

3D Antenna Measurement Summary Report

REPORT NO.: ORCCOG-WTW-P23040703 R1

MODEL NAME: PAS400

TESTED DATE: 2023.5.9

ISSUED: 2023.6.2

APPLICANT : Schneider Electric Industries SAS

ADDRESS : Electropole Site - 38EQ1, 31 rue Pierre Mendes France,
Eybens - 38050 Grenoble cedex 9

ISSUED BY: Bureau Veritas Consumer Products Services (Hong Kong)
Limited, Taoyuan Branch Mobile Communications Laboratory

ADDRESS: No.19, Hwa Ya 2nd Rd., Kwei shan Dist., Taoyuan City, Taiwan
(R.O.C)

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RELEASE CONTROL RECORD

REPORT NO.	REASON FOR CHANGE	DATE ISSUED
ORCCOG-WTW-P23040703	Original release	2023.5.24
ORCCOG-WTW-P23040703 R1	Update antenna information	2023.6.2

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GENERAL INFORMATION

APPLICANT:	Schneider Electric Industries SAS
MANUFACTURER:	Schneider Electric Industries SAS
MODEL NAME:	PAS400
MEASUREMENT STATNDARD	ANSI/IEEE 149 1979.

TESTED BY : Leo Chen , **DATE :** 2023.6.2
Leo Chen / Engineer

PREPARED BY : Johnny Liu , **DATE :** 2023.6.2
Johnny Liu / Supervisor

APPROVED BY : Ken Chan , **DATE :** 2023.6.2
Ken Chan / Manager

1. Test Methods

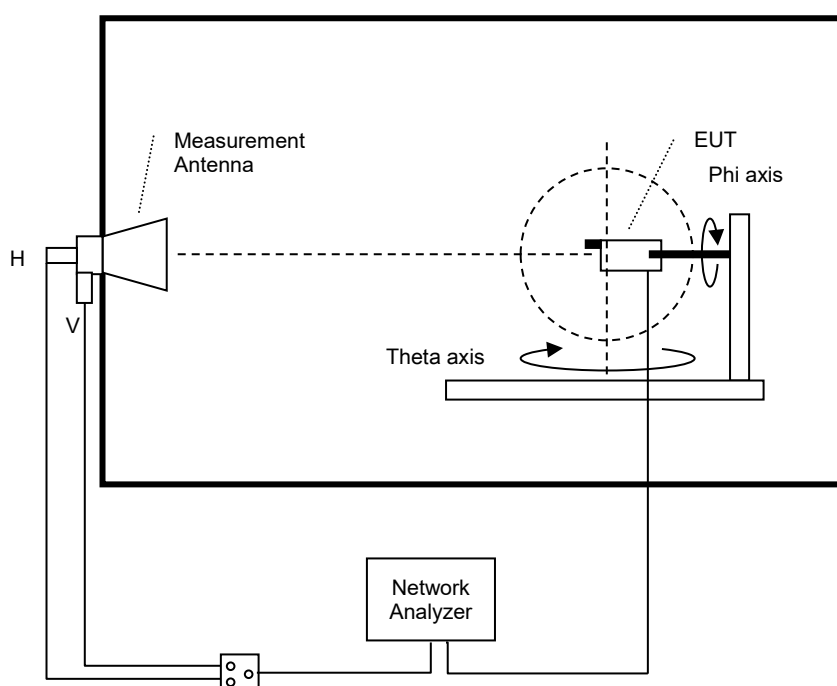
The Antenna Gain Test is performed according to The ANSI/IEEE Std 149 12.3.1 Antenna Gain (Small size (< 42cm) Linear Polarization Antennas), using a two-axis support device and one fixed measurement antenna. The EUT is positioned along the required MAPS centerline fixture holder. The EUT is then stepped between 0 and 180 degrees along the theta axis in 15-degree increments. At each theta position, the phi axis is stepped from 0-360 degrees in 15-degree increments. Data is recorded using the Network analyzer for both theta and phi polarizations at each position. Depending on the protocol, an appropriate filter is used in the EMQuest software to process the data. Upon completion of the test, test results (angular dependent EIRP) is calculated at each measurement point and the required value is automatically calculated. This test procedure is repeated for frequency and configuration as required.

2. Description of the anechoic chamber:

Length: 7.32 m

Width: 3.66 m

Height: 3.51 m



3. Test Equipment List

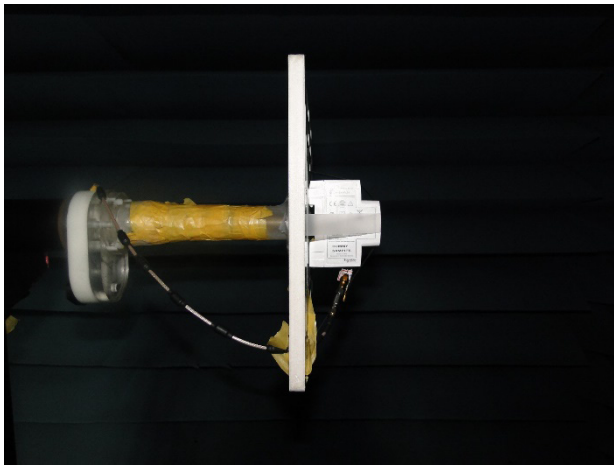
TYPE OF EQUIPMENT	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
(OTA3-HY) ETS Anechoic Chamber	ETS-Lindgren AMS-8500	CT0000411-1132	N/A
Measurement Software	ETS-Lindgren EMQuest V1.14 build 31654	1281	N/A
Multi-Axis Positioning System	ETS-Lindgren 2090-OPTI	00086248	N/A
Switch Control	Agilent 3499A	MY42005285	N/A
Network Analyzer	Agilent E5071C	MY46104190	2023/5/29

4. Measurement Uncertainty

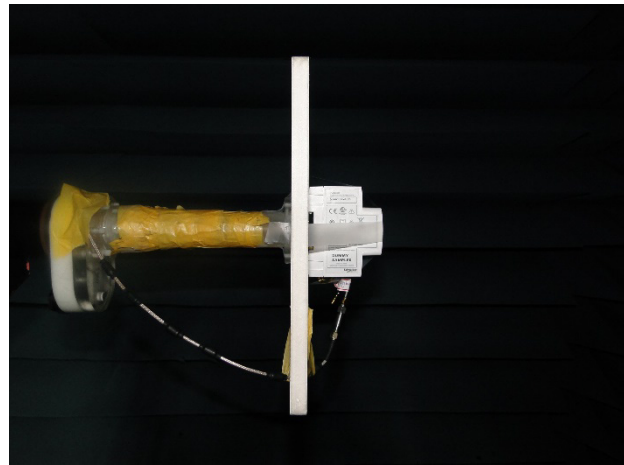
Expanded Uncertainty for Measurement ($k=2$ or 95.45% Confidence Level) at Passive antenna test over frequency range:.

FREQUENCY RANGE	MEASUREMENT UNCERTAINTY
780~2200 MHz	1.40 dB
2200~3000 MHz	1.72 dB
3000~6000 MHz	3.86 dB

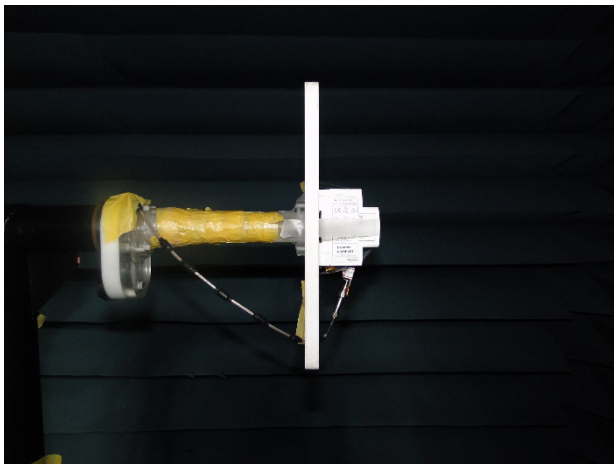
5. Testing Setup Photo



With PCB Antenna ANT1_1



With PCB Antenna U8_1



With PCB Antenna U7_1

6. Antenna Radiation Performance

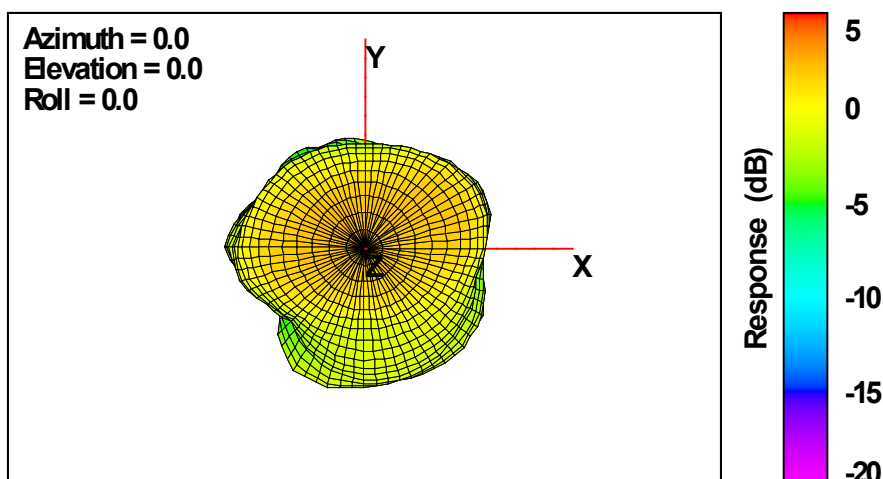
With PCB Antenna U8_1			
Frequency (MHz)	2400	2440	2500
Average Gain (dBi)	-3.15	-3.16	-3.34
Peak Gain (dBi)	2.44	2.60	2.14
Efficiency (%)	48.42	48.29	46.37
With PCB Antenna U7_1			
Frequency (MHz)	2400	2440	2500
Average Gain (dBi)	-2.21	-2.61	-3.52
Peak Gain (dBi)	3.03	2.73	1.18
Efficiency (%)	60.10	54.87	44.45

