



PRODUCT SPECIFICATION

Version 2.1

IEEE 802.11 b/g/n 1T1R USB Module

Model Number: WF75RL1510C

P/N: 07-MT7601-MA0G

CMIIT ID: 2014DP6213

2.4G channel: 1-13

(Media Tek MT7601U)

客户认可 Custom Approval Section		
Custom Name		
Department		
Approval		Date:

拟制 DESIGN	审核 CHECK	批准 APPROVAL
高照	陈宇科	熊运自
20151210	20151210	20151210

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Document revision history

Rev.	Date	Author	Reason for Changes
Version 1.0	2014-09-03		Draft
Version 1.1	2014-09-16		Adding shield cover
Version 1.2	2014-12-18		Adding P/N No.
Version 1.3	2015-01-27		Adding CMIIT ID Update the label info
Version 1.4	2015-09-20		Edited 11b frequency range
Version 2.0	2015-12-10		PowerEN edited
Version 2.1	2016-01-06		GI edited+ FCC Statement



1. Brief Description

This document is to specify the product requirements for 802.11 b/g/n USB Module. This Module is based on Media Tek MT7601U chipset that complied with IEEE 802.11g, IEEE 802.11b, IEEE 802.11n standard from 2.4G-2.5GHz, and it can be used to provide up to 54Mbps for 802.11g, 11Mbps for 802.11b and 150Mbps for 802.11n to connect your wireless LAN.

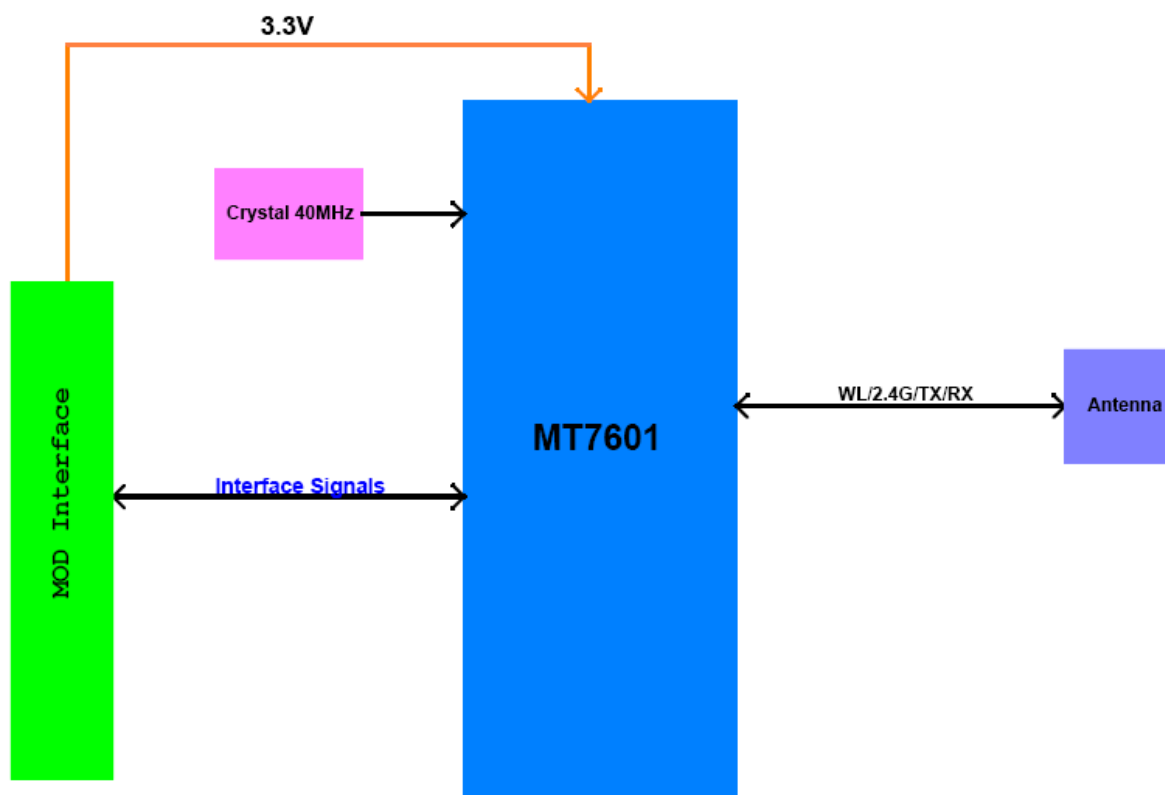
With seamless roaming, fully interoperability and advanced security with WEP standard, 802.11b/g/n USB Module offers absolute interoperability with different vendors 802.11 b, 802.11 g, 802.11n Access Points through the wireless LAN.

