Foxconn WFUR6

Hardware

Specification

Rev. 0.2

Document Revision History

Document Revision	Date	Modifier	Comments
0.1	Dec. 30, 2013	Lin Eric	Initial release
0.2	Feb. 21,2014	Lin Eric	Modify Pin Definitions

Contents

1. Introduction

1.1 Product Overview

The Foxconn WFUR6 wireless LAN module contains the Realtak® RTL8812AU single chip which is a highly integrated single-chip MIMO (Multiple In, Multiple Out) Wireless LAN (WLAN) USB 2.0 network interface controller complying with the wireless very high throughput IEEE 802.11ac Draft 2.0 and 802.11n specifications. It fully complies with IEEE 802.11 a/b/g/n /ac feature rich wireless connectivity at high standards, delivers reliable, cost-effective, throughput from an extended distance. The optimized radio frequency architecture and baseband algorithms provide super performance and low power consumption. Deploy a high efficient USB engine and hardware data processing accelerators without overloading the host processor. Security, quality of service and international regulation are supported by WFUR6 and giving end users the greatest performance anytime in any circumstance.

1.2 Key Features

➢ CMOS MAC, Baseband PHY and RF in a single chip for IEEE 802.11a/b/g/n/ac Draft 2.0 compatible WLAN

➢ 802.11ac MIMO solution for 5G band

➢ Complete 802.11n MIMO solution for 2.4GHz and 5Ghz band

➢ 2x2 MIMO technology for extended reception robustness and exceptional throughput

➢ Maximum PHY data rate up to 173.3 Mbps using 20MHz bandwidth, 400Mbps using 40MHz bandwidth, and 866.7Mbps using 80MHz bandwidth.

➢ WEP 64/128, WPA, WPA2, TKIP, AES, WAPI

➢ QoS-WMM, WMM-PS, WPS/WPS2, PIN, PBC

➢ Complies with USB 1.0/1.1/2.0 for WLAN

➢ International Regulation – 802.11i/h/k

➢ Low power with advanced power management

2. Electrical Specifications

2.1 Pin Definitions

Table 2.1 Pin Definitions

Pin	# Name	Pin	# Name
51	N/A	52	+3.3V
49	N/A	50	GND
47	N/A	48	N/A
45	N/A	46	N/A
43	GND	44	N/A
41	+3.3V	42	N/A
39	+3.3V	40	GND
37	GND	38	UDP
35	GND	36	UDM
33	HSIN_A	34	GND
31	HSIP_A	32	N/A
29	GND	30	N/A
27	GND	28	N/A
25	HSON_A	26	GND
23	HSOP_A	24	N/A
21	GND	22	N/A
19	N/A	20	PDn
17	N/A	18	GND
15	GND	16	N/A
13	N/A	14	N/A
11	N/A	12	N/A
9	GND	10	N/A
7	N/A	8	N/A
5	N/A	6	N/A
3	N/A	4	GND
1	N/A	2	+3.3V

2.2 Power Consumption Specifications

Power consumption is measured using current probe loop on the Power rails of the USB interface (Pins).

Table 2.2 Power Consumption Specifications(preliminary)

Description	Typical	Unit
Disable	19	mA
2G/2T- HT 40MHz MCS 7(14dBm)	235	mA
2G/2T- HT 20MHz MCS 7(14dBm)	260	mA
2G/2T- OFDM54M(15dBm)	270	mA
2G/2T- CCK11M(17dBm)	320	mA
5G/2T- HT 80MHz MCS 9(12dBm)	243	mA
5G/2T- HT 40MHz MCS 7(14dBm)	265	mA
5G/2T- HT 20MHz MCS 7(14dBm)	310	mA
5G/2T- OFDM54M(15dBm)	310	mA
2G/2R- HT 40MHz MCS 7	148	mA
2G/2R- HT 20MHz MCS 7	143	mA
2G/2R- OFDM54M	143	mA
2G/2R- CCK11M	143	mA
5G/2R- HT 80MHz MCS 9	195	mA
5G/2R- HT 40MHz MCS 7	188	mA
5G/2R- HT 20MHz MCS 7	185	mA
5G/2R- OFDM54M	185	mA

