

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	NT750QFG /NP750QFG	Yes	NB	9.7						
*****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	BA42-00765A				BA42-00766A					
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	2.08	1.91	2.22	1.97	1.17	1.61	1.01	2.86	3.97	2.94	
Aux	2.47	1.16	0.50	0.87	1.91	1.99	0.19	4	2.85	3.23	
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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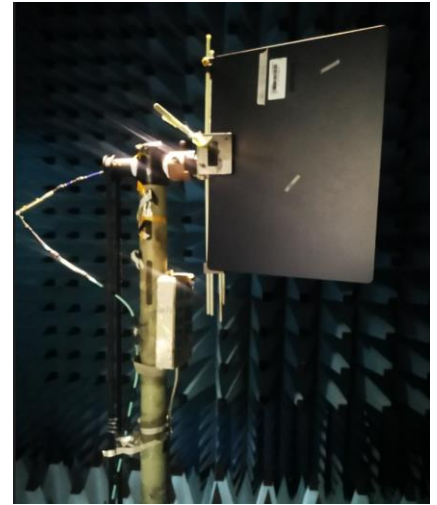
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1. **Applicable test methods**



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

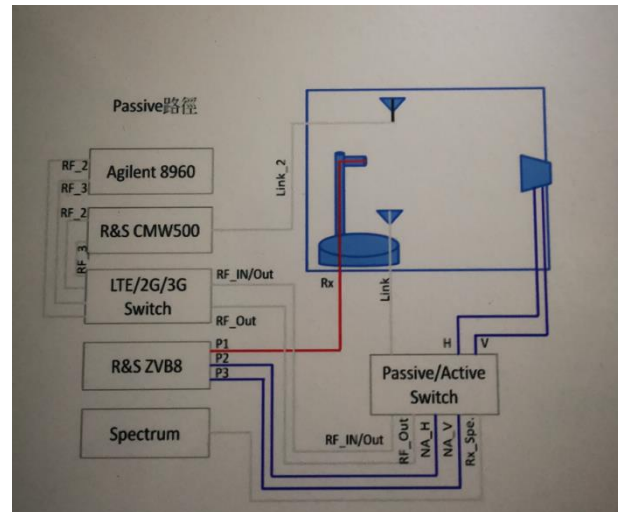
2. **Test & System Description**

a. Test setup

Test Environment



Schematic diagram

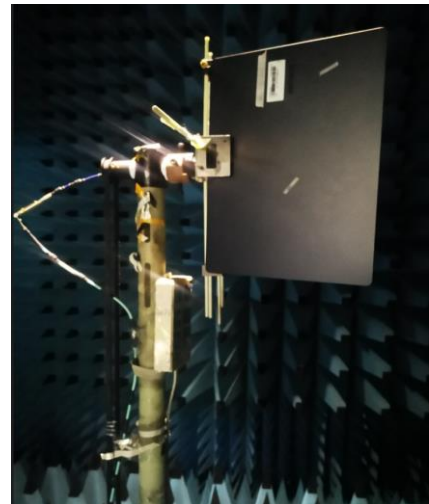


b. Equipment list



Equipment list						
NO.	Device	Type/Model	Serial#	Manufacturer	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: <i>Dongxiu.Ma</i>		
Test Date: 2022.11						

3. Setup photo



Antenna Sample / Antenna Data

Requirements for worldwide regulatory approval

Section	Description of Required OEM / ODM Antenna Information	US / IC	EU	Japan	Taiwan	S. Korea
1A	Part Number for Antenna only	Required	Required	Required	Required	Required
1B	Antenna Manufacturer Name	Required	Required	Required	Required	Required
1C	Description of Antenna Type	Required	Required	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Optional	Optional	Optional	Optional
1E	Main & Aux antenna (Peak Gain W/ cable loss) *	Required	Required	Required	Required	Required
1E OR 1F, 1G, 1H						
1F	Main & Aux antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Main & Aux antenna (Cable loss W/ connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs <u>and</u> Drawings of Main & Aux antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Optional	Required	Required	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Optional	Required	Optional
5	Photograph(s) or Drawings showing location of antennas in platform. <u>(S. Korea requires photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.</u>	Required	Required	Optional	<u>Required (Photos)</u>	<u>Required (Photos)</u>
6	Mech. drawings / photos with dimensions of antenna locations and distance from end-user (For evaluation of SAR testing requirement).	Required	N/A	N/A	N/A	N/A
7	Photograph(s) or Drawings showing the location of all antennas (WLAN, other) and distance between those transmitting antennas. Information will be used to evaluate whether co-location testing is required.	Required	N/A	N/A	N/A	N/A
8	Local representative contact information for LMA/PARS process.	Required	N/A	N/A	N/A	N/A
9	Antenna gain range should be equal or greater than -2 dBi. (2.4/5/6GHz: EU, 6GHz: FCC)	Required	Required	N/A	N/A	N/A

