

RG-BT10-06 型近距离蓝牙模块规格

一、概述

基于 Class 2 功率等级的 RG-BT10-06 型近距离蓝牙模块，完全遵循 Bluetooth V2.0 蓝牙设计规范。模块内置锂电池充电线路，支持降压和升压两种类型的供电模式：降压型供电模式适应外部锂电池直接供电、升压型供电模式适应外部两节 1.5V 干电池直接供电。

本模块可专业集成蓝牙 SPP 协议，主要应用于蓝牙转 RS232 串口数据通讯及蓝牙无线数据采集与遥控。RG-BT10-06 型近距离蓝牙模块是深圳市红果电子科技有限公司专业打造的第二代 Class 2 蓝牙精品，充分展示了公司在蓝牙应用领域具有前瞻性的战略眼光和由此产生的新技术成果。

本模块内置 PCB 射频天线，具有收发灵敏性高、低成本、体积小、功耗低等优点。在无遮挡的情况下，同功率等级的模块点对点最短传输距离可达 10 米。



二、特征

- 工业级标准设计
- 尺寸大小：27.5 x 13.2 x 2(mm)
- 遵循 Bluetooth V2.0 蓝牙规范
- 可专业集成 SPP 蓝牙协议
- 数据安全认证与加密
- 点对点传输距离最近可达 10 米
- 支持低功耗模式: Park, Sniff, Hold 和 Deep Sleep
- 支持连接 7 个蓝牙从设备
- 高数据率 2.4GHz 射频链路,支持自适应跳频 (AFH)
- 集成了降压/升压型 DC-DC 转换器和 LDO。
- 可编程波特率 UART 接口，最大波特率：115200bps
- 支持 UART 编程接口
- 支持 I2C 总线接口
- 具有 22 个 PIO 输入输出端口
- 具有 6 路模拟信号输入端口（与 PIO 口复用）
- 绿色环保

三、应用领域

- 蓝牙无线遥控
- 蓝牙与 RS232 (RS485) 串口数据转换
- 医疗设备蓝牙无线数据采集与传输
- 车辆蓝牙无线监控及诊断

地址：深圳市龙岗区龙城街道爱联社区爱联锦绣村五巷十号一楼 电话：0755-89728163；13392443131

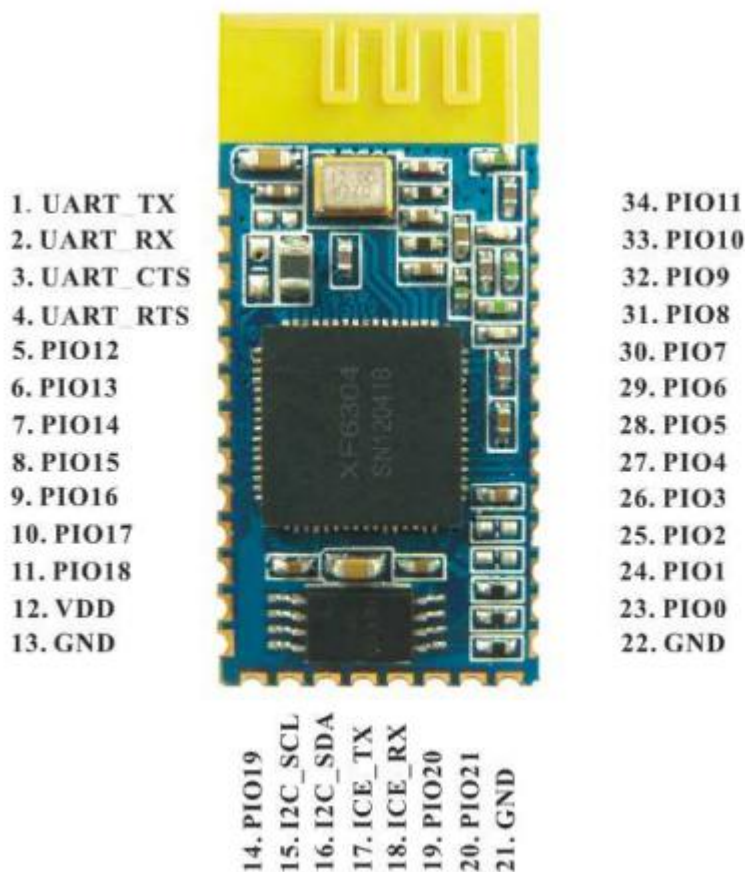
网址：www.redgoo.com.cn

E-mail：redgoo@163.com

QQ：827212011

- 工业及安防蓝牙无线控制与数据采集
- 各类手持 POS 机蓝牙数据采集与传输
- NFC 及 RFID 射频识别蓝牙传输
- 蓝牙无线操纵杆及游戏手柄
- 蓝牙无线打印机
- 蓝牙 GPS 导航
- 蓝牙无线仪器仪表

