

# 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)						
	Quanta		Yes	Tablet							
****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)							
HongBo	Main: loop Aux: monopole		DQ602377800	DQ602377800							
Peak gain w/ cable loss (dBi)*											
	2.4GHz 2400-2483.5 MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz	5.9GHz 5850-5895MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0 GHz 6875-7125MHz	
Main	2.47	2.72	2.69	2.73	2.48	N/A	N/A	N/A	N/A	N/A	
Aux	2.63	2.39	2.34	2.31	1.52	N/A	N/A	N/A	N/A	N/A	
Intel Reference Gain/Type/ Separation distance											
Antenna Type	Antenna Peak gain (In dBi)*										Distance to the end user (mm)
	2.4GHz 2400-2483.5 MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.6GHz 5470-5725MHz	5.8GHz 5725-5850MHz	5.9GHz 5850-5895MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0GHz 6875-7125MHz	
Design	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	Generic: refer to modular FCC SAR report Mid-power: ≥ 8 mm Low power: ≥ 5 mm
PIFA	3.24	3.64	3.73	4.77	4.97	4.72	4.83	4.30	5.37	5.59	
Dipole	2.89	2.92	3.19	4.41	4.22	4.22	4.83	4.30	4.49	5.34	
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)											
* 3D Peak Antenna gain should be equal or greater than -2 dBi											
- If a host integrator plans to use a lower gain antenna of the same type, additional CBP(FCC)/EDT(EU) testing need to be performed while the module is installed in the host.											

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## 1. Applicable test methods

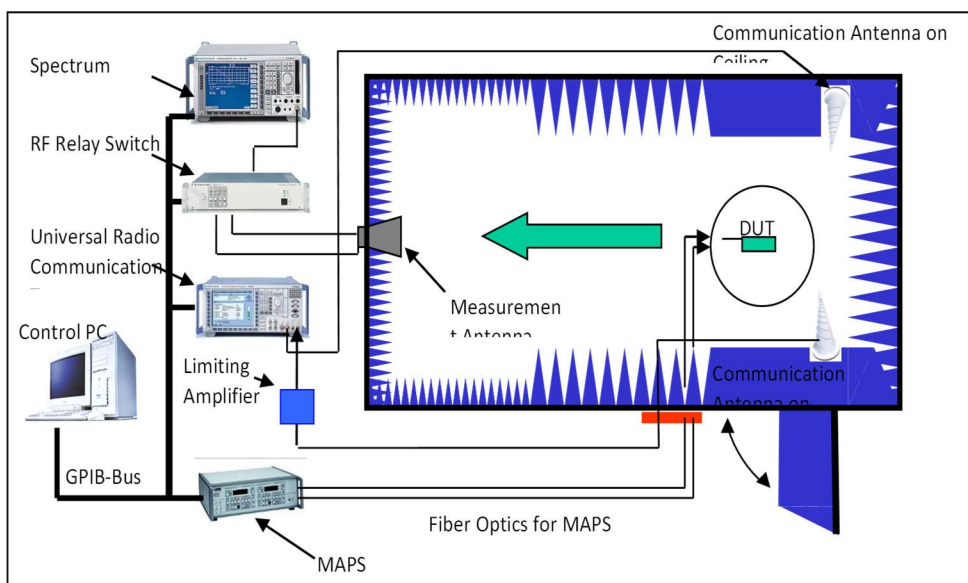
ETS-Lindgren AMS-8500 system is 3D fully anechoic chamber, it is applied to the “Conical Cut test method”, the detail description is described as below.

The Conical Cut method requires the ability of the Measurement Antenna to be physically rotated in the theta plane (overhead) of the EUT for implementations using a single Measurement Antenna, Eleven conical cuts are required to capture data at every 15 degrees from the EUT, with the top (0 degrees) and bottom (180 degrees) cuts not being measured. Typically, the EUT will remain affixed to a turntable during the entire measurement process. The Measurement Antenna will be positioned at a starting theta angle. The EUT will then be rotated around the full 360 degrees of phi rotation. The Measurement Antenna will then be positioned at the next theta angle, and the process repeated.

