

CDW-B1800DL-01H

WiFi 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
			V1.1	2025.03.18

深圳市中龙通电子科技有限公司
CHINA DRAGON TECHNOLOGY LIMITED

公司地址：深圳市宝安区沙井街道南浦路林坡坑蚝三第一工业园 B4 栋

电话：(86 755) 81449957

传真：(86 755) 81449967

E-mail: Info@cdtech.cn

[Http://www.cdtech.cn](http://www.cdtech.cn)

CDW-B1800DL_Series Module Datasheet

Module Type	Description	Remark
CDW-B1800DL-00	AIC8800DL, b/g/n/ax, single band, BW40M, 1T1R, wifi (USB2.0) +BT5.2 (USB2.0), 1-ANT type, no shielding	
CDW-B1800DL-10	AIC8800DL, b/g/n/ax, single band, BW40M, 1T1R, wifi (USB2.0) +BT5.2 (USB2.0), IPEX-ANT type, no shielding	
CDW-B1800DL-00H	AIC8800DL, b/g/n/ax, single band, BW40M, 1T1R, wifi (USB2.0) +BT5.2 (USB2.0), 1-ANT type, no shielding	IC
CDW-B1800DL-10H	AIC8800DL, b/g/n/ax, single band, BW40M, 1T1R, wifi (USB2.0) +BT5.2 (USB2.0), IPEX-ANT type, no shielding	IC
CDW-B1800DL-01H	AIC8800DL, b/g/n/ax, single band, BW40M, 1T1R, wifi (USB2.0) +BT5.2 (USB2.0), 1-ANT type, Have shielding	

更改记录:

Reversion History:

版本 Version	日期 Date	更改内容 Modification
1.0	2024.06.12	First release
1.1	2025.03.18	Add CDW-B1800DL-01H module

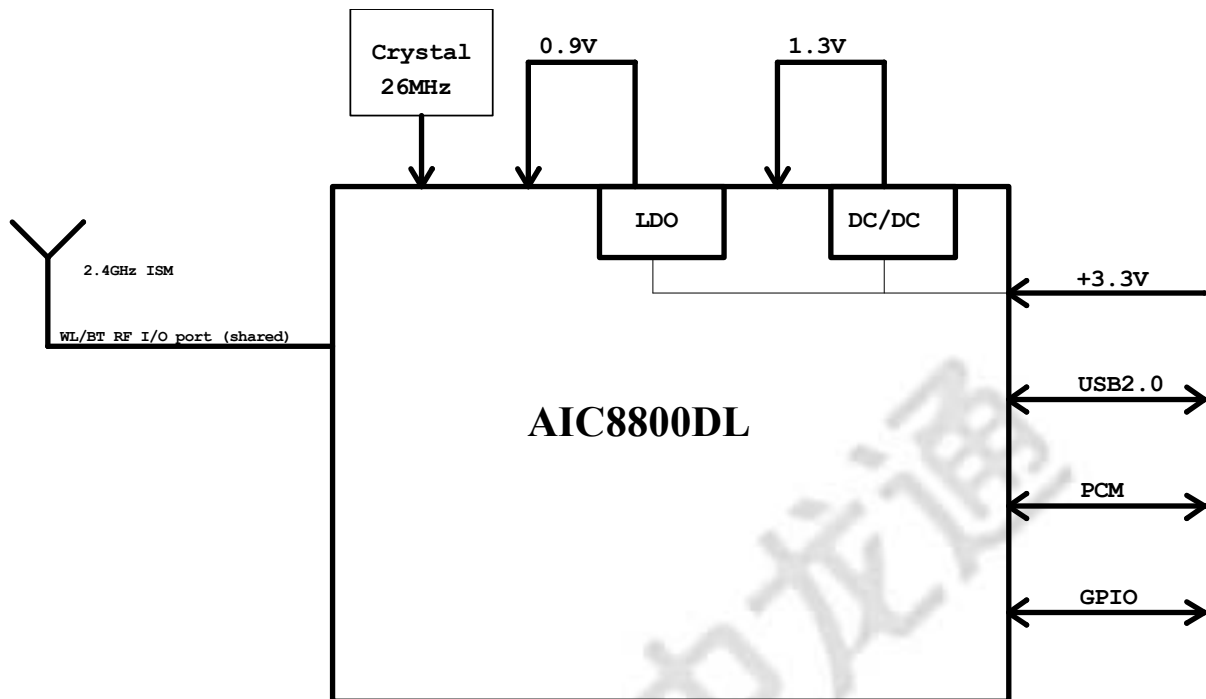
1. Overview

The CDW-B1800DL-01H module is a highly integrated chip 2.4GHz Wi-Fi6, BLE5.2 for wireless application.

