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IEEE 802.11 a/b/g/n 300Mbps WiFi Module

Product Specifications

Model: TOP-S5

Version: 1.1

2015-12-15

1. Introduction

The TOP-S5 is a WLAN module supporting IEEE 802.11a/b/g/n standards with 7-pin or 4-pin connector supporting USB2.0 interface. This is a small form factor and low cost compact WLAN module designed for the wireless connectivity. This module operates in 2.4GHz and 5GHz dual band frequency , it applies a highly integrated MAC/BBP and RF/PA/LNA single chip RT5572 with 300Mbps PHY rate supporting. It fully complies with IEEE802.11n draft 3.0 and IEEE802.11a/b/g feature.

2. Features

- 20MHz/40MHz bandwidth, support 2T2R mode in 2.4GHz and 5GHz .
- 802.11a: 6, 9, 12, 24, 36, 48, 54Mbps; 802.11b: 1, 2, 5.5, 11Mbps; 802.11g: 6, 9, 12, 24, 36, 48, 54Mbps ; 802.11n: Support PHY rate up to 300Mbps.
- Support Soft-AP; QoS-WMM, WMM-PS; WiFi Direct;
- WPS pin, LED indicates WiFi link & activity;
- Multiple BSSID support; Power management.

3. Product Information

3.1 Specification (Typical Value):

Main Chipset	Ralink RT5572N
Operation Frequency	2412~2483.5MHz,4.915~5.825GHz (Different country adopts different frequency)
Protocols	802.11b: CCK, QPSK, BPSK, 802.11a/g/n: OFDM
Antennas	Two outputs to two dual band external antennas
Security	WEP 64/128, WPA/WPA2/WAPI, TKIP/AES; WPS/WPS2:PIN,PBC
Typical Transmit Power (Antenna feed point)	802.11b (CCK) 11Mbps: 17+/-1dBm
	802.11g (OFDM) 54Mbps: 15+/-1dBm
	802.11a (OFDM) 54Mbps: 11+/-1.5dBm
	802.11n (HT20@MCS7), 13+/-1dBm; (HT40@MCS7),12+/-1dBm
Receive Sensitivity (Antenna feed point)	802.11b: -88+/-1dBm; 802.11g: -73+/-1dBm
	802.11n (HT20), -71+/-1dBm; 802.11n (HT40), -68+/-1dBm
	802.11a: -70+/-1dBm

Operating Voltage/current	5.0VDC $\pm$ 5% ; <350mA @802.11n,HT40 ; or 3.3VDC $\pm$ 5% <500mA, @802.11n,HT40 5.0VDC $\pm$ 5% ; <450mA @802.11a,HT40 ; or 3.3VDC $\pm$ 5% <630mA, @802.11a,HT40
Host interface	USB 2.0
Interface	7-pin or 4-pin, 2.0mm , or 4-pin 2.54 mm pitch pin header
Dimensions/Weight	48x18mm / 3.6g

