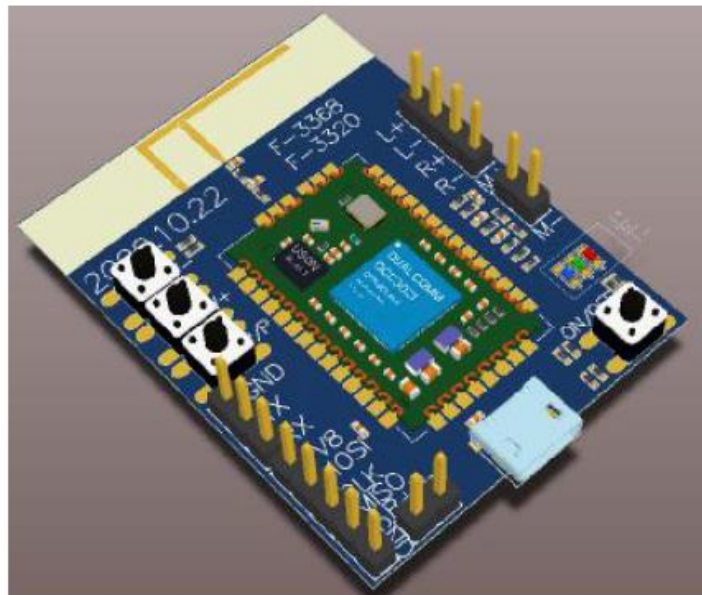# Product specifications

## (Bluetooth module)

Product Model: F-3320
Document number: XZX_RD_SP_F 3320V1.0
Hardware version: V1.0
File version: V 1.0
Entry into force :2020-10-12



(Picture for reference only)

| Change record | | | | | |
|---|---|---|---|---|---|
| Version | Revised content | Page | Revision date | Revision | Auditor |
| V1.0 | New construction | 16 | 2020-10-30 | Li Jian | |
| | | | | | |
| | | | | | |

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# Catalogue (Content)

# 1  Summary

F -3320(QCC3021) Bluetooth module is an intelligent wireless audio data dual-mode transmission product developed by our company. It is a high-end and high-efficiency stereo wireless transmission scheme. The module adopts QCC3021 chip to provide high quality sound quality and compatibility for the module. Overall performance is more optimized.F -3320(QCC3021) Bluetooth module adopts driver-free mode. Customers only need to connect the module to the application product, which can quickly realize the wireless transmission of music and enjoy the fun of wireless music.

# 2  Basic characteristics

- Bluetooth v5.0 compliance specification
- 120MHz Qualcomm Audio DSP
- 32MHz Development Application Processor
- Flexible QSPI Flash
- Programming platform
- Advanced Audio Algorithm
- High performance 24 stereo audio interface
- Digital and analog microphone interfaces
- Flexible PIO controllers and LED pins with PWM support
- 1 Microphone noise reduction and echo cancellation technology
- SBC,AA C audio codec
- Supports serial interface: UART (I2C/SPI) USB 2.0
- Integrated lithium-ion charger

# 3  Applications

- Bluetooth Audio
- Bluetooth headset
- No phone calls
- Bluetooth Wireless Audio
- Bluetooth Digital Transmission Application
- Support for mobile interconnection peripherals
- Bluetooth Smartphone

# 4 Performance parameters

## 4.1 Module parameters

| Module parameters | |
|---|---|
| Wireless standards | Bluetooth Bluetooth V5.0 |
| Antenna | PCB Antenna |
| Frequency range | 2.402 GHz-2.480GHz |
| Transmission power | CLASS1 |
| Receiving sensitivity | Max=-95 DB |
| Extended interface | PIO, SPI, AIO, UART, USB, I2S, I2C, PWM, MIC, LIN, SPK (L/R) |
| Support systems: | Support for Android (android), Apple (IOS) and windows systems |
| Audio decoding output: | SBC, AAC |
| Module dimensions | 15 mm *24mm*2mm (LxWxH) SMD |
| Certification information | - |

