

QOGRISYS

欧飞信科技

O9201PB

Wi-Fi Dual-band 2x2
802.11ax + Bluetooth5.4
Module Datasheet

Cover of Approval Sheet

PRODUCT NAME	Part No.	Description
O9201PB	FWAAO9201PB10	WQ9201B PCIe 3.3V 2T2R 13*15*2.35mm 80MHz 11ax WIFI6+BT5.4-UART External 2Antenna Shield CAN

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

Maker Information:

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Revision History

Version	Date	Description	Draft	Approved
V1.0	2026-02-04	Preliminary Project version	EZX	Ben·Chen
V1.1	2026-04-20	Update module laser engraving information	EZX	Ben·Chen

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1. Overview

1.1 Introduction

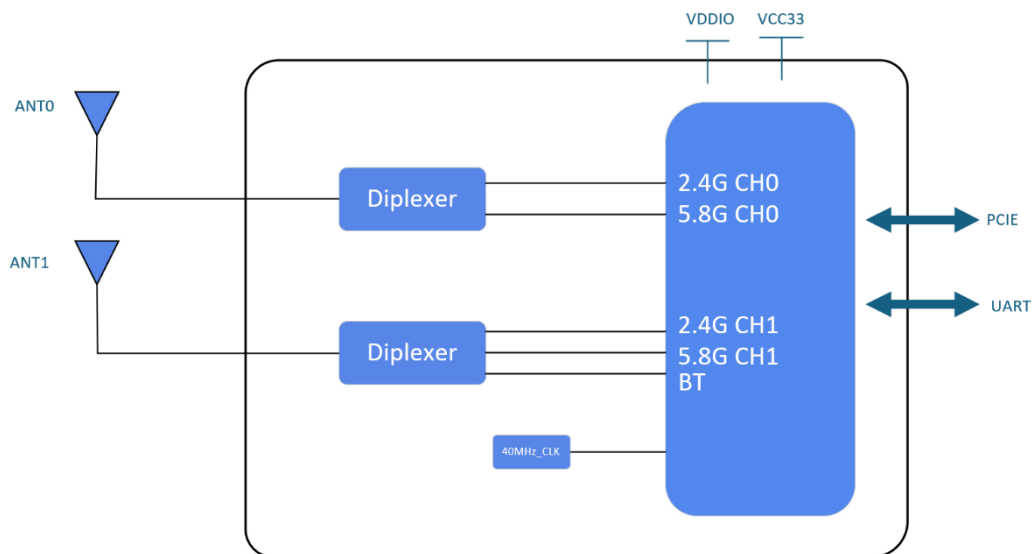
The O9201PB is a dual-mode chip, support 2x2 2.4G + 5G dual-frequency concurrent Wi-Fi function and Bluetooth function. Wi-Fi Da We supports Wi-Fi protocol IEEE 802.11ax and backward compatibility protocol 802.11a/b/g/n/ac. The Bluetooth subsystem supports the Bluetooth system Protocol 5.4 with low-power audio.

The O9201PB chip integrates five high-performance RISC-VCPUs, high-speed interfaces PCIe2. The chip supports a good radio frequency with very low power consumption And baseband performance.

1.2 Features

- Supported for the IEEE 802.11 a / b / g / n / ac / ax protocol.
- Dual-band 2.4 GHz/5 GHz support.
- Integrated with a high-performance iPA.
- Support for 2x2 MIMO.
- Support for dual-frequency concurrency: 2.4 GHz and 5 GHz for simultaneous 1T1R transmission.
- 20MHz/40MHz channel bandwidth for 2.4 GHz and 20MHz/40MHz/80MHz channel bandwidth for 5 GHz.
- Support uplink MU-OFDMA TX and downlink MU-OFDMA RX.
- Support uplink MU-MIMO TX and downlink MU-MIMO RX.
- Support WFA、WPA/WPA2/WPA3、WEP、WAPI.
- Supports IEEE 802.11k /v/r protocol.
- Support P2P GO/GC mode.
- DBS supports STA+AP, STA+ P2P GO, and STA+ P2P GC.
- Fully compatible with Bluetooth 5.4 protocol.
- Support for BT / BLE dual-mode.
- Support BLE Audio.
- Support BR/EDR/LE-1M/LE-2M modulation mode.
- Support SCO over I2S.
- Intelligent AFH channel selection strategy is supported.
- Ensemble PA/LNA/Balun.

