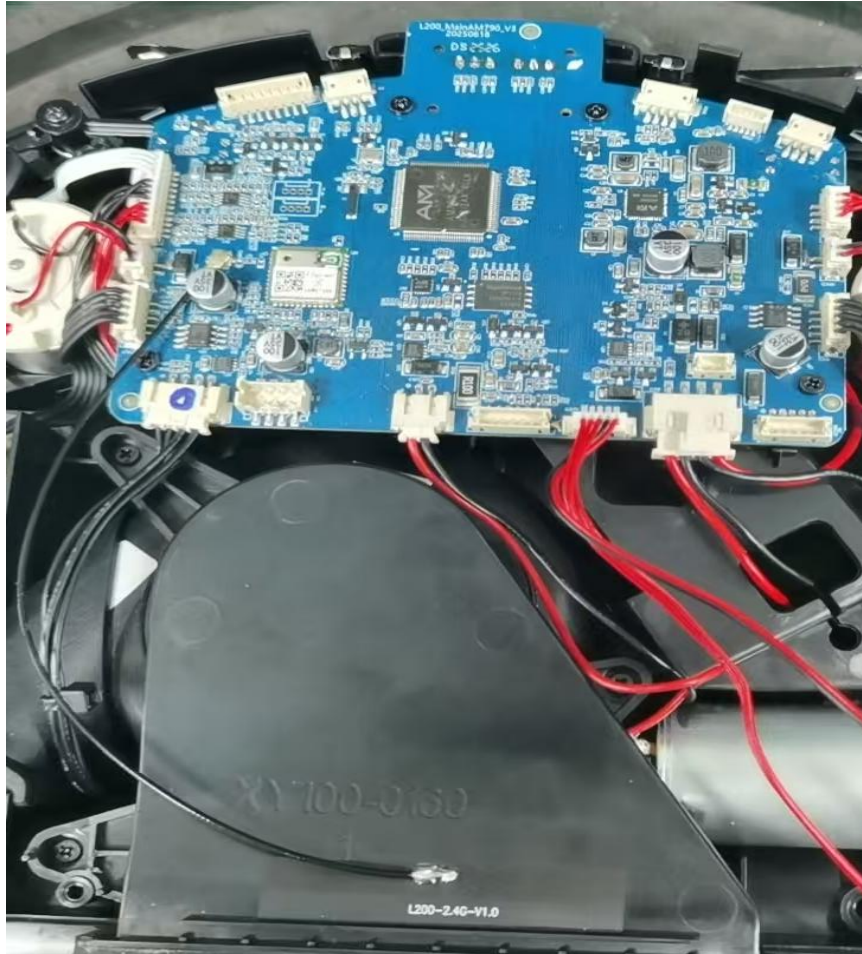


UAW6158B 加 L200_Main Technical Manual



catalogue

1. FCC Statement	-----03
2. Product list	-----05
3. Product Description	-----06
4. Block diagram	-----07
5. Scope of use	-----09
6. RF antenna installation method	-----10
7. Wireless Module(UAW6158B) Installation	-----13

1. 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. 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 modular has been tested and found to comply with part 15 requirements for Modular Approval.

FCC Caution: Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

CFR 47 FCC Part 15 subpart C and Subpart f has been investigated. It is applicable to the modular transmitter

2.3 Specific Operational Use Conditions – Antenna Placement Within the Host Platform

The module is tested for standalone mobile RF exposure use condition. The antenna must be installed such that 20cm is maintained between the

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

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.

2.4 Limited Module Procedures

Not applicable

2.5 Trace Antenna Designs

Not applicable

2.6 RF Exposure Considerations

This device 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.

2.7 Antenna Type and Gain

The following antennas have been certified for use with this module. Only antennas of the same type with equal or lower gain may also be used with this module. Other types of antennas and/or higher gain antennas may require the additional authorization for operation. Antenna Specification list below:

Antenna Type	Antenna Model No.	Maximum Antenna Gain (dBi)	Frequency Range
PCB Antenna	DX-WF24	-0.1	2402– 2480MHz

2.8 End Product Labelling Compliance Information

When the module is installed in the host device, the FCC ID label must be visible through a window on the final device or it must be visible when an access panel, door or cover is easily removed. If not, a second label must be placed on the outside of the final device that contains the following text: "Contains FCC ID: 2BQSG-UAW658E". The FCC ID can be used only when all FCC compliance requirements are met.

