

Regulatory WLAN Antenna Information (Template)

(English Language Required for Intel Regulatory Review / Approval)

(OEM/ODM or antenna vendor is required to complete this document with platform antenna information.)

Remove Intel references and make this your own document)

Platform information					
Brand	ODM	****End product model name	Intel platform (ex: Yes, No or NA)	Platform type (ex: regular NB, convertible PC, AIO...etc)	*SAR minimum separation (mm)
Valve	Quanta	1010	No		2.23

****Please fill in exact product model name and make sure the model name is visible on product cover or any parts for end users recognize for authority inspection.

Antenna information							
Vendor		Type	Antenna Part number (Main)		Antenna Part number (Aux)		
High-Tek		PIFA	DQ60ACQD0E5 (0ACQD022049N)		DQ60ACQD0E4 (0ACQD022050N)		
Peak gain w/ cable loss (dBi)							
2.4GHz 2400-2500MHz	5.2&5.3GHz 5150-5350MHz	5.5GHz 5470-5725MHz	5.8GHz 5725-5850MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	6.9GHz 6875-7125MHz
2.76	2.87	2.57	2.29				

Module information
(Please check with "x" when applies, or to fill-in proper model in empty column and specify (manual key-in) if you use non-regular sku, ie. Low power sku or mid power sku.)

Model	Form factor and suffixes												
9560 (JfP 2)		NGW		D2W		D2WL	AX201 (HrP2)		NGW		D2W		D2WL
9260 (ThP 2)		NGW		D2WL			AX200 (CcP2)		NGW		D2WL		
9461 (JfP 1)		NGW		D2W			AX210 (TyP2)		NGW		D2W		
9462 (JfP 1)		NGW		D2W			Other model					RTL8822C	

Intel Reference Gain/Type/ Separation distance

Antenna Type	Antenna Peak gain (In dBi)									Distance to the end user (mm)
	2.4GHz 2400-2500MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.5GHz 5470-5725MHz	5.8GHz 5725-5850MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	6.9GHz 6875-7125MHz	
PIFA	3.24	3.64	3.73	4.77	4.97	4.83	4.3	5.37	5.59	Generic sku: refer to modular FCC SAR report Mid-power sku: ≥8 Low power sku: ≥5

Notes (marked with *)

*SAR minimum separation (mm)

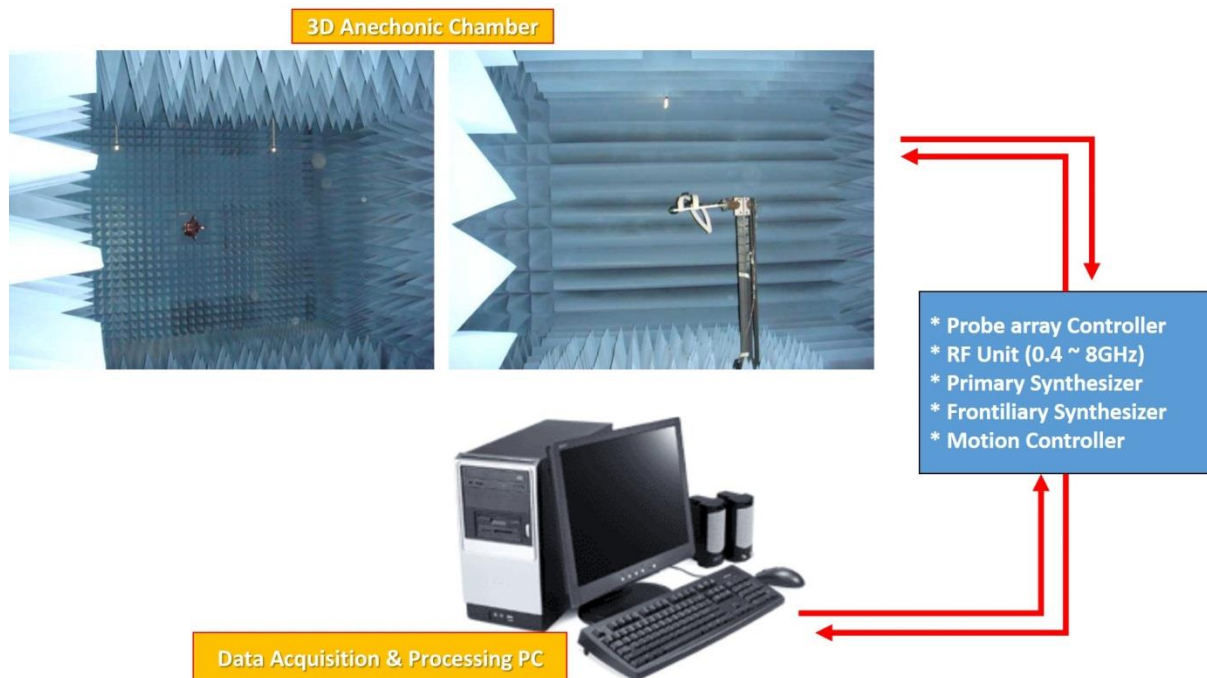
- Regular NB: Minimum antenna-to-body (from antenna bottom to the bottom of the device)
- Tablet / Convertible PC: Minimum antenna-to-edge (5 sides of the device)
- Mini-tablet: Minimum antenna-to-edge (6 sides of the device)

