PRODUCT SPECIFICATION

5263B-SS

Wi-Fi Dual-band 2X2 11ac + Bluetooth 5.0

Combo Module

Version:v1.2

Customer: _____

Customer P/N:_____

Signature:_____

Date:_____

Office: 14th floor, Block B, phoenix zhigu, Xixiang Street, Baoan District, Shenzhen

Factory: NO.8, Litong RD., Liuyang Economic & Technical Development Zone, Changsha, CHINA

TEL: +86-755-2955-8186 Website: www.fn-link.com

5263B-SS Module Datasheet

Ordering Information	Part NO.	Description
	FG5263BSSX-00	5263B-SS MT7663BSN BT5.0 3 antenna ports

Target power

2.4G:17/15/14

5G:15/14/13

CONTENTS

Revision History

Version	Date	Contents of Revision Change	Preparde	Checked	Approved
V1.0	2020/02/10	New version	Lxy	Lxy	SZS
V1.1	2020/11/17	Update material list	Lxy	Lxy	SZS
V1.2	2023/5/29	Update the specification format change the standaard to ±2dbm Update SDIO Pin Description,Bluetooth Specification Format and package	Fc	LXY	QJP

1. General Description

1.1 Introduction

Fn-Link Technology would like to announce a low-cost and low-power consumption module which has all of the Wi-Fi and Bluetooth functionalities. The highly integrated module makes the possibilities of web browsing, VoIP, Bluetooth headsets applications. With seamless roaming capabilities and advanced security, also could interact with different vendors' 802.11a/b/g/n/ac 2x2 Access Points in the wireless LAN.

5263B-SS module complies with IEEE 802.11 a/b/g/n/ac 2x2 dual-band Wi-Fi subsystem and a Bluetooth subsystem. The Wi-Fi subsystem contains the 802.11 a/b/g/n/ac radio, baseband, and MAC that are designed to meet both the low power and high throughput application.

5263B-SS has a 32-bit RISC MCU that handles Wi-Fi and Bluetooth tasks,and could offload data frame processing in Wi-Fi host driver.The Bluetooth subsystem contains the Bluetooth radio, baseband, link controller.

This compact module is a total solution for a combination of Wi-Fi and Bluetooth V5.0 technologies. The module is specifically developed for all portable devices.

1.2 Description

Model Name	5263B-SS
Product Description	Support Wi-Fi/Bluetooth functionalities
Dimension	L x W x H: 15 x 13 x 1.7 mm (typical)
Wi-Fi Interface	Support SDIO V3.0/V2.0/V1.1
BT Interface	SDIO
OS supported	Android /Linux
Operating temperature	-10°C to 70°C
Storage temperature	-40°C to 85°C

2. Features

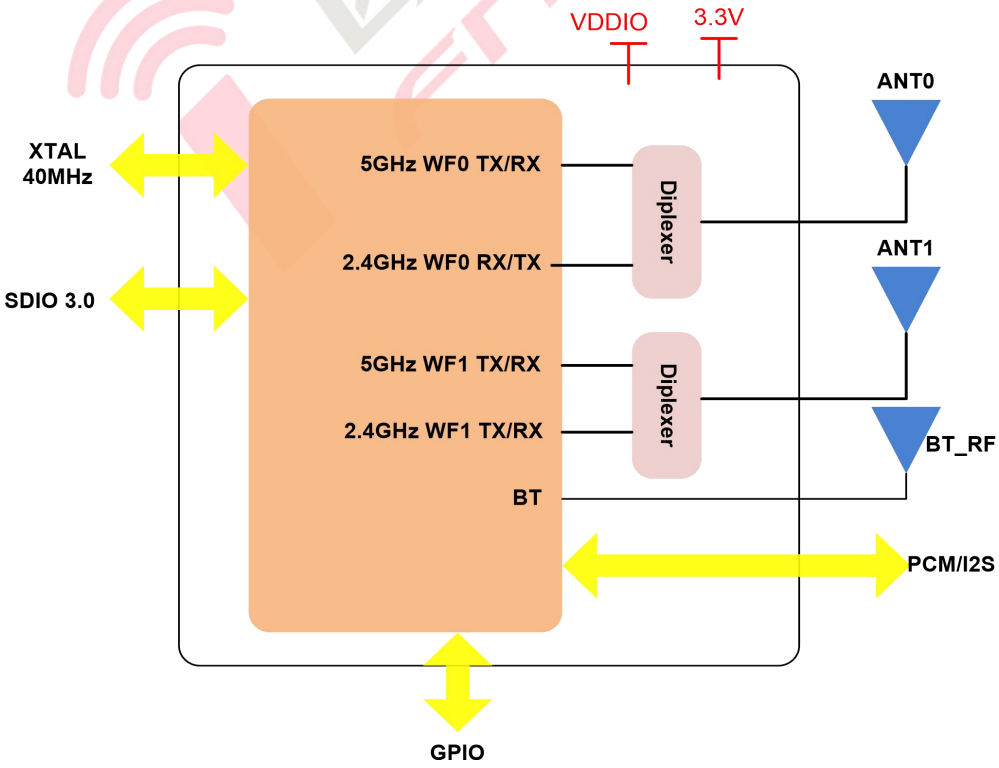
General

- Integrate high efficiency power management unit with single 3.3V power supply input
- SDIO device fully compliant to SDIO 3.0 specification
- Programmable and multiplexed GPIO pins
- IEEE 802.11 a/b/g/n/ac compliant
- Support 20MHz, 40MHz, 80Mhz bandwidth in 2.4GHz band 5GHz band
- Dual-band 2T2R mode, data rate up to 867Mbps
- Support MU-MIMO RX and DBDC (dual band dual concurrent)
- Support STBC, LDPC, TX Beamformer and RX Beamformee
- Greenfield, mixed mode, legacy modes support
- IEEE 802.11 d/e/h/i/j/k/mc/r/v/w support
- Security support for WFA WPA/WPA2/WPA3 personal, WPS 2.0
- QoS support of WFA WMM, WMM PS

