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)
Intel	Samsung	NP730QFG NP734QFG	Yes	NB	9.47

*****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)
WNC	PIFA	BA42-00744A	BA42-00745A

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	1.93	2.88	3.13	2.54	1.6	1.62	0.62	1.68	3.03	2.63
Aux	2.78	2.43	3.33	2.69	3.51	1.76	3.95	3.95	3.82	3.75

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
PIFA	**3.24**	**3.64**	**3.73**	**4.77**	**4.97**	**4.72**	**4.83**	**4.30**	**5.37**	**5.59**	Mid-power: ≥ 8 mm
Dipole	**2.89**	**2.92**	**3.19**	**4.41**	**4.22**	**4.22**	**4.83**	**4.30**	**4.49**	**5.34**	Low power: ≥ 5 mm

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)

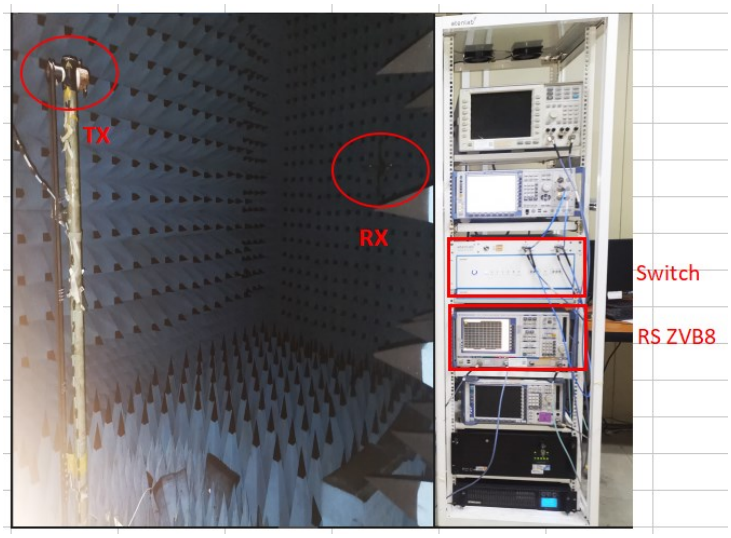
- Mini-tablet: Minimum antenna-to-edge (6 sides of the device)

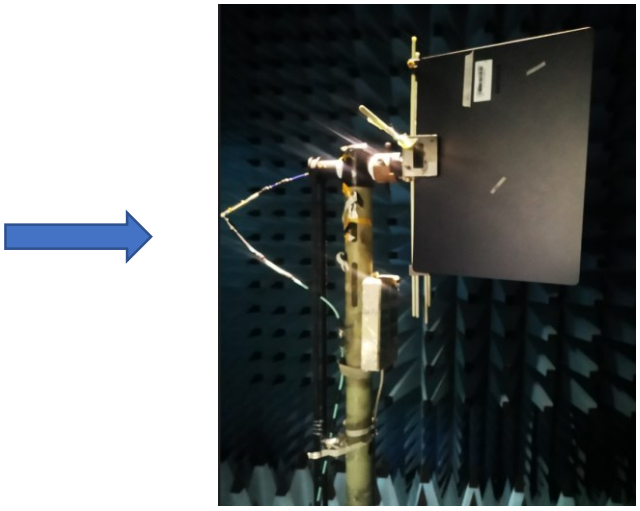
*** 3D Peak Antenna gain should be equal or greater than -2 dBi**

- 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.

Table of contents

1. **Applicable test methods**

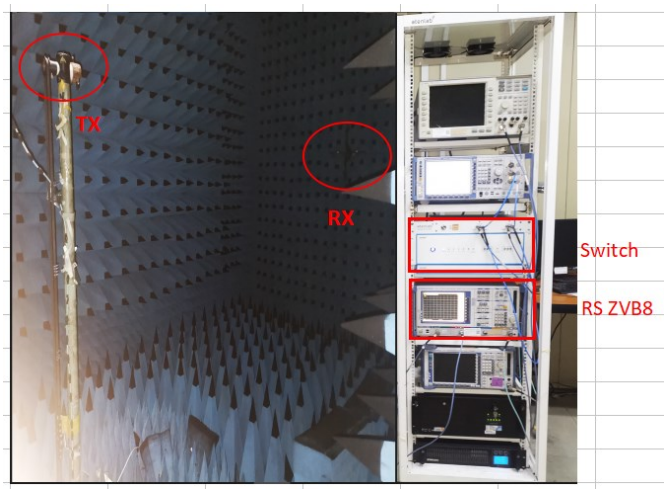




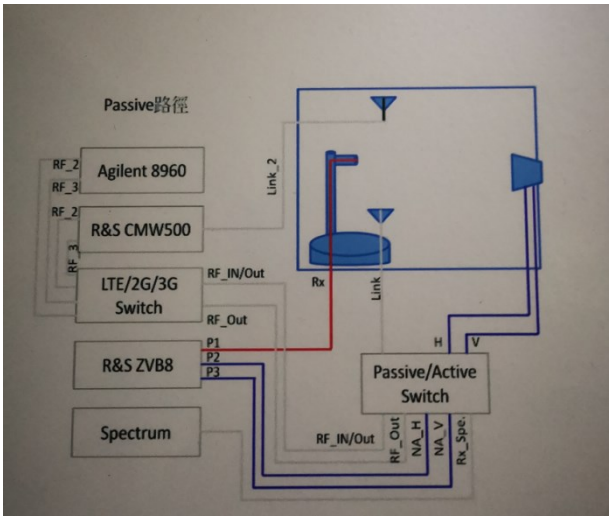
As right picture, make DUT to be 110 degree, lay it on chamber transmitting terminal, RX antenna receive the signal and feedback to Network analyzer, then test result come out by software calculating

2. **Test & System Description**
   a. Test setup

Test Environment



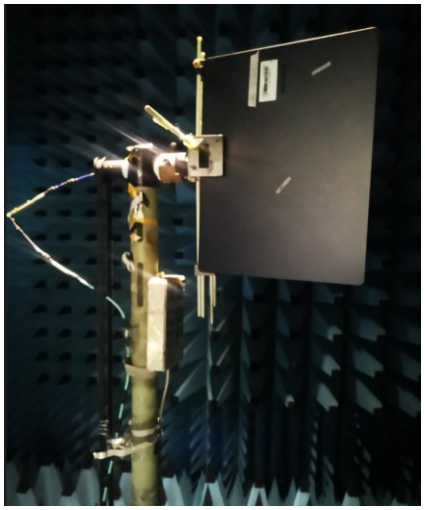
Schematic diagram



b. Equipment list

Equipment list						
NO.	Device	Type/Mode	Serial #	Manfacturer	Cal-Date	Cal.DueDate
1	Chamber	\	\	ATEN LAB	2022.9.20	2023.03.20
2	Software	\	\	ATEN LAB	\	\
3	Active/passive switch	\	\	ATEN LAB	\	\
4	Network analyzer	ZVB8	1145.1010.10	R&S	2022.2.28	2023.2.28
5	Horn antenna	BBHX9120E	\	SCHWARZBECK	2020.06.22	\
Tester: Dongxiu.Ma Sign : Dongxiu.Ma Test Date: 2022.11						

