GigaDevice Semiconductor Inc.

GD32VF103T-START
User Guide
V1.0

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1. Summary

GD32VF103T-START uses GD32VF103TBU6 as the main controller. It uses Mini USB interface to supply 5V power. Reset, Boot, Wakeup key, LED, GD-Link and Ardunio are also included.

2. Function Pin Assign

Table 2-1 Function pin assignment

Function	Pin	Description
LED	PA8	LED1
RESET		K1-Reset
KEY	PA0	K2-Wakeup key
USB	PA11	USB_DM
	PA12	USB_DP
	PA9	USB_VBUS

3. Getting started

The EVAL board uses Mini USB connecter to get power DC +5V, which is the hardware system normal work voltage. A GD-Link on board is necessary in order to download and debug programs. Select the correct boot mode and then power on, the LEDPWR will turn on, which indicates that the power supply is OK.

The projects are created based on eclipse 4.7.2. Note that to configure the "Debug Configurations" before debug and download.

4. Hardware layout overview

4.1. Power supply

Figure 4-1 Schematic diagram of power supply
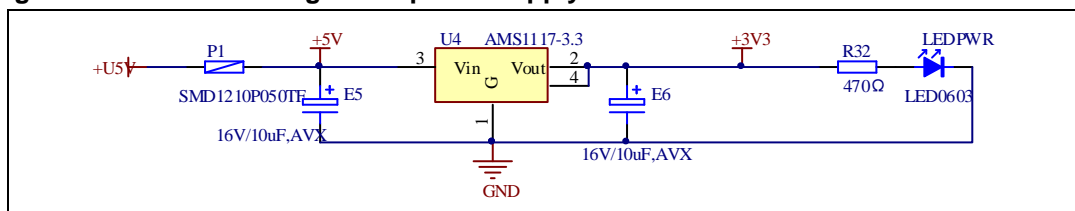
4.2. Boot option

Figure 4-2 Schematic diagram of boot option
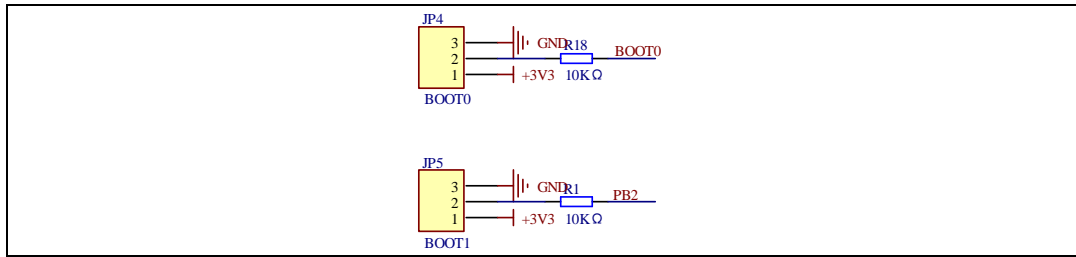
4.3. LED

Figure 4-3 Schematic diagram of LED function
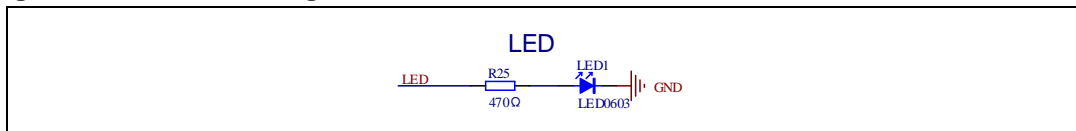
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Figure 4-4 Schematic diagram of Key function

