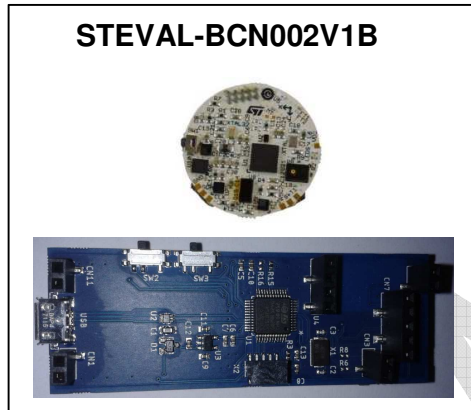


## BlueNRG-Tile – Bluetooth LE enabled Sensor Node Development Kit

### Data Brief



### Features

Evaluation boards Kit based on two boards:  
STEVAL-BCN002V1

- BlueNRG-232: Bluetooth Low Energy single-mode system-on-chip, compliant with Bluetooth 5.0 specifications
- BALF-NRG-02D3: ultra-miniature balun and harmonic filter
- LSM6DSO: iNEMO 6DoF inertial module, ultra-low power and high accuracy
- LIS2MDL: Magnetic sensor, digital output, 50 gauss magnetic field dynamic range, ultra-low power high performance 3-axis magnetometer
- VL53L1X: Long distance ranging Time-of-Flight sensor based on ST FlightSense technology
- MP34DT05TR-A: MEMS audio sensor omnidirectional digital microphone, 64 dB SNR, -26 dBFS sensitivity, top-port, 122.5 dB SPL AOP
- LPS22HH: Ultra-compact piezo-resistive absolute pressure sensor, 260-1260 hPa,

digital output barometer, full-mold dust resistant, holed LGA package (HLGA)

- HTS221: Capacitive digital sensor for relative humidity and temperature
  - CR2032 Battery powered (not included)
- STEVAL-BCN002V1D
- Daughter board to reprogram and debug firmware running on sensor board
  - ST BlueMS and BlueNRG-Mesh demo Apps available on Android (Google Play) and iOS (iTunes)
  - Target Applications:
    - Internet of Things, Smart Building, Home and City
    - Tracking System, Supply Chain/ Cold-Chain Management
    - Smart Agriculture (soil control, animal activity tracking, etc.)

### Description

STEVAL-BCN002V1B Is a bundle kit based on STEVAL-BCN2V1, multi sensors board based on BlueNRG-2 SoC Bluetooth Low Energy 5.0 Application processor. This board is embedding difference sensor as Accelerometer, Gyroscope, Magnetometer, Pressure, Humidity, Time-of-Flight, Microphone and is powered by a common coin battery, CR2032. This sensor board is connecting to Bluetooth LE enabled smartphone, using ST BlueMS APP available on Google Play and iTunes stores. The Adapter board, STEVAL-BCN002V1D is used to program, debug and power the board via USB.

