

User Guide

N32H497ZGL7_STB Development Board Hardware User Guide

Introduction

The purpose of this document is to enable users to quickly familiarize themselves with the N32H497ZGL7_STB development board, understand its functions, usage instructions, and precautions, so as to carry out MCU debugging and development based on the development board.

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1 Hardware Development Instructions

1.1 Brief

The N32H497ZGL7_STB development board is used for sample development of the 32-bit N32H497ZGL7 chip from National Technology Corporation. This document details the functions, usage instructions, and precautions of the N32H497ZGL7_STB development board.

1.2 Development board functions

The main MCU chip on the development board is model N32H497ZGL7, with an LQFP144 pin package. The development board connects all the functional interfaces to facilitate customer development.

1.3 Development board layout

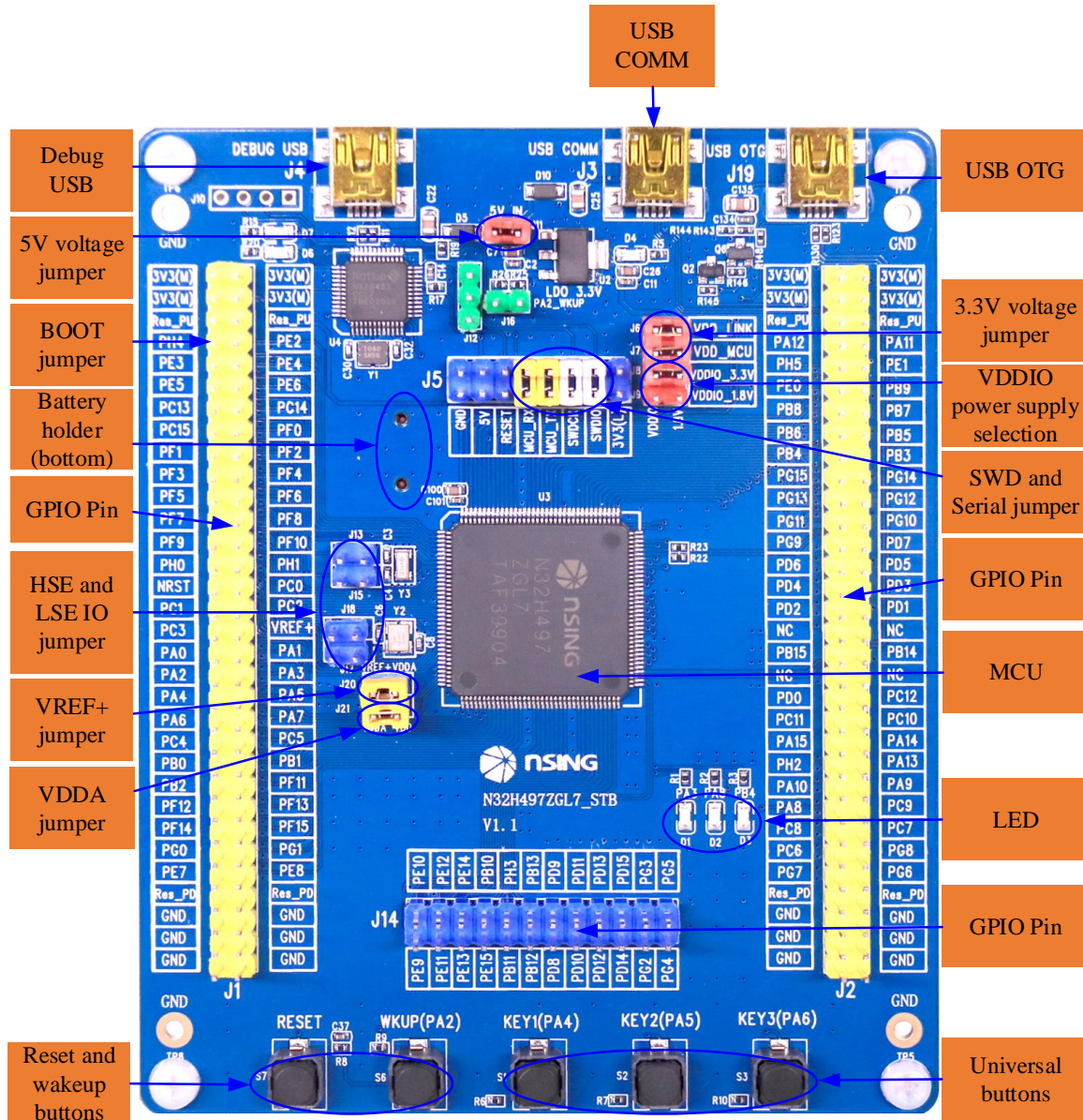


Figure 1-1 Development board layout

1) Power supply for the development board

The development board can be powered via a USB COM port (J3) or a DEBUG USB port (J4), connected to the 3.3V LDO input via jumper J11. VDD_LINK and VDD_MCU can be powered via a 3.3V jumper, while the VDDIO pin can be powered via either a 3.3V or 1.8V jumper.

2) USB COMM interface (J3)

is used to connect the DP and DM signals of the main MCU (U1) for USB interface communication with the main MCU.

3) Debug USB (J4)

The DEBUG USB interface of the NS-LINK chip (U4) can provide the function of downloading and debugging the main MCU program, and can also be connected to the MCU's serial port to provide USB to serial port function.