With PCB Antenna ANT1_1									
Frequency (MHz)	2400	2440	2500	5150	5250	5350	5500	5725	5825
Average Gain (dBi)	-2.25	-2.36	-2.82	-3.73	-4.57	-5.72	-7.28	-7.90	-7.75
Peak Gain (dBi)	3.22	3.06	2.80	2.94	2.28	1.24	-0.30	-1.08	-0.92
Efficiency (%)	59.63	58.08	52.23	42.36	34.89	26.82	18.72	16.23	16.80

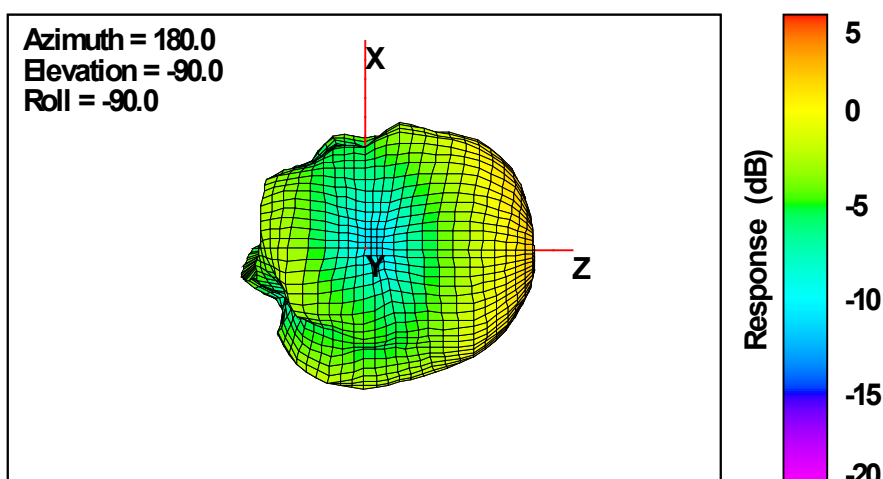
7. 3D Antenna Patterns

7.1. With PCB Antenna U8_1

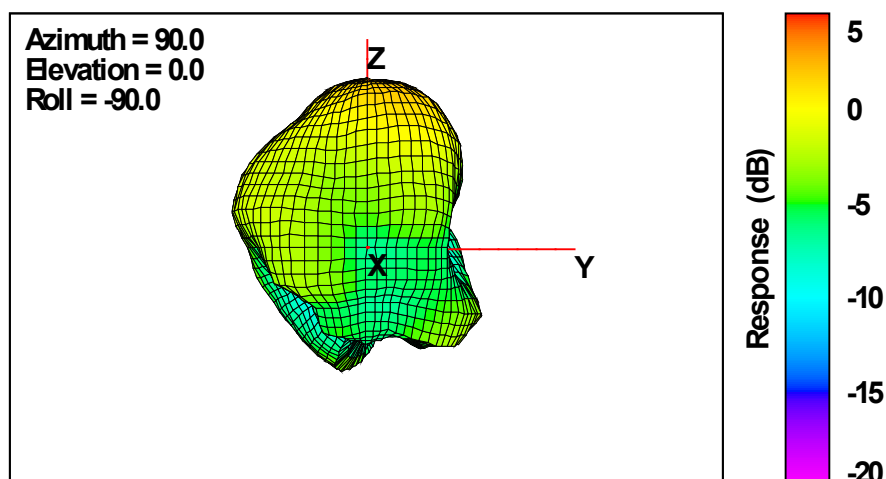
2400MHz
Total



Total

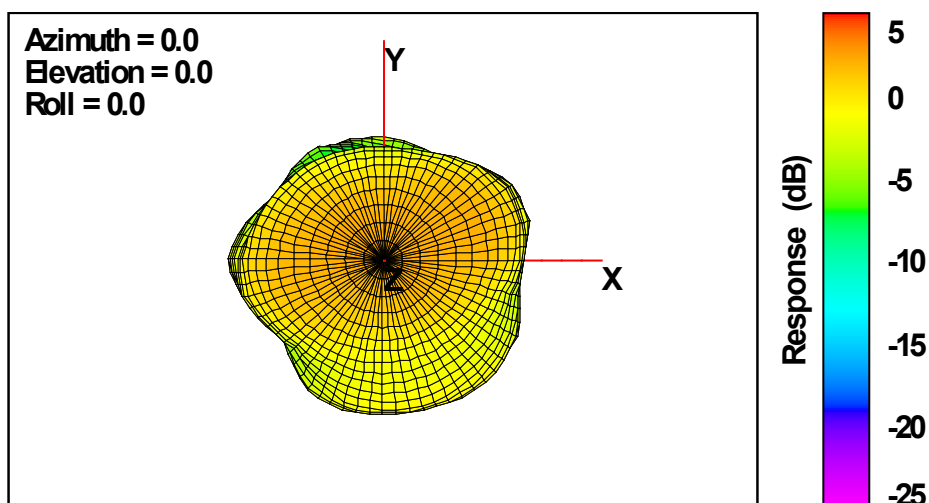


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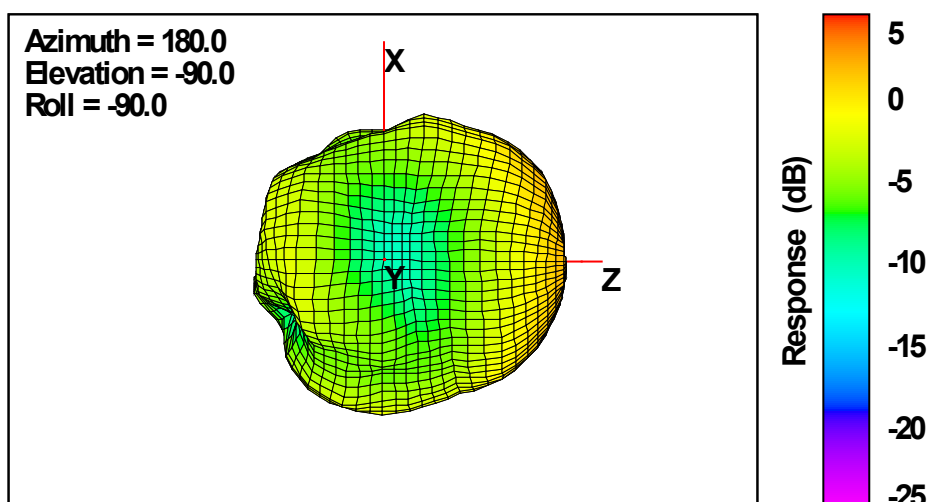


Frequency (MHz)	2400
Average Gain (dBi)	-3.15
Peak Gain (dBi)	2.44
Efficiency (%)	48.42

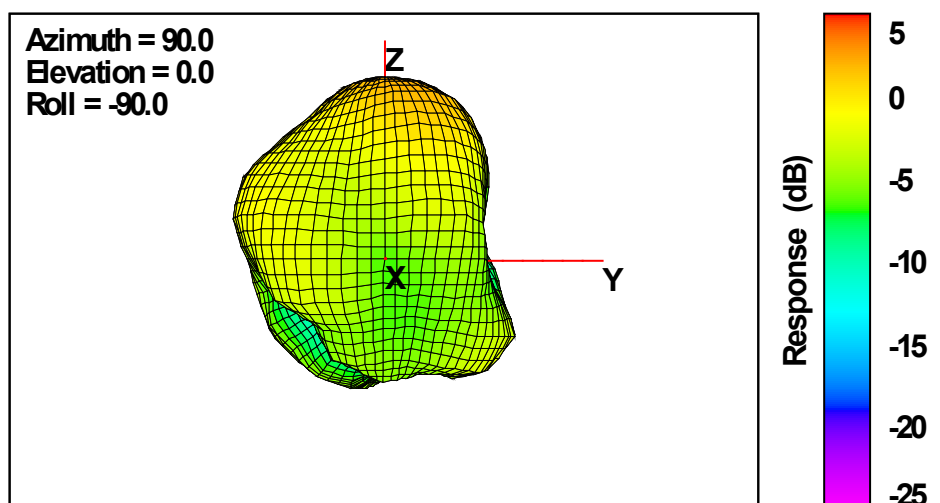
**2450MHz
Total**



Total

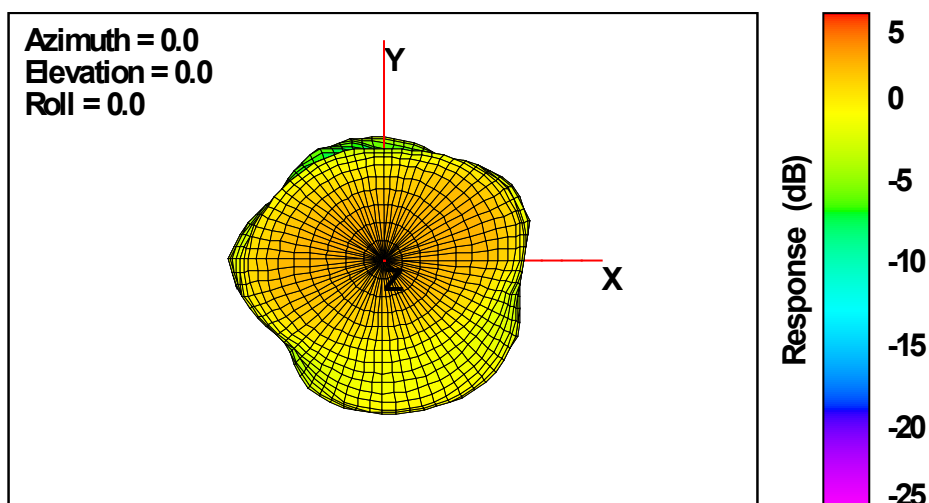


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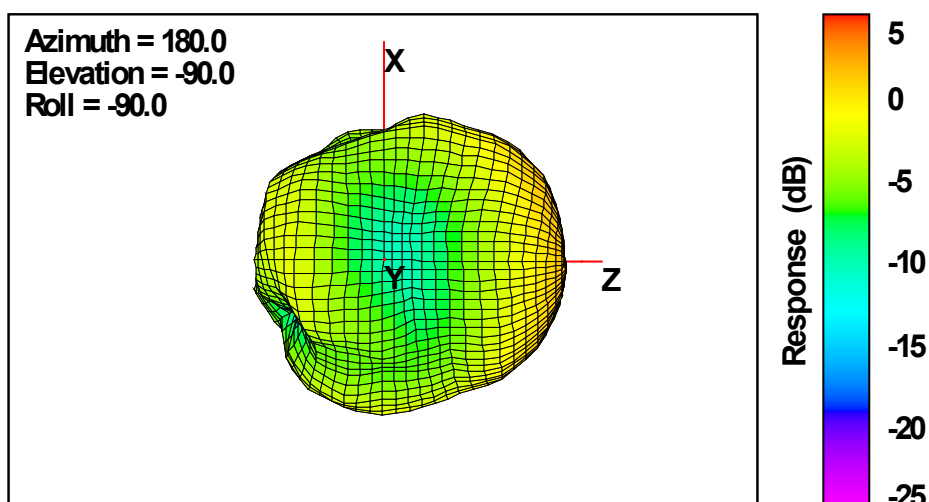


