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)
Lenovo	HQ	ThinkBook 14 G4+ ARA	Yes	NB	10.86mm

*****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)
SPEED	PIFA	F-0G-XZ-0300-000-K0	F-0G-XZ-0300-000-K0

Peak gain w/ cable loss (dBi)

2.4GHz 2400-2500MHz	5.2&5.3GHz 5150-5350MHz	5.5GHz 5470-5725MHz	5.8GHz 5725-5850MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	6.9GHz 6875-7125MHz
2. 92	3. 48	2. 93	2. 98	3. 77	2. 98	3. 73	3. 66

Module information

(Please check with "x" when applies, or to fill-in proper model in empty column and specify (manual key-in) if you use non-regular sku, ie. Low power sku or mid power sku.)

Model	Form factor and suffixes											
9560 (JfP 2)		NGW		D2W		D2WL	AX201 (HrP2)		NGW		D2W		D2WL
9260 (ThP 2)		NGW		D2WL			AX200 (CcP2)		NGW		D2WL		
9461 (JfP 1)		NGW		D2W			AX210 (TyP2)		NGW		D2W		
9462 (JfP 1)		NGW		D2W			Other Intel model						

Intel Reference Gain/Type/ Separation distance

Antenna Type	Antenna Peak gain (In dBi)									Distance to the end user (mm)
	2.4GHz 2400-2500MHz	5.2GHz 5150-5250MHz	5.3GHz 5250-5350MHz	5.5GHz 5470-5725MHz	5.8GHz 5725-5850MHz	6.2GHz 5925-6425MHz	6.5GHz 6425-6525MHz	6.7GHz 6525-6875MHz	6.9GHz 6875-7125MHz	Generic sku: refer to modular FCC SAR report Mid-power sku: ≥8 Low power sku: ≥5
PIFA	**3.24**	**3.64**	**3.73**	**4.77**	**4.97**	**4.83**	**4.3**	**5.37**	**5.59**	

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)

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	N/A	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Desired	Desired	Desired	Desired
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 and Drawings of Main & Aux antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	Required	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Desired	Required	Desired
5	Photograph(s) or Drawings showing location of antennas in platform. (S. Korea requires photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.	Required	Required	Desired	Required (Photos)	Required (Photos)
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

Antenna Information

Section 1. Antenna Assembly Specifications

1A Antenna Part Number	1B Manu-facturer	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)
F-0G-XZ-0300-000-K0 MAIN Antenna	Speed Wireless technology Co.,Ltd.	PIFA	Speed-tech(宣德) C87P115 50 ohm Coaxial length: 212.3mm diameter:1. 13mm	2400-2500	2.78	3.44	3	0.66
				5150-5350	3.1	4.1	3	1.00
				5470-5725	2.69	3.71	3	1.02
				5725-5850	2.98	4.04	3	1.06
				5925-6425	3.77	5.22	3	1.45
				6425-6525	2.98	4.61	3	1.63
				6525-6875	3.73	5.45	3	1.72
				6875-7125	3.66	5.75	3	2.09
F-0G-XZ-0300-000-K0 AUX Antenna	Speed Wireless technology Co.,Ltd.	PIFA	Speed-tech(宣德) C87P115 50 ohm Coaxial length:277.8mm diameter:1. 13mm	2400-2500	2.92	3.78	3	0.86
				5150-5350	3.48	4.79	3	1.31
				5470-5725	2.93	4.26	3	1.33
				5725-5850	2.72	4.11	3	1.39
				5925-6425	3.15	4.63	3	1.48
				6425-6525	2.96	4.65	3	1.69
				6525-6875	2.93	4.9	3	1.97
				6875-7125	2.96	5.34	3	2.38

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

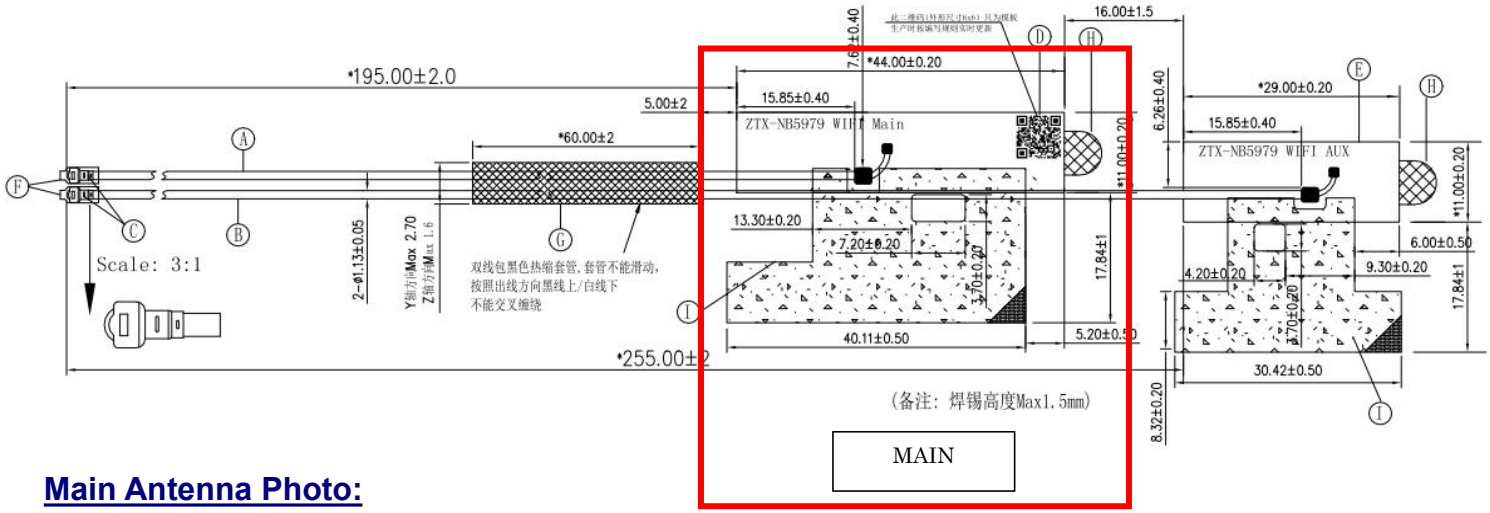
3D Antenna Peak Gain Table:

	Main antenna	Aux Antenna
Frequency (MHz)	(dBi)	(dBi)
2400	2.78	2.92
2450	2.38	2.74
2500	2.55	2.73
5150	2.98	2.17
5250	3.10	3.48
5350	3.08	3.13
5470	2.50	2.93
5600	2.67	2.45
5725	2.69	2.34
5785	2.60	2.72
5850	2.98	2.20
5925	3.77	2.30
6000	3.18	2.55
6125	2.90	2.67
6225	2.88	2.23
6325	2.48	3.15
6425	2.11	2.96
6525	2.98	2.30
6625	3.45	2.49
6725	3.73	2.93
6875	3.10	2.39
6925	3.56	2.64
7000	3.60	2.96
7125	3.66	2.47

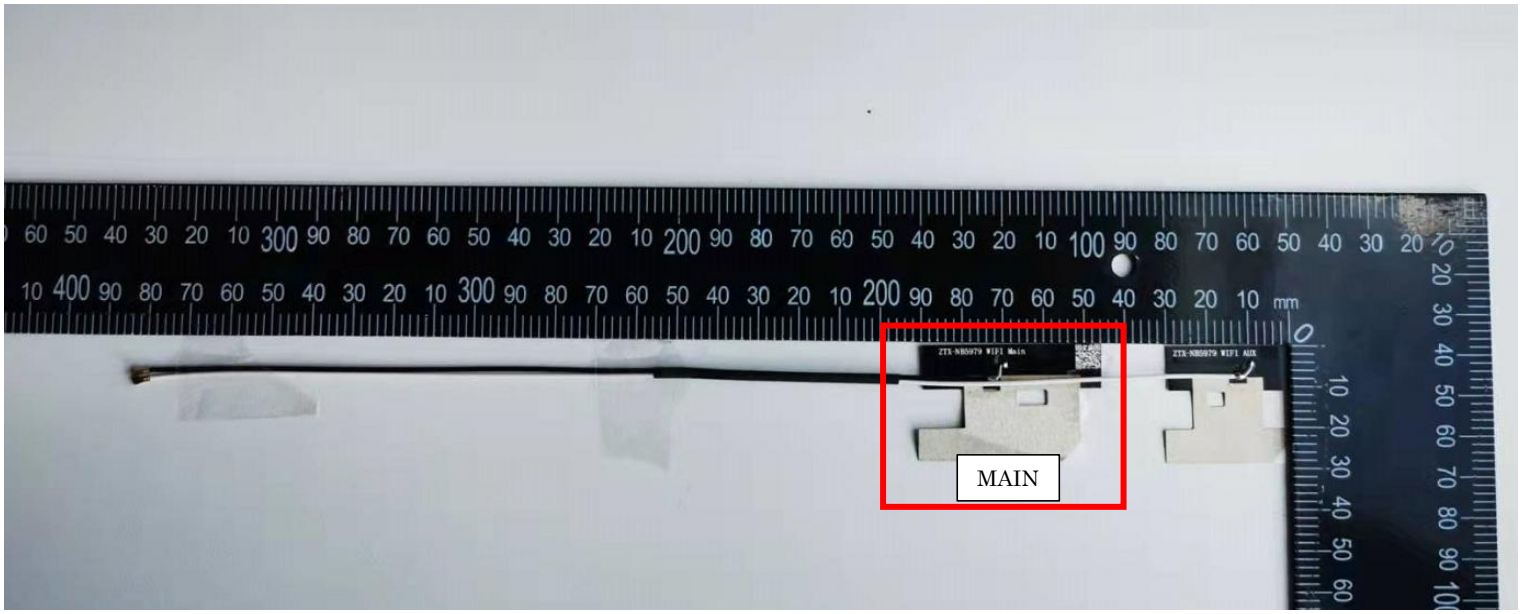
Section 2. Dimensioned Photos or Drawings of Antennas

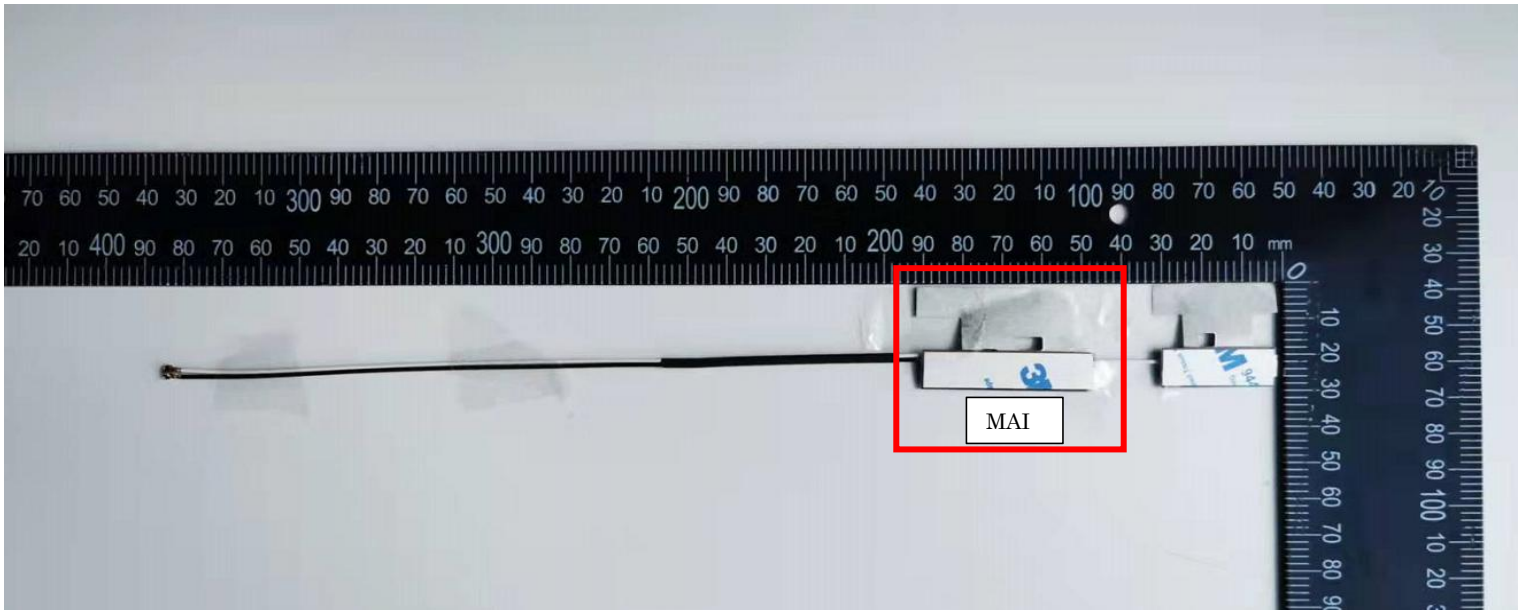
Include a dimensioned photo and dimensioned drawing of Main antenna here.

