



Model WF-R51B-ESA1 User Manual

IEEE 802.11 1x1 WiFi 6 Wireless LAN and Bluetooth 5.3 Combo Module

[SoC RTL8851BE]

for 802.11a/b/g/n/ac/ax + Bluetooth 5.3

Version: 1.0

<Specification may be changed without prior notice>

Sichuan AI-Link Technology Co., Ltd

四川爱联科技股份有限公司

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Address: Anzhou Industrial Park, Mianyang, Sichuan, P.R.C					
Company: Sichuan AI-Link Technology Co., Ltd.					
Module Name			WF-R51B-ESA1		
	Designed by		Reviewed by		Approved by
Signature	QIN, Dakai		FAN, Xijun		DING, Shuangpeng
Date	5/21/2025		5/21/2025		5/21/2025

Model WF-R51B-ESA1

➤ **Compatible WLAN Standards**

IEEE Std. 802.11 a/b/g/n/ac/ax

Bluetooth V2.1/4.2/5.3

➤ **SoC**

RTL8851BE

➤ **Product Size**

16mm×12mm×1.9mm

➤ **Product Weight**

2.5 g

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Features

WLAN

- ✚ IEEE 802.11 a/b/g/n/ac/ax compliant
- ✚ Support 20/40MHz bandwidth in 2.4GHz and 20/40/80MHz in 5GHz band
- ✚ Dual bands 1T1R mode
- ✚ RTL8851BE data rate up to 600.5Mbps with PCIe Gen1.1

Bluetooth

- ✚ Bluetooth v5.3 (BT 5.3 Logo Compliant)
- ✚ Compliant with Bluetooth v2.1+EDR
- ✚ Integrated MCU to execute Bluetooth protocol stack
- ✚ Supports all packet types in basic rate and enhanced data rate
- ✚ Supports Secure Simple Pairing
- ✚ Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles
- ✚ Dual Mode support: Simultaneous LE and BR/EDR

Revision Record

Revision	Date	Description	Edited by
V1.0	21/5/2025	Premier Release	QIN,Dakai

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1 General Description

1.1 System Overview

Model WF-R51B-ESA1 is a highly integrated WiFi module by AI-Link, based on the SoC RTL8851BE, featuring a 1x1 a/b/g/n/ac/ax dual-band Wi-Fi, and a Bluetooth v5.3 subsystems.

The finely tuned hardware architecture and baseband algorithms provide superlative RF performance, as well as low power consumption. Intelligent MAC design powers a highly efficient offload engine; the hardware supports standard features of higher level of security, performance, and conforms most international regulations, offering the great performance at any time, in any circumstance.

1.2 System Properties

Dimension	Typically, 16mm×12mm×2.3mm
Chipset	RTL8851BE
Operating Frequency	2.4GHz: 2.412~2.4835 GHz 5 GHz: 5.150~5.850GHz
Antenna	2 IPEX-4 Connector
Operating Voltage	3.3V±5%
PCB Information	4-layers design (0.6+/-0.1mm)
Peripheral Interface	WIFI@PCIE BT@USB
Rate	11b: 1, 2, 5.5 and 11Mbps 11a/g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~7, up to 150Mbps 11ac: MCS0~9, Nss=1, BW=80MHz up to 433.3Mbps 11ax: MCS0~11, Nss=1, BW=80MHz up to 600.5Mbps
Operating Temperature	-10°C to +70°C

Storage Temperature	-40°C to +85°C
ESD Protection	IEC(Contact discharge): $\pm 2000V$

1.3 Diagram

The hardware architecture for the module is shown in Figure 1. The AI-Link' s WF-R51B-ESA1 module Complies with IEEE standards 802.11a/b/g/n/ac/ax; it also supports 1x1 and could reach up to data rate of 600.5 Mbps. Meanwhile, it is also a module of Bluetooth v5.3 and Wi-Fi Dual-band.

