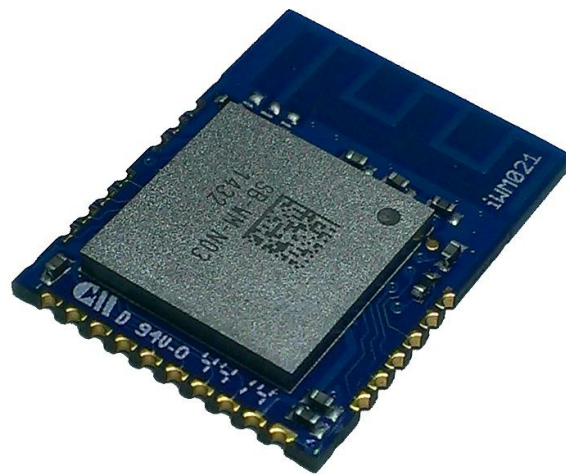


Embedded WiFi Module for M2M and IOT



size
20mmX15mm

Contents

- [Contents](#)
- [Introduction](#)
 - [Description](#)
 - [Features](#)
 - [Applications](#)
- [Block Diagram](#)
- [Typical Application](#)
 - [Direct Link](#)
 - [Local Network](#)
 - [Cloud \(TCP Client/ HTTP Client\)](#)
 - [Modbus Gateway](#)
- [Pin Definition](#)
- [Application Circuits](#)
- [Specification](#)
 - [Absolute Maximum Rating](#)
 - [Recommendable Operation Condition](#)
 - [Current Consumption](#)
 - [RF specification](#)
 - [I/O specification](#)
- [Dimension](#)
- [Mechanical Drawing](#)
- [Recommend Footprint](#)
- [Revision History](#)

Introduction

Description

iWM021 is a complete IEEE 802.11 b/g/n WiFi module for embedded wireless solution. It is a cost effective and low power solution for M2M and IOT application. It is designed for smart grid, smart home, security, building automation, toys, robots, remote health and wellness monitoring and other M2M and IOT applications.

The module integrates an ARM Cortex-M3 MCU and Broadcom WiFi MAC/front end. It manages all the MAC and TCP/IP stack embedded. Except the on board PCB antenna, an external antenna connection pin is also provided to maximum the usage. User could choose one of the antenna to be used.

Different level of wireless connection is supported. Direct connection could be a cable replacement in M2M scenario. Local networking could be an easy adoption for factory and building. We also provide cloud package to help customer to connect to Internet and manage through the internet. You just need to connect your system/device/asset to iWM021 through UART and then use provided web/APP interface to manage your connection. Thus, it can be used to enable wireless connectivity to the simplest existing products with minimal engineering effort.