3. Setup photo



Antenna Information

Section 1. Antenna Assembly Specifications

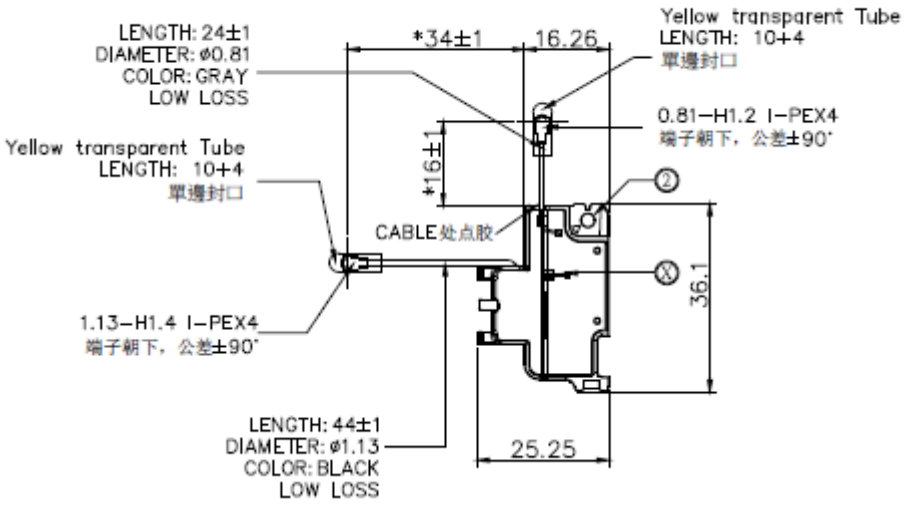
1A Antenna Part Number	1B Manufacturer	1C Antenna Type	1D Cable Assembly Part Number and Information	Freq Range MHz	1E * Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G Max VSWR	1H Cable Loss (dB)
(P/N:BA42-00744A) Tx1/ Rx1 Antenna (Main)	Wistron Neweb Corporation	PIFA	(P/N:81XBLC15.G01) MHF4L 50 ohm Coaxial length: 44mm diameter: 1.13mm	2400-2483.5	2400-2483.5MHz 1.93 dBi (peak)	2400-2483.5MHz 2.04 dBi (peak)	2400-2483.5MHz 2.0 max	2400-2483.5MHz 0.11 dBi (peak)
				5150-5250	5150-5250MHz 2.88 dBi (peak)	5150-5250MHz 3.06 dBi (peak)	5150-5250MHz 2.5 max	5150-5250MHz 0.18 dBi (peak)
				5250-5350	5250-5350MHz 3.13 dBi (peak)	5250-5350MHz 3.31 dBi (peak)	5250-5350MHz 2.5 max	5250-5350MHz 0.18 dBi (peak)
				5470-5725	5470-5725MHz 2.54 dBi (peak)	5470-5725MHz 2.72 dBi (peak)	5470-5725MHz 2.5 max	5470-5725MHz 0.18 dBi (peak)
				5725-5850	5725-5850MHz 1.60 dBi (peak)	5725-5850MHz 1.79 dBi (peak)	5725-5850MHz 2.5 max	5725-5850MHz 0.19 dBi (peak)
				5850-5895	5850-5895MHz 1.62 dBi (peak)	5850-5895MHz 1.81 dBi (peak)	5850-5895MHz 2.5 max	5850-5895MHz 0.19 dBi (peak)
				5925-6425	5925-6425MHz 0.62 dBi (peak)	5925-6425MHz 0.81 dBi (peak)	5925-6425MHz 2.5 max	5925-6425MHz0.19 dBi (peak)
				6425-6525	6425-6525MHz 1.68 dBi (peak)	6425-6525MHz 1.87 dBi (peak)	6425-6525MHz 2.5 max	6425-6525MHz0.19 dBi (peak)
				6525-6875	6525-6875MHz 3.03 dBi (peak)	6525-6875MHz 3.23 dBi (peak)	6525-6875MHz 2.5 max	6525-6875MHz0.20 dBi (peak)
				6875-7125	6875-7125MHz 2.63 dBi (peak)	6875-7125MHz 2.83 dBi (peak)	6875-7125MHz 2.5 max	6875-7125MHz0.20 dBi (peak)
(P/N:BA42-00745A) Tx2/ Rx2 Antenna (Aux)	Wistron Neweb Corporation	PIFA	(P/N:81XBLC15.G02) MHF4L 50 ohm Coaxial length: 274mm diameter: 1.13mm	2400-2483.5	2400-2483.5MHz 2.78 dBi (peak)	2400-2483.5MHz 3.47dBi (peak)	2400-2483.5MHz 2.0 max	2400-2483.5MHz 0.69 dBi (peak)
				5150-5250	5150-5250MHz 2.43 dBi (peak)	5150-5250MHz 3.55 dBi (peak)	5150-5250MHz 2.5 max	5150-5250MHz 1.12 dBi (peak)
				5250-5350	5250-5350MHz 3.33 dBi (peak)	5250-5350MHz 4.45 dBi (peak)	5250-5350MHz 2.5 max	5250-5350MHz 1.12 dBi (peak)
				5470-5725	5470-5725MHz 2.69 dBi (peak)	5470-5725MHz 3.84 dBi (peak)	5470-5725MHz 2.5 max	5470-5725MHz 1.15 dBi (peak)
				5725-5850	5725-5850MHz 3.51 dBi (peak)	5725-5850MHz 3.69 dBi (peak)	5725-5850MHz 2.5 max	5725-5850MHz 1.18 dBi (peak)
				5850-5895	5850-5895MHz 1.76 dBi (peak)	5850-5895MHz 2.94 dBi (peak)	5850-5895MHz 2.5 max	5850-5895MHz 1.18 dBi (peak)
				5925-6425	5925-6425MHz 3.95 dBi (peak)	5925-6425MHz 5.13 dBi (peak)	5925-6425MHz 2.5 max	5925-6425MHz1.18 dBi (peak)
				6425-6525	6425-6525MHz 3.95 dBi (peak)	6425-6525MHz 5.14 dBi (peak)	6425-6525MHz 2.5 max	6425-6525MHz1.19 dBi (peak)
				6525-6875	6525-6875MHz 3.82 dBi (peak)	6525-6875MHz 4.01 dBi (peak)	6525-6875MHz 2.5 max	6525-6875MHz 1.19 dBi (peak)
				6875-7125	6875-7125MHz 3.75 dBi (peak)	6875-7125MHz 3.95 dBi (peak)	6875-7125MHz 2.5 max	6875-7125MHz 1.20 dBi (peak)

