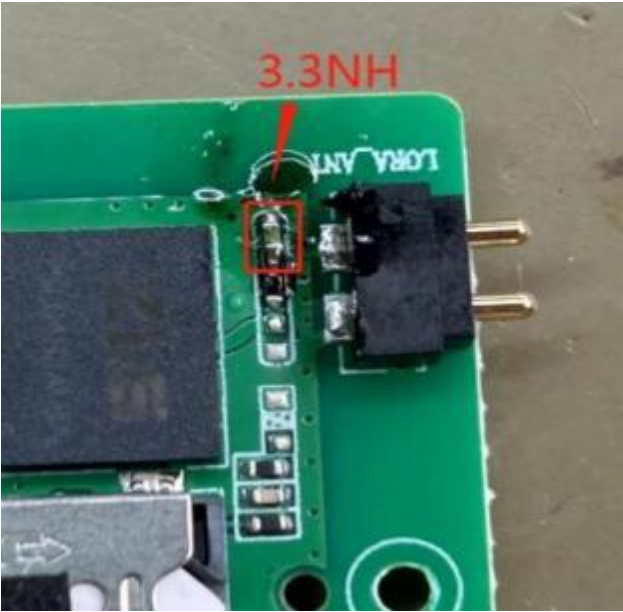


KG-04-NA Antenna Test Report

- ☐ LORA Antenna Matching and Efficiency
- ☐ Main antenna OTA data
- ☐ Main antenna matching

LORA Antenna Matching and Efficiency

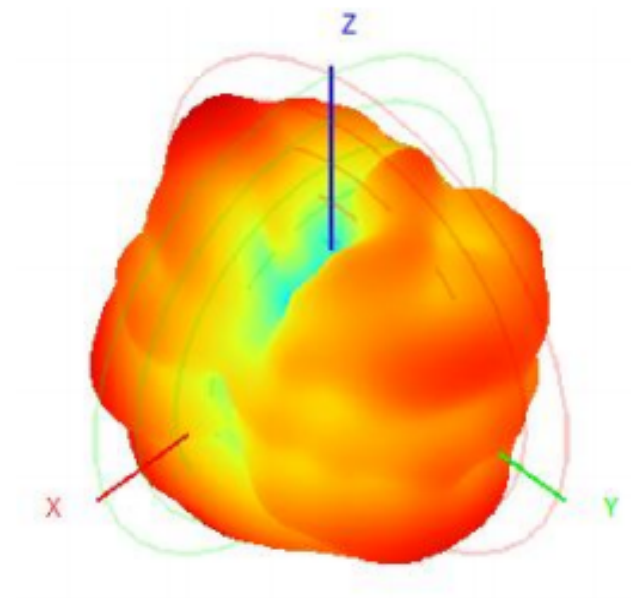


Frequency	Efficiency	Efficiency. dB	Gain. dB
922	48%	-3.21	2.27

And 3.3 NH inductor (original motherboard unchanged)

