Bluetooth Module

Bluetooth Module Manual

Warranty period: 2 years
A/S: 1544-7777

1. INTRODUCTION

1.1 Overview

LCB-001 is a small size and low power module for Bluetooth with PCB antenna. LCB-001 use the nRF52810 solution(Nordic), and it can be applied to air solution, home appliances etc.

Nordic nRF52810 is a highly integrated single-chip low power Bluetooth network controller. It combines an ARM-Cortex M4 MCU, Bluetooth, and RF in a single chip. It also provides a bunch of configurable GPIOs which are configured as digital peripherals for different applications and control usage.
nRF52810 integrates internal memories for complete Bluetooth functions. The embedded memory configuration also provides simple application developments.

1.2 Key Features

Bluetooth LE
Supported data rates: 1 Mbps Bluetooth® low energy mode
Integrated PCB antenna
SIZE : 48mm x 20mm x 10mm
-90 dBm sensitivity in Bluetooth® low energy mode (2.4GHz)
-20 to +4 dBm TX power, configurable in 4 dB steps
On-chip balun (single-ended RF)
20 mA peak current in TX (4 dBm)
15 mA peak current in RX

3. ELECTRICAL SPECIFICATION

3.1 Absolute Maximum Ratings

Description	Min.	Typ	Max.	Unit
Storage Temperature	-30		+80	℃
Storage Humidity (40℃)			85	%

3.2 Operating conditions

Description	Min.	Typ	Max.	Unit
Supply Voltage	4.5		13.2	Vdc
Ambient Temperature	-20		+70	℃
Ambient Humidity (40℃)			85	%

3.3 Power Supply Voltages

Input power	Unit
VDD_5V	5V ± 0.5V
VDD_12V	12V ± 1.2V

3.4 Current Consumption

Device state	Code rate	Output power	Current consumption	
			Min	Max
ON_Transmit	BLE 4.2 / 1Mbps	4 dBm	12.0 mA	20.0 mA
Wake up (Advertising)	BLE 4.2 / 1Mbps	N/A	1.0 mA	1.5 mA
Sleep	BLE 4.2 / 1Mbps	N/A	0.2 mA	0.5 mA

3.5 Standard Rated Specification

Division	Characteristic
Host Interface	UART
Frequency Range	2.402GHz ~ 2.480GHz (2.4GHZ ISM)
Dimension	L x W x H : 48 x 20 x 10 (typical) mm
Spread Spectrum	FHSS (Frequency Hopping Spread Spectrum)
Data Rate	1 Mbps

3.6 Electrical Specifications for Bluetooth (Radiation TEST)

TX characteristics

Parameter	Description	Min	Typ	Max	Unit
Frequency		2,402		2,480	MHz
Output Power ON_Transmit	Low Energy/ 1Mbps	-20	0	4	dBm
BAND EDGE			-50	-54	dBc
Harmonic Output Power	2nd		-50	-54	dBm/MHz
Harmonic Output Power	3rd		-50	-54	dBm/MHz

RX characteristics

Parameter	Description	Min	Typ	Max	Unit
Frequency		2,402		2,480	MHz
Sensitivity	1Mbps		-90		dBm

5. FCC CERTIFICATION

5.1 FCC Notice

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 the receiver.
- Connect the equipment to 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.
Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Please notice that 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 FCC ID : BEJ-LCB001" any similar wording that expresses the same meaning may be used.

5.2 FCC RF Radiation Exposure Statement

This equipment complies with FCC 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 equipment should be installed and operated with a minimum distance of 20 cm (7.8 inches) between the antenna and your body. Users must follow the specific operating instructions for satisfying RF exposure compliance.

6. IC CERTIFICATION

6.1 Industry Canada 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.

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) L'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Please notice that if the IC 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 IC : 2703N-LCB001" any similar wording that expresses the same meaning may be used.
L'étiquette d'homologation d'un module d'Innovation, Sciences et Développement économique Canada devra être posée sur le produit hôte à un endroit bien en vue, en tout temps. En l'absence d'étiquette, le produit hôte doit porter une étiquette sur laquelle figure le numéro d'homologation du module d'Innovation, Sciences et Développement économique Canada, précédé du mot « contient », ou d'une formulation similaire allant dans le même sens et qui va comme suit : Contient IC : 2703N-LCB001 est le numéro d'homologation du module

6.2 IC Radiation Exposure Statement

This equipment complies with IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm (7.8 inches) between the antenna and your body.
NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm (7,8 pouces) entre l'antenne et votre corps.
REMARQUE: LE FABRICANT NE PEUT ÊTRE TENU RESPONSABLE DES INTERFÉRENCES RADIO OU TÉLÉVISÉES CAUSÉES PAR DES MODIFICATIONS NON AUTORISÉES DE CET APPAREIL. CES MODIFICATIONS PEUVENT ANNULER L'AUTORITE DE L'UTILISATEUR A FAIRE FONCTIONNER L'APPAREIL.

Bluetooth module specifications	
Model	LCB-001
Frequency Range	2402 MHz - 2480 MHz
Output Power (Max)	5.26 dBm