DRAFT



# STEVAL-BCN002V1B

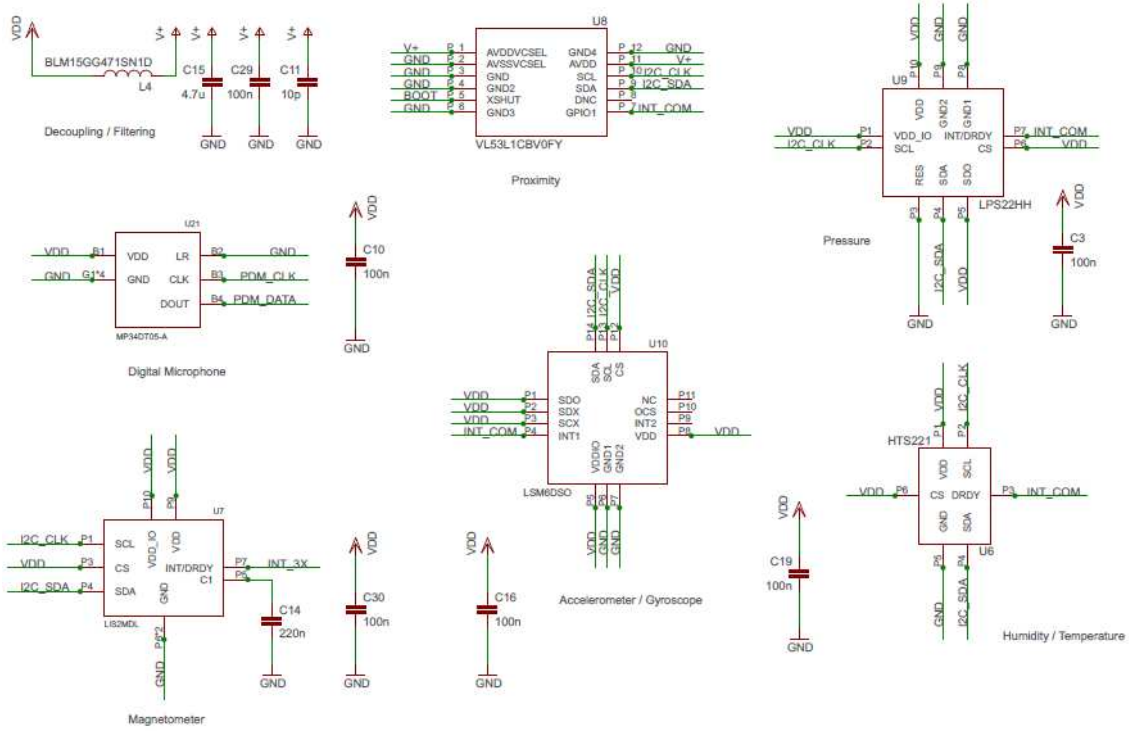


Figure 3. STEVAL-BCN002V1 Connectors Schematic diagram

