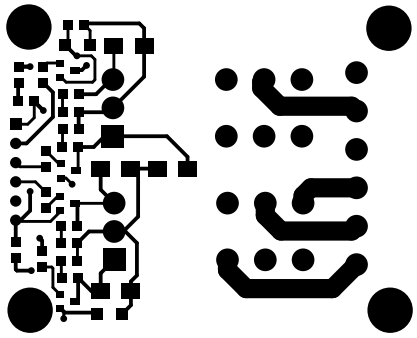


BOM						
NO.	QNTY.	REF	DESC.	MANUFACTURER	SUPPLIER	SUPPLIER PART NO
1	2	CN1,CN2	3 PIN SCREW TERMINAL PITCH 5.08MM	PHOENIX	DIGIKEY	277-1248-ND
2	1	CN3	6 PIN MALE HEADER PITCH 2.54MM	WURTH	DIGIKEY	732-5319-ND
3	2	C1,C3	0.1uF/50V SMD SIZE 0805	MURATA/YAGEO	DIGIKEY	
4	2	C2,C4	10uF/16V SMD SIZE 1210 OR 1206	MURATA/YAGEO	DIGIKEY	
5	5	D1,D2,D3,D4,D5	LED RED SMD SIZE 0805	OSRAM	DIGIKEY	475-1278-1-ND
6	4	D6,D7,D8,D9	1N4007 SMD	DIODE INCORP	DIGIKEY	S1MBDITR-ND
7	2	LS1,LS2	RELAY-OMRON G5RL-K1-E-DC12	OSRAM	DIGIKEY	
8	4	Q1,Q2,Q3,Q4	BC847AL SMD SOT223	NEXPERIA	DIGIKEY	1727-2924-2-ND
9	9	R1,R2,R3,R4,R5,R6,R7,R8,R9	1K 5% SMD SIZE 0804	MURATA/YAGEO	DIGIKEY	



SILK SCREEN TOP


BOTTOM LAYER


TOP LAYER

PCB DIMENSIONS 54.61MM X 44.45MM