Doc Name	DL2103B-QCA4004 User's Manual		
Doc No.	DL-YJ-20150516-001	Version	1.1.2
Prepare: Biao Sun		Check :	Approve:
Prepare Date: Mar. 28, 2016		Check Date:	Approve Date:

DL2103B-QCA4004 User's Manual

Hangzhou Delan Technology Co., Ltd

Version History

Version	Revised Date	Revised by	Participant	Revision Contents	Remarks
1.1.2	July.16th, 2016	Biao Sun		First Released	

Contents

1 Introduction

1.1 *Summary*

1.1.1 Features

Support 802.11 b/g/n Wireless Standards.

WIFI @2.4GHz, support WPA / WPA2 safe mode.

Support different working mode: STA / AP / STA+AP.

Support multiple network protocols

Support remote upgrading

Option on board antenna or external antenna

Support UART、GPIO interface

Ultra compact size：15mm * 30mm * 3.5mm SMD package

Support low power consumption

SRRC Authentication

RoHS compliant

1.1.2 Basic Parameters

Types	Parameters	Value
Wireless	Standard	802.11b/g/n
	Frequency	2.412GHZ-2.462GHZ
	Transmit Power	802.11b：15.59±1dBm
		802.11g：15.37±1dBm
		802.11n：15.16±1dBm
	Receiver Sensitivity	802.11b：-76dBm(@11Mbps,CCK)
		802.11g：-65dBm(@54Mbps,OFDM)
		802.11n：-64dBm(@HT20,MCS7)
	Antenna	Internal: default
Hardware	Data Interface	UART
		GPIO
	Operating Voltage	2.9~3.6V
	Operating Current	Consistently sending: ~200mA Normal mode:average: ~50mA, peak：~200mA Low power mode：~10mA，peak：~200mA
	Operating Temp	-20~70℃
	Storage Temp	-45~125℃
	Dimensions	15mm * 30mm * 3.5mm
Software	Network Type	AP/STA
	Security Mechanisms	WEP/WPA-PSK/WPA2-PSK
	Update Firmware	WEP64/WEP128/TKIP/AES
	Encryption	Local, remote
	Customization	Support SDK
	Network Protocol	IPv4、TCP/UDP
	User configuration	One button network configuration Connect to cloud server for free

1.1.3 Main Applications

Handhold devices

Smart medical

Wireless control in industry
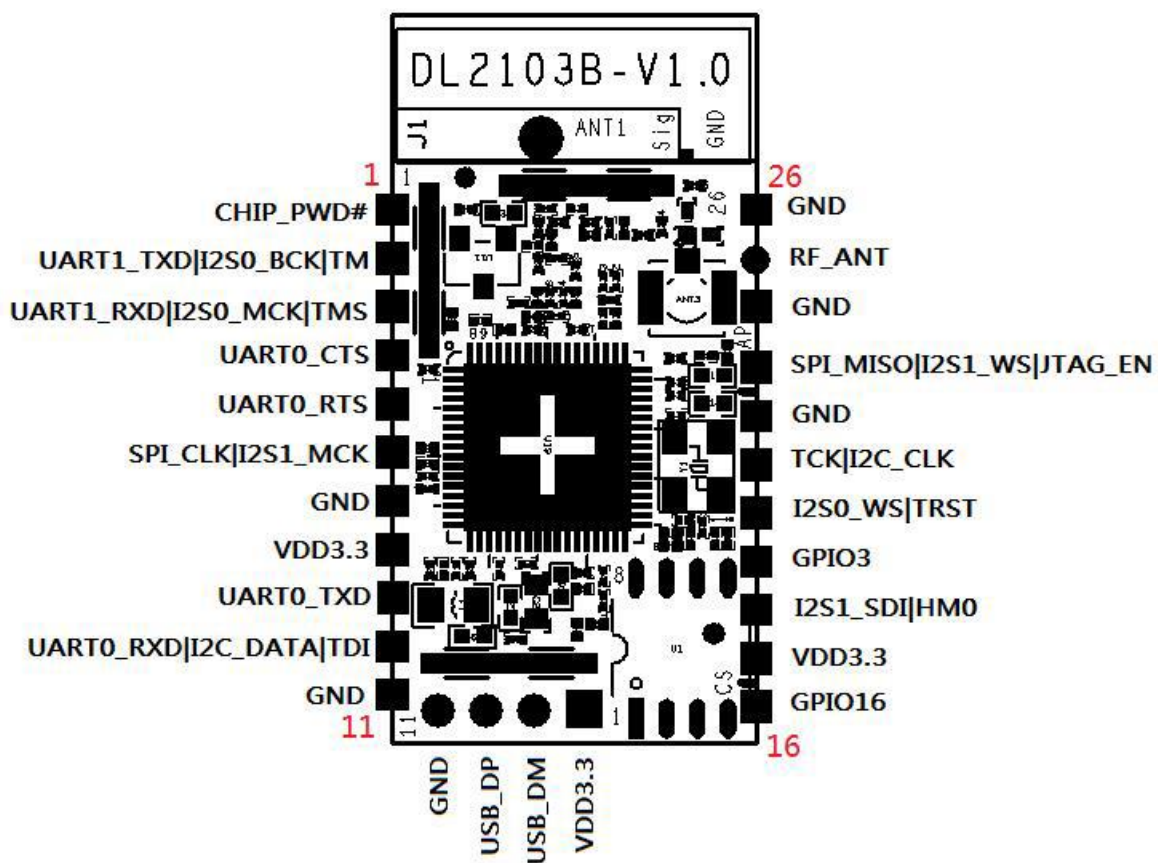
Remote monitor

