

# Sunnyway Technology (China) Co., Ltd.

## Antenna SPEC

Customer name:Mobiletek		Project name:PT102A
Operating Band: LTE B2/B4/B12&GPS&WIFI&433		
Motherboard version:PT102_V2_221102A		
<b>Material specifications</b>		
Specifications and models	Material No	Customer data
Main antenna	SH22396IB89	

<b>Change your resume</b>				
Date of establishment/change	Change the content	Changers	Version	
23.3.21			V1.0	
<b>SUNNYWAY Will sign the box</b>				
R & D	ME:	Audit:	QE:	Approved:
	RF:	Audit:		
<b>The customer will sign the bar</b>				
Electrical engineer	PM	ME	QE	

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# 1. Project information

## Machine Information



## Antenna information



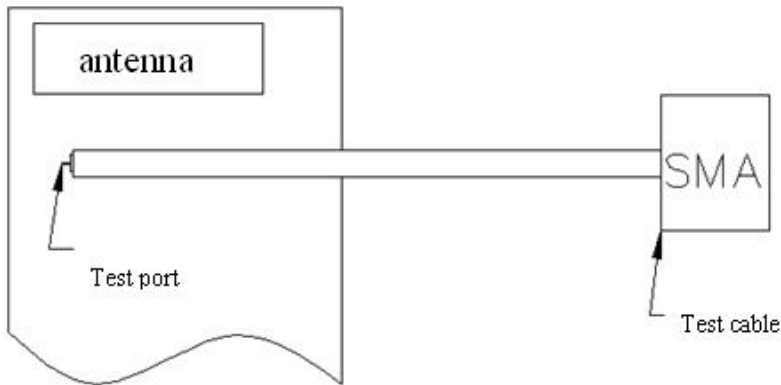
Motherboard	PT102_V2_221102A
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The final verification antenna performance prototype is kept in our company for at least one year to facilitate the analysis and resolution of antenna production anomalies, Ensure the quality of antenna shipment

## 2. Test fixture

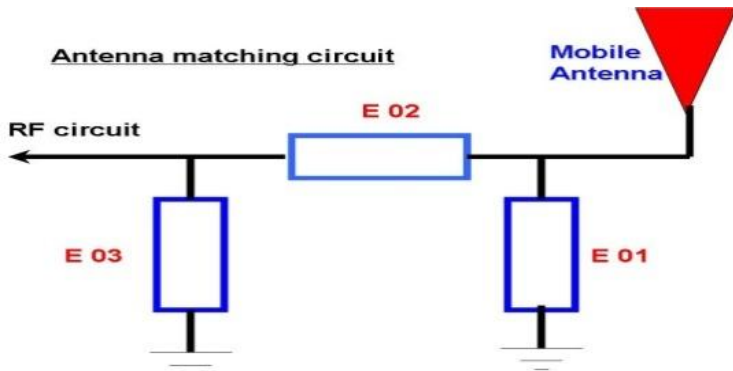
Purpose: To test antenna passive parameters as accurately as possible.

methods: the fixture is to use a 50 ohm coaxial cable, one end is connected to the pad after the antenna 's matching circuit (the front of the antenna switch) , and the other end is connected to the SMA connector.