3.2 Block Diagram

Figure 1: System Block Diagram of 7 pin TOP-S5 5.0V WLAN Module

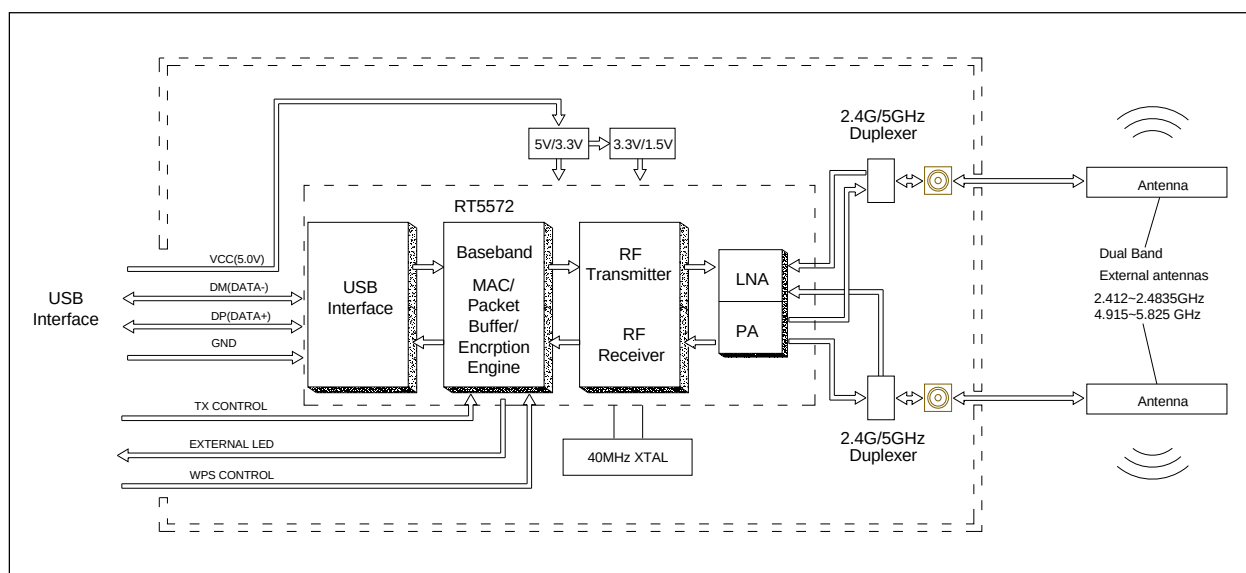


Figure 2: System Block Diagram of 7 pin TOP-S5 3.3V WLAN Module

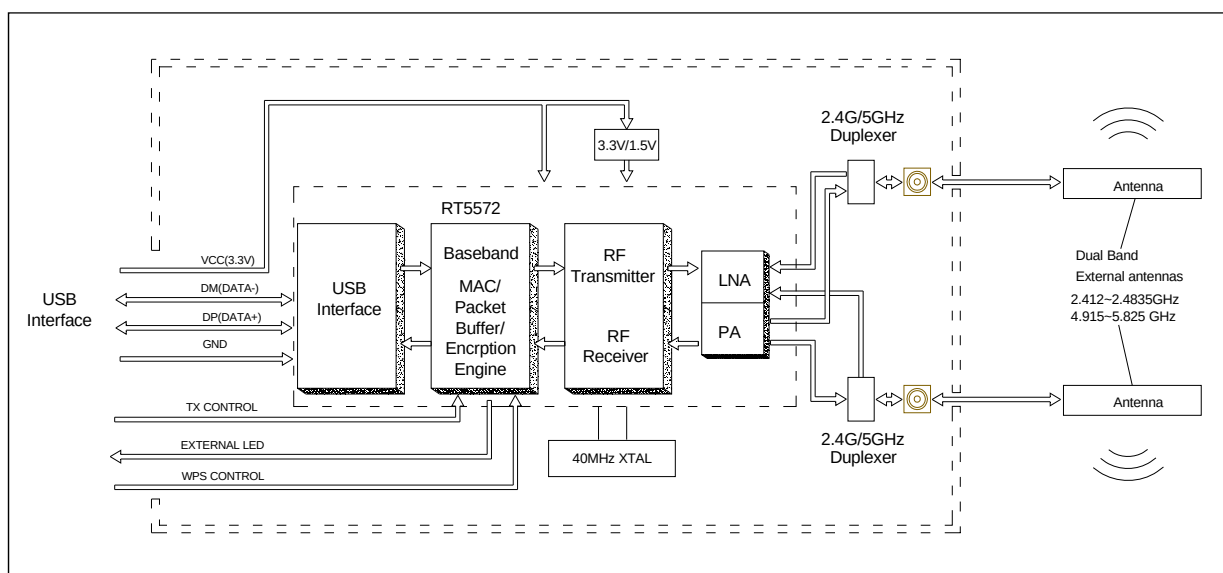


Figure 3: System Block Diagram of 4 pin TOP-S5 5.0V WLAN Module

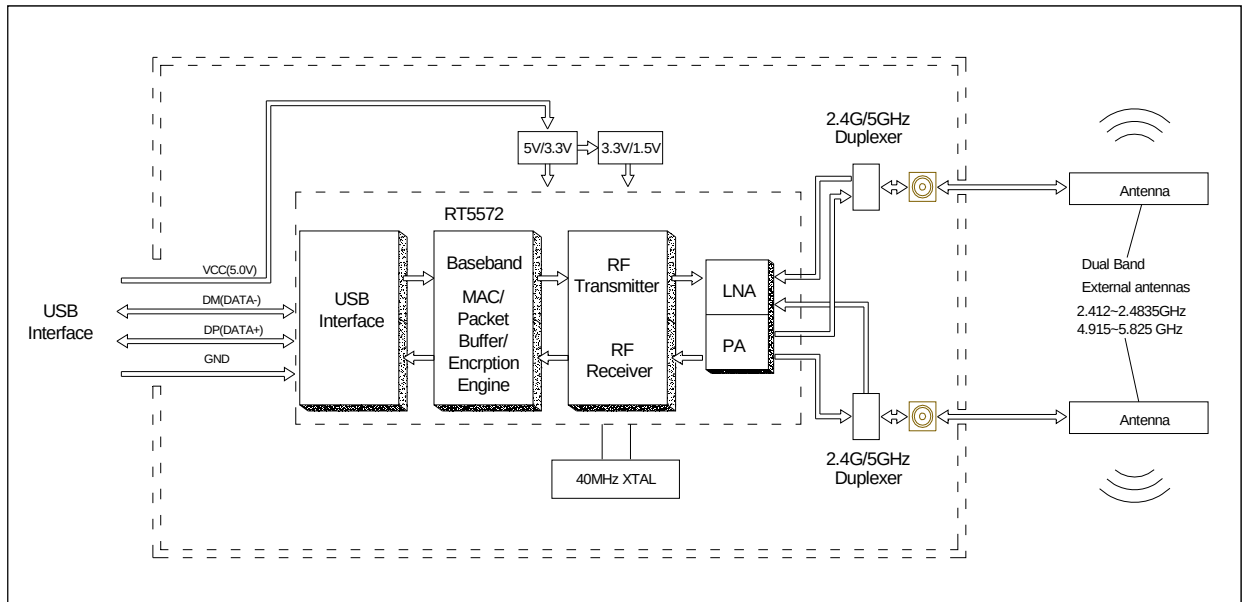
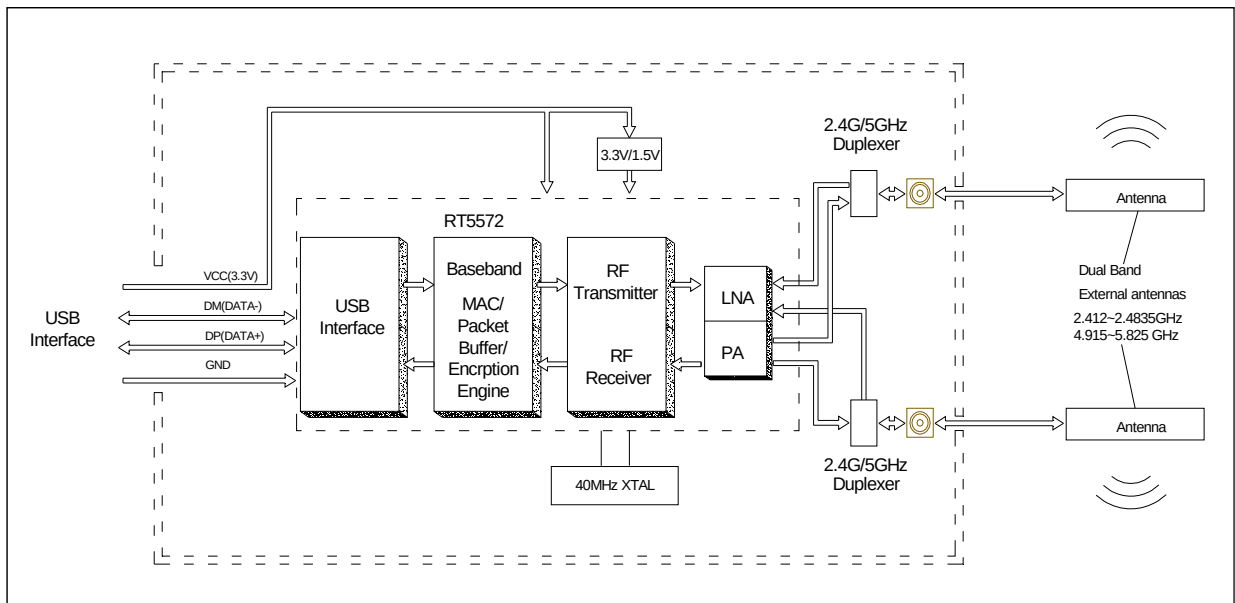