## 2. Test & System Description

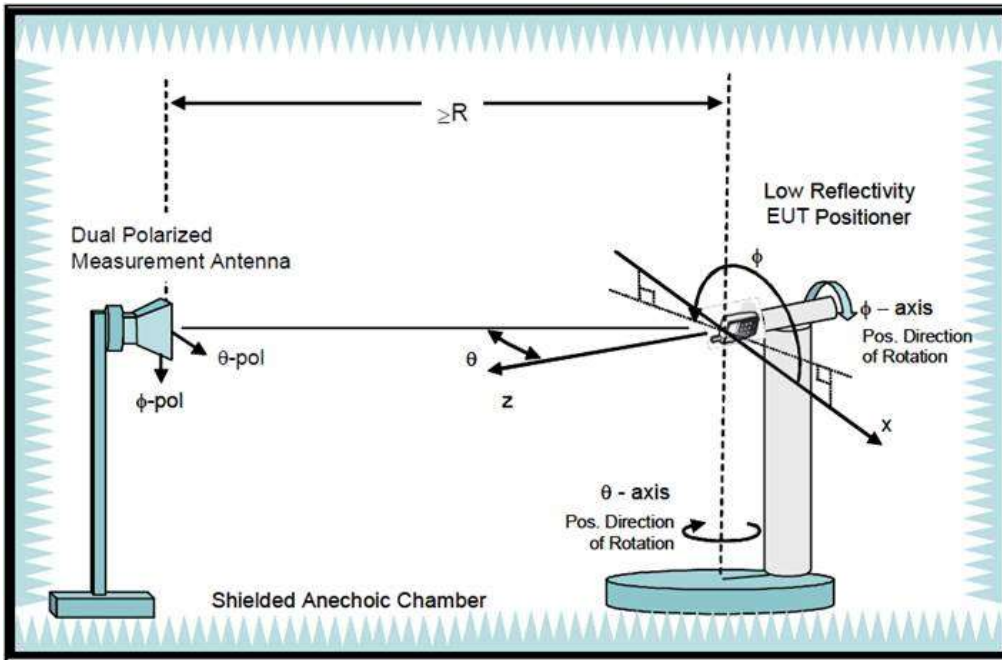
### a. Test setup

- Measurement Chamber: ETS-Lindgren 3D fully anechoic chamber and its measuring system (AMS-8500)
- Base Station Simulator: Agilent E5515C (or R&S CMU200)
- ETS-Lindgren EMCO-2090 Auxiliary Ports RF Relay Switches
- Spectrum Analyzer: Agilent N9010A
- Network Analyzer: Agilent E5071C



**Measurements are performed in a ETS-Lindgren AMS-8500 3D fully anechoic test system.**

**The test system includes a high-performance RF-shielded, rectangular anechoic chamber, a Multi-Axis Positioning System (MAPS), and *EMQuest™ EMQ-100* data acquisition and analysis software. The geometry of the setup is specified below for reference.**



b. Equipment list

Equipment Description	Manufacturer	Identification no.	Current calibration date	Next calibration date
Anechoic Chamber (Including instrument)	ETS-Lindgren	AMS-8500	2021/03/01	2023/03/01
Network analyzer	Agilent	E5071C	2022/01/07	2023/01/06
Measurement software	ETS-Lindgren	EMQuest	N/A	N/A
Multi axis positioning system(MAPSTM)	ETS-Lindgren	EMCO 2115	2021/03/01	2022/03/01
Multi axis positioning system(MAPSTM)	ETS-Lindgren	EMCO 2110	2021/03/01	2022/03/01
MAPSTM controller	ETS-Lindgren	EMCO 2090	2021/03/01	2022/03/01
Horn antenna	ETS-Lindgren	3164-10	2021/03/01	2024/03/01
Cable	ETS-Lindgren	RFC SMS Series	2022/03/01	2022/09/01

3. Setup photo



# Antenna Information

## Section 1. Antenna Assembly Specifications

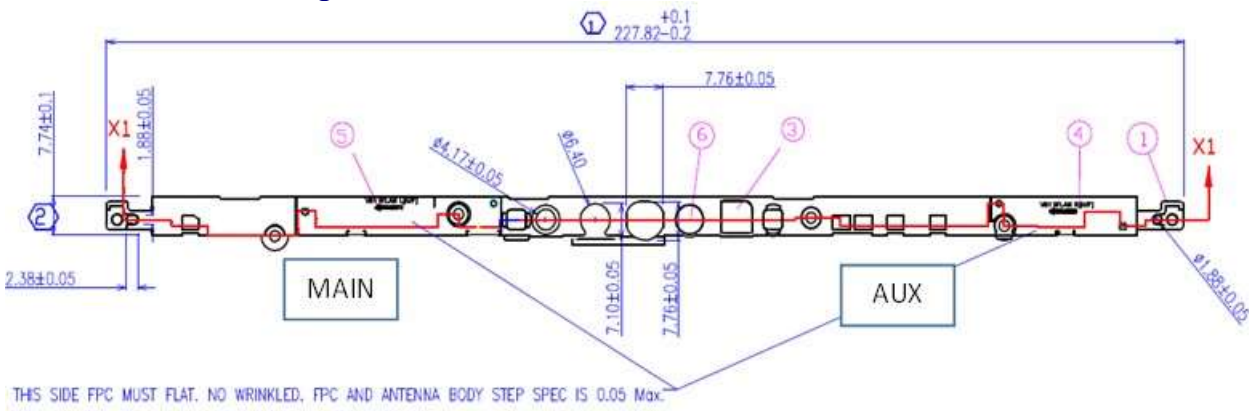
1A	1B	1C	1D	1E	1F	1G	1H	
Antenna Part Number	Manufacturer	Antenna Type	Cable Assembly Part Number and Information	Freq Range MHz	* Peak Gain W/ Cable loss (dBi)	Peak Gain w/o Cable Loss (dBi)	Max VSWR	Cable Loss (dB)
P/N: DQ602377800 Main Antenna	HONGBO WIRELESS COMMUNICATION TECHNOLOGY CO., LTD	Loop	(P/N: DD0V81TH400) 50 ohm Coaxial length: 136.2mm diameter: 1.13mm	2400-2483.5	2.47	3.17	3.0	0.7
				5150-5250	2.72	3.82	3.0	1.1
				5250-5350	2.69	3.79	3.0	1.1
				5470-5725	2.73	3.93	3.0	1.2
				5725-5850	2.48	3.88	3.0	1.4
				5850-5895	N/A	N/A	N/A	N/A
				5925-6425	N/A	N/A	N/A	N/A
				6425-6525	N/A	N/A	N/A	N/A
				6525-6875	N/A	N/A	N/A	N/A
P/N: DQ602377800 Aux Antenna	HONGBO WIRELESS COMMUNICATION TECHNOLOGY CO., LTD	Monopole	(P/N: DD0V81TH200) 50 ohm Coaxial length: 31.2mm diameter: 1.13mm	2400-2483.5	2.63	2.83	3.0	0.2
				5150-5250	2.39	2.79	3.0	0.4
				5250-5350	2.34	2.74	3.0	0.4
				5470-5725	2.31	2.91	3.0	0.6
				5725-5850	1.52	2.22	3.0	0.7
				5850-5895	N/A	N/A	N/A	N/A
				5925-6425	N/A	N/A	N/A	N/A
				6425-6525	N/A	N/A	N/A	N/A
				6525-6875	N/A	N/A	N/A	N/A
6875-7125	N/A	N/A	N/A	N/A				