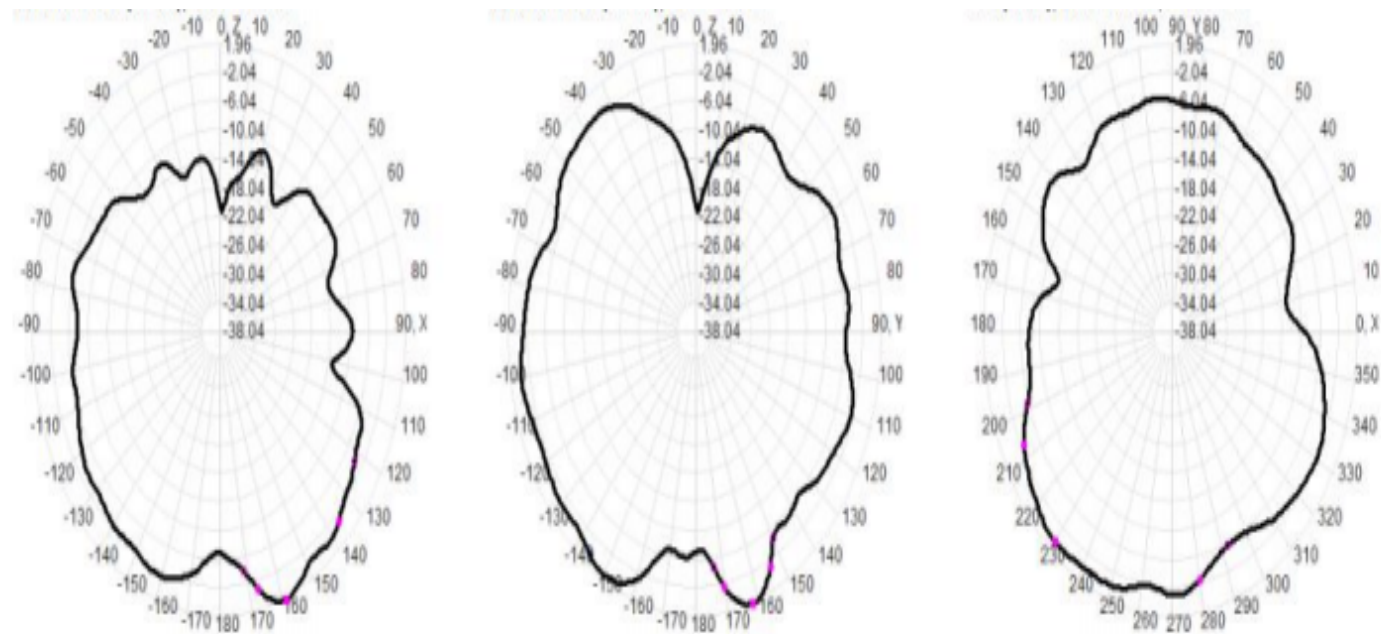
Radiation Pattern

Antenna 3D Radiation Pattern

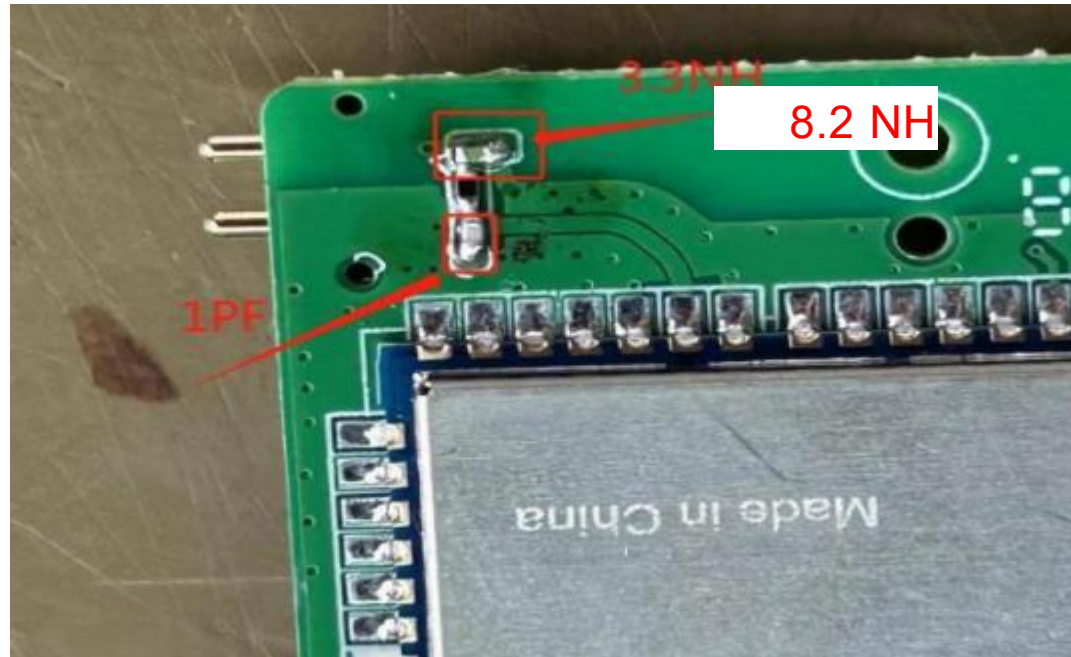


922MHz

Antenna 2D Radiation Pattern



Main antenna matching



The main set antenna terminal comes out and first parallel the 8.2 NH inductor and then the 1PF capacitor

Thank You





Huizhou Boshijie Technology

Co., Ltd

Material Recognition Letter

Customer Name	Huizhou Boshijie Technology Co., Ltd
Project Name	
Product Name	GPS built-in antenna/ceramic antenna
Product model	Silk screen: KG-04/ Size: 25 * 25 * 2 MM
Customer Material Number	1301-00971

Supplier Information

Supplier Name:	Shenzhen Jiakai Electronics Co., Ltd
Supplier address:	No. 1204, Floor 12, Building 1, Phase I, Zhuoyue City, Zhongkang North Road, Shangmeilin, Futian District, Shenzhen
Contact number:	0755-83178069
EMAIL:	wangchen@jkelec.com

Supplier Signature

RoHS Materials Non-RoHS Materials-

Division	Make	Engineering Department	Design Department	Quality Department
Signed by	Shang Lirong	Hu Shanshan	Shang Lirong	Dai Youjiang
Date of Signature				

Note: 1. RoHS materials, non-RoHS materials must be selected; 2. The engineering department and design department need to participate in the drama to select material types and sign them according to customer needs.

Shenzhen Boshijie Technology Co., Ltd

Recognition status	-Acknowledged	-Refuse to admit
	-Conditional recognition must meet the conditions:	
	-Temporary Limited Recognition Limited Purchase PCS (need to sign the special procurement process)	

Division	Responsible for	-ID section	-Structure		-Hardware		-Quality	
			Structure PL	Director of Structure	Hardware PL	Director of Hardware	QPM	SQE
Check item	Delivery date	Appearance process	Structural dimensions and specifications		Electrical properties, specifications		Appearance, sample testing	
Signed by								
Date								
1. Purchase follow-up material delivery date; 2. Design appearance and craft ID signature; 3. Sign the material structure of the mold and hardware shell; 4. Signature of electronic devices, modules and battery hardware; 5. The PE department cooperates with the quality inspection department to be responsible for signing the qualified appearance and sample testing.								

Note: 1. The supplier signatory should pay attention to the customers requirements and material numbers, and send samples for approval according to the requirements. Document No.: B-QR-QC-1709 Document Version: A2

2. The internal signatories of Boshijie should pay attention to the review, and the materials must meet our companys usage requirements.

3. This document is kept by the purchasing department and the quality department each, and the valid storage time is 2 years.

Approval Sheet	
Customer	
Supplier P/N	DAE1568R2520 NBDD2-T
Customer P/N	

Customers Approval Certificate	
Checked & Approval by	
Date	

Please return this copy as a certi administration of your approval.

1 SCOPE

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

E-mail: sales@jkelec.com _ 1

This specification shall cover the characteristics of the dielectric antenna element with the type DAE1568R2520NBDD2-T.