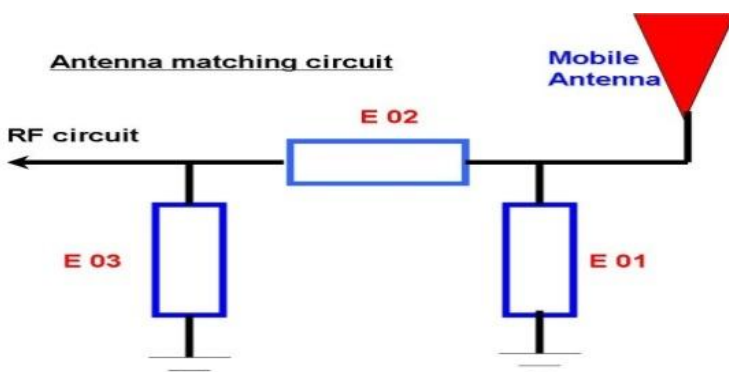
## 3. Matching circuit

### The main antenna



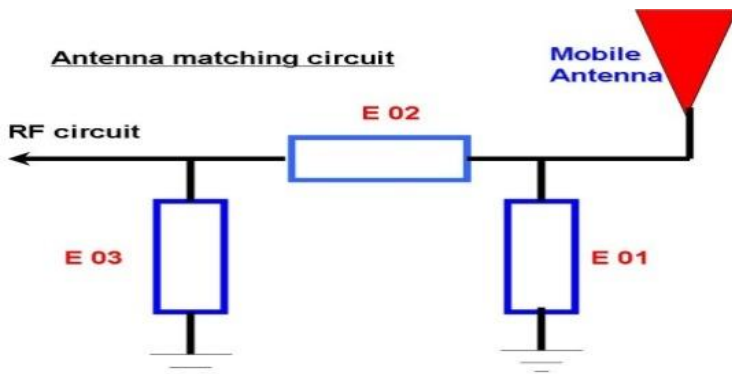
Element	Value
E1	N/A
E2	0 Ω
E3	N/A

### Diversity antenna



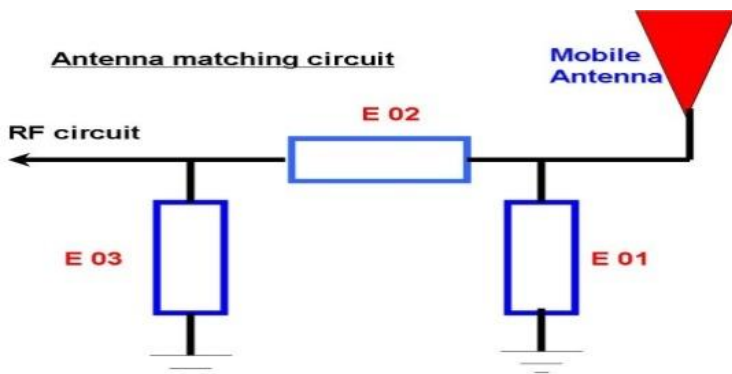
Element	Value
E1	N/A
E2	0 Ω
E3	N/A

**Wi-fi antenna**



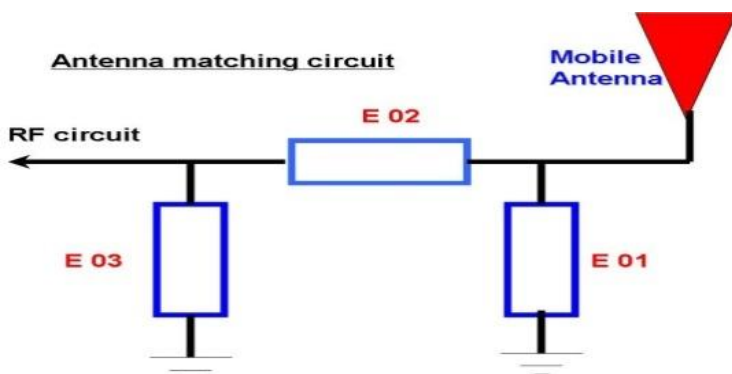
Element	Value
E1	N/A
E2	0 Ω
E3	N/A

**GPS antenna**



Element	Value
E1	N/A
E2	0 Ω
E3	N/A

**433 Antenna**



Element	Value
E1	18nH
E2	0 Ω
E3	N/A

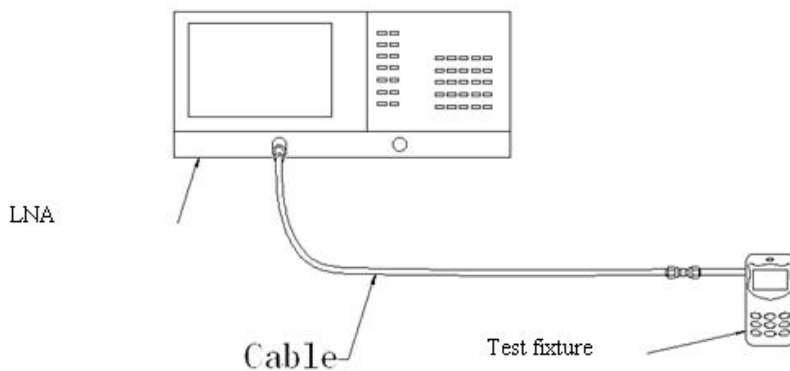
## 4. S11 Test

### 4.1 S11 test method instructions

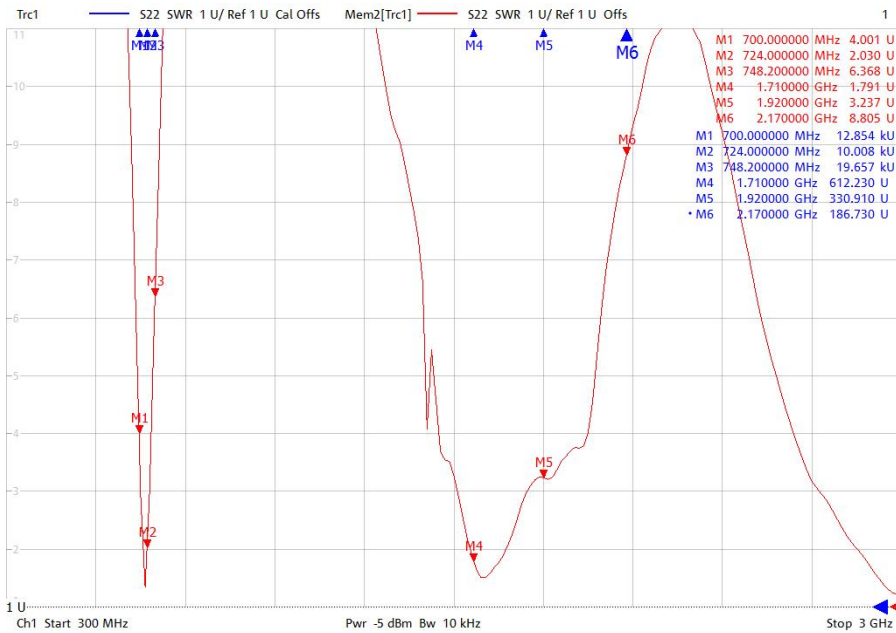
Test equipment: LNA(E5062A)