2.9 Information on Test Modes and Additional Testing Requirements

This transmitter is tested in a standalone mobile RF exposure condition and any co-located or simultaneous transmission with other transmitter(s) class II permissive change re-evaluation or new FCC authorization. Host manufacturer installed this module with single modular approval should perform the test of radiated emission and spurious emission according to FCC part 15c, 15.209, 15.207 requirement, only if the test result comply with FCC part 15c 15.209, 15.207

requirement, then the host can be sold legally.

2.10 Additional testing, Part 15 Subpart B Disclaimer

This transmitter module was tested as a subsystem and its certification does not cover the FCC Part 15 subpart B rules requirement applicable to the final host. The final host will still need to be reassessed for compliance to this portion of rules requirements if applicable.

As long as all conditions above are 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.

2.11 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 host integrator must follow the integration instructions provided in this document and ensure that the composite system end product complies with the requirements by a technical assessment or evaluation to the rules and to KDB Publication 996369.

The host integrator installing this module into their product must ensure that the final composite product complies with the requirements by a technical assessment or evaluation to the rules, including the transmitter operation and should refer to guidance in KDB Publication 996369.

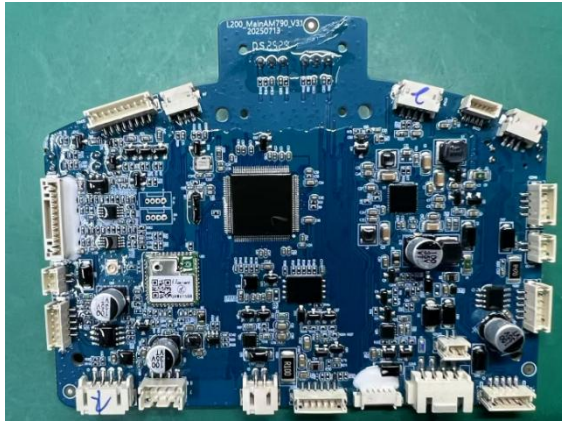
OEM/Host Manufacturer Responsibilities

OEM/Host manufacturers are ultimately responsible for the compliance of the Host and Module. The final product must be assessed against all the essential requirements of the FCC rule such as FCC Part 15 subpart B before it can be placed on the US market. This includes reassessing the transmitter module for compliance with the Radio and RF Exposure essential requirements of the FCC rules.

2.12 How to Make Changes - 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.

2. product list



L200_MainAM790
Module (UAW6158B)



Wireless



WIFI antenna

3. product description

3-1.UAW6158B This wireless SDIO module features integrated Wi-Fi 2.4G-band 1 transceiver and low-power Bluetooth 5.0 MCU design, delivering high RF performance, enhanced security, and energy efficiency. It communicates with peripherals via SDIO interface, supports 802.11b/g/n wireless standard, operates on 3.3V single power supply, and is packaged as a postage stamp size. The installation method of hole is flexibly applied to all kinds of consumer products to meet customer needs to the greatest extent.

Built-in: 128KB ROM and 512KB SRAM

Built-in: 2304bit fuse and safety guidance

working frequency : WIFI: 2400MHz~2483.5MHz

working frequency : BLE: 2400MHz~2483.5MHz

Support Wi-Fi+BLE 5.0

Support 802.11b/g/n Wireless standards

Support STA/AP Two modes of operation

Single frequency 1T1R mode

working voltage: 3.1V~3.46V

Support HT20/HT40

Support AES/SHA/ECC encryption algorithm

SDIO 2.0 The interface has a clock rate of up to 50MHz, small size and simple peripheral circuit

3-2.L200_Main790 The motherboard communicates with the Wireless Module through the SDIO 2.0 interface via the AM790 SOC instruction, the power management chip AM318 provides 3.3V power supply for the Wireless Module, and the UAW6158B Wireless Module forms a Wi-Fi 2.4G network control through the Wi-Fi antenna.

