

CDW-U966000-01

DATASHEET

Software:

客 户 Customer	客户承认 Approve (请盖印章)	日期 Date

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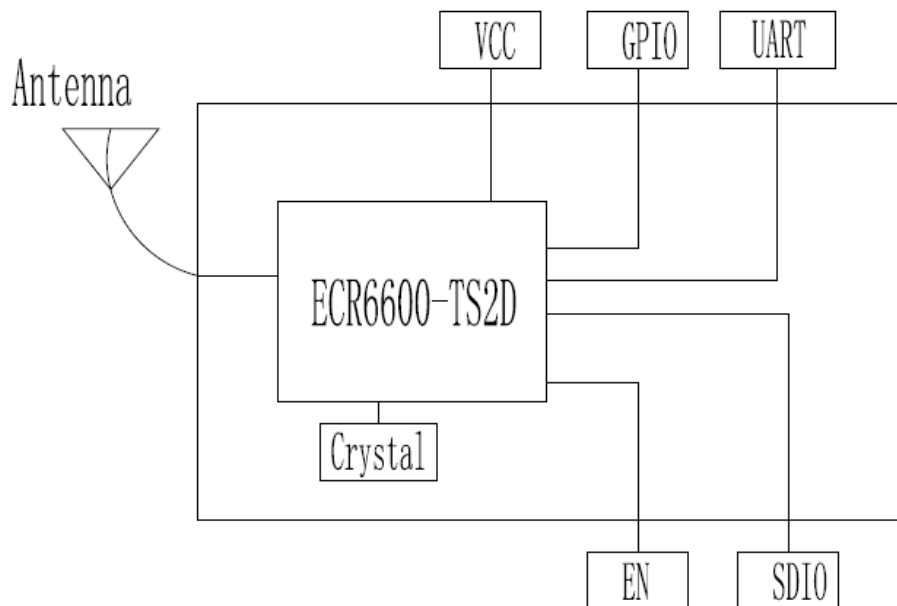
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1. Overview

The CDW-U966000-01 designed by Cdtech basing on the ECR6600 is a Wi-Fi+BLE module.

ESWIN ECR6600 series is a highly integrated single-chip low power 802.11ax Wireless LAN (WLAN) and BLE controllers. The chip combines the modules including High-performance Andes D10 MCU, WLAN MAC, 1T1R capable WLAN baseband, RF, and Bluetooth, etc. It also provides a bunch of configurable GPIOs which are configured as digital peripherals for variant applications and control use.

ECR6600 series integrates internal memories to support Wi-Fi protocol functions and provides simple application developments via the embedded memory configuration.



2. Features

Wi-Fi Features

- Support of IEEE 802.11 b/g/n/ax
- Support of Full MAC (LMAC+UMAC)
- Support of SoftAP, STA, and Wi-Fi direct connectivity mode
- Support of WMM QoS
- All guard interval (0.8/1.6/3.2 us)
- Support of 802.11ax MCS0 up to MCS7
- Maximal bit-rate of 150 Mbps
- Support of MU-OFDMA in UL and DL as a non-AP STA
- Support of Beamforming as a STA (beamformee)
- Support of Mid-amble
- Support 20M and 40M bandwidth
- Support of DCM