1.3 Block Diagram



1.4 General Specification

Model Name	O9201PB
Product Description	Support WiFi6+BT5.4
Dimension	L x W x H: 13 x 15 x 2.3 (typical) mm
Wi-Fi Interface	PCle
BT Interface	UART
Operating temperature	-10 to 85°C
Storage temperature	-40 to 125°C

Note: This module operates normally within a temperature range of -30°C to 85°C; continuous operation at extreme temperature points over extended periods is not recommended.

1.5 Recommended Operating Rating

Feature		Minimum	Type	Maximum	Units
Operating Temperature		-10	25	85	°C
VCC		3.15	3.3	3.45	V
Power Consumption (Type VCC)	TX (2.4G HE40)	583mA			
	RX (2.4G HE40)	306mA			
	TX (5G HE80)	672mA			
	RX (5G HE80)	407mA			
	Power Up	152mA			
	BT TX (1DH5)	248mA			
	BT RX	157mA			

2. RF Specification

2.1 Wi-Fi RF Specification

2.4GHz RF Specification	
Feature	Description

Operating Frequency	2.400~2.4835GHz		
Standards	Wi-Fi: IEEE 802.11b/g/n/ax & Wi-Fi compliant		
Operating Channel	2.4GHz : Ch1~14		
Modulation	802.11b : CCK 802.11 g/n/ax : OFDM /1024-QAM、256-QAM、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 300Mbps (2.4G HE40 2T2R) 802.11ax: up to 500Mbps data rate (2.4G HE40 2T2R)		
Output Power, tolerance ± 1.5 dB			
Protocol Standard	Data Rate	Spec.(dBm)	EVM(dB)
802.11b	@11Mbps	18	≤ -9
802.11g	@54Mbps	15	≤ -25
802.11ax	@HE20 MCS 11	13	≤ -35
802.11ax	@HE40 MCS 11	13	≤ -35
Receiver Sensitivity, CCK modulation PER≤8%、OFDM modulation PER≤10%			
Protocol Standard	Data Rate	Spec.(dBm)	
802.11b(20MHz)	1Mbps	-85	
	11Mbps	-82	
802.11g(20MHz)	6Mbps	-85	
	54Mbps	-68	
802.11n(20MHz)	MCS 0	-85	
	MCS 7	-67	
802.11n(40MHz)	MCS 0	-82	
	MCS 7	-64	
802.11ax(20MHz)	MCS 0	-85	
	MCS 11	-55	
802.11ax(40MHz)	MCS 0	-82	
	MCS 11	-52	
5GHz RF Specification			
Feature	Description		
Operating Frequency	5G:5.15 GHz ~ 5.845 GHz (5.0 GHz ISM Band)		
Standards	Wi-Fi: IEEE 802.11 a/n/ac/ax Wi-Fi compliant		
Modulation	802.11 a/n/ac/ax : OFDM /1024-QAM、256-QAM、64-QAM、16-QAM、QPSK、BPSK		
PHY Data rates	Wi-Fi: 802.11a:54,48,36,24,18,12,9,6Mbps 802.11n: up to 300Mbps(5G HT40 2T2R) 802.11ac: up to 800Mbps (5G VHT80 2T2R) 802.11ax: up to 1200Mbps data rate (5G HE80 2T2R)		
Output Power, tolerance ± 1.5 dB			
Protocol Standard	Data Rate	Spec.(dBm)	EVM(dBm)

