

# USER MANUAL

Wireless Module

Model Name: WN4520L

	Liteon P/N	Sony P/N
Type A	AAZ100426G0	

Version 1.0

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## Change History

Revision	Date	Author	Change List
Version 1.0	2017/ 07 / 19	Kaysa Lee	Initial release

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CONTENT

1 PRODUCT OVERVIEW ..... 3

1.1 DESCRIPTION ..... 3

1.2 FEATURES ..... 3

1.3 GENERAL SPECIFICATIONS..... 3

1.4 PARTS LAYOUT..... 4

1.5 BOARD OUTLINE ..... 5

1.6 PANEL DRAWING ..... 6

1.7 PCB INFORMATION..... 7

1.8 SHIELDING..... 8

# 1 PRODUCT OVERVIEW

## 1.1 DESCRIPTION

WN4520L is a WLAN module which using Chipsets : Rockchip NanoD and Realtek RTL8821CSH

## 1.2 FEATURES

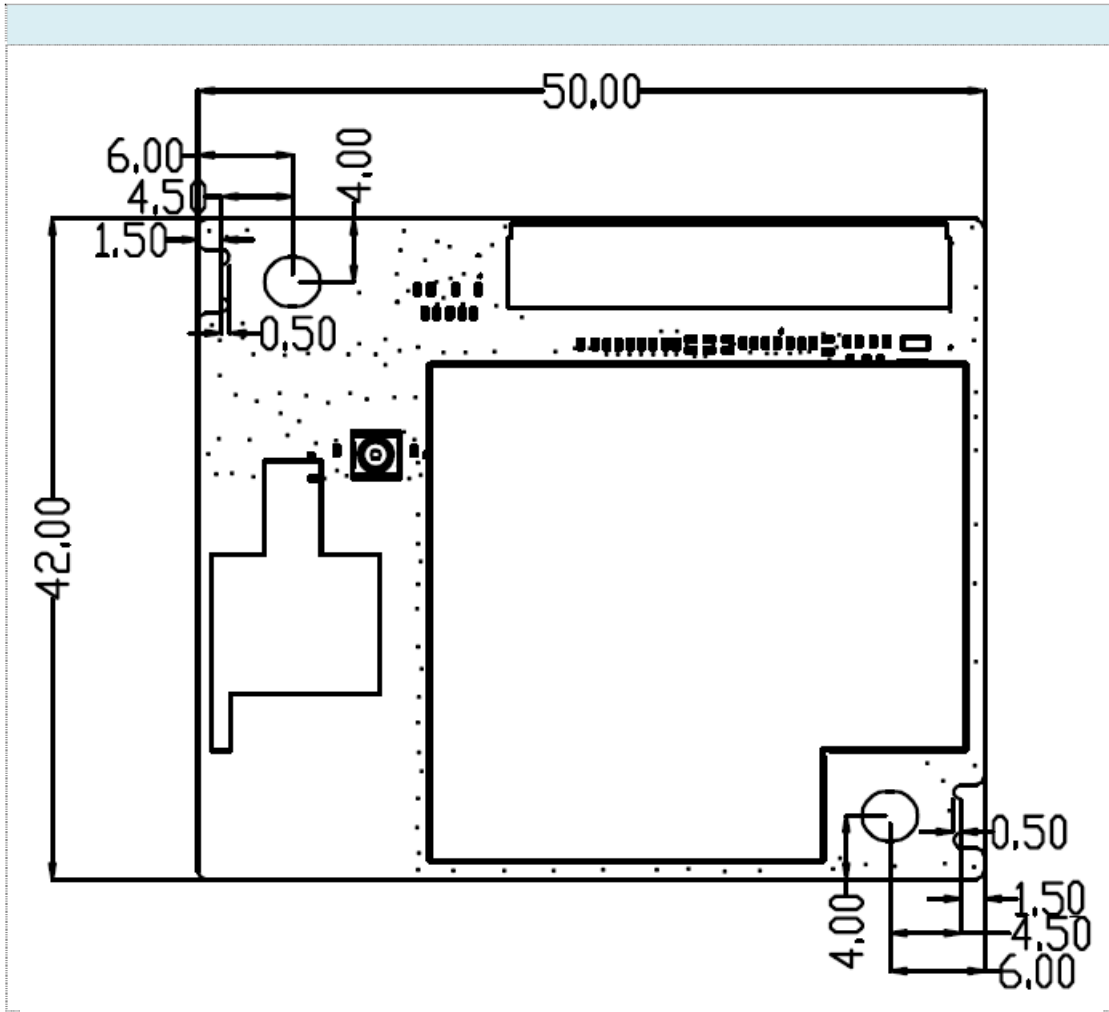
- Operate at 2.4GHz / 5GHz band
- 150Mbps PHY Rate Support
- 1T1R Mode
- 20MHz Bandwidth Support (2.4G) , 20/40MHz Bandwidth Support (5G)
- IEEE standards support: IEEE 802.11a/b/g and 802.11n
- 802.11i- WEP 64/128, AES, TKIP
- RoHS compliance
- Low Halogen compliance