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4.7. MCU

Figure 4-7 Schematic diagram of MCU

4.8. Ardunio

Figure 4-8 Schematic diagram of Ardunio
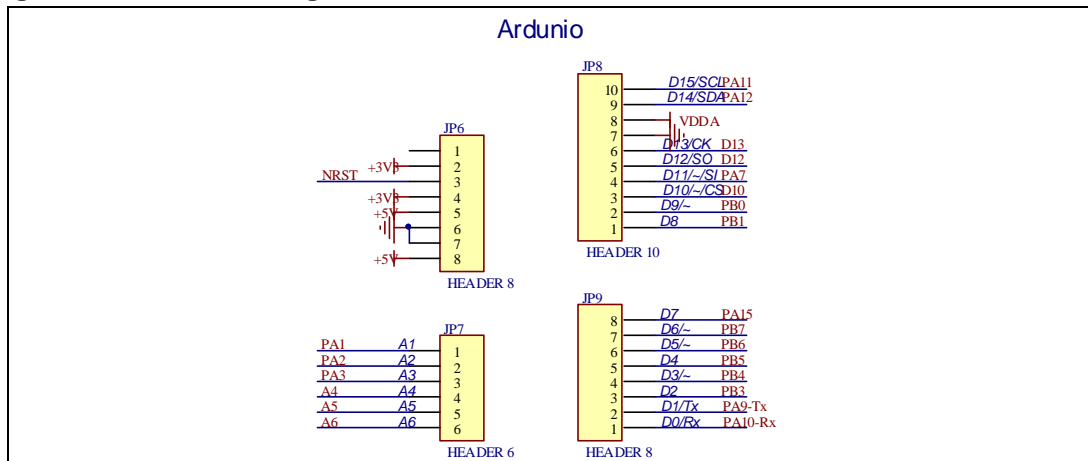
5. Routine use guide

