KEYESTUDIO KEYESTUDIO V4.0 Development Board

KEYESTUDIO V4.0 Development Board for Arduino UNO R3 User Manual

Model: KEYESTUDIO V4.0 Development Board

1. Introduction

The KEYESTUDIO V4.0 Development Board is a microcontroller board fully compatible with Arduino UNO R3. It is designed for ease of use in electronics prototyping and STEM education. This board features an updated CP2102 USB serial chip for reliable connectivity and includes a USB cable for immediate use. Its distinctive yellow-black design with clear silk-screened pin labels enhances readability and user experience.

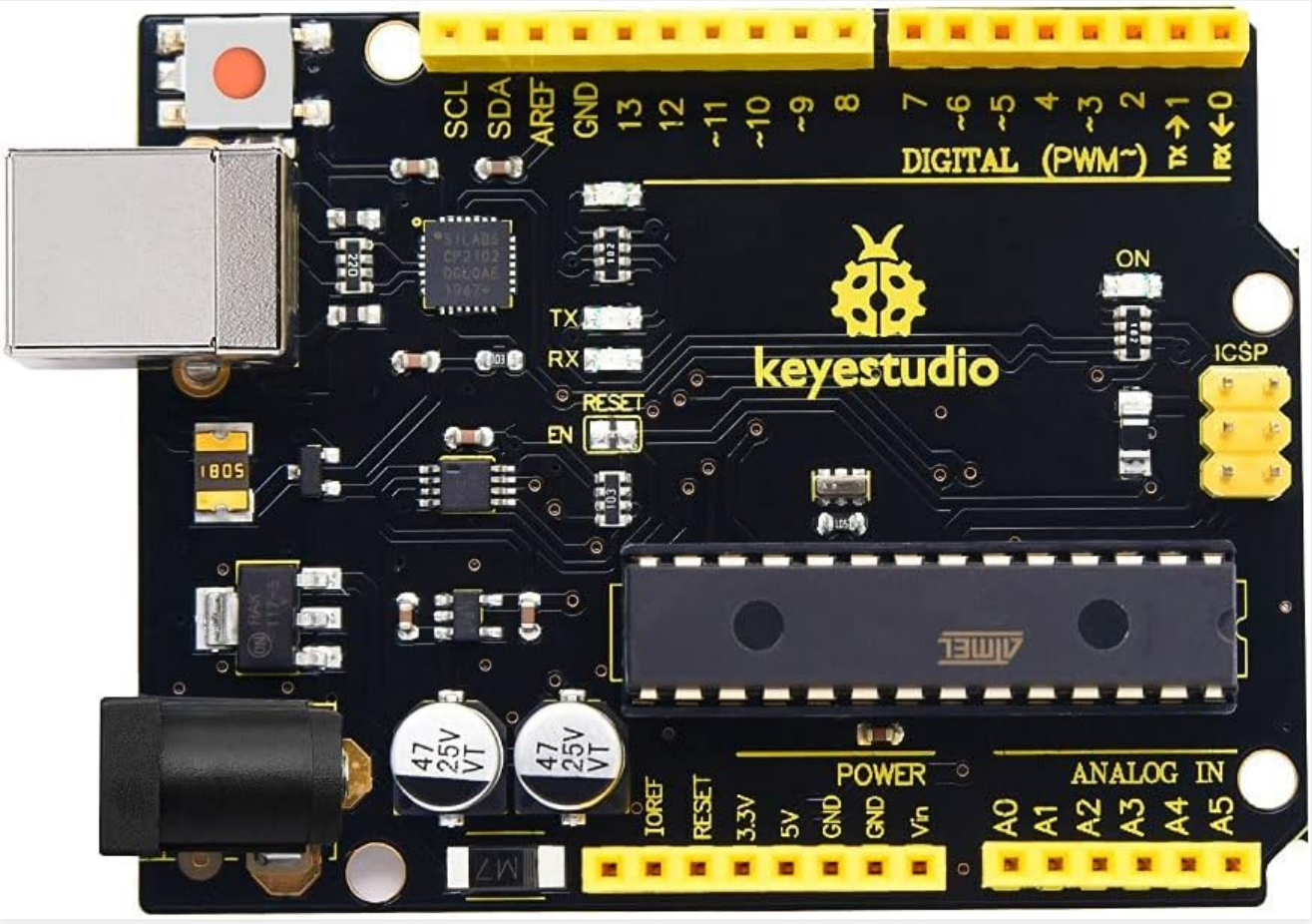

Figure 1: Top view of the KEYESTUDIO V4.0 Development Board.

