

# ARM® ARM926EL-S Based 32-bit Microprocessor

## NuMaker-emWin-RDK-N9H30 User Manual

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## 1 Overview

The NuMaker-emWin-RDK-N9H30 demo board is N9H30 series product. Users can use the board to develop and verify the emWin application program easily.

The N9H30 series embedded the ARM®926 core for HMI applications which need high computing power and rich communication interfaces. The CPU can run up to 300 MHz and equipped with USB2.0 high speed device, USB2.0 high speed host, Ethernet interfaces and other rich peripherals, such as LCD, NAND, SD, ADC, UART, SPI, I<sup>2</sup>C, I<sup>2</sup>S, CAN, RTC...etc.

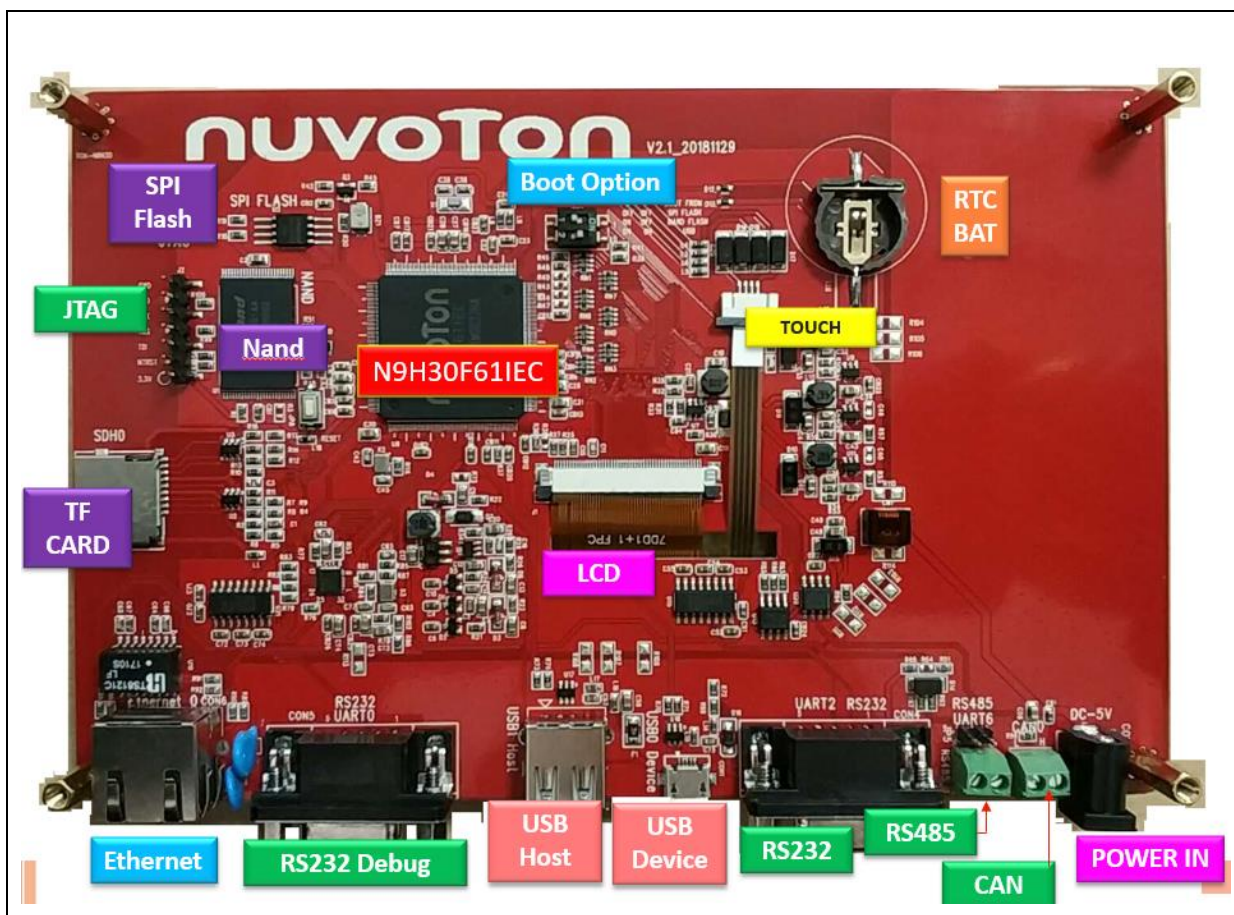


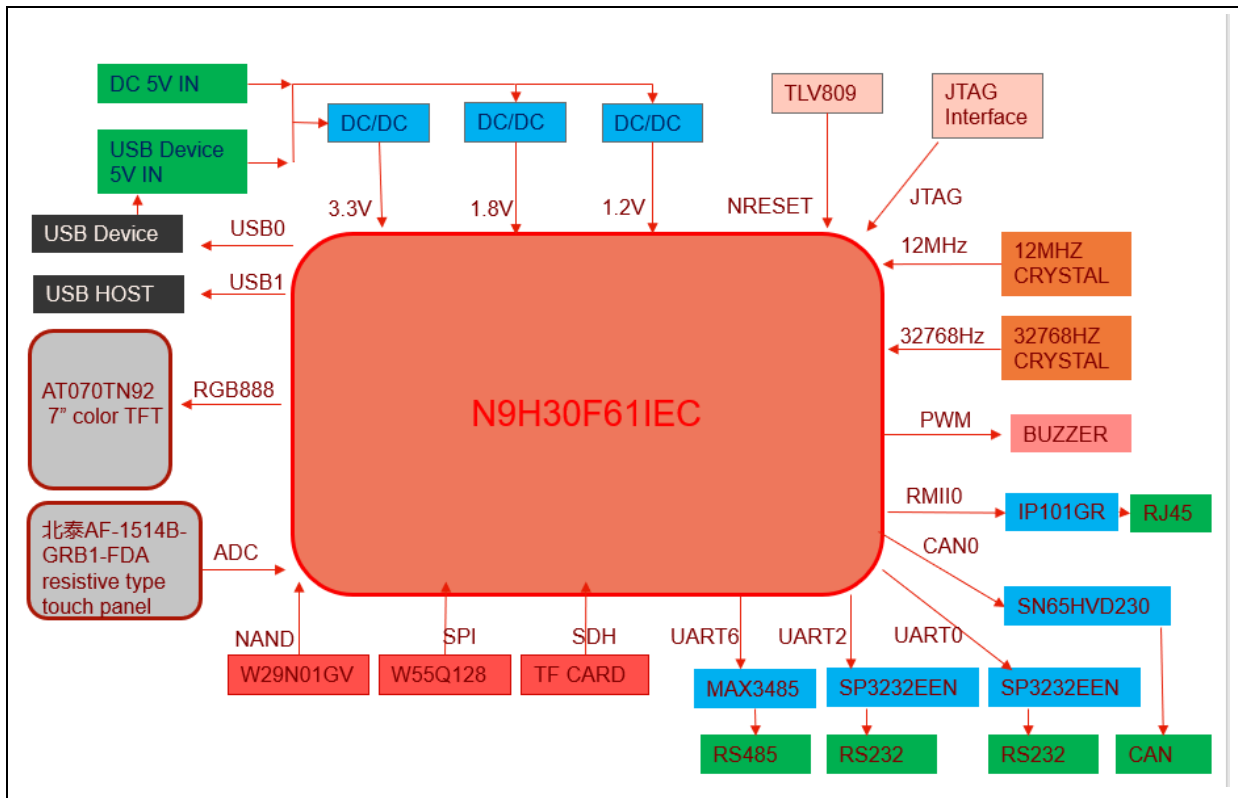
Figure 1-1 NuMaker-emWin-RDK-N9H30 Demo Board

