

Regulatory WWAN Antenna Information

Platform	
Platform Owner	DELL
Brand Name	DELL
Model Name	P176G
ODM	Compal
Target Launch Date	
Antenna	
Manufacturer	WNC
Part Number	■ Tx1/Rx1/Rx2 Antenna WWAN Main/AUX: 81ELA715.G38 (DC33002RS0L)
	■ Tx1/Rx1/Rx2 Antenna WWAN Main/AUX: 81ELA715.G42 (DC33002RS2L)
	■ MIMO2/3 Antenna WWAN: 81ELA715.G48 (DC33002RS1L)
Module	
With WWAN Module	L860-GL-16 (4G LTE) / FM350-GL (5G NR)
(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).</u> <u>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 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 WNC P/N: 81ELA715.G38 81ELA715.G42 Customer P/N: DC33002RS0L DC33002RS2L	WNC	Couple	Cable length: 173mm diameter: 1.13mm 50 ohm SLL Coaxial MAIN Connector: I-PEX PN:20565-001R-13	617-698MHz dBi -0.03 (peak)	617-698MHz dBi 0.25 (peak)	617-698MHz 3.30 max	617-698MHz dBi 0.28 (peak)
				698-821MHz dBi 1.84 (peak)	698-821MHz dBi 2.12 (peak)	698-821MHz 3.30 max	698-821MHz dBi 0.28 (peak)
				824-960MHz dBi 0.66 (peak)	824-960MHz dBi 0.94 (peak)	824-960MHz 3.30 max	824-960MHz dBi 0.28 (peak)
				1425-1515MHz dBi 1.11 (peak)	1425-1515MHz dBi 1.49 (peak)	1425-1515MHz 3.30 max	1425-1515MHz dBi 0.38 (peak)
				1710-2200MHz dBi 1.32 (peak)	1710-2200MHz dBi 1.7 (peak)	1710-2200MHz 3.30 max	1710-2200MHz dBi 0.38 (peak)
				2300-2690MHz dBi 0.47 (peak)	2300-2690MHz dBi 0.92 (peak)	2300-2690MHz 3.30 max	2300-2690MHz dBi 0.45 (peak)
				3400-3800MHz dBi 1.19 (peak)	3400-3800MHz dBi 1.74 (peak)	3400-3800MHz 3.30 max	3400-3800MHz dBi 0.55 (peak)
				4200-4700MHz dBi 0.32 (peak)	4200-4700MHz dBi 0.94 (peak)	4200-4700MHz dBi 3.30 (peak)	4200-4700MHz dBi 0.62 (peak)
	WNC	Couple	Cable length: 504mm diameter: 1.13mm 50 ohm SLL Coaxial AUX Connector: I-PEX PN:20565-001R-13	5150-5925MHz dBi 1.48 (peak)	5150-5925MHz dBi 2.17 (peak)	5150-5925MHz 3.30 max	5150-5925MHz dBi 0.69 (peak)
				617-698MHz dBi -5.17 (peak)	617-698MHz dBi -4.36 (peak)	617-698MHz 3.30 max	617-698MHz dBi 0.81 (peak)
				698-821MHz dBi -0.11 (peak)	698-821MHz dBi 0.7 (peak)	698-821MHz 3.30 max	698-821MHz dBi 0.81 (peak)
				824-960MHz dBi 1.22 (peak)	824-960MHz dBi 2.03 (peak)	824-960MHz 3.30 max	824-960MHz dBi 0.81 (peak)
				1425-1515MHz dBi -0.65 (peak)	1425-1515MHz dBi 0.45 (peak)	1425-1515MHz 3.30 max	1425-1515MHz dBi 1.1 (peak)
				1557-1610 MHz dBi -0.80 (peak)	1557-1610 MHz dBi 0.3 (peak)	1557-1610 MHz 3.30 max	1557-1610 MHz dBi 1.1 (peak)
				1805-2200MHz dBi -0.95 (peak)	1805-2200MHz dBi 0.15 (peak)	1805-2200MHz 3.30 max	1805-2200MHz dBi 1.1 (peak)
				2300-2690MHz dBi 0.00 (peak)	2300-2690MHz dBi 1.33 (peak)	2300-2690MHz 3.30 max	2300-2690MHz dBi 1.33 (peak)
				3400-3800MHz	3400-3800MHz	3400-3800MHz	3400-3800MHz

				0.85 dBi (peak)	2.46 dBi (peak)	3.30 max	1.61 dBi (peak)
				4200-4700MHz -0.18 dBi (peak)	4200-4700MHz 1.64 dBi (peak)	4200-4700MHz 3.30 dBi (peak)	4200-4700MHz 1.82 dBi (peak)
				5150-5925MHz -2.77 dBi (peak)	5150-5925MHz -0.75 dBi (peak)	5150-5925MHz 3.30 max	5150-5925MHz 2.02 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 WNC P/N: 81ELA715.G48 Customer P/N: DC33002RS1L	WNC	Couple	Cable length: 147.5mm diameter: 1.13mm 50 ohm SLL Coaxial Connector: I-PEX PN:20565-001R-13	1425-1515MHz -1.77 dBi (peak)	1425-1515MHz -1.45 dBi (peak)	1425-1515MHz 3.50 max	1425-1515MHz 0.32 dBi (peak)
				1710-2200MHz 1.73 dBi (peak)	1710-2200MHz 2.05 dBi (peak)	1710-2200MHz 3.50 max	1710-2200MHz 0.32 dBi (peak)
				2300-2690MHz 0.56 dBi (peak)	2300-2690MHz 0.95 dBi (peak)	2300-2690MHz 3.50 max	2300-2690MHz 0.39 dBi (peak)
				3400-3800MHz 0.53 dBi (peak)	3400-3800MHz 1 dBi (peak)	3400-3800MHz 3.50 max	3400-3800MHz 0.47 dBi (peak)
				4200-5000MHz 1.52 dBi (peak)	4200-5000MHz 2.05 dBi (peak)	4200-5000MHz 3.50 max	4200-5000MHz 0.53 dBi (peak)
	WNC	Couple	Cable length: 218mm diameter: 1.13mm 50 ohm SLL Coaxial Connector: I-PEX PN:20565-001R-13	1805-2200MHz 1.96 dBi (peak)	1805-2200MHz 2.43 dBi (peak)	1805-2200MHz 3.50 max	1805-2200MHz 0.47 dBi (peak)
				2300-2690MHz 1.96 dBi (peak)	2300-2690MHz 2.53 dBi (peak)	2300-2690MHz 3.50 max	2300-2690MHz 0.57 dBi (peak)
				3400-3800MHz 1.73 dBi (peak)	3400-3800MHz 2.42 dBi (peak)	3400-3800MHz 3.50 max	3400-3800MHz 0.69 dBi (peak)
				4200-5000MHz 0.76 dBi (peak)	4200-5000MHz 1.54 dBi (peak)	4200-5000MHz 3.50 max	4200-5000MHz 0.78 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

Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal	Vertical	Horizontal	Vertical
	(dBi)	(dBi)	(dBi)	(dBi)
617	-6.02	-5.15	-7.96	-6.59
634.5	-5.15	-4.65	-7.64	-5.80
652	-4.70	-4.11	-7.32	-5.17
663	-4.77	-4.19		
680.5	-4.80	-3.47		
698	-2.56	-0.03		
703	-2.43	0.81		
707.5	-2.31	1.04		
717	-2.08	1.53	-5.13	-2.21
725.5	-1.84	1.00	-4.94	-2.08
748	-0.91	0.77	-2.71	-0.21
756	-0.71	1.84	-2.22	-0.11
768	-0.52	1.69	-1.87	-0.19
777	-0.89	1.13	-1.88	-0.61
782	-1.13	1.65	-2.01	-1.07
787	-1.43	1.17	-2.20	-1.55
814	-3.12	0.34	-3.95	-2.44
824	-2.83	0.45	-2.99	-1.55
832	-2.32	0.48	-2.37	-0.80
836.5	-2.02	0.46	-2.07	-0.44
849	-1.13	0.66	-1.30	0.59
862	-0.34	0.44	-0.84	1.22
880	-0.12	0.00	-1.42	0.98
897.5	-0.49	0.61	-1.75	0.94
915	-0.92	0.45	-1.15	0.74
925	-1.09	0.26	-1.03	0.33
960	-2.07	-0.90	-2.73	-1.65
1427.9	-1.76	1.07	-5.57	-4.67
1447.9	-1.96	1.11	-4.96	-2.98
1455.4	-2.15	1.04	-4.67	-2.51
1462.9	-2.19	0.94	-4.26	-2.07
1496	-0.76	0.17	-3.26	-0.72
1510.9	-1.07	-0.14	-3.53	-0.65
1557			-4.52	-0.80
1575			-4.62	-1.44
1610			-4.51	-1.77

High band

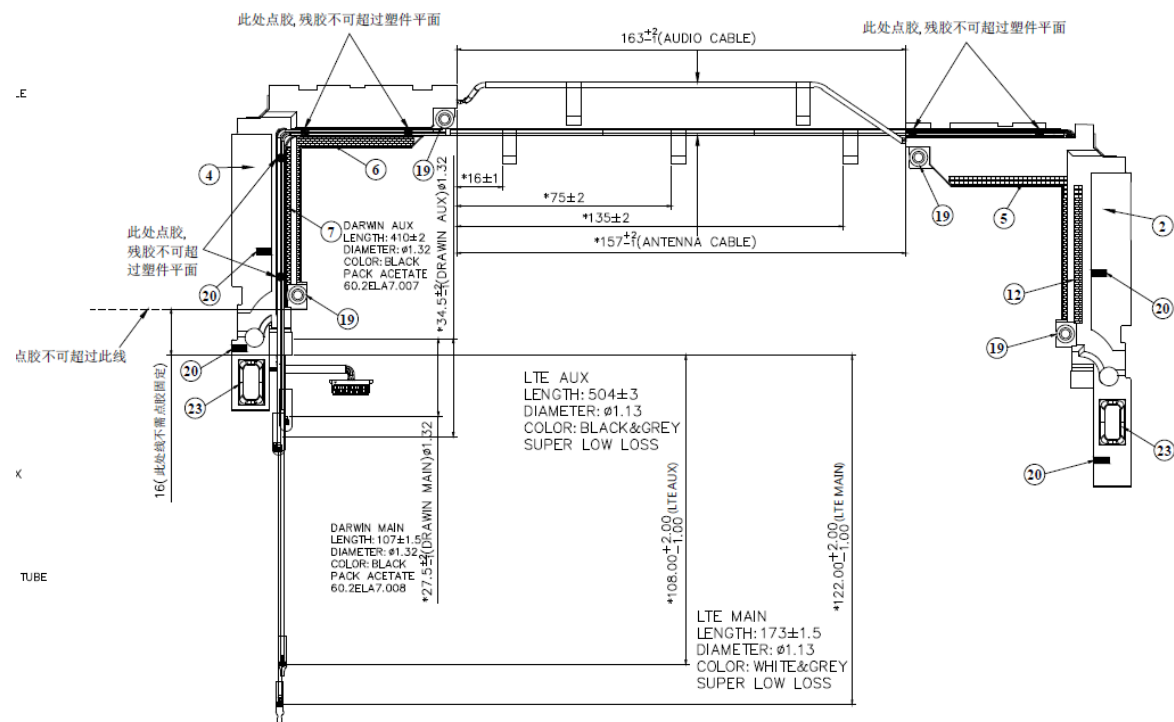
Frequency (MHz)	TPx antenna		DRx antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
1710	1.32	-0.34		
1732.5	0.54	-0.18		
1747.5	-0.02	-0.24		
1755	-0.32	-0.35		
1785	-1.02	-1.11		
1805	-1.26	-1.25	-2.38	-2.88
1850	-1.89	-2.32	-1.86	-2.36
1880	0.29	-1.86	-1.92	-1.96
1910	1.16	-1.38	-1.99	-1.82
1920	1.18	-1.27	-2.01	-1.58
1950	0.76	-0.98	-2.47	-1.82
1980	-0.74	-1.09	-2.99	-2.66
2110	-0.59	-1.12	-2.61	-0.95
2200	-0.29	-0.35	-2.10	-2.00
2300	-0.09	-0.22	-0.17	-0.43
2305	-0.05	-0.34	-0.34	-0.51
2315	-0.01	-0.66	-0.67	-0.68
2350	-0.36	-0.74	-1.54	-1.29
2400	-0.84	-0.12	-1.04	-1.74
2500	-0.47	-0.12	-0.59	-0.70
2570	-0.31	-0.68	-0.62	-0.36
2595	-0.38	-0.69	-0.65	-0.24
2620	-0.10	-0.34	-0.97	0.00
2690	0.47	-1.58	-0.46	-1.06
3400	-0.28	1.19	-1.09	0.17
3500	-1.10	0.69	-1.25	-1.49
3600	-1.74	-0.90	-2.54	-2.67
3700	-2.27	-2.63	-0.27	-0.55
3800	-3.95	-4.47	0.12	0.85
4200	0.32	-1.20	-1.28	-0.18
4400	-1.27	-3.80	-3.28	-3.56
4700	-2.64	-5.25	-7.76	-7.13
5150	0.49	-1.10	-6.42	-6.02
5537.5	-0.15	1.48	-3.85	-2.77
5925	0.68	1.05	-5.02	-3.13

	DRx2 antenna		DRx1 antenna	
Frequency (MHz)	Horizontal	Vertical	Horizontal	Vertical
	(dBi)	(dBi)	(dBi)	(dBi)
1452	-1.77	-2.44		
1474	-3.01	-2.75		
1496	-3.51	-3.09		
1710	1.58	-2.60		
1732.5	1.71	-2.09		
1747.5	1.62	-1.87		
1755	1.48	-1.91		
1785	1.73	-2.60		
1805	1.23	-2.50	1.24	1.06
1850	-0.32	-1.28	1.44	0.51
1880	-0.12	0.13	1.03	1.79
1910	0.55	0.21	1.36	1.06
1920	1.18	0.15	1.37	1.96
1950	0.25	1.09	1.00	1.68
1980	0.93	1.44	1.65	1.54
2110	0.72	0.33	1.81	0.56
2200	0.89	-2.92	1.33	-2.25
2300	0.56	-1.79	1.39	-2.58
2305	0.53	-1.89	1.19	-2.45
2315	0.56	-1.62	0.85	-2.23
2350	-0.24	-2.17	1.96	-2.17
2400	0.19	-2.16	0.94	-2.50
2500	0.25	-3.84	0.77	-3.11
2570	-2.56	-3.97	0.53	-2.85
2595	-2.50	-3.73	-0.22	-2.99
2620	-2.30	-3.52	-0.84	-2.51
2690	-0.96	-3.10	0.45	-0.67
3400	0.52	-5.16	0.04	-2.70
3500	0.15	-4.10	1.73	-2.73
3600	0.53	-2.99	-0.03	-2.48
3700	-0.33	-4.37	-1.02	-2.60
3800	0.03	-2.34	-1.67	-2.54
4200	1.52	-1.70	-3.05	-2.68
4400	-0.40	-3.19	-0.30	-1.49
4700	-3.41	-1.13	-0.24	-1.92
5000	0.89	-2.22	0.76	-0.18

Section 2. Dimensioned Photos or Drawings of Antennas

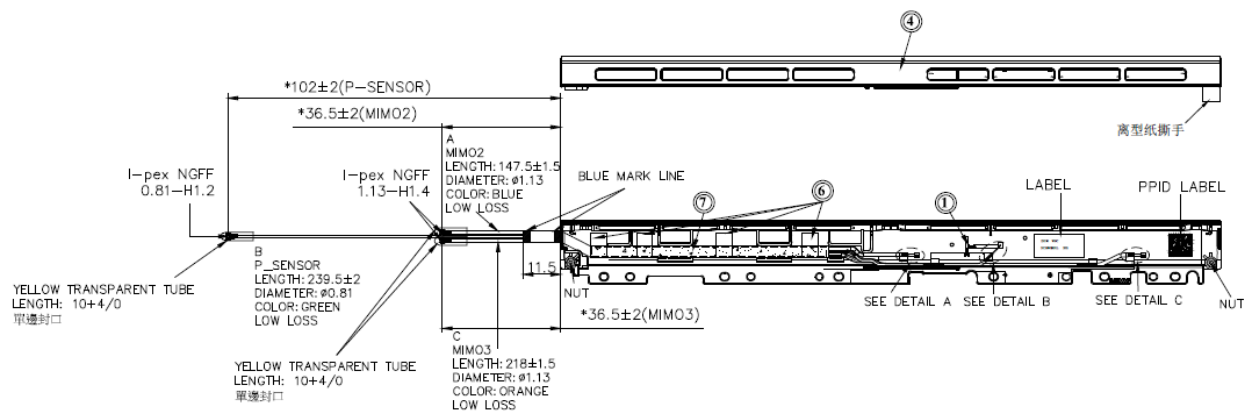
Include a dimensioned photo and dimensioned drawing of Main & Aux antenna here.

TPx/DRx Antenna Dimensioned Drawing:



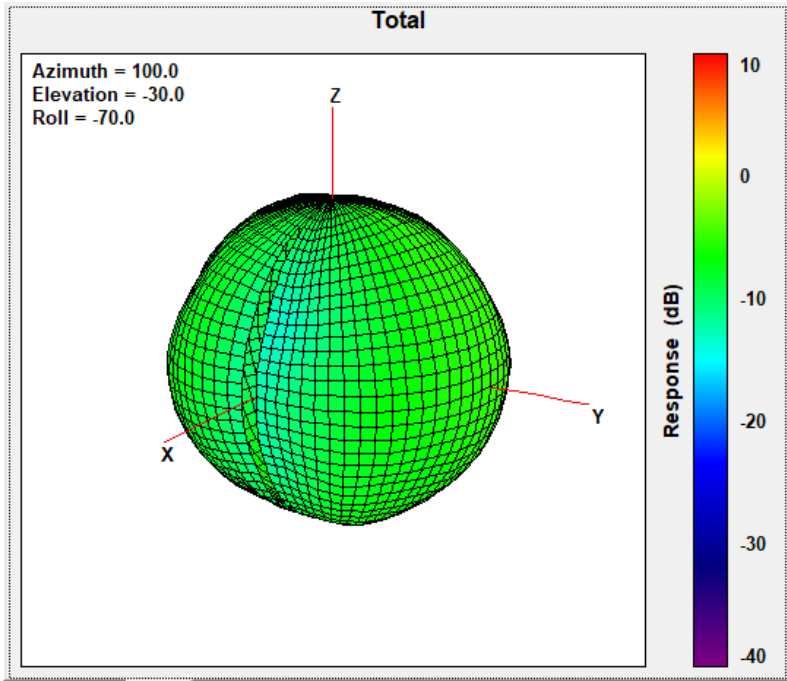
Include a dimensioned photo and dimensioned drawing of Aux antenna here.

DRx2/DRx1 Antenna Dimensioned Drawing:



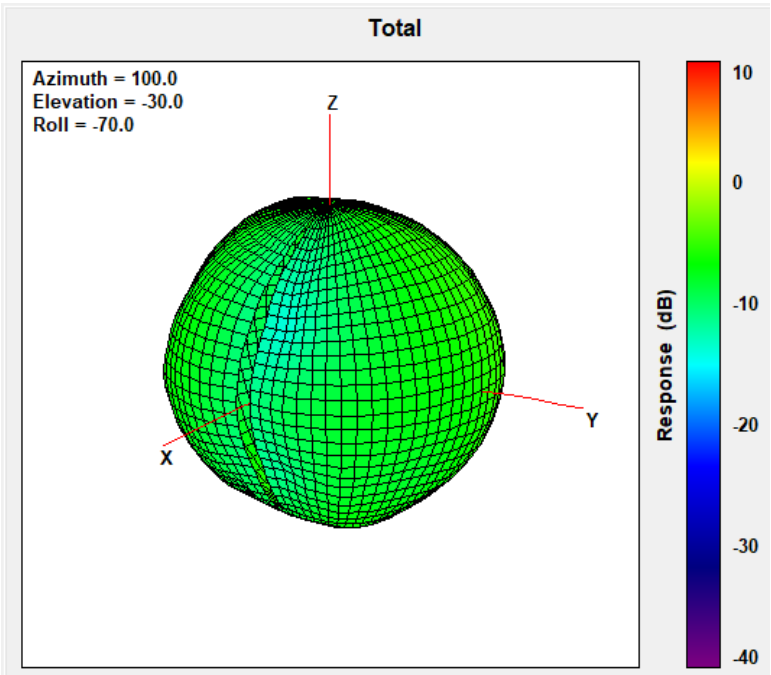
Section 3. Radiation characteristics of antennae Loaded in Host Platform
WWAN Main Antenna (TPx)

617MHz



Center Frequency	617 MHz
Horizontal (dBi) peak	-6.02
Vertical (dBi) peak	-5.15

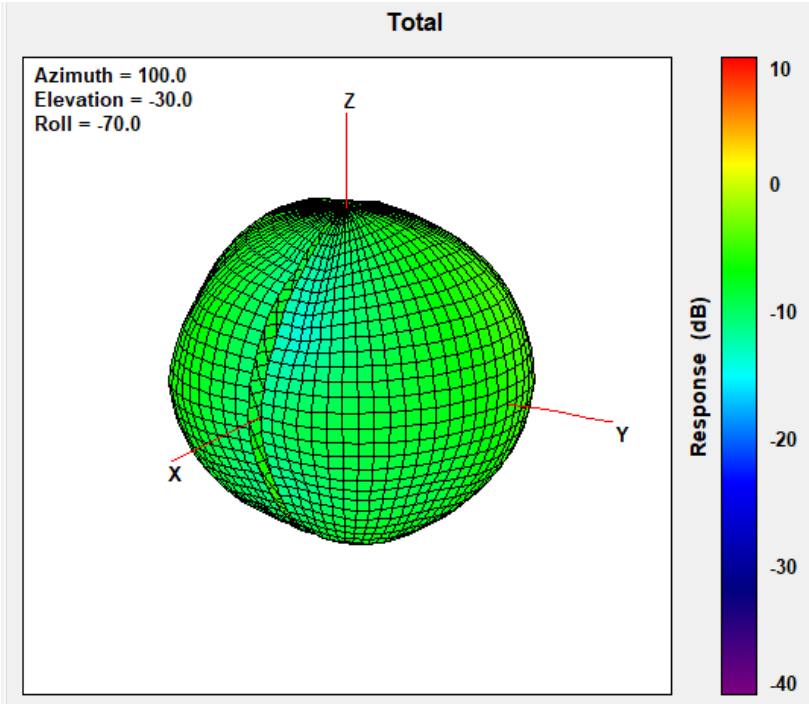
634.5MHz



Center Frequency	634.5MHz
Horizontal (dBi) peak	-5.15

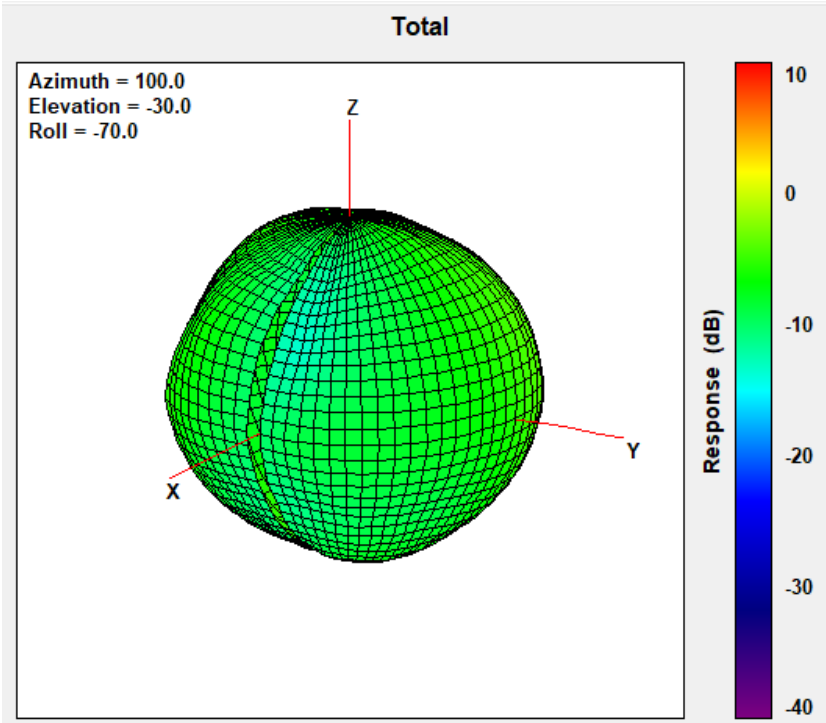
Vertical (dBi) peak	-4.65
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652MHz



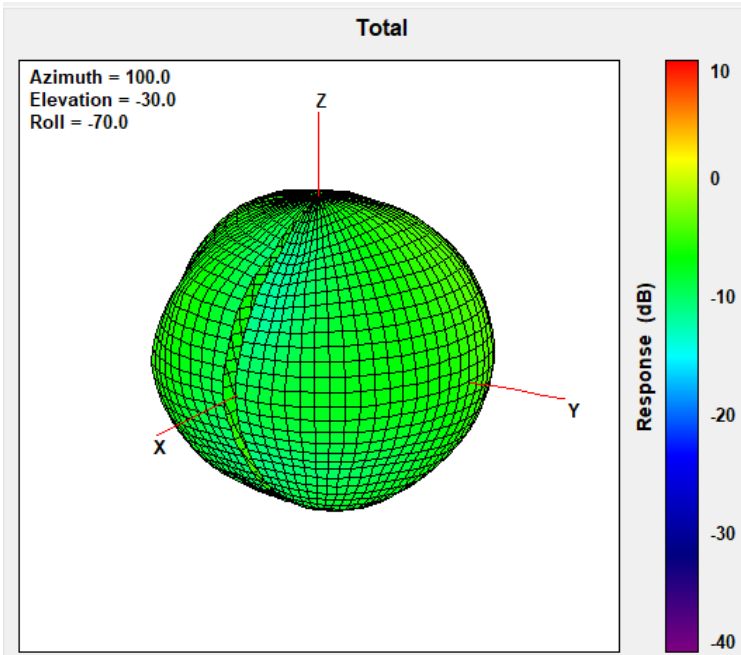
Center Frequency	652 MHz
Horizontal (dBi) peak	-4.70
Vertical (dBi) peak	-4.11

663MHz



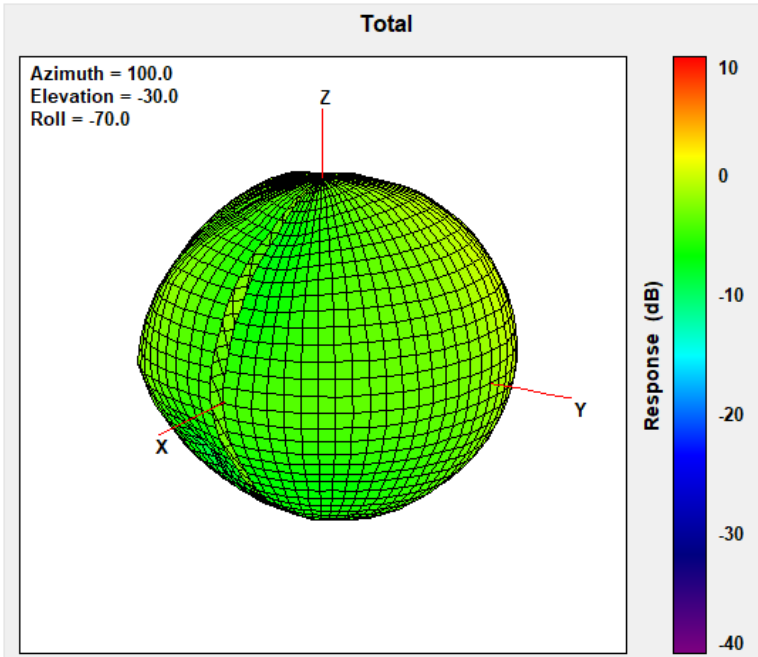
Center Frequency	663MHz
Horizontal (dBi) peak	-4.77
Vertical (dBi) peak	-4.19

680.5MHz



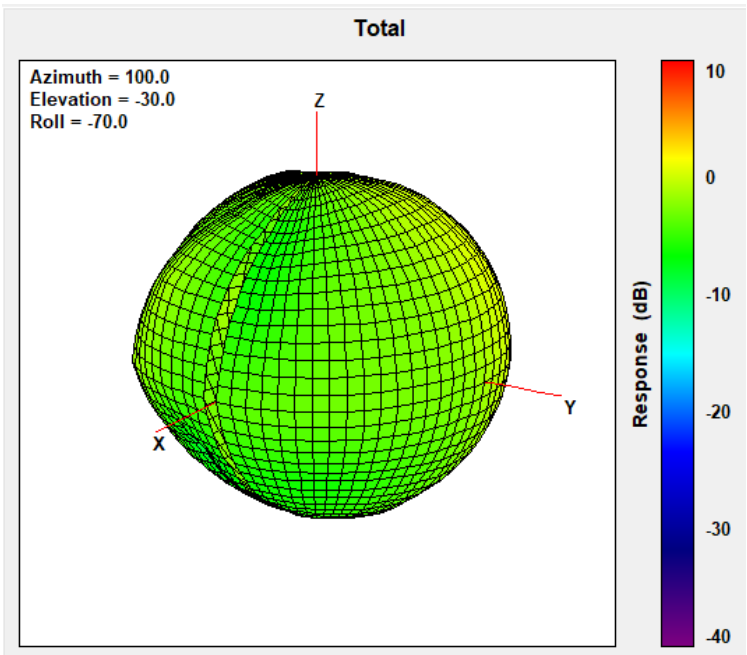
Center Frequency	680.5 MHz
Horizontal (dBi) peak	-4.80
Vertical (dBi) peak	-3.47

