WU106 IoT WLAN Module Datasheet

Document Information		
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This document applicable to the following products：

Product name	Type number	Product status
WU106	WU106(09220)	Mass production
	WU106(0922001)	Mass production

Contents

1 General Description

The WU106 Wi-Fi Module is a small form-factor, single stream, 802.11b/g/n WiFi module with on-board low power application processor. It is a low cost serial WiFi module, support UART-WiFi - Ethernet data transmission.

The WU106 has been optimized for client applications in the home, enterprise, smart grid, home automation and control that have lower data rates and transmit or receive data on an infrequent basis. The WU106 Wi-Fi Module also enables rapid application development of ultra low power devices with the complete application SW on-chip . This combination makes the WU106 Wi-Fi Module an ideal solution for low power automation and sensor solutions because of its high efficiency and low power consumption (features standby current consumption of less than 10uA while still monitoring peripherals). Furthermore, due to the encryption and tamper detection capabilities of the module it is also suitable for security applications.

The WU106 Wi-Fi Module can be used to design applications using 802.11b/g/n communication protocols. All features are enhanced by a built-in antenna, external antenna connector and an interface port to the carrier board. This interface port includes power supply pins, GPIO ports and UART ports.

Figure 1: WU106 Top View

2 Applications

- IoT (internet of things)
- Network Consumer Device
- Metering
- Building Automation

- Home Automation
- Smart Home Gateway
- Smart Lighting
- Smart Plug
- Industry Control

3 Features

- Compliant to IEEE 802.11b/g/n.
- 1T1R 2.4GHz with support for a 150Mbps PHY data rate.
- AT command transmission mode and UART transparent transmission mode.
- Smart link.
- Support TCP, UDP.
- Support interface: UART, I2C, I2S/SPI, PWM, GPIO.
- Security: WEP64/128, TKIP, AES, WPA, WPA2, WAPI.
- Support AP mode and station mode .
- RoHS compliance meets environment-friendly requirement.
- UART baud rate: 9600 – 115200bps.
- Size: 31.3mm(L) x 20.3mm(W) x 3.2mm(H) dimension.
- RoHS compliance (Lead-free) .
- FCC,CE compliance.

