Regulatory WWAN Antenna Information

Platform	
Platform Owner	DELL
Brand Name	DELL
Model Name	P175G
ODM	Compal
	NB mode
Antenna	
Manufacturer	speed
Part Number	■ Tx1/Rx1 Antenna WWAN Main/AUX: F-0G-FH-6165-002-00(DC33002RF1L)
	■ MIMO2/3 Antenna WWAN: F-0G-FH-6155-004-00(DC33002R91L)
Module	
With WWAN Module	FM350-GL
(Check Box)	L860-GL-16

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	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 Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E *Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
Tx/Rx1 Antenna **speed P/N:** F-0G-FH-6165-002-00 **Customer P/N:** DC33002RF1L	**speed**	**PIFA**	**Cable length: 319mm diameter: 1.13mm 50 ohm SLL Coaxial MAIN** **Connector: I-PEX PN:20565-001R-13**	617-698MHz **-8.79** dBi (peak)	617-698MHz **-8.24** dBi (peak)	617-698MHz **3.50** max	617-698MHz **0.55** dBi (peak)
				698-821MHz **-0.78** dBi (peak)	698-821MHz **-0.23** dBi (peak)	698-821MHz **3.50** max	698-821MHz **0.55** dBi (peak)
				824-960MHz **-2.14** dBi (peak)	824-960MHz **-1.56** dBi (peak)	824-960MHz **3.50** max	824-960MHz **0.58** dBi (peak)
				1425-1515MHz **-5.91** dBi (peak)	1425-1515MHz **-5.21** dBi (peak)	1425-1515MHz **3.50** max	1425-1515MHz **0.70** dBi (peak)
				1710-2200MHz **1.08** dBi (peak)	1710-2200MHz **1.88** dBi (peak)	1710-2200MHz **3.50** max	1710-2200MHz **0.80** dBi (peak)
				2300-2690MHz **0.48** dBi (peak)	2300-2690MHz **1.37** dBi (peak)	2300-2690MHz **3.50** max	2300-2690MHz **0.89** dBi (peak)
				3400-3800MHz **-3.16** dBi (peak)	3400-3800MHz **-2.10** dBi (peak)	3400-3800MHz **3.50** max	3400-3800MHz **1.06** dBi (peak)
				4200-4700MHz **-3.51** dBi (peak)	4200-4700MHz **-2.29** dBi (peak)	4200-4700MHz **3.50** dBi (peak)	4200-4700MHz **1.22** dBi (peak)
				5150-5925MHz **-3.47** dBi (peak)	5150-5925MHz **-2.12** dBi (peak)	5150-5925MHz **3.50** max	5150-5925MHz **1.35** dBi (peak)
	speed	**PIFA**	**Cable length: 511mm diameter: 1.13mm 50 ohm SLL Coaxial AUX** **Connector: I-PEX PN:20565-001R-13**	617-698MHz **-5.89** dBi (peak)	617-698MHz **-5.08** dBi (peak)	617-698MHz **3.50** max	617-698MHz **0.81** dBi (peak)
				698-821MHz **-1.65** dBi (peak)	698-821MHz **-0.77** dBi (peak)	698-821MHz **3.50** max	698-821MHz **0.88** dBi (peak)
				824-960MHz **-3.82** dBi (peak)	824-960MHz **-2.90** dBi (peak)	824-960MHz **3.50** max	824-960MHz **0.92** dBi (peak)
				1425-1515MHz **-2.15** dBi (peak)	1425-1515MHz **-1.03** dBi (peak)	1425-1515MHz **3.50** max	1425-1515MHz **1.12** dBi (peak)
				1557-1610 MHz **-3.86** dBi (peak)	1557-1610 MHz **-2.72** dBi (peak)	1557-1610 MHz **3.50** max	1557-1610 MHz **1.14** dBi (peak)
				1805-2200MHz **-1.60** dBi (peak)	1805-2200MHz **-0.3** dBi (peak)	1805-2200MHz **3.50** max	1805-2200MHz **1.3** dBi (peak)
				2300-2690MHzz **2.37** dBi (peak)	2300-2690MHzz **3.80** dBi (peak)	2300-2690MHzz **3.50** max	2300-2690MHzz **1.43** dBi (peak)

				3400-3800MHz -0.95 dBi (peak)	3400-3800MHz 0.74 dBi (peak)	3400-3800MHz 3.50 max	3400-3800MHz 1.69 dBi (peak)
				4200-4700MHz -2.33 dBi (peak)	4200-4700MHz -0.36 dBi (peak)	4200-4700MHz 3.50 dBi (peak)	4200-4700MHz 1.97 dBi (peak)
				5150-5925MHz -1.56 dBi (peak)	5150-5925MHz 0.61 dBi (peak)	5150-5925MHz 3.50 max	5150-5925MHz 2.17 dBi (peak)

1A Antenna Part Number	1B Manufacture	1C Antenna Type	1D Cable Assembly Part Number and Information	1E *Peak Gain W/ Cable loss (dBi)	1F Peak Gain w/o Cable Loss (dBi)	1G VSWR	1H Cable Loss (dBi)
Antenna **speed P/N:** F-0G-FH-6155-004-00 **Customer P/N:** DC33002R91L	**speed**	**Coupled**	**Cable length: 147.5mm diameter: 1.13mm 50 ohm LL Coaxial** **Connector: I-PEX PN:20565-001R-13**	1425-1515MHz -3.59 dBi (peak)	1425-1515MHz -3.27 dBi (peak)	1425-1515MHz 3.5 max	1425-1515MHz 0.32 dBi (peak)
				1710-2200MHz -0.30 dBi (peak)	1710-2200MHz 0.08 dBi (peak)	1710-2200MHz 3.5 max	1710-2200MHz 0.38 dBi (peak)
				2300-2690MHz 0.08 dBi (peak)	2300-2690MHz 0.49 dBi (peak)	2300-2690MHz 3.5 max	2300-2690MHz 0.41 dBi (peak)
				3400-3800MHz -1.39 dBi (peak)	3400-3800MHz -0.9 dBi (peak)	3400-3800MHz 3.5 max	3400-3800MHz 0.49 dBi (peak)
				4200-5000MHz 0.64 dBi (peak)	4200-5000MHz 1.21 dBi (peak)	4200-5000MHz 3.5 max	4200-5000MHz 0.57 dBi (peak)
	Speed	**Coupled**	**Cable length: 218mm diameter: 1.13mm 50 ohm LL Coaxial** **Connector: I-PEX PN:20565-001R-13**	1805-2200MHz 1.07 dBi (peak)	1805-2200MHz 1.62 dBi (peak)	1805-2200MHz 3.5 max	1805-2200MHz 0.55 dBi (peak)
				2300-2690MHzz 1.57 dBi (peak)	2300-2690MHzz 2.18 dBi (peak)	2300-2690MHzz 3.5 max	2300-2690MHzz 0.61 dBi (peak)
				3400-3800MHz 0.75 dBi (peak)	3400-3800MHz 1.47 dBi (peak)	3400-3800MHz 3.5 max	3400-3800MHz 0.72 dBi (peak)
				4200-5000MHz -1.56 dBi (peak)	4200-5000MHz -0.72 dBi (peak)	4200-5000MHz 3.5 max	4200-5000MHz 0.84 dBi (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

	TPx antenna		DRx antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
617	-16.49	-15.79	-10.40	-9.57
634.5	-15.18	-13.55	-9.32	-8.20
652	-13.27	-13.06	-8.14	-5.89
663	-12.16	-12.17		
680.5	-10.88	-10.43		
698	-9.50	-8.79		
703	-9.18	-7.96		
707.5	-8.97	-7.71		
717	-8.52	-7.06	-4.05	-2.66
725.5	-7.80	-6.08	-4.25	-3.20
748	-5.02	-3.47	-2.13	-3.71
756	-4.06	-2.61	-1.65	-2.77
768	-2.79	-1.48	-1.75	-3.04
777	-2.23	-0.91	-1.88	-3.11
782	-1.92	-0.79	-2.31	-3.22
787	-1.84	-0.78	-2.72	-3.44
791			-3.41	-3.47
806			-4.22	-4.01
814	-2.30	-1.75	-4.94	-3.88
821			-5.84	-3.78
824	-2.70	-2.14	-6.19	-3.82
832	-3.19	-2.52	-6.11	-3.99
836.5	-3.42	-2.72	-6.32	-4.08
849	-3.76	-3.24	-6.79	-4.35
862	-4.42	-4.20	-6.73	-4.72
880	-5.22	-4.72	-6.84	-5.85
897.5	-6.24	-5.01	-7.65	-6.64
915	-7.12	-5.41	-6.28	-6.19
925	-7.00	-5.57	-5.38	-5.51
960	-5.98	-6.02	-5.20	-5.99
1427.9	-6.39	-6.80	-5.55	-5.03
1447.9	-6.29	-6.94	-5.21	-4.19
1455.4	-5.91	-6.33	-5.16	-3.97
1462.9	-6.34	-6.78	-4.88	-3.77
1496	-6.62	-6.16	-4.54	-2.50
1510.9	-6.55	-6.14	-4.79	-2.15
1557			-5.16	-4.92
1575			-4.77	-4.96
1610			-4.79	-3.86

High band

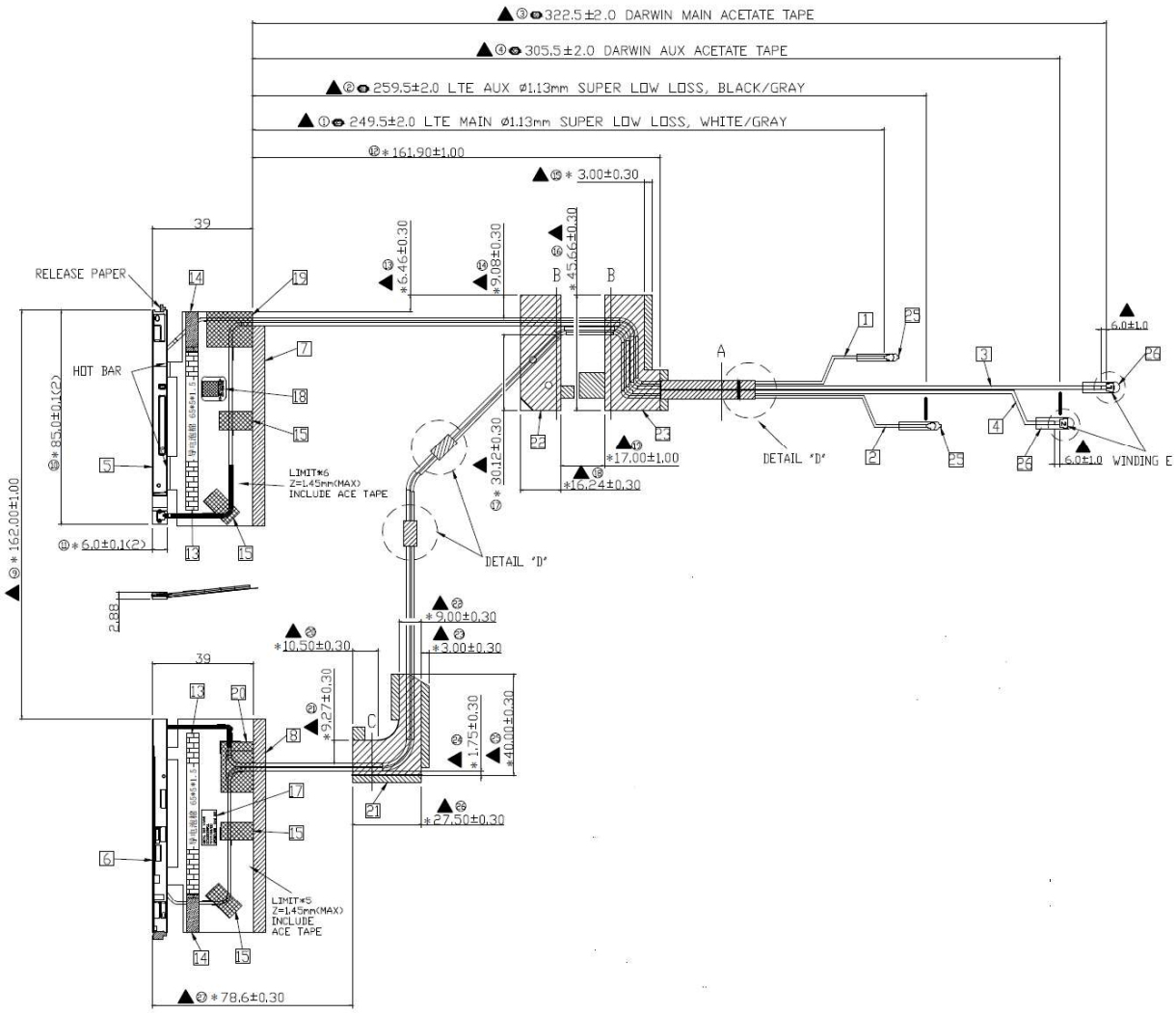
Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
1710	-2.60	-2.78		
1732.5	-1.42	-2.09		
1747.5	-0.79	-1.89		
1755	-0.57	-1.97		
1785	-1.23	-3.17		
1805	-1.25	-2.99	-3.26	-1.73
1850	-0.41	-2.27	-2.46	-2.58
1880	-0.33	-1.66	-2.17	-2.21
1910	0.09	-1.12	-2.88	-2.93
1920	0.07	-1.15	-3.05	-3.29
1950	0.36	-1.05	-2.77	-2.49
1980	1.08	-0.46	-2.91	-1.69
2110	0.95	-0.75	-1.56	-3.26
2200	-0.05	-0.90	-2.07	-1.60
2300	0.23	-0.41	1.44	2.37
2305	0.09	-0.48	1.42	2.31
2315	-0.09	-0.71	1.32	2.16
2350	-0.51	-0.88	0.52	1.62
2400	0.47	0.21	0.63	2.04
2500	0.48	-0.64	1.88	1.89
2570	-0.36	-1.29	1.54	1.10
2595	-0.33	-1.67	1.47	0.67
2620	-0.37	-1.63	1.09	0.46
2690	-1.95	-2.40	0.61	0.72
3400	-4.33	-6.42	-0.95	-1.33
3500	-4.80	-6.68	-2.94	-2.88
3600	-3.16	-3.76	-2.76	-3.90
3700	-3.57	-4.46	-2.81	-3.14
3800	-5.48	-5.10	-5.14	-4.67
4200	-4.30	-3.93	-5.12	-5.00
4400	-4.46	-4.30	-2.33	-3.02
4700	-3.92	-3.51	-2.60	-3.72
5150	-4.01	-4.13	-1.57	-1.56
5537.5	-4.22	-4.47	-3.49	-4.37
5925	-3.47	-4.42	-4.83	-5.14

	DRx2 antenna		DRx1 antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
1452	-3.85	-3.83		
1474	-4.21	-3.95		
1496	-3.59	-3.69		
1710	-1.20	-1.21		
1732.5	-1.42	-0.62		
1747.5	-1.64	-0.45		
1755	-1.78	-0.59		
1785	-0.92	-0.44		
1805	-0.74	-0.52	0.19	0.21
1850	-2.05	-1.51	0.34	0.14
1880	-2.14	-1.50	1.02	0.27
1910	-1.57	-1.24	0.12	0.38
1920	-1.43	-1.06	0.97	0.47
1950	-1.06	-1.41	0.74	0.67
1980	-0.91	-1.86	1.07	0.50
2110	-1.54	-3.06	0.02	0.54
2200	-0.30	-2.52	1.07	-1.32
2300	-1.74	-0.56	1.57	-0.70
2305	-1.74	-0.51	1.38	-0.70
2315	-1.75	-0.47	1.06	-0.94
2350	-0.65	-1.07	1.29	-1.79
2400	-0.64	-0.72	0.79	-2.00
2500	-1.02	-1.17	1.03	-0.38
2570	-0.46	-1.29	1.42	-0.29
2595	-0.20	0.08	1.19	0.36
2620	-0.53	-0.37	1.55	0.57
2690	-1.46	-0.63	1.03	0.87
3400	-1.39	-1.53	-1.69	-2.20
3500	-2.33	-3.34	-1.20	-3.18
3600	-2.02	-3.14	-1.30	-1.61
3700	-3.04	-4.01	0.75	-4.75
3800	-2.42	-1.92	-0.53	-3.07
4200	0.14	-1.67	-1.56	-3.08
4400	-0.54	-4.05	-2.03	-2.52
4700	-2.27	-3.38	-2.43	-1.87
5000	-2.42	0.64	-3.02	-3.55

Section 2. Dimensioned Photos or Drawings of Antennas

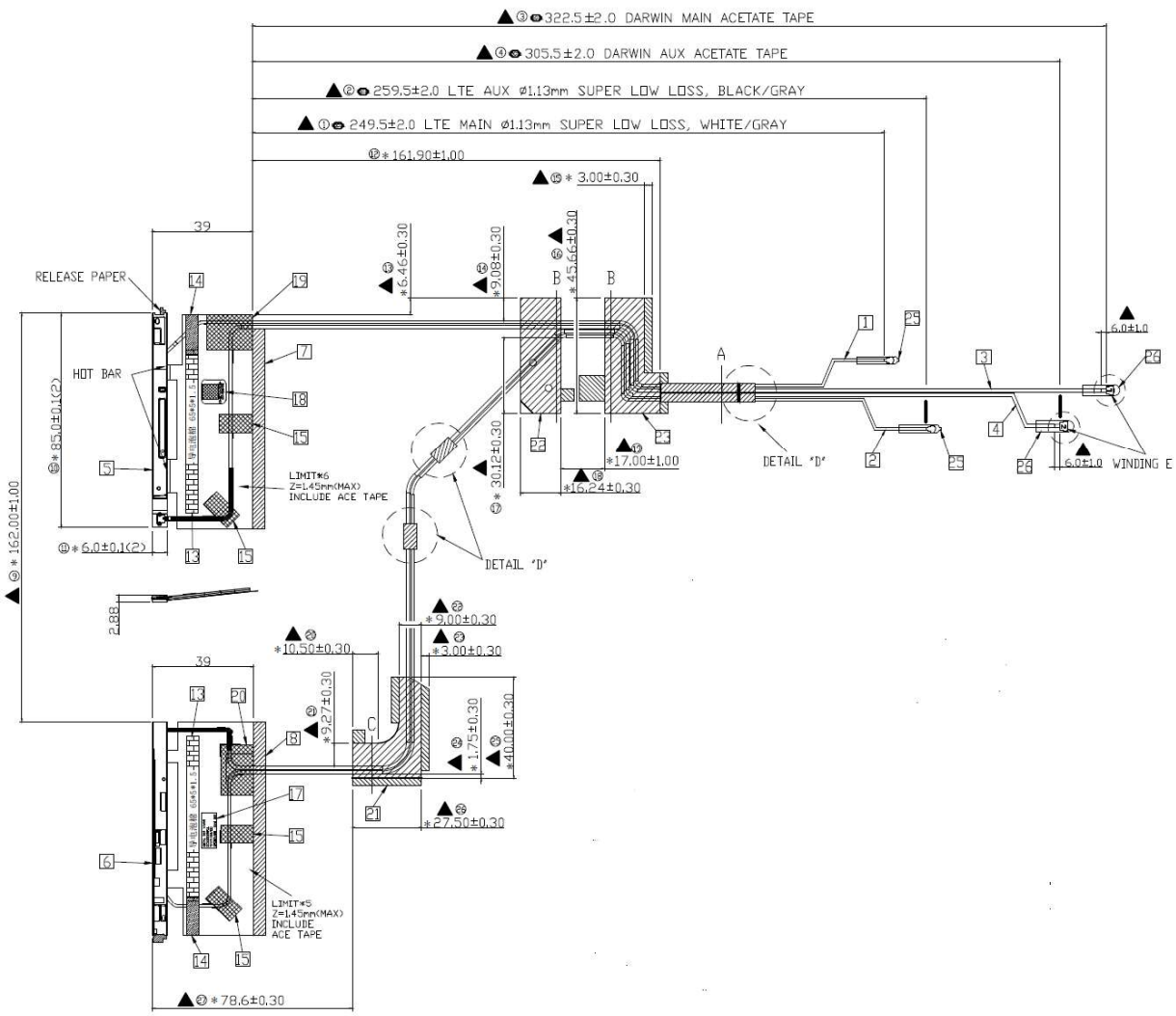
Include a dimensioned photo and dimensioned drawing of Main antenna here.

TPx Antenna Dimensioned Drawing:



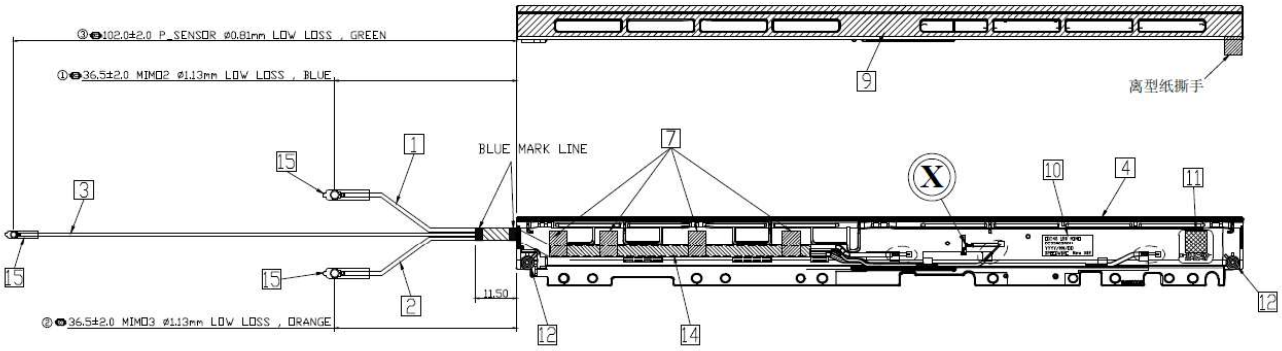
Include a dimensioned photo and dimensioned drawing of Aux antenna here.

DRx Antenna Dimensioned Drawing:



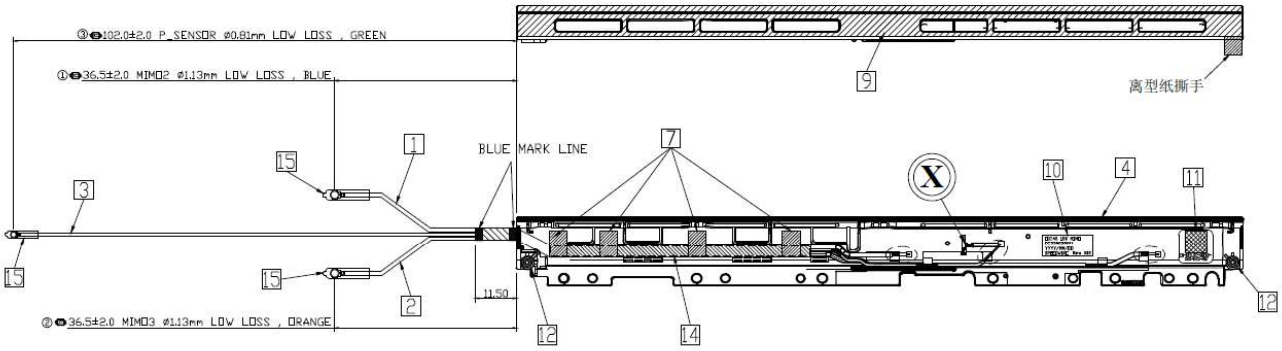
Include a dimensioned photo and dimensioned drawing of Aux antenna here.

DRx2 Antenna Dimensioned Drawing:



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

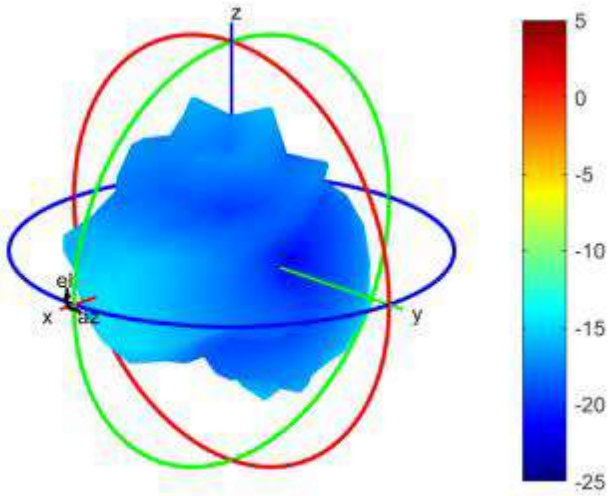
DRx1 Antenna Dimensioned Drawing:



Section 3. Radiation characteristics of antennae Loaded in Host Platform

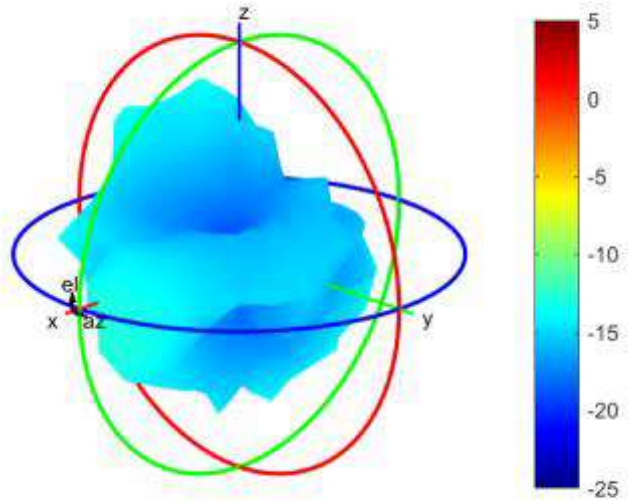
WWAN Main Antenna (TPx)

617MHz



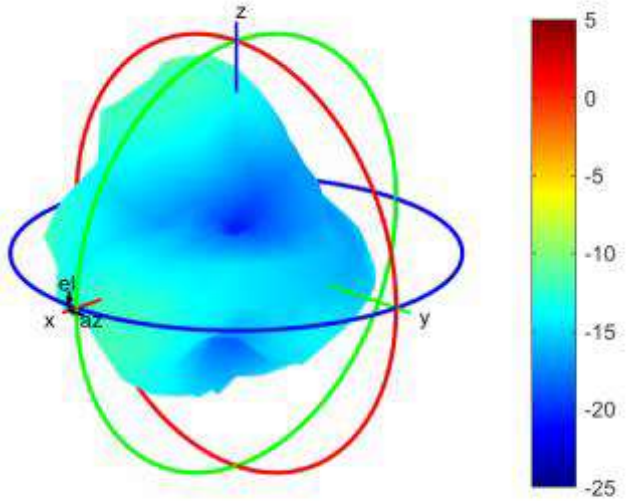
Center Frequency	**617 MHz**
Horizontal (dBi) peak	-16.49
Vertical (dBi) peak	-15.79

634.5MHz



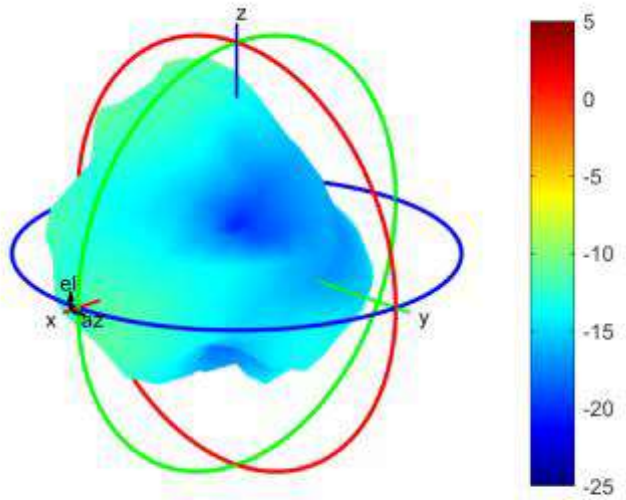
Center Frequency	**634.5MHz**
Horizontal (dBi) peak	-15.18
Vertical (dBi) peak	-13.55

652MHz



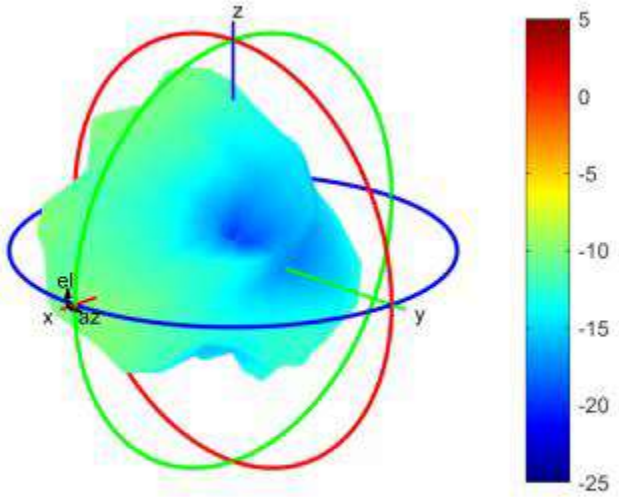
Center Frequency	**652MHz**
Horizontal (dBi) peak	-13.27
Vertical (dBi) peak	-13.06

663MHz



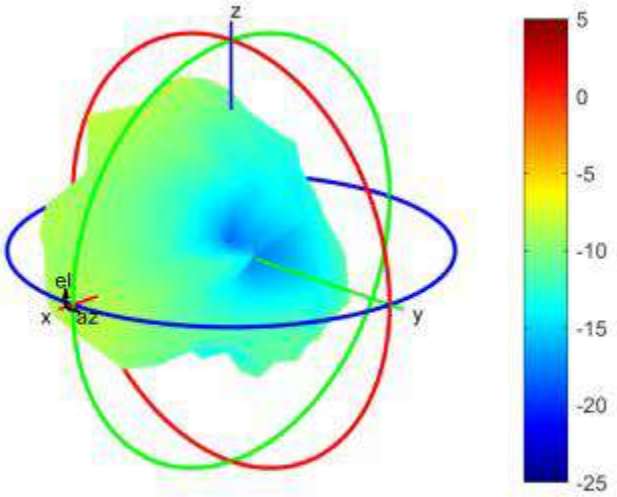
Center Frequency	**663MHz**
Horizontal (dBi) peak	-12.16
Vertical (dBi) peak	-12.17

680.5MHz



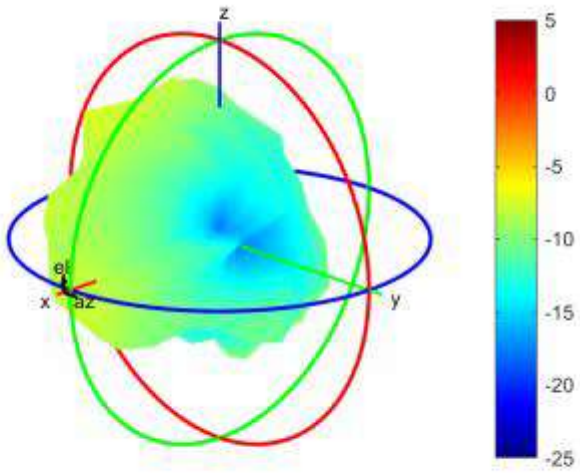
Center Frequency	**680.5 MHz**
Horizontal (dBi) peak	-10.88
Vertical (dBi) peak	-10.43

698MHz



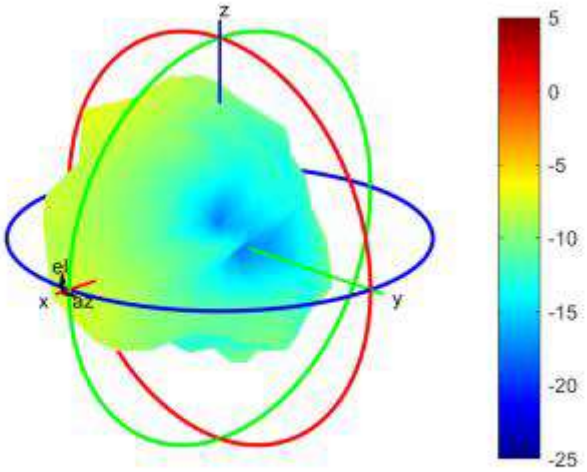
Center Frequency	**698MHz**
Horizontal (dBi) peak	-9.50
Vertical (dBi) peak	-8.79