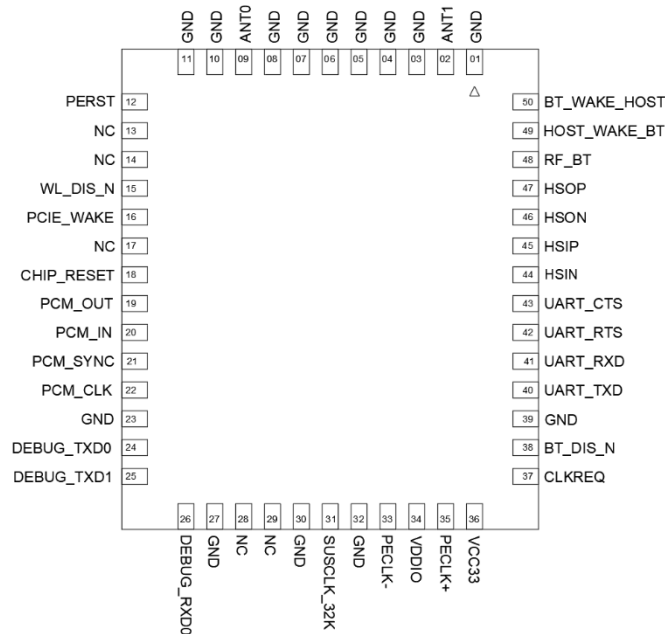
802.11a	@54Mbps	15	≤ -25
802.11ac	@VHT80 MCS 9	13	≤ -32
802.11ax	@HE20 MCS 11	13	≤ -35
802.11ax	@HE80 MCS 11	11	≤ -35
Receiver Sensitivity, OFDM modulation PER $\leq 10\%$			
Protocol Standard	Data Rate	Spec.(dBm)	
802.11a(20MHz)	6Mbps	-85	
	54Mbps	-68	
802.11n(20MHz)	MCS 0	-85	
	MCS 7	-67	
802.11n(40MHz)	MCS 0	-82	
	MCS 7	-64	
802.11ac(20MHz)	MCS 0	-85	
	MCS 8	-62	
802.11ac(40MHz)	MCS 0	-82	
	MCS 9	-57	
802.11ac(80MHz)	MCS 0	-79	
	MCS 9	-54	
802.11ax(20MHz)	MCS 0	-85	
	MCS 11	-55	
802.11ax(40MHz)	MCS 0	-82	
	MCS 11	-52	
802.11ax(80MHz)	MCS 0	-79	
	MCS 11	-49	

2.2 BT RF Specification

Feature	Description		
Operating Frequency	2.402~2.480GHz		
Number of Channels	79 channels		
Standards	Bluetooth V5.4		
Modulation	8DPSK, $\pi/4$ DQPSK, GFSK		
PHY Data rates	Supports 2Mbps Bluetooth Low Energy(BLE), BLE Long Range		
Output Power(BLE)	Min(dBm)	Typical(dBm)	Max(dBm)
	11.5	13	14.5
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-92	
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)		-92	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-87	

3.Pin Definition

3.1 Pin Outline



3.2 Pin Definition

Top side

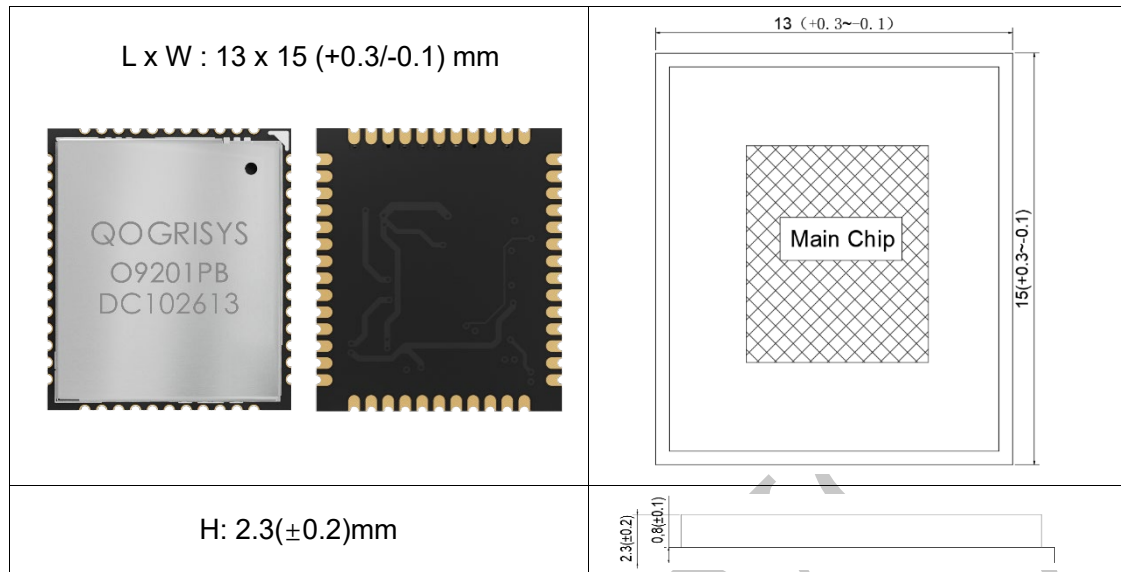
NO	Name	Type	Description	Voltage
1	GND	—	Ground connections	
2	ANT1	I/O	RF I/O port chain1, Dual band Wi-Fi and BT(2 ant type)	
3	GND	—	Ground connections	
4	GND	—	Ground connections	
5	GND	—	Ground connections	
6	GND	—	Ground connections	
7	GND	—	Ground connections	
8	GND	—	Ground connections	
9	ANT0	I/O	RF I/O port chain0, dual band Wi-Fi	
10	GND	—	Ground connections	
11	GND	—	Ground connections	
12	PERST	I/O	PCIE reset, active low	VDDIO
13	NC	—	No connect	
14	NC	—	No connect	
15	WL_DIS_N	I	Enable pin for wlan device Default ON: pull high; OFF: pull low	VDDIO
16	PCIE_WAKE	I/O	PCIE wake up host, ,active low	VDDIO

