



**OFLYCOMM**

欧飞信科技

**O9001UE**

WiFi 802.11 bgn 1X1 2.4G Only

Module Datasheet

## Cover of Approval Sheet

PRODUCT NAME	Part No.	Description
O9001UE	FWAAO9001UE10	WQ9001 USB 3.3V 1T1R 13*12.2*1.6mm 11b/g/n WIFI External antenna

Customer: \_\_\_\_\_

Customer P/N: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Maker Information:

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**Revision History**

<b>Version</b>	<b>Date</b>	<b>Description</b>	<b>Draft</b>	<b>Approved</b>
V0.1	2022-12-02	-Preliminary Project version	CCJ	Turbo
V0.2	2022-12-08	- Pinout definition update	CCJ	Turbo
V1.0	2023-03-14	- Addition the description	CCJ	Turbo

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# 1. Overview

## 1.1 Introduction

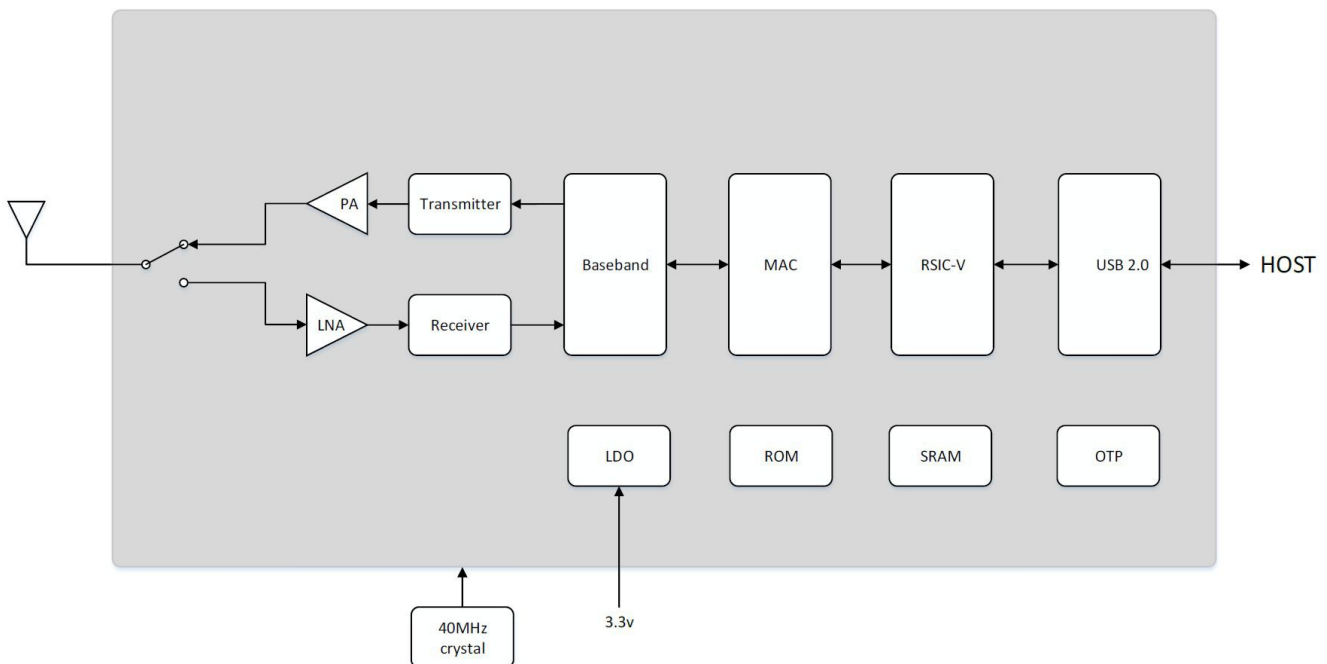
O9001UE is a highly integrated, high performance 802.11 b/g/n WLAN SoC chip with USB interface (USB 2.0 compliant). O9001UE integrates RF transceiver, 802.11 PHY & MAC, RISC-V CPU, OTP, USB interface and power management circuits. The integrated RF circuits include power amplifier (PA), low noise amplifier (LNA), T/R switch and balun. Therefore, O9001UE provides a complete solution for high throughput and reliable wireless LAN application.

