



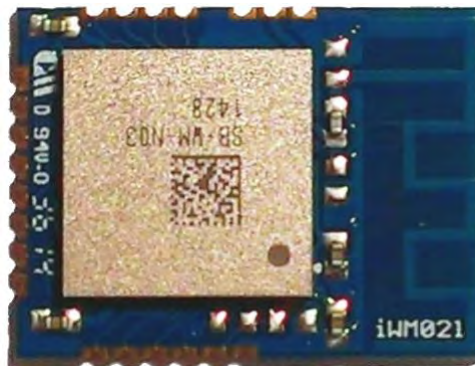
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***ACT-WF580M***  
***Embedded WiFi Module***  
***for M2M and IOT***



Real size: 20 mm X 15 mm

**December 17, 2014**

**Version. 1.0.1**

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## REVISION HISTORY

Revision History		
Revision	Date	Comment
1.0.1	12/17/2014	Initial release

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# 1 INTRODUCTION

## 1.1 Description

ACT-WF580M 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 ACT-WF580M 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.

## 1.2 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: WEP, WPA/WPA2
- Supported data rate:
  - IEEE 802.11b, 1-11Mbps
  - IEEE 802.11g, 6-54Mbps

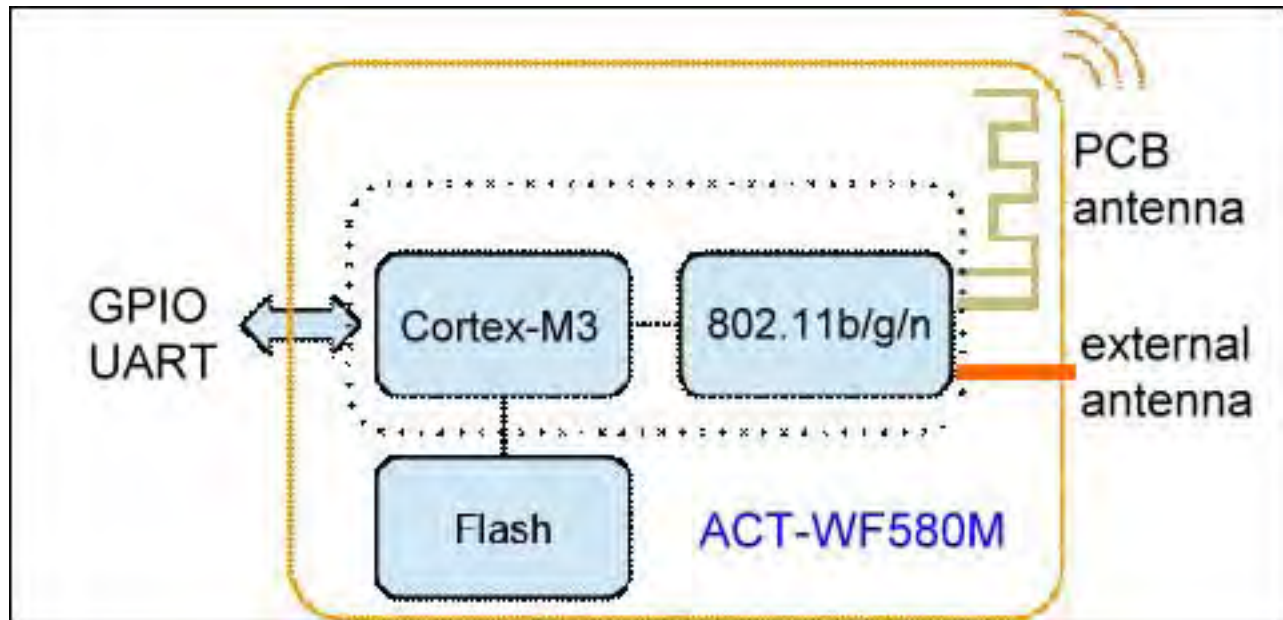
- IEEE 802.11n(2.4GHz), 7.2-72.2 Mbps
- Antenna:
  - on board PCB antenna
  - external antenna pin
- Input/Output:
  - UART
  - GPIO
- Advanced 1X1 802.11n feature:
  - full/half guard interval
  - frame aggregation
  - space time block coding(STBC)
  - low density parity check(LDPC) encoding
- BRCM 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)