4) USB OTG (J19)

The development board has an onboard USB OTG interface (J19), which enables upgrades and debugging between master and slave devices.

5) SWD interface and serial port (J5)

SWD interface: SWDIO and SWDCK, used for downloading and debugging the main MCU program. ULINK2 or JLINK can be used to download and debug the MCU, or jumper caps can be used to short the SWDIO and SWDCK signal pins to download and debug the MCU via DEBUG USB.

Serial ports: MCU_TX and MCU_RX are used as external serial signals. PA9 (TX) and PA10 (RX) of the MCU are used as serial ports. They can be used to connect serial devices independently, or the MCU_TX signal pin and MCU_RX signal pin can be shorted with jumpers to convert the USB port to a serial port through NS-LINK on the development board for the convenience of customers.

6) Reset and wake-up buttons (S7, S6)

S7 and S6 are the reset button and wake-up button, respectively, connected to the NRST pin and PA2 pin of the chip, and used for chip reset and wake-up functions.

7) General buttons (S1, S2, S3)

S1, S2, and S3 are general-purpose buttons, which are connected to the PA4, PA5, and PA6 pins of the chip, respectively.

8) LED lights

D1, D2, and D3 are LEDs, which are connected to the PA3, PA8, and PB4 pins of the chip, respectively.

9) BOOT (J1 PIN7)

The J1 PIN7 PH4 pin is the BOOT0 connector, which can be shorted to power and ground as needed using a jumper cap.

10) GPIO ports (J1, J2, J14)

of the chip are brought out, and 3.3V and GND pins are reserved on the connectors for easy testing. For detailed interface definitions, please refer to the "UM_N32H49X Series User Manual".