## 4.2 Recommended working conditions

| Scope of operation | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Operating temperature range | -40 | - | +85 | ° C |
| Battery | 3.0 | 3.7 | 4.6 | V |
| 5V (USB VBUS) | 4.75 | 5.0 | 6.5 | V |
| Digital I/O | 1.7 | 1.8 | 3.6 | V |
| AIO/LED | 0 | - | 6.5 | V |
| AUDIO-IN/OUT | 0 | - | 1.95 | V |

## 4.3 Battery Input Pin Specification

| BAT | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Operating voltage | 2.8 | 3.7 | 4.6 | V |
| Software power-off threshold | - | 3 | - | V |
| Under voltage lockout rising threshold | 2.47 | 2.6 | 2.73 | V |
| Under voltage lockout hysteresis | 50 | - | 120 | mV |
| USB dead/weak battery rising threshold | 3.14 | 3.3 | 3.46 | V |
| USB dead/weak battery hysteresis | 50 | - | 120 | mV |

## 4.4 Charger Input Pin Specification

| VCHG | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Operating voltage (full device specification) | 4.75 | 5.0 | 6.5 | V |
| Operating voltage (reduced charger specification) | 4.0 | 5.0 | 6.5 | V |
| VCHG_PRESENT rising threshold | 3.4 | 3.6 | 4.0 | V |
| VCHG_PRESENT hysteresis | 70 | - | 150 | mV |

| Full operating range | VCHG_PRESENT | - | 6.5 | V |
|---|---|---|---|---|
| On chip pull-down (disabled when VCHG_PRESENT =1) | 10 | 20 | 30 | kΩ |

## 4.5 Battery charge

| Trickle charge mode | Min | Typical | Max | Unit |
|---|---|---|---|---|
| VPRE threshold (reading) | 2 | 2.1 | 2.2 | V |
| VPRE threshold (falling) | 1.9 | 2.0 | 2.1 | V |
| Trickle charge current: VCHG：4.25V to 6.5V VBAT：0V to 2.2V Full temperature range：-10℃ to 125℃ | 1 | - | 50 | mA |

| Pre-charge mode | | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| VFAST threshold (reflecting) Configured by application software | 0 | 2.8 | 2.9 | 3.0 | V |
| | 1 | 2.9 | 3.0 | 3.1 | V |
| | 2 | 3.0 | 3.1 | 3.2 | V |
| | 3 | 2.4 | 2.5 | 2.6 | V |
| VFAST threshold (falling) hissesis | 0.15 | | 0.2 | 0.25 | V |

| Fast charge modes | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Internal fast charge accuracy: VCHG：5V VBAT：3.4V Temperature：25℃ | 197(-1.5%) | 200 | 203(+1.5%) | mA |
| Internal fast charge accuracy: VCHG：4.75V to 6.5V VBAT：2V to 4.2V VCHG-VBAT ≥ V 0.55 temperature range：-10°C to 125°C | 194 (-3%) | 200 | 206 (+3%) | mA |
| Internal fast charge accuracy (Low VCHG voltage) VCHG：4.4V to 6.5V VBAT：2V to 4.2V VCHG-VBAT ≥0.15 V Full temperature range：-10°C to 125°C | 100 (-50%) | 200 | 206 (+3%) | mA |

| Fast charge mode | | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Battery Voltage<br>VCHG：5V<br>Temperature：25℃ | | 4.18 (-0.5%) | 4.2 | 4.22 (+0.5%) | V |
| Battery Voltage<br>VCHG ： VFLOAT+50 mV to 6.5V<br>Full temperature range：-10°C to 125°C | | 4.16 (-1%) | 4.2 | 4.24 (+1%) | V |
| Termination current<br>Termination accuracy as a percentage of fast charge | 0 | 7 | 10 | 13 | |
| | 1 | 17 | 20 | 23 | |
| | 2 | 27 | 30 | 33 | |
| | 3 | 37 | 40 | 43 | |
| Fast charge mode | | Min | Typical | Max | Unit |
| Voltage hysteresis on VBAT,VHYST,as a percentage of VFLOAT | 0 | 1.8%<br>(75 mVat 4.2V) | 2.4%<br>(100 mVat 4.2V) | 3.0%<br>(125 mVat 4.2V) | % |
| | 1 | 3%<br>(125 mVat 4.2V) | 3.6%<br>(150 mVat 4.2V) | 4.2%<br>(175 mVat 4.2V) | % |
| | 2 | 4.2%<br>(175 mVat 4.2V) | 4.8%<br>(200 mVat 4.2V) | 5.4%<br>(225 mVat 4.2V) | % |
| | 3 | 5.4%<br>(225 mVat 4.2V) | 6%<br>(250 mVat 4.2V) | 6.5%<br>(275 mVat 4.2V) | % |

