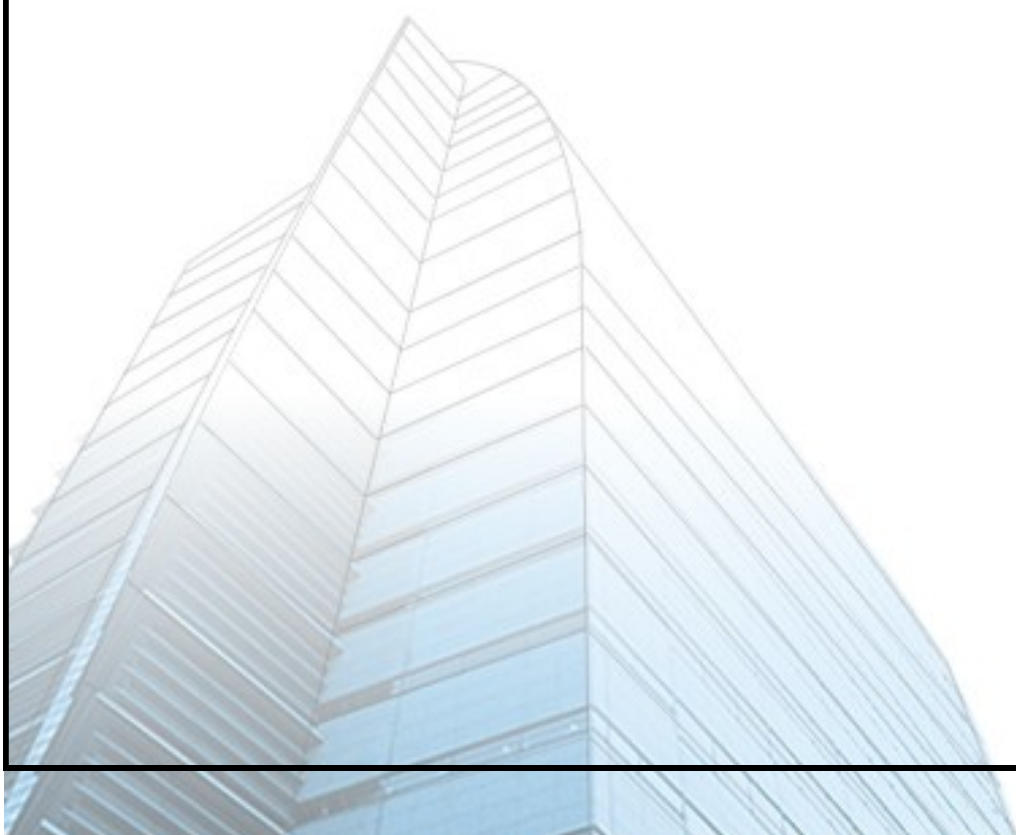


# **User MANUAL**

## **802.11b/g/n 2T2R Wireless LAN USB Module**

**Model Name: WN3604R**

**Brand: LITEON**



## CONTENT

|                                            |           |
|--------------------------------------------|-----------|
| <b>WARNING STATEMENTS .....</b>            | <b>3</b>  |
| <b>PRODUCT FEATURES .....</b>              | <b>6</b>  |
| <b>PRODUCT SPECIFICATIONS.....</b>         | <b>6</b>  |
| MAIN CHIPSET .....                         | 6         |
| FUNCTIONAL SPECIFICATIONS .....            | 6         |
| <b>RECOMMENED OPEATION CONDITIONS.....</b> | <b>8</b>  |
| <b>PIN DEFINIITON .....</b>                | <b>8</b>  |
| <b>MECHANICAL .....</b>                    | <b>9</b>  |
| <b>MAC LABEL .....</b>                     | <b>9</b>  |
| <b>ENVIRONMENTAL .....</b>                 | <b>10</b> |
| OPERATING .....                            | 10        |
| STORAGE.....                               | 10        |

## WARNING STATEMENTS

### **FCC Statement:**

#### 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: 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 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.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible. This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi transmitter product procedures. Referring to the multi transmitter policy, multiple transmitter(s) and module(s) can be operated simultaneously without C2PC.

IMPORTANT NOTE: FCC Radiation Exposure Statement: This equipment complies with FCC 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.

