



FTY-RM23-DS-C

Module Data sheet



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Customer Approval

Company _____

Title _____

Signature _____

Date _____

FTY _____

Version Update Record

Version	Date	Revision Content	Editorial staff	approval
V1.0	2020/05/27	The first version		

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1 Overview

1.1 Introduction

FTY-RM23-DS-C is a small size and low profile of WiFi+BT combo module with LGA (Land-Grid Array) footprint, board size is 12mm*12mm with module height of 1.6mm. It can be easily manufactured on SMT process and highly suitable for tablet PC, ultra book, mobile device and consumer products. It provides GSPI/SDIO interface for WiFi to connect with host processor and high speed UART interface for BT. It also has a PCM interface for audio data transmission with direct link to external audio codec via BT controller. The WiFi throughput can go up to 150Mbps in theory by using 1x1 802.11n b/g/n technology and Bluetooth can support BT2.1+EDR/and BT4.2.

1.2 Features

- Operate at ISM frequency bands (2.4GHz)
- GSPI/SDIO for Wi-Fi and UART for Bluetooth
- IEEE standards support: IEEE 802.11b, IEEE 802.11g, IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i
- Fully Qualified for Bluetooth 2.1 + EDR 4.2 Supports Bluetooth 4.2 Low Energy(BLE)
- HS-UART interface for Bluetooth data
- Enterprise level security which can apply WPA/WPA2 certification for Wi-Fi.
- Wi-Fi one transmitter and one receiver allow data rates supporting up to 150 Mbps downstream and 150 Mbps upstream PHY rates
- For Wi-Fi/BT, it uses fixed path for Wi-Fi and BT, Which means the antenna assigned for Wi-Fi and BT.

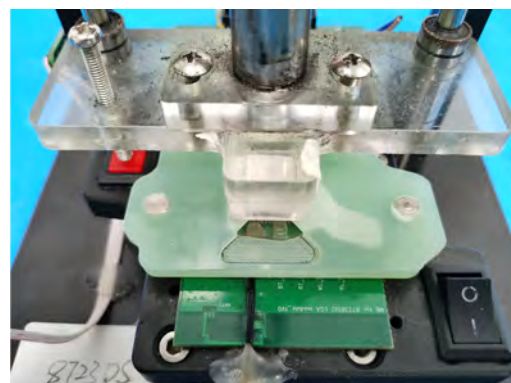
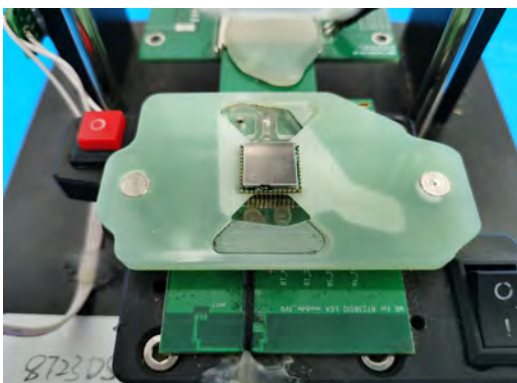
Note:

Manufacturer: Shenzhen Feiteng Cloud Technology Co., LTD

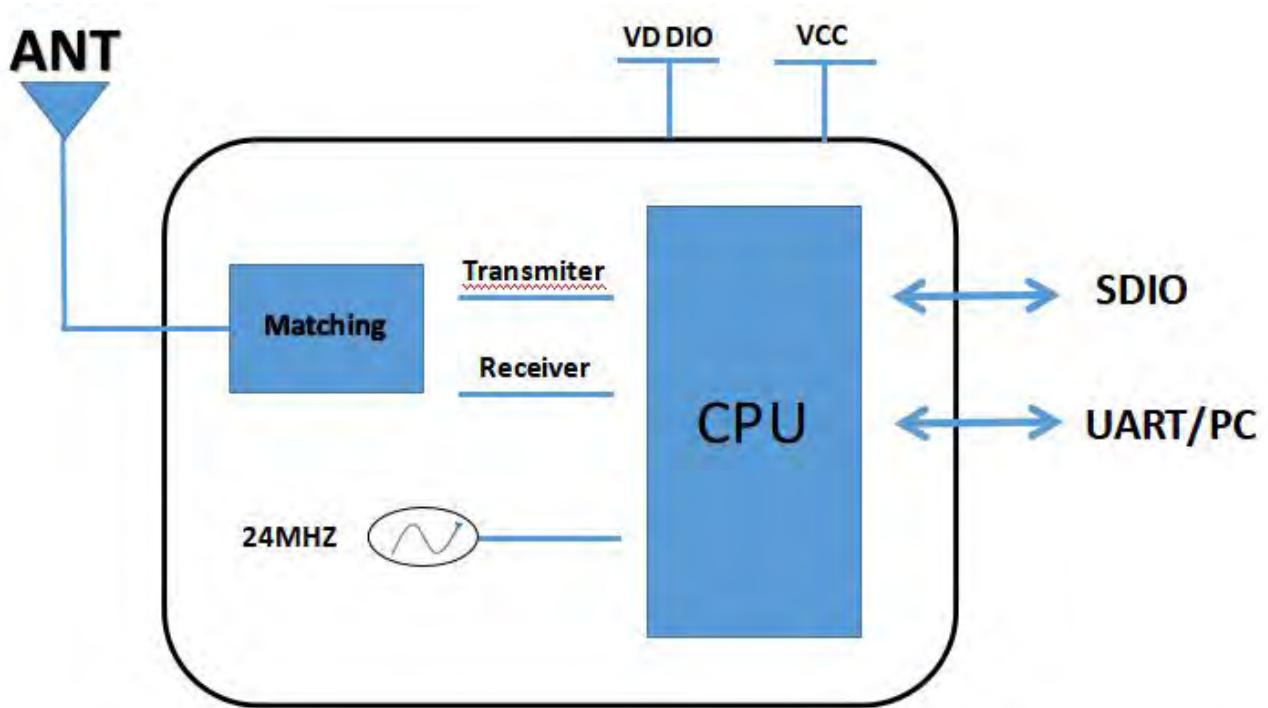
Model Number: FTY-WIFI-28

Product name: Test fixture

Installation instructions: Place the module in the groove corresponding to the fixture and press it so that the module is in good contact with the thimble on the fixture.



1.3 Block Diagram



1.4 General Specification

Model Name	FTY-RM23-DS-C
Product Description	Support WLAN-Bluetooth coexistence
Dimension	L x W x H: 12x 12x 1.6 mm
Wi-Fi Interface	Support GSPI / SDIO
BT interface	Support UART
Operating temperature	-10° C ~ 70° C
Storage temperature	-20° C ~ 85°C
RoHS	All hardware components are fully compliant with EU RoHS directive

1.5 DC Characteristics

Power Supply Characteristics

symbol	Parameter	Minimum	Typical	Maximum	Units
VCC	3.3V supply voltage	3.0	3.3	3.6	V
VDDIO	I/O supply voltage	1.75	3.3	3.6	V
VCC	3.3V rating current	--	--	600	mA
VCC	3.3V Current Consumption (linking)	--	--	150	mA

PROVIDER: Dongguan chuancheng Electronics Co., LTD

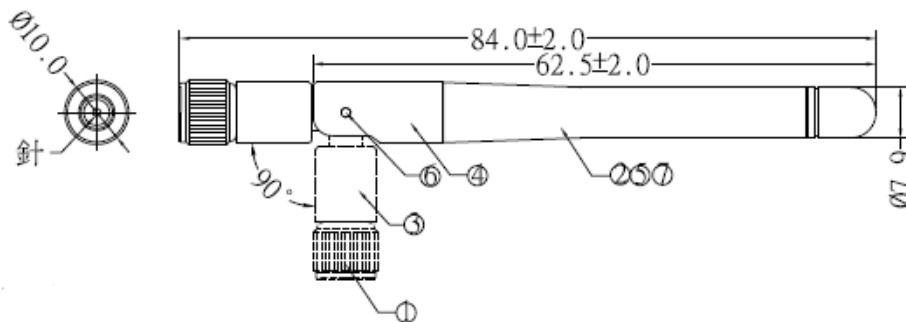
PART NAME: External antenna

SPEC: wifi 2412-2462MHz, BT 2402-2480MHz

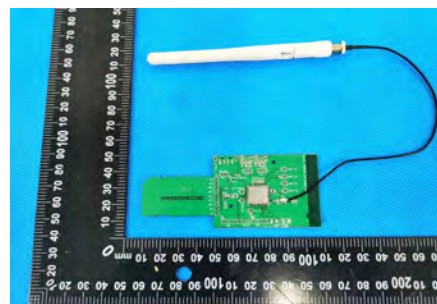
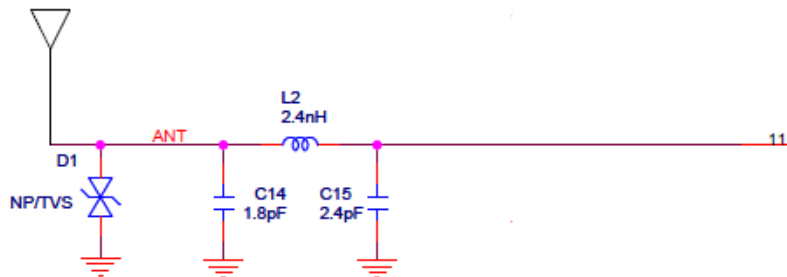
Antenna:

1. Size(mm)

Gain: 0dBi
connector :RP-SMA



2. Antenna matching circuit



2 RF Specifications

2.1 2.4GHz RF Specification

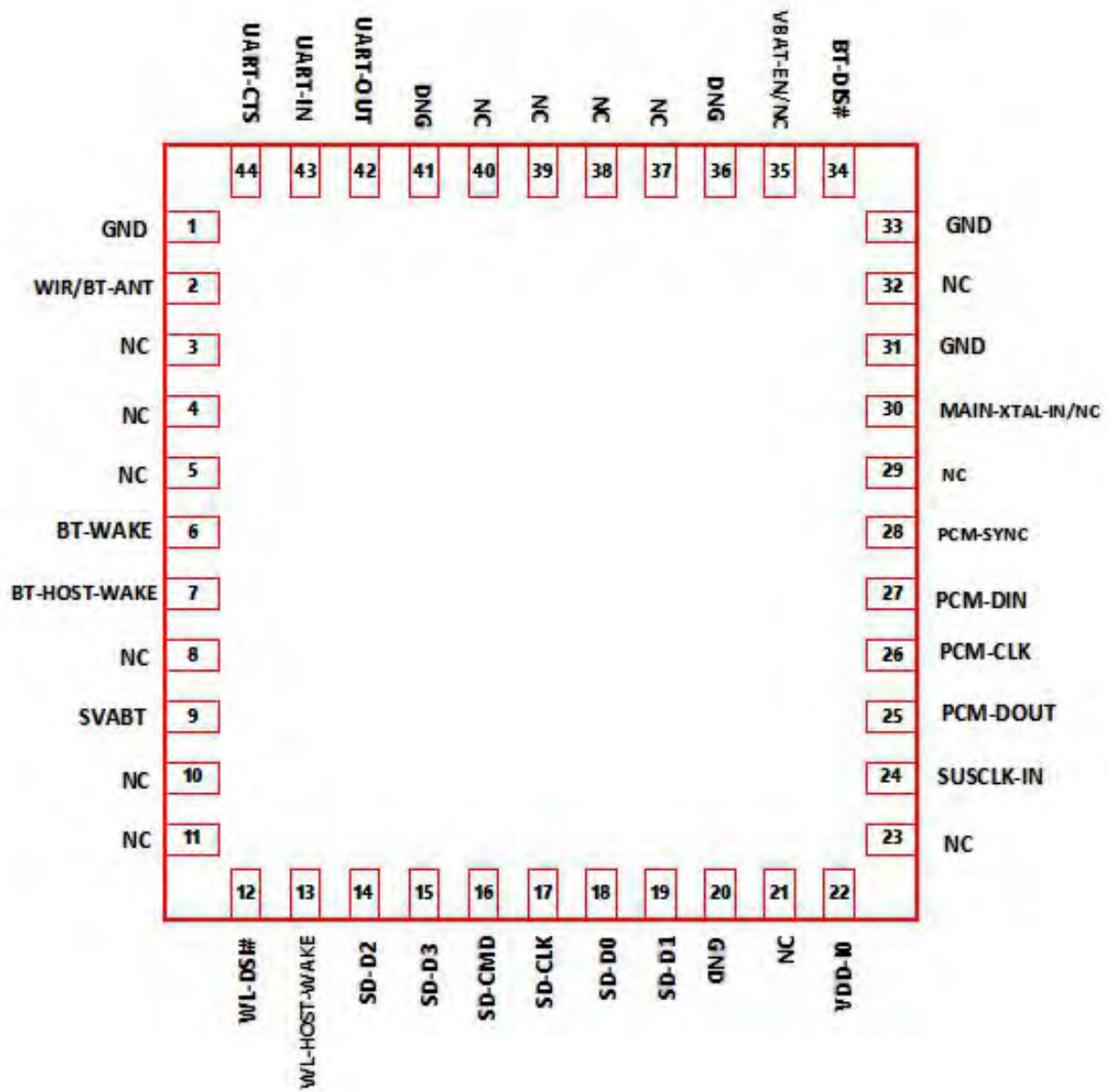
Features	Description		
WLAN Standard	WLAN 11b/g/n		
Frequency Range	2.412 ~ 2.462GHz		
Data Transfer Rate	1,2,5.5,6,11,12,18,22,24,30,36,48,54,60,90,120 and maximum of 150Mbps		
Modulation Method	BPSK/ QPSK/ 16-QAM/ 64-QAM		
Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing)		
OS Support	Windows 2000,XP32-64,Vista 32/64,Win7 32/64,Linux,Mac, Android, WIN CE		
2.4G Transmitter Specifications			
TX Rate	TX Power	TX Power Tolerance	EVM
802.11b @ 11 Mbps	15dBm	±2dBm	≤-10dB
802.11g@54Mbps	12dBm	±2dBm	≤-25dB
802.11n@135Mbps	15dBm	±2dBm	≤-28dB
2.4G Receiver Specifications			
RX Rate	Min Input Level(Typ)	Max Input Level(Typ)	PER
802.11b @ 11 Mbps	-89dBm	-87dBm	8%
802.11g@54Mbps	-74dBm	-72dBm	10%
802.11n@135Mbps	-70dBm	-68dBm	10%