2. Product Features

- **Microcontroller:** ATmega328P-PU.
- **USB Serial Chip:** CP2102, ensuring full compatibility with Arduino.
- **Digital I/O Pins:** 14 (6 of which can be used as PWM outputs).
- **Analog Inputs:** 6.
- **Clock Speed:** 16 MHz quartz crystal.
- **Memory:** 32 KB Flash Memory (0.5 KB used by bootloader).
- **Connectivity:** USB connection and a power jack for external power.
- **Additional Features:** ICSP headers and a reset button.
- **Design:** Yellow-black PCB with clear, easy-to-read pin labels.

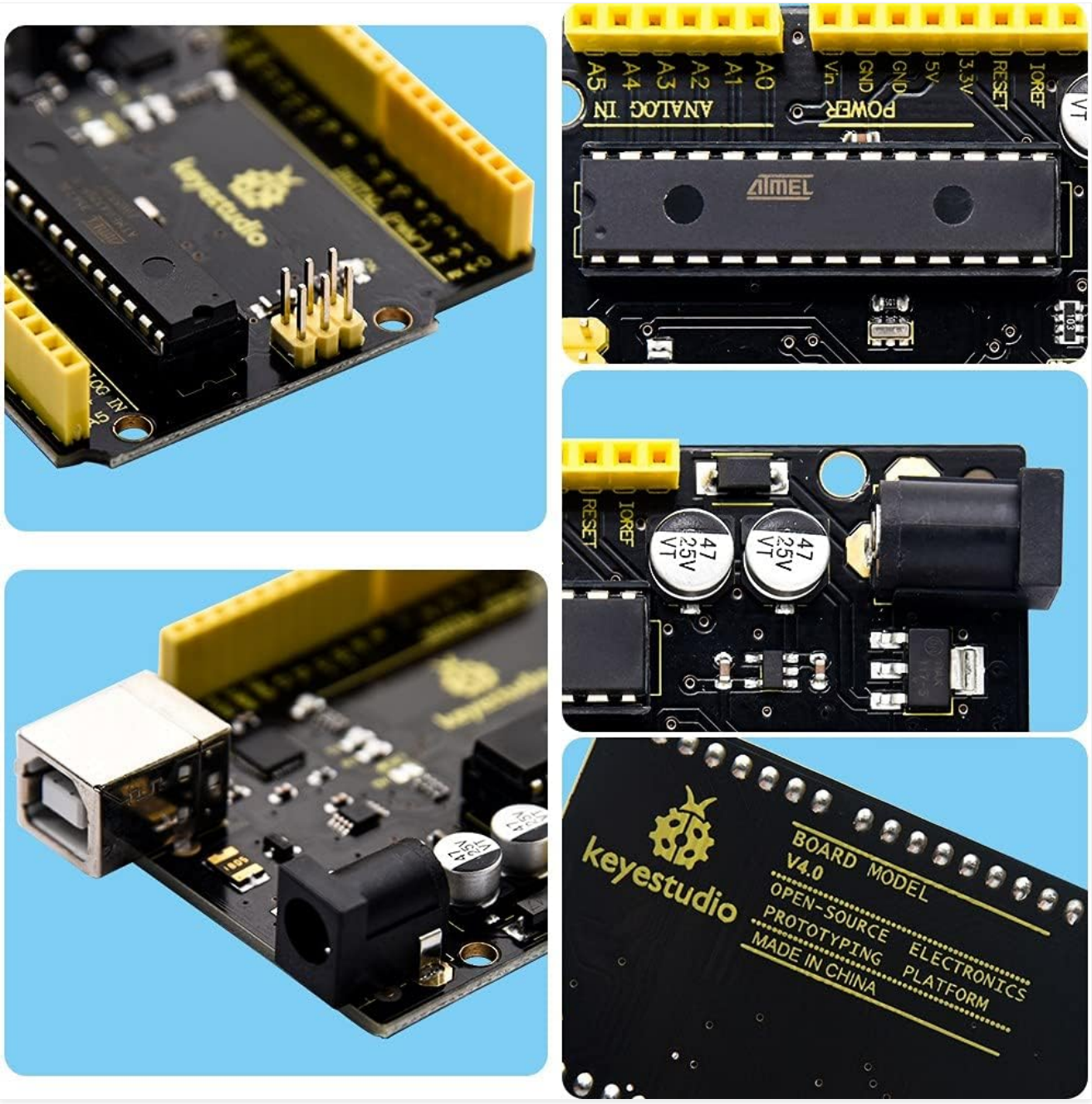

Figure 2: Detailed view of board components.

3. Setup Instructions

1. **Driver Installation:** If using Windows, you may need to install the CP210X USB to UART bridge VCP driver from Silicon Labs. Search online for "CP210X USB to UART bridge VCP driver" to find the official download.
2. **Connect to Computer:** Use the provided USB cable to connect the KEYESTUDIO V4.0 Development Board to your computer. The board can be powered via this USB connection.
3. **Install Arduino IDE:** Download and install the official Arduino Integrated Development Environment (IDE) from the Arduino website (www.arduino.cc/en/software).
4. **Select Board and Port:** Open the Arduino IDE. Go to **Tools > Board** and select "Arduino Uno". Then, go to **Tools > Port** and select the serial port corresponding to your connected board (it will typically show "Arduino Uno" or the CP2102 chip).
5. **External Power (Optional):** For projects requiring more power or standalone operation, connect an AC to DC adapter (7-12V) to the power jack on the board.