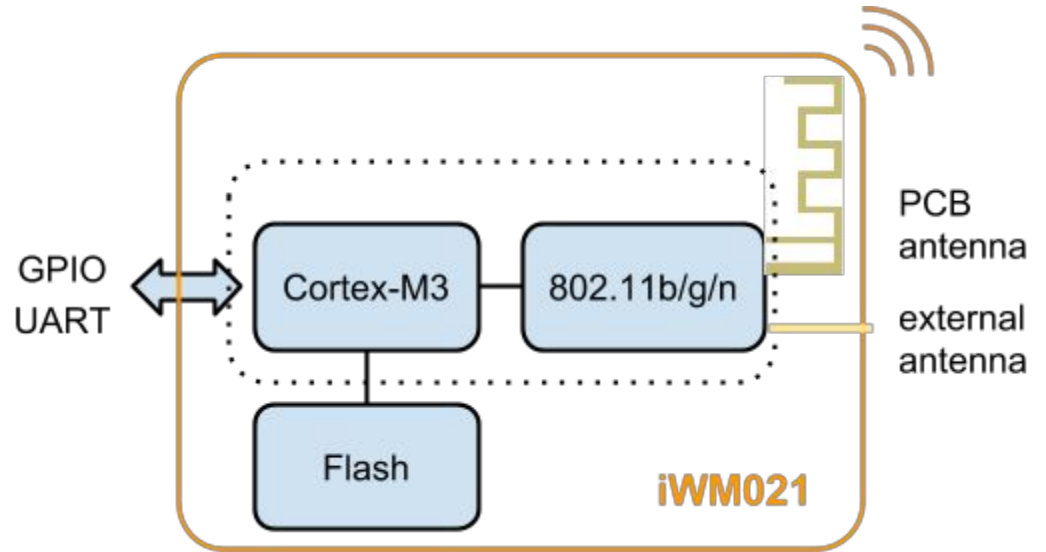
Features

- MCU: ARM 32-bit Cortex™-M3
- Network standard: 802.11b, 802.11g, 802.11n(single stream)
- Frequency band: 2.4GHz
- Transmit power:
 - +17dBm @802.11b
 - +13dBm @802.11g
 - +11dBm @802.11n
- Minimum receiver sensitivity: -80dBm
- Hardware encryption: WPA/WPA2
- Supported data rate:
 - IEEE 802.11b, 1-11Mbps
 - IEEE 802.11g, 6-54Mbps
 - IEEE 802.11n(2.4GHz), 7.2-72.2 Mbps
- Antenna:
 - on board PCB antenna
 - external antenna pin
- Input/Output:
 - UART
 - GPIO
- Advanced 1X1 802.11n feature:
 - full/half guard interval
 - frame aggregation
 - space time block coding(STBC)
 - low density parity check(LDPC) encoding
- BRCM WICED fully compatible
- Web based configuration interface
- Ready-to-use firmware for different application(see typical application page)
- Operational temperature: -40°C to 85°C
- Certification: FCC and CE compliant. (logo by request)

Applications

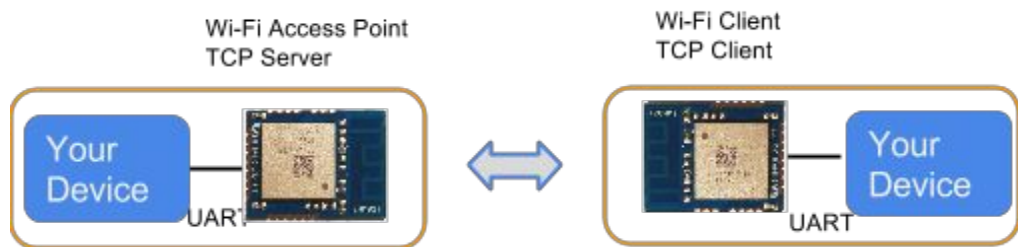
- Lighting control
- Precision Agriculture
- Smart home
- Building automation
- Toys
- Health and wellness monitoring
- Security
- Robots
- Smart grid
- Instrument
- Industrial automation

