

Esp32+VSC+Esp-IDF+Lvgl+ST7789详细点亮过程

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0 订阅 1 篇文章

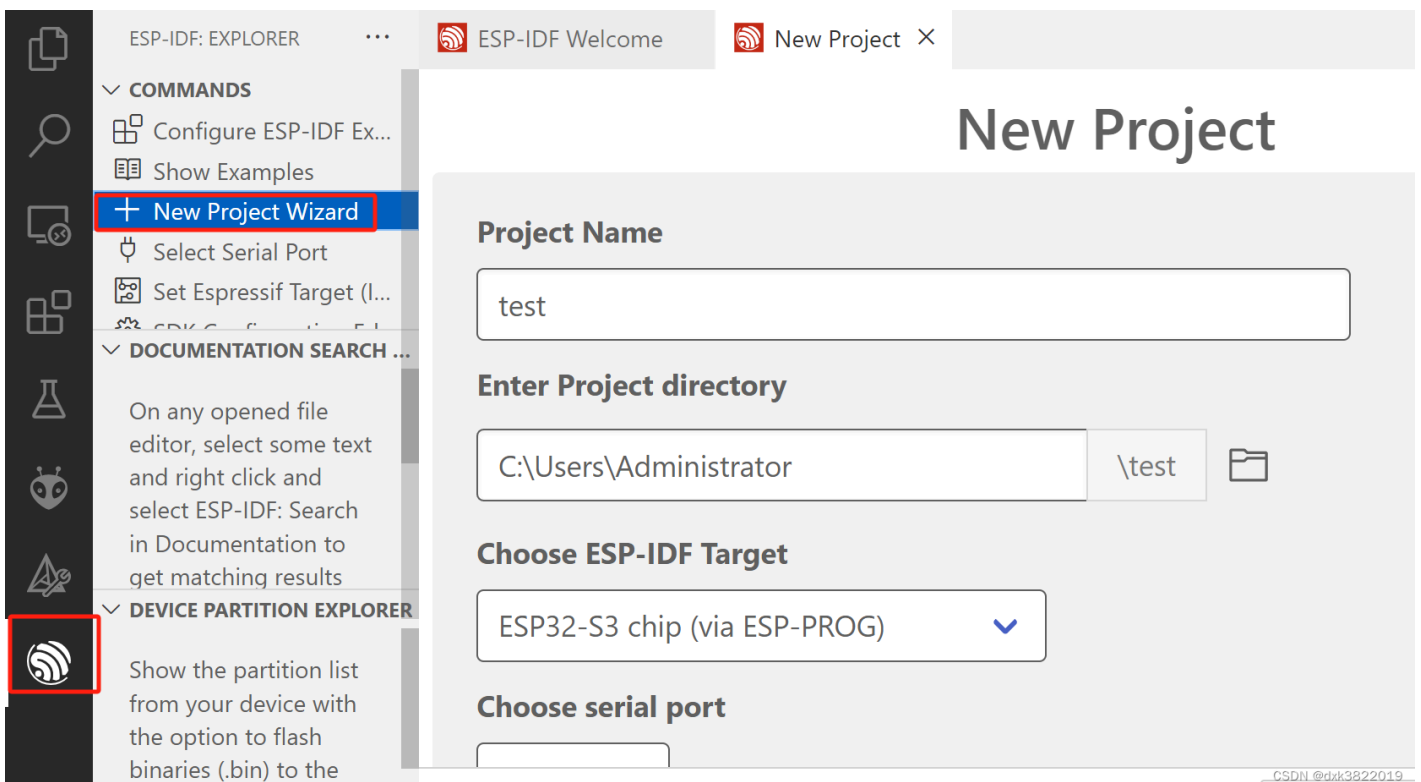
订阅专栏

摘要

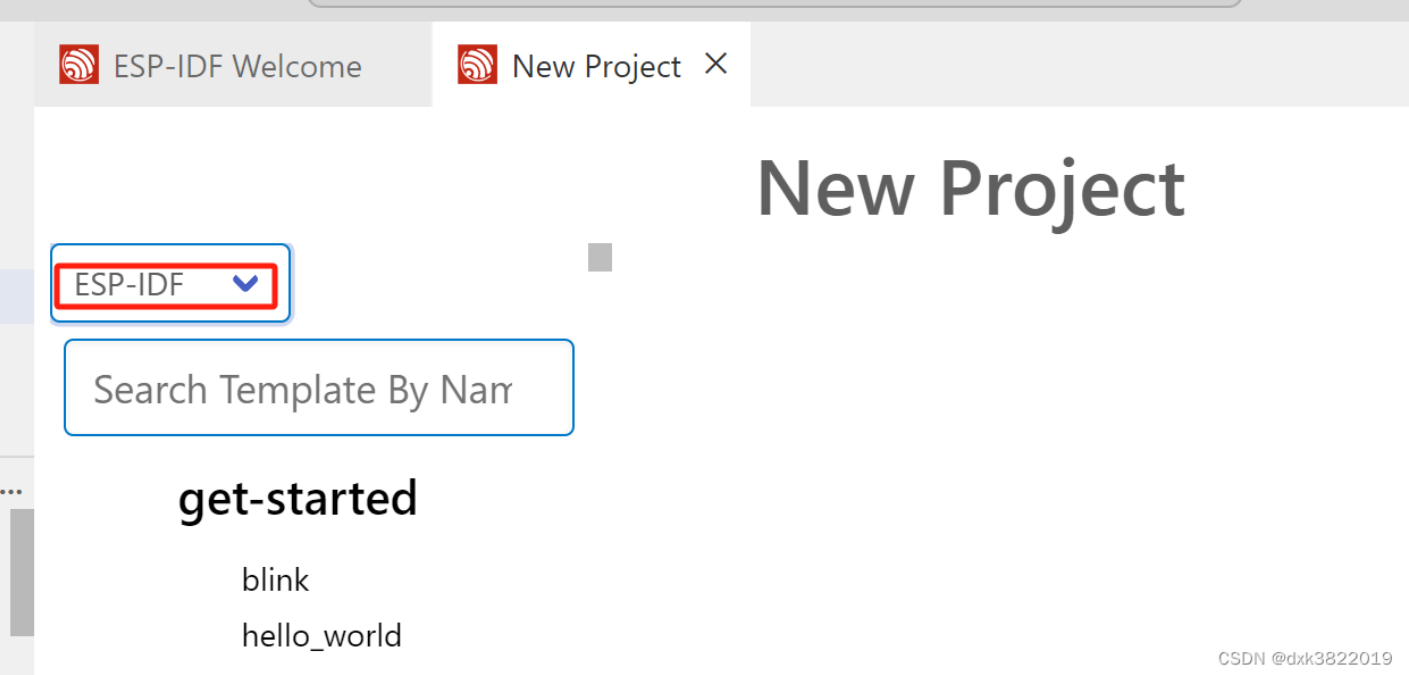
本文详细指导如何在ESP32项目中将LCD控制器从GC9A01替换为ST7789，包括创建工程、修改配置文件、添加驱动接口和配置LVGL，最终实现编译和下载程序到硬件。

