

User Manual

Model:3303-SBSL

Module Features

- A. Support IEEE802.11b/g/n wireless standards
- B. Support WEP、WPA and WPA2 encryption
- C. Support UART\PWM\ADC\GPIO\I2C Interface
- D. Support STA\AP\AP+STA mode, etc.
- E. Support a key function Configuration
- F. Support TLS\SSL protocol and mDNS
- G. Support PCB antenna
- H. 3.3V power supply
- I. Size 17.7mm*31mm*3.6mm (with shield)

1. Product Overview (Hardware)

WT25BSL adopts MTK IOT scheme, is a support 802.11b/g/n WiFi module, can communicate with other device via UART port. Module integrates RF transceiver, MAC, Base-Band, all WiFi protocol and configuration information and network protocol stack, can be widely used in fields such as intelligent home device, remote monitoring equipment, medicine and other fields.

Module integrated ARM Cortex-M4F processor, high primary frequency can reach 192MHz, SRAM 352KB, and built-in 2MB Flash.

1.1 Module basic parameter

1.1.1 Wlan parameter

Frequency Range	2.412 GHz - 2.462 GHz
Wireless Standard	IEEE 802.11 b/g/n
RF Power	802.11 b: 15.2-15.72dBm; 802.11 g: 12.36-13.20dBm 802.11 n20: 11.23-12.27dBm; 802.11 n40: 9.63-9.71dBm
Antenna	Built-in: PCB antenna
	External: not support
Receiving Sensitivity	802.11b < -91dBm@1Mbps 802.11b < -81dBm@11Mbps 802.11g < -86dBm@6Mbps 802.11g < -69dBm@54Mbps
Protocol Stack	IPv4, TCP/UDP/FTP/HTTP/HTTPS/TLS/mDNS
Data Rate (max)	11M@802.11b, 54M@802.11g, MCS7@802.11n
Security Support	Encryption Standard: WEP/WEPA/WPA2 Encryption Algorithm: WEP64/WEP128/TKIP/AES
Network Type	STA/AP/STA+AP/WIFI Direct

1.1.2 Absolute Maximum Ratings

Symbol	Description	Min.	Max.	Units
Ts	Storage temperature	-40	125	°C
TA	Ambient operating temperature	0	70	°C
Vdd	Supply voltage	3.0	3.6	V
Vio	Voltage on IO pin	0	3.3	V
ESD	ESD protection (HBM)		2000	V

1.1.3 DC Voltage and current

Specifications	Min.	Typ.	Max.	Units
VDD	3	3.3	3.6	V
VIL(input low voltage)	0		0.8	V
VIH(input high voltage)	2		3.6	V
VOL(output low voltage)	0		0.4	V
VOH(output high voltage)	2.4		3.6	V
Io	4		16	mA
RPU (Pullup Resistance)	40		190	kΩ
RPD(Pulldown Resistance)	10		50	kΩ
Standby		110		mA
pulse current @TX 11b @18dBm 11Mbps		320	335	mA
pulse current @TX 11g @16dBm 54Mbps		280	290	mA

1.1.4 IEEE802.11b mode

ITEM	Specification
Modulation Type	DSSS / CCK
Frequency range	2412MHz~2462MHz
Channel	CH1 to CH11
Data rate	1, 2, 5.5, 11Mbps

TX Characteristics	Min	Typical	Max.	Unit
Transmitter Output Power				
11bTarget Power		16		dBm
Frequency Error	-10		+10	ppm
Constellation Error(peak EVM)@ target power				
1~11Mbps			-40	

RX Characteristics	Min	Typical	Max.	Unit
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Minimum Input Level Sensitivity				
1Mbps (FER \leq 8%)		-94	-91	dBm
11Mbps (FER \leq 8%)		-84	-81	dBm
Maximum Input Level (FER \leq 8%)	-10			dBm

1.1.5 IEEE802.11g mode

ITEM	Specification
Modulation Type	OFDM
Frequency range	2412MHz~2462MHz
Channel	CH1 to CH11
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps

TX Characteristics	Min	Typical	Max.	Unit
Transmitter Output Power				
11gTarget Power		13.5		dBm
Frequency Error	-10		+10	ppm
Constellation Error(peak EVM)@ target power				
6Mbps			-26	dB
54Mbps			-33	dB
Transmit spectrum mask				
@11MHz			-20	dBr
@20MHz			-28	dBr
@30MHz			-40	dBr

RX Characteristics	Min	Typical	Max.	Unit
Minimum Input Level Sensitivity				
6Mbps		-90	-86	dBm
54Mbps		-71	-69	dBm
Maximum Input Level (FER \leq 10%)	-20			dBm

