

产品说明书

Product User Guide

1. 介绍 Introduction

1.1 简要 Overview

- ★ BT-MQ38-JK1是一款基于QCC3008芯片的单模蓝牙模组。
BT-MQ38-JK1 is a single mode Bluetooth module based on QCC3008 chip. BT V5.0 BDR+EDR only
- ★ 本模组是由一单射频和基带芯片组成并应用于蓝牙2.4GHz系统。
The module is a single-chip radio and baseband IC for Bluetooth 2.4GHz systems.

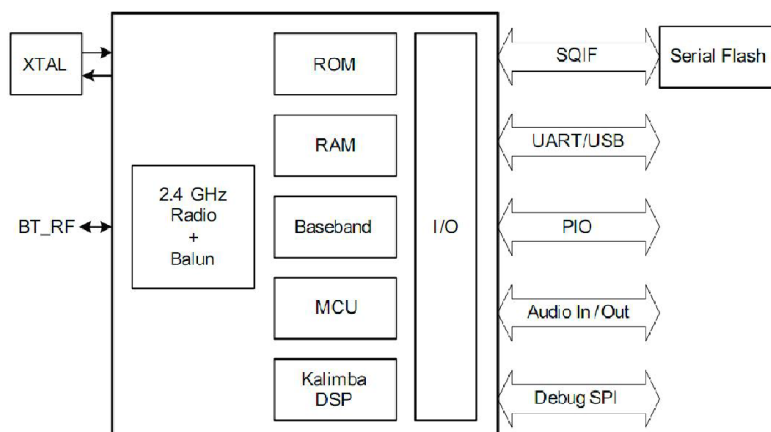
1.2 特征 Features

- ★ 支持蓝牙5.0版本。
Support Bluetooth v5.0 specification.
- ★ 支持立体声编解码和立体声线路输入。
Support stereo codec and line input.
- ★ 支持单mic cVc免提通话的降噪和回音消除。
Support 1-mic cVc hands-free NR/EC..
- ★ 支持模块和手机端音频相互转换。
Support audio transfer between carkit and mobile phone.
- ★ 支持aptX、SBC、AAC音频编解码。
Support aptX,SBC,AAC audio codecs.
- ★ 蓝牙有效自由空间连接距离长达10米。
The wireless connection at distances up to 10 meters.
- ★ 模组尺寸26.8*16.8*3.2mm
Module Size: 26.8*16.8*3.2mm.

1.3 应用 Applications

- ★ 车载免提
Hands-Free Car Kits
- ★ 无线立体声音箱。
Wired Stereo Speakers
- ★ 便携式媒体播放器
Portable media players

1.4 框图 Block Diagram



2. 规格 Specification

2.1 通用规格 General Specification

| | | |
|---|---------------------------------|---|
| 1 | 产品名称 Product Name | 蓝牙模组 Bluetooth Module |
| 2 | 芯片类型 Chip set | QCC3008 QFN |
| 3 | 功率等级 Power class level | Class 2 ($-6\text{dBm} < P_{AV} < 4\text{dBm}$) |
| 5 | 额定电压 Rated Voltage | 3.3V DC (50mVp-p 纹波电压) |
| 6 | 工作电压范围 Operation Voltage range | 2.8V~3.6V DC |
| 7 | 工作距离范围 Operation Distance Range | 10 meters |
| 7 | 尺寸 Dimension | 26.8*16.8*3.2mm (L*W*H) |
| 8 | 蓝牙标准 Bluetooth Standard | Bluetooth v5.0 |

2.2 温度和湿度规格 Temperature and Humidity specification

| | |
|------------------------------------|----------|
| 工作温度范围 Operation Temperature range | -40~85°C |
| 储存温度范围 Storage Temperature range | -40~90°C |
| 储存湿度范围 Storage Humidity range | 10% ~90% |

