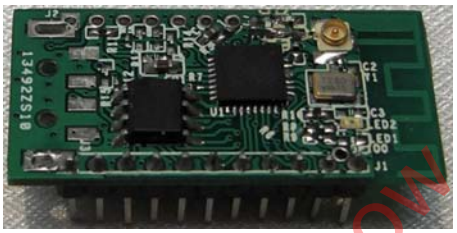
A WIFI Module based on ESP8266EX WIFI SOC and WIFI Applications

FEATURES

- **802.11 WIFI**
  - 802.11 b/g/n based on ESP8266EX
  - STA, AP, and STA+AP modes
  - SmartConfig and Airkiss supported
  - Supporting Clouds e.g. Gizwits & weChat etc
  - Antenna optimized
    - > Optimized Small Size PCB Antenna
    - > Matching Network Optimized
    - > RF Frequency Calibrated Each
    - > High-efficient exceeding 70%
    - > Semi Omni Directional
    - > Additional with an optional IPEX
  - Max output power: 20dBm
  - RX sensitivity: -91dBm
- **Host Interface**
  - UART: LVTTL, up to 2 Mbps
  - SPI / SDIO
  - Small SIP Connector of pitch 2mm
- **SPI Flash**
  - 512K~4MBytes options
- **2 LEDS**
  - Mapped as Link Light and WIFI Light
  - User controllable
- **Extension IO resources**
  - 1 SPI / SDIO, Master/slave
  - 1 HSPI, Master/Slave
  - 1 ADC input multiplexed, and/or
  - 12 GPIOs multiplexed
  - 12 GPIOs available as PWM output
  - Released Reset Pin for external usage
    - > Deep Sleep wakeup via CH_EN
- **Low Power**
  - Supporting deep sleep with auto wake-up, light sleep mode, partial and complete power-down modes
  - Optimized configuration for unused pins
  - Power consumption grand total
    - > Average : 130mW
    - > Peak : 420mW
    - > Power Down : <1mW
- **Small Dimension of USB housing**
  - PCB size: 31x15x0.8mm



- **SDK and APIs**
  - Compatible with Espressif SDK
  - API available for VC and Linux
- **Develop, debug, and burn Tools**
  - Compliant with SDK IDEs including either standard by Espressif or some other mainstream vendors
  - Available with Web server & Clouds Libs
  - Available with S8266WIFI® debug and download Tools

- **Module Company**
  - Available with a debug/burn company module, with SIP socket and USB-Serial converter, convenient for debug and programming
- **Temperature**
  - Operating: -40~ 85°C
  - Storage: -40~125°C

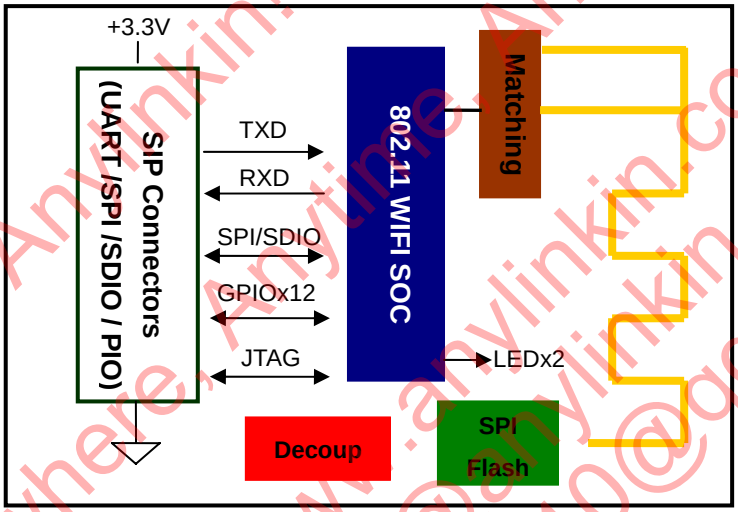
APPLICATIONS

- 2.4-GHz 802.11b/g/n System
- Home/Building Automation, e.g. Smart Home, Lighting Systems etc
- Industrial Control and Monitoring
- Low-Power Wireless Sensor Networks
- Consumer Electronics
- Health Care

DESCRIPTIONS

The M8266WIFI® is a cost-effective, flexible, functional, high-performance, and green 802.11 b/g/n WIFI module. It incorporates SIP connectors providing host interface of UART and SPI/SDIO, and a high-performance and high- integration wireless SOC ESP8200EX providing wireless smart connectivity additional with some IO peripherals including LED indicators.