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

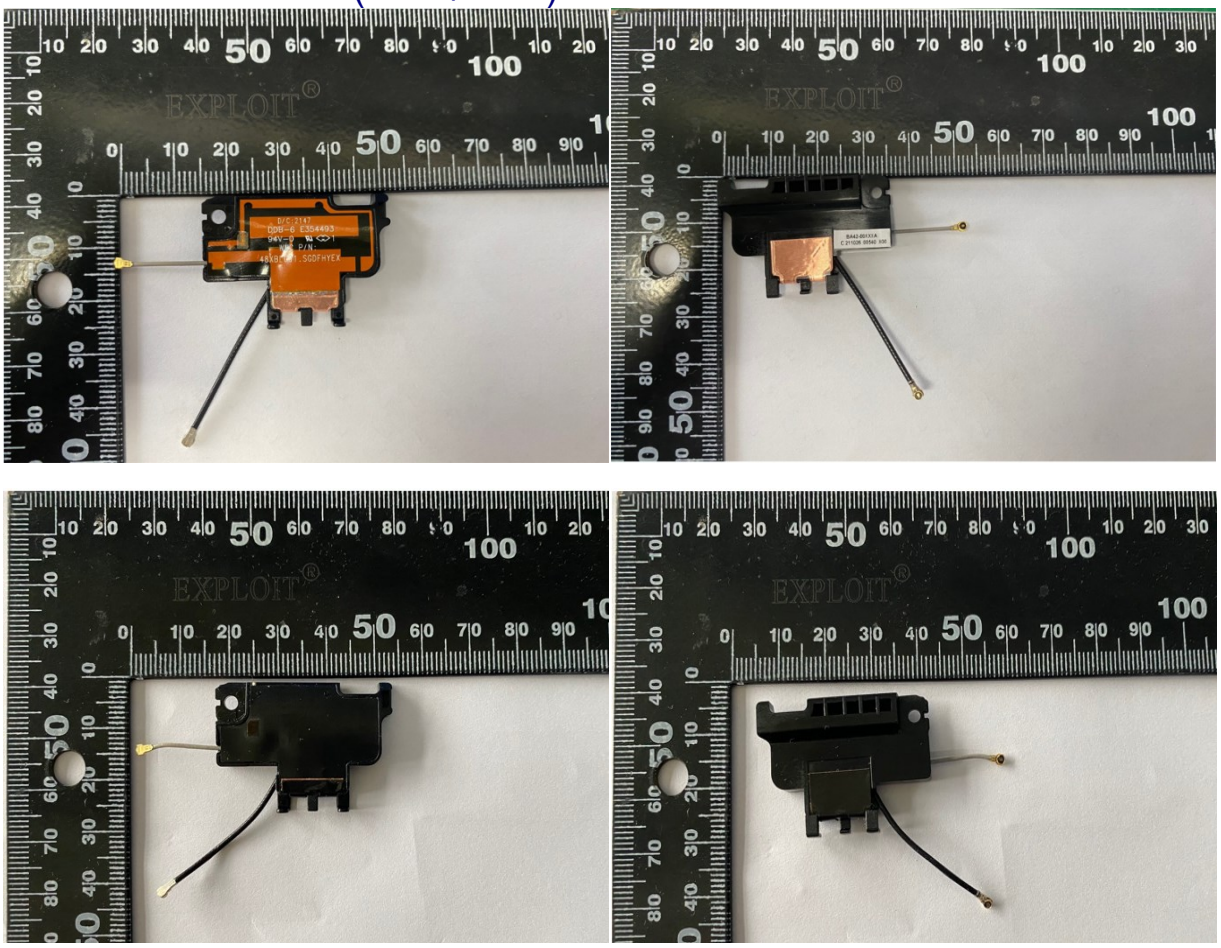
Section 2. Dimensioned Photos or Drawings of Antennas

Include a dimensioned photo and dimensioned drawing of Main antenna here.

Main Antenna Dimensioned Drawing:



Main Antenna Photo (Front/Back):



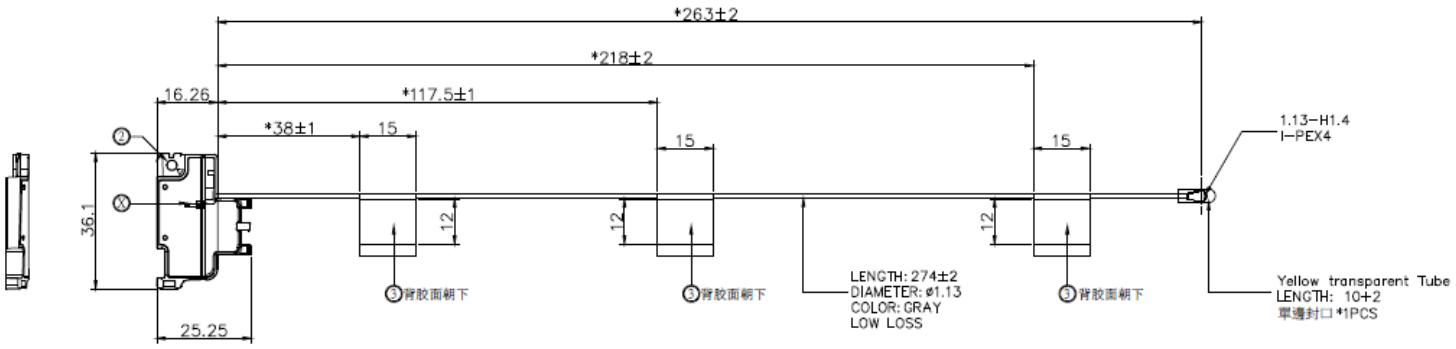
Antenna Manufacturer: Wistron Neweb Corportation

Antenna Part Number: 81XBLC15.G01 (Main)