17	NC	—	No connect	
18	CHIP_RESET	I/O	Global reset	3.3V
19	PCM_OUT	O	PCM Data output	VDDIO
20	PCM_IN	I	PCM data input	VDDIO
21	PCM_SYNC	I/O	PCM sync signal	VDDIO
22	PCM_CLK	I/O	PCM clock	VDDIO
23	GND	—	Ground connections	
24	NC	—	No connect	
25	NC	—	No connect	
26	NC	—	No connect	
27	GND	—	Ground connections	
28	NC	—	No connect	
29	NC	—	No connect	
30	GND	—	Ground connections	
31	SUSCLK_32K	I/PD	External Low Power Clock input (32.768KHz) If not used keep NC	
32	GND	—	Ground connections	
33	PECLK-	I/O	PCIE CLK-	
34	VDDIO	P	I/O Voltage supply input 1.8V or 3.3V	1.8V or 3.3V
35	PECLK+	I/O	PCIE CLK+	
36	VCC33	P	Main power voltage source input 3.3V	3.3V
37	CLK REQ	I/O	PCIE clk request	VDDIO
38	BT_DIS_N	I	Enable pin for Bluetooth device Default ON: pull high; OFF: pull low	VDDIO
39	GND	—	Ground connections	
40	UART_TXD	O	Bluetooth UART interface	VDDIO
41	UART_RXD	I	Bluetooth UART interface	VDDIO
42	UART_RTS	O	Bluetooth UART interface	VDDIO
43	UART_CTS	I	Bluetooth UART interface	VDDIO
44	HSIN	I	PCIE RX-	
45	HSIP	I	PCIE RX+	
46	HS0N	O	PCIE TX-	
47	HS0P	O	PCIE TX+	
48	RF_BT	I/O	BT antenna (optional if 3 ant type) 2 ant type NC this pin	
49	HOST_WAKE_BT	I	HOST wake-up Bluetooth device	VDDIO
50	BT_WAKE_HOST	O	Bluetooth device to wake-up HOST	VDDIO

4. Dimensions

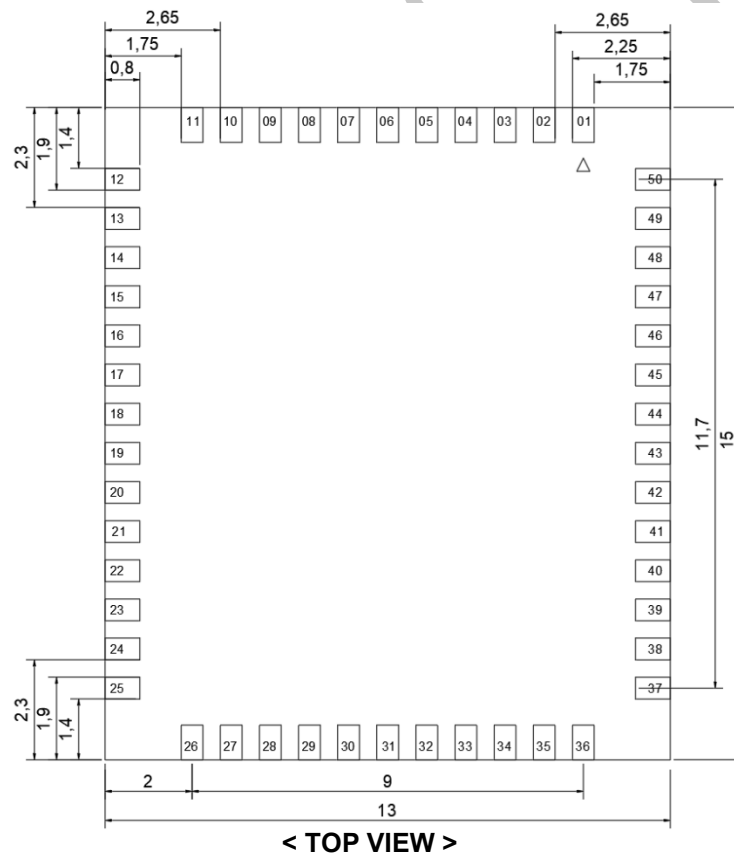
4.1 Physical Dimensions and Module Photo

