

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)						
Dell	Compal	P112F	Yes	NB	11.89 mm						
*****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)								
Hong Bo Co., Ltd..	PIFA	Antenna P/N: 260-24388 Compal P/N: DC33002N20L	Antenna P/N: 260-24389 Compal P/N: DC33002N21L								
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	2.983	2.618	2.526	2.901	2.925	2.425	NA	NA	NA	NA	
Aux	2.489	2.441	2.441	2.492	1.899	1.949	NA	NA	NA	NA	
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	Generic: refer to modular FCC SAR report
Design	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	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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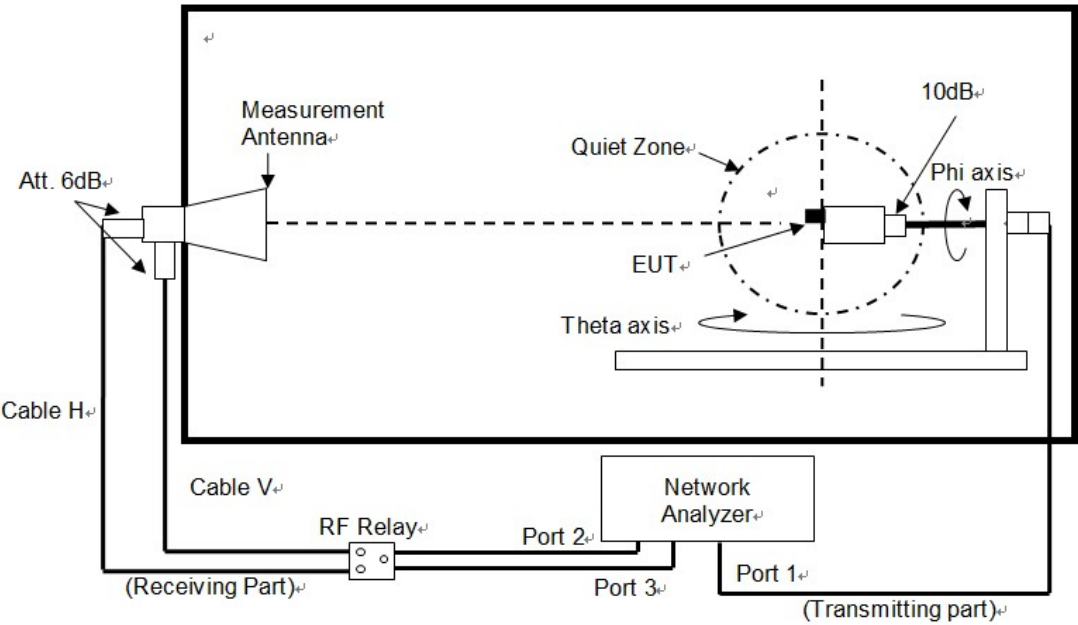
1. Applicable test methods

This test report is prepared for host antenna testing under a Full Anechoic Chamber.

2. Test & System Description

a. Test setup

<insert test diagram here for test site utilized>

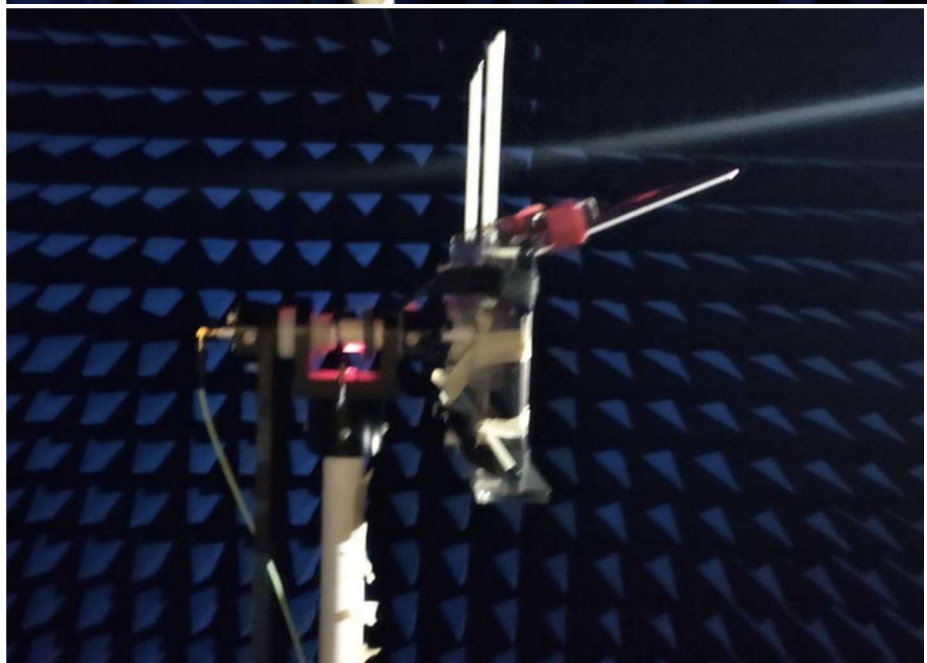
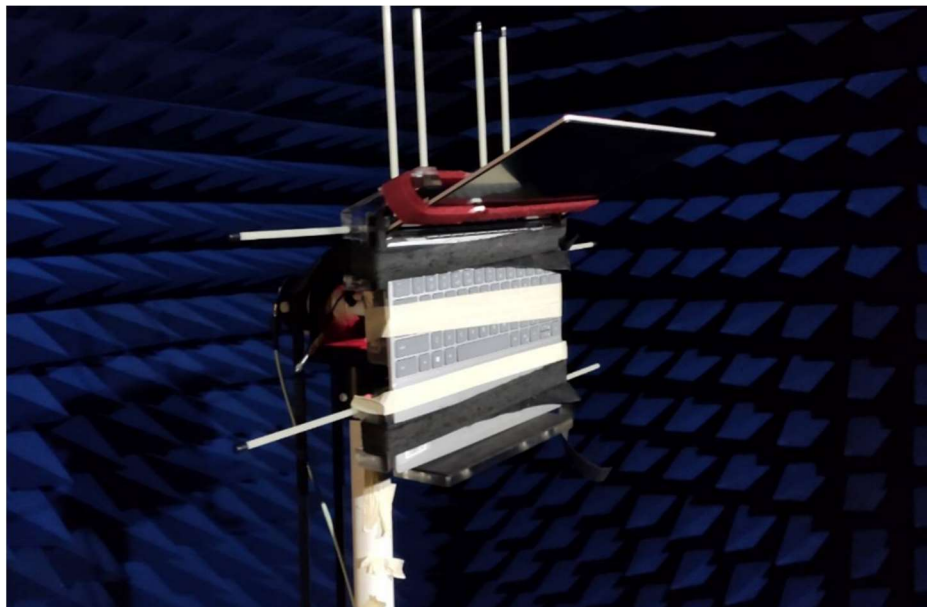


