



DX-BT33-P

Development board

manual

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Updated records

Version	Date	Instructions	Author
V1.0	2025/07/22	Initial version	ZMW
V2.0	2025/09/23	Optimizing parameters	ZMW

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1. Development Board Introduction

1.1. Overview

DX-PJ30 is a Bluetooth development kit, which is independently developed and built by Shenzhen DX-SMART Technology Co., Ltd. for customers. It can be used with DX-BT33/DX-BT39 module. The module uses NRF52833 main control chip, which has high performance, low power consumption and rich peripheral interface.

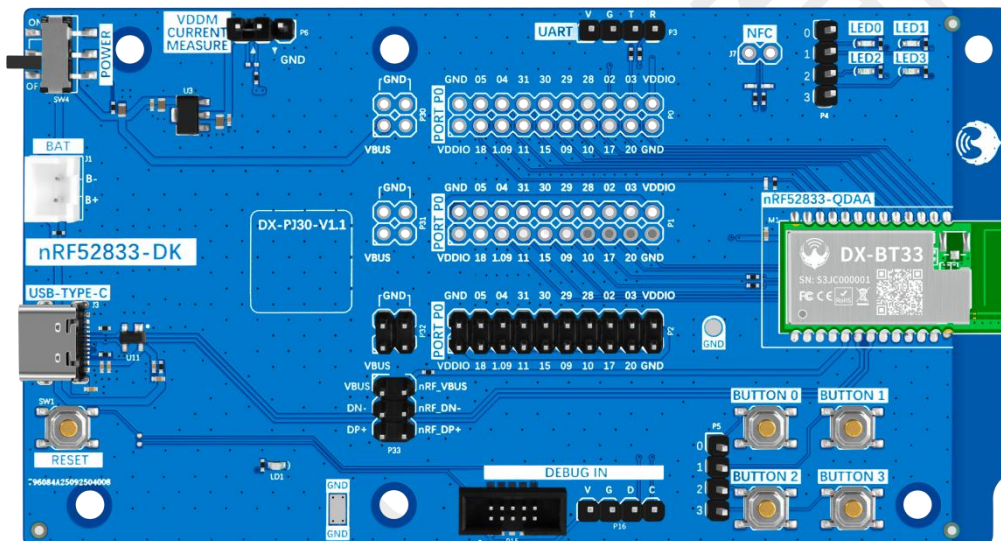


Figure 1: Development board (BT33)

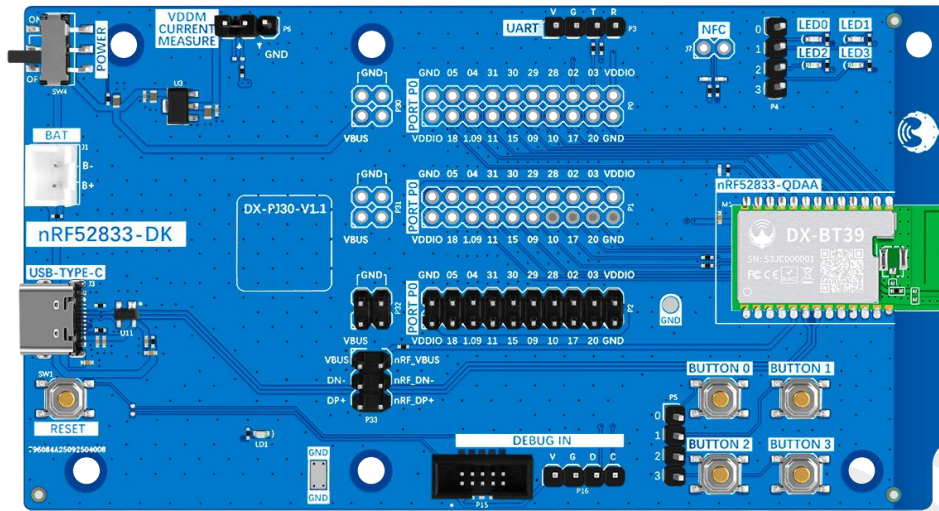


Figure 2: Development board (BT39)

