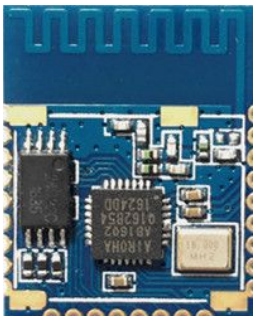
DX-BT12 4.0 Bluetooth module



1．Feature：

Bluetooth protocol: Bluetooth Specification V4.0 BLE, transceivers haven’t byte restrictions

Working frequency：2.4GHz ISM band

Modulation：GFSK(Gaussian Frequency Shift Keying)

Sensitivity：≤-84dBm at 0.1% BER

Security features：Authentication and encryption

Support service：Central & Peripheral UUID FFE0,FFE1,FFE2

Power consumption:

Low-power mode: standby current 1-3mA, Iphone is 3mA, Android is 8mA when transmission.

Normal working mode: standby 8mA, transmission 8mA.

Power supply：+3.3VDC 50mA

Size：22mm x 12mm x 2mm

Bluetooth certification：BQB, FCC, ROHS, REACH

Transmission distance：10-12m

2. Physical Feature

Operating Frequency Band	2.4GHz ISM band
Bluetooth Specification	2.0+BLE4.0
Output Power Class	Class 2
Operating Voltage	3.3V
Host Interface	UART
Dimension	22mm (L) x 12 (W) mm x 2mm (H)

3. Operating Voltage

project	Min.	Typ.	Max.	Unit
IO Supply voltage (VDDIO)	1.7		3.6	V
Battery Input(BAT_P) (LI_MODE_N = 0)	2.7	3.0	4.2	V
Battery Input(BAT_P) (LI_MODE_N = 1)	2		3.6	V
Charger supply voltage(VCHG)	4.5	5	6.5	V

Transparent transmission parameters

1．UART parameter

Baud rate	9600~3000000 (Defaults 9600)
Data bit	8
Stop bit	1
Check Digit	none
Hardware flow control	Optional
the maximum bytes in a single package	280 bytes

2．Data throughput

SPP data throughput

RX	TX
105987B/s	85055B/s

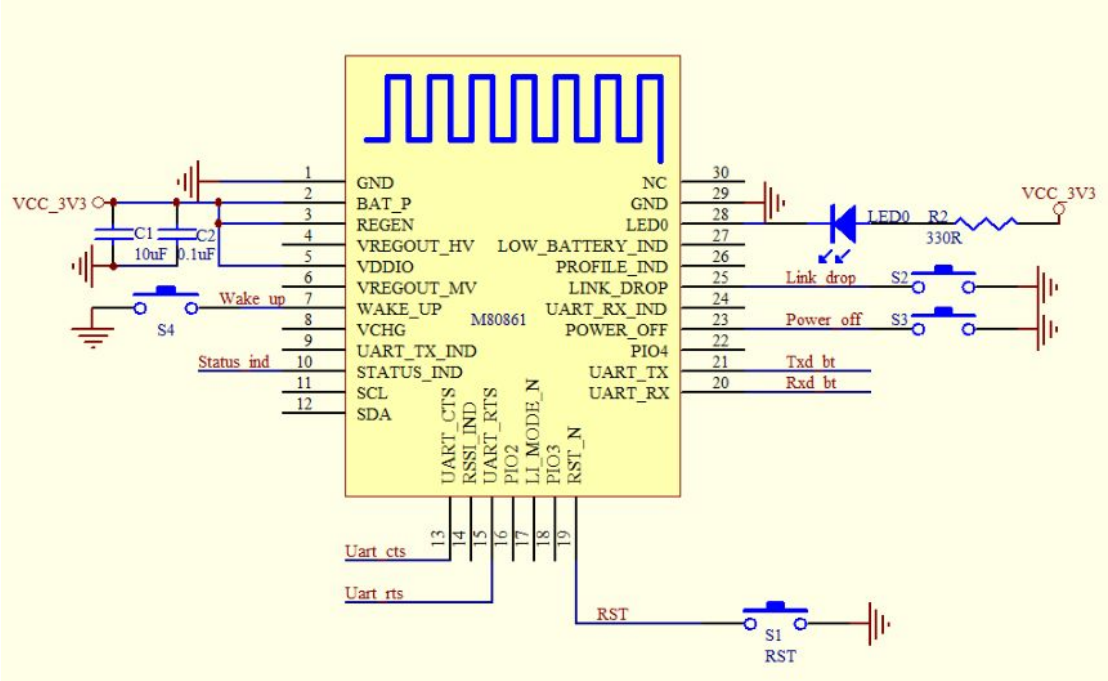
BLE data throughput

UART->DX-BT12->IPhone 5		UART->DX-BT12->Android	
Baud rate	3000000	Baud rate	3000000
Connection interval (ms)	18.75	Connection interval (ms)	18.75
Sending interval(ms)	20	Sending time-consuming(ms)	50
Sending interval(ms)	continuous sending	Sending interval(ms)	continuous sending
Throughput (bytes/sec)	4291	Throughput (bytes/sec)	4274

