WLT8266BMG BLE Module

Datasheet

V1.1

Introduction

This BLE module is designed to connect electronic products and smart mobile devices via Bluetooth Low Energy technology. It can be widely used in various application senario, such as industrial control, instrumentation, logistics tracking, health care, smart home, motion measurement, automotive electronics, leisure toys, etc. With WLT8266BMG module's integrated BLE stack, fine-tuned RF performance and power consumption, and module level BQB/FCC/CE certifcations, developpers can use this module to make their product development cycle much shorter.

The following is a table of different modules of our WLT8266BM product family:

Table 1 WLT8266BM Series Modules

Module type	Function	Size(mm)
WLT8266BMG	Wi-linktech Standard software BLE module,does not support software customization.Standard software functions including BLE passthrough data, AT Command control, Smartphone App configuration, OTA firmware upgrade. Provide Android/IOS APP reference source code	15×17
WLT8266BM	BLE modules with customized software per each customer specific needs. In addition to supporting all functions of WLT8266BMG, it also supports slave, host,Mesh networking, master-slave role switching, BLE/Mesh switching and other working modes.	
WLT8266BME	Same software functions as WLT8266BM, but with a smaller module mechanical size to adapt to more application scenarios.	11.2×15

Note： 1,Antena locates at the shorter edge of the module. For detailed size parameters, please refer to the details of 'WLT866BMG Data sheet'.

2,WLT8266BM supports mesh function, which can realize users' networking and multi-connection requirements. In addition, in order to solve the problem that the power consumption of Mesh is too high and BLE can not meet the needs of multi-connection , our company specially developed a BLE/Mesh switching technology to reduce the overall system power consumption while meeting the needs of users. For more information, please login at http://www.wi-linktech.com/ to contact our customer service.

3,WLT8266BMG， WLT8266BM， WLT8266BME each have a shielded version as well. If you need it, you can contact us.

4,For module samples and development boards, please login to Alibaba International Station https://www.alibaba.com/ search WLT8266BMG for purchase. Or login at http://www.wi-linktech.com/ to contact our customer service

About This Manual

《WLT8266BMG Datasheet》 provides an introduction to the basic functions of the WLT8266BMG module, including the electrical specifications, radio frequency performance, pin size, and reference schematic design of the module.Readers can refer to this document for detailed understanding and application of the overall function and parameters of the module. For more questions,please login at http://www.wi-linktech.com/to contact our company or customer service.

Version History

Version Information Management

Vision	Date	Update Record	Editor
V1.0	2018.12.19	Summary、Specifications Description 、Pin Description、Reference Design	Leon Enqing.Li
V1.1	2019.02.19	Add introduction	Eric

Content

1. Summary

1.1 Functions

WLT8266BMG is a small and low-cost Standardized passthrough Bluetooth BLE module designed by Wi-linktech.

The features of this module are as follows：

- Built in high performance 32-bit MCU，128KB Flash，16KB SRAM
- Conforming to Bluetooth 5.0 standard
- The output power of up to +8dBm
- The reception sensitivity of -92dBm
- Support UART interface
- Support AT command
- Support APP parameter configuration
- On-board high performance PCB antenna and support external antenna
- The stamp-bore for printer is easy for welding and reliable
- Ultra small package: 15x17mm
- FCC/CE/BQB 5.0 Certificated

WLT8266BMG module Only need to connect 4 pins(VCC, GND, TX and RX) to complete data transmission and receiving function.It also supports the use of AT instructions to modify the default name and other related parameters (see "WLT8266BMG User manual" document for details).

After the module configuration is completed, you can use relevant mobile phone software to test the transmission function.Android users can search through Baidu mobile phone assistant to download wi-linktech official test software "wi-linktech test software". For Apple users,we recommend 'light blue' from mobile phone store, as shown in figure 1;

Figure 1. Wi-linktech test software APP & Light Blue APP

Wi-linktech has been engaged in the field of Bluetooth for many years, and has strong R&D strength. We can easily realize the interconnection of users' Bluetooth devices, data transmission and other applications. Based on WLT8266BMG standard module, our company can customize Bluetooth module according to customer requirements and application, and provide corresponding software and hardware support. Details can be obtained from our company at http://www.wi-linktech.com/ or customer service.

