

MiOYOOW 1

MiOYOOW Electronic DIY Circuit Kit: Gradient RGB LED Circular Lamp Module Instruction Manual

Model: 1

1. INTRODUCTION

This instruction manual provides detailed guidance for assembling, operating, and maintaining the MiOYOOW Electronic DIY Circuit Kit, a Gradient RGB LED Circular Lamp Module. This kit is designed for individuals interested in soldering practice and learning about basic electronic circuits, resulting in a functional and visually appealing LED light display.

2. SAFETY INFORMATION

Before beginning assembly, please read and understand all safety precautions. Soldering involves high temperatures and can produce fumes. Always work in a well-ventilated area and wear appropriate personal protective equipment.

- **Ventilation:** Ensure adequate ventilation to disperse solder fumes.
- **Eye Protection:** Wear safety glasses to protect against solder splashes or flying debris.
- **Burn Prevention:** Soldering irons reach high temperatures. Avoid direct contact with the tip and allow components to cool before handling.
- **Electrical Safety:** Do not power the circuit until all components are correctly soldered and inspected. Use only the specified power source (DC 3V).
- **Tool Handling:** Handle soldering irons and other tools with care. Keep them away from flammable materials.
- **Children:** This kit contains small parts and requires soldering. It is not suitable for young children without adult supervision.

3. PACKAGE CONTENTS

Verify that all components listed below are present in your kit before starting assembly. Refer to the component listing image for visual identification.

