CDW-61723DE-00

WLAN 11b/g/n PCIe 1T1R + Bluetooth 5.0 module

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
			V1.0	2021.05.11

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更改记录：

Reversion History：

版本 Version	日期 Date	更改内容 Modification
1.0	2021.05.11	First release

1. Overview

The 61723DE-00 is a single-die wireless local area network (WLAN) and Bluetooth (BT) combination solution to support 1 ×1 IEEE 802.11b/g/n WLAN standards and BT 5.0 + HS, enabling seamless integration of WLAN/BT and low-energy technology.

2. Features

- Support a low-power PCIe 1.1 interface for WLAN and a USB2.0 interface for BT
- Support WLAN 2.4GHz band channels
- Supports 20 MHz/40 MHz bandwidth
- Integrated DPDT
- Support PCIe LTR/L1.OFF state supported
- Compatible with Bluetooth V2.1 and V4.2 Systems
- Supports Bluetooth 4.0 Low Energy(BLE)
- Supports Bluetooth 5.0 High Duty Cycle Non-Connectable Advertising
- Supports all packet types in basic rate and enhanced data rate
- Bluetooth 4.0 Dual Mode support(Simultaneous LE and BR/EDR)
- Supports multipel Low Energy states

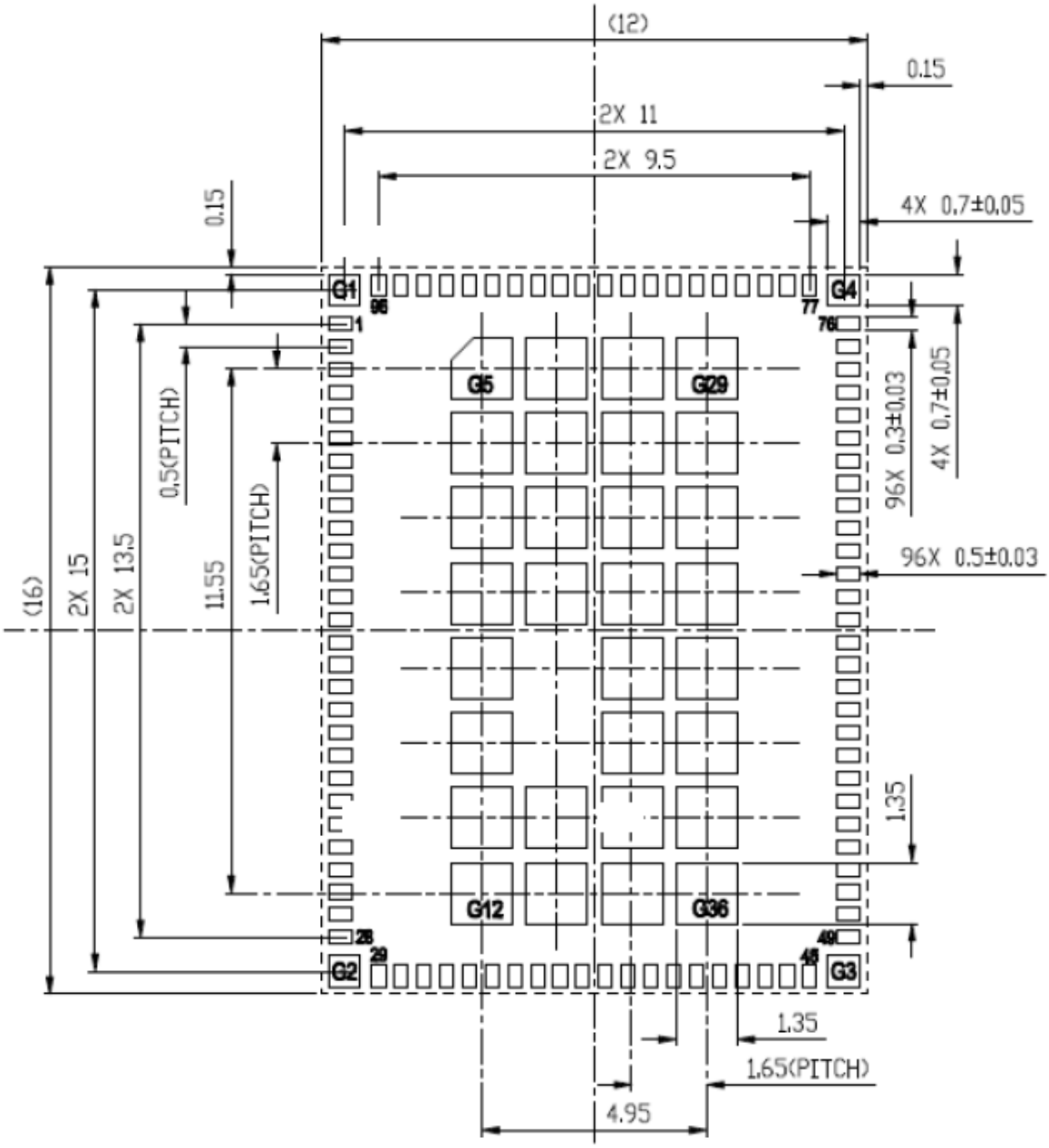
3. General Specification

Model	CDW-61723DE-00
Product Name	WLAN 11b/g/n PCIe 1T1R + Bluetooth 5.0 module
Major Chipset	RTL8723DE-VB-CG
Standard	802.11b/g/n
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Frequency Band	2.4GHz ISM Band
WiFi Interface	PCIe1.1
BT Interface	USB2.0
Operating Temperature	-20 °C ~ 65 °C
Storage Temperature	-40 °C ~ 85 ℃
