CDW-61821CE-00

WiFi 11ac + BT 5.0 Module Spec

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	2020.08.15

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更改记录：

Reversion History：

版本 Version	日期 Date	更改内容 Modification
1.0	2020.08.15	First release

1. Overview

The 61821CE-00 is a single-die wireless local area network (WLAN) and Bluetooth (BT) combination solution to support 1 × 1 IEEE 802.11a/b/g/n/ac WLAN standards and BT 5.0 + HS, enabling seamless integration of WLAN/BT and low-energy technology.

2. Features

- Support a low-power PCIe 2.1 interface for WLAN and a USB2.0 interface for BT
- Support 802.11ac 1x1, Wave-2 compliant with MU-MIMO STA mode
- Support WLAN 2.4GHz and 5GHz band channels
- Supports 20 MHz/40 MHz at 2.4 GHz and supports 20 MHz, 40 MHz, or 80 MHz a t 5 GHz
- Support PCIe LTR/L1.OFF state supported
- Supports Bluetooth 5.0 system
- Bluetooth 5.0 Dual Mode support(Simultaneous LE and BR/EDR)
- Supports multipel Low Energy states

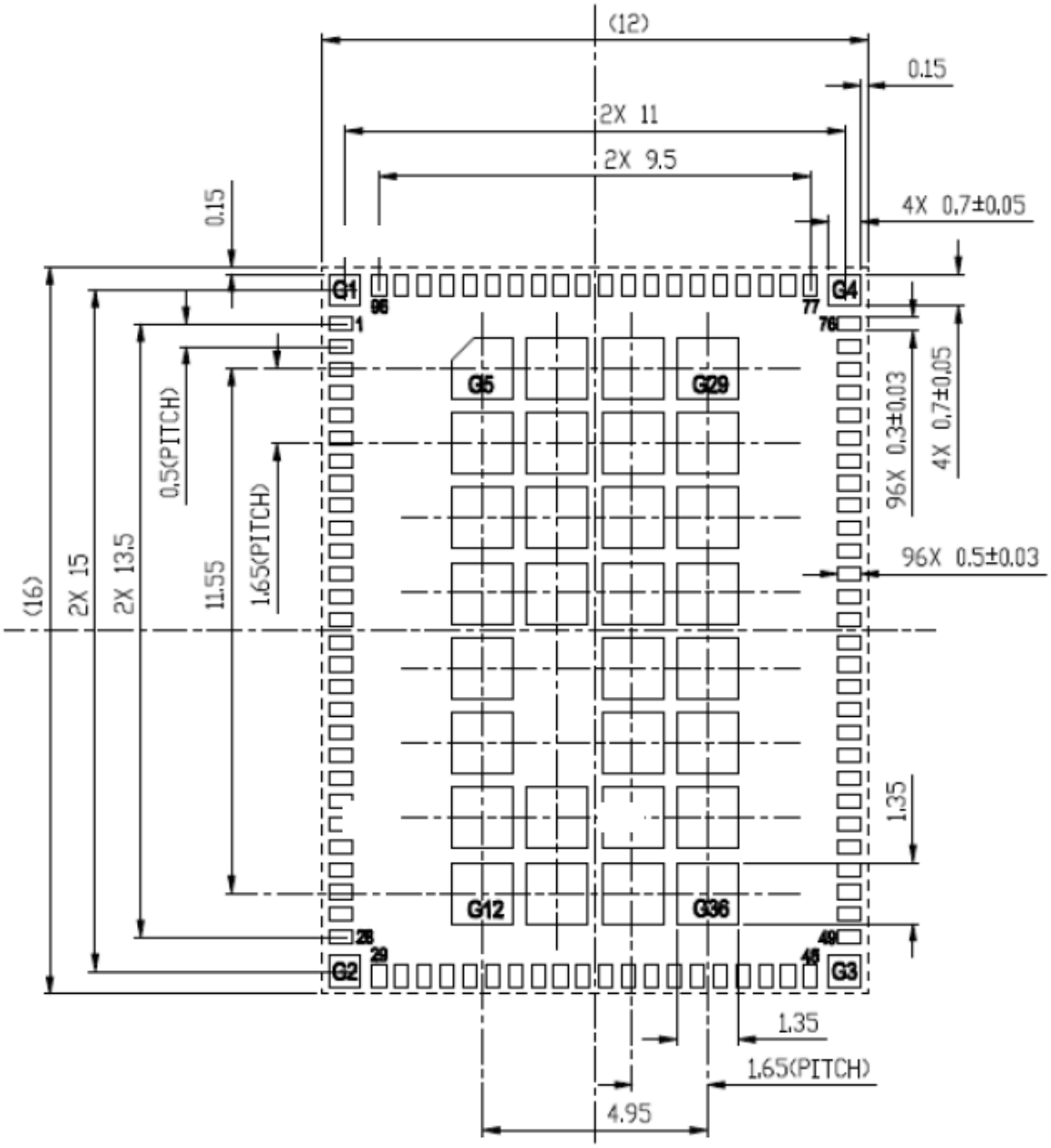
3. General Specification

Model	CDW-61821CE-00
Product Name	WLAN 11a/b/g/n/ac PCIe 1T1R + Bluetooth 5.0 module
Major Chipset	RTL8821CE -CG
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	PCIe
BT Interface	USB
Operating Temperature	-20 °C ~ 65 °C
Storage Temperature	-40 °C ~ 85 ℃
Humidity	5% to 90% maximum
Dimension	16x12x2.0 (LxWxH) ±0.2mm

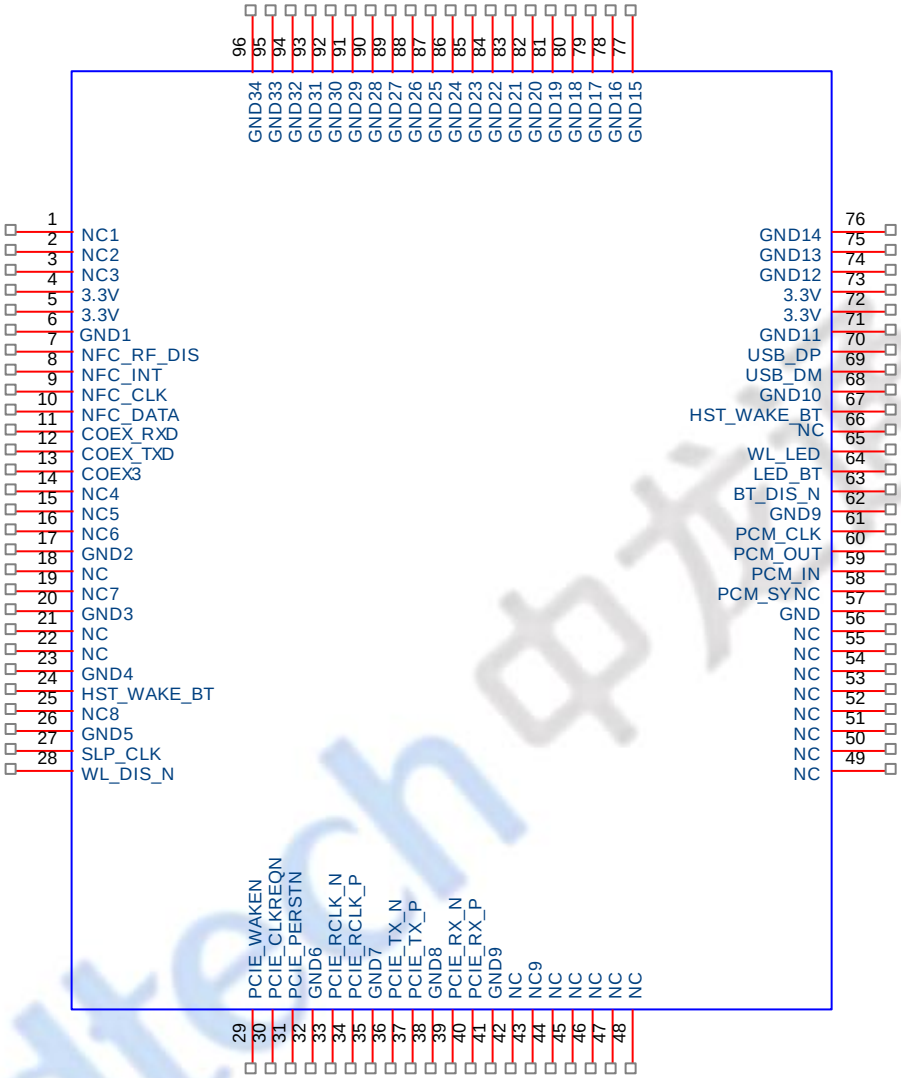
4. Electrical Characteristics

symbol	Parameter	Minimum	Typical	Maximum	Units
3.3V	3.3V supply voltage	3.0	3.3	3.6	V
Current	3.3V rating current	--	--	1000	mA

