

## 802.11ac, 2T2R Wireless LAN USB Module

# WN4521L

Version 1.2

## User's Manual

### Change History:

Revision	Date	Author	Change List
Version 1.0	2018/04/18	Bryant Chen	Preliminary
Version 1.1	2018/06/20	Ken Chang	Update MAC label and product picture Update to V02(Offset 0x06 = 21, 0x104 = E3)
Version 1.2	2018/06/29	Ken Chang	Modified Antenna type to Printed Antenna

## PRODUCT DESCRIPTION

The Wireless LAN USB Module is a sleek miniature Wireless LAN device working under 2.4/5 GHz frequency band. Compatible with IEEE standards, 802.11ac, 802.11a, 802.11b, 802.11g and support 802.11n. It provides full functional wireless access within wireless environments anytime, anywhere at a data rate of up to 866.7Mbps. WN4521L comes with an USB 3.0 interface providing the maximum transfer rate of 5Gb/s.

WN4521L embodies 2 transmitter 2 receiver (2T2R) architecture to ensure reliable and cost-effective wireless connectivity at high throughput over an extended range. Optimized RF architecture and base band algorithms provide outstanding performance with low-power consumption.

## PRODUCT FEATURES

- Operate at 2.4/5 GHz band
- 866.7Mbps PHY Rate Support
- 2T2R Modes
- 20MHz/40MHz/80MHz Bandwidths Support
- USB 3.0 supports 5Gb/s high speed
- IEEE standards support: IEEE 802.11a/b/g and 802.11n, 802.11ac
- 802.11i- WEP 64/128, AES, TKIP
- Low power with advanced Power Management
- RoHS compliance

## Product specifications

### Main chipset

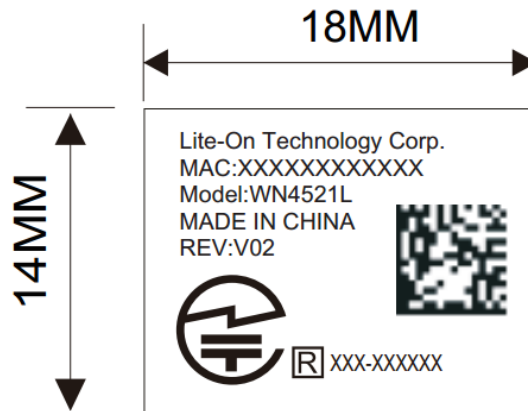
Realtek RTL8812BU

<b>Standard</b>	IEEE802.11ac; IEEE802.11a; IEEE802.11b; IEEE 802.11g; IEEE802.11n
<b>Bus Interface</b>	Universal Serial Bus (USB3.0)
<b>Data Rate</b>	802.11b: 11, 5.5, 2, 1 Mbps 802.11a / 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 15 for HT20MHz MCS 0 to 15 for HT40MHz 802.11ac: MCS 0 to 9 for HT80MHz
<b>Media Access Control</b>	CSMA/CA with ACK
<b>Radio Technology</b>	<b>802.11b:</b> CCK, DQPSK, DBPSK <b>802.11a / 802.11g:</b> BPSK, QPSK, 16 QAM, 64QAM <b>802.11n:</b> BPSK, QPSK, 16QAM, 64QAM <b>802.11ac:</b> BPSK, QPSK, 16QAM, 64QAM, 256QAM
<b>Network architecture</b>	
<b>Operating Channel</b>	<b>2.4GHz:</b> 1-13 <b>5GHz:</b> 36 – 48, 52 -64 100 – 140, 149 - 165
<b>Frequency Range</b>	<b>2.4GHz:</b> 2.412 ~ 2.472 GHz <b>5GHz:</b> 5180 ~ 5845 GHz
<b>Transmit Output Power</b>	<b>WiFi:</b> 11b: 17+/-1.5dBm(11Mbps) 11a/g: 13+/-1.5dBm(54Mbps) <b>2.4G:</b> 11n: 13+/-1.5dBm(MCS7HT20) 11n: 12+/-1.5dBm(MCS7HT40) <b>5G:</b> 11n: 12+/-2dBm(MCS7HT20) 11n: 11+/-2dBm(MCS7HT40) 11ac: 9+/-2dBm (HT80)