2. Features

- CMOS single-chip fully-integrated RF, Modem and MAC
- Support 2.4GHz Wi-Fi6
- Support 20/40MHz bandwidth
- Data rates up to 286.8Mbps@TX and 229.4Mbps@RX
- Support STA, AP, Wi-Fi Direct modes concurrently
- Support STBC, beamforming
- Support Wi-Fi6 TWT
- Support MU-MIMO, OFDMA
- Support Two NAV, Buffer Report, Spatial reuse, Multi-BSSID, intra-PPDU power save
- Support LDPC
- Support DCM, Mid-amble, UORA
- Support WEP/WPA/WPA2/WPA3-SAE Personal, MFP
- Supports USB2.0 interface
- Integrated low power timer and watchdog
- Supports all the mandatory and optional features of Bluetooth Low Energy
- Supports advanced master and slave topologies
- Use an optimization method to assess channel quality, AFH enhancement

3. Block Diagram



4. General Specification

Model	CDW-B1800DL-01H
Product Name	WiFi module
Major Chipset	AIC8800DL
Standard	802.11b/g/n/ax
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM/256-QAM/1024-QAM
Frequency Band	2.4GHz
WiFi Interface	USB2.0
BLE Interface	USB2.0
Operating Temperature	-20° C ~ 70° C
Storage Temperature	-20° C ~ 85°C
Humidity	5% to 90% maximum
Moisture Sensitivity Level	MSL3

5. RF Specification

A. WiFi RF Specification

Feature	Description
WLAN Standard	IEEE 802.11b/g/n/ax WiFi compliant
Frequency Range	2.400 GHz ~ 2.483.5 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz : Ch1 ~ Ch11
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM, 16-QAM, QPSK, BPSK 802.11 ax : OFDM /256-QAM, 64-QAM, 16-QAM, QPSK, BPSK
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -97dBm, typical
	- 2Mbps PER @ -95dBm, typical
	- 5.5Mbps PER @ -92dBm, typical
	- 11Mbps PER @ -89dBm, typical
Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -91dBm, typical
	- 9Mbps PER @ -89dBm, typical
	- 12Mbps PER @ -86dBm, typical
	- 18Mbps PER @ -83dBm, typical
	- 24Mbps PER @ -80dBm, typical
	- 36Mbps PER @ -77dBm, typical
	- 48Mbps PER @ -74dBm, typical
	- 54Mbps PER @ -72dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -90dBm, typical
	- MCS=1 PER @ -87dBm, typical
	- MCS=2 PER @ -84dBm, typical
	- MCS=3 PER @ -81dBm, typical
	- MCS=4 PER @ -78dBm, typical
	- MCS=5 PER @ -75dBm, typical

B. Bluetooth Specification

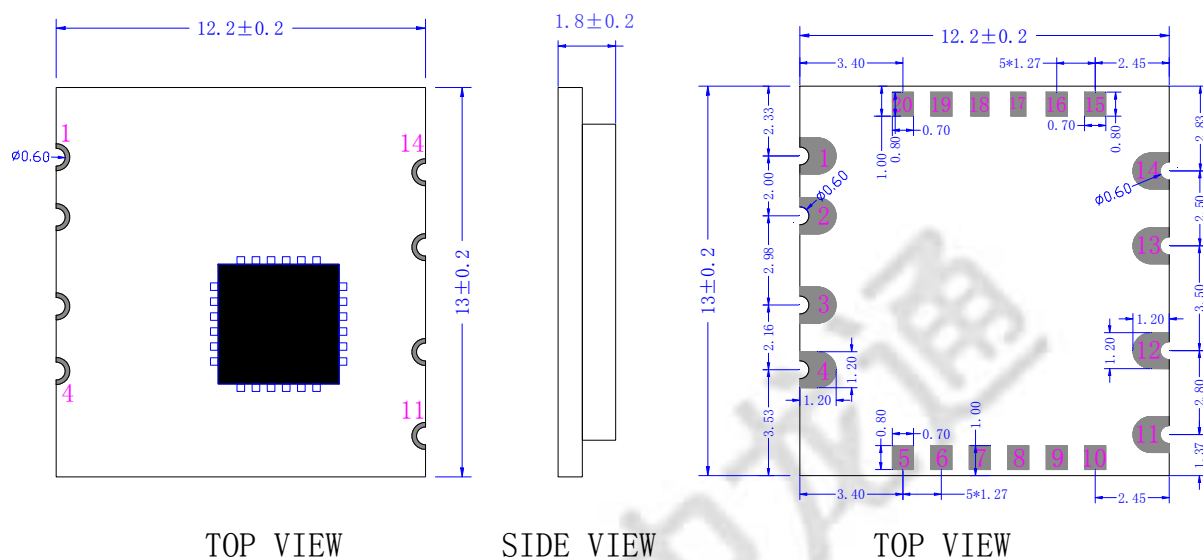
Feature	Description
General Specification	
Bluetooth Standard	BLE5.2
Host Interface	USB
Frequency Band	2402 MHz ~ 2480 MHz
Number of Channels	BLE:40 channels
RF Specification	
Output Power, tolerance ± 2 dBm	
Sensitivity, tolerance ± 2 dBm	
Sensitivity @ BLE=30.8% for LE(1Mbps)	-90 dBm
Sensitivity @ BLE=30.8% for LE(2Mbps)	-91 dBm
Maximum Input Level	GFSK(1Mbps): -20 dBm
	GFSK(2Mbps): -20 dBm

