Product Specification

US302-RL

Model Name: IEEE 802.11n WLAN

USB 2.0 Module

Version: 0.4

Date: 2008/9/15

Quanta Microsystems, Inc.

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Contents

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1. Revision History

Date	Release	Author	Description
2008/5/24	0.1	Richard Chou	First release
2008/6/15	0.2	Richard Chou	Rx parameters modified
2008/8/15	0.3	Richard Chou	Tx power modified
2008/9/15	0.4	Richard Chou	Add mechanical drawing

2. Related Documents

Date	Author	Document(s)
2008/6/10	*Ralink*	RT3070 datasheet

3. Overview

3.1. Scope

This document describes the specifications of US302 WLAN USB module. The low power consumption and smaller size are suitable for USB adapter.

US302 implements half-duplex OFDM, CCK, and DSSS baseband processing supporting all IEEE 802.11n data rates. The MAC supports the IEEE 802.11 wireless MAC protocol as well as 802.11i security, receive and transmit filtering, error recovery, and quality of service(QoS), and Extended Range technology, dramatically increasing WLAN performance

3.2. Features

- BPSK, QPSK, 16 QAM, 64 QAM, DBPSK, DQPSK and CCK modulation technique
- Operates at 2.4GHz frequency band
- 802.11e compatible bursting
- Supports Windows XP, Windows Vista, Linux kernel 2.6.10.
- USB bus powered, external power is no required.
- Support Pre-IEEE 802.11n (TGn draft 6.0), short GI and long GI, 20MHz and 40 MHz bandwidth. Data rate up to 150Mbps maximum.
- Supports Ad-hoc mode in IEEE 802.11b, Ad-hoc G (802.11g OFDM rates) and Ad-hoc N (802.11n rates) mode.
- 802.11n SSN technique (1Transmit/1Receive).
- Supports Infrastructure mode in 802.11n,802.11b and 802.11g modes
- Supports Site survey: 802.11n/g/b BSS and IBSS.
- Supports USB adapter hot-swap, device driver disable/enable
- Supports Radio On/Off in software.
- Supports IEEE 802.1X,
  - i Authentication modes: Open system, Share Key, Auto Switch, IEEE 802.1x, WPA, WPA-PSK, WPA2, WPA2-PSK
  - ii Encryption method: WEP 64/128, TKIP, AES
- USB 2.0(High/Full Speed) and backward compatible with USB 1.1 (Full Speed).

