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RKNanoD EVK Hardware
User's Guide
(Version 2.2)

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1、Introduction

This document serves as the user guide for the Rockchip RKNanoD Product Evaluation Kit (EVK). Contained in this user guide are about each functional module and details associated with using and configuring the EVK switches, connectors, Keys, test points, and jumpers. The RKNanoD EVK contains the Mother Board,the Main Board and other expansion boards. Contact us for the detail design data bases on EVK board.

Figure 1-1 shows the top view of the Mother Board. And that is no components on the bottom of EVK board.
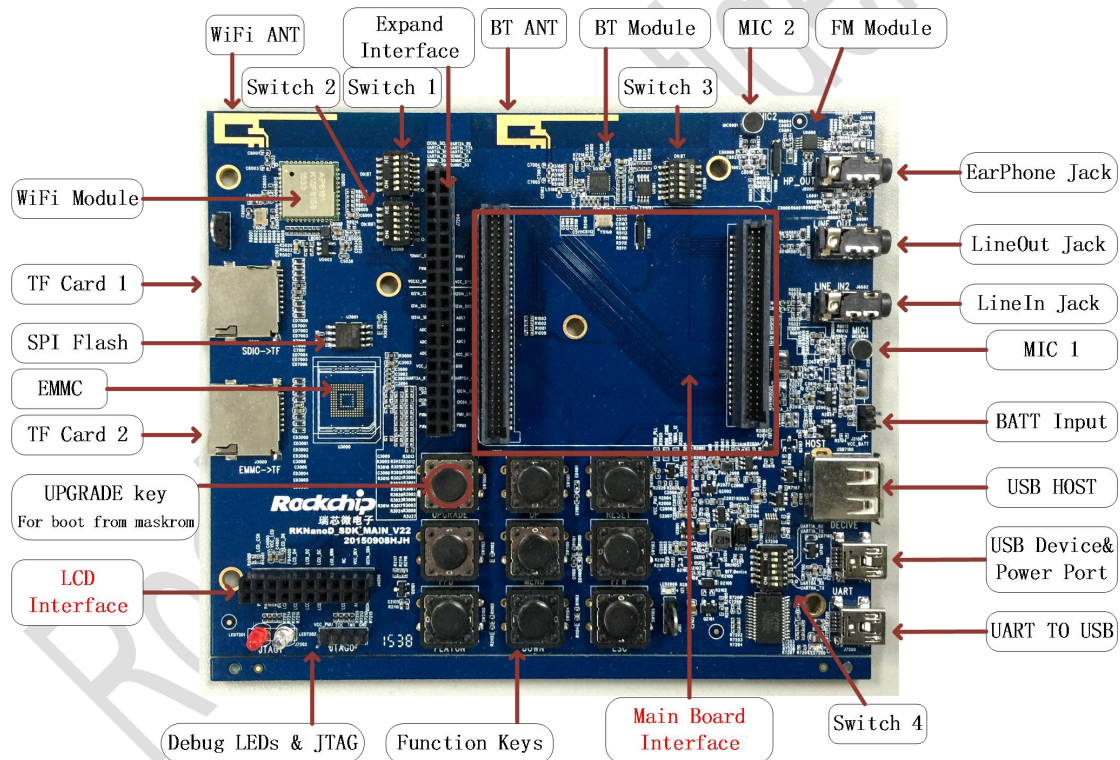

Figure 1-1: Top view of RKNanoD EVK mother board

Figure 1-2 to Figure 1-4 show the top view of the Main Boards, includes three chip packages of NanoD: QFN68, BGA121 and LQFP128.

Figure 1-2: Top view of QFN68 chip package Main Board

Figure 1-3: Top view of BGA121 chip package Main Board

Figure 1-4: Top view of LQFP128 chip package Main Board

Figure 1-5 shows the top view of the LCD Board, which is one of the expansion boards.