703 MHz



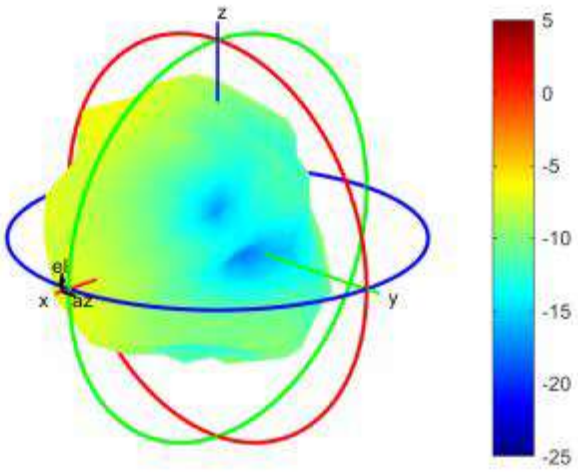
Center Frequency	**703 MHz**
Horizontal (dBi) peak	-9.18
Vertical (dBi) peak	-7.96

707.5MHz



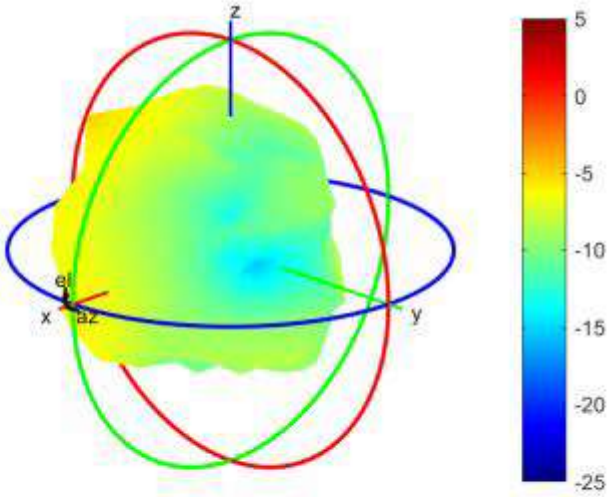
Center Frequency	**707.5MHz**
Horizontal (dBi) peak	-8.97
Vertical (dBi) peak	-7.71

717MHz



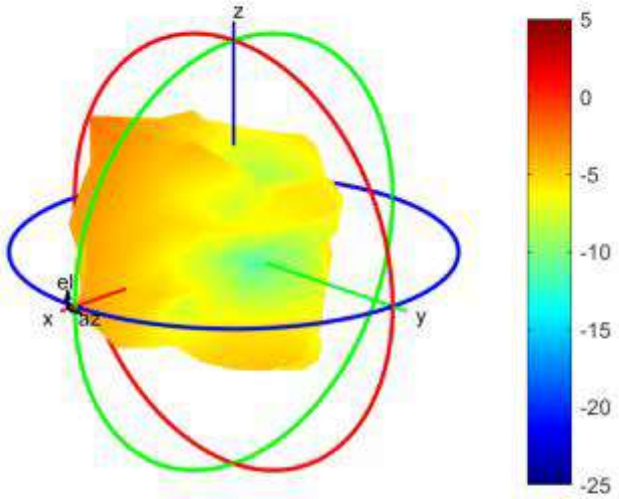
Center Frequency	**717 MHz**
Horizontal (dBi) peak	-8.52
Vertical (dBi) peak	-7.06

725.5MHz



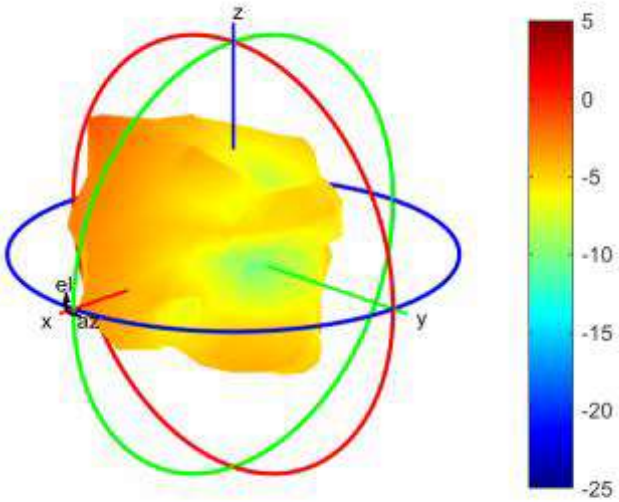
Center Frequency	**725.5MHz**
Horizontal (dBi) peak	-7.80
Vertical (dBi) peak	-6.08

748MHz



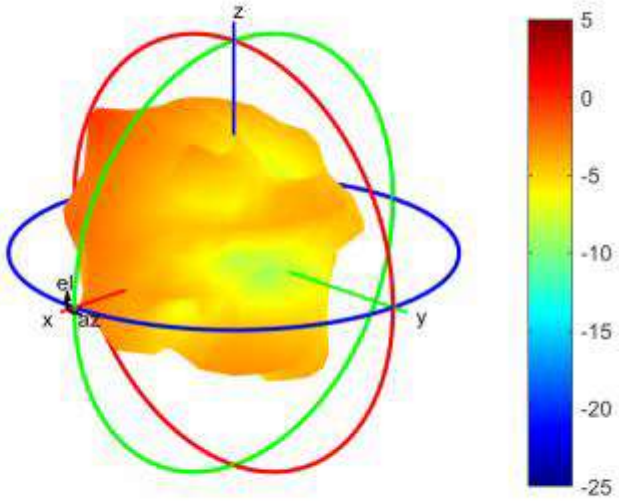
Center Frequency	**748MHz**
Horizontal (dBi) peak	-5.02
Vertical (dBi) peak	-3.47

756MHz



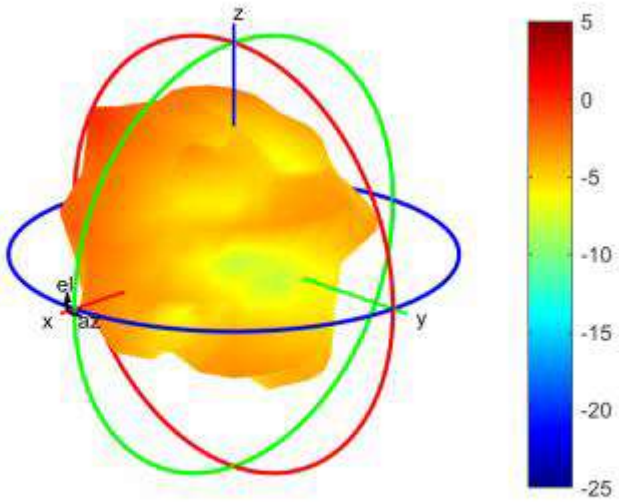
Center Frequency	**756MHz**
Horizontal (dBi) peak	-4.06
Vertical (dBi) peak	-2.61

768MHz



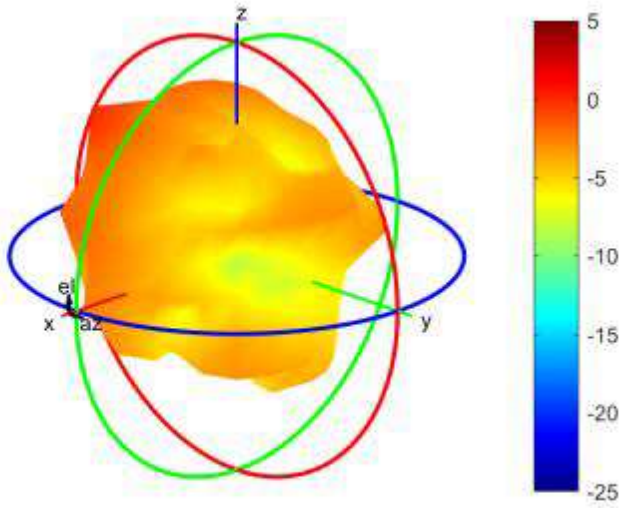
Center Frequency	**768MHz**
Horizontal (dBi) peak	-2.79
Vertical (dBi) peak	-1.48

777MHz



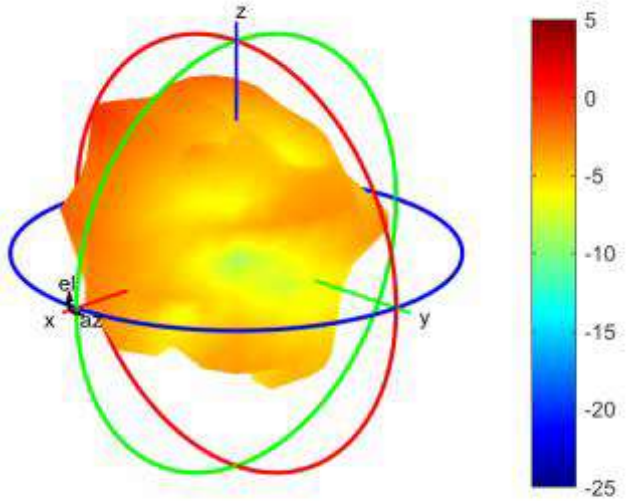
Center Frequency	**777MHz**
Horizontal (dBi) peak	-2.23
Vertical (dBi) peak	-0.91

782MHz



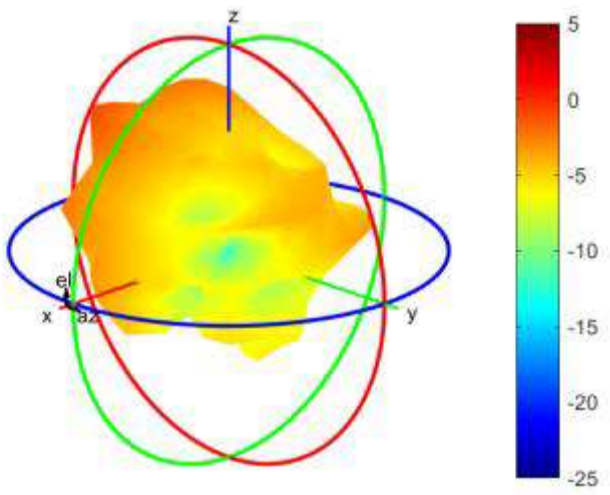
Center Frequency	**782MHz**
Horizontal (dBi) peak	-1.92
Vertical (dBi) peak	-0.79

787MHz



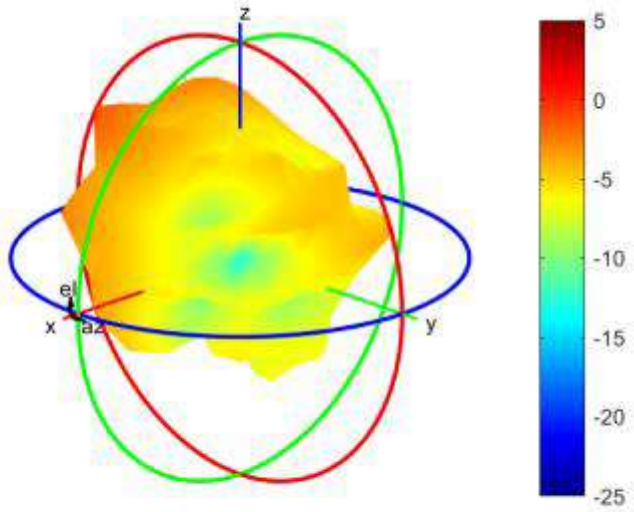
Center Frequency	**787MHz**
Horizontal (dBi) peak	-1.84
Vertical (dBi) peak	-0.78

814MHz



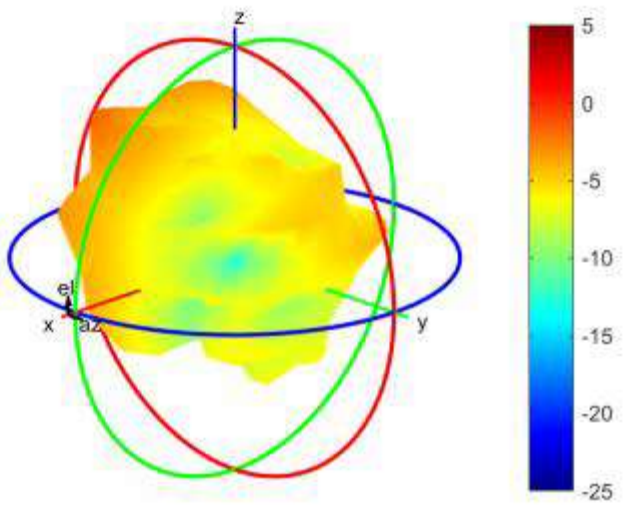
Center Frequency	**814MHz**
Horizontal (dBi) peak	-2.30
Vertical (dBi) peak	-1.75

824MHz



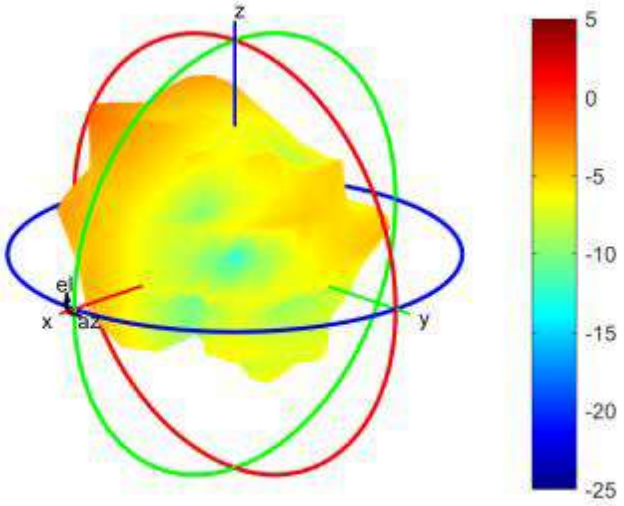
Center Frequency	**824MHz**
Horizontal (dBi) peak	-2.70
Vertical (dBi) peak	-2.14

832MHz



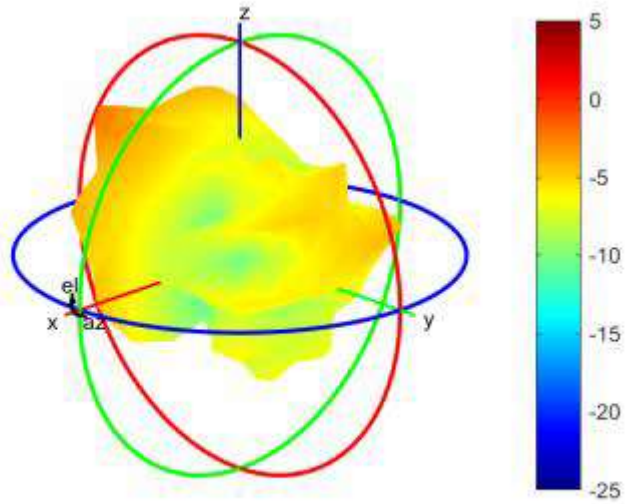
Center Frequency	**832MHz**
Horizontal (dBi) peak	-3.19
Vertical (dBi) peak	-2.52

836.5MHz



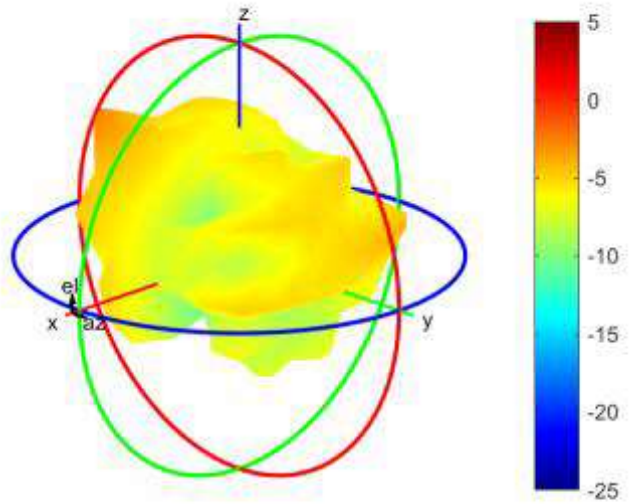
Center Frequency	**836.5MHz**
Horizontal (dBi) peak	-3.42
Vertical (dBi) peak	-2.72

849MHz



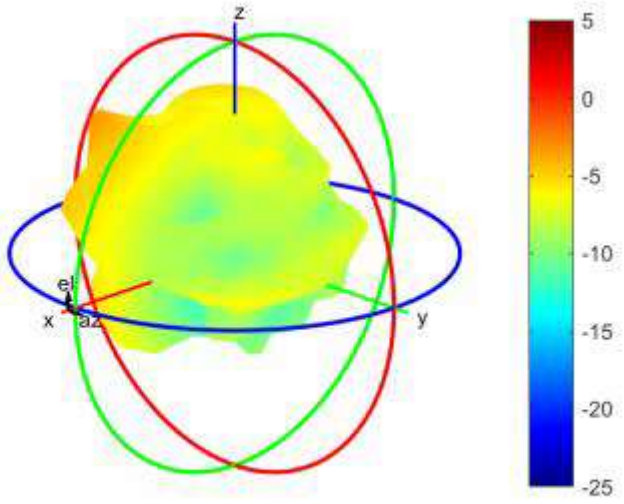
Center Frequency	**849MHz**
Horizontal (dBi) peak	-3.76
Vertical (dBi) peak	-3.24

862MHz



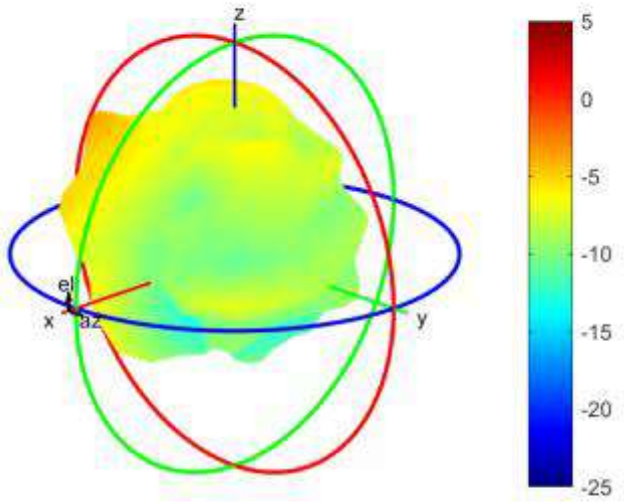
Center Frequency	**862MHz**
Horizontal (dBi) peak	-4.42
Vertical (dBi) peak	-4.20

880MHz



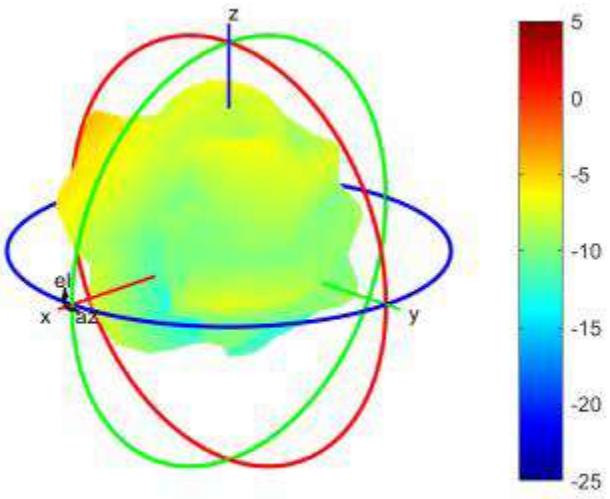
Center Frequency	**880MHz**
Horizontal (dBi) peak	-5.22
Vertical (dBi) peak	-4.72

897.5MHz



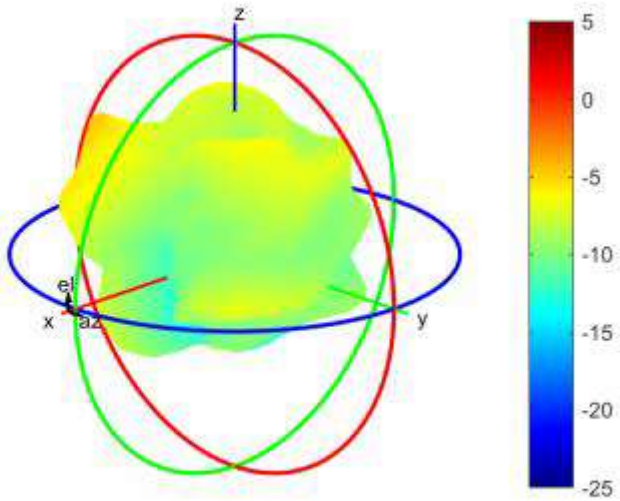
Center Frequency	**897.5MHz**
Horizontal (dBi) peak	-6.24
Vertical (dBi) peak	-5.01

915MHz



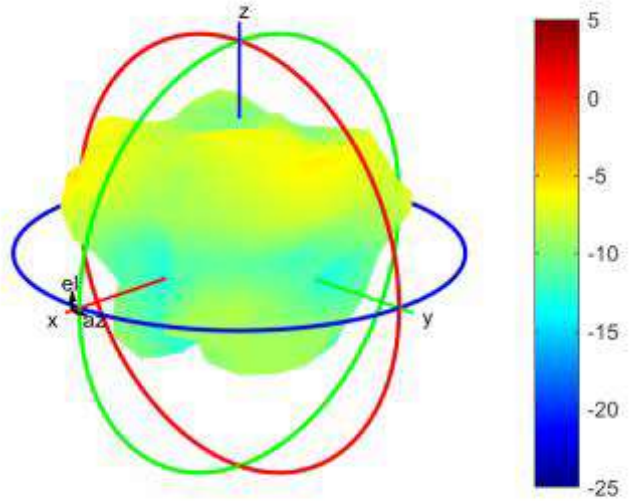
Center Frequency	**915MHz**
Horizontal (dBi) peak	-7.12
Vertical (dBi) peak	-5.41

925MHz



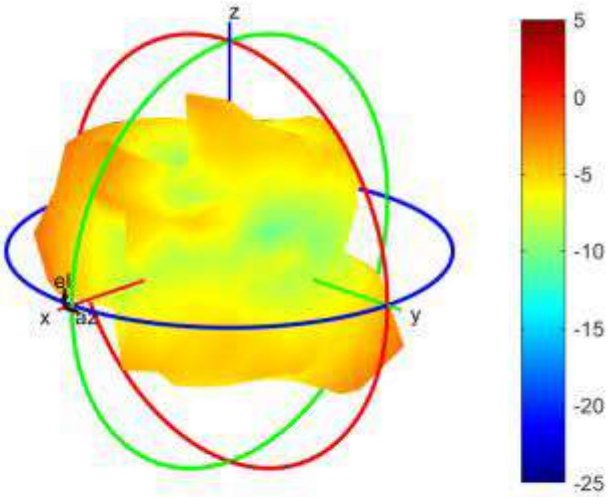
Center Frequency	**925MHz**
Horizontal (dBi) peak	-7.00
Vertical (dBi) peak	-5.57

960MHz



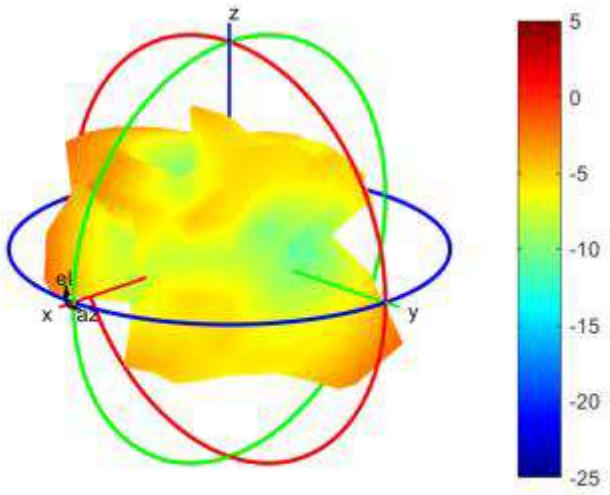
Center Frequency	**960MHz**
Horizontal (dBi) peak	-5.98
Vertical (dBi) peak	-6.02

1427.9MHz



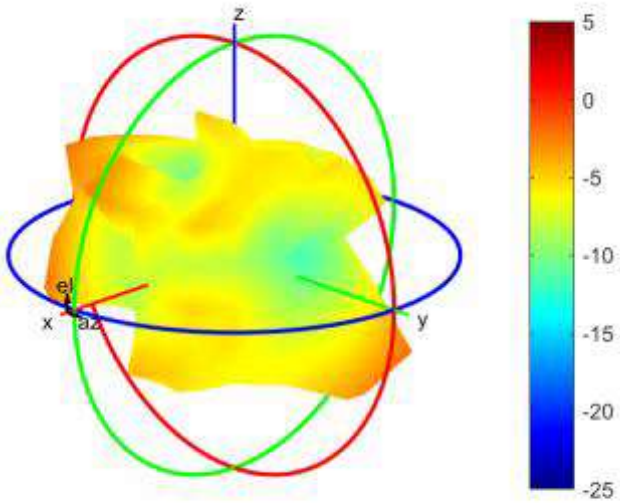
Center Frequency	**1427.9MHz**
Horizontal (dBi) peak	-6.39
Vertical (dBi) peak	-6.80

1447.9MHz



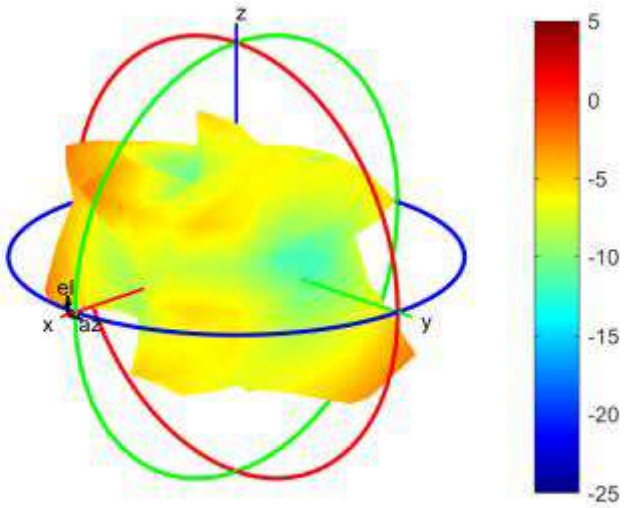
Center Frequency	**1447.9MHz**
Horizontal (dBi) peak	-6.29
Vertical (dBi) peak	-6.94

1455.4MHz



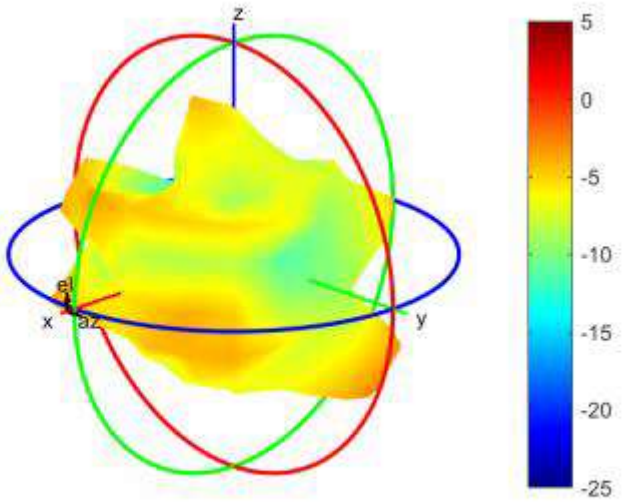
Center Frequency	**1455.4MHz**
Horizontal (dBi) peak	-5.91
Vertical (dBi) peak	-6.33

1462.9MHz



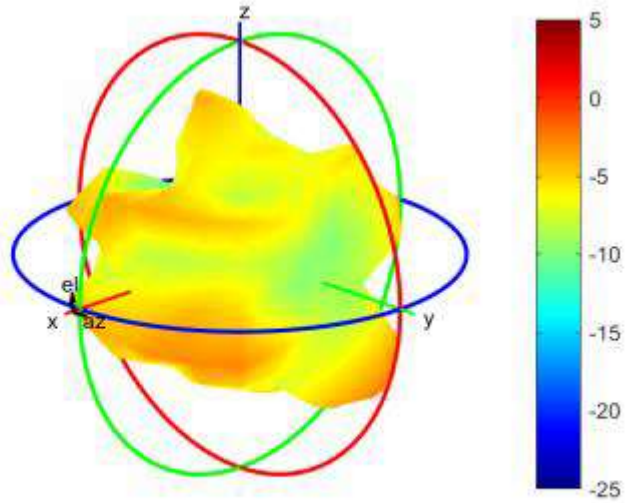
Center Frequency	**1462.9MHz**
Horizontal (dBi) peak	-6.34
Vertical (dBi) peak	-6.78

1496MHz



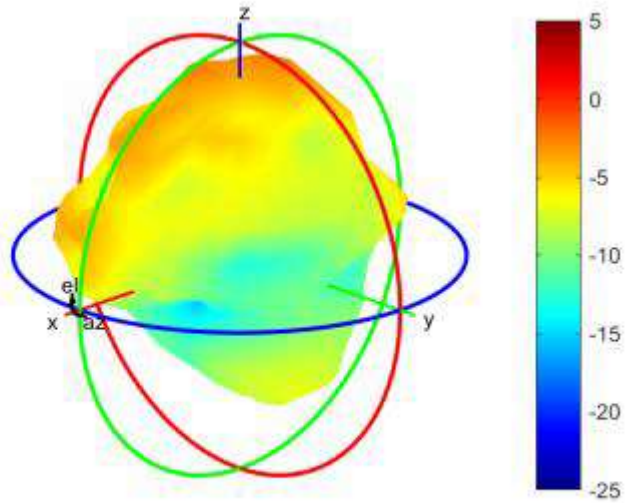
Center Frequency	**1496MHz**
Horizontal (dBi) peak	-6.62
Vertical (dBi) peak	-6.16

1510.9 MHz



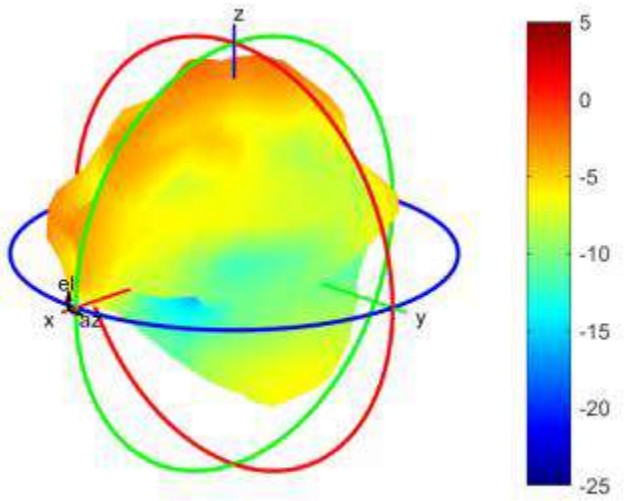
Center Frequency	**1510.9 MHz**
Horizontal (dBi) peak	-6.55
Vertical (dBi) peak	-6.14

1710 MHz



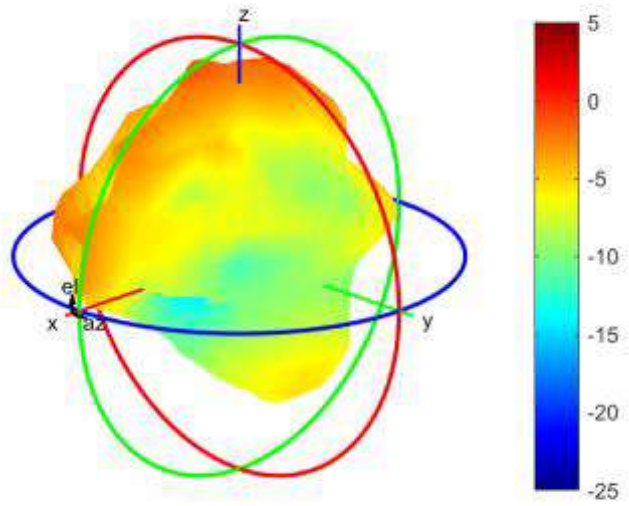
Center Frequency	**1710 MHz**
Horizontal (dBi) peak	-2.60
Vertical (dBi) peak	-2.78