2.3 射频发射规格 TX Radio Specification

| 项目 Items | | 最小 Min. | 典型 Typ. | 最大 Max. | 单位 Unit |
|---|-----------------|------------|------------|------------|------------|
| 输出功率 Output transmit power | | -6 | 0 | 4 | dBm |
| 调制特性 Modulation characteristics | f1 avg | 140 | - | 175 | kHz |
| | f2 max | 115 | - | - | kHz |
| | f2avg/f1avg | 80 | - | - | % |
| 初始载波频率容限 Initial carrier-frequency tolerance | | -75 | - | 75 | kHz |
| 载波频率漂移 Carrier frequency drift | DH1 | -25 | - | 25 | kHz |
| | DH3 | -40 | - | 40 | kHz |
| | DH5 | -40 | - | 40 | kHz |
| | Drift rate/50us | -20 | - | 20 | kHz |

2.4 射频接收规格 RX Radio Specification

| 项目 Items | 最小 Min. | 最大 Max. | 单位 Unit |
|---|------------|------------|------------|
| 单时隙灵敏度 (P=-70dBm) Single sensitivity(P=-70dBm) | | <0.1 | % |
| 多时隙灵敏度 (P=-70dBm) Multi sensitivity(P=-70dBm) | | <0.1 | % |
| 最大输入电平 (P=-20dBm) Maximum input Level(P=-20 dBm) | | <0.1 | % |

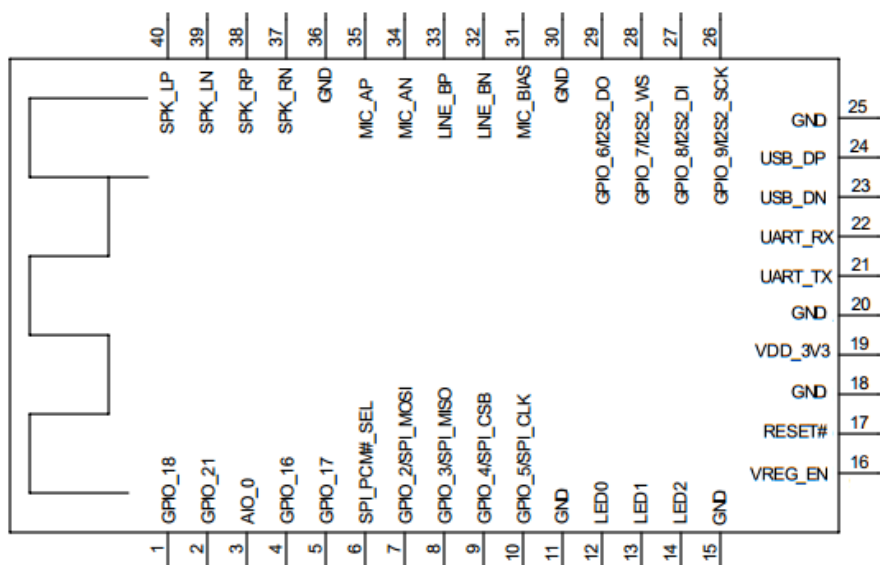
2.5 音频规格 Audio Specification

| 项目 Items | 条件 Conditions | 最小 Min. | 典型 Typ. | 最大 Max. | 单位 Unit |
|---------------------------------|------------------|------------|------------|------------|------------|
| 输出幅值(有效值) Output Level(Vrms) | 1kHz,0dB 标准音源 | 0 | 0.3 | 0.4 | V |
| 频率响应 Frequency Response | 21Hz~17KHz 标准音源 | -3 | 0 | 3 | dB |