4 Application Block Diagram

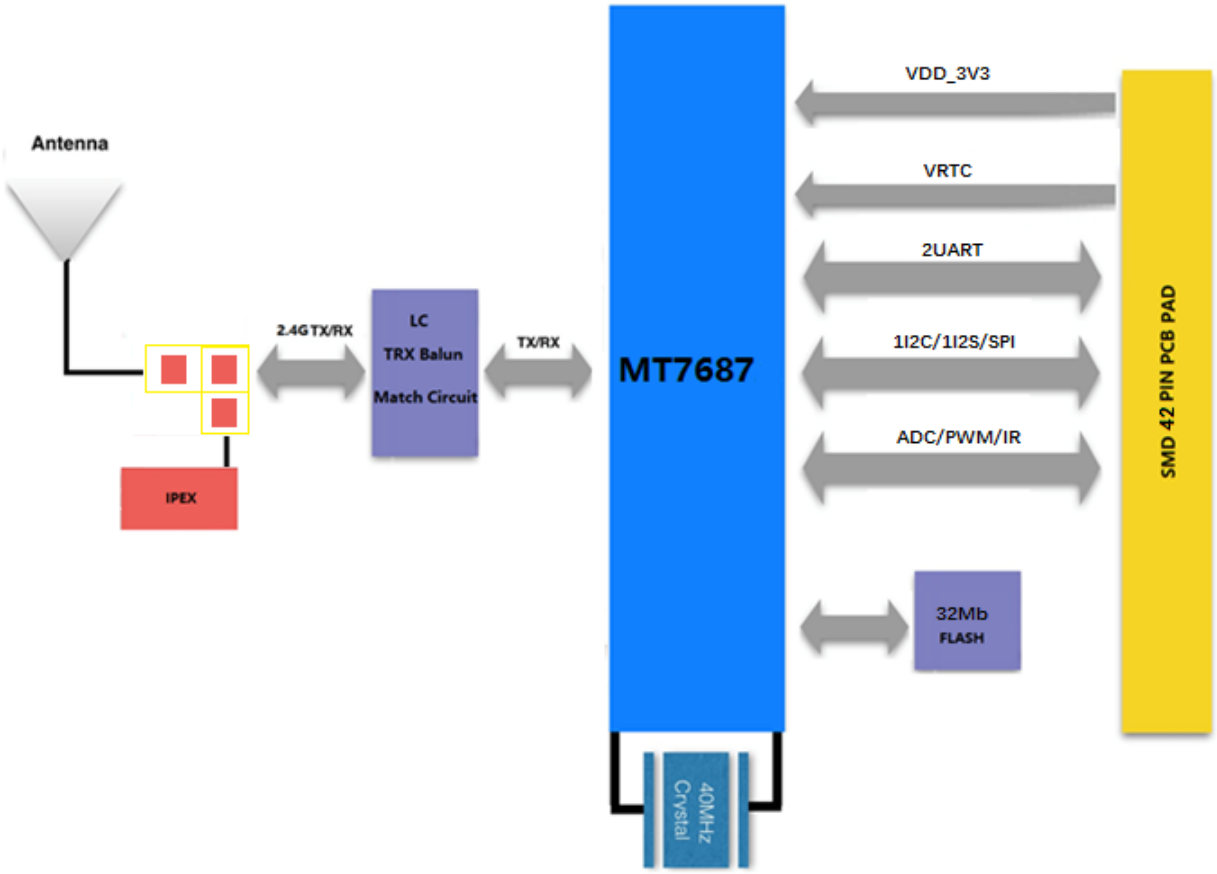

Figure 2: WU106 Block Diagram

5 Module Specifications

Hardware Features	
Model	WU106
Antenna Type	IPEX or PCB Antenna
Chipset Solution	MT7687
Voltage	3.3V±10%
Dimension(L×W×H)	31.3mm*20.3mm*3.2mm
Wireless Features	
Wireless Standards	IEEE 802.11b/g/n
Frequency Range	2.412GHz---2.484GHz

Data Rates	IEEE 802.11b : 1,2,5.5,11Mbps
	IEEE 802.11g : 6,9,12,18,24,36,48,54Mbps
	IEEE 802.11n : MCS0--MCS7 @ HT20
	MCS0--MCS7 @ HT40
Receiver Sensitivity	HT40 MCS7 : -70dBm@10% PER(MCS7)
	HT20 MCS7 : -73dBm@10% PER(MCS7)
	54M: -77dBm@10% PER
	11M: -89dBm@ 8% PER
Modulation	DSSS (DBPSK, DQPSK, CCK)
Technique	OFDM (BPSK, QPSK, 16-QAM, 64-QAM)
Wireless Security	WPA/WPA2, WEP, TKIP and AES, WPS2.0, WAPI
Transmit Power	IEEE 802.11n: 15dBm @HT20/40 MCS7
	IEEE 802.11g: 16dBm @54MHz
	IEEE 802.11b: 18dBm @11MHz
Work Mode	AP Mode/Station Mode
Others	
Certification	RoHS
Environment	Operating Temperature: -20℃~70℃
	Storage Temperature: -40℃~125℃
	Operating Humidity: 10%~90% non-condensing
	Storage Humidity: 5%~90% non-condensing

