
Title :

PCI Express M.2 Card WLAN module
SX-PCEBE-AP

Drawing Type :

User Manual

Drawing No.:

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1. 製品概要 / Product information

SX-PCEBE-AP は QCN9274(Qualcomm Atheros 社)を採用した Dual Band IEEE802.11a/b/g/n/ac/ax/be、及び PCI express 3.0 dual-lane 準拠の無線モジュールです。本モジュールは PA と LNA を内蔵した RF フロントエンドモジュール及び各種電源/クロックなどの外部回路を内蔵しています。また、本モジュールは 2x2 MU-MIMO と 2 ストリームシステム対応で、160MHz 帯域幅モードをサポートしています。

SX-PCEBE-AP is the radio module on Qualcomm QCN9274 which supports Dual Band IEEE802.11a/b/g/n/ac/ax/be and PCI express 3.0 dual-lane. This module includes RF front end module, Power regulators and clock sources. Also this module supports high speed 2x2 MU-MIMO, 2 spatial streams and 160MHz bandwidth.

製品番号 SKU	製品名称 Product Name	製品タイプ Product Type
ZXE04748	SX-PCEBE-AP	Bulk packing
ZXE04749	SX-PCEBE-AP-SP	Sample pack

特徴 (Features)

- IEEE802.11a/b/g/n/ac/ax/be 準拠 (2.4 GHz, 5 GHz)
IEEE802.11a/b/g/n/ac/ax/be compliant (2.4 GHz, 5 GHz)
- 2 スペーシャルデータストリームシステム (2T2R)
2 spatial data stream system (2T2R)
- 5 GHz : 20/40/80/160 MHz 帯域幅モード対応 (PHY データレート 2882.4 Mbps)
2.4 GHz : 20/40 MHz 帯域幅モード対応 (PHY データレート 688.2 Mbps)

5GHz: Support 20/40/80/160 MHz bandwidth mode (PHY Data rate 2882.4 Mbps)
2.4GHz: Support 20/40 MHz bandwidth mode (PHY Data rate 688.2 Mbps)

PHY Data Rate

- 802.11b/g 1-54 Mbps
 - 802.11a 6-54 Mbps
 - 802.11n 1Stream MCS0-7 High Speed mode (HT mode)
802.11n 2Stream MCS8-15 High Speed mode (HT mode)
 - 802.11ac 1Stream/2Stream MCS0-9 Very High Speed mode (VHT mode)
 - 802.11ax 1Stream/2Stream MCS0-11 High Efficiency Speed mode (HE mode)
 - 802.11be 1Stream/2Stream MCS0-13 Extreme High Throughput Speed mode (EHT mode)
-
- Wireless LAN ホスト IF として PCI express 3.0 dual-lane 対応
Supports PCI express 3.0 dual-lane as the Wireless LAN host interface
 - 本製品は欧州の RoHS 指令(2011/65/EU) ,(EU) 2015/863 に準拠しています。
This product is compliant with the EU's RoHS directive (2011/65/EU) and(EU) 2015/863
 - 本製品は英国の RoHS 規則 2012 (S.I.2012/3032)に準拠しています。
This product is compliant with the UK's RoHS regulations 2012 (S.I.2012/3032)

※AP モード専用で、STA モードでの動作はサポートしません

AP mode only, does not support STA mode.

2. 基板仕様 / Board specifications

2.1. 一般仕様 / General specifications

Items	Specifications		Units	Remarks
モジュール形状 Module form	M.2 Card Type Key E		—	
アンテナコネクタ Antenna connectors	MHF1 connector x 2		—	
アンテナポートインピーダンス Antenna port impedance	50 +/- 20%		Ω	公称値 Nominal value (2.4-2.5GHz, 5.18-5.85GHz)
インターフェイス Device Interfaces	Dual-lane PCI Express 3.0		—	Note1
無線接続方式 RF Interface	IEEE802.11a/b/g/n/ac/ax/be		—	<u>Not Support Wi-Fi 6E (6G band)</u>
重さ Weight	12		g	Typ.
寸法 Dimension	40 x 60 x 4.1		mm	W x H x D 公差 Tolerance W +/- 0.30mm H +/- 0.20mm D +/- 0.50mm
MTBF	90,000		h	Min.
アンテナコネクタ挿抜回数 The number of antenna connector's add-remove	10		Times	Max. I-PEX 90224-001 使用時 Use I-PEX 90224-001
PCI Express Mini Card 着脱回数 The number of PCI Express Mini Card's add-remove	10		Times	Max.
ESD 耐性 ESD resistance	Antenna pins	+/- 2000	V	Max. Human Body Model at MHF1 Port JS-001-2012 (JESD22-A114F) Class 2 device 電源無印加 (w/ no power supply)

