

# QCC5151 Bluetooth Module operating/installation instruction

Product Description: Bluetooth Module

Model / HVIN: QCC5151

The module device FCC ID: Q2O-QCC5151 / IC: 152B-QCC5151

## Device description

- Quad-core processor architecture
- High-performance Bluetooth® stereo audio SoC
- Flexible flash programmable platform
- Low power modes to extend battery life

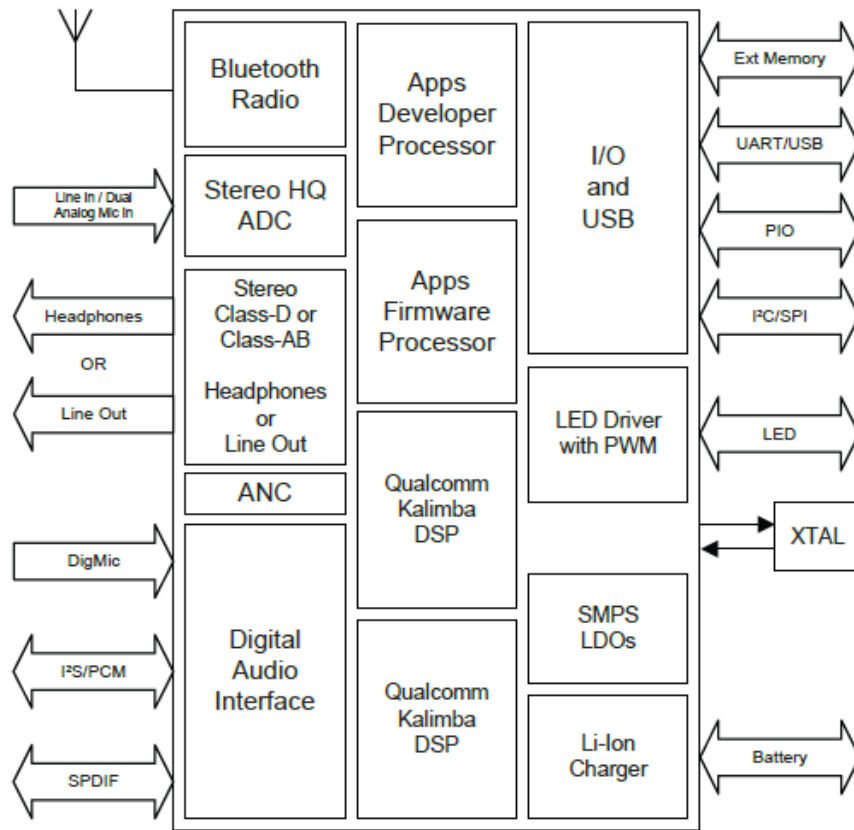
## Applications

- Wired/wireless stereo headsets/headphones
- Qualcomm TrueWireless™ stereo earbuds

## Features

- Qualified to Bluetooth v5.2 specification
- Dual 120 MHz Qualcomm® Kalimba™ audio DSPs
- 32/80 MHz Developer Processor for applications
- Firmware Processor for system
- Flexible QSPI flash programmable platform
- High-performance 24-bit stereo audio interface
- Digital and analog microphone interfaces
- Flexible PIO controller and LED pins with PWM support
- Serial interfaces: UART, Bit Serializer (I<sup>2</sup>C/SPI), USB 2.0
- Advanced audio algorithms
- Active Noise Cancellation: Hybrid, Feedforward, and Feedback modes, using Digital or Analog Mics, enabled using license keys available from Qualcomm®
- Qualcomm® aptX™ and aptX HD Audio
- aptX Adaptive, enabled using license key
- Qualcomm® cVc™ Noise Cancellation Technology, enabled using license key
- Integrated PMU: Dual SMPS for system/digital circuits, Integrated Li-ion battery charger
- 94-ball 4.377 mm x 4.263 mm x 0.57 mm, 0.4 mm pitch WLCSP

## System architecture



QCC5151 WLCSP is a system on-chip (SoC) with:

- On-chip Bluetooth
- Audio and programmable application processor
- High-performance, analog, and digital audio codecs
- Class-AB and Class-D headphone drivers
- Advanced power management
- Li-ion battery charger
- LED drivers
- Flexible interfaces, including:
  - I2S
  - I2C
  - UART
  - PIO

Qualcomm

### Processors

QCC5151 WLCSP includes an application-dedicated Developer Processor and a system Firmware Processor that run code from an external quad serial peripheral interface (QSPI) flash

Both processors have tightly coupled memory (TCM) and an on-chip cache for performance while executing from external flash memory. The system Firmware Processor provides functions developed by Qualcomm Technologies International, Ltd. (QTI). The Developer Processor provides flexibility to the product designer to customize their product.

