CDW-B1800D4-L3
Dual-band WiFi6 + BLE Module Spec
（USB2.0, BW40M, IPEX antenna type, 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	2025.05.15

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更改记录：

Reversion History：

版本 Version	日期 Date	更改内容 Modification
1.0	2025.02.24	First release
1.1	2025.05.15	Customized Laser Engraving Design

1. Overview

The B1800D4-L3 is a single-die wireless local area network (WLAN) and BLE combination solution to support 1 × 1 IEEE 802.11 a/b/g/n/ax/ac WLAN standards and BLE enabling seamless integration of WLAN/BLE and low-energy technology.

2. Features

- Supports a low-power USB2.0 interface for WLAN and a UART/PCM interface for BLE
- Provides a highly integrated WLAN system-on-chip (SoC) for 5 GHz 802.11ac, or 2.4 GHz/5 GHz 802.11n WLAN applications
- Support WLAN 2.4GHz and 5GHz band channels
- Supports BLE and ANT+ and backward compatibility with BLE + Enhanced Data Rate
- Supports a single-ended RF port for cleaner and lower cost design
- Supports 20 MHz/40 MHz at 2.4 GHz and supports 20 MHz, 40 MHz at 5 GHz
- Support MU-MIMO,OFDMA

4. General Specification

Model	CDW-B1800D4-L3
Product Name	WLAN 802.11a/b/g/n/ax/acUSB2.0 1T1R + BLE module
Major Chipset	AIC8800D40L
Standard	802.11a/b/g/n/ac/ax
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM/256-QAM/1024-QAM
Frequency Band	Dual band 2.4&5GHz ISM
WiFi Interface	USB
BLE Interface	USB
Operating Temperature	-20° C ~ 70° C
Storage Temperature	-20° C ~ 125°C
Humidity	5% to 90% maximum
Dimension	13x12.2x2.3 (LxWxH) ±0.2mm

5. RF Specification

A. 2.4GHz RF Specification

Feature	Description
WLAN Standard	IEEE 802.11b/g/n/ax 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 802.11 ax : OFDMA /1024-QAM,256-QAM, 64-QAM, 16-QAM, QPSK, BPSK
Output Power	802.11b / 1Mbps : 18dBm ± 2 dB @ EVM ≤ -10dB 802.11b /11Mbps : 18dBm ± 2 dB @ EVM ≤ -15dB
	802.11g / 6Mbps : 18dBm ± 2 dB @ EVM ≤ -5dB 802.11g /54Mbps : 15 dBm ± 2 dB @ EVM ≤ -28dB
	802.11n /MCS0 : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11n /MCS7 : 15 dBm ± 2 dB @ EVM ≤ -32dB
	802.11ax /HE0(20/40M) : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11ax /HE11(20/40M) : 13 dBm ± 2 dB @ EVM ≤ -36dB
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -93 dBm, typical
	- 2Mbps PER @ -90 dBm, typical
	- 5.5Mbps PER @ -88 dBm, typical
	- 11Mbps PER @ -86 dBm, typical
Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -91 dBm, typical
	- 9Mbps PER @ -89 dBm, typical
	- 12Mbps PER @ -86 dBm, typical
	- 18Mbps PER @ -83 dBm, typical
	- 24Mbps PER @ -80 dBm, typical
	- 36Mbps PER @ -77 dBm, typical
	- 48Mbps PER @ -74 dBm, typical
	- 54Mbps PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -90 dBm, typical
	- MCS=1 PER @ -87 dBm, typical
	- MCS=2 PER @ -84 dBm, typical
	- MCS=3 PER @ -81 dBm, typical

