Comchips

KX6335
Module Data sheet

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Website: www.comchips.com

Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

Version Update Record

Version	Date	Revision Content	Editorialstaff	approval
V1.0	2021/7/14	The first version		

CONTENTS

1 Overview

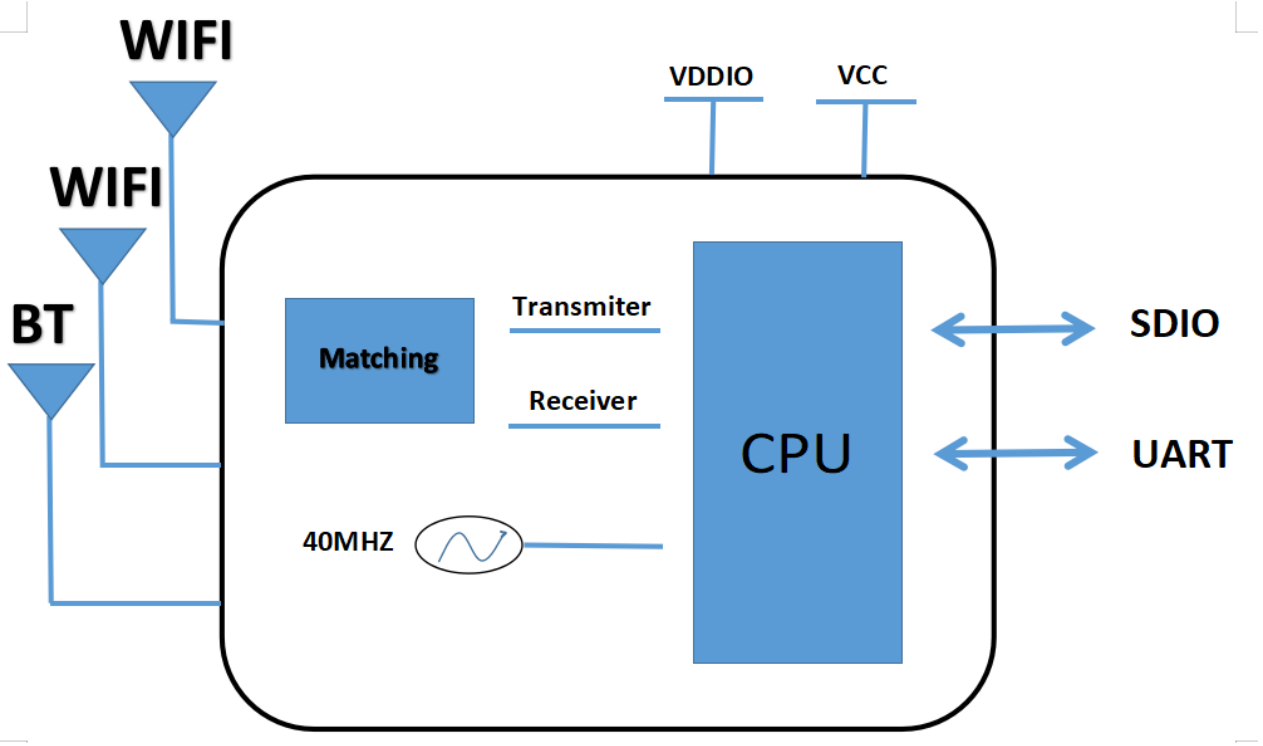
1.1 Introduction

The KX6335 is a highly integrated single-chip that support 802.11ac solutions with Multi-user MIMO (Multiple-Input, Multiple-Output) with integrated Bluetooth 2.1/3.0/4.1/5.0 controller, SDIO (SDIO 1.1/2.0/3.0) interface, and HS-UART mixed interface. It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in s single chip. The KX6335 provides a complete solution for a high- performance integrated wireless and Bluetooth device.

1.2 Features

- CMOS MAC, Baseband PHY and RF in a single chip for IEEE 802.11a/b/g/n/ac compatible WLAN
- Support 802.11ac 2x2,Wave-2 compliant with MU-MIMO
- Support 20/40MHz at 2.4GHz
- Supports 20/40/80MHz at 5GHz
- Support WLAN-Bluetooth coexistence
- Support low power Bluetooth
- Bluetooth 5.0 Dual Mode Support: Both LE and BR/BDR are supported

1.3 Block Diagra



1.4 General Specification

Model Name	KX6335
Product Description	WIFI5 and Bluetooth PCIE Module
Dimension	L x W x H: 15x 13x2.3 (±0.3) mm
Wi-Fi Interface	Support SDIO 3.0
BT interface	Support UART
Operating temperature	0 to +70° C
Storage temperature	-55°C to 125°C
RoHS	All hardware components are fully compliant with EU RoHS directive

1.5 DC Characteristics

Power Supply Characteristics

symbol	Para eter	Minimum	Typical	Maximum	Units
VCC	3.3V supply voltage	3.135	3.3	3.465	V
VDDIO	I/O supply voltage	1.71	1.8 or 3.3	3.46	V
VCC	3.3V rating current	--	--	1500	mA

