



User Manual and Warning Statements
SNPRC-2350 & SNPRC-2351
FCC ID: B94SNPRC235X; IC: 466S-SNPR235X
802.11 a/b/g/n/ac/ax (2.4 & 5 GHz) Wi-Fi radio + BT/BLE Radio module

Interconnection of Host Product Main board and SNPRC-2350 / SNPRC-2351 Radio module

In this document, it is explained how typically SNPRC-2350 / SNPRC-2351 radio module will be interfaced with the host product's main board. SNPRC-2350 is a separate radio module compared to the host product's main board and comes in 3 different configurations. 2 of the configurations have miligrid connector on the radio module. The 3rd configuration have a FFC connector. The configuration with the miligrid connector is soldered directly to the host product's main board. For the case of module with the FFC connector, a mating FFC connector is soldered on the main board and a short FFC is used to connect the radio module the main board.

SNPRC-2351 is a separate radio module compared to the host product's main board and comes in 3 different configurations. 2 of the configurations have the straight miligrid connector on the radio module and 1 have right-angled miligrid connector on the radio module. The radio module with the miligrid connector is soldered directly to the host product's main board.

Figure 1 shows the interconnection of exact certified SNPRC-2350 / SNPRC-2351 to a typical main board of a product with ZERO modification to the radio module.

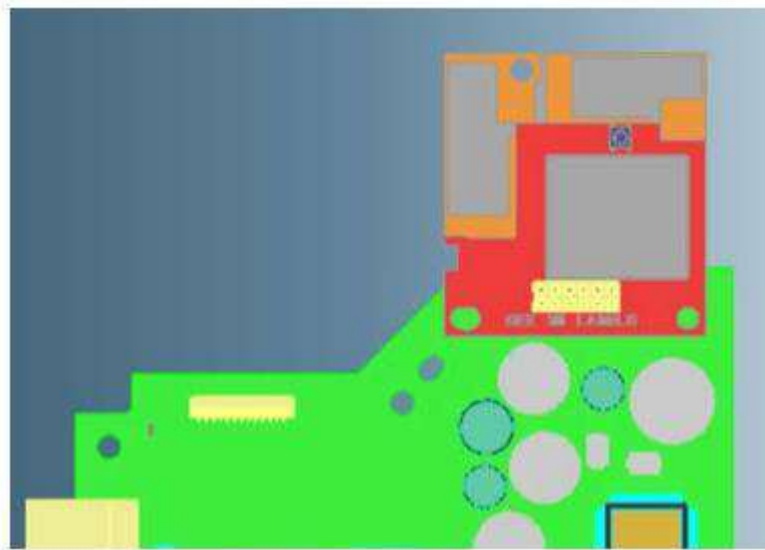


Figure 1: Interconnection of SNPRC-2350 / SNPRC-2351 Radio module to the Host Product Main Board



Installation Guidance Document

Conditions on using HP regulatory approvals:

- A. Must ensure that HP's product (the "Brand-Name-Product") is electrically identical to the design used for the official certification testing of the radio module. If the radio module's design is modified, then relevant testing will be conducted and supported by official reports to support compliance. Modification to the design include any change which impact RF, EMC , EMF performance of the radio module.
- B. Antennas used with the product are of the same type, with same or lower gains as approved and providing antenna reports.
- C. Customer is responsible for regression testing to accommodate changes to the certified designs, new antennas, and portable RF exposure safety testing/approvals.
- D. Appropriate labels must be affixed to the customer Product that complies with applicable regulations in all respects.
- E. The radio usually operates in client mode, but may operate in master mode to connect to up to five nearby devices to exchange print information. Master mode is only available the 2.4 GHz band and non-DFS 5GHz channels; to ensure compliance with local regulations, the device should be set to the country domain in which the access point is installed.
- F. A user's manual or instruction manual must be included with the product that contains the text as required by applicable law. Without limitation of the foregoing, an example (for illustration purposes only) of possible text to include is set forth below:



Radio specific Regulatory Statements in the Product's User Manual

1. USA—Federal Communications Commission (FCC)

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.

INFORMATION TO USER:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of 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. If not installed and used in accordance with the instructions, it 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 and correct the interference by one or more of the following measures:

-Reorient or relocate the receiving antenna

- Increase the distance between the equipment and the receiver.
- Connect the equipment to 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 the equipment.

