

CDW-G47663U-00**DATASHEET****Software:**

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

拟制 Design	审核 Check	批准 Approve	版本 Version	日期 Date
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更改记录:

Reversion History:

版本 Version	日期 Date	更改内容 Modification
1.0	2021.05.15	New Revision Release

1. Overview

The CDW-G47663U-00 is a highly integrated single chip Module which has built in a 2x2 dual-band wireless LAN radio and Bluetooth radio. It supports IEEE 802.11a/b/g/n/ac standard and provides the highest PHY rate up to 867Mbps, offering feature-rich wireless connectivity and reliable throughput from an extended distance. It includes Bluetooth EDR and LE radio which complies with Bluetooth v2.1+EDR, v4.2, Low Energy, and v5.1.

2. Features

2.1 Platform

- Embedded high-performance 32-bit RISC microprocessor
- Integrate high efficiency switching regulator
- 40MHz crystal clock support with low power operation in sleep mode
- Best-in-class active and idle power consumption performance
- Fully Compliance with USB v2.0 specification
- Internal thermal sensor for temperature compensation and thermal protection.
- Self calibration.
- Advanced FDD/TDD mode Wi-Fi/Bluetooth coexistence scheme.
- Wi-Fi and Bluetooth over USB.

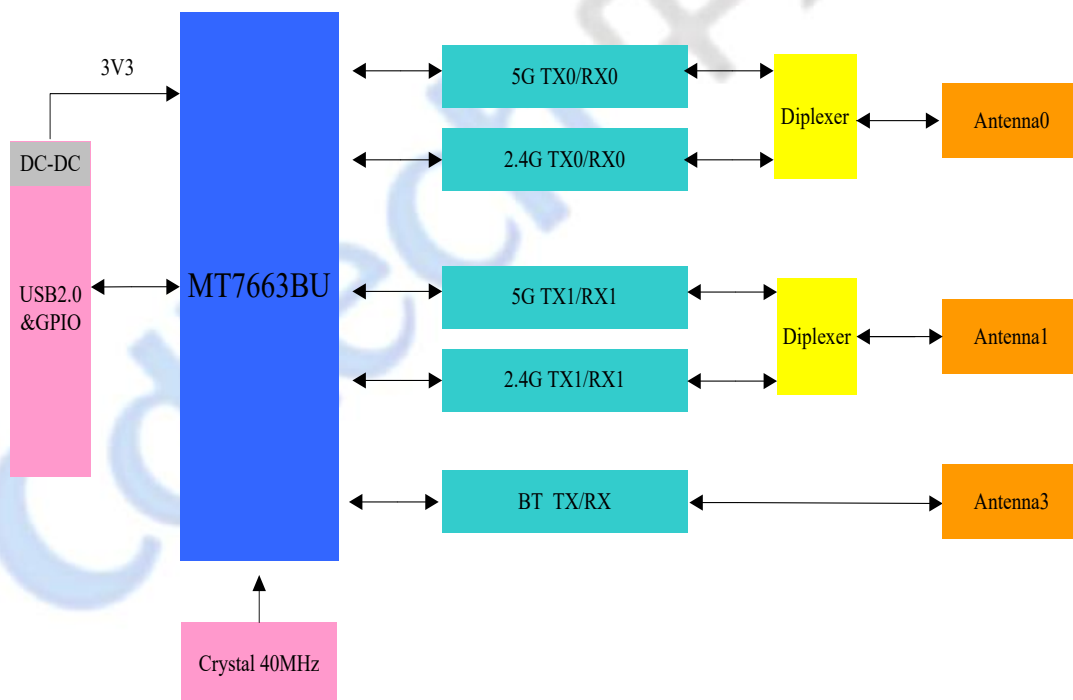
2.2 WLAN

- IEEE 802.11a/b/g/n11ac compliant
- Support 20/40MHz bandwidth in 2.4GHz band and 20/40/80MHz in 5GHz band, and.
- Dual-band 2T2R mode with data rate up to 867Mbps
- Greenfield, mixed mode, legacy modes support
- Integrated LNA, PA, and T/R switch
- Optional external LNA and PA support.
- IEEE 802.11d/e/h/i/j/k/r/v/w support
- Security support for WFA WPA/WPA2 /WPA3personal, WPS2.0
- Support MU-MIMO RX
- QoS support of WFA WMM, WMM PS