1.1.6 IEEE802.11n 40MHz bandwidth mode

ITEM	Specification
Modulation Type	OFDM
Frequency range	2422MHz~2452MHz
Channel	CH3 to CH11
Data rate	MCS0/1/2/3/4/5/6/7

TX Characteristics	Min	Typical	Max.	Unit
Transmitter Output Power				
11n HT40 Target Power		10		dBm
Frequency Error	-10		+10	ppm
Constellation Error(peak EVM)@ target power				
MCS0			-26	dB
MCS7			-33	dB
Transmit spectrum mask				
@11MHz			-20	dB
@20MHz			-28	dB
@30MHz			-40	dB

RX Characteristics	Min	Typical	Max.	Unit
Minimum Input Level Sensitivity				
MCS0		-90	-86	dBm
MCS7		-71	-69	dBm
Maximum Input Level (FER ≤ 10%)	-20			dBm

1.1.6 IEEE802.11n 20MHz bandwidth mode

ITEM	Specification
Modulation Type	OFDM
Frequency range	2412MHz~2462MHz
Channel	CH1 to CH11
Data rate	MCS0/1/2/3/4/5/6/7

TX Characteristics	Min	Typical	Max.	Unit
Transmitter Output Power				
11n HT20 Target Power		12.5		dBm
Frequency Error	-10		+10	ppm
Constellation Error(peak EVM)@ target power				
MCS0			-26	dB
MCS7			-33	dB
Transmit spectrum mask				
@11MHz			-20	dBr
@20MHz			-28	dBr
@30MHz			-40	dBr

RX Characteristics	Min	Typical	Max.	Unit
Minimum Input Level Sensitivity				
MCS0		-90	-86	dBm
MCS7		-71	-69	dBm
Maximum Input Level (FER ≤ 10%)	-20			dBm

1.1.7 IEEE802.11n 40MHz bandwidth mode

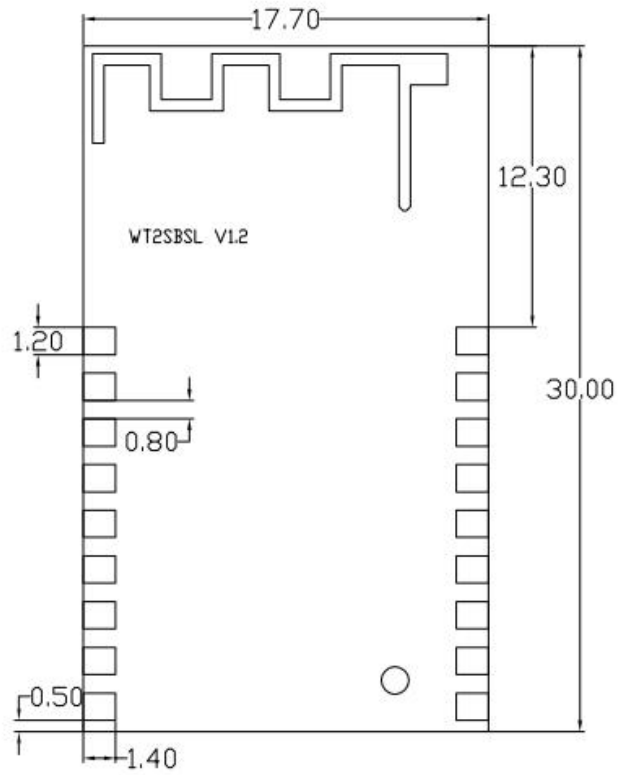
ITEM	Specification
Modulation Type	OFDM
Frequency range	2422MHz~2452MHz
Channel	CH3 to CH9
Data rate	MCS0/1/2/3/4/5/6/7

TX Characteristics	Min	Typical	Max.	Unit
Transmitter Output Power				
11n HT40 Target Power		10		dBm
Frequency Error	-10		+10	ppm
Constellation Error(peak EVM)@ target power				
MCS0			-26	dB
MCS7			-33	dB
Transmit spectrum mask				
@11MHz			-20	dBr
@20MHz			-28	dBr
@30MHz			-40	dBr