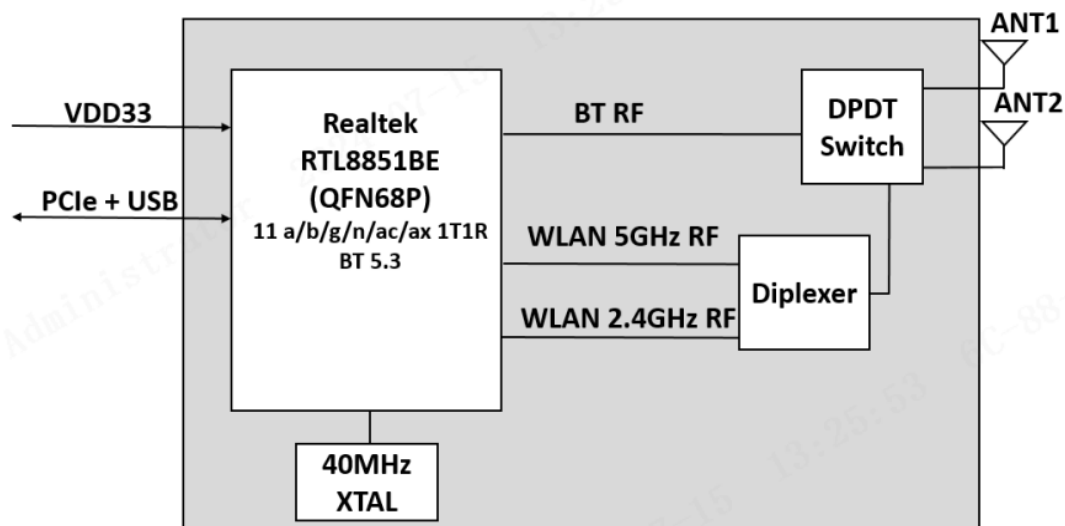
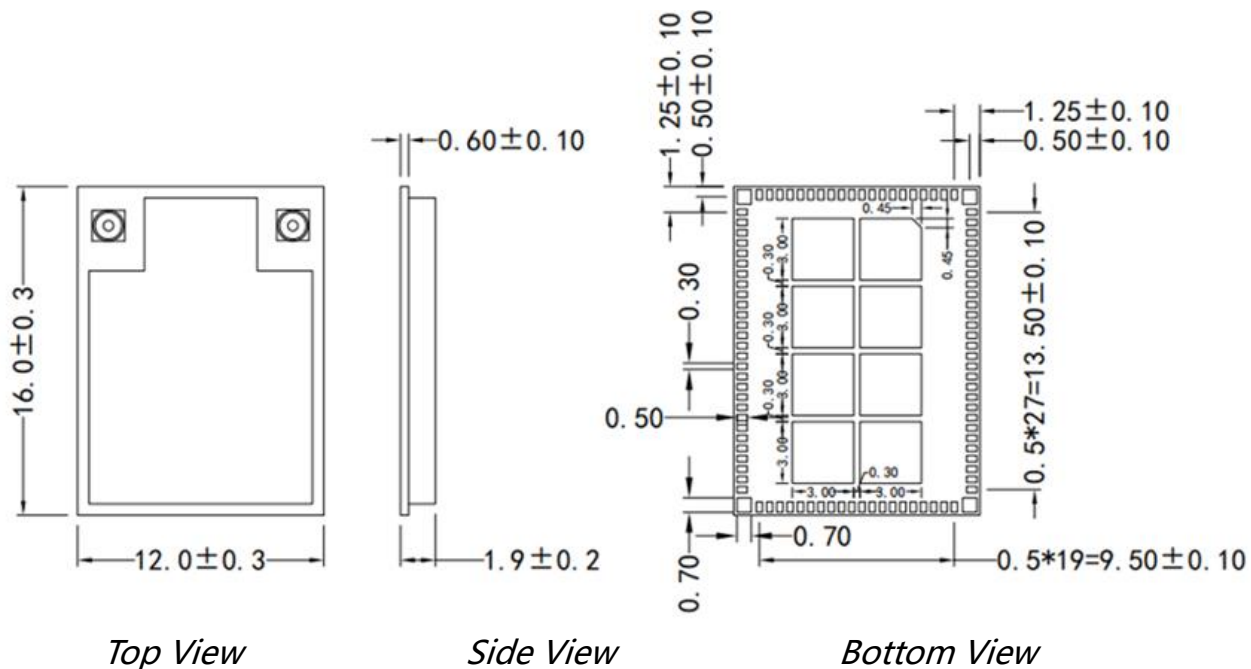


Figure 1: WF-R51B-ESA1 Block Diagram

2 Mechanical Dimensions

2.1 Mechanical Outline Drawing

- Typical Dimension (W x L x T): 16.0mmx 12.0mm x 1.9mm
- General tolerance: $\pm 0.2\text{mm}$