2 RF Specifications

2.1 2.4GHz RF Specification

Feature	**Description**
WLAN Standard	IEEE 802.11a/b/g/n/ac WiFi compliant
Frequency Range	2.400 GHz ~ 2.497 GHz (2.4 GHz ISM Band)
Number of Channels	2.4GHz：Ch1 ~ Ch14
Modulation	802.11b : DQPSK, DBPSK, CCK 802.11 g/n : OFDM /64-QAM,16-QAM, QPSK, BPSK
Output Power	802.11b /11Mbps : 17dBm ± 2 dB @ EVM ≤ -13dB
	802.11g /54Mbps : 14 dBm ± 2 dB @ EVM ≤ -25dB
	802.11n /MCS7 : 13 dBm ± 2 dB @ EVM ≤ -28dB
Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -93 dBm, typical
	- 2Mbps PER @ -91 dBm, typical
	- 5.5Mbps PER @ -88 dBm, typical
	- 11Mbps PER @ -86 dBm, typical
Receive Sensitivity	- 6Mbps PER @ -90 dBm, typical
	- 9Mbps PER @ -89 dBm, typical
	- 12Mbps PER @ -88 dBm, typical
	- 18Mbps PER @ -85 dBm, typical

(11g,20MHz) @10% PER	- 24Mbps	PER @ -82 dBm, typical
	- 36Mbps	PER @ -79 dBm, typical
	- 48Mbps	PER @ -74 dBm, typical
	- 54Mbps	PER @ -72 dBm, typical

Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0	PER @ -90 dBm, typical
	- MCS=1	PER @ -87 dBm, typical
	- MCS=2	PER @ -85 dBm, typical
	- MCS=3	PER @ -81 dBm, typical
	- MCS=4	PER @ -78 dBm, typical
	- MCS=5	PER @ -73 dBm, typical
	- MCS=6	PER @ -72 dBm, typical
	- MCS=7	PER @ -70 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0	PER @ -87 dBm, typical
	- MCS=1	PER @ -84 dBm, typical
	- MCS=2	PER @ -82 dBm, typical
	- MCS=3	PER @ -79 dBm, typical
	- MCS=4	PER @ -75 dBm, typical
	- MCS=5	PER @ -71 dBm, typical
	- MCS=6	PER @ -69 dBm, typical
	- MCS=7	PER @ -68 dBm, typical
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0, NSS1	PER @ -89 dBm, typical
	- MCS=1, NSS1	PER @ -86 dBm, typical
	- MCS=2, NSS1	PER @ -85 dBm, typical
	- MCS=3, NSS1	PER @ -81 dBm, typical
	- MCS=4, NSS1	PER @ -78 dBm, typical
	- MCS=5, NSS1	PER @ -73 dBm, typical
	- MCS=6, NSS1	PER @ -71 dBm, typical
	- MCS=7, NSS1	PER @ -70 dBm, typical
	- MCS=8, NSS1	PER @ -67 dBm, typical
	- MCS=0, NSS1	PER @ -86 dBm, typical
	- MCS=1, NSS1	PER @ -84 dBm, typical

Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=2, NSS1 PER @ -82 dBm, typical
	- MCS=3, NSS1 PER @ -79 dBm, typical
	- MCS=4, NSS1 PER @ -75 dBm, typical
	- MCS=5, NSS1 PER @ -71 dBm, typical
	- MCS=6, NSS1 PER @ -69 dBm, typical
	- MCS=7, NSS1 PER @ -68 dBm, typical
	- MCS=8, NSS1 PER @ -63 dBm, typical
	- MCS=9, NSS1 PER @ -58 dBm, typical
Maximum Input Level	802.11b : -10 dBm
	802.11g/n : -20 dBm
Antenna Reference	Small antennas with 0~2 dBi peak gain

2.2 5GHz RF Specification

Feature	**Description**
WLAN Standard	IEEE 802.11a/n/ac 2x2, WiFi compliant
Frequency Range	4.900 GHz ~ 5.845 GHz (5.0 GHz ISM Band)
Number of Channels	5.0GHz：Please see the table
Modulation	802.11a : OFDM /64-QAM,16-QAM,QPSK, BPSK 802.11n : OFDM /64-QAM,16-QAM,QPSK, BPSK 802.11ac : OFDM /256-QAM
Output Power	802.11a /54Mbps : 13 dBm ± 2dB @ EVM ≤ -25dB
	802.11n HT20 /MCS7 : 12 dBm ± 2 dB @ EVM ≤ -28dB
	802.11n HT40 /MCS7 : 12 dBm ± 2 dB @ EVM ≤ -28dB
	802.11ac VHT20 /MCS8 : 10dBm ± 2 dB @ EVM ≤ -32dB
	802.11ac VHT40 /MCS9 : 10dBm ± 2 dB @ EVM ≤ -32dB
	802.11ac VHT80 /MCS9 : 10 dBm ± 2 dB @ EVM ≤ -32dB
	- 6Mbps PER @ -89 dBm, typical
	- 9Mbps PER @ -88 dBm, typical
	- 12Mbps PER @ -87 dBm, typical
	- 18Mbps PER @ -84 dBm, typical