	- MCS=4	PER @ -78 dBm, typical
	- MCS=5	PER @ -75 dBm, typical
	- MCS=6	PER @ -72 dBm, typical
	- MCS=7	PER @ -70 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -87 dBm, typical
	- MCS=1	PER @ -84 dBm, typical
	- MCS=2	PER @ -81 dBm, typical
	- MCS=3	PER @ -78 dBm, typical
	- MCS=4	PER @ -75 dBm, typical
	- MCS=5	PER @ -72 dBm, typical
	- MCS=6	PER @ -69 dBm, typical
	- MCS=7	PER @ -67 dBm, typical
Receive Sensitivity (11ax,20MHz) @10% PER	- HE=0	PER @ -90 dBm, typical
	- HE=1	PER @ -88 dBm, typical
	- HE=2	PER @ -86 dBm, typical
	- HE=3	PER @ -84 dBm, typical
	- HE=4	PER @ -81 dBm, typical
	- HE=5	PER @ -79 dBm, typical
	- HE=6	PER @ -76 dBm, typical
	- HE=7	PER @ -73 dBm, typical
	- HE=8	PER @ -70 dBm, typical
	- HE=9	PER @ -68 dBm, typical
Receive Sensitivity (11ax,40MHz) @10% PER	- HE=0	PER @ -88 dBm, typical
	- HE=1	PER @ -86 dBm, typical
	- HE=2	PER @ -83 dBm, typical
	- HE=3	PER @ -80 dBm, typical
	- HE=4	PER @ -77 dBm, typical
	- HE=5	PER @ -74 dBm, typical
	- HE=6	PER @ -72 dBm, typical
	- HE=7	PER @ -69 dBm, typical
	- HE=8	PER @ -66 dBm, typical
	- HE=9	PER @ -64 dBm, typical
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n/ax : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

B. 5GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11a/n/ac/ax 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 802.11ax: OFDMA/1024-QAM	
Output Power	802.11a / 6Mbps : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11a /54Mbps : 15 dBm ± 2 dB @ EVM ≤ -28dB	
	802.11n HT20 /MCS0 : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11n HT20 /MCS7 : 15 dBm ± 2 dB @ EVM ≤ -28dB	
	802.11n HT40 /MCS0 : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11n HT40 /MCS7 : 15 dBm ± 2 dB @ EVM ≤ -28dB	
	802.11ac VHT20 /MCS0 : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11ac VHT20 /MCS8 : 14 dBm ± 2 dB @ EVM ≤ -32dB	
	802.11ac VHT40 /MCS0 : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11ac VHT40 /MCS9 : 14 dBm ± 2 dB @ EVM ≤ -32dB	
	802.11ax HE0(20M) : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11ax HE11(20M) : 12 dBm ± 2 dB @ EVM ≤ -34dB	
	802.11ax HE0(40M) : 18 dBm ± 2 dB @ EVM ≤ -5dB 802.11ax HE11(40M) : 12 dBm ± 2 dB @ EVM ≤ -34dB	
Receive Sensitivity (11a,20MHz) @10% PER	- 6Mbps	PER @ -93dBm, typical
	- 9Mbps	PER @ -90 dBm, typical
	- 12Mbps	PER @ -87 dBm, typical
	- 18Mbps	PER @ -84 dBm, typical
	- 24Mbps	PER @ -81 dBm, typical
	- 36Mbps	PER @ -78 dBm, typical
	- 48Mbps	PER @ -76 dBm, typical
	- 54Mbps	PER @ -74 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -92 dBm, typical
	- MCS=1	PER @ -89 dBm, typical
	- MCS=2	PER @ -86 dBm, typical
	- MCS=3	PER @ -83 dBm, typical
	- MCS=4	PER @ -80 dBm, typical
	- MCS=5	PER @ -77 dBm, typical
	- MCS=6	PER @ -74 dBm, typical

