**SGS-CSTC Standards Technical Services Co., Ltd.**
**Shenzhen Branch**

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# *ANTENNA PASSIVE TEST REPORT*

| | |
|---|---|
| **Application No:** | ZO/2021/20006 |
| **Applicant:** | Yadea technology group co., Lte. |
| **Manufacturer:** | Yadea technology group co., Lte. |
| **Product Name:** | Dashboard |
| **Model No.(EUT):** | Yadea01 |
| **Standards:** | ANSI/IEEE Std 149-2008 |
| **Date of Receipt:** | 2021.03.17 |
| **Date of Test:** | 2021.03.17 |
| **Date of Issue:** | 2023.02.13 |

**Approved & Released by**

Ervin Li

OTA Manager

**Tested by**

Coco. Huang

OTA Engineer

Authorized Signature:

Derek Yang
Wireless Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

# REVISION HISTORY

| Revision Record | | | | |
|---|---|---|---|---|
| **Version** | **Chapter** | **Date** | **Modifier** | **Remark** |
| 01 | | 2021.04.21 | | Original |
| 02 | 3.0 | 2023.02.13 | Yuanyu Luo | Update equipment calibration date |
| | | | | |

# CONTENTS

# 1 General Information

## 1.1 Details of Client

| | |
|---|---|
| Applicant | Yadea technology group co., Lte. |
| Address: | Dongsheng Road Dacheng Industrial Zone Anzhen Xishan District Wuxi Jiangsu |
| Manufacturer | Yadea technology group co., Lte. |
| Address: | Dongsheng Road Dacheng Industrial Zone Anzhen Xishan District Wuxi Jiangsu |
| | Yadea technology group co., Lte. |
| | No.515 Xishan Road, Anzhen Town, Xishan District, Wuxi City, Jiangsu Province, China |

## 1.2 Test Location

| | |
|---|---|
| Company: | SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab |
| Address: | No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China |
| Post code: | 518057 |
| Telephone: | +86 (0) 755 2601 2053 |
| Fax: | +86 (0) 755 2671 0594 |
| E-mail: | ee.shenzhen@sgs.com |

## 1.3 Test Specification

| Identity | Document Title |
|---|---|
| **ANSI/IEEE Std 149-2008** | IEEE Standard Test Procedures for Antennas |

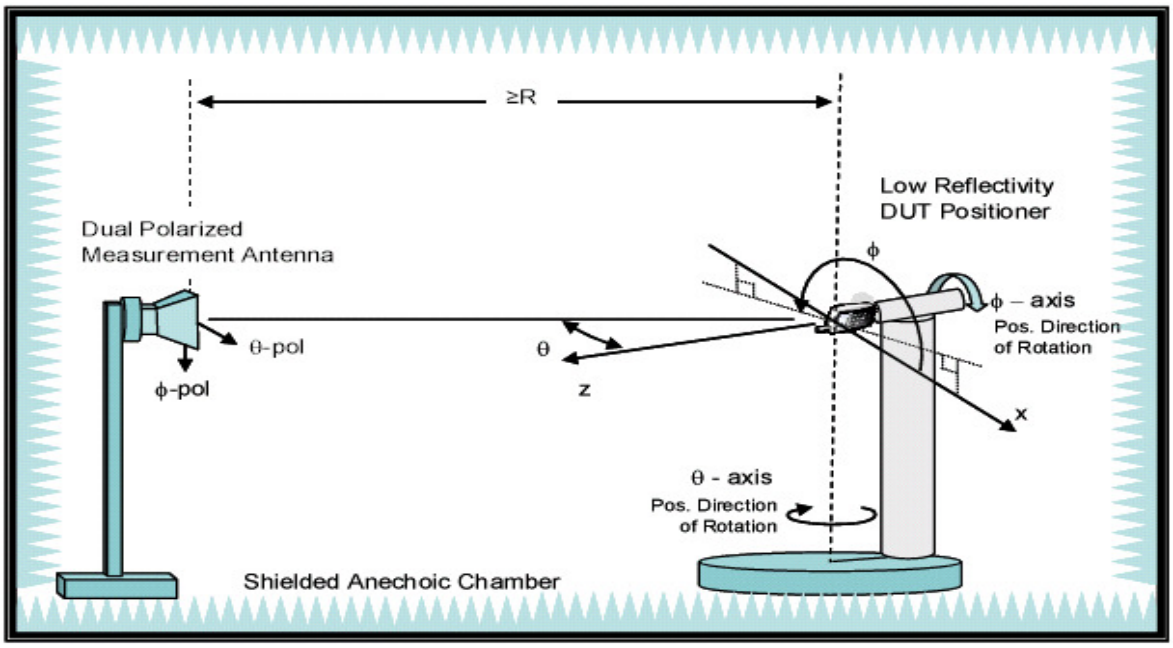
## 1.4 Laboratory Environment

| | | |
|---|---|---|
| Temperature | Min. =19℃，Max. = 25℃ | |
| Relative humidity | Min. =40%，Max. =72% | |
| Shield effect | 0.7-6GHz | > 100dB |
| Ground resistance | <0.5Ω | |

