

Sample Approved Sheet

Hetuo（BS510AE-L） Acknowledgment

Customer Name Jinshang Technology (Shenzhen) Co., Ltd

Client Type BS510AE

Brand BS510AE-V5.1 R-V1.0

Hetuo Judgment Audit Team

| Formulate | Check    | Ratify      | Acknowledge the book completion time |
|-----------|----------|-------------|--------------------------------------|
| Zhang ji  | Huxuewen | Daitingting | 2024.4.22                            |

（Client） Judgment Audit Team

Acknowledgement Number Proving time

|                                                                                                                                                                                                                                                                          |       |        |                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|--------------------------------------|
| acknowledge                                                                                                                                                                                                                                                              | check | ratify | Acknowledge the book completion time |
|                                                                                                                                                                                                                                                                          |       |        |                                      |
| Project Review <input type="checkbox"/> Three acknowledgements <input type="checkbox"/> Specifications/drawings<br><input type="checkbox"/> examining report <input type="checkbox"/> Specimen PCS <input type="checkbox"/> Safety standard <input type="checkbox"/> HSF |       |        |                                      |
| Appraisal report <input type="checkbox"/> Accept <input type="checkbox"/> Conditional acceptance <input type="checkbox"/> Refuse                                                                                                                                         |       |        |                                      |

## 1. Antenna picture

The report mainly provides the test status of the electrical properties parameters **BS510AE**. The **BS510AE** antenna is a **2.4-2.5GHz** Band . The antenna Picture and assembly are shown below.



Antenna picture & assembly picture

## 2. Antenna Test Equipment Introduction

Test of antenna input characteristics using Agilent E5071C and Agilent 5062A vector network analyzer; The radiation pattern of the antenna are tested using the Satimo starlab 3D near field Anechoic Chamber , and the instrument is used to agilent8960 E5515 and Agilent E4438C. The test coordinates of the darkroom are as follows:

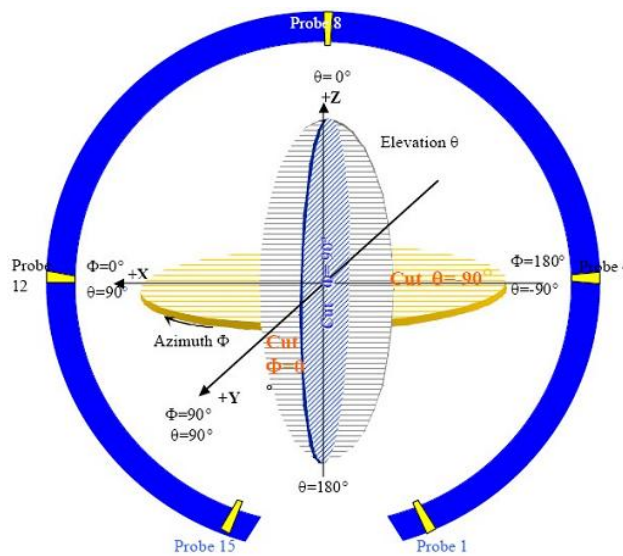


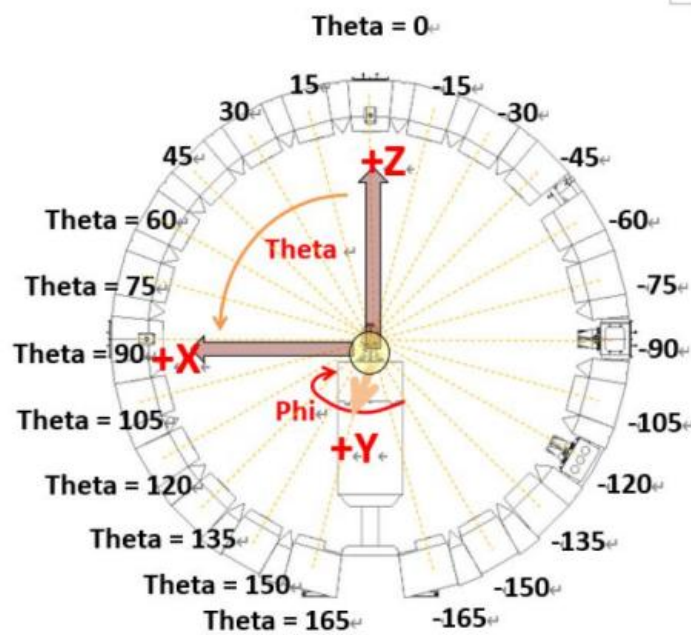
图 4 3D 微波暗室测试坐标系 (back view)