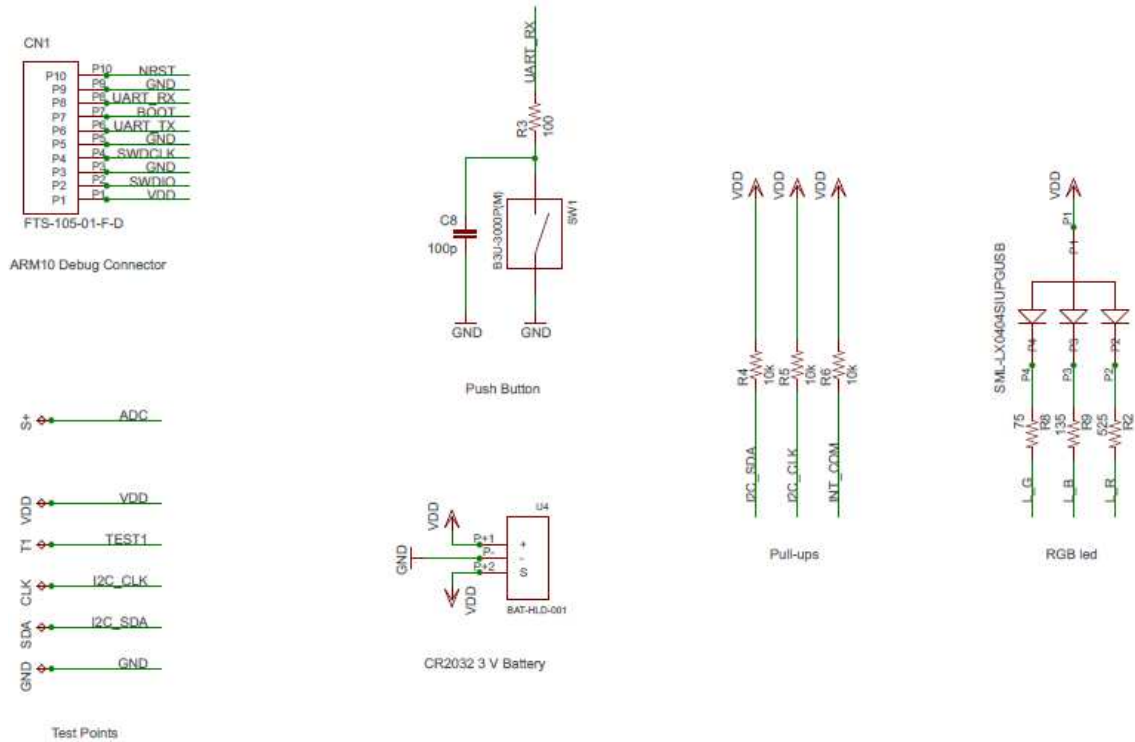


Figure 4. STEVAL-BCN002V1D STM32 Schematic diagram

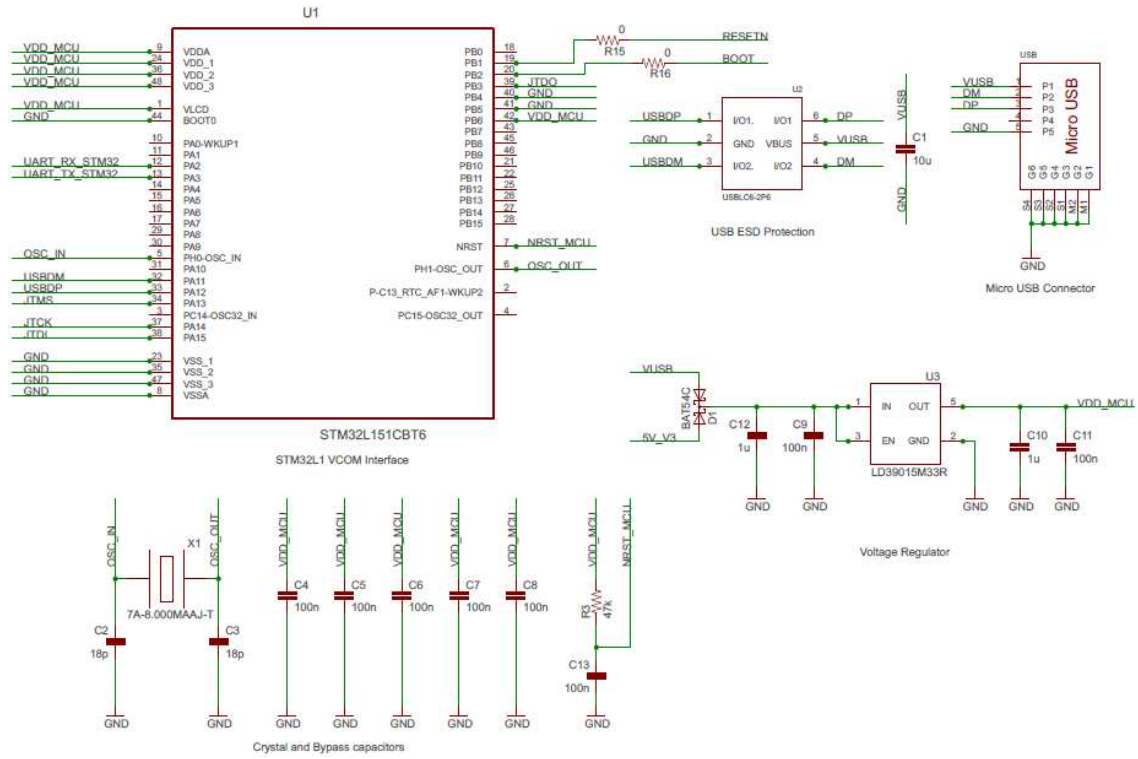