698MHz

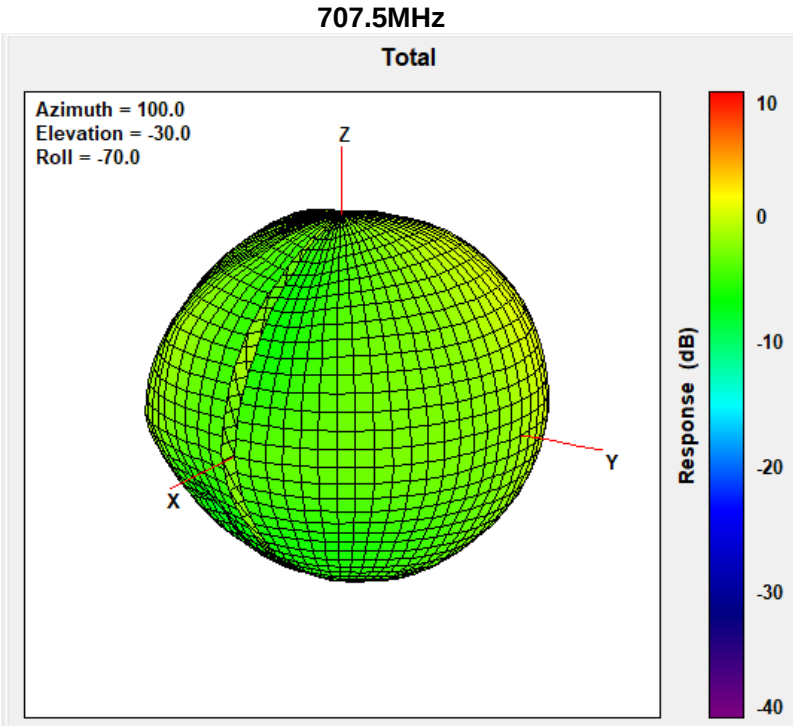


Center Frequency	698 MHz
Horizontal (dBi) peak	-2.56
Vertical (dBi) peak	-0.03

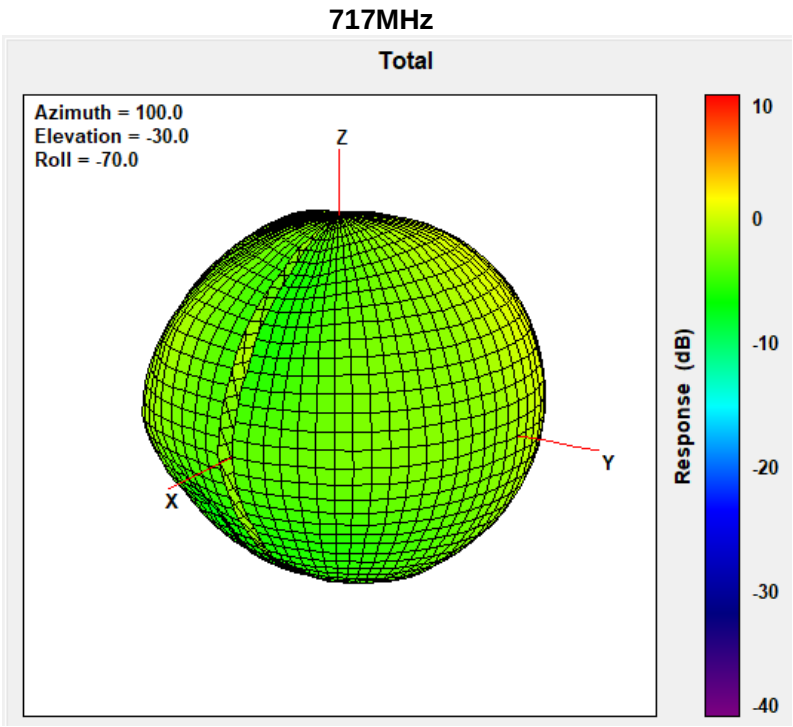
703MHz



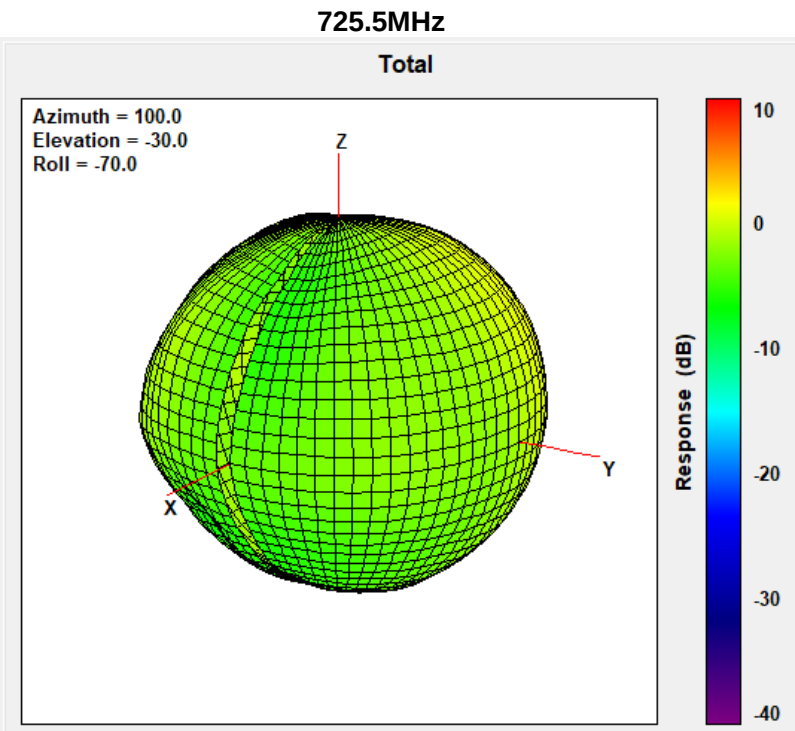
Center Frequency	703MHz
Horizontal (dBi) peak	-2.43
Vertical (dBi) peak	0.81



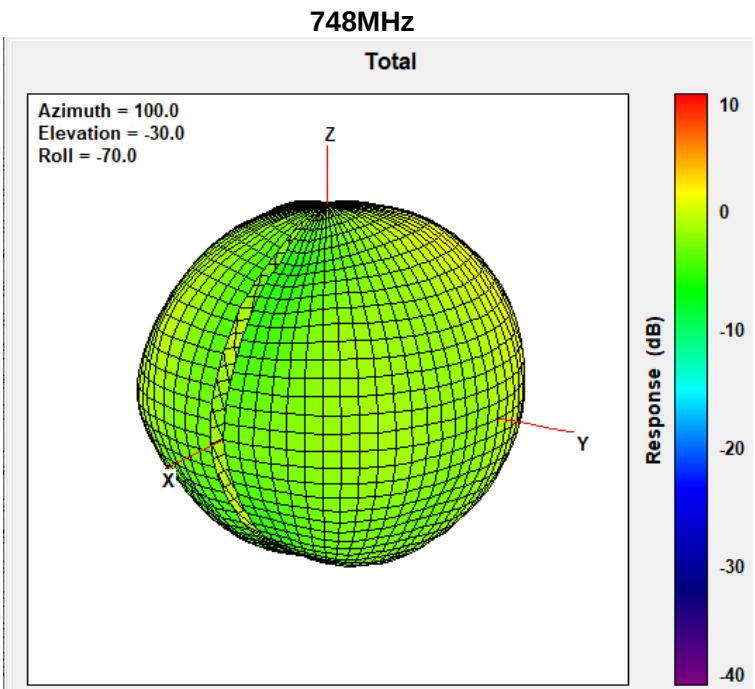
Center Frequency	707.5MHz
Horizontal (dBi) peak	-2.31
Vertical (dBi) peak	1.04



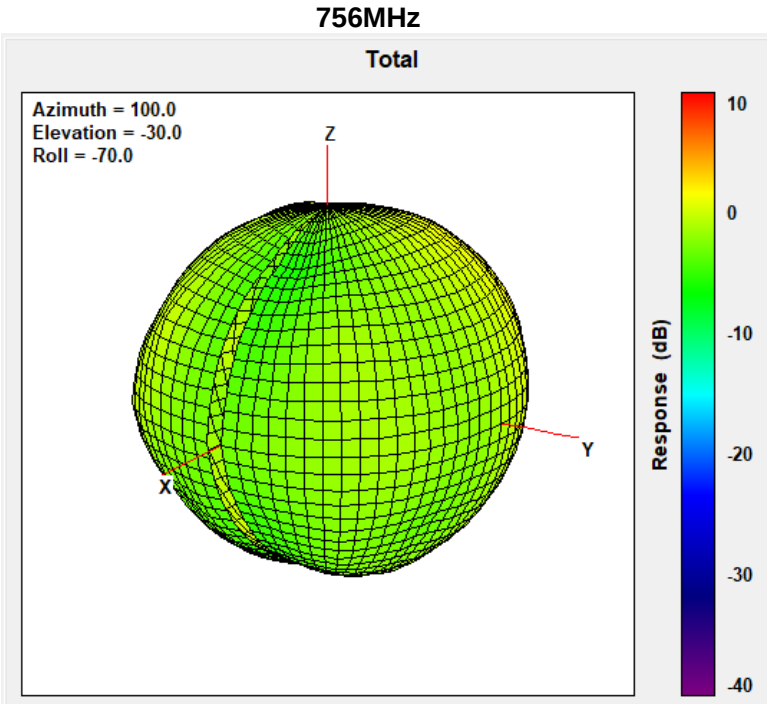
Center Frequency	717MHz
Horizontal (dBi) peak	-2.08
Vertical (dBi) peak	1.53



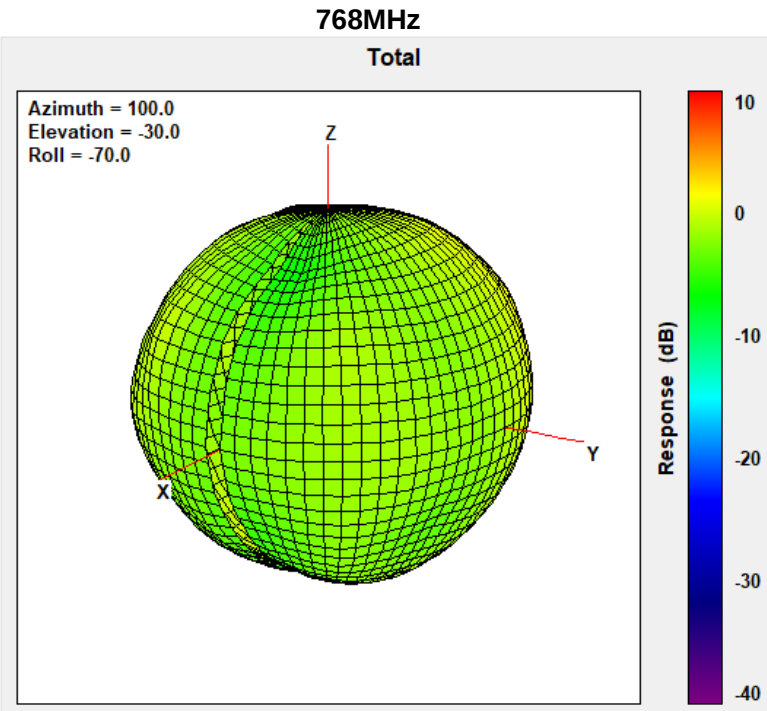
Center Frequency	725.5MHz
Horizontal (dBi) peak	-1.84
Vertical (dBi) peak	1.00



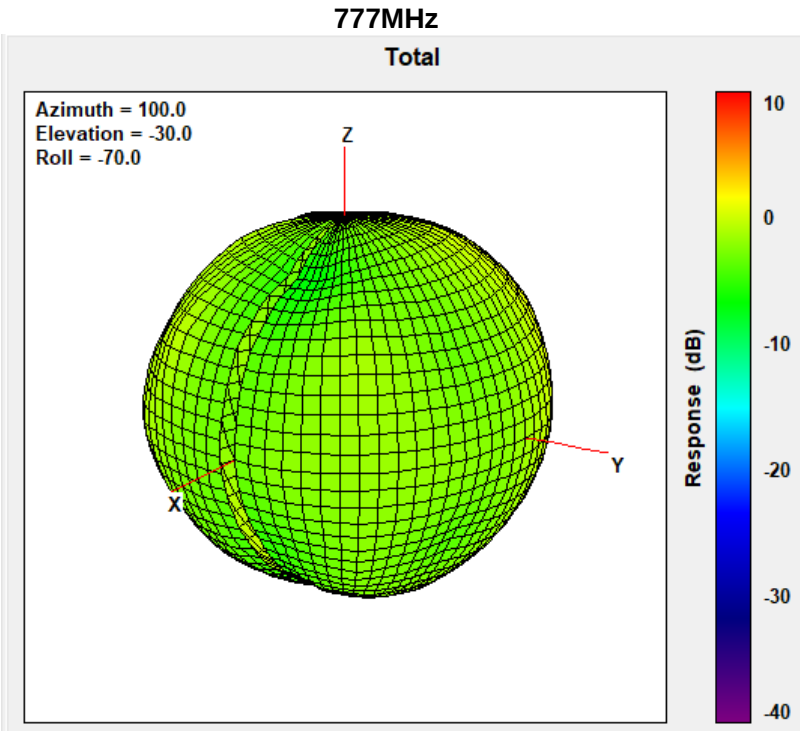
Center Frequency	748MHz
Horizontal (dBi) peak	-0.91
Vertical (dBi) peak	0.77



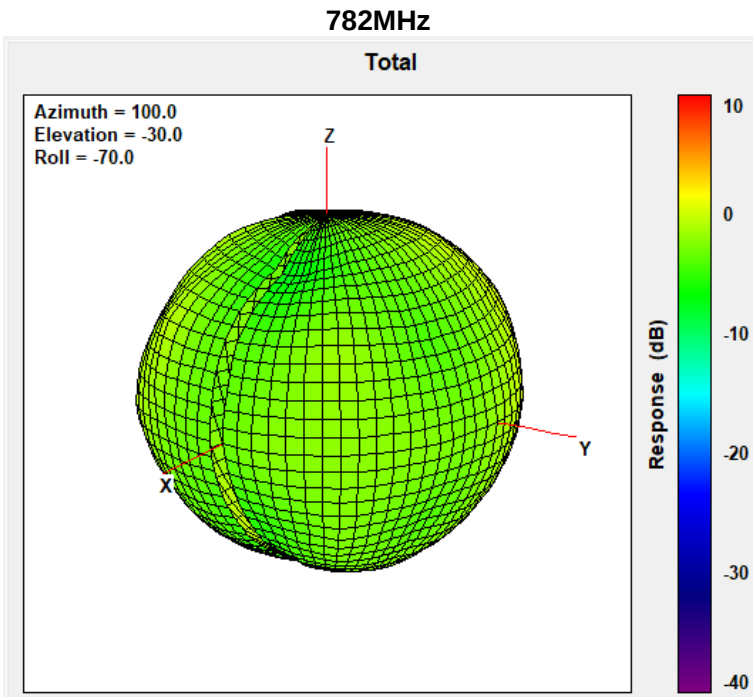
Center Frequency	756MHz
Horizontal (dBi) peak	-0.71
Vertical (dBi) peak	1.84



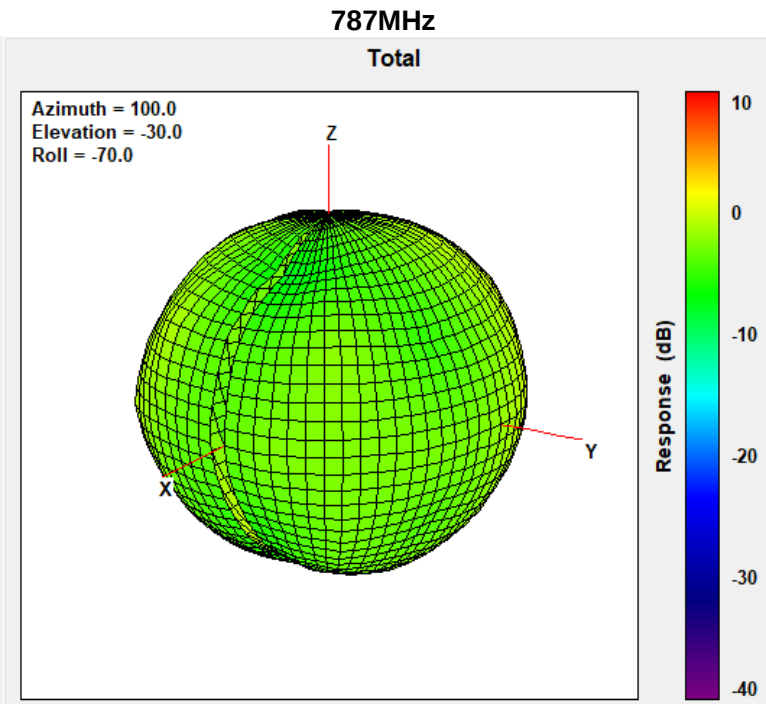
Center Frequency	768MHz
Horizontal (dBi) peak	-0.52
Vertical (dBi) peak	1.69



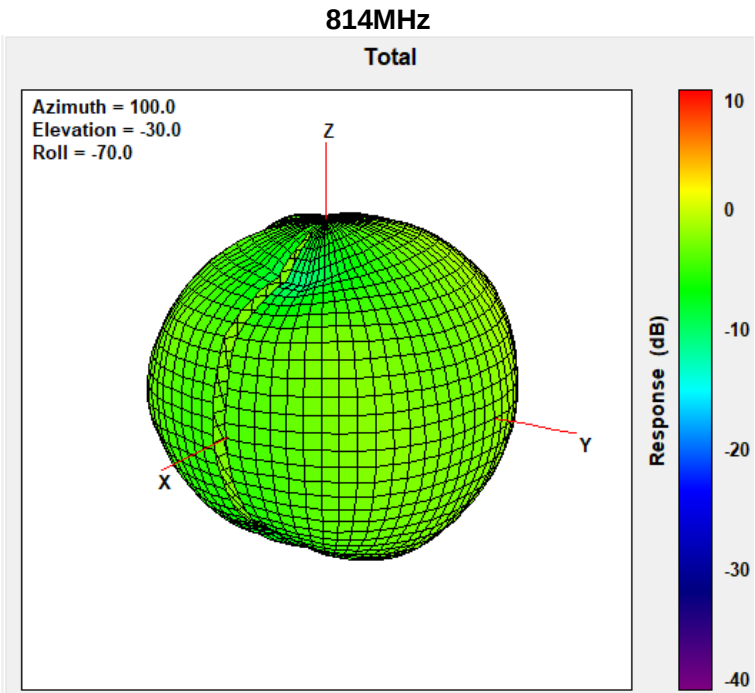
Center Frequency	777MHz
Horizontal (dBi) peak	-0.89
Vertical (dBi) peak	1.13



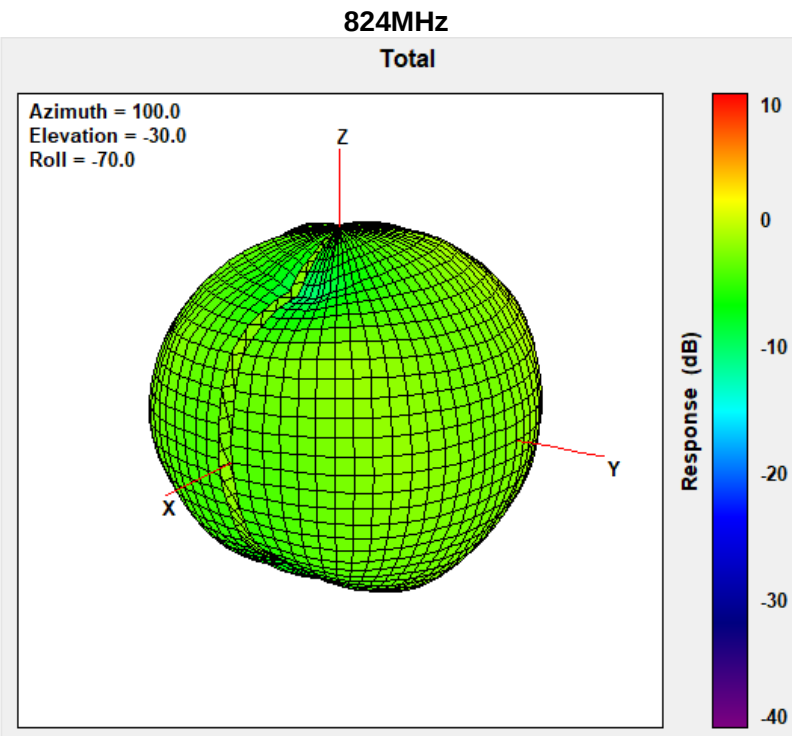
Center Frequency	782MHz
Horizontal (dBi) peak	-1.13
Vertical (dBi) peak	1.65



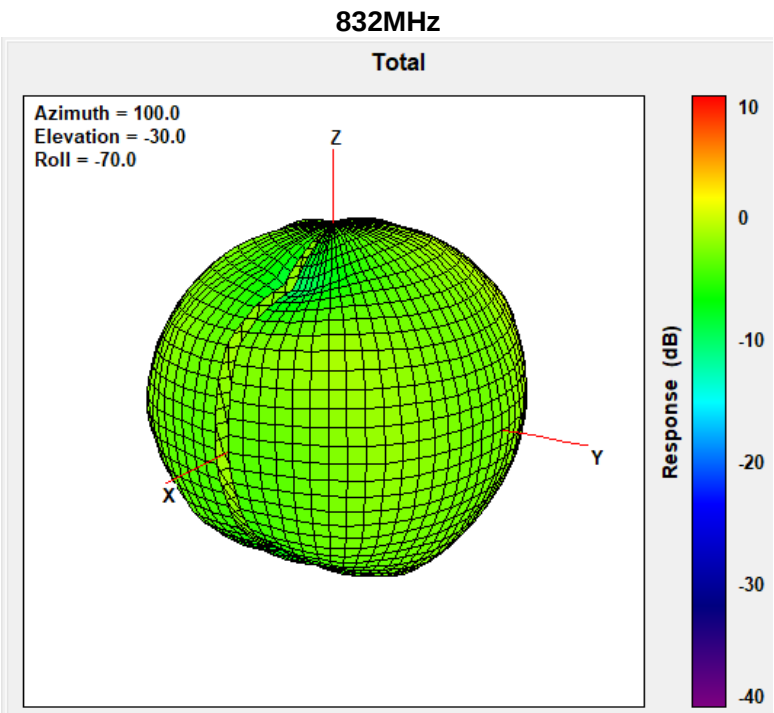
Center Frequency	787MHz
Horizontal (dBi) peak	-1.43
Vertical (dBi) peak	1.17



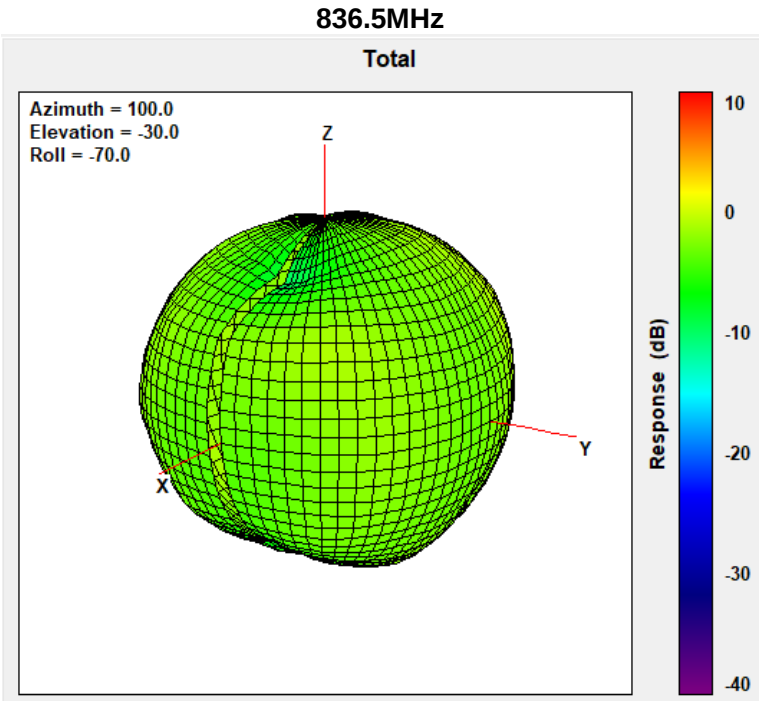
Center Frequency	814MHz
Horizontal (dBi) peak	-3.12
Vertical (dBi) peak	0.34



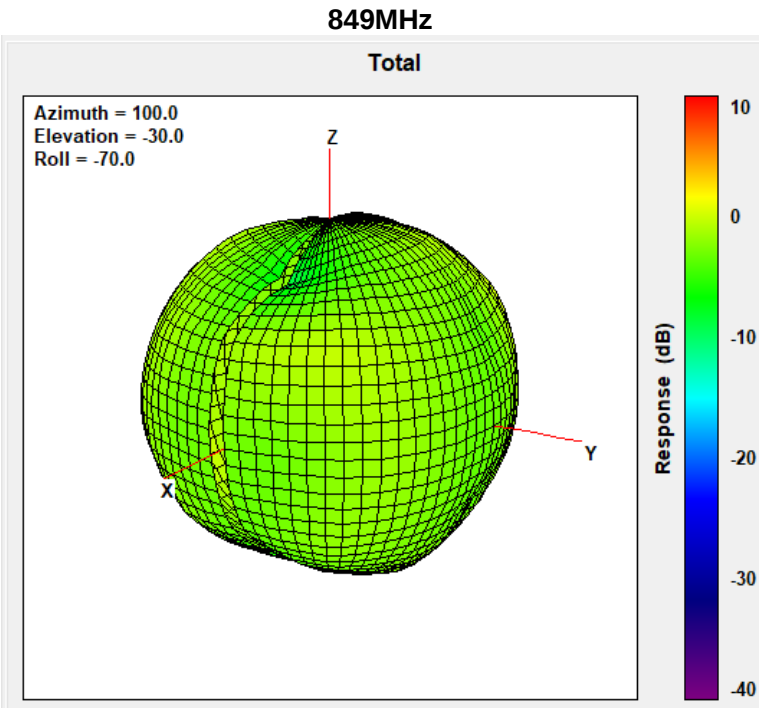
Center Frequency	824MHz
Horizontal (dBi) peak	-2.83
Vertical (dBi) peak	0.45



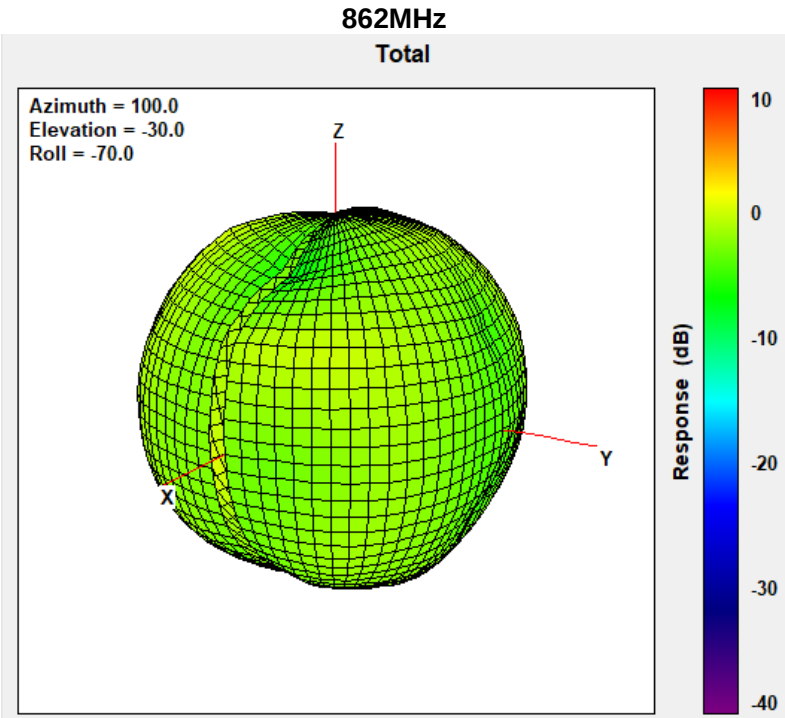
Center Frequency	832MHz
Horizontal (dBi) peak	-2.32
Vertical (dBi) peak	0.48



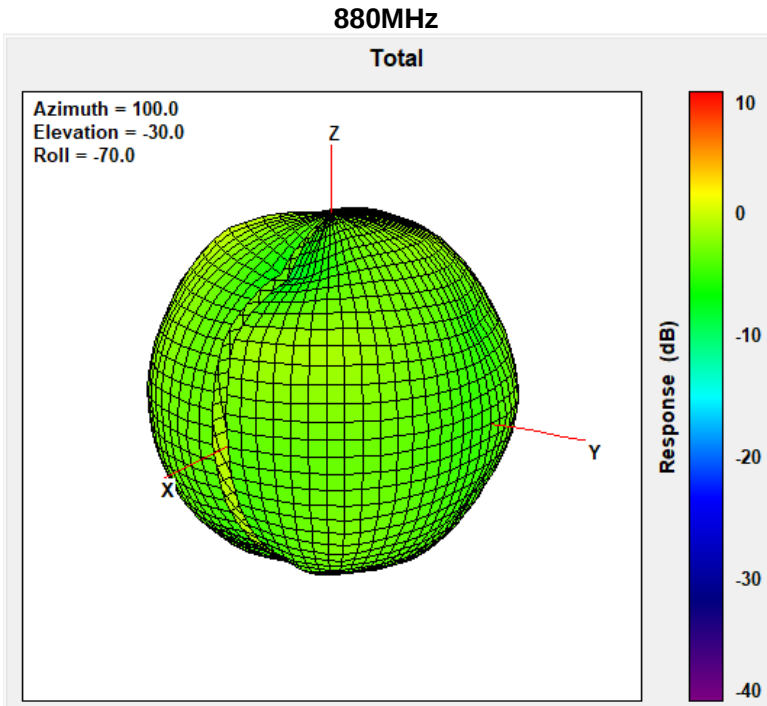
Center Frequency	836.5MHz
Horizontal (dBi) peak	-2.02
Vertical (dBi) peak	0.46