Block Diagram

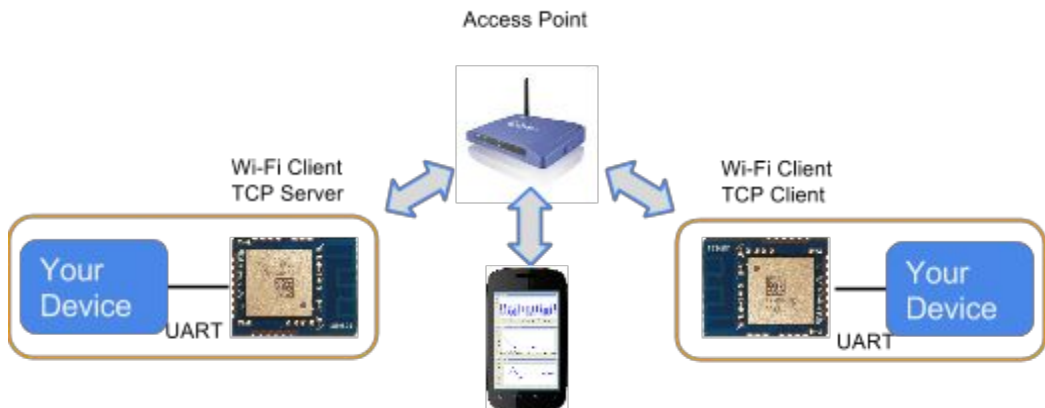


Typical Application

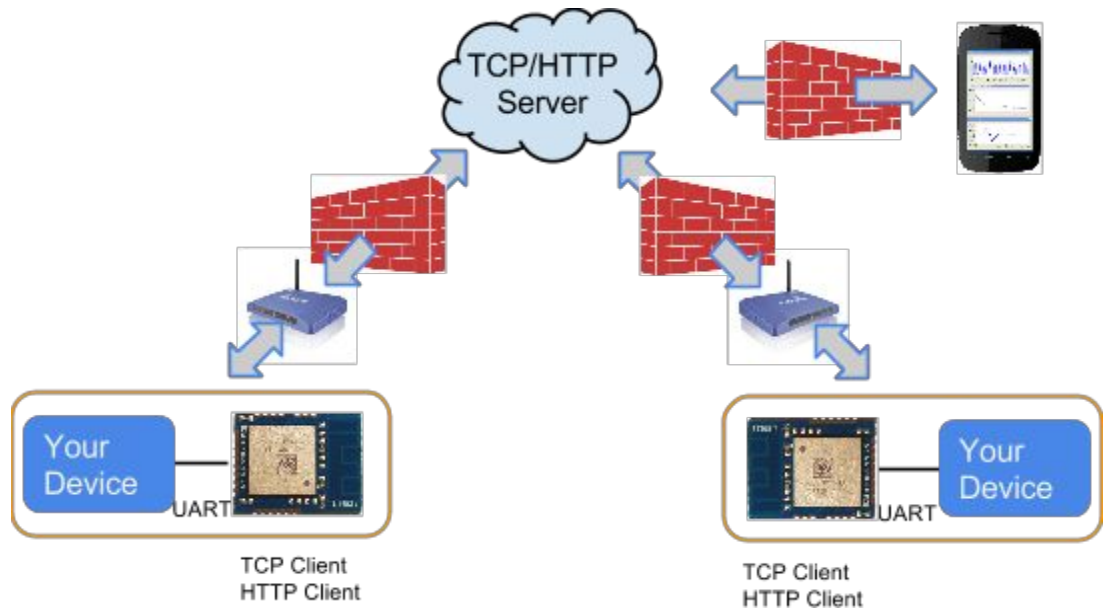
Direct Link



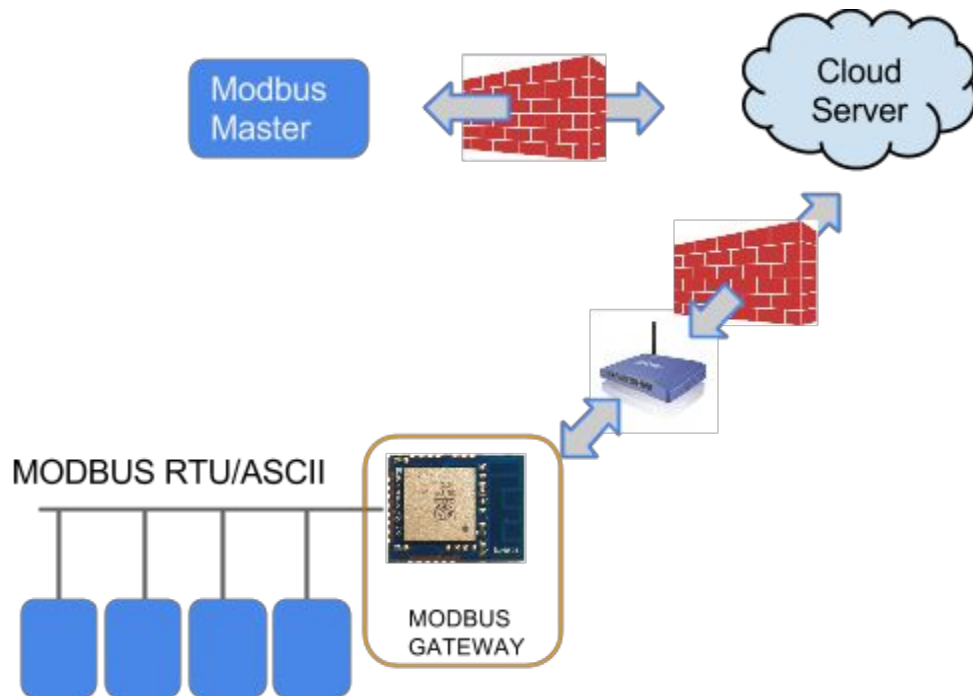
Local Network



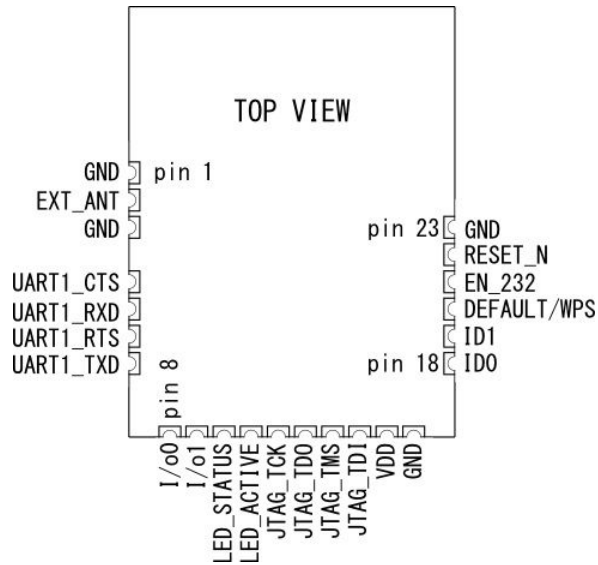
Cloud (TCP Client/ HTTP Client)



Modbus Gateway



Pin Definition



Pin #	Pin Name	Pin Type	Description
1	GND	P	ground
2	EXT_ANT	I	External antenna input, 50 ohm impedance required
3	GND	P	ground
4	UART1_CTS	I	UART1 hardware flow control
5	UART1_RXD	I	UART1 receive data input
6	UART1_RTS/ RS485_DE	O	UART1 hardware flow control RS485 direction control : L:receiver enable; H:output enable
7	UART1_TXD	O	UART1 transmit data output
8	I/O0	I/O	General purpose output only
9	I/O1	I/O	General purpose output only
10	LED_STATUS	O	Indicates system ready, high active.
11	LED_ACTIVE	O	H: WiFi connected flash: data is transmitted through WiFi
12	JTAG_TCK	I	Debug port. Suggest to reserve a pad for debug purpose.
13	JTAG_TDO	O	Debug port. Suggest to reserve a pad for debug purpose.
14	JTAG_TMS	I	Debug port. Suggest to reserve a pad for debug purpose.
15	JTAG_TDI	I	Debug port. Suggest to reserve a pad for debug purpose.

Specification

Absolute Maximum Rating

Supply Power	Max. +3.46 Volt, Min. 0 Volt
Storage Temperature	-40° to 85° Celsius
Voltage Ripple	+2%

Recommendable Operation Condition

Operating Temperature	-40° to 85° Celsius
Humidity	Max 95%, Non condensing, relative humidity
VDD	3.3 Volt +- 5%

Current Consumption

Tx mode(11b,11Mbps,Max current)	Max. 355 mA, Typ. 295 mA
Tx mode(11g, 54Mbps, Max current)	Max. 245 mA, Typ. 175 mA
Tx mode(11n, MCS7, Max current)	Max. 235 mA, Typ. 165 mA
Rx mode	Max. 100mA, Typ. 85mA