Figure 5. STEVAL-BCN002V1D Debug Schematic diagram

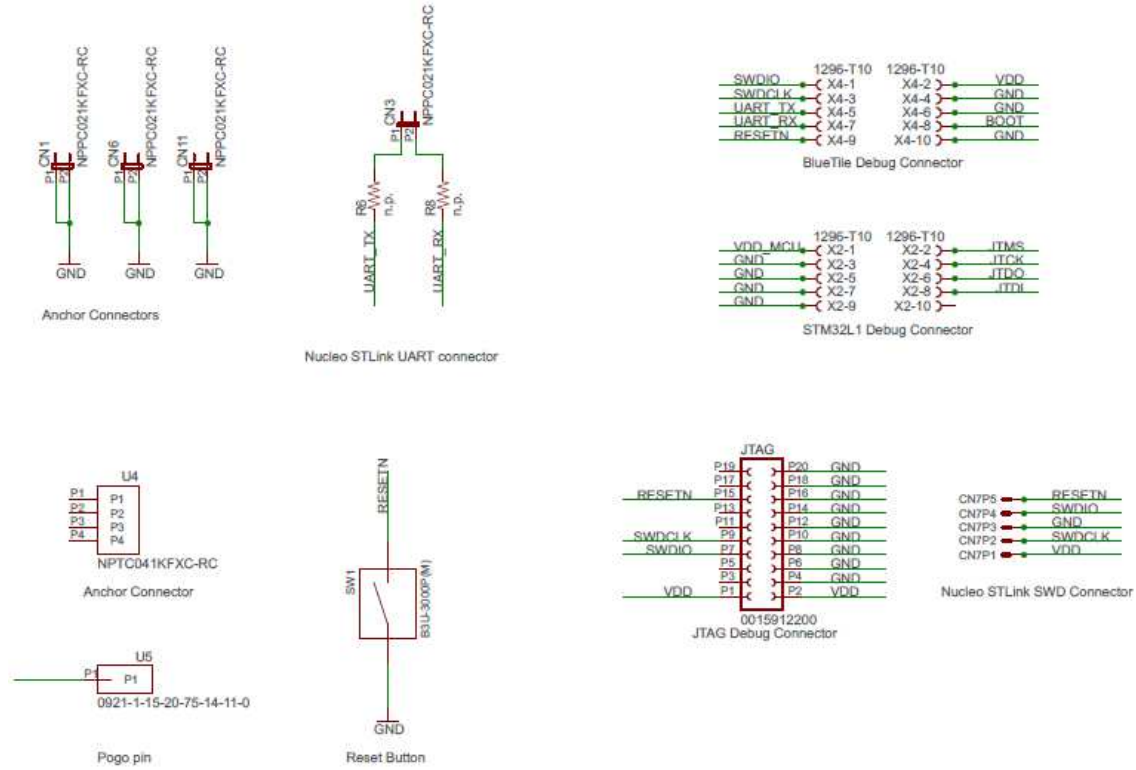
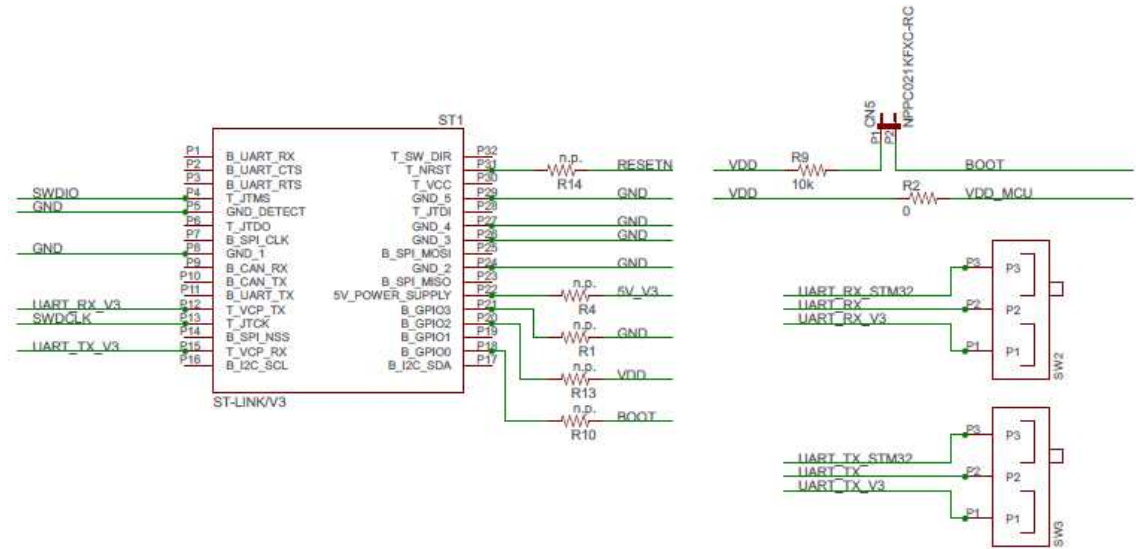


