

User Guide

N32G030KxL7-STB Development Board Hardware User Guide

Introduction

The purpose of this document is to allow users to quickly familiarize themselves with N32G030K8L7-STB and N32G030K6L7-STB development board, understand the functions, instructions and precautions of the development board, so as to conduct MCU debugging and development based on the development board.

The use of N32G030K8L7-STB and N32G030K6L7-STB is the same, this article takes N32G030K8L7-STB as an example

CONTENS

1	HARDWARE DEVELOPMENT INSTRUCTIONS.....	1
1.1	<i>Briefly</i>	<i>1</i>
1.2	<i>Development board function.....</i>	<i>1</i>
1.3	<i>Development board layout.....</i>	<i>2</i>
1.4	<i>Development Board Jumper Instructions</i>	<i>4</i>
1.5	<i>Development board schematic.....</i>	<i>5</i>
2	VERSION HISTORY	10
3	NOTICE.....	11

1 Hardware Development Instructions

1.1 Briefly

The N32G030K8L7-STB development board is used for sample development of 32-bit N32G030K8L7series chips of Nations Technology Co., Ltd. This document describes the functions, usage instructions and precautions of the N32G030K8L7-STB development board in detail.

1.2 Development board function

The main MCU chip of the development board is N32G030K8L7, and it is packaged with LQFP32 pins. The development board connects all functional interfaces to facilitate customer development.