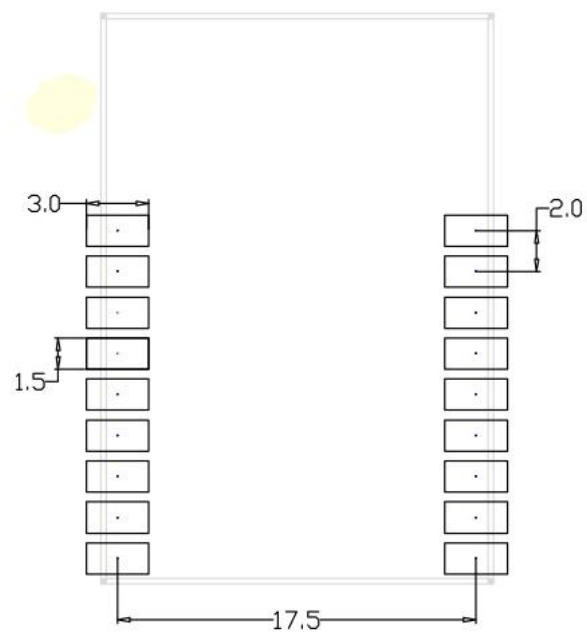
RX Characteristics	Min	Typical	Max.	Unit
Minimum Input Level Sensitivity				
MCS0		-90	-86	dBm
MCS7		-71	-69	dBm
Maximum Input Level (FER ≤ 10%)	-20			dBm

1.2 Hardware Description

1.2.1 Mechanical Dimensions

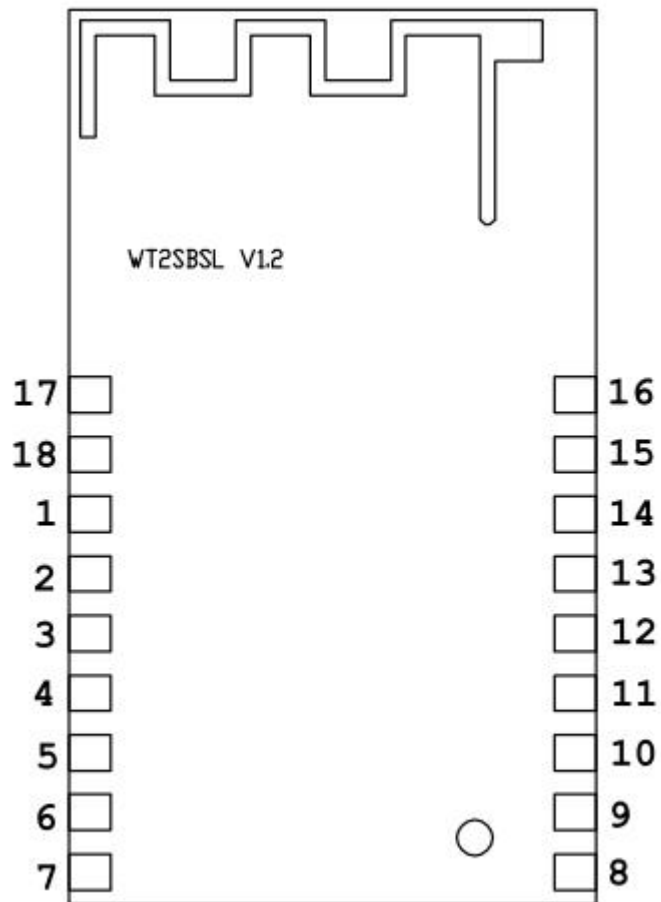


1.2.2 Recommend package dimension



(unit: mm)

1.2.3 Interface definition



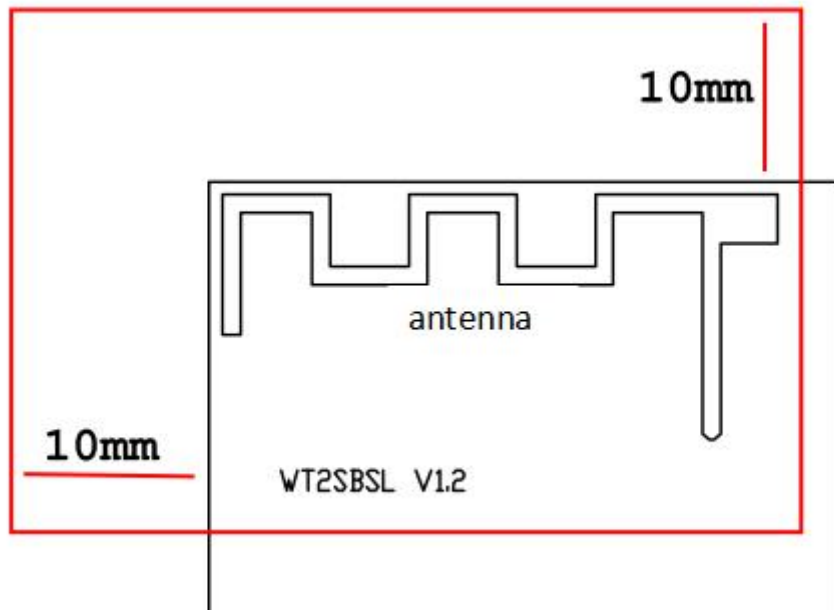
pin	net	description	type
1	GND	GND	POWER
2	VDD	3.3V	POWER
3	NRST	Hardware reset (restart)	I
4	TX0	UART0 TX	0
	GPI03		I/O
5	RX0	UART0 RX	I
	GPI02		I/O
6	TX1	UART1 TX	0
	GPI037		I/O
7	RX1	UART1 RX	I
	GPI036		I/O
8	RX1	UART1 RX	I
	GPI036		I/O
9	TX1	UART1 TX	0
	GPI037		I/O
10	GPI039		I/O
11	GPI035		I/O