摘要由CSDN通过智能技术生成

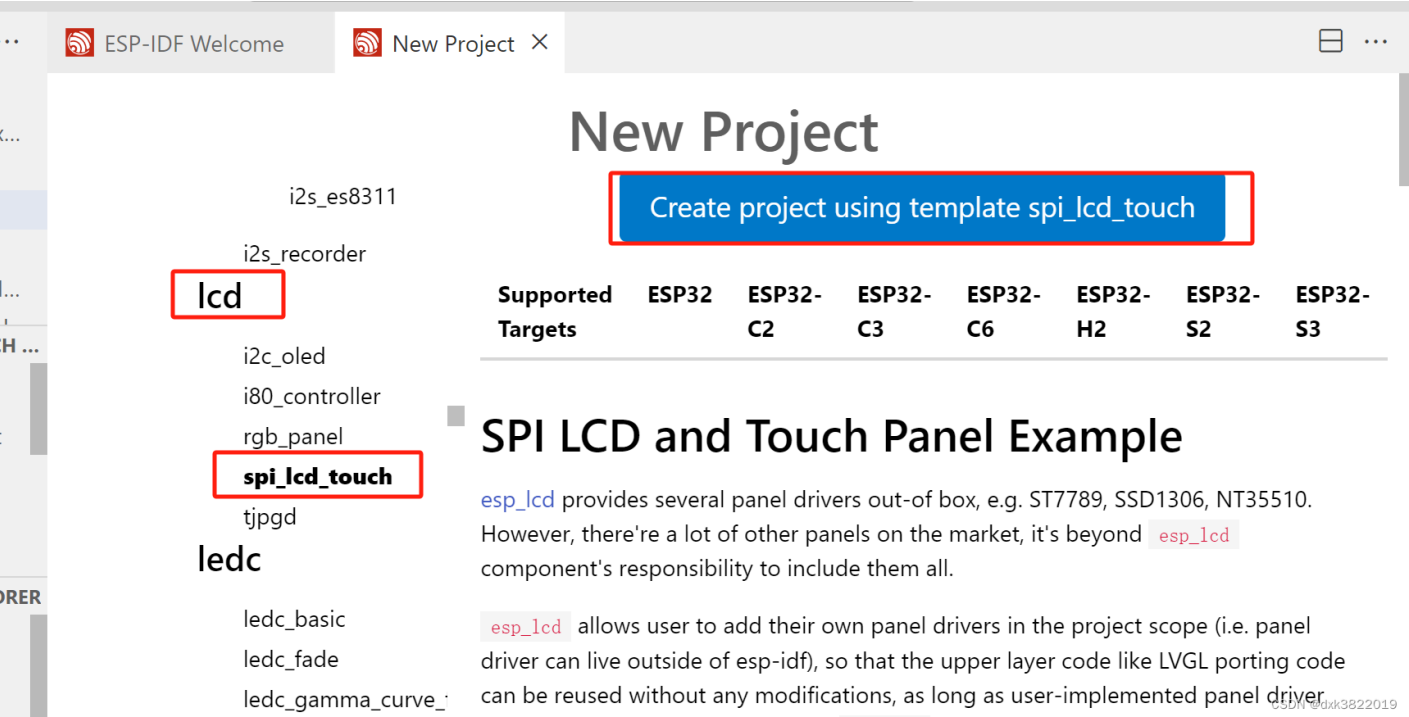
1.先创建一个工程



这里选择ESP-IDF

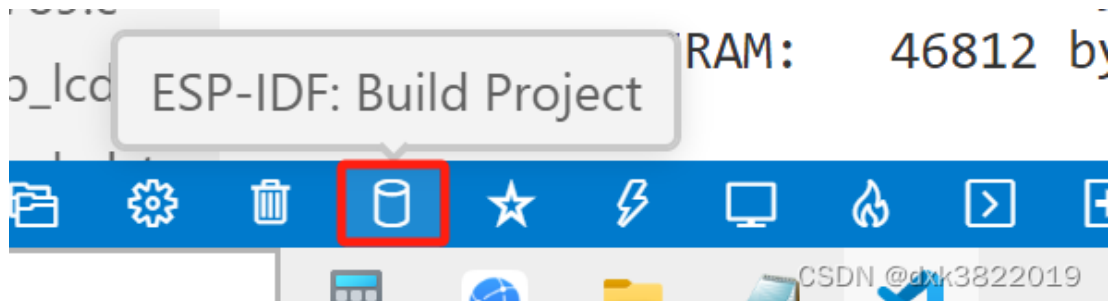


找到LCD，spi_lcd_touch，点击创建工程。