1732.5 MHz



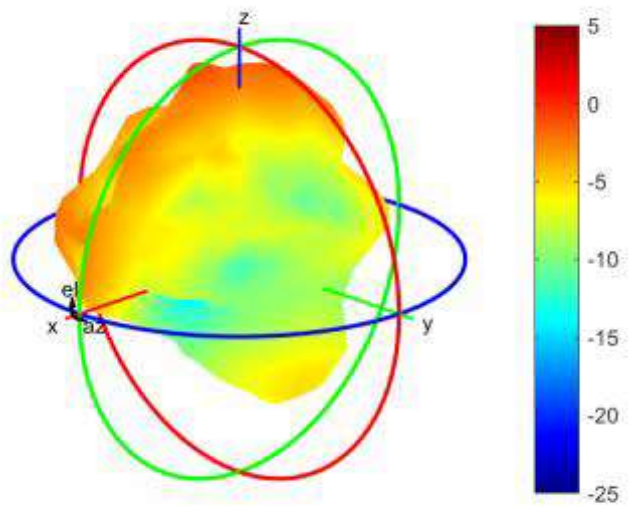
Center Frequency	**1732.5 MHz**
Horizontal (dBi) peak	-1.42
Vertical (dBi) peak	-2.09

1747.5 MHz



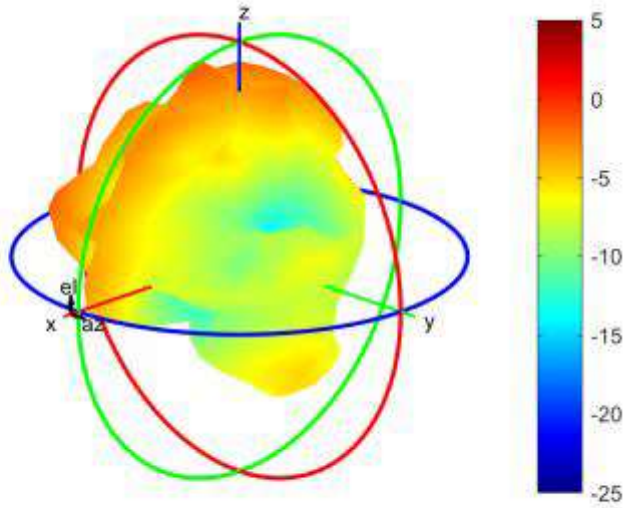
Center Frequency	**1747.5 MHz**
Horizontal (dBi) peak	-0.79
Vertical (dBi) peak	-1.89

1755 MHz



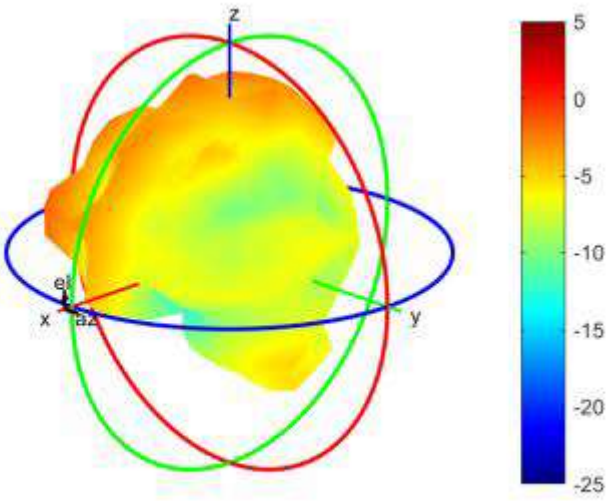
Center Frequency	**1755 MHz**
Horizontal (dBi) peak	-0.57
Vertical (dBi) peak	-1.97

1785 MHz



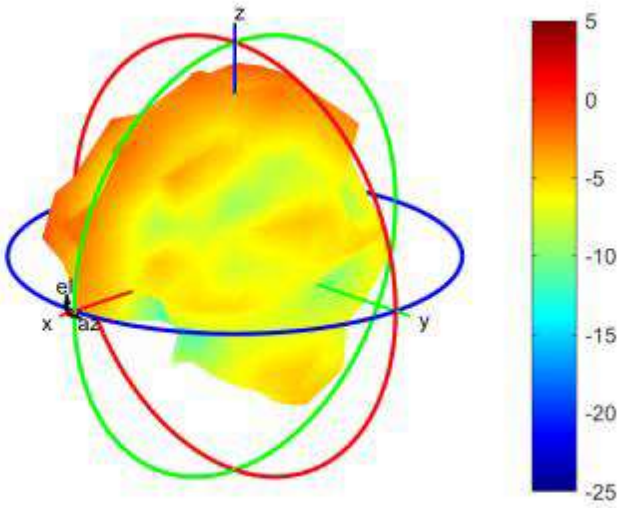
Center Frequency	**1785 MHz**
Horizontal (dBi) peak	-1.23
Vertical (dBi) peak	-3.17

1805 MHz



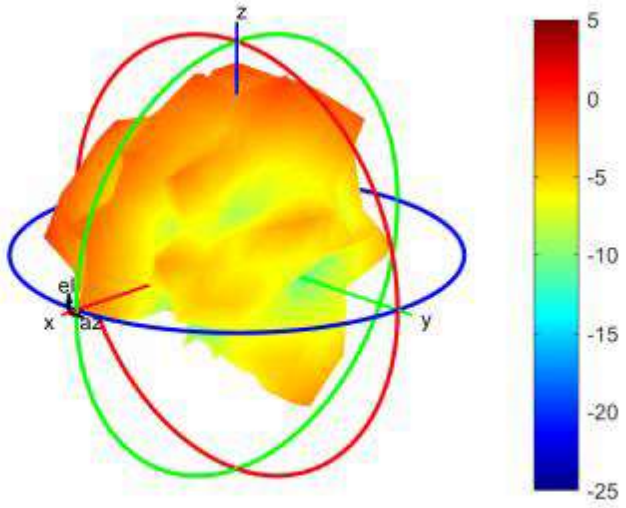
Center Frequency	**1805 MHz**
Horizontal (dBi) peak	-1.25
Vertical (dBi) peak	-2.99

1850 MHz



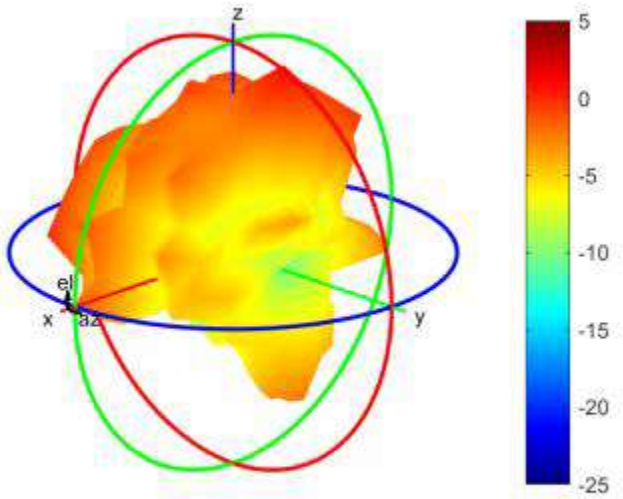
Center Frequency	**1850 MHz**
Horizontal (dBi) peak	-0.41
Vertical (dBi) peak	-2.27

1880 MHz



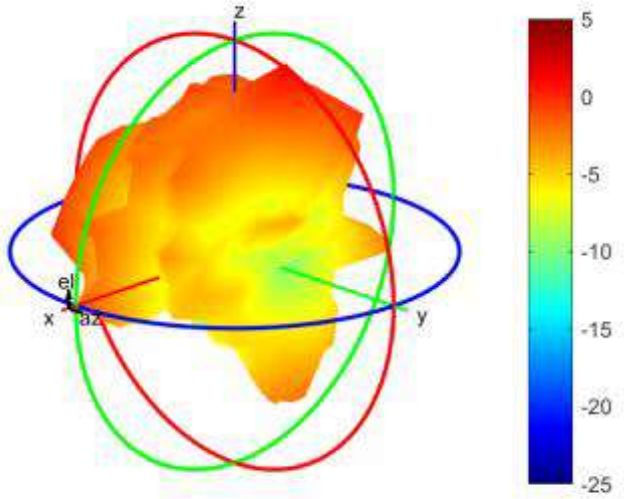
Center Frequency	**1880 MHz**
Horizontal (dBi) peak	-0.33
Vertical (dBi) peak	-1.66

1910MHz



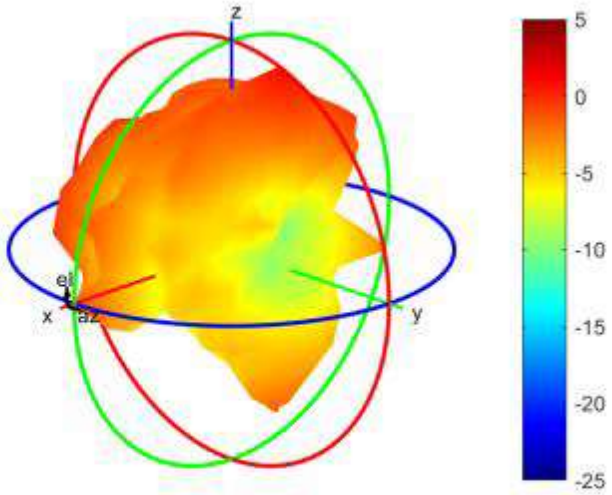
Center Frequency	**1910MHz**
Horizontal (dBi) peak	0.09
Vertical (dBi) peak	-1.12

1920MHz



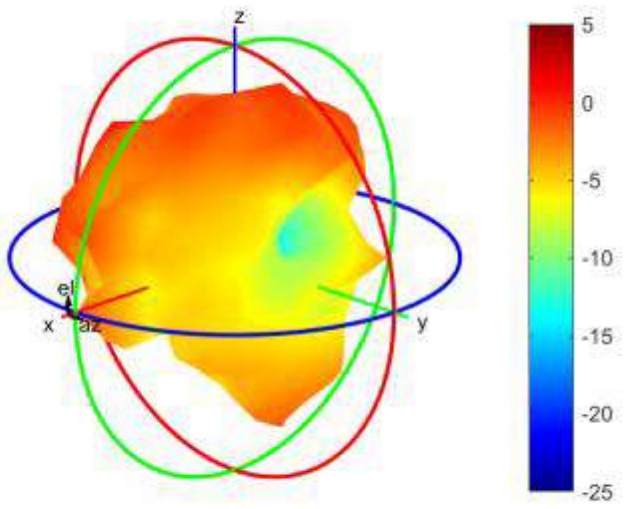
Center Frequency	**1920MHz**
Horizontal (dBi) peak	0.07
Vertical (dBi) peak	-1.15

1950MHz



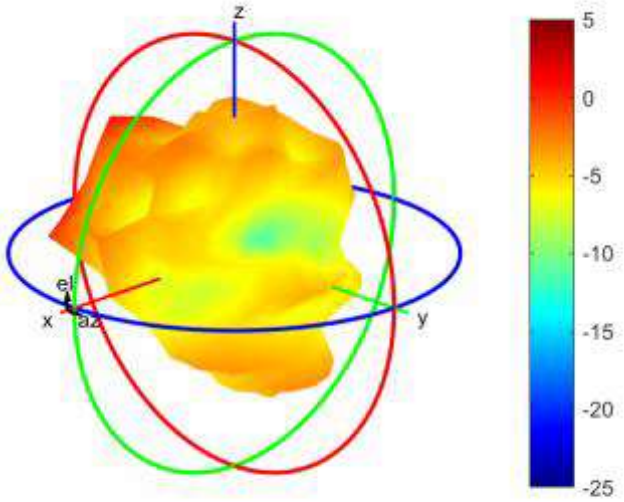
Center Frequency	**1950MHz**
Horizontal (dBi) peak	0.36
Vertical (dBi) peak	-1.05

1980MHz



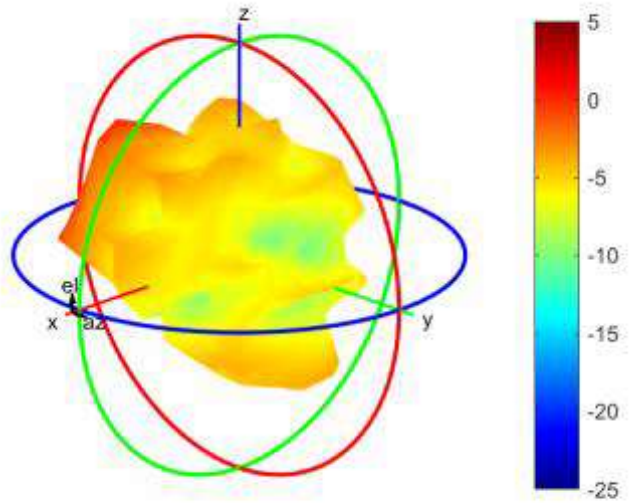
Center Frequency	**1980MHz**
Horizontal (dBi) peak	1.08
Vertical (dBi) peak	-0.46

2110MHz



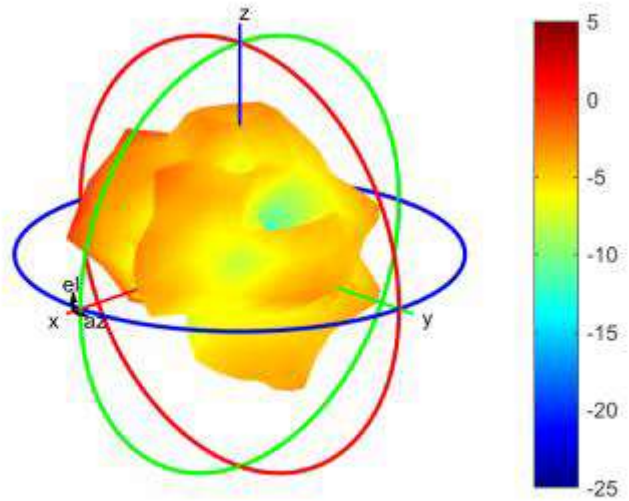
Center Frequency	**2110MHz**
Horizontal (dBi) peak	0.95
Vertical (dBi) peak	-0.75

2200MHz



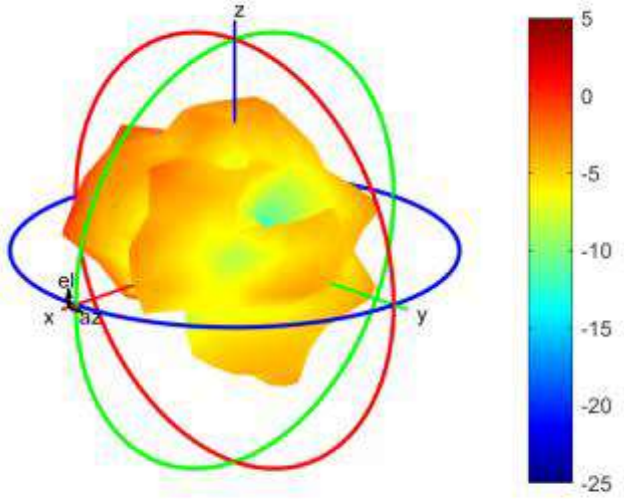
Center Frequency	**2200MHz**
Horizontal (dBi) peak	-0.05
Vertical (dBi) peak	-0.90

2300MHz



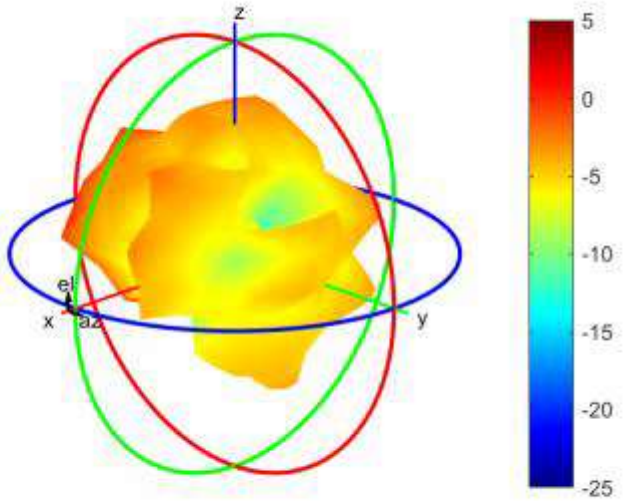
Center Frequency	**2300MHz**
Horizontal (dBi) peak	0.23
Vertical (dBi) peak	-0.41

2305MHz



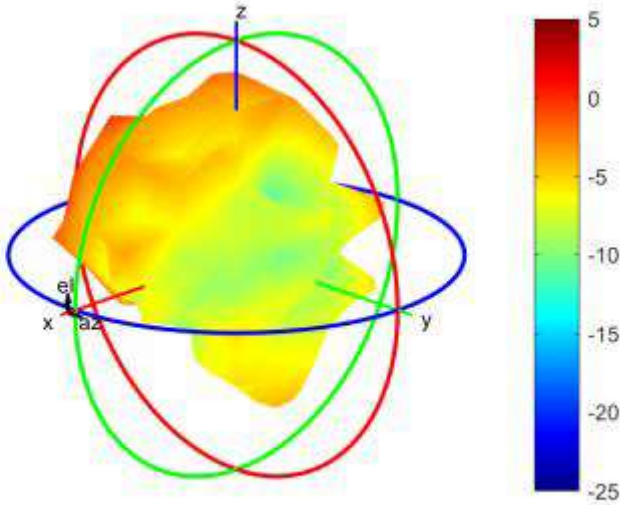
Center Frequency	**2305MHz**
Horizontal (dBi) peak	0.09
Vertical (dBi) peak	-0.48

2315MHz



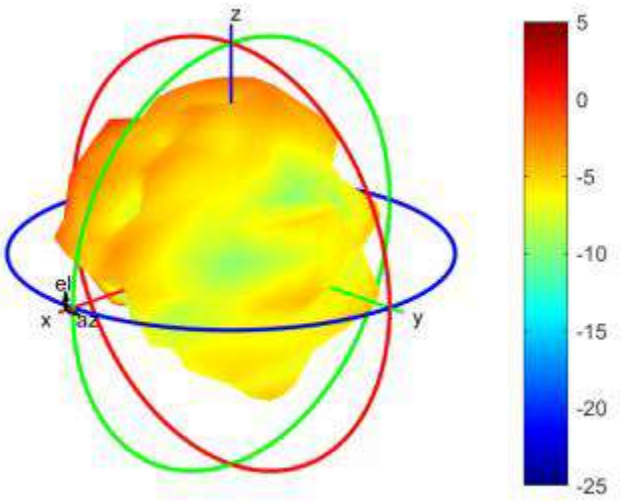
Center Frequency	**2315MHz**
Horizontal (dBi) peak	-0.09
Vertical (dBi) peak	-0.71

2350MHz



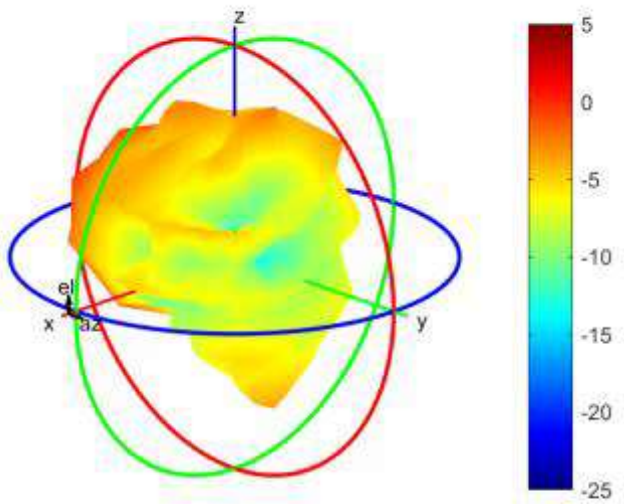
Center Frequency	**2350MHz**
Horizontal (dBi) peak	-0.51
Vertical (dBi) peak	-0.88

2400MHz



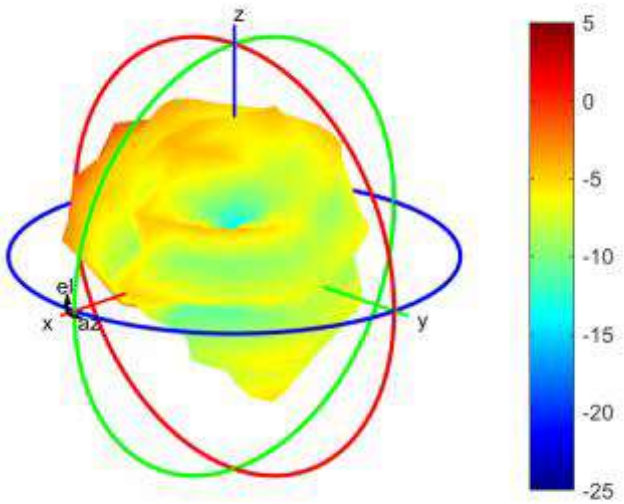
Center Frequency	**2400MHz**
Horizontal (dBi) peak	0.47
Vertical (dBi) peak	0.21

2500MHz



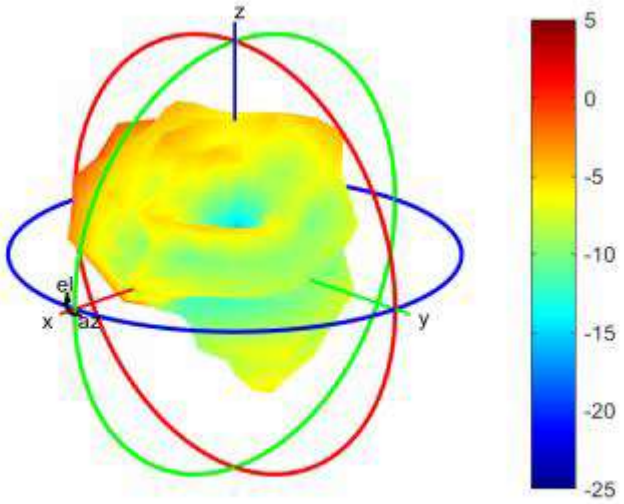
Center Frequency	**2500MHz**
Horizontal (dBi) peak	0.48
Vertical (dBi) peak	-0.64

2570MHz



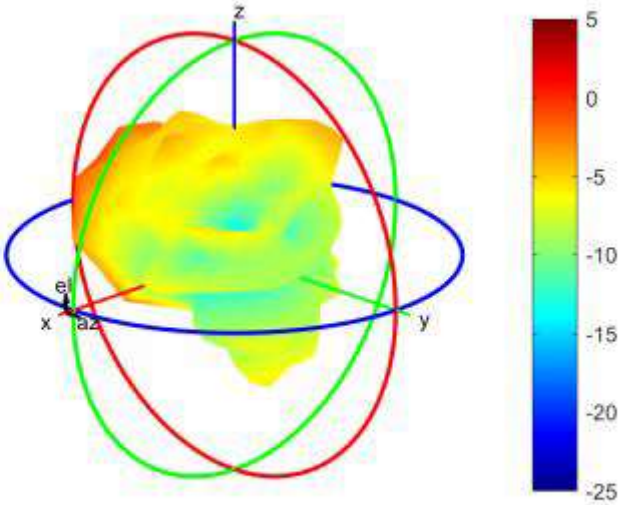
Center Frequency	**2570MHz**
Horizontal (dBi) peak	-0.36
Vertical (dBi) peak	-1.29

2595MHz



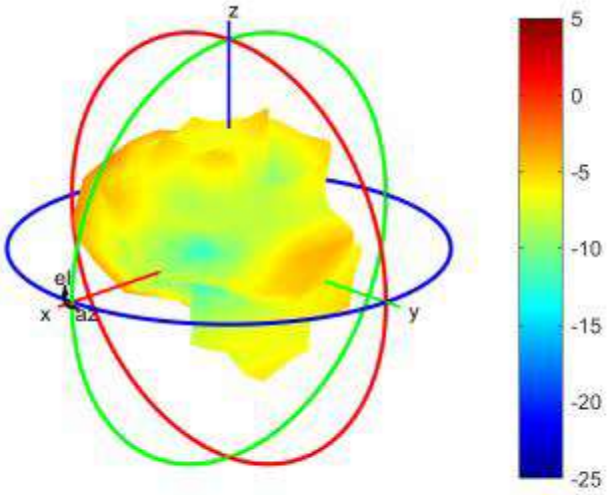
Center Frequency	**2595MHz**
Horizontal (dBi) peak	-0.33
Vertical (dBi) peak	-1.67

2620MHz



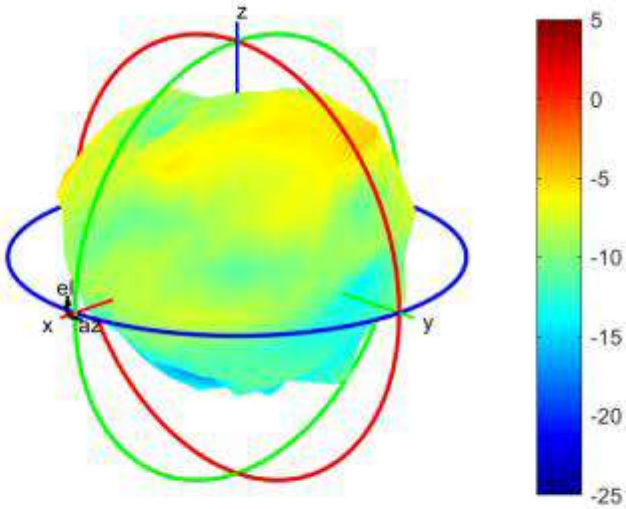
Center Frequency	**2620MHz**
Horizontal (dBi) peak	-0.37
Vertical (dBi) peak	-1.63

2690MHz



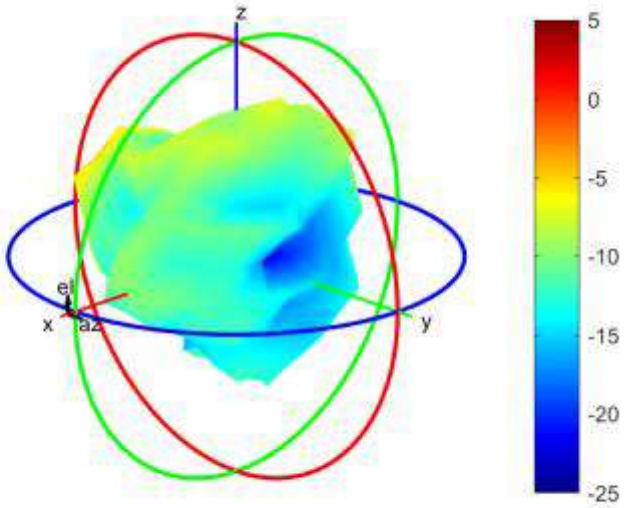
Center Frequency	**2690MHz**
Horizontal (dBi) peak	-1.95
Vertical (dBi) peak	-2.40

3400MHz



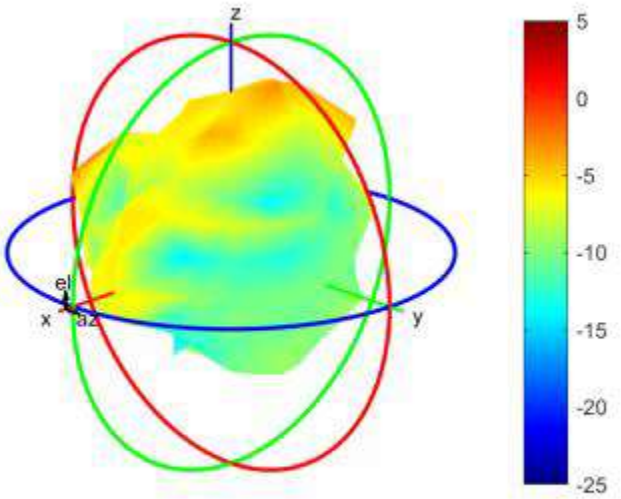
Center Frequency	**3400MHz**
Horizontal (dBi) peak	-4.33
Vertical (dBi) peak	-6.42

3500MHz



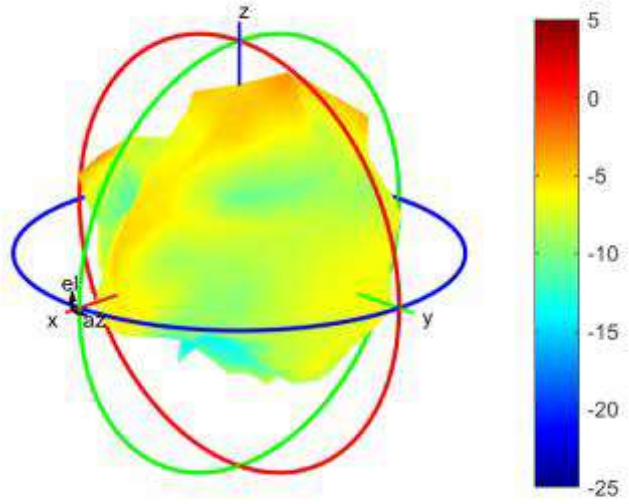
Center Frequency	**3500MHz**
Horizontal (dBi) peak	-4.80
Vertical (dBi) peak	-6.68

3600MHz



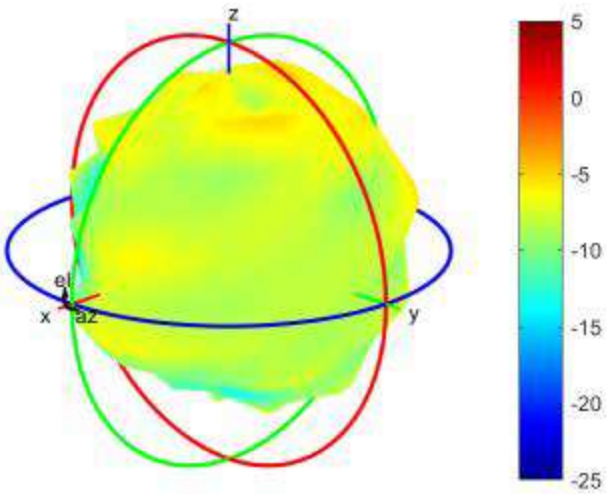
Center Frequency	**3600MHz**
Horizontal (dBi) peak	-3.16
Vertical (dBi) peak	-3.76

3700MHz



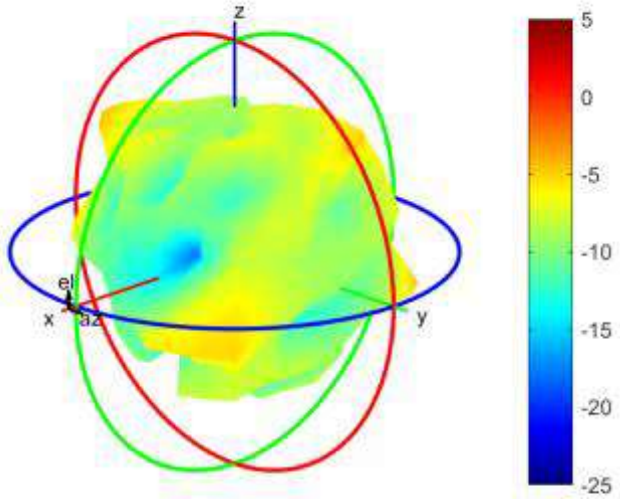
Center Frequency	**3700MHz**
Horizontal (dBi) peak	-3.57
Vertical (dBi) peak	-4.46

3800MHz



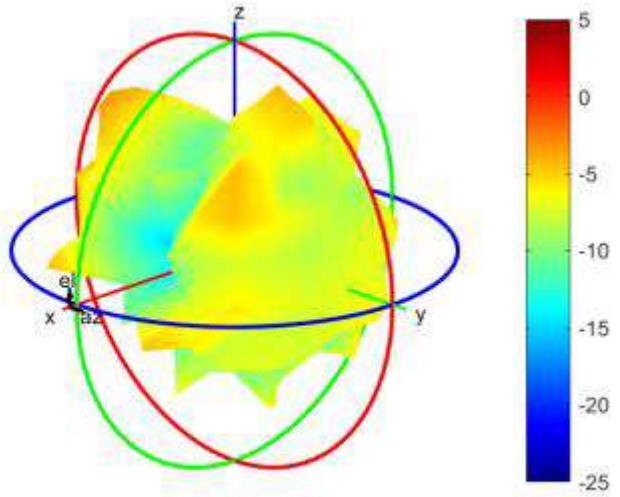
Center Frequency	**3800MHz**
Horizontal (dBi) peak	-5.48
Vertical (dBi) peak	-5.10

