

User Manual

- **Product Name: Wi-Fi 7 BE5000 M.2 card**
- **Model Name: PCE3310M**
- **FCC ID: U2M-PCE3310M**

1. Hardware Design Specification

PCE3310M is a Wi-Fi 7 dual-band module with M.2 interface to engine 2.4GHz EHT40 and 5GHz EHT160. Power by Mediatek SoC MT7991AV and RFIC MT7976CN with internal PA and LNA.

1.1 Major Components

SKUs		PCE3310M
Main Chip	Radio	MT7991AV
	2.4GHz Transceiver +iPA	MT7976CN
	5GHz Transceiver +iPA	MT7976CN
	Zero Wait DFS	Support
RF components	2.4GHz FEM	N/A
	5GHz FEM	N/A
	WIPS FEMs	N/A
	2.4GHz Filter	BF2012-L2R4NCAT/LF x 2
	5GHz Filter	BF1608-N5R5NANT/LF x 3
	Diplexer (2.4GHz/5GHz)	LFD182G45DCJD949 x2

1.2 Wi-Fi Specification (2.4GHz/5GHz)

Based on the transmit power (Tx) and receive sensitivity (Rx) specifications of MT7976CN, we conclude Tx power from chips and summarize Rx specification as the following table.

Radio	2.4GHz	5GHz
Data Rate	688Mbps	4323Mbps
Available Bandwidth	20/40MHz	20/40/80/160MHz
Adopted FEM	iPA	iPA
Available frequency	2412-2483.5MHz	5150-5850MHz
Transmit Power @ antenna port	12-19dBm	10-18dBm
Receive Sensitivity	-60~-94dBm	-48~-88dBm

1.3 Power Consumption

The max power consumption is around 8W.

PCB Dimensions/Layers.

PCE3310M	Dimension/Layer	49.3 x 53 x 0.8 mm / 6 layers
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1.4 Support driver

PCE3310M is an integrated module on the customer's system board. The selected SDK or driver would be discussed and be negotiated first.

According to initial validation from Seano, we successfully brought up this module on MT7988AV platform.

1.5 Compliant Regulatory

The planned certification domain would be covered following regulatory.

1.5.1 Tier 1 Compliant Regulatory

Countries/Regions	RF Standards	EMC Standards	Safety Standards
USA	OET Bulleting 65/Part 2.1093 FCC Part 15.247 FCC Part 15.407	FCC Part 15, Subpart B Class B	N/A
EU	EN 300 328 v2.2.2 EN 300 440 EN 301 893 v2.1.1 EN 50385: 2017 EN 301 489-1/-17 v3.1.1	CISPR 32:2012 EN55032:2012 CISPR 24:2010 EN55024:2010 EN55035	N/A

2. Warning statements

FCC

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 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 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 complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 41cm between the radiator & your body.

This device is restricted to indoor use.

Information for OEMs and host integrators

The OEM or integrator is obligated to adhere to these requirements and restrictions as a condition for using the module's certification. The OEM or integrator is responsible to perform the required additional host regulatory testing and/or obtaining the required host approvals for compliance.

This module is intended for OEM integrators under the following conditions:

This module is only FCC authorized for the specific rule parts 15.407, 15.247 listed on the grant, and the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host product as being Part 15 Subpart B compliant.

The host product manufacturer must provide following statement in end-product manuals.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 41cm between the radiator & your body.

This module has been approved to operate with the antenna types listed below, with the maximum permissible gain indicated.

Antenna List

No.	Type	Peak Gain	Connector	MFG	Part No.
1	Dipole	4 dBi for 2400~2500MHz 5.5 dBi for 5150~5850MHz	Reverse SMA	AWAN	7102A0558000
2	PIFA	4.3 dBi for 2400~2500MHz 5.09 dBi for 5150~5850MHz	I-Pex	Enrack	7102A1341000

This module is restricted to integration into hosts for indoor use only.

OEM integrator has be limited the operation channels in channel 1-11 for 2.4GHz band.

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

If any changes or modifications need to be made to the integrated product, such as adding or adjusting the antenna or cable, follow the guidelines provided by Grantee.

For further assistance, please contact: Antony.Wu Antony.Wu@senao.com

The user manual of the end product should include (information for OEMs)

The module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

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

The antenna(s) used for this transmitter must not transmit simultaneously with any other antenna or transmitter.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 41 cm from all persons.

This device is restricted to indoor use.

Label of the end product:

The host product must be labeled in a visible area with the following " Contains FCC ID: U2M-PCE3310M ".

The end product shall bear the following 15.19 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.

ISED

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.**

This radio transmitter [IC: 3616C-PCE3310M] 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 List

No.	Type	Peak Gain	Connector	MFG	Part No.
1	Dipole	4 dBi for 2400~2500MHz 5.5 dBi for 5150~5850MHz	Reverse SMA	AWAN	7102A0558000
2	PIFA	4.3 dBi for 2400~2500MHz 5.09 dBi for 5150~5850MHz	I-Pex	Enrack	7102A1341000

Le présent émetteur radio [IC: 3616C-PCE3310M] 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.

This device is restricted to indoor use.

IC Radiation Exposure Statement:

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 23cm between the radiator & your body.

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 23cm de distance entre la source de rayonnement et votre corps.

OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Modular OEM Integrator Notice

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed such that 23 cm may be maintained between the antenna and users. The final end product must be labeled in a visible area with the following: "Contains transmitter module IC: 3616C-PCE3310M".

Contient le module d'émission IC: 3616C-PCE3310M

The Host Model Number (HMN) must be indicated at any location on the exterior of the end product or product packaging or product literature which shall be available with the end product or online.

This device is restricted to indoor use.

IMPORTANT NOTE for OEM integrator:

This module is intended for OEM integrator.

The OEM integrator is still responsible for

1. ensuring that the end-user has no manual instructions to remove or install module
2. the ISED compliance requirement of the end product, which integrates this module.
3. Appropriate measurements and if applicable additional equipment authorizations of the host device to be addressed by the integrator/manufacture.

4. The separate approval is required for all other operating configurations, including portable configurations and different antenna configurations

Antenna List

No.	Type	Peak Gain	Connector	MFG	Part No.
1	Dipole	4 dBi for 2400~2500MHz 5.5 dBi for 5150~5850MHz	Reverse SMA	AWAN	7102A0558000
2	PIFA	4.3 dBi for 2400~2500MHz 5.09 dBi for 5150~5850MHz	I-Pex	Enrack	7102A1341000