b. Equipment list

<insert test diagram here for test site utilized>

Name	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
ENA Series Network Analyzer	Keysight	E5071C	MY46900218	2022/8/4	2023/8/3
RF Switch	Keysight	3499A	N/A	N/A	N/A
Multi-Axis Positioner Controller	ETS-Lindgren	2090	N/A	N/A	N/A
Medium-Duty Positioner	ETS-Lindgren	2110	N/A	N/A	N/A
Measurement Horn Antenna	EMCO	3164-08	20241	N/A	N/A
Anechoic chamber	ETS-Lindgren	AMS-8500	N/A	2022/6/11	2023/6/10
Note:Chamber calibration included full set of implement					

3. Setup photo



Antenna Information

Section 1. Antenna Assembly Specifications

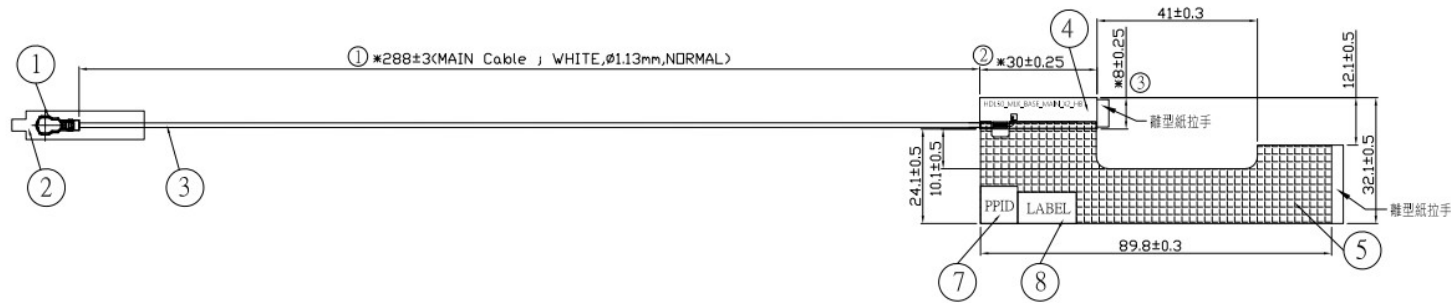
1A	1B	1C	1D		1E	1F	1G	1H
Antenna Part Number	Manufacturer	Antenna Type	Cable Assembly Part Number and Information	Freq Range MHz	* Peak Gain W/ Cable loss (dBi)	Peak Gain w/o Cable Loss (dBi)	Max VSWR	Cable Loss (dB)
P/N: DC33002N20L (260-24388) Main Antenna	Hong-BO Co., Ltd.	PIFA	50 ohm Coaxial length:288mm diameter: 1.13mm Connector: KangShuo (MHF)	2400-2483.5	2.983 dBi (peak)	3.615 dBi (peak)	3.00 max	0.632 dBi (peak)
				5150-5250	2.618 dBi (peak)	3.241 dBi (peak)	3.00 max	0.623 dBi (peak)
				5250-5350	2.526 dBi (peak)	3.651 dBi (peak)	3.00 max	1.125 dBi (peak)
				5470-5725	2.901 dBi (peak)	4.005 dBi (peak)	3.00 max	1.105 dBi (peak)
				5725-5850	2.925 dBi (peak)	4.059 dBi (peak)	3.00 max	1.134 dBi (peak)
				5850-5895	2.425 dBi (peak)	3.589 dBi (peak)	3.00 max	1.164 dBi (peak)
				5925-6425	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
				6425-6525	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
				6525-6875	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
				6875-7125	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
P/N: DC33002N21L (260-24389) AUX Antenna	Hong-BO Co., Ltd.	PIFA	50 ohm Coaxial length:390mm diameter: 1.13mm Connector: KangShuo (MHF)	2400-2483.5	2.489 dBi (peak)	3.474 dBi (peak)	3.00 max	0.985 dBi (peak)
				5150-5250	2.441 dBi (peak)	3.752 dBi (peak)	3.00 max	1.311 dBi (peak)
				5250-5350	2.441 dBi (peak)	3.972 dBi (peak)	3.00 max	1.531 dBi (peak)
				5470-5725	2.492 dBi (peak)	4.130 dBi (peak)	3.00 max	1.637 dBi (peak)
				5725-5850	1.899 dBi (peak)	3.580 dBi (peak)	3.00 max	1.680 dBi (peak)
				5850-5895	1.949 dBi (peak)	3.659 dBi (peak)	3.00 max	1.710 dBi (peak)
				5925-6425	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
				6425-6525	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
				6525-6875	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)
				6875-7125	0.000 dBi (peak)	0.000 dBi (peak)	0.00 max	0.000 dBi (peak)