12	GPI033		I/O
13	VDD	3.3V	POWER
14	GND	GND	POWER
15	GPI057		I/O
	ADC_IN0	ADC Input0	I
16	GPI058		I/O
	ADC_IN1	ADC Input1	I
17	I2C1_SCL		I/O
	GPI024		I/O
18	I2C1_SDA		I/O
	GPI025		I/O

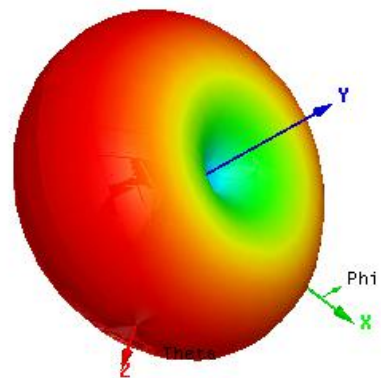
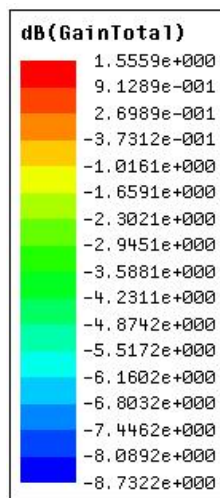
Note:

1. UART 0 is used for general transparent transmission , and UART1 is used for the output of debug information,and the serial ports output level is described with reference to DC characteristics,by default.
2. NRST is that module hardware resets ,and low level is effective ,restars after module resets,adn keeps original configuration information. The inner existing RC electrify restoration circuit of module itself.
3. Under the default situations,PIN 12 (GPIO33) is the network light pin,is used for external LED,the configuring condition of indicating module.
4. Under the default situations,PIN11 (GPIO35) is the module software reset pin,and high level is effective,and former configuration information of the back module that resets is eliminated similar factory reset.
5. All GPIO all support PWM output.
6. TX and RX are used for communicating with the ppu of 3V power supply among the UART0,and the serial ports output level is described with reference to 3.3joint DC characteristics.
7. Unsettled processing is done in the GPIO suggestion that is not used,and forbids on the circuit that to **GPIO35,GPIO37** does and draws processing.

1.2.3 Built-in Antenna

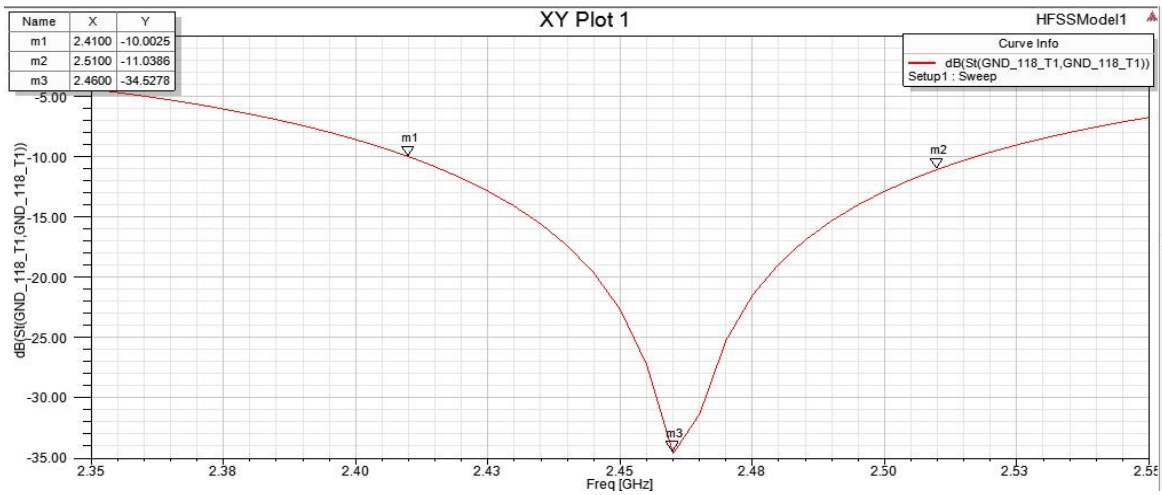


The support of this module selects PCB board to carry antenna, and in 2.4G~2.5G frequency range, antenna port S11 is less than -10dB, the about 1.5dB of antenna gain.