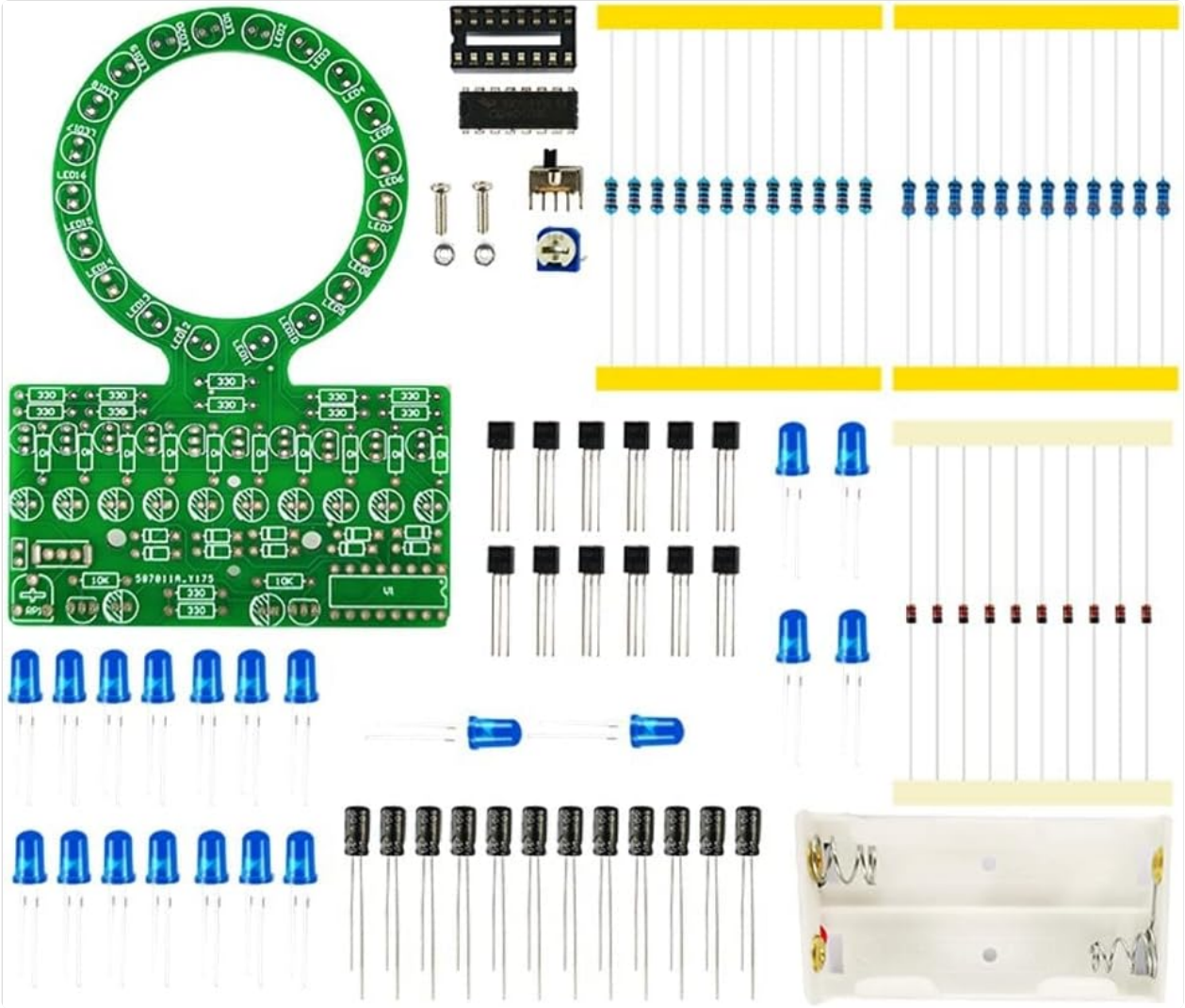


Image 3.1: Overview of all individual components included in the kit, neatly arranged for identification.

Component Listing				
No.	Component Name	PCB Marker	Parameter	Quantity
1	Metal Film Resistor	R1-R10,R21,R24	10K	12
2	Metal Film Resistor	R11-R20,R22,R23	330ohm	12
3	IN4148 Diode	D1-D10	DO-35	10
4	S9013 Transistor	Q1-Q12	TO-92	12
5	Electrolytic Capacitor	C1-C12	10uF	12
6	Potentiometer	RP1	100K	1
7	Toggle Switch	ON-OFF		1
8	5mm Blue LED	LED1-LED20		20
9	CD4017 Chip	U1	DIP-16	1
10	IC Socket	U1	DIP-16	1
11	AA*2 Battttery Socket	P1		1
12	M2*10 Screw			2
13	M2 Nut			2
14	PCB Board		104*74mm	1

Image 3.2: Detailed component listing table, showing item number, component name, PCB marker, parameter, and quantity.

Component Listing				
No.	Component Name	PCB Marker	Parameter	Quantity
1	Metal Film Resistor	R1-R10,R21,R24	10K	12
2	Metal Film Resistor	R11-R20,R22,R23	330ohm	12
3	IN4148 Diode	D1-D10	DO-35	10
4	S9013 Transistor	Q1-Q12	TO-92	12
5	Electrolytic Capacitor	C1-C12	10uF	12
6	Potentiometer	RP1	100K	1
7	Toggle Switch	ON-OFF		1
8	5mm Blue LED	LED1-LED20		20
9	CD4017 Chip	U1	DIP-16	1
10	IC Socket	U1	DIP-16	1

No.	Component Name	PCB Marker	Parameter	Quantity
11	AA*2 Battery Socket	P1		1
12	M2*10 Screw			2
13	M2 Nut			2
14	PCB Board		104*74mm	1

4. ASSEMBLY INSTRUCTIONS

Follow these steps carefully to assemble your LED Circular Lamp Module. It is recommended to solder components from smallest to largest, paying close attention to polarity and orientation.

4.1 Tools Required (Not Included)

- Soldering Iron
- Solder Wire
- Solder Wick or Desoldering Pump (for corrections)
- Wire Cutters/Flush Cutters
- Needle-nose Pliers
- Multimeter (optional, for testing)