Antenna Information

Section 1. Antenna Assembly Specifications

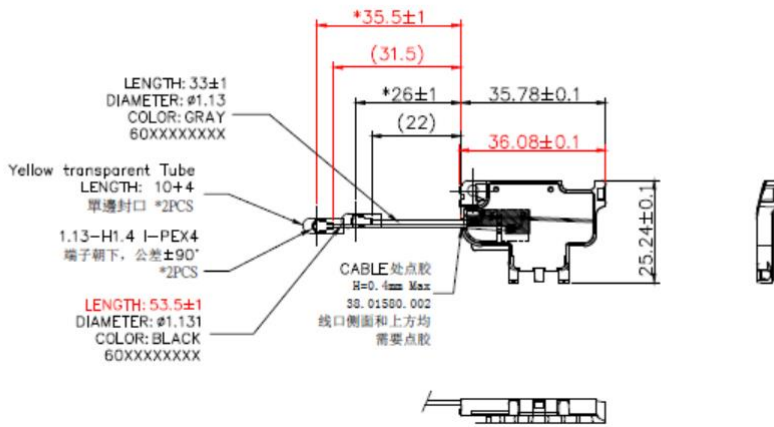
1A Antenna Part Number	1B Manufacturer	1C Antenna Type	1D Cable Assembly Part Number and Information	Freq Range MHz	1E * Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G Max VSWR	1H Cable Loss (dB)
(P/N:BA42-00765 A) Tx1/ Rx1 Antenna (Main)	Wistron Neweb Corporation	PIFA	(P/N:81XBLC15.G19) MHF4L 50 ohm Coaxial length: 53.5mm diameter: 1.13mm	2400-2483.5	2400-2483.5MHz 2.08 dBi (peak)	2400-2483.5MHz 2.26 dBi (peak)	2400-2483.5MHz 2.0 max	2400-2483.5MHz 0.18 dBi (peak)
				5150-5250	5150-5250MHz 1.91 dBi (peak)	5150-5250MHz 2.18 dBi (peak)	5150-5250MHz 2.5 max	5150-5250MHz 0.27 dBi (peak)
				5250-5350	5250-5350MHz 2.22 dBi (peak)	5250-5350MHz 2.49 dBi (peak)	5250-5350MHz 2.5 max	5250-5350MHz 0.27 dBi (peak)
				5470-5725	5470-5725MHz 1.97 dBi (peak)	5470-5725MHz 2.25 dBi (peak)	5470-5725MHz 2.5 max	5470-5725MHz 0.28 dBi (peak)
				5725-5850	5725-5850MHz 1.17 dBi (peak)	5725-5850MHz 1.45 dBi (peak)	5725-5850MHz 2.5 max	5725-5850MHz 0.28 dBi (peak)
				5850-5895	5725-5850MHz 1.61 dBi (peak)	5725-5850MHz 1.89 dBi (peak)	5725-5850MHz 2.5 max	5725-5850MHz 0.28 dBi (peak)
				5925-6425	5925-6425MHz 1.01 dBi (peak)	5925-6425MHz 1.31 dBi (peak)	5925-6425MHz 2.5 max	5925-6425MHz 0.30 dBi (peak)
				6425-6525	6425-6525MHz 2.86 dBi (peak)	6425-6525MHz 3.16 dBi (peak)	6425-6525MHz 2.5 max	6425-6525MHz 0.30 dBi (peak)
				6525-6875	6525-6875MHz 3.97 dBi (peak)	6525-6875MHz 4.28 dBi (peak)	6525-6875MHz 2.5 max	6525-6875MHz 0.31 dBi (peak)
				6875-7125	6875-7125MHz 2.94 dBi (peak)	6875-7125MHz 3.25 dBi (peak)	6875-7125MHz 2.5 max	6875-7125MHz 0.31 dBi (peak)
(P/N:BA42-00766 A) Tx2/ Rx2 Antenna (Aux)	Wistron Neweb Corporation	PIFA	(P/N:81XBLC15.G20) MHF4L 50 ohm Coaxial length: 360.5mm diameter: 1.13mm	2400-2483.5	2400-2483.5MHz 2.47 dBi (peak)	2400-2483.5MHz 3.37dBi (peak)	2400-2483.5MHz 2.0 max	2400-2483.5MHz 0.90 dBi (peak)
				5150-5250	5150-5250MHz 1.16 dBi (peak)	5150-5250MHz 2.64 dBi (peak)	5150-5250MHz 2.5 max	5150-5250MHz 1.48 dBi (peak)
				5250-5350	5250-5350MHz 0.50 dBi (peak)	5250-5350MHz 1.98 dBi (peak)	5250-5350MHz 2.5 max	5250-5350MHz 1.48 dBi (peak)
				5470-5725	5470-5725MHz 0.87 dBi (peak)	5470-5725MHz 2.38 dBi (peak)	5470-5725MHz 2.5 max	5470-5725MHz 1.51 dBi (peak)
				5725-5850	5725-5850MHz 1.91 dBi (peak)	5725-5850MHz 3.42 dBi (peak)	5725-5850MHz 2.5 max	5725-5850MHz 1.51 dBi (peak)
				5850-5895	5725-5850MHz 1.99 dBi (peak)	5725-5850MHz 3.50 dBi (peak)	5725-5850MHz 2.5 max	5725-5850MHz 1.51 dBi (peak)
				5925-6425	5925-6425MHz 0.19 dBi (peak)	5925-6425MHz 1.74 dBi (peak)	5925-6425MHz 2.5 max	5925-6425MHz 1.55 dBi (peak)
				6425-6525	6425-6525MHz 4.00 dBi (peak)	6425-6525MHz 5.55 dBi (peak)	6425-6525MHz 2.5 max	6425-6525MHz 1.55 dBi (peak)
				6525-6875	6525-6875MHz 2.85 dBi (peak)	6525-6875MHz 4.47 dBi (peak)	6525-6875MHz 2.5 max	6525-6875MHz 1.62 dBi (peak)
				6875-7125	6875-7125MHz 3.23 dBi (peak)	6875-7125MHz 5.85 dBi (peak)	6875-7125MHz 2.5 max	6875-7125MHz 1.62 dBi (peak)