## 2 Board Feature List

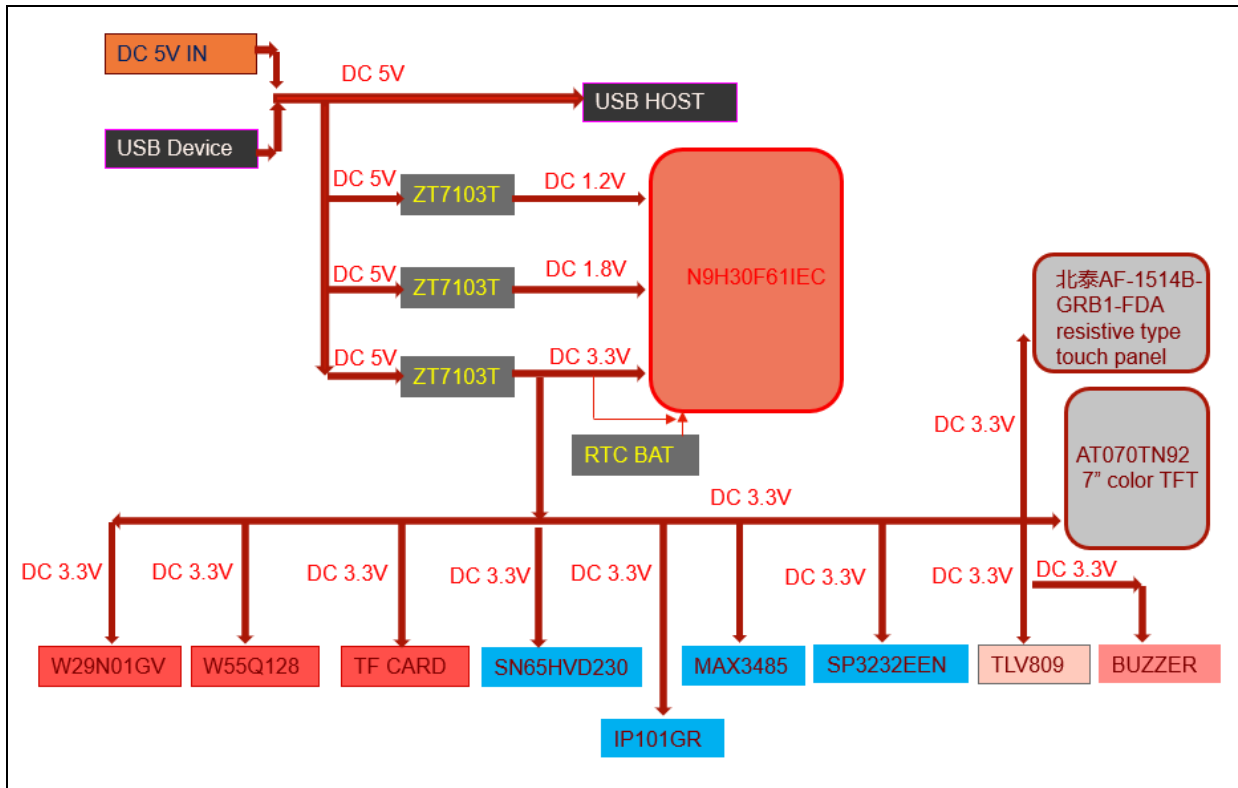
1. Adopted Nuvoton ARM926EJS-based MPU N9H30F61I, it can run up to 300MHz.
2. NAND Flash used Winbond W29N01GV 128MB with 8-bit data bus width.
3. SPI Flash used W25Q128FVSG 16MB.
4. Boot selection by NAND or SPI or USB.
5. One DB9 RS232 port with N9H30 UART0 for debugging.
6. One DB9 RS232 port with N9H30 UART2 for user application.
7. Installed SN65HVD230 transceiver for CAN bus communication.
8. Installed MAX3485 transceiver for RS485 device connection.
9. USB supports both HS USB2.0 device with micro USB connector and HS USB 2.0 host with type-A connector.
10. Provided one Micro-SD/TF card slot for data storage with SD memory card.
11. Used 7" TFT LCD and embedded that resistive type touch panel.
12. Reserved an external coin-cell socket for RTC power backup with CR2032 battery.
13. Provided one 10/100Mb Ethernet RJ45 port.
14. Provided one buzzer device for user application.
15. JTAG interface is reserved for software development advanced.
16. System powered could be supplied by DC-5V adaptor or USB VBUS.

