

PRODUCT SPECIFICATION

6220HL-IF

Wi-Fi Single-band 1x1 + Bluetooth 4.2

Combo Module

Version:v1.3

Customer: _____

Customer P/N: _____

Signature: _____

Date: _____

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6220HL-IF Module Datasheet

Ordering Information	Part NO.	Description
	FG6220HLIF-00	RTL8720CF-VA2-CG 802.11 b/g/n/,33*18mm,UART/1T1R+BLE4.2 板载天线+ipex 头



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Revision History

[illegible]

1. General Description

1.1 Introduction

6220HL-IF is an embedded high-performance Wi-Fi+BLE module, which adopts the Realtek XMC1R-CGT chip platform solution. 6220HL-IF is an integrated PCB on-board antenna and an external false. The module is mainly applicable to smart home appliances, home automation, industrial Internet and other Internet of Things applications.

1.2 Description

Model Name	6220HL-IF
Product Description	Support Wi-Fi/Bluetooth functionalities
Dimension	L x W x H: 33 x 18 x 3.12 mm
Wi-Fi Interface	SDIO device, SPI, UART, GPIO, PWM, I2C
Operating temperature	-20° C to +85° C
Storage temperature	-40° C to 125° C

2. Features

General

- Complete 802.11n solution for 2.4GHz band
- CMOS MAC, Baseband PHY, and RF in a single chip for 802.11b/g/n compatible WLAN
- Compatible with 802.11n specification
- Backward compatible with 802.11b/g devices while operating in 802.11n mode
- Maximum data rate 26Mbps in 802.11g and 65Mbps in 802.11n
- 65Mbps receive PHY rate and 65Mbps transmit PHY rate using 20MHz bandwidth
- 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services

