
Bluetooth Module Datasheet

Model: SJR-BTM875-W

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1 Introduction

Sky Jiarun Technologies introduces the pioneer of the Bluetooth 5.0 modules SJR-BTM875-W which is a high performance, cost effective, low power and compact solution. The Bluetooth module provides a complete 2.4GHz Bluetooth system based on the CSR8675 WLCSP chipset which is a single chip radio and baseband IC for Bluetooth 2.4GHz systems,. This module is fully qualified single-chip dual mode Bluetooth@v5.0 system.

2 Key Features

Bluetooth Profiles

- Bluetooth v5.0 specification support
- Qualcomm® Bluetooth® Low Energy secure connection
- A2DP v1.3.1
- AVRCP v1.6
- HFP v1.7
- HSP v1.2
- MAP v1.1
- PBAP v1.1.1
- DID v1.1
- QTIL's proximity pairing and QTIL's proximity connection

Music Enhancements

- aptX, aptX Low Latency, SBC, and AAC audio codecs
- Qualcomm TrueWireless™ Stereo (TWS), which allows two devices to be configured as a stereo pair
- Configurable Signal Detection to trigger events
- 1 bank of up to 10-stage Speaker Parametric EQ
- 6 banks of up to 5-stage User Parametric EQ for music enhancement
- Qualcomm® meloD™ Expansion audio processing: 3D stereo widening
- Comander to compress or expand the dynamic range of the audio
- Post Mastering to improve DAC fidelity
- Dual I²S outputs with crossover

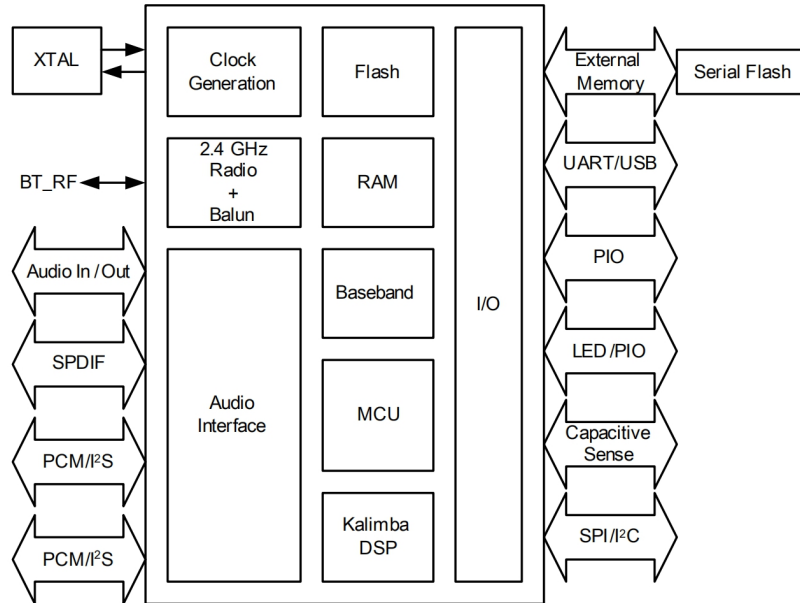
Additional Functionality

- Support for multi-language programmable audio prompts
- Multipoint support for A2DP connection to 2 A2DP sources for music playback
- Talk-time extension, which automatically reduces processor functions to extend use when a low battery condition is detected
- Slim module with 15mm x 22mm x 2.5mm

3 Applications

- Stereo Headsets
- Wired Stereo headsets and headphones
- Portable Bluetooth Stereo speakers

