CUQI WS2812B 10x10 5050

CUQI WS2812B RGB-IC Panel LED 10x10 Instruction Manual

Model: 5050

Brand: CUQI

1. INTRODUCTION

This manual provides comprehensive instructions for the CUQI WS2812B RGB-IC Panel LED 10x10. This panel features 100 individually addressable RGB LEDs, making it an ideal component for various DIY lighting projects, especially when integrated with microcontrollers like Raspberry Pi or Arduino.

Please read this manual thoroughly before use to ensure proper installation and operation.

2. KEY FEATURES

- **Individually Addressable WS2812B LEDs:** Each LED is independently controllable, allowing for complex programming of multiple colors and dynamic lighting effects.
- **10x10 Pixel LED Panel:** The panel measures approximately 10.42 x 9.38 cm and contains a total of 100 RGB LEDs, each with a built-in IC chip.
- **DC 5V Operation:** Designed to operate with a standard 5V DC power supply.
- **Broad Compatibility:** Compatible with popular microcontrollers such as Arduino and Raspberry Pi, utilizing libraries like FastLED and Adafruit NeoPixel. Also supports various dedicated LED controllers (e.g., K-1000C, SP105E, SP108E).
- **DIY Project Versatility:** Offers flexibility to control light color, flow speed, and brightness for custom LED displays, artistic installations, holiday decorations, and other creative lighting applications.

3. PACKAGE CONTENTS

Ensure all items are present and in good condition upon opening the package:

- 1x CUQI WS2812B RGB-IC Panel LED (10x10, 100 LEDs)

4. TECHNICAL SPECIFICATIONS

Feature	Specification
Brand	CUQI
Model Number	5050
Dimensions (Panel)	10.42 x 9.38 cm (4.09 x 3.7 inches)
Number of LEDs	100 (10x10 matrix)
LED Type	WS2812B RGB-IC (5050 SMD)
Input Voltage	DC 5V
Power Consumption	6 watts
Color	Multicolor
Special Feature	Dimmable
Usage Environment	Indoor
Product Weight	50 g

