Doc Name	DL2106A-ESP8266 User's Manual		
Doc No.	DL-DS-20160328-001	Version	1.0.0
Prepare: Murphy Shawn	Check:	Approve:	
Prepare Date: Mar. 28, 2016	Check Date:	Approve Date:	

DL2106A-ESP8266 User's Manual

Hangzhou Delan Technology Co., Ltd

Version History

Version	Revised Date	Revised by	Participant	Revision Contents	Remarks
1.0.0	Mar. 28, 2016	Murphy Shawn		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.

Micro Sizes: 15mm * 30mm * 3.5mm.

10 bit high precision ADC inside.

TCP/IP protocol stack inside.

TR switch, BALUN, LNA, PA (Power Amplifier) and network configuration inside.

PLL, Stabilizer and power management tools inside.

Holding current is 10μA, turn-off current is less than 5μA.

Low power 32 bit MCU inside, which can also be an application processor.

Support SDIO 2.0, SPI, UART and other interfaces.

Working temperature: from -40℃ to 125℃.

1.1.2 Basic Parameters

Types	Parameters	Value
Wireless	Certification	CCC / FCC / CE
	Standard	802.11b/g/n
	Frequency	2412MHZ-2462MHZ
	Transmit Power	802.11b: 16.95±1dBm
		802.11g: 14.96±1dBm
		802.11n: 14.86±1dBm
	Receiver Sensitivity	802.11b: (11Mbps) -91dBm
		802.11g: (54Mbps) -75dBm
		802.11n: (MCS7) -72dBm
	Antenna	Internal: default
Hardware	Data Interface	GPIO/PMW, UART/SDIO/SPI/I^2C
	Operating Voltage	3.0~3.6V

	Working Temperature	-40~125℃
	Storage Temperature	Room temperature
	Size	15mm * 30mm * 3.5mm
Software	Wireless Network Type	AP / STA / AP+STA
	Security Mechanism	WPA-PSK / WPA2-PSK
	Encryption type	WEP / TKIP / AES
	Firmware Upgrading	Remote (cloud) or local (Serial interface).
	Custom Development	Support customizing your server and redeveloping based on SDK
	Network Protocols	IPv4, TCP / UDP / HTTP / FTP
	Users' Configure	AT+ instruction set, website operation, IOS, Android terminal.

1.1.3 Main Applications

Smart Plug

Intelligent Home

Internet of Things

Wireless control in industry

Baby Monitor

Network video recorder

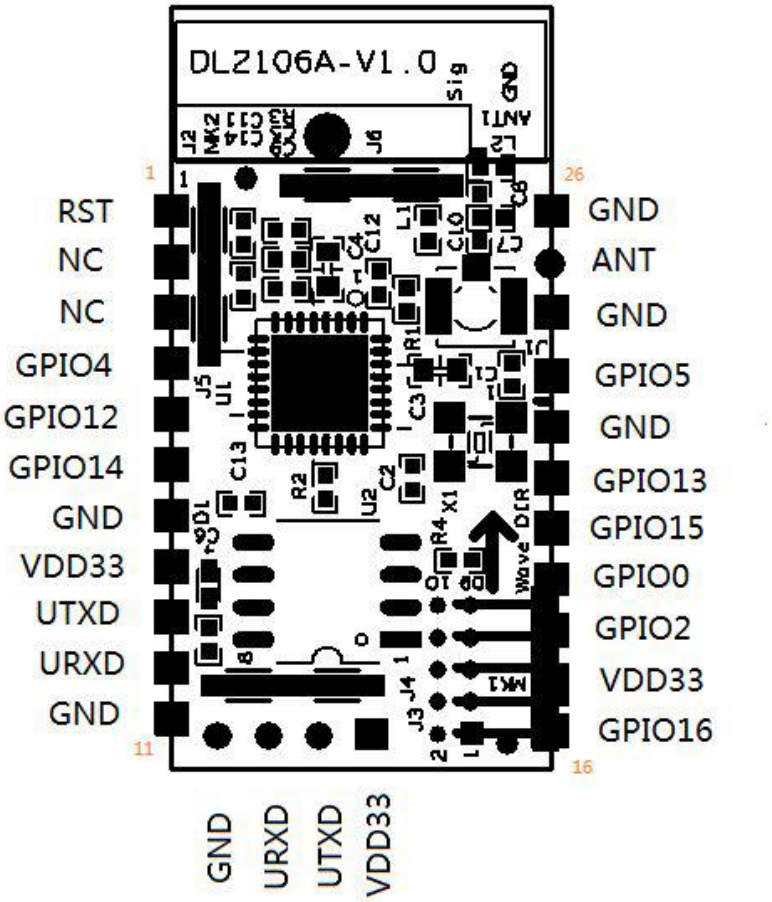
Wireless Sensor & Industrial Control

Smart Wearables

Light Control

1.2 Introduction of hardware

1.2.1 Pin Definitions



Pin	Network Label	Characteristic	Description
1	RST	O, TTL 3.3V	Reset outside, Low Level Effective

