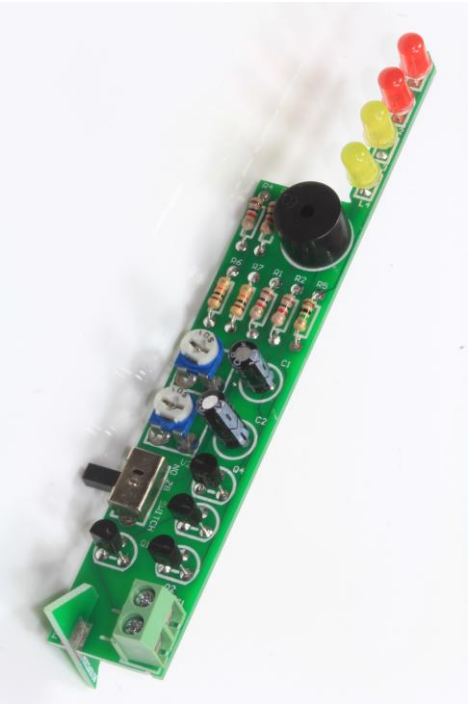


WARNING VIBRATING LED AND BUZZER WITH CLASSIC CIRCUIT

PRODUCT CODE: M00270074

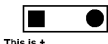
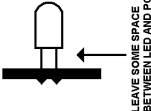
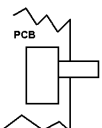
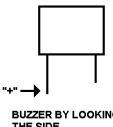


FEATURE:

- Warning LED and buzzer without using any IC on building the vibration circuit.
- There is a leg for the kit so that the kit could stand upright.
- Assembly is needed.

READ BEFORE INSTALLATION:

- Put the component on the side of screen printing and solder on the back of PCB without printing.

 FIGURE 1	 FIGURE 2	 FIGURE 3
 FIGURE 4	 FIGURE 5	 FIGURE 6
 FIGURE 7		

INSTALLATION:

Just install the component to the PCB M00260119 according to below table.

ITEM	SYMBOL ON PCB	DESCRIPTION	OUTLOOK	DIRECTION ON INSTALLATION? AND OTHER
1	R1	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
2	R2	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
3	R3	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
4	R4	RESISTOR, 1K ohms	BROWN, BLACK, RED	NO
5	R5	RESISTOR, 1M ohms	BROWN, BLACK, GREEN	NO
6	R6	RESISTOR, 10K ohms	BROWN, BLACK, ORANGE	NO
7	R7	RESISTOR, 10K ohms	BROWN, BLACK, ORANGE	NO
8	L1	LED	RED	YES, FIGURE 1, FIGURE 2, NOTE 1
9	L2	LED	RED	YES, FIGURE 1, FIGURE 2, NOTE 1
10	L3	LED	YELLOW	YES, FIGURE 1, FIGURE 2, NOTE 1
11	L4	LED	YELLOW	YES, FIGURE 1, FIGURE 2, NOTE 1
12	Q1	TRANSISTOR, 9014, NPN	FIGURE 3	YES
13	Q2	TRANSISTOR, 9014, NPN	FIGURE 3	YES
14	Q3	TRANSISTOR, 9014, NPN	FIGURE 3	YES
15	Q4	TRANSISTOR, 9014, NPN	FIGURE 3	YES
16	C1	CAPACITOR, 1uF	MARK WITH 1uF OR SAME MEANING OF VALUE	NOTE 1
17	C2	CAPACITOR, 1uF	MARK WITH 1uF OR SAME MEANING OF VALUE	NOTE 1
18	V1	VARIABLE RESISTOR, 1M ohms	FIGURE 4	YES
19	V2	VARIABLE RESISTOR, 1M ohms	FIGURE 4	YES
20	S1	INPUT FOR TRIGGERING SIGNAL	FIGURE 6	NOTE 2
21	SWITCH	SLIDE SWITCH	SIX LEGS, FIGURE 5	YES, FIGURE 5
22	BZ	BUZZER	FIGURE 7	YES, NOTE 1
23	/	LEG	PCB IN OUTLOOK	NOTE 3

- NOTE 1: On component, longer leg is “+”.
- NOTE 2: Metal terminal is facing outside the PCB.
- NOTE 3: You could solder the both PCB together. There are soldering pads on the bottom on both PCB.

HOW TO PLAY?