## 1.3 GENERAL SPECIFICATIONS

<b>Main Chipset</b>	RTL8821CSH
<b>Standard</b>	IEEE 802.11a/b/g/n
<b>Bus Interface</b>	USB 2.0
<b>Form Factor</b>	42mm x 50mm x 3.5mm
<b>Weight</b>	8g
<b>Data Rate</b>	WiFi: 802.11b: CCK, DQPSK, DBPSK 802.11a, 802.11g: 64QAM, 16QAM, QPSK, BPSK 802.11n: 64QAM, 16QAM, QPSK, BPSK
<b>Frequency Range</b>	2.400 ~ 2.4835 GHz 5.150 ~ 5.85GHz
<b>Transmit Output Power</b>	WiFi: 11b: 13 +/- 1.5dBm (11Mbps) 11g: 13 +/- 1.5dBm (54Mbps) 11n: 13 +/- 1.5dBm (MCS7 HT20) 11a: 13 +/- 1.5dBm (54Mbps) , *5.8GHz = 13 +/- 1.5dBm 11an: 13 +/- 1.5dBm (MCS7 HT20/40) , *5.8GHz = 13 +/- 1.5dBm
<b>Receive Sensitivity</b>	WiFi: 11b @ 11Mbps: (Max.) : -85dBm , (Typical) : -89dBm (PER<8%) 11g @ 54Mbps: (Max.) : -69dBm , (Typical) : -75.5dBm (PER<10%) 11n @ MCS7 (2.4g HT20): (Max.) : -67dBm , (Typical) : -73dBm (PER<10%) 11n @ MCS7 (5g HT20): (Max.) : -67dBm , (Typical) : -71dBm (PER<10%) 11n @ MCS7 (5g HT40): (Max.) : -64dBm , (Typical) : -68.5dBm (PER<10%)
<b>Temperature &amp; Humidity</b>	Normal Test Condition: 25 +/- 2deg.C , 65 +/- 2% RH Operating: -10 to 70 deg.C Storage: -40 to 85 deg.C
<b>Operating Voltage</b>	4V ±10% I/O supply voltage

<b>Current Consumption</b>	TBD
<b>Antenna Type</b>	Printed Antenna: 2.4G: 2.5dBi (max peak gain) 5G: 3.5dBi (max peak gain)