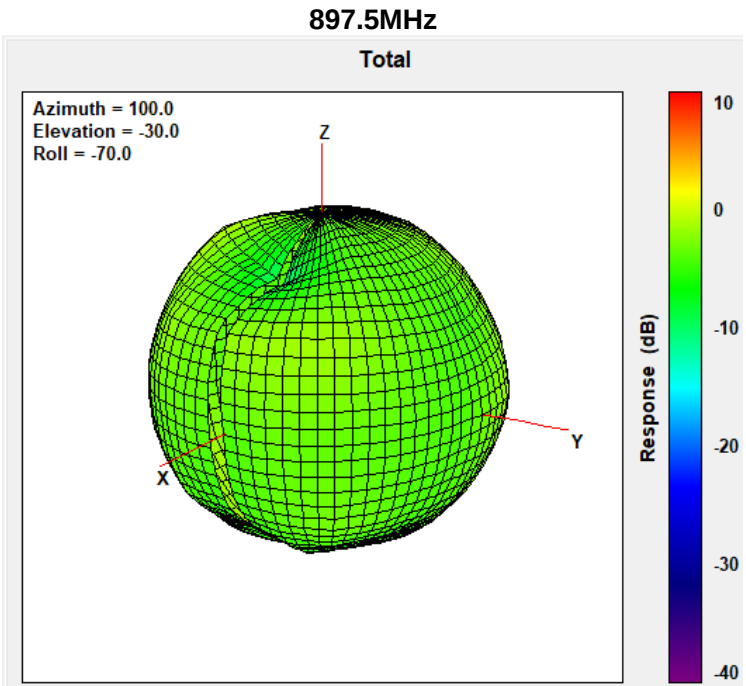
Center Frequency	849MHz
Horizontal (dBi) peak	-1.13
Vertical (dBi) peak	0.66



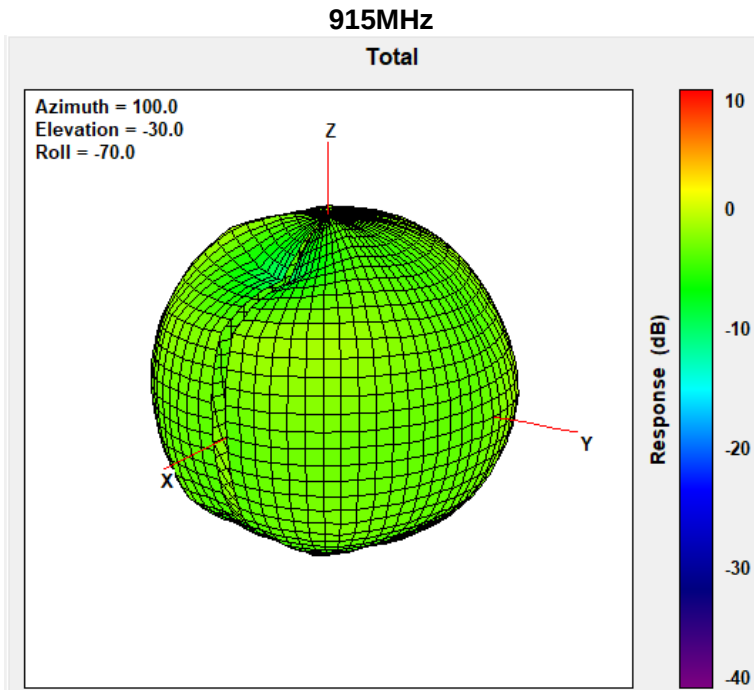
Center Frequency	862MHz
Horizontal (dBi) peak	-0.34
Vertical (dBi) peak	0.44



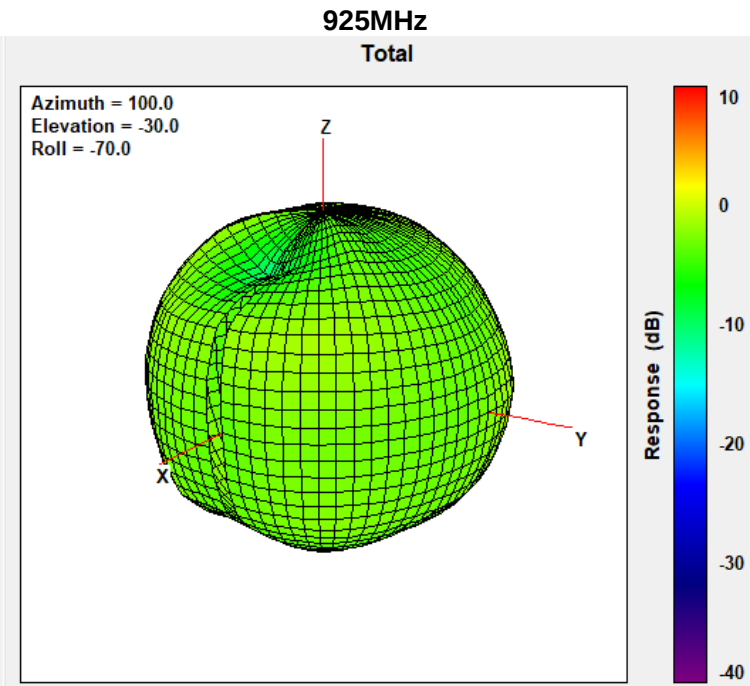
Center Frequency	880MHz
Horizontal (dBi) peak	-0.12
Vertical (dBi) peak	0.00



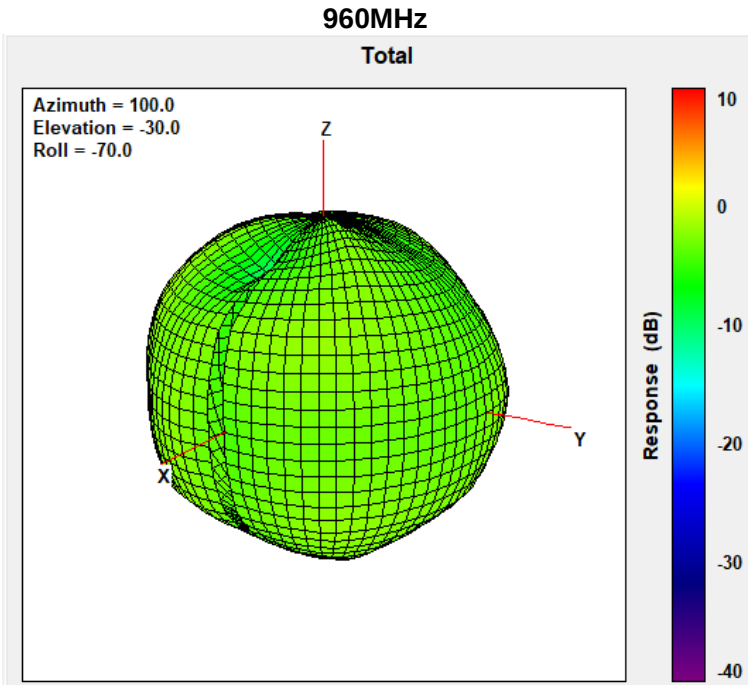
Center Frequency	897.5MHz
Horizontal (dBi) peak	-0.49
Vertical (dBi) peak	0.61



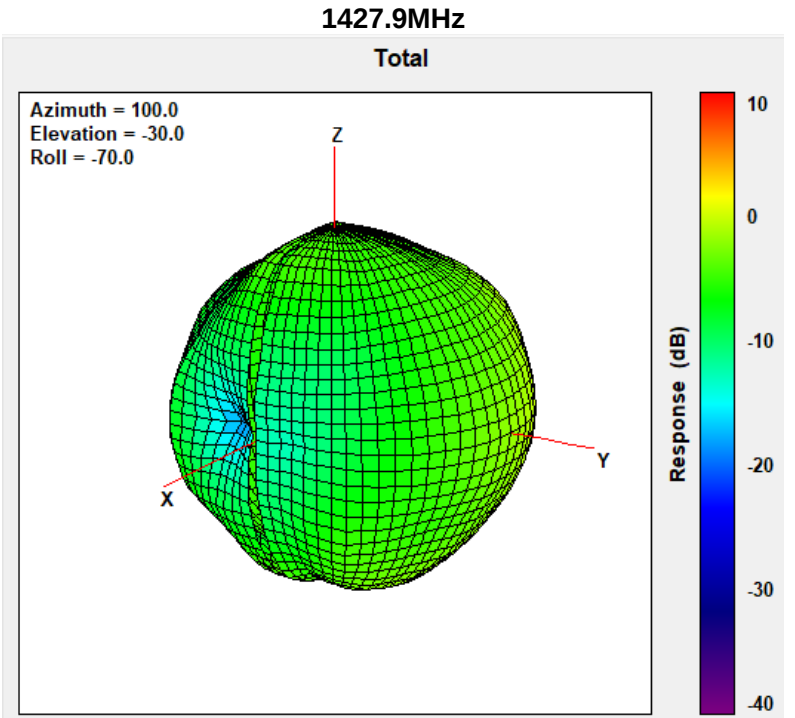
Center Frequency	915MHz
Horizontal (dBi) peak	-0.92
Vertical (dBi) peak	0.45



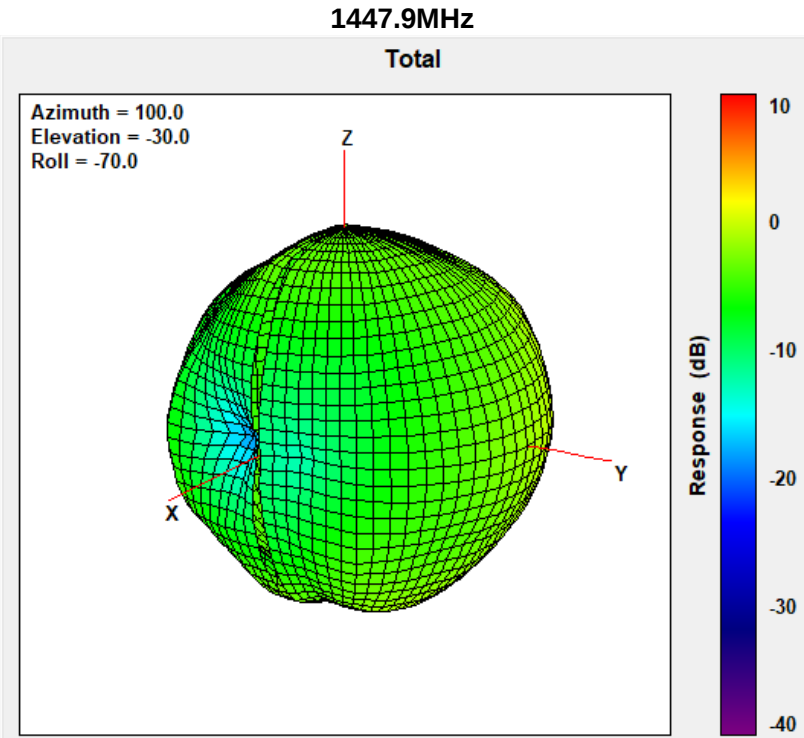
Center Frequency	925MHz
Horizontal (dBi) peak	-1.09
Vertical (dBi) peak	0.26



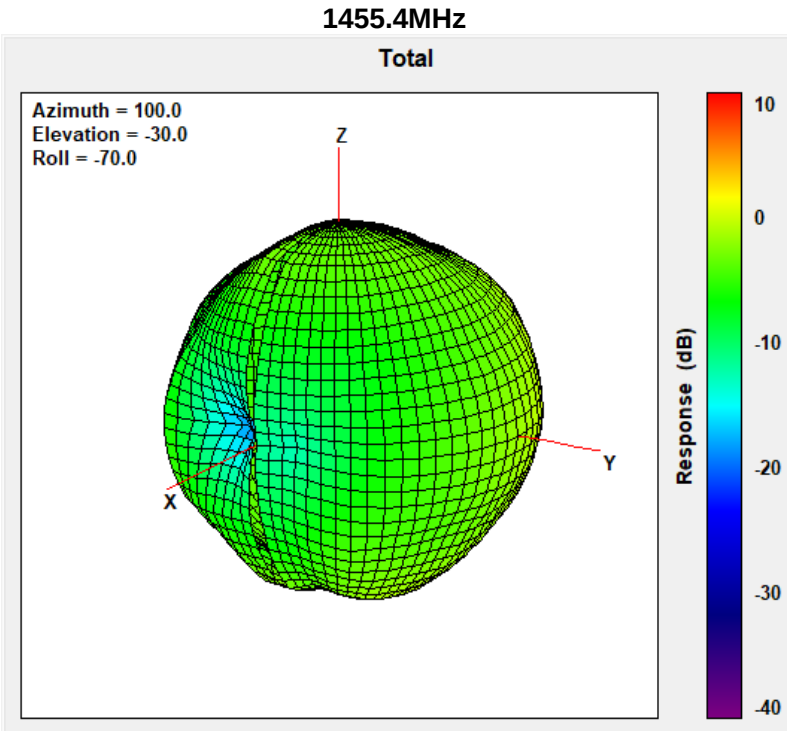
Center Frequency	960MHz
Horizontal (dBi) peak	-2.07
Vertical (dBi) peak	-0.90



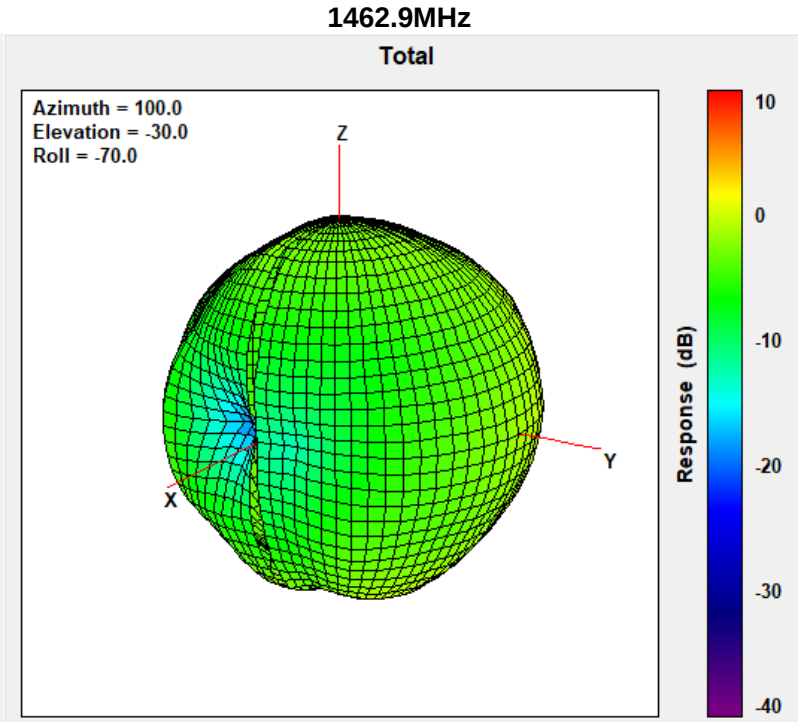
Center Frequency	1427.9MHz
Horizontal (dBi) peak	-1.76
Vertical (dBi) peak	1.07



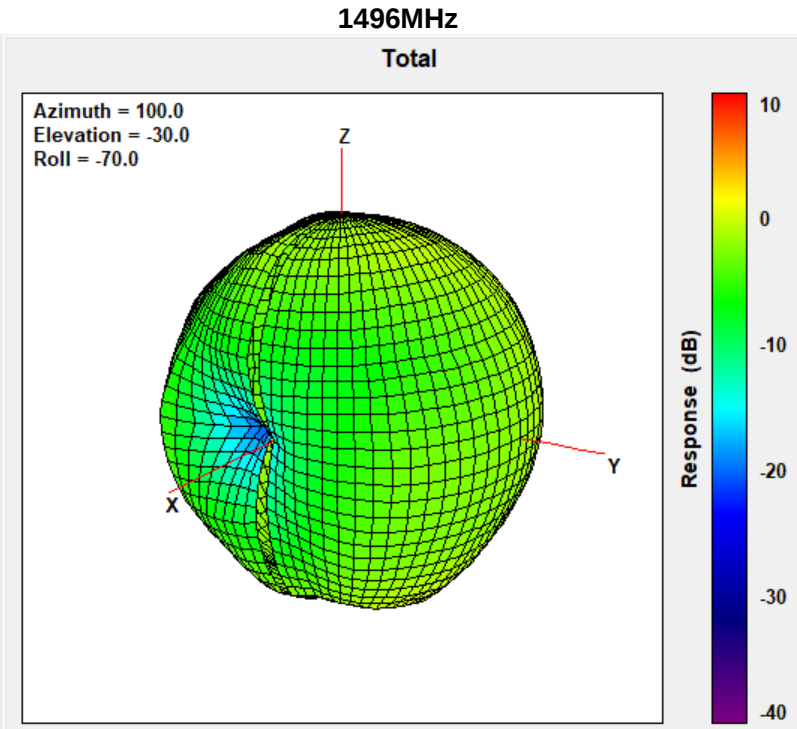
Center Frequency	1447.9MHz
Horizontal (dBi) peak	-1.96
Vertical (dBi) peak	1.11



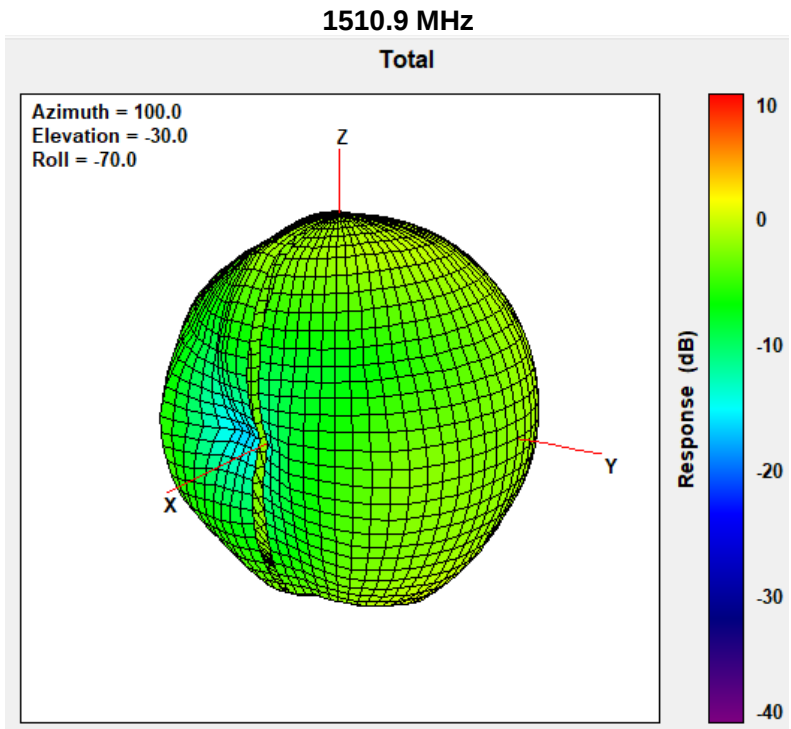
Center Frequency	1455.4MHz
Horizontal (dBi) peak	-2.15
Vertical (dBi) peak	1.04



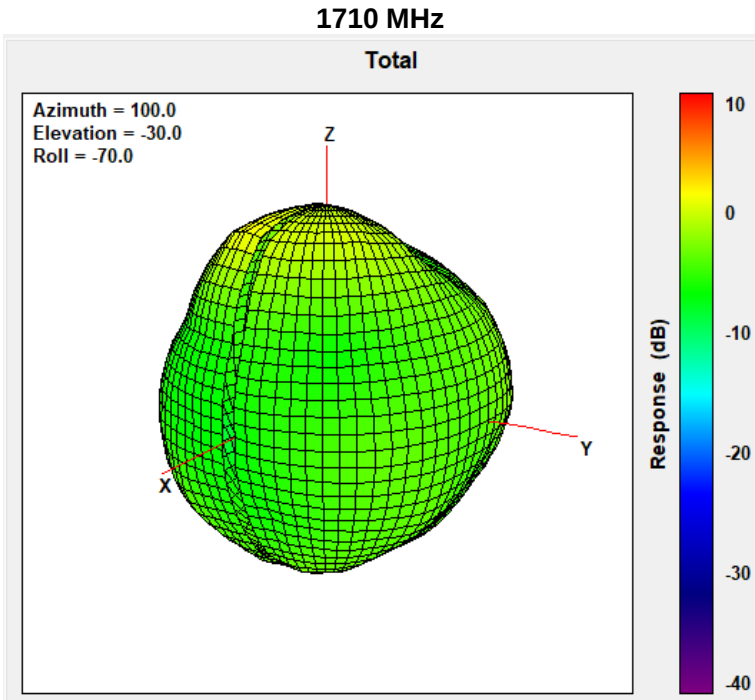
Center Frequency	1462.9MHz
Horizontal (dBi) peak	-2.19
Vertical (dBi) peak	0.94



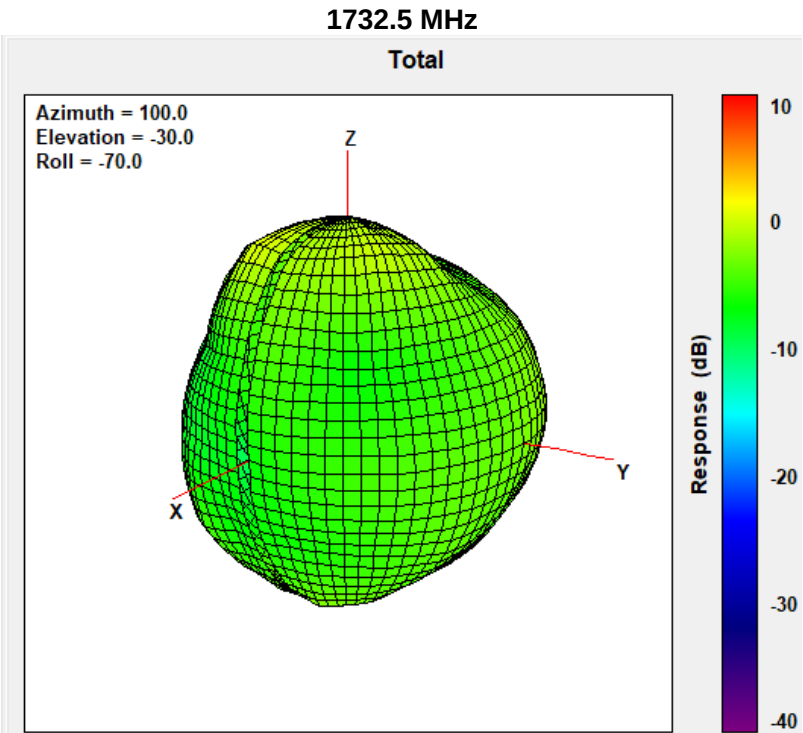
Center Frequency	1496MHz
Horizontal (dBi) peak	-0.76
Vertical (dBi) peak	0.17



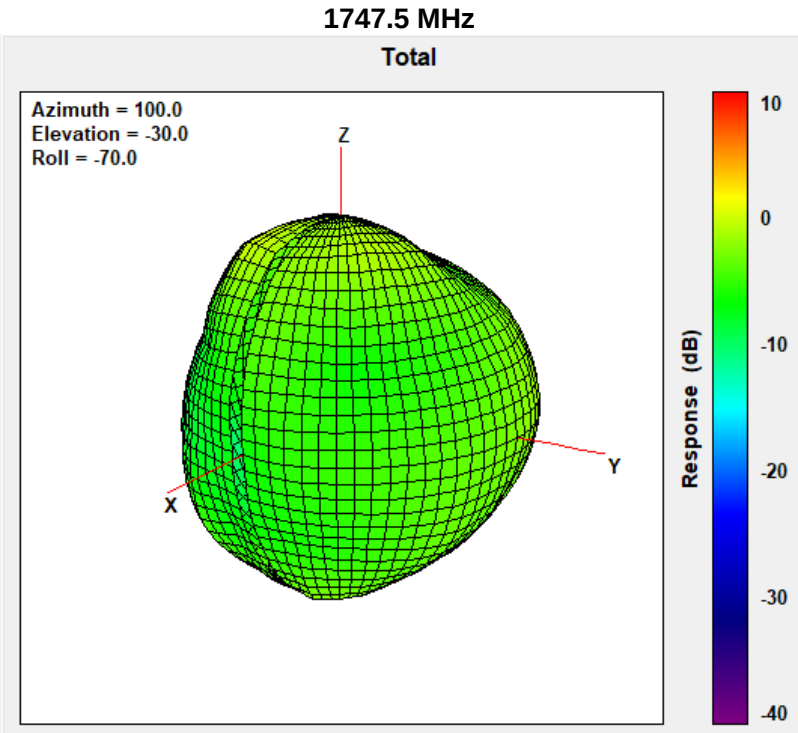
Center Frequency	1510.9 MHz
Horizontal (dBi) peak	-1.07
Vertical (dBi) peak	-0.14



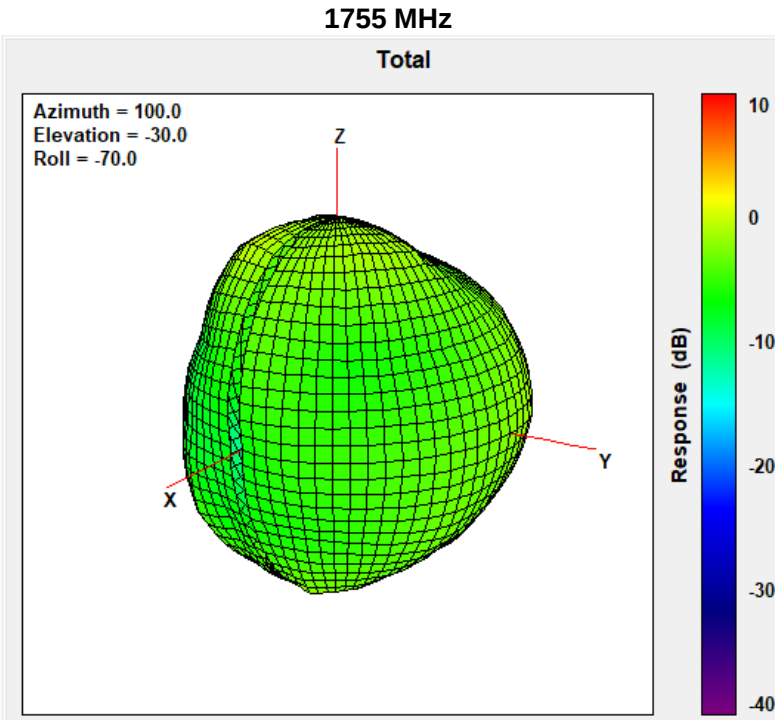
Center Frequency	1710 MHz
Horizontal (dBi) peak	1.32
Vertical (dBi) peak	-0.34



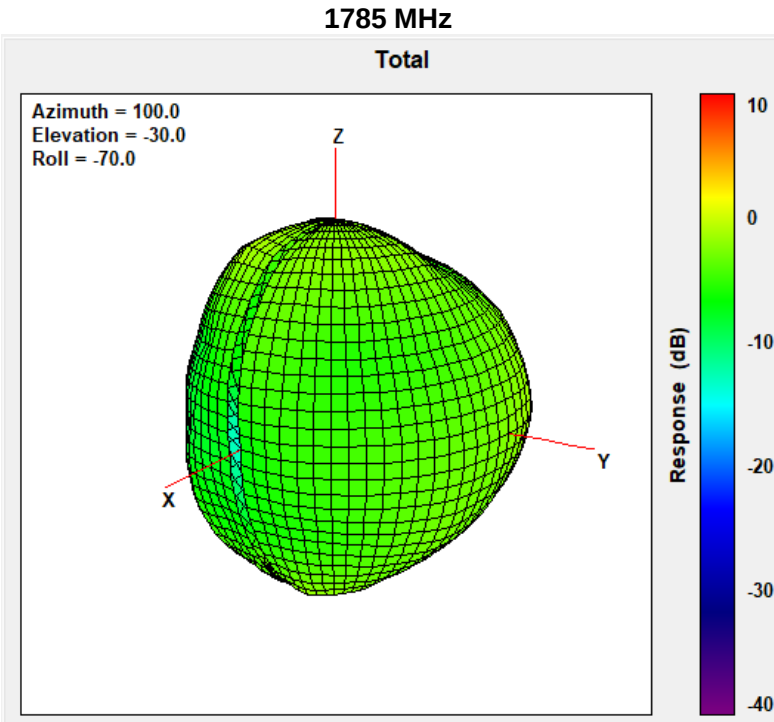
Center Frequency	1732.5 MHz
Horizontal (dBi) peak	0.54
Vertical (dBi) peak	-0.18



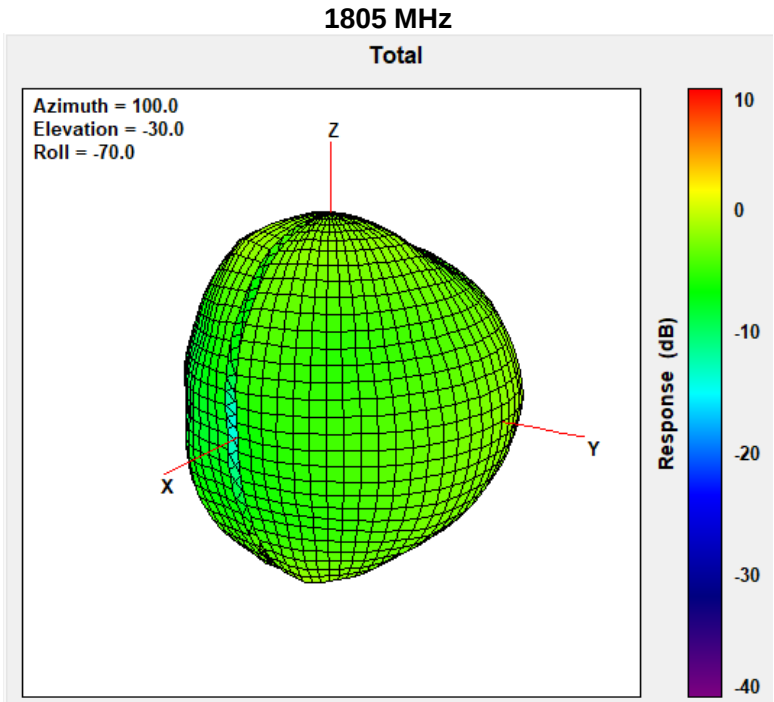
Center Frequency	1747.5 MHz
Horizontal (dBi) peak	-0.02
Vertical (dBi) peak	-0.24