The M8266WIFI® is designed with special consideration to be convenient for redevelopment and firmware updating, simple deployment, and mass production, dedicated for home, industrial control, and consumer digital applications, quite suitable for many digit control communication system, either as an access to the central unit of a control system, or as a smart node extending connection to a MCU end unit.



ABSOLUTE MAXIMUM RATINGS

		MIN	MAX	UNIT
Supply Voltage	The Voltage on the VCC PIN of the SIP connectors			V
IO Voltage	The Voltage on the IO PINs of the SIP connectors			V
Input RF level				dBm
Temperature range	Storage condition	-40	125	^{o}C
	Operating condition	-40	85	^{o}C
ESD	HBM		2	KV
	MM		500	V

RECOMMENDED OPERATING CONDITIONS

		最小	最大	单位
Supply Voltage	The Voltage on the VCC PIN of the SIP connectors	3.0	3.6	伏
IO Voltage The Voltage on the IO PINs of the SIP connectors	VIL，Voltage of logic 0 input	-0.3	0.25	伏
	VIH，Voltage of logic 1 input	0.75VCC	3.6	
	VOL，Voltage of logic 0 output		0.1VCC	
	VOH，Voltage of logic 1 output	0.8VCC		
IO Current, output	The output current on the IO PINs of the SIP connectors		12	mA

POWER CONSUMPTIONS

	TEST CONDITIONS			MIN	TYP	MAX	UNIT
I_{VBUS} (@VCC pin of the SIP Connector, VBUS=+3.3V) Note1	Normal Mode	RF Disabled			22		mA
		STA Mode	WIFI Connected But in Idle		27		mA
			WIFI Connected And in communication		110		mA
			WIFI not Connected And Searching AP		112		mA
		AP Mode			120		mA
	Sleep Mode	Light sleep			<0.2		mA
		Deep sleep			<0.2		mA
	UART Boot				62 Note2		mA
	Flash Download				62 Note2		mA

Notes:

Note 1: The Value observed from the VCC pin of the SIP Connector, other than from the GND Pin. The observed value covers the total power consumed by the Module, including the WIFI IC, Flashing LEDs, and other passive components etc.

Note 2: Values measured with boot from UART0.

