Cdtech CDW-C45502S-01 Wi-Fi Module Owner's Manual

Contents

Cdtech CDW-C45502S-01 Wi-Fi Module

Specifications

- **Model:** CDW-C45502S-01
- **Product Name:** WiFi Module
- **Major Chipset:** ASR550X
- **Standard:** IEEE 802.11 b/g/n
- **Operating Temperature:** Standard Operating Temperature

Product Information

Overview

- CDW-C45502S-01 is a highly integrated, high-performance and low-cost 1×1 IEEE 802.11 b/g/n System-on-Chip (SoC) for the Internet of Things (IoT).
- It integrates an RF transceiver, 802.11 PHY+MAC, ARM Cortex-M4F, advanced peripheral interfaces, Real Time Counter (RTC), and power management circuits.

Product Usage Instructions

Features

- Support 802.11 b/g/n compatible WLAN
- Support 802.11e QoS enhancement (WMM)
- Support 802.11i (WPA/WPA2 PSK), Open/WEP/TKIP/CCMP
- Integrated Power Amplifier (PA) with internal power detector and closed loop power calibration
- Support eXecute-in-Place (XiP) on flash and external SPI flash
- Support OTA

Pin Description

PIN Name	Type	Description

Packaging Detail

- Vacuum AL BAG ANTI-STATIC
- Color of plastic disc: blue

FAQ

Q: How do I update the firmware on the CDW-C45502S-01 WiFi Module?

A: To update the firmware, follow these steps: 1. Step 1 2. Step 2 3. Step 3 …

Overview

CDW-C45502S-01 is a highly integrated, high-performance and low-cost 1×1 IEEE 802.11 b/g/n System-on-Chip (SoC) for the Internet of Things (IoT). ASR550X integrates an RF transceiver, 802.11 PHY+MAC, ARM Cortex-M4F, advanced peripheral interfaces, Real Time Counter (RTC), and power management circuits. The integrated RF and analog circuit incorporate a T/R switch, RF balun, power amplifier, low-noise amplifier, and entire power management modules.

Features

- Support 802.11 b/g/n compatible WLAN
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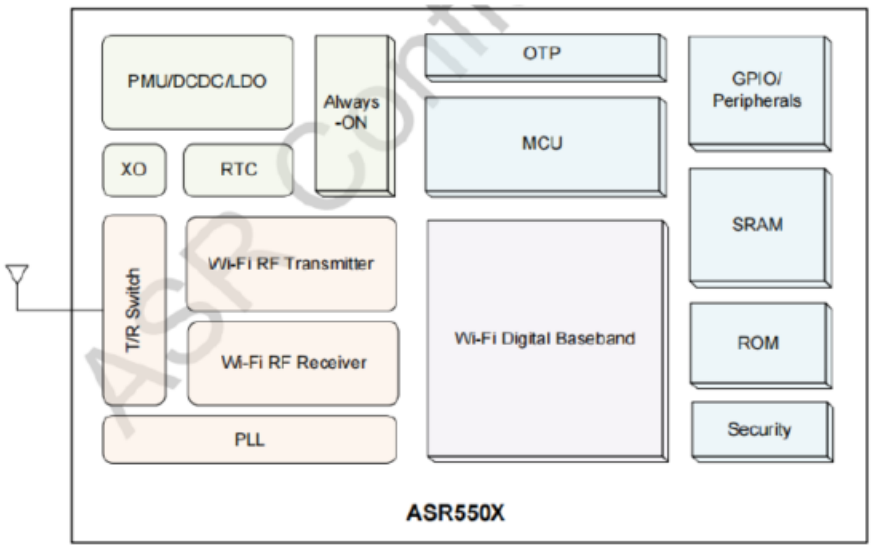
Block Diagram