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

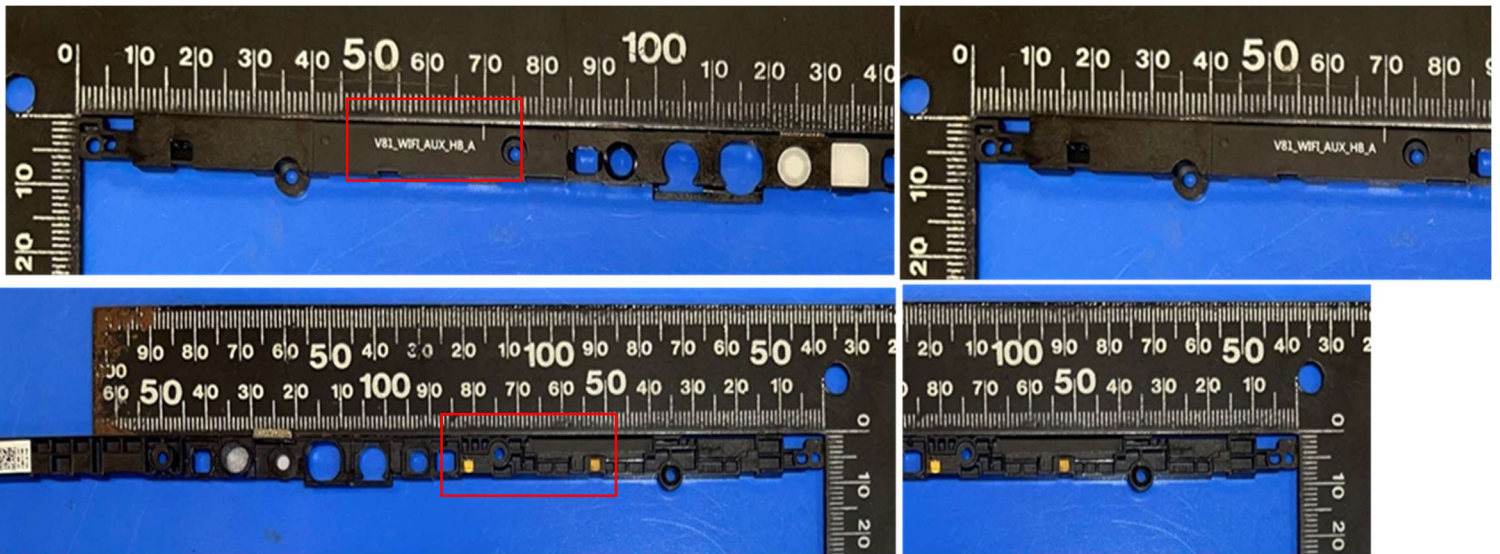
## Section 2. Dimensioned Photos and Drawings of Antennas

Include the dimensioned photo and drawing of Main antenna here.