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

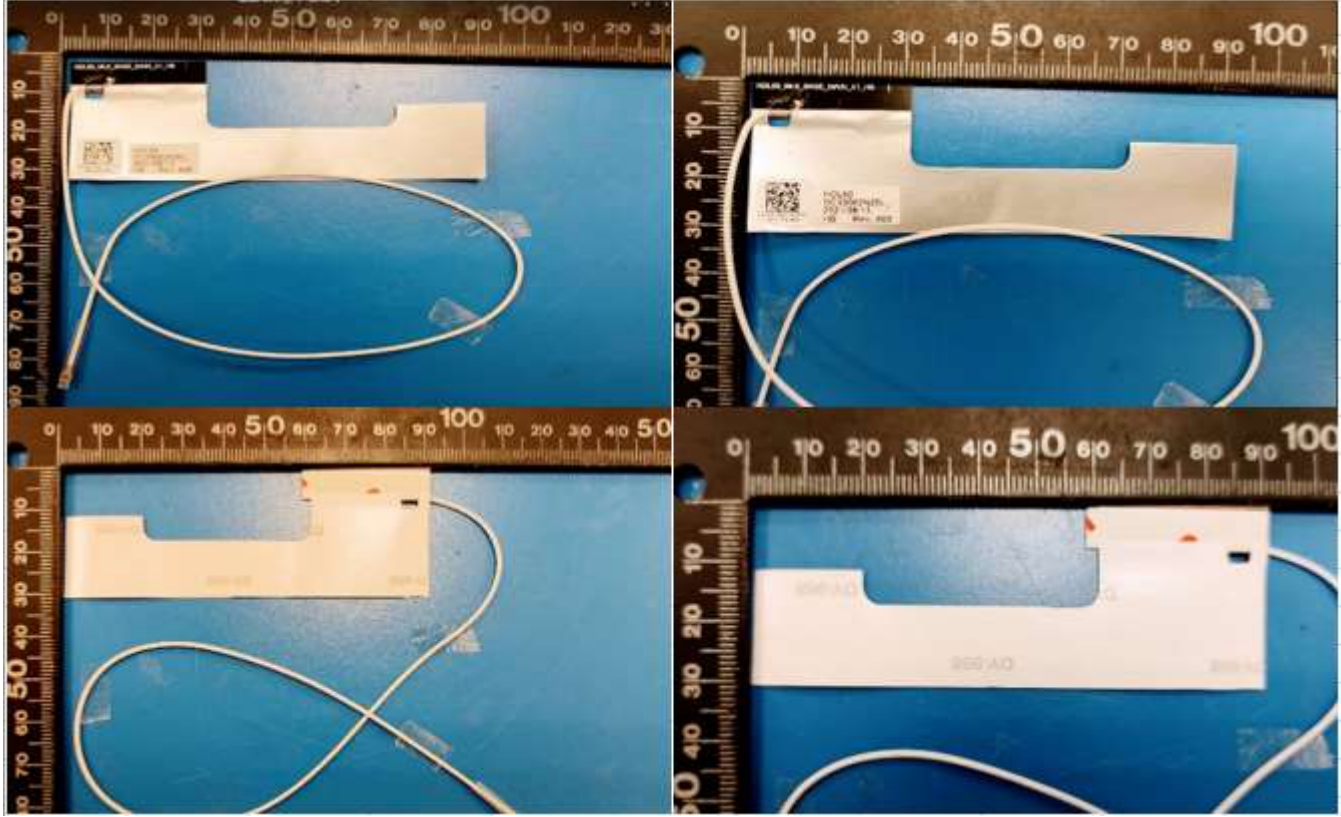
Section 2. Dimensioned Photos and Drawings of Antennas

Include the dimensioned photo and drawing of Main antenna here.

Main Antenna Drawing:



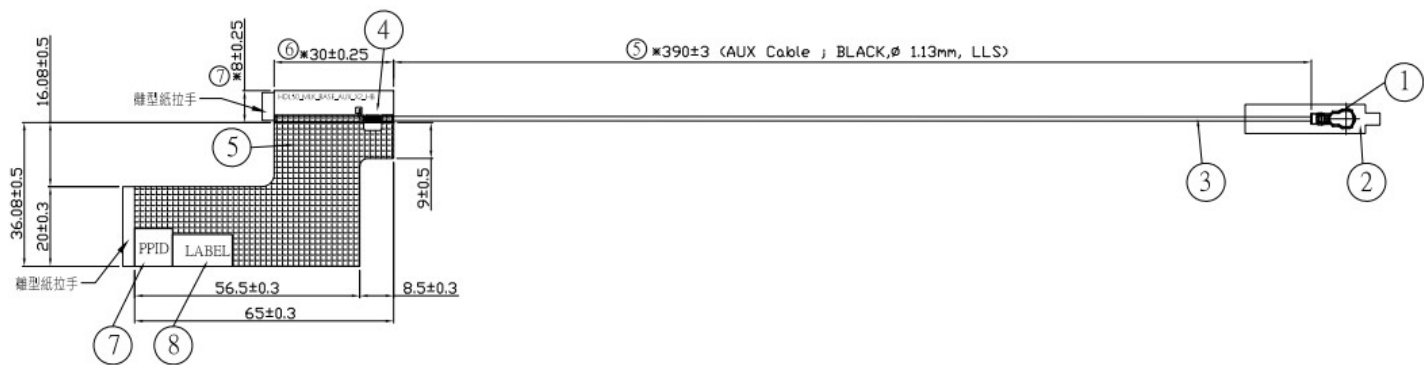
Main Antenna Photo (Front/Back):