Main Antenna Dimensioned Drawing:



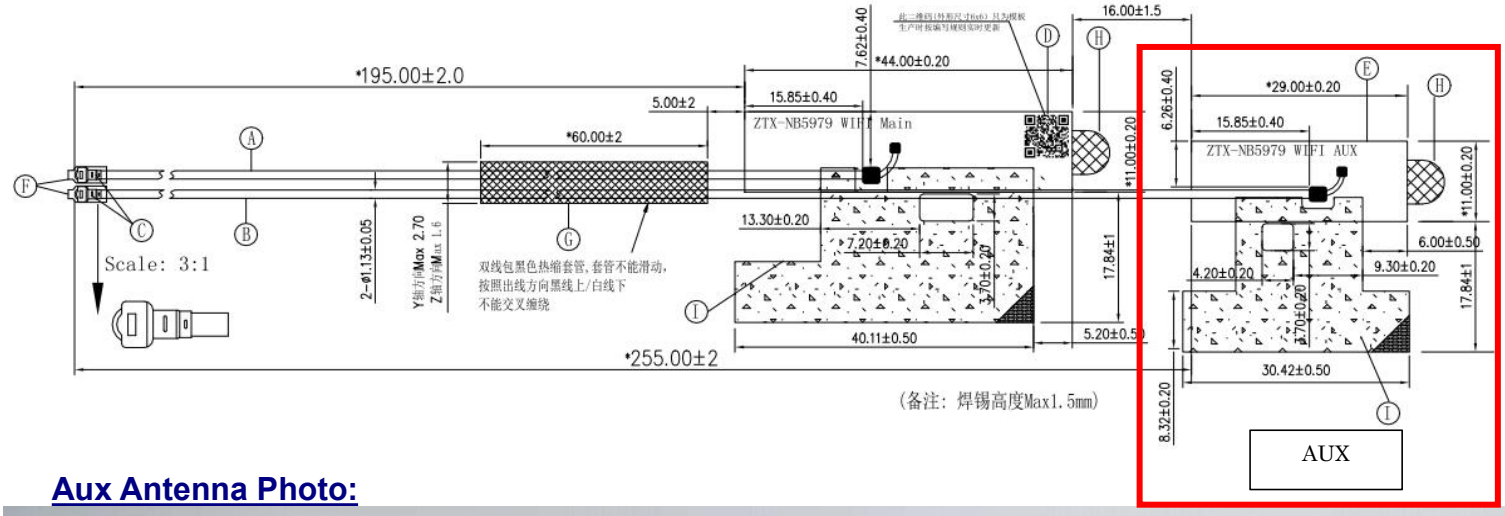
Main Antenna Photo:



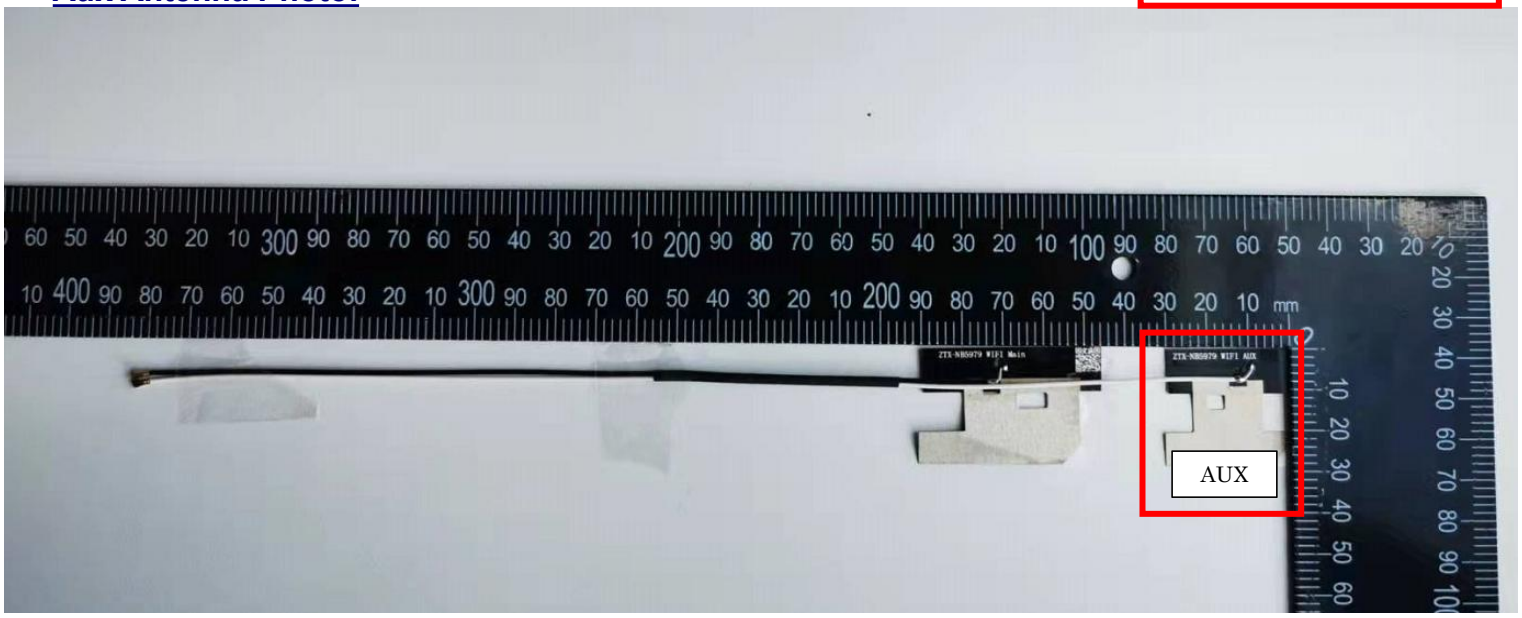


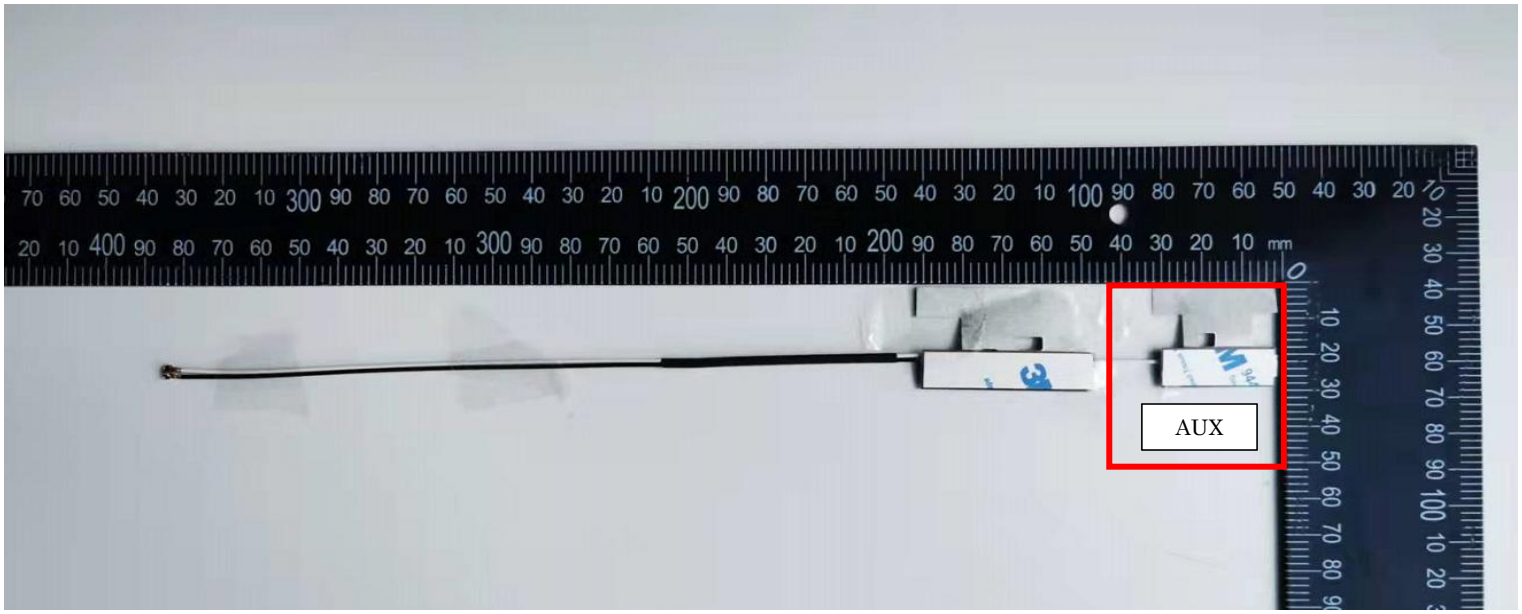
Include a dimensioned photo and dimensioned drawing of Aux antenna here.

Aux Antenna Dimensioned Drawing:



Aux Antenna Photo:

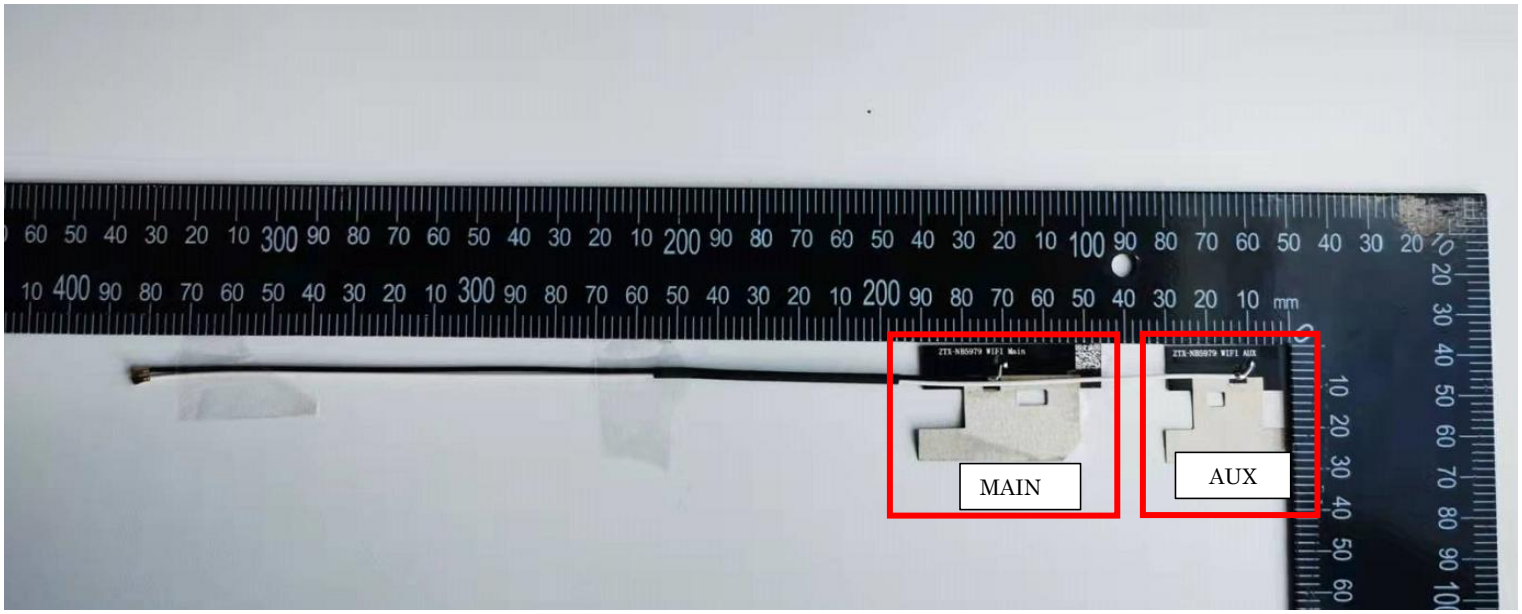




Include front view photo of all 2 antennas here.

