

Antenna Test Report

Report No.: TEOT2211000597E4

Test Plan: Non-compliance with ISO17025

Applicant Name: ZEROPLUS

Manufacturer Name: ZEROPLUS

Product Name: C21062

Model Number: P4 BT Wireless Controller 27th Edition

Measurements performed at

SGS Taiwan Ltd.

Hwaya District, Taiwan

Issued Date: December 05, 2022

| | Name | Date & Signature | Distribution |
|--------------|----------------------------|--|--------------|
| Prepared by: | Nandi Chen Sr. Engineer | <i>Nandi Chen</i> December 05, 2022 | |
| Approved by: | Shawn Yen Supervisor | <i>Shawn Yen</i> December 05, 2022 | |

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Measurement System Information

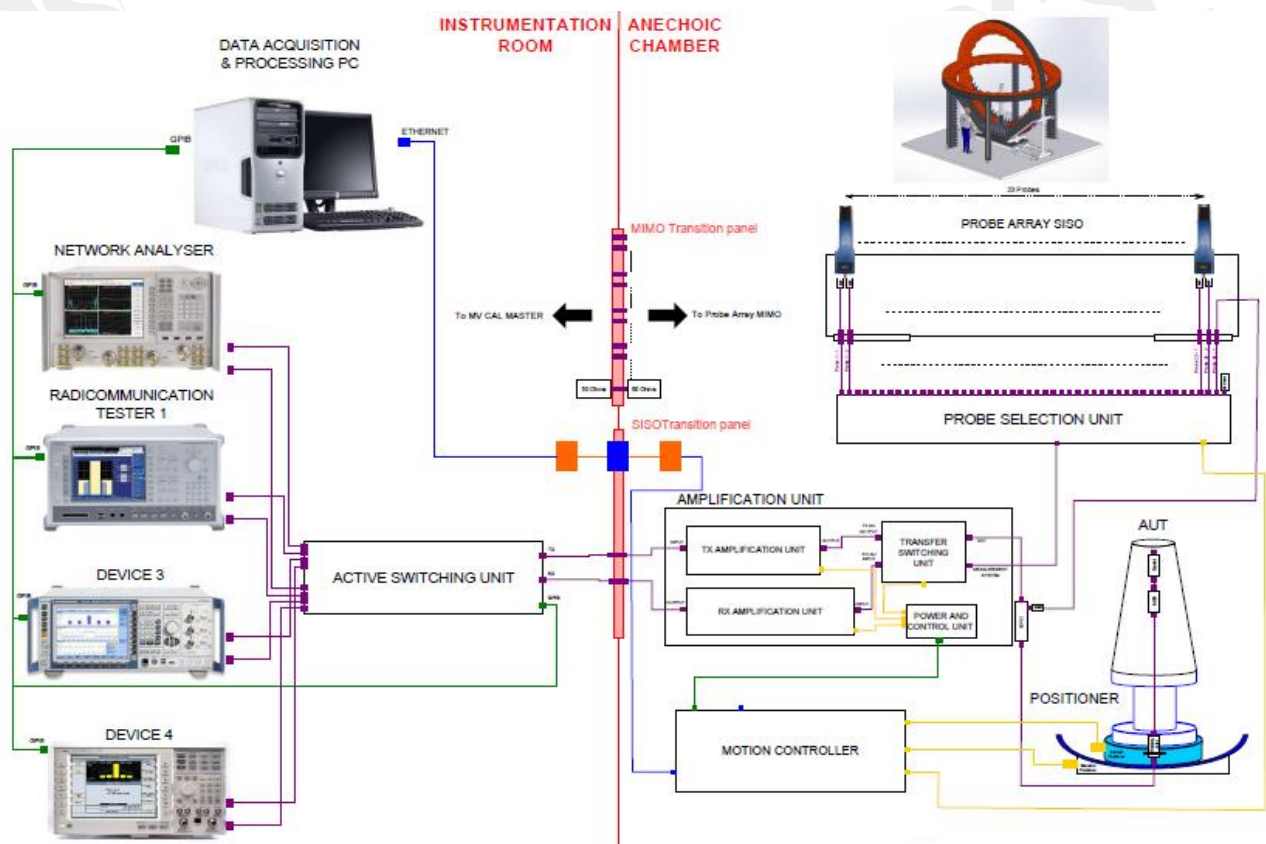
General Information

Testing Condition:

- Temperature: $22 \pm 3^{\circ}\text{C}$
- Humidity: $< 80\%$

Measurement Facility:

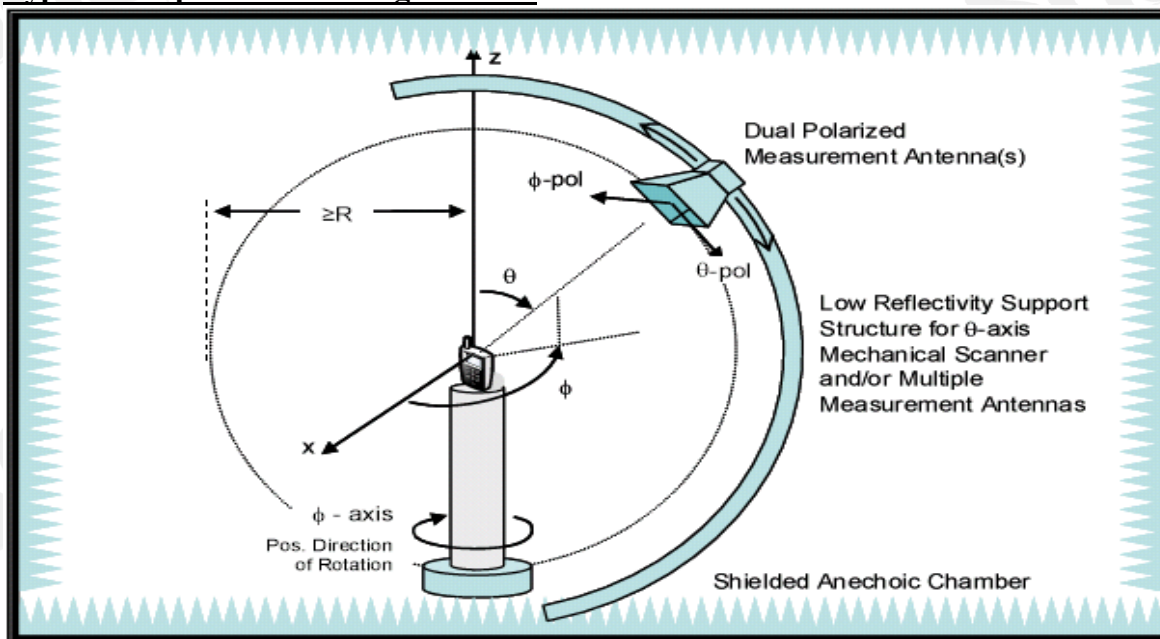
- Measurement Chamber: MVG 3D fully anechoic chamber and its measuring system (Stargate-24-L)
- Base Station Simulator: Anritsu MT8820C (or R&S CMU200)
- Network Analyzer: Agilent E5071C



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Measurements are performed in a MVG **Stargate-24-L** with the StarAct interface for a base station simulator. The **Stargate-24-L** has 23 probe antennas mounted with equal spacing on a circular arch. Electronic switching of the probe antennas provides outstanding measurement speed. The geometry of the setup, with only a Styrofoam column within 1.6 meters of the EUT, ensures minimum interference and low ripple on the measured radiation patterns. The DUT is placed on top of the pedestal, in the center of the system.

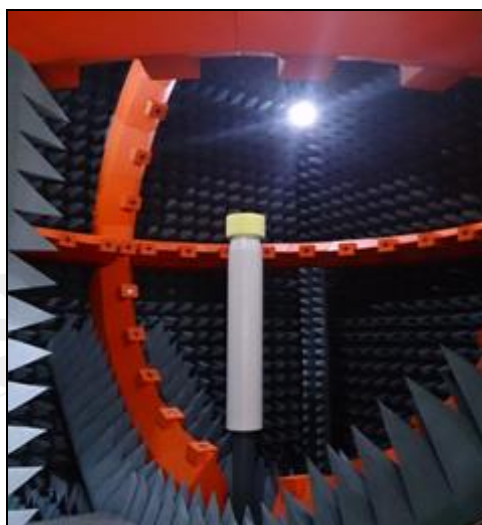
Typical Setup for MVG Stargate-24-L:



Instruments View



Inside View



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Testing Laboratory: Identification of the Responsible Test Laboratory.● **OTA Laboratory:****SGS Taiwan Ltd. Wireless Laboratory**

No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan 24803.