Test method: With a 50 ohm CABLE ,CABLE export from instrument testing port , After the calibration with calibration Key, connected to the SMA connector, Records the return loss and VSWR of the related frequency points.

Test schematic diagram is as follows:

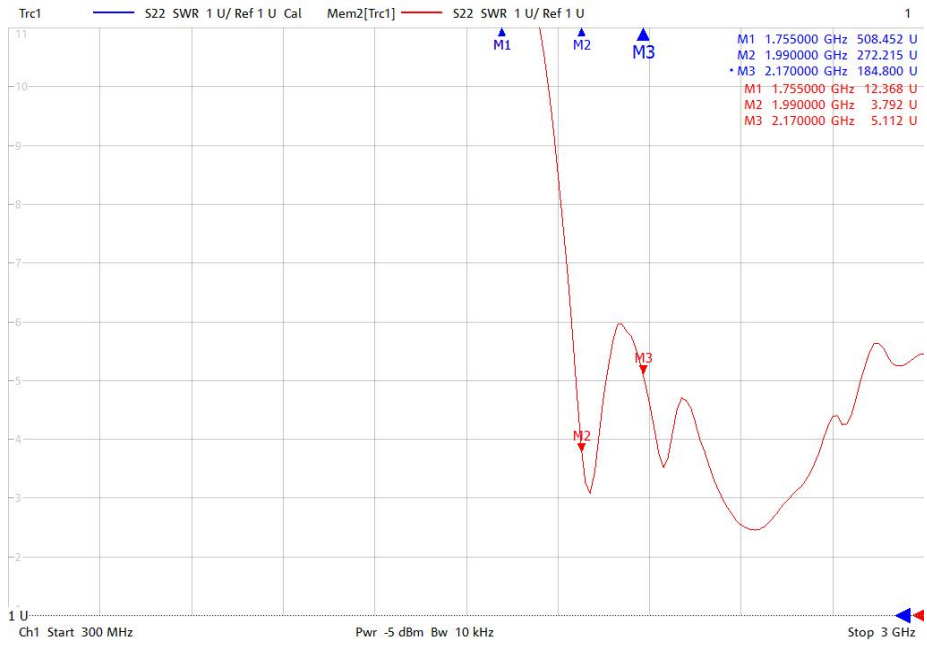


### 4.2 S11 Parameter The main antenna



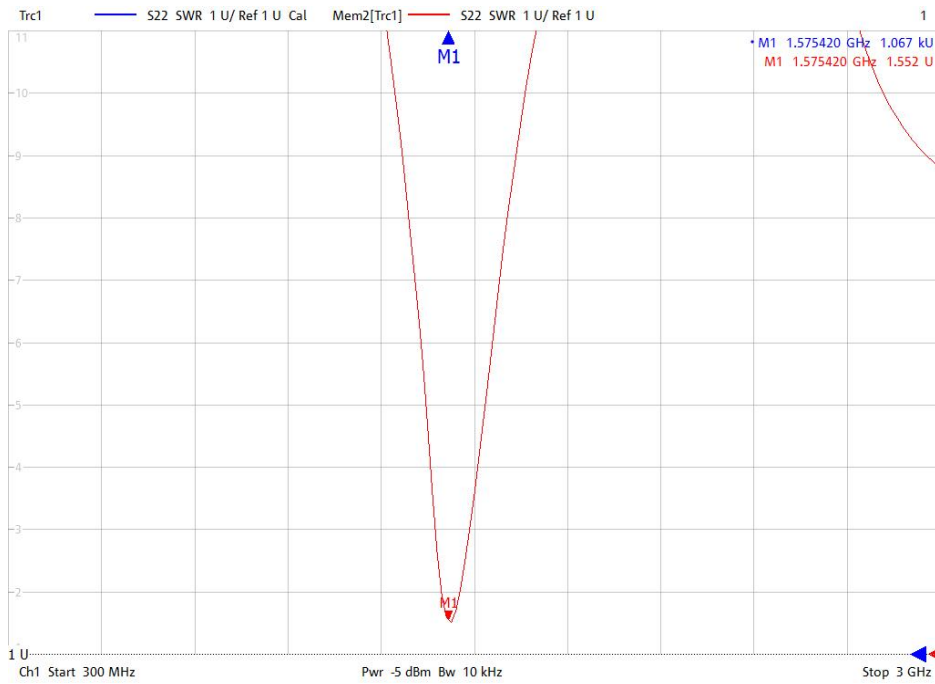
FRq (MHz)	VSWR
700	4.0
724	2.03
748	6.36
1710	1.79
1920	3.23
2170	8.8