2	NC	NC	NC
3	NC	NC	NC
4	UART0_CTS	O, TTL 3.3V	GPIO/ UART0_CTS
5	UART0_RTS	O, TTL 3.3V	GPIO/ UART0_RTS
6	SPI_CLK	O, TTL 3.3V	SPI Clock
7	GNF	GND	Ground
8	VDD 3.3	3.3V	Power
9	UART0_TXD	O, TTL 3.3V	UART0_TXD, data serial interface
10	UART0_RXD	I, TTL 3.3V	UART0_RXD, data serial interface
11	GNF	GND	Ground
12	GNF	GND	Ground
13	UART0_RXD	O, TTL 3.3V	The same as PIN 10.
14	UART0_TXD	I, TTL 3.3V	The same as PIN 9.
15	VDD 3.3	3.3V	Power
16	FLASH_CS	I, TTL 3.3V	Flash signal.

17	VDD 3.3	3.3V	Power
18	HM0	TTL 3.3V	Mode configuration pin, forbidden for users
19	GPIO3	TTL 3.3V	Spare GPIO
20	I^2S0_WSIGND	TTL 3.3V	GPIO/ SPIM_CSI/ LED
21	I^2C_CLK	TTL 3.3V	I^2C Clock I^2C_CLK. Spare. Used as I^2C pull-up-4.7K outside.
22	GND	GND	Ground
23	AP_MODE	Pull-up-10K, I, TTL3.3V	Short-circuit to choose AP or STA. High level as default, pull down for 5s to enter AP mode.
24	GND	GND	Ground
25	RF_ANT	O	Output of RF, accessible for external antenna
26	GND	GND	Ground

Directions: I – Input, O – Output, GND – Ground.

1.2.2 Electrical Characteristics

Electrical Characteristics

Parameters	Conditions	Minimum	Typical	Maximum
Storage Temperature		-45℃	Room temperature	125℃
Maximum Soldering Temperature	IPC/ JEDEC/ J-STD-020			260℃
Working Voltage		0V	3.3V	3.6V
I/O Voltage		0V		3.3V
I/O Current				12mA
Electrostatic Release	TAMB=25℃		2KV	

Power

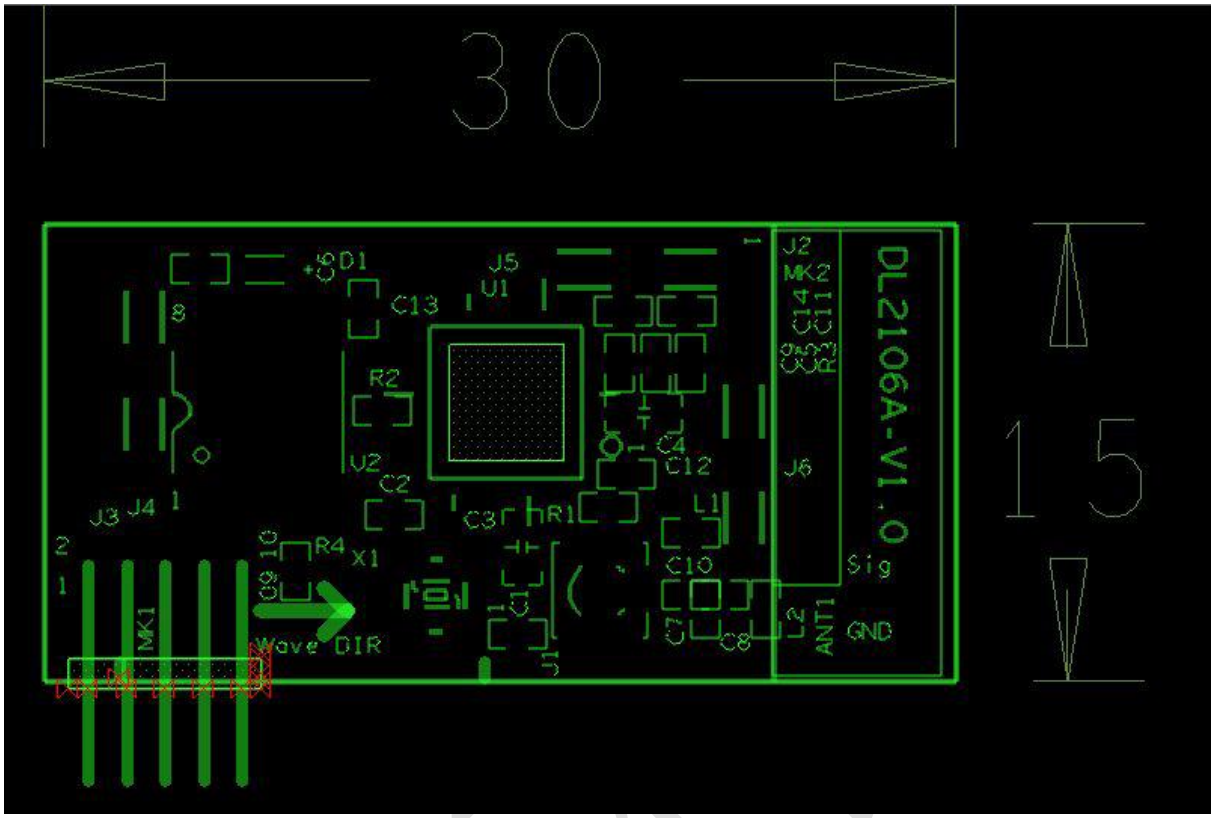
Parameters	Conditions	Minimum	Typical	Maximum
Working Voltage		3.0V	3.3V	3.6V
802.11.b, CCK 11Mbps, POUT=17dBm			170mA	
802.11.g, OFDM 54Mbps, P			140mA	