IMPORTANT NOTE: This module is intended for OEM integrator. The OEM integrator is responsible for the compliance to all the rules that apply to the product into which this certified RF module is integrated. Additional testing and certification may be necessary when multiple modules are used.

20 cm minimum distance has to be able to be maintained between the antenna and the users for the host this module is integrated into. Under such configuration, the FCC radiation exposure limits set forth for an population/uncontrolled environment can be satisfied.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

#### USERS MANUAL OF THE END PRODUCT:

In the user's manual of the end product, the end user has to be informed to keep at least 20 cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment. If the size of the end product is smaller than 8x10cm, then additional FCC part 15.19 statement is required to be available in the user's manual: This device complies with Part 15 of 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.

#### LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains FCC ID: PPQ-WN3604R". If the size of the end product is larger than 8x10cm, then the following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

#### OEM Integrator Checklist

The party below will implement the LITE-ON Module in host systems in accordance with the instructions specified in this document and the documents referenced herein.

- 1.The OEM integrator will ensure the Module is integrated in a host systems using only the approved antenna model(s) described in this document.
- 2.The OEM integrator will ensure the antenna placement inside the host system will maintain the required spacing to end user for RF Exposure compliance, as specified in this document.
- 3.If other radios are integrated inside the host with the LITE-ON Module, the OEM integrator will contact its test lab, TCB or LITE-ON to determine if additional FCC compliance evaluation is required to meet FCC collocation rules.
- 4.The OEM integrator will ensure end user documentation will contain the specified regulatory wording and ensure the host system and the Module itself are labeled as specified in this

document.

5. The OEM integrator will ensure the Module is programmed in the factory with compliant transmit power not exceeding the levels specified in this document. LITE-ON requests that the OEM integrator acknowledge its receipt of this document and the above instructions. You may contact LITE-ON with any questions concerning this document or the responsibilities of the OEM integrator

**IC statement:**

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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;
- 2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

**IC Radiation Exposure Statement**

This equipment complies with IC RSS-102 radiation exposure limit set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Déclaration d'exposition à la radiation : Cet équipement respecte les limites d'exposition aux rayonnements IC définies pour un environnement non contrôlé. Cet équipement doit être installé et mis en marche à une distance minimale de 20 cm qui sépare l'élément rayonnant de votre corps.

L'émetteur ne doit ni être utilisé avec une autre antenne ou un autre émetteur ni se trouver à leur proximité.

**End Product Labeling**

This transmitter module is authorized only for use in device where the antenna may be installed such that 25 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 4491A-WN3604R".

**Plaque signalétique du produit final**

Ce module émetteur est autorisé uniquement pour une utilisation dans un dispositif où l'antenne peut être installée de telle sorte qu'une distance de 25cm peut être maintenue entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 4491A-WN3604R".

## PRODUCT FEATURES

- Operate at ISM frequency Band (2.4GHz)
- IEEE Standards Support, 802.11b, 802.11g and 802.11n
- Support USB 2.0 host interface
- Enterprise level security supporting: WPA, WPA2, WPS2.0, WAPI
- Two-stream IEEE 802.11n support for 20MHz and 40MHz bandwidth channels
- provides PHY layer rates up to 300Mbps
- Integrated LNA, PA and T/R switch
- Support Wi-Fi Direct
- RoHS compliance
- Low Halogen compliance

## PRODUCT SPECIFICATIONS

### MAIN CHIPSET

MAC/ Baseband/ RF: MediaTek MT7603U

### FUNCTIONAL SPECIFICATIONS

| WiFi Function         |                                                                       |
|-----------------------|-----------------------------------------------------------------------|
| Standard              | IEEE802.11b; IEEE 802.11g; IEEE 802.11n                               |
| Bus Interface         | USB2.0                                                                |
| Data Rate             | <b>802.11b:</b><br>11, 5.5, 2, 1 Mbps                                 |
|                       | <b>802.11g:</b><br>54, 48, 36, 24, 18, 12, 9, 6 Mbps                  |
|                       | <b>802.11n:</b><br>MCS 0 to 15 for HT20MHz<br>MCS 0 to 15 for HT40MHz |
|                       |                                                                       |
| Media Access Control  | CSMA/CA with ACK                                                      |
| Modulation Techniques | <b>802.11b:</b><br>CCK, DQPSK, DBPSK                                  |
|                       | <b>802.11g:</b><br>64QAM, 16QAM, QPSK, BPSK                           |
|                       | <b>802.11n:</b><br>64QAM, 16QAM, QPSK, BPSK                           |
|                       |                                                                       |
| Network Architecture  | Ad-hoc mode (Peer-to-Peer)<br>Infrastructure mode                     |
| Operation Channel     | <b>2.4GHz</b>                                                         |
|                       | 11: (Ch. 1-11) – United States                                        |
|                       | 13: (Ch. 1-13) – Europe                                               |