RF specification

Wireless	IEEE 802.11b/g/n(single stream)
Network modes	infrastructure, Ad-Hoc
Data rate	IEEE 802.11b, 1-11Mbps IEEE 802.11g, 6-54Mbps IEEE 802.11n(2.4GHz), 7.2-72.2 Mbps
Frequency band	2.400 – 2.484 GHz
Number of selectable Sub channels	14 channels
Channel Bandwidth	20MHz
Modulation	OFDM, DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK , 16QAM, 64QAM
Maximum receive input level	- 10dBm (with PER < 8%@11 Mbps) - 20dBm (with PER < 10%@54 Mbps) - 20dBm (with PER < 10%@MCS7)

Minimum receive input level	- 87dBm (typ. with PER < 8%@11 Mbps) - 70dBm (typ. with PER < 10%@54 Mbps) - 70dBm (typ. with PER < 10%@MCS7)
Transmit Power	17dBm (typical)@ 802.11b 13dBm (typical)@ 802.11g 11dBm (typical)@ 802.11n
Carrier Frequency Accuracy	+/- 20ppm (crystal: 26MHz +/-10ppm in 25°C)
Antenna	on board PCB antenna and external antenna optional
Range	up to 50M meters(in open area)
Security	WPA/WPA2

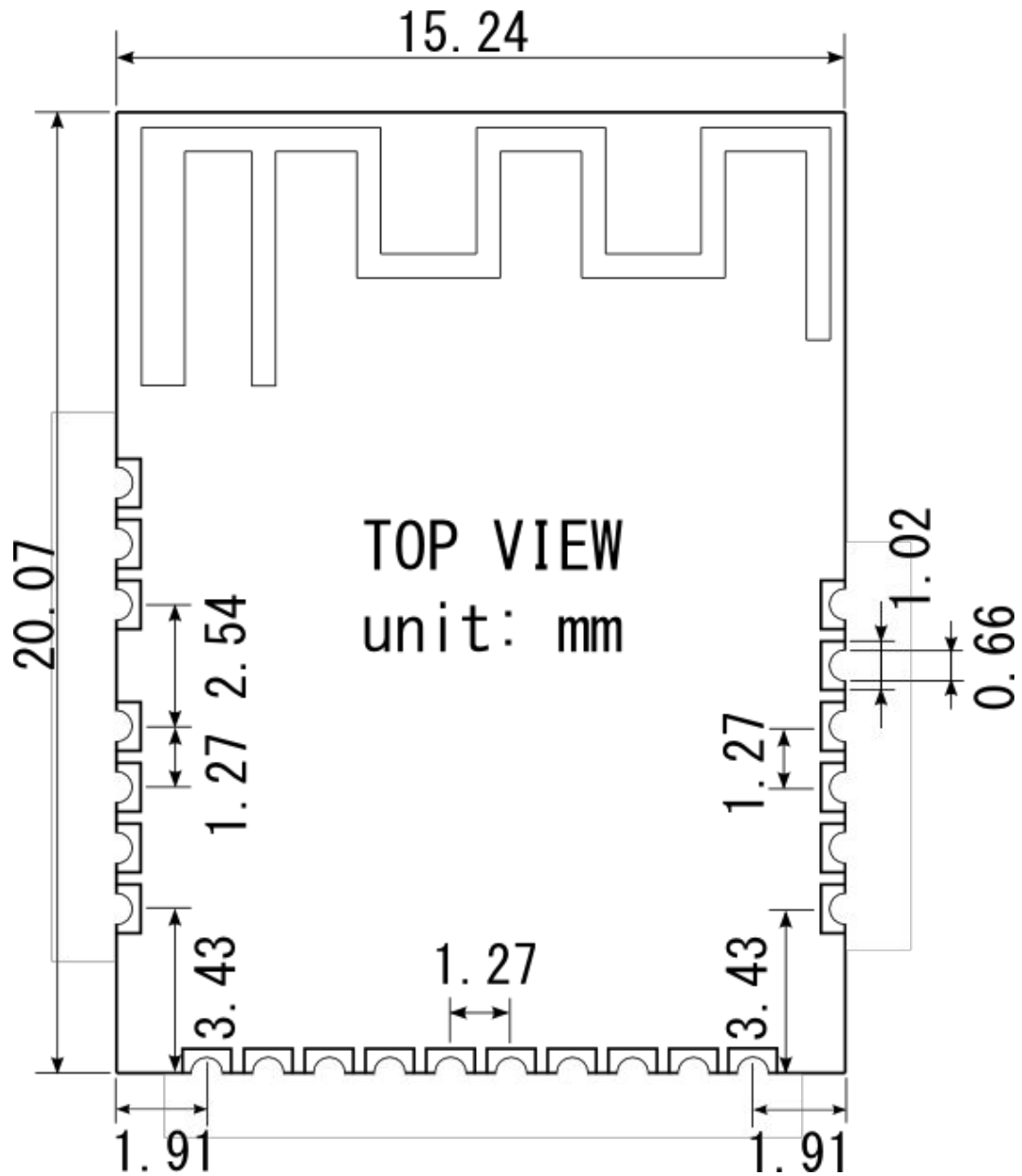
I/O specification

General purpose input/output	level 0-3.3V maximum rating: 3.6V input low voltage: 0-0.8V input high voltage: 2V-3.3V output driving current: 4mA output low voltage: <0.4V output high voltage: >VDD-0.4V
Serial interface	UART(support RS232/RS422/RS485) Baud rate: 9600 to 921.6 K Parity: None, Even, Odd Flow Control: RTS/CTS

Dimension

Dimensions L x W x H (mm)	20 x 15 x 2.15 (subject to change)
---------------------------	------------------------------------

Mechanical Drawing



Revision History

Date	Revision	Changes
Jul 2014	A	Initial release
Aug 4, 2014	A1	<ol style="list-style-type: none"> 1. change model name from iwm-011 to iwm-020 2. add pin definition 3. add mechanical drawing 4. update dimension 5. add recommend footprint 6. update block diagram 7. modify description 8. modify I/O specification
