N32WB031_STB Development Board Hardware User Guide

Introduction

This document aims to quickly familiarize users with N32WB031_STB development board, help them understand the functions, instructions and precautions of the development board, so as to engage in debugging and development based on the development board.

Contents

1．Description of Hardware Development

1．1 Introduction

N32WB031_ The STB development board is used for the development of the low-power Bluetooth chip N32WB031 of Nations Technologies Inc. This document describes in detail the functions, instructions and precautions of N32WB031 _STB development board.

1．2 Functions of Development Board

The development board is designed with N32WB031 chip and QFN32 package. The development board connects all functional interfaces to facilitate customers' development.
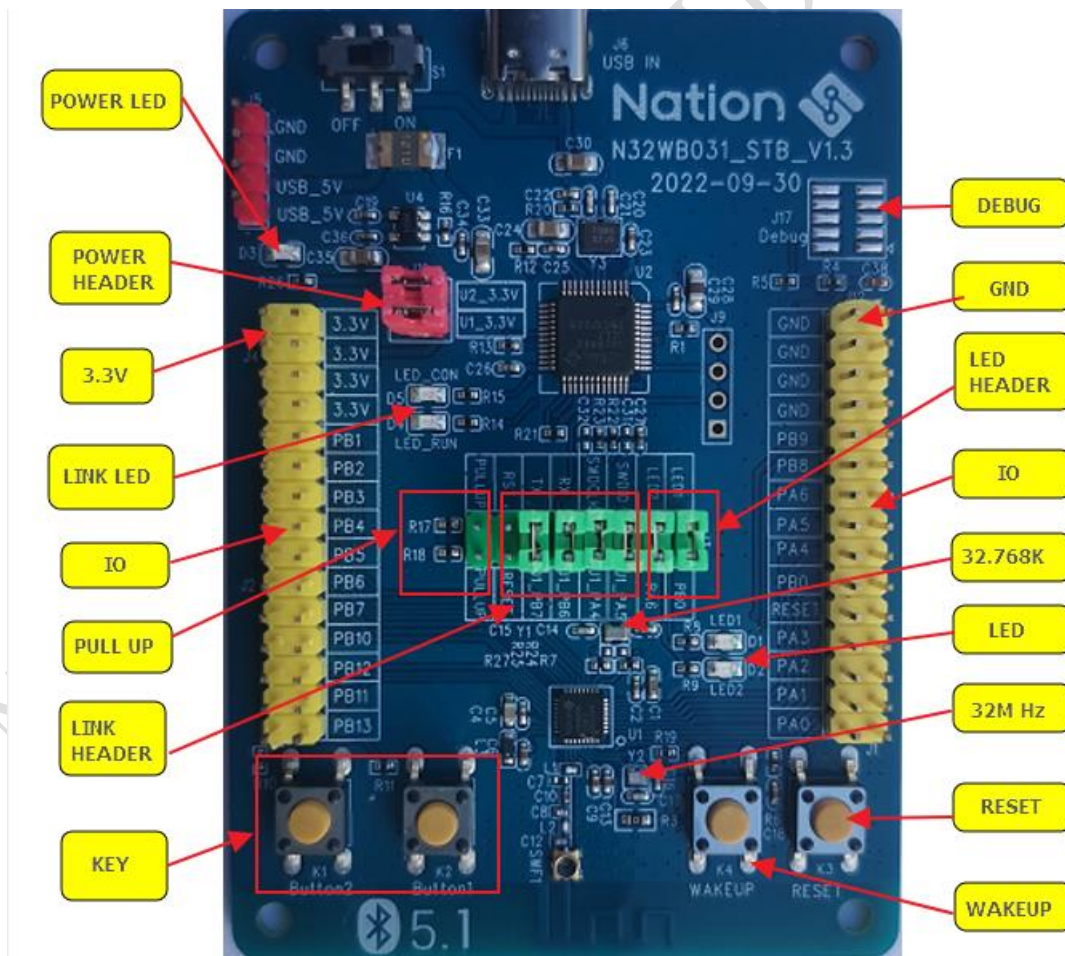
1．3 Layout of Development Board
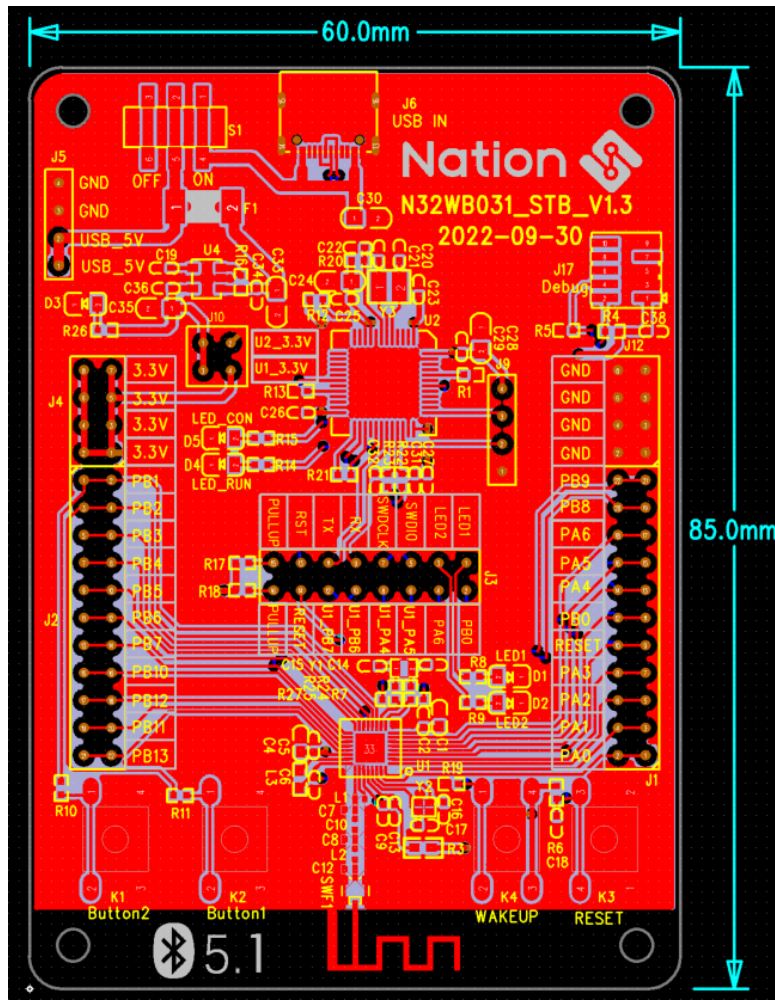
Fig.1-1 Layout of Development Board