Bluetooth Features

- Support Bluetooth 5.0

3. Block Diagram



4. General Specification

4.1 2.4GHz RF Specification

Feature	Description	
WLAN Standard	IEEE 802.11 b/g/n Wi-Fi compliant	
Frequency Range	2.400 GHz ~ 2.4835 GHz (2.4 GHz ISM Band)	
Number of Channels	2.4GHz：Ch1 ~ Ch14	
Test Items	**Typical Value**	**EVM**
Output Power	802.11b /11Mbps : 17dBm ± 2 dB	EVM ≤ -9dB
	802.11g /54Mbps : 15dBm ± 2 dB	EVM ≤ -25dB
	802.11n /MCS7 : 14dBm ± 2 dB	EVM ≤ -28dB
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	±20ppm	
SISO Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -92 dBm	≤-83
	- 2Mbps PER @ -90 dBm	≤-80
	- 5.5Mbps PER @ -87 dBm	≤-79
	- 11Mbps PER @ -85 dBm	≤-76
SISO Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -89 dBm	≤-85
	- 9Mbps PER @ -88 dBm	≤-84
	- 12Mbps PER @ -87 dBm	≤-82
	- 18Mbps PER @ -84 dBm	≤-80
	- 24Mbps PER @ -81 dBm	≤-77
	- 36Mbps PER @ -78 dBm	≤-73
	- 48Mbps PER @ -73 dBm	≤-69
	- 54Mbps PER @ -71 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -89 dBm	≤-85
	- MCS=1 PER @ -86 dBm	≤-82
	- MCS=2 PER @ -84 dBm	≤-80
	- MCS=3 PER @ -80 dBm	≤-77
	- MCS=4 PER @ -77 dBm	≤-73
	- MCS=5 PER @ -72 dBm	≤-69
	- MCS=6 PER @ -71 dBm	≤-68
	- MCS=7 PER @ -69 dBm	≤-67
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0, PER @ -88 dBm	≤-82
	- MCS=1, PER @ -85 dBm	≤-79
	- MCS=2, PER @ -83 dBm	≤-77

	- MCS=3, PER @ -79 dBm	≤-74
	- MCS=4, PER @ -76 dBm	≤-70
	- MCS=5, PER @ -72 dBm	≤-66
	- MCS=6, PER @ -70 dBm	≤-65
	- MCS=7, PER @ -69 dBm	≤-64
Maximum Input Level	802.11b : -10 dBm	
	802.11g/n : -20 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

4.2 5GHz RF Specification

Conditions : VBAT=3.3V ; VDDIO=3.3V ; Temp:25°C

Feature	**Description**	
WLAN Standard	IEEE 802.11a/n/ac 2x2, Wi-Fi compliant	
Frequency Range	5.150 GHz ~ 5.850 GHz	
Number of Channels	5.8GHz：Please see the table1	
Test Items	**Typical Value**	**EVM**
Output Power	802.11a /54Mbps : 15 dBm ± 2 dB	EVM ≤ -25dB
	802.11n /MCS7 : 14 dBm ± 2 dB	EVM ≤ -28dB
	802.11ac /MCS9 : 13 dBm ± 2 dB	EVM ≤ -32dB
Test Items	**Test Value**	**Standard Value**
SISO Receive Sensitivity (11a,20MHz) @10% PER	- 6Mbps PER @ -88 dBm	≤-85
	- 9Mbps PER @ -87 dBm	≤-84
	- 12Mbps PER @ -86 dBm	≤-82
	- 18Mbps PER @ -83 dBm	≤-80
	- 24Mbps PER @ -80 dBm	≤-77
	- 36Mbps PER @ -77 dBm	≤-73
	- 48Mbps PER @ -72 dBm	≤-69
	- 54Mbps PER @ -70 dBm	≤-68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -88 dBm	≤-85
	- MCS=1 PER @ -85 dBm	≤-82
	- MCS=2 PER @ -83 dBm	≤-80
	- MCS=3 PER @ -80 dBm	≤-77
	- MCS=4 PER @ -76 dBm	≤-73
	- MCS=5 PER @ -71 dBm	≤-69
	- MCS=6 PER @ -70 dBm	≤-68

	- MCS=7 PER @ -68 dBm	≤-67
SISO Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -85 dBm	≤-82
	- MCS=1 PER @ -82 dBm	≤-79
	- MCS=2 PER @ -80 dBm	≤-77
	- MCS=3 PER @ -77 dBm	≤-74
	- MCS=4 PER @ -73 dBm	≤-70
	- MCS=5 PER @ -69 dBm	≤-66
	- MCS=6 PER @ -67 dBm	≤-65
	- MCS=7 PER @ -66 dBm	≤-64
SISO Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0, NSS1 PER @ -86 dBm	≤-82
	- MCS=1, NSS1 PER @ -84 dBm	≤-80
	- MCS=2, NSS1 PER @ -82 dBm	≤-77
	- MCS=3, NSS1 PER @ -79 dBm	≤-73
	- MCS=4, NSS1 PER @ -75 dBm	≤-69
	- MCS=5, NSS1 PER @ -70 dBm	≤-68
	- MCS=6, NSS1 PER @ -69 dBm	≤-67
	- MCS=7, NSS1 PER @ -68 dBm	≤-62
	- MCS=8, NSS1 PER @ -64 dBm	≤-60
SISO Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=0, NSS1 PER @ -84 dBm	≤-79
	- MCS=1, NSS1 PER @ -81 dBm	≤-77
	- MCS=2, NSS1 PER @ -79 dBm	≤-74
	- MCS=3, NSS1 PER @ -76 dBm	≤-70
	- MCS=4, NSS1 PER @ -73 dBm	≤-66
	- MCS=5, NSS1 PER @ -68 dBm	≤-65
	- MCS=6, NSS1 PER @ -67 dBm	≤-64
	- MCS=7, NSS1 PER @ -66 dBm	≤-59
	- MCS=8, NSS1 PER @ -61 dBm	≤-57
	- MCS=9, NSS1 PER @ -58 dBm	≤-55
SISO Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0, NSS1 PER @ -81 dBm	≤-79
	- MCS=1, NSS1 PER @ -78 dBm	≤-76
	- MCS=2, NSS1 PER @ -76 dBm	≤-74
	- MCS=3, NSS1 PER @ -72 dBm	≤-71
	- MCS=4, NSS1 PER @ -69 dBm	≤-67
	- MCS=5, NSS1 PER @ -66 dBm	≤-63
	- MCS=6, NSS1 PER @ -64 dBm	≤-62
	- MCS=7, NSS1 PER @ -62 dBm	≤-61
	- MCS=8, NSS1 PER @ -58 dBm	≤-56