### Diversity antenna



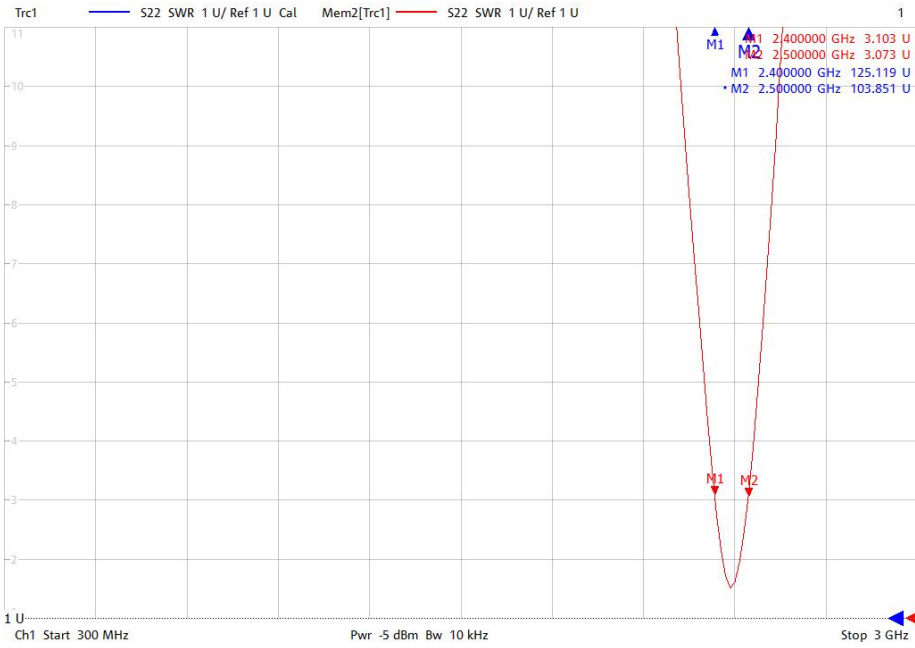
FRq (MHz)	VSWR
1710	12.3
1920	3.79
2170	5.11