5.1. GPIO_Runing_LED

5.1.1. 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

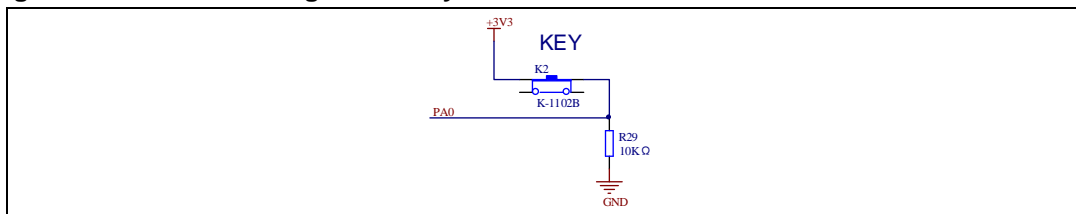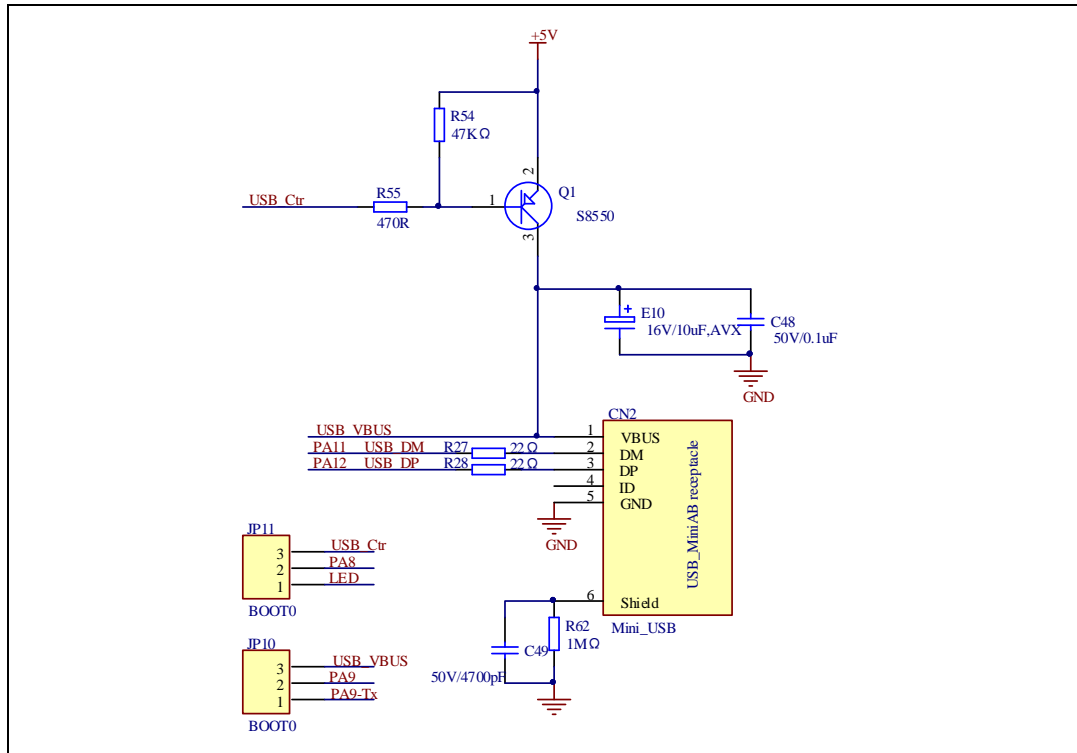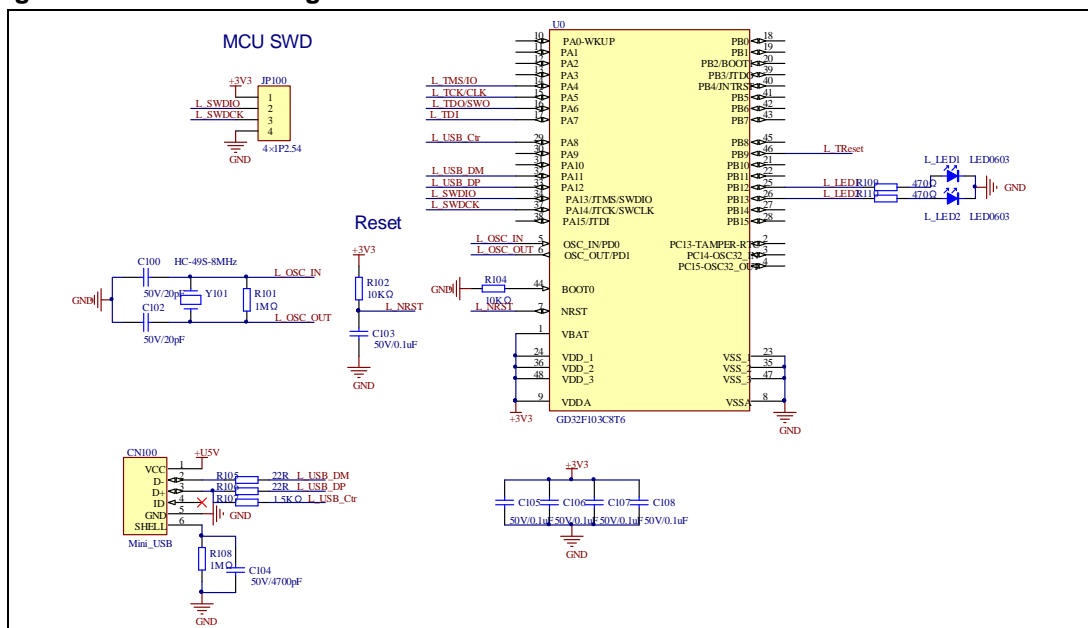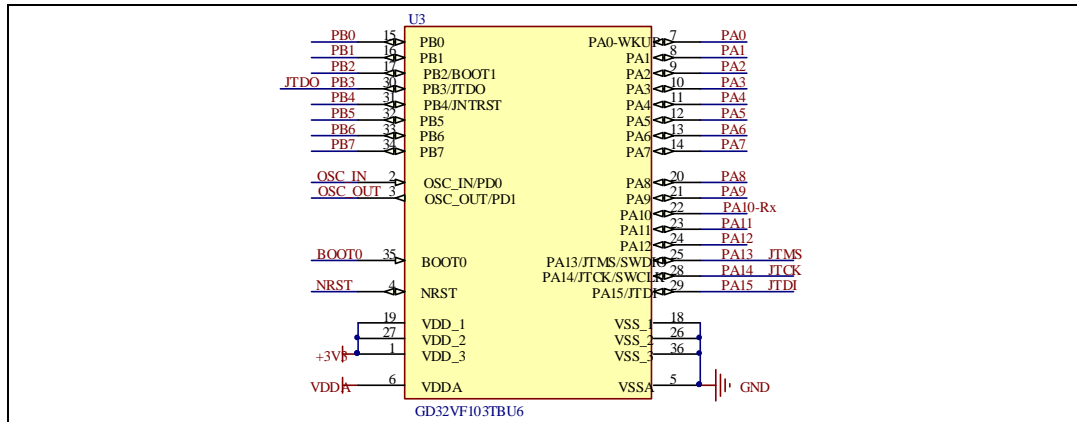GD32VF103T-START board has one LED. The LED1 is controlled by GPIO. This demo will show how to light the LED.

5.1.2. DEMO running result

Download the program < 01_GPIO_Running_LED > to the START board, LED1 will turn on and off in sequence with interval of 200ms, repeat the process.

