



深圳大夏龙雀科技有限公司
Shenzhen DX-SMART Technology Co Ltd.

DX-BT22\BT23 蓝牙模块
DX-BT22\BT23 Bluetooth Module

Note: English instructions go to page 16
(英文说明书请跳转到第16页)

技术手册

v 2.0

版本	修订日期	修订说明	维护人
V1.0	2018.11.2	初始版本	VICTOR
V2.0	2019.3.19	内容增加	VICTOR



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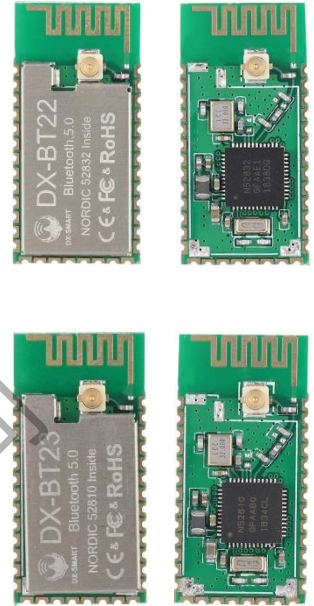
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一. 概述

DX-BT22、DX-BT23 5.0蓝牙模块是深圳大夏龙雀科技有限公司专为智能无线数据传输而打造，DX-BT23采用NORDIC公司原装进口nRF52810射频芯片，DX-BT22 采用nRF52832射频芯片，支持蓝牙4.2 和蓝牙5.0，芯片自带高性能ARM CORTEX-M4内核，并拥有UART、I2C、SPI、ADC、DMA、PWM等丰富的外设资源。模块引出了nRF52810、nRF52832大部分I/O口，具体请查看引脚定义。方便为用户进行多方位的开发。该模块我们使用了32MHz高精度晶振，保证其工业特性和稳定性能。

蓝牙5.0的主要优势包括：与蓝牙4.2的BLE实现方案相比，具有2 x空中数据带宽(2Mbps)，以及8 x广播能力，具有广播包扩展功能，将广播包有效载荷提升至251字节，从而实现更高效的数据传送，特别是在信标应用中。52810使用S112协议栈，该协议栈是一个通过严格测试并且经过优化的轻量级协议栈，用以配合nRF52810 SoC的196kB Flash/24kB RAM配置。S112 协议栈仅占据100kB Flash，确保可留出充足的存储器容量来配合广泛的大众市场低功耗蓝牙应用，并且为OTA应用软件更新提供可靠的支持。



二. 模块默认参数：

蓝牙协议	Bluetooth Specification V5.0 BLE
工作频率	2.4GHz ISM band
通信接口	UART
供电电源	3.3V
天线	可以选择PCB板载天线、或外接DB天线(默认为PCB天线)
通信距离	30-40M (空旷环境)
外观尺寸	27(L)mm x 13 (W)mm x 2(H) mm (±0.1mm)
蓝牙认证	FCC CE ROHS REACH
蓝牙名称	BT22、BT23
串口参数	9600、8数据位、1停止位、无校验、无流控
空中升级	本模块支持OTA空中升级
Service UUID	FFE0
Notify & Write UUID	FFE1
Write UUID	FFE2
Work temperature	MIN:-20℃ - MAX:+70℃
定制需求	本模块可以接受各种方案定制，如有需求可以联系我司。



三. 应用领域:

DX-BT22、DX-BT23 模块同时支持 BT5.0 BLE 协议, 可以同具备 BLE 蓝牙功能的 iOS 设备直接连接, 支持后台程序常驻运行。主要用于短距离的数据无线传输领域。避免繁琐的线缆连接, 能直接替代串口线。BT23 模块成功应用领域:

- ※ 蓝牙无线数据传输;
- ※ 手持 POS 设备;
- ※ 智能家居控制;
- ※ 蓝牙遥控玩具;
- ※ 手机、电脑周边设备;
- ※ 医疗设备无线数据传输;
- ※ 蓝牙打印机;
- ※ 共享单车;

四. 功耗参数

模式	状态	电流	Unit
低功耗模式	Discoverable	282	uA
	Connected	2.59	mA
正常工作模式	Discoverable	2.49	mA
	Connected	2.59	mA
软件关机	Shutdown	0.3	uA

五. 射频特性

Rating	Value	Unit
BLE 发射功率	-20 --- +4	dBm
BLE 灵敏度	-96	dBm

六. 透传参数

数据吞吐量:

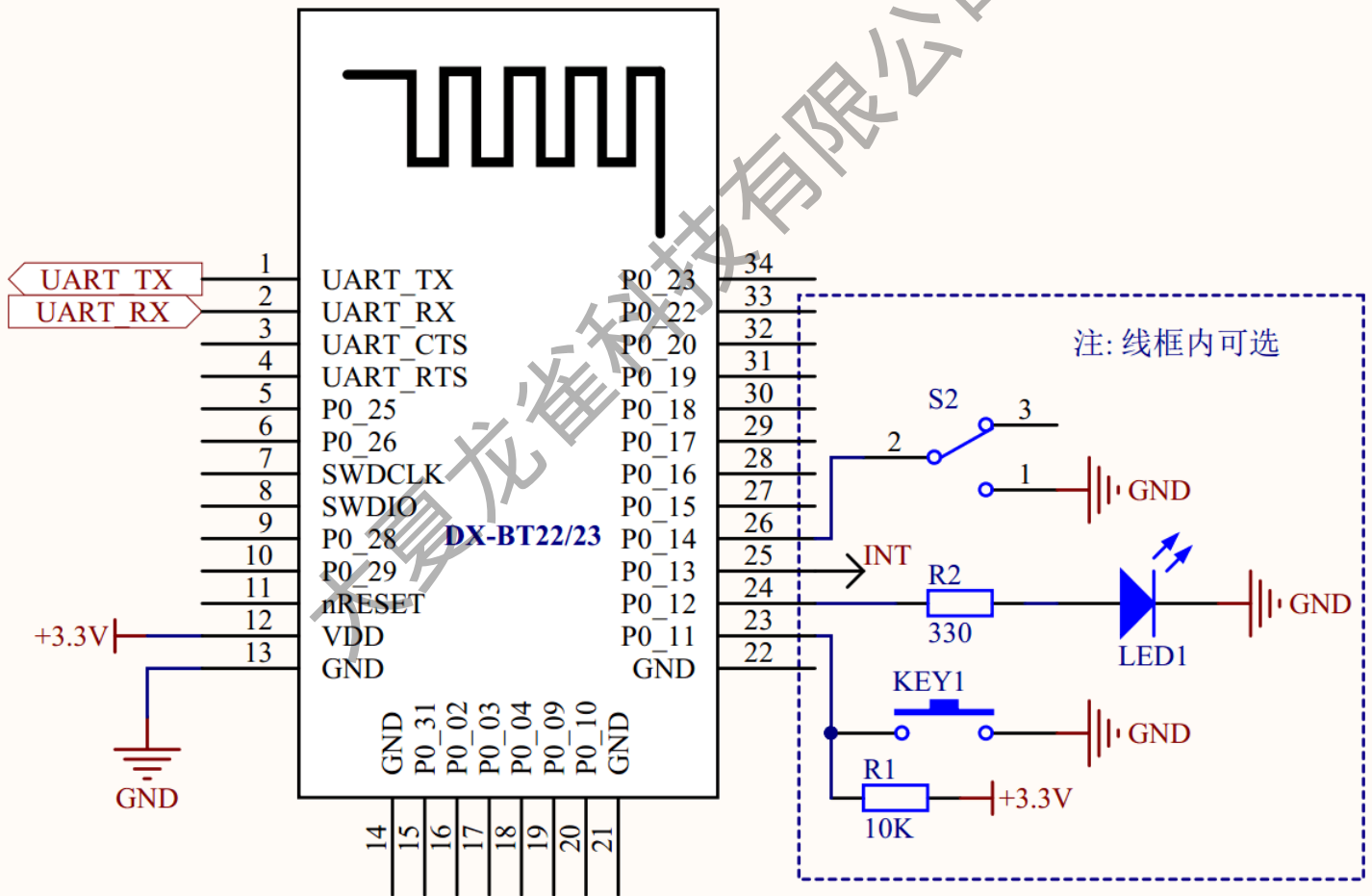
Android Nexus 6P->BT22\23 -> UART		UART ->BT22\23 -> Android Nexus 6P	
波特率	115200	波特率	115200
连接间隔时间(ms)	15	连接间隔时间(ms)	15
APP 数据包大小(bytes)	200	串口数据包大小(bytes)	200
发送间隔(ms)	27	发送间隔(ms)	30
吞吐量(bytes/s)	7200	吞吐量(bytes/s)	6400
Characteristic 写方式	Write without Response	Characteristic 通知方式	Notify
iPhone 6s->BT22\23 -> UART		UART ->BT22\23 -> iPhone 6s	
波特率	115200	波特率	115200



