

User's Manual

WM-294-V2 WLAN 11n USB module (1T1R)

Version: 1.2

Manufacturer	CC&C Technologies, Inc.
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Revision History

Version	Issue date	Reason for revision
1.0	Mar. 02, 2015	First edition
1.1	Oct. 05, 2016	Modify Features
1.2	Nov. 01, 2016	Remove PDN Function

Overview

WM-294-V2 is a WLAN 11n USB module, which fully supports the features and functional compliance of IEEE 802.11n, e and i standards. It supports up to 150Mbps high-speed wireless network connections.




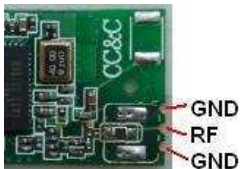
It is designed to provide excellent performance with low power consumption and enhance the advantages of robust system and cost-effective. It is targeted at competitive superior performance, better power management applications.

Features

- Operates in 2.4 GHz frequency bands
- One Transmit and one Receive path(1T1R)
- Data rates: up to 150Mbps
- 802.11e-compatible bursting and I standards
- BPSK, QPSK, 16 QAM, 64 QAM modulation schemes
- WEP, TKIP, and AES, WPA, WPA2 encryption schemes

Factory options

- DC power input 3.3V or 5V input
- RF output by chip antenna(type-1), RF connector(type-2), RF pad on module(type-3), RF output on half-hole pin(type-4)
- WPS control function on half-hole pin 6
- Support LED function when choose WPS option
- With or without shielding cover

RF type-1	RF type-2	RF type-3	RF type-4
			

General Specification

Model Name	WM-294-V2
Product Name	WLAN 11n USB module
Standard	802.11b/g/n, 802.3, 802.3u
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 150Mbps
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Frequency Band	2.4GHz ISM Band
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing)
RF AVG Output Power (tolerance ± 2 dBm)	13(± 2)dBm@11n, 15(± 2)dBm@11b, 15(± 2)dBm@11g
Operation Mode	Ad hoc, Infrastructure
Receiver Sensitivity	11Mbps -80dBm@8%,54Mbps -70dBm@10%,130Mbps -64dBm@10%
Operation Range	Up to 180 meters in open space
LED	Data transmission (factory option)
OS Support	Windows XP /Vista /7/8, Mac, Linux
Security	WEP, TKIP, AES, WPA, WPA2
Interface	USB 2.0
Power Consumption	RTL8188EUS: DC 5V module - Transmit: max. 125 mA; Receive: max 105 mA DC 3.3V module - Transmit: max. 172 mA; Receive: max 139 mA
Operating Temperature	0 - 50° C ambient temperature
Storage Temperature	-10 ~ 70° C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	25 x 12 x 2 mm (LxWxH)

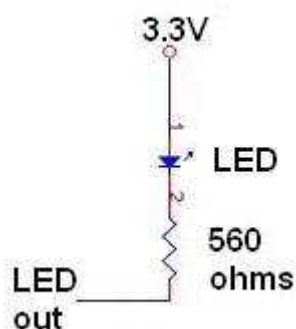
DC power input: (factory option)

Module	Minimum	Typical	Maximum	Unit
DC 5V module	4.75	5	5.25	V
DC 3.3V module	3.135	3.3	3.465	V

Pin outs:

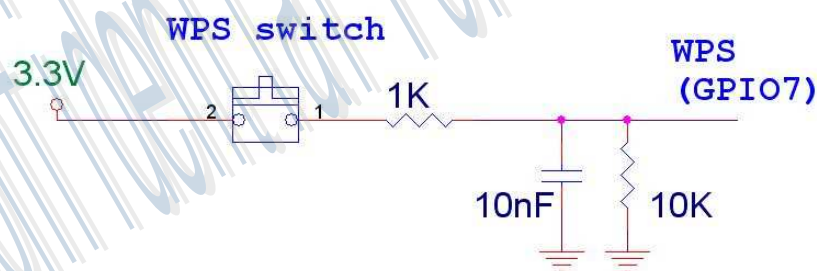


The external circuit for WiFi activity LED display (LED function is a factory option)



The function of pin 6 is optional to WPS (GPIO7) , a factory option.