1.4 Development Board Jumper Instructions

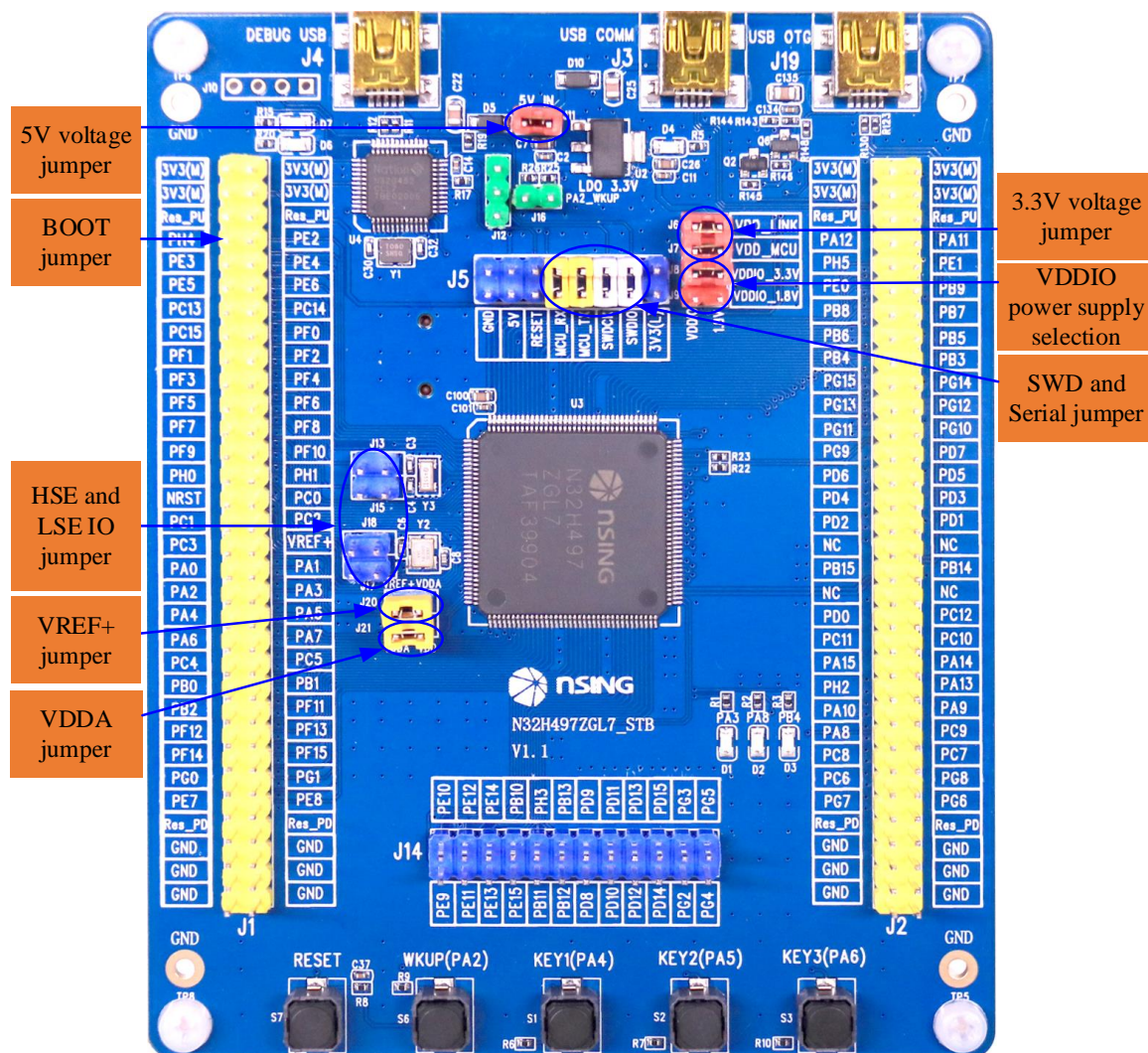


Figure 1-2 Jumper Instructions

surface 1-1 Development Board Jumper Specifications

No.	jumper position	Jumper function	Instructions for use
1	J11	5V input voltage jumper	The J11 jumper is used to connect the J3 and J4 USB ports to supply power to the LDO 3.3V input port.
2	J6, J7	3.3V power supply jumper	J6: Provides 3.3V power to the NS-LINK module . J7 : Provides 3.3V power to the main MCU chip.
3	J8、 J9	VDDIO power supply selection	J8: VDDIO is selected to be powered by 3.3V. J9: VDDIO is selected to be powered by 1.8V.
4	J5	SWD jumper	To download a program to the MCU via the USB DEBUG port using NS-LINK, you need to short the SWDIO and SWDCK signal pins.
	J5	Serial jumper	When using NS-LINK as a serial port via the USB DEBUG port, it is necessary to short the MCU_TX signal pin and the MCU_RX signal pin.
5	J1 PIN7	BOOT jumper	J1 PIN7: BOOT0.
6	J16	PA2 WAKEUP jumper	J16: Shorting this jumper will wake up the MCU via PA2 when the USB interface is plugged in (set PA2 to the WKUP signal).
7	J21	VDDA jumper	J21: Short this jumper, and VDDA will be directly connected to VDD for power supply.
8	J20	VREF+ jumper	J20: Shorting this jumper will cause VREF+ to use an external VDD as the reference source.
9	J13, J115	LSE pin connected to J1 IO jumper	J13, J15: Shorting this jumper connects the PC14 and PC15 pins of LSE to the PIN14 and PIN15 pins of J1 for external debugging.
10	J17, J18	HSE pin connected to J1 IO jumper	J17, J18: Shorting this jumper connects the PH0 and PH1 pins of HSE to the PIN27 and PIN28 pins of J1 for external debugging.