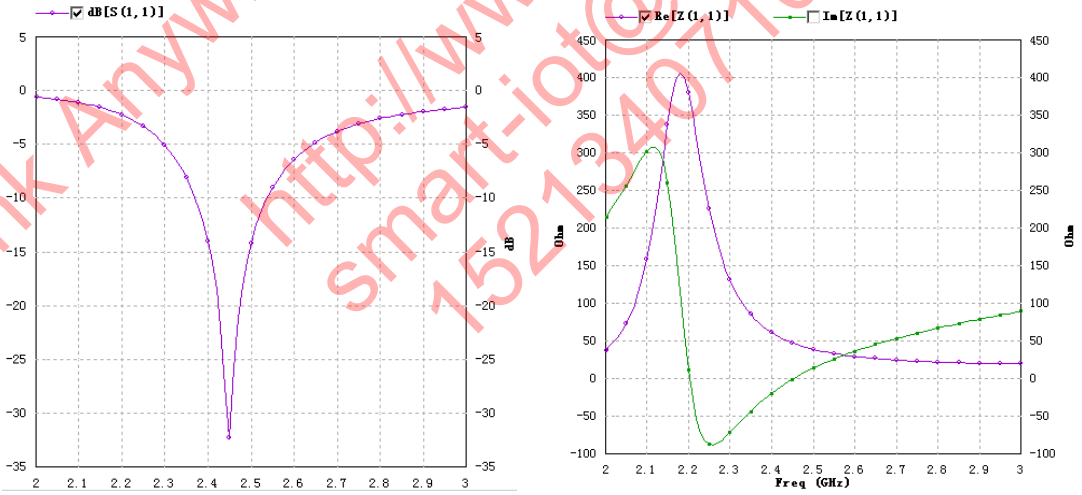
RF SPECIFICATION

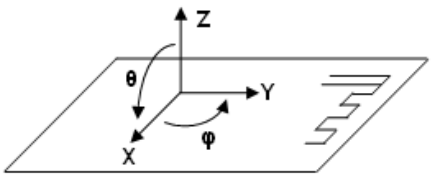
- **RF Parameters**

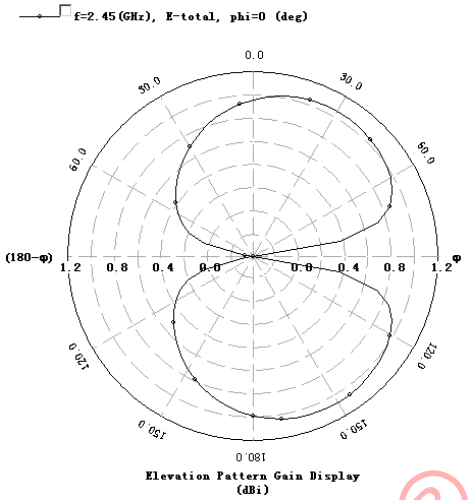
Parameters		MAX	TYP	MIN	Unit
Antenna Gain			1.1		dBi
Directivity max			2.4		dBi
S(1,1)	without plastic housing, @2.45GHz			-32 note1	dB
	With plastic housing, @2.45GHz			-29 note1	
VSWR, @2.45GHz				1.05 note1	
Impedance Bandwidth (-10dB) note1			180 (2.36-2.54)		MHz (GHz)
Gain Bandwidth(3dB) note1			710 (2.21-2.92)		MHz (GHz)
Antenna Efficiency note1		74.4			%
TX Power note1		20			dBm
RX Sensitivity note1				-91	dBm
Free Line of Sight(LOS) Range				150 note2	m

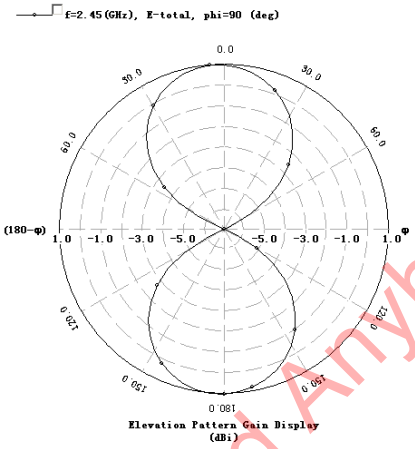
Notes:

1. Measured at 50 ohm matching
2. Measured at 50 ohm matching, 2.45GHz, 250kbps, 1% PER









- **Objective Comparisons against other modules**

TBD

LED GPIO USAGE

LED1	GPIO0	WIFI LED	Light On: GPIO output LOW Light Off: GPIO output High
LED2	GPIO5	LINK LED	Light On: GPIO output LOW Light Off: GPIO output High

OPTIONAL BOOT MODE JUMPERS

		FITTED	**UNFITTED**
R5	mTDO/BootSel2	Pulled Down	Floating, Internal Pulled up
R6	GPIO0/BootSel1	Pulled Down	Floating, Internal Pulled up
R7	GPIO2/BootSel0	Pulled Down	Floating, Internal Pulled up

EXTENDABLE IO RESOURCES CONNECTORS

1. SIP Connector J1

- Size: hole diameter = 0.75mm, pitch = 2mm
- Total 11 pins. Pin1 located at USB connector side

PIN#	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
Func		TXD	RXD		SPI nHold	SPI nWP	SPI nCS	SPI CLK	SPI MISO	SPI MOSI	
Alter1	**GND**			**nRST**	SDIO DATA2	SDIO DATA3	SDIO CMD	SDIO CLK	SDIO DATA0	SDIO DATA1	**+3.3V**
Alter2		GPIO01	GPIO03		GPIO09	GPIO10	GPIO11	GPIO06	GPIO07	GPIO08	
ADC MUX								√			

2. SIP Connector J1

- Size: hole diameter = 0.75mm, pitch = 2mm
- Total 7 pins. Pin1 located at USB connector side

PIN#	1		2	3	4	5	7
Func	GND	nRESET	JTAG mTDO	JTAG mTCK	JTAG mTDI	JTAG mTMS	+3.3 V
Alter1			HSPI nCS	HSPI MOSI	HSPI MISO	HSPI CLK	
Alter2			GPIO15	GPIO13	GPIO12	GPIO14	

