

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)**

Platform	
Platform Owner	DELL / COMPAL
Brand Name	DELL
Model Name	P33T
ODM	COMPAL ELECTRONICS
Target Launch Date	
Antenna	
Manufacturer	Speed
Part Number	<ul style="list-style-type: none"> ■ Tx1/Rx1 <u>Antenna</u> WWAN Main: Antenna P/N: Main: F-0G-FH-6163-001-00 COMPAL P/N: DC33002R10L ■ Rx2 Antenna WWAN Aux : Antenna P/N: Main: F-0G-FH-6163-002-00 COMPAL P/N: DC33002R11L
Module	
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 <u>and</u> 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. <u>(S. Korea requires photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.</u>	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)
Tx/Rx1 Antenna P/N: 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 dBi -3.52 (peak)	617-698MHz dBi -3 (peak)	617-698MHz 4.5 max	617-698MHz dBi 0.52 (peak)
				698-821MHz dBi -1.57 (peak)	698-821MHz dBi -1.02 (peak)	698-821MHz 4.5 max	698-821MHz dBi 0.55 (peak)
				824-960MHz dBi -2.05 (peak)	824-960MHz dBi -1.46 (peak)	824-960MHz 4.5 max	824-960MHz dBi 0.59 (peak)
				1425-1515MHz dBi 0.02 (peak)	1425-1515MHz dBi 0.76 (peak)	1425-1515MHz 4 max	1425-1515MHz dBi 0.74 (peak)
				1710-2200MHz dBi 1.02 (peak)	1710-2200MHz dBi 1.93 (peak)	1710-2200MHz 4 max	1710-2200MHz dBi 0.91 (peak)
				2300-2690MHz dBi -0.77 (peak)	2300-2690MHz dBi 0.2 (peak)	2300-2690MHz 4 max	2300-2690MHz dBi 0.97 (peak)
				3400-3800MHz dBi -1.9 (peak)	3400-3800MHz dBi -0.73 (peak)	3400-3800MHz 4 max	3400-3800MHz dBi 1.17 (peak)
				5150-5925MHz dBi 0.87 (peak)	5150-5925MHz dBi 2.42 (peak)	5150-5925MHz 4 max	5150-5925MHz dBi 1.55 (peak)
Rx2 Antenna P/N: 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 dBi -2.69 (peak)	617-698MHz dBi -1.97 (peak)	617-698MHz 4.5 max	617-698MHz dBi 0.72 (peak)
				716-821MHz dBi -3.03 (peak)	716-821MHz dBi -2.26 (peak)	716-821MHz 4.5 max	716-821MHz dBi 0.77 (peak)
				824-960MHz dBi -4.94 (peak)	824-960MHz dBi -4.12 (peak)	824-960MHz 4.5 max	824-960MHz dBi 0.82 (peak)
				1425-1515MHz dBi -1.46 (peak)	1425-1515MHz dBi -0.43 (peak)	1425-1515MHz 4 max	1425-1515MHz dBi 1.03 (peak)
				1557-1610 MHz dBi -1.9 (peak)	1557-1610 MHz dBi -0.83 (peak)	1557-1610 MHz 4 max	1557-1610 MHz dBi 1.07 (peak)
				1805-2200MHz dBi -0.04 (peak)	1805-2200MHz dBi 1.22 (peak)	1805-2200MHz 4 max	1805-2200MHz dBi 1.26 (peak)
				2300-2690MHz dBi 0.0 (peak)	2300-2690MHz dBi 1.35 (peak)	2300-2690MHz 4 max	2300-2690MHz dBi 1.35 (peak)
				3400-3800MHz dBi -3.11 (peak)	3400-3800MHz dBi -1.49 (peak)	3400-3800MHz 4 max	3400-3800MHz dBi 1.62 (peak)
5150-5925MHz dBi 0.37 (peak)	5150-5925MHz dBi 2.52 (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

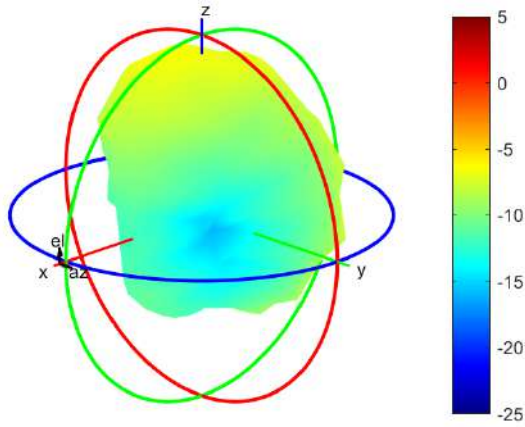
Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
617	-6.61	-6.61		
635	-6.62	-6.62		
652	-5.41	-5.63		
663	-4.91	-4.97		
681	-4.15	-4.07		
698	-3.67	-3.52		
703	-3.91	-3.55		
707.5	-3.77	-3.47		
717	-3.17	-3.39	-3.79	-3.52
725.5	-2.99	-3.49	-3.43	-3.48
748	-3.31	-3.31	-3.03	-3.55
756	-3.49	-3.49	-3.29	-4.36
768	-2.8	-1.93	-4.04	-5.45
777	-2.97	-1.62	-4.32	-5.10
782	-3.32	-1.95	-4.50	-4.57
787	-3.77	-1.57	-5.27	-4.45
814	-4.62	-2.79	-6.15	-5.68
824	-4.6	-2.68	-5.90	-5.59
832	-4.45	-2.59	-5.59	-5.60
836.5	-4.29	-2.21	-5.67	-5.31
849	-4.11	-2.05	-5.28	-5.16
862	-4.22	-2.08	-5.25	-5.01
880	-4.13	-2.98	-5.94	-4.94
897.5	-4.72	-3.52	-6.48	-5.14
915	-3.45	-2.79	-6.89	-5.92
925	-3.37	-2.9	-7.17	-6.89
960	-4.24	-2.61	-7.76	-5.96
1427.9	-3.33	-0.43	-5.26	-4.79
1447.9	-2.96	-0.05	-3.73	-4.39
1455.4	-2.97	0.01	-3.37	-4.57
1462.9	-3.04	0.02	-3.04	-4.23
1496	-3.11	-0.33	-1.89	-3.07
1510.9	-2.77	-0.29	-1.46	-2.77
1557			-1.90	-2.54
1575			-2.53	-2.95
1610			-4.10	-5.06

High band

Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
1710	-2.09	0.43		
1732.5	-1.68	1.02		
1747.5	-1.63	0.96		
1755	-1.64	0.76		
1785	-1.68	-0.33		
1805	-0.63	-0.62	-1.15	-1.15
1850	-1.42	-1.95	-0.54	-0.95
1880	-0.74	-1.96	-1.38	-1.38
1910	-0.5	-1.84	-1.11	-1.41
1920	-0.48	-1.66	-1.28	-1.53
1950	-0.09	-0.53	-0.97	-1.16
1980	0.22	-0.08	-0.38	-1.27
2110	-1.34	-1	-0.71	-0.04
2200	-2.23	-0.86	-0.77	-1.56
2300	-1.09	-1.32	-0.29	0.00
2305	-1.12	-1.09	-0.25	-0.01
2315	-0.98	-1.07	-0.30	-0.12
2350	-1.43	-1.38	-1.15	-0.56
2400	-2.83	-4.06	-1.61	-1.17
2500	-0.77	-2.96	-0.19	-0.20
2570	-2.88	-4.15	-0.85	-0.67
2595	-3.12	-4.12	-1.23	-0.30
2620	-2.96	-4.91	-2.09	-0.30
2690	-4.91	-6.08	-4.58	-1.77
3400	-5.4	-5.76	-4.02	-3.11
3500	-6.46	-6.66	-4.16	-3.19
3600	-3.87	-3.07	-5.96	-5.71
3700	-2.89	-3.14	-5.37	-6.84
3800	-2.96	-1.9	-4.79	-5.84
4200	-6.15	-6.1	-5.09	-4.13
4400	-5.51	-5.26	-10.04	-6.99
4700	-4.83	-4.37	-6.88	-6.39
5150	-1.04	-1.8	-3.04	-0.68
5537.5	-0.54	-2.73	-4.54	-4.38
5925	0.15	0.87	-2.22	0.37

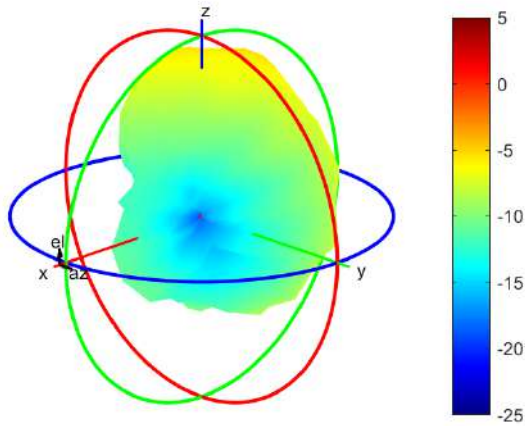
Section 3. Radiation characteristics of antennae Loaded in Host Platform **WWAN Main Antenna (TPx)**

617MHz



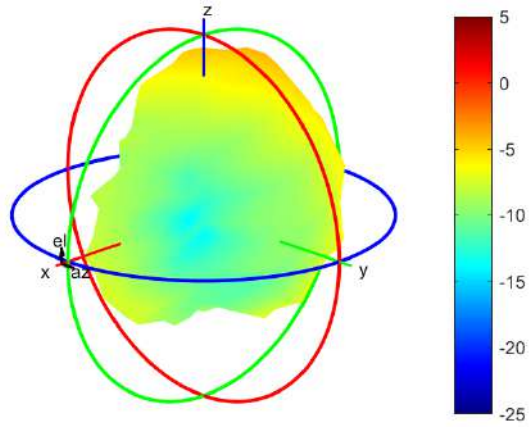
Center Frequency	617 MHz
Horizontal (dBi) peak	-6.61
Vertical (dBi) peak	-6.61

635MHz



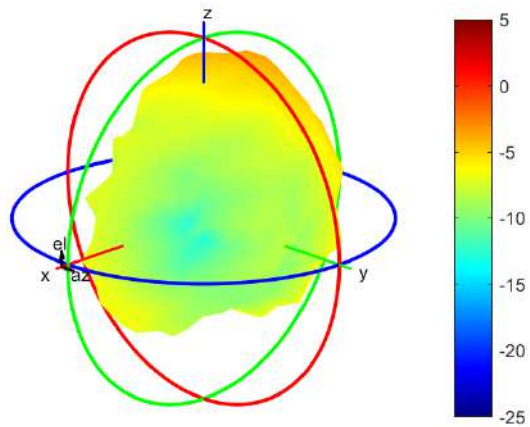
Center Frequency	635 MHz
Horizontal (dBi) peak	-6.62
Vertical (dBi) peak	-6.62

652MHz



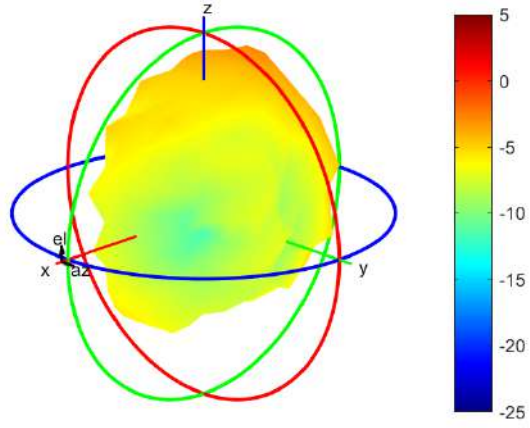
Center Frequency	652 MHz
Horizontal (dBi) peak	-5.41
Vertical (dBi) peak	-5.63

663MHz



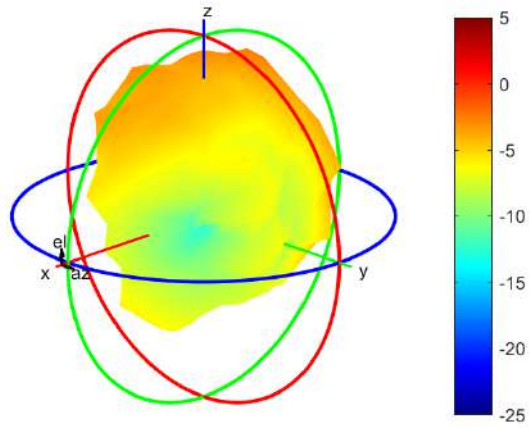
Center Frequency	663 MHz
Horizontal (dBi) peak	-4.91
Vertical (dBi) peak	-4.97

681MHz



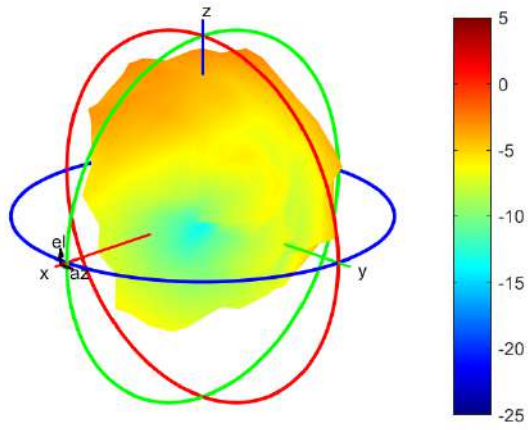
Center Frequency	681 MHz
Horizontal (dBi) peak	-4.15
Vertical (dBi) peak	-4.07

698MHz



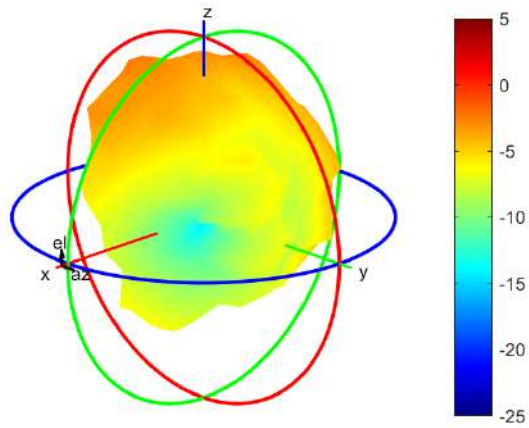
Center Frequency	698 MHz
Horizontal (dBi) peak	-3.67
Vertical (dBi) peak	-3.52

703MHz



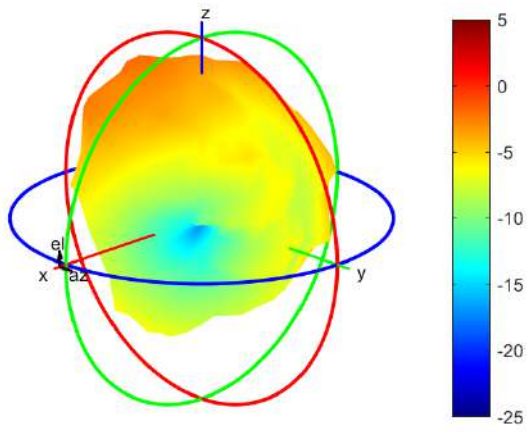
Center Frequency	703MHz
Horizontal (dBi) peak	-3.91
Vertical (dBi) peak	-3.55

707.5MHz



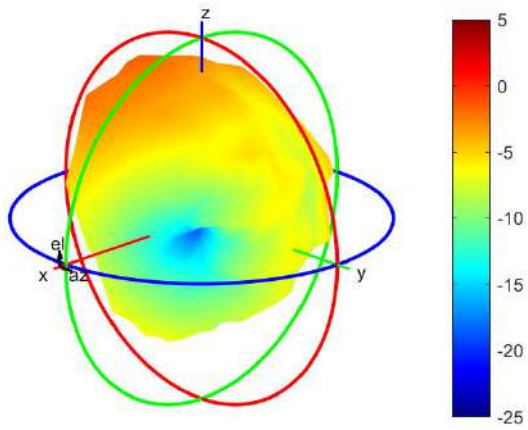
Center Frequency	707.5MHz
Horizontal (dBi) peak	-3.77
Vertical (dBi) peak	-3.47

