



WIFI+BT Module

IEEE 802.11 a/b/g/n/ac/ax 2T/2R

Model Number: WXT2FM2511

Product Description

The WXT2FM2511 is a complete 2.4GHz/5GHz/6GHz WIFI 2×2 MIMO module. This module provides a high level of integration with a dual-stream IEEE 802.11ax MAC/ base band /radio and Bluetooth 5.2.The WLAN operation supports 20MHz,40MHz and 80MHz channels for data rates up to 1201Mbps. It fully complies with IEEE 802.11 a/b/g/n/ac/ax feature rich wireless connectivity at high standards,delivers reliable,cost-effective, throughput from an extended distance.

Product Features

- ◆ Complies with IEEE 802.11b/g/n/ax for 2.4GHz, IEEE 802.11a/n/ac/ax for 5GHz, IEEE 802.11ax for 6GHz Wireless LAN.
- ◆ Bluetooth v5.2
- ◆ Two transmit and Two receive path(2T2R)
- ◆ Works with all existing network infrastructure.
- ◆ Capable of up to 128-Bit WEP Encryption.
- ◆ Freedom to roam while staying connected.
- ◆ UP to 1201 Mbps High-Speed Transfer Rate in 802.11ax mode of operation.
- ◆ Operating Systems: Linux, Win10, Win11.
- ◆ Low power consumption.
- ◆ Easy to install and configure.

Product Specification

Model	WIFI+BT Module
Product Name	WXT2FM2511
Standard	802.11 a/b/g/n/ac/ax
Interface	USB
Data Transfer Rate	1,2,5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 1201Mbps
Modulation Method	GFSK,n/4-DQPSK,8DPSK(bluetooth) DQPSK,DBPSK,CCK(802.11b) QPSK,BPSK,16QAM,64QAM with OFDM (802.11g) QPSK,BPSK,16QAM,64QAM with OFDM (802.11n) QPSK,BPSK,16QAM,64QAM with OFDM (802.11a) QPSK,BPSK,16QAM,64QAM,256QAM with OFDM (802.11ac) QPSK,BPSK,16QAM,64QAM,256QAM,1024QAM with OFDMA (802.11ax)
Frequency Band	BLUETOOTH 2402~2480 MHz WIFI 2.4G: 2412~2462 MHz 5G: 5150~5350MHz, 5470~5725MHz, 5725~5850MHz 6G: 5925~7125MHz
Operation Mode	Infrastructure
Security	WEP, TKIP, AES, WPA, WPA2
Operating Voltage	5V±10%
Current Consumption	<1000mA
Antenna Type	PIFA
Operating Temperature	0 ~ 70°C ambient temperature
Storage Temperature	-40 ~ 80°C ambient temperature
Humidity	5 to 95 % maximum (non-condensing)





NOTICE:

- ◆ please keep this product and accessories attached to the places which children can't touch;
- ◆ do not splash water or other liquid onto this product, otherwise it may cause damage;
- ◆ do not put this product near the heat source or direct sunlight, otherwise it may cause deformation or malfunction;
- ◆ please keep this product away from flammable or naked flame;
- ◆ please do not repair this product by yourself. Only qualified personnel can be repaired.

FCC Statement

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.

This equipment 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.

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

The module is limited to OEM installation ONLY.

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

2.6

The module is limited to installation in mobile application. Host device must be operated a minimum of 20cm between people.

Here are two types of instruction for RF exposure:

- 1;The host product which the module installed shall be mobile application.
- 2; The end user manual shall be provide additional text from the host product manufacturer to end users, It shall include FCC compliance statements related to the transmitter or labeling requirements.If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).

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

2.4

The module complies with FCC Part 15.247 / Part 15.407 and apply for Single module approval.

2.5

Trace antenna designs: Not applicable.

Any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, require that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.