Table of contents

1. Applicable test method
2. Test & System Description
 - a. Test setup
 - b. Equipment list
3. Setup photo

1. Applicable test methods

The radiation pattern of antenna is measured in both horizontal polarization and vertical polarization. The radiation pattern measurements are performed in the three-dimensional anechoic chamber. The chamber provides less than -30dB reflectivity from 800MHz through 8GHz. The chamber is calibrated using both standard dipole antenna and horn antenna. The Gain here is expressed as dBi that standardizes the isotropic antenna. The Gain measurements and antenna radiation pattern are also performed in the same chamber described previously. Figure 2 shows the schematic diagram for measuring radiation pattern and Gain.



2. Test & System Description

a. Test setup

1. Frequency Range

2400~2500MHz, for WLAN application.

5150~5850MHz, for WLAN application

2. Antenna Configuration

The antenna basically has two parts; the stamping and the cable assembly with the connector on one side. The

detailed drawing is attached.

3. VSWR

The VSWR is measured with network analyzer that support up to 8GHz. All the measurements are performed

with the customer provided fixture. Figure 1 shows the typical schematic diagram for measuring VSWR.

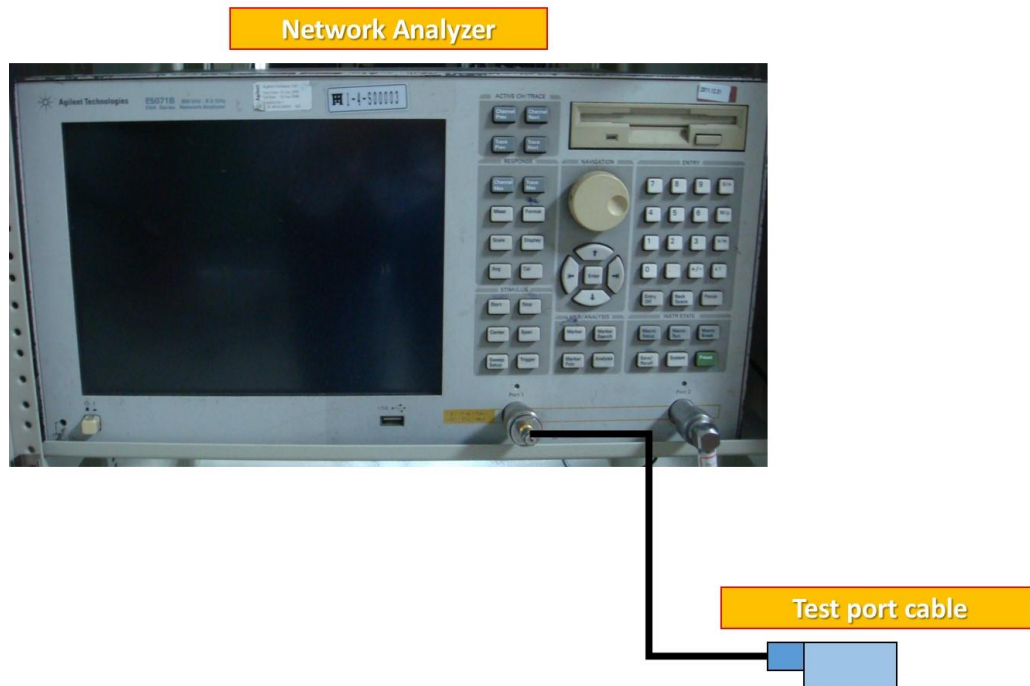


Figure 1. The schematic diagram for measuring VSWR

b. Equipment list

Test Equipment

The equipment for the antenna measurement we used is as follows:

- A. Network Analyzer, support up to 8GHz, to measure the VSWR and input impedance of antenna.
- B. Three-dimensional anechoic chamber to measure antenna gain and radiation pattern(Standard horn antenna was used to calibrate the chamber)
- C. Digital caliper to measure the dimensions.
- D. Climatic chamber for mechanical tests.

Radiated Setup

item	Device	Type/Model	manufacturer	Cal. Date	Cal. Due Date
1	Anechoic Chamber	AMS-8500	ETS-Lindgren	2021/12/20	2022/12/20
2	Turn Table	ETS	ETS-Lindgren	N/A	N/A
3	Measurement SW	EMQuest1.08	ETS-Lindgren	N/A	N/A
4	Vector Network Analyzer	Agilent E5071B	Agilent	2021/12/17	2022/12/17
5	Receive Antenna Absorber Nested Dual- Polarized Dual-Vivaldi Array Antenna 700MHz to 6GHz	EMCO 3164-08	ETS-Lindgren	N/A	N/A
6	Multi Axis Positioning System (MAPS™)	EMCO 2115CR	ETS-Lindgren	N/A	N/A
7	MAPS™ Controller	MECO 2090	ETS-Lindgren	N/A	N/A
8	Horn antenna	3164-08	ETS-Lindgren	2021/12/15	2022/12/15
9	Cable 0.5m - 700MHz~10GHz	RG316	Senyu	2021/12/21	2022/12/21