Antenna Manufacturer: Speed Wireless technology Co.,Ltd

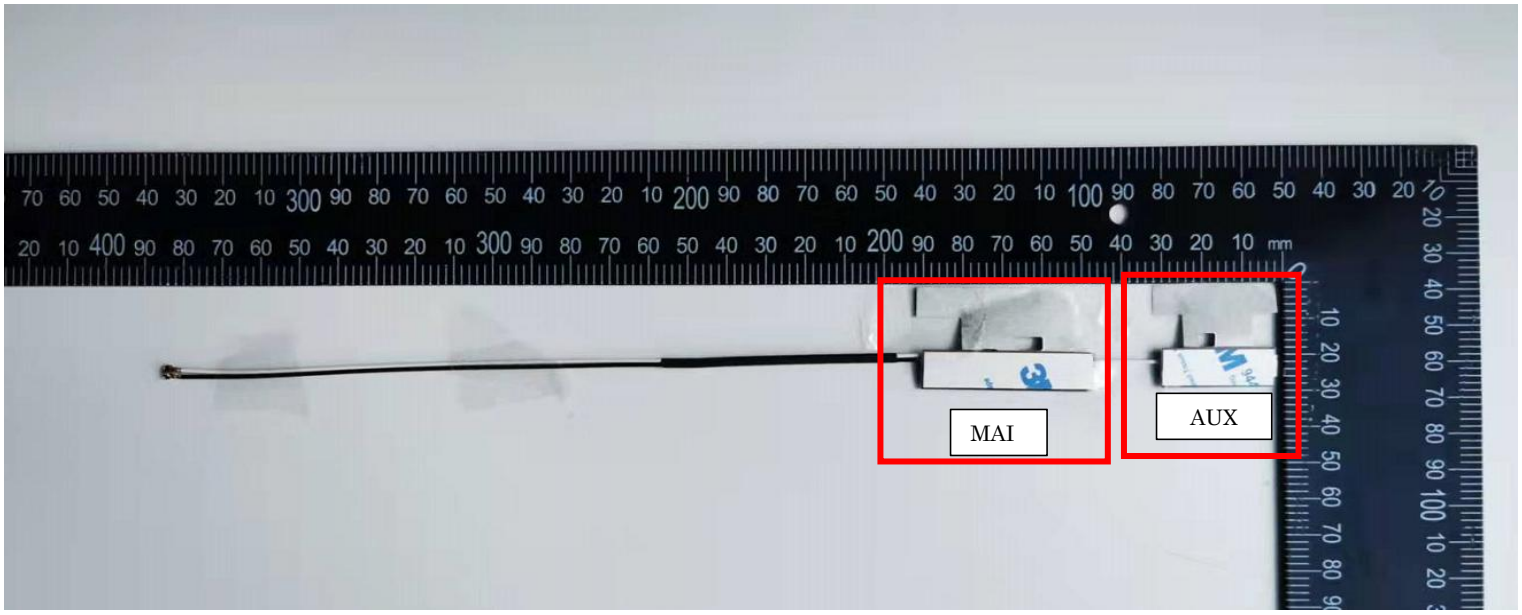
Antenna Part Number: F-0G-XZ-0300-000-K0



Include back view photo of all 2 antennas here.

Antenna Manufacturer: Speed Wireless technology Co.,Ltd.

Antenna Part Number: F-0G-XZ-0300-000-K0

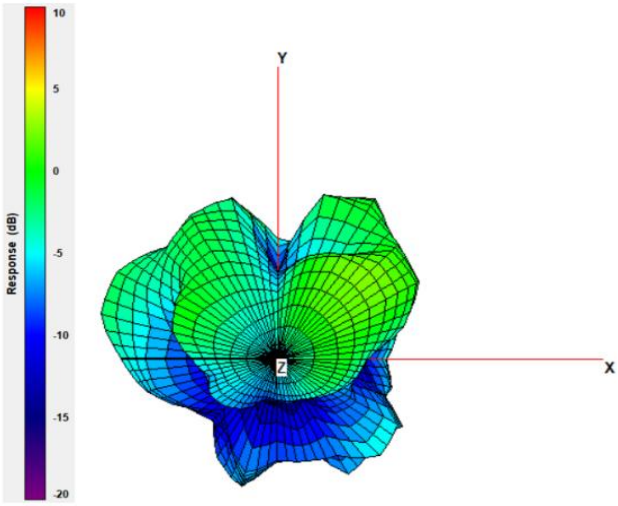


Note: antenna photo should include L type ruler

Section 3. Radiation characteristics of antennae Loaded in Host Platform

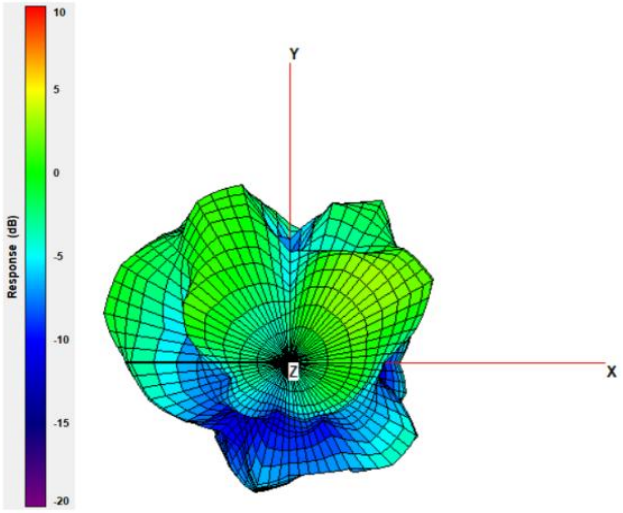
2400-2500MHz radiation characteristic

Main antenna: 2400 MHz



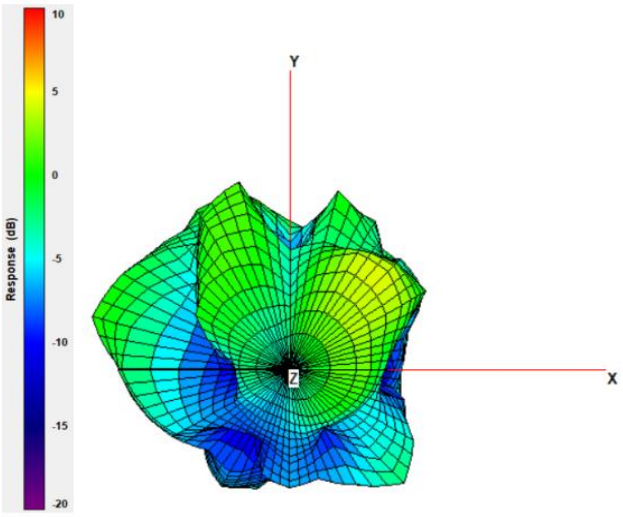
Center Frequency	**2400 MHz**
Three-dimensional (dBi) peak	**2.78**

Main antenna: 2450 MHz



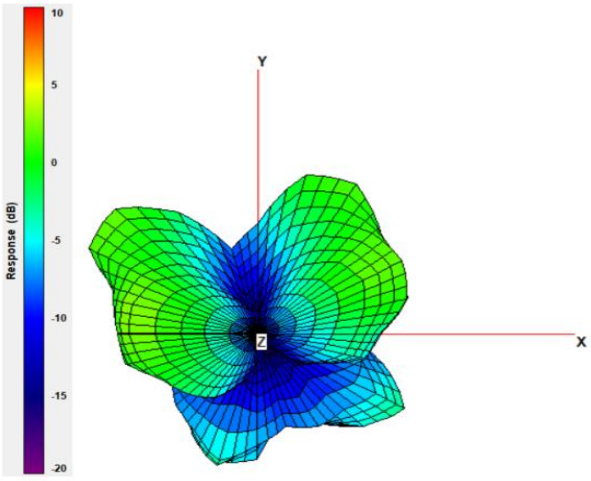
Center Frequency	**2450 MHz**
Three-dimensional (dBi) peak	**2.38**

Main antenna: 2500 MHz



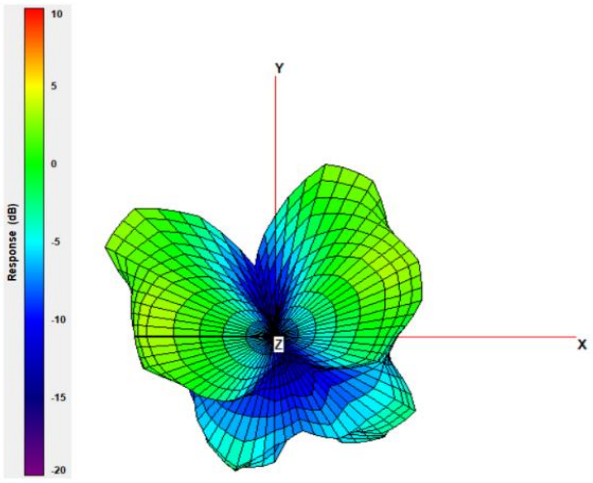
Center Frequency	**2500 MHz**
Three-dimensional (dBi) peak	**2.55**

Aux antenna: 2400 MHz



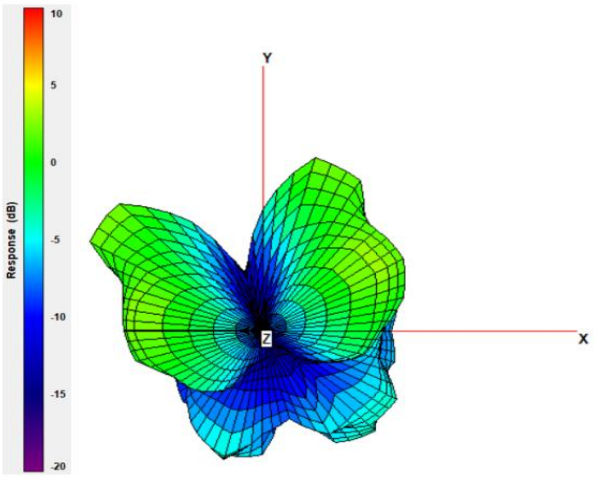
Center Frequency	**2400 MHz**
Three-dimensional (dBi) peak	**2.92**