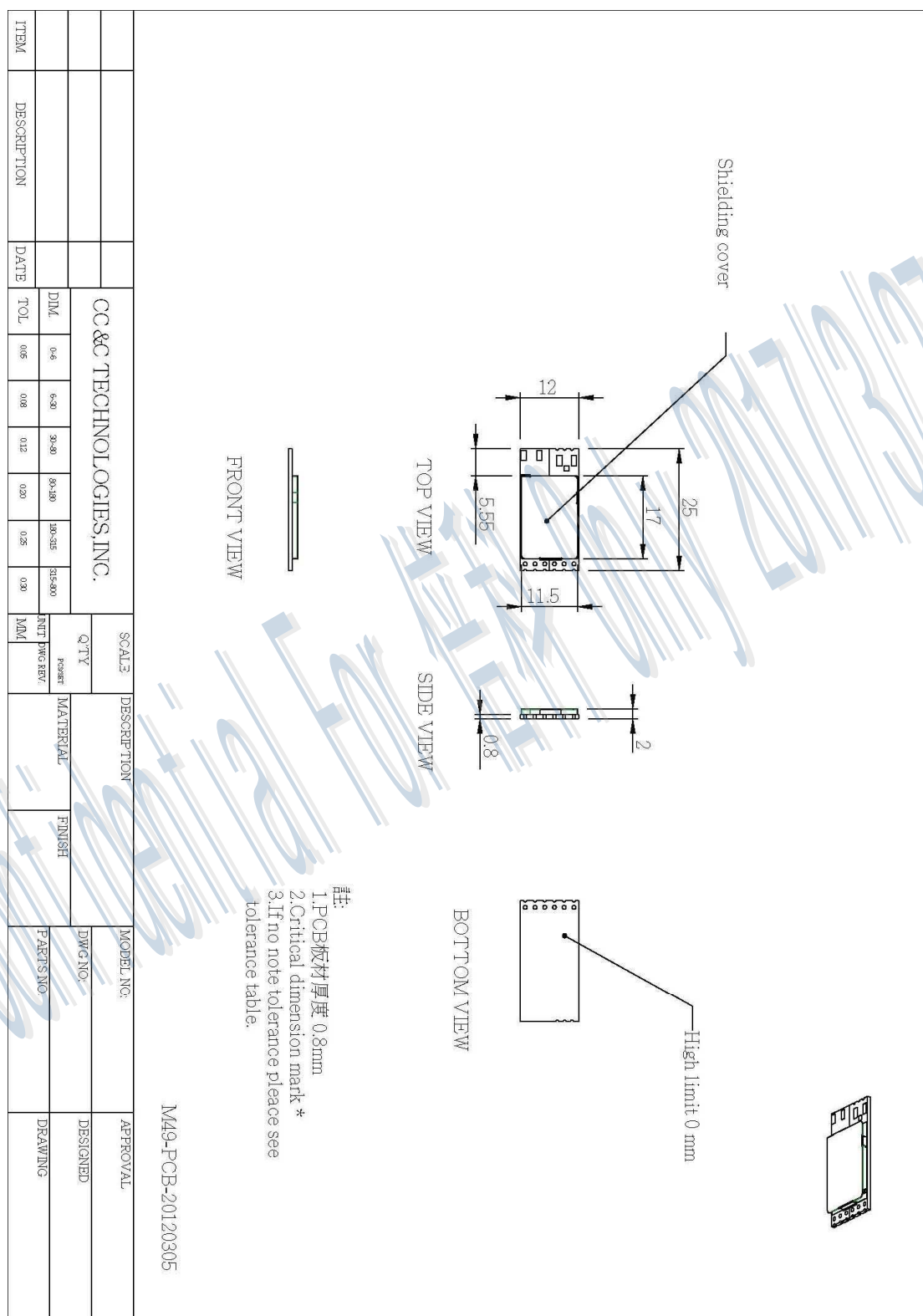
The external circuit for WPS function input (factory option), uses a tact switch.