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

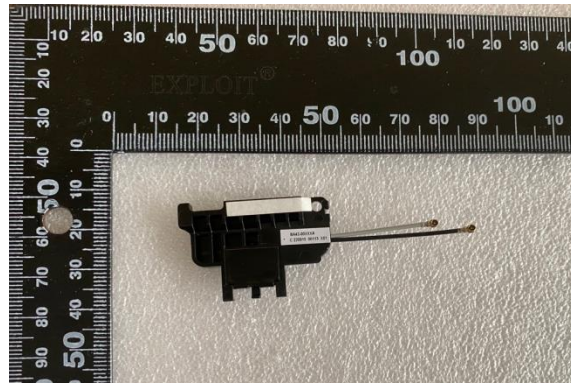
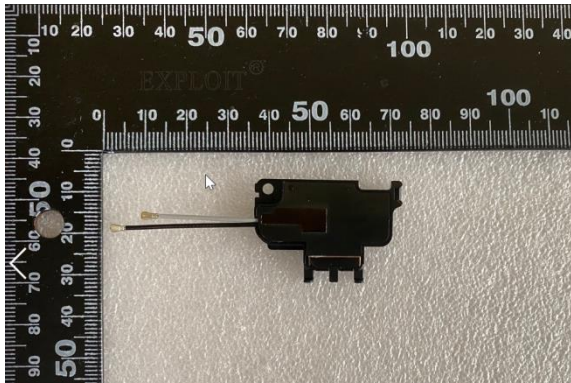
Section 2. Dimensioned Photos or Drawings of Antennas

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

Main Antenna Dimensioned Drawing:



Main Antenna Photo (Front/Back):



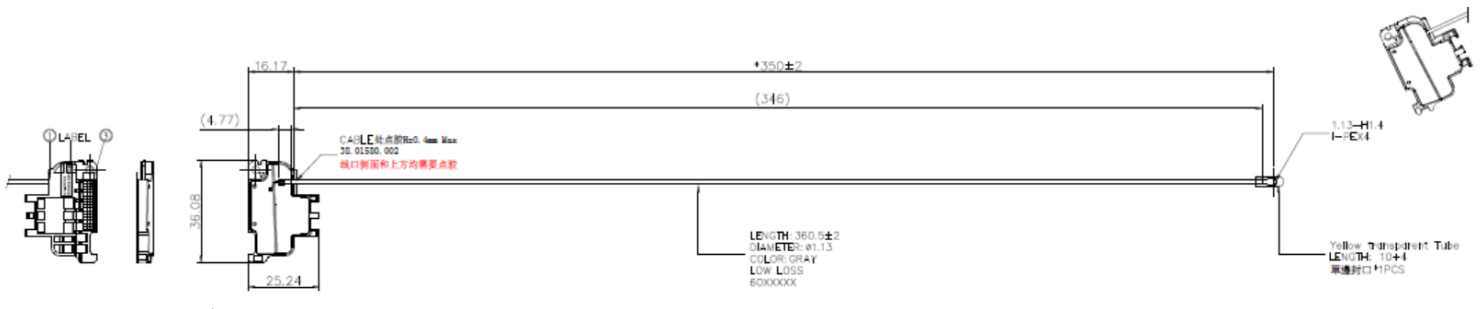
Antenna Manufacturer: Wistron Neweb Corporation

Antenna Part Number: 81XBLC15.G19 (Main)

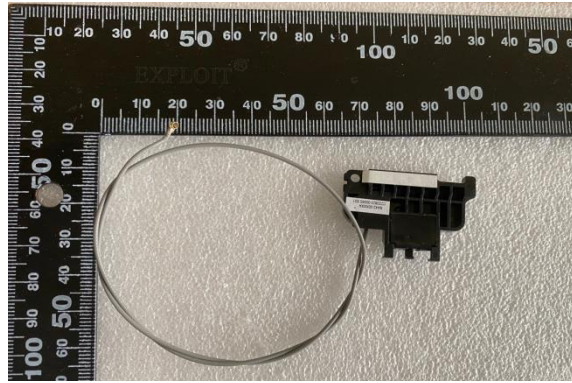
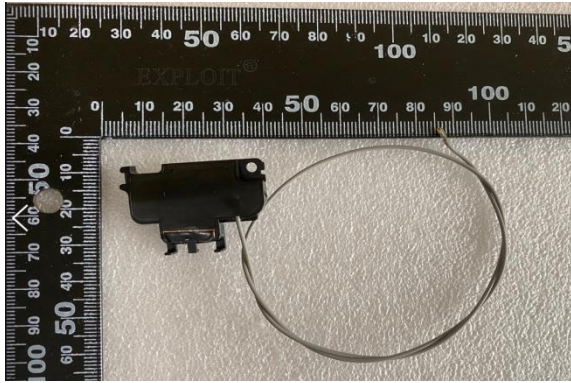
Note: antenna photo should include L type ruler According to the design request , all the components color should be black or gray , only the antenna FPCB color change to black , antenna pattern keeps the same