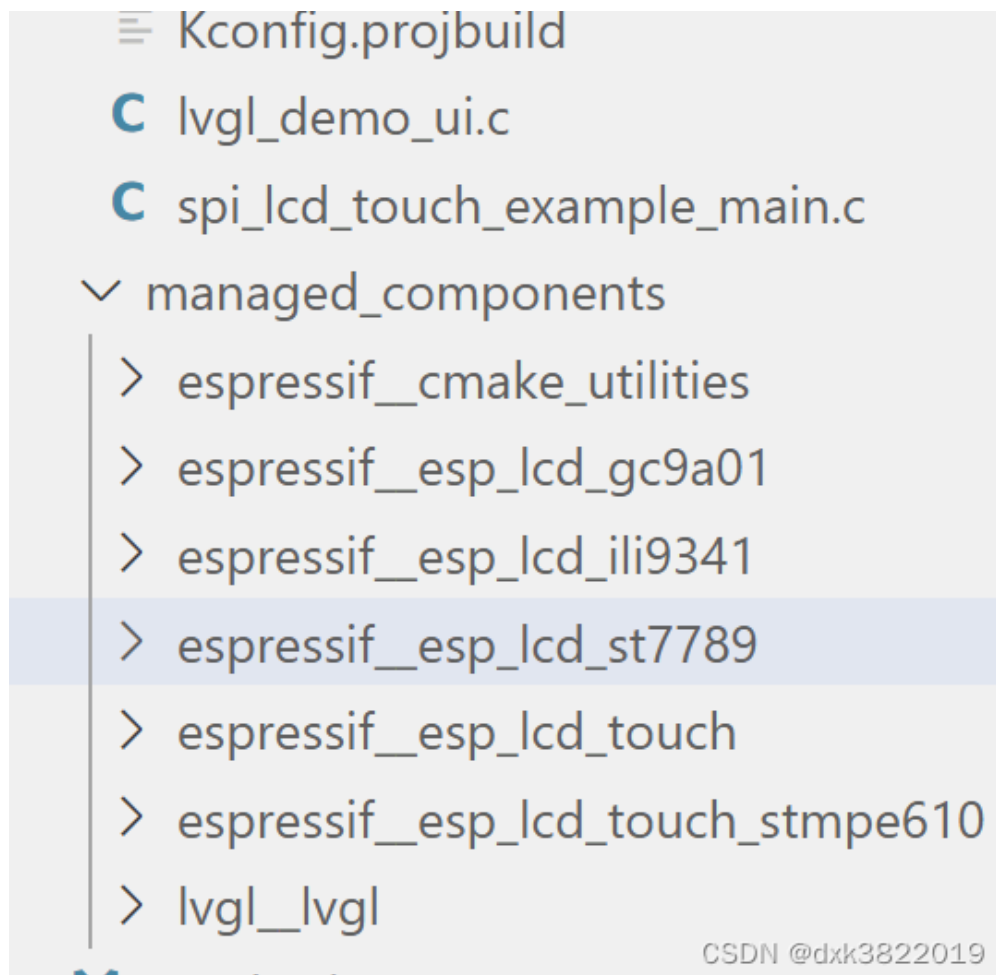


2.添加ST7789 文件夹

先编译一下，编译成功后，工程目录里面会出现一个文件夹，managed_components，

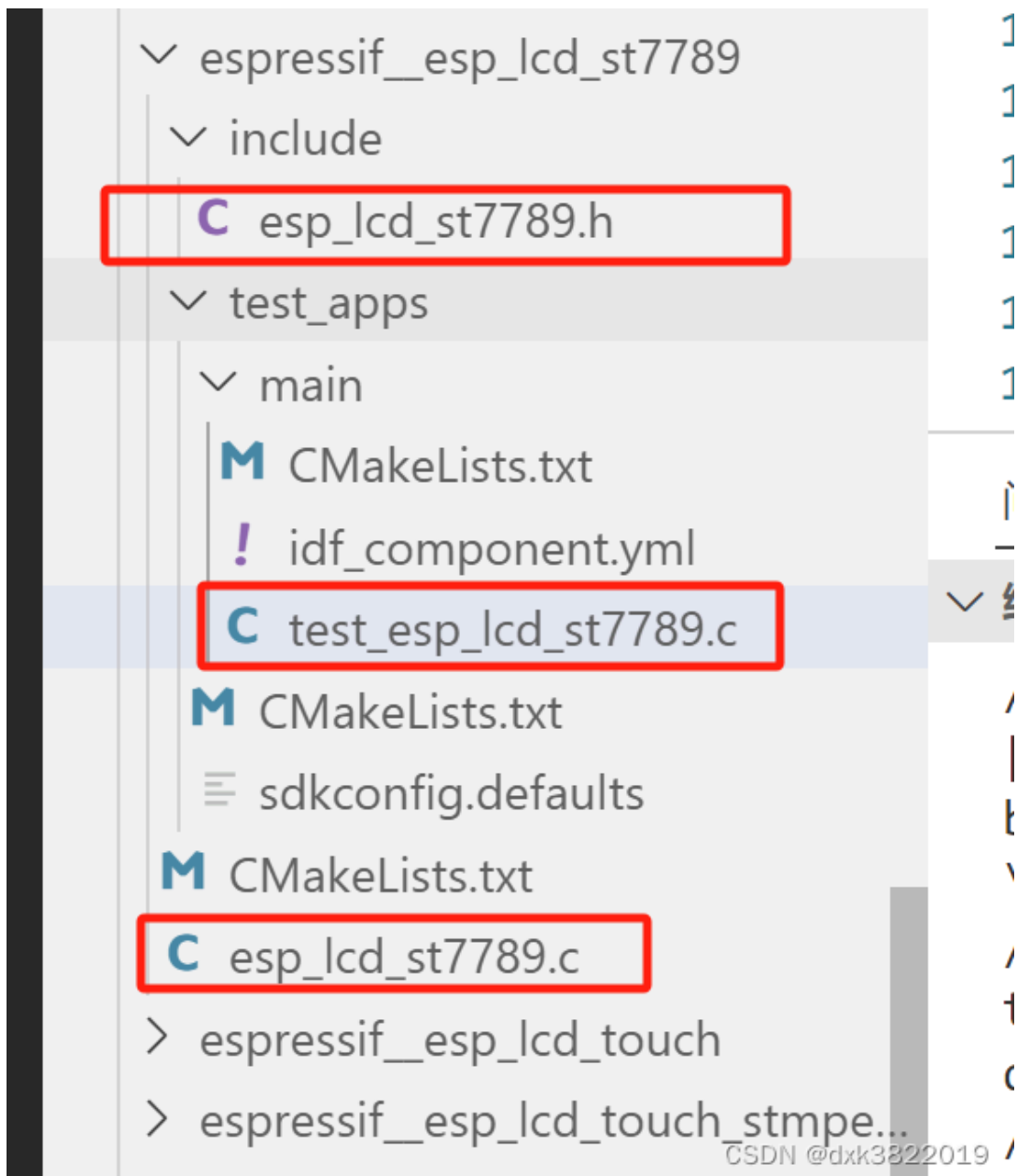


复制espressif_esp_lcd_gc9a01文件夹在同级目录，然后