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	
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Distribution list

Issue		Date	Modifications
TR.261.29.24.ROM	A	17 Sep 2024	Initial Release

ISO 9001 BUREAU VERITAS Certification

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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

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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.

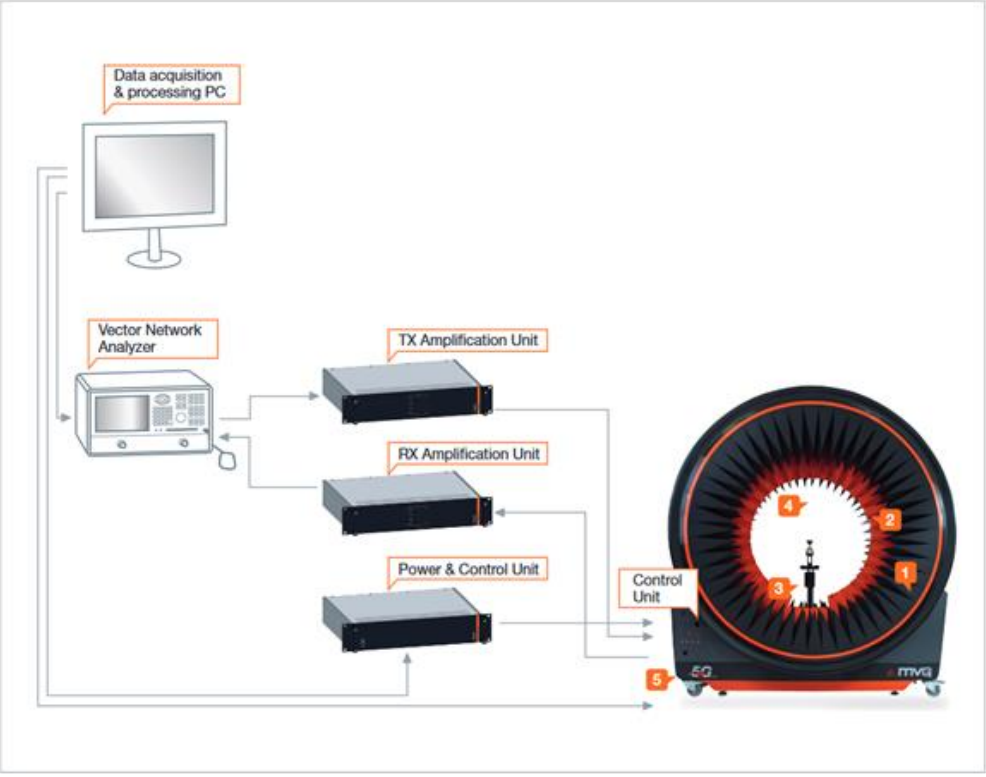

Figure 2-1: MVG StarLab 50 GHz

Figure 2-2: Copper Mountain M5180 Vector Network Analyzer

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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

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5 SYSTEM SETUP AND COORDINATE SYSTEM

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

Ambient temperature = 25°C.