2.2 Bluetooth Section:

Feature	Description		
General Specification			
Bluetooth Standard	Bluetooth BLE4.0,Compatible with Bluetooth v2.1+EDR and v4.2 Systems		
Host Interface	UART		
Antenna Reference	PCB antenna with 0dBi peak gain		
Frequency Band	2402 MHz ~ 2480 MHz		
Number of Channels	0~78 channels		
Modulation	GFSK, DPSK, DQPSK		
RF Specification			
	Min.	Typical.	Max.
Sensitivity @ BER=0.1% for GFSK (1Mbps)	-94 dBm	-92 dBm	-90 dBm
Sensitivity @ BER=0.01% for $\pi/4$ -DQPSK (2Mbps)	-89 dBm	-87 dBm	-85 dBm
Sensitivity @ BER=0.01% for 8DPSK (3Mbps)	-85 dBm	-83 dBm	-81 dBm
Maximum Input Level	GFSK (1Mbps):-10dBm		
	$\pi/4$ -DQPSK (2Mbps) :-10dBm		
	8DPSK (3Mbps) :-10dBm		

3 Pin Assignments

3.1 Pin Outline



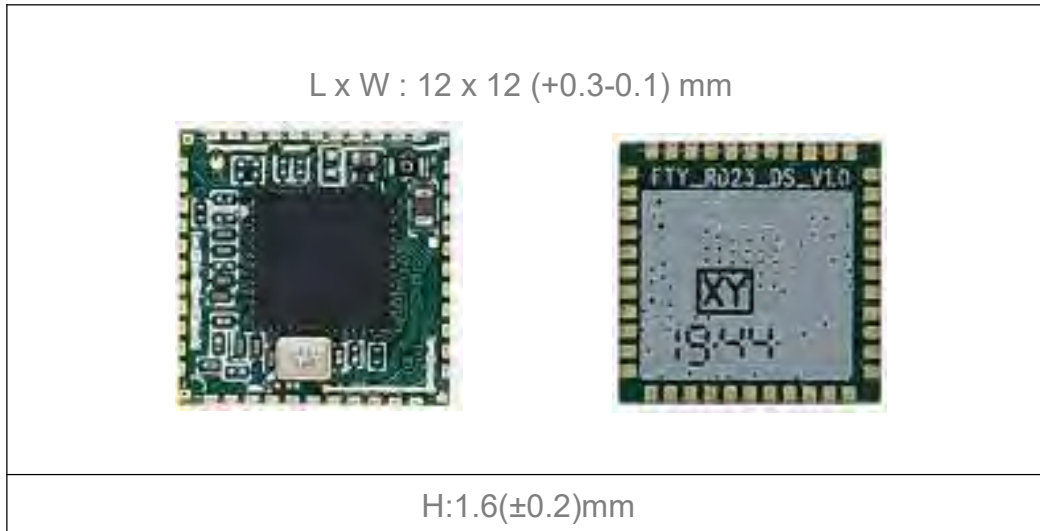
3.2 Pin Definition

PIN	Function	Description
1	GND	Ground
2	WIFI/BT_ANT	WIFI/BT_ANT
3	NC	NC
4	NC	NC
5	NC	NC
6	BT_WAKE	HOST wake-up Bluetooth device
7	BT_HOST_WAKE	Bluetooth device to wake-up HOST
8	NC	NC
9	VABT	3.3V
10	NC	NC
11	NC	NC
12	WL_DSI#	Shared with GPIO11 This Pin CanExternally Shutdown the RTL8723DS WLAN WL_DISn is Pulled Low. When this pin deasserted, SDIO interface will be disabled. This pin can also support the WLAN Ra-dio off function with host interface remaining connected.
13	WL_HOST_WAKE	WLAN to wake-up HOST
14	SD_D2	SDIO data line 2
15	SD_D3	SDIO data line 3
16	SD_CMD	SDIO command line
17	SD_CLK	SDIO CLK line
18	SD_D0	SDIO data line 0
19	SD_D1	SDIO data line 1
20	GND	Ground
21	NC	NC