717MHz



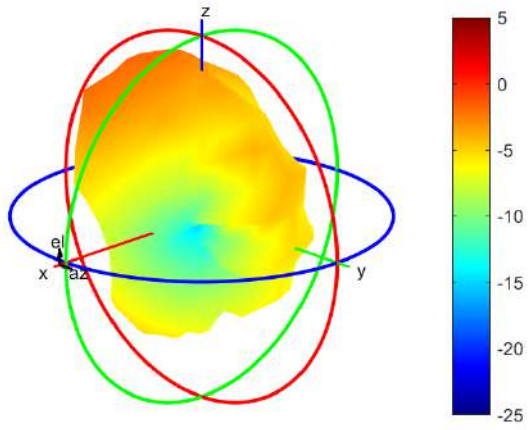
Center Frequency	717MHz
Horizontal (dBi) peak	-3.17
Vertical (dBi) peak	-3.39

725.5MHz



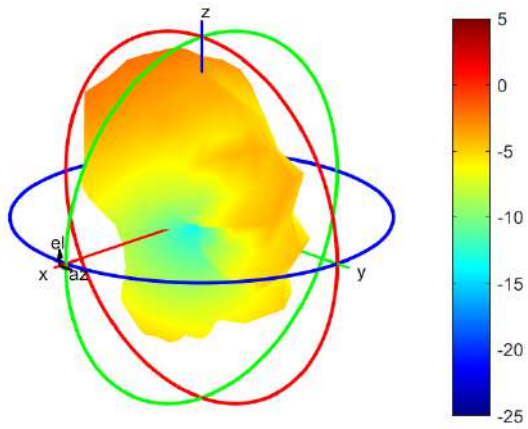
Center Frequency	725.5MHz
Horizontal (dBi) peak	-2.99
Vertical (dBi) peak	-3.49

748MHz



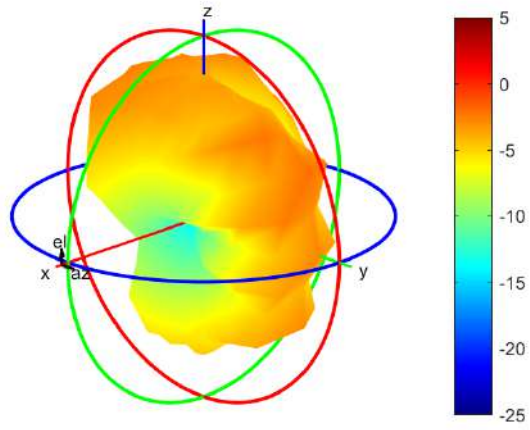
Center Frequency	748MHz
Horizontal (dBi) peak	-3.31
Vertical (dBi) peak	-3.31

756MHz



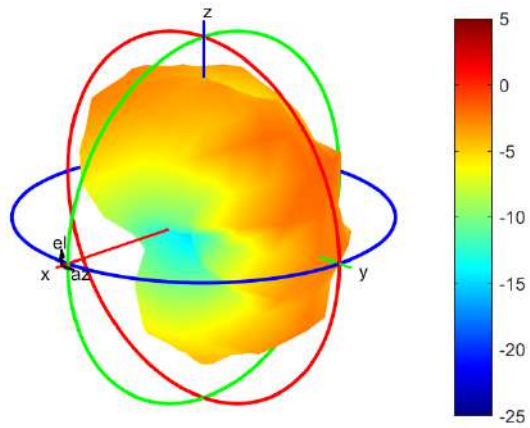
Center Frequency	756MHz
Horizontal (dBi) peak	-3.49
Vertical (dBi) peak	-3.49

768MHz



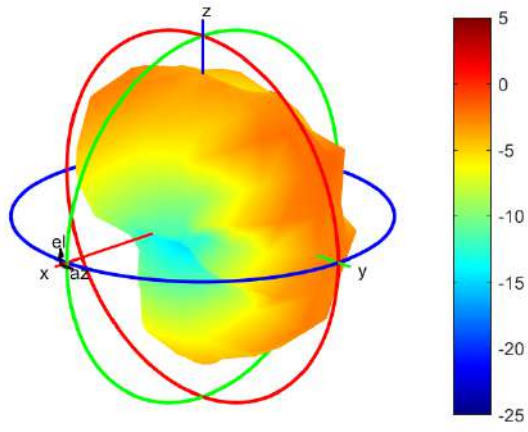
Center Frequency	768MHz
Horizontal (dBi) peak	-2.8
Vertical (dBi) peak	-1.93

777MHz



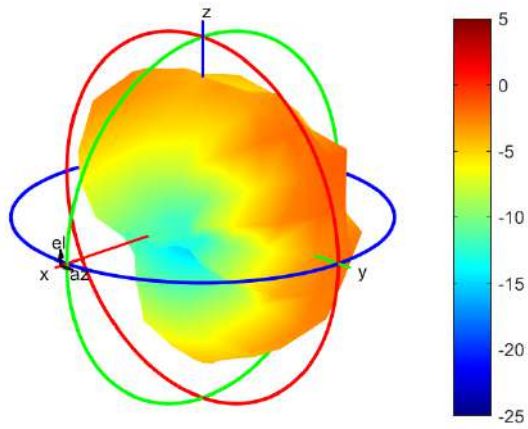
Center Frequency	777MHz
Horizontal (dBi) peak	-2.97
Vertical (dBi) peak	-1.62

782MHz



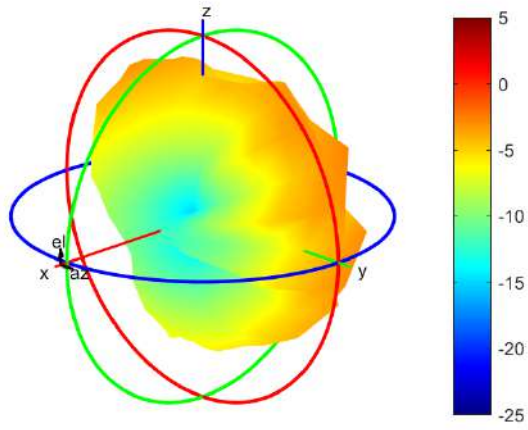
Center Frequency	782MHz
Horizontal (dBi) peak	-3.32
Vertical (dBi) peak	-1.95

787MHz



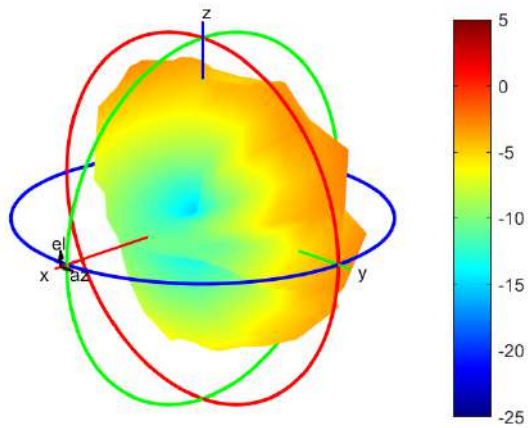
Center Frequency	787MHz
Horizontal (dBi) peak	-3.77
Vertical (dBi) peak	-1.57

814MHz



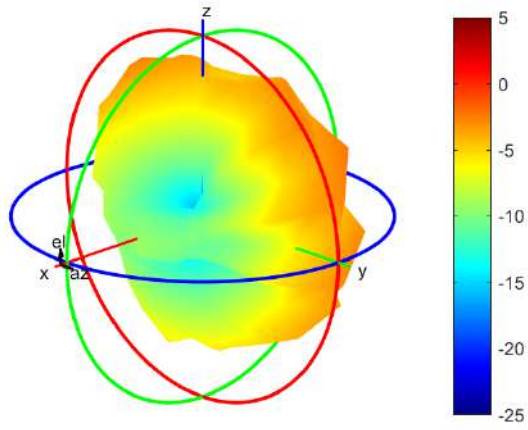
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Horizontal (dBi) peak	-4.62
Vertical (dBi) peak	-2.79

824MHz



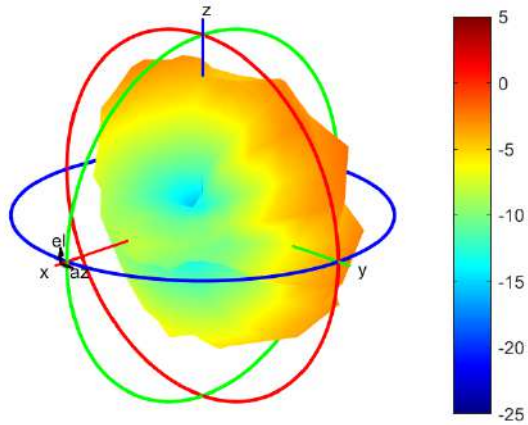
Center Frequency	824MHz
Horizontal (dBi) peak	-4.6
Vertical (dBi) peak	-2.68

832MHz



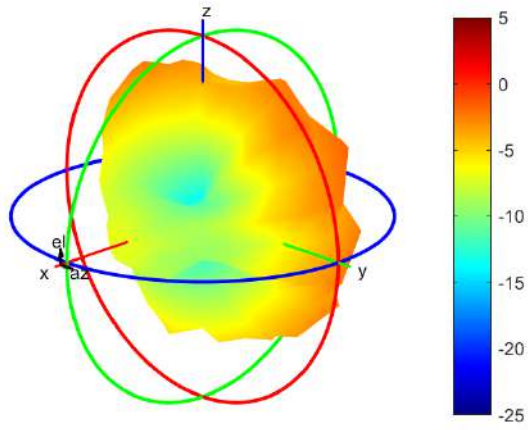
Center Frequency	832MHz
Horizontal (dBi) peak	-4.45
Vertical (dBi) peak	-2.59

836.5MHz



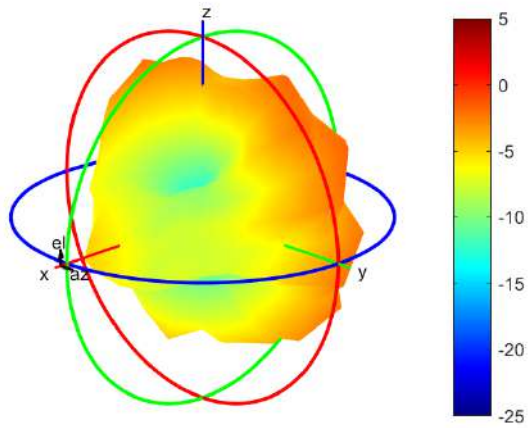
Center Frequency	836.5MHz
Horizontal (dBi) peak	-4.29
Vertical (dBi) peak	-2.21

849MHz



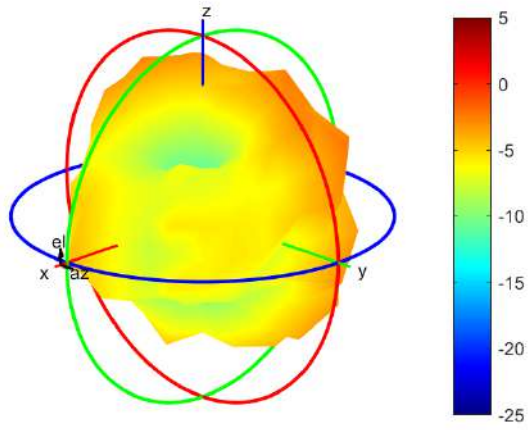
Center Frequency	849MHz
Horizontal (dBi) peak	-4.11
Vertical (dBi) peak	-2.05

862MHz



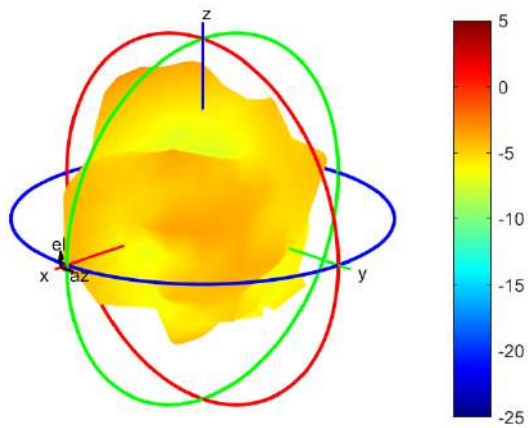
Center Frequency	862MHz
Horizontal (dBi) peak	-4.22
Vertical (dBi) peak	-2.08

880MHz



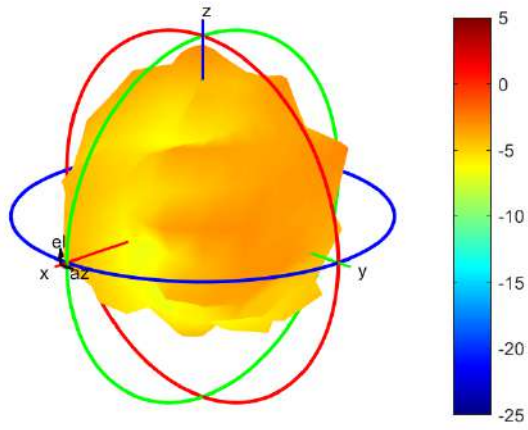
Center Frequency	880MHz
Horizontal (dBi) peak	-4.13
Vertical (dBi) peak	-2.98

897.5MHz



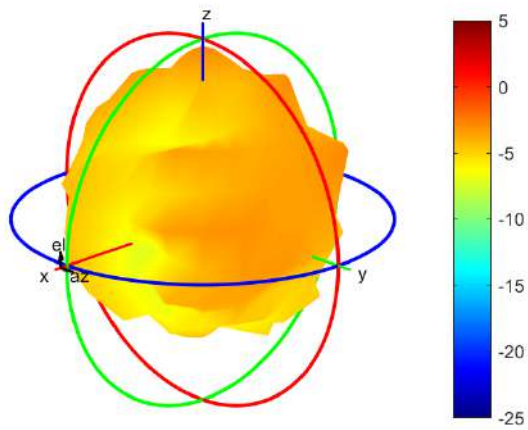
Center Frequency	897.5MHz
Horizontal (dBi) peak	-4.72
Vertical (dBi) peak	-3.52

915MHz



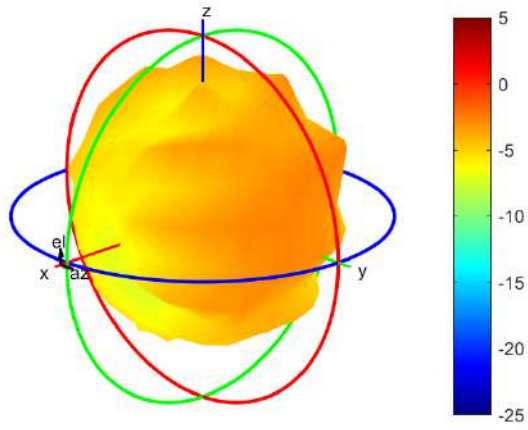
Center Frequency	915MHz
Horizontal (dBi) peak	-3.45
Vertical (dBi) peak	-2.79

925MHz



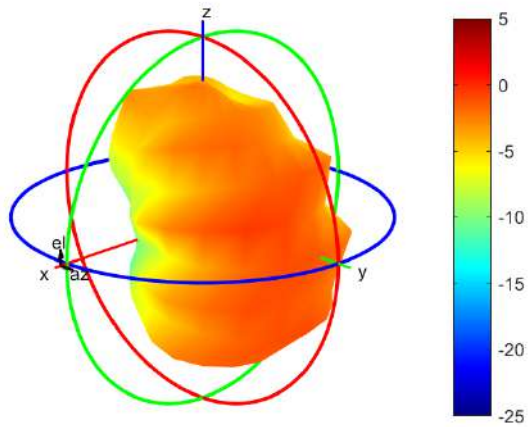
Center Frequency	925MHz
Horizontal (dBi) peak	-3.37
Vertical (dBi) peak	-2.9

