

Dual Band 2.4/5GHz 2x2 802.11ac Wave 1 MiniPCle WiFi Module Designed for Dual Band Wireless Access Points

Model: WLE600VX



KEY FEATURES

- Qualcomm Atheros QCA9880
- 2.4GHz, 2x2 MIMO OFDM Technology, up to 400Mbps physical data rate
- 5GHz, 2x2 MIMO OFDM Technology, up to 866.7Mbps physical data rate
- Dual Band 2.4/5GHz 2x2 WiFi 5 (802.11ac Wave 1)
- MiniPCle interface with PCIe 1.1
- IEEE 802.11ac compliant & backward compatible with 802.11a/b/g/n
- Supports Spatial Multiplexing, Low-Density Parity Check (LDPC) Codes, Maximal Ratio Combining (MRC), Space Time Block Code (STBC)
- Supports IEEE 802.11d, e, h, i, k, r, v time stamp, and w standards
- Supports Dynamic Frequency Selection (DFS)
- Cards are individually calibrated for Quality Assurance

Specifications

Chipset	Qualcomm Atheros QCA9880 'Peregrine' Series
Reference Design	Qualcomm Atheros XB140
Host Interface	MiniPCle interface with PCIe 1.1
Operating Voltage	3.3V
Power Consumption	3.5W (Max)
Wireless	2.4GHz 802.11b/g/n 5GHz 802.11a/n/ac 2x U.FL Connectors
Frequency Range	2.412~2.472GHz, 5.150~5.825GHz, selectable dual band
Modulation Techniques	OFDM: BPSK, QPSK, DBPSK, DQPSK, 16-QAM, 64-QAM, 256-QAM
Channel Spectrum Widths for WLAN	Supports 20/40MHz at 2.4GHz, Supports 20/40/80MHz at 5GHz
ESD Sensitivity	Class 1C
Supported Operating System	Supported by CompexWRT with Qualcomm Atheros reference wireless drivers or OpenWRT/LEDE with ath10k wireless drivers, on WPJ344, WPJ558, WPJ563, WPJ564, WPQ864, and WPQ865.
Certification	FCC, CE Certified, REACH and RoHS Compliance
Environmental Temperature	Operating: -20°C to 70°C, Storage: -40°C to 90°C
Environmental Humidity, Non-Condensing	Operating: 5% to 95%, Storage: Max. 90%
Dimensions (W x H x D) in mm	29.85 x 50.8 x 3.2

*Configurations are subject to change without notifications.

U.FL connectors

CHI

CHO

Model: WLE600VX 7AA

MAC: 04F0214FB2D1
S/N: 28312251
FCC ID: TK4WLE600VX

MiniPCle Edge Connector

Technical drawings of the 100-pin Mini PCI Express connector showing dimensions in millimeters (mm).

Top View Dimensions:

- Overall width: 29.85 ± 0.15
- Width of mounting holes area: 24.20 ± 0.10
- Overall height: 50.80 ± 0.15
- Width of pin header: 25.80 ± 0.15
- Mounting hole diameter: $\phi 2.50 \pm 0.10$

Side View Dimensions:

- Height of top flange: 1.00 ± 0.1
- Height of main body: 1.3 ± 0.20
- Height of bottom flange: 2.20 ± 0.20

Front View: Shows the 100-pin header and the mounting holes.

Perspective View: Shows the connector from an angled perspective.

All dimensions are in mm.

Ordering Configuration

Item Code	Model	Description
WLE600VX 7AA000S	WLE600VX	2x2 802.11a/b/g/n/ac 2.4GHz/5GHz miniPCle card

Compliance Information

FCC Compliance 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 device must accept any interference received, including interference that may cause undesired operation. Product that is a radio transmitter is labeled with FCC ID.

FCC Caution:

- (1) Exposure to Radio Frequency Radiation. This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be collocated 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.
- (2) Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.
- (3) This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- (4) Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user authority to operate the equipment.

RF exposure warning

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

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

IMPORTANT NOTE: In the event that these conditions cannot 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 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 FCC authorization.

The antenna gain which being use as below:

Antenna Type	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Omni Antenna	Smart Ant Inc	2	2.4GHz: 4.5, 5GHz: 7.0

The modular transmitter is only FCC authorized for the specific rule parts (15.247 and 15.407) listed on the grant, and that the product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

OEM integration instructions:

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

The module is only limited to installation in mobile applications. The antenna must be installed such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmit or antenna. The module shall be only used with the integral antenna(s) that has been originally tested and certified with this module.

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 requirement with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

OEM integration instructions:

In the event that these conditions cannot be met (for example certain laptop configuration or co-location with another transmitter), then the FCC authorization for this module in combination with the host equipment is no longer considered valid and the FCC ID of the module cannot be used on the final product. In these and circumstance, 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 authorization 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 FCC ID: TK4WLE600VX or Contains FCC ID: TK4WLE600VX"

Information that must be placed in the end user manual:

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.

