N32G052RBL7_STB Development Board Hardware Usage Guide

Introduction

The purpose of this document is to allow users to quickly familiarize themselves with the N32G052RBL7_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.

CONTENS

1 Hardware Development Instructions

1.1 Briefly

The N32G052RBL7_STB development board is used for sample development of the 32-bit N32G052RBL7 chip of National Technology Co., Ltd. This document describes in detail the functions, usage instructions and precautions of the N32G052RBL7_STB development board.

1.2 Development board function

The main MCU chip model of the development board is N32G052RBL7, LQFP64 pin package. The development board connects all functional interfaces to facilitate customer development.
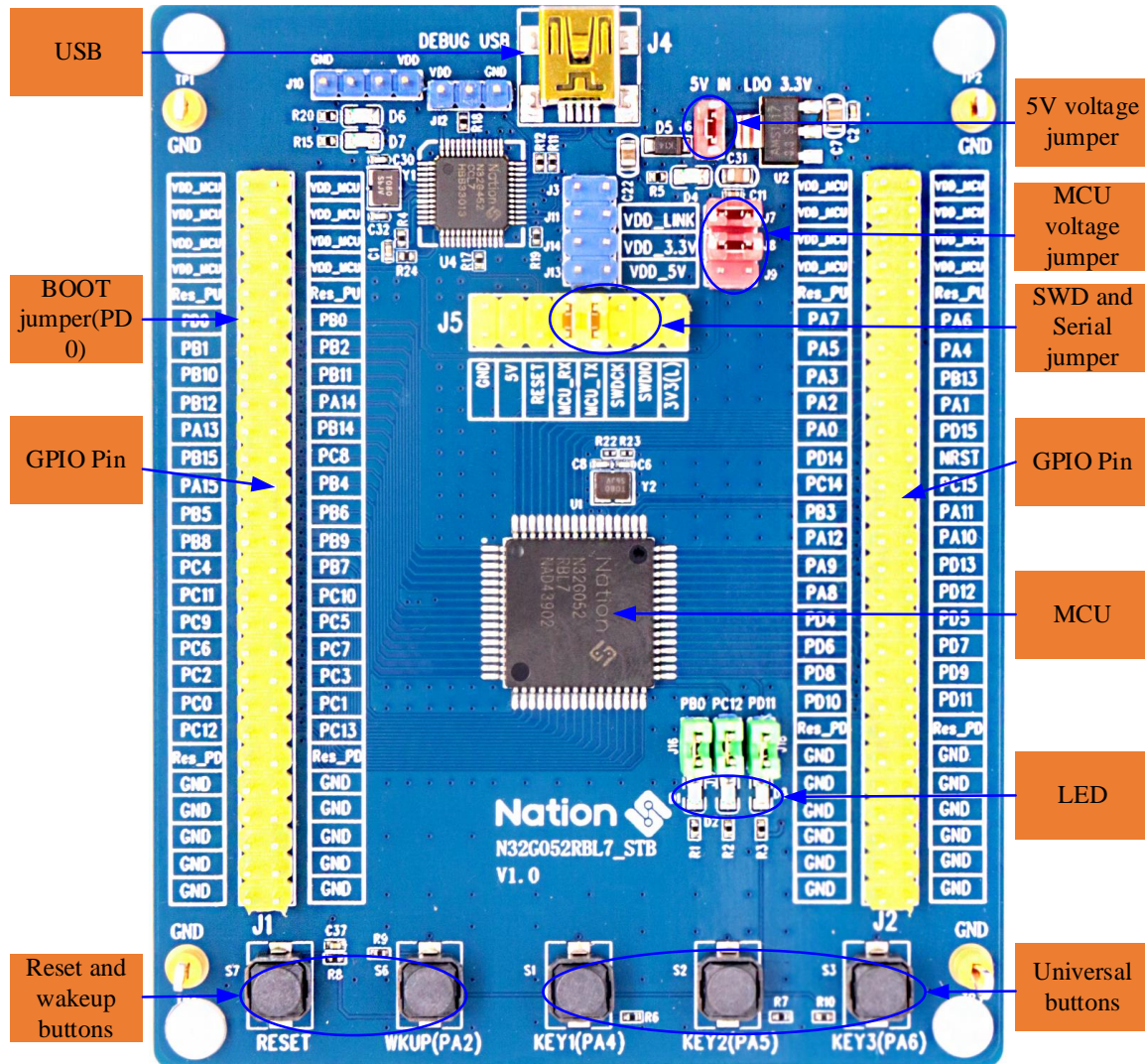
1.3 Development board layout

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 the 3.3V LDO input port through the J6 jumper .