### 3 Function Description

#### 3.1 System Block Diagram

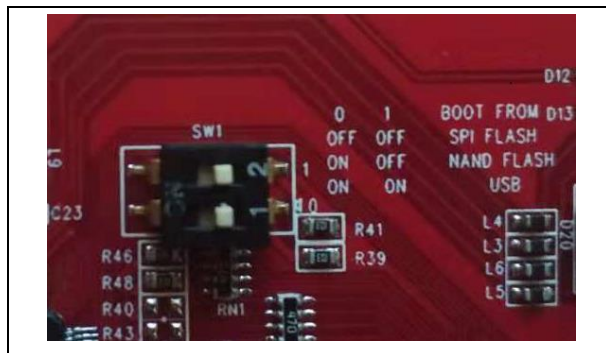


### 3.2 System Power Scheme



### 3.3 I/O or Jumper Description

#### 3.3.1 Power-on Setting



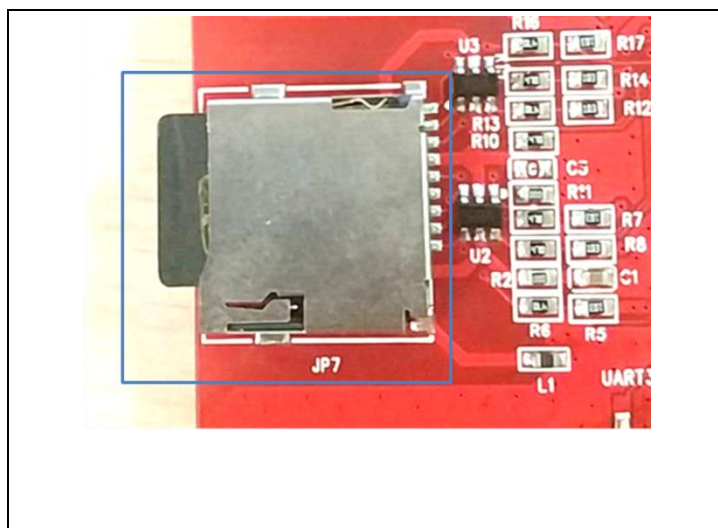
#### SW1 Function Description:

NuMaker-emWin-RDK-N9H30 provided system program code booting source from NAND Flash, SPI-NOR Flash or USB. In the board we have programmed a sample emWin code to NAND flash for demonstration.

About USB booting purpose is for Flash memory programming through the NuWriter of PC utility tool, regarding the NuWriter operation please refer the user manual to get for detail.

SW1-1	SW1-2	Boot From
ON	ON	booting from USB for PC communication
ON	OFF	booting from NAND Flash
OFF	OFF	booting from SPI Flash

### 3.3.2 SD Connector



- JP7: NuMaker-emWin-RDK-N9H30 provided a micro SD connector for user use what program accesses or data storage.

Note. N9H30 cannot support system booting.

### 3.3.3 UART Interfaces

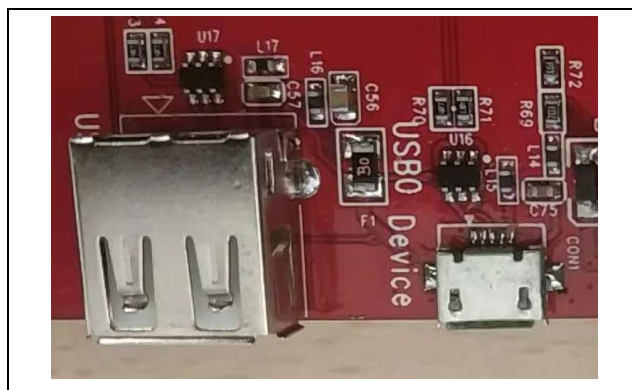






- CON5: One DB-9 connector for RS232 communication, the UART signals are from N9H30 UART0 TXD and RXD interfaces and through the RS232 transceiver, SP3232EEN. This port is dedicated for message debugging.
- CON4: One DB-9 connector for RS232 communication, the UART signals are from N9H30 UART2 TXD and RXD interfaces and through the RS232 transceiver, SP3232EEN. This port is reserved for user application.

### 3.3.4 USB Port



- CON1: This is a Micro USB connector, it is for PC communication and the signals are from N9H30 USB port-0
- CON2: This is a Type-A USB HOST connector, it is for USB devices connection and the signals are from N9H30 USB port-1

Note. CON1 VBUS can power supplied for system if connected with PC or notebook.



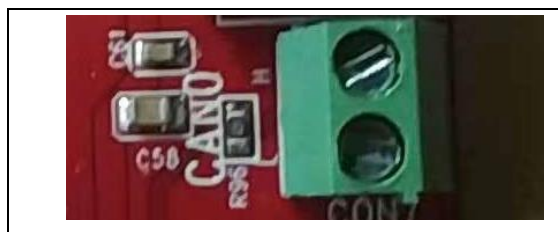
### 3.3.5 RS485 Interface



- J5: NuMaker-emWin-RDK-N9H30 provided a two-pin terminal connector with 3.5mm pitch for RS485 device connection.

Note. MAX3485 is RS485 (half-duplex communication) transceivers and built in to NuMaker-emWin-RDK-N9H30 demo board already.

### 3.3.6 CAN Interface



- CON7: NuMaker-emWin-RDK-N9H30 provided a two-pin terminal connector with 3.5mm pitch for CAN bus device communication with N9H30 CAN0 port.

Note. CAN transceivers, SN65HVD230 have built in to NuMaker-emWin-RDK-N9H30 demo board already.