2.3 Bluetooth

- Bluetooth 5 dual mode for 2x the speed
- Bluetooth specification v2.1+EDR
- Bluetooth v4.2 Low Energy(LE)
- Standard HCI interface over USB super-speed, high-speed and full-speed mode
- Best-in-class BT/Wi-Fi coexistence performance
- Scatternet support: Up to 7 piconets simultaneously with background inquiry/page scan
- Up to 7 simultaneous active ACL links
- Support SCO and SCO link with re-transmission
- Support wide-band speech
- Integrated high efficiency PA and TSSI

3. Block Diagram



4. General Specification

Model	CDW-G47663U-00
Product Name	WLAN 11a/b/g/n/ac USB2.0 2T2R + Bluetooth 5.1module
Major Chipset	MT7663BU
Standard	802.11a/b/g/n/ac
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM/256-QAM
Frequency Band	2.4GHz and 5GHz ISM Band
WiFi Interface	USB2.0
BT Interface	USB2.0
Operating Temperature	-20° C ~ 70° C
Storage Temperature	-40° C ~ 85°C
Humidity	5% to 90% maximum
Dimension	46.5x40.0x5.8mm (LxWxH)

5. Electrical Characteristics

5.1 WiFi Section: 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/b/g/n/ac WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz : Ch1 ~ Ch14
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Receive Sensitivity 11b,20MHz @8%PER	- 1Mbps,PER @ -98 dBm, typical - 11Mbps,PER @ -89dBm, typical
Receive Sensitivity 11g,20MHz @10%PER	- 6Mbps,PER @ -95dBm, typical - 54Mbps,PER @ -75 dBm, typical
Receive Sensitivity 11n,20MHz @10%PER	- MCS=0,PER @ -95 dBm, typical - MCS=7,PER @ -74 dBm, typical
Receive Sensitivity 11n,40MHz @10%PER	- MCS=0,PER @ -91dBm, typical - MCS=7,PER @ -72 dBm, typical

5GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/n/ac 2x2, WiFi compliant
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	5.0GHz : Please see the table
Modulation	802.11a : OFDM /64-QAM, 16-QAM, QPSK, BPSK 802.11n : OFDM /64-QAM, 16-QAM, QPSK, BPSK 802.11ac : OFDM /256-QAM
Receive Sensitivity 11a, 20MHz @10%PER	- 6Mbps, PER @ -92 dBm, typical - 54Mbps, PER @ -75 dBm, typical
Receive Sensitivity 11n, 20MHz @10%PER	- MCS=0, PER @ -92 dBm, typical - MCS=7, PER @ -73 dBm, typical
Receive Sensitivity 11n, 40MHz @10%PER	- MCS=0, PER @ -88 dBm, typical - MCS=7, PER @ -71 dBm, typical
Receive Sensitivity 11ac, 20MHz @10%PER	- MCS=0, NSS1 PER @ -90 dBm, typical - MCS=8, NSS1 PER @ -69 dBm, typical
Receive Sensitivity 11ac, 40MHz @10%PER	- MCS=0, NSS1 PER @ -87 dBm, typical - MCS=9, NSS1 PER @ -65 dBm, typical
Receive Sensitivity 11ac, 80MHz @10%PER	- MCS=0, NSS1 PER @ -84 dBm, typical - MCS=9, NSS1 PER @ -62 dBm, typical

5.2 Bluetooth Section:

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V2.1+EDR,V4.2,V5.1		
Host Interface	USB2.0		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
	Min	Typical	Max
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)		-86 dBm	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-80 dBm	
Maximum Input Level	GFSK (1Mbps):-20dBm		
	$\pi/4$ -DQPSK (2Mbps) :-20dBm		
	8DPSK (3Mbps) :-20dBm		