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3.3. Specification

<table>
<tr><td>Standards Conformity</td><td>IEEE 802.11n(draft 3.0)</td><td>Frequency Range</td><td>11b/g/n: 2.412~2.4835GHz</td></tr>
<tr><td>Type</td><td>USB 2.0 with 6pins connector</td><td>Channels</td><td>11b/g: CH1~11
11n (HT20): CH1~11
11n (HT40): CH3~9</td></tr>
<tr><td>Modulation Technique</td><td>OFDM/ BPSK/ QPSK/ CCK</td><td>Data Rate (Mbps)</td><td>1Mbps to 11Mbps for 11b,
6Mbps to 54Mbps for 11g,
MCS0 to MCS7 for 11n HT20/HT40</td></tr>
<tr><td>Device Drivers</td><td>Windows XP SP2 32bit/64bit
Linux kernel 2.6.16
Windows Vista 32/64bit</td><td>Security</td><td>Supports 64-bit & 128-bit WEP for legacy mode
WPA/WPA2/WPS for all mode</td></tr>
<tr><td>Operating Voltage</td><td>DC 3.3V via USB bus power</td><td>Coverage Area</td><td>60Meters (Indoor)
80Meters (Outdoor)</td></tr>
<tr><td>Warranty</td><td>1 year warranty limited</td><td>Temperature</td><td>0 ~ 60℃ (Operation),
-20~70℃ (Storage)</td></tr>
<tr><td>Sensitivity
(AntA+AntB)</td><td><table><tr><td>Data rate</td><td>Typical</td></tr><tr><td>11Mbps CCK (11b)</td><td>- 85 dBm</td></tr><tr><td>54Mbps OFDM(11g)</td><td>- 70 dBm</td></tr><tr><td>11n HT20 MCS7</td><td>- 66 dBm</td></tr><tr><td>11n HT40 MCS7</td><td>- 63 dBm</td></tr></table></td><td>Output Power
(AntA)</td><td><table><tr><td>Data rate</td><td>Typical</td></tr><tr><td>11Mbps CCK (11b)</td><td>+16 dBm</td></tr><tr><td>54Mbps OFDM(11g)</td><td>+13 dBm</td></tr><tr><td>6Mbps OFDM (11g)</td><td>+16 dBm</td></tr><tr><td>HT20 MCS7</td><td>+12 dBm</td></tr><tr><td>HT40 MCS7</td><td>+12 dBm</td></tr></table></td></tr>
<tr><td>Current Consumption
(AntA+AntB)</td><td colspan="3"><table><tr><td>Mode</td><td>Watts/mA@3.3v</td></tr><tr><td>11b TX</td><td>0.660/200</td></tr><tr><td>11g TX</td><td>0.594/180</td></tr><tr><td>11n HT20 TX</td><td>0.627/190</td></tr><tr><td>11n HT40 TX</td><td>0.660/200</td></tr><tr><td>11b RX</td><td>0479/145</td></tr><tr><td>11g RX</td><td>0.479/145</td></tr><tr><td>11n HT20 RX</td><td>0.479/145</td></tr><tr><td>11n HT40 RX</td><td>0.627/190</td></tr><tr><td>WLAN off</td><td>0.165/50</td></tr></table></td></tr>
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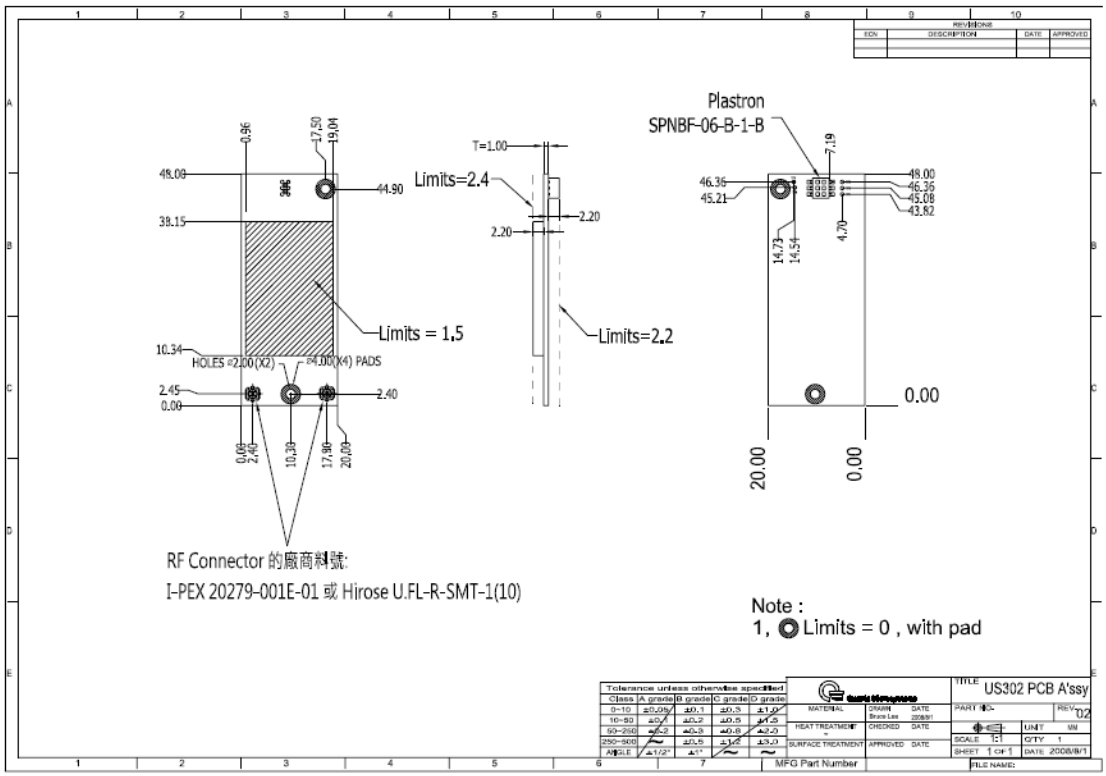
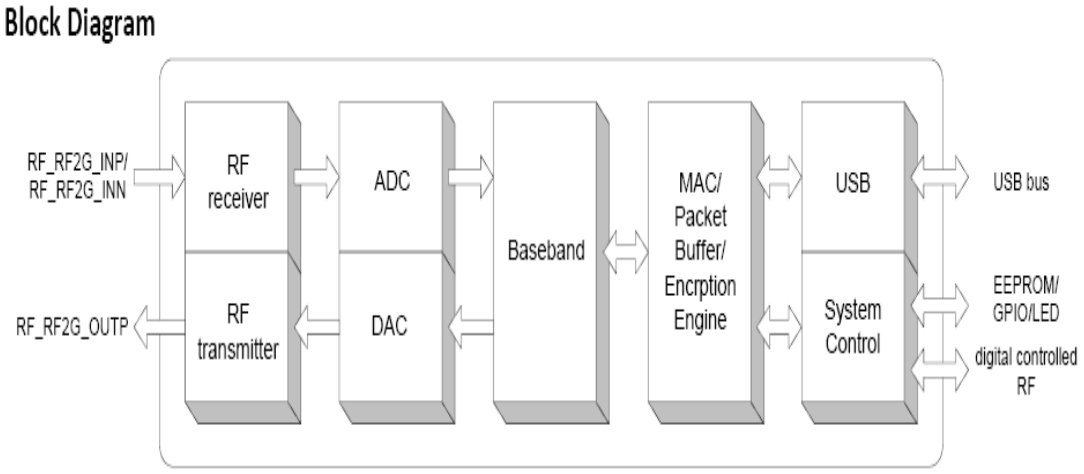
3.4. Mechanical Characteristics



3.5. Module function Block Diagram



3.6. RoHS Compliant

US302RL is fully compliant with RoHS requirement.

4. Engineering sheets

Pins Out and Pin Descriptions

Pin no.	*Definition*	*Pin no.*	*Definition*
1	*USB data differential input*	*2*	*USB data differential input*
3	*Reset*	*4*	*Ground*
5	*3.3V*	*6*	*Ground*

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/RSS-210 of the FCC/IC 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/IC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15/RSS-210 of the FCC/IC 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.

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 20cm between the radiator & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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,

IMPORTANT NOTE: In the event that these conditions can not 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/IC 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/IC authorization.