



TEST REPORT

APPLICANT : Grundig Car Radio Ltd

PRODUCT NAME : Car Audio System

MODEL NAME : GX-3900

TRADE NAME : GRUNDIG

BRAND NAME : GRUNDIG

STANDARD(S) : IEEE Std 149-2021

RECEIPT DATE : 2023-11-21

TEST DATE : 2023-11-22

ISSUE DATE : 2024-01-04



Edited by:

Fang Jinshan

Fang Jinshan(Rapporteur)

Approved by:

Chi Shide

Chi Shide(Supervisor)

NOTE: This document is issued by Shenzhen Morlab Communications Technology Co., Ltd., the test report shall not be reproduced except in full without prior written permission of the company. The test results apply only to the particular sample(s) tested and to the specific tests carried out which is available on request for validation and information confirmed at our website.





DIRECTORY

- 1. Technical Information3**
- 1.1. Applicant and Manufacturer Information 3**
- 1.2. Equipment Under Test (EUT) Description3**
- 2. Test Results 4**
- 2.1. Applied Reference Documents4**
- 2.2. Test Conditions 4**
- 2.3. Measurement Uncertainty 4**
- 2.4. Test Results lists5**
- Annex A Test Setup Photos 6**
- Annex B Figures7**
- 1. 2D Radiation Pattern 7**
- 2. 3D Radiation Pattern 10**
- Annex C General Information13**
- 1.1 Identification of the Responsible Testing Laboratory13**
- 1.2 Identification of the Responsible Testing Location13**
- 1.3 Test Equipments Utilized 13**
- 1.4 Test Software Utilized13**
- Annex D EUT Photos**

Change History		
Version	Date	Reason for change
1.0	2024-01-04	First edition

1. Technical Information

Note: Provide by applicant.

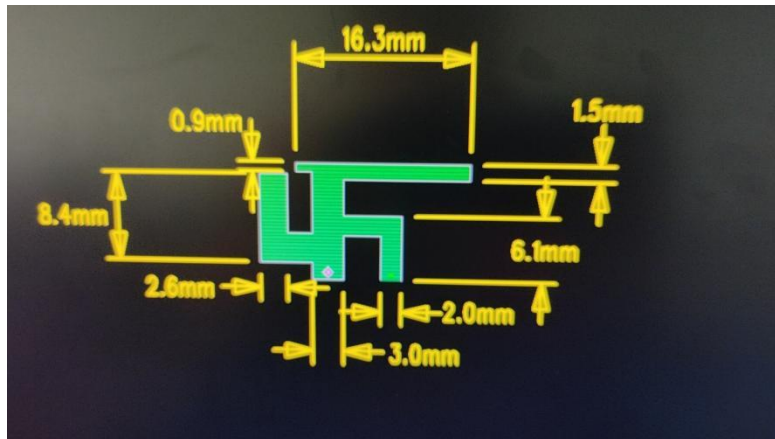
1.1. Applicant and Manufacturer Information

Applicant:	Grundig Car Radio Ltd
Applicant Address:	17/Floor, EU Yan Sang Bldg. 11-15 Chatham, Road South T. S.T, Kowloon, Hong Kong, China
Manufacturer:	Grundig Car Radio Ltd
Manufacturer Address:	17/Floor, EU Yan Sang Bldg. 11-15 Chatham, Road South T. S.T, Kowloon, Hong Kong, China
Factory:	Dongguan Team Force ELECTRONICS CO., LTD
Factory Address:	FULONG INDUSTRIAL ZONE, FULONG VILLAGE, SHIPAI TOWN, DONGGUAN, GUANGDONG PROVINCE, P.R. CHINA

1.2. Equipment Under Test (EUT) Description

Wireless Type	WiFi/Bluetooth
Frequency	2400MHz-2500MHz/5745MHz-5825MHz
Antenna Type	PCB Antenna
Hardware Version	Main Board: B37 Panel Board: B12
Software Version	V1
IMEI	N/A
Sample No.	14#

Dimension:



2. Test Results

2.1. Applied Reference Documents

Leading reference documents for testing:

No.	Identity	Document Title
1	IEEE Std 149-2021	IEEE Recommended Practice for Antenna Measurements

2.2. Test Conditions

Test Environment Conditions:

Relative Humidity(%):	25 - 75
Temperature(°C):	10 - 30

2.3. Measurement Uncertainty

The uncertainty is calculated using the methods suggested in the “Guide to the Expression of Uncertainty in Measurement” (GUM) published by ISO. When the test result is a critical value, we will use the measurement uncertainty give the judgment result based on the 95% Confidence intervals.

