Shenzhen World Elite Electronic Co. LTD.

Sample Approval Sheet

Product Information：

Customer	Acoustic Innovation (Huizhou) Co., Ltd.
Material Description	BTA1386 BLE Antenna
Customer's Part number	VA.E.03313860010ZR
Specifications	FPC（L24.8*W19.3mm）+Black Coaxial Cable（Φ0.81*35mm）+Welding
Supplier's Part number	136-A1386-20A
Date	2023-03-15

Supplier：

Prepared By	Checked By	Approved By
Zhang Dengqiao	Li Yuepeng	Zhang Xiangting

Customer Approval：

Accepted By	Checked By	Approved By

Results：

☐Full Approval
☐Conditional Approval
☐Unqualified
☐Others:

Shenzhen World Elite Electronic Co. LTD.
Add:Xiangyuer Industrial Park, No. 8, Longsheng Road, Longgang Street, Longgang District, Shenzhen, Guangdong, China
Tel:86-755-89983786

Contents

1、Specification

This report mainly provides the testing status of various electrical and structural performance parameters of BTA1386 BLE Antenna.

Figure 1 Antenna

Figure 2 Antenna Placement

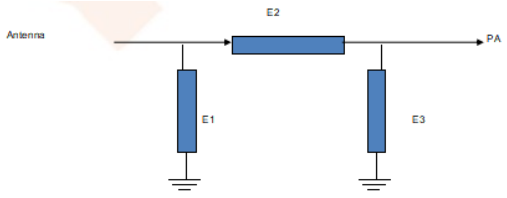
1.1 Electrical specification standard

1.1.1 Electrical Specifications

The antenna operates in the 2400-2480 MHz. The following table is the electrical performance index of the antenna designed by our company.

Antenna	BTA1386 BLE Antenna
Frequency Range	2400-2480MHz
VSWR	< 2.0
Efficiency	> 45%
Impedance	50 ohm
Polarization	Linear polarization

1.1.2 Antenna Matching Network



Element	Value
E1(0402)	N/A
E2(0402)	ORI
E3(0402)	N/A

Schematic diagram of matching circuit modification

2、Test

The antenna was debugged and tested with the prototype provided by the customer.

2.1 Test of passive S11

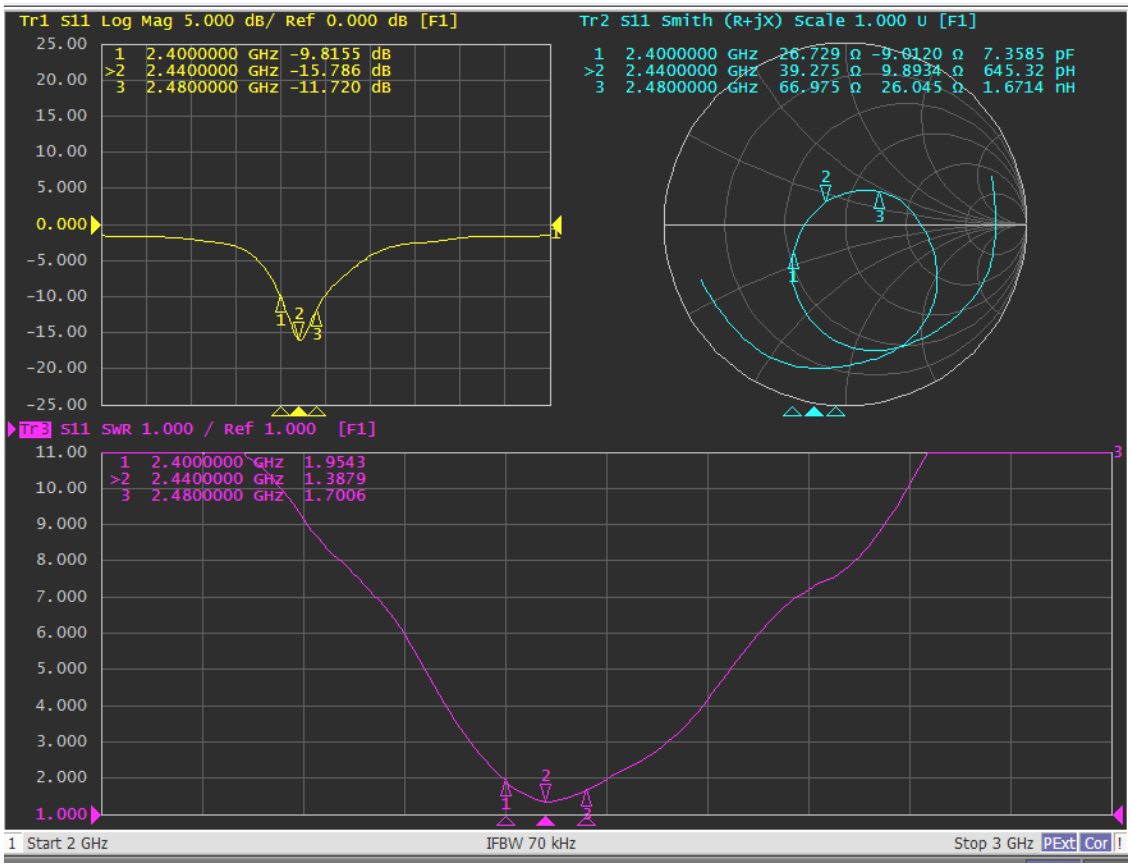
2.1.1 Test connection

The passive S11 test device is connected as follows: Network Analyzer → Test Line → Test Fixture.

