



Model AL-8733B-WG-A Datasheet

IEEE 802.11 1x1 WiFi 4 Wireless LAN

and

Bluetooth 5.2

2 ANT

Combo Module

for 802.11a/b/g/n + Bluetooth 5.2

Version: 1.0

<Specification may be changed without prior notice>

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Module Name		AL-8733B-WG-A	
	Designed by	Reviewed by	Approved by
Signature	Qin, Dakai	HUANG, Wei	DING, Shuangpeng
Date	3/26/2026	3/26/2026	3/26/2026

Model AL-8733B-WG-A

➤ Compatible WLAN Standards

IEEE Std. 802.11 a/b/g/n
Bluetooth V2.1/4.2/5.2

➤ SoC

RTL8733BU-VK

➤ Product Size

47mm×30mm×6.0mm

➤ Product Weight

4.96 g



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RoHS

Features

WLAN

- ✚ IEEE 802.11 a/b/g/n compliant
- ✚ Support 20MHz, 40MHz bandwidth in 2.4GHz, 5GHz band
- ✚ Dual bands 1T1R mode
- ✚ Data rate up to 150Mbps with USB2.0

Bluetooth

- ✚ Compatible with Bluetooth v2.1+EDR and v5.2 Systems
- ✚ Supports Bluetooth 4.0 Low Energy (BLE)
- ✚ Supports BT/BLE dual mode
- ✚ Supports BT/Wi-Fi coexistence
- ✚ USB2.0

Revision Record

Revision	Date	Description	Edited by
V1.0	3/26/2026	Premier Release	Qin, Dakai

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1 General Description

1.1 System Overview

Model AL-8733B-WG-A is a highly integrated WiFi module by AI-Link, featuring a 2x2 a/b/g/n dual-band Wi-Fi, and a Bluetooth v5.2 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	47.0mm×30.0mm×6.0mm
Chipset	RTL8733BU-VK
System	Linux, Android
Operating Frequency	2.4GHz:2.400~2.4835 GHz 5 GHz: 5.150~5.850GHz
Antenna	IPEX Connector and Internal Antenna
Operating Voltage	3.3V±5%
PCB Information	2-layers design (1.0+/-0.10mm)
Peripheral Interface	USB 2.0
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
Operating Temperature	0°C to +70°C
Storage Temperature	-40°C to + 85°C
ESD Protection	HBM: 2000V

1.3 Diagram

The hardware architecture for the module is shown in Figure 1. The AI-Link' s AL-8733B-WG-A module Complies with IEEE standards 802.11a/b/g/n; it could reach up to data rate of 150 Mbps. Meanwhile, it is also a module of Bluetooth v5.2 and Wi-Fi Dual-band.