960MHz



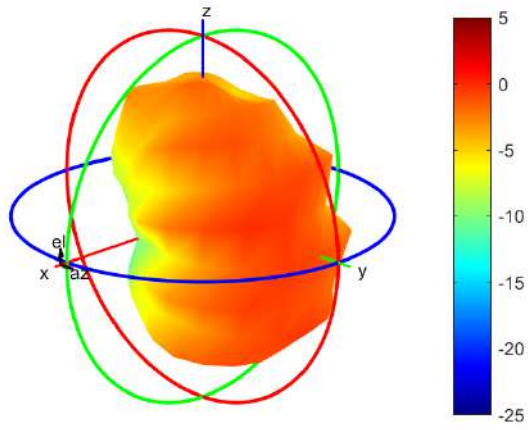
Center Frequency	960MHz
Horizontal (dBi) peak	-4.24
Vertical (dBi) peak	-2.61

1427.9MHz



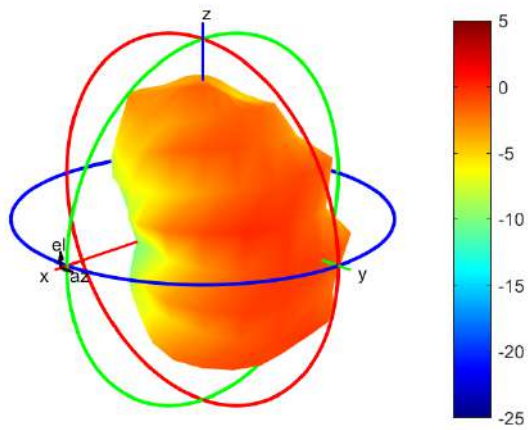
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Horizontal (dBi) peak	-3.33
Vertical (dBi) peak	-0.43

1447.9MHz



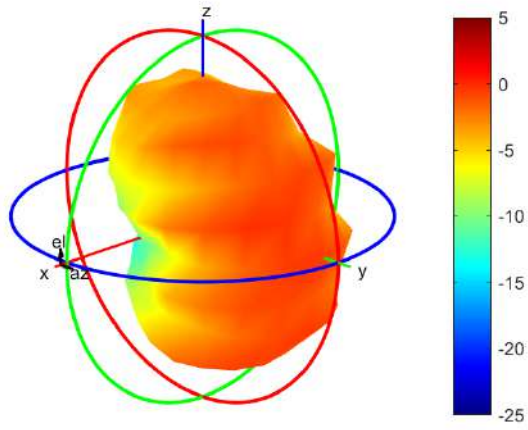
Center Frequency	1447.9MHz
Horizontal (dBi) peak	-2.96
Vertical (dBi) peak	-0.05

1455.4MHz



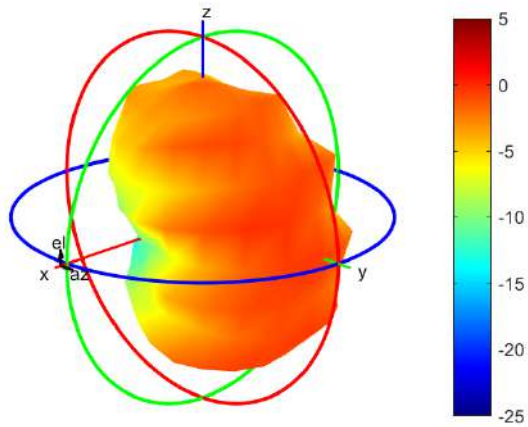
Center Frequency	1455.4MHz
Horizontal (dBi) peak	-2.97
Vertical (dBi) peak	0.01

1462.9MHz



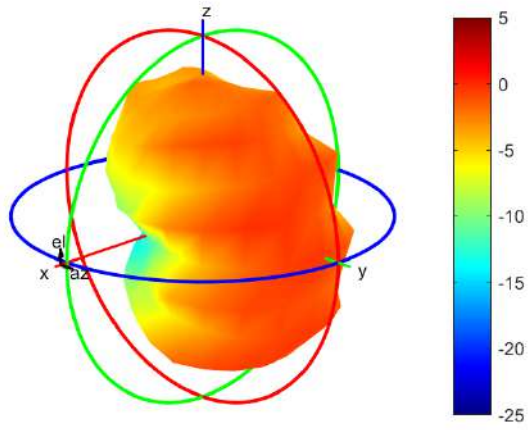
Center Frequency	1462.9MHz
Horizontal (dBi) peak	-3.04
Vertical (dBi) peak	0.02

1496MHz



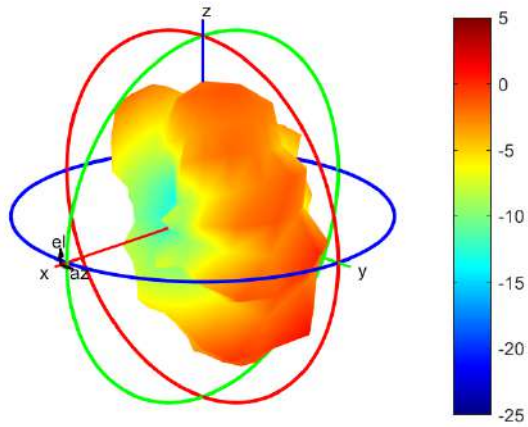
Center Frequency	1496MHz
Horizontal (dBi) peak	-3.11
Vertical (dBi) peak	-0.33

1510.9 MHz



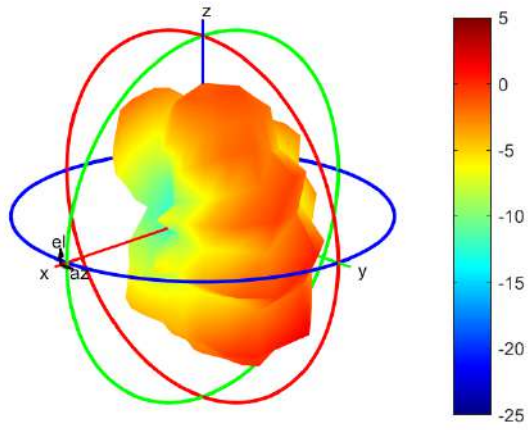
Center Frequency	1510.9 MHz
Horizontal (dBi) peak	-2.77
Vertical (dBi) peak	-0.29

1710 MHz



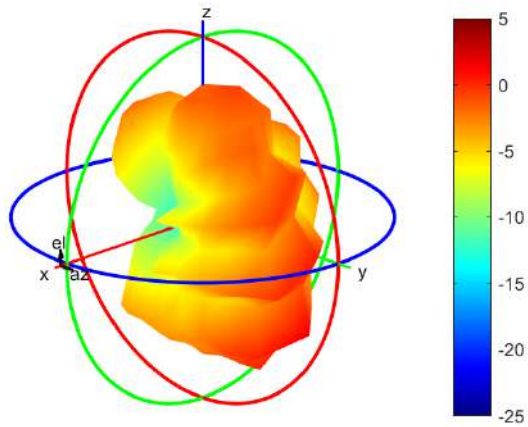
Center Frequency	1710 MHz
Horizontal (dBi) peak	-2.09
Vertical (dBi) peak	0.43

1732.5 MHz



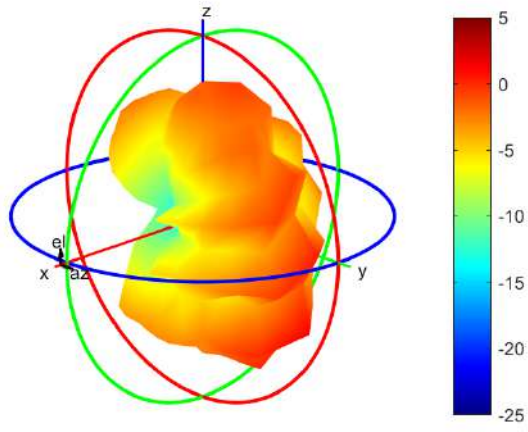
Center Frequency	1732.5 MHz
Horizontal (dBi) peak	-1.68
Vertical (dBi) peak	1.02

1747.5 MHz



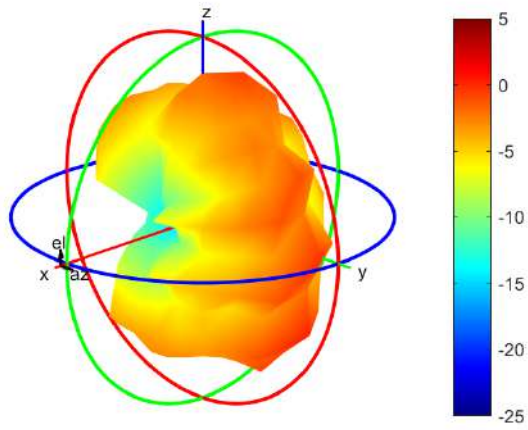
Center Frequency	1747.5 MHz
Horizontal (dBi) peak	-1.63
Vertical (dBi) peak	0.96

1755 MHz



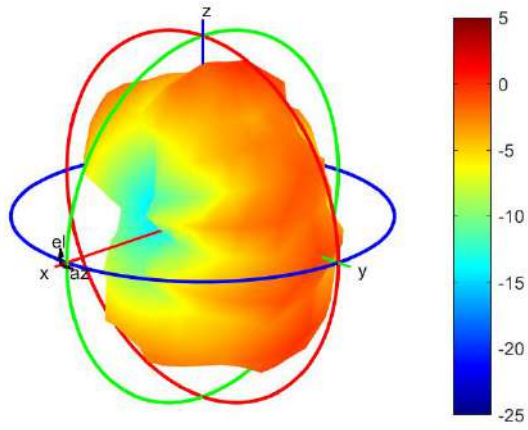
Center Frequency	1755 MHz
Horizontal (dBi) peak	-1.64
Vertical (dBi) peak	0.76

1785 MHz



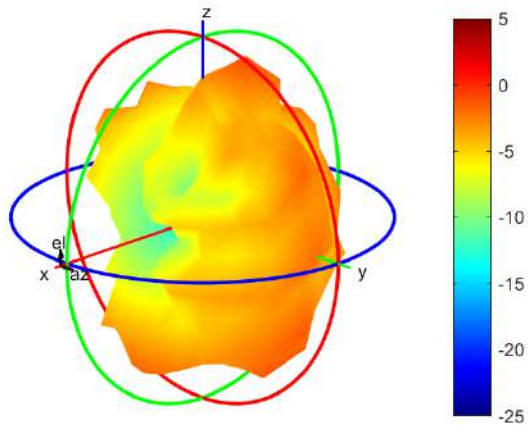
Center Frequency	1785 MHz
Horizontal (dBi) peak	-1.68
Vertical (dBi) peak	-0.33

1805 MHz



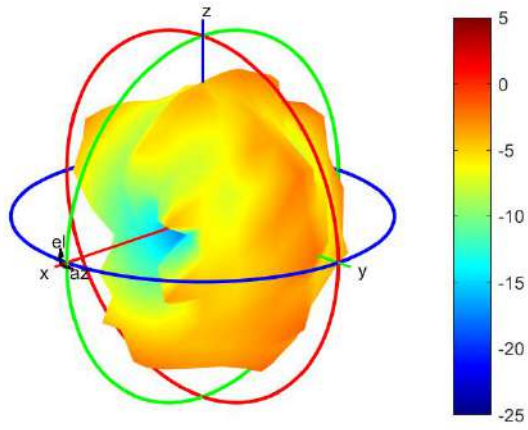
Center Frequency	1805 MHz
Horizontal (dBi) peak	-0.63
Vertical (dBi) peak	-0.62

1850 MHz



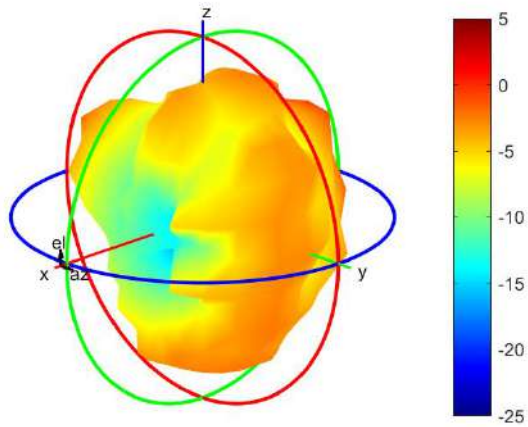
Center Frequency	1850 MHz
Horizontal (dBi) peak	-1.42
Vertical (dBi) peak	-1.95

1880 MHz



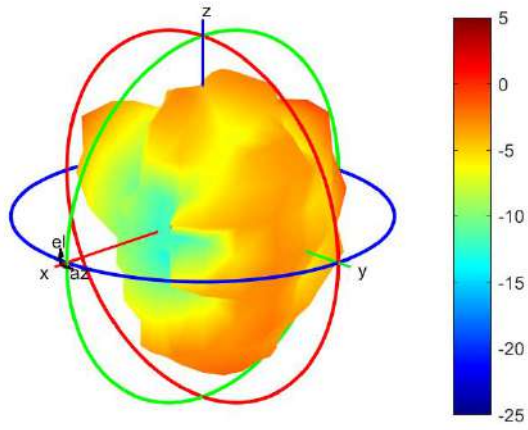
Center Frequency	1880 MHz
Horizontal (dBi) peak	-0.74
Vertical (dBi) peak	-1.96

1910MHz



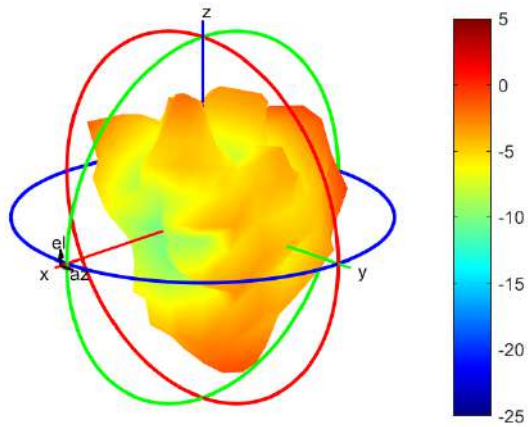
Center Frequency	1910MHz
Horizontal (dBi) peak	-0.5
Vertical (dBi) peak	-1.84

1920MHz



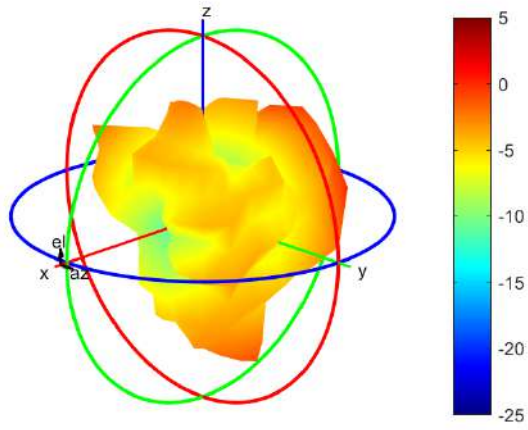
Center Frequency	1920MHz
Horizontal (dBi) peak	-0.48
Vertical (dBi) peak	-1.66

1950MHz



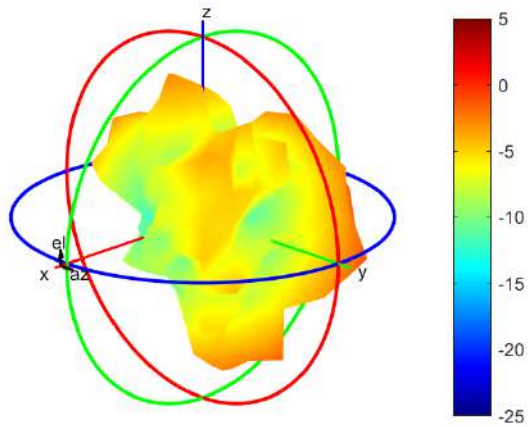
Center Frequency	1950MHz
Horizontal (dBi) peak	-0.09
Vertical (dBi) peak	-0.53