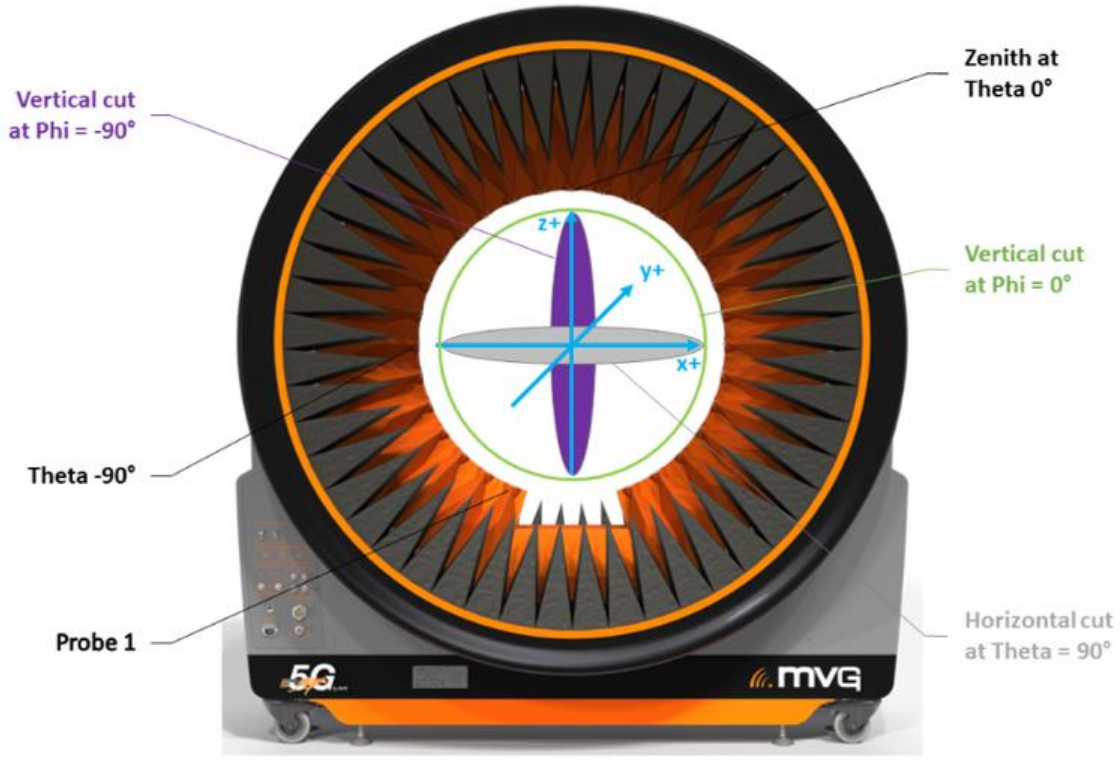

Figure 5-1: StarLab spherical coordinate system

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6 TEST RESULTS

Measurement set-up with reference coordinate system