2. Features

- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate.
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11n standard to provide wireless 150Mbps data rate.
- Operation at 2.4G-2.5GHz frequency band to meet worldwide regulations
- Supports WEP ,WPA ,WPA2,TKIP,AES enhanced security
- Drivers support Windows XP 32/64, 2000, 7,Vista 32/64, linux OS
- High speed USB 2.0 interface
- ROHS compliant

3. Application Diagrams

3.1 Functional Block Diagram



3.2 General Requirements

3.2.1 IEEE 802.11b Section

	Feature	Detailed Description
3.2.1.1	Standard	IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	DQPSK , DBPSK , DSSS , and CCK
3.2.1.3	Operating Frequency	2400 ~ 2483.5MHz ISM band
3.2.1.4	Channel Numbers	11 channels for United States 13 channels for Europe Countries 14 channels for Japan
3.2.1.5	Data Rate	11,5.5,2,and 1Mbps
3.2.1.6	Media Access Protocol	CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	- Typical RF Output Power at each RF chain,Data Rate and at room Temp. 25degree C 17dBm (±2dB) at 1,2,5.5,11Mbps

3.2.1.8	Receiver Sensitivity at Antenna Connector	- Typical Sensitivity at Which Frame(1000-byte PDUs)Error Rate=8% -76 dBm at 2Mbps -76 dBm for 11Mbps
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3.2.2 IEEE 802.11g Section

	Feature	Detailed Description
3.2.2.1	Standard	IEEE 802.11g
3.2.2.2	Radio and Modulation Type	QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.2.3	Operating Frequency	2400 ~ 2483.5MHz ISM band
3.2.2.4	Channel Numbers	11 channels for United States 13 channels for Europe Countries 13 channels for Japan
3.2.2.5	Data Rate	6, 9, 12, 18, 24, 36, 48, 54Mbps
3.2.2.6	Media Access Protocol	CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	- Typical RF Output Power(tolerance ± 2dB) at each RF chain, Data Rate and at roomTemp. 25degree C +17 dBm at 6, 9Mbps +16 dBm at 12,18Mbps +15 dBm at 24,36Mbps +14 dBm at 48,54Mbps
3.2.2.8	Receiver Sensitivity at Antenna Connector	- Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25 degree C -82 dBm at 6Mbps -81 dBm at 9Mbps -79 dBm at 12Mbps -77 dBm at 18Mbps -74 dBm at 24Mbps -70 dBm at 36Mbps -66 dBm at 48Mbps -65 dBm at 54Mbps

3.2.3 IEEE 802.11n Section

	Feature	Detailed Description
3.2.3.1	Standard	IEEE 802.11n
3.2.3.2	Radio and Modulation Type	BPSK , QPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	2400 ~ 2483.5MHz
3.2.3.4	Data Rate(Mbps)	