6. Recommended Operating Rating

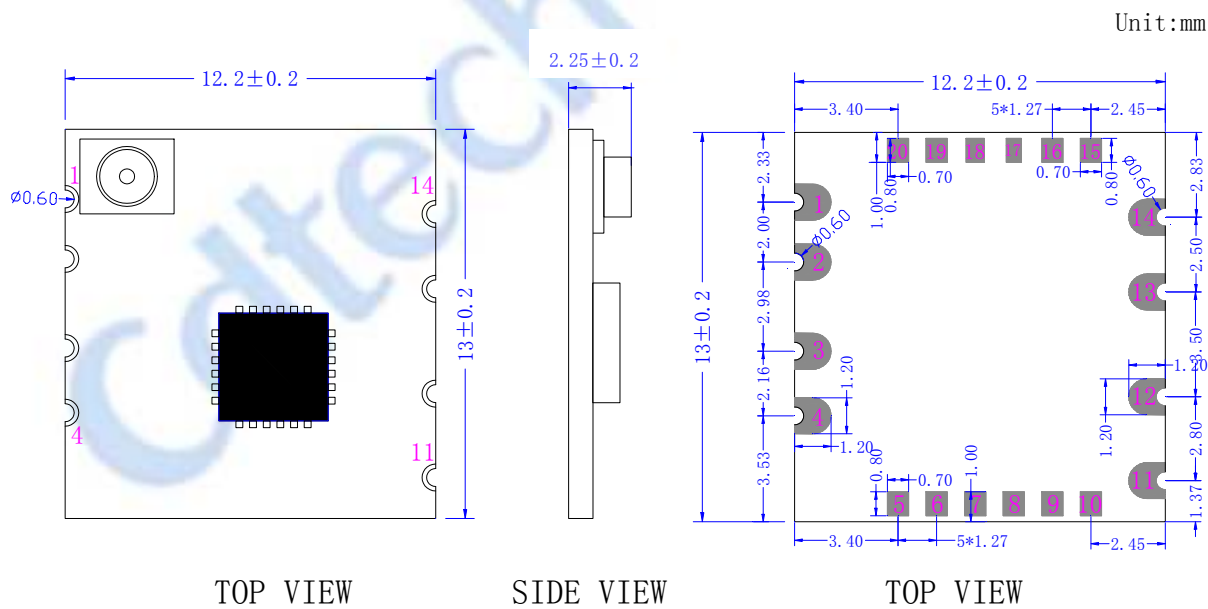
symbol	Parameter	Minimum	Typical	Maximum	Units
VDD	3.3V supply voltage	3.0	3.3	3.6	V
VDDIO	I/O supply voltage	1.7	1.8	1.9	V
Current	3.3V rating current	--	--	800	mA

