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Report No.: ZO/2020/70017/01
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ANTENNA PASSIVE TEST REPORT

| | |
|-------------------------|------------------------|
| Application No: | ZO/2020/70017 |
| Applicant: | HCS (Suzhou) Limited |
| Manufacturer: | HCS (Suzhou) Limited |
| Product Name: | Remote Control |
| Model No.(EUT): | RC4213402/02BR |
| Standards: | ANSI/IEEE Std 149-2008 |
| Date of Receipt: | 2020/07/14 |
| Date of Test: | 2020/07/14 |
| Date of Issue: | 2020/07/14 |

Approved & Released by

Justin Feng

OTA Manager

Tested by

Roc Zhou

OTA Engineer

Authorized Signature:



Derek Yang
Wireless Laboratory Manager

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REVISION HISTORY

| Revision Record | | | | |
|-----------------|---------|------------|----------|----------|
| Version | Chapter | Date | Modifier | Remark |
| 01 | | 2020/07/14 | | Original |
| | | | | |
| | | | | |



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1 General Information

1.1 Details of Client

| | |
|--------------|---|
| Applicant | HCS (Suzhou) Limited |
| Address: | 19F-20F, Building B-3rd, 209 ZhuYuan road, Building B-3rd, NEW District, Suzhou new district, PRC |
| Manufacturer | HCS (Suzhou) Limited |
| Address: | 19F-20F, Building B-3rd, 209 ZhuYuan road, Building B-3rd, NEW District, Suzhou new district, PRC |

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
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1.3 Test Specification

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

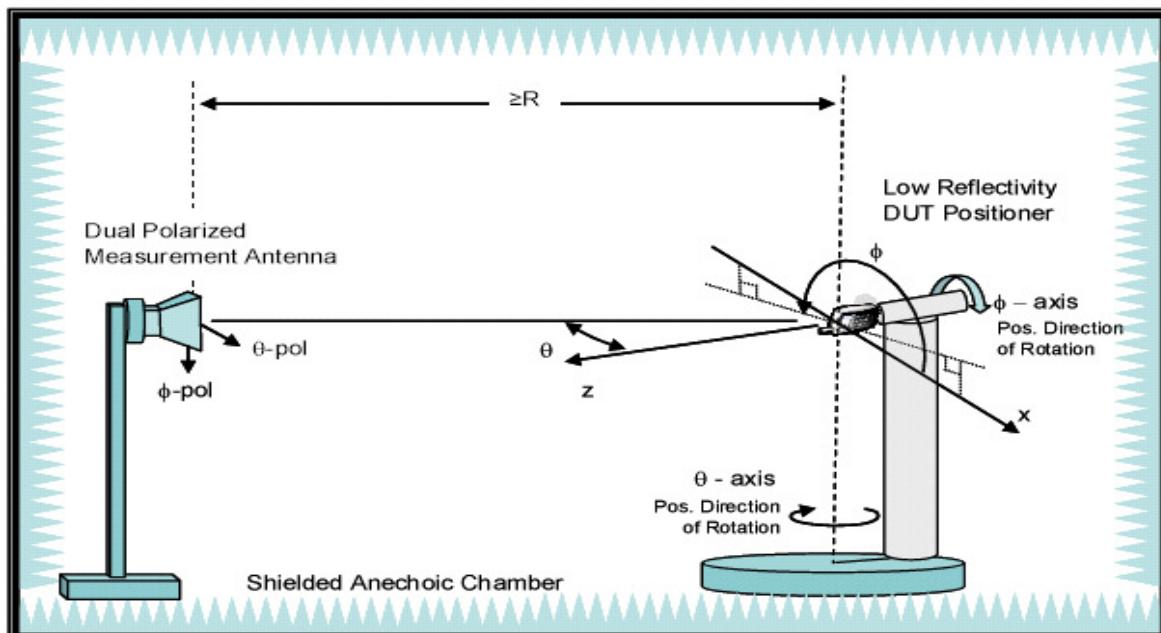
1.4 Laboratory Environment

| | | |
|-------------------|--------------------------|---------|
| Temperature | Min. =19°C , Max. = 25°C | |
| 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

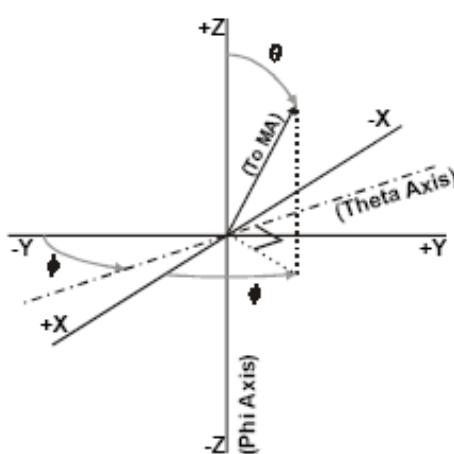


Figure 1 Test coordinate system

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 S/N MY46523591 | Keysight | 2020-04-09 | 2021-04-08 |
| Quad-Ridge Horn Antenna 700 MHz-10 GHz | EMCO 3164-08 S/N 161915 | ETS-Lindgren L.P. | N/A | N/A |
| MAPS Controller | EMCENTER S/N 160485 | ETS-Lindgren L.P. | N/A | N/A |



