
# TEST REPORT

| Measurements performed at: | Measurements performed for: |
|---|---|
| **MICROWAVE VISION ITALY s.r.l.** | **ELCA S.R.L** |
| **Via dei Castelli Romani, 59** | **Via del Commercio, 7/B** |
| **00071 – Pomezia (RM) – Italy** | **36065 – Mussolente (VI) – Italy** |

mvg
Microwave Vision Group

# Summary:

**This document summarizes the measurement services performed at Microwave Vision Italy. The purpose of this document is to provide a summary of the measurement procedure, traceability information and data for the Devices Under Test (DUT).**

| | Name | Function | Date | Signature |
|---|---|---|---|---|
| **Prepared by** | G. VENTURINI | Measurement Technician | 17 Sep 2024 |  |
| **Checked by** | A. FARUOLO | Sales Manager and Quality Responsible | 17 Sep 2024 |  |
| **Approved by** | L.J. FOGED | Scientific Director | 17 Sep 2024 |  |

**Distribution list**

| Issue | | Date | Modifications |
|---|---|---|---|
| TR.261.34.24.ROM | A | 17 Sep 2024 | Initial Release |

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# 1 DEVICES UNDER TEST

| Devices under test |
|---|
| X1 pz |

| Customer Information | |
|---|---|
| Customer | **Elca s.r.l** |
| Customer Contact | **Stefano Mocellin** |

**Table 1-1: Devices under test and customer information**

# 2 MEASUREMENT SYSTEM DESCRIPTION AND SPECIFICATIONS

StarLab is the ultimate tool for antenna pattern measurements in laboratories and production environments where space is limited, cost is critical, and the flexibility of a portable system is required. For near-field passive measurements, a Vector Network Analyzer is used as the RF source/receiver. The Control Unit drives the two positioning motors and the electronic scanning of the probe arrays. The amplification unit amplifies the signal on transmission and reception channels according to the frequency bands. The Transfer Switching Unit is used to switch between the emission by AUT and the reception by AUT modes. The power and control unit supplies the power and drives the RF units.