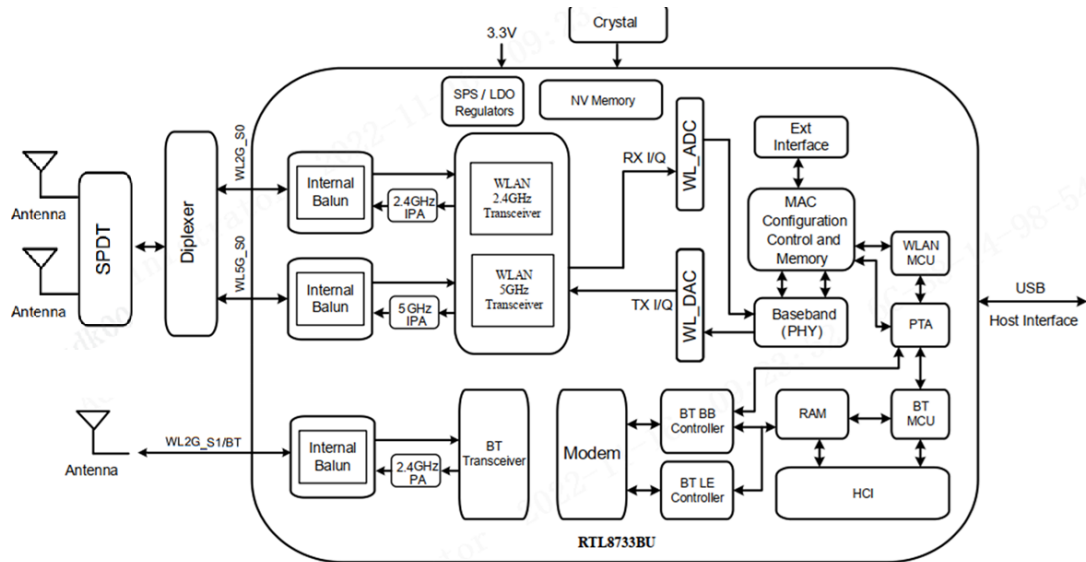


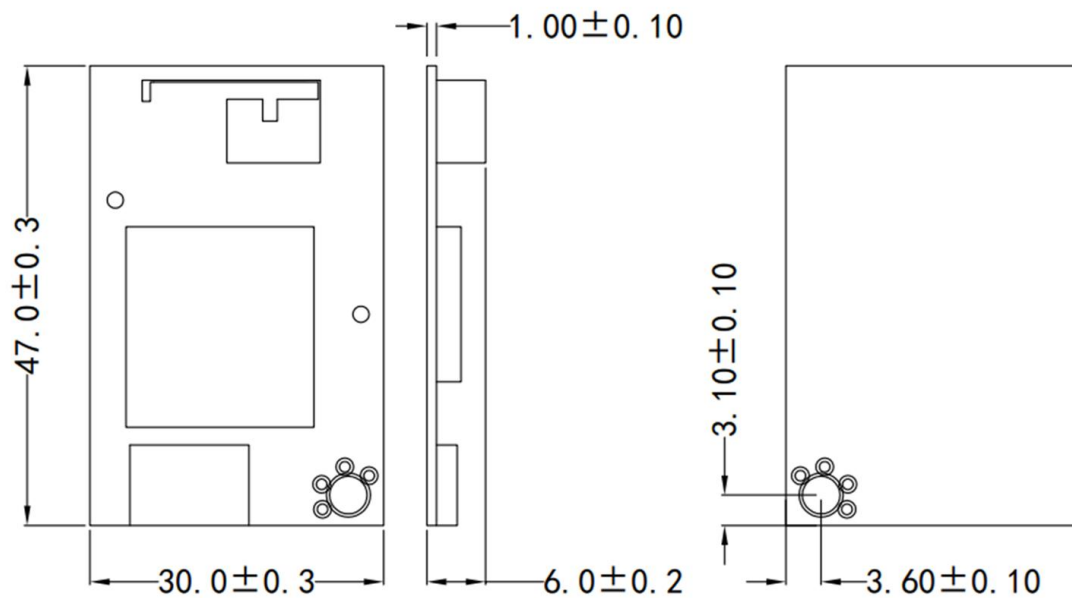
Figure 1: AL-8733B-WG-A Block Diagram

2 Mechanical Dimensions

2.1 Mechanical Outline Drawing

Typical Dimension (W x L x T): 47.0mmx 30.0mm x 6.0mm

PCB Thickness: 1.0mm



Top View

Bottom View

2.2 Pin definitions

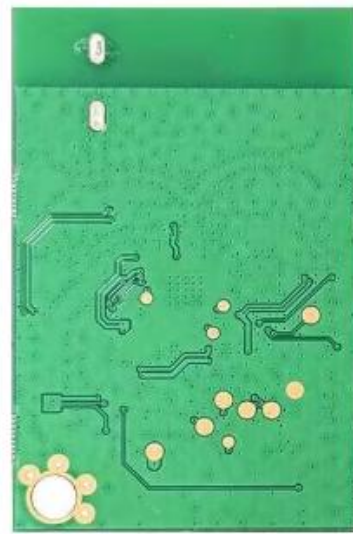


Pin	Define	Description
1	GND	GND
2	HSDP	HSDP
3	HSDM	HSDM
4	VIN	+3.3V
5	VIN	+3.3V
6	VIN	+3.3V
7	DEV_WAKE_HOST	Wlan WAKE Host (internal 100k Ohm pull high)
8	HOST_WAKE_DEV	Host WAKE Wlan
9	RESET	Reset (internal 100k Ohm pull high and 0.1uF capacitor to ground)
10	GND	GND