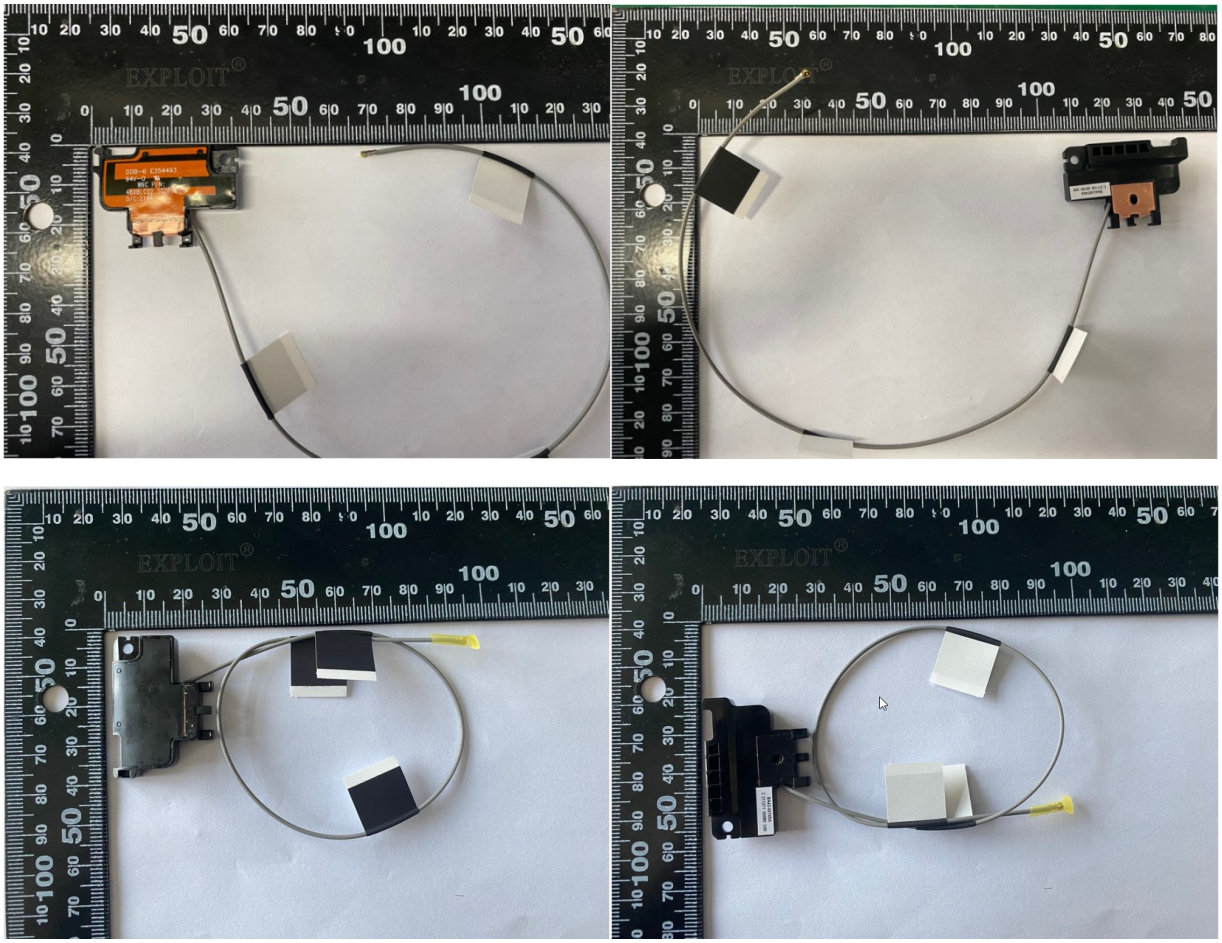
Note: antenna photo should include L type ruler According to the design request， all the components color should be black or gray，only the antenna FPCB color change to black，antenna pattern keeps the same

Aux Antenna Dimensioned Drawing:

Include a dimensioned photo and dimensioned drawing of Aux antenna here.



Aux Antenna Photo (Front/Back):



Antenna Manufacturer: Wistron Neweb Corportation

Antenna Part Number: 81XBLC15.G02 (Aux)

Note: antenna photo should include L type ruler

According to the design request， all the components color should be black or gray，only the antenna FPCB color change to black，antenna pattern keeps the same

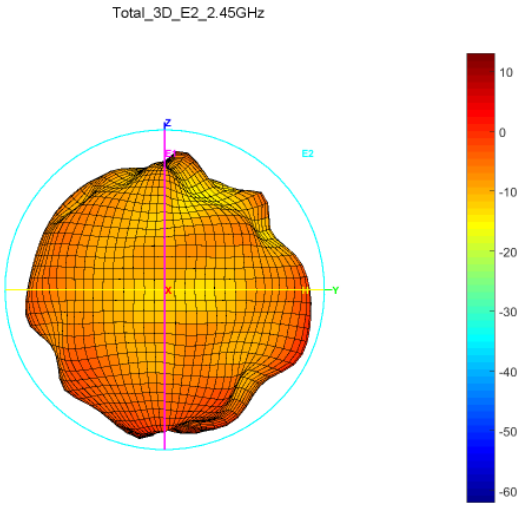
Section 3. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Main antenna: 2450 MHz

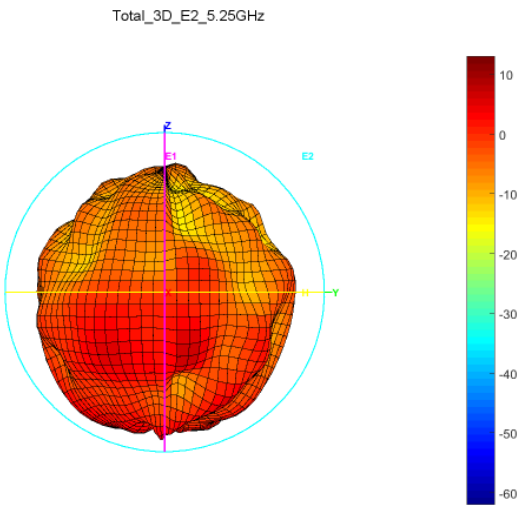
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2400-2483.5	1.93



Max Antenna 3D Radiation Pattern 5150-5250 MHz

Main antenna: 5250 MHz

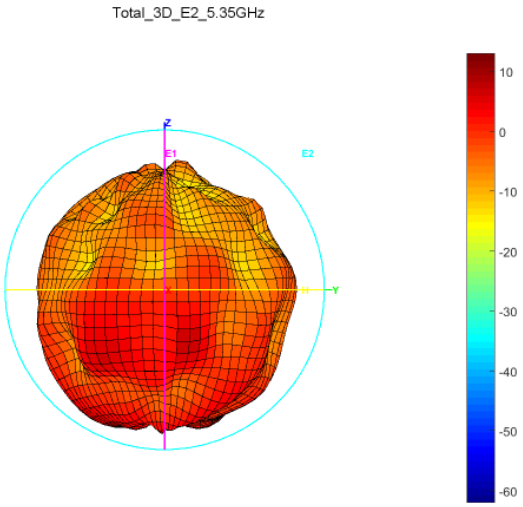
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.88