UART->DX-BT12->IPhone 5		UART->DX-BT12->Android	
Baud rate	3000000	Baud rate	3000000
Connection interval (ms)	18.75	Connection interval (ms)	18.75
Characteristic writing way	Write without Response	Characteristic writing way	Write without Response
App data size (bytes)	53260	Sending file size (bytes)	50000
Sending interval(ms)	20	Sending time-consuming(s)	50
Throughput (bytes/sec)	4635	Throughput (bytes/sec)	1916

* For reference only

Application circuit：



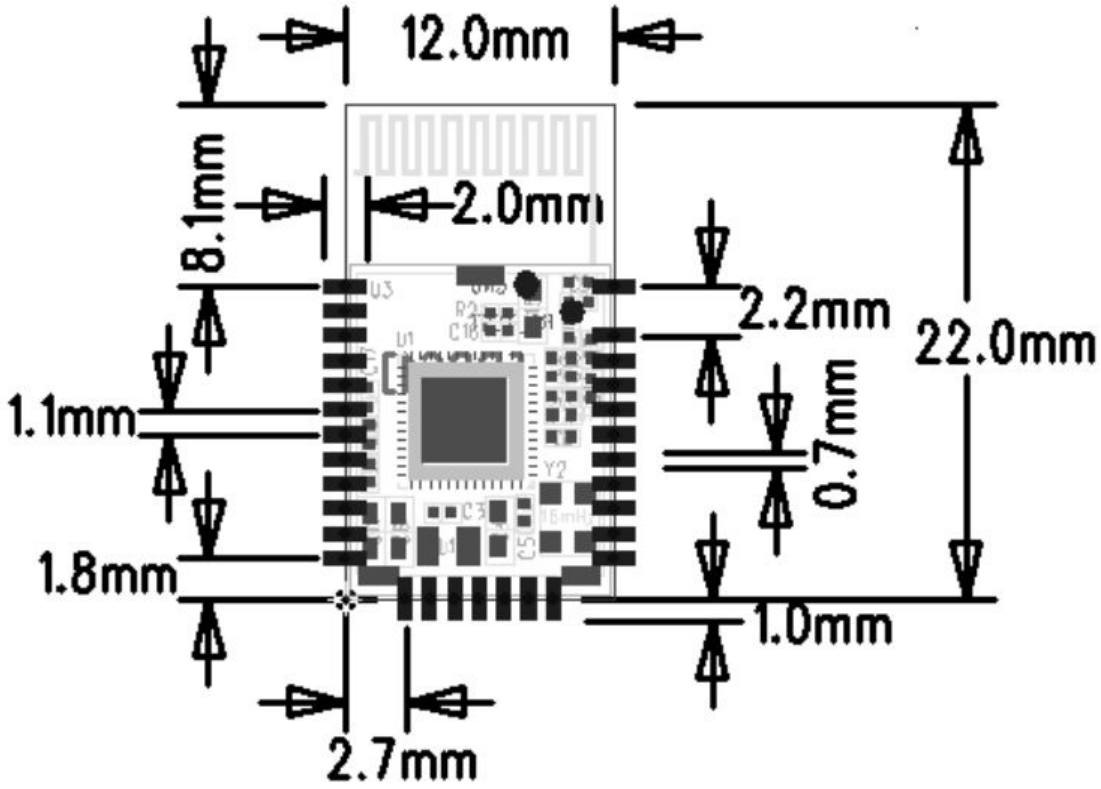
Pin Function：

PIN	IO	Name	Type	Description
1	P	GND	Ground	
2	P	BAT_P	Module power input PIN (2.7V ~ 4.2V), the default is 3.3V. Note: when off After the Module is powered off, the IO that the MCU is not connected to must be driven low.	
3	I	REGEN	Module Power-on test pin, need to pull up to VBAT (Note: must be pulled high, otherwise the module can not start)	
4	P	VREGOUT_HV	3.3V LDO output PIN, the maximum output current of this power is 300mA	
5	P	VDDIO	Module IO port power supply (1.7 ~ 3.6V, the customer can according to the IO voltage The size of their own configuration within the scope of the voltage size, the default is 3.3V)	

6	P	VREGOUT_MV	Internal 1.8V LDO output pin, the maximum output current of this power supply is 200mA
7	I	WAKE_UP	Module wake-up pin: 1. When Module enters hibernation, the PIN will detect a rising edge change Module is awakened and Module enters pairing after waking up (power-on default is high). 2. When the module is enabled Sniff mode (serial command set), MCU to Module must pull low when sending data to wake module up and then delay ≥ 2ms and then send data.
8	P	NC	NC
9	O	NC	NC
10	O	STATUS_IND	Bluetooth connection status: High level - fail connect Low level - connect successfully
11	N/A	NC	NC
12	N/A	NC	NC
13	I	UART_CTS	UART flow control, the flow control function is enabled by default. When the module detects this PIN is high, it indicates that the MCU processes. However, the Module will stop transmitting data to the MCU. The Module will wait for the PIN to be low before restarting the data transmission.
14	O	NC	NC
15	O	UART_RTS	UART flow control, flow control enabled by default, when the Module data processing comes however, This IO output to inform the MCU high; low level can receive MCU normally The data.
16	I	NC	NC

