WLT6200

BLE

Moudle

Datasheet

V1.3

About Datasheet

The specification of WLT6200 module provides an introduction of the basic functions of WLT6200 module, including the electrical specification, RF performance, pin size, and design of reference schematic diagram, etc. Readers can refer to this document to have a detailed understanding of the overall functional parameters of the module application, please log in http://www.wi-linktech.com/ or contact our company or customer service.

To obtain the module samples and development board, please login to Alibaba international site https://www.alibaba.com/ search WLT6200 for purchase. Or contact our customer service at http://www.wi-linktech.com/.

Revision history

Version information management

Version number	Time	Update record	Editor
V1.0	2019.08	The initial release	
V1.1	2020.01	Notes for modifying bootctl	
V1.2	2020.03	Change relevant size picture	
V1.3	2020.03	Modify package, modify size	

directory

1. Summary

1.1 Functions

WLT8258 is a small, low-cost Bluetooth BLE standard pass-through module designed by Wi-linktech.

The features of this module are as follows:

- Built-in high performance 32-bit MCU，4Mbit FLASH，64kByte RAM
- Comply with Bluetooth 4.2 standard
- Transmission power: maximum +10dBm
- Receiving sensitivity：-94dBm
- Support UART interface
- Support Keyscan、PWM
- Support AT instruction
- Onboard high performance PCB antenna, and support external antenna
- Stamp hole pin,easy and reliable welding
- Super small package：11.2x16mm
- Operating temperature：-40℃~+85℃

After the module configuration is completed, pass-through function can be tested with relevant mobile phone software. Android users can download Wi-linktech's official test software "Wi-linktech test software" by searching baidu's mobile assistant. Apple users recommend using the mobile store's light blue, as shown in figure 1:

Figure 1

Wi-linktech has been engaged in the Bluetooth field for many years, with strong research and development strength, which can easily realize the interconnection of users' Bluetooth devices, data transmission and other applications. Based on the standard version of WLT8258, our company can customize and design Bluetooth modules that meet the requirements of customers, and provide corresponding software and hardware support. For details, please contact our company at http://www.wi-linktech.com/ or customer service.

1.2 Application fields

Personal equipment：

Wearable, mouse and keyboard, remote control toys；

Retail logistics：

Electronic shelf label, cold chain transport；

Smart home：

Lighting, sensor, intelligent lock, remote control, lawn mower, voice control, intelligent printer, lift table and chair;

Industrial control:

Security monitoring, special printers, medical equipment;

2. Electrical specifications

Name	Parameter(condition)	Min	Typ	Max	Unit
Power Supplies					
VDD	Voltage Input	1.8	3.3	3.6	V
Temperature					
TEMP	Operating Temperature	-20		+75	℃
Digital Input Pin					
VIH	High Level	VIO-0.3		VIO+0.3	V
VIL	Low Level	VSS		VSS+0.3	V
Digital Output Pin					
VOH	High Level	VIO-0.3		VIO+0.3	V
VOL	Low Level	VSS		VSS+0.3	V
Current Consumption					
Retention mode①	Retention mode (LPO, no retention RAM,POR, sleep timer, I/O interrupts on), can be waked up by sleep timer & any GPIO		0.7		uA
Retention mode②	Retention mode (LPO, 4kB retention RAM,POR, sleep timer, I/O interrupts on), can be waked up by sleep timer & any GPIO		2.7		uA
RX mode	RX mode, BLE , 100% on(wo DCDC @3V)		16		mA
TX mode	TX mode, BLE mode, 100% on(wo DCDC @3V)		18		mA
Sniff	Average Current, 500ms sniff, hold connection			32	uA
Sleep			2		uA
Discoverable	ADV interval:640ms Scan interval:1280ms Scan window:11.25ms		137		uA
Normal RF Condition					
FOP	Operating Frequency	2400		2480	Mhz
FXTAL	Crystal Frequency		32		Mhz
Transmitter Characteristics					
PRF	RF output power	-46	0	10	dBm
CD	Carrier Drift Rate		5		kHz/50us
PRF1	Out of band emission 2Mhz(GFSK)		-40		dBm

