

QOGRISYS

欧飞信科技

O8852PB

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

Cover of Approval Sheet

PRODUCT NAME	Part No.	Description
O8852PB	FWAAO8852PB10	RTL8852BE-VR-CG PCIE 3.3V 2T2R 13*15*2.3mm 11ax +BT5.2 2Antenna Shield CAN

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

Maker Information:

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Revision History

Version	Date	Description	Draft	Approved
V1.0	2025-07-28	Preliminary Project version	EZX	Ben·Chen
V2.0	2025-11-11	Revise Company Logo and Address Revised Operating Temperature Specifications	EZX	Ben·Chen
V2.1	2026-04-20	Update module laser engraving information	EZX	Ben·Chen

CONTENTS

1.OVERVIEW	4
1.1 INTRODUCTION	4
1.2 FEATURES	4
1.3 BLOCK DIAGRAM	4
1.4 GENERAL SPECIFICATION	5
1.5 RECOMMENDED OPERATING RATING	5
2. RF SPECIFICATION	5
2.1 WI-FI RF SPECIFICATION	5
2.2 BT RF SPECIFICATION	7
3.PIN DEFINITION	7
3.1 PIN OUTLINE	7
3.2 PIN DEFINITION	8
4.DIMENSIONS	9
4.1 PHYSICAL DIMENSIONS AND MODULE PHOTO	9
4.2 MODULE PHYSICAL DIMENSIONS	10
5 REFERENCE DESIGN	11
5.1 REFERENCE SCHEMATIC	11
5.2 EXTERNAL ANTENNA	11
5.3 REAL-WORLD TESTING	11
6 RECOMMENDED REFLOW PROFILE	13
7 PACKAGE	13
7.1 REEL	13
7.2 STORAGE TEMPERATURE AND HUMIDITY	14

1. Overview

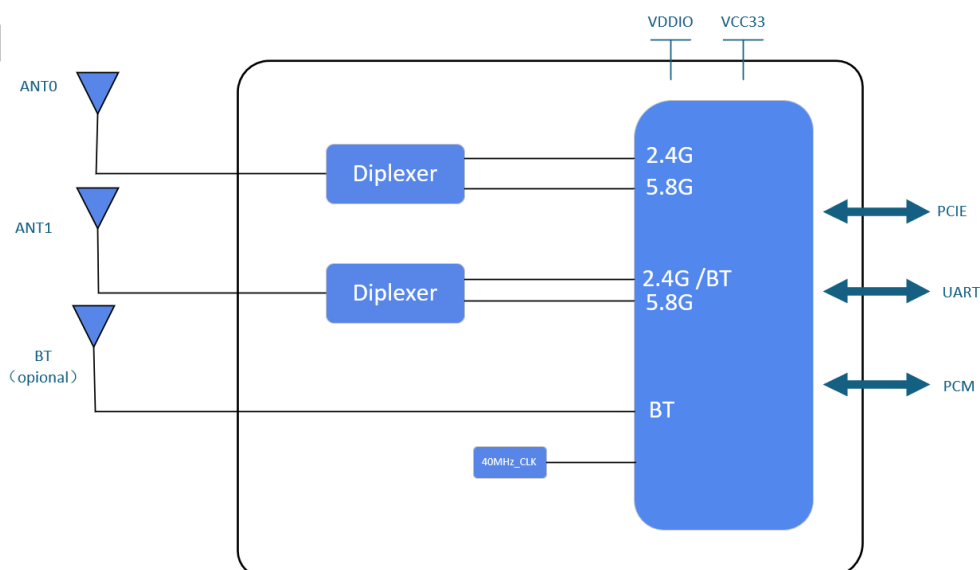
1.1 Introduction

The O8852PB is a highly integrated single-module that support 2-stream 802.11ax solutions with Multi-user MIMO (Multiple-Input, Multiple-Output) with Wireless LAN (WLAN) PCI Express network interface controller with integrated Bluetooth 5.2 UART/PCM interface controller. It combines a WLAN MAC, 2T2R capable WLAN baseband, and RF in a single chip. The RTL8852BE-VR provides a complete solution for a high-performance integrated wireless and Bluetooth device.