2.3 Product Photos



TOP View



BOTTOM View

4 Interface

4.1 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
2.4GHz-Band TX CCK, 1Mbps	247	mA
2.4GHz-Band TX OFDM, 6Mbps	246	mA
2.4GHz-Band TX HT20, MCS0	246	mA
2.4GHz-Band TX HT40, MCS0	285	mA
5GHz-Band TX OFDM, 6Mbps	267	mA
5GHz-Band TX HT20, MCS0	266	mA
5GHz-Band TX HT40, MCS0	271	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%.

5.2 Bluetooth Current Consumption

Description	Value	Unit
TX BR DH5	66	mA
TX EDR 2DH5	66	mA
TX EDR 3DH5	65	mA
TX BLE 1M	57	mA
TX BLE 2M	41	mA

**R:*

[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

MP_Kit_RTL11n_8733BU_USB_v0.45 or later

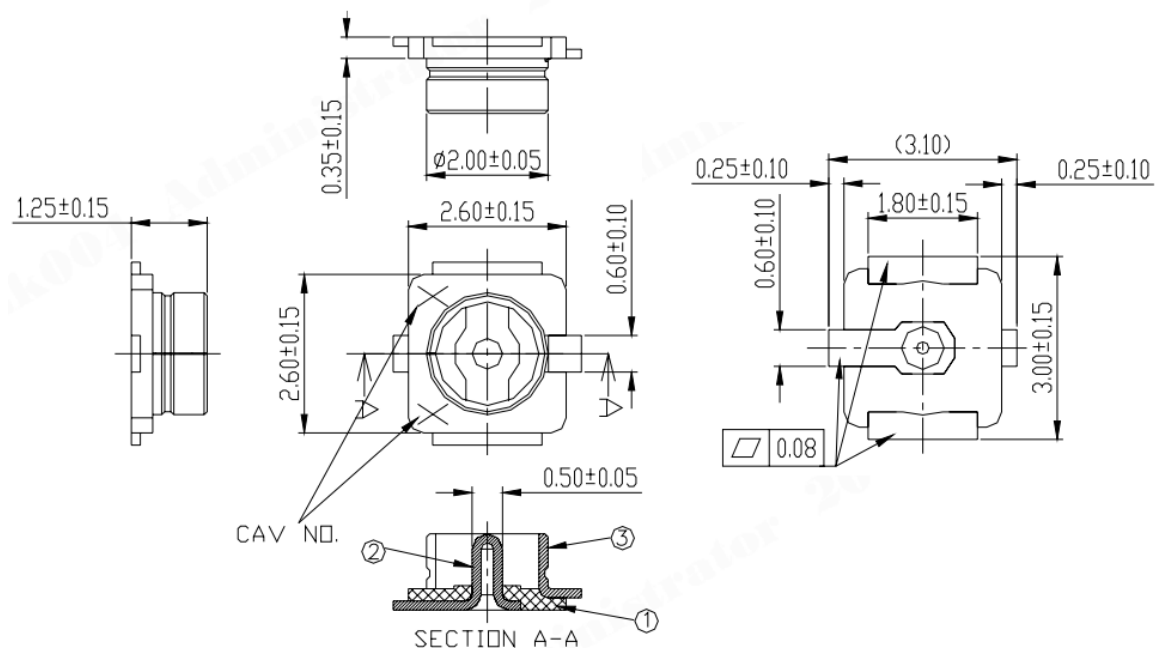
6.2 Normal Driver

NA

**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 Connector Dimension



The dimensions of the connector

8 Appendix

8.1 Key Components List

N O.	Name	Model	Specification	Manufacturer
1	IC	RTL8733BU-VK		Realtek
2	PCB	JUI7.820.1722 series	FR-4, 2-lay, 1.0mm	IQE TBD RJX SUNKING
3	Crystal	3225 40M	3225 40MHz	TKD JWT ECEC Faith Long
4	DPX	1608		ACX Sunlord Wilsin Glead FTR

FCC Warning

15.19 Labeling requirements.

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.

