BRC01 蓝牙模组规格书

BRC01 BT Module Datasheet

当前手册版本：V1.0

Current version ：V1.0

Product Designation : BLE Module

Brand Name: Aurender Inc

Test Model: BRC01

目录

1. 概述 Overview

BRC01系列数传模组是基于超低耗电BLESOC蓝牙芯片设计开发，集成MCU，基带控制器，RF及多种外设接口，完全兼容蓝牙BLE5.0协议。本系列模块数据透传应用同时支持BLE主、从和多连接，提供UART等接口与外部MCU连接，可应用于多种用户自定义的应用场景。本系列模块集成度高，扩展性强，功耗低，模块尺寸小，广泛应用于多种产品领域。

BRC01自带板载天线，使用更简单。

The **BRC01** series data transmission module is designed and developed based on the ultra-low power BLESOC Bluetooth chip, integrating MCU and baseband control

Device, RF and multiple peripheral interfaces, fully compatible with Bluetooth BLE5.0 protocol. This series of module data transmission applications supports BLE master, slave, and multi connection simultaneously, providing interfaces such as UART to connect with external MCUs, and can be applied to various user-defined application scenarios. This series of modules has high integration, strong scalability, low power consumption, small module size, and is widely used in various product fields.

BRC01 comes with an onboard antenna, making it easier to use.

2. 规格参数Specification parameters

射频	**频率 Frequency**	2.4GHz~2.48GHzISMband
	支持协议 Support agreement	BLEV4.2/V5.0
	调制方式 Modulation Type	GFSK@125Kbps,500Kbps,1Mbps,2Mbps
	发射功率 Transmission power	-0.116dBm
	接收灵敏度 Receiver sensitivity	-95dbm
	天线 Antenna	内置天线&板载天线 Internal antenna &Onboard antenna
接口	**通信接口 Communication interface**	TTLUART(默认115200bps)
	工作电压 Working voltage	VCC:1.8V~3.3V
	工作温度 Operation temperature	-40~85℃
功耗	**ActiveRx**	1mA
	ActiveTx@0dbm	2.5mA
	内存保持@32KBRAM	2uA
	休眠 Hibernate	0.8uA
	SocOff	0.3uA
	1秒周期性广播@0dbm	平均<9uA

注:以上耗电数据为KeithleyDM6500实测的典型值,模组在客户实际电路中的功耗将受到外围电路,配置参数和软件功能的影响.

BRC01相对其它型号最大的优势就是耗电低，下图耗电对比图，可供参考.

The above power consumption data is a typical value measured by Keithley DM6500. The power consumption of the module in the customer's actual circuit will be affected by peripheral circuits, configuration parameters, and software functions

The biggest advantage of **BRC01** compared to other models is its low power consumption. The power consumption comparison chart below is for reference

3. 典型应用Typical applications

BRC01模组可以快速实现模组与手机，模组与模组的点对点数据传输,用户MCU通过通用串口(UART)跟模组进行连接，可实现和移动设备进行数据的双向通讯。模组接收到来自用户MCU串口的数据后，将自动转发给移动设备；移动设备可以通过APP写数据到模组，模组将收到的数据通过串口发送给用户的MCU。

BRC01同时也支持多连接，主从同开应用，在连接移动设备的同时还能连接其它BLE设备.

