

CDI-WX9721DC-00

WLAN 802.11 a/b/g/n+BLE5.0 Module Spec
(UART, 1 antenna type,with shielding)

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
			V1.1	2025.11.26

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更改记录:

Reversion History:

版本 Version	日期 Date	更改内容 Modification
1.0	2025.10.18	First release
1.1	2025.11.26	The update features built-in 128Mbit FLASH memory

1.Overview

CDI-WX9721DC-00 be based on RTL8721DCM-VA3-CG designed module , it is a highly integrated single-chip low power dual bands (2.4GHz and 5GHz) Wireles LAN (WLAN) and Bluetooth Low Energy (BLE 5.0)communication controller. It consists of a high performance MCU (Armv8-M, Cortex-M33 instruction set compatible) called Real-M300 (or KM4thereafter) and alow power MCU (Armv8-M,Cortex-M23 instruction set compatible) called RealM200 or KM0 thereafter) ,WLAN (802.11a/b/g/n) MAC, an 1T1R capable WLAN baseband, RF, Bluetooth and peripherals.

There are also audio codec, Key-Scan and touch kevs integrated into this IC Besides, High speed connectivity interfaces, SD1 and USB are provided. flexible design configures GPIO to different functions according to applications.

2.Features

- Wi-Fi 802.11 a/b/g/n 1x1, 2.4GHz &5GHz
- Supports 20MHz/40MHz up to MCS7
- Internal PTA interface for arbitrating data transmission between Wi-Fi and internal Bluetooth or external 2.4G devices
- Both central and peripheral modes
- BLE 5.0
- Low power beacon listen mode
- The module has 128Mbit FLASH memory

4.General Specification

Model	CDI-WX9721DC-00
Product Name	WLAN 802.11 a/b/g/n+BLE5.0 Module Spec
Major Chipset	RTL8721DCM-VA3-CG
FLASH	GD25Q128ESIG 128Mbit
Standard	802.11 a/b/g/n
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM
Frequency Band	Dual band 2.4GHz&5GHz ISM
Interface	UART
Operating Temperature	-20~ 70°C ambient temperature
Storage Temperature	-40 ~ 85°C ambient temperature
Humidity	5% to 90 % maximum (non-condensing)
Dimension	30.0x20.0 x3.0(L*W*H) ±0.2mm

5. RF Specification

2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11b/g/n WiFi compliant
Frequency Range	2.412 GHz ~ 2.462 GHz
Number of Channels	2.4GHz: Ch1 ~ Ch11
Modulation	802.11b: CCK 802.11g/n: BPSK,QPSK,16QAM,64QAM/OFDM
Output Power	802.11b / 11Mbps:17.5±2dBm @ EVM ≤ -10dB 802.11g / 54Mbps:16±2dBm @ EVM ≤ -25dB 802.11n / MCS7 HT20/HT40:16±2dBm @ EVM ≤ -28dB
Receive Sensitivity 11b@8%PER	11Mbps PER @ -83dBm
Receive Sensitivity 11g@10%PER	54Mbps PER @ -71dBm
Receive Sensitivity 11n@10%PER	MCS7 PER @ -68dBm

5GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11a/n WiFi compliant
Frequency Range	5.18 GHz ~ 5.825 GHz
Number of Channels	CH36~CH165(20M) CH38~CH159(40M)
Modulation	802.11a: BPSK,QPSK,16QAM,64QAM/OFDM 802.11n: BPSK,QPSK,16QAM,64QAM/OFDM
Output Power	802.11a / 54Mbps:15±2dBm @ EVM ≤ -25dB 802.11n / MCS7 HT20/HT40:14±2dBm @ EVM ≤ -28dB
Receive Sensitivity 11a@10%PER	54Mbps PER @ -71dBm
Receive Sensitivity 11n@10%PER	MCS7 PER @ -68dBm