四、管脚分布



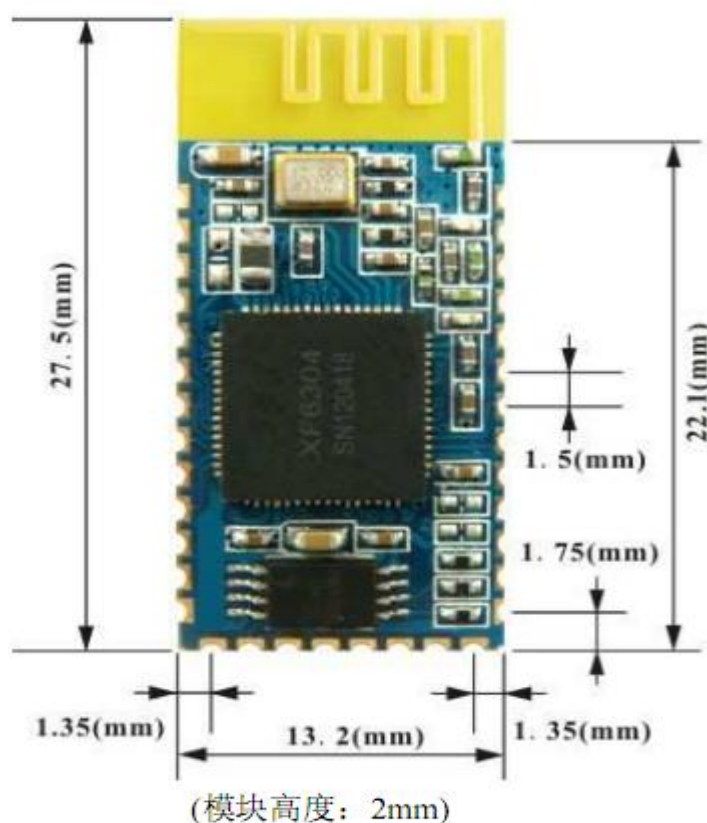
五、管脚描述

管脚序号	名称	类型	描述
1	UART_TX	internal pull-up	UART Data output
2	UART_RX	internal pull-down	UART Data input
3	UART_CTS	internal pull-down	UART clear to send, active low
4	UART_RTS	weak internal pull-up	UART request to send, active