1.2. Features

- Supports developed wireless communication protocols
 - Bluetooth 5.1
 - Bluetooth mesh
 - NFC
 - 802.15.4
 - Thread
 - 2.4GHz specific frequency
 - Zigbee
- 4-way user programmable LED
- 4 way user programmable keys
- USB port
- 1 way UART serial port
- SEGGER J-Link programmable debug
- Power consumption measurement interface

2. Proposed development environment

To facilitate the access to the sample code and free code validation, need to prepare the right tools, recommendations are as follows:

- PC: Windows10 is recommended
- MCU integrated development environment: keil5
- Burning method: SEGGER J-Link burner burning
- Debugging tools: Serial port assistant (log debugging information)

3. SDK file structure

名称	修改日期	类型	大小
components	2021/8/23 17:40	文件夹	
config	2021/8/21 19:01	文件夹	
documentation	2021/8/21 19:00	文件夹	
examples	2021/8/21 19:01	文件夹	
external	2021/8/21 19:01	文件夹	
external_tools	2021/8/21 18:32	文件夹	
integration	2021/8/21 18:32	文件夹	
modules	2021/8/21 18:32	文件夹	
license.txt	2021/8/21 18:32	文本文档	1 KB

Figure 3: SDK file

- Components: Nordic development of all kinds of the SDK, only include the header file, source files and library files
- Config: configuration files of different types of chips
- documentation: Reference documentation for the SDK and different SOTFDeviceapis
- Examples: according to the different transmission protocol/BLE role/peripherals application scenarios such as the design of routines
- external: third-party libraries or source code



- External_tools: third-party tools
- Integration: the integration of the old version of the SDK (SDK14 or less)
- modules: New SDK (>SDK14) drives nrfx and supports nRF5 SDK (for nRF51/52 chips) and nRF Connect SDK (for nRF91/53 chips)

4. Quick demo

4.1. Software features

- The development board burns sample programs by default, which can be used according to the following steps
 1. Power through the type-c interface, and then turn on the power switch
 2. Connect the UART interface, open the serial port assistant, select the corresponding COM port, set the baud rate 9600(use the serial port Assistant tool in the data package)
 3. Connect pin P0_11 with any LED interface of the development board
 4. Open the phone and search the Bluetooth name of BT33/BT39 through the Bluetooth APP of our company. After successful connection, data transmission can be carried out
- All the pins on BT33/BT39 have been led out to facilitate the development of other functions



5. Application interface

5.1. Functional block diagram

The block diagram shows the functional architecture of the DX-PJ30 development board

