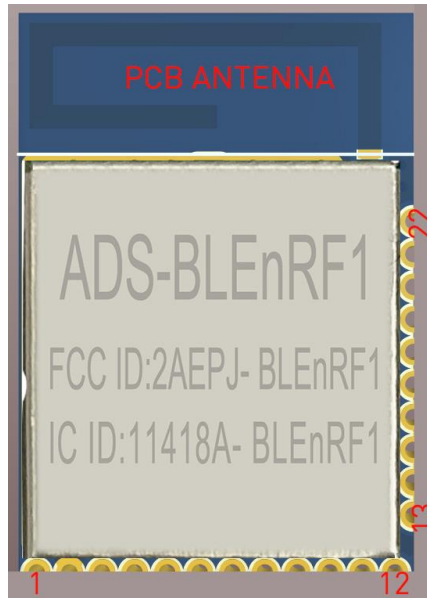


ADS-BLEnRF1 MANUAL



- Nordic nRF52832 with ARM Cortex M4F.
 - -96 dBm sensitivity
 - 2 Mbps Bluetooth low energy mode
 - 1 Mbps, 2 Mbps supported data rates
 - TX power -20 to +4 dBm in 4 dB steps
 - Single-pin antenna interface
 - 5.3 mA peak current in TX (0 dBm)
 - 5.4 mA peak current in RX
 - Integrated high performance PCB trace antenna:
 - Operation voltage: 1.7V to 3.6V
 - Operation temperature: -40 °C to +85 °C
- pin1- Rx (Data from antenna, 0-5 Volts)

pin#	pin name	pin#	pin name
1	3.3V	12	P0.08
2	GND	13	BLE_TX
3	P0.31	14	BLE_RX
4	P0.30	15	P0.13
5	Debug_tx	16	P0.14
6	Debug_rx	17	P0.15
7	EEPROM-SCK	18	P0.18
8	EEPROM-MOSI	19	P0.19
9	EEPROM-MISO	20	RESET
10	EEPROM-NPSC	21	BLE_SC
11	P0.07	22	BLE_SD

This equipment complies with the FCC RF 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 and any part of your body.

FCC 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.

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

Note: 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 Radiation Exposure Statement

This modular complies with FCC RF 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 and your body.

DONGGUAN PORTMAN ELECTRONIC SCIENCE AND TECHNOLOGY CO., LTD. /ADS-BLEnRF1-ANT2402MHz ~ 2480MHz:
-0.5dBi(declare by Applicant)

Compliance list INTEGRATION INSTRUCTIONS for 996369 D03 OEM the and 996369 D03 OEM by Sections 2.2 through 2.12.

Requirement	Yes	N/A	Comment
2.2 List of applicable FCC rules List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required. ³	YES		FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247
2.3 Summarize the specific operational use conditions Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual. In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.	YES		PCB antenna with antenna gain -0.5dBi
2.4 Limited module procedures If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with. The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions. A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum		N/A	Not applicable

<p>signaling amplitude, buffered modulation/data inputs, or power supply regulation. The alternative method could include that the limited module manufacturer reviews detailed test data or host designs prior to giving the host manufacturer approval.</p> <p>This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host. The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured. For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.</p>			
<p>2.5 Trace antenna designs</p> <p>For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces. The integration information shall include for the TCB review the integration instructions for the following aspects: layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.⁴</p> <p>a) Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);</p> <p>b) Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered);</p> <p>c) The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;</p> <p>d) Appropriate parts by manufacturer and specifications;</p> <p>e) Test procedures for design verification; and</p>		N/A	Not applicable

<p>compliance.</p> <p>The module grantee shall provide a notice that 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.</p>			
<p>2.6 RF exposure considerations</p> <p>It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person’s body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. 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).</p>	YES		<p>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.</p>
<p>2.7 Antennas</p> <p>A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni-directional antenna” is not considered to be a specific “antenna type”)).</p> <p>For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that</p>	YES		<p>PCB antenna with antenna gain -0.5dB</p>

unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.			
2.8 Label and compliance information Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating "Contains FCC ID" with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748 .	YES		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: 2AEPJ-BLENRF1 Or Contains FCC ID: 2AEPJ-BLENRF1 "
2.9 Information on test modes and additional testing requirements Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host. Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer's determination that a module as installed in a host complies with FCC requirements.	YES		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.
2.10 Additional testing, Part 15 Subpart B disclaimer The grantee should include a statement that 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	YES		Refer to instruction Any company of the host device which install this modular with limit modular approval should perform the test of radiated & conducted emission and spurious emission, etc. according to FCC part 15B : 15.107 and 15.109, 15B Class B requirement, Only if the test result comply with FCC part 15B : 15.107 and 15.109, 15B Class B requirement, then the host can be sold legally.

<p>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.</p>		<p>When the module is installed inside another device, the user manual of the host must contain below warning statements;</p> <p>Note: 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.</p> <p>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:</p> <ul style="list-style-type: none"> —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.
<p>2.11 Note EMI Considerations</p> <p>Note that a host manufacture is recommended to use 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</p> <p>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.</p>	<p>YES</p>	<p>Note: host manufacture is recommended to use 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</p> <p>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.</p>

<p>2.12 How to make changes</p> <p>Since . only Grantees are permitted to make permissive changes, it is recommended that module manufactures provide contact information and some guidance to host providers in the integration instructions if they expect their module will be used differently than granted.</p>	YES		only Grantees are permitted to make permissive changes.
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IC STATEMENT

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

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences

et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :

- (1) Cet appareil ne doit pas causer d'interférences.
- (2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

IC Radiation Exposure Statement

This modular complies with IC 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.

If the IC 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 IC: 11418A-BLENRF1"

when the module is installed inside another device, the user manual of this device must contain below warning

statements;

1. 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.

2. Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation,

Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :

- (1) Cet appareil ne doit pas causer d'interférences.
- (2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

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.