6. Electrical Characteristics

6.1 WLAN current consumption

Description	TYP	Unit
Sleep mode, radio off	1.23	mA
2.4GHz RX Power saving, DTIM=1	2.39	mA
2.4GHz RX Active, HT20, MCS15	132	mA
2.4GHz TX CCK, 11Mbps @ 21dBm	417	mA
2.4GHz TX HT20, MCS15 @ 17.5dBm	596	mA
2.4GHz TX HT20, MCS8 @ 18dBm	652	mA
5GHz VHT80 RX Listen, 2RX	157	mA
5GHz RX Active, VHT80, MCS9, Nss=2	236	mA
5GHz TX VHT80, MCS9, Nss=2 @ 15dBm	717	mA
5GHz TX VHT80, MCS0, Nss=2 @ 17dBm	775	mA

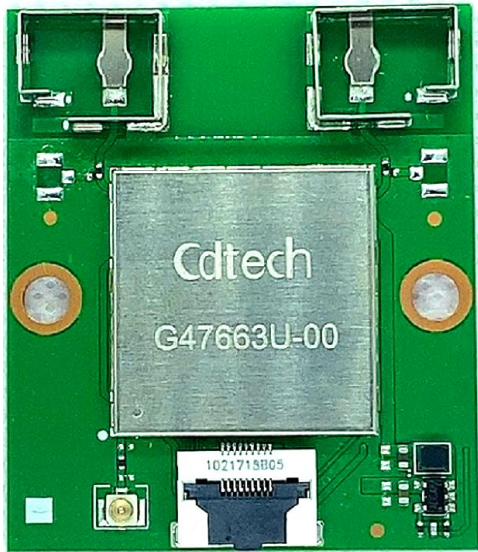
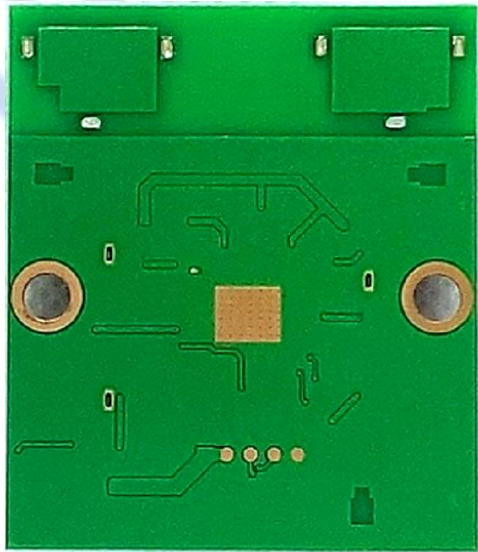
6.2 Bluetooth current consumption

Description	TYP	Unit
Sleep mode, radio off	1.73	mA
Bluetooth TX @ 15dBm	86.5	mA
Bluetooth RX	29.4	mA
Bluetooth SCO connection, HV3 packets+sniff mode+scan (Page scan interval=1.28sec, inquiry scan interval=2.56s, sniff interval=500ms)	3.2	mA
Bluetooth page scan+inquiry scan (Page scan interval=1.28s, inquiry scan interval=2.56s)	2.14	mA
Bluetooth page scan (Page scan interval=1.28s)	1.92	mA

7. Supplier

Supplier list	
Name of Material	Supplier brand
Main chip	MTK
Crystal	FK/TKD /muRata/TXC/JWT/ HOSONIC/ Siward
PCB	Bomin/Benchuang/E-Tech
Diplexer	ACX/Walsin/GLEAD/TDK/ Sunlord
Inductor	Sunlord/CHILISIN/SAMWHA/TDK
Capacitance	SAMSUNG /EYANG/ WALSIN/ muRata/TAIYO/ Darfon
Resistor	UniOhm /YAGEO/ WALSIN
DC-DC	RYCHIP/ZILLTEK

