User manual

WLAN BT Module
Model Number: WXT2AM2101
EPSON

Product Descrition

The WXT2AM2101 is a complete dual-band(2.4GHz and 5GHz and 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 5.4.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 and IEEE 802.11a/n/ac/ax 5GHz Wireless LAN.and IEEE 802.11ax 6GHz Wireless LAN
- ◆ Bluetooth v5.4
- ◆ Two transmit and Two receive path(2T2R)
- ◆ Works with all existing network nfrastructure.
- ◆ 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,Win7, Win8, Win10,XP
- ◆ Low power consumption.
- ◆ Easy to install and configure.
- ◆ High speed USB 3.0 interface
- ◆ROHS compliant

Product Specification

Model	WXT2AM2101
Product Name	WLAN BT Module/ 無線局域網/藍牙設備
Standard	802.11 a /b/g/n/ac/ax
Interface	USB
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 1201Mbps
Modulation Method	GFSK,n/4-DQPSK,8DPSK(bluetooth) DSSS(802.11b) OFDM (802.11g) OFDM (802.11n) OFDM (802.11a) OFDM (802.11ac) OFDMA (802.11ax)
Frequency Band	BLUETOOTH 2402~2480 MHz WIFI 2.4G: 2412~2462 MHz 5G: 5150~5850MHz 6G: 5825 - 7.125GHz
Operation Mode	Infrastructure
Security	WEP, TKIP, AES, WPA, WPA2
Operating Voltage	DC 3.3V
Current Consumption	2A
Antenna Type	Ipex connect
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 Statements

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.

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

FCC Radiation Exposure Statement

The modular can be installed or integrated in mobile or fix devices only. This modular cannot be installed in any portable device, for example, USB dongle like transmitters is forbidden.
This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

If the FCC identification number is not visible when the module is installed inside another 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 can use wording such as the following: "Contains Transmitter Module FCC ID: BKMAE-WXT2AM Or Contains FCC ID: BKMAE-WXT2AM"

When the module is installed inside another device, the user manual of this device must contain below warning statements:
1. 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. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

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.
The end user manual shall include all required regulatory information/warning as shown in this manual, include:
This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

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.

Requirement per KDB996369 D03

2.2 List of applicable FCC rules

CFR 47 FCC PART 15 SUBPART C has been investigated. It is applicable to the modular transmitter.

2.3 Summarize the specific operational use conditions

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.
This radio transmitter BKMAE-WXT2AM have been approved by Federal Communications Commission 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. The concrete contents to check are the following three points.

1) Must use an antenna such as FPC Antenna with a gain not exceeding 4.65 dBi for WIFI and -1.01dBi for BT;

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. A modification to the antenna is required FCC/ISED Class II permissive change.
This device has been approved as mobile device in accordance with FCC and ISED Canada RF exposure requirements. This means that a restricted minimum separation distance of 20cm between the antenna and any person.
A change in use that involves a separation distance ≤20cm (Portable usage) between the Module's antenna and any persons is a change in the RF exposure of the module and, hence, is subject to a FCC Class 2 Permissive Change and a ISED Canada Class 4 Permissive Change policy in accordance with FCC KDB 996396 D01 and ISED Canada RSP-100.

2.4 Limited module procedures

The module is a single module, not applicable.

2.5 Trace antenna designs

The module has no tracking antenna be used, not applicable.

2.6 RF exposure considerations

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.
The host product shall show the same or similar statement to the end users in the end-product manuals.
If the module is installed to a host / end product with a used distance <20cm, additional SAR evaluation or measurement must be followed according to FCC KDB 447498 and RSS-102.
If the module is installed to a host / end product with multiple transmitters, additional RF exposure evaluation must be performed for the simultaneous transmission condition per FCC KDB 447498 and RSS-102. A Formula is also showed below:
The procedure rules are provided in 2.3 in this document. As the module manufacturer is still taking responsibility for the compliance of this module, if you have any changes mentioned above, you must advise and get the help from us with the contact information as shown below 2.12.