7. Footprint Dimension

7.1 No IPEX Footprint Dimension

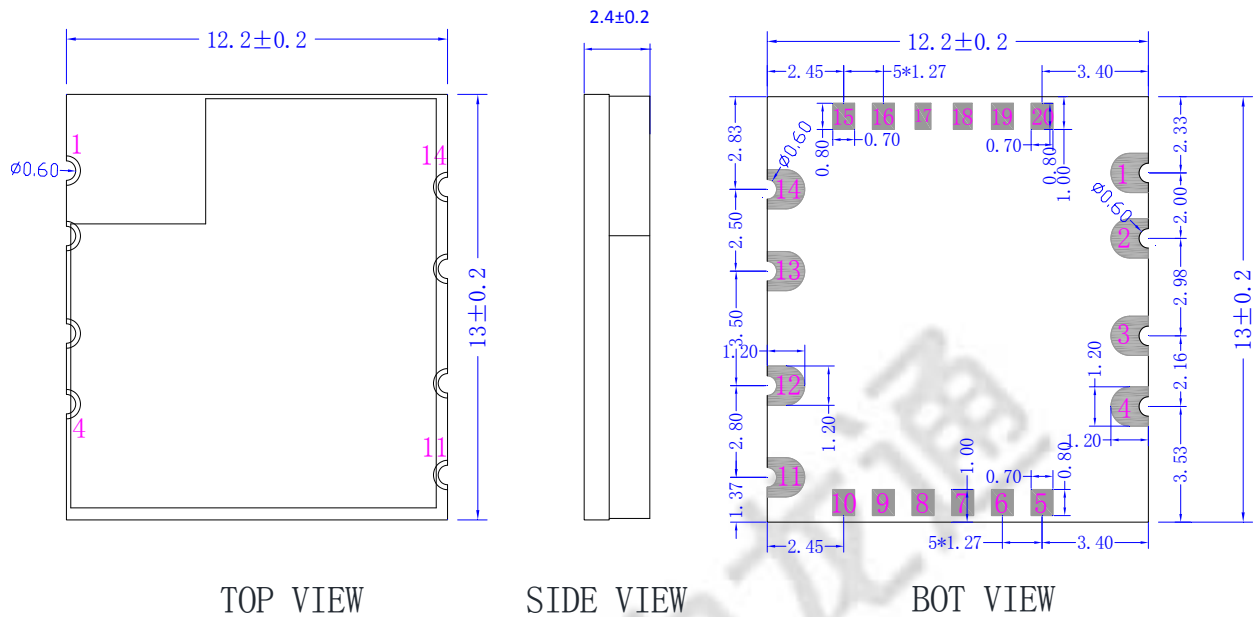


7.2 IPEX Footprint Dimension

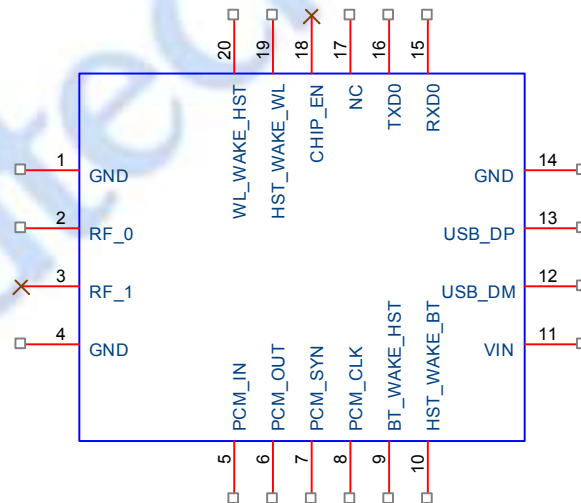


7.3 No IPEX have shielding footprint Dimension

Unit:mm



8. Pin Description



NO	Name	Description
1	GND	Ground connections
2	RF0	RF0 I/O port ;When have IPEX the PIN is NC
3	RF1	NC, Keep Floating

4	GND	Ground connections(Note: The PIN must be connected to GND)
5	PCM_IN	BLE_PCM data Input . This pin is also shared with GPIOA2.
6	PCM_OUT	BLE_PCM data Output . This pin is also shared with GPIOA3
7	PCM_SYNC	BLE_PCM frame Synchronization. This pin is also shared with GPIOA0.
8	PCM_CLK	BLE_PCM Clock. This pin is also shared with GPIOA1.
9	BT_WAKE_HOST	BLE Wakeup Host pin. This pin is also Shared with GPIOB2.
10	HOST_WAKE_BT	Host Wakeup BLE pin. This pin is also shared with GPIOB3.
11	VCC	Power supply 3.3V is required
12	USB_DM	High-Speed USB D- Signal
13	USB_DP	High-Speed USB D+ Signal
14	GND	Ground connections
15	RXD0	Floating, Debug pin
16	TXD0	Floating, Debug pin
17	NC	Floating
18	Chip_en	Low closed.
19	HOST_WAKE_WLAN	Host Wakeup WLAN pin. This pin is also shared with GPIOB0.
20	WLAN_WAKE_HOST	WLAN Wakeup Host pin. This pin is also Shared with GPIOB1.