1.3 Development board layout

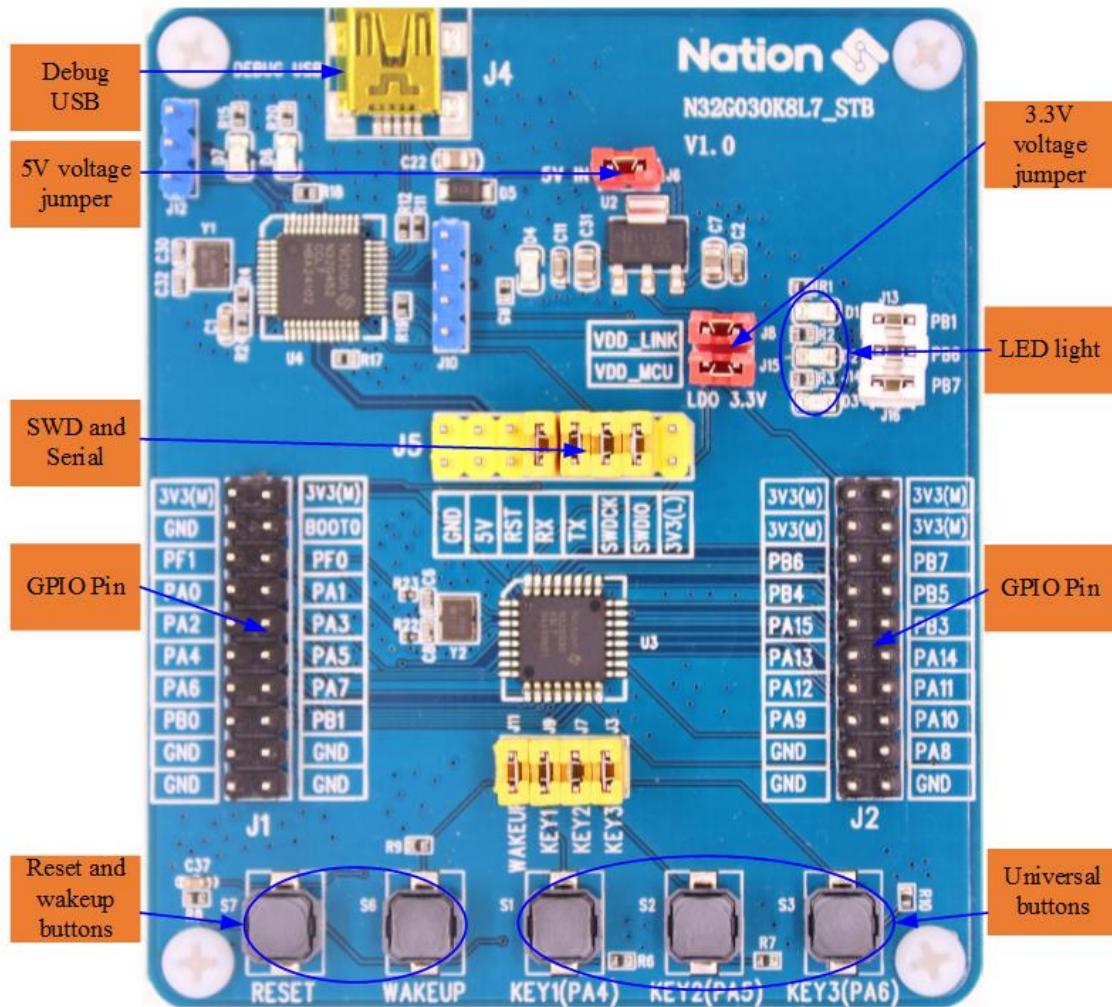


Figure 1-1 Development board layout

1) Power supply for the development board

The development board can be powered by DEBUG USB (J4), and connected to 3.3V LDO input port through J6 jumper.

2) Debug USB (J4)

Through the DEBUG USB interface of NS-LINK chip (U4), it can provide MCU program download debugging function, or connect the serial port of MCU to provide USB serial port function.

3) SWD interface and Serial port (J5)

SWD interface: SWDIO and SWDCK, used to download and debug the main MCU program, you can use ULINK2 or JLINK to download and debug the MCU, or you can short the SWDIO signal pin and the SWDCK signal pin with the jumper cap, and download the MCU through DEBUG USB debugging.

Serial port: MCU_TX and MCU_RX, used as serial port external signal, MCU's PA9 (TX) and PA10 (RX) are used as serial port, which can be connected to serial port devices separately, or the jumper cap can short the MCU_TX signal pin and the MCU_RX signal pin, Through the NS-LINK on the development board, the USB port is converted into a serial port, which is convenient for customers to use.

4) Reset and Wake Buttons (S7, S6)

S7 and S6 are the reset button and wake-up button respectively, Connect the chip's NRST pin and PA0-WKUP pin respectively for chip reset and wake-up functions.

5) Universal keys (S1, S2, S3)

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

6) BOOT (J1 PIN4)

J1 PIN4 is BOOT0 pin, which can be shorted to power and ground through jumper caps as needed.

7) GPIO (J1, J2)

The GPIO interface of the chip is all led out, and the 3.3V voltage and GND pins are also reserved on the pins, which is convenient for testing. For the specific definition of the interface, please refer to "DS_N32G030 Series Datasheet".