O9001UE supports all data rates for IEEE 802.11 b/g/n with one spatial stream transmission over 20MHz bandwidth.

## 1.2 Features

- 802.11b/g/n 1T1R WLAN
- Complies with USB2.0 for WLAN
- Maximum data rate: 54Mbps in 802.11g and 72Mbps in 802.11n
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11e
- Support AP & STA function
- Encryption: open / WEP40 / WEP104 / TKIP / AES128 in STA mode, open / AES128 in AP mode

## 1.3 Block Diagram



## 1.4 General Specification

Model Name	O9001UE
Product Description	Support Wi-Fi functionalities
Dimension	L x W x H: 13 x 12.2 x 1.6 (typical) mm
Wi-Fi Interface	USB2.0
Operating temperature	0°C to 70°C
Storage temperature	-30°C to 105°C

## 1.5 Recommended Operating Rating

Feature		Minimum	Type	Maximum	Units
Operating Temperature		0	25	70	°C
VCC		3.15	3.3	3.45	V
Power Consumption (MAX VCC)	TX (2.4G HT20)	310 mA			
	RX (2.4G HT20)	86 mA			

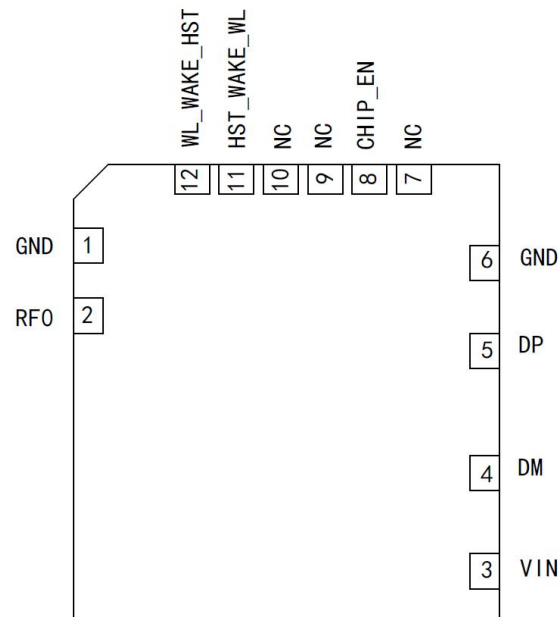
## 2. RF Specification

### 2.1 Wi-Fi RF Specification

Feature	Description		
Operating Frequency	2.400~2.4835GHz		
Standards	Wi-Fi: IEEE 802.11b/g/n & Wi-Fi compliant		
Operating Channel	2.4GHz : Ch1~13		
Modulation	802.11b : CCK 802.11 g/n : OFDM /64-QAM、16-QAM、QPSK、BPSK		
PHY Data rates	Wi-Fi:802.11b:11,5.5,2,1Mbps 802.11g:54,48,36,24,18,12,9,6Mbps 802.11n: up to 72Mbps		
Output Power, tolerance $\pm 1.5$ dB			
Protocol Standard	Data Rate	Spec.(dBm)	EVM(dB)
802.11b	@11Mbps	19	$\leq -10$
802.11g	@54Mbps	15	$\leq -25$
802.11n	@MCS 7	15	$\leq -28$
Receiver Sensitivity CCK modulation PER $\leq 8\%$ 、OFDM modulation PER $\leq 10\%$			
Protocol Standard	Data Rate	Spec.(dBm)	
802.11b	1Mbps	-82	
	11Mbps	-76	
802.11g	6Mbps	-82	
	54Mbps	-64	
802.11n	HT20_MCS 0	-82	
	HT20_MCS 7	-64	