3.RF Specification

3.1 TX Specifications (preliminary)

Table 3.1 TX Specifications

	Target Power(dBm)	Tolerance(dB)
	Chain 0/Chain 1	
802.11a	13	+1.5/-2
802.11ac(20MHz)	14.5	+/-1.5
802.11ac(40MHz)	14	+/-1.5
802.11ac(80MHz)	12	+/-2
801.11b	16	+/-2
802.11g	15	+/-2
802.11n(20MHz)	14	+/-2
802.11n(40MHz)	13.5	+/-2

3.2 RX Specifications (preliminary)

Table 3.2 RX Specifications (ANT 1 & ANT 2)

Data Rate (Mbps)	Modulation	Rx Sensitivity (dBm)		Data Rate (Mbps)	Modulation	Rx Sensitivity (dBm)	
		Max.	Typ.			Max.	Typ.
1	DBPSK	-83	-94	HT20-7.22	BPSK	-82	-87
2	DQPSK	-80	-93	HT20-14.44	QPSK	-79	-86
5.5	CCK	-78	-91	HT20-21.67	QPSK	-77	-84
11	CCK	-76	-89	HT20-28.89	16-QAM	-74	-82
6	OFDM	-85	-88	HT20-43.33	16-QAM	-70	-78
9	OFDM	-84	-87	HT20-57.78	64-QAM	-66	-74
12	OFDM	-82	-86	HT20-65	64-QAM	-65	-72
18	OFDM	-80	-85	HT20-72.22	64-QAM	-64	-71

24	OFDM	-77	-82	HT40-15	BPSK	-79	-87
36	OFDM	-73	-79	HT40-30	QPSK	-76	-84
48	OFDM	-69	-75	HT40-45	QPSK	-74	-81
54	OFDM	-68	-74	HT40-60	16-QAM	-71	-79
				HT40-90	16-QAM	-67	-74
				HT40-120	64-QAM	-63	-71
				HT40-135	64-QAM	-62	-70
				HT40-150	64-QAM	-61	-68
				HT80-32.5	BPSK	-76	-83
				HT80-65	QPSK	-73	-83
				HT80-97.5	QPSK	-71	-81
				HT80-130	16-QAM	-68	-77
				HT80-195	16-QAM	-64	-74
				HT80-260	64-QAM	-60	-70
				HT80-292.5	64-QAM	-59	-68
				HT80-325	64-QAM	-58	-67
				HT80-390	256-QAM	-53	-62
				HT80-433.3	256-QAM	-51	-59

3.3 Antenna Specifications

Nominal antenna port impedance specification is 50 ohms for the Foxconn WFUR6 hardware.

For regulatory requirements, it is assumed that the antenna gain is:

◆ Antenna gain for the 2.4GHz band : 3.47 dB

◆ Antenna gain for the 5GHz band : 4.66 dB

There are two antennas supporting 2.4~2.5GHz band and 5.15~5.85GHz.