| Charger headroom error mode | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Headroom error threshold (falling) | 30 | 65 | 100 | mV |
| Headroom error threshold (reading) | 95 | 140 | 170 | mV |

| Charger Vbat overvoltage mode | Min | Typical | Max | Unit |
|---|---|---|---|---|
| Overvoltage (reading) | 4.65 | 4.7 | 4.75 | V |
| Headroom error hysteresis | - | 100 | - | mV |
| Headroom error threshold (falling) | 4.55 | 4.6 | 4.65 | V |

| Charger with external transistor mode | Min | Typical | Max | Unit |
|---|---|---|---|---|
| External fast charge current,IFAST | 0.2 | – | 1.8 | A |
| External pass device hfe | 45 | 120 | 700 | – |
| Charger with external transistor mode accuracy Full temperature range：-10°C to 125°C | MAX | | | – |
| | The accuracy is the sum of the following:<br> of current corresponding to 100mV drop across the external sense resistor ■±1 per cent<br>■ ± accuracy of the external sense resistor | | | |

## 4.6 LED drive foot

| LED driver pads | | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Open drain current | High impedance state | - | - | 5 | uA |
| | Current sink state | - | - | 50 | mA |
| LED pad resistance | V < V 0.5 | - | - | 12 | Ω |
| VIL input logic level low | | - | - | 0.4 | V |
| VIH input logic level high | | 1.0 | - | - | V |

## 4.7 Audio parameters

## 4.7.1Class-AB DAC audio output

| Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Input Sample Width | - | - | - | 24 | Bits |
| Input Sample Rate,Fsample | - | 8 | - | 192 | kHz |
| Max Power | dBFS, 32Ω, and 16Ω load 0 | - | - | 30 | mW |
| Load | - | 16 | 32 | 30K | Ω |
| SNR | kHz fin =1<br>48 kHz Fsample<br>B/W =20 Hz B/W =20 kHz A-Weighted<br>-1 dBFS<br>32Ω load | - | 101 | - | dBA |
| THD+N | kHz fin =1<br>48 kHz Fsample<br>B/W =20 Hz B/W =20 kHz<br>dBFS 0<br>30 mW<br>32Ω load | - | -90.5 | - | dB |
| Digital gain | Digital gain resolution =1/32 | -24 | - | 21.5 | dB |
| Stereo separation (rosstalk) | - | 80 | - | - | dB |

## 4.7.2High-quality (HQ ADC) single-ended audio input

| Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Output Sample Width | - | - | - | 24 | Bits |
| Output Sample Rate,Fsample | - | 8 | - | 96 | kHz |
| Input level | - | - | - | 2.4 | V pk-pk |
| Input impedance | dB to 24dB analog gain 0 | - | 20 | - | kΩ |
| | 27 dB to 39dB analog gain | - | 10 | - | kΩ |
| SNR | kHz fin =1<br>48 kHz Fsample<br>B/W =20 Hz B/W =20 kHz<br>A-Weighted<br>THD+N<0.1 per cent<br>2.4 V pk-pk input (0dB gain) | - | 101 | - | dBA |
| THD+N | kHz fin =1<br>48 kHz Fsample<br>B/W =20 Hz B/W =20 kHz<br>2.4 V pk-pk input (0dB gain) | - | -85 | - | dB |
| Digital gain | Digital gain resolution =1/32 | -24 | - | 21.5 | dB |
| Analog gain | 3 dB steps 3 | 0 | - | 39 | dB |