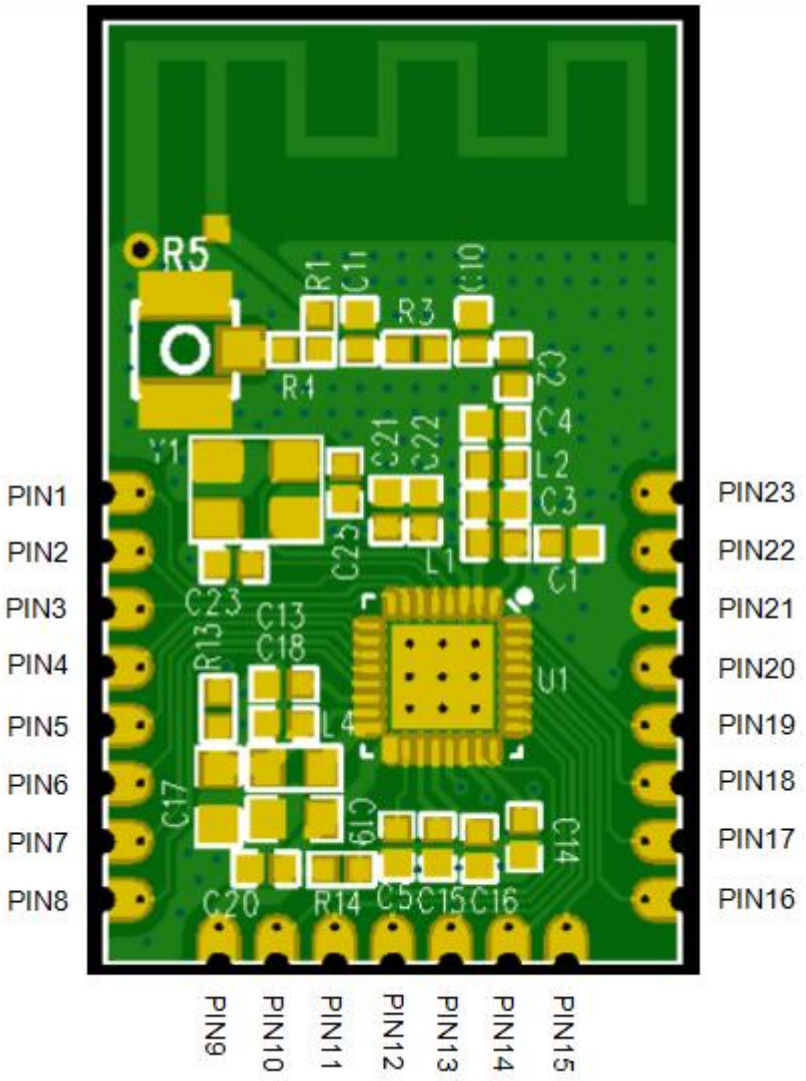
BRC01除了支持AT指令控制以外，也开放原生SDK和参考软件设计，支持BLE协议的基础上开放MCU和外设资源，这样能够简化系统结构，降低整机成本.

The **BRC01** module can quickly achieve point-to-point data transmission between modules and mobile phones, as well as between modules. The user MCU connects to the module through a universal serial port (UART), enabling bidirectional communication of data with mobile devices. After receiving data from the user MCU serial port, the module will automatically forward it to the mobile device; Mobile devices can write data to the module through the APP, and the module will send the received data to the user's MCU through the serial port.

BRC01 also supports multiple connections and master-slave applications, allowing it to connect to other BLE devices while also connecting to mobile devices

BRC01 not only supports AT command control, but also opens up native SDK and reference software design. On the basis of supporting BLE protocol, it opens up MCU and peripheral resources, which can simplify the system structure and reduce the overall cost