		<table><tr><th rowspan="2">MCS</th><th colspan="2">GI=800ns</th><th colspan="2">GI=400ns</th></tr><tr><th>20MHz</th><th>40MH</th><th>20MHz</th><th>40MHz</th></tr><tr><td>0</td><td>6.5</td><td>13.5</td><td>7.2</td><td>15</td></tr><tr><td>1</td><td>13</td><td>27</td><td>14.4</td><td>30</td></tr><tr><td>2</td><td>19.5</td><td>40.5</td><td>21.7</td><td>45</td></tr><tr><td>3</td><td>26</td><td>54</td><td>28.9</td><td>60</td></tr><tr><td>4</td><td>39</td><td>81</td><td>43.3</td><td>90</td></tr><tr><td>5</td><td>52</td><td>108</td><td>57.8</td><td>120</td></tr><tr><td>6</td><td>58.5</td><td>121.5</td><td>65.0</td><td>135</td></tr><tr><td>7</td><td>65</td><td>135</td><td>72.2</td><td>150</td></tr><tr><td>8</td><td>13</td><td>27</td><td>14.444</td><td>30</td></tr><tr><td>9</td><td>26</td><td>54</td><td>28.889</td><td>60</td></tr><tr><td>10</td><td>39</td><td>81</td><td>43.333</td><td>90</td></tr><tr><td>11</td><td>52</td><td>108</td><td>57.778</td><td>120</td></tr><tr><td>12</td><td>78</td><td>162</td><td>86.667</td><td>180</td></tr><tr><td>13</td><td>104</td><td>216</td><td>115.556</td><td>240</td></tr><tr><td>14</td><td>117</td><td>243</td><td>130.000</td><td>170</td></tr><tr><td>15</td><td>130</td><td>270</td><td>144.444</td><td>300</td></tr></table>	MCS	GI=800ns		GI=400ns		20MHz	40MH	20MHz	40MHz	0	6.5	13.5	7.2	15	1	13	27	14.4	30	2	19.5	40.5	21.7	45	3	26	54	28.9	60	4	39	81	43.3	90	5	52	108	57.8	120	6	58.5	121.5	65.0	135	7	65	135	72.2	150	8	13	27	14.444	30	9	26	54	28.889	60	10	39	81	43.333	90	11	52	108	57.778	120	12	78	162	86.667	180	13	104	216	115.556	240	14	117	243	130.000	170	15	130	270	144.444	300
