RF Module Specification And User Manual

1. Overall Introduction

Ths is a wireless module designed based on Nordic Semiconductor solution. The module include chip antenna, frequency on the 2.4GHz band. This module is have RF high output power、and support BLE function. Please see below of the feature:

- Based on the Nordic nRF52840-QIAA SoC
- Multiple protocol of BLE upon customer preference
- Low power requirements, Ultra-low peak, Average and idle mode power Consumption
- Compatible with a large installed based of mobiles phones, tablets and computers
- Fully coverage of wireless applications
- BLE transmission could help products to fit all operation system
- BLE could help products to fit all kinds of hardware

2. Specification

• 2.4 GHz transceiver,

- GFSK modulation
- Data whitening
- On-air data rates
- 125 kbps
- 250 kbps
- 1 Mbps
- 2 Mbps
- Transmitter with programmable output power of -20 dBm to +8 dBm, in 4 dB steps
- Transmitter whisper mode -30 dBm
- RSSI function (1 dB resolution)
- Receiver with integrated channel filters achieving maximum sensitivity
- -96 dBm at 125 / 250 kbps
- -93 dBm at 1 Mbps BLE
- -90 dBm at 1 Mbps
- -85 dBm at 2 Mbps

- Supply Voltage range 1.7V to 5.5V
- RF Synthesizer
- 1 MHz frequency programming resolution
- 1 MHz non-overlapping channel spacing at 1 Mbps, 125Kbps and 250 kbps
- 2 MHz non-overlapping channel spacing at 2 Mbps
- Baseband controller
- EasyDMA RX and TX packet transfer directly to and from RAM
- Dynamic payload length
- On-the-fly packet assembly/disassembly and AES CCM payload encryption
- 8 bit, 16 bit, and 24 bit CRC check (programmable polynomial and initial value)
  - •Dimension:

Length	Width	Height
18 ± 0.3mm	10 ± 0.3mm	1.95 ± 0.2mm

INTRODUCTION

Direct Test Mode is used to control the Device Under Test (DUT) and provides a report back to the Tester.

1. over HCI or
2. through a 2-wire UART interface

Each DUT shall implement one of the two Direct Test Mode methods in order to test purpose.

List of applicable FCC rules

FCC Part15C, 15.207, 15.209 , 15.247 and Part2.1093

Federal Communications Commission (FCC) Statement

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.

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 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 of the device.

FCC RF Radiation Exposure Statement:
This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
This equipment 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 20 centimeters between the radiator and your body.

Instructions to the OEM/Integrator:
The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished

product which states: “Contains transmitter module F CC ID: 2AI2V-ISBLE1810X52L”, Additionally, the following statement should be included on the label and in the final product’s 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 interferences, and (2) this device must accept any interference received, including interference that may cause undesired operation.”

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC certification if they meet the following conditions. Otherwise, additional FCC approvals must be obtained.

- The host product with the module installed must be evaluated for simultaneous transmission requirements.
- The users manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.
- OEM integrator /End product manufacturer must 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 end product can be sold legally
- The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.
- This Module is full modular approval, it is limited to OEM installation ONLY.
- The module is limited to installation in mobile application.
- A separate approval is required for all other operating configurations, including portable configurations with respect to Part 2.1093 and difference antenna configurations.
- The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- The Grantee will provide guidance to the Host Manufacturer for compliance with the Part 15B requirements if requested.
- To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed below table.

Fixed Print Antenna , 0 +/- 0.5 dBi
Ipex type detachable PIFA Antenna , 2.0 +/- 0.5 dBi
Ipex type detachable PCB Antenna , 2.0 +/- 0.5 dBi
Ipex type detachable Dipole Antenna , 4.5 +/- 0.5 dBi
The antennas above comply with FCC 15.203 requirements.
All type of antenna impedance is 50Ω