Max Antenna 3D Radiation Pattern 5250-5350 MHz

Main antenna: 5350 MHz

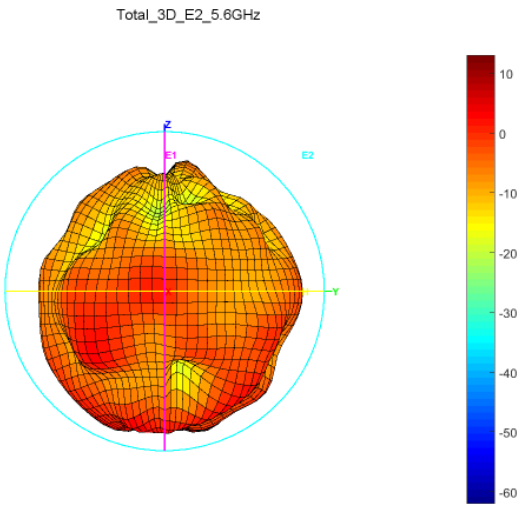
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	3.13



Max Antenna 3D Radiation Pattern 5470-5725 MHz

Main antenna: 5600 MHz

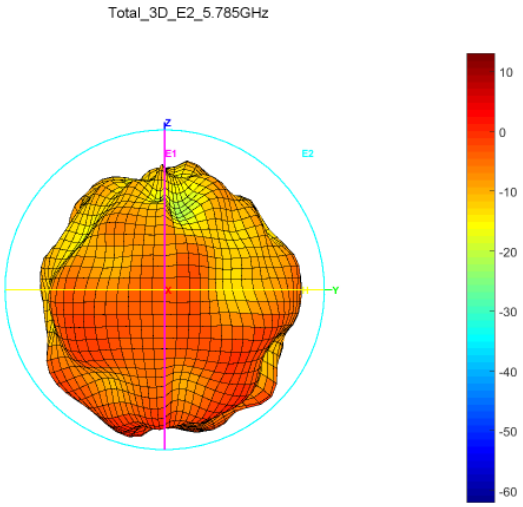
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	2.54



Max Antenna 3D Radiation Pattern 5725-5850 MHz

Main antenna: 5785 MHz

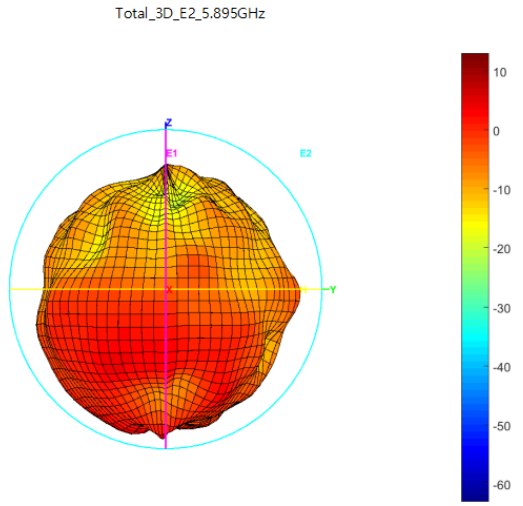
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	1.6



Max Antenna 3D Radiation Pattern 5850-5895 MHz

Main antenna: 5895 MHz

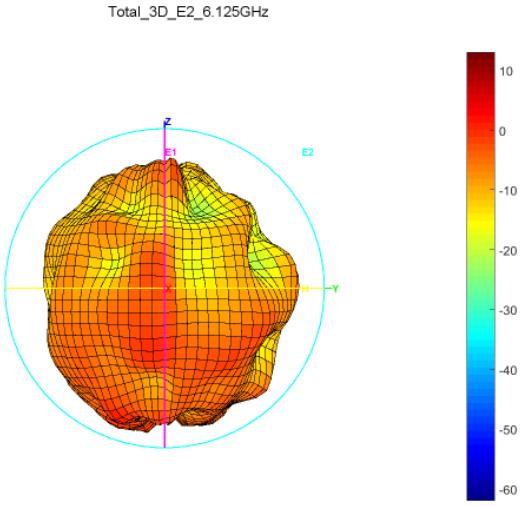
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5850-5895	1.62



Max Antenna 3D Radiation Pattern 5925-6425 MHz

Main antenna: 6125 MHz

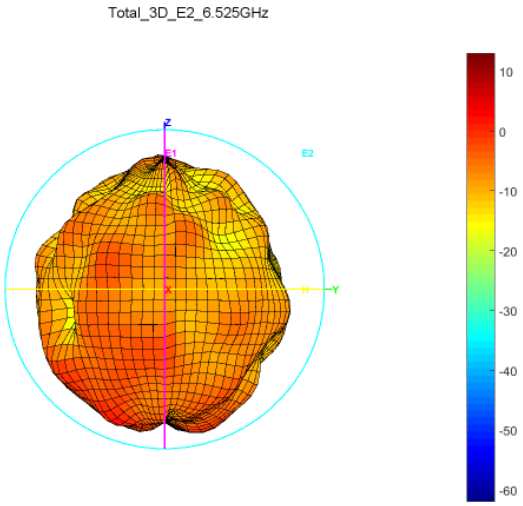
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5925-6425	0.62



Max Antenna 3D Radiation Pattern 6425-6525 MHz

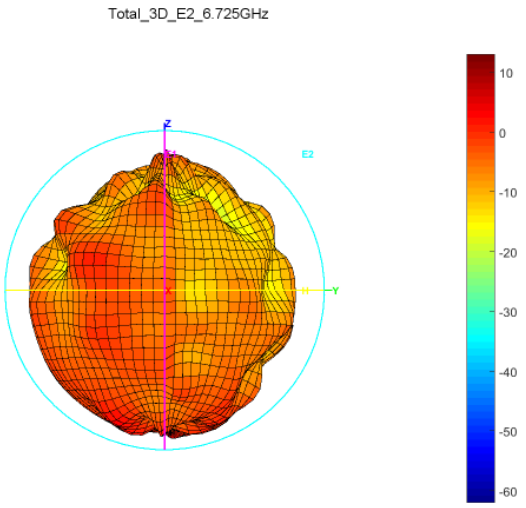
Main antenna: 6525 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6425-6525	1.68



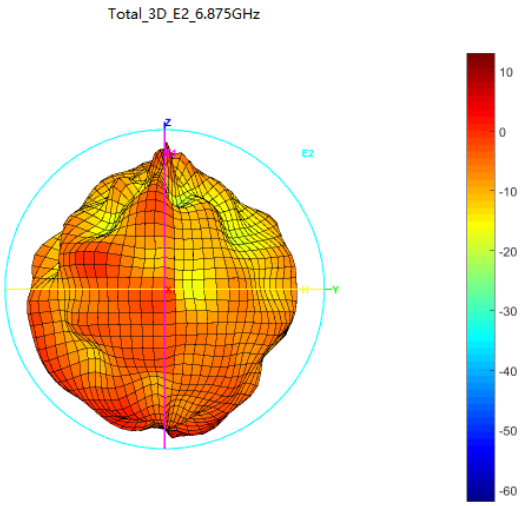
Max Antenna 3D Radiation Pattern 6525-6875 MHz
Main antenna: 6725 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6525-6875	3.03