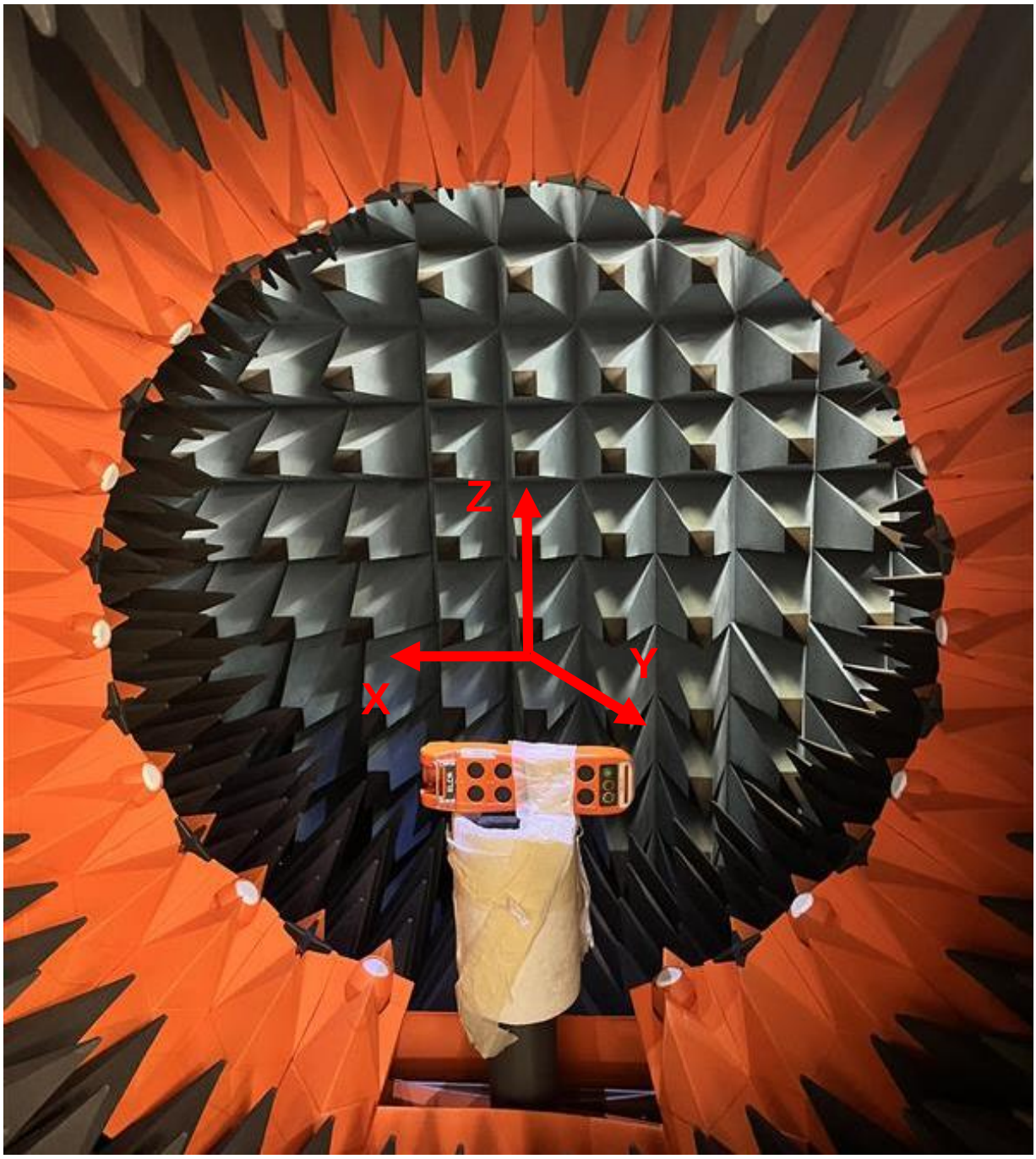

Figure 6-1: AT E29-MIA

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Gain

In the following graphs is reported the gain of the DUT: AT E29-MIA

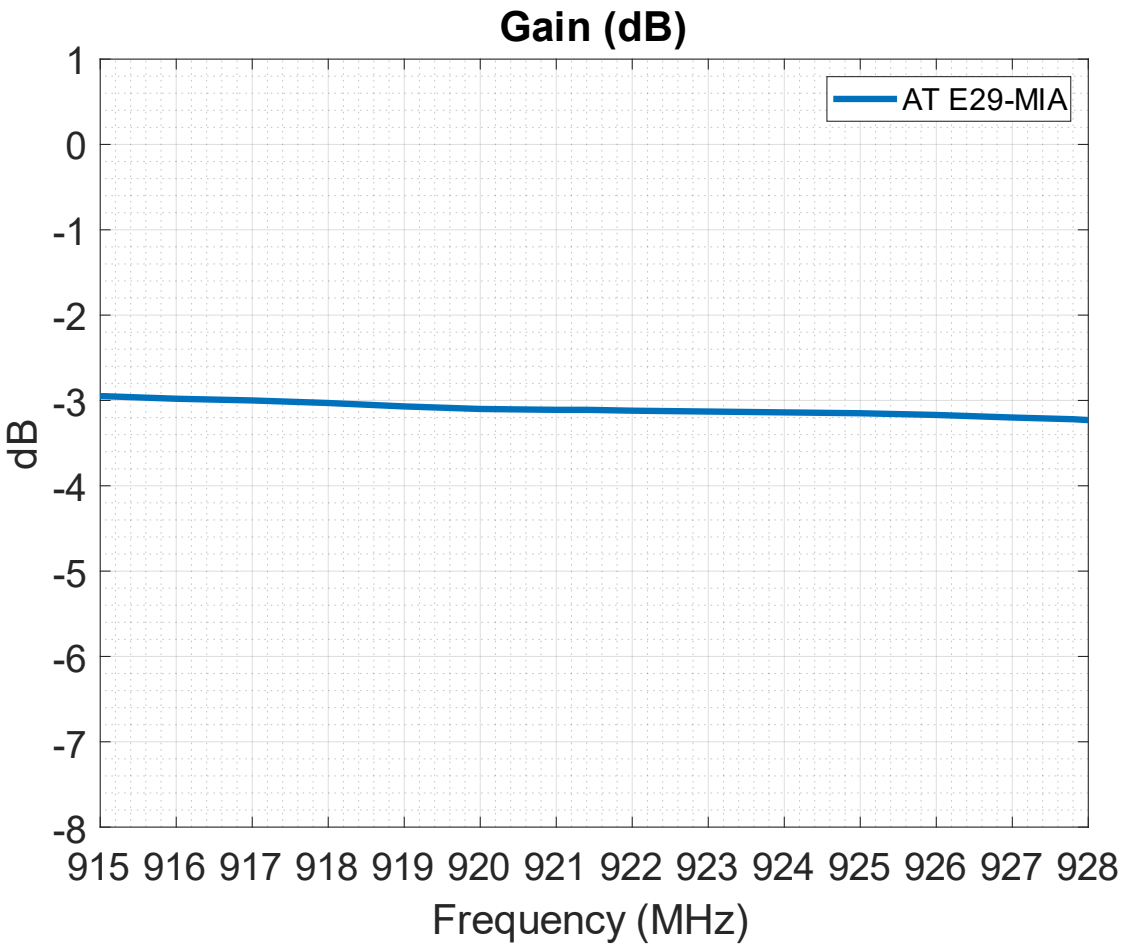