2 PART NO.

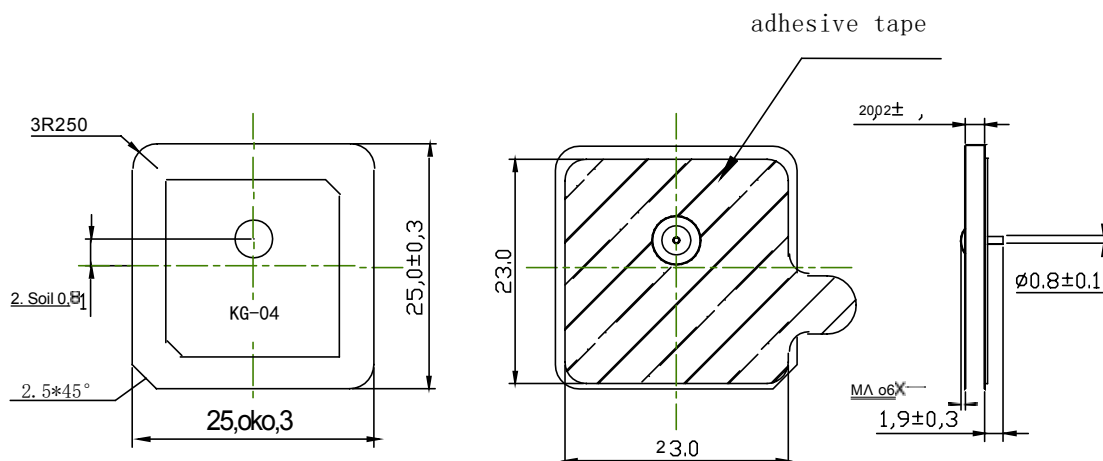
PART NUMBER	CUSTOMER PART NO	SPECIFICATION NO
DAE1568R2520NBDD2-T		

3 OUTLINE DRAWING AND DIMENSIONS

3.1 Appearance: No visible damage and dirt.

3.2 The products conform to the RoHS directive and national environment protection law.

3.3 Dimensions



4 ELECTRICAL SPECIFICATIONS

4.1 Performance Characteristics

Items	Content
Nominal frequency MHz	1561 ~ 1575
Center frequency MHz (without adhesive tape on 30*40mm ground plane)	1569 ± 3.0
real part at CF	27 ± 10 Ω
imaginary part at CF	1 ± 10 Ω
Polarization Model	RHCP
Frequency Temperature Coefficient	20 ppm/deg. °C max

4.2 RATING

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

E-mail: sales@jkelec.com

Items	Requirement
Operating temperature	-40℃~+85℃
Storage temperature	-40℃~+105℃

4.3 Impedance Characteristic

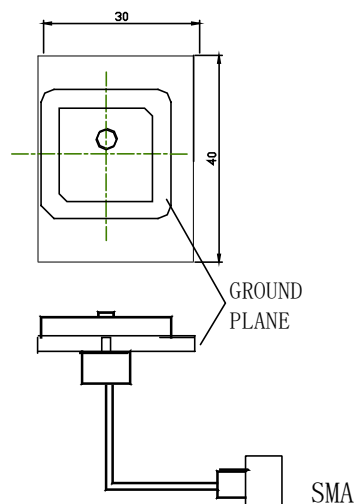


5 TEST

5.1 Test Conditions

Part shall be measured under condition (Temp.: 20℃±15℃, Humidity: 65%±20% R.H.).

5.2 Test Jig



6 ENVIRONMENTAL TEST

No.	Item	Test Condition	Remark
-----	------	----------------	--------

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

E-mail: sales@jkelec.com

6.1	Humidity Test	The device is subjected to 90% ~ 95% relative humidity $60^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for 96h, then dry out at $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and less than 65% relative humidity for 2h ~ 4h. After dry out the device shall satisfy the specification in table 1.	It shall fulfill the Specification sTable1.
6.2	High Temperature Exposure	The device shall satisfy the specification in table 1 after leaving at 105°C for 96h, provided it would be measured after 2h ~ 4h leaving in $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and less than 65% relative humidity.	It shall fulfill the Specification sTable1.
6.3	Low Temperature	The device shall satisfy the specification in table 1 after leaving at -40°C for 96h, provided it would be measured after 2h ~ 4h leaving in $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and less than 65% relative humidity.	It shall fulfill the Specification sTable1.
6.4	Temperature Cycle	Subject the device to -40°C for 30min. followed by a high temperature of 105°C for 30min cycling shall be repeated 5 times. At the room temperature for 1h prior to the measurement.	It shall fulfill the Specification sTable1.
6.5	Vibration	Subject the device to vibration for 2h each in x, y and z axis with the amplitude of 1.5 mm, the frequency shall be varied uniformly between the limits of 10Hz ~ 55Hz.	It shall fulfill the Specification sTable1.
6.6	Soldering Test	Lead terminals are heated up to $350^{\circ}\text{C} \pm 10^{\circ}\text{C}$ for $5\text{s} \pm 0.5\text{s}$ with brand iron and the element shall be measured after being placed in natural conditions for 1 h. No visible damage and it shall fulfill the specifications in Table 1	It shall fulfill the Specification sTable1.
6.7	Solder ability	Lead terminals are immersed in soldering bath of $260^{\circ}\text{C} \sim 290^{\circ}\text{C}$ for $3\text{s} \pm 0.5\text{s}$. More than 95% of the terminal surface of the device shall be covered with fresh solder.	The terminal shall be at least 95% covered by solder.
6.8	Terminal Pressure Strength	Force of 20N is applied to each lead in axial direction for $10\text{s} \pm 1\text{s}$ (see drawing). No visible damage and it shall fulfill the specifications in Fig 1	Mechanical damage such as breaks shall not occur.