Aux Antenna Dimensioned Drawing:

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



Aux Antenna Photo (Front/Back):



Antenna Manufacturer: Wistron Neweb Corporation

Antenna Part Number: 81XBLC15.G20 (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

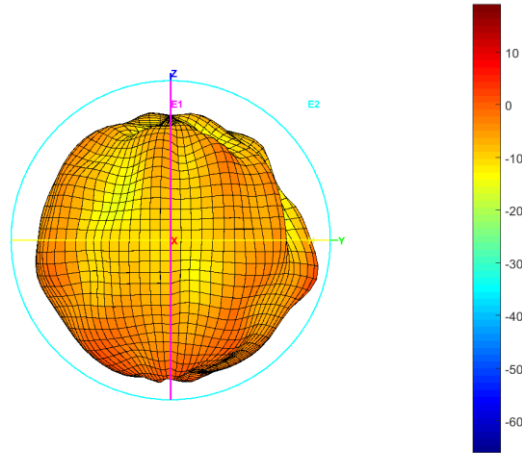
Main Antenna

Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Main antenna: 2450 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
2400-2483.5	2.08

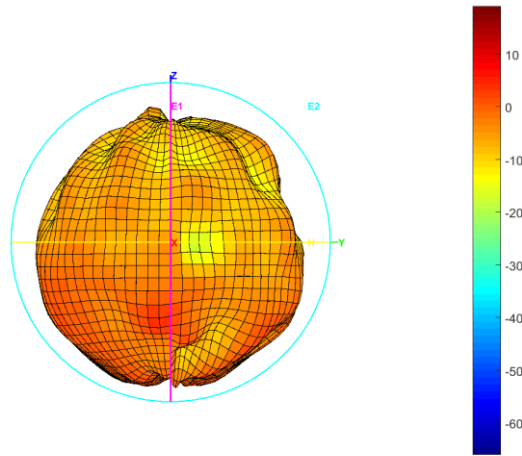
Total_3D_E2_2.45GHz



Max Antenna 3D Radiation Pattern 5150-5250 MHz
Main antenna: 5250 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5150-5250	1.91

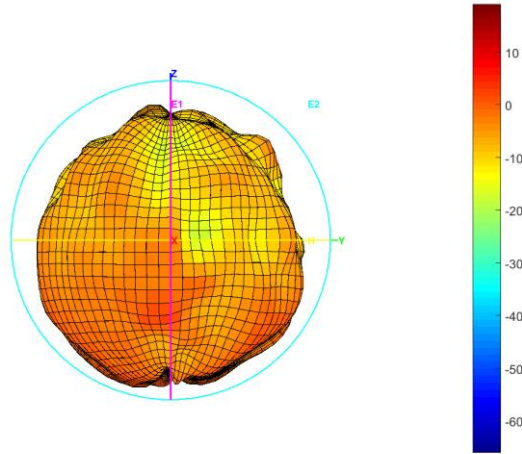
Total_3D_E2_5.25GHz



Max Antenna 3D Radiation Pattern 5250-5350 MHz
Main antenna: 5350 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5250-5350	2.22

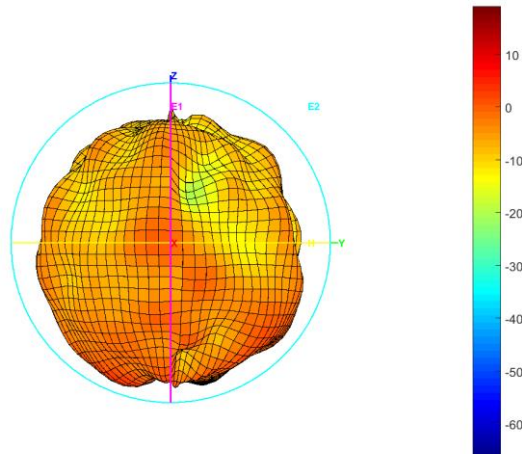
Total_3D_E2_5.35GHz



Max Antenna 3D Radiation Pattern 5470-5725 MHz
Main antenna: 5600 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5470-5725	1.97

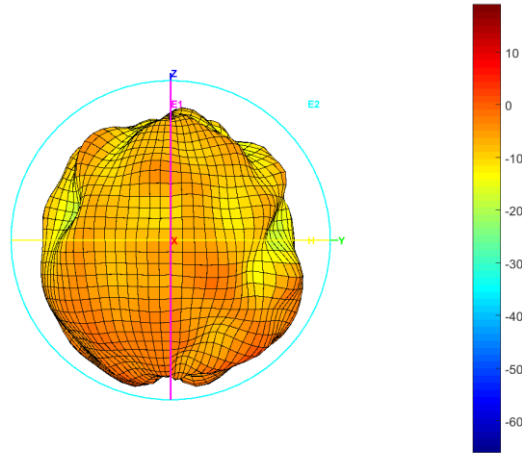
Total_3D_E2_5.6GHz



Max Antenna 3D Radiation Pattern 5725-5850 MHz
Main antenna: 5785 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5725-5850	1.17