Main Antenna Drawing:



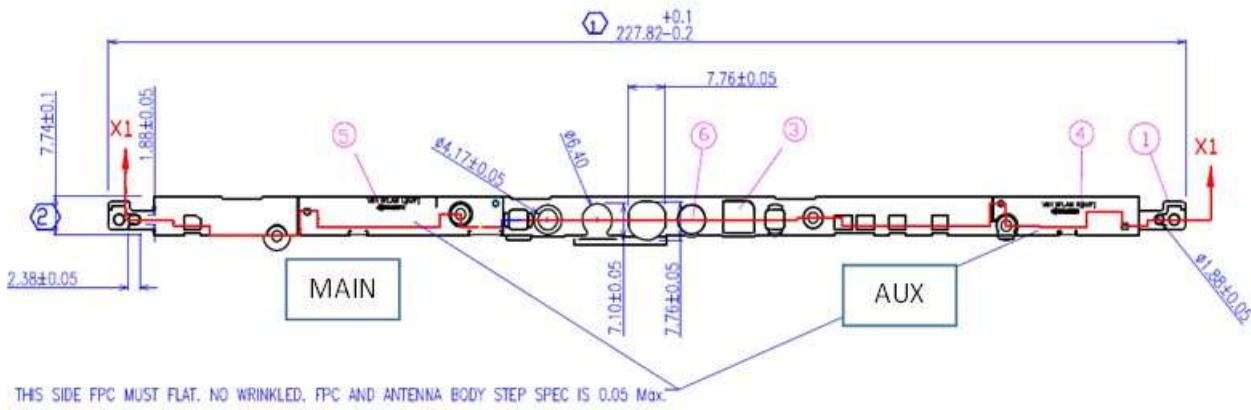
Main Antenna Photo (Front/Back):



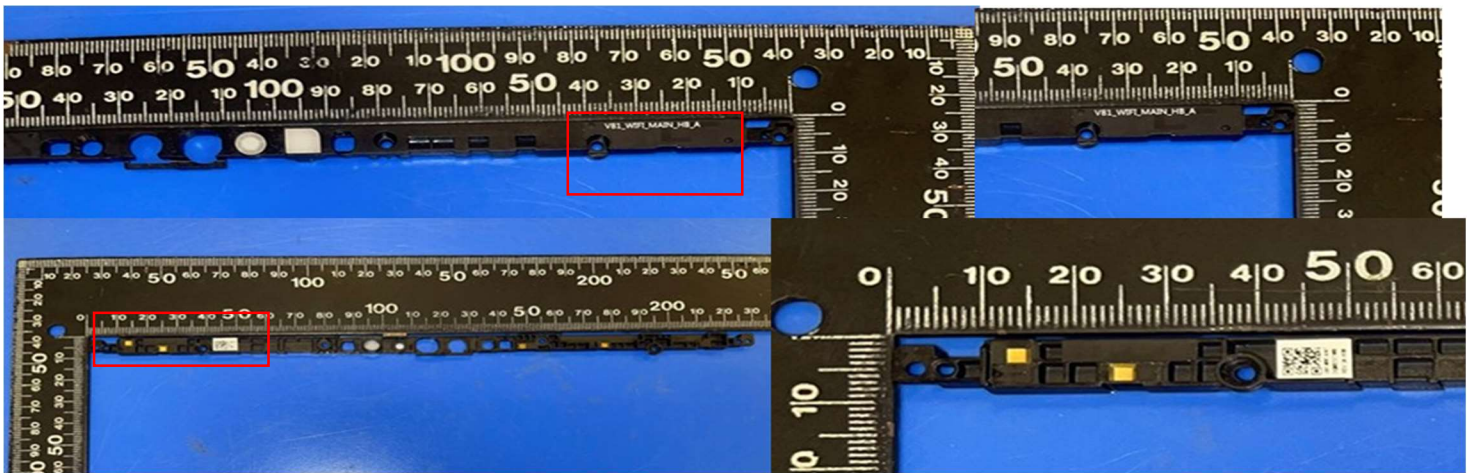
Note: antenna photo should include L type ruler

Include the dimensioned photo and drawing of Aux antenna here.

Aux Antenna Drawing:



Aux Antenna Photo (Front/Back):



Note: antenna photo should include L type ruler

Include front view photo of all 2 antennas here.

Antenna Manufacturer: HONGBO WIRELESS COMMUNICATION TECHNOLOGY CO., LTD  
Antenna Part Number: DQ602377800