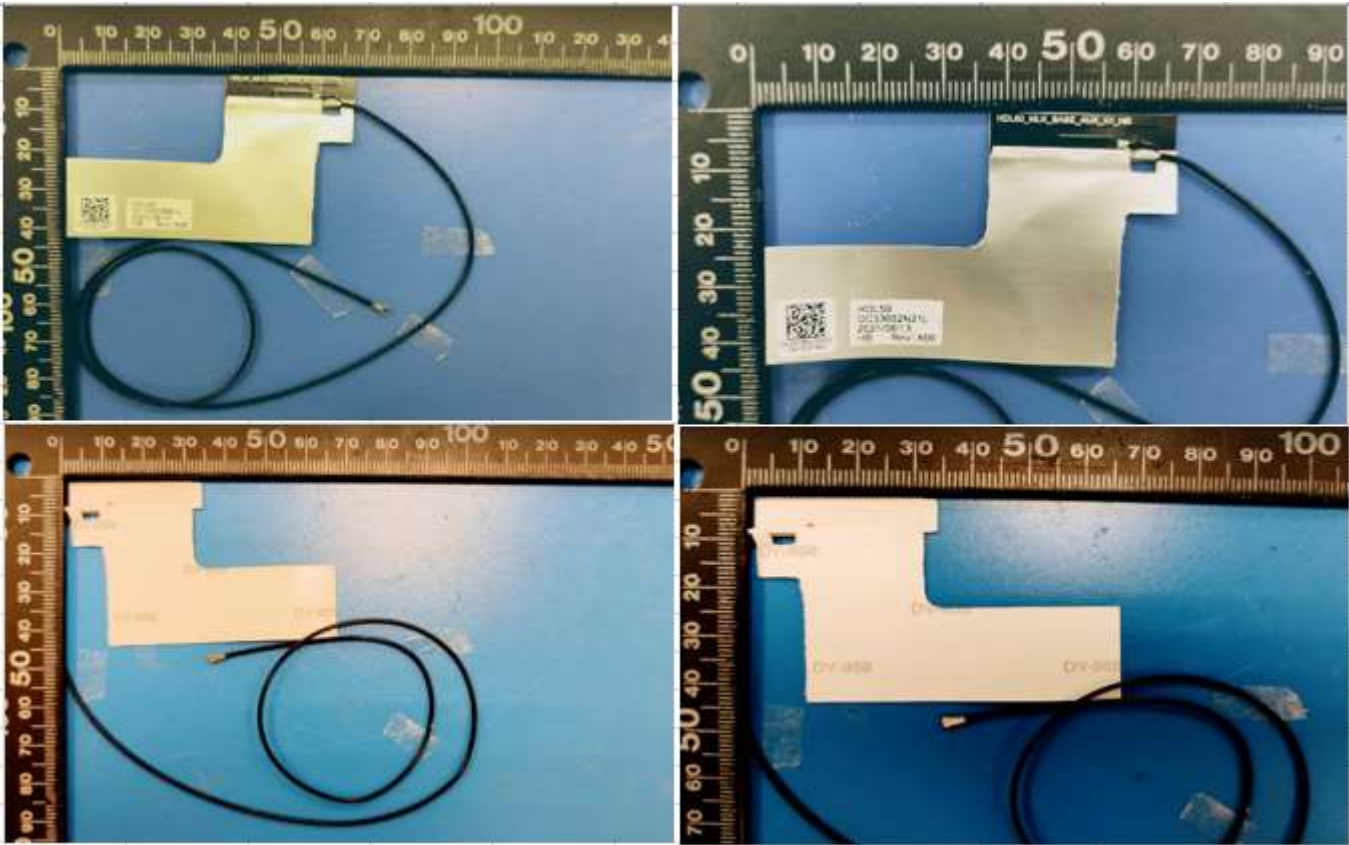
Note: antenna photo should include L type ruler

Include the dimensioned photo and drawing of Aux antenna here.

Aux Antenna Drawing:



Aux Antenna Photo (Front/Back):



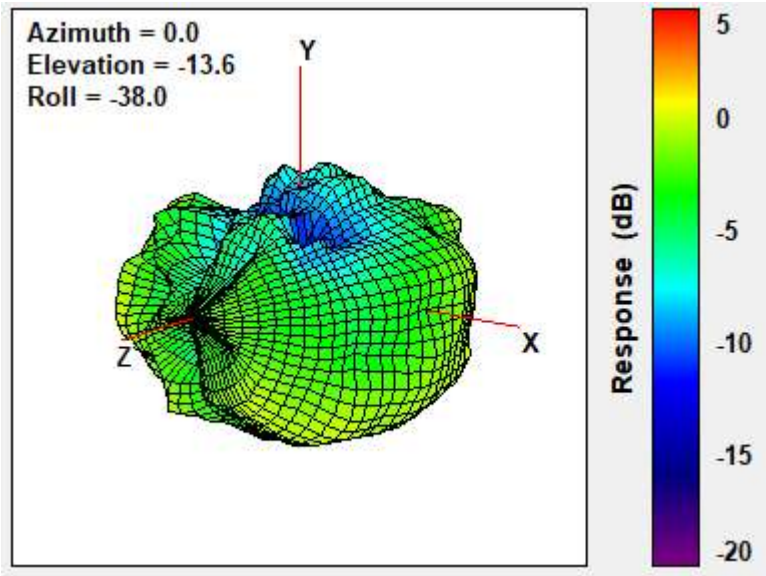
Note: antenna photo should include L type ruler

Section 3. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

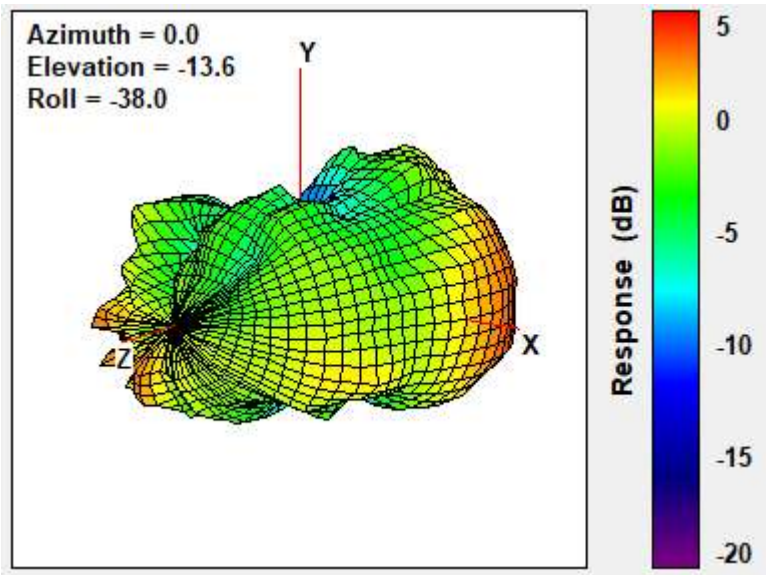
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	2.983