6 Module Pinout and Pin Description

Module Pinout

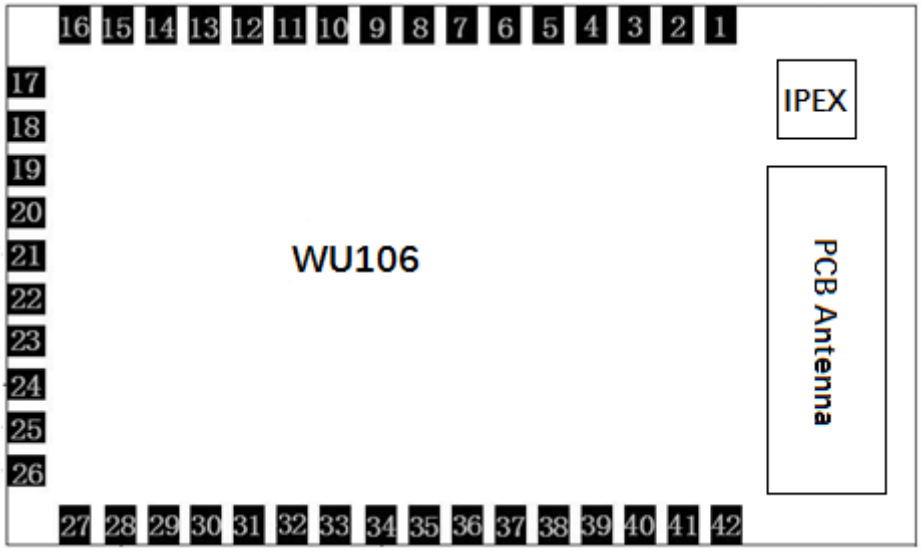

Figure 3: WU106 Pin Package

Pin Description

Pin No.	Pin Name	Description	Remark
1	GND	Ground	
2	GND	Ground	
3	UART0_RX	UART0 Data Input to Module	GPIO2
4	UART0_TX	UART0 Data Output from Module	GPIO3
5	SPI_DATA0_FLASH	NC	GPIO4
6	SPI_DATA1_FLASH	NC	GPIO5
7	SPI_CS1	SPI Chip Set1	GPIO6
8	UART0_RTS	UART0 Request to Send	GPIO0
9	UART0_CTS	UART0 Clear to Send	GPIO1
10	GND	Ground	
11	SPI_CS0_FLASH	NC	GPIO7
12	SPI_MOSI_FLASH	NC	GPIO24
13	SPI_MISO_FLASH	NC	GPIO25
14	SPI_CLK_FLASH	NC	GPIO26

15	I2C0_CLK	I2C Clock	GPIO27
16	VDD	Power Supply： 2.97-3.63V	
17	GND	Ground	
18	RTC_3V3	RTC Power Supply: 1.6-3.63V	
19	PWR_EN_RTC	Control Module Power in Sleep Mode	
20	I2C0_DATA	I2C Data	GPIO28
21	I2S_MCLK/SPI_MOSI	I2S MCLK/SPI MOSI	GPIO29
22	I2S_FS/SPI_MISO	I2S FS/SPI MISO	GPIO30
23	I2S_M_TX/I2S_S_RX/SPI_SCK	I2S Master TX/I2S Slave RX/SPI SCK	GPIO31
24	I2S_BCLK/SPI_CS_0	I2S BCLK/SPI CS	GPIO32
25	EN_WF		
26	GND	Ground	
27	VDD	Power Supply： 2.97-3.63V	
28	GND	Ground	
29	ADC3/MISC_LED_OUT	ADC Input/LED Output	GPIO60
30	ADC2/WF_LED_OUT	ADC Input/WIFI LED Output	GPIO59
31	ADC1	ADC Input	GPIO58
32	ADC0	ADC Input	GPIO57
33	UART1_CTS/MISC_LED_OUT	UART1 CTS/LED Output	GPIO39
34	RESET		
35	UART1_RX	UART0 Data Input to Module	GPIO36
36	UART1_TX	UART0 Data Output from Module	GPIO37
37	GND	Ground	
38	UART1_RTS/WF_LED	UART1 RTS/LED Output	GPIO38
39	GPIO	GPIO35	GPIO35
40	IR_RX/MISC_LED_OUT	IrDA RX/LED Output	GPIO34
41	IR_TX/WF_LED	IrDA TX/LED Output	GPIO33
42	GND	Ground	