FIG1

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

E-mail: sales@jkelec.com

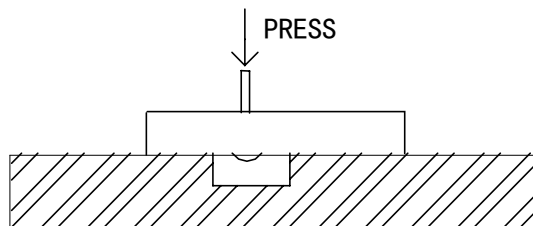


TABLE1

Item	SpecificationAfter Test (MHz)
Center Frequency change	± 2.0

7. PACKAGE

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

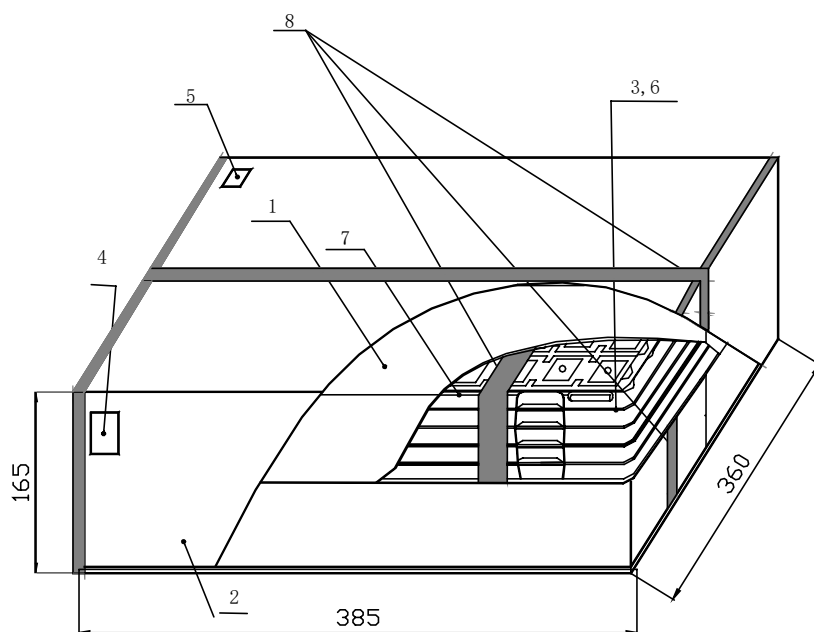
Tel: +86-755-83178086

E-mail: sales@jkelec.com

To protect the products in storage and transportation, it is necessary to pack them (outer and inner package). On paper pack, the following requirements are requested.

7.1 Dimensions and Mark

At the end of package, the warning (moisture proof, upward put) should bestick to it. Dimensions and Mark (see below)



unit: mm

NO.	Name	Quantity
1	Inner Box	4
2	Package	1
3	Vacuum Bag	4
4	Certificate of approval	1
5	Label	5
6	Cushion	20
7	Package Base	24
8	Adhesive tape	3.5 m

7.2 Section of package

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

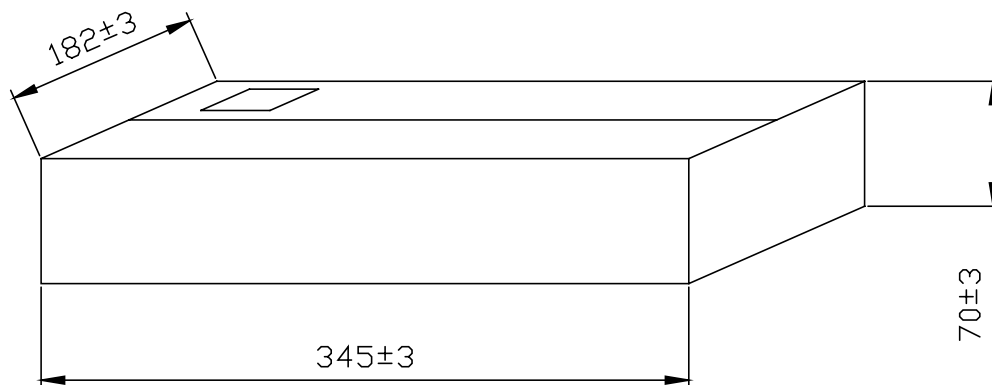
E-mail: sales@jkelec.com

Package is made of corrugated paper with thickness of 0.8 cm. Package has 4 inner boxes, each box has 1 vacuum bag.

7.3 Quantity of package

Per package base	50 elements
Per vacuum bag	5 package bases
Per inner box	1 vacuum bag
Per package	4 inner boxes
(1000 pieces of elements)	

7.4 Inner box Dimensions



unit: mm

8. OTHER

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

E-mail: sales@jkelec.com

8.1 Caution of use

8.1. 1 Please do not apply excess mechanical stress to the component and terminals at soldering.

8.1. 2 The component may be damaged when an excess stress will be applied.

8.1. 3 This specification mentions the quality of the component as a single unit. Please ensure the component is thoroughly evaluated in your application circuit.

8.2 Notice

8.2. 1 Please return one of this specification after your signature of acceptance.

8.2. 2 When something gets doubtful with this specification, we shall jointly work together in agreement.

Add: No.1188, Jiahang Road, Jiaxing, Zhejiang, China (314001)

Tel: +86-755-83178086

E-mail: sales@jkelec.com _ 8



Huizhou Boshijie Technology Co.,

Ltd

Material Recognition Letter

Customer Name	Huizhou Boshijie Technology Co., Ltd
Project Name	KG04
Product Name	4G built-in antenna/FPC antenna
Product model	Silk screen: 20U0760 AX2/Size: 45.6 * 30 * 0.2
Customer Material Number	

Supplier Information

Supplier Name:	Dongguan Youbi Electronics Co., Ltd
Supplier address:	Building 79, New Sun Industrial City, No. 9 Xinfu Road, Lincun, Tangxia Town, Dongguan City
Contact number:	13686295193
EMAIL:	hhp @ ub-rf. com

Supplier Signature

RoHS Materials ☒ Non RoHS Material-

Division	Make	Engineering Department	Design Department	Quality Department
Signed by	Lu Yongxin	Loess release	Zhu Zhifun	Li Shufei
Date of Signature	2023/7/26	2023/7/26	2023/7/26	2023/7/26

Note: 1. RoHS materials, non-RoHS materials must be selected; 2. The engineering department and design department need to participate in the drama to select material types and sign them according to customer needs.