1980MHz



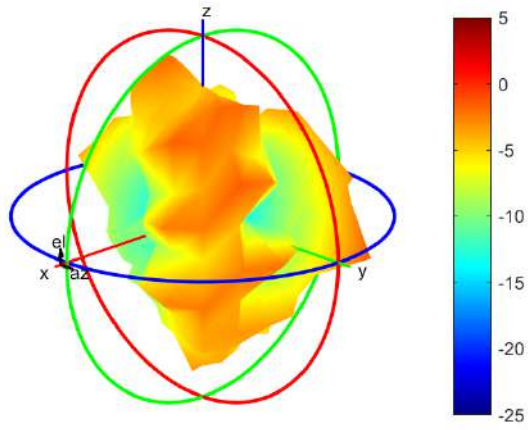
Center Frequency	1980MHz
Horizontal (dBi) peak	0.22
Vertical (dBi) peak	-0.08

2110MHz



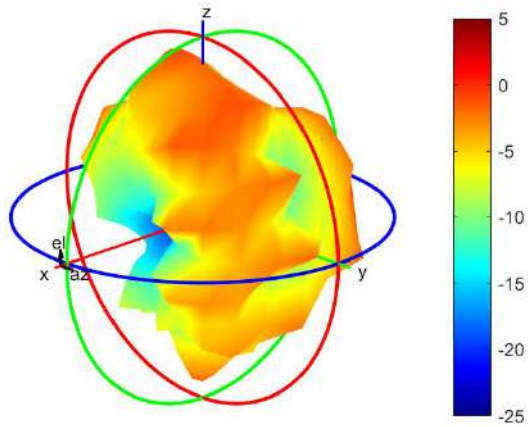
Center Frequency	2110MHz
Horizontal (dBi) peak	-1.34
Vertical (dBi) peak	-1

2200MHz



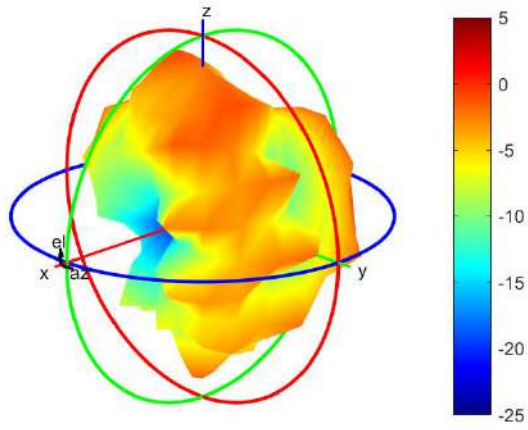
Center Frequency	2200MHz
Horizontal (dBi) peak	-2.23
Vertical (dBi) peak	-0.86

2300MHz



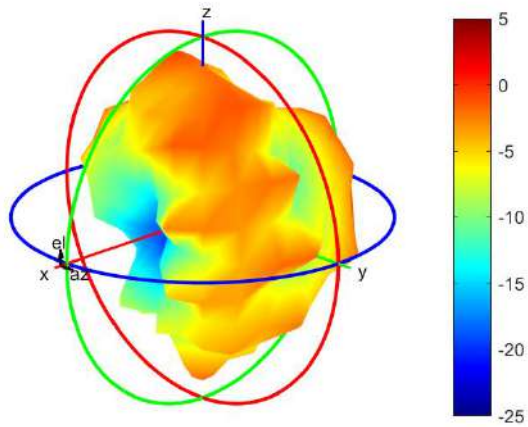
Center Frequency	2300MHz
Horizontal (dBi) peak	-1.09
Vertical (dBi) peak	-1.32

2305MHz



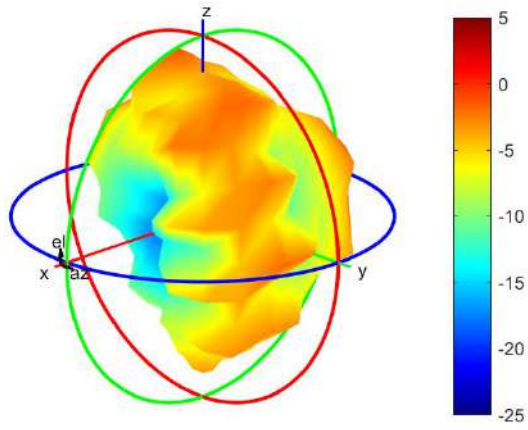
Center Frequency	2305MHz
Horizontal (dBi) peak	-1.12
Vertical (dBi) peak	-1.09

2315MHz



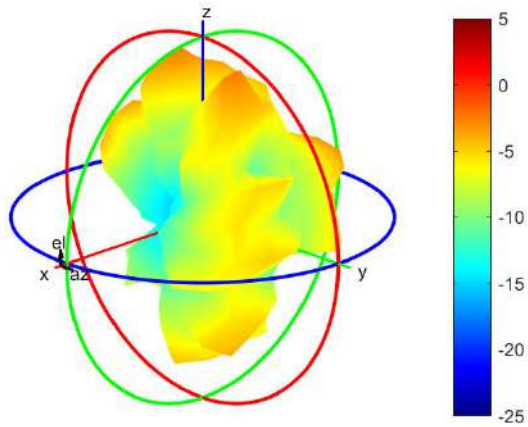
Center Frequency	2315MHz
Horizontal (dBi) peak	-0.98
Vertical (dBi) peak	-1.07

2350MHz



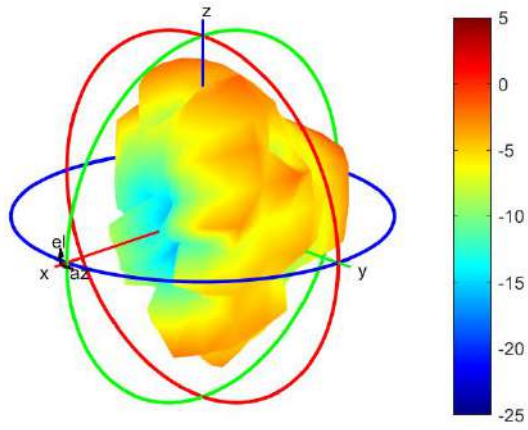
Center Frequency	2350MHz
Horizontal (dBi) peak	-1.43
Vertical (dBi) peak	-1.38

2400MHz



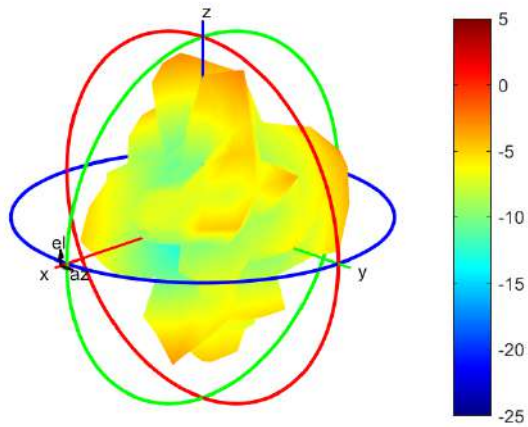
Center Frequency	2400MHz
Horizontal (dBi) peak	-2.83
Vertical (dBi) peak	-4.06

2500MHz



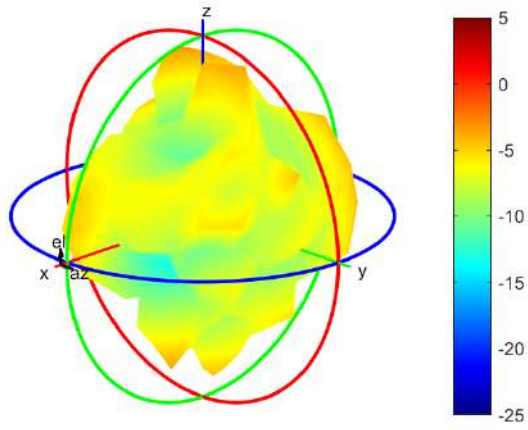
Center Frequency	2500MHz
Horizontal (dBi) peak	-0.77
Vertical (dBi) peak	-2.96

2570MHz



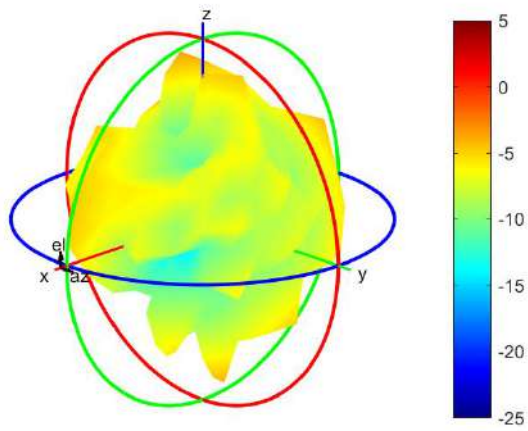
Center Frequency	2570MHz
Horizontal (dBi) peak	-2.88
Vertical (dBi) peak	-4.15

2595MHz



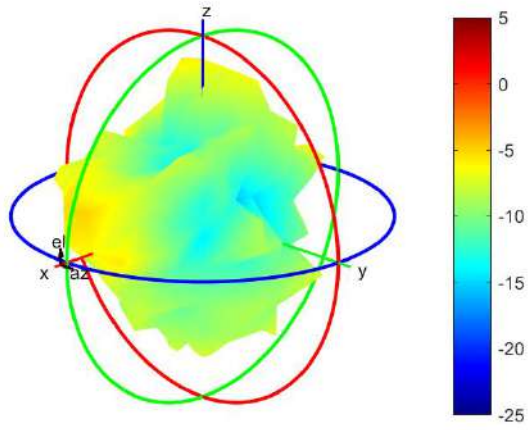
Center Frequency	2595MHz
Horizontal (dBi) peak	-3.12
Vertical (dBi) peak	-4.12

2620MHz



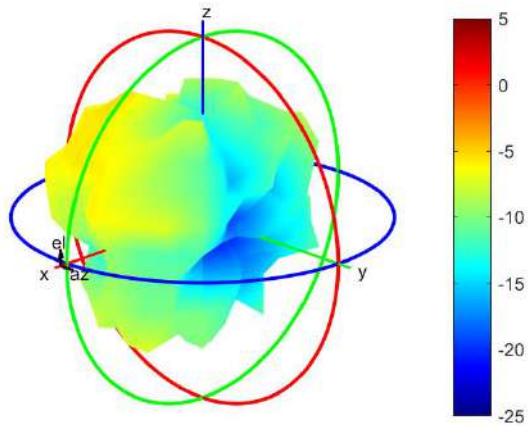
Center Frequency	2620MHz
Horizontal (dBi) peak	-2.96
Vertical (dBi) peak	-4.91

2690MHz



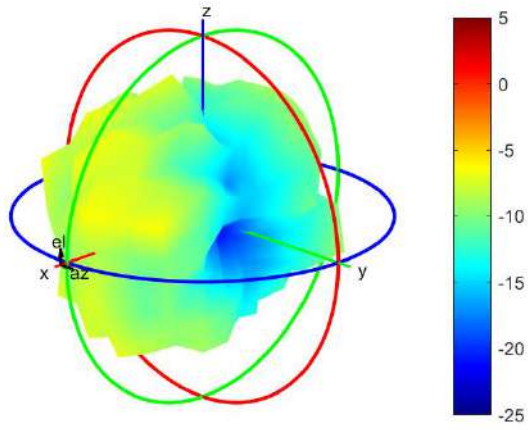
Center Frequency	2690MHz
Horizontal (dBi) peak	-4.91
Vertical (dBi) peak	-6.08

3400MHz



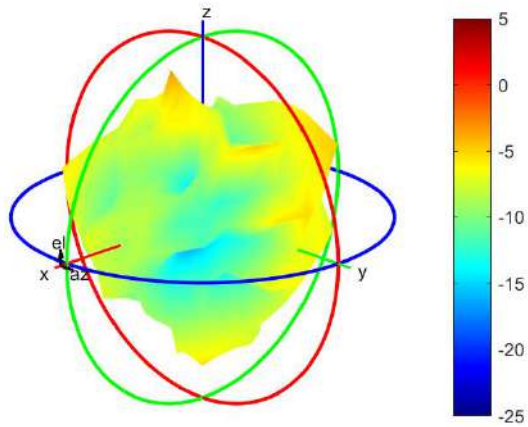
Center Frequency	3400MHz
Horizontal (dBi) peak	-5.4
Vertical (dBi) peak	-5.76

3500MHz



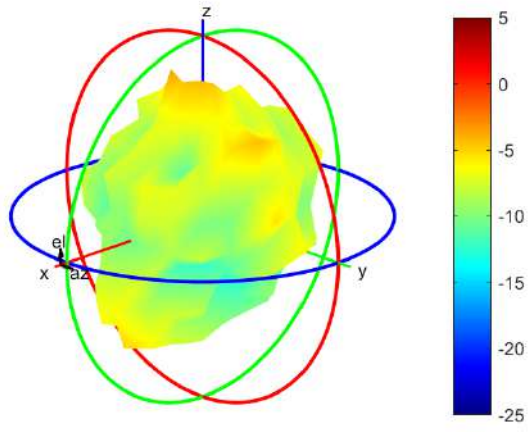
Center Frequency	3500MHz
Horizontal (dBi) peak	-6.46
Vertical (dBi) peak	-6.66

3600MHz



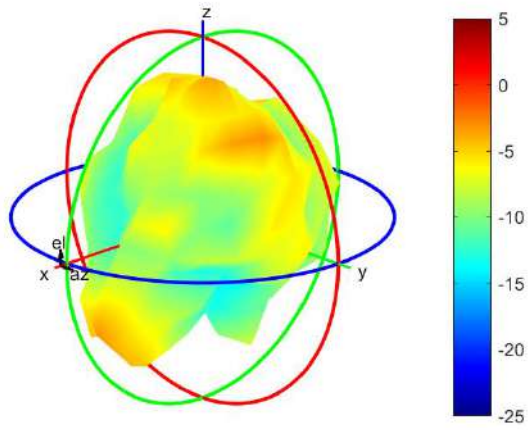
Center Frequency	3600MHz
Horizontal (dBi) peak	-3.87
Vertical (dBi) peak	-3.07

3700MHz



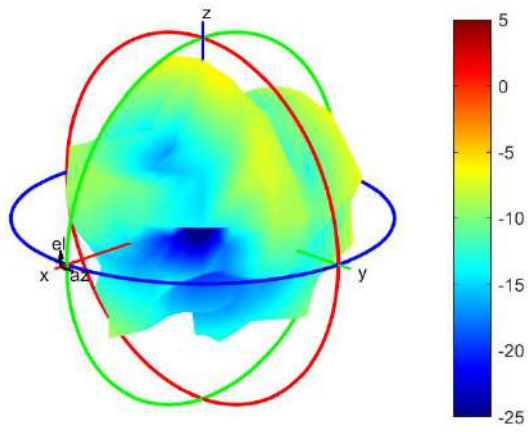
Center Frequency	3700MHz
Horizontal (dBi) peak	-2.89
Vertical (dBi) peak	-3.14

3800MHz



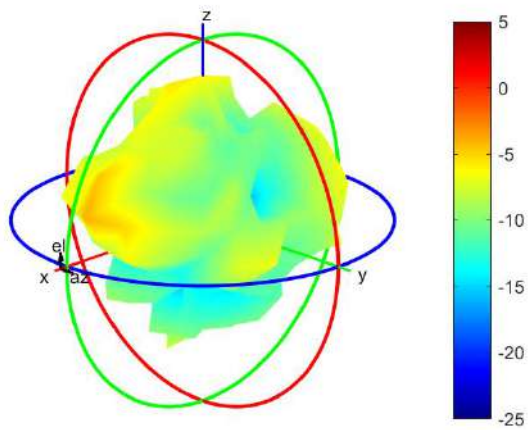
Center Frequency	3800MHz
Horizontal (dBi) peak	-2.96
Vertical (dBi) peak	-1.9