7 PCB Footprint and Dimensions

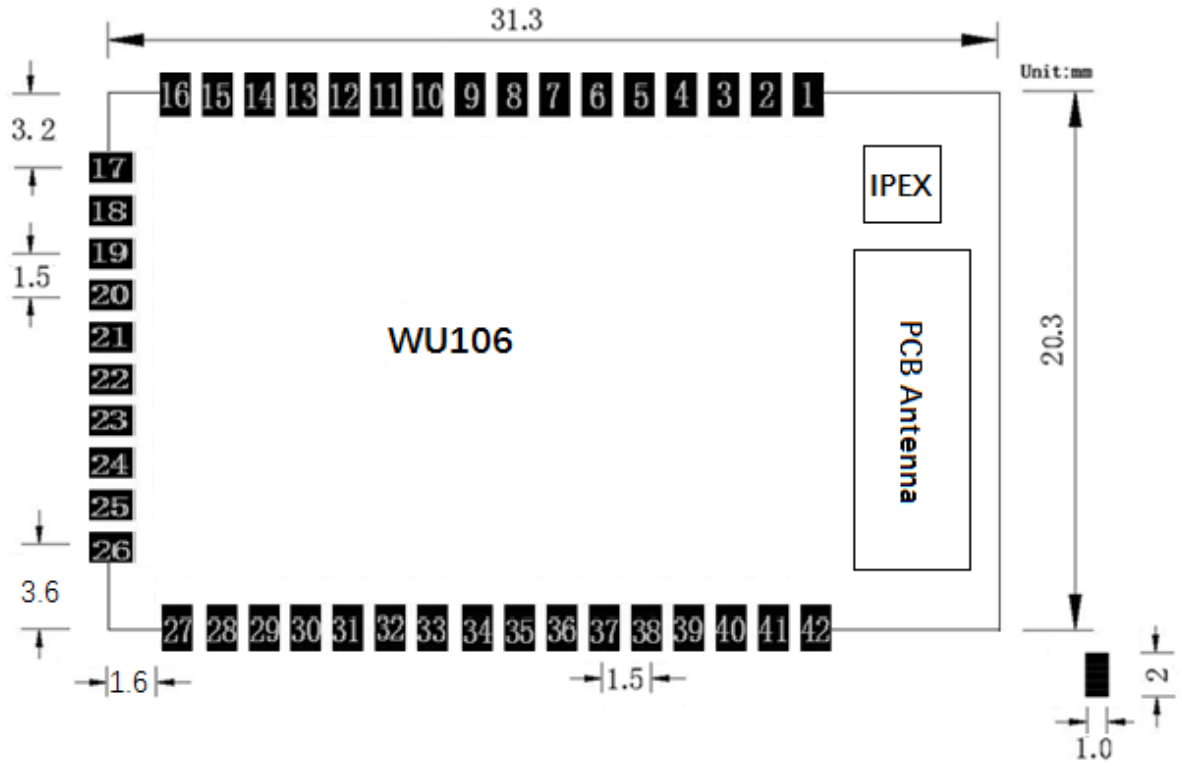

Figure 4: WU106 Recommend PCB Footprint

8 Electrical Characteristics

a) Absolute Maximum Ratings

Parameter	Condition	Min.	Typ.	Max.	Unit
Storage Temperature Range		-40		125	°C
ESD Protection	VESD	/		2000	V
Supply Voltage	VDD_3V3	0		3.6	V
Voltage On Any I/O Pin		-0.3		3.63	V

Table9-1: Absolute Maximum Ratings

WU106 series modules are Electrostatic Sensitive Devices and require special precautions while handling.

ESD precautions

The WU106 module contain highly sensitive electronic circuitry and are Electrostatic Sensitive Devices (ESD). Handling the WU106 module without proper ESD protection may destroy or damage them permanently.

The WU106 module are electrostatic sensitive devices (ESD) and require special ESD precautions typically applied to ESD sensitive components. Proper ESD handling and packaging procedures must be applied throughout the processing, handling, transportation and operation of any application that incorporates the WU106 module. Don't touch the module by hand or solder with non-anti-static soldering iron to avoid damage to the module.

b) Recommended Operation Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Temperature Range	TA	-20		70	ºC
Power Supply	VDD_3V3	2.97	3.3	3.46	V
Power Supply	VRTC_3V3	1.6		3.63	V
Input Low Voltage	VIL	-0.3		0.8	V
Input High Voltage	VIH	2		3.63	V