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 and the KEY
■ Learn to use SysTick to generate 1ms delay

GD32VF103T-START board has one LED and Wakeup key. The LED1 is controlled by GPIO.

This demo will show how to use the Wakeup key to control the LED1. When press down the Wakeup Key, it will check the input value of the IO port. If the value is 1 and will wait for 50ms. Check the input value of the IO port again. If the value still is 1, it indicates that the button is pressed successfully and toggle LED1.

5.2.2. DEMO running result

Download the program < 02_GPIO_Key_Polling_mode > to the START board, the LED1 will flash once for test, press down the Wakeup Key, LED1 will be turned on. Press down the Wakeup Key again, LED1 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

GD32VF103T-START board has one LED and Wakeup key. The LED1 is controlled by GPIO.

This demo will show how to use the EXTI interrupt line to control the LED1.When press down the Wakeup Key, it will produce an interrupt. In the interrupt service function, the demo will toggle LED1.

5.3.2. DEMO running result

Download the program < 03_EXTI_Key_Interrupt_mode > to the START board, the LED1 will flash once for test, press down the Wakeup Key, LED1 will be turned on. Press down the Wakeup Key again, LED1 will be turned off.

5.4. USBFS_Device

5.4.1. CDC_ACM

DEMO purpose

This demo includes the following functions of GD32 MCU:

■ Learn how to use the USBFS peripheral
■ Learn how to implement USB CDC device

Start board has one USBFS interface. In this demo, the startboard is enumerated as an USB virtual COM port, which was shown in device manager of PC as below. This demo makes the USB device look like a serial port, and loops back the contents of a text file over USB port. To run the demo, input a message using the PC's keyboard. Any data that shows in HyperTerminal is received from the device.

DEMO running result

Download the program <04_USBFS\Device\CDC_ACM> to the start board and run. When you input message through computer keyboard, the HyperTerminal will receive and shown

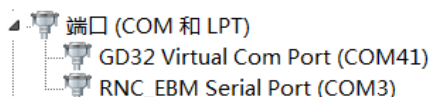the message. For example, when you input "GigaDevice MCU", the HyperTerminal will get and show it as below.

5.4.2. MSC

DEMO Purpose

This demo includes the following functions of GD32 MCU:

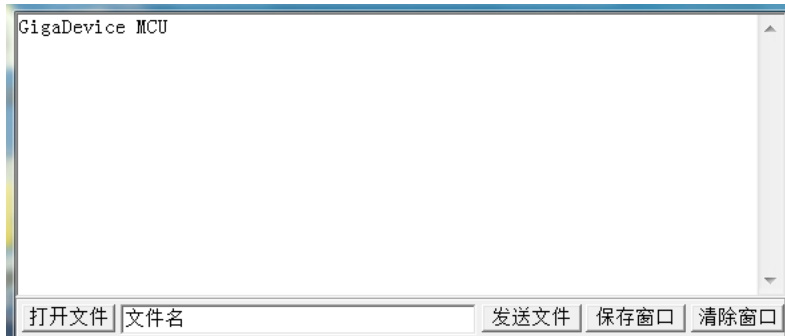■ Learn how to use the USBFS
■ Learn how to implement USB MSC(mass storage) device

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 flash 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_USBFS\Device\MSC> to the start board and run. When the start board connect to the PC, you will find a USB large capacity storage device is in the universal serial bus controller, and there is 1 more disk drives in the equipment manager of PC.

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. USBFS_Host

5.5.1. MSC

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

GD32VF103T-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.

DEMO Running Result

Jump the JP11 to OTG and the JP10 to Usart. Then insert the OTG cable to the USB port, download the program <04_USBFS\Host\MSC_Host> to the start board and run.

If an Udisk has been attached, the COM will print "Device connect", indicating that the U disk is successfully connected.

First pressing the Wakeup key, the COM will print "Read List", indicating that the contents of the U disk have been read correctly.

Then pressing the Wakeup key again, the COM will print "Write File", indicating that the files has written to the U disk.

The third press of the Wakeup button, the COM will print "Done", indicating the end of the MSC host example.

Finally, pull out the U disk, the COM will print "Device disconnect"

6. Revision history

Table 6-1 Revision history

Revision No.	Description	Date
1.0	Initial Release	Sept.18, 2019

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