(Unit: mm)



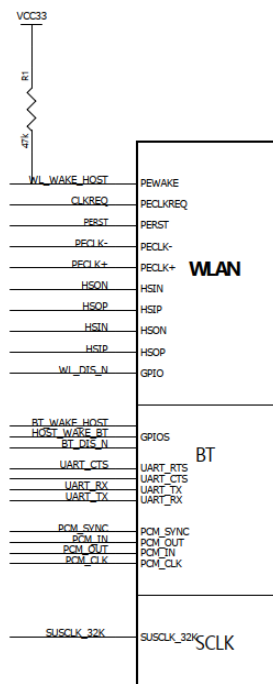
4.2 Module Physical Dimensions

(Unit: mm)



5.1 Reference schematic

C7 caps should be close d to pin 34 of the module



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

2.4G Real-world Testing					
Protocol Standard		channel	Power (dBm)	EVM(dB)	Rx Sensitivity (dBm)
802.11g(54Mbps)	ANT1	2412	14.8	-41.1	-76
		2437	15.3	-40.4	-76
		2472	15.5	-40.9	-76
	ANT2	2412	14.6	-41.9	-76
		2437	15.1	-41.6	-76
		2472	15.6	-41.2	-76
802.11ax(HE20_MCS11)	ANT1	2412	12.7	-42.0	-62
		2437	13.2	-40.6	-62
		2472	13.9	-41.8	-62

	ANT2	2412	12.4	-42.0	-62
		2437	13.0	-41.0	-62
		2472	13.5	-41.7	-62
802.11ax(HE40_MCS11)	ANT1	2422	13.2	-40.4	-62
		2462	14.0	-39.2	-62
	ANT2	2422	12.9	-40.8	-62
		2462	13.6	-40.8	-62
5G Real-world Testing					
Protocol Standard		channel	Power (dBm)	EVM(dB)	Rx Sensitivity (dBm)
802.11a(54Mbps)	ANT1	5180	13.9	-41.7	-76
		5600	14.9	-40.8	-76
		5825	16.3	-38.7	-76
	ANT2	5180	14.1	-42.2	-76
		5600	14.0	-42.1	-76
		5825	15.2	-40.3	-76
802.11ax(HE20_MCS11)	ANT1	5180	12.1	-40.4	-62
		5500	12.5	-39.9	-62
		5825	14.5	-38.7	-62
	ANT2	5180	12.3	-41.7	-62
		5500	12.1	-41.9	-62
		5825	13.9	-40.5	-62
802.11ax(HE80_MCS11)	ANT1	5210	9.6	-40.0	-58
		5610	10.9	-39.2	-58
		5775	12.2	-38.7	-58
	ANT2	5210	9.7	-40.2	-58
		5610	10.2	-39.7	-58
		5775	12.1	-39.4	-58