PRF2	Out of band emission 3Mhz(GFSK)		-48		dBm
BW	20dB bandwidth		0.9		Mhz
PRF1	Out of band emission 2Mhz (π/4 DQPSK & 8PSK)		-30	-20	
PRF2	Out of band emission 3Mhz (π/4 DQPSK & 8PSK)		-42	-40	
Receiver Characteristics					
	BT4.0 (BLE)				
SEN	High Gain mode, Sensitivity @0.1%		-93		dBm
MaxIn	Maximum Input Power		5		dBm
C/ICO	Co-channel C/I, Basic Rate, GFSK		7		dB
C/I1ST	ACS C/I 1Mhz, Basic Rate, GFSK		5.5	7	dB
C/I2ND	ACS C/I 2Mhz, Basic Rate, GFSK		-36	-34	dB
C/I3RD	ACS C/I 3Mhz, Basic Rate, GFSK		-43		dB
C/I1STI	ACS C/I image channel, Basic Rate, GFSK		-34		dB
C/I2NDI	C/I 1 MHz adjacent to image channel, Basic Rate, GFSK		-28		dB

(1) If RF output power should be larger than -4dBm, VDD should be larger than 2.5V..

(2) VDD should always be powered on in all working cycles..

(3) Result based on standard gain mode.

(4) Result based on -2dBm Pout.

(5) Continuous operation at or beyond these conditions may permanently damage the device.

3. Pin description

3.3 Pin assignment

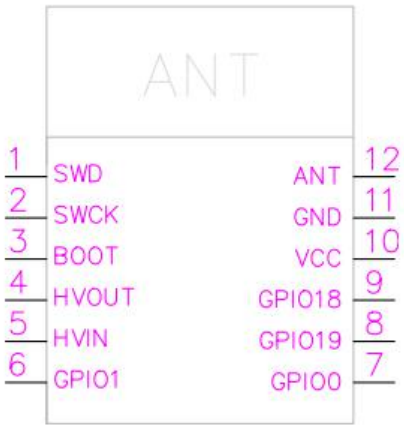

Figure 3- 1 moudle pin diagram

3.2 Pin definition

PIN #	Pin name	type	describe
1	SWD	GND	SWI data/ General I/O/PWM5
2	SWCK	I/O	SWI clk/ General I/O/PWM4
3	BOOT	I/O	Mode selection（Running@Low,Burning@High)
4	HVOUT	I/O	Li battery/USB LDO out 2.8V，typically 1uF decouple cap
5	HVIN	I/O	Li battery/USB LDO in 3~5.5V，typically 4.7uF decouple cap
6	GPIO1	I/O	General I/O/ADC5/PWM3/UART1_RX
7	GPIO0	I/O	General I/O/ADC4/PWM2/UART1_TX
8	GPIO19	I/O	General I/O/ADC2/UART0_RX(Burning interface)
9	GPIO18	I/O	General I/O/ADC3/UART0_TX(Burning interface)
10	VCC	POWER	VCC(1.8-3.6V)
11	GND	POWER	GND
12	ANT	Analog Output	Outgoing end of external RF antenna

3.3 UART Interface

The module supports UART (universal asynchronous transceiver) and realizes full duplex transmission and reception through TX and RX interfaces.

。

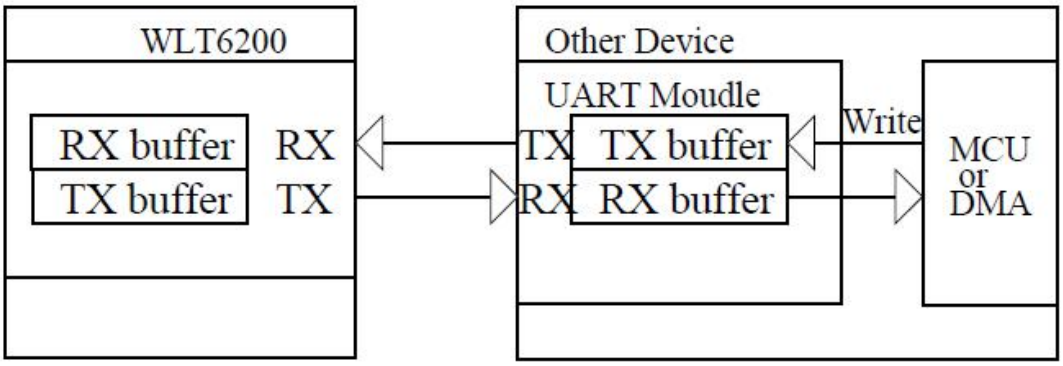

图 3- 2 UART Communication

As shown in figure 3-2, the sent data is written to the TX buffer, and the UART module uses the TX pin to extract the data from the TX buffer transferred to other devices, the data received by the RX pin is first sent to the RX buffer and then through the MCU or DMA Read.