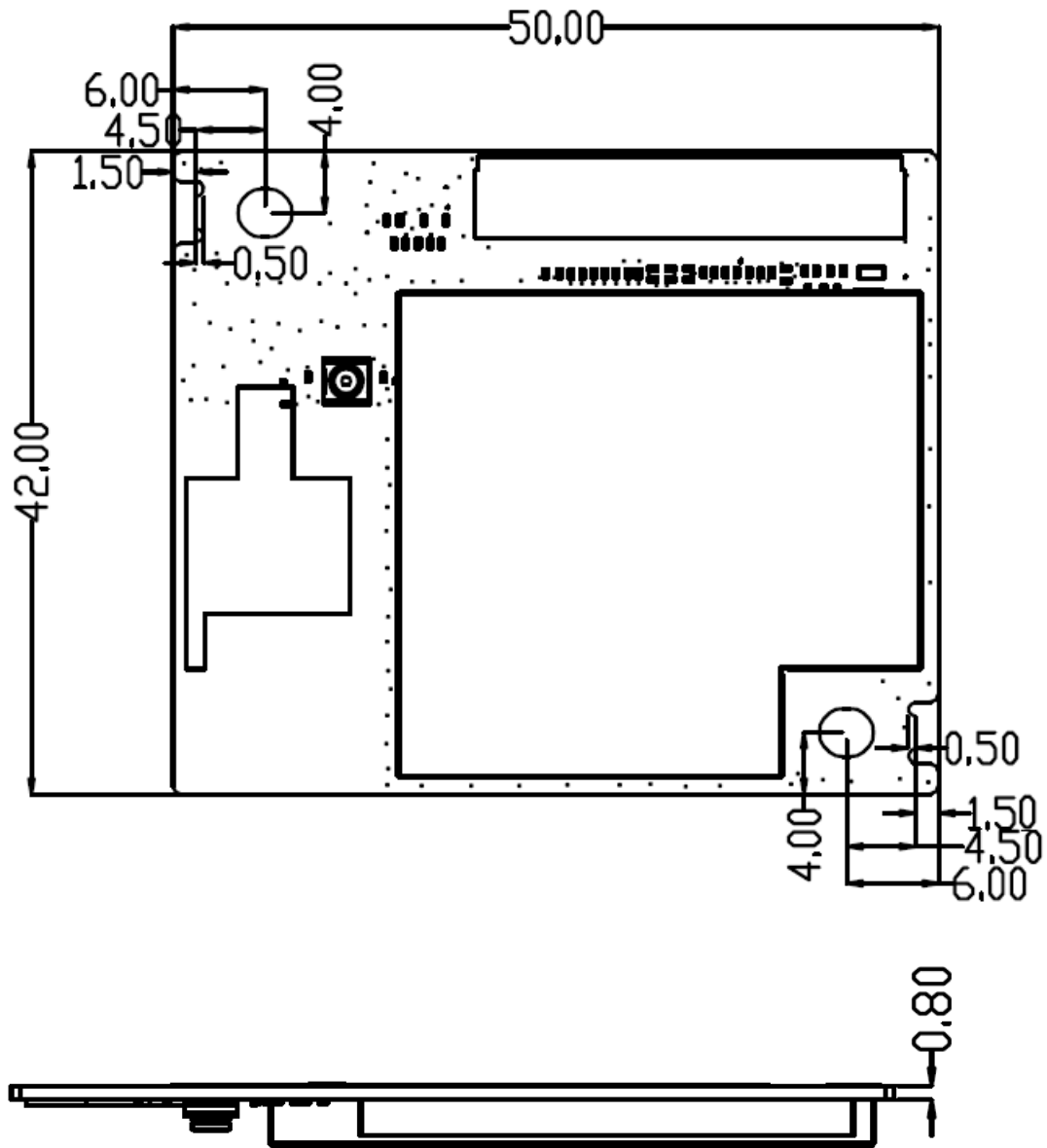
**1.4 PARTS LAYOUT**



unit : mm

All dimension tolerances are +/- 0.2 mm, unless otherwise specified.