BLE Features

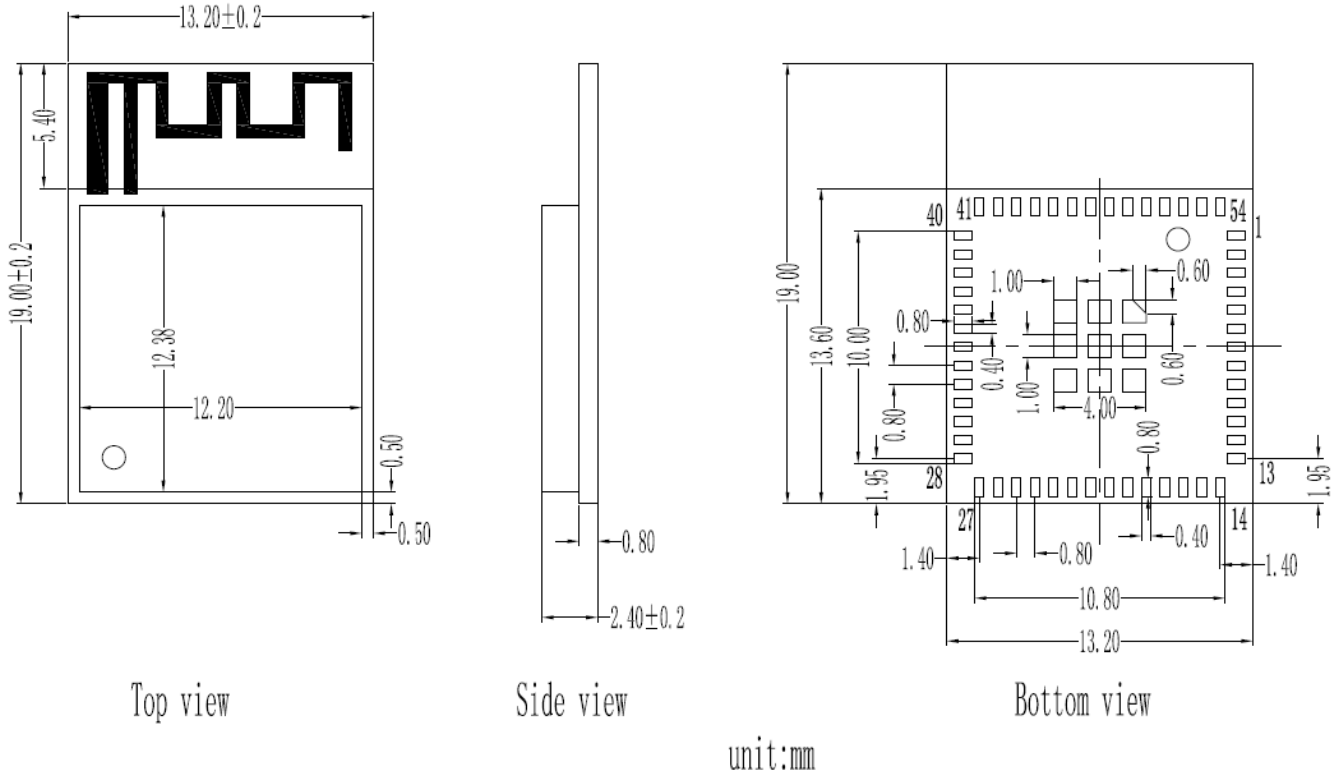
- BLE5.1(AOA/AOD is not supported)
- Support BLE and BT multi-device connection
- Supports simultaneous broadcast of packages and scanning
- Enhanced Power Control
- Simultaneous advertising and scanning
- Supports asynchronous data sending and receiving
- Supports connection parameter update
- Supports extend packet length
- Supports link layer encryption
- Supports LE Ping

The WI-FI subsystem and the BLE subsystem share RF components, including ADC/DAC/PLL. Wi-Fi and BLE can only work one at a time

3. General Specification

Model	CDW-U966000-01
wlan standard	IEEE 802.11b/g/n/ax Wi-Fi6 and BLE 5.1
Major Chipset	ECR6600-T2SD
Modulation	802.11b(DSSS):CCK(11,5.5Mbps),DQPSK(2Mbps),DBPSK(1Mbps) 802.11g(OFDM):BPSK(9,6Mbps),QPSK(18,12Mbps),16QAM(36,24Mbps),64QAM(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 Transmitting 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 75Mbps(20MHZ);up to 150Mbps(40MHZ) WIFI 802.11ax:up to 75Mbps(20MHZ) BLE: 1Mbps, 2Mbps
Frequency Band	WiFi:2412~2462MHZ BT: 2402~2480MHZ
Receiver 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
Interface	UART
Encryption	WEP/WPA-PSK/WPA2-PSK
SPI flash	2M Byte default Embedded
Power supply current	Min: 500 mA
Operating Temperature	-40~ +85°C ambient temperature
Storage Temperature	-40 ~ 125°C ambient temperature
Humidity	5 to 90 % maximum (non-condensing)
Dimension	19 x 13.2 x 2.4 mm (LxWxH) ±0.2mm