Figure 6-2: Peak gain over frequency

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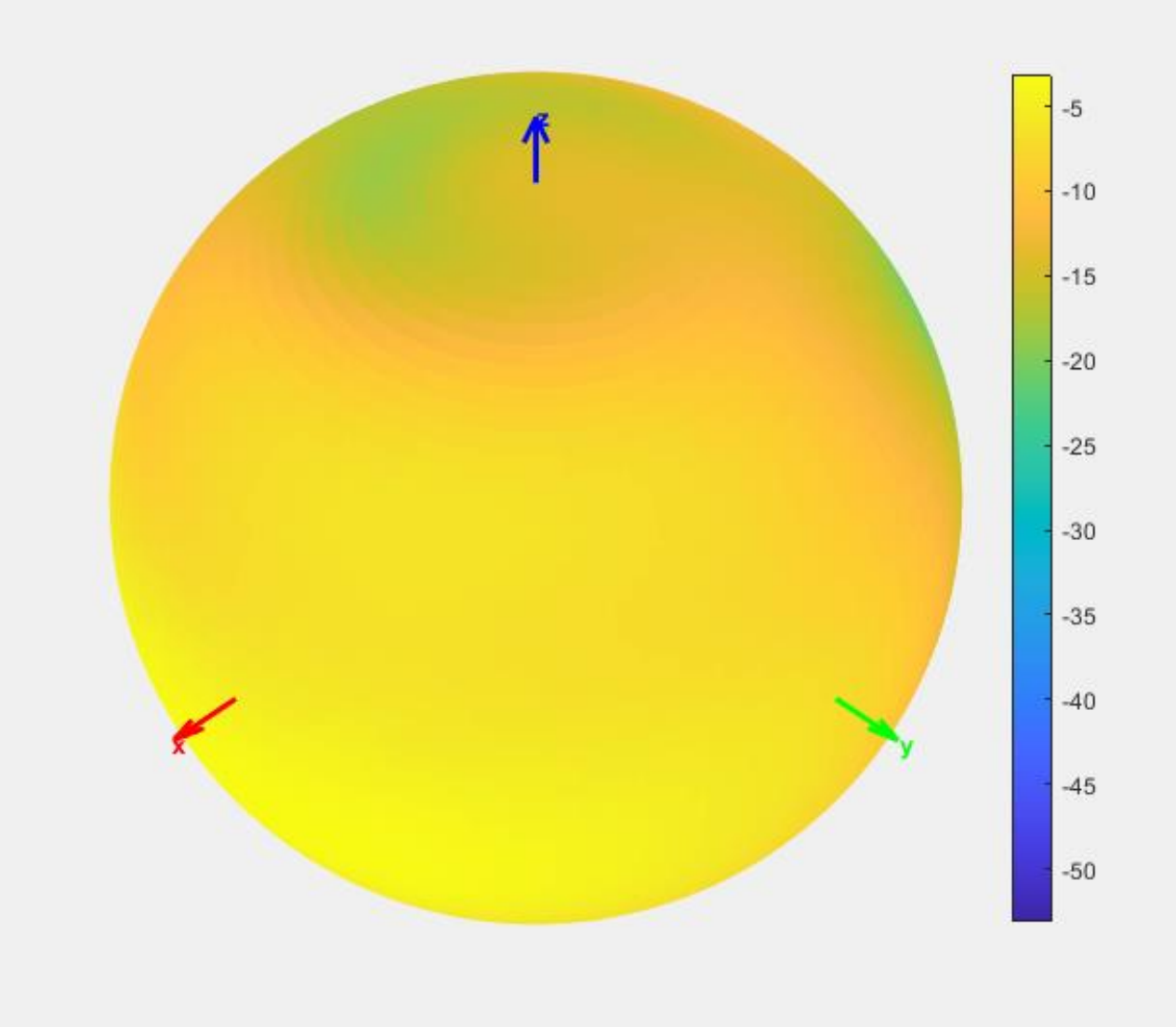

Figure 6-3: 3D gain pattern @921.4 MHz

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