1.2 Application Field

Personal Device:

Wearable, Mouse and keyboard, Remote control toys;

Retail Logistics:

Electronic shelf label, Cold chain transportation;

Smart Home Application:

Lighting, Sensors, Intelligent locks, Remote controls, Lawn mowers, Voice control, Intelligent printers, Lifting tables and chairs;

Industrial Control :

Security monitoring, Special printer, Medical equipment;

2. Electrical Parameters

Table 2 Power supply specifications

Symbol	Minimum	Typical	Maximum	Units
VDD	2.7	3.3	3.6	V

Table 3 Digital I/O specifications

Symbol	Minimum	Normal	Maximum	Units
V_{IH}	0.7VDD	-	VDD	V
V_{IL}	VSS	-	0.3VDD	V
V_{OH}	VDD-0.3	-	VDD	V
V_{OL}	VSS	-	0.3	V

Table 4 Temperature specification

Item	Minimum	Maximum	Units
Storage	-65	+150	℃
Soldering	-	+260	℃
Working	-40	+85	℃

Table 5 Power consumption

Item	Typical	Units
Tx current @0dBm	10.8	mA
Rx current	9.8	mA
Sleep advertisement	30	uA
Deep sleep	1	uA

Temperature:25℃ Operating voltage:3.3V Operating mode:DC-DC

Note: Typical current values for transmitting and receiving modes are at full speed.

3. Bluetooth Specification

Table 6 RF_Rx performance

Item	Symbol	Minimum	Normal	Maximum	Units
Sensitivity	1Mbps	-93	-92	-90	dBm
Frequency offset tolerance	-	-300	-	+300	KHz
Co-channel rejection	-	-	-7	-	dB
In-band blocking rejection	±1 MHz offset	-	12	-	dB
	-2 MHz offset	-	47	-	dB
	-3 MHz offset	-	48	-	dB
	+3 MHz offset	-	50	-	dB
	>4 MHz offset	-	52	-	dB
Image rejection	-	-	44	-	dB

Table 7 RF_Tx performance

Item	Symbol	Minimum	Normal	Maximum	Units
Output	-	-37	0	8	dBm
Modulation 20dB bandwidth	-	-	1000	-	KHz

Table 8 WLT8266BMG Bluetooth module transmission measured distance

Module	Test items	Distance（m）， Open area
WLT8266BMG	Maximum data transmission distance	70

4. Pin Description

4.1 Pin Assignment

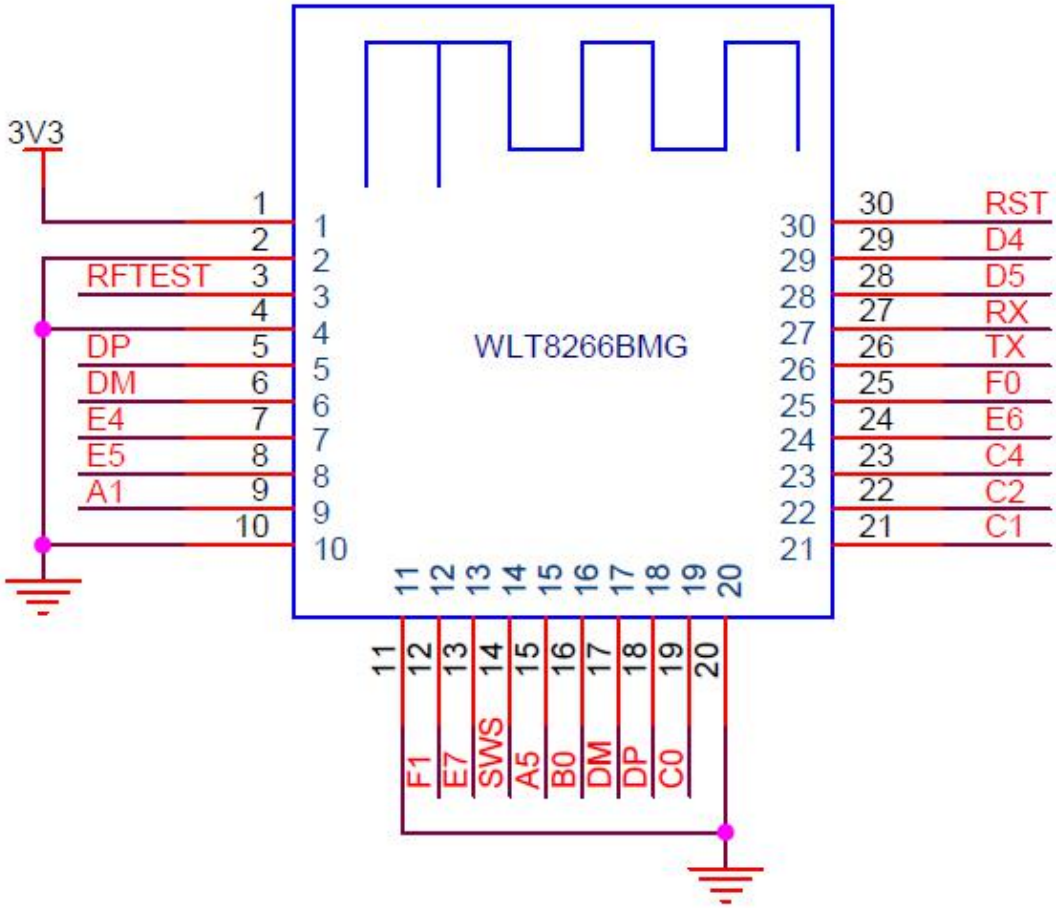


Figure 2.pin assignment

4.2 Pin Definition

Table 9 Module pin definition

PIN #	Name	Type	Description
1	3V3	POWER	powered by3.3V
2、4、10、11、20	GND	POWER	Ground
3	RF_TEST	ANALOG	Reserved for external antenna
5、18	DP	I/O	USB data Positive/GPIO/ANA_B<6>
6、17	DM	I/O	USB data Minus/GPIO/ANA_B<5>
7	E4	I/O	GPIO16/ANA_E<4>
8	E5	I/O	GPIO17/ANA_E<5>
9	A1	I/O	PWM3 output/GPIO/ ANA_A<1>
12	F1	I/O	SPI clock/I2C_SCK/GPIO/ ANA_F<1>
13	E7	I/O	SPI data input/I2C_SDA/GPIO/ ANA_E<7>
14	SWS	I/O	Single wire slave/GPIO/ANA_A<0>
15	A5	I/O	PWM4 output/GPIO/ ANA_A<5>
16	B0	I/O	PWM5 output/GPIO/ ANA_B<0>
19	C0	I/O	PWM0 output/GPIO/ANA_C<0>/ Analog mcrophone Bias
21	C1	I/O	GPIO/PWM1 inverting output/ANA_C<1>/ Analog microphone input
22	C2	I/O	PWM1 inverting output/GPIO/ANA_C<2>
23	C4	I/O	PWM2 output/GPIO/ ANA_C<4>
24	E6	I/O	SPI chip select. Active low/ UART_RTS /GPIO/ANA_E<6>
25	F0	I/O	SPI data output/ UART_CTS /GPIO/ ANA_F<0>
26	TX	I/O	GPIO4/UART_TX/ ANA_C<6>
27	RX	I/O	GPIO5/UART_RX/ ANA_C<7>
28	D5	I/O	GPIO11/ ANA_D<5>/ (optional) 32KHz crystal output
29	D4	I/O	GPIO10/ ANA_D<4>/(optional) 32KHz crystal input
30	RST	I/O	Power on reset, active low

4.3 UART Interface

WLT8266BM UART Using “four-wire system”， Namely：UART_TX，UART_RX，UART_RTS,UART_CTS.If the number of usable pins of the master MCU is limited, WLT8266BMG and the master MCU can use "two-wire system" to communicate at least, that is, only UART_TX and UART_RX are needed. The schematic diagram is as follows：

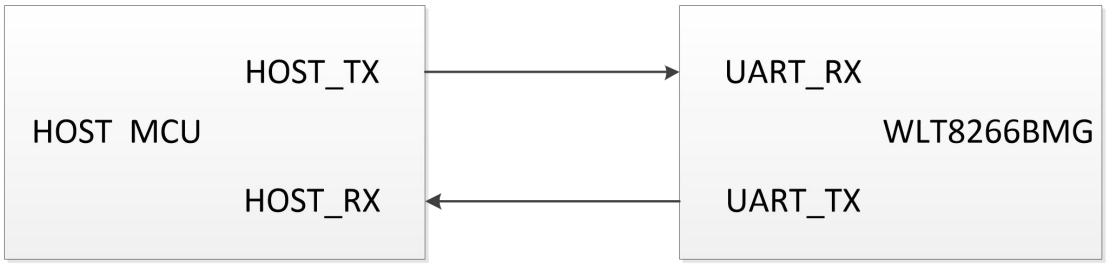


Figure 3. UART connection between WLT8266BMG and Host MCU

5. Reference Design

5.1 Reference Schematic

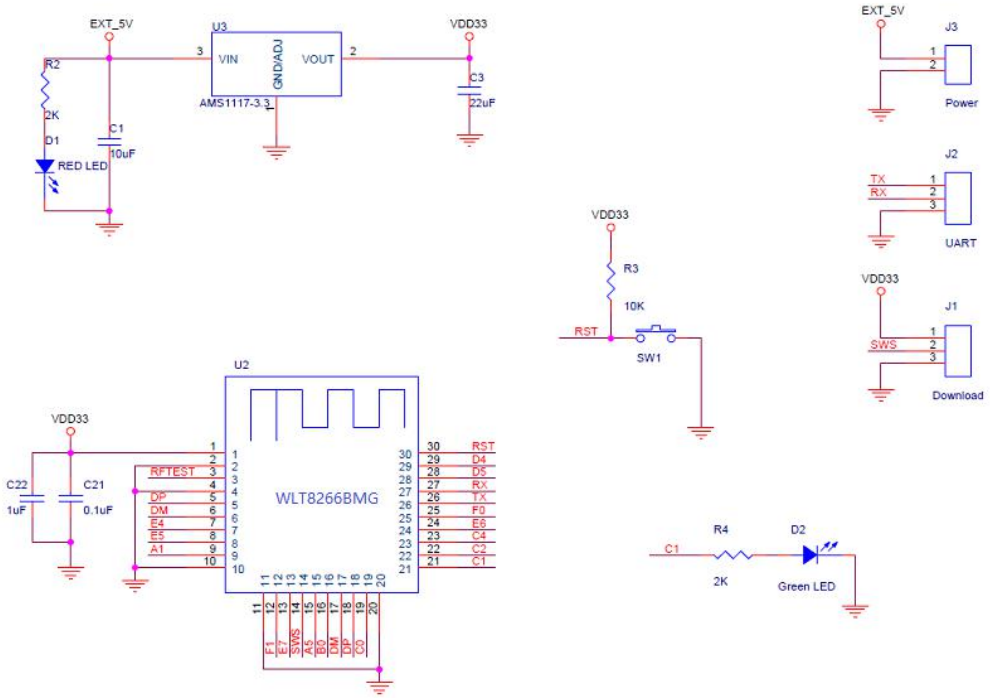


Figure 4. Reference schematic diagram

5.2 Module Encapsulation

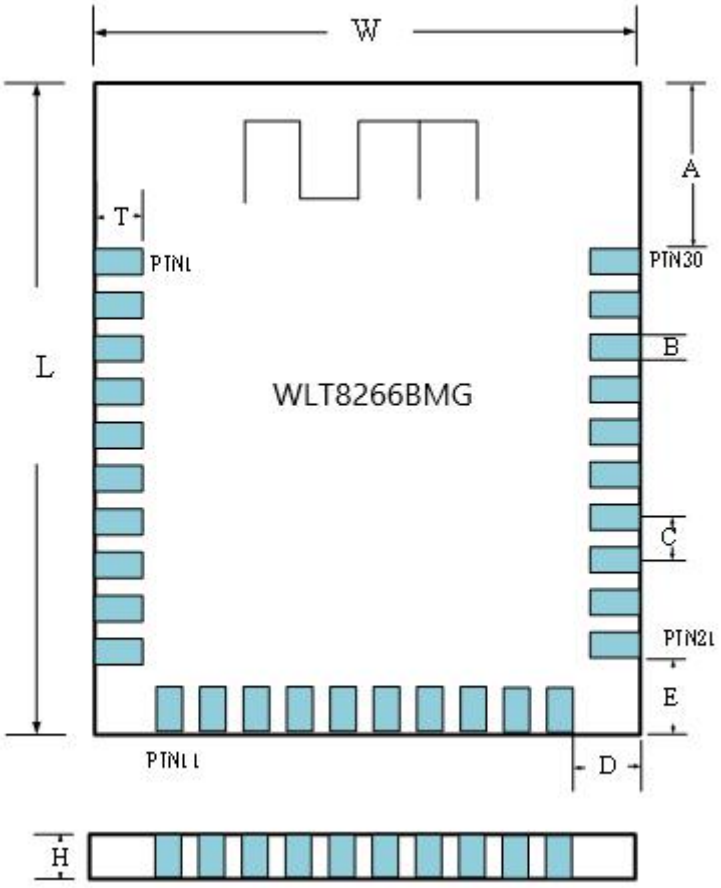


Figure 5. WLT8266BMG Module size（Top view）

Table 10 Module size

Symbol	Min.	Typ.	Max.
W	14.96	15.00	15.04
L	16.96	17.00	17.04
T	0.73	0.75	0.77
A	4.55	4.60	4.65
B	-	0.80	-
C	-	1.10	-
D	2.10	2.15	2.20
E	1.65	1.7	1.75
H	1.50	1.60	1.70

5.3 Module Appearance

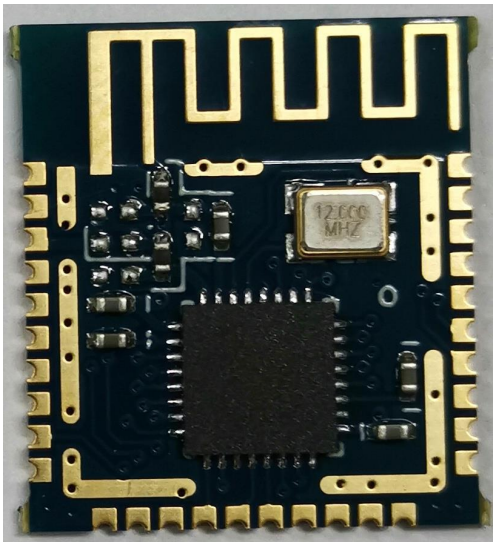


Figure 6. WLT8266BMG module

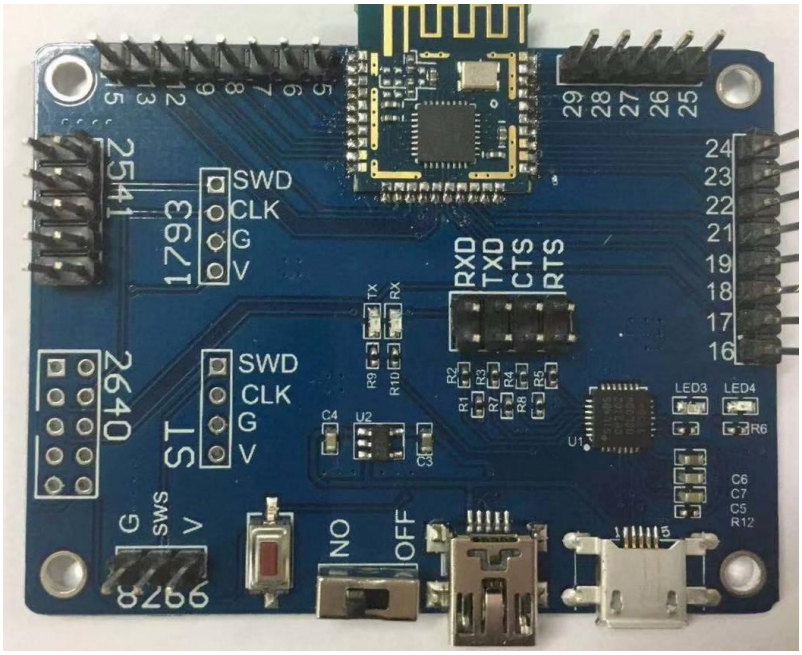


Figure 7. WLT8266BMG development board

For purchase of WLT8266BMG module and development board, Please login to Alibaba International Station at https://www.alibaba.com/,search WLT8266BMG for purchase. Or login at http://www.wi-linktech.com/ to contact our customer service.

5.4 Matters Needing Attention

Bluetooth works in a frequency of 2.4GHz, the design of PCB and Mechanical should be careful to avoid the impact of various factors on the RF performance. Please note the following:

1. Outer casing surrounding WLT8266BMG module should avoid using metal materials. If the casing is metal, it is recommended to use an external 2.4GHz antenna.

2. Metal screws should be far away from RF part of module.

3. Module should be placed on the edge of motherboard, ensure the antenna towards outside.Please make sure that all layers have no trace or copper under the Antenna region.

5.5 Recommended Reflow Profile

Reflux parameters can be referred to the following settings:

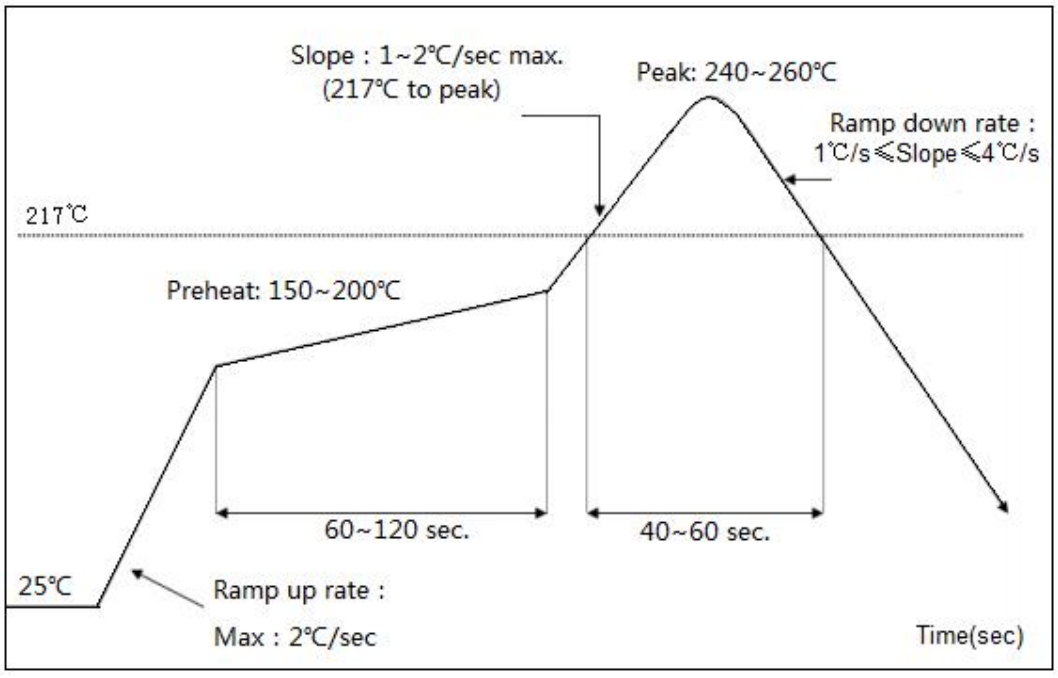


Figure 8. Temperature Curve of Secondary Reflow

Table 11. Reflow soldering parameter

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	

5.6 Package Information

Tape reel（Vacuum packing）

Size： Radius (R)=160(mm)

Figure 9. Shipping Information

Note:

1 tape reel = 1200pcs;

6. Software Introduction

WLT8266BMG is a data transmission module, which supports transparent transmission mode and command transfer mode.

AT + instruction set mode is that the user configures parameters by inputting commands through the serial port. For detailed commands, please check “WLT8266BMG User Manual” document.

WLT8266BMG supports customer customization, please contact our company.

7. Attachment（Related Certification）

CE Certificated:

CERTIFICATE

Anbotek
Product Safety

CERTIFICATE
Of Conformity
Directive 2014/53/EU
On The Radio Equipment Directive

Certificate No.:	ATSZAWW171226003
Certificate Holder:	Wi-linktech Communication Technologies (Shanghai) Co.,Ltd
Address:	Room217, 518Bibo Road, Pudong New District, Shanghai, China
Manufacturer:	Wi-linktech Communication Technologies (Shanghai) Co.,Ltd
Address:	Room217, 518Bibo Road, Pudong New District, Shanghai, China
Product Name:	BT 4.2 single
Model No.:	WLT8266BM
Trade Mark:	N.A.
Rating:	Input: DC 5V, 20mA by USB Port

The radio equipment meets the following essential requirements		Compiled
Article 3(1)(a) ■ Safety	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013	Yes
Article 3(1)(a) ■ Health	EN 62479:2010	Yes
Article 3(1)(b) ■ EMC	Draft ETSI EN 301 489-1 V2.2.0 (2017-03) EN 55032: 2015 EN 55024: 2010+A1: 2015 Draft ETSI EN 301 489-17 V3.2.0 (2017-03)	Yes
Article 3(2) ■ Radio	Draft ETSI EN 300 328 V2.2.0 (2017-11)	Yes

Note: The attached Annex forms part of this certificate which consists of 2 pages.

ANBOTEK Anbotek CERTIFICATION

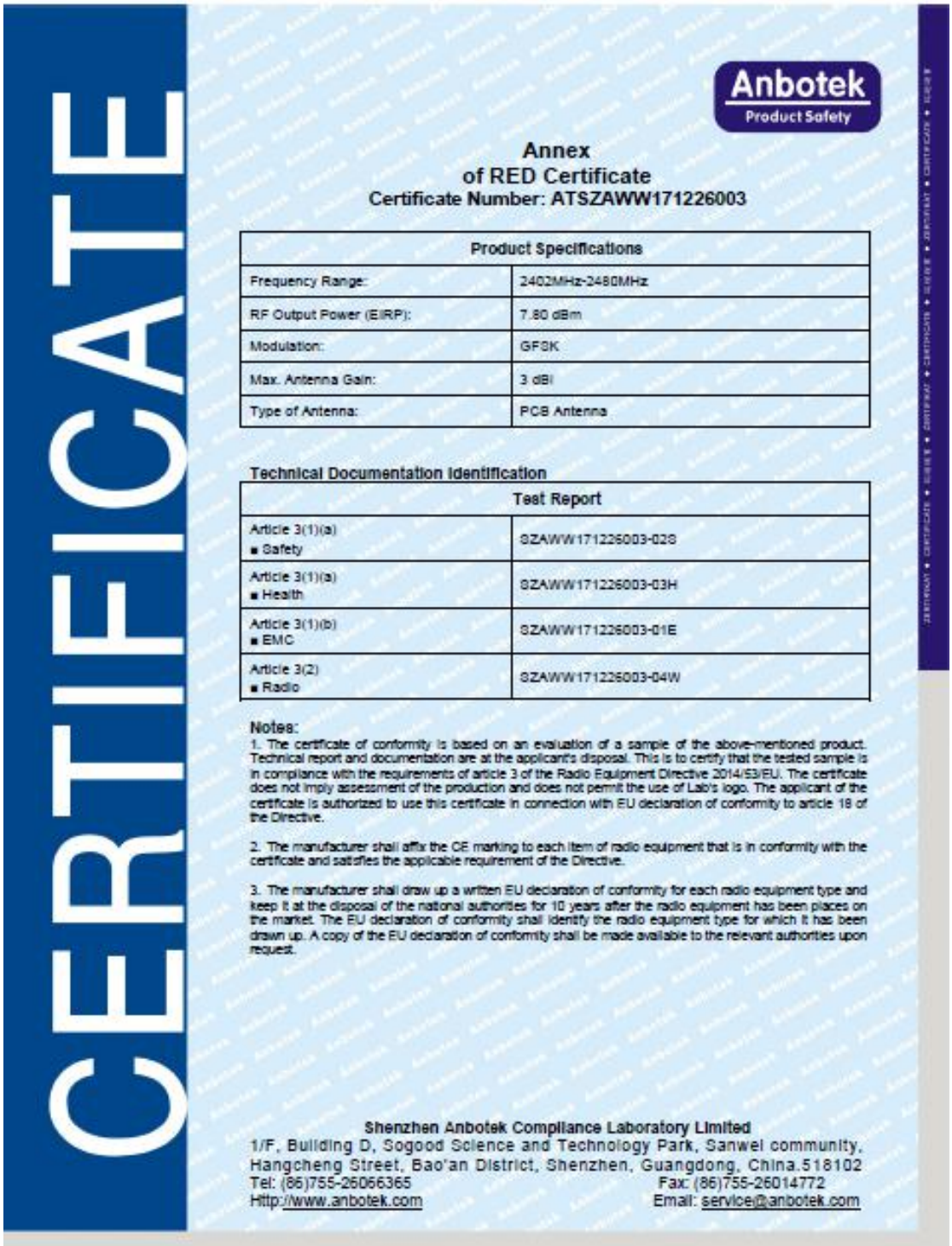
Certified by
Tom Chen
Manager

Jan. 05, 2018
Date

CE The CE Marking may only be used if all relevant and effective EU Directives are complied with CE

Shenzhen Anbotek Compliance Laboratory Limited
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102
Tel: (86)755-26066365 Fax: (86)755-26014772
Http://www.anbotek.com Email: service@anbotek.com

Figure 10. CE Certificated（1）



CERTIFICATE

Anbotek
Product Safety

Annex
of RED Certificate
Certificate Number: ATSZAWW171226003

Product Specifications	
Frequency Range:	2402MHz-2480MHz
RF Output Power (EIRP):	7.80 dBm
Modulation:	GFSK
Max. Antenna Gain:	3 dBi
Type of Antenna:	PCB Antenna

Technical Documentation Identification

Test Report	
Article 3(1)(a) ■ Safety	SZAWW171226003-02S
Article 3(1)(a) ■ Health	SZAWW171226003-03H
Article 3(1)(b) ■ EMC	SZAWW171226003-01E
Article 3(2) ■ Radio	SZAWW171226003-04W

Notes:

1. The certificate of conformity is based on an evaluation of a sample of the above-mentioned product. Technical report and documentation are at the applicant's disposal. This is to certify that the tested sample is in compliance with the requirements of article 3 of the Radio Equipment Directive 2014/53/EU. The certificate does not imply assessment of the production and does not permit the use of Lab's logo. The applicant of the certificate is authorized to use this certificate in connection with EU declaration of conformity to article 18 of the Directive.

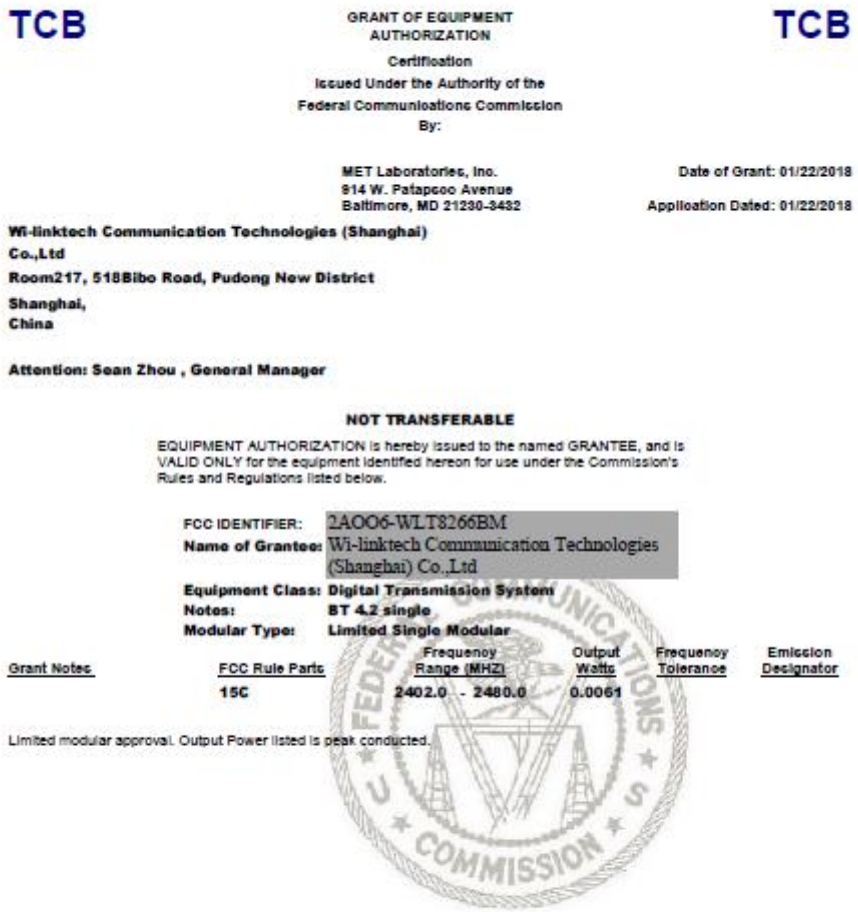
2. The manufacturer shall affix the CE marking to each item of radio equipment that is in conformity with the certificate and satisfies the applicable requirement of the Directive.

