

# Regulatory WWAN Antenna Information

(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)**

<b>Platform</b>	
Platform Owner	DELL / COMPAL
Brand Name	DELL
Model Name	IDB10
ODM	COMPAL ELECTRONICS
Target Launch Date	
<b>Antenna</b>	
Manufacturer	Speed
Part Number	<ul style="list-style-type: none"> <li>■ Tx1/Rx1 <a href="#">Antenna</a> WWAN Main:                      Antenna P/N: Main: F-0G-FH-6163-001-00                      COMPAL P/N: DC33002R10L</li> </ul>
	<ul style="list-style-type: none"> <li>■ Rx2 Antenna WWAN Aux :                      Antenna P/N: Main: F-0G-FH-6163-002-00                      COMPAL P/N: DC33002R11L</li> </ul>
<b>Module</b>	
With WWAN Module	FM101-GL (DW5824e)
(Check Box)	

## 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	Tx1, Tx2 & Tx3 antenna (Peak Gain W/ cable loss) *	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Tx1, Tx2 & Tx3 antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Tx1, Tx2 & Tx3 antenna (Cable loss W/ connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs and Drawings of Tx1, Tx2, and Tx3 (or Rx3) antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	N/A	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	<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

# Antenna Information

## Section 1. Antenna Assembly Specifications

1A	1B	1C	1D	1E	1F	1G	1H
Antenna Part Number	Manufacture	Antenna Type	Cable Assembly Part Number and Information	*Peak Gain W/ Cable loss (dBi)	Peak Gain w/o Cable Loss (dBi)	VSWR	Cable Loss (dBi)
<b>Tx/Rx1</b> Antenna <b>P/N:</b> F-0G-FH-6163-001-00 /DC33002R10L	Speed	PIFA	(1)Cable P/N: SY113SLL (2)Cable length: 346mm diameter: 1.13mm 50 ohm Coaxial (3)Connector P/N: I-PEX MHF4	617-698MHz -2.97 dBi (peak)	617-698MHz -2.45 dBi (peak)	617-698MHz 6 max	617-698MHz dBi 0.52 (peak)
				698-821MHz -1.61 dBi (peak)	698-821MHz -1.06 dBi (peak)	698-821MHz 6 max	698-821MHz dBi 0.55 (peak)
				824-960MHz -1.34 dBi (peak)	824-960MHz -0.75 dBi (peak)	824-960MHz 6 max	824-960MHz dBi 0.59 (peak)
				1425-1515MHz 0.54 dBi (peak)	1425-1515MHz 1.28 dBi (peak)	1425-1515MHz 4 max	1425-1515MHz dBi 0.74 (peak)
				1710-2200MHz 2.18 dBi (peak)	1710-2200MHz 3.09 dBi (peak)	1710-2200MHz 4 max	1710-2200MHz dBi 0.91 (peak)
				2300-2690MHz 0.79 dBi (peak)	2300-2690MHz 1.76 dBi (peak)	2300-2690MHz 4 max	2300-2690MHz dBi 0.97 (peak)
				3400-3800MHz 0.19 dBi (peak)	3400-3800MHz 1.36 dBi (peak)	3400-3800MHz 4 max	3400-3800MHz dBi 1.17 (peak)
				5150-5925MHz 0.43 dBi (peak)	5150-5925MHz 1.98 dBi (peak)	5150-5925MHz 4 max	5150-5925MHz dBi 1.55 (peak)
<b>Rx2</b> Antenna <b>P/N:</b> F-0G-FH-6163-002-00 / DC33002R11L	Speed	PIFA	(1)Cable P/N: SY113SLL (2)Cable length: 480mm diameter: 1.13mm 50 ohm Coaxial (3)Connector P/N: I-PEX MHF4	617-698MHz -1.57 dBi (peak)	617-698MHz -0.85 dBi (peak)	617-698MHz 5 max	617-698MHz dBi 0.72 (peak)
				716-821MHz -1.49 dBi (peak)	716-821MHz -0.72 dBi (peak)	716-821MHz 5 max	716-821MHz dBi 0.77 (peak)
				824-960MHz -3.22 dBi (peak)	824-960MHz -2.4 dBi (peak)	824-960MHz 5 max	824-960MHz dBi 0.82 (peak)
				1425-1515MHz -0.28 dBi (peak)	1425-1515MHz 0.75 dBi (peak)	1425-1515MHz 4 max	1425-1515MHz dBi 1.03 (peak)
				1557-1610 MHz -0.1 dBi (peak)	1557-1610 MHz 0.97 dBi (peak)	1557-1610 MHz 4 max	1557-1610 MHz dBi 1.07 (peak)
				1805-2200MHz 0.98 dBi (peak)	1805-2200MHz 2.24 dBi (peak)	1805-2200MHz 4 max	1805-2200MHz dBi 1.26 (peak)
				2300-2690MHz 3.00 dBi (peak)	2300-2690MHz 4.35 dBi (peak)	2300-2690MHz 4 max	2300-2690MHz dBi 1.35 (peak)
				3400-3800MHz 0.21 dBi (peak)	3400-3800MHz 1.83 dBi (peak)	3400-3800MHz 4 max	3400-3800MHz dBi 1.62 (peak)
				5150-5925MHz 0.81 dBi (peak)	5150-5925MHz 2.96 dBi (peak)	5150-5925MHz 4 max	5150-5925MHz dBi 2.15 (peak)

- **Antenna Peak Gain required being test in system basis.**
- **1E frame contend absolutely peak antenna gain include H/V**

## Antenna Peak Gain Table: Low and middle band

Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal	Vertical	Horizontal	Vertical
	(dBi)	(dBi)	(dBi)	(dBi)
617	-5.86	-5.29		
635	-7.5	-5.96		
652	-4.63	-3.4		
663	-4	-3.17		
681	-3.56	-3.14		
698	-3.08	-2.97		
703	-2.84	-3.31		
707.5	-2.95	-3.04		
717	-2.74	-2.91	-2.23	-1.49
725.5	-2.7	-2.79	-2.52	-1.51
748	-3.95	-4.09	-2.73	-2.65
756	-4.42	-3.75	-3.11	-3.57
768	-2.58	-2.99	-3.67	-4.72
777	-1.83	-2.61	-4.39	-4.62
782	-1.7	-2.43	-4.54	-4.28
787	-1.61	-2.68	-4.8	-3.5
814	-2.36	-4	-4.74	-3.73
824	-2.24	-3.66	-4.44	-3.77
832	-2.28	-3.13	-4.28	-3.85
836.5	-2.28	-3.19	-4.21	-3.87
849	-2.26	-2.47	-3.82	-3.79
862	-1.91	-2.61	-4.01	-3.77
880	-2.08	-3.07	-4.04	-3.59
897.5	-2.44	-4.63	-3.76	-3.26
915	-1.6	-3.53	-3.9	-3.22
925	-1.34	-3.25	-4.13	-3.58
960	-1.36	-3.43	-5.25	-4.5
1427.9	-0.42	-0.24	-4.43	-4.37
1447.9	-0.15	0.4	-3.52	-2.89
1455.4	-0.04	0.39	-3.22	-2.5
1462.9	0.03	0.38	-2.79	-2.1
1496	0.27	0.1	-1.16	-1.21
1510.9	0.54	0.2	-0.28	-1.11
1557			-0.1	-0.97
1575			-0.51	-0.77
1610			-2.19	-1.33

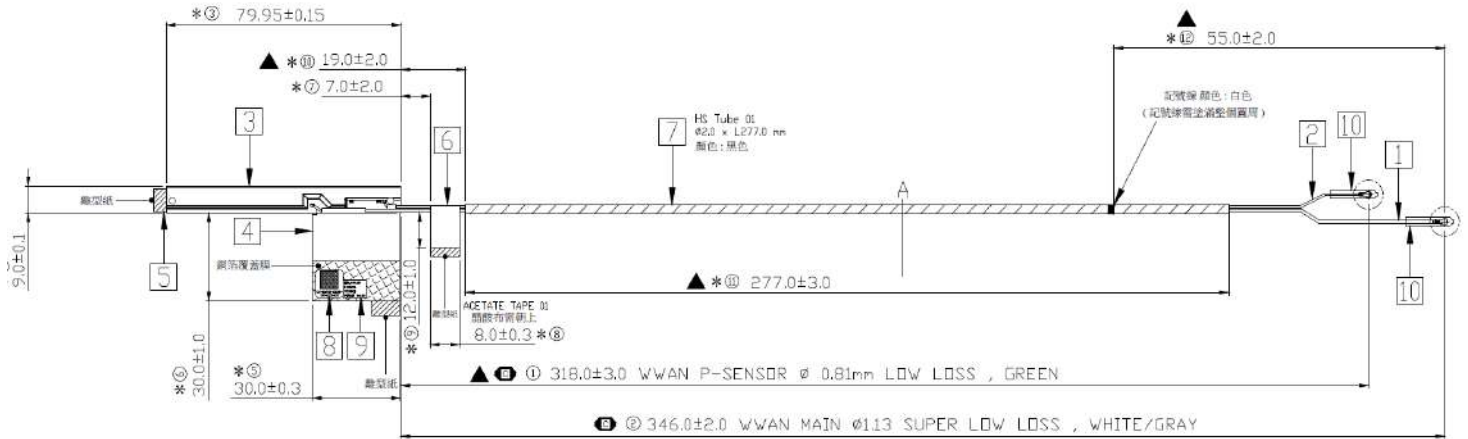
**High band**

Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal	Vertical	Horizontal	Vertical
	(dBi)	(dBi)	(dBi)	(dBi)
1710	-0.52	-0.45		
1732.5	0.57	0.47		
1747.5	0.91	0.59		
1755	0.97	0.61		
1785	0.36	0.23		
1805	1.31	-0.07	0.57	0.57
1850	1.11	0.14	-0.25	-0.25
1880	0.47	-0.19	-1.69	-1.22
1910	0.84	-0.87	-0.79	-1.31
1920	1.09	-0.84	-0.49	-1.26
1950	2.18	0.46	-0.23	-0.84
1980	2.04	0.8	-0.18	-0.47
2110	1.68	-0.09	-0.65	0.98
2200	0.09	-0.63	-1.07	0.65
2300	0	0.79	0.25	3.00
2305	0.28	0.58	0.27	2.94
2315	0.12	0.32	0.00	2.59
2350	-0.43	-0.13	-0.35	2.43
2400	-1.37	-0.93	-0.40	1.70
2500	0.33	0.59	0.40	1.47
2570	-1.83	-1.63	-0.16	0.50
2595	-2.79	-2.81	-0.47	0.41
2620	-2.52	-2.24	-0.50	-0.08
2690	-3.83	-2.71	0.12	0.20
3400	-5.73	-3.49	-1.50	-3.08
3500	-5.82	-4.48	0.21	-2.35
3600	-3.93	-2.85	-0.66	-2.51
3700	-1.5	-1.5	-1.31	-2.52
3800	0.19	0.19	-0.58	-2.23
4200	-4.98	-4.98	-3.24	-2.40
4400	-4.46	-5.82	-5.87	-7.04
4700	-6.74	-5.21	-4.00	-5.02
5150	-2.51	0.43	-0.87	-1.39
5537.5	-3.39	-2.35	-5.74	-6.07
5925	-0.99	-0.57	0.81	-2.52

## Section 2. Dimensioned Photos or Drawings of Antennas

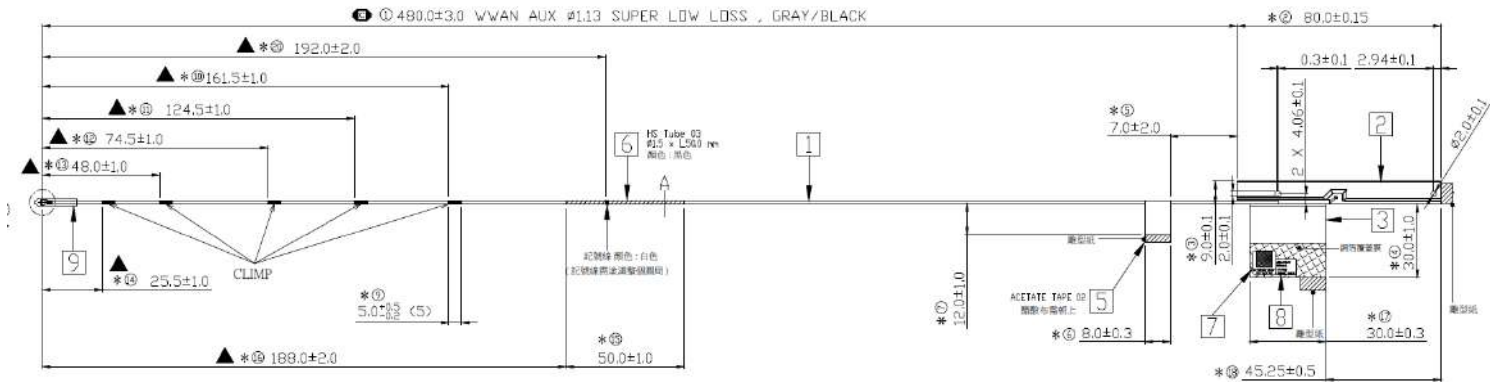
Include a dimensioned photo and dimensioned drawing of Main antenna here.

### Tx1/Rx1 Antenna Dimensioned Drawing:



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

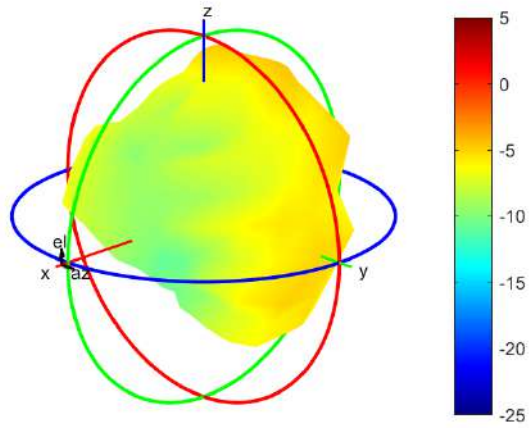
### Rx2 Antenna Dimensioned Drawing:



## Section 3. Radiation characteristics of antennae Loaded in Host Platform

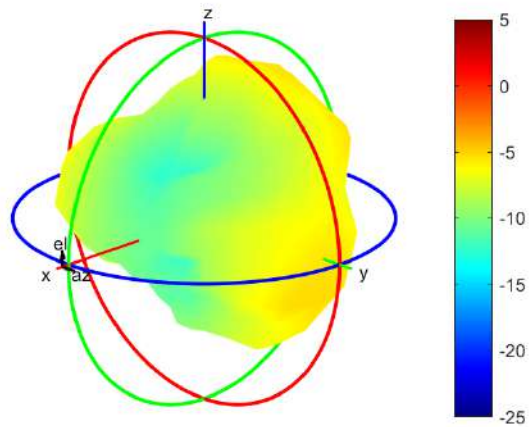
### WWAN Main Antenna (TPx)

**617MHz**



Center Frequency	<b>617 MHz</b>
Horizontal (dBi) peak	-5.86
Vertical (dBi) peak	-5.29

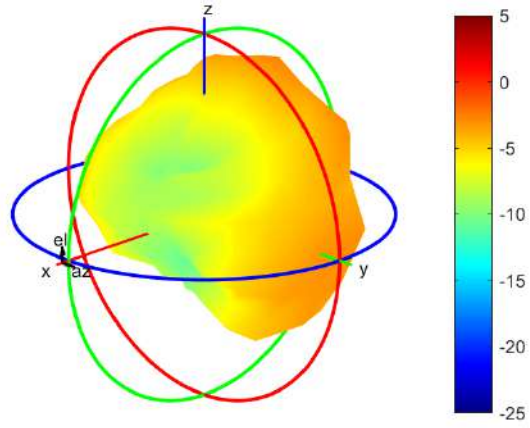
**635MHz**



Center Frequency	<b>635 MHz</b>
Horizontal (dBi) peak	-7.5
Vertical (dBi) peak	-5.96

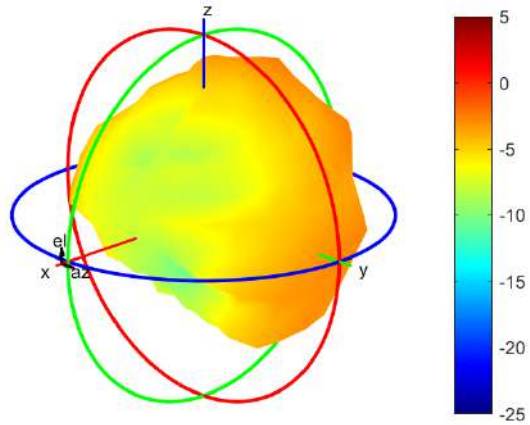


**652MHz**



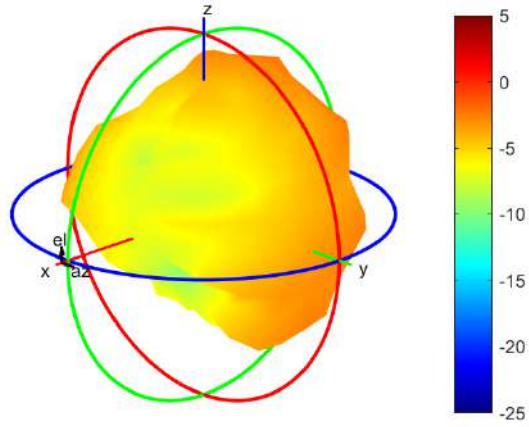
Center Frequency	<b>652 MHz</b>
Horizontal (dBi) peak	-4.63
Vertical (dBi) peak	-3.4