改一下文件夹名称，改成espressif_esp_lcd_st7789。



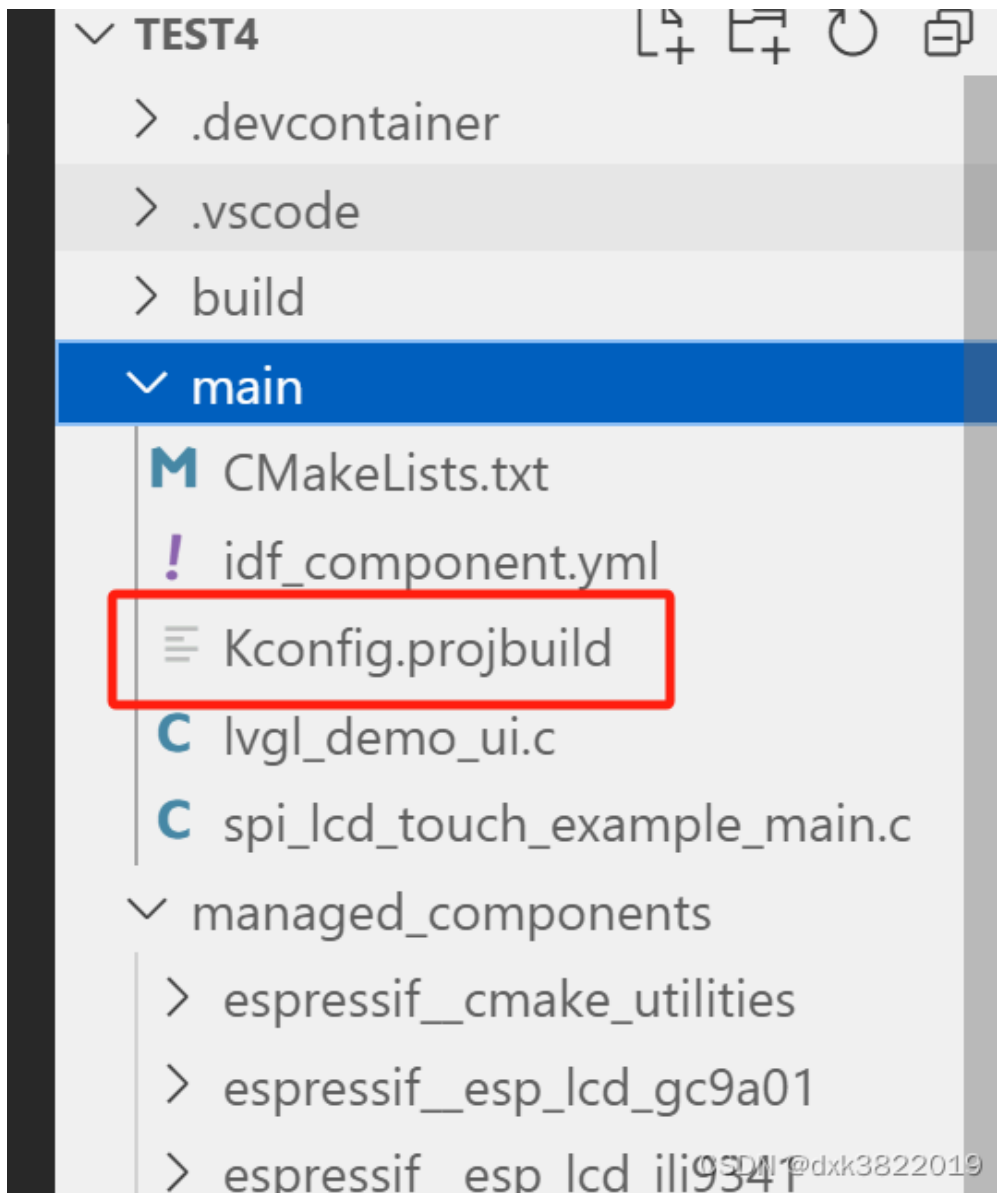
将espressif_esp_lcd_st7789文件夹里面的所有所有C文件和头文件里面的GC9A01全部换成ST7789，gc9a01换成st7789，名称和内容里面的全都换。