Figure 4: System Block Diagram of 4 pin TOP-S5 3.3V WLAN Module



3.3 Mechanical Information

3.3.1 OUTLINE and Connection Interface (Pictures are for reference only)

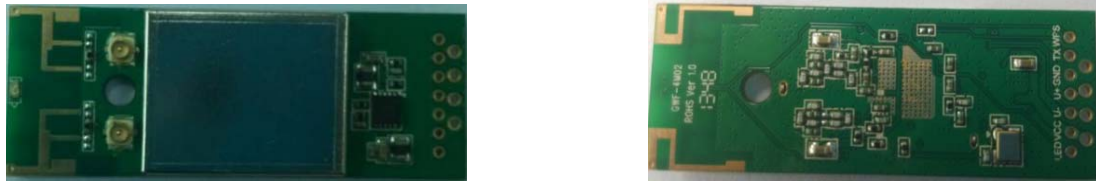
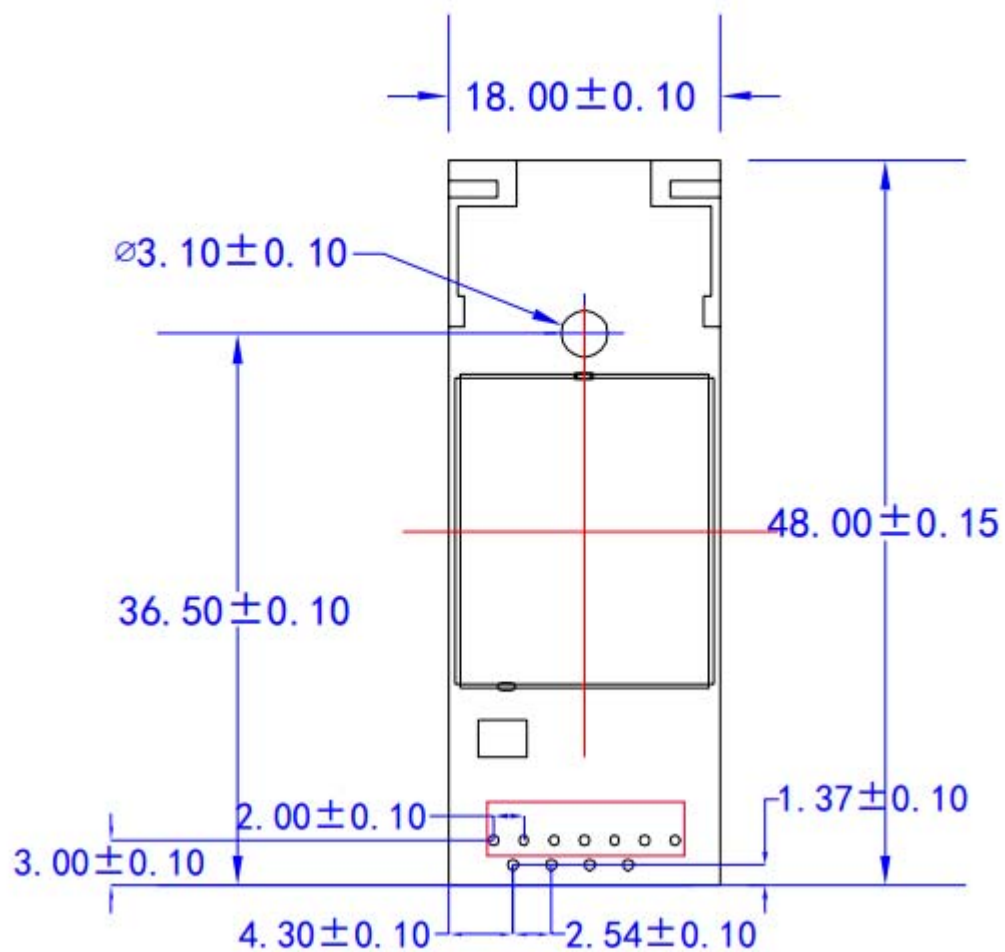
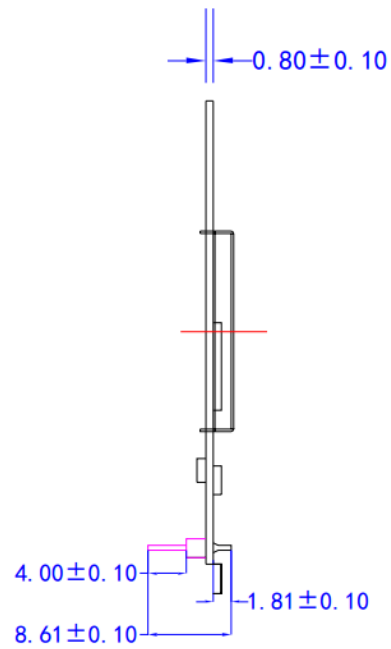