Frequency (MHz)	2440
Average Gain (dBi)	-3.16
Peak Gain (dBi)	2.60
Efficiency (%)	48.29

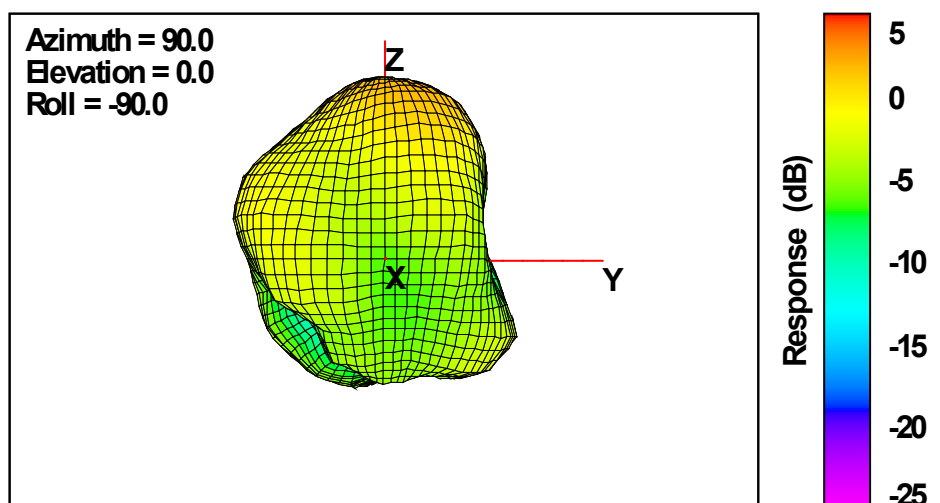
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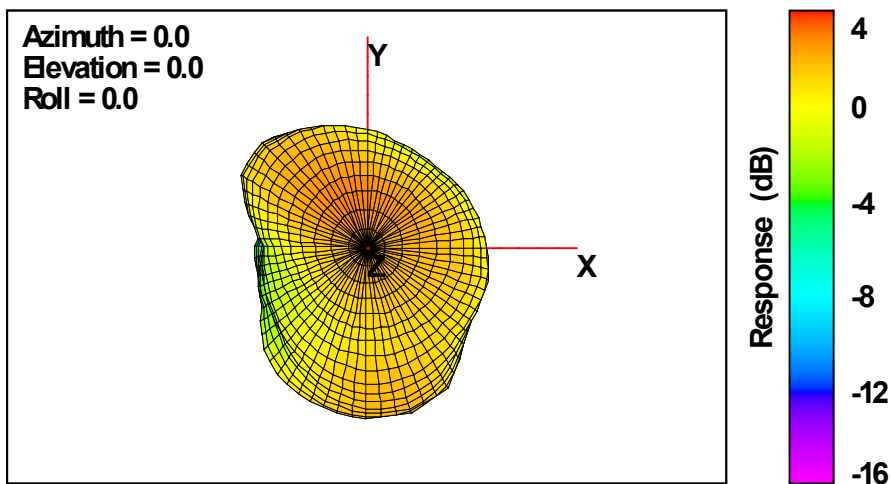
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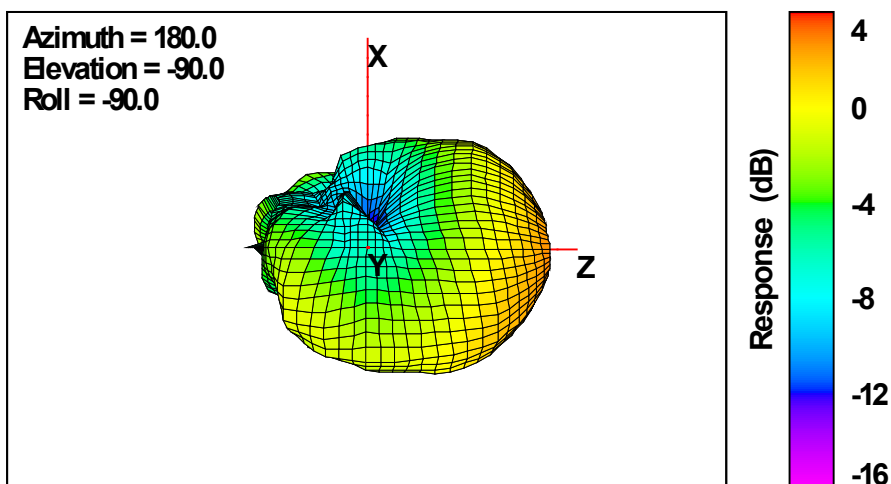
Frequency (MHz)	2500
Average Gain (dBi)	-3.34
Peak Gain (dBi)	2.14
Efficiency (%)	46.37

7.2. With PCB Antenna U7_1

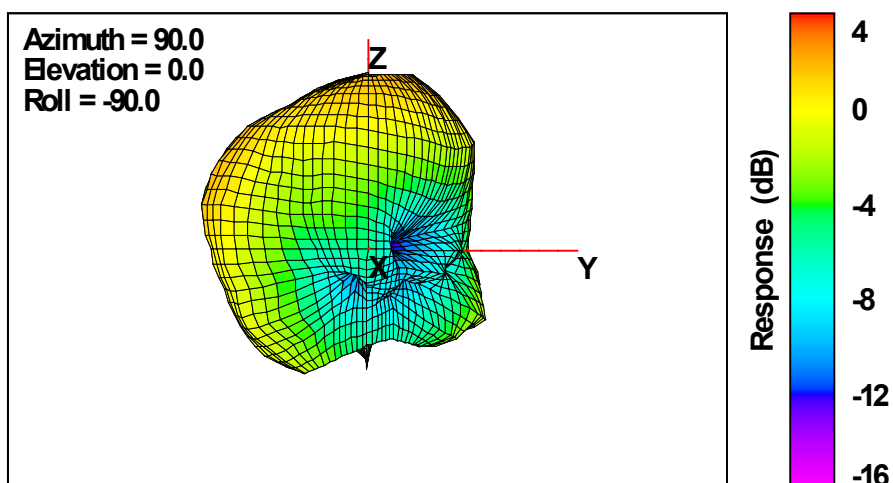
2400MHz
Total



Total

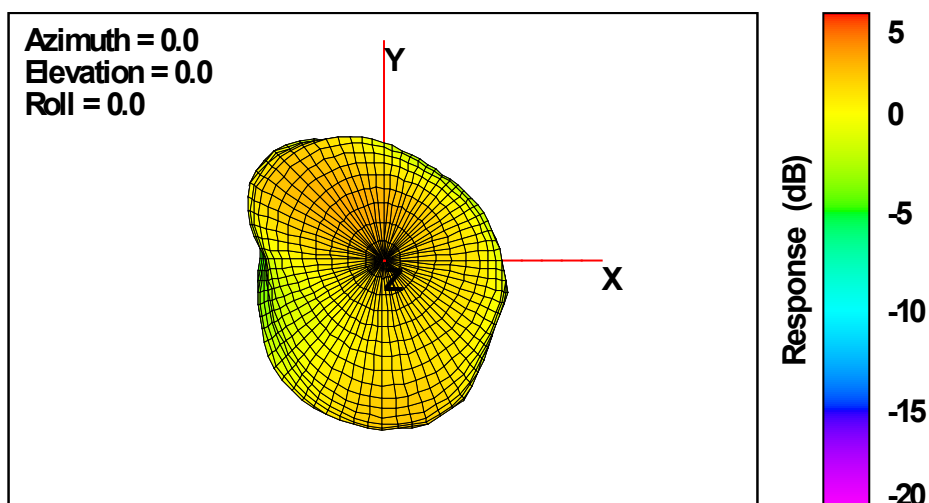


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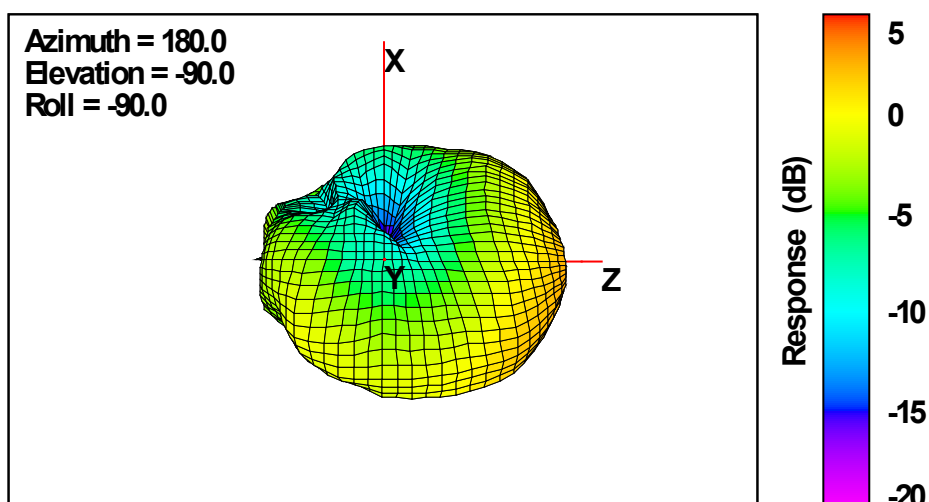