### 3. Electrical Specification

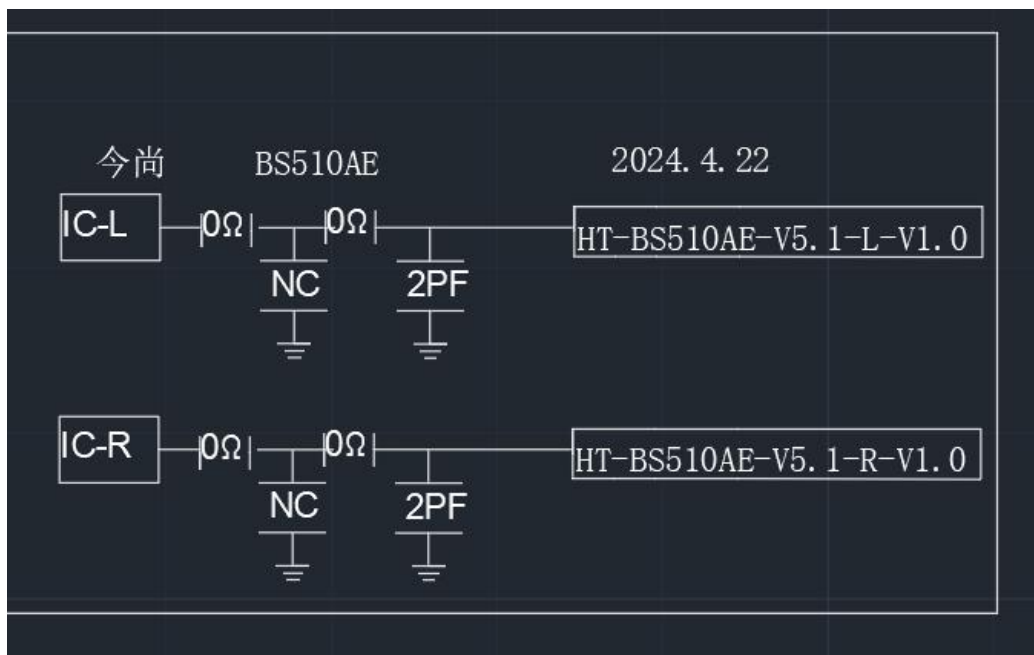
#### 3-2 Passive S11 parameter

Measuring Method is a  $50\ \Omega$  coaxial cable is connected to the antenna. Then this cable is connected to a network analyzer to measure the S11 parameter, Keeping this fixture away from metal at least 20cm.

