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Project 2: WS2812 RGB

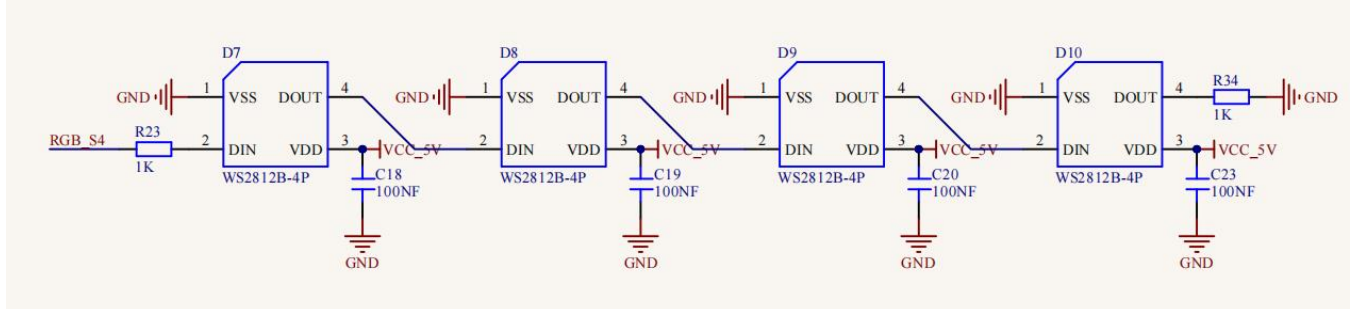
1. Description



In this project, we will work to use WS2812 LED to display different colors. Its principle is different from the seven-color LED, we need a pin to control it. This is an intelligent external controlled LED light source integrating control circuit and light emitting

circuit. The appearance of each LED is the same as that of a 5050 LED and each component is a pixel. There are four LEDs on our motor driver board, namely four pixels. Let's learn how to control it to display any color.

2. Component Knowledge



The four pixel LEDs are connected in series, and we can control any one of the LEDs with a pin(here we use D10) and make it display any color. The pixel contains an intelligent digital interface data locking signal and amplifying driver circuit as well as a high-precision internal oscillator and a 12V high voltage programmable constant current control part, which

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effectively ensures the color consistency of the pixel light.

The data protocol adopts the communication mode of single-line return to zero code. After the pixel is powered on and reset, the S terminal receives the data transmitted from the controller.

When the first 24bit data extracted by the first pixel, which will be sent to the data latch inside the pixel. This 2812RGB communication protocol and driver has been encapsulated in the bottom layer, we can directly call the interface function to use.

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3. Test Code

You can drag blocks to edit. Blocks listed below are for your reference

(1)

Events

when Arduino begin

(2)

NeoPixel RGB

init RGB6812 PIN# 4 Socket Type NEO_GRB Count 4

RGB6812 PIN# 4 lights 1 colour: R 100 G 150 B 255

RGB6812 PIN# 4 Brightness 100

RGB6812 display show PIN# 4

The image shows the Keyestudio IDE interface. On the left, there is a sidebar with various block categories: Events (yellow), Control (orange), Car lights (green), NeoPixel RGB (orange), servo (purple), Ultrason (pink), and IR Remote (pink). The main workspace is divided into two sections. The top section, labeled 'Events', contains a single block 'when Arduino begin' which is highlighted with a red box and a red arrow pointing to it from the 'Events' category. The bottom section, labeled 'NeoPixel RGB', contains four blocks: 'init RGB6812' (with PIN# 4, Socket Type NEO_GRB, and Count 4), 'RGB6812' (with PIN# 4, lights 1, and colour R 100, G 150, B 255), 'RGB6812' (with PIN# 4 and Brightness 100), and 'RGB6812 display show' (with PIN# 4). These four blocks are also highlighted with a red box. A red arrow points from the 'NeoPixel RGB' category to the first block in this section.

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Complete Test Code



4. Test Result

After uploading the code and turn the DIP switch to the ON end and power on, we can see that the 4 2812 LEDs will respectively be red, green, blue and white.

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5. Expanded Project: Flowing Water Light

