Ingenic® PD_JZ4775_NEWTON Development Board

Hardware Manual

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Ingenic PD_JZ4775_NEWTON Development Board

Hardware Manual

Release history

Date	Revision	Change
2014.02	1.0	First release
2014.05	1.1	1. Change the LCD description. 2. Add the part number of J5,J8,J9.

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1 Overview

PD_JZ4775_NEWTON Development Board integrated a nine axes sensor for sports , it contain a gyroscope , a accelerometer and a magnetometer . It also integrated a temperature a humidity sensor （options）, a pressure sensor (options）and a ECG sensor . The sensors in the development board make it can uses for wearable devices and health care products .

This development board had a WIFI+Bluetooth+FM+NFC module , WIFI support 802.11 a/b/g/n protocol and it can work into two band of 2.4 GHz and 5 GHz ; Bluetooth support BT 4.0 & BER & ALE protocol .

It can easily through LCD , SMB , UART , GPIO interface connect to the device of custom .

1.1 Functions of PD_JZ4775_NEWTON

- CPU : 1.0 GHz supports Android, Linux and Mini OS.
- Memory & Flash : KMS5U000JM-B308（4GB eMMC + 3Gb LPDDR）
- LCD/TOUCH : 240X240 1.6" panel with capacitive touch screen , backlight control by software
- Multimedia : Support every multimedia software De/Encoder.
- 2 keys : Can provide soft power on/off and extended application etc.
- USB : Support USB 2.0 device .
- SDIO interface : Connect to WIFI .
- PCM CODEC interface : Connect to the Bluetooth PCM interface .
- UART : Two wires RS232 protocol , connect to the ECG sensor and Bluetooth .
- SMB interface : Control PMU,capacitive touch screen, nine axes sensor, pressure sensor(option), temperature & humidity sensor(option), NFC, Fuel Gauge
- I2S interface : Connect to Digital MIC
- Advanced power manager: Lithium battery charge; support RTC alarm and power up; very low power consumption; battery charging status indicator and battery voltage monitor.

