Intrinsyc Open-Q™ 410 (APQ8016) SOM Module Certification Technical Note 16: OEM Integrator Guide

[Document: ICS-01RND1181-TN-016 Revision: 1.1]

Identification

Document Title	Intrinsyc Open-Q™ 410 (APQ8016) SOM Module Certification Technical Note 16: OEM Integrator Guide
Document Number	ICS-01RND1181-TN-016
Version	1.1
Date	June 30, 2016

History

REVISION	DATE	DESCRIPTION	PAGES
1.0	June 13, 2016	Original Document	All
1.1	June 30, 2016	Removed water mark from document and made changes recommended by TCB.	All

Note: The Intrinsyc Open-Q™ 410 SOM radio module (the "Module") is certified for compliance for use in the USA and Canada only. For use in other countries, certificates of compliance must be obtained for that country or region before the module can be sold, operated or incorporated into products. In addition, any deviation from the settings, methods, conditions and restrictions for integration of the Module into a host system, as defined in this document, could be a violation of applicable national law and may be punishable as such, and in such event, the products into which the Module is incorporated may not be lawfully distributed or sold in such countries. Intrinsyc assumes no responsibility for any such liability or loss related to installation or operation of the Module.

Table of Contents

1. INTRODUCTION

This document describes the steps that the OEM integrator must follow when designing and manufacturing a system utilizing the Open-Q™ 410 SOM Transmitter Module.

Failing to follow the instructions in this document may invalidate the FCC and IC (Industry Canada) certifications and authorizations of the Module for use in the U.S. and Canada.

The Module certifications described in this document apply only to radio conformance for the Module. The OEM integrator is responsible for all system-level EMI/EMC and Product Safety testing and certifications that apply to the host system in the U.S. and other countries where the system will be marketed or sold.

2. APPLICABLE MODULE

Model	USA/FCC	CANADA/IC
Open-Q™ 410 SOM	2AFDI-ITCOQ410S	9049A-ITCOQ410S

3. ADDITIONAL REGULATORY CONFORMANCE TESTING AND/OR SUBMISSIONS REQUIRED BY THE INTEGRATOR

- The modular certifications apply to the radio conformance for the Module only. The OEM integrator is responsible for additional system-level EMI/EMC and Product Safety testing and certification that applies in the U.S. and other countries to the host system containing the Module. This includes but is not limited to Federal Communications Commission ("FCC") Part 15 Class B Digital Emissions. These system-level EMC tests are to be done with the Module installed and included in the scope of the submission.
- Some of the countries for which modular certifications are provided require additional submissions, authorizations or import permission by the system-vendor or importer. The integrator is responsible for these additional actions.
- Modular radio certification is not possible in some countries. For such countries, OEM integrators must ensure radio certification for the end system is obtained, before placing the product on the market.

4. COMPLIANT/ALLOWABLE TX POWER SETTINGS

Any adjustments made to increase transmit power settings will invalidate all radio certifications for this module.

5. ALLOWABLE ANTENNAS TO USE WITH THE RADIO MODULE

The Open-Q™ 410 SOM passed certification testing with the following antenna:

Model	Type	Connector	Peak Gain (dBi)
001-0014 LSR 2.4 GHz FlexPIFA Antenna w/U.FL cable, 100mm	PIFA	U.FL	2.0

The required antenna impedance is 50 ohms.

Use of other antenna types or the same type of antenna but with higher gain than listed above is not allowed without additional testing and appropriate FCC or IC approval.

Use of a similar antenna may only require a C1PC to confirm the performance for SAR is the same or better (i.e. lower) but only an equivalent antenna can be used without any additional testing.

6. ANTENNA PLACEMENT AND RF SAFETY

The FCC and other countries' regulatory bodies impose strict conditions and limitations on the RF exposure levels of end products. Acceptable RF exposure levels for this Module depend on transmit power, the location of the transmitting antenna(s) inside the host system and the expected separation of the transmitting antennas to the end user. OEM integrators must take great care to ensure each host system complies with the applicable RF exposure requirements.

The antenna-to-user (bystander) separation distance must be greater than 20 cm.

Failure to adhere to these separation/spacing rules will invalidate the FCC and IC certifications for the Module.