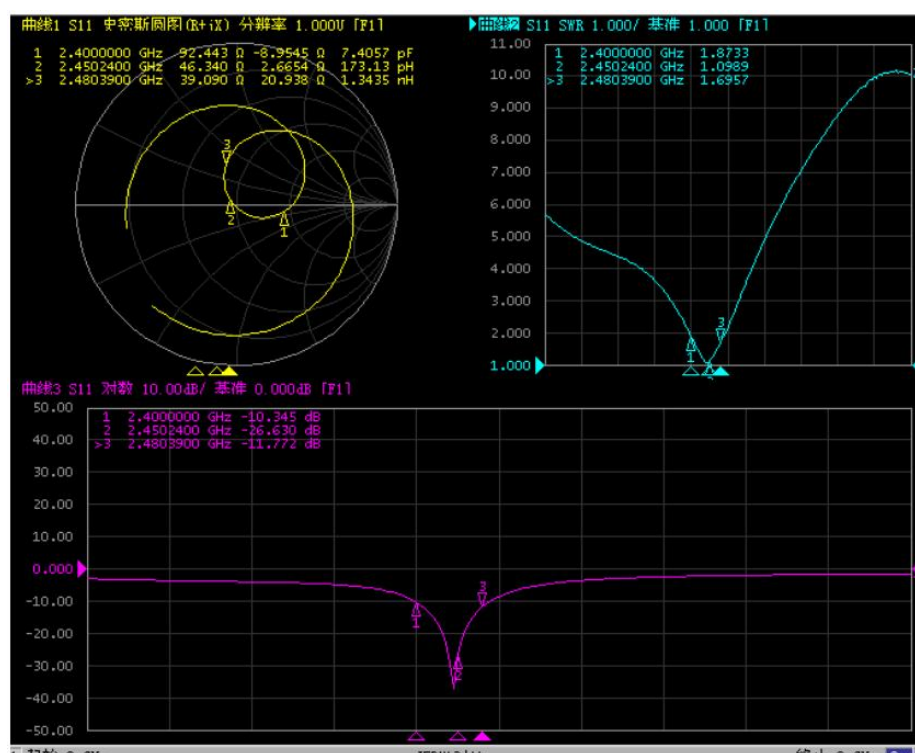
### Sample status & coordinates



VSWR



## S11--(BT ANT)



### 3-3 Antenna Matching Network

#### Gain&Efficiency-----BT-ANT

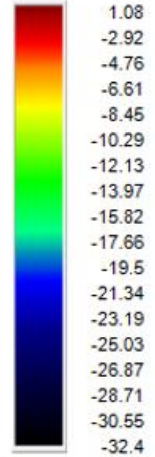
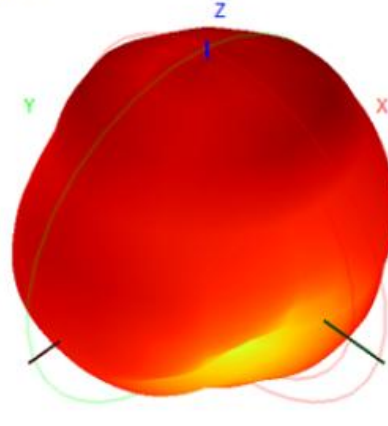
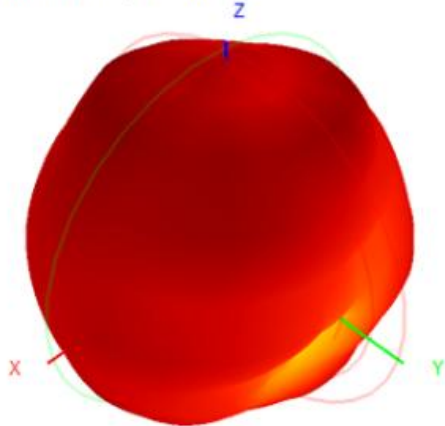
#### Gain & Efficiency——BT- ANT(R)

| Frequency (MHz) | Efficiency (%) | Peak GAIN (dBi) |
|-----------------|----------------|-----------------|
| 2400            | 25.87          | 1.08            |
| 2410            | 27.61          | 0.88            |
| 2420            | 28.32          | 0.59            |
| 2430            | 29.67          | 0.38            |
| 2440            | 31.92          | 0.47            |
| 2450            | 32.40          | 1.26            |
| 2460            | 30.91          | 1.42            |
| 2470            | 29.45          | 1.11            |
| 2480            | 28.49          | 1.34            |
| 2490            | 27.18          | 0.78            |
| 2500            | 26.41          | 1.38            |