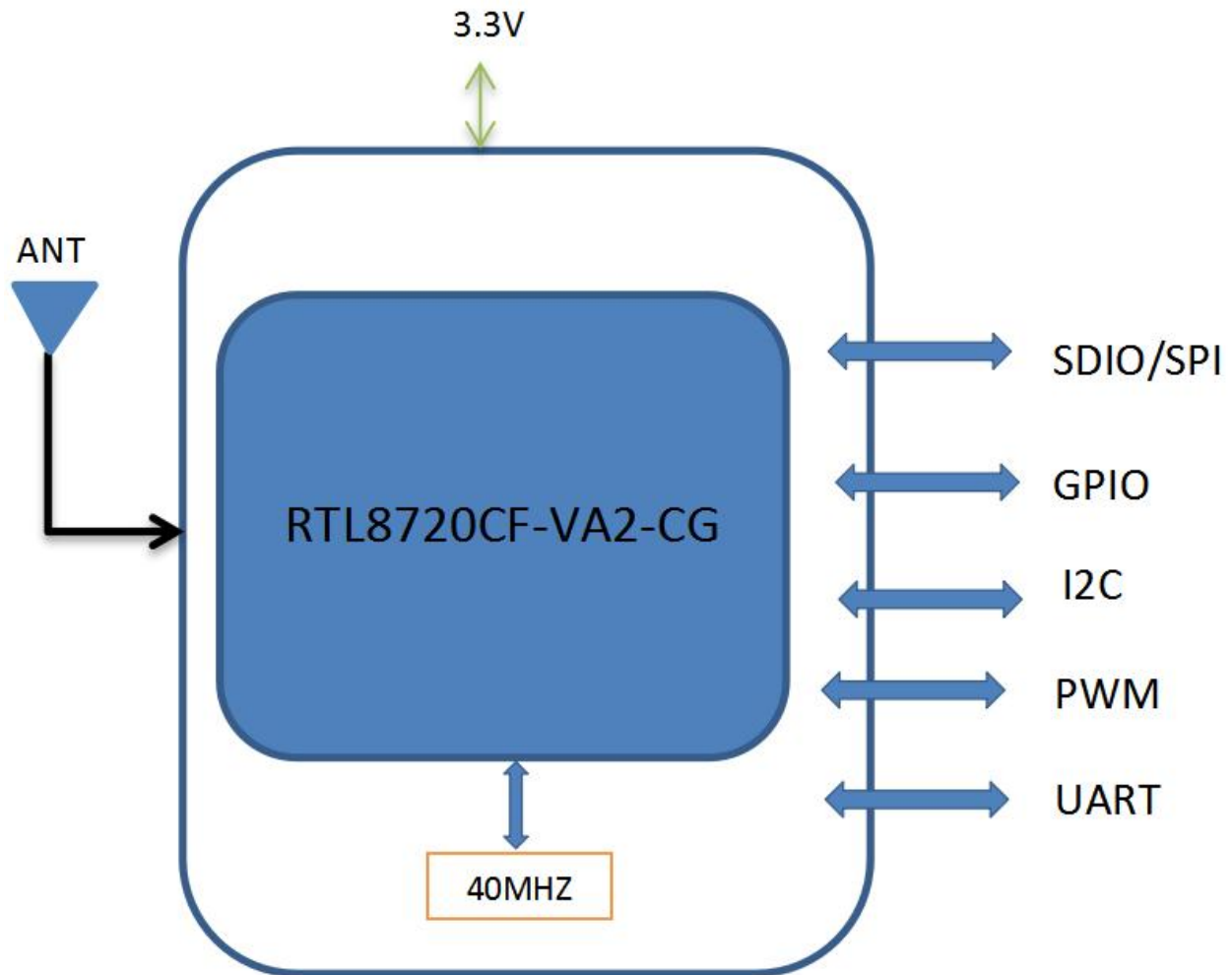
Host Interface

- Support SDIO 2.0 High Speed mode

Bluetooth Features

- Bluetooth Smart Ready (Bluetooth Low Energy) supporting BT4.2 BQB

3. Block Diagram



4. General Specification

4.1 WI-FI 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	
Modulation	WiFi: DSSS DBPSK/DQPSK/CCK OFDM BPSK/QPSK/16QAM/64QAM	
Test Items	Typical Value	EVM
Output Power	802.11b /11Mbps : 17dBm $\pm$ 2 dB	EVM $\leq$ -10dB
	802.11g /54Mbps : 15dBm $\pm$ 2 dB	EVM $\leq$ -25dB
	802.11n /MCS7 : 14dBm $\pm$ 2 dB	EVM $\leq$ -28dB
Spectrum Mask	Meet with IEEE standard	
Freq. Tolerance	$\pm$ 20ppm	

SISO Receive Sensitivity (11b,20MHz) @8% PER	- 1Mbps PER @ -91 dBm	≤ -83
	- 2Mbps PER @ -89 dBm	≤ -80
	- 5.5Mbps PER @ -87 dBm	≤ -79
	- 11Mbps PER @ -85 dBm	≤ -76
SISO Receive Sensitivity (11g,20MHz) @10% PER	- 6Mbps PER @ -87 dBm	≤ -85