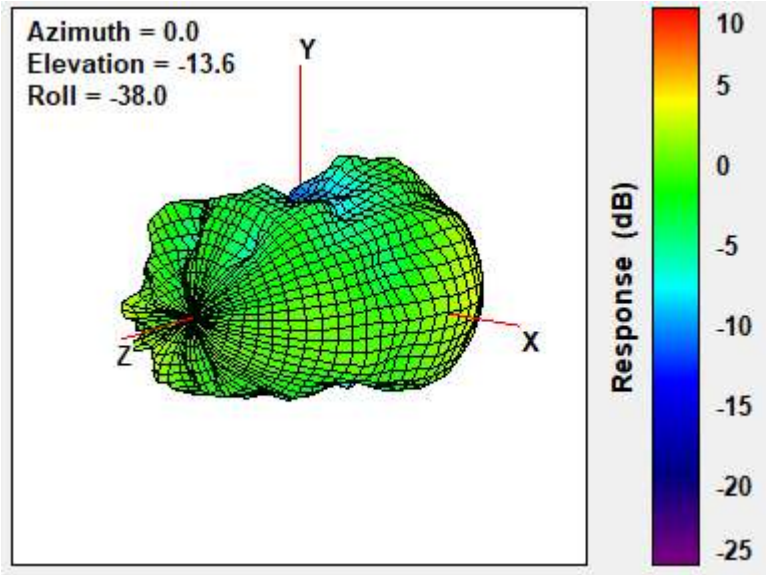
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.618



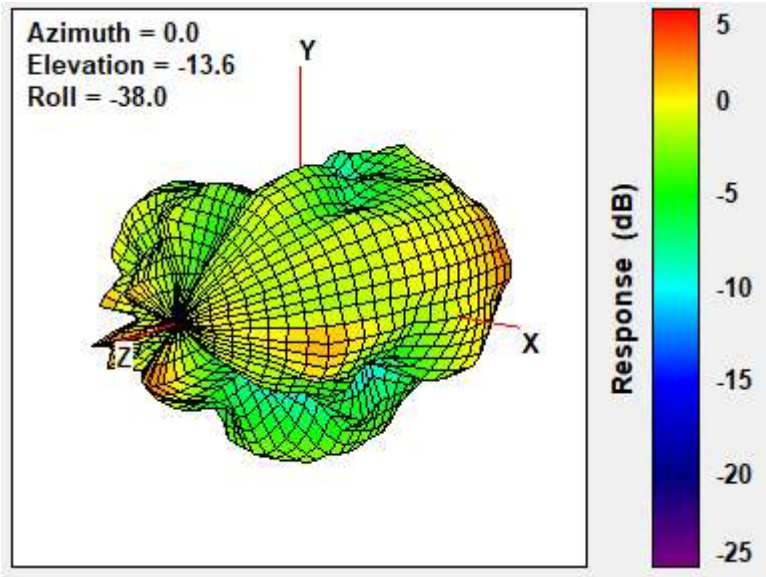
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	2.526



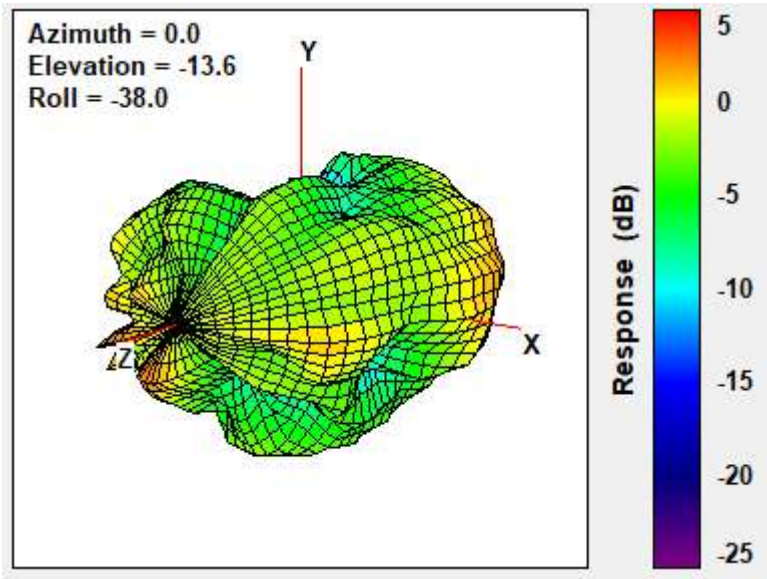
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	2.901



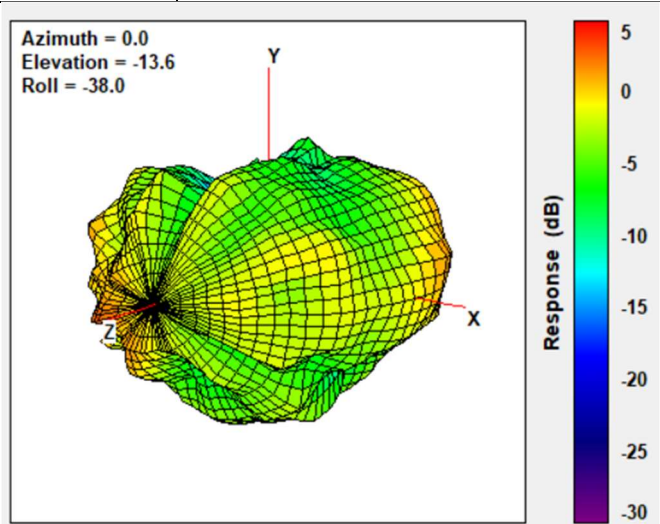
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	2.925



Max Antenna 3D Radiation Pattern 5850-5895 MHz

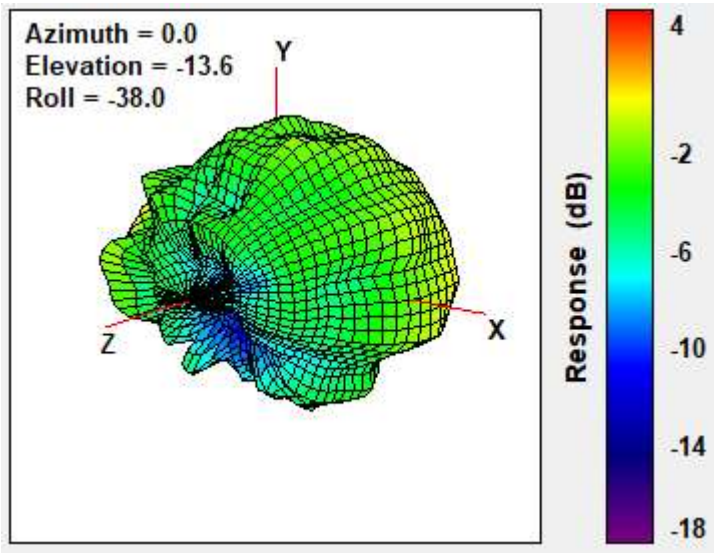
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5850-5895	2.425