### 3.Pin Assignments

#### 3.1 Pin Outline



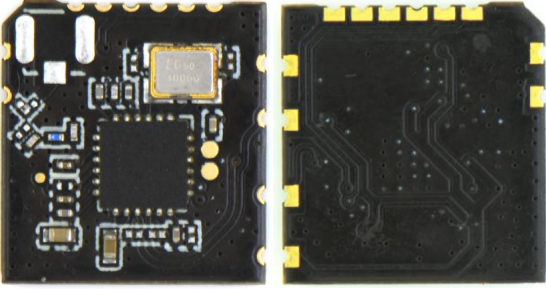
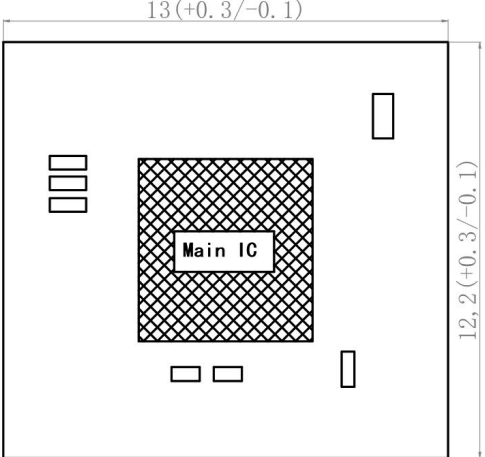
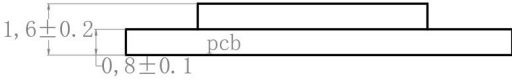
#### 3.2 Pin Definition

NO	Name	Type	Description	Voltage
1	GND	-	Ground connections	
2	RF0	I/O	antenna is for WiFi	
3	VIN	-	Main power voltage source input 3.3V	3.3V
4	DM	I/O	USB2.0 differential pair for WLAN	
5	DP	I/O	USB2.0 differential pair for WLAN	
6	GND	-	Ground connections	
7	NC	-	NC	
8	CHIP_EN	I	Global reset (active low)	3.3V
9	NC	-	NC	
10	NC	-	NC	
11	HST_WAKE_WL	O	Host wake up WLAN device	3.3V
12	WL_WAKE_HST	I	WLAN device wake up host	3.3V

### 4.Dimensions

#### 4.1Physical Dimensions and Module Photo

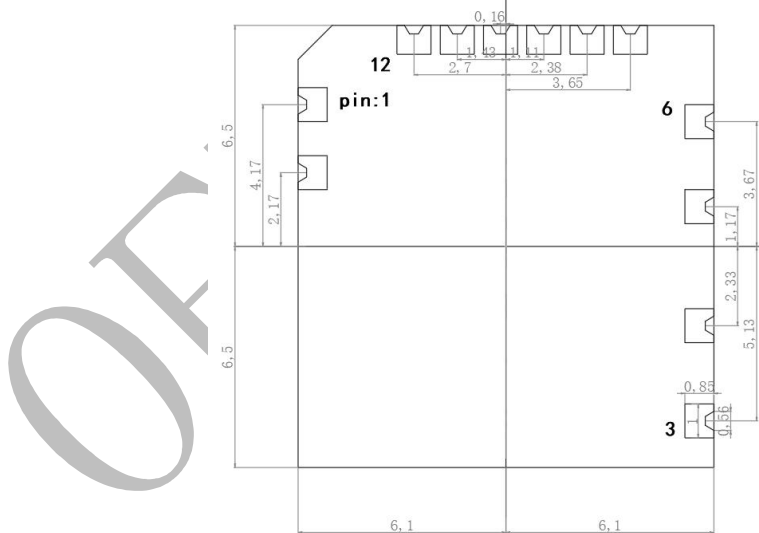
(Unit: mm)