4. Reference Design

4.1 Reference schematic

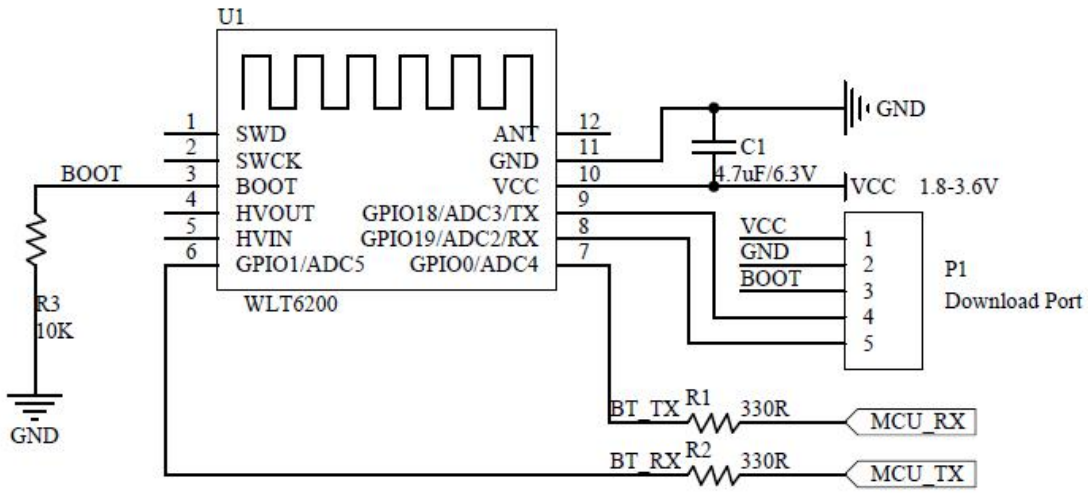

Figure 4- 1 reference schematic diagram

Note： Boot pin is pulled high for download mode and pulled low for normal operation (or suspended)。

4.2 Module dimension

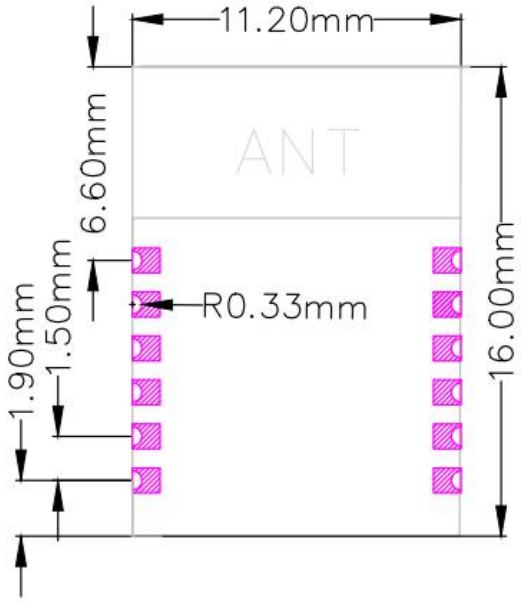

Figure 4- 2 Module plan dimension drawing

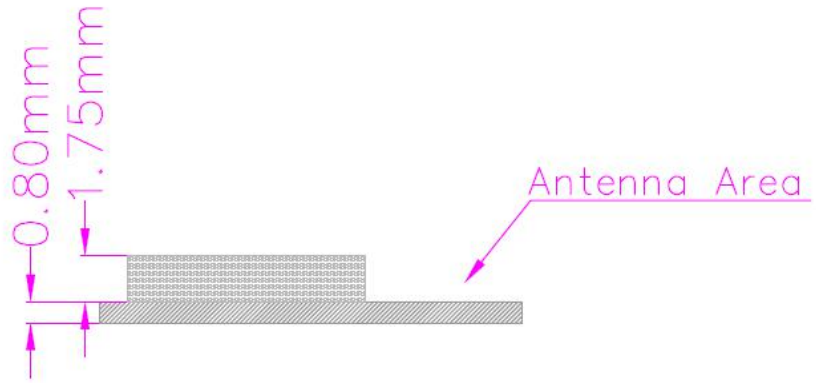

Figure 4- 3 Module side dimension drawing

Overall dimension of module	Length (X)	11.20 ± 0.2 mm
	Width (Y)	16.00± 0.2mm
Antenna position and size	Length (X)	11.20 mm
	Width (Y)	6.60 mm
PCB thickness	Height (H)	0.80 ± 0.05 mm
Total module thickness	Height (H)	2.55 mm typical