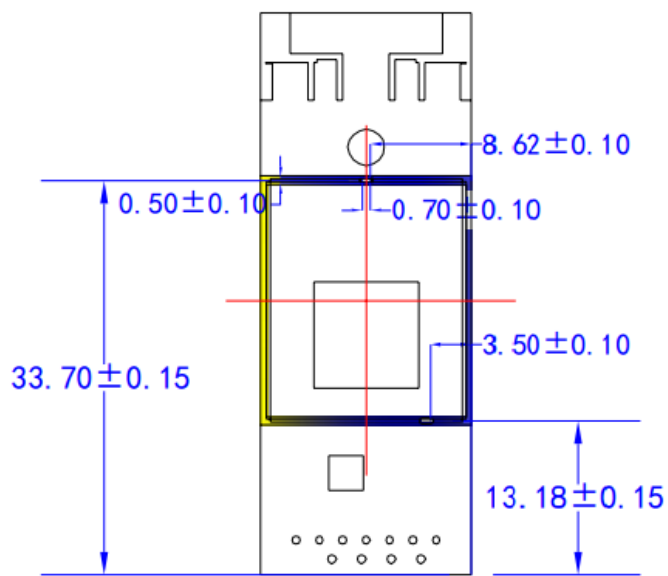
Figure 5: 5.0VDC power input module.





RF connector at bottom

Figure 6: General Dimensions



RF connector at top

Figure 7: General Dimensions

3.3.1.1 4-pin 2.54 mm pitch pin header.

a). Model: TOP-S5, 4M02

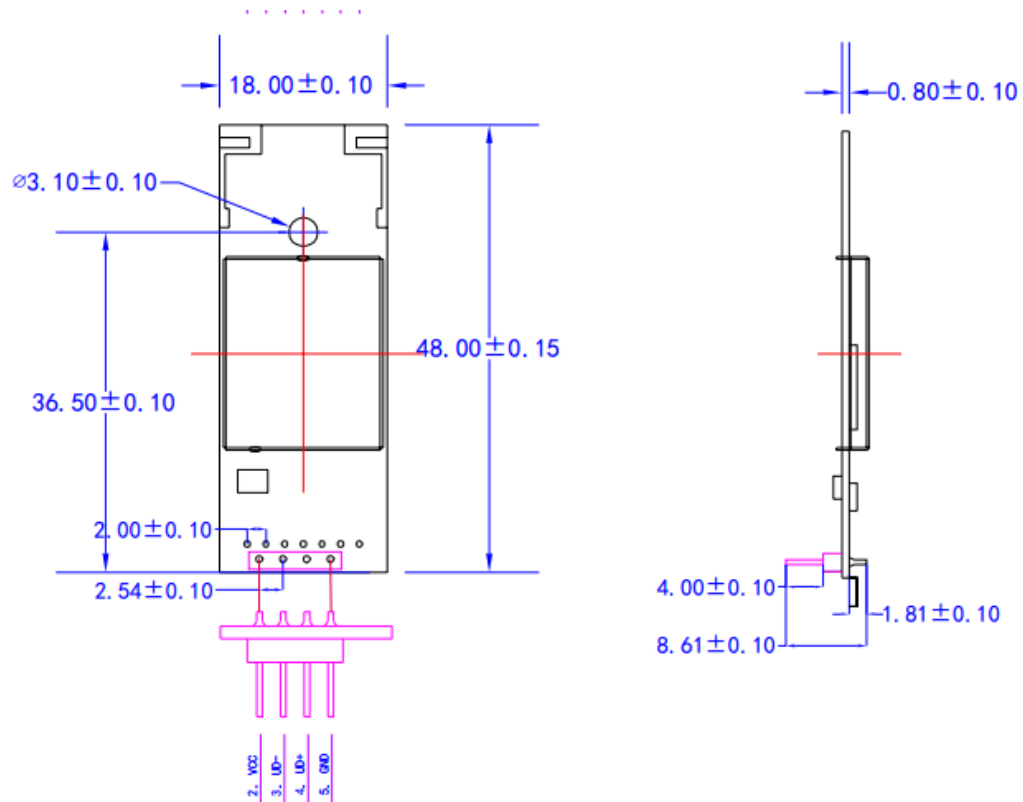


Figure 8:Bottom side 4-Pin 2.54mm pitch pin header interface.

