N32A455VEL7-EVB Development Board Hardware Usage Guide

Introduction

The purpose of this document is to allow users to quickly familiarize themselves with the N32A455VEL7-EVB 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 N32A455VEL7-EVB development board is used for sample development of 32-bit N32A455VEL7 chips of National Technology Co., Ltd. This document describes the functions, usage instructions and precautions of the N32A455VEL7-EVB development board in detail.

1.2 Development board function

The main MCU chip of the development board is N32A455VEL7, and it is packaged with LQFP100 pins. The development board connects all functional interfaces to facilitate customer development, In addition, there are power supply and GND on the board to facilitate debugging.

The main functional interfaces are as follows:

Table 1 1 Main function interface description

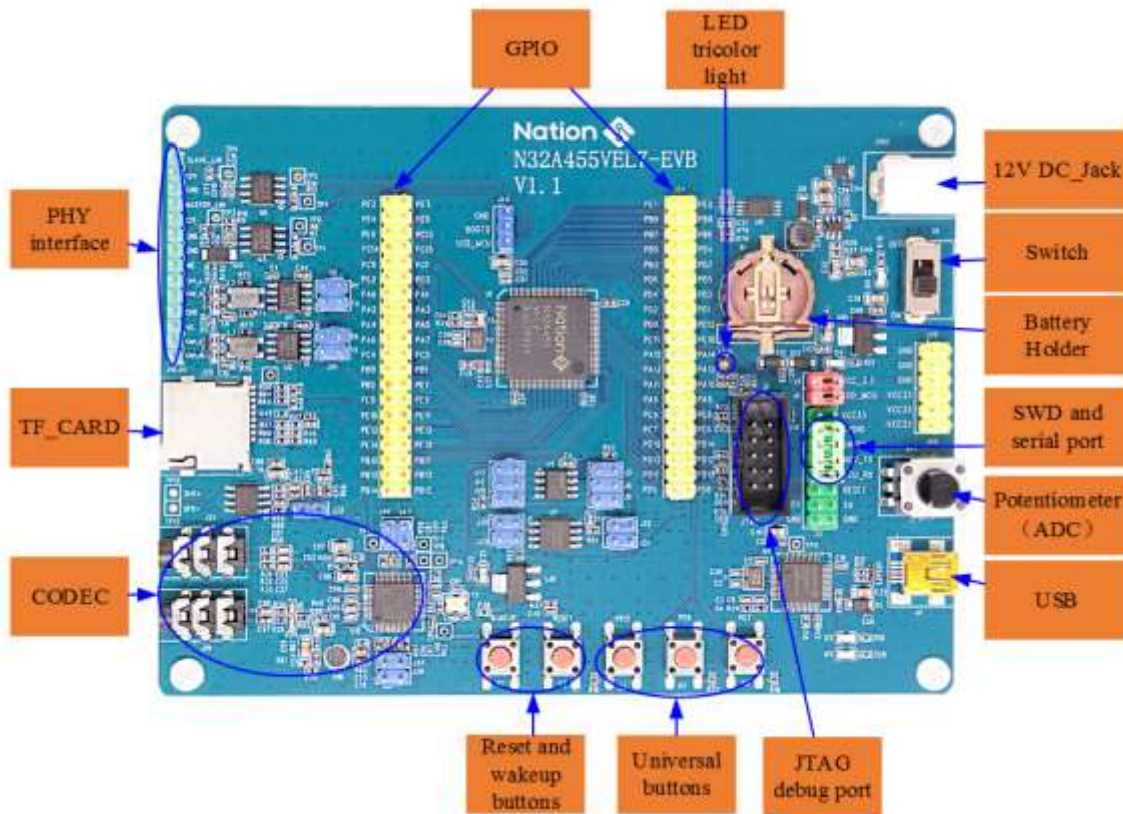| No.	interface	Interface tag	illustrate
1	USB	J4	USB connector
2	NSLINK_SWD /UART	J2	NSLINK signal
3	JTAG	J1	JTAG debug interface
4	MCU IO	J7、J24	MCU GPIO pins
5	PHY	J11、J13、J16、J18	PHY communication interface

1.3 Development board layout

Figure 1-1 Development board layout

1) Power supply for the development board

The development board has two power supply methods: 1) DC_JACK power supply, input voltage 12V, DC_JACK bit number J100; 2) USB power supply, input voltage 5V, USB bit number J4, both power supply modes are controlled by switch S6. After the switch S6, the power input to the LDO is converted to 3.3V voltage, and then the voltage is divided into two channels, one supports the power supply of the MCU alone, selected by the jumper J6, and the other supports the power supply of the other functional modules, selected by the jumper J5.

2) NSLINK interface (J4)

The NSLINK interface can be used for program download and debugging, supports two download modes:

2 / **8**

JTAG and SWD, and has a virtual serial port, which can be selected by jumper J2.

3) JTAG interface（J1）.

The development board has an independent 10Pins JTAG/SWD for Jlink debugging.