Figure 6. STEVAL-BCN002V1D ST-Link V3 Schematic diagram



## 2 Component layout

Figure 7. STEVAL-BCN002V1 Components

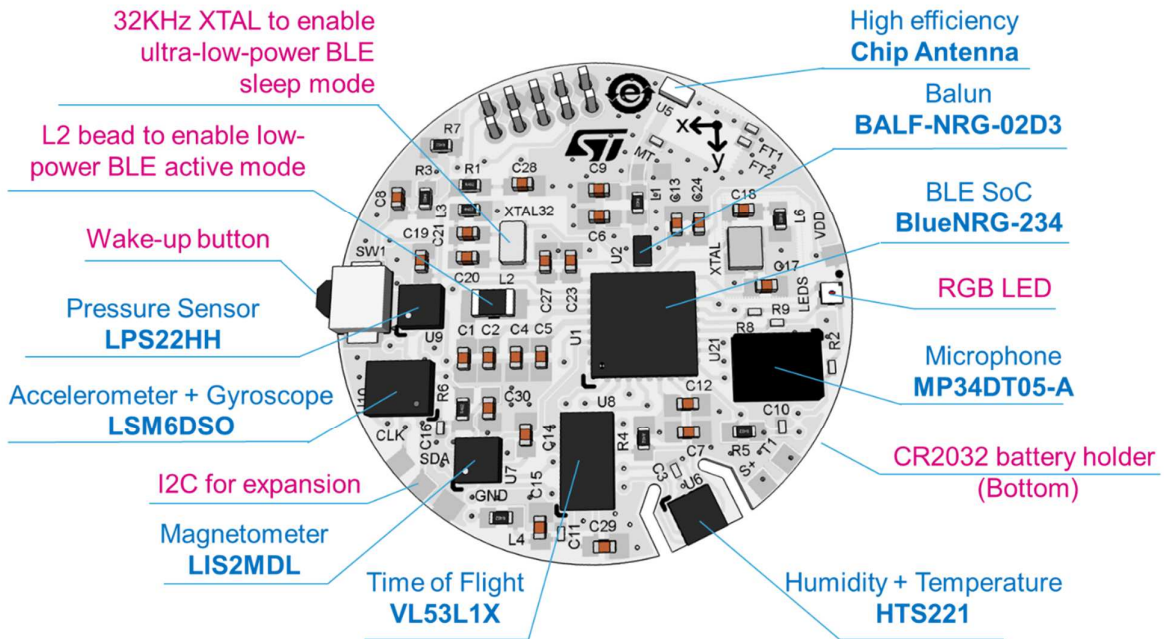
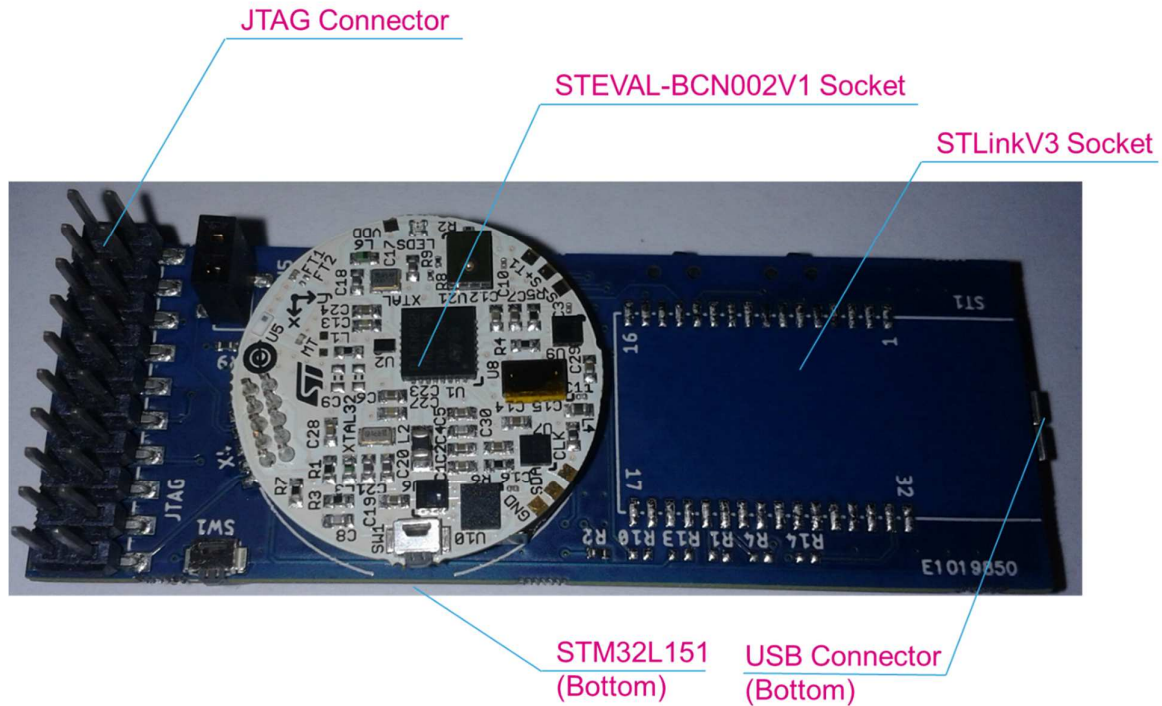