Frequency (MHz)	2400
Average Gain (dBi)	-2.21
Peak Gain (dBi)	3.03
Efficiency (%)	60.10

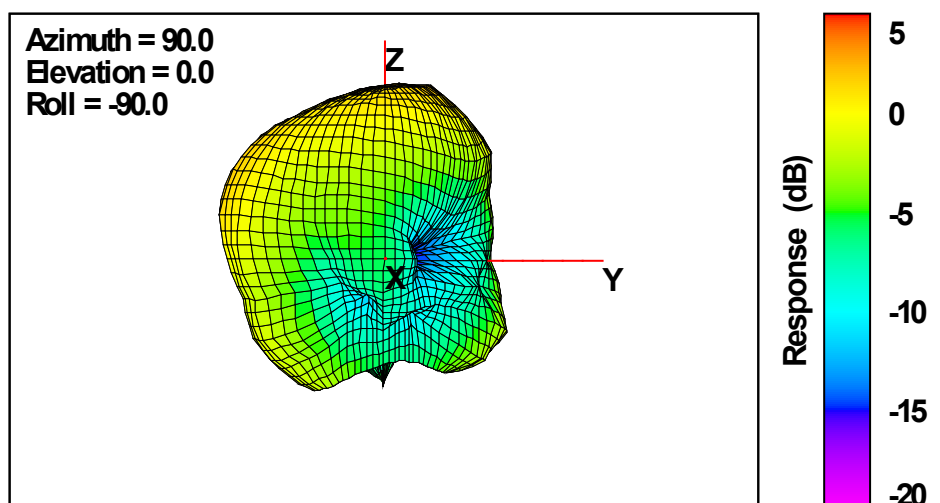
**2450MHz
Total**



Total

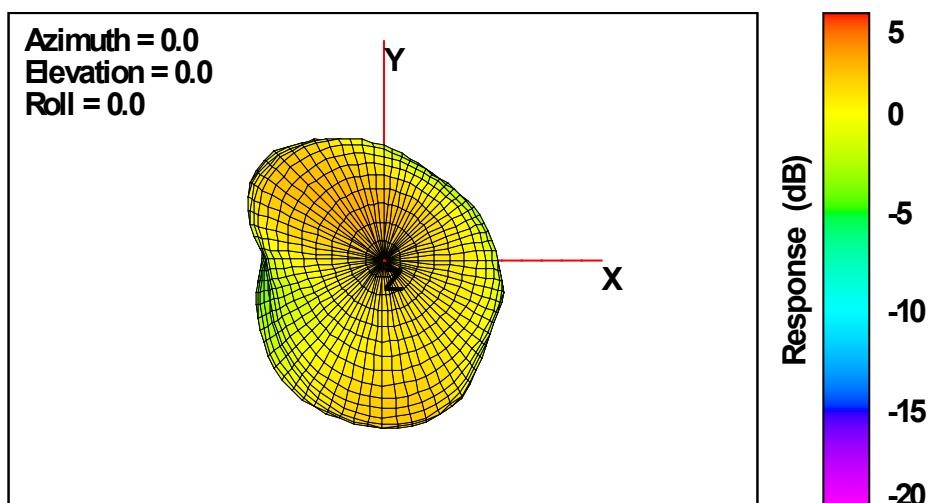


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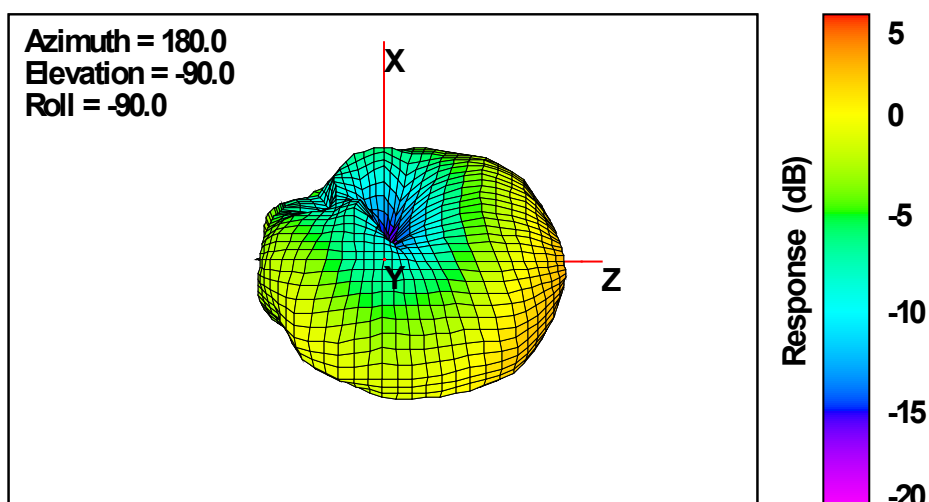


Frequency (MHz)	2440
Average Gain (dBi)	-2.61
Peak Gain (dBi)	2.73
Efficiency (%)	54.87

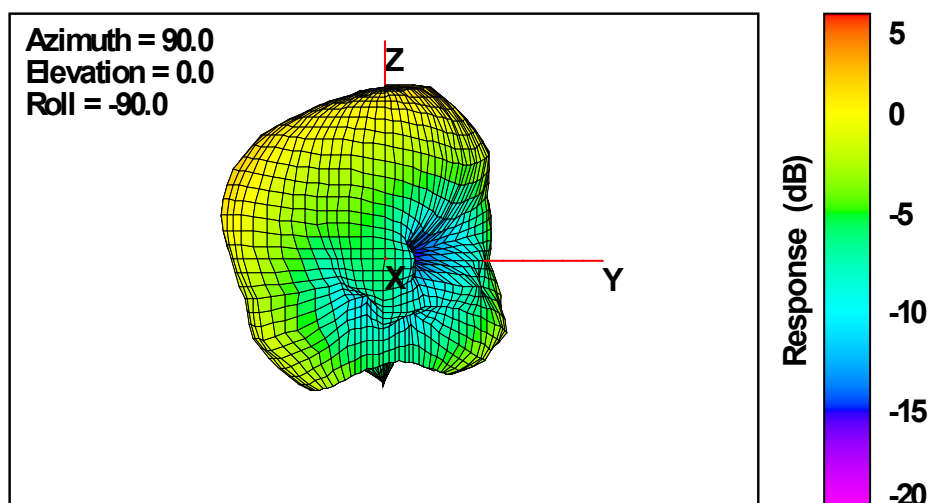
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Total**



Total



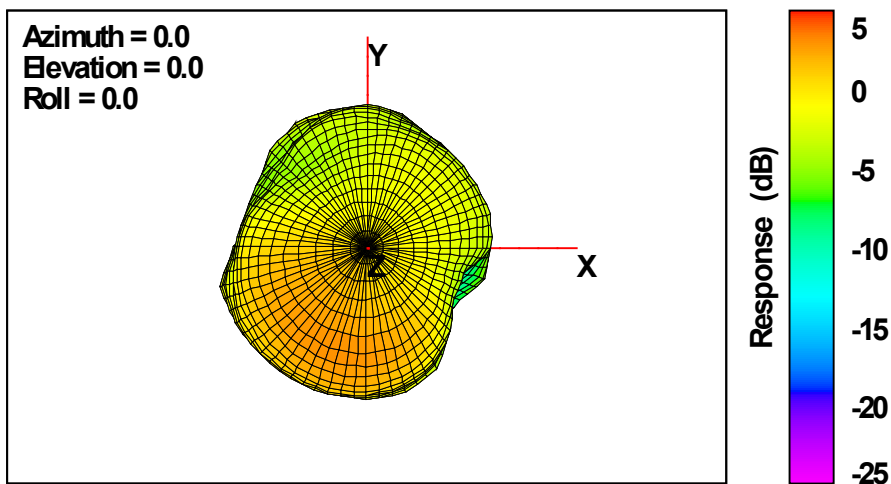
Total



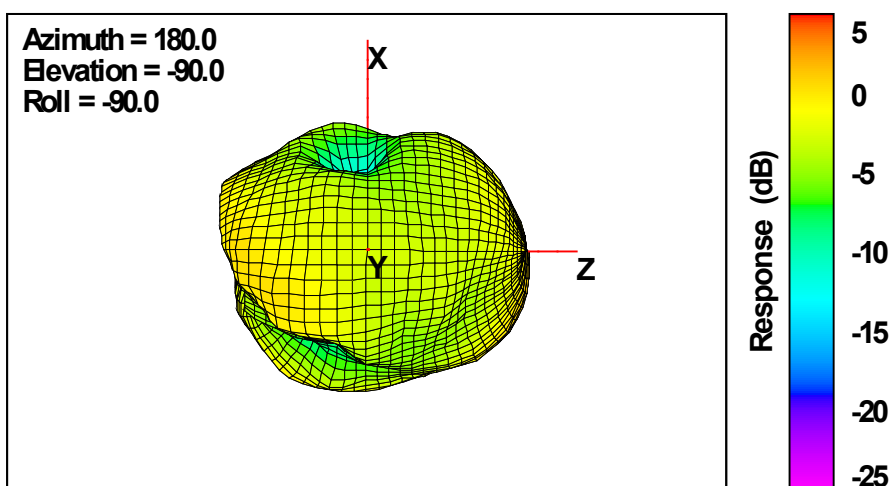
Frequency (MHz)	2500
Average Gain (dBi)	-3.52
Peak Gain (dBi)	1.18
Efficiency (%)	44.45