Humidity	5% to 90% maximum
Dimension	16x12x2.0 (LxWxH) ±0.2mm

4.Electrical Characteristics

symbol	Parameter	Minimum	Typical	Maximum	Units
3.3V	3.3V supply voltage	3.0	3.3	3.6	V
Current	3.3V rating current	--	--	800	mA

5. Layout Recommendation(Unit: mm)



NO.	Name	Type	Description	Voltage
1	NC	—	No connect	
2	NC	—	No connect	
3	NC	—	No connect	
4	3.3V	P	3.3V INPUT	3.3V
5	3.3V	P	3.3V INPUT	3.3V
6	GND	—	Ground connections	
7	NFC_RF_DIS	—	No connect	
8	NFC_INT	—	No connect	
9	NFC_CLK	—	No connect	
10	NFC_DATA	—	No connect	
11	COEX_RXD	I/O	LTE_RX(GPIO5)	3.3V
12	COEX_TXD	I/O	LTE_TX(GPIO4)	3.3V
13	COEX3	I/O	LTE_PRI(GPIO12)	3.3V
14	NC	—	No connect	
15	NC	—	No connect	
16	NC	—	No connect	
17	GND	—	Ground connections	
18	NC	—	No connect	
19	NC	—	No connect	
20	GND	—	Ground connections	
21	NC	—	No connect	
22	NC	—	No connect	
23	GND	—	Ground connections	
24	HST_WAKE_DEV	I	GPIO13	3.3V
25	NC	—	No connect	
26	GND	—	Ground connections	
27	SLP_CLK	I	External 32.768KHz input	3.3V
28	WL_DIS_N	I	Enable pin for WL device(GPIO9)	3.3V
29	PCIE_WAKEN	I/O	PCIe wake signal（active low）	3.3V
30	PCIE_CLKREQN	I/O	PCIe clock request(active low)	3.3V
31	PCIE_PERSTN	I	PCIe host indication to reset the device	3.3V
32	GND	—	Ground connections	
33	PCIE_RCLK_N	I	PCIe differential Clock input —N	
34	PCIE_RCLK_P	I	PCIe differential Clock input —P	
35	GND	—	Ground connections	
36	PCIE_TX_N	O	PCIe Transmit Data —N	
37	PCIE_TX_P	O	PCIe Transmit Data —P	
38	GND	—	Ground connections	