**663MHz**



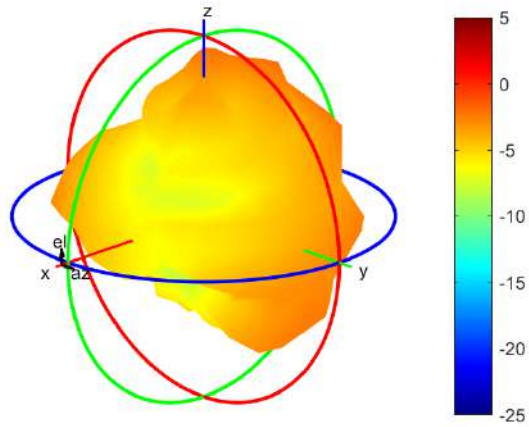
Center Frequency	<b>663 MHz</b>
Horizontal (dBi) peak	-4
Vertical (dBi) peak	-3.17

**681MHz**



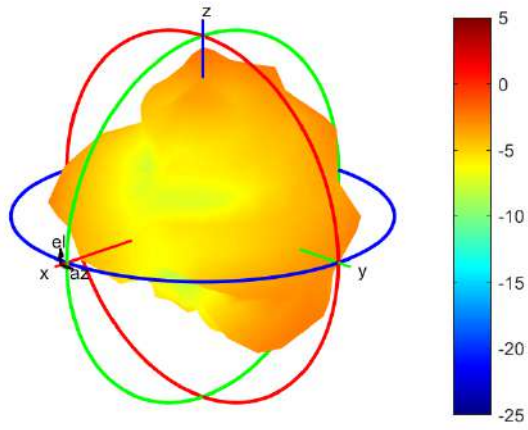
Center Frequency	<b>681 MHz</b>
Horizontal (dBi) peak	-3.56
Vertical (dBi) peak	-3.14

**698MHz**



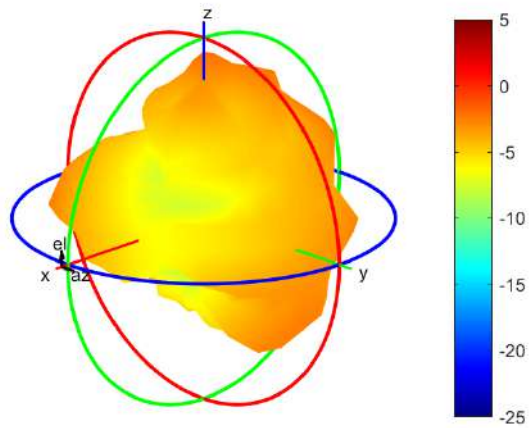
Center Frequency	<b>698 MHz</b>
Horizontal (dBi) peak	-3.08
Vertical (dBi) peak	-2.97

**703MHz**



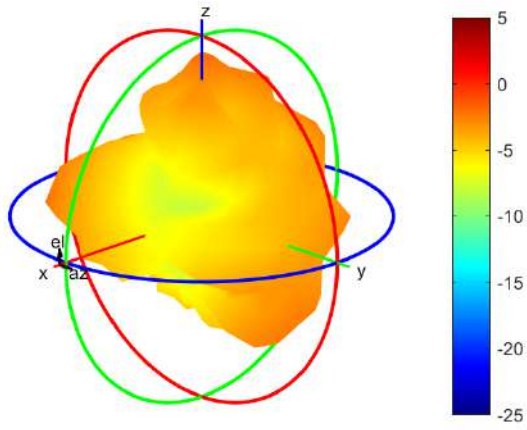
Center Frequency	<b>703MHz</b>
Horizontal (dBi) peak	-2.84
Vertical (dBi) peak	-3.31

**707.5MHz**



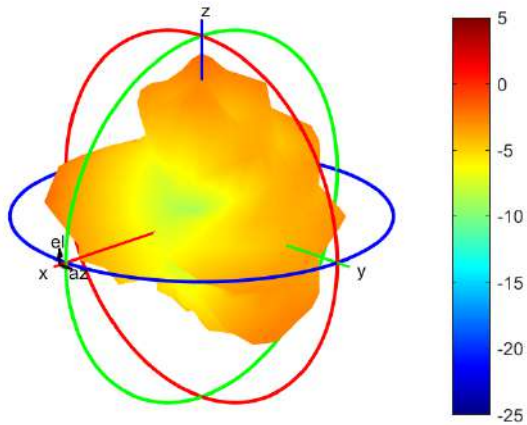
Center Frequency	<b>707.5MHz</b>
Horizontal (dBi) peak	-2.95
Vertical (dBi) peak	-3.04

**717MHz**



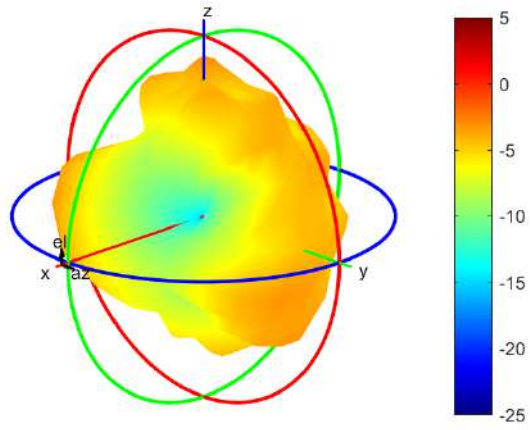
Center Frequency	<b>717MHz</b>
Horizontal (dBi) peak	-2.74
Vertical (dBi) peak	-2.91

**725.5MHz**



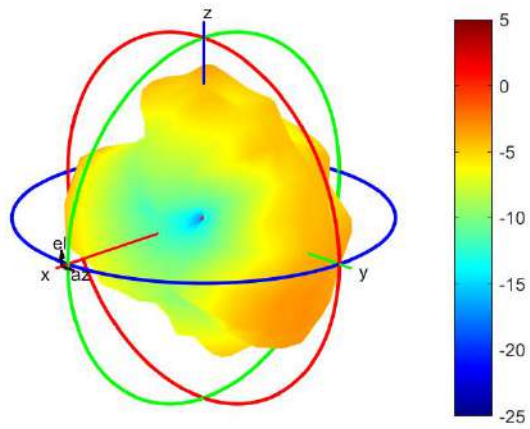
Center Frequency	<b>725.5MHz</b>
Horizontal (dBi) peak	-2.7
Vertical (dBi) peak	-2.79

**748MHz**



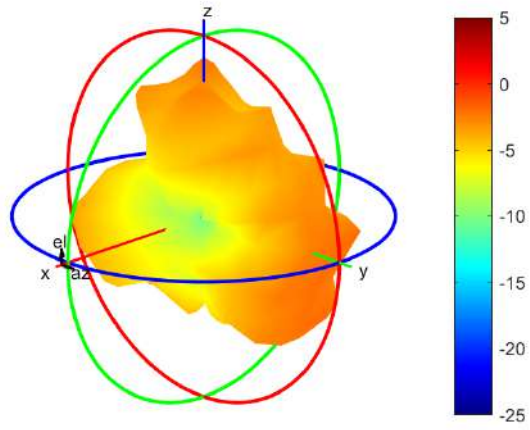
Center Frequency	<b>748MHz</b>
Horizontal (dBi) peak	-3.95
Vertical (dBi) peak	-4.09

**756MHz**



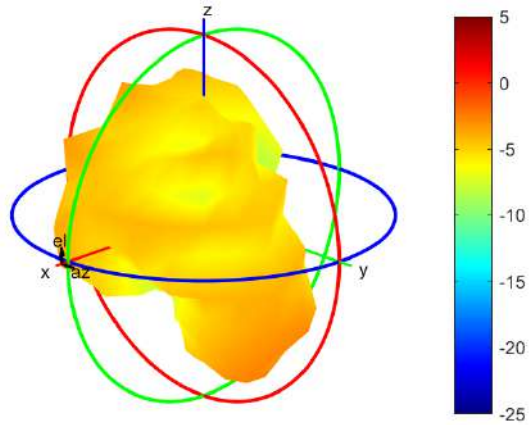
Center Frequency	<b>756MHz</b>
Horizontal (dBi) peak	-4.42
Vertical (dBi) peak	-3.75

**768MHz**



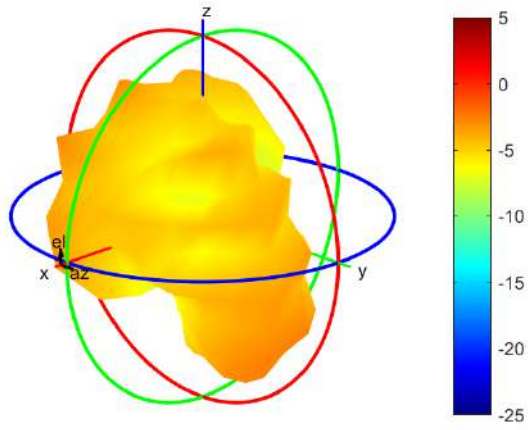
Center Frequency	<b>768MHz</b>
Horizontal (dBi) peak	-2.58
Vertical (dBi) peak	-2.99

**777MHz**



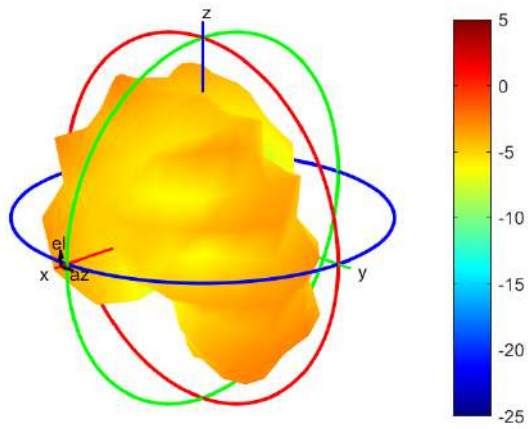
Center Frequency	<b>777MHz</b>
Horizontal (dBi) peak	-1.83
Vertical (dBi) peak	-2.61

**782MHz**



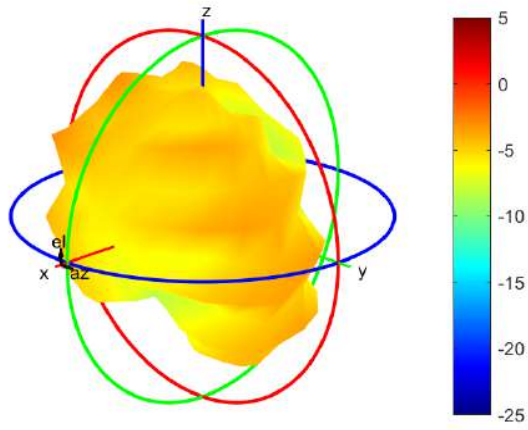
Center Frequency	<b>782MHz</b>
Horizontal (dBi) peak	-1.7
Vertical (dBi) peak	-2.43

**787MHz**



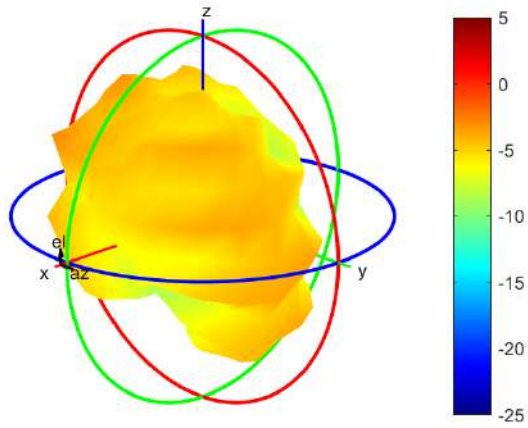
Center Frequency	<b>787MHz</b>
Horizontal (dBi) peak	-1.61
Vertical (dBi) peak	-2.68

**814MHz**



Center Frequency	<b>814MHz</b>
Horizontal (dBi) peak	-2.36
Vertical (dBi) peak	-4

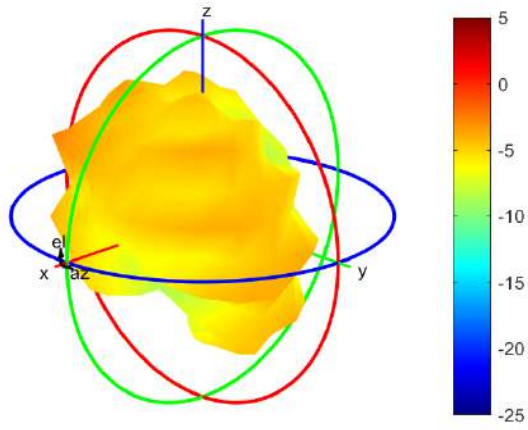
**824MHz**



Center Frequency	<b>824MHz</b>
Horizontal (dBi) peak	-2.24
Vertical (dBi) peak	-3.66

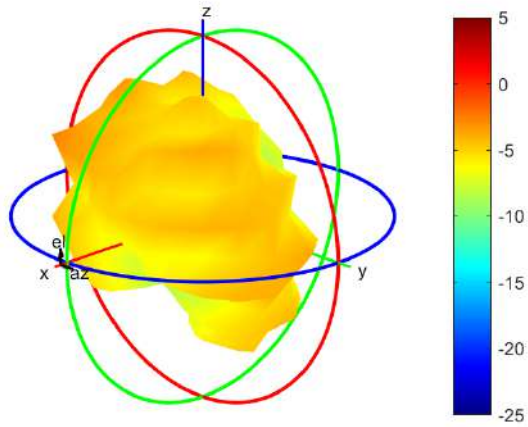


**832MHz**



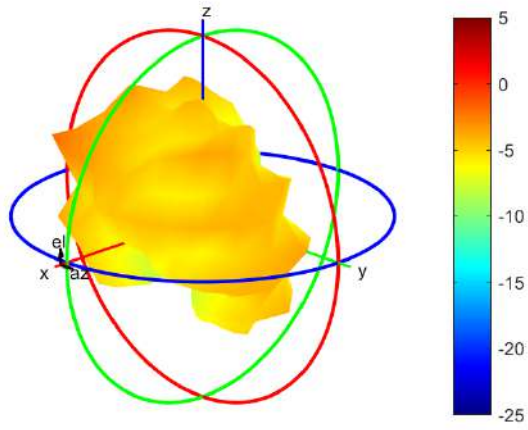
Center Frequency	<b>832MHz</b>
Horizontal (dBi) peak	-2.28
Vertical (dBi) peak	-3.13

**836.5MHz**



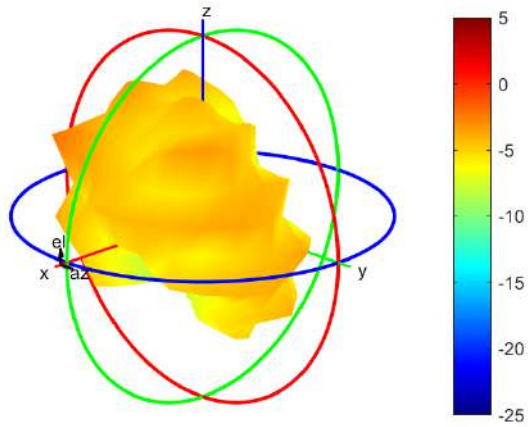
Center Frequency	<b>836.5MHz</b>
Horizontal (dBi) peak	-2.28
Vertical (dBi) peak	-3.19

**849MHz**



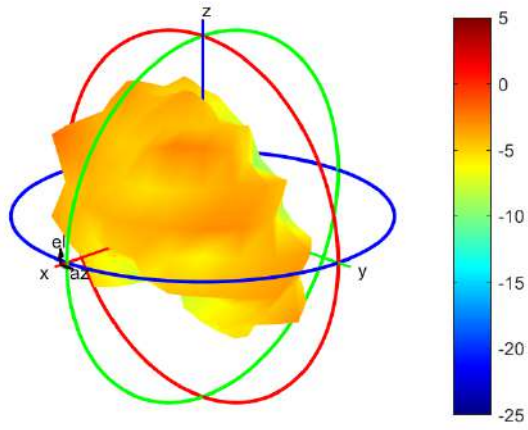
Center Frequency	<b>849MHz</b>
Horizontal (dBi) peak	-2.26
Vertical (dBi) peak	-2.47