| Stereo separation (rosstalk) | – | 80 | – | – | dB |
|---|---|---|---|---|---|

## 4.7.3High-quality (HQ ADC) differential audio input

| Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Output Sample Width | – | – | – | 24 | Bits |
| Output Sample Rate,Fsample | – | 8 | – | 96 | kHz |
| Input level | – | – | – | 2.4 | V pk-pk |
| Input impedance | dB to 24dB analog gain 0 | – | 20 | – | kΩ |
| | 27 dB to 39dB analog gain | – | 10 | – | kΩ |
| SNR | kHz fin =1<br>48 kHz Fsample<br>B/W =20 Hz B/W =20 kHz A-Weighted<br>THD+N<0.1 per cent<br>2.4 V pk-pk input (0dB gain) | – | 100 | – | dBA |
| THD+N | kHz fin =1<br>48 kHz Fsample<br>B/W =20 Hz B/W =20 kHz<br>2.4 V pk-pk input (0dB gain) | – | –91 | – | dB |
| Digital gain | Digital gain resolution =1/32 | –24 | – | 21.5 | dB |
| Analog gain | 3 dB steps 3 | 0 | – | 39 | dB |
| Stereo separation (rosstalk) | – | 80 | – | – | dB |

## 4.7.4Microphone bias

| Parameter | Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| Output voltage, step =0.1 V) | – | 1.5 | – | 2.1 | V |
| Output current capability | – | 0.07 | – | 3.0 | mA |
| Output noise | B/W =20 Hz B/W =20 kHz Unweighted | 4.5 | 5.1 | 7.3 | μVrms |
| Crosstalk Between Microphones | Using recommended application circuit | – | 80 | – | dB |

## 4.8 Digital terminal features

| | Min | Typ | Max | Unit |
|---|---|---|---|---|
| VDD_PADS supply | 1.7 | 1.8 | 3.6 | V |
| VIL input logic level low | – | – | 0.22 x VDD_PADS | V |
| VIH input logic level high | 0.7 x VDD_PADS | – | – | V |
| Drive current (configurable) | 2, 4, 8, 12 | 4 | – | mA |
| VOL output logic level low,at max rated drive | – | – | 0.22 x VDD_PADS | V |
| VOH output logic level high,at max rated drive | x 0.75 VDD_PADS | – | – | V |
| Strong pull (up & down) | 15 | 65 | 150 | kΩ |
| Weak pull (up & down) | 500 | 2200 | 5000 | kΩ |

## 4.9 SYS_CTRL Enabling energy

| SYS_CTRL,switching threshold | Min | Typ | Max | Unit |
|---|---|---|---|---|
| Rising threshold | – | – | 1.6 | V |
| Falling threshold | 0.4 | – | – | V |

# 5 R F parameters

| Parameters | Test conditions | Minimum | Typical | Maximum | Unit |
|---|---|---|---|---|---|
| FOP | Working frequency | 2402 | | 2480 | M Hz |
| F XTAL | Crystal frequency | | 32 | | M Hz |
| Launch | | | | | |
| R F TRP | Output power | | 8 | | d Bm |
| PBW | Modulation bandwidth | | | 1 | M Hz |
| Dev | Frequency offset | | ±10 | | kHz |
| Receiving | | | | | |
| Max Input | 0.01% BER received power | | – | | d Bm |
| RXSENS | 0.01% BER sensitivity sensitivity | | -91 | | d Bm |
| Comment: All of the above test results are° C room temperature 3.3 V power supply mode | | | | | |

# 6 Static test

| Test | Pins | Specification | Class |
|---|---|---|---|
| Human Body Model | AIO/LED[5：4,2：0] | JS-001-2017 | 1C (1 000 V) |
| | All other pins | JS-001-2017 | 2(2000 V) |
| Charge Device model | All pins | JS-002-2014 | C2a (500V) |