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

1. FCC regulations restrict the operation of this device to indoor use only.
2. The operation of this device is prohibited on oil platforms, cars, trains, boats, and aircraft, except that operation of this device is permitted in large aircraft while flying above 10,000 feet.
3. Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

The device must be professionally installed.

The intended use is generally not for the general public.

It is generally for industry/commercial use.

The connector is within the transmitter enclosure and can only be accessed by disassembly of the transmitter that is not normally required.

The user has no access to the connector.

Installation must be controlled.

Installation requires special training.

2.2

This module has been assessed against the following FCC rule parts: CFR 47 FCC Part 15 C (15.247, DTS and DSS) and CFR 47 FCC Part 15 E (NII). It is applicable to the modular transmitter.

The concrete contents to check are the following three points.

2.3

1. Antenna type is a PIFA with no more than 2 dBi gain at 2.4 GHz, 3 dBi gain at 5GHz and 4 dBi at 6GHz.
2. Should be installed so that the end user cannot modify the antenna
3. Feed line should be designed in 50ohm

Fine tuning of return loss etc. can be performed using a matching network.

The antenna shall not be accessible for modification or change by the end user.

Le contenu concret à vérifier sont les trois points suivants.

1. Une des trois antennes suivantes doit être utilisée.
 2. doivent être installés de façon que l'utilisateur final ne peut pas modifier l'antenne
 3. La ligne d'alimentation doit être conçue en 50ohm
- Le réglage précis de la perte de rendement, etc. peut être effectué en utilisant un réseau correspondant.



2.7

Antennas:

BLE

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2402-2480	PCB	1

BT

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2402-2480	PCB	1

2.4G wifi

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	PCB	3.1
2	2412-2462	PCB	3.1

5G wifi

Antenna No.	Frequency Band	Antenna Type	Max Antenna Gain (dBi)
1	5180 ~ 5825	PCB	4.17
2	5180 ~ 5825	PCB	4.17

Wifi 6E

Antenna No.	Frequency Band	Antenna Type	Max Antenna Gain (dBi)
1	5925 ~ 7125	PCB	4.7
2	5925 ~ 7125	PCB	4.7

Canada Statement

This radio transmitter 12290A-WXT2F 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 12290A-WXT2F 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 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.*

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

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;

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 RF, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

This radio transmitter IC : 12290A-WXT2F has been approved by FCC and 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 12290A-WXT2F 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.



The concrete contents to check are the following three points.

1. Antenna type is a PIFA with no more than 3.1 dBi gain at 2.4 GHz, 4.17 dBi gain at 5GHz and 4.7 dBi at 6GHz.
2. Should be installed so that the end user cannot modify the antenna
3. Feed line should be designed in 50ohm

Fine tuning of return loss etc. can be performed using a matching network.

The antenna shall not be accessible for modification or change by the end user.

Le contenu concret à vérifier sont les trois points suivants.

1. Le type d'antenne est pifa avec un gain ne dépassant pas 3.1 DBI à 2,4 GHz, 4.17 DBI à 5 GHz et 4.7 DBI à 6 GHz.
2. doivent être installés de façon que l'utilisateur final ne peut pas modifier l'antenne
3. La ligne d'alimentation doit être conçue en 50ohm

Le réglage précis de la perte de rendement, etc. peut être effectué en utilisant un réseau correspondant.

Antennas:

BLE

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2402-2480	PCB	1

BT

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2402-2480	PCB	1

2. 4G wifi

Antenna	Frequency (MHz)	Antenna Type	MAX Antenna Gain (dBi)
1	2412-2462	PCB	3.1
2	2412-2462	PCB	3.1

5G wifi

Antenna No.	Frequency Band	Antenna Type	Max Antenna Gain (dBi)
1	5180 ~ 5825	PCB	4.17
2	5180 ~ 5825	PCB	4.17

Wifi 6E

Antenna No.	Frequency Band	Antenna Type	Max Antenna Gain (dBi)
1	5925 ~ 7125	PCB	4.7
2	5925 ~ 7125	PCB	4.7



Notice to OEM integrator

Must use the device only in host devices that meet the FCC/ISED RF exposure category of mobile, which means the device is installed and used at distances of at least 20 cm from persons.