NOTE1	Single-lane 動作のみ評価を実施。 Dual-lane でご使用を検討される場合は当社窓口にご相談ください。 Evaluation is conducted only in single-lane mode. If you are considering using dual-lane mode, please consult us.
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2.2. 環境条件 Environmental specifications

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
動作周囲温度 Operating ambient temperature	-40	—	+85	°C	実装後電源電圧印加時 After assembled with powered
動作ケース温度 Operating case temperature	-40	—	+90	°C	実装後電源電圧印加時 After assembled with powered
動作湿度 Operating humidity	15	—	80	%RH	結露無きこと Non condensing 実装後電源電圧印加時 After assembled with powered
保存温度 Assembled storage temperature	-40	—	+85	°C	実装後電源電圧無印加時 After assembled with no-powered
保存湿度 Assembled storage humidity	15	—	85	%RH	結露無きこと Non condensing 実装後電源電圧無印加時 After assembled with no-powered
保管温度 Storage temperature	+5	—	+35	°C	梱包時 Packaged
保管湿度 Storage humidity	20	—	60	%RH	結露無きこと Non condensing 梱包時 Packaged

2.3. 電気的仕様 / Electrical specifications

絶対最大定格 Absolute Maximum Ratings

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
VDD3P3_PCIE Main Power supply voltage	-0.3	—	+3.6	V	
VDD_XPA_PCIE RF FEM Power supply voltage	-0.3	—	+6.0	V	

推奨動作条件 Recommended Operating Conditions

Items	Specifications			Units	Remarks
	Min.	Typ.	Max.		
VDD3P3_PCIE Main Power supply voltage	+3.14	+3.3	+3.46	V	
VDD_XPA_PCIE RF FEM Power supply voltage	+4.75	+5.0	+5.25	V	

デジタル論理信号レベル Digital logic signal level ($V_{DDIO} = +1.8V$ operation)

Items	Parameters	Specifications			Units
		Min.	Typ.	Max.	
V_{IH}	Input High Voltage	$0.7 \times V_{DDIO}$	+1.8	$V_{DDIO} + 0.3$	V
V_{IL}	Input Low Voltage	-0.3	—	$0.3 \times V_{DDIO}$	V
V_{OH}	Output High Voltage	$V_{DDIO} - 0.45$	—	V_{DDIO}	V
V_{OL}	Output Low Voltage	0.0	—	0.45	V

2.4. 無線 LAN 一般仕様 / Wireless LAN general specifications

Items	Specifications				Units	Remarks
Chipset	QCN9274 (Qualcomm Atheros)				—	
Country/Domain Code	Select by software				—	NOTE1
Operating Center Frequency	Band	Modes	Min	Max		
	2.4GHz	11b	2412	2472	MHz	
		11g/n/ax/be 20MHz	2412	2472	MHz	
		11n/ax/be 40MHz	2422	2462	MHz	
	5GHz	11a/n/ac/ax/be 20MHz	5180	5825	MHz	
		11n/ac/ax/be 40MHz	5190	5795	MHz	
		11ac/ax/be 80MHz	5210	5775	MHz	
		11ac/ax/be 160MHz	5250	5570	MHz	
Link Data Rate	11b	1,2,5.5L,5.5S,11L,11S			Mbps	
	11a/g	6,9,12,18,24,36,48,54			Mbps	
	11n	MCS 0,1,2,3,4,5,6,7			—	1Stream
	11n	MCS 8,9,10,11,12,13,14,15			—	2Stream
	11ac	MCS 0,1,2,3,4,5,6,7,8,9			—	
	11ax	MCS 0,1,2,3,4,5,6,7,8,9,10,11			—	
	11be	MCS 0,1,2,3,4,5,6,7,8,9,10,11,12,13			—	
Modulation type	11b	DSSS(DBPSK,DQPSK,CCK)			—	
	11a/g/n	OFDM(BPSK,QPSK,16QAM,64QAM)			—	
	11ac	OFDM(BPSK,QPSK,16QAM,64QAM, 256QAM)			—	
	11ax	OFDM(BPSK,QPSK,16QAM,64QAM, 256QAM,1024QAM)			—	
	11be	OFDM(BPSK,QPSK,16QAM,64QAM, 256QAM,1024QAM,4096QAM)			—	
Encryption	RC4	128			bits	
	AES	128			bits	