	- MCS=7	PER @ -72 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -90 dBm, typical
	- MCS=1	PER @ -87 dBm, typical
	- MCS=2	PER @ -84 dBm, typical
	- MCS=3	PER @ -81 dBm, typical
	- MCS=4	PER @ -78 dBm, typical
	- MCS=5	PER @ -75 dBm, typical
	- MCS=6	PER @ -72 dBm, typical
	- MCS=7	PER @ -70 dBm, typical
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0, NSS1	PER @ -91 dBm, typical
	- MCS=1, NSS1	PER @ -88 dBm, typical
	- MCS=2, NSS1	PER @ -85 dBm, typical
	- MCS=3, NSS1	PER @ -82 dBm, typical
	- MCS=4, NSS1	PER @ -79 dBm, typical
	- MCS=5, NSS1	PER @ -76dBm, typical
	- MCS=6, NSS1	PER @ -73 dBm, typical
	- MCS=7, NSS1	PER @ -70 dBm, typical
	- MCS=8, NSS1	PER @ -68 dBm, typical
Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0, NSS1	PER @ -89 dBm, typical
	- MCS=1, NSS1	PER @ -86 dBm, typical
	- MCS=2, NSS1	PER @ -83 dBm, typical
	- MCS=3, NSS1	PER @ -80 dBm, typical
	- MCS=4, NSS1	PER @ -77 dBm, typical
	- MCS=5, NSS1	PER @ -74 dBm, typical
	- MCS=6, NSS1	PER @ -71 dBm, typical
	- MCS=7, NSS1	PER @ -68 dBm, typical
	- MCS=8, NSS1	PER @ -65 dBm, typical
	- MCS=9, NSS1	PER @ -63 dBm, typical
Receive Sensitivity (11ax,20MHz) @10% PER	- HE=0	PER @ -89 dBm, typical
	- HE=1	PER @ -86 dBm, typical
	- HE=2	PER @ -83 dBm, typical
	- HE=3	PER @ -80 dBm, typical
	- HE=4	PER @ -77 dBm, typical
	- HE=5	PER @ -74 dBm, typical
	- HE=6	PER @ -71 dBm, typical
	- HE=7	PER @ -68 dBm, typical

	- HE=8	PER @ -65 dBm, typical
	- HE=9	PER @ -63 dBm, typical
Receive Sensitivity (11ax,40MHz) @10% PER	- HE=0	PER @ -87 dBm, typical
	- HE=1	PER @ -84 dBm, typical
	- HE=2	PER @ -81 dBm, typical
	- HE=3	PER @ -78 dBm, typical
	- HE=4	PER @ -75 dBm, typical
	- HE=5	PER @ -72 dBm, typical
	- HE=6	PER @ -69 dBm, typical
	- HE=7	PER @ -66 dBm, typical
	- HE=8	PER @ -63 dBm, typical
	- HE=9	PER @ -61 dBm, typical
Maximum Input Level	802.11a/n/ac/ax : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

C. BLE RF Specification

Feature	Description
RF Specification	
Output Power, tolerance±2dBm	
BLE Output Power	6dBm
Sensitivity, tolerance±2dBm	
Sensitivity @ BLE=30.8% for LE(1Mbps)	-100 dBm
Sensitivity @ BLE=30.8% for LE(2Mbps)	-90 dBm