Internet of Things

Wireless Sensor & Industrial Control

Smart Wearables

Light Control

1.2 Introduction of hardware

1.2.1 Pin Definitions

Pin	Network Label	Characteristic	Description
1	CHIP_PWD#	O，TTL3.3V	4004 hardware reset， inner
2	UART1_TXD|I2S0_BCK |TM	O，TTL3.3V	UART1_TXD debug serial port TXD
3	UART1_RXD|I2S0_MC	I，TTL3.3V	UART1_RXD debug serial

	K|TMS		port RXD
4	UART0_CTS	O，TTL3.3V	GPIO/ UART0_CTS
5	UART0_RTS	O，TTL3.3V	GPIO/UART0_RTS
6	SPI_CLK|I2S1_MCK	O，TTL3.3V	
8、17	VDD3.3	3.3V	Power
9	UART0_TXD	O，TTL3.3V	UART0_TXD digital serial port TXD
10	UART0_RXD|I2C_DATA|TDI	I，TTL3.3V	UART0_RXD digital serial port RXD，external pull-up 4.7K when use as I2C
12	GND	GND	Power
13	UART0_RXD	O，TTL3.3V	The same with PIN 10
14	UART0_TXD	I，TTL3.3V	The same with PIN 9
15	VDD3.3	3.3V	
16	GPIO16	I，up 10K，TTL3.3V	Flash chip hardware reset signal
21	TCK|I2C_CLK	O，TTL3.3V	reserve, external pull-up 4.7K when use as I2C
20	I2S0_WS|TRST	O，TTL3.3V	GPIO/ SPIM_CS1/LED
18	HM0	TTL3.3V	Mode configuration pin，users can't use
19	GPIO3	TTL3.3V	Reserve GPIO
23	SPI_MISO|I2S1_WS|JTAG_EN	I，up 10K，TTL3.3V	Short circuit choose AP or STA， default high level,lower 5s into the AP
25	RF_ANT	O	RF output，can use

			external antenna，default PCB antenna
7、11、22、24、26	GND	GND	Ground

Instruction：

I-input；O-output ；Power-；GND：ground

USB_DP:USB's positive；

USB_DM:USB's negative；this USB is used for calibration.

1.2.2 Electrical Characteristics

Electrical Characteristics

Parameter	Condition	minimum	Typical value	maximum	unit
Storage temperature		-45		125	℃
Maximum welding temperature				260	℃
Working voltage		0	3.3	3.6	V
I/O voltage		0		3.3	V
Electrostatic release (human model)	TAMB=25℃		2		KV

Power supply & consumption

| Parameter	Condition	minimum	Typical value	maximum	unit
Working voltage		2.9	3.3	3.6	V
Working current,peak			200	300	mA
Working current			60		mA
Working current(low power)			10		mA
Maximum output level		2.2		3.3	V
Minimum output level		0		0.4	V
Maximum input level		1.8		3.6	V
Minimum input level		-0.3		0.3	V

1.2.3 Mechanical Dimensions

The physical size of the DL2103B (unit: mm): 15 * 30 *3.5.