Figure 1-5: Top view of LCD Board

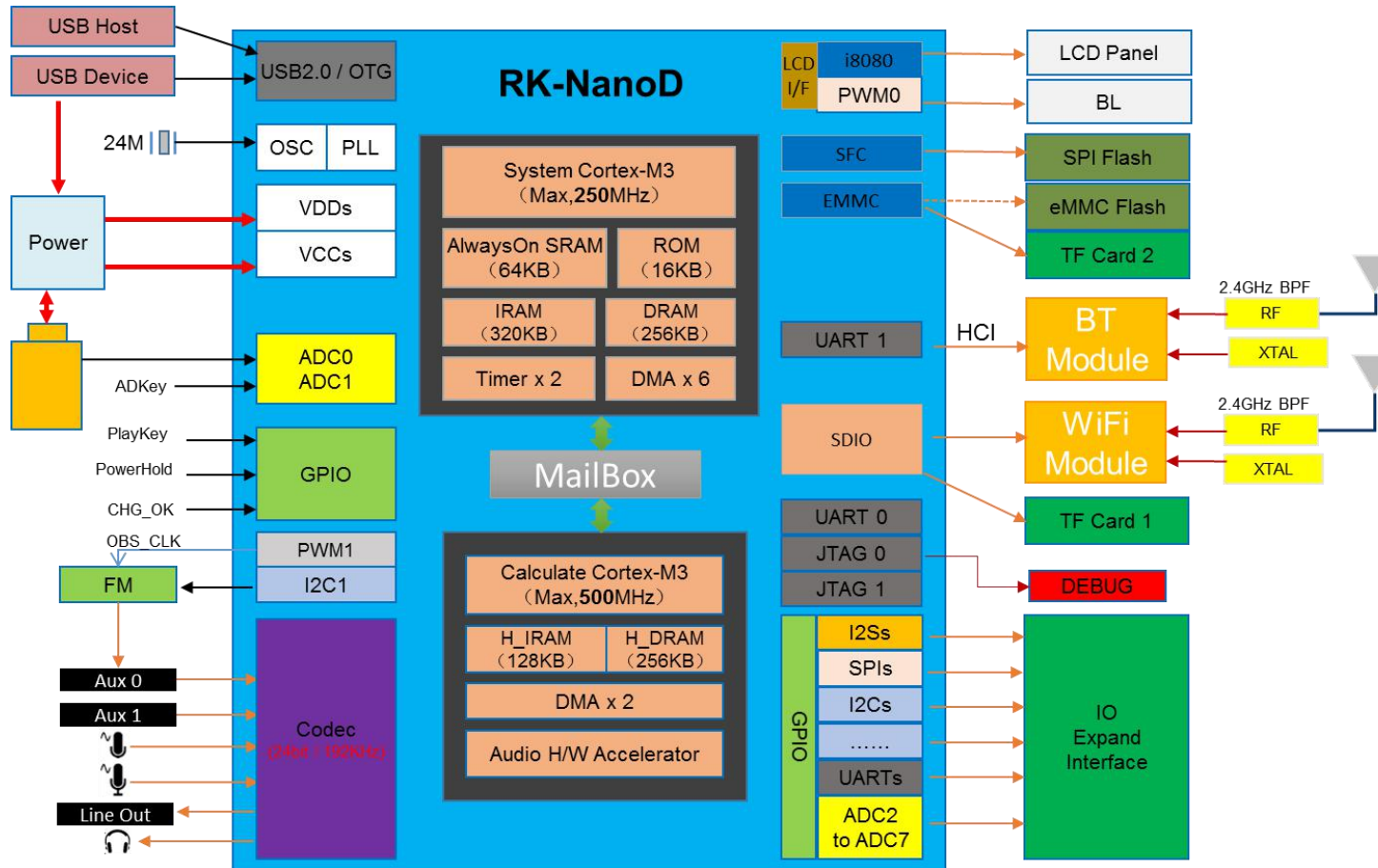Figure 1-6 shows Block diagram of RKNanoD EVK board.

Figure1-6: Block Diagram of RKNanoD EVK board

Table 1 Recommanded Operating Conditions

Parameters	Specifications	Unit
Power Requirements	4.8 to 5.5	V
Relative Humidity	0 to 90	%
Operating Temperature	-10 to 50	℃
Storage Temperature	-40 to 125	℃

CAUTION

Never supply more than 5.5V or an opposite polarity power to the RKNanoD EVK.

Doing so may be damage board components.