Huizhou Boshijie Technology Co., Ltd

Recognition status	-Acknowledged	-Refuse to admit
	-Conditional recognition must meet the conditions:	
	-Temporary Limited Recognition Limited Purchase PCS (need to sign the special procurement process)	

Division	Responsibility	-ID	-Structure		-Hardware		-Quality	
			Structure	Director	Hardware	Director	QPM	SQE

on	le for	section	re PL	of Structure	PL	of Hardware		
Check item	Delivery date	Appearanc e process	Structural dimensions and specifications		Electrical properties, specifications		Appearance, sample testing	
Signed by								
Date								
1. Purchase follow-up material delivery date; 2. Design appearance and craft ID signature; 3. Sign the material structure of the mold and hardware shell; 4. Signature of electronic devices, modules and battery hardware; 5. The PE department cooperates with the quality inspection department to be responsible for signing the qualified appearance and sample testing.								

Modification History

Version	Content Revision	Issued by	Date
A	Original version	Eddy	2023-7-26

Content

Item Description

1. Electrical Specification2. TestItems and Equipment3. S Parameter4.

Efficiency and Gain5. Radiation Pattern6. Active test data7.

1. Electrical Specification:

Characteristics	Specifications	Unit
Outline Dimensions	45.6 x30	mm
Frequency	820-960 /1710-2700	MHz
Impedance	50	Ω
VSWR	<5	
Polarization	Linear Polarization	
Gain	2 REF	d Bi
Efficiency	<60	%
Connector Type	/	
Operating temperature	-20℃~+85℃	
Storage Temp	-20℃~+50℃	

2. Test Items and Equipment

	Test items	Test equipment
S Parameter	1. Return Loss 2. VSWR	Network analyzer (AgilentE5071B)
The whole machine of Passive parameters	1. Frequency 2. Gain 3. Radiation Pattern	1.3 D microwave darkroom (5m * 5m * 5m) 2. Network analyzer (AgilentE5071B)
The whole machine	1.	1.3 D microwave darkroom (5m * 5m * 5m) Comprehensive test in strument (CMW500)

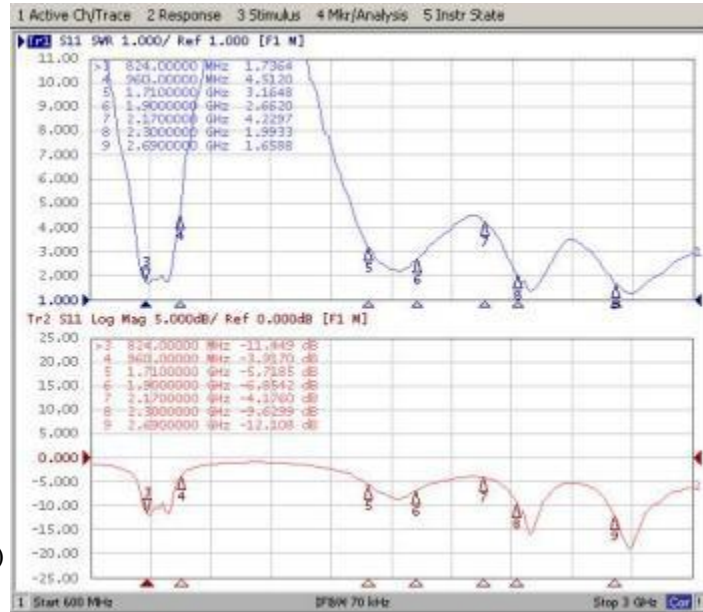


Room101, Building 2, No.9, Room106, Building 3, Leton gScience Park, Room106, BuildingA, Xinzheng Industrial Park,
Xinfa Road, Lin Village, Tangxia Town No.500 Qiuyi Road, Binjiang District 57 LiuxianRoad, BaoanDistrict, Shenzhen
Tel: +86-769-81777126 Website: www.ubuant.com

3. S Parameter

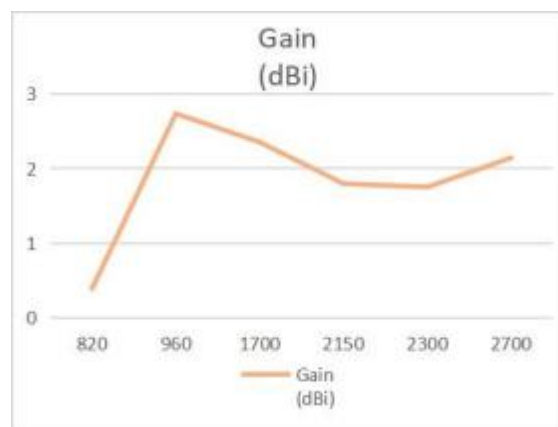
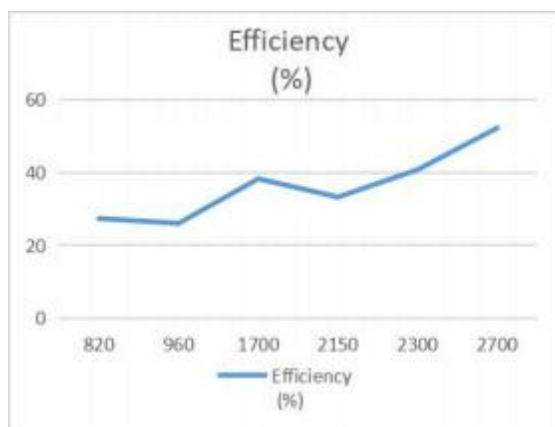
Frequency (MHz)	Return Loss (dB)	VSWR
824	-11.44	1.73
960	-3.91	4.51
1710	-5.71	3.16
1900	-6.85	2.66
2170	-4.17	4.22
2300	-9.62	1.99
2690	-12.10	1.65