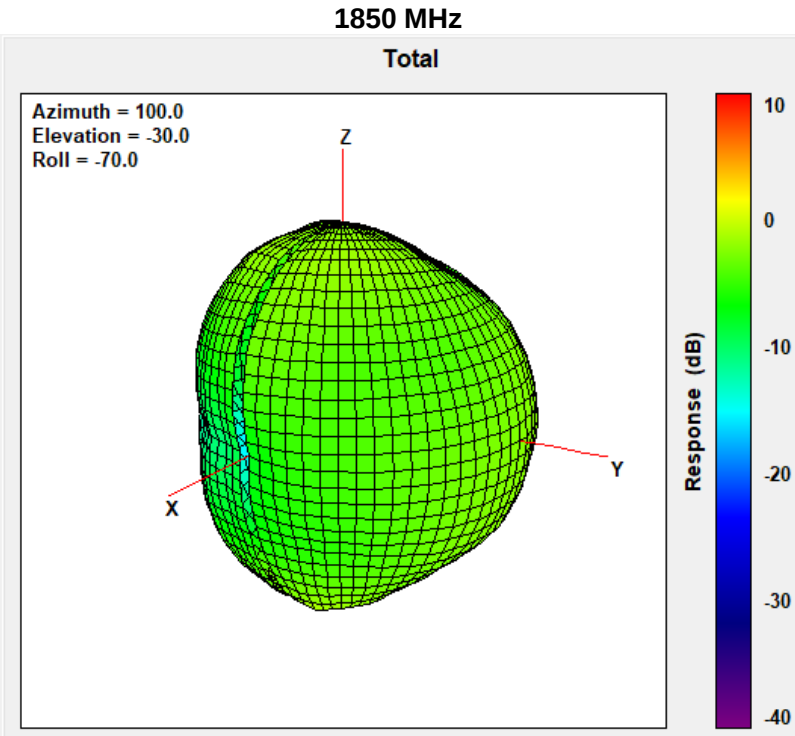
Center Frequency	1755 MHz
Horizontal (dBi) peak	-0.32
Vertical (dBi) peak	-0.35



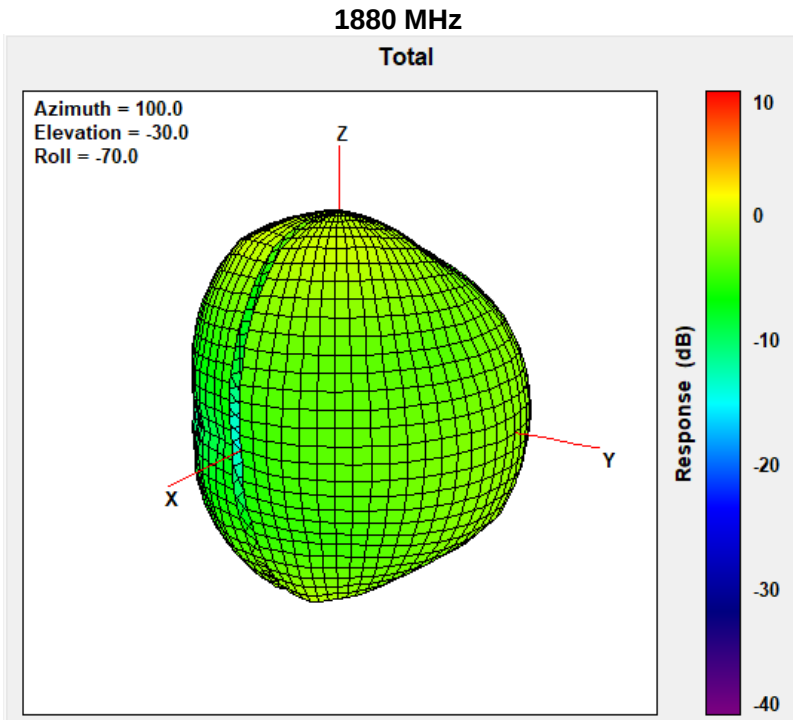
Center Frequency	1785 MHz
Horizontal (dBi) peak	-1.02
Vertical (dBi) peak	-1.11



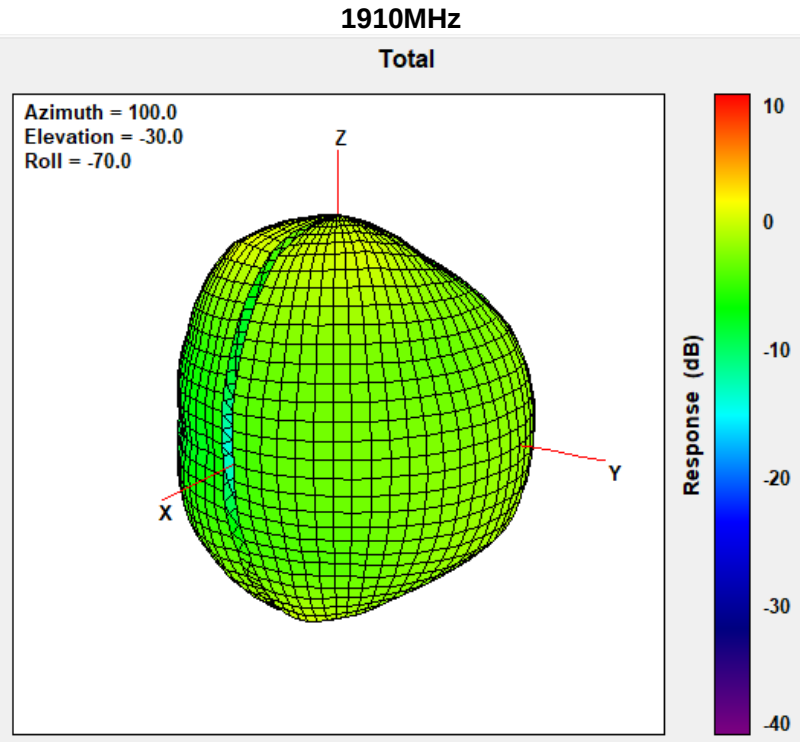
Center Frequency	1805 MHz
Horizontal (dBi) peak	-1.26
Vertical (dBi) peak	-1.25



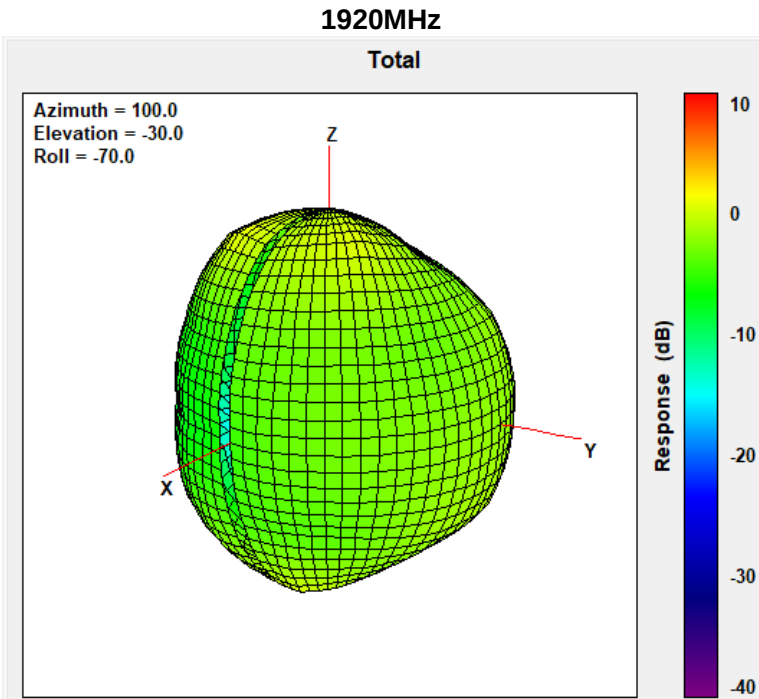
Center Frequency	1850 MHz
Horizontal (dBi) peak	-1.89
Vertical (dBi) peak	-2.32



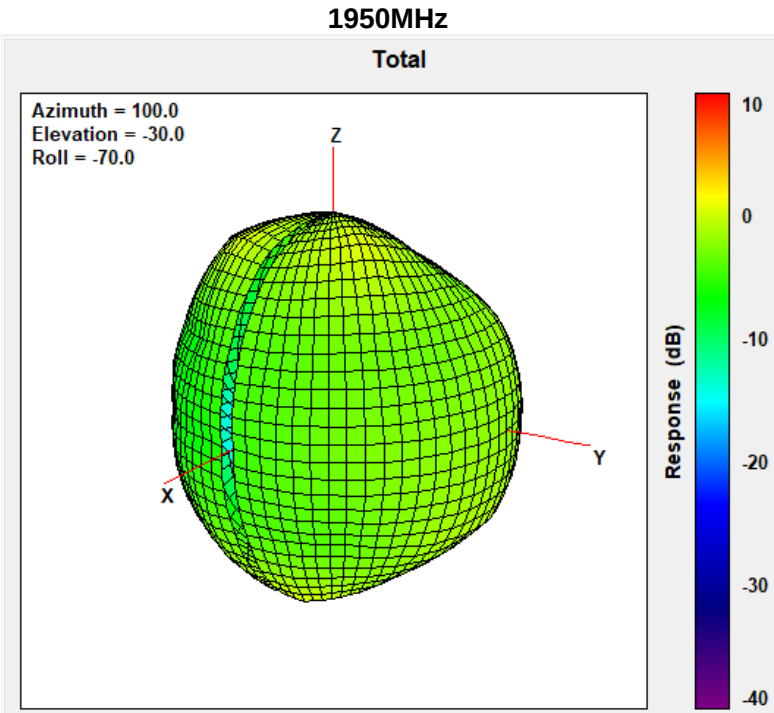
Center Frequency	1880 MHz
Horizontal (dBi) peak	0.29
Vertical (dBi) peak	-1.86



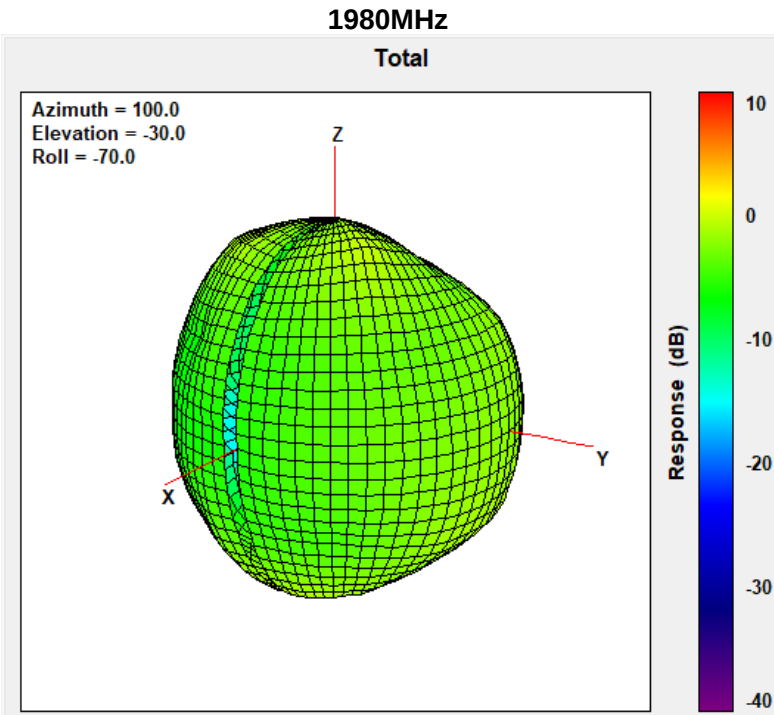
Center Frequency	1910MHz
Horizontal (dBi) peak	1.16
Vertical (dBi) peak	-1.38



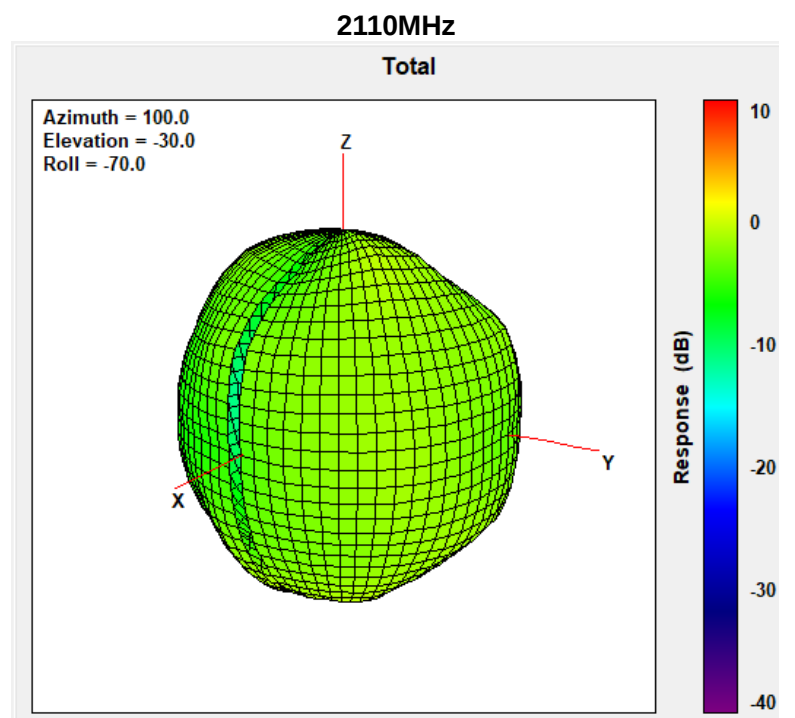
Center Frequency	1920MHz
Horizontal (dBi) peak	1.18
Vertical (dBi) peak	-1.27



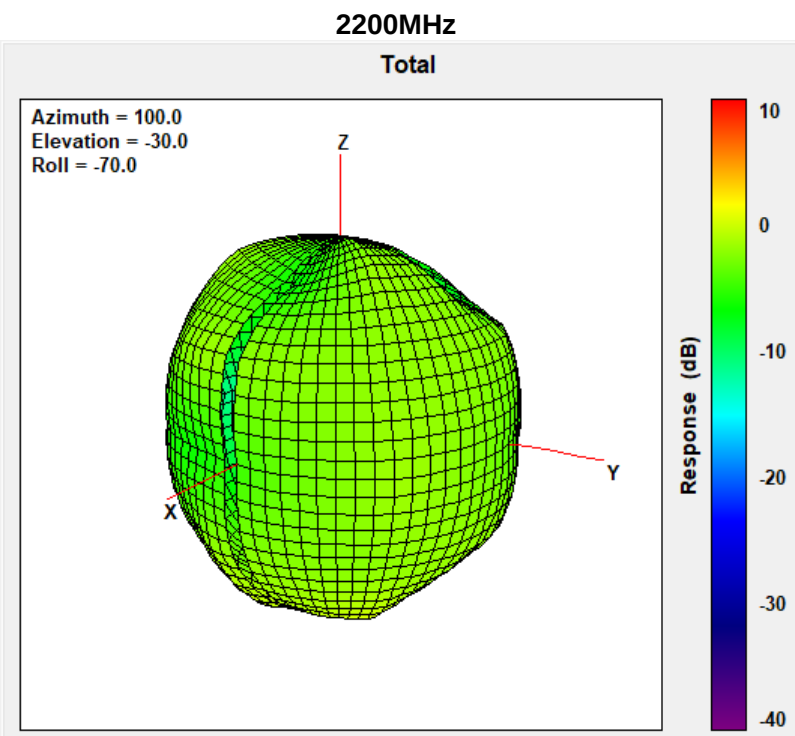
Center Frequency	1950MHz
Horizontal (dBi) peak	0.76
Vertical (dBi) peak	-0.98



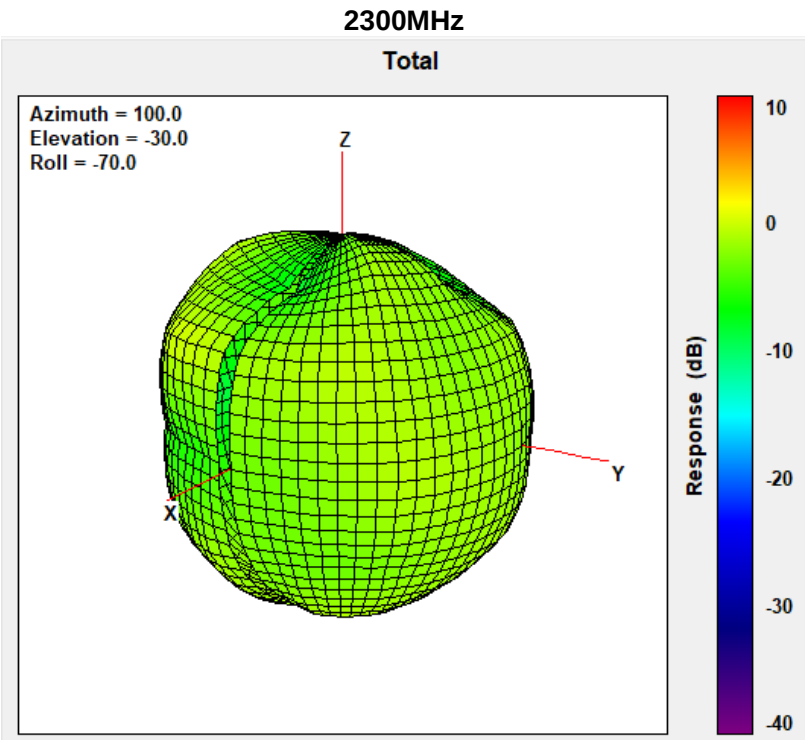
Center Frequency	1980MHz
Horizontal (dBi) peak	-0.74
Vertical (dBi) peak	-1.09



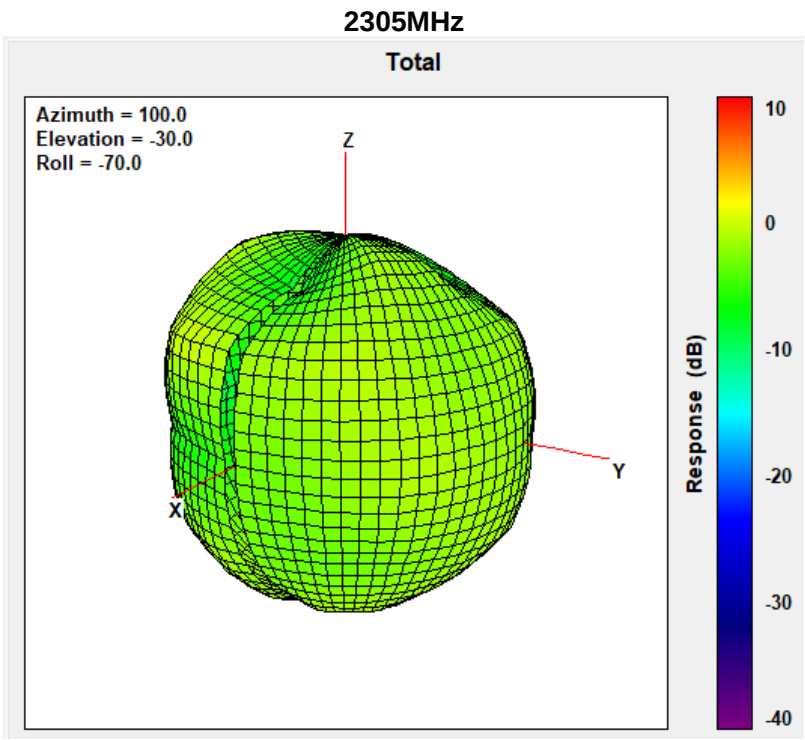
Center Frequency	2110MHz
Horizontal (dBi) peak	-0.59
Vertical (dBi) peak	-1.12



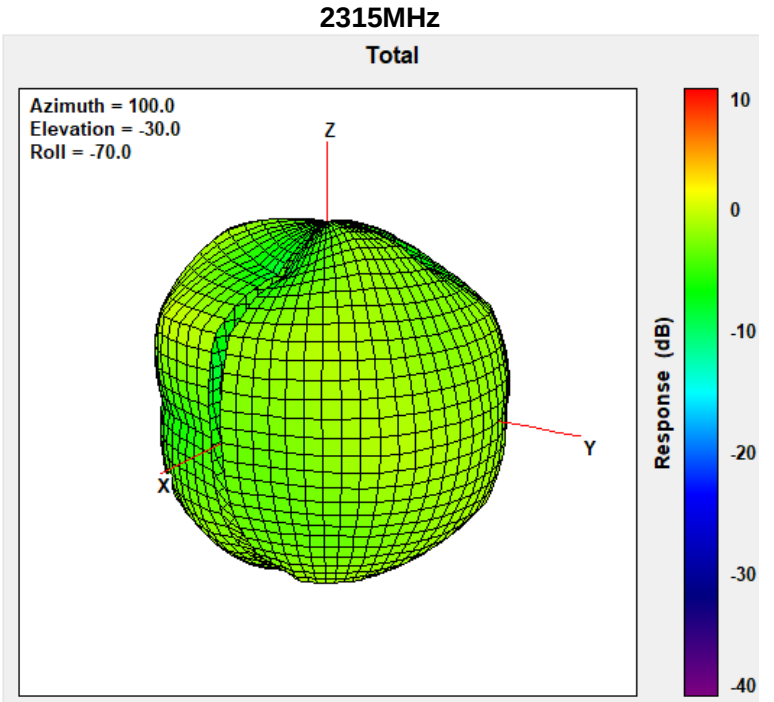
Center Frequency	2200MHz
Horizontal (dBi) peak	-0.29
Vertical (dBi) peak	-0.35



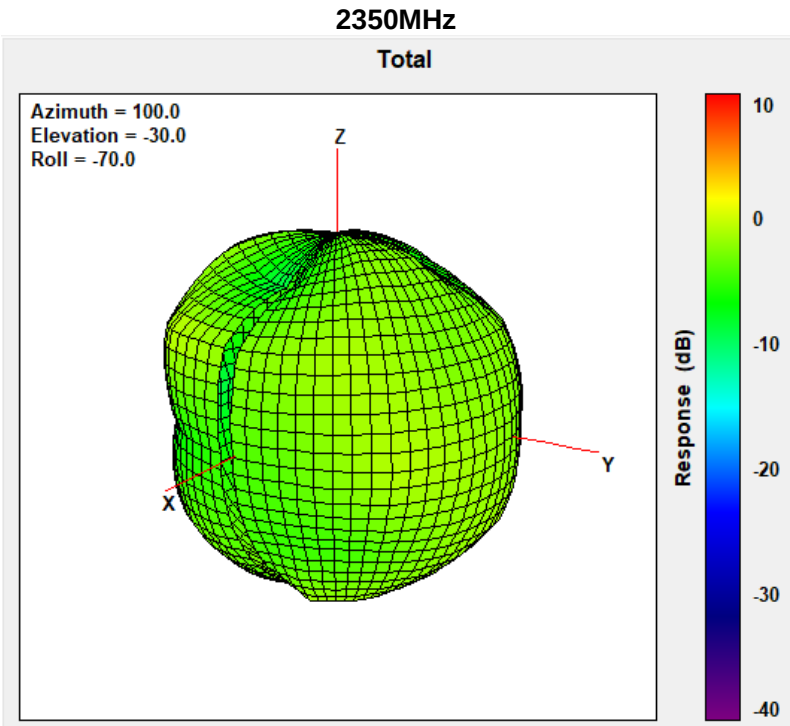
Center Frequency	2300MHz
Horizontal (dBi) peak	-0.09
Vertical (dBi) peak	-0.22



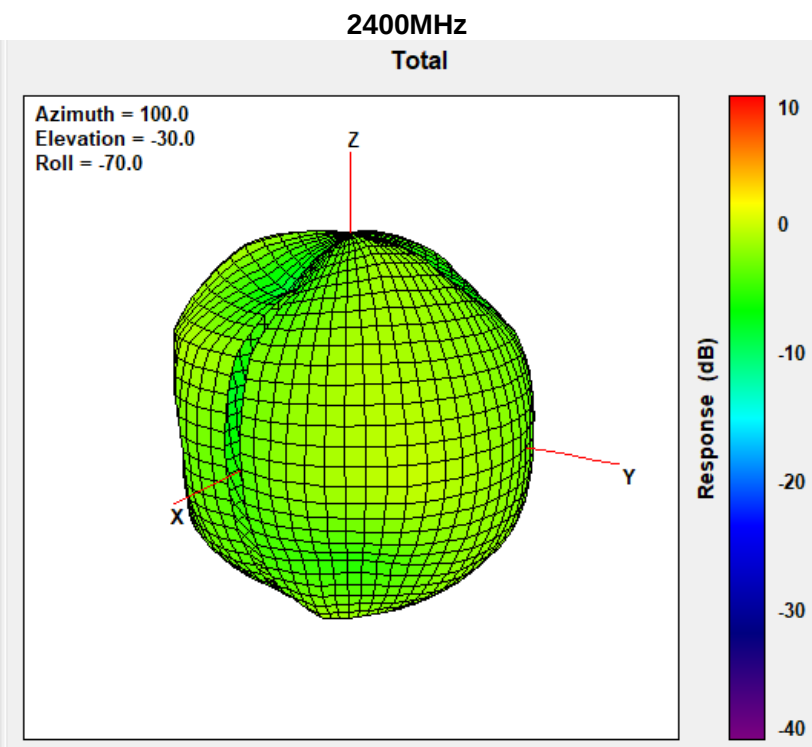
Center Frequency	2305MHz
Horizontal (dBi) peak	-0.05
Vertical (dBi) peak	-0.34



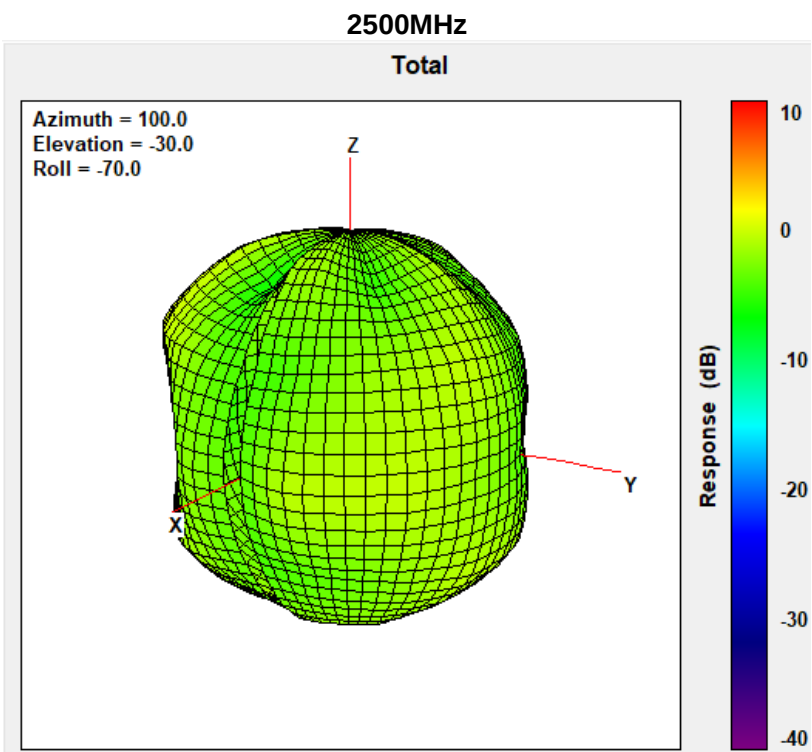
Center Frequency	2315MHz
Horizontal (dBi) peak	-0.01
Vertical (dBi) peak	-0.66



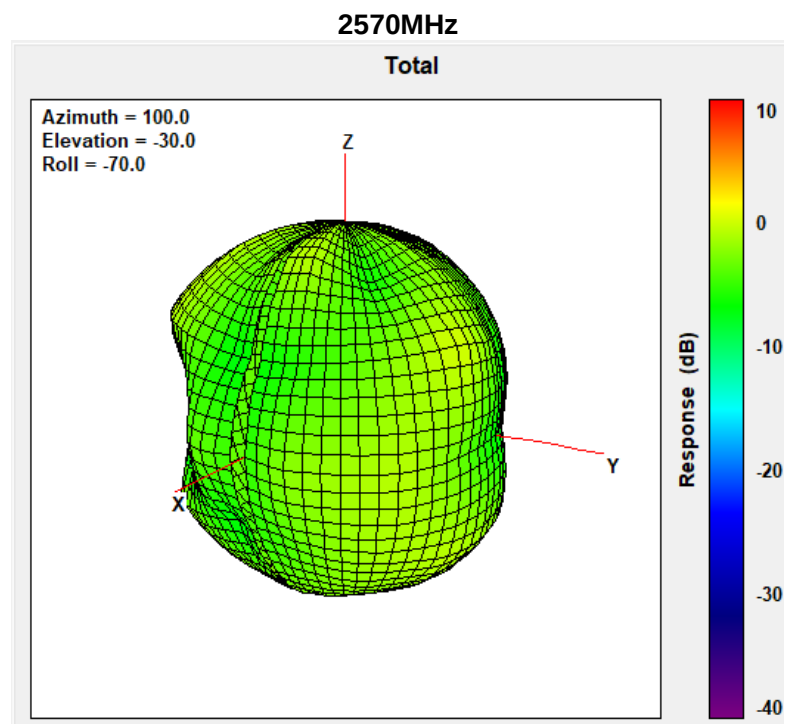
Center Frequency	2350MHz
Horizontal (dBi) peak	-0.36
Vertical (dBi) peak	-0.74