|                                                                               |                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency Range</b>                                                        | <b>802.11bg</b><br>2.400 ~ 2.4835 GHz                                                                                                                                                                               |
| <b>Transmit Output Power – 2x2<br/>MAX: 16.5dBm<br/>(Tolerance: +-1.5dBm)</b> | <b>802.11b:</b><br>15dBm@1-11Mbps<br><b>802.11g:</b><br>15dBm@6-54Mbps<br><b>802.11n:</b><br><b>20MHz</b><br>13dBm@MCS0-7<br><b>40MHz</b><br>13dBm@MCS0-7                                                           |
| <b>Receive Sensitivity</b>                                                    | <b>802.11b:</b><br>-88dBm@1Mbps<br>-82dBm@11Mbps<br><b>802.11g:</b><br>-86dBm@6Mbps<br>-71dBm@54Mbps<br><b>802.11n:</b><br><b>20MHz</b><br>-86dBm@MCS0<br>-68dBm@MCS7<br><b>40MHz</b><br>-83dBm@MCS0<br>-65dBm@MCS7 |
| <b>Security</b>                                                               | WPA, WPA2, WPS, WEP 64/128, IEEE 802.11x, IEEE 802.11i                                                                                                                                                              |
| <b>Operating Voltage</b>                                                      | 3.3V ±10% I/O supply voltage                                                                                                                                                                                        |

**Power Consumption  
(Average)**

| <i>Mode</i>                   | <i>Average</i> | <i>Peak</i> |
|-------------------------------|----------------|-------------|
|                               | <b>2.4G</b>    | <b>2.4G</b> |
| <i>TX</i>                     | <i>TBD</i>     | <i>TBD</i>  |
| <i>RX</i>                     | <i>TBD</i>     |             |
| <i>Unassociated<br/>Idle</i>  | <i>TBD</i>     |             |
| <i>Standby@ wake<br/>mode</i> | <i>TBD</i>     |             |

|                     |                   |
|---------------------|-------------------|
| <b>Antenna Type</b> | 2x U.FL connector |
|---------------------|-------------------|

## RECOMMENDED OPERATION CONDITIONS

For Module

| Symbol | Rating              | Min  | Typ | Max  | Units |
|--------|---------------------|------|-----|------|-------|
| VCC    | 3.3V Supply Voltage | 2.97 | 3.3 | 3.63 | V     |

For MT7603U IC

| Symbol | Rating              | Min  | Typ | Max  | Units |
|--------|---------------------|------|-----|------|-------|
| VDD33  | 3.3V Supply Voltage | 2.97 | 3.3 | 3.63 | V     |
| VDD12  | 1.2V Supply Voltage | 1.14 | 1.2 | 1.26 | V     |
| VDD16  | 1.6V Supply Voltage | 1.34 | 1.6 | 1.76 | V     |

### DC CHARACTERISTICS

| Symbol          | Parameter           | Min   | Typ | Max  | Units |
|-----------------|---------------------|-------|-----|------|-------|
| V <sub>IL</sub> | Input Low Voltage   | -0.28 | -   | 0.6  | V     |
| V <sub>IH</sub> | Input High Voltage  | 2.0   | -   | 3.63 | V     |
| V <sub>OL</sub> | Output Low Voltage  | -0.28 | -   | 0.4  | V     |
| V <sub>OH</sub> | Output High Voltage | 2.4   | -   | 3.63 | V     |