4.2 Step-by-Step Assembly

1. **Resistors (R1-R24):** Identify the 10K (brown-black-orange-gold) and 330ohm (orange-orange-brown-gold) metal film resistors. Insert them into their corresponding positions on the PCB (R1-R10, R21, R24 for 10K; R11-R20, R22, R23 for 330ohm). Bend the leads to hold them in place, solder them, and trim excess leads. Resistors do not have polarity.
2. **Diodes (D1-D10):** Locate the IN4148 diodes. Diodes are polarized. The black band on the diode must match the band marking on the PCB. Insert, solder, and trim.
3. **Transistors (Q1-Q12):** Identify the S9013 transistors. Transistors have a specific orientation. Align the flat side of the transistor with the flat marking on the PCB. Insert, solder, and trim.
4. **Electrolytic Capacitors (C1-C12):** These capacitors are polarized. The longer lead is positive (+), and the shorter lead is negative (-). The negative side is usually marked with a stripe on the capacitor body. Match the negative stripe with the corresponding marking on the PCB. Insert, solder, and trim.
5. **IC Socket (U1):** Insert the 16-pin IC socket into the U1 position. Ensure the notch on the socket aligns with the notch marking on the PCB. Solder all pins. This socket will hold the CD4017 chip later, protecting it from soldering heat.
6. **Potentiometer (RP1) and Toggle Switch (ON-OFF):** Insert the potentiometer and toggle switch into their designated spots. Solder their pins securely.
7. **LEDs (LED1-LED20):** The 5mm blue LEDs are polarized. The longer lead is the anode (+), and the shorter lead is the cathode (-). The PCB also has markings for polarity. Carefully insert each LED, ensuring correct orientation. Solder them and trim the leads.
8. **Battery Socket (P1):** Attach the AA*2 battery socket to the PCB using the M2*10 screws and M2 nuts. Ensure the red wire from the battery socket connects to the positive (+) terminal on the PCB and the black wire to the negative (-) terminal. Solder these connections.
9. **CD4017 Chip (U1):** After all soldering is complete and the PCB has cooled, carefully insert the CD4017

chip into the IC socket. Ensure the notch on the chip aligns with the notch on the socket and PCB. Gently press down until it is fully seated.