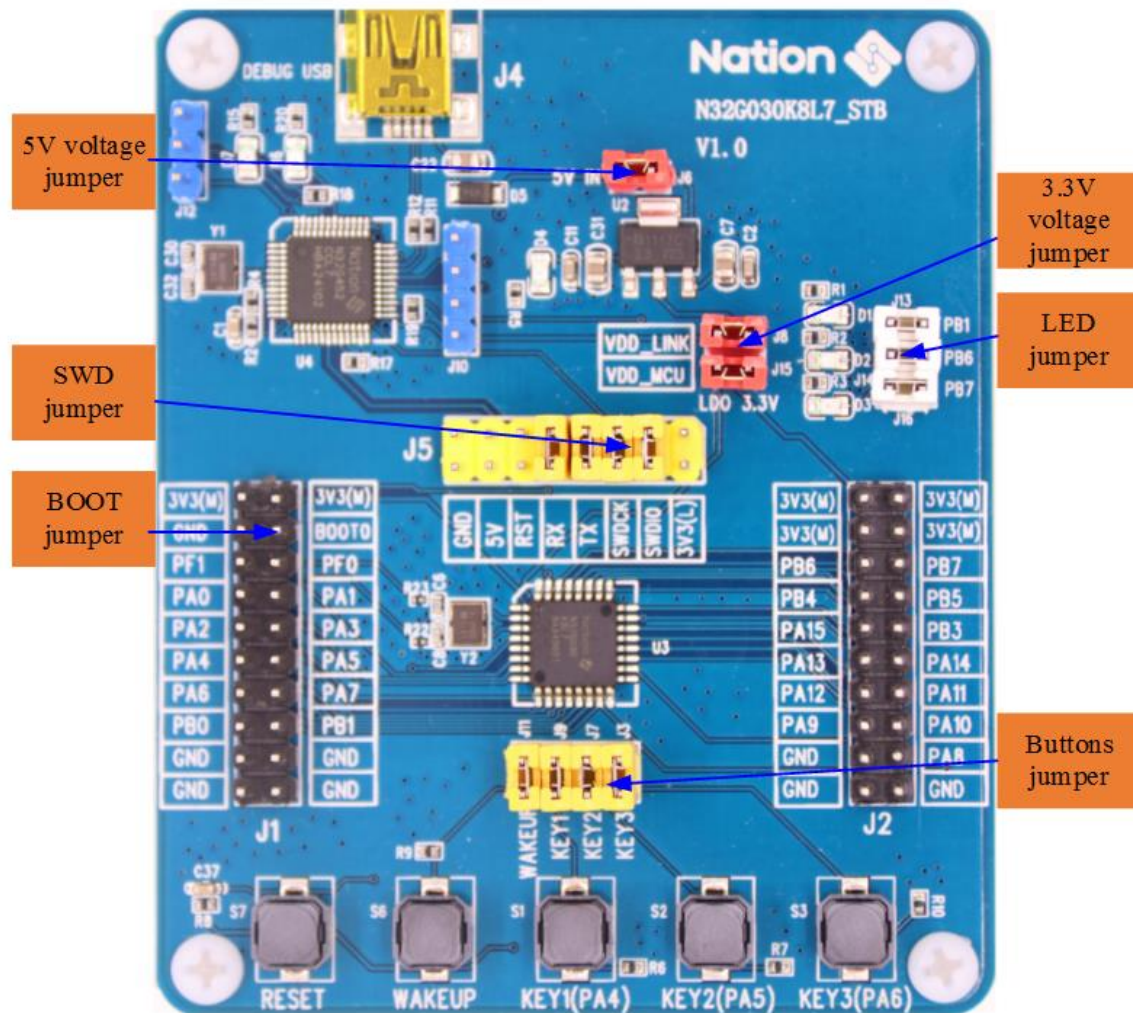


Table 1-1 Development Board Jumper Description List

No.	Jumper bit number	Jumper function	Instructions for use
1	J6	5V input voltage jumper	The jumper J6 is used to connect the USB ports J4 to supply power to the LDO3.3V input port.
2	J8、J15	3.3V Power supply jumper	J8: Power supply 3.3V to NS-LINK MCU chip. J15: Power supply 3.3V to the main MCU chip.
3	J5	SWD jumper	Use NS-LINK to download the program to the MCU through the USB DEBUG port, you need to short-circuit the SWDIO signal pin and the SWDCK signal pin.
	J5	Serial jumper	When using NS-LINK as a serial port through the USB DEBUG port, you need to short-circuit the MCU_TX signal pin and the MCU_RX signal pin.
4	J1 PIN4	BOOT jumper	J1 PIN4: BOOT0.
5	J13、J14、J16	LED light jumper	LED light jumper to disconnect GPIO from LED J13: D1(PB1) J14: D2(PB6) J16: D3(PB7)
6	J3、J7、J9、J11	button jumper	Button jumper to disconnect the GPIO from the button J9: KEY1(PA4) J7: KEY2 (PA5) J3: KEY3(PA6) J11: WAKEUP(PA0)

1.5 Development board schematic

The schematic diagram of the N32G030K8L7-STB development board is described as follows (For details, please refer to "N32G030K8L7-STB_V1.0").

1) MCU connection

Refer to Figure 1-3 for the schematic diagram of the MCU connection. Each VDD pin of the MCU is

The schematic diagram illustrates the N32G030K8L7 MCU circuit. The MCU is a 32-bit microcontroller with a 3.3V supply voltage. It features a crystal oscillator (Y2, 8MHz) and a reset pin (NRST). The MCU is connected to two 20-pin headers, J1 and J2, for external connections. The MCU is powered by VDD_MCU and has a VSS pin. The diagram shows the internal connections of the MCU and the external components connected to it.

MCU Pin Connections:

- Pin 1:** VDD
- Pin 2:** PF0-OSC_IN
- Pin 3:** PF1-OSC_OUT
- Pin 4:** NRST
- Pin 5:** VDDA
- Pin 6:** PA0
- Pin 7:** PA1
- Pin 8:** PA2
- Pin 9:** PA3
- Pin 10:** PA4
- Pin 11:** PA5
- Pin 12:** PA6
- Pin 13:** PA7
- Pin 14:** PA8
- Pin 15:** PA9
- Pin 16:** PA10
- Pin 17:** PA11
- Pin 18:** PA12
- Pin 19:** PA13
- Pin 20:** PA14
- Pin 21:** PA15
- Pin 22:** PA16
- Pin 23:** PA17
- Pin 24:** PA18
- Pin 25:** PA19
- Pin 26:** PA20
- Pin 27:** PA21
- Pin 28:** PA22
- Pin 29:** PA23
- Pin 30:** PA24
- Pin 31:** PA25
- Pin 32:** PA26