BLE RF Specification

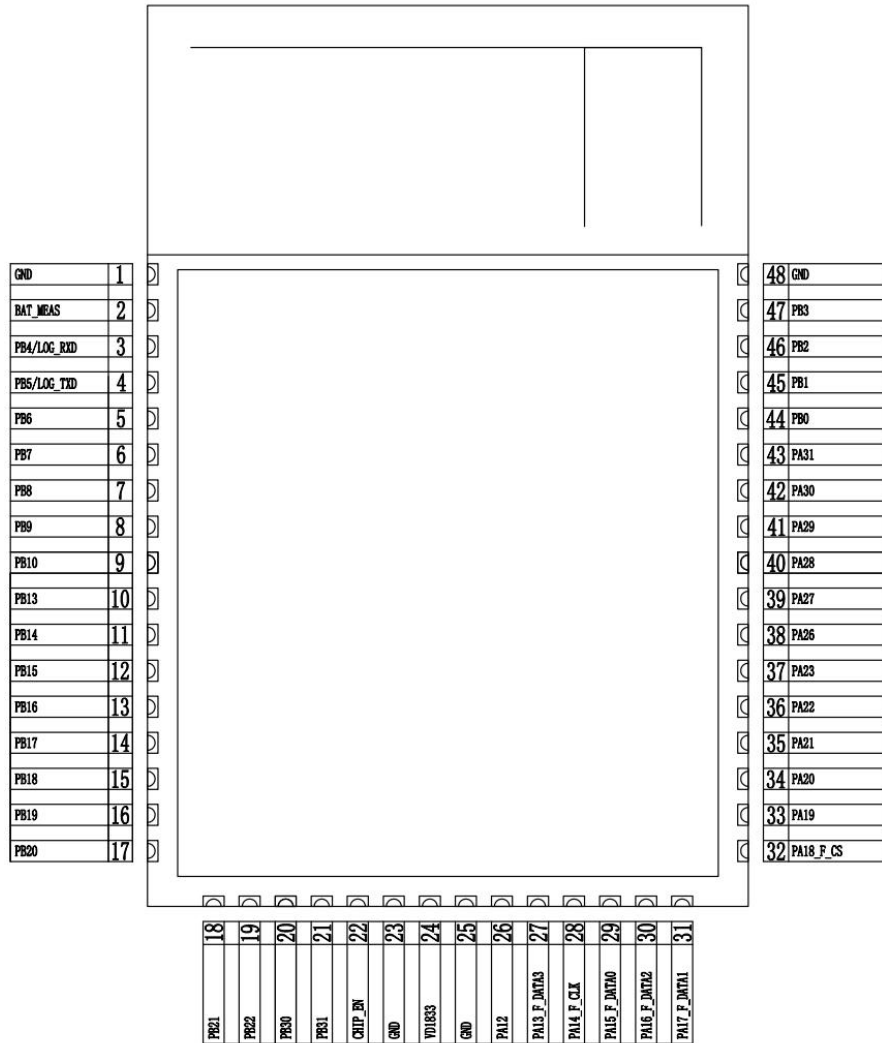
Feature	Description
WLAN Standard	BLE5.0 1M/2Mbps
Frequency Range	2402MHz~2480MHz
Number of Channels	40 chnannels for BLE
Modulation	GFSK
Output Power	normal power 2±2dBm ,BLE low power < -20dbm
Receive Sensitivity @BER=1% FOR GFSK(1Mbps)	PER @ -86dBm
Receive Sensitivity @PER=30.8% FOR BLE	PER @ -90dBm

6.Electrical Characteristics

symbol	Parameter	Minimum	Typical	Maximum	Units
VBAT/VDD	3.3V supply voltage	2.97	3.3	3.63	V
VBAT/VDD	current	--	--	500	mA

Figure 1: Top view of the structure. The overall dimensions are 20.00m (width) and 21.70m (length). The central rectangular area has a width of 15.60m and a length of 19.20m. The structure is composed of several rectangular sections with various offsets and gaps. Key dimensions include 1.85m, 1.20m, 0.70m, 0.35m, 0.50m, 0.70m, 0.50m, 1.20m, 0.65m, and 0.50m. The total width of the structure is 20.00m, and the total length is 21.70m.

Figure 2: Side view of the structure. The overall dimensions are 3.00m (width) and 8.30m (height). The structure is composed of several rectangular sections with various offsets and gaps. Key dimensions include 1.00m, 2.00m, 1.85m, 1.20m, 0.70m, 0.35m, 0.50m, 0.70m, 0.50m, 1.20m, 0.65m, and 0.50m. The total width is 3.00m, and the total height is 8.30m.