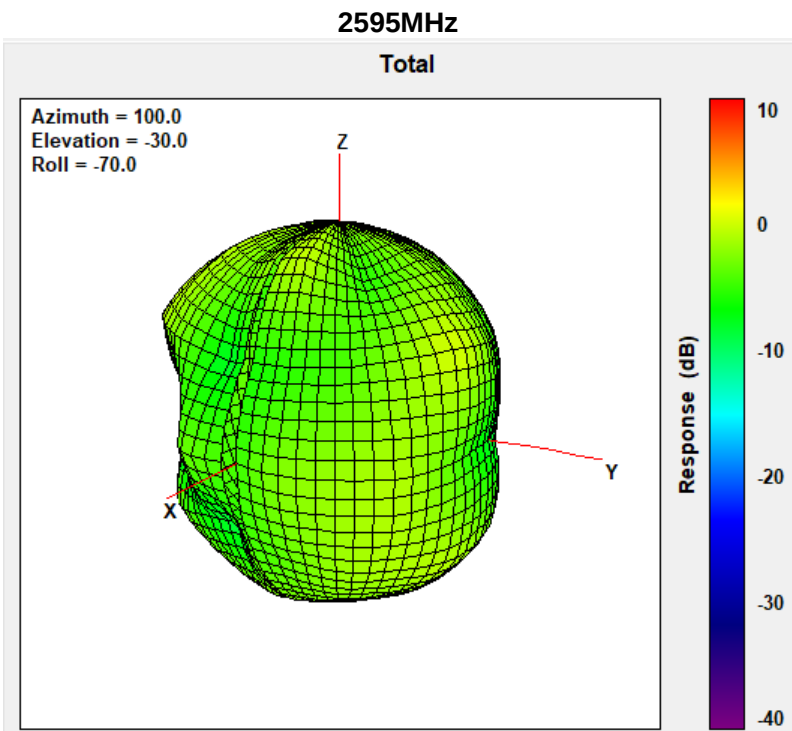
Center Frequency	2400MHz
Horizontal (dBi) peak	-0.84
Vertical (dBi) peak	-0.12



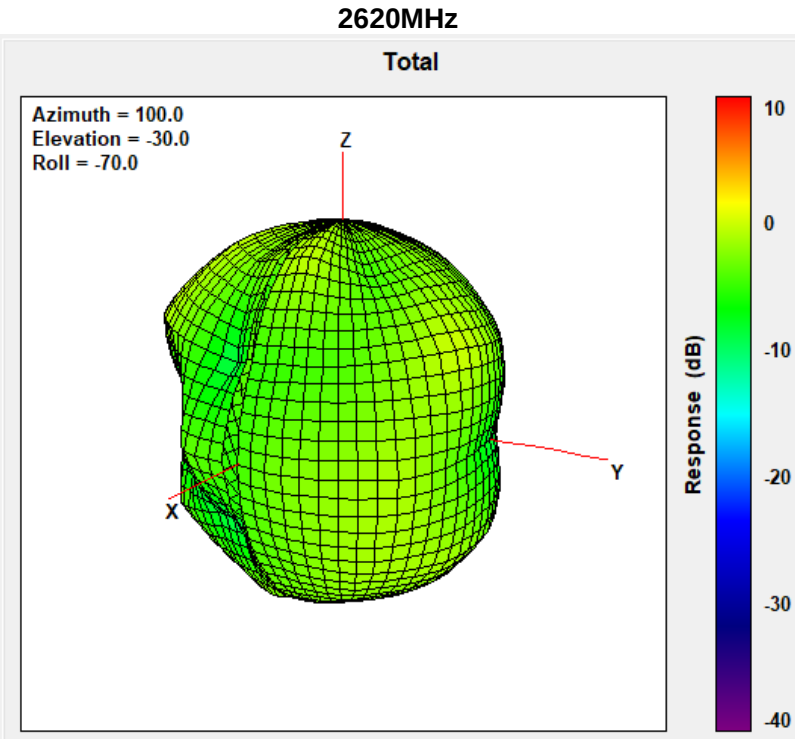
Center Frequency	2500MHz
Horizontal (dBi) peak	-0.47
Vertical (dBi) peak	-0.12



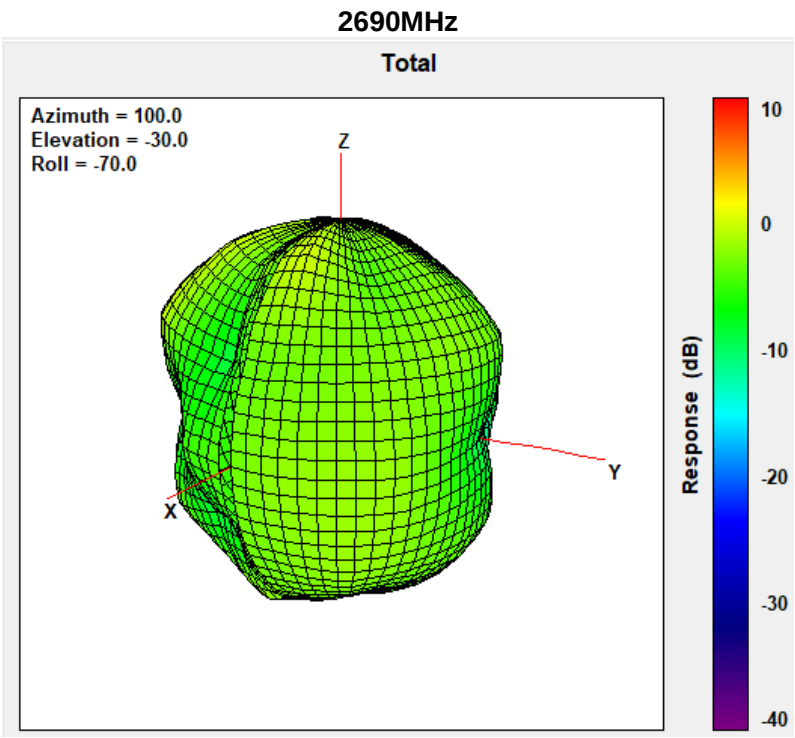
Center Frequency	2570MHz
Horizontal (dBi) peak	-0.31
Vertical (dBi) peak	-0.68



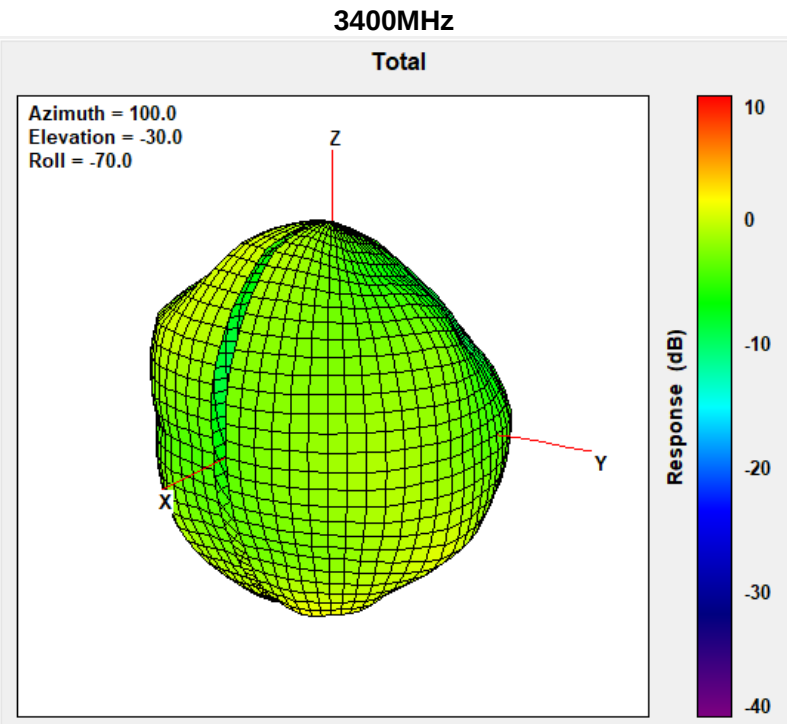
Center Frequency	2595MHz
Horizontal (dBi) peak	-0.38
Vertical (dBi) peak	-0.69



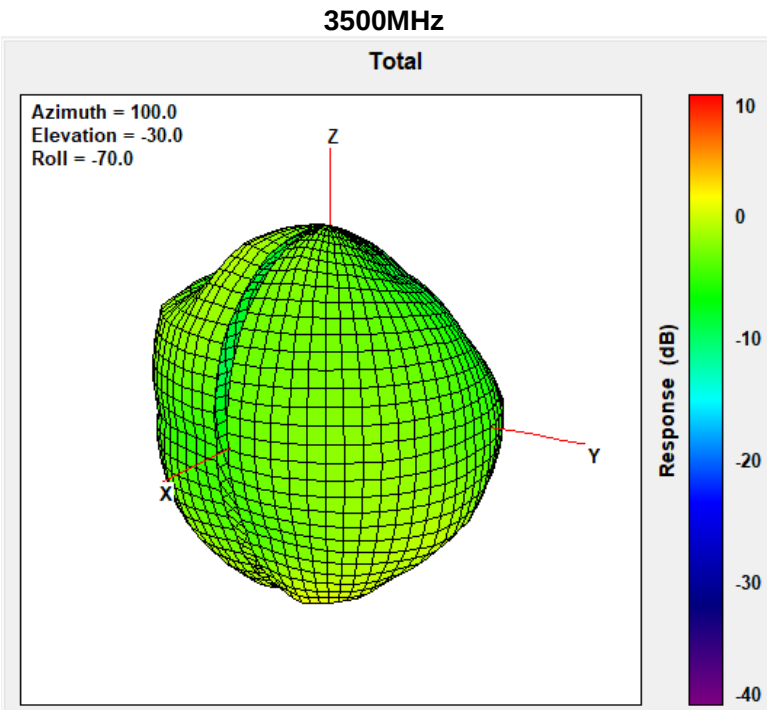
Center Frequency	2620MHz
Horizontal (dBi) peak	-0.10
Vertical (dBi) peak	-0.34



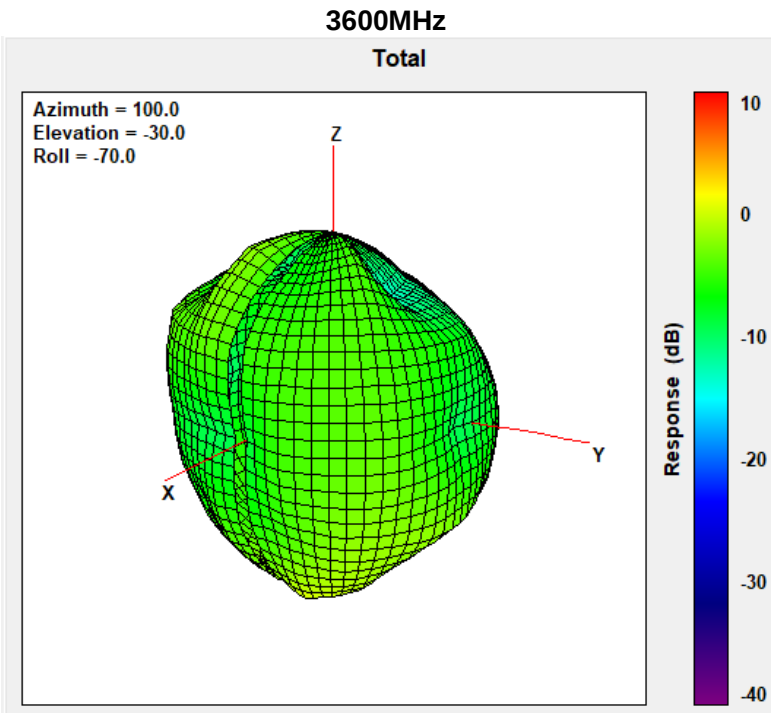
Center Frequency	2690MHz
Horizontal (dBi) peak	0.47
Vertical (dBi) peak	-1.58



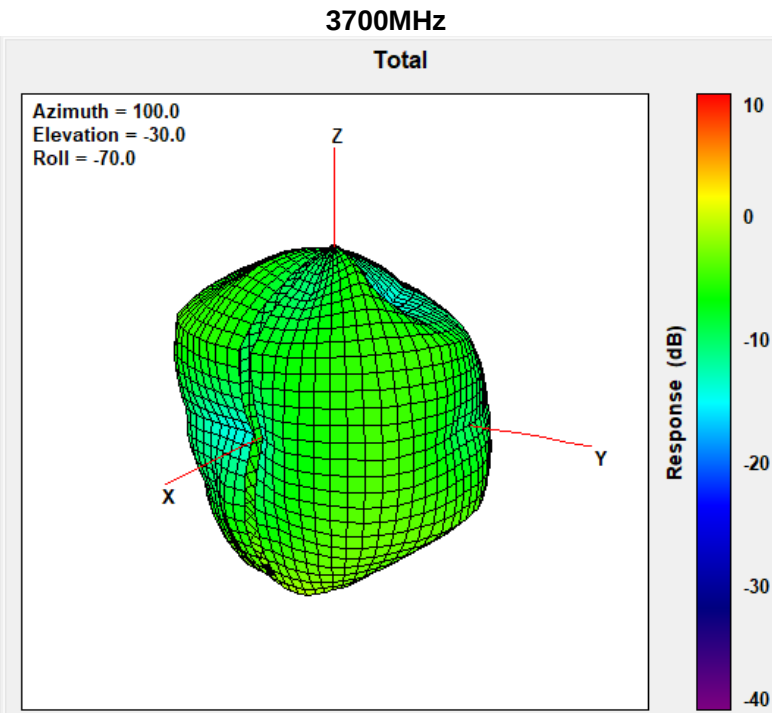
Center Frequency	3400MHz
Horizontal (dBi) peak	-0.28
Vertical (dBi) peak	1.19



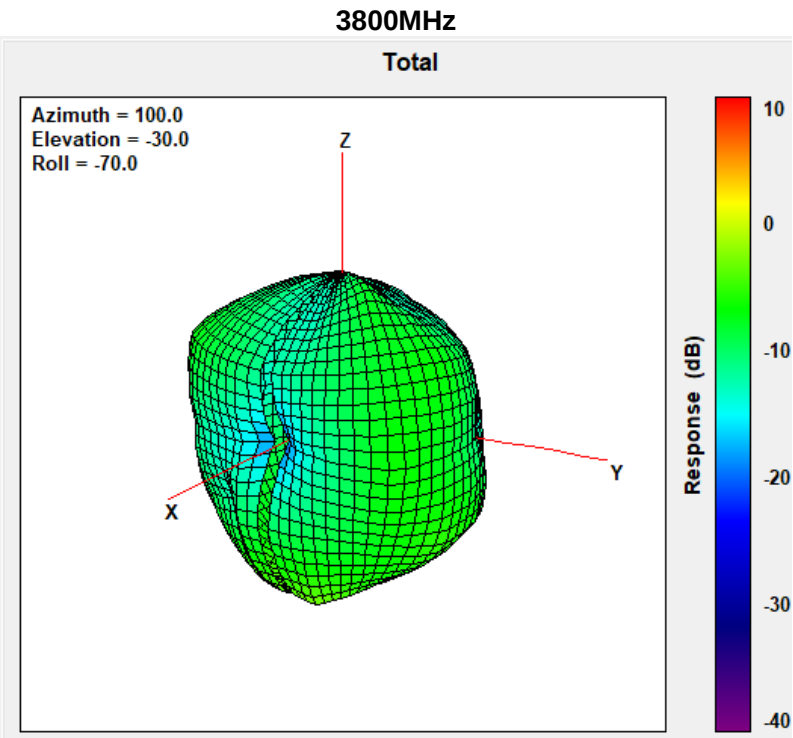
Center Frequency	3500MHz
Horizontal (dBi) peak	-1.10
Vertical (dBi) peak	0.69



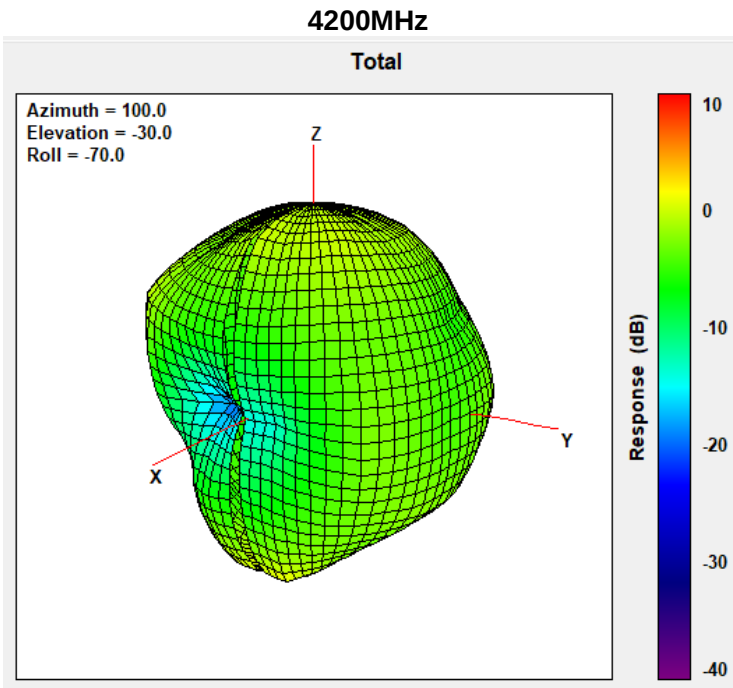
Center Frequency	3600MHz
Horizontal (dBi) peak	-1.74
Vertical (dBi) peak	-0.90



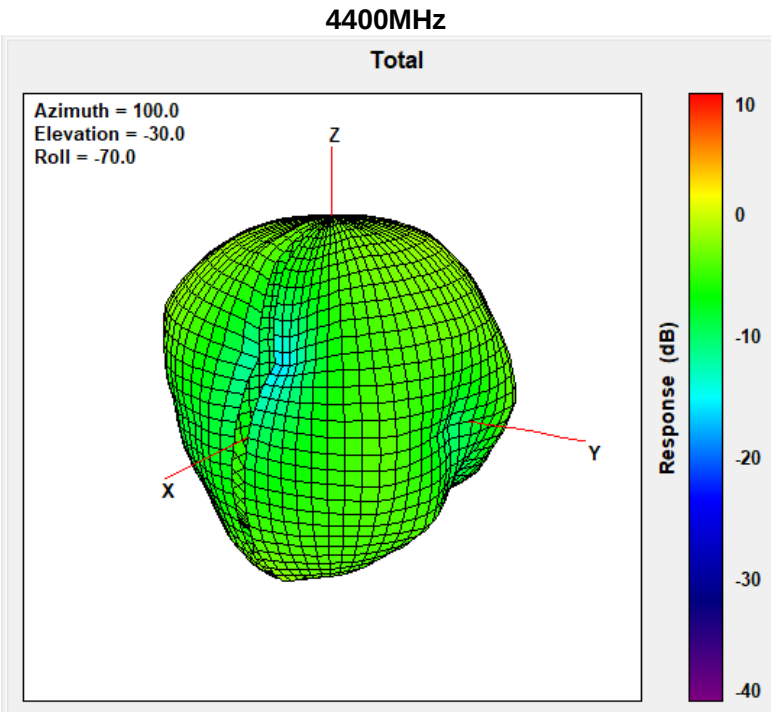
Center Frequency	3700MHz
Horizontal (dBi) peak	-2.27
Vertical (dBi) peak	-2.63



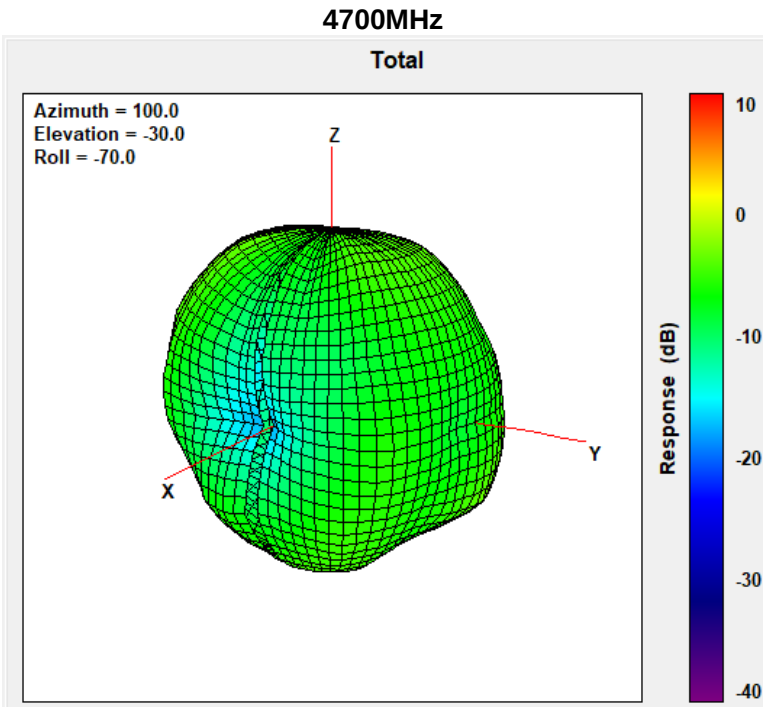
Center Frequency	3800MHz
Horizontal (dBi) peak	-3.95
Vertical (dBi) peak	-4.47



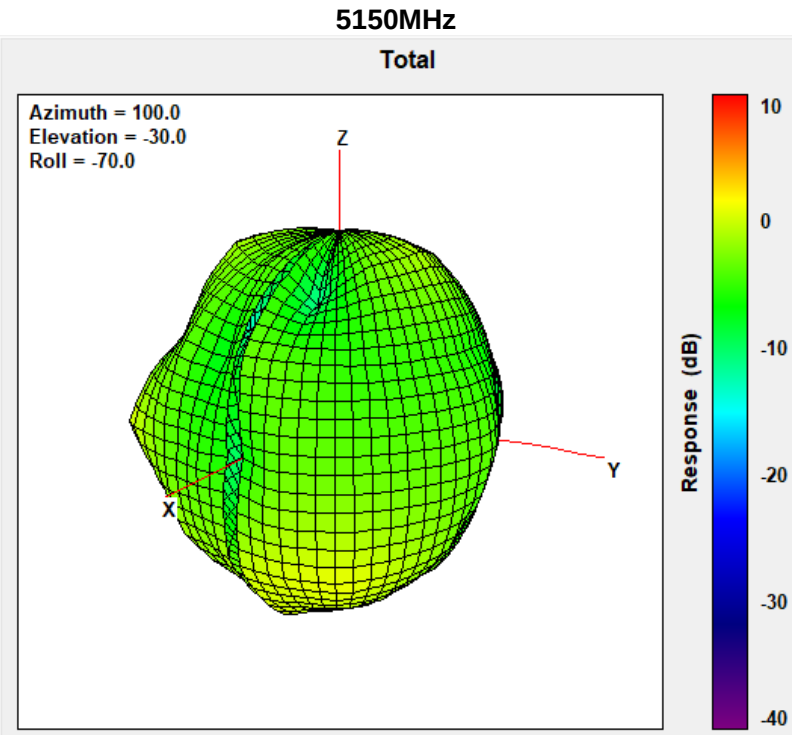
Center Frequency	4200MHz
Horizontal (dBi) peak	0.32
Vertical (dBi) peak	-1.20



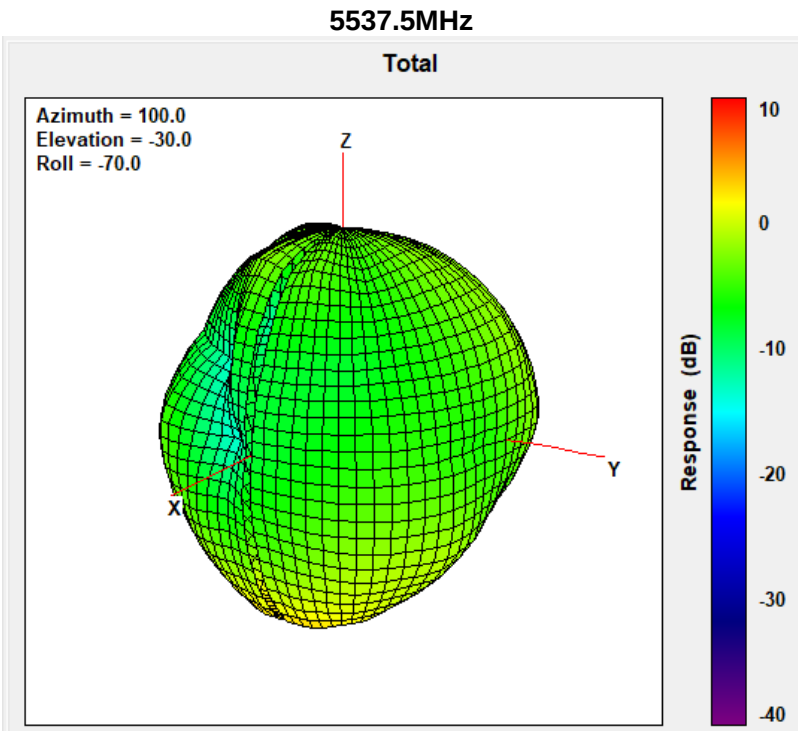
Center Frequency	4400MHz
Horizontal (dBi) peak	-1.27
Vertical (dBi) peak	-3.80



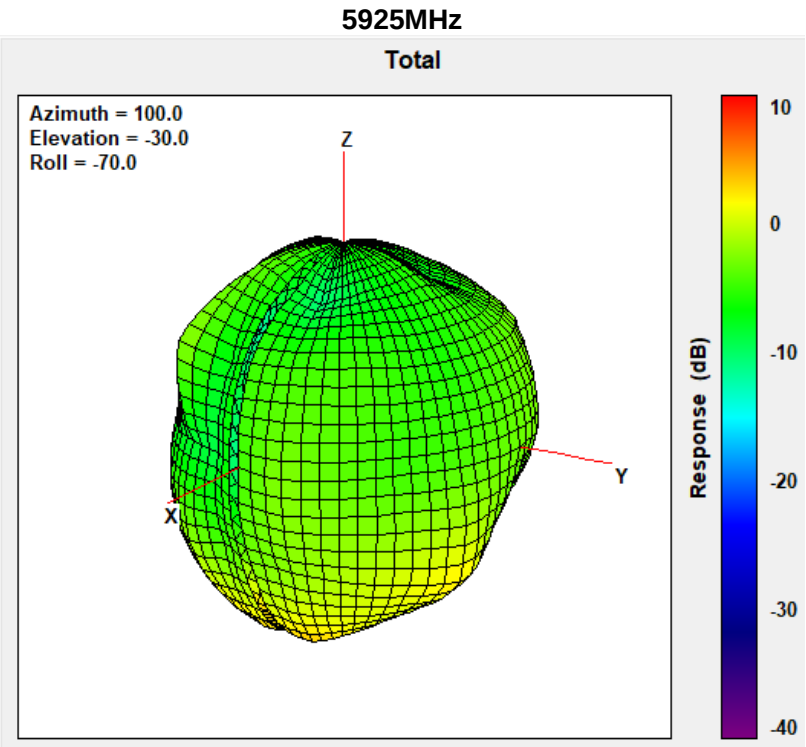
Center Frequency	4700MHz
Horizontal (dBi) peak	-2.64
Vertical (dBi) peak	-5.25



Center Frequency	5150MHz
Horizontal (dBi) peak	0.49
Vertical (dBi) peak	-1.10

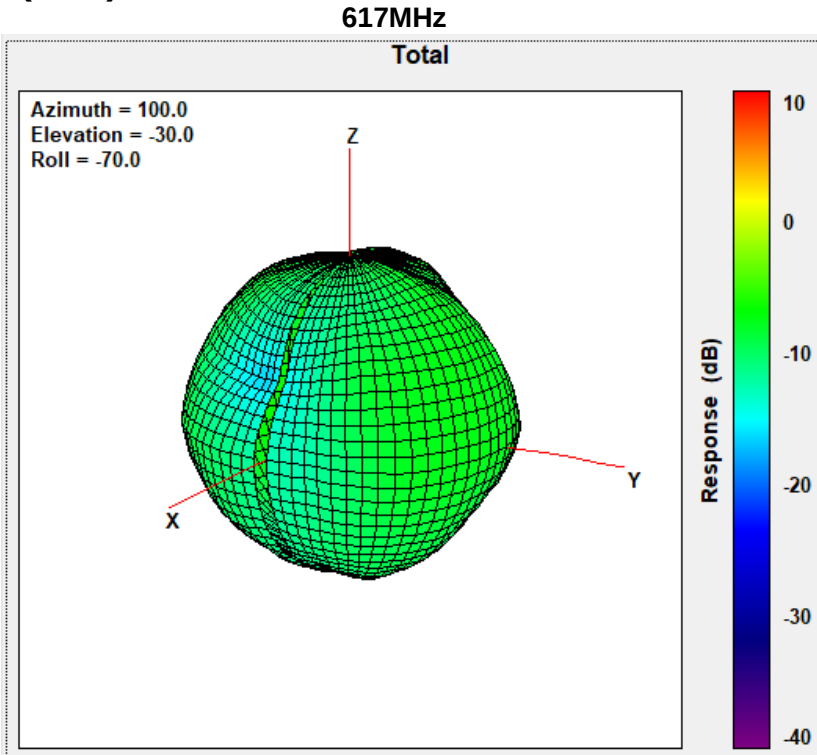


Center Frequency	5537.5MHz
Horizontal (dBi) peak	-0.15
Vertical (dBi) peak	1.48

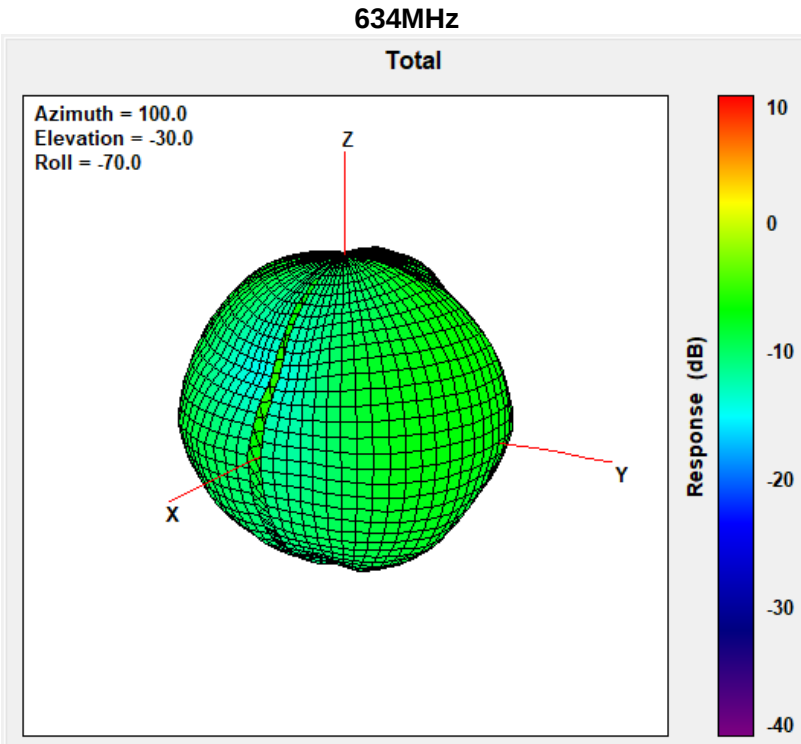


Center Frequency	5925MHz
Horizontal (dBi) peak	0.68
Vertical (dBi) peak	1.05

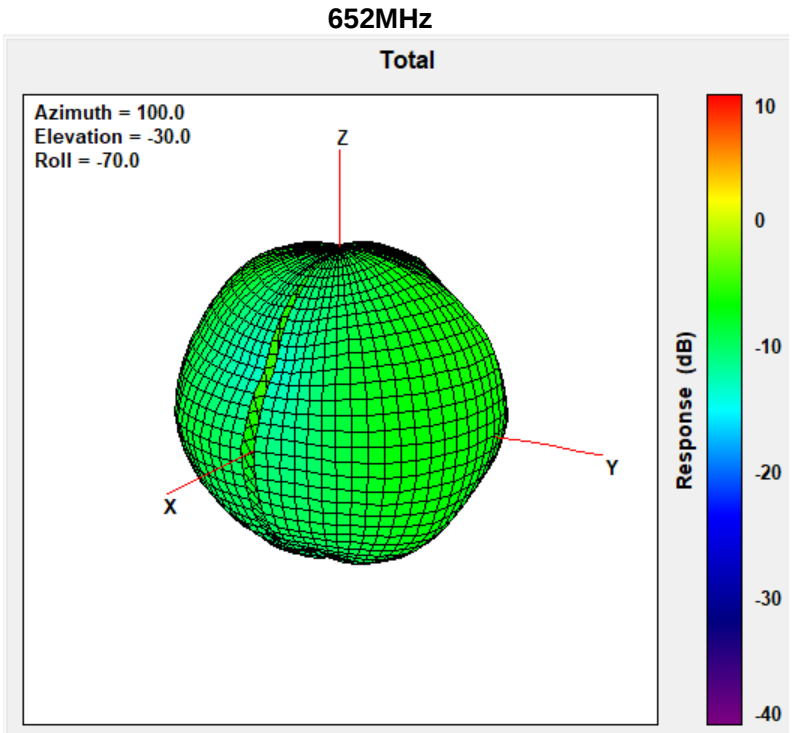
WWAN Aux Antenna (DRx)