NOTE1	デフォルトの国/地域コードとして 0x0000 が最初に書き込まれます。モジュールをロードする際にドライバを使用して任意のコードに変更してください。 The module is initially written with 0x0000 as the default country/region code. Please use the driver to modify it to any code of your choice when loading the module.
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3. 適合規格 / Standards compliance

3.1. 規格一覧 / Standards list

適合規格 (Standards conformity)

- IEEE802.11-2012 (a/b/g/n)
- IEEE802.11ac-2013
- IEEE802.11ax
- IEEE802.11be
- PCI Express 3.0

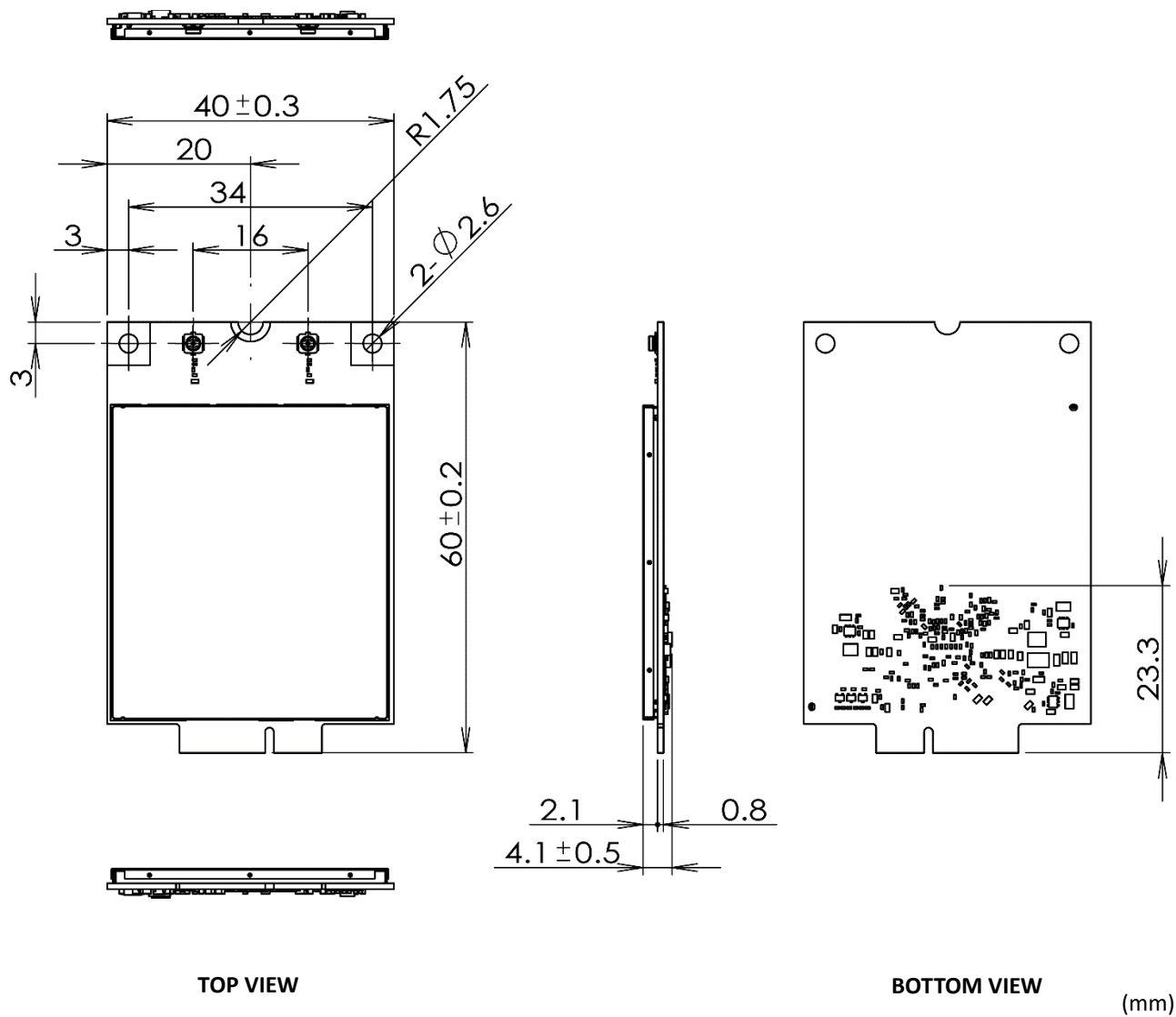
適合法規制 (Law regulation compliance)