备注：音频指标测试规格是采用 A2DP 方式，EQ 使用默认值测量。

3. 设计应用 Design Application

3.1 管脚配置 Pin Assignment

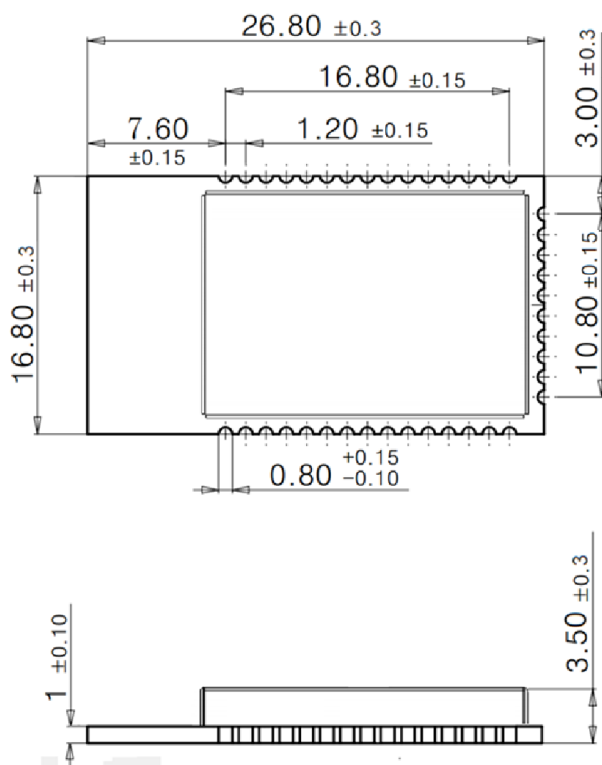


3.2 管脚描述 Pin Description

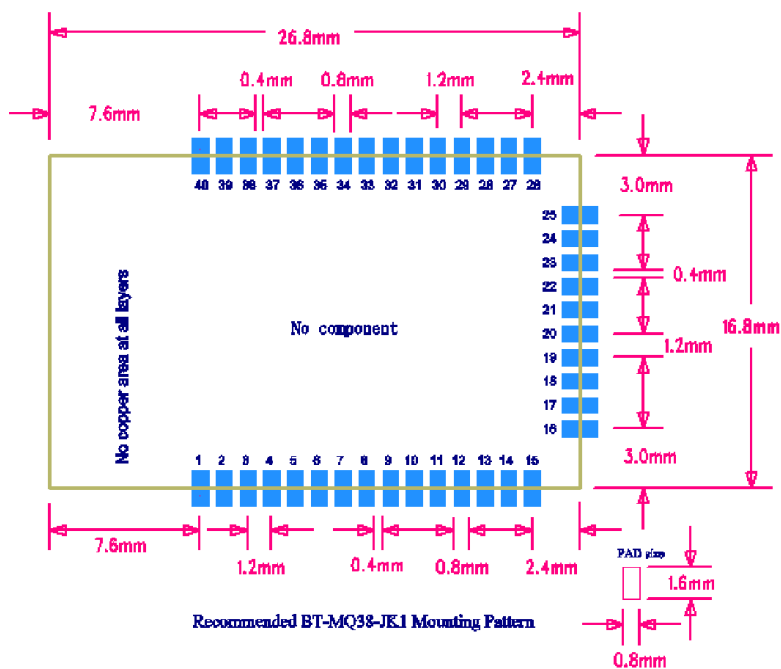
| No. | Pin Name | I/O | Pad type | Pin Description |
|-----|-----------------|-----|-------------------------------------|--|
| 1 | GPIO_18 | I/O | Bidirectional with weak pull-down | Programmable input/output line18 |
| 2 | GPIO_21 | I/O | Bidirectional with weak pull-down | Programmable input/output line21 |
| 3 | AIO_0 | I | Bidirectional | Analog programmable input line 0 |
| 4 | GPIO_16 | I/O | Bidirectional with strong pull-up | Programmable input/output line16 |
| 5 | GPIO_17 | I/O | Bidirectional with strong pull-down | Programmable input/output line17 |
| 6 | SPI_PCM#_SEL | I | Input with weak pulldown | SPI/I ² S select input: 0 = I ² S/PIO interface 1 = SPI(for debugging) |
| 7 | GPIO_2/SPI_MOSI | I/O | Bidirectional with weak pull-down | Programmable input/output line2 -SPI_MOSI: Debug SPI data input -I2S1_SD_IN: I ² S1 synchronous data input |
| 8 | GPIO_3/SPI_MISO | I/O | Bidirectional with weak pull-down | Programmable input/output line3 -SPI_MISO: Debug SPI data output -I2S1_SD_OUT: I ² S1 synchronous data output |
| 9 | GPIO_4/SPI_CSB | I/O | Bidirectional with weak pull-down | Programmable input/output line4 -SPI_CS#: chip select for Debug SPI, active low -I2S1_WS: I ² S1 word select |
| 10 | GPIO_5/SPI_CLK | I/O | Bidirectional with weak pull-down | Programmable input/output line5 -SPI_CLK: Debug SPI clock -I2S1_SCK: I ² S1 synchronous data clock |