Sep 4, 2014	A2	<ol style="list-style-type: none"> 1. Modify pin description and figure 2. Modify block diagram- remove I2S 3. Update typical application diagram 4. Change cover page format 5. Modify feature page 6. Change driving current to TBD in IO specification
Oct 20, 2014	1	<ol style="list-style-type: none"> 1. Change model name from iWM-020 to iWM021 2. Change the photo to new one 3. Remove wording relates diversity on page 3,4 4. Modify block diagram- change name 5. Change photo in typical application diagram 6. Modify pinout figure and pin definition 7. Modify mechanical drawing and footprint 8. Remove I2C and SPI from IO specification 9. Add application circuits section
Oct 30, 2014	1A	<ol style="list-style-type: none"> 1. Update pin definition description on JTAG, RESET, and MFG_MODE 2. Update application circuits on JTAG, RESET, and MFG_MODE 3. Update the driving current of general purpose input/output from TBD to 4mA
Jan 23, 2015	1B	<ol style="list-style-type: none"> 1. In feature page, remove I2S support 2. In feature page, remove features that are not yet supported 3. In feature page and specification page, remove WEP support in hardware encryption 4. In I/O specification, modify the serial interface baud rate 5. In pin definition and application circuits page, change IO1, IO2 name to IO0, IO1 for consistency 6. Change photo in cover page 7. In Specification, change antenna diversity to optional 8. In Specification, adds range information and channel bandwidth information
Feb 2, 2015	1C	<ol style="list-style-type: none"> 1. In pin definition, change MFG_MODE function to

		<p>EN_232</p> <ol style="list-style-type: none">2. Modify application circuit at EN_232(originally MFG_MODE)3. In pin description, change I/O1, I/O2 to only support output function
--	--	---