	- 9Mbps PER @ -86 dBm	≤ -84
	- 12Mbps PER @ -84 dBm	≤ -82
	- 18Mbps PER @ -82 dBm	≤ -80
	- 24Mbps PER @ -79 dBm	≤ -77
	- 36Mbps PER @ -75 dBm	≤ -73
	- 48Mbps PER @ -71 dBm	≤ -69
	- 54Mbps PER @ -70 dBm	≤ -68
SISO Receive Sensitivity (11n,20MHz) @10% PER	- MCS=0 PER @ -87 dBm	≤ -85
	- MCS=1 PER @ -84 dBm	≤ -82
	- MCS=2 PER @ -82 dBm	≤ -80
	- MCS=3 PER @ -79 dBm	≤ -77
	- MCS=4 PER @ -75 dBm	≤ -73
	- MCS=5 PER @ -71 dBm	≤ -69
	- MCS=6 PER @ -70 dBm	≤ -68
	- MCS=7 PER @ -69 dBm	≤ -67
Maximum Input Level	802.11b : -8 dBm	
	802.11g/n : -20 dBm	

4.2 Bluetooth Specification

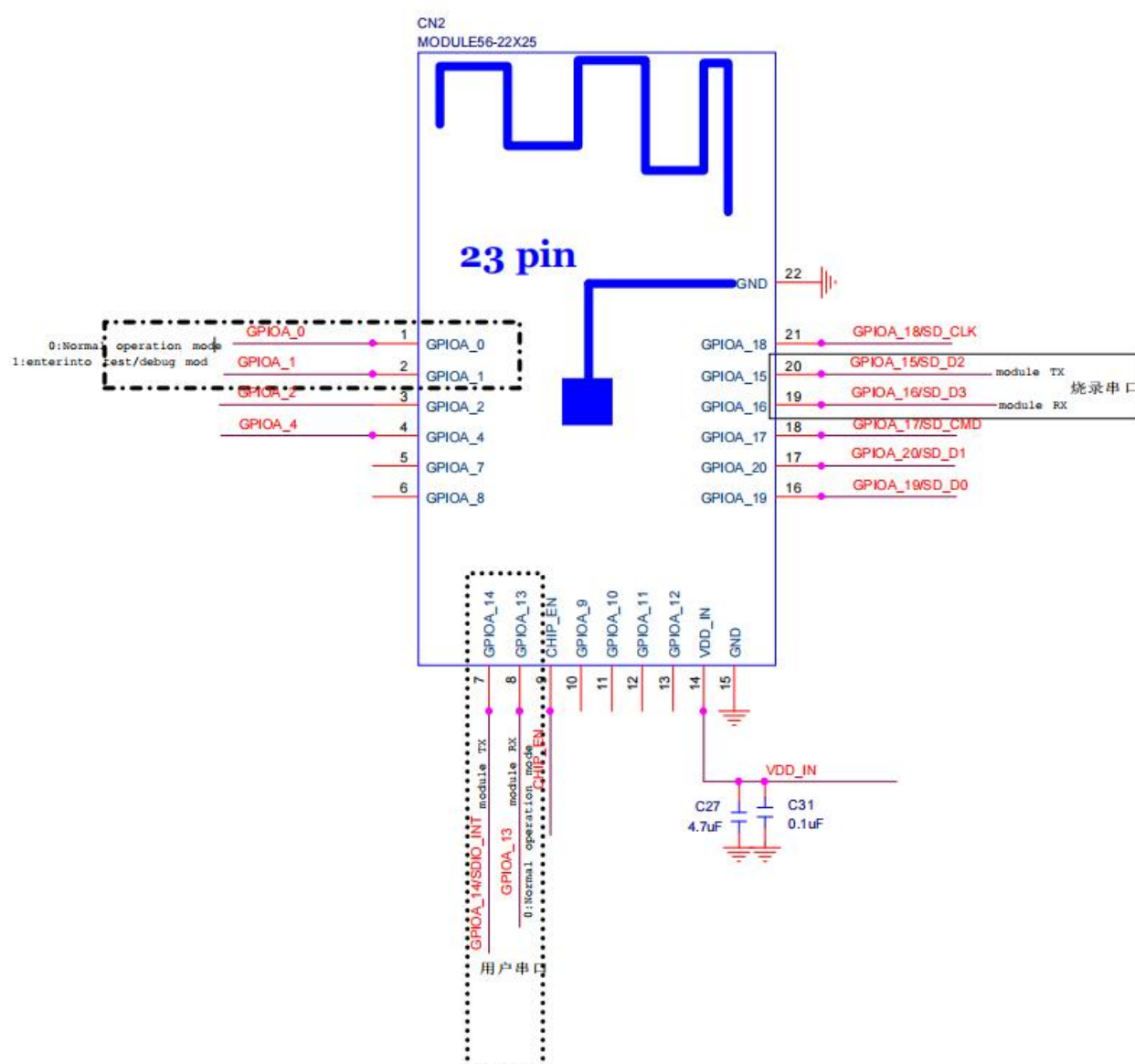
Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth V4.2		
Antenna Reference	Small antennas with 0~2 dBi peak gain		
Frequency Band	2400 MHz ~ 2483.5 MHz		
Number of Channels	40 channels		
Modulation	GFSK		
RF Specification			
	Min(dBm)	Typical(dBm)	Max(dBm)