39	PCIE_RX_N	—	PCIe Receive Data —N	
40	PCIE_RX_P	—	PCIe Receive Data —P	
41	GND	—	Ground connections	
42	NC	—	No connect	
43	NC	—	No connect	
44	NC	—	No connect	
45	NC	—	No connect	
46	NC	—	No connect	
47	NC	—	No connect	
48	NC	—	No connect	
49	NC	—	No connect	
50	NC	—	No connect	
51	NC	—	No connect	
52	NC	—	No connect	
53	NC	—	No connect	
54	NC	—	No connect	
55	NC	—	No connect	
56	NC	—	No connect	
57	GND	—	Ground connections	
58	PCM_SYNC	I/O	PCM_SYNC (input/output)(GPIO2)	3.3V
59	PCM_IN	I	PCM_IN (input)(GPIO0)	3.3V
60	PCM_OUT	O	PCM_OUT (output)(GPIO1)	3.3V
61	PCM_CLK	I	PCM_CLK (input)(GPIO3)	3.3V
62	GND	—	Ground connections	
63	BT_DIS_N	I	Enable pin for BT device(GPIO11)	3.3V
64	BT_LED	O	BT_LED	3.3V
65	WL_LED	O	WL_LED	3.3V
66	NC	—	No connect	
67	HST_WAKE_BT	—	No connect	
68	GND	—	Ground connections	
69	USB_DM	I/O	USB Serial Differential Data Minus	
70	USB_DP	I/O	USB Serial Differential Data Plus	
71	GND	—	Ground connections	
72	3.3V	P	3.3V INPUT	3.3V
73	3.3V	P	3.3V INPUT	3.3V
74	GND	—	Ground connections	
75	GND	—	Ground connections	
76	GND	—	Ground connections	
77	GND	—	Ground connections	
78	GND	—	Ground connections	
79	GND	—	Ground connections	

80	GND	—	Ground connections	
81	GND	—	Ground connections	
82	GND	—	Ground connections	
83	GND	—	Ground connections	
84	GND	—	Ground connections	
85	GND	—	Ground connections	
86	GND	—	Ground connections	
87	GND	—	Ground connections	
88	GND	—	Ground connections	
89	GND	—	Ground connections	
90	GND	—	Ground connections	
91	GND	—	Ground connections	
92	GND	—	Ground connections	
93	GND	—	Ground connections	
94	GND	—	Ground connections	
95	GND	—	Ground connections	
96	GND	—	Ground connections	
G1~G25	GND	—	Ground connections	

7. Suplier

Secondary supplier list	
Material name	**Supplier brand**
WIFI IC	Realtek
Crystal	FK /TKD/JWT
PCBA	A, O, I,F
Power inductance	Sunlord/CHILISIN/SAMWHA
Capacitance	SAMSUNG /EYANG
resistance	UniOhm /YAGEO

8. Physical photo

9 Baking & storage temperature

A. Storage life： 12 months. Storage conditions:<40℃. Relative humidity:<90%R.H.
(保存期限：12个月，储存环境条件：温度在：<40℃，相对湿度：<90%R.H.)

B. After this bag is opened , devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be .(模块包装被拆后，SMT 组装之时限)

a. Check the humidity card :stored at ≦20%RH.If :30%~40%(pink)or greater than 40%(red).Labeling module has moisture absorption.(检查湿度卡：显示值应小于30%（蓝色），如：30%~40%(粉红色）或者大于40%（红色）表示模块已吸湿气.)

b. Mounted within 168 hours at factory conditions of: t≦30%℃， ≦60%R.H.
(工厂环境温度湿度管制：≦30%℃， ≦60%R.H, 168小时内。)

c. Once opened, the workshop the preservation of life for168 hours.
(拆封后，车间的保存寿命为168小时.)