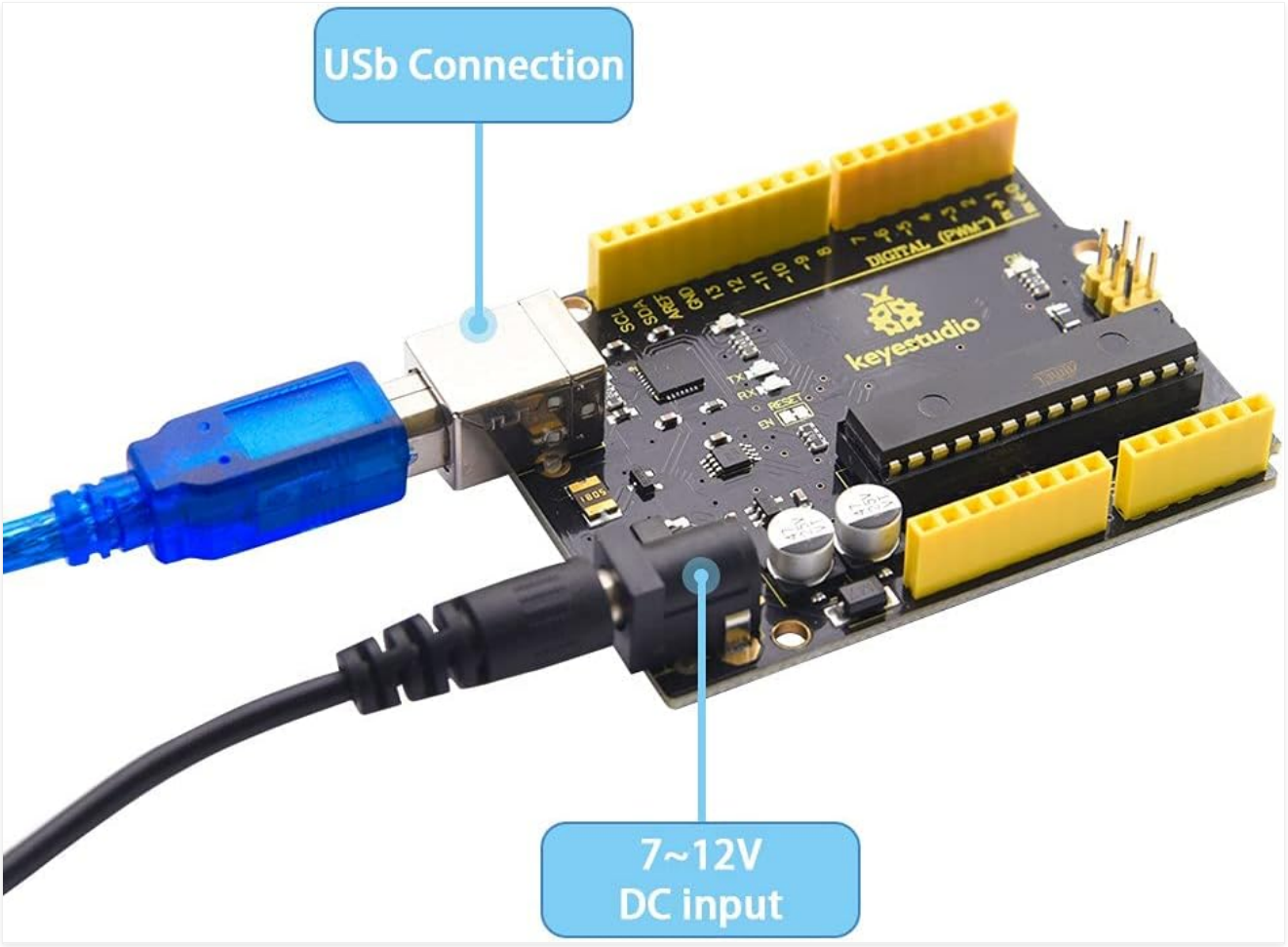

Figure 3: USB and DC power connections.

4. Operating Instructions

1. **Load an Example Sketch:** In the Arduino IDE, go to **File > Examples > 01.Basics > Blink** to open the classic LED blink sketch.
2. **Verify Code:** Click the "Verify" button (checkmark icon) in the Arduino IDE to compile the code and check for errors.
3. **Upload Code:** Click the "Upload" button (right arrow icon) to upload the compiled sketch to your KEYESTUDIO V4.0 Development Board. The RX and TX LEDs on the board will blink during the upload process.
4. **Observe Operation:** Once uploaded, the onboard LED (connected to digital pin 13) should begin to blink, indicating successful operation.
5. **Experiment with Projects:** The board can be used with various sensors, actuators, and shields. Refer to Arduino tutorials and project guides for detailed instructions on specific applications.

