LBEE5XV2EA User Manual for FCC

Model Name: LBEE5XV2EA

FCC ID: Z7AB7000

Since this module is not sold to general end users directly, there is no user manual of module. For the details about this module, please refer to the specification sheet of module. This module should be installed in the host device according to the interface specification (installation procedure) 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 end user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as shown in User manual.

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.

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

This device complies with below part 15 of the FCC Rules. Part 15 Subpart C Part 15 Subpart E.

Since there is no space which indicates FCC ID on this module, FCC ID is indicated in a manual. If the FCC ID is not visible when the module is installed inside another device, then the module is installed must also display a label referring to the enclosed module.

The modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, and 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.

This module designed for mounting inside of the end product by us professionally. Therefore, it complies with the antenna and transmission system requirements of §15.203

When the 6GHz capability built in,

FCC regulations restrict operation of this device to indoor use only. 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. Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

This manual is based on KDB 996369, which is designed to ensure that module manufacturer correctly communication the necessary information to host manufacturers that incorporate their modules.

INTEGRATION INSTRUCTIONS

1. General

   Sections 2 through 10 describe the items that must be provided in the integration instructions for host product manufacturers (e.g., OEM instruction manual) to use when integrating a module in a host product. This Modular transmitter applicant(Stryker) should include information in their instructions for all these items indicating clearly when they are not applicable.

2. List of applicable FCC rules

   This device complies with below part 15 of FCC Rules.

   Part 15 Subpart C

   Part 15 Subpart E

3. Summarize the specific operational use conditions : Applicable

   This module designed for mounting inside of the end product by us professionally. Therefore, it complies with the antenna and transmission system requirements of §15.203

4. Limited module procedures

   Since there is no space which indicates FCC ID on this module, FCC ID is indicated in a manual. If the FCC ID is not visible when the module is installed inside another device, then the module is installed must also display a label referring to the enclosed module.

5. Trace antenna designs

   Please perform the Trace antenna design that followed the specifications of the antenna.

   The concrete contents of a check are the following three points.

   - It is the same type as the antenna type of antenna specifications.
   - An antenna gain is lower than a gain given in antenna specifications. Measure the gain, and confirm the peak gain is less than the application value.
   - The emission level is not getting worse.

     Measure the spurious, and confirm degradation of less than 3dB than spurious value of worst of report used for the application.

     However it is spurious defined below. Please send those reports to Stryker

6. RF exposure considerations

   This equipment is only authorized for use in devices that are used at a distance of at least 20 centimeters between the RF source's radiating structure(s) and the body of the user or nearby persons.

   It is necessary to take a SAR test with your set mounting this module (except to use only Bluetooth). Class II permissive change application is necessary using the SAR report. Please contact Murata. And an application for a Class II permissive change from a Mobile equipment to a Portable equipment is also required

   Note:

   Portable equipment : Equipment for which the spaces between human body and antenna are used within 20cm. Mobile equipment : Equipment used at position in which the spaces between human body and antenna exceeded 20cm.

7. Antennas

Part number	Vendor	Peak Gain(dBi)			Type	Connector
		2.4GHz	5GHz	6GHz		
146153(50mm cable)	Molex	3.2	4.25	5.8	Dipole	u.FL
219611(50mm cable)	Molex	2.67	3.67	4.0	Dipole	u.FL
WT32D1-KX	Unictron	3.0	4.0	4.0	Dipole	u.FL
W24P-U	Invertek	3.2	N/A	N/A	Dipole	u.FL
Type2EA_Antenna	Murata	2.9	2.9	2.5	Monopole	Trace

- W24P-U can only be used at 2.4GHz
- Type2EA_Antenna can only be used for ANT0(Antenna Port0)

8. Label and compliance information

The following statements must be described on the user manual of the host device of this module;

Contains Transmitter Module FCC ID: Z7AB7000 or Contains FCC ID: Z7AB7000

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.

*If it is difficult to describe this statement on the host product due to the size, please describe in the User's manual.

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

Compliance with FCC requirement 15.407(c) Data transmission is always initiated by software, which is the 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 discontinue transmission in case of either absence of information to transmit or operational failure.

Frequency Tolerance: ±20 ppm

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

When this module being integrated in any finished product with 6GHz AP function, compliance according to KDB 987594 D01 must be ensured for equipment class 6ID by following measures.

FCC regulations restrict the operation of this device to indoor use only, a weatherized enclosure cannot be used. 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. Operation of transmitters in the 5.925-7.125 GHz band is prohibited for control of or communications with unmanned aircraft systems.

Only the integrated antennas specified in the section 7 of this manual is allowed, when changes of antenna is requested, please contact Murata as further verification by Class II application is required.

The finished product must be powered by a wired connection and not by battery power.

The host device must be labeled with “Contains FCC ID: Z7AB7000” alone with “Indoor Use Only”.

When installing it in a mobile equipment. Please describe the following warning to the manual.

This equipment is only authorized for use in devices that are used at a distance of at least 20 centimeters between the RF source's radiating structure(s) and the body of the user or nearby persons.

This module is only approval as a mobile equipment.

Therefore, do not install it on portable equipment.

If you wish to use it as a portable equipment, please contact Stryker in advance as Class Ⅱ application accompanied by SAR testing using the final product are required.

9. Information on test modes and additional testing requirements

   Please check the installation manual first. Please contact Murata if you have any questions when conducting the RF certification test on the host. We (Murata) are ready to present the control manual and others for the RF certification test.

10. 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 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.

11. Note EMI Considerations

    Note that a host manufacture is recommended to use KDB 996369 D04 Module Integration Guide recommending as "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. For standalone mode, reference the guidance in D04 Module Integration Guide and for simultaneous mode7; see D02 Module Q&A Question 12, which permits the host manufacturer to confirm compliance.

12. How to make changes

    When changing from the conditions of approval, please present technical documentation that it is equivalent to a Class 1 change. For example, when adding or changing an antenna, the following technical documents are required.

    - The document indicating the same type as the original antenna
    - Technical document showing that the gain is the same or lower than the gain at the time of the original approval
    - Technical document showing that the spurious is no more than 3 dB worse than when it was originally certified

About Power supply

Parameter		Min.	Typ.	Max.	unit
Supply Voltage	VBAT	3.0	3.3	4.8	V
	VDDIO	1.71	1.8	1.89	V

Trace antenna and feed line

About the signal line between an antenna and a module.

It is a 50-ohm line design. Fine tuning of return loss etc. can be performed using a matching network.

However, it is required to check "Class1 change" and "Class2 change" which the authorities define then.

The concrete contents of a check are the following three points.

- It is the same type as the antenna type of antenna specifications.
- An antenna gain is lower than a gain given in antenna specifications.
- The emission level is not getting worse.