

GigaDevice Semiconductor Inc.

GD32205R-START

Arm[®] Cortex[®]-M3 32-bit MCU

User Guide

Revision 1.3

(Dec. 2023)

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1. Summary

GD32F205R-START uses GD32F205RCT6 as the main controller. It uses Mini USB interface or AC/DC adapter as 5V power supply. Reset, Boot, User key, LED, GD-Link, USB are also included. For more details, please refer to GD32F205R-START-V1.0 schematic.

2. Function pin assignment

Table 2-1. Function pin assignment

Function	Pin	Description
LED	PC6	LED2
RESET		K1-Reset
KEY	PA0	K2-User
USB	PA9	USB_VBUS
	PA11	USB_DM
	PA12	USB_DP

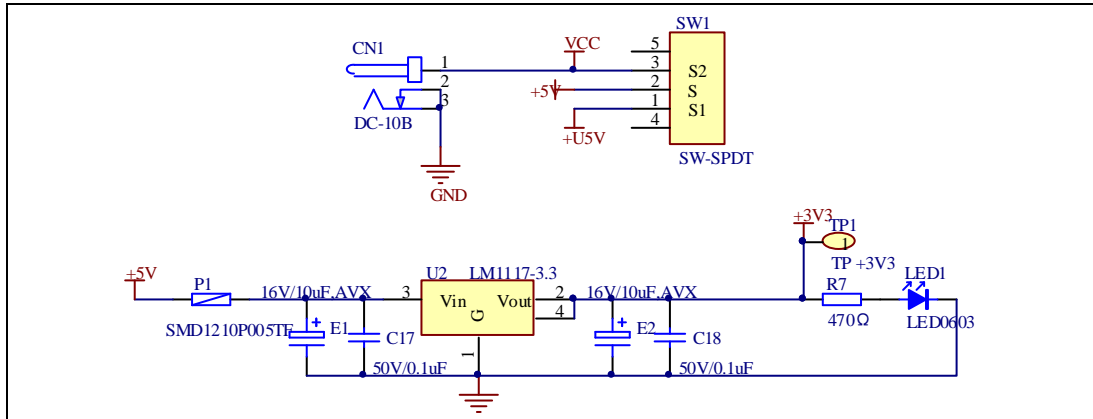
3. Getting started

The START board uses Mini USB connector AC/DC adapter to get power DC +5V, which is the hardware system normal work voltage. A GD-Link on board is necessary to download and debug programs. Select the correct boot mode and then power on, the LED1 will turn on, which indicates that the power supply is OK.