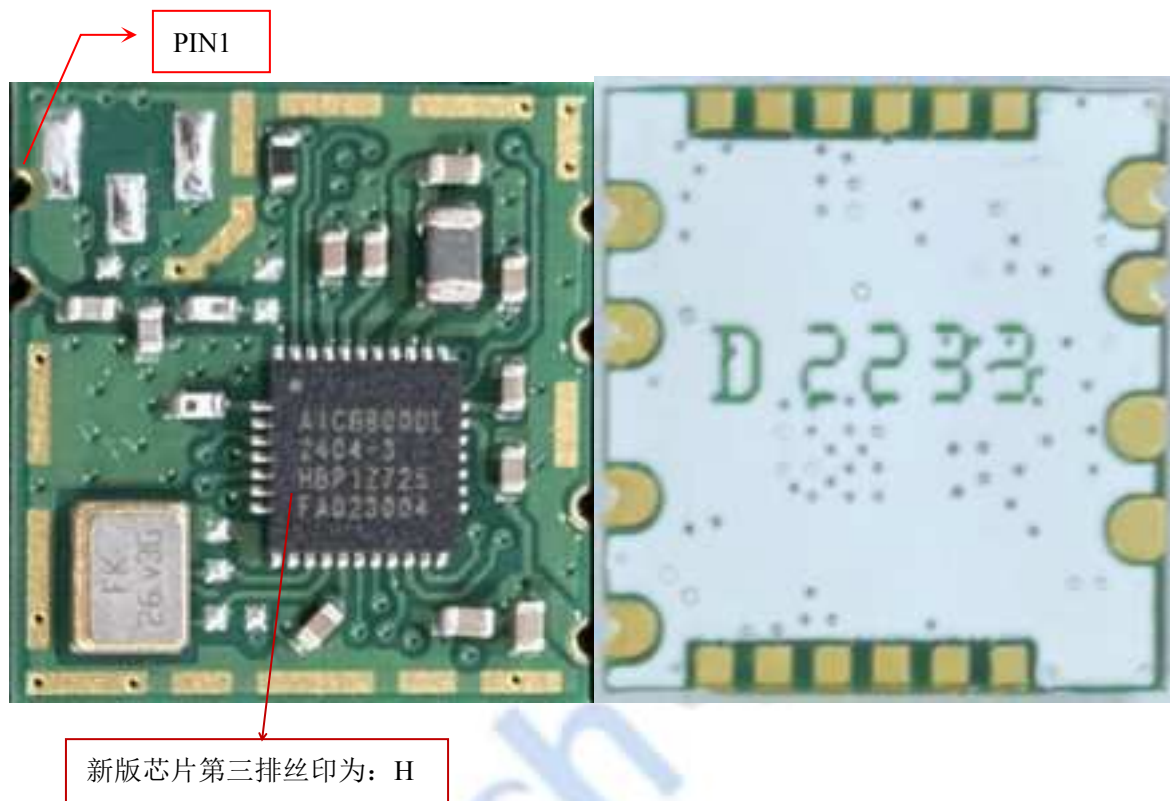
9. Supplier

Supplier list	
Name of material	Material brand
Crystal	26MHz
Inductor	Sunlord/ CHILISIN/ SAMWHA/DDY
Wifi chip	AIC
Capacitance	SAMSUNG /EYANG/Murata
Resistance	UniOhm /YAGEO
PCB(12.2x13x0.8mm)	A,O,I,F