N/A : Not Applicable

Antenna Information

Section 1. Antenna Assembly Specifications

1A Antenna Part Number	1B Manu-facturer	1C Antenna Type	1D Cable Assembly Part Number and Information	Freq Range MHz	1E *Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G Max VSWR	1H Cable Loss (dB)
(P/N: DQ60ACQD0E5 (0ACQD022049N)) Tx1/ Rx1 Antenna	High-Tek Electronics Co., Ltd	PIFA	Connector: Caimei 958-C413-W-B-Bu-A0 50 Ohm Coaxial Cable Length: 88 mm Diameter: 1.13 mm	2400-2500	-0.44dBi (peak)	-0.17 dBi (peak)	3.00 max	0.27 dBi (peak)
				5150-5350	1.87 dBi (peak)	2.25 dBi (peak)	3.00 max	0.38 dBi (peak)
				5470-5725	2.29 dBi (peak)	2.70 dBi (peak)	3.00 max	0.41 dBi (peak)
				5725-5850	2.29 dBi (peak)	2.70 dBi (peak)	3.00 max	0.41 dBi (peak)
				5925-6425				
				6425-6525				
				6525-6875				
				6875-7125				
(P/N: DQ60ACQD0E4 (0ACQD022050N)) Tx2/ Rx2 Antenna	High-Tek Electronics Co., Ltd	PIFA	Connector: Caimei 958-C413-W-B-Bu-A0 50 Ohm Coaxial Cable Length: 20 mm Diameter: 1.13 mm	2400-2500	2.76 dBi (peak)	2.82 dBi (peak)	3.00 max	0.06 dBi (peak)
				5150-5350	2.87 dBi (peak)	2.96 dBi (peak)	3.00 max	0.09 dBi (peak)
				5470-5725	2.57 dBi (peak)	2.66 dBi (peak)	3.00 max	0.09 dBi (peak)
				5725-5850	1.99 dBi (peak)	2.08 dBi (peak)	3.00 max	0.09 dBi (peak)
				5925-6425				
				6425-6525				
				6525-6875				
				6875-7125				

- 3D Antenna Peak Gain required being test in system basis.

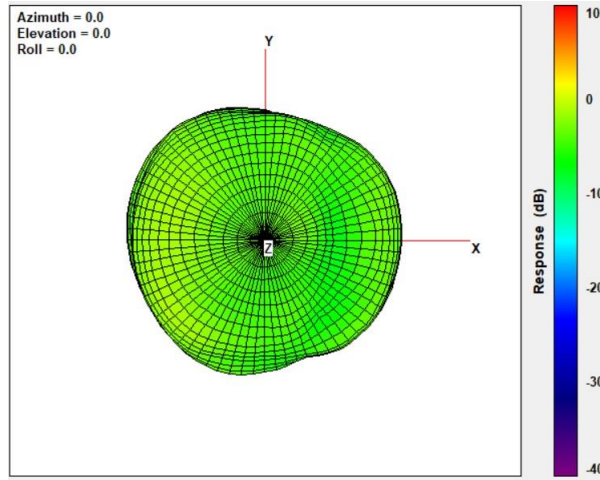
3D Antenna Peak Gain Table:

	Main antenna	Aux Antenna
Frequency (MHz)	(dBi)	(dBi)
2400	-0.93	2.76
2450	-0.54	1.99
2500	-0.44	1.46
5150	0.62	1.38
5250	0.86	2.35
5350	1.87	2.87
5470	2.08	2.53
5600	1.54	2.57
5725	2.29	1.81
5785	2.24	1.72
5850	2.08	1.99
5925		
6000		
6125		
6225		
6325		
6425		
6525		
6625		
6725		
6875		
6925		
7000		
7125		

