



Cdtech CDI-WX56600A-00 Wi-Fi plus BLE Module Owner's Manual

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Cdtech CDI-WX56600A-00 Wi-Fi plus BLE Module



Product Usage Instructions

1. Overview

CDI.WX56600A-00 is a WIFI+BLE module based on the ECR6600 design...

2. Peculiarity

The CDI-WX56600A-00 module supports IEEE 802.11b/g/n/ax...

3. General Specification

The CDI-WX56600A-00 module uses the ECR6600-A40D chipset...

Frequently Asked Questions (FAQ)

Q: Can WI-FI and BLE work simultaneously?

A: No, WI-FI and BLE can only work one at a time.

Software

Customer	Approve	Date

Design	Check	Approve	Version	Date
			V1.0	2024.11.20

Reversion History

Version	Date	Modification
1.0	2024.11.20	First release

Overview

- CDI.WX56600A-OO is a WIFI+BLE module based on the ECR6600 design.
- ECR660() is an Soc chip for smart home IOT tenninal devices that supports Wi-fi 802.11 b/g/n/ax and BLE5.O protocols
- Built-in power management module Power amplifier Low noise amplifier and transceiver switch.
- ECR660() adopts RISC processor architecture, has sufficient storage space, a rich peripheral interface, more secure encryption mechanism
- The FullMAC architecture and wider working range are integrated on-chip.
- The WI-FI subsystem and BLE subsystem share the RF portion, including ADCDAC PLL.WI-FI and BLE can only work one at a time.

peculiarity

- Support IEEE 802.11b/g/n/ax
- Support Full MAC, including LMAC UMAC
- Support SoftAP ,STA and WI FI direct connection mode
- Support WMM Qos
- Support 0.8/1.6/3.2us safety protection interval
- Support 802.11ax MCS0 MCS7
- Supports a maximum bit rate of 150 Mbps
- Support both upstream and downstream MU OFDMA(STA support
- Support f or STA Beamforming (STA as Beamformee)
- · Supports Mid amble
- Supports 20M and 40M bandwidth, 802.11ax only supports 20M bandwidth
- Dual Carrier Modulation (DCM)

BLE peculiarity

• Support BLE 5. 0 protocol (AOA AOD not supported)

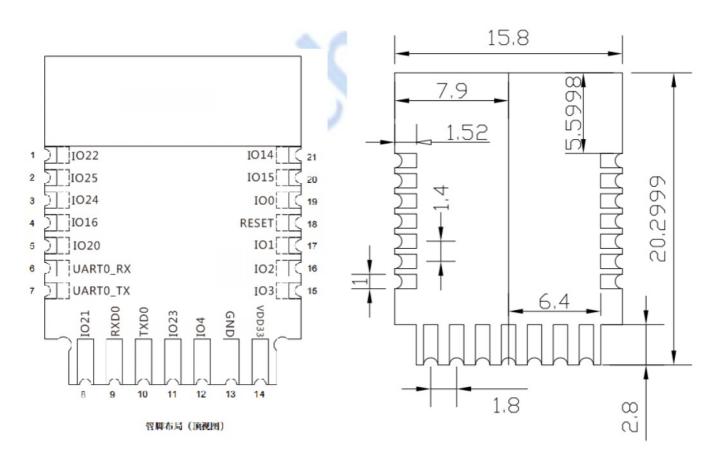
- Supports BLE single device connection
- Support synchronous broadcast and scanning
- Support enhanced power consumption control
- Supports asynchronous data sending and receiving
- Support connection parameter update
- Support s extensible packet length
- Supports link layer encryption
- Supports LE ping

General specification

Model	CDI-WX56600A-00
Product Name	IOT WIFI+BLE Module
Major Chipset	ECR6600-A40D
Modulation mode	802.11b(DSSS):CCK(11,5.5Mbps),DQPSK(2Mbps),DBPSK(1Mbps) 802.11g(OFDM):BPSK(9,6Mbps),QPSK(18,12Mbps),16QAM(36,24M bps),64Q AM(54,48Mbps) 802.11n(OFDM):BPSK,QPSK,16QAM,64QAM(65Mbps) 802.11ax(OFDMA)/64-QAM BLE(GFSK)
Channel bandwidth	WIFI:20MHz/40MHz BLE:2MHz
Basic transfer rate	WIFI 802.11b:11,5.5,2,1 Mbps WIFI 802.11g:54,48,36,24,18,12,9,6 Mbps WIFI 802.11n:up to 72Mbps(20MHZ);up to 150Mbps(40MHZ) WIFI 802.11ax:up to 150Mbps(20MHZ) BLE:1Mbps, 2Mbps
Frequency range	WiFi:2412~2462MHZ BT: 2402~2480MHZ