Output Power (Class 1)	2.5	4.5	6.5
Sensitivity @ BLE=1% for GFSK (1Mbps)		-89	
Maximum Input Level	GFSK (1Mbps):-20dBm		

5. Pin Definition

5.1 Pin Outline

< TOP VIEW >



5.2 Pin Definition details

NO.	Name	Type	Description	Voltage
1	GPIOA_0	I/O	JTAG_CLK/ UART1_IN/PWM0, power on requires low level: normal start mode	
2	GPIOA_1	I/O	JTAG_TMS/UART1_OUT/PWM1, power on requires low level: EFUSE normal import mode	GPIOA_1
3	GPIOA_2	I/O	JTAG_TDO/UART1_IN/SPI_CS/I2C_SCL/PWM2	
4	GPIOA_4	I/O	JTAG_TRST/ UART1_CTS/ SPI_MOSI/ PWM4	
5	GPIOA_7	I/O	UART0_IN/ PWM7 Communication RX	
6	GPIOA_8	I/O	UART0_IN/ PWM8 Communication RX	
7	GPIOA_14/SDIO_INT	I/O	SDIO_INT/ UART0_OUT/ PWM2 Communication TX	
8	GPIOA_13	I/O	UART0_IN/ PWM7 Communication RX	
9	CHIP_EN		Module enable	
10	GPIOA_9	I/O		
11	GPIOA_10	I/O		
12	GPIOA_11	I/O		
13	GPIOA_12	I/O		
14	VDD_IN		Power, The maximum output current of the external power supply is recommended to be 500 mA and above.	
15	GND		Ground connections	
16	GPIOA_19/SD_D0	I/O	SD_D0/SPI_M_D0/UART2_CTS/SPI_MOSI/I2C_SCL/PWM7	
17	GPIOA_20/SD_D1	I/O	SD_D1/SPI_M_D1/UART2_RTS/SPI_MISO/I2C_SDA/PWM0	
18	GPIOA_17/SD_CMD	I/O	SD_CMD/SPI_M_D2/PWM5	
19	GPIOA_16/SD_D3	I/O	SD_D3/SPI_M_CLK/UART2_OUT/SPI_SCL/ I2C_SDA/ PWM4 Commissioning TX	
20	GPIOA_15/SD_D2	I/O	SD_D2/SPI_M_CS/UART2_IN/SPI_CS/I2C_SCL/ PWM3 Commissioning RX	
21	GPIOA_18/SD_CLK	I	SD_CLK/SPI_M_D3/PWM6	
22	GND	-	Ground connections	

P:POWER I:INPUT O:OUTPUT

explain:

GPIO0 power-on instant, do not pull high, or enter the down load mode.

■ Module startup configuration table:

	CHIP_EN	GPIOA_0	GPIOA_13
Normal operation mode	1	0	0 OR 1
URAT download mode	0->1	1	1

■ GPIO1 power-on instant, do not pull high, otherwise the efuse configuration will fail to import and affect the normal operation of the module.