2、RKNanoD Processor

RKnanoD is a ARM Cortex-M3 based microcontroller for Wireless Audio, MP3 player and IOT applications.RKnanoD includes two M3 cores , up to 1M Bytes Ram, internal power management unit,high quality audio codec, dedicated hardware MP3 decode accelerator, hardware lossless audio decode accelerator and rich peripheral interface. RKnanoD can support Wi-Fi and Bluetooth protocol without external memory, support 24 bits 192k Hz sample rate lossless audio decoding with low power consumption, and support three power modes.

Figure 2-1 shows Block diagram of RKNanoD chip architecture.

Figure 2-1: RKNanoD Block Diagram

3、Power Supply

3.1 Overview

The RKNanoD have 2 voltage domains and 3 separate power domains, which can be power up/down by software based on different application scenes.The power for whole RKNanoD EVK board comes from battery or the wall adapter (500mA @5V) or USB.

3.2 Power block diagram

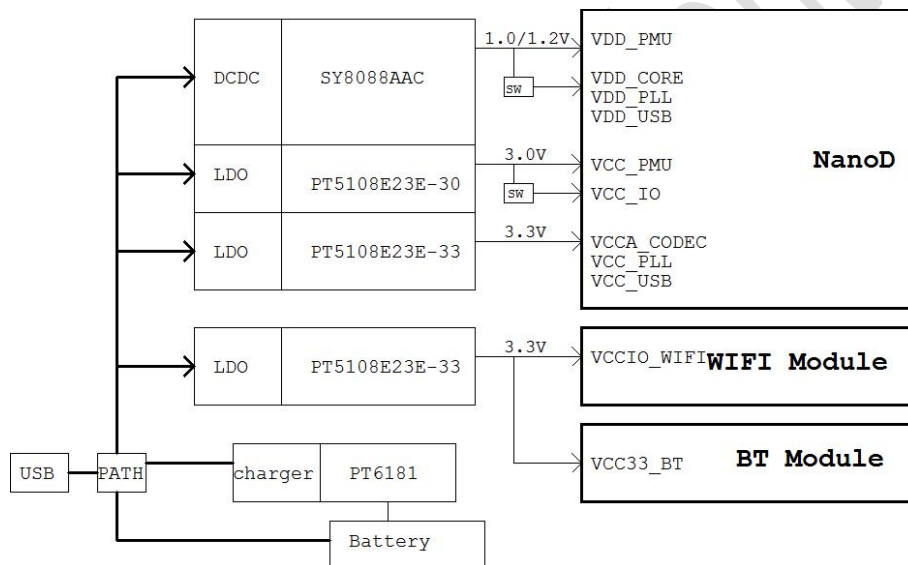Figure 3-1 shows the Power block diagram of RKNanoD EVK board.

Figure 3-1 Power block diagram

More detailed information, please refer to the document "RKNanoD Technical Reference Manual.pdf".

4、Memory

The RKNanoD EVK supports several boot modes, such as eMMC Flash boot, SPI FLASH boot and USB boot. When system is booting, the RKNanoD will read the Memory Chip ID in order, make sure to select the right boot mode. The eMMC Flash boot mode and SPI Flash boot mode are shown as below:
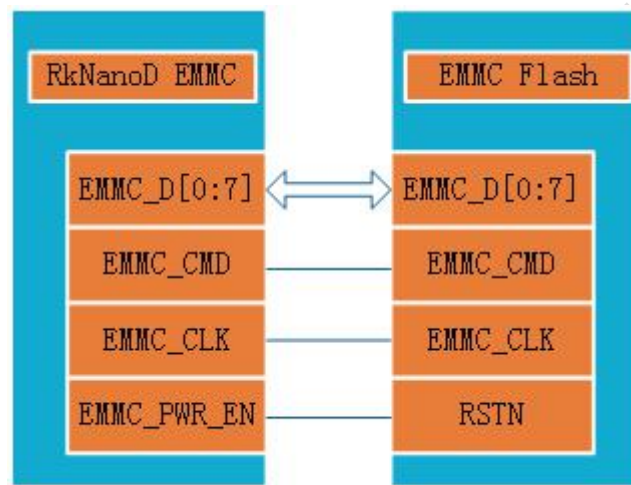
4.1、eMMC Flash