4. Hardware layout overview

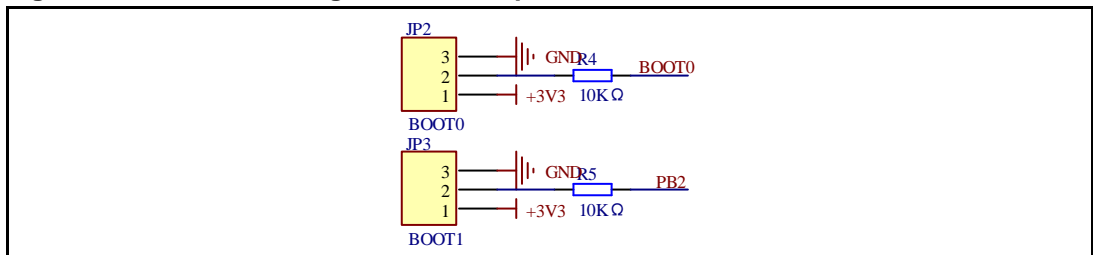
4.1. Power supply

Figure 4-1. Schematic diagram of power supply



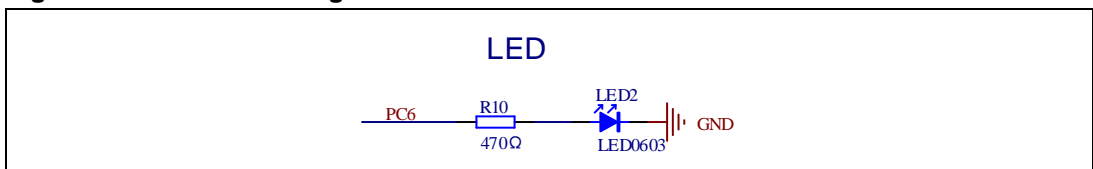
4.2. Boot option

Figure 4-2. Schematic diagram of boot option



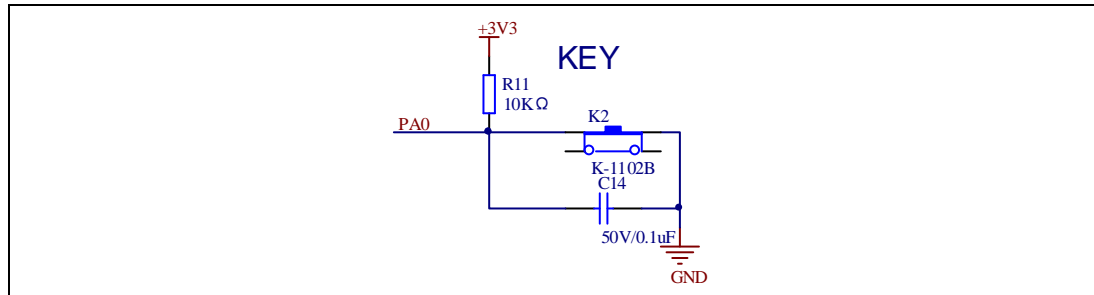
4.3. LED

Figure 4-3. Schematic diagram of LED function



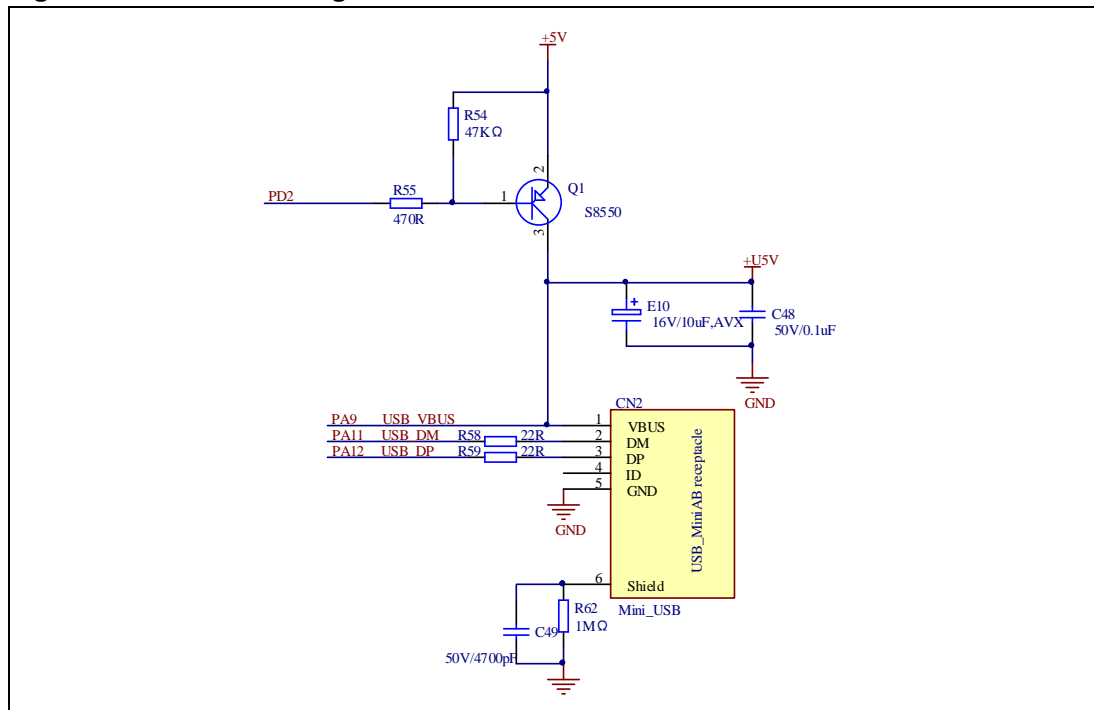
4.4. KEY

Figure 4-4. Schematic diagram of Key function



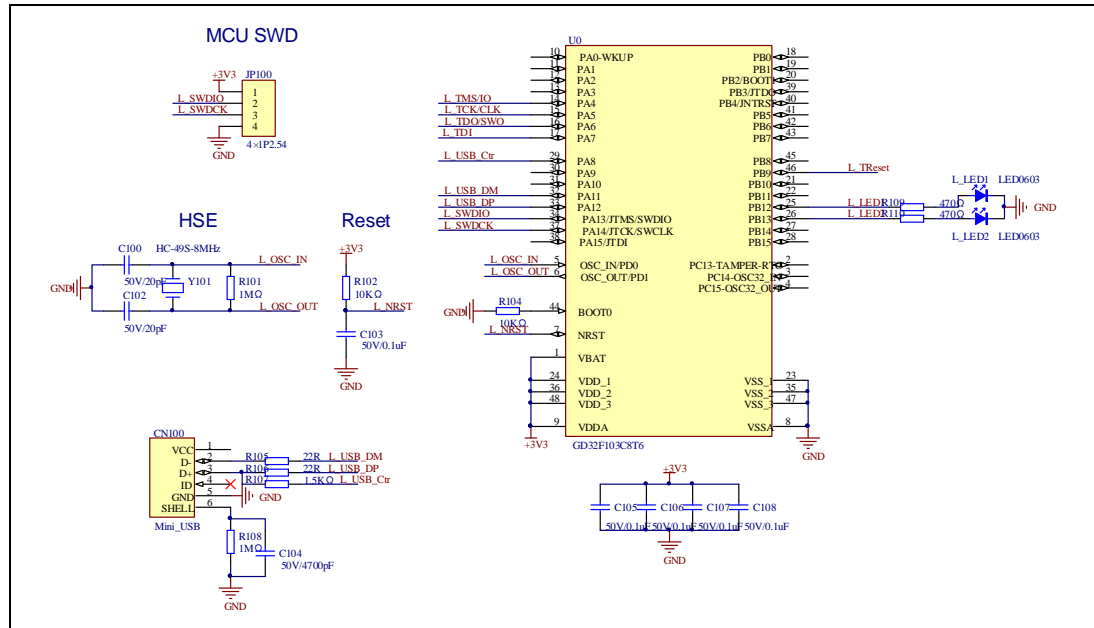
4.5. USB

Figure 4-5. Schematic diagram of USB function



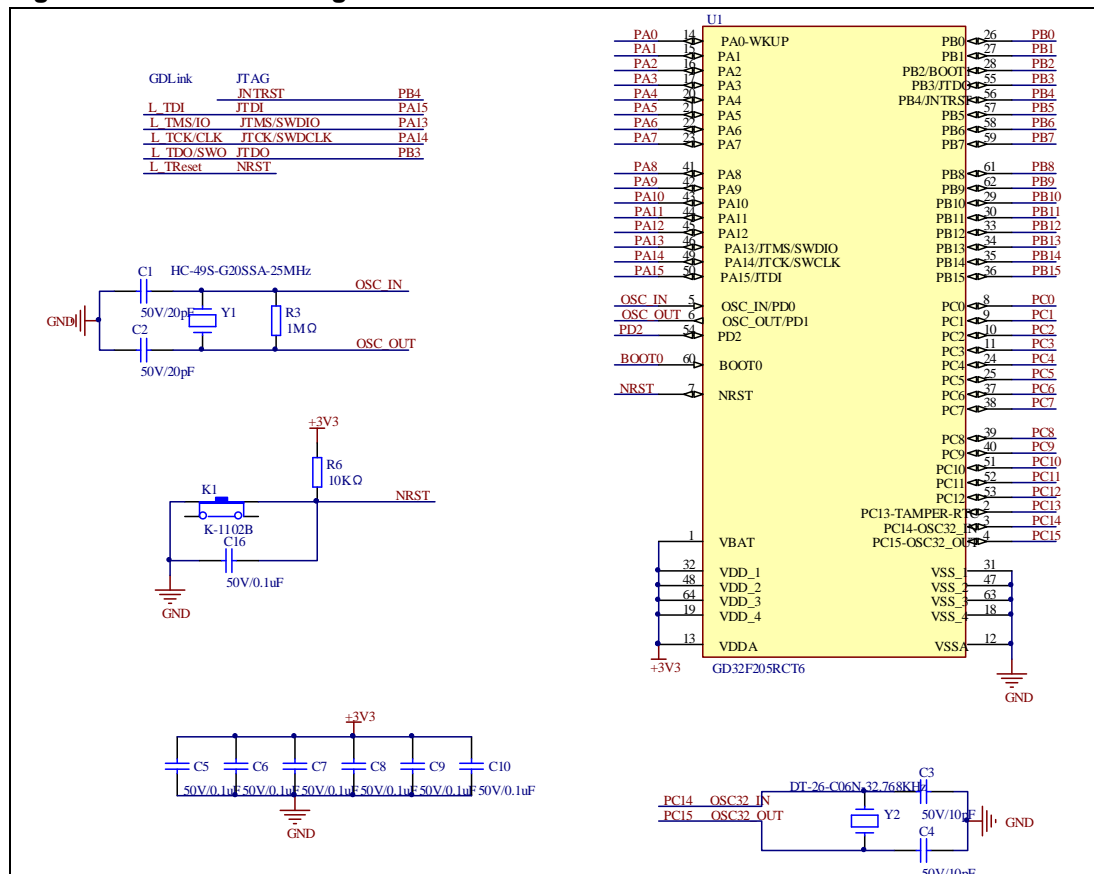
4.6. GD-Link

Figure 4-6. Schematic diagram of GD-Link



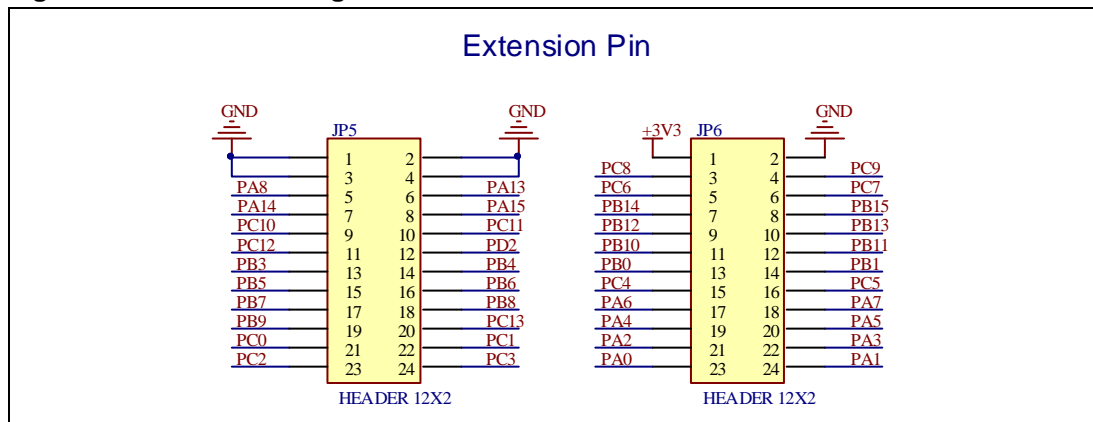
4.7. MCU

Figure 4-7. Schematic diagram of MCU



4.8. Extension

Figure 4-8. Schematic diagram of Extension Pin



5. Routine use guide