General Specification

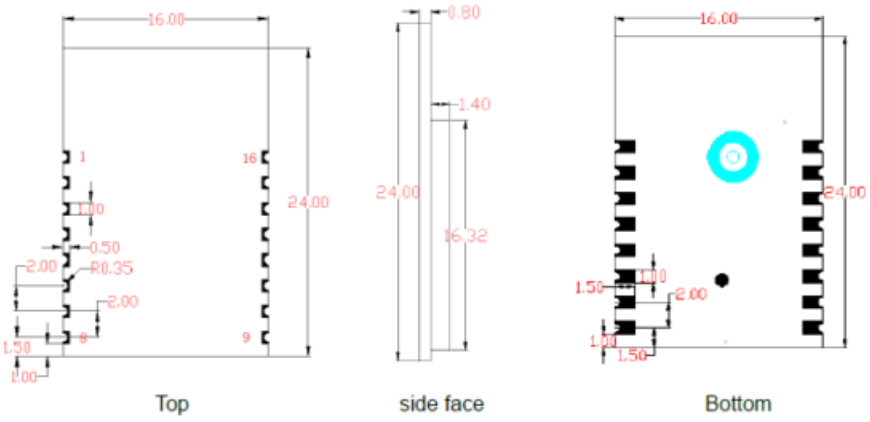
Model	CDW-C45502S-01
Product Name	WiFi Module
Major Chipset	ASR5502S
Standard	802.11b/g/n
Operating	-20~ +70°C ambient temperature
Storage Temperature	-40 ~ 80°C ambient temperature
Dimension	18x15x1.6 (LxWxH) ±0.2mm

RF Specification

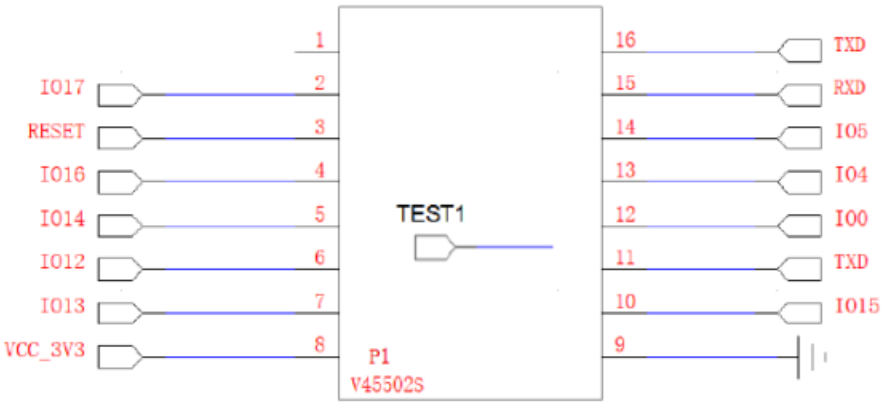
Wifi	**Description**
WLAN Standard	IEEE 802.11b/g/n WiFi compliant
Frequency Range	2.4 2.4835 GHz ISM Band
Number of Channels	2.4GHz Ch1 ~ Ch11
Output Power	802.11b /11Mbps : 17dBm ± 2 dB @ EVM ≤ -15dB
	802.11g /54Mbps : 15dBm ± 2 dB @ EVM ≤ -28dB
	802.11n /MCS7: 14dBm ± 2 dB @ EVM ≤ -30dB
Receive Sensitivity (11b,11MHz)	– 11Mbps PER @ -89dBm, typical
Receive Sensitivity (11g,54Mbps)	– 54Mbps PER @ -76dBm, typical
Receive Sensitivity (11n,20MHz)	– MCS 7 PER @ -73dBm, typical

Physical Dimensions

Note: ± 0.1mm. (Unit: mm)