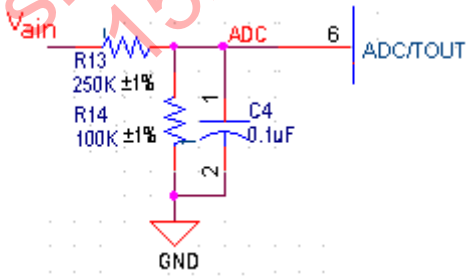
ADC INPUT

1. ADC Input Pin Multiplex

	Jumper Resistance	FITTED	NOT FITTED
J1.9	R12 = 0	ADC INPUT	SD_D0/GPIO7
J2.3	R11 = 0	ADCINPUT	mTCK/ GPIO13

2. Analog Input Voltage and ADC Values

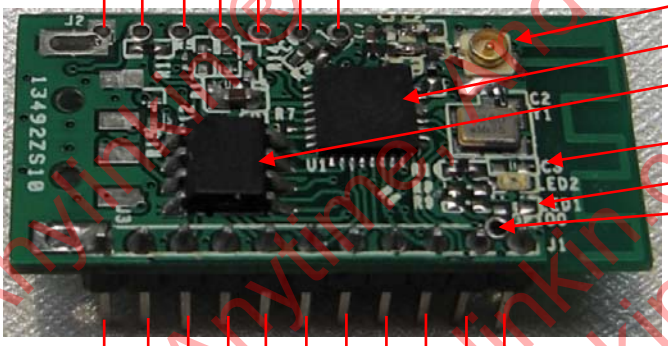
Analog Input （ V_{ain} ）	ADC Value (D_{adc})	Formulator	Precision
0 - 3.5V	0 - 1024	$V_{ain} = \frac{D_{adc}}{1024} \times \frac{(250 + 100)}{100}$	10-bit ADC



3. Note on ADC usage

When the connector pin is multiplexed as ADC input, the multiplexed GPIO pins should be configured as High-impedance input mode.

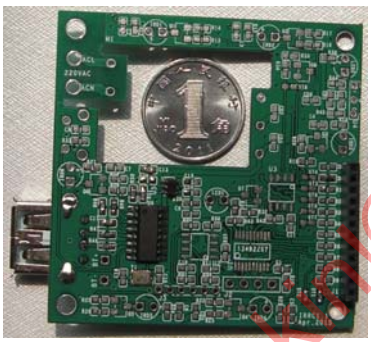
ACTUAL VIEW

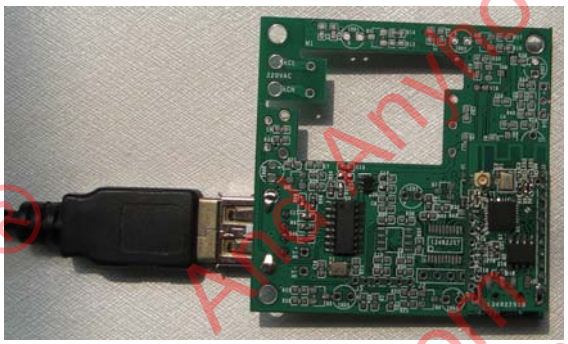


SOFTWARE AND IDE

- Debug and Burn Toolkit Module

There is also a Debug and Burn module, which could be used as a toolkit to debug and burn the module in a convenient way. Please see below picture. This toolkit module is just to provide a SIP socket to accommodate the M8266WI Module and provide a USB-UART convert interface as well.





- **Purchase**
  http://item.taobao.com/item.htm?id=522154585184

- S8266WIFI ® Debug and Download Toolkit

Please refer to document "S8266_Users Manual of ESP8266EX Debug and Download Toolkit",

Download Address: http://pan.baidu.com/s/1pJy3bUN

http://www.ebay.com/itm/282162886460

ORDERING INFORMATION

M 8266 WIFI 1024 - A 3

PCB version, major + minor

ROM size
- 512: 512KBytes
- 1024: 1MBytes
- 2048: 2MBytes
- 4096: 4MBytes

Function type
- WIFI: WIFI module
- ZIGBEE: Zigbee module
- BLE: BLE module
- RF433: RF 433MHz

Identification code

Module type
- U: USB Dongle
- M: Module with SIP connectors

Purchase

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