Aux antenna: 2450 MHz



Center Frequency	**2450 MHz**
Three-dimensional (dBi) peak	**2.74**

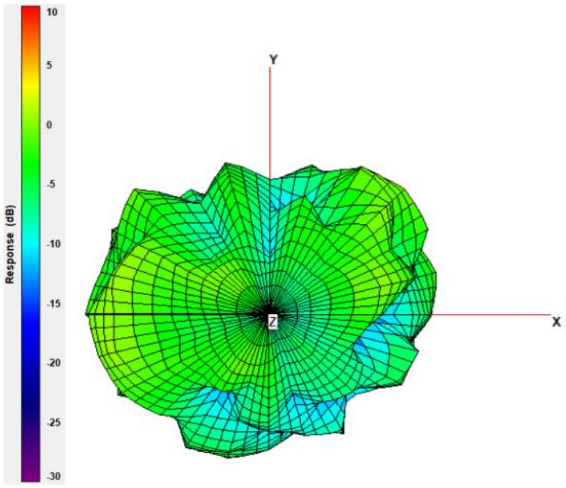
Aux antenna: 2500 MHz



Center Frequency	**2500 MHz**
Three-dimensional (dBi) peak	**2.73**

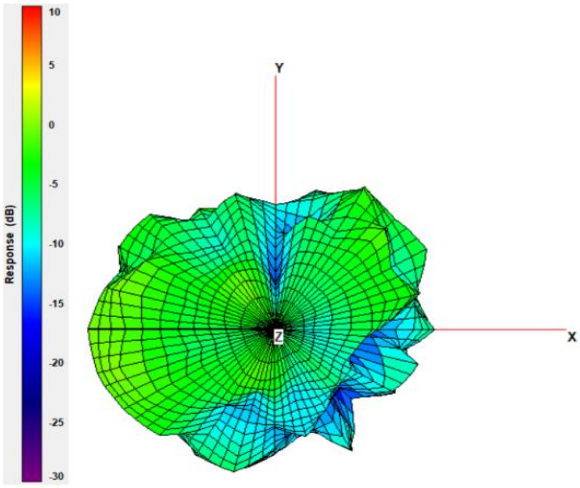
5150-5350MHz radiation characteristic

Main antenna: 5150 MHz



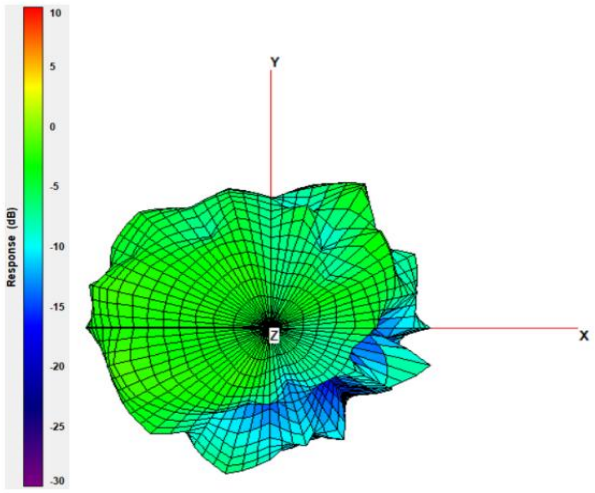
Center Frequency	**5150 MHz**
Three-dimensional (dBi) peak	**2.98**

Main antenna: 5250 MHz



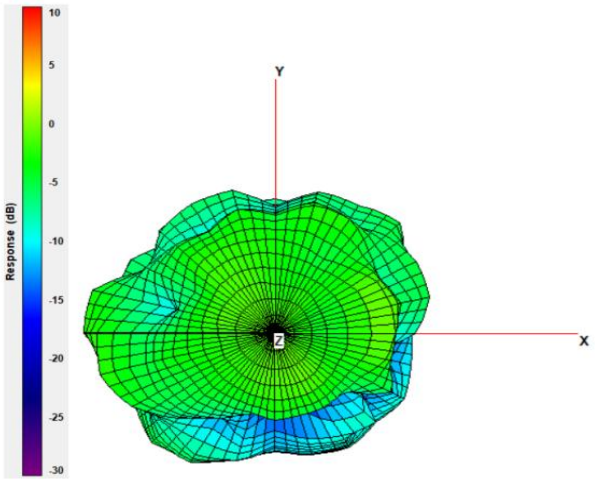
Center Frequency	**5250 MHz**
Three-dimensional (dBi) peak	**3.10**

Main antenna: 5350 MHz



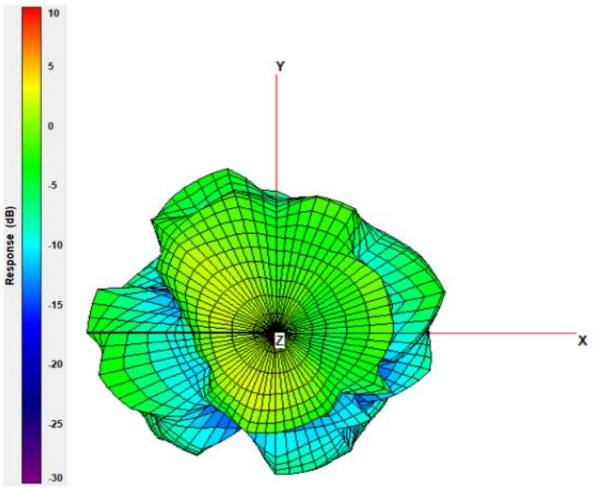
Center Frequency	**5350 MHz**
Three-dimensional (dBi) peak	**3.08**

Aux antenna: 5150 MHz



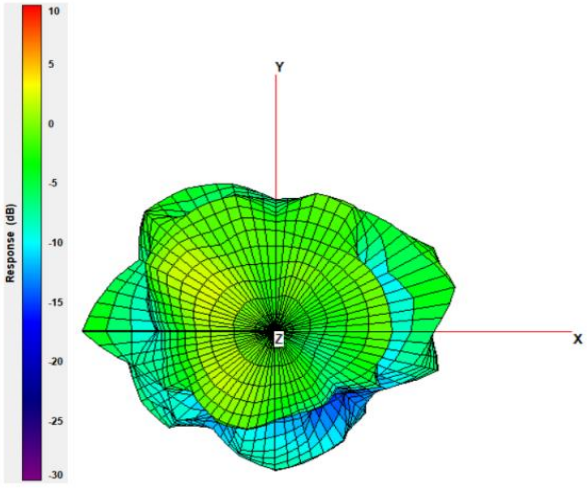
Center Frequency	**5150 MHz**
Three-dimensional (dBi) peak	**2.17**

Aux antenna: 5250 MHz



Center Frequency	**5250 MHz**
Three-dimensional (dBi) peak	**3.48**

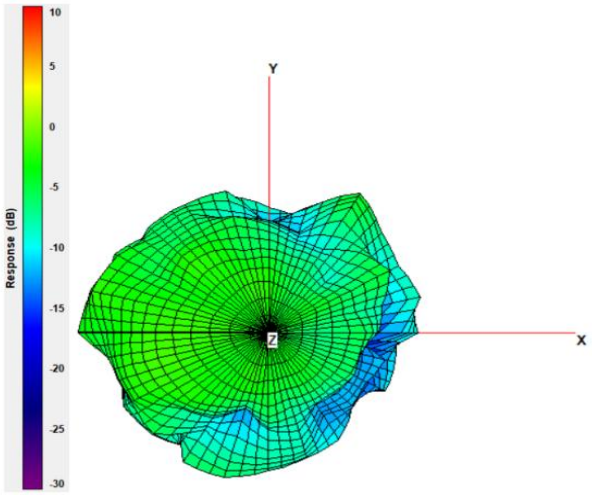
Aux antenna: 5350 MHz



Center Frequency	**5350 MHz**
Three-dimensional (dBi) peak	**3.13**

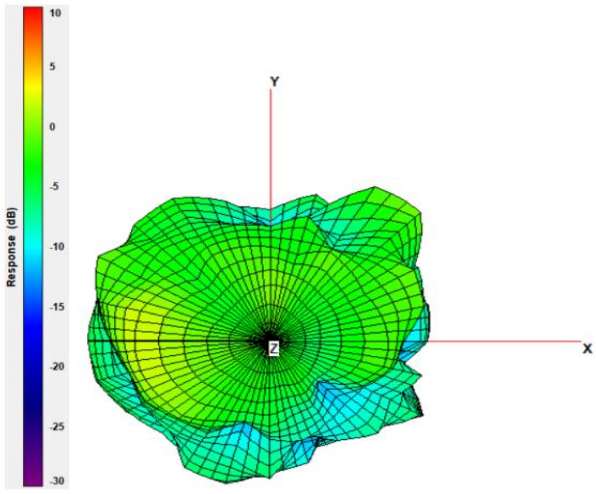
5470-5725MHz radiation characteristic

Main antenna: 5470 MHz



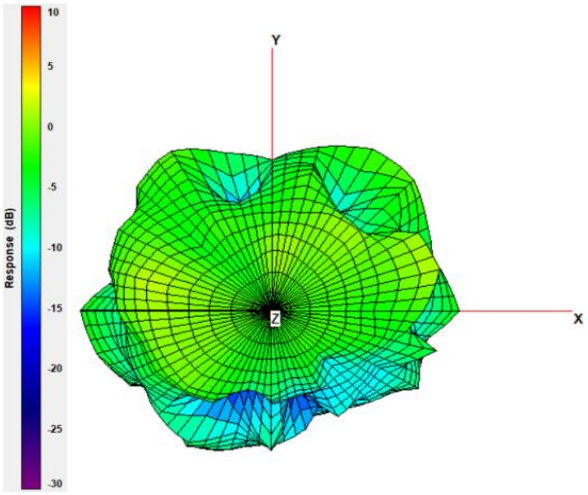
Center Frequency	**5470 MHz**
Three-dimensional (dBi) peak	**2.50**

Main antenna: 5600 MHz



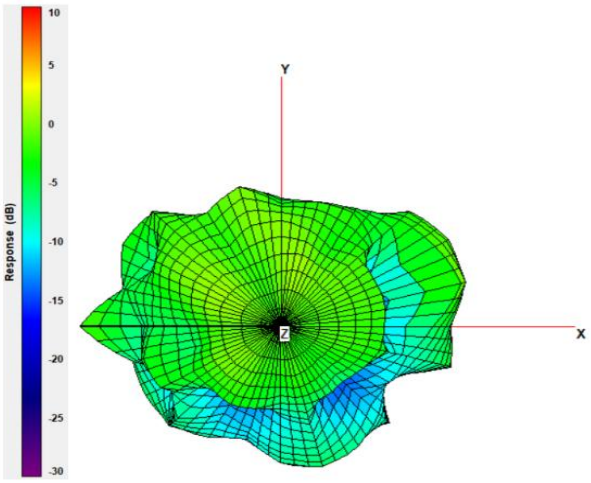
Center Frequency	**5600 MHz**
Three-dimensional (dBi) peak	**2.67**

Main antenna: 5725 MHz



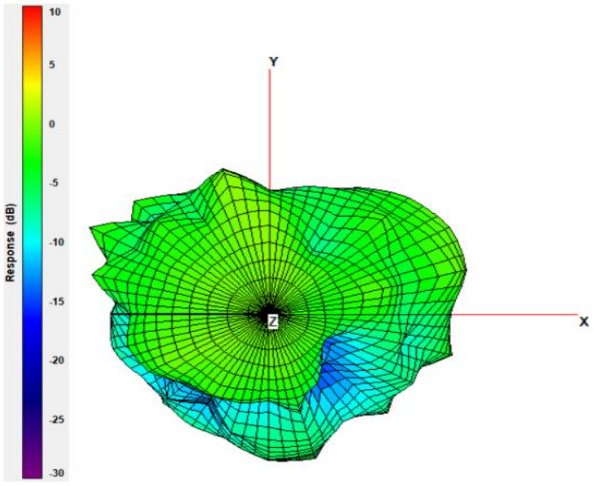
Center Frequency	**5725 MHz**
Three-dimensional (dBi) peak	**2.69**

Aux antenna: 5470 MHz



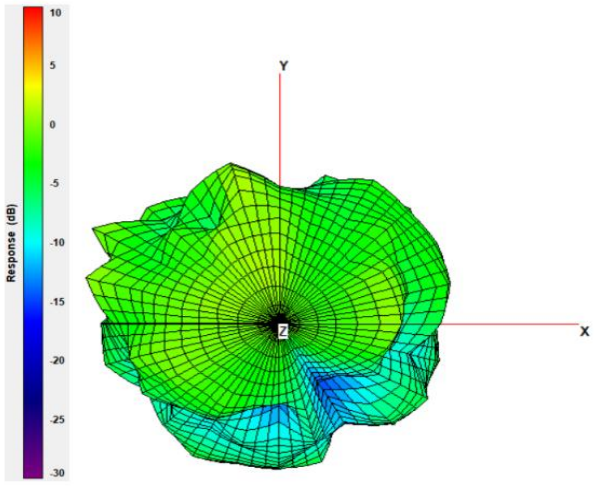
Center Frequency	**5470 MHz**
Three-dimensional (dBi) peak	**2.93**

