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Wi-linktech WLT8018MBLE BLE Transparent Transmission Module Instruction Manual

**WLT8018M BLE
transparent transmission module
Module specification**

Latest version |V1.1
Verentone (Shanghai) Communication Technology Co., LTD
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Contents

About this Manual

The "WLT8018M Module Specification" provides an introduction to the basic functions of the WLT8018M module, including the electrical specifications of the module, RF performance, pin size, and reference schematic design.

Readers can refer to this document for the overall functional parameters of the module have a detailed understanding of the application.

Revision history

Version Information Management

Version number	time	update record	editor
V1.0	2022.10.12	Initial version	
V1.1	2022.11.20	Updated bugs	

Overview

The WLT8018M is a Bluetooth Low Power through-pass module from Valentone. The module is mainly used in the Internet of Things data communication, through a wealth of peripheral interfaces to implement data acquisition and control. In transparent transmission mode, the user's product can quickly dock with the module and communicate with the mobile device to realize the intelligent control and management of the product.

The WLT8018M is based on the Bluetooth Low Power 5.0 protocol, which can be used for transparent and encrypted point-to-point data transmission. Users do not need to care about the transmission protocol, and only need to make simple Settings to communicate.

The module supports BLE (Up to Bluetooth 5.0) and BLE Mesh. Dynamic stack and protocol Profile configuration are supported, and product features can be configured via software, providing the ultimate flexibility. It also supports hardware OTA upgrades, allowing convenient product features to be rolled out and upgraded.

Figure 1-1: WLT8018M module

1.1. Function Features

Built-in high performance 32-bit MCU, 512KB Flash, 48KB SRAM

- Bluetooth 5. 0 compliant. Support 2M, 1 Mbps, 500 Kbps, 125 Kbps rates
- Transmit power: Max +10dBm (min to -20dBm)
- Receiving sensitivity: in LDO mode 1Mbps receiving sensitivity up to 95dBm
- Support UART, SPI, I2C, I2S, ADC, PWM and other interfaces,
- support AT instruction support lithium battery charging function

- Support true random number generator and hardware AES-128 encryption
- High performance PCB antenna on board, and support for external antenna
- Stamp hole pin, easy and reliable welding
- Ultra-small package: 13.3×16.5mm
- Supply voltage: 2.4V-4.3V
- Working temperature: -40℃~+85℃

WLT8018M module only needs to connect VCC,GND,TX,RX four lines to complete the data transparent transmission function, but also supports the use of AT instructionsto modify the default name and other related parameters (for details, see the "WLT8018M AT+ instruction instruction" document).

After the module is configured, you can use the relevant mobile phone software to test the transparent transmission function. Android users can download the official test software "WLT Connect" from Huawei App Market. Apple users are recommended to use light blue from the mobile phone store.

Weilentong has been engaged in the field of Bluetooth for many years, and has strong research and development strength, which can easily realize the interconnection of users' Bluetooth devices, data transmission and various other applications. Based on the WLT8018M standard version module, we can customize the Bluetooth module according to customer requirements, and provide the corresponding hardware and software support. For more details, please contact our company **http://www.wi-linktech.com/** or customer service.

1.2. Application Areas
Personal Devices:
Cameras

Electrical specifications

Table 2-1: Maximum rated parameters

Item	Symbol	Min	Max	Unit
Supply voltage	VBAT	2.4	4.	V
Storage temperature	Tstr	-40	105	°C
Welding temperature	Tsld		260	°C

Note:

1. The electrical characteristics listed are target specifications and are for reference only. Some data may be updated based on actual test results.
2. The voltage values shown are based on GND in the module. Any voltage that exceeds the "maximum rating" may cause permanent damage to the device.

Table 2-2: Recommended operating conditions

Item	Symbol	Min	Typ.	Max	Unit
Supply voltage	VBAT	2.4	3.3	4.3	V
Operating temperature	Topr	-40		85	"C

Table 2-3: Operating current (VDD=3.3V, T=25 ° C)

Item	Sym.	Min	Typ.	Max	Unit	Condition
RX current	IRx		9.7		mA	Whole Module Working
TX current	ITx		8.0		mA	Whole Module Working @Od Bm With DCDC enable
Sleep pattern			6.1		uA	
Power off			2.7		uA	

Table 2-4: n pin input/output characteristics (VDD=3.3V, T=25 ° C)

Item	Min	Typ.	Max	Unit	Condition
Operating frequency	2402		2480	Mhz	
Transmitting power	-20	0	10	dBm	
Receiving sensitivity	–	-98		dBm	
Receiving sensitivity (1Mbps)		-95	–	dBm	LDOlvlODE