# 2 OTA Measurements System Configuration

## 2.1 Test Configuration

Great-Circle-Cut method is used to measure the antenna 3D GAIN of EUT in OTA qualified anechoic chamber. Equipment Under Test (EUT) geometry centre vertical projection at the centre of platform, the distance from EUT to measurement antenna is 5m




F-1. OTA Measurement System Configuration

## 2.2 Test Measurement

**Spherical coordinate system**

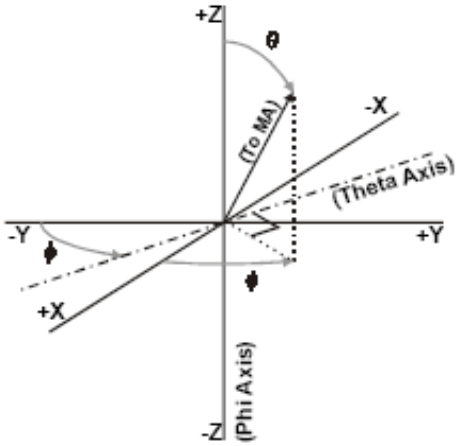



Figure 1 Test coordinate system

Note: Theta is from 0~180 degree. Phi is from 0~360. Rotate the EUT and record the Data, the step of rotation is 15 degree.

# 3 Test Equipment List

| Type of Equipment | Model Number | Manufacture | Calibration Date | Valid Period |
|---|---|---|---|---|
| Network Analyzer | E5071C<br>S/N MY46523591 | Keysight | 2020-04-09 | 2021-04-08 |
| Quad-Ridge Horn Antenna<br>700 MHz-10 GHz | EMCO 3164-08<br>S/N 161915 | ETS-Lindgren L.P. | N/A | N/A |
| MAPS Controller | EMCENTER<br>S/N 160485 | ETS-Lindgren L.P. | N/A | N/A |