Aux antenna: 5600 MHz



Center Frequency	**5600 MHz**
Three-dimensional (dBi) peak	**2.45**

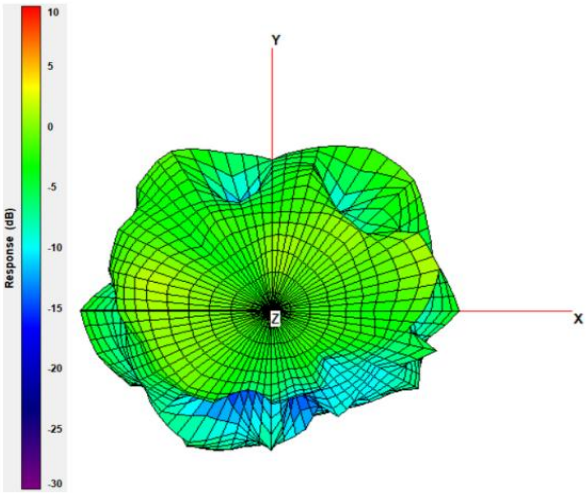
Aux antenna: 5725 MHz



Center Frequency	**5725 MHz**
Three-dimensional (dBi) peak	**2.34**

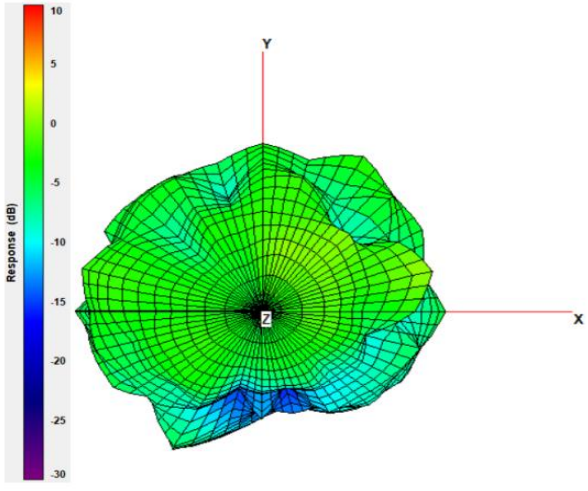
5725-5850MHz radiation characteristic

Main antenna: 5725 MHz



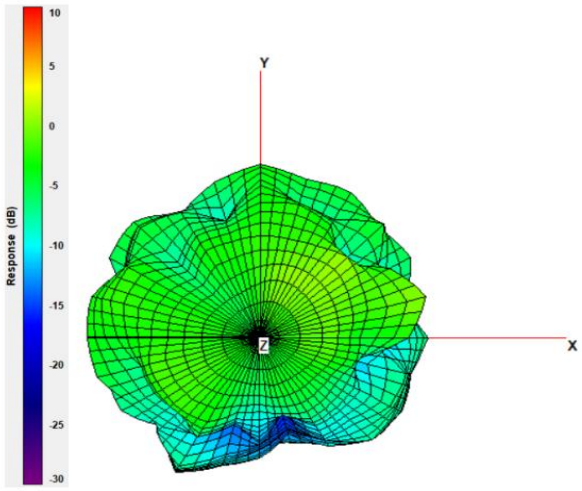
Center Frequency	**5725 MHz**
Three-dimensional (dBi) peak	**2.69**

Main antenna: 5785 MHz



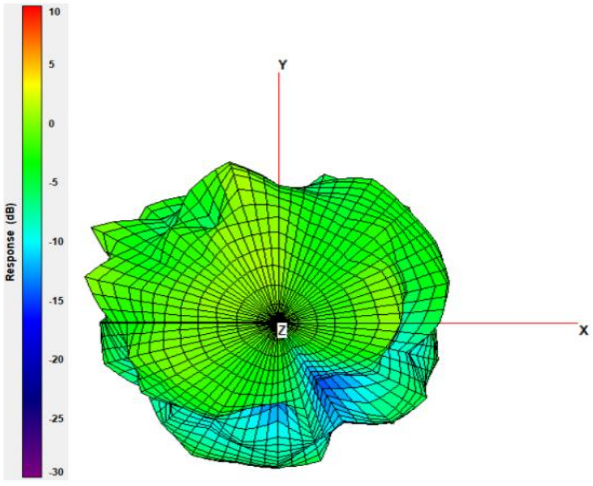
Center Frequency	**5785 MHz**
Three-dimensional (dBi) peak	**2.60**

Main antenna: 5850 MHz



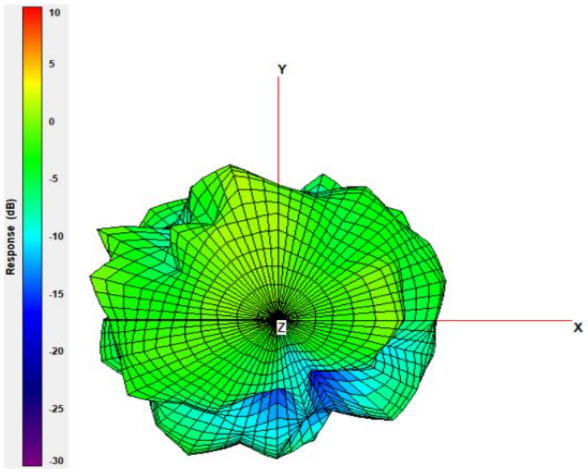
Center Frequency	**5850 MHz**
Three-dimensional (dBi) peak	**2.98**

Aux antenna: 5725 MHz



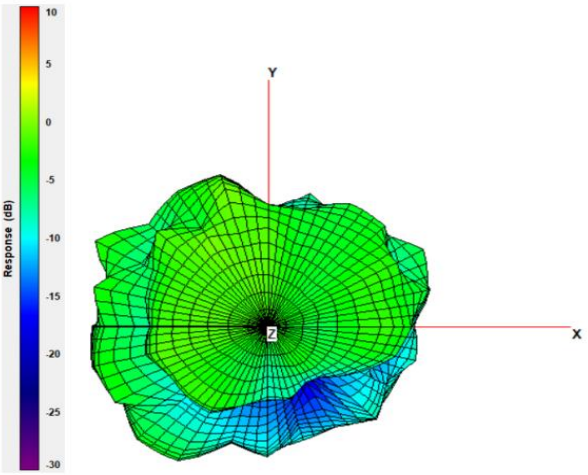
Center Frequency	**5725 MHz**
Three-dimensional (dBi) peak	**2.34**

Aux antenna: 5785 MHz



Center Frequency	**5785 MHz**
Three-dimensional (dBi) peak	**2.72**

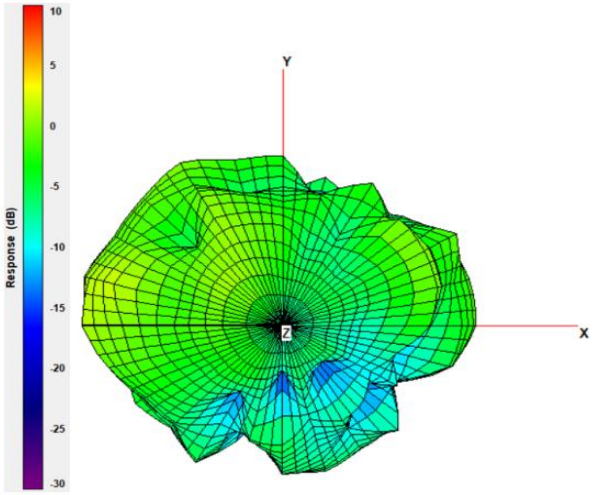
Aux antenna: 5850 MHz



Center Frequency	**5850 MHz**
Three-dimensional (dBi) peak	**2.20**

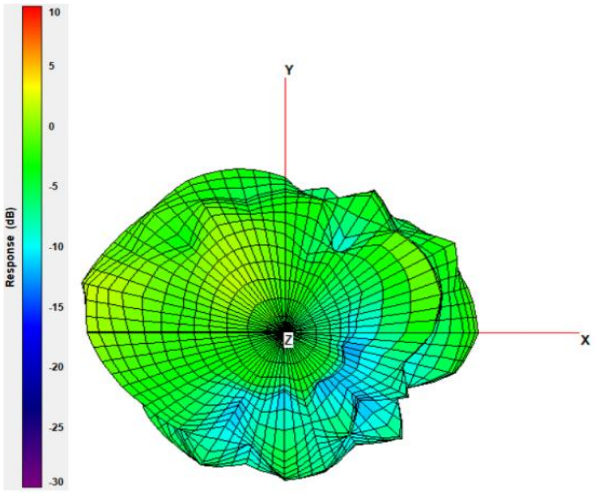
5925-6425MHz radiation characteristic

Main antenna: 5925 MHz



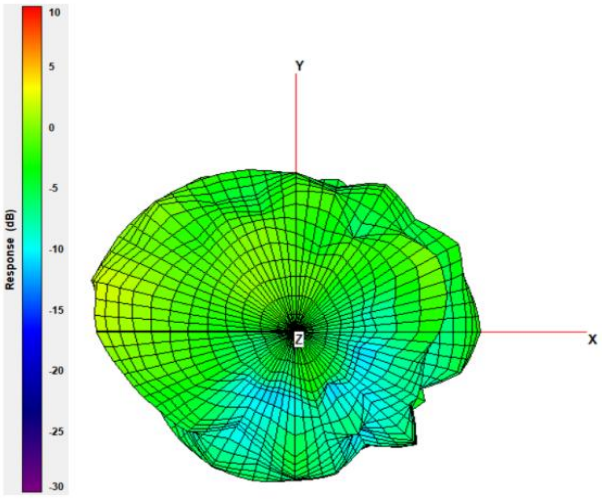
Center Frequency	**5925 MHz**
Three-dimensional (dBi) peak	**3.77**

Main antenna: 6000 MHz



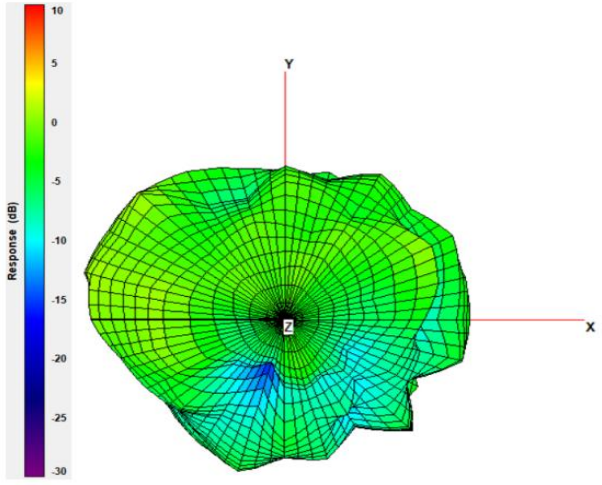
Center Frequency	**6000 MHz**
Three-dimensional (dBi) peak	**3.18**

Main antenna: 6125 MHz



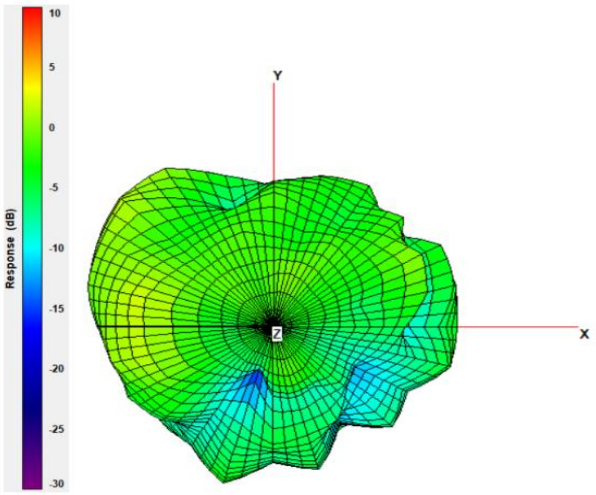
Center Frequency	**6125 MHz**
Three-dimensional (dBi) peak	**2.90**

