WIFI+2.4G

User Manual

Model:52201

FCC Warning
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 inte rference received, including interference that may cause undesired operation.

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 interferenceto 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.

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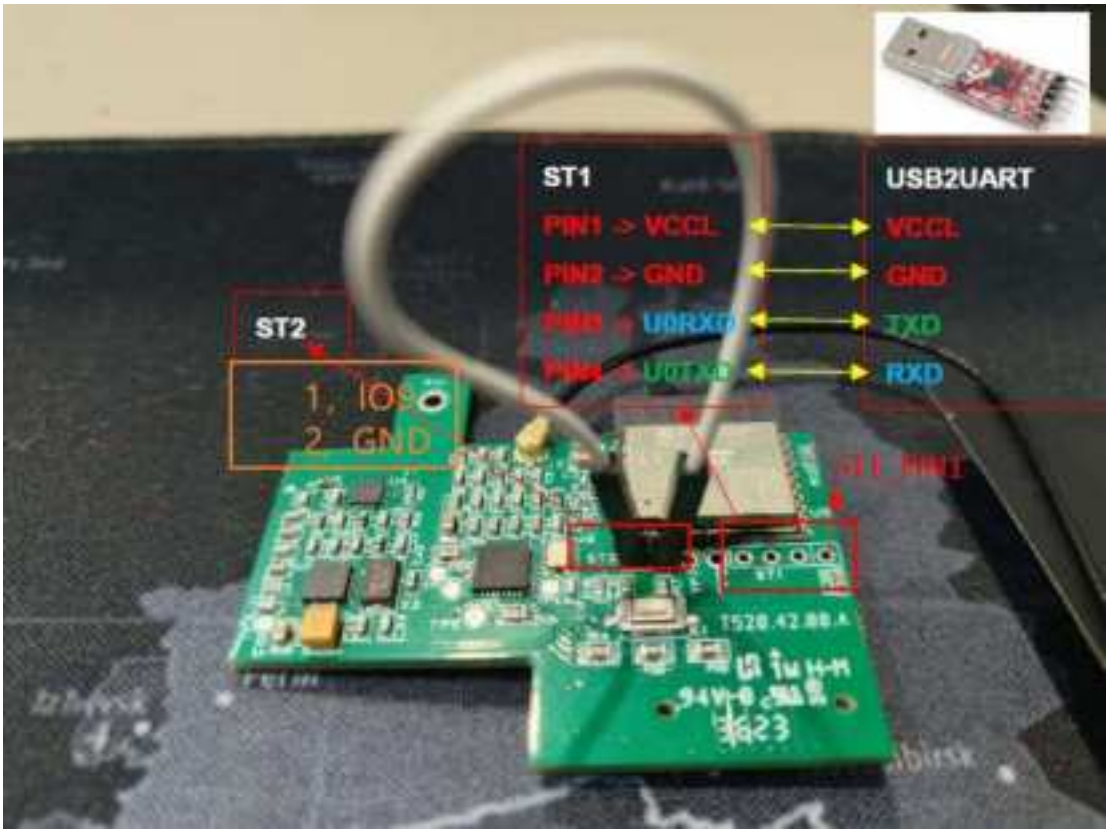

1）CC2500 supports 2.4G OOK launch technology "2450 Mhz Single band"

2）Working base on the 2.4GWIFI Chip ESP32-C3(Xtal:40Mhz);frequency Range：2412MHz~2462MHz;Supports 20 MHz, 40 MHz bandwidth in 2.4GHz band

3）Module CC2500 and module ESP32-C3 supply 3.3V through the test board

4)To ensure that the power supply to the ESP32-C3 chip is stable during power-up, it is advised to add an RC delay circuit at the EN pin. The recommended setting for the RC delay circuit is usually R = 10 kΩ and C = 1 μF. However, specific parameters should be adjusted based on the power-up timing of the module and the power-up and reset sequence timing of the chip.

5)The LED PWM controller can generate independent digital waveform on six channels. The LED PWM controller:

· Can generate digital waveform with configurable periods and duty cycle. The resolution of duty cycle can be up to 14 bits.

· Has multiple clock sources, including APB clock and external main crystal clock.

· Can operate when the CPU is in Light-sleep mode.

· Supports gradual increase or decrease of duty cycle, which is useful for the LED RGB color-gradient generator.

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6) 400 nA SLEEP mode current consumption,Fast startup time: 240 us from SLEEP to RX or TX mode
(measured on EM design)Wake-on-radio functionality for automatic low-power RX polling
Separate 64-byte RX and TX data FIFOs (enables burst mode data transmission)

7)The CC2500 is a low-cost 2.4 GHz transceiver designed for very low-power wireless appli-cations. The circuit is intended for the 2400-2483.5 MHz ISM (Industrial, Scientific and Medical) and SRD (Short Range Device) frequency band.
The RF transceiver is integrated with a highly configurable baseband modem. The modem supports various modulation formats and has a configurable data rate up to 500 kBaud.
CC2500 provides extensive hardware support for packet handling, data buffering, burst transmissions, clear channel assessment, link quality indication, and wake-on-radio.
The main operating parameters and the 64-byte transmit/receive FIFOs of CC2500 can be controlled via an SPI interface. In a typical system, the CC2500 will be used together with a microcontroller and a few additional passive components.

8) Support for asynchronous and synchronous serial receive/transmit mode for backwards compatibility with existing radio communication protocols

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules
CFR 47 FCC Part 15 Subpart C has been investigated. It is applicable to the modular transmitter

2.3 Specific Operational Use Conditions - Antenna Placement Within the Host Platform

The module is tested for standalone mobile RF exposure use condition.

- The antenna must be installed such that 20cm is maintained between the antenna and users,
- The transmitter module may not be co-located with any other transmitter or antenna. In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

2.4 Limited Module Procedures
Not applicable

2.5 Trace Antenna Designs
Not applicable

2.6 RF Exposure Considerations
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

2.7 Antenna Type and Gain
The module only used PCB antenna and maximum antenna gain is 3.0dBi for 2.4GWIFI;.FPC Antenna and maximum antenna gain is 3.0dBi for 2.4g short distance.
Only antennas of the same type with equal or lower gain may also be used with this module. Other types of antennas and/or higher gain antennas may require the additional authorization for operation.

2.8 End Product Labelling Compliance Information
When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily removed. If not, a second label must be placed on the outside of the final device that contains the following text: “Contains FCC ID: 2AK5Y-52201”. The FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on Test Modes and Additional Testing Requirements
This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) class II permissive change re-evaluation or new FCC authorization.
Host manufacturer installed this modular with single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15C, 15.209, 15.207 requirement, only if the test result comply with FCC part 15C, 15.209, 15.207 requirement, then the host can be sold legally.

2.10 Additional testing, Part 15 Subpart B Disclaimer
This transmitter modular us tested as a subsystem and its certification does not cover the FCC Part 15 Subpart B rules requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rules requirements if applicable.
As long as all conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this modular installed.

2.11 Manual Information to The End User
The OEM integrator 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 host integrator must follow the integration instructions provided in this document and ensure that the composite system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.
The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB Publication 996369.

OEM/Host Manufacturer Responsibilities
OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be reassessed against all the essential requirements of the FCC rule such as FCC Part 15 Subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and RF Exposure essential requirements of the FCC rules.

2.12 How to Make Changes - Important Note
In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.