5. SETUP INSTRUCTIONS

5.1. Unpacking and Inspection

Carefully remove the WS2812B RGB-IC Panel LED from its protective packaging. Inspect the panel for any visible damage or missing components.
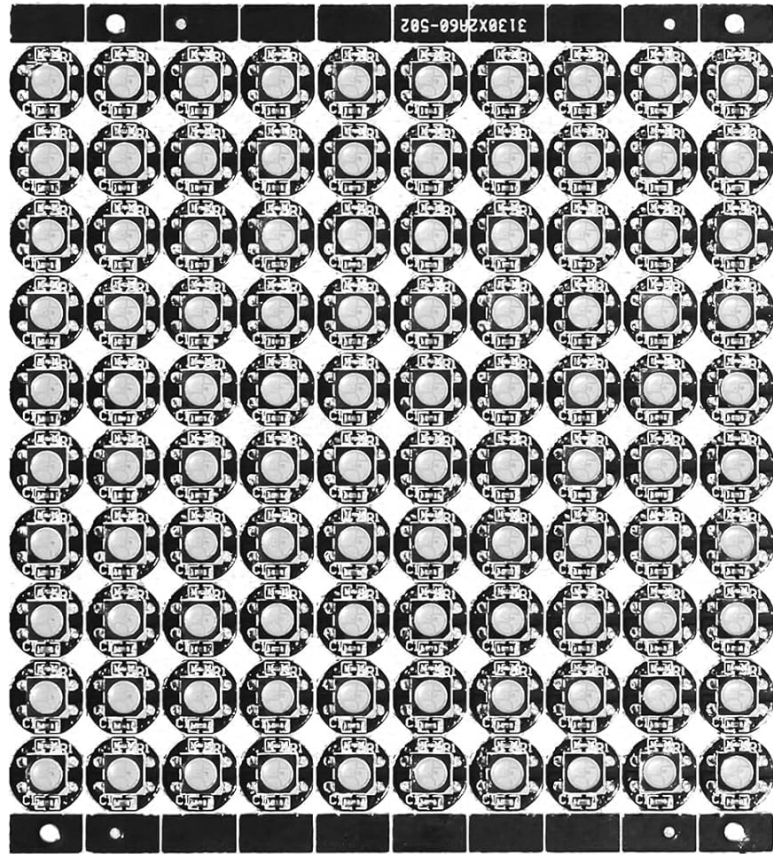
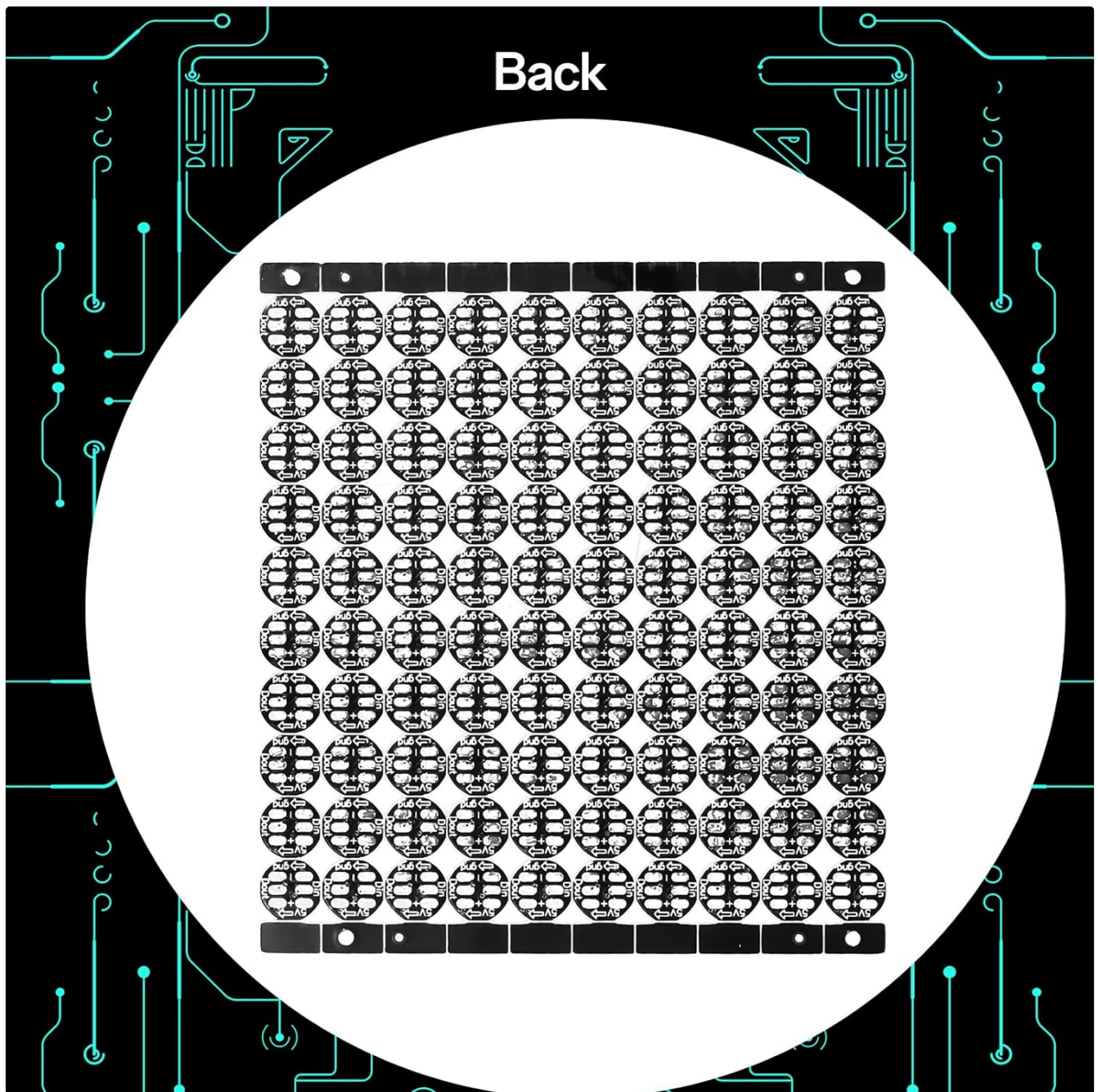# Front