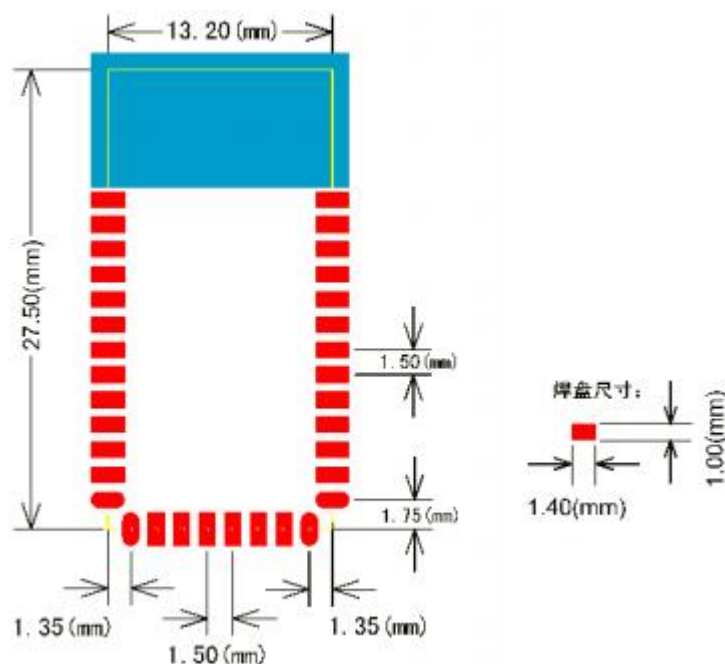
			Low															
5	PI012	Enable internal pull-up or pull-down	Programmable input/output line															
6	PI013	Enable internal pull-up or pull-down	Programmable input/output line															
7	PI014	Enable internal pull-up or pull-down	Programmable input/output line															
8	PI015	Enable internal pull-up or pull-down	Programmable input/output line															
9	PI016	Enable internal pull-up or pull-down	Programmable input/output line															
10	PI017	Enable internal pull-up or pull-down	Programmable input/output line															
11	PI018	Enable internal pull-up or pull-down	Programmable input/output line															
12	VDD	<table border="1"> <thead> <tr> <th>Condition</th> <th>MIN</th> <th>TYP</th> <th>MAX</th> <th>UNIT</th> </tr> </thead> <tbody> <tr> <td>Buck mode</td> <td>3</td> <td>4</td> <td>5</td> <td>V</td> </tr> <tr> <td>Boost mode</td> <td>2</td> <td>2.5</td> <td>3.4</td> <td>V</td> </tr> </tbody> </table>	Condition	MIN	TYP	MAX	UNIT	Buck mode	3	4	5	V	Boost mode	2	2.5	3.4	V	Normal external power supply: 3.3V
Condition	MIN	TYP	MAX	UNIT														
Buck mode	3	4	5	V														
Boost mode	2	2.5	3.4	V														
13	GND	VSS	Ground															
14	PI019	Enable internal pull-up or pull-down	Programmable input/output line															
15	I2C_SCL	I2C master clock	Programmable input/output line															
16	I2C_SDA	I2C master data	Programmable input/output line															
17	ICE_TX	Enable internal pull-up or pull-down	UART output, used only in test mode															
18	ICE_RX	Enable internal pull-up or pull-down	UART output, used only in test mode															
19	PI020	Enable internal pull-up or pull-down	Programmable input/output line															
20	PI021	Enable internal pull-up or pull-down	Programmable input/output line															
21	GND	VSS	Ground															
22	GND	VSS	Ground															
23	PI00	Enable internal pull-up or pull-down	Programmable input/output line															
24	PI01	Enable internal pull-up or pull-down	Programmable input/output line															
25	PI02	Enable internal pull-up or pull-down	Programmable input/output line															
26	PI03	Enable internal pull-up or pull-down	Programmable input/output line															

27	PI04	Enable internal pull-up or pull-down	Programmable input/output line
28	PI05	Enable internal pull-up or pull-down	Programmable input/output line
29	PI06	Enable internal pull-up or pull-down	Programmable input/output line
30	PI07	Enable internal pull-up or pull-down	Programmable input/output line
31	PI08	Enable internal pull-up or pull-down	Programmable input/output line
32	PI09	Enable internal pull-up or pull-down	Programmable input/output line
33	PI010	Enable internal pull-up or pull-down	Programmable input/output line
34	PI011	Enable internal pull-up or pull-down	Programmable input/output line

六、外形尺寸



七、PCB 封装尺寸



警示：蓝牙模组粘贴区域内 PCB 顶层尽量不要走线或铺铜(建议加铺丝印油)；模组底部射频测试点区域 PCB 顶层严禁走线或铺铜；天线区域（蓝色标示区域）应尽可能远离金属物，PCB 板各层不得在此区域走线、铺铜，电源层和电源参考层也不得穿过此区域。通常将蓝牙模块天线部位靠近 PCB 板边沿安放，PCB 板天线区域开槽。

八、电器特性

Table1. DC Electrical Specification

DESCRIPTION	CONDITION	MIN	TYP	MAX	UNIT
Supply voltage	Buck DC-DC mode	3	4	5	V
	Boost DC-DC mode	2	2.5	3.4	V
Ambient temperature		-20	27	+85	°C
CMOS low level input voltage		0	--	0.3*VDD	V
CMOS high level input voltage		0.7*VDD	--	VDD	V

Table2. Absolute Maximum Ratings

PARAMETER	MIN	TYP	MAX	UNIT
Storage temperature	-40	--	125	°C
Supply voltage	0	--	6	V
LNA input level	--	--	+10	dBm

Table3. Power Consumption

(VDD = 4V with buck DC-DC, T_A = +27 °C)

OPERATION MODE	MIN	TYP	MAX	UNIT
RX	--	47.7	--	mA
TX	--	47.8	--	mA
Sniff mode, 9 us interval	--	4.6	--	mA
Sniff mode, 500 us interval	--	144	--	uA
Sleep mode	--	60	--	uA

