

User Manual

Introduction

WLM200N5-23ESD MiniPCI wireless network adapter provides up to 200mW output power with electrostatic discharged (ESD) protection. WLM200N5-23ESD provides leading 802.11a/n performance, supporting up to 300Mbps physical data rates and about 200Mbps of actual user throughput on both the uplink and downlink. Adding Compex WLM 11n series mini-pci wireless network adapter to your device will greatly improve the network performance and achieve higher efficiency of everyday activities such as file transfers, Internet browsing, and media streaming. Built on Atheros chipset, it can be used with all draft IEEE 802.11n compatible WLANs, and is ideally suited to be integrated into a wide range of OEM devices.

WLE200N5-23ESD is provides leading 802.11a/n performance. Main chip is AR9280 of Atheros. Also it's 2x2 802.11N Single-band MIMO miniPCIE

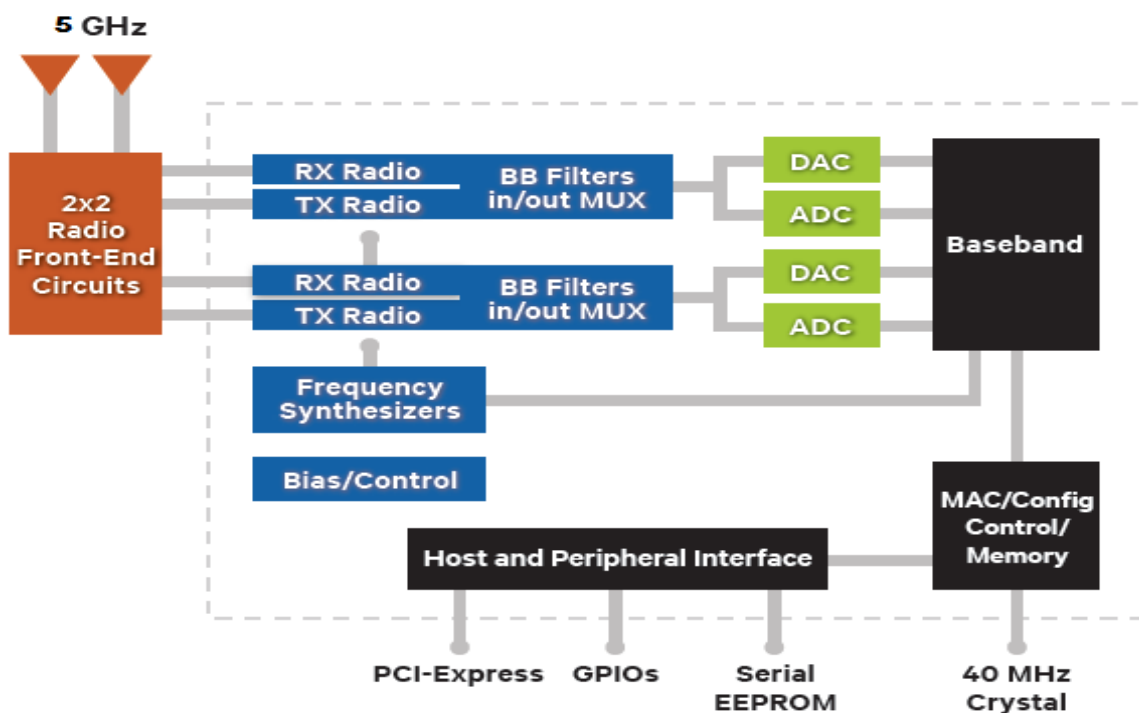
Hardware Configuration

1. Main Chipset Information

ITEM	Vendor	Part Number
IEEE802.11a/n mac/baseband/radio	Atheros	AR9280

2. Circuit block configuration

WLE200N5-23 block diagram



Operational Description

WLE200N5-23 is connected to a communication controller role for users who use the wireless devices, also this module is a device that satisfies the specifications of the 802.11a / n.

-Features

- Atheros XSPAN family chipset
- 5 GHz IEEE 802.11n compliant and backward compatible with 802.11a
- 5 GHz single-band MIMO 2 x 2 spatial multiplexing technique
- Built-in ESD Protection with ESD/EMP Immunity Threshold:15KeV
- Supports up to 300 Mbps physical data rates
- Delivers 10 times the throughput and nearly twice the range of legacy 802.11a network
- Transmission Power Control (IEEE 802.11h TPC)
- Multi-Country Roaming Supported (IEEE802.11d Global Harmonization Standard)

WLM200N5-23ESD integrates an Atheros AR9280 chipset to create RF energy. The Atheros AR9280 is an all CMOS, single chip solution for dual-band, multi-mode, IEEE 802.11a/n WLANs. It integrates a 5GHz radio, analog-to-digital and digital-to-analog (ADC/DAC) converters, a baseband processor and multi-protocol media access control.

For the AR9280's transmitter, it combines baseband in-phase(I) and quadrature (Q) signals, converts them to the desired frequency, and drives the RF signal off-chip. This RF signal is again filtered by a low pass filter, before sending into a power amplifier chipset, which amplifies the RF signal. For the AR9280's receiver, it uses an integrated dual conversion architecture and requires no off-chip intermediate frequency (IF) filters.

Users manual of the end product:

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 IC 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. IC statement is required to be available in the users manual: This Class B digital apparatus complies with Canadian ICES-003.

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.

To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the

details of how the module is integrated with the host, the grantee (the party responsible for the module grant) shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

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.

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 20cm between the radiator & your body.

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

Operations in the 5.15-5.25GHz / 5.725-5.850 GHz band are restricted to indoor usage only.

This device meets all the other requirements specified in Part 15E, Section 15.407 of the FCC Rules.

Separate approval is required for all other operating configuration, including portable configurations with respect to Part 2.1093 and different antenna configurations.