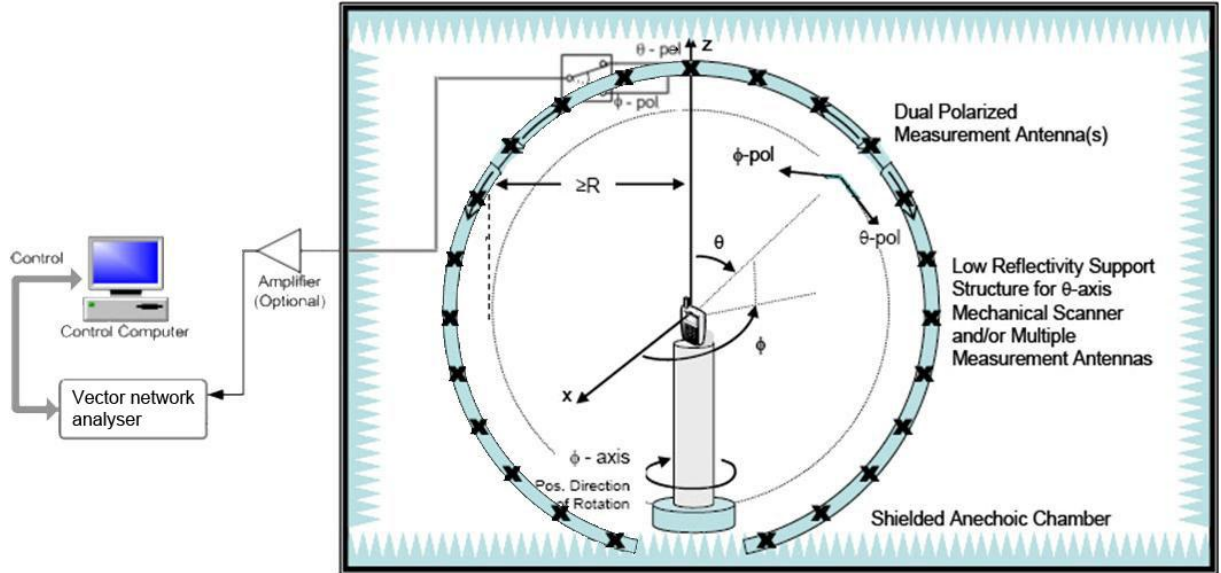


2.4. Test Results lists

2.4.1. Gain

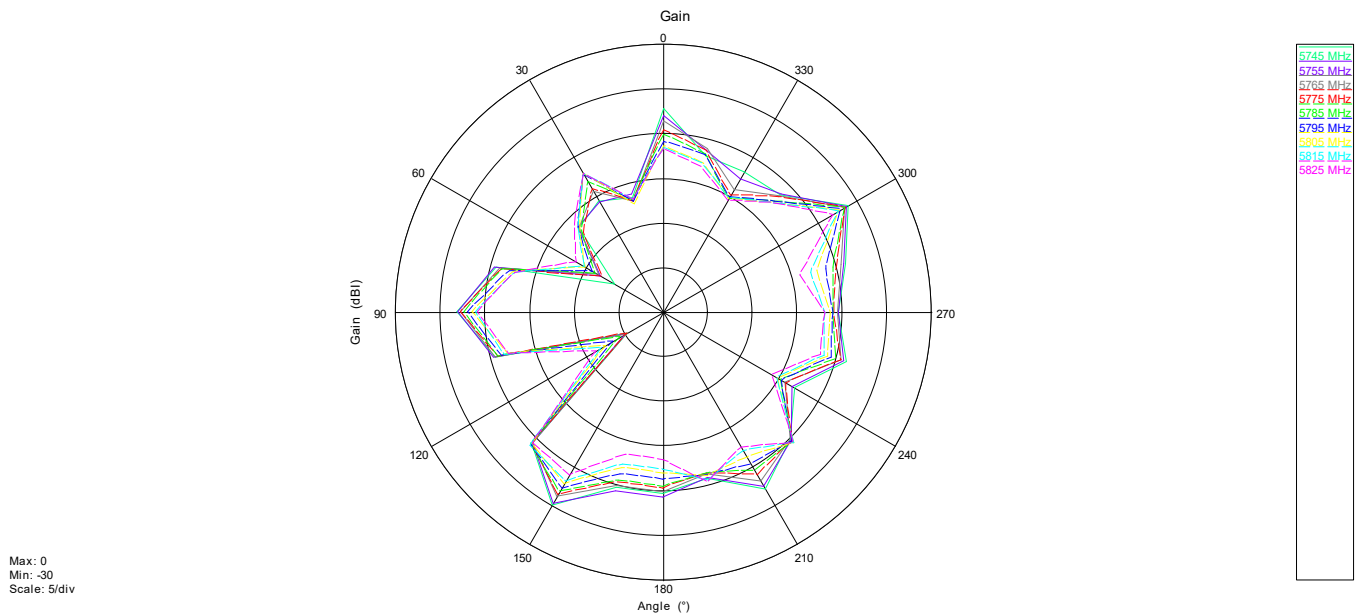
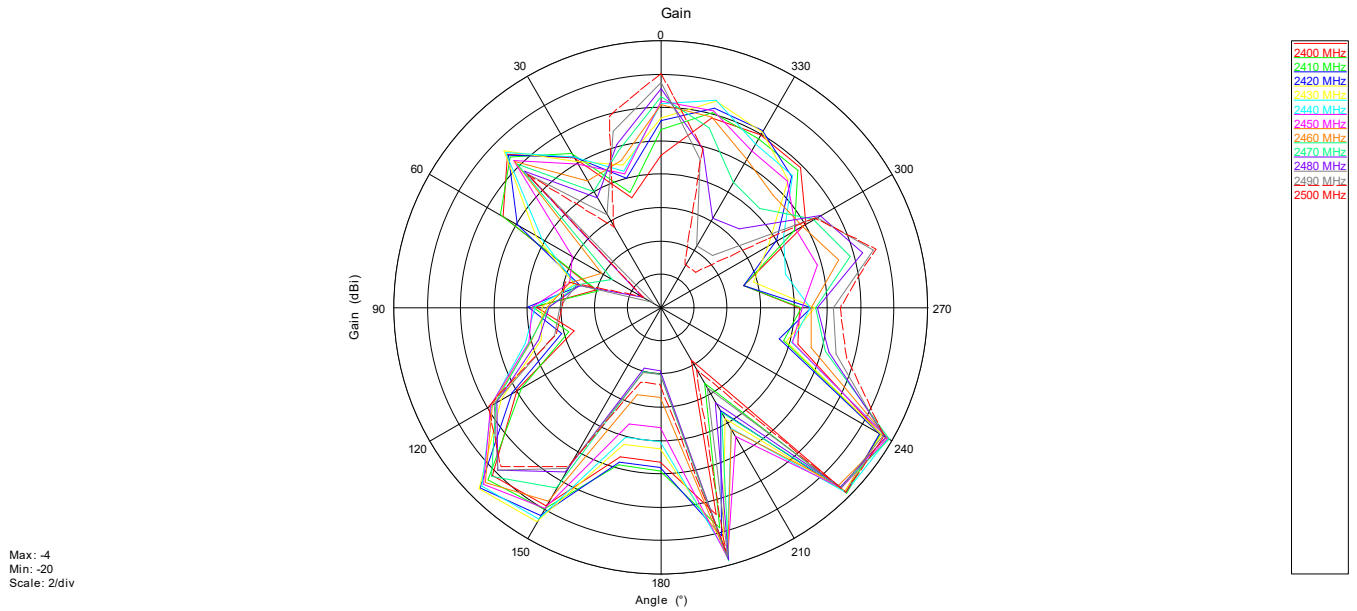
Frequency (MHz)	Gain(dBi)
2400	-4.46
2410	-4.30
2420	-4.08
2430	-3.61
2440	-2.85
2450	-2.65
2460	-2.89
2470	-3.10
2480	-2.81
2490	-2.55
2500	-2.31
5745	-2.02
5755	-2.32
5765	-2.78
5775	-3.00
5785	-3.46
5795	-3.93
5805	-4.27
5815	-4.54
5825	-5.18