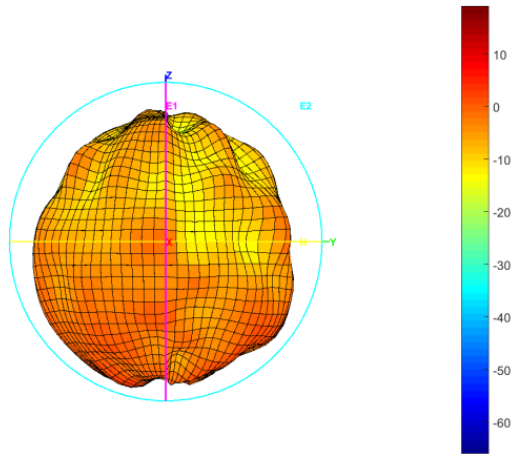
Total_3D_E2_5.785GHz



Max Antenna 3D Radiation Pattern 5850-5895 MHz
Main antenna: 5895 MHz

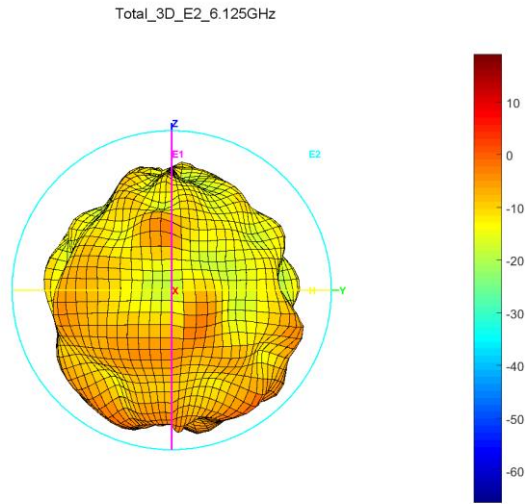
Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5850-5895	1.61

Total_3D_E2_5.895GHz



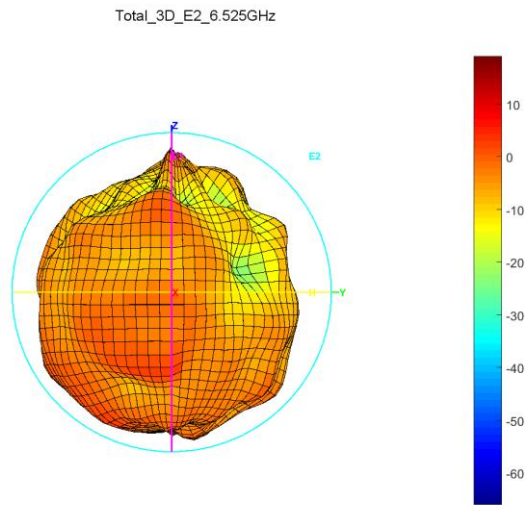
Max Antenna 3D Radiation Pattern 5925-6425 MHz
Main antenna: 6125 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5925-6425	1.01



Max Antenna 3D Radiation Pattern 6425-6525 MHz
Main antenna: 6525 MHz

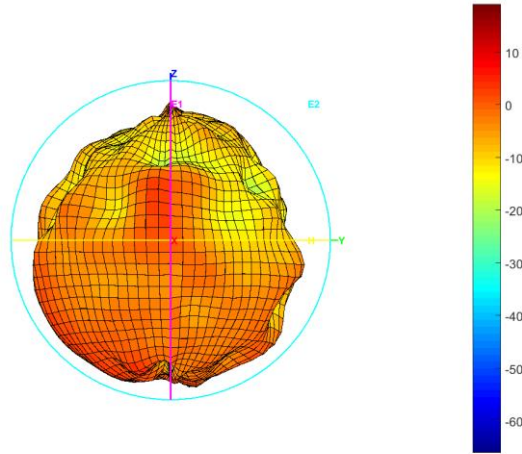
Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6425-6525	2.86