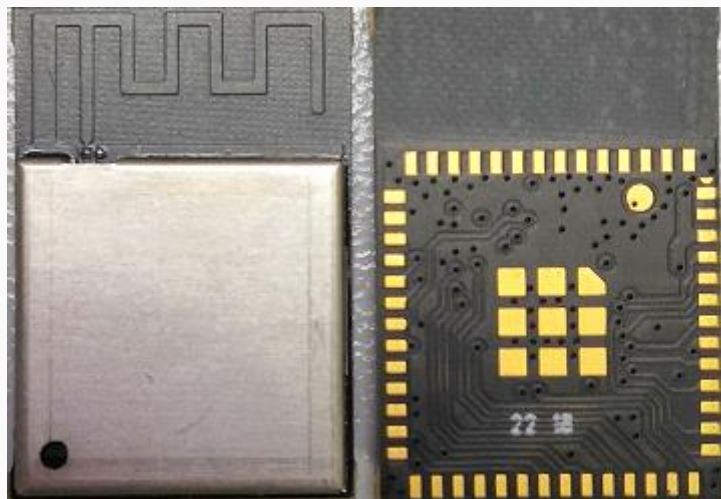
4. Pin Description and PCB size



Top view

Side view

Bottom view



NO	NAME	DESCRIPTION
1	GND	Grounding
2	GND	Grounding
3	VCC	Module power supply (+3.3V)
4	GPI023	General GPIO
5	GPI022	General GPIO
6	GPI021	General GPIO
7	GPI025	General GPIO
8	EN	CHIP_EN(PULL-UP)
9	GPI024	General GPIO
10	GPI016	General GPIO
11	NC	-
12	GPI017	General GPIO, UART1_RX (Application port)
13	GPI013	General GPIO, UART1_TX (Application port)
14	VDD_OP8	Digital power supply
15	VDD_EFUSE	eFuse program power, the power is 1.8V
16	GPI00	General GPIO, SPI_CLK
17	GPI03	General GPIO, SPI_MISO
18	GPI02	General GPIO, SPI_MOSI
19	GPI01	General GPIO, SPI_CS
20	GPI020	General GPIO
21	RESET_B	TEST MODE
22	GPI015	General GPIO
23-26	NC	-
27	GND	Grounding
28-32	NC	-
33	GPI04	General GPIO
34	GPI014	General GPIO
35	GPI05	General GPIO, UART0_RX (DEBUG)
36	GPI06	General GPIO, UART0_TX (DEBUG)
37	NC	-
38-54	GND	Grounding

Note: Module only supports SPI, module download methods: VCC, GND, EN (pull up) , UART0, UART0, RESET (serial RTS)

5. Electrical characteristics

5.1 DC Electrical Specification

Parameter		Minimum	Nominal	Maximum	Unit	
C_{IN}	Pin capacitance		2		pf	
V_{IH}	High-level input voltage	0.7vdd		vdd	V	
V_{IL}	Low-level input voltage	0		0.3vdd		
I_{IH}	High-level input current	-10		10	uA	
I_{IL}	Low-level input current	-10		10	uA	
V_{OH}	High-level output voltage	0.9vdd			V	
V_{OL}	Low-level output voltage			0.1vdd	V	
I_{OH}	High-level source current	4 mA	2	3.2	5	mA
I_{OL}	Low-level sink current	4 mA	4	5.2	7	mA
R_{PU}	Pull-up resistor		66K	81.1k	110k	Ω
R_{PD}	Pull-down resistor		55k	62.7k	82.5k	Ω