Without Shielding Cover



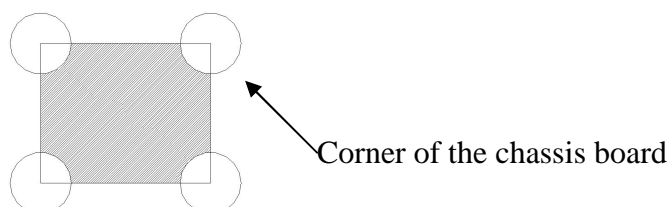
With Shielding Cover



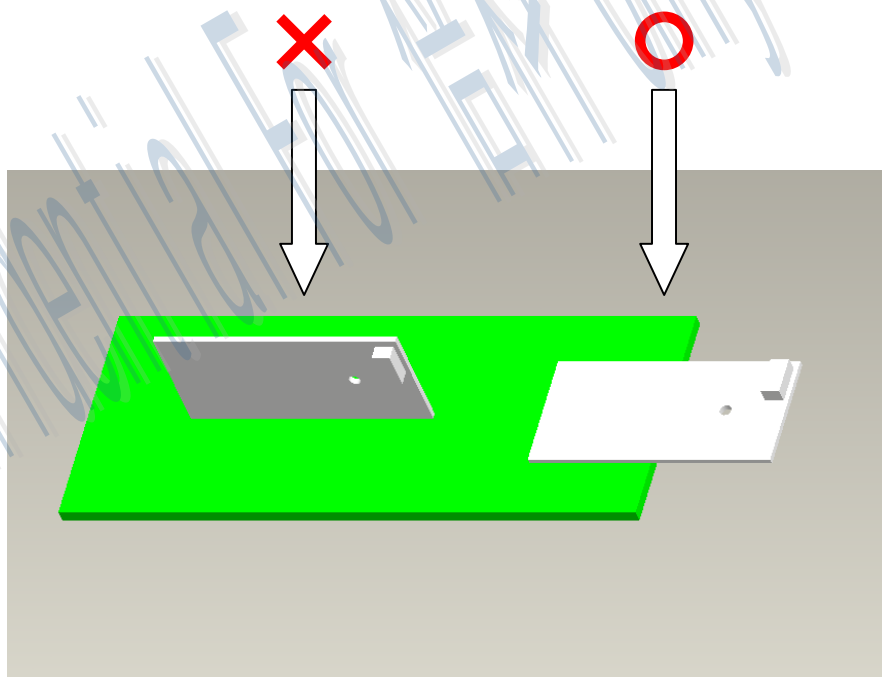
Subject to change without notice

Placement Notice

- In order to get a better performance please don't put any metal shielding in the surrounding area of module and try to leave the module placed in the corner of chassis board as close as possible.