连接间隔时间(ms)	15	连接间隔时间(ms)	15
APP 数据包大小(bytes)	100	串口数据包大小(bytes)	200
发送间隔(ms)	30	发送间隔(ms)	30
吞吐量(bytes/s)	3000	吞吐量(bytes/s)	6400
Characteristic 写方式	Write without Response	Characteristic 通知方式	Notify

注：此表格参数仅做参考，不代表模组能支持的最大数据吞吐量。

七. 模块引脚说明及最小电路图：



八. 管脚功能描述：

管脚序号	管脚名称	管脚说明
1	UART_TX	串口数据输出
2	UART_RX	串口数据输入



3	UART_CTS	悬空
4	UART_RTS	悬空
5	PO_25	可编程输入输出口
6	PO_26	可编程输入输出口
7	SWDCLK	烧录时钟口
8	SWDIO	烧录数据口
9	PO_28	可编程输入输出口
10	PO_29	可编程输入输出口
11	RESETB	低电平复位，至少5ms
12	VCC	电源 V3.3
13	GND	地
14	GND	地
15	PO_31	可编程输入输出口
16	PO_02	可编程输入输出口
17	PO_03	可编程输入输出口
18	PO_04	可编程输入输出口
19	PO_09	可编程输入输出口
20	PO_10	可编程输入输出口
21	GND	地
22	GND	地
23	PO_11	唤醒、断开连接引脚(见详细说明)
24	PO_12	LED 灯管脚(见详细说明)
25	PO_13	透传通道状态指示口(见详细说明)
26	PO_14	模式切换键(见详细说明)
27	PO_15	可编程输入输出口
28	PO_16	可编程输入输出口
29	PO_17	可编程输入输出口
30	PO_18	可编程输入输出口
31	PO_19	可编程输入输出口
32	PO_20	可编程输入输出口
33	PO_22	可编程输入输出口
34	PO_23	可编程输入输出口



九. 功能引脚详细说明

1、P24 脚 (P0_12): LED 灯指示引脚

- 用于指示蓝牙模块所处状态，LED灯闪烁方式与蓝牙模块状态对应见下表：

模块	LED 显示	模块状态
从模块	均匀慢速闪烁 (800ms-on, 800ms-off)	待机状态
	长亮	连接状态
主模块	均匀闪烁 (300ms-on, 300ms-off)	搜索及连接中
	长亮	连接状态

1、P25 脚 (P0_13): 透传通道状态指示脚

引脚状态	透传通道状态
输出低电平	未开启
输出高电平	已开启

2、P23 脚 (P0_11): 唤醒、断开连接脚 (模块处于连接状态有效)

模块状态	低电平脉冲功能
休眠与关机时输入低电平	唤醒模块
已连接时输入低电平	断开连接
按键长按 5S	模块恢复出厂设置

3、P26 脚 (P0_14): 模式切换脚

引脚状态	模块状态
悬空或拉高	模块为透传模式
拉低	模块进入 AT 命令模式

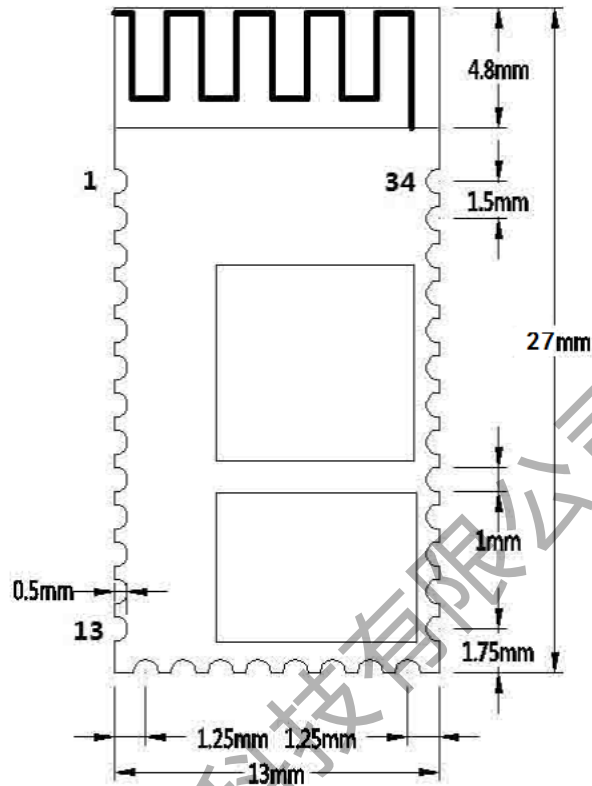
十一. LAYOUT 注意事项

DX-BT22、DX-BT23 蓝牙模块工作在2.4G无线频段，应尽量避免各种因素对无线收发器的影响，注意以下几点：

- 1、包围蓝牙的产品外壳避免使用金属，当使用部分金属外壳时，应尽量让模块天线部分远离金属部分。产品内部金属连接线或者金属螺钉，应尽量远离模块天线部分。
- 2、模块天线部分应靠载板PCB 四围放置，不允许放置于板中，且天线下方载板铣空，与天线平行的方向，不允许铺铜或走线、或直接把天线部分直接露出载板。
- 3、建议在基板上的模块贴装位置使用绝缘材料进行隔离，例如在该位置放一个整块的丝印 (TopOverLay)