1.2 Features

- Supported for the IEEE 802.11 a / b / g / n / ac / ax protocol.
- Dual-band 2.4 GHz/5 GHz support.
- Supports 802.11ac 2x2, Wave-2 compliant with RX MU-MIMO
- 20MHz/40MHz channel bandwidth for 2.4 GHz and 20MHz/40MHz/80MHz channel bandwidth for 5 GHz.
- Support WPA/WPA2/WPA3/WEP/WAPI. Open, shared key, and pair-wise key authentication services
- Fully compatible with Bluetooth 5.2 protocol.
- Compatible with Bluetooth v2.1+EDR
- Dual Mode support: Simultaneous LE and BR/EDR
- Enhanced BT/Wi-Fi Coexistence Control to improve transmission quality in different profiles
- Supports Bluetooth for class1, class2 and class3 power level transmissions without requiring an external PA
- Integrated 32K oscillator for power management

1.3 Block Diagram



1.4 General Specification

Model Name	O8852PB
Product Description	Support WiFi6+BT5.2
Dimension	L x W x H: 15 x 13 x 2.3 (typical) mm
Wi-Fi Interface	PCIe
BT Interface	UART/PCM
Operating temperature	0 to 70°C
Storage temperature	-40 to 125°C

Note: This module operates normally within a temperature range of -15°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		0	25	70	°C
VCC		3.15	3.3	3.45	V
Power Consumption (Type VCC)	TX (2.4G HE40)	575 mA			
	RX (2.4G HE40)	224 mA			
	TX (5G HE80)	641 mA			
	RX (5G HE80)	290 mA			
	Power Up	143 mA			
	BT TX (3DH5)	84 mA			
	BT RX(3DH5)	47 mA			

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 HT40 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	20	≦ -9
802.11g		@54Mbps	18	≦ -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	18	≤-25
802.11ac	@VHT80 MCS 9	15	≤-32
802.11ax	@HE20 MCS 11	13	≤-35
802.11ax	@HE80 MCS 11	13	≤-35
Receiver Sensitivity,OFDM modulation PER≤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	

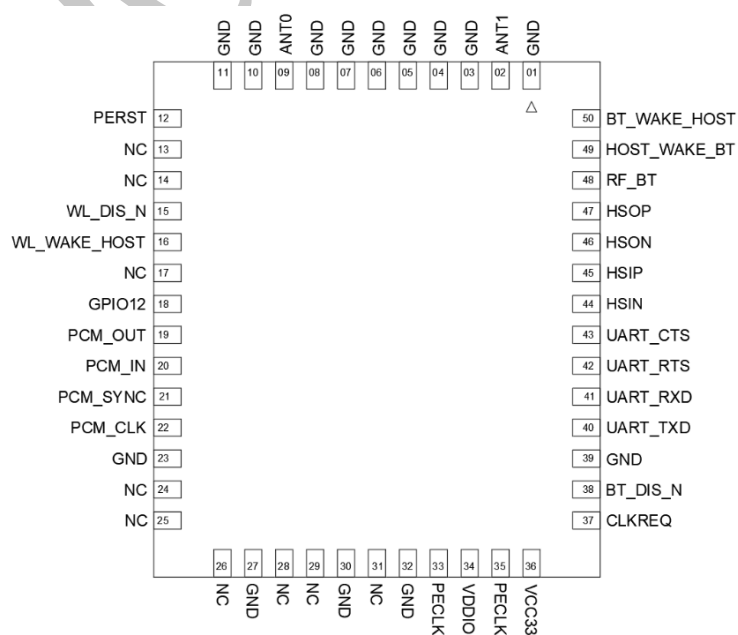
802.11ac(40MHz)	MCS 0	-82
	MCS 9	-57
802.11ac(80MHz)	MCS 0	-79
	MCS 9	-54
802.11ax(20MHz)	MCS 0	-85
	MCS 11	-55
802.11ax(40MHz)	MCS 0	-82
	MCS 11	-52
802.11ax(80MHz)	MCS 0	-79
	MCS 11	-49