Receive Sensitivity (11a,20MHz) @10% PER	- 24Mbps PER @ -81 dBm, typical
	- 36Mbps PER @ -78 dBm, typical
	- 48Mbps PER @ -73 dBm, typical
	- 54Mbps PER @ -72 dBm, typical
Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -89 dBm, typical
	- MCS=1 PER @ -86 dBm, typical
	- MCS=2 PER @ -84 dBm, typical
	- MCS=3 PER @ -81 dBm, typical
	- MCS=4 PER @ -77 dBm, typical
	- MCS=5 PER @ -72 dBm, typical
	- MCS=6 PER @ -71 dBm, typical
	- MCS=7 PER @ -68 dBm, typical
Receive Sensitivity (11n,40MHz) @10% PER	- MCS=0 PER @ -86 dBm, typical
	- MCS=1 PER @ -83 dBm, typical
	- MCS=2 PER @ -81 dBm, typical
	- MCS=3 PER @ -78 dBm, typical
	- MCS=4 PER @ -74 dBm, typical
	- MCS=5 PER @ -70 dBm, typical
	- MCS=6 PER @ -68 dBm, typical
	- MCS=7 PER @ -67 dBm, typical
Receive Sensitivity (11ac,20MHz) @10% PER	- MCS=0, NSS1 PER @ -87 dBm, typical
	- MCS=1, NSS1 PER @ -85 dBm, typical
	- MCS=2, NSS1 PER @ -83 dBm, typical
	- MCS=3, NSS1 PER @ -80 dBm, typical
	- MCS=4, NSS1 PER @ -76 dBm, typical
	- MCS=5, NSS1 PER @ -71 dBm, typical
	- MCS=6, NSS1 PER @ -70 dBm, typical
	- MCS=7, NSS1 PER @ -69 dBm, typical
	- MCS=8, NSS1 PER @ -65 dBm, typical
	- MCS=0, NSS1 PER @ -85 dBm, typical
	- MCS=1, NSS1 PER @ -82 dBm, typical
	- MCS=2, NSS1 PER @ -80 dBm, typical
	- MCS=3, NSS1 PER @ -77 dBm, typical

Receive Sensitivity (11ac,40MHz) @10% PER	- MCS=4, NSS1 PER @ -74 dBm, typical
	- MCS=5, NSS1 PER @ -69 dBm, typical
	- MCS=6, NSS1 PER @ -68 dBm, typical
	- MCS=7, NSS1 PER @ -67 dBm, typical
	- MCS=8, NSS1 PER @ -62 dBm, typical
	- MCS=9, NSS1 PER @ -58 dBm, typical
Receive Sensitivity (11ac,80MHz) @10% PER	- MCS=0, NSS1 PER @ -82 dBm, typical
	- MCS=1, NSS1 PER @ -79 dBm, typical
	- MCS=2, NSS1 PER @ -77 dBm, typical
	- MCS=3, NSS1 PER @ -73 dBm, typical
	- MCS=4, NSS1 PER @ -70 dBm, typical
	- MCS=5, NSS1 PER @ -67 dBm, typical
	- MCS=6, NSS1 PER @ -65 dBm, typical
	- MCS=7, NSS1 PER @ -63 dBm, typical
	- MCS=8, NSS1 PER @ -59 dBm, typical
	- MCS=9, NSS1 PER @ -55 dBm, typical
Maximum Input Level	802.11a/n/ac : -20 dBm
Antenna Reference	Small antennas with 0~2 dBi peak gain