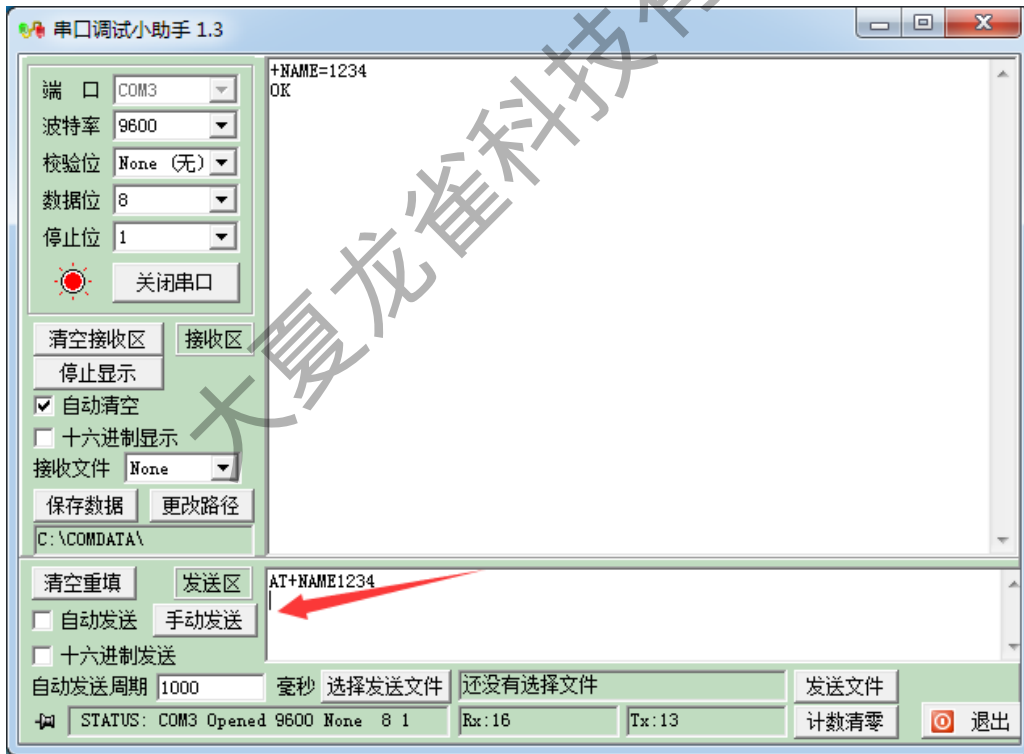
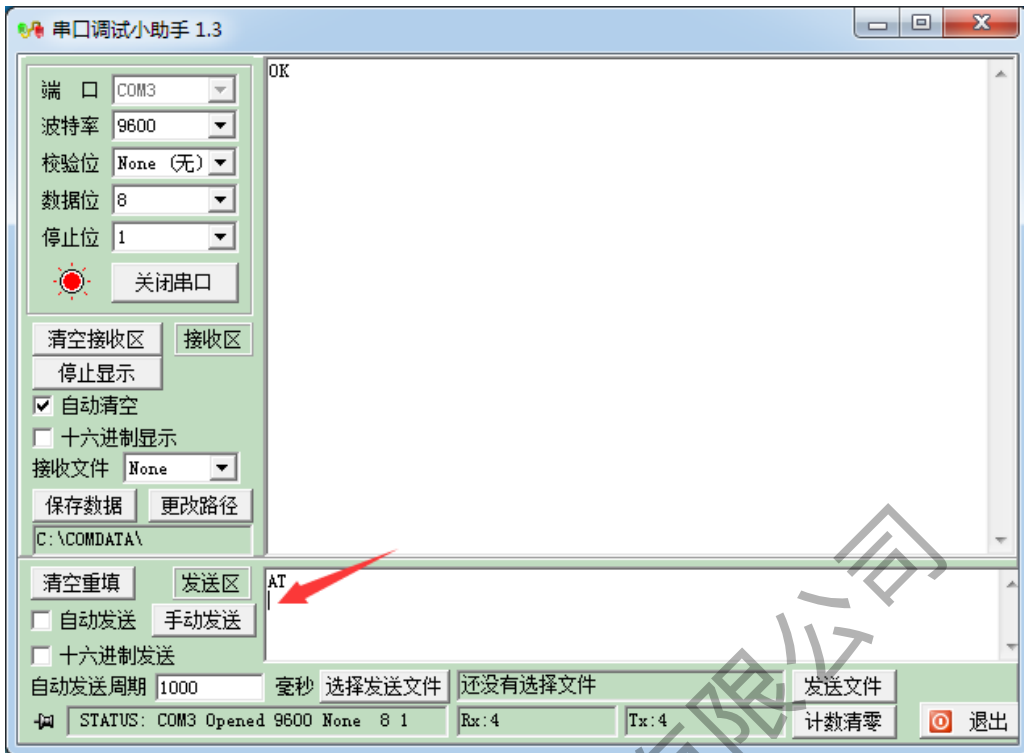
十. 外形尺寸:



十二. AT 指令集

模块发送命令时，需要将 P26 脚拉低，此时模块进入命令模式，AT 指令才响应。另外，当模块已经连接为透传模式时，将此脚拉低，模块进入命令模式，也可以接收 AT 命令，悬空后立即进入透传模式。

- 1、AT 指令，属于字符行指令，按行解析（即发 AT 指令时必须以回车换行或者\r\n、16 进制为 0D0A 结尾）
 - 2、AT 指令为大写，指令前缀为 AT+，可分为参数设置指令和读取指令。
 - 3、设置指令格式：AT+<CMD><PARAM>操作成功返回：+<CMD>=<PARAM>\r\n OK\r\n 失败不返回字符。
 - 4、读取指令格式：AT+<CMD>操作成功返回：+<CMD>=<PARAM>\r\n 失败不返回字符。
- AT 命令格式举例(图一为 AT 测试命令，图二为将蓝牙名称改为 1234)：



1、测试指令：

功能	指令	响应	说明
测试指令	AT \r\n	OK\r\n	



2、获取软件版本号：

功能	指令	响应	说明
查询版本号	AT+VERSION\r\n	+VERSION=<version>\r\n	<version >软件版本号

注：依据不同的模块与定制需求，版本会有区别。

3、查询模块蓝牙地址码：

功能	指令	响应	说明
查询模块 MAC 地址	AT+LADDR\r\n	+LADDR=<laddr>\r\n	<laddr>蓝牙 MAC 地址码

4、设置\查询设备名称：

功能	指令	响应	说明
查询模块蓝牙名	AT+NAME\r\n	+NAME=<name>\r\n	<name>蓝牙名，最长为 18 个字节 默认名称：BT22\BT23
设置模块蓝牙名	AT+NAME<name>\r\n	+NAME=<name>\r\n OK	

示例：1. 发送设置：

AT+NAMEDX-BT22\r\n ——设置模块设备名为：“DX-BT22”

返回：

+NAME=DX-BT22\r\n ——设置模块设备名为：“DX-BT22”成功
OK

2. 发送查询：

AT+NAME\r\n ——查询模名

返回：

+NAME=DX-BT22\r\n ——返回模块设备名为：“DX-BT22”

5、设置\查询一串口波特率：

功能	指令	响应	说明
查询模块波特率	AT+BAUD\r\n	+BAUD=<baud>\r\n	<baud>波特率对应序号 1:1200 2:2400 3:4800 4:9600 5:19200 6:38400 7:57600 8:115200 默认值：4 (9600)
设置模块波特率	AT+BAUD<baud>\r\n	+BAUD=<baud>\r\n OK\r\n	