Main antenna: 6225 MHz



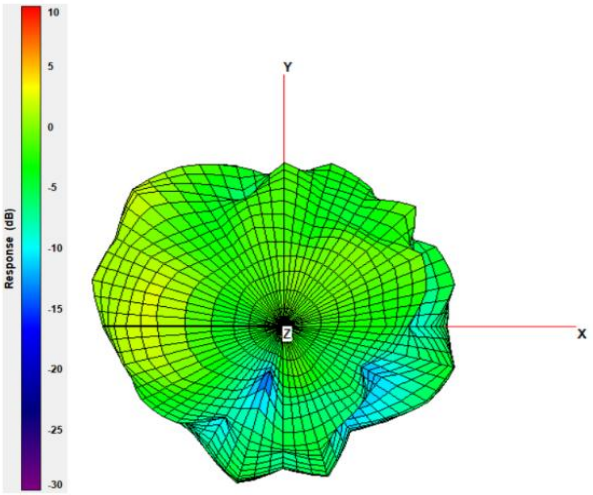
Center Frequency	**6225 MHz**
Three-dimensional (dBi) peak	**2.88**

Main antenna: 6325 MHz



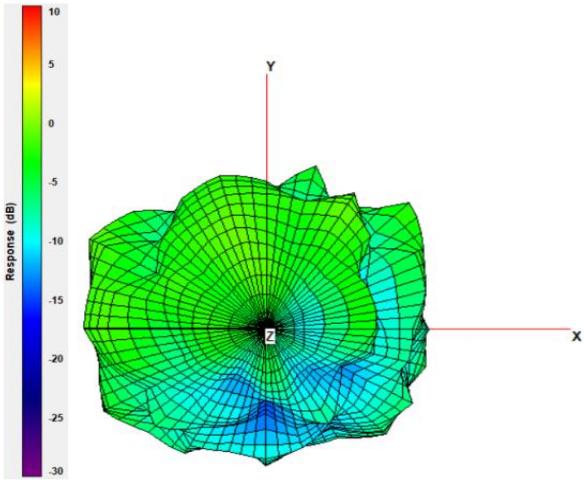
Center Frequency	**6325 MHz**
Three-dimensional (dBi) peak	**2.48**

Main antenna: 6425 MHz



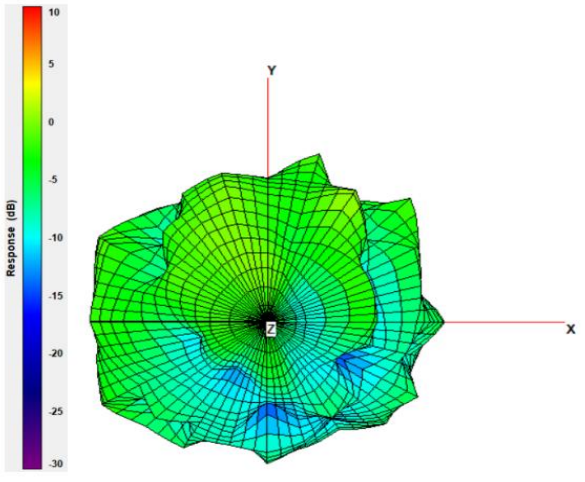
Center Frequency	**6425 MHz**
Three-dimensional (dBi) peak	**2.11**

Aux antenna: 5925 MHz



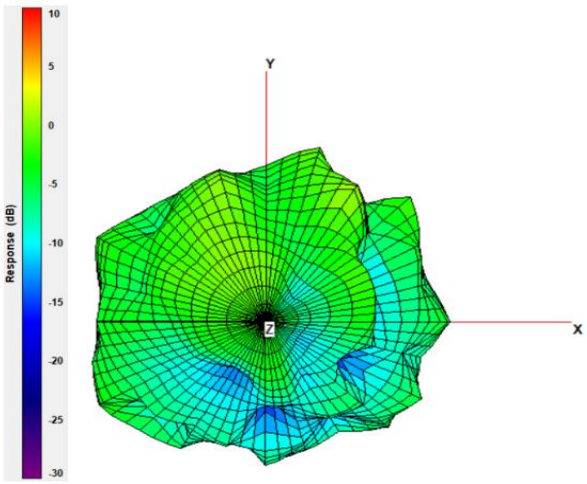
Center Frequency	**5925 MHz**
Three-dimensional (dBi) peak	**2.30**

Aux antenna: 6000 MHz



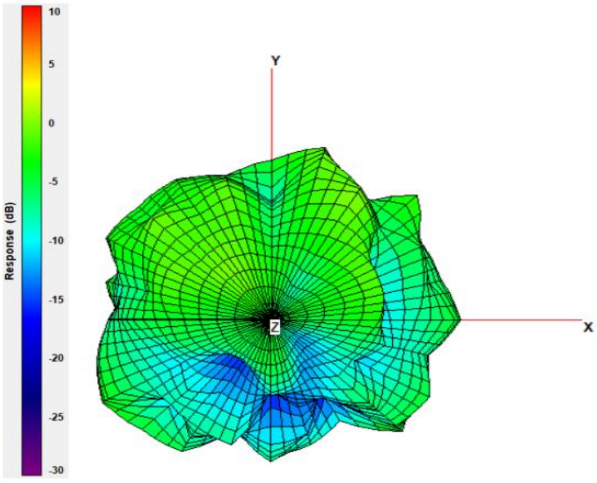
Center Frequency	**6000 MHz**
Three-dimensional (dBi) peak	**2.55**

Aux antenna: 6125 MHz



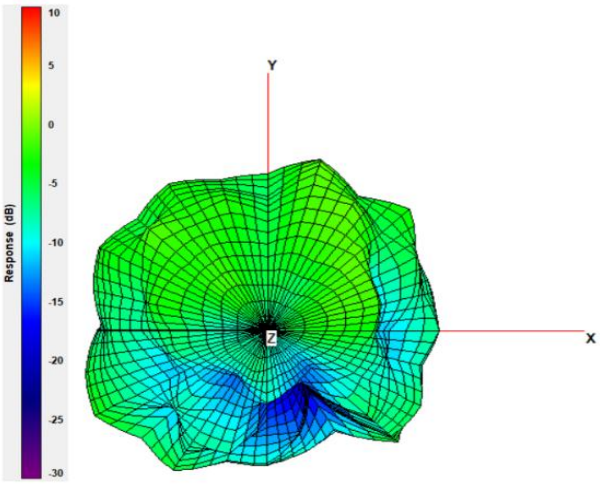
Center Frequency	**6125 MHz**
Three-dimensional (dBi) peak	**2.67**

Aux antenna: 6225 MHz



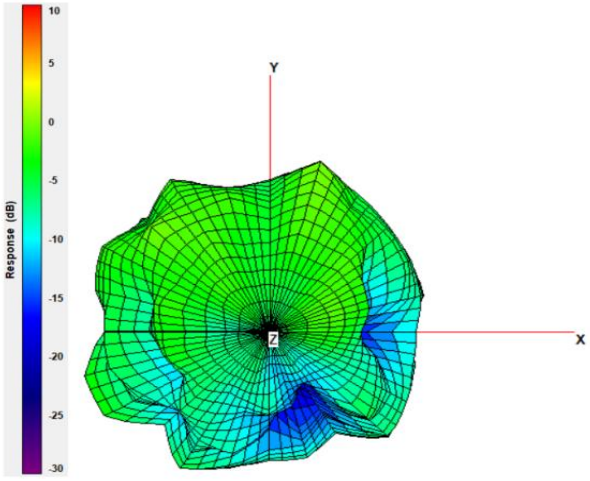
Center Frequency	**6225 MHz**
Three-dimensional (dBi) peak	**2.23**

Aux antenna: 6325 MHz



Center Frequency	**6325 MHz**
Three-dimensional (dBi) peak	**3.15**

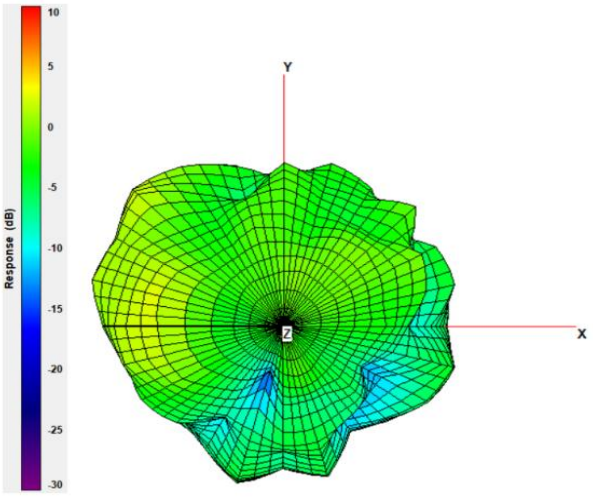
Aux antenna: 6425 MHz



Center Frequency	**6425 MHz**
Three-dimensional (dBi) peak	**2.96**

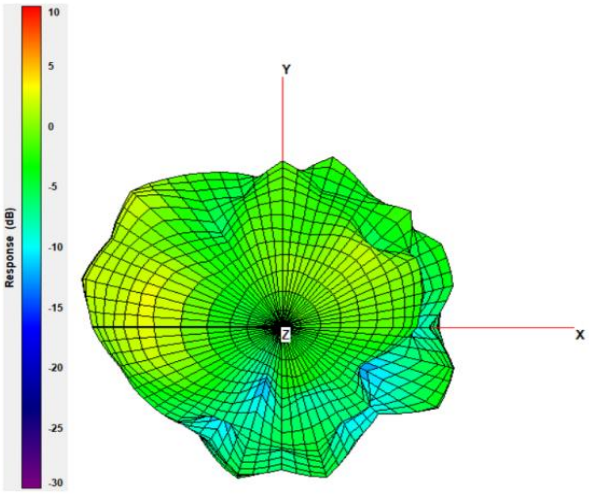
6425-6525MHz radiation characteristic

Main antenna: 6425 MHz



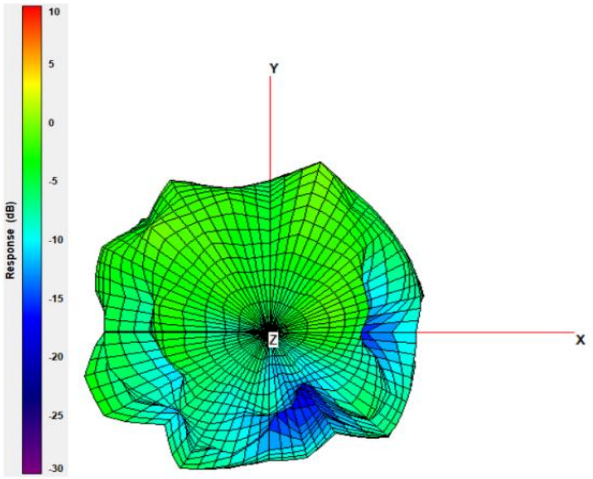
Center Frequency	**6425 MHz**
Three-dimensional (dBi) peak	**2.11**

