CHANZON 100F5050-WH-1518LM

CHANZON 5050 White SMD LED Diode Lights User Manual

Model: 100F5050-WH-1518LM | Brand: CHANZON

1. Introduction

This manual provides essential information for the safe and effective use of your CHANZON 5050 White SMD LED Diode Lights. These surface-mount devices (SMD) are designed for various electronic applications, offering bright, energy-efficient illumination. Please read this manual thoroughly before installation and operation.
The package contains 100 pieces of 5050 White SMD LEDs, each measuring 5.0 x 5.0 mm, emitting a white light with a color temperature range of 6000K-9000K and a luminous intensity of 15-18 lumens.

2. Safety Information

- **Electrical Safety:** Always ensure power is disconnected before handling or installing LEDs. Incorrect voltage or current can damage the LEDs or pose a safety hazard.
- **Polarity:** LEDs are polarity-sensitive. Connecting them with reverse polarity will prevent them from lighting up and can cause damage. Always verify polarity before applying power.
- **Heat:** While LEDs are energy-efficient, they still generate some heat. Ensure adequate heat dissipation, especially when operating multiple LEDs or at higher currents, to prevent overheating and premature failure.
- **Eye Protection:** Do not stare directly into illuminated LEDs, as the bright light can cause eye strain or temporary vision impairment.
- **Soldering:** When soldering, use appropriate safety equipment, including eye protection and ventilation. Avoid prolonged contact of the soldering iron with the LED to prevent thermal damage.
- **Small Components:** These LEDs are small components. Keep them out of reach of children to prevent accidental ingestion.

3. Product Overview

The CHANZON 5050 White SMD LED is a compact, high-brightness light-emitting diode suitable for various electronic projects and replacements. Each LED features three chips within a single package, providing efficient light output.

Key Features:

- **Type:** PLCC 6 Surface Mount (SMT) 5050 package.
- **Color Temperature:** White, 6000K-6500K.
- **Luminous Intensity:** 15-18 Lumens per LED.
- **Viewing Angle:** Wide 120 degrees.
- **Operating Voltage:** DC 3V-3.2V.
- **Operating Current:** 60mA.
- **Dimensions:** Approximately 5.0mm x 5.0mm.
- **Electrode Type:** Copper.

Product Components:

Each package contains 100 individual 5050 White SMD LED diodes. These are typically supplied on a tape reel for ease of handling and automated assembly, though they can be used individually for DIY projects.

Figure 3.1: Close-up view of a single CHANZON 5050 White SMD LED diode, showing its compact 5x5mm form factor.

Figure 3.2: CHANZON 5050 White SMD LEDs supplied on a tape reel, ready for use in electronic projects.

4. Setup and Installation

Proper setup is crucial for the longevity and performance of your SMD LEDs. Follow these guidelines for installation:

4.1 Polarity Identification

The 5050 SMD LED is a diode and requires correct polarity for operation. Incorrect connection will prevent the LED from lighting up and may cause damage. Refer to the diagram below for polarity identification. The arrow on the reverse side of the LED typically points from the anode (+) to the cathode (-).