- ◇ 日本電波法 (MIC)
証明規則第 2 条第 1 項 第 19 号 (WLAN)
証明規則第 2 条第 1 項 第 19 号の 3 (W52/W53/W56 DFS master 対応)
Article 2 paragraph 1 item (19) (WLAN)
Article 2 paragraph 1 item (19)-3 (W52/W53/W56 with DFS master)
認証番号 (Certification number): **003-250037**
- ◇ FCC Part15
Subpart C (2.4GHz WLAN)
Subpart E (U-NII-1/2A/2C/3 with DFS master)
ID: **N6C-PCEBEAP**
- ◇ ISSED RSS-247
RSS-247 (2.4GHz WLAN)
RSS-247 (U-NII-1/2A/2C/3 with DFS master)
ID: **4908A-PCEBEAP**
- ◇ ETSI
EN 300 328 (2.4GHz WLAN)
EN 301 893(W52/W53/W56/W58 with DFS master)
- ◇ Ofcom
EN 300 328 (2.4GHz WLAN)
EN 301 893(W52/W53/W56/W58 with DFS master)
- ◇ EN62368-1
- ◇ EN 62311
- ◇ CE RoHS Directive

対応国 (Countries)

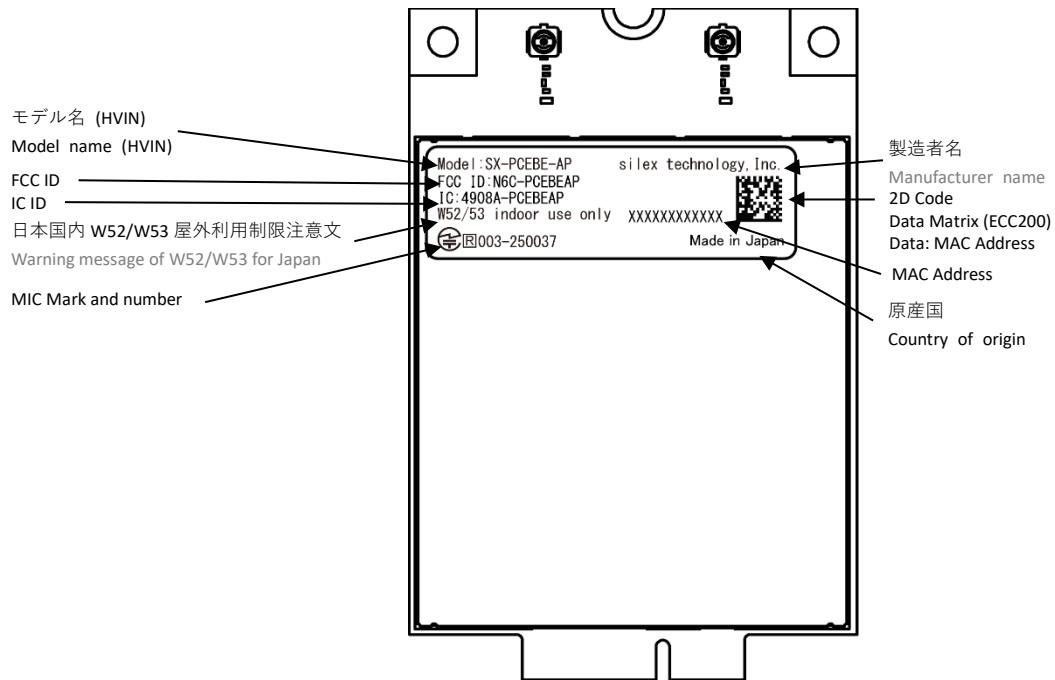
- Asia
 - ・ Japan
- North America
 - ・ US
 - ・ Canada
- EU
- United Kingdom