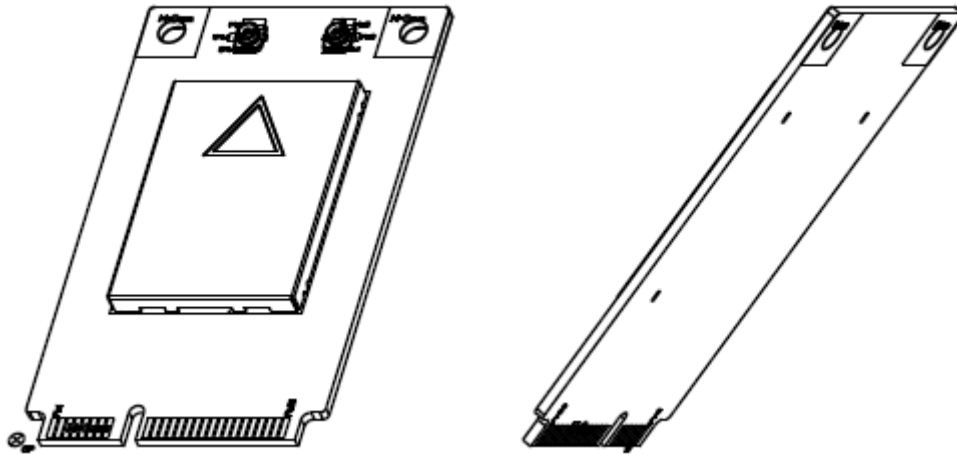The antenna will be defined **ANT 1** and **ANT 2** where is listing below:

Figure 4.1 WFUR6 Perspective

4. Mechanical Specifications

4.1 Mechanical Drawing
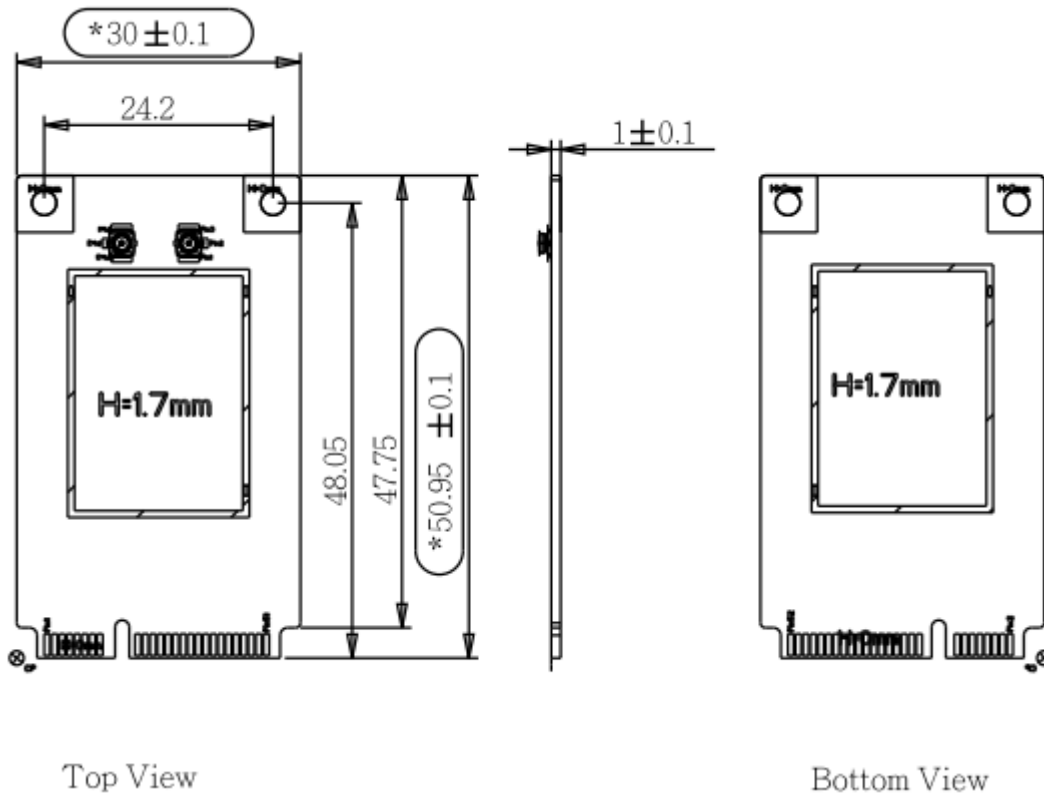
Figure 4.1 WFUR6 mechanical drawing

4.2 RF connector

Manufacturer: Speed tech

Manufacturer P/N: C88P132-01001-H

4.2.1 Specification

Operating temperature range: -40℃~90℃

Storage temperature range: -40℃~90℃

Characteristic impedance: 50Ω (0~3GHz)