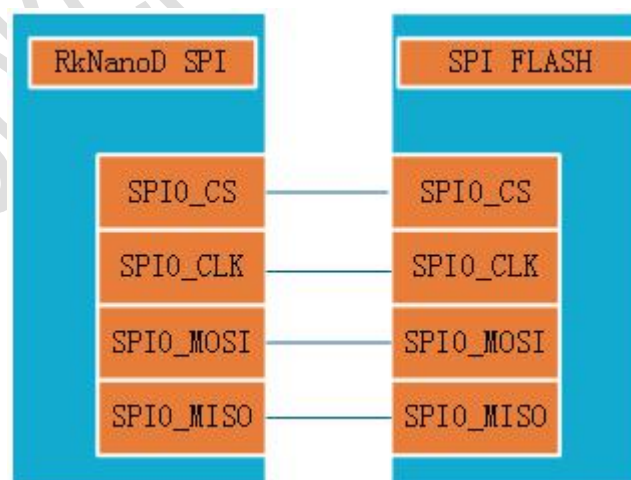Figure 4-1: Connection between RKNanoD and eMMC FLASH

4.2、SPI Flash

Figure 4-2: Connection between RKNanoD and SPI Flash

The RKNanoD EVK supports these three boot modes, but not at the same time. So the EVK select SPI Flash as a default option, if you want to use other boot modes, please refer to the EVK schematic to change the SPI Flash Chip to eMMC.

5、TF Card Interfaces

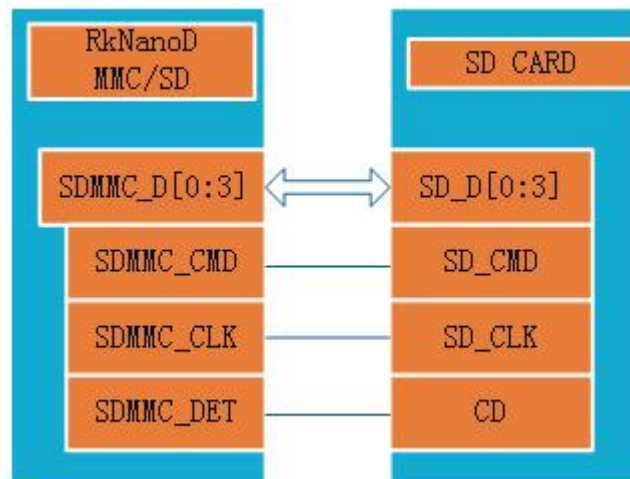RKNanoD supports two channel to connect TF Card, by SD/MMC controller or SDIO port.

Figure 5-1: Connection between RKNanoD and MMC/SD

6、USB OTG

RKNanoD Integrated an USB PHY for USB2.0 high speed which can support USB OTG. Figure 6-1 shows the USB connection.
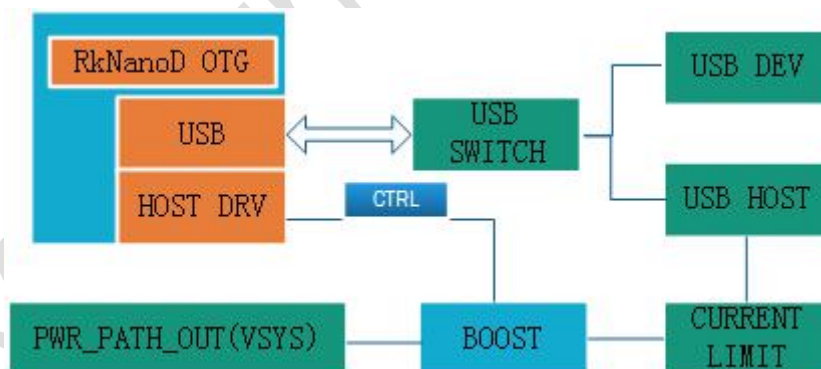