4 Block Diagram

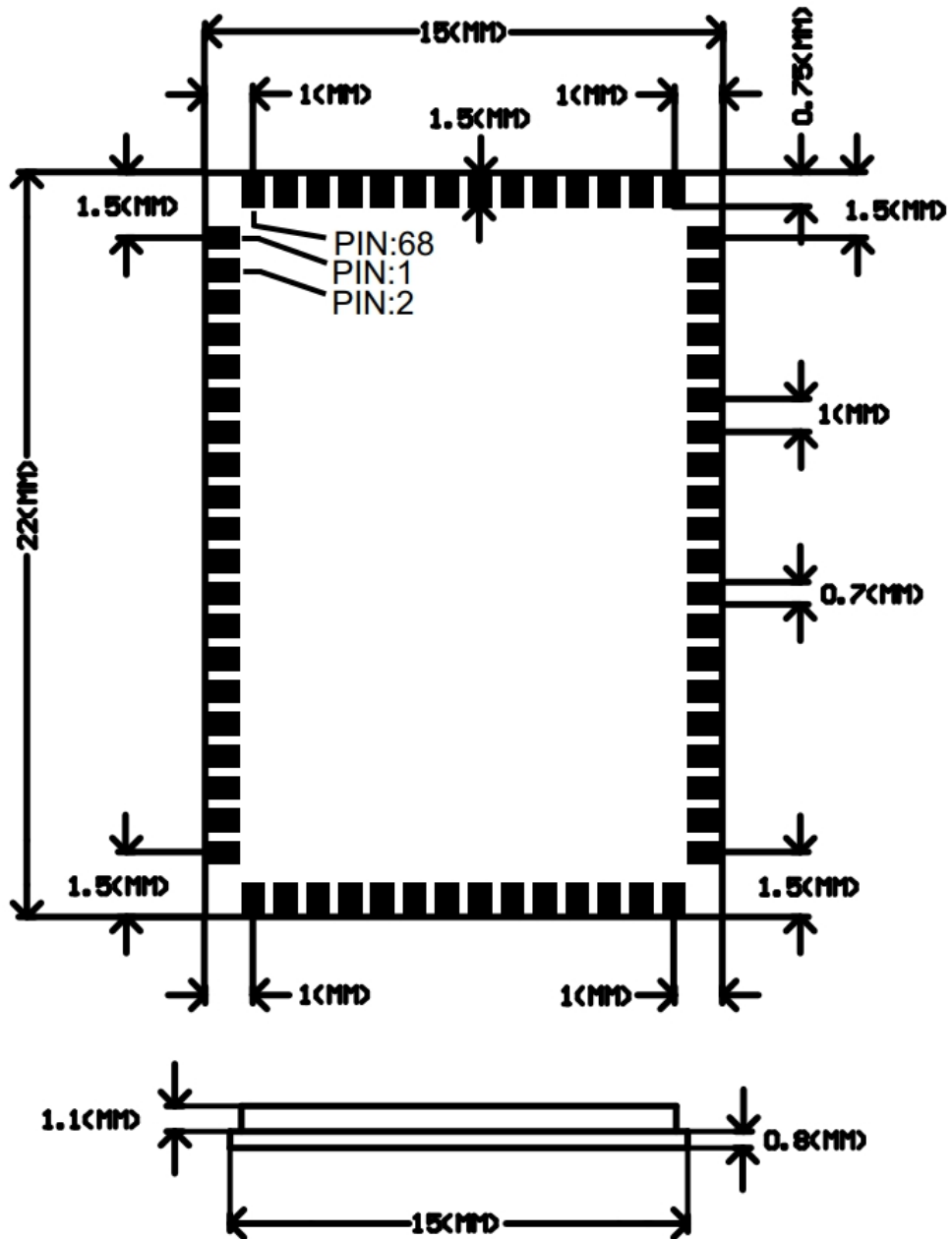


5 General specifications

| | |
|-----------------------------------|------------------------------------|
| Model Name | SJR-BTM875-W |
| Product Description | Bluetooth 5.0 Class2 Module |
| Bluetooth Standard | Bluetooth 5.0 |
| Chipset | CSR8675 WLCSP |
| Dimension | 15mm x 22mm x 2.5mm |
| Operating Conditions | |
| Voltage | 2.8~4.2V |
| Temperature | -10~+70°C |
| Storage Temperature | -40~+85°C |
| Electrical Specifications | |
| Frequency Range | 2402~2480MHz |
| Maximum RF Transmit Power | 9dBm |
| $\pi/4$ DQPSK Receive Sensitivity | -91dBm |
| 8DPSK Receive Sensitivity | -81dBm |