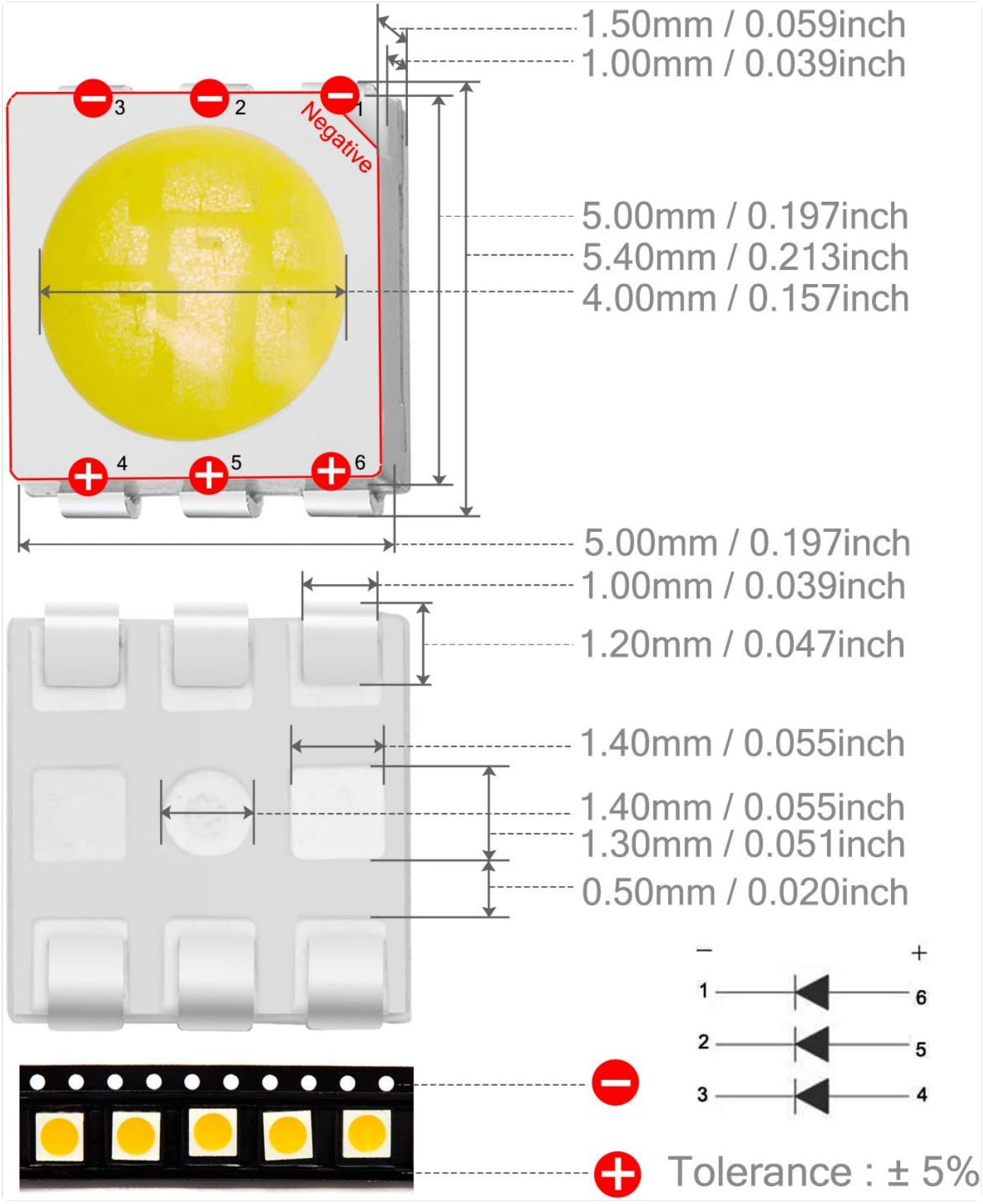

Figure 4.1: Detailed diagram illustrating the dimensions, pin configuration, and polarity markings for the CHANZON 5050 SMD LED. Pins 1, 2, 3 are typically negative (cathode), and pins 4, 5, 6 are positive (anode, with internal diodes indicating current flow).

4.2 Power Requirements and Resistor Calculation

Each 5050 White SMD LED operates at a forward voltage (Vf) of 3V-3.2V and a forward current (If) of 60mA. To prevent damage from excessive current, a current-limiting resistor is almost always required when connecting LEDs to a power source higher than their forward voltage.

Use Ohm's Law to calculate the appropriate resistor value:

R = (Vs - Vf) / If

Where:

R = Resistor value in Ohms (Ω)

Vs = Supply voltage (Volts)

Vf = LED forward voltage (3.2V for these LEDs)

If = LED forward current (0.060A or 60mA for these LEDs)

Example: For a 12V supply voltage (Vs) and a single LED (Vf=3.2V, If=0.06A):

$$R = (12V - 3.2V) / 0.06A = 8.8V / 0.06A \approx 146.67\ \Omega$$

A standard resistor value of 150 Ω would be suitable. Always choose a resistor with a power rating sufficient for the dissipated power ($P = I^2R$).