Main

Aux



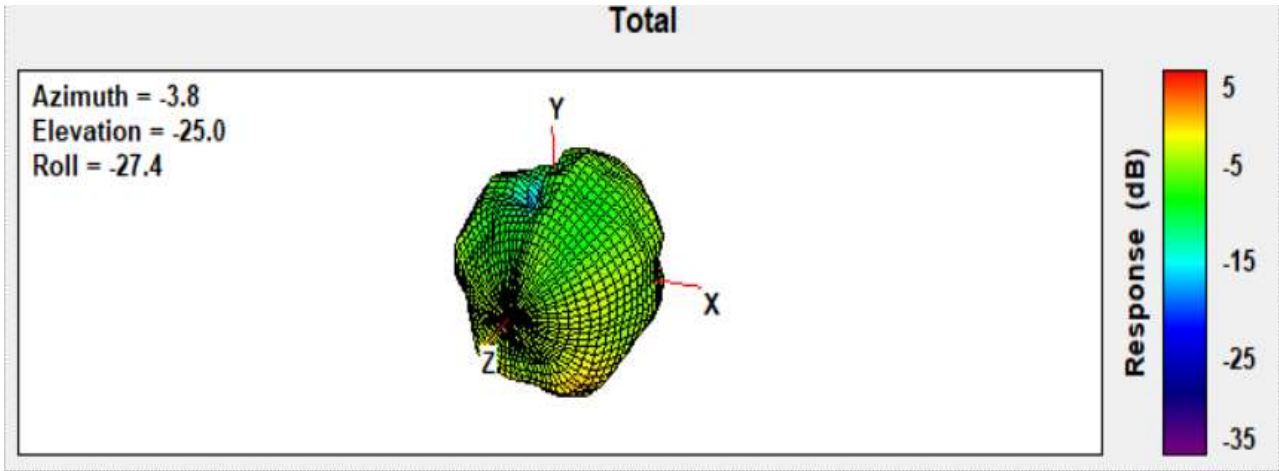


## Section 3. Radiation characteristics of antenna loaded in Host Platform

### Main Antenna

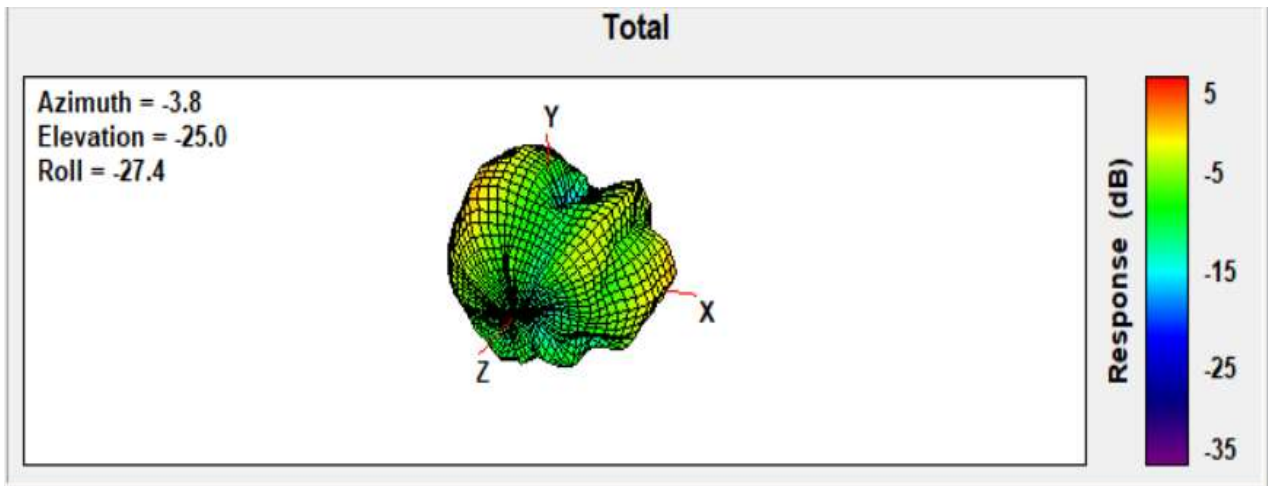
#### Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	2.47



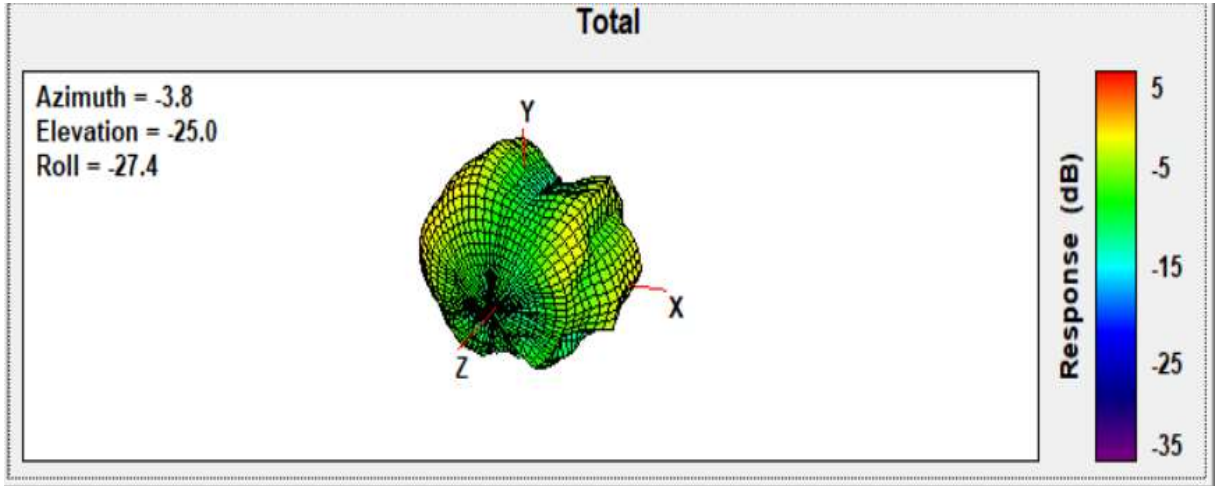
#### Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.72