4 Measurement Uncertainty

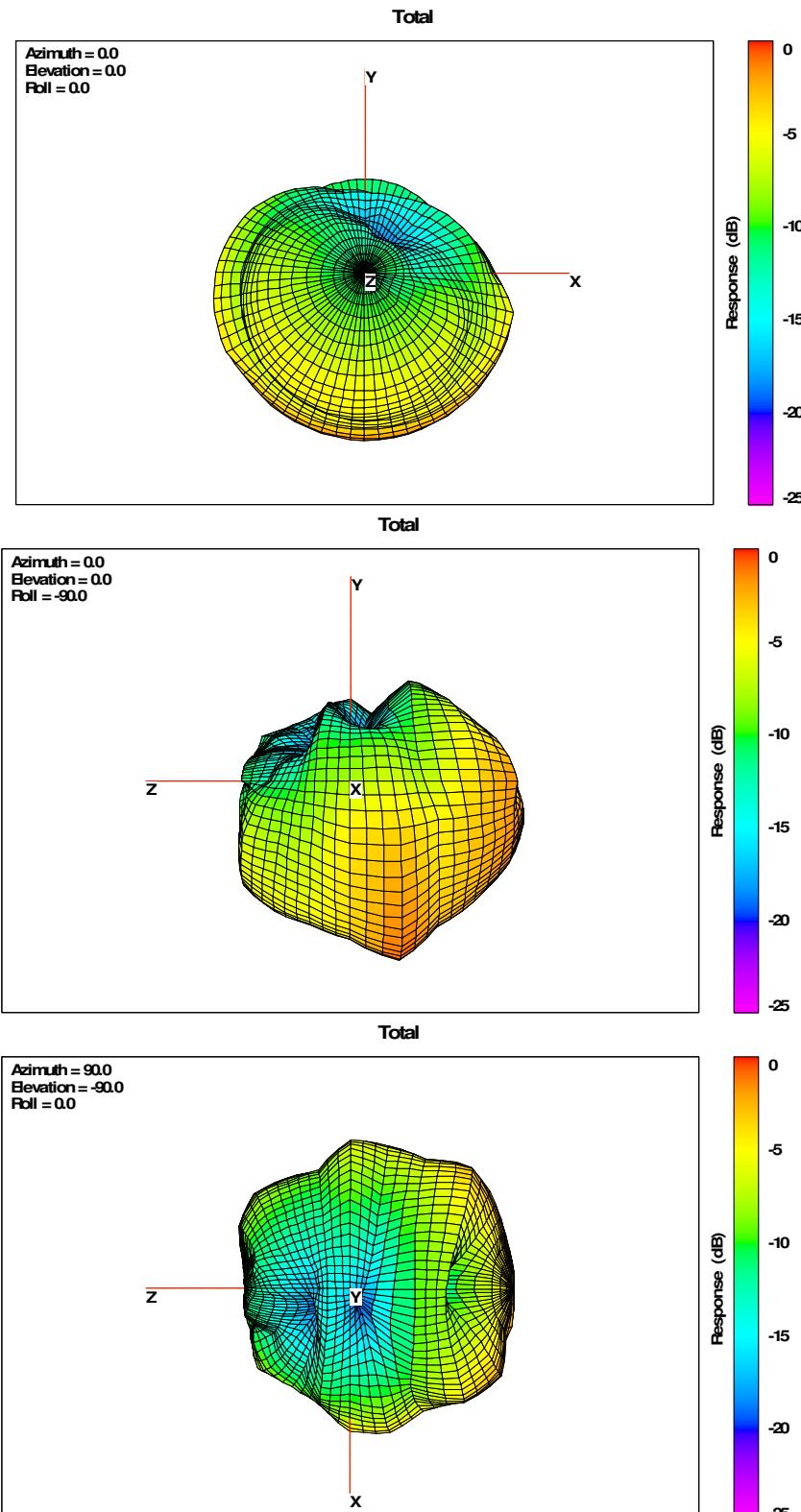
| Item | 2400-2500 MHz (dB) |
|---|--------------------|
| Gain | 0.88 |
| Efficiency | 0.88 |
| Measurement Uncertainty (95% CONFIDENCE INTERVAL) K=2 | |