Telephone: +886 2 2299 3279

Fax: +886 2 2298 0488

Internet: <http://www.tw.sgs.com>

● **Testing Location:**

No. 2, Keji 1st Rd., Hwaya Technology Park, Guishan District, Taoyuan City, Taiwan 33383.

Details of Applicant:

| | |
|-----------------------------|---|
| Applicant's name: | ZEROPLUS |
| Applicant's address: | 3F, No.121, Jian 8th Rd, Chung Ho District |
| Contact person: | Joe |
| Telephone: | +886-2-66202225 Ext.309 |
| Fax: | N/A |
| E-mail: | joecheng0815@zeroplus.com.tw |

Details of Manufacturer:

| | |
|-----------------------------|---|
| Applicant's name: | ZEROPLUS |
| Applicant's address: | 3F, No.121, Jian 8th Rd, Chung Ho District |
| Contact person: | Joe |
| Telephone: | +886-2-66202225 Ext.309 |
| Fax: | N/A |
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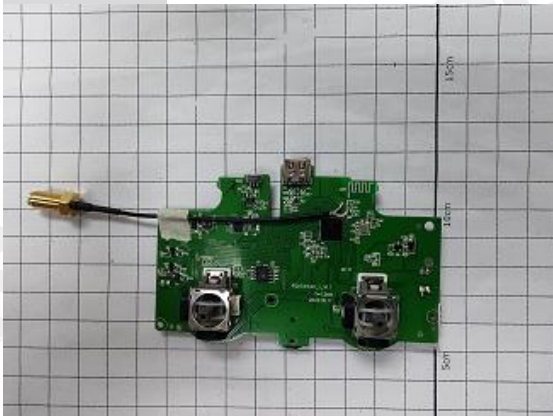
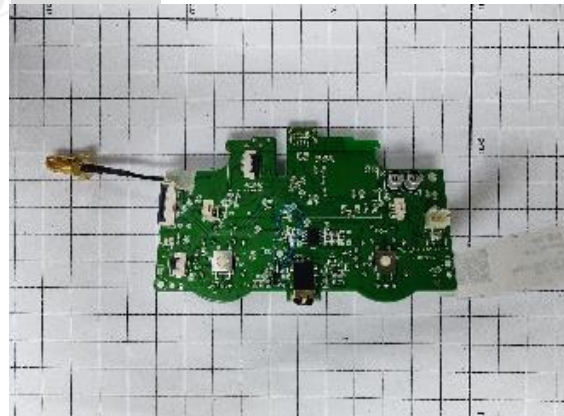
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Details of EUT:

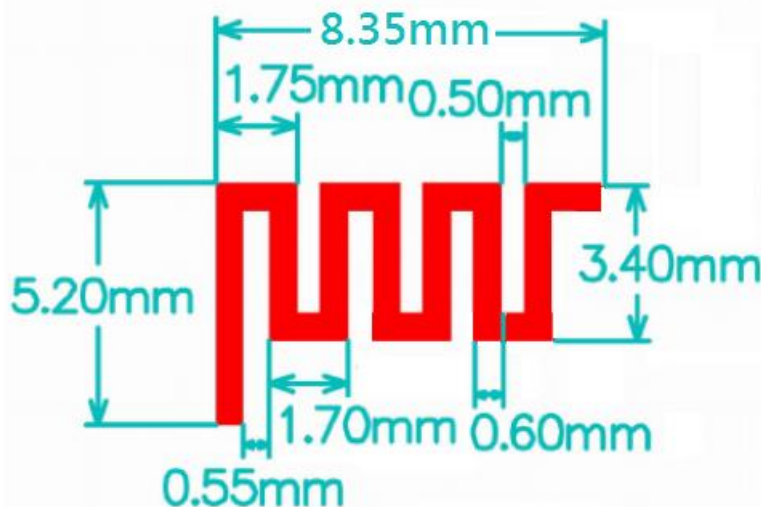
| | |
|-----------------------------|---|
| Device Description: | C21062 |
| Device Manufacturer: | ZEROPLUS |
| Device Model: | P4 BT Wireless Controller 27th Edition |
| Hardware Version: | N/A |
| Software Version: | N/A |
| Frequency Range: | 2400MHz ~ 2500MHz Step size: 10MHz |
| Antenna Type: | PCB |