5.1. GPIO_Running_LED

5.1.1. DEMO purpose

This demo includes the following functions of GD32 MCU:

- Learn to use GPIO control the LED and the Key
- Learn to use SysTick to generate 1ms delay

GD32F205R-START board has two LEDs. The LED1 is used as Power Indicator and LED2 is controlled by GPIO. This demo will show how to use the SysTick to generate delay and toggle the LED2 when the delay arrives.

5.1.2. DEMO running result

Download the program <01_GPIO_Running_LED> to the START board, LED2 will toggle every 500 ms.

5.2. GPIO_Key_Polling_mode

5.2.1. DEMO purpose

This demo includes the following functions of GD32 MCU:

- Learn to use GPIO control the LED
- Learn to use SysTick to generate 1ms delay

GD32F205R-START board has two LED and a User Key. The LED1 is used as Power Indicator and LED2 is controlled by GPIO.

This demo will show how to use the User Key to control the LED2. When press down the User Key, it will check the input value of the IO port. If the value is 0 and wait for 100ms. Check the input value of the IO port again. If the value still is 0, it indicates that the button is pressed successfully and toggle LED2.

5.2.2. DEMO running result

Download the program <02_GPIO_Key_Polling_mode> to the START board, press down the User Key, LED2 will be turned on. Press down the User Key again, LED2 will be turned off.

5.3. EXTI_Key_Interrupt_mode

5.3.1. DEMO purpose

This demo includes the following functions of GD32 MCU:

- Learn to use GPIO control the LED and the KEY
- Learn to use EXTI to generate external interrupt

GD32F205R-START board has two LED. The LED1 is used as power indicator and LED2 is controlled by GPIO.

