

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)		
ASUS	Compal	B5402FB,B5402FBA B5402F			Yes	Convertible PC		1.8		
*****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)		
PULSE		PIFA			DC33002R500 (TZ2381D)			DC33002R510 (TZ2381E)		
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	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0 GHz 6875-7125MHz	
Main	0.91	2.63	3.06	3.47	3.52	3.54	2.98	3.11	3.07	
Aux	1.31	2.17	2.79	4.1	4.06	3.72	2.68	3.09	2.54	
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	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	7.0GHz 6875-7125MHz	Generic sku: refer to modular FCC SAR report Mid-power sku: ≥ 8 mm Low power sku: ≥ 5 mm
Design	3.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
PIFA	3.23	3.64	3.73	4.77	4.97	4.83	4.30	5.37	5.59	
Dipole	2.89	2.92	3.19	4.41	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.										

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

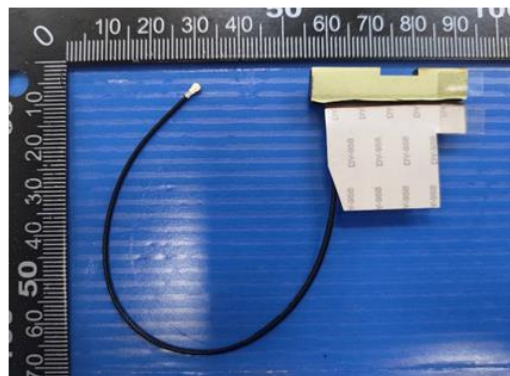
Antenna Information

Section 1. Antenna Assembly Specifications

1A	1B	1C	1D		1E	1F	1G	1H
Antenna Part Number	Manufacturer	Antenna Type	Cable Assembly Part Number and Information	Freq Range MHz	*Total Peak Gain W/ Cable loss (dBi)	Total Peak Gain w/o Cable Loss (dBi)	Max VSWR	Cable Loss (dB)
(P/N: DC33002R500 (TZ2381D) Main Antenna	PULSE	PIFA	50 ohm Coaxial length: 150cm diameter: 1.13mm	2400-2483.5	2400-2483.5MHz 0.91 dBi (peak)	2400-2483.5MHz 1.33 dBi (peak)	2400-2483.5MHz 2.5 max	2400-2483.5MHz 0.42 dB (peak)
				5150-5250	5150-5250MHz 2.63 dBi (peak)	5150-5250MHz 3.25 dBi (peak)	5150-5250MHz 2.5	5150-5250MHz 0.62 dB (peak)
				5250-5350	5250-5350MHz 3.06 dBi (peak)	5250-5350MHz 3.68 dBi (peak)	5250-5350MHz 2.5	5250-5350MHz 0.62 dB (peak)
				5470-5725	5470-5725MHz 3.47 dBi (peak)	5470-5725MHz 4.12 dBi (peak)	5470-5725MHz 2.5	5470-5725MHz 0.65 dB (peak)
				5725-5850	5725-5850MHz 3.52 dBi (peak)	5725-5850MHz 4.17 dBi (peak)	5725-5850MHz 2.5	5725-5850MHz 0.65 dB (peak)
				5925-6425	5925-6425MHz 3.54 dBi (peak)	5925-6425MHz 4.30 dBi (peak)	5925-6425MHz 2.5 max	5925-6425MHz 0.76 dB (peak)
				6425-6525	6425-6525MHz 2.98 dBi (peak)	6425-6525MHz 3.75 dBi (peak)	6425-6525MHz 2.5 max	6425-6525MHz 0.77 dB (peak)
				6525-6875	6525-6875MHz 3.11 dBi (peak)	6525-6875MHz 3.92 dBi (peak)	6525-6875MHz 2.5 max	6525-6875MHz 0.81 dB (peak)
				6875-7125	6875-7125MHz 3.07 dBi (peak)	6875-7125MHz 3.90 dBi (peak)	6875-7125MHz 2.5 max	6875-7125MHz 0.83 dB (peak)
(P/N: DC33002R510 (TZ2381E) Aux Antenna	PULSE	PIFA	50 ohm Coaxial length: 186cm diameter: 1.13mm	2400-2483.5	2400-2483.5MHz 1.31 dBi (peak)	2400-2483.5MHz 1.83 dBi (peak)	2400-2483.5MHz 2.5 max	2400-2483.5MHz 0.52 dB (peak)
				5150-5250	5150-5250MHz 2.17 dBi (peak)	5150-5250MHz 2.95 dBi (peak)	5150-5250MHz 2.5	5150-5250MHz 0.78 dB (peak)
				5250-5350	5250-5350MHz 2.79 dBi (peak)	5250-5350MHz 3.57 dBi (peak)	5250-5350MHz 2.5	5250-5350MHz 0.78 dB (peak)
				5470-5725	5470-5725MHz 4.10 dBi (peak)	5470-5725MHz 4.90 dBi (peak)	5470-5725MHz 2.5	5470-5725MHz 0.80 dB (peak)
				5725-5850	5725-5850MHz 4.06 dBi (peak)	5725-5850MHz 4.87 dBi (peak)	5725-5850MHz 2.5	5725-5850MHz 0.81 dB (peak)
				5925-6425	5925-6425MHz 3.72 dBi (peak)	5925-6425MHz 4.66 dBi (peak)	5925-6425MHz 2.5 max	5925-6425MHz 0.94 dB (peak)
				6425-6525	6425-6525MHz 2.68 dBi (peak)	6425-6525MHz 3.63 dBi (peak)	6425-6525MHz 2.5 max	6425-6525MHz 0.95 dB (peak)
				6525-6875	6525-6875MHz 3.09 dBi (peak)	6525-6875MHz 4.09 dBi (peak)	6525-6875MHz 2.5 max	6525-6875MHz 1.00 dB (peak)
				6875-7125	6875-7125MHz 2.54 dBi (peak)	6875-7125MHz 3.57 dBi (peak)	6875-7125MHz 2.5 max	6875-7125MHz 1.03 dB (peak)