### GPS antenna



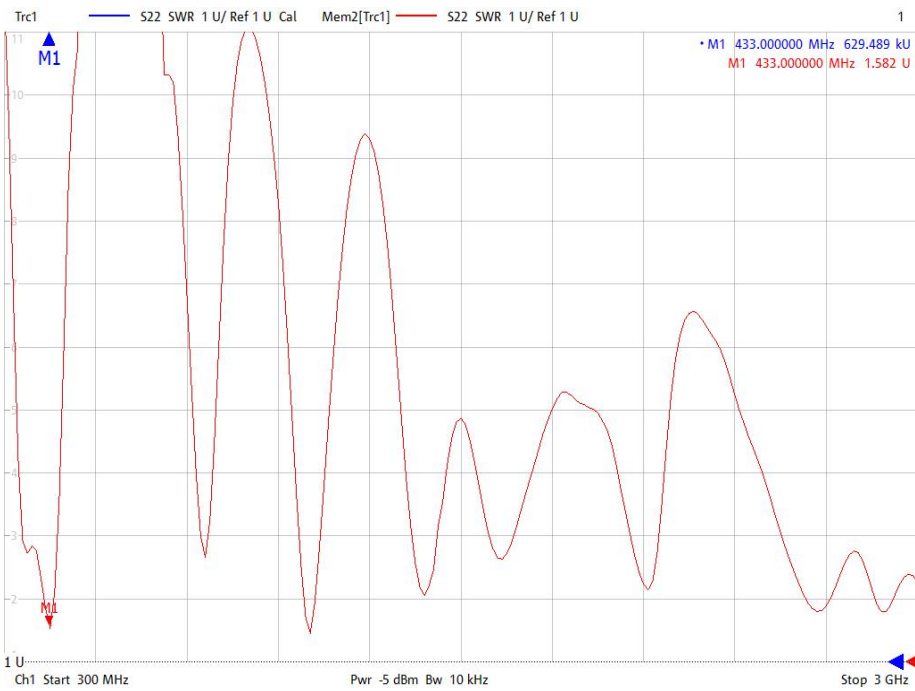
FRq (MHz)	VSWR
1575	1.55

**Wi-fi antenna**



FRq (MHz)	VSWR
2400	3.1
2500	3.07

**433 Antenna**



FRq (MHz)	VSWR
433	1.58

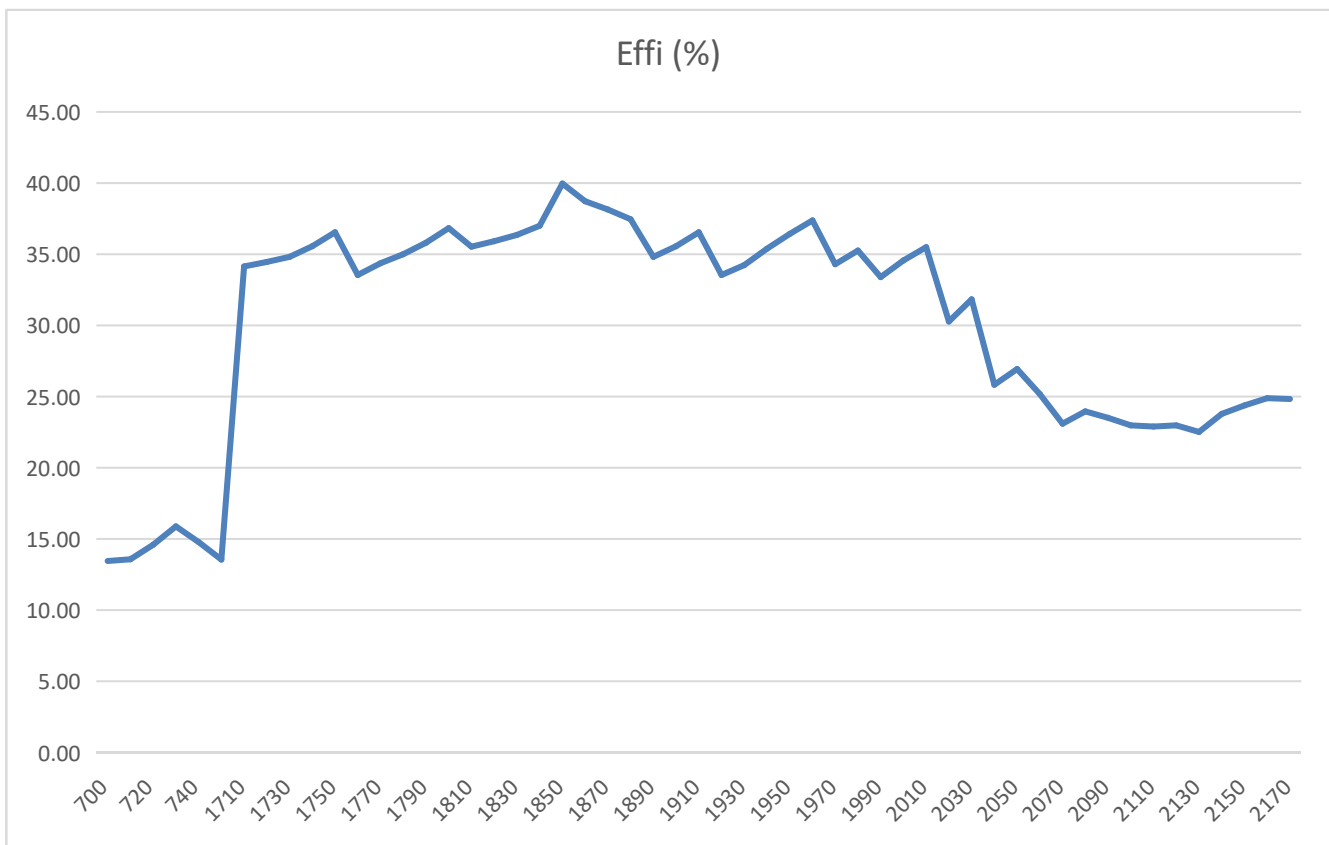


5. Anechoic Chamber test data test system: SHIELDED  
 ANECHOIC chamber test environment: temperature  $22\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ ,  
 humidity  $50\% \pm 15\%$  test equipment: when testing passive data,  
 when testing active data using Network analyzer Agilent  
 E5062C, agilent 8960/CMW500/E4438C was used