Section 3. Radiation characteristics of antennae Loaded in Host Platform

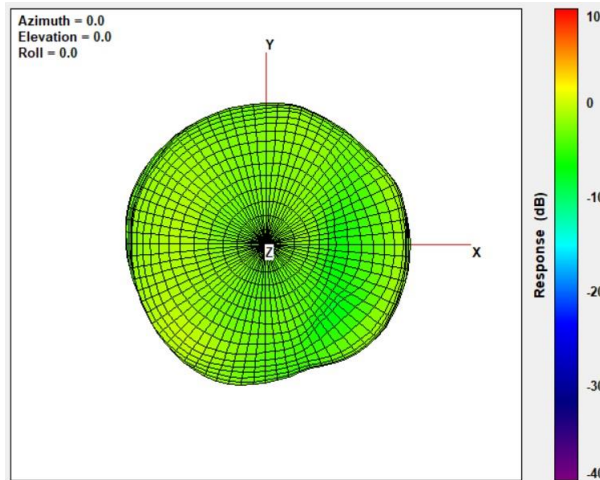
2400-2500MHz radiation characteristic

Main antenna: 2400 MHz



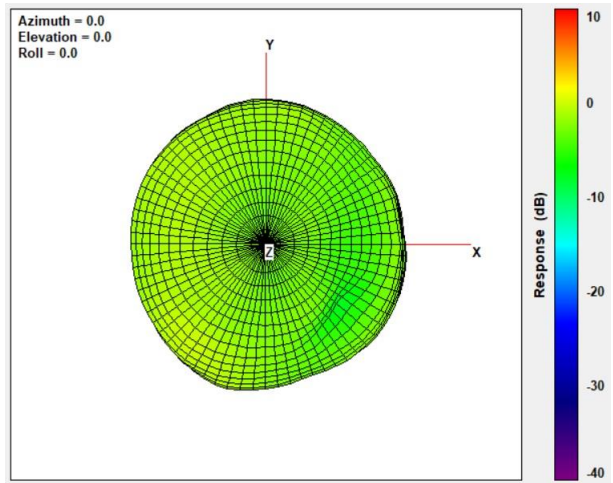
Center Frequency	2400 MHz
Three-dimensional (dBi) peak	-0.93

Main antenna: 2450 MHz



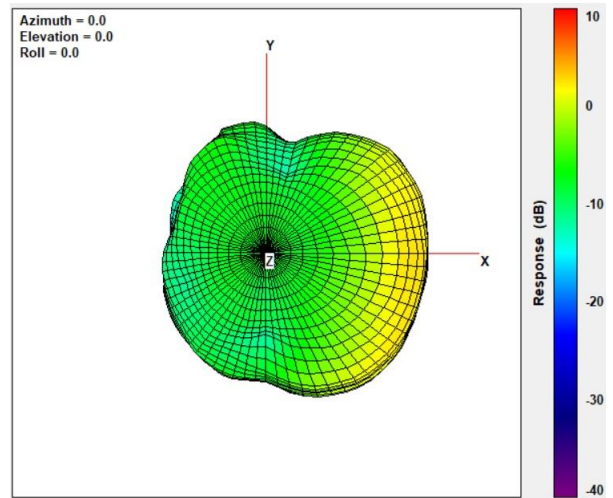
Center Frequency	2450 MHz
Three-dimensional (dBi) peak	-0.54

Main antenna: 2500 MHz



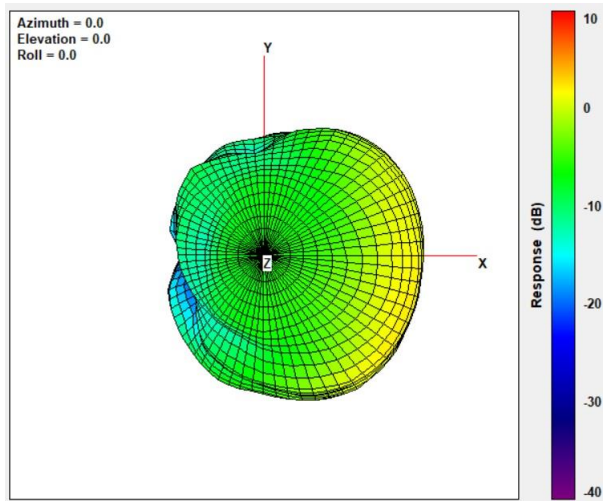
Center Frequency	2500 MHz
Three-dimensional (dBi) peak	-0.44

Aux antenna: 2400 MHz



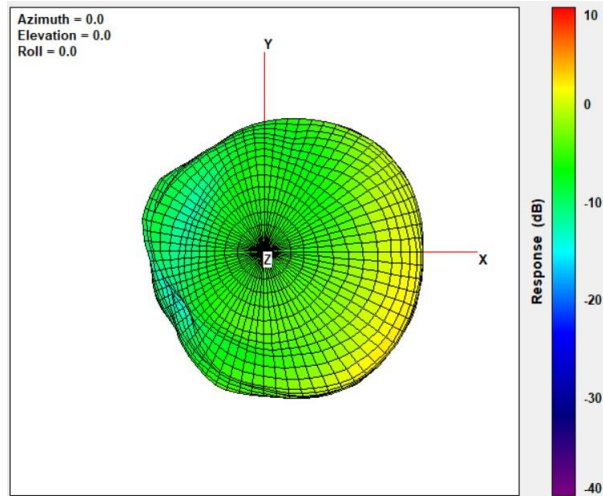
Center Frequency	2400 MHz
Three-dimensional (dBi) peak	2.76