External Components:

- Crystal Oscillator (Y2):** 8MHz, connected to pins 2 and 3.
- Reset Pin (NRST):** Connected to pin 4.
- Power Supply (VDD_MCU):** Connected to pin 1.
- Ground (VSS):** Connected to pin 32.
- Capacitors:** C50 (4.7uF), C51 (0.1uF), C52 (0.1uF), C53 (0.1uF).
- Resistors:** R22 (0R), R23 (0R).

Headers J1 and J2:

- Header J1:** 20-pin header with pins 1-20. Pins 1-10 are labeled PA0-PA9, and pins 11-20 are labeled PA10-PA19.
- Header J2:** 20-pin header with pins 1-20. Pins 1-10 are labeled PA0-PA9, and pins 11-20 are labeled PA10-PA19.

2) Power Design

6 / 11

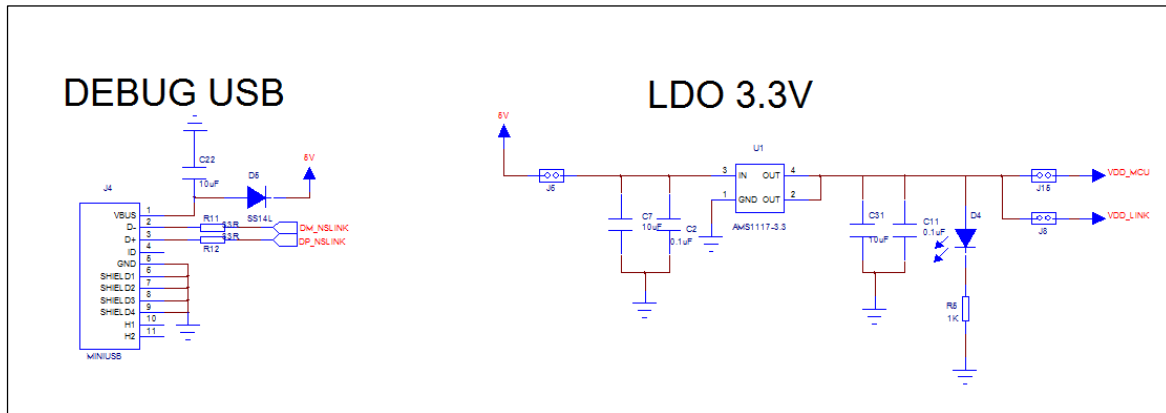


Figure 1-4 Power Design

3) button design

Refer to Figure 1-5 for the schematic diagram of the key design. There are a total of 5 keys, which are the three general keys, the MCU wake-up key and reset key.