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4. Electrical and Thermal Characteristics

4.1 Temperature Limit Ratings

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	+80	°C
Ambient Operating Temperature	0	60	°C
Junction Temperature	0	125	°C

4.2 General Section

	Feature	Detailed Description
5.2.1	Antenna Type	Integrated antenna
5.2.2	Operating Voltage	5.0V ± 10%
5.2.3	Current Consumption	230mA at continuous transmit mode 190mA at receive mode w/o receiving packet
5.2.4	USB	High Speed USB2.0 Interface

4.3 Software Requirements

Driver	Windows XP 32/64, 2000, 7, Vista 32/64, linux OS
Security	WEP , WPA , WPA2, TKIP, AES

4.3.1 Information

	Feature	Detailed Description
4.3.1.1	General Information	General Information shows the name of Wireless Adapter, Adapter MAC Address, Regulatory Domain, Firmware Version, and Utility Version.
4.3.1.2	Current Link Information	Current Link Information shows the C
4.3.1.3	Site survey	To search the neighboring access points and display the information of all access points.

4.3.2 Mechanical Requirements

	Feature	Detailed Description
4.3.2.1	Length	• 36mm(PCB)
4.3.2.2	Width	• 22mm(PCB)
4.3.2.3	Height	• 1.0mm(PCB)

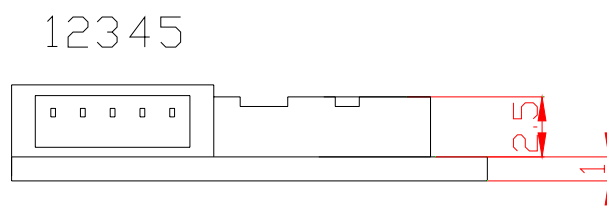
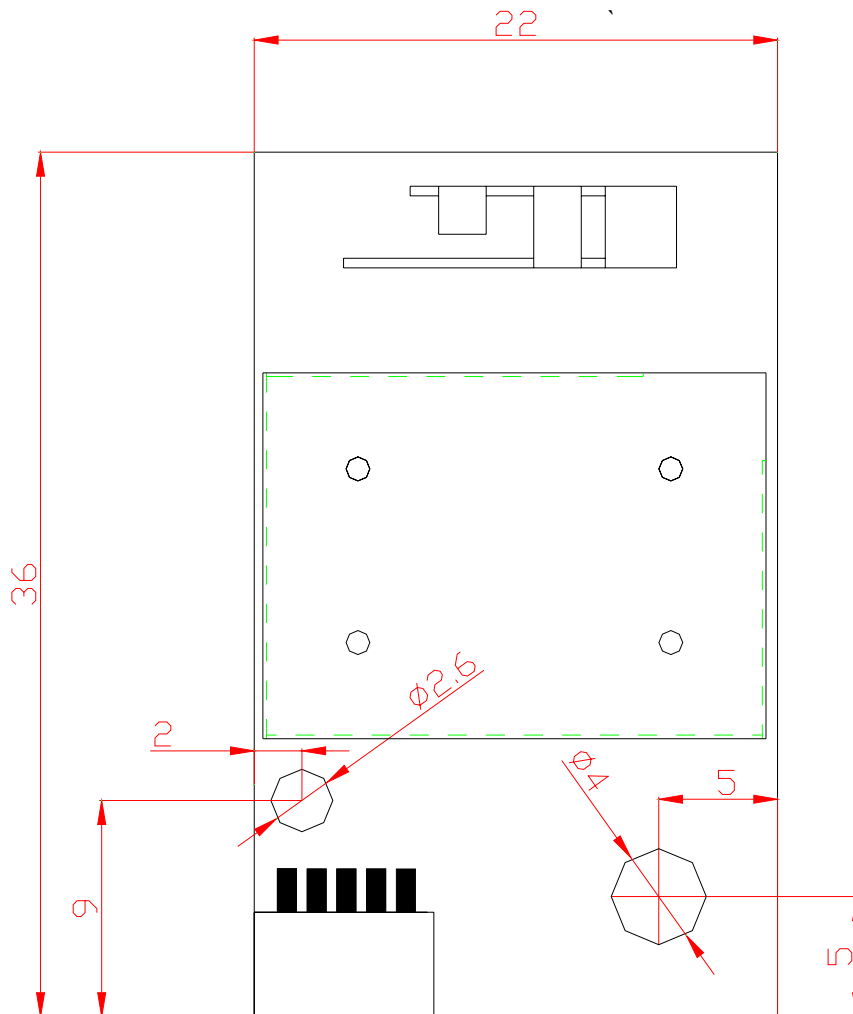
4.3.3 Environmental Requirements