Aux antenna: 2450 MHz



Center Frequency	2450 MHz
Three-dimensional (dBi) peak	1.99

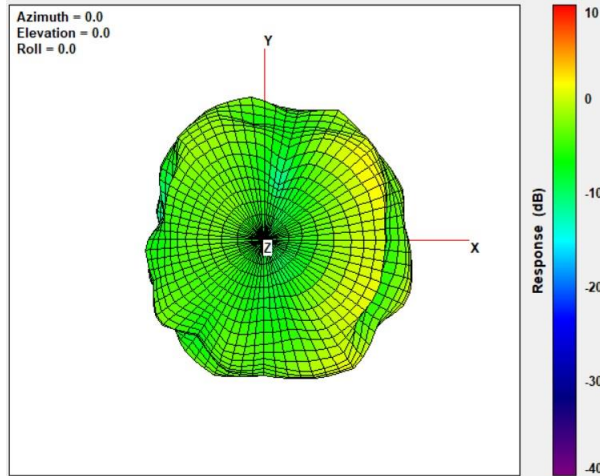
Aux antenna: 2500 MHz



Center Frequency	2500 MHz
Three-dimensional (dBi) peak	1.46

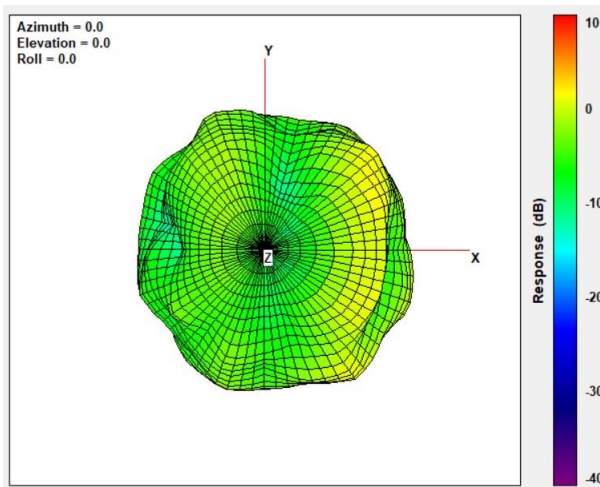
5150-5350MHz radiation characteristic

Main antenna: 5150 MHz



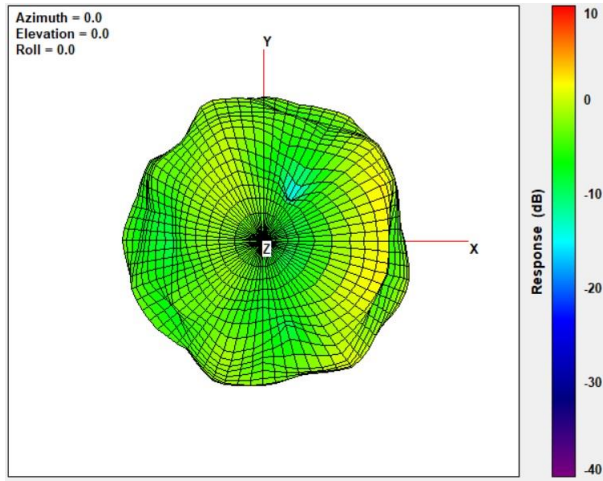
Center Frequency	5150 MHz
Three-dimensional (dBi) peak	0.62

Main antenna: 5250 MHz



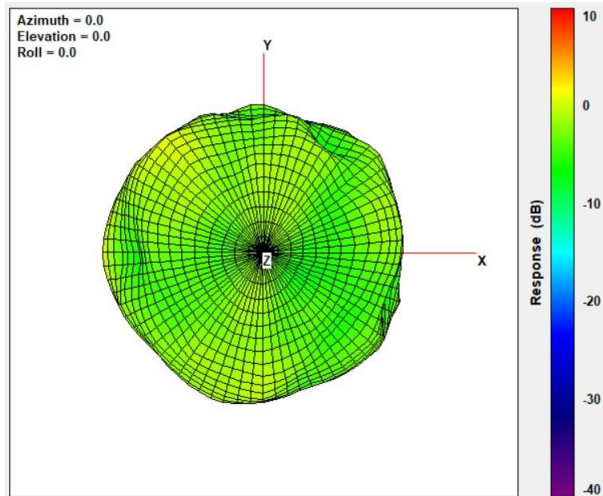
Center Frequency	5250 MHz
Three-dimensional (dBi) peak	0.86

Main antenna: 5350 MHz



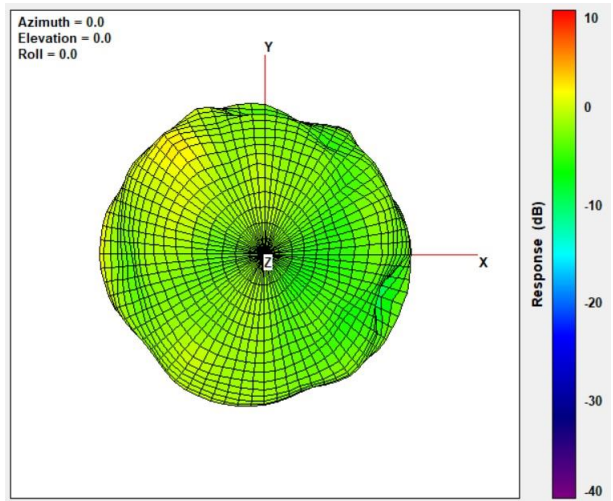
Center Frequency	5350 MHz
Three-dimensional (dBi) peak	1.87

