

**GigaDevice Semiconductor Inc.**

**GD32130K-START**

**User Guide**

**V3.1**

(Dec.31.2021)

# Table of Contents

<b>Table of Contents .....</b>	<b>1</b>
<b>List of Figures.....</b>	<b>2</b>
<b>List of Tables.....</b>	<b>3</b>
<b>1. Summary .....</b>	<b>4</b>
<b>2. Function Pin Assign .....</b>	<b>4</b>
<b>3. Getting started.....</b>	<b>4</b>
<b>4. Hardware layout overview.....</b>	<b>5</b>
4.1. Power supply.....	5
4.2. Boot option.....	5
4.3. LED .....	5
4.4. KEY .....	6
4.5. GD-Link .....	6
4.6. Extension .....	7
4.7. MCU.....	7
<b>5. Routine use guide .....</b>	<b>8</b>
5.1. GPIO_Running_LED .....	8
5.1.1. DEMO purpose.....	8
5.1.2. DEMO running Result.....	8
5.2. GPIO_Key_Polling_mode .....	8
5.2.1. DEMO purpose.....	8
5.2.2. DEMO running Result.....	8
5.3. EXTI_Key_Interrupt_mode.....	9
5.3.1. DEMO purpose.....	9
5.3.2. DEMO running Result.....	9
5.4. TIMER_Key_EXTI .....	9
5.4.1. DEMO purpose.....	9
5.4.2. DEMO running result .....	9
<b>6. Revision history .....</b>	<b>10</b>

# List of Figures

Figure 4-1 Schematic diagram of power supply .....	5
Figure 4-2 Schematic diagram of boot option.....	5
Figure 4-3 Schematic diagram of LED function .....	5
Figure 4-4 Schematic diagram of Key function .....	6
Figure 4-5 Schematic diagram of GD-Link function .....	6
Figure 4-6 Schematic diagram of Extension Pin .....	7
Figure 4-7 Schematic diagram of MCU Pin .....	7

# List of Tables

Table 2-1 Pin assignment .....	4
Table 4-1 Boot configuration .....	5
Table 6-1 Revision history .....	10

## 1. Summary

GD32130K-START-V1.0 board uses GD32F130K8U6 as the main controller. As a complete development platform of GD32F1x0 powered by ARM® Cortex™-M3 core, the board supports full range of peripherals. It uses mini-USB interface to supply 3.3V power. SWD, Reset, Boot, User button key, LED and Extension Pin are also included. This document details its hardware schematic and the relevant applications.

## 2. Function Pin Assign

Table 2-1 Pin assignment

Function	Pin	Description
LED	PB3	LED1
	PB4	LED2
KEY	PA0	K1-User Key
RESET		K2-Reset

## 3. Getting started

The START Board uses mini-USB connector to get power, the hardware system power is +3.3V. A mini-USB cable are necessary to down programs. Select the correct boot mode and then power on, the LED3 will turn on, which indicates the power supply is ready.

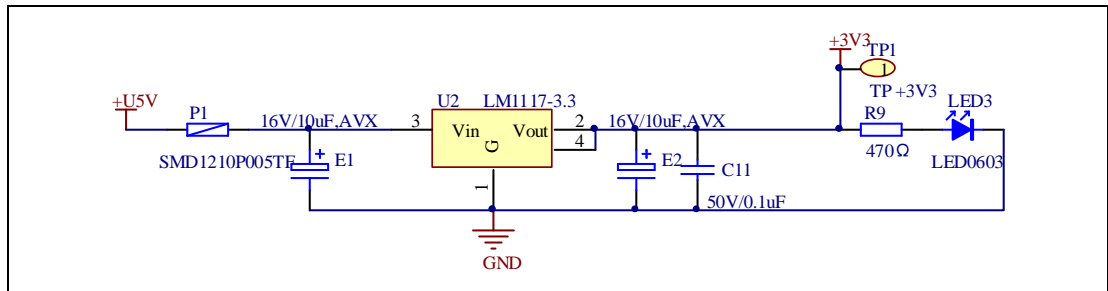
There are Keil version and IAR version of all projects. Keil version of the projects are created based on Keil MDK-ARM 4.74 uVision4. IAR version of the projects are created based on IAR Embedded Workbench for ARM 7.40.2. During use, the following points should be noted:

1. If you use Keil uVision4 to open the project, install the GD32F1x0\_AddOn.3.2.0.exe to load the associated files.
2. If you use Keil uVision5 to open the project, there are two ways to solve the "Device Missing (s)" problem. One is to install GigaDevice.GD32F1x0\_DFP.3.2.0.pack. In Project menu, select the Manage sub menu, click on the "Version Migrate 5 Format..." menu, the Keil uVision4 project will be converted to Keil uVision5 project. Then add "C:\Keil\_v5\ARM\Pack\ARM\CMSIS\4.2.0\CMSIS\Include" to C/C++ in Option for Target. The other is to install Addon directly. Select the installation directory of Keil uVision5 software, such as C:\Keil\_v5, in Destination Folder of Folder Selection. Select the corresponding device in Device of Option for Target and add "C:\Keil\_v5\ARM\Pack\ARM\CMSIS\4.2.0\CMSIS\Include" to C/C++ in Option for Target.
3. If you use IAR to open the project, install IAR\_GD32F1x0\_ADDON.3.2.0.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

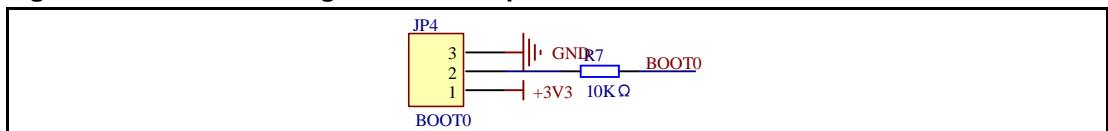
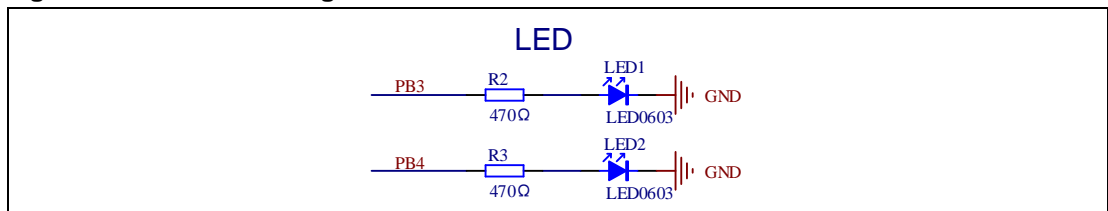


Table 4-1 Boot configuration

BOOT1	BOOT0	Boot Mode
Default	2-3	User memory
	1-2	System memory
Changed by ISP	1-2	SRAM memory