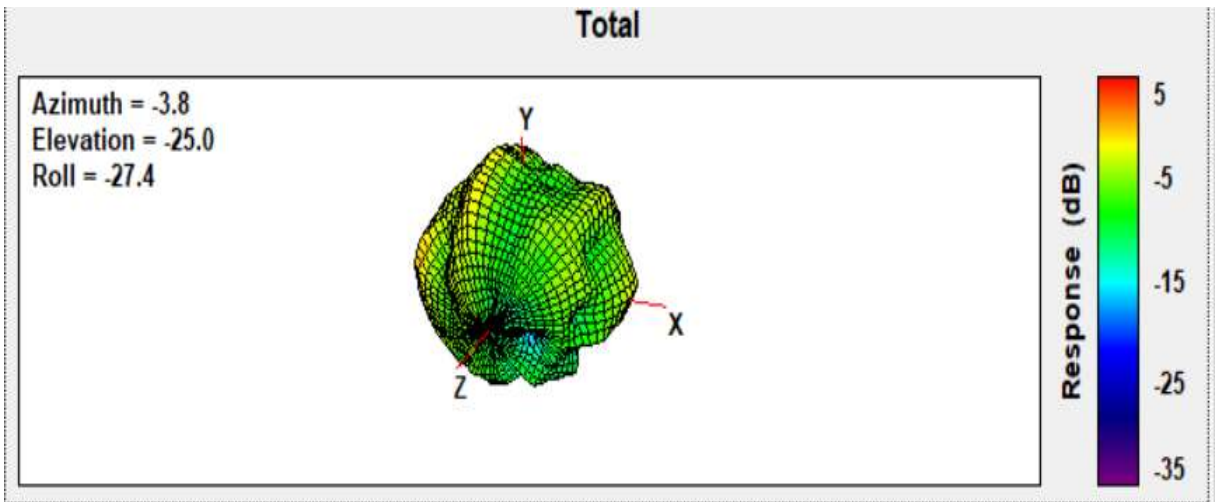
### Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	2.69



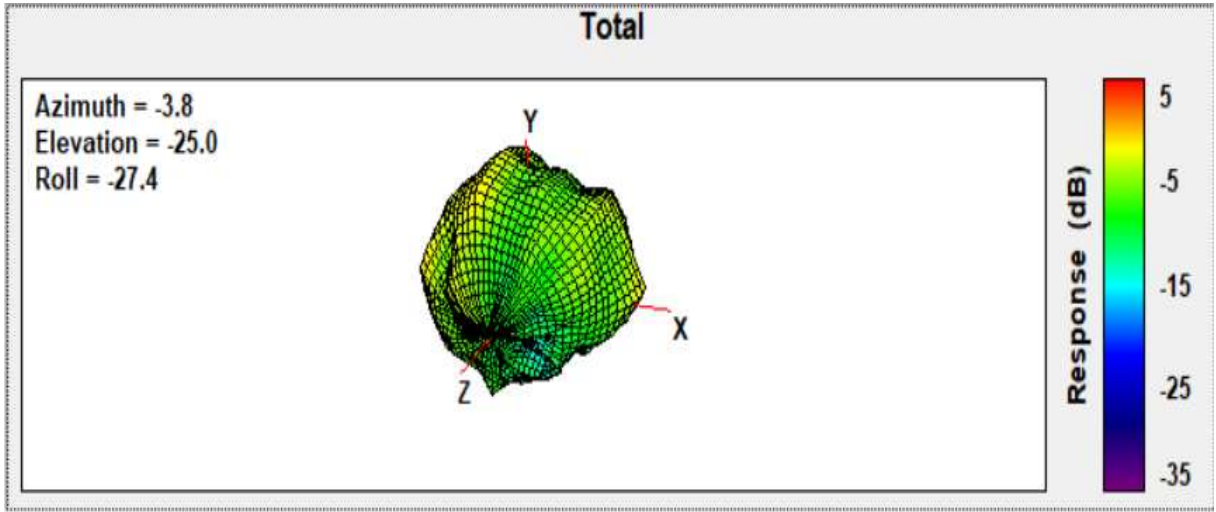
### Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	2.73