7.3. With PCB Antenna ANT1_1

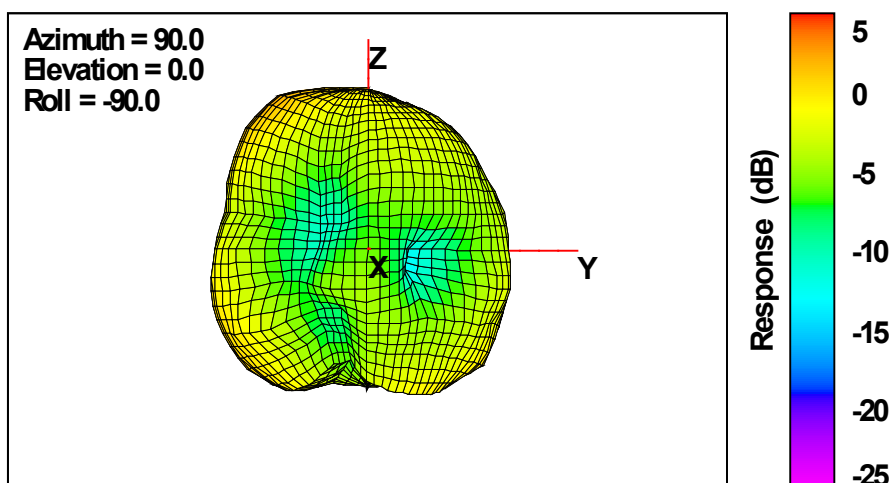
2400MHz
Total



Total

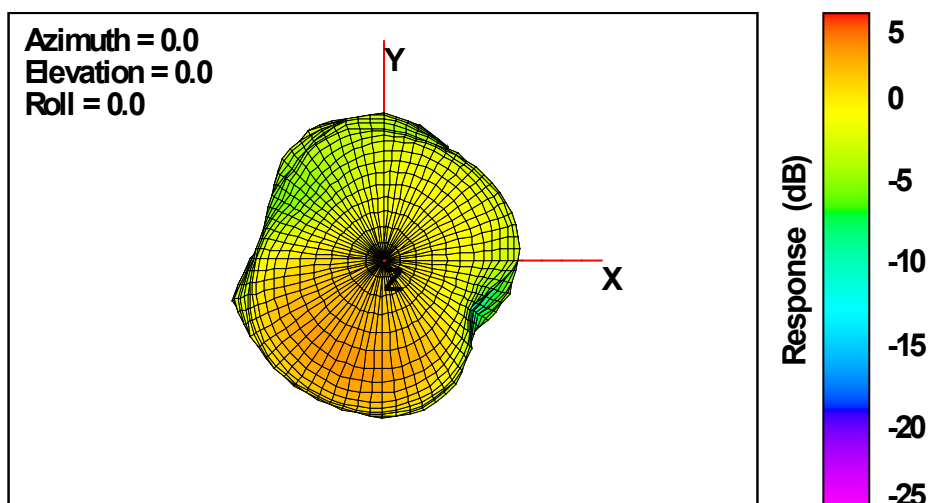


Total

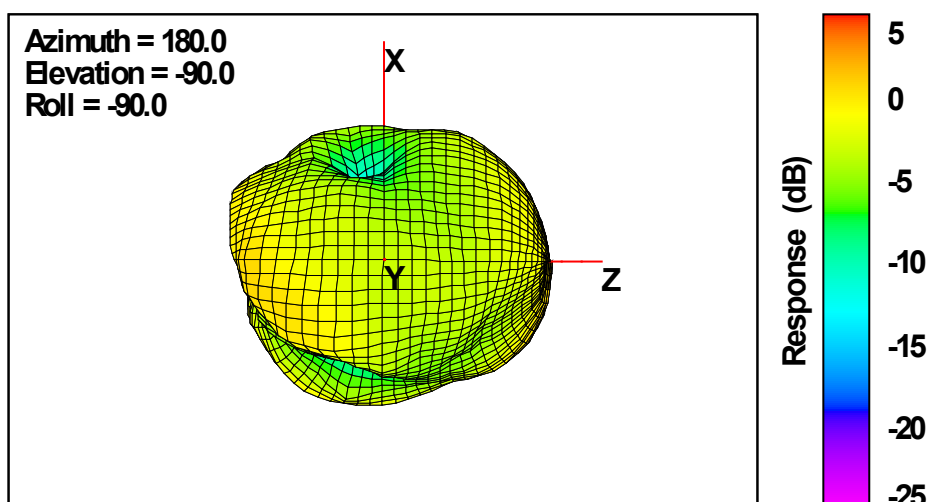


Frequency (MHz)	2400
Average Gain (dBi)	-2.25
Peak Gain (dBi)	3.22
Efficiency (%)	59.63

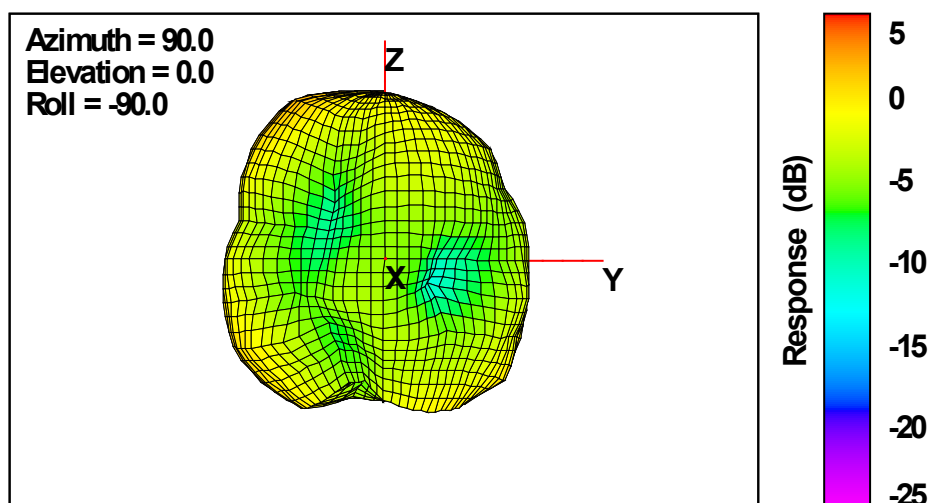
**2440MHz
Total**



Total

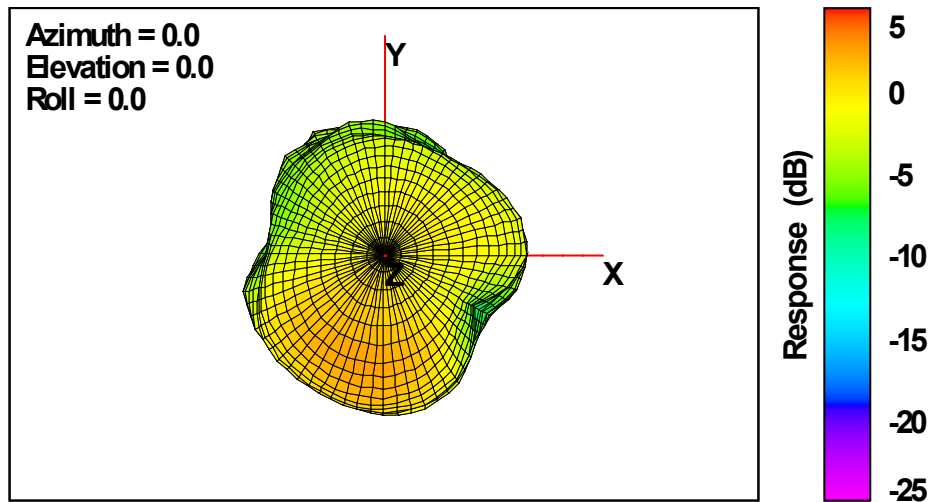


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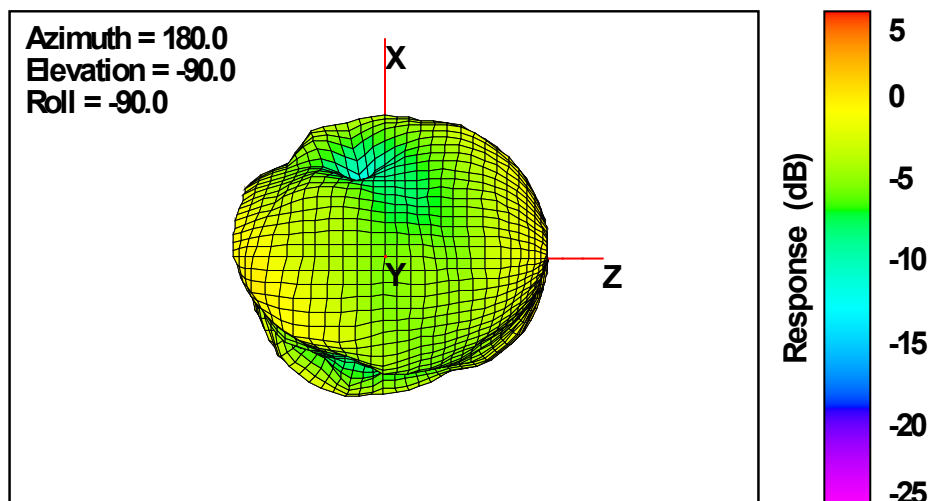


Frequency (MHz)	2440
Average Gain (dBi)	-2.36
Peak Gain (dBi)	3.06
Efficiency (%)	58.08