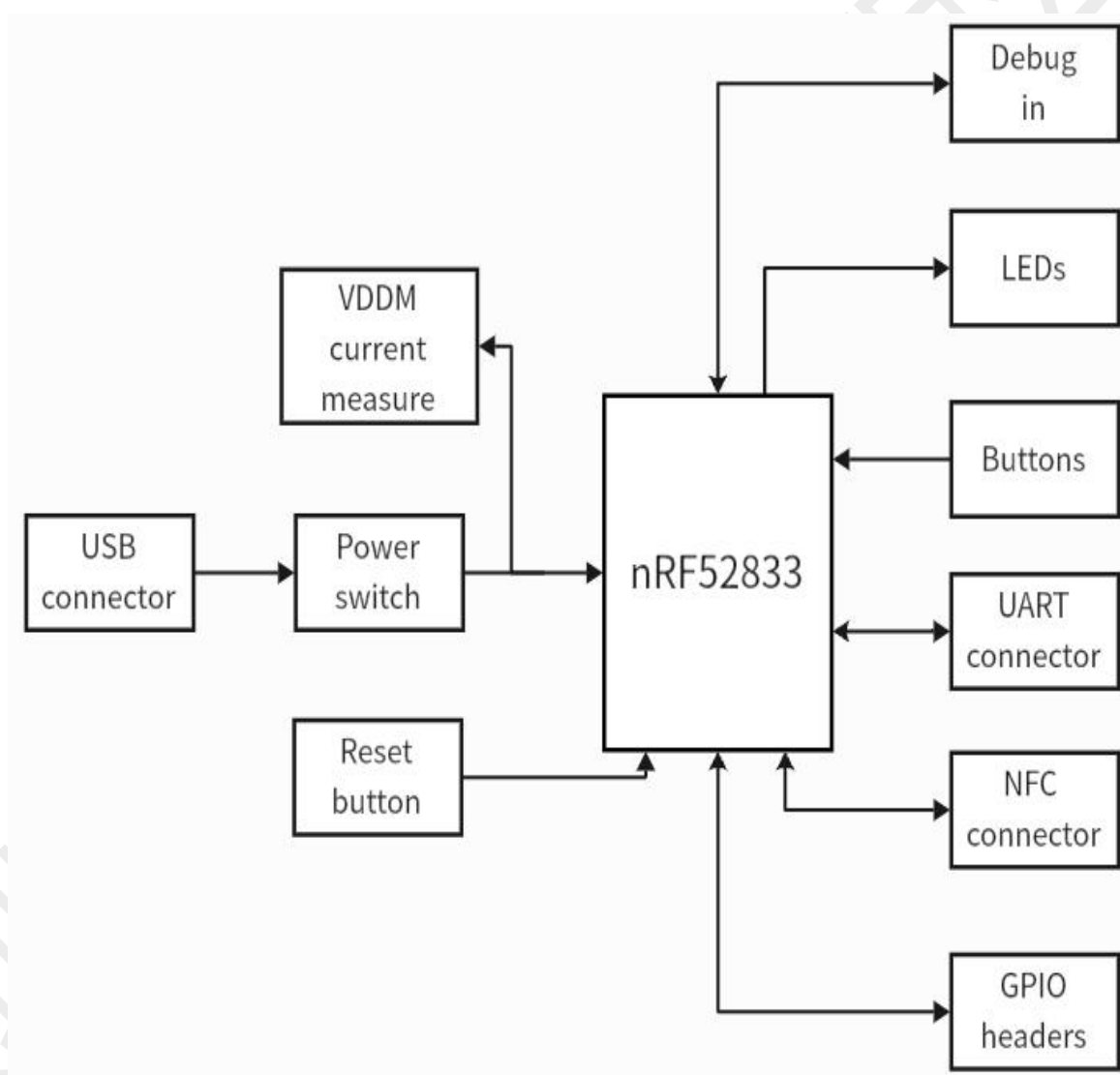


Figure 4: Functional block diagram



5.2. GPIO interface

The GPIO port of BT33/BT39 can be accessed through ports **P0,P1** and **P2**

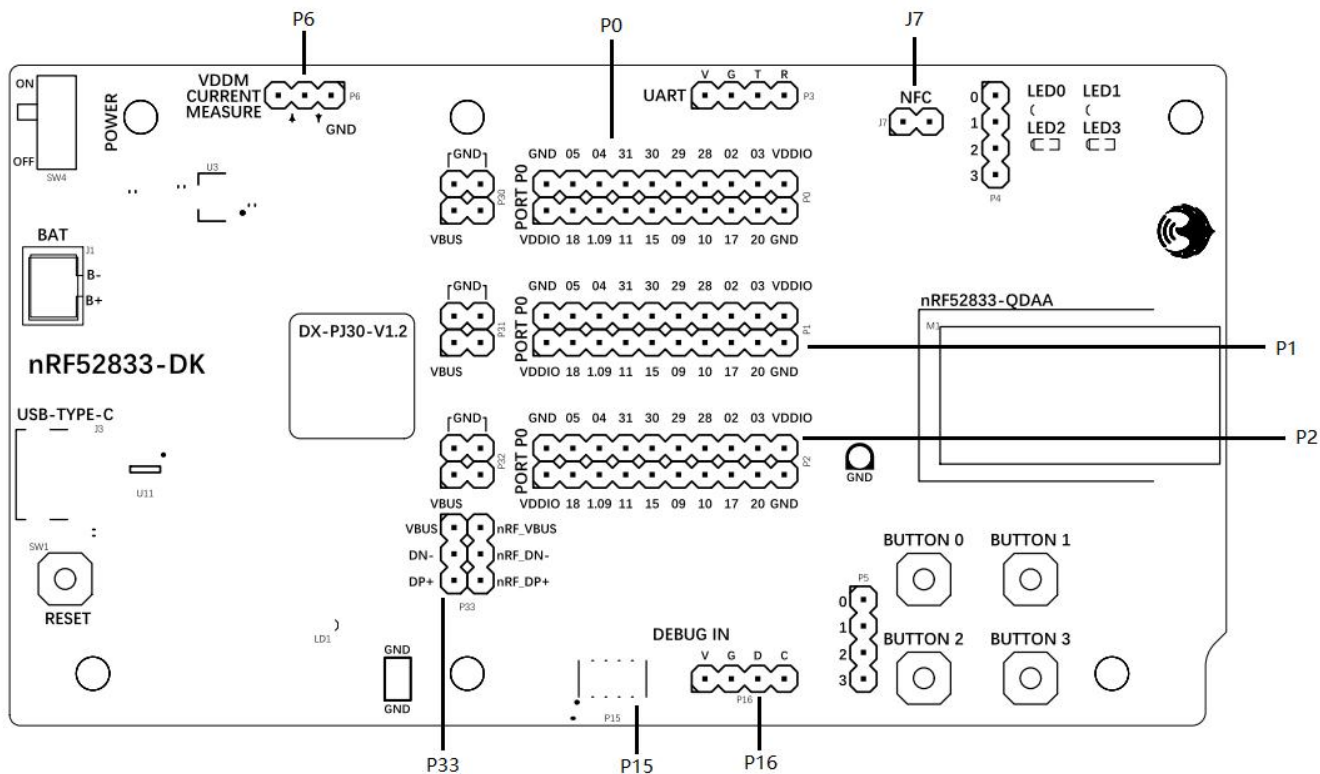


Figure 5: nRF52833-DK GPIO interface diagram

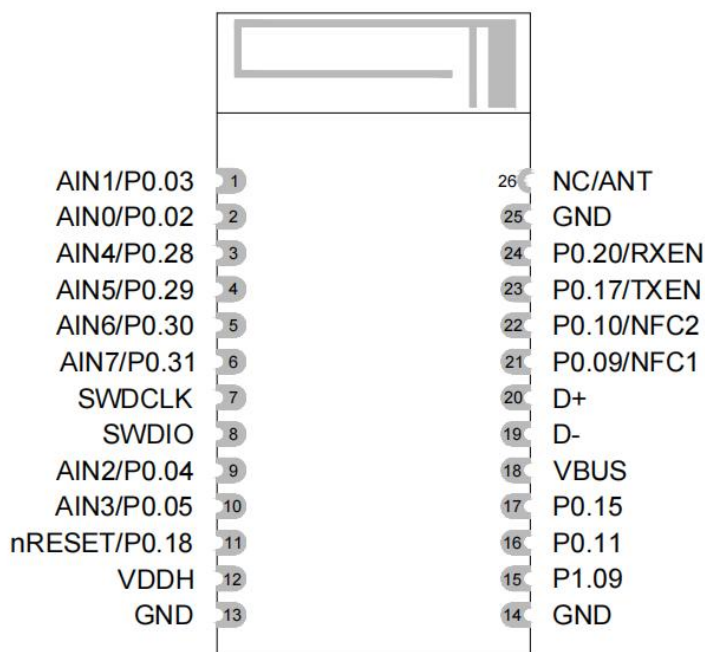


Figure 6: GPIO interface diagram of BT33/BT39 module

Table 1: GPIO port pin definition specification table

BT33 / BT39 module pin number	nRF52833 IO pin	Pin function	Instructions
1	P0.03	UART_TX, I/O	Programmable input/output foot, UART
2	P0.02	UART_RX, I/O	Programmable input/output foot, UART
3	P0.28	I/O	Programmable input/output feet
4	P0.29	I/O	Programmable input/output pins
5	P0.30	I/O	Programmable input/output feet
6	P0.31	I/O	Programmable input/output feet



9	P0.04	I/O	Programmable input/output feet
10	P0.05	I/O	Programmable input/output feet
11	P0.18	RESET	Reset feature by default
24	P0.20	PA_RXEN, I/O	Programmable input/output pins, integrated PA inside the module enhance the connection distance
23	P0.17	PA_TXEN, I/O	Programmable input/output feet, integrated PA inside the module can enhance the connection distance
22	P0.10	NFC, I/O	Programmable input/output foot, NFC foot
21	P0.09	NFC, I/O	Programmable input/output foot, NFC foot
17	P0.15	I/O	Programmable input/output feet
16	P0.11	I/O	Programmable input/output feet
15	P1.09	I/O	Programmable input/output feet

Note: PA function only exists in BT33 module, BT33 module P0_17 and P0_20 feet only as a function of PA, and need to make the corresponding feet, after open PA function, module transmission power is less than 4 DBM, otherwise the power will lead to damage of PA.