**862MHz**



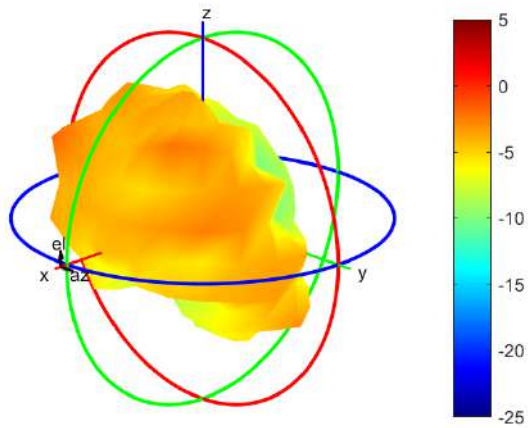
Center Frequency	<b>862MHz</b>
Horizontal (dBi) peak	-1.91
Vertical (dBi) peak	-2.61

**880MHz**



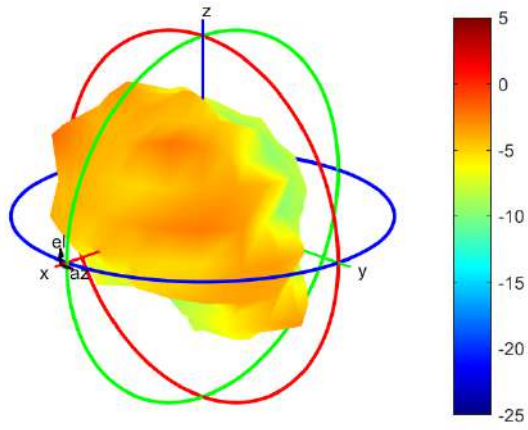
Center Frequency	<b>880MHz</b>
Horizontal (dBi) peak	-2.08
Vertical (dBi) peak	-3.07

**897.5MHz**



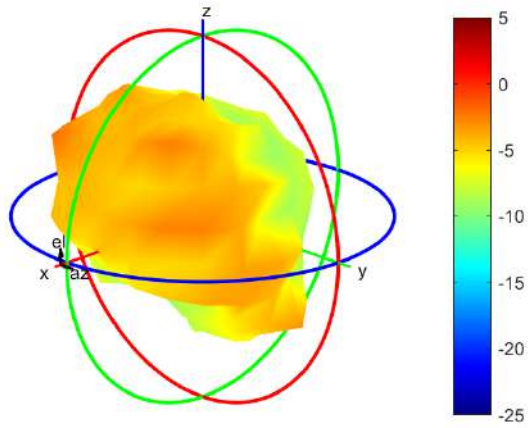
Center Frequency	<b>897.5MHz</b>
Horizontal (dBi) peak	-2.44
Vertical (dBi) peak	-4.63

**915MHz**



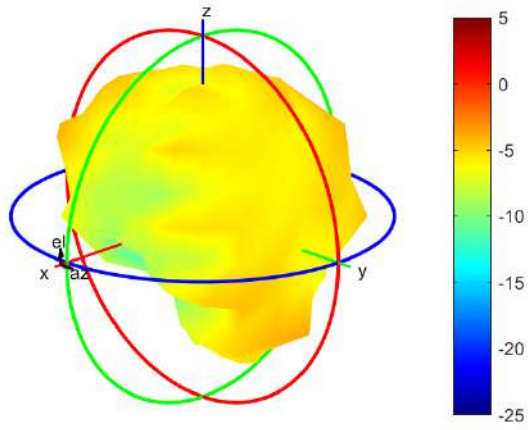
Center Frequency	<b>915MHz</b>
Horizontal (dBi) peak	-1.6
Vertical (dBi) peak	-3.53

**925MHz**



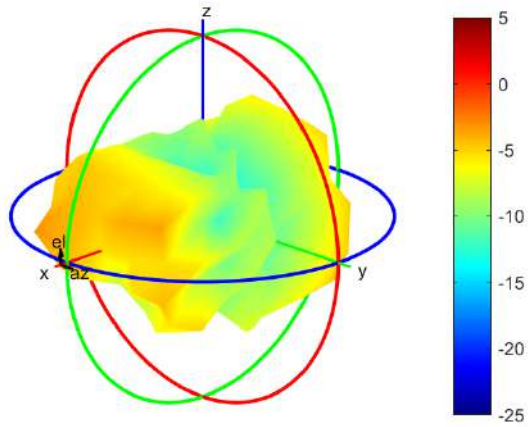
Center Frequency	<b>925MHz</b>
Horizontal (dBi) peak	-1.34
Vertical (dBi) peak	-3.25

**960MHz**



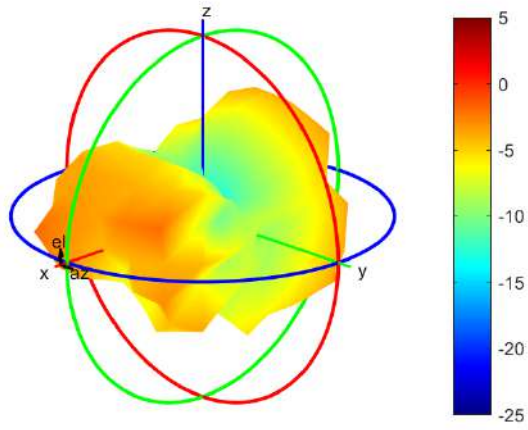
Center Frequency	<b>960MHz</b>
Horizontal (dBi) peak	-1.36
Vertical (dBi) peak	-3.43

**1427.9MHz**



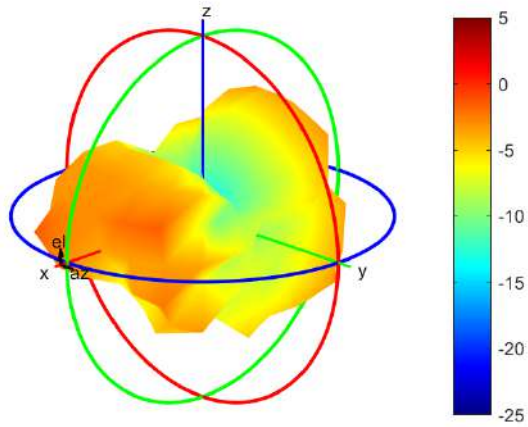
Center Frequency	<b>1427.9MHz</b>
Horizontal (dBi) peak	-0.42
Vertical (dBi) peak	-0.24

**1447.9MHz**



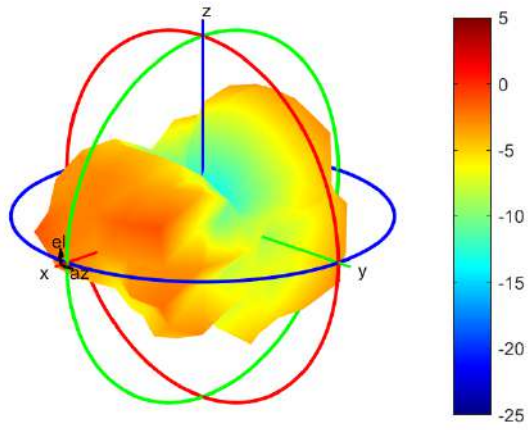
Center Frequency	<b>1447.9MHz</b>
Horizontal (dBi) peak	-0.15
Vertical (dBi) peak	0.4

**1455.4MHz**



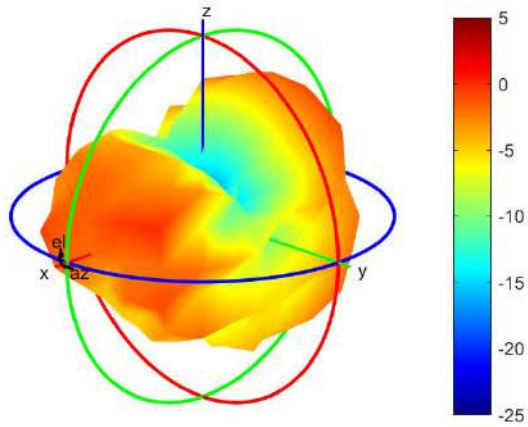
Center Frequency	<b>1455.4MHz</b>
Horizontal (dBi) peak	-0.04
Vertical (dBi) peak	0.39

**1462.9MHz**



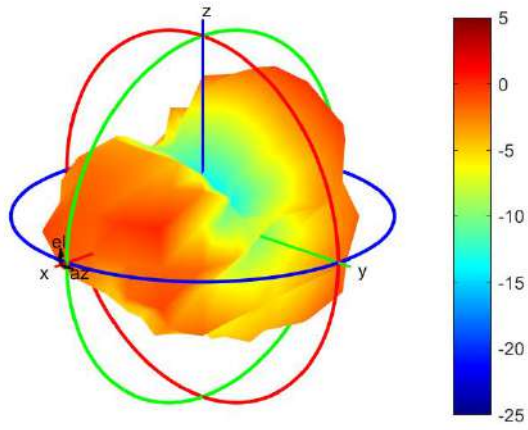
Center Frequency	<b>1462.9MHz</b>
Horizontal (dBi) peak	0.03
Vertical (dBi) peak	0.38

**1496MHz**



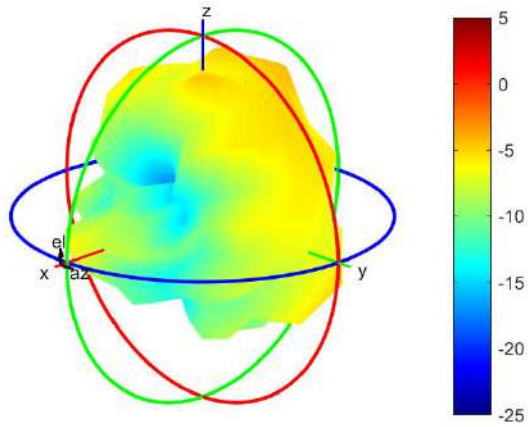
Center Frequency	<b>1496MHz</b>
Horizontal (dBi) peak	0.27
Vertical (dBi) peak	0.1

**1510.9 MHz**



Center Frequency	<b>1510.9 MHz</b>
Horizontal (dBi) peak	0.54
Vertical (dBi) peak	0.2

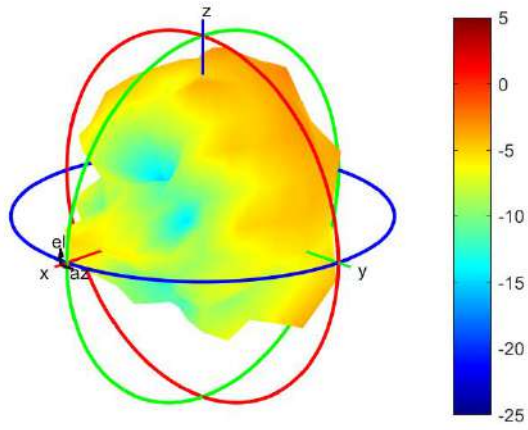
**1710 MHz**



Center Frequency	<b>1710 MHz</b>
Horizontal (dBi) peak	-0.52
Vertical (dBi) peak	-0.45

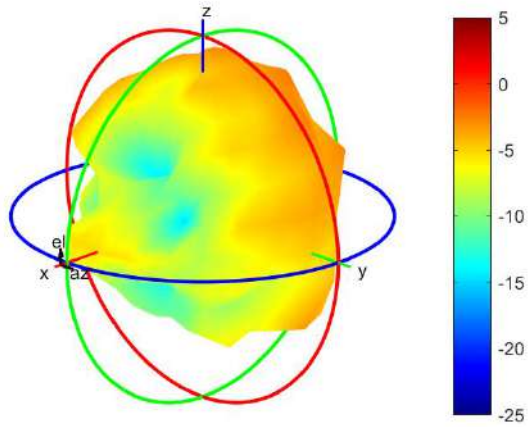


**1732.5 MHz**



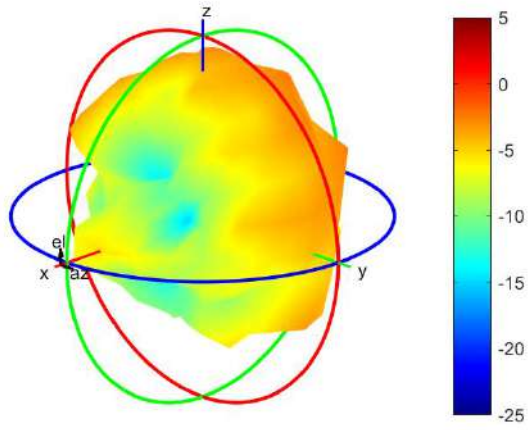
Center Frequency	<b>1732.5 MHz</b>
Horizontal (dBi) peak	0.57
Vertical (dBi) peak	0.47

**1747.5 MHz**



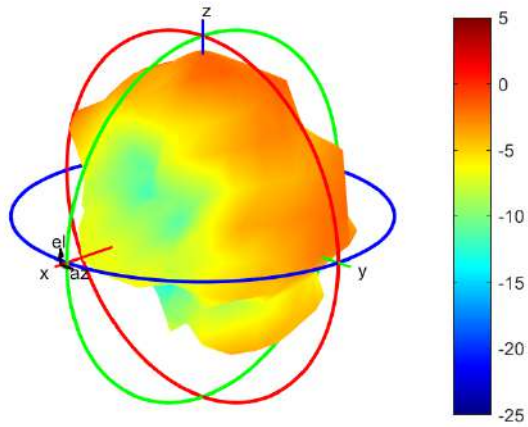
Center Frequency	<b>1747.5 MHz</b>
Horizontal (dBi) peak	0.91
Vertical (dBi) peak	0.59

**1755 MHz**



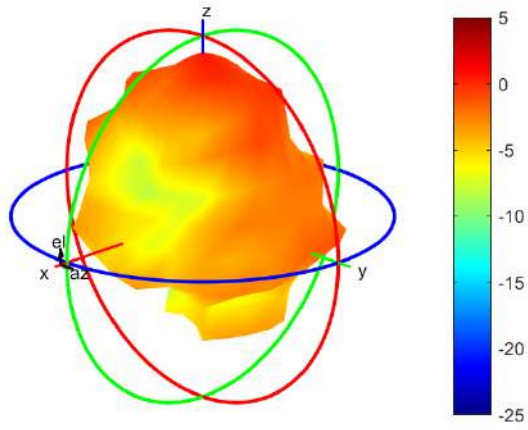
Center Frequency	<b>1755 MHz</b>
Horizontal (dBi) peak	0.97
Vertical (dBi) peak	0.61

**1785 MHz**



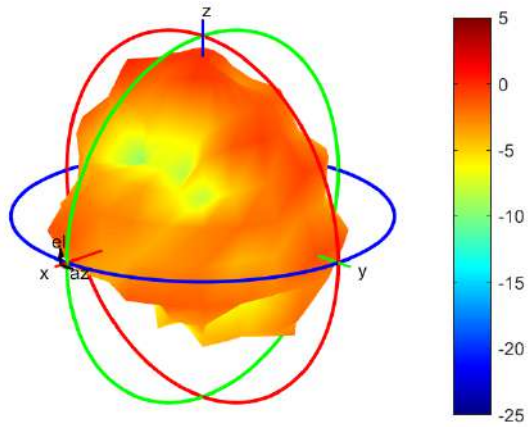
Center Frequency	<b>1785 MHz</b>
Horizontal (dBi) peak	0.36
Vertical (dBi) peak	0.23

**1805 MHz**



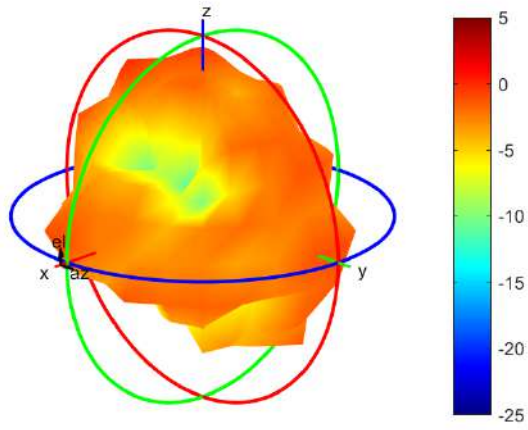
Center Frequency	<b>1805 MHz</b>
Horizontal (dBi) peak	1.31
Vertical (dBi) peak	-0.07

**1850 MHz**



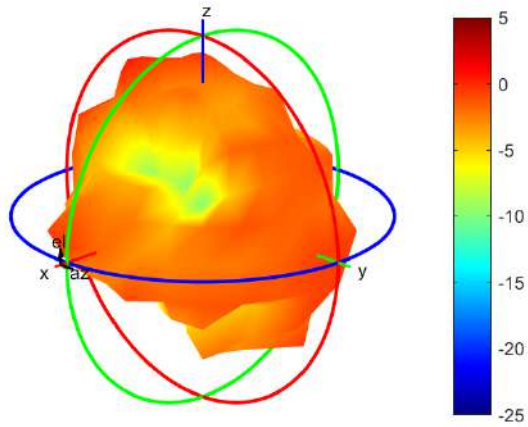
Center Frequency	<b>1850 MHz</b>
Horizontal (dBi) peak	1.11
Vertical (dBi) peak	0.14