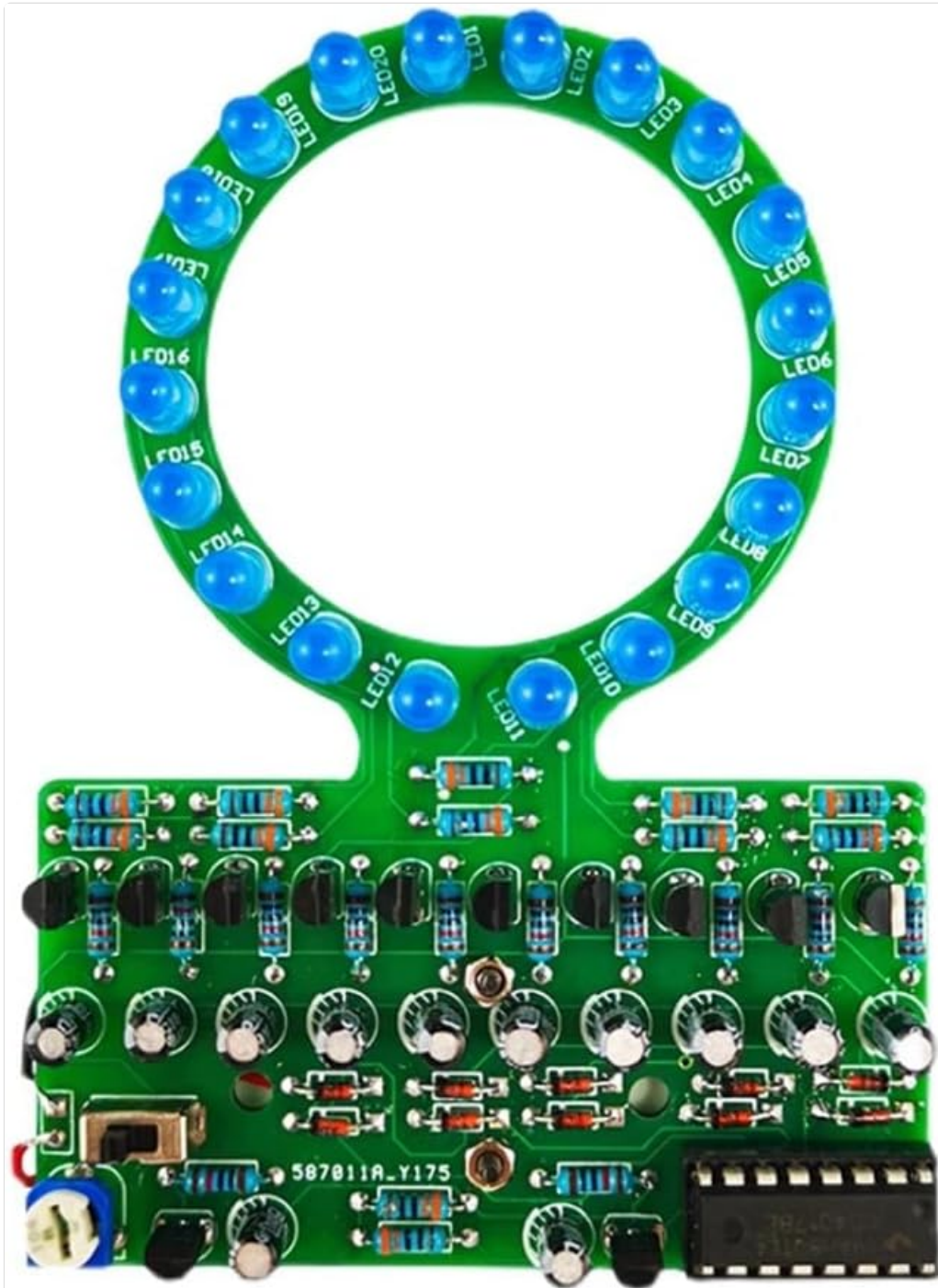


Image 4.1: A view of the fully assembled circuit board, showcasing the soldered components and the circular arrangement of blue LEDs.