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

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6525-6875	3.97

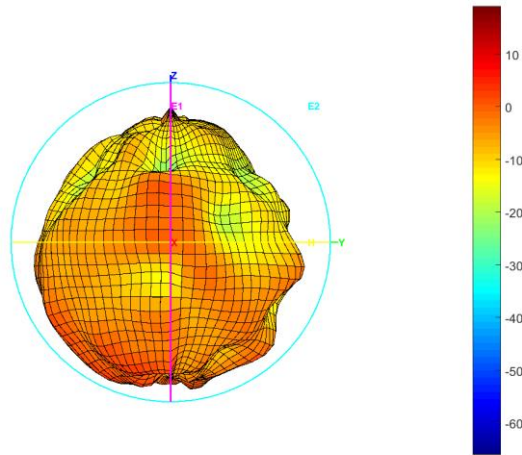
Total_3D_E2_6.725GHz



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

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6875-7125	2.94

Total_3D_E2_6.875GHz

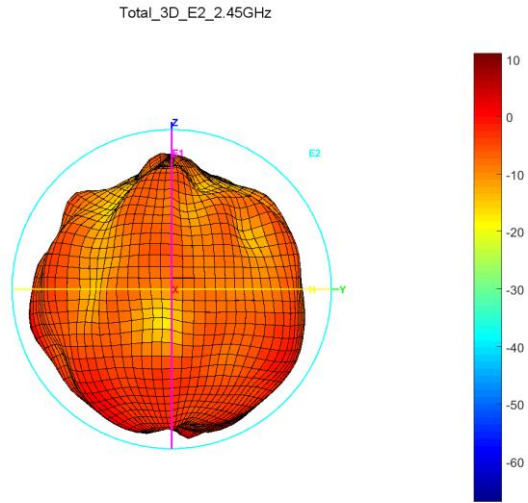


Aux Antenna

Aux Antenna 3D Radiation Pattern 2400 – 2483.5 MHz
Aux antenna: 2450 MHz

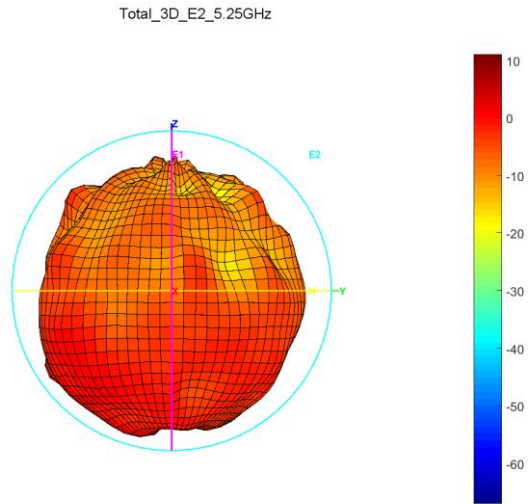
Frequency	Peak Gain w/o Cable Loss
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(MHz)	(dBi)
2450	2.47



Aux Antenna 3D Radiation Pattern 5150-5250 MHz
 Aux antenna: 5250 MHz

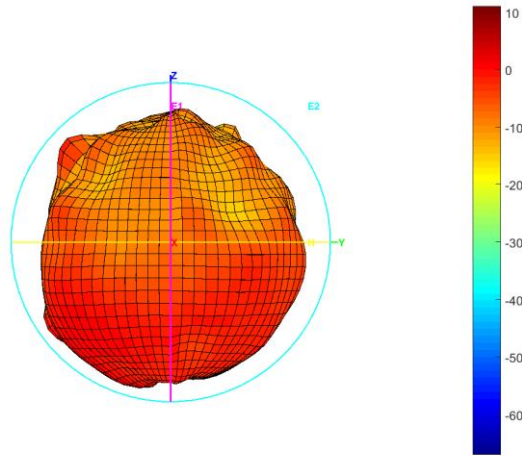
Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5150-5250	1.16



Aux Antenna 3D Radiation Pattern 5250-5350 MHz
 Aux antenna: 5350 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5250-5350	0.5

Total_3D_E2_5.35GHz

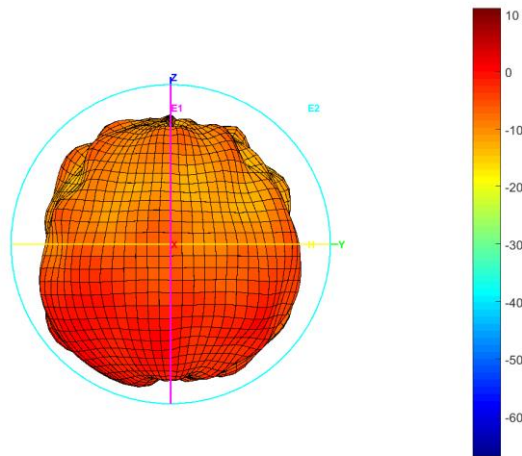


Aux Antenna 3D Radiation Pattern 5470-5725 MHz

Aux antenna: 5470 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5470-5725	0.87

Total_3D_E2_5.47GHz

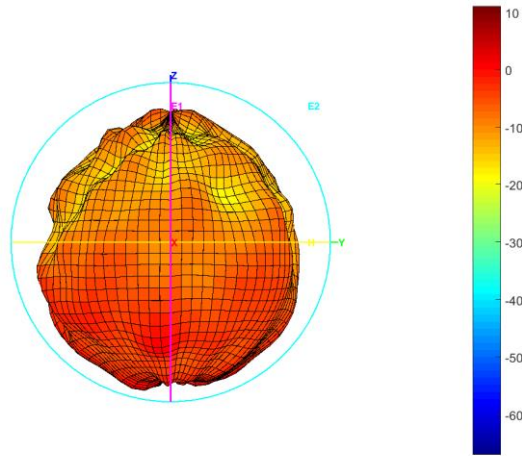


Aux Antenna 3D Radiation Pattern 5725-5850 MHz

Aux antenna: 5785 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5725-5850	1.91