* Voltage Standing Wave Ratio (VSWR) Return Loss (RL)
 $RL = 20 * \log_{10} [(VSWR+1)/(VSWR-1)]$



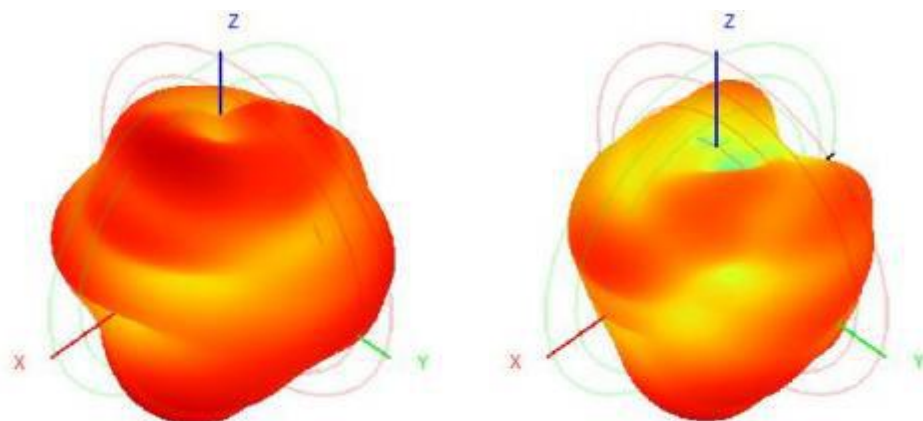
4. Efficiency and Gain

Frequency (MHz)	820	960	1700	2150	2300	2700
Efficiency (%)	27.39	26.07	38.28	33.25	40.77	52.24
Gain (dBi)	0.39	2.73	2.35	1.80	1.75	2.14