2) USB interface (J4)

Through the DEBUG USB interface of the NS-LINK chip (U4), the main MCU program download and debugging function can be provided, and the serial port of the MCU can also be connected to provide the

USB to serial port function..

3) 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. You can also use a jumper cap to short-circuit the SWDIO signal pin and SWDCK signal pin to download the MCU through DEBUG USB. debug .

Serial port: MCU_TX and MCU_RX are used as serial port external signals. MCU's PA9 (TX) and PA15 (RX) are used as serial ports. They can be connected to external serial port devices separately, or the jumper cap can be shorted to the MCU_TX signal pin and MCU_RX signal pin. Convert the USB port to a serial port through NS-LINK on the development board to facilitate customer use .

4) Reset and Wake Buttons (S7, S6)

S7 and S6 are the reset button and wake-up button respectively, which are connected to the NRST pin and PA2 pin of the chip 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 PB0, PC12 and PD11 of the chip respectively.

6) BOOT (J1 PIN11)

J1 PIN11 PD0 pin is the BOOT0 pin, which can be shorted to power and ground through a jumper as needed.

7) GPIO口（J1，J2）

All chip GPIO interfaces are lead out, and 3.3V voltage and GND pins are also reserved on the pins to facilitate testing. For the specific definition of the interface, please refer to the "UM_N32G052RBL7 User Manual".
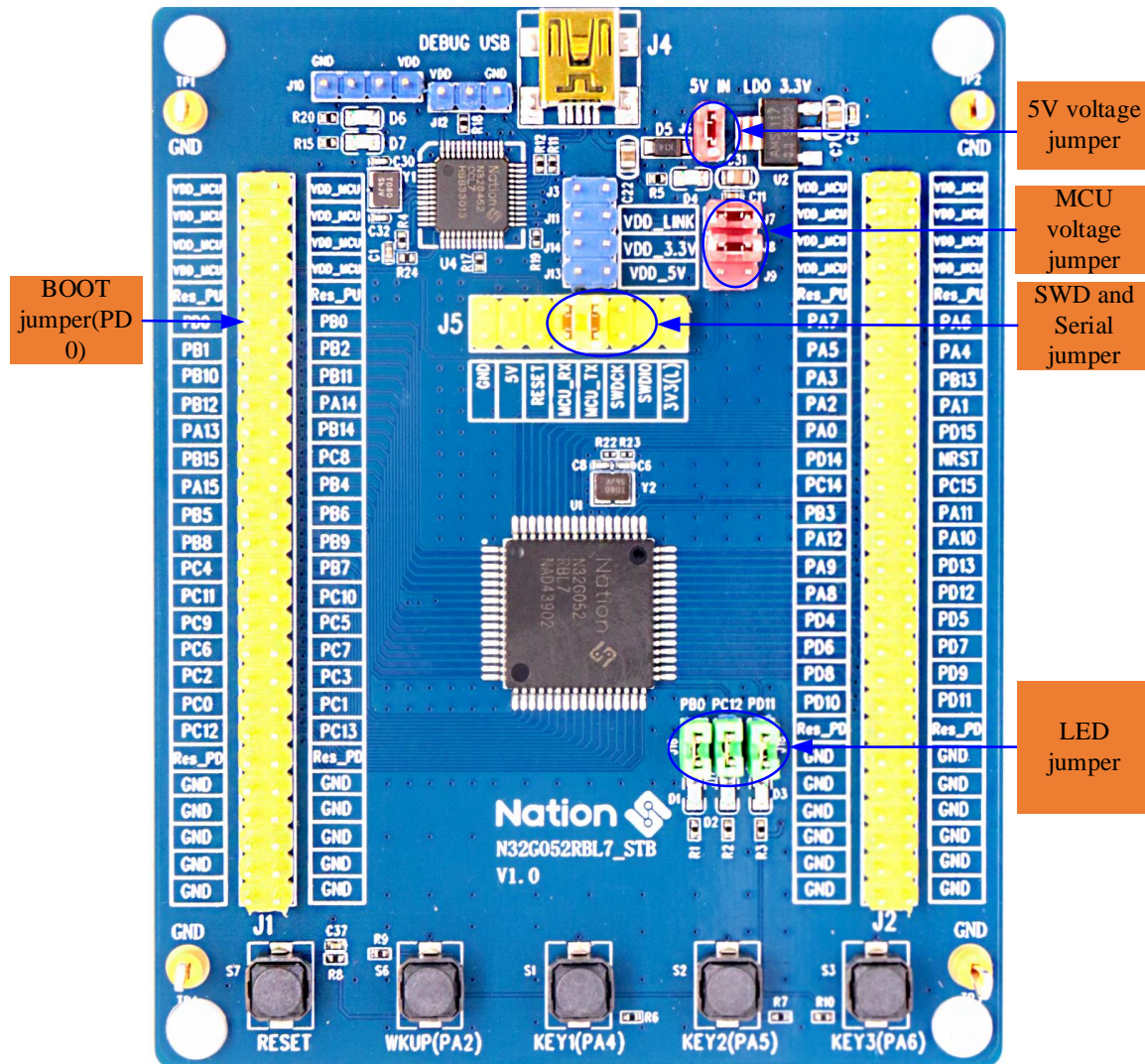
1.4 Development Board Jumper Instructions