OUT=15dBm				
802.11.n, MCS7, P OUT=13dBm			120mA	
802.11.b, 1K, -80dBm			50mA	
802.11.g, 1K, -70dbm			56mA	
802.11.n, 1K, -65dbm			56mA	
Modem-sleep			15mA	
Light-sleep			0.9mA	
Deep-sleep			10μA	
Power off			5μA	
Working current (Low power)			10mA	

1.2.3Size

Physical size: 15mm * 30mm * 3.5mm. Thickness of PCB: 1.0mm.

Graph of PCB:

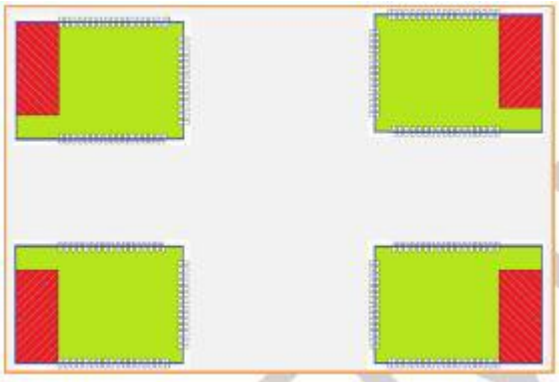


1.2.4Antenna

1.2.4.1 Internal

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

1) The place where antenna sets should be clear.
2) Antenna should be far from metal, 10mm at least away from high devices.
3) No metal shell where antenna set.
4) To reduce possible influence on wireless signal from your PCB, Suggested locations of DL2106A in your PCB are as follows:



1.2.4.2 External

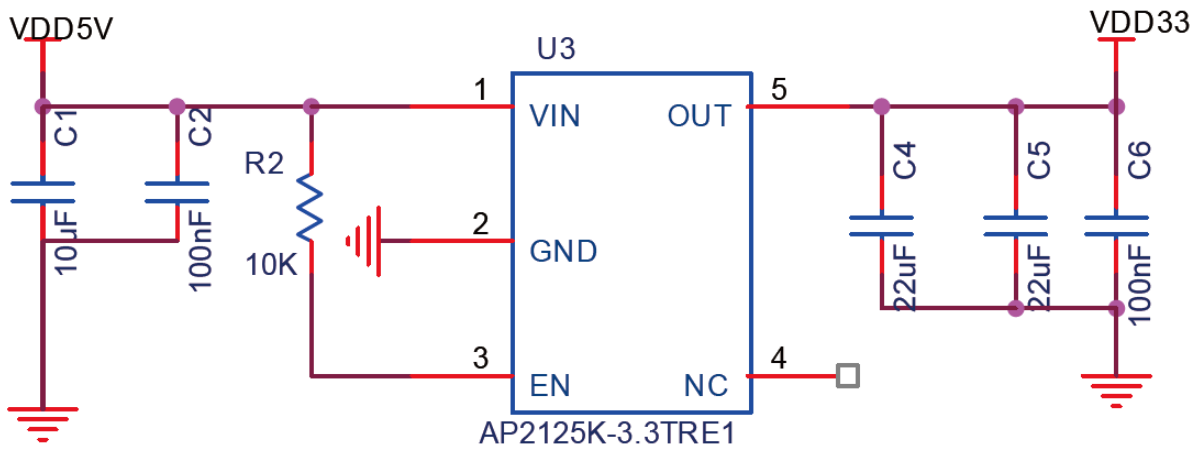
DL2106A offers interface of external antenna (Pin 2, ANT).