6 Module Package Information

6.1 Pinout Diagram and package dimensions

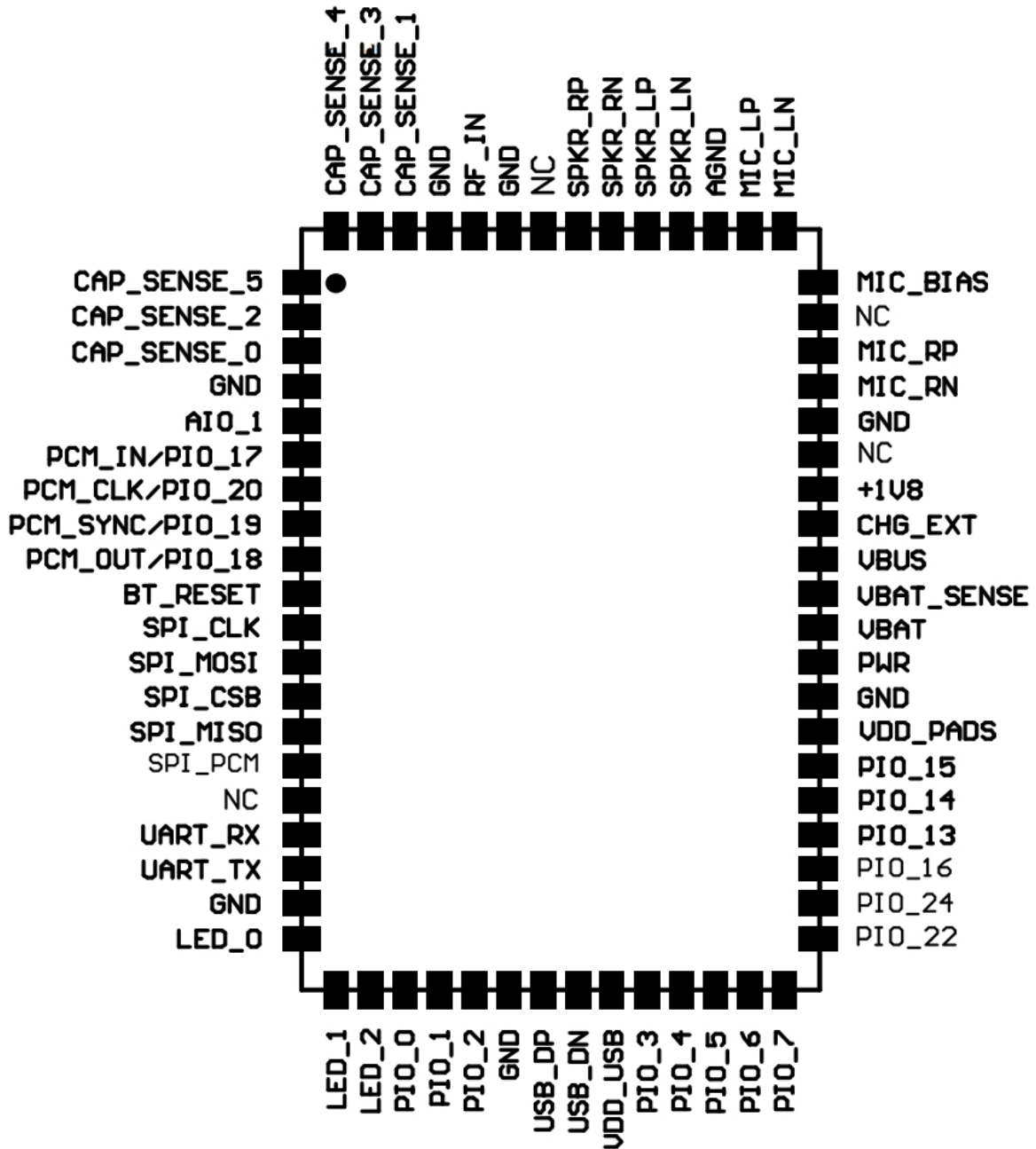


Note: Tolerance without mark default $\pm 0.05\text{mm}$
尺寸未标注公差处公差为 $\pm 0.05\text{mm}$