System integrators must include the FCC ID on the end product.

This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product



procedures. Referring to the multi-transmitter policy, multiple-transmitter(s) and module(s) can be operated simultaneously without C2PC

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

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

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 module is intended for OEM integrators only. Per FCC KDB 996369 D03 OEM Manual v01 guidance, the following conditions must be strictly followed when using this certified module:

KDB 996369 D03 OEM Manual v01 rule sections:

2.2 List of applicable FCC rules

This module has been tested for compliance to FCC Part 15.247, 15.407

2.3 Summarize the specific operational use conditions

The module is tested for standalone mobile RF exposure use condition. Any other usage conditions such as co-location with other transmitter(s) or being used in a portable condition will need a separate reassessment through a class II permissive change application or new certification.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

This equipment complies with FCC mobile radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator & your body. If the module is installed in a portable host, a separate SAR evaluation is required to confirm compliance with relevant FCC portable RF exposure rules.



2.7 Antennas

The following antennas have been certified for use with this module; antennas of the same type with equal or lower gain may also be used with this module. The antenna must be installed such that 20 cm can be maintained between the antenna and users.

Antenna NO.	RF Port NO.	Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length
1	1/2	0/1	HP	SNPRC-2351	3.5	2.4~2.4835GHz	PIFA (on-board)	none(like solder)	NA
					4.5	5.15~5.85GHz			
2	1/2	0/1	HP	SNPRC-2350	3.5	2.4~2.4835GHz	PIFA (on-board)	none(like solder)	NA
					4.5	5.15~5.85GHz			
3	2	1	Yageo	ANTX200P002B24553	0.9	2.4~2.4835GHz	PIFA	I-PEX	200 mm
					2.3	5.15~5.85GHz			
4	2	1	Yageo	ANTX300P002B24553	0.9	2.4~2.4835GHz	PIFA	I-PEX	300 mm
					2.3	5.15~5.85GHz			
5	2	1	WNC	81EAB815.G23	2	2.4~2.4835GHz	PIFA	I-PEX 1st	200 mm
					3	5.15~5.85GHz			
6	2	1	WNC	81EAB815.G24	-0.3	2.4~2.4835GHz	PIFA	I-PEX 1st	300 mm
					1.5	5.15~5.85GHz			

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: “Contains FCC ID: B94SNPRC235X”. The grantee’s FCC ID can be used only when all FCC compliance requirements are met

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 product user manual shall include all required regulatory information/warning as shown in this manual.

2.9 Information on test modes and additional testing requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) or portable use will require a separate class II permissive change re-evaluation or new certification.



2.10 Additional testing, Part 15 Subpart B disclaimer

This transmitter module is tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B (unintentional radiator) rule requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rule requirements if applicable.

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and EMF essential requirements of the FCC rules. This module must not be incorporated into any other device or system without retesting for compliance as multi-radio and combined equipment.

As long as all 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.

2.11 Note EMI Considerations

Please follow the guidance provided for host manufacturers in KDB publications 996369 D02 and D04.

2.12 How to make changes

Only Grantees are permitted to make permissive changes. Please contact us should the host integrator expect the module to be used differently than as granted:

Contact Name	Manish Oswal
Contact Title	Wireless Regulatory Engineer
Tel No	+65 6703 2925
E-mail	Manish.Oswal@hp.com

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



2. Canada -Industry Canada (IC)

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'ISED applicables aux appareils radio exempts de licence. L'exploitation est autorisée 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 ISED radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with greater than 20cm between the radiator & your body

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements ISED établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à plus de 20 cm entre le radiateur et votre corps.

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

- 1) The antenna must be installed and operated with greater than 20cm 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: (Pour utilisation de dispositif module)

- 1) L'antenne doit être installée et exploitée avec plus de 20 cm 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 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 and operated with greater than 20cm between the antenna and users. The final end product must be labeled in a visible area with the following:
"Contains IC: 466S-SNPR235X

Plaque signalétique du produit final

Ce module émetteur est autorisé uniquement pour une utilisation dans un appareil où

l'antenne peut être installée et utilisée à plus de 20 cm entre l'antenne et les utilisateurs. Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: "Contient des IC: 466S-SNPR235X



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) 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 as appropriate;
- (iv) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

