

RM10

Bluetooth Module

1. INTRODUCTION

Overview

RM10 it is a Bluetooth dual-mode module series. It supports a Bluetooth Low Energy and compliant system for audio and data communication.

RM10 integrates an ultra-low-power DSP and application processor with embedded flash memory, a high-performance stereo codec, a power management subsystem, I2S, LED drivers and ADC I/O in a SOC IC.

Both cores use external flash to execute code, making it easy for user to differentiate products from new features without delaying the development. By default, RM10 module is equipped with powerful and easy-to-use Feasycom firmware.

It's easy to use and completely encapsulated. Feasycom firmware enables users to access Bluetooth functionality with simple ASCII commands delivered to the module over serial interface - it's just like a Bluetooth modem.

Therefore, RM10 provides an ideal solution for developers who want to integrate Bluetooth wireless technology into their design.

Features

- Qualified to Bluetooth® v5.1 specification

- 32 MHz Developer Processor for applications

- Firmware Processor for system

- Advanced audio algorithms

- High-performance 24-bit stereo audio interface

- Digital and analog microphone interfaces

- I2S/PCM, SPDIF interfaces input/output

- SBC and AAC audio codecs support

- Serial interfaces: UART, Bit Serializer (I²C/SPI), USB 2.0

- Integrated PMU: Dual SMPS for system/digital

circuits, Integrated Li-ion battery charger

Application subsystem

Dual core application subsystem 32 MHz operation

32-bit Firmware Processor:

- Reserved for system use
- Runs Bluetooth upper stack, profiles,

house-keeping code

32-bit Developer Processor:

- Runs developer applications

Both cores execute code from external flash memory

using QSPI clocked at 32MHz

On-chip caches per core allow for optimized

performance and power consumption

Bluetooth subsystem

Qualified to Bluetooth v5.1 specification including

2 Mbps Bluetooth low energy(Production parts)

Single ended antenna connection with on-chip balun

and Tx/Rx switch

Bluetooth, Bluetooth low energy, and mixed

topologies supported

Class 1 support

Application

Bluetooth speakers

Bluetooth music box

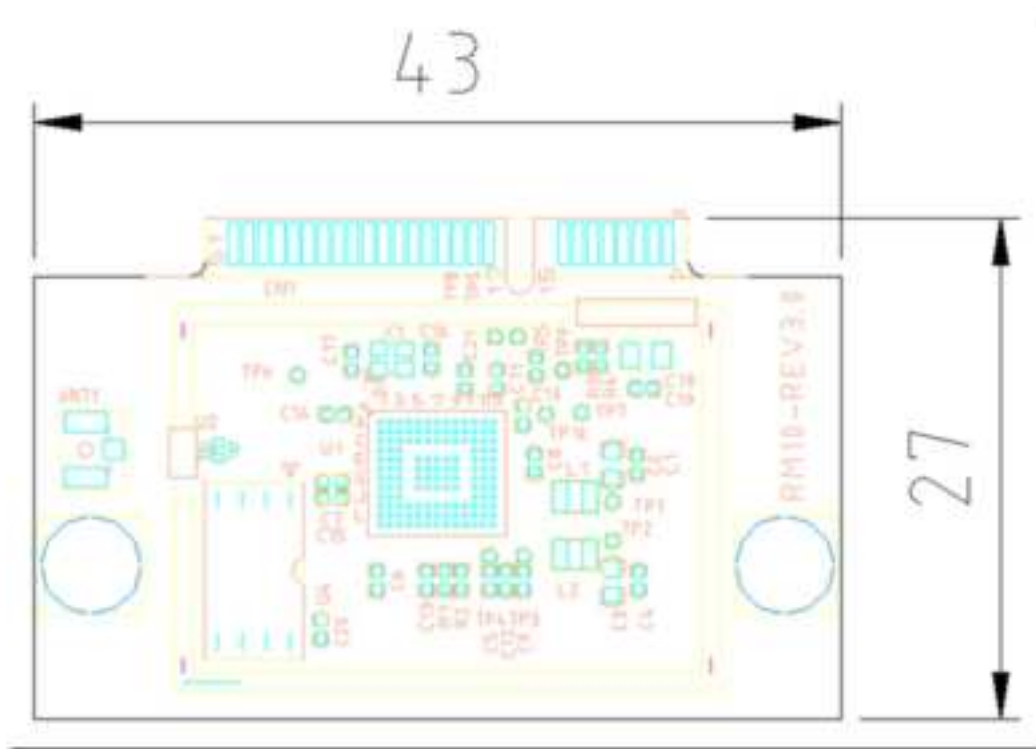
2. General Specification

| Categories | Features | Implementation |
|-------------------------------|----------------------|--|
| | Chip | QCC3083 |
| | Bluetooth Version | V5.1 Dual-mode |
| | | 2402MHz ~ 2480MHz |
| | Raw Data Rates (Air) | Mbps (Classic BT - BR/EDR) |
| Host Interface Peripherals | UART Interface | TX, RX, CTS, RTS |
| | | General Purpose I/O |
| | | Default 115200,N,8,1 |
| | | Baudrate support from 1200 to 4000000 |
| | GPIO | 20 (maximum – configurable) lines |
| | | O/P drive strength (2, 4, 8, or 12 mA) |
| | | Pull-up resistor (33 K Ω) control |
| | SPI Interface | SPI debug and programming interface with read access disable locking |
| | USB Interface | 1 full-speed (12Mbps) |
| Supply Voltage | Supply | 4.75V ~ 5.5V |

3. PIN Definition Descriptions

| | | | |
|----|-----------------|----|----------------|
| 1 | I2S_PCM_DOUT[0] | 22 | PIO-32 |
| 2 | PIO-31 | 23 | GND |
| 3 | I2S_PCM_MCLK | 24 | GND |
| 4 | BT_UART_TX | 25 | BT_UART_RTSN |
| 5 | I2S_PCM_SYNC | 26 | GND |
| 6 | BT_UART_CTSN | 27 | BT_UART_RX |
| 7 | GND | 28 | GND |
| 8 | PIO-33 | 29 | GND |
| 9 | GND | 30 | I2S_PCM_DIN[0] |
| 10 | GND | 31 | GND |
| 11 | VCC_5V0 | 32 | GND |
| 12 | BT_USB_DN | 33 | GND |
| 13 | VCC_5V0 | 34 | GND |
| 14 | BT_USB_DP | 35 | GND |
| 15 | VCC_5V0 | 36 | GND |
| 16 | GND | 37 | GND |
| 17 | BT_SYS_CTRL | 38 | GND |
| 18 | TBR_MOSI | 39 | GND |
| 19 | TBR_CLK | 40 | GND |
| 20 | BT-RESET# | 41 | GND |
| 21 | TBR_MISO | 42 | GND |
| 43 | GND | 48 | GND |
| 44 | GND | 49 | GND |
| 45 | GND | 50 | GND |
| 46 | GND | 51 | 1V8_SMPS |
| 47 | GND | 52 | GND |

4. Mechanical Details



FCC Approval

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 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.

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

This device should be installed and operated with minimum 20 cm between the radiator and your body.

INTEGRATION INSTRUCTIONS

List of applicable FCC rules

This module complies with Part 15.247 of the FCC rule.

Summarize the specific operational use conditions

Not applicable

Limited module procedures

This is Limited modular approval as this module is limited to installation by the grantee into our host systems.

This module is certified as limited modular approval as it does not have its own power supply regulator, therefore the host device must supply a rated voltage(5V) using a voltage regulator or equivalent.

Note: Please check that the voltage is between 4.75V and 5.5V when a rated voltage is applied to the module.

Host product manufacturers are responsible to follow the integration guidance and to perform a limited set of transmitter module verification testing, to ensure the end product is in compliance with the FCC rules.

Trace antenna designs

Not applicable

RF exposure considerations

This module complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. 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). **Antennas**

The antenna that can be used with the transmitter is as follows.

Antenna Model Name: RS151, Type: PCB Antenna, Gain: 2.76dBi

Cable: RPSMA to IPEX Cable, Loss: 0.46dB

Label and compliance information

The module is labeled with its own FCC. If the FCC ID 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. In that case, the final end product must be labeled in a visible area with the following;

“Contains FCC ID: 2ANYL-RM10”

The host manual shall include the following regulatory 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 this equipment.

This device should be installed and operated with minimum 20 cm between the radiator and your body.

Information on test modes and additional testing requirements

Testing of the host product with all the transmitters installed - referred to as the composite investigation test- is recommended, to verify that the host product meets all the applicable FCC rules. The host manufacturer can use the software to control the RF signal during test.

Additional testing, Part 15 Subpart B disclaimer

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 for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

The host product may 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.

Note EMI Considerations

Not applicable