### 1.3 Applications

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

- Smart grid
- Instrument
- Industrial automation

## 2 BLOCK DIAGRAM

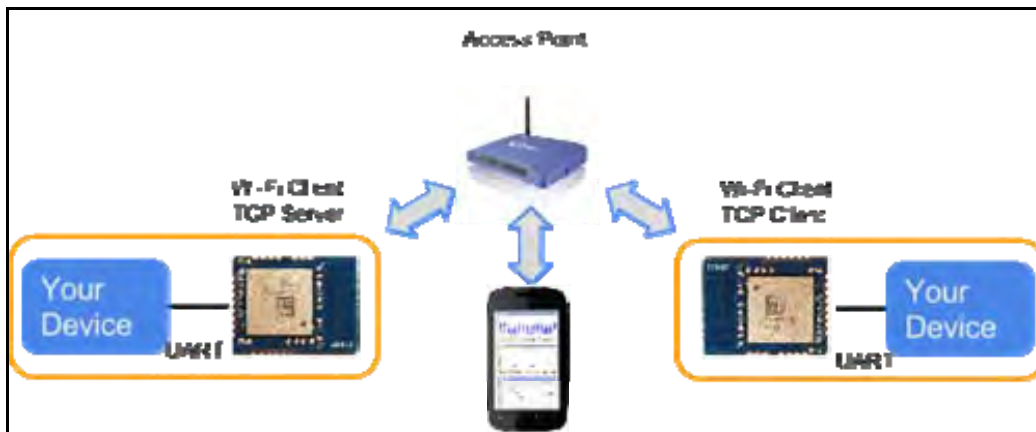


### 3 TYPICAL APPLICATION

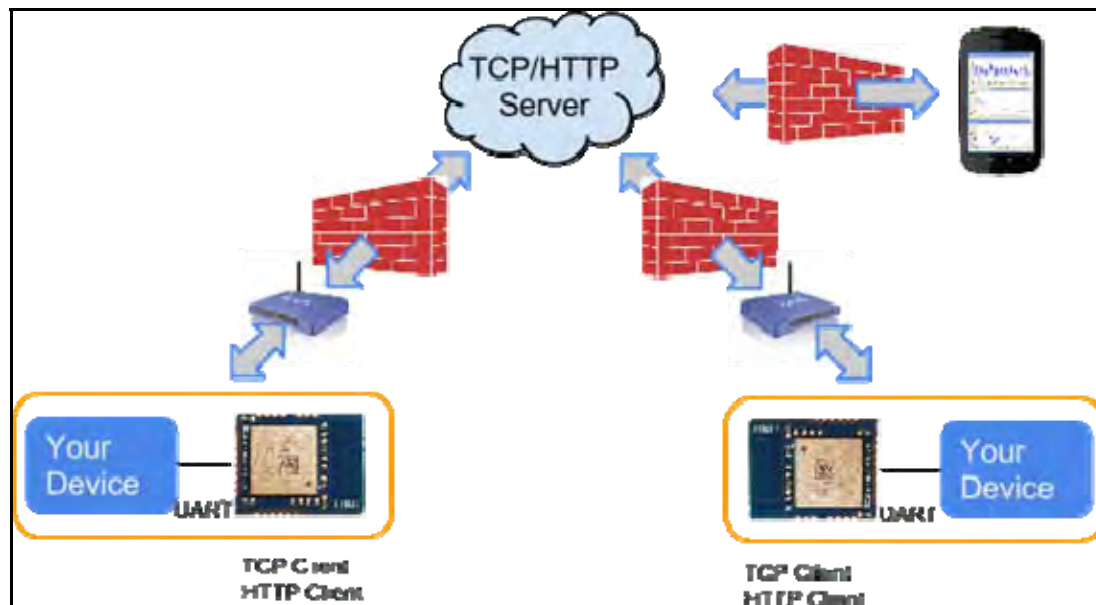
#### 3.1 Direct Link



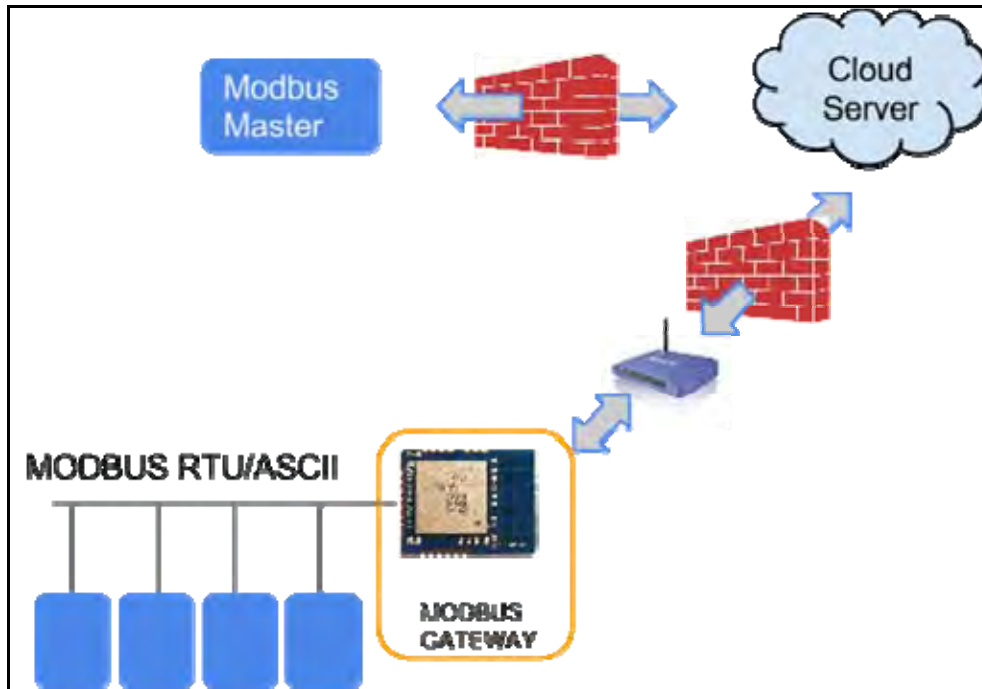
#### 3.2 Local Network



#### 3.3 Cloud (TCP Client/ HTTP Client)

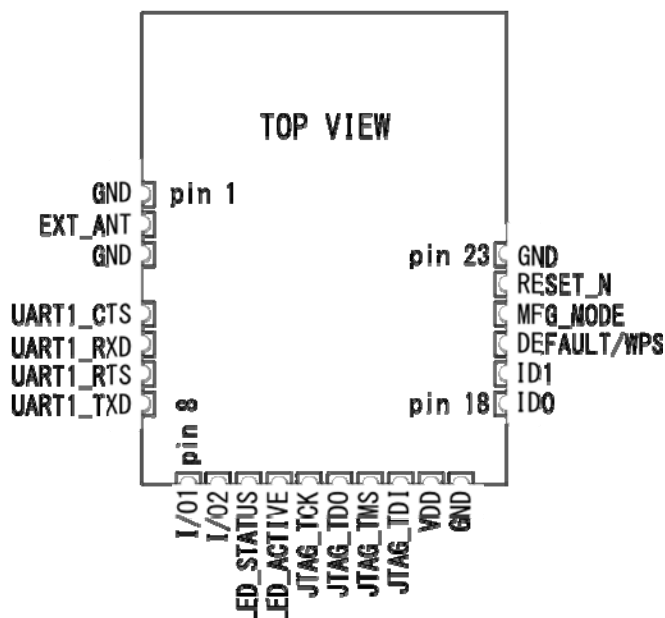


### 3.4 Modbus Gateway





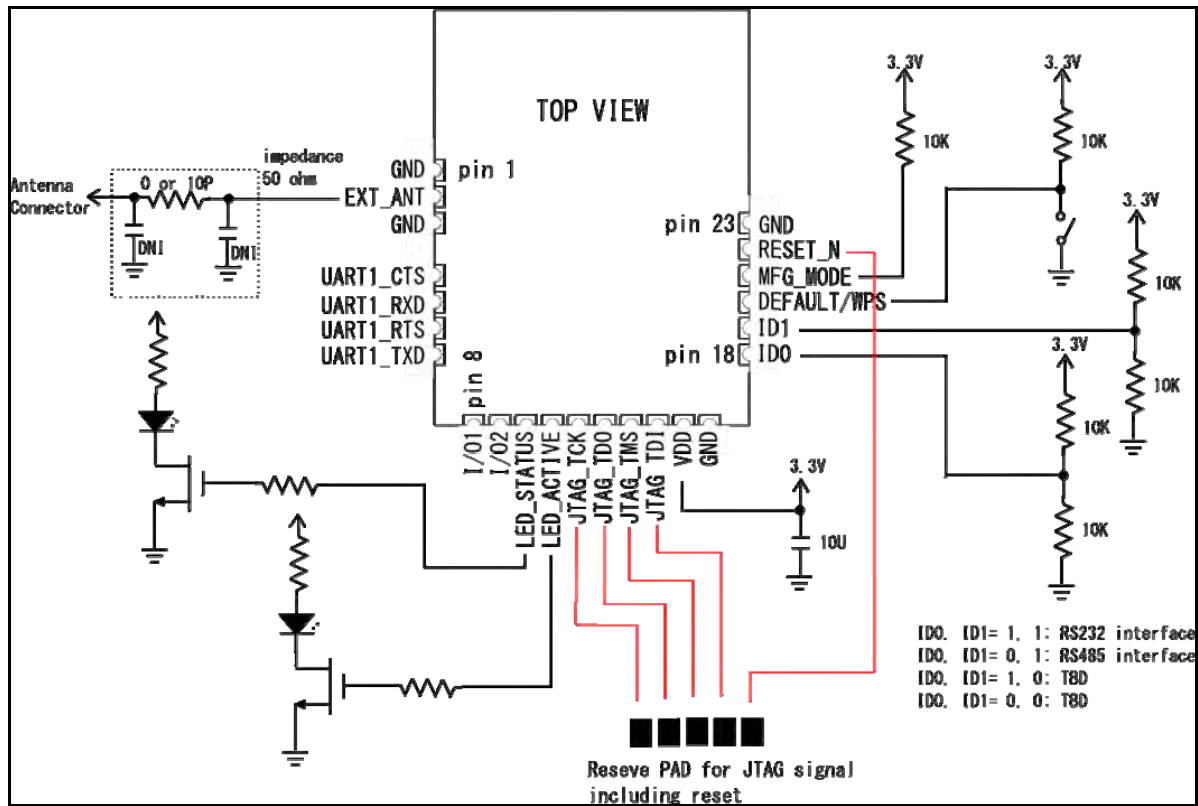
## 4 PIN DEFINITION



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/O1	I/O	Reserved for general purpose input and output
9	I/O2	I/O	Reserved for general purpose input and output