Parameters of external antenna are as follows:

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 Peripheral circuits

Reference Peripheral circuits (Transform 5V into 3.3V)

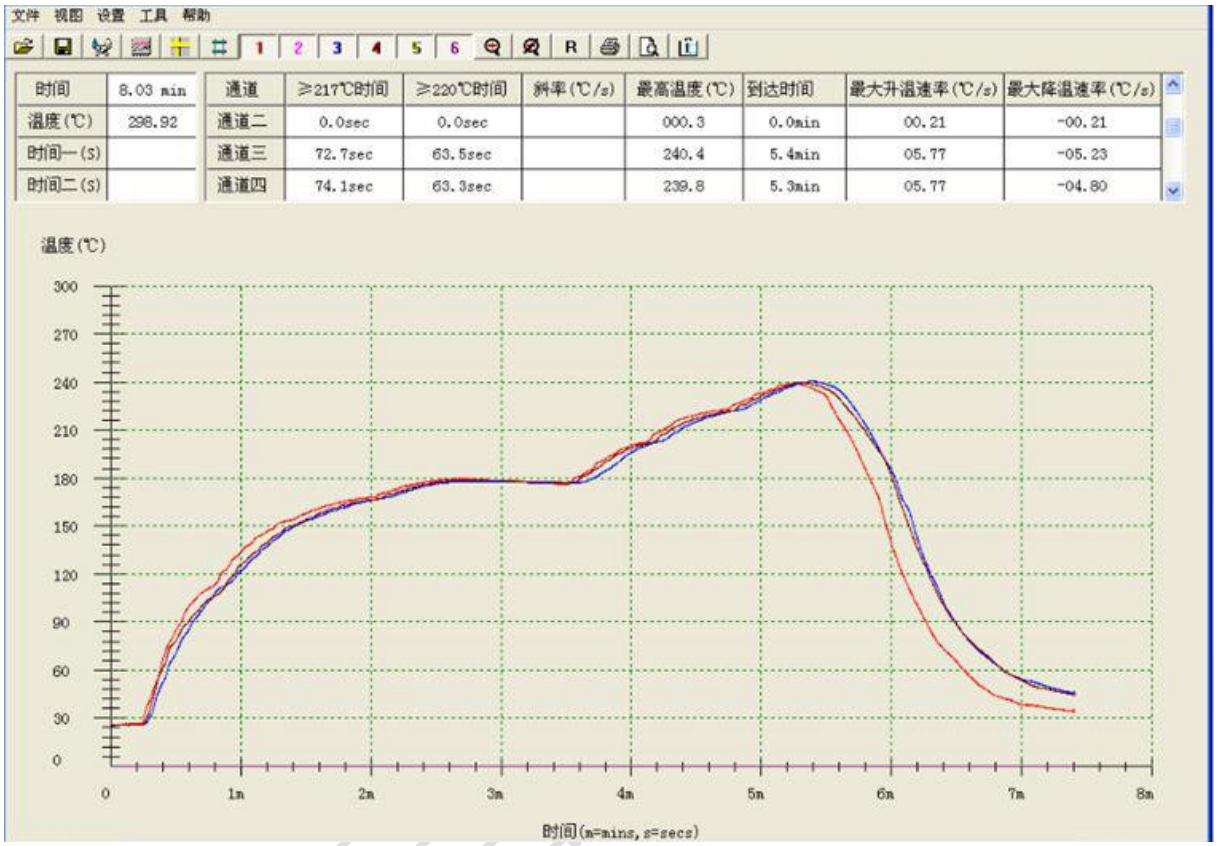


1.2.6 Precautions in designing your PCB

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.

1.2.7 Furnace temperature curve



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-DL2106A".

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: DL2106A
Brand: N.A.
Gain: 3dBi