


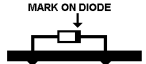
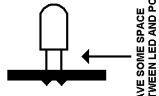
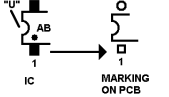

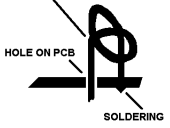
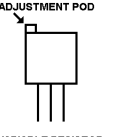
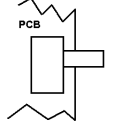
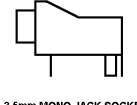
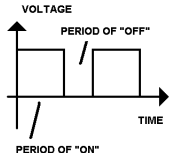
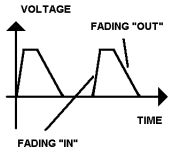
FLASHING STAR WITH STYLE ADJUSTMENT

PRODUCT CODE: M00270030

DESCRIPTION: Four resistors in the star are to control the period of "ON" and "OFF", the rate of fading "IN" and "OUT".

READ BEFORE INSTALLATION:

- Put the component on the side of screen printing and solder on the back of PCB without printing.
- Placing direction of component.
- 1. On component, longer leg is "+".
- 2. On PCB marking, square pad as Figure 1 is always "+".
- 3. For diode, please install as Figure 2.
- Do not put the LED to very bottom, just install as Figure 3.
- For any IC, finding out which leg is first leg (FIGURE 4) is important. Also, solder the socket (chair) to the PCB and the IC sit on the top.
- For 9V Battery Adaptor, Red is B+ and Black is B-. Also, please tie a knot after the red and black wire has passed the neighbors hole before soldering. This is similar to Figure 6.

| | | |
|---|--|---|
|  <p>This is +</p> <p>FIGURE 1</p> |  <p>MARK ON DIODE</p> <p>DIRECTION OF MARKING ON PCB</p> <p>FIGURE 2</p> |  <p>LEAVE SOME SPACE BETWEEN LED AND PCB</p> <p>FIGURE 3</p> |
|  <p>IC MARKING ON PCB</p> <p>THE FIRST LEG OF IC IS KNOWN FROM THE DIRECTION OF CHARACTER, BLACK SPOT OR "U" EDGE OF IC.</p> <p>FIGURE 4</p> |  <p>TRANSISTOR BY LOOKING AT THE TOP</p> <p>FIGURE 5</p> |  <p>TIE A KNOT</p> <p>HOLE ON PCB</p> <p>SOLDERING</p> <p>FIGURE 6</p> |
|  <p>ADJUSTMENT POD</p> <p>VARIABLE RESISTOR</p> <p>FIGURE 7</p> |  <p>PCB</p> <p>FIGURE 8</p> |  <p>3.5mm MONO JACK SOCKET</p> <p>FIGURE 9</p> |
|  <p>VOLTAGE</p> <p>PERIOD OF "OFF"</p> <p>PERIOD OF "ON"</p> <p>TIME</p> <p>FIGURE 10</p> |  <p>VOLTAGE</p> <p>FADING "OUT"</p> <p>FADING "IN"</p> <p>TIME</p> <p>FIGURE 11</p> | |

CIRCUIT EXPLANATION:

Please read the below together with the circuit diagram in Figure 12.

Part 1 is the oscillator of the circuit and this is also the control of the period of "ON" and "OFF" of the circuit (FIGURE 10).

- When Leg 1 of U1A is high, C1 would charge through VR1 and D1. VR1 is to control the rate of charging.
- When Leg 1 of U1A is low, C1 would discharge through D2 and VR2. Then finally go back to Leg 1 of U1A. VR2 is to control the rate of discharge.
- The state of Leg 1 is the result of comparator circuit of Leg 2 and Leg 3 of U1A. Leg 1 would be high when Leg 2 is lower than Leg 3. Leg 1 would be low when Leg 2 is higher than Leg 3.
- The feedback circuit in above finally would control the period of "ON" and "OFF" of the whole circuit.

Part 2 work as voltage comparator circuit so that the output at Leg 7 of U1B is more "SQUARE". You can, in fact, remove this circuit without big change to the whole circuit. But adding this part can make you easier to understand part 1 can only control the rate of oscillating as well as period of "ON" and "OFF" and have no effect on rate of fading.

- Part 3 work as a buffer circuit so that this can isolate the circuit before and after this.
- Part 4 is the circuit for fading "IN" and "OUT" (FIGURE 11).
- When Leg 8 of U1C is high in voltage, this would charge C2 through D3 and VR3. VR3 is to control the rate of charging and this is the slope of fading "IN".
- When Leg 8 of U1C is low in voltage, the charges at C2 would discharge through VR4 and D4. Then finally go to Leg 8 of U1C. VR4 is to control the rate of discharge and this is the slope of fading "OUT".