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 reserving a pad for debug purpose.
13	JTAG_TDO	O	Debug port. Suggest reserving a pad for debug purpose.

14	JTAG_TMS	I	Debug port. Suggest reserving a pad for debug purpose.
15	JTAG_TDI	I	Debug port. Suggest reserving a pad for debug purpose.
16	VDD	P	+3.3V power input. Decoupling with 10U or larger ceramic capacitor
17	GND	P	ground
18	ID0	I	For RS232 interface, connect this pin to high through a 10K resistor; For RS485 interface, connect this pin to low through a 10K resistor.
19	ID1	I	For serial application, connect this pin to high through a 10K resistor.
20	DEFAULT/WPS	I	connect to WPS and factory default button (low active). short press: WPS; long press (>4 sec): reset system to factory default
21	MFG_MODE	I	Reserved for manufacturing purpose only. Pull up with a 10K resistor.
22	RESET_N	I	Module reset, internal pull up. Suggest reserving a pad for debug purpose.
23	GND	P	ground

## 5 APPLICATION CIRCUITS



## 6 SPECIFICATION

### 6.1 Absolute Maximum Rating

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

### 6.2 Recommendable Operation Condition

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

### 6.3 Current Consumption

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

### 6.4 RF Specification

	<b>Wireless</b>	IEEE 802.11b/g/n (single stream)
	<b>Network modes</b>	infrastructure, Ad-Hoc