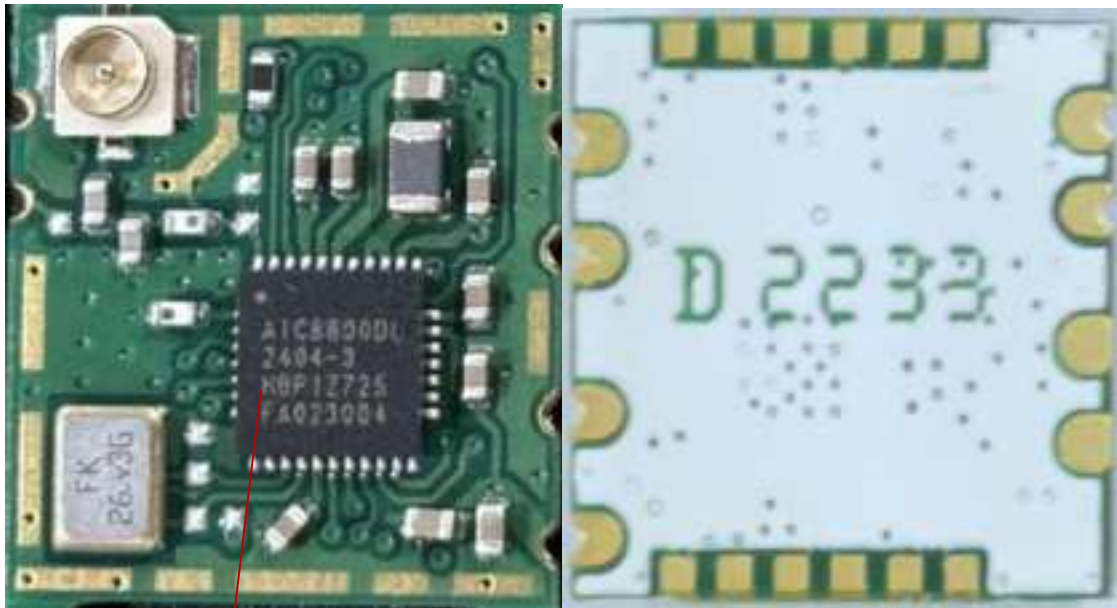
所用物料均符合 RoHS 要求。

10. Physical photo

10.1 No IPEX Physical photo: CDW-B1800DL-00H



10.1 IPEX Physical photo: CDW-B1800DL-10H



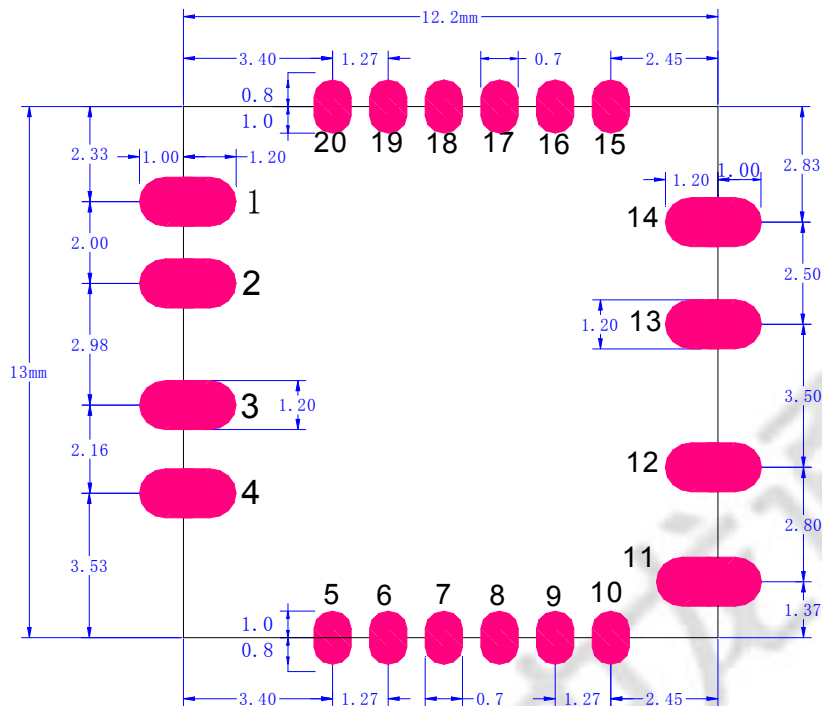
新版芯片第三排丝印为：H

10.2 CDW-B1800DL-01H



说明：PCB 不同供应商，底部丝印有微小差异

11. Layout Recommendation



(Top view)

12. Warpage



翘曲（间隙）的检验标准：

将模组放在水平大理石上，用 0.1mm 厚度的塞尺测量模组底部与大理石之间的间隙，
要求 $gap \leq 0.1mm$

13. Baking & storage temperature & Recommended Reflow Profile

（烘烤，储存温度和推荐炉温）

13.1 Baking & storage temperature

A. Storage life: 12 months. Storage conditions: $<40^{\circ}C$. Relative humidity: $<90\%R.H.$

(保存期限：12个月，储存环境条件：温度在： $<40^{\circ}C$ ，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 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: $40^{\circ}C \pm 5^{\circ}C$, 120 hours. (烘烤温度条件: $40^{\circ}C \pm 5^{\circ}C$, 120小时).

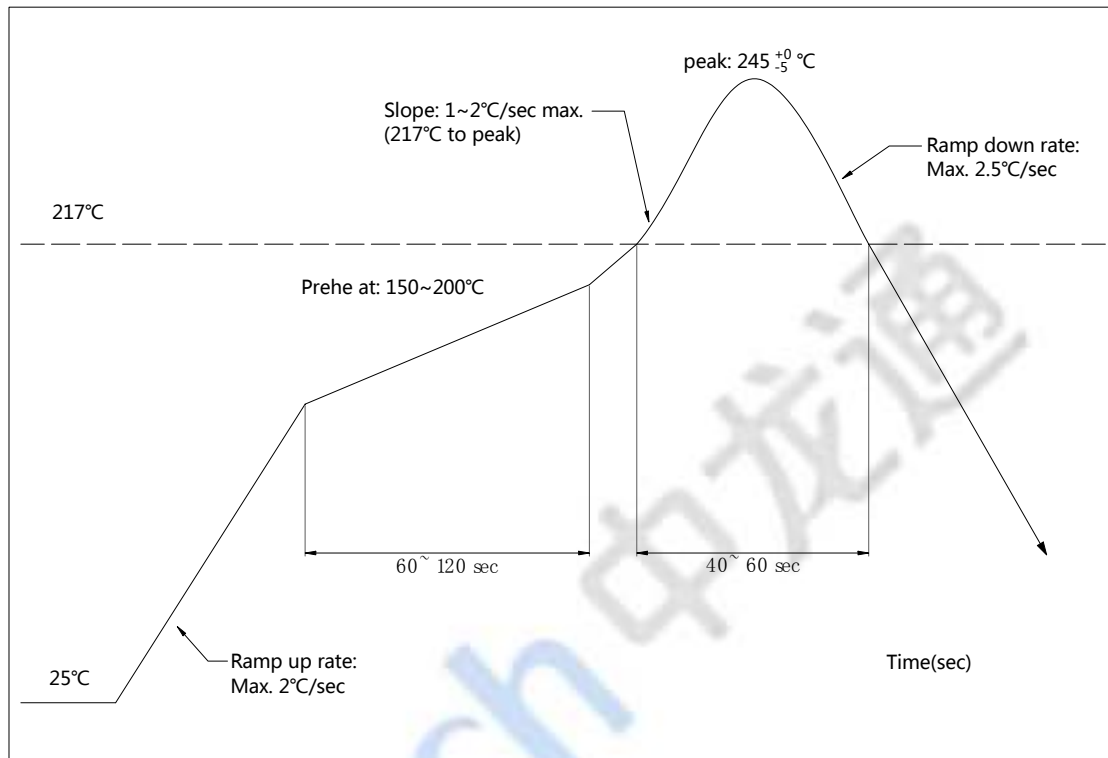
c. After baking, put proper amount of desiccant to seal packages.
(烘烤后, 放入适量的干燥剂再密封包装)

13.2 Recommended Reflow Profile

Referred IPC/JEDEC standard.