| | | | | |
|----|----------|-----|-------------------------------------|---|
| 11 | GND | - | - | Ground |
| 12 | LED0 | O | Open-drain output | LED Driver |
| 13 | LED1 | O | Open-drain output | LED Driver |
| 14 | LED2 | O | Open-drain output | LED Driver |
| 15 | GND | - | - | Ground |
| 16 | VREG_EN | I | Input with internal pull-down | Regulator enable. A high input enables the on-chip regulators, which can then be latched on internally. |
| 17 | RESET# | I | Input with strong pull-up | Reset if low. Pull low for minimum 5 ms to cause a reset |
| 18 | GND | - | - | Ground |
| 19 | VDD_3V3 | I | VDD | Positive supply for Module - Supply voltage : Typical 3.3V. |
| 20 | GND | - | - | Ground |
| 21 | GPIO_1 | I/O | Bidirectional with strong pull-up | Programmable input/output line1 |
| 22 | GPIO_0 | I/O | Bidirectional with strong pull-up | Programmable input/output line0 |
| 23 | USB_DN | I/O | Bidirectional | USB data minus |
| 24 | USB_DP | I/O | Bidirectional | USB data plus with selectable internal 1.5K pull-up resistor |
| 25 | GND | - | - | Ground |
| 26 | GPIO_9 | I/O | Bidirectional with strong pull-down | Programmable input/output line9 |
| 27 | GPIO_8 | I/O | Bidirectional with strong pull-up | Programmable input/output line8 |
| 28 | GPIO_7 | I/O | Bidirectional with strong pull-down | Programmable input/output line7 |
| 29 | GPIO_6 | I/O | Bidirectional with strong pull-down | Programmable input/output line6 |
| 30 | GND | - | - | Ground |
| 31 | MIC_BIAS | O | Analog out | Microphone bias |
| 32 | LINE_BN | I | Analog in | Line input negative, channel B |
| 33 | LINE_BP | I | Analog in | Line input positive, channel B |
| 34 | MIC_AN | I | Analog in | Line or microphone input negative, channel A |
| 35 | MIC_AP | I | Analog in | Line or microphone input positive, channel A |
| 36 | GND | - | - | Ground |
| 37 | SPK_RN | O | Analog out | Speaker output negative, right |
| 38 | SPK_RP | O | Analog out | Speaker output positive, right |
| 39 | SPK_LN | O | Analog out | Speaker output negative, left |
| 40 | SPK_LP | O | Analog out | Speaker output positive, left |

3.3 模块外形 Module Outline



3.4 模块尺寸 Module Dimension



模块尺寸 26.8*16.8*3.5mm(长*宽*高)
Module Size: 26.8*16.8*3.5mm (L*W*H)

FCC Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

PCB antenna with antenna gain 0.49dBi

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 the equipment.

Note: 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.

We will retain control over the final installation of the modular such that compliance of the end product is assured. In such cases, an operating condition on the limit modular approval for the module must be only approved for use when installed in devices produced by a specific manufacturer. If any hardware modify or RF control software modify will be made by host manufacturer, C2PC or new certificate should be apply to get approval, if those change and modification made by host manufacturer not expressly approved by the party responsible for compliance, then it is illegal.

FCC Radiation Exposure Statement

This modular complies with FCC RF 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.

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 Transmitter Module FCC ID: ZWY3008X Or Contains FCC ID: ZWY3008X”

When the module is installed inside another device, the user manual of the host must contain below warning statements;

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

Note: 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.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with modular approval should 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 host can be sold legally.