

# MR500-UV-BT 产品规格书

## Product Specification

TLSR8258 2.4GHz 无线模块

## 第一章 概述 summary

### 1.1 产品简介 Product Introduction

MR500-UV-BT 是正浩创新科技基于 TELINK TLSR8258 无线 SOC 设计生产的一款小体积、低功耗、高可靠性、工作在 2.4GHz 频段的蓝牙 模块, 芯片自带高达 48Mhz 的 32 位高性能 MCU, 发射功率最高可达到 12dBm, 其最低周期休眠电流 2uA。

The MR500-UV-BT is a small size, low power consumption, high reliability Bluetooth module designed and produced by EcoFlow Inc. based on TELINK TLSR8258 wireless SOC, operating in the 2.4GHz frequency band. The chip comes with a 32-bit high-performance MCU with a maximum transmission power of 12dBm and a minimum sleep current of 2uA.

### 1.2 功能特点

- 大容量：512K 容量的 flash, 64K 容量的 RAM, 网络节点可以扩展到 100 以上；
- Large capacity: 512K capacity flash, 64K capacity RAM, network nodes can scale to over 100
- 角色切换：用户可通过串口指令让设备在终端和休眠终端的两种类型中任意切换；Role switching: Users can use serial port commands to allow devices to switch between terminal and sleep terminal types at will
- 支持多种网络拓扑：点对点, 星型网, MESH 网；
- Support multiple network topologies: peer-to-peer, star network, MESH network;
- 网络自愈：网络中间节点丢失, 其他网络自动加入或保持原网络；
- Network self-healing: If an intermediate node in the network is lost, other networks will automatically join or maintain the original network
- 串口配置：模块内置串口指令, 用户可通过出串口指令配置（查看）模块的参数及功能。
- Serial Port Configuration: The module has built-in serial port instructions, and users can configure (view) the parameters and functions of the module through the serial port instructions.
- 一键恢复波特率：如果用户忘记或不知波特率的情况下, 可使用该功能, 恢复默认波特率为 115200。
- One click recovery of baud rate: If the user forgets or does not know the baud rate, this function can be

used to restore the default baud rate to 115200

- 串口接收唤醒：支持串口接收唤醒功能，当模块处于休眠状态下当接收到一帧小于等于 10 个字节的数  
据时将被唤醒，此数据为唤醒帧用于唤醒模块将不会被当做数据处理。
- Serial port wake-up reception: supports the serial port wake-up reception function. When the module is  
in a sleep state and receives a frame of data less than or equal to 10 bytes, it will be awakened. This data  
is a wake-up frame used to wake up the module and will not be processed as data.
- 模块复位：用户可通过串口命令对模块进行复位操作。
- Module reset: Users can reset the module through serial commands
- 恢复出厂设置：用户可通过串口命令对模块进行出厂设置的恢复
- Restore factory settings: Users can restore the factory settings of the module through serial commands
- 空中配置：用户可使用空中配置指令远程配置网络中的其他设备
- Over the air configuration: Users can remotely configure other devices in the network using over the air  
configuration commands

## 第二章 规格参数 Specification parameters

### 2.1 极限参数 Limit parameters

主要参数 main parameter	性能 function		备注
	最小值	最大值	
电源电压 (V) supply voltage	1.9	3.6	Permanently burned out module exceeding 3.6V
工作温度 (C°) working temperature	-40	+85	Industrial grade