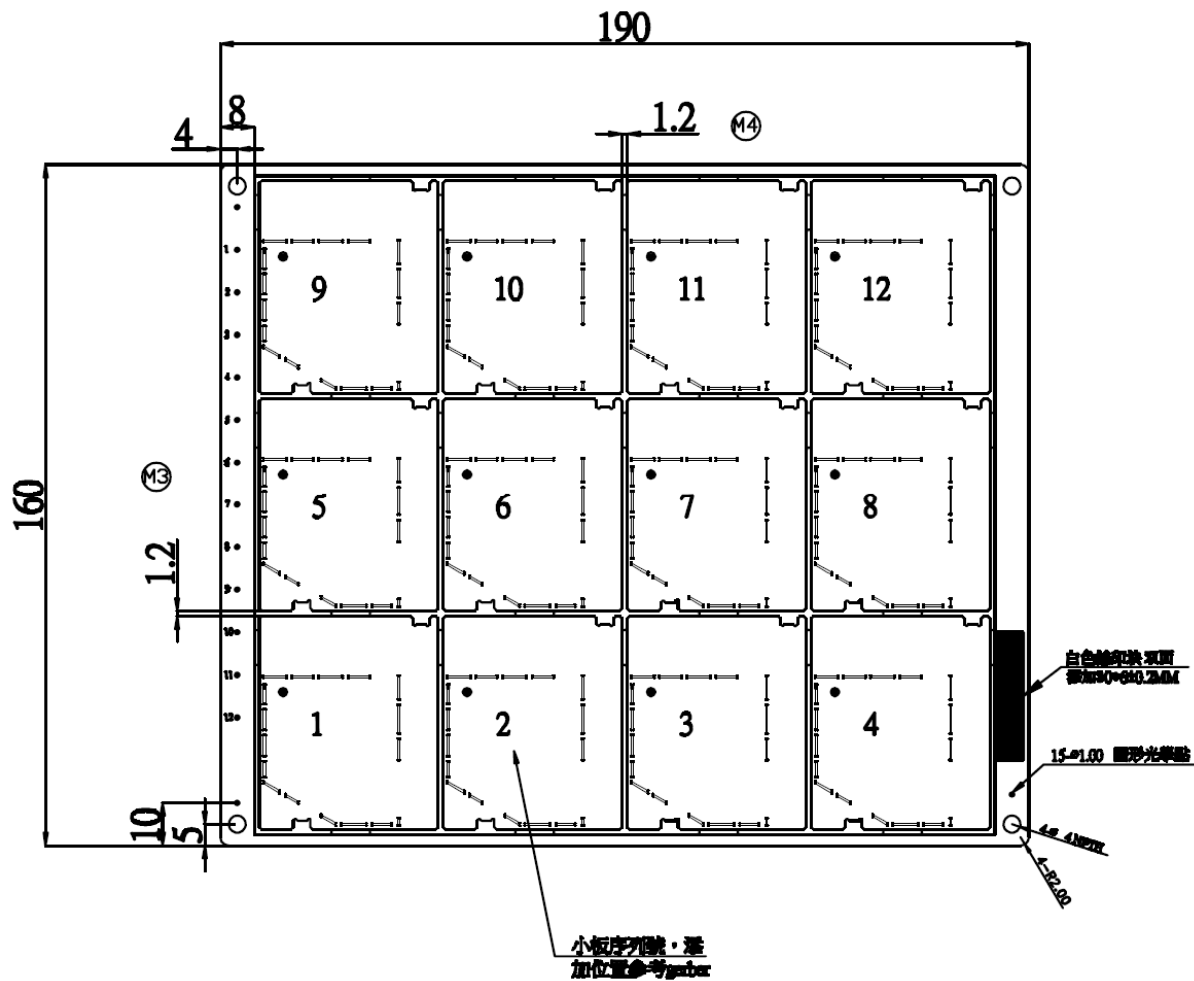
1.5 BOARD OUTLINE



unit : mm

All dimension tolerances without specification are +/- 0.2 mm, except routing area +/- 0.25mm.