Table4. Buck DC-DC Converter Characteristics

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
Input voltage		3	4	5	V
Output voltage	$I_{load} = 100 \text{ mA}$	1.9	2.1	2.3	V
● Normal operation					
Output ripple		--	40	--	mV
Maximum load current		80	--	120	mA
Power efficiency	$I_{load} = 50 \text{ mA}$	--	90	--	%
Current limit		--	300	--	mA
Load regulation	$I_{load} = 2 \text{ mA to } 100 \text{ mA}$	--	--	50	mV
Line regulation	Input voltage: 2.6 V to 4.3 V, with $I_{load} = 50 \text{ mA}$	--	--	20	mV
Transient Regulation	$I_{load} = 1 \text{ mA to } 100 \text{ mA}$ in 10 μs	--	50	--	mV
Output capacitor		--	4.7	--	μF
Capacitor ESR		--	30	--	mOhm
Inductor		--	10	--	μH
Inductor ESR		--	--	500	mOhm
● Low power mode					
Output ripple		--	50	--	mV
Maximum load current		--	100	--	mA
Quiescent current		--	--	100	μA
● Disable mode					
Quiescent current		--	--	10	μA

Table5. Boost DC-DC Converter Characteristics

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
Input voltage		2.0	2.5	3.4	V
Output voltage	$I_{load} = 100 \text{ mA}$	2.7	3	3.3	V
● Normal Operation					
Output ripple		--	50	--	mVrms
Transient settling time		--	100	--	μs
Maximum load current		80	-	120	mA
Power efficiency	$I_{load} = 50 \text{ mA}$	--	80	--	%
Current limit		--	300	--	mA
Load regulation	$I_{load} = 2 \text{ mA} \sim 100 \text{ mA}$	--	--	150	mV
Line regulation	Input variation from 2.0 V \sim 3.0 V, $I_{load} = 50 \text{ mA}$	--	--	200	mV
Transient regulation	$I_{load} = 1 \text{ mA to } 100 \text{ mA}$ in 10 μs	--	50	--	mV

Output capacitor		--	4.7	--	μF
Capacitor ESR		--	30	--	mOhm
Inductor		--	4.7	--	μH
Inductor ESR		--	--	500	mOhm
● Low Power Mode					
Output ripple		--	200	--	mVrms
Transient settling time		--	100	--	μs
Maximum load current		--	100	--	mA
Quiescent current		--	--	100	μA
● Disable Mode					
Quiescent current		--	--	10	μA

九、射频特性

Table6. Frequency Synthesizer Characteristics

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
General Specifications					
Frequency range		2400	--	2500	MHz
Frequency step		--	1	--	MHz
Crystal frequency		--	12	--	MHz
Crystal frequency accuracy		--	--	20	ppm

Table7. Receiver Characteristics

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
General Specifications					
Frequency range		2402	--	2480	MHz
Sensitivity	@ 0.1% BER	--	-86	--	dBm
Maximum received signal	@ 0.1% BER	-20	--	--	dBm
Co-Channel interference, $C/I_{\text{co-channel}}$		--	6.9	11	dB
Adjacent (1 MHz) interference, $C/I_{1\text{MHz}}$		--	-6.5	0	dB
Adjacent (2 MHz) interference, $C/I_{2\text{MHz}}$		--	--	-23	dB
Adjacent (>3 MHz) interference, $C/I_{>3\text{MHz}}$		--	-62.1	-40	dB
Image frequency interference, C/I_{image}		--	-33	-9	dB
Adjacent (1 MHz) interference to in-band image frequency, $C/I_{\text{image}+1\text{MHz}}$		--	-42.1	-20	dB
Out-of-band blocking performance	30 MHz–2000 MHz	-10	--	--	dBm
	2000 MHz–2400 MHz	-27	--	--	dBm
	2500 MHz–3000 MHz	-27	--	--	dBm
	3000 MHz–12.5 GHz	-10	--	--	dBm

Note: 1. BQB allows up to 5 exceptions. This item may use two exceptions.

Table8. Transmitter Characteristics

PARAMETER	CONDITION	MIN	TYP	MAX	UNIT
General Specifications					
Frequency range		2402	--	2480	MHz
Maximum output power		--	0	--	dBm
Adjacent channel transmit power	$F = F_0 - < 3 \text{ MHz}$	--	--	-40	dBm
	$F = F_0 - 3 \text{ MHz}$	--	-45	-40	dBm
	$F = F_0 - 2 \text{ MHz}$	--	--	-20	dBm
	$F = F_0 - 1 \text{ MHz}$	--	--	-20	dBm
	$F = F_0 + 1 \text{ MHz}$	--	--	-20	dBm
	$F = F_0 + 2 \text{ MHz}$	--	--	-20	dBm
	$F = F_0 + 3 \text{ MHz}$	--	-45	-40	dBm
	$F = F_0 + > 3 \text{ MHz}$	--	--	-40	dBm