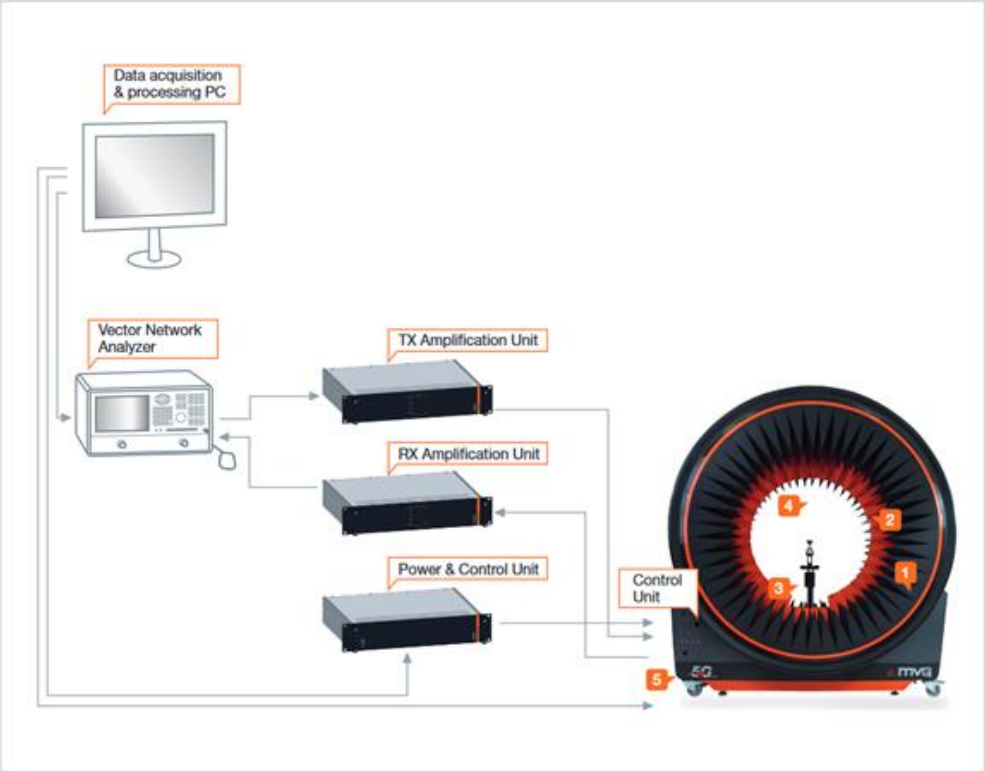


**Figure 2-1: MVG StarLab 50 GHz**


**Figure 2-2: Copper Mountain M5180 Vector Network Analyzer**

# 3 CALIBRATION METHOD

The method used to measure the AUT is based on the gain-transfer or substitution method in which the unknown power gain of a test antenna is measured by comparing it to that of a gain-standard antenna [IEEE Standard Test Procedures for Antennas, ANSI/IEEE Std 149-1979].

The calibrated substitution antenna is MVG 945 MHz SLEEVE DIPOLE (SD945) as shown in Figure 3-1.

Measurements have been conducted in accordance with IEEE Std 1720 “Recommended Practice for Near-Field Antenna Measurements”.

**Figure 3-1: MVG 945 MHz SLEEVE DIPOLE (SD945) used for the calibration activity**

# 4 LIST OF EQUIPMENT

| Manufacturer | Equipment Description | Serial Number ID | Current calibration date | Calibration due date |
|---|---|---|---|---|
| MVG | **StarLab 50 GHz** Spherical near-field measurement system | 1104629-0001 | 06/2023 | 09/2024 (every 1 year) |
| COPPER MOUNTAIN | **M5180** Vector Network Analyzer | 19037915 | 10/2023 | 10/2026 (every 3 years) |
| MVG | **SD945** Sleeve Dipole Reference antenna | SD945 | 02/2020 | 02/2026 (every 6 years) |

**Table 4-1: List of equipment**

# 5 SYSTEM SETUP AND COORDINATE SYSTEM

The measurements set-up is shown in Figure 5-1.

Ambient temperature = 25°C.