	- MCS=9, NSS1 PER @ -56 dBm	≤-54
Maximum Input Level	802.11a/n : -30 dBm	
Antenna Reference	Small antennas with 0~2 dBi peak gain	

[1]5GHz(20MHz) Channel table

Band range	Operating Channel Numbers	Channel center frequencies(MHz)
5150MHz~5250MHz	36	5180
	40	5200
	44	5220
	48	5240
5250MHz~5350MHz	52	5260
	56	5280
	60	5300
	64	5320
5470MHz~5725MHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
	140	5700
5725MHz~5850MHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

4.3 Bluetooth Specification

Feature	Description
General Specification	
Bluetooth Standard	BDR,EDR(1Mbps & 2Mbps & 3Mbps),LE(1Mbps),2LE(2Mbps)
Host Interface	SDIO
Frequency Band	2400 MHz ~ 2483.5 MHz
Number of Channels	79 channels for classic,40 channels for BLE
Modulation	GFSK, π/4-DQPSK,8DPSK
RF Specification	
Output Power , tolerance -12/+9 dB	
	CL1(dBm)
BDR Output Power	6
EDR Output Power	6
BLE Output Power	6
Sensitivity, tolerance : /	
Sensitivity @ BER=0.1% for GFSK (1Mbps)	-89
Sensitivity @ BER=0.01% for π/4-DQPSK (2Mbps)	-85
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)	-83
Sensitivity @ BLE=30.8% for LE (1Mbps)	-93
Sensitivity @ BLE=30.8% for 2LE (2Mbps)	-93
Maximum Input Level	GFSK (1Mbps):-20dBm
	π/4-DQPSK (2Mbps) :-20dBm
	8DPSK (3Mbps) :-20dBm

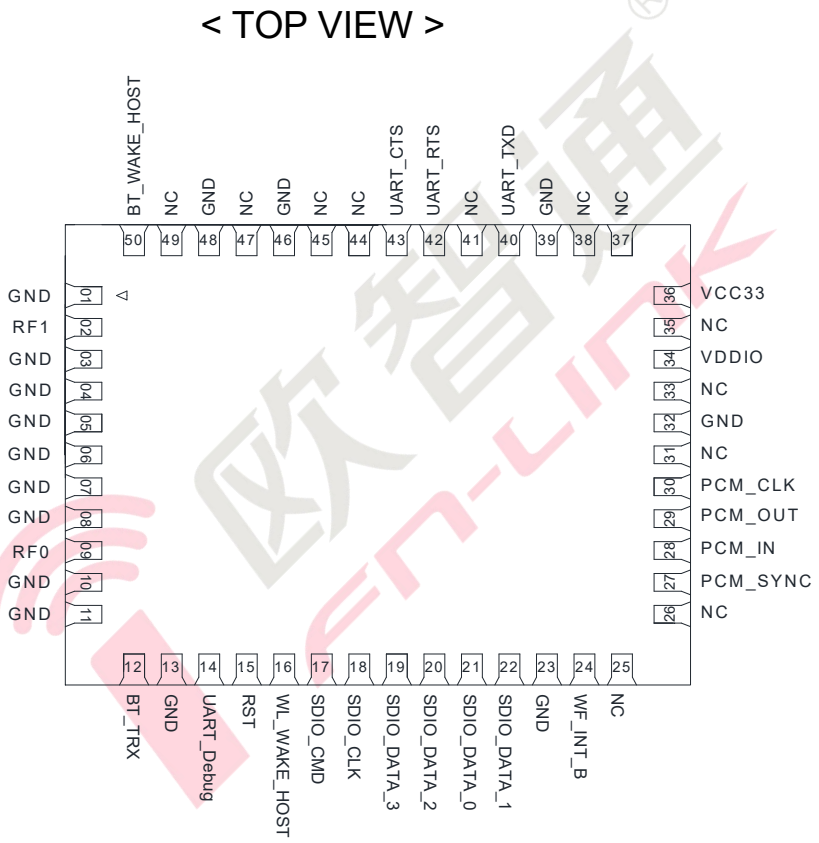
5. ID setting information

WI-FI

Vendor ID	-
Product ID	-

6. Pin Definition

6.1 Pin Outline



6.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GND	-	Ground connections	
2	RF1	I/O	RF I/O port chain1	
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	RF0	I/O	RF I/O port chain0	
10	GND	-	Ground connections	
11	GND	-	Ground connections	
12	BT_RF	I/O	Bluetooth RF	
13	GND	-	Ground connections	
14	UART_DEBUG	I/O	Floating (Don't connected to ground)	
15	RST	I	Reset function Default pull high , pull low active	VDDIO
16	WL_WAKE_HOST	O	WLAN to wake-up HOST Low active	VDDIO
17	SD_CMD	I/O	SDIO command line	
18	SD_ CLK	I/O	SDIO clock line	
19	SD_DA3	I/O	SDIO data line 3	
20	SD_DA2	I/O	SDIO data line 2	
21	SD_DA0	I/O	SDIO data line 0	
22	SD_DA1	I/O	SDIO data line 1	
23	GND	-	Ground connections	
24	WF_INT_B	I/O	Floating (Don't connected to ground)	
25	NC	-	Floating (Don't connected to ground)	
26	NC	-	Floating (Don't connected to ground)	
27	PCM_SYNC	I/O	PCM interface sync	VDDIO
28	PCM_IN	I	PCM interface input data	VDDIO
29	PCM_OUT	O	PCM interface output data	VDDIO
30	PCM_CLK	I/O	PCM interface clock	VDDIO
31	NC	-	Floating (Don't connected to ground)	
32	GND	-	Ground connections	
33	NC	-	Floating (Don't connected to ground)	
34	VDDIO	P	I/O Voltage supply input 1.8V or 3.3V	1.8V/3.3V
35	NC	-	Floating (Don't connected to ground)	
36	VCC33	P	Main power voltage source input 3.3V	3.3V
37	NC	-	Floating (Don't connected to ground)	
38	NC	-	Floating (Don't connected to ground)	
39	GND	-	Ground connections	
40	UART_TXD	O	Not used Floating this pin	DVDDIO
41	NC	-	Floating (Don't connected to ground)	