4200MHz



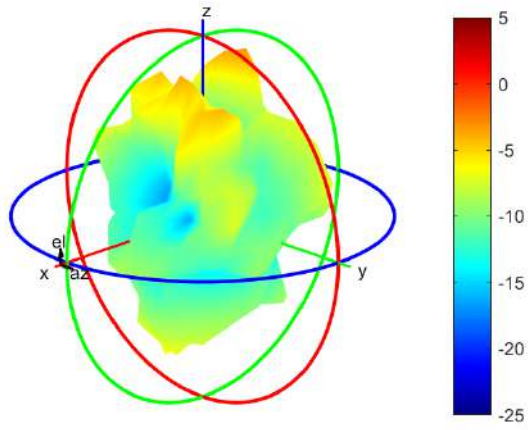
Center Frequency	4200MHz
Horizontal (dBi) peak	-6.15
Vertical (dBi) peak	-6.1

4400MHz



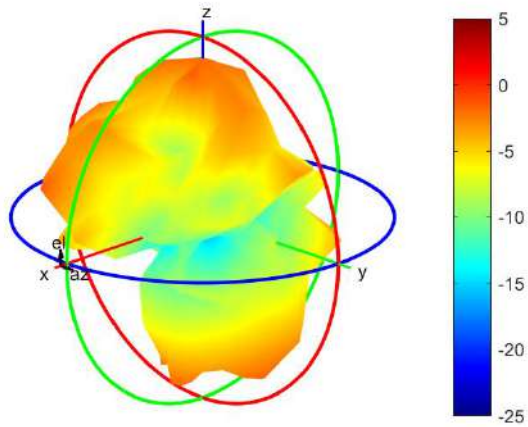
Center Frequency	4400MHz
Horizontal (dBi) peak	-5.51
Vertical (dBi) peak	-5.26

4700MHz



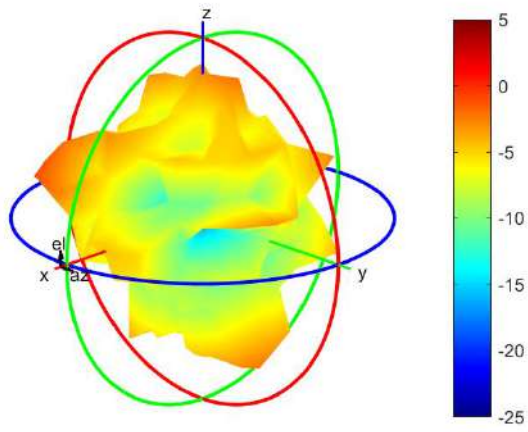
Center Frequency	4700MHz
Horizontal (dBi) peak	-4.83
Vertical (dBi) peak	-4.37

5150MHz



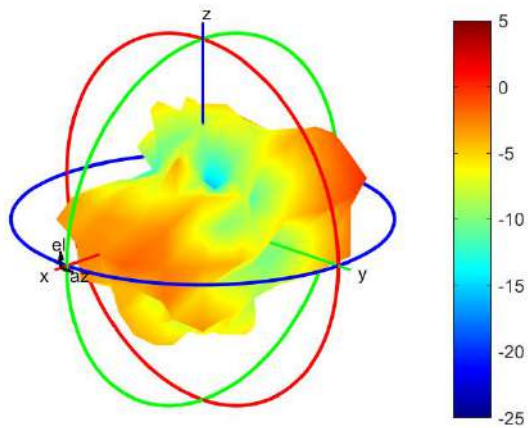
Center Frequency	5150MHz
Horizontal (dBi) peak	-1.04
Vertical (dBi) peak	-1.8

5537.5MHz



Center Frequency	5537.5MHz
Horizontal (dBi) peak	-0.54
Vertical (dBi) peak	-2.73

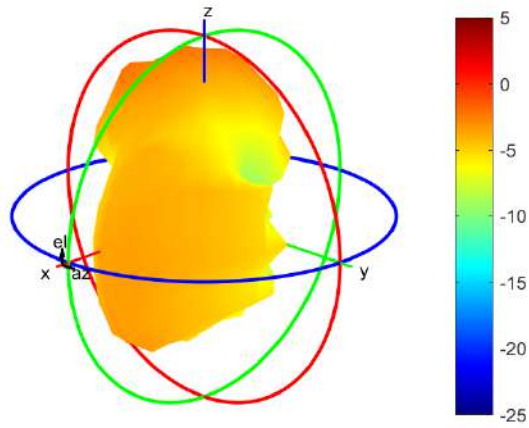
5925MHz



Center Frequency	5925MHz
Horizontal (dBi) peak	0.15
Vertical (dBi) peak	0.87

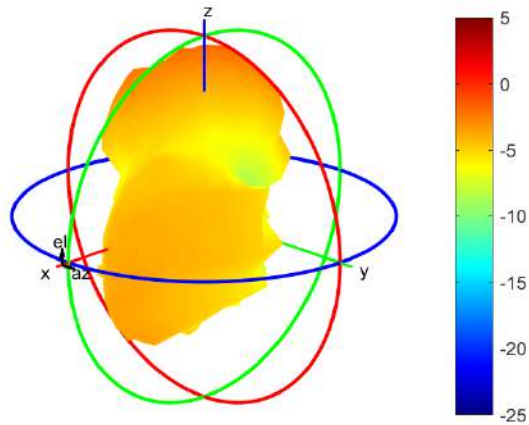
WWAN Aux Antenna (DRx)

717MHz



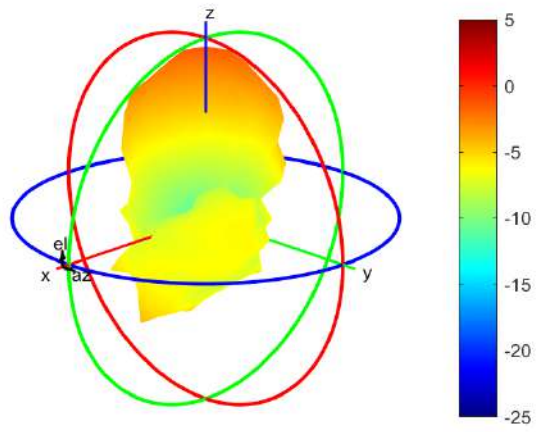
Center Frequency	717MHz
Horizontal (dBi) peak	-3.79
Vertical (dBi) peak	-3.52

725.5MHz



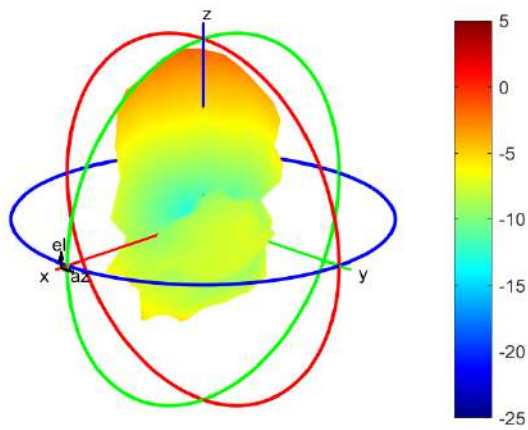
Center Frequency	725.5MHz
Horizontal (dBi) peak	-3.43
Vertical (dBi) peak	-3.48

748MHz



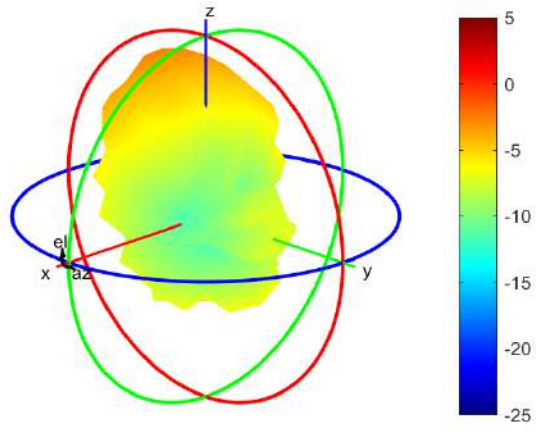
Center Frequency	748MHz
Horizontal (dBi) peak	-3.03
Vertical (dBi) peak	-3.55

756MHz



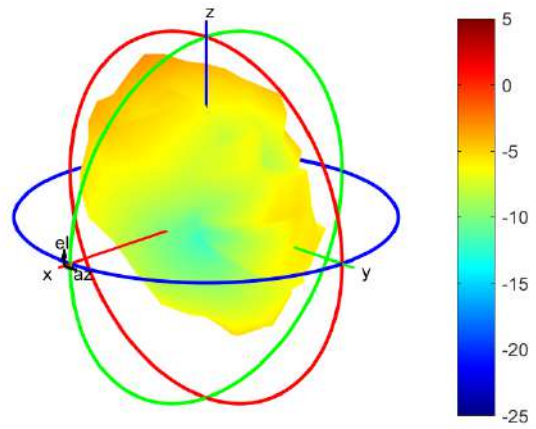
Center Frequency	756MHz
Horizontal (dBi) peak	-3.29
Vertical (dBi) peak	-4.36

768MHz



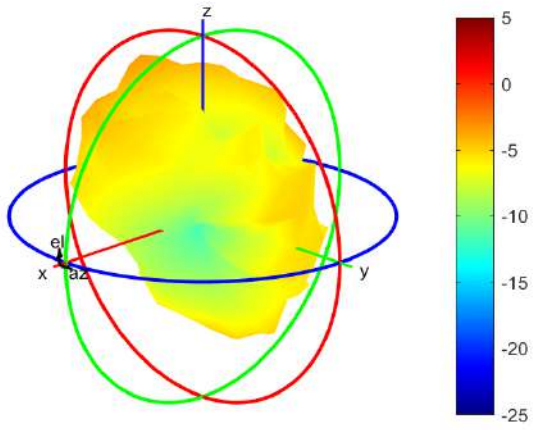
Center Frequency	768MHz
Horizontal (dBi) peak	-4.04
Vertical (dBi) peak	-5.45

777MHz



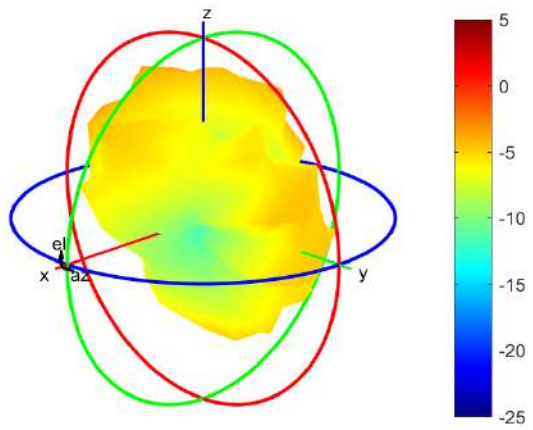
Center Frequency	777MHz
Horizontal (dBi) peak	-4.32
Vertical (dBi) peak	-5.10

782MHz



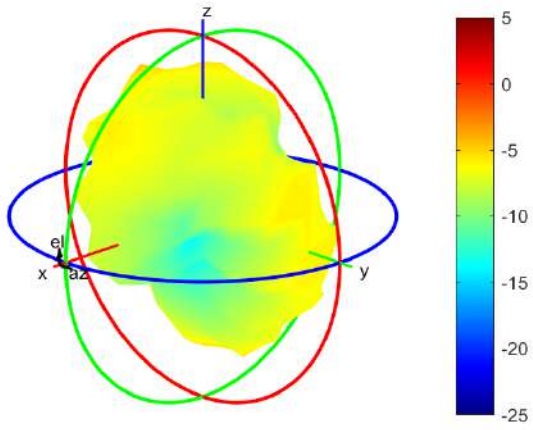
Center Frequency	782MHz
Horizontal (dBi) peak	-4.50
Vertical (dBi) peak	-4.57

787MHz



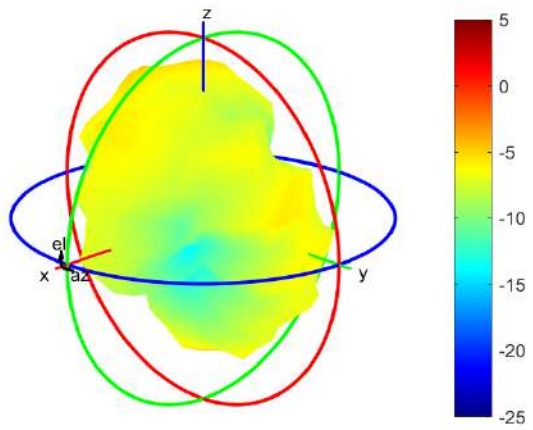
Center Frequency	787MHz
Horizontal (dBi) peak	-5.27
Vertical (dBi) peak	-4.45

814MHz



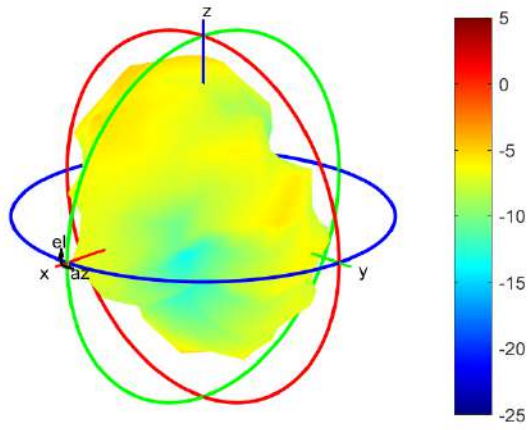
Center Frequency	814MHz
Horizontal (dBi) peak	-6.15
Vertical (dBi) peak	-5.68

824MHz



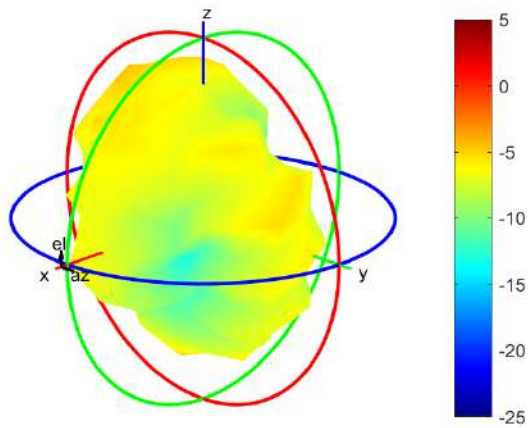
Center Frequency	824MHz
Horizontal (dBi) peak	-5.90
Vertical (dBi) peak	-5.59

832MHz



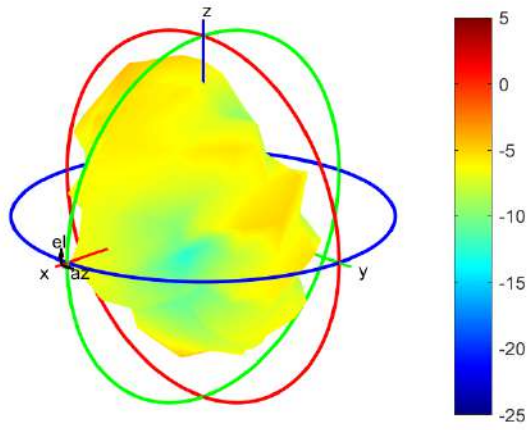
Center Frequency	832MHz
Horizontal (dBi) peak	-5.59
Vertical (dBi) peak	-5.60

836.5MHz



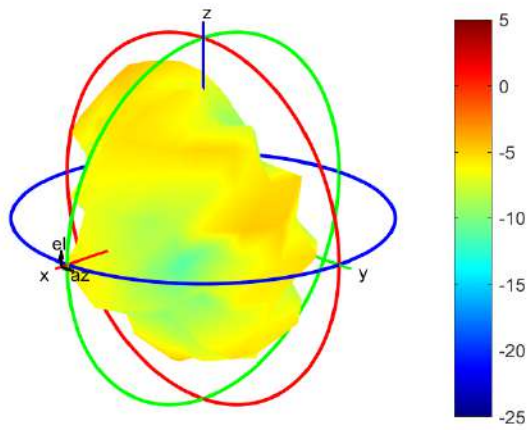
Center Frequency	836.5MHz
Horizontal (dBi) peak	-5.67
Vertical (dBi) peak	-5.31