4.3 Soldering Instructions

These are surface-mount components and require careful soldering. It is recommended to use a fine-tip soldering iron and lead-free solder.

1. **Prepare Pads:** Ensure the PCB pads are clean and tinned with a small amount of solder.
2. **Position LED:** Carefully place the LED onto the pads, aligning the polarity markings. Tweezers can be helpful.
3. **Solder One Pad:** Apply heat to one pad and the corresponding LED terminal simultaneously, then apply a small amount of solder. Once the solder flows, remove the iron and allow it to cool. This tacks the LED in place.
4. **Solder Remaining Pads:** Solder the remaining pads, ensuring good contact and avoiding solder bridges between terminals. Minimize heating time to prevent damage to the LED.
5. **Inspect:** Visually inspect all solder joints for quality.

Tip: Using a slightly hotter iron for a shorter duration can minimize total thermal exposure to the LED compared to a cooler iron for a longer duration.

5. Operating Instructions

Once properly installed with the correct current-limiting resistor, apply the specified DC voltage to your circuit. The LEDs should illuminate brightly and consistently.

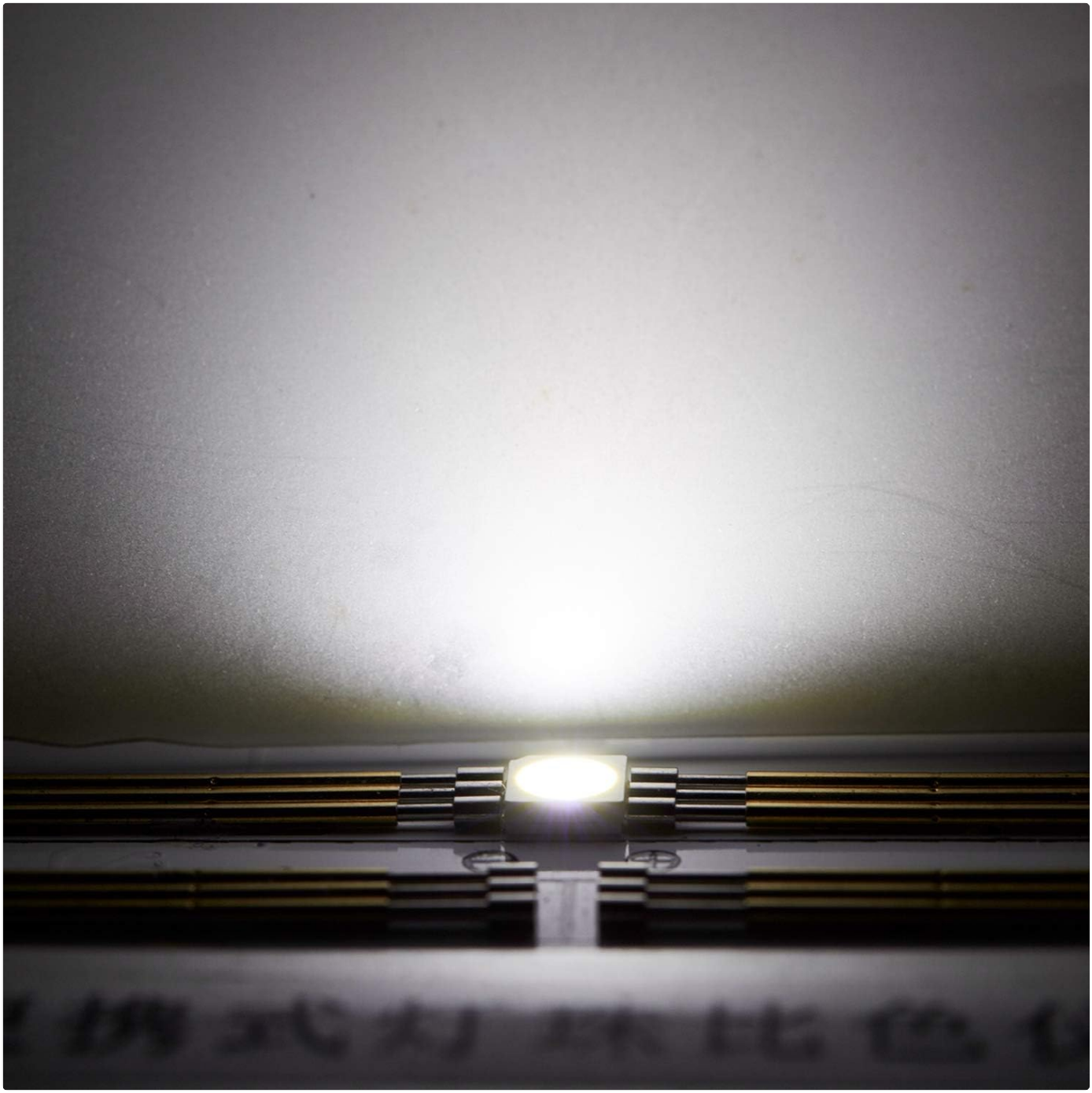

Figure 5.1: An illuminated CHANZON 5050 White SMD LED demonstrating its bright, uniform light output.

Multiple LED Configurations:

- **Series Connection:** LEDs can be connected in series. Sum the forward voltages (Vf) of all LEDs in the series, then use this sum in the resistor calculation: R = (Vs - ΣVf) / If. Ensure the supply voltage (Vs) is greater than the total forward voltage of the series.
- **Parallel Connection:** When connecting LEDs in parallel, it is highly recommended to use a separate current-limiting resistor for each LED. This ensures even current distribution and prevents one LED from drawing too much current and failing prematurely due to slight variations in Vf.

6. Maintenance

CHANZON 5050 White SMD LEDs are designed for long-term, maintenance-free operation under proper conditions. However, consider the following:

- **Cleaning:** If necessary, gently clean the LED surface with a soft, dry cloth. Avoid abrasive cleaners or excessive

moisture.