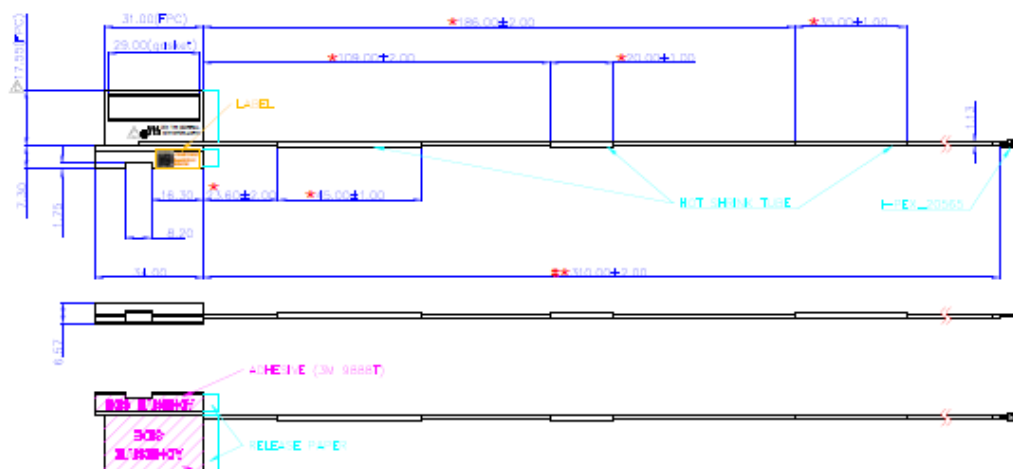
- 3D Antenna Peak Gain required being test in system basis.

Main Antenna Dimensioned Drawing:

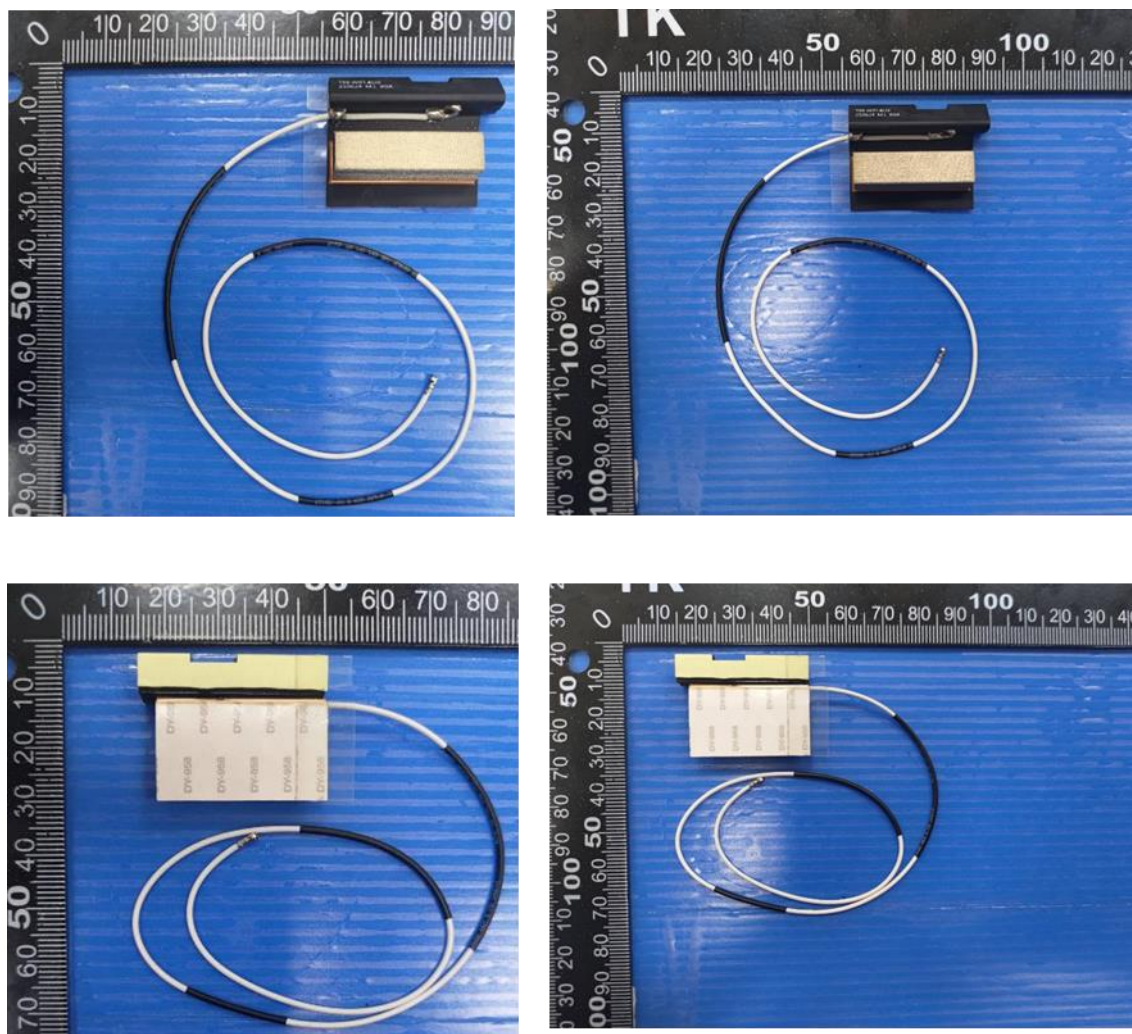


Aux Antenna Dimensioned Drawing:

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



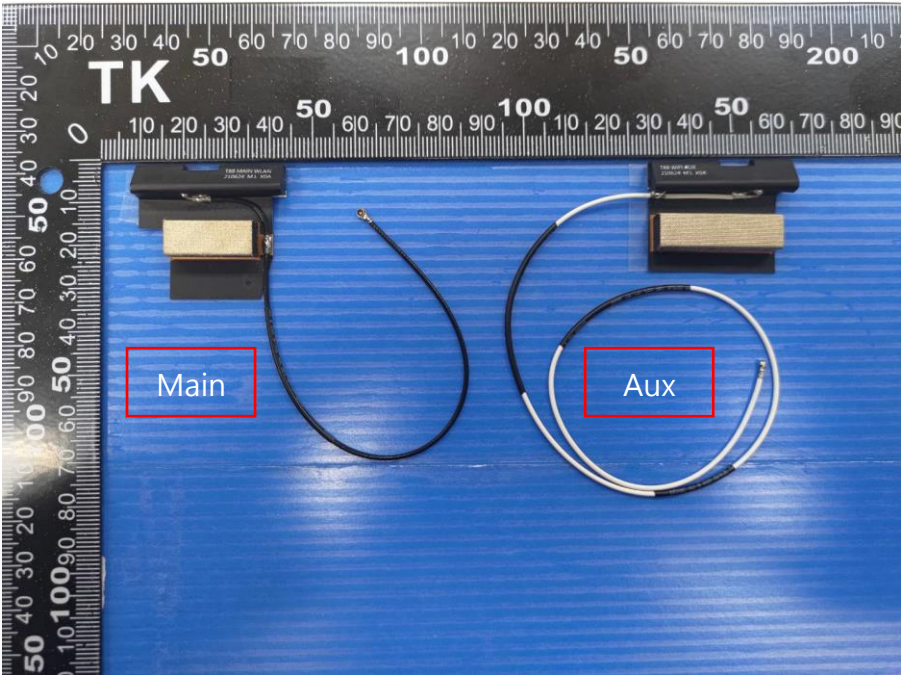
Aux Antenna Photo (Front/Back):



Include front view photo of all 2 antennas here.