5.2 Recommended Operating Conditions

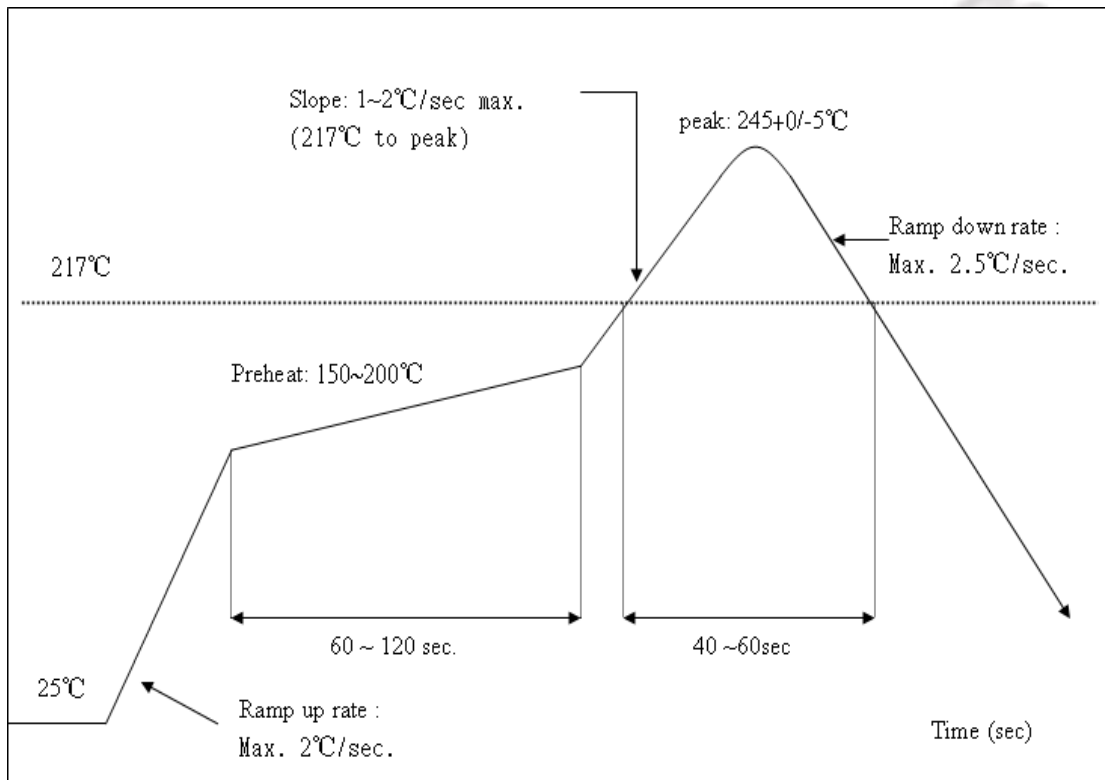
Parameter	Pin Name	Minimum	Typical	Maximum	Unit
Operating voltage	vcc-pin	3	3.3	3.6	V
Operating temperature		-40		85	$^{\circ}\text{C}$