Auxiliary Antenna

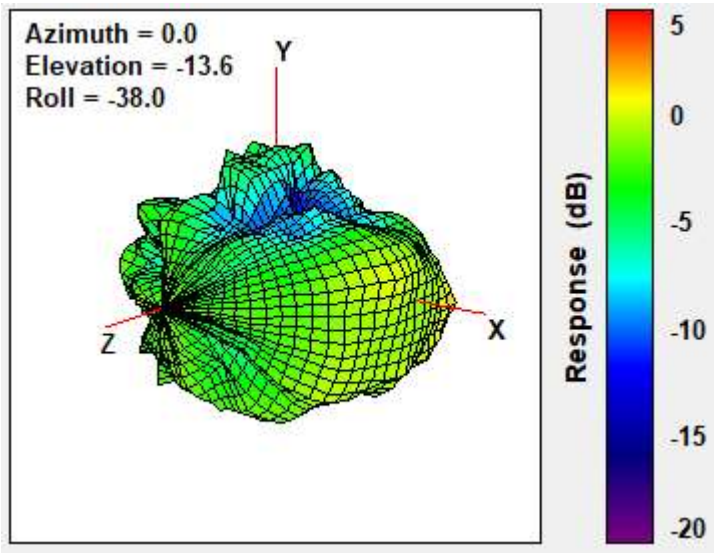
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	2.489



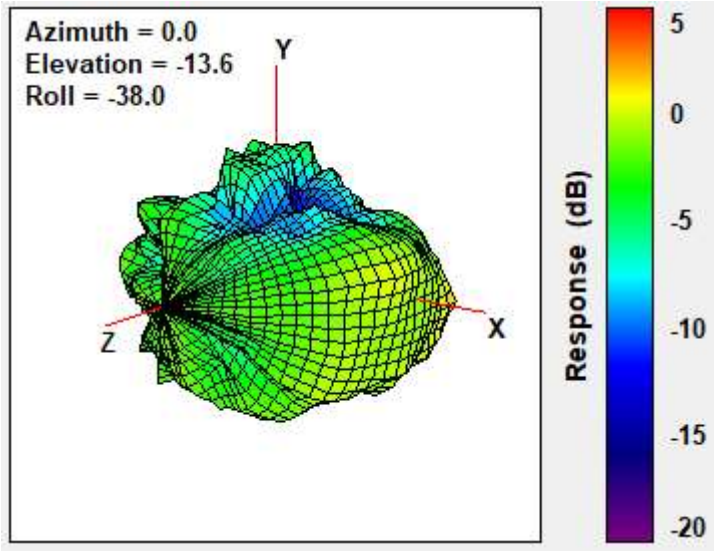
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.441



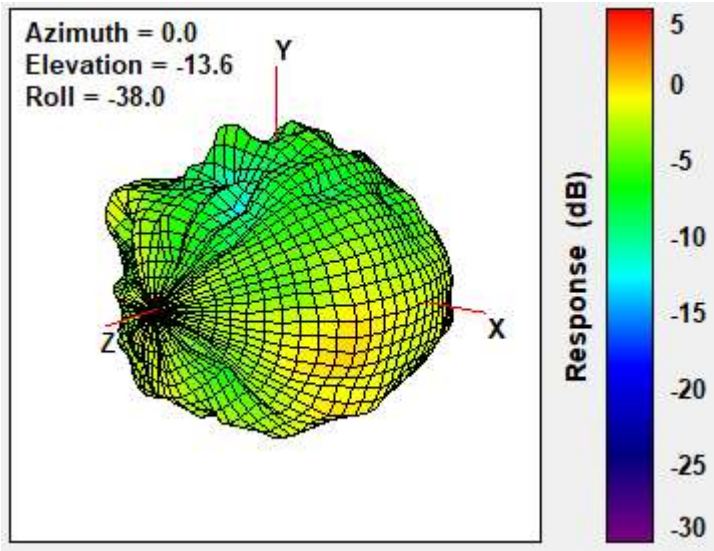
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	2.441



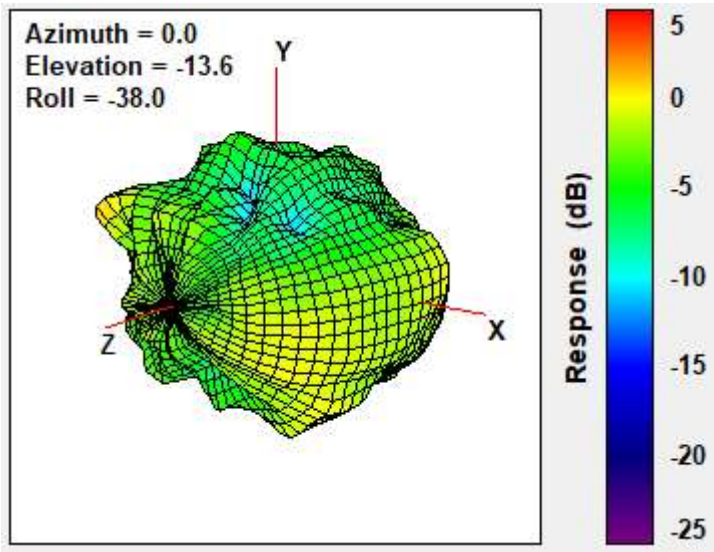
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	2.492