2.2 BT RF Specification

Feature	Description		
Operating Frequency	2.402~2.480GHz		
Number of Channels	79 channels		
Standards	Bluetooth V5.2		
Modulation	8DPSK, $\pi/4$ DQPSK, GFSK		
PHY Data rates	Supports 2Mbps Bluetooth Low Energy(BLE),BLELong Range		
Output Power	Min(dBm)	Typical(dBm)	Max(dBm)
	3.5	5	6.5
Sensitivity @ BER=0.1% for GFSK (1Mbps)		-98	
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)		-95	
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)		-92	

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	3.3V
13	NC	—	No connect	
14	NC	—	No connect	
15	WL_DIS_N	I	GPIO9,WL RESET, Default ON: pull high; OFF: pull low	VDDIO
16	WL_WAKE_HOST	O	WAKE#, WLAN wake-up HOST, active low	VDDIO
17	NC	—	No connect	
18	GPIO12	I/O	IO pin, if not used please NC	VDDIO
19	PCM_OUT	O	PCM Data output Not supported please NC	VDDIO
20	PCM_IN	I	PCM data input Not supported please NC	VDDIO
21	PCM_SYNC	I/O	PCM sync signal Not supported please NC	VDDIO
22	PCM_CLK	I/O	PCM clock Not supported please NC	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	NC	—	No connect	

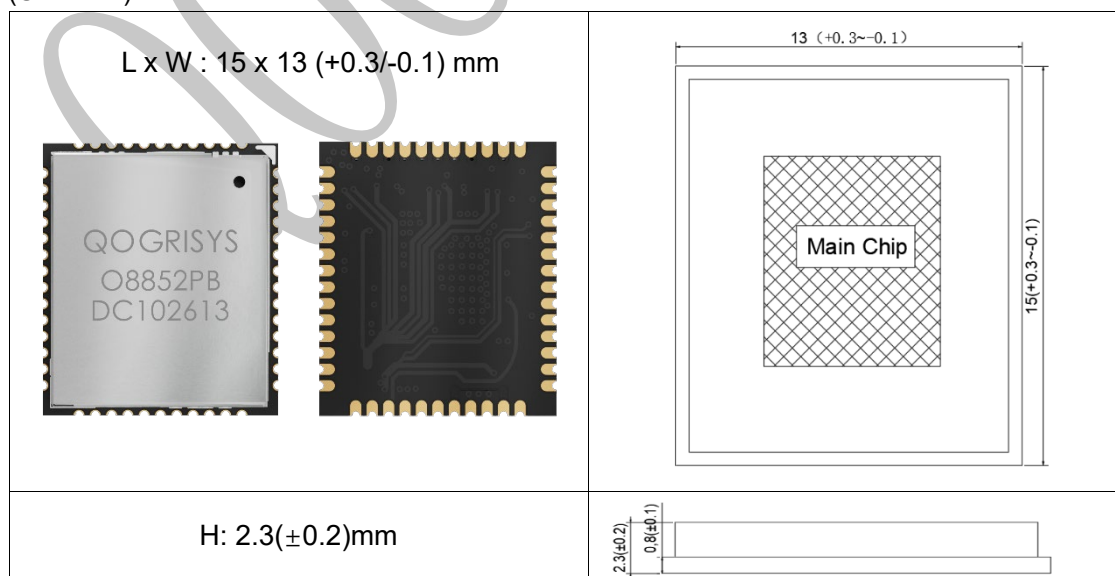
32	GND	—	Ground connections	
33	PECLK-	I/O	PCIE CLK-	
34	VDDIO	P	I/O Voltage supply input 1.8V or 3.3V	1.8V or 3.3V
35	PECLK+	I/O	PCIE CLK+	
36	VCC33	P	Main power voltage source input 3.3V	3.3V
37	CLK REQ	I/O	PCIE clk request	3.3V
38	BT_DIS_N	I	Enable pin for Bluetooth device Default ON: pull high; OFF: 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