42	UART_TRS	I/O	Floating (Don’t connected to ground)	
43	UART_CTS	I/O	Floating (Don’t connected to ground)	
44	NC	-	Floating (Don’t connected to ground)	
45	NC	-	Floating (Don’t connected to ground)	
46	GND	-	Ground connections	
47	NC	-	Floating (Don’t connected to ground)	
48	GND	-	Ground connections	
49	NC	-	Floating (Don’t connected to ground)	
50	BT_WAKE_HOST	O	Bluetooth device to wake-up HOST Low active	VDDIO

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

7. Electrical Specifications

7.1 Power Supply DC Characteristics

The digital IO supports VDD33 or VDD18 application

	MIN	TYP	MAX	Unit
Operating Temperature	-10	25	70	deg.C
VDD33	2.97	3.3	3.63	V
VDDIO	1.7	1.8	1.9	V

7.2 Power Consumption

VESD(HBM)	VBAT	2000V
	ANT0	2000V
	ANT1	2000V
	BT_RF	2000V

7.3 Interface Circuit time series

7.3.1 SDIO Pin Description

Module supports SDIO version 3.0. SDIO Pin Description as below.

SDIO Pin Description

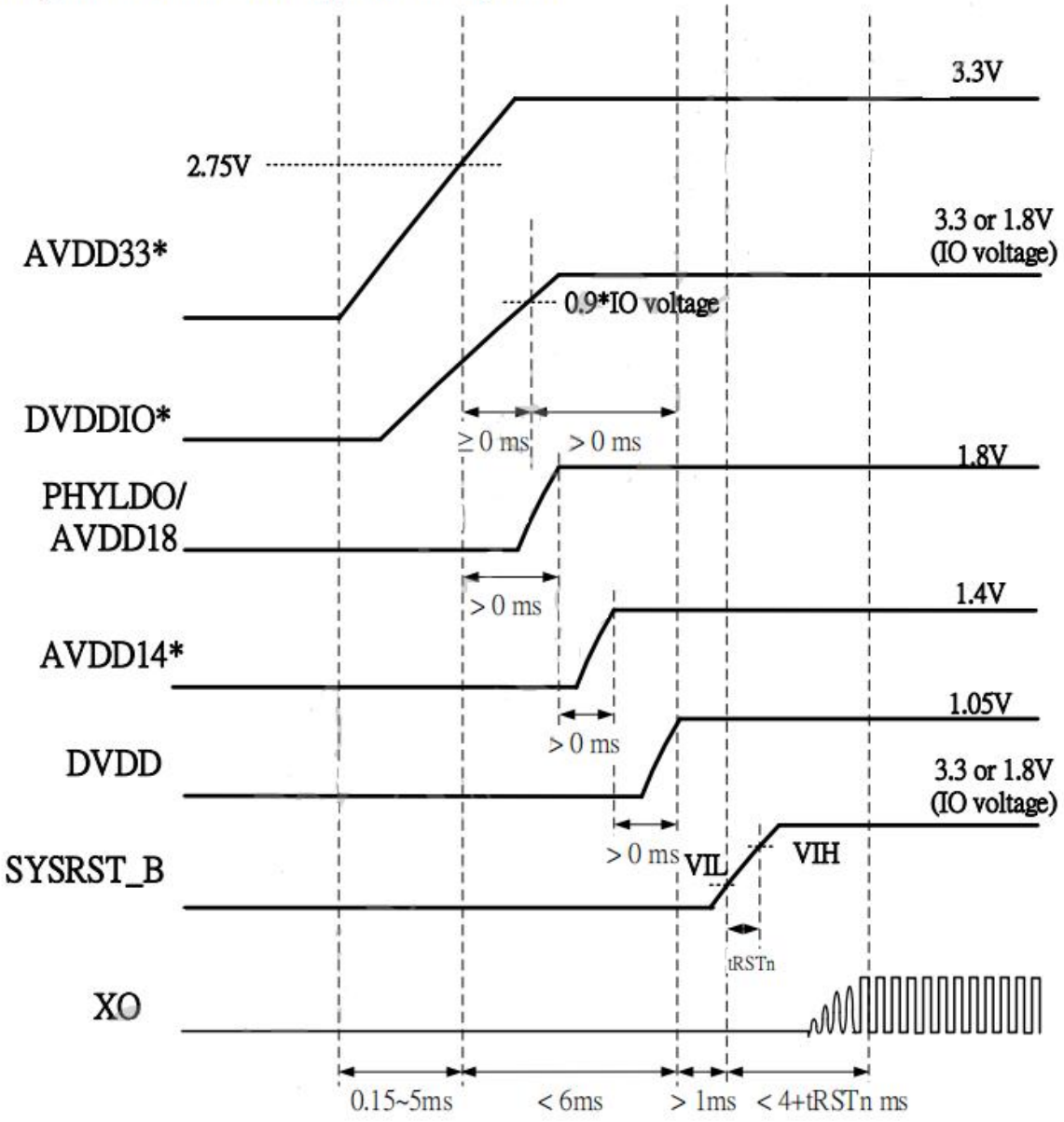
SD 4-Bit Mode	
DATA0	Data Line 0
DATA1	Data Line 1 or Interrupt
DATA2	Data Line 2 or Read Wait
DATA3	Data Line 3
CLK	Clock
CMD	Command Line

7.3.2 SDIO Timing Diagram

For timing criteria, please check specification in “SD specification Part1 Physical Layer Specification Version 3.01”

7.3.3 Chip power on sequence

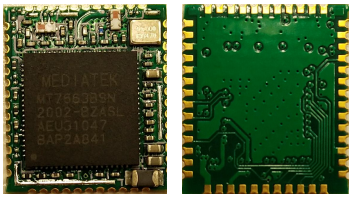
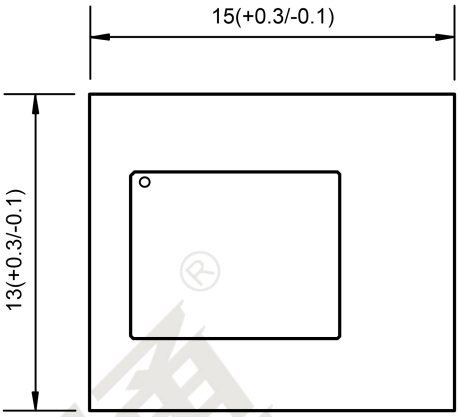
The figure below shows the chip power on sequence.