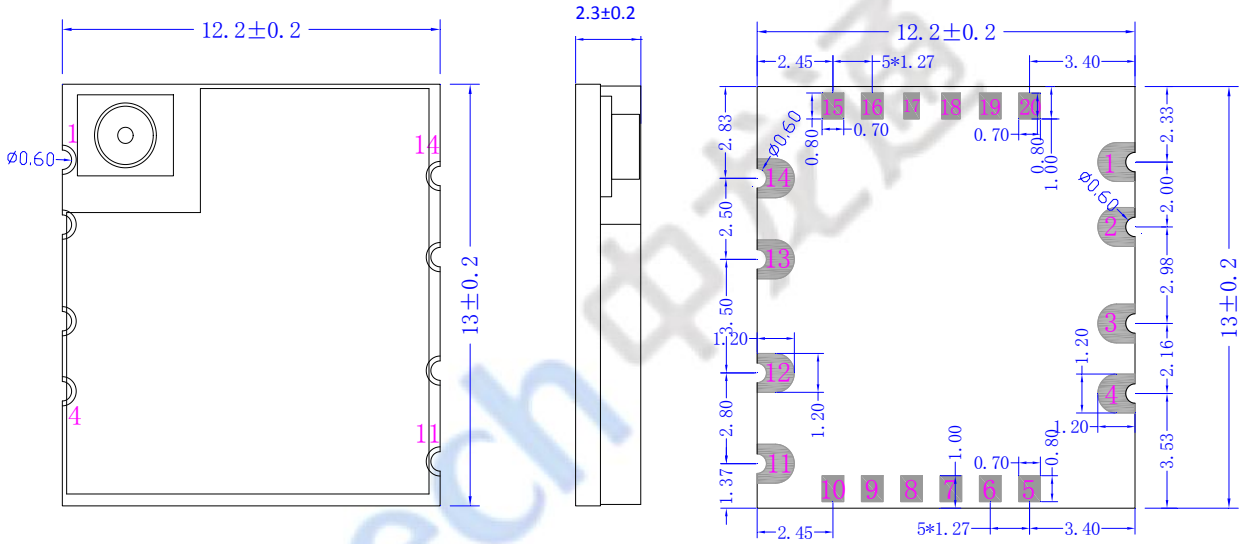
6. Recommended Operating Rating

symbol	Parameter	Minimum	Typical	Maximum	Units
VDD	3.3V supply voltage	3.0	3.3	3.6	V
VDDIO	I/O supply voltage	3.0	3.3	3.6	V
Current	3.3V rating current	--	--	1000	mA

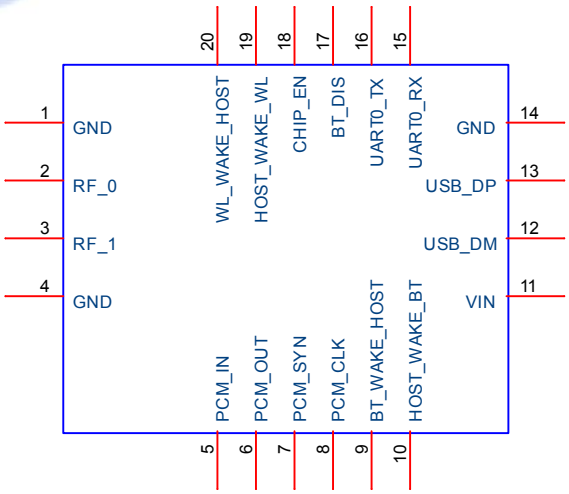
7. Physical Dimensions

(Unit:mm)