### 5.1 Passive test data

Passive efficiency of WIFI antennas

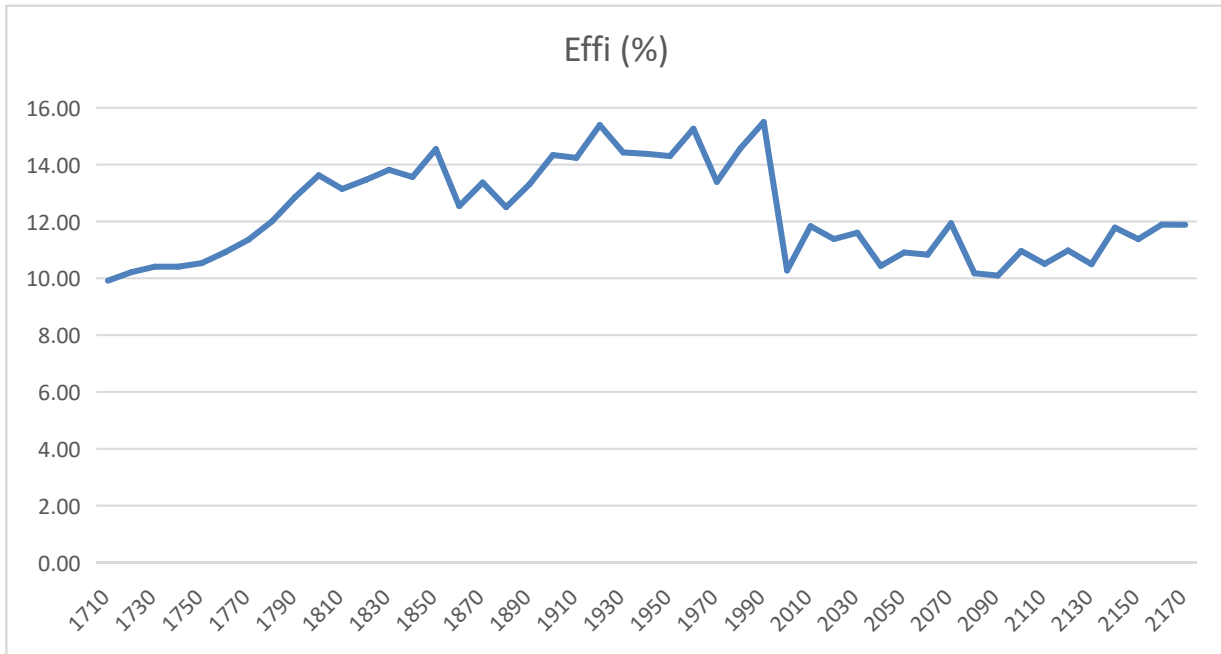
#### The main antenna



Freq. (MHz)	700-740			1710-2170		
	Min	Max	Avg	Min	Max	Avg
Effi (%)	13.45	15.88	14.39	22.51	39.96	32.02
Effi (dB)	-8.71	-7.99	-8.43	-6.48	-3.98	-5.02

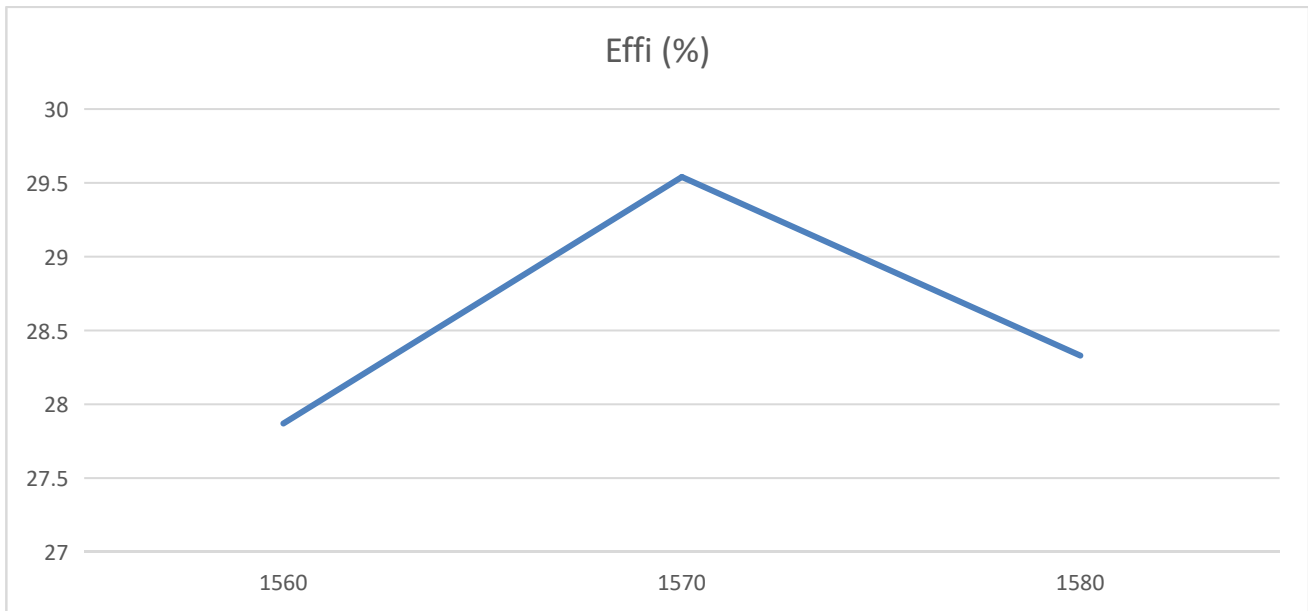
Sunnyway Technology (china) Ltd. Company Antenna Specification

