

GigaDevice Semiconductor Inc.

GD32E231C-START
Arm[®] Cortex[®]-M23 32-bit MCU

User Guide

Revision 1.1

(Dec. 2021)

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1. Summary

GD32E231C-START uses GD32E231C8T6 as the main controller. It uses Mini USB interface to supply 5V power. Reset, Boot, Wakeup key, LED, GD-Link, Arduino are also included. For more details please refer to GD32E231C-START-V1.0 schematic.

2. Function pin assignment

Table 2-1 Function pin assignment

Function	Pin	Description
LED	PA7	LED1
	PA8	LED2
	PA11	LED3
	PA12	LED4
RESET		K1-Reset
KEY	PA0	K2-Wakeup

3. Getting started

The EVAL board uses Mini USB connector 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.

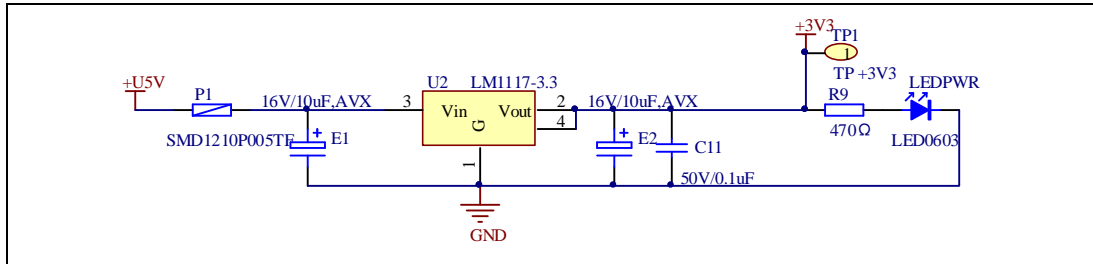
There are Keil version and IAR version of all projects. Keil version of the projects are created based on Keil MDK-ARM 5.25 uVision5. IAR version of the projects are created based on IAR Embedded Workbench for ARM 8.31.1. During use, the following points should be noted:

1. If you use Keil uVision5 to open the project. In order to solve the "Device Missing (s)" problem, you can install GigaDevice.GD32E23x_DFP.1.0.0.pack.
2. If you use IAR to open the project, install IAR_GD32E23x_ADDON_1.0.0.exe to load the associated files.