Antenna Manufacturer: PULSE

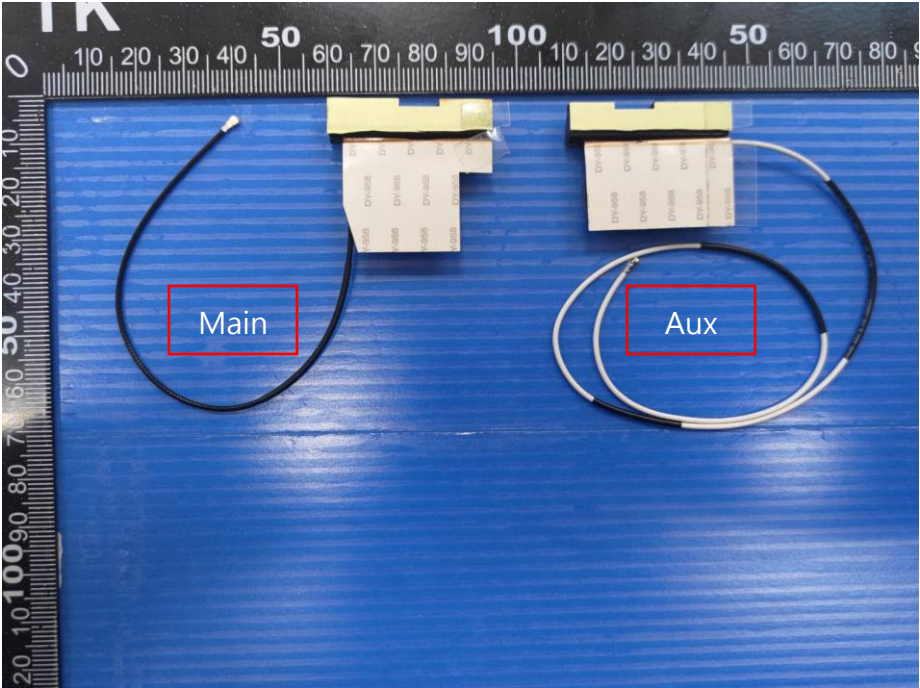
Antenna Part Number: DC33002R500 (TZ2381D) (Main), DC33002R510 (TZ2381E) (Aux)



Include back view photo of all 2 antennas here.

Antenna Manufacturer: PULSE

Antenna Part Number: DC33002R500 (TZ2381D) (Main), DC33002R510 (TZ2381E) (Aux)



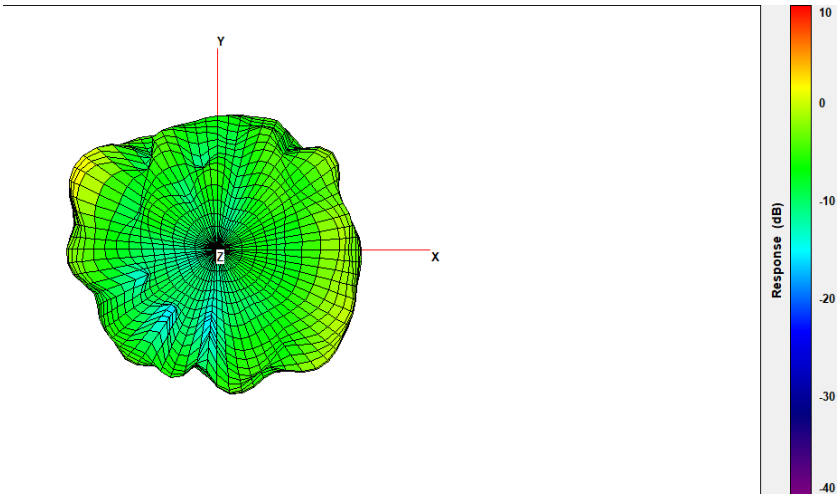
Note: antenna photo should include L type ruler

Section 3. Radiation characteristics of antenna loaded in Host Platform

Main Antenna

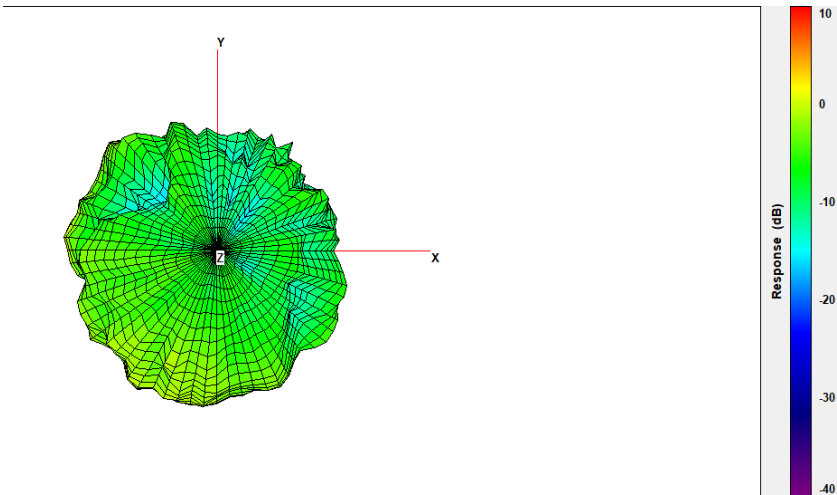
Max Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
2400-2483.5	0.91