1.2 PD_JZ4775_NEWTON System Architecture

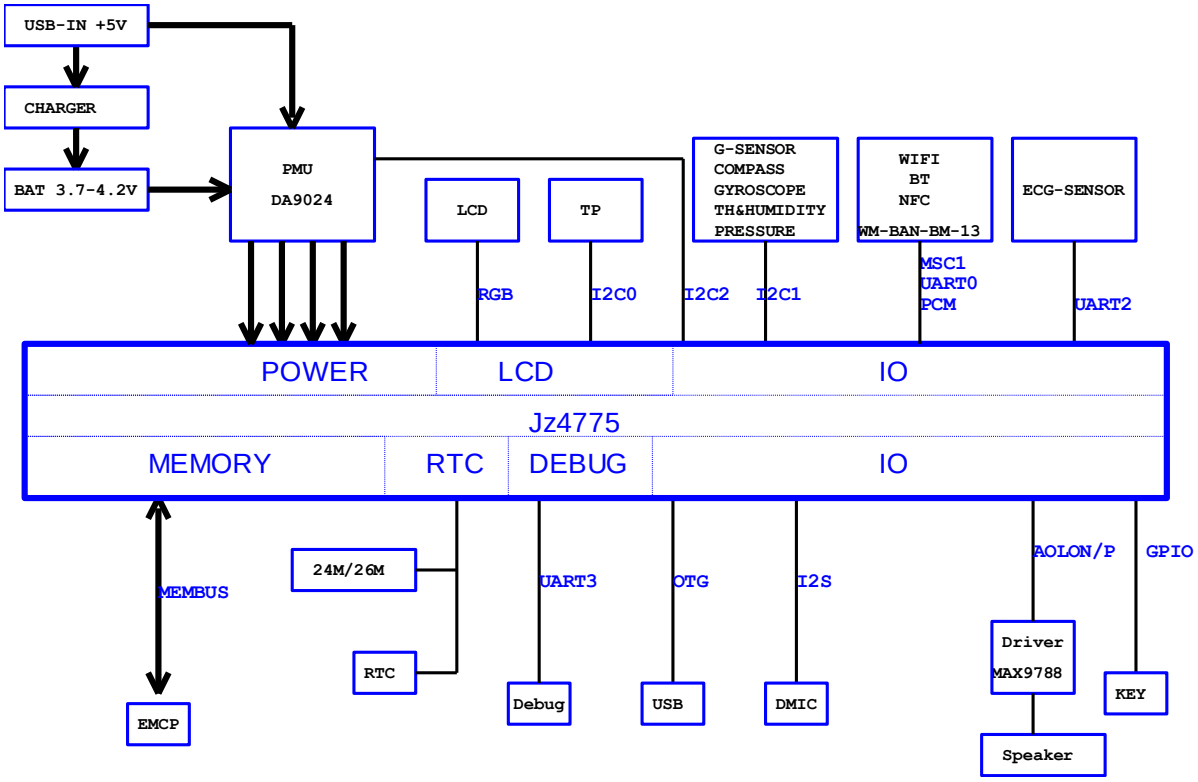

Figure 11 PD_JZ4775_NEWTON System Architecture

2 Hardware Description

In this section, we describe every hardware module of the board. Please refer to the user's guide of JZ4775 first. For the other components, please refer to relative datasheet. For the details of the board, please refer to PD_JZ4775_NEWTON schematic design.

2.1 PD_JZ4775_NEWTON Board Picture

Figure 2-1 shows the picture of the main components and connectors.
Max size is 41.4mmX 21.6mm.

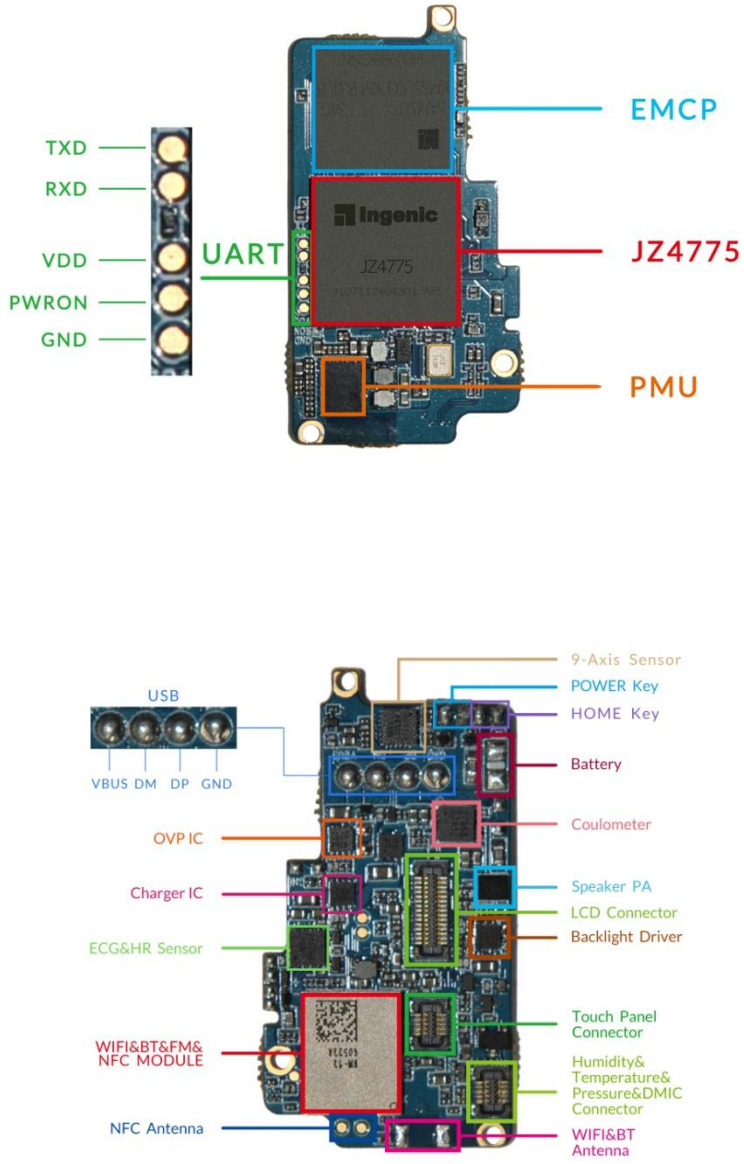

Figure 21 PD_JZ4775_NEWTON board

2.2 Power

PD_JZ4775_NEWTON powered by USB test points, also need a LI battery and it can only get 500mA from the USB.

Connect the LI battery with the board and press the WAKEUP button, the ONKEY signal of PMU will be pulled low. When PMU get this signal , it will powered the system and send out a RESET signal , the system start work. You can press the WAKEUP button keeping a few seconds to shutdown the system (control by software) . When CPU receive the WAKEUP signal , it will control PMU to turn off the power of system by the SMB bus. If there is something out of control , you can press the WAKEUP button for 7.5 second, PMU will turn off the power and then reset the system.

PMU chip is DA9024 of Dialog, powered +3.3V , +1.8V , +1.2V , +2.5V for system , VCORE of DA9024 output +2.5V for RTC controller through a diode .

2.3 System Reset

When power on, PMU provides a RESET signal to CPU. When the system is power on, you can press the WAKEUP button for 7.5 second , then the PMU will output a RESET signal to cpu.