L200 Main 790 motherboard:

Working input voltage: 11V-24V

Supports Wi-Fi 2.4G network control and Bluetooth networking mode

Supports 4 PWM brushed motor control

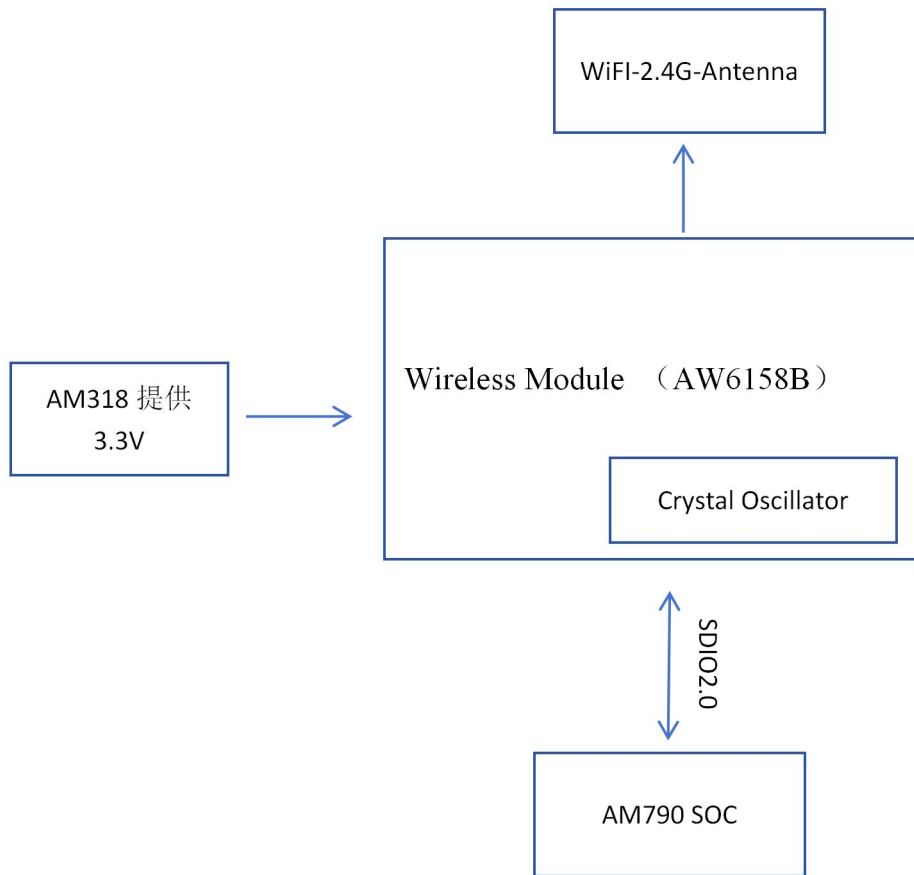
Supports 1 PWM brushless motor control

Supports 4 battery charges

Support radar control and map building

Supports 12-channel ADC sampling

4. frame diagram



UAW6158B Pin definition

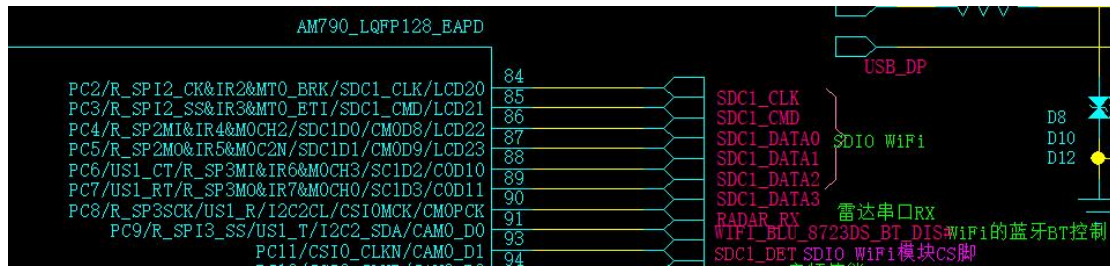
number	Pin definition	IO mold	function
1	GND	P	GND
2	ANT	O	RF output port
3	GND	P	GND
4	NC	—	NC
5	GPI012	I/O	GPI012
6	NC	—	NC
7	NC	—	NC
8	NC	—	NC
9	VDD33	I	VCC 3.3V

