

**GigaDevice Semiconductor Inc.**

**GD32150G-START**

**User Guide**

**V3.0**

(Nov.20.2019)

# Table of Contents

Table of Contents .....	1
List of Figures.....	2
List of Tables.....	3
1. Summary.....	4
2. Function Pin Assign.....	4
3. Getting started.....	4
4. Hardware layout overview .....	5
4.1. Power supply.....	5
4.2. Boot option .....	5
4.3. LED.....	5
4.4. KEY.....	6
4.5. USB .....	6
4.6. GD-Link .....	7
4.7. Extension .....	7
4.8. MCU.....	8
5. Routine use guide .....	8
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 .....	9
5.3. EXTI_Key_Interrupt_mode .....	9
5.3.1. DEMO purpose .....	9
5.3.2. DEMO running Result .....	9
5.4. USB_D_HID_keyboard.....	9
5.4.1. DEMO purpose .....	9
5.4.2. DEMO running result.....	10
6. Revision history .....	11

# 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 USB function .....	6
Figure 4-6 Schematic diagram of GD-Link function .....	7
Figure 4-7 Schematic diagram of Extension Pin .....	7
Figure 4-8 Schematic diagram of MCU Pin .....	8

# List of Tables

Table 2-1 Pin assignment .....	4
Table 4-1 Boot configuration .....	5
Table 6-1 Revision history .....	11

## 1. Summary

GD32150G-START-V1.1 board uses GD32F150G8U6 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	PA1	LED1
KEY	PA0	K1-User Key
RESET		K2-Reset
USB	PA11	USBDM
	PA12	USBDP
	PA15	USBDP pull up pin

## 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:

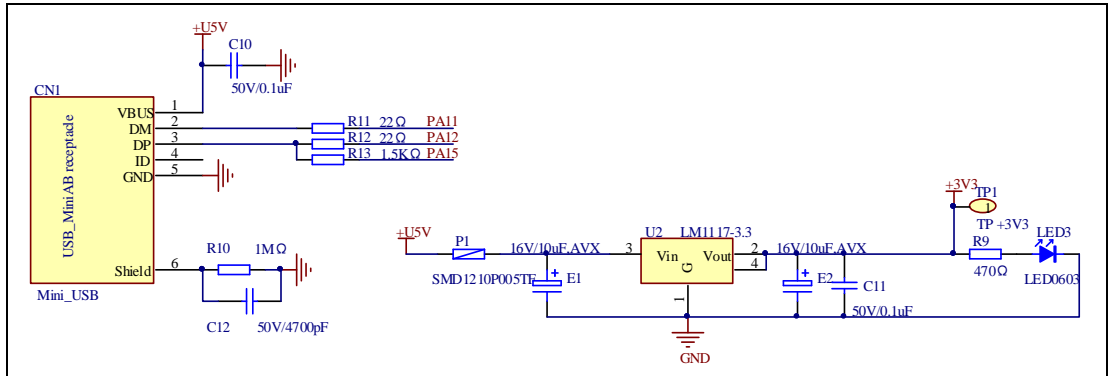
1. If you use Keil uVision4 to open the project, install the GD32F1x0\_AddOn.3.2.0.exe to load the associated files.
2. If you use Keil uVision5 to open the project, there are two ways to solve the "Device Missing (s)" problem. One is to install GigaDevice.GD32F1x0\_DFP.3.2.0.pack. In Project menu, select 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

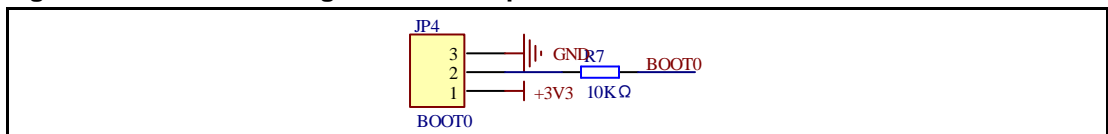
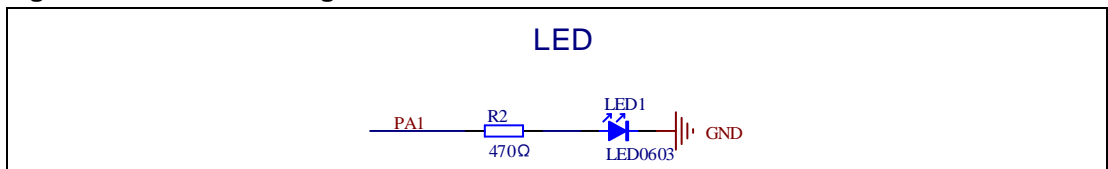