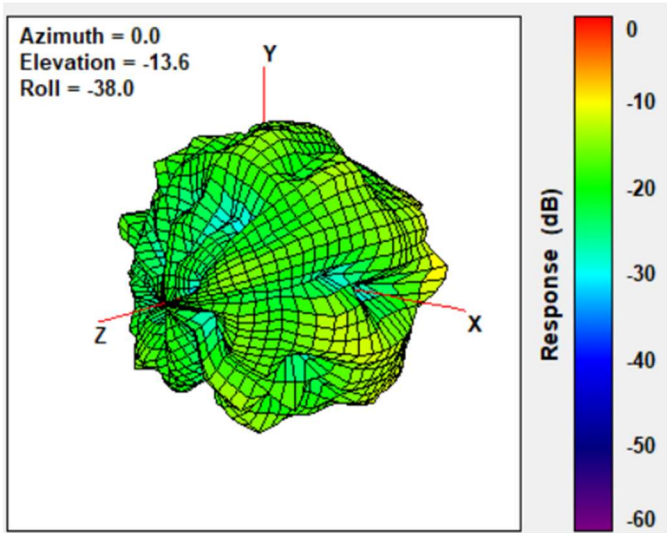
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	1.899



Max Antenna 3D Radiation Pattern 5850-5895 MHz

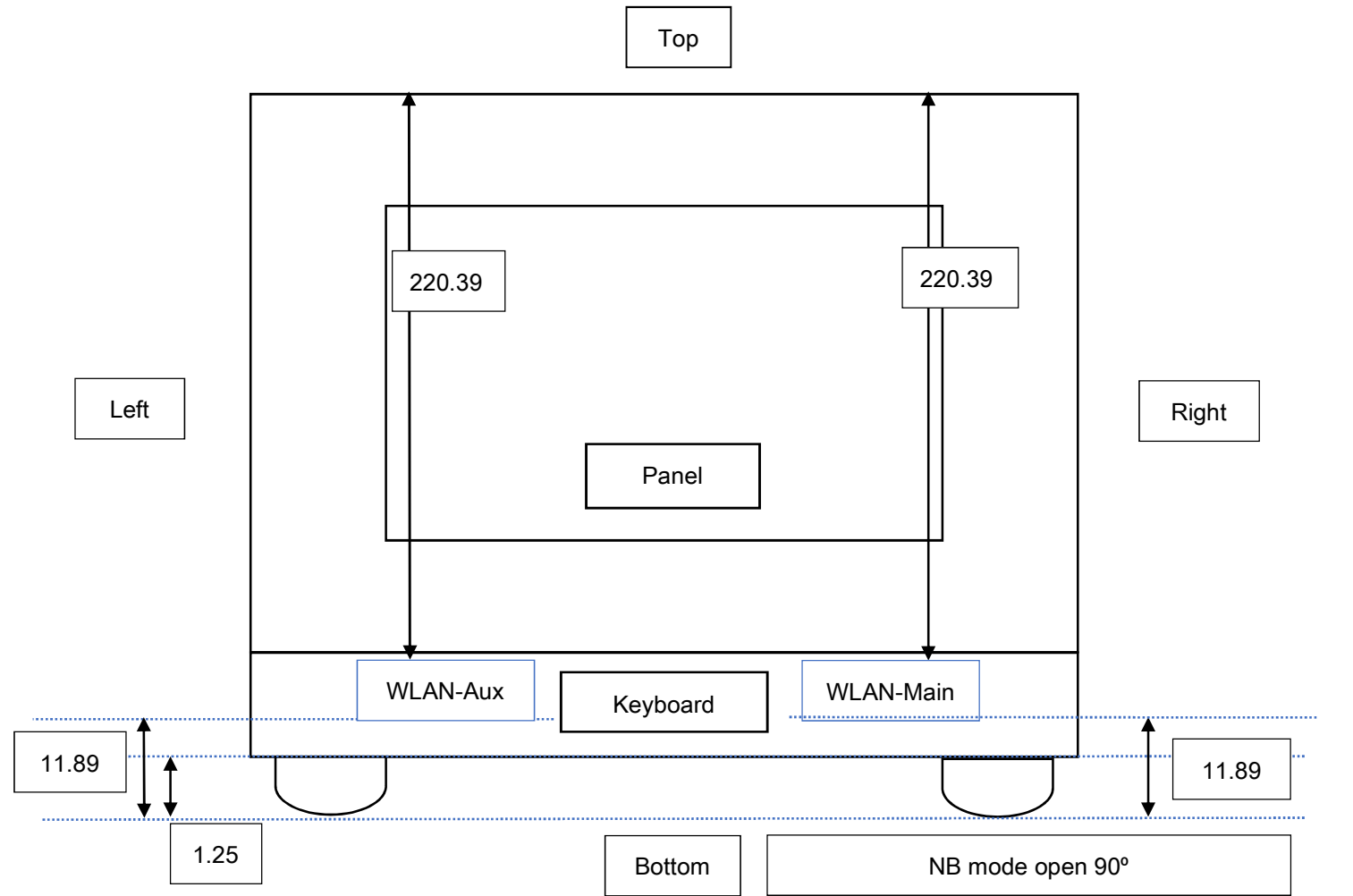
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5850-5895	1.949