Table 2: PA control logic

Modes	PA_TXEN	PA_RXEN
Launch status	1	1 or 0
Receiving status	0	1
Off state	0	0

5.3. Power port

The main power supply area of the DX-PJ30 development board is shown below

- USB-Type-C interface: The default power supply mode, through 5V voltage input step down to 3.3V power supply to the BT33/BT39 module
- VDDM: the actual power consumption can be inserted into the current meter measurement in the experiment module, may also directly to 3.3 V power development board
- BAT: the lithium battery power supply, power supply range of 3.3 V ~ 5 V

5.4. Button and LED interface

DX - PJ30 development board on the four buttons and LED by corresponding interface connected with arbitrary GPIO, control.

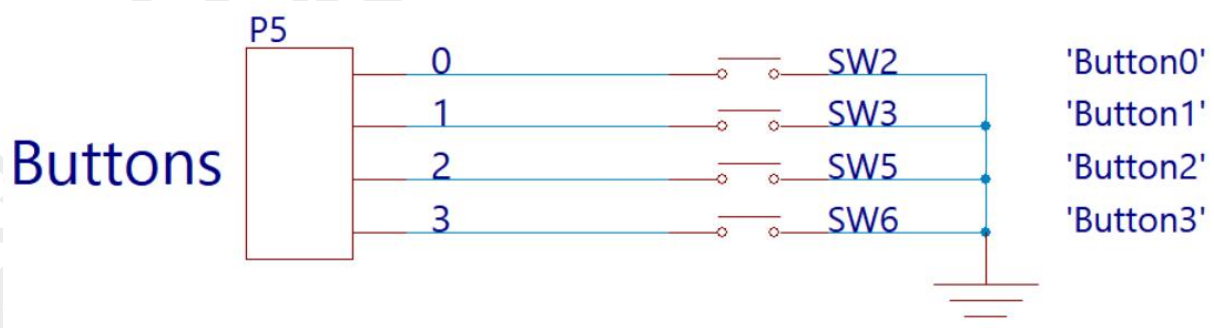


Figure 7: DX Buttons - PJ30 interface diagram

Buttons are low level activated, and when the button is pressed, the input is connected to ground. These buttons do not have external pull-up resistors. The corresponding IO port must be configured to have an input with an internal pull-up resistor in order to be able to record the button being pressed.

Leds are low level activated, and when a high level is output to the LED through any IO port, the leds are lit. Details see figure 7 DX - PJ30 LEDs interface diagram.

