

# WIFI Bee

## Overview



WiFi Bee is a serial port WiFi module that fully supports IEEE 802.11b/g/n wireless standards. It is internally integrated TCP/IP protocol stack and compatible with any Bee socket. It can directly plug into the Bee sockets and use the UART port for communication.

## Applications

- Portable products
- Home appliances and electrical appliances
- Industrial M2M communications
- Point of Sale Terminals
- Buildings automation
- Logistics and Freight Management
- Home security and Automation
- Medical applications

## Features

- Compliant to IEEE 802.11b/g and single stream 802.11n
- Integrated TCP / IP protocol stack



- Support OPEN, WEP, WPA/WPA2-PSK Encryptions
- Support Station, Ad-Hoc and SoftAP modes
- Support TCP, UDP, HTTP Client protocols
- Support DHCP Server / DHCP Client
- Support AT commands and transparent transmission mode
- Support Web server for configuration
- Host interface through UART and SPI
- Support data flow control on UART interface, maximum rate of 921600bps
- On-board ceramic antenna
- Support parameters store; through pin control the module after power on can enter directly into the transparent transmission mode without any command
- Under transparent transmission mode, support TCP automatically reconnection and wireless-disconnected automatically reconnection

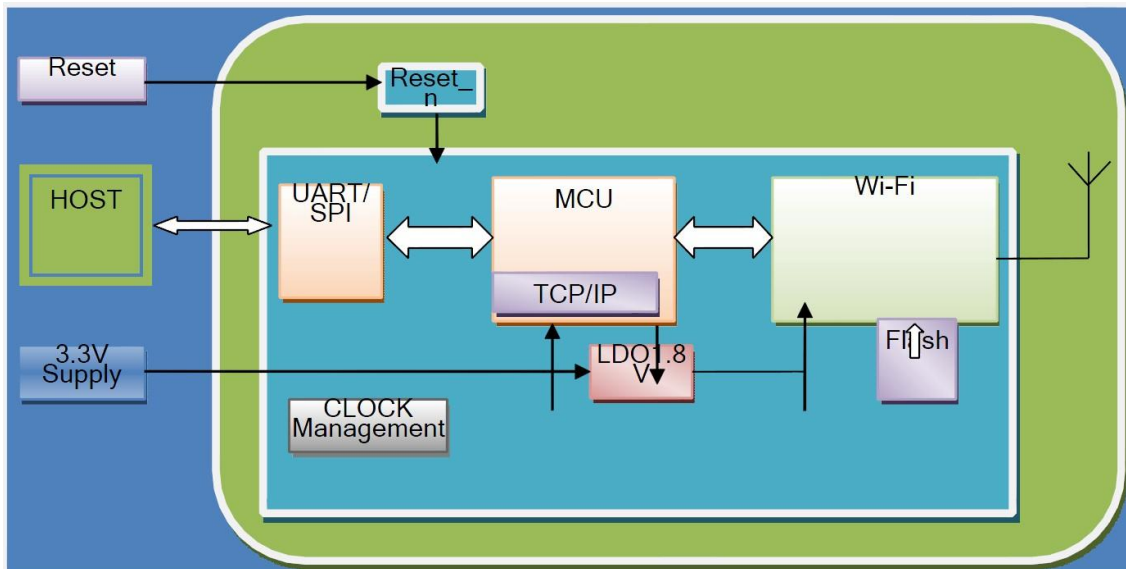
## Specifications

PCB size	36.2mm X 27.16mm X 1.6mm
Power supply	3.3V
Compatible port	Bee socket
UART baud rate	9600~921600bps

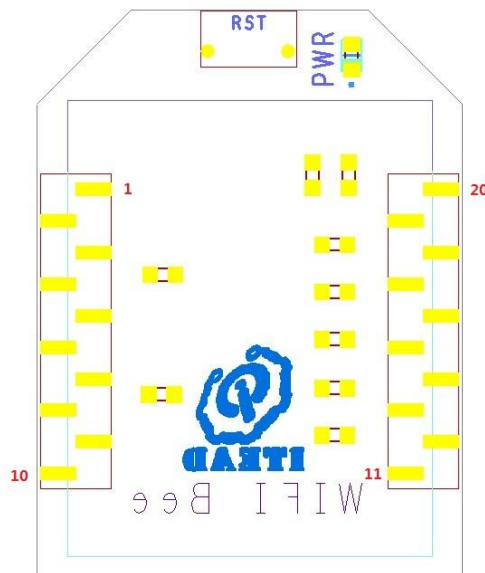
## Electrical Characteristics

Parameters	Min.	Type	Max.	Unit
Power supply	3	3.3	3.6	VDC
Current consumption (VCC=3.3V)	0.5	15000	100000	uA
Maximum RF input (Reference: 50Ω)	-	+10	-	dB
ESD resistance	-	-	2000	V

# WIFI Bee System Block Diagram



## Hardware



## Pinmap

Pin	Pin name	Type	Description
1	VCC	P	Power supply

2	TX	O	Data Output
3	RX	I	Data Input
5	Reset	I	WIFI Reset
10	GND	G	Ground
12	CTS	I(G)	UART Transmit Clear(Connected to Ground)
16	RTS	O	UART Transmit Request
4,6,7,8,9,11,13,14,15,17,18, 19,20	NC	-	No connection