1.5 Development board schematic

The schematic diagram of the N32H497ZGL7_STB development board is described below (see "N32H497ZGL7_STB_V1.1" for details):

1) MCU connection

Referring to Figure 1-3, which shows the MCU connection schematic, each VDD pin of the MCU is connected to a capacitor, and all GPIOs are led out and connected to the J1, J2 and J14 pins for easy debugging.

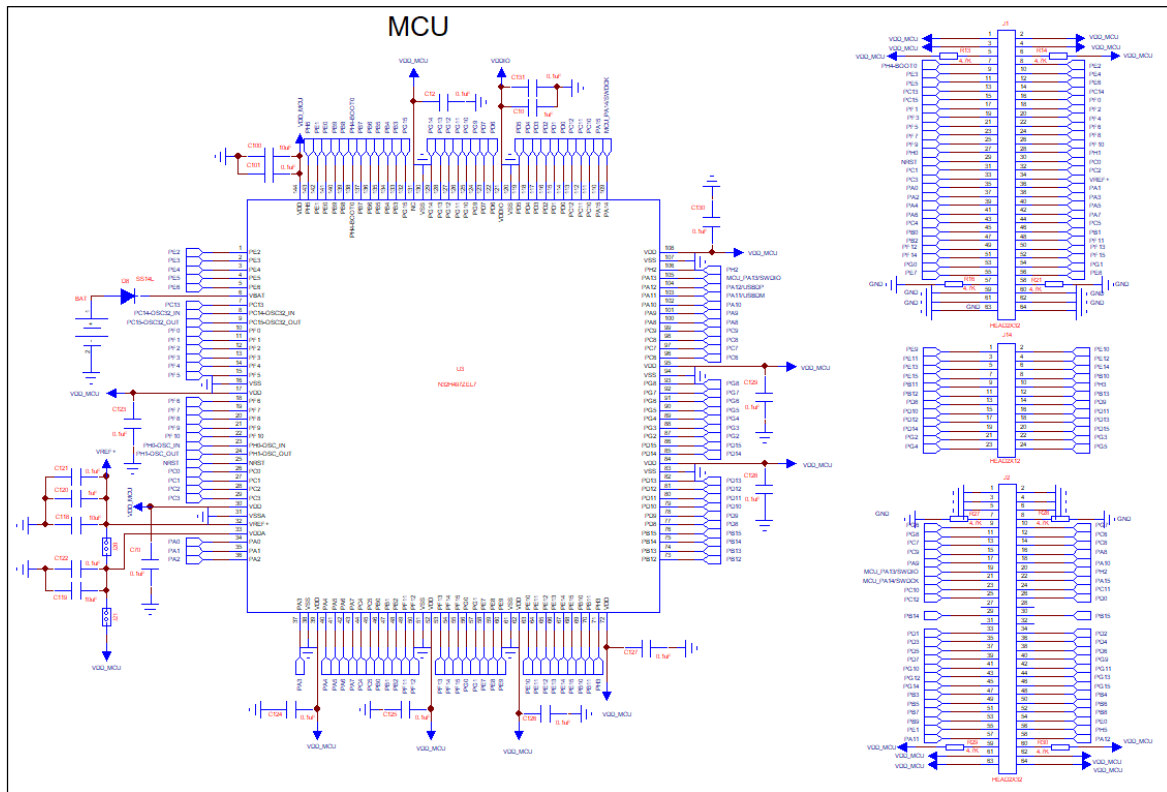


Figure 1-3 MCU connection diagram

2) Power supply design

Referring to Figure 1-4, which shows the power supply design schematic, the PCB is powered by 5V via USB (J3/J4), and then by 3.3V output via LDO to power the entire PCB. VDDIO can be powered by either 3.3V or 1.8V via a jumper.