2.3 5GHz(20MHz) Channel table

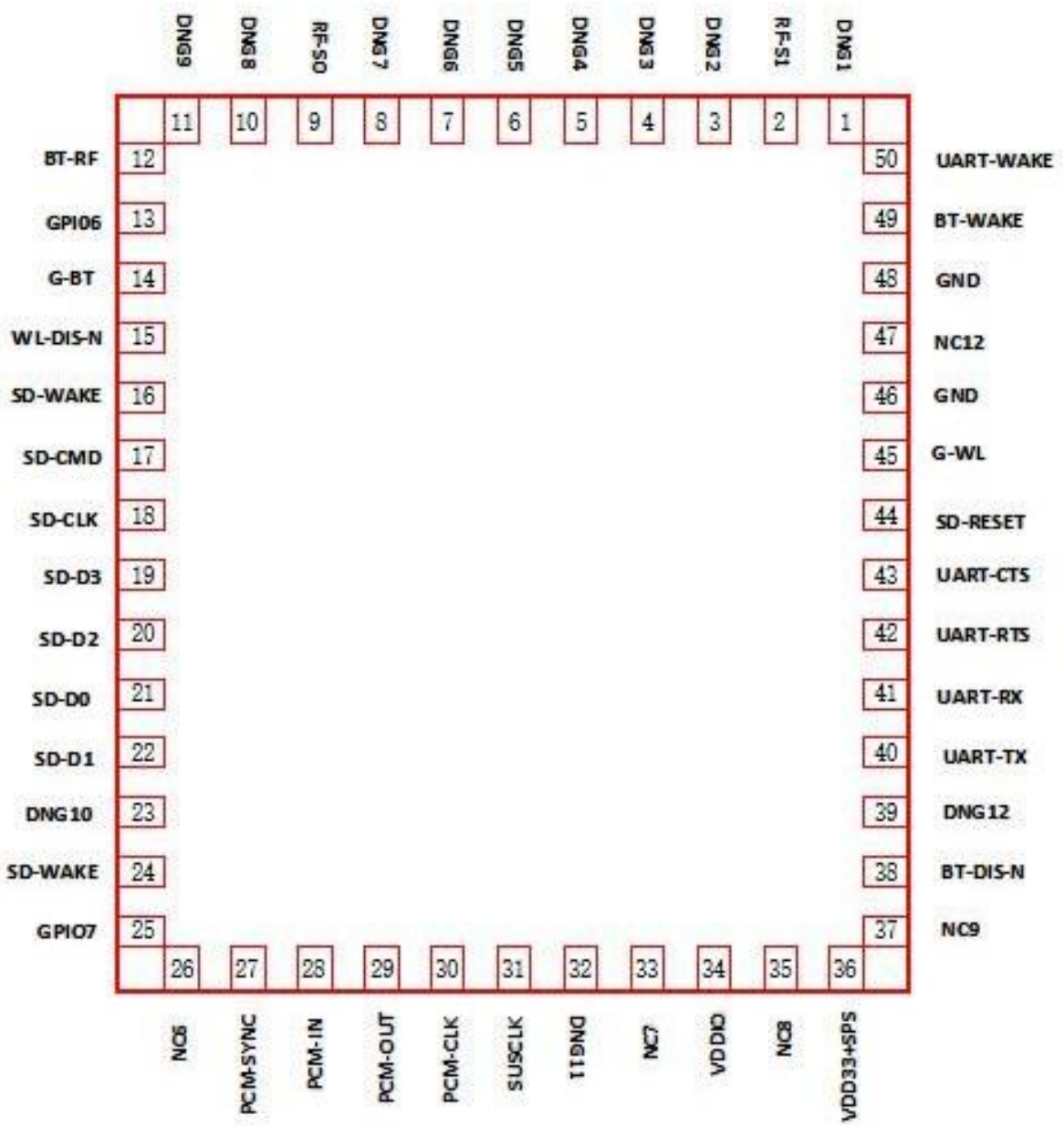
Band (GHz)	Operating Channel Numbers	Channel centr frequencies(MHz)
5.15GHz~5.25GHz	36	5180
	40	5200
	44	5220
	48	5240
5.25GHz~5.35GHz	52	5260
	56	5280
	60	5300
	64	5320
5.5GHz~5.7GHz	100	5500
	104	5520
	108	5540
	112	5560
	116	5580
	120	5600
	124	5620
	128	5640
	132	5660
	136	5680
	140	5700
5.725GHz~5.825GHz	149	5745
	153	5765
	157	5785
	161	5805
	165	5825

2.4 Bluetooth Section:

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V4.2 of 1, 2 and 3 Mbps.		
Host Interface	UART		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	79 channels		
Modulation	FHSS, GFSK, DPSK, DQPSK		
RF Specification			
Power (BDR：GFSK/1Mbps)	0dBm	5 dBm	10dBm
Power(EDF：π /4-DQPSK/2Mbps)	0dBm	5 dBm	10dBm
Power (BLE：GFSK/1Mbps)	0dBm	5 dBm	10dBm
Sensitivity @ BER=0.1% for (BDR：GFSK/1Mbps)		-85 dBm	
Sensitivity @ BER=0.1% for(EDF：π /4-DQPSK/2Mbps)		-85 dBm	
Sensitivity @ BER=0.1% for (BLE：GFSK/1Mbps)		-85 dBm	
Initial Freq Error	BDR：GFSK/1Mbps:±75KHZ		
	EDF：π /4-DQPSK/2Mbps :±75KHZ		
	BLE：GFSK/1Mbps :±75KHZ		