Max Antenna 3D Radiation Pattern 6875-7125 MHz
Main antenna: 6875 MHz

Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6875-7125	2.63

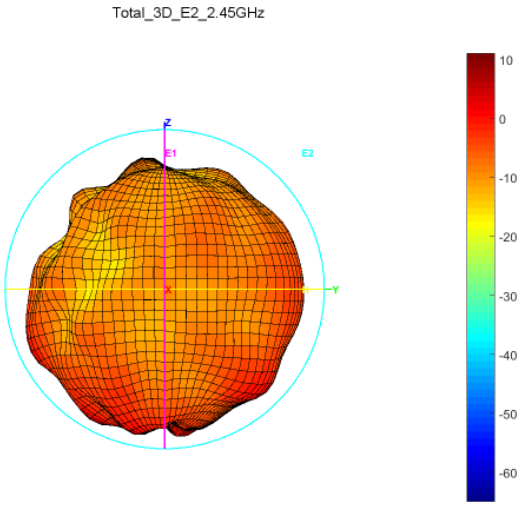


Auxiliary Antenna

Aux Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Aux antenna: 2450 MHz

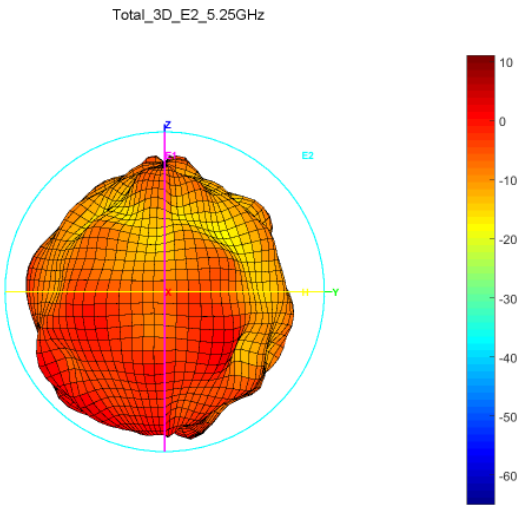
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
2450	2.78



Aux Antenna 3D Radiation Pattern 5150-5250 MHz

Aux antenna: 5250 MHz

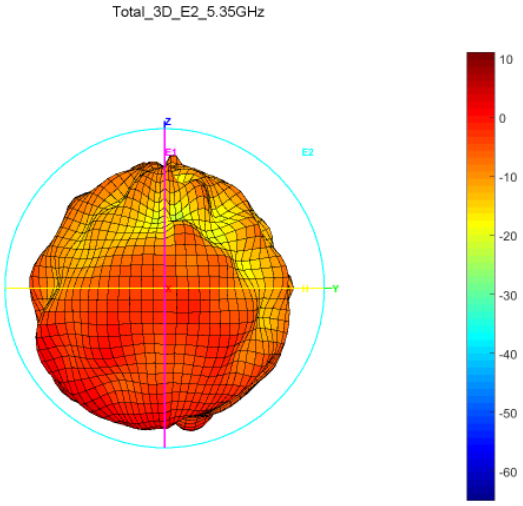
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5150-5250	2.43



Aux Antenna 3D Radiation Pattern 5250-5350 MHz

Aux antenna: 5350 MHz

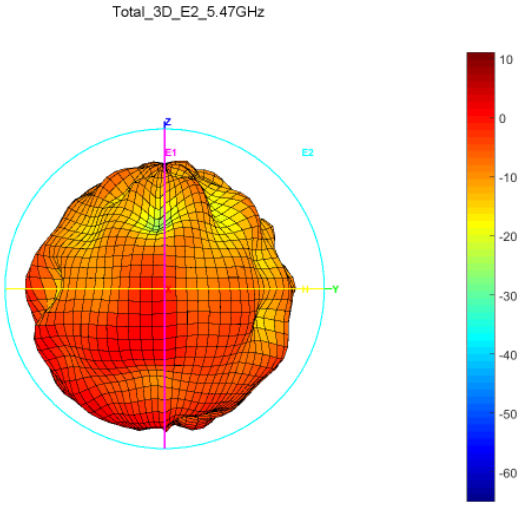
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5250-5350	3.33



Aux Antenna 3D Radiation Pattern 5470-5725 MHz

Aux antenna: 5470 MHz

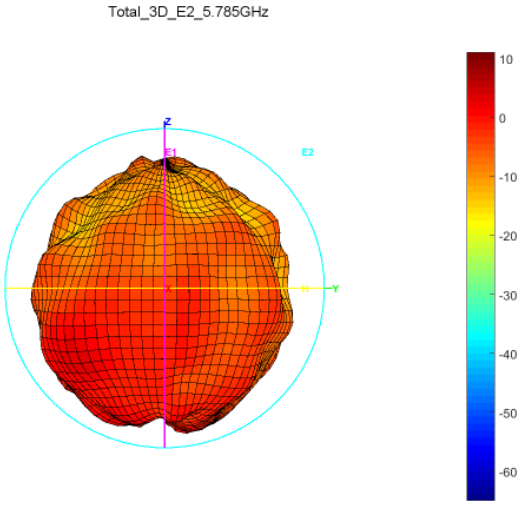
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5470-5725	2.69



Aux Antenna 3D Radiation Pattern 5725-5850 MHz

Aux antenna: 5785 MHz

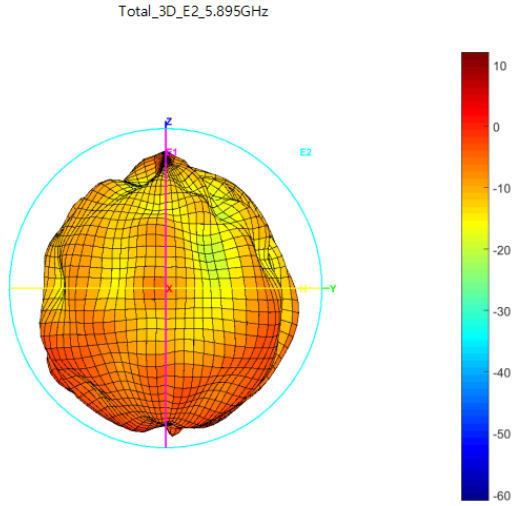
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5725-5850	3.51



Max Antenna 3D Radiation Pattern 5850-5895 MHz

Aux antenna: 5895 MHz

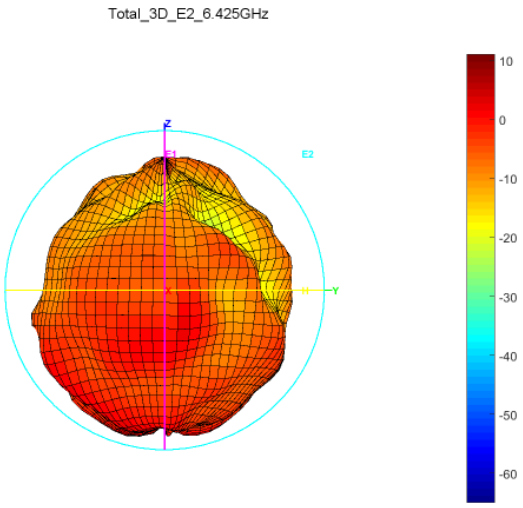
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5850-5895	1.76