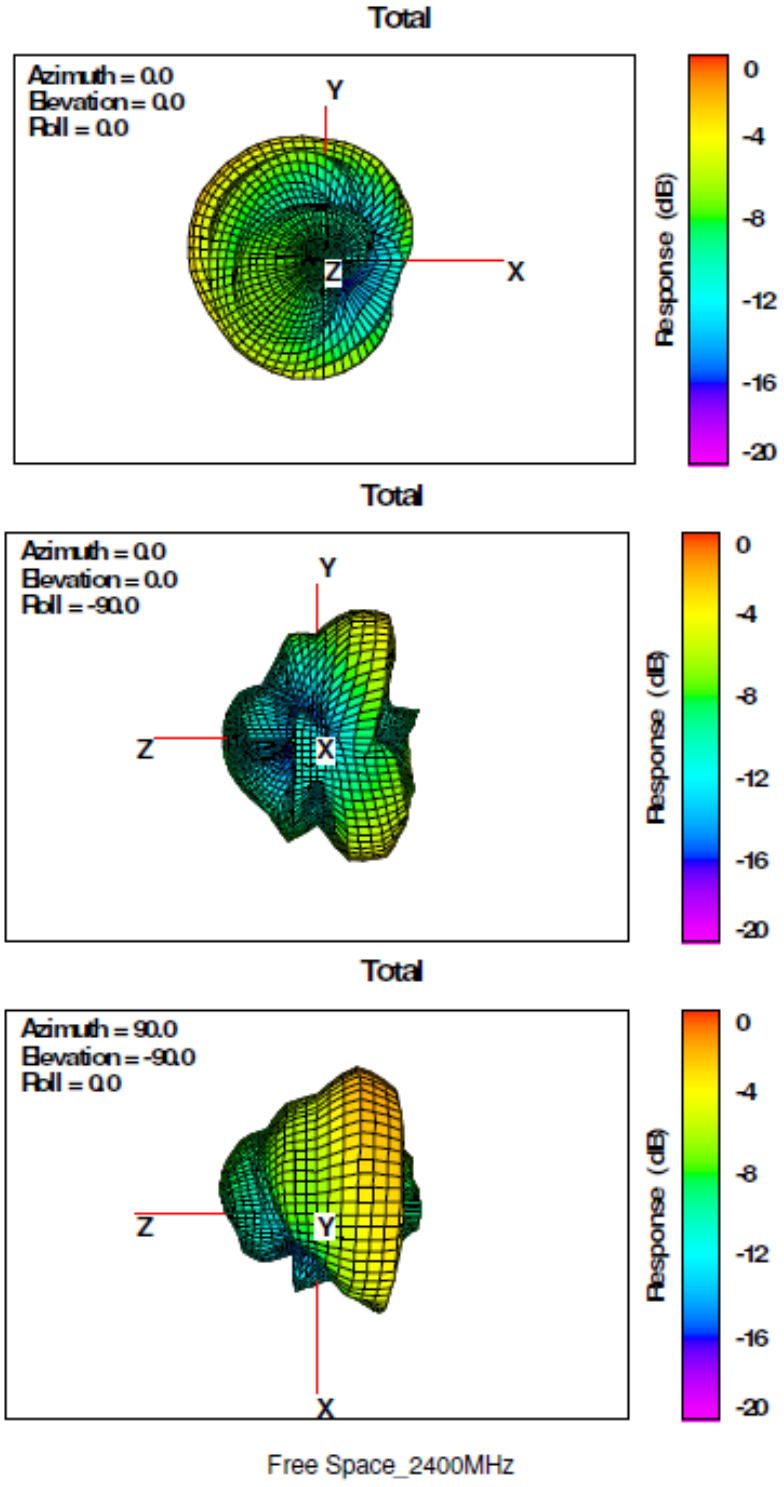
# 4 Measurement Uncertainty

| Item | 2400-2500 MHz (dB) |
|---|---|
| Gain | 0.88 |
| Efficiency | 0.88 |
| Measurement Uncertainty (95% CONFIDENCE INTERVAL) K=2 | |

# 5 Test Results

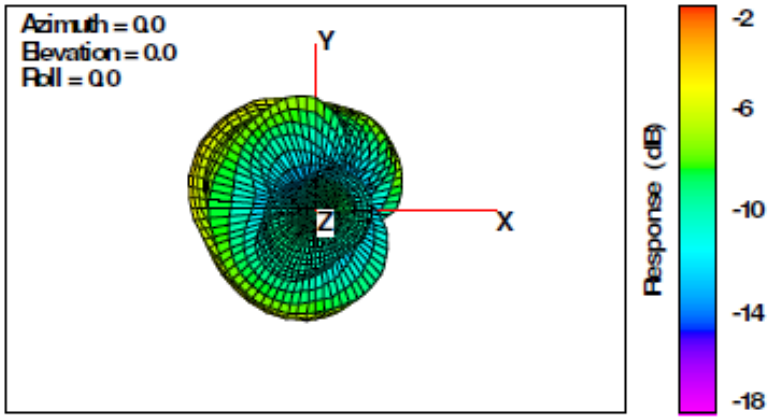
| Free Space | | | |
|---|---|---|---|
| Frequency (MHz) | Efficiency (dB) | Efficiency (%) | Gain (dBi) |
| 2400 | -7.03 | 19.80 | -1.55 |
| 2410 | -7.51 | 17.74 | -2.03 |
| 2420 | -7.88 | 16.28 | -2.48 |
| 2430 | -8.12 | 15.43 | -2.92 |
| 2440 | -8.28 | 14.85 | -3.35 |
| 2450 | -8.55 | 13.95 | -3.67 |
| 2460 | -8.73 | 13.39 | -3.79 |
| 2470 | -8.79 | 13.21 | -3.85 |
| 2480 | -8.68 | 13.54 | -3.71 |
| 2490 | -8.84 | 13.05 | -3.86 |
| 2500 | -9.05 | 12.43 | -4.05 |

# 6 3-D Antenna Pattern




Free Space_2400MHz

Total

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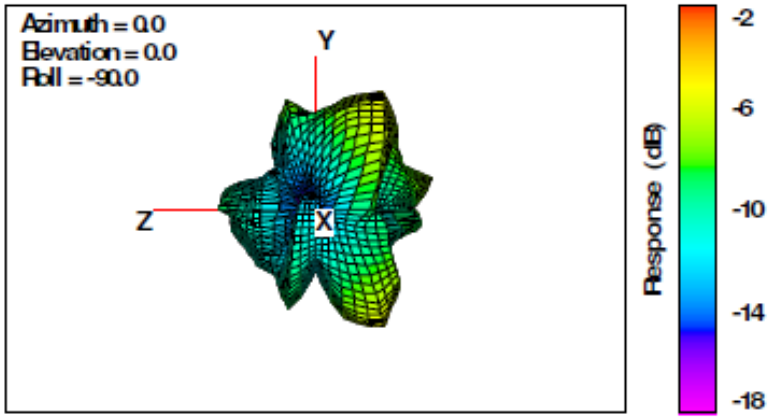