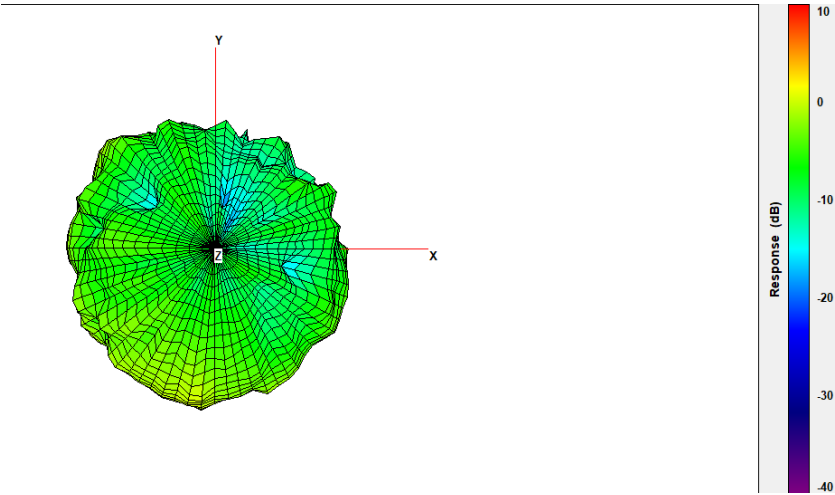
Max Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5150-5250	2.63



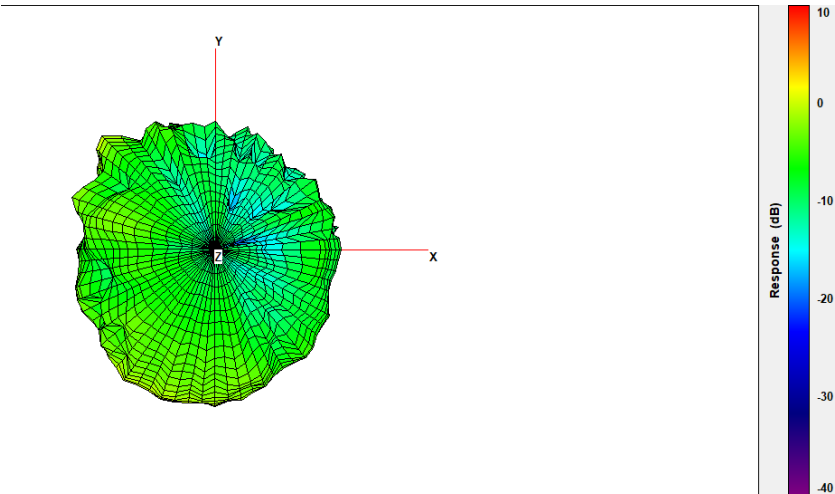
Max Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5250-5350	3.06



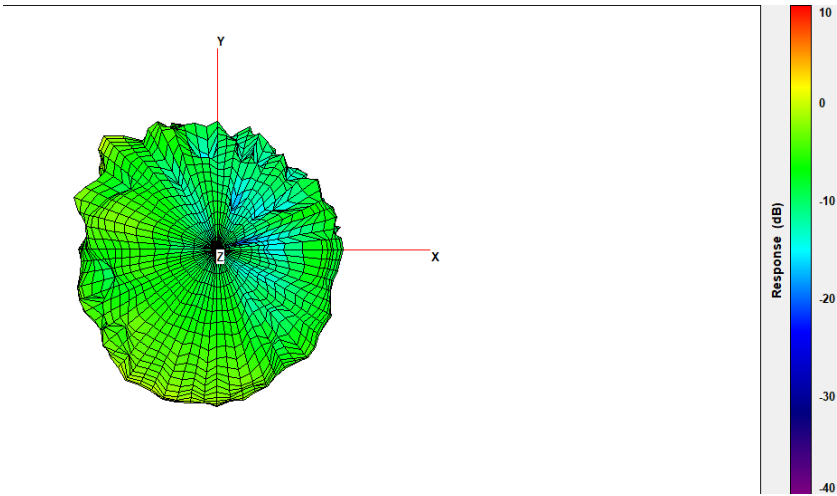
Max Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5470-5725	3.47



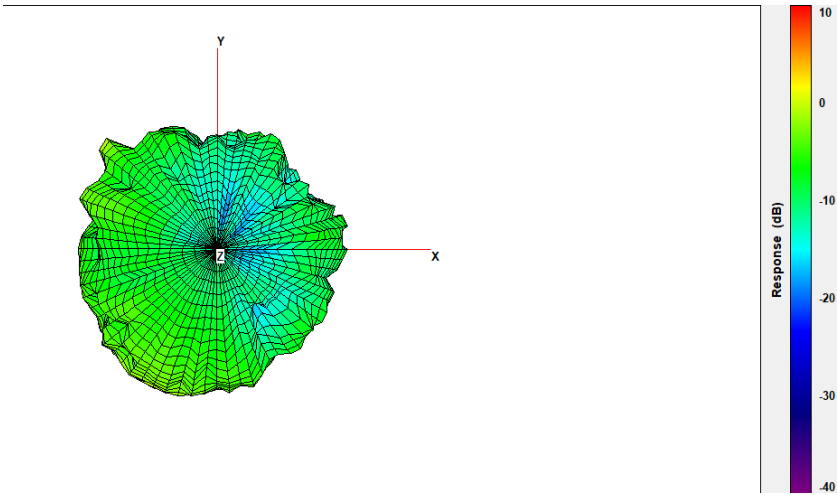
Max Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5725-5850	3.52



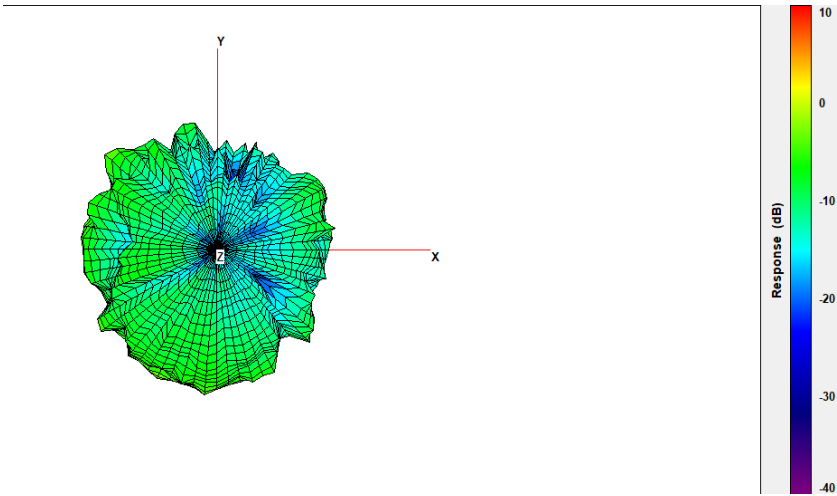
Max Antenna 3D Radiation Pattern 5925-6425 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5925-6425	3.54