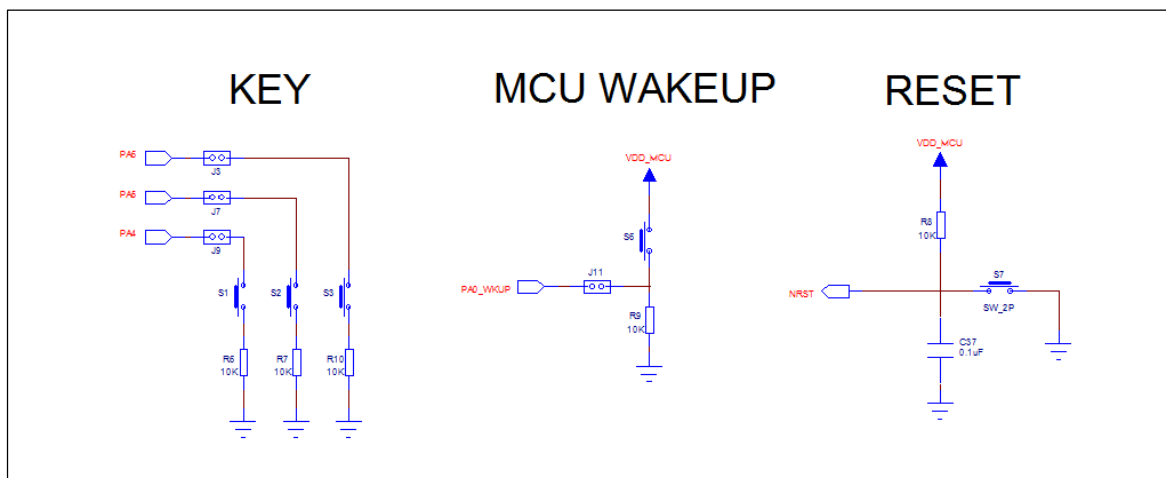


Figure 1-5 Button Design

4) LED light design

Refer to Figure 1-6 for the schematic diagram of LED light design. There are a total of 5 LED lights. D1, D2, and D3 are connected to PB1, PB6 and PB7 of the main MCU respectively, which can be used for debugging. D6 and D7 are used for NS-LINK MCU control to monitor the running status of NS-LINK.

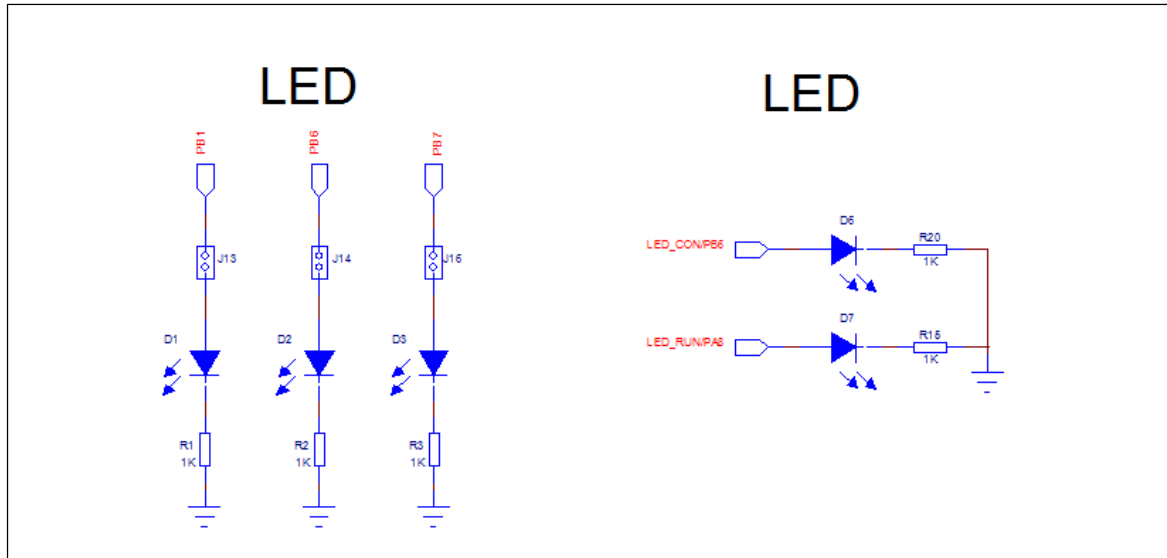


Figure 1-6 LED Light Design

5) crystal

Refer to Figure 1-7 for the crystal connection diagram. The chip has 8MHz external crystals.