3.3.1.2 4-pin 2.0 mm pitch pin header

a). Model: TOP-S5, 4M02

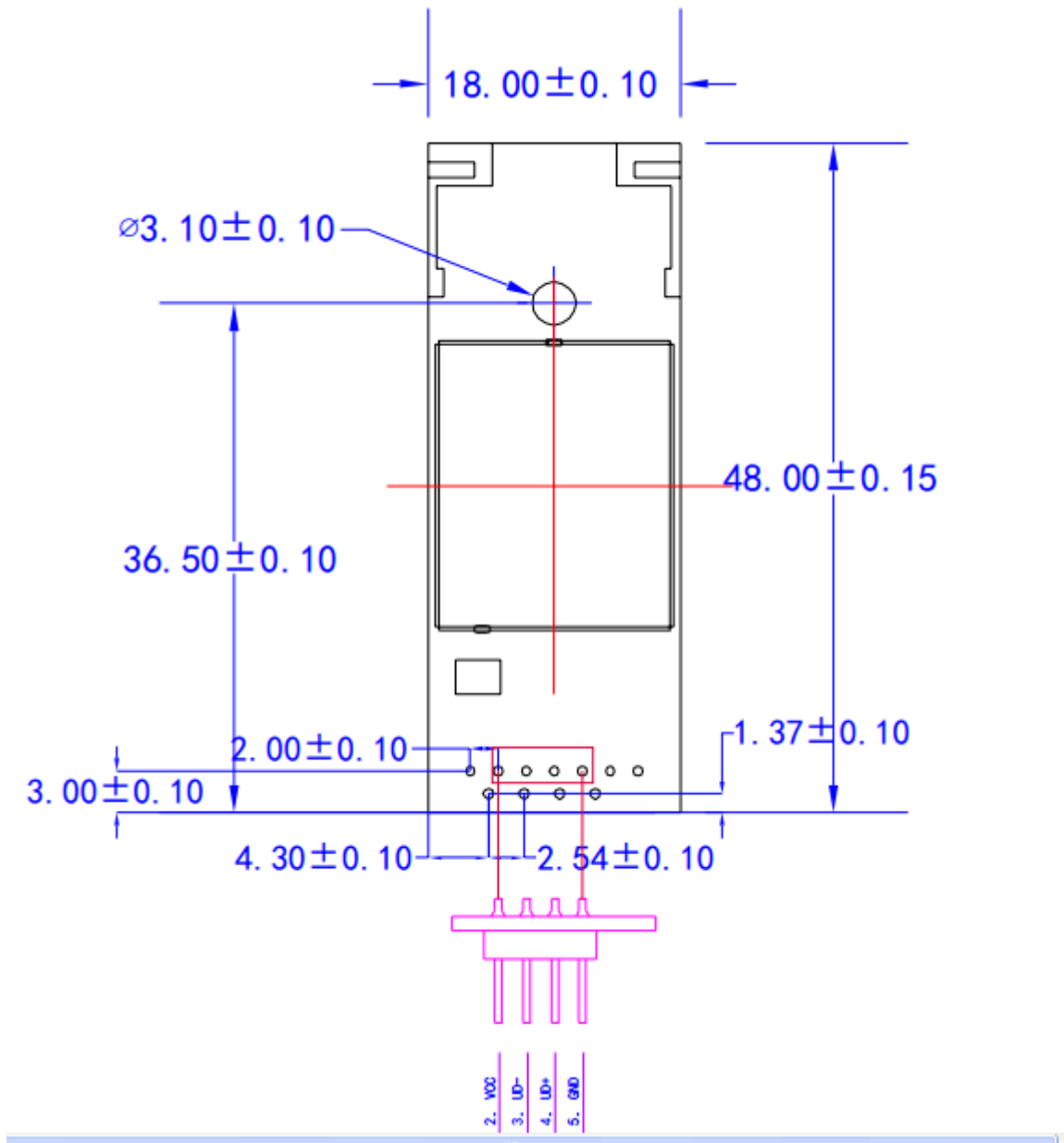


Figure 10: Bottom side 4-Pin 2.0mm pitch pin header interface.