- The above in both are to control the rate of fading "IN" and "OUT".
- Part 5 is the same as Part 3. This work as buffer circuit so that this can isolate the circuit before and after this. The Leg 12 of UID is to sense the voltage of C2 during the time of charging or discharging. This finally would become the output of Leg 14 of UID.
- Part 6 would light up all the LED from L1 to L7 when the voltage of emitter of Q1 is low. The brightness is depending on how low the emitter is. This, in fact, depends on the result of part 4.
- Part 7 would light up all the LED from L8 to L14 when the voltage of emitter of Q2 is high. The brightness is depending on how high the emitter is. This, in fact, depends on the result of part 4.
- Part 8 is the circuit for power supply. D5 is to preventing reverse power supply. C3 is to make the whole circuit working at stable voltage.

INSTALLATION:

Just install the component to the PCB M00260048 according to below table.

| ITEM | SYMBOL ON PCB | DESCRIPTION | OUTLOOK | DIRECTION IS IMPORTANT? |
|------|-----------------------|----------------------------|---|-------------------------|
| 1 | R1 | RESISTOR, 10K ohms | BROWN, BLACK, ORANGE | NO |
| 2 | R2 | RESISTOR, 10K ohms | BROWN, BLACK, ORANGE | NO |
| 3 | R3 | RESISTOR, 10K ohms | BROWN, BLACK, ORANGE | NO |
| 4 | R4 | RESISTOR, 100K ohms | BROWN, BLACK, YELLOW | NO |
| 5 | R5 | RESISTOR, 100K ohms | BROWN, BLACK, YELLOW | NO |
| 6 | R6 | RESISTOR, 100K ohms | BROWN, BLACK, YELLOW | NO |
| 7 | R7 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 8 | R8 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 9 | R9 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 10 | R10 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 11 | R11 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 12 | R12 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 13 | R13 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 14 | R14 | RESISTOR, 1K ohms | BROWN, BLACK, RED | NO |
| 15 | R15 | RESISTOR, 1K ohms | BROWN, BLACK, RED | NO |
| 16 | R16 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 17 | R17 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 18 | R18 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 19 | R19 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 20 | R20 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 21 | R21 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 22 | R22 | RESISTOR, 330 ohms | ORANGE, ORANGE BROWN | NO |
| 23 | D1 | DIODE, IN4148 | FIGURE 2 (MOSTLY TRANSPARENT RED) | FIGURE 2 |
| 24 | D2 | DIODE, IN4148 | FIGURE 2 (MOSTLY TRANSPARENT RED) | FIGURE 2 |
| 25 | D3 | DIODE, IN4148 | FIGURE 2 (MOSTLY TRANSPARENT RED) | FIGURE 2 |
| 26 | D4 | DIODE, IN4148 | FIGURE 2 (MOSTLY TRANSPARENT RED) | FIGURE 2 |
| 27 | D5 | DIODE, IN4001 | FIGURE 2 (MOSTLY BLACK) | FIGURE 2 |
| 28 | L1 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 29 | L2 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 30 | L3 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 31 | L4 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 32 | L5 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 33 | L6 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 34 | L7 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 35 | L8 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 36 | L9 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 37 | L10 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 38 | L11 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 39 | L12 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 40 | L13 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 41 | L14 | LED | ONE LONG LEG AND ONE SHORT LEG | YES |
| 42 | VR1 | VARIABLE RESISTOR, 1M ohms | FIGURE 7 | NO |
| 43 | VR2 | VARIABLE RESISTOR, 1M ohms | FIGURE 7 | NO |
| 44 | VR3 | VARIABLE RESISTOR, 1M ohms | FIGURE 7 | NO |
| 45 | VR4 | VARIABLE RESISTOR, 1M ohms | FIGURE 7 | NO |
| 46 | Q1 | TRANSISTOR, PNP | FIGURE 5, 9012 IS MARKED ON THE COMPONENT | YES |
| 47 | Q2 | TRANSISTOR, NPN | FIGURE 5, 9014 IS MARKED ON THE COMPONENT | YES |
| 48 | U1 | DIP 14 SOCKET | 14 LEGS | NO |
| 49 | C1 | CAPACITOR, 10uF | MARK WITH 10uF OR SAME MEANING OF VALUE | YES |
| 50 | C2 | CAPACITOR, 10uF | MARK WITH 10uF OR SAME MEANING OF VALUE | YES |
| 51 | C3 | CAPACITOR, 10uF | MARK WITH 10uF OR SAME MEANING OF VALUE | YES |
| 52 | SWITCH | SLIDE SWITCH | SIX LEGS | FIGURE 8 |
| 53 | DCJACK | 3.5mm MONO JACK SOCKET | FIGURE 9 | YES |
| 54 | B+, B- | 9V BATTERY ADAPTOR | RED WIRE, BLACK WIRE | YES |
| 55 | ON THE TOP OF ITEM 48 | IC, LM324 | 14 LEGS | FIGURE 4 |

- After installation, you can adjust the value of VR1, VR2, VR3 and VR4 so as to control the flashing pattern you want.
- Because this circuit is not working at dual polarity, brightness between L1 to L7 and L8 to L14 is not balance.
- You can also use external DC adaptor as power sources. You can use our product M00270013 or other similar adaptor.