10	NC	—	NC
11	NC	—	NC
12	LDO_EN	I	Reset, low level effective
13	WAKE_UP_HOST	0	WIFI wakes up the host, high level is valid
14	SD_D2	I/O	SD_D2
15	SD_D3	I/O	SD_D3
16	SD_CMD	I/O	SD_CMD
17	SD_CLK	I	SD_CLK
18	SD_D0	I/O	SD_D0
19	SD_D1	I/O	SD_D1
20	GND	P	GND
21	NC	—	NC
22	VDDIO	P	Module GPIO power configuration pins 3.3V (selectable 1.8V)
23	NC	—	NC
24	NC	—	NC
25	NC	—	NC
26	NC	—	NC
27	NC	—	NC
28	NC	—	NC
29	NC	—	NC
30	NC	—	NC
31	GND	P	GND
32	NC	—	NC
33	GND	P	GND
34	NC	—	NC
35	NC	—	NC
36	GND	P	GND
37	GPIO01	I/O	GPIO01/UART_LOG_TX
38	GPIO00	I/O	GPIO00/UART_LOG_RX
39	NC	—	NC
40	NC	—	NC
41	NC	—	NC
42	NC	—	NC
43	NC	—	NC
44	NC	—	NC

Note: P indicates the power pin, I/O indicates the input/output pin, and I indicates the input pin

[illegible]

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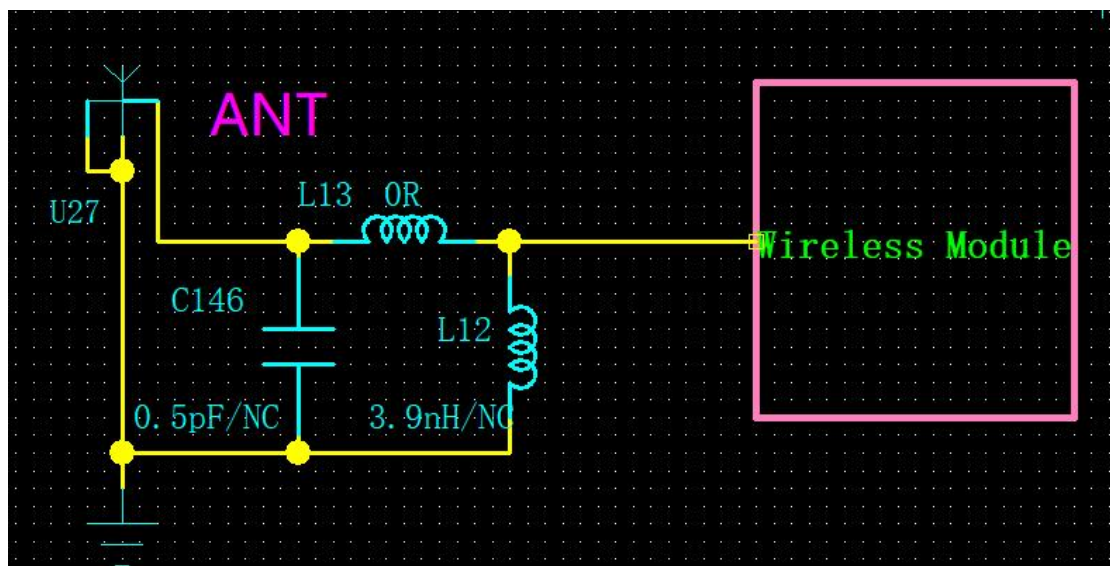
AM790 SOC