Receiving sensitivity	 11b CCK11(PER<8%)< -85dBm;11g OFDM54(PER<10%) < -72dBm; 11n HT20 MCS7(PER<10%) < -71dBm 11n HT40 MCS7(PER<10%) < -67dBm 11ax HT20 MCS7(PER<10%) < -70dBm BLE Receiving Sensitivity@1Mbit/s < -90dBm 			
wifi interface	UART			
Encryption protocol	WEP/WPA-PSK/WPA2-PSK			
SPI flash	2M Byte default Embedded			
Supply current	Min: 500 mA			
Operating ambient temperature	-40~ +85°C ambient temperature			
Storage ambient temperature	-40 ~ 125°C ambient temperature			
Working ambient humidity	5 to 90 % maximum (non-condensing)			
PCBA size	20.3 x 15.8 x 2.4 mm (LxWxH) ±0.2mm			

Pin description and size



NO	NAME	DESCRIPTION			
1	GPIO22	GPIO SD_H_DATA0/UART0_TXD/PWM_CTRL0/I2C_TXWS			
2	GPIO25	GPIO SD_H_DATA3/PWM_CTRL3/I2C_SDA			
3	GPIO24	GPIO SD_H_DATA2/UART1_CTS/PWM_CTRL2/I2S_MCLK			
4	GPIO16	GPIO TESTMODE/UART1_CTS/IR_OUT/PWM_CTRL2			
5	GPIO20	GPIO PWM_CTRL3/AUX_2/VOUT_IP/I2S_MCLK			
6	UART0_RX	GPIO,UART0_RX			
7	UART0_TX	GPIO,UART0_T			
8	GPIO21	GPIO SD_H_CMD/UART0_RXD/I2C_SDA/I2S_TXD			
9	RXD0	GPIO,UART2_RX			
10	TXD0	GPIO,UART2_TX			
11	GPIO23	GPIO SD_H_DATA1/UART1_RTS/PWM_CTRL1/I2S_TXSCK			
12	GPIO4	GPIO TRST/UART0_RTS/PWM_CTRL4/SPI1_CS1/MSPI_CS1			
13	GND				
14	VDD33	+3.3V)			
15	GPIO3	GPIO TDI/UART0_CTS/PWM_CTRL3/SPI1_MISO/I2C_SDA			
16	GPIO2	GPIO TDO/UART1_TXD/PWM_CTRL2/SPI1_MISI/I2C_SCL			
17	GPIO1	GPIO TMS/UART1_RXD/PWM_CTRL1/SPI1_CS0/I2S_RXD			
18	RESET	TEST MODE			
19	GPIO0	GPIO TCK/UART2_TXD/PWM_CTRL0/SPI1_CLK/I2S_TXSCK			
20	GPIO15	GPIO BOOTMODE1/AUX_1/VOUT_QN/PWM_CTRL5/I2S_TXWS			
21	GPIO14	GPIO BOOTMODE1/AUX_0/VOUT_QP/PWM_CTRL4/I2S_TXD			





Electrical characteristics

Dc characteristic

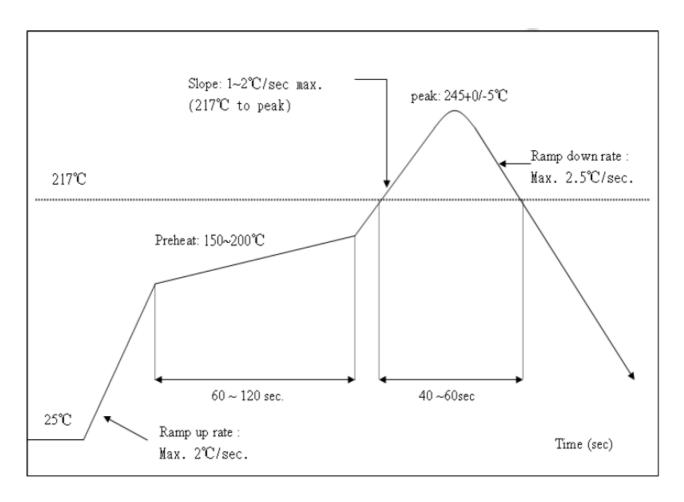
Parameter		Minimum	Typical	Maximum	Units
CIN Pin capacitance			2		pf
VIH High-level input voltage		0.7vdd		vdd	V
VIL Low-level input voltage		0		0.3vdd	
IIH High-level input current		-10		10	uA
IIL Low-level input current		-10		10	uA
VOH High-level output voltage		0.9vdd			V
VOL Low-level output voltage				0.1vdd	V
IOH High-level source current 4 mA		2	3.2	5	mA
IOL Low-level sink current 4 mA		4	5.2	7	mA
RPU Pull-up resistor		66K	81.1k	110k	Ω
RPD Pull-down resistor		55k	62.7k	82.5k	Ω