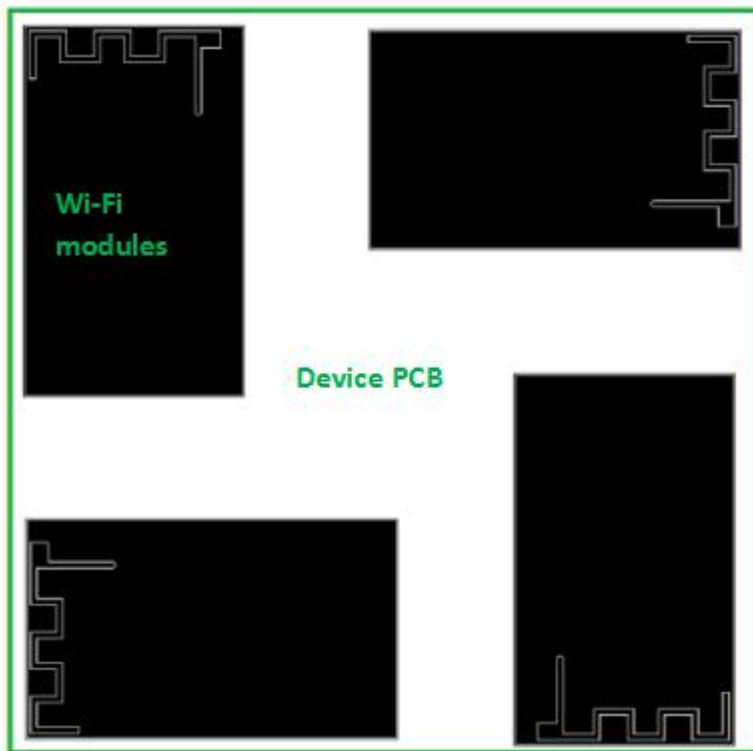
antenna gain emulation radiation diagram

The antenna port S11 simulation curve



When selecting the PCB antenna, the module in place should pay attention to the following points when :

1. Components and parts and floor files can not be placed in user PCB base plate and module antenna corresponding region, preferably can be with PCB hollow out that should the zone.
2. Do not place any components and parts in the suggestion module antenna area 10mm, the module base plate is also avoided cabling as for as possible in this zone, forbids applying copper
3. Use in the mould that module is not placed on metal-back or has metal to spray paint.
4. The user is when the pcb board layout in suggestion, as far as possible with the antenna of wifi module near bottom edge, be shown in the following figure, to guarantee the good performance of antenna.



1.3 The Hardware Reference Design

1.3.1 The UART Interface Design

For the equipment of 3.3V power supply, can equipment of serial and module serial ports directly be linked to each other by the diagram circuit and accomplish communication;

If the 5V power supply unit can or design the associated level change-over circuit voluntarily with reference to following circuit, resistance value can be adjusted according to side circuit.

1.3.2 Power Requirements

Give module for power supply if produce 3.3V voltage through LDO, then the capacitance of C1 can be considered with 10u ~ 22u; Give module for power supply if produce 3.3V through the DCDC power supply, the electric capacity of C1 can be considered with 47u or bigger aluminium electrolytic condenser.

Please guarantee that power supply can provide enough big electric current, power down occur to avoid module when sending data, the maximum input current of suggestion module is greater than 330mA

Module leaves two 3.3V pin, both can select a pin to module voltage to be provided arbitrarily, also can supply power simultaneously by two pin

Maintenance

1.Power rating: Input DC3.3V

2.Declaration of Conformity

Hangzhou Gubei Electronics Technology Co., Ltd. hereby declares that this Wifi Module is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.a copy of the original declaration of conformity may be found or obtained at <https://shop1413998575180.1688.com/>

C E0700

FCC Caution.

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.

Any 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.

The distance between user and device should be no less than 20cm.

The Wifi module is designed to comply with the FCC statement. FCC ID is 2ACDZ-3303-SBSL. The host system using Wifi module, should have label indicated it contain modular FCC ID: 2ACDZ-3303-SBSL