Figure 8. STEVAL-BCN002V1D Components







### 3 Getting Started with STEVAL-BCN002V1D

STEVAL-BCN002V1D Default configuration allow user to:

1) If PLUGGED on a NUCLEO STLink:

- Hardware modification: populate R6 and R8 with 0 ohm
- Programming: using Nucleo STLink mini USB
- Virtual COM: using Nucleo STLink mini USB; both SW3 and SW2 must be in (P1-P2) position

2) If using an EXTERNAL JTAG debugger:

- Programming: using JTAG connector on top
- Virtual COM: using micro USB connector on the bottom; both SW3 and SW2 must be in (P2-P3) position

3) If using the INTEGRATED USB to UART interface:

- Programming: using micro USB connector on the bottom and only using BlueNRG-1 Flasher Utility
- Virtual COM: using micro USB connector on the bottom; both SW3 and SW2 must be in (P2-P3) position

3) If using the INTEGRATED ST-LINK/V3:

- Hardware modification: populate R4 and R14 with 0 ohm
- Programming: using ST-LINK/V3 SWD
- Virtual COM: using ST-LINK/V3 micro USB; both SW3 and SW2 must be in (P1-P2) position

## 4 Certification

### 4.1 Regulatory compliance

The RF certifications obtained are described in Table 1.

**Table 1. RF certification summary**

		<b>Comment</b>
FCC ID	S9NSTEBCN2V1	On board PCB antenna
IC ID	8976C- STEBCN2V1	On board PCB antenna
RED	Compliant	Approved with on PCB board antenna

### 4.2 FCC and IC

#### FCC Compliance

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 manufacturer could void the user's authority to operate the equipment.

#### Innovation, Science and Economic Development Canada Compliance

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

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

#### Conformité à Innovation, Sciences et Développement Économique Canada

Cet appareil contient un ou plusieurs émetteurs / récepteurs exemptés de licence conformes à la norme Innovation, Science (s) RSS exemptés de licence par Science et Développement économique Canada.

L'utilisation est soumise aux deux conditions suivantes:

1. cet appareil ne doit pas causer d'interférences nuisibles, et
2. cet appareil doit accepter de recevoir tous les types d'interférence, y comprises les interférences susceptibles d'entraîner un fonctionnement indésirable.

Les changements ou les modifications non expressément approuvés par le fabricant pourraient annuler le permis d'utiliser l'équipement.

## 4.3 CE

STEVAL-BCN002V1B bundle kit complies with the following European EMI/EMC and safety directives and standards:

- EN 300 328 V 2.1.1 (2016-11) (a)
- ETSI EN 301 489-17 V3.1.1 (2017-02) (b)
- ETSI EN 301 489-1 V2.1.1 (2017-02) (c)
- EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 (d)
- EN 62311:2008

The module is provided by CE marking:

Figure 9. CE marking



The module has obtained the RED certificate: No. (**certification in progress**)

The certified module production firmware release is: 1.X

For additional information please refer to:

STMicroelectronics Via C. Olivetti, 2 Agrate Brianza 20864 (ITALY)

### Simplified EU Declaration of Conformity

Hereby, STMicroelectronics SRL declares that the radio equipment type STEVAL-BCN002V1B is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address: [www.st.com/bluetile](http://www.st.com/bluetile)

## 5 Radio Features

Standard	Bluetooth Low Energy	
Antenna	Embedded	
RF Frequency	2402-2480	MHz
Max Output Power	8	dBm

## 6 Revision history

Table 2. Document revision history

Revision	Date of modification	Description of modification
1.0	27-Jun-2018	Preliminary draft
1.1	19-October-2018	Updated chapter 4
1.2	5-Nov-2018	Added RF Features table

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