<p>L x W : 13 x 12.2(+0.3/-0.1) mm</p> 	
<p>H: 1.6 (±0.2)mm</p>	
<p>Weight</p>	<p>4.5g</p>

### 4.2 Module Physical Dimensions

(Unit: mm)

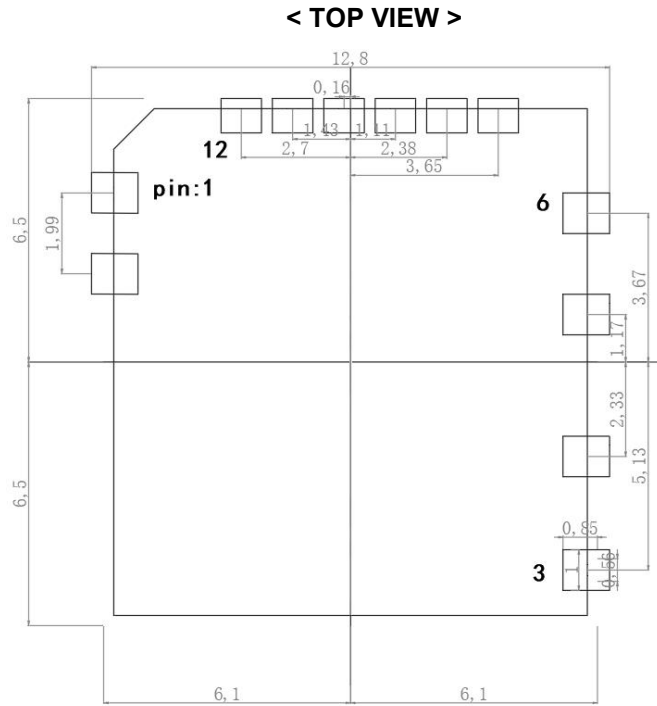
< TOP VIEW >





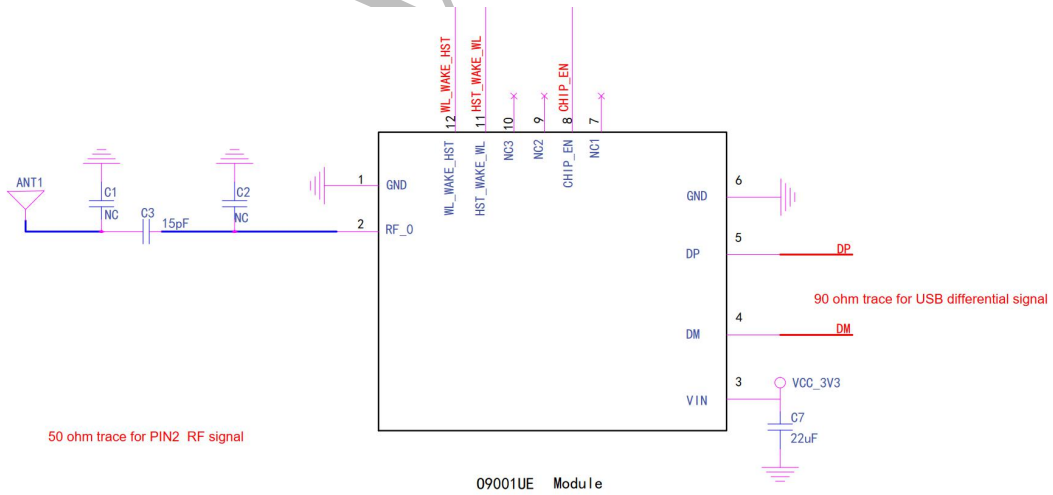
### 4.3 Layout Recommendation

(Unit: mm)



## 5 Reference Design

### 5.1 Reference schematic



Note:

- 1, Please add 22uF cap for VCC\_3V3.
- 2, For USB 2.0 differential signal, requires 90 ohm impedance.
- 3, For PIN2 RF IO trace, keep 50 ohm impedance.