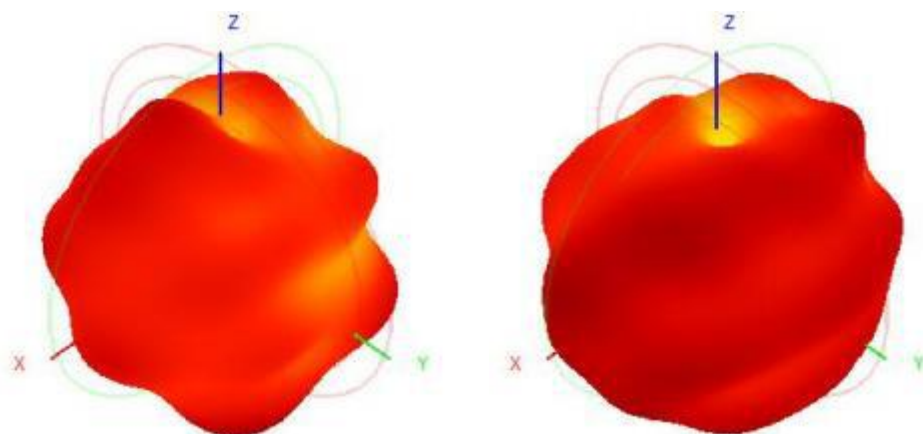
5. Radiation Pattern

5-1 Antenna 3D Radiation Pattern



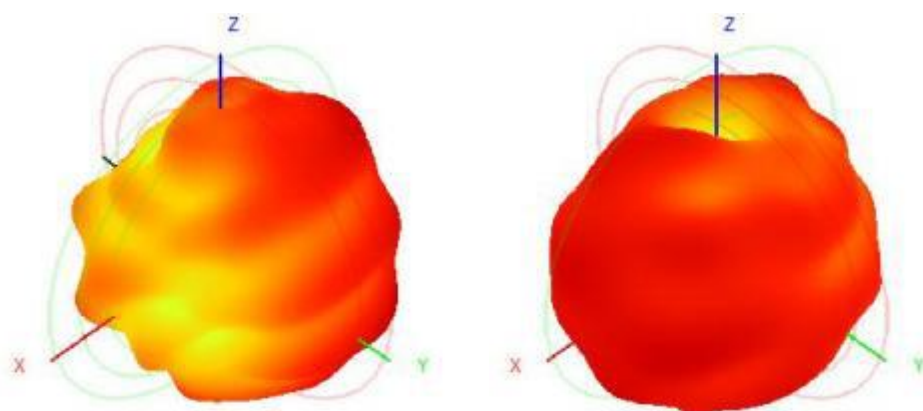
820MHz

960MHz



1700MHz

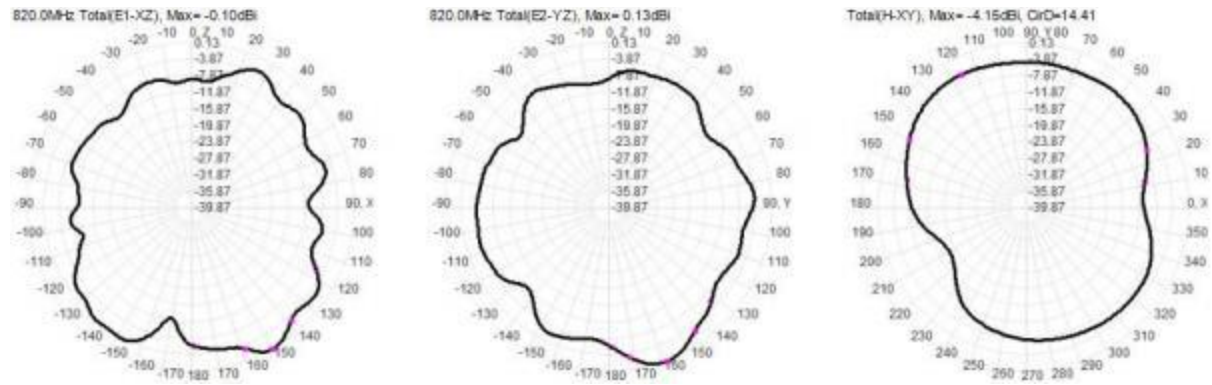
2150MHz



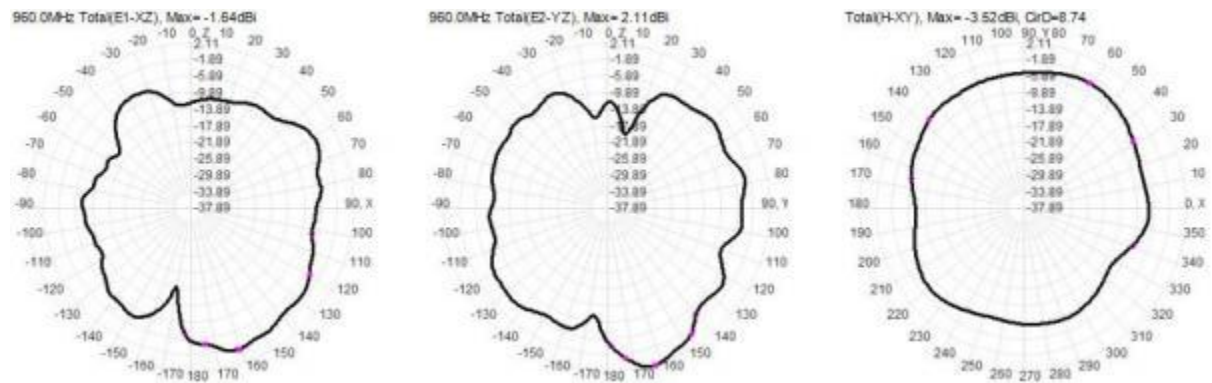
2300MHz

2700MHz

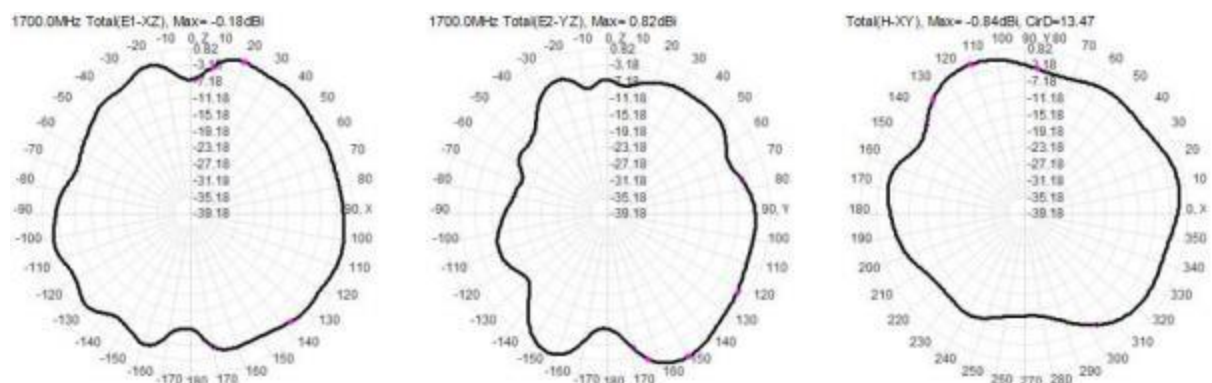
5-2 Antenna 2D Radiation Pattern



820MHz

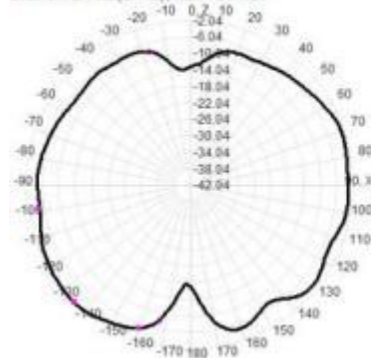


960MHz

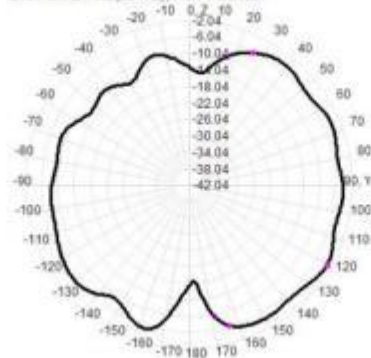


1700MHz

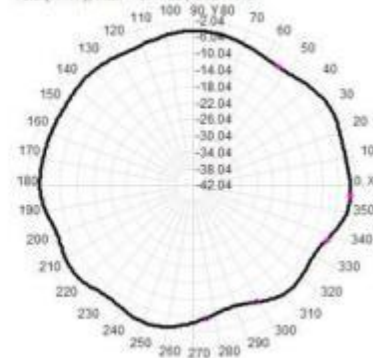
2150.0MHz Total(E1-XZ), Max=-2.04dBi



2150.0MHz Total(E2-YZ), Max=-3.26dBi

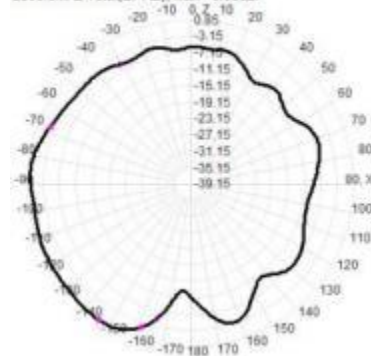


Total(H-XY), Max=-3.47dBi, CirD=7.49

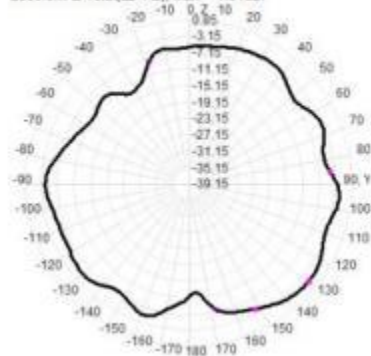


2150MHz

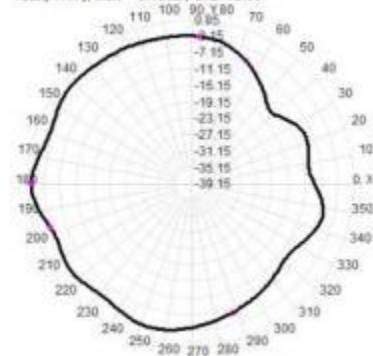
2300.0MHz Total(E1-XZ), Max=0.85dBi



2300.0MHz Total(E2-YZ), Max=-1.54dBi

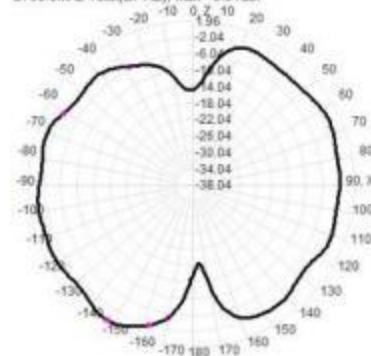


Total(H-XY), Max=-0.15dBi, CirD=12.80

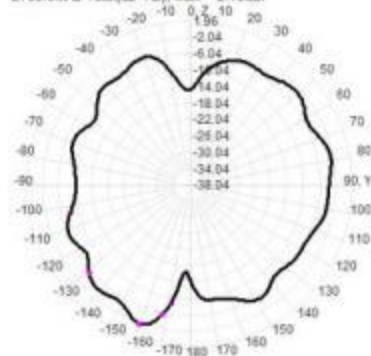


2300MHz