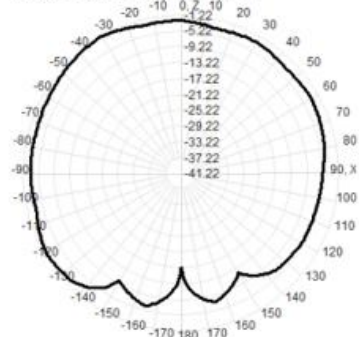
## 2D&3D — BT- ANT

2400.0MHz H+V, Eff: 25.9%

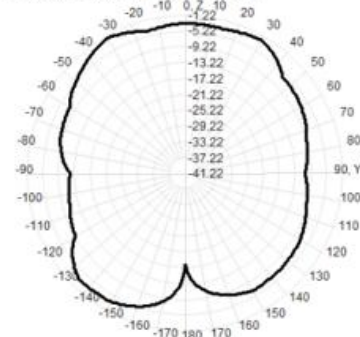
Back View



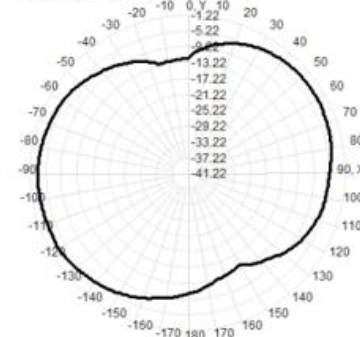
2400.0MHz Total(E1-XZ), Max= -1.22dBi



2400.0MHz Total(E2-YZ), Max= -1.83dBi



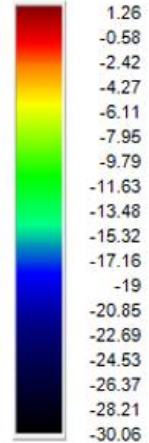
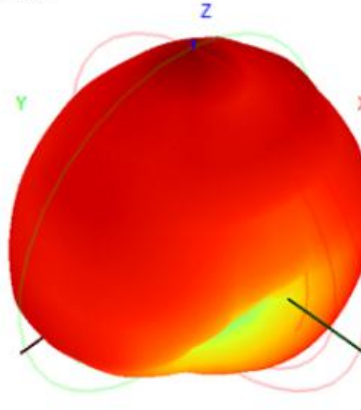
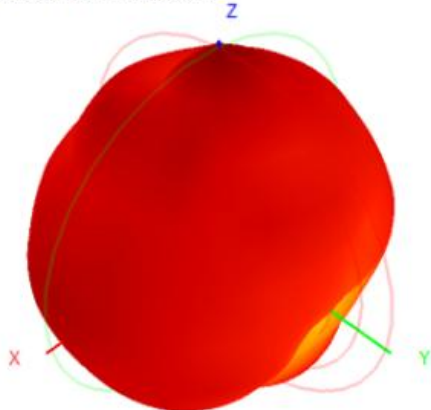
Total(H-XY), Max= -3.21dBi, CirD=11.52