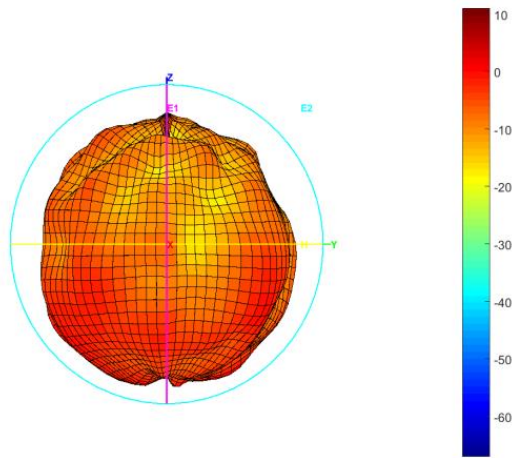
Total_3D_E2_5.785GHz



Aux Antenna 3D Radiation Pattern 5850-5895 MHz
Aux antenna: 5895 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5850-5895	1.99

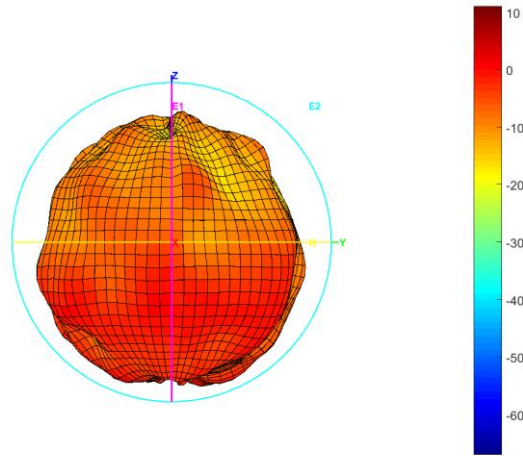
Total_3D_E2_5.895GHz



Aux Antenna 3D Radiation Pattern 5925-6425 MHz
Aux antenna: 6125 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5925-6425	0.19

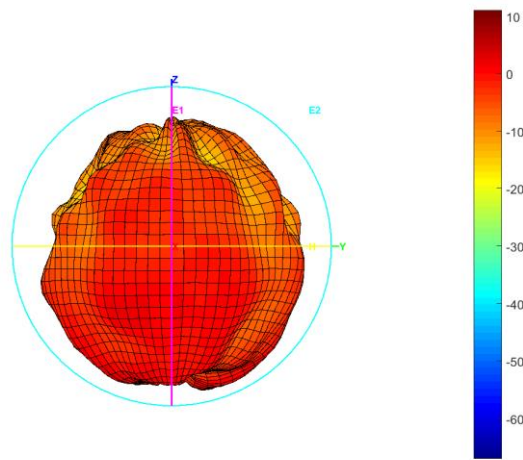
Total_3D_E2_6.125GHz



Aux Antenna 3D Radiation Pattern 6425-6525 MHz
 Aux antenna: 6425 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6425-6525	4

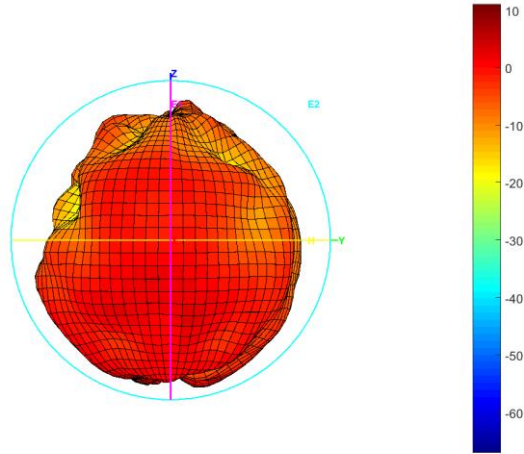
Total_3D_E2_6.525GHz



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

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6525-6875	2.85

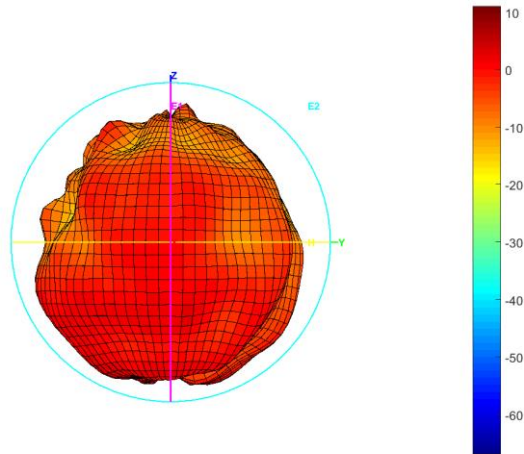
Total_3D_E2_6.725GHz



Aux Antenna 3D Radiation Pattern 6875-7125 MHz
 Aux antenna: 6785 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6875-7125	3.23