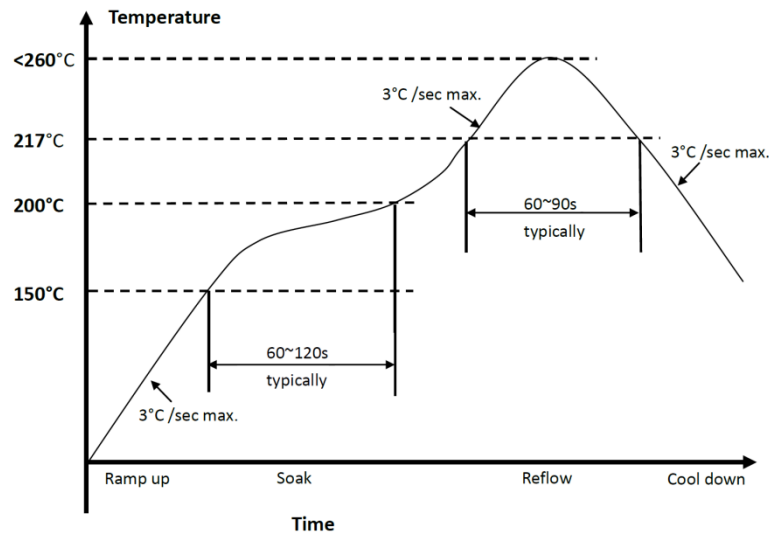
Description: The test environment is: temperature 25 °C humidity 60%

6 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

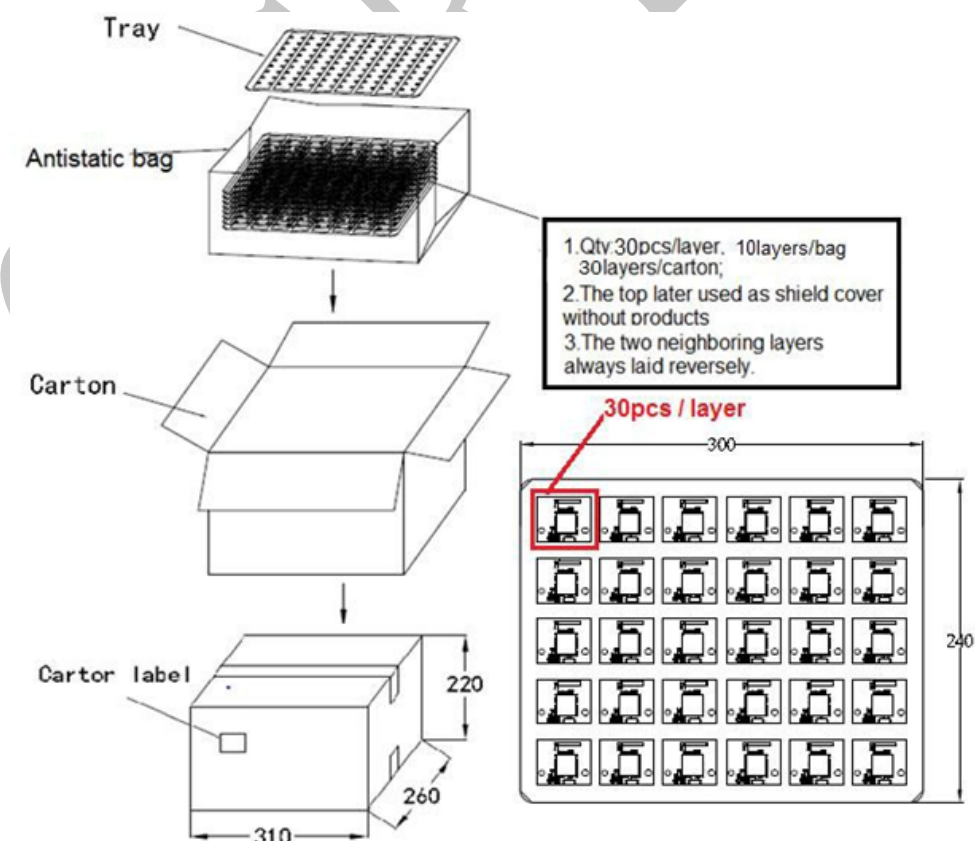
Peak Temperature : <260°C

Number of Times : 2 times max



7 Package

7.1 Reel



7.2 Storage Temperature And Humidity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care all the relative requirements for using this kind of components.

Moreover, the customer has to take care of the following conditions:

- a) Calculated shelf life in sealed bag: 12 months at <40°C and <90% relative humidity (RH).
- b) Environmental condition during the production: 30°C / 60% RH according to IPC/JEDEC J-STD-033A paragraph 5.
- c) The maximum time between the opening of the sealed bag and the reflow process must be 168 hours if condition.
- d) "IPC/JEDEC J-STD-033A paragraph 5.2" is respected.
- e) Baking is required if conditions b) or c) are not respected.
- f) Baking is required if the humidity indicator inside the bag indicates 10% RH or more.

THE END