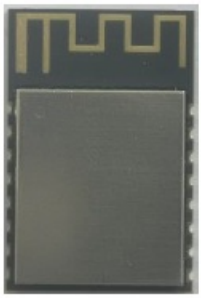


Pin Description



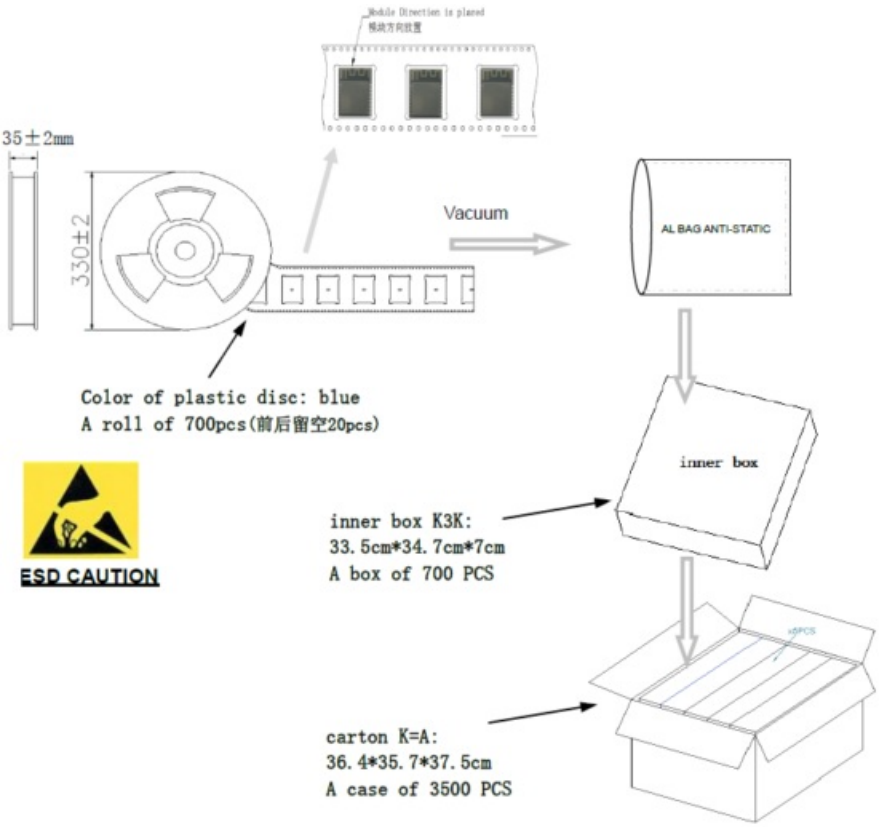
NO.	PIN Name	Type	Description
1	NC	—	No, connect, keep floating
2	IO17	—	GPIO,(No connect, keep floating)
3	RESET	I/O	Enable the foot
4	IO16	—	GPIO,(No connect, keep floating)
5	IO14	—	GPIO,(No connect, keep floating)
6	IO12	—	GPIO,(No connect, keep floating)
7	IO13	—	GPIO,(No connect, keep floating)
8	VCC_3V3	P	3.3V INPUT
9	GND	—	Ground connections
10	IO15	—	GPIO,(No connect, keep floating)
11	TXD	I/O	(for printing the module's internal information)
12	IO0	—	GPIO,(No connect, keep floating)
13	IO4	—	GPIO,(No connect, keep floating)
14	IO5	—	GPIO,(No connect, keep floating)
15	RDX	I/O	UART 1 _ RXD (User Serial Port)
16	TXD	I/O	UART 1 _ TXD (User Serial Port)
17	TEST1	I/O	Boot with UART Need to pull up

Physical photo



Description: PCB's different suppliers

Packaging Detail



FCC Warning Statement

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. 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 under 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 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.

FCC Radiation Exposure Statement

The antennas used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located for 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. This device must accept any interference received, including interference that may cause undesired operation.

Radiation Exposure Statement:

- This equipment complies with FCC 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.
- The availability of some specific channels and/or operational frequency bands are country-dependent and are firmware programmed at the factory to match the intended destination.
- The firmware setting is not accessible by the end user.

The final end product must be labeled in a visible area with the following:

Contains Transmitter Module FCC ID: 2BFLD-CDWC45502S01

Requirement per KDB996369 D03

List of applicable FCC rules

- List the FCC rules that are applicable to the modular transmitter. These are the rules that specifically establish the bands of operation, the power, spurious emissions, and operating fundamental frequencies. DO NOT list compliance to unintentional-radiator rules (Part 15 Subpart B) since that is not a condition of a module grant that is extended to a host manufacturer. See also Section 2.10 below concerning the need to notify host manufacturers that further testing is required.3
- **Explanation:** This module meets the requirements of FCC part 15C(15.247).

Summarize the specific operational use conditions

- Describe use conditions that are applicable to the modular transmitter, including for example any limits on antennas, etc. For example, if point-to-point antennas are used that require reduction in power or compensation for cable loss, then this information must be in the instructions. If the use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual.
- In addition, certain information may also be needed, such as peak gain per frequency band and minimum gain, specifically for master devices in 5 GHz DFS bands.
- **Explanation:** The EUT has PCB antenna, The antenna gain is -0.74dBi.

2.4 Limited module procedures

- If a modular transmitter is approved as a "limited module," then the module manufacturer is responsible for approving the host environment that the limited module is used with.
- The manufacturer of a limited module must describe, both in the filing and in the installation instructions, the alternative means that the limited module manufacturer uses to verify that the host meets the necessary requirements to satisfy the module limiting conditions.
- A limited module manufacturer has the flexibility to define its alternative method to address the conditions that limit the initial approval, such as: shielding, minimum signaling amplitude, buffered modulation/data inputs, or power supply regulation.
- The alternative method could include that the limited module manufacturer reviews detailed test data or host

designs prior to giving the host manufacturer approval.
- This limited module procedure is also applicable for RF exposure evaluation when it is necessary to demonstrate compliance in a specific host.
- The module manufacturer must state how control of the product into which the modular transmitter will be installed will be maintained such that full compliance of the product is always ensured.
- For additional hosts other than the specific host originally granted with a limited module, a Class II permissive change is required on the module grant to register the additional host as a specific host also approved with the module.
- **Explanation:** The module is a single module.