注：模块设置波特率后需重新上电，启用新波特率进行数据通信和 AT 指令解析。

示例：设置串口波特率：38400

1. 发送设置：

AT+BAUD6\r\n

返回：

+BAUD=6\r\n

OK\r\n

2. 发送查询：

AT+BAUD\r\n

返回：

+BAUD=6\r\n

6、设置\查询—服务 SERVICE UUID：（修改完之后要重启手机蓝牙，手机才生效）

功能	指令	响应	说明
查询模块服务 UUID	AT+UUID\r\n	+UUID =<service>\r\n	<service>服务 UUID 默认服务 UUID： FFE0
设置模块服务 UUID	AT+UUID<service>\r\n	+UUID =<service>\r\n OK	

示例：设置服务 UUID 为：FF00

1. 发送设置：

AT+UUID0xFF00\r\n

返回：

+UUID=0xFF00\r\n

OK

7、设置\查询—通知 NOTIFY UUID\写入 WRITE UUID：（修改完之后要重启手机蓝牙，手机才生效）

功能	指令	响应	说明
查询模块通知\写入 UUID	AT+CHAR\r\n	+CHAR=<UUID >\r\n	<UUID>通知\写入 UUID
设置模块通知\写入 UUID	AT+CHAR<UUID>\r\n	+CHAR=<UUID>\r\n OK	默认值：FFE1

注：此通道是为可读写通道（即可以读也可写）

示例：设置通知\写入 UUID 为：FE01

1. 发送设置：

AT+CHAR0xFE01\r\n

返回：



+ CHAR=FE01r\n
OK\r\n

8、设置\查询—写入 WRITE UUID : (修改完之后要重启手机蓝牙, 手机才生效)

功能	指令	响应	说明
查询模块写入 UUID	AT+WRITE\r\n	+WRITE=<UUID>\r\n	<UUID>写入 UUID
设置模块写入 UUID	AT+WRITE<UUID>\r\n	+WRITE=<UUID>\r\n OK	默认值: FFE2

9、设置\查询—低功耗模式:

功能	指令	响应	说明
查询模块低功耗模式	AT+PWRM\r\n	+PWRM=<Param>\r\n	<Param> (0、1)
设置模块低功耗模式	AT+PWRM<Param>\r\n	+PWRM=<Param>\r\n OK	0: 低功耗模式 1: 正常工作模式 默认值: 1

10、设置/查询—广播时间间隔:

功能	指令	响应	说明
查询模块广播时间间隔	AT+ADVI\r\n	+ADVI=<Param>\r\n	Param: 0~F
设置模块广播时间间隔	AT+ADVI<Param>\r\n	+ADVI=<Param>\r\n OK	0—100ms 1—152.5ms 2—211.25ms 3—318.75ms 4—417.5ms 5—546.25ms 6—760ms 7—852.5ms 8—1022.5ms 9—1285ms A—2000ms B—3000ms C—4000ms D—5000ms E—6000ms F—7000ms 默认设置: 0

注: 此指令可以用于降低功耗

11、查询/设置—模块发射功率:



功能	指令	响应	说明
查询模块发射功率	AT+POWE\r\n	+POWE=<POWE>\r\n	<POWE>: 0: -40 dB 1: -20 dB 2: -16 dB 3: -12 dB 4: -8 dB 5: -4 dB 6: 0 dB 7: +4 dB 默认: 7
设置模块发射功率	AT+POWE<POWE>\r\n	+POWE=<POWE>\r\n OK\r\n	

12、软件重启:

功能	指令	响应	说明
软件重启	AT+RESET\r\n	OK\r\n	

13、软件关机:

功能	指令	响应	说明
软件关机	AT+SHUTDOWN\r\n	OK\r\n	

注: 模块软件关机后, 可以通过硬件复位脚复位, 或者断开脚短接开机。

14、恢复出厂设置:

功能	指令	响应	说明
恢复出厂设置	AT+DEFAULT\r\n	OK\r\n	

15、设置\查询一主从模式: (仅 BT22 有效)

功能	指令	响应	说明
查询模块主从模式	AT+ROLE\r\n	+ROLE=< Param >\r\n	< Param >(0、1) 0: 主从一体模式 1: 单主模式 默认值: 0
设置模块主从模式	AT+ROLE<Param >\r\n	+ROLE=< Param >\r\n	

注: 主从一体模式: 模块主模式与从模式同时工作, 可以连接从设备, 可以被主设备连接。

单主模式: 模块关闭从模式功能, 不能被主设备搜索和连接, 只可以连接从设备。

主设备、从设备只能是我司模块之间配套使用, 不支持与其他公司模块间通信。

16、手动搜索蓝牙设备: (仅 BT22 有效)



功能	指令	响应	说明
搜索蓝牙设备	AT+INQ\r\n	OK\r\n	

示例：

发送搜索：

AT+INQ\r\n

返回：

OK\r\n

+INQS\r\n

-- 开始

+INQ:1 0x001583000001 -63\r\n

-- 蓝牙设备 1

+INQ:2 0x001583000002 -56\r\n

-- 蓝牙设备 2

...

...

+INQE\r\n

-- 结束

Devices Found x

(x 代表数量)

17、打印搜索到设备列表：（仅 BT22 有效）

功能	指令	响应	说明
搜索蓝牙设备	AT+SHOW\r\n	搜到的设备列表	

18、设置\查询—自动搜索蓝牙设备：（仅 BT22 有效）

功能	指令	响应	说明
查询模块搜索模式	AT+AUTOINQ\r\n	+AUTOINQ=<Param> \r\n	< Param > (0、1) 0：手动搜索
设置模块搜索模式	AT+AUTOINQ<Param> \r\n	+AUTOINQ=<Param>\r\n OK\r\n	1：自动搜索 默认值：0

19、手动连接蓝牙设备：（仅 BT22 有效）

功能	指令	响应	说明
连接蓝牙设备	AT+CONN<Param>\r\n	连接信息	Param：搜索的 1~9 设备序号

示例（若搜索到设备 1：0x001583000001）：

发送连接：

AT+CONN1\r\n

-- 连接序号为 1 的设备

返回：

+Connecting>>0x001583000001\r\n

-- 连接中

+Connected>>0x001583000001\r\n

-- 已连接

20、设置\查询—自动连接蓝牙设备：（仅 BT22 有效）



功能	指令	响应	说明
查询模块连接模式	AT+AUTOCONN\r\n	+AUTOCONN=<Param>\r\n	<Param> (0、1) 0: 手动连接 1: 自动连接 默认值: 0
设置模块连接模式	AT+AUTOCONN<Param>\r\n	+AUTOCONN<Param>\r\n OK	

注：开启自动搜索自动连接后，模块会自动连接周边信号最强的模块。

21、连接远端指定地址蓝牙：（仅 BT22 有效）

功能	指令	响应	说明
连接蓝牙设备	AT+CONA<Param>\r\n	连接信息	Param: MAC 地址 如: 0x112233445566

22、绑定指定地址蓝牙：（掉电后会记忆已绑定地址）（仅 BT22 有效）

功能	指令	响应	说明
连接蓝牙设备	AT+BIND<Param>\r\n	连接信息	Param: MAC 地址 如: 0x112233445566

注：此指令绑定地址后，上电会自动搜索连接该地址设备，如需连接新设备，需清除记忆。

23、清除连接记忆和清除已绑定：（仅 BT22 有效）

功能	指令	响应	说明
清除记忆	AT+CLEAR\r\n	OK\r\n	

注：AT+CLEAR 是用于清除主模块清除已绑定和记忆的最后一个从模块（主模块当设定为自动搜索自动连接时，连接了一个从模块，断开之后，将会继续寻找连接这个从模块，如果需要连接新的从模块，需要清除之前的记忆）。