5. Areas of use

Laser sweeper

6. RF antenna installation method

6-1. RF reference circuit



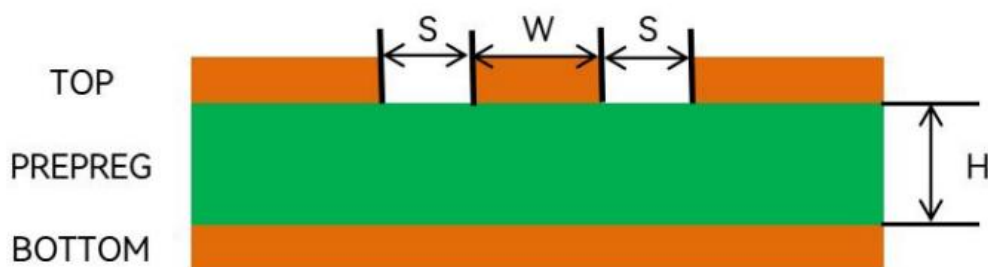
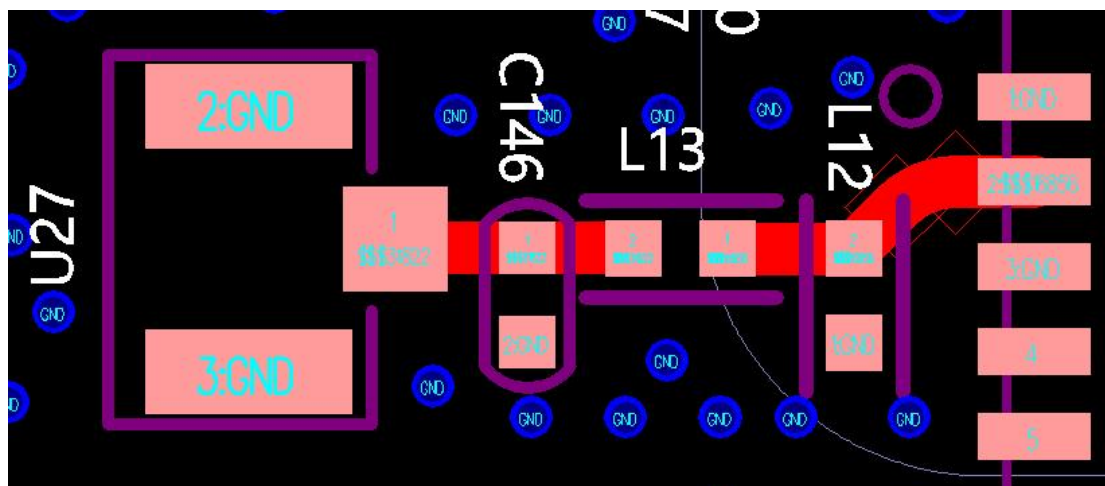
Attention:

In the figure, L13 C146 L12 is a reserved Π -type matching circuit, which is convenient for tuning

Impedance matching; L13 is affixed with 0 ohm by default, and C146 L12 is empty;

To prevent the RF port from being damaged by ESD, it is highly recommended to reserve an ESD device at the antenna end, taking care that the parasitic capacitance does not exceed 0.5 pF.

To ensure optimal RF signal transmission performance, all RF transmission lines must maintain a precise characteristic impedance of $50\ \Omega$. This impedance value is primarily determined by multiple parameters including the dielectric constant of the substrate material, the signal line width (W), the spacing distance (S) between the signal line and the reference ground plane, as well as the thickness (H) of the dielectric layer.



Attention:

The RF trace connected to the module's RF antenna pad must utilize a microstrip line or other

Types of RF transmission lines. It is recommended to employ impedance simulation tools to achieve precise $50\ \Omega$ impedance matching for the RF signal line.