4. Hardware layout overview

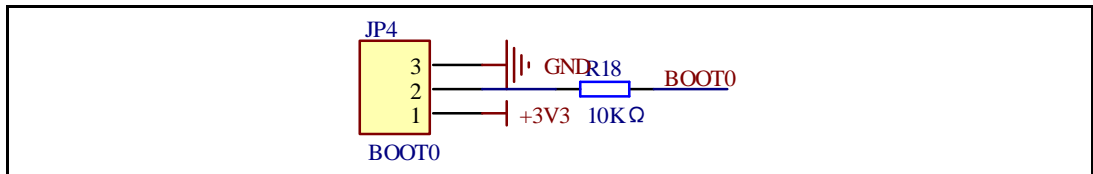
4.1. Power supply

Figure 4-1 Schematic diagram of power supply



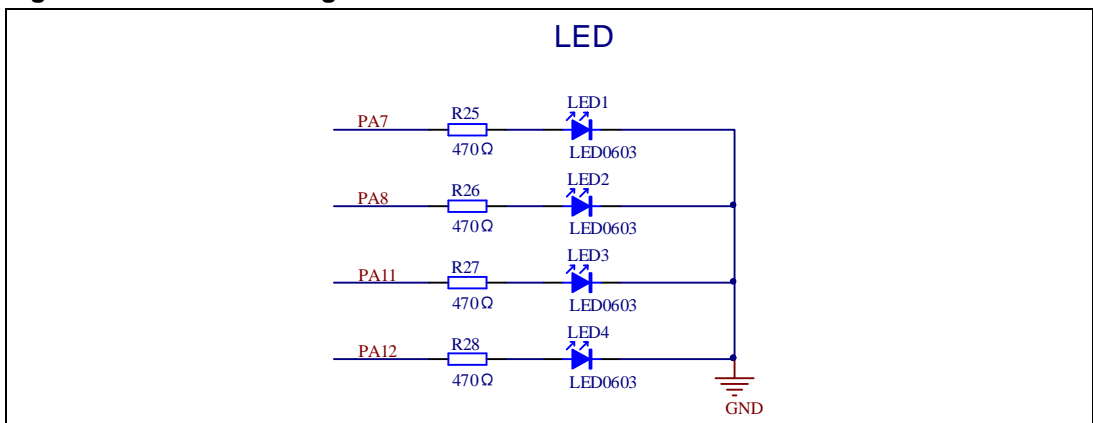
4.2. Boot option

Figure 4-2 Schematic diagram of boot option



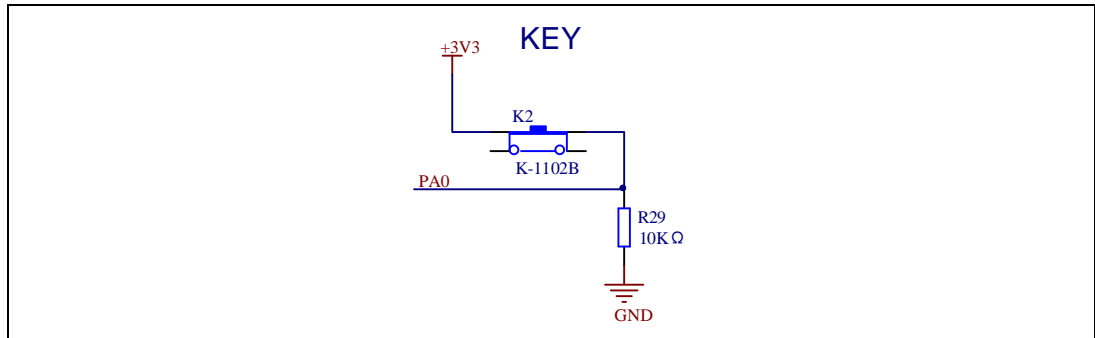
4.3. LED

Figure 4-3 Schematic diagram of LED function



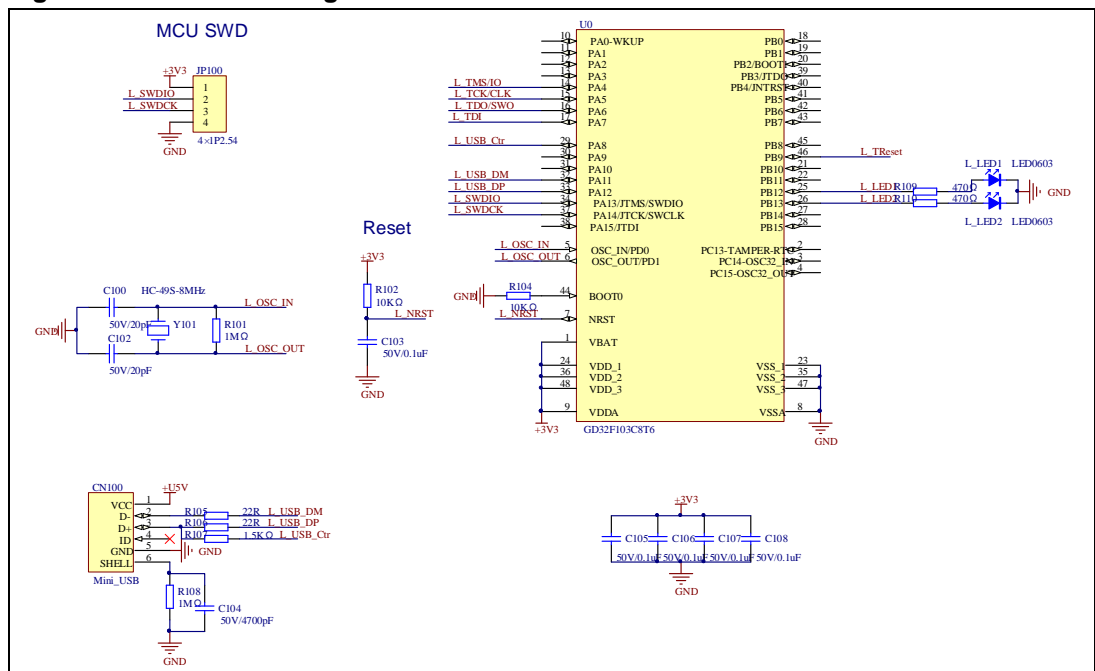
4.4. KEY

Figure 4-4 Schematic diagram of Key function



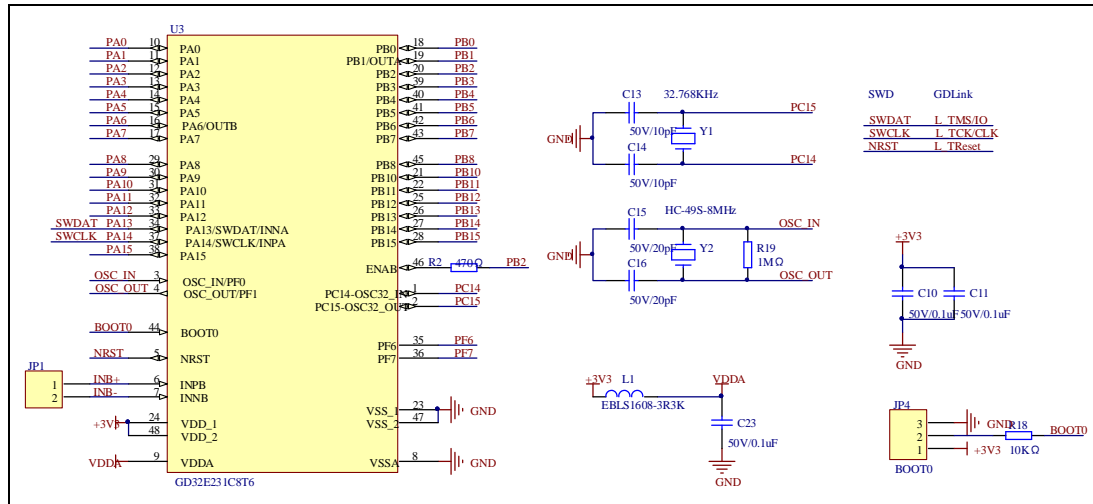
4.5. GD-Link

Figure 4-5 Schematic diagram of GD-Link



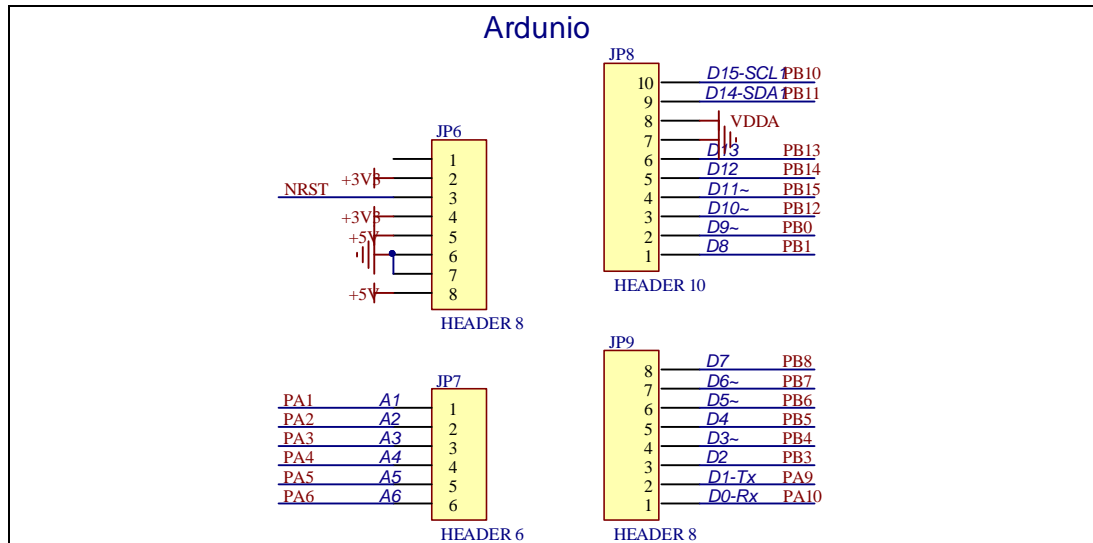
4.6. MCU

Figure 4-6 Schematic diagram of MCU



4.7. Arduino

Figure 4-7 Schematic diagram of Arduino



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
- Learn to use SysTick to generate 1ms delay

GD32E231C-START board has four LED. The LED1 are 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 EVAL board, LED1 will turn on and off in sequence with interval of 1000ms, 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

GD32E231C-START board has two keys and four LED. The two keys are Reset key and Wakeup key. The LED1 are 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 EVAL board, all the LEDs are flashed once for test and LED1 is on, press down the Wakeup Key, LED1 will be turned off. Press down the Wakeup Key again, LED1 will be turned on.

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

GD32E231C-START board has two keys and four LED. The two keys are Reset key and Wakeup key. The LED1 are 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 EVAL board, all the LEDs are flashed once for test and LED1 is on, press down the Wakeup Key, LED1 will be turned off. Press down the Wakeup Key again, LED1 will be turned on.

5.4. TIMER_Key_EXTI

5.4.1. 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
- Learn to use TIMER to generate PWM

GD32E231C-START board has two keys and four LED. The two keys are Reset key and Wakeup key. The LED1 are controlled by GPIO.

This demo will show how to use the TIMER PWM to trigger EXTI interrupt to toggle the state of LED1 and 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.

5.4.2. DEMO running result

Download the program < 04_TIMER_Key_EXTI > to the EVAL board, all the LEDs are flashed once for test, press down the Wakeup Key, LED1 will be turned on. Press down the Wakeup Key again, LED1 will be turned off. Connect PA6(TIMER2_CH0) and PA5

with DuPont line. The LED1 will be toggled every 500ms.

6. Revision history

Table 6-1 Revision history

Revision No.	Description	Date
1.0	Initial Release	Feb.19, 2019
1.1	Modify document header and homepage	Dec. 31, 2021

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