

# Foxconn WFUR7

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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

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# 1. Introduction

## 1.1 Product Overview

The Foxconn WFUR7 wireless LAN module contains the Realtek® RTL8188ETV single chip which is a highly integrated single-chip 802.11n Wireless LAN (WLAN) network USB interface (USB 1.0/1.1/2.0 compliant) controller. It combines a WLAN MAC, a 1T1R capable WLAN baseband, and WLAN RF in a single chip. The RTL8188ETV provides a complete solution for a high throughput performance integrated wireless LAN device. It fully complies with IEEE 802.11 b/g/n 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 WFUR7 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 802.11b/g/n compatible WLAN
- IEEE 802.11b/g/n compatible WLAN
- Complete 802.11n solution for 2.4GHz band
- 72.2Mbps receive PHY rate and 72.2Mbps transmit PHY rate using 20MHz bandwidth
- 150Mbps receive PHY rate and 150Mbps transmit PHY rate using 40MHz bandwidth
- IEEE 802.11e QoS Enhancement (WMM)
- 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services
- Complies with USB 1.0/1.1/2.0 for WLAN
- Low power with advanced power management

## 2. Electrical Specifications

### 2.1 Pin Definitions

**Table 3.1 Pin Definitions**

Pin	# Name	Pin	# Name
15	GND	16	GND
13	GND	14	WPS
11	GND	12	GND
9	GND	10	GND
7	GND	8	HSDP
5	GND	6	HSDM
3	GND	4	+3.3V
1	PDn	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 3.2 Power Consumption Specifications(preliminary)**

Description	Typical	Unit
Disable	19	mA
2G/2T- HT 40MHz MCS 7(14dBm)	290	mA
2G/2T- HT 20MHz MCS 7(14dBm)	199	mA
2G/2T- OFDM54M(15dBm)	206	mA
2G/2T- CCK11M(17dBm)	295	mA
2G/2R- HT 40MHz MCS 7	143	mA
2G/2R- HT 20MHz MCS 7	143	mA
2G/2R- OFDM54M	143	mA
2G/2R- CCK11M	143	mA

## 3. RF Specification

### 3.1 TX Specifications (preliminary)

Table 3.1 TX Specifications

Data Rate (Mbps)	Modulation	Tx Typical Power (dBm)	Data Rate (Mbps)	Modulation	Tx Typical Power (dBm)
1	DBPSK	16	HT20-7.22	BPSK	14
2	DQPSK	16	HT20-14.44	BPSK	14
5.5	CCK	16	HT20-21.67	QPSK	14
11	CCK	16	HT20-28.89	QPSK	14
6	OFDM	15	HT20-43.33	16-QAM	14
9	OFDM	15	HT20-57.78	16-QAM	14
12	OFDM	15	HT20-65	64-QAM	14
18	OFDM	15	HT20-72.22	64-QAM	14
24	OFDM	15	HT40-15	BPSK	14
36	OFDM	15	HT40-30	QPSK	14
48	OFDM	15	HT40-45	QPSK	14
54	OFDM	15	HT40-60	16-QAM	14
			HT40-90	16-QAM	14
			HT40-120	64-QAM	14
			HT40-135	64-QAM	14
			HT40-150	64-QAM	14

※Each tolerance is  $\pm 2\text{dBm}$

### 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

### 3.3 Antenna Specifications

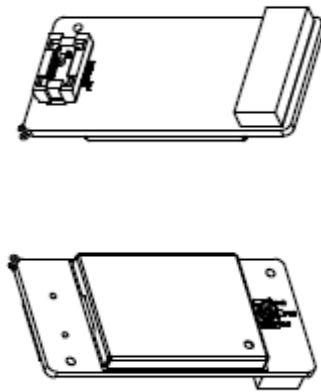
Nominal antenna port impedance specification is 50 ohms for the Foxconn WFUR7 hardware.

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

- ◆ Antenna gain for the 2.4GHz band : 1.22 dBi

There are one antennas supporting 2.4-2.5GHz band.

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



**Figure 3.1 WFUR7 Perspective**

## 4. Mechanical Specifications

### 4.1 Mechanical Drawing

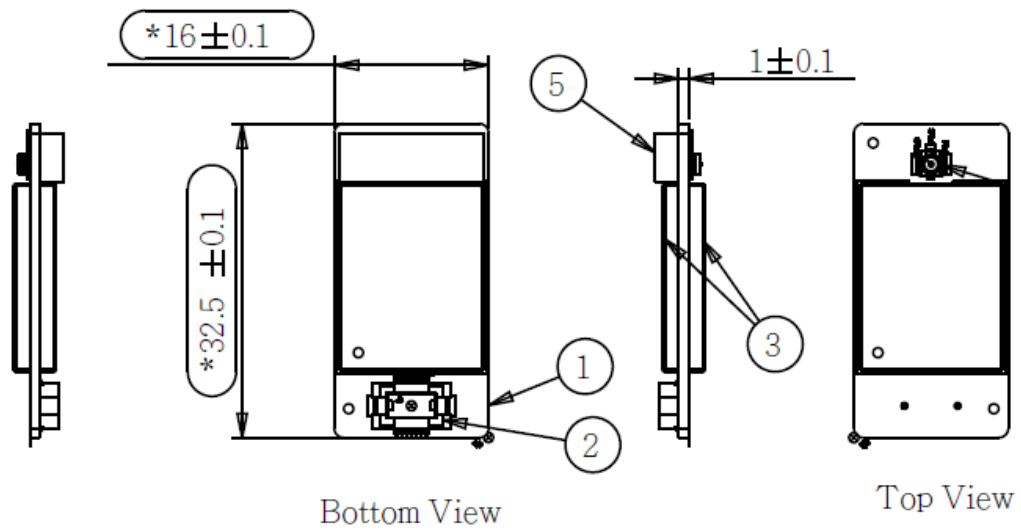


Figure 4.1 WFUR7 mechanical drawing

## 5. Environmental Specifications

The following tables provide normal operating conditions and maximum rating requirements for WFUR7 hardware.

**Table 5.1 Operating Conditions (preliminary)**

Environment	Limits
Operating	0 ~ 60°C

※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	°C	45	-	90	%

※ Temperature condition for storage (Packaged) in warehouse is Maximum 40°C up to 6 months.

## 6. Part Numbering

### 6.1 ID Definitions

Table 7.1 ID Definitions

WLAN Type	Mode	PID	VID
Realtek RTL8188ETV LAN 802.11n usb2.0 Network Adaptor	BGN	0x8179	0x0BDA

## 7. Module Photo

**Top Side**



**Bottom Side**



**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.

**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)

**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-WFUR7"

"Contains IC:2878F-WFUR7 "

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 WA-M-LA-02-041 PIFA antenna with 1.22dBi 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-WFUR7 and IC:2878F-WFUR7. 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.