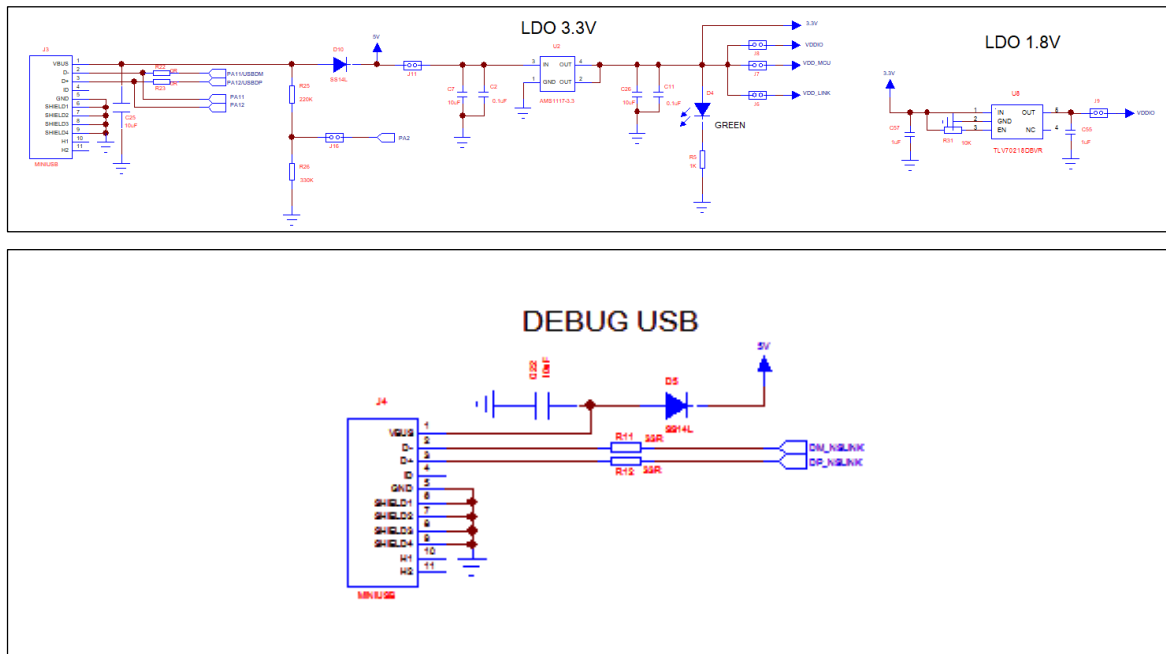


Figure 1-4 Power supply design

3) Button Design

Referring to Figure 1-5, which shows the button design schematic, there are a total of 5 buttons: 3 general buttons, an MCU wake-up button, and a reset button.