Chip power on sequence

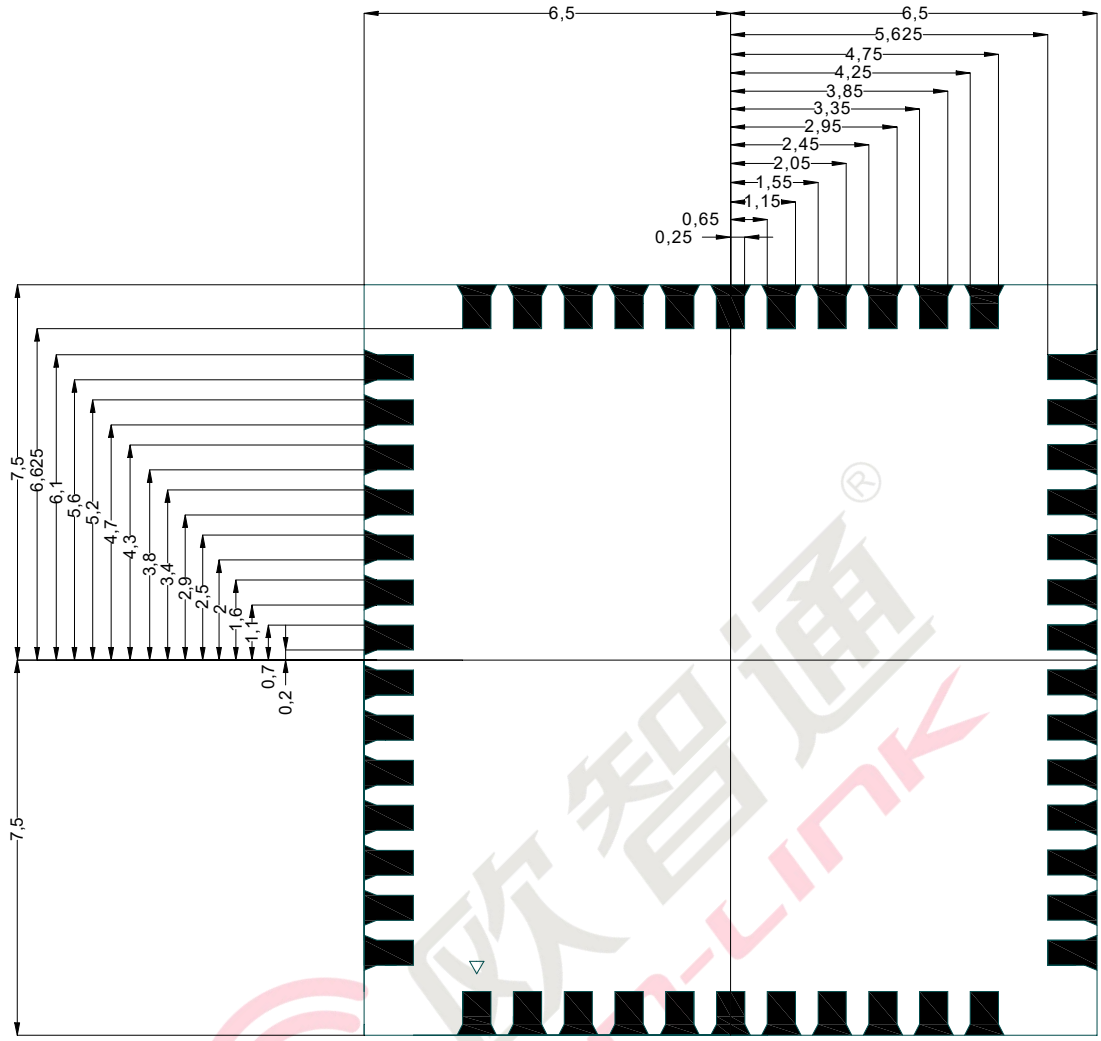
8. Size reference

8.1 Module Picture

L x W : 15 x 13 (+0.3/-0.1) mm 	
H: 1.7 (±0.2) mm	
Weight	0.65g

8.2 Physical Dimensions

<TOP View>


6,5
6,5
5,625
4,75
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2,95
2,45
2,05
1,55
1,15
0,65
0,25
7,5
6,625
6,1
5,6
5,2
4,7
4,3
3,8
3,4
2,9
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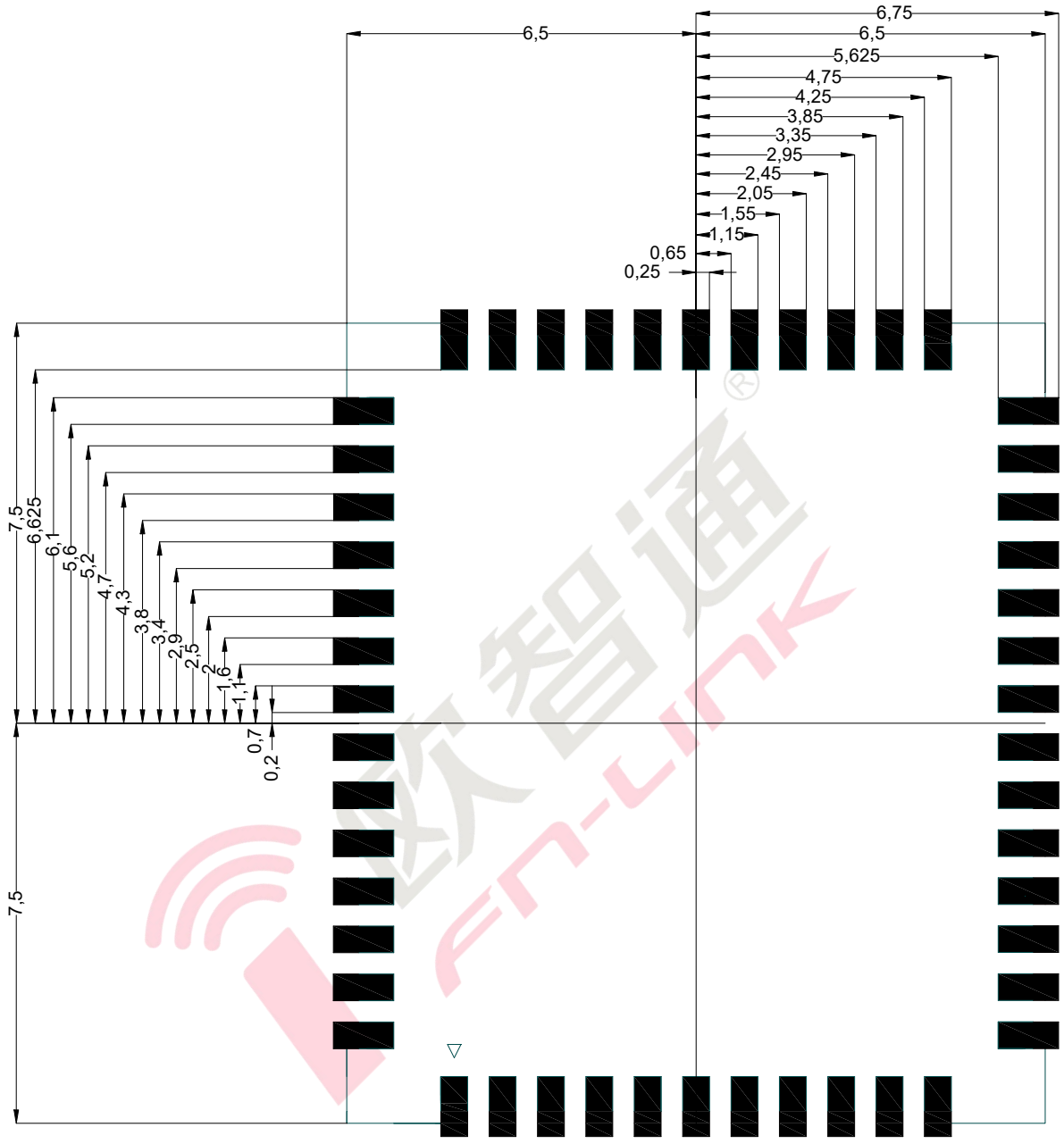
2
1,6
1,1
0,7
0,2
7,5