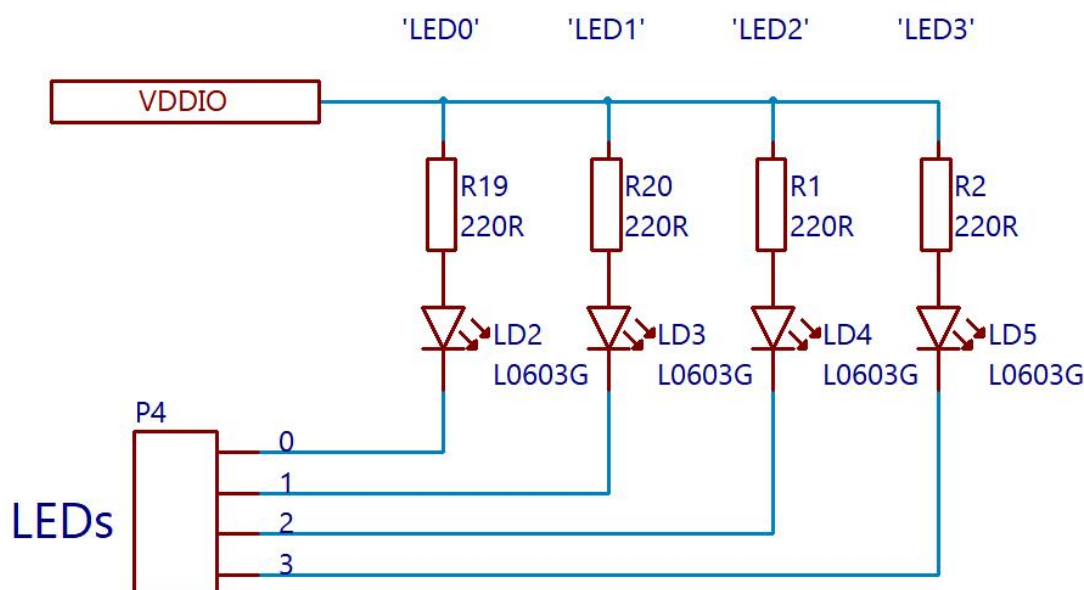


Figure 8: DX-PJ30 LEDs interface diagram

5.5. NFC antenna interface

DX-PJ30 supports NFC function, and **J7** on the DX-PJ30 development board is equipped with NFC antenna input interface by default, which can be used with NFC antenna.

5.6. USB-TYPE-C

You can use USB-related functions by burning the official related sample program, and the specific steps are as follows

1. Through the jumper cap or dupont line will P33 corresponding USB interface c



corresponding connection

2. Through the type - c interface for power supply, then open the power switch
3. Record the official sample program, you can directly use the USB function through the TYPE - C interface

5.7. Debug To debug or burn

DX - PJ30 development board available buffer SEGGER J - the Link is through the **P15** or **P16** interface to record or debug program modules.

5.8. VDDM current measurement

DX - PJ30 development board through **P6** interface monitoring BT33 or BT39 consumption current value. Can through the following is a measurement tool for current measurements

- Power Profiler Kit II (PPK2)
- The oscilloscope
- ammeter
- Power analyzer

6. Mechanical dimensions and layout recommendations

This section describes the mechanical dimensions of development board, all the size of the unit for mm; All dimensions not marked with tolerance, tolerance is ± 0.3 mm.