然后清理，再编译

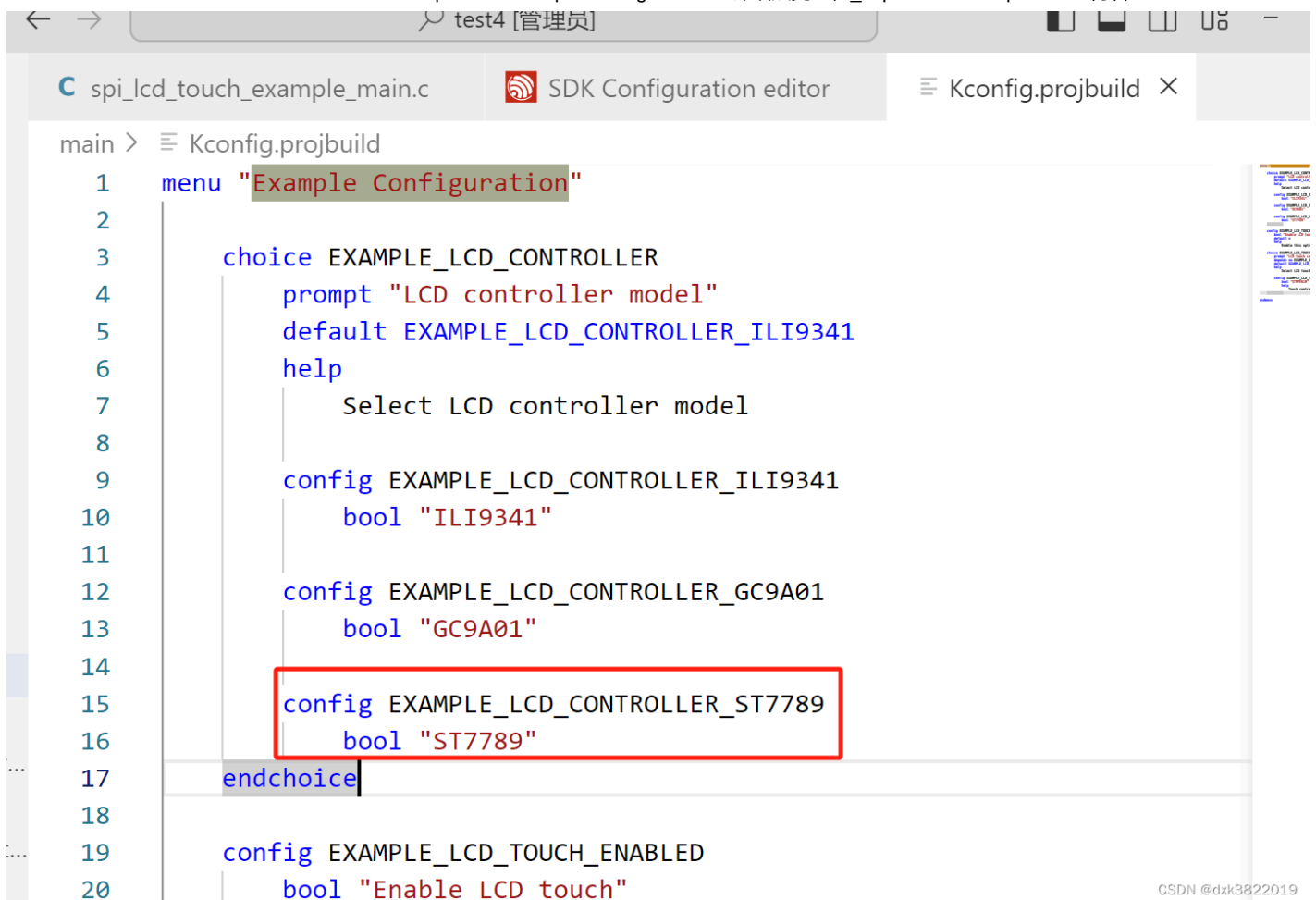


3.修改Kconfig, 添加ST7789选项

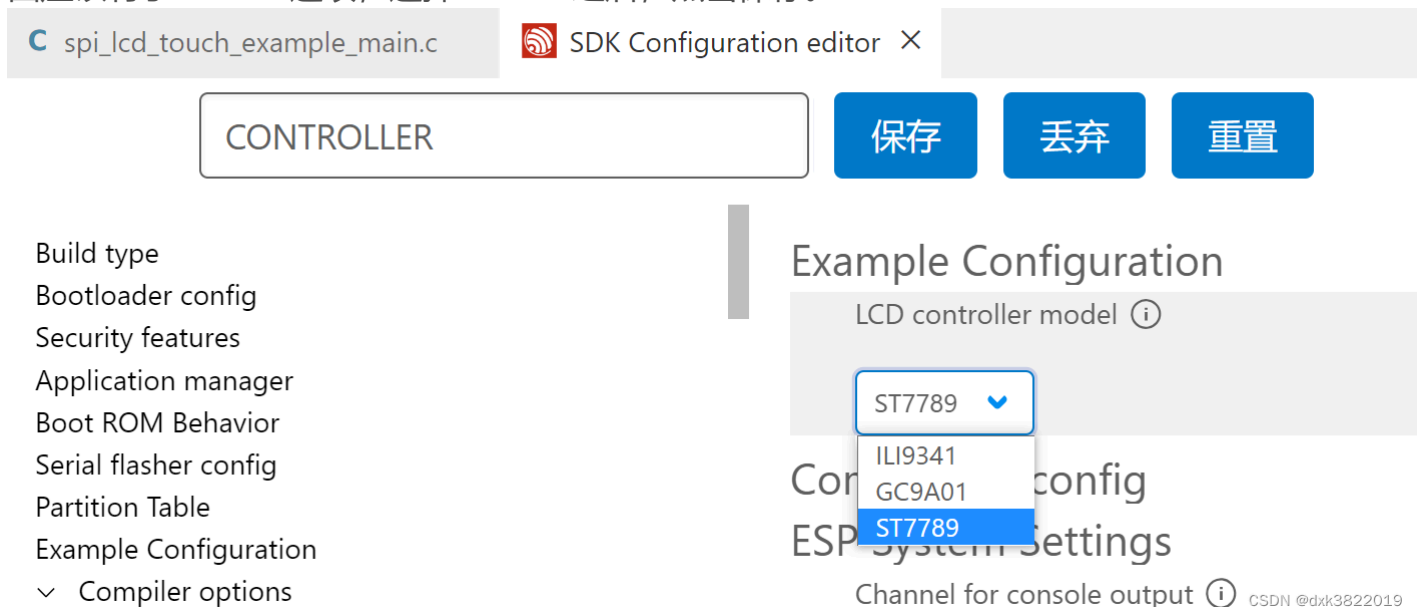
找到main文件夹下的Kconfig.projbuild文件并打开。



在下图位置添加ST7789选项，然后保存并关闭文件。



重启一下VSC，再次进入SDK menuconfig配置，搜CONTROLLER，发现LCD_controller里面应该有了ST7789选项，选择ST7789之后，点击保存。



4.配置LCD驱动接口

在main文件夹下的spi_lcd_touch_example_main.c文件中添加ST7789的屏幕配置宏定义。

C spi_lcd_touch_example_main.c 3 X

main > C spi_lcd_touch_example_main.c > EXAMPLE_LCD_PARAM_BITS

```

47  #define EXAMPLE_PIN_NUM_LCD_CS          4
48  #define EXAMPLE_PIN_NUM_BK_LIGHT        2
49  #define EXAMPLE_PIN_NUM_TOUCH_CS        15
50
51  // The pixel number in horizontal and vertical
52  #if CONFIG_EXAMPLE_LCD_CONTROLLER_ILI9341
53  #define EXAMPLE_LCD_H_RES                240
54  #define EXAMPLE_LCD_V_RES                320
55  #elif CONFIG_EXAMPLE_LCD_CONTROLLER_GC9A01
56  #define EXAMPLE_LCD_H_RES                240
57  #define EXAMPLE_LCD_V_RES                240
58  #elif CONFIG_EXAMPLE_LCD_CONTROLLER_ST7789
59  #define EXAMPLE_LCD_H_RES                240
60  #define EXAMPLE_LCD_V_RES                240
61  #endif
62  // Bit number used to represent command and parameter
63  #define EXAMPLE_LCD_CMD_BITS              8
64  #define EXAMPLE_LCD_PARAM_BITS           0

```

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添加一下ST7789的接口配置。