P:POWER I:INPUT O:OUTPUT VDDIO:1.8V or 3.3V

4. Dimensions

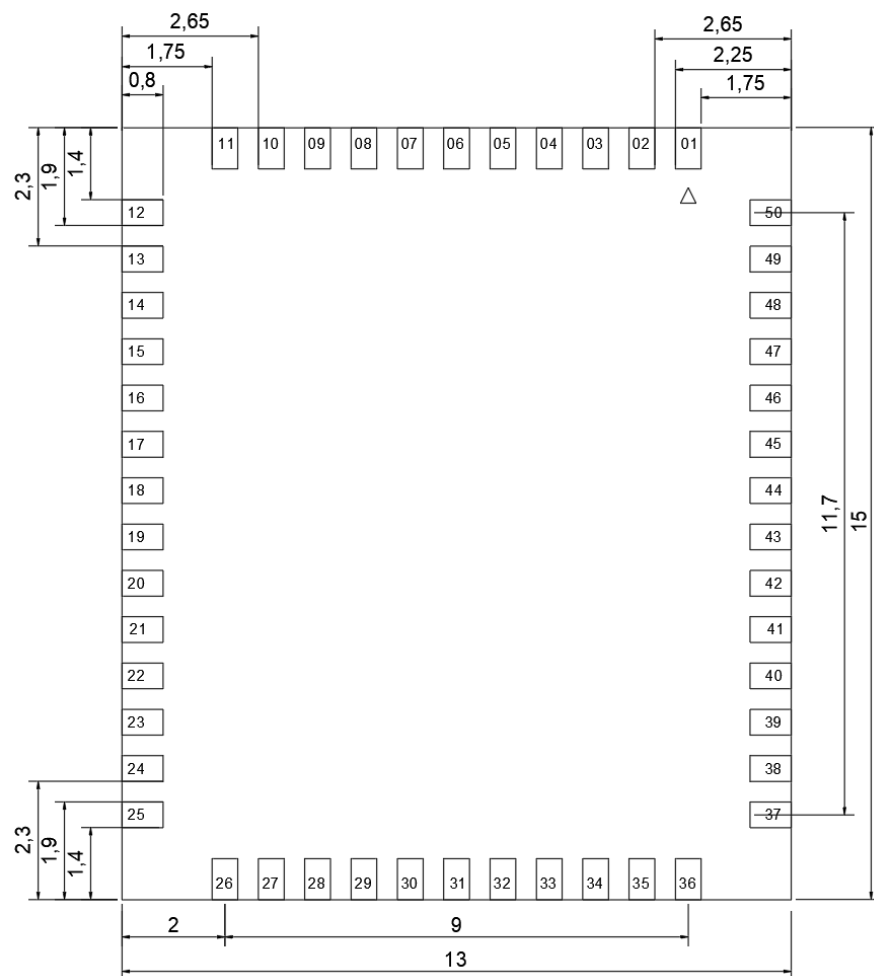
4.1 Physical Dimensions and Module Photo

(Unit: mm)



4.2 Module Physical Dimensions

(Unit: mm)