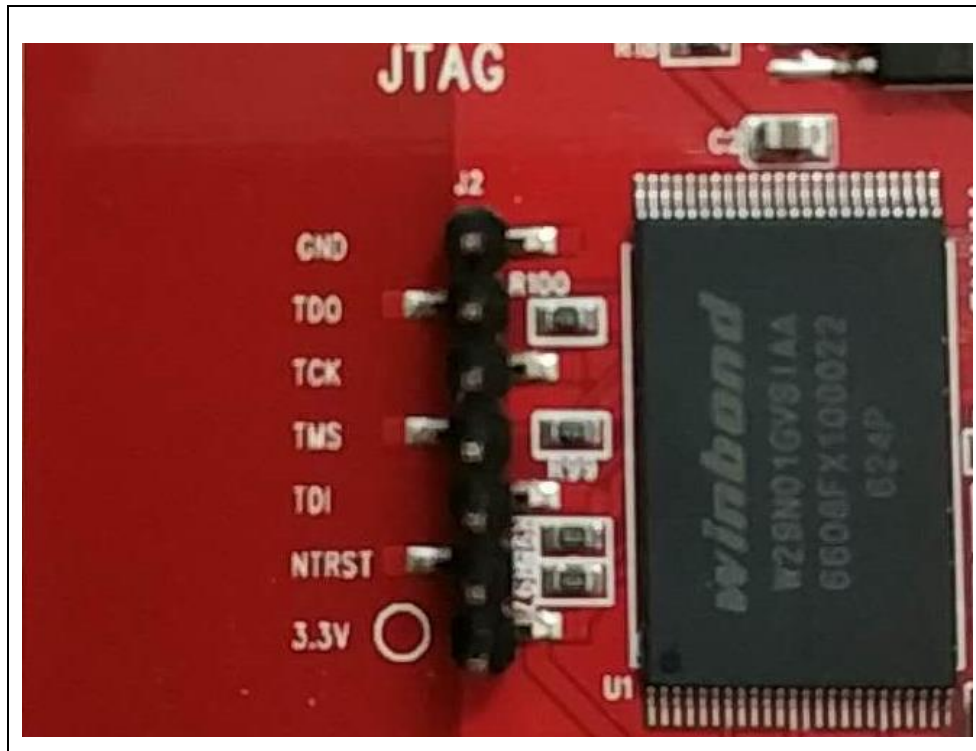
### 3.3.7 Ethernet Port



- CON6: NuMaker-emWin-RDK-N9H30 provided a standard RJ-45 port for 10M/100M Ethernet communication.

Note. NuMaker-emWin-RDK-N9H30 has built in the RMIIPHY, IC+ IP101GR on board already.

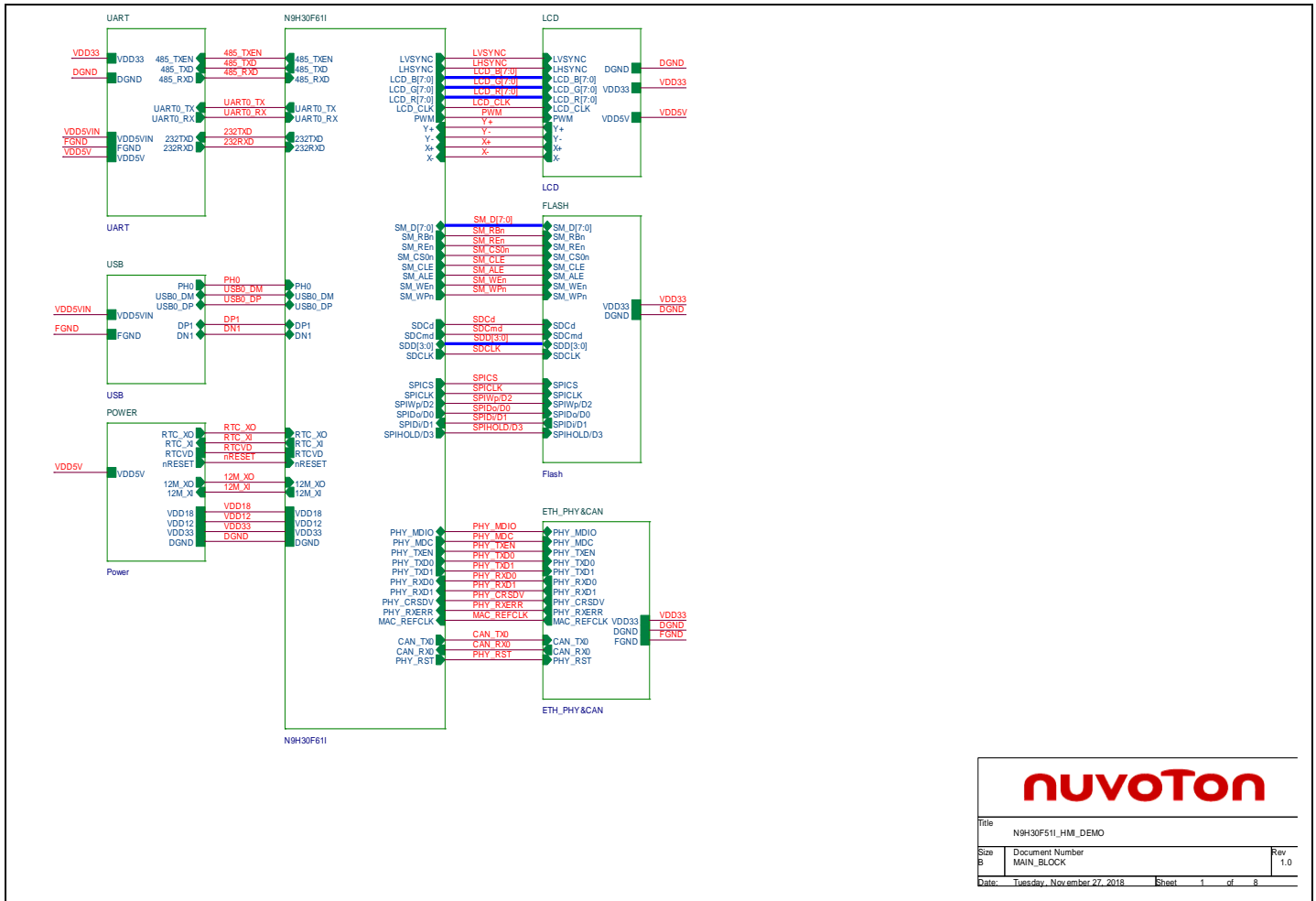
3.3.8 JTAG Port



- J2: NuMaker-emWin-RDK-N9H30 demo board provided one male header x6 connector with pitch 2.54mm for N9H30 JTAG signals; user can make that wiring connection with Keil- ICE for software development advanced.