5. Layout Recommendation(Unit: mm)



6. Pin Description



NO.	Name	Type	Description
1	NC	—	No connect
2	NC	—	RF I/O port (2.4G and 5G)
3	NC	—	No connect
4	3.3V	P	3.3V INPUT
5	3.3V	P	3.3V INPUT
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	GPIO6
12	COEX_TXD	I/O	GPIO12
13	COEX3	I/O	GPIO7
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
25	NC	—	No connect
26	GND	—	Ground connections
27	SLP_CLK	I	External 32.768KHz input
28	WL_DIS_N	I	Enable pin for WL device(GPIO9)
29	PCIE_WAKEN	I/O	PCIe wake signal（active low）
30	PCIE_CLKREQN	I/O	PCIe clock request(active low)
31	PCIE_PERSTN	I	PCIe host indication to reset the device
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)
59	PCM_IN	I	PCM_IN (input)(GPIO0)
60	PCM_OUT	O	PCM_OUT (output)(GPIO1)
61	PCM_CLK	I	PCM_CLK (input)(GPIO3)
62	GND	—	Ground connections
63	BT_DIS_N	I	Enable pin for BT device(GPIO7)
64	BT_LED	O	BT_LED
65	WL_LED	O	WL_LED
66	NC	—	No connect
67	HST_WAKE_BT	I	GPIO13
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
73	3.3V	P	3.3V INPUT
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

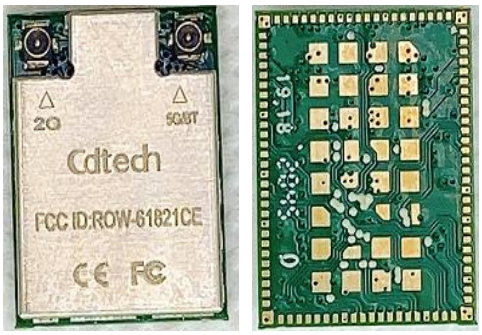
84	GND	—	Ground connections
85	GND	—	Ground connections
86	GND	—	Ground connections
87	GND	—	Ground connections
88	GND	—	Ground connections
89	GND	—	Ground connections
90	GND	—	Ground connections
91	GND	—	Ground connections
92	GND	—	Ground connections
93	GND	—	Ground connections
94	GND	—	Ground connections
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
RF_Switch	QWave Richwave
Crystal	FK , TKD, JWT
PCBA	A, O, I,F
Diplexer	TDK, ACX, Walsin, GLEAD, Sunlord
Power inductance	Sunlord, CHILISIN, SAMWHA
Capacitance	SAMSUNG /EYANG
resistance	UniOhm /YAGEO

8. Physical photo

61821CE-00



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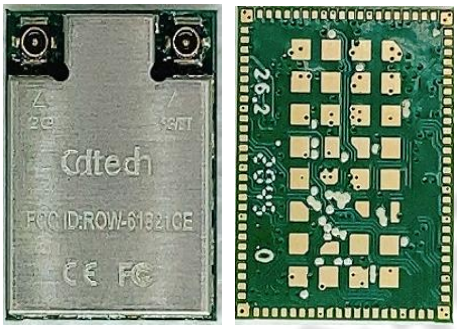

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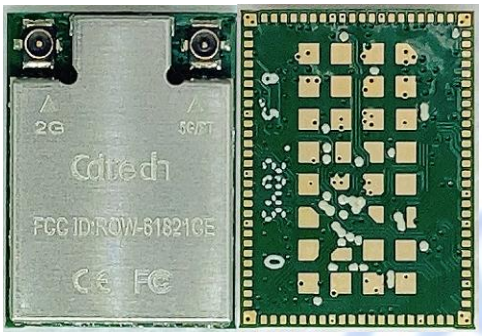
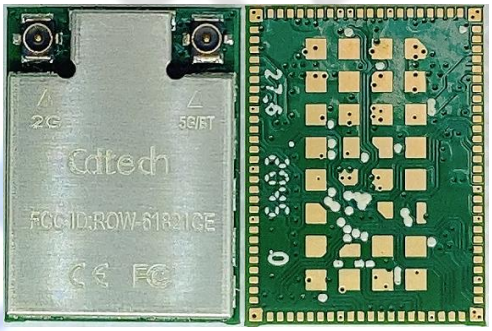