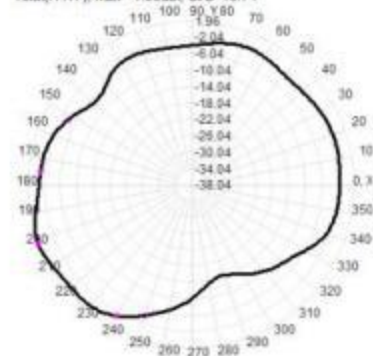
2700.0MHz Total(E1-XZ), Max=0.81dBi



2700.0MHz Total(E2-YZ), Max=-2.13dBi



Total(H-XY), Max=1.96dBi, CirD=16.74



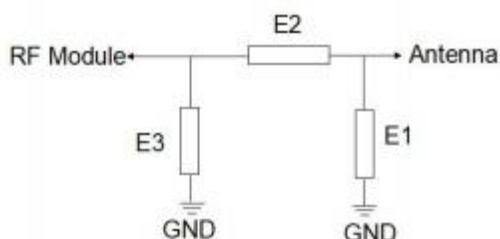
2700MHz

6. Active test data

Band	Channel	TRP	TIS
GSM 850	L	25.1	
	M	25.3	
	H	25.7	-94
GSM 900	L	27.6	
	M	27	
	H	25.7	-94.9
DCS 1800	L	26.6	
	M	25.8	
	H	26.9	-106.4
PCS 1900	L	26.8	
	M	26.1	
	H	26.5	-107
B1 (10M)	L	20.1	
	M	20.2	
	H	19.9	-95.2

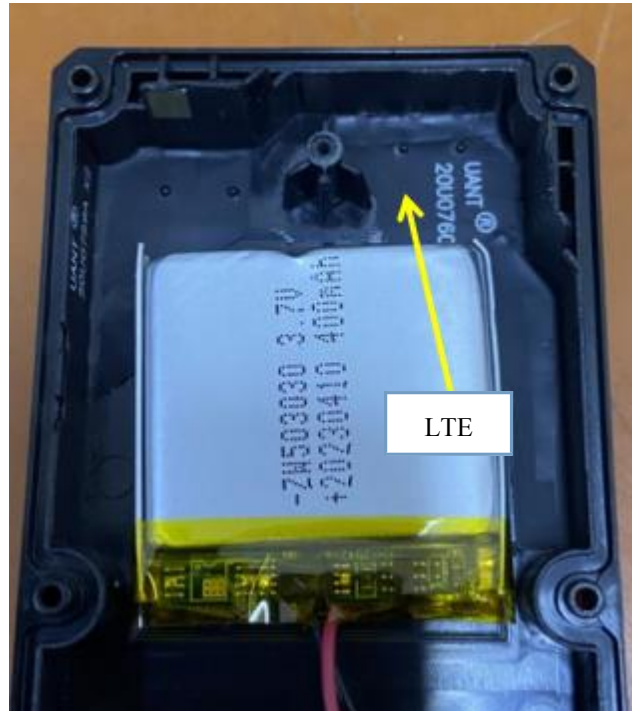
Band	Channel	TRP	TIS	Band	Channel	TRP	TIS
B3 (10M)	L	20.3		B38 (10M)	L	19.6	
	M	20.2			M	18.6	
	H	20.5	-92.5		H	18.4	-95.1
B5 (10M)	L	16.3		B39 (10M)	L	20.1	
	M	15.8			M	19.7	
	H	16.6	-83.4		H	19.1	-94.6
B8 (10M)	L	17.7		B40 (10M)	L	20.3	
	M	17.6			M	20.6	
	H	17.8	-85.3		H	20.2	-94.2
B34 (10M)	L	20.3		B41 (10M)	L	19.6	
	M	20.4			M	18.5	
	H	20.2	-94		H	18.1	-94.6

7. Antenna Matching Net work



Element	Value
E1	并6.8nH
E2	0Ω
E3	N/C

8. Antenna installation diagram



9. Mechanical Specification