2.1.2 Passive S11

The following table shows the standing wave ratio values of the edge frequency points of the antenna operating frequency band. The waveform of Return Loss and VSWR obtained by the test is shown as follows.

Frequency(MHz)	2400	2440	2480
VSWR	1.95	1.38	1.70
Return Loss	-9.81	-15.78	-11.72



2.2 Gain and efficiency test

2.2.1 Test Position

Yuande microwave anechoic chamber, the test frequency range is 400MHz-6GHz.

2.2.2 Test equipment

Network analyzer, standard horn antenna, multi-probe near field antenna test system, test computer, etc

2.2.3 Results Summary

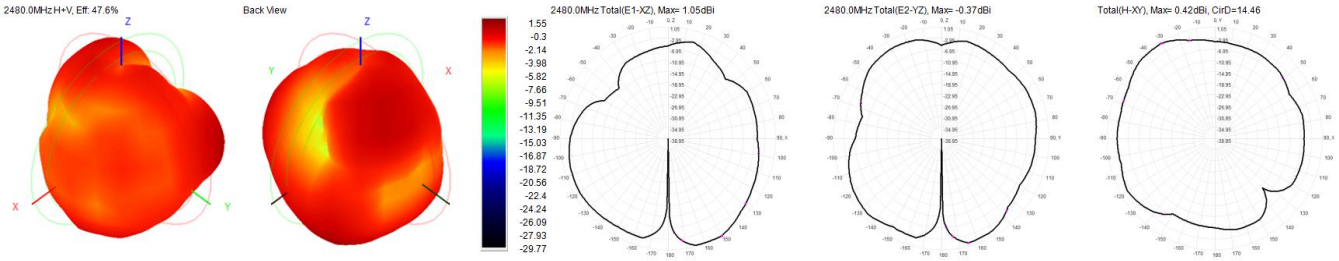
In the microwave anechoic chamber, the measured values related to efficiency and gain are shown in the table below.

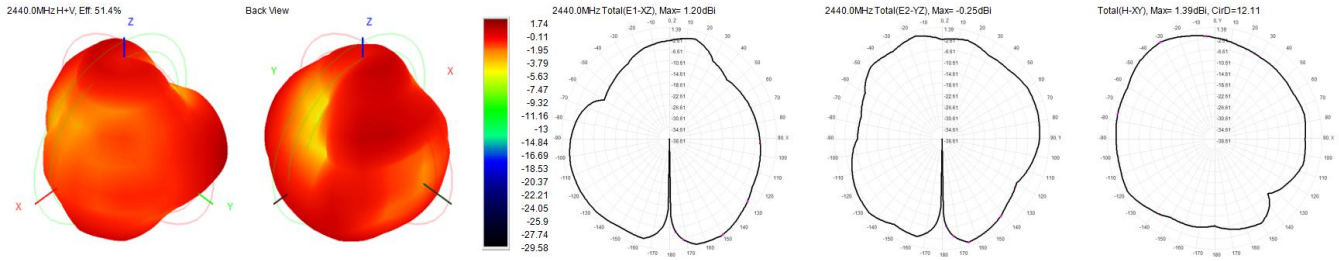
Frequency (MHz)	2400	2410	2420	2430	2440	2450	2460	2470	2480	2490	2500
Efficiency (dBi)	-3.31	-3.33	-2.86	-2.90	-2.89	-2.69	-3.02	-2.88	-3.23	-3.32	-3.36
Gain (dBi)	1.18	1.35	1.83	1.82	1.74	1.91	1.66	1.83	1.55	1.37	1.13
Efficiency (%)	46.67	46.47	51.75	51.34	51.38	53.82	49.94	51.48	47.56	46.60	46.17
Directivity (dB)	4.49	4.68	4.69	4.72	4.63	4.60	4.67	4.72	4.77	4.69	4.48
Peak Gain Position (Theta)	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00	165.00
Peak Gain Position (Phi)	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00	330.00	135.00
Efficiency ThetaPol (%)	24.60	24.24	26.89	26.61	26.64	27.86	25.71	26.38	24.21	23.59	23.21
Efficiency PhiPol (%)	22.07	22.23	24.86	24.74	24.74	25.96	24.23	25.11	23.35	23.00	22.96
Upper Hem. Efficiency (%)	19.27	18.86	20.77	20.34	20.08	20.78	19.01	19.37	17.65	17.27	16.99
Lower Hem. Efficiency (%)	27.40	27.61	30.98	31.01	31.30	33.04	30.93	32.12	29.92	29.33	29.18