1.6 PANEL DRAWING



NOTE: EXCEPT OTHER SPECIFIED

1. THICKNESS OF PCB:  $0.8 \pm 0.08\text{mm}$

2. TOLERANCE:  $\pm 0.1\text{mm}$ ; OUTLINE TOLERANCE:  $\pm 0.1\text{mm}$

3. NPTH HOLE:  $\pm 0.05\text{mm}$ ; PTH HOLE  $\pm 0.075\text{mm}$

4. MARKED (M) IS THE CRITICAL DIMENSION

5. 白漆要求: 白色絲印應平整, 無沙眼, 不可有斷痕,

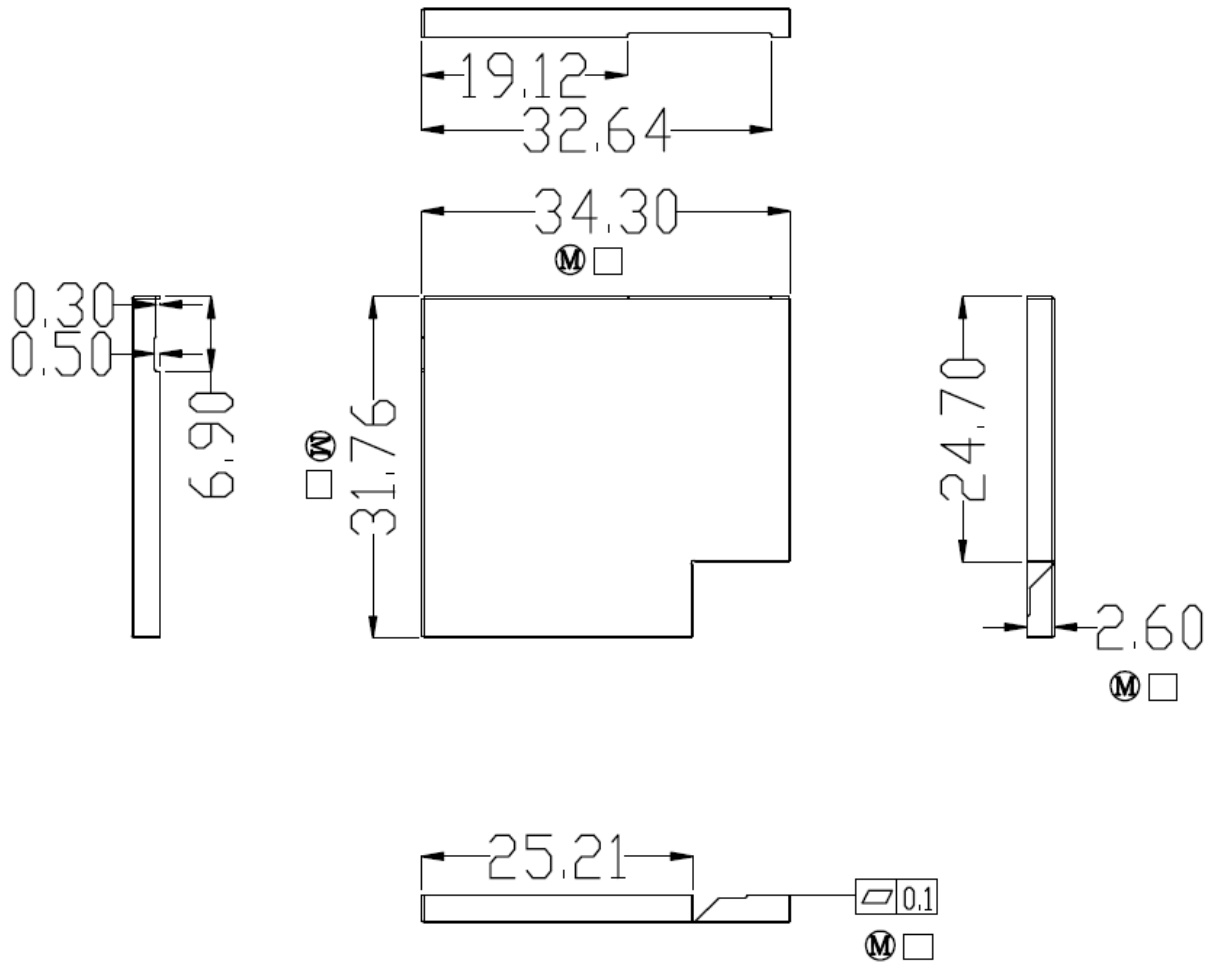
不可有電測針眼, 厚度:  $1\text{mil} \begin{smallmatrix} +0.15\text{mil} \\ -0 \end{smallmatrix}$ 。

DEG DIM	A	B	C	D	ANGLE
0-5	$\pm 0.02$	$\pm 0.05$	$\pm 0.10$		$0^\circ - 30^\circ \pm 0.1^\circ$
5-10	$\pm 0.05$	$\pm 0.10$	$\pm 0.15$		$31^\circ - 60^\circ \pm 0.3^\circ$
10-50	$\pm 0.10$	$\pm 0.15$	$\pm 0.20$		$61^\circ - 90^\circ \pm 0.5^\circ$
50-100	$\pm 0.15$	$\pm 0.20$	$\pm 0.25$		
100	$\pm 0.15\%$	$\pm 0.20\%$	$\pm 0.25\%$		

**1.7 PCB INFORMATION**

<b>No.</b>	<b>Item</b>	<b>Vendor #1</b>	<b>Vendor #2</b>
1	PWB Supplier	APCB	PIOTEK
2	ID Mark		
3	PWB Supplier UL File No.		
4	PWB Material Supplier		
5	PWB Material		
6	PWB Material Supplier UL File No.		
7	Flame Class		
8	Rated Temperature (Max Operation Temp.)		