2.7 Antennas

This radio transmitter has been approved by Federal Communications Commission to operate with the antenna types listed below, with the maximum permissible gain indicated. FCC ID: BKMAE-WXT2AM
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.	Type of ANT A:	Type of ANT B:	Gain of the antenna(Max.)	Frequency range
Bluetooth	FPC Antenna	/	-1.01dBi	2400-2500MHz
2.4GWiFi	FPC Antenna	FPC Antenna	2.26dBi	2400-2500MHz
5GWiFi	FPC Antenna	FPC Antenna	4.62dBi	5.15 – 5.25GHz; 5.25 – 5.35GHz; 5.47 – 5.725GHz; 5.725 – 5.85GHz:
6GWiFi	FPC Antenna	FPC Antenna	4.65dBi	5825 - 7.125GHz

2.8 Label and compliance information

The final end product must be labeled in a visible area with the following" Contains FCC ID: BKMAE-WXT2AM".

2.9 Information on test modes and additional testing requirements

Host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host.
Additional testing requirements should be taking into account for different operating conditions for the transmitter function.
If this module is operated as a stand-alone modular in a host:

Radiated spurious emission per FCC Part 15.247, 15.249 and RSS247, RSS-210.

The host should be operated in all its normal mode with the modular transmitter active.

Please follow 2.11 in this document to obtain a best radio engineer design.

If this module is operated as multiple simultaneously transmitting modules in a host:

Foundation frequency power, Radiated spurious emission per FCC Part 15.249 and RSS-210. Conducted spurious emission and conducted power per FCC part 15.247 and RSS-247.

Please contact the modular manufacturer through the contact information shown below 2.12 to get the test software.

This module should be operated in transmitter mode with other transmitter for the simultaneous condition.

Please follow 2.11 in this document to obtain a best radio engineer design.

The procedure rules are provided in 2.3 in this document. As the module manufacturer is still taking responsibility for the compliance of this module, if you have any changes mentioned above, you must advise and get the help from us with the contact information as shown below 2.12.

2.10 Additional testing, Part 15 Subpart B disclaimer

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.

2.11 Note EMI Considerations
EMI consideration for transmitting simultaneously:
This module is stand-alone modular. If the end product has multiple certified modules integrated in a host and transmitting simultaneously: When after radiated emission testing, if there are no additional emissions generated due to simultaneous-transmission operations compared to single transmitter operations testing, it is not necessary to file the additional simultaneous transmission test data. FCC class II permissive changes is no necessary.
However, RF exposure for transmitting simultaneously also needed, please refer to 2.6 in this document.

To obtain better engineer design while installing this module:
It is recommended to place the module as close as possible to the edge of the baseplate. If conditions permit, make the antenna feed point closest to the edge of the baseplate. Please ensure that the module is not covered by any metal shell. Do not lay copper, wire, or place components in the antenna area of the module PCB.

2.12 How to make changes
Only the module grantee is permitted to make permissive changes. If the host integrator is expected to install the module in a way different from this manual or want to change the module, please contact:
Company: Seiko Epson Corporation
Address: 3-3-5 Owa Suwa-shi Nagano-Ken 392-8502, Japan
Email: murakami.yoshinobu@exc.epson.co.jp

CE Statement:

Frequency band:
Bluetooth: 2402MHz – 2480MHz
2.4G WIFI: 2412MHz – 2472MHz
5GWIFI: 5150MHz – 5250MHz, 5250MHz – 5350MHz, 5470MHz – 5725MHz, 5725MHz – 5850MHz,
6GWIFI: 5945 – 6425 MHz

RF Effective Isotropic Radiated Power, EIRP:
2.4GWIFI: EIRP<20dBm
Bluetooth: EIRP<20dBm
5GWIFI : 5150-5250MHz: EIRP<23dBm;
5250–5350MHz: EIRP<20dBm;
5470-5725MHz: EIRP<20dBm;

5725 – 5850MHz: EIRP<13.98dBm;
6GWIFI: 5945-6425MHz: EIRP<23dBm

This device complies with relevant RF radiation exposure limits when positioned at least 20cm away from your body.

The WLAN function for this device is restricted to indoor use only when operating in the 5150 to 5350 MHz frequency range.

	AT	BE	BG	CH	CY	CZ	DK	DE	EE	EL	ES	FI
	FR	HR	HU	IE	IS	IT	LI	LT	LU	LV	MT	NL
	NO	PL	PT	RO	SE	SI	SK	TR	UK(NI)			

	UK

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