**1880 MHz**



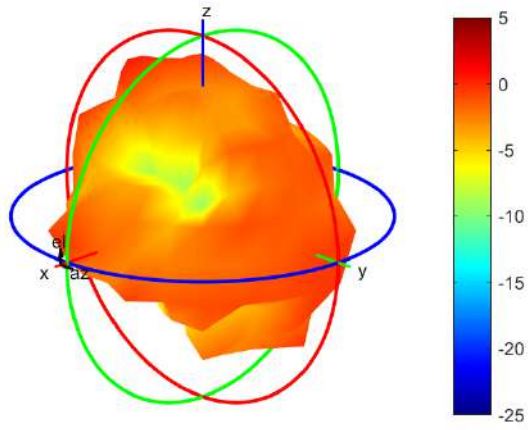
Center Frequency	<b>1880 MHz</b>
Horizontal (dBi) peak	0.47
Vertical (dBi) peak	-0.19

**1910MHz**



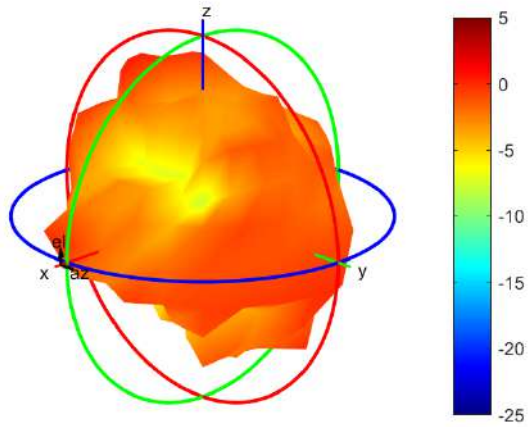
Center Frequency	<b>1910MHz</b>
Horizontal (dBi) peak	0.84
Vertical (dBi) peak	-0.87

**1920MHz**



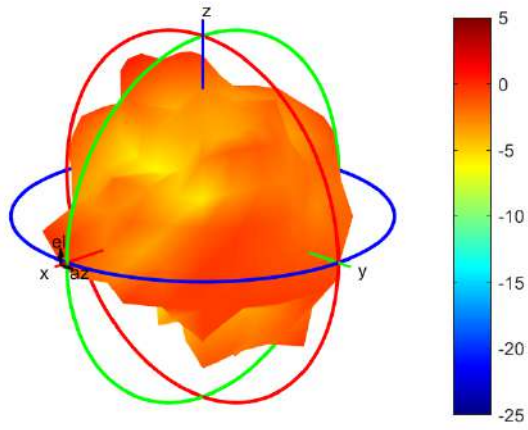
Center Frequency	<b>1920MHz</b>
Horizontal (dBi) peak	1.09
Vertical (dBi) peak	-0.84

**1950MHz**



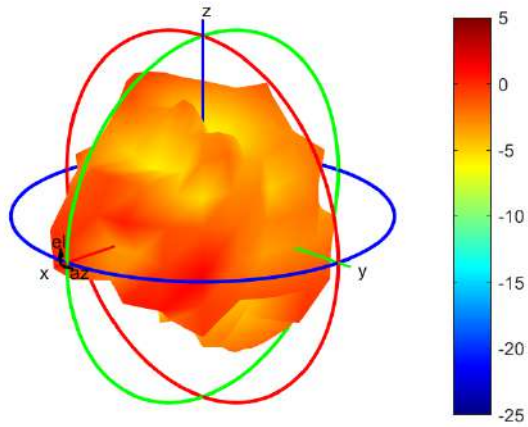
Center Frequency	<b>1950MHz</b>
Horizontal (dBi) peak	2.18
Vertical (dBi) peak	0.46

**1980MHz**



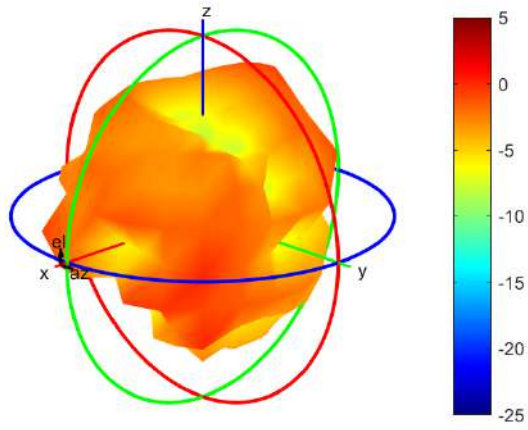
Center Frequency	<b>1980MHz</b>
Horizontal (dBi) peak	2.04
Vertical (dBi) peak	0.8

**2110MHz**



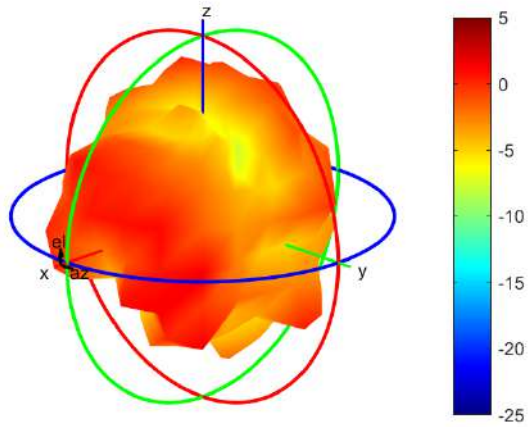
Center Frequency	<b>2110MHz</b>
Horizontal (dBi) peak	1.68
Vertical (dBi) peak	-0.09

**2200MHz**



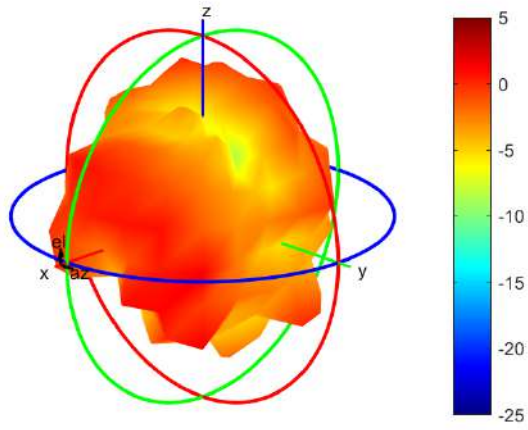
Center Frequency	<b>2200MHz</b>
Horizontal (dBi) peak	0.09
Vertical (dBi) peak	-0.63

**2300MHz**



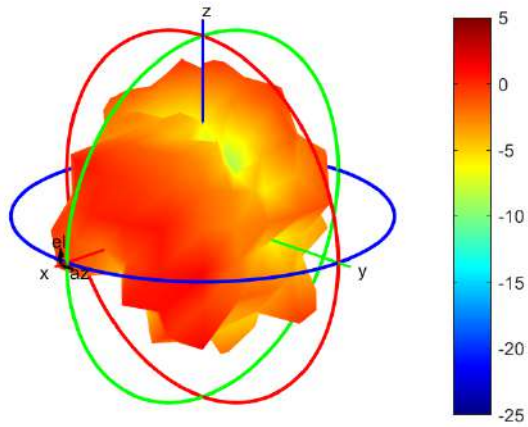
Center Frequency	<b>2300MHz</b>
Horizontal (dBi) peak	0.0
Vertical (dBi) peak	0.79

**2305MHz**



Center Frequency	<b>2305MHz</b>
Horizontal (dBi) peak	0.28
Vertical (dBi) peak	0.58

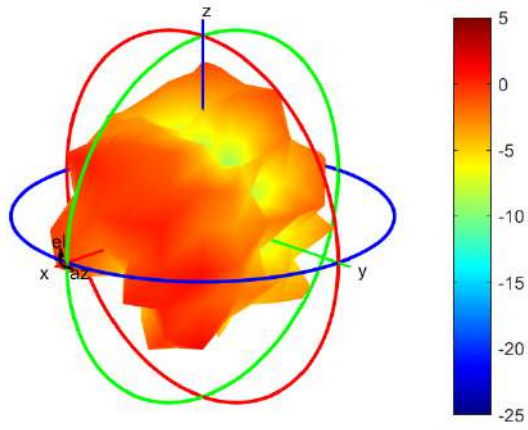
**2315MHz**



Center Frequency	<b>2315MHz</b>
Horizontal (dBi) peak	0.12
Vertical (dBi) peak	0.32

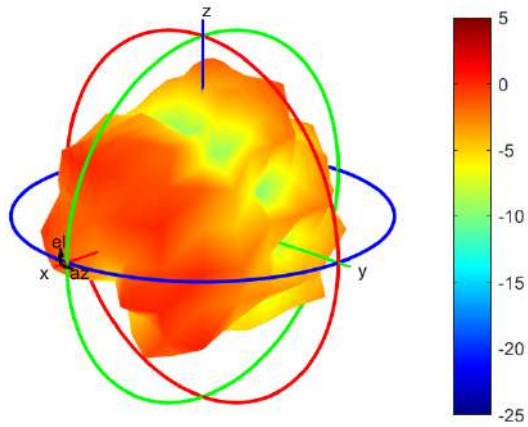


**2350MHz**



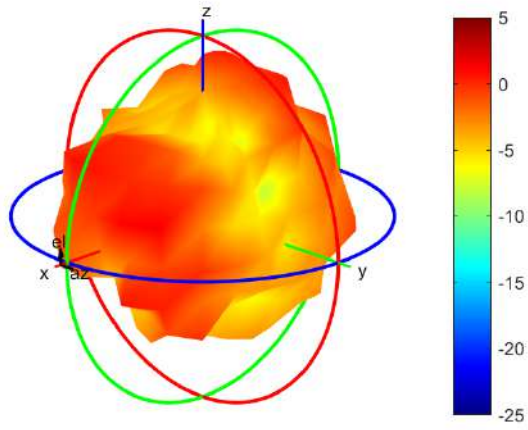
Center Frequency	<b>2350MHz</b>
Horizontal (dBi) peak	-0.43
Vertical (dBi) peak	-0.13

**2400MHz**



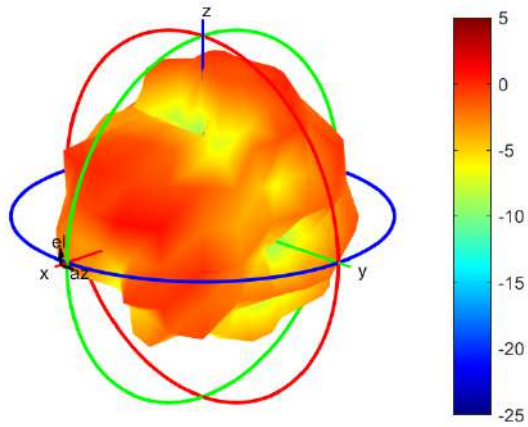
Center Frequency	<b>2400MHz</b>
Horizontal (dBi) peak	-1.37
Vertical (dBi) peak	-0.93

**2500MHz**



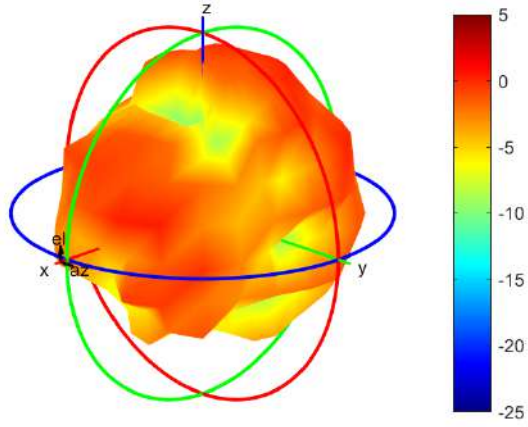
Center Frequency	<b>2500MHz</b>
Horizontal (dBi) peak	0.33
Vertical (dBi) peak	0.59

**2570MHz**



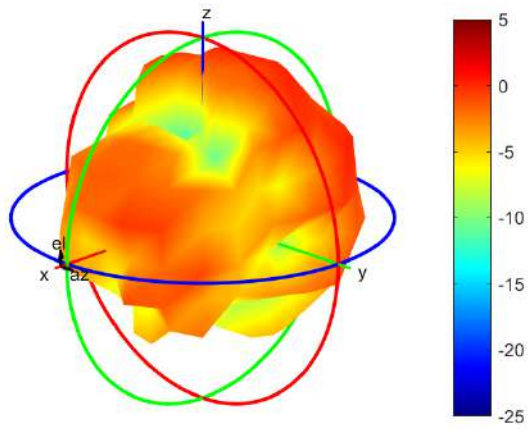
Center Frequency	<b>2570MHz</b>
Horizontal (dBi) peak	-1.83
Vertical (dBi) peak	-1.63

**2595MHz**



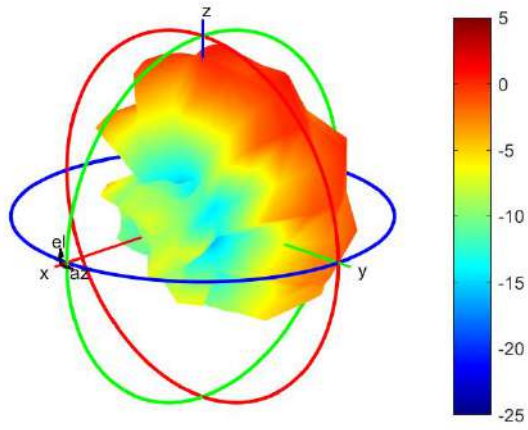
Center Frequency	<b>2595MHz</b>
Horizontal (dBi) peak	-2.79
Vertical (dBi) peak	-2.81

**2620MHz**



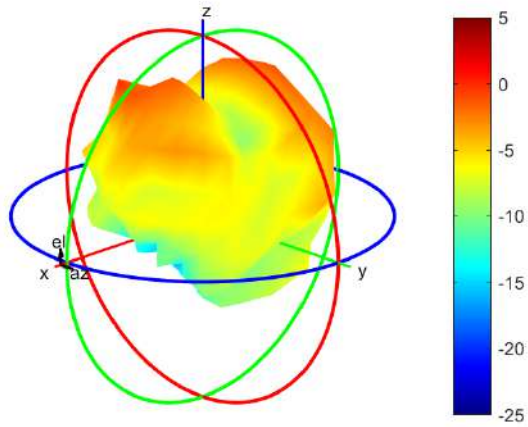
Center Frequency	<b>2620MHz</b>
Horizontal (dBi) peak	-2.52
Vertical (dBi) peak	-2.24

**2690MHz**



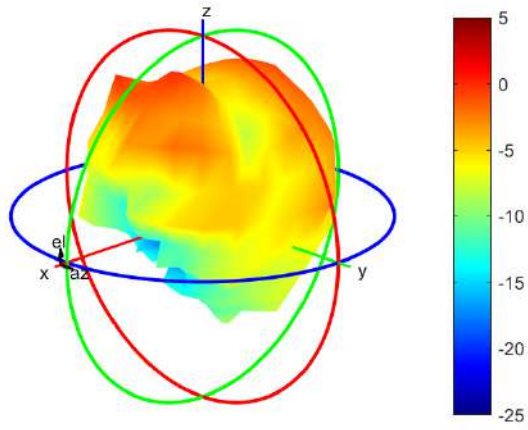
Center Frequency	<b>2690MHz</b>
Horizontal (dBi) peak	-3.83
Vertical (dBi) peak	-2.71

**3400MHz**



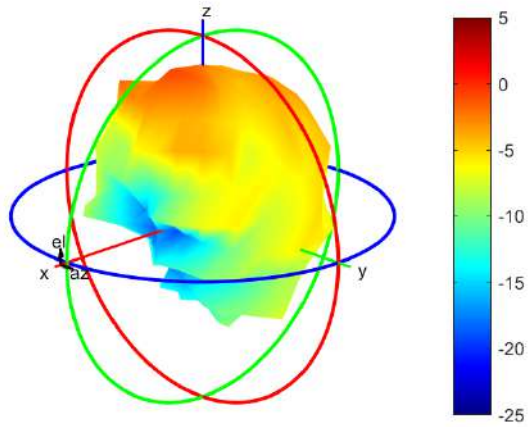
Center Frequency	<b>3400MHz</b>
Horizontal (dBi) peak	-5.73
Vertical (dBi) peak	-3.49

**3500MHz**



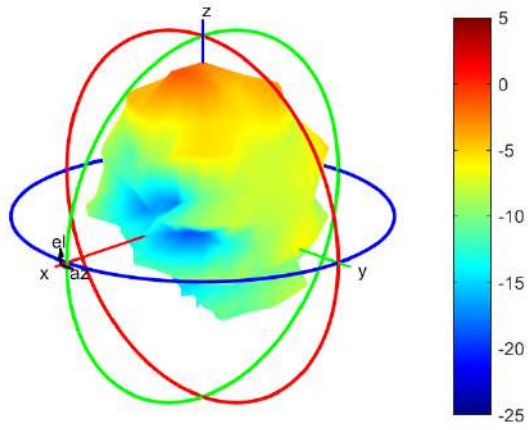
Center Frequency	<b>3500MHz</b>
Horizontal (dBi) peak	-5.82
Vertical (dBi) peak	-4.48