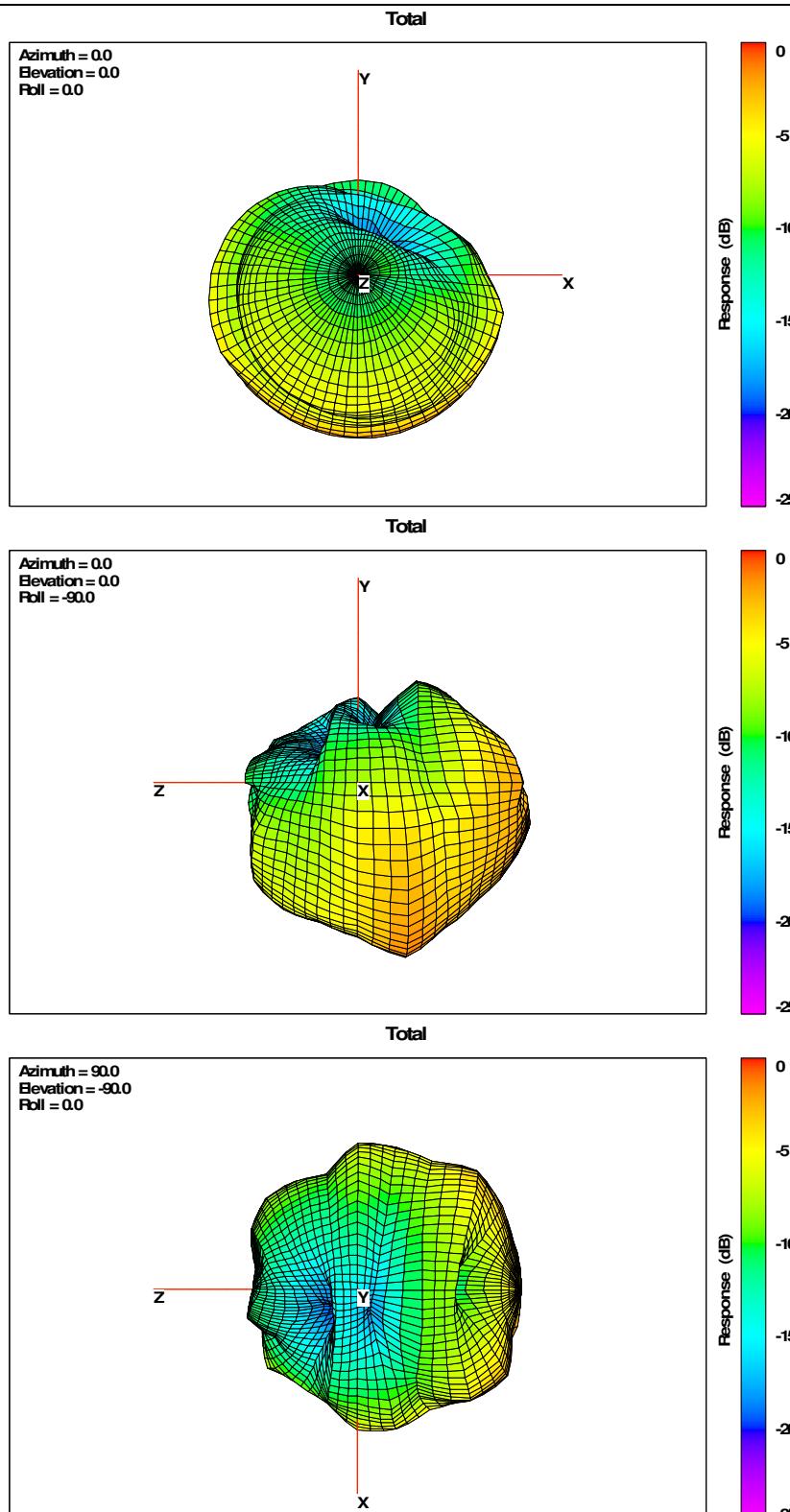
5 Test Results

| FreeSpace | | | |
|-----------------|-----------------|----------------|------------|
| Frequency (MHz) | Efficiency (dB) | Efficiency (%) | Gain (dBi) |
| 2400 | -5.77 | 26.47 | -0.35 |
| 2402 | -5.79 | 26.38 | -0.38 |
| 2405 | -5.80 | 26.28 | -0.42 |
| 2410 | -5.90 | 25.72 | -0.52 |
| 2415 | -5.96 | 25.36 | -0.62 |
| 2420 | -5.99 | 25.15 | -0.70 |
| 2425 | -6.03 | 24.92 | -0.78 |
| 2430 | -6.04 | 24.90 | -0.84 |
| 2435 | -6.13 | 24.37 | -0.95 |
| 2440 | -6.13 | 24.36 | -0.94 |
| 2441 | -6.15 | 24.29 | -0.96 |
| 2445 | -6.11 | 24.47 | -0.95 |
| 2450 | -6.06 | 24.76 | -0.87 |
| 2455 | -6.12 | 24.45 | -0.93 |
| 2460 | -6.20 | 23.96 | -0.98 |
| 2465 | -6.20 | 23.97 | -0.87 |
| 2470 | -6.36 | 23.13 | -0.92 |
| 2475 | -6.41 | 22.85 | -0.94 |
| 2480 | -6.38 | 22.99 | -0.80 |
| 2482 | -6.40 | 22.90 | -0.76 |
| 2485 | -6.44 | 22.71 | -0.75 |
| 2490 | -6.51 | 22.35 | -0.78 |
| 2495 | -6.57 | 22.03 | -0.80 |
| 2500 | -6.46 | 22.57 | -0.64 |