Section 4. Antenna Host Platform Location Information

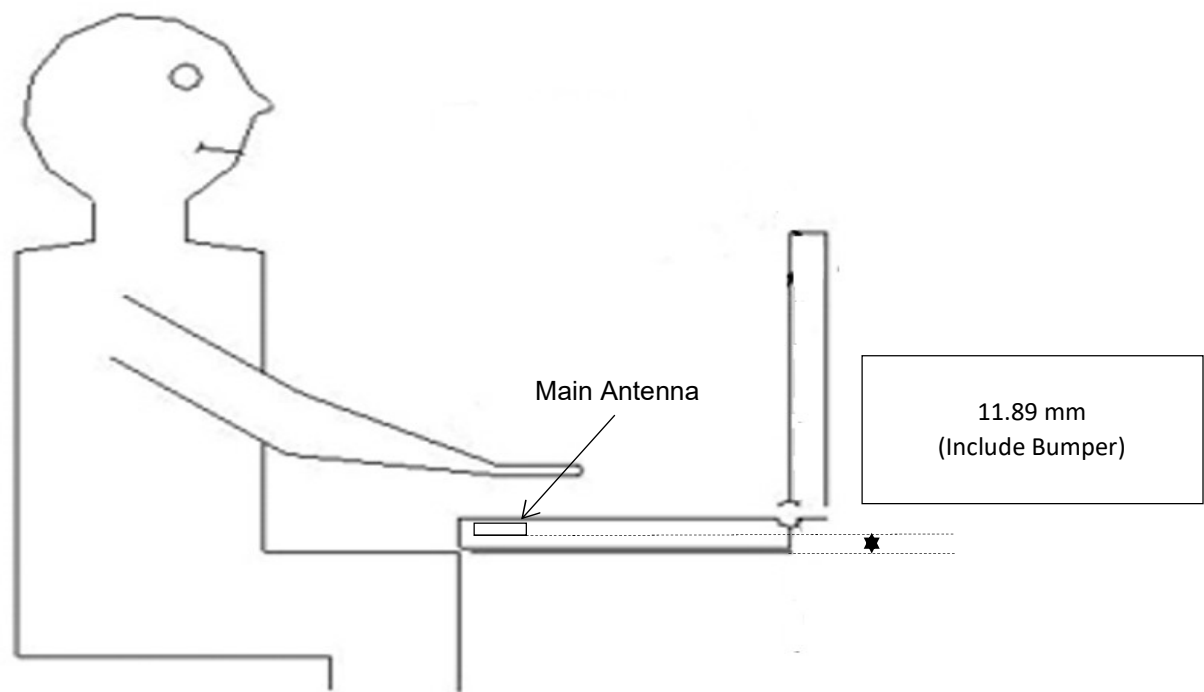
Include a **dimensioned photo(s) or dimensioned drawing(s)** of Main and Aux antenna placements (measurements are not required for receive-only antenna).

Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



Section 5. Antenna dimensional information for SAR evaluation

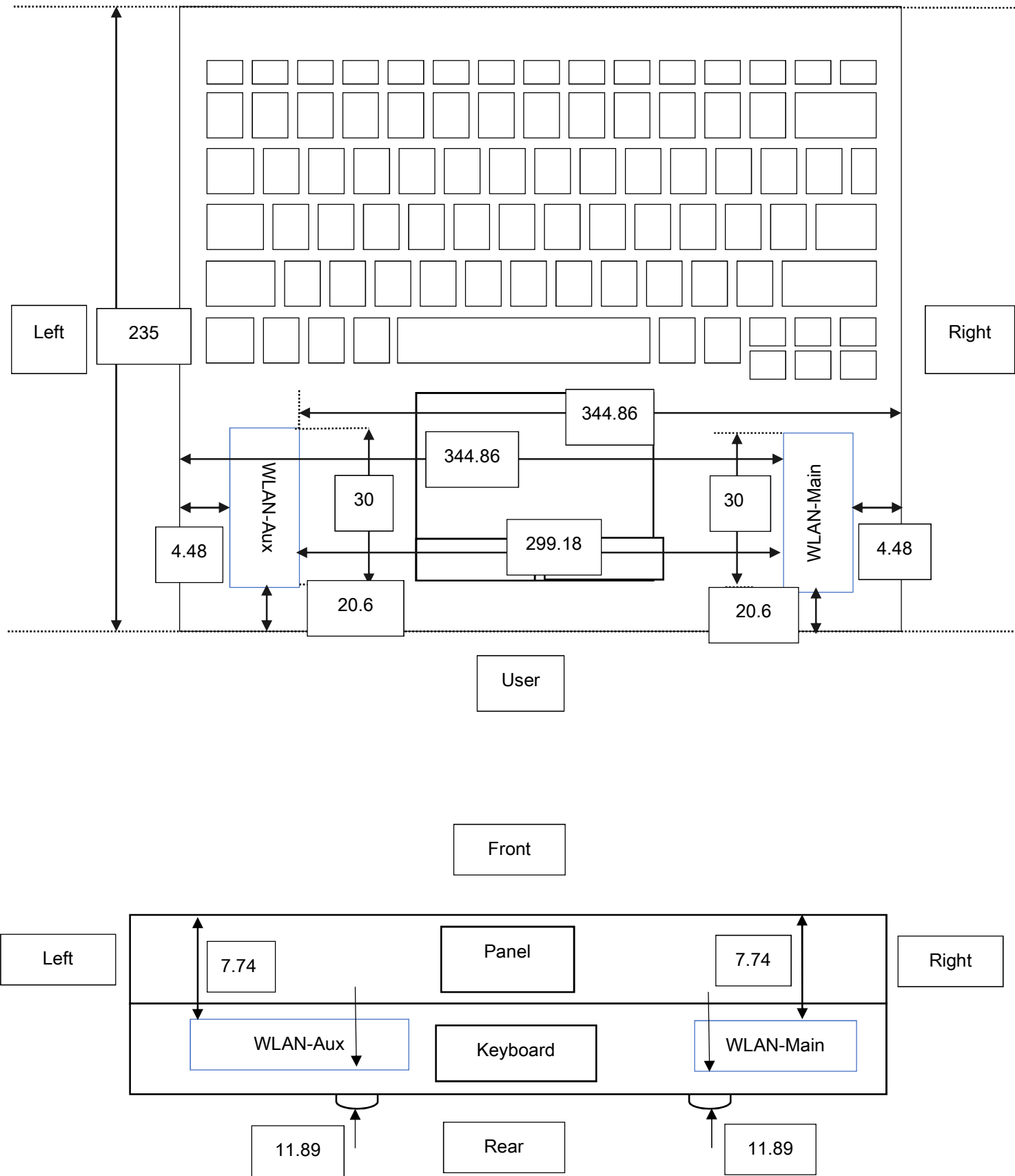
Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user. For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary landscape positions. Include a description of any proximity sensors or power throttling implementations that limit or exclude use of any host orientation.



Section 6. Diagram Example of Co-Location Antenna Separation

Include a **dimensioned photo or dimensioned drawing** showing the distance (mm) between all WLAN transmit antennas and other co-located radiator transmit antenna such as Bluetooth, WWAN,..

(Note: Due to the evolving rules regarding co-location, each platform will need to be reviewed on a case by case basis)



Revision History

Revision	Description	Date
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