8.4 Layout Recommendation

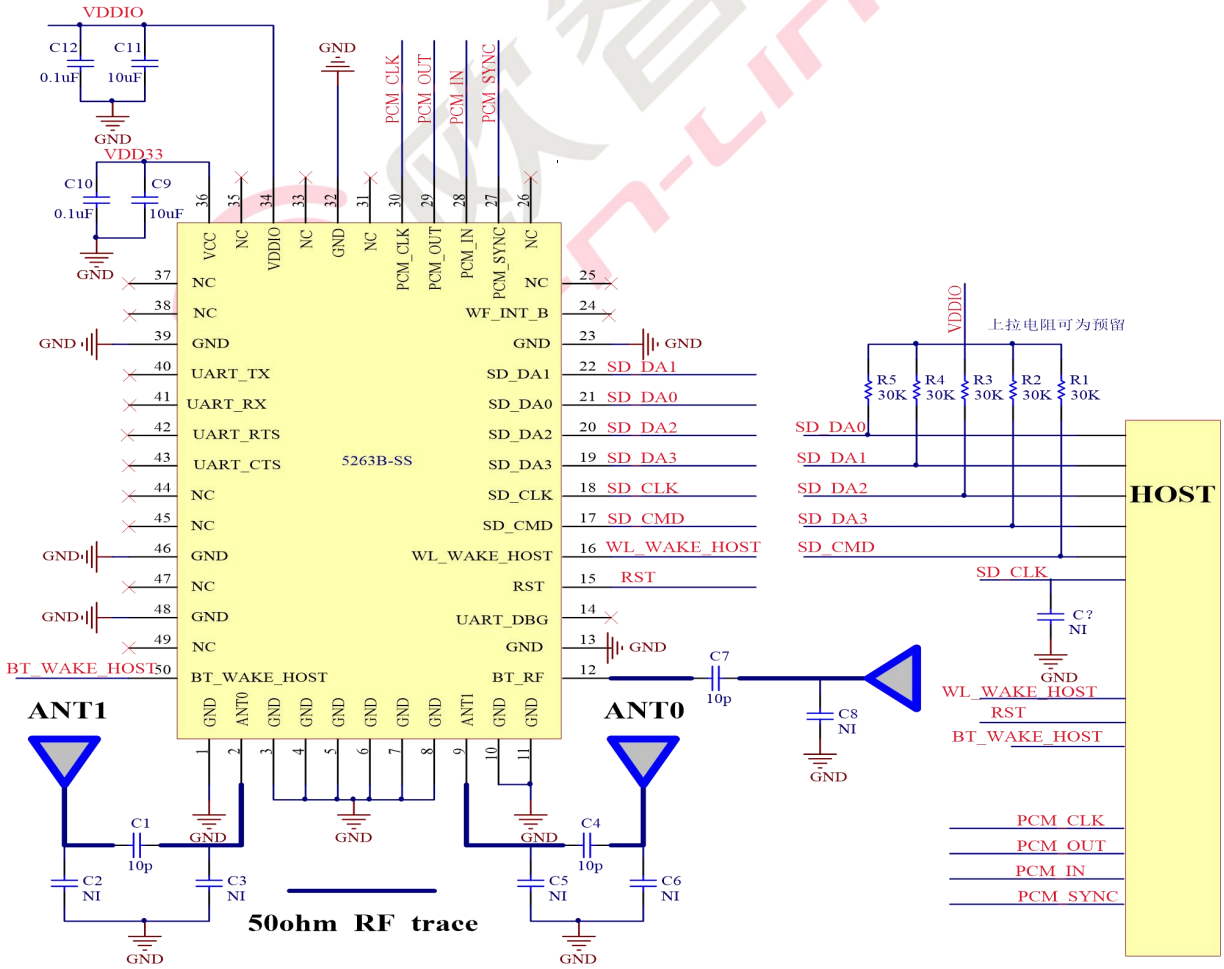


9. The Key Material List

Item	Part Name	Description	Manufacturer
1	Inductor	0805 2.2UH,±20%,1200mA	MURATA,microgate,cenke,ceaiya,GK,Chilisin,INPAQ
2	Diplexer	DP1608-2.4G+5G diplexer	TDK,GLEAD,Walsin,Murata,ACX,FTR
3	Crystal	2520 40MHz 10ppm 12pF	HOSONIC,ECEC,TKD,JWT
4	Chipset	MT7663BSN 9X9mm QFN76	MTK
5	PCB	5263B-SS 13X15X0.8mm	XY-PCB,KX-PCB,Sunlord,SL-PCB,Truly