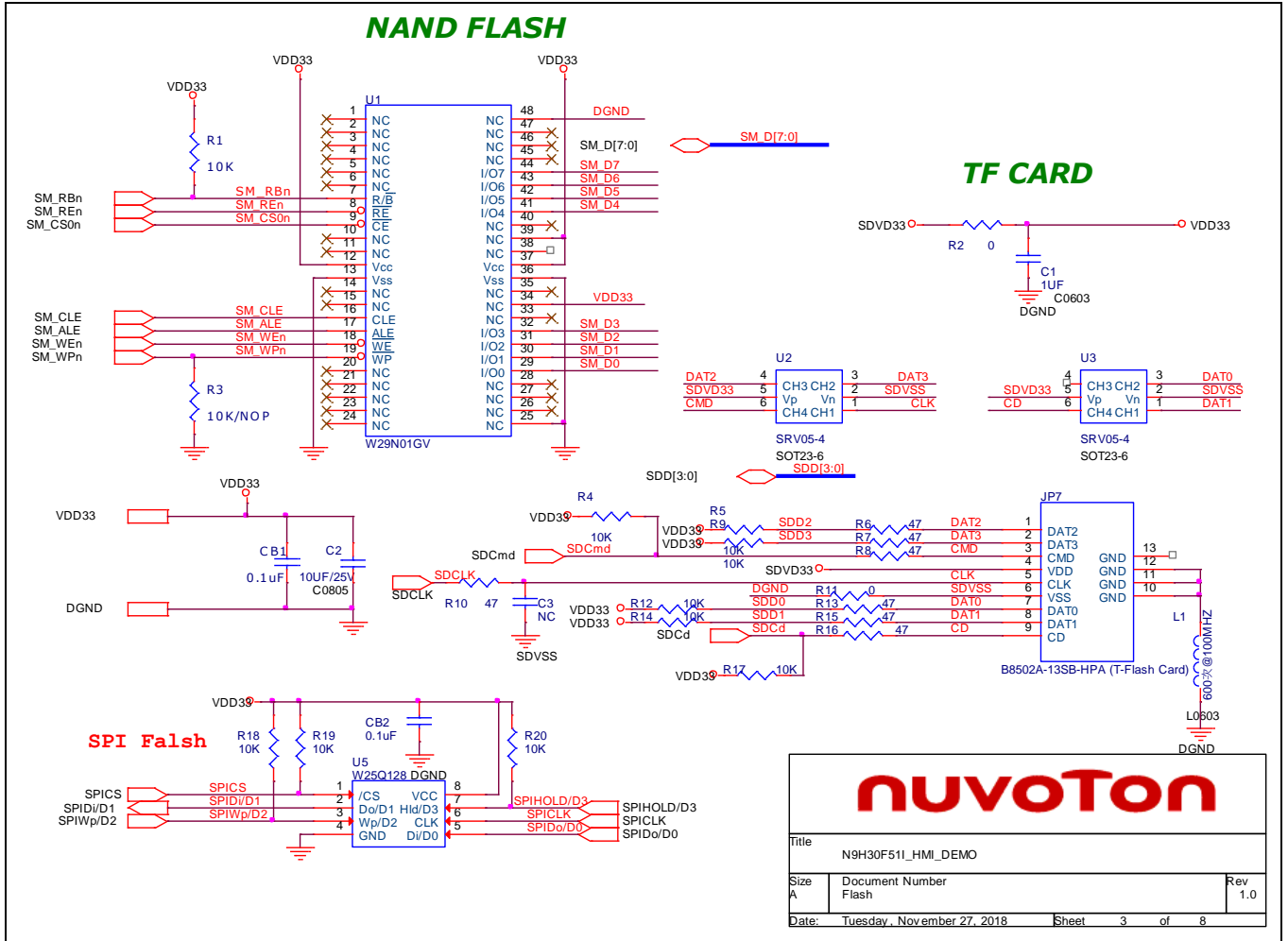
## 4 NuMaker-emWin-RDK-N9H30 Demo Board Schematic

### 4.1 Main Block



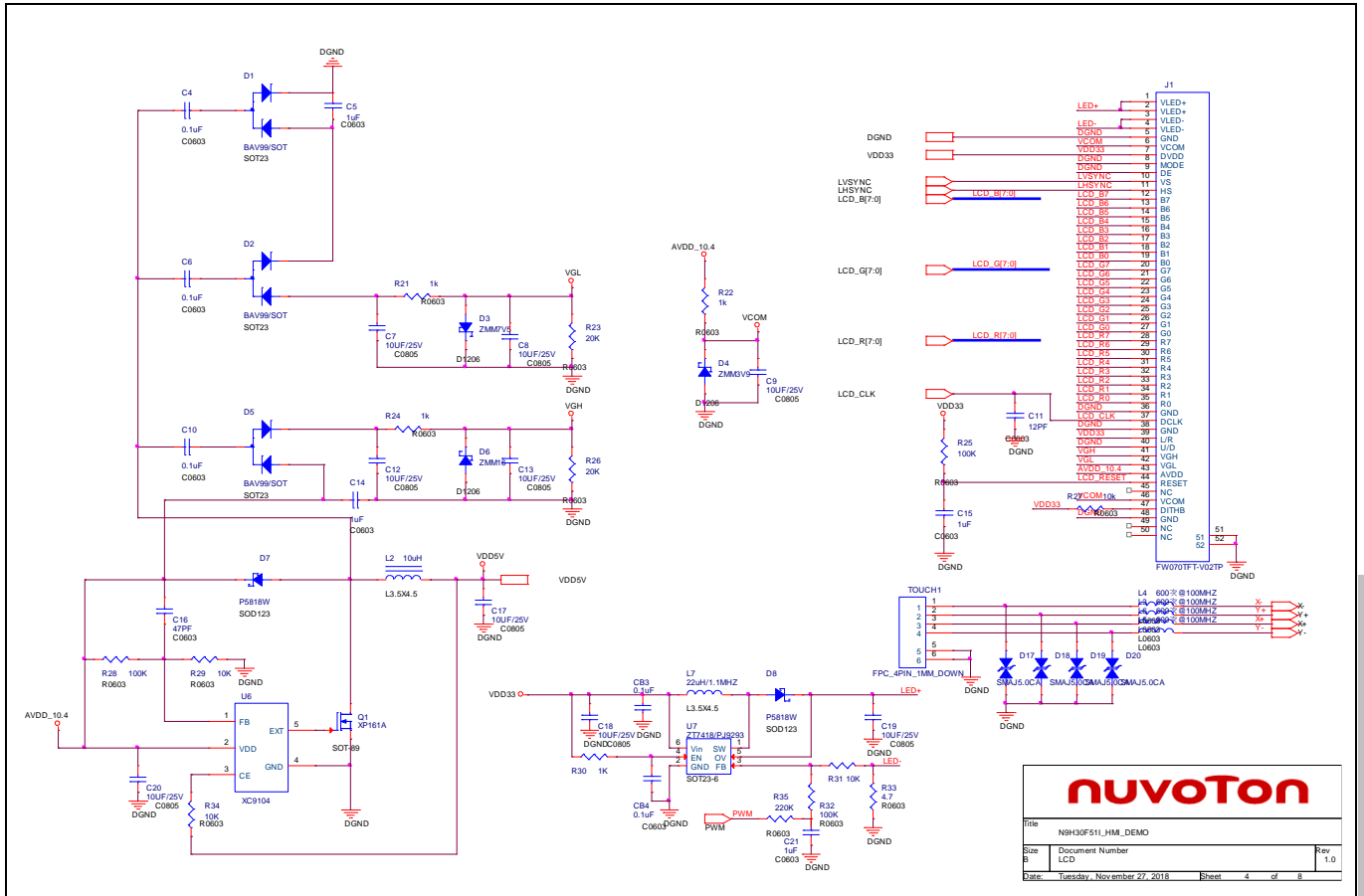
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N9H30F511_HMI_DEMO		
Size	Document Number	Rev
B	MAIN_BLOCK	1.0
Date:	Tuesday, November 27, 2018	Sheet 1 of 8