Table 4-1 Boot configuration

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

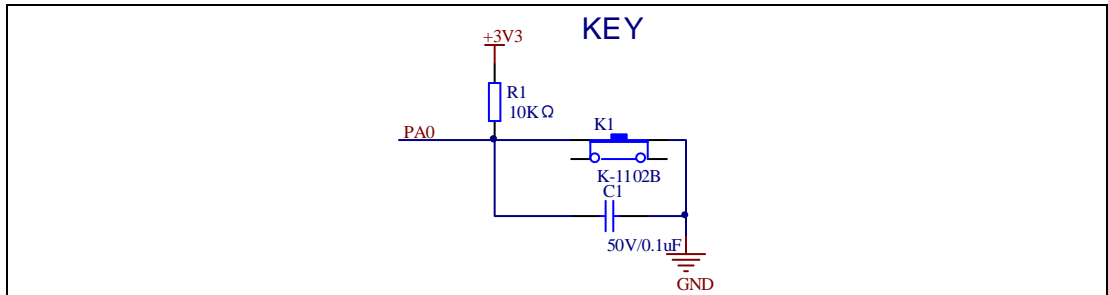
### 4.3. LED

Figure 4-3 Schematic diagram of LED function



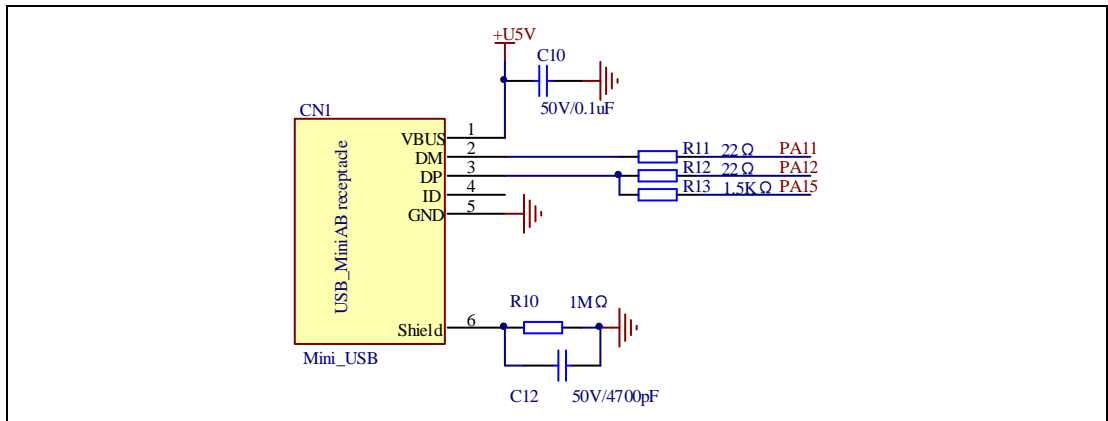
#### 4.4. KEY

Figure 4-4 Schematic diagram of Key function



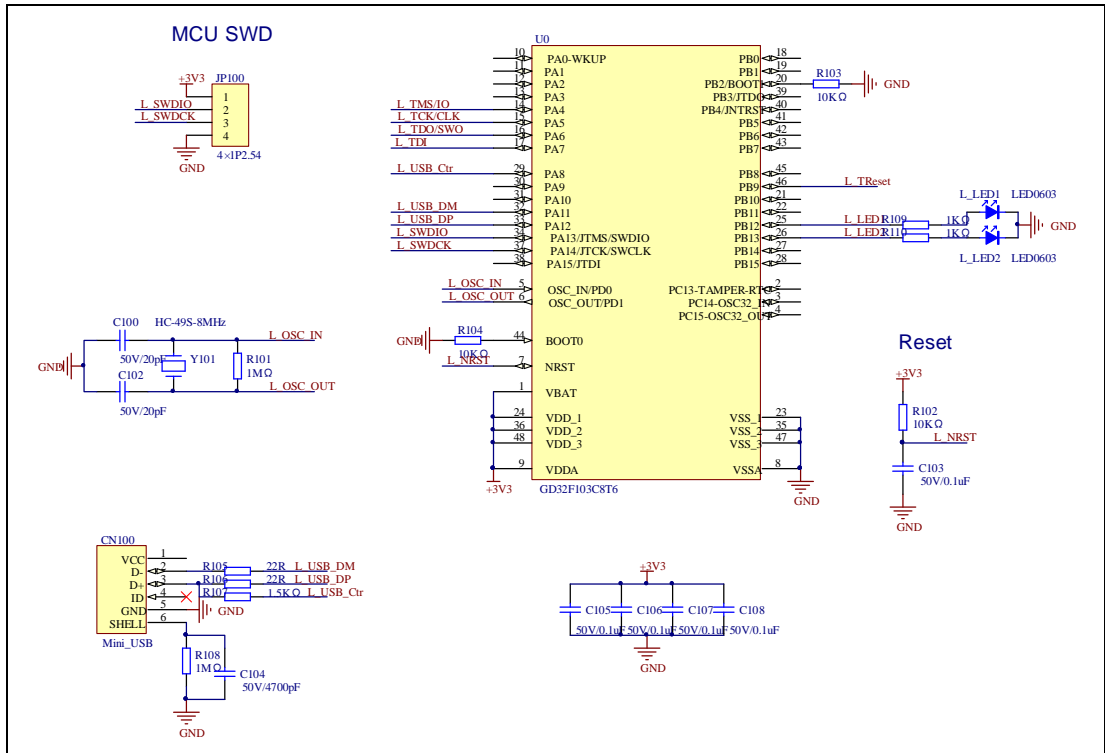
#### 4.5. USB

Figure 4-5 Schematic diagram of USB function



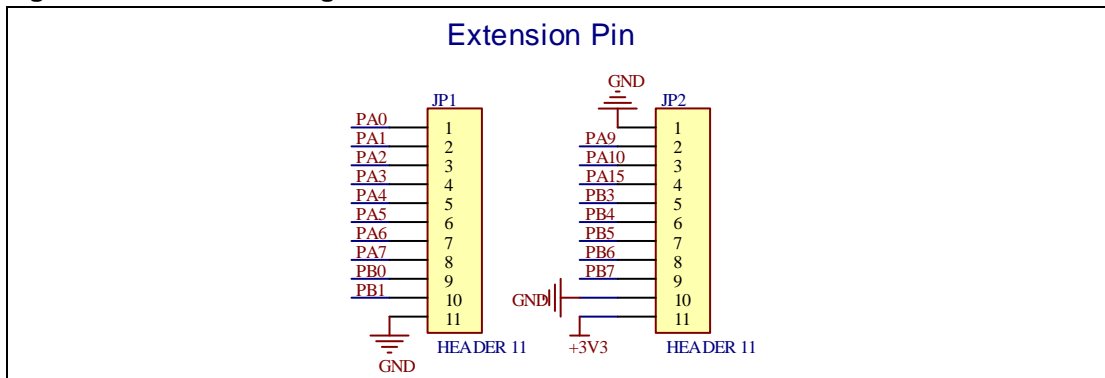
## 4.6. GD-Link

Figure 4-6 Schematic diagram of GD-Link function



## 4.7. Extension

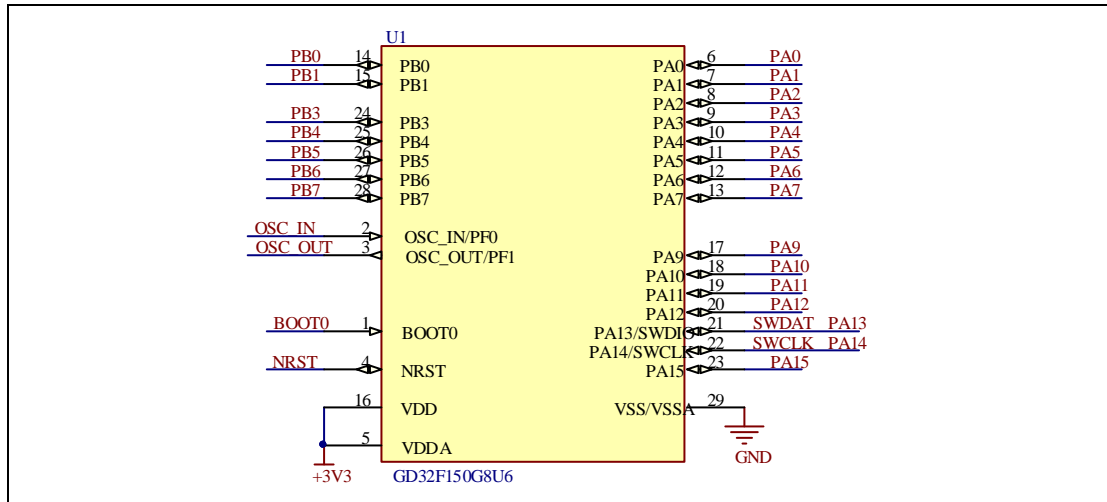
Figure 4-7 Schematic diagram of Extension Pin





## 4.8. MCU

Figure 4-8 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

GD32150G-START-V1.1 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 board, the state of LED1 is toggled every 500ms.

### 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

GD32150G-START-V1.1 board has two keys and one LED. The two keys are Reset key and User key. The LED1 is 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, 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.

## 5.3. 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

GD32150G-START-V1.1 board has two keys and one LED. The two keys are Reset key and User key. The LED1 is 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. USBD\_HID\_keyboard

### 5.4.1. DEMO purpose

This demo includes the following functions of GD32 MCU:

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

GD32150G-START-V1.1 board has two keys and LED1. The two keys are Reset key and User key. In this demo, the 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 one characters 'a'.