Figure 1: Front view of the LED panel.
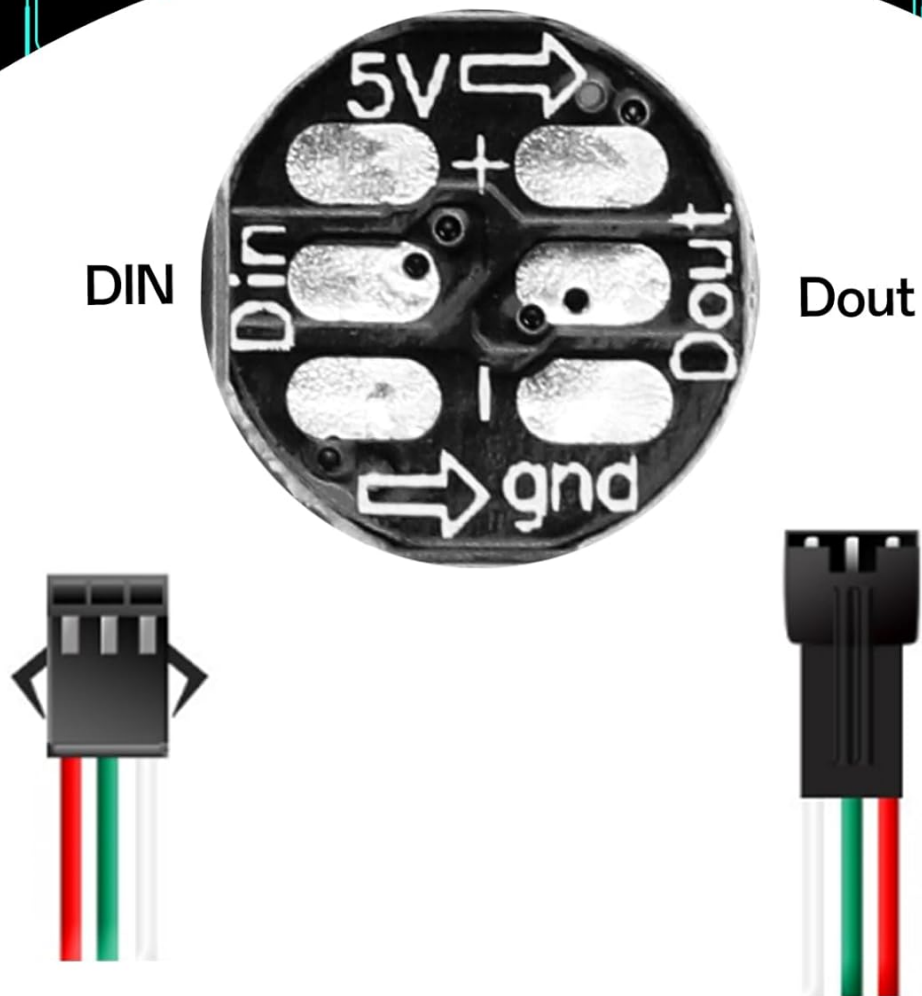
Figure 2: Back view of the LED panel.

5.2. Wiring Connections

The panel requires a 5V DC power supply and a data input signal. Each LED is individually addressable via a 3-pin connection. Identify the following pins on the panel:

- **+5V:** Power input (red wire typically)
- **DIN:** Data input (green or white wire typically)
- **GND:** Ground (black or blue wire typically)
- **DOUT:** Data output (for chaining multiple panels)

Connect the +5V, DIN, and GND pins to your chosen microcontroller (e.g., Arduino, Raspberry Pi) or dedicated LED controller. Ensure correct polarity to prevent damage to the panel or controller.

Figure 3: Wiring method for WS2812B LEDs.