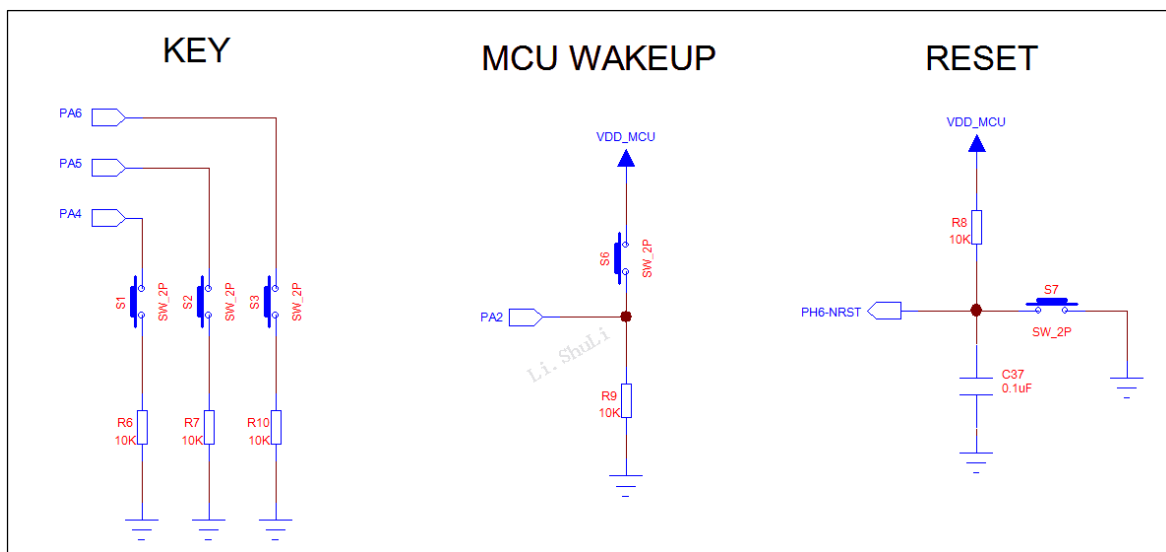


Figure 1-5 Button Design

4) LED lighting design

Referring to Figure 1-6, which shows the LED light design schematic, there are a total of 5 LEDs. D1,

D2, and D3 are connected to PA3, PA8, and PB4 of the main MCU, respectively, and can be used for debugging. D6 and D7 are used for NS-LINK MCU control to monitor the NS-LINK's operating status.

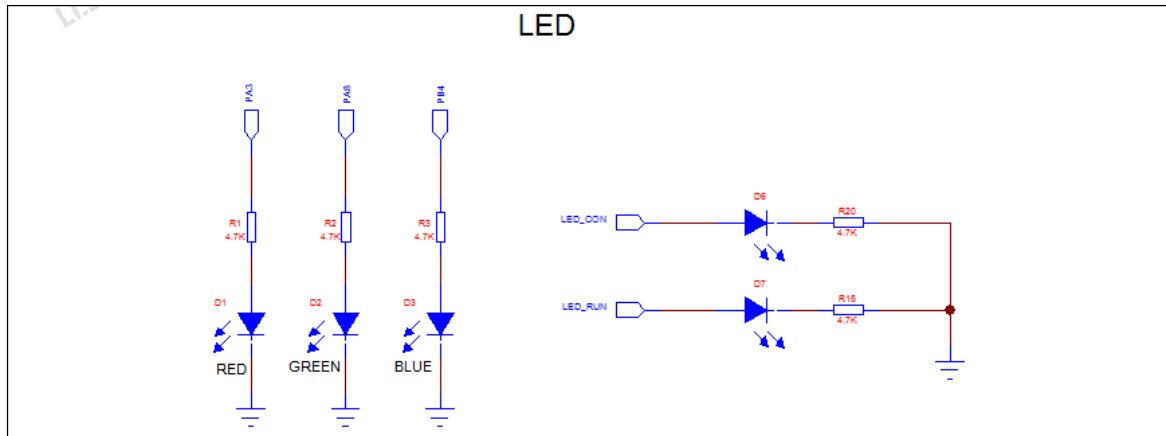


Figure 1-6 LED lighting design

5) crystal

Referring to Figure 1-7, which shows the crystal connection diagram, the chip has two external crystals, one at 32.768 kHz and the other at 16 MHz.