Figure 6-1: USB connection

7、LCD Interface

RKNanoD supports Intel 8080 MCU interface for LCD. The EVK provide a LCD interface for LCD board to compatible with the different LCD panel.
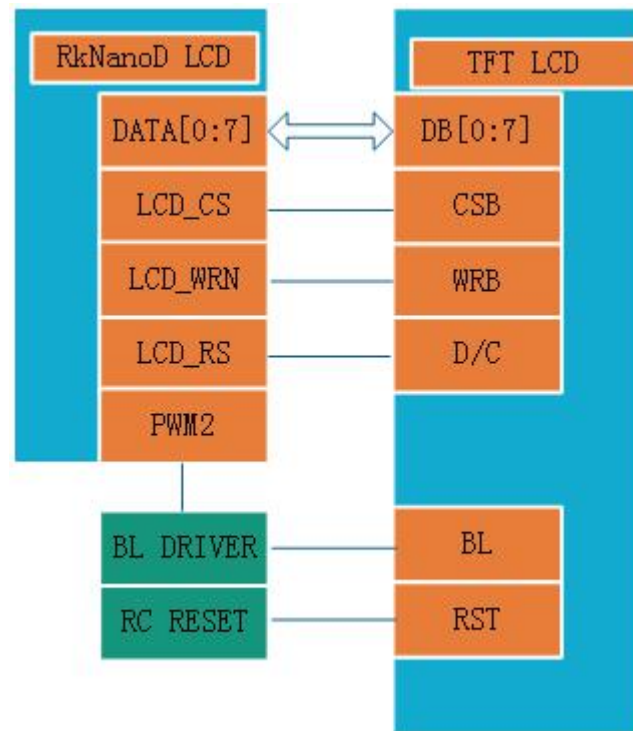

Figure 7-1: LCD connection

8、Expand Interface

If customers want to realize other functions, the expand interface may meet demands. The expand interface is based on the following definitions:

|	
I2C0A_SCL	UART2A_RX
UART2A_TX	UART1A_CTS
UART1A_RST	UART1A_TX
UART1A_RX	SDMMC_D1
SDMMC_D0	SDMMC_CLK
SDMMC_CMD	SDMMC_D3
SDMMC_D2	PWM4
PWM2	GND
VCC33_WIFI	VCC_SYS
I2S1A_CLK	I2S1A_LRCK
I2S1A_SCLK	I2S1A_SDO
I2S1A_SDI	ADC7
ADC6	ADC5
ADC4	ADC3
ADC2	VCC_DEV
VCC_IO	GND
UART2A_RTS	UART2A_CTS
I2C1A_SCL	I2C1A_SDA
I2C0A_SDA	I2C0A_SCL
PWM3	PMU_IDLE
PWM1	PWM0

Figure 8-1: Expand Interface

9、Audio

RKNanoD integrates a Audio-Codec, which supports below features:

Microphone input

Stereo line input

Stereo line output

Stereo virtual-ground headphone output
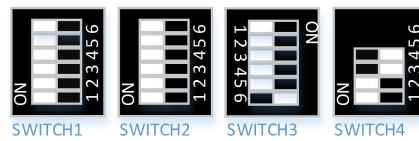
10、Function Configuration

Some functions must use SWITCHes to configure, figure 1-1 shows the locations of each SWITCHes.