Table 4- 1 module design dimensions

4.3 Matters needing attention

Bluetooth working at 2.4GHz frequency, should try to avoid the impact of various factors on wireless transceiver, pay attention to the following points:

- Avoid using metal in the product shell that surrounds the moudle. If the shell is metal,consider using an external antenna.
- Metal screws inside the product shoule
- To maximize RF performance,the user mortherboard layout should follow the following recommendations:

1) Antenna clearance area: the user mainboard located directly below the module antenna area shall not have any copper foil wiring (including power supply, ground and signal layer).

2) Module position: the module should ideally be placed in the corner of the user's main board, and the PCB antenna is located at the far end of the main board. This position minimizes the clearance area of the antenna.
(Refer to the definition of antenna clearance area below)

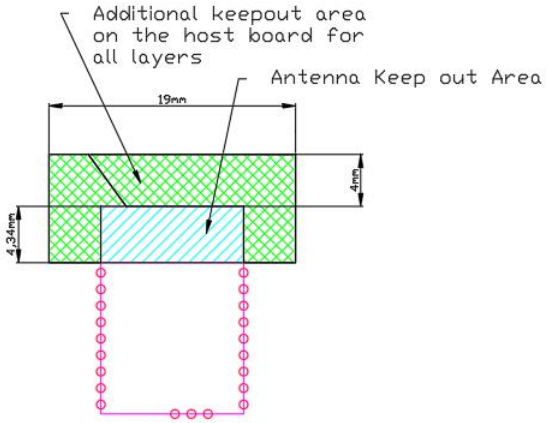

图 4- 4 Antenna Keep out

4.4 Reference package size

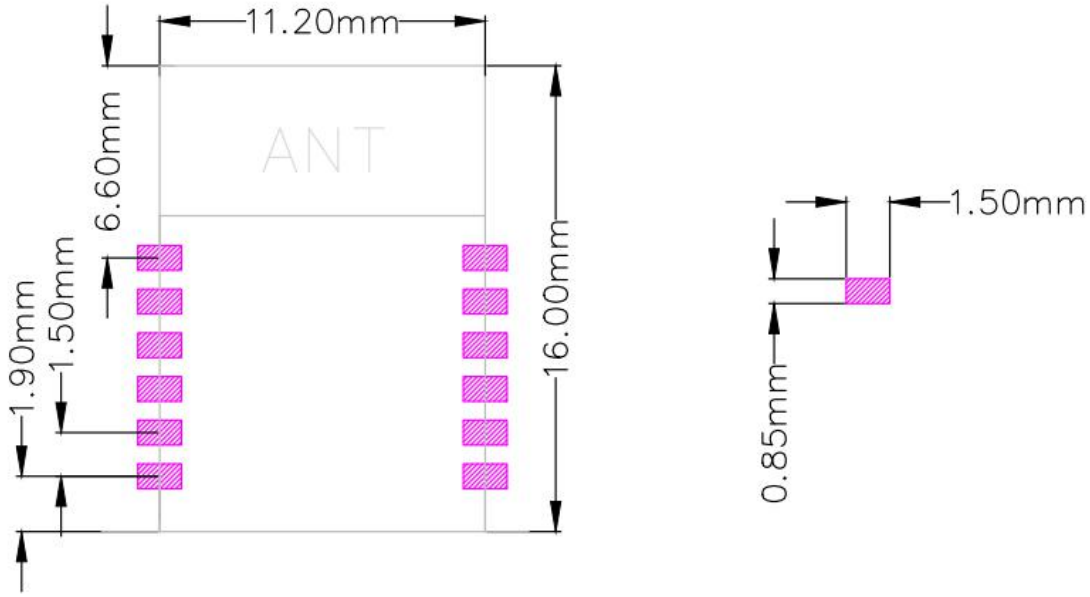

Figure 4- 5 Reference PCB Dimension drawing

5. Reflux parameter recommendation

The reflux parameters can refer to the following settings：

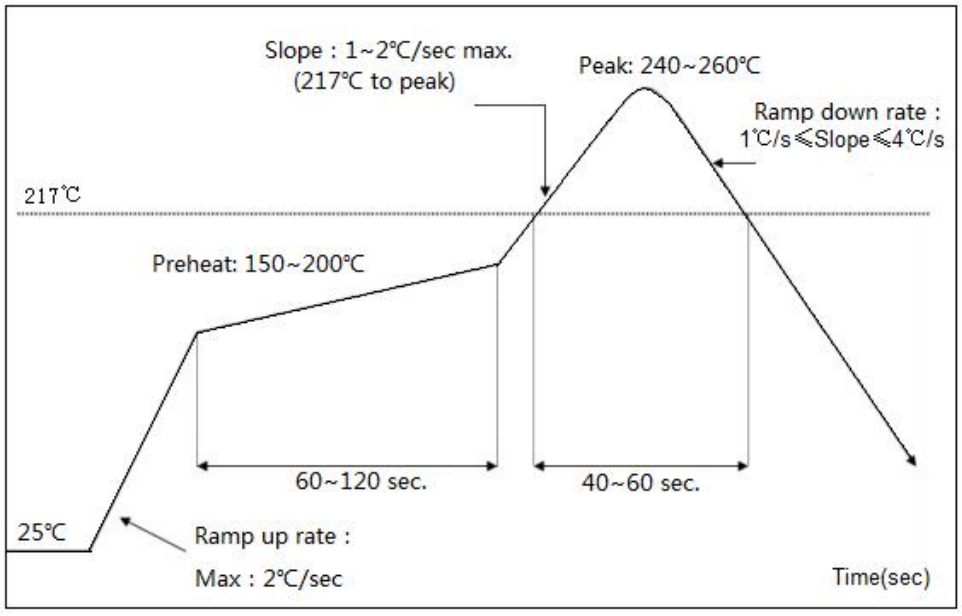

Figure 5- 1 Reflux recommended curve

Temperature range	Time	Key parameters
Preheat zone(<150℃)	60-120S	Ramp up rate:≤2S
Uniform temperature zone(150-200℃)	60-120S	Ramp up rate:<1S
Recirculation zone(>217℃)	40-60S	Peak:240-260℃
Cooling zone	Ramp down rate:1℃/s≤Slope≤4℃/s	

Table 5- 1 Reflux recommended parameters

6. Software application

WLT6200 is a data transmission module and supports transparent transmission mode and command transmission mode.

The AT + instruction set mode is that the user inputs commands through the serial port to configure parameters. For details of specific commands, please see the application documents of relevant WLT6200 module software. WLT6200 supports customer customization. Please contact our company for details.

FCC Statement

FCC standards: FCC CFR Title 47 Part 15 Subpart C Section 15.247

Integral antenna with antenna gain 1.5dBi