6. Recommended Reflow Profile

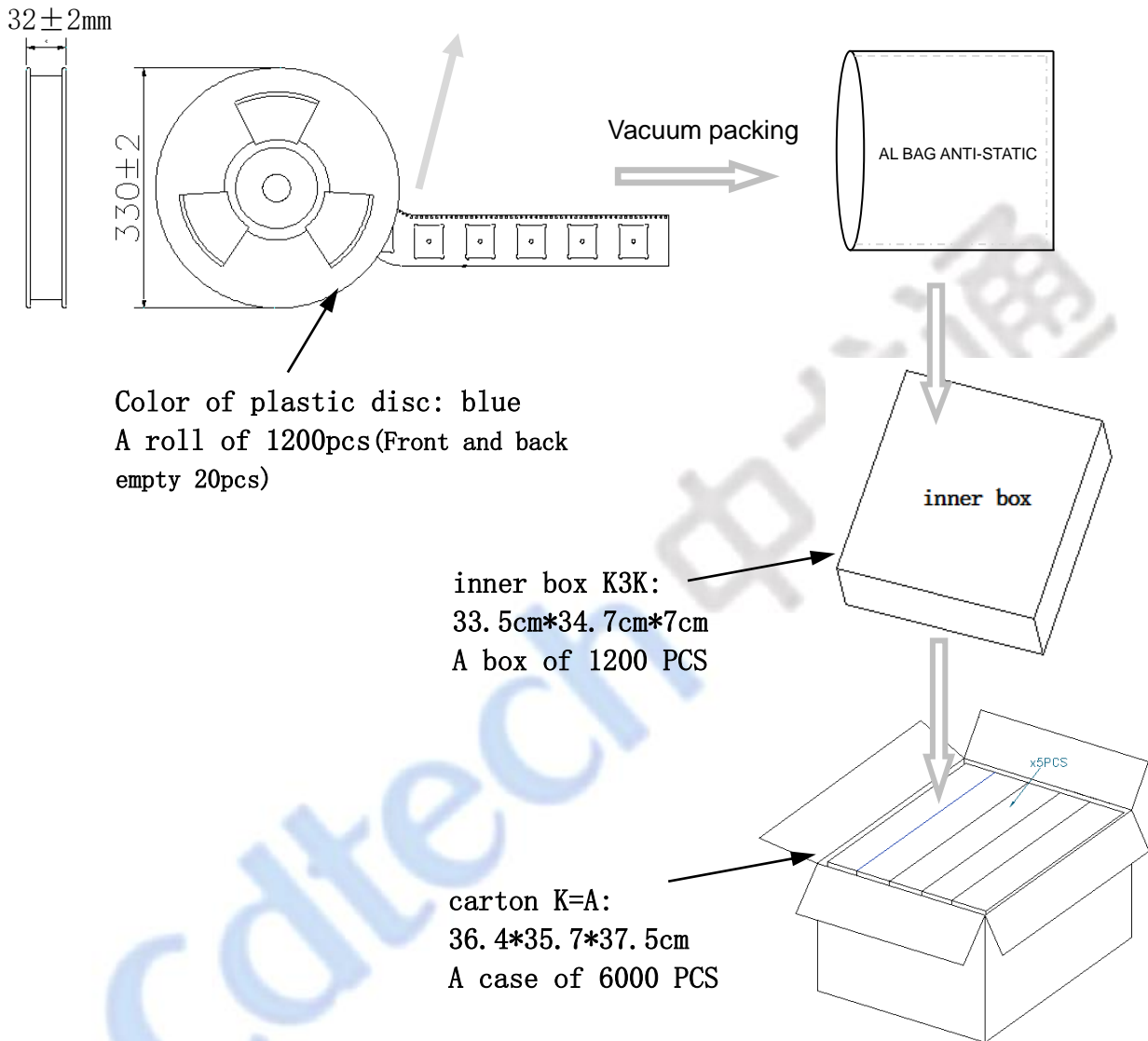
Referred IPC/JEDEC standard.

Peak Temperature : <math><250^{\circ}\text{C}</math>

Number of Times : 2 times



7. Package



ESD CAUTION

The CDW-U966000-01 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. please handle with care to avoid the permanent malfunction or the 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) this device must accept any interference received, including interference that may cause undesired operation.

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

15.105 Information to the user.

(b) 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 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.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with 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 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 labelled in a visible area with the following:

“Contains Transmitter Module ROW-CDWU96600001”

Requirement per KDB996369 D03

2.2 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.

Explanation: This module meets the requirements of FCC part 15C(15.247).it specifically establish the 6dB Bandwidth,, Peak Output Power, Radiated Spurious Emission, Power Spectral Density, Restricted Band of Operation and Band Edge (Out of Band Emissions) Measurement

2.3 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, Yes, the module contains a permanently attached antenna, The antenna gain is -0.66dBi.

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.

2.5 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, require 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 trace antenna designs, and This manual has been shown the layout of trace design, antenna, connectors, and isolation requirements.

2.6 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-CDWU96600001.

2.7 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, Yes, the module contains a permanently attached antenna, The antenna gain is -0.66dBi.

2.8 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: ROW-CDWU96600001"

2.9 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: WiFi Ranger, A LinOra Company can increase the utility of our modular transmitters by providing instructions that simulates or characterizes a connection by enabling a transmitter.

2.10 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 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.

Explanation: The module without unintentional-radiator digital circuitry, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.

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