NO	Name	Description
1	GND	Ground connections
2	BAT_MEAS	Pin for battery voltage measurement
3	PB4/LOG_RXD	The default function is LOGUART Rx, and it can be configured as other functions after IC boot. If it is configured as a GPIO function, the LOGUART function becomes invalid.
4	PB5/LOG_TXD	The default function is LOGUART Tx, and it can be configured as other functions after IC boot. If it is configured as a GPIO function, the LOGUART function becomes invalid.
5	PB6	The default function is general-purpose input/output, and it can be configured as other functions
6	PB7	The default function is general-purpose input/output, and it can be configured as other functions
7	PB8	The default function is general-purpose input/output, and it

		can be configured as other functions
8	PB9	The default function is general-purpose input/output, and it can be configured as other functions
9	PB10	The default function is general-purpose input/output, and it can be configured as other functions
10	PB13	The default function is general-purpose input/output, and it can be configured as other functions
11	PB14	The default function is general-purpose input/output, and it can be configured as other functions
12	PB15	The default function is general-purpose input/output, and it can be configured as other functions
13	PB16	The default function is general-purpose input/output, and it can be configured as other functions
14	PB17	The default function is general-purpose input/output, and it can be configured as other functions
15	PB18	The default function is general-purpose input/output, and it can be configured as other functions
16	PB19	The default function is general-purpose input/output, and it can be configured as other functions
17	PB20	The default function is general-purpose input/output, and it can be configured as other functions
18	PB21	The default function is general-purpose input/output, and it can be configured as other functions
19	PB22	The default function is general-purpose input/output, and it can be configured as other functions
20	PB30	Wakeup pin. This pin should be maintained PU during reset. The default function is general-purpose input/output, and it can be configured as other functions.
21	PB31	Wakeup pin. The IC operating mode is determined by the level of trap pin PB31/TM_DIS during the process of power on. 1: Normal mode 0: Test mode The default function is general-purpose input/output, and it can be configured as other functions
22	CHIP_EN	Chip enable or shut-down selected pin. 1: Enable the chip 0: Shut down the chip
23	GND	Ground connections
24	VD1833	Power Supply
25	GND	Ground connections
26	PA12	The default function is general-purpose input/output, and it can be configured as other functions.
27	PA13_F_DATA3	The default function is general-purpose input/output, and it can be configured as other functions.

		FLASH:PA13_F_DATA3	
28	PA14_F_CLK	The default function is general-purpose input/output, and it can be configured as other functions. FLASH:PA14_F_CLK	
29	PA15_F_DATA0	The default function is general-purpose input/output, and it can be configured as other functions. FLASH:PA15_F_DATA0	
30	PA16_F_DATA2	The default function is general-purpose input/output, and it can be configured as other functions. FLASH:PA16_F_DATA2	
31	PA17_F_DATA1	The default function is general-purpose input/output, and it can be configured as other functions. FLASH:PA17_F_DATA1	
32	PA18_F_CS	The default function is general-purpose input/output, and it can be configured as other functions. FLASH:PA18_F_CS	
33	PA19	The default function is general-purpose input/output, and it can be configured as other functions.	
34	PA20	The default function is general-purpose input/output, and it can be configured as other functions.	
35	PA21	The default function is general-purpose input/output, and it can be configured as other functions.	
36	PA22	The default function is general-purpose input/output, and it can be configured as other functions.	
37	PA23	The default function is general-purpose input/output, and it can be configured as other functions.	
38	PA26	The default function is general-purpose input/output, and it can be configured as other functions.	
39	PA27	The default function is general-purpose input/output, and it can be configured as other functions.	
40	PA28	The default function is general-purpose input/output, and it can be configured as other functions.	
41	PA29	The default function is general-purpose input/output, and it can be configured as other functions.	
42	PA30	The default function is SWD CLK, and it can be configured as other functions after IC boot.	
43	PA31	The default function is SWD DATA, and it can be configured as other functions after IC boot.	
44	PB0	The default function is general-purpose input/output, and it can be configured as other functions.	
45	PB1	The default function is general-purpose input/output, and it can be configured as other functions.	
46	PB2	The default function is general-purpose input/output, and it	

		can be configured as other functions.
47	PB3	The default function is general-purpose input/output, and it can be configured as other functions.
48	GND	Ground connections

8.Supplier

Supplier list	
Name of material	Material brand
Crystal	FJ /JWT /KYX /TKD
Duplexer	ACX/Walsin/GLEAD/TDK/ Sunlord/FTR
Inductor	Sunlord/CHILISIN/SAMWHA/TDK/MuRata/INPAQ
WiFi chip	Realtek
Capacitance	SAMSUNG /EYANG/ WALSIN/ MuRata/TAIYO/ Darfon
FLASH	MXIC/Winbond/ZBIT/Fudan/GigaDevice
Switch	Maxscend/RichWave/GSR
PCB	Bomin/Kexiang/Sunlord/Taijing