22	VDD_IO	1.8V / 3.3V
23	NC	NC
24	SUSCLK_IN	Shared with GPIO8. External 32K or RTC clock input with.
25	PCM_DOUT	PCM Data output
26	PCM_CLK	PCM Clock
27	PCM_DIN	PCM data input
28	PCM_SYNC	PCM sync signal
29	NC	NC
30	MAIN_XTAL_IN/NC	MAIN_XTAL_IN/NC
31	GND	Ground
32	NC	NC
33	GND	Ground
34	BT_DIS#	General Purpose Input/Output Pin
35	VBAT_EN/NC	VBAT_EN/NC
36	GND	Ground
37	NC	NC
37	NC	NC
38	NC	NC
39	NC	NC
40	NC	NC
41	GND	Ground
42	UART_OUT	HOST Data output
43	UART_IN	HOST Data input
44	UART_CTS	HOST_CTS

4 Dimensions

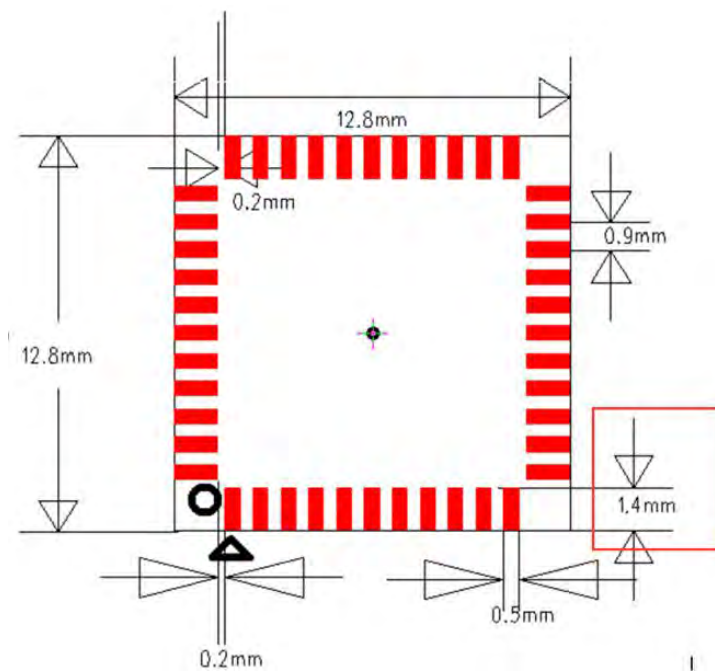
4.1 Module Picture



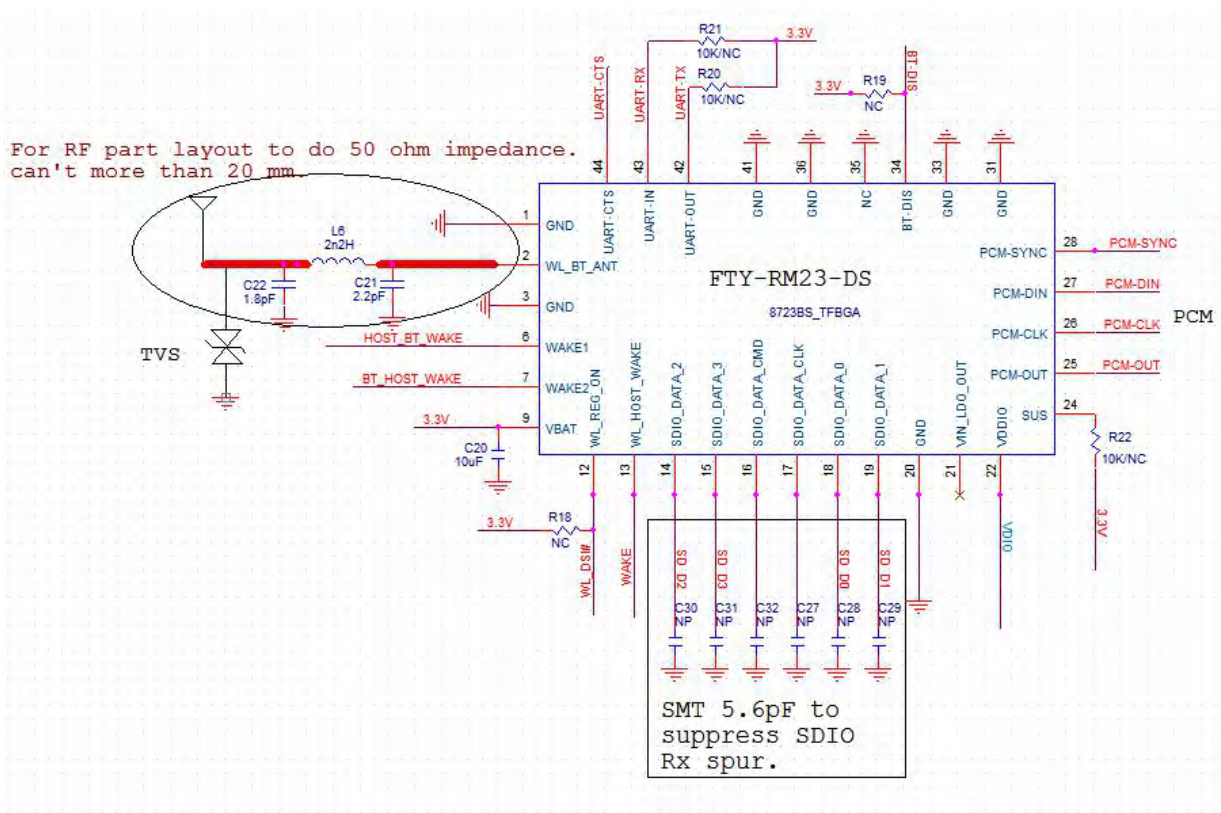