4.2 Flash Memory



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4.3 LCD Interface



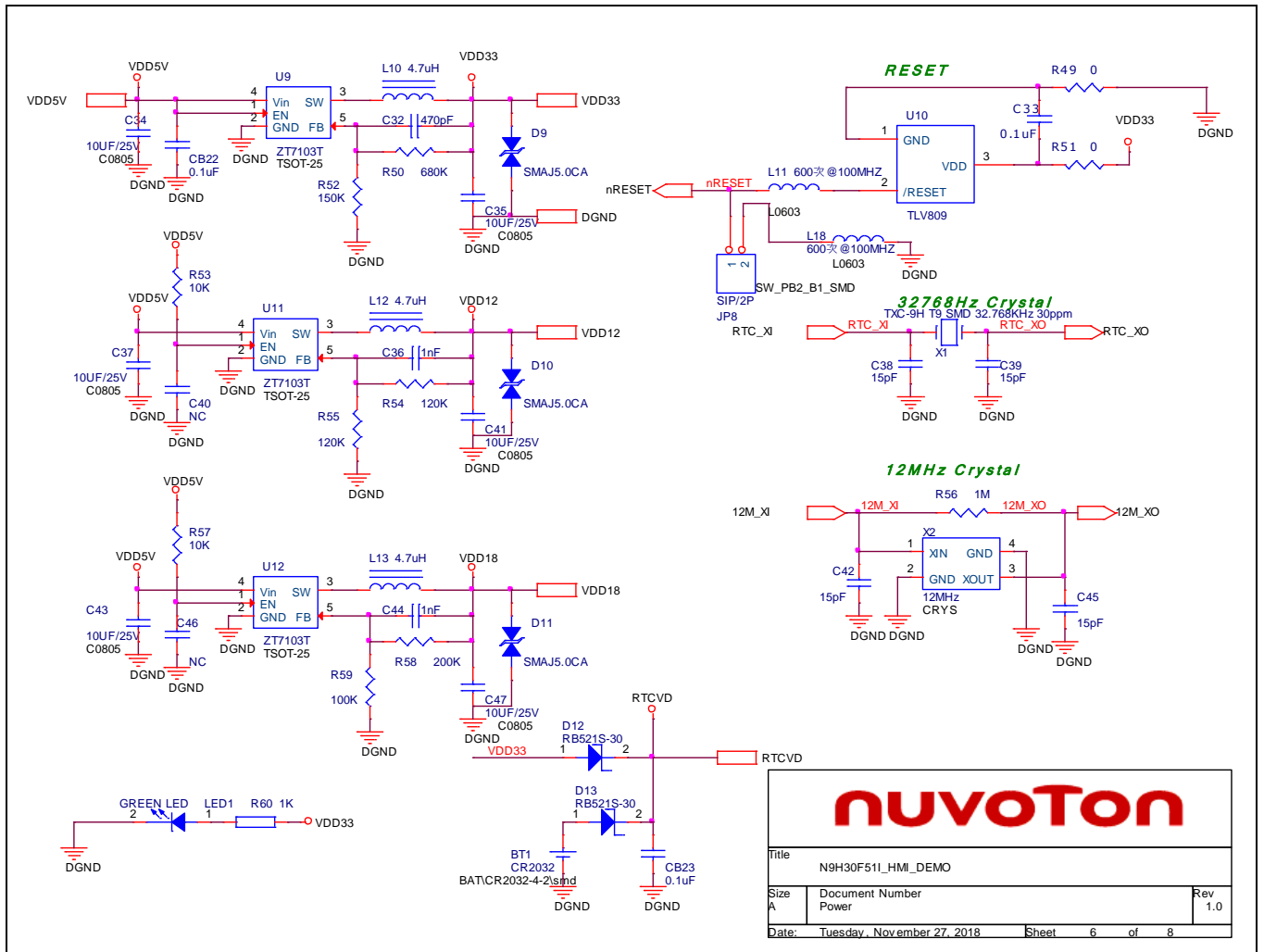
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Rev	3	Document Number	Rev 1.0
Date	Tuesday, November 27, 2018	Sheet	4 of 8