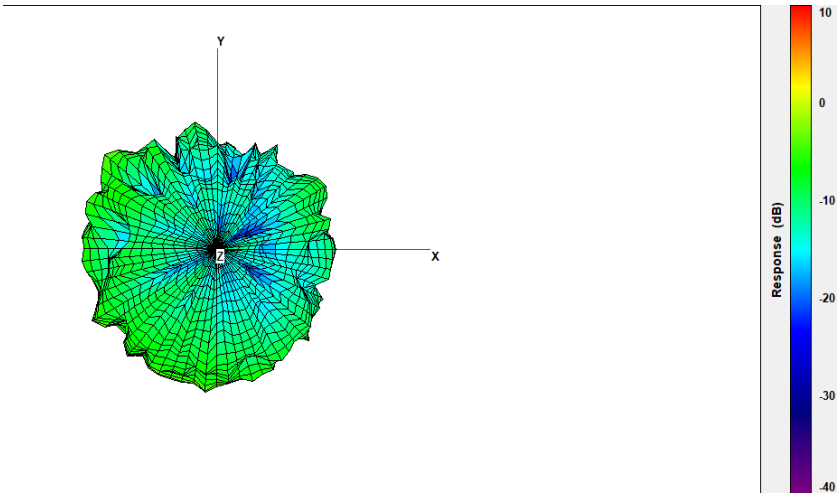
Max Antenna 3D Radiation Pattern 6425-6525 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6425-6525	2.98



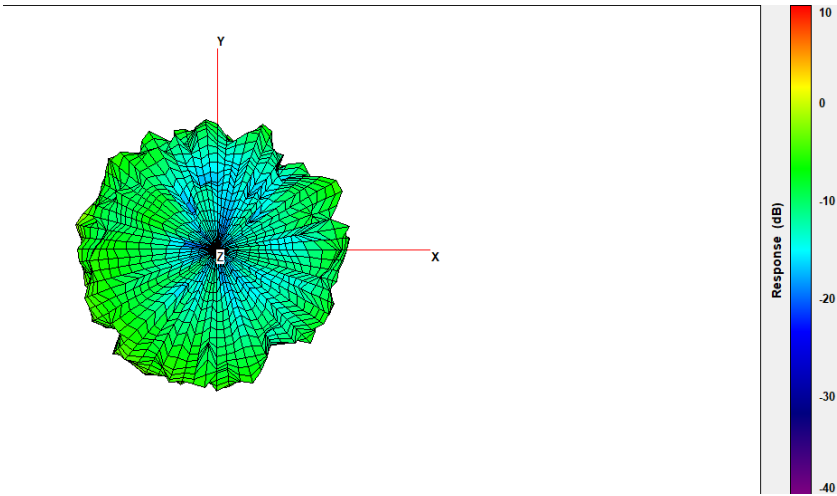
Max Antenna 3D Radiation Pattern 6525-6875 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6525-6875	3.11



Max Antenna 3D Radiation Pattern 6875-7125 MHz

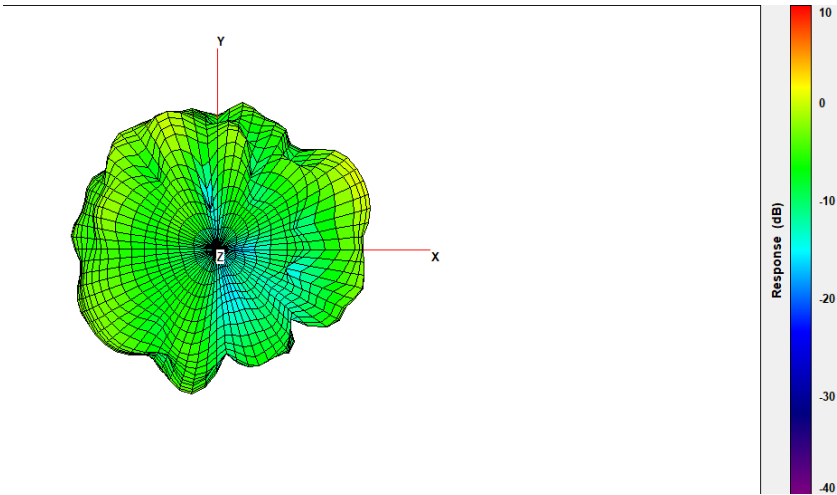
Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6875-7125	3.07



Auxiliary Antenna

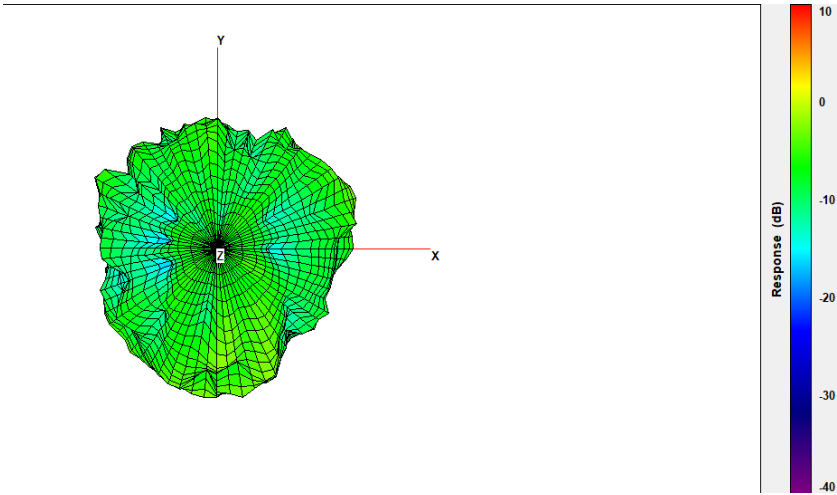
Aux Antenna 3D Radiation Pattern 2400 – 2483.5 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
2400-2483.5	1.31



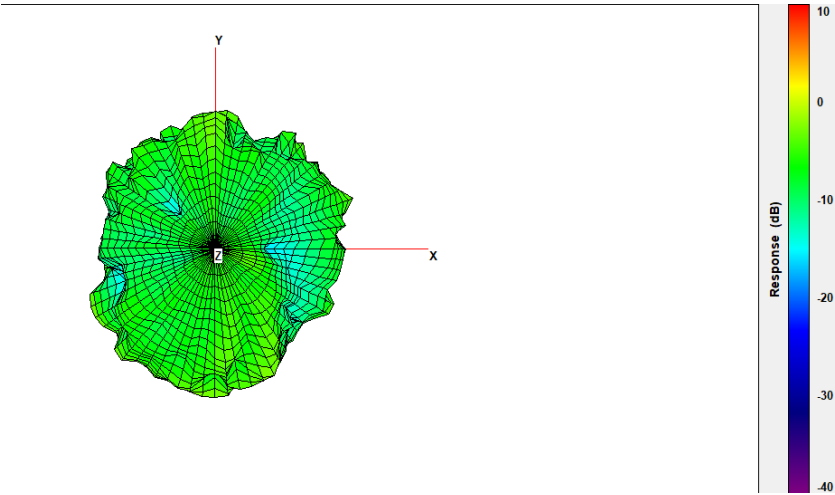
Aux Antenna 3D Radiation Pattern 5150-5250 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5150-5250	2.17



