ORFM-WMT7620
Product Specification

Version	Issue date	Changes	Remark
0.1	2014/3/06	Initial Version	
0.2	2014/10/3	Modify memory configuration	
0.3	2015/4/29	Update 2T2R data rate and temperature range	
0.4	2015/8/13	Update output power	
0.5	2018/01/12	Modified product number	

IMPORTANT

This document contains important Information and therefore
should not be disclosed to third parties without prior written consent of ORing Industrial Networking Co. Ltd.

Signature:

Author:	Reviewed by:	Approved by:	Remarks:
Isaac Chang			

1. Introduction

ORFM-MT7620-01 module is designed for easy-design-in low cost and suitable for Wi-Fi applications. The module can support WAN, LAN, UART, I2C, SPI, I2S, SDXC and GPIO interfaces and work for 2T2R mode.

2. Technical specification

Items		Specification
Supported Standard and Protocol		IEEE 802.11n, IEEE 802.11g, IEEE 802.11b, IEEE 802.3, IEEE 802.3u, CSMA/CA, CSMA/CD,TCP/IP,DHCP, ICMP, NAT, PPPoE
Dimension		35*30 mm
Power consumption		< 350mA
Operating Temperature Range		-30 ~ 70 deg. C
Storage Temperature Range		-40 ~ 85 deg. C
	WAN Port	one 10/100M adaptive RJ45 port
	LAN Port	one 10/100M adaptive RJ45 port
RF Parameters	Frequency Range	2.4~2.4835GHz
	Baud Rate	1T1R : (see table below)

1T1R :

MCS index	Data rate (Mbit/s)			
	20 MHz channel		40 MHz channel	
	800ns	400ns	800ns	400ns
0	6.5	7.2	13.5	15
1	13	14.4	27	30
2	19.5	21.7	40.5	45
3	26	28.9	54	60
4	39	43.3	81	90
5	52	57.8	108	120
6	58.5	65	121.5	135
7	65	72.2	135	150

2T2R

MCS	Data rate (Mbit/s)

index	20 MHz channel		40 MHz channel	
	800ns	400ns	800ns	400ns
8	13.00	14.40	27.00	30.00
9	26.00	28.90	54.00	60.00
10	39.00	43.30	81.00	90.00
11	52.00	57.80	108.00	120.00
12	78.00	86.70	162.00	180.00
13	104.00	115.60	216.00	240.00
14	117.00	130.00	243.00	270.00
15	130.00	144.40	270.00	300.00

		IEEE 802.11g：54/48/36/24/18/12/9/6(adaptive)
		IEEE 802.11b：11/5.5/2/1M(adaptive)
	Number of Channel	13
	Modulation Scheme	DBPSK、DQPSK、CCK and OFDM(BPSK/QPSK/16-QAM/64-QAM)
	Sensitivity @ PER	150M：-68dBm@10% PER；130M：-68dBm@10% PER； 108M： -68dBm@10% PER；54M：-72dBm@10% PER 11M：-85dBm@8% PER；6M：-88dBm@10% PER 1M：-90dBm@8% PER；
	Output Power	802.11b: 19 dBm ± 1.5dBm@11Mbps (2T2R total power) 802.11g: 17.5 dBm ± 1.5dBm@54Mbps (2T2R total power) 802.11gn HT20: 16.5 dBm ± 1.5dBm @MCS7 (2T2R total power) 802.11gn HT40: 14.5 dBm ± 1.5dBm @MCS7 (2T2R total power)
	Antenna	Two IPEX I connectors for two external antenna(2T2R)
WIFI Operation Mode		Client/AP
System Service		Virtual Server：Internal web server for browser to access
Device Management		Area setting Restore to default factory setting Software upgrade Reboot

	Change password
WLAN Security Mode	OPENWEP
	SHAREDWEP
	WEPAUTO
	WPA
	WPA-PSK
	WPA2
	WPA2-PSK
	WPAPSKWPA2PSK
	WPA1WPA2(WPA and WPA2 hybrid mode)
	802.1x

3. Software features

- Support WPS
- Support AP（Access point）、Client（WiFi Station) mode
- **AP mode**
  - o Default operation mode. In this mode, the module work as an Access Point, don't need any configuration.
  - o User can use PC via RJ45 or smart phone via WiFi to login MT7620A AP mode and change the default configuration (through browser).
- **Client mode**
  - o In this mode, module is a WiFi station.

4. Development tool :

We provide development tool for easy connection of power, RS-232, LAN, WAN, and USB port.