Aux antenna: 5150 MHz



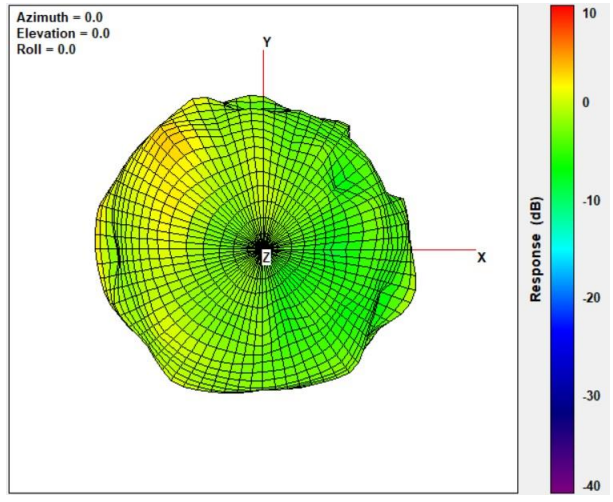
Center Frequency	5150 MHz
Three-dimensional (dBi) peak	1.38

Aux antenna: 5250 MHz



Center Frequency	5250 MHz
Three-dimensional (dBi) peak	2.35

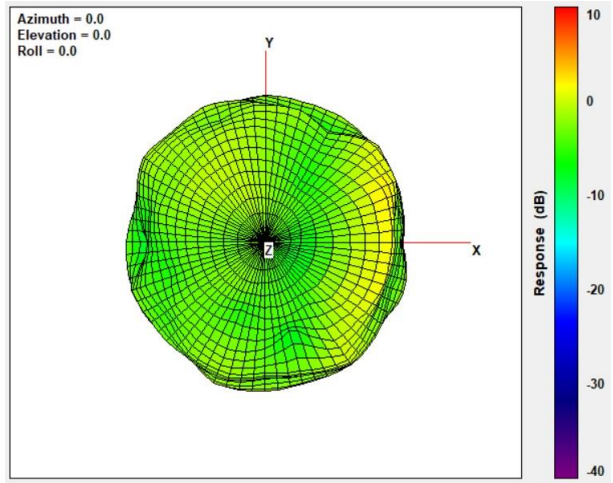
Aux antenna: 5350 MHz



Center Frequency	5350 MHz
Three-dimensional (dBi) peak	2.87

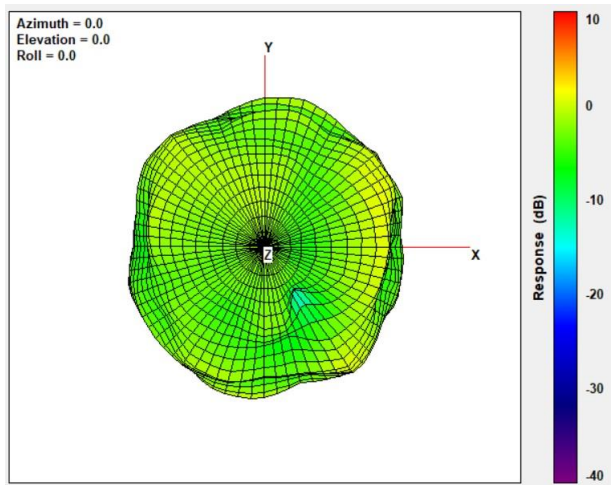
5470-5725MHz radiation characteristic

Main antenna: 5470 MHz



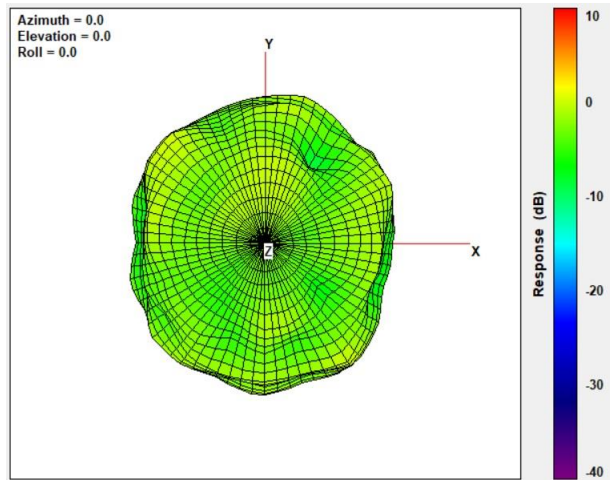
Center Frequency	5470 MHz
Three-dimensional (dBi) peak	2.08