■ GPIO23 power-on instant, do not pull high, otherwise it will affect the normal operation of the module

6. Electrical Specifications

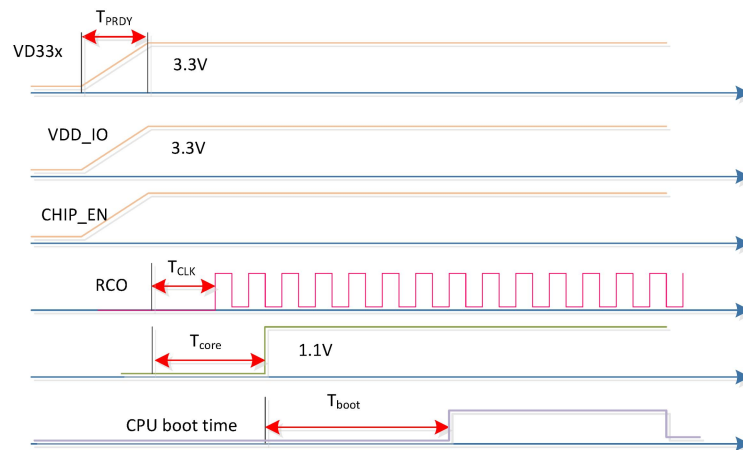
6.1 Power Supply DC Characteristics

	MIN	TYP	MAX	Unit
Operating Temperature	-20	25	85	deg.C
VCC33	3.0	3.3	3.6	V

6.2 Power Consumption

model	Mcu status	describe	TYP	Unit
shutdown			10	uA
Deep sleep			30	uA
Standby	Power-gated		200	uA
Sleep	Clock-gated	WLAN off	450	uA
MCU Active			9	mA
WLAN on(beacon only)	MCU sleep		58	mA
WLAN asoc idle(2.4G),RF ON	MCU sleep	DTIM=1	3	mA
WLAN asoc idle(2.4G),RF ON	MCU sleep	DTIM=3	2	mA
BT active+WLAN active	MCU sleep		60	mA

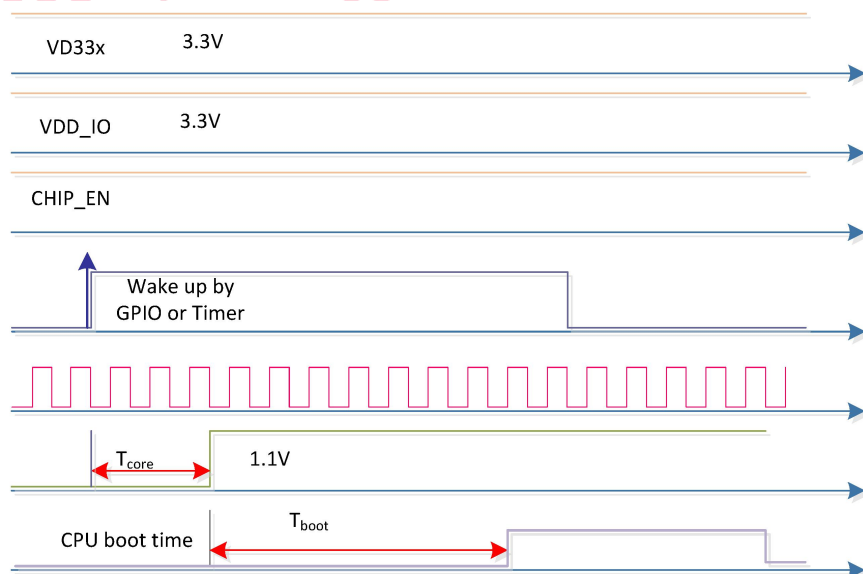
6.3 Power On Sequence



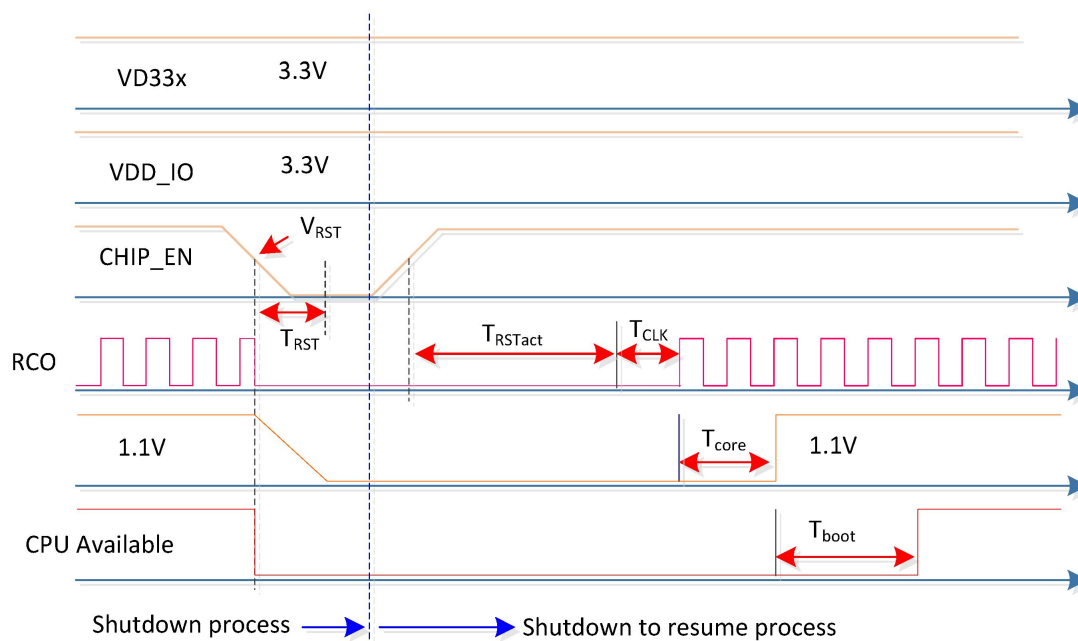
Symbol	Parameter	Minimum	Typical	Maximum	Unit
T_{PRDY}	3.3V ready time	0.6	0.6	1	ms
T_{CLK}	Internal ring clock stable time after 3.3V ready	1			ms
T_{core}	Core power ready time	1.5	1.5		ms
T_{boot}	Application ready time				ms
V_{RST}	Shutdown occurs after CHIP_EN lower than this voltage	0	0	1.65	V
T_{RST}	The require time that CHIP_EN lower than V_{RST}	--	10	--	us