- This separation is measured between the closest point of each transmitting antenna inside the host device to the point of contact by the user or nearby person outside the host device.
- For notebooks/netbooks/laptops with antennas in display section, the LCD is opened 90 degrees/perpendicular to the keyboard. The separation distance is then measured from the nearest point of each transmitting antennas to the bottom of the host. Use in the keyboard section of a netbook or laptop or use in a tablet device or convertible tablet would require host-specific testing.
- For notebooks/netbooks/laptops, the transmitting antenna cables shall be positioned away from the antenna elements to conform to the configuration tested for compliance.
- When transmitting antennas are installed in the display section of notebook/netbook/laptops, the display section shall not have metallic components and material that can influence or change the operating and RF exposure characteristics of the antennas.
- The separation between the main and aux antennas must be at least 3 cm.
- The transmitter module may not be co-located with any other transmitter or antenna.
- SAR evaluation is required if the separation distance between the user or bystanders and the device is less than or equal to 20 cm.

Where one or more of the conditions above cannot be met for a particular host system, additional testing is required to secure the necessary certifications for the system.

Note: These restrictions do not apply to receive-only antenna.

7. SIMULTANEOUS TRANSMISSION WITH OTHER INTEGRATED OR PLUG-IN RADIOS

The FCC and IC impose conditions and limitations when additional radio(s) are co-located in the same host system as the Module *with capability to transmit simultaneously*. Co-locating other radios such as an integrated or plug in Wireless WAN/cellular radio with the Module requires additional evaluation and possibly submission for authorization from the FCC and IC.

Because the rules are highly dependent on the characteristics of the particular radios that are co-located and simultaneously transmitting, the OEM integrator should seek guidance from a knowledgeable test lab or consultant to determine if additional testing and certification is required. In this case, failure to evaluate and follow the required FCC and IC procedures will invalidate the FCC and IC certifications of the Module and end system.

8. MODULE MAY NOT BE INSTALLED BY END USERS

FCC and IC rules require this Module to be installed in host systems at the factory by the OEM integrator. Thus, end users of the system may not install the Module. Therefore, the host product user instructions must not advise the end user on how to access or remove the Module. Additional FCC authorization/filing is needed to allow end user installation of the radio modules.

If modules are provided to the end users for installation in the host, a two-way authentication protocol is required to limit the module to operate only with the authorized host system.

9. REQUIRED LABELING ON THE OUTSIDE OF THE HOST

9.1 FCC Labeling Requirements on the Outside of the Host

The FCC requires a label on the outside of the host system visible to the end user. Example wording is:

Contains: FCC ID: 2AFDI-ITCOQ410S IC: 9049A-ITCOQ410S

The FCC requires a logo signifying emission compliance on the outside of the host system. The OEM integrator is responsible to perform FCC Part 15 Class B digital emissions testing on the end system with the radio Module installed. The FCC logo below should not be affixed unless the OEM integrator has obtained the necessary Part 15 approval, e.g., self-declaration of conformity.

If the host system is approved to FCC Class B digital emissions limits under a grant of certification issued by a TCB, the FCC ID number shown on the grant should be used on the label instead of the FCC logo below.

Also see https://www.fcc.gov/logos.

A certified modular has the option to use a permanently affixed label, or an electronic label (Refer to FCC KDB 784748 D02 e labeling for e-labelling guidance). All modules without an integrated display on the module must be labelled with a module's FCC ID - Section 2.926.

9.2 Industry Canada Labeling Requirements on the Outside of the Host

End Product Labeling

The final end product must be labeled in a visible area with the following for the Open-Q™ 410 SOM: **Contains IC: 9049A-ITCOQ410S.**

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: Open-Q™ 410 SOM: **Contient des IC: 9049A-ITCOQ410S.**

10. REQUIRED LABELING ON THE MODULE

10.1 FCC and Industry Canada Labelling on the Module

The OEM integrator must ensure that the FCC ID and IC number is affixed on the Module or in a User/Installation Manual along with other country certification numbers and logos as described herein.

Note: the original Module manufacturer may affix regulatory labeling at time of Module manufacturing. However, the OEM integrator must ensure that Module labeling is complete, correct, and applicable for all the countries to which the host system is to be imported, marketed, or sold.

11. REQUIRED REGULATORY WORDING FOR END USER MANUAL / INSTALLATION MANUAL

11.1 FCC Requirements for End User Manual / Installation Manual

The OEM integrator must provide instructions in the end user manual how to retrieve the module FCC ID for host devices using electronic labeling (for example an integrated display) in lieu of a physical label or nameplate to meet the labelling requirements of Industry Canada (Refer to FCC KDB 784748 D02 e labeling document for guidance).

The OEM integrator must include text in the end user manual (meeting the regulators' requirements. When the module is installed inside another device, the user manual of that device must contain the statements and warnings below (text in red font must be replaced):

FEDERAL COMMUNICATIONS 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 product does not contain any user serviceable components. Any unauthorized product changes or modifications will invalidate warranty and all applicable regulatory certification and approvals, including authority to operate this device.