**3600MHz**



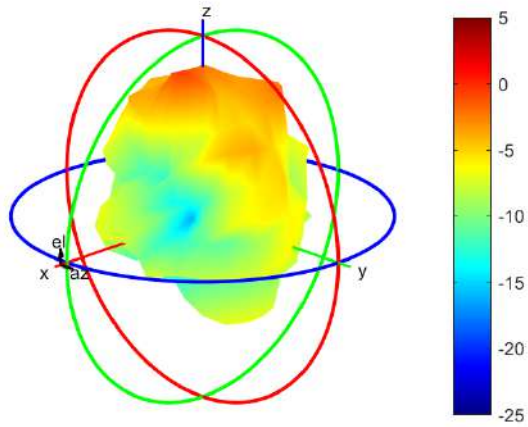
Center Frequency	<b>3600MHz</b>
Horizontal (dBi) peak	-3.93
Vertical (dBi) peak	-2.85

**3700MHz**



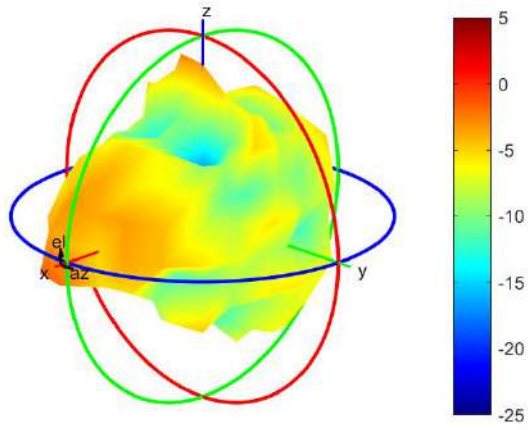
Center Frequency	<b>3700MHz</b>
Horizontal (dBi) peak	-1.5
Vertical (dBi) peak	-1.5

**3800MHz**



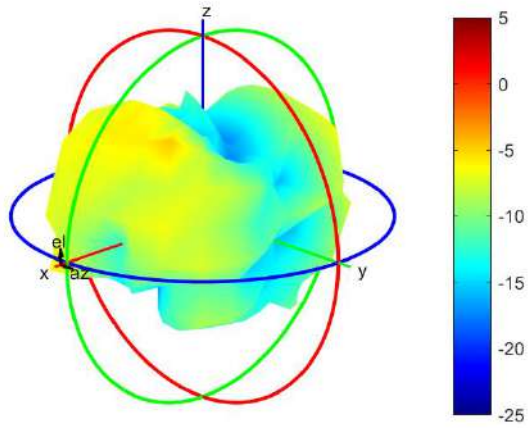
Center Frequency	<b>3800MHz</b>
Horizontal (dBi) peak	0.19
Vertical (dBi) peak	0.19

**4200MHz**



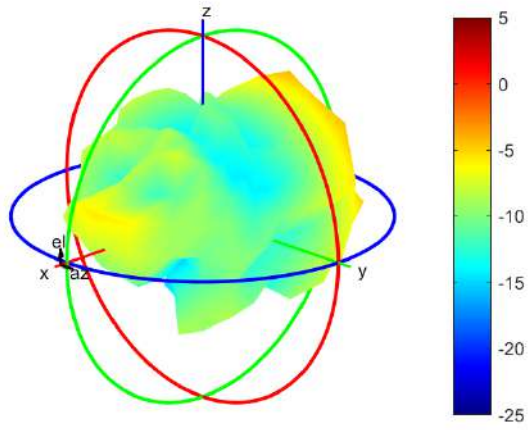
Center Frequency	<b>4200MHz</b>
Horizontal (dBi) peak	-4.98
Vertical (dBi) peak	-4.98

**4400MHz**



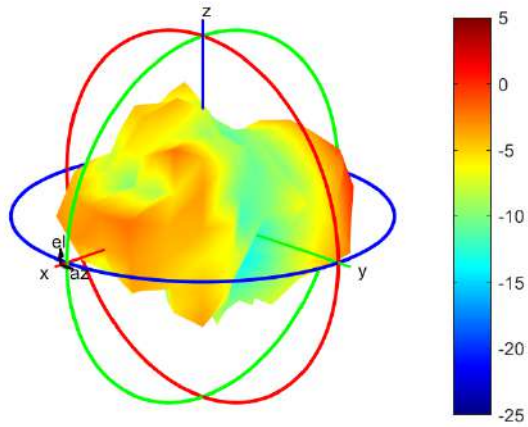
Center Frequency	<b>4400MHz</b>
Horizontal (dBi) peak	-4.46
Vertical (dBi) peak	-5.82

**4700MHz**



Center Frequency	<b>4700MHz</b>
Horizontal (dBi) peak	-6.74
Vertical (dBi) peak	-5.21

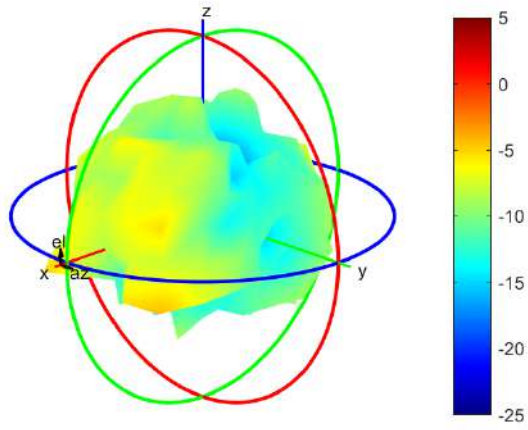
**5150MHz**



Center Frequency	<b>5150MHz</b>
Horizontal (dBi) peak	-2.51
Vertical (dBi) peak	0.43

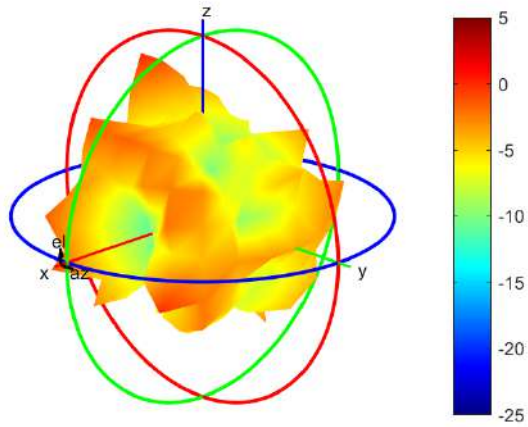


**5537.5MHz**



Center Frequency	<b>5537.5MHz</b>
Horizontal (dBi) peak	-3.39
Vertical (dBi) peak	-2.35

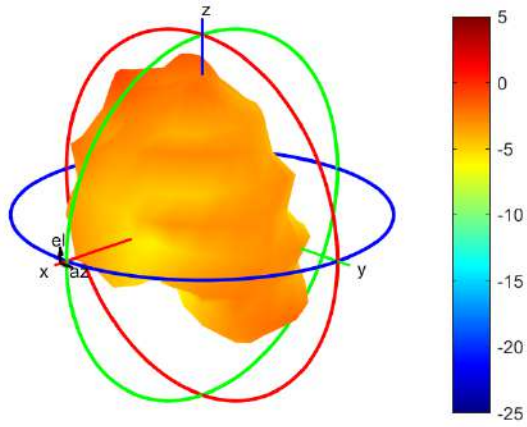
**5925MHz**



Center Frequency	<b>5925MHz</b>
Horizontal (dBi) peak	-0.99
Vertical (dBi) peak	-0.57

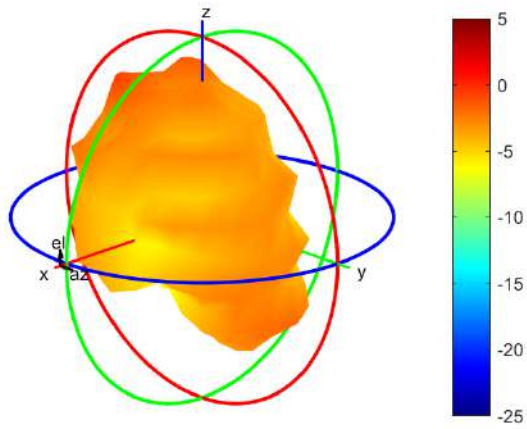
## WWAN Aux Antenna (DRx)

**717MHz**



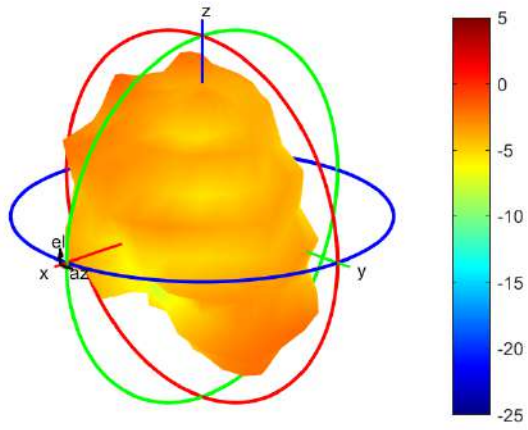
Center Frequency	<b>717MHz</b>
Horizontal (dBi) peak	-2.23
Vertical (dBi) peak	-1.49

**725.5MHz**



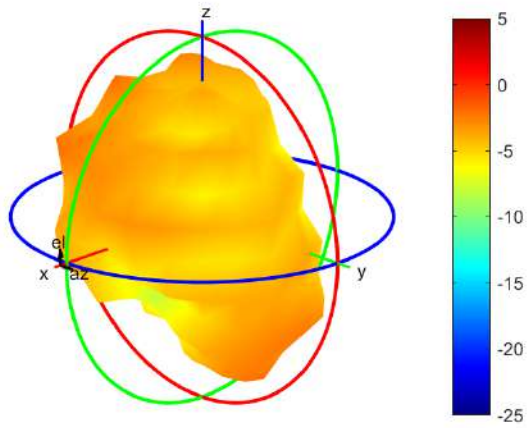
Center Frequency	<b>725.5MHz</b>
Horizontal (dBi) peak	-2.52
Vertical (dBi) peak	-1.51

**748MHz**



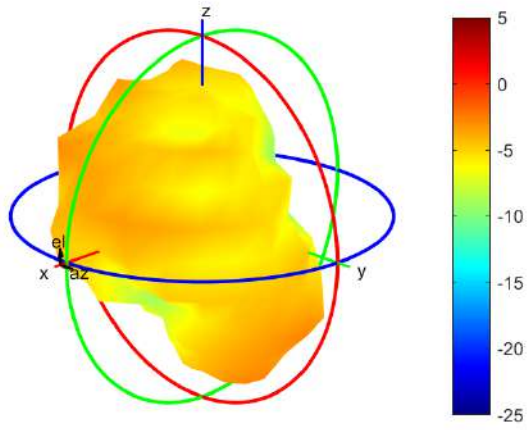
Center Frequency	<b>748MHz</b>
Horizontal (dBi) peak	-2.73
Vertical (dBi) peak	-2.65

**756MHz**



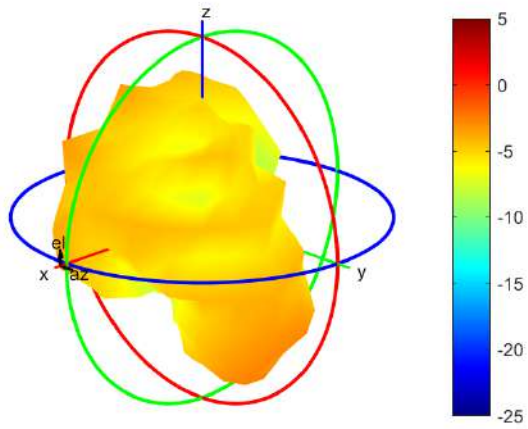
Center Frequency	<b>756MHz</b>
Horizontal (dBi) peak	-3.11
Vertical (dBi) peak	-3.57

**768MHz**



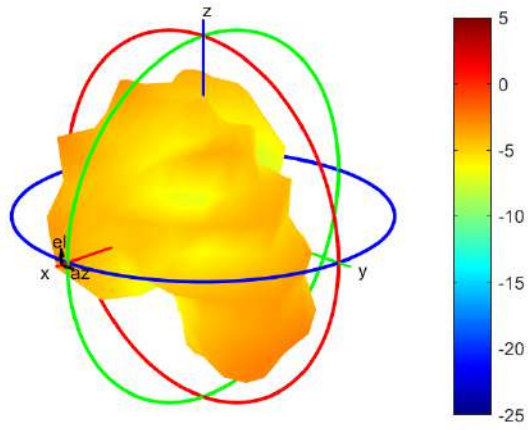
Center Frequency	<b>768MHz</b>
Horizontal (dBi) peak	-3.67
Vertical (dBi) peak	-4.72

**777MHz**



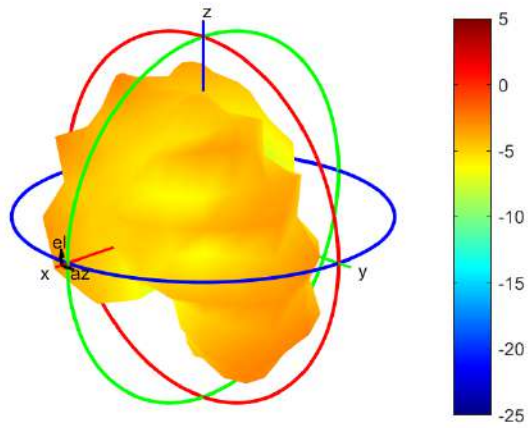
Center Frequency	<b>777MHz</b>
Horizontal (dBi) peak	-4.39
Vertical (dBi) peak	-4.62

**782MHz**



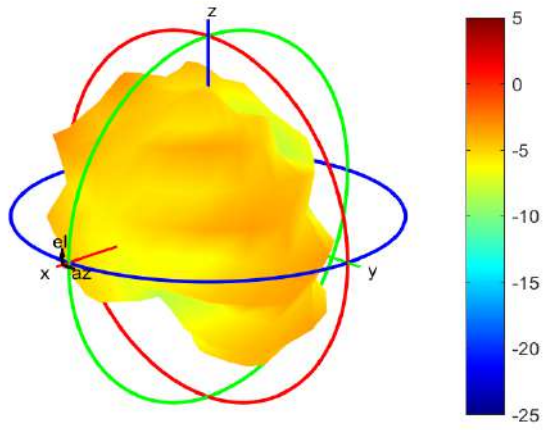
Center Frequency	<b>782MHz</b>
Horizontal (dBi) peak	-4.54
Vertical (dBi) peak	-4.28

**787MHz**



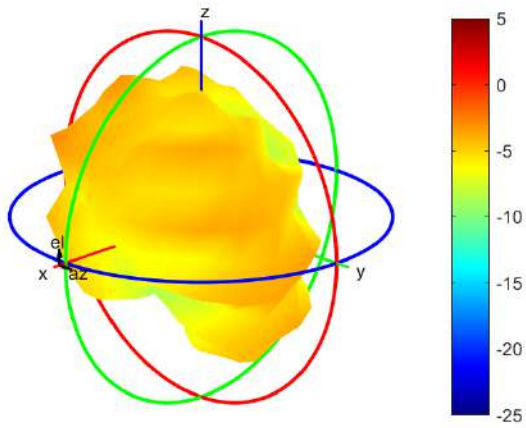
Center Frequency	<b>787MHz</b>
Horizontal (dBi) peak	-4.8
Vertical (dBi) peak	-3.5

**814MHz**



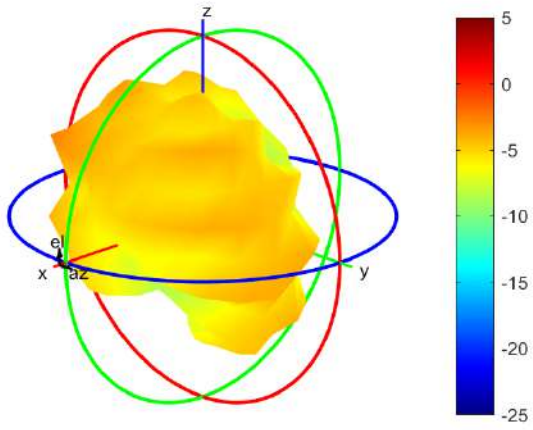
Center Frequency	<b>814MHz</b>
Horizontal (dBi) peak	-4.74
Vertical (dBi) peak	-3.73

**824MHz**



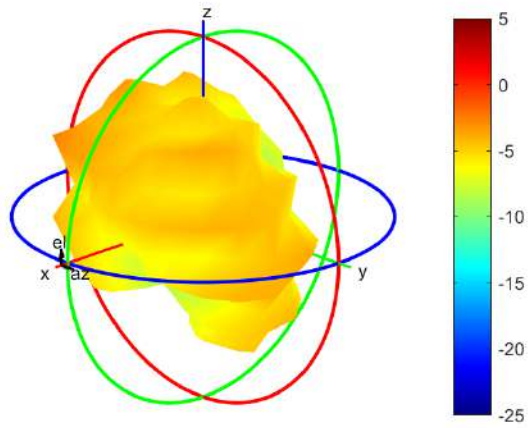
Center Frequency	<b>824MHz</b>
Horizontal (dBi) peak	-4.44
Vertical (dBi) peak	-3.77