You can drag blocks to edit. Blocks listed below are for your reference

(1) **Events**

when Arduino begin

(2) **Variable Type**

Declare Global variable Type int Name item Assigned to 0

variable item

Set item variable by 0

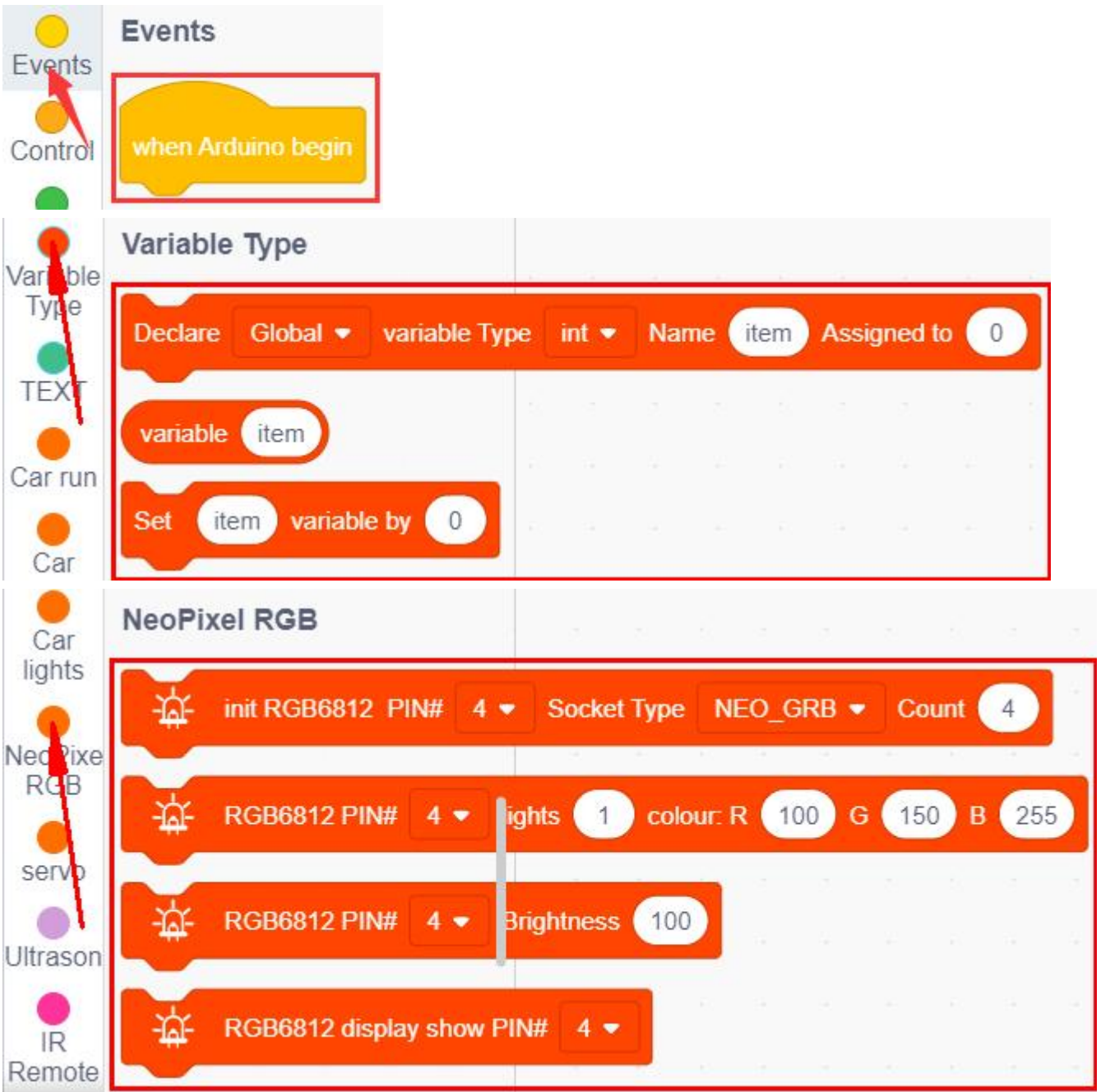
(3) **NeoPixel RGB**

init RGB6812 PIN# 4 Socket Type NEO_GRB Count 4

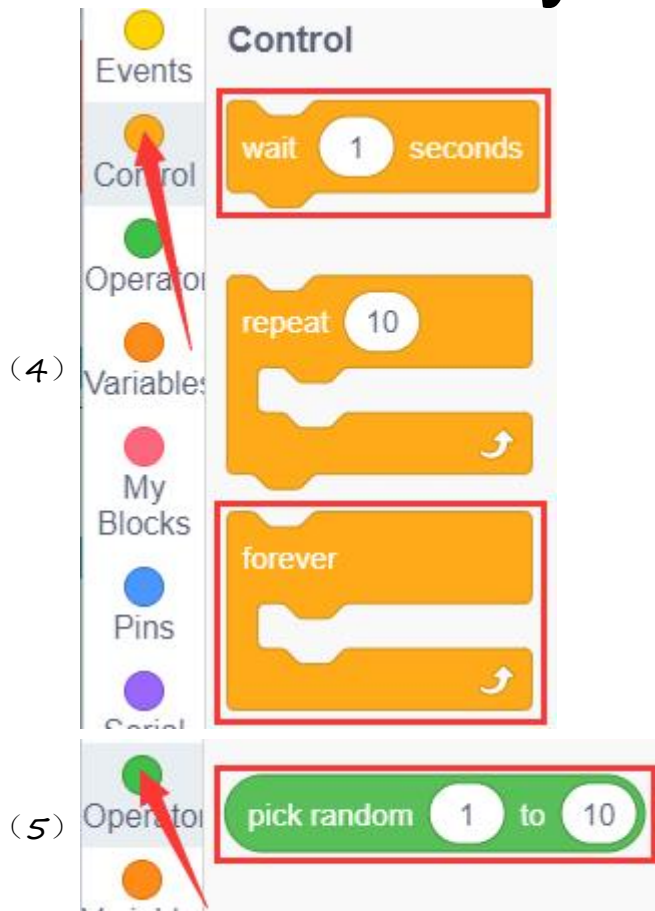
RGB6812 PIN# 4 lights 1 colour: R 100 G 150 B 255

RGB6812 PIN# 4 Brightness 100

RGB6812 display show PIN# 4



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Complete Test Code



Once the code has been uploaded successfully, we will see four LEDs showing the flowing light in a random color.