# 7 Module Size Chart
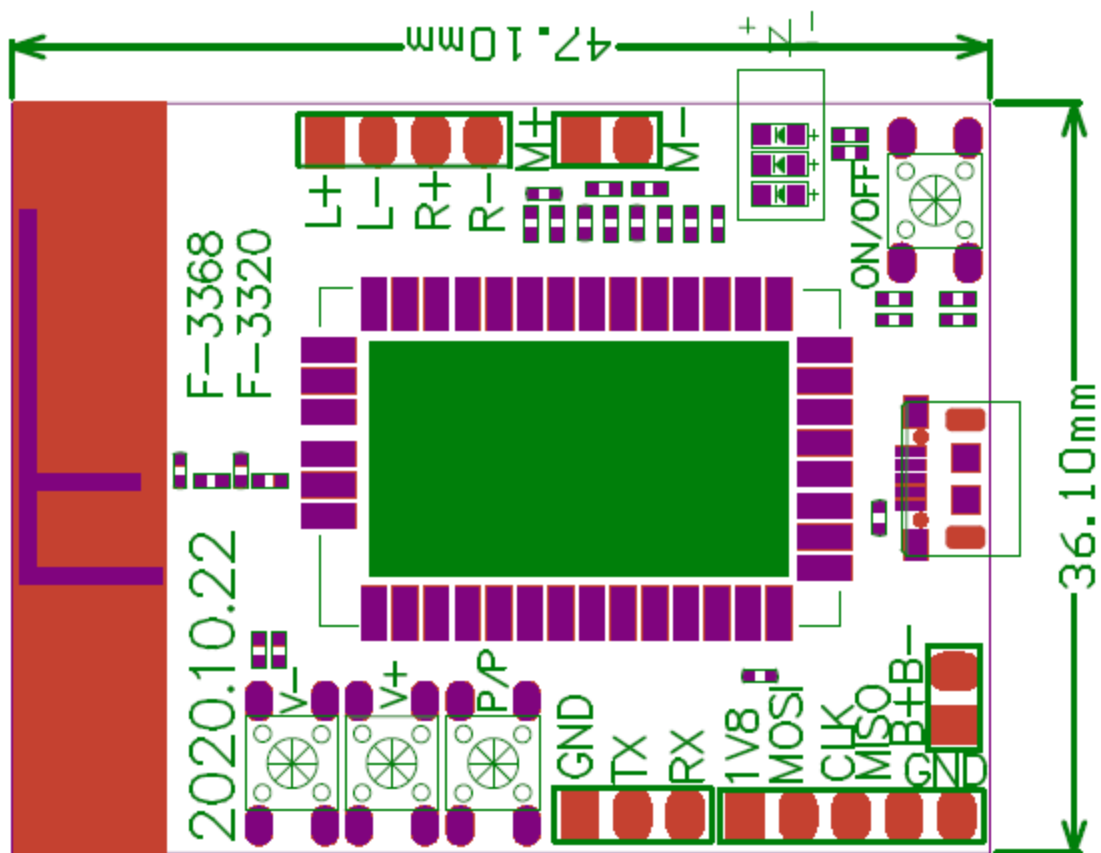


# 8.1 Module Footbit Definition Chart

解脚定义

SP_LP SP_LN SP_RP SP_RN Lin_IN_R MIC_P MIC_BIAS Line_IN_L MIC_N IO12_LED0 IO11_LED1 IO13_LED2 VDDIO3 GPIO15_MFB

P36 P35 P34 P33 P32 P31 P30 P29 P28 P27 P26 P25 P24 P23

P37 GND
P38 NC
P39 NC
P40 GND
P41 ANT
P42 GND

P22 NC
P21 GPIO8
P20 NC
P19 USB_P
P18 USB_N
P17 USB_5V
P16 SYS_3V
P15 NC

P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14

GPIO7 GPIO6 PIO14 GPIO2 PIO10 GPIO9 TXD RXD GPIO4 GPIO5 GPIO8 GPIO3 VBAT GND

## 8.2 Pin Function Description

| Foot position | Symbol name | Pin type | Initial state | State description |
|---|---|---|---|---|
| P1 | PIO-21 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 21. Alternative function: ■PCM_DOUT[2] |
| P2 | PIO-20 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 20. Alternative function: ■PCM_DOUT[1] |
| P 3 | PIO-19 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 19. Alternative function: ■PCM_DIN[0] |
| P 4 | PIO-18 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 18. Alternative function: ■PCM_DOUT[0] |
| P 5 | PIO-17 | Digital: Bidirectional with programmable | Weak pull-down | Programmable I/O line 17. |