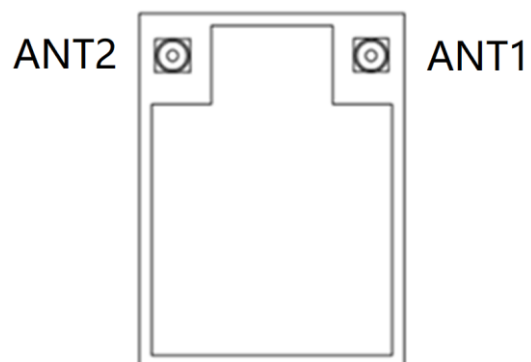
2.2 M2 Standard Pin Definitions(Module Key E)



序号	定义	功能
1~3	NC	NC
4~5	3.3V	3.3V INPUT
6	GND	GND
7	NFC_RF_DIS	NC
8	NFC_INT	NC
9	NFC_CLK	NC
10	NFC_DATA	NC
11	COEX_RXD	GPI06
12	COEX_TXD	GPI012
13	COEX3	GPI07
14~16	NC	NC
17	GND	GND
18~19	NC	NC
20	GND	GND
21~22	NC	NC
23	GND	GND
24	HST_WAKE_DEV	GPI013
25	NC	NC
26	GND	GND
27	SLP_CLK	External 32.768KHz input
28	WL_DIS_N	Enable pin for WL device(GPI09)
29	PCIE_WAKEN	PCie wake signal (active low)
30	PCIE_CLKREQN	PCie clock request(active low)
31	PCIE_PERSTN	PCie host indication to reset the device
32	GND	GND
33	PCIE_RCLK_N	PCie differential Clock input —N
34	PCIE_RCLK_P	PCie differential Clock input —P
35	GND	GND
36	PCIE_TX_N	PCie Transmit Data —N

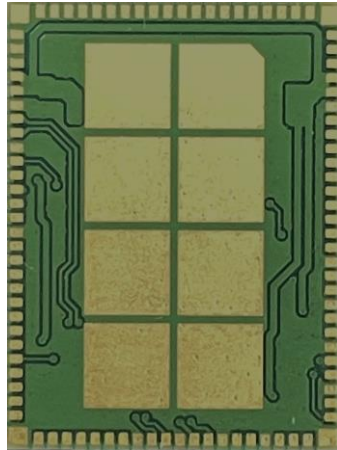
37	PCIE_TX_P	PCie Transmit Data —P
38	GND	GND
39	PCIE_RX_N	PCie Receive Data —N
40	PCIE_RX_P	PCie Receive Data —P
41	GND	GND
42~57	NC	NC
58	PCM_SYNC	PCM_SYNC (input/output) (GPIO2)
59	PCM_IN	PCM_IN (input) (GPIO0)
60	PCM_OUT	PCM_OUT (output) (GPIO1)
61	PCM_CLK	PCM_CLK (input) (GPIO3)
62	GND	GND
63	BT_DIS_N	Enable pin for BT device (GPIO11)
64	BT_LED	BT_LED
65	WL_LED	WL_LED
66	NC	NC
67	HST_WAKE_BT	GPIO13
68	GND	GND
69	USB_DM	USB Serial Differential Data Minus
70	USB_DP	USB Serial Differential Data Plus
71	GND	GND
72~73	3.3V	3.3V INPUT
74~96	GND	GND

2.3 IPEX definition



- 1、ANT1=2.4G WIFI; ANT2=5G WIFI+BT
- 2、ANT1=5G WIFI+BT; ANT2=2.4G WIFI

2.3 Product Photos



Bottom View



Top View

2.4 Label Information

✚ Top Label



- WIFI MAC information QR code
- ✚ BT Mac =WIFI Mac + 1
- Part number: WF-R51B-ESA1
- Manufacturer: 四川爱联科技股份有限公司