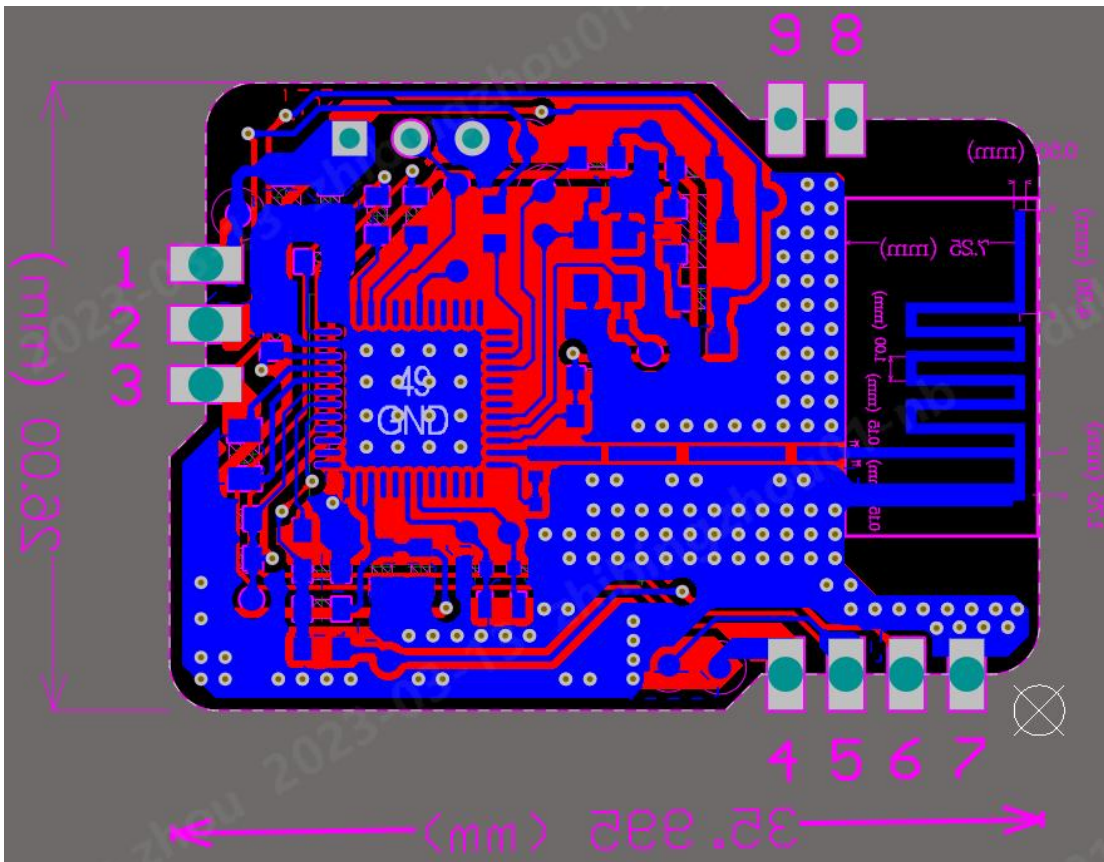
### 2.2 工作参数 Working parameters

main parameter	function			Note
	min	nom	max	
Working voltage (V)	1.9	3.3	3.6	≥ 3.3V Guaranteed output power
Communication level (V)		3.3		There is a risk of burning out when using 5V TTL
Working temperature (C°)	-40	-	+85	Industrial grade design
Operating frequency (MHz)	2405	-	2480	Support for ISM frequency band
Air Speed (bps)		250K		
main parameter	Description		remarks	

Reference distance	30m	
Packaging method	SMD type	
Interface method	2.5mm	Stamp hole
Full name of IC	TLSR8258F512ET48	
FLASH	512KB	
RAM	64KB	
kernel	32 位 MCU	
Overall dimensions	36*26mm	
Antenna interface	PCB	Equivalent impedance 50 Ω

### 第三章 机械尺寸与引脚定义 Mechanical

#### dimensions and pin definitions



Pin number	Pin name	Pin direction	Pin purpose
1	3.3V	input	Module power supply
2	nWakeupFromBT	input	Reserved, directly

			suspended
3	nLedFromBT	output	Reserved, directly suspended
4	TX	output	Serial port sending end TX
5	RX	input	Serial port receiver RX
6	BT_Matching	input	Reserved, directly suspended
7	GND	-	Ground wire, connected to the power reference ground
8	NC	-	Reserved, directly suspended
9	NC	-	Reserved, directly suspended

## FCC STATEMENT

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, and

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

Warning: 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 uses and can radiate radio frequency energy and, if not installed

and used in accordance with 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 or more of the 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 equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The device can be used in portable exposure condition without restriction.

## **Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01**

### **2.2 List of applicable FCC rules**

FCC Part 15 Subpart C 15.247 & 15.207 & 15.209

### **2.3 Specific operational use conditions**

Operation Frequency:2402~2480MHz

Number of Channel:40 Channels

Modulation Type:GFSK

Antenna Type:PCB antenna

Antenna Gain(Peak):3.32 dBi (Provided by customer)

The module can be used for mobile or portable applications with a **maximum 3.32dBi antenna**. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

### **2.4 Limited module procedures**

The **EF-SR8258 module** is "limited module", which is used with the installation requirement as described as above. Any other alternative method on using **EF-SR8258 module** should get approval with reviews of detailed test data or host designs, especially RF exposure evaluation part..

## 2.5 Trace antenna designs

Not applicable. The module has its own antenna, and doesn't need a host's printed board microstrip trace antenna etc.



## 2.6 RF exposure considerations

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. The device can be used in portable exposure condition without restriction.

And if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

## 2.7 Antennas

Antenna Specification are as follows:

Antenna Type:PCB antenna

Antenna Gain(Peak):3.32 dBi (Provided by customer)

This device is intended only for host manufacturers under the following conditions:

The transmitter module may not be co-located with any other transmitter or antenna;

The module shall be only used with the External antenna(s) that has been originally tested and certified with this module. The antenna must be either permanently attached or employ a 'unique' antenna coupler.

As long as the conditions above are met, further transmitter test will not be required. However, the host manufacturer is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

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## 2.8 Label and compliance information

Host product manufacturers need to provide a physical or e-label stating "Contains **FCC ID 2A2P9-EFSR8258** With their finished product.

## 2.9 Information on test modes and additional testing requirements

Operation Frequency:2402~2480MHz

Number of Channel:40 Channels

Modulation Type:GFSK

Antenna Type:PCB antenna

Antenna Gain(Peak):3.32 dBi (Provided by customer)

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.

Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

## 2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is **only** FCC authorized for FCC Part 15 Subpart C 15.247 & 15.207 & 15.209 and that the host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification. If the grantee markets their product as being Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuitry), then the grantee shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

Compliance of this device in all final host configurations is the responsibility of the Grantee. OEM integrators and end-users must be provided with specific operating instructions for satisfying RF exposure compliance. OEM integrators are instructed to ensure that the end user has no manual instructions to remove or install the device.