Main antenna: 6525 MHz



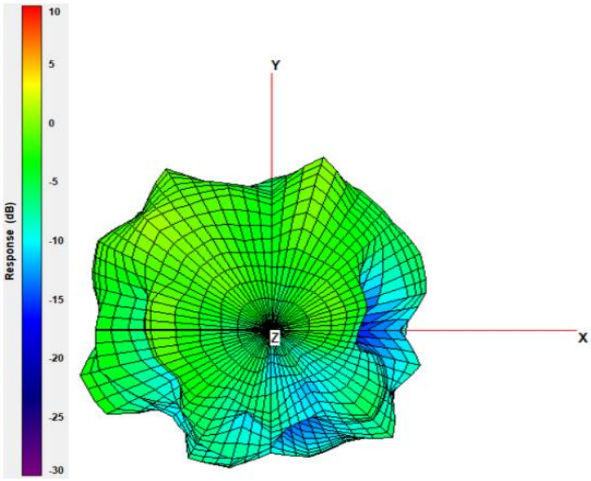
Center Frequency	**6525 MHz**
Three-dimensional (dBi) peak	**2.98**

Aux antenna: 6425 MHz



Center Frequency	**6425 MHz**
Three-dimensional (dBi) peak	**2.96**

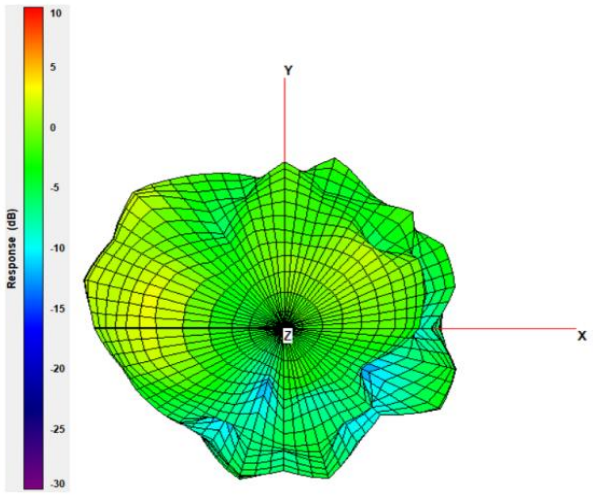
Aux antenna: 6525 MHz



Center Frequency	**6525 MHz**
Three-dimensional (dBi) peak	**2.30**

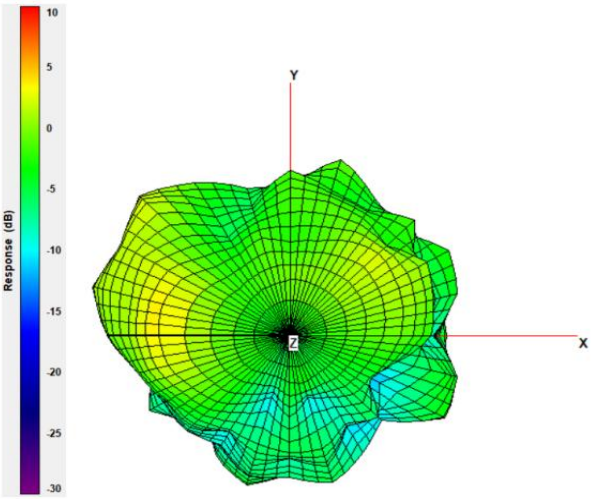
6525-6875MHz radiation characteristic

Main antenna: 6525 MHz



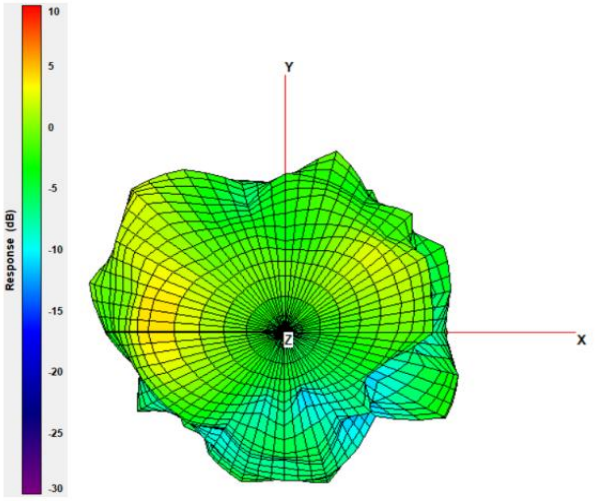
Center Frequency	**6525 MHz**
Three-dimensional (dBi) peak	**2.98**

Main antenna: 6625 MHz



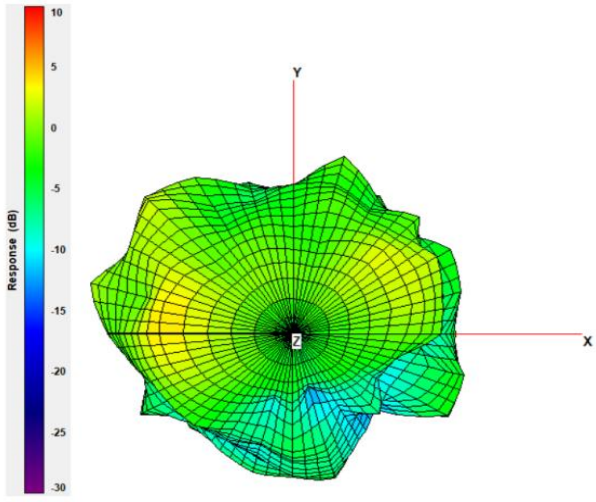
Center Frequency	**6625 MHz**
Three-dimensional (dBi) peak	**3.45**

Main antenna: 6725 MHz



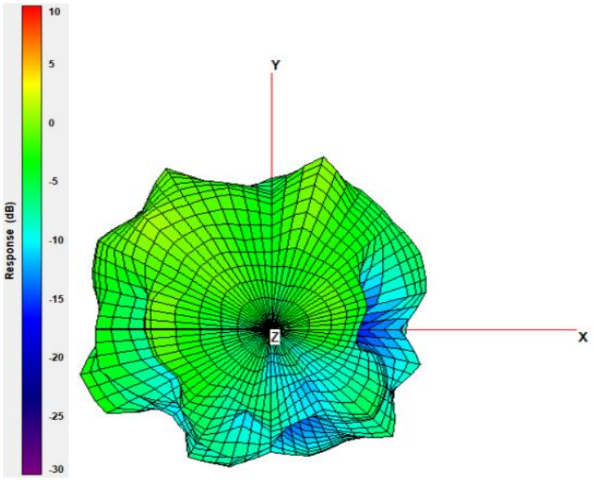
Center Frequency	**6725 MHz**
Three-dimensional (dBi) peak	**3.73**

Main antenna: 6875 MHz



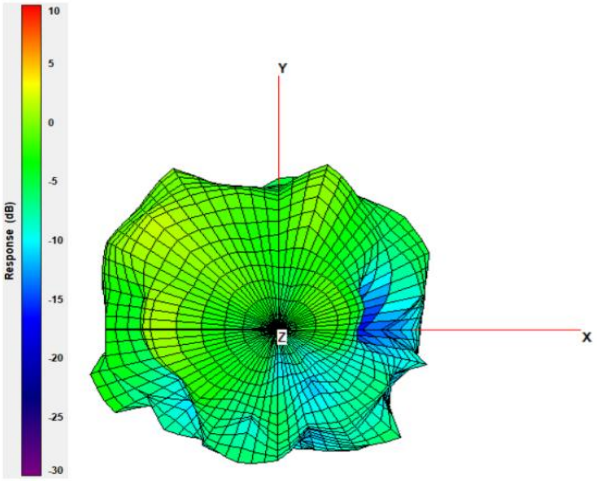
Center Frequency	**6875 MHz**
Three-dimensional (dBi) peak	**3.10**

Aux antenna: 6525 MHz



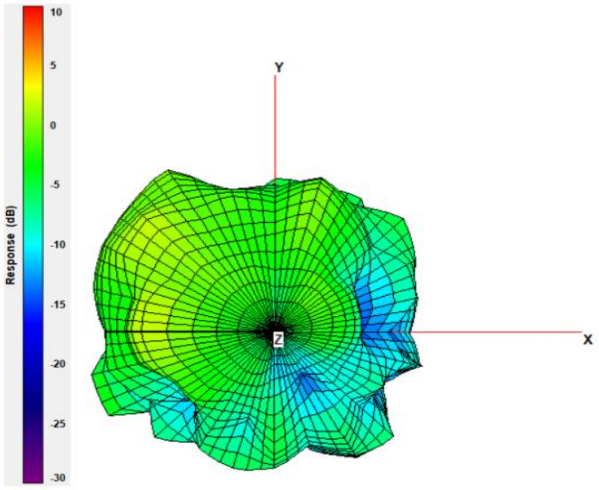
Center Frequency	**6525 MHz**
Three-dimensional (dBi) peak	**2.30**

Aux antenna: 6625 MHz



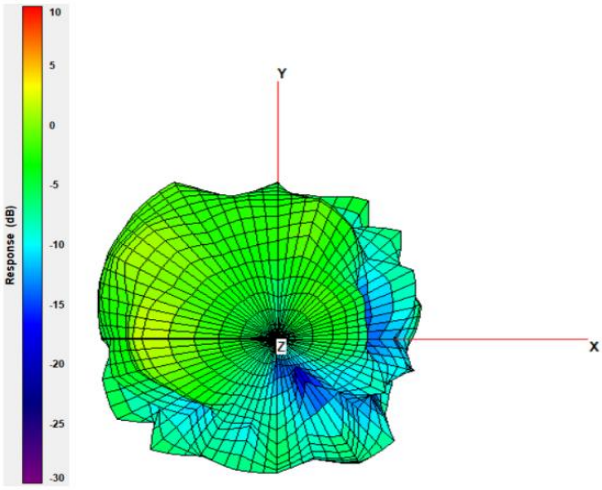
Center Frequency	**6625 MHz**
Three-dimensional (dBi) peak	**2.49**

Aux antenna: 6725 MHz



Center Frequency	**6725 MHz**
Three-dimensional (dBi) peak	**2.93**

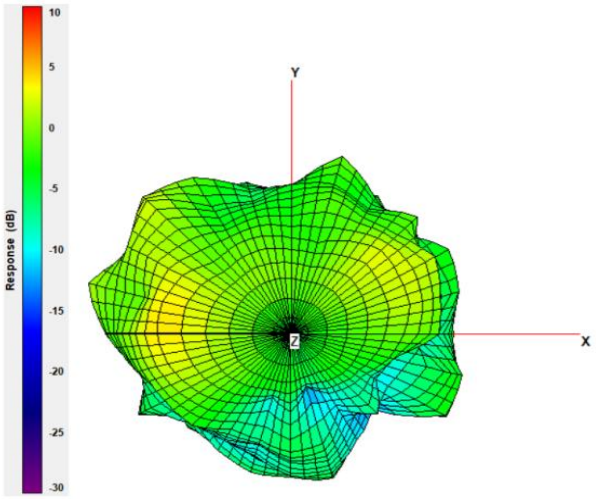
Aux antenna: 6875 MHz



Center Frequency	**6875 MHz**
Three-dimensional (dBi) peak	**2.39**

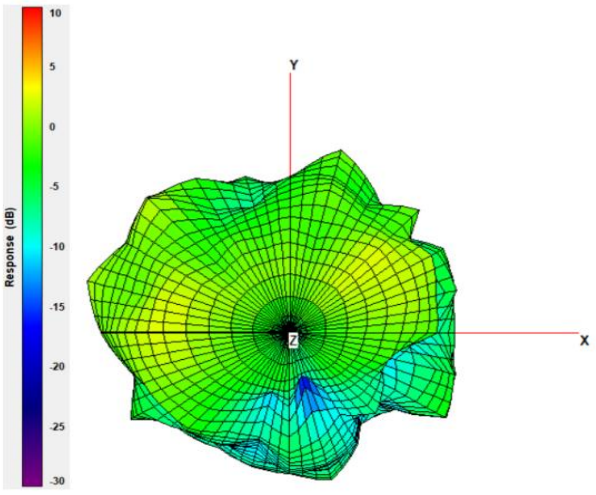
6875-7125MHz radiation characteristic

Main antenna: 6875 MHz



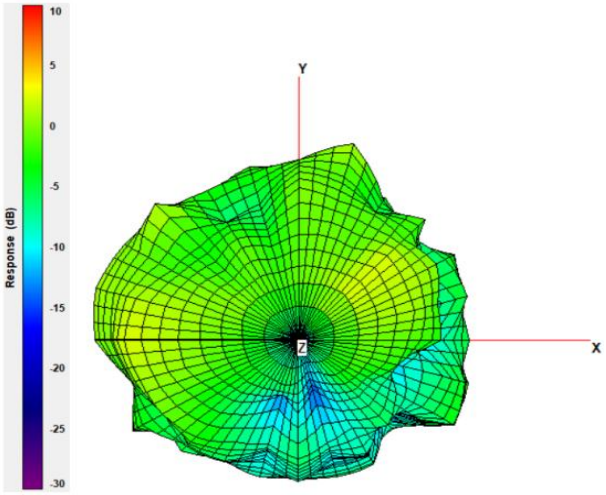
Center Frequency	**6875 MHz**
Three-dimensional (dBi) peak	**3.10**