6.4 Interface Circuit time series

6.4.1 Resume from Standby

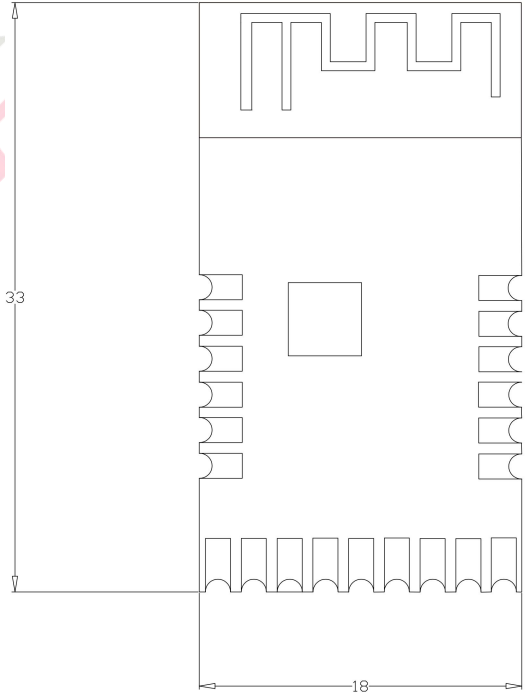


6.4.2 Shutdown Sequence



7. Size reference

7.1 Module Picture

L x W : 33 x 18 (±0.2) mm	
H:3.12(±0.2) mm	
Weight	2.37g

Note: Module Picture the actual shipment shall prevail

7.2 Marking Description



二维码内容: 112233445566;FG6220HLIF-00

1. Fn-Link 商标 logo
2. 机型: 6220HL-IF
3. CMIIT ID:24J43T23T842
4. 二维码: 编码规则为 “wifi mac 地址;成品料号”

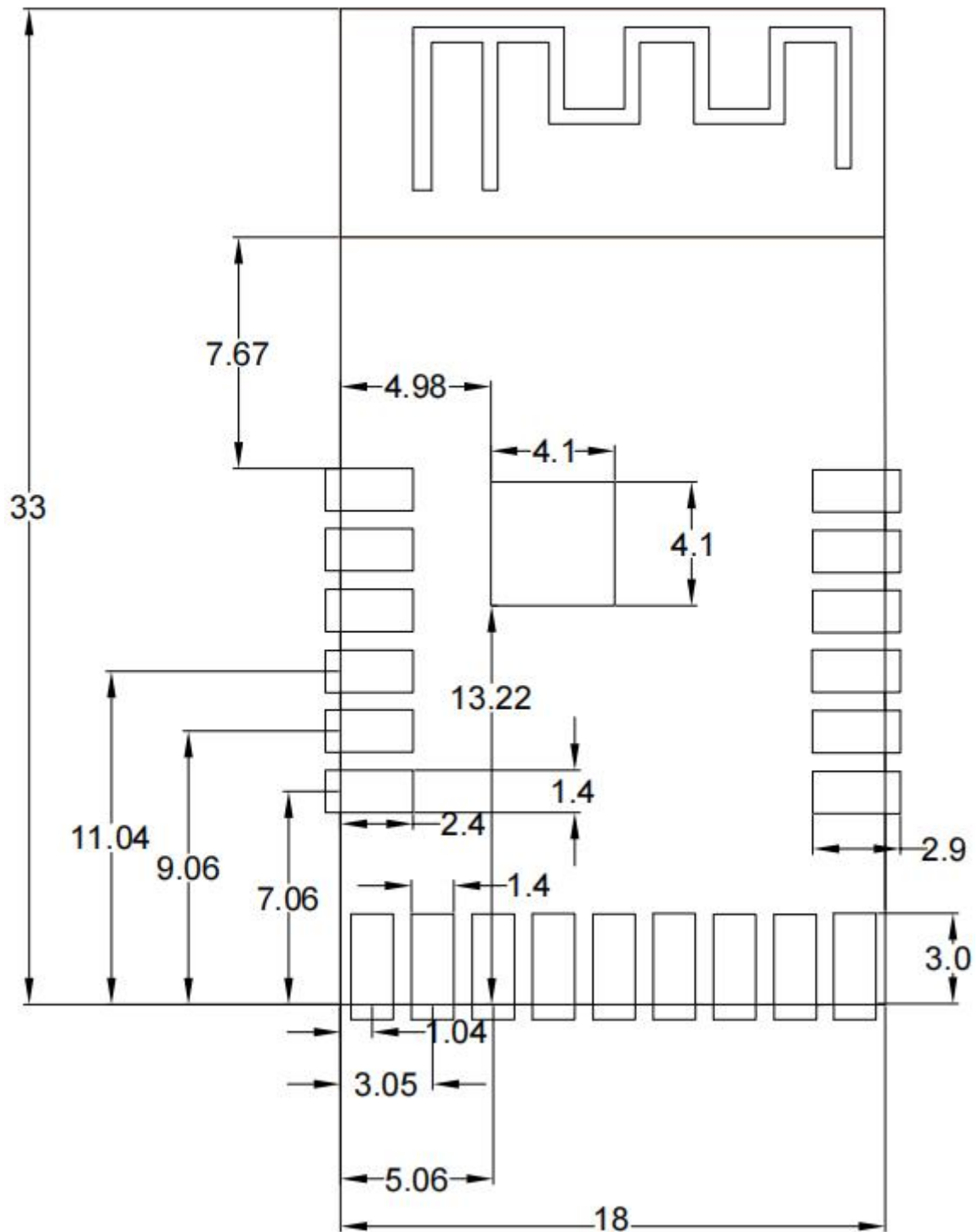
例如: 112233445566;FG6220HLIF-00 (MAC 地址以实际为准)