Voltage standing wave ratio: 1.3 max. at 2.4GHz, 1.4 max. at 6GHz
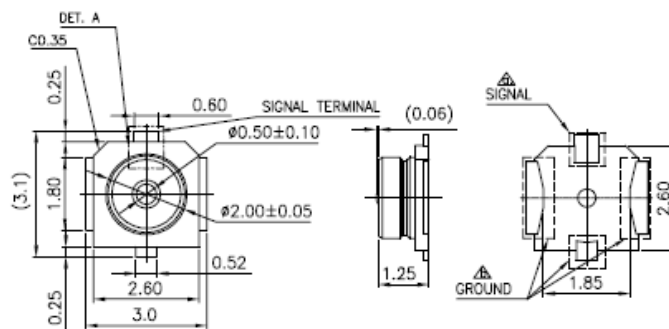
4.2.2 Dimensions: (Unit: mm)

Figure 4.2 RF connector dimensions
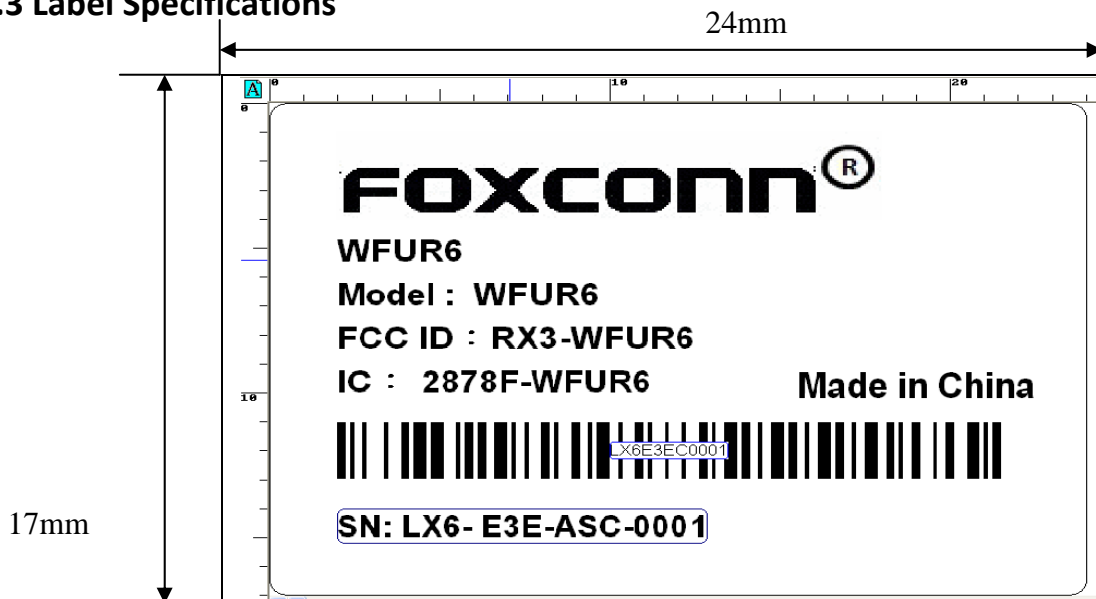
4.3 Label Specifications

Figure 4.3 WFUR6 Label Drawing

5. Environmental Specifications

The following tables provide normal operating conditions and maximum rating requirements for WFUR6 hardware.

Table 5.1 Operating Conditions (preliminary)

Environment	Limits
Operating	0～60℃

※The radio parts at operating state and above temperature of T-shield.