Recommended working conditions

Parameter	Pin name	Minimum	Typical	Maximum	Units
Operating voltage	vcc-pin	3	3.3	3.6	V
Operating temperature		-40		85	°C

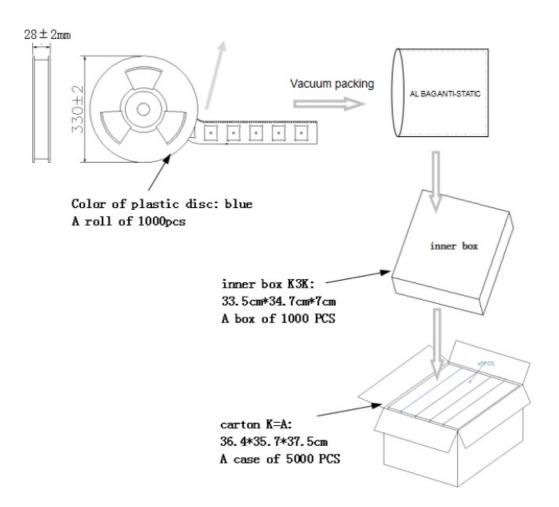
Recommended Reflow Profile

Referred IPC/JEDEC standard. Peak Temperature: <250°C Number of Times: 2 times



Baking and storage temperature

- Storage life 12 months. Storage conditions:<40°C. Relative humidity:<90%R.H.
- After this bag is opened, devices that will be subjected to infrared reflow, vapor phase reflow, or equivalent processing must be.
- Check the humidity card: stored at 20%RH.If: 30%~40%(pink)or greater than 40%(red). The labeling module has moisture absorption.
- Mounted within 168 hours at factory conditions of: t 30%°C 60%R.H.
- Once opened, the preservation of life for 168 hours.
- · Module apart packing after 168 hours If baking is required, devices may be baked
- Modules must be to remove module moisture problem
- Baking temperature: 40°C±5°C, 120 hours.
- After baking, put the proper amount of desiccant to seal the packages.





ESD CAUTION

The WX56600A-00 module is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although the WX56600A-00 module has built-in ESD protection circuitry, please handle with care to avoid permanent malfunction or performance degradation.

FCC WARNING

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

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

This device and its antenna(s) must not be co-co-located or operating in conjunction with any other antenna or transmitter. 15.105 Information to the user.

For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

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 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.

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

Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be 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 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:

Requirement

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) it specifically establishes the 6dB Bandwidth,, Peak Output Power, Radiated Spurious Emission, Power Spectral Density, Restricted Band of Operation and Band Edge (Out of Band Emissions) Measurement

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 a 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, Yes, the module contains a permanently attached antenna, The antenna gain is -0.76dBi.

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 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.

- 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);
- 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);
- The parameters shall be provided in a manner permitting host manufacturers to design the printed circuit (PC) board layout;
- · Appropriate parts by manufacturer and specifications;
- · Test procedures for design verification; and
- 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 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 trace antenna designs, and this manual has been shown the layout of trace design.

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: ROW-CDIWX56600A.

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 "omnidirectional 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 a 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 a antenna, Yes, the module contains a permanently attached antenna, The antenna gain is 0.76 dBi.

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 a label in a visible area indicating the following text: "Contains FCC ID: ROW-CDIWX56600A"

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 simulate or characterize 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: The company can increase the utility of our modular transmitters by providing instructions that simulate or characterize 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 circuity), 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 is without unintentional radiator digital circuity, so the module does not require an evaluation by FCC Part 15 Subpart B. The host shoule be evaluated by the FCC Subpart B.

Documents / Resources



<u>Cdtech CDI-WX56600A-00 Wi-Fi plus BLE Module</u> [pdf] Owner's Manual CDI-WX56600A-00 Wi-Fi plus BLE Module, CDI-WX56600A-00, Wi-Fi plus BLE Module, BLE Module, Module

References

- ③_____
- ©_____
- User Manual

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