4. 外形尺寸External dimensions



Dimensions：26mmX16mmX0.8mm

Pin pitch，Up & down：1.6mm，Left & right：16mm

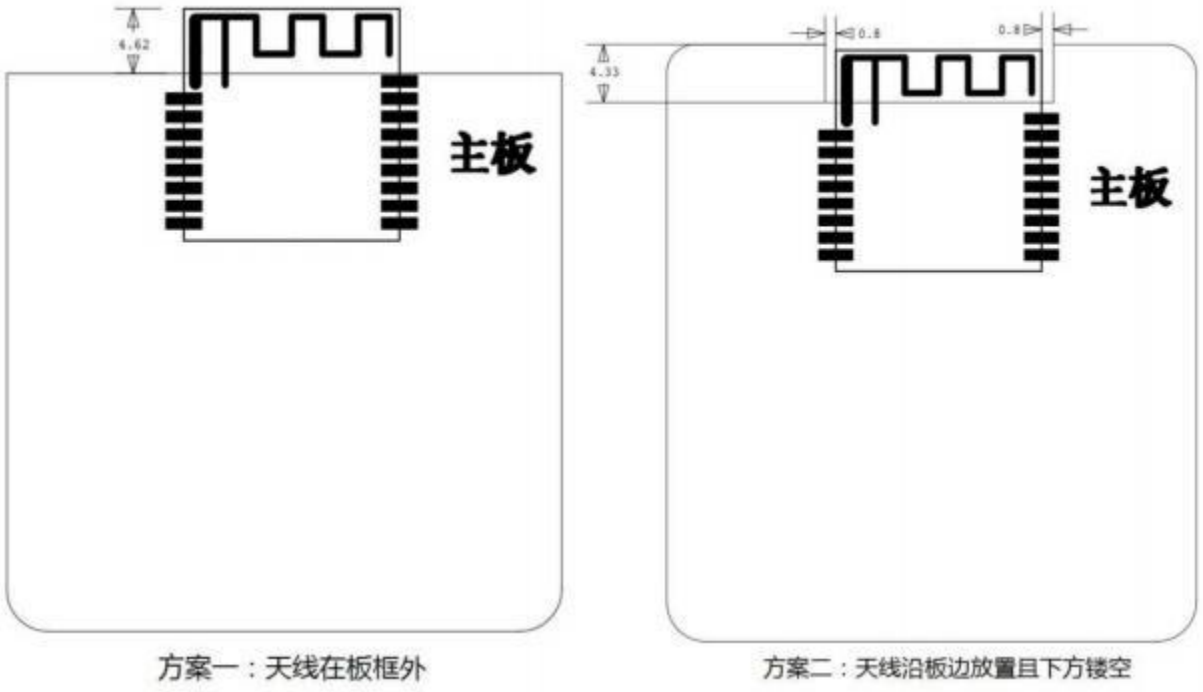
5. 引脚说明Pinouts

PIN	IC PIN	NAME	FUNCTION
1	6	GPIO18	GPIO18/PWM0_0P/PWM2/UART1_CTS/UART4_RTS/UART4_ISO7816_RST/SPI3_MOSI/TWI0_SCL/QDx_A/BLE_SYNC/I2SG1_LRCLK/KEY10/CAPTURE0
2	7	GPIO26	GPIO26/PWM0_0N/PWM1_0/PWM4/UART1_RTS/UART1_ISO7816_RST/SPI3_MISO/TWI0_SDA/QDx_B/BLE_IN_PROCESS/I2SG1_BCLK/KEY15/CAPTURE0
3	8	GPIO6	GPIO6/PWM0_3P/PWM2/UART0_CTS/UART3_RTS/UART3_ISO7816_RST/SPI3_CLK/TWI1_SCL/QDx_A/BLE_PTI[0]/I2SG1_BCLK/DMIC_CLK/KEY11/CAPTURE0
4	9	GPIO7	GPIO7/PWM0_3N/PWM1_3/UART0_RTS/UART3_CTS/UART0_ISO7816_RST/TWI1_SDA/QDx_B/BLE_PTI[1]/I2SG1_MCLK/DMIC_DAT/KEY7/CAPTURE1
5	10	GPIO8	GPIO8/PWM0_5P/PWM4/UART3_TX/UART3_ISO7816_CLK/SPI3_SS/TWI2_SCL/QDy_A/BLE_PTI[2]/I2SG1_LRCLK/PDM_DOUT/KEY8/CAPTURE1
6	11	GPIO9	GPIO9/PWM0_5N/PWM1_5/PWM5_IRTX/UART3_RX/UART3_ISO7816_DAT/TWI2_SDA/QDy_B/KEY9/CAPTURE0
7	12	GPIO12	GPIO12/PWM0_4P/PWM3/UART0_TX/UART0_ISO7816_CLK/TWI0_SCL/QDz_A/BLE_PTI[3]/I2S_DOUT/KEY5/CAPTURE0/HOST_SWCLK(G1)
8	13	GPIO13	GPIO13/PWM0_4N/PWM1_4/UART0_RX/UART0_ISO7816_DAT/TWI0_SDA/QDz_B/I2S_DIN/DMIC_DAT/KEY6/CAPTURE1/HOST_SWDIO(G1)
9	17	IOVCC	/
10	18	CHIPEN	/
11	24	GPIO0	GPIO0/PWM0_0P/PWM1_3/UART2_RX/UART4_CTS/UART2_ISO7816_DAT/SPI0_MISO/SPI2_MISO/TWI0_SCL/QDx_A/WLAN_TX/I2S_DOUT/PDM_DOUT/KEY0/CAPTURE0/LRADC0
12	25	GPIO1	GPIO1/PWM0_0N/PWM1_0/UART2_TX/UART4_RTS/UART2_ISO7816_CLK/SPI0_MOSI/SPI2_MOSI/TWI0_SDA/QDx_B/WLAN_RX/I2SG0_BCLK/KEY1/CAPTURE1/LRADC1
13	26	GPIO22	GPIO22/PWM0_4P/PWM2/UART3_RTS/UART3_ISO7816_RST/SPI2_MISO/TWI1_SCL/QDz_A/I2S_DOUT/DMIC_CLK/KEY9/CAPTURE0/LRADC2
14	27	GPIO21	GPIO21/PWM0_5N/PWM1_5/PWM5_IRTX/UART3_RX/UART3_ISO7816_DAT/SPI2_CLK/TWI2_SDA/QDy_B/WLAN_RX/I2SG0_LRCLK/PDM_DOUT/KEY2/CAPTURE1/LRADC1
15	28	GPIO20	GPIO20/PWM0_5P/PWM4/UART3_TX/UART3_ISO7816_CLK/SPI2_SS/TWI2_SCL/QDy_A/WLAN_TX/I2SG1_LRCLK/DMIC_DAT/KEY3/CAPTURE0/LRADC0