Main antenna: 6925 MHz



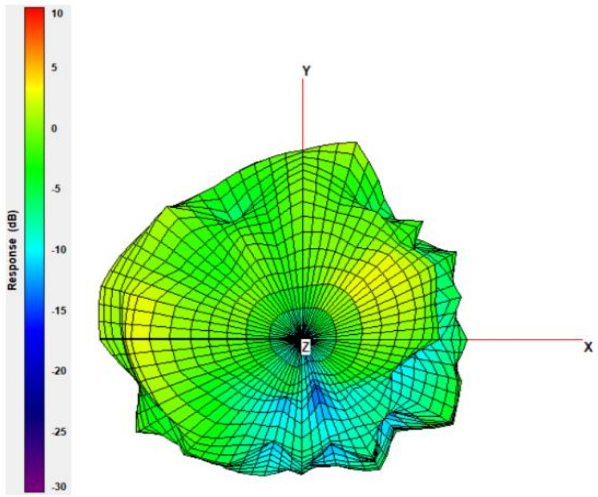
Center Frequency	**6925 MHz**
Three-dimensional (dBi) peak	**3.56**

Main antenna: 7000 MHz



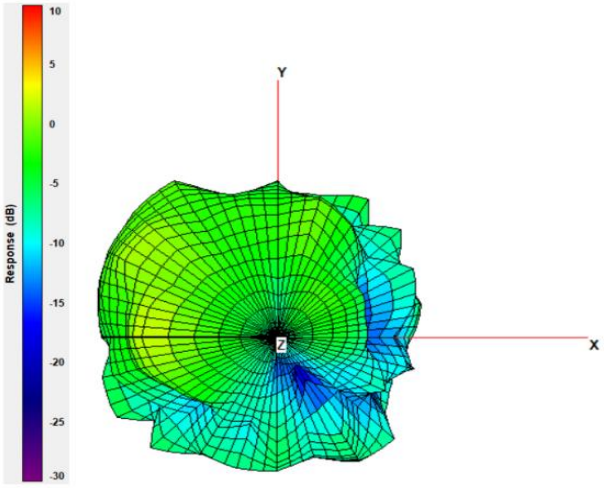
Center Frequency	**7000 MHz**
Three-dimensional (dBi) peak	**3.60**

Main antenna: 7125 MHz



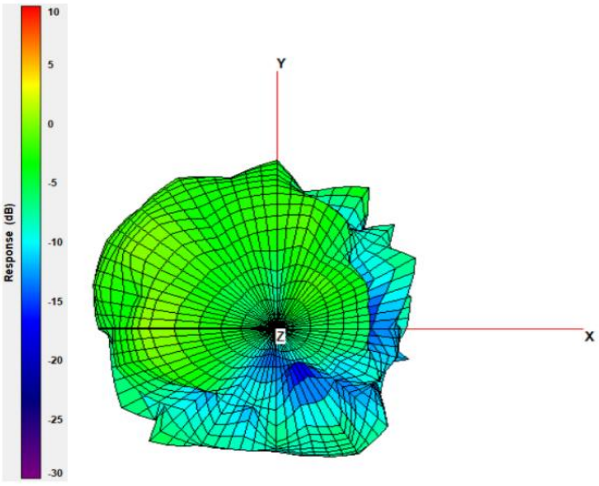
Center Frequency	**7125 MHz**
Three-dimensional (dBi) peak	**3.66**

Aux antenna: 6875 MHz



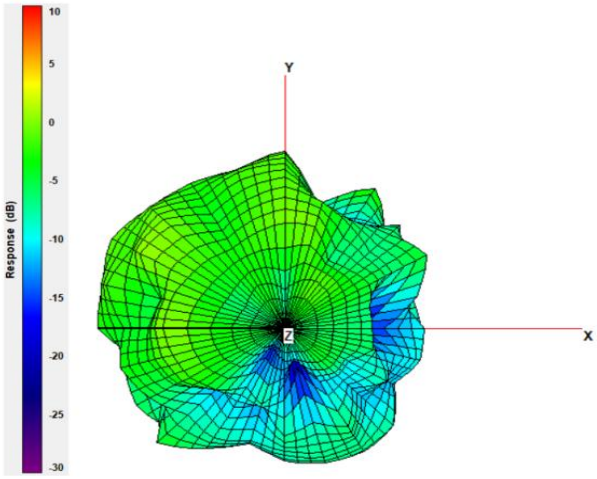
Center Frequency	**6875 MHz**
Three-dimensional (dBi) peak	**2.39**

Aux antenna: 6925 MHz



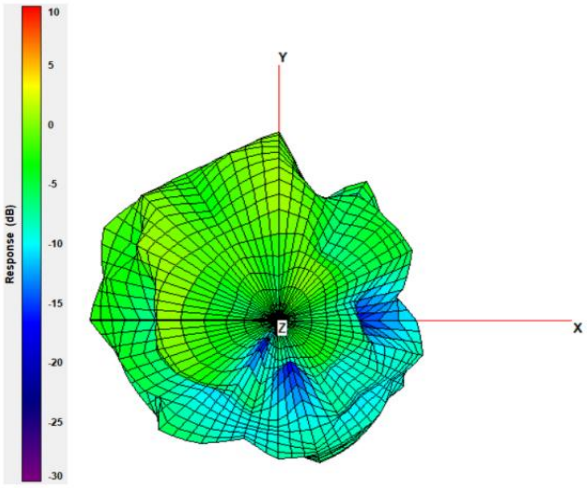
Center Frequency	**6925 MHz**
Three-dimensional (dBi) peak	**2.64**

Aux antenna: 7000 MHz



Center Frequency	**7000 MHz**
Three-dimensional (dBi) peak	**2.96**

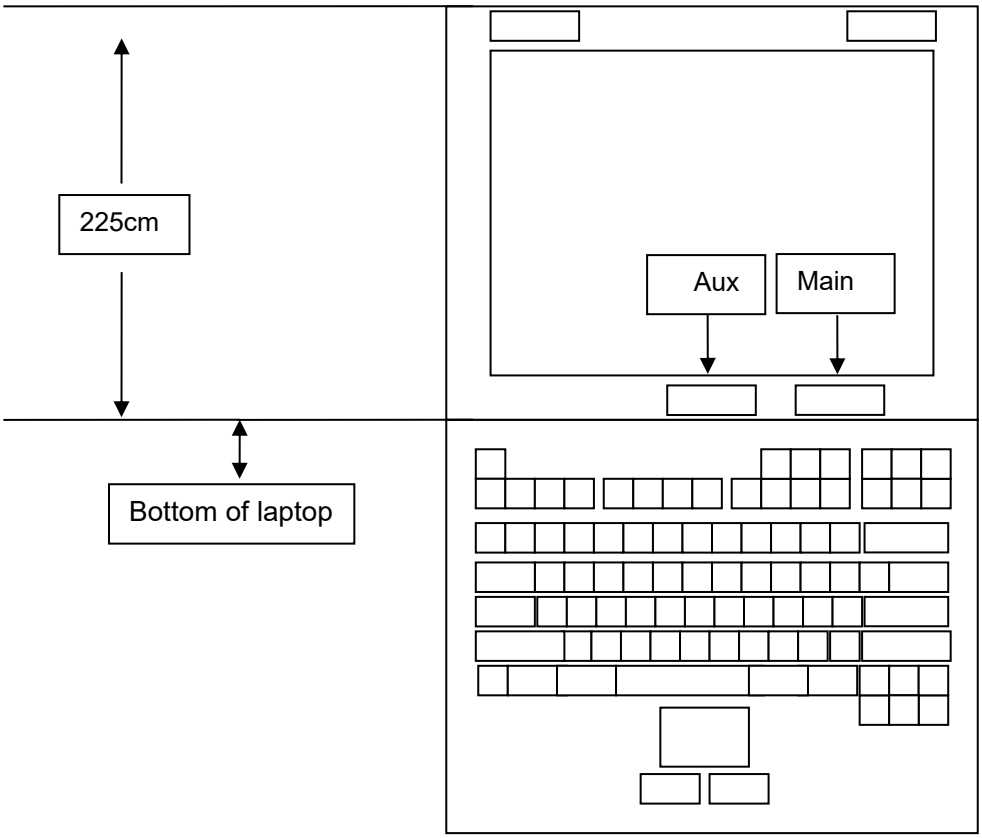
Aux antenna: 7125 MHz



Center Frequency	**7125 MHz**
Three-dimensional (dBi) peak	**2.47**

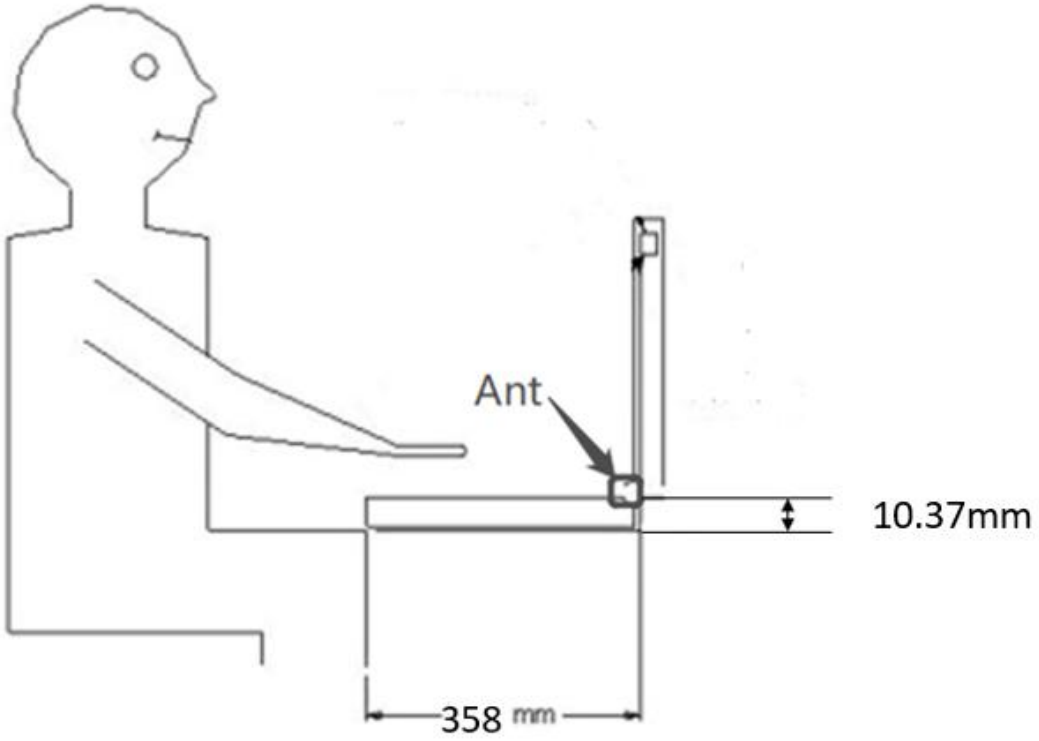
Section 4. Antenna Host Platform Location Information

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)