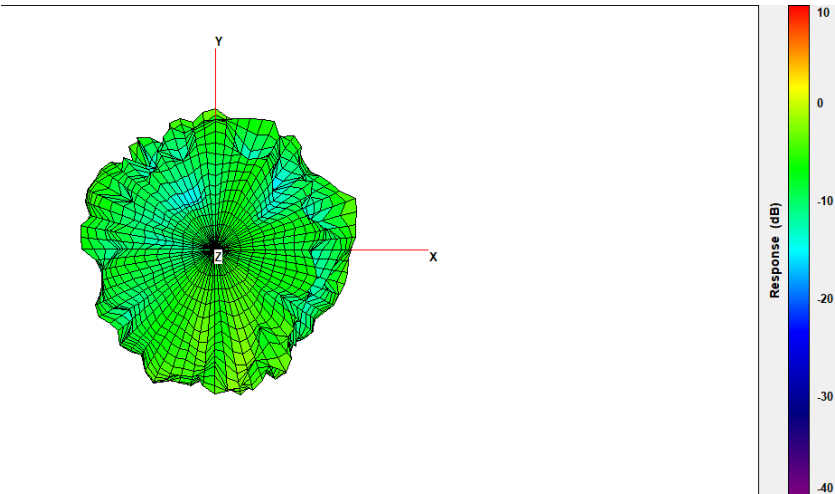
Aux Antenna 3D Radiation Pattern 5250-5350 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5250-5350	2.79



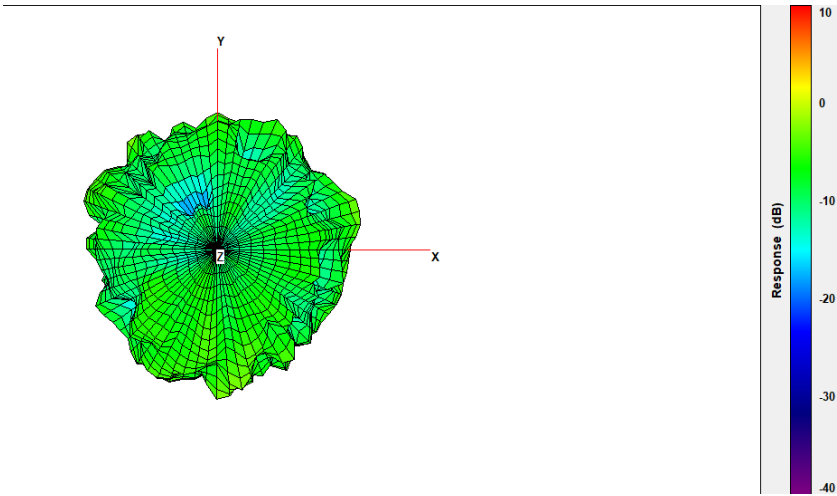
Aux Antenna 3D Radiation Pattern 5470-5725 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5470-5725	4.10



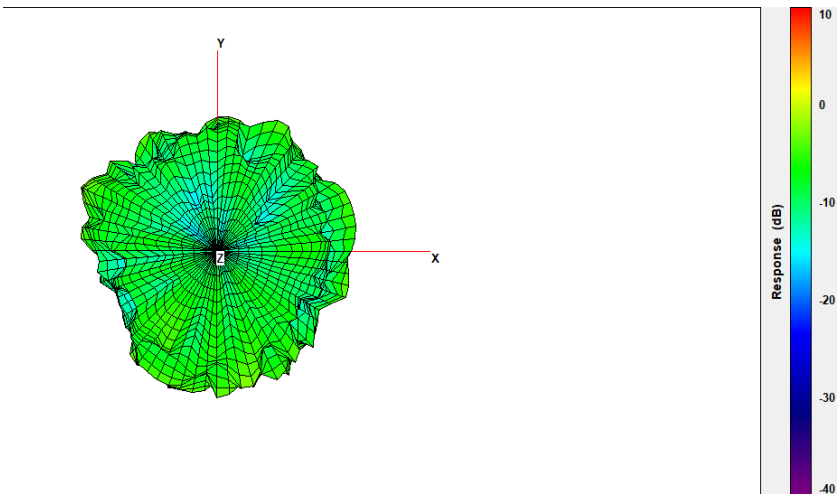
Aux Antenna 3D Radiation Pattern 5725-5850 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5725-5850	4.06



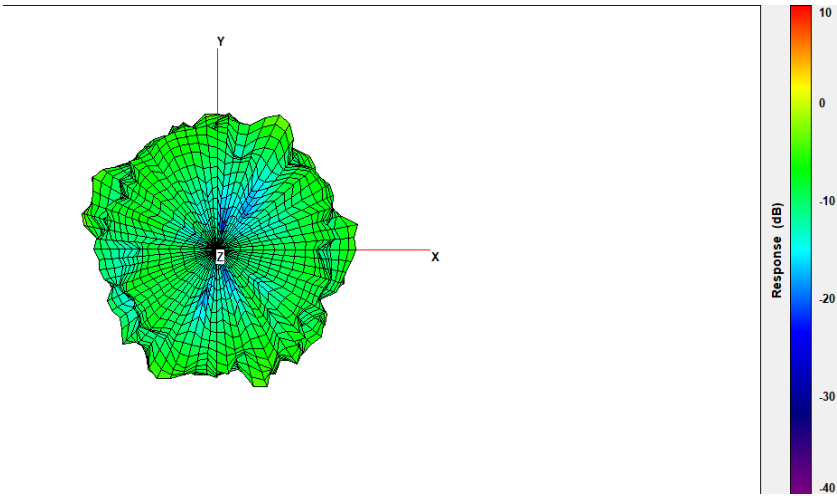
Aux Antenna 3D Radiation Pattern 5925-6425 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
5925-6425	3.72