3 Pin Assignments

3.1 Pin Outline



3.2 Pin Definition

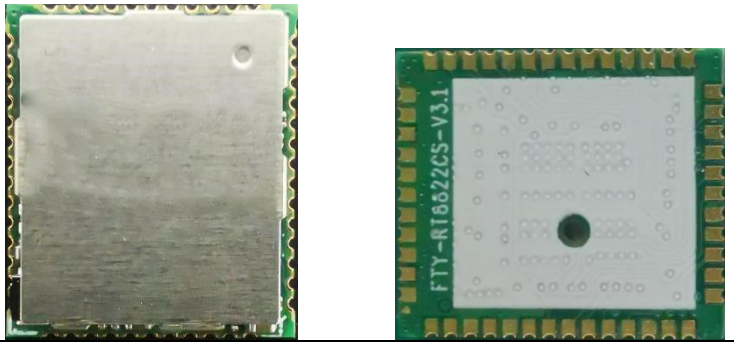
NO.	Name	Type	Descripti n
1	GND	—	Ground connections
2	RF_S1	I/O	ANT1
3	GND	—	Ground connections
4	GND	—	Ground connections
5	GND	—	Ground connections
6	GND	—	Ground connections
7	GND	—	Ground connections
8	GND	—	Ground connections
9	RT_S0	I/O	ANT0
10	GND	—	Ground connections
11	GND	—	Ground connections
12	BT RF	I/O	BT ANT
13	GPIO6	—	General Purpose Input/ Output Pin
14	G_BT	—	General Purpose Input/ Output Pin
15	WL_DIS_N	I	RF on-off
16	SD_WAKE	O	WLAN to wake-up HOST
17	SD_CMD	I/O	SDIO command line
18	SD_CLK	I/O	SDIO CLK
19	SD_D3	I/O	SDIO Data Line 3
20	SD_D2	I/O	SDIO Data Line 2
21	SD_D0	I/O	SDIO Data Line 0
22	SD_D1	I/O	SDIO Data Line 1
23	GND	—	Ground connections
24	SD_WAKE	I	WLAN to wake-up HOST
25	GPIO7	—	General Purpose Input/ Output Pin
26	NC	—	No connect

27	PCM_SYNC	I/O	PCM sync signal
28	PCM_IN	I	PCM DATA INPUT
29	PCM_OUT	I	PCM DATA OUTPUT
30	PCM_CLK	I/O	PCM CLK
31	SUSCLK	—	External Low Power Clock input(32.768KHz)
32	GND	—	Ground connections
33	NC	—	No connect
34	VDDIO	P	I/O Voltage supply input 1.8V or 3.3V
35	NC	—	No connect
36	VD33_SPS	P	3.3V
37	NC	—	No connect
38	BT_DIS_N	—	Enable pin for Bluetooth device ON: pull high ; OFF: pull low
39	GND	—	Ground connections
40	UART_TX	O	High-Speed UART Data Out
41	UART_RX	I	High-Speed UART Data In
42	UART_RTS	O	High-Speed UART RTS
43	UART_CTS	I	High-Speed UART CTS
44	SD_RESET	—	SDIO BUS REST
45	G_WL	—	General Purpose Input/ Output Pin
46	GND	—	Ground connections
47	NC	—	No connect
48	GND	—	Ground connections
49	BT_WAKE	—	Host wake-up Bluetooth device
50	UART_WAKE	O	Bluetooth device to wake-Host