Aux Antenna 3D Radiation Pattern 5925-6425 MHz

Aux antenna: 6125 MHz

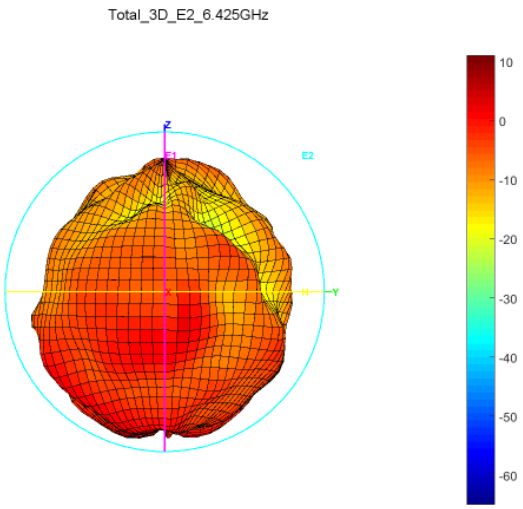
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
5925-6425	3.95



Aux Antenna 3D Radiation Pattern 6425-6525 MHz

Aux antenna: 6425 MHz

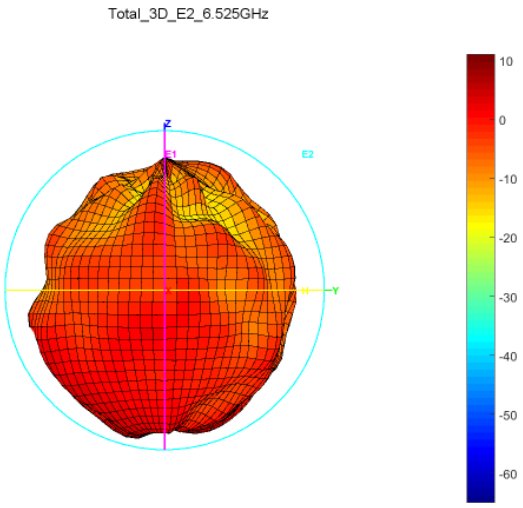
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6425-6525	3.95



Aux Antenna 3D Radiation Pattern 6525-6875 MHz

Aux antenna: 6525 MHz

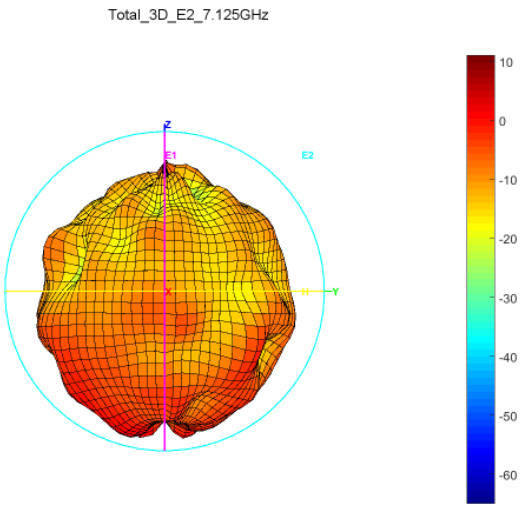
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6525-6875	3.82



Aux Antenna 3D Radiation Pattern 6875-7125 MHz

Aux antenna: 7125 MHz

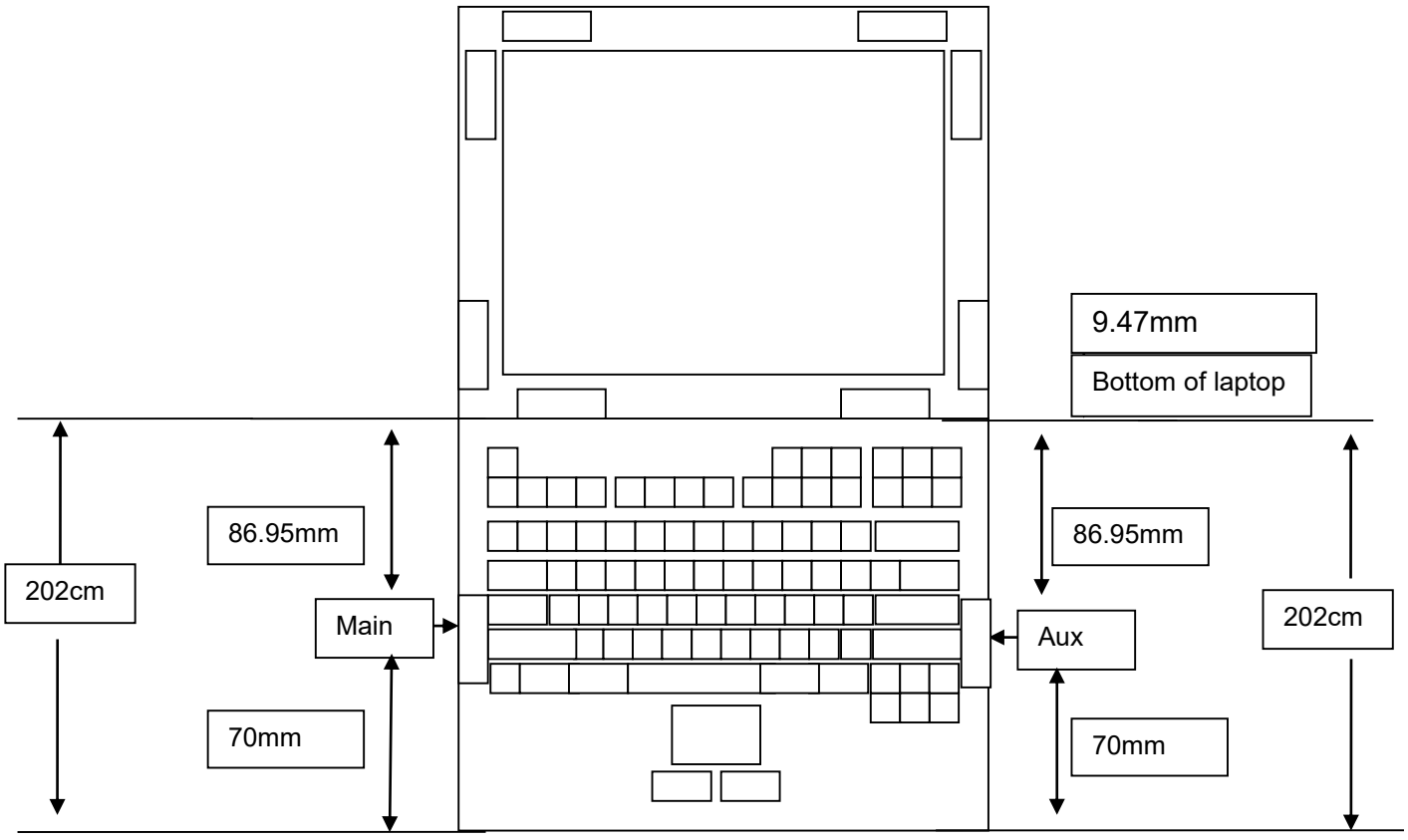
Frequency (MHz)	Peak Gain w/ Cable Loss (dBi)
6875-7125	3.75