## Max Antenna 3D Radiation Pattern 5725-5850 MHz

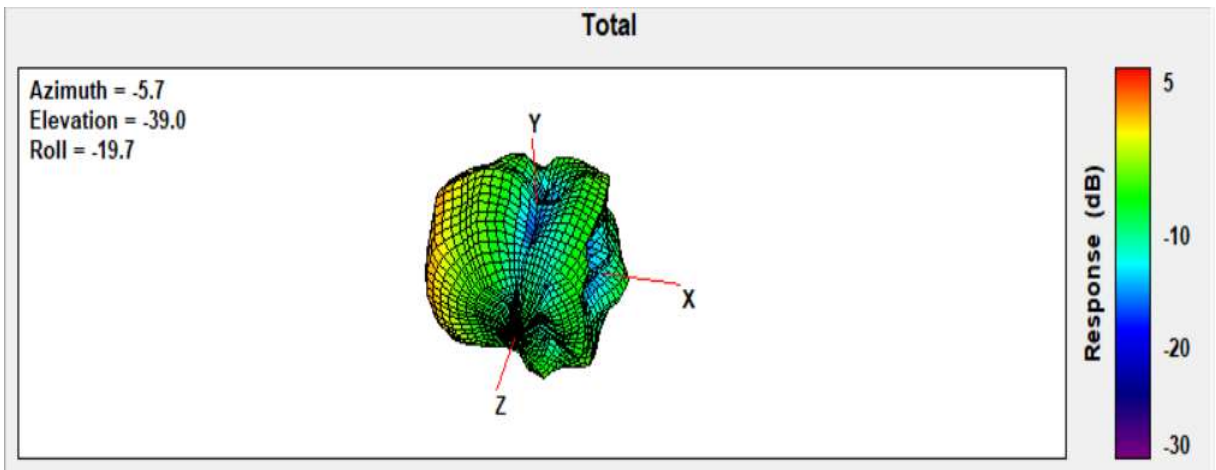
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	2.48



## Auxiliary Antenna

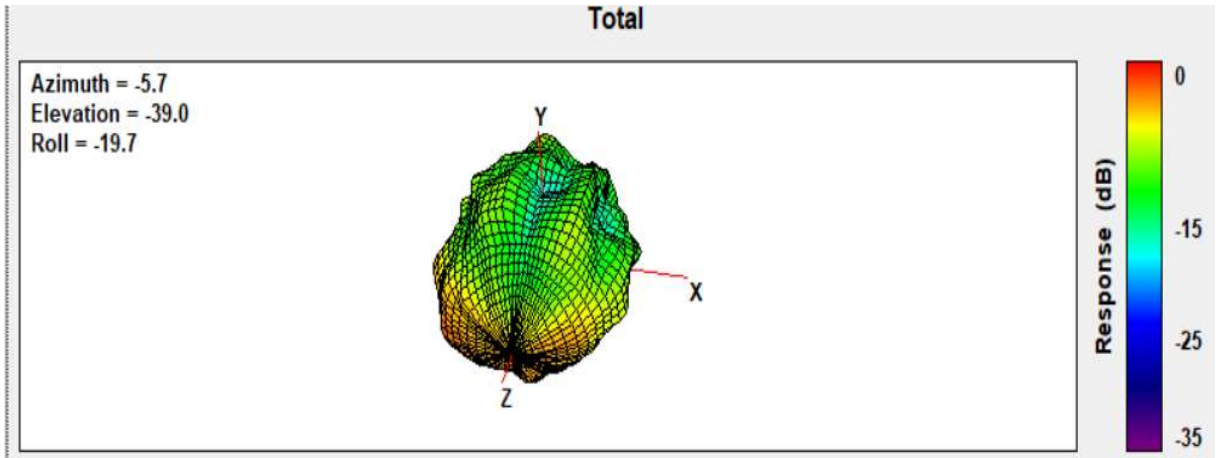
### Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	2.63



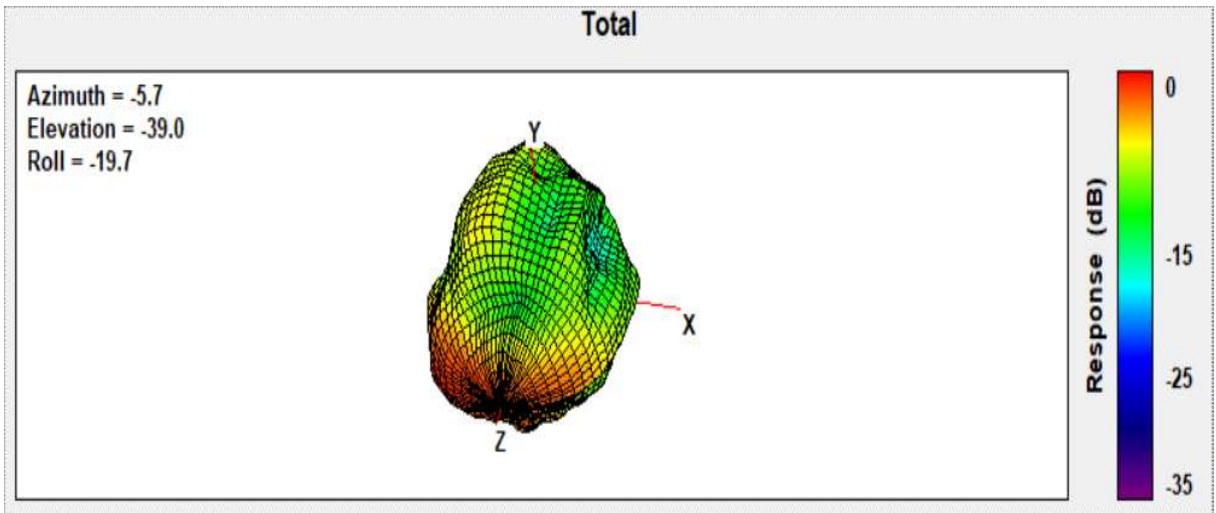
### Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.39