Table 2-5: Bluetooth characteristics

Item	Sym.	Min	Typ.	Max	Unit	Condition
Input high level	VIN	0.7VDD	–	VDD+0.3	V	
Input low level	VIL	-0.3	–	0.3VDD	V	
Output high level	VOH	1.8	–	–	V	
Output low level	VOL	–	–	0.33	V	

Pin description

3.1. Pin distribution

Figure 3-1: Module pin diagram

Note: The pin function in Figure 3-1 can be redefined by pin reuse

3.2. Connection diagram

The module supports UART port for communication, and transmits and receives data through TX and RX. And support hardware RTS and CTS flow control function.

Figure 3-2: UART communication

3.3.Pin definition

PIN	Pin name	type	Description
1	GND	GND	GND
2	VBAT	POWER	Positive power supply for DC/DC
3	PA6	Digital 1/0	PA6/SCL 1/I2SDOUT/PWM0/SSPDOUT/URXD0/URXD1/CLKOUT/PDMCLK/PWM1
4	NC		
5	NC		
6	PA7	Digital 1/0	PA7/SDA1/I2SDIN/PWM1/SSPDIN/UTXD0/UTXD1/ANTCTL0/PDMDAT/PWMO
7	NC		
8	NC		
9	NC		
10	NC		
11	PAO	Digital 1/0	PAO/SCL0/12SCLK/PWMO/SSPCLK/U RXDO/URXD1/CLKOUT/PDMCLK/PWM 1
12	PA1	Digital 1/0	PA1/SDA0/12SFRM/PWM 1/SSPCSN/UTXDO/UTXD1 IANTCTLO/PDM DAT/PWMO
13	PCS	Digital 1/0	PC5/SDA0/I2SFRM/PWM5/SSPCSN/UTXD0/UTXD1 /SWV/PDMDAT/PWM4
14	PC6	Digital 1/0	PC6/SCL1/I2SD0UT/PWM4/SSPD0UT /URXDO/URXD1 /SWTCK/PDMCLK/PWMS
15	PD7	Digital 1/0	PD7/SDA1/I2SD1N/PWM 1/SSPDIN/UTXDO/UTXD1IANTCTL1/PDMDAT/PWMO/ADC3
16	PD6	Digital 1/0	PD6/SCL 1 2SD0UT/PWMO/SSPDOUT/URXDO/U RXD1/CLKOUT/PDMCLK/PWM 1IADC2
17	LED1	ANALOG IN	LED1 control output
18	PG	Digital 1/0	PG/SDA 1/12SD1N/PWMS/SSPDIN/UTXDO/UTXD1/SWDIO/PDMDAT/PWM4
19	RESET	Digital 1/0	Reset
20	PD4	Digital 1/0	PD4/SCL0/I2SCLK/PWM4/SSPCLK/URXD0/U RXD1IANTCTLO/PDMCLK/PWM 5/ADCO
21	PDS	Digital 1/0	PG/SDA 1/12SD1N/PWMS/SSPDIN/UTXDO/UTXD1/SWDIO/PDMDAT/PWM4
22	PA2	Digital 1/0	PA2/SCL 1/I2SD0UT/PWM2/SSPD0UT /URXDO/U RXD1IANTCTLO/PDMCLK/PWM 3
23	PA3	Digital 1/0	PA3/SDA1/I2SDIN/PWM3/SSPDIN/UTXD0/UTXD1/ANTCTL 1/PDMDAT/PWM2
24	LED2	Digital 0	LED2 control output

Note: PA2 module is internally pull-up to LDO_OUT by 10K, cannot be used as high level input detection and low level output, all digital IO except PA2 can be used as GPIO, with configurable pull-upresistance.