The end user manual shall include FCC Part 15 /ISED RSS GEN compliance statements related to the transmitter as show in this manual.

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B, ICES 003.

2.10

Any company of the host device which install this modular should perform the test of radiated & conducted emission and spurious emission etc. according to FCC Part 15C: 15.247 and 15.209 & 15.207, 15B class B requirement, only if the test result comply with FCC part 15C: 15.247 and 15.209 & 15.207, 15B class B requirement. Then the host can be sold legally.

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. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

2.9

Testing of the host product with all the transmitters installed – referred to as the composite investigation test- is recommended, to verify that the host product meets all the applicable FCC rules. The radio spectrum is to be investigated with all the transmitters in the final host product functioning to determine that no emissions exceed the highest limit permitted for any one individual transmitter as required by Section 2.947(f). The host manufacturer is responsible to ensure that when their product operates as intended it does not have any emissions present that are out of compliance that were not present when the transmitters were tested individually.

If the modular transmitter has been fully tested by the module grantee on the required number of channels, modulation types, and modes, it should not be necessary for the host installer to re-test all the available transmitter modes or settings. It is recommended that the host product manufacturer, installing the modular transmitter, perform some investigative measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits (e.g., where a different antenna may be causing additional emissions). The testing should check for emissions that may occur due to the intermixing of emissions with the other transmitters, digital circuitry, or due to physical properties of the host product (enclosure). This investigation is especially important when integrating multiple modular transmitters where the certification is based on testing each of them in a stand-alone configuration.

This modular transmitter is only FCC authorized for the specific rule parts (47CFR Part 15.247 and 15.407) 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.

Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.

The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual.

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

2.8

Please notice that if the FCC identification number is not visible when the module is installed inside the host device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label shall use the wording: **Contains FCC ID: 2AC23-WXT2F**

Please notice that if the ISED Canada certification number is not visible when the module is installed inside the host device device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label c hall use the wording: **Contains IC: 12290A-WXT2F**

Refer to the minimum antenna gain requirements and antenna type (PIFA) that are approved for use with this module detailed in the previous sections. Use of other antennas will require additional certification procedures for the host system with FCC and ISED Canada.



This equipment complies with FCC and ISED-Canada radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed in host systems that are installed and operated with a minimum distance of 20cm between the radiator & people. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter except as permitted by FCC and ISED-Canada multi-transmitter rules.

The module is limited to installation in mobile application.

For a normal application, for example, A television, host systems that are installed and operated with a minimum distance of 20cm between the radiator & people.

If the end-user really needed to install in host systems that are installed and operated with a distance less than 20cm between the radiator & people, for example, a cell phone or laptop, the host systems need to comply with the requirements in KDB 996369 D03 OEM Manual v01 and KDB 996369 D04 Module Integration Guide v02.

The module is not intended for general public, it must be professionally installed.