	Feature	Detailed Description
4.3.3.1	Operating Temperature Conditions	• The product is capable of continuous reliable operation when operating in ambient temperature of 0°C to + 45°C .
4.3.3.2	Non-Operating Temperature Conditions	• Neither subassemblies is damaged nor the operational performance is degraded when restored to the operating temperature after exposing to storage temperature in the range of -20°C to + 75°C .
4.3.3.3	Operating Humidity conditions	• The product is capable of continuous reliable operation when subjected to relative humidity in the range of 10% and 90% non-condensing.
4.3.3.4	Non-Operating Humidity Conditions	• The product is not damaged nor the performance is degraded after exposure to relative humidity ranging from 5% to 95% non-condensing

5 Connector Definition

1, 5-Pin 1.25mm connector (Horizontal Type)

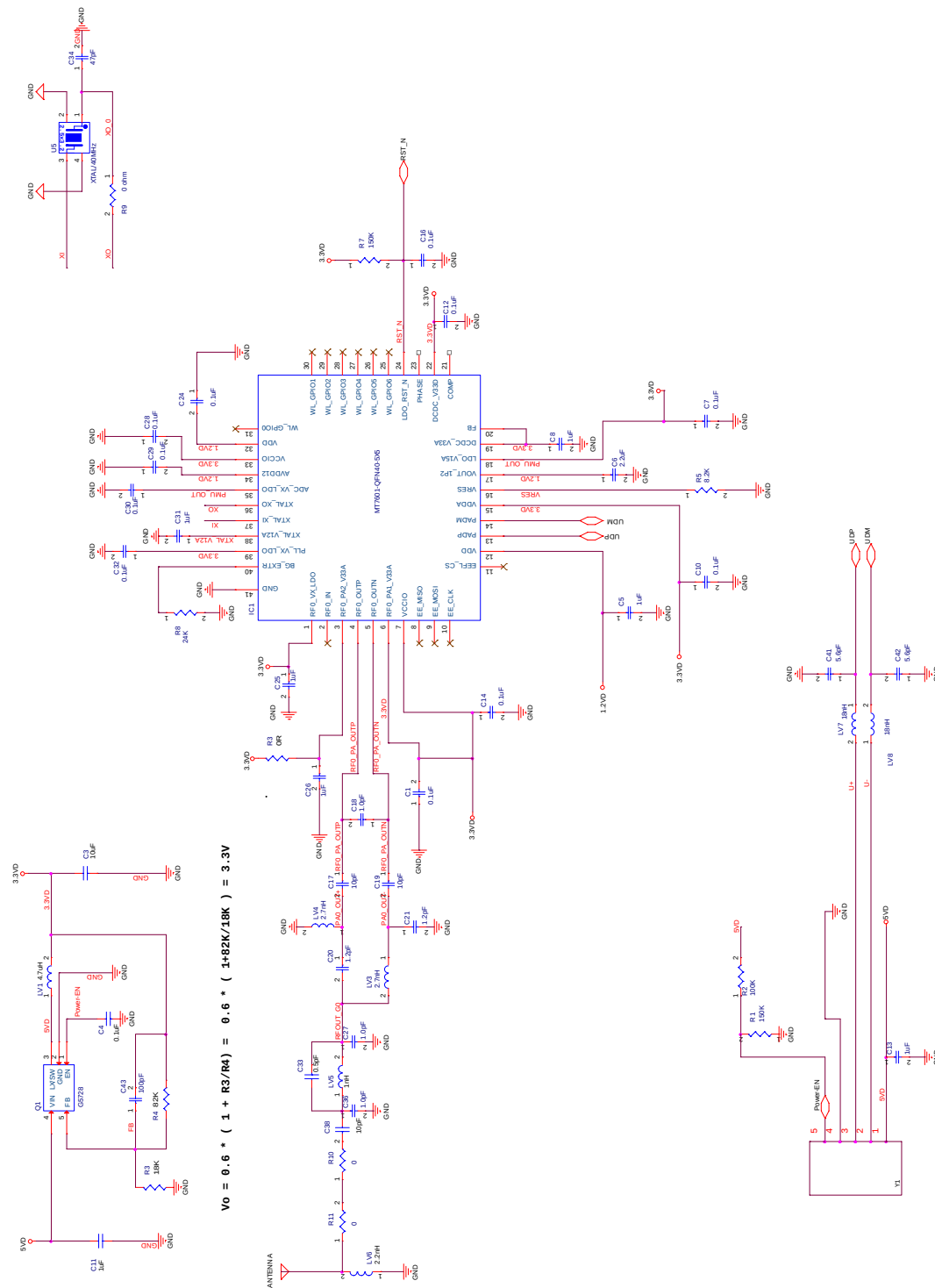
Pin	1	2	3	4	5
Definition	Power-en	GND	D+	D-	Vcc



*TOLERANCES ARE +/-0.5mm UNLESS OTHERWISE SPECIFIED

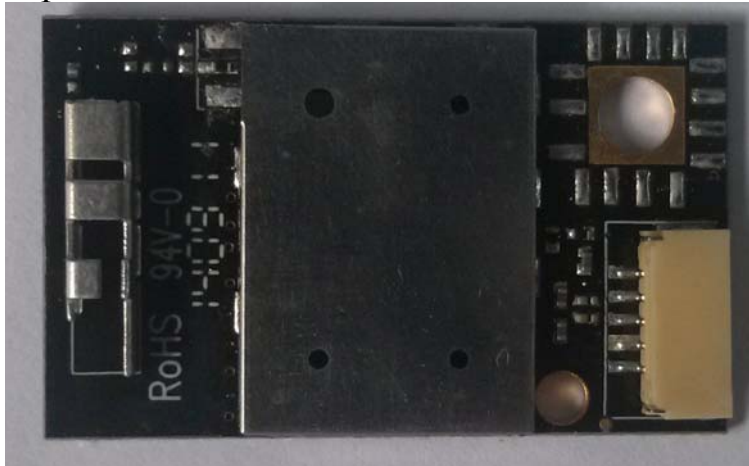
*UNIT:mm

Appendix 1 : Schematic



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Appendix 3 : Top & Bottom vertical view



Connector view:





FCC 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 or more 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.

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.

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment.

This equipment 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.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product. Modular could be only used in mobile or fix device, and could not be used in any portable device. The module must be installed in TV set.

In the event that these conditions can not be met (for example certain laptop configurations or co-location 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 re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

Caution!

The manufacturer is not responsible for any radio or TV interference caused by unauthorized modifications to this equipment. Such modifications could void the user authority to operate the equipment.

Regulation information

- (1) This device and its antenna(s) must not be co-located or operating in conjunction with any other



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antenna or transmitter.

- (2) This compliance to FCC radiation exposure limits for an uncontrolled environment, and minimum of 20cm separation between antenna and body.

(3)

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.

- (4) The end product must carry a label stating "Contains TX FCC ID: 2AC23-WF75RL1510C" .