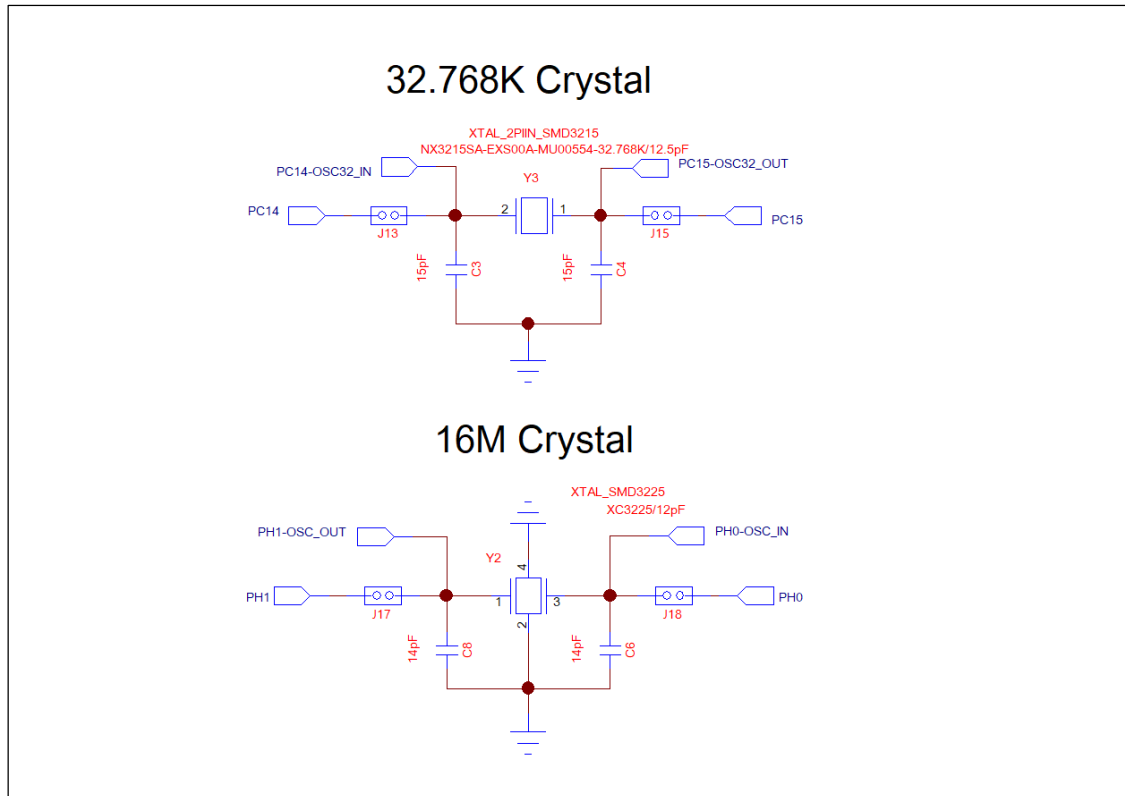


Figure 1-7 Crystal Design

6) BAT

Referring to Figure 1-8, which shows the schematic diagram of the external BAT battery, the CR1220 battery can be connected to the external battery holder on the PCB board to supply power to the VBAT pin.

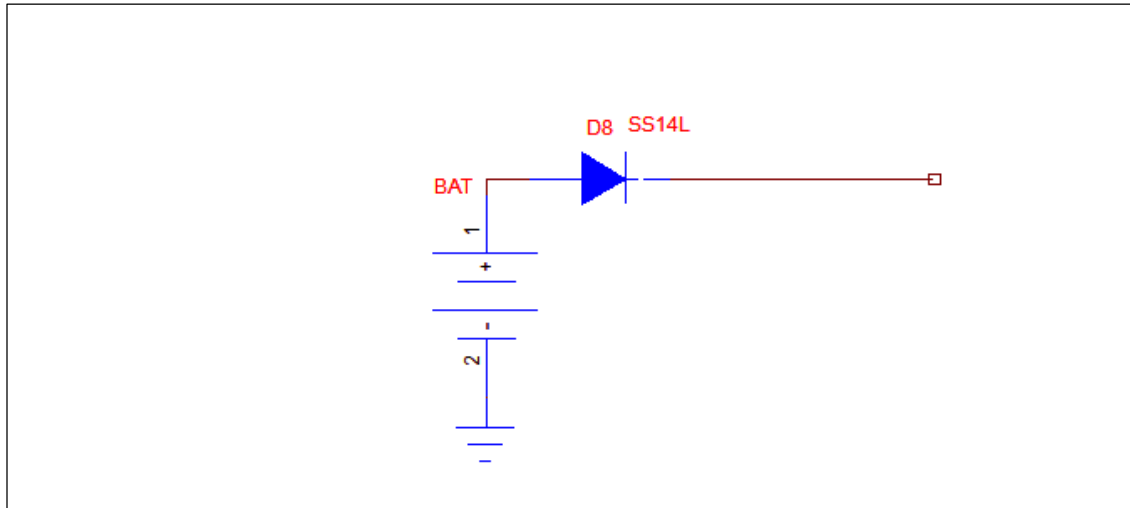


Figure 1-8 BAT

7) NS-LINK

Referring to Figure 1-9, which shows the NS-LINK schematic, users can directly connect a USB cable via the DEBUG USB port to download programs, eliminating the need for a ULINK or JLINK programmer. Debugging can also be performed via the DEBUG USB port, which simulates a serial port.