4 Dimensions

4.1 Module Picture

L x W : 15 x 13 (±0.3) mm

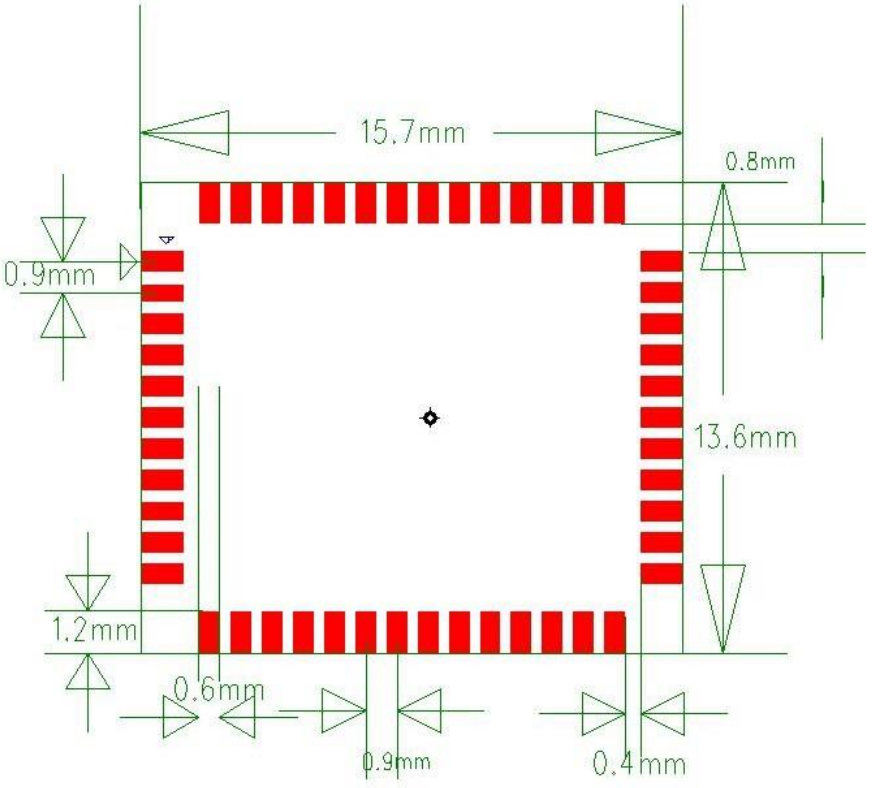


H:2.3(±0.3)mm

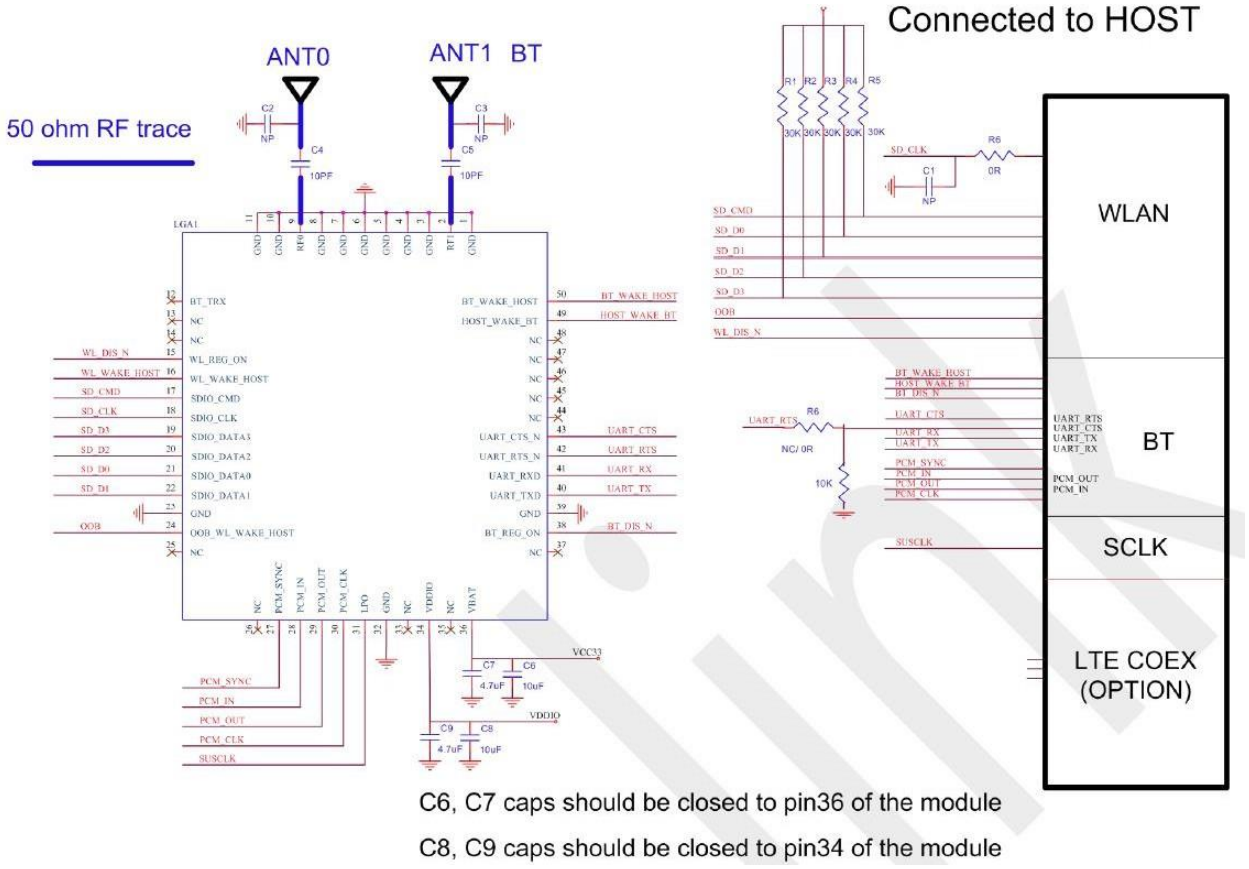
4.2 Module Physical Dimensions

(Unit: mm)

< TOP VIEW >



5 Reference Design



Note:

1.ANT_A, ANT_B are all support 2.4G/5G function,ANT_B is support Bluetooth also;

2.The module requires independent power supply, supply capacity ≥ 1000mAand ripple less than 150mV;

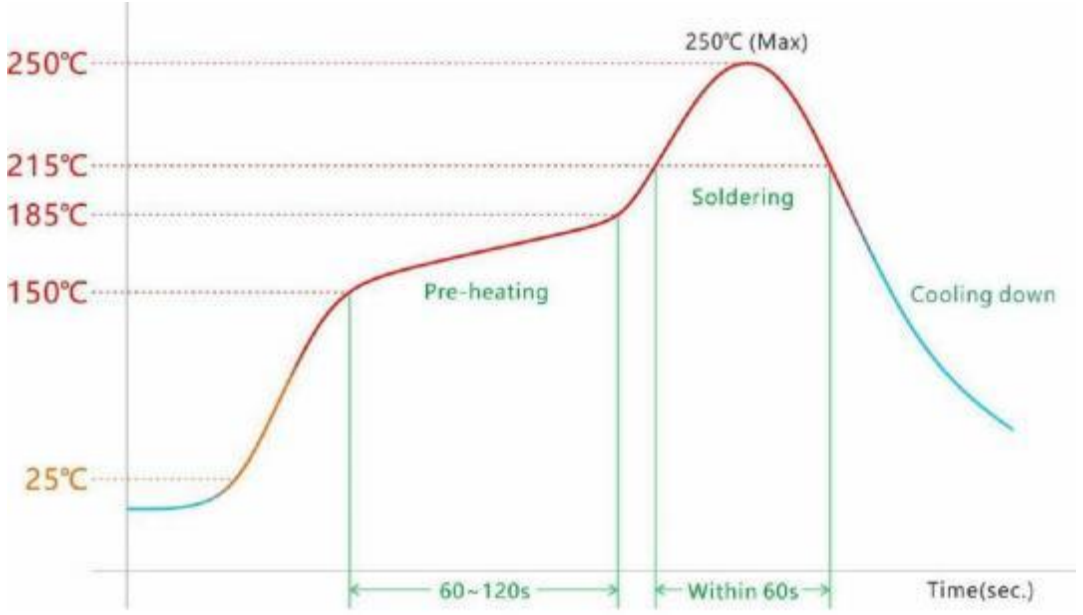
3.Do not share power with amplifier, camera, etc.