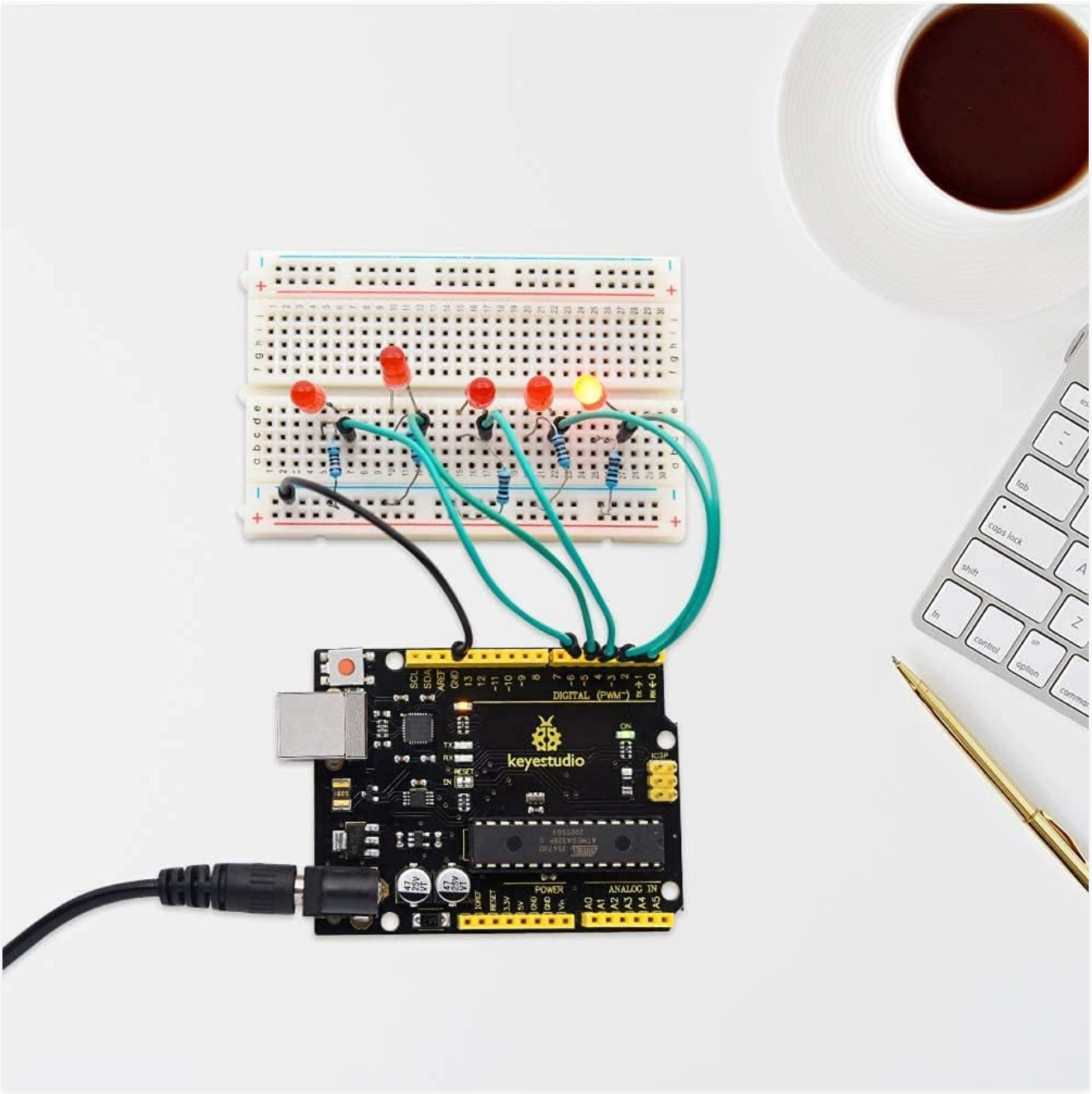

Figure 4: Board connected to a breadboard for a project.

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Video 1: Official KEYESTUDIO video demonstrating the V4.0 Development Board and its features.

5. Maintenance

- **Storage:** Store the board in an anti-static bag when not in use to prevent damage from electrostatic discharge.
- **Cleaning:** Use a soft, dry cloth to clean the board. Avoid using liquids or abrasive cleaners.
- **Handling:** Handle the board by its edges to minimize contact with components and prevent static discharge.
- **Power Supply:** Always ensure the correct voltage (7-12V for external power) is applied to avoid damaging the board.

6. Troubleshooting

- **Board Not Detected:**
  - Ensure the CP210X USB to UART bridge VCP driver is correctly installed (refer to Setup Instructions).
  - Try a different USB port or USB cable.
  - Restart your computer and the Arduino IDE.

- **Upload Errors:**
  - Verify that the correct board type ("Arduino Uno") and serial port are selected in the Arduino IDE.
  - Check all wiring for loose connections or short circuits.
  - Ensure no other programs are using the serial port.
- **No Power/LEDs Not Lighting Up:**
  - Check USB cable connection or external power supply.
  - Ensure the power source provides the correct voltage.