849MHz



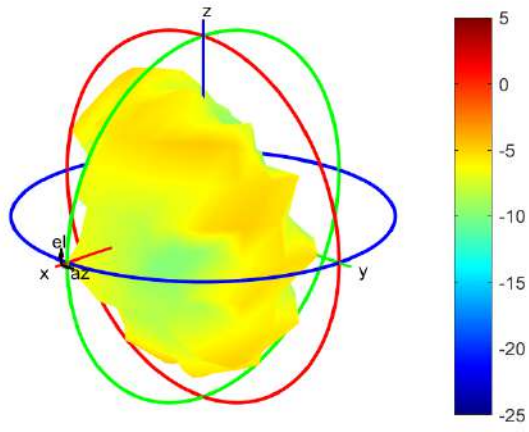
Center Frequency	849MHz
Horizontal (dBi) peak	-5.28
Vertical (dBi) peak	-5.16

862MHz



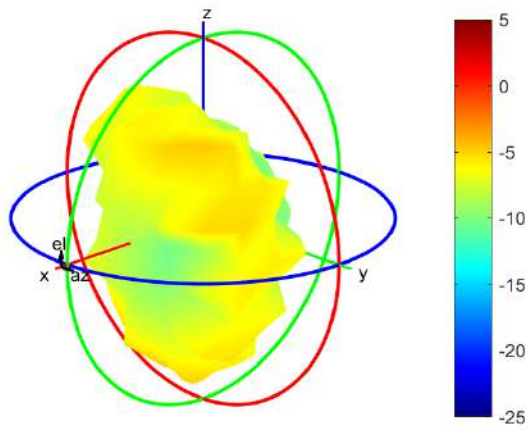
Center Frequency	862MHz
Horizontal (dBi) peak	-5.25
Vertical (dBi) peak	-5.01

880MHz



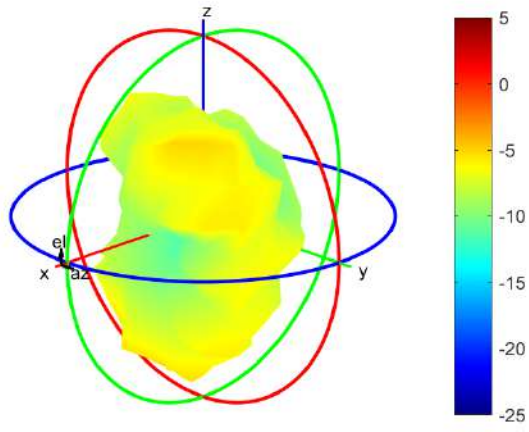
Center Frequency	880MHz
Horizontal (dBi) peak	-5.94
Vertical (dBi) peak	-4.94

897.5MHz



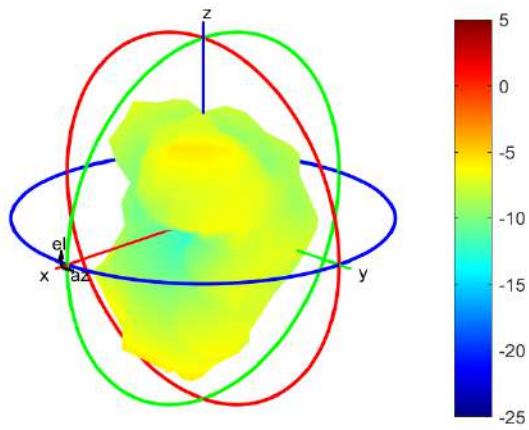
Center Frequency	897.5MHz
Horizontal (dBi) peak	-6.48
Vertical (dBi) peak	-5.14

915MHz



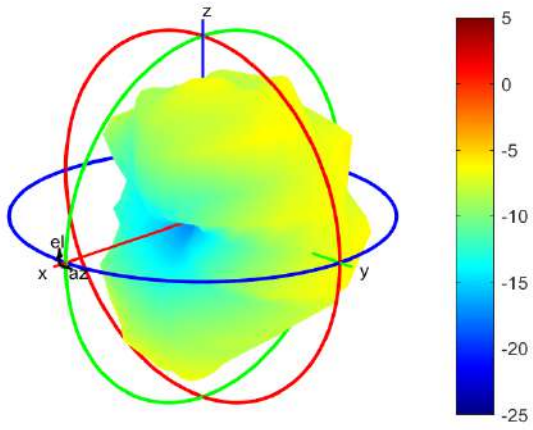
Center Frequency	915MHz
Horizontal (dBi) peak	-6.89
Vertical (dBi) peak	-5.92

925MHz



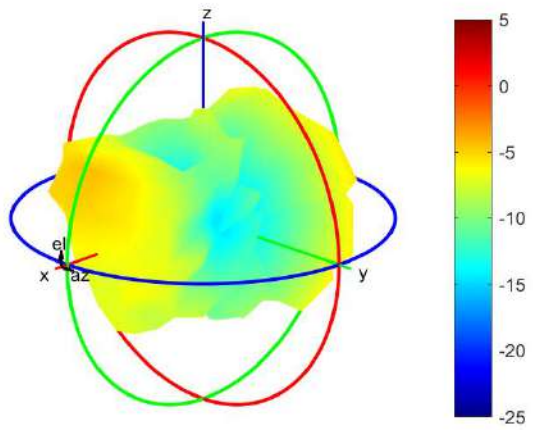
Center Frequency	925MHz
Horizontal (dBi) peak	-7.17
Vertical (dBi) peak	-6.89

960MHz



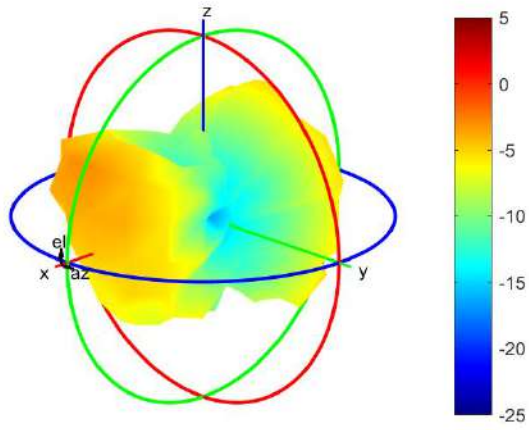
Center Frequency	960MHz
Horizontal (dBi) peak	-7.76
Vertical (dBi) peak	-5.96

1427.9MHz



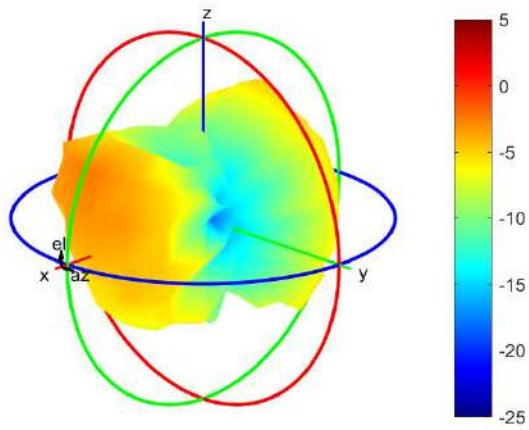
Center Frequency	1427.9MHz
Horizontal (dBi) peak	-5.26
Vertical (dBi) peak	-4.79

1447.9MHz



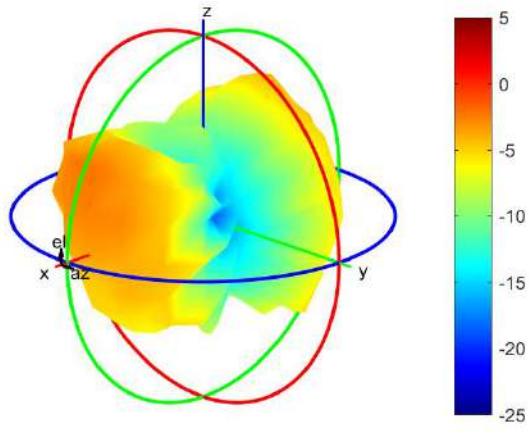
Center Frequency	1447.9MHz
Horizontal (dBi) peak	-3.73
Vertical (dBi) peak	-4.39

1455.4MHz



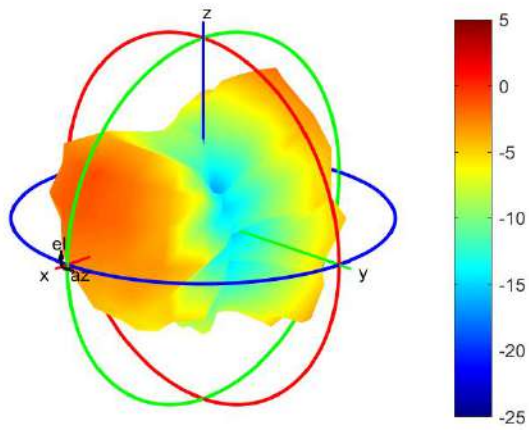
Center Frequency	1455.4MHz
Horizontal (dBi) peak	-3.37
Vertical (dBi) peak	-4.57

1462.9MHz



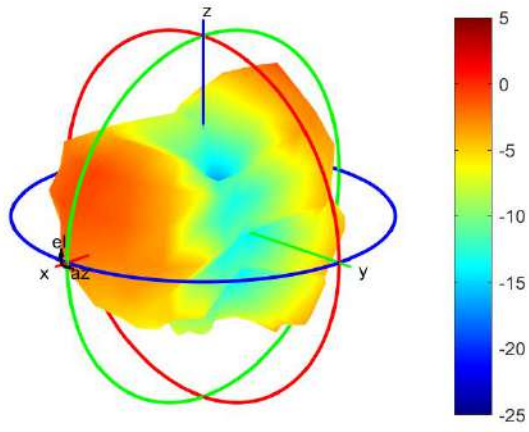
Center Frequency	1462.9MHz
Horizontal (dBi) peak	-3.04
Vertical (dBi) peak	-4.23

1496MHz



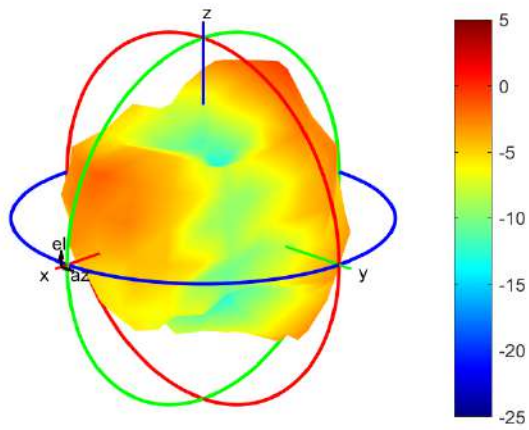
Center Frequency	1496MHz
Horizontal (dBi) peak	-1.89
Vertical (dBi) peak	-3.07

1510.9MHz



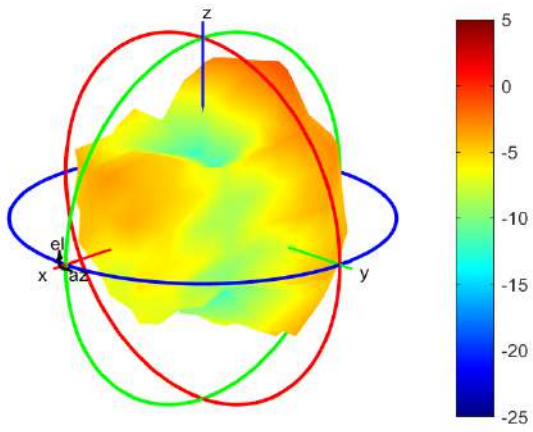
Center Frequency	1510.9MHz
Horizontal (dBi) peak	-1.46
Vertical (dBi) peak	-2.77

1557MHz



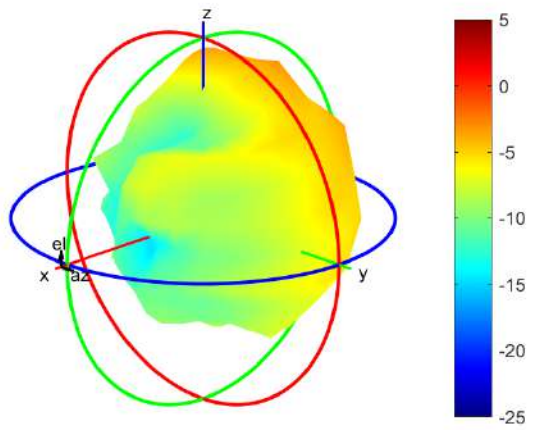
Center Frequency	1557MHz
Horizontal (dBi) peak	-1.90
Vertical (dBi) peak	-2.54

1575MHz



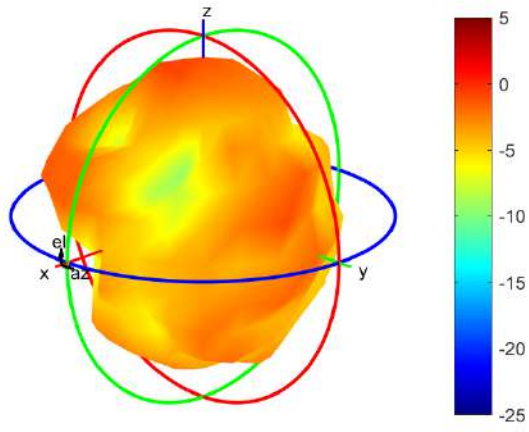
Center Frequency	1575MHz
Horizontal (dBi) peak	-2.53
Vertical (dBi) peak	-2.95

1610MHz



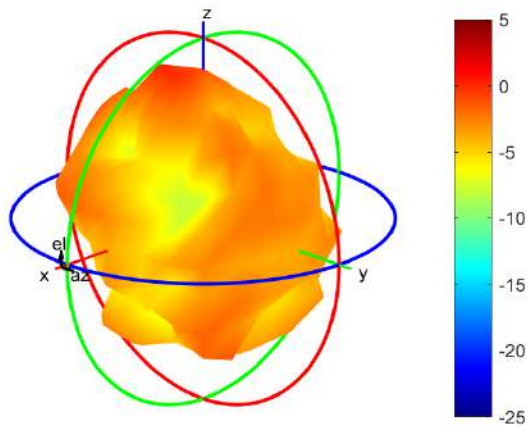
Center Frequency	1610MHz
Horizontal (dBi) peak	-4.10
Vertical (dBi) peak	-5.06

1805 MHz



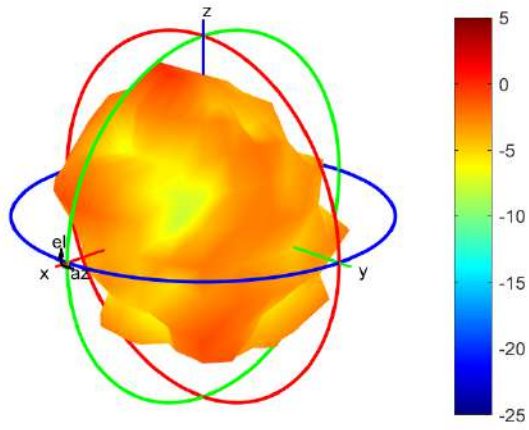
Center Frequency	1805 MHz
Horizontal (dBi) peak	-1.15
Vertical (dBi) peak	-1.15

1850 MHz



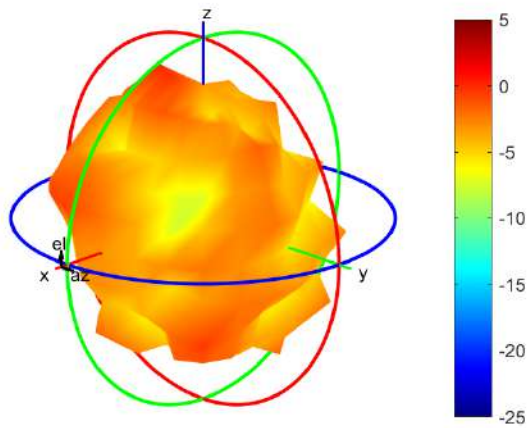
Center Frequency	1850 MHz
Horizontal (dBi) peak	-0.54
Vertical (dBi) peak	-0.95