4) PHY communication interface

Support 2-way CAN PHY and 2-way LIN PHY communication. When using 2-way CAN PHY for debugging, two sets of jumper caps J10 and J14 need to be connected. The 2-way CAN PHY lead-out interface is J11 and J18, and the 2-way LIN PHY lead-out interface is J13 and J16.

5) TF_CARD

Onboard TF card slot, the TF card slot is located on the TOP side of the development board, the bit number is J28.

6) CODEC

The development board uses CODEC chip (VS1053B), input LINE_IN interface J19 and electret MIC U16, one headphone output interface J21, and outputs one external speaker interface SPK1&SPK2 through the power amplifier chip (HT6872). CODEC chip bit number U15, power amplifier chip (HT6872) bit number U18. CODEC supports both SPI and I2S communication. If SPI communication is selected, jumpers J46 and J47 need to be connected; if I2S communication is selected, jumpers J37 and J38 need to be connected.

7) EEROM&PSRAM

The development board uses EEROM chip (CAT24C08YI-GT3), EEROM chip bit number U6.

8) SPI_FLASH&QSPI_FLASH

The development board has one SPI FLASH (W25Q128JVSIQTR) and one QSPI FLASH (P25Q40HA-SSH-IT), SPI FLASH bit number U7, QSPI FLASH bit number U5, the two are selected by jumpers, if SPI FLASH is selected, connect the jumper J29, J30, J31, J32; if QSPI FLASH is selected, connect jumpers J3, J8, J9, J12, J15, J20.

9) KEY

There are 5 mechanical buttons on the development board, the WAKEUP button is numbered S1, the

RESET button is numbered S2, and the general buttons are numbered S3, S4, and S5.

10) GPIO port

80 independent GPIO ports, which can be multiplexed with other function pins, see "DS_N32A455 Series

Data Sheet" for details.

1.4 Development Board Jumper Instructions

Table 1 2 Description list of key jumpers on the development board

No.	Jumper bit number	jumper function	Instructions for use
1	J5	3.3V power supply option	Power supply for other functional modules except MCU must be connected to
2	J6	3.3V power supply option	To supply power to the MCU, it must be connected
3	J44	BOOT0 pull-down selection	Then pull up on the left and pull down on the right.
4	J2	NSlink jumper selection	Press the silk screen to select the desired download method.
5	J46、J47	CODEC SPI communication selection	Connect this item when CODEC selects SPI communication mode
6	J37、J38	CODEC I2S communication selection	Connect this item when CODEC selects I2S communication mode
7	J29、J30、J31、J32	SPI flash selection	Connect this item when using SPI flash
8	J3、J8、J9、J12、J15、J20	QSPI flash selection	Connect this item when using QSPI flash
9	J10、J14、	CAN PHY selection	Connect this item when using CAN PHY communication

1.5 N32A455VEL7-EVB Development Board Schematic

Please refer to the PDF file "N32A455VEL7-EVB_V1.1" for the schematic diagram of N32A455VEL7-EVB.

- **Description of peripheral devices:**

1) VCC_MCU: Put two capacitors near pin VDD_3, 4.7uF and 0.1uF respectively; put two capacitors near pin VDDA, respectively 1uF and 0.1uF, and put 0.1uF capacitors near the other power pins.

2) VCC33: Put a 0.1uF capacitor to the ground near the pin.

2 Version history

Version	Date	Modify
V1.0	2023-02-25	Initial version

3 Notice

This document is the exclusive property of Nations Technologies Inc. (Hereinafter referred to as NATIONS). This document, and the product of NATIONS described herein (Hereinafter referred to as the Product) are owned by NATIONS under the laws and treaties of the People's Republic of China and other applicable jurisdictions worldwide.

NATIONS does not grant any license under its patents, copyrights, trademarks, or other intellectual property rights. Names and brands of third party may be mentioned or referred thereto (if any) for identification purposes only.

NATIONS reserves the right to make changes, corrections, enhancements, modifications, and improvements to this document at any time without notice. Please contact NATIONS and obtain the latest version of this document before placing orders.

Although NATIONS has attempted to provide accurate and reliable information, NATIONS assumes no responsibility for the accuracy and reliability of this document.

It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. In no event shall NATIONS be liable for any direct, indirect, incidental, special, exemplary, or consequential damages arising in any way out of the use of this document or the Product.

NATIONS Products are neither intended nor warranted for usage in systems or equipment, any malfunction or failure of which may cause loss of human life, bodily injury or severe property damage. Such applications are deemed, "Insecure Usage".

Insecure usage includes, but is not limited to: equipment for surgical implementation, atomic energy control instruments, airplane or spaceship instruments, all types of safety devices, and other applications intended to support or sustain life.

All Insecure Usage shall be made at user's risk. User shall indemnify NATIONS and hold NATIONS harmless from and against all claims, costs, damages, and other liabilities, arising from or related to any customer's Insecure Usage.

Any express or implied warranty with regard to this document or the Product, including, but not limited to, the warranties of merchantability, fitness for a particular purpose and non-infringement are disclaimed to the fullest extent permitted by law.

Unless otherwise explicitly permitted by NATIONS, anyone may not use, duplicate, modify, transcribe or otherwise distribute this document for any purposes, in whole or in part