6 The Key Material List

No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8822CS-VS-CG	Realtek Semiconductor Corp	
2	PCB	FTY_RT8822CS-V3.1	Shenzhen xiangyu circuit co., LTD	
3	PCB	FTY_RT8822CS-V3.1	Shenzhen Kexiang Precision Circuit Technology Co., LTD	
4	Crystal oscillator	3225 40MHZ 12PF +/-10PPM -20+85℃	hefei jing wei Electronics Co. Ltd	
5	Crystal oscillator	3225 40MHZ 12PF +/-10PPM -20+85℃	ZhejiangLanjingxin Microelectronics Co., LTD	
6	duplexor	双工器 1.6×0.8mm 6P 2.4GHz/5GHz RFDIP160806BLM6T25 华新科	Shenzhen gangxinda Electronic Technology Co., LTD	
7	duplexor	双工器 1.6×0.8mm 6P 2.4GHz/5GHz DPX1608R24554K85 （HEK）	Dongguan Hekang Electronics Co., LTD	

7 Recommended Reflow Profile

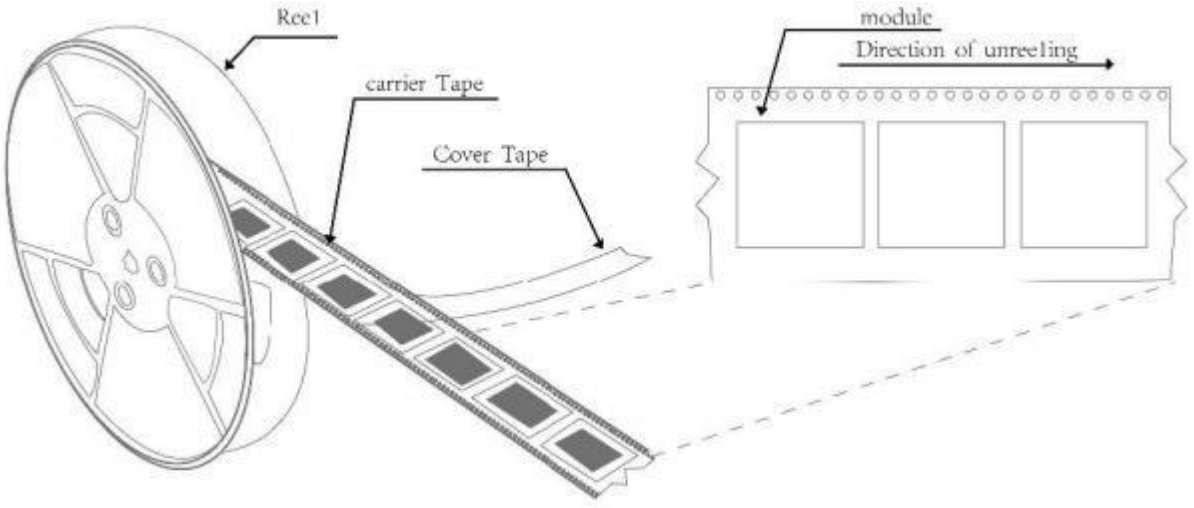
Referred to IPC/JEDEC standard.
Peak Temperature : <250° C
Number of Times : ≤2 times