<b>Data rate</b>	IEEE 802.11b, 1-11Mbps IEEE 802.11g, 6-54Mbps IEEE 802.11n (2.4GHz), 7.2-72.2 Mbps
<b>Frequency band</b>	2.400 – 2.484 GHz
<b>Number of selectable Sub channels</b>	14 channels
<b>Modulation</b>	OFDM, DSSS (Direct Sequence Spread Spectrum), DBPSK, DQPSK, CCK , 16QAM, 64QAM
<b>Maximum receive input level</b>	- 10dBm (with PER < 8%@11 Mbps) - 20dBm (with PER < 10%@54 Mbps) - 20dBm (with PER < 10%@MCS7)
<b>Minimum receive input level</b>	- 87dBm (typ. with PER < 8%@11 Mbps) - 70dBm (typ. with PER < 10%@54 Mbps) - 70dBm (typ. with PER < 10%@MCS7)
<b>Transmit Power</b>	17dBm (typical)@ 802.11b 13dBm (typical)@ 802.11g 11dBm (typical)@ 802.11n
<b>Carrier Frequency Accuracy</b>	+/- 20ppm (crystal: 26 MHz +/-10 ppm in 25°C)
<b>Antenna</b>	on board PCB antenna and external antenna diversity
<b>Range</b>	up to_TBD meters ( in open area)
<b>Security</b>	WEP, WPA/WPA2