**832MHz**



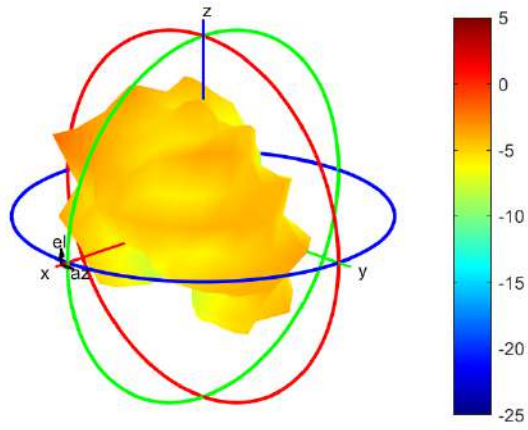
Center Frequency	<b>832MHz</b>
Horizontal (dBi) peak	-4.28
Vertical (dBi) peak	-3.85

**836.5MHz**



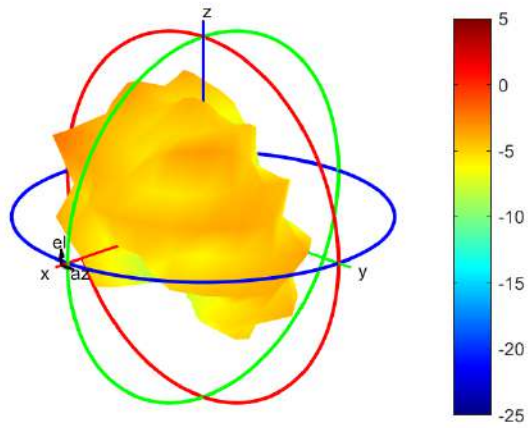
Center Frequency	<b>836.5MHz</b>
Horizontal (dBi) peak	-4.21
Vertical (dBi) peak	-3.87

**849MHz**



Center Frequency	<b>849MHz</b>
Horizontal (dBi) peak	-3.82
Vertical (dBi) peak	-3.79

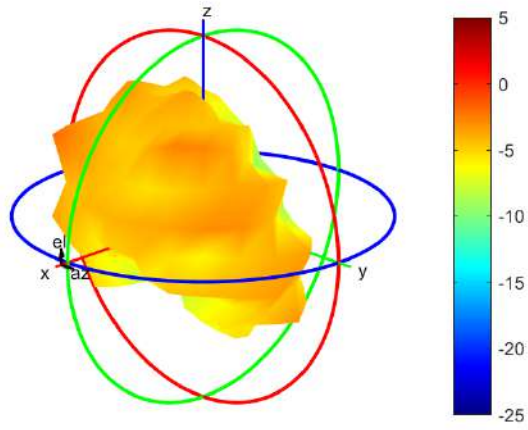
**862MHz**



Center Frequency	<b>862MHz</b>
Horizontal (dBi) peak	-4.01
Vertical (dBi) peak	-3.77

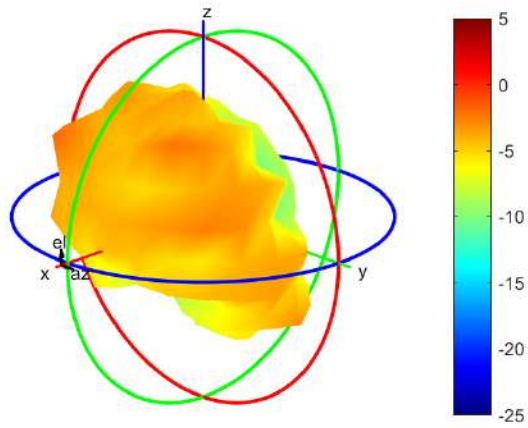


**880MHz**



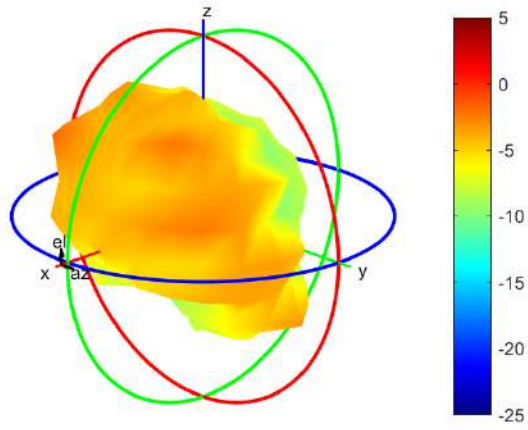
Center Frequency	<b>880MHz</b>
Horizontal (dBi) peak	-4.04
Vertical (dBi) peak	-3.59

**897.5MHz**



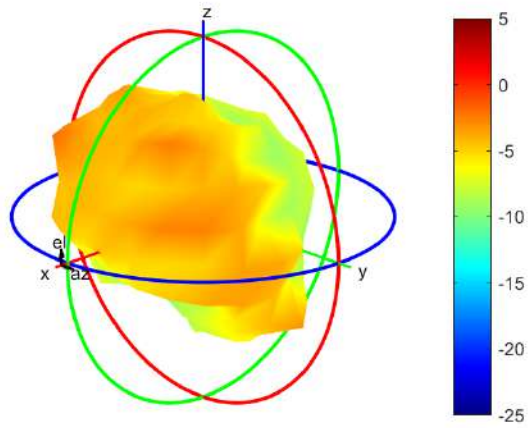
Center Frequency	<b>897.5MHz</b>
Horizontal (dBi) peak	-3.76
Vertical (dBi) peak	-3.26

**915MHz**



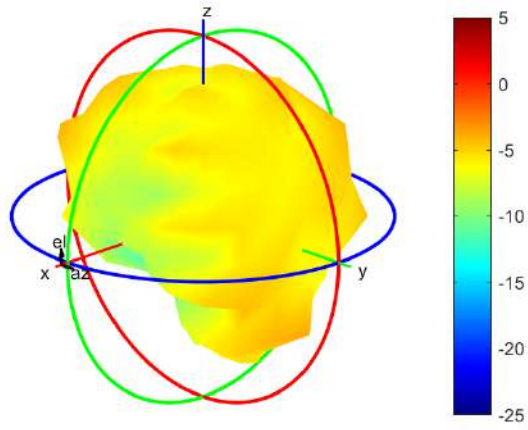
Center Frequency	<b>915MHz</b>
Horizontal (dBi) peak	-3.9
Vertical (dBi) peak	-3.22

**925MHz**



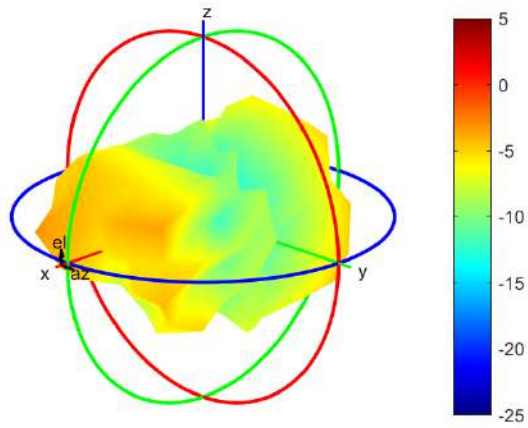
Center Frequency	<b>925MHz</b>
Horizontal (dBi) peak	-4.13
Vertical (dBi) peak	-3.58

**960MHz**



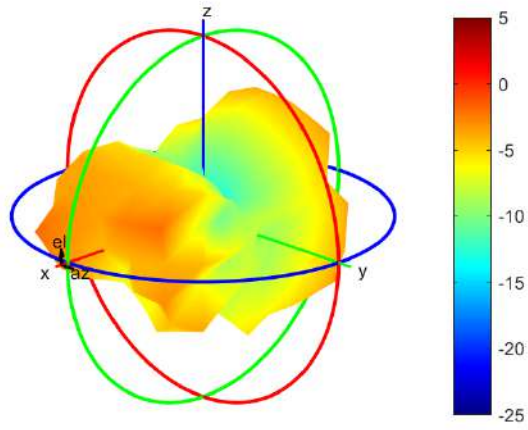
Center Frequency	<b>960MHz</b>
Horizontal (dBi) peak	-5.25
Vertical (dBi) peak	-4.5

**1427.9MHz**



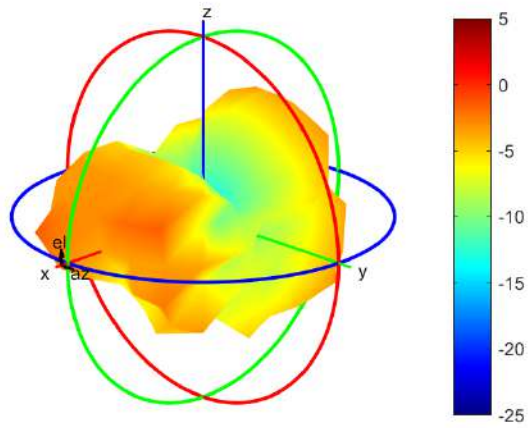
Center Frequency	<b>1427.9MHz</b>
Horizontal (dBi) peak	-4.43
Vertical (dBi) peak	-4.37

**1447.9MHz**



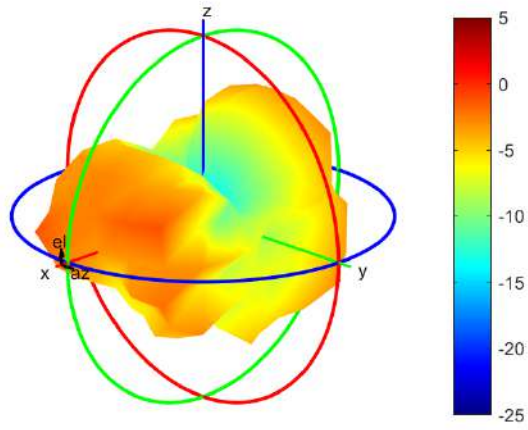
Center Frequency	<b>1447.9MHz</b>
Horizontal (dBi) peak	-3.52
Vertical (dBi) peak	-2.89

**1455.4MHz**



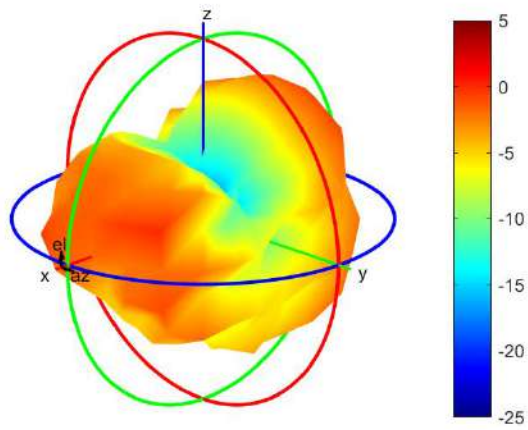
Center Frequency	<b>1455.4MHz</b>
Horizontal (dBi) peak	-3.22
Vertical (dBi) peak	-2.5

**1462.9MHz**



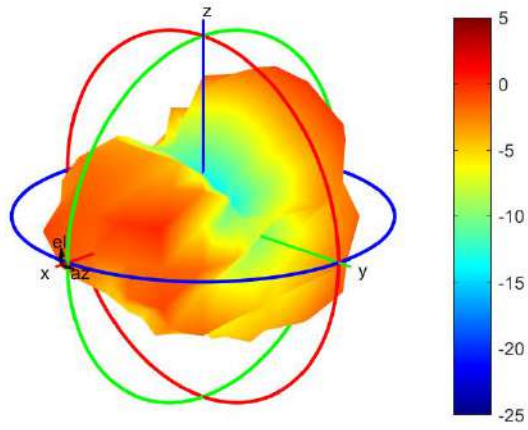
Center Frequency	<b>1462.9MHz</b>
Horizontal (dBi) peak	-2.79
Vertical (dBi) peak	-2.1

**1496MHz**



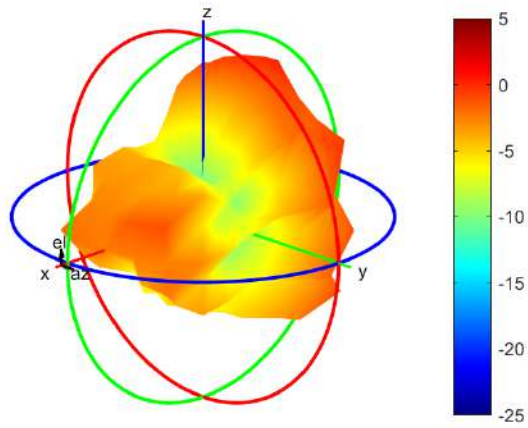
Center Frequency	<b>1496MHz</b>
Horizontal (dBi) peak	-1.16
Vertical (dBi) peak	-1.21

**1510.9MHz**



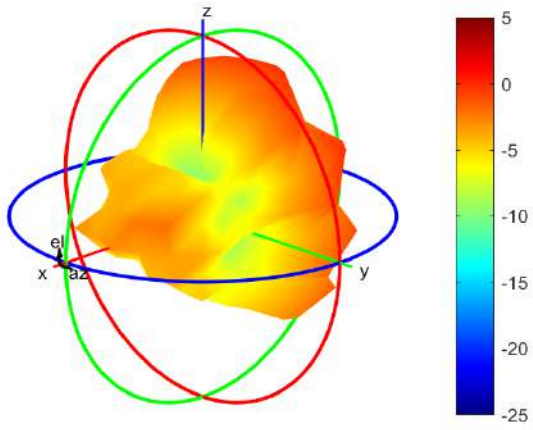
Center Frequency	<b>1510.9MHz</b>
Horizontal (dBi) peak	-0.28
Vertical (dBi) peak	-1.11

**1557MHz**



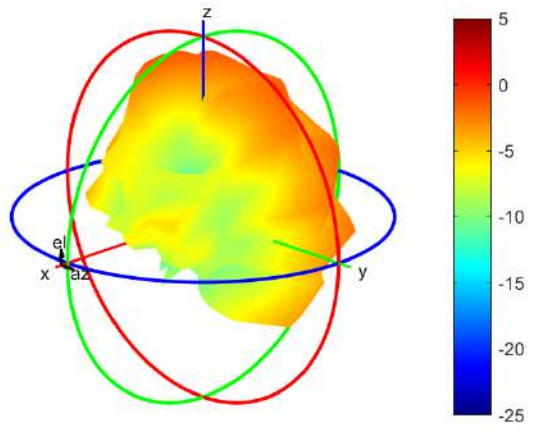
Center Frequency	<b>1557MHz</b>
Horizontal (dBi) peak	-0.1
Vertical (dBi) peak	-0.97

**1575MHz**



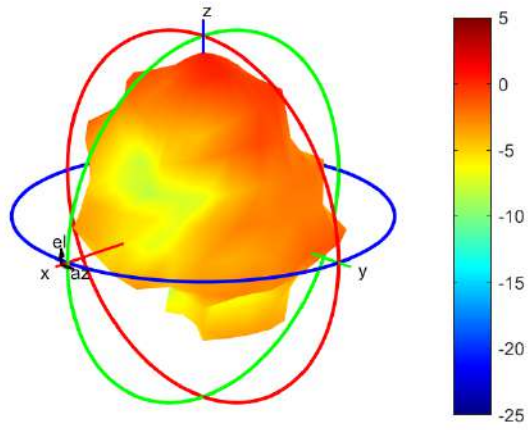
Center Frequency	<b>1575MHz</b>
Horizontal (dBi) peak	-0.51
Vertical (dBi) peak	-0.77

**1610MHz**



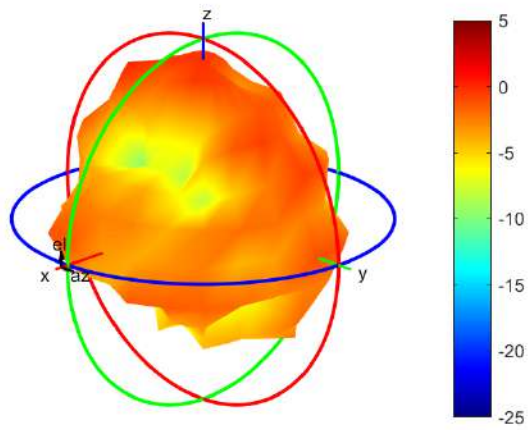
Center Frequency	<b>1610MHz</b>
Horizontal (dBi) peak	-2.19
Vertical (dBi) peak	-1.33

**1805 MHz**



Center Frequency	<b>1805 MHz</b>
Horizontal (dBi) peak	0.57
Vertical (dBi) peak	0.57