C. Module apart packing after 168 hours，If baking is required, devices may be baked for.
(如在拆封后的168个小时内未使用完，需要烘烤，烘烤条件如下：)

a. Modules must be to remove module moisture problem. (模块须重新烘烤，以除去模块吸湿问题.)

b. Baking temperature: 40℃ ±5℃, 120 hours. (烘烤温度条件：40℃ ±5℃，120小时).

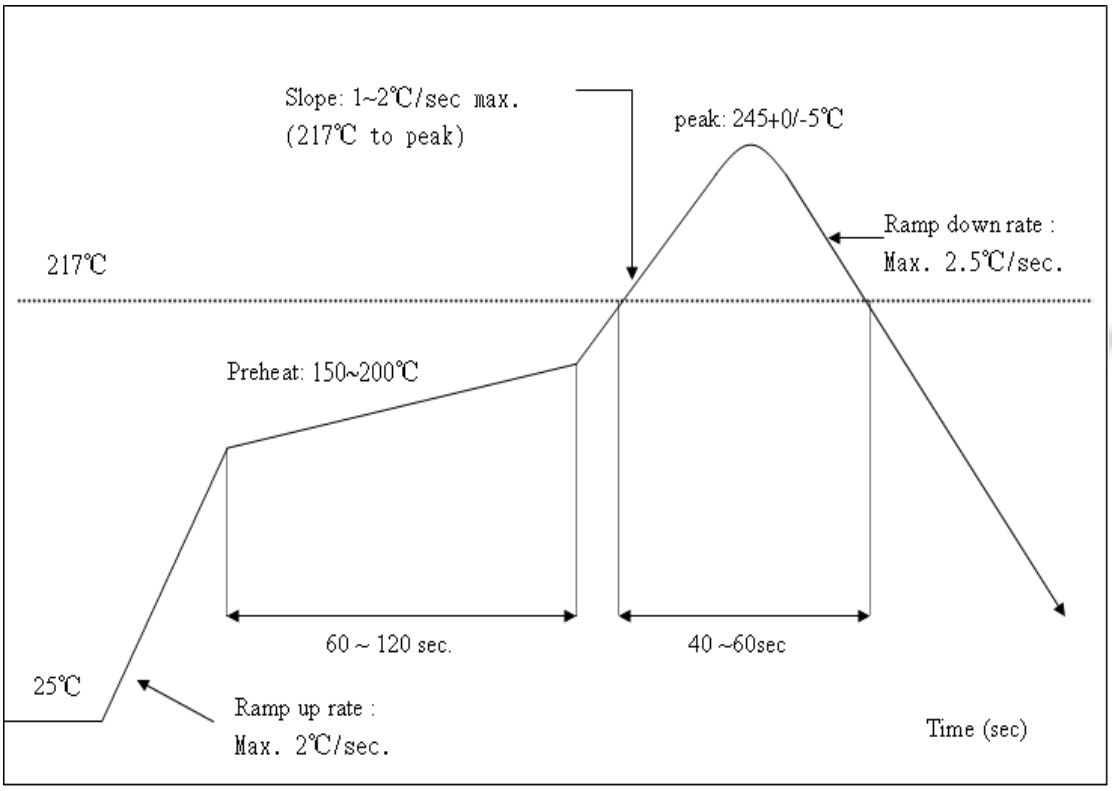
c. After baking, put proper amount of desiccant to seal packages.
(烘烤后，放入适量的干燥剂再密封包装)