Main antenna: 5600 MHz



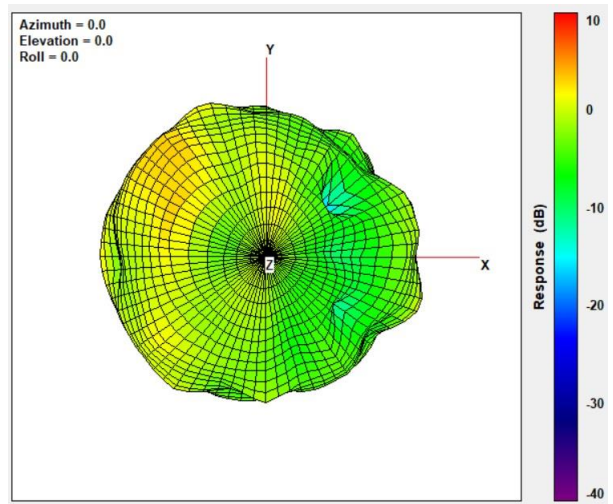
Center Frequency	5600 MHz
Three-dimensional (dBi) peak	1.54

Main antenna: 5725 MHz



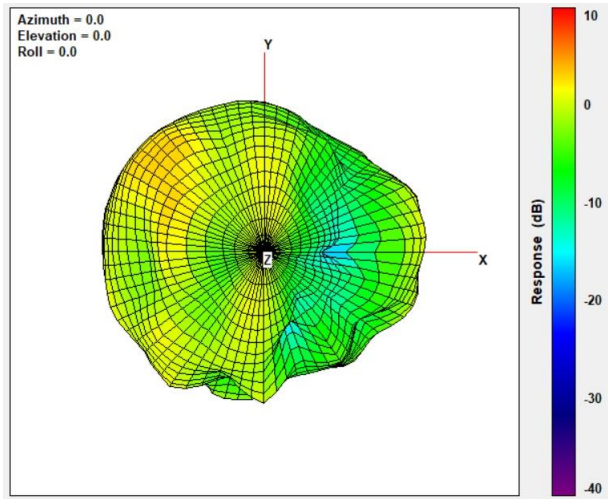
Center Frequency	5725 MHz
Three-dimensional (dBi) peak	2.29

Aux antenna: 5470 MHz



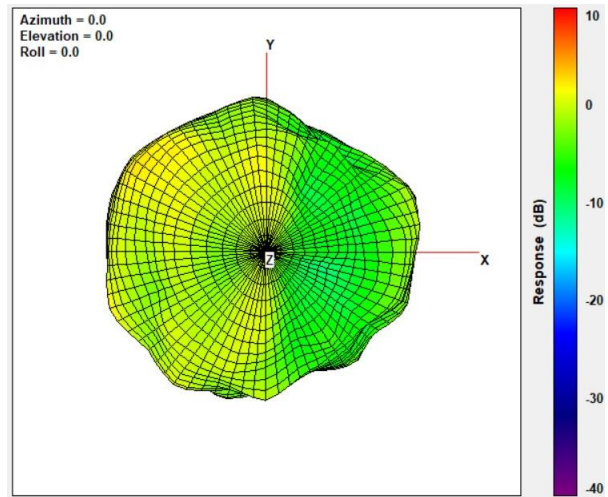
Center Frequency	5470 MHz
Three-dimensional (dBi) peak	2.53

