User Manual

PRODUCT NAME : Single Band 1T1R Wi-Fi Module

MODEL NAME : TWFM-M311D

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2014.04.08	2014.04.08	2014.04.08	PAGE	9

Table of Contents

No.	Description	Page
1	Features	2
2	Ordering Information	2
3	Label Marking	2
4	Storage Test Conditions	3
5	Operating Test Conditions	4
6	Standard Test Conditions	4
7	Block Diagram	5
8	Pin Description	6
9	Test Method	7
10	Outline Drawing	9

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1. Features

TWFM-M311D is the small size and low power module for IEEE 802.11b/g/n wireless LAN. TWFM-M311D is based on Marvell 88W8782U solution.

- IEEE 802.11 b/g/n single band WLAN infrastructure
- Size : 37.0 x 28.0 x 3.7 mm
- 2.4GHz internal PA
- 1T1R mode with 150Mbps PHY rate for both transmit and receiving
- Pattern printed antenna
- Use on-chip OTP(One-Time Programmable)
- USB 2.0
- Supports drivers for Linux
- Security : Supports 802.11i security standards
  (AEC/CCMP, WEP/TKIP, AES/CMAC, WAPI)
- Application: DTV, DVD Player, Blue-ray Disk Player, STB, Printer, etc.)

2. Ordering Information

Model	Description
TWFM-M311D	Wi-Fi Module, Single Band 1T1R

3. Label Marking

① Model No.

② MAC Address BAR Code(except for OUI)[1)]

③ MAC Address No.

④ Product Lot No. : 1301A1201
- 13 : Year
- 01 : Month
- A : Revision No.
- 12 : Date
- 01 : Manufactured process

[1)] OUI : Organizationally Unique Identifier

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4. Storage Test Conditions

Parameter	Min	Max	Unit
Storage Temperature	-10	+80	℃
Storage Humidity (@ 40℃)	-	90	%

Caution : The specifications above the Table define levels at which permanent damage to the device can occur. Function operation is not guaranteed under these conditions. Operating at absolute maximum conditions for extend periods can adversely affect the long-term reliability of the device.

※ Other conditions

1) Do not use or store modules in the corrosive atmosphere, especially where chloride gas, sulfide gas, acid, alkali, salt or the like are contained. Also, avoid exposure to moisture.
2) Store the modules where the temperature and relative humidity do not exceed 5 to 40℃ and 20 to 60%.
3) Assemble the modules within 6 months. Check the soldering ability in case of 6 months over.

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5. Operating Conditions

Parameter	Min	Typ	Max	Unit
Operating Temperature	0	-	+60	℃
Operating Humidity (40℃)	-	-	85	%
Supply Voltage	+4.75	+5.0	+5.25	Vdc

6. Standard Test Conditions

The Test for electrical specification shall be performed under the following condition Otherwise this following conditions, not guaranteed this performance.

6-1. Ambient condition

Temperature	25 ± 5℃
Humidity	65 ± 5%

6-2. Power supply voltages

Input power	Supply Voltage
+5.0V	+5.0V ± 5%

6-3. Current consumption

Current Consumption	Min.	Typ.	Max.	Unit
TX Mode (MCS7)	-	-	500	mA 1)
Idle and Associated state	-	-	180	
Radio disabled state	-	-	70	

Note 1 : This figure is the RMS(root mean square) value.

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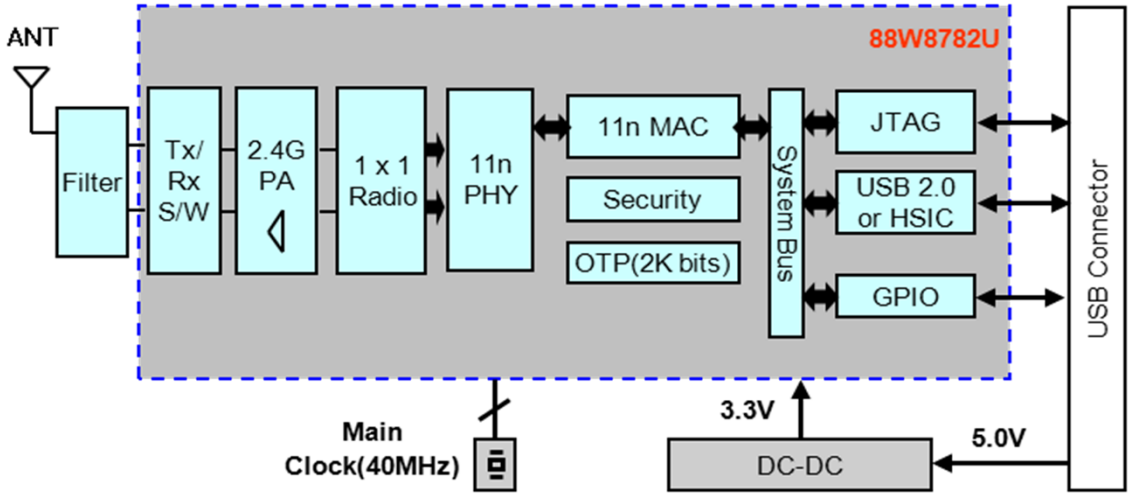
7. Block Diagram