The π -type matching circuit should be placed as close as possible to the RF port,

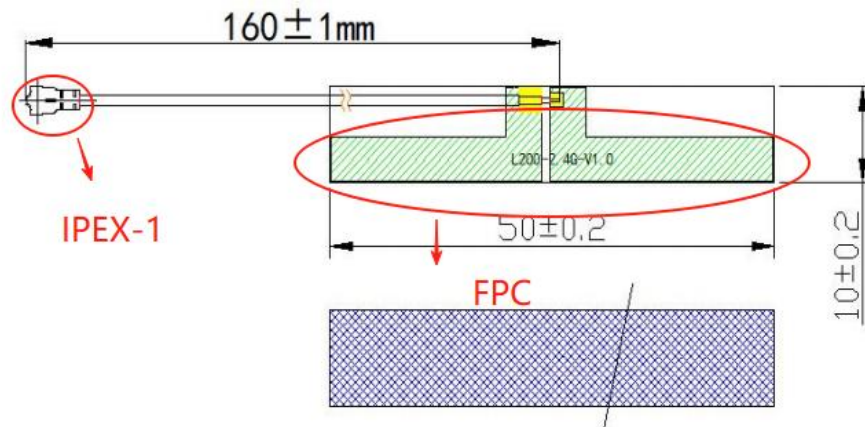
The reference ground plane of the RF signal line must remain in tact and continuous. Additionally,

adding an appropriate number of grounding vias around the signal line and reference ground plane can effectively enhance RF performance.

The RF trace must be kept away from interference sources and should neither cross nor run parallel to any signal lines on adjacent layers.

6-2: L200 WiFi-2.4G-Antenna installation

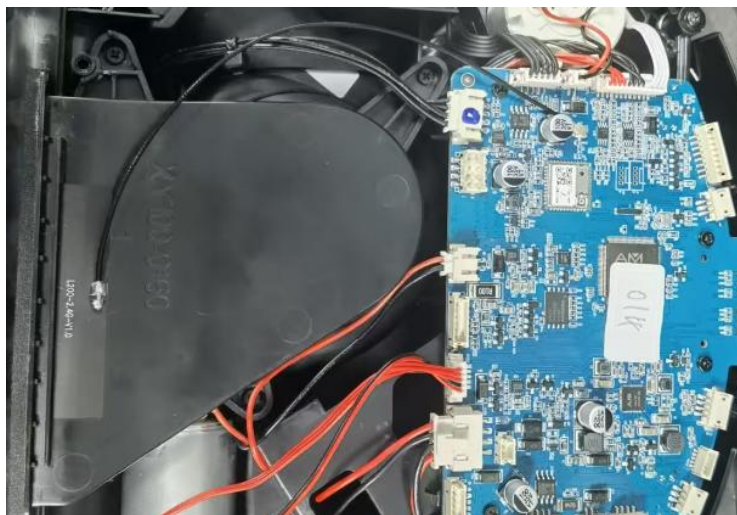
The L200 antenna consists of an IPEX-1 coaxial interface and an FPC antenna, as shown below:



The L200 WiFi-2.4G-antenna is connected to the motherboard U27 connector via IPEX-1, and the FPC is glued to the fan housing as shown below:



The effect after antenna installation is as follows:



7. Wireless Module(UAW6158B) install

7.1 ModuleMechanicalDimensions

The UAW6158B module uses a 44-pin stamp hole design with an overall size of $12\text{mm} (\pm 0.15) \times 12\text{mm} (\pm 0.15) \times 1.8\text{mm} (+0.3/-0.2)$, as shown in the figure.