Unit: MM

Recommended PCB layout footprint

6.2 Module Pin descriptions



| Pin# | Pin Name | Pin Type | Description |
|------|-----------------|------------------------------------|---|
| 1 | CAP_SENSE_5 | Analogue input | Capacitive touch sensor input |
| 2 | CAP_SENSE_2 | Analogue input | Capacitive touch sensor input |
| 3 | CAP_SENSE_0 | Analogue input | Capacitive touch sensor input |
| 4 | GND | Ground | Digital Ground |
| 5 | AIO_1 | Bi-directional | Analogue programmable input / output line |
| 6 | PCM_IN/PIO_17 | Bi-directional with weak pull_down | Synchronous data input.Alternative function PIO[17] |
| 7 | PCM_CLK/PIO_20 | Bi-directional with weak pull_down | Synchronous data clock.Alternative function PIO[20] |
| 8 | PCM_SYNC/PIO_19 | Bi-directional with weak pull_down | Synchronous data sync.Alternative function PIO[19] |

| | | | |
|----|-----------------|------------------------------------|--|
| 9 | PCM_OUT/PIO_18 | Bi-directional with weak pull_down | Synchronous data output.Alternative function PIO[18] |
| 10 | BT_RESET | Input with strong pull-up | Reset if low.Input debounced so must be low for >5ms to cause a reset |
| 11 | SPI_CLK/PIO_20 | Input with weak pull-down | SPI Clock. Alternative function PIO[20] |
| 12 | SPI_MOSI/PIO_17 | Input with weak pull-down | SPI data input. Alternative function PIO[17] |
| 13 | SPI_CSB/PIO_19 | Input with strong pull-up | Chip select for SPI,active low. Alternative function PIO[19] |
| 14 | SPI_MISO/PIO_18 | Output with weak pull-down | SPI data output. Alternative function PIO[18] |
| 15 | SPI_PCM | Bidirectional with weak pull-down | Highs witches SPI/PCM lines to SPI, lows witches SPI/PCM lines to PCM /I ² S/PIO use. |
| 16 | NC | NC | NC |
| 17 | UART_RX/PIO13 | Bi-directional with strong pull_up | UART data input. Alternative function PIO[13] |
| 18 | UART_TX/PIO14 | Bi-directional with weak pull_up | UART data output. Alternative function PIO[14] |
| 19 | GND | Ground | Digital Ground |
| 20 | LED_0 | Open drain | LED driver Alternative function PIO[29] |
| 21 | LED_1 | Open drain | LED driver Alternative function PIO[30] |
| 22 | LED_2 | Open drain | LED driver Alternative function PIO[31] |
| 23 | PIO_0 | Bi-directional with weak pull_down | Programmable input/output line |
| 24 | PIO_1 | Bi-directional with weak pull_down | Programmable input/output line |
| 25 | PIO_2 | Bi-directional with weak pull_down | Programmable input/output line |
| 26 | GND | Ground | Digital Ground |
| 27 | USB_DP | Bi-directional | USB data plus with selectable internal 1.5kohm pull-up resistor |
| 28 | USB_DN | Bi-directional | USB data minus |
| 29 | 3V3_USB | NC | 3.3 V bypass regulator output Positive supply for USB ports |
| 30 | PIO_3 | Bi-directional with weak pull_down | Programmable input/output line |
| 31 | PIO_4 | Bi-directional with weak pull_down | Programmable input/output line |
| 32 | PIO_5 | Bi-directional with weak pull_down | Programmable input/output line |
| 33 | PIO_6 | Bi-directional with weak pull_down | Programmable input/output line |
| 34 | PIO_7 | Bi-directional with weak pull_down | Programmable input/output line |
| 35 | PIO_22 | Bi-directional with weak pull_down | Programmable input/output line |
| 36 | PIO_24 | Bi-directional with weak pull_down | Programmable input/output line |
| 37 | PIO_16 | Bi-directional with weak pull_down | Programmable input/output line |
| 38 | PIO_13 | Bi-directional with weak pull_down | Programmable input/output line |
| 39 | PIO_14 | Bi-directional with weak pull_down | Programmable input/output line |
| 40 | PIO_15 | Bi-directional with weak pull_down | Programmable input/output line |
| 41 | VDD_PADS | Analogue in | positive supply input for digital input/output ports PIOx |
| 42 | GND | Ground | Digital Ground |
| 43 | PWR | Input enable | Regulator enable input. Can also be sensed as an input. Regulator enable and multifunction button. A high input (tolerant to VBAT) enables the on-chip regulators, which can then be latched on internally and the button used as a multifunction input. |