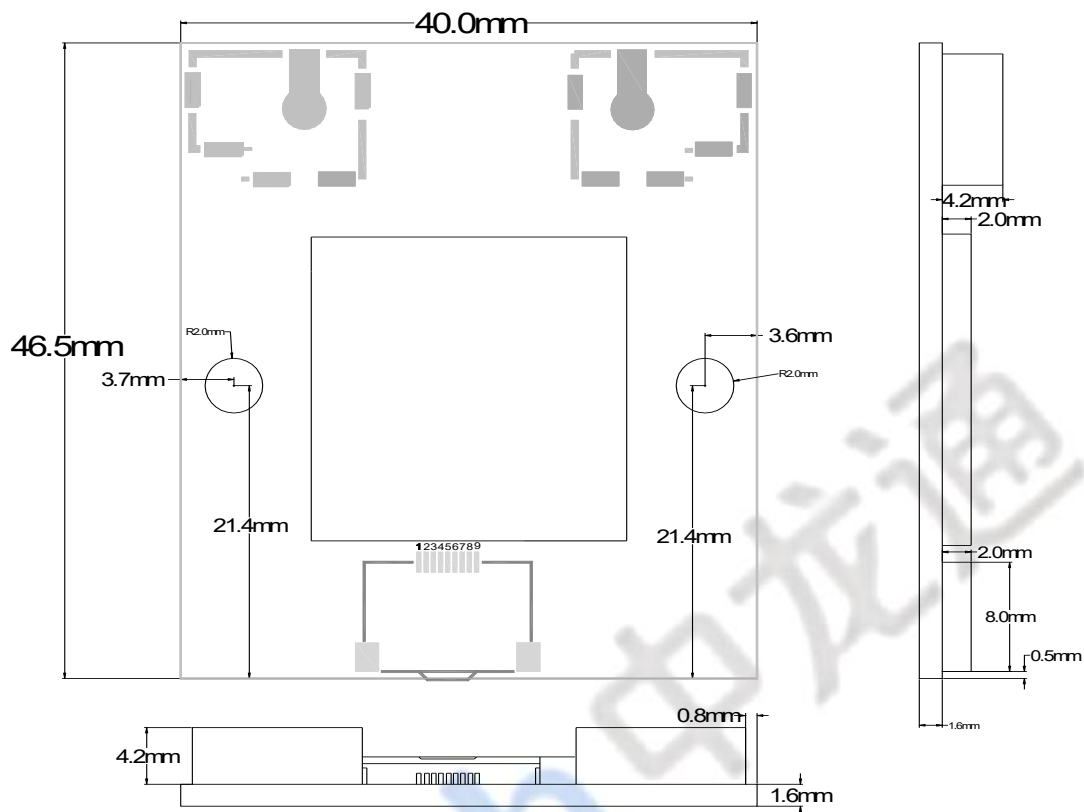
8. Module photo

	
TOP VIEW	BOTTOM VIEW
Dimension:46.5x40.0x5.8mm (LxWxH)(LxWxH) ±0.25mm	

Installation suggestions:

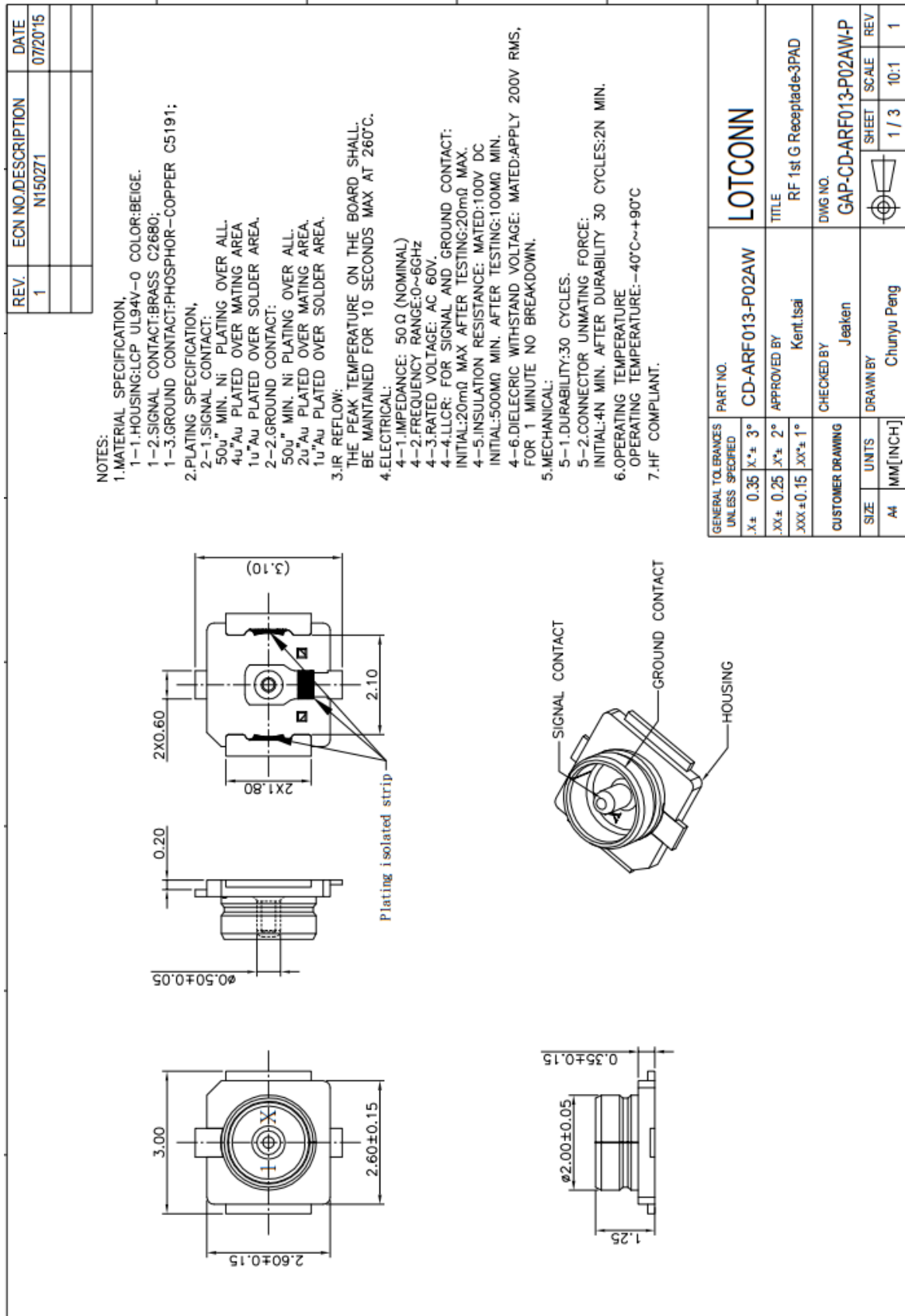
1. A distance of approximately 10mm should be maintained between the module and the TV back panel using positioning columns, foam, or plastic card trays.
2. The module should be installed away from areas that are prone to interference, such as the motherboard, FFC lines, and T-CON boards.