61821CE-11

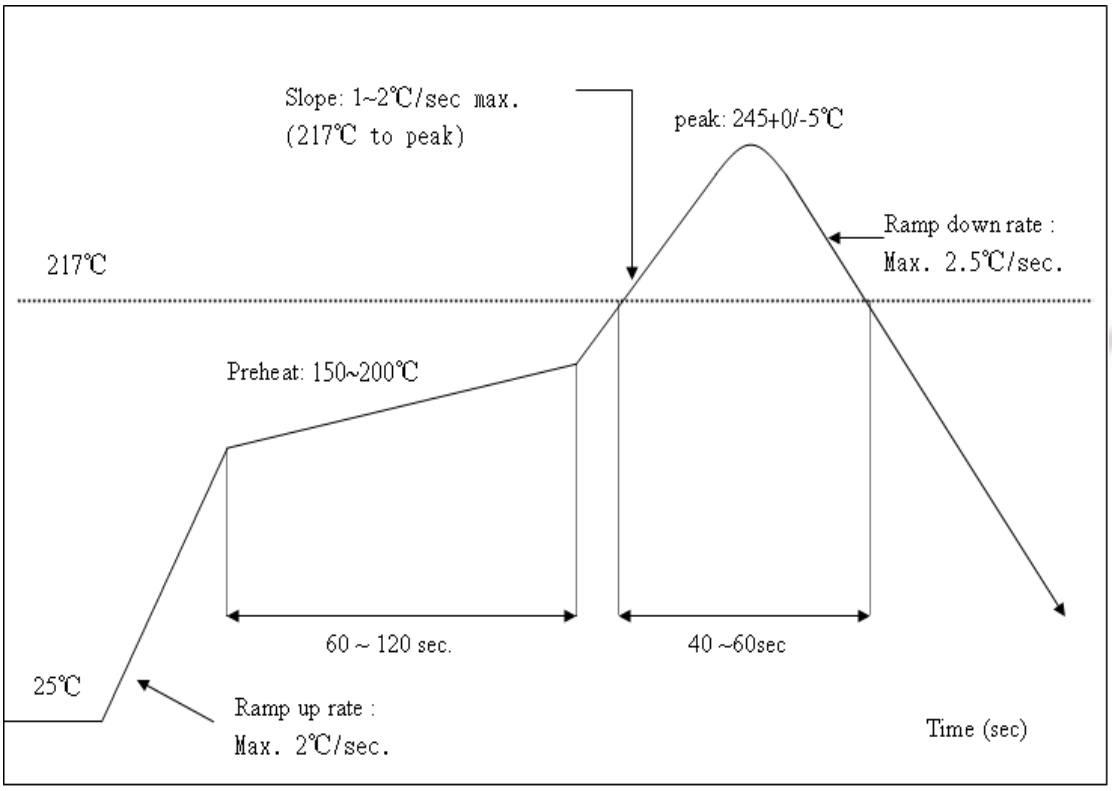


9. Recommended Reflow Profile

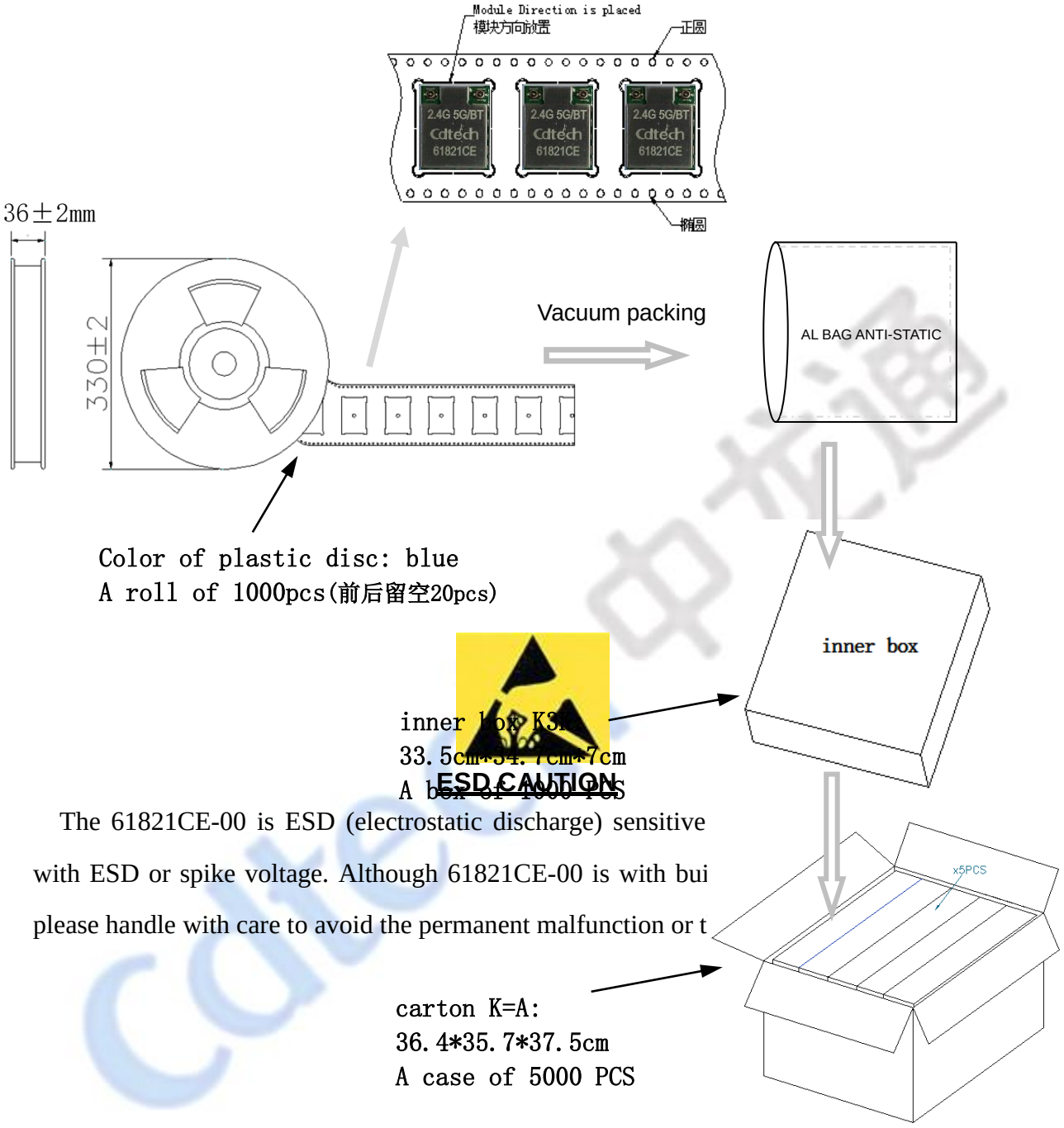
Referred IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : 2 times



10. Packing information



inner box K3:
33.5cm*34.7cm*7cm
A box of 1000 PCS

The 61821CE-00 is ESD (electrostatic discharge) sensitive with ESD or spike voltage. Although 61821CE-00 is with bui please handle with care to avoid the permanent malfunction or t

carton K=A:
36.4*35.7*37.5cm
A case of 5000 PCS

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 FCC ID is: ROW-61821CE.

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, This module meets the requirements of FCC part 15E(15.407).it specifically establish the 6dB Bandwidth, 26 dB and 99% Emission Bandwidth, Peak Output Power, Radiated Spurious Emission, Power Spectral Density, Restricted Band of Operation and Band Edge (Out of Band Emissions) , Frequency Stability 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 two PIFA antenna, Antenna A support 5GHz WIFI and BT, Antenna B support 2.4GHz WIFI, Yes, the module have a unique antenna connector, The antenna gain is 2.4G WIFI:2.27dBi, BT: 0.97dBi, 5.1G: 2.53dBi, 5.3G WIFI:1.11dBi, 5.8G WIFI:2.01dBi.

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 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-61821CE.

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 two PIFA antenna, Yes, the module have a unique antenna connector, The antenna gain is 2.4G WIFI:2.27dBi, BT: 0.97dBi, 5.1G: 2.53dBi, 5.3G WIFI:1.11dBi, 5.8G WIFI:2.01dBi.

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-61821CE

2.9 Information on test modes and additional testing requirements[5]

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.