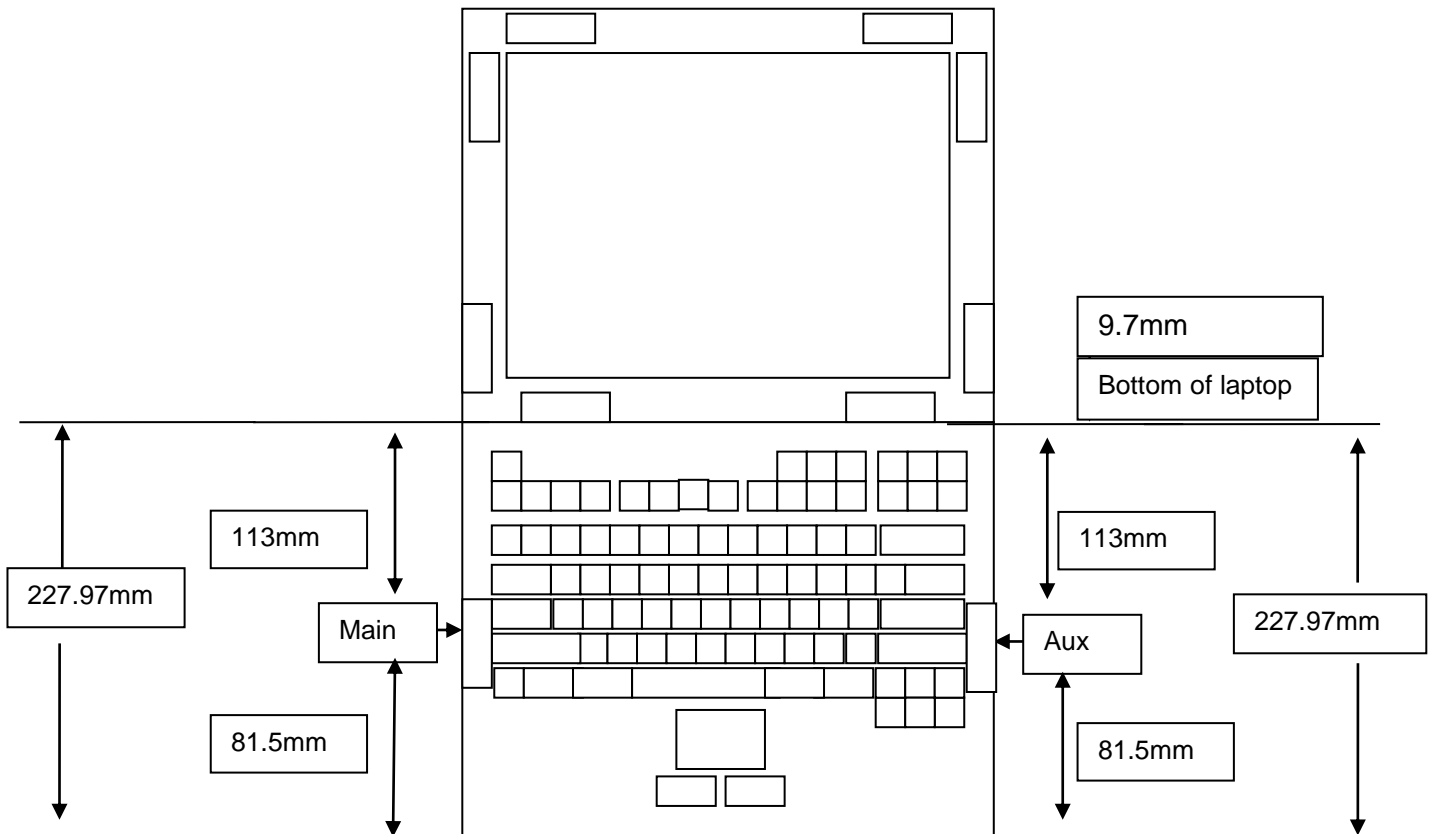
Total_3D_E2_6.875GHz



Section 4. Antenna Host Platform Location Information

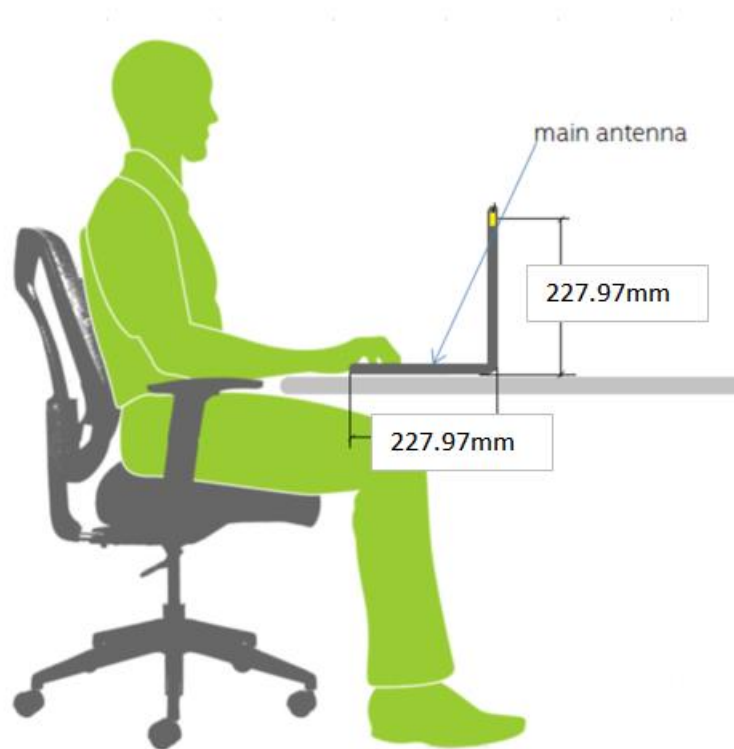
Include a **dimensioned photo(s) or dimensioned drawing(s)** of Main and Aux antenna placements (measurements are not required for receive-only antenna).

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)