4200MHz



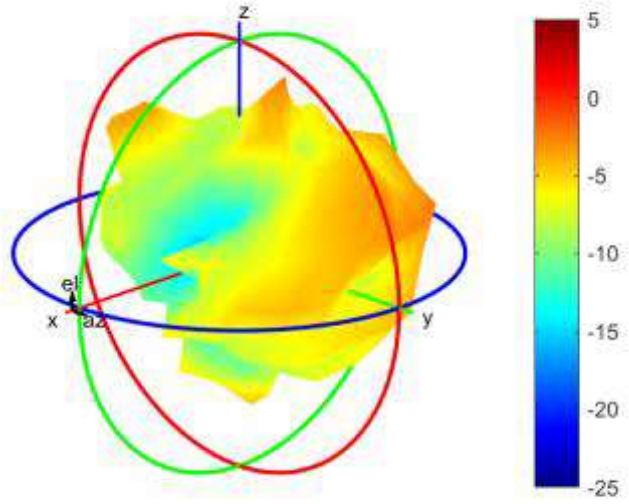
Center Frequency	**4200MHz**
Horizontal (dBi) peak	-4.30
Vertical (dBi) peak	-3.93

4400MHz



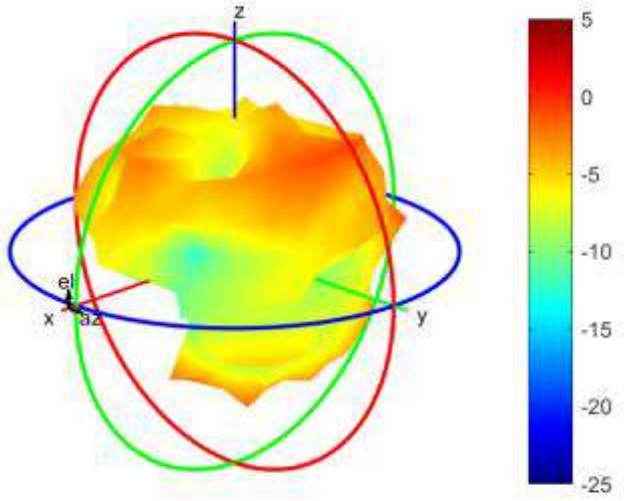
Center Frequency	**4400MHz**
Horizontal (dBi) peak	-4.46
Vertical (dBi) peak	-4.30

4700MHz



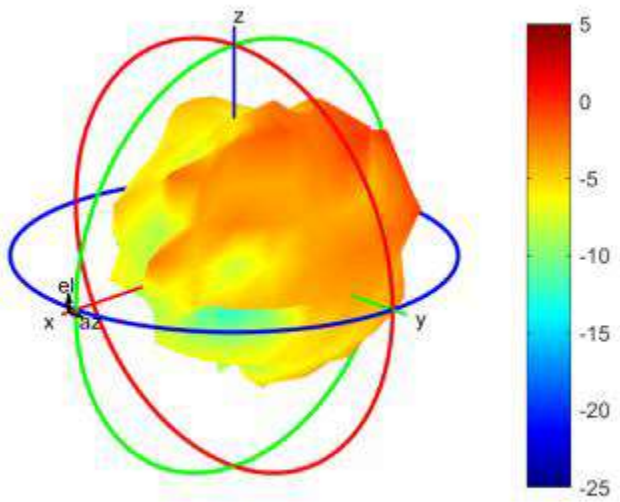
Center Frequency	**4700MHz**
Horizontal (dBi) peak	-3.92
Vertical (dBi) peak	-3.51

5150MHz



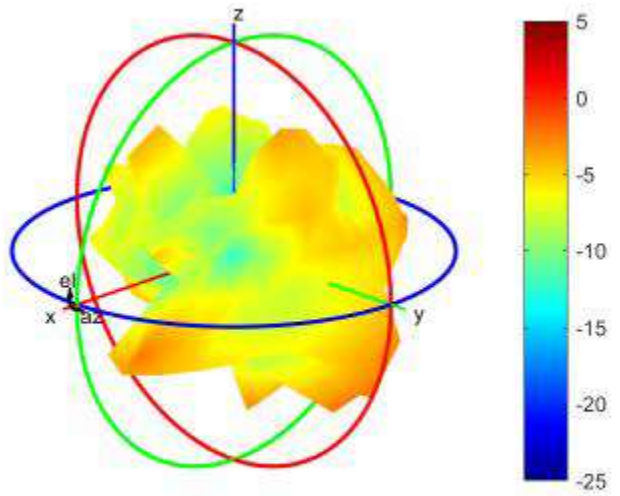
Center Frequency	**5150MHz**
Horizontal (dBi) peak	-4.01
Vertical (dBi) peak	-4.13

5537.5MHz



Center Frequency	**5537.5MHz**
Horizontal (dBi) peak	-4.22
Vertical (dBi) peak	-4.47

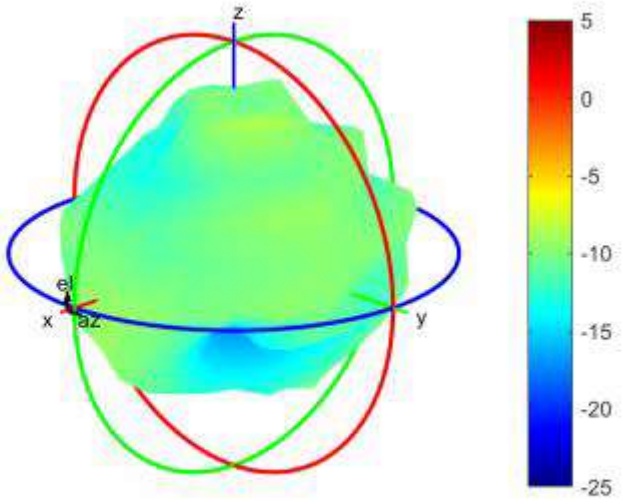
5925MHz



Center Frequency	**5925MHz**
Horizontal (dBi) peak	-3.47
Vertical (dBi) peak	-4.42

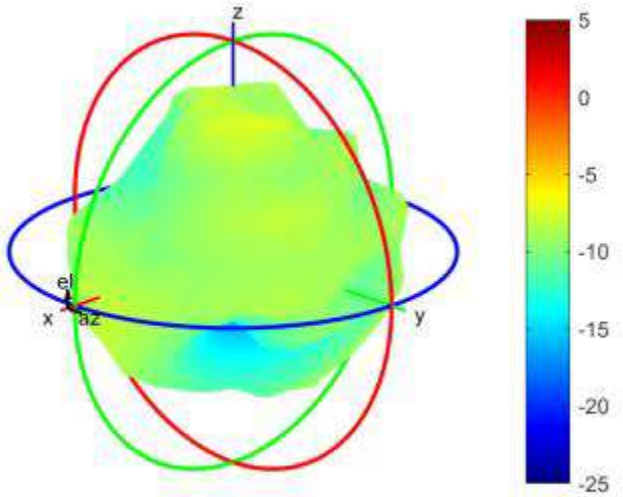
WWAN Aux Antenna (DRx)

617MHz



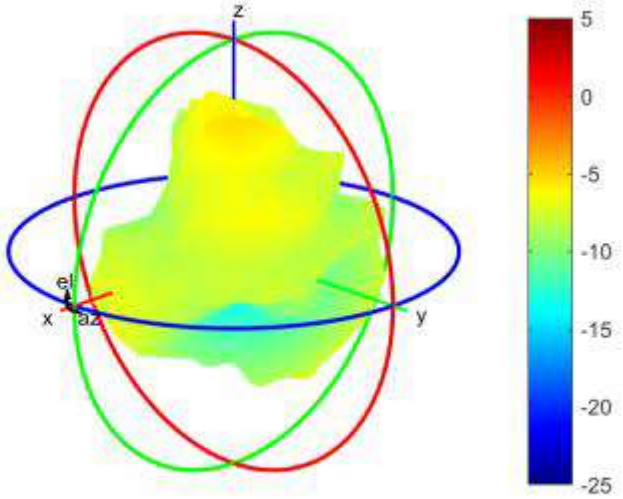
Center Frequency	**617MHz**
Horizontal (dBi) peak	-10.40
Vertical (dBi) peak	-9.57

634MHz



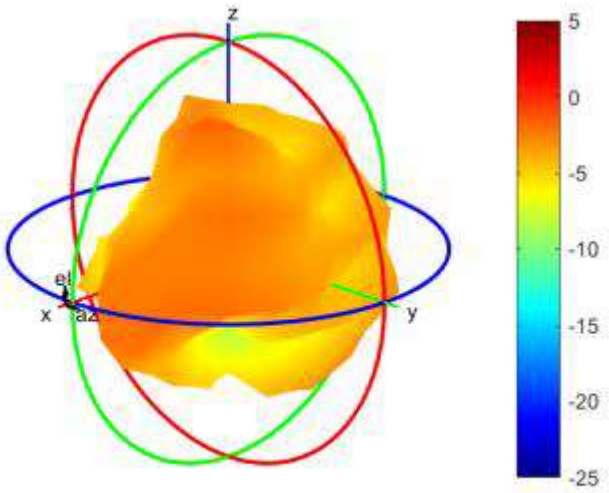
Center Frequency	634**MHz**
Horizontal (dBi) peak	-9.32
Vertical (dBi) peak	-8.20

652MHz



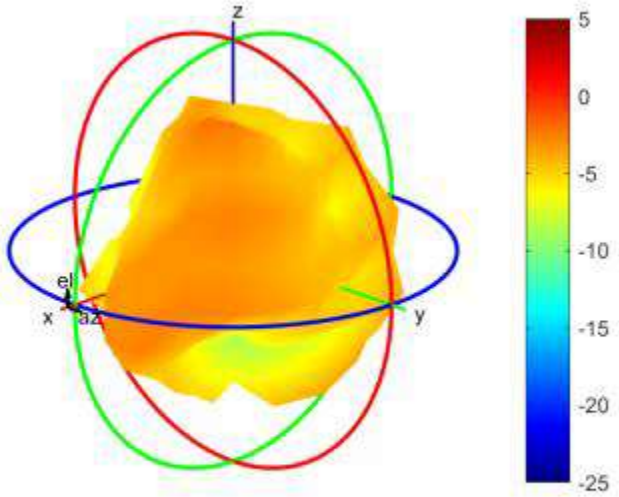
Center Frequency	**652MHz**
Horizontal (dBi) peak	-8.14
Vertical (dBi) peak	-5.89

717MHz



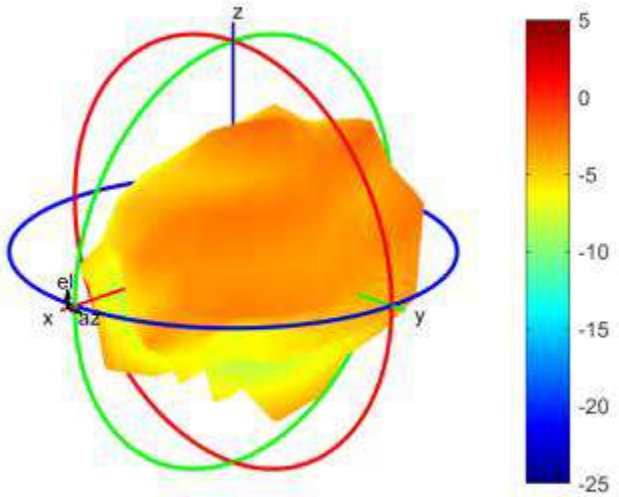
Center Frequency	**717MHz**
Horizontal (dBi) peak	-4.05
Vertical (dBi) peak	-2.66

725.5MHz



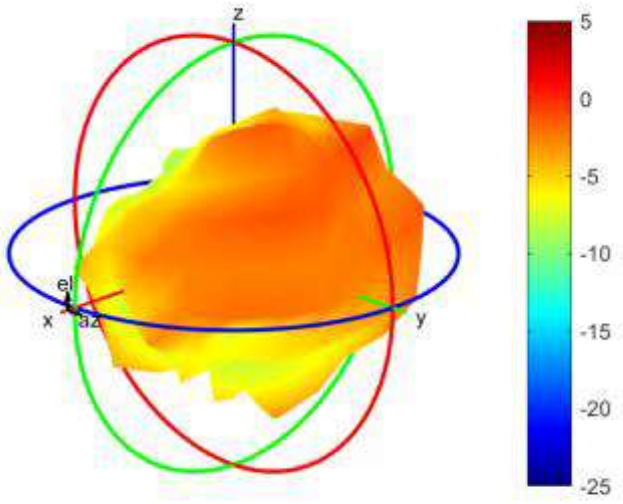
Center Frequency	**725.5MHz**
Horizontal (dBi) peak	-4.25
Vertical (dBi) peak	-3.20

748MHz



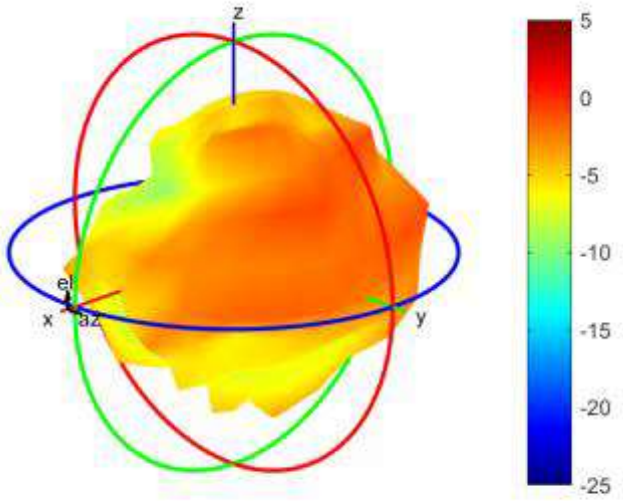
Center Frequency	**748MHz**
Horizontal (dBi) peak	-2.13
Vertical (dBi) peak	-3.71

756MHz



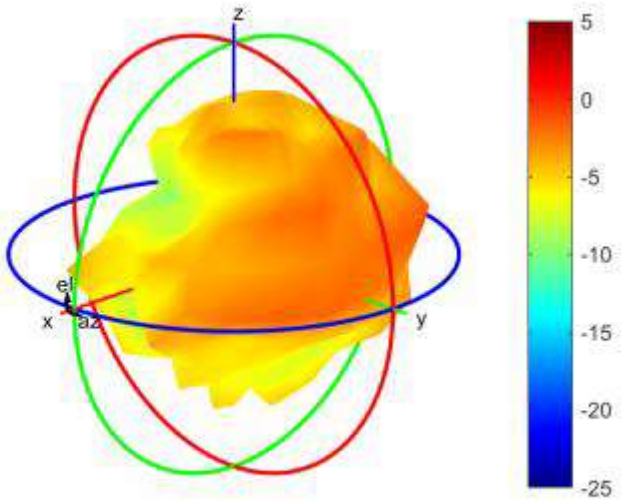
Center Frequency	**756MHz**
Horizontal (dBi) peak	-1.65
Vertical (dBi) peak	-2.77

768MHz



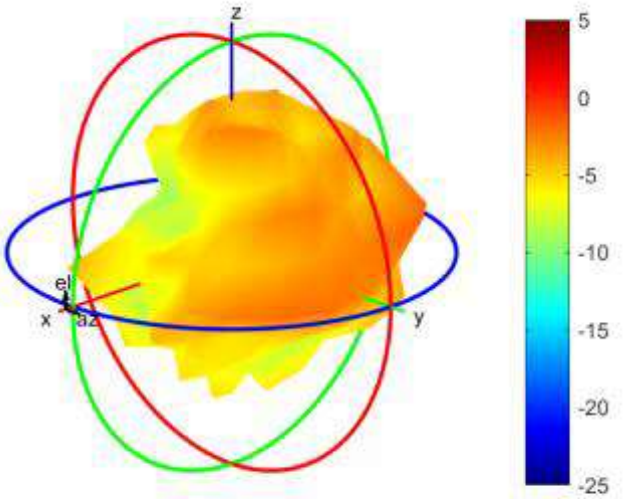
Center Frequency	**768MHz**
Horizontal (dBi) peak	-1.75
Vertical (dBi) peak	-3.04

777MHz



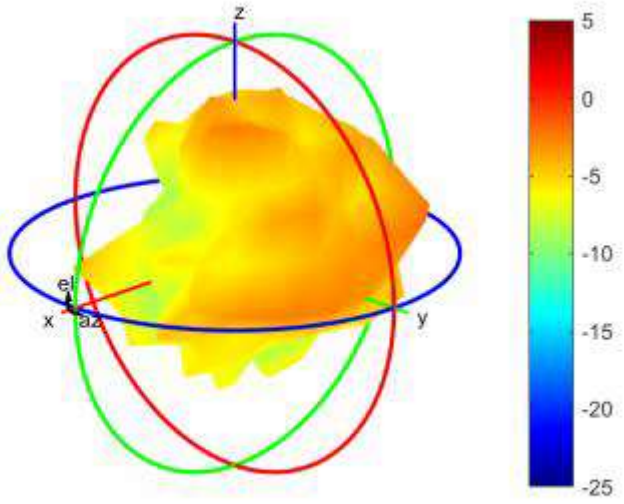
Center Frequency	**777MHz**
Horizontal (dBi) peak	-1.88
Vertical (dBi) peak	-3.11

782MHz



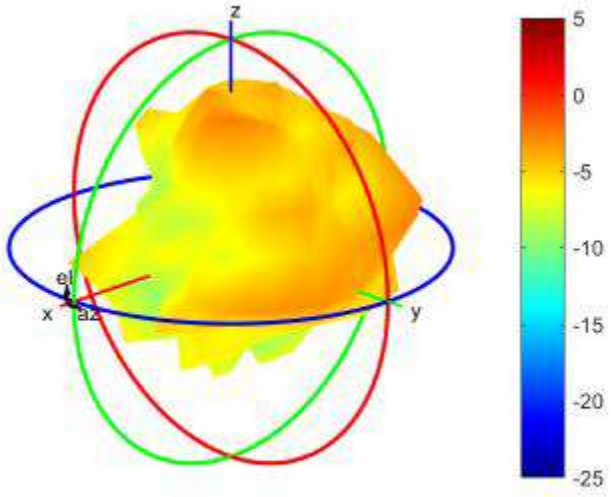
Center Frequency	**782MHz**
Horizontal (dBi) peak	-2.31
Vertical (dBi) peak	-3.22

787MHz



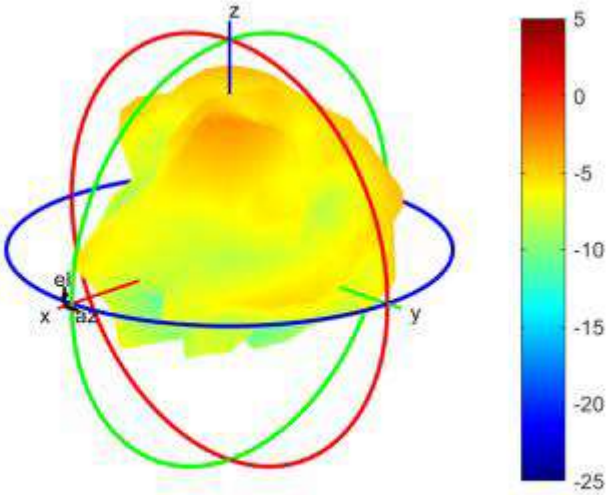
Center Frequency	**787MHz**
Horizontal (dBi) peak	-2.72
Vertical (dBi) peak	-3.44

791MHz



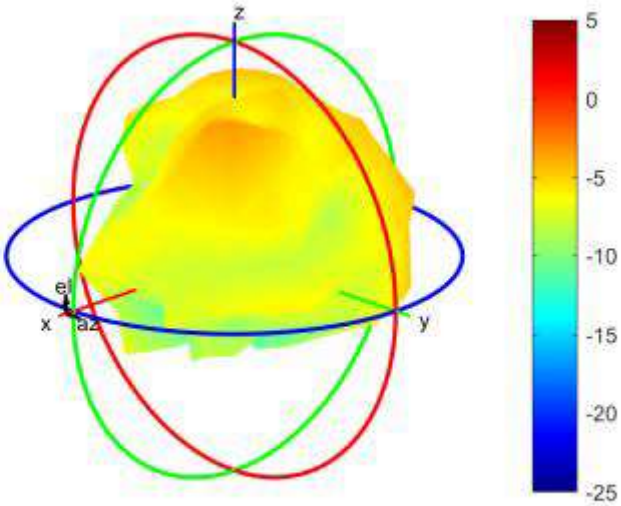
Center Frequency	**791MHz**
Horizontal (dBi) peak	-3.41
Vertical (dBi) peak	-3.47

806MHz



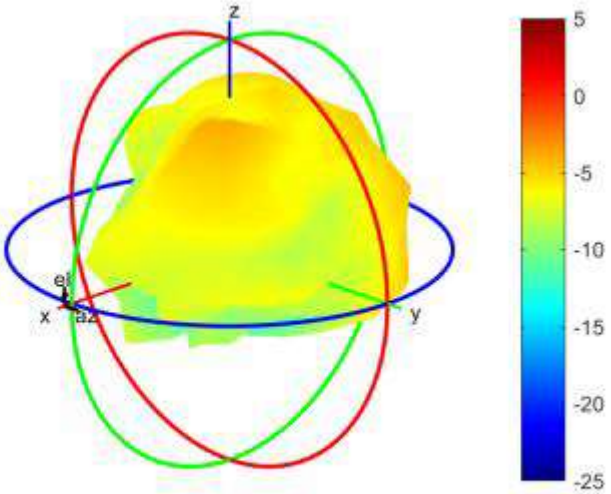
Center Frequency	**806MHz**
Horizontal (dBi) peak	-4.22
Vertical (dBi) peak	-4.01

814MHz



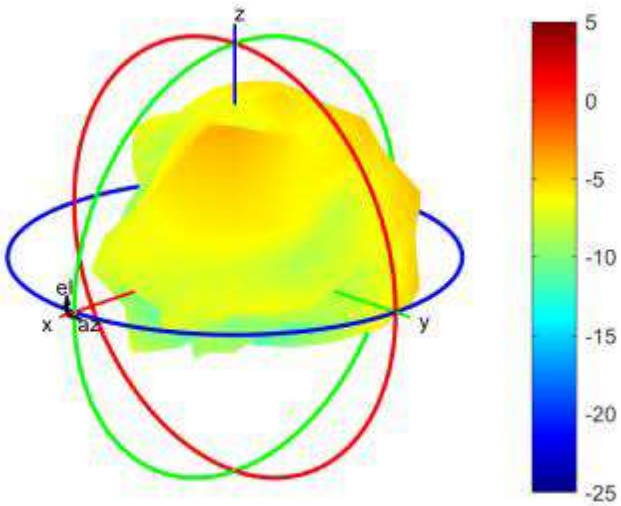
Center Frequency	**814MHz**
Horizontal (dBi) peak	-4.94
Vertical (dBi) peak	-3.88

821MHz



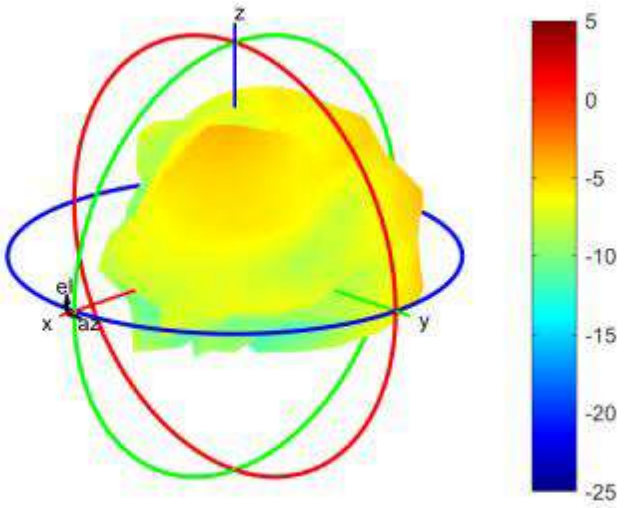
Center Frequency	**821MHz**
Horizontal (dBi) peak	-5.84
Vertical (dBi) peak	-3.78

824MHz



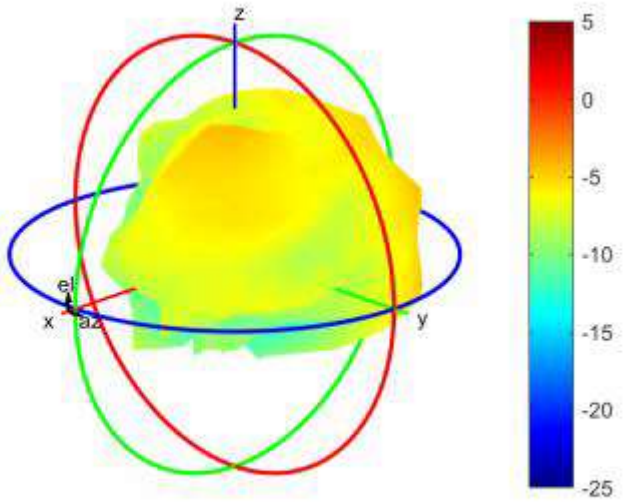
Center Frequency	**824MHz**
Horizontal (dBi) peak	-6.19
Vertical (dBi) peak	-3.82

832MHz



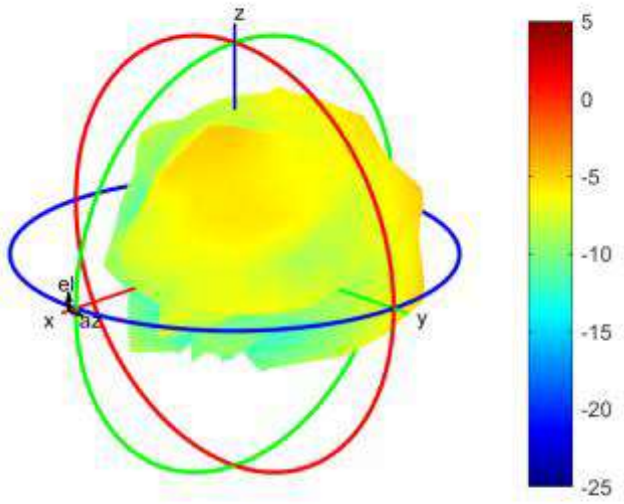
Center Frequency	**832MHz**
Horizontal (dBi) peak	-6.11
Vertical (dBi) peak	-3.99

836.5MHz



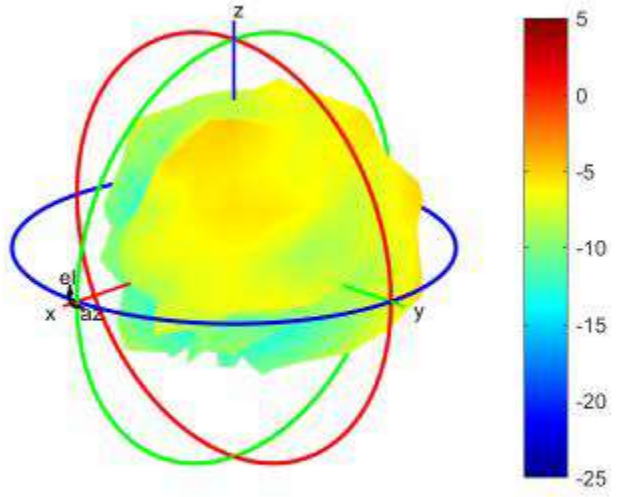
Center Frequency	**836.5MHz**
Horizontal (dBi) peak	-6.32
Vertical (dBi) peak	-4.08

849MHz



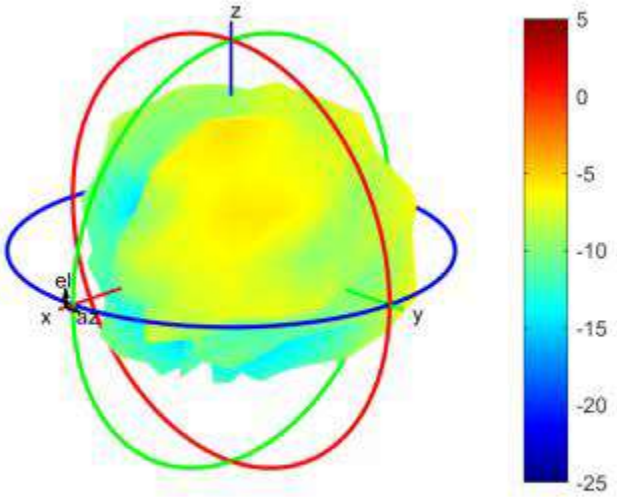
Center Frequency	**849MHz**
Horizontal (dBi) peak	-6.79
Vertical (dBi) peak	-4.35

862MHz



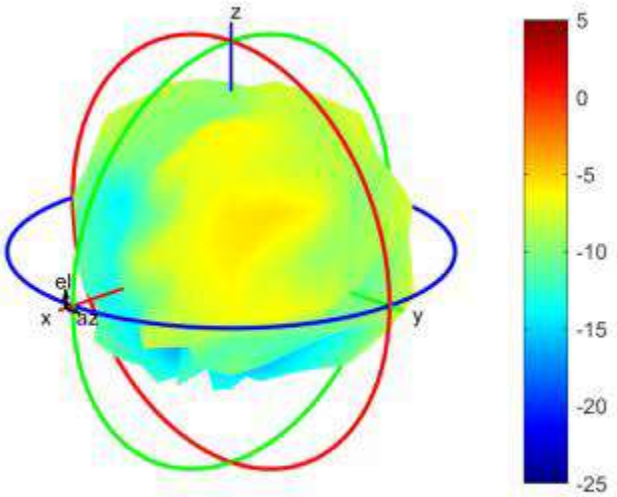
Center Frequency	**862MHz**
Horizontal (dBi) peak	-6.73
Vertical (dBi) peak	-4.72

880MHz



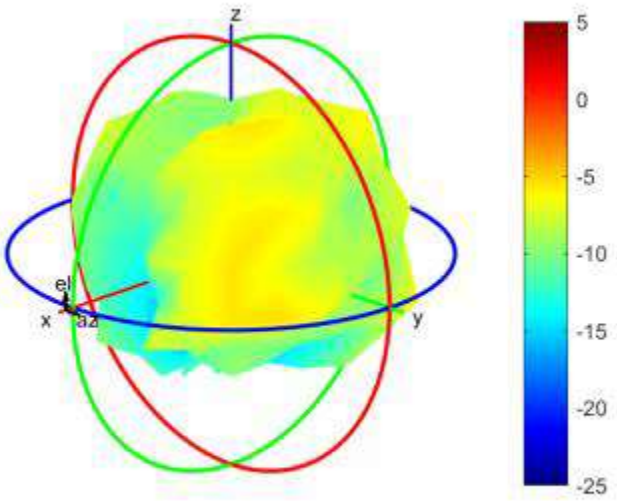
Center Frequency	**880MHz**
Horizontal (dBi) peak	-6.84
Vertical (dBi) peak	-5.85

897.5MHz



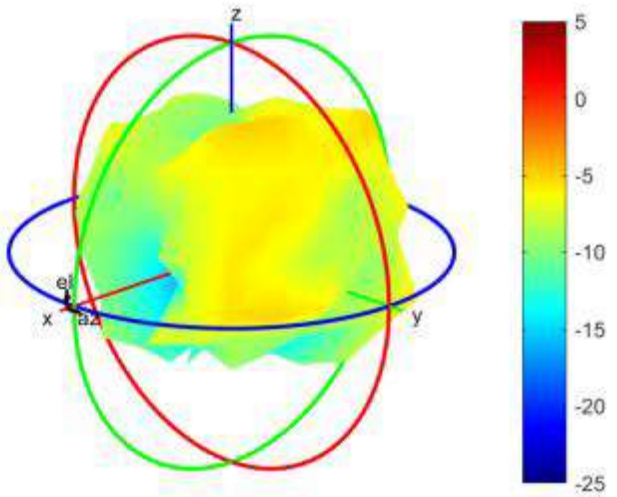
Center Frequency	**897.5MHz**
Horizontal (dBi) peak	-7.65
Vertical (dBi) peak	-6.64