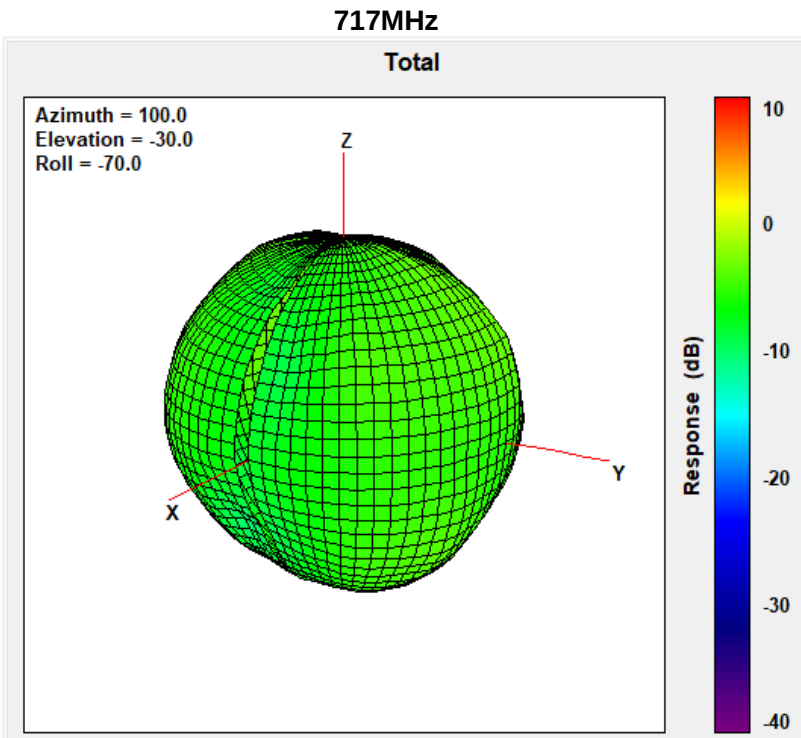
Center Frequency	617MHz
Horizontal (dBi) peak	-7.96
Vertical (dBi) peak	-6.59



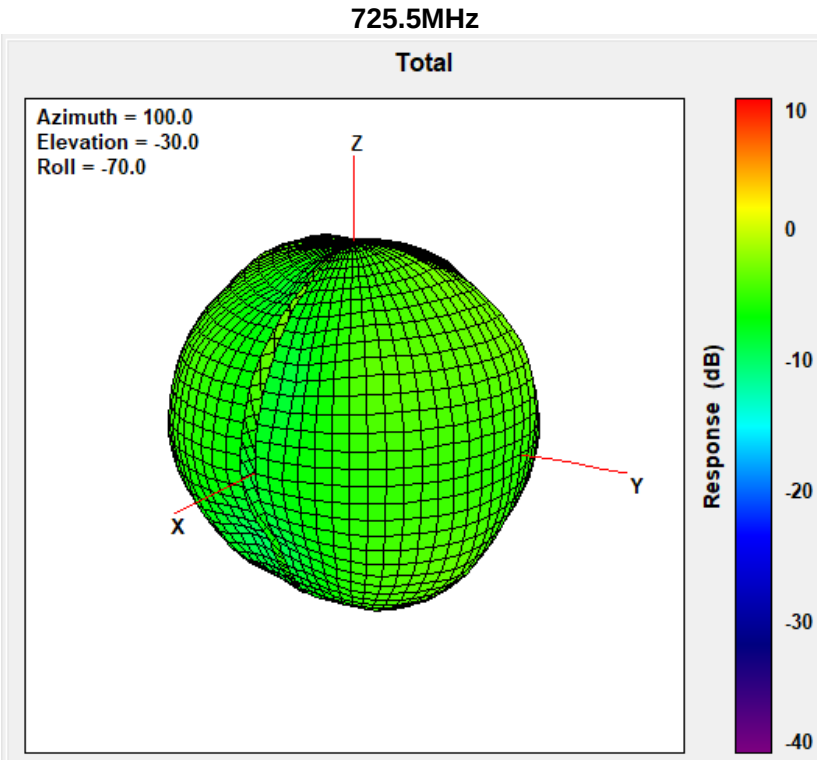
Center Frequency	634MHz
Horizontal (dBi) peak	-7.64
Vertical (dBi) peak	-5.80



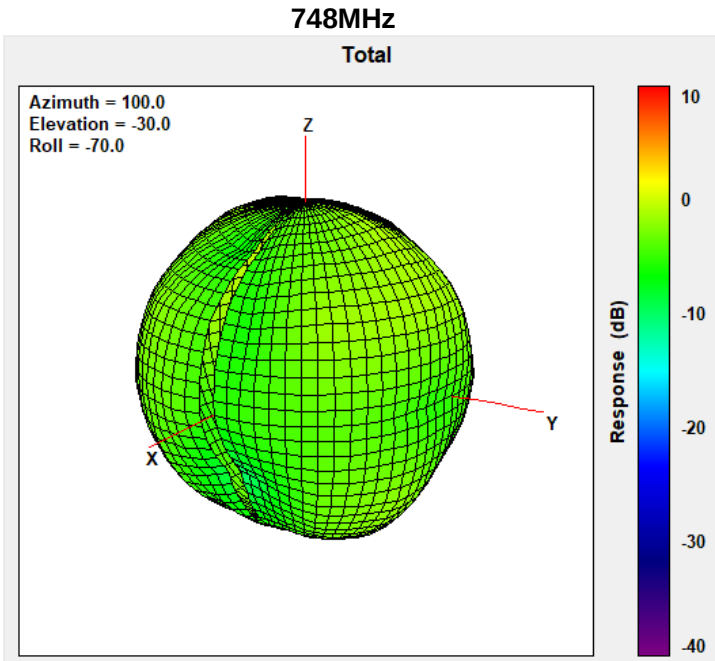
Center Frequency	652MHz
Horizontal (dBi) peak	-7.32
Vertical (dBi) peak	-5.17



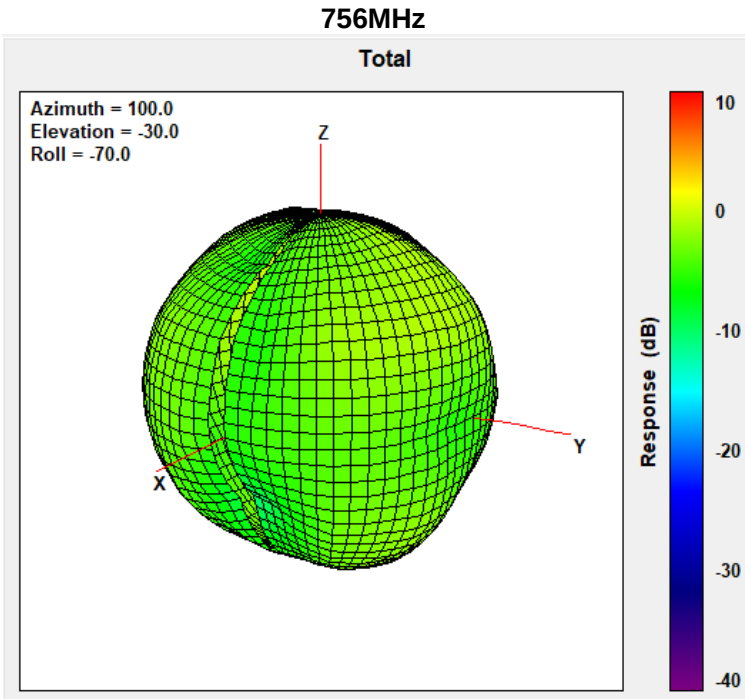
Center Frequency	717MHz
Horizontal (dBi) peak	-5.13
Vertical (dBi) peak	-2.21



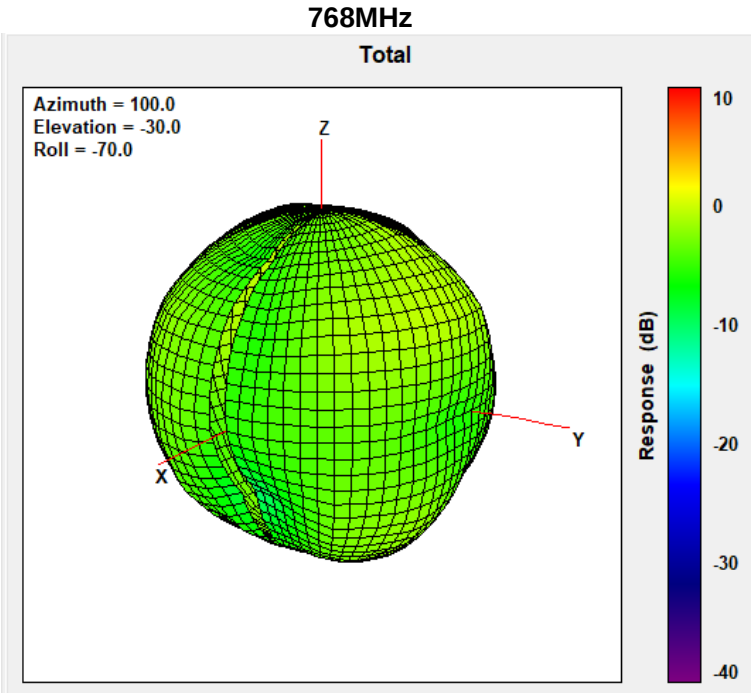
Center Frequency	725.5MHz
Horizontal (dBi) peak	-4.94
Vertical (dBi) peak	-2.08



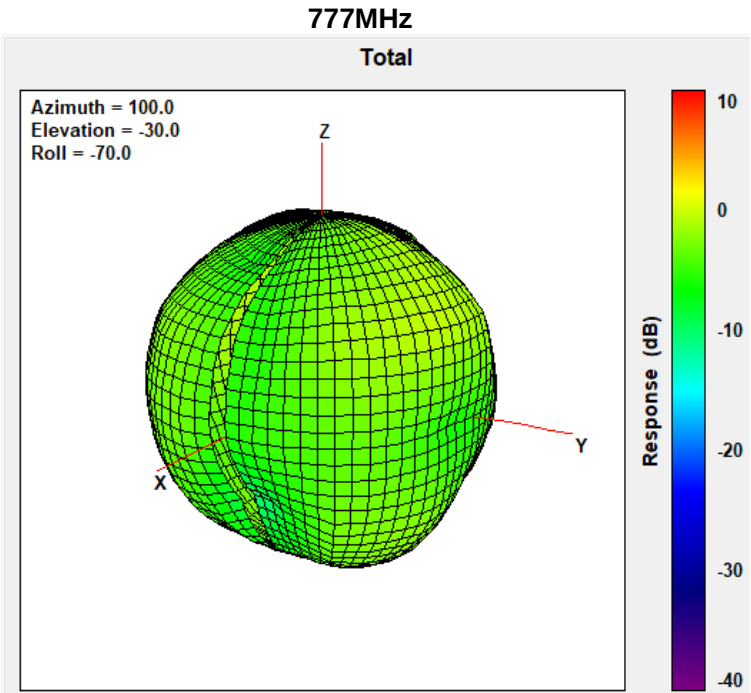
Center Frequency	748MHz
Horizontal (dBi) peak	-2.71
Vertical (dBi) peak	-0.21



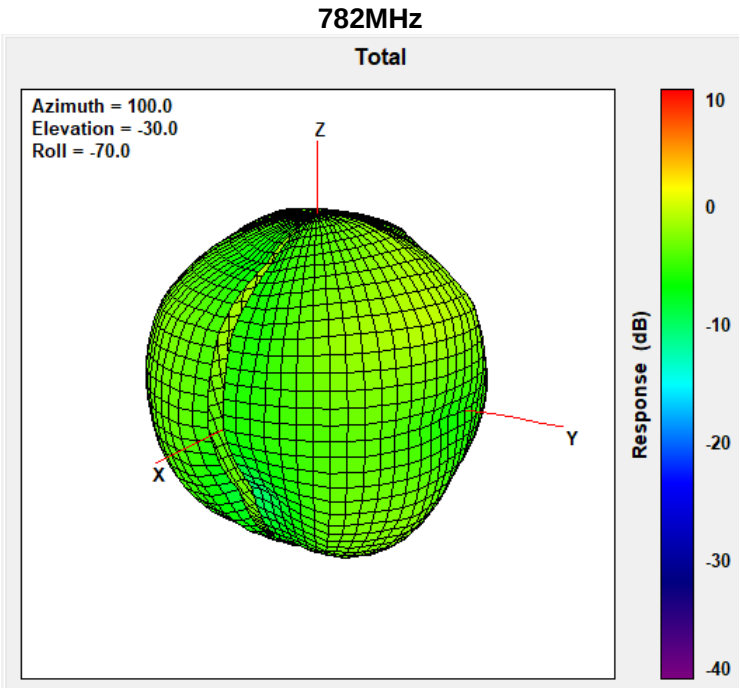
Center Frequency	756MHz
Horizontal (dBi) peak	-2.22
Vertical (dBi) peak	-0.11



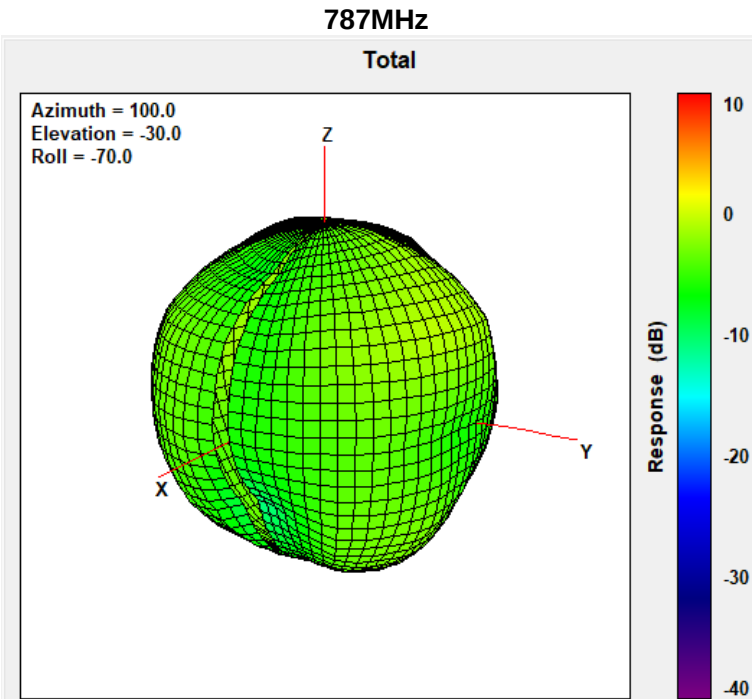
Center Frequency	768MHz
Horizontal (dBi) peak	-1.87
Vertical (dBi) peak	-0.19



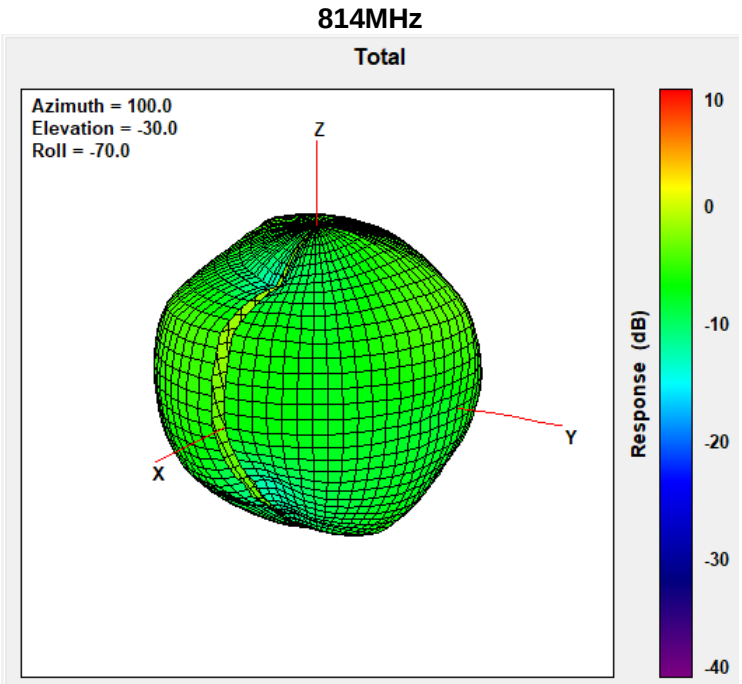
Center Frequency	777MHz
Horizontal (dBi) peak	-1.88
Vertical (dBi) peak	-0.61



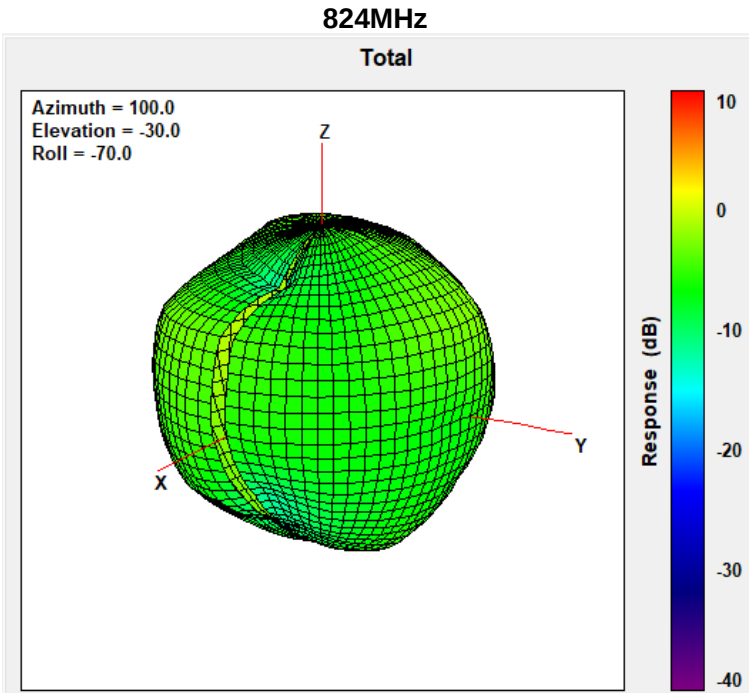
Center Frequency	782MHz
Horizontal (dBi) peak	-2.01
Vertical (dBi) peak	-1.07



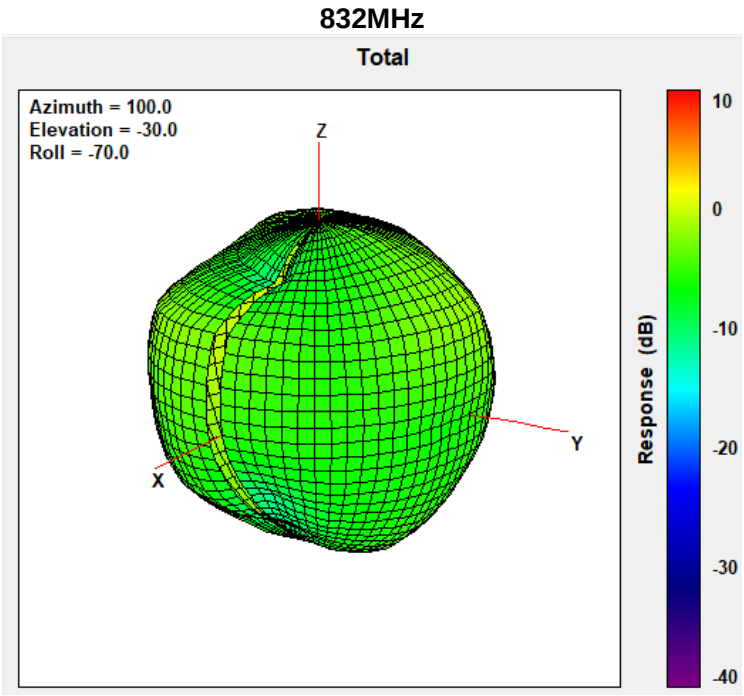
Center Frequency	787MHz
Horizontal (dBi) peak	-2.20
Vertical (dBi) peak	-1.55



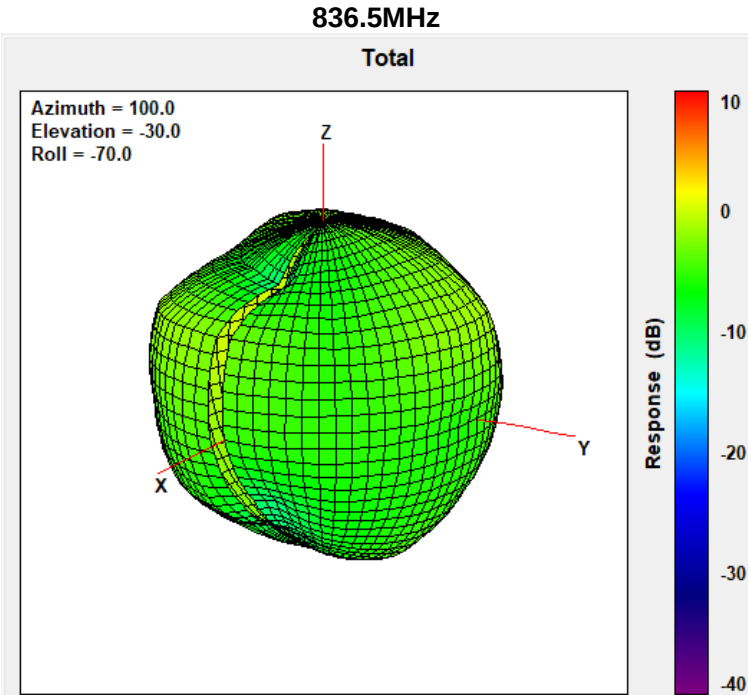
Center Frequency	814MHz
Horizontal (dBi) peak	-3.95
Vertical (dBi) peak	-2.44



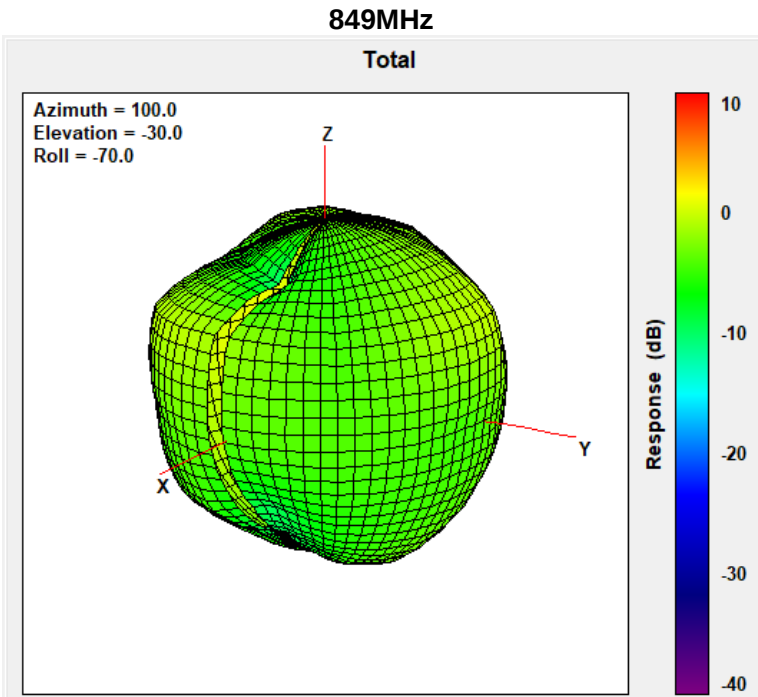
Center Frequency	824MHz
Horizontal (dBi) peak	-2.99
Vertical (dBi) peak	-1.55



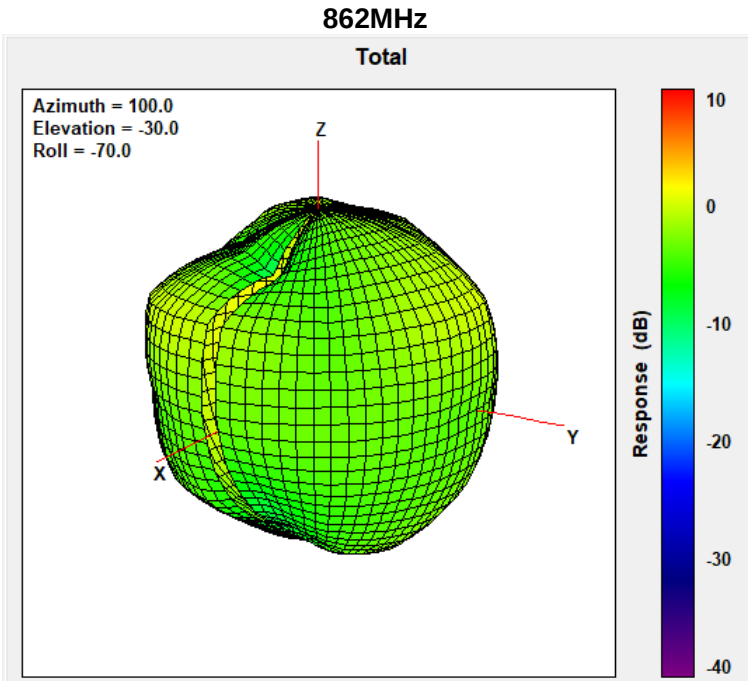
Center Frequency	832MHz
Horizontal (dBi) peak	-2.37
Vertical (dBi) peak	-0.80



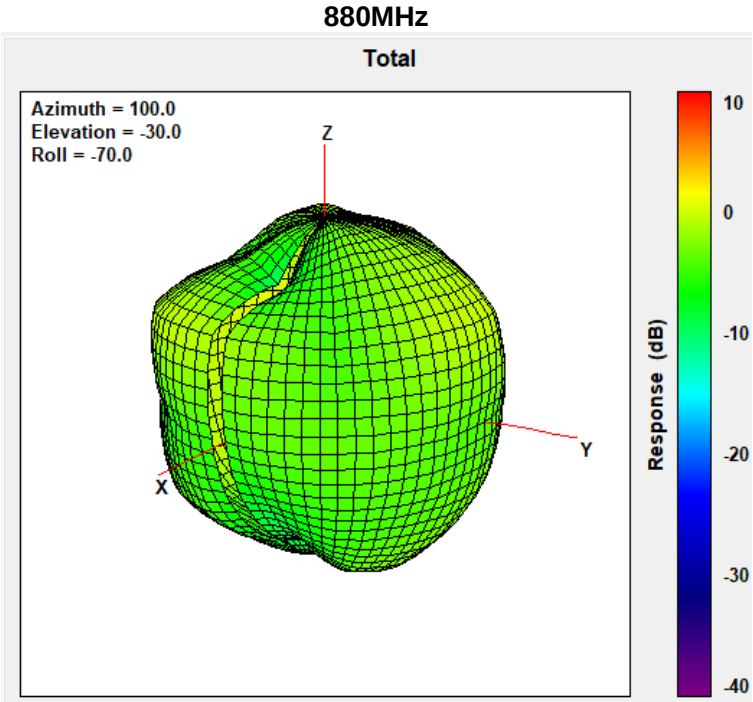
Center Frequency	836.5MHz
Horizontal (dBi) peak	-2.07
Vertical (dBi) peak	-0.44