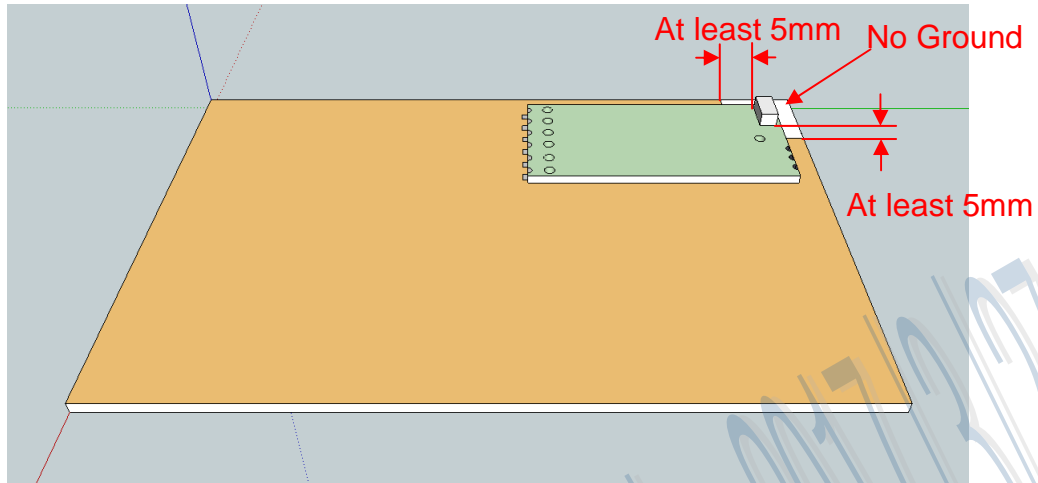


- Considering antenna field pattern it is better to put the module in horizontal way with the chassis board.

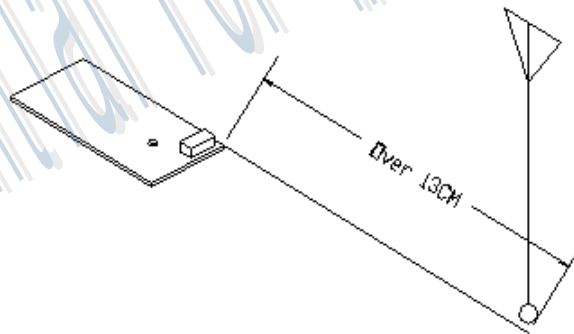


■ Chip Antenna

The antenna area in the module should protrude outside the Ground at least 5mm

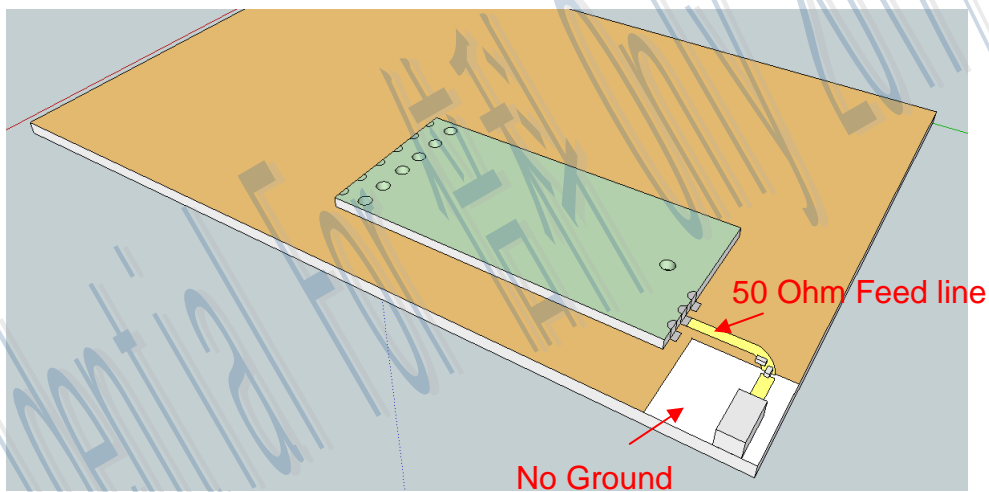
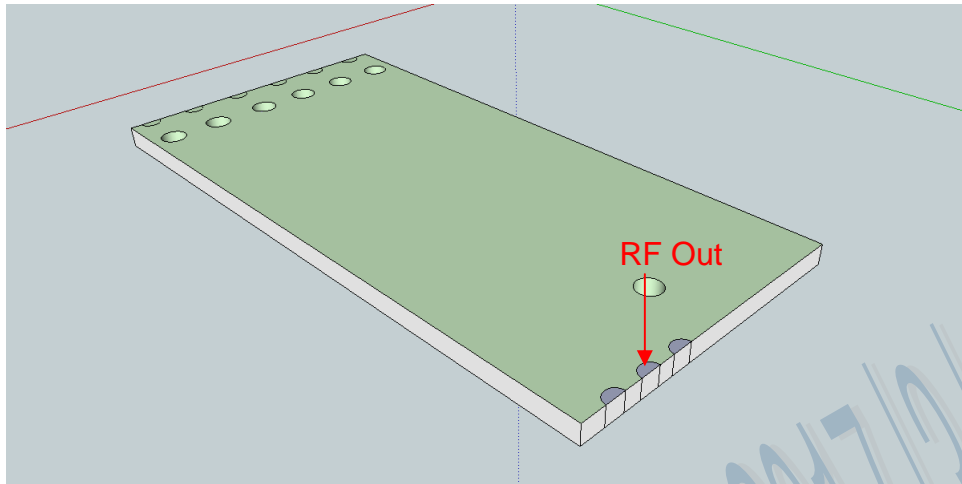