**Diversity antenna**



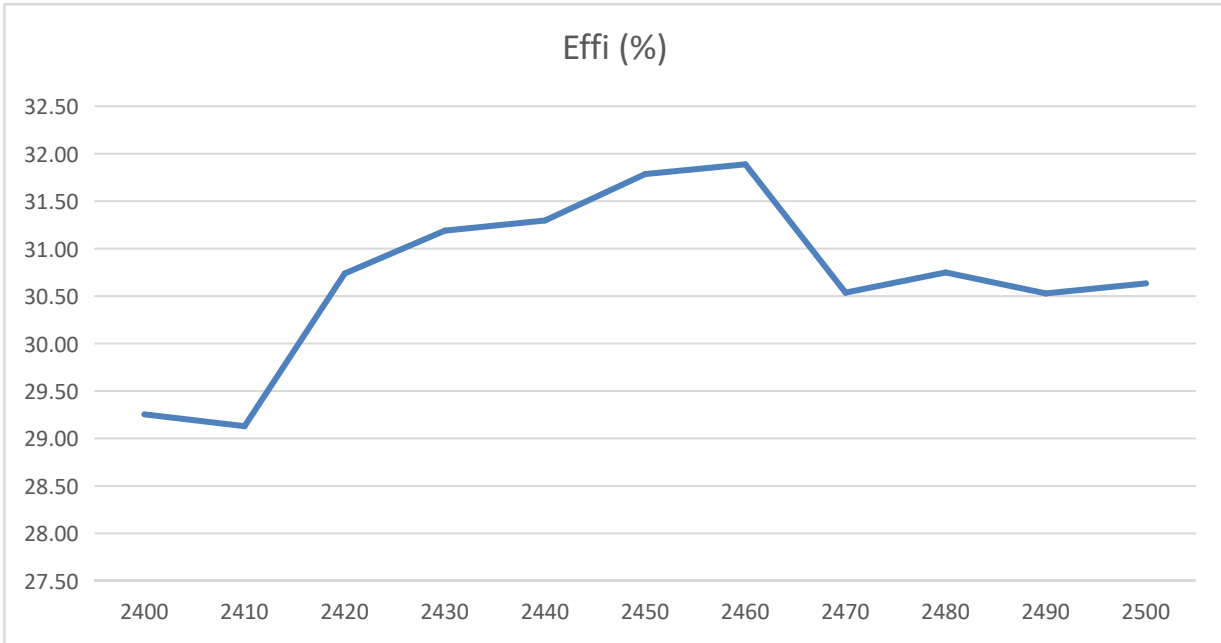
Freq. (MHz)	1710-2170		
	Min	Max	Avg
Effi (%)	9.92	15.5	12.31
Effi (dB)	-10.04	-8.01	-9.14

**GPS antenna**



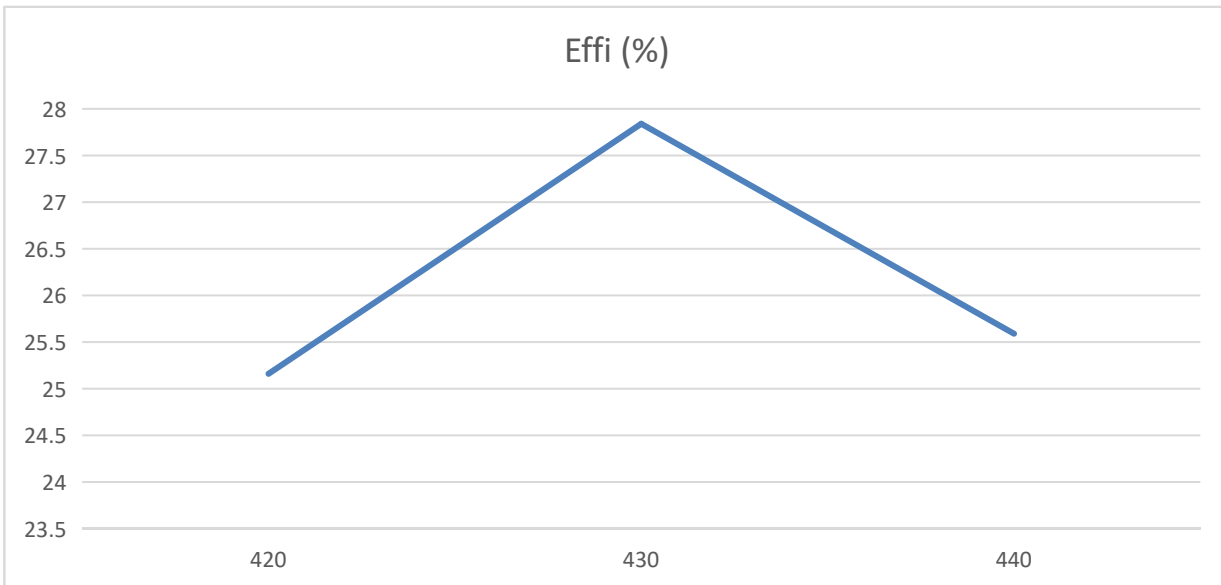
Freq. (MHz)	1560-1580		
	Min	Max	Avg
Effi (%)	27.87	29.54	28.58
Effi (dB)	-5.55	-5.3	-5.44