10. Reference Design

C11/C12 should be closed to pin34
C9/C10 should be closed to pin36



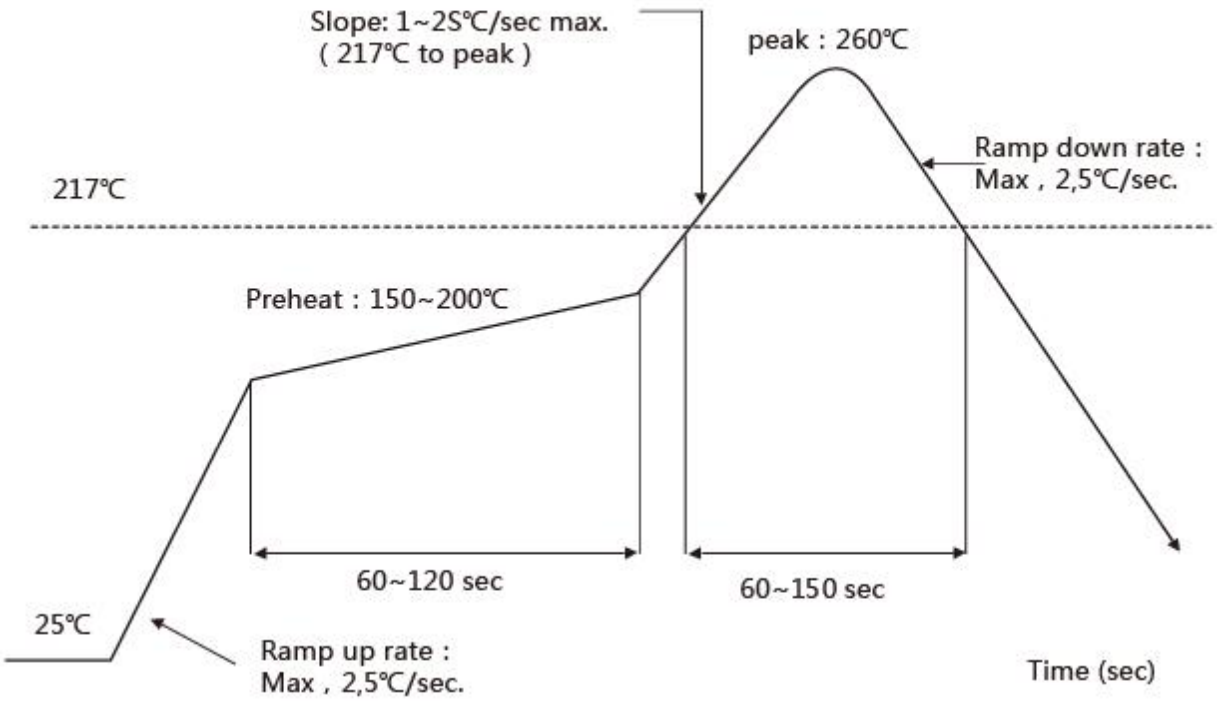
11. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature: ≤260°C

Time within 5°C of peak temperature：≥10s

Number of Times: ≤2 times



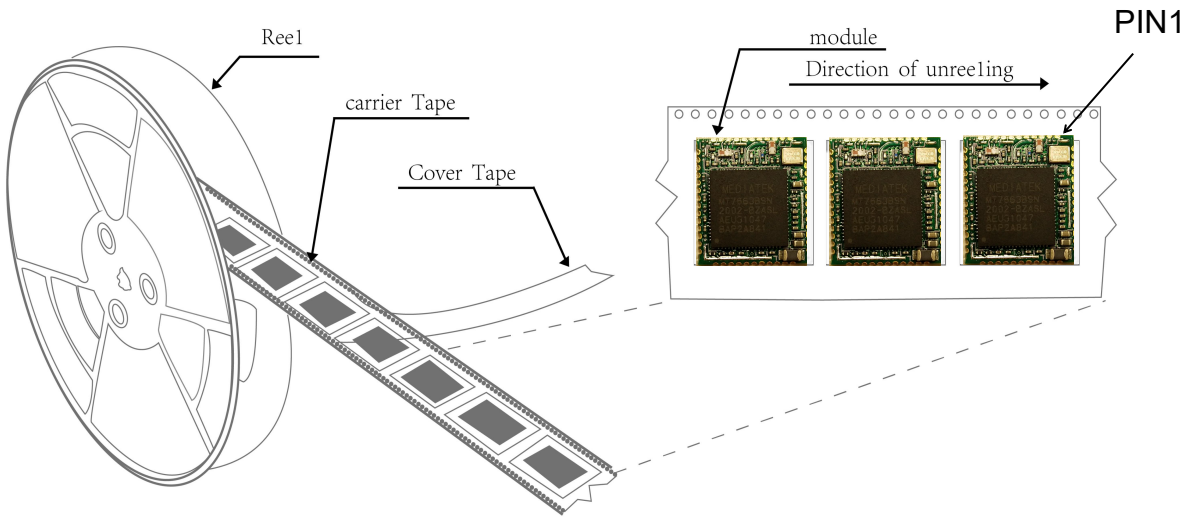
12. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