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 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 and radiates 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 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 or 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.

IMPORTANT! Changes or modifications not expressly approved by [System Manufacturer Name] could void the user's authority to operate the equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

FCC RF Exposure Requirements:

This product complies with the FCC RF exposure limit set forth for an uncontrolled environment and is safe for intended operation as described in this manual. This device is only authorized for use in a mobile application, at least 20 cm of separation distance between the radiating antenna and the user's body must be maintained at all times. Further RF exposure reduction can be achieved if the product can be kept as far as possible from the user's body or set the device to a lower output power if such a function is available. Separate approval is required for all other operating configurations, including portable configurations with respect to 47 CFR Part 2.1093 and different antenna configurations.

11.2 Industry Canada Requirements for End User Manual / Installation Manual

Industry Canada Statements

This device complies with Industry Canada license-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;
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

This radio transmitter (IC: 9049A-ITCOQ410S/ Open-Q™ 410 SOM) 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. The required antenna impedance is 50 ohms.

Le présent émetteur radio (IC: 9049A-ITCOQ410S/ Open-Q™ 410 SOM) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur. L'impédance d'antenne requise est de 50 ohms.

Antenna Information:

Model	Type	Connector	Peak Gain (dBi)
001-0014 LSR 2.4 GHz FlexPIFA Antenna w/U.FL cable, 100mm	PIFA	U.FL	2.0

Radiation Exposure Statement

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

Déclaration d'exposition aux radiations

Cet appareil se conforme aux limites d'exposition aux rayonnements pour un environnement non contrôlé. L'antenne (s) qui est utilisé pour cet émetteur doit être installé pour produire une distance de séparation d'au moins 20 cm de toutes personnes et ne doit pas être installé à proximité ou utilisé en conjonction avec une autre antenne ou émetteur.

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

1. The antenna used will be of the same type and with an antenna gain of 2 dBi or lower.
2. The antenna must be installed such that 20 cm is maintained between the antenna and users.
3. The transmitter module may not be co-located with any other transmitter or antenna.

As long as the conditions above are met, further transmitter tests will not be required. However, the OEM integrator is still responsible for testing the end product and 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 utilisée sera du même type et avec un gain d'antenne de 2 dBi ou moins.
2. L'antenne doit être installé de telle sorte que 20 cm est maintenue entre l'antenne et les utilisateurs.
3. Le module émetteur peut ne pas être co-localisé avec un autre émetteur ou antenne.

Tant que les conditions ci-dessus sont remplies, d'autres tests d'émission ne seront pas nécessaires. Cependant, l'intégrateur OEM est toujours responsable pour tester le produit final et toutes les exigences de conformité supplémentaires nécessaires avec ce module installé.

Important Note:
In the event that these conditions cannot be met, then the Canadian 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, 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.

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 shown in this manual.

The OEM integrator must provide instructions in the end user manual how to retrieve the module IC number for host devices using electronic labeling (for example an integrated display) in lieu of a physical label or nameplate to meet the labelling requirements of Industry Canada (Refer to IC Notice 2014-DRS1003 for guidance).

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.

L'intégrateur OEM doit fournir des instructions dans le manuel utilisateur expliquant comment récupérer le numéro IC du module pour les appareils hôtes en utilisant l'étiquetage électronique (par exemple un écran intégré) en lieu et place d'une étiquette physique ou plaque signalétique pour répondre aux exigences en matière d'étiquetage d'Industrie Canada (Se reporter à la note d'IC 2014 - DRS1003 pour plus d'information).

12. OEM INTEGRATOR CHECKLIST

The OEM Integrator will integrate the Module in the host systems in accordance with the instruction specified in this document and the documents referenced herein.

- The OEM Integrator will ensure the Module is integrated in a host system using only antennas that are of the same type and having equal or less antenna gain as described in this document.
- The OEM Integrator will ensure the antennal placement inside the host system will maintain the required spacing to the end user for RF Exposure compliance, as specified in this document.
- If other radios are integrated inside the host with the Module, the OEM Integrator will contact a test lab or TCB to determine if additional FCC compliance evaluation is required to meet FCC collocation rules.
- The OEM Integrator will ensure end user documentation will contain the specified regulatory wording and ensure the host system and the Module itself is labeled as specified in this document.
- The OEM Integrator will ensure that nothing is done that will change the transmit power level of the module.
- The OEM Integrator will ensure end user documentation will contain clear instructions on how to access the FCC ID and IC Number of the module should an electronic display (e-labeling) be used to meet the FCC and IC labeling requirements (Refer to FCC KDB 784748 D02 e labeling document and IC Notice 2014-DRS1003 for guidance).