Fig. 1-2 PCB screen printing of development board

1) Power supply for development board

The development board is powered through USB port.

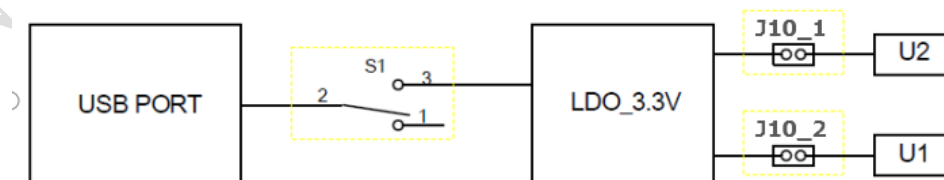The power system of the development board is shown in the figure below:

Fig. 1-3 Power system of development board

2) USB communication interface

TYPE-C USB port (J6) is used;

3) Wakeupkey (K4)

K4 is a wakeup key used to wake up the chip. Low level wakeup is used here.

4) General keys (K1, K2)

K1 and K2 are general keys that connect the pins PB1 and PB2 corresponding to the chip.

5) Reset key (K3)

K3 is a reset key for chip reset.

6) IO port (J1, J2)

All chip IO interfaces are led out. J4 VCC voltage pin and J12 GND pin are reserved beside the pins to facilitate testing. Refer to N32WB031 Data Manual for specific definitions of interfaces.