## RF Electrical Characteristics

### ● RF Receiver Characteristics

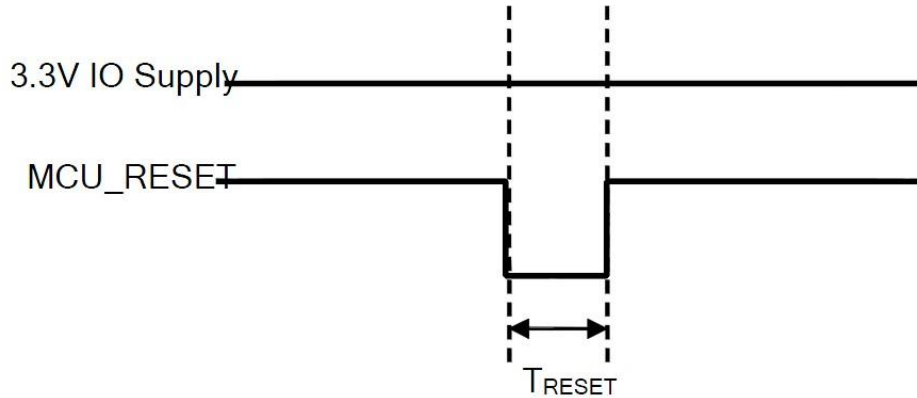
Parameters		Test Conditions	Typical Value	Unit
Receiver sensitivity	11b,1Mbps		-97	dBm
	11b,2Mbps		-92	dBm
	11b,5.5Mbps		-90	dBm
	11b,11Mbps		-88	dBm
	11g,9Mbps		-91	dBm
	11g,18Mbps		-81	dBm
	11g,36Mbps		-87	dBm
	11g,54Mbps		-75	dBm
	11n,MCS1,13Mbps		-89	dBm
	11n,MCS3,26Mbps		-82	dBm
	11n,MCS5,52Mbps		-75	dBm
11n,MCS7,65Mbps		-72	dBm	
Maximum input signal	CH7	11g,54Mbps	10	dBm
Adjacent channel suppression	6Mbps		37	dBc
	54Mbps		21	dBc
	MCS0		38	dBc
	MCS7		20	dBc

### ● RF Transmitter Characteristics

Symbol	Parameters	Rate	Typical Value	Unit	
Ftx	11b,1Mbps	-	2.4	GHz	
Pout	Output power	802.11b	1Mbps	17	dBm
		802.11g	6Mbps	17	dBm
		802.11n,HT20	MCS0	17	dBm
		802.11g,EVM	54Mbps	14	dBm
		802.11n,HT20EVM	MCS7	10	dBm

## MCU Reset

The below figure shows the MCU reset timing diagram and reset pulse length.



The below table shows the description of MCU reset parameters.

Symbol	Description	Typical Value (us)
$T_{RESET}$	MCU reset pulse length	100

## Power

As the following figure shows, WIFI Bee supports 5 operating modes:

Mode	Command	Parameter	MCU	Wireless	Wakeup Style	Typical Value
0	at+pwrmode=	0	Normal_Mode	Max_Perf	No need	100mA
1	at+pwrmode=	1	Sleep_Mode	Power_Save	No need	20mA
2	at+pwrmode=	2	Sleep_Mode	Shut_down	CMD: at+wake_up	2mA
3	at+pwrmode=	3	Deep_Sleep	Power_Save	Interrupt	3mA
4	at+pwrmode=	4	Deep_Sleep	Shut_down	Interrupt	0.5uA

### 1) Power Mode 0----at+pwrmode=0

In power Mode 0, WIFI Bee module operates at the best performance, and the wireless and MCU is completely active.

### 2) Power Mode 1----at+pwrmode=1

The wireless and MCU enter into low power mode. Host can operate module by AT command, sending and receiving data.

### 3) Power Mode 2----at+pwrmode=2

When enter this mode, module saves connection status automatically, power down wireless and MCU enter into low power mode. Host should only use "at+wake\_up", to wake up module and restore operation.

### 4) Power Mode 3----at+pwrmode=3

When enter this mode, MCU enter into deep sleep and cannot respond any command, but wireless keeps current



connection status. The host can only wake this part via UART\_CTS pin or via sending data through wireless to the module, the module enters into mode 1, and operate normally on.

#### 5) Power Mode 4----at+pwrmode=4

When enter into this mode, module save current connection status, power down wireless, and then module enters into deep sleep. Module cannot respond any command and wireless data. It have the lowest power consumption. The host can only wake module up via UART\_CTS, and restore the power mode before deep sleep.

## Indicator and Button

### 1. PWR indicator

Power LED indicator: When the power supply is working, the LED is on.

### 2. RST button

WIFI reset button: When push the button, the WIFI Bee is reset.

## Notes

The WIFI Bee has on-board ceramic antenna, it doesn't need an external antenna to make it work.

## Revision History

Revision	Description	Writer	Date
v1.0	Initial	Stan Lee	2013-5-22