1880 MHz



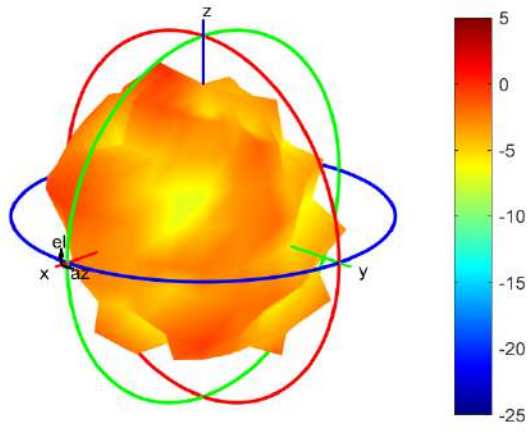
Center Frequency	1880 MHz
Horizontal (dBi) peak	-1.38
Vertical (dBi) peak	-1.38

1910MHz



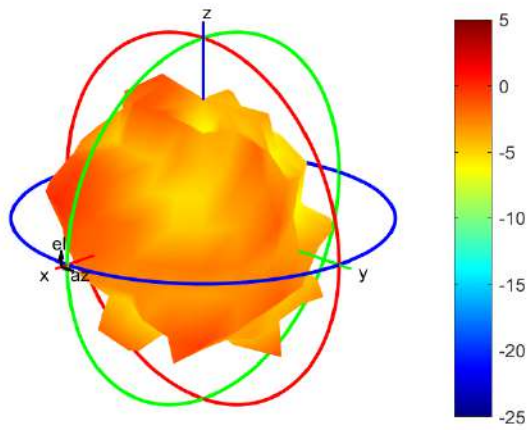
Center Frequency	1910MHz
Horizontal (dBi) peak	-1.11
Vertical (dBi) peak	-1.41

1920MHz



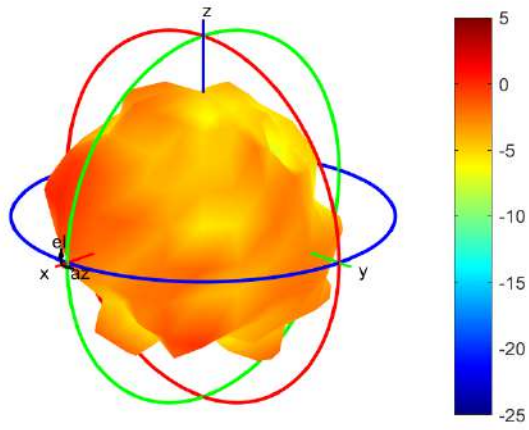
Center Frequency	1920MHz
Horizontal (dBi) peak	-1.28
Vertical (dBi) peak	-1.53

1950MHz



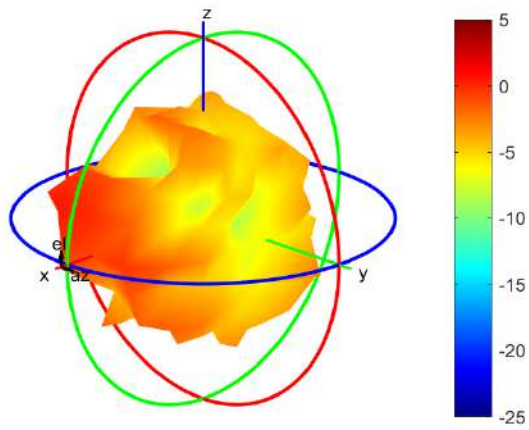
Center Frequency	1950MHz
Horizontal (dBi) peak	-0.97
Vertical (dBi) peak	-1.16

1980MHz



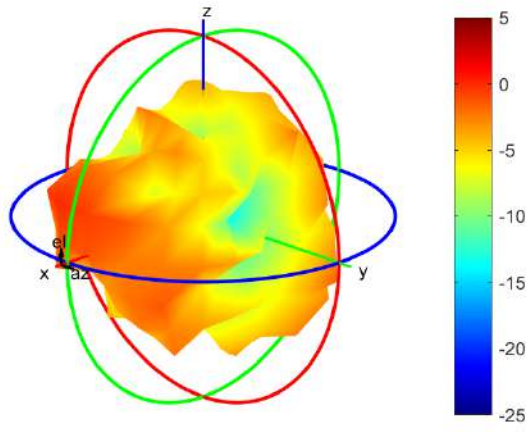
Center Frequency	1980MHz
Horizontal (dBi) peak	-0.38
Vertical (dBi) peak	-1.27

2110MHz



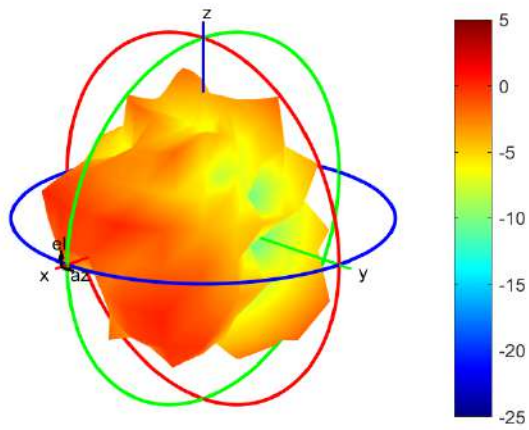
Center Frequency	2110MHz
Horizontal (dBi) peak	-0.71
Vertical (dBi) peak	-0.04

2200MHz



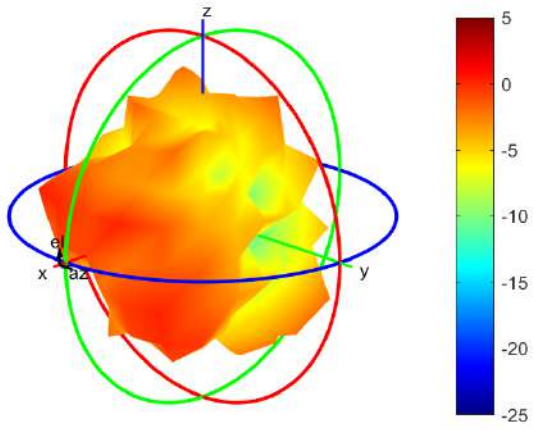
Center Frequency	2200MHz
Horizontal (dBi) peak	-0.77
Vertical (dBi) peak	-1.56

2300MHz



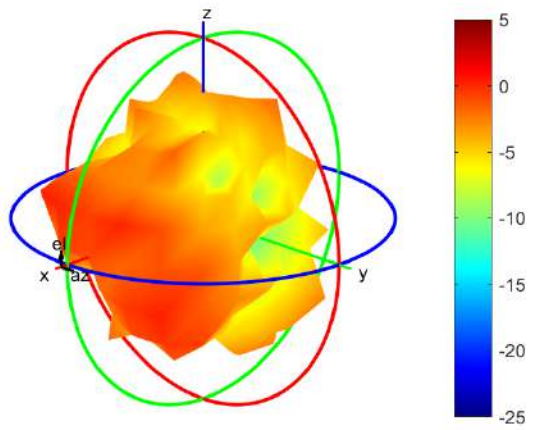
Center Frequency	2300MHz
Horizontal (dBi) peak	-0.29
Vertical (dBi) peak	0.00

2305MHz



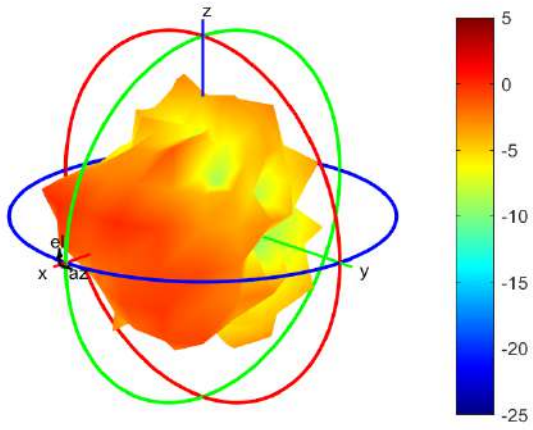
Center Frequency	2305MHz
Horizontal (dBi) peak	-0.25
Vertical (dBi) peak	-0.01

2315MHz



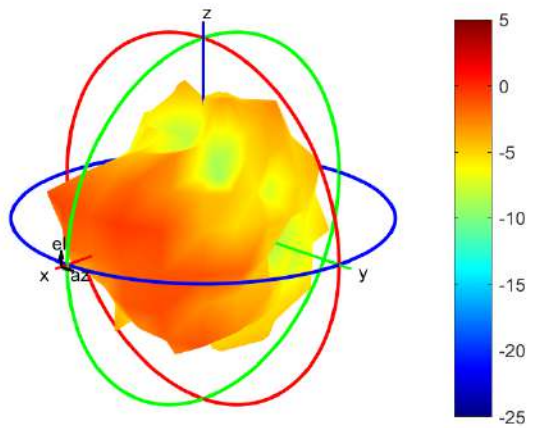
Center Frequency	2315MHz
Horizontal (dBi) peak	-0.30
Vertical (dBi) peak	-0.12

2350MHz



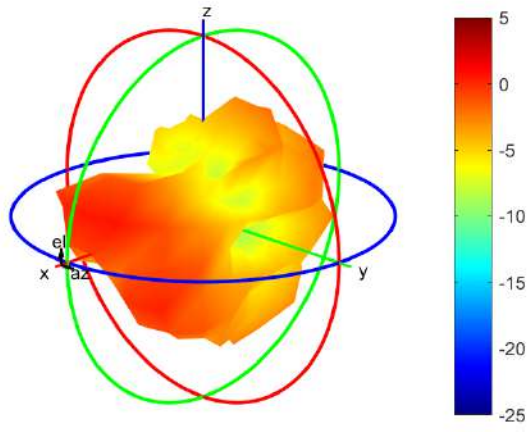
Center Frequency	2350MHz
Horizontal (dBi) peak	-1.15
Vertical (dBi) peak	-0.56

2400MHz



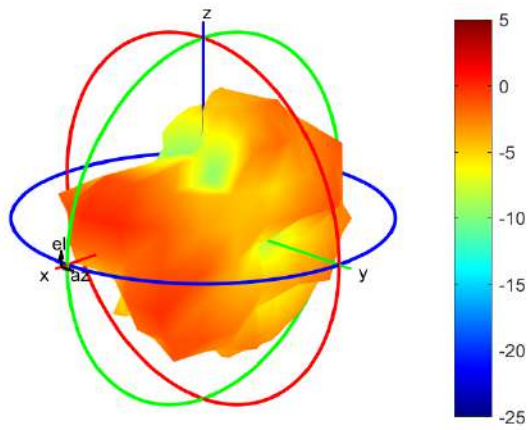
Center Frequency	2400MHz
Horizontal (dBi) peak	-1.61
Vertical (dBi) peak	-1.17

2500MHz



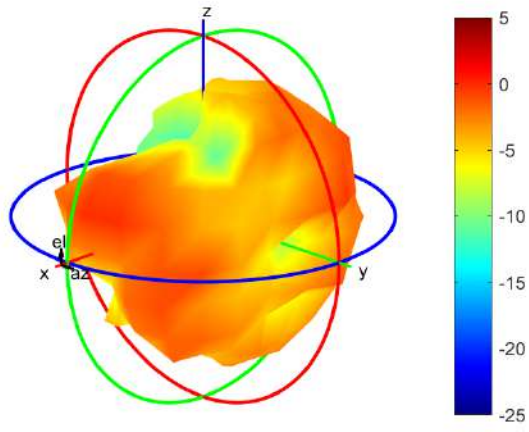
Center Frequency	2500MHz
Horizontal (dBi) peak	-0.19
Vertical (dBi) peak	-0.20

2570MHz



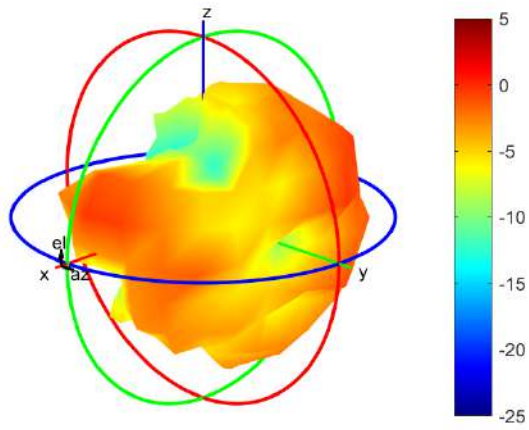
Center Frequency	2570MHz
Horizontal (dBi) peak	-0.85
Vertical (dBi) peak	-0.67

2595MHz



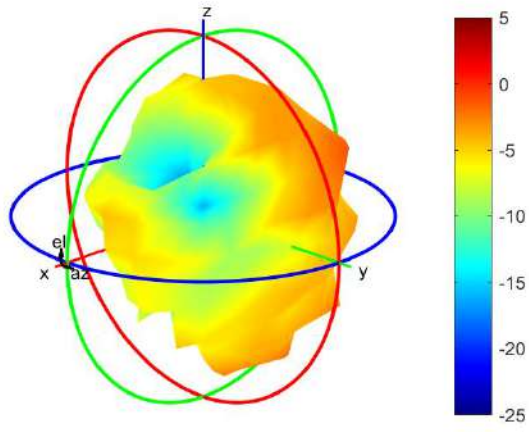
Center Frequency	2595MHz
Horizontal (dBi) peak	-1.23
Vertical (dBi) peak	-0.30

2620MHz



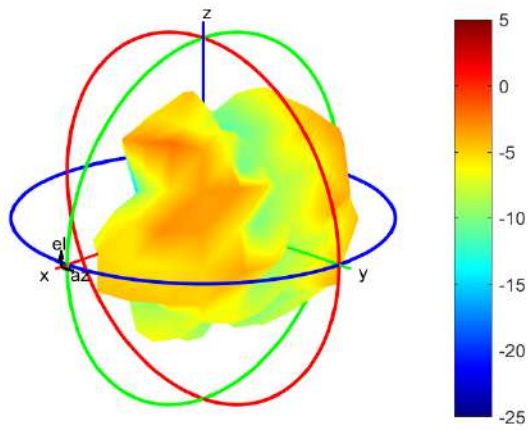
Center Frequency	2620MHz
Horizontal (dBi) peak	-2.09
Vertical (dBi) peak	-0.30

2690MHz



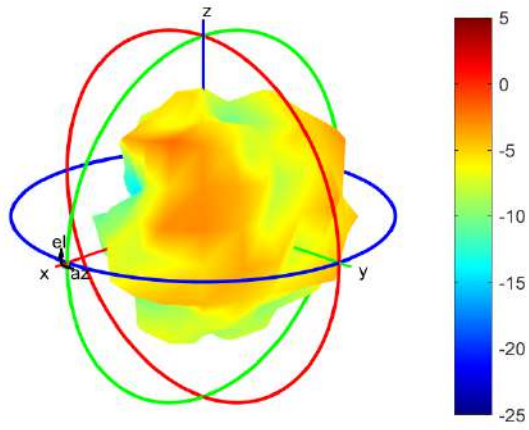
Center Frequency	2690MHz
Horizontal (dBi) peak	-4.58
Vertical (dBi) peak	-1.77

