AR4100 SiP Modular Certification

Instructions to OEM Integrators

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Revision history

Revision	Date	Description
Ver. 1.0	July 2011	Initial release
Ver. 2.0	March 2012	Updated Antenna Placement and RF Harzrd (SAR) Compliance
A	January 2013	Updated cover page

Regulatory Warning Regarding Allowed Antennas and SiP Module Implementation by End Integrators

The Qualcomm Atheros AR4100 SiP module (FCCID: PPD-AR4100) may only be used with the antenna options specified in this document and in the document *PPD-AR4100 SiP Module: Certified Antennas and Layout*.

You must contact Qualcomm Atheros, Inc. representative to discuss any proposed deviations from the specifications in this document. No deviation may be made without prior written agreement with Qualcomm Atheros, Inc. Any such deviation may require retesting and additional FCC certification submissions before being accepted.

As a condition of use, Qualcomm Atheros SiP module users agree to abide by the Customer Agreement for Use of SiP Modular Certifications. Failure to follow Customer Agreement or the requirements in this document will invalidate the Modular Certifications.

NOTE: This document must be read in conjunction with the document *PPD-AR4100 SiP Module: Certified Antennas and Layout*.

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1 Introduction

This document describes mandatory steps required by the OEM integrator when designing and manufacturing any system utilizing a Qualcomm Atheros System in Package (SiP) module referred to as the SiP integrating system. Also refer to the *Qualcomm Atheros Regulatory Compliance Guide* available on the Qualcomm Atheros customer support site or from your Qualcomm Atheros customer support representative.

This guide applies to WLAN Client modules that act under control of an Access Point. This document does not apply to a Client module or Access Point with radar detection feature.

WARNING: Failure to comply with all requirements and conditions in this document may result in non-compliance of the SiP integrating system with FCC rules and invalidate the Qualcomm Atheros FCC certification for the module.

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2 Antennas Allowed to be Used with the SiP Module

The Integrator must request from Qualcomm Atheros sales or regulatory contact person the current version of the document *PPD-AR4100 SiP Module: Certified Antennas and Layout,* which specifies the allowable antennas and connection method for use with the certified SiP module.

NOTE: You must contact the Qualcomm Atheros Regulatory Group to discuss necessary actions where alternate antenna models or connection schemes are desired. Any such deviations from the Certified Antenna specifications provided by Qualcomm Atheros must not be implemented without prior written acceptance. Unauthorized deviations may invalidate the FCC certification of the SiP Module.

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3 Antenna Placement and RF Hazard (SAR) Compliance

For SiP integrating systems or systems certified as FCC Mobile Category devices, the FCC Grant of approval for the Qualcomm Atheros module is only valid when the integrator ensures antenna placement in the host system maintains the following minimum separation for each respective antenna variation of the AR4100 SiP module between any part of the antenna element(s) and any part of the end user's body (considering their likely or usual operation position and grip): 4 mm for chip antenna variant, 17 mm for PCB antenna variant, and 11mm for PIFA antenna variant. This spacing is naturally met by non-mobile systems such as access points or desktop PCs. Laptop PCs typically have integrated antennas placed high in the LCD display assembly. However, many of the host devices that use a Qualcomm Atheros SiP module will fall under FCC Portable Category.

Additional certification testing including RF Exposure (SAR) testing and an FCC certification submission are required to gain permission to place antennas closer than the mentioned minimum separation distance by the end-user for each antenna variant. Such SiP integrating systems will require certification per FCC rules for a host.

This separation distance limit is specified on the FCC modular grant of approval (dated 7/19/2011):

"allows this module to be used in stand-alone portable exposure condition without restriction on host platform with the most conservative antenna to user separations of 1.1 cm for PIFA antenna, 1.7 cm for PCB antenna, and 0.4 cm for Chip ..."

NOTE: You must contact the Qualcomm Atheros Regulatory Group to evaluate need for RF exposure evaluation and additional FCC testing and submission for host PCs where antenna element will not maintain the separation from end user per above description.

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4 Colocation of Radio Module with Other Integrated or Plug-In Radios

The FCC Grant of approval for the Qualcomm Atheros SiP module includes a restriction that no other radio be operated inside the same host system. If other radio devices are to be integrated with the Qualcomm Atheros SiP module then additional evaluation and FCC submission may be required - outside of the scope of the existing Qualcomm Atheros SiP modular approval.

Also, the end-user instructions (provided by the integrator of the Qualcomm Atheros SiP module) must warn end users to turn off the radio while any other plug-in radio is being operated in the same host system.

This restriction is specified on the FCC modular grant of approval:

"The antenna used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter."

NOTE: You must contact the Qualcomm Atheros Regulatory Group to evaluate need for additional FCC evaluation for cases where any co-located radio exists in the same host PC as the Qualcomm Atheros SiP module.

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5 Required Host System Labeling

FCC ID and Industry Canada ID on Host System

In addition to affixing the FCCID on the Qualcomm Atheros SiP module, the OEM Integrator must affix the SiP's FCCID on the outside of the product (on the host).

Example wording to appear somewhere on the outside of the host system visible to the end user:

Contains FCCID: PPD-AR4100*

FCC Logo on the Host System

The FCC logo shown below must appear on the host system, signifying declared compliance of the system with FCC digital emissions rules.

The AR4100 component will also be produced using the designation AR6103. There is no difference in the hardware. This is done for marketing purposes.

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6 Required User Manual Wording for Host System

The FCC requires the following text (or equivalent) be included in the documentation provided to the end user. The following example *text* can be used by the integrator in the end user documents:

Satisfying RF Exposure Compliance and Radio Compliance

FCCID: PPD-AR4100

This device generates and radiates radio-frequency energy in compliance with FCC radio frequency radiation exposure guidelines for an uncontrolled environment. This equipment must be installed and operated while maintaining a minimum body-to-antenna distance of 1.1cm for PIFA antenna, 1.7 cm for PCB antenna and 0.4 cm for Chip. The integrator can select applicable value based on antenna type in host device.

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 product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certifications and approvals.

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Include the following co-location statement (unless special permission was granted allowing co-location of additional radios with the Qualcomm Atheros SiP module):

"This radio module may not be operated with any other radio or transmitting antenna, unless the Qualcomm Atheros SiP module is disabled"

FCC Part 15 Digital Emissions Compliance

We [System Manufacturer Name, Address, Telephone], declare under our sole responsibility that the product [System Name] 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.

WARNING: 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 the one the receiver is connected to.

Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:
The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

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Industry Canada requires the following wording to the end user in French and English:

Industry Canada Notice:
This device complies with Canadian RSS-210.

To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or its transmitting antenna) that is installed outdoors is subject to licensing. The installer of this radio equipment must ensure that the antenna is located or pointed such that it does not emit RF field in excess of Health Canada limits for the general population; consult Safety Code 6, obtainable from Health Canada's web site www.hc-sc.gc.ca/rpb.

"This Class B digital apparatus complies with Canadian ICES-003"

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

Avis de Conformité à la Réglementation d'Industrie Canada:

Pour empêcher toute interférence aux services faisant l'objet d'une licence, cet appareil doit être utilisé à l'intérieur seulement et devrait être placé loin des fenêtres afin de fournir un écran de blindage maximal. L'installateur du présent matériel radio doit s'assurer que l'antenne est située ou pointée de manière à ce que cette dernière n'émette pas de champs radioélectriques supérieurs aux limites specifées par Santé Canada pour le grand public; consulter le Code de sécurité 6, disponible sur le site Web de Santé Canada, à l'adresse suivante: www.hc-sc.gc.ca/rpb.

End of Required User Manual Wording to end user

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