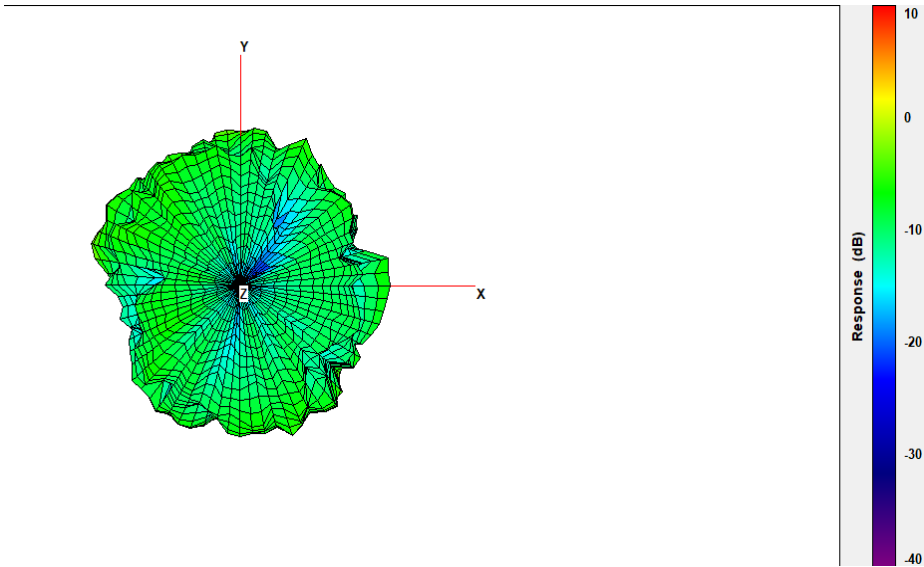
Aux Antenna 3D Radiation Pattern 6425-6525 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6425-6525	2.68



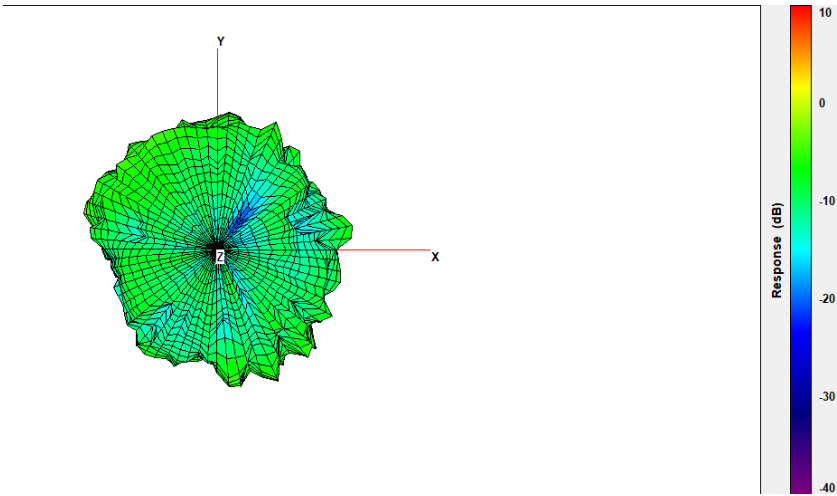
Aux Antenna 3D Radiation Pattern 6525-6875 MHz

Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6525-6875	3.09



Aux Antenna 3D Radiation Pattern 6875-7125 MHz

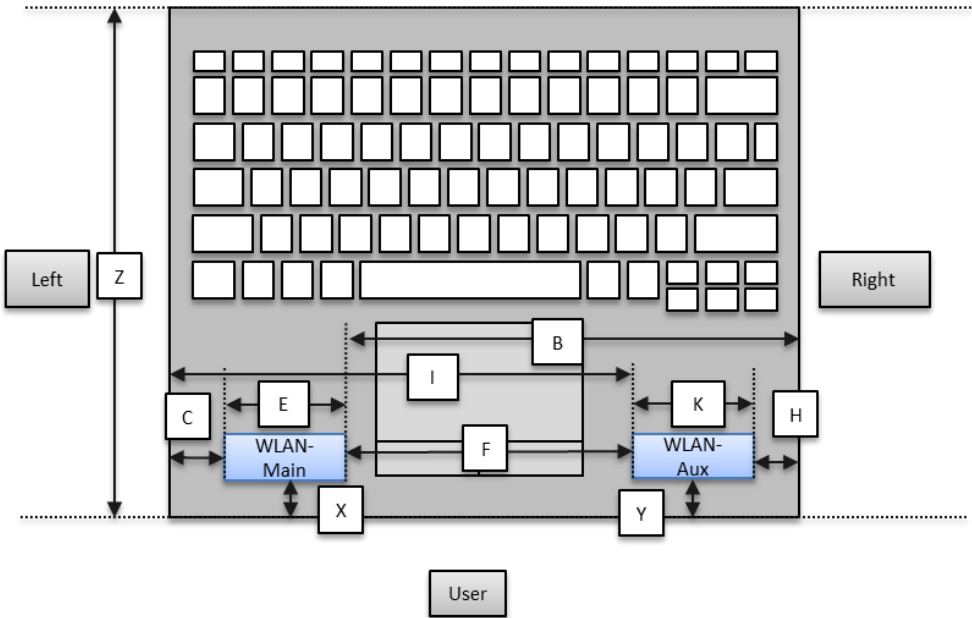
Frequency (MHz)	Peak Gain w/o Cable Loss (dBi)
6875-7125	2.54



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).