7) External antenna connector

There is an external antenna connector on the board. When the cable is not connected, the on-board RF circuit is connected to the on-board PCB antenna; after the external cable is connected, the on-board RF circuit and the on-board PCB antenna are automatically disconnected. The onboard antenna connector is Murata MM8130-2600, and user can use the Murata MXHS83QE3000 test probe to connect antenna connector .See the figure below.
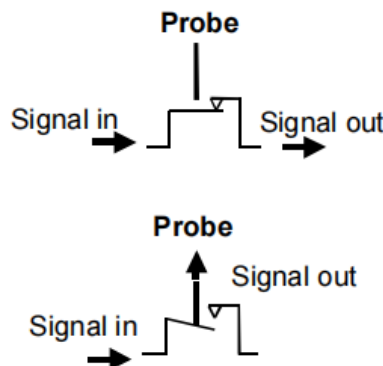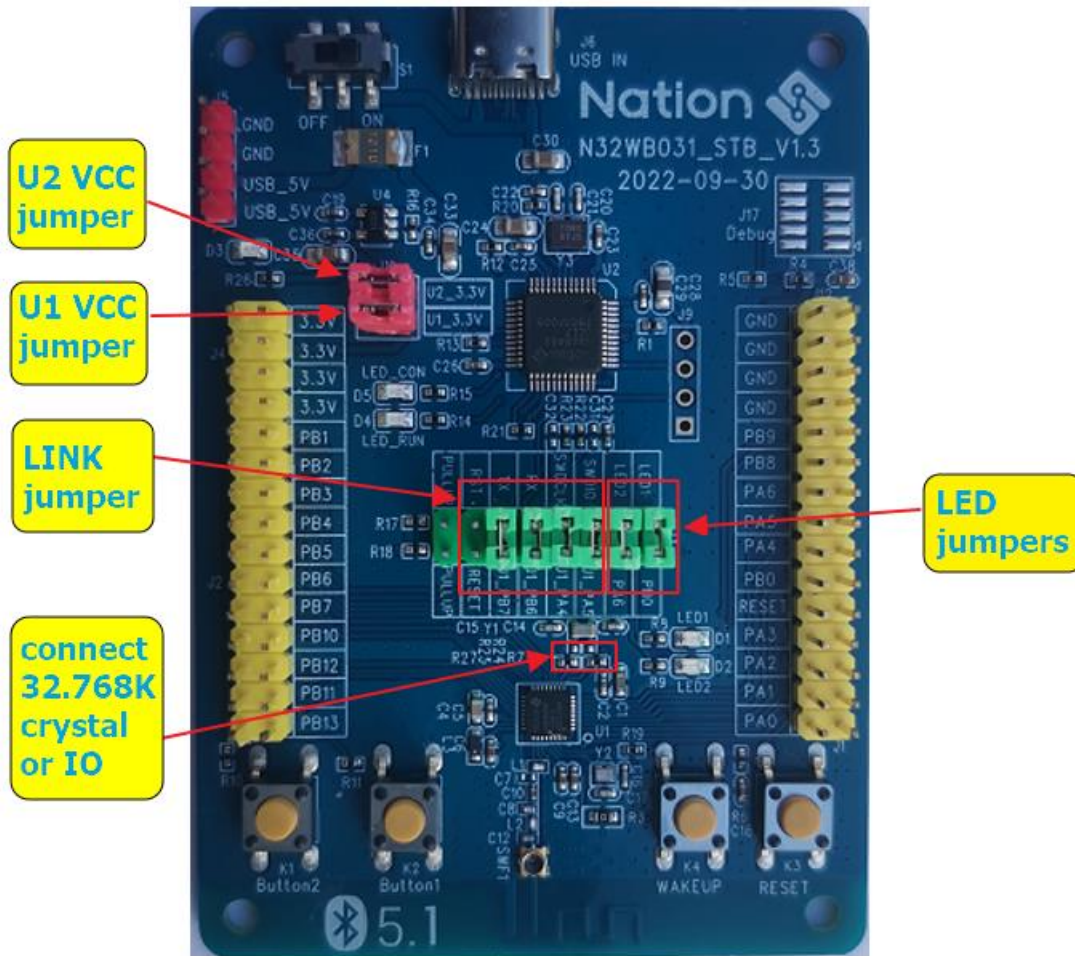
1. 4 Instructions for Development Board Jumper

Fig. 1-4 Layout of key jumper of development board

| S/N	Jumper bit number	Function of jumper	Instructions for use
1	J10	U1&U2 power supply jumper	Short circuit 3.3V output to U1&U2
2	J3	LINK selection jumper	Short circuit J3 SWDIO/SWCLK, and download the program to U1 through U2; Short circuit J3 RX/TX, and conduct serial port debugging through U2 Short circuit J3 RST and reset U1 through U2
3	/	32.768K/IO selection	For the specific connection method, see the diagram at the bottom of the development board(default:IO)
4	J3	LED1/LED2selection jumper	Short the "LED jumpers" position in the "Layout of key jumper of development board " diagram, connect PB0 to LED1, and connect PA6 to LED2

In addition, there are two pull-up resistors connected to J3, which can be used for IOs that require external pull-ups. For details, see the position of J3 PULLUP on the development board.