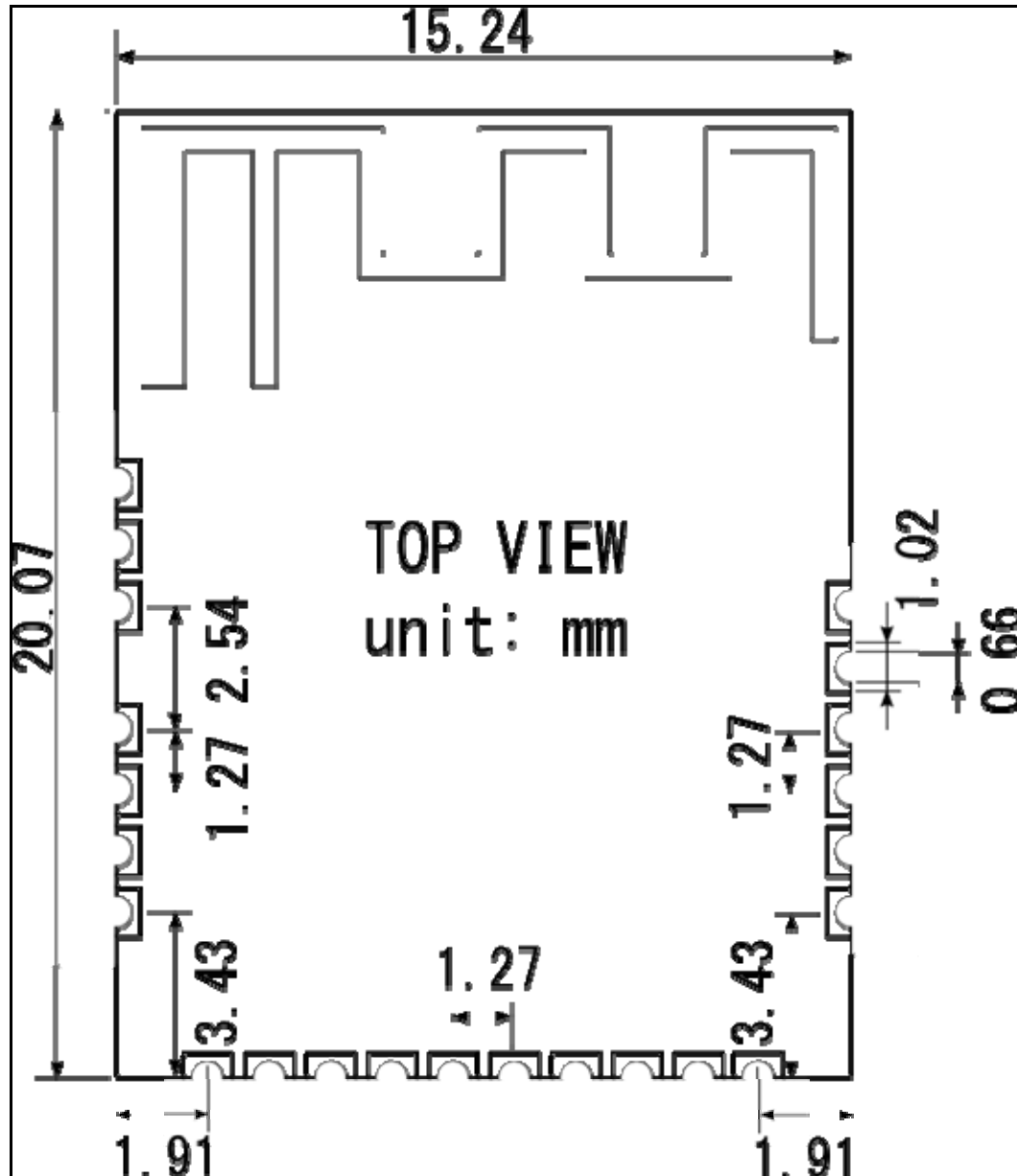
## 6.5 I/O Specification

	<b>General purpose input/output</b>	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
	<b>Serial interface</b>	UART ( support RS232/RS422/RS485) Baud rate: 9600 to 921.6 K Parity: None, Even, Odd Flow Control: RTS/CTS