2.4 System boot mode

PD_JZ4775_NEWTON has 2 boot modes:

- USB
- MSC0

Table 2-1 describes the setting of boot start:

Table 21 BOOT SETUP

Hold push key	Boot From
WAKEUP KEY	USB Boot
NONE	MSC0 Boot (default)

2.5 SYSTEM MEMORY (LPDDR)

PD_JZ4775_NEWTON use eMCP, content EMMC & LPDDR , 32bit width , 3Gbit.

2.6 Flash

PD_JZ4775_NEWTON use eMCP, content EMMC & LPDDR , memory size is 4G Byte .

2.7 LCD interface and Expansion card

2.7.1 LCD interface definition

PD_JZ4775_NEWTON integrated a LCD connector J5(BM10NB(0.8)-30DS-0.4V(51)), default is a smart LCD interface .

Table 22 LCD Interface（J5）Signals Definition

Pin Number	Signal	Pin Number	Signal
1	VCI33	2	VCI33
3	VDDIO18	4	BUS_SEL
5	LCD_RESET	6	NCS
7	DNC	8	GND
9	WR_E	10	RD_E
11	GND	12	DB7
13	DB6	14	DB5
15	DB4	16	DB3
17	DB2	18	DB1
19	DB0	20	SDA
21	LCD_BUSY	22	TE
23	VLED+	24	VLED-
25	NC	26	NC
27	NC	28	NC
29	NC	30	GND

There are some special signals: 1-LCD_SPL; 2-LCD_CLS; 3-LCD_PS; 4-LCD_REV. For details please refer to JZ4775 datasheet.

The back light control chip is SGM3733BYTDI6G/TR in the main board, control by PWM of CPU, the max current is 20mA .

2.7.2 Touch screen interface

J8 (BM10NB(0.8)-10DS-0.4V(51)) is the touch screen connector. The signal of J8 is defined in the Table 2-3 .

Table 2-3 Touch Screen Connector (J8) Definition

Pin Number	Signal	Pin Number	Signal
1	VDDA33	2	IRQ
3	NC	4	SCL
5	GND	6	SDA
7	NC	8	RESET
9	GND	10	VDD18

2.8 USB interface

PD_JZ4775_NEWTON support USB 2.0 device, it has 4 test points. When you insert the USB, the board will be power on .

2.9 Audio System

2.9.1 MIC

JZ4775 provides an internal AC97/I2S audio CODEC and 24bits DAC/ADC. User can connect other external CODEC.

PD_JZ4775_NEWTON support digital MIC in the external board (optional).

2.9.3 Speaker

PD_JZ4775_NEWTON can drive a piezoelectric ceramic loudspeaker .

2.10 WIFI&BT&NFC

PD_JZ4775_NEWTON integrated a WM-BAN-BM-13 module, which can communicate to other device with WIFI or BT or NFC .

2.11 Keypad Interface

There are two keys , one is WAKEUP key and another is HOME key .

2.12 ECG sensor

The ECG sensor on the board can monitor the health of body, it can communicate to CPU by UART2.

2.13 Nine Axes sensor

The nine axes sensor contain gyroscope, accelerometer, magnetometer, and it will transmission the signal to CPU by SMB1 bus.

2.14 Extend DMIC & Temperature & Humidity sensor

The connector of J9 (BM10NB(0.8)-10DS-0.4V(51)) can extend DMIC & Temperature & Humidity sensor. The signal definition of J9 is in the Table 2-4.

Table 2-4 DMIC & Temperature & Humidity senor connector J9 signal definition

Pin Number	Signal	Pin Number	Signal
1	VCC_PRESS_18	2	GND
3	DMIC_LR	4	CLK
5	DMIC_DOUT	6	GND
7	GND	8	SMB1_SDA
9	SMB1_SCK	10	GND

2.15 Debug interface

There are four UART3 points on the board, you can connect the test points to the UART external board for debug .

3 Quick start PD_JZ4775_NEWTON

When you get the PD_JZ4775_NEWTON board, it has been initialized with Android system. Before power on the board, please do the following step:

- Connecting debug port to serial port , the data configuration is 57600-8-n-1 ;
- Connecting battery and USB ;

Keys introduction：

- WAKEUP key: system power on/off and wakeup manual. Long pushing will turn on the board, once again will turn it off. When in sleep mode, long pushing will wake up the system; If trouble occurs , press this button for 7.5 second will reset the system .
- HOME key： system will return the home screen.

Start Android system:

After power on the board, there will be output on the console via serial port and LCD panel. After a moment, the demo application will be launched; you will go into a rich and colorful multimedia world.