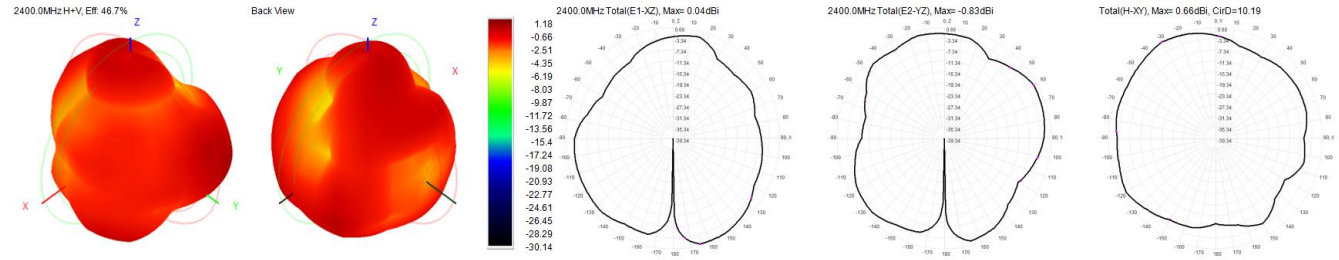
T90(H)circular degree	10.19	9.91	10.86	11.67	12.11	12.66	13.38	14.09	14.46	14.30	13.72
E1(XZ)beam width	47.00	47.00	46.00	44.00	44.00	44.00	45.00	44.00	43.00	43.00	41.00
E1(XZ)front-to-rear ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
E2(YZ)beam width	57.00	77.00	75.00	31.00	31.00	33.00	34.00	35.00	36.00	35.00	36.00
E2(YZ)front-to-rear ratio	0.25	0.15	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Max Gain Axis Ratio**(P)**	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Elevation 10° min(max) axial ratio **(P)**	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Hc(XY)beam width	88.00	87.00	85.00	80.00	71.00	53.00	53.00	52.00	53.00	55.00	55.00
Hc(XY)front-to-rear ratio	4.66	4.78	4.90	5.01	5.12	5.37	5.55	5.78	5.85	5.86	5.64

The gain (dBi) value in the test result corresponds to the maximum value in the 3D directional diagram.

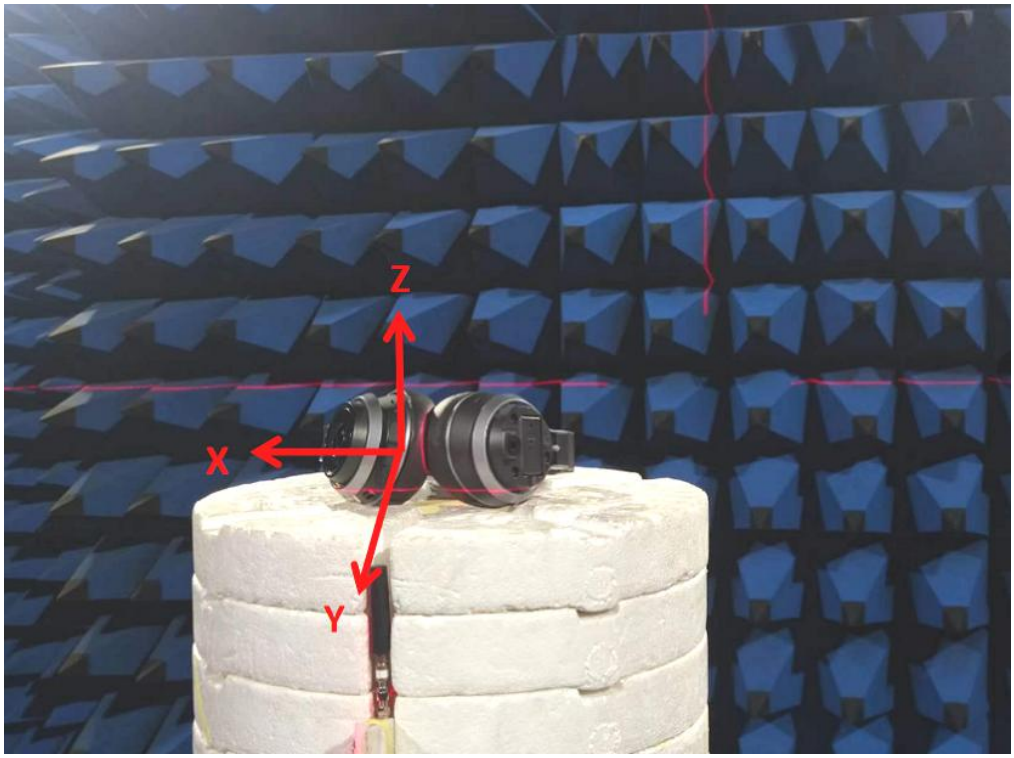
2.2.4 Radiation Pattern Results







2.2.5 Test Environment



3、Conclusion

This antenna is designed on the basis of the prototype provided by the customer. The above electrical performance parameters are tested under the environmental treatment conditions of the test prototype. The electrical parameters and structural performance have met the technical requirements. Please confirm!

4、Part Drawing