8 Package Information

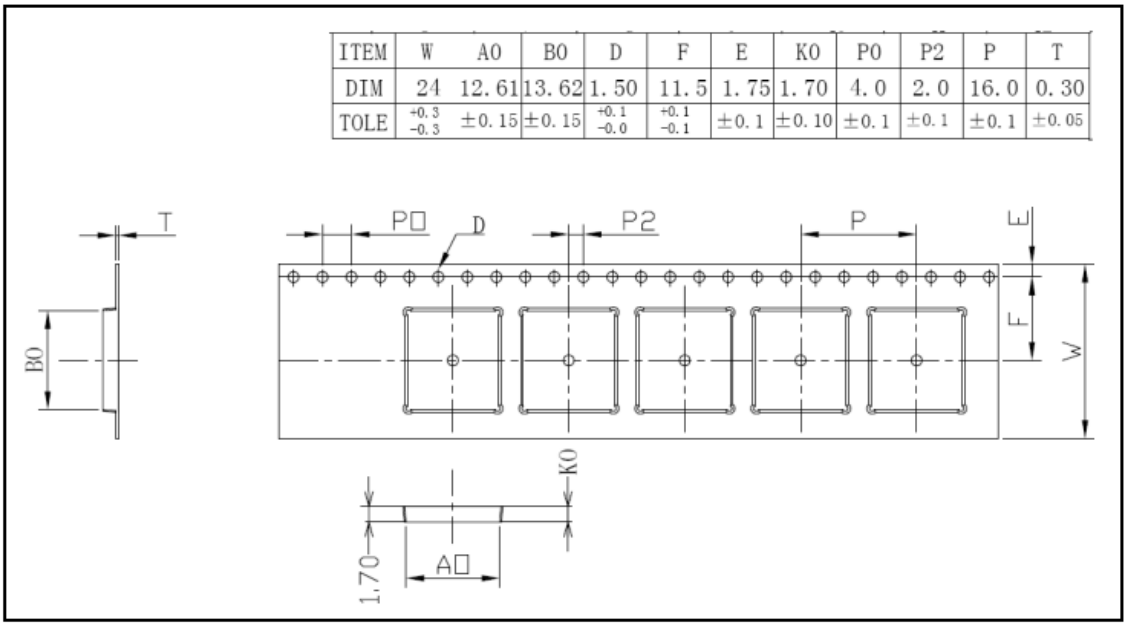
8.1Reel

A roll of 2000pcs

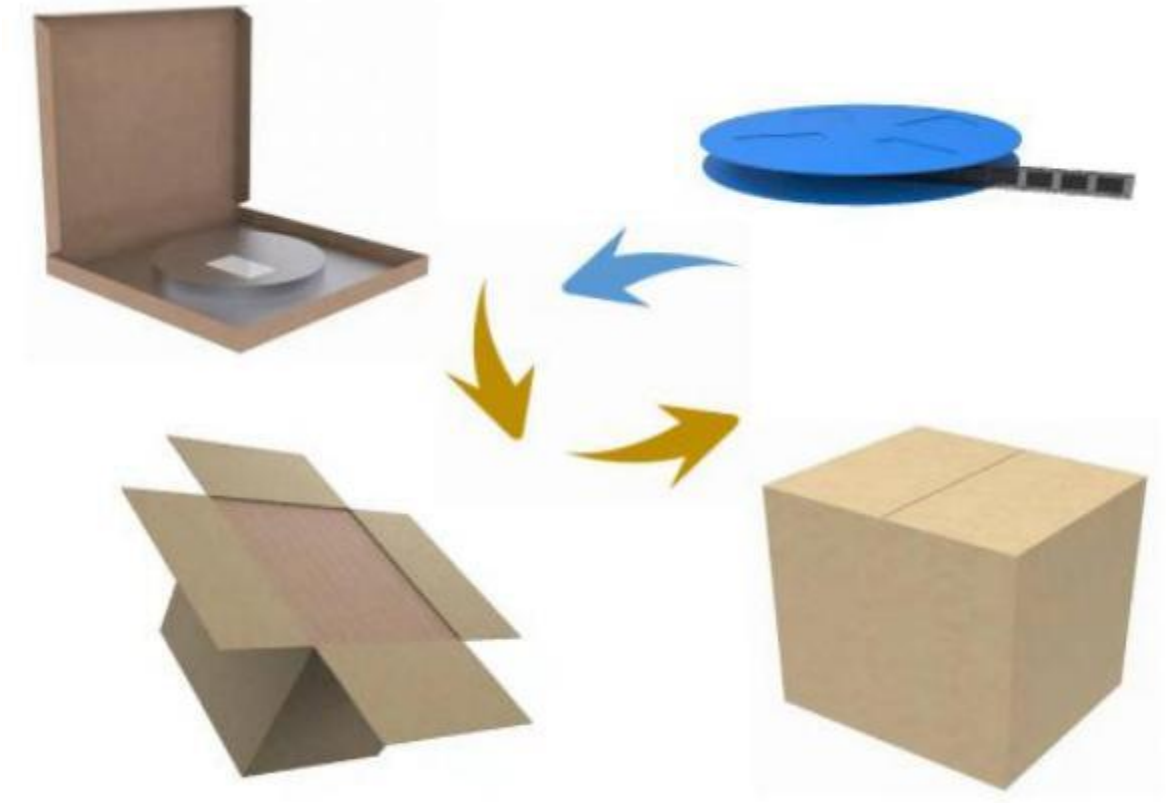


8.2 Carrier Tape Detail

ITEM	W	A0	B0	D	F	E	K0	P0	P2	P	T
DIM	24	12.61	13.62	1.50	11.5	1.75	1.70	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



8.3 Packaging Detail



8.4 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

b) “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