9. Pin Description and PCB size



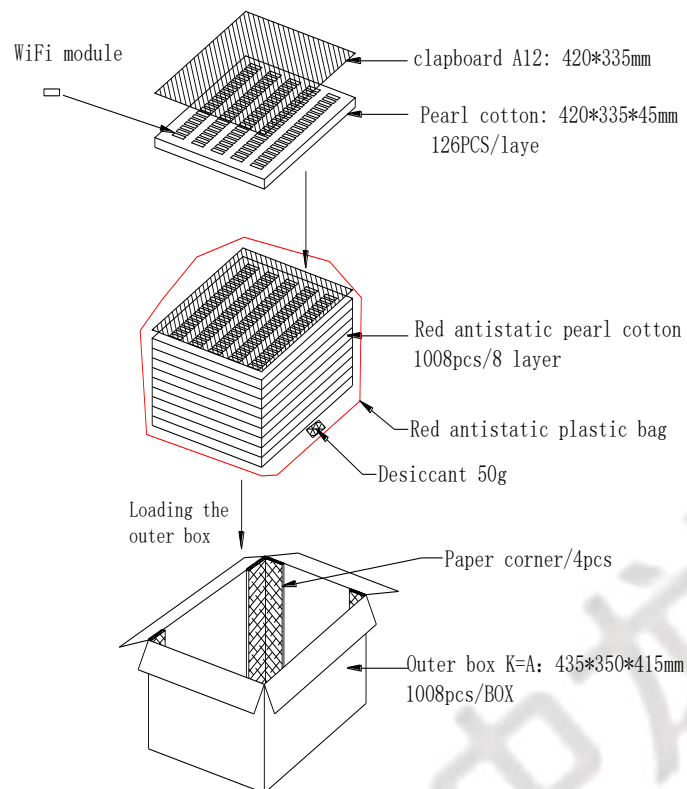
NO.	Symbol	Description
1	RESET	System reset MT7663BUN,low active(Module 10k Pull-Up)
2	WOW	Wake up system via wifi,low active(Module 10k Pull-Up)
3	GND	Ground connections
4	DP	USB positive differential data lines
5	DM	USB negative differential data lines
6	GND	Ground connections
7	BT_WAKE_HOST	Wake up system via BT,low active(Module 10k Pull-Up)
8	VCC	Power supply 5V
9	VCC	Power supply 5V

10. IPEX Connector Spec

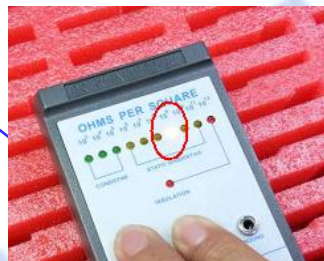


11.FPC Connector spec





Pearl cotton
Antistatic test



4pcs paper protector

**ESD CAUTION**

The CDW-G47663U-00 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although CDW-G47663U-00 is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.

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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, 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

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, and
- (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 labelled in a visible area with the following:

"Contains Transmitter Module FCC ID: ROW-G47663U"

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).

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, 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.

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 PCB antenna designs, and this manual has been shown the layout of 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-G47663U.

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 External antenna (BT/BLE), PCB antenna (2.4G/5G WIFI), the antenna gain is below.

BT: External antenna, 1.89 dBi

BLE: External antenna, 1.89 dBi

2.4G WIFI: PCB antenna

Antenna A: 2.66 dBi

Antenna B: 2.56 dBi

5G WIFI: PCB antenna

5.1G Antenna A: 3.84 dBi; Antenna B: 3.8 dBi

5.8G Antenna A: 3.78 dBi; Antenna B: 3.59 dBi

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-G47663U"

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: 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 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.

2.11 Note EMI Considerations

Note that a host manufacture is recommended to use D04 Module Integration Guide recommending as "best practice" RF design engineering testing and evaluation in case non-linear interactions generate additional non-compliant limits due to module placement to host components or properties

Explanation: The host manufacturer is strongly recommended to confirm compliance with FCC requirements for the transmitter when the module is installed in the host. This module is a stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, the host manufacturer has to consult with the module manufacturer for the installation method in the end system. Host manufacturer is recommended to use D04 Module Integration Guide. The final host product may also need to be evaluated against FCC rule part 15 Subpart B (criteria for unintentional radiators) in order to be properly authorized for operation as part 15B

2.12 How to make changes

Since. only Grantees are permitted to make permissive changes, it is recommended that module manufactures provide contact information and some guidance to host providers in the integration instructions if they expect their module will be used differently than granted.

Explanation: Module manufacturer contact: Tel: 13510082761,
E-mail: songxiaoyue@cdtech.cn