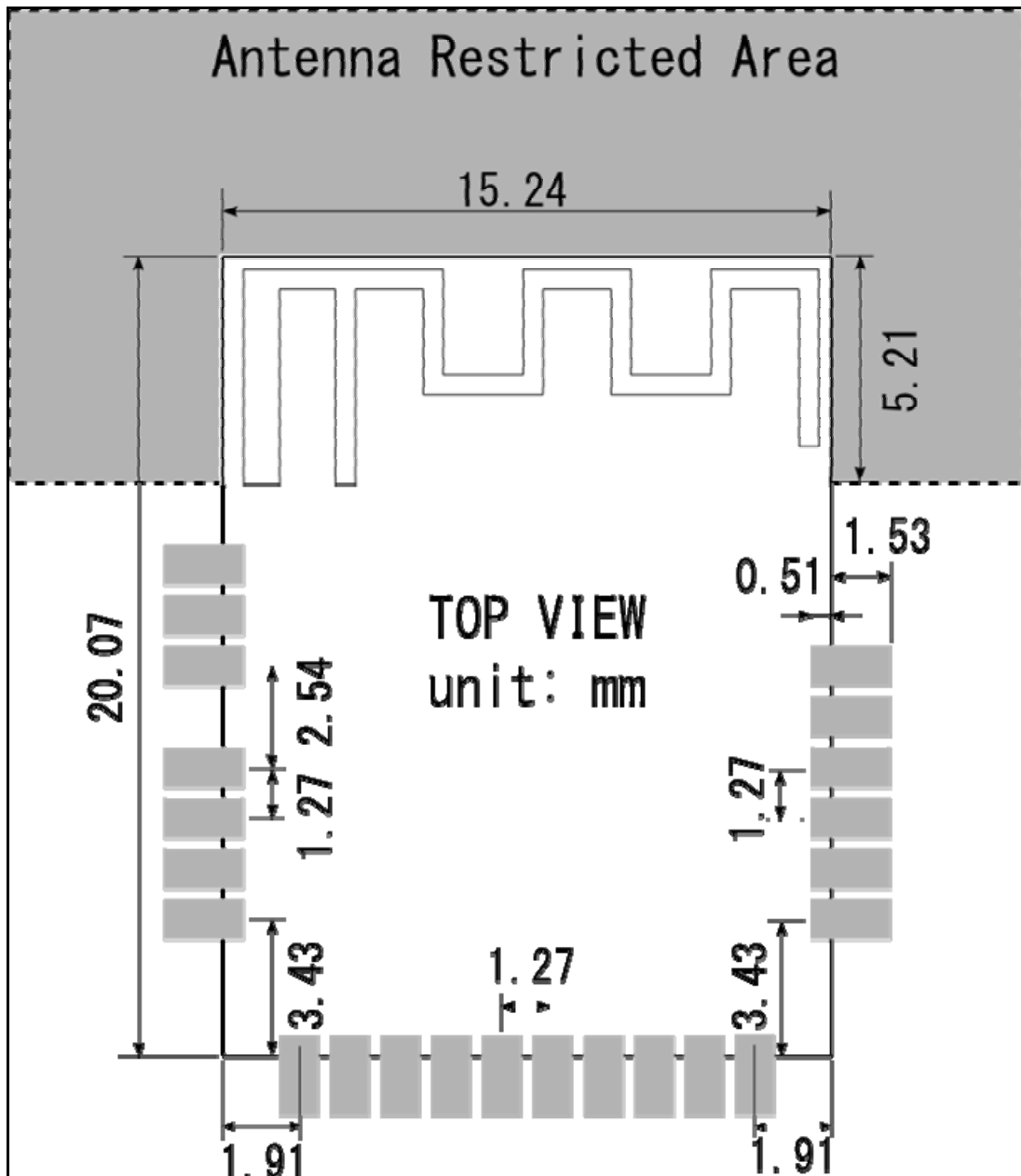
7 DIMENSION

Dimensions	L x W x H (mm)	20x 15 x 2.15 (subject to change)
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8 MECHANICAL DRAWING



9 RECOMMEND FOOTPRINT





## 10 WARRANTY INFORMATION

ACTiSYS Corporation warrants the first end-user purchaser, for a period of 1 year from the date of purchase, that this wireless interface (The Product) will be free from defective workmanship and materials, and agrees that it will, at its option, either repair the defect or replace the defective Product or part thereof at no charge to the purchaser for parts or for labor.

This warranty does not apply to any appearance items of the Product, any consumable items such as paper, ink ribbon, or batteries supplied with the Product, or to any equipment or any hardware, software, firmware, or peripheral other than the Product. This warranty does not apply to any Product the exterior of which has been damaged or defected, which has been subjected to misuse, abnormal service or handling, or which has been altered or modified in design, construction or interfacing. Tampering with Label Voids Warranty.

In order to enforce the rights under this limited warranty, the purchaser should mail, ship or carry the Product, together with proof of purchase, to ACTiSYS.

The limited warranty described above is in addition to whatever implied warranties may be granted to purchasers by law. To the extent permitted by applicable law, ALL IMPLIED WARRANTIES INCLUDE THE WARRANTIES OF MERCHANT ABILITY AND FITNESS FOR USER ARE LIMITED TO A PERIOD OF 1 YEAR FROM THE DATE OF PURCHASE. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

Neither the sales personnel of the seller nor any other person is authorized to make any warranties other than those described above, nor to extend the duration of any warranties beyond the time period described above on behalf of ACTiSYS Corporation.

The warranties described above shall be the sole and exclusive remedy available to the purchaser. Correction of defects, in the manner and for the period of time described above, shall constitute full satisfaction of all claims, whether based on contract, negligence, strict liability or otherwise. In no event shall ACTiSYS Corporation be liable or in any way responsible, for any damages or defects in the Product which were caused by repair or attempted repairs performed by anyone other than ACTiSYS technician. Nor shall ACTiSYS Corporation be liable or in any way responsible for any incidental or consequential economic or property damage. Some states do not allow the exclusion of incidental or consequential damages, so the above exclusion may not apply to you.

### FOR YOUR RECORDS

For your assistance in reporting this product in case of loss or theft, please record below the model number and serial, which are located on the bottom of the case. Please retain this information.

**Model Number:**

**Serial Number:**

**Date of Purchase:**



**11 CONTACT INFORMATION****GO WIRELESS WITH ACTiSYS IR**

**ACTiSYS**  
*The Wireless Infra-red Expert*

- ◆ IrDA Protocol Software For Portable Devices
- ◆ IrDA Test Software For Hardware Systems
- ◆ IrDA Printer And Computer Adapters

115.2K, 4M and 16M bps

IR2000L

IR220L/L+

IR100M/1000M

The graphic features a central red background with the ACTiSYS logo and tagline. Below the logo are three bullet points listing services: IrDA Protocol Software For Portable Devices, IrDA Test Software For Hardware Systems, and IrDA Printer And Computer Adapters. Above the bullet points, the text '115.2K, 4M and 16M bps' is displayed. Below the bullet points, three images show IrDA adapters: IR2000L, IR220L/L+, and IR100M/1000M. The central area is surrounded by various electronic devices connected by red lines, including a printer, a PDA, a mobile phone, a laptop, a camera, and a scanner.

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