十三．联系我们

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1. Overview

DX-BT22, DX-BT23 5.0 Bluetooth module is built for Shenzhen Wireless Dragon Data Technology Co., Ltd. for smart wireless data transmission, DX-BT23 uses NORDIC company imported nRF52810 RF chip, DX-BT22 uses nRF52832 RF chip, supports Bluetooth 4.2 and Bluetooth 5.0, the chip comes with high-performance ARM CORTEX-M4 core, and has a wealth of peripheral resources such as UART, I2C, SPI, ADC, DMA, PWM. The module leads to most I/O ports of nRF52810 and nRF52832. Please refer to the pin definition for details. Convenient for multi-faceted development for users. In this module, we use a 32MHz high-precision crystal oscillator to ensure its industrial characteristics and stability.

The main advantages of Bluetooth 5.0 include: 2 x air data bandwidth (2 Mbps) and 8 x broadcast capability compared to the Bluetooth 4.2 BLE implementation, with broadcast packet extension to boost the broadcast packet payload to 251 bytes. This enables more efficient data transfer, especially in beacon applications. The 52810 uses the S112 protocol stack, a rigorously tested and optimized lightweight protocol stack for the 196kB Flash/24kB RAM configuration of the nRF52810 SoC. The S112 protocol stack occupies only 100kB of Flash, ensuring sufficient memory capacity to accommodate a wide range of mass-market low-power Bluetooth applications and providing reliable support for OTA application software updates.

2. Module default parameters:

Bluetooth Protocol	Bluetooth Specification V4.0 BLE
Working Frequency	2.4GHz ISM band
Communication Interface	UART
Power Supply	3.3V
Communication distance	30-40M (Open and unobstructed environment)
Physical Dimension	18.5(L)mm x 13.5(W)mm x 2(H) mm (± 0.1 mm)
Bluetooth Authentication	FCC CE ROHS REACH
Bluetooth Name	BT22、BT23
Serial Port Parameters	9600、8 data bits、1 stop bit、No check、No flow control
Air upgrade	This module supports OTA air upgrade
Service UUID	FFE0
Notify\Write UUID	FFE1



Write UUID	FFE2
Work temperature	MIN:-20℃ - MAX:+70℃
Customized requirements	If you have other special function requirements, you can contact us to customize the module.

3. Application area:

DX-BT22、DX-BT23 module supports BT4 .0 BLE protocol, which can be directly connected to iOS devices that have BLE Bluetooth function, and supports background program resident operation.

Successful application of BT22\23 module:

- ※ Bluetooth wireless data transmission;
- ※ Mobile phones, computer peripherals;
- ※ Handheld POS device;
- ※ Medical equipment wireless data transmission;
- ※ Smart Home Control;
- ※ Automotive Inspection OBD Equipment;
- ※ Bluetooth printer;
- ※ Bluetooth remote control toy;
- ※ Anti-lost device, LED light control;

4. Power consumption parameters:

Mode	Status	Current	Unit
Low power mode	Discoverable	282	uA
	Connected	2.59	mA
Normal working mode	Discoverable	2.49	mA
	Connected	2.59	mA
Software shutdown	Shutdown	0.3	uA

5. Radio frequency characteristics:

Rating	Value	Unit
BLE Transmit power	-20 - +4	dBm
BLE Sensitivity	-96	dBm

6. Transparent transmission parameters

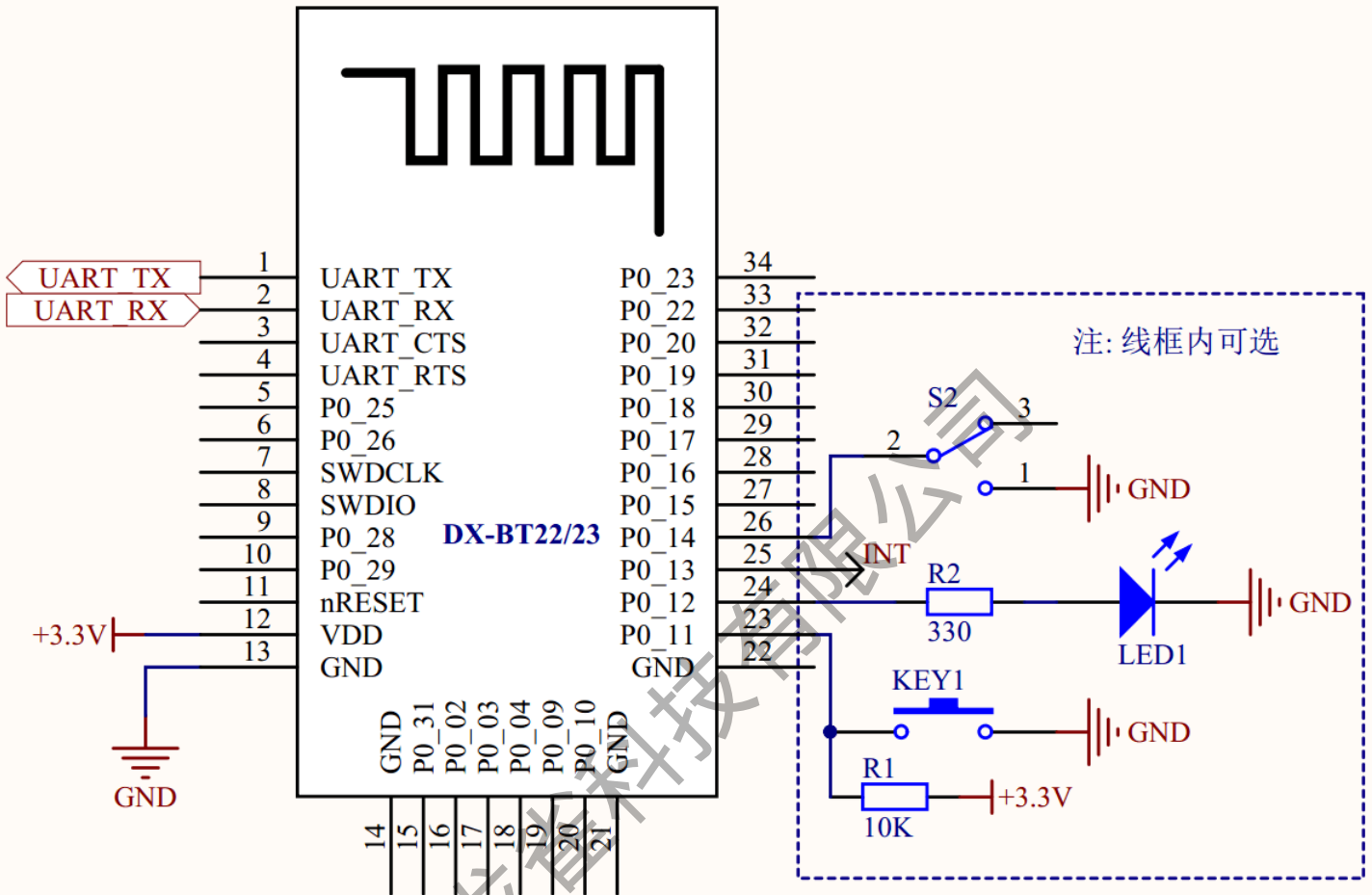


Data throughput:

Android Nexus 6P->BT22\23 -> UART		UART ->BT22\23 -> Android Nexus 6P	
Baud rate	115200	Baud rate	115200
Connection interval (ms)	15	Connection interval (ms)	15
Serial packet size (bytes)	200	Serial packet size (bytes)	200
Transmission interval (ms)	27	Transmission interval (ms)	30
Throughput (bytes/s)	7200	Throughput (bytes/s)	6400
Characteristic Write	Write without Response	Characteristic Notify	Notify
iPhone 6s->BT22\23 -> UART		UART ->BT22\23 -> iPhone 6s	
Baud rate	115200	Baud rate	115200
Connection interval (ms)	15	Connection interval (ms)	15
Serial packet size (bytes)	100	Serial packet size (bytes)	200
Transmission interval (ms)	30	Transmission interval (ms)	30
Throughput (bytes/s)	3000	Throughput (bytes/s)	6400
Characteristic Write	Write without Response	Characteristic Notify	Notify

Note: This table parameter is for reference only and does not represent the maximum data throughput that the module can support.

7. Module pin description and minimum circuit diagram:



8. Pin function description:

Pin number	Pin name	Pin description
1	UART_TX	Serial data output
2	UART_RX	Serial data input
3	UART_CTS	NC
4	UART_RTS	NC
5	P0_25	Programmable input and output port
6	P0_26	Programmable input and output port
7	SWDCLK	Burn clock port



8	SWDIO	Burn data port
9	P0_28	Programmable input and output port
10	P0_29	Programmable input and output port
11	RESETB	Low level reset, at least 5ms
12	VCC	3.3 V
13	GND	Land
14	GND	Land
15	P0_31	Programmable input and output port
16	P0_02	Programmable input and output port
17	P0_03	Programmable input and output port
18	P0_04	Programmable input and output port
19	P0_09	Programmable input and output port
20	P0_10	Programmable input and output port
21	GND	Land
22	GND	Land
23	P0_11	Wake up and disconnect pins (see detailed description)
24	P0_12	LED light pin(see detailed description)
25	P0_13	Transparent transmission channel status indication port (see detailed description)
26	P0_14	Mode switch button (see detailed description)
27	P0_15	Programmable input and output port
28	P0_16	Programmable input and output port
29	P0_17	Programmable input and output port
30	P0_18	Programmable input and output port
31	P0_19	Programmable input and output port
32	P0_20	Programmable input and output port
33	P0_22	Programmable input and output port
34	P0_23	Programmable input and output port

9. Detailed description of function pins:

1. P24 pin (P0_12): LED indicator pin

- Used to indicate the status of the Bluetooth module. Correspondence between the LED flashing mode and the Bluetooth module status is shown in the following table:



Mode	LED Display	Module Status
Slave module	Uniformly slow flashing (800ms-on, 800ms-off)	standby mode
	Long bright	Connection Status
Main module	Evenly flashing (300ms-on,300ms-off)	Search and connect
	Long bright	Connection Status

2. P25 pin (P0_13): Transparent transmission channel status indicator foot

Pin state	Transparent channel status
Output low level	Unopened
Output high level	Turned on

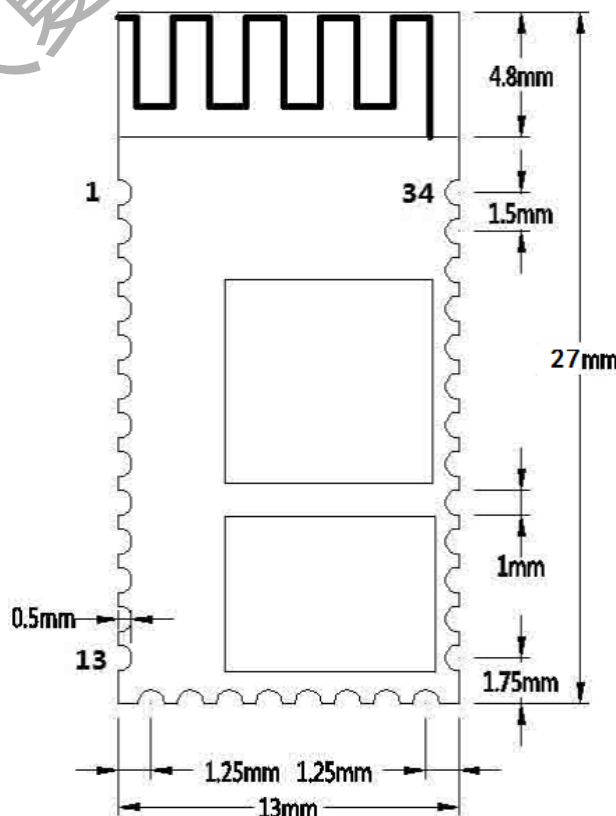
3. P23 pin (PP0_11): connection interrupt pin

Pin state	Low level pulse function
Sleep and shutdown	Wake-up module
connected	Disconnect
Press and hold 5S	Module restored to factory settings

4. P23 pin (P0_14): connection interrupt pin (module is in the connected state)

Pin state	Module status
Hanging or pulling high	Module enters transparent mode
Pull down	Module enters AT command mode

10. Dimensions:





11. LAYOUT Precautions:

The DX-BT22、DX-BT23 Bluetooth module works in the 2.4G wireless band. It should try to avoid the influence of various factors on the wireless transceiver. Pay attention to the following points:

1. the product shell surrounding the Bluetooth module to avoid the use of metal, when using part of the metal shell, should try to make the module antenna part away from the metal part.
2. The internal metal connecting wires or metal screws of the product should be far away from the antenna part of the module.
3. The antenna part of the module should be placed around the PCB of the carrier board. It is not allowed to be placed in the board, and the carrier board under the antenna is slotted. The direction parallel to the antenna is not allowed to be copper or traced. It is also a good choice to directly expose the antenna part out of the carrier board.
4. It is recommended to use insulating material for isolation at the module mounting position on the substrate. For example, put a block of screen printing (TopOverLay) at this position.