- **Environmental Conditions:** Operate LEDs within their specified temperature and humidity ranges. Extreme conditions can shorten lifespan.
- **Inspection:** Periodically inspect solder joints and connections for any signs of corrosion or loosening, especially in high-vibration environments.

7. Troubleshooting

If your CHANZON 5050 White SMD LEDs are not functioning as expected, consider the following troubleshooting steps:

Problem	Possible Cause	Solution
LED does not light up.	◦ Incorrect polarity. ◦ No power supply or insufficient voltage. ◦ Faulty solder joint or open circuit. ◦ LED is damaged.	◦ Verify polarity using Figure 4.1. ◦ Check power supply and connections. Ensure voltage is sufficient and current-limiting resistor is correctly calculated. ◦ Inspect solder joints and continuity with a multimeter. ◦ Replace the LED if damaged.
LED is dim or flickers.	◦ Insufficient current or voltage. ◦ Poor connection. ◦ Resistor value too high.	◦ Check power supply and resistor calculation. ◦ Re-solder connections. ◦ Recalculate and replace resistor if necessary.
LED fails prematurely.	◦ Excessive current (resistor too low or missing). ◦ Overheating. ◦ Voltage spikes. ◦ Manufacturing defect (rare).	◦ Verify resistor calculation and ensure it's in circuit. ◦ Ensure adequate heat dissipation. ◦ Consider voltage regulation or protection circuits. ◦ Replace the LED.

8. Specifications

Parameter	Value
Brand	CHANZON
Model Name	100F5050-WH-1518LM
LED Type	5050 SMD (Surface Mount Device)
Emitting Color	White
Color Temperature	6000K-6500K (Daylight White)
Luminous Intensity (Brightness)	15-18 Lumens

Parameter	Value
Forward Voltage (Vf)	DC 3V-3.2V
Forward Current (If)	60mA
Viewing Angle	120 Degrees
Dimensions (L x W)	5.0mm x 5.0mm (0.2"W x 0.2"H)
Material	Copper (Electrode Type)
Quantity per Pack	100 pieces
Power Consumption	0.2 Watts (per LED)
Certification	CE

9. Warranty and Support

For warranty information or technical support regarding your CHANZON 5050 White SMD LED Diode Lights, please contact CHANZON directly through their official website or the retailer from whom the product was purchased. Keep your purchase receipt as proof of purchase.
You can visit the CHANZON store for more products and support:CHANZON Store on Amazon