10. Recommended Reflow Profile

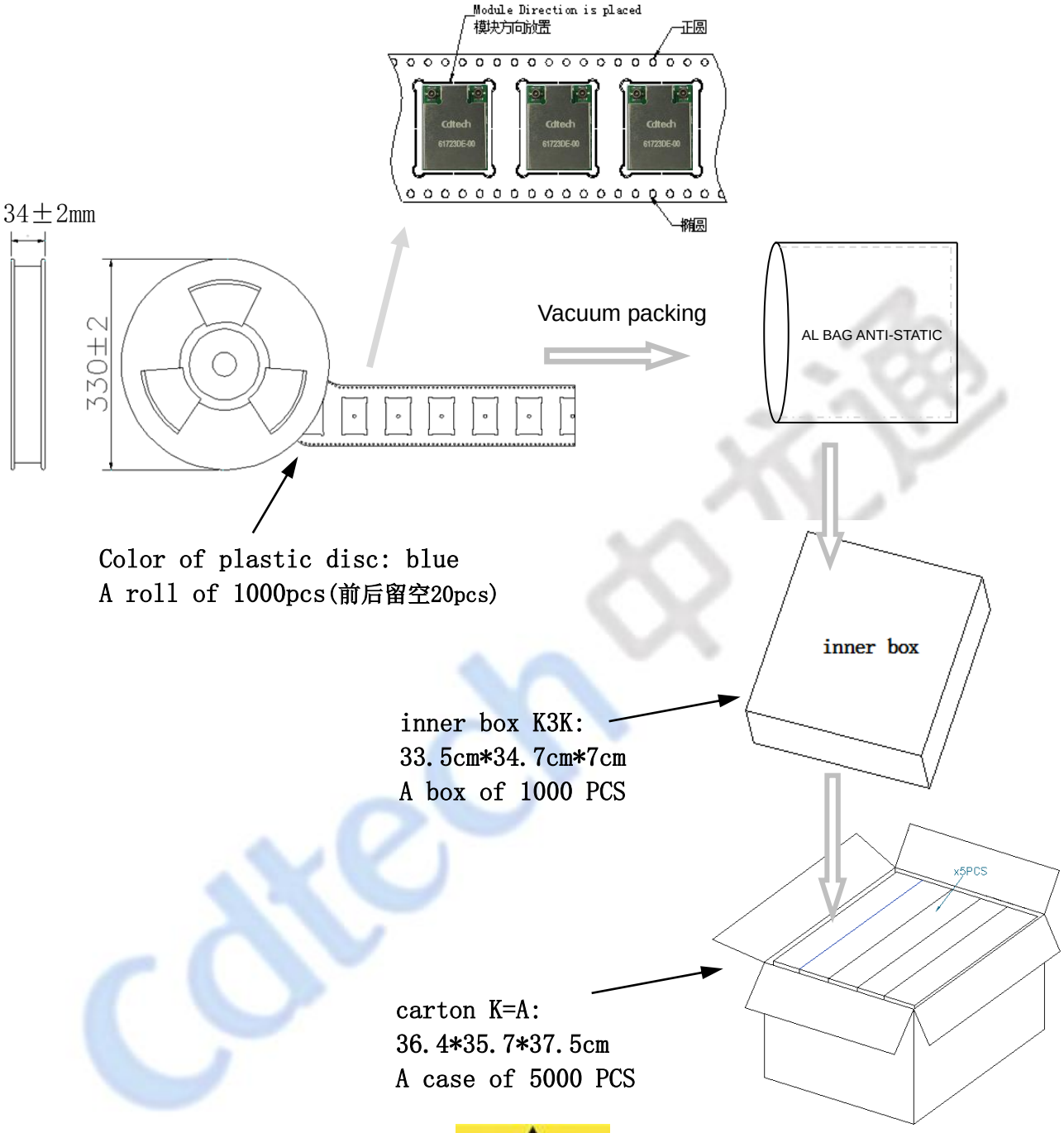
Referred IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : 2 times



11. Packing information



ESD CAUTION

The 61723DE-00 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although 61723DE-00 is with built-in ESD protection circuitry, 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-CDW61723DE

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.3

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 one external antenna, support 2.4GHz WIFI and BT, Yes, the module have a unique antenna connector, The antenna gain is 2dBi.

2.4 Limited module procedures

If a modular transmitter is approved as a "limited module," then the module manufacturer isresponsible 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 Limited Single Modular.

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-CDW61723DE

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 one external antenna, Yes, the module have a unique antenna connector, The antenna gain is 2dBi.

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-CDW61723DE

2.9 Information on test modes and additional testing requirements5

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: WiFiRanger, 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 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 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.