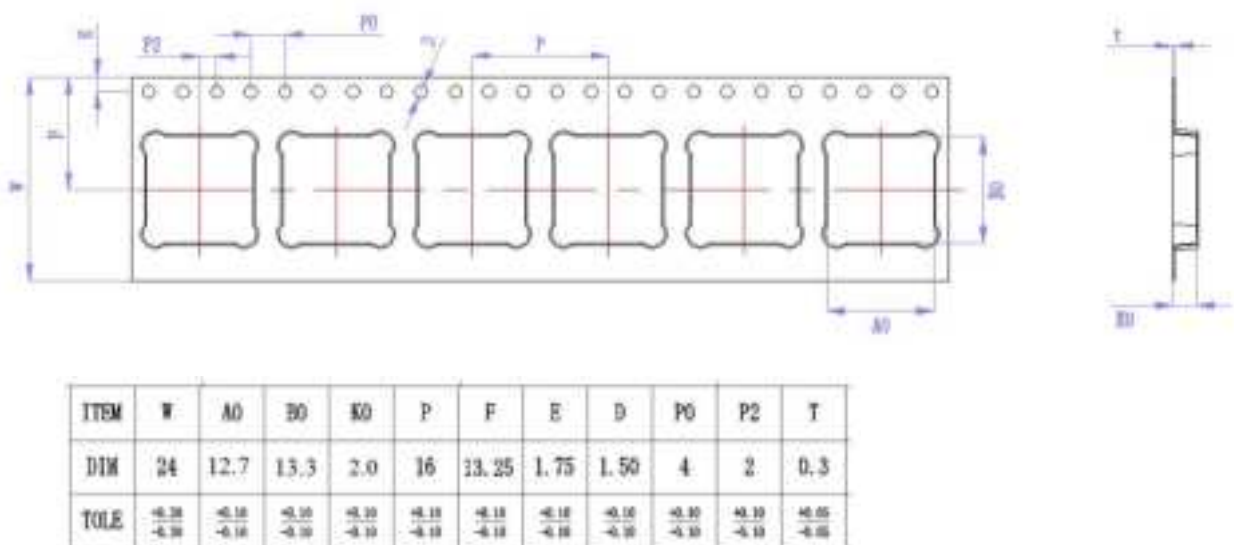
Peak Temperature : $<250^{\circ}\text{C}$