FCC Modular approval configuration control

Control of the end product into which the module will be installed must be maintained such that full compliance of the end product is always ensured. The modular transmitter must comply with any specific rule or operating requirements applicable to the transmitter and the manufacturer must provide adequate instructions along with the module to explain any such requirements.

It is the responsibility of the OEM or module level customer to install the master device in accordance with the guidelines of this manual. In order to maintain compliance with FCC

regulations, the module installer must adhere to the guidelines listed in the installation section of this manual.

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

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna, As long as 2 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.
- 3) The WLE200N5-23ESD MiniPCIE wireless network adaptor module is limited to installation in mobile or fixed applications.

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 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 FCC ID: XQ8WLE200N5-23ESD”.

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 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.*

Caution:

- (i) the device for operation in the band 5 150-5 250 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 band 5 725-5 850 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

Avertissement:

- (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 la bande 5 725-5 850MHz) 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.

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 20cm 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 20 cm de distance entre la source de rayonnement et votre corps.

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

- 1) The antenna must be installed such that 20 cm is maintained between the antenna and users, and
- 2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 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.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

- 1) L'antenne doit être installée de telle sorte qu'une distance de 20 cm est respectée entre l'antenne et les utilisateurs, et
- 2) Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 2 conditions ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

IMPORTANT NOTE:

In the event that these conditions cannot 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 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 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 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 IC: 11273A-WLE200N523ESD".

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 20cm 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: 11273A-WLE200N523ESD".

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.

This radio transmitter (IC: 11273A-WLE200N523ESD) has been approved by Industry Canada to operate with the antenna types listed 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.

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 integere ce module.

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

Le présent émetteur radio (IC: 11273A-WLE200N523ESD) 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.

OEM Installation Instructions

In order to maintain compliance with FCC, Industry Canada, and any other applicable regulations, it is required of the OEM or module level customer to adhere to the guidelines listed in this manual.

Instructions d'installation OEM

Afin de maintenir la conformité aux normes FCC, Industrie Canada, et tous les autres règlements applicables, il est nécessaire de la clientèle OEM ou niveau du module d'adhérer aux lignes directrices énoncées dans ce manuel.

Compliance with country code requirements

This device is in compliance with the software configuration control and county code requirements of KDB 594280.

Below are the guidelines that the OEMs will follow to comply with the software configuration control and county code requirements of KDB 594280.

- OEMs will request Summit Semiconductor to provide them with a software program for a particular country that will allow them the access over the audio configuration fields.
- Summit will provide the software program with the country code already hard coded to a particular country that the OEM has requested so that OEMs can change only audio related configuration.
- Once the OEM completes the audio configuration changes and runs the software program, the country code is set automatically without OEM input. The program then verifies the settings for the OEM guarantying the correct application of the country code.

OEMs are required to sign an attestation statement ensuring that a module programmed to a specific country code will only be used in products shipped to that country.

Conformité aux exigences de code de pays

Cet appareil est en conformité avec les exigences de la KDB 594280 contrôle de la configuration du logiciel et du code de comté.

Voici les lignes directrices que le EMT suivre pour se conformer aux exigences de la KDB 594280 contrôle de la configuration du logiciel et du code de comté.

- OEM demandera Sommet Semiconductor pour leur fournir un logiciel pour un pays particulier qui leur permettra l'accès sur les champs de configuration audio.
- Sommet fournira le logiciel Avec le Code de paie Déjà CodeE en dur à Un pays en Particulier Que l'OEM un Demandé circonstancielle et déjà than les articles puissent Modifier la configuration only audio connexe.
- Une fois l'OEM complète les changements de configuration audio et exécute le programme de logiciels, le code du pays est réglé automatiquement sans contribution OEM. Le programme vérifie ensuite les paramètres de l'OEM garantissant l'application correcte du code de pays.

OEM sont tenus de signer une déclaration d'attestation assurer qu'un module programmé à un code spécifique du pays ne sera utilisé dans les produits expédiés vers ce pays.

Details of the product

Technical Specifications									
Chipset	Atheros AR9280								
Host Interface	PCI-Express 1.1 Standard								
Operating Voltage	3.3 VDC								
Power Consumption	11a Cont. Tx @6M								
	11na Cont. Tx@HT20 MCS0								
	11na Cont. Tx@HT40 MCS0								
	11a Cont. Rx								
	Standby								
Antenna Connector	2 x MMCX								
Data Rate	IEEE 802.11a :	54Mbps	48Mbps	36Mbps	24Mbps	18Mbps	12Mbps	9Mbps	6Mbps
	IEEE 802.11n :	20MHz	1Nss: 65Mbps @ 800GI, 72.2Mbps @ 400GI (Max.)						
			2Nss: 130Mbps @ 800GI, 144.4Mbps @ 400GI (Max.)						
	IEEE 802.11n :	40MHz	1Nss: 135Mbps @ 800GI, 150Mbps @ 400GI (Max.)						
2Nss: 270Mbps @ 800GI, 300Mbps @ 400GI (Max.)									
Frequency Range	IEEE 802.11a/n:	5.150 ~ 5.250 GHz, 5.725 ~ 5.850 GHz (US & Canada)							
		5.150 ~ 5.250 GHz, 5.725 ~ 5.875 GHz (Europe)							
		5.150 ~ 5.250 GHz (Japan)							
Modulation Techniques	OFDM: BPSK, QPSK, 16QAM, 64QAM								
RoHS Compliance	Yes								
Temperature Range	Operating: -20°C to 70°C								
	Storage: -40°C to 90°C								
Humidity	Operating: 5% to 95% (non-condensing)								
	Storage: Max.90% (non-condensing)								
Dimension	59.6mm x 51.5mm x 6mm								

Dimensions Drawing