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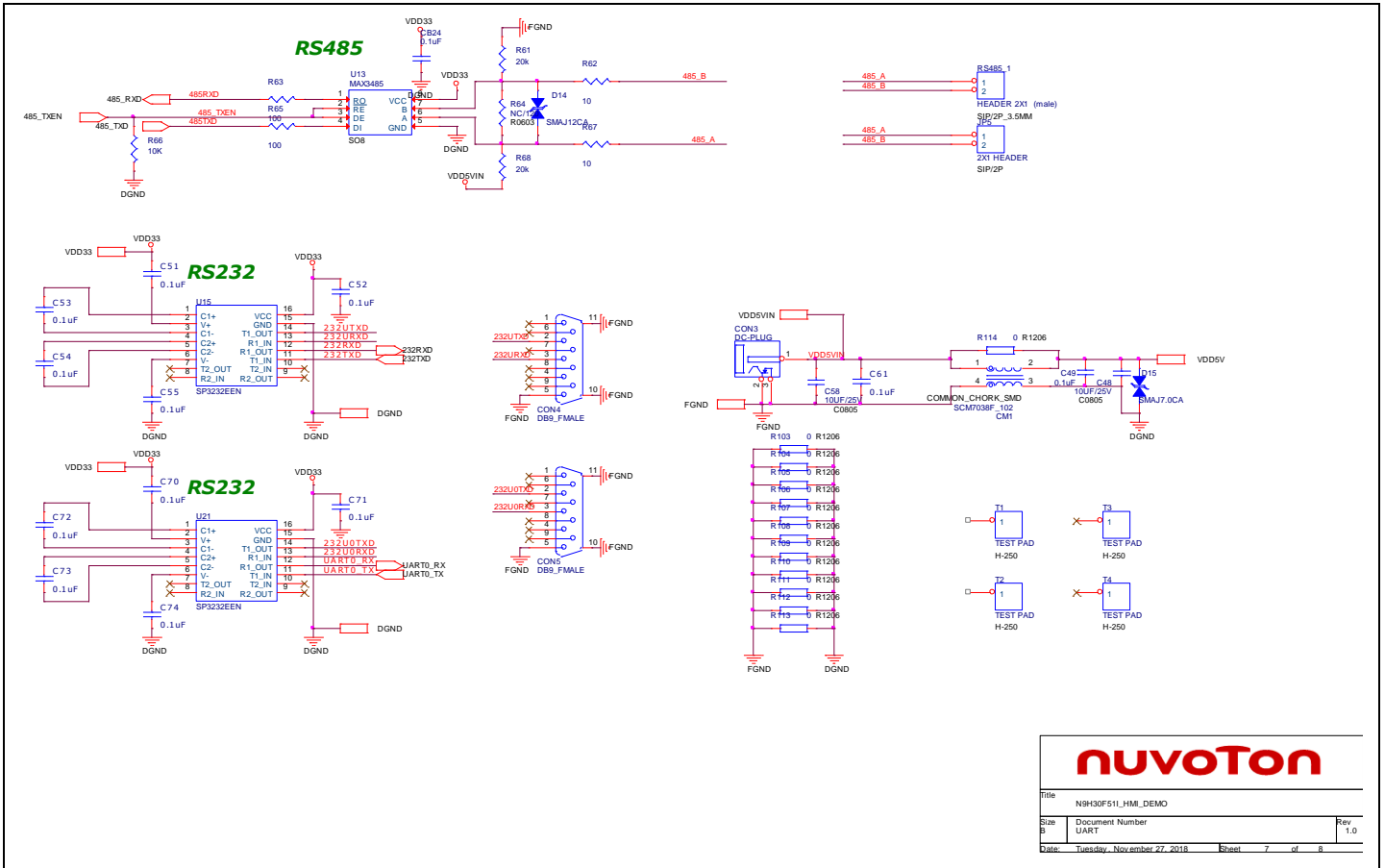
4.5 Power