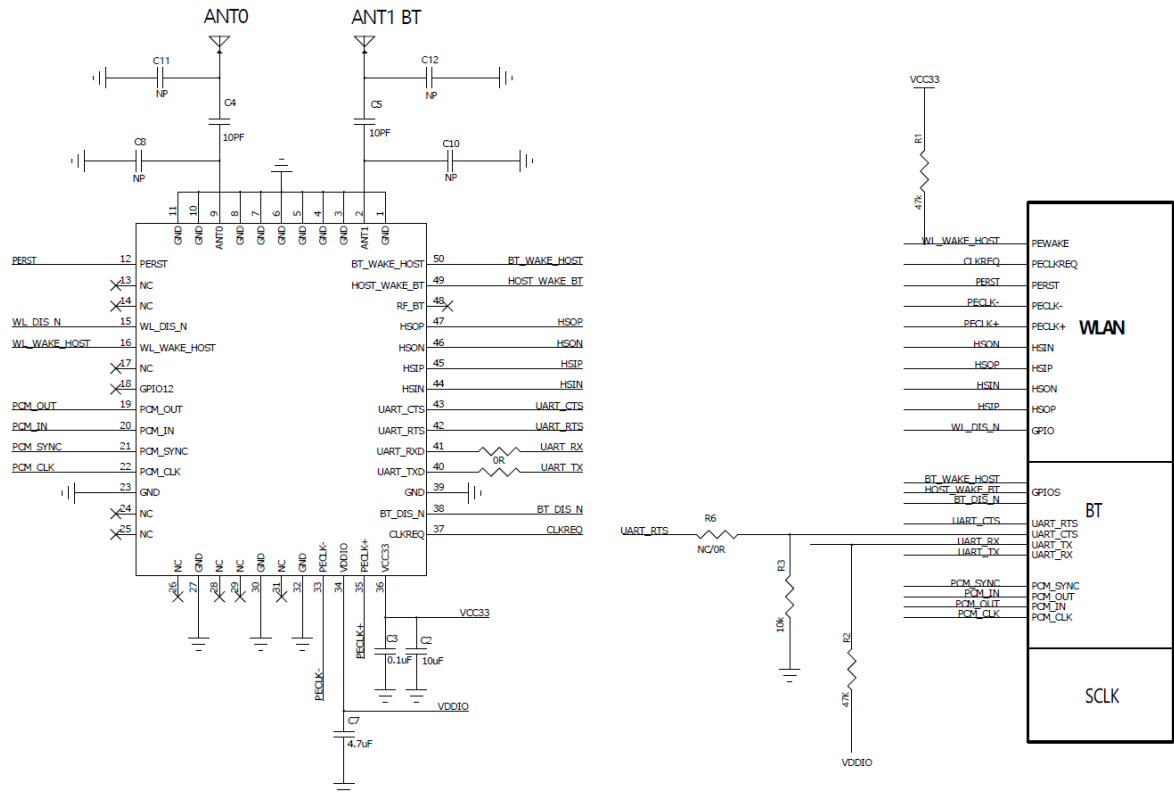


< TOP VIEW >

5 Reference Design

5.1 Reference schematic

50 ohm RF trace



C2,C3 caps should be close d to pin 36 of the module

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

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

2.4G Real-world Testing					
Protocol Standard		channel	Power (dBm)	EVM(dB)	Rx Sensitivity (dBm)
802.11g(54Mbps)	ANT0	2412	18.4	-35.5	-76
		2437	18.1	-34.5	-76
		2472	18.1	-32.3	-76
	ANT1	2412	18.3	-31.2	-76
		2437	18.2	-31.2	-76
		2472	18.1	-31.2	-76
802.11ax(HE20_MCS11)	ANT0	2412	13.4	-41.7	-66
		2437	13.2	-41.0	-66
		2472	13.2	-38.6	-66

	ANT1	2412	13.7	-37.2	-66
		2437	13.7	-36.9	-66
		2472	13.6	-36.4	-66
802.11ax(HE40_MCS11)	ANT0	2422	13.4	-42.3	-63
		2462	13.1	-40.8	-63
	ANT1	2422	13.4	-37.8	-63
		2462	13.5	-37.5	-63
5G Real-world Testing					
Protocol Standard		channel	Power (dBm)	EVM(dB)	Rx Sensitivity (dBm)
802.11a(54Mbps)	ANT0	5180	18.3	-34.0	-76
		5600	18.1	-33.6	-76
		5825	18.2	-34.1	-76
	ANT1	5180	18.3	-32.5	-76
		5600	18.5	-32.8	-76
		5825	18.2	-32.2	-76
802.11ax(HE20_MCS11)	ANT0	5180	13.3	-41.4	-65
		5500	12.5	-40.8	-65
		5825	12.9	-41.2	-65
	ANT1	5180	13.5	-42.1	-65
		5500	13.2	-40.0	-65
		5825	13.3	-41.3	-65
802.11ax(HE80_MCS11)	ANT0	5210	12.9	-41.2	-59
		5690	12.0	-39.4	-59
		5775	12.2	-40.3	-59
	ANT1	5210	13.4	-41.4	-59
		5690	12.4	-39.3	-59
		5775	12.8	-39.9	-59