| | | | | |
|---|---|---|---|---|
| | | | | strength internal pullup/ pull-down | | Alternative function: ■PCM_SYNC |
| P 6 | PIO-16 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 16. Alternative function: ■PCM_CLK |
| P 7 | PIO-15 | Digital: Bidirectional with programmable strength internal pullup/ pull-down | Weak pull-down | Programmable I/O line 15. Alternative function: ■MCLK_OUT |
| P 8 | PIO-6 [TBR_MOSI] | Digital: Bidirectional with programmable strength internal pullup/ pull-down | Strong pull-up | Programmable I/O line 6. Alternative function: ■TBR_MOSI[0] |
| P 9 | PIO-8 [TBR_CLK] | Digital: Bidirectional with programmable strength internal pullup/ pull-down | Weak pull-down | Programmable I/O line 8. Alternative function: ■TBR_CLK |
| P 10 | CHG_SENSE | Analog | - | Charger input sense pin after external mode sense-resistor.High impedance. NOTE If using internal charger or no charger,connect VCHG_SENSE direct to VCHG. |
| P 11 | PIO-7 TBR_MISO | Digital: Bidirectional with programmable strength internal pullup/ pull-down | Strong pull-up | Programmable I/O line 7. Alternative function: ■TBR_MISO[0] |
| P 12 | PIO-1 REST | Digital: Bidirectional with programmable strength internal pullup/pull-down | Strong pull-up | Automatically defaults to RESET#mode when the device is unpowered, or in off modes.Reconfigurable as a PIO after boot. Alternative function: Programmable I/O line : 1 |
| P 13 | VBAT | Analog | - | Battery voltage sense input. |
| P 14 | GND | | - | Ground |
| P15 | VBAT_SENSE | Analog | - | Battery voltage sense input. |
| P16 | CHG_EXT | Analog | - | External charger transistor current control.Connect to base of external charger transistor as per application schematic. |
| P17 | V CHG | Supply | - | Supply to SMPS power switch from charger input. |
| P18 | USBDN | Digital | - | USB Full Speed device DI/O. IEC-61000-4-2(device level) ESD Protection |
| P19 | USBDP | Digital | - | USB Full Speed device D+I/O. IEC-61000-4-2(device level) ESD Protection |
| P20 | AIO_5 | Analog or digital input/ open drain output. | - | General-purpose analog/digital input or open drain LED output. |

| | | | | |
|---|---|---|---|---|
| P21 | PIO-4 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 4. Alternative function: ■TBR_MOSI[1] |
| P22 | PIO-3 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 3. Alternative function: ■TBR_MISO[2] |
| P23 | MFB [SYS_CTRL] | Digital input | – | Typically connected to an ON/OFF push button. Boots device in response to a button press when power is still present from battery and/or charger but software has placed the device in the OFF or DORMANT state. Additionally useable as a digital input in normal operation. No pull. Additional function: ■PIO[0] input only |
| P24 | 1V8_SMPS | – | – | 1.8 V OUT |
| P25 | LED0 [AIO_0] | Analog or digital input/open drain output. | – | General-purpose analog/digital input or open drain LED output. |
| P26 | LED1 [AIO_1] | Analog or digital input/open drain output. | – | General-purpose analog/digital input or open drain LED output. |
| P27 | LED2 [AIO_2] | Analog or digital input/open drain output. | – | General-purpose analog/digital input or open drain LED output. |
| P28 | MIC A N | Analog | – | Microphone differential 1input, negative. Alternative function: ■Differential audio line input left, negative |
| P29 | MIC A P | Analog | – | Microphone differential 1input, positive. Alternative function: ■Differential audio line input left, positive |
| P30 | MIC_BIAS | Analog | – | Mic bias output. |
| P31 | MIC B N | Analog | – | Microphone differential 2input, negative. Alternative function: ■Differential audio line input right, negative |
| P32 | MIC B P | Analog | – | Microphone differential 2input, positive. Alternative function: ■Differential audio line input right, positive |
| P33 | SPKR_RN | Analog | – | Headphone/speaker differential right output, negative. Alternative function: ■Differential right line output, negative |