915MHz



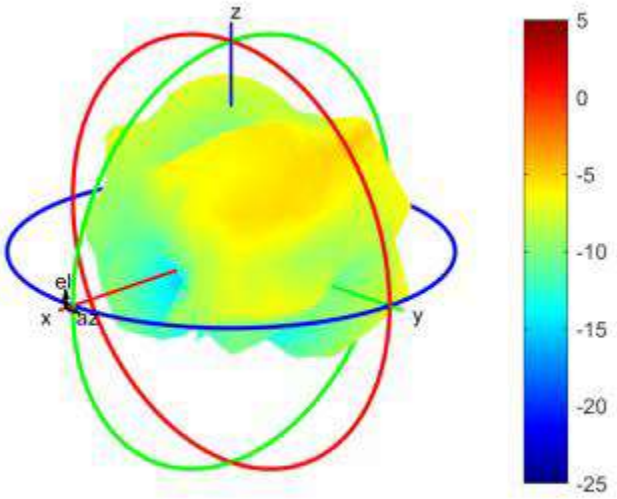
Center Frequency	**915MHz**
Horizontal (dBi) peak	-6.28
Vertical (dBi) peak	-6.19

925MHz



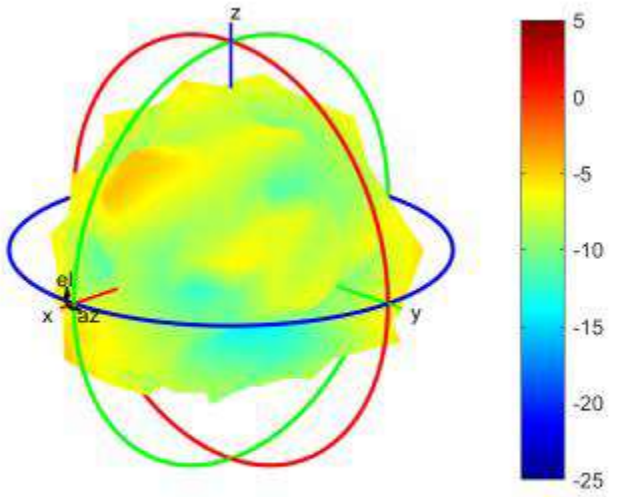
Center Frequency	**925MHz**
Horizontal (dBi) peak	-5.38
Vertical (dBi) peak	-5.51

960MHz



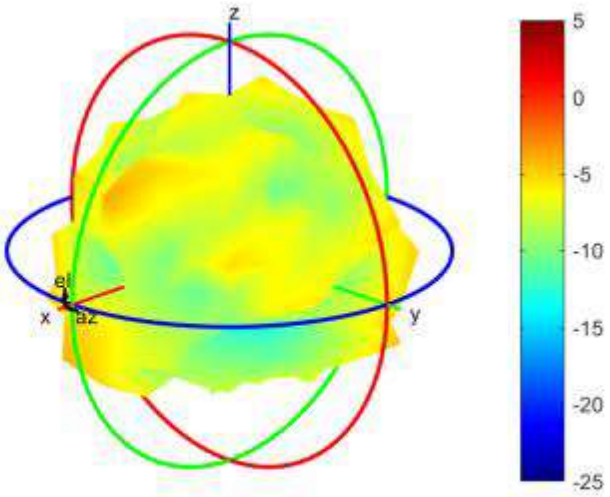
Center Frequency	**960MHz**
Horizontal (dBi) peak	-5.20
Vertical (dBi) peak	-5.99

1427.9MHz



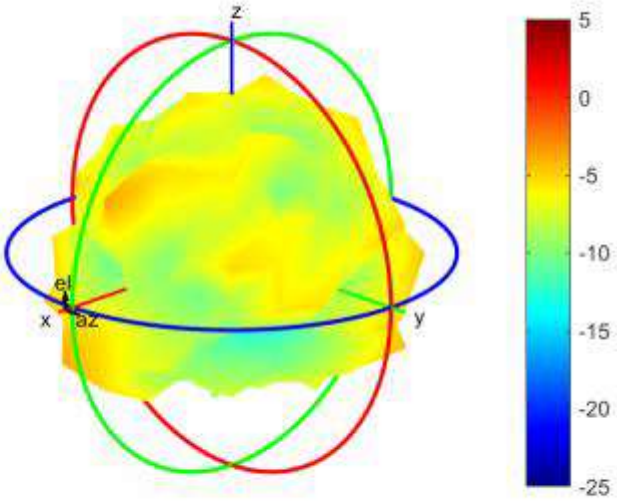
Center Frequency	**1427.9MHz**
Horizontal (dBi) peak	-5.55
Vertical (dBi) peak	-5.03

1447.9MHz



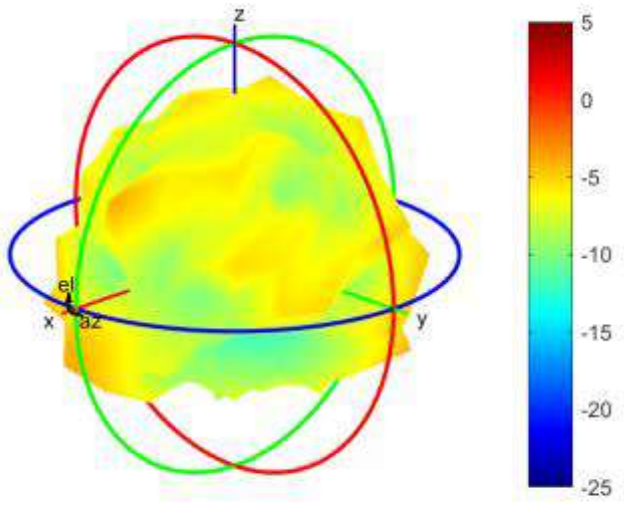
Center Frequency	**1447.9MHz**
Horizontal (dBi) peak	-5.21
Vertical (dBi) peak	-4.19

1455.4MHz



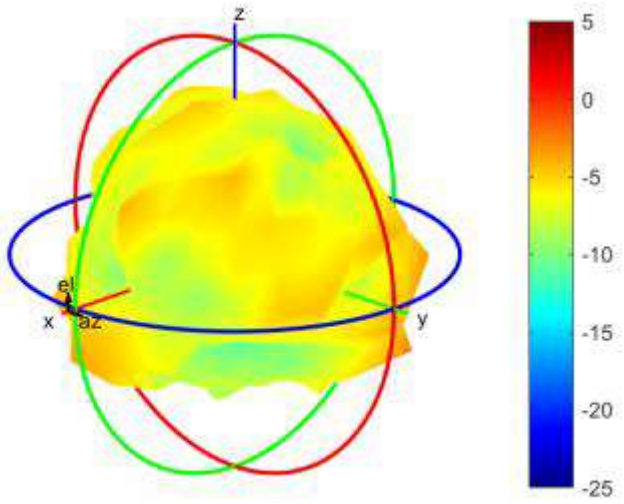
Center Frequency	**1455.4MHz**
Horizontal (dBi) peak	-5.16
Vertical (dBi) peak	-3.97

1462.9MHz



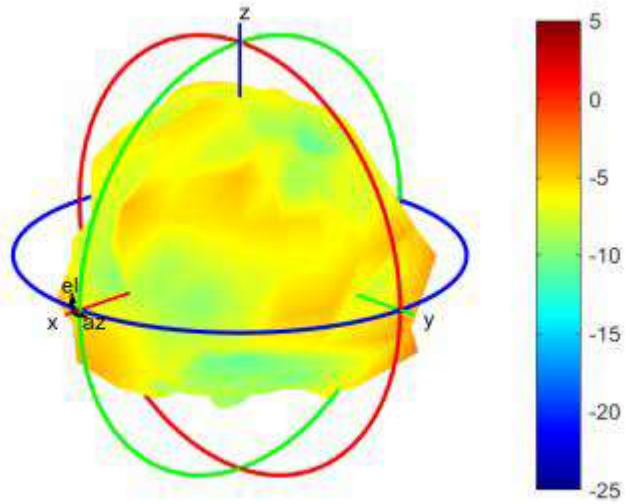
Center Frequency	**1462.9MHz**
Horizontal (dBi) peak	-4.88
Vertical (dBi) peak	-3.77

1496MHz



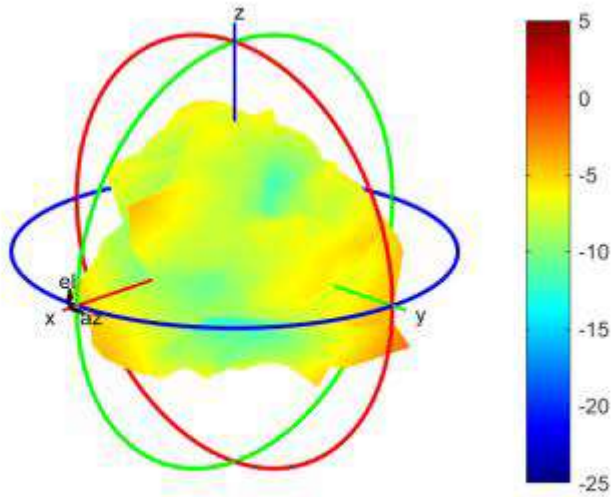
Center Frequency	**1496MHz**
Horizontal (dBi) peak	-4.54
Vertical (dBi) peak	-2.50

1510.9MHz



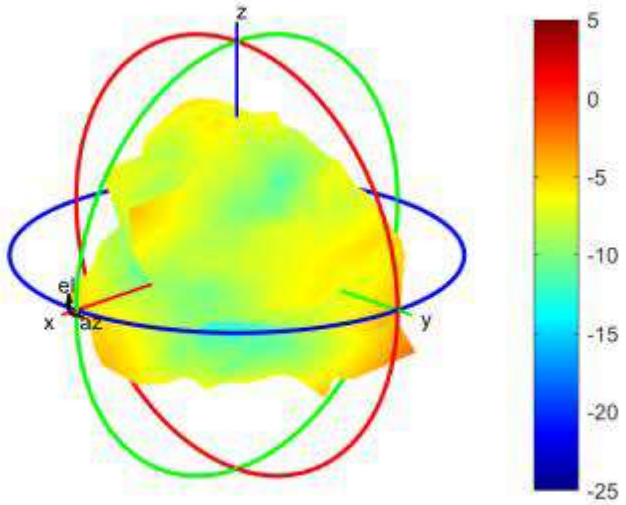
Center Frequency	**1510.9MHz**
Horizontal (dBi) peak	-4.79
Vertical (dBi) peak	-2.15

1557MHz



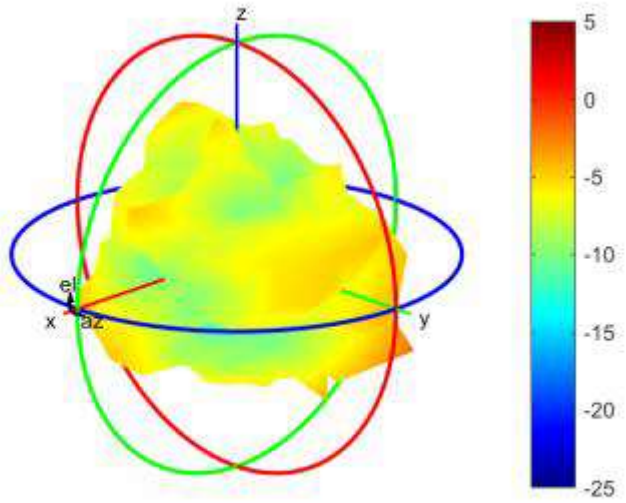
Center Frequency	**1557MHz**
Horizontal (dBi) peak	-5.16
Vertical (dBi) peak	-4.92

1575MHz



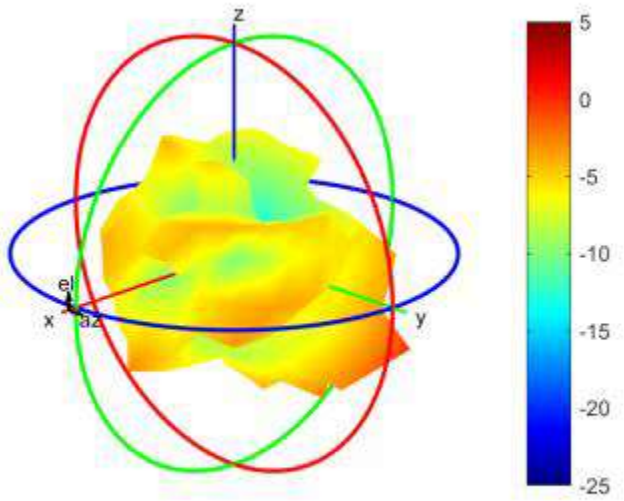
Center Frequency	**1575MHz**
Horizontal (dBi) peak	-4.77
Vertical (dBi) peak	-4.96

1610MHz



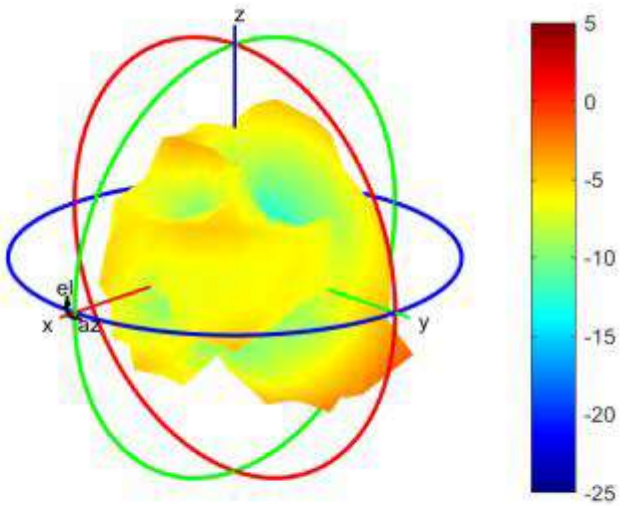
Center Frequency	**1610MHz**
Horizontal (dBi) peak	-4.79
Vertical (dBi) peak	-3.86

1805 MHz



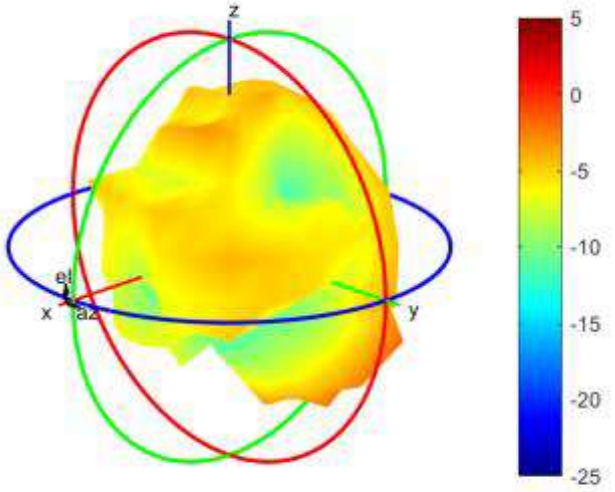
Center Frequency	**1805 MHz**
Horizontal (dBi) peak	-3.26
Vertical (dBi) peak	-1.73

1850 MHz



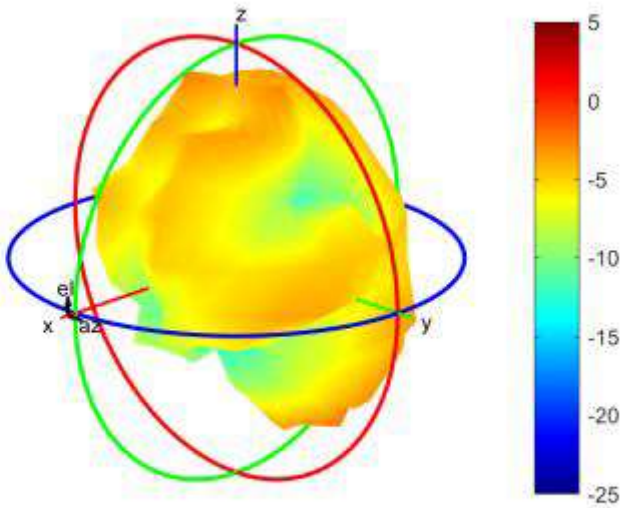
Center Frequency	**1850 MHz**
Horizontal (dBi) peak	-2.46
Vertical (dBi) peak	-2.58

1880 MHz



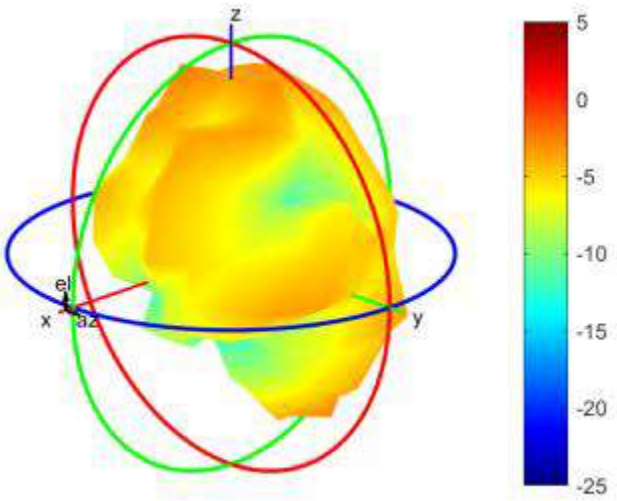
Center Frequency	**1880 MHz**
Horizontal (dBi) peak	-2.17
Vertical (dBi) peak	-2.21

1910MHz



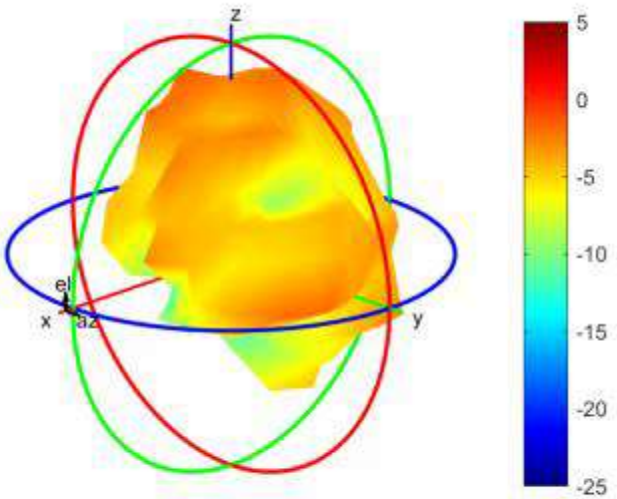
Center Frequency	**1910MHz**
Horizontal (dBi) peak	-2.88
Vertical (dBi) peak	-2.93

1920MHz



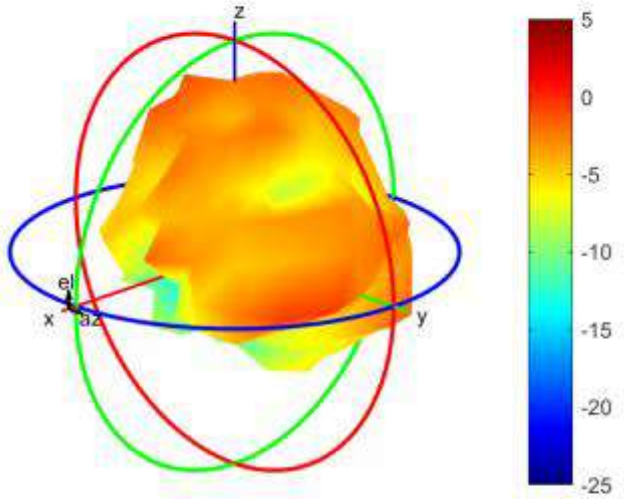
Center Frequency	**1920MHz**
Horizontal (dBi) peak	-3.05
Vertical (dBi) peak	-3.29

1950MHz



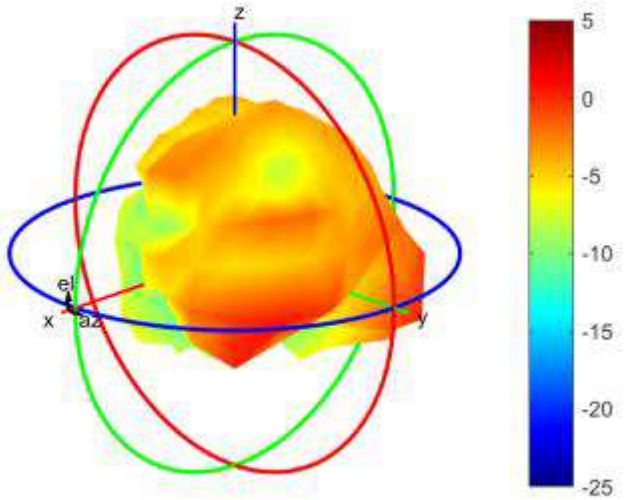
Center Frequency	**1950MHz**
Horizontal (dBi) peak	-2.77
Vertical (dBi) peak	-2.49

1980MHz



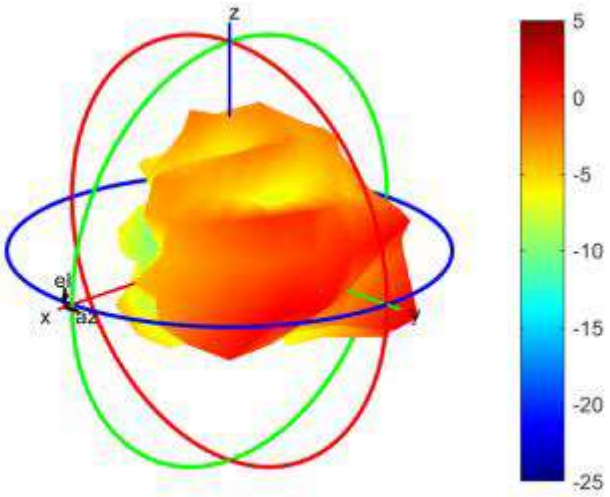
Center Frequency	**1980MHz**
Horizontal (dBi) peak	-2.91
Vertical (dBi) peak	-1.69

2110MHz



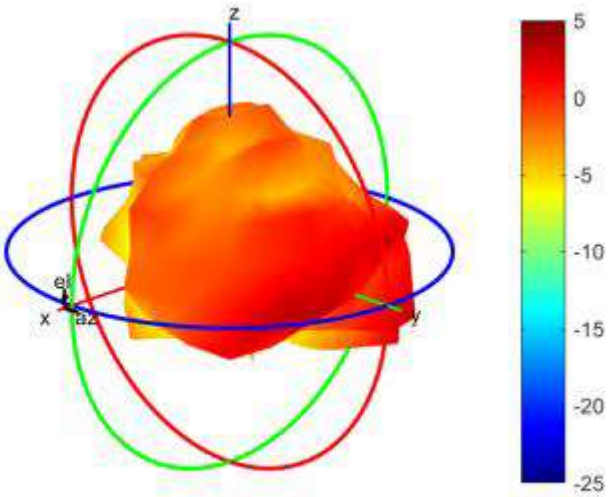
Center Frequency	**2110MHz**
Horizontal (dBi) peak	-1.56
Vertical (dBi) peak	-3.26

2200MHz



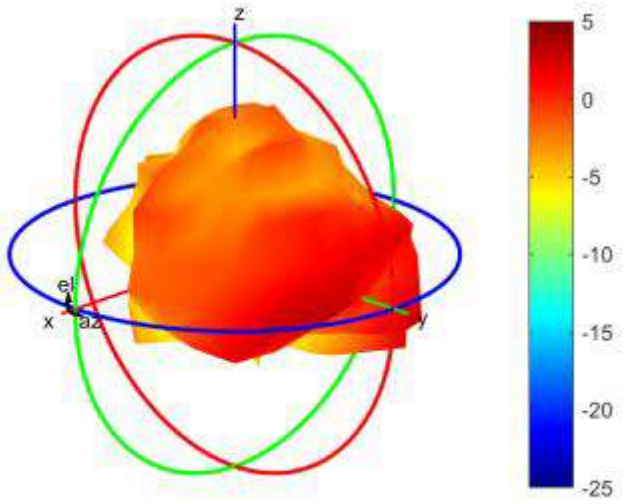
Center Frequency	**2200MHz**
Horizontal (dBi) peak	-2.07
Vertical (dBi) peak	-1.60

2300MHz



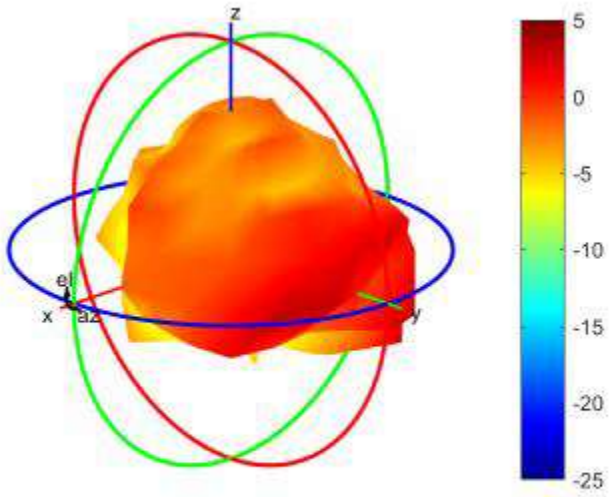
Center Frequency	**2300MHz**
Horizontal (dBi) peak	1.44
Vertical (dBi) peak	2.37

2305MHz



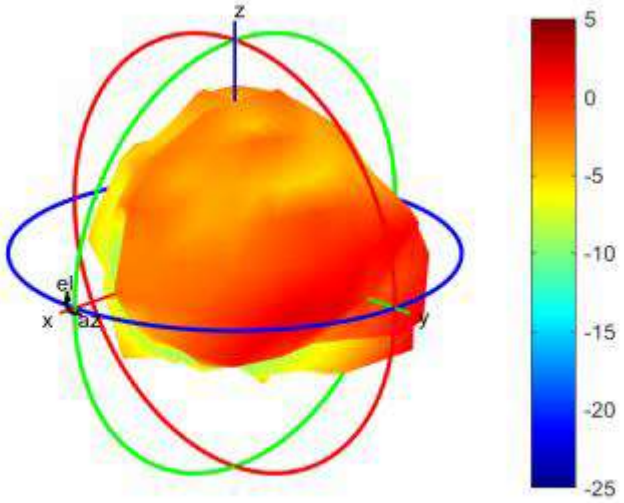
Center Frequency	**2305MHz**
Horizontal (dBi) peak	1.42
Vertical (dBi) peak	2.31

2315MHz



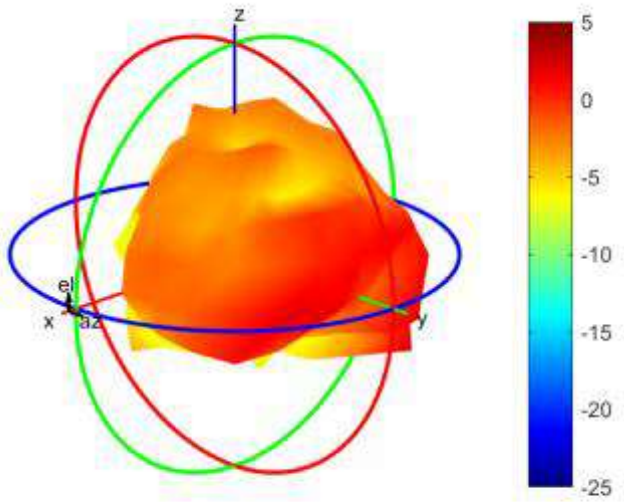
Center Frequency	**2315MHz**
Horizontal (dBi) peak	1.32
Vertical (dBi) peak	2.16

2350MHz



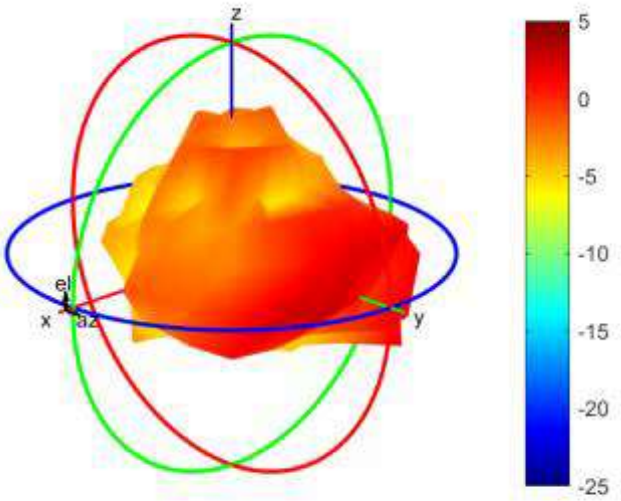
Center Frequency	**2350MHz**
Horizontal (dBi) peak	0.52
Vertical (dBi) peak	1.62

2400MHz



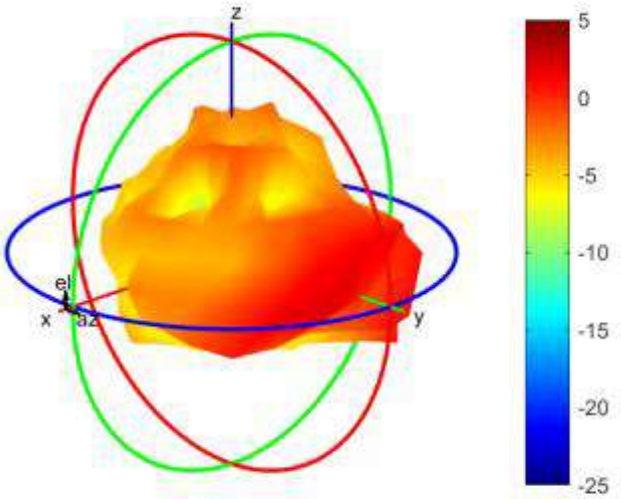
Center Frequency	**2400MHz**
Horizontal (dBi) peak	0.63
Vertical (dBi) peak	2.04

2500MHz



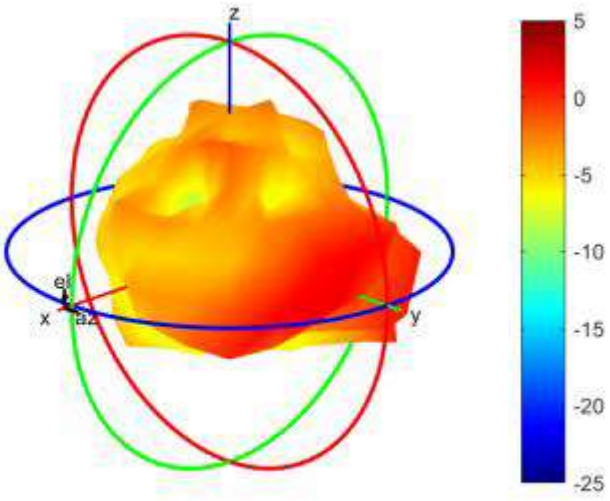
Center Frequency	**2500MHz**
Horizontal (dBi) peak	1.88
Vertical (dBi) peak	1.89

2570MHz



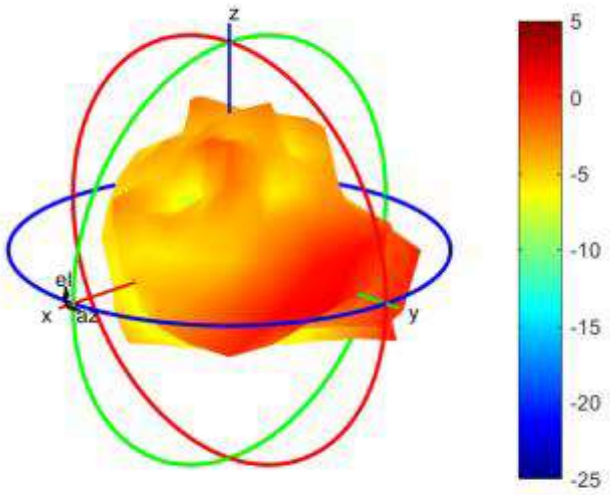
Center Frequency	**2570MHz**
Horizontal (dBi) peak	1.54
Vertical (dBi) peak	1.10

2595MHz



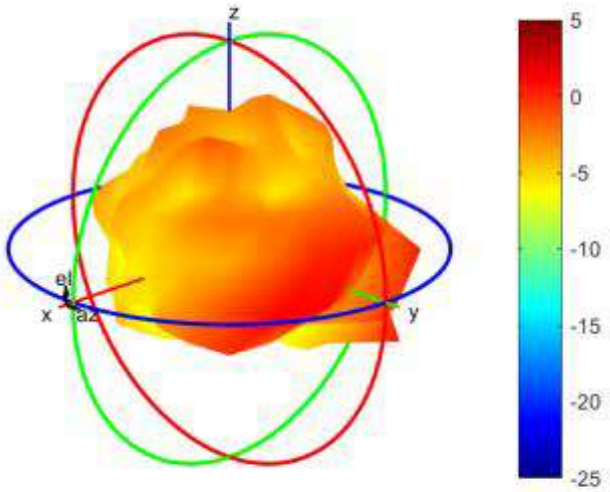
Center Frequency	**2595MHz**
Horizontal (dBi) peak	1.47
Vertical (dBi) peak	0.67