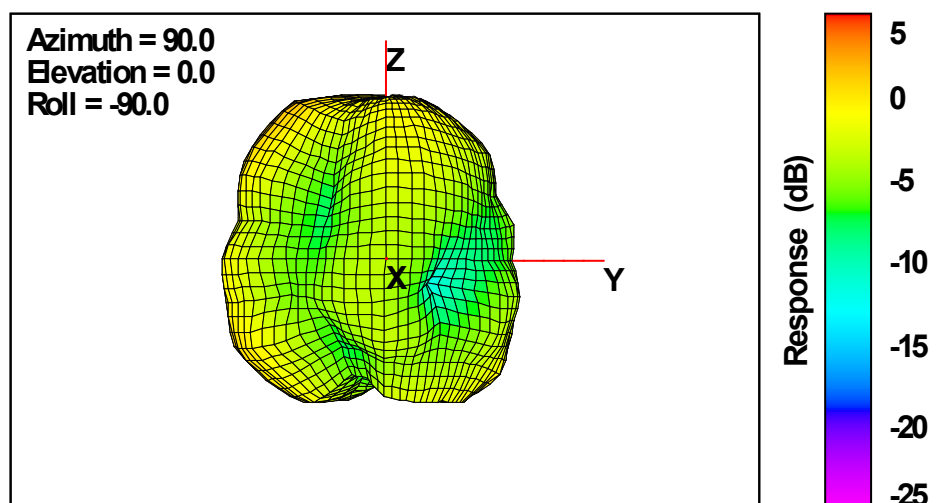
**2500MHz
Total**



Total

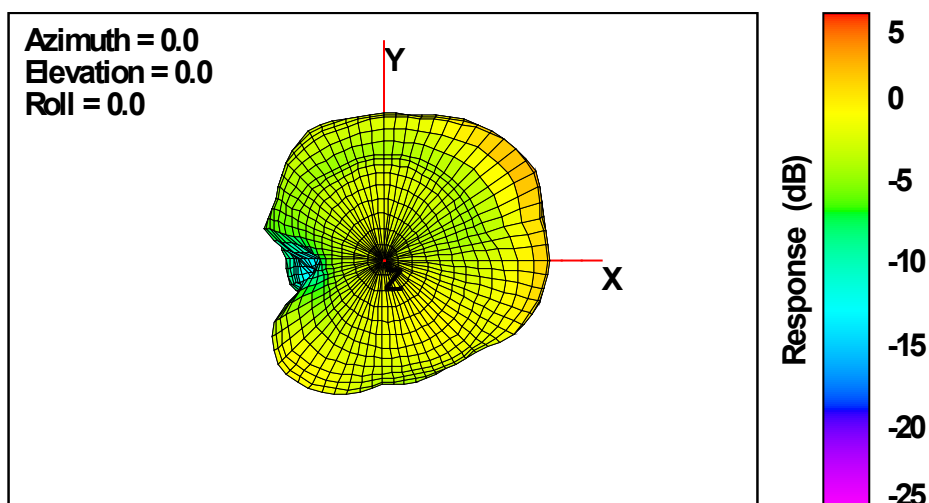


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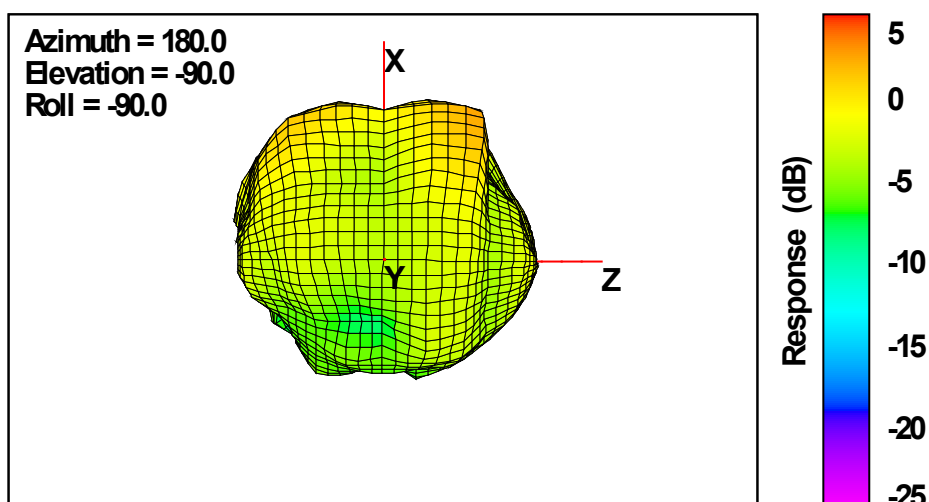


Frequency (MHz)	2500
Average Gain (dBi)	-2.82
Peak Gain (dBi)	2.80
Efficiency (%)	52.23

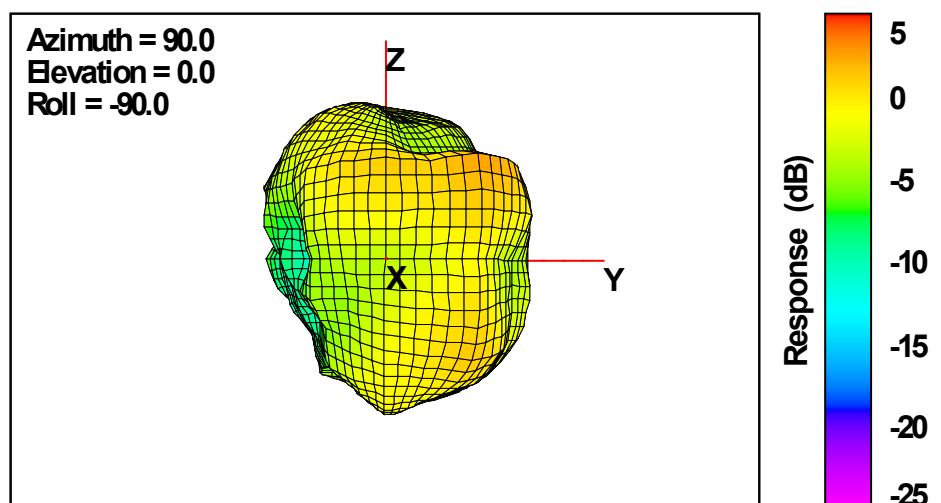
**5150MHz
Total**



Total

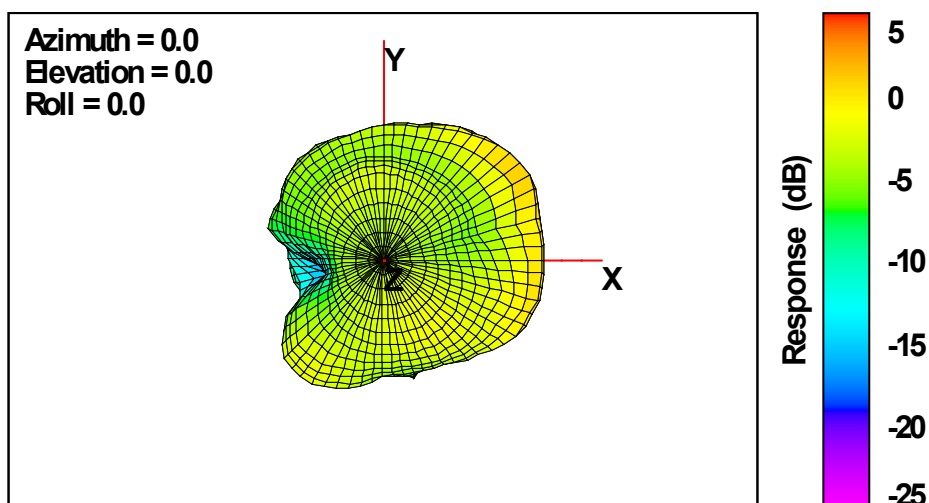


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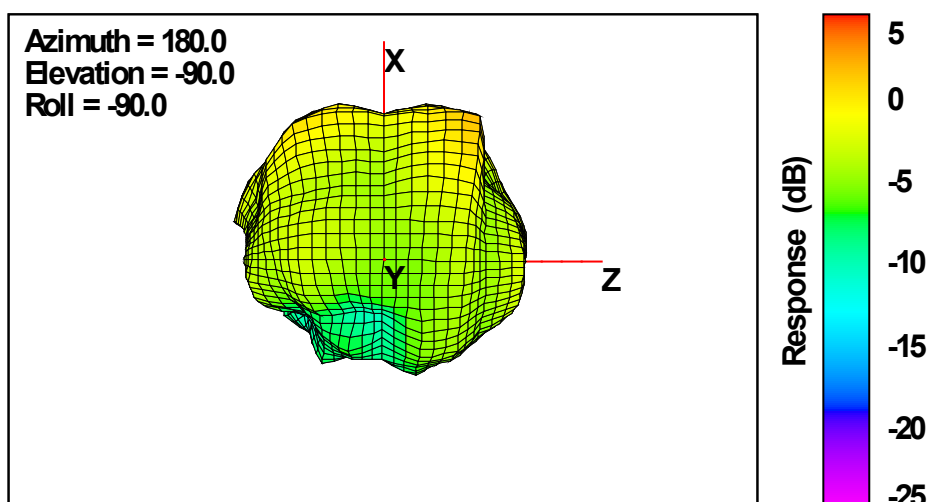


Frequency (MHz)	5150
Average Gain (dBi)	-3.73
Peak Gain (dBi)	2.94
Efficiency (%)	42.36