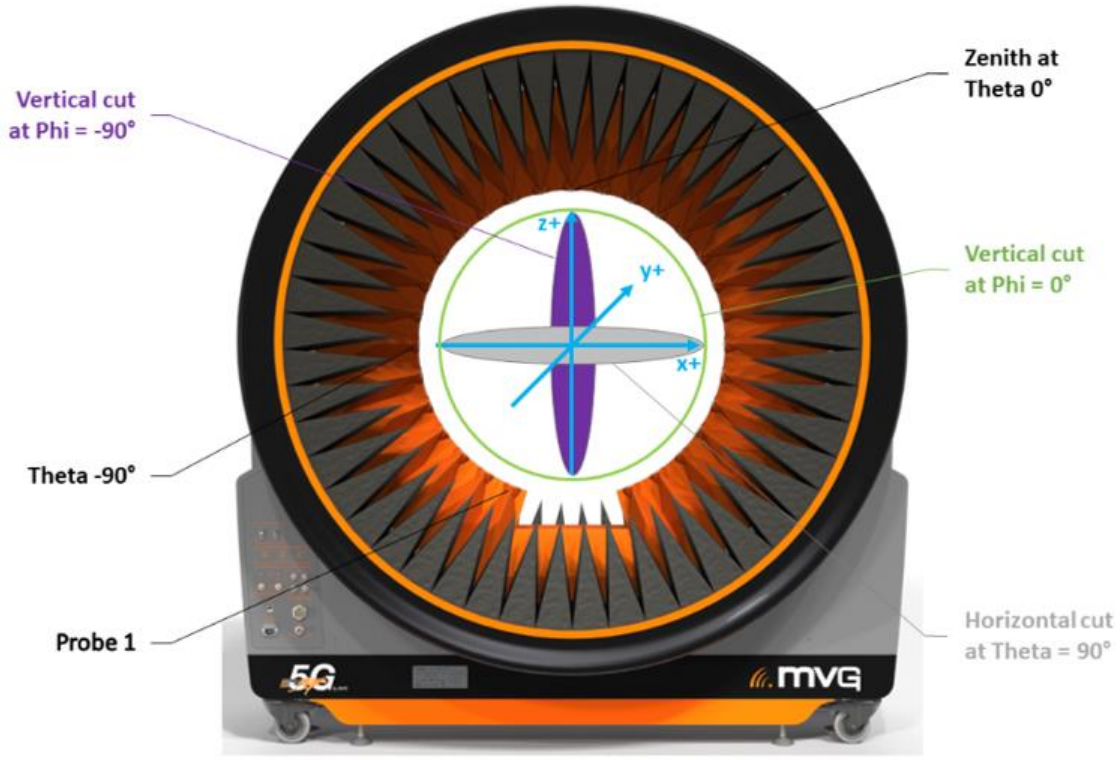


**Figure 5-1: StarLab spherical coordinate system**

# 6 TEST RESULTS

## Measurement set-up with reference coordinate system

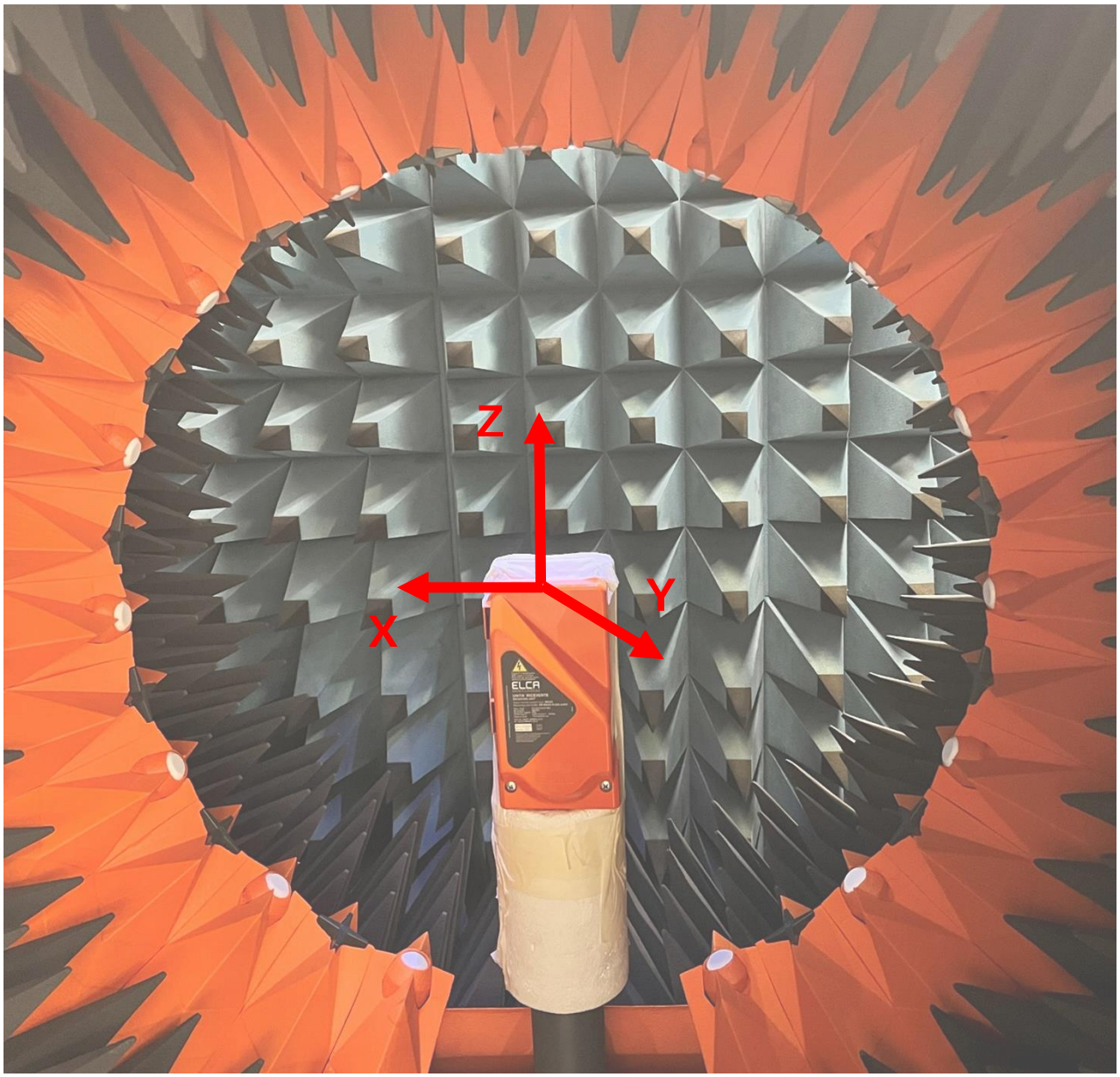