**1.8 SHIELDING**



**NOTE:**

1. THICKNESS OF MATERIAL :Material: C7521 T=0.15MM
2. MARKED □ IS CONTROL DIMENSIONS AND CTF ITEMS
3. MARKED (M) IS THE CRITICAL DIMENSION
4. tolerance level: B

DIM	DEG				ANGLE
	A	B	C	D	
0-5	±0.05	±0.05	±0.10		0°-30° ±0.1°
5-10	±0.05	±0.10	±0.15		31°-60° ±0.3°
10-50	±0.10	±0.10	±0.20		61°-90° ±0.5°
50-100	±0.15	±0.20	±0.25		
100-	±0.15%	±0.20%	±0.25%		



## FCC WARNING STATEMENT

### FEDERAL COMMUNICATIONS 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 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.

### CAUTION:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the 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.

**RF exposure warning** This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment must be installed and operated in accordance with provided instructions and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This device is restricted to indoor use.

This device is slave equipment, the device is not radar detection and not ad-hoc operation in



## End Product Labeling

The final end product must be labeled in a visible area with the following: "Contains FCC ID: PPQ-WN4520L "

### **IMPORTANT NOTE:**

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 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. Verification, Doc) of the host device to be addressed by the integrator/manufacture.
4. The separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and different antenna configurations

### **USERS MANUAL OF THE END PRODUCT:**

The module is limited to installation in mobile or fixed applications

In the users manual of the end product, the end user has to be informed to keep at least 20cm 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 the palm of the hand, then additional FCC part 15.19 statement is required to be available in the users 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.

**IC WARNING STATEMENT****Canada, avis d'Industry Canada (IC)**

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

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

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This device is restricted to indoor use.

**High Power Radars:** High power radars are allocated as primary users (meaning they have priority) in the 5250MHz to 5350MHz and 5650MHz to 5850MHz bands. These radars could cause interference and/or damage to Wireless LAN devices used in Canada.

*Les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250 - 5350 MHz et 5650 - 5850 MHz. Ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.*

**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: 4491A-WN4520L”.

Contient le module d'émission IC: 4491A-WN4520L

This radio transmitter (4491A-WN4520L) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Ant.	Brand	Model	Type	Gain(dBi)	
				2.4G	5G
1	LI-TEON	WN4520L	Printed Antenna	2.5	3.5

Le présent émetteur radio (4491A-WN4520L) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal et l'impédance requise pour chaque type d'antenne. Les types d'antenne non inclus dans cette liste, ou dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Ant.	Brand	Model	Type	Gain(dBi)	
				2.4G	5G
1	LI-TEON	WN4520L	Printed Antenna	2.5	3.5

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.

**Radio Frequency (RF) Exposure Information**

The radiated output power of the Wireless Device is below the Industry Canada (IC) radio frequency exposure limits. The Wireless Device should be used in such a manner such that the potential for human contact during normal operation is minimized.

This device has also been evaluated and shown compliant with the IC RF Exposure limits under mobile exposure conditions. (antennas are greater than 20cm from a person's body).

**Informations concernant l'exposition aux fréquences radio (RF)**

La puissance de sortie émise par l'appareil de sans fil est inférieure à la limite d'exposition aux fréquences radio d'Industry Canada (IC). Utilisez l'appareil de sans fil de façon à minimiser les contacts humains lors du fonctionnement normal.

**Ce périphérique a également été évalué et démontré conforme aux limites d'exposition aux RF d'IC dans des conditions d'exposition à des appareils mobiles (les antennes se situent à moins de 20 cm du corps d'une personne).**

**Japan Statement:**

5GHz product for indoor use only.

この製品は屋内においてのみ使用可能です

**CE Statement:****Compliance with 2014/53/EU Radio Equipment Directive (RED)**

In accordance with Article 10.8(a) and 10.8(b) of the RED, the following table provides information on the frequency bands used and the maximum RF transmit power of the product for sale in the EU:

Frequency range (MHz)	Max. Transmit Power (dBm/mW)
2400-2483.5	dBm
5150-5250	dBm
5250-5350	dBm
5470-5725	dBm

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.

The device is restricted to indoor use only.

	AT	BE	BG	HR	CY	CZ	DK
	EE	FI	FR	DE	EL	HU	IE
	IT	LV	LT	LU	MT	NL	PL
	PT	RO	SK	SI	ES	SE	UK

**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。

無線資訊傳輸設備必須具備安全功能，以保護未經授權之一方任意更改軟體進而避免發射機操作於非經認證之頻率、輸出功率、調變形式或其他射頻參數設定。

無線資訊傳輸設備避免影響附近雷達系統之操作。