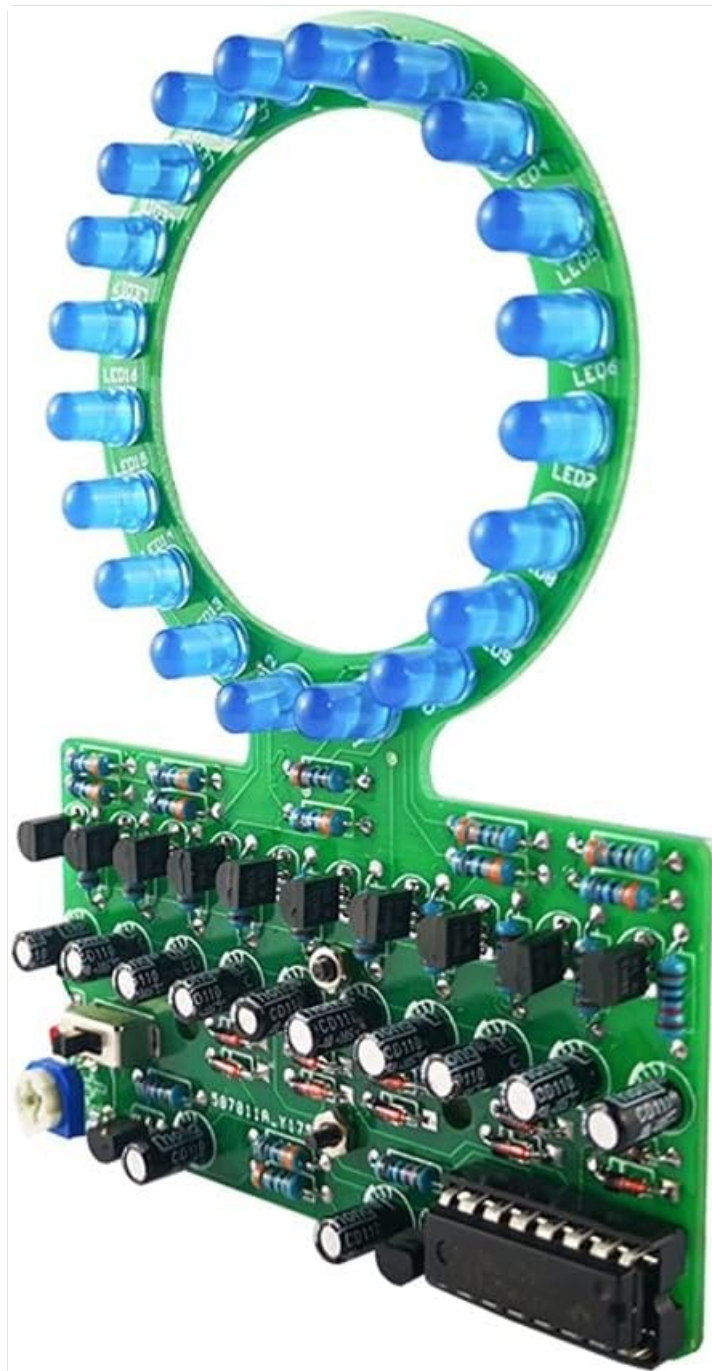


Image 4.2: An angled perspective of the assembled kit, providing a clearer view of the component placement on the PCB and the LED ring structure.

5. OPERATING INSTRUCTIONS

Once assembly is complete, follow these steps to operate your LED Circular Lamp Module:

1. **Insert Batteries:** Insert two AA batteries (not included) into the battery socket, ensuring correct polarity (+ and -).
2. **Power On:** Flip the toggle switch to the 'ON' position. The LEDs should begin to light up in a circular, gradient pattern.
3. **Adjust Speed:** Use the potentiometer (the knob) to adjust the speed of the LED light flow. Turning the knob clockwise or counter-clockwise will increase or decrease the speed of the gradient effect.
4. **Power Off:** To turn off the module, flip the toggle switch to the 'OFF' position.



Image 5.1: The assembled circuit board with two AA batteries correctly installed in the battery holder, ready for operation.