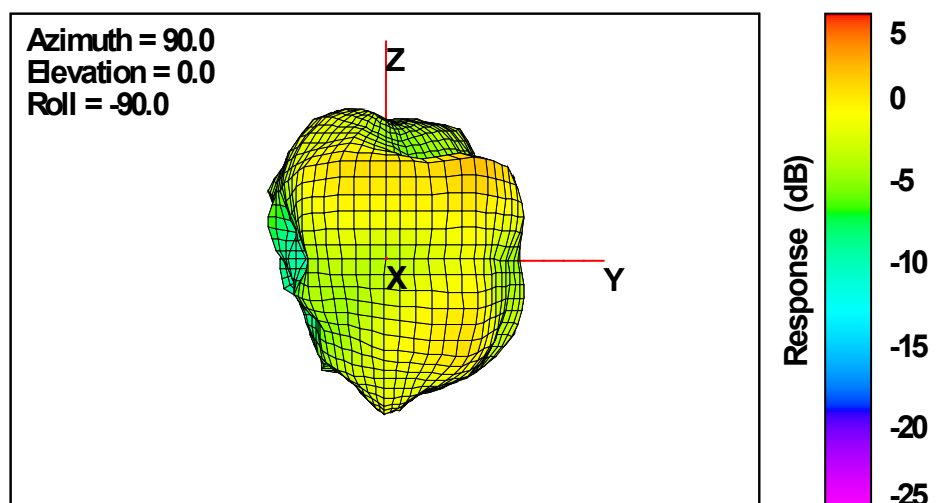
**5250MHz
Total**



Total

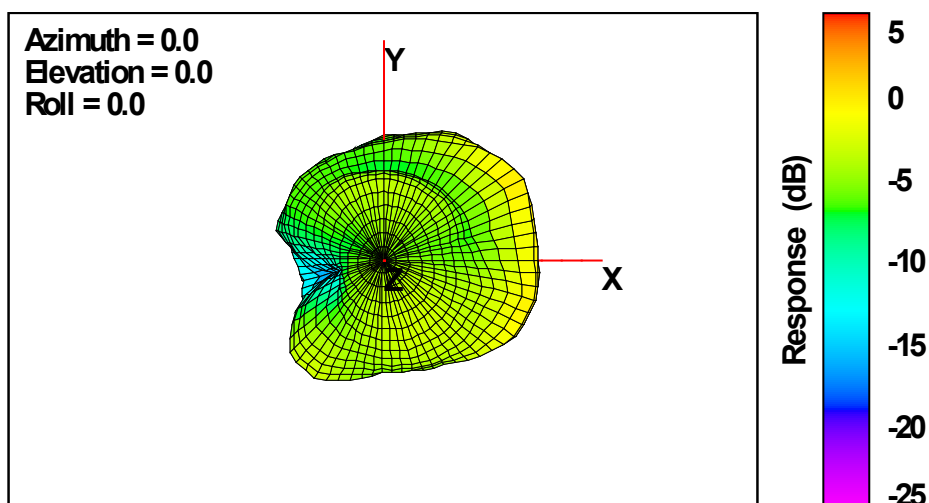


Total

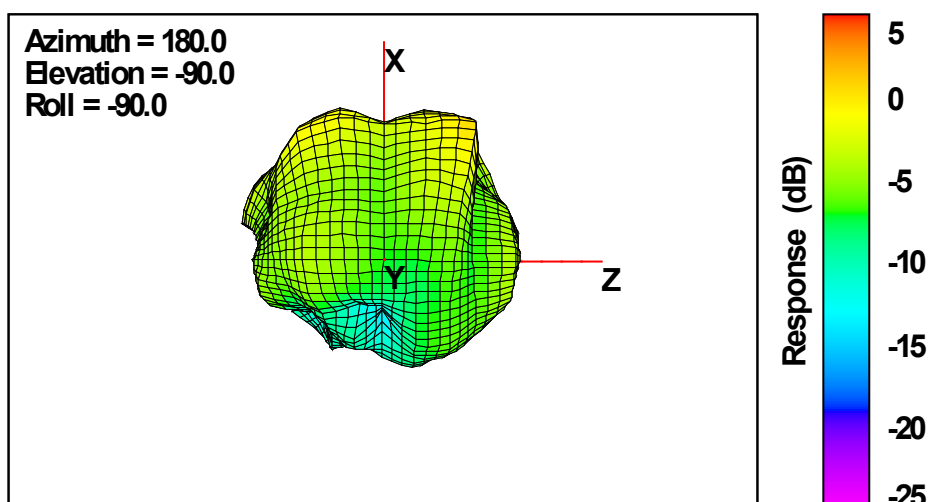


Frequency (MHz)	5250
Average Gain (dBi)	-4.57
Peak Gain (dBi)	2.28
Efficiency (%)	34.89

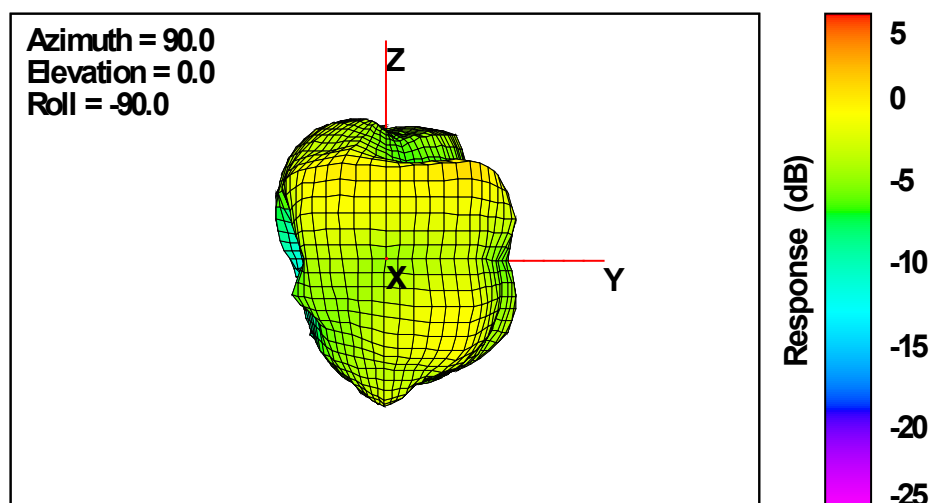
**5350MHz
Total**



Total

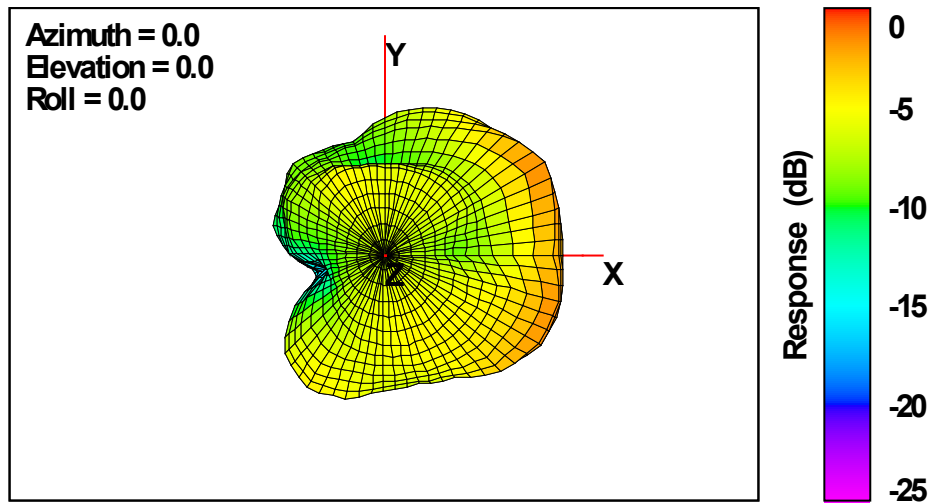


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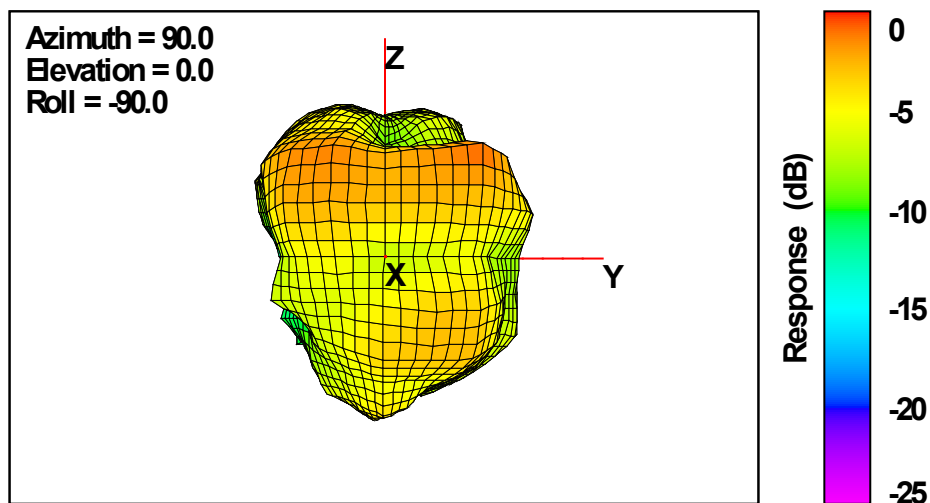


Frequency (MHz)	5350
Average Gain (dBi)	-5.72
Peak Gain (dBi)	1.24
Efficiency (%)	26.82