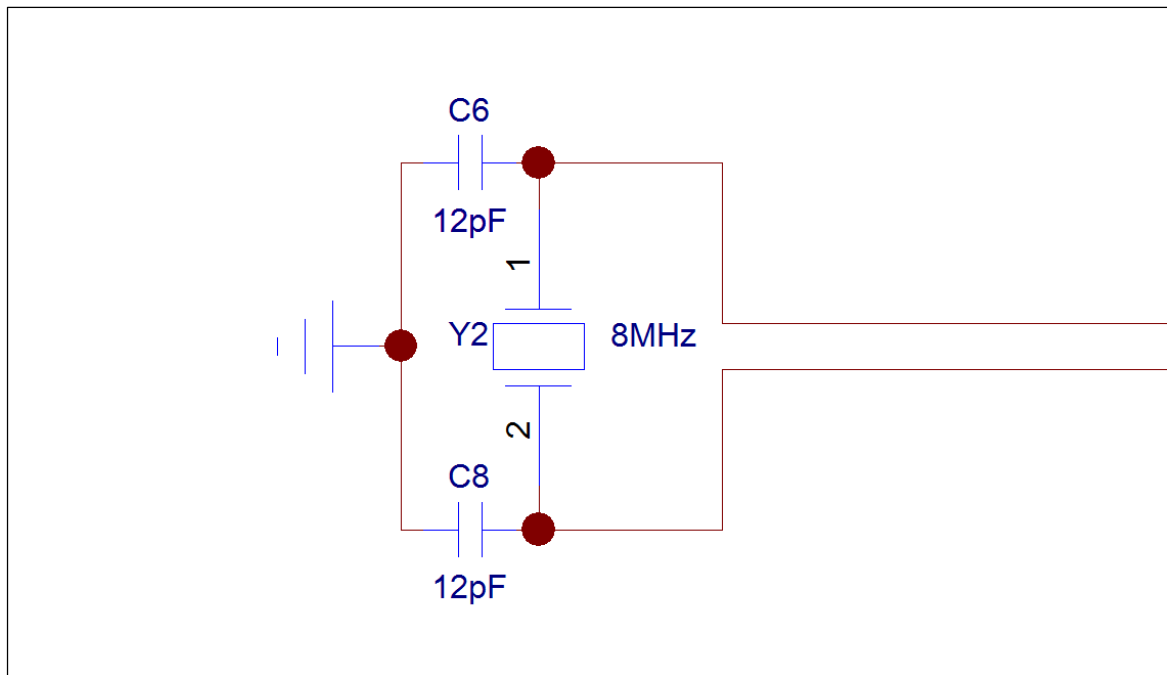


Figure 1-7 crystal design

6) NS-LINK

Refer to Figure 1-8 for the schematic diagram of NS-LINK. Users can directly connect the USB cable to

download the program through the DEBUG USB port, omitting the ULINK or JLINK writer. You can also debug through the DEBUG USB analog serial port.

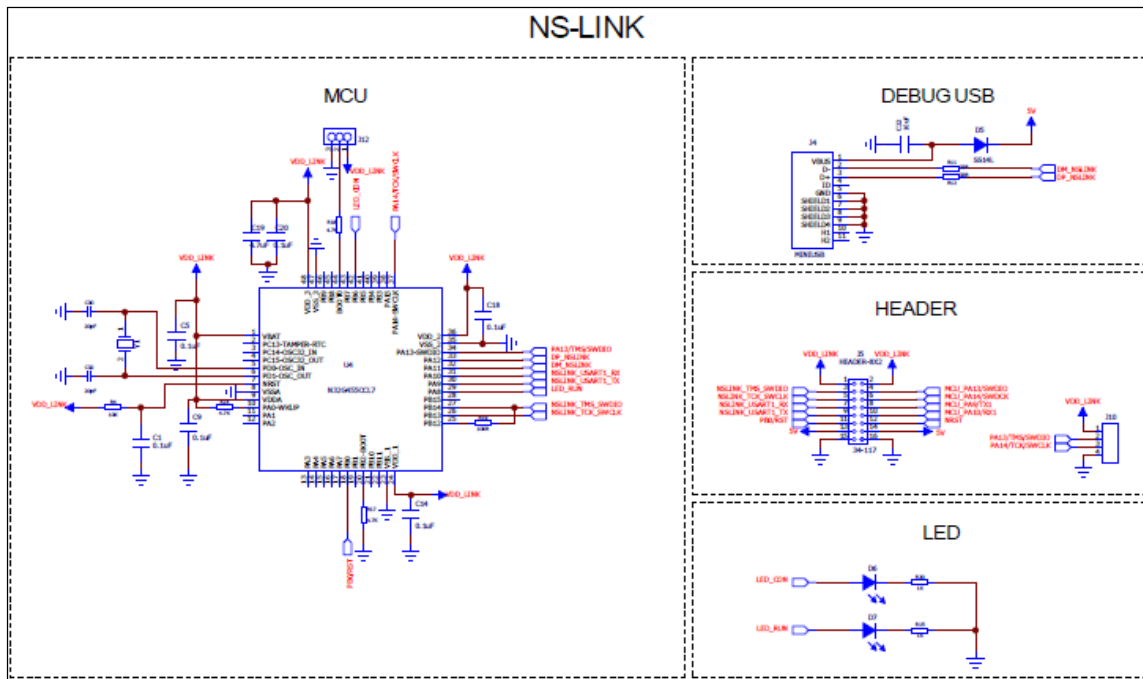


Figure 1-8 NS-LINK

- **Description of peripheral devices:**

- 1) When designing PCB LAYOUT, put two capacitors near VDD (PIN1), 4.7uF and 0.1uF respectively, and put 0.1uF capacitors near the other VDD pins.

2 Version history

Version	Date	Modify
V1.0	2020-07-25	1. Initial version

3 Notice

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