3 RF Characteristics

3.1 Wi-Fi Subsystem

Items	Contents	
WLAN Standard	IEEE 802.11a/b/g/n/ac/ax	
Frequency Range	2.400 GHz ~ 2.4835 GHz @ 2.4G	
	5.150GHz ~5.850GHz @ 5G	
Channels	CH1 to CH13 @ 2.4G	
	CH36 to CH165 @ 5G	
Modulation Mode	802.11b: DBPSK, DQPSK ,CCK	
	802.11 a/g/n: BPSK, QPSK, 16QAM, 64QAM	
	802.11 ac: BPSK, QPSK, 16QAM, 64QAM,256QAM	
	11ax: BPSK, QPSK, 16QAM, 64QAM,256QAM,1024QAM	
Output Power & EVM	Power Value	EVM
	2.4G	
	802.11b/11Mbps: 17±2dBm	≤ -10dB
	802.11g/54Mbps: 16±2dBm	≤ -25dB
	802.11n HT20/MCS7: 16±2dBm	≤ -28dB
	802.11n HT40/MCS7: 16±2dBm	≤ -28dB
	802.11ax HE20/MCS11: 14±2dBm	≤ -35dB
	802.11ax HE40/MCS11: 14±2dBm	≤ -35dB
	5G	
	802.11a /54Mbps:16±2dBm	≤ -25dB
	802.11n HT20 /MCS7:16±2dBm	≤ -28dB
	802.11n HT40 / MCS7: 16±2dBm	≤ -28dB
	802.11ac VHT20/MCS8: 15±2dBm	≤ -30dB
	802.11ac VHT40/MCS9: 14±2dBm	≤ -32dB
	802.11ac VHT80/MCS9: 14±2dBm	≤ -32dB
	802.11ax HE20/MCS11: 12±2dBm	≤ -35dB
	802.11ax HE40/MCS11: 12±2dBm	≤ -35dB
	802.11ax HE80/MCS11: 12±2dBm	≤ -35dB

Items	Contents	
Receiver Sensitivity @2.4G/5G/6G PER≤10% 2.4	Rate Type	Max
	2.4G	
	802.11b/11Mbps PER≤8%	-85dBm
	802.11g/54Mbps	-71dBm
	802.11n HT20/MCS7	-68dBm
	802.11n HT40/MCS7	-67dBm
	802.11ax HE20/MCS11	-57dBm
	802.11ax HE40/MCS11	-55dBm
	5G	
	802.11a /54Mbps	-71dBm
	802.11n HT20 /MCS7	-68dBm
	802.11n HT40 /MCS7	-67dBm
	802.11ac VHT20 /MCS8	-64dBm
	802.11ac VHT40 /MCS9	-58dBm
	802.11ac VHT80 /MCS9 @5G	-56dBm
	802.11ax HE20 /MCS11 @5G	-57dBm
	802.11ax HE40 /MCS11 @5G	-55dBm
	802.11ax HE80 /MCS11 @5G	-51dBm

3.2 Bluetooth Subsystem

Items	Contents			
Host Interface	USB			
TX Characteristics				
Channel	BR、 EDR:CH0 toCH78			
	LE:CH0 to CH39			
Modulation	GFSK、 $\pi/4$ -DQPSK 、 8PSK			
TX Power	Rate Type	Min(dBm)	Typ(dBm)	Max(dBm)
	1DH5		4	
	2DH5		4	
	3DH5		4	
	1LE		4	
	2LE		4	
RX Characteristics				
RX	Rate Type	Min(dBm)	Typ(dBm)	Max(dBm)
	1DH5 (BER<0.1%)			-85
	2DH5 (BER<0.01%)			-85
	3DH5 (BER<0.01%)			-79
	1LE (PER<30.8%)			-89
	2LE (PER<30.8%)			-87

* Note: [1] Typical RF Output Power are tested at room temp.25°C

4 Interface

4.1 PCIE interface

The module supports PCI Express End Point which is fully compliant with the PCI Express Base Specification Revision 1.1. It supports PCI Express Gen1 (2.5Gbps) differential bus speed. The module supports PCI Express low power operations such as ASPM L1.0, ASPM L1.CLK_PM, ASPM L1.SS (L1.1 and L1.2), and PCI PM L2 state. It also supports WAKE_N for device wakeup host scenario, as well as remote wake-up signaling. The PCI Express interface is only used for Wi-Fi operations. The DMA ring and the data structure are controlled by the descriptor-based PDMA engine over PCI Express interface

4.2 USB Interface

The module supports the USB (USB v2.0 specification) device port, Use USB as the host interface for Bluetooth.