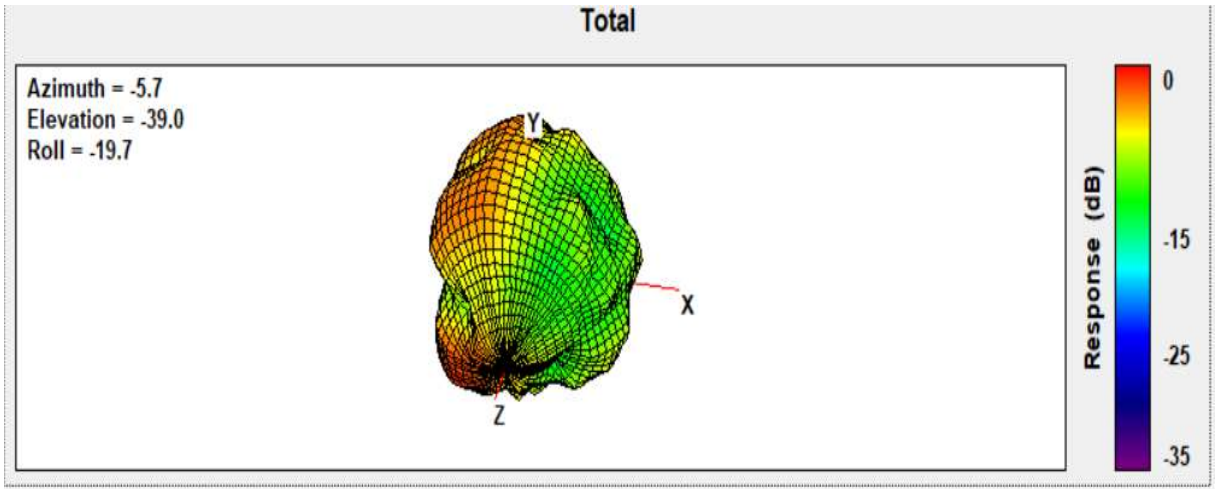
### Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	2.34



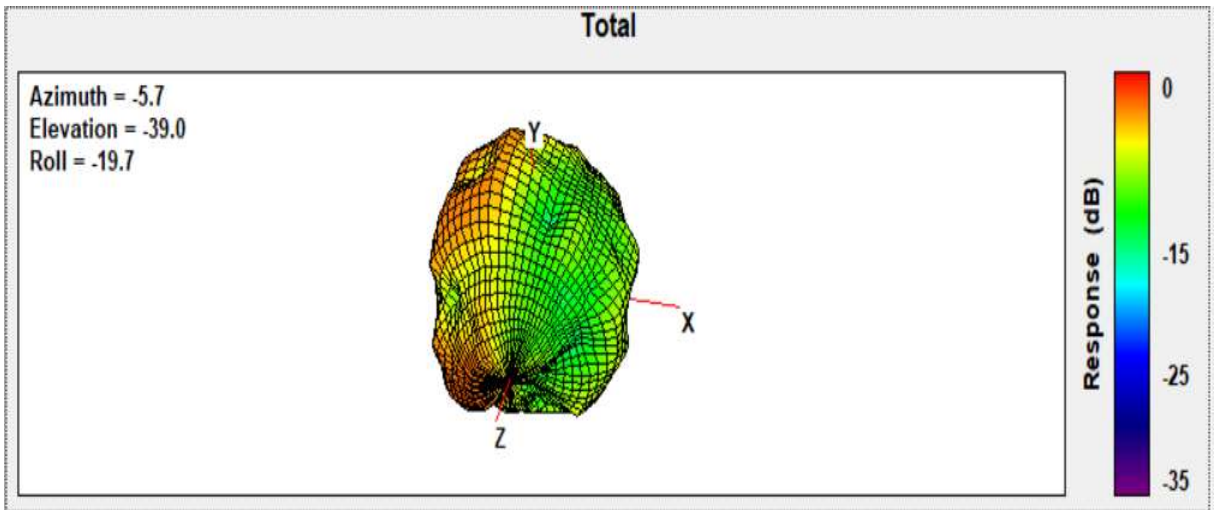
### Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	2.31



### Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	1.52



## Revision History

<b>Revision</b>	<b>Description</b>	<b>Date</b>
10.3	<u>Page2-5</u> Add Applicable test method, Test & System Description and Setup photo	July 24, 2022
10.4	<u>Cover page</u> Add Intel 5.9GHz reference antenna gain <u>Cover page/Section1/Section3</u> Add 5.9GHz antenna gain information	September 15, 2022