4. 機械的仕様 / Mechanical specifications



NOTE1:	特に記載が無い場合、寸法公差は $\pm 0.15\text{mm}$ All dimension tolerances are $\pm 0.15\text{mm}$ except specified.
NOTE2:	はんだ厚み = 0.1mm Solder thickness = 0.1mm

5. マーキング仕様 / Marking specifications



6. 使用上の注意 / Notifications

- ◇ 本製品の仕様は、§6. に掲げる法規制に適合していますが、以下の場合は仕様が変更になる可能性があります。
This module is compliant to the law regulations mentioning §6. But the contents may change at below conditions.
 - 1) §6.1 に掲げる国以外で使う場合。
In case this module is used in the different country from the list of §6.1
 - 2) §6.2 に掲げるアンテナ以外を使う場合。
In case this module is used with different antenna from the antenna list of §6.2
 - 3) 認可の更新が必要な場合。
In case the certification must be renewed.
- ◇ 本製品は一般電子機器への組込みを目的に設計された物であり、航空機器、原子力制御、高信頼性医療器、高信頼性セキュリティ器等、極めて高い水準の信頼性・品質を要求される機器への組込みを意図した物ではありません。**医療機器に組込む際は医療機器クラスに関係なく弊社営業までお問い合わせください。**
This module has been designed for being embedded in the general electric devices, not in the extremely reliable demands like aircraft instruments, nuclear control instruments, high reliable medical instruments (Class III, IV), high reliable security instruments or any other such devices.
In the case of being embedded in the medical instruments, please ask our sales reps regardless of the medical class.
- ◇ 本製品は電波を媒体として通信を行いますので、第三者への情報漏洩を防ぐ為にセキュリティに関する設定を実施いただく事を強く推奨します。
Because this module communicates through radio waves, it is highly recommended to set security system in order to prevent the information leak to third parties.
- ◇ 本製品は組込みを意図した無線装置です。本製品の機能、特性をご理解の上、組込み最終製品での評価をお願いいたします。又、本無線装置単品での EMC 測定は実施しておりませんので、本無線装置を組み込んだ製品形態での EMC 試験の実施、及び認可申請を行う必要があります。
This module is a radio module for embedded purpose. Please understand functions and features of this module, and evaluate as the final product which has this module embedded. Also, as evaluation of EMC conformity of this module has not been performed, EMC conformity evaluation and application must be performed with the final product which this module is embedded.
- ◇ 本製品が使用する無線帯域において、同一周波数帯を利用する装置への影響又は装置からの影響を受ける場合があります。設置においては事前に環境の調査を実施してください。
The wireless bands this module is using may affect the peripheral devices which use same bands and vice versa. When install them, please check the use environment in advance.