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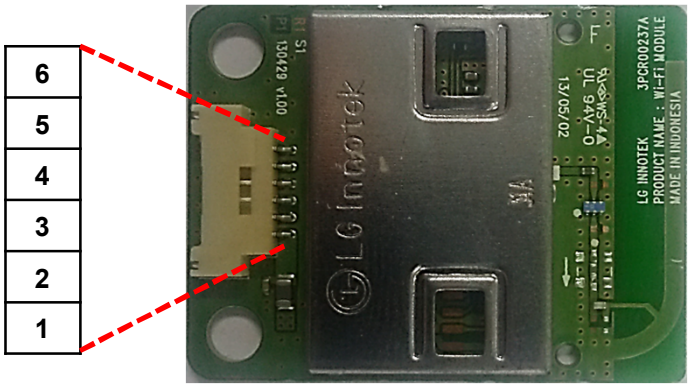
8. Pin Description

Pin No.	Pin Name	I/O	Pin Description
1	VCC	I	VDD 5.0V
2	D-	I/O	USB Communication signal USB_DN
3	D+	I/O	USB Communication signal USB_DP
4	GND	-	GND
5	WOW	I	Wake-up WLAN
6	NC	I	Shielding GND

< TOP View >



Note.

1) Recommend a module install sequence for prevent USB device failure
   - Supply 5.0V power and GND
   - Connect to data signal (USB_DP, USB_DN)
2) If remove the module, proceed in reveres sequence
3) Connector ⓐ : (CONN 12507WR-06L, YEONHO ELECTRONICS CO., LTD.)

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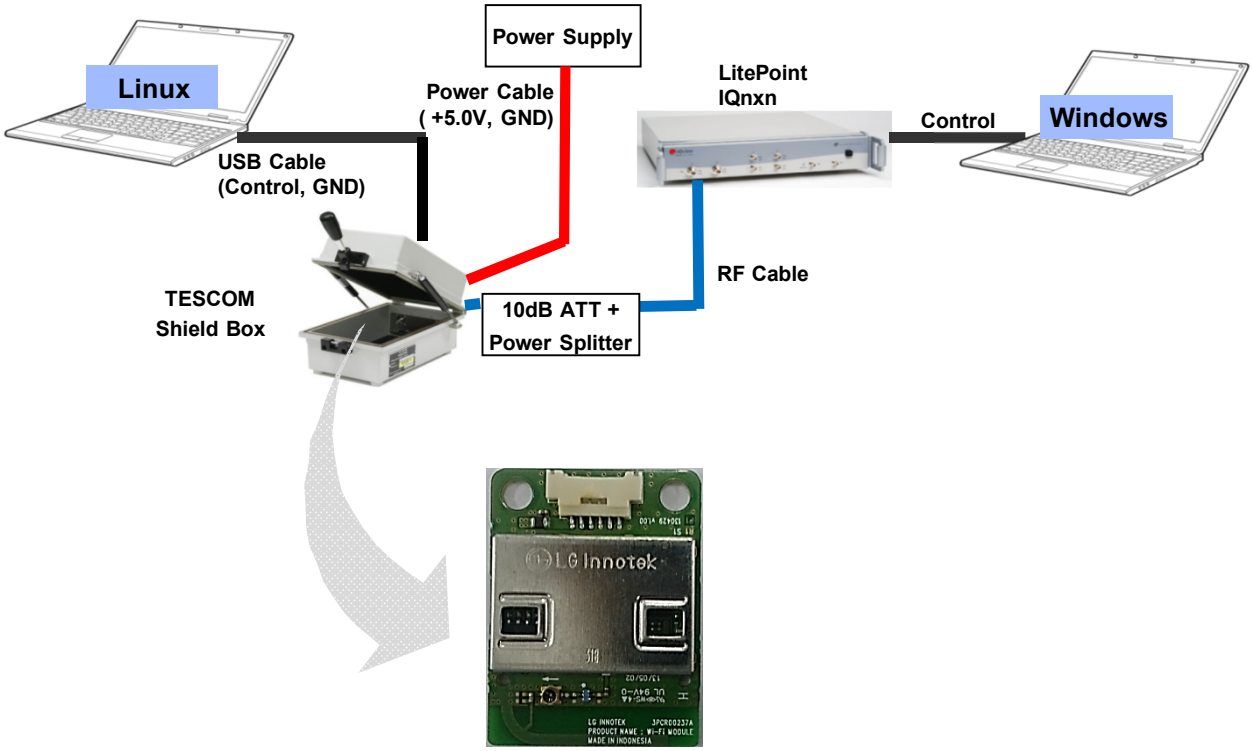
9. Test method