**Figure 6-1: AR MAGO FLEXI. A-915**

## Gain

In the following graphs is reported the gain of the DUT: AR MAGO FLEXI. A-915

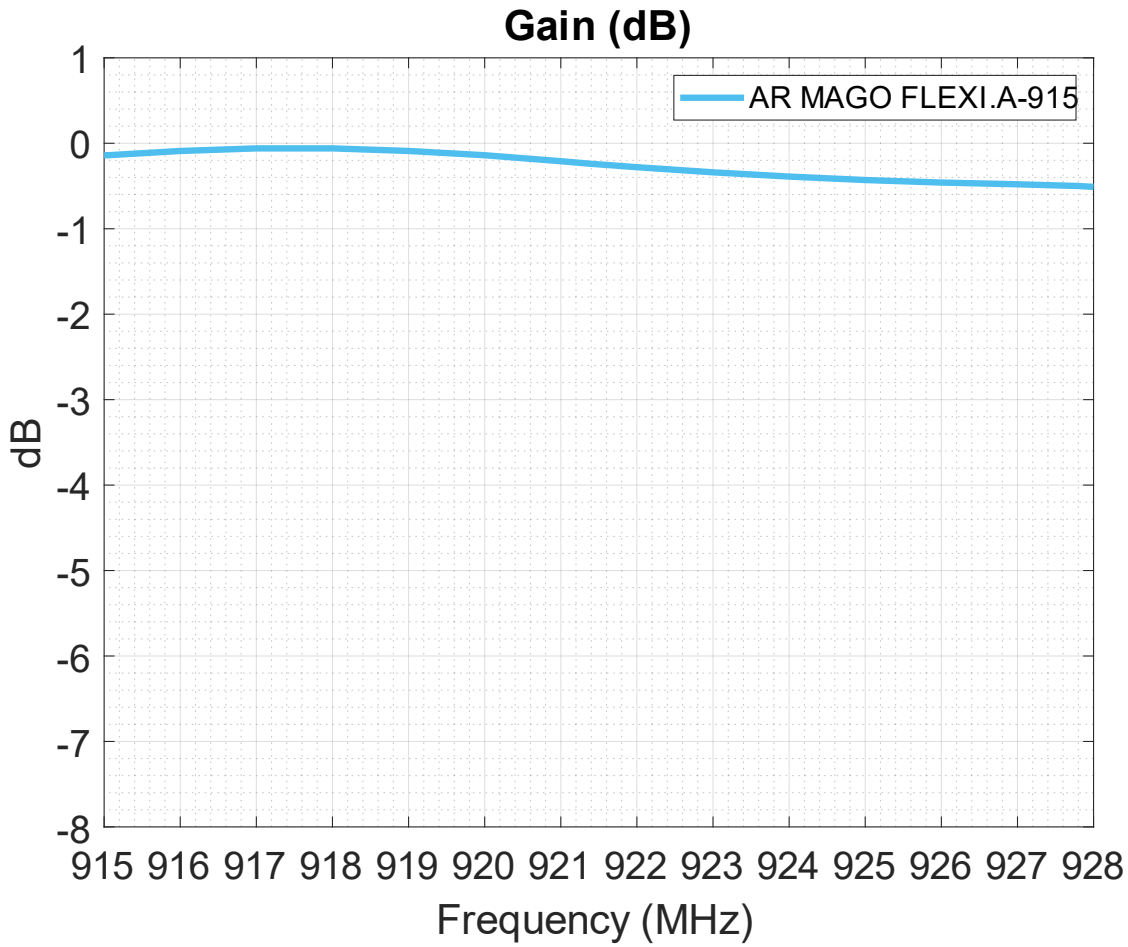