Annex A Test Setup Photos

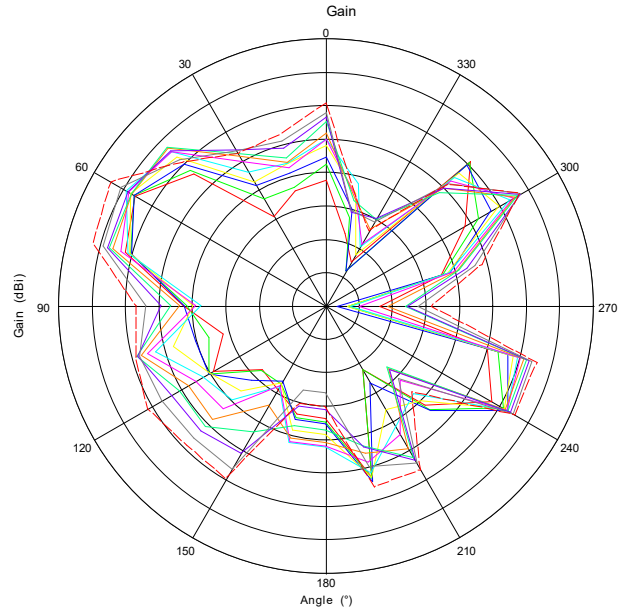


Annex B Figures

1. 2D Radiation Pattern

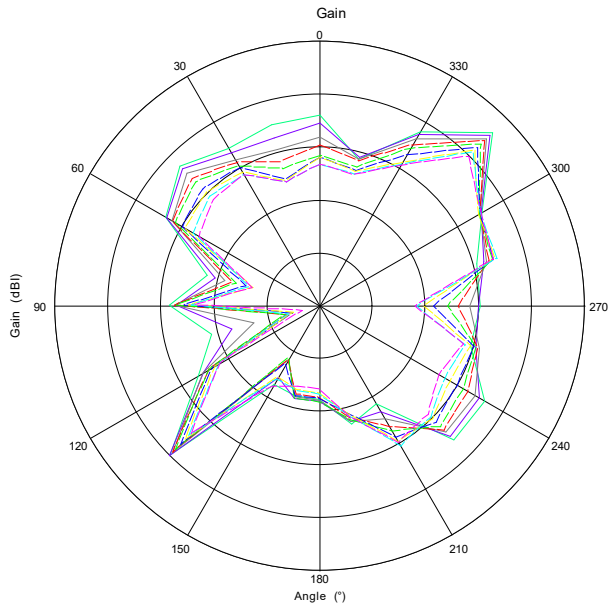


Phi=0°



Max: -2
Min: -18
Scale: 2/div

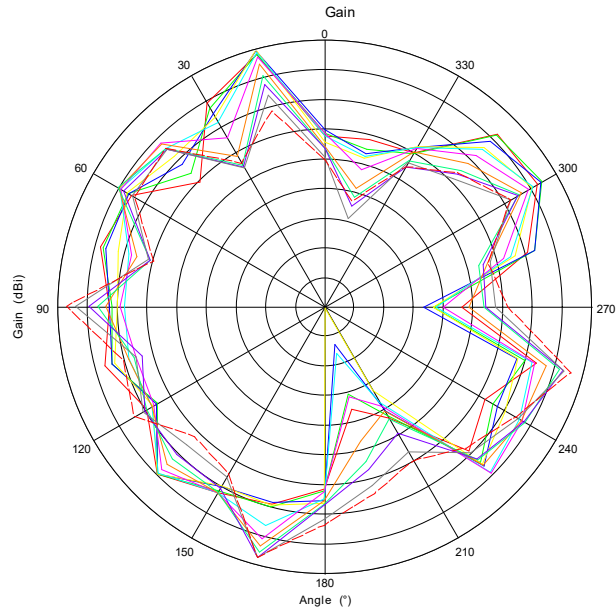
- 2400 MHz
- 2410 MHz
- 2420 MHz
- 2430 MHz
- 2440 MHz
- 2450 MHz
- 2460 MHz
- 2470 MHz
- 2480 MHz
- 2490 MHz
- 2500 MHz



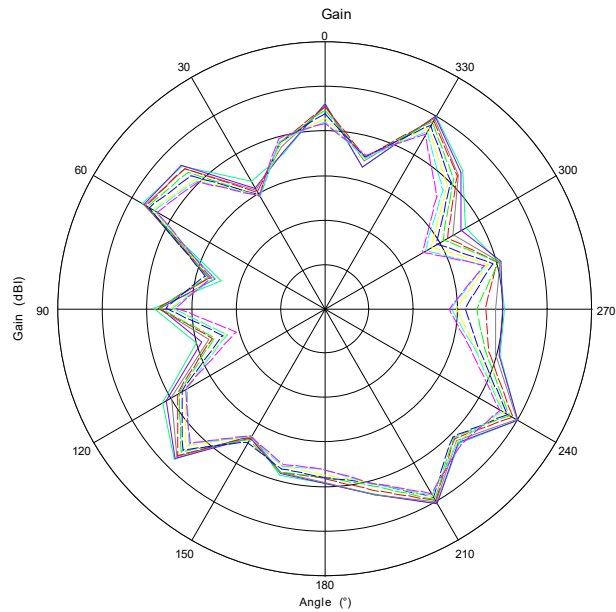
Max: 0
Min: -25
Scale: 5/div

- 5745 MHz
- 5755 MHz
- 5765 MHz
- 5775 MHz
- 5785 MHz
- 5795 MHz
- 5805 MHz
- 5815 MHz
- 5825 MHz