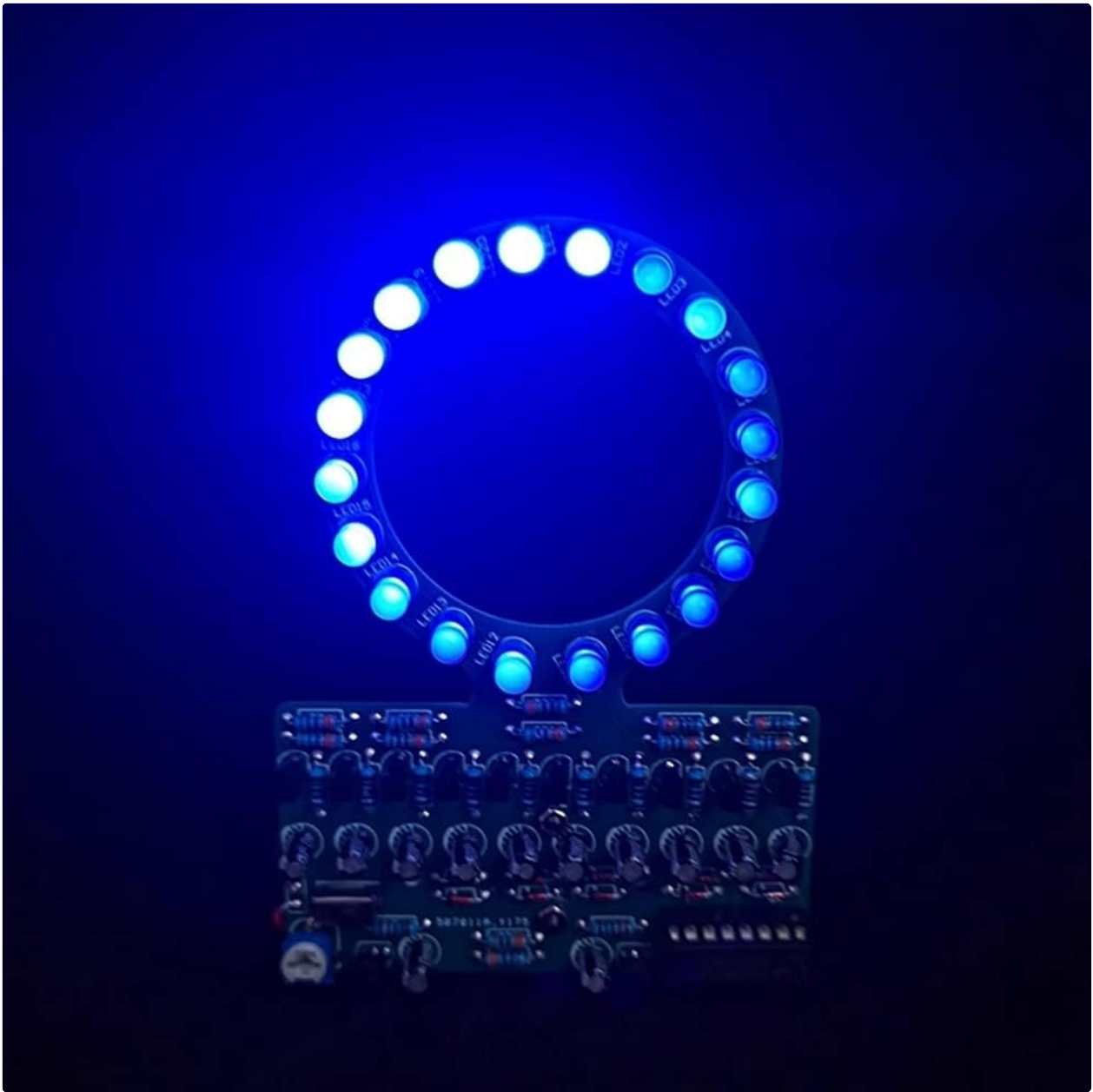


Image 5.2: The LED module operating in a dark setting, demonstrating the vibrant blue light and the circular flow pattern.

6. MAINTENANCE

This DIY kit requires minimal maintenance. Following these guidelines will help ensure its longevity:

- **Cleaning:** If dust accumulates, gently wipe the PCB and components with a soft, dry cloth. Avoid using liquids.
- **Battery Replacement:** Replace AA batteries when the LED brightness diminishes or the pattern becomes erratic. Always remove depleted batteries promptly to prevent leakage.
- **Storage:** Store the module in a dry, cool place away from direct sunlight and extreme temperatures.
- **Inspection:** Periodically inspect solder joints for any signs of cracking or corrosion. Re-solder if necessary.

7. TROUBLESHOOTING

If your LED Circular Lamp Module is not functioning as expected, refer to the following troubleshooting tips:

- **No LEDs Light Up:**

- Check battery polarity and ensure batteries are fresh.
- Verify the toggle switch is in the 'ON' position.
- Inspect all solder joints for cold joints (dull, lumpy solder) or bridges (solder connecting two unintended points).
- Ensure the CD4017 chip is correctly inserted into its socket and oriented properly.
- **Some LEDs Not Lighting Up:**
 - Check the polarity of the specific non-lighting LED.
 - Inspect the solder joints for that LED.
 - A faulty LED is possible, though rare.
- **Erratic or Incorrect Pattern:**
 - Re-check the polarity and orientation of all diodes, transistors, and electrolytic capacitors. Incorrect polarity can cause unexpected behavior.
 - Ensure the CD4017 chip is fully seated and correctly oriented.
 - Inspect for any solder bridges between adjacent pins on the IC socket or other components.
- **Speed Adjustment Not Working:**
 - Check the soldering of the potentiometer.
 - Ensure the potentiometer itself is not faulty (rare).

8. SPECIFICATIONS

Key technical specifications for the MiOYOOW Electronic DIY Circuit Kit:

- **Work Voltage:** DC 3V (requires 2x AA batteries)
- **Work Temperature:** -25°C to 85°C
- **Work Humidity:** 5% to 95% RH
- **PCB Dimensions:** 104mm x 74mm
- **Material:** Copper (PCB traces)
- **LED Type:** 5mm Blue LEDs
- **Features:** Capacitive delay, fading effect, adjustable speed