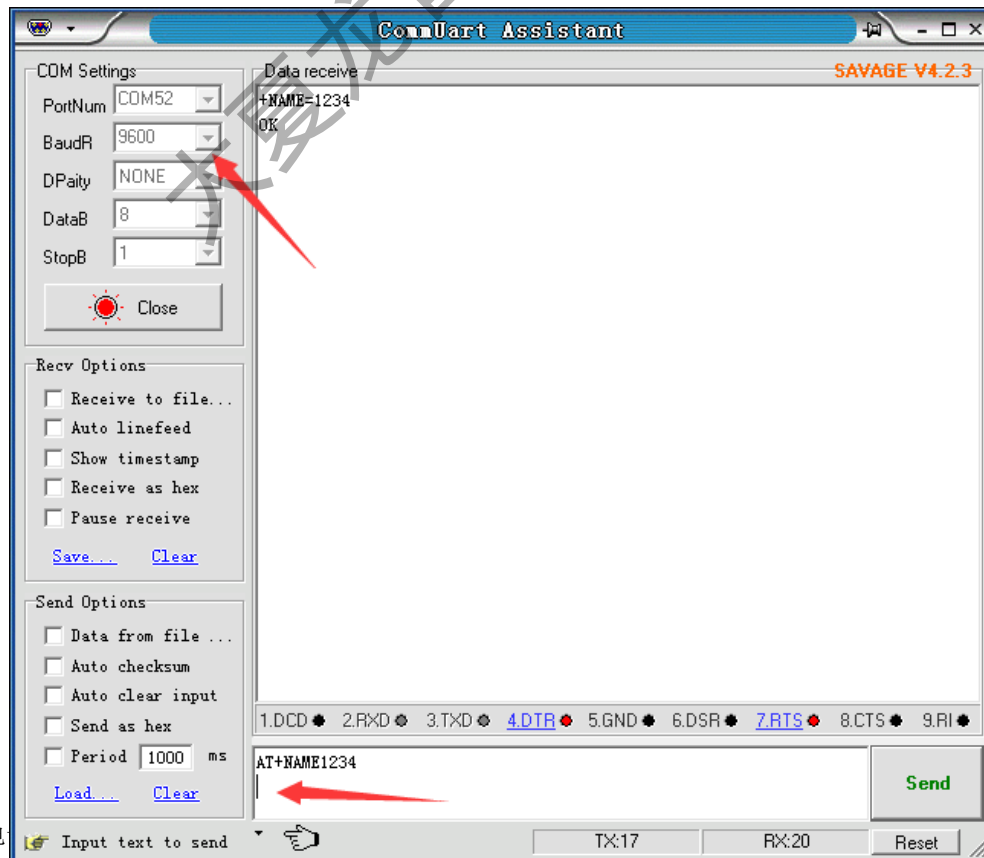
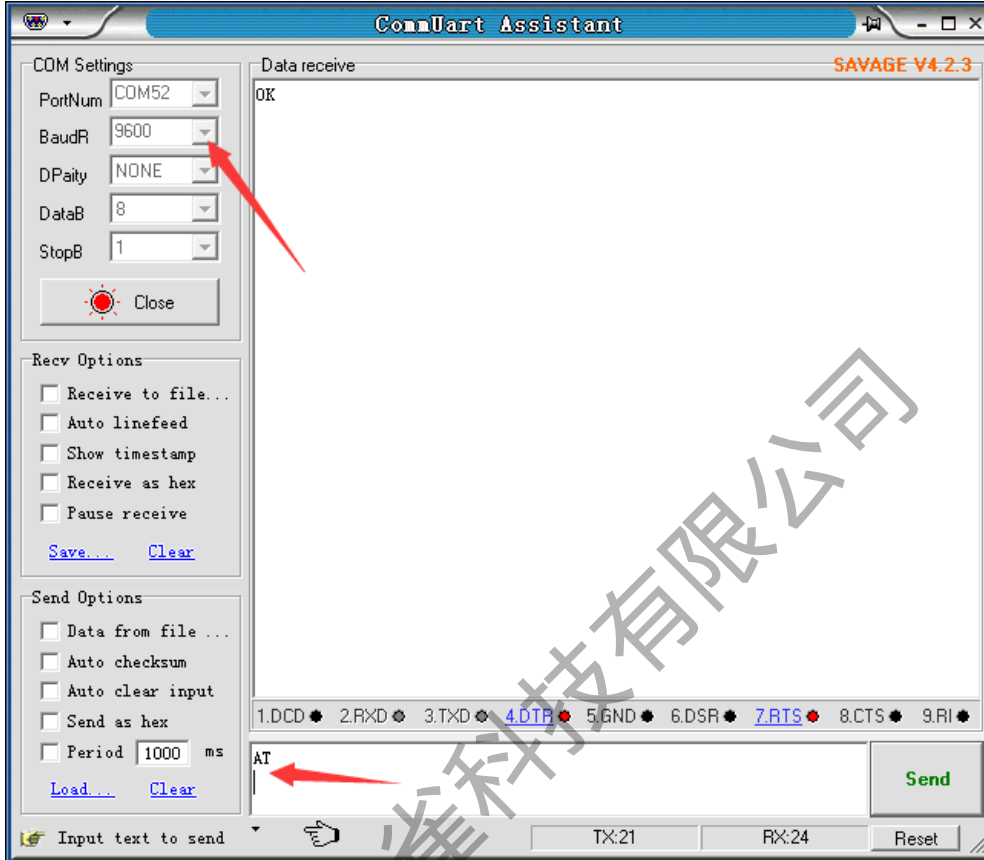
12. AT COMMAND

When the module sends a command, the P26 pin needs to be pulled low. At this time, the module enters the command mode, and the AT command responds. In addition, when the module has been connected to the transparent transmission mode, the foot is pulled low, the module enters the command mode, and can also receive the AT command, and immediately enters the transparent transmission mode after being suspended.

1. AT command, which belongs to the character line instruction, is parsed according to the line (that is, AT command must be returned by carriage return or \r\n, hexadecimal number is 0D0A)
2. The AT command supports case and the instruction prefix is AT+, which can be divided into parameter setting instructions and read instructions.
3. Set the instruction format: AT+<CMD><PARAM> Operation returns successfully: +<CMD>=<PARAM>\r\n OK\r\n Failure does not return characters.
4. Read instruction format: AT+<CMD>Operation succeeds: +<CMD>=<PARAM>\r\n Failure does not return a return character.



AT command format example (Figure 1 is AT test command, Figure 2 is to change the Bluetooth name to 1234):





1、Test Command:

Function	Command	Response	Description
Test instructions	AT\r\n	OK\r\n	

2、Get The Software Version:

Function	Command	Response	Description
Query version number	AT+VERSION\r\n	+VERSION=<version>\r\n OK\r\n	<version > Software version number

Note:The version will be different depending on different modules and customization requirements.

3、Query Module Bluetooth MAC:

Function	Command	Response	Description
Query module MAC address	AT+LADDR\r\n	+LADDR=<laddr>\r\n	<laddr> Bluetooth 12-bit MAC Address Code

4、Set/Query Device Name:

Function	Command	Response	Description
Query module Bluetooth name	AT+NAME\r\n	+NAME=<name>\r\n	<name> Bluetooth name, up to 18 bytes
Set the module Bluetooth name	AT+NAME<name>\r\n	+NAME=<name>\r\n OK	Default name: BT22、 BT23

Example:

1. Send Settings:

AT+NAME=DX-BT22\r\n ——Set module device name: “DX-BT22”

return:

+NAME=DX-BT22\r\n ——Set module device name: “DX-BT22” succeeded
OK\r\n

2. Send inquiry:

AT+NAME\r\n ——Query module name

return:

+NAME=DX-BT22\r\n ——Return module device name: “DX-BT22”



5、Set/Query - Serial Port Baud Rate:

Function	Command	Response	Description
Query module baud	AT+BAUD\r\n	+BAUD=<baud>\r\n	<baud> Baud rate corresponding serial number 1:1200 2:2400 3:4800 4:9600 5:19200 6:38400 7:57600 8:115200 Default: 4 (9600)
Set the module baud	AT+BAUD<baud>\r\n	+BAUD=<baud>\r\n OK\r\n	

Note: The module must be re-powered after setting the baud rate, enabling the new baud rate for data communication and AT command resolution.