- ◇ 本製品について分解や改造を行うと電波法に基づいた処罰を受ける事があります。
There are cases in which you will be punished by the radio law if this module is disassembled or modified.
 - ◇ 本製品は端子や部品が露出した組込み用モジュールです。製品組込み時には静電気（本製品には静電気に弱い高周波デバイスを使用しております）や水滴、その他粉塵等には十分注意願います。
Some terminals and electric parts of this module are exposed. When embed this module in your products, should attract attention to ESD, condensing, and other dusts.
 - ◇ 周辺で同一周波数帯を使う他の無線機器を使う場合、以下に特に注意してください。
(IEEE802.11-2012 及び IEEE802.11ac-2013 参照)
In the case using the other wireless devices using same frequency band around this product, please take care below. (See IEEE802.11-2012 and IEEE802.11ac-2013)
- 1) 2.4GHz 帯では、本モジュールの中心周波数から $\pm 25\text{MHz}$ (5Ch) 以上の間隔をあけて使用することが推奨されます。
 $\pm 25\text{MHz}$ ($\pm 25\text{MHz}$) or more frequency separation from the center frequency of this module is recommended in 2.4GHz.
 - 2) 隣接チャネル及び非隣接チャネルの信号入力には十分注意して、混信を避ける環境を設定してください。
Appropriate environment to avoid interference from the adjacent channels or the non-adjacent channels is necessary.
- 2.4GHz 隣接チャネル：中心周波数 $\pm 25\text{MHz}$ (5Ch), 非隣接チャネル：中心周波数 $\pm 30\text{MHz}$ (6Ch)以上
2.4GHz: Center frequency $\pm 25\text{MHz}$ (5Ch), Non Adjacent channel: Further than Center frequency $\pm 30\text{MHz}$ (6Ch)
- 5GHz HT20 隣接チャネル：中心周波数 $\pm 20\text{MHz}$ (4Ch), 非隣接チャネル：中心周波数 $\pm 40\text{MHz}$ (8Ch)以上
5GHz HT20: Center frequency $\pm 20\text{MHz}$ (4Ch), Non Adjacent channel: Further than Center frequency $\pm 40\text{MHz}$ (8Ch)
- 5GHz HT40 隣接チャネル：中心周波数 $\pm 40\text{MHz}$ (8Ch), 非隣接チャネル：中心周波数 $\pm 80\text{MHz}$ (16Ch)以上
5GHz HT40 Adjacent channel: Center frequency $\pm 40\text{MHz}$ (8Ch), Non Adjacent channel: Further than Center frequency $\pm 80\text{MHz}$ (16Ch)
- 5GHz HT80 隣接チャネル：中心周波数 $\pm 80\text{MHz}$ (16Ch), 非隣接チャネル：中心周波数 $\pm 160\text{MHz}$ (32Ch)以上
5GHz HT80 Adjacent channel: Center frequency $\pm 80\text{MHz}$ (16Ch), Non Adjacent channel: Further than Center frequency $\pm 160\text{MHz}$ (32Ch)
- 5GHz HT160 隣接チャネル：中心周波数 $\pm 160\text{MHz}$ (32Ch), 非隣接チャネル：中心周波数 $\pm 320\text{MHz}$ (64Ch)以上
5GHz HT160 Adjacent channel: Center frequency $\pm 160\text{MHz}$ (32Ch), Non Adjacent channel: Further than Center frequency $\pm 160\text{MHz}$ (64Ch)
- ※上記の条件外であっても、強い電波入力がある場合は混信する可能性があるので、周辺の無線機器は十分距離を離してご使用ください。
Even if these conditions is satisfied, the module is possibly interfered when strong signal is input. The other wireless system should be enough far from this module
- ◇ 対向機からの入力は、アンテナゲインを含み 2.4GHz 帯で -20dBm 以下、5GHz 帯で -30dBm 以下としてください。
The input level from the opponent device must be -20dBm or less at 2.4GHz, -30dBm or less at GHz with including antenna gain.

Federal Communication Commission 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 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.

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

Operations in the 5.15-5.25GHz 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.

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 20 cm between the radiator & your body.