| | | | |
|----|-------------|-------------------|---|
| 44 | VBAT | Power supply | Battery positive terminal |
| 45 | VBAT_SENSE | NC | Battery charger sense input |
| 46 | VBUS | Power supply | Alternative supply via bypass regulator for 1.8V and 1.35V switchmode power supply regulator inputs. Must be connected to the same potential as VOUT_3V3. |
| 47 | CHG_EXT | NC | External battery charger control |
| 48 | +1V8 | Open drain output | LED driver |
| 49 | NC | NC | NC |
| 50 | GND | Ground | Digital Ground |
| 51 | MIC_RN | Analogue in | Microphone input negative,right |
| 52 | MIC_RP | Analogue in | Microphone input positive,right |
| 53 | NC | NC | NC |
| 54 | MIC_BIAS | Analogue out | Microphone bias |
| 55 | MIC_LN | Analogue in | Microphone input negative,left |
| 56 | MIC_LP | Analogue in | Microphone input positive,left |
| 57 | AGND | Ground | Analogue Ground |
| 58 | SPKR_LN | Analogue out | Speaker output negative,left |
| 59 | SPKR_LP | Analogue out | Speaker output positive,left |
| 60 | SPKR_RN | Analogue out | Speaker output negative,right |
| 61 | SPKR_RP | Analogue out | Speaker output positive,right |
| 62 | NC | NC | NC |
| 63 | GND | Ground | Analogue Ground |
| 64 | RF_IN | RF | Bluetooth 50ohm transmitter output/receiver input |
| 65 | GND | Ground | Analogue Ground |
| 66 | CAP_SENSE_1 | Analogue input | Capacitive touch sensor input |
| 67 | CAP_SENSE_3 | Analogue input | Capacitive touch sensor input |
| 68 | CAP_SENSE_4 | Analogue input | Capacitive touch sensor input |