### 5.2 External Antenna

When the customer selects an external antenna, the external antenna selected must meet the parameter requirements specified ,Impedance 50Ω

### 5.3 Real-world Testing

Protocol Standard	channel	Power (dBm)	EVM(dB)	Rx Sensitivity (dBm)
802.11b(11Mbps)	2412	20.2	-24.4	-86
	2437	19.6	-25	-85
	2472	19.7	-25.4	-86
802.11g(54Mbps)	2412	15.6	-31.7	-72
	2437	15.4	-32.3	-72
	2472	15.4	-32.5	-73
802.11n(20Mbps_MCS7)	2412	15.6	-32.5	-69
	2437	15.4	-32.8	-69
	2472	15.4	-32.9	-69

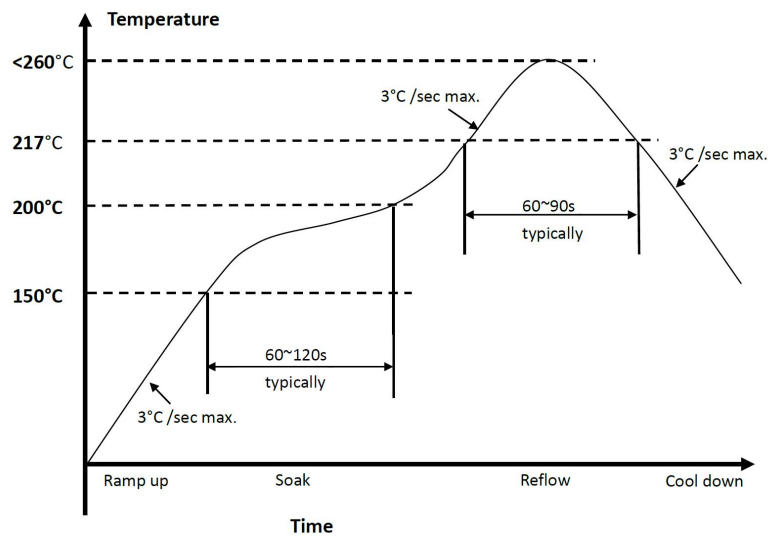
Description: The test environment is: temperature 25 °C humidity 60%

## 6 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

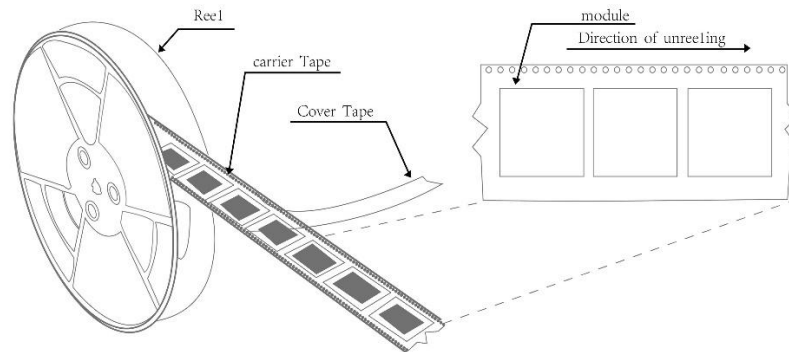
Peak Temperature : <260°C

Number of Times : 2 times max



## 7 Package

### 7.1 Reel



### 7.2 Storage Temperature And Humidity

1. Storage Condition: Moisture barrier bag must be stored under 30°C, humidity under 85% RH. The calculated shelf life for the dry packed product shall be a 12 months from the bag seal date. Humidity indicator cards must be blue, <30%.
2. Products require baking before mounting if humidity indicator cards reads > 30% temp < 30°C, humidity < 70% RH, over 96 hours.  
Baking condition: 125°C, 12 hours. Baking times: 1 time.

THE END