Duration of Tests:

| | |
|-----------------------------|-------------------|
| Sample Receive Date: | 2022-11-29 |
| Test Starting Date: | 2022-11-30 |
| Test Ending Date: | 2022-11-30 |
| Report Issued Date: | 2022-12-05 |

Photographs of EUT:**Front View****Side View**

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List of Equipment

Equipment Summary Sheet

| Equipment Description | Manufacturer | Identification no. | Current calibration date | Next calibration date |
|--------------------------------------|--------------|--------------------|--------------------------|-----------------------|
| Universal Radio Communication tester | Anritsu | MT8820C | 2022/10/14 | 2023/10/13 |
| Network Analyzer | Agilent | E5071C | 2021/01/12 | 2023/01/11 |
| Sleeve Dipole | MVG | SD740 | 2022/01/07 | 2025/01/06 |
| Dual Ridge Horn | MVG | SH800 | 2022/11/09 | 2023/11/08 |
| Stargate-24-L probe array | MVG | Stargate-24-L | 2022/08/26 | 2023/08/25 |
| Measurement software | MVG | SPM V1.9 | N/A | N/A |

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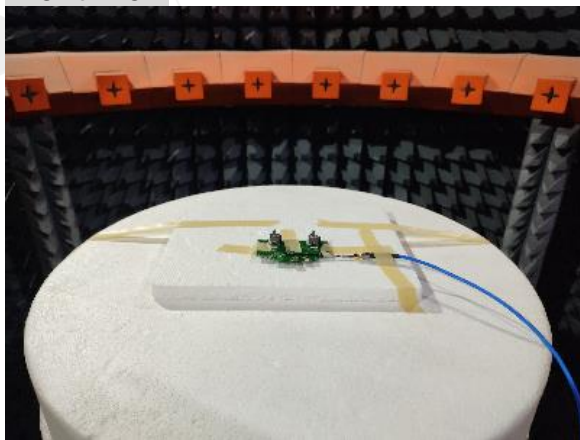
Antenna Gain and Efficiency

P4 BT Wireless Controller 27th Edition

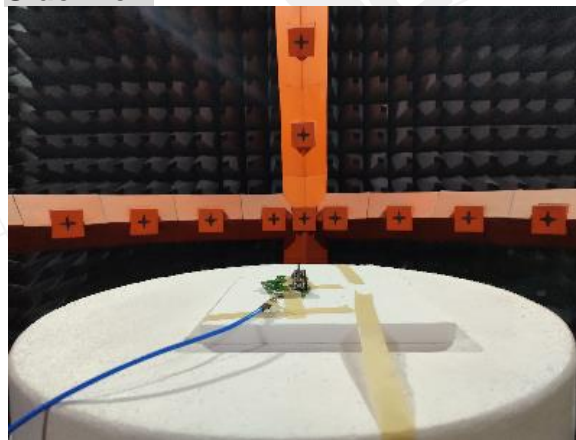
| Freq(MHz) | Peak Gain. dBi | Efficiency | Average . dBi |
|-----------|----------------|------------|---------------|
| 2400.00 | -1.73 | 19.03% | -7.21 |
| 2410.00 | -1.84 | 19.16% | -7.18 |
| 2420.00 | -1.74 | 19.74% | -7.05 |
| 2430.00 | -1.16 | 22.68% | -6.44 |
| 2440.00 | -0.68 | 25.10% | -6.00 |
| 2450.00 | -0.53 | 27.35% | -5.63 |
| 2460.00 | -0.58 | 28.68% | -5.42 |
| 2470.00 | -0.17 | 31.61% | -5.00 |
| 2480.00 | 0.04 | 32.16% | -4.93 |
| 2490.00 | 0.03 | 31.82% | -4.97 |
| 2500.00 | 0.22 | 32.71% | -4.85 |