Unit:mm



8. Pin Description

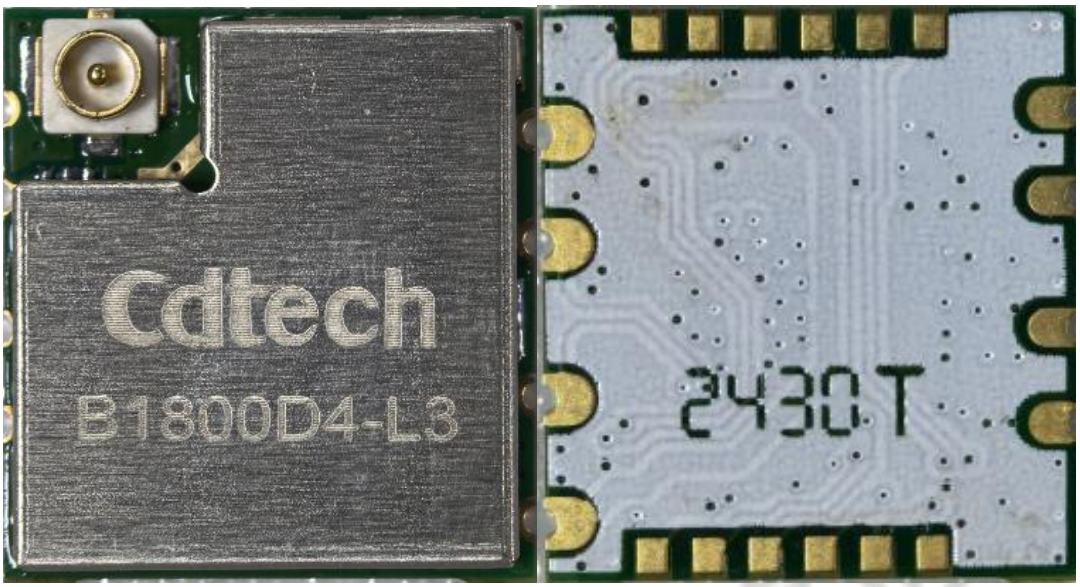


NO.	Name	Type	Description
1	GND	—	Ground connections
2	RF_0	—	keep floating
3	RF_1	—	keep floating
4	GND	—	Ground connections
5	PCM_IN	I	PCM data input
6	PCM_OUT	O	PCM data output
7	PCM_SYN	I	PCM sync signal
8	PCM_CLK	I/O	PCM CLK
9	BT_WAKE_HOST	O	BT wake up host
10	HOST_WAKE_BT	I	Host wake up BT
11	VIN	P	3.3V POWER INPUT
12	USB_DM	I/O	USB DATA DM
13	USB_DP	I/O	USB DATA DP
14	GND	—	Ground connections
15	UART0_RX	—	keep floating(for debug RXD0)
16	UART0_TX	—	keep floating(for debug TXD0)
17	BT_DIS	—	keep floating
18	CHIP_EN	I/O	WiFi system enable
19	HOST_WAKE_WL	I	HOST wake up WL device
20	WL_WAKE_HOST	O	WL device to wake Host

9. Suplier

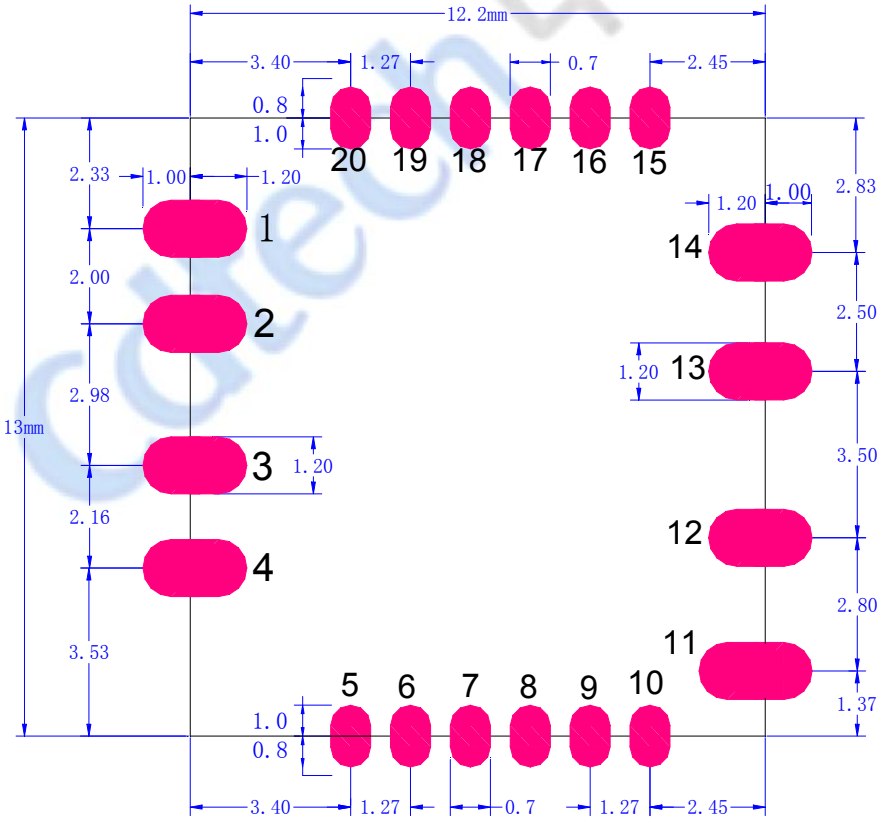
Supplier list	
Name of material	Material brand
Crystal	JWT/FK/TKD/Murata/TXC
Duplexer	ACX/GLEAD/Sunlord/Walsin
Inductor	Sunlord/ CHILISIN/ SAMWHA/Murata
Wifi chip	AIC
Capacitance	SAMSUNG /EYANG
Resistance	UniOhm /YAGEO
PCB(13x12.2x0.8mm)	A,O,I,F,D,T