13. Package

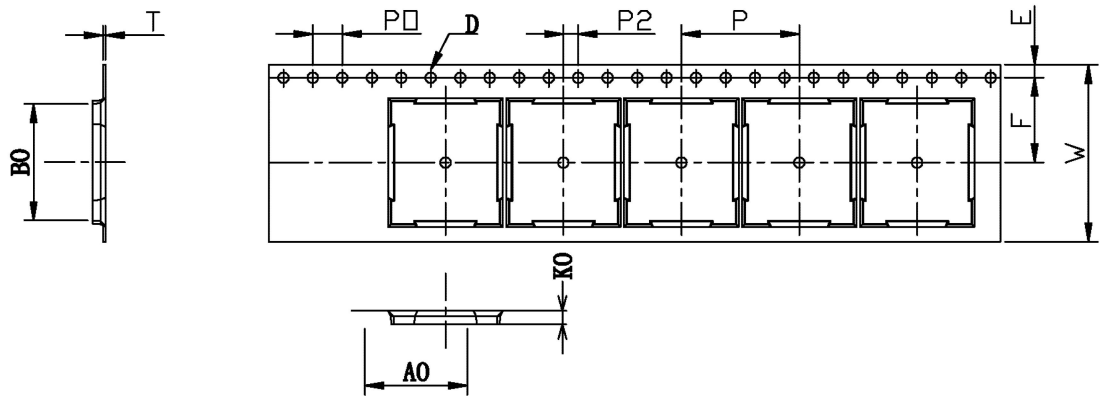
13.1 Reel

A roll of 1500pcs

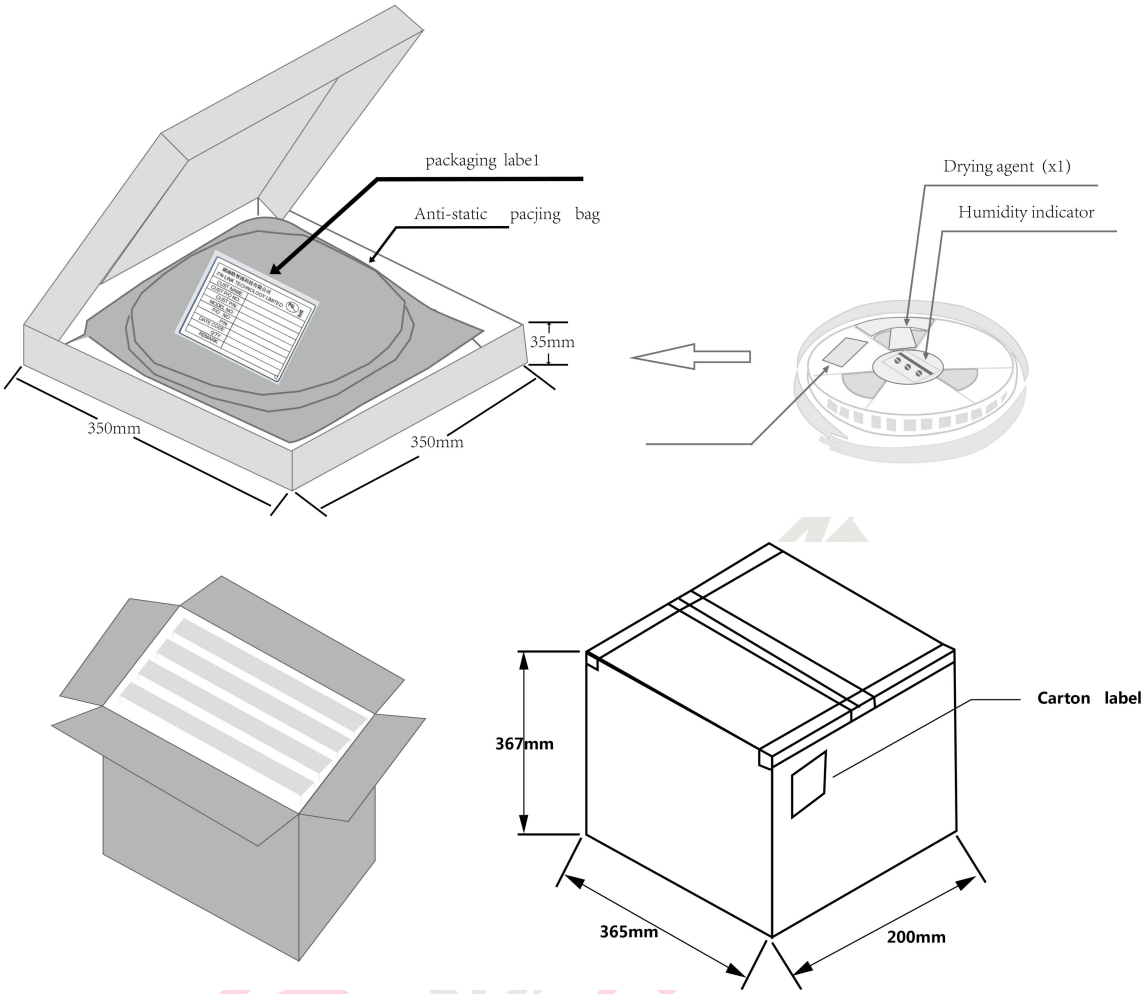


13.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	13.40	15.40	1.50	11.5	1.75	2.65	4.0	2.0	16.0	0.30
TOLE	+0.3 −0.3	±0.15	±0.15	+0.1 −0.0	+0.1 −0.1	±0.1	±0.10	±0.1	±0.1	±0.1	±0.05

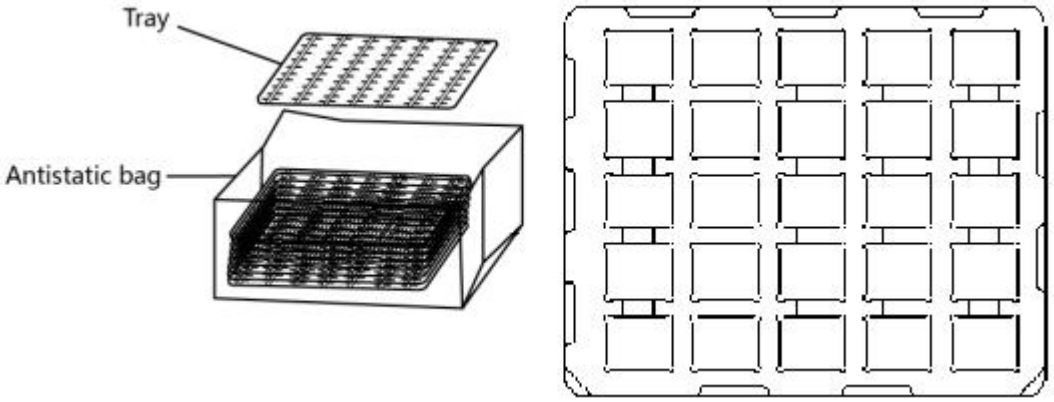


13.3 Packaging Detail



13.4 Tray

Use pallet packaging for less than 300 pieces



14. Moisture sensitivity

The Modules is a Moisture Sensitive Device level 3, in according with standard IPC/JEDEC J-STD-020, take care
all the relatives 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