The DOUT pin allows you to chain multiple panels together. Connect the DOUT of the first panel to the DIN of the next panel, and so on. Remember to provide adequate power for all chained panels.
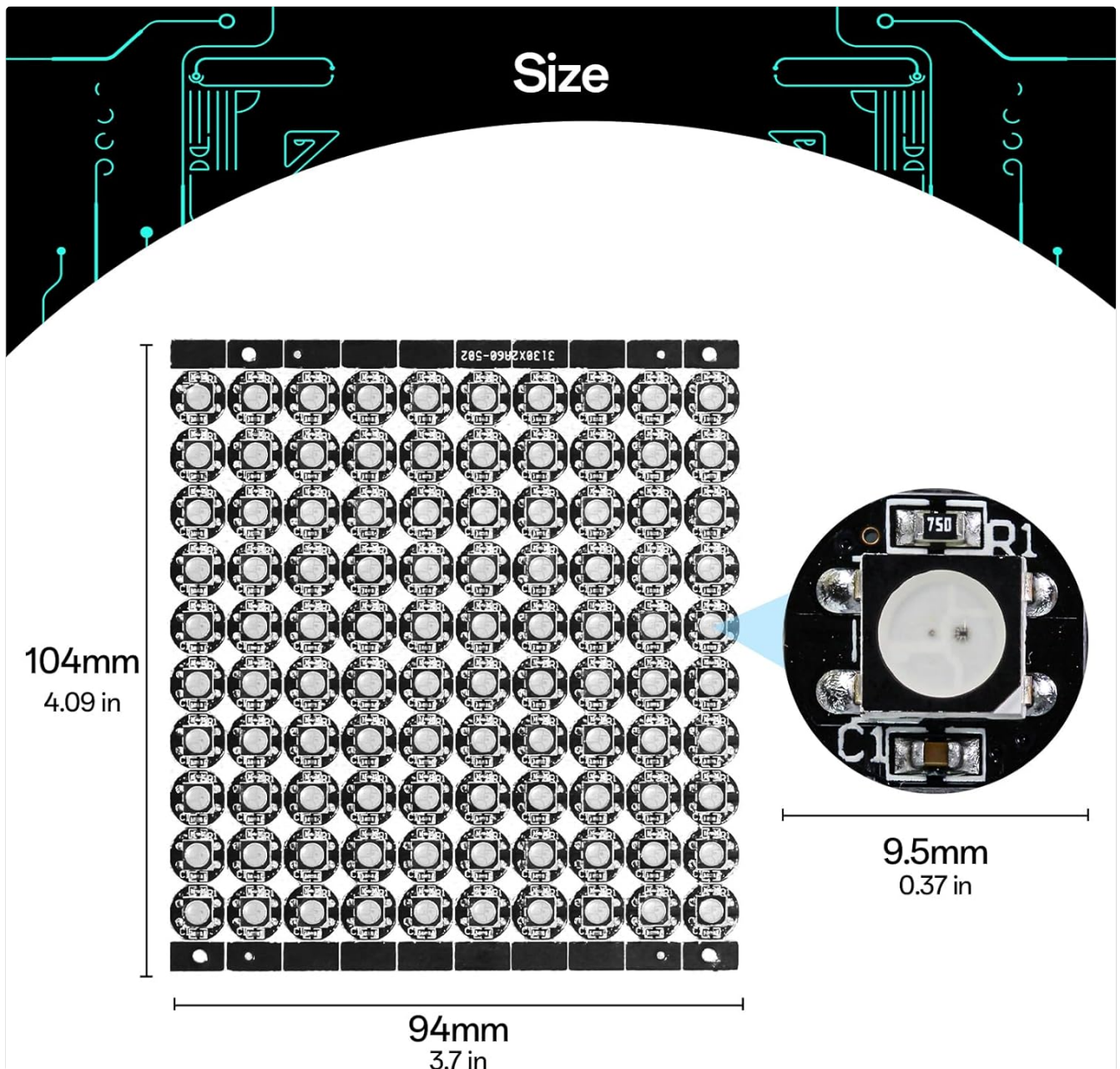
Figure 4: Dimensions of the 10x10 LED panel.

5.3. Power Supply Considerations

A stable 5V DC power supply is crucial for optimal performance. The current requirement depends on the number of LEDs and their brightness settings. For 100 LEDs at full brightness, a power supply capable of delivering sufficient current (e.g., 6A for 6W at 5V) is recommended. Always ensure your power supply can handle the maximum current draw of your entire LED setup.

6. OPERATING THE LED PANEL

6.1. Microcontroller Compatibility and Control Options

The CUQI WS2812B panel is highly versatile and compatible with various microcontrollers and control methods:

- **Arduino:** Use popular libraries like Adafruit NeoPixel or FastLED for easy programming.
- **Raspberry Pi:** Can be controlled using Python libraries or other programming languages.
- **Dedicated LED Controllers:** Compatible with various specialized controllers such as K-1000C, SP105E, and

SP108E, which often offer pre-programmed effects and easier user interfaces.

Multiple Control Options

Note: Controller requires additional purchase and is not included.

Arduion uno

Raspberry pi

K-1000C

SP105E

SP108E

WIFI controller

Figure 5: Multiple control options for the LED panel.

6.2. Programming the LED Panel

To control the LEDs, you will need to write code for your chosen microcontroller. Libraries like Adafruit NeoPixel and FastLED significantly simplify this process by providing functions to set individual LED colors, brightness, and create complex dynamic effects.

Refer to the documentation of your chosen library and microcontroller for specific programming examples and detailed guides. Many online resources and communities are available to assist with programming WS2812B LEDs.

6.3. Basic Control Example (Conceptual)

A typical setup involves connecting the data pin (DIN) of the LED panel to a digital output pin on your microcontroller. Here's a conceptual example using Arduino with the FastLED library:

```
#include <FastLED.h>

#define NUM_LEDS 100
#define DATA_PIN 6 // Connect DIN to Arduino Digital Pin 6

CRGB leds[NUM_LEDS];

void setup() {
  FastLED.addLeds<WS2812B, DATA_PIN, GRB>(leds, NUM_LEDS);
}

void loop() {
  // Example: Light the first LED red
  leds[0] = CRGB::Red;
  FastLED.show();
  delay(50); // Small delay

  // Example: Cycle through colors for all LEDs
  for(int i = 0; i < NUM_LEDS; i++) {
    leds[i] = CHSV(millis() / 10 + i * 2, 255, 255);
  }
  FastLED.show();
  delay(10);
}
```

This example demonstrates how to initialize the FastLED library and set individual LED colors. You can expand upon this code to control all 100 LEDs and create your desired patterns and animations.