<b>Receiver Sensitivity</b>	<p><b>802.11b:</b> Less than -76dBm</p> <p><b>802.11g:</b> Less than -82dBm @ 6Mbps Less than -65dBm @ 54Mbps</p> <p><b>802.11n:</b> Less than -82dBm @ MCS0 Less than -64dBm @ MCS7</p> <p><b>802.11ac:</b> Less than -54dBm @ MCS9</p>
<b>Security</b>	64-bit, 128-bit WEP, TKIP, AES, WPA, WPA2, WPS IEEE 802.11i
<b>Operating Voltage</b>	5V ±5% I/O supply voltage
<b>OS supported</b>	Windows, Linux(embedded system)
<b>Antenna Type</b>	Printed Antenna
<b>Power Consumption</b>	*TBD

\*Environmental factors dependent

**MAC Label**



**Product Picture**



**ENVIRONMENTAL****Operating**

Operating Temperature: 0° c to 70° c

Relative Humidity: 5-90%

**Storage**

Temperature: -40° c to 80° c

Relevant Humidity: 5-95%

**WARNINGS****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 is restricted for indoor use.

**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.

**The module is limited to OEM installation ONLY.**

**This module is intended for OEM integrators under the following conditions:**

1. This module is restricted to installation in products for use only in mobile and fixed applications.
2. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons.
3. The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.
4. OEM integrator has be limited the operation channels in channel 1-11 for 2.4GHz band.
5. Fixed outdoor applications for point to multipoint operations are subject to the conditions in Part 15.407(a)(1)(i).

**The OEM integrator is still responsible for**

1. ensuring that the end-user has no manual instructions to remove or install module
2. the FCC compliance requirement of the end product, which integrates this module.
3. Appropriate measurements (e.g. 15 B compliance) and if applicable additional equipment authorizations (e.g. SDoc) of the host device to be addressed by the integrator/manufacturer.
4. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

We hereby acknowledge our responsibility to provide guidance to the host manufacturer in the event that they require assistance for ensuring compliance with the Part 15 Subpart B requirements.

**The user manual of the end product should include**

1. Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.
2. the restriction of operating this device in **indoor** could void the user's authority to operate the equipment.
3. This device and its antenna(s) must **not be co-located** or operating in conjunction with any other antenna or transmitter.
4. This equipment should be installed and operated with minimum distance **20cm** between the radiator & your body.
5. The FCC part 15.19 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.

**Label of the end product:**

The final end product must be labeled in a visible area with the following "Contains TX  
FCC ID: **PPQ-WN4521L**".

The end product shall bear the following 15.19 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.



**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.

the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

**IMPORTANT NOTE:****IC Radiation Exposure Statement:**

This equipment complies with IC RSS-102 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.

*Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20cm de distance entre la source de rayonnement et votre corps*

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.).

**IMPORTANT NOTE:** In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the IC authorization is no longer considered valid and the IC No. 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 IC authorization.

#### End Product Labeling

This transmitter module is authorized only for use in device 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 a visible area with the following: "Contains transmitter module IC: IC: 4491A-WN4521L".

*Contient le module d'émission IC: IC: 4491A-WN4521L*

#### IMPORTANT NOTE for OEM integrator:

This module is intended for OEM integrator.

The OEM integrator is still responsible for

1. ensuring that the end-user has no manual instructions to remove or install module
2. the ISED compliance requirement of the end product, which integrates this module.
3. Appropriate measurements and if applicable additional equipment authorizations of the host device to be addressed by the integrator/manufacturer.
4. The separate approval is required for all other operating configurations, including portable configurations and different antenna configurations

The transmitter module may not be co-located with any other transmitter or antenna.

Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

*CAN ICES-3 (B)/NMB-3(B)*

**CE Statement:**

This equipment complies with EU 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.

**NCC 警語:**

經型式認證合格之低功率射頻電機，非經許可，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻電機之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前項合法通信，指依電信法規定作業之無線電通信。低功率射頻電機須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。