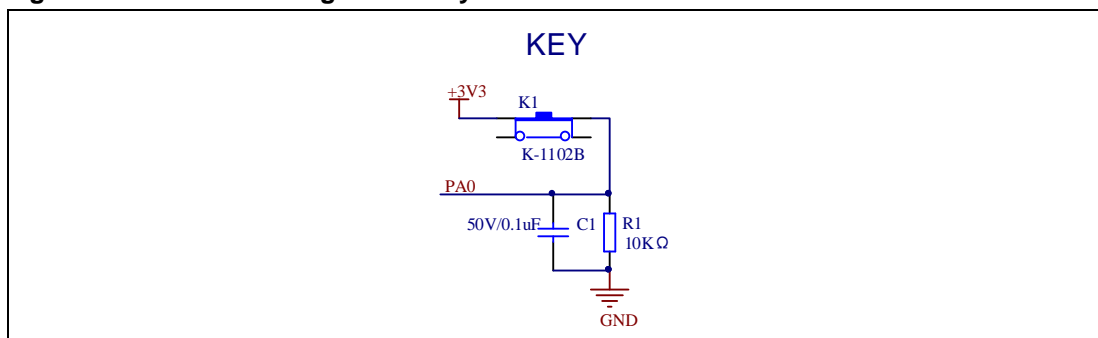
### 4.3. LED

Figure 4-3 Schematic diagram of LED function



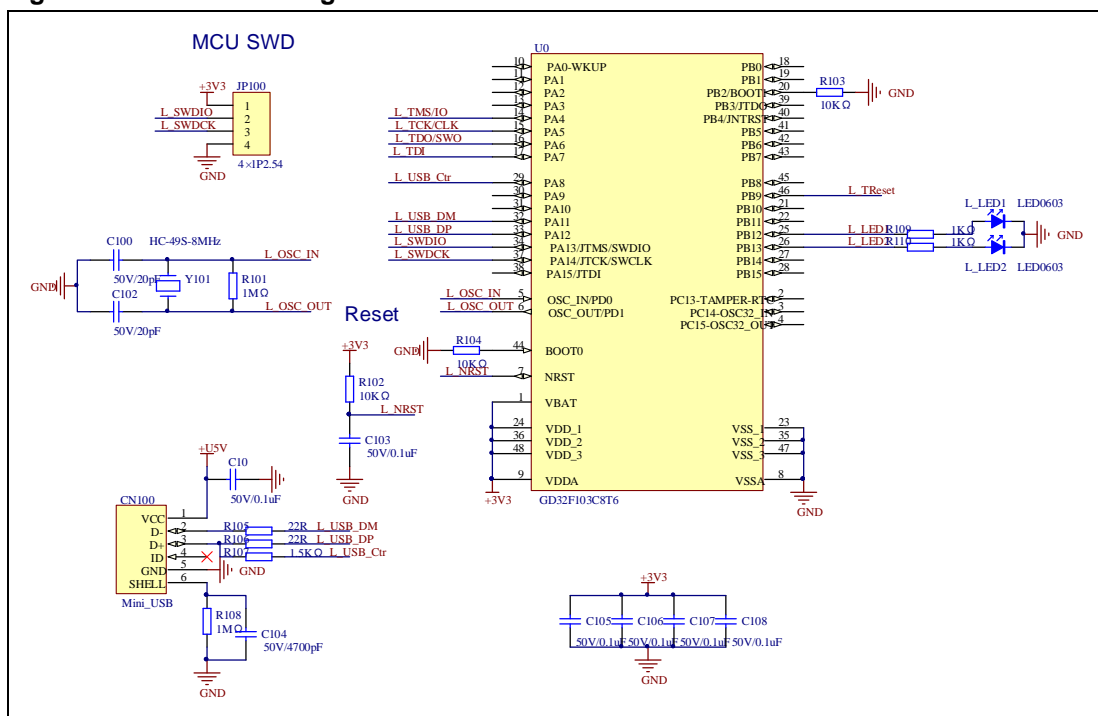
#### 4.4. KEY

### Figure 4-4 Schematic diagram of Key function



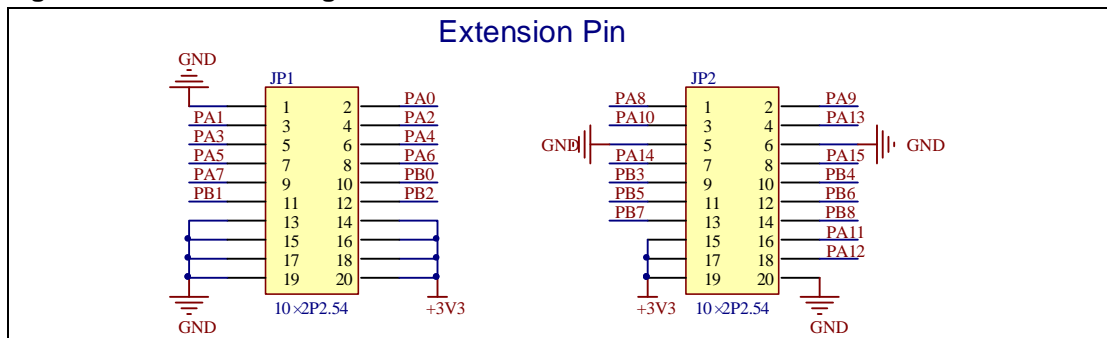
#### 4.5. GD-Link

### Figure 4-5 Schematic diagram of GD-Link function



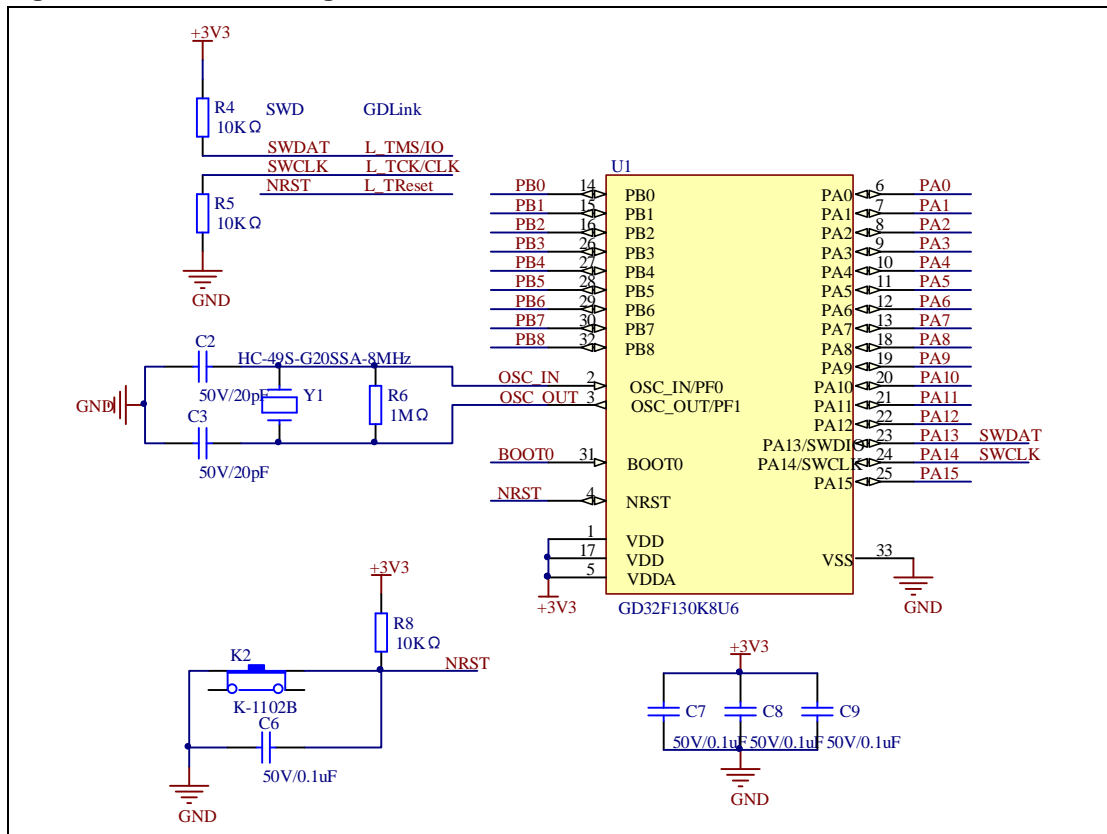
## 4.6. Extension

Figure 4-6 Schematic diagram of Extension Pin



## 4.7. MCU

Figure 4-7 Schematic diagram of MCU 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 for controlling the LED
- Learn to use SysTick to generate 1ms delay

GD32130K-START-V1.0 board has two LEDs. The LED1 and LED2 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 board, two LEDs will turn on one by one from LED1 to LED2 every 200ms, and then turn off together. 200ms later, the two LEDs work like previous again.

### 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

GD32130K-START-V1.0 board has two keys and two LEDs. The two keys are Reset key and User key. The LED1 and LED2 are controlled by GPIO.

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

#### 5.2.2. DEMO running Result

Download the program <02\_GPIO\_Key\_Polling\_mode> to the board, first of all, all the LEDs will be flashed once for test. Then press down the User Key, LED1 will be turned on. Press down the User 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 to control the LED and the KEY
- Learn to use EXTI to generate external interrupt

GD32130K-START-V1.0 board has two keys and two LEDs. The two keys are Reset key and User key. The LED1 and LED2 are controlled by GPIO.

This demo will show how to use EXTI interrupt line to control the LED1. When press down the User 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 board, first of all, the LED1 will be flashed once for test. Then press down the User Key, LED1 will be turned on. Press down the User Key again, LED1 will be turned off.

## 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

GD32130K-START-V1.0 board has two keys and two LEDs. The two keys are Reset key and Wakeup key. The LED1 and LED2 are controlled by GPIO.

This demo will show how to use the TIMER PWM to toggle the state of LED2 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 board, all the LEDs are flashed once for test. Press down the User Key(EXTI0) LED1 will be turned on or off. Connecting PA6 (TIMER2\_CH0) and PB4 with DuPont line, the LED2 will be toggled every 500ms.

## 6. Revision history

**Table 6-1 Revision history**

Revision No.	Description	Date
1.0	Initial Release	Jun.28, 2017
2.0	Updated format across the whole document	Jun.1, 2019
3.0	Updated format across the whole document	Nov.20, 2019
3.1	Updated format across the whole document	Dec.31, 2021

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