| | | | | |
|---|---|---|---|---|
| P34 | SPKR_RP | Analog | – | Headphone/speaker differential right output,positive. Alternative function: ■Differential right line output, positive |
| P35 | SPKR_LN | Analog | – | Headphone/speaker differential left output,negative. Alternative function: ■Differential left line output, negative |
| P36 | SPKR_LP | Analog | – | Headphone/speaker differential left output,positive. Alternative function: ■Differential left line output, positive |
| P37 | PIO-2 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 2. Alternative function: ■TBR_MISO[3] |
| P38 | PIO-5 | Digital: Bidirectional with programmable strength internal pullup/pull-down | Weak pull-down | Programmable I/O line 5. Alternative function: ■TBR_MISO[1] |
| P39 | V8_SMPS 3V3-1 | – | – | V8IN 3V3-1 |
| P40 | GND | – | – | Ground |
| P41 | ANT | RF | – | Bluetooth transmit/receive. |
| P42 | GND | – | – | Ground |
| | | | | |

# 9 Notes

A. During the use of the module, please pay attention to avoid the influence of interference sources such as power amplifier, boost circuit and DC/DC circuit on the module, and avoid the module power supply circuit forming series circuit with high power circuit unit to reduce the interference

B. If there are batteries, metal objects, LCD screens, horns, etc. next to the module antenna, the distance from the antenna is required to be at least 15 mm (as shown)
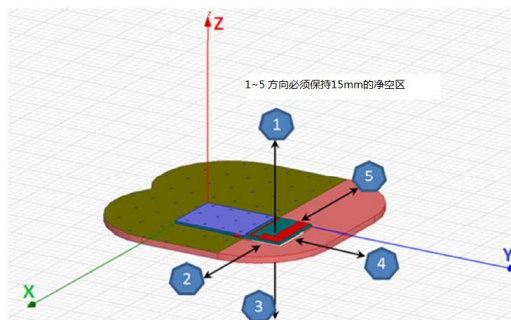


C. PCB board: because metal will weaken the function of the antenna, when giving the module board, it is strictly forbidden to lay the ground and line under the module antenna.

D. Because the metal case is shielding the RF signal, it is recommended not to install it in the metal case

E. With regard to the use environment, wireless signals are easily affected by the surrounding environment, such as trees, metals and other obstacles will have a certain absorption of wireless signals, so in practical applications, the distance of data transmission is affected to a certain extent

# 10 Recommended reflux temperature
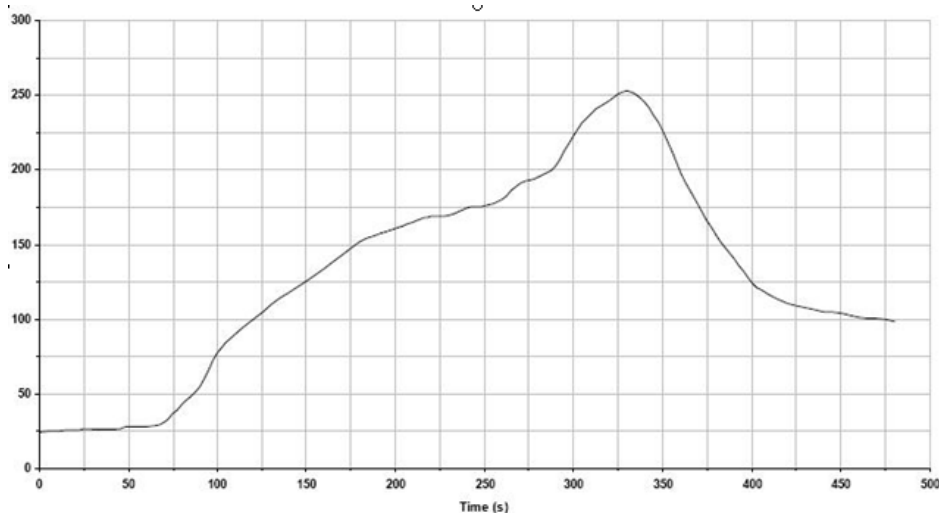


Key features of the profile：

- Initial Ramp=1-2.5℃/ sec to 175℃equilibrium

- Equilibrium time=60 to 80seconds

Ramp to Maximum temperature (250℃)=3℃/ sec Max

- Time above liquidus temperature(217℃ seconds 45-90

- Device absolute maximum reflow temperature：250℃

# 11 Applied circuits

(OEM) Integrator has to assure compliance of the entire end-product incl. the integrated RF Module. For 15 B (§15.107 and if applicable §15.109) compliance, the host manufacturer is required to show compliance with 15 while the module is installed and operating.