10. Physical photo



Note: There are minor differences in the bottom silk-screen printing for PCBs from different suppliers.

11. Layout Recommendation



(Top view)

12.Warpage

Inspection standard for warpage (gap):

Place the module on a horizontal marble surface and measure the gap between the bottom of the module and the marble with a feeler gauge of 0.1mm thickness. The requirement is that the gap should be no more than 0.12mm.

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℃. 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).

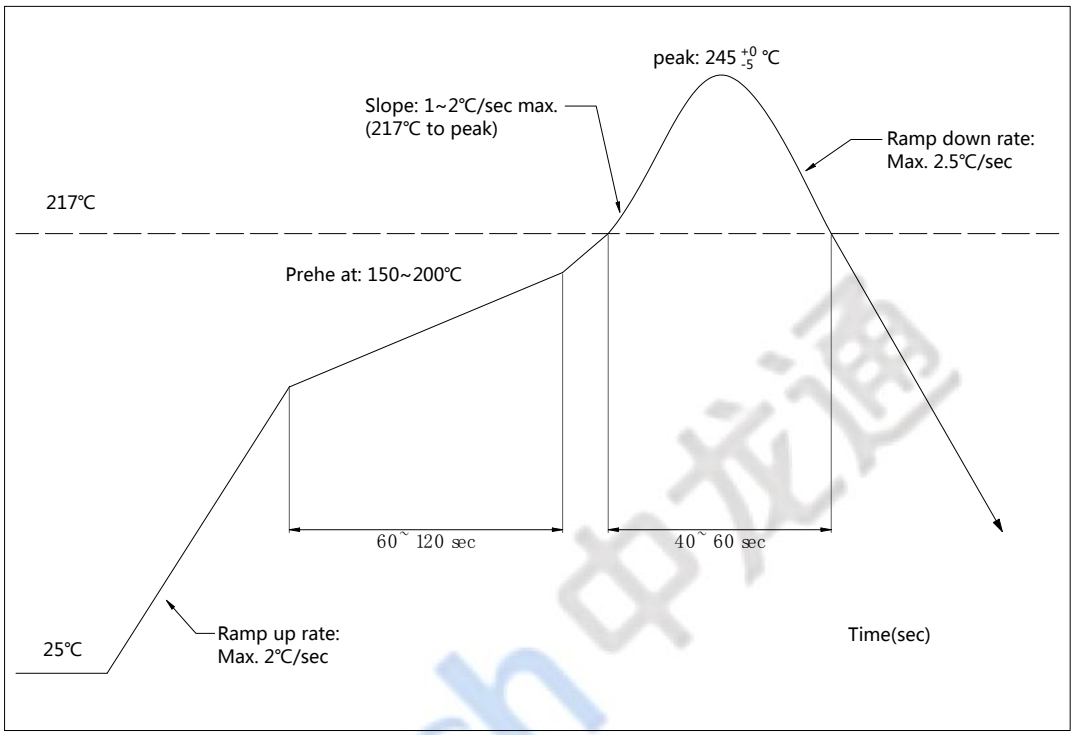
c. After baking, put proper amount of desiccant to seal packages.
(烘烤后，放入适量的干燥剂再密封包装)

13.2 Recommended Reflow Profile

Referred IPC/JEDEC standard.