1.2.4 Antenna

1.2.4.1、Build-in antenna

1. Internal antenna is default. If you choose internal antenna, you'd to pay attention to the followings:

2. The place where antenna sets should be clear.

3. Antenna should be far from metal, 10mm at least away from high devices.

4. No metal shell where antenna set.

5. To reduce possible influence on wireless signal from your PCB, Suggested locations of DL2103B in your PCB are as follows:
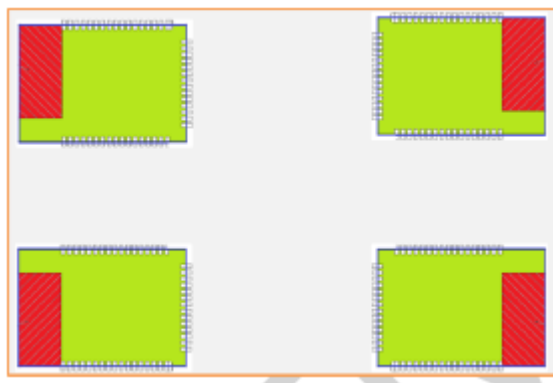
1.2.4.2、External

DL2103B offers interface of external antenna, weld antenna to pin 26（RF_ANT）, and weld R1 too. Or weld an IPEX basement, short circuit the public pin of R1 and L27 with two pins of IPEX.
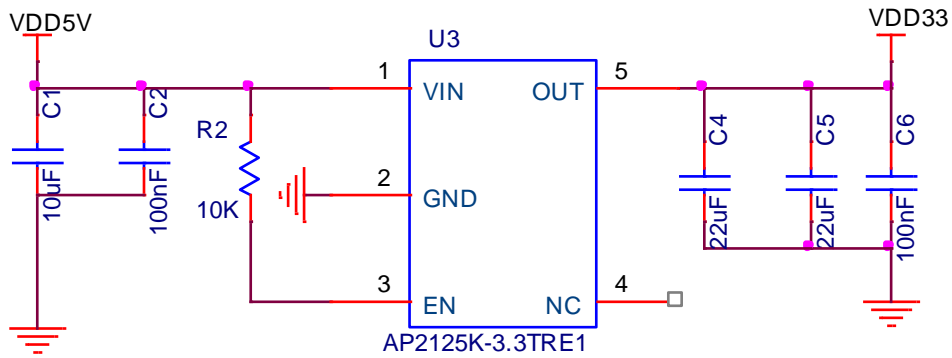
Parameters of external antenna are as follows:

Item	Parameter
Frequency	2.4~2.5GHZ
Impedance	50 Ohm
VSWR	2(max)
Return Loss	-10dB（Max）
Connection Type	Choose according to the actual condition.