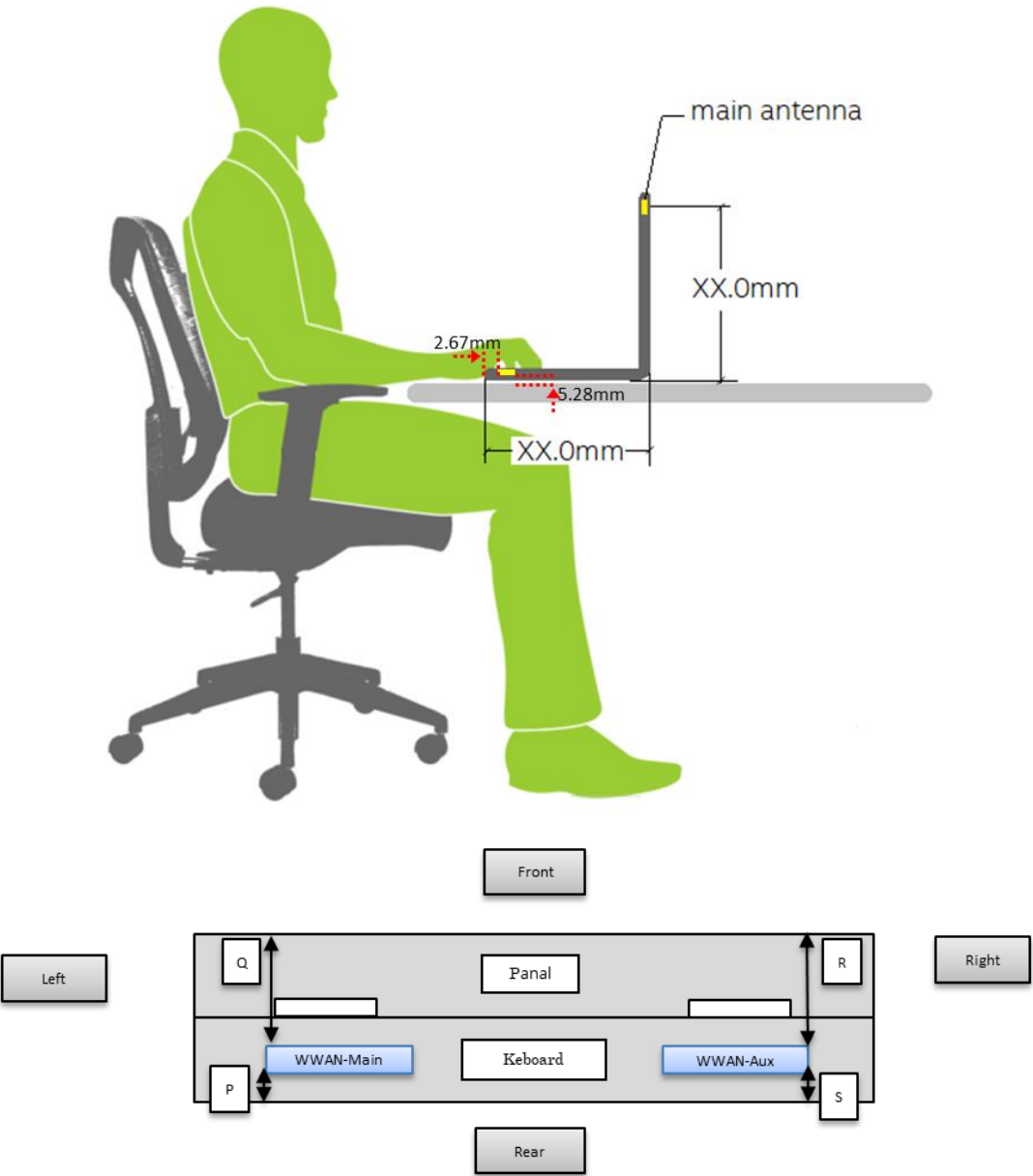
Any antenna that transmits must show dimensions to bottom of laptop. Provide a description of the materials that are used for supporting or surrounding transmit antennas; for example, non-conductive plastics vs. conductive coated plastic or metallic materials.



Minimum Separation Distance			
Item	Antenna	Position	Distance (mm)
A	WLAN-Main	to Top	215
B	WLAN-Main	to Right	231
C	WLAN-Main	to Left	57.8
D	WLAN-Main	to Bottom	5.28
E	WLAN-Main	Main Antenna Length	34
F	Main-Aux	Main to Aux	156.5
G	WLAN-Aux	to Top	215
H	WLAN-Aux	to Right	41.1
I	WLAN-Aux	to Left	247.7
J	WLAN-Aux	to Bottom	5.28
K	WLAN-Aux	Aux Antenna Length	34
L	NB	Bumper thickness	1.25
X	WLAN-Main	to User	2.67
Y	WLAN-Aux	to User	2.67
Z	NB	Keyboard depth	220

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.

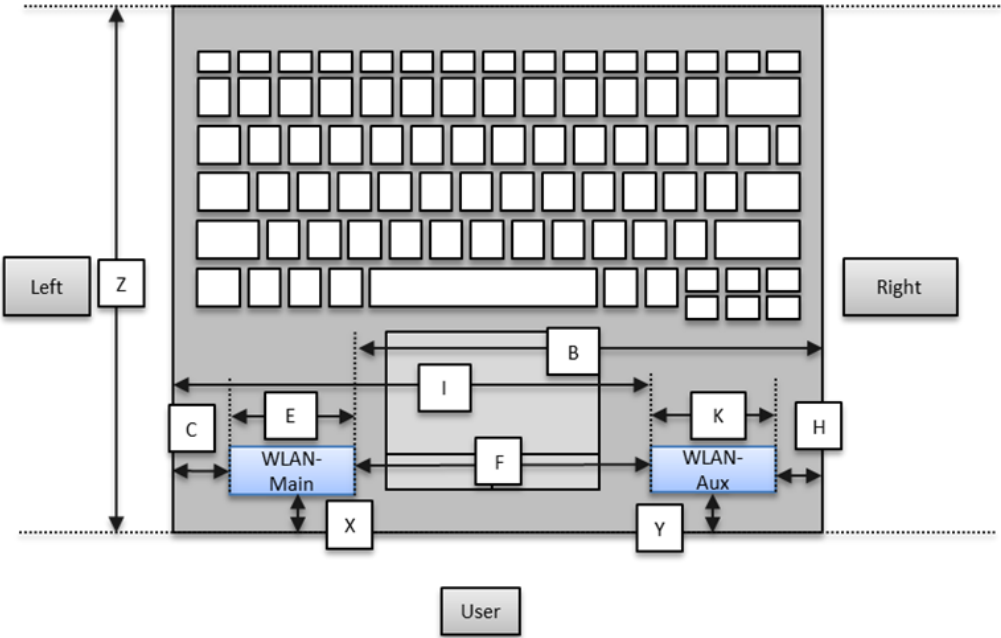


Minimum Separation Distance			
Item	Antenna	Position	Distance (mm)
Q	WLAN-Main	to Front	11.98
P	WLAN-Main	to Rear	1.8
R	WLAN-Aux	to Front	11.98
S	WLAN-Aux	to Rear	1.8

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)



Minimum Separation Distance			
Item	Antenna	Position	Distance(mm)
A	WLAN-Main	to Top	215
B	WLAN-Main	to Right	231
C	WLAN-Main	to Left	57.8
D	WLAN-Main	to Bottom	5.28
E	WLAN-Main	Main Antenna Length	34
F	Main-Aux	Main to Aux	156.5
G	WLAN-Aux	to Top	215
H	WLAN-Aux	to Right	41.1
I	WLAN-Aux	to Left	247.7
J	WLAN-Aux	to Bottom	5.28
K	WLAN-Aux	Aux Antenna Length	34
L	NB	Bumper thickness	1.25
X	WLAN-Main	to User	2.67
Y	WLAN-Aux	to User	2.67
Z	NB	Keyboard depth	220