2620MHz



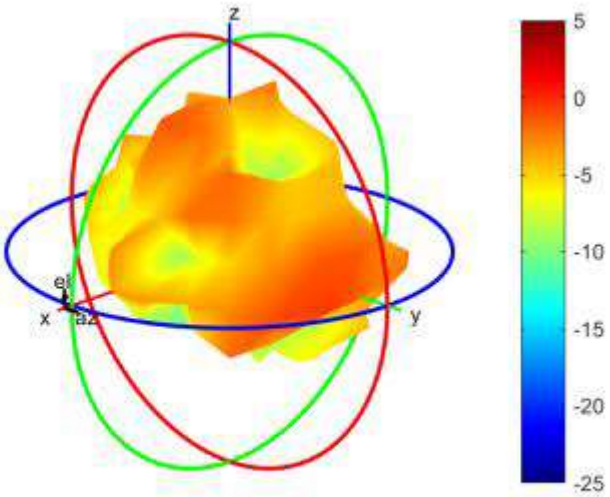
Center Frequency	**2620MHz**
Horizontal (dBi) peak	1.09
Vertical (dBi) peak	0.46

2690MHz



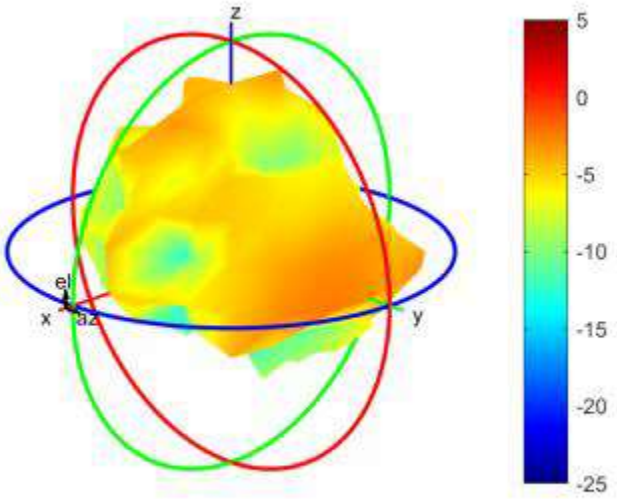
Center Frequency	**2690MHz**
Horizontal (dBi) peak	0.61
Vertical (dBi) peak	0.72

3400MHz



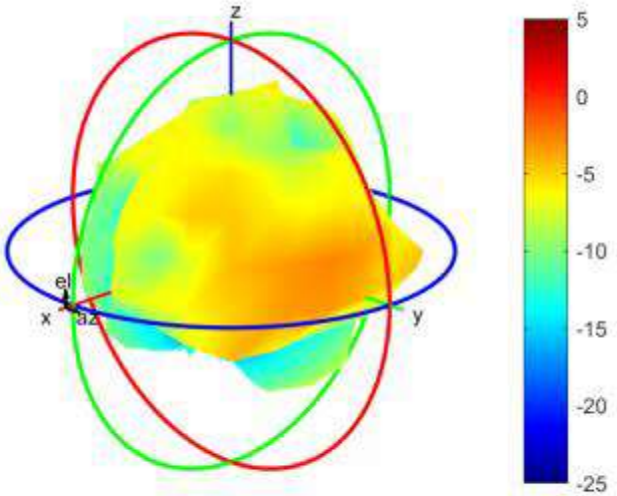
Center Frequency	**3400MHz**
Horizontal (dBi) peak	-0.95
Vertical (dBi) peak	-1.33

3500MHz



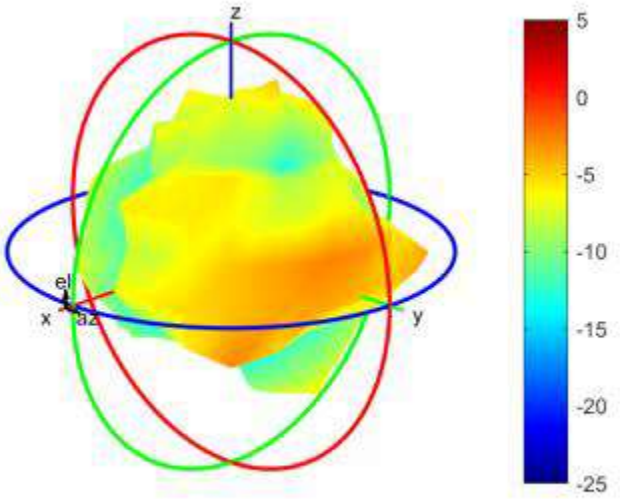
Center Frequency	**3500MHz**
Horizontal (dBi) peak	-2.94
Vertical (dBi) peak	-2.88

3600MHz



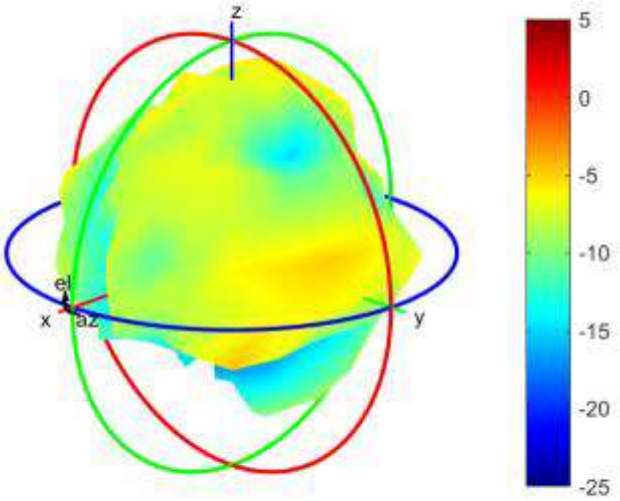
Center Frequency	**3600MHz**
Horizontal (dBi) peak	-2.76
Vertical (dBi) peak	-3.90

3700MHz



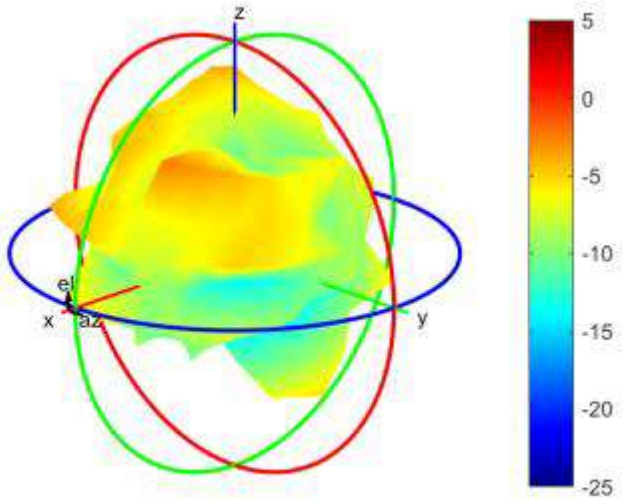
Center Frequency	**3700MHz**
Horizontal (dBi) peak	-2.81
Vertical (dBi) peak	-3.14

3800MHz



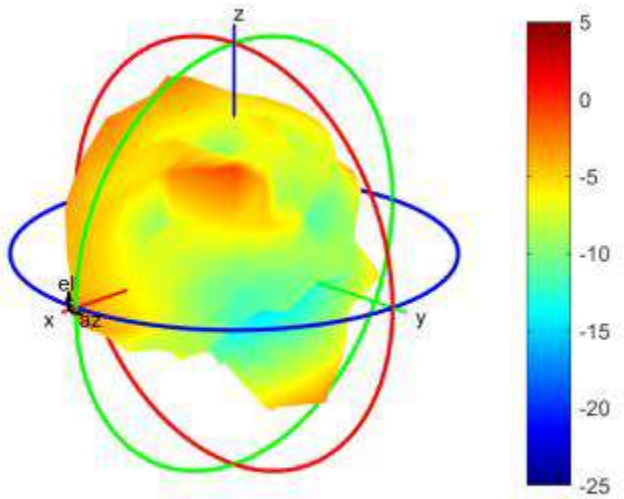
Center Frequency	**3800MHz**
Horizontal (dBi) peak	-5.14
Vertical (dBi) peak	-4.67

4200MHz



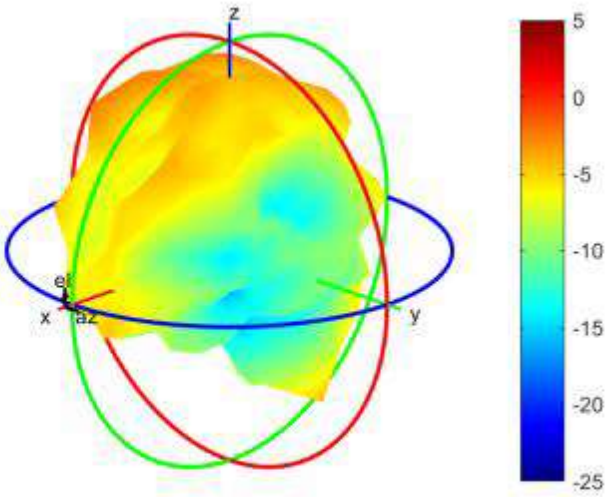
Center Frequency	**4200MHz**
Horizontal (dBi) peak	-5.12
Vertical (dBi) peak	-5.00

4400MHz



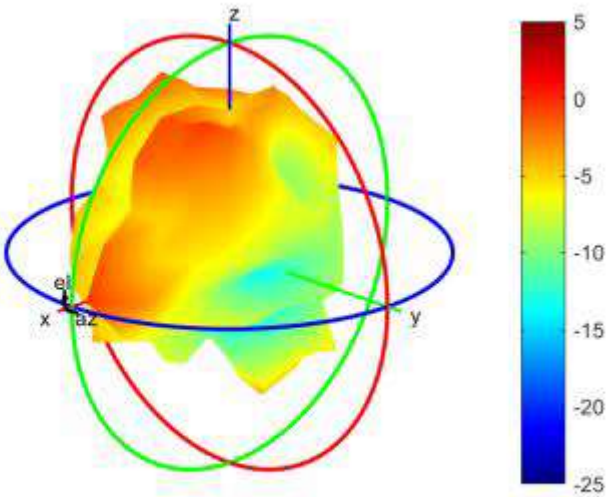
Center Frequency	**4400MHz**
Horizontal (dBi) peak	-2.33
Vertical (dBi) peak	-3.02

4700MHz



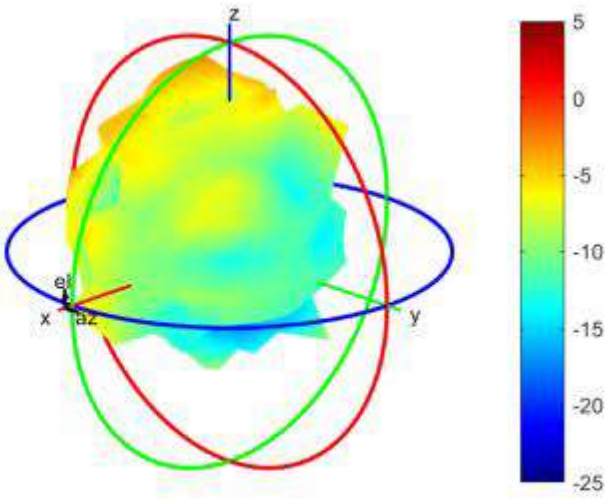
Center Frequency	**4700MHz**
Horizontal (dBi) peak	-2.60
Vertical (dBi) peak	-3.72

5150MHz



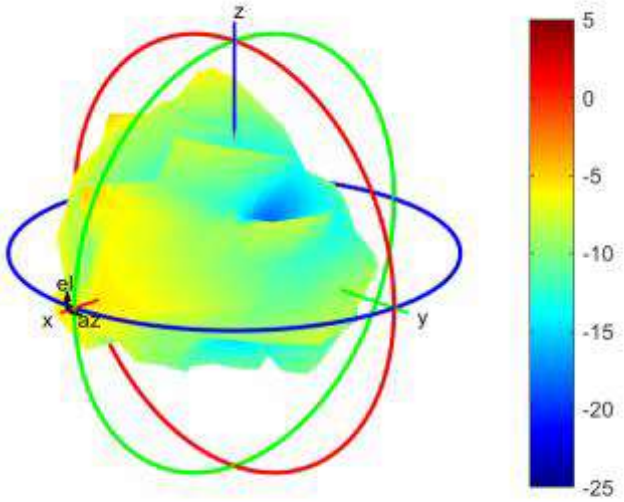
Center Frequency	**5150MHz**
Horizontal (dBi) peak	-1.57
Vertical (dBi) peak	-1.56

5537.5MHz



Center Frequency	**5537.5MHz**
Horizontal (dBi) peak	-3.49
Vertical (dBi) peak	-4.37

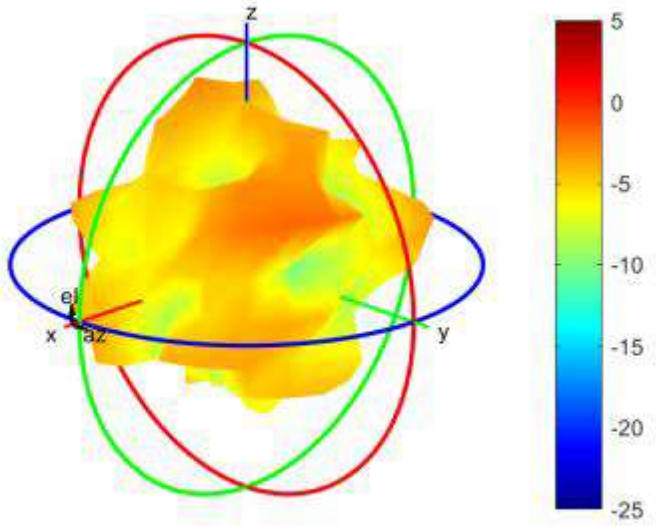
5925MHz



Center Frequency	**5925MHz**
Horizontal (dBi) peak	-4.83
Vertical (dBi) peak	-5.14

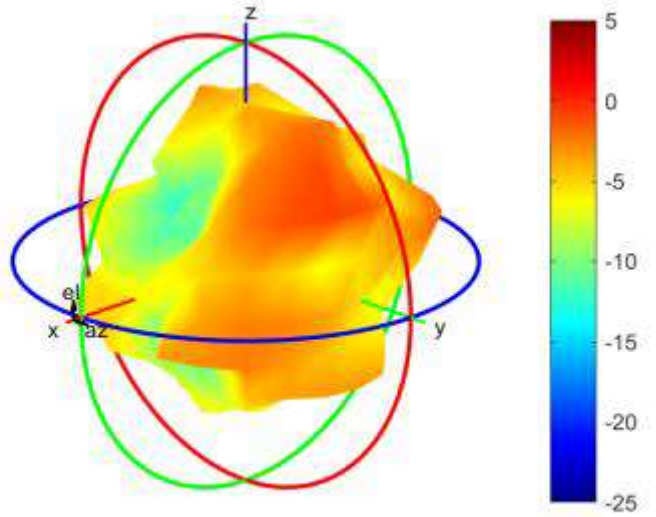
MIMO2 Antenna (DRx2)

1452 MHz



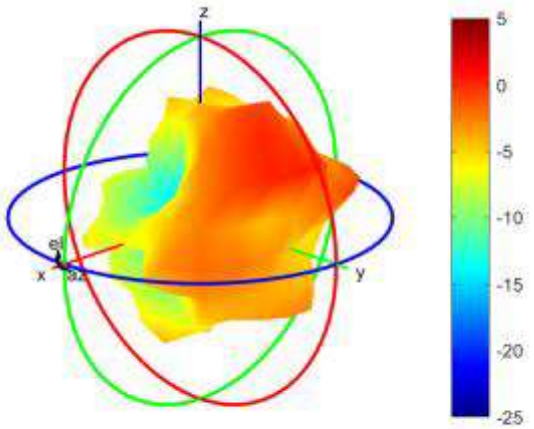
Center Frequency	**1452 MHz**
Horizontal (dBi) peak	-3.85
Vertical (dBi) peak	-3.83

1474 MHz



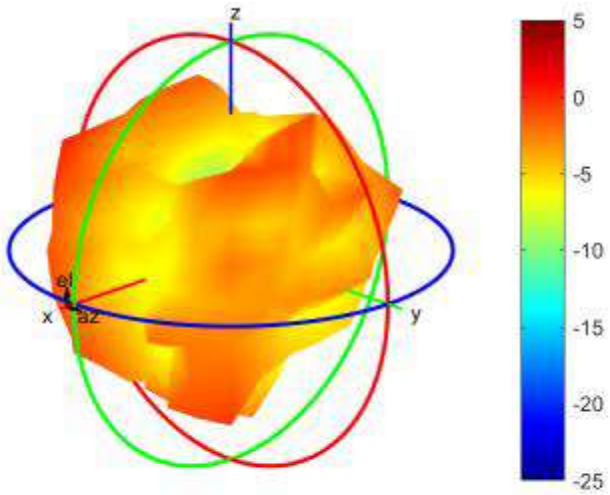
Center Frequency	**1474 MHz**
Horizontal (dBi) peak	-4.21
Vertical (dBi) peak	-3.95

1496 MHz



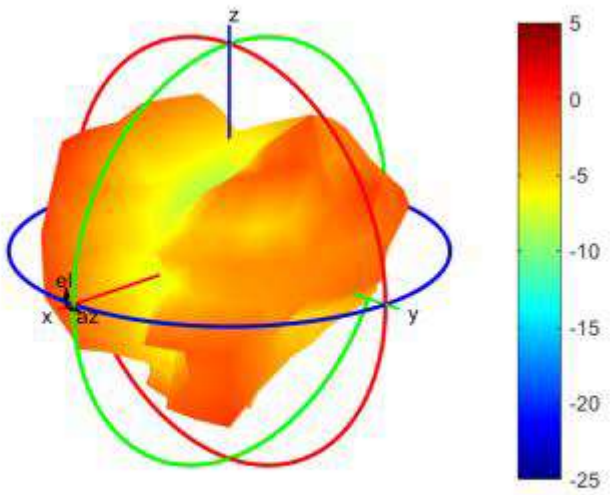
Center Frequency	**1496 MHz**
Horizontal (dBi) peak	-3.59
Vertical (dBi) peak	-3.69

1710 MHz



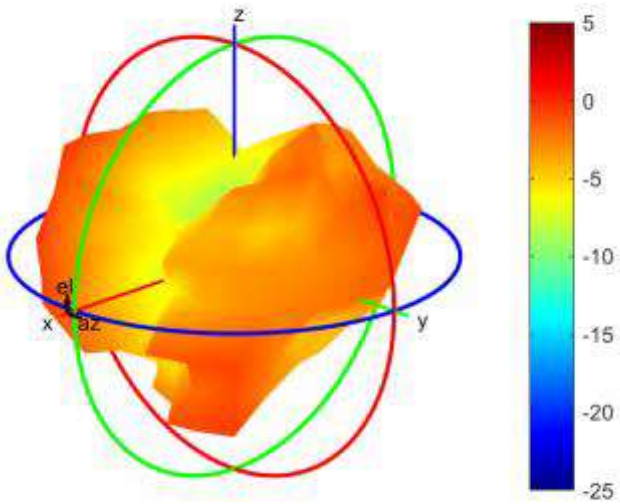
Center Frequency	**1710 MHz**
Horizontal (dBi) peak	-1.20
Vertical (dBi) peak	-1.21

1732.5 MHz



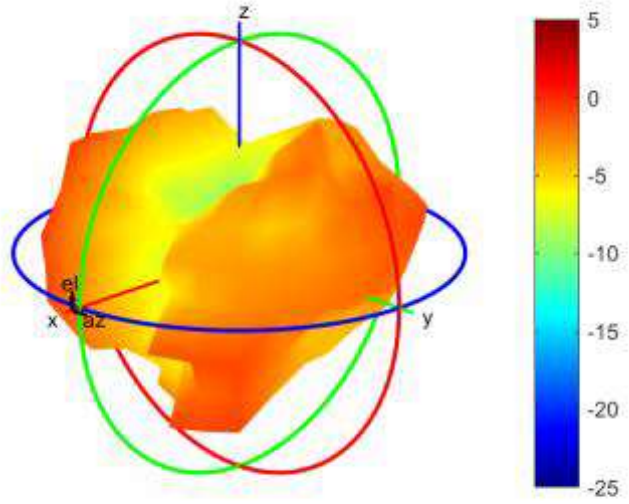
Center Frequency	**1732.5 MHz**
Horizontal (dBi) peak	-1.42
Vertical (dBi) peak	-0.62

1747.5 MHz



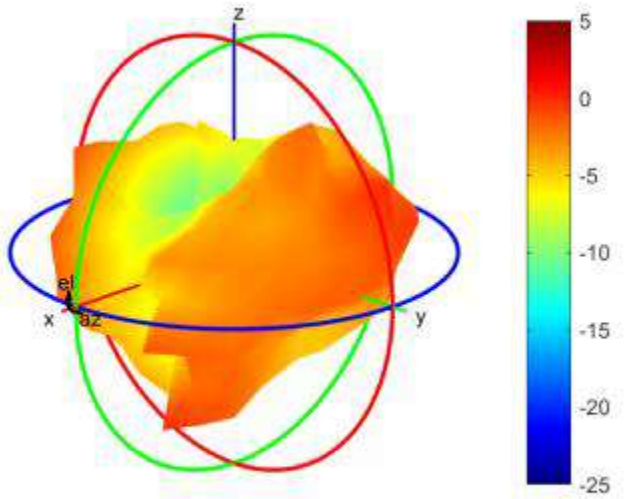
Center Frequency	**1747.5 MHz**
Horizontal (dBi) peak	-1.64
Vertical (dBi) peak	-0.45

1755 MHz



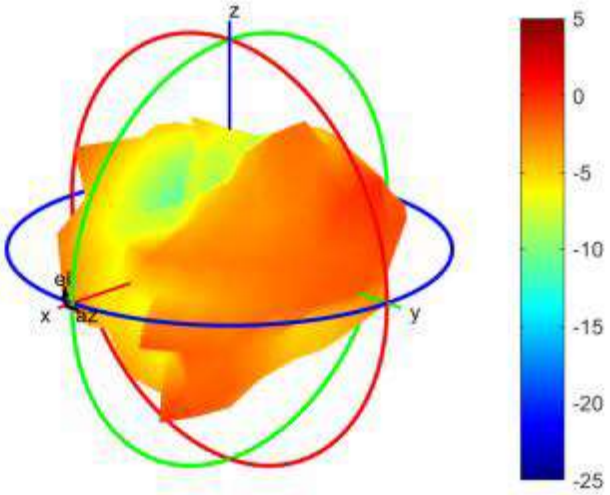
Center Frequency	**1755 MHz**
Horizontal (dBi) peak	-1.78
Vertical (dBi) peak	-0.59

1785 MHz



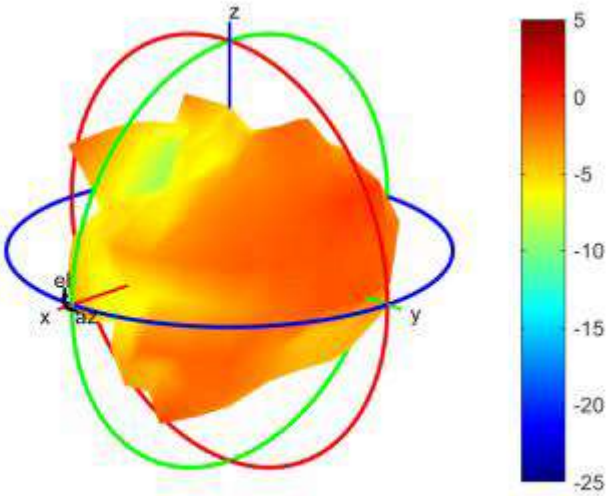
Center Frequency	**1785 MHz**
Horizontal (dBi) peak	-0.92
Vertical (dBi) peak	-0.44

1805 MHz



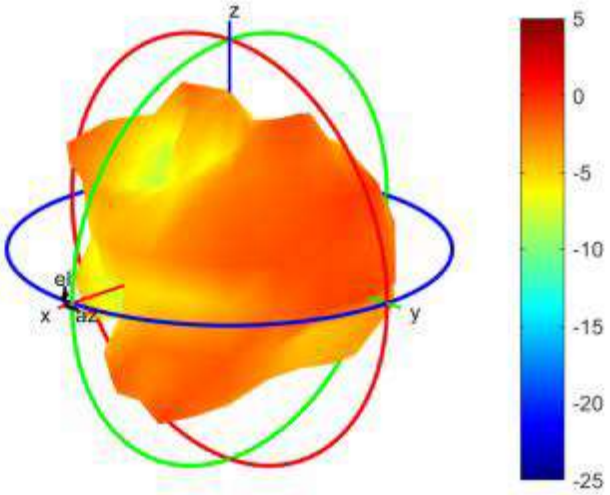
Center Frequency	**1805 MHz**
Horizontal (dBi) peak	-0.74
Vertical (dBi) peak	-0.52

1850 MHz



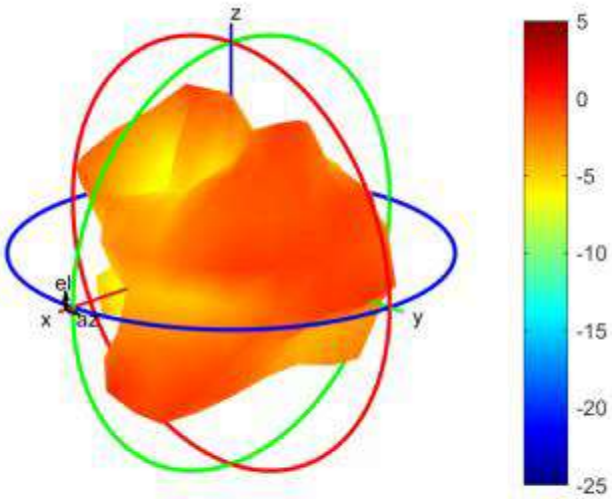
Center Frequency	**1850 MHz**
Horizontal (dBi) peak	-2.05
Vertical (dBi) peak	-1.51

1880 MHz



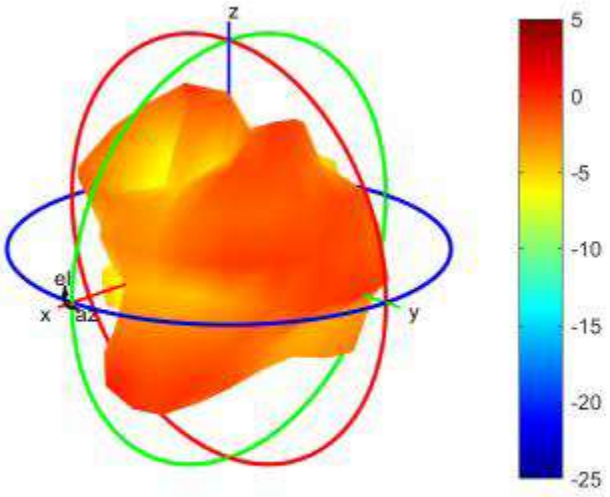
Center Frequency	**1880 MHz**
Horizontal (dBi) peak	-2.14
Vertical (dBi) peak	-1.50

1910MHz



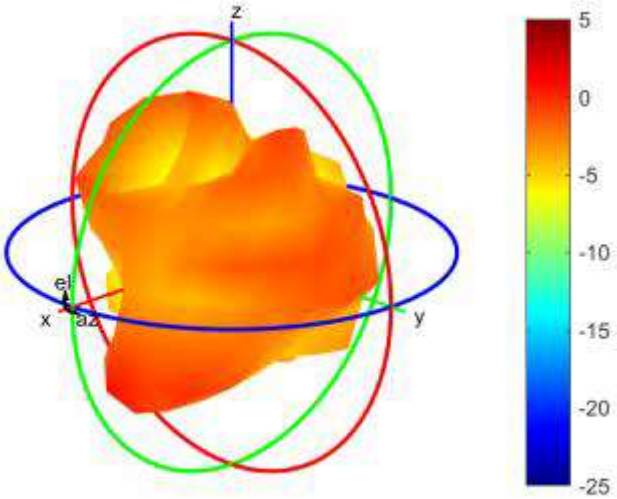
Center Frequency	**1910MHz**
Horizontal (dBi) peak	-1.57
Vertical (dBi) peak	-1.24

1920MHz



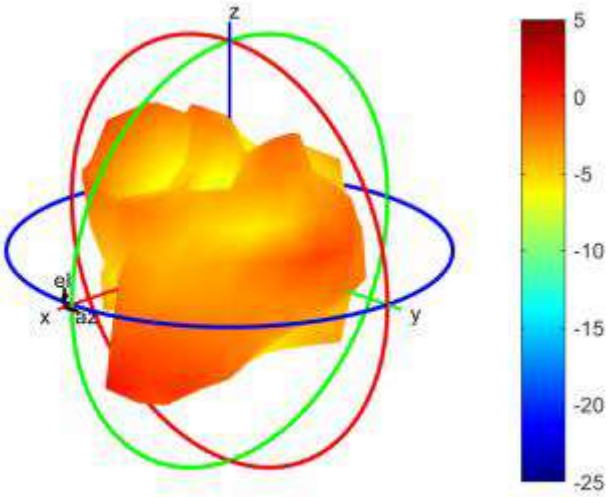
Center Frequency	**1920MHz**
Horizontal (dBi) peak	-1.43
Vertical (dBi) peak	-1.06

1950MHz



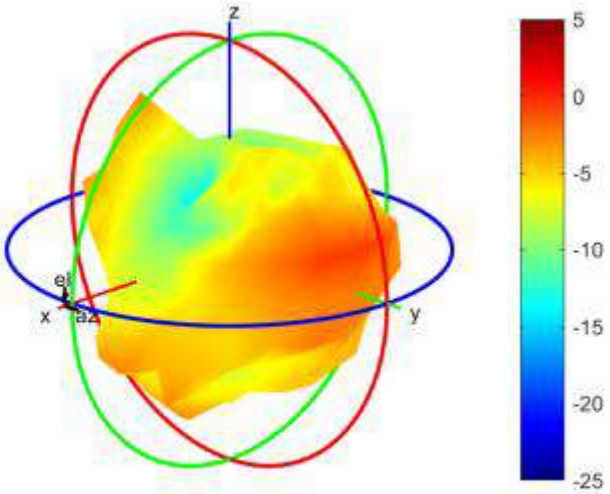
Center Frequency	**1950MHz**
Horizontal (dBi) peak	-1.06
Vertical (dBi) peak	-1.41

1980MHz



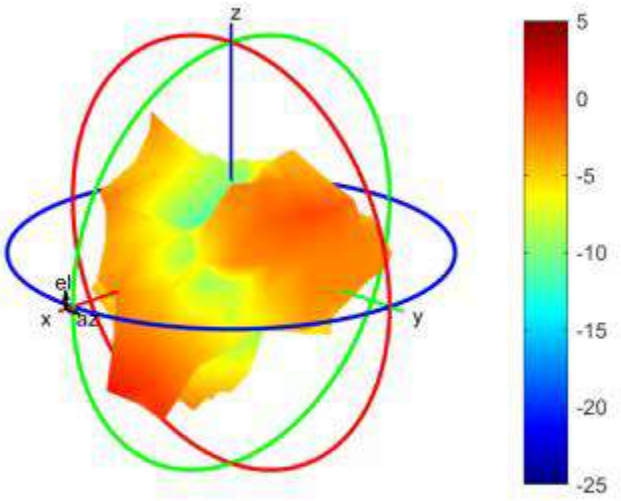
Center Frequency	**1980MHz**
Horizontal (dBi) peak	-0.91
Vertical (dBi) peak	-1.86