Figure 1-2 Development Board Jumper Description

Table 1-1 Development Board Jumper Description List

| No.	Jumper bit number	Jumper function	Instructions for use
1	J6	5V input voltage jumper	J11 jumper is used to connect the J4 USB interface to supply power to the LDO3.3V input port.
2	J7、J8	3.3V Power supply jumper	J7: Power Supply 3.3V to NS-LINK MCU chip. J8: 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 PIN11	BOOT jumper	J1 PIN11：BOOT0.
5	J16、J17、J18	LED light jumper	J16、J17、J18：This jumper can disconnect and connect the GPIO and LED on and off。 J16：D1(PB0) J17：D2(PC12) J18：D3(PD11)

1.5 Development board schematic

The schematic diagram of the N32G052RBL7_STB development board is explained as follows (see "N32G052RBL7_STB_V1.0" for details).

1) MCU connection

Refer to Figure 1-3 for the MCU connection schematic diagram. The MCU VDD pin is connected to a decoupling capacitor. All GPIOs are connected to the J1, J2 and J3 pins for easy debugging..

Figure 1-3　MCU connection diagram

2) Power Design
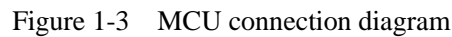
Refer to Figure 1-4 for the power supply design schematic. The PCB supplies 5V power through USB, and then outputs 3.3V voltage through LDO. It can power 3.3V/5V to the MCU through jumper J8/J9.

Figure 1-4 Power Design
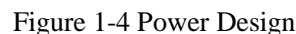
3) Button design

Refer to Figure 1-5 for the schematic diagram of button design. There are 5 buttons in total, including 3