DIY Project

Figure 6: Examples of DIY projects with the LED panel.

7. MAINTENANCE

To ensure the longevity and optimal performance of your LED panel, follow these maintenance guidelines:

- **Keep Clean and Dry:** Avoid exposing the panel to moisture, liquids, or extreme temperatures. This product is designed for indoor use only.

- **Handle with Care:** Do not apply excessive force, bend the panel sharply, or drop it, as this may damage the LEDs or internal circuit traces.

- **Check Connections:** Periodically inspect all wiring connections for looseness or signs of corrosion. Ensure all connections are secure.

- **Cleaning:** If the panel becomes dirty, gently wipe it with a soft, dry, lint-free cloth. Do not use abrasive cleaners, solvents, or harsh chemicals, as these can damage the LEDs or the PCB.

8. TROUBLESHOOTING

If you encounter issues with your CUQI WS2812B RGB-IC Panel LED, refer to the following troubleshooting tips:

- **LEDs Not Lighting Up:**
  - **Power Supply:** Ensure the 5V DC power supply is correctly connected and providing sufficient current for all LEDs.
  - **Wiring:** Double-check that the +5V, DIN, and GND connections are secure and correctly wired to your microcontroller or controller. Verify polarity.
  - **Code:** Confirm that your microcontroller code is correctly uploaded and configured to address the LEDs.
  - **Individual LED Test:** If possible, test a single LED or a small section of the panel to help isolate the problem.

- **Incorrect Colors or Flickering:**
  - **Data Line Integrity:** Ensure the data line (DIN) is not excessively long or experiencing electromagnetic interference. For longer runs or 3.3V microcontrollers, consider using a logic level shifter.
  - **Power Supply Issues:** Insufficient power or voltage drops can cause flickering or incorrect color display. Ensure the power supply is stable.
  - **Library Configuration:** Verify that the LED type (WS2812B) and color order (e.g., GRB) are correctly specified in your programming library.

- **Only Some LEDs Work or Chain Breaks:**
  - **Damaged LEDs:** Since WS2812B LEDs are chained, a faulty LED can interrupt the data signal for all subsequent LEDs in the chain. Identify and replace any damaged LEDs.
  - **Bad Solder Joints:** Inspect solder points for continuity, especially if you have made custom connections or modifications.

9. WARRANTY AND SUPPORT

For warranty information, technical support, or any product-related inquiries, please refer to the manufacturer's official website or contact your retailer directly. Keep your purchase receipt as proof of purchase.

Manufacturer: CUQI

10. ENERGY EFFICIENCY

This product has an energy efficiency rating of F.

For detailed information regarding the energy efficiency of this product, please scan the QR code on the energy label or visit the EPREL database:
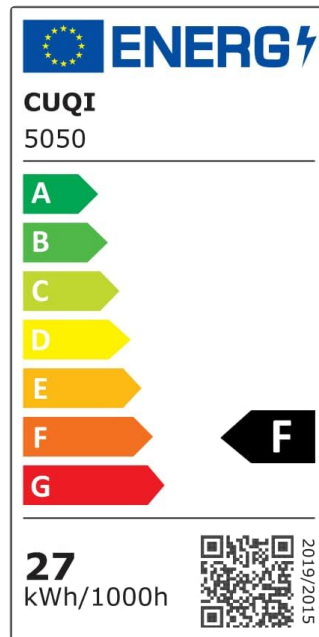
Figure 7: Energy Efficiency Label.

11. RELATED PRODUCT VIDEOS

11.1. WS2812 RGB LED Matrix Panel Demonstration

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This video demonstrates various lighting effects and modes achievable with a WS2812 RGB LED matrix panel, including music mode, text mode, and video mode. It showcases the dynamic capabilities of individually addressable LEDs.

11.2. Tesfish 5V WS2812B LED Strip Overview

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This video provides an overview of the Tesfish 5V WS2812B LED strip, demonstrating its flexibility, strong adhesive, and how each LED can be cut. It also shows the connection to a controller and various color displays.

11.3. Tesfish 5V WS2812B LED Strip Features

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This video highlights additional features of the Tesfish 5V WS2812B LED strip, including its cuttable design, built-in WS2811 IC, and strong adhesive. It also shows controller connection and various color modes.