1.5 Schematic Diagram of Development Board

The schematic diagram of N32WB031_TB development board is presented as follows:

1) **Bluetooth chip connection**

- Figure 1-5 presents the schematic diagram of Bluetooth chip connection. All IOs are connected to pins J1 and J2 to facilitate debugging.

- The chip is externally connected with 32.768K and 32M crystal. 32.768KHZ crystal connection pins can be reused as general purpose IO, so the half-pad jumper mode is added to facilitate crystal connection. These two jumpers are connected to IO by default, and the half pad is soldered to the other side when crystal connection is required.
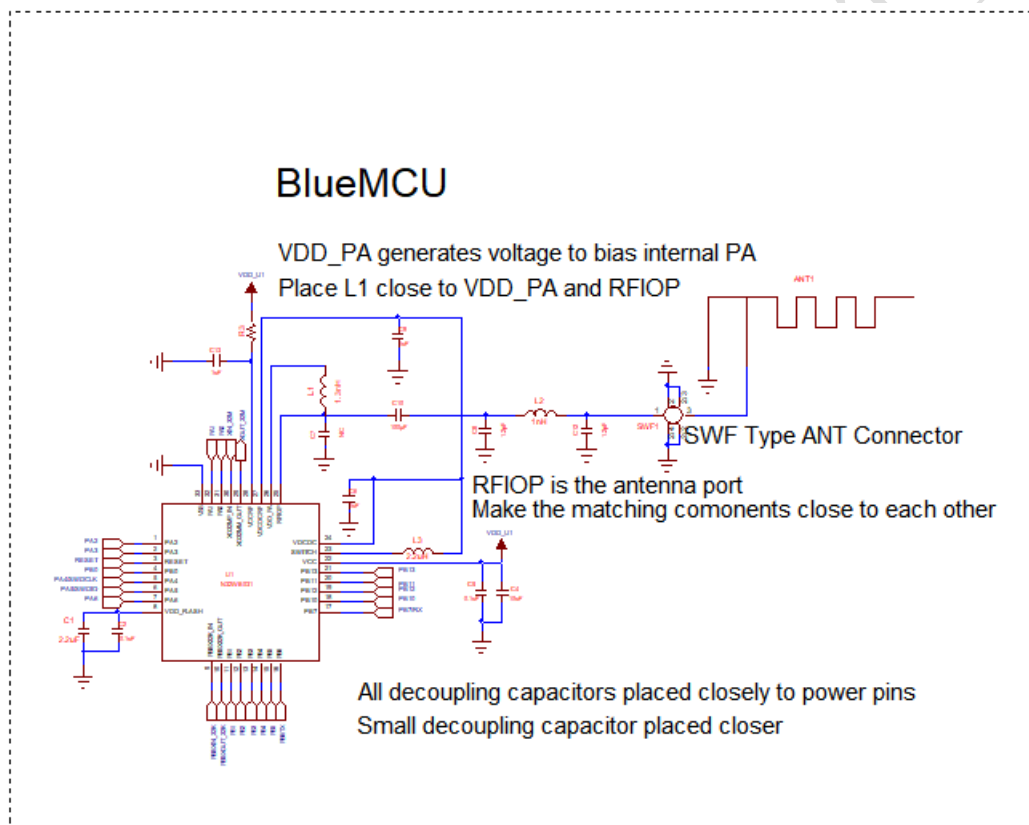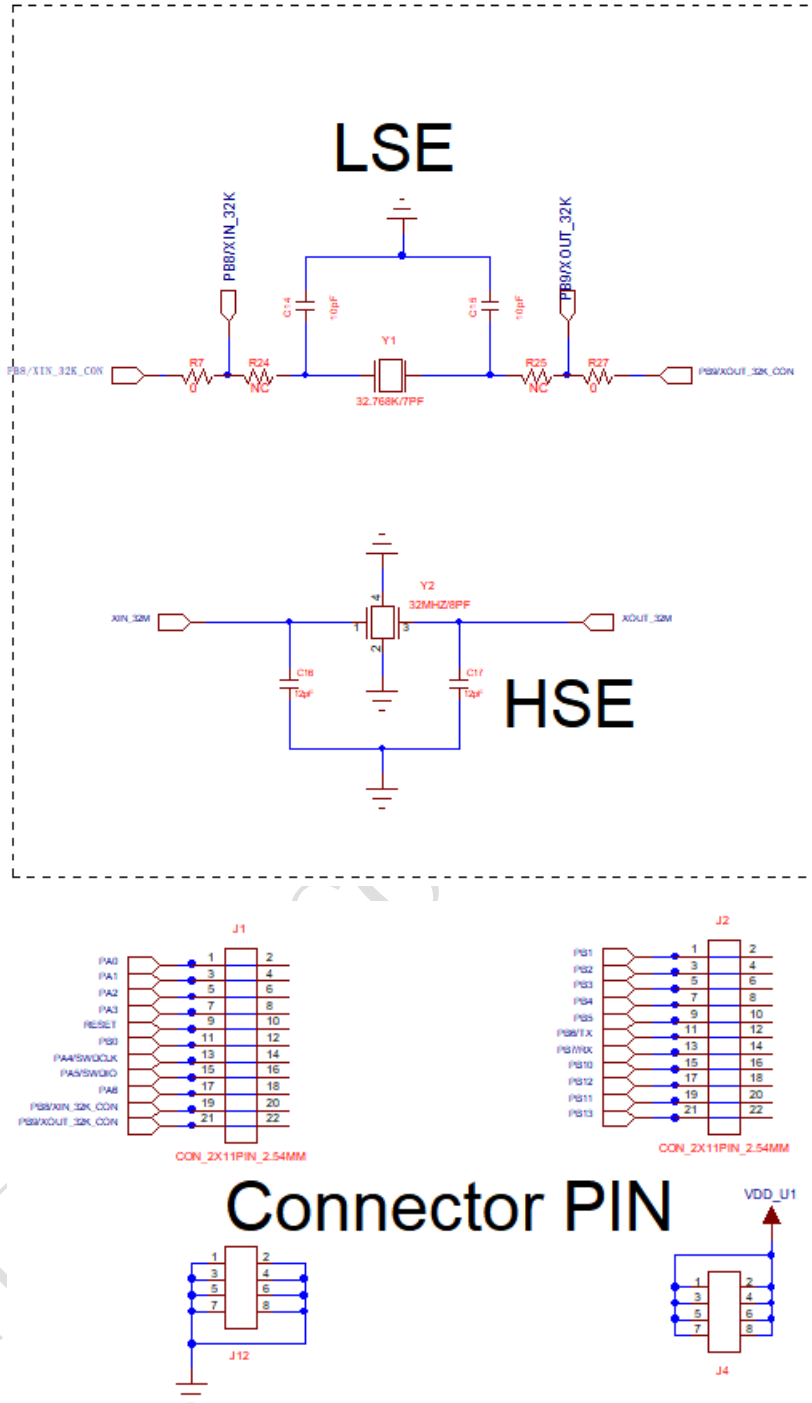
Fig. 1-5 Connection Diagram of Bluetooth Chip