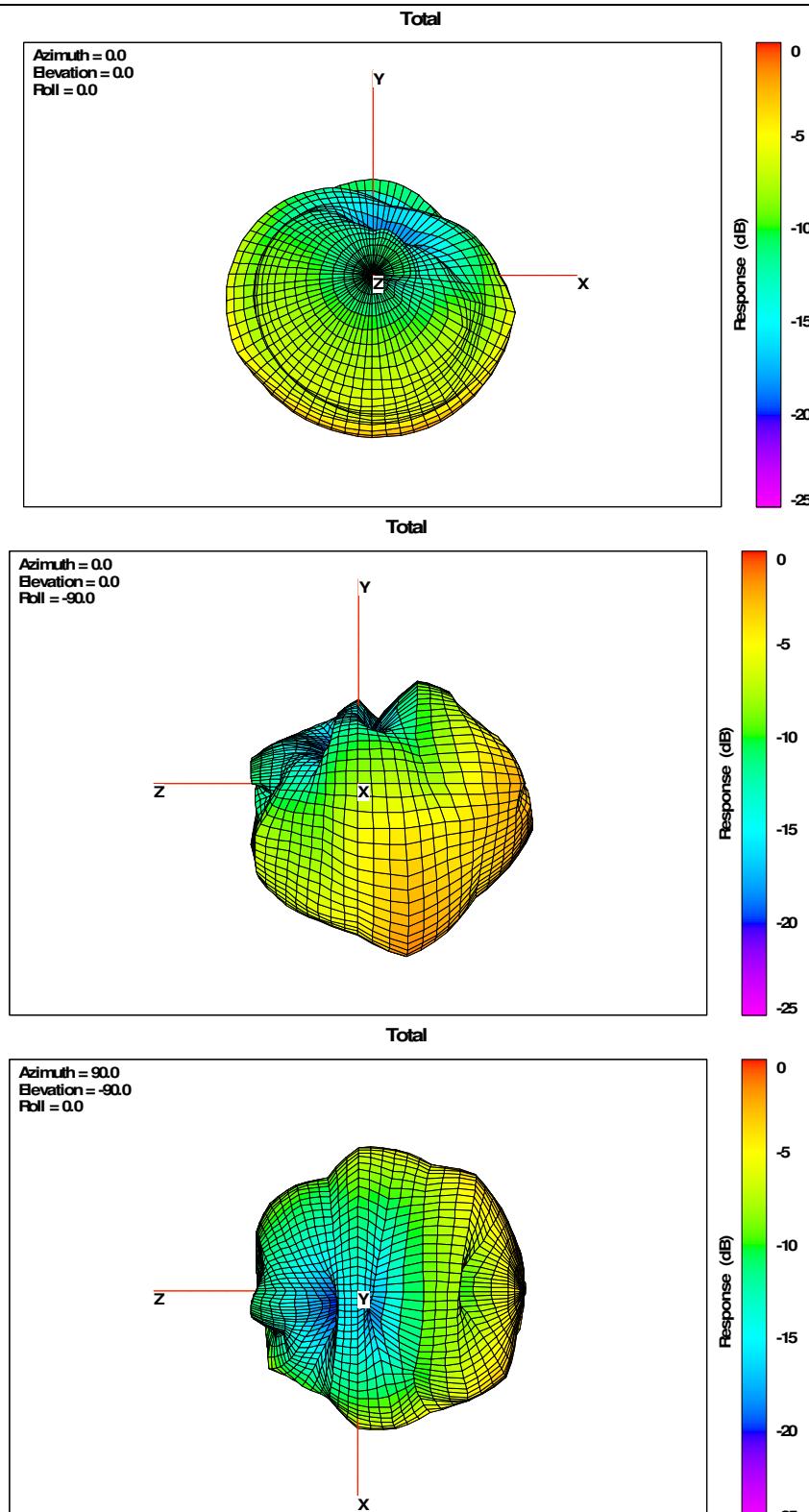
6 3-D Antenna Pattern



FS_2402MHz



FS_2441MHz



FS_2480MHz

7 Test Configuration



Free Space View



EUT Photo

---END---