1.2.5 Power supply circuits
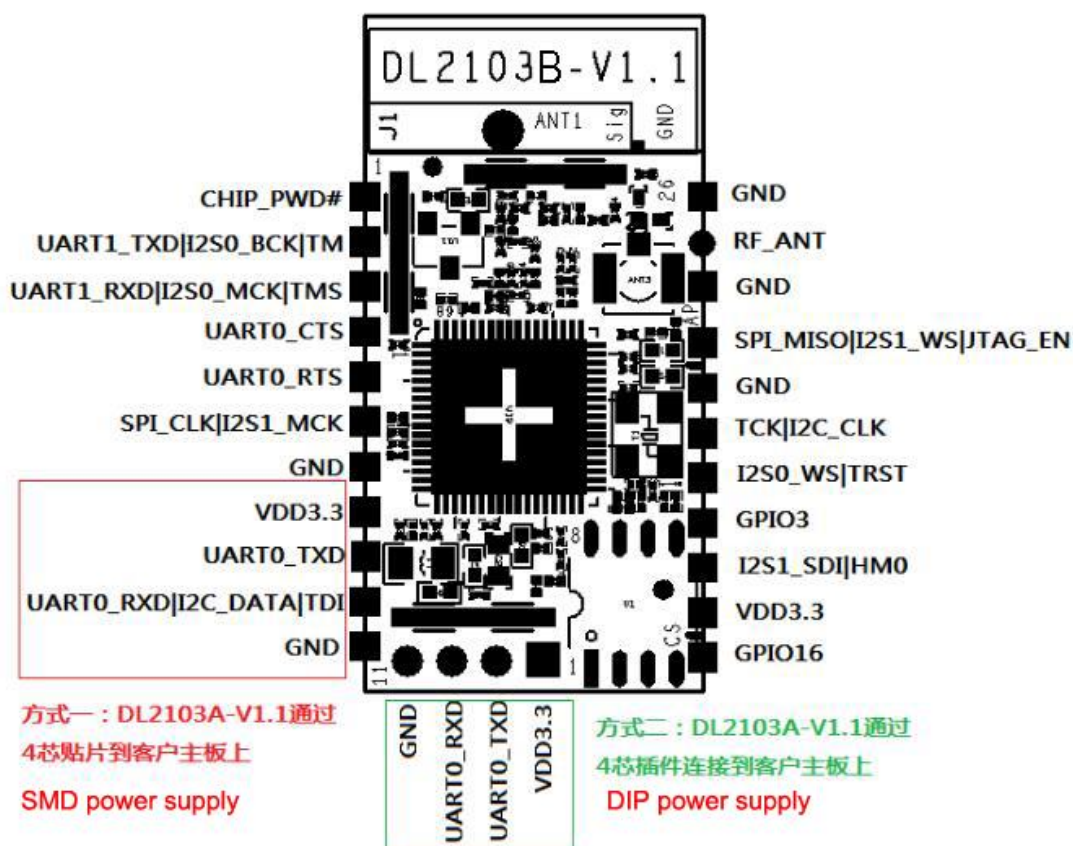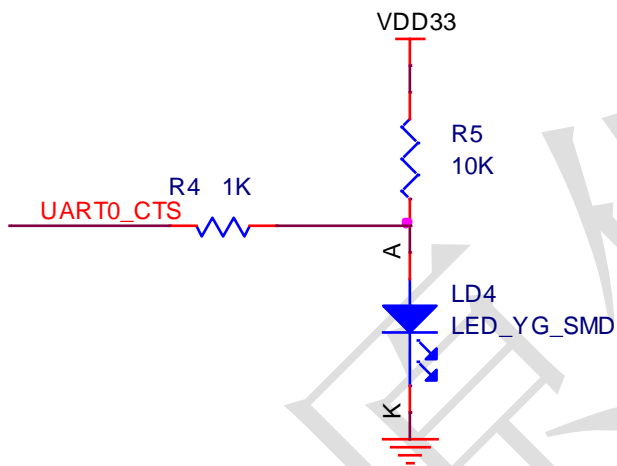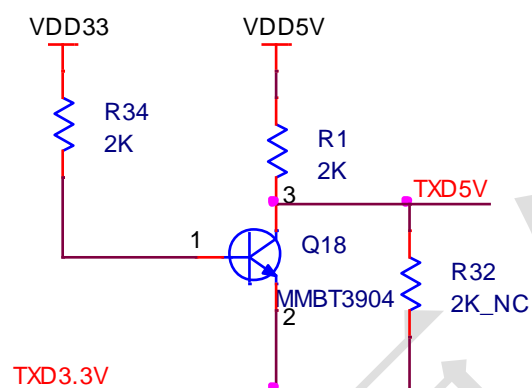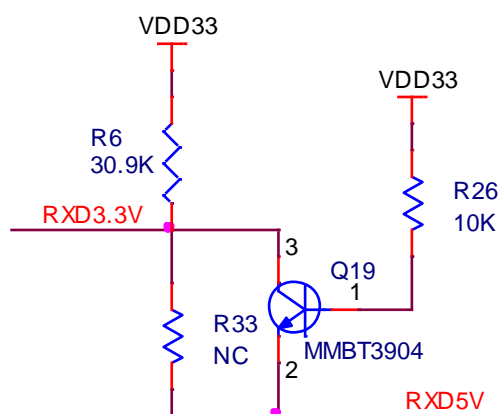
1.2.6 Peripheral circuits