If there is any voltage source (5V to 9V) plug into “S1”, the “L1, L2” and “L3, L4” would flash alternately. If you turn on the buzzer by switching on “SWITCH”, the buzzer would beep. The rate of flashing and beeping could be control by turning “V1” and “V2”. By using this logic, this could be used as warning LED and buzzer by connecting this to any external circuit.

CIRCUIT EXPLANATION:

In fact, this is a classic vibration circuit because this circuit do not use any IC to made the vibration. On the other hand, this would not take any energy from power supply when the circuit do not have any vibration. If you use IC to make the similar effect, this need power supply feeding to IC all the time even there is no any vibration.

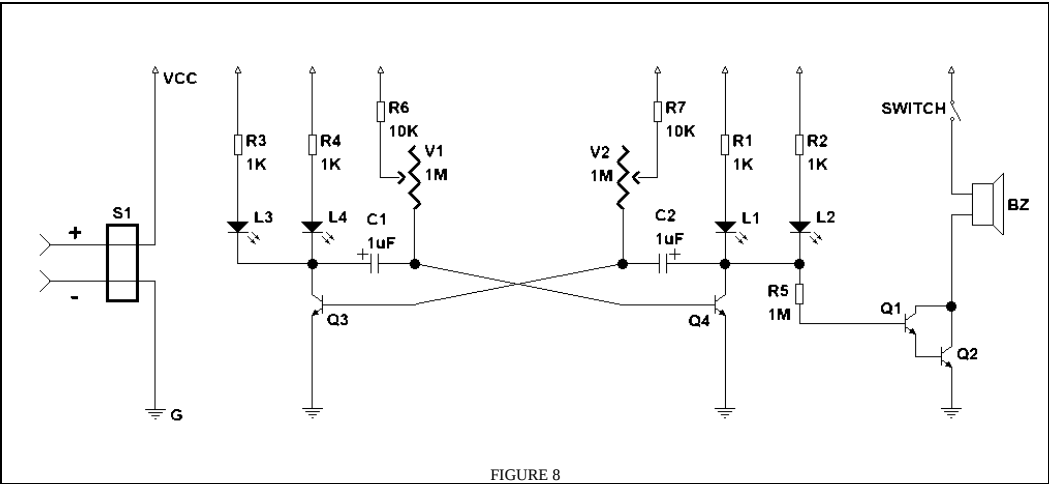
There are two figures to show you the circuit detail. Figure 8 is a raw circuit diagram. The logic of this circuit is little difficult to be understood for most people. As a result, we draw Figure 9 to show you the detail.

I just use Figure 9 to explain the circuit. When power is provided to “S1” due to any external circuit, either “C1” or “C2” would have more “+” and “-” charges on this. You may think left-hand side and right-hand side of circuit is almost symmetric. Both should contain same amount and type of charge on both “C1” and “C2” when power is initial feeding to the circuit. But the reality is that all the components would have little difference on value even the marking on value are the same. “C1” maybe the actual value is 1.00001uF and “C2” is 0.9999uF. This is the same on resistor, transistor..... This little difference makes the vibration could start to vibrate. I assume now the circuit is already on stable vibration status. Now the first half of vibration is taking place at left-hand side. The arrow on Figure 9 is the “+” charge where to flow when this first half take place. The charge is just to flow from “L3” and “L4”. “L3” and “L4” light on. Then push the “+” charge from left-hand side of “C1”. Finally, the “+” charge on right-hand side of “C1” repel from “C1” and turn on “Q4”. You may think why “L1” and “L2” do not light on when “Q4” is on. The reason is that the “+” charge stay on right-hand side of “C2” would go to collector of “Q4”. At the same time “+” charge would start to cumulates at left hand side of “C2” through “R7” and “V2”. After all the charge on “C1” or “C2” have used up for this first half of vibration. The second half of vibration start but on mirror side. The result is that “L1, L2” and “L3, L4” vibrate alternately. The function of “V1” and “V2” is to control the charging time so as to control vibration rate or duty cycle.

The function of R6 and R7 is a protection resistance so as to prevent the player adjusting V1 and V2 to too low the resistance accidentally.

“R5”, “Q1” and “Q2” connecting in this way because this can turn on “Q2” by using very little of current. You could also understand as let vibration circuit do not know the existing of “R5” “Q1”, “Q2”, “BZ”, “SWITCH” Then you can control the flashing rate as well as duty cycle just due to “V1” and “V2”.

CIRCUIT DIAGRAM:



OTHER DIAGRAM:

