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TELETRON WL3MR1501 WiFi BLE Module

TELETRON WL3MR1501 WiFi BLE Module Instruction Manual

Contents

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Specifications

- **Product:** WL3MR1501 Dual-band Module with Bluetooth Low Energy (V5.0)
- **Chipset:** Realtek RTL8721DM
- **Wireless Standards:** IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, IEEE 802.11n
- **Frequency Bands:** 2.4~2.5GHz and 5.15GHz ~ 5.85GHz

Features and Function Block Diagram
Block diagram details the functional components and their interconnections within the module.

Product Usage Instructions

- **Step 1: Module Installation**
    - Ensure the host device is powered off before inserting the module into the designated slot.
- **Step 2: Driver Installation**
    - Install the necessary drivers for the module to function correctly on your operating system.
- **Step 3: Module Configuration**
    - Access the configuration settings on your device to connect to the desired wireless network.
- **Step 4: Bluetooth Pairing**
    - If using Bluetooth functionality, follow the pairing instructions in your device's settings to establish a connection.

General Description

This document is to specify the product requirements for 802.11a/b/g/n Dual-band module and Bluetooth Low Energy (V5.0). The WL3MR1501 module based on Realtek RTL8721DM chipset that complied with IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11a standard from 2.4~2.5GHz and 5.15GHz ~ 5.85GHz

Features and Function

Features and Function Block Diagram

- Compatible with IEEE 802.11a standard to provide wireless 54Mbps data rate
- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate
- Compatible with IEEE 802.11n standard to provide wireless 150Mbps data rate
- Support 20MHz, bandwidth in 2.4GHz band
- Support 20MHz, bandwidth in 5GHz band
- Greenfield, mixed mode, and legacy modes support
- Security support for WFA WPA/WPA2 personal, WPS2.0, WAPI
- Bluetooth LE 5.0
- CART
- RoHS compliant
  - **Size: 2**6 mm x 16 mm / H max: 3.4 mm
  - **Interface:** UART Interface
  - **Supply voltage:** 3.3V

General Requirements

IEEE 802.11b Section

	Feature	Detailed Description
3.2.1.1	Standard	● IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	● DQPSK , DBPSK and CCK with DSSS
3.2.1.3	Operating Frequency	● 2400 2483.5MHz ISM band
3.2.1.4	Channel Numbers	● 13 channels for Worldwide
3.2.1.5	Data Rate	● at most 11Mbps
3.2.1.6	Media Access Protocol	● CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	● Typical RF Output Power at each RF chain, and at room Temp. 25℃ ● 17±2 dBm at 11Mbps
3.2.1.8	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate<8% at room Temp 25℃ ● -83 dBm for 11Mbps

IEEE 802.11g Section

	Feature	Detailed Description
3.2.2.1	Standard	● IEEE 802.11g
3.2.2.2	Radio and Modulation Type	● QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.2.3	Operating Frequency	● 2400 2483.5MHz ISM band
3.2.2.4	Channel Numbers	● 13 channels for Worldwide
3.2.2.5	Data Rate	● at most 54Mbps
3.2.2.6	Media Access Protocol	● CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	● Typical RF Output Power at each RF chain, at room Temp. 25°C ● 15±2 dBm at 54Mbps
3.2.2.8	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate<10% at room Temp 25°C ● -71 dBm for 54Mbps

IEEE 802.11a Section

	Feature	Detailed Description
3.2.3.1	Standard	● IEEE 802.11a
3.2.3.2	Radio and Modulation Type	● QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	● 5.15~5.25GHz ● 5.25~5.35GHz ● 5.47~5.725GHz ● 5.725~5.825GHz
3.2.3.4	Data Rate	● at most 54Mbps
3.2.3.5	Media Access Protocol	● CSMA/CA with ACK
3.2.3.6	Transmitter Output Power at Antenna Connector	● Typical RF Output Power at each RF chain, at room Temp. 25℃ ● 15±2 dBm at 54Mbps
3.2.3.7	Receiver Sensitivity at Antenna Connector	● Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate<10% at room Temp 25℃ ● -71 dBm for 54Mbps

IEEE 802.11n Section

	Feature	Detailed Description
3.2.4.1	Standard	● IEEE 802.11n
3.2.4.2	Radio and Modulation Type	● BPSK , QPSK , 16QAM ,64QAM with OFDM
3.2.4.3	Operating Frequency	● 2.4GHz :2400 ~ 2483.5MHz ISM band ● 5GHz : 5.15~5.25GHz 5.25~5.35GHz 5.47~5.725GHz 5.725~5.825GHz
3.2.4.4	Data Rate	● at most 150 Mbps
3.2.4.5	Media Access Protocol	● CSMA/CA with ACK
3.2.4.6	Transmitter Output Power at Antenna Connector	● Typical RF Output Power at each RF chain, at roomTemp 25℃
		2.4GHz Band/HT20 ● 15±2 dBm at MCS7	
		5GHz Band/HT20 ● 14±2 dBm at MCS7	
3.2.4.7	Receiver Sensitivity	● Typical Sensitivity at each RF chain. @Frame (1000-byte PDUs) Error Rate=10% and at room Temp 25℃

	at Antenna Connector	2.4GHz Band/HT20 ● -68dBm at MCS7	
		5GHz Band/HT20 ● -68dBm at MCS7	

Bluetooth Section

	Feature	Detailed Description		
3.2.5.1	Bluetooth standard	● Bluetooth V5.0		
3.2.5.2	Modulation	● GFSK		
3.2.5.3	Operating Frequency	● 2402MHz-2480MHz		
3.2.5.4	Channel Numbers	● 40 channels for BLE		
3.2.5.5	Symbol Rate	● 1Mbps,2Mbps		
		Min dBm	Typical dBm	Max dBm
3.2.5.6	BLE Output Power		4	
3.2.5.7	Sensitive @PER=30.8% FOR BLE		-90	

Electronic Characteristic

Parameter	Minimum	Maximum	Units
Storage Temperature	-55	+125	°C
Ambient Operating Temperature	-20	85	°C

|	Feature	Detailed Description
4.2.1	Antenna Type	● Printed Antenna
4.2.2	Operating Voltage	● 3.3V±10%
4.2.3	Current Consumption	● 500mA@TX ● 300mA@RX
4.2.4	Form Factor and Interface	● UART
4.2.5	Connector	● PAD

Equipment for Application

Equipment for Application and Factory Information

Equipment for Application	Company Name	TELETRON INC.	Basic Model Name	WL3MR1501
	Product Name	WiFi BLE Module	Country of origin	CHINA
	Manufacturer	HUIZHOU GAOSHENGDA TECHNOLOGY CO.,LTD	Date	24.04

Factory	■ ■ Company Name	Huizhou Gaoshengda Technology Co., Ltd.	■■■■■ Personnel in Charge	Wei Xiaozhong
		No.2,Jin-da Road,Huinan High-tech Industrial Park,Hui-ao Avenue,Huizhou City,Guangdong, 516025		
	Address	China		
	TEL/Mobile	+86 7522096618 / +86 13825495795	E-mail	**weixz@gaosd.com**

Design Guide

For Antenna radiation, place the ANT area of the module on the outside of the PCB or apply a Copper Keepout Area as shown.
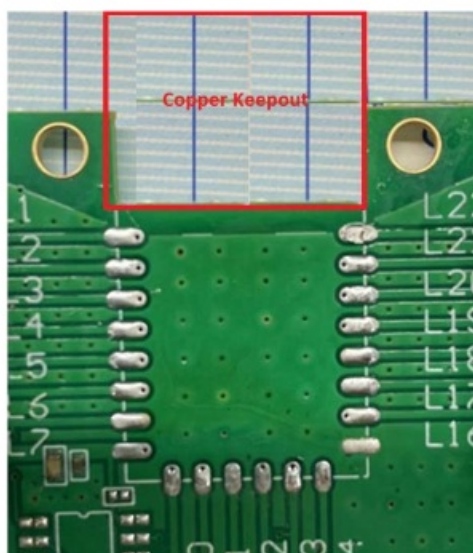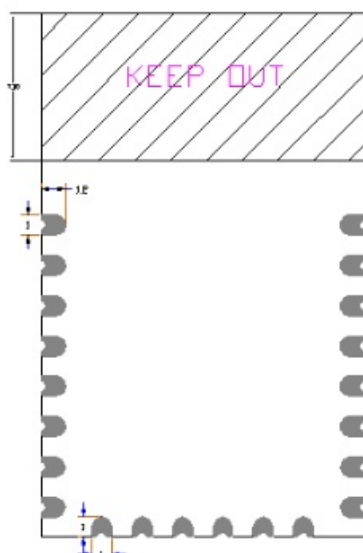
FCC

FCC Information to User

This equipment has been tested and found to comply with the limits for a Class B digital device, under Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a

residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used by the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment to 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.

Caution THE GRANTEE IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE E USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

IMPORTANT NOTE: FCC RF Radiation Exposure Statement This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be colocated or operating in conjunction with any other antenna or transmitter.

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. Tthis device must accept any interference received, including interference that may cause undesired operation of the device.
   A label must be affixed to the outside of the host product with the following statements:

- **Product Name:** WiFi BLE Module
- **Contains FCC ID:** 2BFHG-WL3MR1501

OEM/integrators Installation Manual

The modules are limited to OEM installation only the OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install the module. the OEM integrator is still responsible for testing their end product for any additional compliance requirements required with this module installed.

Instructions to the OEM/integrator
The OEM integrator must include the instructions or statements required by parts 15.19 and 15.21 in the user manual. the OEM integrator must include a separate section in the host user's manual concerning the operating conditions to satisfy RF exposure compliance. there is a requirement that the grantee guide the host manufacturer for compliance with part 15B requirements.

This device is intended only for OEM integrators under the following conditions:

1. This equipment should be installed and operated with a minimum distance of 30 centimeters between the radiator and your body.
2. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

As long as the 2 conditions above are met, further transmitter tests will not be required. However, the OEM integrator is still responsible for testing their end product for any additional compliance requirements with this device installed. This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC certification if they meet the following conditions. Otherwise, additional FCC approvals must be obtained. The host product with the module installed must be evaluated for simultaneous. transmission requirements.

- The user's manual for the host product must indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC RF exposure guidelines.
- To comply with FCC regulations limiting both maximum RF output power and human exposure to RF radiation, use this module only with the included onboard antenna.
- The final host/module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators to be properly authorized for operation as a Part 15 digital device.
- These modules are designed to comply with the FCC single modular FCC grant.

End Product Labeling
To satisfy FCC exterior labeling requirements, the following text must be placed on the exterior of the end product. Contains Transmitter module FCC ID:2BFHG-WL3MR1501.

Manual Information to the End User
The OEM integrator is responsible for ensuring the end user has no manual instruction to remove or install the module. The end user manual shall include all required regulatory information/warnings as shown in this manual.

Frequently Asked Questions

- **Q: What are the supported wireless standards for the WL3MR1501 module?**
    - **A:** The module supports IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, and IEEE 802.11n standards.
- **Q: How many channels are available for use in the IEEE 802.11b standard?**
    - **A:** There are 13 channels available for worldwide use in the IEEE 802.11b standard.

Documents / Resources

TELETRON WL3MR1501 WiFi BLE Module [pdf] Instruction Manual
WL3MR1501 WiFi BLE Module, WL3MR1501, WiFi BLE Module, BLE Module, Module

References

- **User Manual**