5 Electrical Current Consumption

5.1 WLAN Current Consumption

Description	Value	Unit
5G Transmit@HE80,11ax	330	mA
5G Receive@HE80,11ax	130	mA
2.4G Transmit@HE40,11ax	250	mA
2.4G Receive@HE40,11ax	120	mA
2.4G Transmit@OFDM11Mbps,11b	260	mA
2.4G Receive@OFDM11Mbps,11b	180	mA

**Note:*

[1] Results are measured provided VDD33 is 3.3V. TX power is measured at the antenna port. The temperature is 25oC.

[2] The duty cycle for TX/RX measurement is 100%.

[3] The chip variation is +/- 25%.

6 Software Information

6.1 RF Driver

RTL8851B_PCIE_MP_Package_ALPHA_v2.0.45 or later.

6.2 Normal Driver

Please contact AI-LINK directly.

**Note:*

The software (driver) package version is subject to change without notice because it may encounter several updates. It is advised to consult with AI-Link for the best right driver package.

7 RF Connector Dimension

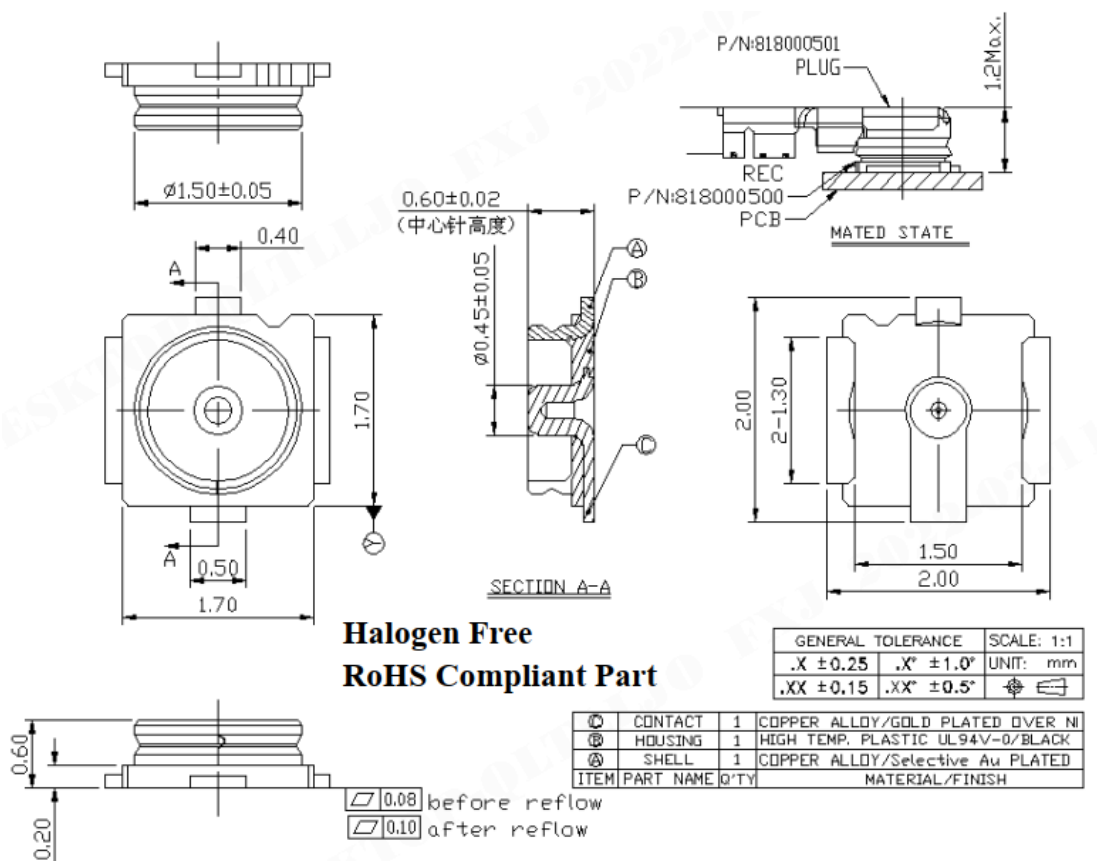
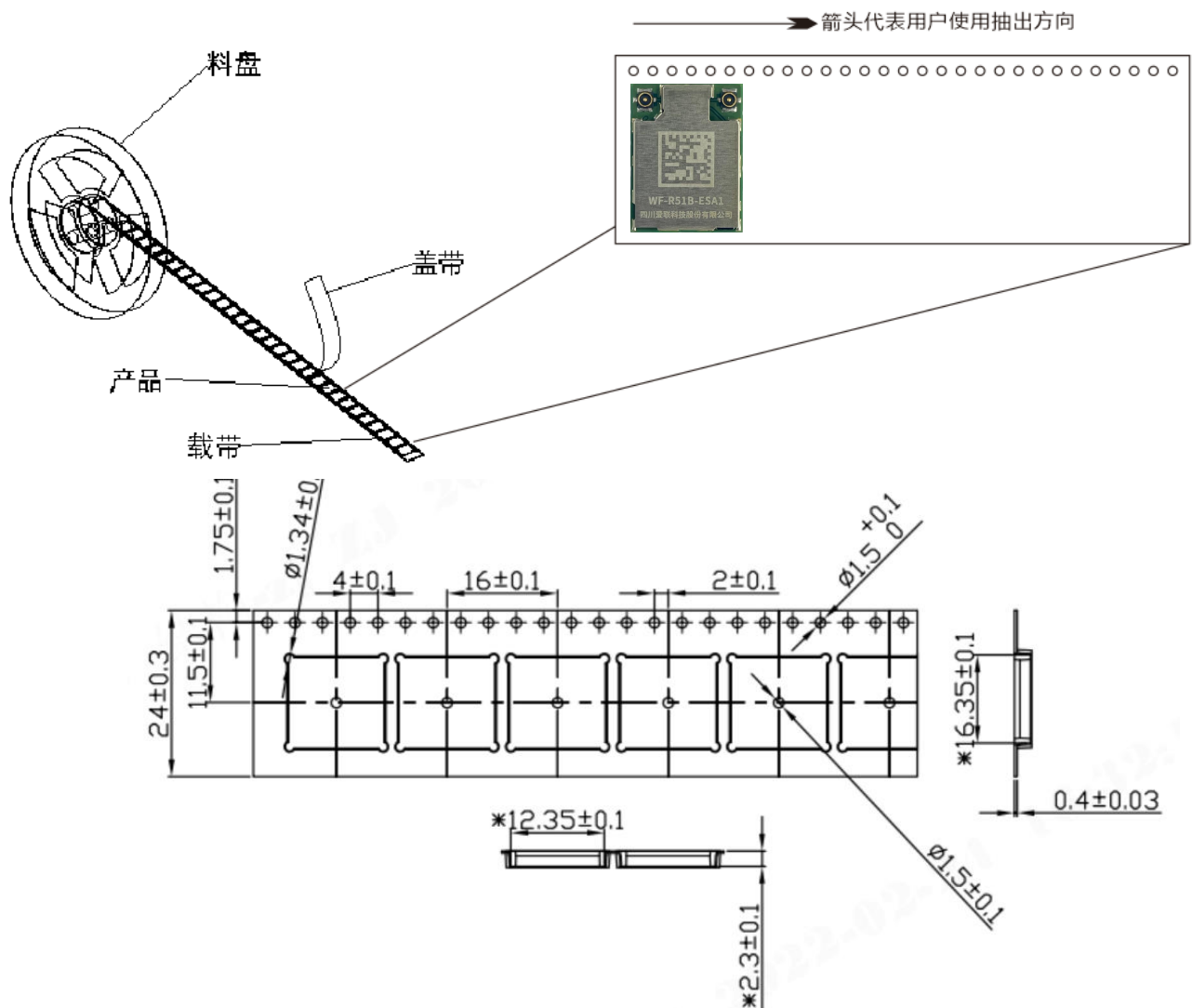


Figure 2: The dimensions of the connector

8 Package, Storage & Disposal

8.1 Packaging Information:



- 1、产品放置方向、标签粘贴位置、包装按示意图进行；
- 2、每卷放1600只产品，每小盒放1卷，大箱共8装个小盒，产品数量共12800只/箱；
- 3、外箱尺寸：370mm*300mm*370mm，小盒尺寸：360mm*360mm*37mm；
- 4、真空包内放置2g干燥剂2袋，6色湿度卡1张；
- 5、其它未尽事宜按客户的包装要求执行。

8.2 Storage

All electronic components must be stored in a clean, well-ventilated place free of corrosive gas. Unless otherwise specified, the temperature and humidity of the storage place must meet below requirements:

- + Temperature: -40~85°C;
- + Humidity: 20%~75%;
- + Humidity sensitivity grade: MSL 3
- + Container Requirement: products shall be placed in a container well-functioning as an electrostatic shielding.