CIRCUIT DIAGRAM:

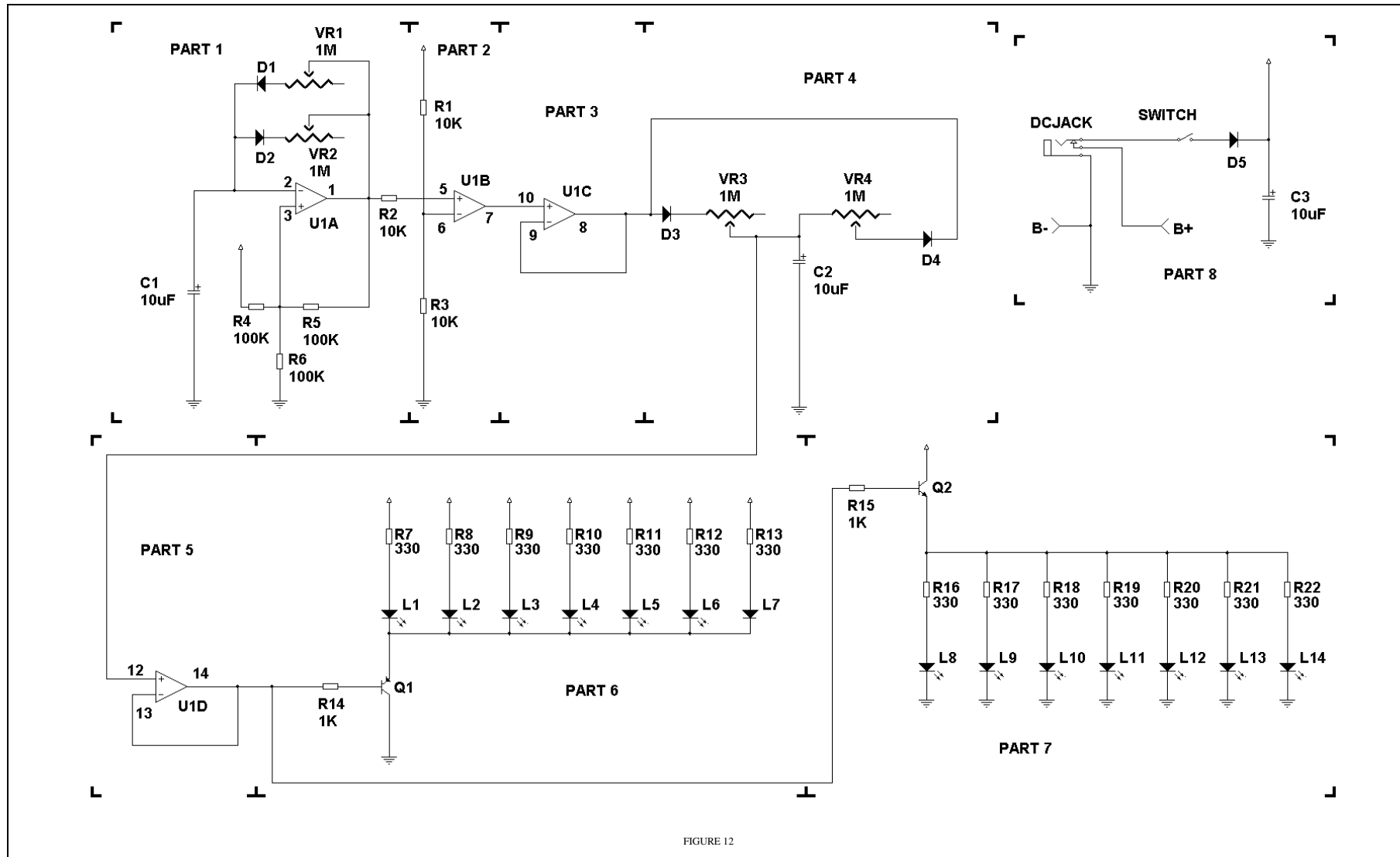


FIGURE 12