C spi_lcd_touch_example_main.c X

main > C spi_lcd_touch_example_main.c > app_main(void)

```

218  ESP_ERROR_CHECK(esp_lcd_new_panel_ili9341(io_handle, &panel_config, &panel_handle));
219  #elif CONFIG_EXAMPLE_LCD_CONTROLLER_GC9A01
220  ESP_LOGI(TAG, "Install GC9A01 panel driver");
221  ESP_ERROR_CHECK(esp_lcd_new_panel_gc9a01(io_handle, &panel_config, &panel_handle));
222  #elif CONFIG_EXAMPLE_LCD_CONTROLLER_ST7789
223  ESP_LOGI(TAG, "Install GC9A01 panel driver");
224  ESP_ERROR_CHECK(esp_lcd_new_panel_st7789(io_handle, &panel_config, &panel_handle));
225  #endif
226
227  ESP_ERROR_CHECK(esp_lcd_panel_reset(panel_handle));
228  ESP_ERROR_CHECK(esp_lcd_panel_init(panel_handle));
229  #if CONFIG_EXAMPLE_LCD_CONTROLLER_GC9A01
230  ESP_ERROR_CHECK(esp_lcd_panel_invert_color(panel_handle, true));
231  ESP_ERROR_CHECK(esp_lcd_panel_mirror(panel_handle, true, false));
232  #elif CONFIG_EXAMPLE_LCD_CONTROLLER_ST7789
233  ESP_ERROR_CHECK(esp_lcd_panel_invert_color(panel_handle, true));
234  ESP_ERROR_CHECK(esp_lcd_panel_mirror(panel_handle, false, false));
235  #endif
236  // user can flush pre-defined pattern to the screen before we turn on the screen
237  ESP_ERROR_CHECK(esp_lcd_panel_disp_on_off(panel_handle, true));
238
239  #if CONFIG_EXAMPLE_LCD_TOUCH_ENABLED