8.3 Disposal

The waste disposal of this product and the package should comply with the applicable local/regional /state/ international regulations.

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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, specifically for master devices in 5 GHz DFS bands.

Explanation: The EUT has a FPC Antenna, and the antenna use a permanently attached antenna which is not replaceable.

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 not a limited 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: 2AOKI-AL8851B

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 FPC Antenna, and the antenna use a permanently attached antenna which is unique.

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: 2AOKI-AL8851B, Contains IC: 23460-AL8851B”

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: Top band 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 module without unintentional-radiator digital circuitry, so the module does not require an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B.

FCC 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.

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.

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.

ISED Statement

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

- (1) this device may not cause interference, and
- (2) this device must accept any interference, including interference that may cause undesired operation of the device."

This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

Le présent appareil est conforme aux CNR d'Industrie 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'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the device.

Toute modification non approuvée explicitement par le fournisseur de licence de l'appareil peut entraîner l'annulation du droit de l'utilisateur à utiliser l'appareil.

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada

RF exposure statement

The equipment complies with IC Radiation exposure limit set forth for uncontrolled environment.

This

equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

L'équipement respecte la limite d'exposition aux rayonnements IC établie pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec une distance minimale de 20 cm entre le radiateur et votre corps.

The OEM must certify the final end product to comply with unintentional radiators (FCC Sections 15.107 and 15.109) before declaring compliance of the final product to Part 15 of the FCC rules and regulations. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change.

The OEM must comply with the FCC labeling requirements. If the module's label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: "Contains transmitter module FCC ID: 2AYHE-2402A". Additionally, the following statement should be included on the label and in the final product's user manual:

"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 interferences, and
- (2) this device must accept any interference received, including interference that may cause undesired operation."

The module is limited to installation in mobile or fixed applications. Separate approval is required for all other operating configurations, including portable configuration with respect to Part 2.1093 and different antenna configurations.

A module or modules can only be used without additional authorizations if they have been tested and granted under the same intended end - use operational conditions, including simultaneous transmission operations.

When they have not been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of at least one of the modules submit a permissive change application.

When having a module grantee file a permissive change is not practical or feasible, the following guidance provides some additional options for host manufacturers. Integrations using modules where additional testing and/or FCC application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module requirements; and (C) simultaneous transmissions for independent collocated transmitters not previously granted together.

This Module is full modular approval, it is limited to OEM installation ONLY.

Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure compliance of the entire end product include the integrated Module. Additional measurements (15B) and/or equipment authorizations (e.g. Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to the end user

IC labeling requirement for the final end product:

The final end product must be labeled in a visible area with the following “Contains IC: 23460-AL8851B”

The Host Marketing Name (HMN) must be indicated at any location on the exterior of the host product or product packaging or product literature, which shall be available with the host product or online.

This radio transmitter [IC:23460-AL8851B] has been approved by Innovation, Science and Economic Development Canada to operate with the antenna types listed below, with the maximum permissible gain indicated. Antenna types not included in this list that have a gain greater than the maximum gain indicated for any type listed are strictly prohibited for use with this device.

Frequency range	Manufacturer	Peak gain	Impedance	Antenna type
2402~2480MHz	Shenzhen Yishengbang Technology Co., LTD	1.92dBi	50 Ω	FPC Antenna
2412~2462MHz	Shenzhen Yishengbang Technology Co., LTD	1.92dBi	50 Ω	FPC Antenna
5150-5250 MHz	Shenzhen Yishengbang Technology Co., LTD	2.21dBi	50 Ω	FPC Antenna
5250-5350 MHz	Shenzhen Yishengbang Technology Co., LTD	2.21dBi	50 Ω	FPC Antenna
5470-5725 MHz	Shenzhen Yishengbang Technology Co., LTD	2.4dBi	50 Ω	FPC Antenna
5725-5850 MHz	Shenzhen Yishengbang Technology Co., LTD	2.75dBi	50 Ω	FPC Antenna