#### 5.4.2. DEMO running result

Download the program <04\_USBD\_HID\_Keyboard> to the START board and run. If you press the User key, will output 'a'.

## 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

## Important Notice

This document is the property of GigaDevice Semiconductor Inc. and its subsidiaries (the "Company"). This document, including any product of the Company described in this document (the "Product"), is owned by the Company under the intellectual property laws and treaties of the People's Republic of China and other jurisdictions worldwide. The Company reserves all rights under such laws and treaties and does not grant any license under its patents, copyrights, trademarks, or other intellectual property rights. The names and brands of third party referred thereto (if any) are the property of their respective owner and referred to for identification purposes only.

The Company makes no warranty of any kind, express or implied, with regard to this document or any Product, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The Company does not assume any liability arising out of the application or use of any Product described in this document. Any information provided in this document is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. Except for customized products which has been expressly identified in the applicable agreement, the Products are designed, developed, and/or manufactured for ordinary business, industrial, personal, and/or household applications only. The Products are not designed, intended, or authorized for use as components in systems designed or intended for the operation of weapons, weapons systems, nuclear installations, atomic energy control instruments, combustion control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, life-support devices or systems, other medical devices or systems (including resuscitation equipment and surgical implants), pollution control or hazardous substances management, or other uses where the failure of the device or Product could cause personal injury, death, property or environmental damage ("Unintended Uses"). Customers shall take any and all actions to ensure using and selling the Products in accordance with the applicable laws and regulations. The Company is not liable, in whole or in part, and customers shall and hereby do release the Company as well as it's suppliers and/or distributors from any claim, damage, or other liability arising from or related to all Unintended Uses of the Products. Customers shall indemnify and hold the Company as well as it's suppliers and/or distributors harmless from and against all claims, costs, damages, and other liabilities, including claims for personal injury or death, arising from or related to any Unintended Uses of the Products.

Information in this document is provided solely in connection with the Products. The Company reserves the right to make changes, corrections, modifications or improvements to this document and Products and services described herein at any time, without notice.