NUMAKER-EMWIN-RDK-N9H30 USER MANUAL



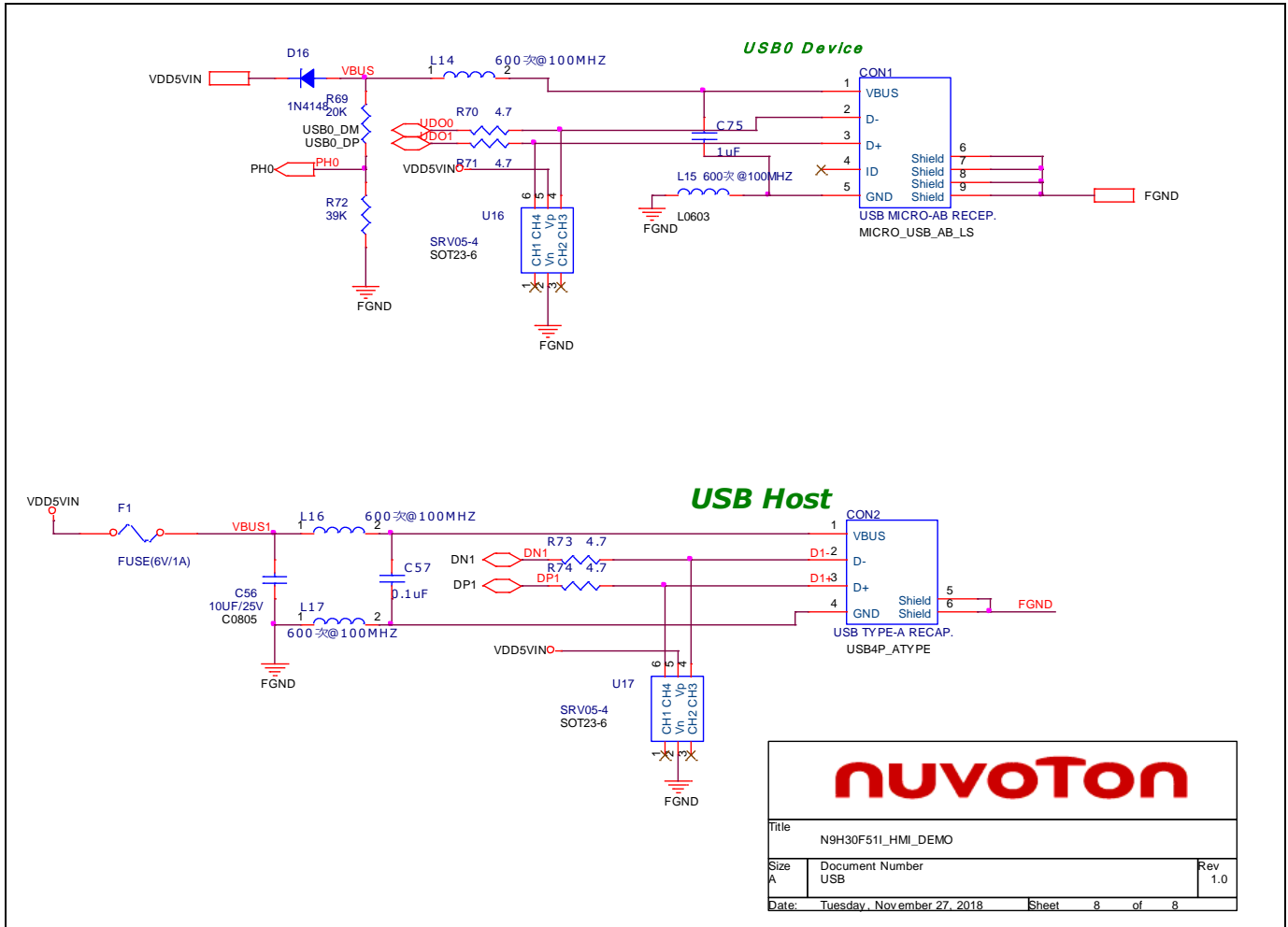
4.6 UART



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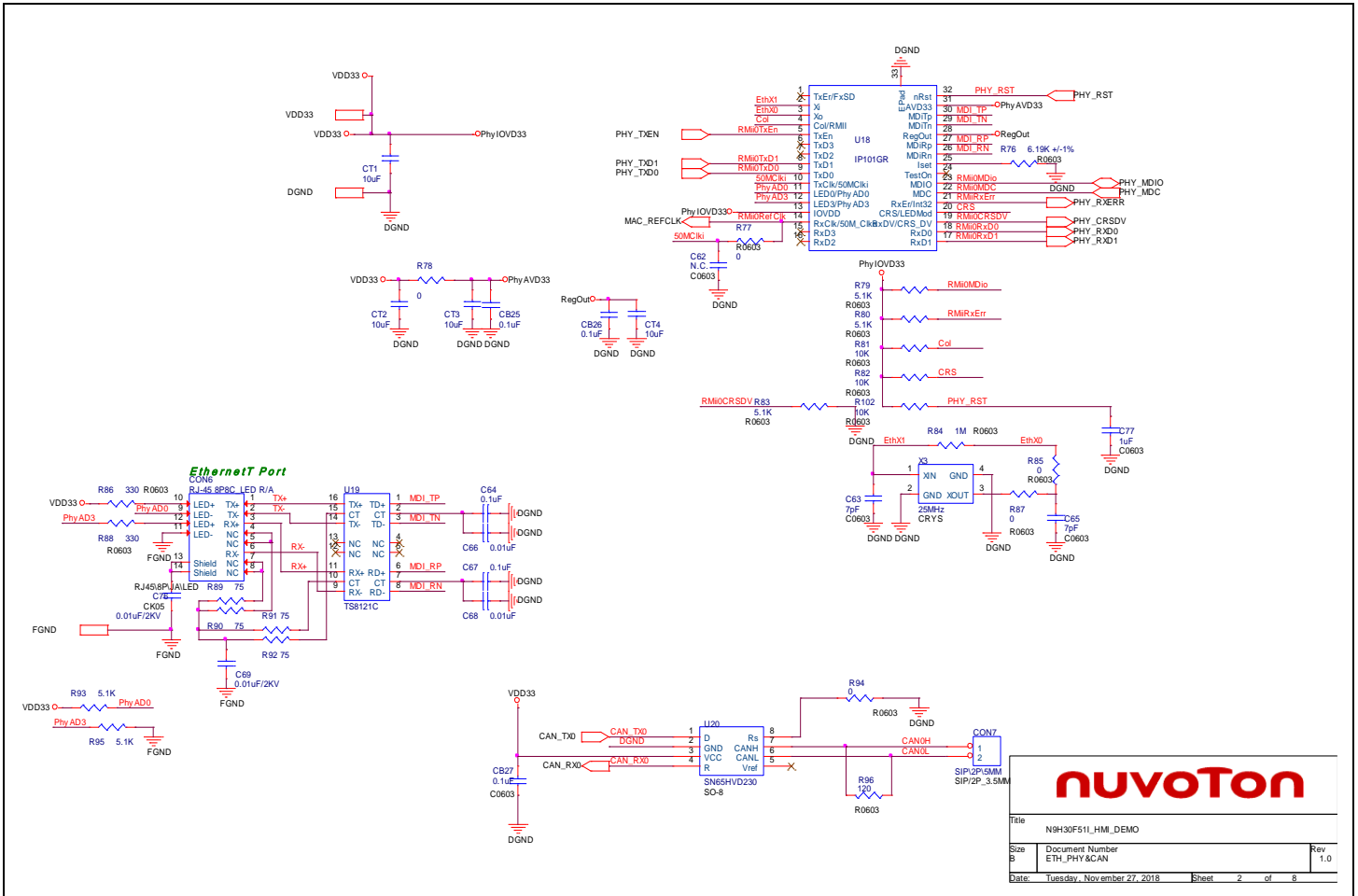
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4.7 USB



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4.8 ETH\_PHY&CAN



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B	ETH_PHY&CAN	1.0
Date:	Tuesday, November 27, 2018	Sheet 2 of 8

NUMAKER-EMWIN-RDK-N9H30 USER MANUAL

## 5 Revision History

Date	Revision	Description
2018.10.03	1.00	1. Initially.
2018.11.27	2.00	1. PCB version 2.1, supports Ethernet and CAN
2021.03.26	2.01	1. Rename NuMaker-emWin-RDK-N9H30

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