5. Module Dimension : 35*30 mm
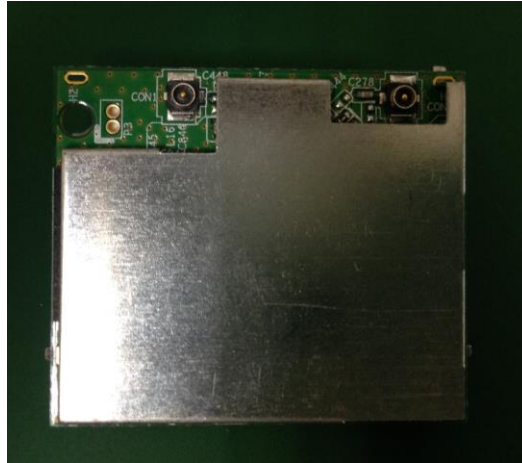
There are two 1.27mm pitch header on the bottom side of module P1 and P2.

6. Pin Assignment

P1 :

Multi 1	Multi 2	GPIO	Main			Main	GPIO	Multi 2	Multi 1
		GPIO50	SD_CDT	1	2	SD_CMD	GPIO51		
		GPIO52	SD_D0	3	4	SD_D3	GPIO55		
		GPIO53	SD_D1	5	6	SD_D2	GPIO54		
		GPIO48	SD_WP	7	8	SD_CLK	GPIO49		
		REFCLK	WDT_RST	9	10	POR			
		GPIO40	LINK0	11	12	GPIO0			
		GPIO41	LINK1	13	14	SPI_MISO	GPIO6		
	REFCLK	GPIO37	SPI_CS1	15	16	UART_TX	GPIO15		
		GPIO4	SPI_CLK	17	18	UART_RX	GPIO16		
		GPIO42	LINK2	19	20	SPI_MOSI	GPIO5		

P2 :

Multi 1	Multi 2	GPIO	Main			Main	GPIO	Multi 2	Multi 1
		GPIO2	I2C_SCLK	1	2	I2C_SD	GPIO1		
			TXO3_P	3	4	RXI4_P			
			TXO3_N	5	6	RXI4_N			
RXD	PCMDTX	GPIO14	RIN	7	8	LINK4	GPIO44		
RTS_N	PCMFS	GPIO11	DTR_N	9	10	GND			
	I2SSDI	GPIO10	RXD	11	12	USB_P			
	I2SCLK	GPIO7	RTS_N	13	14	USB_N			
			3.3VD	15	16	GND			
			3.3VD	17	18	TXO4_P			
TXD	PCMCLK	GPIO12	DCD_N	19	20	TXO4_N			
	I2SWS	GPIO8	TXD	21	22	RXI3_N			
CTS_N	PCMDRX	GPIO13	DSR_N	23	24	RXI3_P			
		GPIO43	LINK3	25	26	CTS_N	GPIO9	I2SSDO	
		GPO72	WLAN_LED	27	28	1.8VD			

P1 :

Pin #	Function	Direction	Description
1	SD_CDT	In	SDXC Card Detect
2	SD_CMD	Out	SDXC Command
3	SD_D0	In/Out	SDXC Data0
4	SD_D3	In/Out	SDXC Data3
5	SD_D1	In/Out	SDXC Data1
6	SD_D2	In/Out	SDXC Data2
7	SD_WP	In	SDXC Write Protect
8	SD_CLK	Out	SDXC Clock
9	WDT_RST	Out	Watchdog timeout reset, can be configured as ref clock output
10	POR	In	Power on reset input, low active
11	LINK0	Out	Link LED for port 0
12	GPIO0	Out	GPIO0 or WPS push button
13	LINK1	In/Out	Link LED for port 1
14	SPI_MISO	In	SPI MISO signal
15	SPI_CS1	Out	SPI chip select signal 1
16	UART_TX	A	Console UART TXD signal
17	SPI_CLK	Out	SPI clock output
18	UART_RX	A	Console UART RXD signal
19	LINK2	Out	Link LED for port 2
20	SPI_MOSI	Out	SPI MOSI signal

P2 :

