

5GHz IEEE802.11a/n 2T2R 300Mbps High Performance



Package Contents

1 x MiniPCI Adapter (EMP5605H (ALVARION))

Alvarion miniPCI series radio modules perform extreme high power and economize the power consumption on the system platform. **EMP5605H (ALVARION)** is an 802.11a/n WiFi 2x2 mini-PCI module designed specifically for integration to maximum performance ratio. EMP5605H (ALVARION) delivers the ultimate wireless triple play experience for video, voice, and data transmission in the home, for the business, and on the road.

With enhanced features on the ESD protection, industrial-based operating temperature, economized system power consumption, industrial-best sensitivity than normal module, MMCX connectors, and stable heating protection design, makes the module is easily to integrate into a wide range of any platform.

Features

Industrial-best sensitivity -90dBm@6Mbps, -72dBm@54Mbps, -89dBm@MCS0/MCS8, -70dBm@MCS7/MCS15

Supports IEEE 802.11a/802.11n Compatible among multiple wifi networks

Enables bandwidth up to 300Mbps Fast throughput for 802.11a and 802.11n

2T2R design architecture Higher and greater reliable throughputs over range

MMCX antenna connector Two MMCX connectors

Specification

Hardware Specification

Standard	WECA(WiFi & WiFi5 Compliance), IEEE802.11a/n, RoHS		
Chipset	Atheros AR9220		
Physical Interface	32-bit Mini-PCI Type III A 2 x MMCX Connector		
Power Requirements	External DC power in supported, Voltage=5V		
Current Consumption Information	Tx Current Consumption	Continuous Tx@802.11a	<1.7A
		Continuous Tx@802.11n	<2A

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	Rx Current Consumption	Continuous Rx	<600mA
	Card on Current	Data Communicating with AP	<450mA
	Sleep Current	Sleep Mode	<100mA

RF Specification

Frequency Band	802.11a 5.15 ~ 5.35GHz, 5.47 ~ 5.725GHz, 5.725~5.825GHz		
Data rate	300 Mbps		
Receive Sensitivity (Typical)	802.11n(20MHz) -89dBm @ MCS0/MCS8 -70dBm @ MCS7/MCS15	802.11n(40MHz) -86dBm @ MCS0/MCS8 -68dBm @ MCS7/MCS15	802.11a -90dBm @ 6Mbps -72dBm @ 54Mbps
Available transmit power (with external 5V power)	802.11n (± 2dBm) 26dBm @ MCS0~1/MCS8~9 25dBm @ MCS2~3/MCS10~11 24dBm @ MCS4/MCS12 23dBm @ MCS5/MCS13 23dBm @ MCS6/MCS14 21dBm @ MCS7/MCS15	802.11a(± 2dBm) 26dBm @ 6~24Mbps 25dBm @ 36Mbps 24dBm @ 48Mbps 23dBm @ 54Mbps	

Software Specification

Security	WPA, WPA2, 64/128 bits WEP, TKIP and AES Hardware-base IEEE 802.11i encryption engine
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Environment & Mechanical

Temperature Range	-30°C to 80°C
Humidity (non-condensing)	0%~95% typical
Dimensions	66mm (L) x 59.5mm (W) x 5mm (H)
Weight	16g

Federal Communication Commission Interference 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.

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 transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

For operation within 5.15 ~ 5.25GHz / 5.47 ~5.725GHz frequency range, it is restricted to indoor environment. The band from 5600-5650MHz will be disabled by the software during the manufacturing and cannot be changed by the end user. This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

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 **165cm** between the radiator & your body.

This device is intended only for OEM integrators under the following conditions:

- 1) Due to the facts that this module has high built-in output power and with a high gain direction antenna, the module can be used in a professional installed end product only. The final product must be professional installed to make sure that 165 cm can be maintained between the antenna and users, and
- 2) The professional installer shall make sure that the all antennas are fully exposure to the outside radar signal(s) source with no obstruction in between them for proper DFS operation. Also, if extra length of cable is needed for the antenna installation then a proper amplifier must be added to the path for compensating the cable loss. Otherwise the DFS detection sensitivity will be impaired. The improper installation of the antenna may reduce the antenna sensitivity and invalidated the certification.
- 3) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

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 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.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that **165cm** may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains FCC ID: **LKT-BULTRA-5**". The grantee's FCC ID can be used only

when all FCC compliance requirements are met.

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.