Keep the distance at least 13 cm long with WLAN or other antenna of same frequency band to avoid the interference or deteriorate the performance.

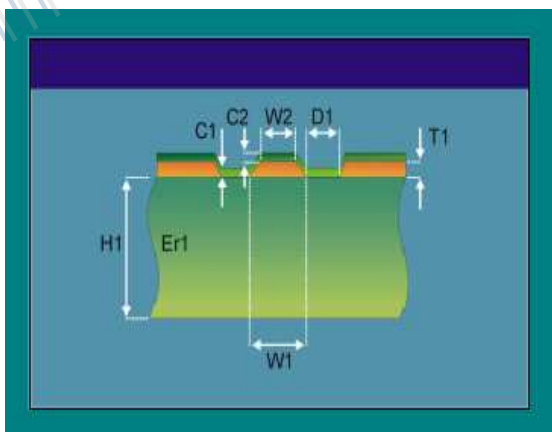


■ RF out

This RF out pin, it needs the input impedance of 50 Ohm



50 Ohm Feed line:



H1: 20 ~ 60 mil

Er1: 4.2

W1: 20 mil

W2: 20 mil

D1: 5 mil

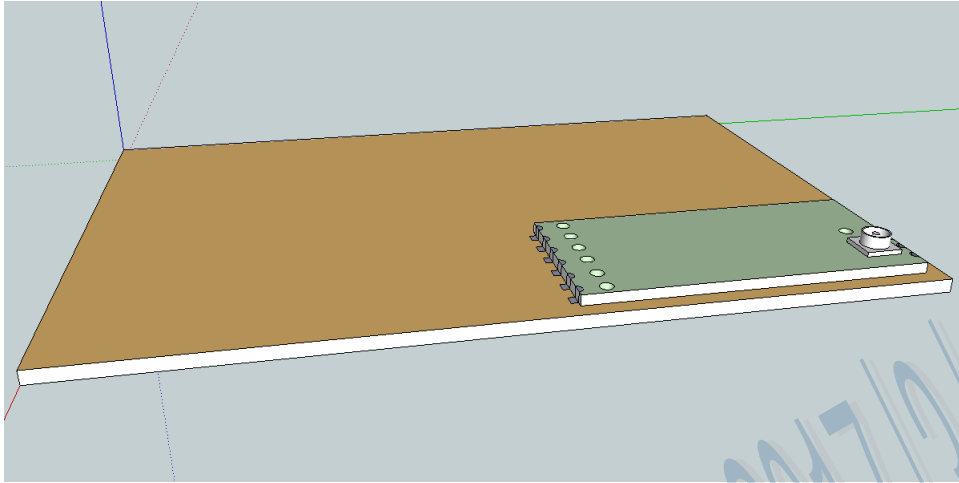
C1: 0.7 mil

C2: 0.7 mil

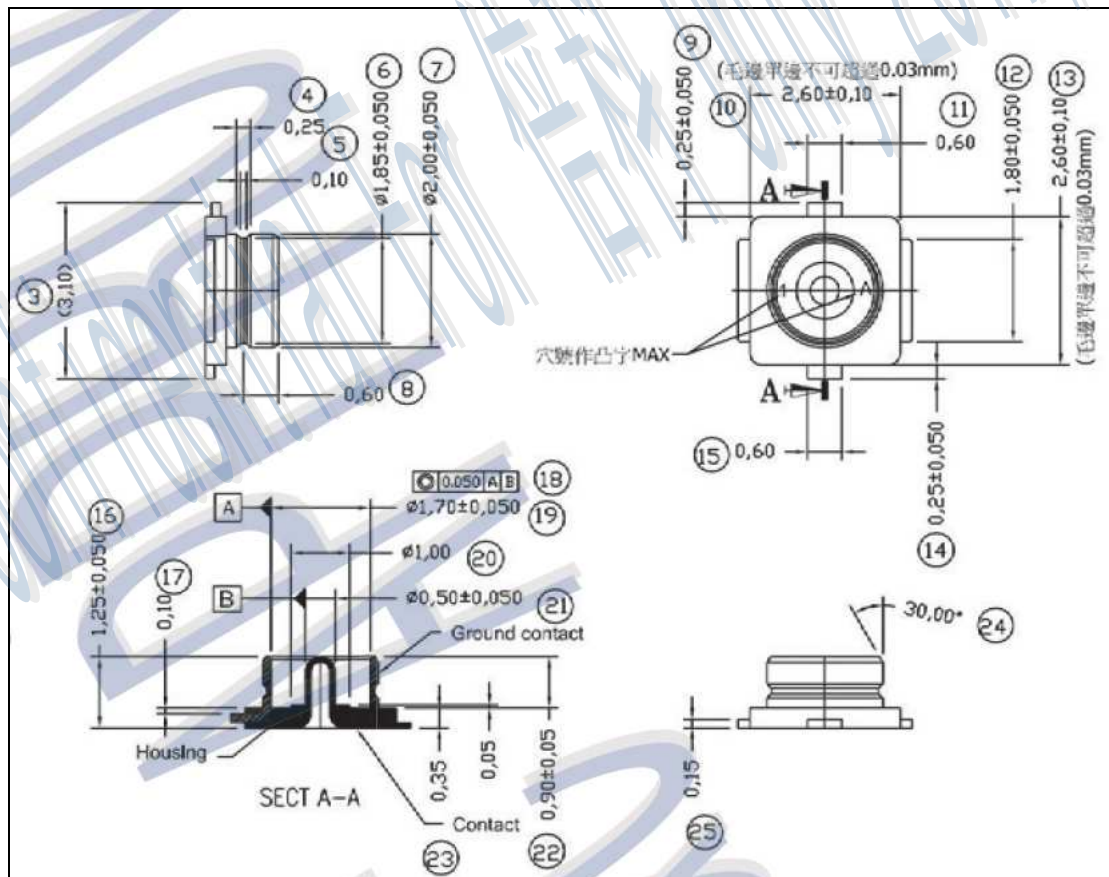
T1: 1.4 mil (1 oz)