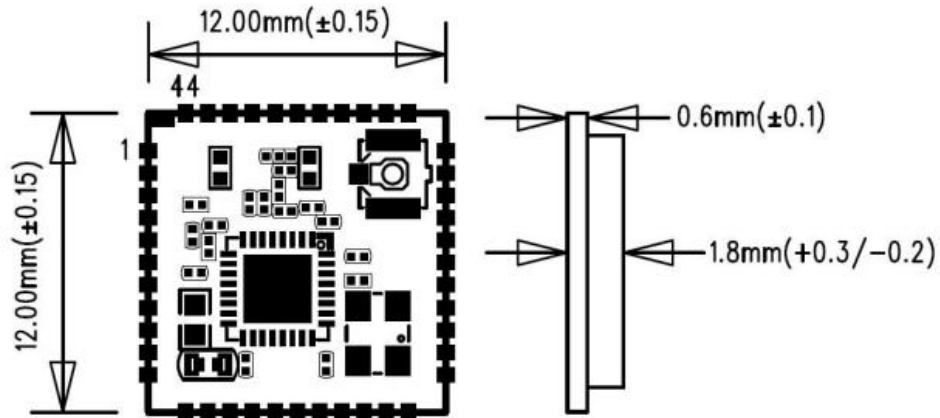
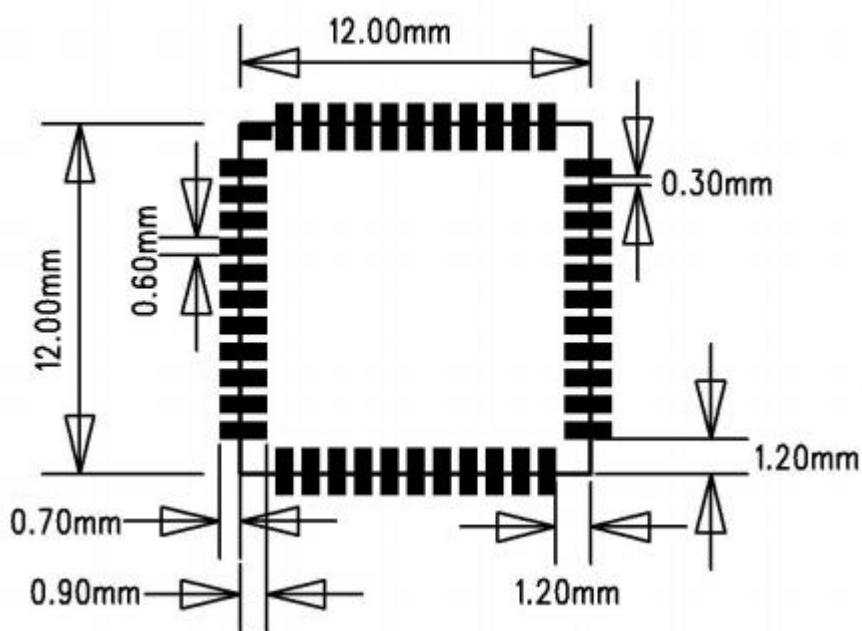


图 1 PCBA 尺寸图

Module appearance diagram



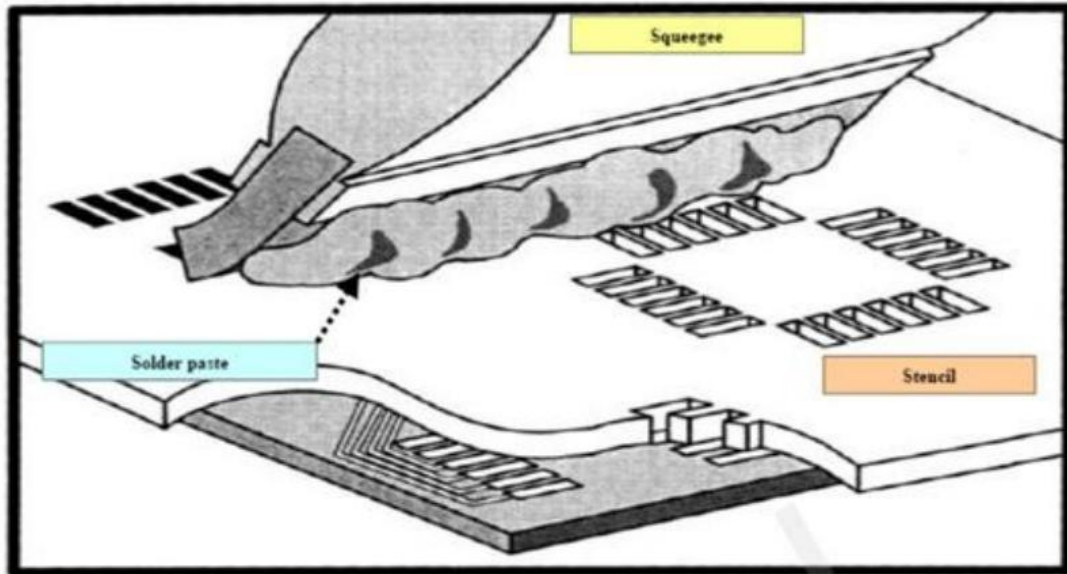
7.2 RecommendedPCB Packages



PCB package(fron view in millimeters)