```

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此处也要改一下RGB设置。

C spi_lcd_touch_example_main.c X

C lcd_types.h



SDK Configuration editor

main > C spi_lcd_touch_example_main.c > app_main(void)

```

198     .cs_gpio_num = EXAMPLE_PIN_NUM_LCD_CS,
199     .pclk_hz = EXAMPLE_LCD_PIXEL_CLOCK_HZ,
200     .lcd_cmd_bits = EXAMPLE_LCD_CMD_BITS,
201     .lcd_param_bits = EXAMPLE_LCD_PARAM_BITS,
202     .spi_mode = 0,
203     .trans_queue_depth = 10,
204     .on_color_trans_done = example_notify_lvgl_flush_ready,
205     .user_ctx = &disp_drv,
206 };
207 // Attach the LCD to the SPI bus
208 ESP_ERROR_CHECK(esp_lcd_new_panel_io_spi((esp_lcd_spi_bus_handle_t)LCD_HOST,
209
210     esp_lcd_panel_handle_t panel_handle = NULL;
211     esp_lcd_panel_dev_config_t panel_config = {
212         .reset_gpio_num = EXAMPLE_PIN_NUM_LCD_RST,
213         .rgb_endian = LCD_RGB_ENDIAN_RGB,
214         .bits_per_pixel = 16,
215     };
216 #if CONFIG_EXAMPLE_LCD_CONTROLLER_ILI9341
217     ESP_LOGI(TAG, "Install ILI9341 panel driver");
218     ESP_ERROR_CHECK(esp_lcd_new_panel_ili9341(io_handle, &panel_config, &pane

```

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设置下引脚宏定义。

C spi_lcd_touch_example_main.c X

C lcd_types.h



SDK Configuration editor

main > C spi_lcd_touch_example_main.c > ...

```

33 // Using SPI2 in the example
34 #define LCD_HOST SPI2_HOST
35
36 ///////////////////////////////////////////////////////////////////
37 // Please update the following configuration according to your
38 ///////////////////////////////////////////////////////////////////
39 #define EXAMPLE_LCD_PIXEL_CLOCK_HZ (20 * 1000 * 1000)
40 #define EXAMPLE_LCD_BK_LIGHT_ON_LEVEL 1
41 #define EXAMPLE_LCD_BK_LIGHT_OFF_LEVEL !EXAMPLE_LCD_BK_LIGHT_ON_LEVEL
42 #define EXAMPLE_PIN_NUM_SCLK 18
43 #define EXAMPLE_PIN_NUM_MOSI 19
44 #define EXAMPLE_PIN_NUM_MISO 21
45 #define EXAMPLE_PIN_NUM_LCD_DC 5
46 #define EXAMPLE_PIN_NUM_LCD_RST 3
47 #define EXAMPLE_PIN_NUM_LCD_CS 4
48 #define EXAMPLE_PIN_NUM_BK_LIGHT 2
49 #define EXAMPLE_PIN_NUM_TOUCH_CS 15
50

```

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5.配置LVGL

打开这个交换字节的选项。

- Unity unit testing library
- USB-OTG
 - Root Hub configuration
- Virtual file system
- Wear Levelling
- Wi-Fi Provisioning Manager
- CMake Utilities
- ESP LCD TOUCH
- LVGL configuration
 - Color settings**
 - Memory settings

Color settings

Color depth. ⓘ

16: RGB565

☒ Swap the 2 bytes of RGB565 color. Useful if the display has an 8-bit interface (e.g. SPI). ⓘ

Enable more complex drawing routines to manage screens transparency. ⓘ

Adjust color mix functions rounding ⓘ

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打开显示FPS显示

fps

保存 丢弃 重置

- Elliptic Curve Ciphers
- Show configurations with potential security risks
- SP-MQTT Configurations
- lewlilb
- IVS
- OpenThread
 - Thread Operational Dataset
- rotocomm
- Threads
- SPI Flash driver
 - SPI Flash behavior when brownout
 - Auto-detect flash chips
- SPIFFS Configuration

Component config

LVGL configuration

Feature configuration

Others

☒ Show CPU usage and FPS count. ⓘ

Performance monitor position. ⓘ

Bottom right

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打开显示memory显示

used memory

保存 丢弃 重置

- Curve Ciphers
- configurations with potential security risks
- T Configurations
- Thread
 - d Operational Dataset
- im
- ash driver
- ash behavior when brownout
- detect flash chips
- Configuration

Component config

LVGL configuration

Feature configuration

Others

☒ Show the used memory and the memory fragmentation.