7 Electrical Characteristics

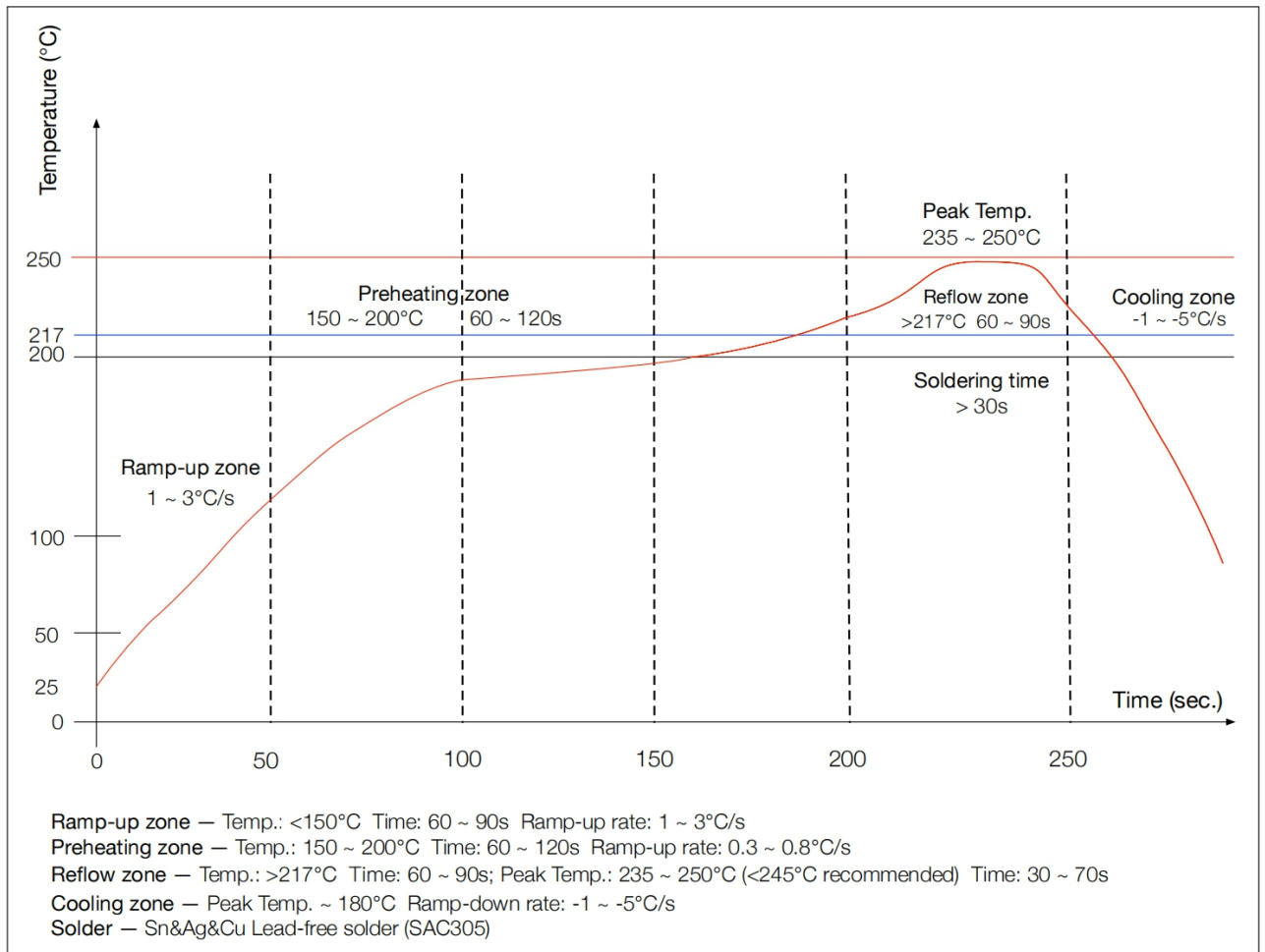
7.1 Absolute Maximum Ratings

| Rating | Minimum | Maximum |
|---------------------|---------|---------|
| Storage temperature | -40°C | +85°C |

7.2 Recommended Operating Conditions

| Operating Condition | Minimum | Maximum |
|-----------------------------|---------|---------|
| Operating temperature range | -10°C | +70°C |
| Supply voltage: VBAT | +2.8V | +4.2V |

8 Recommended reflow temperature profile



The module Must go through 125°C baking for at least 9 hours before SMT AND IR reflow process!

若拆封后未立即上线，天嘉润科技建议让下次上线前务必以 **125°C** 烘烤 **9** 小时以上！

Record of Changes

| Data | Revision | Description |
|------------|----------|--|
| 2020-08-25 | V1.0 | Original publication of this document. |
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