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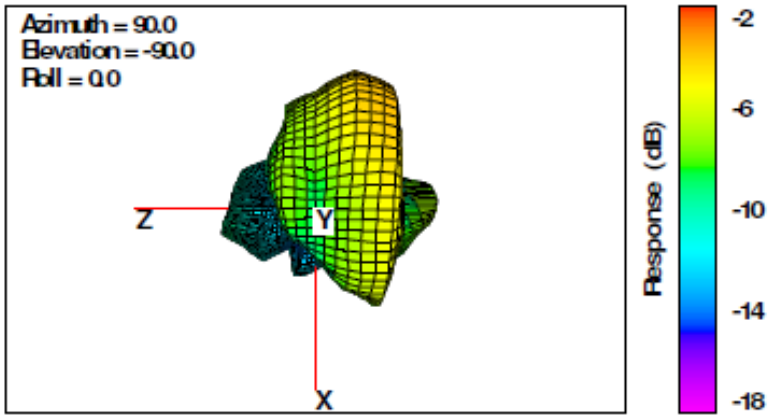
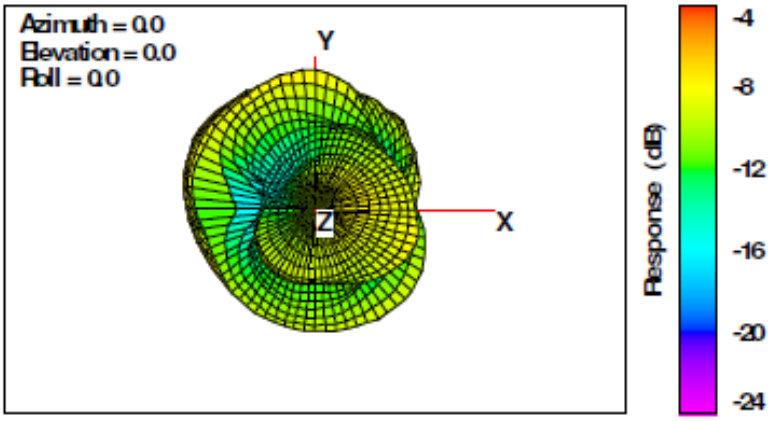



Free Space_2450MHz

Total

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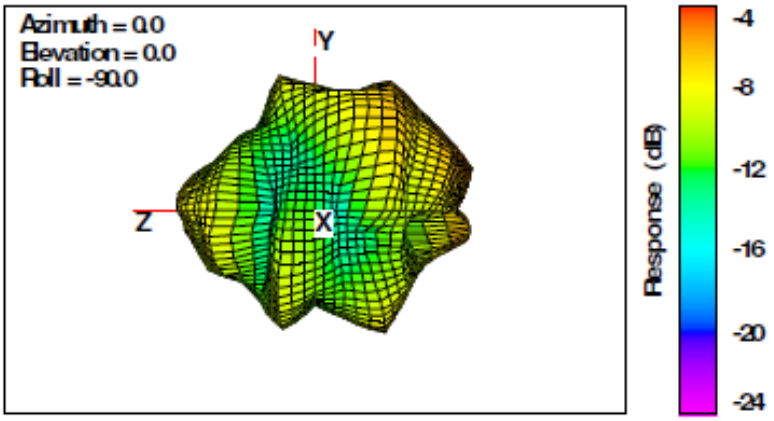