7. Specifications

Brand	KEYESTUDIO
Model Name	KEYESTUDIO V4.0 Development Board
Microcontroller	ATmega328P-PU
Flash Memory	32 KB (0.5 KB used by bootloader)
SRAM	2 KB
EEPROM	1 KB
Clock Speed	16 MHz
Digital I/O Pins	14 (6 PWM outputs)
Analog Input Pins	6
Operating Voltage	5V
Input Voltage (recommended)	7-12V
USB Serial Chip	CP2102
Dimensions	100 x 62 x 23 mm
Weight	0.07 Kilograms (70g)

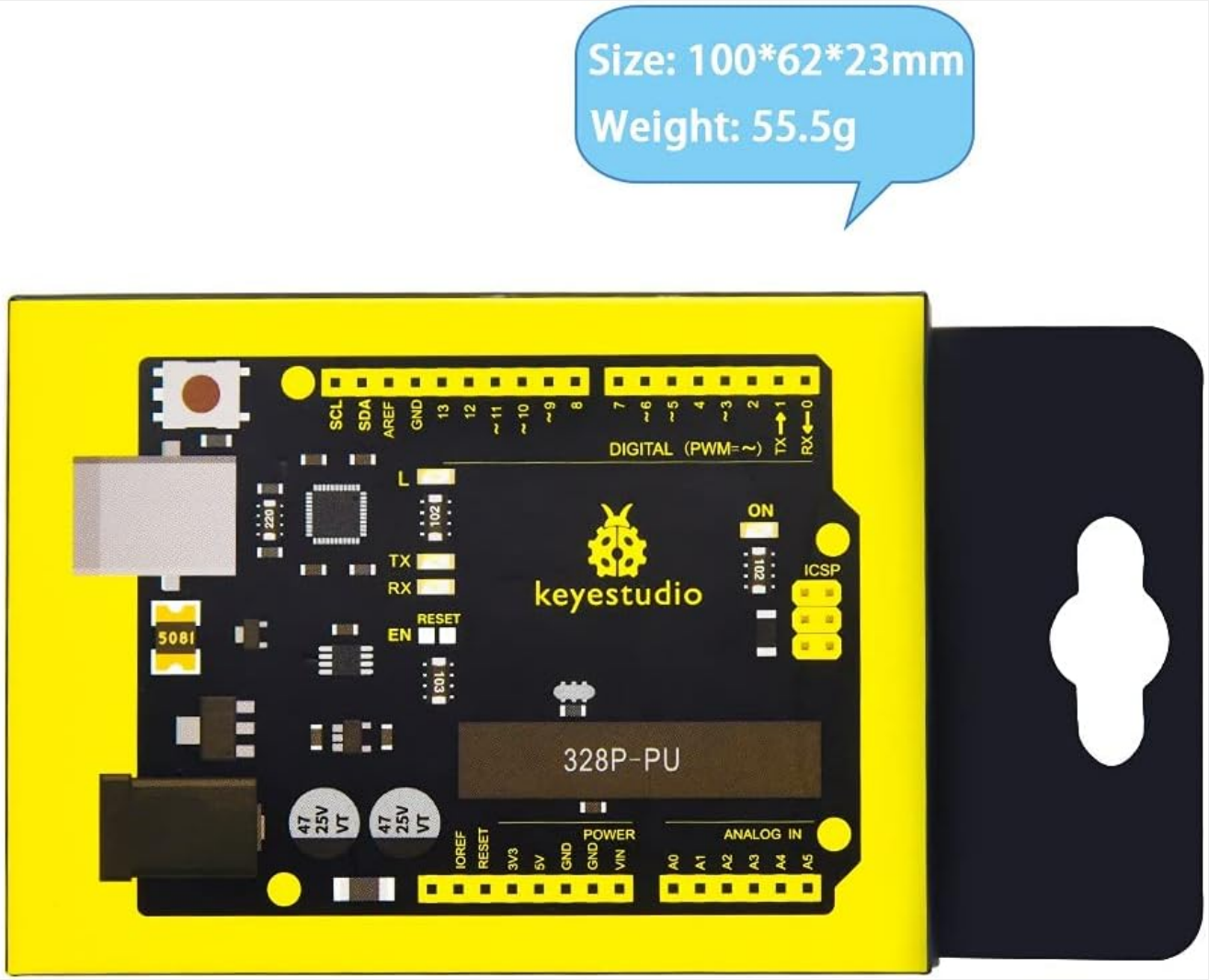

Figure 5: Board dimensions and weight.

8. Warranty and Support

For warranty information and technical support, please refer to the official KEYESTUDIO website or contact their customer service directly. Keep your purchase receipt for any warranty claims.