2) Power supply design

Figure 1-6 presents the schematic diagram of power supply design. The whole board can input 5V through the USB interface of J6, and then convert it to 3.3V through LDO. Besides, it can also input the voltage to U1/U2 through jumper (J10).
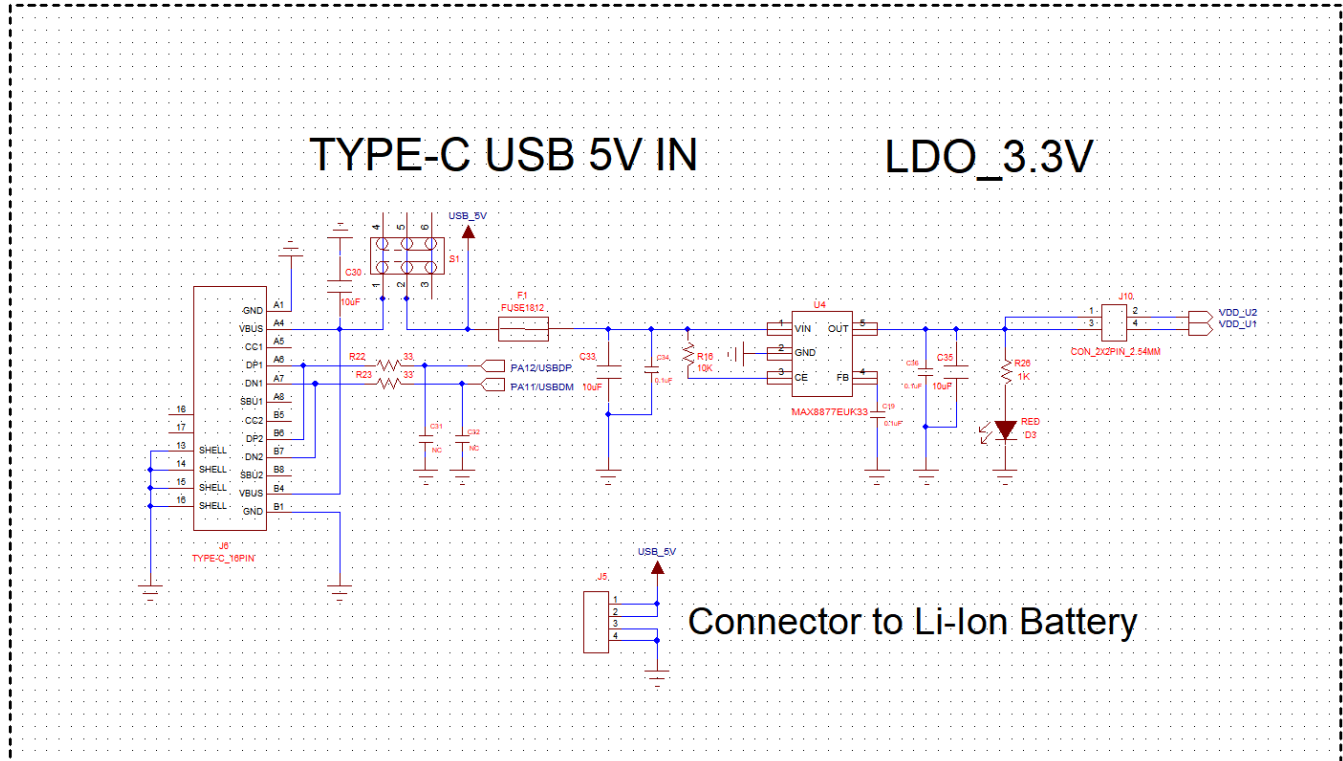

Fig. 1-6 Power Supply Design

3) Design of keys

Figure 1-7 presents the schematic diagram of key design. There are 4 keys in total, including 2 general keys, a reset key and a wakeup key.

Fig. 1-7 Design of Keys
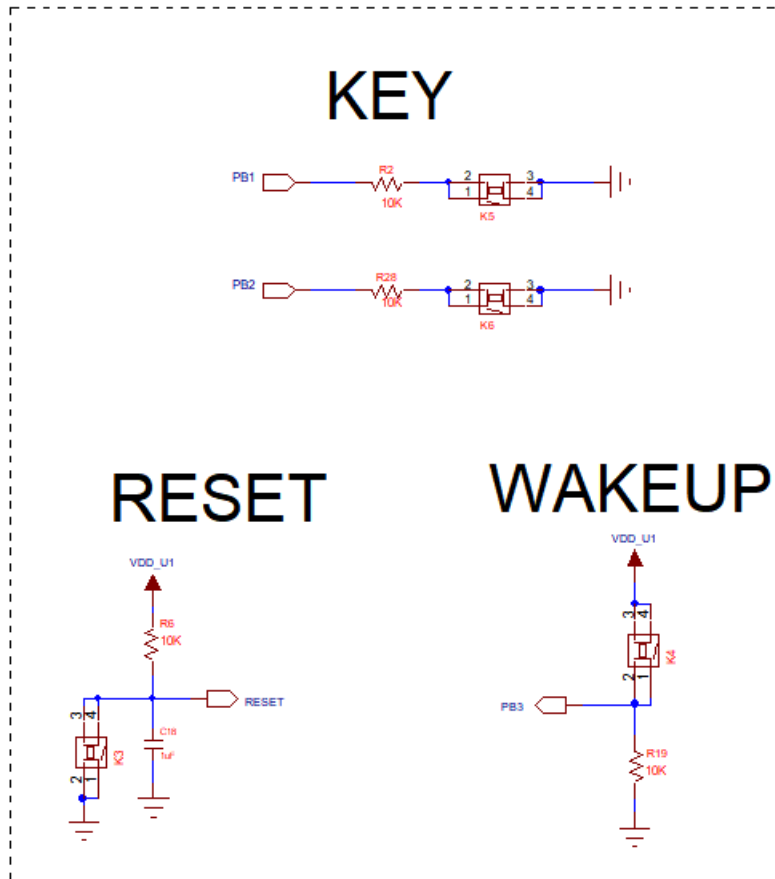
4) Design of LED