3. The manufacturer shall draw up a written EU declaration of conformity for each radio equipment type and keep it at the disposal of the national authorities for 10 years after the radio equipment has been places on the market. The EU declaration of conformity shall identify the radio equipment type for which it has been drawn up. A copy of the EU declaration of conformity shall be made available to the relevant authorities upon request.

Shenzhen Anbotek Compliance Laboratory Limited
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102
Tel: (86)755-26066365 Fax: (86)755-26014772
Http://www.anbotek.com Email: service@anbotek.com

Figure 11. CE Certificated（2）

FCC Certificated:



TCB

GRANT OF EQUIPMENT AUTHORIZATION

Certification

Issued Under the Authority of the Federal Communications Commission By:

TCB

MET Laboratories, Inc.
914 W. Patapsco Avenue
Baltimore, MD 21230-3432

Date of Grant: 01/22/2018

Application Dated: 01/22/2018

Wi-linktech Communication Technologies (Shanghai) Co.,Ltd
Room217, 518Bibo Road, Pudong New District
Shanghai,
China

Attention: Sean Zhou , General Manager

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is VALID ONLY for the equipment identified hereon for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: 2AOO6-WLT8266BM
Name of Grantee: Wi-linktech Communication Technologies (Shanghai) Co.,Ltd
Equipment Class: Digital Transmission System
Notes: BT 4.2 single
Modular Type: Limited Single Modular

Grant Notes	FCC Rule Parts	Frequency Range (MHZ)	Output Watts	Frequency Tolerance	Emission Designator
	15C	2402.0 - 2480.0	0.0061		

Limited modular approval. Output Power listed is peak conducted.

Figure 12. FCC Certificated

BQB Bluetooth 5.0 Certificated：

Bluetooth

Project Details

< td>

Project Name	WLT82XX moudle
Product Type	End Product
TCRL Version:	TCRL 2018-1
Referenced Qualified Design(s)	
Previously Qualified Design Used in this Qualification(s)	113548
Listing Date	2018-08-16
Declaration ID	D040342

Product Listing(s)

Name	Website	Category	Publish Date	Model Number	Description
WLT82XX moudle	http://www.wi-linktech.com/	Unique Products	8/16/2018 12:00:00 AM	WLT8266BM	BT 5.0 single

Member Company	Wi-linktech communication technologies (Shanghai) Co., Ltd.

Declaring Member Contact / Listing Contact Person

Name	zhou sean
Address	Room207,No.518 Bibo Road,
City	Shanghai
State	Shanghai
Country	China
Postal Code	201203

Complete the Project and Submit Product(s) for Qualification

By typing my name or other symbol of my signature into the "Signature" field below, I agree on behalf of Wi-linktech communication technologies (Shanghai) Co., Ltd. ("Company") to Bluetooth Launch Studio Terms of Use, and I make the following representations and warranties personally and on behalf of Company. The following representations and warranties, together with all project information and the Bluetooth Launch Studio Terms of Use, are the Supplier Declaration of Conformity and Declaration of Compliance described in the Program Reference Document (PRD) and Declaration Process Document (DPD).

- ☑ I am authorized by Company to submit all of the information included in this project and all information is complete and accurate.
- ☑ Company does not, by its governing documents or other applicable law, require more than one signatory, a stamp or seal, or a witnessed signature to be legally bound.
- ☑ I agree on behalf of Company to contract in English and electronically, and adopt the characters and symbols input in the signature field below as my signature, with the same effect as an ink signature.
- ☑ The products included in this project are owned and distributed by Company under a Product name that identifies Company as the source of the Product. Company has the right to use and reference all Qualified Designs referenced in the project, and the products and referenced Qualified Designs comply with the version of the Bluetooth Specification identified in the project submission.
- ☑ The product(s) included in this project and the corresponding Qualified Designs comply with the Bluetooth Launch Studio Terms of Use.

If any of the foregoing is not correct or you do not agree, you must exit this form without signing.

Figure 13.BQB 5.0 Certificated