This is a conducted test method of Wi-Fi RF performance.

1) Test Condition.



2) Test Set-up List.
- Instrument : LitePoint IQnxn or IQflex
- Shield Box : Tescom TC-5910DP
- RF Cable : TESCOM 4011-0011
- Attenuator : Mini-Circuit 15542 10dB attenuator
- USB Cable, LAN Cable, RF Cable
- Power Supply

3) Test Flow
- Install the test set-up.
- Power OFF.
- Open the Shield box and install the DUT for test.
- Close the shield box.
- Power ON.
- Check the driver icon.
- Start testing.

#. Notes.
- Be careful that you can consider a RF cable LOSS.

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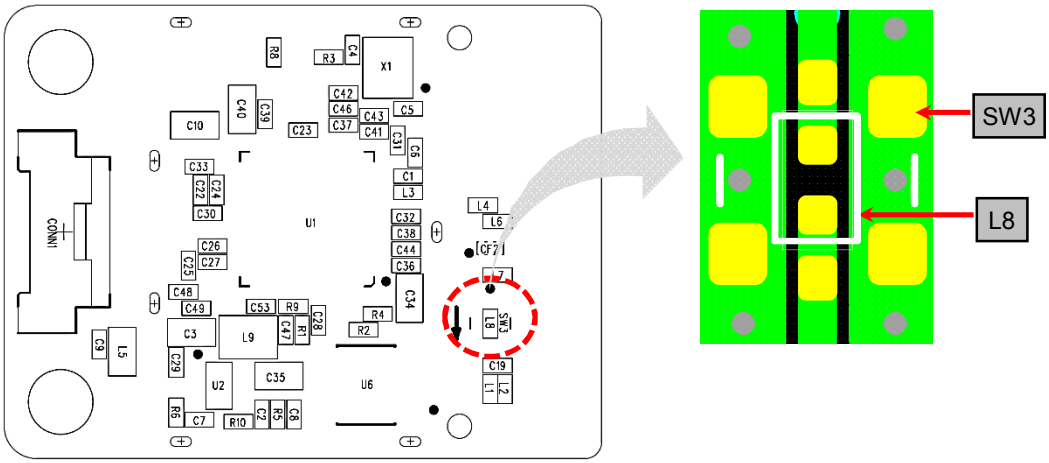
4) Test Method

(1) Remove the L8(L8 = 9pFH)



< Top view >

(2) Attach SW3(SW3 = MM8130-2600)

MM8130-2600

(3) After all RF Test, remove SW3 and attach L8 (L8 = 9pF)