9.Warpage



Warpage Clearance Inspection Standard:

Place the module on a horizontal marble platform, measure the clearance between the module bottom and marble surface with a 0.1mm thickness feeler gauge. Requirement: gap $\leq$ 0.1 mm

10. Baking & storage temperature & Recommended Reflow Profile (烘烤, 储存温度和推荐炉温)

10.1 Baking & storage temperature

A. Storage life: 12 months. Storage conditions: <40°C. Relative humidity: <90%R.H.

(保存期限: 12个月, 储存环境条件: 温度在: <40°C, 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 $\leq 20\%RH$. 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: $t \leq 30^\circ C$, $\leq 60\%R.H$.

(工厂环境温度湿度管制: $\leq 30^\circ C$, $\leq 60\%R.H$, 168小时内。)

c. Once opened, the workshop the preservation of life for 168 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: $40^\circ C \pm 5^\circ C$, 120 hours. (烘烤温度条件: $40^\circ C \pm 5^\circ C$, 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)

D. Module reel packaging items as follows: (模块卷盘包装事项如下:)

a. Storage life: 12 months. Storage conditions: <40°C. Relative humidity: <90%R.H.

(保存期限: 12个月, 储存环境条件: 温度在: <40°C, 相对湿度: <90%R.H.)

b. Module apart packing after 168 hours, To launch patch need to bake, to move the module hygroscopic, baking temperature conditions: $125^\circ C$, 8 hours.

c. (模块拆开包装 168 小时后, 如要上线贴片需要重新烘烤, 以除去模块吸湿问题, 烘烤温度条件: $125^\circ C$, 8 小时。)

d. The actual number of module reel packing which is based on the actual number of packages to the customer requirements.

(模块卷盘包装以客户要求的实际包装数量为准。)

E. Module pallet packaging items as follows: (模块托盘包装事项如下:)

a. Storage life: 3 months. Storage conditions: <40°C. Relative humidity: <90%R.H.

b. (保存期限: 3个月, 储存环境条件: 温度在: <40°C, 相对湿度: <90%R.H.)

c. Module if not used within 48 hours, before launch the need for baking, baking temperature: $125^\circ C$, 8 hours.

d. (模块如在 48 小时内未使用, 在上线之前需要进行烘烤, 烘烤温度条件: $125^\circ C$, 8 小时。)

e. Pallet packaging each plate is 100 PCS. The actual number of module pallet packing which is based on the actual number of packages to the customer requirements.

f. (托盘包装每盘为 100pcs, 模块托盘包装以客户要求的实际包装数量为准。)