Trace antenna designs

- For a modular transmitter with trace antenna designs, see the guidance in Question 11 of KDB Publication 996369 D02 FAQ – Modules for Micro-Strip Antennas and traces.
- The integration information shall include for the TCB review the integration instructions for the following aspects: layout of trace design, parts list (BOM), antenna, connectors, and isolation requirements.
- **a)** Information that includes permitted variances (e.g., trace boundary limits, thickness, length, width, shape(s), dielectric constant, and impedance as applicable for each type of antenna);
- **b)** Each design shall be considered a different type (e.g., antenna length in multiple(s) of frequency, the wavelength, and antenna shape (traces in phase) can affect antenna gain and must be considered);
- **c)** The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;
- **d)** Appropriate parts by manufacturer and specifications;
- **e)** Test procedures for design verification; and
- **f)** Production test procedures for ensuring compliance.
- The module grantee shall provide a notice that any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, requires that the host product manufacturer must notify the module grantee that they wish to change the antenna trace design. In this case, a Class II permissive change application is required to be filed by the grantee, or the host manufacturer can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.
- **Explanation:** Yes, the module with PCB antenna designs, and this manual has shown the layout of design, antenna, connectors, and isolation requirements.

RF exposure considerations

- It is essential for module grantees to clearly and explicitly state the RF exposure conditions that permit a host product manufacturer to use the module. Two types of instructions are required for RF exposure information: (1) to the host product manufacturer, to define the application conditions (mobile, portable – xx cm from a person's body); and (2) additional text needed for the host product manufacturer to provide to end users in their end-product manuals. If RF exposure statements and use conditions are not provided, then the host product manufacturer is required to take responsibility of the module through a change in FCC ID (new application).
- **Explanation:** This module 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 module is designed to comply with the FCC statement, FCC ID is: 2BFLD-CDWC45502S01.

Antennas

- A list of antennas included in the application for certification must be provided in the instructions. For modular transmitters approved as limited modules, all applicable professional installer instructions must be included as part of the information to the host product manufacturer. The antenna list shall also identify the antenna types (monopole, PIFA, dipole, etc. (note that for example an “omni-directional antenna” is not considered to be a specific “antenna type”)). For situations where the host product manufacturer is responsible for an external connector, for example with an RF pin and antenna trace design, the integration instructions shall inform the installer that unique antenna connector must be used on the Part 15 authorized transmitters used in the host product. The module manufacturers shall provide a list of acceptable unique connectors.
- **Explanation:** The EUT has PCB antenna, the antenna gain is -0.74dBi.

Label and compliance information

- Grantees are responsible for the continued compliance of their modules to the FCC rules. This includes advising host product manufacturers that they need to provide a physical or e-label stating “Contains FCC ID” with their finished product. See Guidelines for Labeling and User Information for RF Devices – KDB Publication 784748.
- **Explanation:** The host system using this module, should have label in a visible area indicated the following texts: “Contains FCC ID: 2BFLD-CDWC45502S01”

Information on test modes and additional testing requirements

- Additional guidance for testing host products is given in KDB Publication 996369 D04 Module Integration Guide. Test modes should take into consideration different operational conditions for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product.
- The grantee should provide information on how to configure test modes for host product evaluation for different operational conditions for a stand-alone modular transmitter in a host, versus with multiple, simultaneously transmitting modules or other transmitters in a host. Grantees can increase the utility of their modular transmitters by providing special means, modes, or instructions that simulates or characterizes a connection by enabling a transmitter. This can greatly simplify a host manufacturer’s determination that a module as installed in a host complies with FCC requirements.
- **Explanation:** Can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

Additional testing, Part 15 Subpart B disclaimer

- The grantee should include a statement that the modular transmitter is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on the grant, 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 circuit), 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.

- **Explanation:** The module without unintentional-radiator digital circuit, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.
- **(86 755) 81449967**
- **E-mail:** Info@cdtech.cn
- http://www.cdtech.cn

Documents / Resources

	Cdtech CDW-C45502S-01 Wi-Fi Module [pdf] Owner's Manual CDW-C45502S-01 Wi-Fi Module, CDW-C45502S-01, Wi-Fi Module, Module

References

- [-]
- [-]
- User Manual