3400MHz



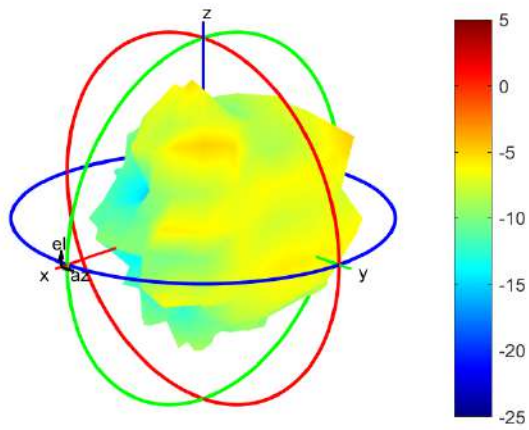
Center Frequency	3400MHz
Horizontal (dBi) peak	-4.02
Vertical (dBi) peak	-3.11

3500MHz



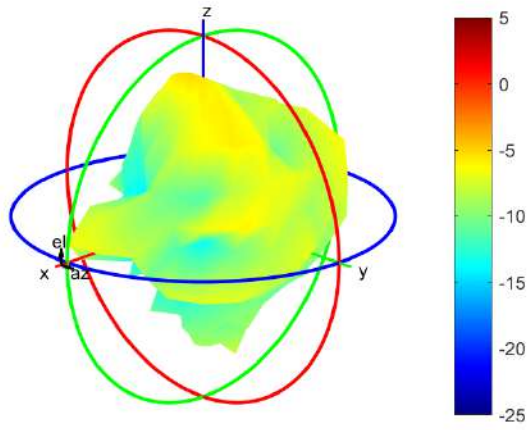
Center Frequency	3500MHz
Horizontal (dBi) peak	-4.16
Vertical (dBi) peak	-3.19

3600MHz



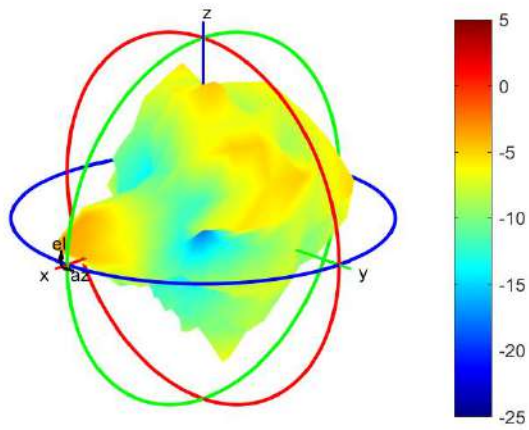
Center Frequency	3600MHz
Horizontal (dBi) peak	-5.96
Vertical (dBi) peak	-5.71

3700MHz



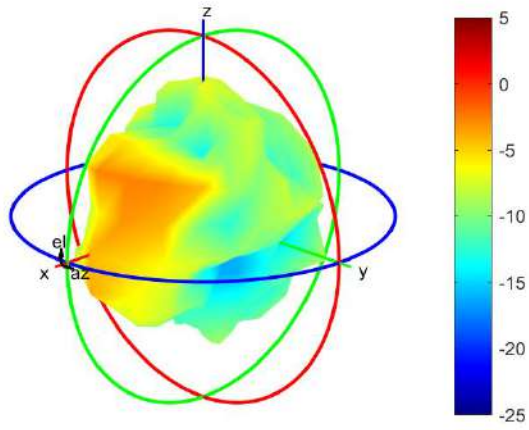
Center Frequency	3700MHz
Horizontal (dBi) peak	-5.37
Vertical (dBi) peak	-6.84

3800MHz



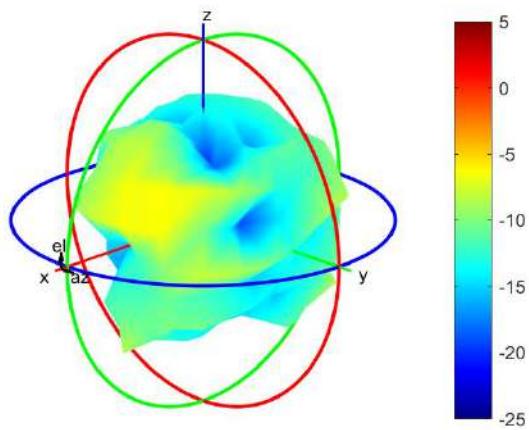
Center Frequency	3800MHz
Horizontal (dBi) peak	-4.79
Vertical (dBi) peak	-5.84

4200MHz



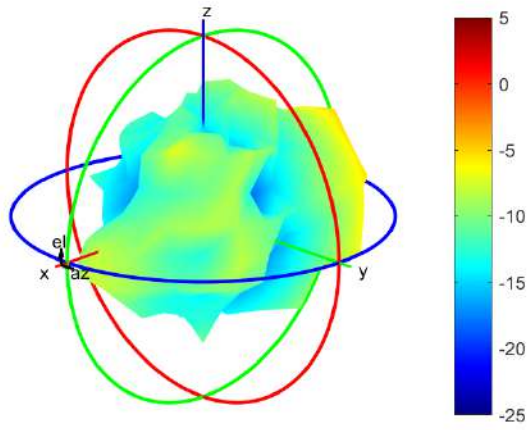
Center Frequency	4200MHz
Horizontal (dBi) peak	-5.09
Vertical (dBi) peak	-4.13

4400MHz



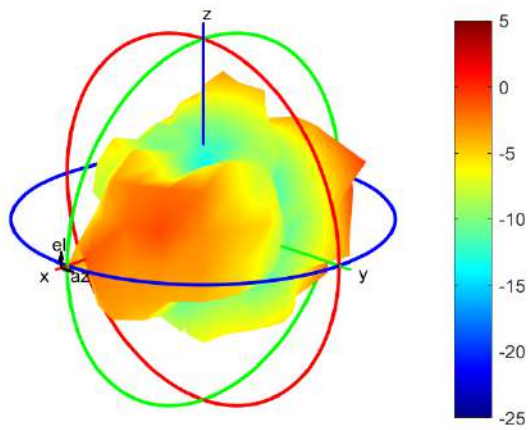
Center Frequency	4400MHz
Horizontal (dBi) peak	-10.04
Vertical (dBi) peak	-6.99

4700MHz



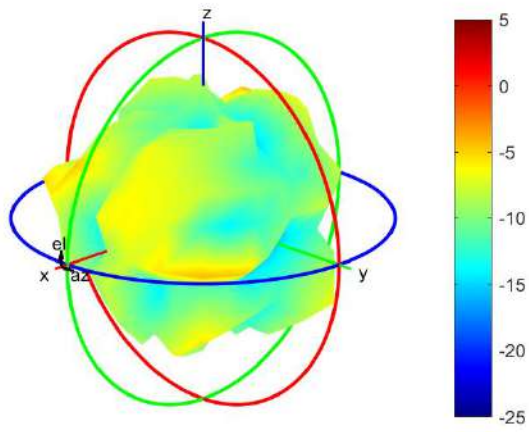
Center Frequency	4700MHz
Horizontal (dBi) peak	-6.88
Vertical (dBi) peak	-6.39

5150MHz



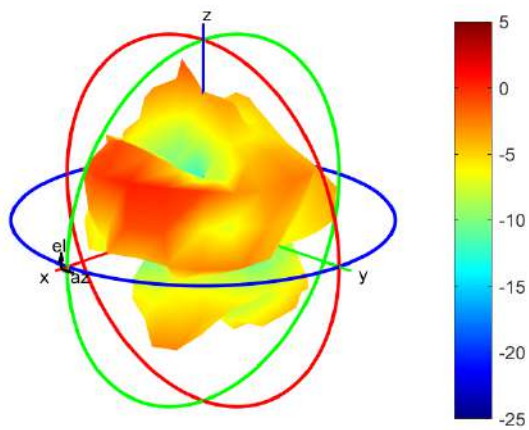
Center Frequency	5150MHz
Horizontal (dBi) peak	-3.04
Vertical (dBi) peak	-0.68

5537.5MHz



Center Frequency	5537.5MHz
Horizontal (dBi) peak	-4.54
Vertical (dBi) peak	-4.38

5925MHz



Center Frequency	5925MHz
Horizontal (dBi) peak	-2.22
Vertical (dBi) peak	0.37

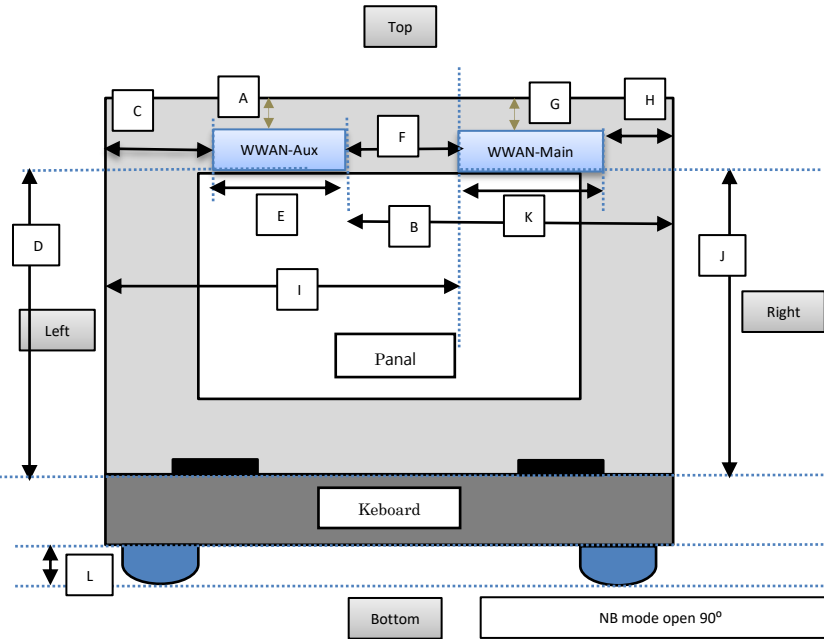
Section 4. Antenna Host Platform Location Information

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.

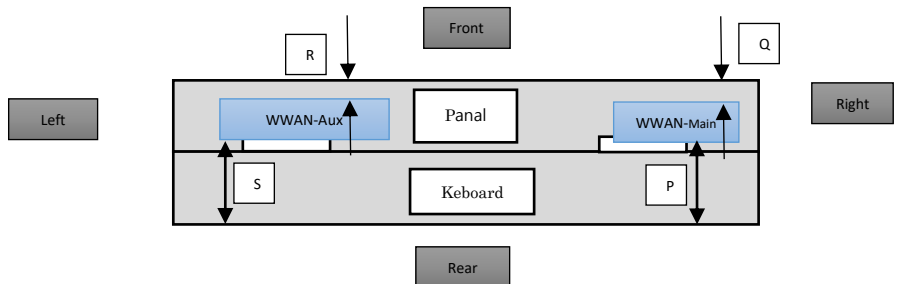
Minimum Separation Distance

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	80
G	WWAN-Main	to Top	60
H	WWAN-Main	to Right	5.5
I	WWAN-Main	to Left	39.6
J	WWAN-Main	to Bottom (Not include Keyboard)	185.57
K	WWAN-Main	Main Antenna Length	80
L	NB	Bumper thickness	2.1



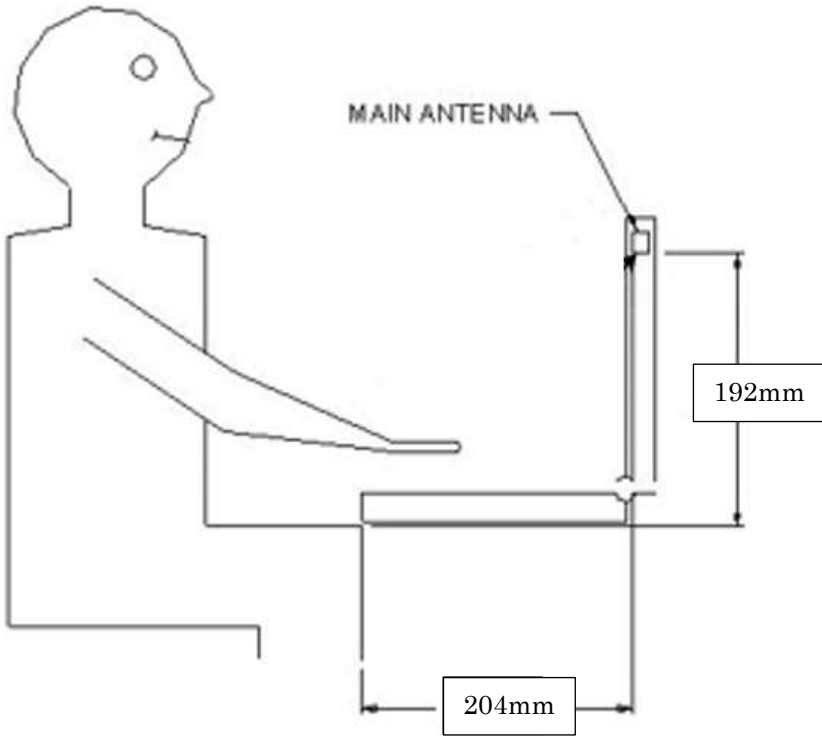
Minimum Separation Distance

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

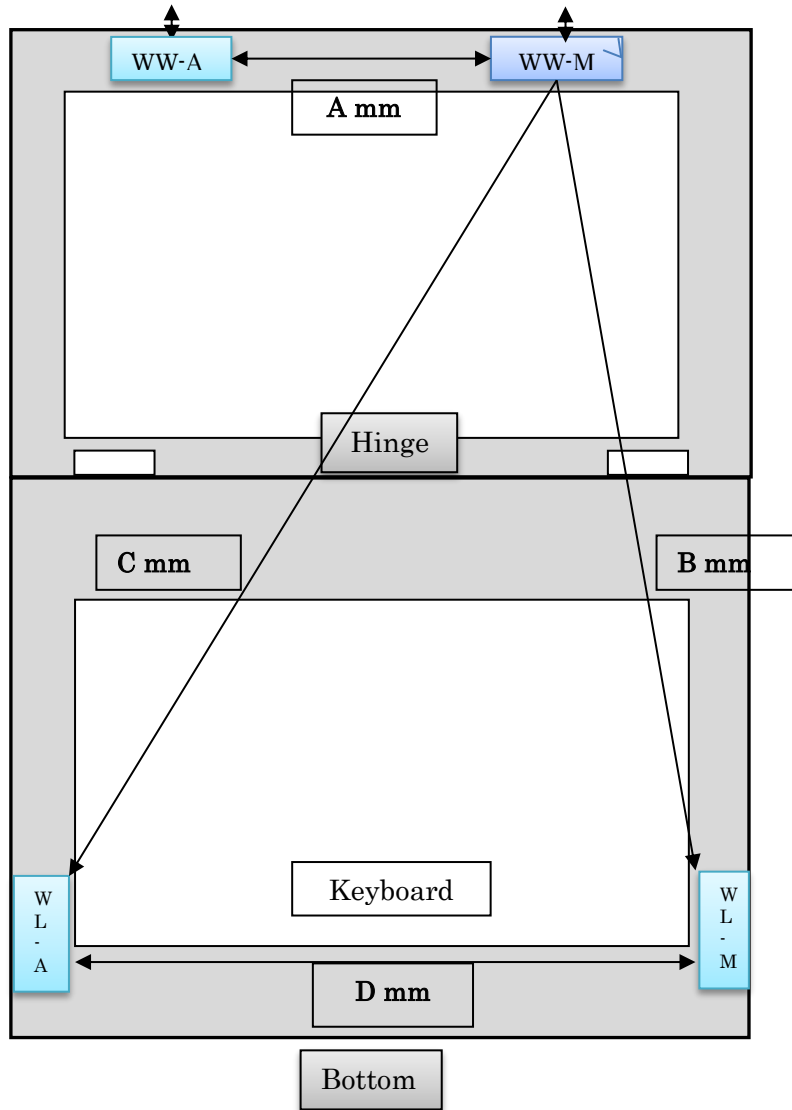
Include a **dimensioned photo(s) or dimensioned drawing(s)** showing the distance (mm) between the transmit antennas and the user. For notebook/laptop hosts show lapheld position (example below). For tablet hosts show all orientations including lapheld, primary & secondary portrait, primary & secondary 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