2110MHz



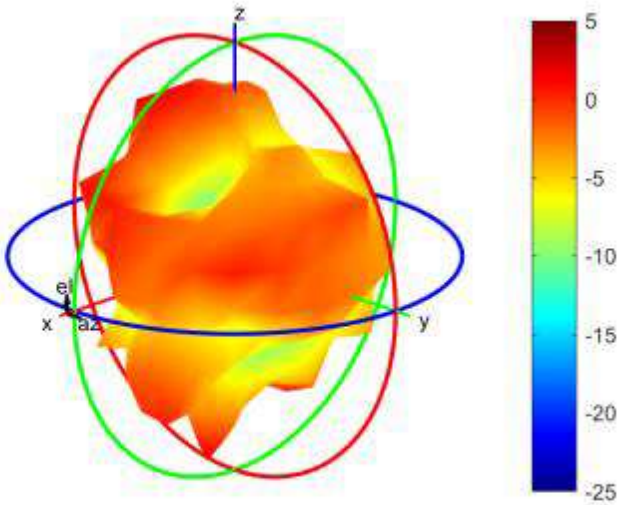
Center Frequency	**2110MHz**
Horizontal (dBi) peak	-1.54
Vertical (dBi) peak	-3.06

2200MHz



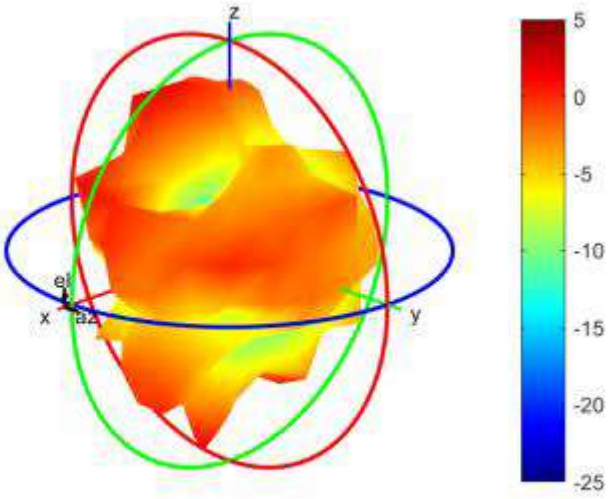
Center Frequency	**2200MHz**
Horizontal (dBi) peak	-0.30
Vertical (dBi) peak	-2.52

2300MHz



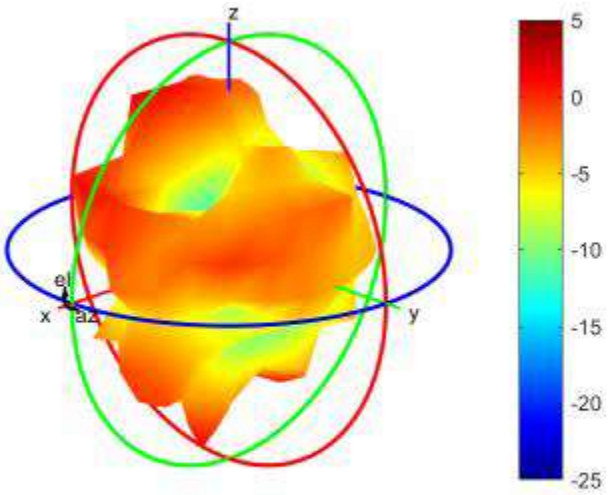
Center Frequency	**2300MHz**
Horizontal (dBi) peak	-1.74
Vertical (dBi) peak	-0.56

2305MHz



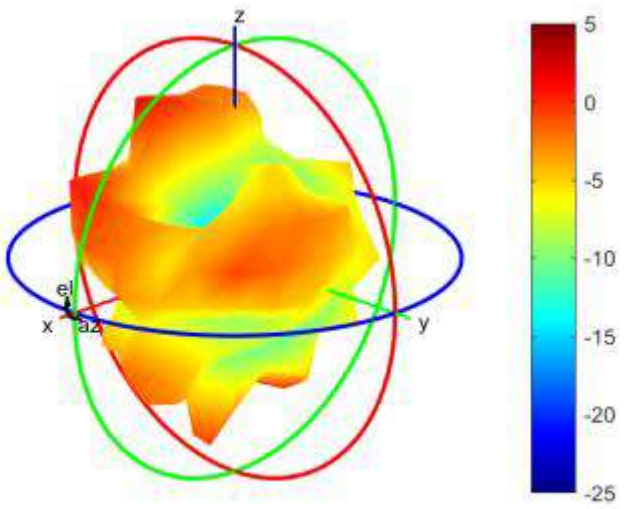
Center Frequency	**2305MHz**
Horizontal (dBi) peak	-1.74
Vertical (dBi) peak	-0.51

2315MHz



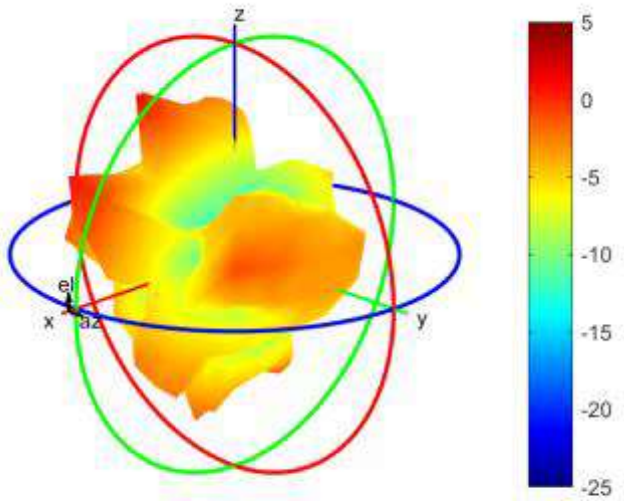
Center Frequency	**2315MHz**
Horizontal (dBi) peak	-1.75
Vertical (dBi) peak	-0.47

2350MHz



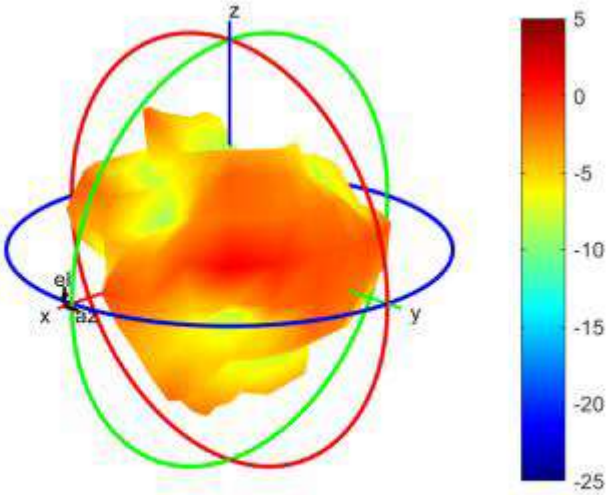
Center Frequency	**2350MHz**
Horizontal (dBi) peak	-0.65
Vertical (dBi) peak	-1.07

2400MHz



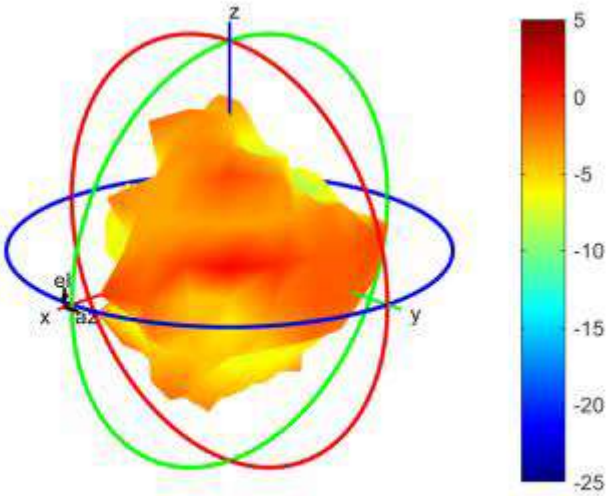
Center Frequency	**2400MHz**
Horizontal (dBi) peak	-0.64
Vertical (dBi) peak	-0.72

2500MHz



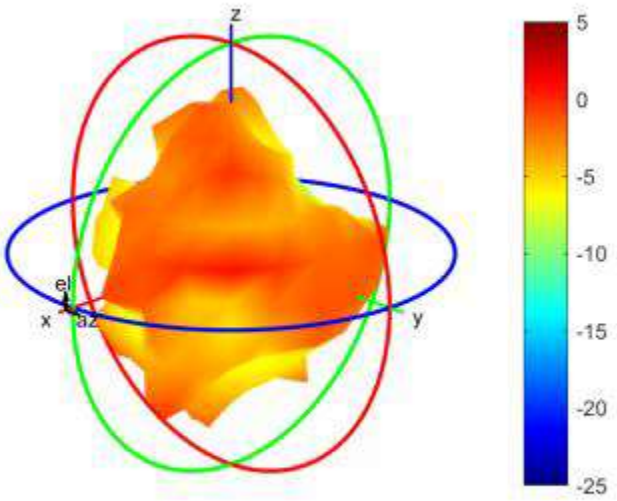
Center Frequency	**2500MHz**
Horizontal (dBi) peak	-1.02
Vertical (dBi) peak	-1.17

2570MHz



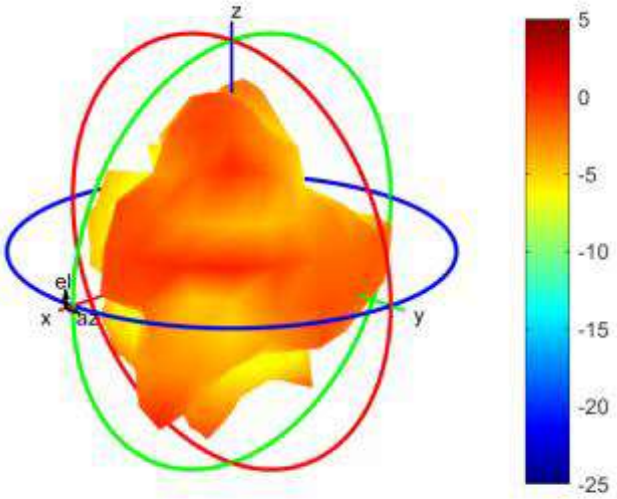
Center Frequency	**2570MHz**
Horizontal (dBi) peak	-0.46
Vertical (dBi) peak	-1.29

2595MHz



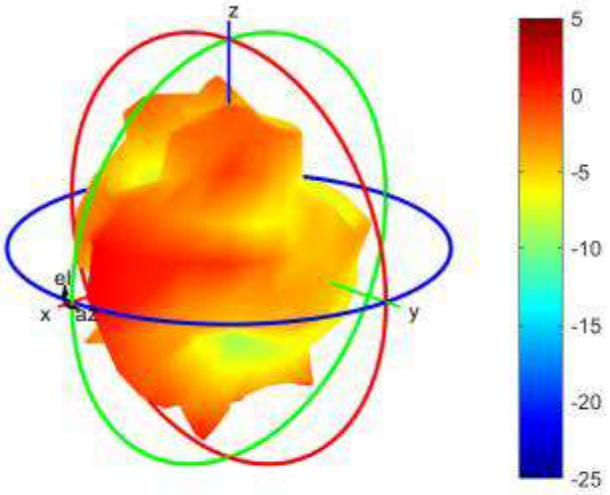
Center Frequency	**2595MHz**
Horizontal (dBi) peak	-0.20
Vertical (dBi) peak	-0.08

2620MHz



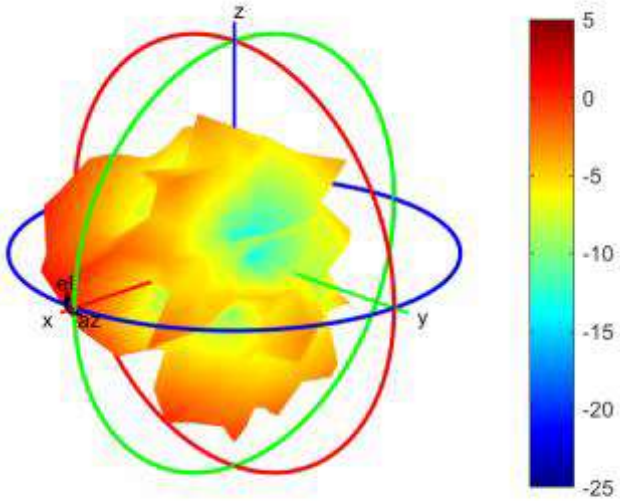
Center Frequency	**2620MHz**
Horizontal (dBi) peak	-0.53
Vertical (dBi) peak	-0.37

2690MHz



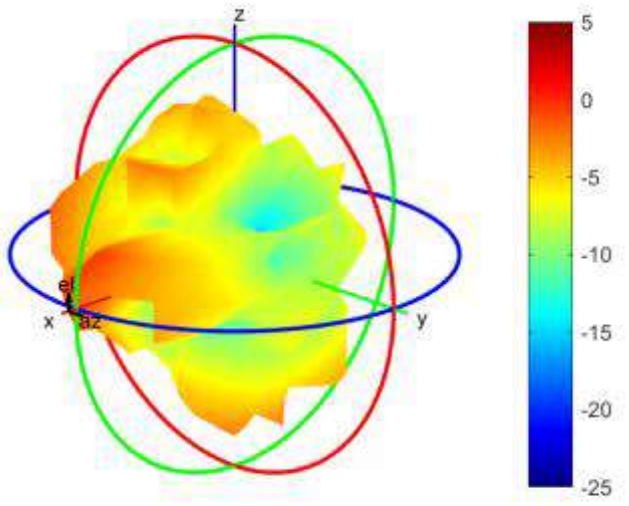
Center Frequency	**2690MHz**
Horizontal (dBi) peak	-1.46
Vertical (dBi) peak	-0.63

3400MHz



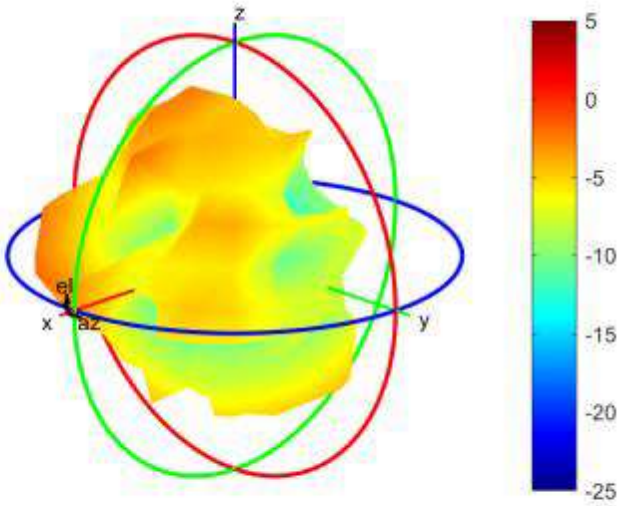
Center Frequency	**3400MHz**
Horizontal (dBi) peak	-1.39
Vertical (dBi) peak	-1.53

3500MHz



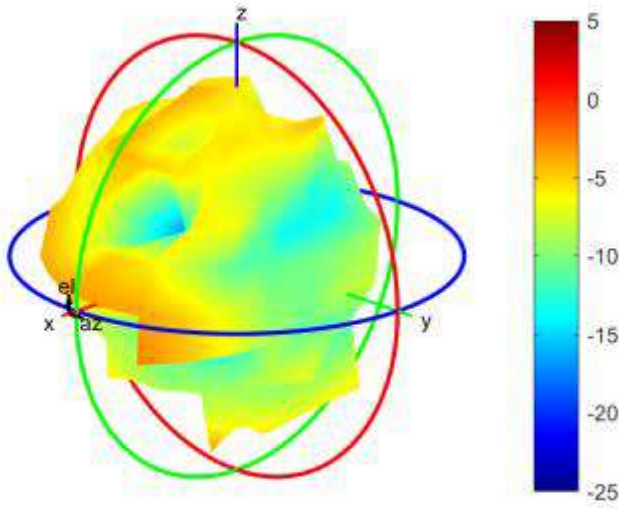
Center Frequency	**3500MHz**
Horizontal (dBi) peak	-2.33
Vertical (dBi) peak	-3.34

3600MHz



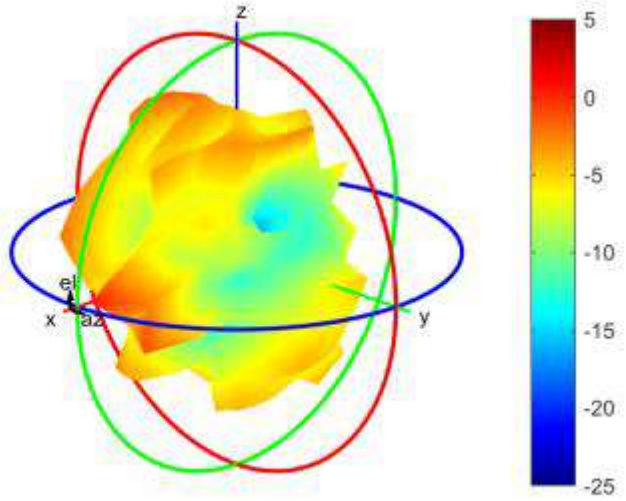
Center Frequency	**3600MHz**
Horizontal (dBi) peak	-2.02
Vertical (dBi) peak	-3.14

3700MHz



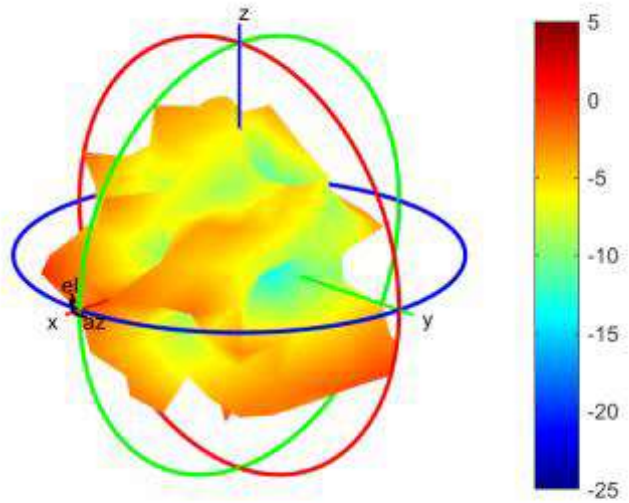
Center Frequency	**3700MHz**
Horizontal (dBi) peak	-3.04
Vertical (dBi) peak	-4.01

3800MHz



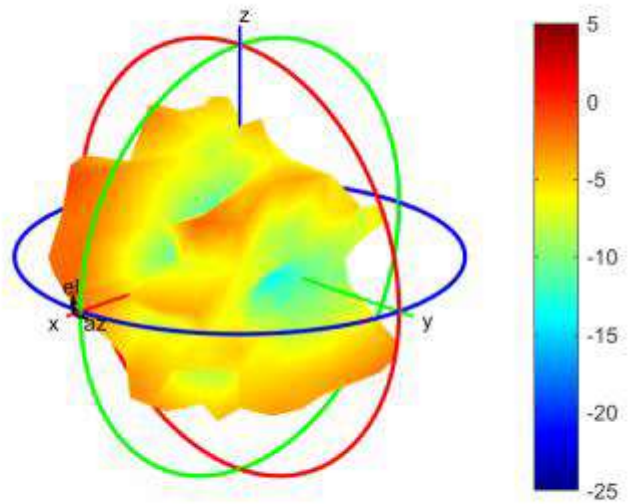
Center Frequency	**3800MHz**
Horizontal (dBi) peak	-2.42
Vertical (dBi) peak	-1.92

4200MHz



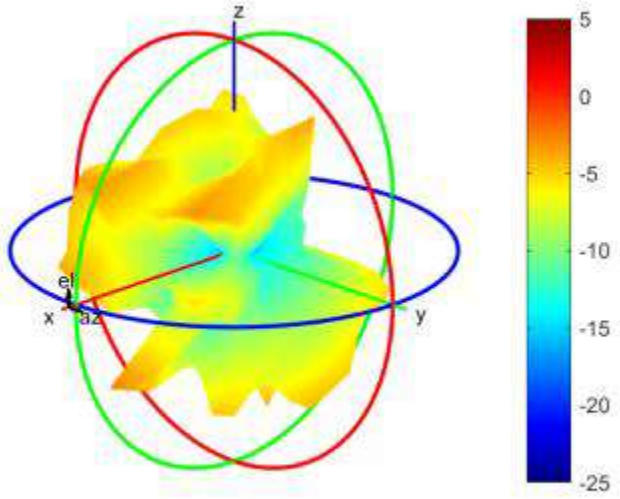
Center Frequency	**4200MHz**
Horizontal (dBi) peak	0.14
Vertical (dBi) peak	-1.67

4400MHz



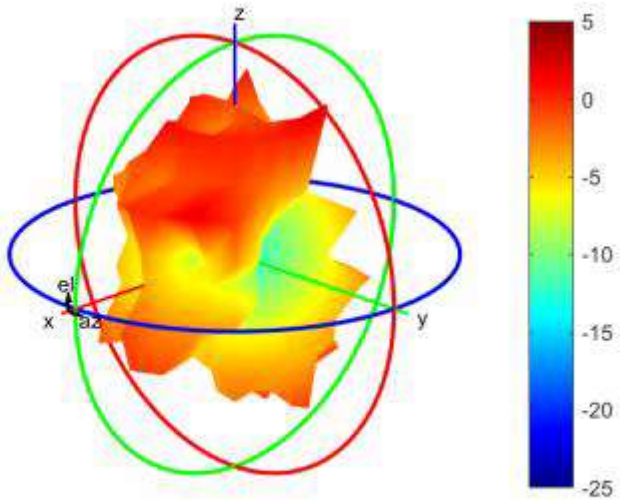
Center Frequency	**4400MHz**
Horizontal (dBi) peak	-0.54
Vertical (dBi) peak	-4.05

4700MHz



Center Frequency	**4700MHz**
Horizontal (dBi) peak	-2.27
Vertical (dBi) peak	-3.38

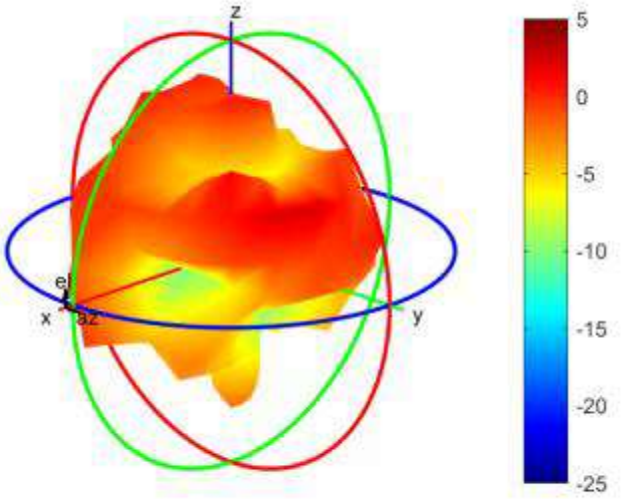
5000MHz



Center Frequency	**5000MHz**
Horizontal (dBi) peak	-2.42
Vertical (dBi) peak	0.64

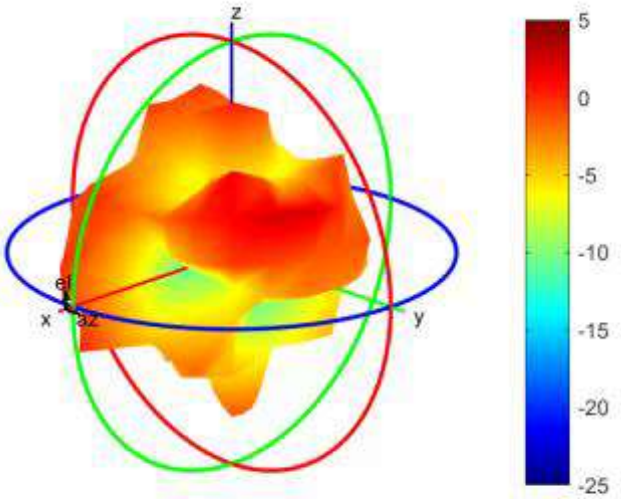
MIMO3 Antenna (DRx1)

1805 MHz



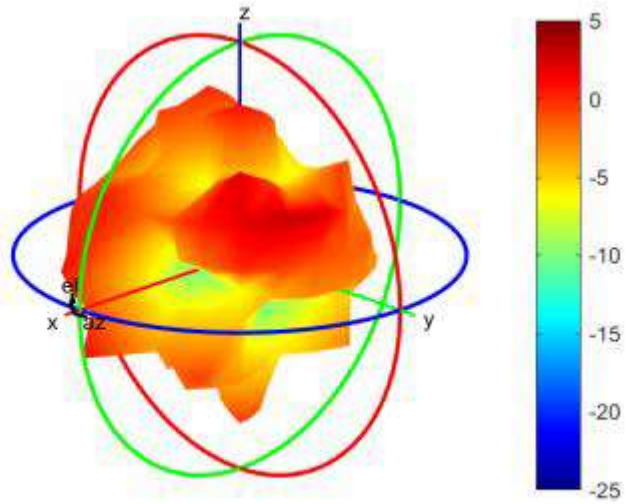
Center Frequency	**1805 MHz**
Horizontal (dBi) peak	0.19
Vertical (dBi) peak	0.21

1850 MHz



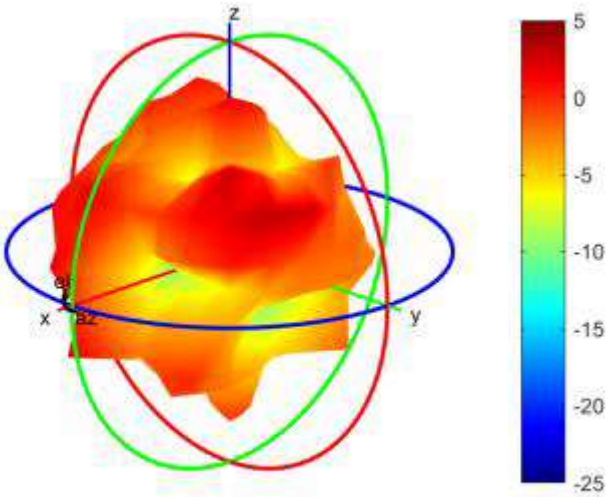
Center Frequency	**1850 MHz**
Horizontal (dBi) peak	0.34
Vertical (dBi) peak	0.14

1880 MHz



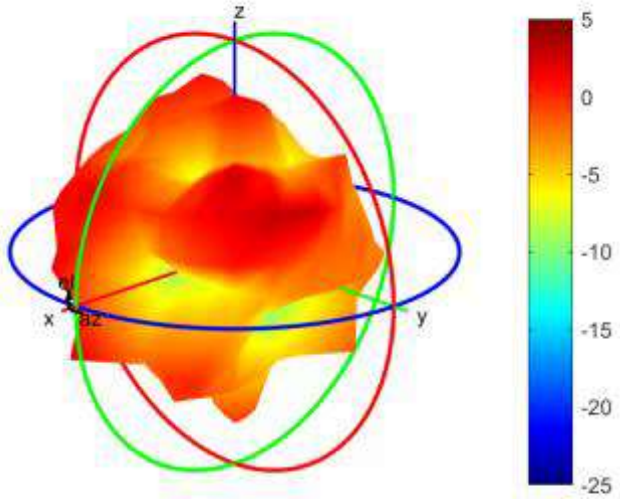
Center Frequency	**1880 MHz**
Horizontal (dBi) peak	1.02
Vertical (dBi) peak	0.27

1910MHz



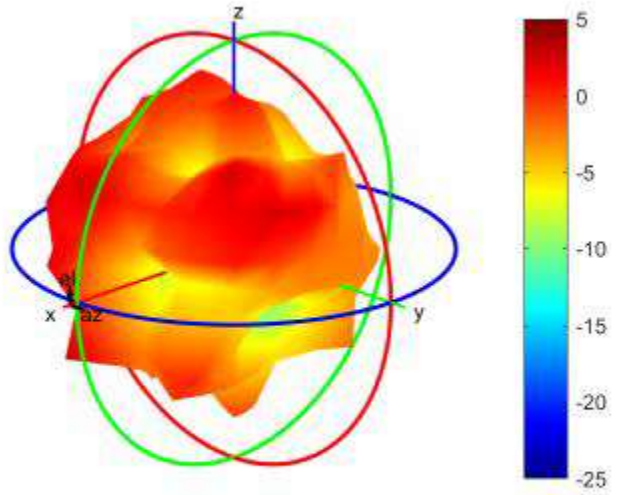
Center Frequency	**1910MHz**
Horizontal (dBi) peak	0.12
Vertical (dBi) peak	0.38

1920MHz



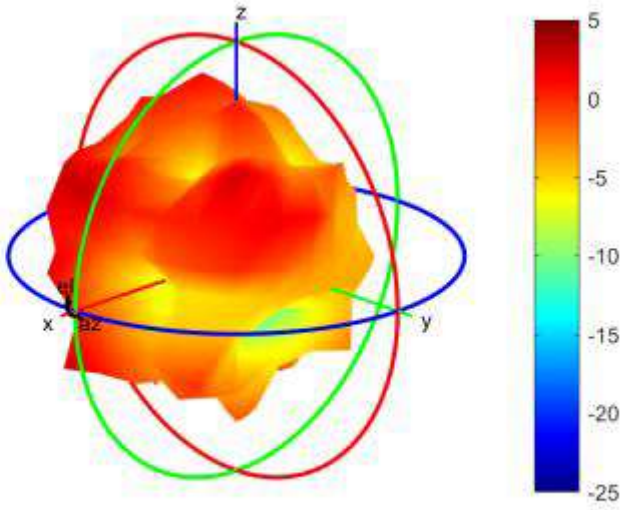
Center Frequency	**1920MHz**
Horizontal (dBi) peak	0.97
Vertical (dBi) peak	0.47

1950MHz



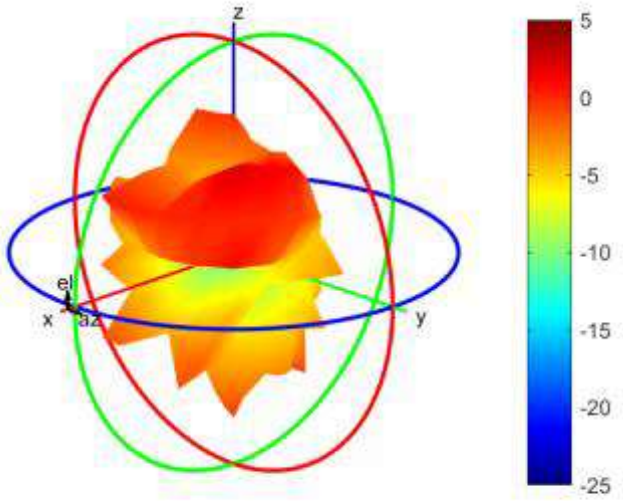
Center Frequency	**1950MHz**
Horizontal (dBi) peak	0.74
Vertical (dBi) peak	0.67

1980MHz



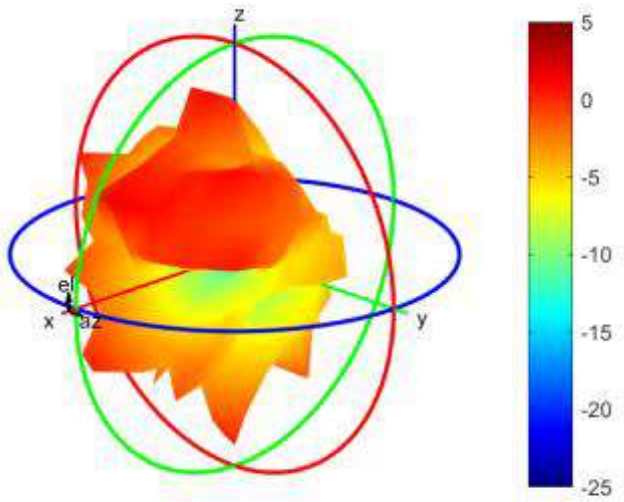
Center Frequency	**1980MHz**
Horizontal (dBi) peak	1.07
Vertical (dBi) peak	0.50