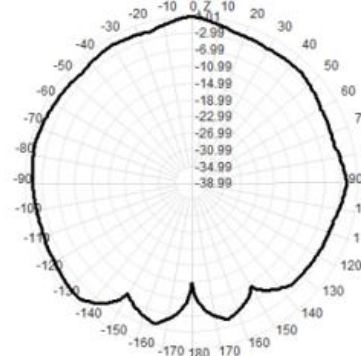
## 2D&3D — BT- ANT

2450.0MHz H+V, Eff: 32.4%

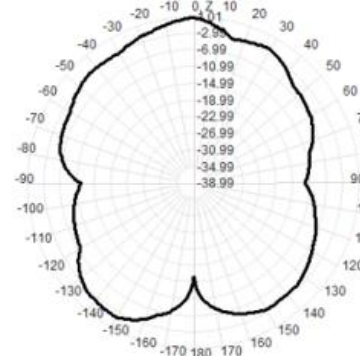
Back View



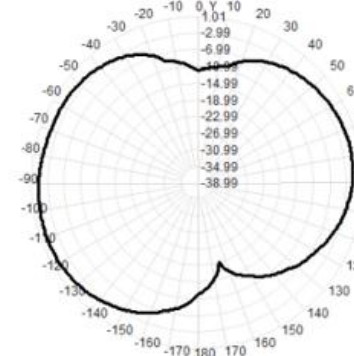
2450.0MHz Total(E1-XZ), Max= 1.01dBi



2450.0MHz Total(E2-YZ), Max= 0.76dBi



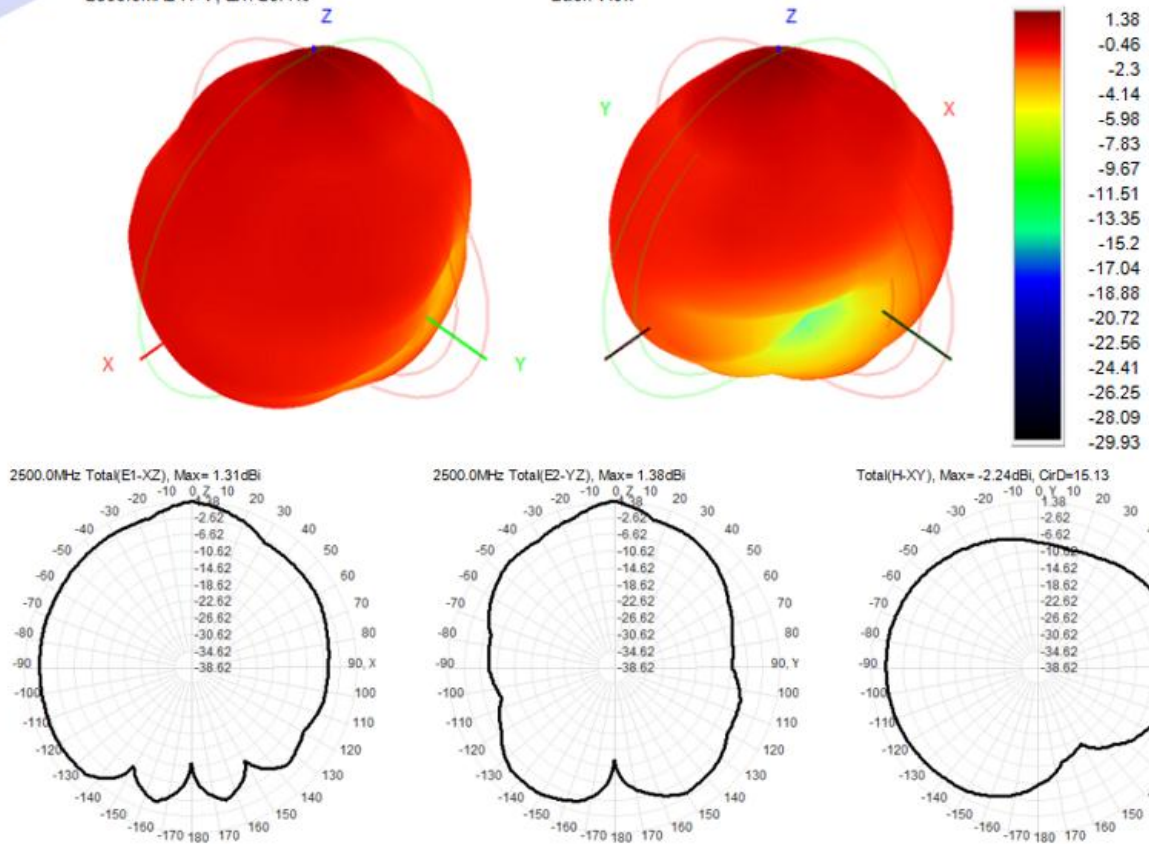
Total(H-XY), Max= -0.55dBi, CirD=18.83



**2D&3D BT- ANT**

2500.0MHz H+V, Eff: 26.4%

Back View

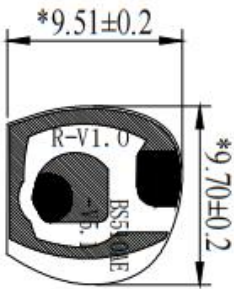
**OTA DATA(R)--free space**

| Test Equipment: |                   | R&S CMW500 |          |          |
|-----------------|-------------------|------------|----------|----------|
| Test Condition: |                   |            |          |          |
| Band            | Wireless Protocol | Channel    | TRP(dBm) | TIS(dBm) |
| BT              |                   | 0          | 0.00     | -84.43   |
|                 |                   | 39         | 0.97     | -84.32   |
|                 |                   | 78         | -0.04    | -84.83   |

**4. Mechanical Specification:**

Mechanical Configuration (Unit: mm)

The appearance of the antenna is according to drawing Figure 7



每300mm×300mm面积内,氧化点个数不超过2个,做成整排,不可单个;

| MODIFICATION |             |         |
|--------------|-------------|---------|
| VER          | DESCRIPTION | DATE    |
| V0           |             | 24.2.98 |
| V1           |             | 24.3.7  |

## 深圳市合拓科技有限公司

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OF DEVICES WITHOUT PERMISSION.

| DIMENSIONS |     | IN   |     | MM  |     | IN  |     | MM  |     | IN    |       | MM    |     |
|------------|-----|------|-----|-----|-----|-----|-----|-----|-----|-------|-------|-------|-----|
|            |     | 1/16 | 1/8 | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1   | 1 1/8 | 1 1/4 | 1 3/4 | 2   |
| 6-20       | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 8-20       | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 10-20      | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 12-20      | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 14-20      | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 16-20      | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 18-20      | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |
| 20-20      | 1/8 | 1/8  | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8 | 1/8   | 1/8   | 1/8   | 1/8 |

| SHEET                            | NAME | UNIT | MM | USED | IN | MATERIAL  |      | REJECTION<br>NOTE | PART NAME        | DESIGNED | CHECKED | APPROVED |
|----------------------------------|------|------|----|------|----|-----------|------|-------------------|------------------|----------|---------|----------|
|                                  |      |      |    |      |    | TREATMENT | SIZE |                   |                  |          |         |          |
| 1                                | 1    | 1    | 1  | 1    | 1  |           |      |                   | HT-20240422001-R |          |         |          |
| Customer Rev BSS10AE-V5.1 R-V1.0 |      |      |    |      |    |           |      |                   |                  |          |         |          |
| SHEET 1 OF 1                     |      |      |    |      |    |           |      |                   |                  |          |         |          |
| 2023-04-23                       |      |      |    |      |    |           |      |                   |                  |          |         |          |