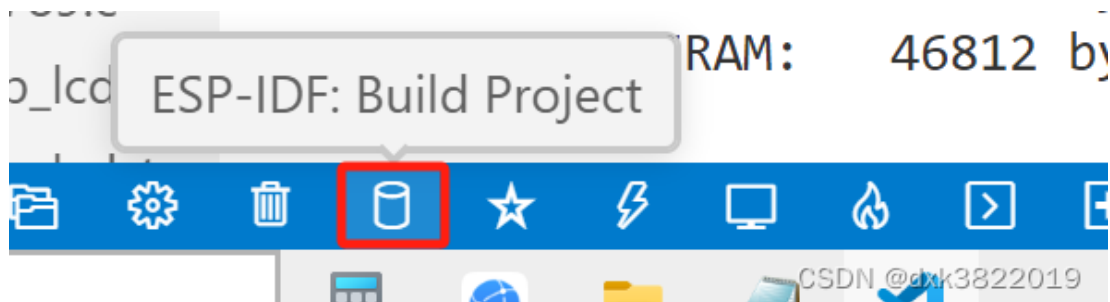
Memory monitor position. ⓘ

Bottom left

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6.编译下载程序

编译一下工程。

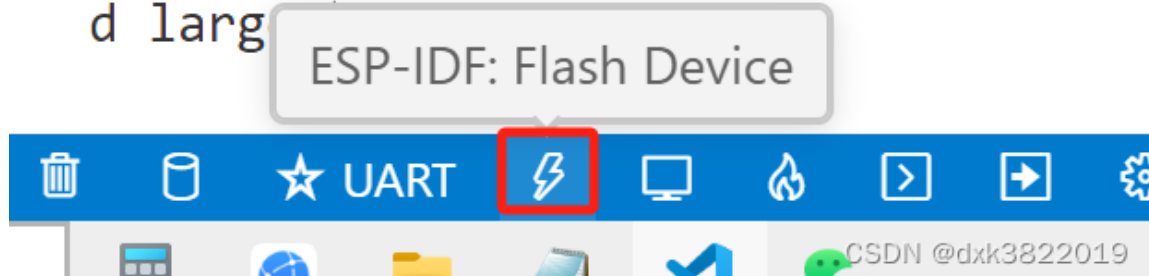


显示编译成功。

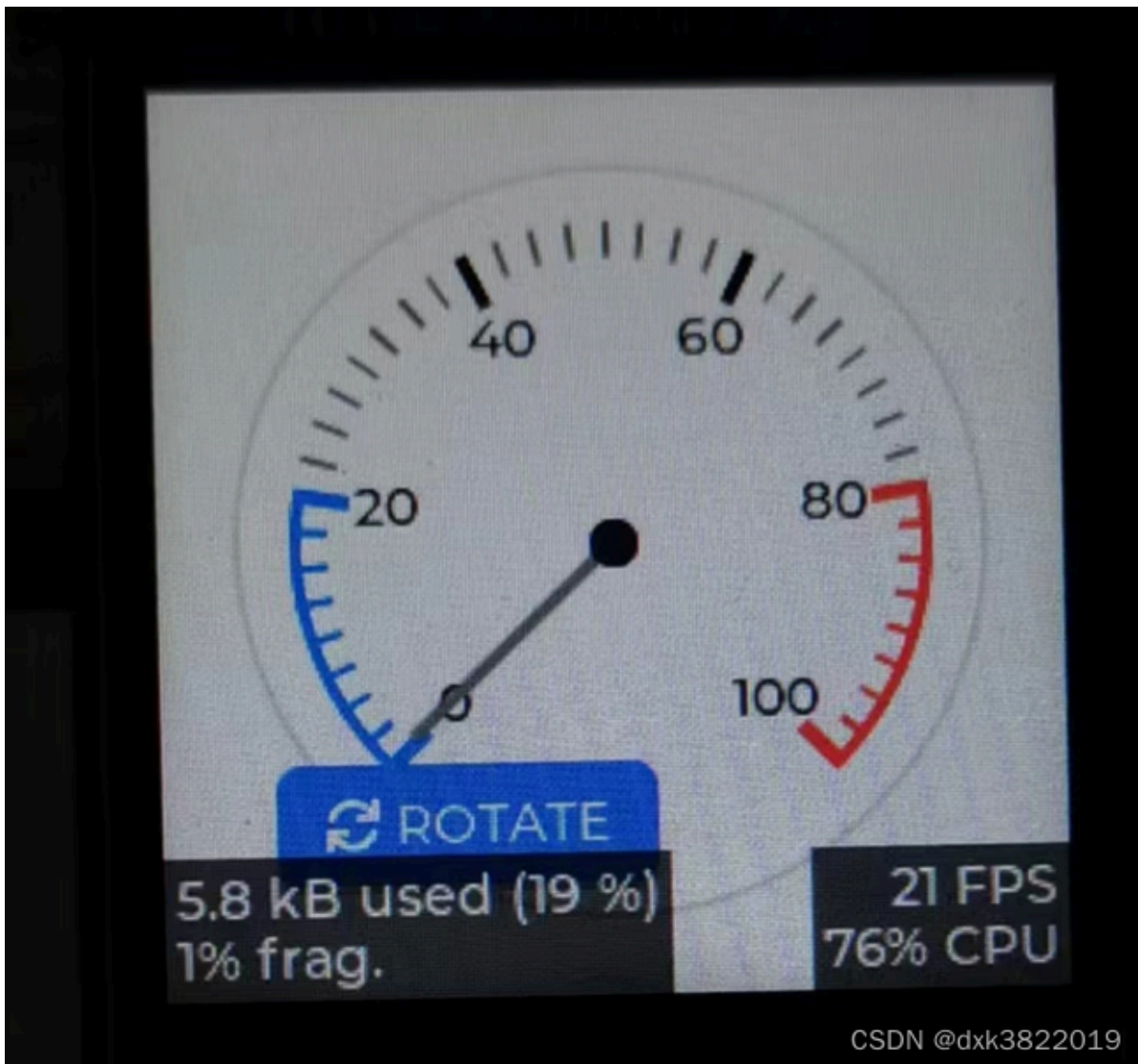
```
○ Total sizes:
Used static IRAM: 62162 bytes ( 300078 remain, 1
7.2% used)
    .text size: 61135 bytes
    .vectors size: 1027 bytes
Used static D/IRAM: 46844 bytes ( 299012 remain, 1
3.5% used)
    .data size: 10636 bytes
    .bss size: 36208 bytes
Used Flash size : 355039 bytes
    .text: 285671 bytes
    .rodata: 69112 bytes
Total image size: 427837 bytes (.bin may be padded
larger)
```

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```
Total image size: 427837 bytes (.bin may be padded
larger)
```



连接好硬件，通电，搞定！



感谢大家观看！