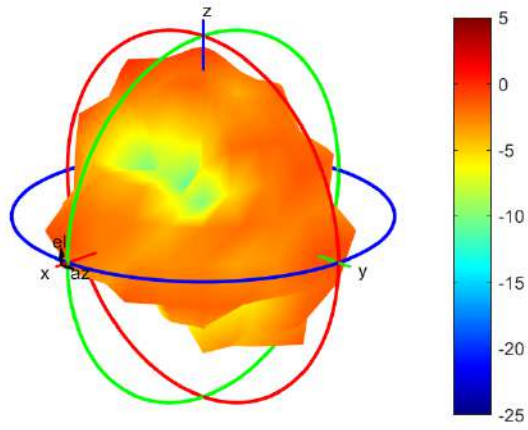
**1850 MHz**



Center Frequency	<b>1850 MHz</b>
Horizontal (dBi) peak	-0.25
Vertical (dBi) peak	-0.25

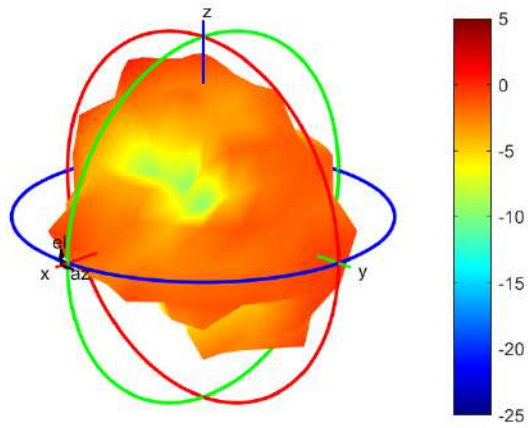


**1880 MHz**



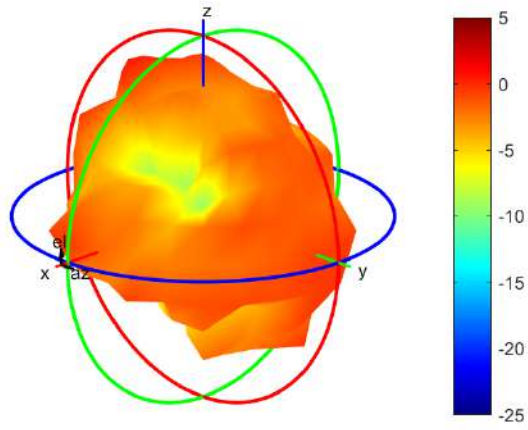
Center Frequency	<b>1880 MHz</b>
Horizontal (dBi) peak	-1.69
Vertical (dBi) peak	-1.22

**1910MHz**



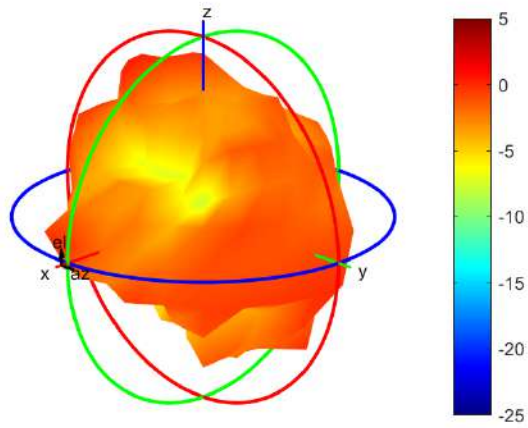
Center Frequency	<b>1910MHz</b>
Horizontal (dBi) peak	-0.79
Vertical (dBi) peak	-1.31

**1920MHz**



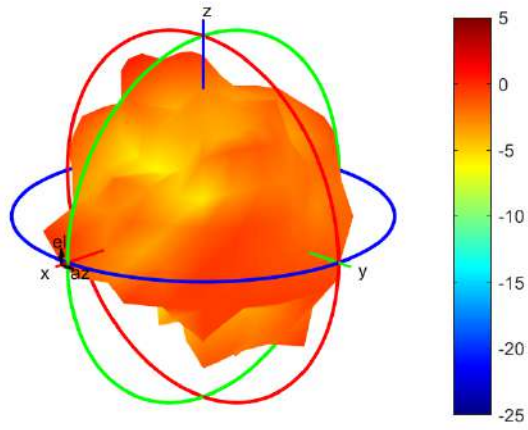
Center Frequency	<b>1920MHz</b>
Horizontal (dBi) peak	-0.49
Vertical (dBi) peak	-1.26

**1950MHz**



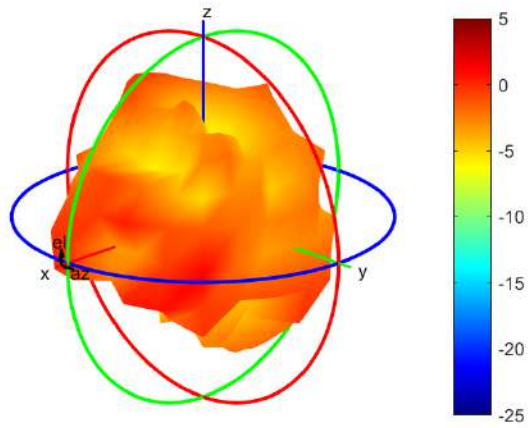
Center Frequency	<b>1950MHz</b>
Horizontal (dBi) peak	-0.23
Vertical (dBi) peak	-0.84

**1980MHz**



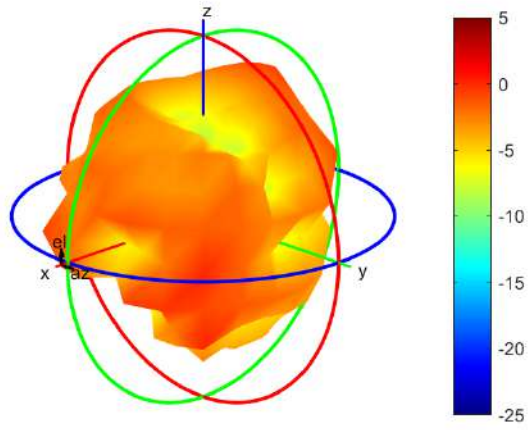
Center Frequency	<b>1980MHz</b>
Horizontal (dBi) peak	-0.18
Vertical (dBi) peak	-0.47

**2110MHz**



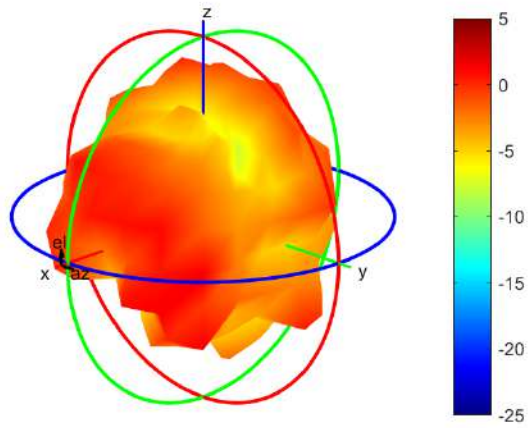
Center Frequency	<b>2110MHz</b>
Horizontal (dBi) peak	-0.65
Vertical (dBi) peak	0.98

**2200MHz**



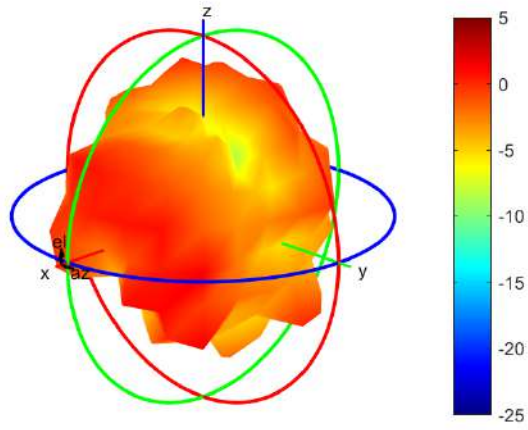
Center Frequency	<b>2200MHz</b>
Horizontal (dBi) peak	-1.07
Vertical (dBi) peak	0.65

**2300MHz**



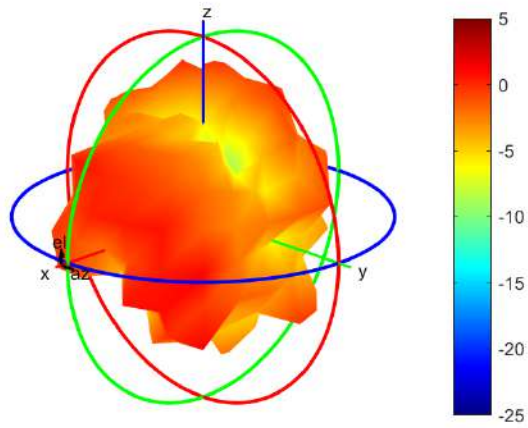
Center Frequency	<b>2300MHz</b>
Horizontal (dBi) peak	0.25
Vertical (dBi) peak	3

**2305MHz**



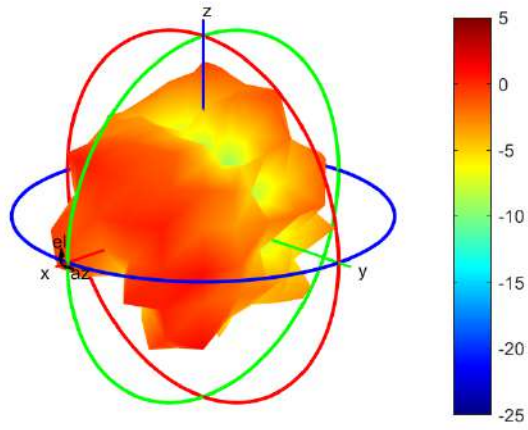
Center Frequency	<b>2305MHz</b>
Horizontal (dBi) peak	0.27
Vertical (dBi) peak	2.94

**2315MHz**



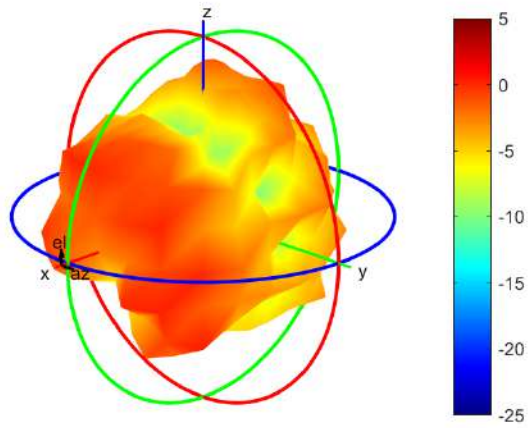
Center Frequency	<b>2315MHz</b>
Horizontal (dBi) peak	0.0
Vertical (dBi) peak	2.59

**2350MHz**



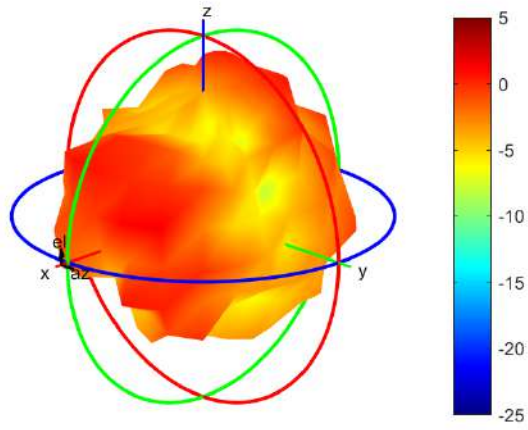
Center Frequency	<b>2350MHz</b>
Horizontal (dBi) peak	-0.35
Vertical (dBi) peak	2.43

**2400MHz**



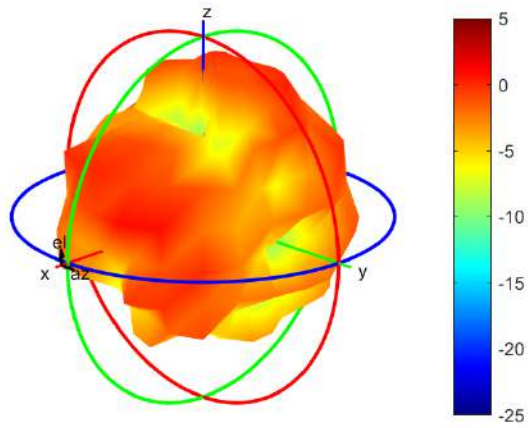
Center Frequency	<b>2400MHz</b>
Horizontal (dBi) peak	-0.4
Vertical (dBi) peak	1.7

**2500MHz**



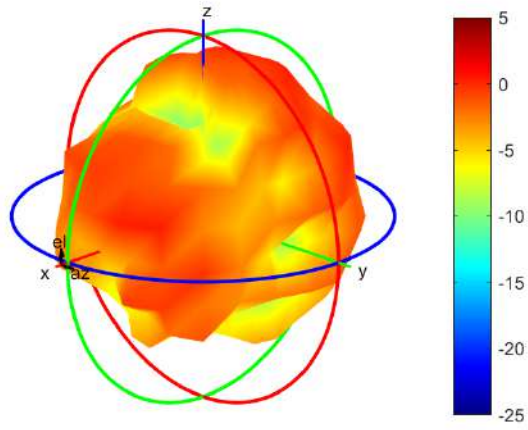
Center Frequency	<b>2500MHz</b>
Horizontal (dBi) peak	0.4
Vertical (dBi) peak	1.47

**2570MHz**



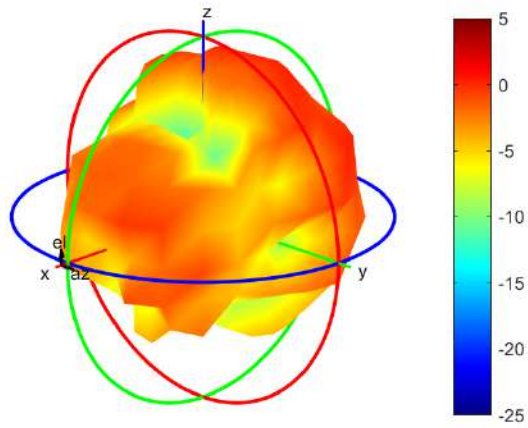
Center Frequency	<b>2570MHz</b>
Horizontal (dBi) peak	-0.16
Vertical (dBi) peak	0.5

**2595MHz**



Center Frequency	<b>2595MHz</b>
Horizontal (dBi) peak	-0.47
Vertical (dBi) peak	0.41

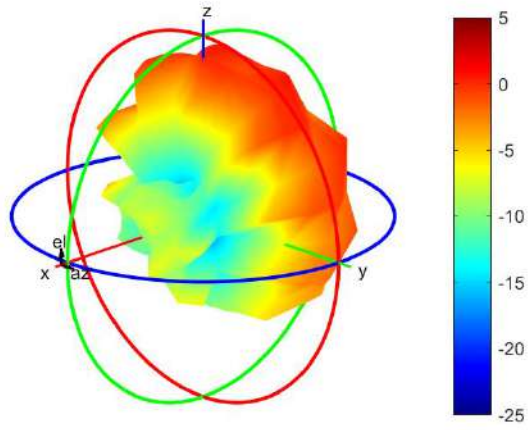
**2620MHz**



Center Frequency	<b>2620MHz</b>
Horizontal (dBi) peak	-0.5
Vertical (dBi) peak	-0.08

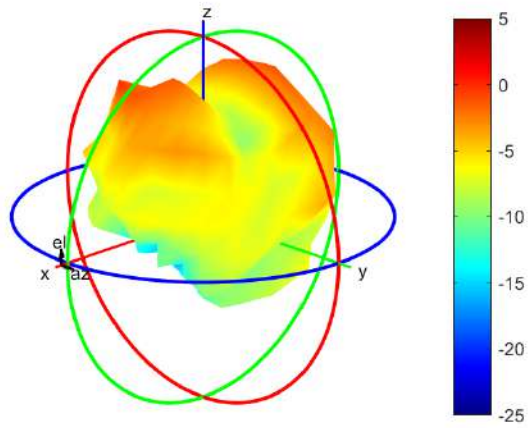


**2690MHz**



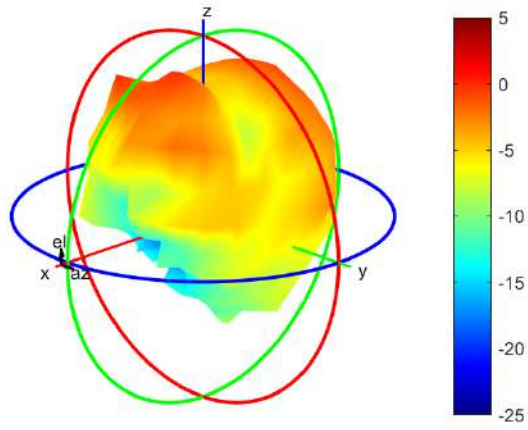
Center Frequency	<b>2690MHz</b>
Horizontal (dBi) peak	0.12
Vertical (dBi) peak	0.2