Table 5.2 Non-operating Conditions (preliminary)

Environment	Temperature				Humidity			
	Min.	Typ.	Max.	Unit	Min.	Typ.	Max.	Unit
Non-Operating	-40	25	85	℃	45	-	90	%

※ Temperature condition for storage (Packaged) in warehouse is Maximum 40℃ up to 6 months.
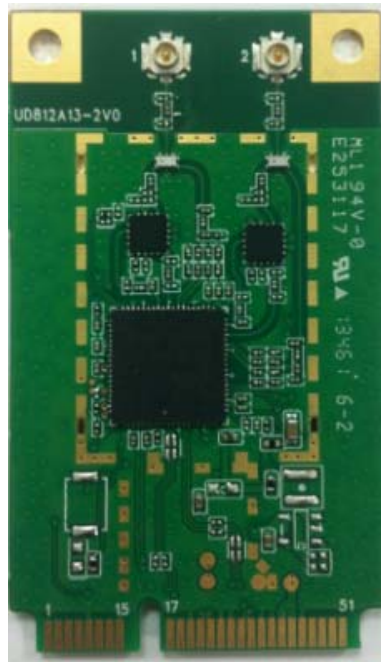
6. Part Numbering

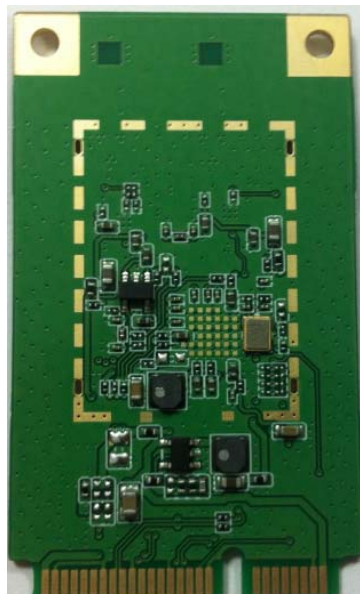## 6.1 ID Definitions

Table 6.1 ID Definitions

WLAN Type	Mode	PID	VID
Realtek RTL8812-AU LAN 802.11n usb2.0 Network Adaptor	BGN	0x881A	0x0BDA

7. Module Photo

Top Side

Bottom Side

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. The end user manual shall include all required regulatory information/warning as show in this manual.

Federal Communication Commission Interference Statement

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.

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.

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

➢ This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

➢ Operation on the 5.15-5.25 GHz frequency band is restricted to indoor use only.

Industry Canada Statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

➢ CAN ICES-3(B)/ NMB-3(B)

➢ The device could automatically discontinue transmission in case of absence of information to transmit, or operational failure. Note that this is not intended to prohibit transmission of control or signaling information or the use of repetitive codes where required by the technology.

- the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;
- the maximum antenna gain permitted for devices in the bands 5250–5350 MHz and 5470–5725 MHz shall comply with the e.i.r.p. limit; and
- the maximum antenna gain permitted for devices in the band 5725–5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

In addition, high-power radars are allocated as primary users (i.e. priority users) of the bands 5250–5350 MHz and 5650–5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Radiation Exposure Statement

This equipment complies with FCC/IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator & your body.

End Product Labeling

When the module is installed in the host device, the FCC/IC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily re-moved. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID:RX3-WFUR6"
"Contains IC:2878F-WFUR6 "
The grantee's FCC ID/IC ID can be used only when all FCC/IC compliance requirements are met.

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,
(2) The transmitter module may not be co-located with any other transmitter or antenna.
(3) The FX5541-11-002-C-TB00 antenna with 4.66dBi gain was verified in the conformity testing. Radiated transmit power must be equal to or lower than that specified in the FCC/IC Grant of Equipment Authorization for FCC ID:RX3-WFUR6 and IC:2878F-WFUR6. A separate approval is required for all other antenna type, or higher gain antenna.

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC/IC authorization is no longer considered valid and the FCC ID/IC ID cannot 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/IC authorization.