Section 4. Antenna Host Platform Location Information

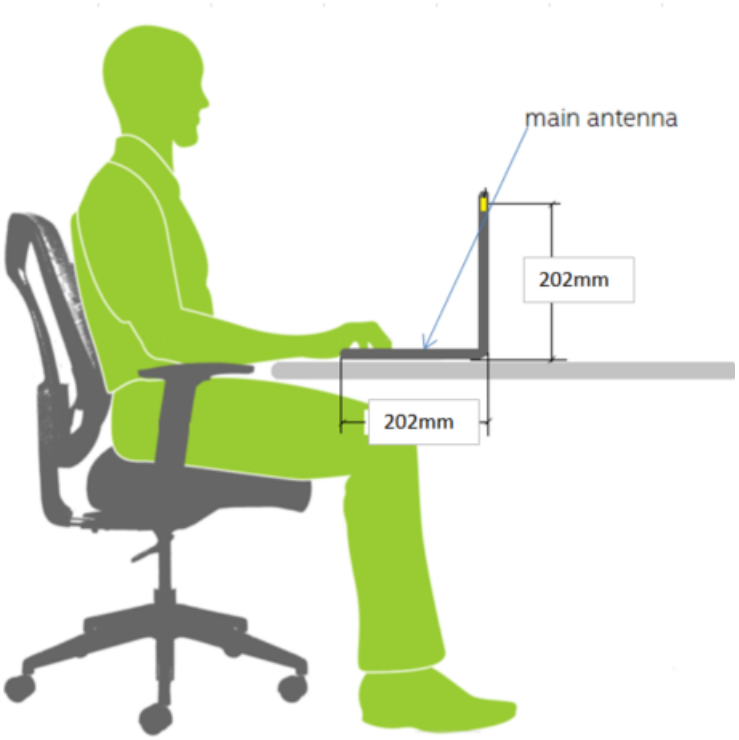
Include a **dimensioned photo(s) or dimensioned drawing(s)** of Main and Aux antenna placements (measurements are not required for receive-only antenna).

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

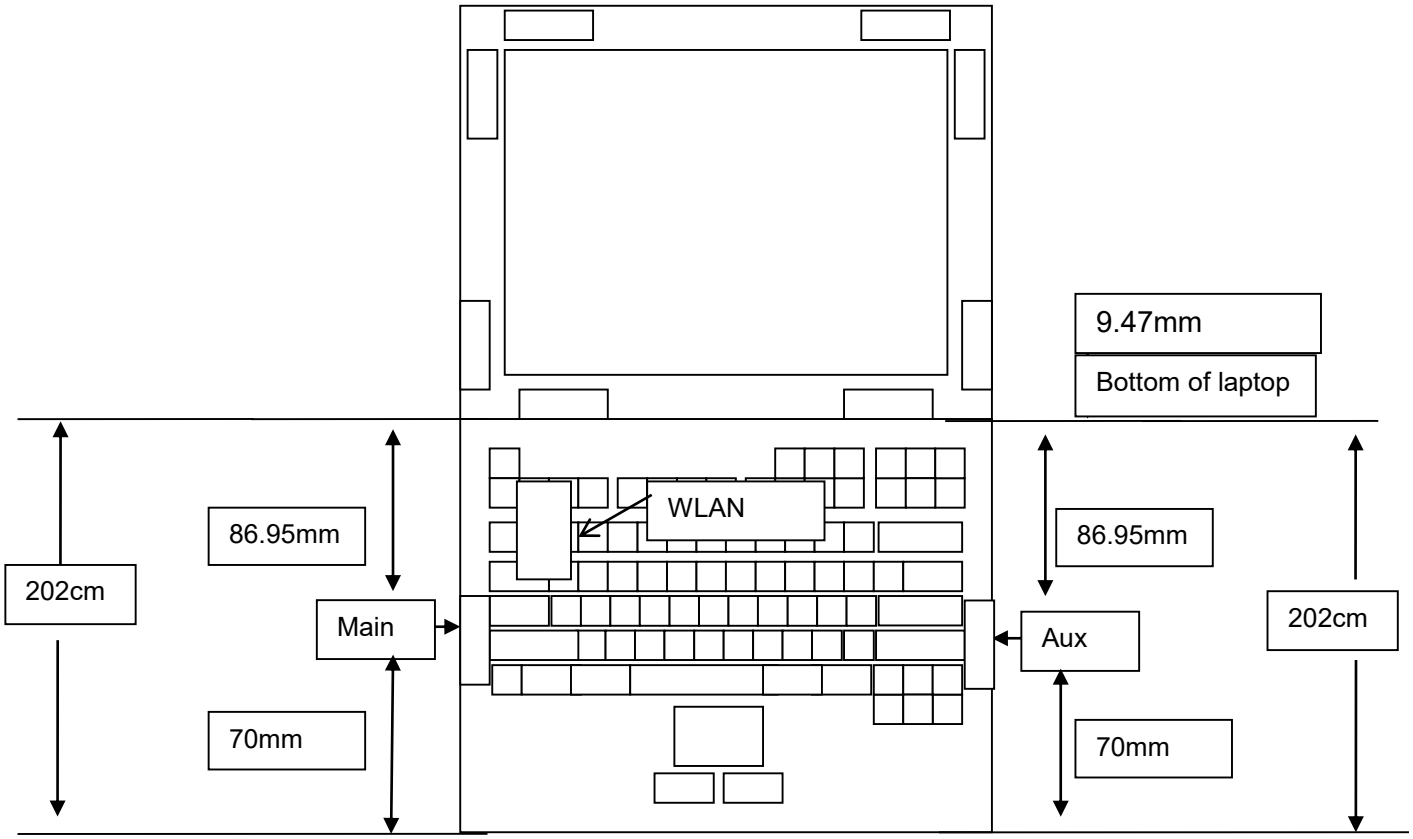
Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user. For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary 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	Page2-5 Add Applicable test method, Test & System Description and Setup photo	July 24, 2022
10.4	Cover page Add Intel 5.9GHz reference antenna gain Cover page/Section1/Section3 Add 5.9GHz antenna gain information	September 15, 2022