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The future is cool.

ABR-WM01-MXX Series

User manual

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WARNING - NCC

NCC
警語

此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，並要求平台廠商於平台上標示或相似含意的標示

根據 NCC LP0002低功率射頻器材技術規範 章節3.8.2：

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。

『內含發射器模組：  CCXXxxLPyyyZzW』

WARNING - FCC

FCC

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.

Federal Communications Commission (FCC) Statement

15.105(b)

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.

15.21

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

FCC RF Radiation Exposure Statement:

- 1.This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- 2.This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

WARNING - IC

IC	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, and 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, et 2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement. Caution: Exposure to Radio Frequency Radiation 1.To comply with the Canadian RF exposure compliance requirements, this device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter. 2.To comply with RSS 102 RF exposure compliance requirements, a separation distance of at least 20 cm must be maintained between the antenna of this device and all persons. Attention: exposition au rayonnement radiofréquence 1.Pour se conformer aux exigences de conformité RF canadienne l'exposition, cet appareil et son antenne ne doivent pas être co-localisés ou fonctionnant en conjonction avec une autre antenne ou transmetteur. 2.Pour se conformer aux exigences de conformité CNR 102 RF exposition, une distance de séparation d'au moins 20 cm doit être maintenue entre l'antenne de cet appareil et toutes les personnes.
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Required End Product Labeling

Any device incorporating this module must include an external, visible, permanent marking or label which states: “Contains FCC ID: 2A7B5-MX2” and “Contains IC : 29413MX2”

Obligation d'étiquetage du produit final:

Tout dispositif intégrant ce module doit comporter un externe, visible, marquage permanent ou une étiquette qui dit: "Contient IC : 29413MX2”

Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

FCC

This module has been tested and found to comply with the following requirements for Modular Approval.

- Part 15.247 - Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

Test Modes

This device uses various test mode programs for test set up which operate separate from production firmware. Host integrators should contact the grantee for assistance with test modes needed for module/host compliance test requirements.

Antennas

The following external antenna type have been approved for use with this radio transmitter.

Radio	Antenna Type	Freq. (MHz)	Max. Peak Antenna Gain (dBi)
Bluetooth	Dipole	2402-2480	3.31 dBi

Antennas

This radio transmitter (IC: 2A7B5-MX2, HVIN: ABR-WM01-MKE, ABR-WM01-M) 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.

Antennes

Cet émetteur radio (IC: 2A7B5-MX2, HVIN: ABR-WM01-MKE, ABR-WM01-M) a été approuvé par Industrie Canada pour fonctionner avec les types d'antenne énumérés ci-dessous avec le gain maximal admissible indiqué . types d'antennes non inclus dans cette liste , ayant un gain supérieur au gain maximum indiqué pour ce type , sont strictement interdits pour une utilisation avec cet appareil.

Radio	Antenna Type	Freq. (MHz)	Max. Peak Antenna Gain (dBi)
Bluetooth	Dipole	2402-2480	3.31



ABR-WM01-MKE

ARM Cortex-M33 secure processor core with Bluetooth/Thread/Zigbee wireless technology, 512KB SRAM, 1MB Flash with 2MB QSPI external Flash was built-in M.2 KEY E module with DC/DC power system inside.

Wireless Technology	Main Feature	Core Processor & Embedded System
- Wireless: Bluetooth Low Energy, ANTTM, and 802.15.4 for, among others, Thread and Zigbee protocols. It also allows the implementation of proprietary 2.4 GHz protocols. - RF Power for application (max) - EIRP: < 9.8 dBm - TX: < +6.5dBm	- Operation Temperature: -40 ~ + 105°C - Built-in 2MB QSPI Flash support data log or DFU function - Built-in RC RT Crystal, or external 32.768KHz - NCC/CE/FCC/IC/TELEC/NBTC/Bluetooth CERTIFICATION - Wireless Technology Supported: - Bluetooth5/Thread/Zigbee - Support Bluetooth Mesh - Bluetooth Long Range Mode	- ARM Cortex-M33 DUAL CORE - Application Core – 128/64Mhz - Network Core – 64Mhz - APP CORE Data Buffer - 1MB Flash + 512KB SRAM + 2MB QSPI Flash - NET CORE Data Buffer - 256 KB Flash + 64 KB RAM - Arm TrustZone CryptoCellTM-312 security subsystem - GPIO: 45 Configurable Pins - OS: ZephyrOS
Power Information for Low Power Usage	Interfaces	Package Type
- Input VCC: 2.7 ~ 3.6V with regulator build-in - nRF5340 core 0.9uA in System OFF 1.3uA in System ON 1.5uA in System ON with network core RTC running 1.7uA in System ON with 64KB network core RAM retained and network core RTC running - FEM – < 1uA in Sleep Mode - QSPI Flash - < 1uA in Power-down	- USB 12 bits ADC - SPI - I2C - I2S - PDM - UART - PWM	22 x 30 x 3.6 mm - M.2 KEY E Form





ABR-WM01-M

ARM Cortex-M33 secure processor core with Bluetooth/Thread/Zigbee wireless technology, 512KB SRAM, 1MB Flash with 2MB QSPI external Flash was built-in module with $-40 \sim +105^{\circ}\text{C}$ operation temperature with DC/DC power system inside.

Wireless Technology	Main Feature	Core Processor & Embedded System
- Wireless: Bluetooth Low Energy, ANTTM, and 802.15.4 for, among others, Thread and Zigbee protocols. It also allows the implementation of proprietary 2.4 GHz protocols. - RF Power for application (max) - EIRP: < 9.8 dBm - TX: < +6.5dBm	- Operation Temperature: $-40 \sim +105^{\circ}\text{C}$ - Built-in 2MB QSPI Flash support data log or DFU function - Built-in RC RT Crystal, or external 32.768KHz - NCC/CE/FCC/IC/TELEC/NBTC/Bluetooth CERTIFICATION - Wireless Technology Supported: - Bluetooth5/Thread/Zigbee - Support Bluetooth Mesh - Bluetooth Long Range Mode	- ARM Cortex-M33 DUAL CORE - Application Core – 128/64Mhz - Network Core – 64Mhz - APP CORE Data Buffer - 1MB Flash + 512KB SRAM + 2MB QSPI Flash - NET CORE Data Buffer - 256 KB Flash + 64 KB RAM - Arm TrustZone CryptoCellTM-312 security subsystem - GPIO: 39 Configurable Pins - OS: ZephyrOS
Power Information for Low Power Usage	Interfaces	Package Type
- Input VCC: 2.7 ~ 3.6V with regulator build-in - nRF5340 core 0.9uA in System OFF 1.3uA in System ON 1.5uA in System ON with network core RTC running 1.7uA in System ON with 64KB network core RAM retained and network core RTC running - FEM – < 1uA in Sleep Mode - QSPI Flash - < 1uA in Power-down	- USB 12 bits ADC - SPI - I2C - I2S - PDM - UART - PWM	12 x 16 x 2.0 mm - M.2 LGA Form