**Wi-fi antenna**



Freq. (MHz)	2400-2500		
	Min	Max	Avg
Effi (%)	29.13	31.89	30.67
Effi (dB)	-5.36	-4.96	-5.13

**433 Antenna**



Freq. (MHz)	420-440		
	Min	Max	Avg
Effi (%)	25.16	27.84	26.19
Effi (dB)	-5.99	-5.55	-5.82

### The main antenna gain

Band	Antenna gain(dbi)
Band 2	-4
Band 4	-4
Band 12	-3

### 5.2 Active test data

The main antenna active test data (free space, screen off)

Band	Channel	OTA (dBm)	
		TRP (dB)	TIS (dB)
LTE FDD-B2 (10M)	L	19.13	
	M	18.96	
	H	18.64	-91.53
LTE FDD-B4 (10M)	L	19.02	
	M	19.23	
	H	19.17	-90.26
LTE FDD-B12 (10M)	L	16.51	
	M	17.54	
	H	16.78	-87.27

## 6. Ground handling of the prototype



7. The standing wave ratio (SWR) is used as the test standard for antenna mass production. Based on the differences of the project itself, the following criteria are given:

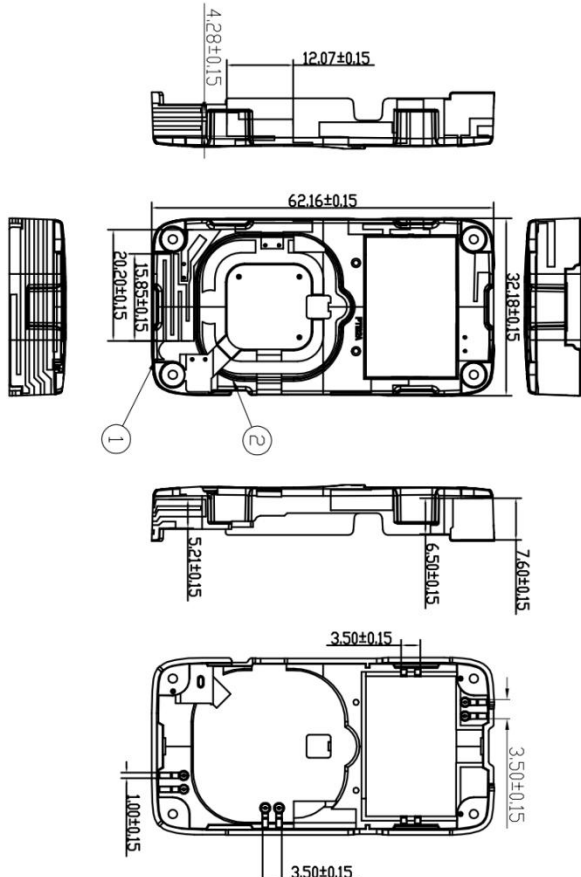
Frequence	SPEC ,Mass Production
700MHz--740MHz 1710MHz--2170MHz 1575.42MHz 2400MHz--2500MHz	VSWR (MP performance) <VSWR(Verify performance)+1

# 8 Engineering drawings

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### Technical requirement

1. Shipping and packaging requirements: (pallet packaging and shipping)
2. LDS surface has no sensitive scratch, leakage and overflow plating. (due to plating process antenna surface will appear insensitive scratches);
3. With \* as the key size, the unmarked tolerance size is plus or minus 0.15MM;
4. The copper plating thickness of LDS antenna is  $8\mu\text{m}$ - $12\mu\text{m}$ , and the nickel plating thickness is  $3\mu\text{m}$ - $5\mu\text{m}$ . The salt spray has been tested for 48H.
5. Electroplating material: copper-nickel
6. According to the general requirements
7. Products meet ROHS requirements.



Number	Name	Part Number	materials	color	natural	quantity
②	bracket	SH2241TB92	DX11385	BLACK	-	-
①	LDS	SH223961A04		natural	-	-

TOLERANCE X.X ±0.25 .XX ±0.20 .XXX ±0.05	ANGULAR $\leq \pm 0.5^\circ$	PART NAME: LDS PT102A	DATE: 2023.2.11
		PART NO: SH223961B89	DRAWN: YUJIANG
		MATERIAL: materials	CHECKED: zhangyuantang
		FINISHING:	APPROVED:
UNIT: mm	COLOUR:	SCALE: 1:1	REV: TA

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