Figure 1-8 presents the schematic diagram of LED design, including five LED lamps in total. D1 and D2 are connected to PB0 and PA6 of N32WB031 through jumper J3, which can be used for debugging purpose; D4 and D5 serve as status display during NS-LINK debugging; D3 serves as the power status indicator, as shown in Figure 1-6 Power Supply Design.

Fig. 1-8 Design of LED
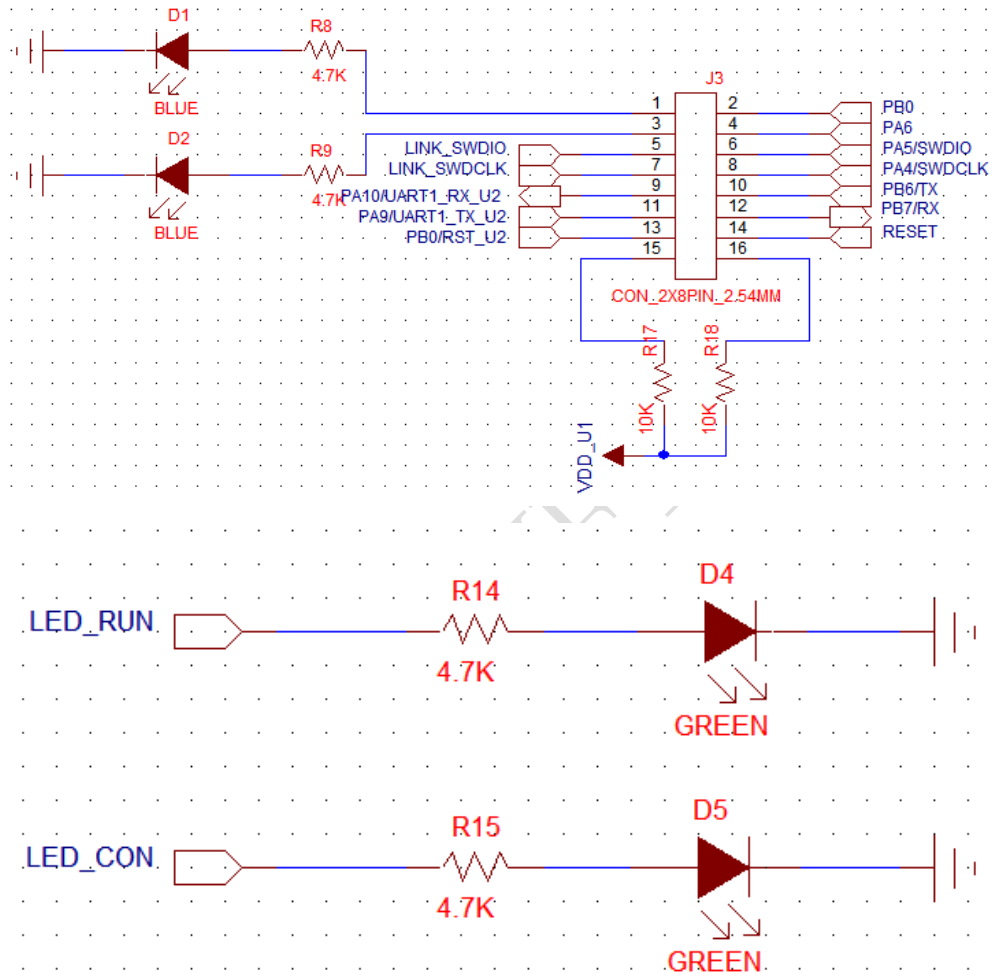
5) USB interface

Figure 1-9 presents the schematic design of USB interface. Users can debug USB through the J6 TYPE-C USB port.