16	29	GPIO4	GPIO4/PWM0_2P/PWM1_5/UART1_TX/UART1_ISO7816_CLK/SPI3_MISO/TWI2_SCL/QDz_A/WLAN_RX/I2S_DIN/KEY4/CAPTURE0/LRADC4/HOST_SWCLK(G0)
17	30	GPIO5	GPIO5/PWM0_2N/PWM1_2/UART1_RX/UART1_ISO7816_DAT/SPI3_MOSI/TWI2_SDA/QDz_B/WLAN_TX/I2SG1_MCLK/PDM_DOUT/KEY12/CAPTURE1/LRADC5/HOST_SWDIO(G0)
18	31	GPIO2	GPIO2/PWM0_1P/PWM1_4/UART4_RX/UART4_ISO7816_DAT/SPI0_SS/SPI2_SS/TWI1_SCL/QDy_A/BLE_RX/I2SG1_BCLK/PDM_DOUT/KEY13/CAPTURE0/LRADC2
19	32	GPIO3	GPIO3/PWM0_1N/PWM1_1/UART4_TX/UART4_ISO7816_CLK/SPI0_CLK/SPI2_CLK/TWI1_SDA/QDy_B/BLE_TX/I2S_DOUT/KEY14/CAPTURE1/LRADC3
20	23	VMIC	GPIO19/PWM1_5/PWM3/UART4_TX/UART4_ISO7816_CLK/I2SG0_MCLK/DMIC_DAT/KEY11/CAPTURE1/VMIC
21	33	GND	/
22	22	MICINP	GPIO40/PWM1_2/PWM5_IRTX/UART4_RX/UART4_ISO7816_DAT/I2SG0_LRCLK/DMIC_DAT/KEY9/CAPTURE1/MICINP
23	21	MICINN	GPIO41/PWM1_3/PWM2/UART4_RTS/UART4_ISO7816_RST/TWI2_SCL/I2S_DIN/PDM_DOUT/KEY10/CAPTURE0/MICINN/VMIC

6. 使用注意事项Precautions for use

为了获得更好的射频性能，天线附近要保留足够净空区，建议选用下图两种走线方式：1.将模组沿PCB板边放置，天线在板框外。2.沿板边放置且下方挖空，天线区域不能敷铜，尽量不走线。具体参考如下：

In order to achieve better RF performance, sufficient clearance should be reserved near the antenna. It is recommended to use the following two wiring methods: 1. Place the module along the edge of the PCB board and place the antenna outside the board frame. 2. Place along the edge of the board and excavate below. Copper should not be laid in the antenna area and wiring should be avoided as much as possible. The specific reference is as follows:



方案一：天线在板框外　　方案二：天线沿板边放置且下方镂空

7. 版本历史Version History

日期 Date	版本号 Version	描述 Description	作者 Author
2024-12-26	1.0	初始版本 Initial version	

8. FCC/IC Statements

(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: 2AO2T-BRC01

"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.

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: 33423-BRC01
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: 33423-BRC01

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.

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.