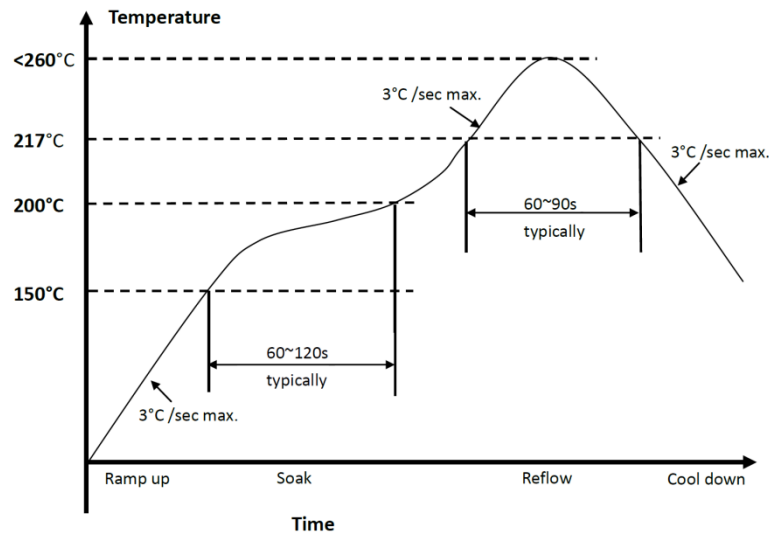
Description: The test environment is: temperature 25 °C humidity 60%

6 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

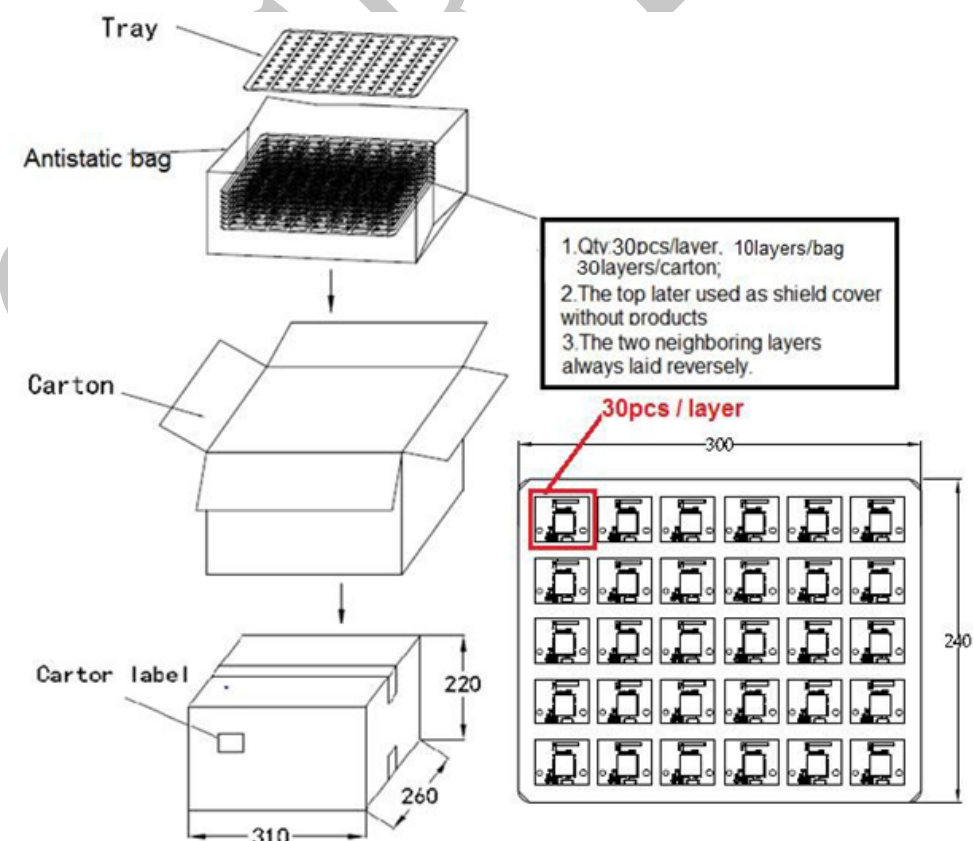
Peak Temperature : <260°C

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