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.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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, usesand can radiate radio frequency energy and, if not installed and used in accordance with theinstructions, may cause harmful interference to radio communications. However, there is noguarantee that interference will not occur in a particular installation. If this equipment does causeharmful interference to radio or television reception, which can be determined by turning theequipment off and on, the user is encouraged to try to correct the interference by one or more ofthe 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.

FCC Radiation Exposure Statement

This modular complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: “Contains Transmitter Module FCC ID: 2AOO6-WLT6200 Or Contains FCC ID: 2AOO6-WLT6200”

When the module is installed inside another device, the user manual of the host must contain below warning statements; 1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

Any company of the host device which install this modular with modular approval should perform the test of radiated & conducted emission and spurious emission,etc. according to FCC part 15C : 15.247 and 15.209 &15.207 ,15B Class B requirement, Only if the test result comply with FCC part 15C : 15.247 and 15.209 &15.207 ,15B Class B requirement， then the host can be sold legally.

IC STATEMENT

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.
Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :
(1) Cet appareil ne doit pas causer d'interférences.
(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

IC Radiation Exposure Statement
This modular complies with IC RF radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

If the IC number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following:
"Contains IC:27627-WLT6200"

when the module is installed inside another device, the user manual of this device must contain below warning statements;
1. 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.
2. Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS) d'Innovation, Sciences et Développement économique Canada. Le fonctionnement est soumis aux deux conditions suivantes :
(1) Cet appareil ne doit pas causer d'interférences.
(2) Cet appareil doit accepter toutes les interférences, y compris celles susceptibles de provoquer un fonctionnement indésirable de l'appareil.

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product