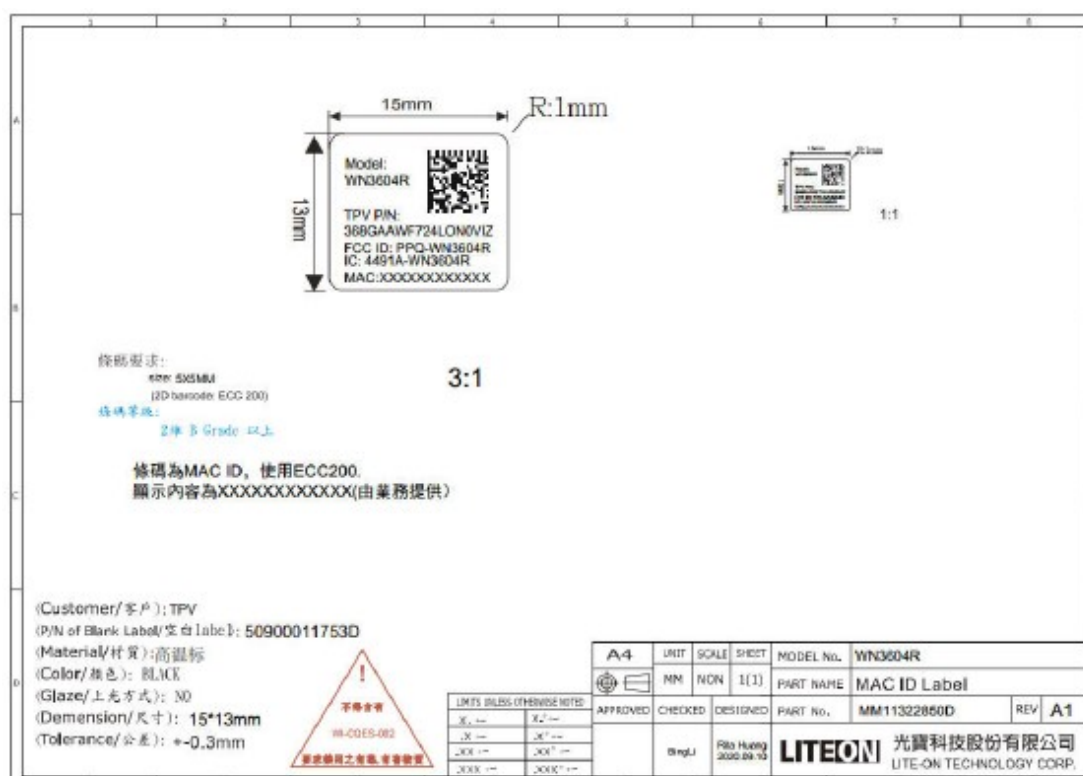
## PIN DEFINITION

| Pin. | Pin Define | Description                         | Status |
|------|------------|-------------------------------------|--------|
| 1    | WOW        | Wake up system via WiFi, low active | YES    |
| 2    | GND        | Ground                              | YES    |
| 3    | USB_D+     | USB Data+                           | YES    |
| 4    | USB_D-     | USB Data-                           | YES    |
| 5    | 3V3        | 3.3V supply input                   | YES    |
| 6    | RST_N      | System reset MT7603U, low active    | YES    |
| 7    | GND        | Ground                              | YES    |
| 8    | RF0        | WiFi_Ant0                           | YES    |
| 9    | GND        | Ground                              | YES    |
| 10   | GND        | Ground                              | YES    |
| 11   | RF1        | WiFi_Ant1                           | YES    |
| 12   | GND        | Ground                              | YES    |

## MECHANICAL

| Pin. | Pin Define | Description                         | Status |
|------|------------|-------------------------------------|--------|
| 1    | WOW        | Wake up system via WiFi, low active | YES    |
| 2    | GND        | Ground                              | YES    |
| 3    | USB_D+     | USB Data+                           | YES    |
| 4    | USB_D-     | USB Data-                           | YES    |
| 5    | 3V3        | 3.3V supply input                   | YES    |
| 6    | RST_N      | System reset MT7603U, low active    | YES    |
| 7    | GND        | Ground                              | YES    |
| 8    | RF0        | WiFi_Ant0                           | YES    |
| 9    | GND        | Ground                              | YES    |
| 10   | GND        | Ground                              | YES    |
| 11   | RF1        | WiFi_Ant1                           | YES    |
| 12   | GND        | Ground                              | YES    |

## MAC Label



## **ENVIRONMENTAL**

### **Operating**

Operating Temperature: 0 to 70 °C

Relevant Humidity: 5-90% (non-condensing)

### **Storage**

Temperature: -20 to 70 °C

Relevant Humidity: 5-95% (non-condensing)