Test Setup

Front View



Side View

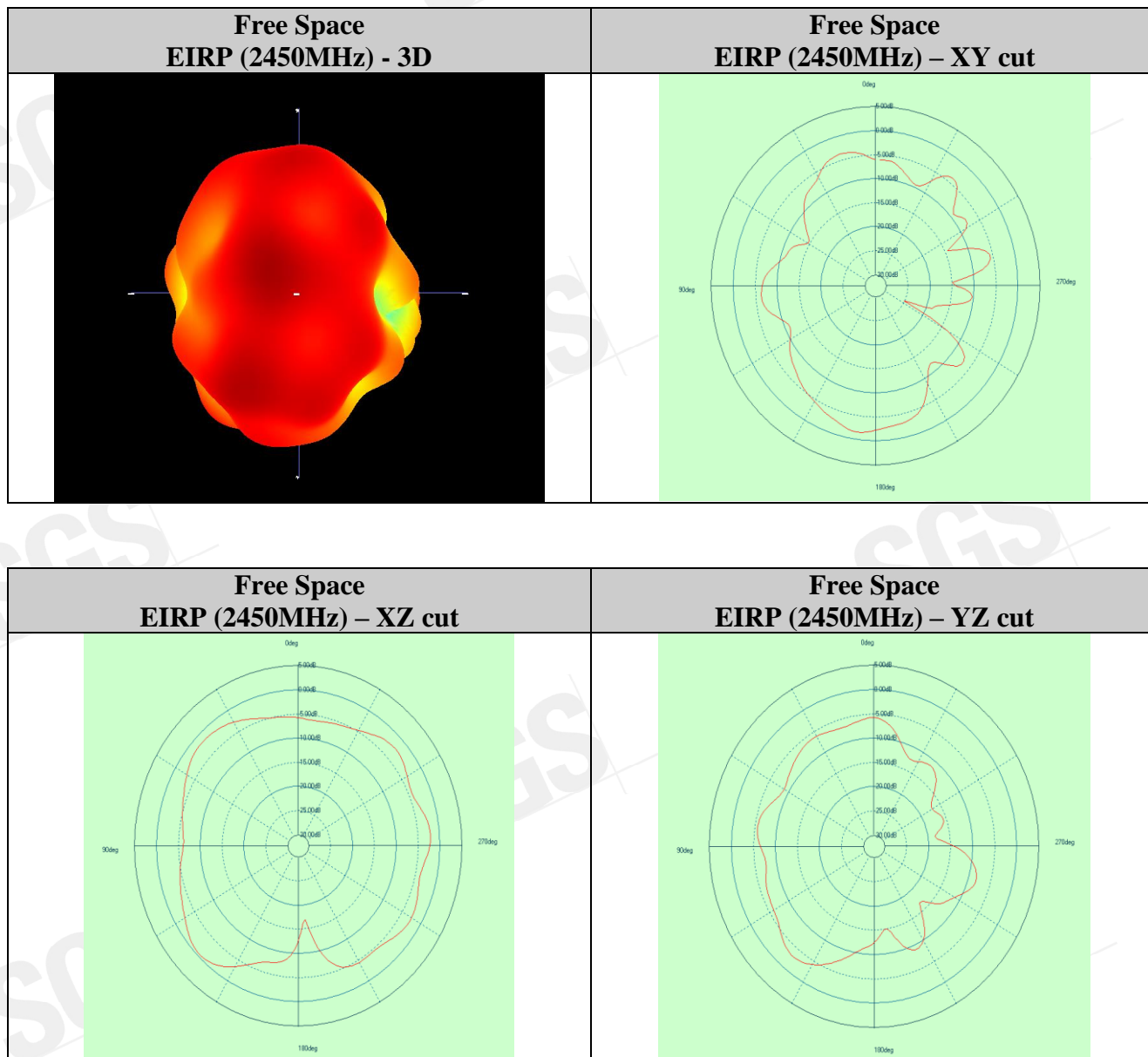


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Antenna 3D Plot Matrix

All plots in this section show the total EIRP ($EIRP_{\theta} + EIRP_{\phi}$) with the +x-axis pointing out of the page, +y-axis pointing right, and +z-axis pointing up.



End of Report

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