This demo will show how to use the EXTI interrupt line to control the LED2. When press down the User Key, it will produce an interrupt. In the interrupt service function, the demo will toggle LED2.

5.3.2. DEMO running result

Download the program <03_EXTI_Key_Interrupt_mode> to the START board. After startup, the LED2 flash once, press down the Tamper key, LED2 will be turned on, press down the Tamper key again, LED2 will be turned off.

5.4. USB_Device

5.4.1. HID_Keyboard

DEMO Purpose

This demo includes the following functions of GD32 MCU:

- Learn how to use the USBFS peripheral mode
- Learn how to implement USB HID(human interface device) device

GD32205R-START board has User keys and one USB_FS interface. In this demo, the GD32205R-START board is enumerated as an USB Keyboard, which uses the native PC Host HID driver, as shown below. The USB Keyboard uses user key to output characters 'c'. In addition, the demo also supports remote wakeup which is the ability of a USB device to bring a suspended bus back to the active condition, and the user key is used as the remote wakeup source.



DEMO Running Result

Download the program <04_USB_Device\HID_Keyboard> to the board and run. If you press the User key, will output 'c'.

If you want to test USB remote wakeup function, you can do as follows:

- Manually switch PC to standby mode
- Wait for PC to fully enter the standby mode
- Press the User key
- If PC is ON, remote wakeup is OK, else failed.

5.4.2. MSC_Udisk

DEMO Purpose

This demo includes the following functions of GD32 MCU:

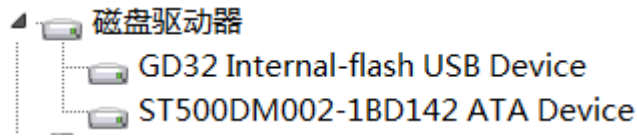
- Learn how to use the USB_FS peripheral mode
- Learn how to implement USB MSC(mass storage) device

This demo mainly implements a U disk. U disk is currently very widely used removable MSC devices. MSC, the Mass Storage device Class, is a transport protocol between a computer and mobile devices, which allow a universal serial bus (USB) equipment to access a host computing device, file transfer between them, mainly including mobile hard disk, mobile U disk drive, etc... The MSC device must have a storage medium, and this Demo uses the MCU's internal SRAM as the storage medium. For more details of the MSC protocol please refer to the MSC protocol standard.

MSC device will use a variety of transport protocols and command formats for communication, so it need to choose the appropriate protocol and command format in the realization of the application. This Demo selects the BOT (bulk only transport) protocol and the required SCSI (small computer interface) command, and is compatible with a wide variety of Window operating systems. Specific BOT protocol and SCSI command specification please refer to the standard of their agreement.

DEMO Running Result

Download the program <04_USB_Device\MSC_Udisk> to the board and run. When the board connect to the PC, you will find a USB mass storage storage device is in the universal serial bus controller, and there is 1 more disk drives in the equipment manager of PC, as shown below:



Then, after opening the resource manager, you will see more of the 1 disk, as shown in the following diagram:



At this point, the write/read/formatting operation can be performed as the other mobile devices.

5.5. USB_Host

5.5.1. DEMO Purpose

This demo includes the following functions of GD32 MCU:

- Learn to use the USBFS as a MSC host
- Learn the operation between the MSC host and the Udisk

GD32205R-START board integrates the USBFS module, and the module can be used as a USB device, a USB host or an OTG device. This demo mainly shows how to use the USBFS as a USB MSC host to communicate with external Udisk.

5.5.2. DEMO Running Result

Jump the JP5 to USB. Then insert the OTG cable to the USB port, download the program <05_USB_Host\Host_MSC> to the board and run.

If an Udisk has been attached, the LED2 will toggle. First pressing the user key will go to the Udisk information stage, next continue pressing the user key will go to the root content of the Udisk stage, then press the user key will write file to the Udisk and the LED2 is on, finally the msc host demo is end.

6. Revision history

Table 6-1. Revision history

Revision No.	Description	Date
1.0	Initial Release	Apr.01st, 2019
1.1	Rebase Release	Oct.31st, 2021
1.2	Firmware update	Jun.30th, 2023
1.3	Firmware update	Dec.31th,2023

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