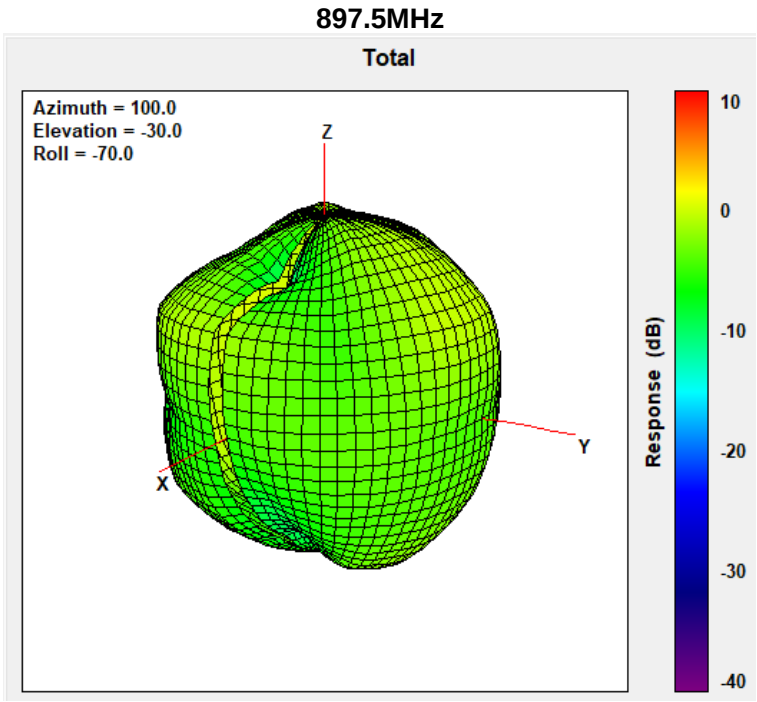
Center Frequency	849MHz
Horizontal (dBi) peak	-1.30
Vertical (dBi) peak	0.59



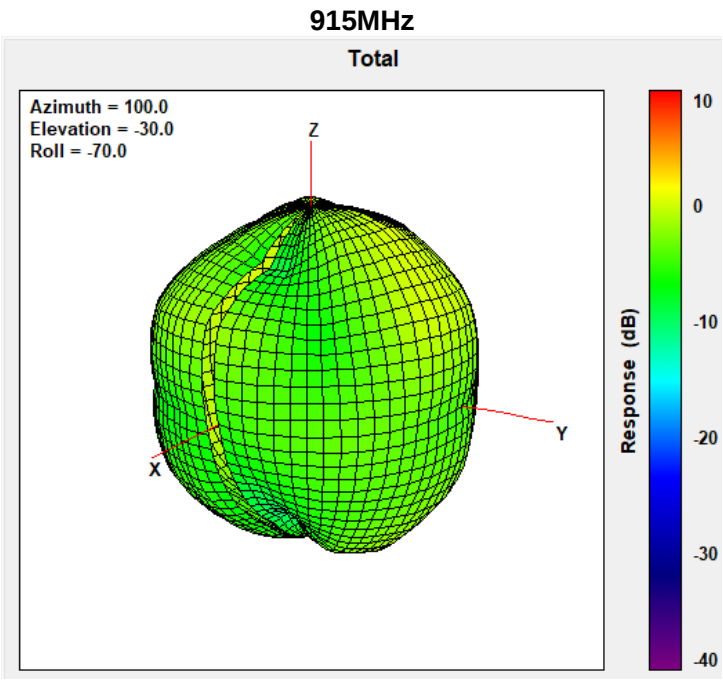
Center Frequency	862MHz
Horizontal (dBi) peak	-0.84
Vertical (dBi) peak	1.22



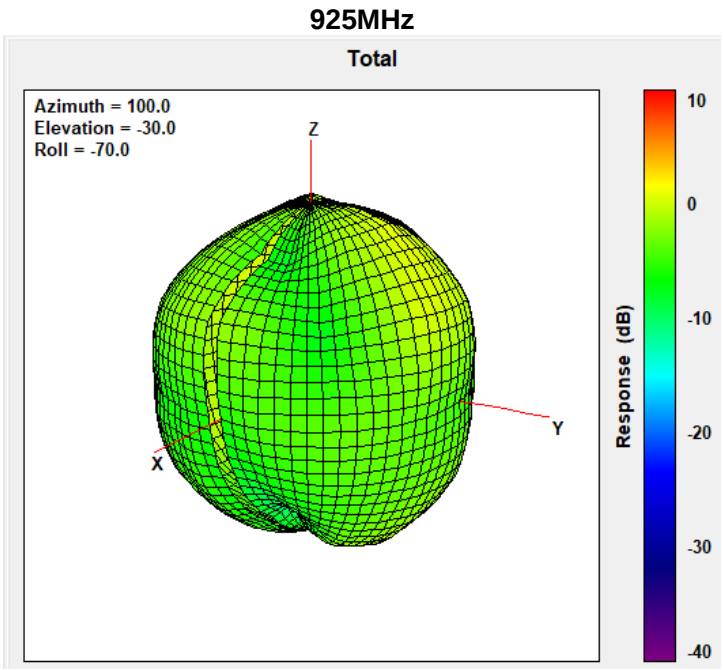
Center Frequency	880MHz
Horizontal (dBi) peak	-1.42
Vertical (dBi) peak	0.98



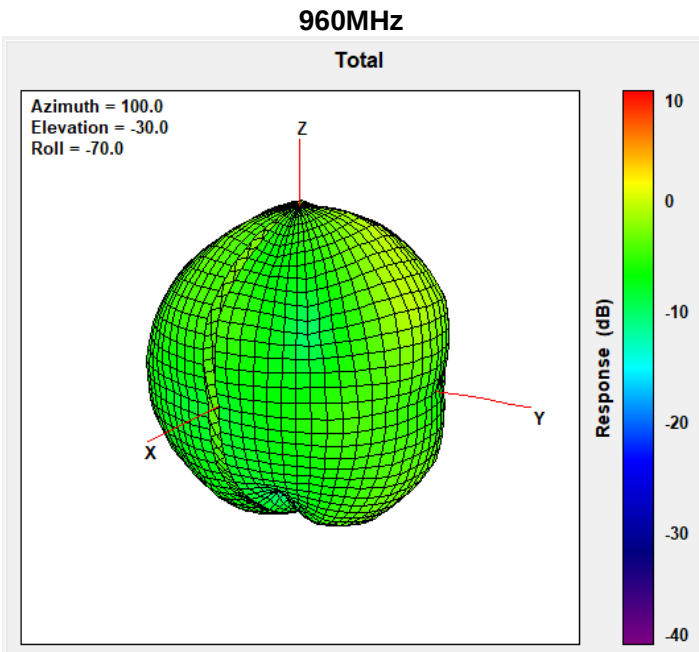
Center Frequency	897.5MHz
Horizontal (dBi) peak	-1.75
Vertical (dBi) peak	0.94



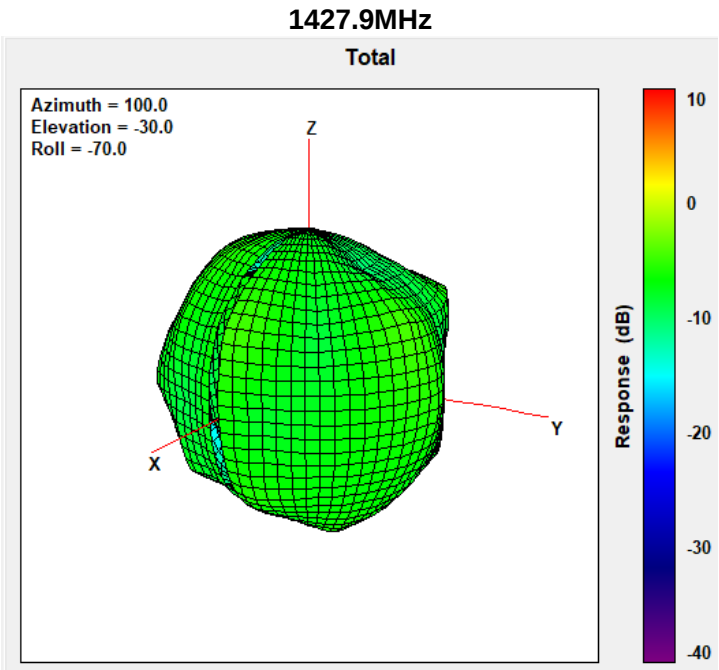
Center Frequency	915MHz
Horizontal (dBi) peak	-1.15
Vertical (dBi) peak	0.74



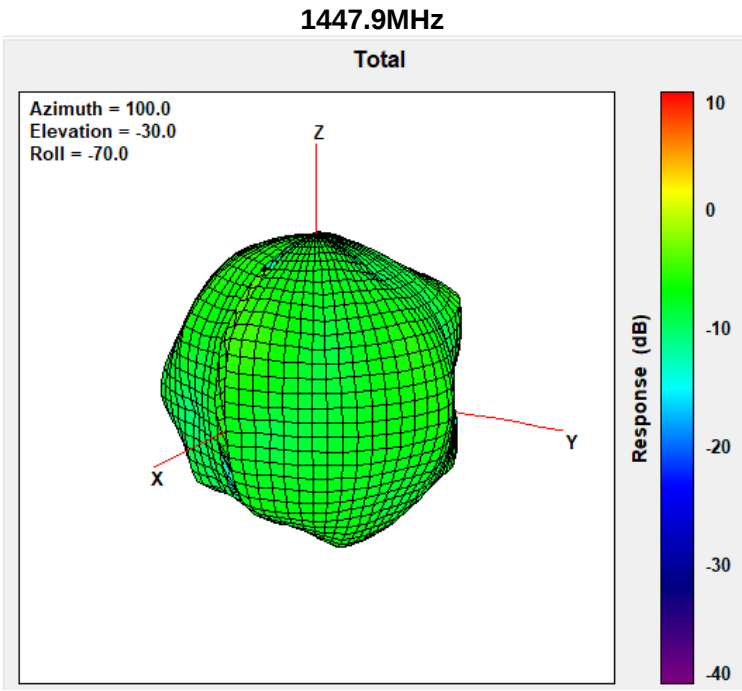
Center Frequency	925MHz
Horizontal (dBi) peak	-1.03
Vertical (dBi) peak	0.33



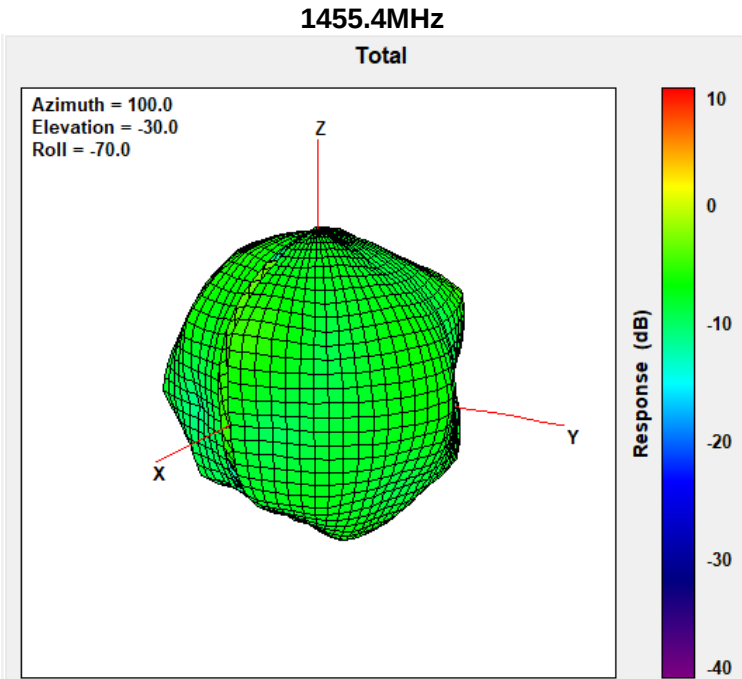
Center Frequency	960MHz
Horizontal (dBi) peak	-2.73
Vertical (dBi) peak	-1.65



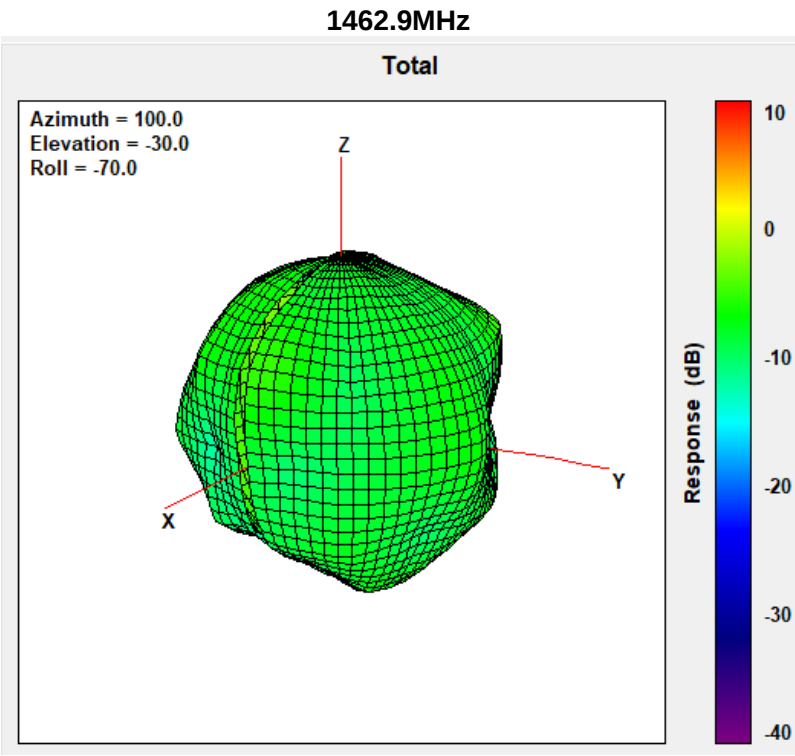
Center Frequency	1427.9MHz
Horizontal (dBi) peak	-5.57
Vertical (dBi) peak	-4.67



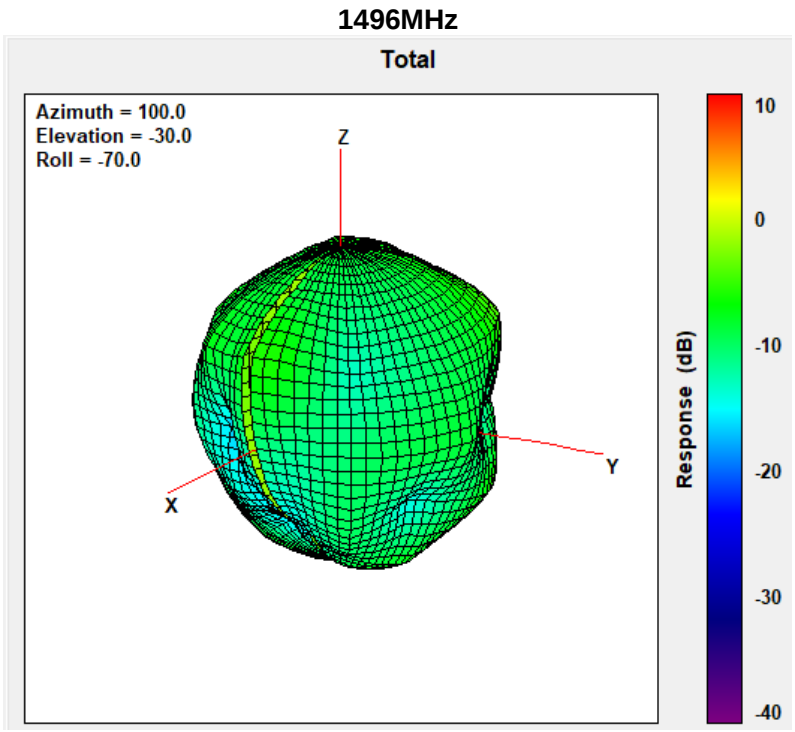
Center Frequency	1447.9MHz
Horizontal (dBi) peak	-4.96
Vertical (dBi) peak	-2.98



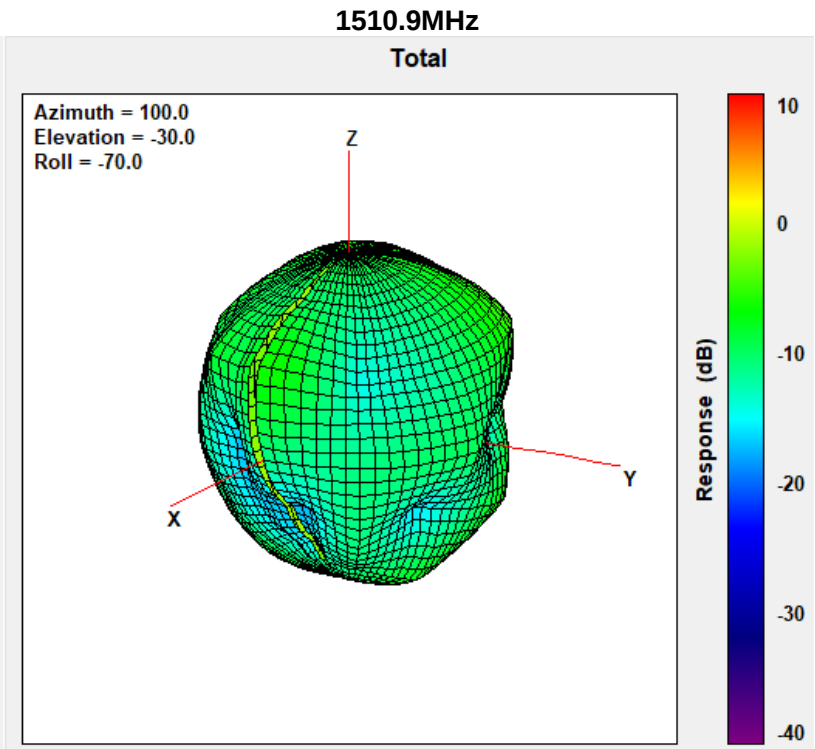
Center Frequency	1455.4MHz
Horizontal (dBi) peak	-4.67
Vertical (dBi) peak	-2.51



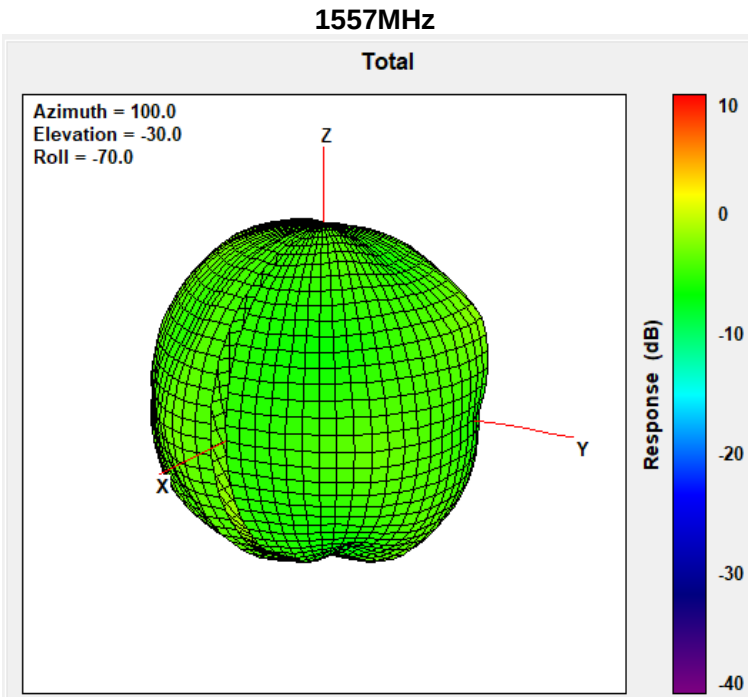
Center Frequency	1462.9MHz
Horizontal (dBi) peak	-4.26
Vertical (dBi) peak	-2.07



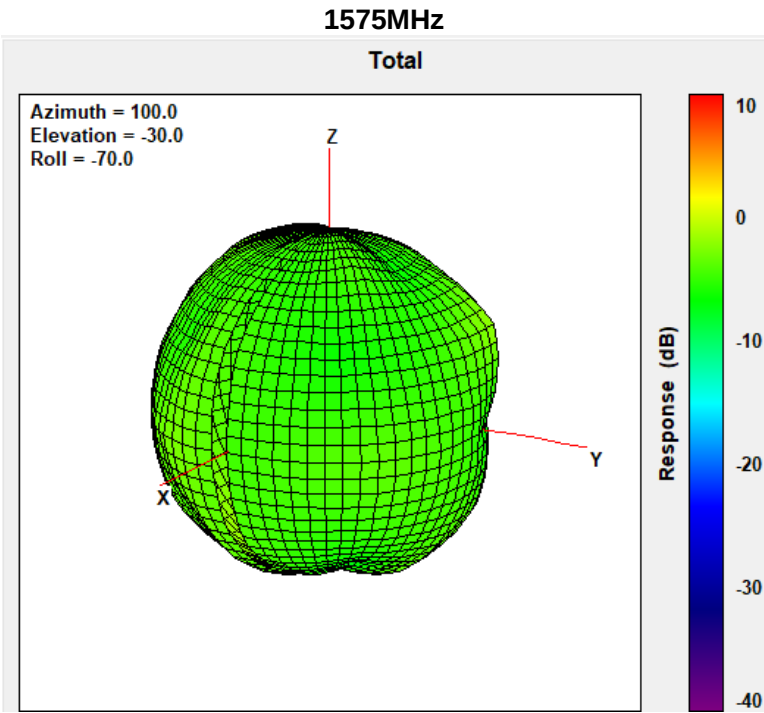
Center Frequency	1496MHz
Horizontal (dBi) peak	-3.26
Vertical (dBi) peak	-0.72



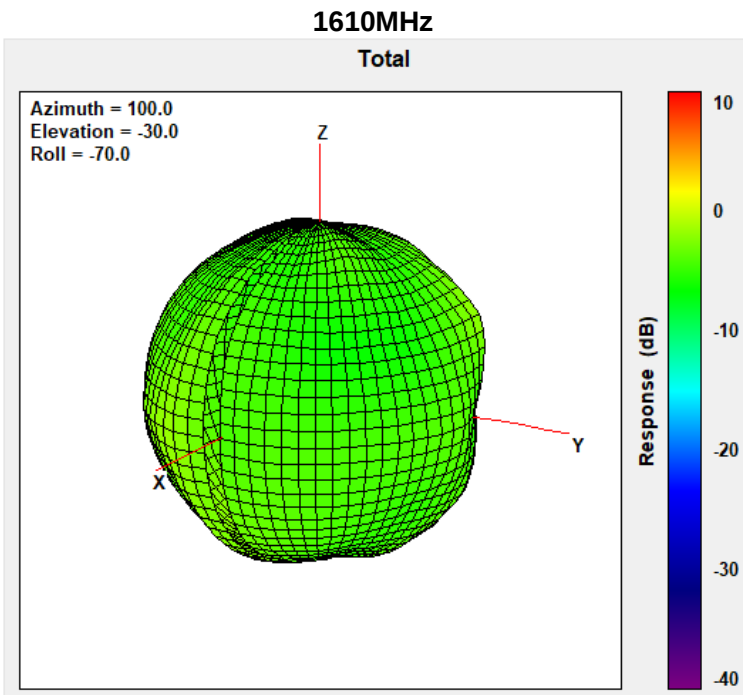
Center Frequency	1510.9MHz
Horizontal (dBi) peak	-3.53
Vertical (dBi) peak	-0.65



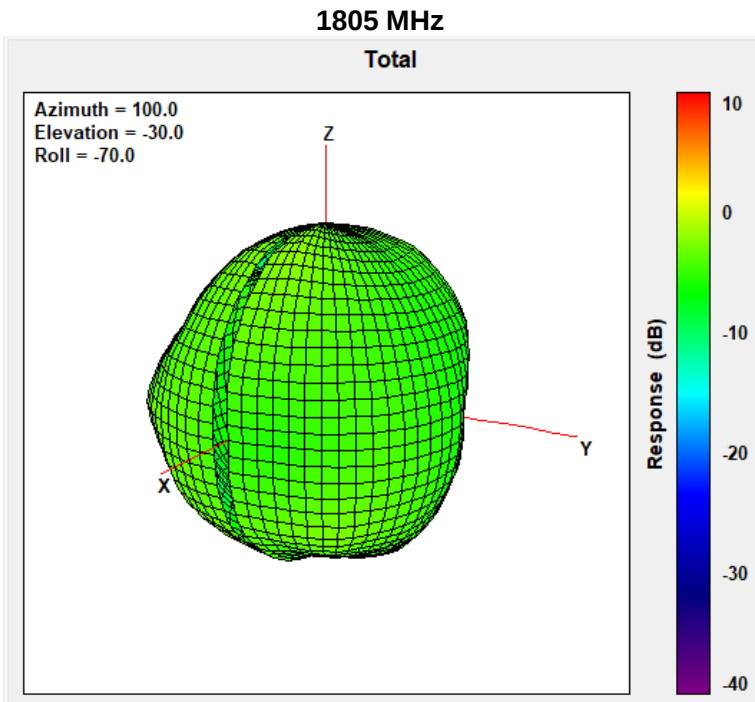
Center Frequency	1557MHz
Horizontal (dBi) peak	-4.52
Vertical (dBi) peak	-0.80



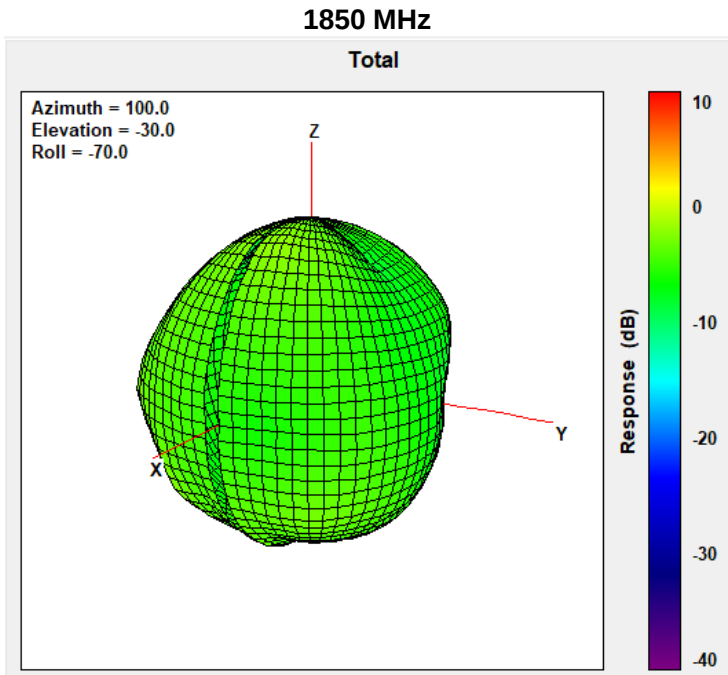
Center Frequency	1575MHz
Horizontal (dBi) peak	-4.62
Vertical (dBi) peak	-1.44



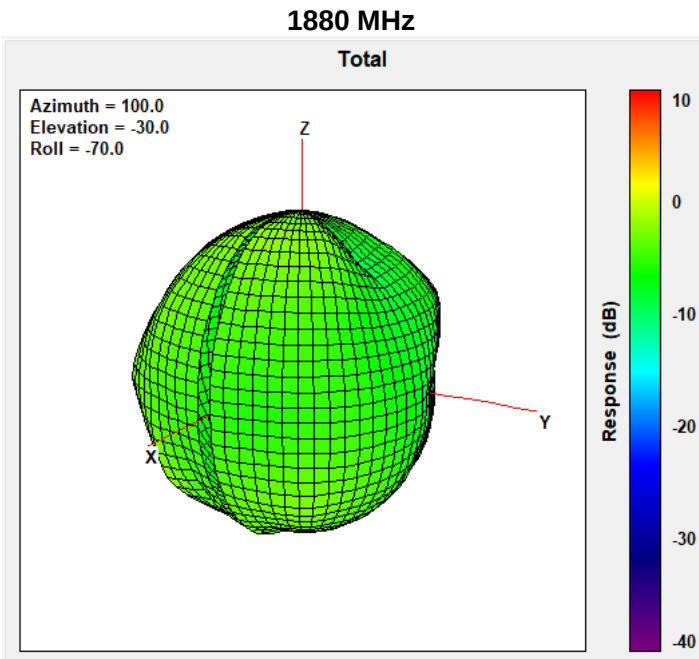
Center Frequency	1610MHz
Horizontal (dBi) peak	-4.51
Vertical (dBi) peak	-1.77



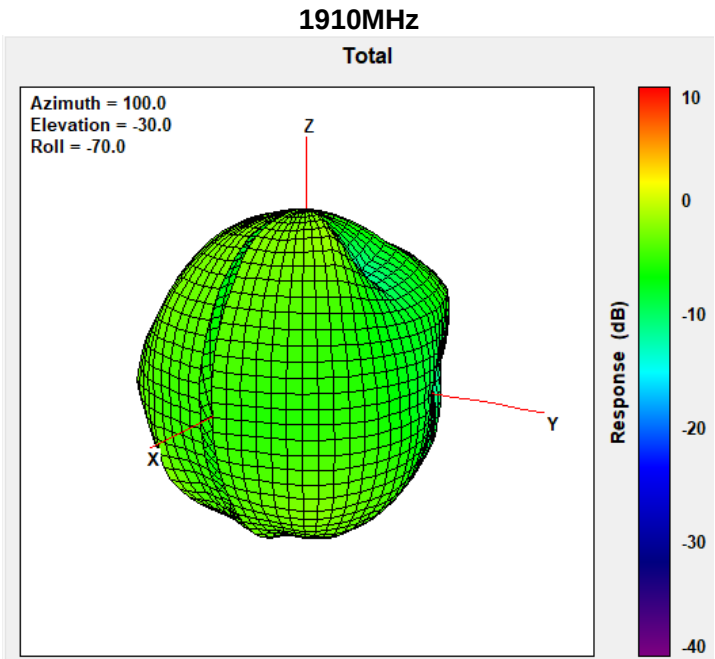
Center Frequency	1805 MHz
Horizontal (dBi) peak	-2.38
Vertical (dBi) peak	-2.88



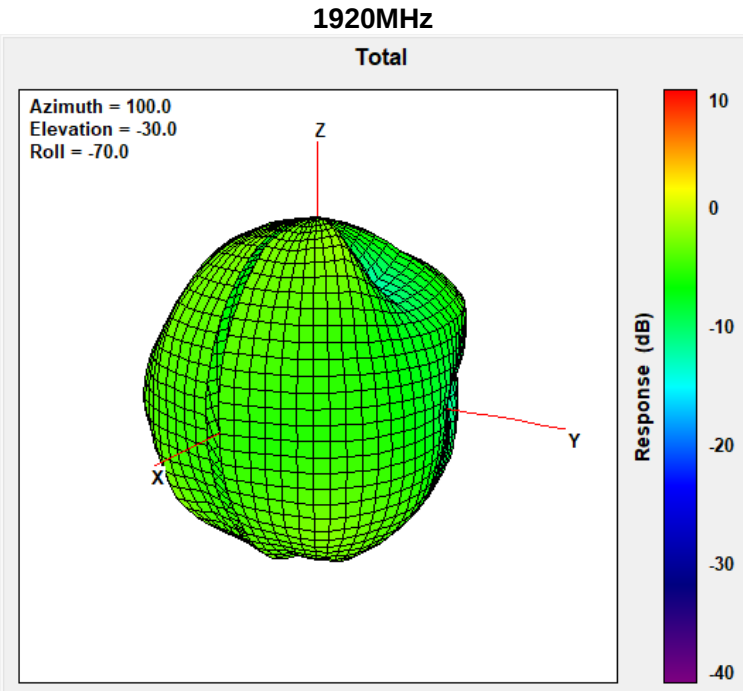
Center Frequency	1850 MHz
Horizontal (dBi) peak	-1.86
Vertical (dBi) peak	-2.36