4.2 Module Physical Dimensions

(Unit: mm)

< TOP VIEW >



5 Reference Design



Note:

1. ANT are all support 2.4G function,ANT is support Bluetooth also;
2. The module requires independent power supply, supply capacity $\geq 1000\text{mA}$ and ripple less than 150mV;
3. Do not share power with amplifier, camera, etc.

6 The Key Material List

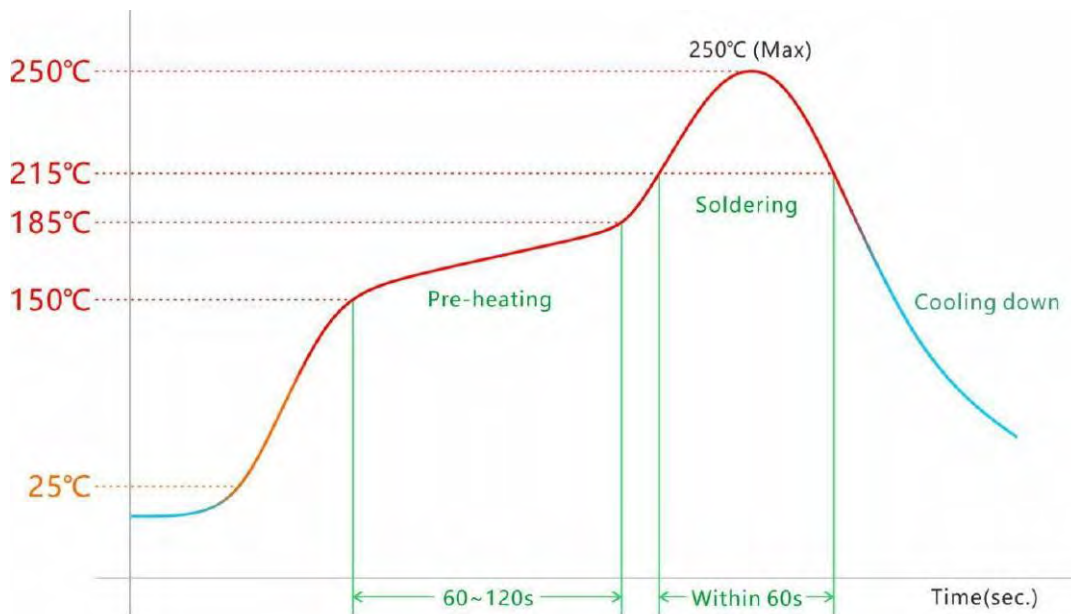
No.	Parts	Specification	Manufacturer	Note
1	Chipset	RTL8723DS-CG/QFN48	Realtek Semiconductor Corp	
2	PCB	FTY_RM23_DS_V1.0	Shenzhen xiangyu circuit co., LTD	
3	Crystal oscillator	2520/24MHZ/ 10PPM/15PF/(-20to+85 度)	hefei jing wei Electronics Co. Ltd.	
4				