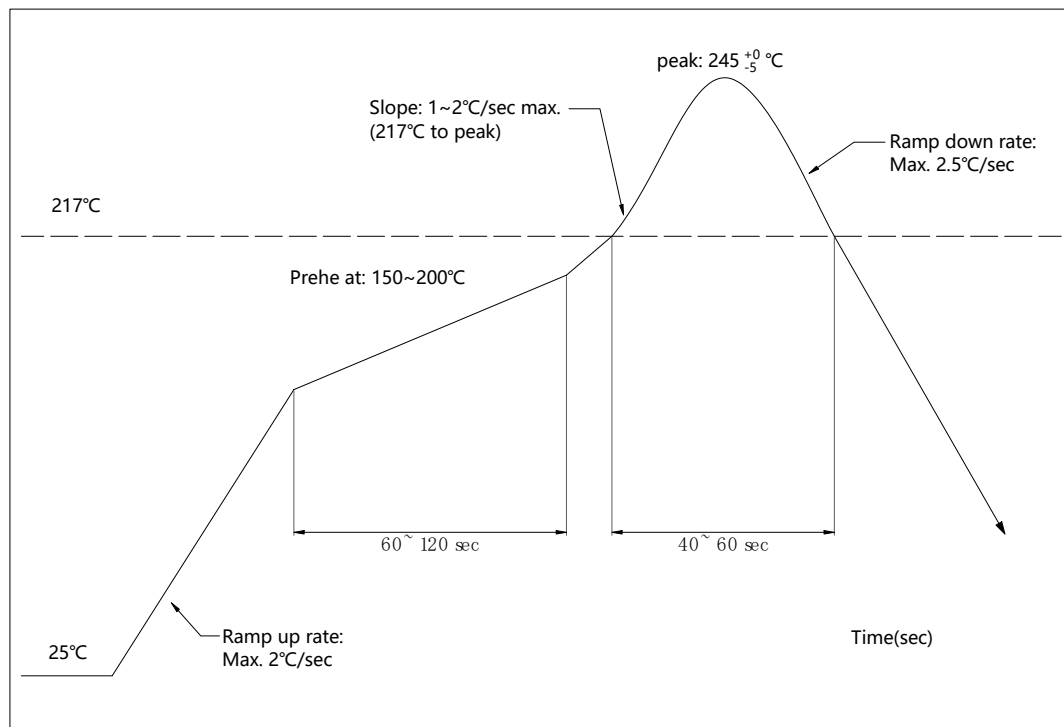
注: 以上包装方式根据客户要求而定, 包装以实际出货为准。

11. Recommended Reflow Profile

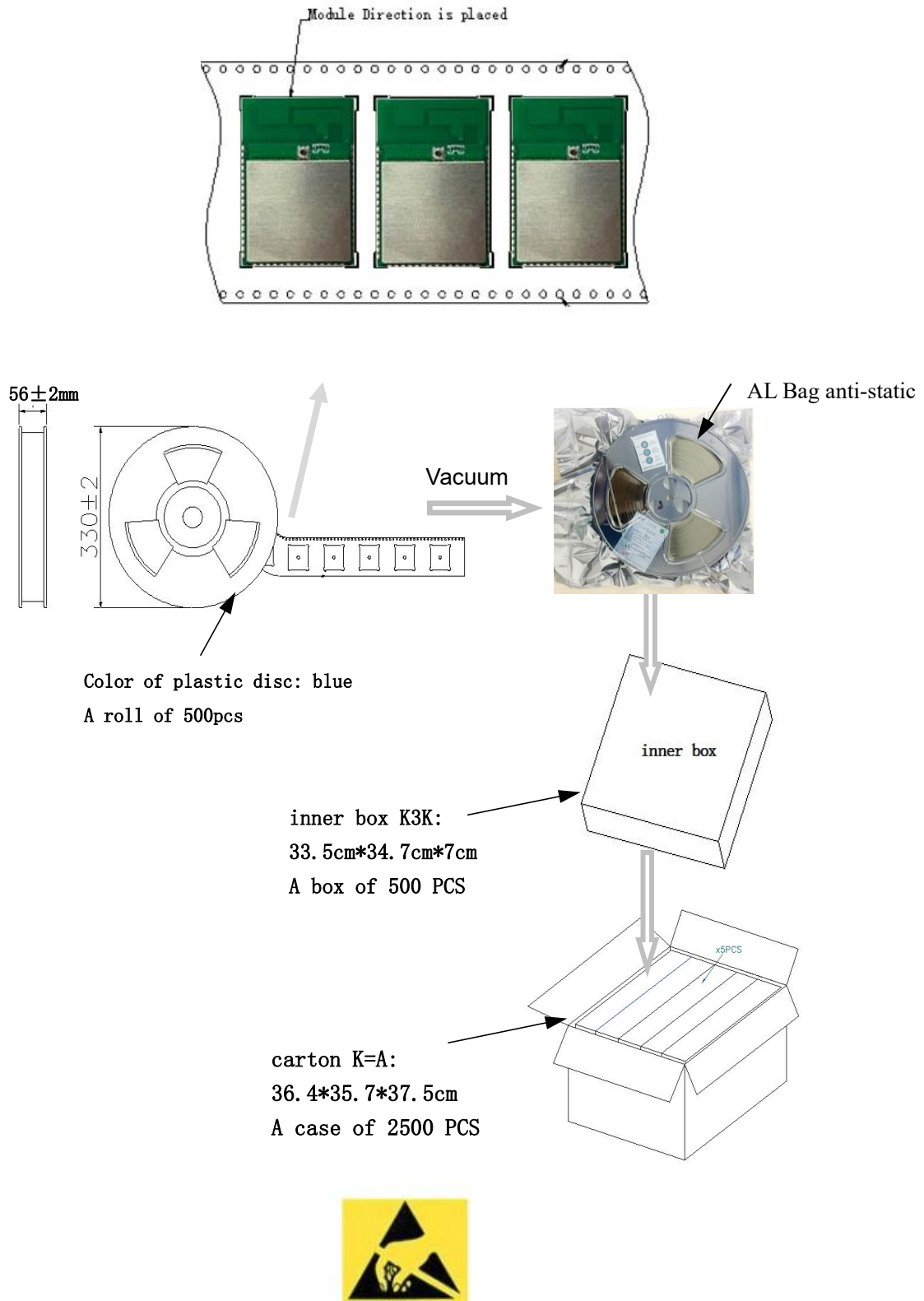
Referred IPC/JEDEC standard.