-----BT MAC 在 WIFI MAC 基础上+1 (WIFI 地址需跳 1, 不能与 BT 地址重复) 二维码中不显示此内容。

7.3 List of certified information

Certification project	Certificate number
SRRC	24J43T23T842
FCC	TBD
CE	TBD
IC	TBD
NCC	TBD
KCC	TBD
TELEC	TBD
Brazil	TBD
Argentina	TBD
Japan	TBD

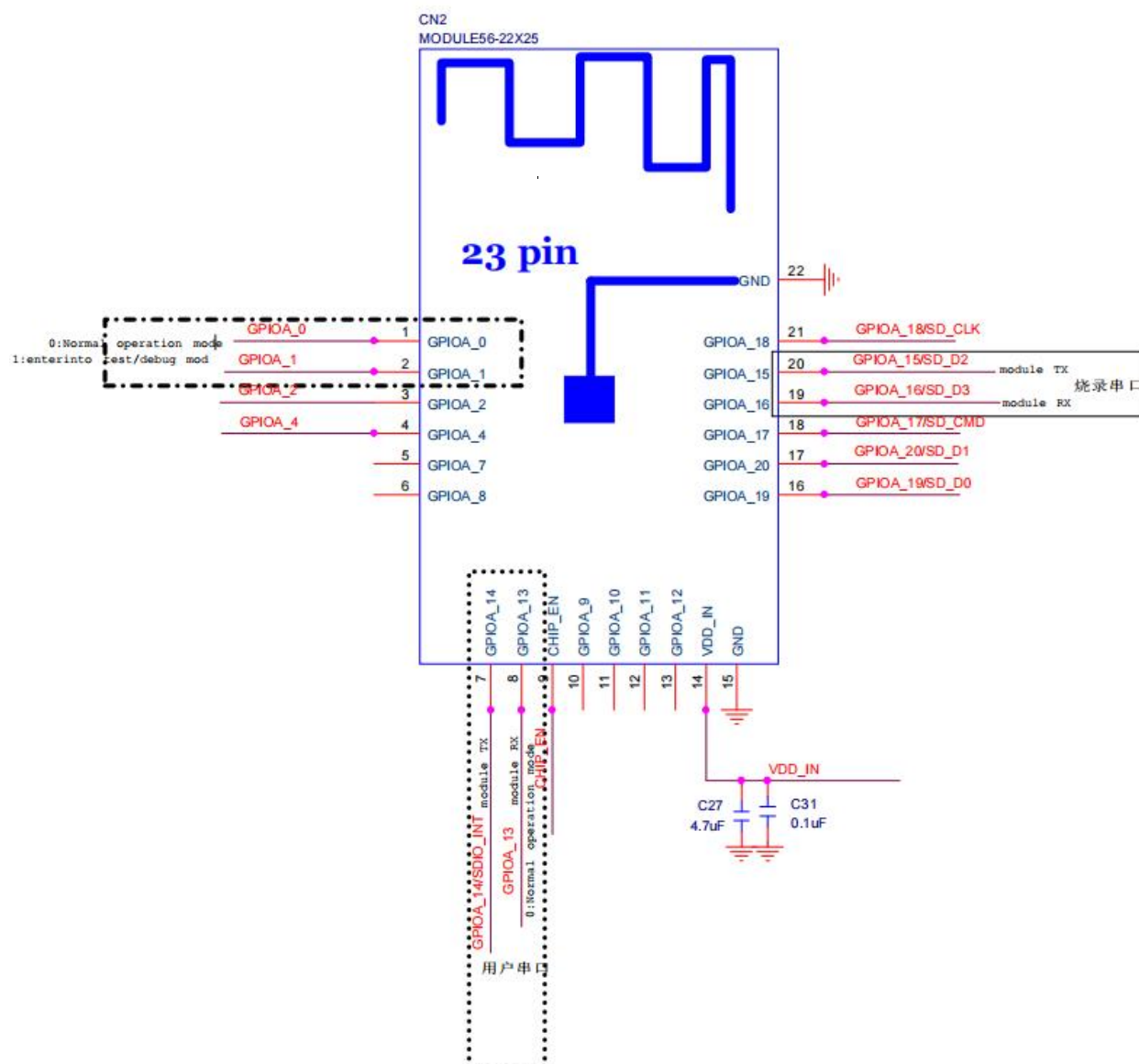
7.4 Layout Recommendation



8. The Key Material List

Item	Part Name	Description	Manufacturer
1	Chipset	RTL8720CF-VA2-CG QFN40,5x5mm	Realtek
2	PCB	6220HL-IF-V2.0 蓝油白字,FR4,4 层通孔,无卤 TG150,化金 2 μ ” , 16 连片,18x33x1.0mm	XY-PCB,KX-PCB,SL-PCB,Sunlord
3	Crystal	2016 40MHZ,12PF,±10PPM	TST,HOSONIC,TKD,ECEC,JWT
4	Shielding	6220HL-IF Shielding	信太,精力通