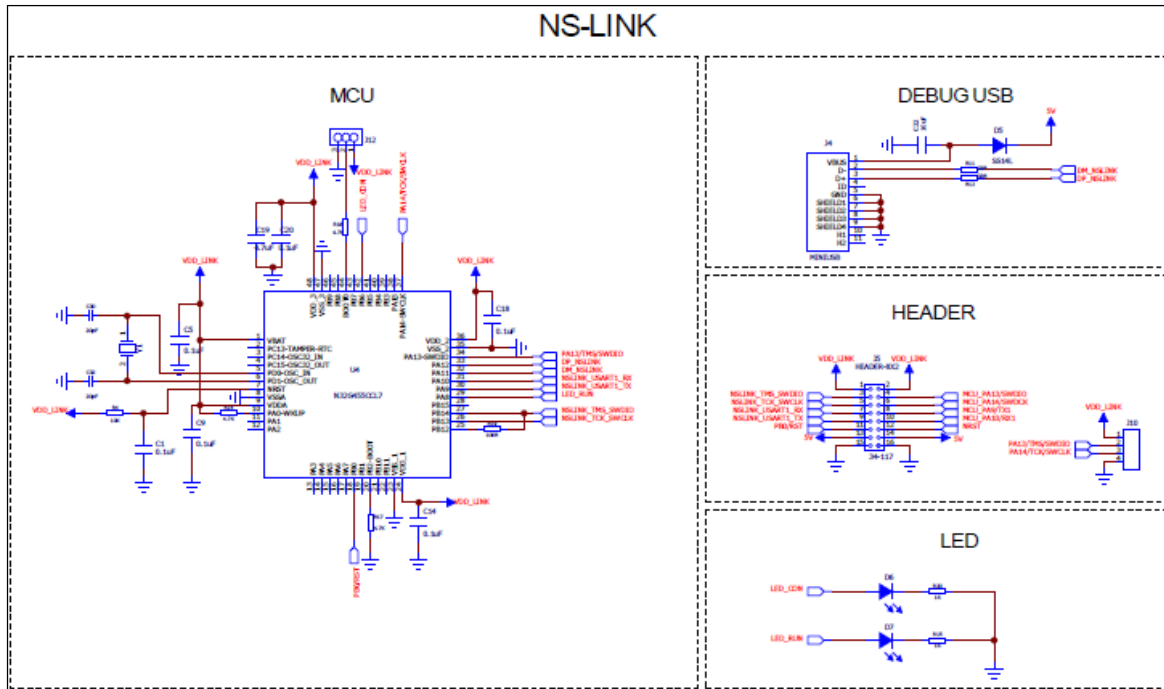


Figure 1-9 NS-LINK

● MCU peripheral device description:

- 1) When designing the PCB layout, place two capacitors, 10uF and 0.1uF, near VDD (PIN144), and place a 0.1uF capacitor near the other VDD pins.
- 2) It is recommended to place a 0.1uF and a 10uF capacitor on the VDDA input pin.
- 3) When VREF+ uses the built-in reference source VREFBUF, it is recommended to place a 0.1uF and a 1uF capacitor near the VREF+ pin. When VREF+ is externally powered, it is recommended to place a 0.1uF and a 10uF capacitor near the VREF+ pin.
- 4) PC14-OSC32_IN, PC15-OSC32_OUT: When an external high-precision RTC clock is required, a 32.768KHz crystal needs to be connected close to the pin. If there is no need, it can be omitted.

2 Historical versions

Version	date	Remark
V1.1	2025-10-28	Create document

3 statement

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