Peak Temperature : <250°C

Number of Times : ≤2 times



12. Packing information



The CDI-WX9721DC-00 is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although CDI-WX9721DC-00 is with built-in ESD protection circuitry,

please handle with care to avoid the permanent malfunction or the performance degradation.

Federal Communication Commission Interference Statement

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 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 other Parts, Part 15B Compliance Requirements for Host product manufacturer

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, 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.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

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.

FCC Declaration of Conformity

We **CHINA DRAGON (HUNAN) TECHNOLOGY CO., LTD.** declare under our sole responsibility that

CDI-WX9721DC-00 comply with Part 15 of FCC Rules.

FCC Radiation Exposure Statement

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

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

This device is intended only for OEM integrators under the following conditions:

- (1) The antenna must be installed such that 20 cm is maintained between the antenna and

users, and

(2) The transmitter module may not be co-located with any other transmitter or antenna,

IMPORTANT NOTE:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling

This transmitter module is authorized only for use in device where the antenna may be installed

such that 20 cm may be maintained between the antenna and users. The final end product must be labelled in a visible area with the following: "Contains FCC ID: **2BFLD-WX9721D**".

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application, a separate approval is required for all

other operating configurations, including portable configurations with respect to §2.1093 and difference antenna configurations.

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

Antenna Change Notice to Host manufacturer

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host

manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

Industry Canada Statement

This device complies with license-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS standard(s).

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.*

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence.

L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et*
- (2) l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.*

The device meets the exemption from the routine evaluation limits in section 2.5 of RSS 102 and compliance with RSS-102 RF exposure, users can obtain Canadian information on RF exposure and compliance.

Le dispositif rencontre l'exemption des limites courantes d'évaluation dans la section 2.5 de RSS 102 et la conformité à l'exposition de RSS-102 rf, utilisateurs peut obtenir l'information canadienne sur l'exposition et la conformité de rf.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body.

Cet émetteur ne doit pas être Co-placé ou ne fonctionnant en même temps qu'aucune autre antenne ou émetteur. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

This radio transmitter (IC:**32294-WX9271DC**) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

Le présent émetteur radio (IC:**32294-WX9271DC**) a été approuvé par Industrie Canada pour fonctionner avec

les types d'antenne énumérés ci-dessous et ayant un gain admissible maximal. Les types d'antenne non inclus dans cette liste, et dont le gain est supérieur au gain maximal indiqué, sont strictement interdits pour l'exploitation de l'émetteur.

Antenna Information

Model	Type	Connector	Peak gain (dBi)
ANT-2000-812	PCB 板载天线	N/A	5.70

Radiation Exposure Statement

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

Déclaration d'exposition aux radiations Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following condition:

- The transmitter module may not be co-located with any other transmitter or antenna.

As long as the condition above is met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.

Cet appareil est conçu uniquement pour les intégrateurs OEM dans les conditions suivantes:

- Le module émetteur peut ne pas être coïmplanté avec un autre émetteur ou antenne.

Tant que les 1 condition ci-dessus sont remplies, des essais supplémentaires sur l'émetteur ne seront pas nécessaires. Toutefois, l'intégrateur OEM est toujours responsable des essais sur son produit final pour toutes exigences de conformité supplémentaires requis pour ce module installé.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the ISSED ID cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

Note Importante:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considéré comme valide et l'ID ISSED ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

The final end product must be labeled in a visible area with the following: Contains IC:

:32294-WX9271DC

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: Contient des IC:

:32294-WX9271DC

Manual Information to the End User

The OEM integrator has to be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end product which integrates this module.

The end user manual shall include all required regulatory information/warning as show in this manual.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module. Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

the device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems

les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

Indoor use only.

13.NCC Warning

取得審驗證明之低功率射頻器材，非經核准，公司、商號或使用者均不得擅自變更頻率、加大功率或變更原設計之特性及功能。

低功率射頻器材之使用不得影響飛航安全及干擾合法通信；經發現有干擾現象時，應立即停用，並改善至無干擾時方得繼續使用。

前述合法通信，指依電信管理法規定作業之無線電通信。

低功率射頻器材須忍受合法通信或工業、科學及醫療用電波輻射性電機設備之干擾。