3.3.1.3 7-pin 2.0 mm pitch pin header and RF connector at top side

a). Model: TOP-S5, 4M02

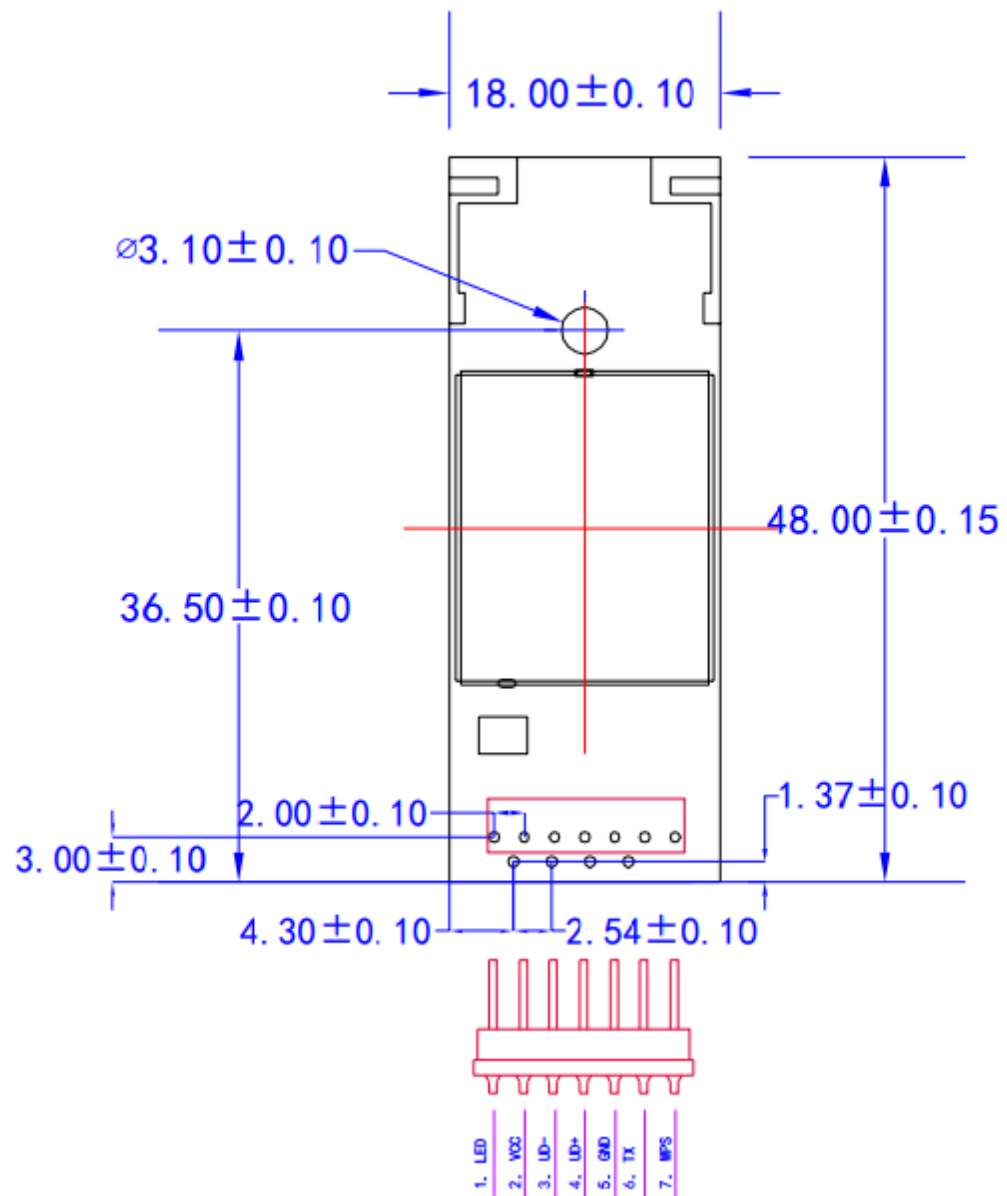


Figure 12: Top side 7-Pin 2.0mm pitch pin header interface.

Tips:

For details model number, please refer to the ordering information.

Pin Definition:

Pin-out	7-pin 2.0mm pitch pin header	4-pin 2.0 or 2.54mm pitch pin header
1	LED* (Wireless TX status)	N/A
2	VCC (3.3 VDC or 5.0VDC)	VCC (3.3 VDC or 5.0VDC)
3	U- (USB data+)	U- (USB data+)
4	U+ (USB data-)	U+ (USB data-)
5	GND (Ground)	GND (Ground)
6	RF/TX ON/OFF control	N/A
7	WPS control	N/A