FCC Notice;

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 Part 15.247, Part 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.	Antenna Type	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Cable Length	Connector Type
1	Dipole	Molex	146153	3.175	2.4-2.4835GHz	50mm	ipex(MHF)
				3.175	5.15-5.25GHz		
				2.975	5.25-5.35GHz		
				4.275	5.47-5.725GHz		
				3.775	5.725-5.85GHz		
2	Dipole	Unictron	AA258 (H2B1PC1A1Cxxxx)	2.67	2.4-2.4835GHz	50mm	ipex(MHF)
				3.22	5.15-5.25GHz		
				3.91	5.25-5.35GHz		
				2.82	5.47-5.725GHz		
				3.97	5.725-5.85GHz		
3	Monopole	Taoglas	GW.05.0153	2.8	2.4-2.4835GHz	-	RP-SMA(M)
4	Monopole	Taoglas	WS.03.B.305151 300x300mm plate	3.23	5.15-5.25GHz	1m+200mm	RP-SMA(M)
				3.85	5.25-5.35GHz	200mm	
				3.34	5.47-5.725GHz	113mm	
				3.32	5.725-5.85GHz	113mm	
				2.7	2.4-2.4835GHz	200mm	
5	PIFA	PANORAMA ANTENNAS	6001535 (differently colored: 6001536) WiFi 1	3.2	5.15-5.25GHz	1m+300mm	ipex(MHF)
				3.9	5.25-5.35GHz	1m+200mm	
				4.3	5.47-5.725GHz	113mm	
				3.4	5.725-5.85GHz	113mm	
				3.2	2.4-2.4835GHz	300mm	
6	PIFA	PANORAMA ANTENNAS	6001535 (differently colored: 6001536) WiFi 2	3.2	5.15-5.25GHz	1m+200mm	ipex(MHF)
				3.5	5.25-5.35GHz	1m+200mm	
				4.2	5.47-5.725GHz	113mm	
				3.6	5.725-5.85GHz	200mm	

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following: "Contains FCC ID: **N6C-PCEBEAP**". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

FCC CAUTION

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

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.

2.11 Note EMI Considerations

We recommend to use "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties. The host manufacturer is responsible for ensuring compliance with the applicable FCC rules for the transmitters operating individually and simultaneously. This includes compliance for the summation of all emissions from all outputs occupying the same or overlapping frequency ranges, as defined by the applicable rules.

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:

Yukinari Shibuya : shibuya@silex.jp

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.

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.

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.

OEM/Host manufacturer responsibilities

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

Prohibited for control of or communications with unmanned aircraft systems, including drones.

Innovation, Science and Economic Development Canada statement:

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause interference.
2. This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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'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 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; (detachable antenna only)
- (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; (detachable antenna only)
- (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; (detachable antenna only)**
- (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; (detachable antenna only)**

(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

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 20 cm 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 considérée 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 FOR MOBILE DEVICE USAGE (>20cm/low power)

This transmitter module is authorized only for use in device where the antenna may be installed and operated with greater than 20 cm between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains IC:4908A-PCEBEAP".

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: 4908A-PCEBEAP".

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.

Label and compliance information

The following information must be indicated on the host device of this module.

Les informations suivantes doivent être indiquées sur le périphérique hôte de ce module.

Contains Transmitter Module IC: 4908A-PCEBEAP

Or

Contains IC: 4908A-PCEBEAP

Operation in the band 5150-5350 MHz

Operation in the band 5150-5350 MHz is only for indoor use to reduce the potential for harmful interference to cochannel mobile satellite systems.

La bande 5150-5350 MHz est 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.

Data transmission

Data transmission is always initiated by software, which is then passed down through the MAC, through the digital and analog baseband, and finally to the RF chip. Several special packets are initiated by the MAC. These are the only ways the digital baseband portion will turn on the RF transmitter, which it then turns off at the end of the packet.

Therefore, the transmitter will be on only while one of the aforementioned packets is being transmitted. In other words, this device automatically discontinues transmission in case of either absence of information to transmit or operational failure.

La transmission des données est toujours initiée par le logiciel, puis les données sont transmises par l'intermédiaire du MAC, par la bande de base numérique et analogique et, enfin, à la puce RF. Plusieurs paquets spéciaux sont initiés par le MAC. Ce sont les seuls moyens pour qu'une partie de la bande de base numérique active l'émetteur RF, puis désactive celui-ci à la fin du paquet. En conséquence, l'émetteur reste uniquement activé lors de la transmission d'un des paquets susmentionnés. En d'autres termes, ce dispositif interrompt automatiquement toute transmission en cas d'absence d'information à transmettre ou de défaillance.

RF exposure considerations

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20cm or more away from person's body.