Fig. 1-9 USB Interface

6) NS-LINK design

Figure 1-10 presents the schematic design of NS-LINK. Through the USB, users can directly download programs to U1, or debug serial ports, or send command to reset U1.

Fig. 1-10 Schematic design of NS-LINK
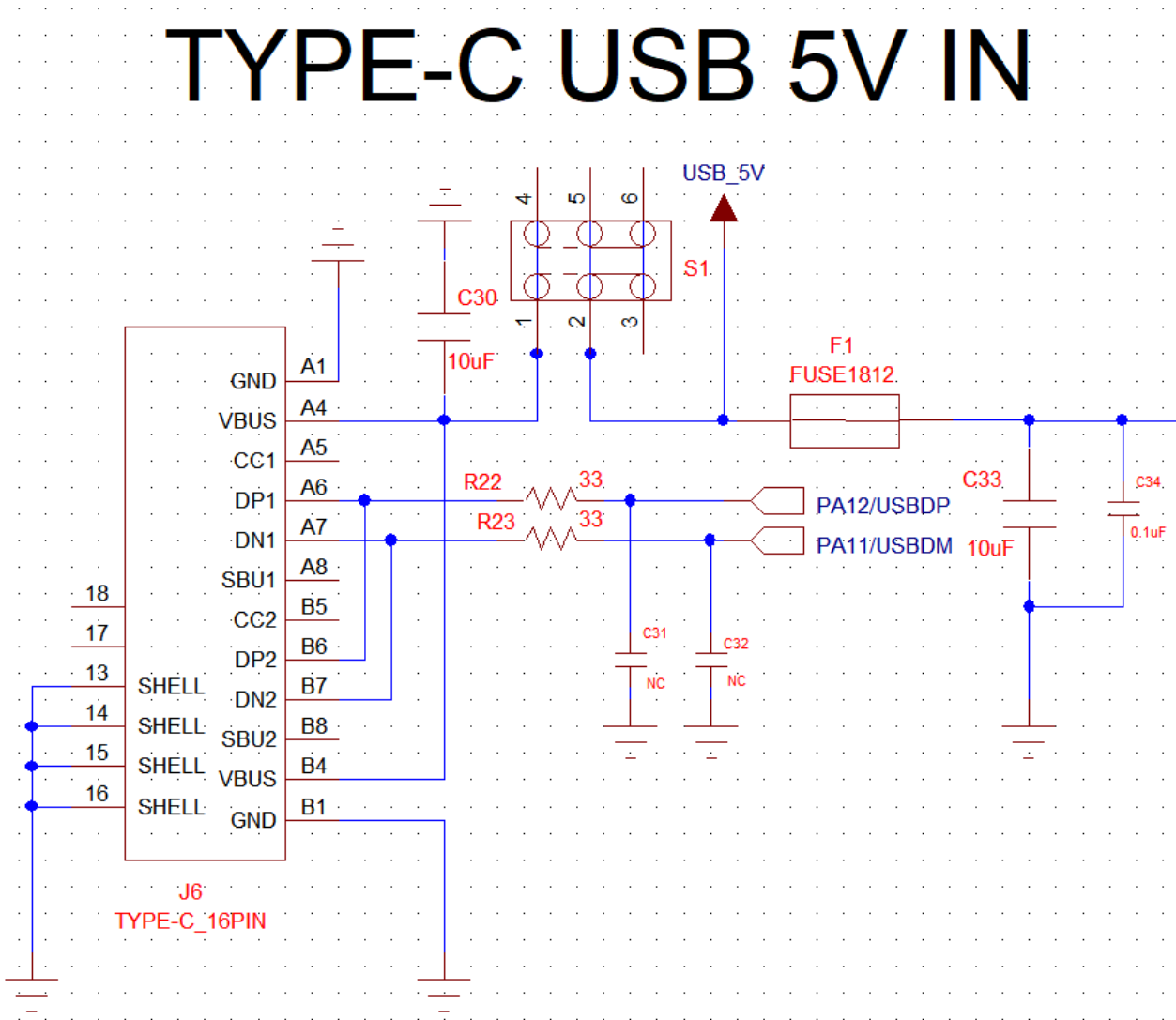
2. Version History

Date	Version	Modification	Author
2022/12/10	V1.2	Initial version	Joe Cai

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