9. Reference Design

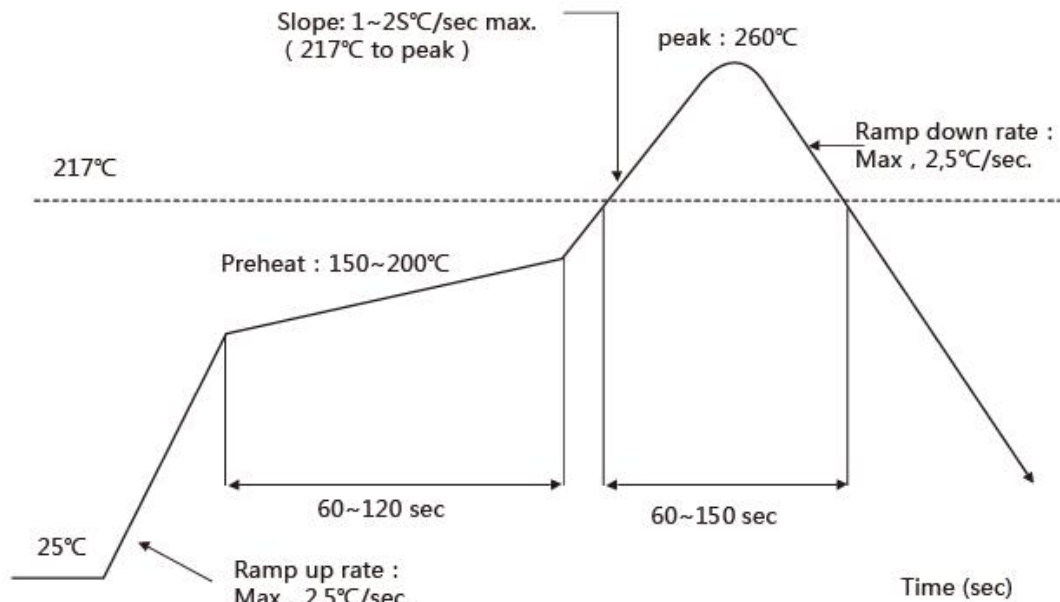


10. Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $<260^{\circ}\text{C}$

Number of Times : ≤ 2 times



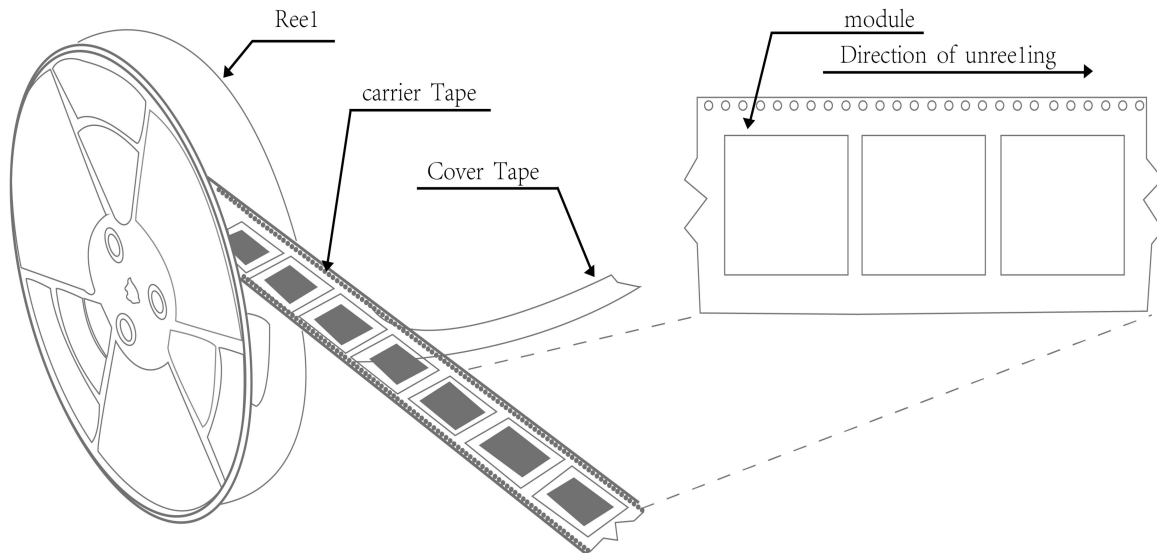
11. RoHS compliance

All hardware components are fully compliant with EU RoHS directive

12. Package

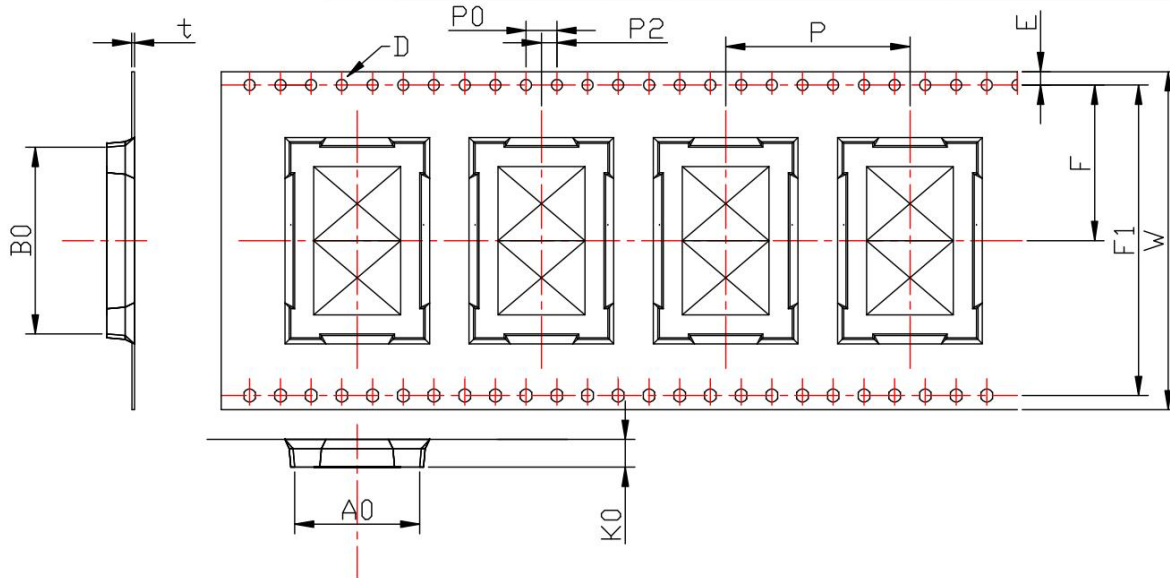
12.1 Reel

A roll of 1500pcs



12.2 Carrier Tape Detail

ITEM	W	A0	B0	D	E	F	F1	K0	P0	P2	P	T
DIM	44	16.00	24.00	1.5	1.75	20.2	40.4	3.60	4.0	2.0	24.0	0.30
TOLE	$\begin{smallmatrix} +0.3 \\ -0.3 \end{smallmatrix}$	± 0.15	± 0.15	$\begin{smallmatrix} +0.1 \\ -0.0 \end{smallmatrix}$	± 0.1	± 0.15	± 0.10	± 0.10	± 0.1	± 0.15	± 0.1	± 0.05



12.3 Packaging Detail

the take-up package



Using self-adhesive tape

Size of black tape: 24mm*24.4m the cover tape :21.3mm*32.6m

Color of plastic disc: blue



NY bag size:450mm*415mm



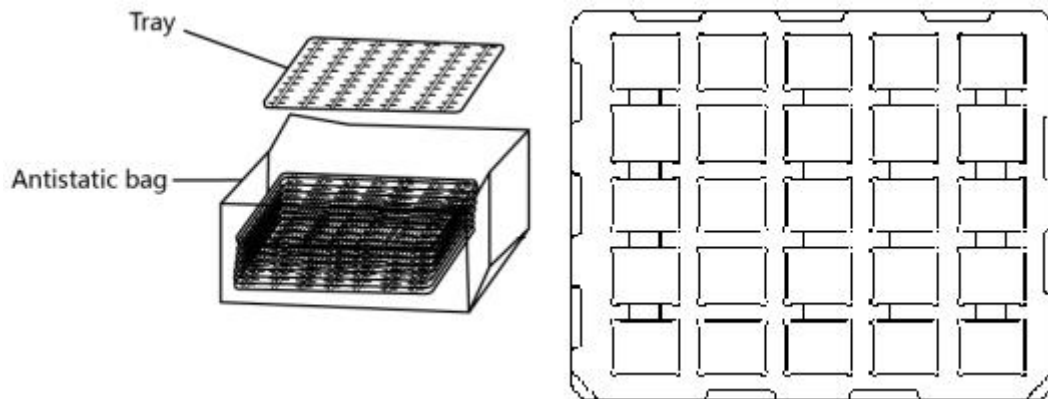
size : 350*350*35mm



The packing case size:360*210*370mm

12.4 Tray

Use pallet packaging for less than 300 pieces



13. 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