7 Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : <math><250^{\circ}\text{C}</math>

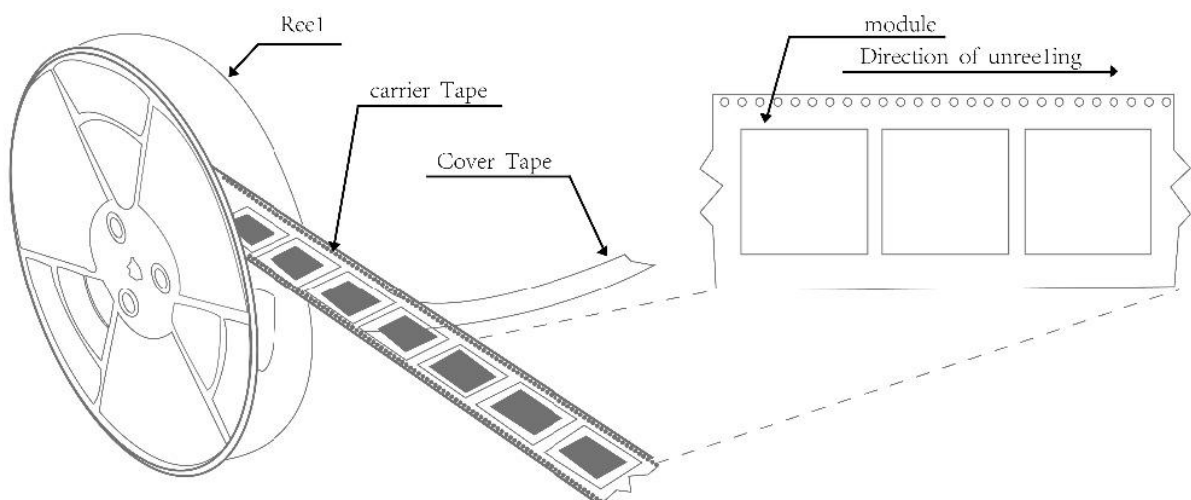
Number of Times : ≤ 2 times



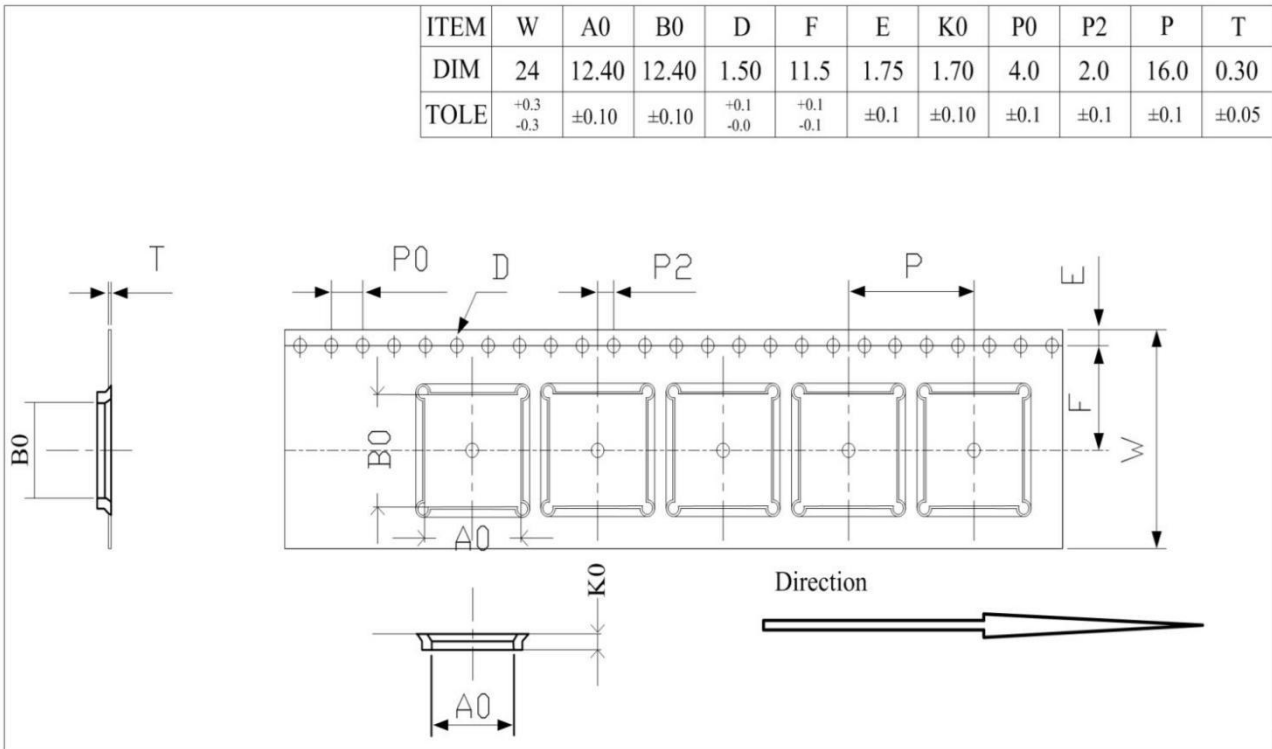
8 Package Information

8.1 Reel

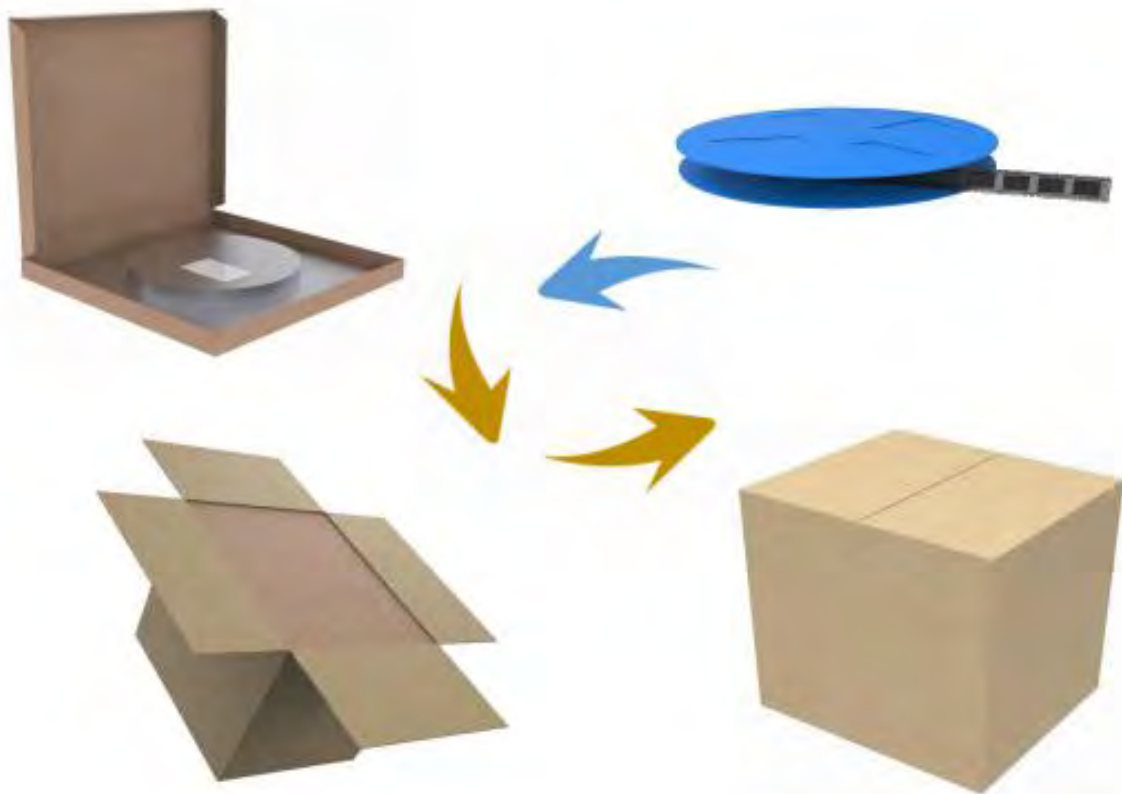
A roll of 2000pcs



8.2 Carrier Tape Detail



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 <math><40^{\circ}\text{C}</math> and <math><90\%</math> relative humidity (RH).
- b) Environmental condition during the production: - 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
- g) The module is limited to OEM installation only.
- h) The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.
- i) This module should be installed and operated with a minimum distance 20cm between the radiator and your body. OEM integrator shall equipped the antenna to compliance with antenna requirement part 15.203& 15.204 and must not be co-located or operating in conjunction with any other antenna or transmitters. And OEM host shall implement a Class II Permissive Change (C2PC) or a new FCC ID to demonstrate complied with FCC standard.
- j) The OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed.
- k) This module support 2.4G WLAN 2412-2462MHz which compliance with part 15.247. This module support 2.4G BT 2402-2480MHz which compliance with part 15.249.
- l) The final end product must be labelled in a visible area with the following:
"Contains Transmitter Module "2A3AKFTYRM23DSC"

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.