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 5150-5250 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) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5 250 à 5 350 MHz et de 5 470 à 5 725 MHz doit être conforme à la limite de la p.i.r.e;



- (iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis (pour les dispositifs utilisant la bande de 5 725 à 5 850 MHz) doit être conforme à la limite de la p.i.r.e. spécifiée, selon le cas;
- (iv) lorsqu'il y a lieu, les types d'antennes (s'il y en a plusieurs), les numéros de modèle de l'antenne et les pires angles d'inclinaison nécessaires pour rester conforme à l'exigence de la p.i.r.e. applicable au masque d'élévation, énoncée à la section 6.2.2.3, doivent être clairement indiqués

This radio transmitter [IC: 466S-SNPR235X] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Le présent émetteur radio [IC: 466S-SNPR235X] a été approuvé par Innovation, Sciences et Développement économique 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 pour tout type figurant sur la liste, sont strictement interdits pour l'exploitation de l'émetteur.

Required Impedance / L'impédance Requisite: 50 Ω

Antenna NO.	RF Port NO.	Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length
1	1/2	0/1	HP	SNPRC-2351	3.5	2.4~2.4835GHz	PIFA (on-board)	none(like solder)	NA
					4.5	5.15~5.85GHz			
2	1/2	0/1	HP	SNPRC-2350	3.5	2.4~2.4835GHz	PIFA (on-board)	none(like solder)	NA
					4.5	5.15~5.85GHz			
3	2	1	Yageo	ANTX200P002B24553	0.9	2.4~2.4835GHz	PIFA	I-PEX	200 mm
					2.3	5.15~5.85GHz			
4	2	1	Yageo	ANTX300P002B24553	0.9	2.4~2.4835GHz	PIFA	I-PEX	300 mm
					2.3	5.15~5.85GHz			
5	2	1	WNC	81EAB815.G23	2	2.4~2.4835GHz	PIFA	I-PEX 1st	200 mm
					3	5.15~5.85GHz			
6	2	1	WNC	81EAB815.G24	-0.3	2.4~2.4835GHz	PIFA	I-PEX 1st	300 mm
					1.5	5.15~5.85GHz			



3. Japan Statement

Host system must be labeled with "Contains MIC ID:xxxxxx", MIC ID displayed on label.
5GHz band (W52, W53): Indoor use only.

4. NCC Statement

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。前述合法通信，指依電信管理法規定作業之無線電通信。低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。

1. 使用此產品時應避免影響附近雷達系統之操作。
2. 高增益指向性天線只得應用於固定式點對點系統。
1. 本模組於取得認證後將依規定於模組本體標示審驗合格標籤。
2. 系統廠商應於平台上標示「本產品內含射頻模組：XXXyyyLPDzzzz-x。」字樣。系統廠商外包裝需標示 NCC LOGO

本器材限使用下列天線

Antenna NO.	RF Port NO.	Chain NO.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length
1	1/2	0/1	HP	SNPRC-2351	3.5	2.4~2.4835GHz	PIFA (on-board)	none(like solder)	NA
					4.5	5.15~5.85GHz			
2	1/2	0/1	HP	SNPRC-2350	3.5	2.4~2.4835GHz	PIFA (on-board)	none(like solder)	NA
					4.5	5.15~5.85GHz			
3	2	1	Yageo	ANTX200P002B24553	0.9	2.4~2.4835GHz	PIFA	I-PEX	200 mm
					2.3	5.15~5.85GHz			
4	2	1	Yageo	ANTX300P002B24553	0.9	2.4~2.4835GHz	PIFA	I-PEX	300 mm
					2.3	5.15~5.85GHz			
5	2	1	WNC	81EAB815.G23	2	2.4~2.4835GHz	PIFA	I-PEX 1st	200 mm
					3	5.15~5.85GHz			
6	2	1	WNC	81EAB815.G24	-0.3	2.4~2.4835GHz	PIFA	I-PEX 1st	300 mm
					1.5	5.15~5.85GHz			



5. CE Statement

This device complies with Directive 2014/53/EU issued by the Commission of the European Community.

Operations in the 5.15-5.35GHz band are restricted to indoor usage only..

Products with wireless functionality EMF This product meets international guidelines (ICNIRP) for exposure to radio frequency radiation. If it incorporates a radio transmitting and receiving device that in normal use, a separation distance of 20 cm ensures that radio frequency exposure levels comply with EU requirements.