Reference Peripheral circuits (Transform 5V into 3.3V)
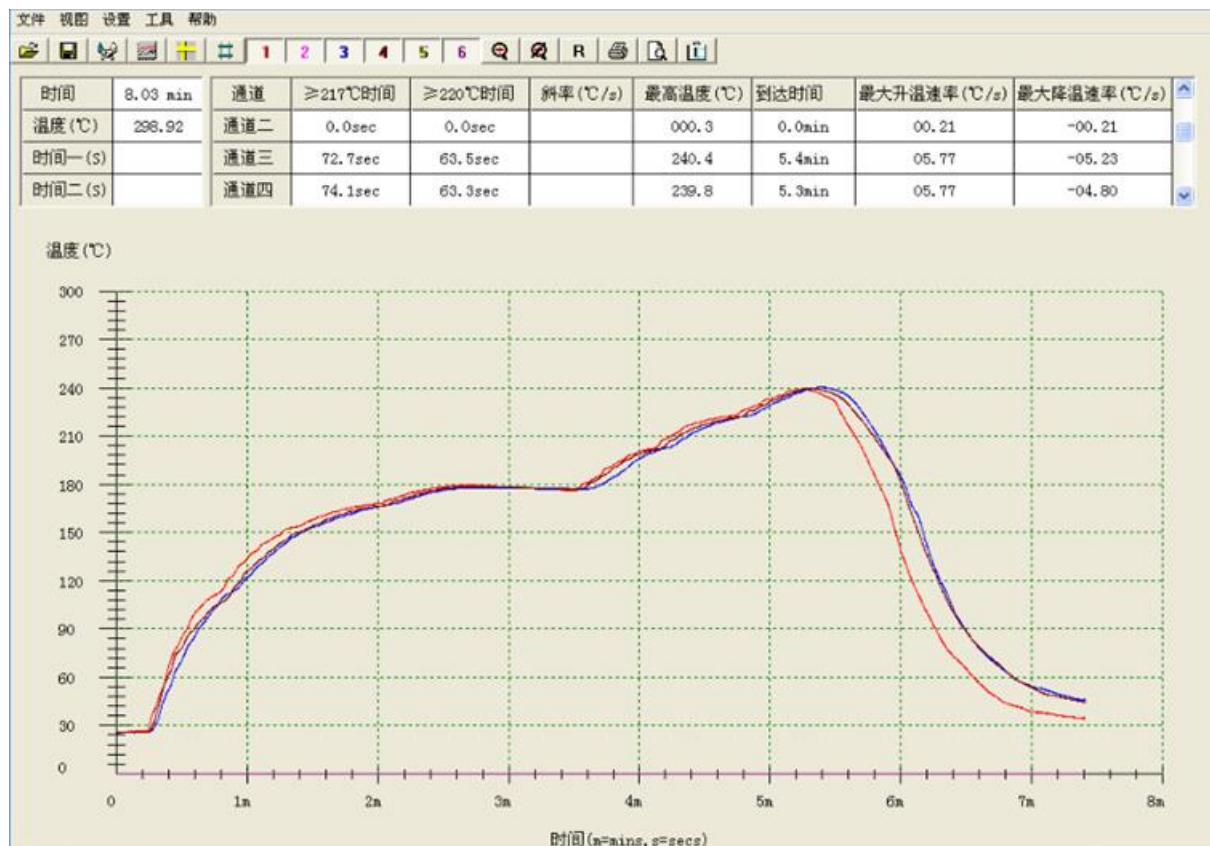

Single indicator reference circuit

Convert circuit between serial port 5VTTL and 3.3VTTL

1.2.7 Precautions in designing your PCB

1) Please use the standard schematic DELAN offered and the general PCB package.

2) When you design your PCB near the antenna, please send your design to us to review.

1.2.8 Furnace temperature curve

时间	8.03 min	通道	≥217℃时间	≥220℃时间	斜率(℃/s)	最高温度(℃)	到达时间	最大升温速率(℃/s)	最大降温速率(℃/s)
温度(℃)	298.92	通道二	0.0sec	0.0sec		000.3	0.0min	00.21	-00.21
时间一(s)		通道三	72.7sec	63.5sec		240.4	5.4min	05.77	-05.23
时间二(s)		通道四	74.1sec	63.3sec		239.8	5.3min	05.77	-04.80

温度(℃)

时间(m=mins,s=secs)

FCC STATEMENT :

This device complies with Part 15 of the FCC Rules. Operation is subject to the

following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may

cause undesired operation.

Warning: Changes or modifications not expressly approved by the party responsible

for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class

B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to

provide reasonable protection against harmful interference in a residential installation.

This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.

Increase the separation between the equipment and receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

FCC INFORMATION (additional)

OEM INTEGRATION INSTRUCTIONS:
This device is intended only for OEM integrators under the following conditions: The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the internal antenna(s) that has been originally tested and certified with this module. As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Validity of using the module certification:
In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End product labeling:
This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: 2AILF-DL2103B".

Information that must be placed in the end user manual:
The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.
This device must be kept away from all persons by 20cm or more and installations using less distance, or installations using antennas with gain greater than that with which this was Certified will require additional approvals.
Antenna Specification:
Type: PCB Antenna
Model: DL2103B
Brand: N.A.
Gain: 3dBi