Impedance: 51 ~ 53 Ohm

■ RF connector

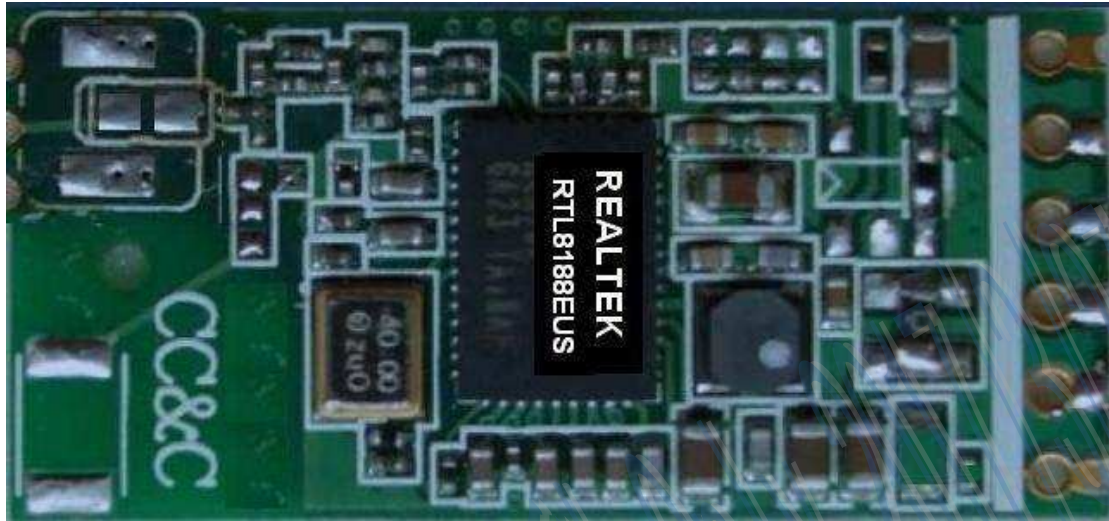


RF connector dimensions (unit: mm)



WM-294-V2 module with RTL8188EUS chip, DC3.3V input:

Without Shielding Cover

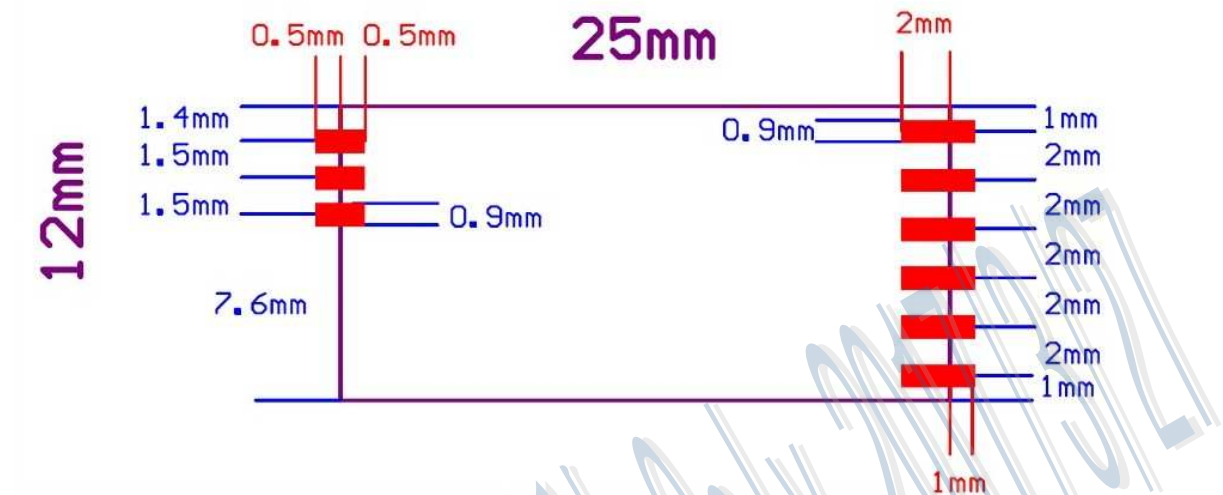


With Shielding Cover



PCB Layout footprint

1. The recommended layout pads for WM-294-V2 module are shown below. (module top view)



All dimensions are in millimeters.
Tolerance: $\pm 0.05\text{mm}$

FCC Warning

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.

NOTE: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could 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. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note 1: Compliance of this device in all final host configurations is the responsibility of the Grantee.

OEM integrators are responsible to satisfy RF exposure requirements. SAR evaluation is valid for portable, mobile and fixed applications.

Note 2: 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.

Note 3: The device must not transmit simultaneously with any other antenna or transmitter.

Note 4: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, CC&C Technologies, Inc. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

Note 5: FCC ID label on the final system must be labeled with "Contains FCC ID: PANWM294V2"

The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the host product. CC&C Technologies, Inc. is responsible for the compliance of the module in all final hosts.

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.