17	I	NC	NC
18	I/O	PIO3	GPIO
19	I	RST_N	Module reset pin: active low
20	I	UART_RX	Module data transmission port
21	O	UART_TX	Module data transmission port
22	I/O	PIO4	GPIO
23	I	POWER_OFF	Module shutdown pin, pull-up input The module shuts down when it detects a low level of 50ms or longer Power off the module boot, only need to WAKE_UP pin low to boot
24	I	GPIO20	GPIO
25	I	LINK_DROP	Module disconnect pin: The module is disconnected when the module detects a low pulse of more than 50ms while the PIN is connected The current connection, enter the pairing (this PIN power-on default is high)
26	O	NC	NC
27	O	NC	NC
28	O	LED0	Bluetooth work indicator (not connected status: uniform slow flashing 800ms-on, 800ms-off; connection status: Always), this pin is an open drain output.
29	P	GND	Ground
30	NC	NC	NC

Size：



AT Instruction set

Users can communicate via a serial port and a Bluetooth chip. The serial port uses Tx, Rx, two signal lines, baud rate supports 9600, 19200, 38400, 57600, 115200bps. The default baud rate of the serial port is 9600bps.

The DX-BT12 dual mode bluetooth serial module instruction is the Command instruction set.

（P.S. if send AT instruction, must use ENTER key or \r\n; 16 hexadecimal regards ODOA as ending. It doesn't need < > when input commend.

The AT instruction can only take effect in the unconnected state of the module. Once the Bluetooth module is connected to the device, the Bluetooth module enters the data transmission mode.）

Instruction detailed description

（AT Instruction must use capital letter， return key and index character as ending：\r\n）

1. Get the software version number:

Instruction	Response	Parameter
AT+VERSION	+VERSION=<Param>	<Param>：Software version number

2. Setting / querying SPP 2.0 device name: （Effect after Reboot）

Instruction	Response	Parameter
AT+SPPNAME<Param>	OK	<Param>: Bluetooth device Default name: "BT12" Max length: 18 bytes
AT+SPPNAME	+NAME=<Param>	

For example:

1. Send setting:

AT+NAME1234\r\n ——change device name to: 1234

Return:

OK\r\n ——change device name to 1234 successfully

2. Send query:

AT+NAME\r\n ——Query device name

Return:

+SPPNAME=BT12\r\n ——change device name to: BT12

3. Setting / querying BLE 4.0 device name: (Effect after Reboot)

Instruction	Response	Parameter
AT+LENAME<Param>	OK	<Param>: Bluetooth device Default name: "BT12" Max length: 18 bytes
AT+LENAME	+NAME=<Param>	

4. Get SPP 2.0 Bluetooth address:

Instruction	Response	Parameter
AT+SPPMAC	**+SPPMAC** **=<Param>**	Param: Bluetooth address

5. Get BLE 4.0 Bluetooth address:

Instruction	Response	Parameter
AT+LEMAC	=+LEMAC =<Param>	Param: Bluetooth address

6. Set / query - serial baud rate:

Instruction	Response	Parameter
AT+BAUD<Param>	OK	<Param>: baud rate (bits/s) The values (decimal): 1——1200 2——2400 3——4800 4——9600 5——19200 6——38400 7——57600 8——115200 Default: 4
AT+BAUD AT+BAU D	+BAUD=<Param>	

For example：Set the serial port baud rate to 38400

1. Send setting：

AT+BAUD6 \r\n

Return：

OK\r\n ——Setting Module baud rate to 38400 successfully

2. Send query：

AT+BAUD\r\n

Return：

+BAUD=6\r\n

7. Reset software

Instruction	Response	Parameter
AT+RESET	OK	NA

8. Power off software

Instruction	Response	Parameter
AT+PWROFF	OK	NA

9. Set whether to enter the low power consumption (this command can not be saved when no power):

Instruction	Response	Parameter
AT+PWRM<Param>	+PWRM=<Param>	Param：（0、1）
	OK	1-Enter low power consumption 0-work normally Defaults: 0
AT+PWRM	+PWRM=<Param>	

P.S. Note: To enter the low-power mode, in order to send instructions, you must pull down or restart pin 7 before sending.

10. Query \ set BLE broadcast time:

Instruction	Response	Parameter
AT+ADVI<Param>	+ADVI=<Param>	Param：（ms）
	OK	The unit is 1ms Default: 165ms
AT+ADVI	+ADVI=<Param>	

11. Set GPIO port:

5、Setting Bluetooth UUID： （Effect after Reboot）

Instruction	Response	Parameter
AT+GPIO<Param>	+ GPIO =<Param>	Param：（1R1、1R0、2R1、2R0、3R1、3R0）
	OK	Corresponding IO port: GPIO3: 1R1 high 1R0 low GPIO4: 2R1 high 2R0 low GPIO20: 3R1 high 3R0 low
AT+GPIO	+GPIO=<Param>	

For example：(Set GPIO4 output port as high level)

1. Send command：

AT+GPIO2R1\r\n ——SGPIO4 output is high

Return：OK\r\n ——Setting successfully