**Figure 6-2: Peak gain over frequency**

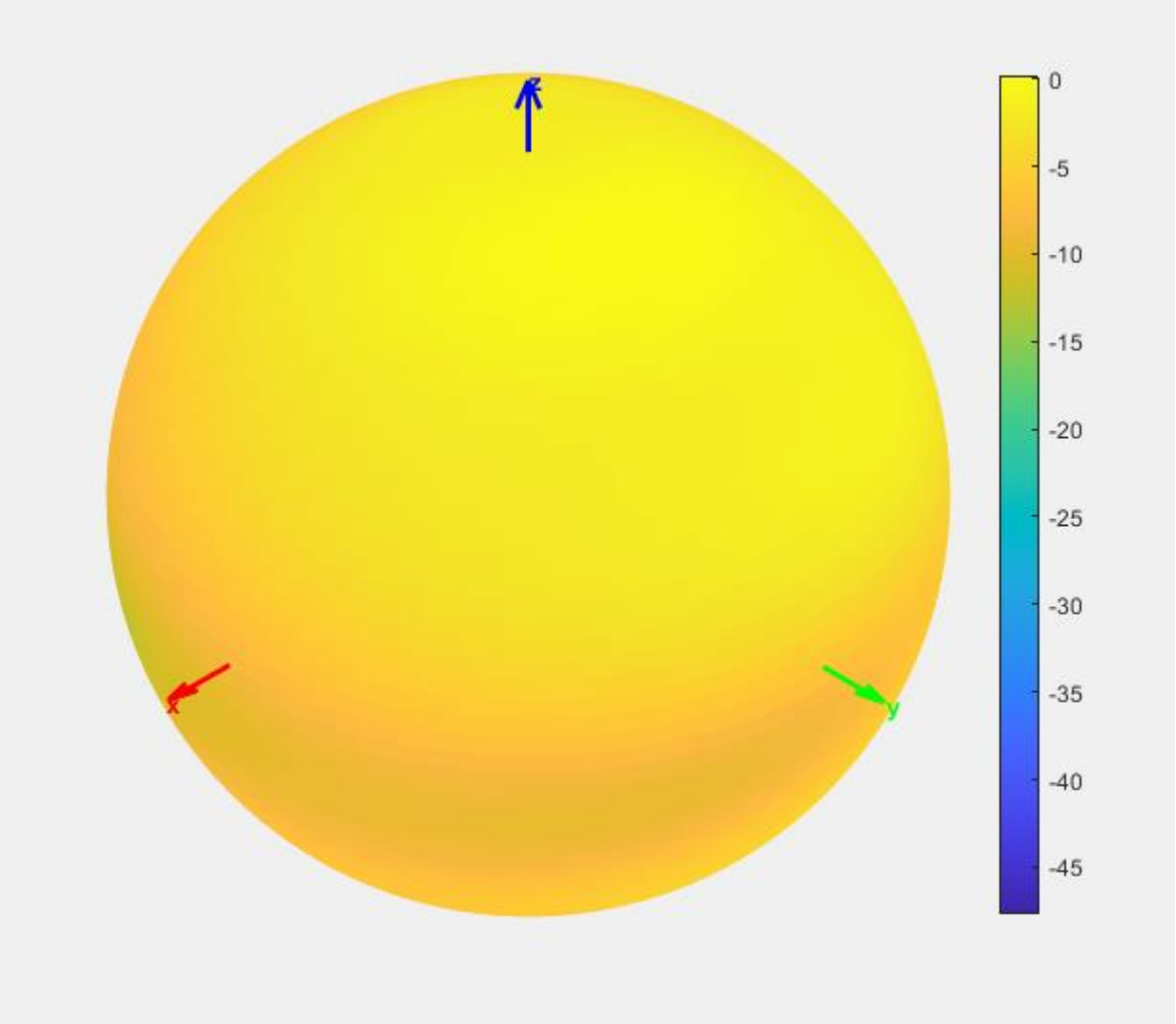


**Figure 6-3: 3D gain pattern @921.4 MHz**

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