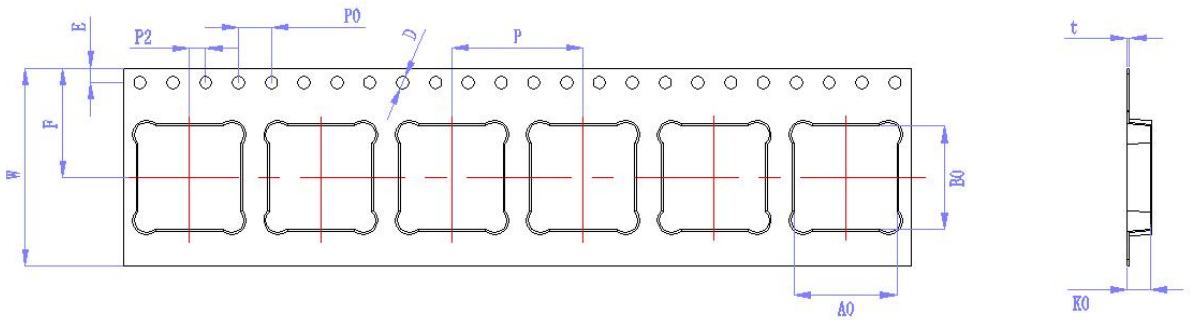
Peak Temperature : <250°C

Number of Times : ≤2 times



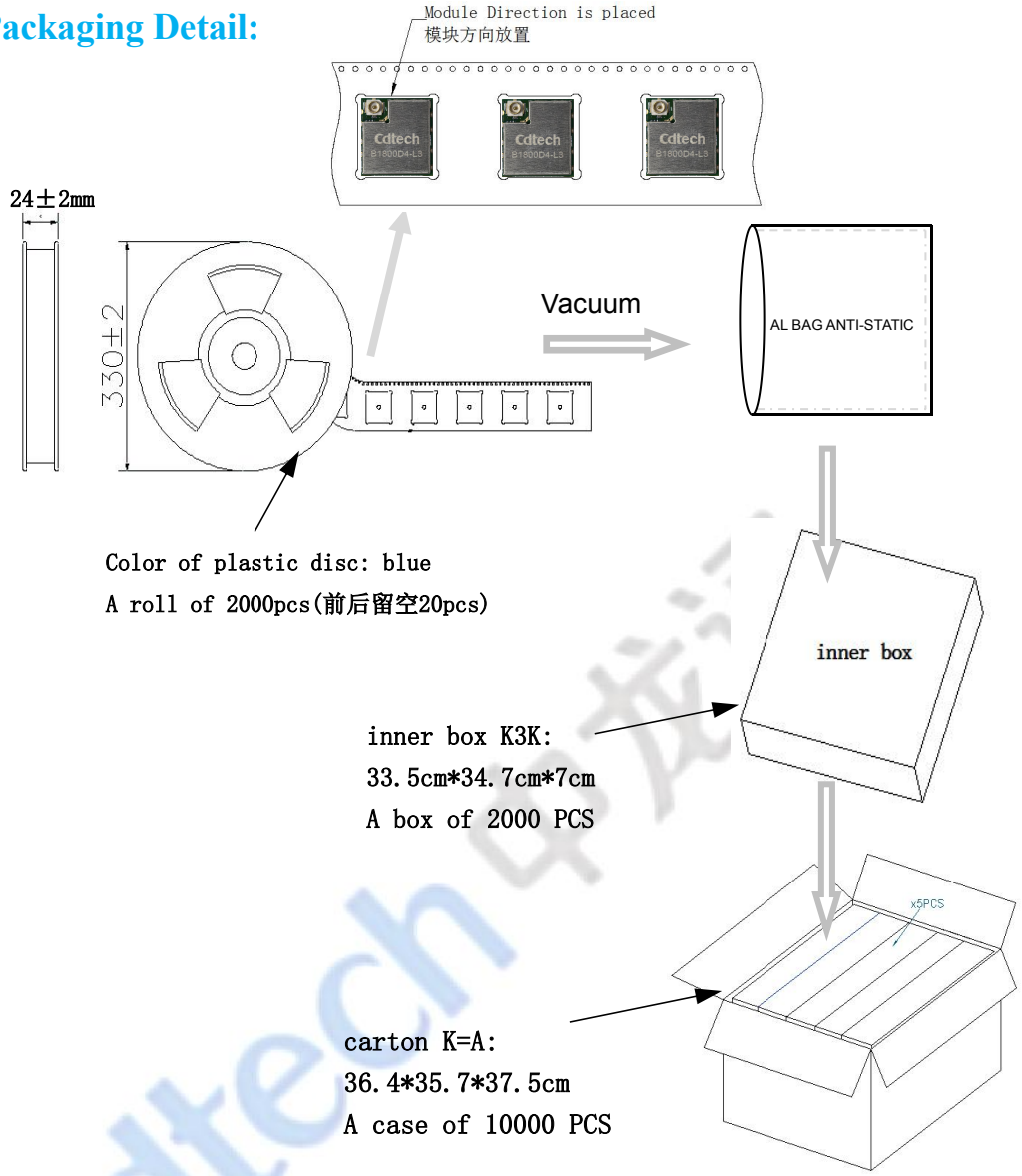
14. Packing information

14.1 Carrier size Detail:



ITEM	W	A0	B0	K0	P	F	E	D	P0	P2	T
DIM	24	12.7	13.3	2.0	16	13.25	1.75	1.50	4	2	0.3
TOLE	+0.30 −0.30	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.10 −0.10	+0.05 −0.05

14.2 Packaging Detail:



ESD CAUTION

The B1800D4-L3 module is ESD (electrostatic discharge) sensitive device and may be damaged with ESD or spike voltage. Although B1800D4-L3 module is with built-in ESD protection circuitry, please handle with care to avoid the permanent malfunction or the performance degradation.

Customized Laser Engraving Design

A、FCC Radiation Exposure Statement

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.
Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
This Module complies with FCC radiation exposure limits set forth for an uncontrolled environment
This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body.
This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
Labelling instruction for Host Product integrator
Please notice that if the FCC identification number is not visible when the module is installed inside another device , then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2BN5S-2504A" any similar wording that expresses the same meaning may be used. Installation Notice to Host Product Manufacturer
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.
Antenna configurations.
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.
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.
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.

B、ISED Regulatory Compliance

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.
L'émetteur/récepteur exempt de licence contenu dans le present appareil est conforme aux CNR d'lnnovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :(1)L'appareil ne doitpas produire de brouillage; (2)L'appareil doit accepter tout brouillage radioélectrique subi, même si lebrouillage est susceptible d'en compromettre le fonctionnement.
This equipment complies with lC RSS - 102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm betweenthe radiator and your body.
Cet éauipement est conforme aux limites d'exposition aux radiations lC CNR - 102 établies pour un environnement non contrólé, Cet équipement doit être installe et utilisé avec une distance minimale de 20cm entre le radiateur et votre corps.
Please notice that if the lC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: 33667-2504A" any similar wording that expresses the same meaning may be used.
L'étiquette d'homologation d'un module d'lnnovation, Sciences et Développement économique Canadadevra être posée sur le produit hote à un endroit bien en vue, en tout temps. En l'absence d'étiquette.le produit hote doit porter une êtiquette sur laquelle figure le numéro d'homologation du module d'lnnovation, Sciences et Développement économique Canada, précédé du mot « contient », ou d'une formulation similaire allant dans le meme sens et qui va comme suit :
Contient IC: 33667-2503U est le numéro d'homologation du module