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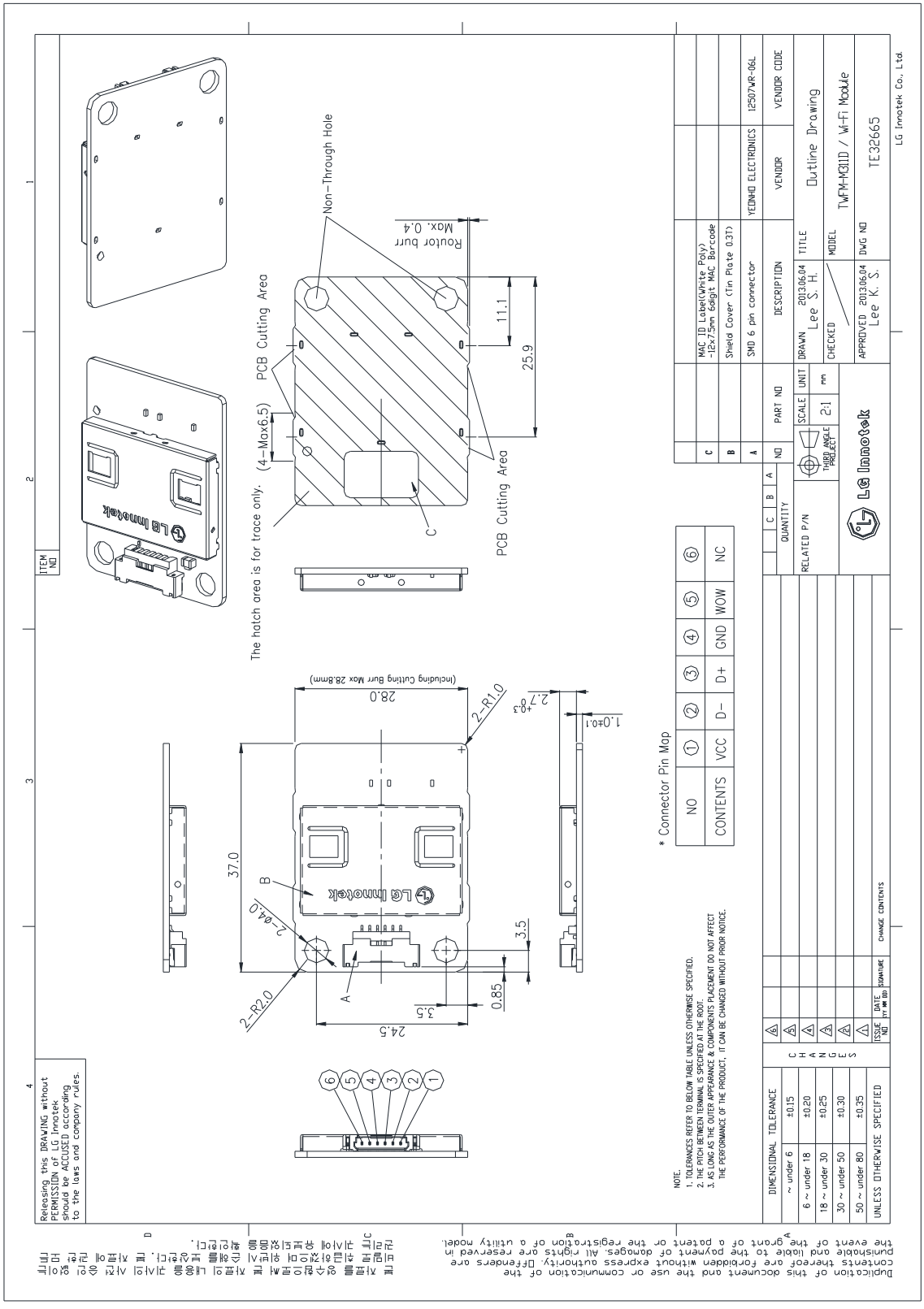
10. Outline Drawing



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FCC Information

This device complies with part 15 of the FCC Results. Operation is subject to the following two conditions :

(1) This device may not cause harmful interface, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for CLASS B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment 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 correct the interference by one or more of the following measures:

1.1. Reorient or relocate the receiving antenna.
1.2. Increase the separation between the equipment and receiver.
1.3. Connect the equipment into an outlet on a circuit different from that to which receiver is connected.
1.4. Consult the dealer or experienced radio/TV technician for help.

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

IC Information

This device complies with Industry Canada license-exempt RSS standard(s). Operation in subject to The following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada RSS standard exempts de licence(s), Son utilisation est soumise à Les deux conditions suivantes: (1) cet appareil ne peut pas provoquer d'interférences et (2) cet appareil doit accepter Toute interférence, y compris les interférences qui peuvent causer un mauvais fonctionnement du dispositif.

Information for OEM Integrator

This device is intended only for OEM integrators under the following conditions:

1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and

2) The transmitter module may not be co-located with any other transmitter or antenna.

End product labelling

The label for end product must include "Contains FCC ID: 2AB83-TWFM-M311D".

"CAUTION : Exposure to Radio Frequency Radiation.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated with minimum distance of 20cm between the radiator and your body. This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users."