7.3 ProductionWelding

Print the solder paste on the stencil with a printing squeegee, so that the solder paste through the opening of the stencil leakage printed on the PCB, the strength of the printing squeegee needs to be adjusted appropriately, in order to ensure the quality of the module printing paste, UAW6158B module pad part of the corresponding stencil thickness should be 0.2 mm.



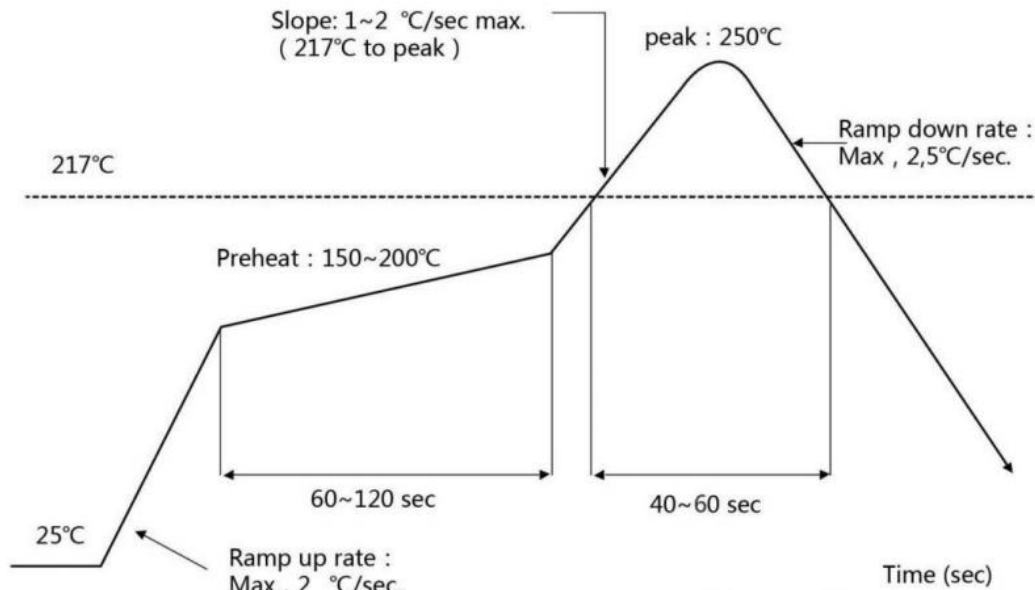
Paste Chart

In order to avoid repeated heat damage to the module, it is recommended that customers reflow the first side of the PCB board before attaching the module. The recommended oven temperature profile is shown below:

Referred to IPC/JEDEC standard.

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

Number of Times : ≤ 2 times



7.3 Patch Wi-Fi modules installed before the notice.

Module installed note:

1. Take and use the module, please insure the electrostatic protective measures.
2. Reflow soldering temperature should be according to the customer the main size of the products, such as the temperature set at $250 + 5$ °C for the MID motherboard.

About the module packaging, storage and use of matters needing attention are as follows:

3. The module of the reel and storage life of vacuum packing: 1). Shelf life: 8 months, storage environment conditions: temperature in: < 40 °C, relative humidity: $< 90\%$ r.h.
4. The module vacuum packing once opened, time limit of the assembly: Card:1) check the humidity display value should be less than 30% (in blue), such as: 30% ~ 40% (pink), or greater than 40% (red) the module have been moisture absorption.
- 2.) factory environmental temperature humidity control: ≤ -30 °C, $\leq 60\%$ r.h..
- 3). Once opened, the workshop the preservation of life for 168 hours.
5. Once opened, such as when not used up within 168 hours:
 - 1). The module must be again to remove the module moisture absorption.
 - 2). The baking temperature: 125 °C, 8 hours.
 - 3). After baking, put the right amount of desiccant to seal packages.