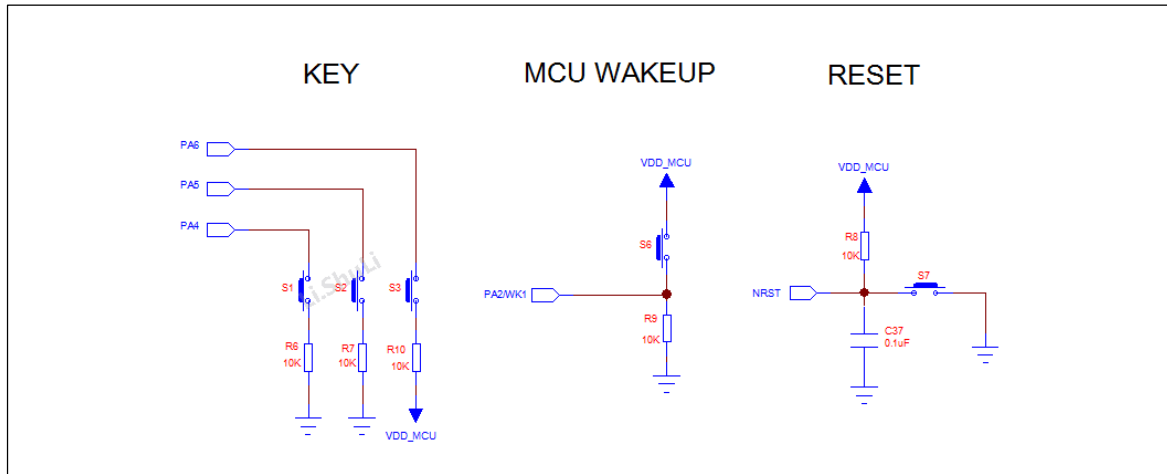general buttons, MCU wake-up button and reset button.

Figure 1-5 Button Design

4) LED light design

Refer to Figure 1-6 for the LED lamp design schematic. There are 5 LED lamps in total. D1, D2, and D3 are connected to PB0, PC12, and PD11 of the main MCU respectively, which can be used for debugging. D6 and D7 are used for NS-LINK MCU control and monitoring of NS-LINK operating status.
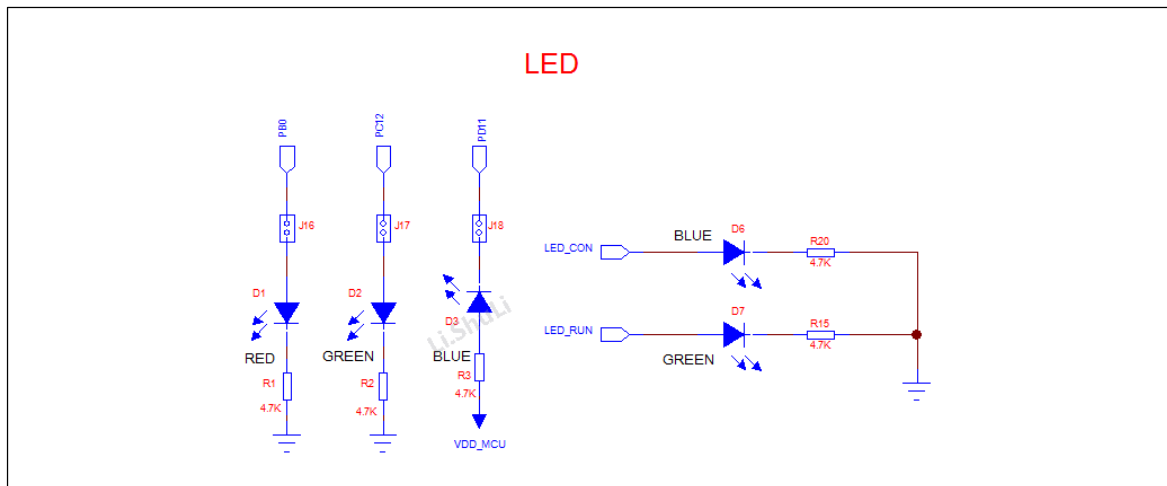