### Audio subsystem

The Audio subsystem contains two programmable Kalimba cores running Qualcomm® Kymera™ system DSP architecture framework from read only memory (ROM). A range of audio processing capabilities are provided from ROM, which are configurable in fully flexible audio graphs. Capabilities executed from random access memory (RAM), including those provided by QTI, the product designer or third parties may complement or replace built-in capabilities in ROM.

### IDE/Software Development Tools

QCC5151 WLCSP is driven by a flexible software platform with integrated development environment (IDE) support. This enables deployment of a broad range of consumer electronic products including headphones, headsets, and Qualcomm TrueWireless stereo earbuds.

### 1.1 List of applicable FCC rules/RSS:

The module complies with FCC Part 15.249/15.247/RSS-210 Issue 10/RSS-247 Issue 2

### 1.2 Summarize the specific operational use conditions:

The module has been certified for Mobile applications. This transmitter must not be collocated or operating in conjunction with any other antenna or transmitter

The manual provides guidance to the host manufacturer will be included in the documentation that will be provided to the OEM.

The OEM integrators, host manufacturers are responsible for ensuring that the end-user has no manual or instructions to remove or install module.

#### **Important notes to third party user, host manufacturer for transceiver module:**

The transceiver Module complies with Part15 of the FCC rules and regulations. Compliance with the labeling requirements, FCC notices and antenna usage guidelines is required. To fulfill FCC Certification, the third-party user must comply with the following regulations:

1. The third-party user must ensure that the text on the external label provided with this device is placed on the outside of the final product. Contains FCC ID: Q2O-QCC5151 (example) / IC: 152B-QCC5151 (example) .The enclosed 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.

2. The transceiver Module may only be used with the antenna (internal, integral) that have been tested and approved for use with this module.

3. The transmitter is certified as a module, it may be integrated or used inside another device (host). No further approval is required when the module is used in accordance with the FCC grant conditions, and any limitations or usage conditions required by the manufacturer's instructions. Modifications not approved by grantee could void the user's authority to operate the equipment.

4. This device and its antenna must not be co-located or operating in conjunction with any other antenna or transmitter.

5. Third party users, host manufacturer must test final product to comply with unintentional radiators before declaring compliance of their final product to Part 15 of the FCC Rules.

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 Statement**

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.

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

### 1.3 Limited module procedures

Not Applicable.

### 1.4 Trace Antenna Designs:

Not Applicable.

### 1.5 RF exposure considerations:

The module has been certified for Mobile applications.

End-user product Manual shall contain below RF exposure statements.

This module 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." The antenna(s) used for this transmitter must not be collocated or operating in conjunction with any other antenna or transmitter.

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).

### 1.6 Antennas:

The EUT only use one type of antenna that has been tested with this module.

This radio transmitter [IC: 152B-QCC5151] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device

Type: IPEX-113-L160MM

Gain: 2dBi

The antenna is connected to the module through a non-standard micro-coaxial connector

The antenna is permanently attached, can't be replaced

### 1.7 Label and compliance information:

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FCC/IC Label: The FCC ID/IC certification number is on the back of the device. It is easily visible.

The host product Labeling Requirements:

NOTICE: The OEM system integrator, host manufacturer must make sure that FCC labeling requirements are met. This includes a clearly visible exterior label on the outside of the final product housing that displays the contents shown in below:

This device contains FCC ID: Q2O-QCC5151

This device contains IC: 152B-QCC5151

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.

### 1.8 Information on test modes and additional testing requirements:

When testing host product, the host manufacture should follow FCC KDB Publication 996369 D04 Module Integration Guide for testing the host products. The host manufacturer may operate their product during the measurements. In setting up the configurations, if the pairing and communication for testing does not work, then the host product manufacturer should coordinate with the module manufacturer for access to test mode software.

### 1.9 Additional testing, Part 15 Subpart B disclaimer:

The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.249) list on the grant, and that 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 when contains digital circuitry.

### 1.10 FCC/IC statement in final product manual:

Below FCC/IC statement shall be included in final product manual

CAUTION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment.

FCC Regulations

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.

This device 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.

#### English

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.

#### French

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique 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;
2. L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.