2110MHz



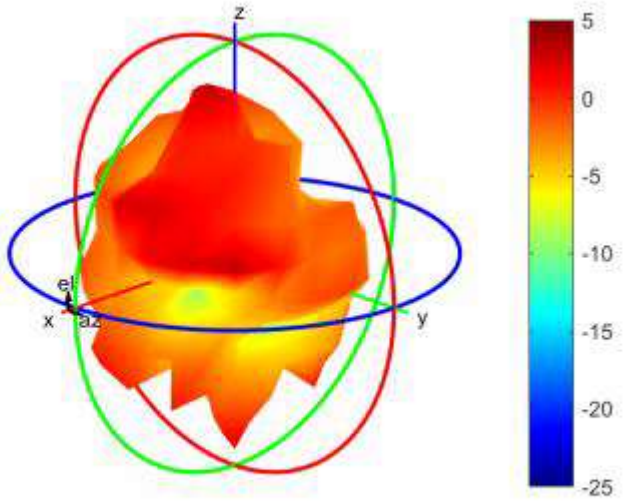
Center Frequency	**2110MHz**
Horizontal (dBi) peak	0.02
Vertical (dBi) peak	0.54

2200MHz



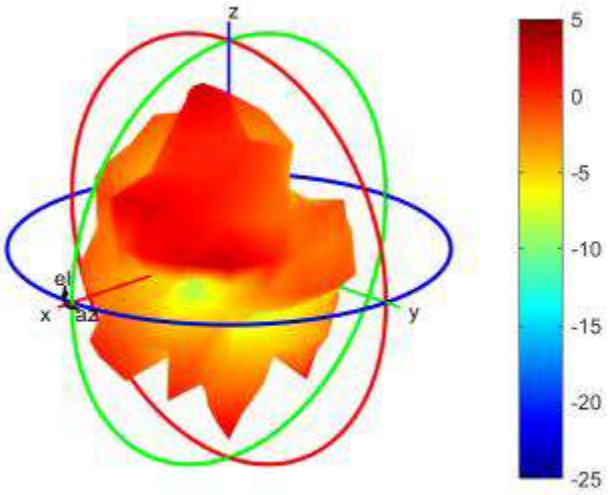
Center Frequency	**2200MHz**
Horizontal (dBi) peak	1.07
Vertical (dBi) peak	-1.32

2300MHz



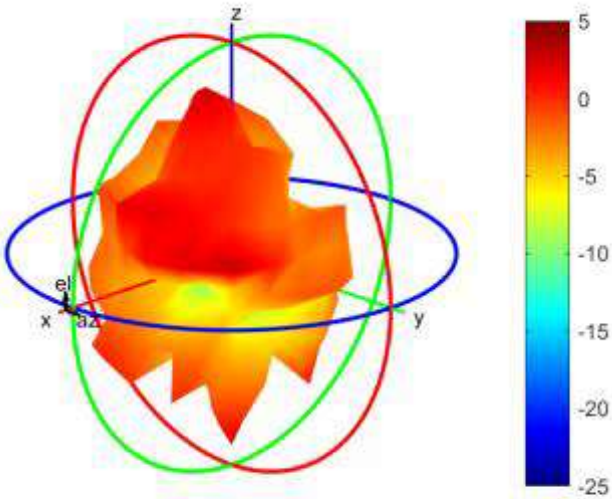
Center Frequency	**2300MHz**
Horizontal (dBi) peak	1.57
Vertical (dBi) peak	-0.70

2305MHz



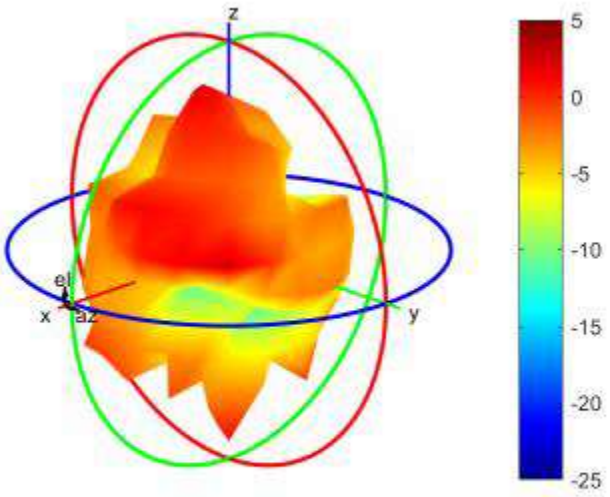
Center Frequency	**2305MHz**
Horizontal (dBi) peak	1.38
Vertical (dBi) peak	-0.70

2315MHz



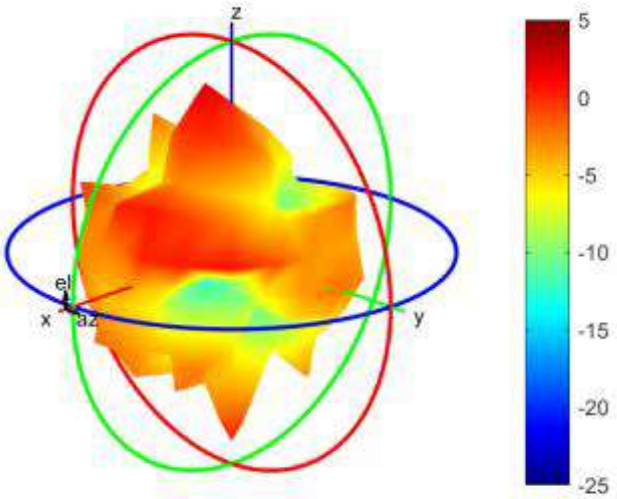
Center Frequency	**2315MHz**
Horizontal (dBi) peak	1.06
Vertical (dBi) peak	-0.94

2350MHz



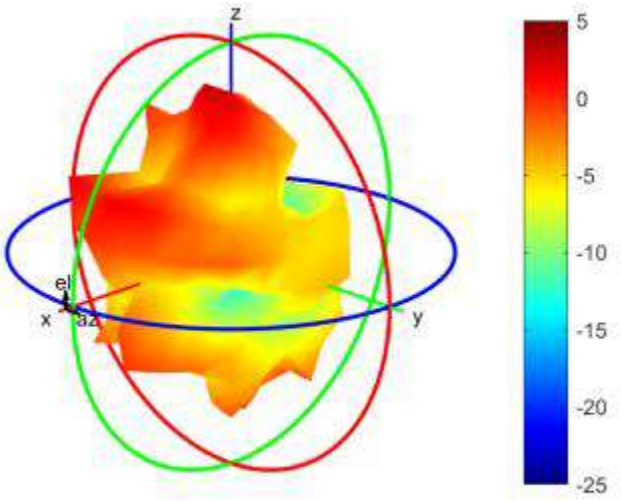
Center Frequency	**2350MHz**
Horizontal (dBi) peak	1.29
Vertical (dBi) peak	-1.79

2400MHz



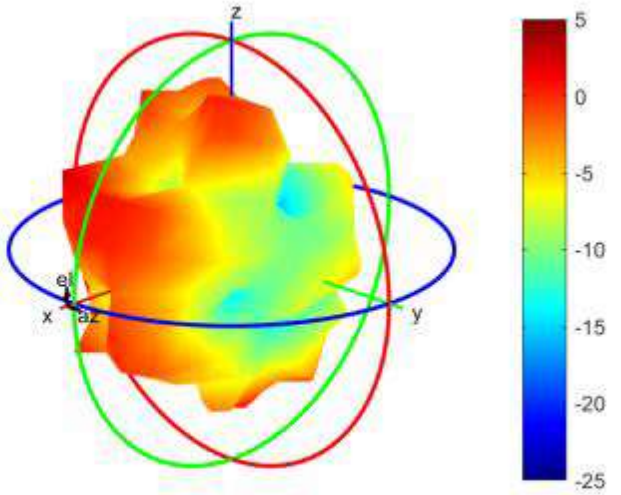
Center Frequency	**2400MHz**
Horizontal (dBi) peak	0.79
Vertical (dBi) peak	-2.00

2500MHz



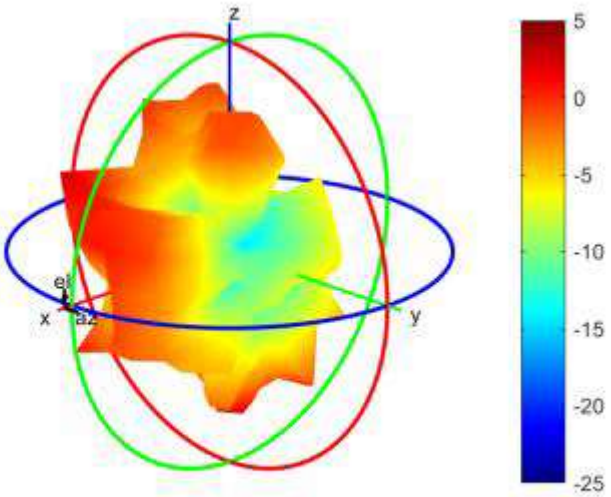
Center Frequency	**2500MHz**
Horizontal (dBi) peak	1.03
Vertical (dBi) peak	-0.38

2570MHz



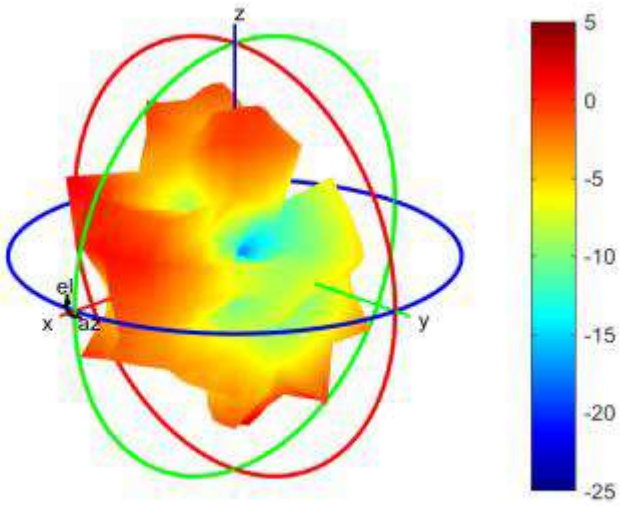
Center Frequency	**2570MHz**
Horizontal (dBi) peak	1.42
Vertical (dBi) peak	-0.29

2595MHz



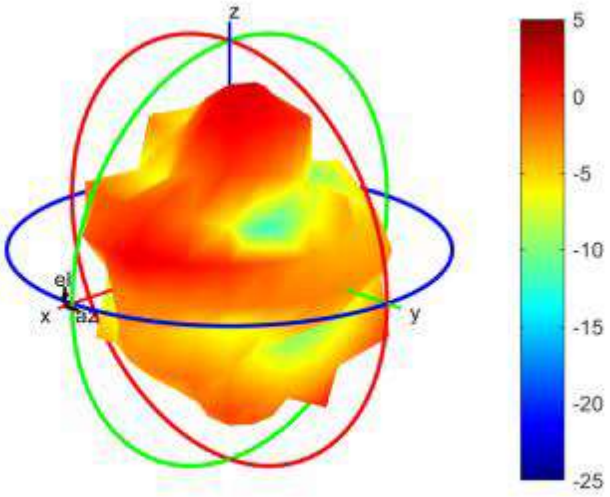
Center Frequency	**2595MHz**
Horizontal (dBi) peak	1.19
Vertical (dBi) peak	0.36

2620MHz



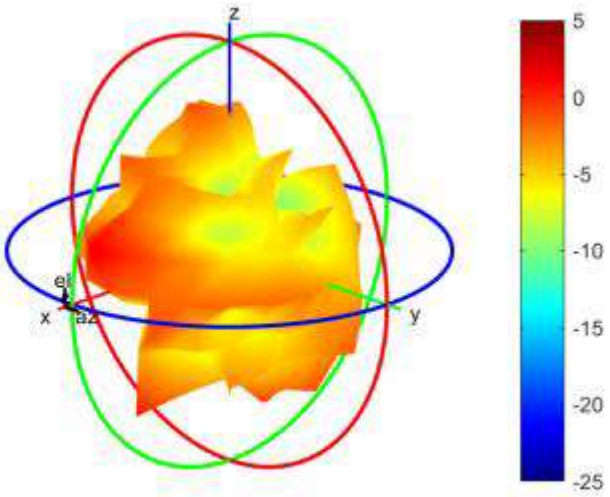
Center Frequency	**2620MHz**
Horizontal (dBi) peak	1.55
Vertical (dBi) peak	0.57

2690MHz



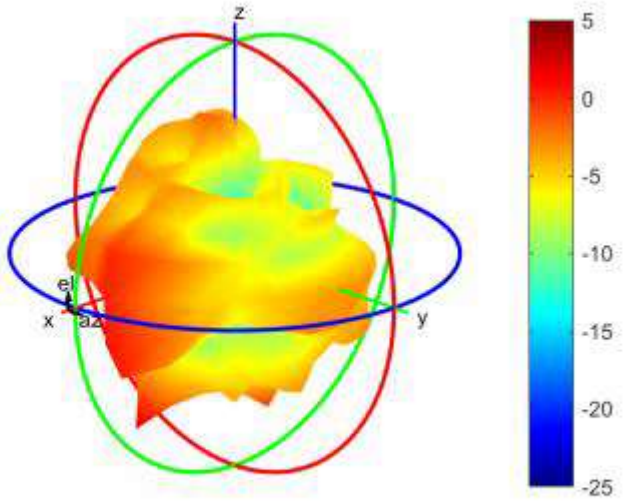
Center Frequency	**2690MHz**
Horizontal (dBi) peak	1.03
Vertical (dBi) peak	0.87

3400MHz



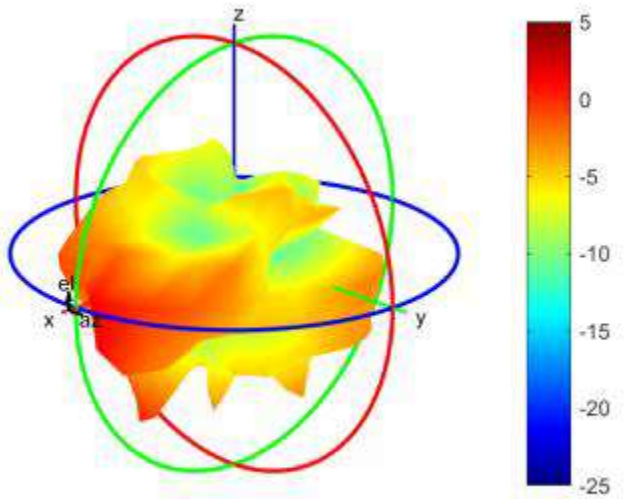
Center Frequency	**3400MHz**
Horizontal (dBi) peak	-1.69
Vertical (dBi) peak	-2.20

3500MHz



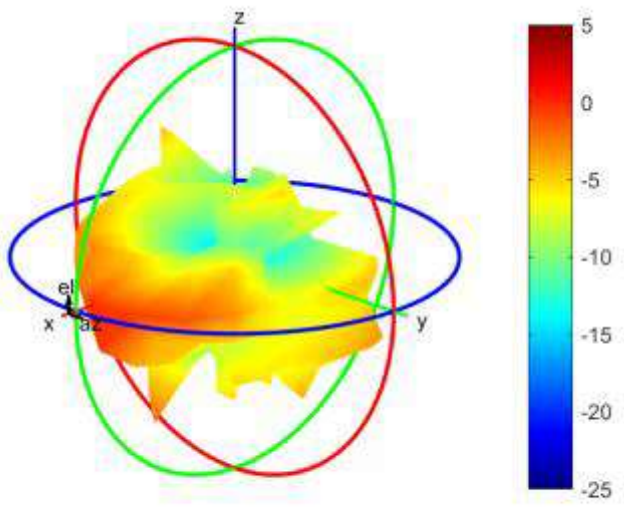
Center Frequency	**3500MHz**
Horizontal (dBi) peak	-1.20
Vertical (dBi) peak	-3.18

3600MHz



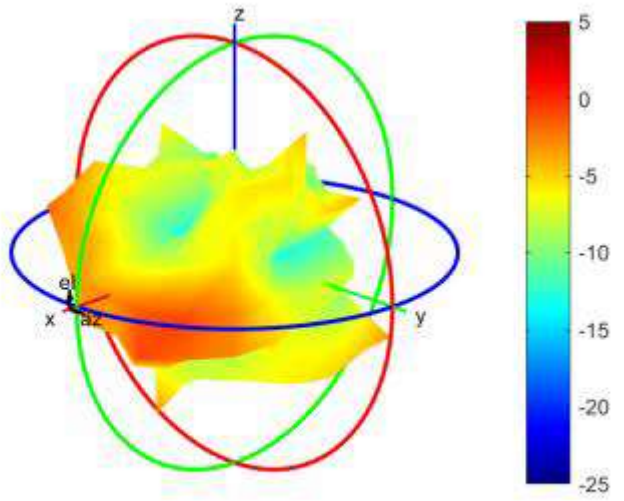
Center Frequency	**3600MHz**
Horizontal (dBi) peak	-1.30
Vertical (dBi) peak	-1.61

3700MHz



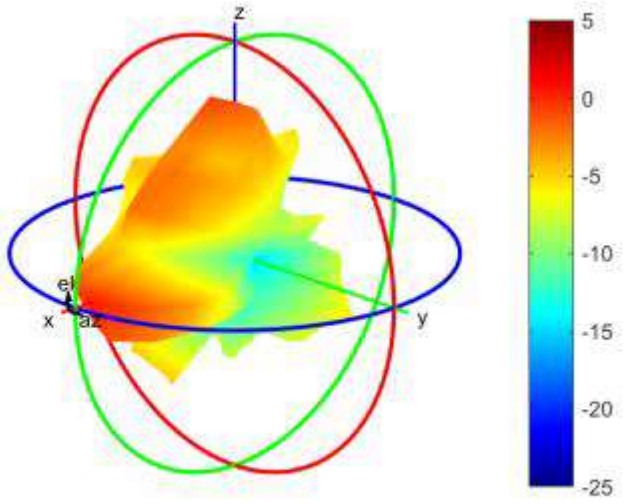
Center Frequency	**3700MHz**
Horizontal (dBi) peak	0.75
Vertical (dBi) peak	-4.75

3800MHz



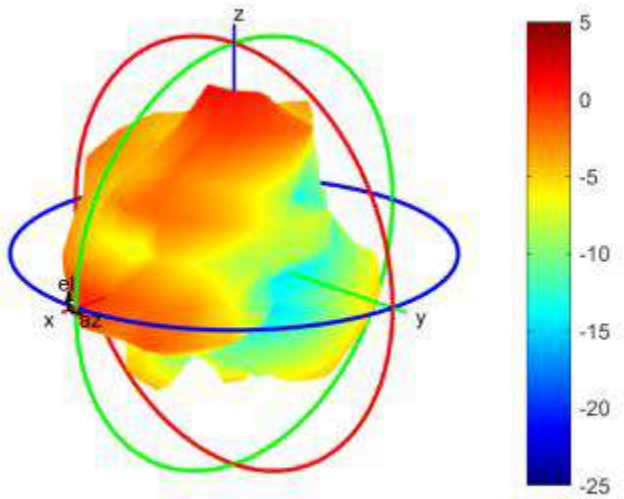
Center Frequency	**3800MHz**
Horizontal (dBi) peak	-0.53
Vertical (dBi) peak	-3.07

4200MHz



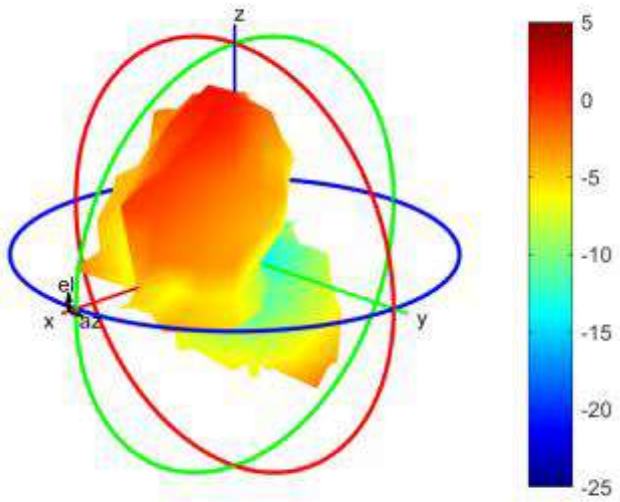
Center Frequency	**4200MHz**
Horizontal (dBi) peak	-1.56
Vertical (dBi) peak	-3.08

4400MHz



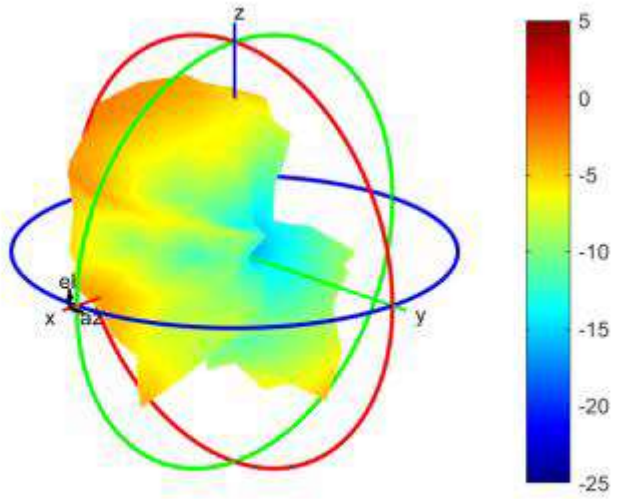
Center Frequency	**4400MHz**
Horizontal (dBi) peak	-2.03
Vertical (dBi) peak	-2.52

4700MHz



Center Frequency	**4700MHz**
Horizontal (dBi) peak	-2.43
Vertical (dBi) peak	-1.87

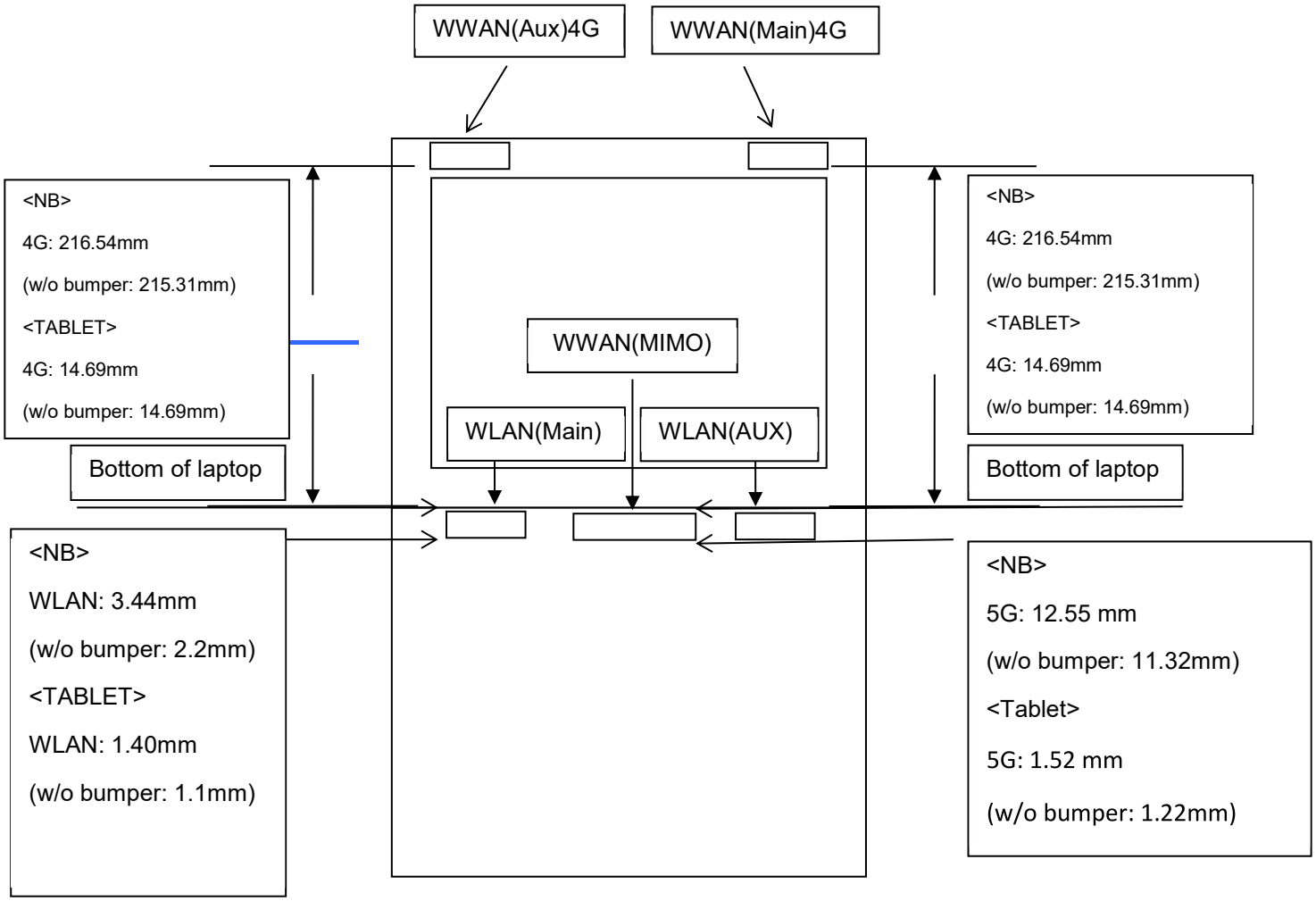
5000MHz



Center Frequency	**5000MHz**
Horizontal (dBi) peak	-3.02
Vertical (dBi) peak	-3.55

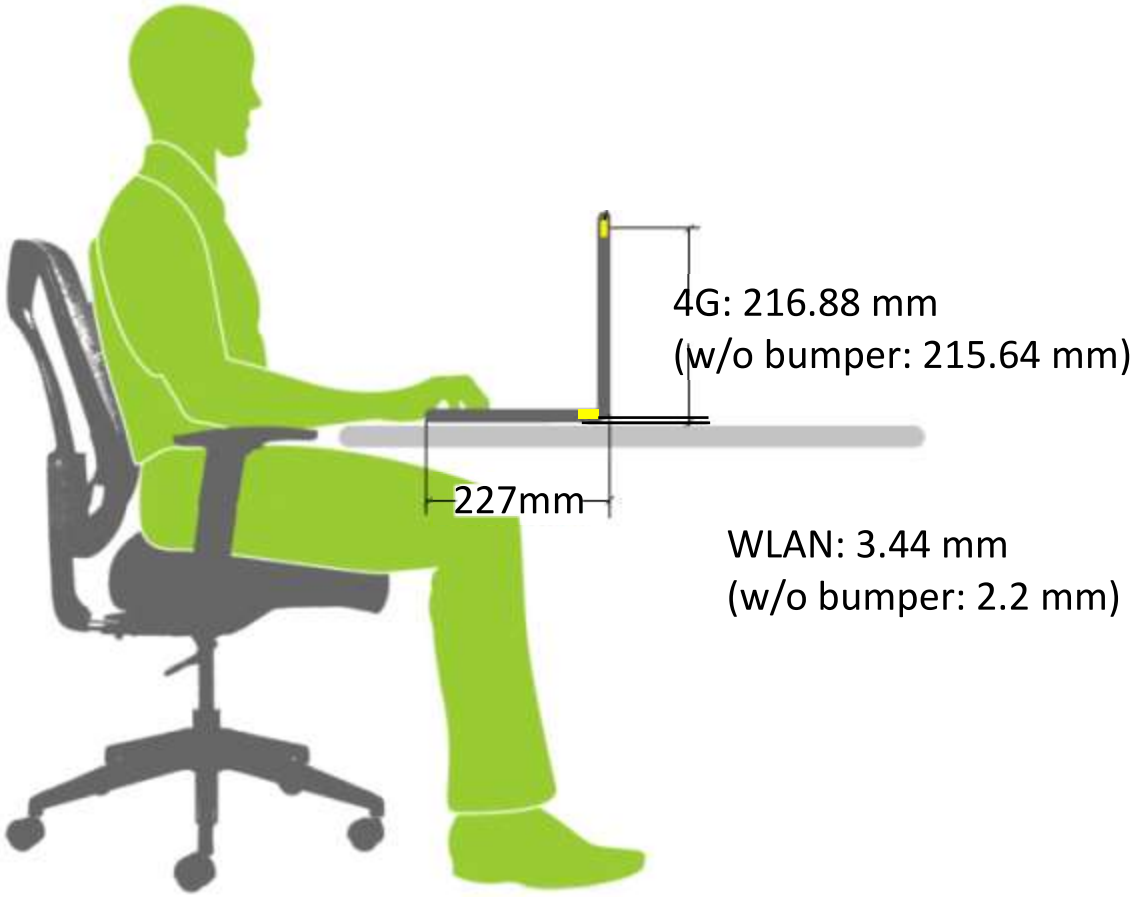
Section 4. Antenna Host Platform Location Information

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.

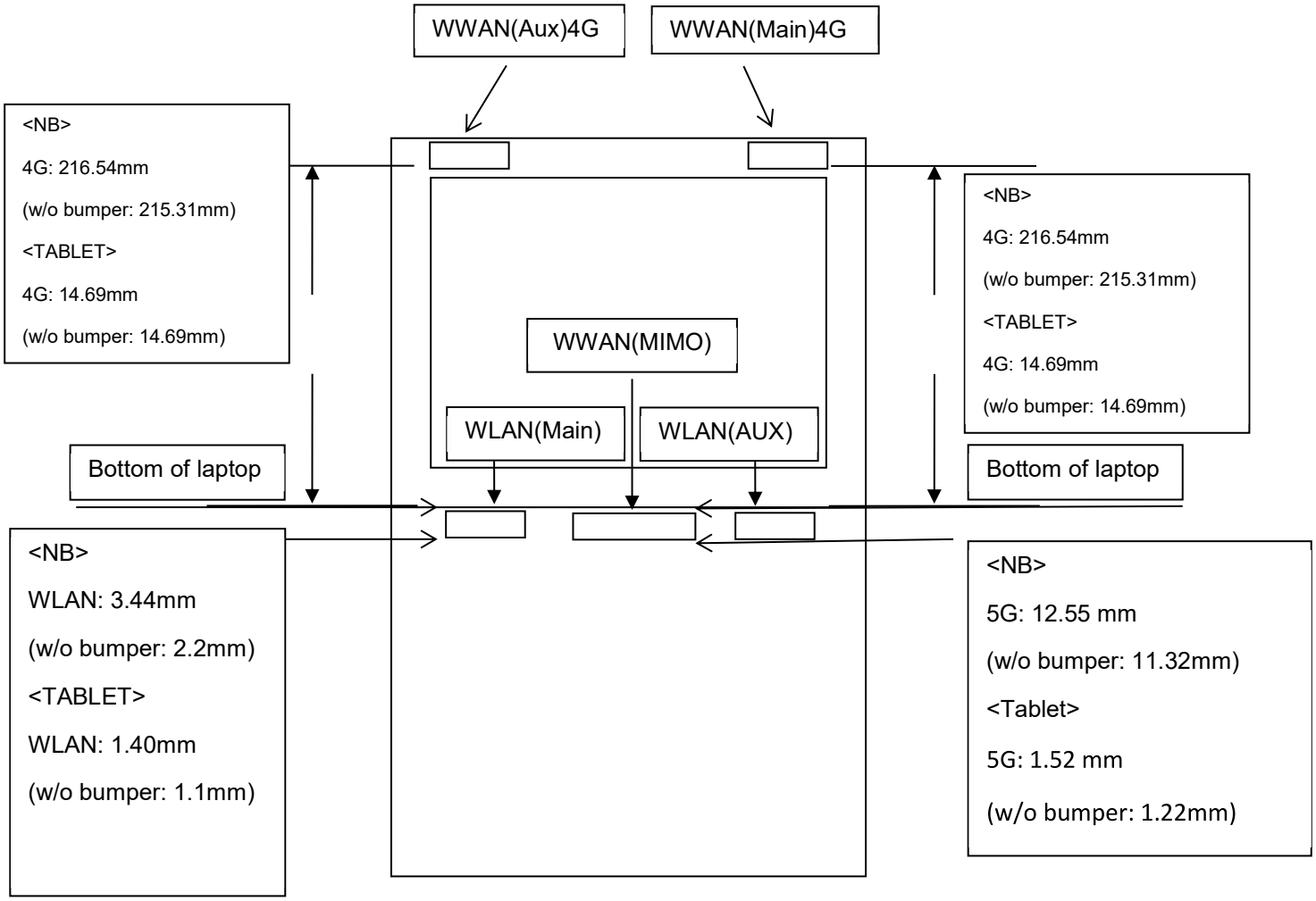


Section 5. Antenna dimensional information for SAR evaluation

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)