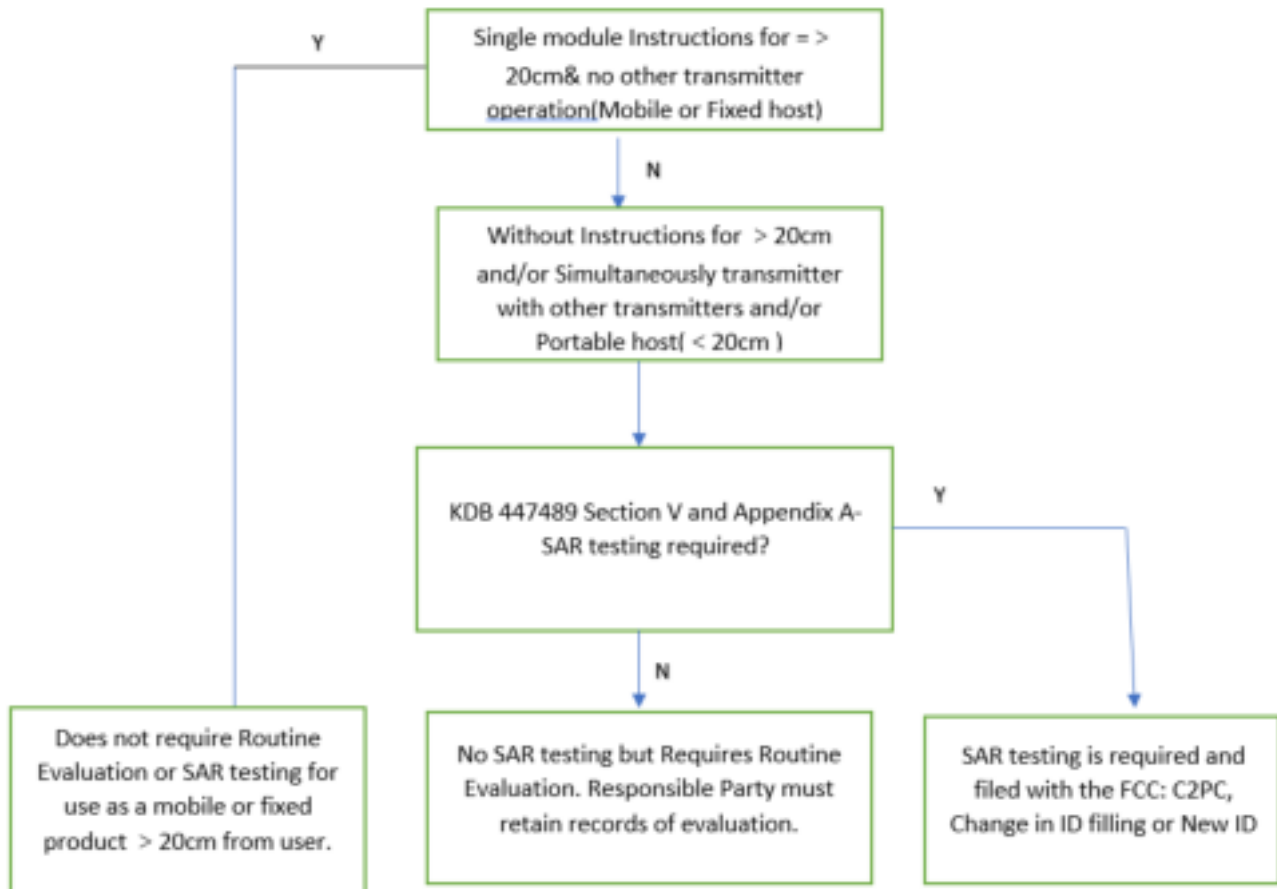
The typical application for the module:

Television	Monitor
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For other devices, A especial driver was need to be installed to the host before start normal use for the module, and it is different for difference kind of host.

Please contact us for more detail before installed to a host.

Here is a general guide to determine RF exposure compliance:





The end user manual shall include FCC Part 15 /ISED RSS GEN compliance statements related to the transmitter as shown below in addition to any other relevant statements or labeling requirements from e.g FCC Part 15 or the Canadian ICES standards.

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 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.*

To ensure compliance with FCC and ISED RF exposure requirements this device must be installed to provide a minimum of 20cm between the device and people.

Pour garantir la conformité aux exigences d'exposition RF de la FCC et d'ISED Canada, cet appareil doit être installé de manière à laisser un minimum de 20 cm entre l'appareil et les personnes.

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

Les dispositifs fonctionnant dans la bande de 5 150 à 5 250 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.

Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host according to FCC Part 15.247, RSS-247, RSS-248 and FCC part 15 E.

This modular transmitter is only FCC authorized for the specific rule parts (47CFR Part 15.247 and 15.407) 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 such as ICES-003 and FCC Part 15 B.

The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual.

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.