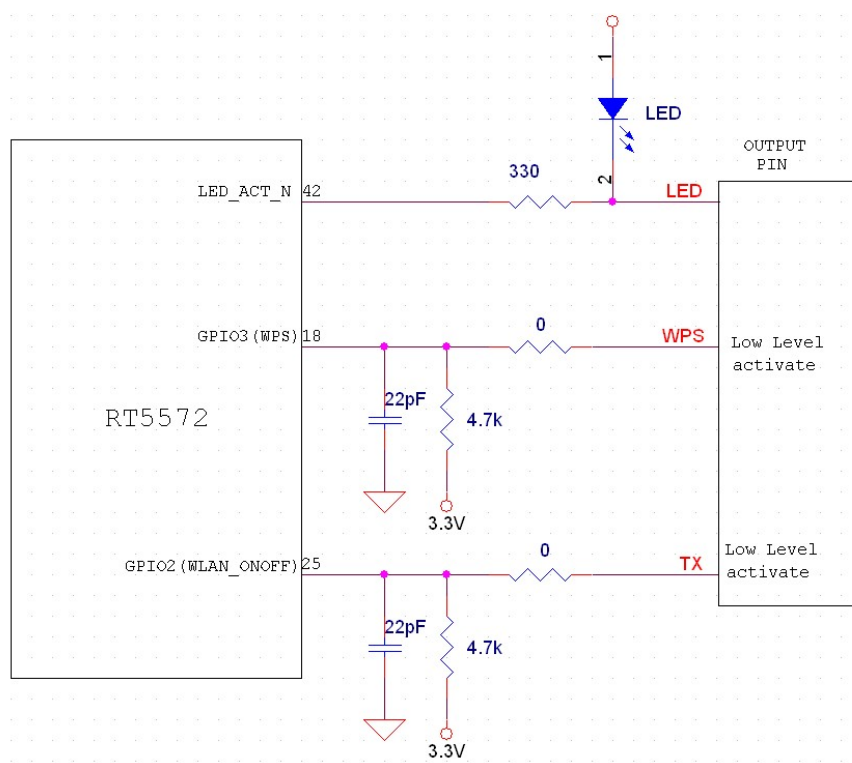


Figure 16: The onboard circuit configuration refer to LED, WPS, TX pinout.

Notes:

- TX or WPS pin is internally pulled up with an onboard 4.7K ohm resistor to 3.3VDC .It is low level (can be connected to ground) activated.
- LED outputs 3.3V blink signal, the LED operation current is limited via the 330 ohm resistor.

If the onboard and external LEDs must be used simultaneously, proper LEDs' operation current must be considered, If necessary, the internal onboard LED can be removed while ordering.

3.4 RF output Connection Information

If the I-PEX RF connection is selected, a 50 ohm external antenna connects to the module RF output via an I-PEX MHF receptacle (RF connector). (Part No. : 20279-001E-01).

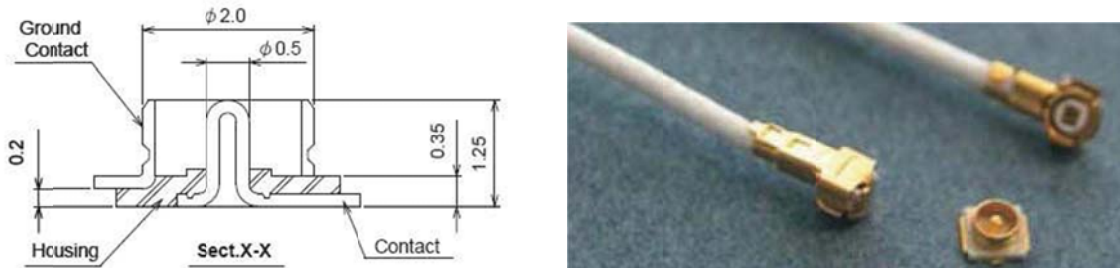


Figure 17:The profile of the I-PEX connector

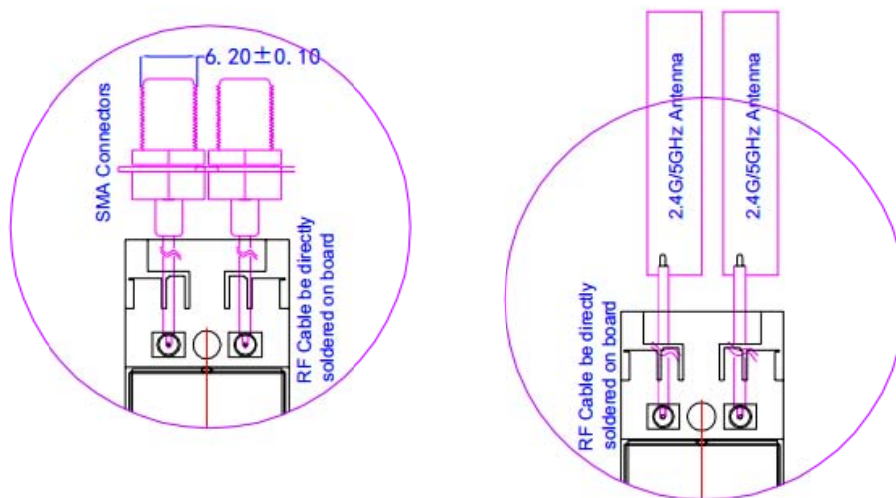
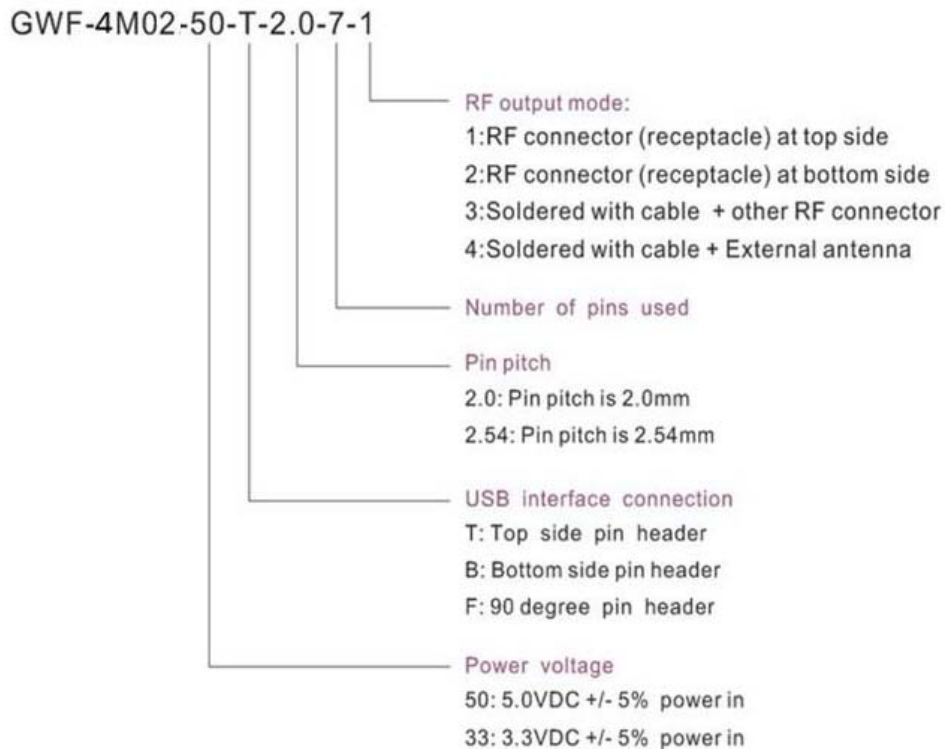