Number of Times : ≤ 2 times

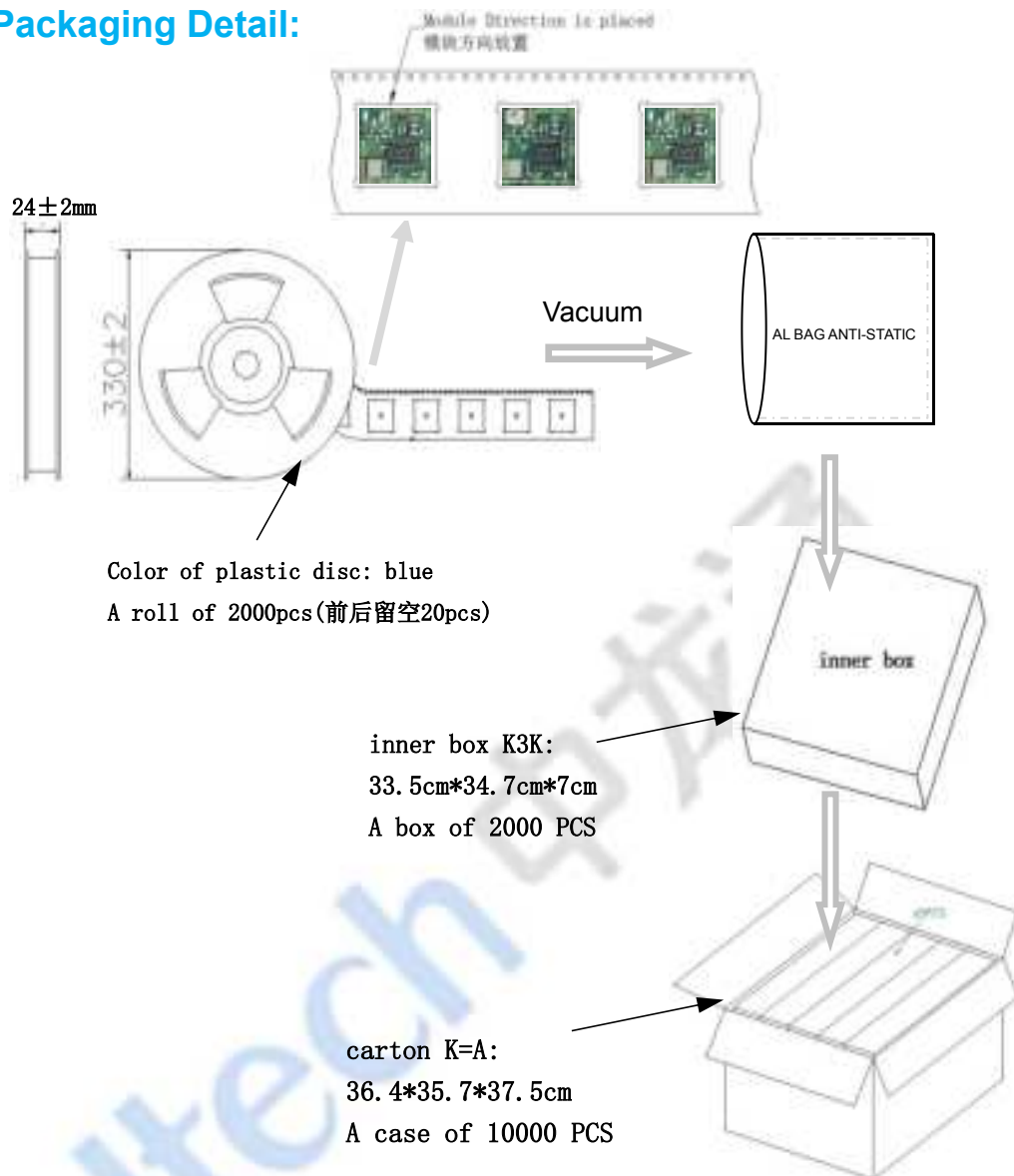


14. Packing information

14.1 Carrier size Detail:



14.2 Packaging Detail:

**ESD CAUTION**

The B1800DL series module is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although B1800DL series module 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 FCC ID:2BN5S-2503V

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).

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.

Explanation: The EUT contains a PCB antennas. Yes, this module includes a permanent additional antenna with a maximum antenna gain of 3.3dBi for 2.4G The prototype is used under mobile conditions.

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: No, The module has no tracking antenna design, is PCB antenna.

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: 2BN5S-2503V

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 contains one PCB antennas. Yes, this module includes a permanent additional antenna with a maximum antenna gain of 3.3dBi for 2.4G. The prototype is used under mobile conditions.

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: 2BN5S-2503V

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 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 host should be evaluated by the FCC Subpart B.

This product adopts PCB antennas. The maximum antenna gain is 3.3dBi for the 2.4G antenna

IC statement

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science

and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following

two conditions:

(1) This device may not cause interference.

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

The term "IC: " before the certification/registration number only signifies that the Industry Canada

technical specifications were met.

This product meets the applicable Industry Canada technical specifications.

Cet appareil contient des émetteurs / récepteurs exemptés de licence conformes aux RSS (RSS)

d'Innovation, Sciences et Développement économique Canada. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible

d'en compromettre le fonctionnement.

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;

2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Please notice that if the ISED certification number is not visible when the module is installed inside

another device, then the outside of the device into which the module is installed should display a label referring to the enclosed module. This exterior label can use wording such as the following:

"Contains IC: 33667-2503V" any similar wording that expresses the same meaning may be used.

L'appareil hôte doit porter une étiquette donnant le numéro de certification du module d'Industrie

Canada, précédé des mots «Contient un module d'émission », du mot « IC: 33667-2503V » ou d'une formulation similaire exprimant le même sens, comme suit

The device meets the exemption from the routine evaluation limits in section 6.6 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 6.6 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.

Cet émetteur radio IC : 33667-2503V a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous, avec le gain maximal admissible indiqué. Les types d'antenne non inclus dans cette liste qui ont un gain supérieur au gain maximum indiqué pour tout type répertorié sont strictement interdits pour une utilisation avec cet appareil.

The radio transmitter IC: 33667-2503V has been approved by The Ministry of Innovation, Science and Economic Development of Canada to use the following antenna types with the specified maximum allowed gain. Antenna types not included in this list, whose gain is higher than the maximum gain of any type listed, are strictly prohibited from use with this device.

Cet émetteur radio IC : **33667-2503V** a été approuvé par Innovation, Sciences et Développement économique Canada pour fonctionner avec les types d'antenne énumérés ci-dessous, avec le gain maximal admissible indiqué. Les types d'antenne non inclus dans cette liste qui ont un gain supérieur au gain maximum indiqué pour tout type répertorié sont strictement interdits pour une utilisation avec cet appareil.

The radio transmitter IC: **33667-2503V** has been approved by The Ministry of Innovation, Science and Economic Development of Canada to use the following antenna types with the specified maximum allowed gain. Antenna types not included in this list, whose gain is higher than the maximum gain of any type listed, are strictly prohibited from use with this device.

ANT1

Type of antenna:	PCB antenna
Antenna Gain:	2.4G :2400-2500(3.3dBi)
Impedance:	50hm
Manufacture:	CHINA DRAGON TECHNOLOGY LIMITED
Model:	SD18V1