The end user manual shall include all required regulatory information/warning as show in this manual.

Industry Canada statement:

This device complies with RSS-210 of the Industry Canada 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.

Ce dispositif est conforme à la norme CNR-210 d'Industrie Canada applicable aux appareils radio exempts de licence. Son fonctionnement est sujet aux deux conditions suivantes: (1) le dispositif ne doit pas produire de brouillage préjudiciable, et (2) ce dispositif doit accepter tout brouillage reçu, y compris un brouillage susceptible de provoquer un fonctionnement indésirable.

Radiation Exposure Statement:

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance **165cm** between the radiator & your body.

Déclaration d'exposition aux radiations:

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 **165cm** de distance entre la source de rayonnement et votre corps.

**This device is intended only for OEM integrators under the following conditions:
(For module device use)**

- 1) Due to the facts that this module has high built-in output power and with a high gain direction antenna, the module can be used in a professional installed end product only. The final product must be professional installed to make sure that 165 cm can be maintained between the antenna and users, and
- 2) The professional installer shall make sure that the all antennas are fully exposure to the outside radar signal(s) source with no obstruction in between them for proper DFS operation. Also, if extra length of cable is needed for the antenna installation then a proper amplifier must be added to the path for compensating the cable loss. Otherwise the DFS detection sensitivity will be impaired. The improper installation of the antenna may reduce the antenna sensitivity and invalidated the certification.
- 3) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 3 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed

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 Canada authorization is no longer considered valid and the 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 Canada authorization.

NOTE IMPORTANTE:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 165cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC: 2514A-BULTRA5".

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 165cm 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: 2514A-BULTRA5".

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.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Caution :

(i) 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;

(ii) the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall comply with the e.i.r.p. limit; and

(iii) the maximum antenna gain permitted for devices in the band 5725-5825 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

(iv) Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Avertissement:

Le guide d'utilisation des dispositifs pour réseaux locaux doit inclure des instructions précises sur les restrictions susmentionnées, notamment :

(i) les dispositifs fonctionnant dans la bande 5 150-5 250 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;

(ii) le gain maximal d'antenne permis pour les dispositifs utilisant les bandes 5 250-5 350 MHz et 5 470-5 725 MHz doit se conformer à la limite de p.i.r.e.;

(iii) le gain maximal d'antenne permis (pour les dispositifs utilisant la bande 5 725-5 825 MHz) doit se conformer à la limite de p.i.r.e. spécifiée pour l'exploitation point à point et non point à point, selon le cas.

(iv) De plus, les utilisateurs devraient aussi être avisés que les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5 250-5 350 MHz et 5 650-5 850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

Professional installation instruction

1. Installation personal

This product is designed for specific application and needs to be installed by a qualified personal who has RF and related rule knowledge. The general user shall not attempt to install or change the setting.

2. Installation location

The product shall be installed at a location where the radiating antenna can be kept **165cm** from nearby person in normal operation condition to meet regulatory RF exposure requirement.

3. External antenna

Use only the antennas which have been approved by the applicant. The non-approved antenna(s) may produce unwanted spurious or excessive RF transmitting power which may lead to the violation of **FCC/IC** limit and is prohibited.

4. Installation procedure

Please refer to user's manual for the detail.

5. Warning

Please carefully select the installation position and make sure that the final output power does not exceed the limit set force in relevant rules. The violation of the rule could lead to serious federal penalty.

Instructions d'installation professionnelle

1. Installation

Ce produit est destiné à un usage spécifique et doit être installé par un

personnel qualifié maîtrisant les radiofréquences et les règles s'y rapportant. L'installation et les réglages ne doivent pas être modifiés par l'utilisateur final.

2. Emplacement d'installation

En usage normal, afin de respecter les exigences réglementaires concernant l'exposition aux radiofréquences, ce produit doit être installé de façon à respecter une distance de **165cm** entre l'antenne émettrice et les personnes.

3. Antenne externe.

Utiliser uniquement les antennes approuvées par le fabricant. L'utilisation d'autres antennes peut conduire à un niveau de rayonnement essentiel ou non essentiel dépassant les niveaux limites définis par **FCC/IC**, ce qui est interdit.

4. Procédure d'installation

Consulter le manuel d'utilisation.

5. Avertissement

Choisir avec soin la position d'installation et s'assurer que la puissance de sortie ne dépasse pas les limites en vigueur. La violation de cette règle peut conduire à de sérieuses pénalités fédérales.