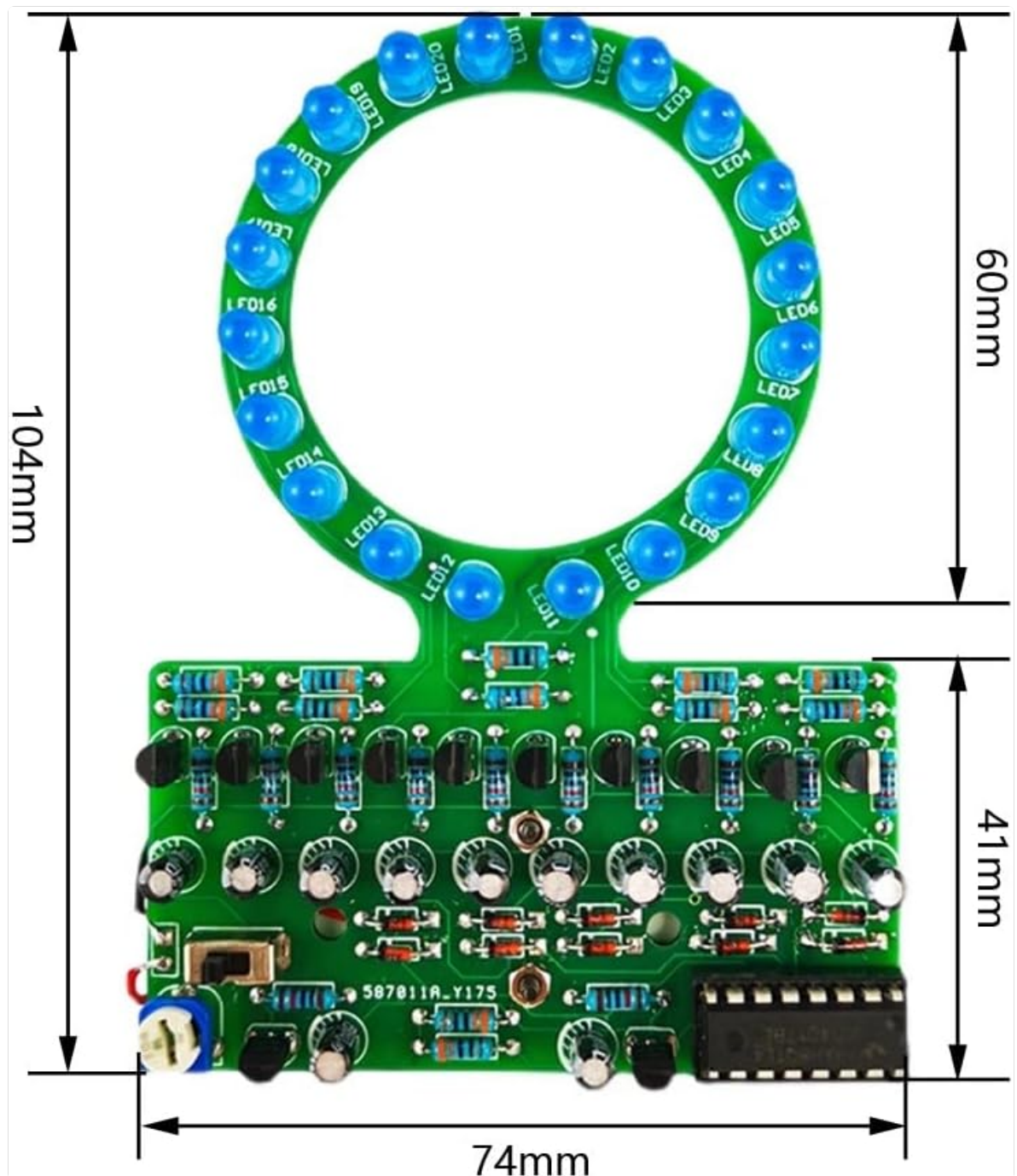


Image 8.1: Dimensional drawing of the assembled PCB, indicating measurements of 104mm in height and 74mm in width.

9. WARRANTY AND SUPPORT

This product is a DIY kit intended for educational and hobbyist purposes. While every effort has been made to ensure component quality, successful operation depends on correct assembly.

For any issues or questions regarding the kit, please contact MiOYOOOW customer service. We aim to provide satisfying solutions within 24 hours.

Please note that damage resulting from incorrect assembly, improper use, or modification is not covered.