Furthermore the module should be transmitting and the evaluation should confirm that the module's intentional emissions (15C) are compliant (fundamental / out-of-band). Finally the integrator has to apply the appropriate equipment authorization (e.g. Verification) for the new host device per definition in §15.101.

Integrator is reminded to assure that these installation instructions will not be made available to the end-user of the final host device.

The final host device, into which this RF Module is integrated" has to be labeled with an auxiliary label stating the FCC ID of the RF Module, such as "Contains FCC ID: OMCBTAUD2

"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 to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

the Integrator will be responsible to satisfy SAR/ RF Exposure requirements, when the module integrated into the host device.

RF Exposure Warning Statements:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.
This equipment shall be installed and operated with minimum distance 20cm between the radiator & body.

The final host device, into which this RF Module is integrated" has to be labeled with an auxiliary label stating the IC of the RF Module, such as" Contains transmitter module IC: 3673A-BTAUD2
Le périphérique hôte final, dans lequel ce module RF est intégré "doit être étiqueté avec une étiquette auxiliaire indiquant le CI du module RF, tel que" Contient le module émetteur IC: 3673A-BTAUD2

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.

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.

Radio Frequency Exposure Statement for IC
The device has been evaluated to meet general RF exposure requirements. The device can be used in mobile exposure conditions. The min separation distance is 20cm.

Déclaration d'exposition aux radiofréquences pour IC
L'appareil a été évalué pour répondre aux exigences générales en matière d'exposition aux RF. L'appareil peut être utilisé dans des conditions d'exposition mobiles. La distance de séparation minimale est de 20 cm.

Module statement

The single-modular transmitter is a self-contained, physically delineated, component for which compliance can be demonstrated independent of the host operating conditions, and which complies with all eight requirements of § 15.212(a)(1) as summarized below.

1) The radio elements have the radio frequency circuitry shielded.
2) The module has buffered modulation/data inputs to ensure that the device will comply with Part 15 requirements with any type of input signal.
3) The module contains power supply regulation on the module.
4) The module contains a permanently attached antenna.
5) The module demonstrates compliance in a stand-alone configuration.
6) The module is labeled with its permanently affixed FCC ID label.
7) The module complies with all specific rules applicable to the transmitter, including all the conditions provided in the integration instructions by the grantee.
8) The module complies with RF exposure requirements.

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

Co-location Warning:
This equipment could not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with the FCC multi-transmitter product procedures.

**Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01**

**2.2 List of applicable FCC rules**
FCC Part 15.247

**2.3 Specific operational use conditions**
This transmitter/module and its antenna(s) must not be co-located or operating in conjunction with any transmitter. This information also extends to the host manufacturer's instruction manual.

**2.4 Limited module procedures**
Not applicable

**2.5 Trace antenna designs**
It is "not applicable" as trace antenna which is not used on the module.

**2.6 RF exposure considerations**
This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This compliance to FCC radiation exposure limits for an uncontrolled environment, and minimum of 20cm separation between antenna and body.
The host product manufacturer would provide the above information to end users in their end-product manuals.

**2.7 Antennas**
PCB antenna; 0dBi; 2.402 GHz～2.480GHz

**2.8 Label and compliance information**
The end product must carry a physical label or shall use e-labeling followed KDB784748D01 and KDB 784748 stating "Contains Transmitter Module FCC ID: OMCBTAUD2".

**2.9 Information on test modes and additional testing requirements**
For more information on testing, please contact the manufacturer.

**2.10 Additional testing, Part 15 Subpart B disclaimer**
The modular transmitter is only FCC authorized for the specific rule parts (FCC Part 15.247) 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 final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed when contains digital circuity.