Pin #	Function	Direction	Description
1	I2C_SCLK	In/Out	I2C Clock signal
2	I2C_SD	In/Out	I2C Data signal
3	TXO3_P	A	Tx positive for port 3
4	RXI4_P	A	Rx positive for port 4
5	TXO3_N	A	Tx negative for port 3
6	RXI4_N	A	Rx negative for port 4
7	RIN		Full UART RIN signal
8	LINK4	Out	Link LED for port 4

| 9	DTR_N		Full UART DTR signal
10	GND		Power ground
11	RXD		Full UART RXD signal
12	USB_P	In/Out	USB signal poistive
13	RTS_N		Full UART RTS_N signal
14	USB_N	In/Out	USB signal negative
15	3.3VD	Power In	3.3V input
16	GND		Power ground
17	3.3VD	Power In	3.3V input
18	TXO4_P	A	Tx positive for port 4
19	DCD_N		Full UART DCD_N signal
20	TXO4_N	A	Tx negative for port 4
21	TXD	Out	Full UART TXD
22	RXI3_N	A	Rx negative for port 3
23	DSR_N	In/Out	Full UART DSR_N signal
24	RXI3_P	A	Rx positive for port 3
25	LINK3	Out	Link LED for port 3
26	CTS_N		Full UART CTS_N signal
27	WLAN_LED	Out	WLAN LED output, active low
28	1.8VD	Power input	1.8V input

7. Memory configuration

Depending on customer's request, the module can be shipped with following configuration :

Flash size : 2MB, 4MB, 8MB, 16MB, 32MB, 64MB
DDR2 size : 64MB, 128MB

8. Mechanical Application Notes

1. CON0 and CON1 are IPEX1 connectors on top side
2. P1 is 2*10 pins 1.27mm male header on bottom side for signals
3. P2 is 2*14 pins 1.27mm male header on bottom side for signals
4. Footprint of P1, P2 is as following, the coordinate of pin1 footprint center for P1 and P2 are (29.5, 10.975) and (9.575,1.425), Please note that this coordinate is the center of pad, not

center of header pin.
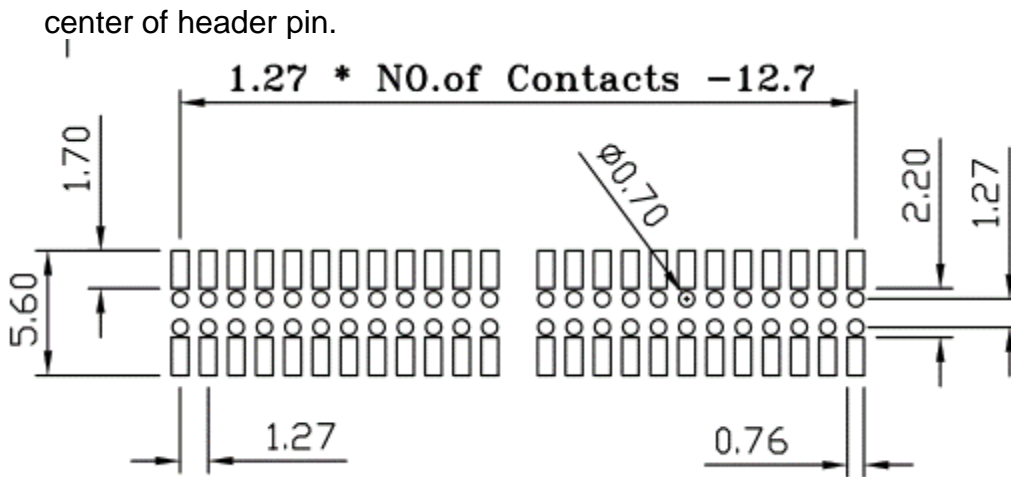
5. H1, H2, H3, H4 are slot holes used for install metal shielding cover if needed
6. D1 is diameter 2.1mm hole for screw fixing
7. D2 is diameter 2.1mm half hole for screw fixing
8. P3 is a 2 pins dip type header holes with 1.27mm pitch. Since P1 and P2 are all located on lower side, this socket can be used optionally to mount module on base PCB for balancing the force of upper side.
9. The mechanical drawing in .dxf format is available under request.

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: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

End Product Labeling

This transmitter module is authorized only for use in devices where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end product must be labeled in visible area with the following: "Contains FCC ID: WHD-ORFM-WMT7620"
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End Product Manual Information

The user manual for end users must include the following information in a prominent location "IMPORTANT NOTE: To comply with FCC RF exposure compliance requirements, the antenna used for this transmitter must be installed to provide a separation distance of at least 20cm from all persons and must not be colocated or operating in conjunction with any other antenna or transmitter."   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.

IMPORTANT NOTE: In the event that these conditions can not be met (for example certain laptop configurations or colocation 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 reevaluating the end product (including the transmitter) and obtaining a separate FCC authorization.   This device is intended only for OEM integrators under the following conditions: The antenna must be installed such that 20 cm is maintained between the antenna and users. As long as a condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed   (for example, digital device emissions, PC peripheral requirements, etc.).