Below is a summary of the pin definition on these SWITCHes:
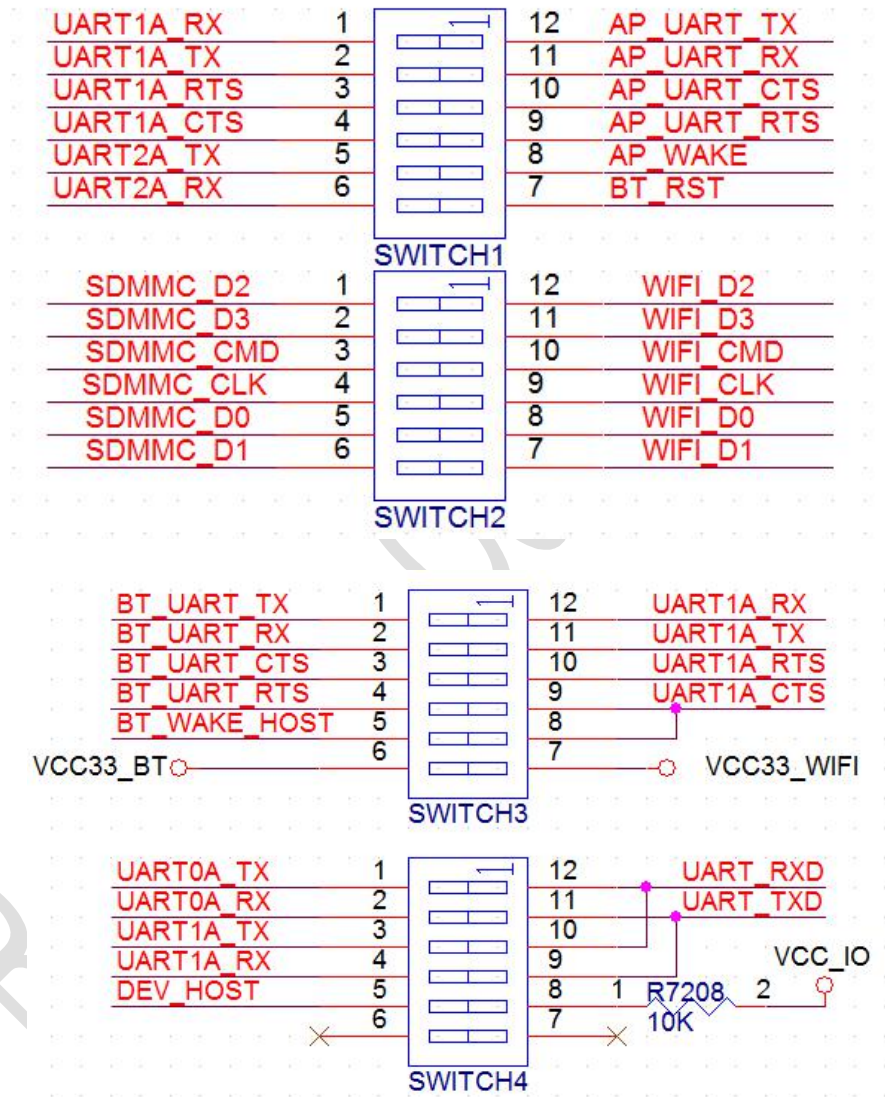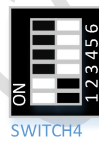
The usage of the SWITCHes are shown below:

WiFi&BT Module：

TF Card 1(SDIO→TF):

RTL8761 BT Module:

UART0 to USB Port:

UART1 to USB Port:

USB HOST:

USB Device:

11、Debug

The RKNanoD EVK provides 3 methods for debugging: read status from the debugging LEDs, through the ULINK-2 emulator, and print logs from UART port.
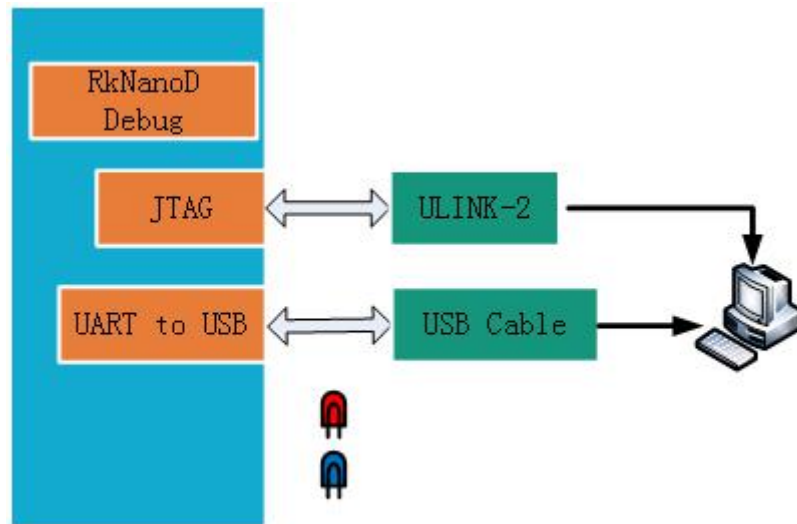

Figure 11-1: Debug Port