6.1. Develop board mechanical ruler

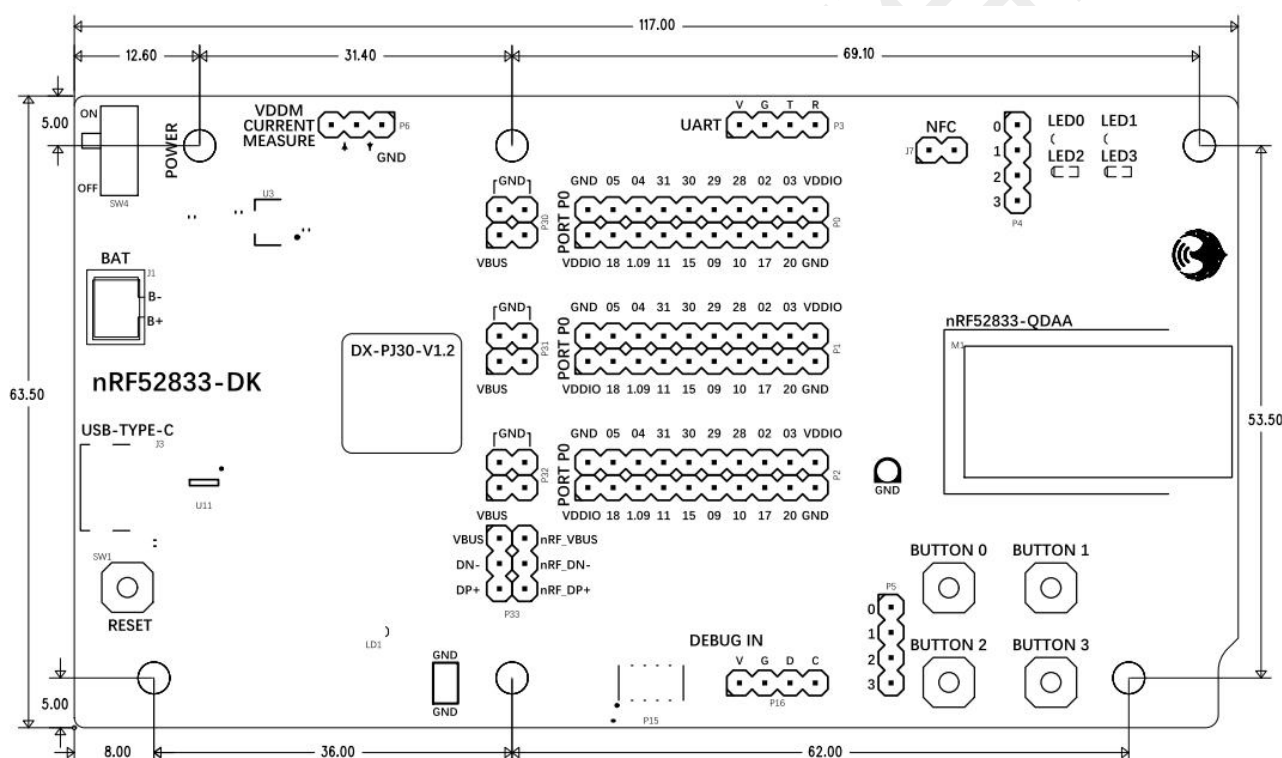


Figure 9: Development board size diagram

6.2. Development board top/bottom view

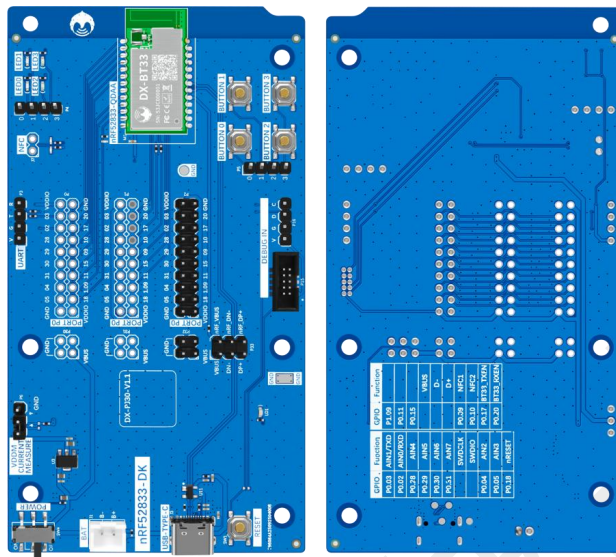


Figure 10: Top view and bottom view of development board (BT33)

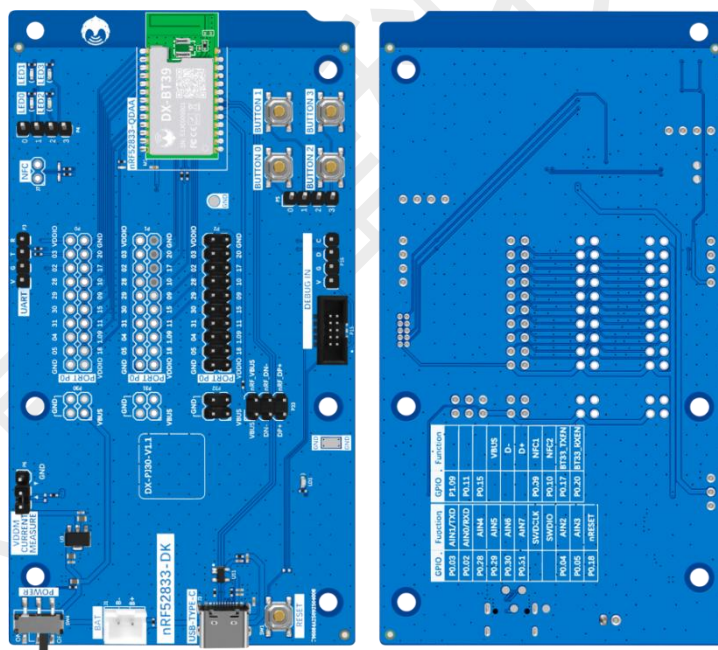


Figure 11: top view and bottom view development board (BT39)

note

The above picture is for reference only, please refer to the actual product appearance and label information.