Phi=90°



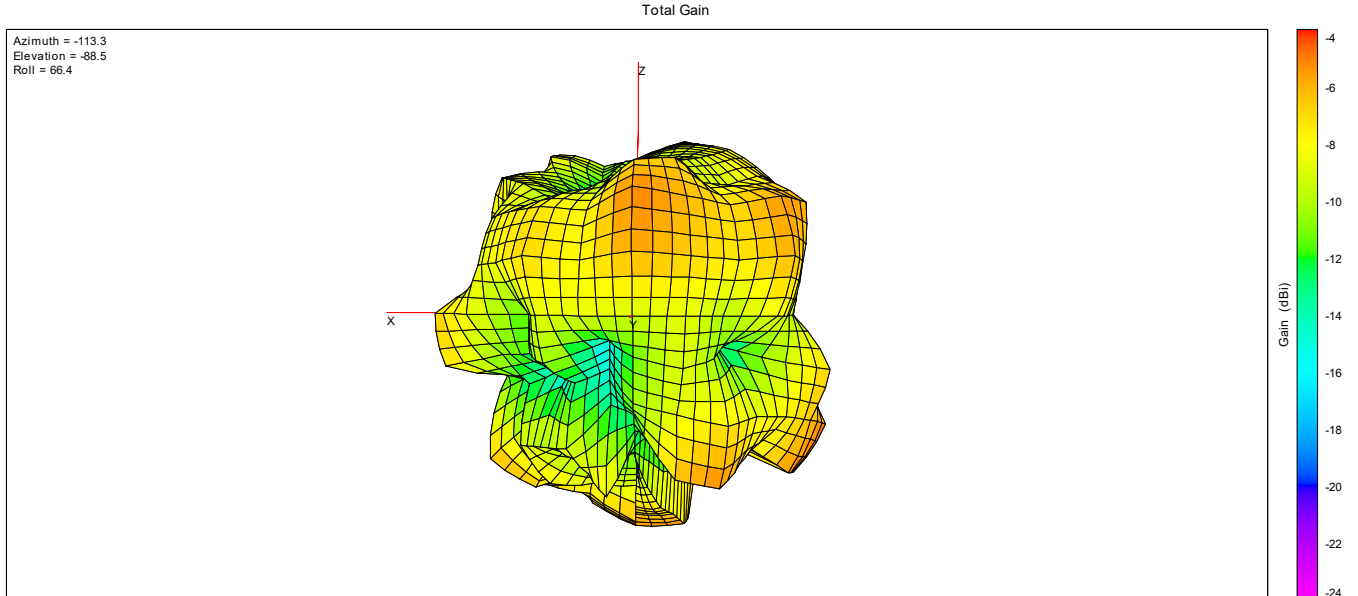
2400 MHz
2410 MHz
2420 MHz
2430 MHz
2440 MHz
2450 MHz
2460 MHz
2470 MHz
2480 MHz
2490 MHz
2500 MHz



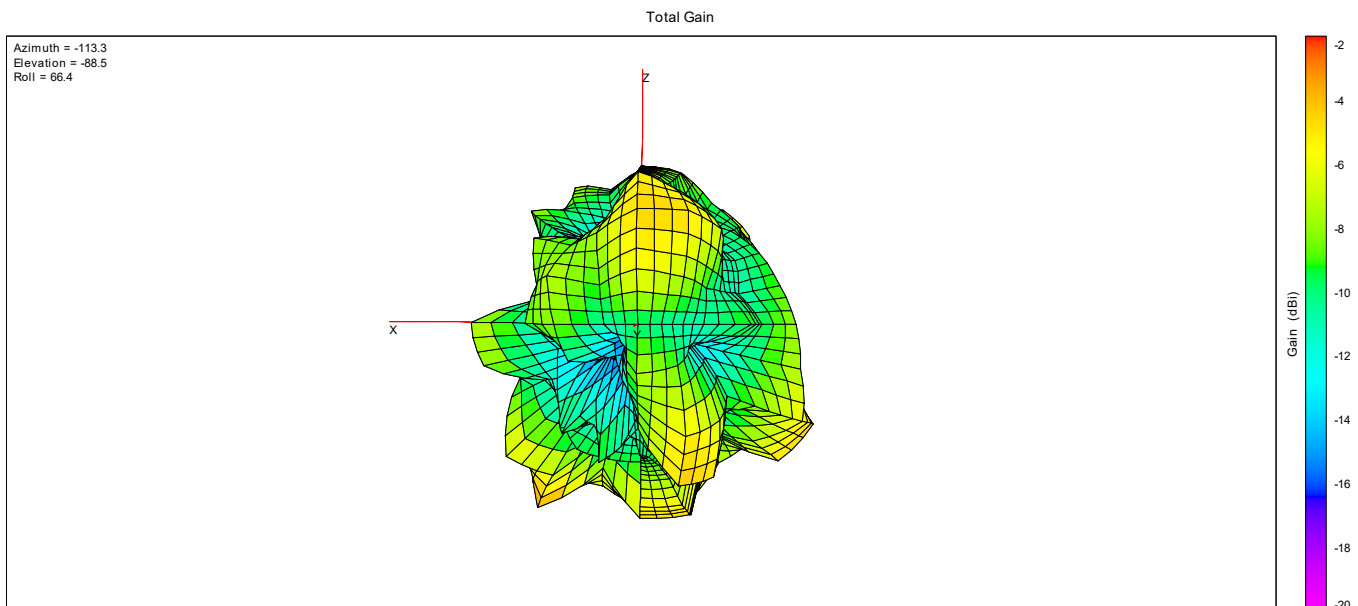
5745 MHz
5755 MHz
5765 MHz
5775 MHz
5785 MHz
5795 MHz
5805 MHz
5815 MHz
5825 MHz