IC Radiation Exposure Statement for Canada

This device complies with Industry Canada licence-exempt RSS standard(s). 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.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

User manuals for transmitters equipped with detachable antennas shall also contain the following notice in a conspicuous location:

This radio transmitter (identify the device by certification number, or model number if Category II) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain and required antenna impedance for each antenna type 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.

Le présent émetteur radio (identifier le dispositif par son numéro de certification ou son numéro de modèle s'il fait partie du matériel de catégorie I) 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.

IMPORTANT NOTE:

Radiation Exposure Statement:

This equipment complies with "Industry Canada RSS-102 for radiation exposure limits set forth for an uncontrolled environment".

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

The user manual for local area network devices shall contain instructions related to the restrictions mentioned in the above sections, namely that:

- (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) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;
- (iii) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and
- (iv) the worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth shall be clearly indicated.

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.

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

- (I) l'appareil pour fonctionner dans la bande 5150-5250 MHz est réservé à une utilisation intérieure pour réduire le potentiel d'interférences nuisibles à la co-canal avec les systèmes mobiles par satellite;
- (li) pour les appareils avec antenne (s) détachable, le gain d'antenne maximal autorisé pour les appareils à les bandes 5250-5350 MHz et 5470-5725 MHz doivent être tels que les équipements encore conforme à la e.i.r.p. limiter;
- (lii) pour les appareils avec antenne (s) détachable, le gain d'antenne maximal autorisé pour les appareils à la bande 5725-5850 MHz doit être telle que l'équipement satisfait encore la pire limites spécifiées pour le point-à-point et non point-à-point de l'opération, le cas échéant; et
- (Iv) l'angle d'inclinaison du pire (s) nécessaire pour rester conforme à la pire masque d'élévation condition énoncée doit être clairement indiqué.

Devraient également être informés les utilisateurs que les radars à haute puissance sont désignés comme utilisateurs principaux (c. priorité utilisateurs) des bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient provoquer interférences et / ou endommager les appareils LE-LAN.

OEM integration instructions:

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

The module is only limited to installation in mobile applications. The antenna must be installed such that 20 cm is maintained between the antenna and users, and the transmitter module may not be co-located with any other transmit or antenna. The module shall be only used with the integral antenna(s) that has been originally tested and certified with this module.

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 requirement with this module installed (for example, digital device emission, PC peripheral requirements, etc.)

OEM integration instructions:

In the event that these conditions cannot be met (for example certain laptop configuration or co-location with another transmitter), then the ISED authorization for this module in combination with the host equipment is no longer considered valid and the IC of the module cannot be used on the final product. In these and circumstance, the OEM integrator will be responsible for re-evaluating. The end product (including the transmitter) and obtaining a separate ISED authorization

End product labeling:

This transmitter module is authorization only for use in device where the antenna may be installed such that 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: 7849A-WLE600VX or Contains IC: 7849A-WLE600VX”

Information that must be placed in the end user manual:

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.

The antenna information:

Antenna Type	Manufacturer	Tx Paths	Max Directional Gain (dBi)
Omni Antenna	Smart Ant Inc	2	2.4GHz: 4.5, 5GHz: 7.0

Instructions d'intégration OEM:

Ce dispositif n'est destiné qu'aux intégrateurs OEM dans les conditions suivantes:

Le module est seulement limité à l'installation dans des applications mobiles. L'antenne doit être installée de telle sorte que 20 cm soient maintenus entre l'antenne et les utilisateurs, et que le module émetteur ne puisse être co-localisé avec aucune autre antenne ou antenne d'émission. Le module ne doit être utilisé qu'avec la ou les antennes intégrales qui ont été testées et certifiées à l'origine avec ce module.

Tant que les trois conditions ci-dessus sont remplies, aucun autre essai de l'émetteur ne sera nécessaire.

Cependant, l'intégrateur OEM est toujours responsable des tests de son produit final pour toute exigence supplémentaire de conformité avec ce module installé (par exemple, émission de périphériques numériques, exigences de périphériques PC, etc.).

Instructions d'intégration OEM:

Si ces conditions ne peuvent pas être remplies (par exemple certaines configurations d'ordinateurs portables ou la co-location avec un autre émetteur), l'autorisation ISDE ce module en combinaison avec l'équipement hôte n'est plus considérée comme valide et le ci du module ne peut pas être utilisé sur le produit final. Dans ces conditions, l'intégrateur OEM sera responsable de la réévaluation. Le produit final (y compris l'émetteur) et l'obtention d'une autorisation séparée

Étiquetage du produit fini:

Ce module émetteur n'est autorisé que pour l'utilisation dans un dispositif où l'antenne peut être installée de telle sorte que cm puisse être maintenu entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans une zone visible avec les indications suivantes:

"Contient le Module émetteur IC: 7849A-WLE600VX ou contient le Module émetteur IC: 7849A-WLE600VX"

Informations devant figurer dans le manuel de l'utilisateur final:

L'intégrateur OEM doit être conscient de ne pas fournir à l'utilisateur final des informations sur l'installation ou la suppression de 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/mises en garde réglementaires requises comme indiqué dans le présent manuel.