**3400MHz**



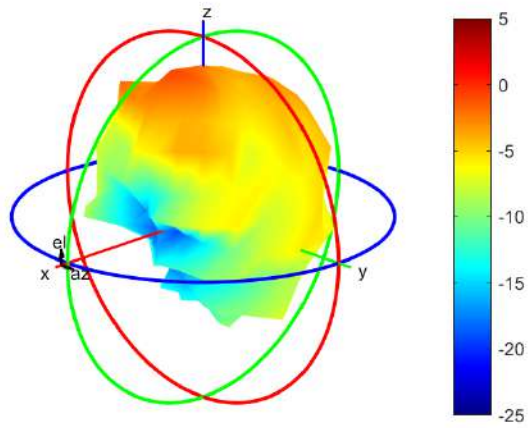
Center Frequency	<b>3400MHz</b>
Horizontal (dBi) peak	-1.5
Vertical (dBi) peak	-3.08

**3500MHz**



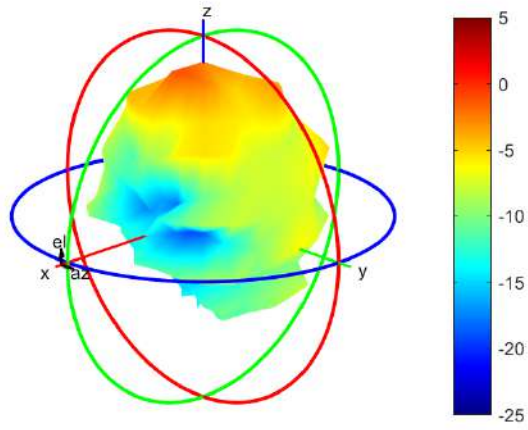
Center Frequency	<b>3500MHz</b>
Horizontal (dBi) peak	0.21
Vertical (dBi) peak	-2.35

**3600MHz**



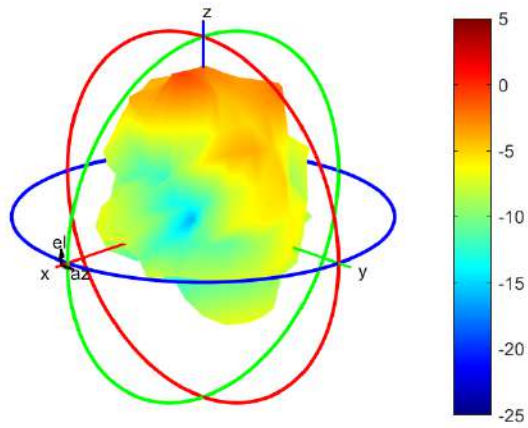
Center Frequency	<b>3600MHz</b>
Horizontal (dBi) peak	-0.66
Vertical (dBi) peak	-2.51

**3700MHz**



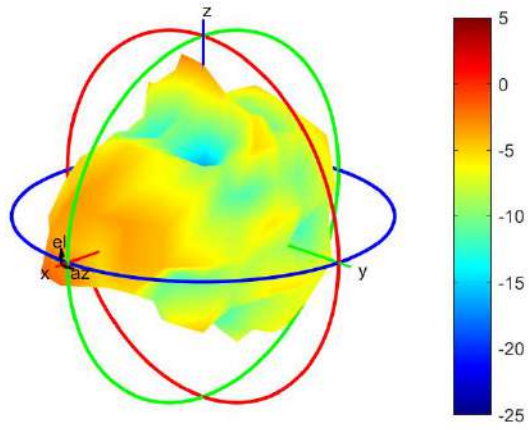
Center Frequency	<b>3700MHz</b>
Horizontal (dBi) peak	-1.31
Vertical (dBi) peak	-2.52

**3800MHz**



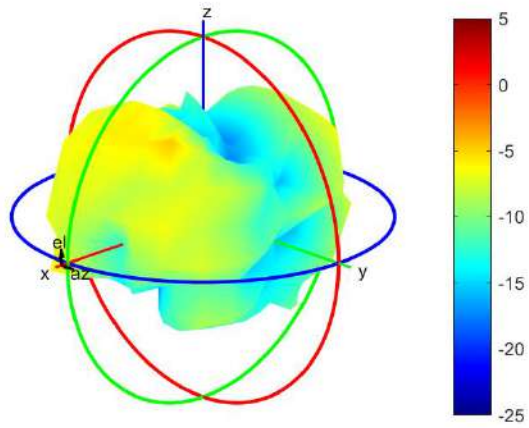
Center Frequency	<b>3800MHz</b>
Horizontal (dBi) peak	-0.58
Vertical (dBi) peak	-2.23

**4200MHz**



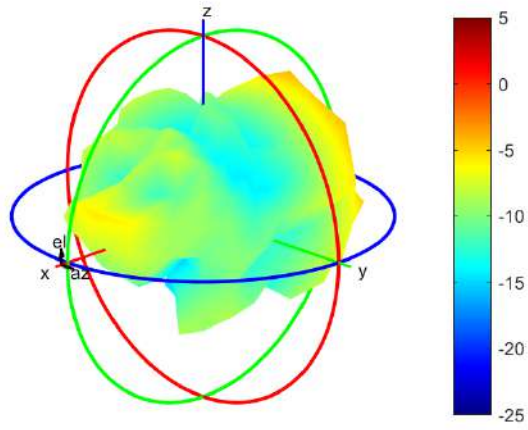
Center Frequency	<b>4200MHz</b>
Horizontal (dBi) peak	-3.24
Vertical (dBi) peak	-2.4

**4400MHz**



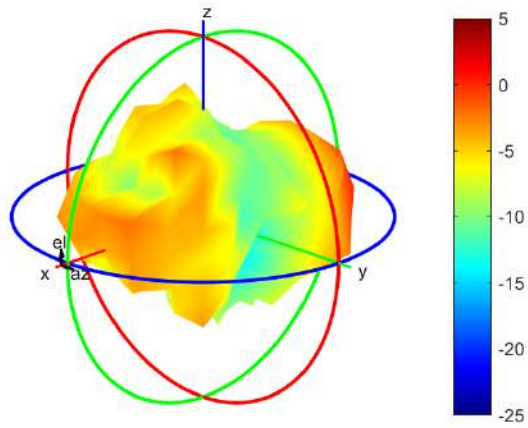
Center Frequency	<b>4400MHz</b>
Horizontal (dBi) peak	-5.87
Vertical (dBi) peak	-7.04

### 4700MHz



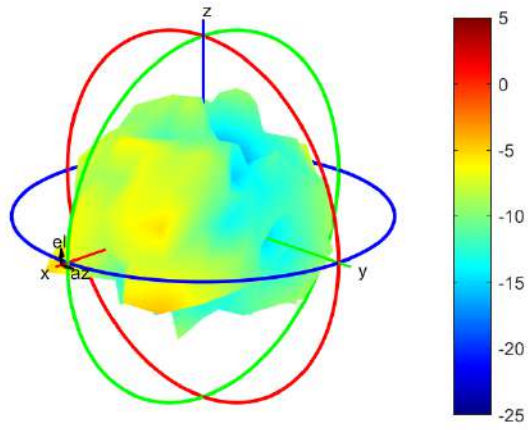
Center Frequency	<b>4700MHz</b>
Horizontal (dBi) peak	-4.0
Vertical (dBi) peak	-5.02

### 5150MHz



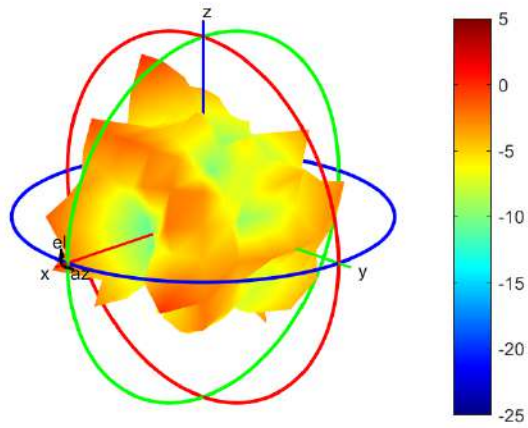
Center Frequency	<b>5150MHz</b>
Horizontal (dBi) peak	-0.87
Vertical (dBi) peak	-1.39

**5537.5MHz**



Center Frequency	<b>5537.5MHz</b>
Horizontal (dBi) peak	-5.74
Vertical (dBi) peak	-6.07

**5925MHz**



Center Frequency	<b>5925MHz</b>
Horizontal (dBi) peak	0.81
Vertical (dBi) peak	-2.52

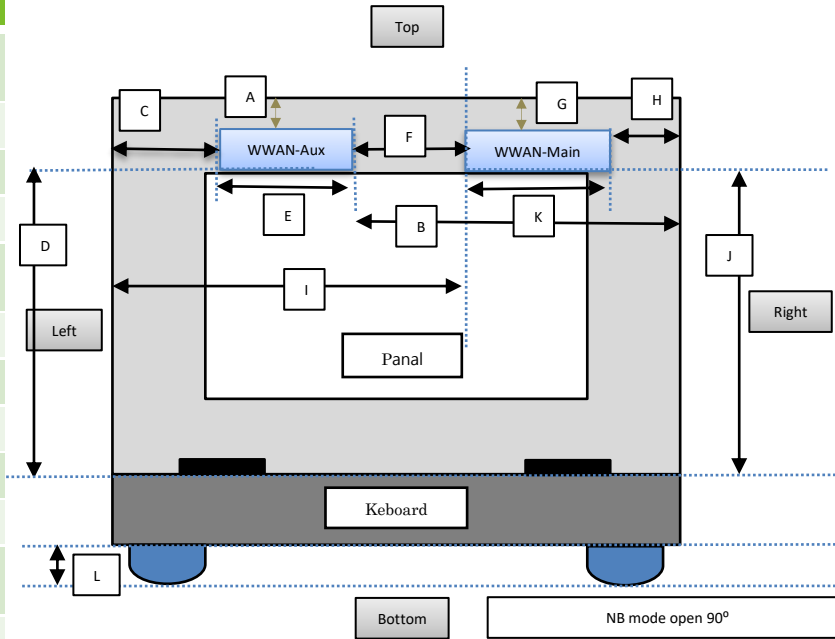
## Section 4. Antenna Host Platform Location Information

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.

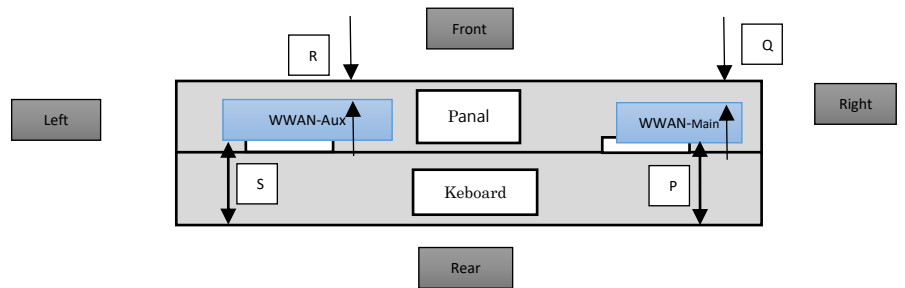
### Minimum Separation Distance

Item	Antenna	Position	Distance (mm)
A	WWAN-Aux	to Top	5.5
B	WWAN-Aux	to Right	179.3
C	WWAN-Aux	to Left	39.5
D	WWAN-Aux	to Bottom (Not include Keyboard)	185.57
E	WWAN-Aux	Aux Antenna Length	80
F	Main-Aux	Main to Aux	60
G	WWAN-Main	to Top	5.5
H	WWAN-Main	to Right	39.6
I	WWAN-Main	to Left	179.2
J	WWAN-Main	to Bottom (Not include Keyboard)	185.57
K	WWAN-Main	Main Antenna Length	80
L	NB	Bumper thickness	2.1



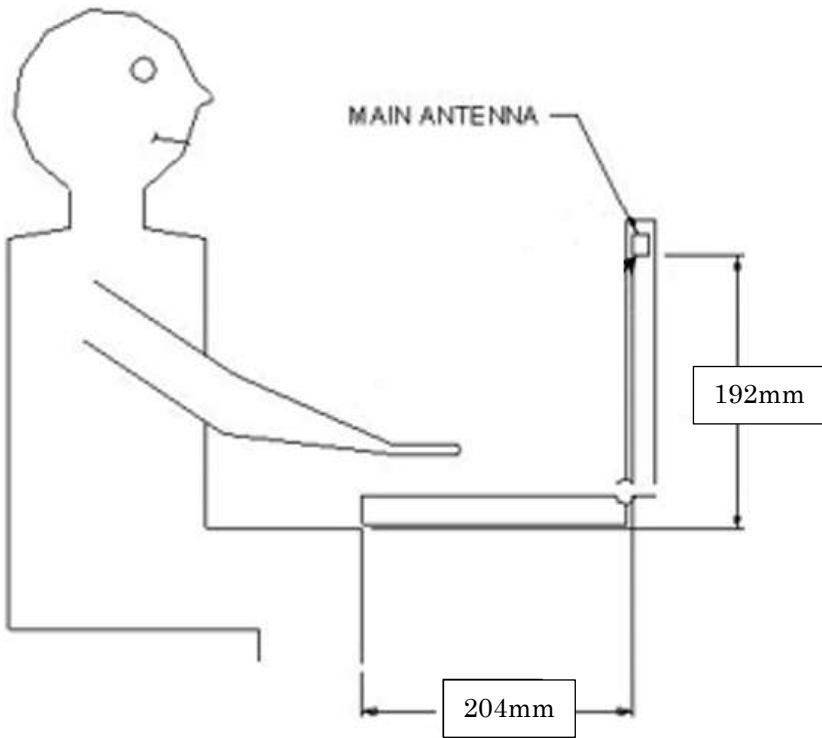
### Minimum Separation Distance

Item	Antenna	Position	Distance (mm)
P	WWAN-Main	to Front	16.69
Q	WWAN-Main	to Rear	2.45
R	WWAN-Aux	to Front	2.45
S	WWAN-Aux	to Rear	16.69



## 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.

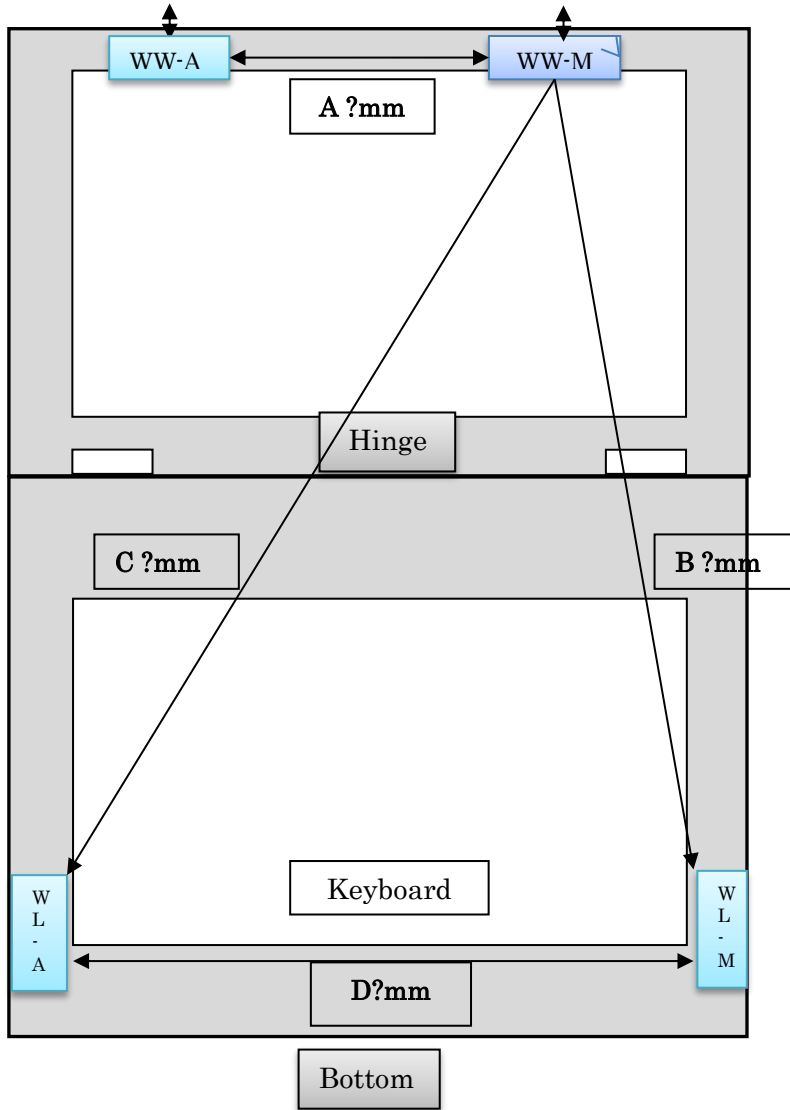




## Section 6. Diagram Example of Co-Location Antenna Separation

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)



Minimum Separation Distance			
Item	Antenna	Position	Distance
			(mm)
A	WWAN	Main to Aux	60
B	WWAN-Main	To WLAN Main	247.2
C	WWAN-Aux	To WLAN Aux	318.6
D	WLAN-Main	To WLAN Aux	275