Figure 1-6 LED Light Design

5) Crystal

Refer to Figure 1-7 for the crystal connection diagram. The chip has an external crystal, which is 8MHz.
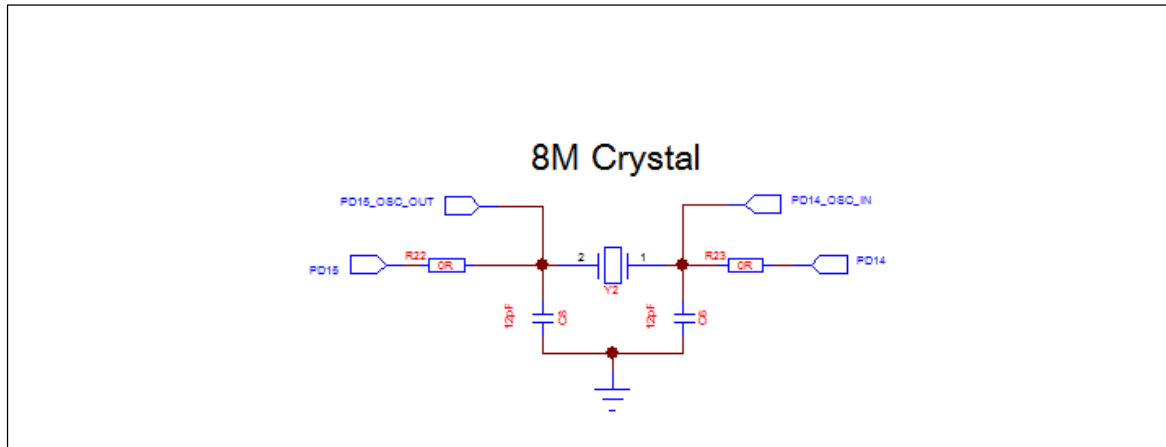
Figure 1-7 crystal design

6) NS-LINK

Refer to Figure 1-8 for the NS-LINK schematic diagram. Users can directly connect the USB cable through the DEBUG USB port to download the program, eliminating the need for a ULINK or JLINK programmer. You can also debug through the DEBUG USB analog serial port.
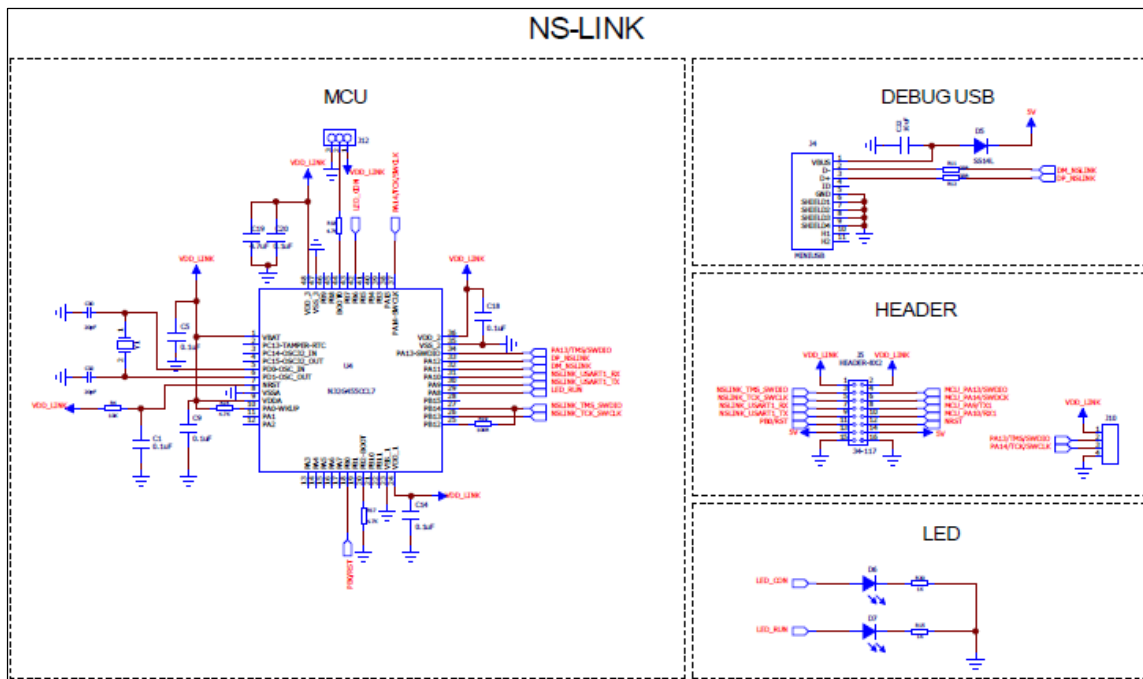

Figure 1-8 NS-LINK

● **Description of peripheral devices:**

1) When designing PCB LAYOUT, there are two capacitors near VDD (PIN55), which are 4.7uF and

0.1uF respectively.

2 Version history

Version	Date	Modify
V1.0	2024-4-2	Initial version

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