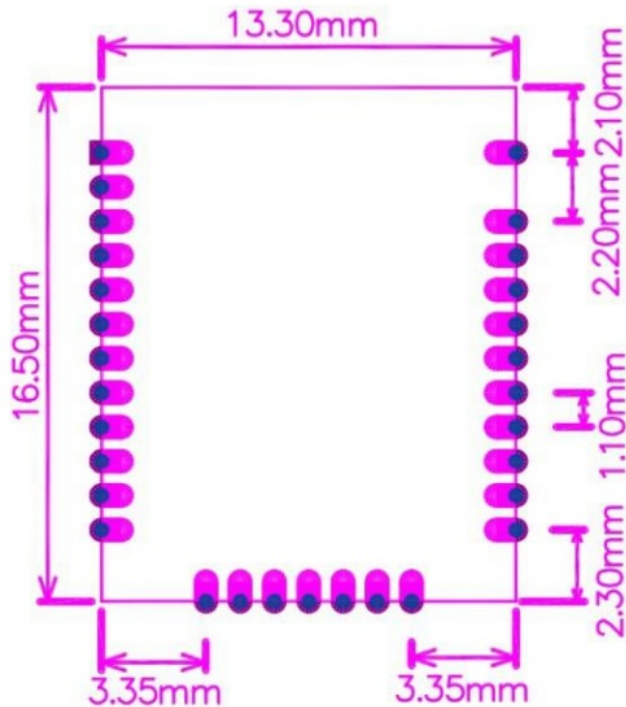## Reference Design

4.1. Outline dimensions of the module

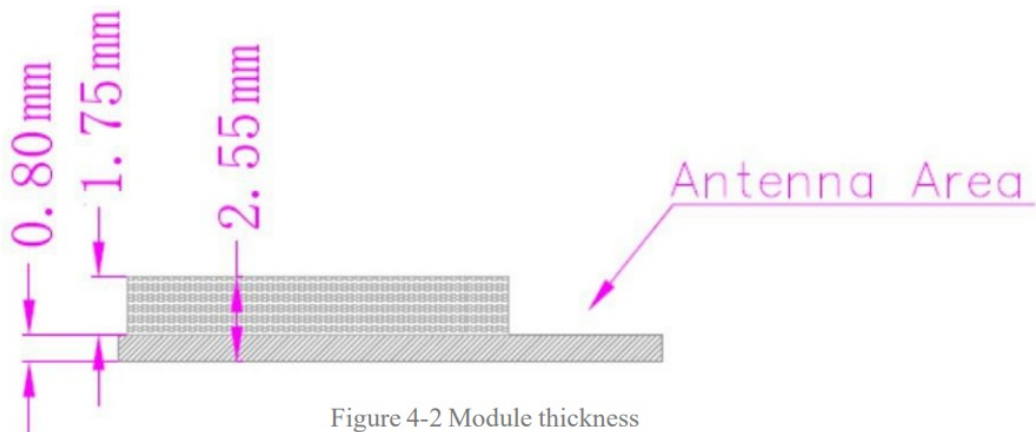Figure 4-1: Top View (Seen from Top) Bottom View (Seen from Bottom)

Figure 4-2 Module thickness

Module dimensions (including process edges)	Length (X)	16.5.00± 0.15mm
	Width (Y)	13.30± 0.2 mm
PCB thickness	Height (H)	0.80 0.1 mm
module thickness (including shield)	Height (H)	2.55 ± 0.1 mm
Shield thickness	Height (H)	1.75 ± 0.05 mm

Table 4-1: Module design dimensions

Note: Verentone reserves the right to select components from different suppliers to realize the functions of the module. At the same time, ensure that all mechanical and electrical specifications and module certifications are maintained. The design should be carried out within the scope of the physical dimensions of the machinery as shown in Figure 5-2. All measurements are in millimeters (mm).

4.2. Precautions

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

- Avoid metal for the part of the product housing that encloses the module, and if the housing is metal, consider using an external antenna.
  Metal screws, etc. inside the product should be kept away from the RF portion of the module.
- In order to maximize RF performance, the user motherboard layout should follow the following recommendations:
- Antenna clearance area: The user motherboard located directly below the antenna area of the module must not have any copper foil wiring (including power, ground, signal layers).
- Module location: The module should ideally be arranged in a corner of the user's motherboard, with the PCB antenna located at the far end of the motherboard. This position minimizes the headroom area for the antenna.
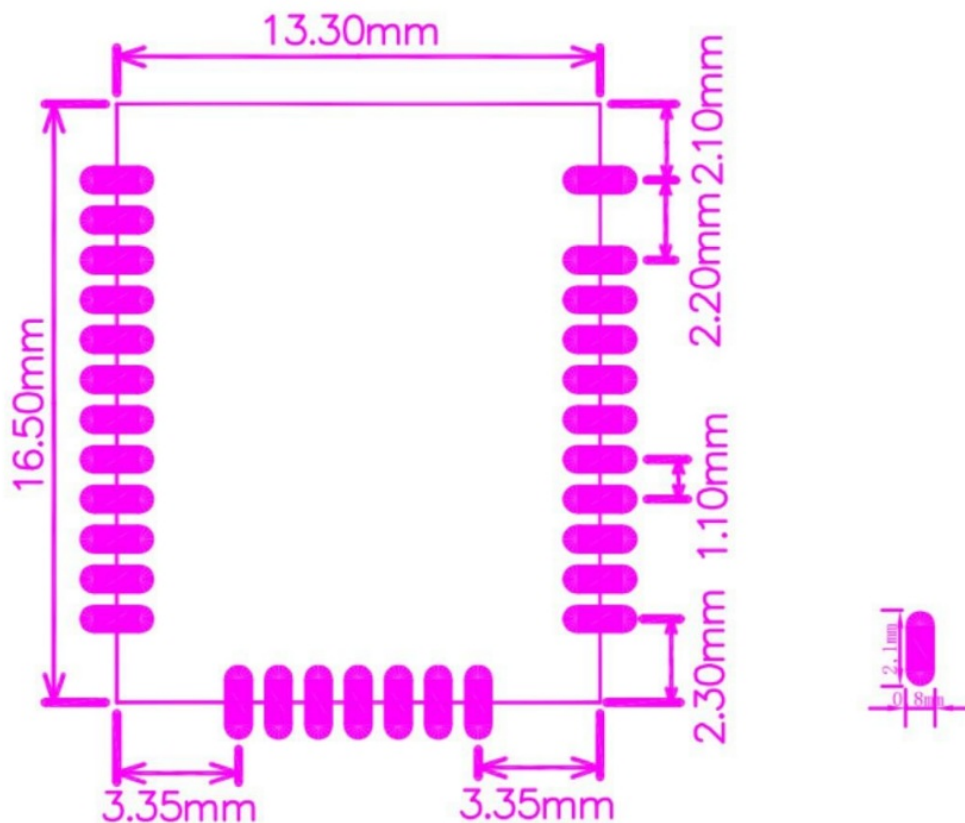
4.3. Refer to PCB packaging

Figure 4-5: Reference package dimensions

Reflux parameters are recommende

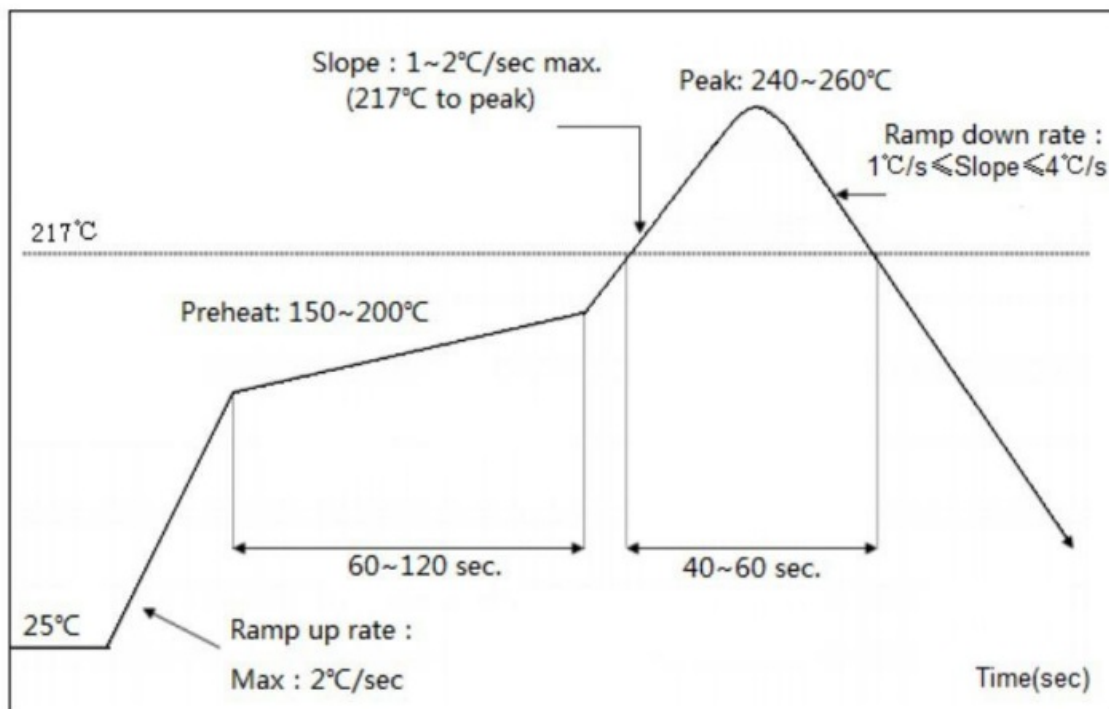The reflux parameters can refer to the following Settings:

Figure 5-1: Backflow recommendation curve

Temperature range	Time	Key parameters
Preheat zone(<150°C)	60-1205	Ramp up rate:2S
Uniform temperature zone(150-200°C)	60-1205	Ramp up rate:<1S
Recirculation zone(>217°C)	40-60S	Peak:240-260°C
Cooling zone	Ramp down rate:1°C/"Slop".4°C/s	

Table 5-1: Recommended reflux parameters

FCC & IC Regulatory Module Integration Instructions
List of applicable FCC rules
This device complies with part 15 of the FCC Rules.
Limited module procedures
Not applicable
Summarize the specific operational use conditions
This module is suitable for remote applications such as electronic shelf labels and cold chain transportation. The module input voltage is nominal DC 2.4-4.3V typical value is DC 3.3V, and the ambient temperature of the module does not exceed 85°C.
RF exposure considerations
This equipment complies with FCC radiation exposure limits set forth or an uncontrolled environment. This equipment should be installed and operated with minimum distance 5mm between the radiator& your body. If the device built into a host as a portable usage the additional RF exposure evaluation may be required as specified by 2.1093.

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.
Lable and compliance information
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: 2AOO6WLT8018M Or

Contains FCC ID: 2AOO6-WLT8018M"
If the IC 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 IC: 26141WLT8018M Or Contains IC: 26141-WLT8018M"
When the module is installed inside anther device,the user manual of the host must contain below warning statements:
1. This device complies with Industry Canada licence-exempt RSSstandard(s). Operation is subject to the following two conditions:
(1) this device may not cause interference.
(2) this device mustaccept any interference, including interference that may causeundesired operation of the device.
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

Additional testing,Part 15 subpart B disclaimer
The final host/module combination need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.
The host integrator installing this module into their product mustensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules,including the transmitter operation and should refer to guidance in KDB 996369.

Frequency spectrum to be investigated
For host products with certified modular transmitter,the frequency range of investigation of the composite system is specified by rule in Sections 15.33(a(1 through (a(3,or the range applicable to the digital device as shown in Section 15.33(b(1 whichever is the higher frequency range of investigation.

FCC Statement
Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
This device may not cause harmful interference
This device must accept any interference received including interference that may cause undesired operation

Software Application

In addition to the basic single link transparent transmission function, the WLT8018M can also support the function of master/slave co-existence multiple connections.
For details, please refer to WLT8018M BLE Transparent Transmission Module Quick Start.
WLT8018M support customer customization, please contact our company for details.

About Us
Founded in 2011, Verentong (Shanghai) Communication Technology Co., Ltd. is a fast growing Internet of Things wireless communication technology company located in the core area of Zhangjiang High-tech Development Zone in Pudong, Shanghai. The company focuses on providing the world's leading wireless connectivity solutions for the Internet of Things (WiFi/ Bluetooth /BLE/Lora/NB-IOT, etc.), including self-developed and self-branded communication chips, communication modules, communication boards, communication protocol software, mobile phone apps, cloud computing and other parts. The company mainly serves large and medium-sized customers in industrial Internet of Things, automotive, medical and fitness, financial payment and security, high-end consumer electronics, professional Musical Instruments, office equipment and other industries, including more than 40 deeply customized global industry leading customers in China, the United States, Europe, South Korea and other regions, as well as more than 200 large and medium-sized customers with close cooperation.
Adhering to the concept of people-oriented, integrity, responsibility and innovation, the company is committed to becoming a high-tech company with talent and technology as its core competitiveness and sustainable development. The company's core team has more than 10 years of management and technical experience in top 500 US-funded high-tech enterprises, emphasizes sustainable win-win cooperation with customers, combines the company's wireless connectivity and Cloud technology with in-depth customization of customer industry applications, and provides reliable wireless connectivity technical support for continuous product innovation and service innovation for large and medium-sized customers in the era of Internet of Things.

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Documents / Resources

![W logo] WLT8018M BLE transparent transmission module Module specification	**Wi-linktech WLT8018MBLE BLE Transparent Transmission Module** [pdf] Instruction Manual 2AOO6-WLT8018M, 2AOO6WLT8018M, wlt8018m, WLT8018MBLE BLE Transparent Transmission Module, WLT8018MBLE, BLE Transparent Transmission Module, WLT8018MBLE Transmission Module, Transmission Module, BLE Module, Module

References

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