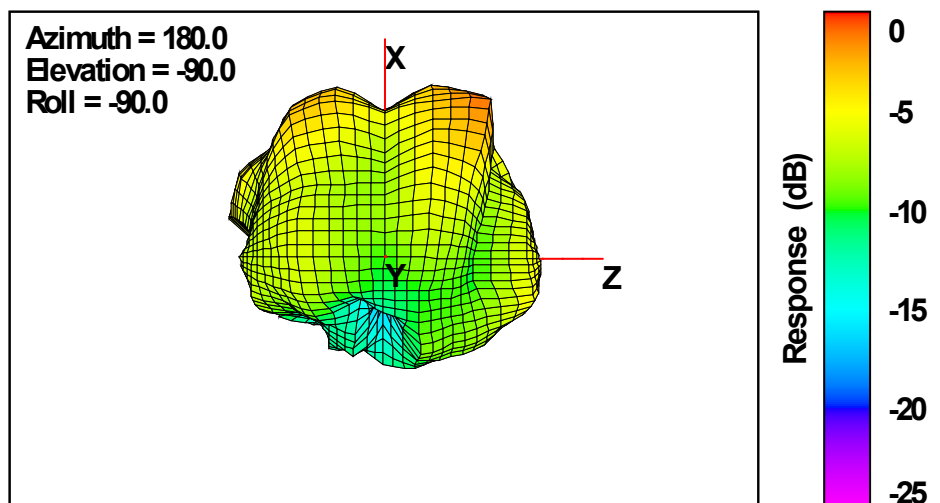
**5500MHz
Total**



Total

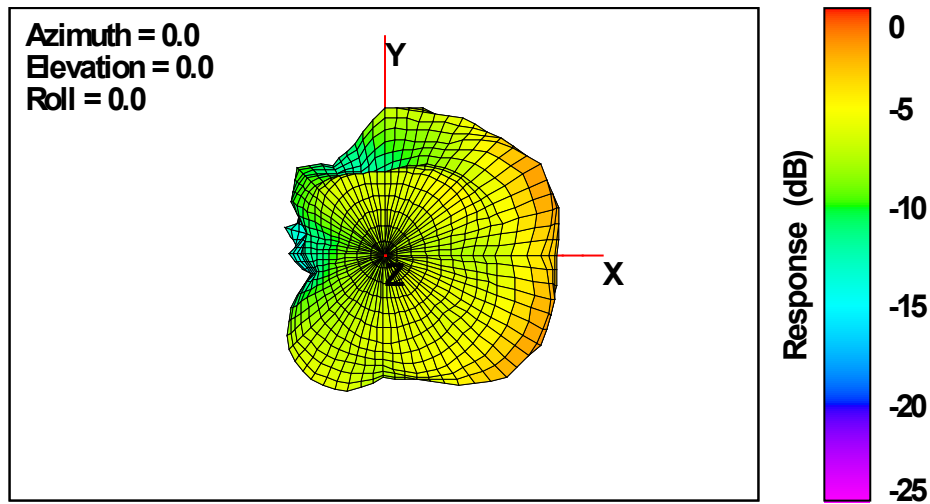


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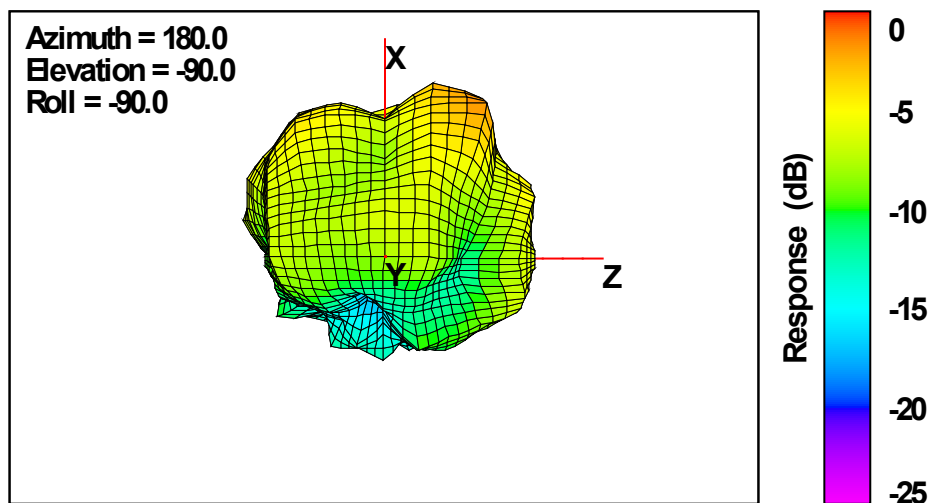


Frequency (MHz)	5500
Average Gain (dBi)	-7.28
Peak Gain (dBi)	-0.30
Efficiency (%)	18.72

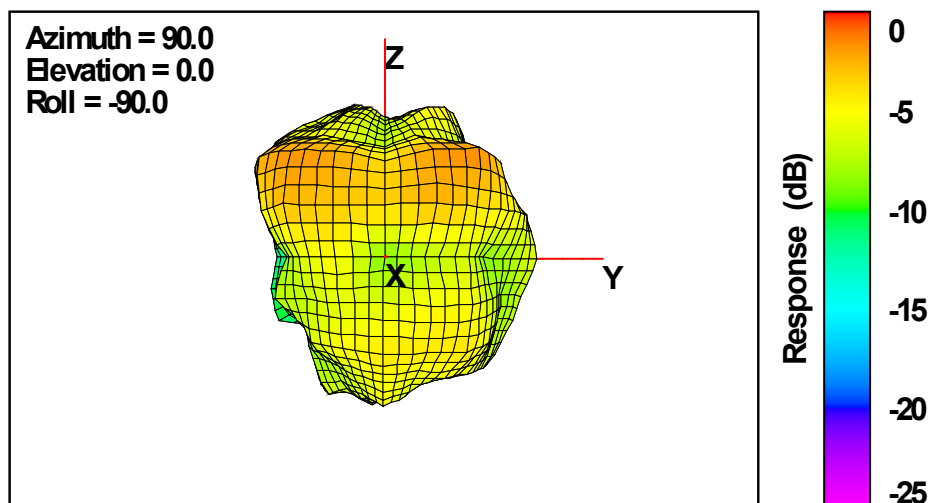
**5725MHz
Total**



Total

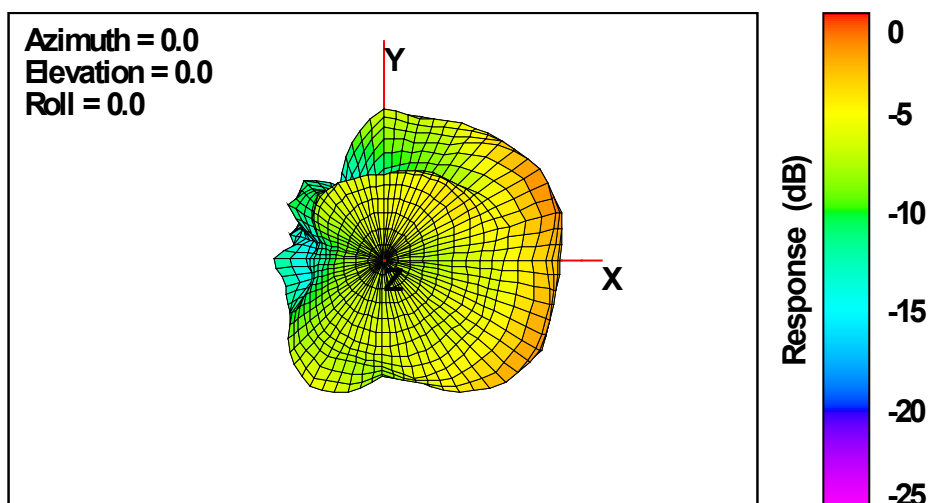


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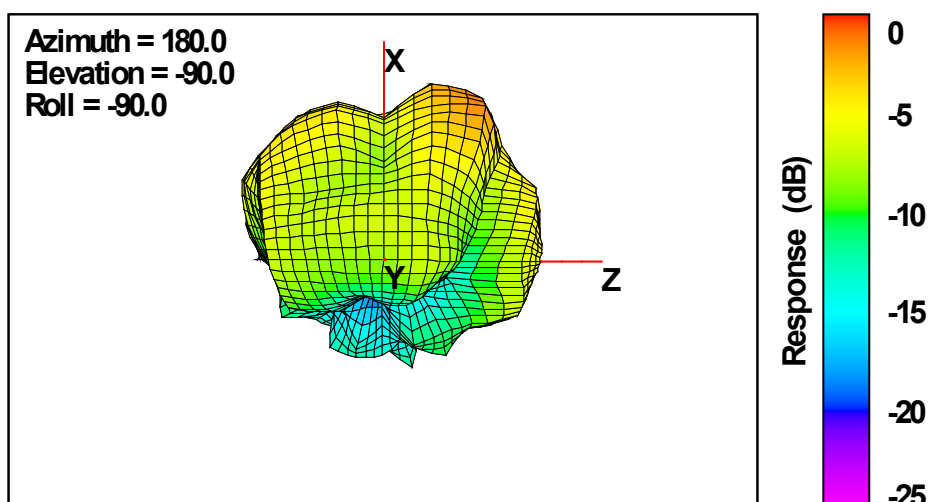


Frequency (MHz)	5725
Average Gain (dBi)	-7.90
Peak Gain (dBi)	-1.08
Efficiency (%)	16.23

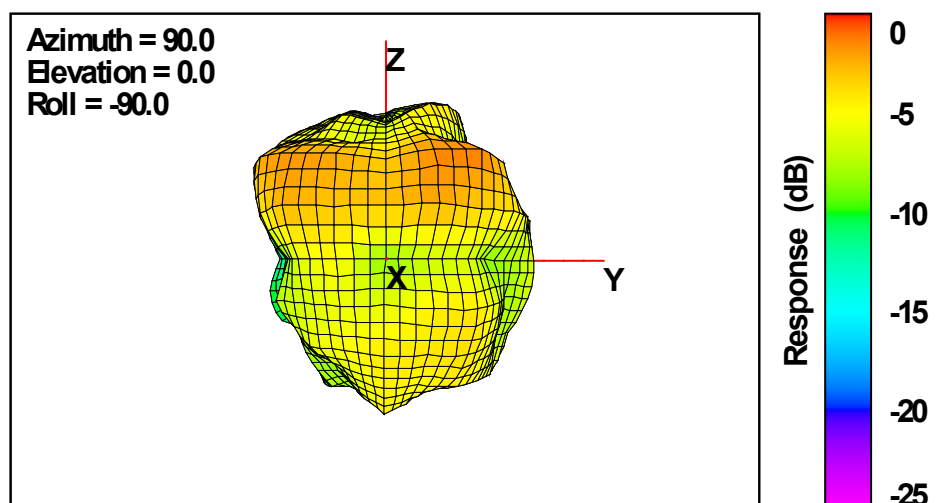
**5825MHz
Total**



Total



Total



Frequency (MHz)	5825
Average Gain (dBi)	-7.75
Peak Gain (dBi)	-0.92
Efficiency (%)	16.80