Theta=90°

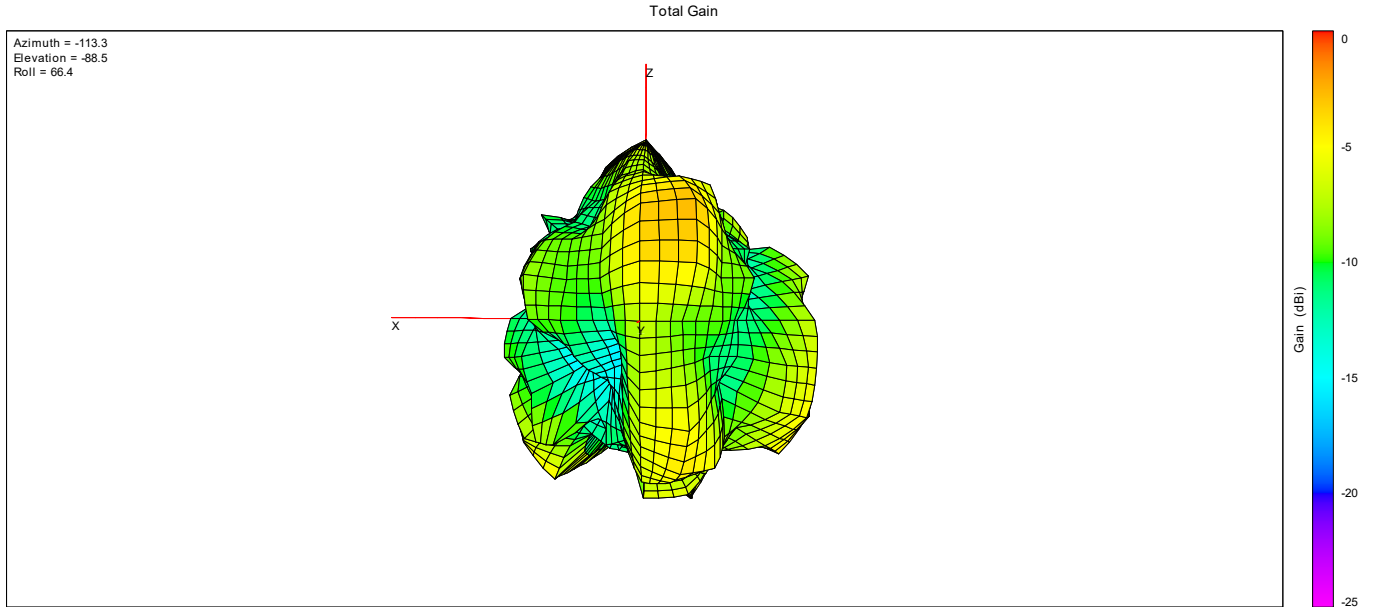
2. 3D Radiation Pattern



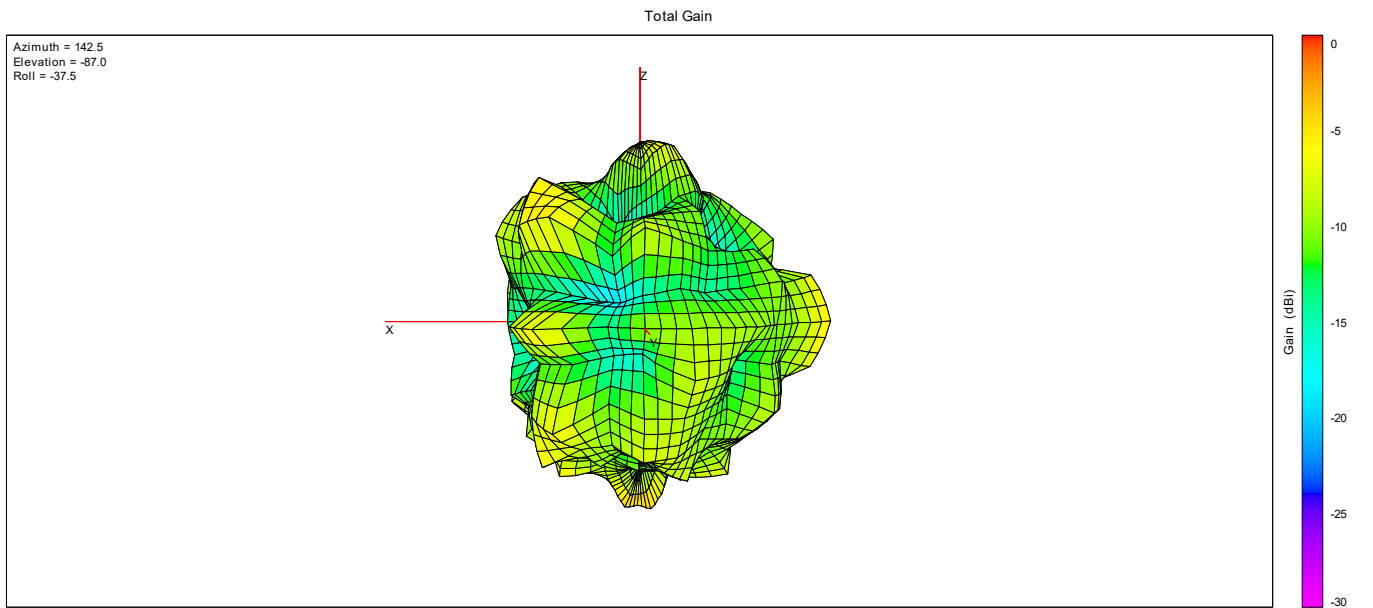
2400MHz



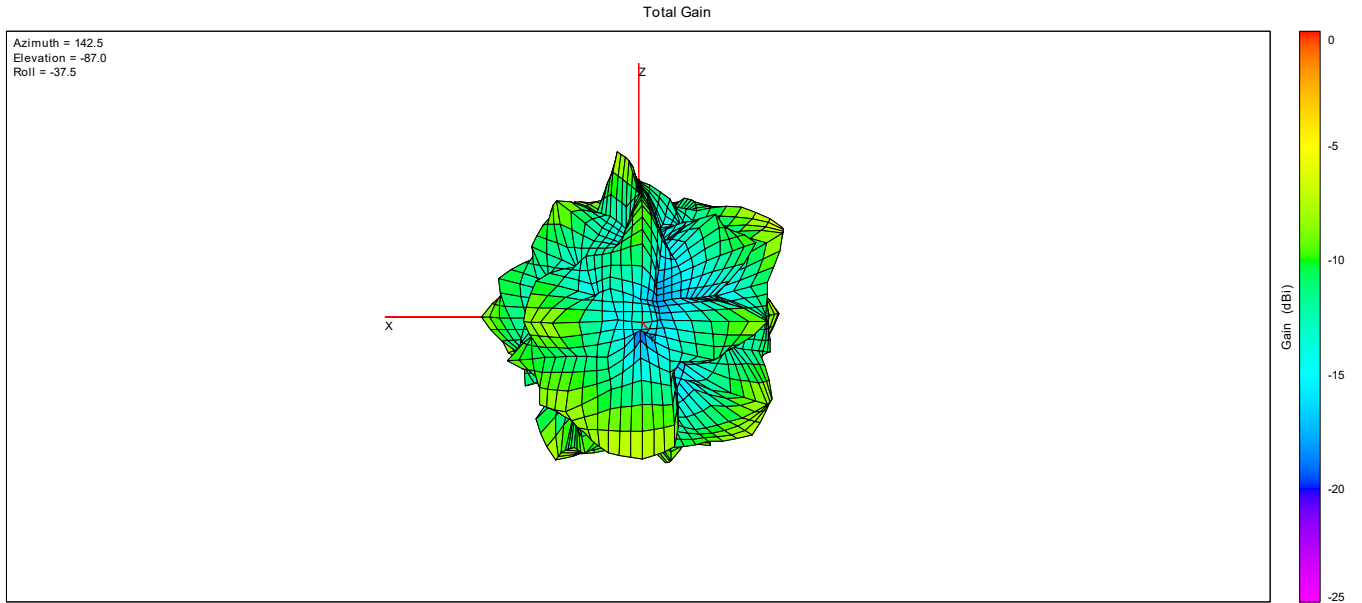
2450MHz



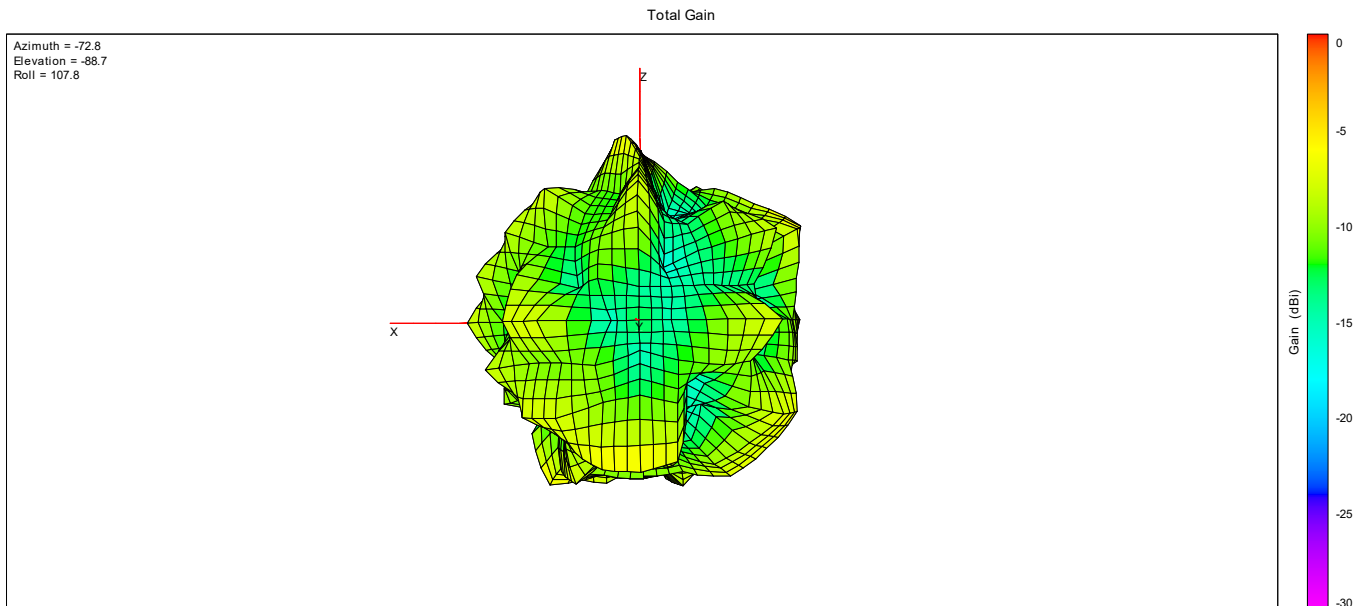
2500MHz



5745MHz



5755MHz



5825MHz



Annex C General Information

1.1 Identification of the Responsible Testing Laboratory

Laboratory Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Laboratory Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , Guangdong Province, P. R. China
Telephone:	+86 755 36698555
Facsimile:	+86 755 36698525

1.2 Identification of the Responsible Testing Location

Name:	Shenzhen Morlab Communications Technology Co., Ltd.
Address:	FL.1-3, Building A, FeiYang Science Park, No.8 LongChang Road, Block67, BaoAn District, ShenZhen , Guangdong Province, P. R. China

1.3 Test Equipments Utilized

No.	Equipement Name	Serial No.	Type	Manufacturer	Cal.Date	Cal.Due Date
1	Network Analyzer	MY46110140	E5071C	Agilent	2023.06.21	2024.06.20
2	OTA Chamber	TJ2235-Q1793	AMS-8923 -150	ETS	2022.11.30	2025.11.29

1.4 Test Software Utilized

No.	Software Name	Serial No.	Type	Manufacturer
1	Antenna Measurement System	1685	EMQuest EMQ-100 V 1.13 Build 21267	ETS

Note:The Main report is end here and the other Annex D will be submitted separately.

————— END OF REPORT —————