Aux antenna: 5600 MHz



Center Frequency	5600 MHz
Three-dimensional (dBi) peak	2.57

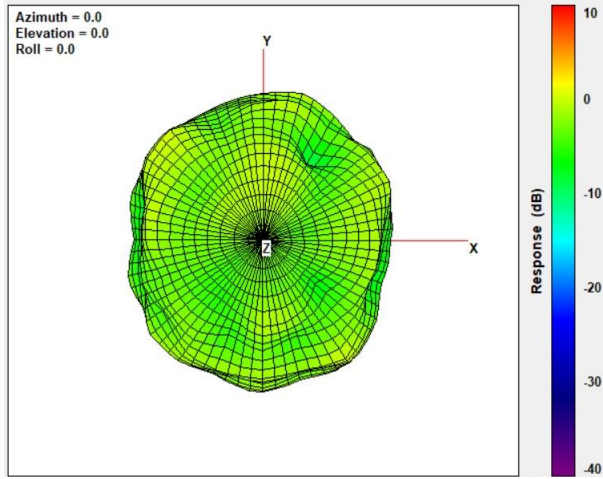
Aux antenna: 5725 MHz



Center Frequency	5725 MHz
Three-dimensional (dBi) peak	1.81

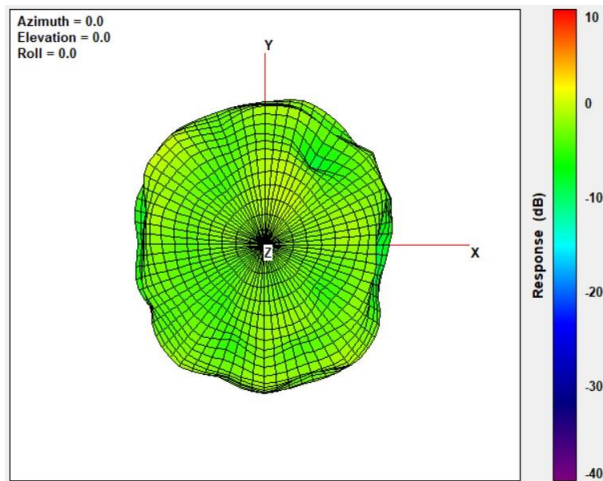
5725-5850MHz radiation characteristic

Main antenna: 5725 MHz



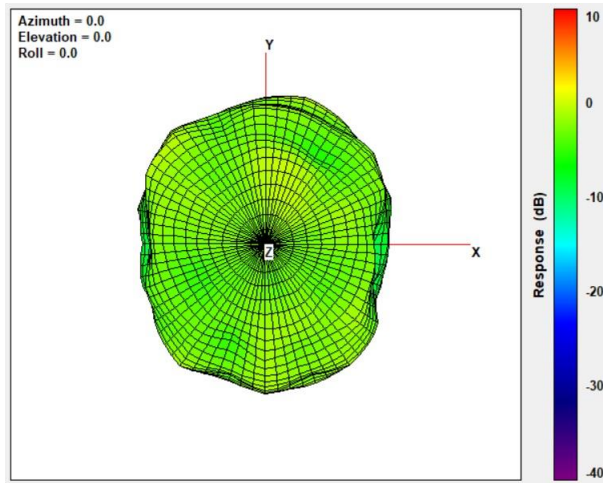
Center Frequency	5725 MHz
Three-dimensional (dBi) peak	2.29

Main antenna: 5785 MHz



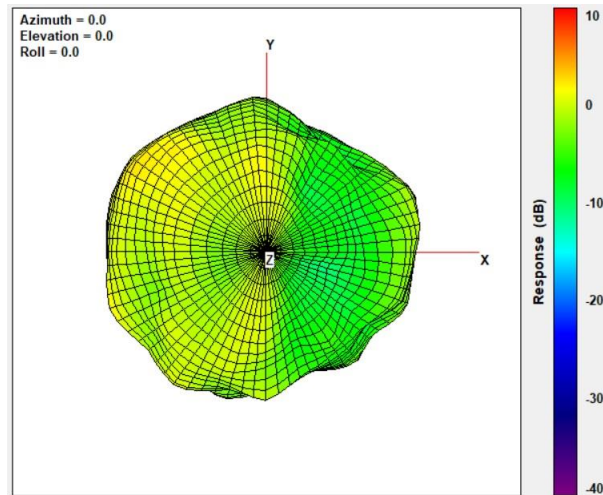
Center Frequency	5785 MHz
Three-dimensional (dBi) peak	2.24

Main antenna: 5850 MHz



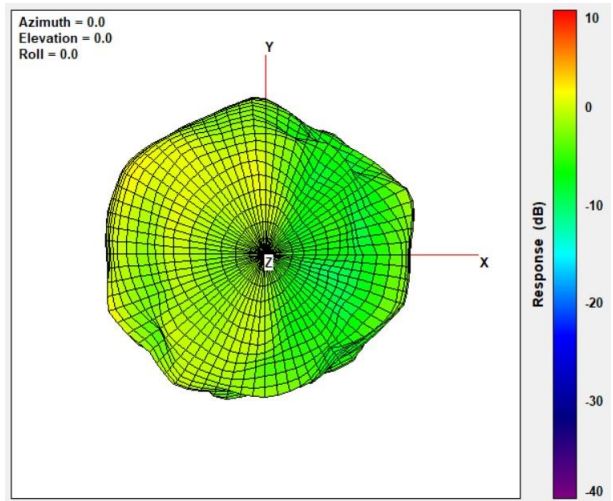
Center Frequency	5850 MHz
Three-dimensional (dBi) peak	2.08

Aux antenna: 5725 MHz



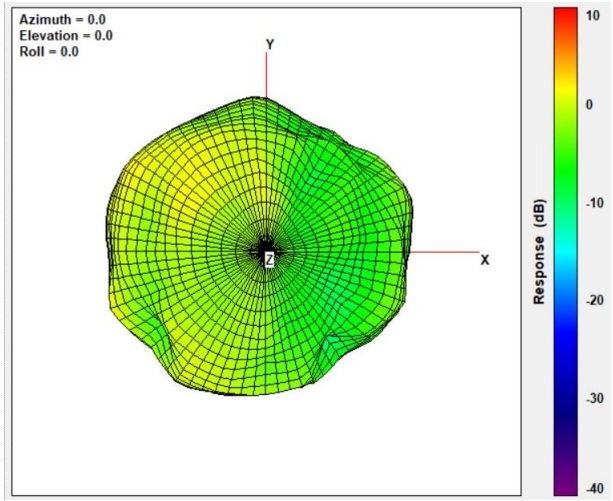
Center Frequency	5725 MHz
Three-dimensional (dBi) peak	1.81

Aux antenna: 5785 MHz



Center Frequency	5785 MHz
Three-dimensional (dBi) peak	1.72

Aux antenna: 5850 MHz



Center Frequency	5850 MHz
Three-dimensional (dBi) peak	1.99