15.21 Information to user.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.105 Information to the user.

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 RF Radiation Exposure Statement:

- 1.This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.
- 2.This equipment complies with RF radiation exposure limits set forth for an uncontrolled environment.

2.1 Conditions on using Sichuan AI-Link Technology Co.,Ltd. regulatory approvals:

A.Customer must ensure that its product (The "CUSTOMER Product") is electrically identical to Sichuan AI-Link Technology Co.,Ltd. reference designs.

Customer acknowledges that any modifications to Sichuan AI-Link Technology Co.,Ltd. reference designs may invalidate regulatory approvals in relation to the CUSTOMER Product, or may necessitate notifications to the relevant regulatory authorities.

B.Customer is responsible for ensuring that antennas used with the product are of the same type, with same or lower gains as approved and providing antenna reports to Sichuan AI-Link Technology Co.,Ltd.

C.Customer is responsible for regression testing to accommodate changes to Sichuan AI-Link Technology Co.,Ltd. reference designs, new antennas, and portable RF exposure safety testing/approvals.

D.Appropriate labels must be affixed to the CUSTOMER Product that comply with applicable regulations in all respects.

E.A user's manual or instruction manual must be included with the customer product that contains the text as required by applicable law. Without limitation of the foregoing, an example (for illustration purposes only) of possible text to include is set forth below:

2.2 List of applicable FCC rules (customers' product must also compliant with these rules)

The module complies with FCC Part 15.247, FCC Part 15.407

2.3 Specific operational use conditions

The module has been certified for Mobile/portable applications. The host product operating conditions must be such that there is a minimum separation distance of 20cm between the antenna radiating structures and nearby persons. The host manufacturer installing this module into their product must ensure that the final composite product complies with the FCC requirements by a technical assessment or evaluation to the FCC rules, including the transmitter operation. The host manufacturer 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. If the end product manufacturer use it to a portable product, please provide the SAR compliance.

2.4 Limited module procedures

Not applicable.

2.5 Trace antenna designs

Not applicable.

2.6 RF exposure considerations

The device can be used in mobile exposure condition without restriction and if RF exposure statement or module layout is changed, then the host product manufacturer required to take responsibility of the module through a change in FCC ID or new application. The FCC ID of the module cannot be used on the final product. In these circumstances, the host manufacturer will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

This equipment complies with FCC's RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must be installed and operated to provide a separation distance of at least 20cm from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. Installers must ensure that 20cm separation distance will be maintained between the device and users.

Note: the OEM product manuals must include a statement in order to alert the users of FCC RF exposure compliance.

2.7 Antennas

The module shall be only used with the following antennas of the same type with equal or lower gain.

The module contain a unique antenna connector, and be marketed and operated only with specific antenna(s), per §§ 15.203, 15.204 (b), 15.204(c), 15.212(a), 2.929(b).

Antenna Type	Antenna Gain	Frequency Range	Connector Type	Min separation
PIFA Antenna	3.93	2402- 2480MHz	i-pex	20cm
	3.93	2402- 2480MHz		
	3.93&3.47	2412- 2462MHz		
	2.36&3.41	5.15-5.25 GHz		
	5.03&3.41	5.25-5.35 GHz		
	5.03&3.54	5.47-5.725 GHz		
	5.19&3.54	5.725-5.85 GHz		

2.8 Label and compliance information

Host product manufacturers must provide a physical or e-label stating
“Contains FCC ID:**2AOKI-WF8733BWG**” with their finished product.

2.9 Information on test modes and additional testing requirements

Host manufacturer must perform test of radiated & conducted emission and spurious emission, etc according to the actual test modes for a stand-alone modular transmitter in a host, as well as for multiple simultaneously transmitting modules or other transmitters in a host product. If no other module used and no change to this module, the product can only to compliance with FCC part 15 B to meet the sale requirement. Only when all the test results of test modes comply with FCC requirements, then the end product can be sold legally.

2.10 Additional testing, Part 15 Subpart B disclaimer

The modular transmitter is only FCC authorized for FCC Part 15 Subpart C 15.247 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.