Table9-2: Operating Conditions

c) Measurement Conditions

System State	Current (Typ.)@3.3V
Standby	3.9 mA
SLEEP(VRTC)	10uA
Transmit (2.4g; +15 dBm @ TX HT20 MCS7.)	90 mA
Transmit (2.4g; +18 dBm @ 11b 11Mbps.)	95 mA

Table9-3: Power Consumption in Different States

9 Manufacturing Process Recommendations

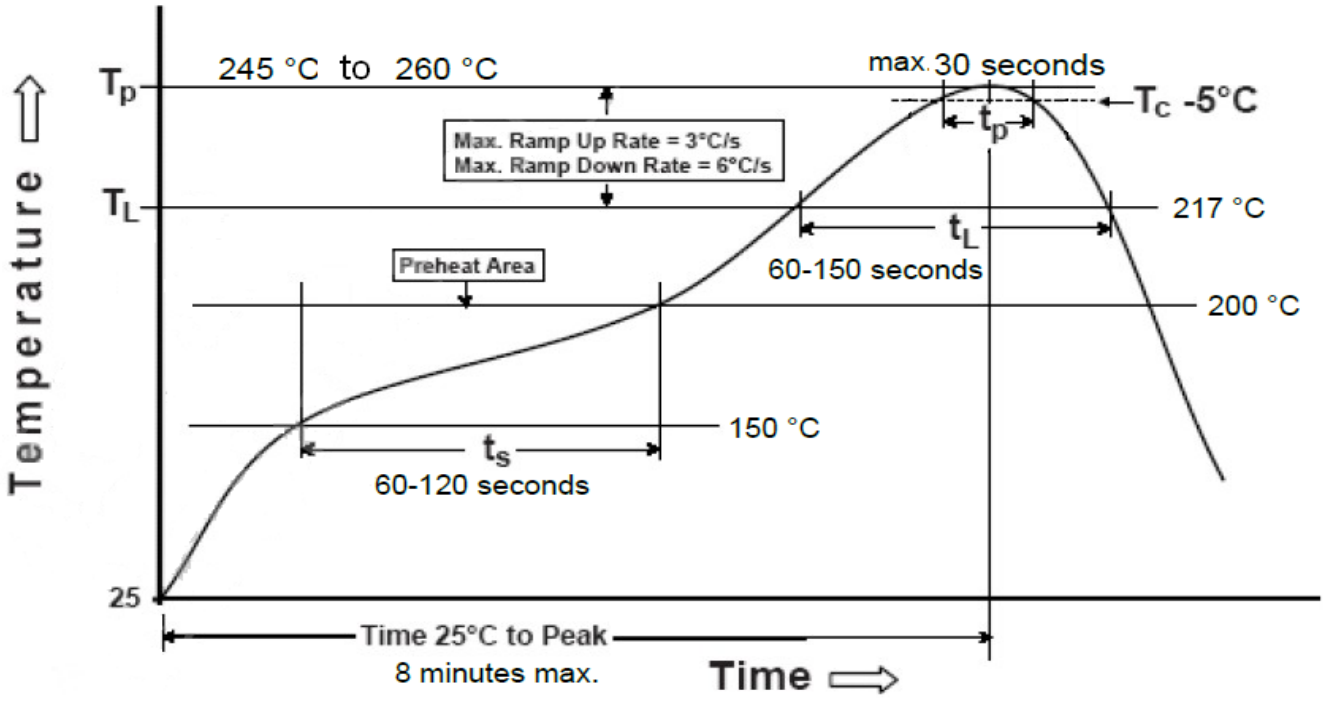

Figure 5: WU106 Typical Lead-free Soldering Profile

Note： The final soldering temperature chosen at the factory depends on additional external factors like choice of soldering paste，size，thickness and properties of the baseboard，etc. Exceeding the maximum soldering temperature in the recommended soldering profile may permanently damage the module.

10 Ordering Information

Module No.	Antenna Connector Type
WU106E	IPEX Connector
WU106P	PCB Antenna

11 Revision History

Revision	Date	Name	Comments
V1.01	2016.06.13	George	Initial Release
V1.02	2017.08.31	George	Update Certification Information
V1.03	2018.03.03	George	Update Operating Temperature

12 Contact Information

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