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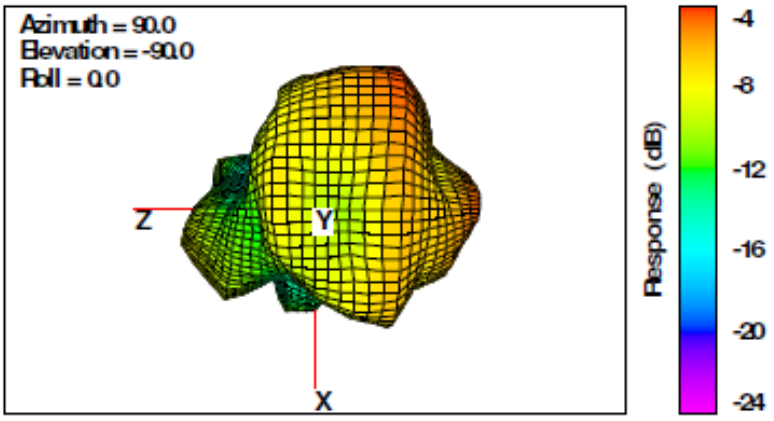
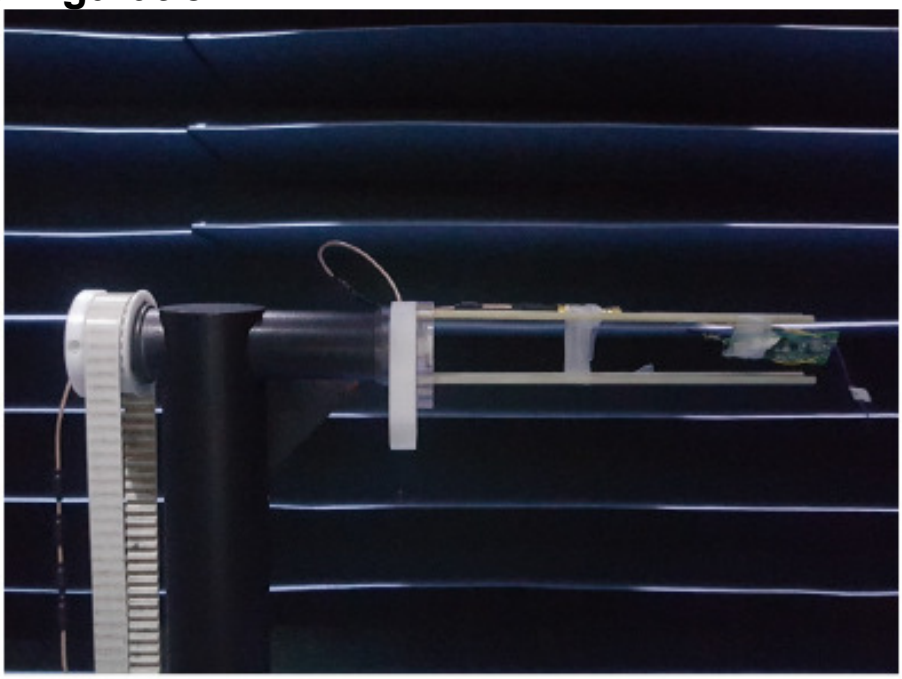
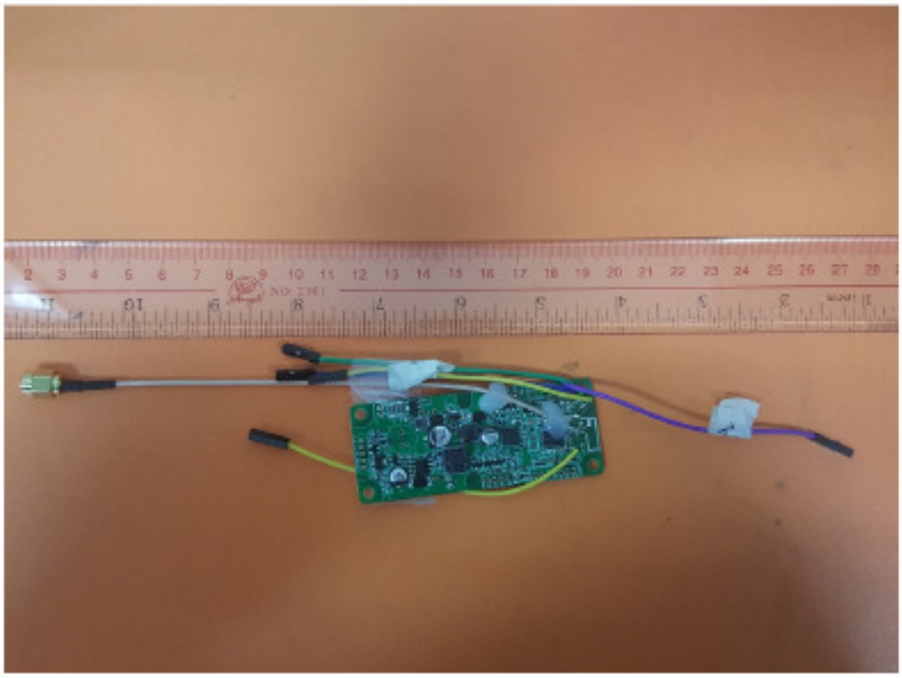



Free Space_2500MHz

# 7 Test Configuration



PCB Free Space View



PCB EUT Photo

**--End--**