Example: Setting the Serial Port Baud Rate: 38400

1. Send Settings:

```
AT+BAUD6\r\n
return:
+BAUD=6\r\n
OK\r\n
```

2. Send inquiry:

```
AT+BAUD?\r\n
return:
+BAUD=6\r\n
OK\r\n
```

6、Settings\Query—SERVICE UUID:

Function	Command	Response	Description
Query service UUID	AT+UUID\r\n	+UUID =<service>\r\n	<service> UUID
Set service UUID	AT+UUID<service>\r\n	+UUID =<service>\r\n OK	Default service UUID:FFE0

Example: Set the service UUID to: FFE0

1. Send Settings:

```
AT+UUID0XFF00\r\n
return:
```



+UUID=0XFF00 r\n
OK

7、Settings\Query—NOTIFY UUID\ WRITE UUID:

Function	Command	Response	Description
Query module notify\write UUID	AT+CHAR\r\n	+CHAR=<UUID >\r\n	<UUID>notify\write UUID
Set module notify \write UUID	AT+CHAR<UUID> \r\n	+CHAR =<UUID>\r\n OK	Default: FFE1

Note: This channel is a readable and writable channel (ie it can be read or written)

Example: Set the notify \write UUID to: FE01

1. Send settings:

AT+CHAR0XFE01\r\n

return:

+CHAR= FE01r\n

OK\r\n

8、Settings\Query—WRITE UUID:

Function	Command	Response	Description
Query module write UUID	AT+WRITE\r\n	+WRITE=<UUID >\r\n	<UUID> write UUID Default: FFE2
Set module write UUID	AT+WRITE<UUID >\r\n	+WRITE=<UUID>\r\n OK	

9、Settings\Query - Low Power Mode:

Function	Command	Response	Description
Query module low power mode	AT+PWRM\r\n	+PWRM=<Param>\r\n	< Param >(0、 1) 0: Low power mode
Set module low power mode	AT+PWRM<Para m>\r\n	+PWRM=<Param>\r\n OK	1: working mode Default: 1

10、Settings\Query - Broadcast time interval:

Function	Command	Response	Description
Query Broadcast time	AT+ ADVI \r\n	+ ADVI=<Param>\r\n	Param: 0~F



interval			0—100ms 1—152.5ms 2—211.25ms 3—318.75ms 4—417.5ms 5—546.25ms 6—760ms 7—852.5ms 8—1022.5ms 9—1285ms A—2000ms B—3000ms C—4000ms D—5000ms E—6000ms F—7000ms Default: 0
Set Broadcast time interval	AT+ADVI<Param>\r\n	+ ADVI=<Param>\r\n OK	

Note: This instruction can be used to reduce power consumption

11、Settings\Query - Module transmit power:

Function	Command	Response	Description
Query module transmit power	AT+POWE\r\n	+POWE=<POWE>\r\n	<POWE>: 0: -40 dB 1: -20 dB 2: -16 dB 3: -12 dB 4: -8 dB 5: -4 dB 6: 0 dB 7: +4 dB 默认: 7
Set module transmit power	AT+POWE<POWE>\r\n	+POWE=<POWE>\r\n OK\r\n	

12、Software restart:

Function	Command	Response	Description
Software restart	AT+RESET\r\n	OK\r\n	

13、Software Shutdown:

Function	Command	Response	Description
Software Shutdown	AT+SHUTDOWN\r\n	OK\r\n	



Note: After the module software is shut down, it can be reset by hardware reset pin, or the foot is short pressed to start.

14、Restore default settings:

Function	Command	Response	Description
Restore default settings	AT+DEFAULT\r\n	OK\r\n	

15、Set\Query –master-slave mode: (only valid for BT22)

Function	Command	Response	Description
Query master-slave mode	AT+ROLE\r\n	+ROLE=< Param >\r\n	< Param >
Set master-slave mode	AT+ROLE< Param >\r\n	+ROLE=< Param >\r\n	0:master-slave mode 1: single master mode Default: 0

Note: Master-slave mode: The module master mode works simultaneously with the slave mode, which can be connected to the slave device and can be connected by the master device.

Single master mode: The module turns off the slave mode function, cannot be searched and connected by the master device, and can only be connected to the slave device.

The master device and the slave device can only be used together with our modules, and communication with other company modules is not supported.

16、Search for Bluetooth devices: (only valid for BT22)

Function	Command	Response	Description
Search for Bluetooth devices	AT+INQ\r\n	OK\r\n	

Example:

Send search:

AT+INQ\r\n

return:

OK\r\n

+INQS\r\n

——Start

+INQ:1 0x001583000001 -63\r\n

——Bluetooth device 1

+INQ:2 0x001583000002 -56\r\n

——Bluetooth device 2

。 。 。

。 。 。

+INQE\r\n

——End



Devices Found x

(x represents the quantity)

17、Print search to device list: (only valid for BT22)

Function	Command	Response	Description
Print list	AT+SHOW\r\n	Print search to device list	

18、Settings\Query—Automatically search for Bluetooth devices: (only valid for BT22)

Function	Command	Response	Description
Query module search mode	AT+AUTOINQ\r\n	+AUTOINQ=<Param>\r\n	< Param > (0、 1) 0: Manual search
Set module search mode	AT+AUTOINQ<Param>\r\n	+AUTOINQ=<rParam>\r\n OK	1: Auto Search Defaults: 0

19、Connect a Bluetooth device: (only valid for BT22)

Function	Command	Response	Description
Connect a Bluetooth device	AT+CONN<Param>\r\n	Connection information	Param: 1~9 device serial number searched

Example (if searching for device 1 : 0x001583000001):

Send connection:

AT+CONN1\r\n

——Connect the device with

sequence number 1

return:

+Connecting>>0x001583000001\r\n ——connecting

+Connected>>0x001583000001\r\n ——connected

20、Settings\Query—Automatically connect to Bluetooth device: (only valid for BT22)

Function	Command	Response	Description
Query module connection mode	AT+AUTOCONN\r\n	+AUTOCONN=<Param>\r\n	< Param > (0、 1) 0: Manual connection



Set module connection mode	AT+AUTOCONN<Param>\r\n	+AUTOCONN=<Param>\r\n OK	1: Auto connection Default: 0
----------------------------	------------------------	-----------------------------	--------------------------------------

21、Connect to the remote specified address Bluetooth: (only valid for BT22)

Function	Command	Response	Description
Connect a Bluetooth device	AT+CONA<Param>\r\n	Connection information	Param: MAC address Such as: 0x112233445566

22、Bind the specified address to Bluetooth: (The address will be remembered after power-off) (only valid for BT23)

Function	Command	Response	Description
	AT+BIND<Param>\r\n		Param: MAC Example: 0x112233445566

Note: After this command is bound to the address, the device will automatically search for the device connected to the address after power-on. If you need to connect a new device, you need to clear the memory.

23、Clear connection memory and clear bound: (only valid for BT22)

Function	Command	Response	Description
Clear memory	AT+CLEAR\r\n	OK\r\n	

Note: AT+CLEAR is used to clear the last slave module of the main module to clear the bound and memorized (the main module is connected to a slave module when it is set to automatically search for automatic connection, after disconnecting, it will continue to find the connection. This slave module, if you need to connect a new slave module, needs to clear the previous memory).

13. Contact us

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