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

Antenna Type

This radio transmitter (4908A-PCEBEAP) 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.

Antenna No.	Antenna Type	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Cable Length	Connector Type
1	Dipole	Molex	146153	3.175	2.4-2.4835GHz	50mm	ipex(MHF)
				3.175	5.15-5.25GHz		
				2.975	5.25-5.35GHz		
				4.275	5.47-5.725GHz		
				3.775	5.725-5.85GHz		
2	Dipole	Unictron	AA258 (H2B1PC1A1Cxxxx)	2.67	2.4-2.4835GHz	50mm	ipex(MHF)
				3.22	5.15-5.25GHz		
				3.91	5.25-5.35GHz		
				2.82	5.47-5.725GHz		
				3.97	5.725-5.85GHz		
3	Monopole	Taoglas	GW.05.0153	2.8	2.4-2.4835GHz	-	RP-SMA(M)
4	Monopole	Taoglas	WS.03.B.305151 300x300mm plate	3.23	5.15-5.25GHz	1m+200mm	RP-SMA(M)
				3.85	5.25-5.35GHz	200mm	
				3.34	5.47-5.725GHz	113mm	
				3.32	5.725-5.85GHz	113mm	
5	PIFA	PANORAMA ANTENNAS	6001535 (differently colored: 6001536) WiFi 1	2.7	2.4-2.4835GHz	200mm	ipex(MHF)
				3.2	5.15-5.25GHz	1m+300mm	
				3.9	5.25-5.35GHz	1m+200mm	
				4.3	5.47-5.725GHz	113mm	
				3.4	5.725-5.85GHz	113mm	
6	PIFA	PANORAMA ANTENNAS	6001535 (differently colored: 6001536) WiFi 2	3.2	2.4-2.4835GHz	300mm	ipex(MHF)
				3.2	5.15-5.25GHz	1m+200mm	
				3.5	5.25-5.35GHz	1m+200mm	
				4.2	5.47-5.725GHz	113mm	
				3.6	5.725-5.85GHz	200mm	

Le présent émetteur radio (4908A-PCEBEAP) 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.

Antenne No.	Type d'antenne	Marque	Modèle	Antenne Net Gain(dBi)	Gamme de fréquences	Longueur du câble	Type de connecteur
1	Dipole	Molex	146153	3.175	2.4-2.4835GHz	50mm	ipex(MHF)
				3.175	5.15-5.25GHz		
				2.975	5.25-5.35GHz		
				4.275	5.47-5.725GHz		
				3.775	5.725-5.85GHz		
2	Dipole	Unictron	AA258 (H2B1PC1A1Cxxxx)	2.67	2.4-2.4835GHz	50mm	ipex(MHF)
				3.22	5.15-5.25GHz		
				3.91	5.25-5.35GHz		
				2.82	5.47-5.725GHz		
				3.97	5.725-5.85GHz		
3	Monopole	Taoglas	GW.05.0153	2.8	2.4-2.4835GHz	-	RP-SMA(M)
4	Monopole	Taoglas	WS.03.B.305151 300x300mm plate	3.23	5.15-5.25GHz	1m+200mm	RP-SMA(M)
				3.85	5.25-5.35GHz	200mm	
				3.34	5.47-5.725GHz	113mm	
				3.32	5.725-5.85GHz	113mm	
5	PIFA	PANORAMA ANTENNAS	6001535 (differently colored: 6001536) WiFi 1	2.7	2.4-2.4835GHz	200mm	ipex(MHF)
				3.2	5.15-5.25GHz	1m+300mm	
				3.9	5.25-5.35GHz	1m+200mm	
				4.3	5.47-5.725GHz	113mm	
				3.4	5.725-5.85GHz	113mm	
6	PIFA	PANORAMA ANTENNAS	6001535 (differently colored: 6001536) WiFi 2	3.2	2.4-2.4835GHz	300mm	ipex(MHF)
				3.2	5.15-5.25GHz	1m+200mm	
				3.5	5.25-5.35GHz	1m+200mm	
				4.2	5.47-5.725GHz	113mm	
				3.6	5.725-5.85GHz	200mm	

ISED PMN : Embedded wireless module