Figure 18: Typical RF output type

3.5 Software and system Information

Operation System	CPU Supplier	Driver
Linux 2.4/2.6	ARM, MIPSII	Available
Windows XP/Vista/7/8	X86 Platform	Available
Mac OS X 10.4~10.8	N/A	Available
Android 4.0	N/A	Available

3.6 Ordering information



Since there are many different types of pin header might be used, such as: straight pin; 90 degree bend pin; long pin; short pin..., please mention the detail requirement of the pin header when ordering. It can be mentioned by part number or by descriptions.

4 Agency Approval



CAUTION:

Agency	Operative standards	Certificate ID
FCC Part15 C	OET65	ZLJTOP-S5
CE	EN60950 EN301489 EN300328 EN62479	Pre-scan undergoing
RoHS	2011/65/EC	√

5 Environment pointer

Special Instructions:

- *Since the 5.0GHz operating current is High, in order to ensure that products -10 ° C to +50 ° C working properly, must be added the heat sink;*
- *If the customer wants to have a better product performance, it is necessary to replace the heat sink thermal performance better (The thicker the larger the area the better the thermal performance).*

Item	category	Range
Temperature	Operating Temperature	-10°C to +50°C
	Storage Temperature	-20°C to +80°C
Humidity	Operating Humidity Conditions	The range of 20% to 80% (non-condensing) .
	Non-Operating Humidity Conditions (including warehouse)	The range of 20% to 80%

6 Disclaimer

THESE MATERIALS AND INFORMATION ARE PROVIDED “AS IS” WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED , INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE OR NON-INFRINGEMENT.

We use reasonable efforts to include accurate and up-to-date information on this document; it does not, however, make any representations as to its accuracy or completeness of the information, text, graphics, links or other items contained within these materials. You use this document to bear the risk of their own. Ogemray,as its suppliers, and other parties involved in creating and delivering this Document's contents shall not be liable for any special, indirect, incidental, or consequential damages, including without limitation, lost revenues or profits.

To comply with FCC RF exposure limits, it is recommended that for the wireless adapter installed in a host computer , the low gain integrated antennas for this device should be located at a minimum separation distance from the body of all persons as specified according to the FCC modular grant conditions.

FCC Statement

Federal Communication Commission Interference Statement

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 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.

FCC Caution:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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.

The TOP-S5 module is for OEM integrations only. The end-user product will be professionally installed in such a manner that only the authorized antennas are used. Any changes or modifications NOT explicitly APPROVED by TOPLINKST could cause the module to cease to comply with FCC rules part 15, and thus void the user's authority to operate the equipment. □

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter module must not be co-located or operating in conjunction with any other antenna or transmitter.

The wireless adapter is not designed for use with high-gain directional antennas. Use of such antennas with these products in a manner other than as described in the following section titled, "Antenna Use" is illegal.

Antenna Use

This device is used printed antenna, the max antenna gain is 2.0dBi

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains FCC ID: ZLJTOP-S5".

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

This device is restricted indoor environment only.

Important Notes:

After integrating this modular approved transmitter according to these instructions in this manual, following points have to be considered:

- The end-product incl. this modular approved transmitter must comply with the FCC regulations. The host manufacturer/integrator is required to show compliance with 15B (§15.107 + 15.109) while the module is installed and operating. In addition, the module should be transmitting and the evaluation should confirm that the module's intentional emissions (15 C) are still compliant (fundamental and out-of-band emission). Verify that there are no additional unintentional emissions other than what is permitted in 15B or emissions compliant with the transmitter rule. Any additional non-compliant emissions are unintentional which means that the host is not compliant.
- Additional antennas may be used with this modular approved transmitter, provided they are from same type, have equal or less gain and have identical in- and outband characteristics as the certified ones. Other antenna types or antennas with higher gain require appropriate equipment authorization.
- Due to its output power the integration is strictly limited into mobile/fixed categorized host devices and the user manual of the host device has to include appropriate RF exposure information/warning.
- Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.
- This modular approved transmitter is approved for stand-alone configurations only. For simultaneous transmission with additional transmitters follow the FCC Multi-transmitter policy.