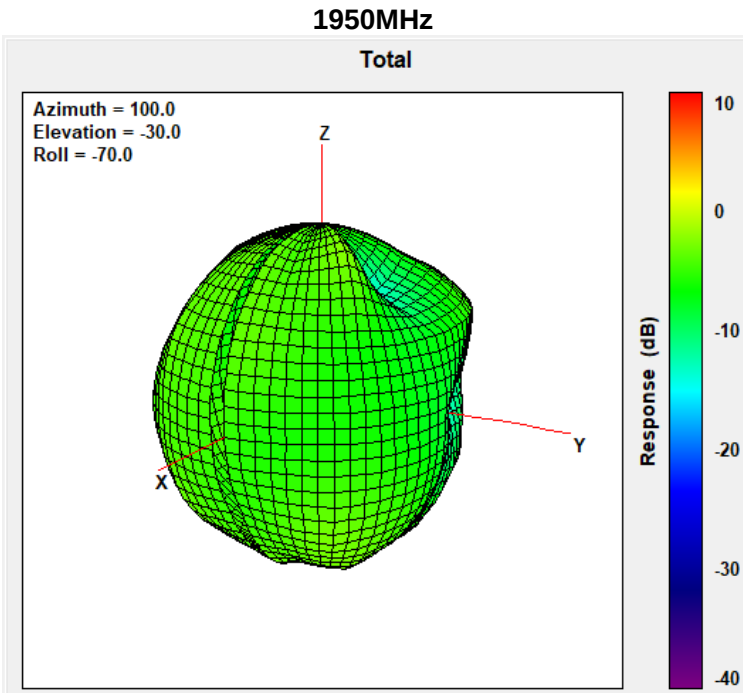
Center Frequency	1880 MHz
Horizontal (dBi) peak	-1.92
Vertical (dBi) peak	-1.96



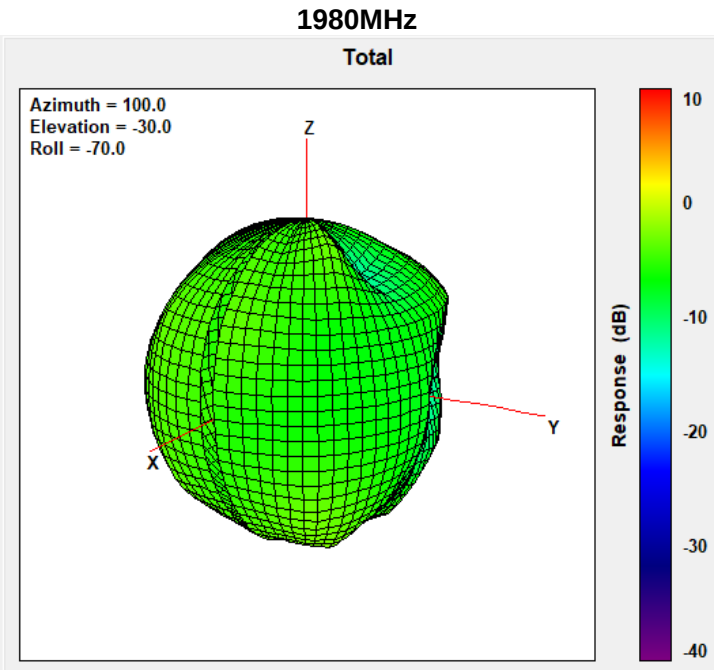
Center Frequency	1910MHz
Horizontal (dBi) peak	-1.99
Vertical (dBi) peak	-1.82



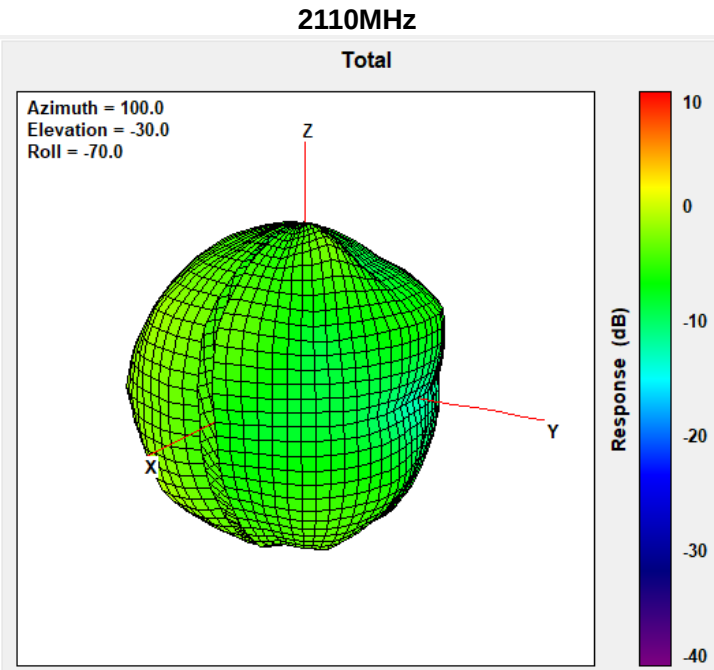
Center Frequency	1920MHz
Horizontal (dBi) peak	-2.01
Vertical (dBi) peak	-1.58



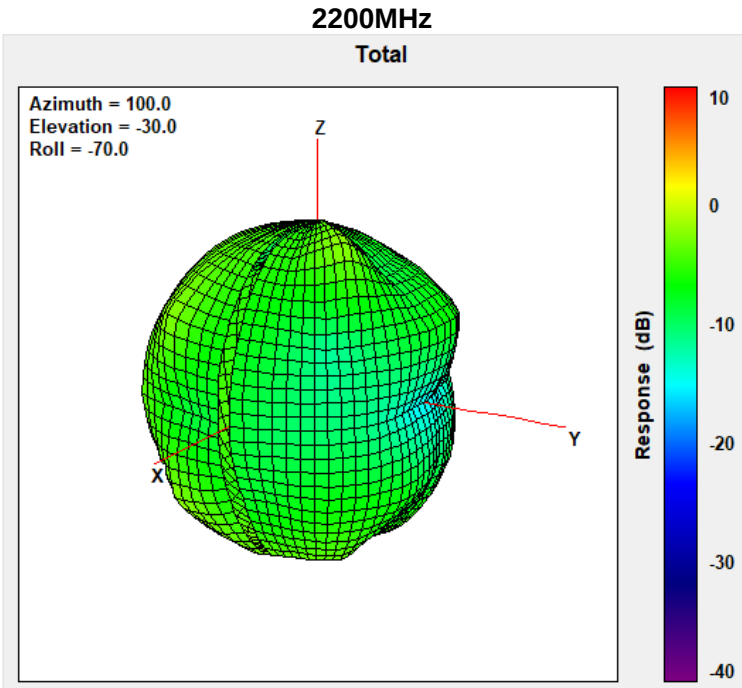
Center Frequency	1950MHz
Horizontal (dBi) peak	-2.47
Vertical (dBi) peak	-1.82



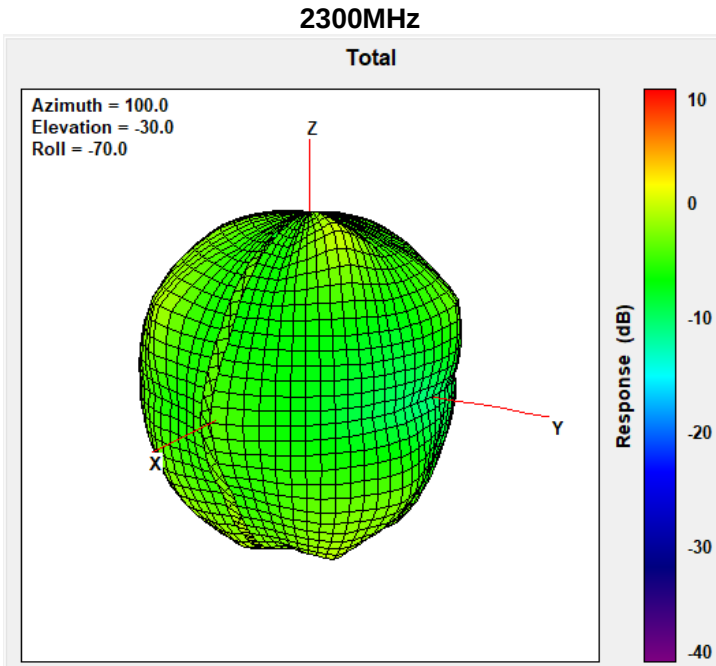
Center Frequency	1980MHz
Horizontal (dBi) peak	-2.99
Vertical (dBi) peak	-2.66



Center Frequency	2110MHz
Horizontal (dBi) peak	-2.61
Vertical (dBi) peak	-0.95

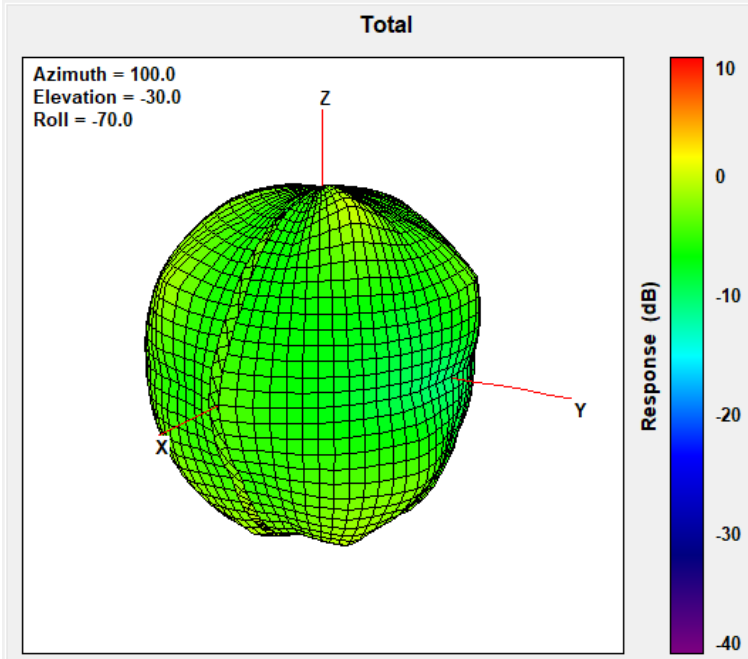


Center Frequency	2200MHz
Horizontal (dBi) peak	-2.10
Vertical (dBi) peak	-2.00



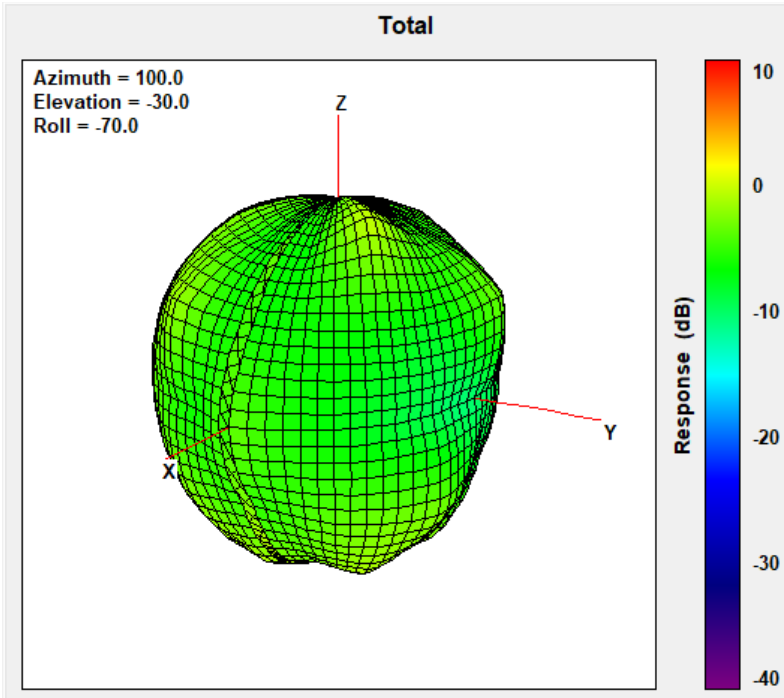
Center Frequency	2300MHz
Horizontal (dBi) peak	-0.17
Vertical (dBi) peak	-0.43

2305MHz

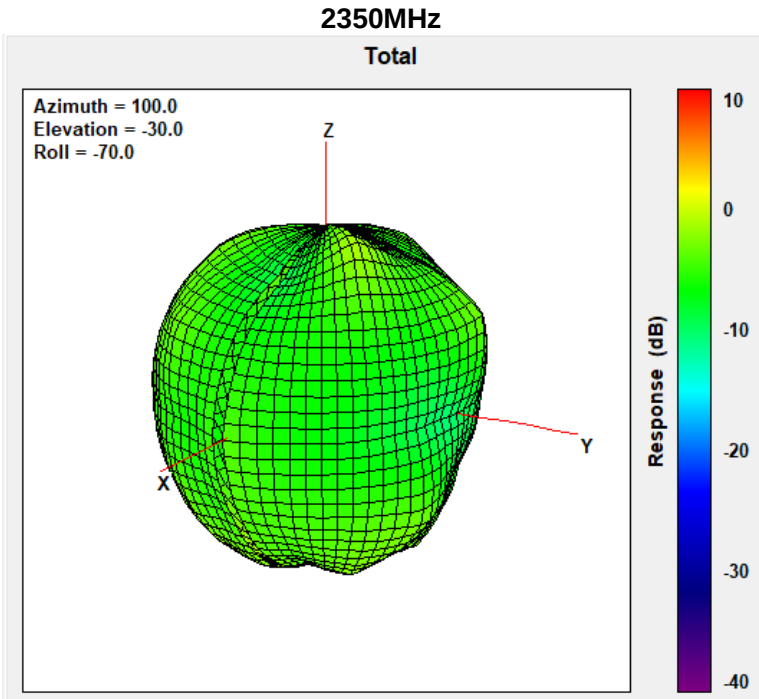


Center Frequency	2305MHz
Horizontal (dBi) peak	-0.34
Vertical (dBi) peak	-0.51

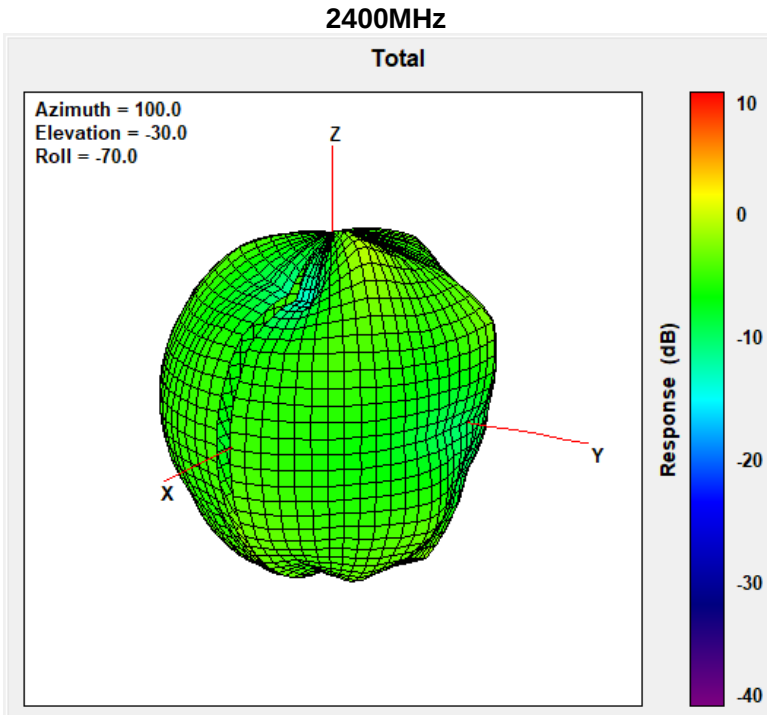
2315MHz



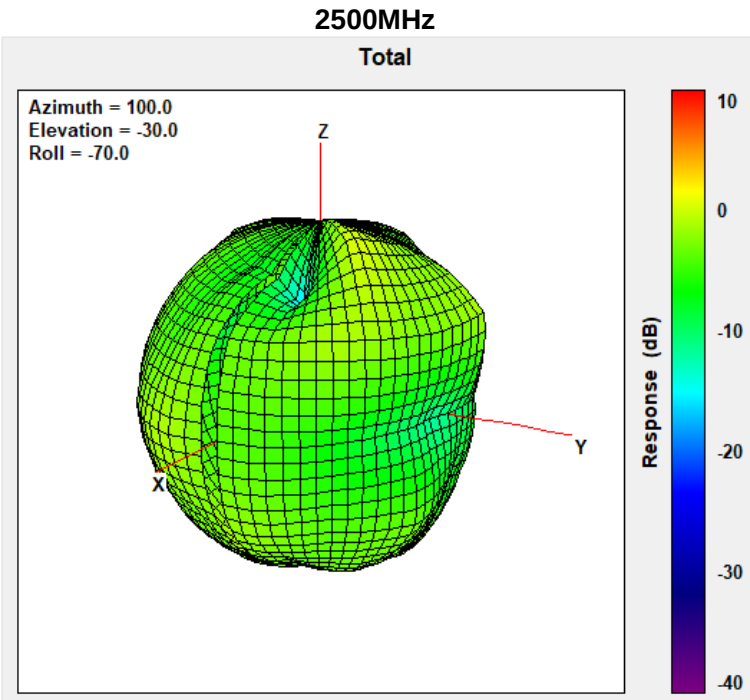
Center Frequency	2315MHz
Horizontal (dBi) peak	-0.67
Vertical (dBi) peak	-0.68



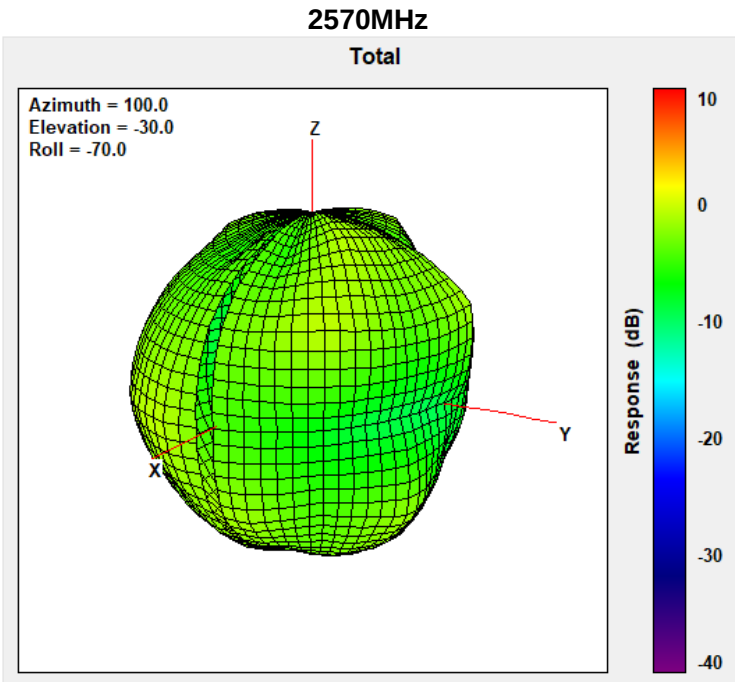
Center Frequency	2350MHz
Horizontal (dBi) peak	-1.54
Vertical (dBi) peak	-1.29



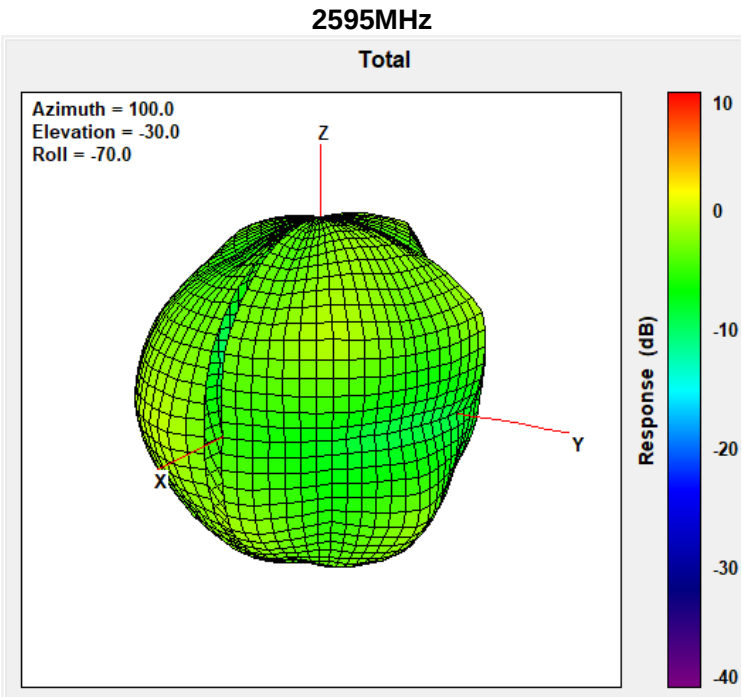
Center Frequency	2400MHz
Horizontal (dBi) peak	-1.04
Vertical (dBi) peak	-1.74



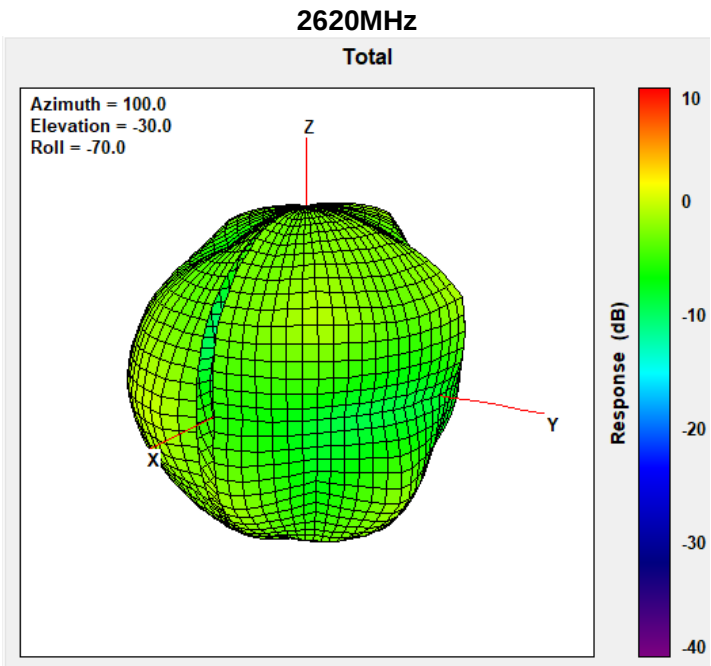
Center Frequency	2500MHz
Horizontal (dBi) peak	-0.59
Vertical (dBi) peak	-0.70



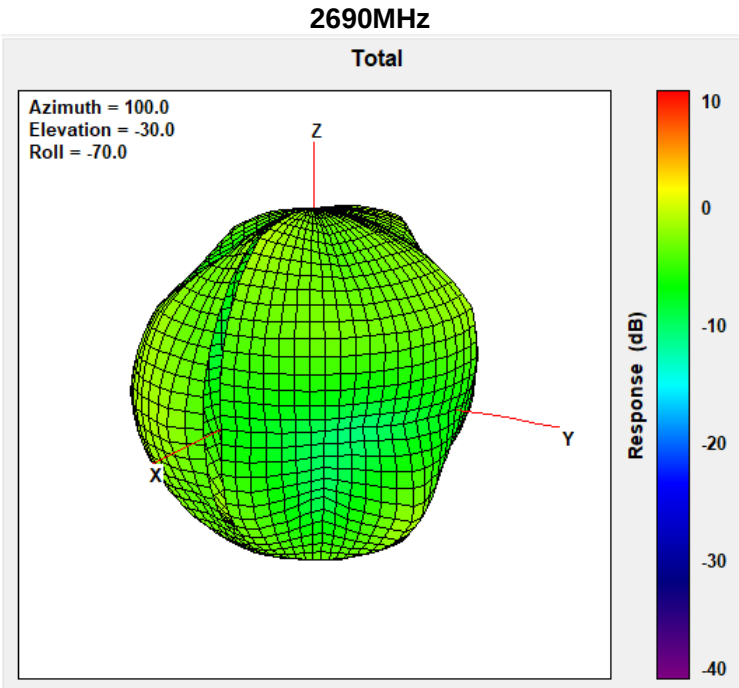
Center Frequency	2570MHz
Horizontal (dBi) peak	-0.62
Vertical (dBi) peak	-0.36



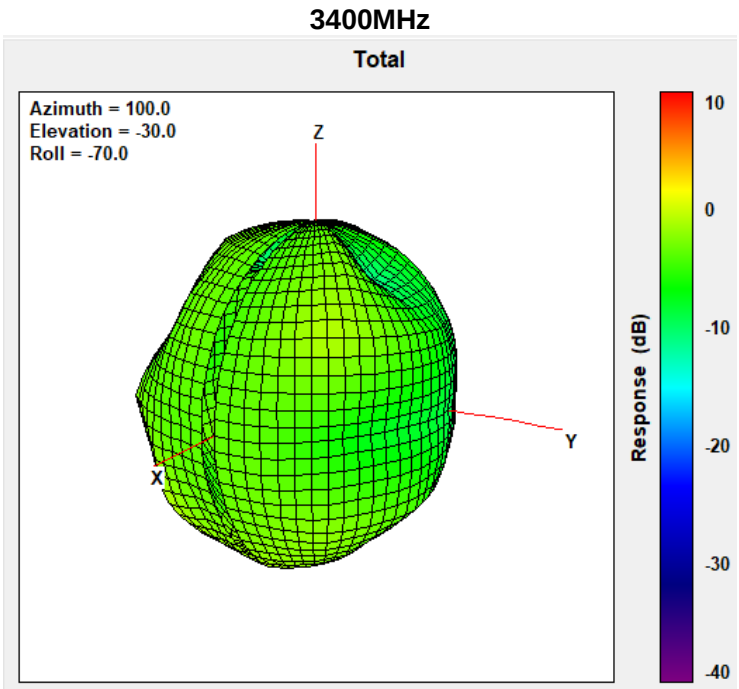
Center Frequency	2595MHz
Horizontal (dBi) peak	-0.65
Vertical (dBi) peak	-0.24



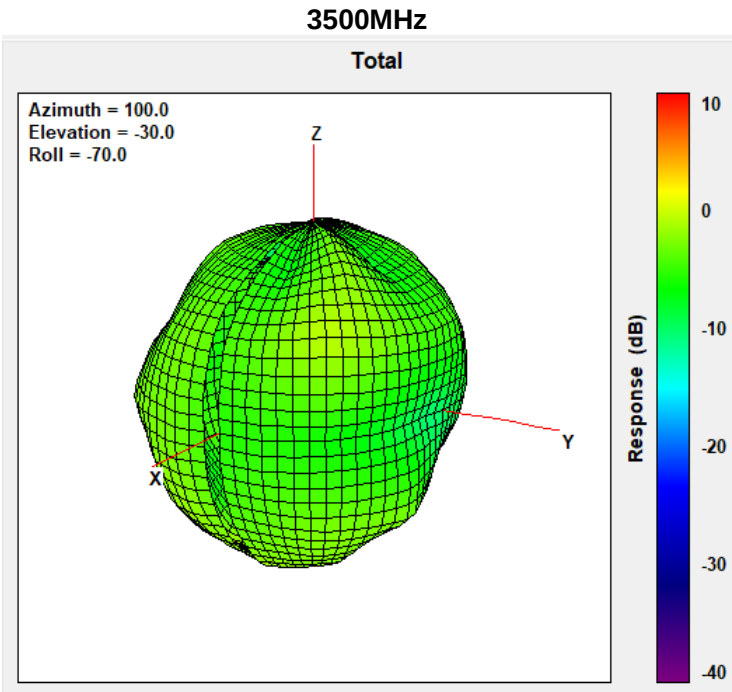
Center Frequency	2620MHz
Horizontal (dBi) peak	-0.97
Vertical (dBi) peak	0.00



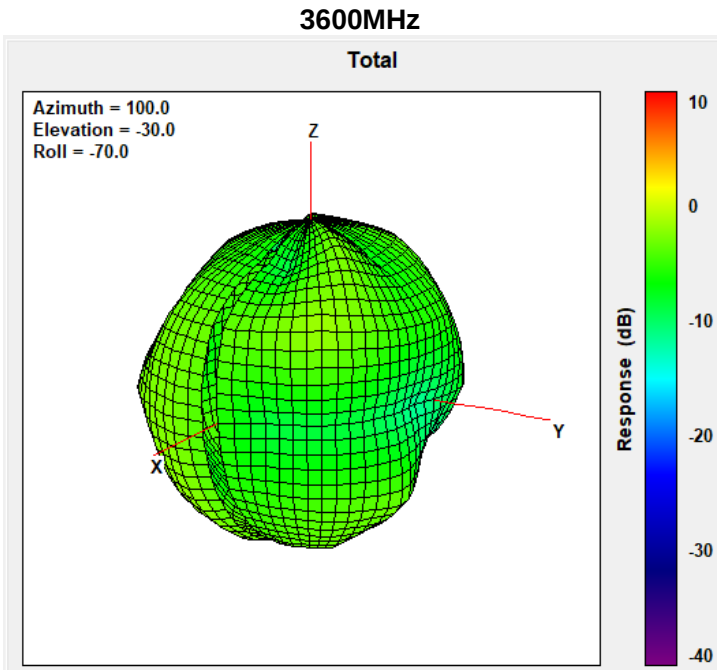
Center Frequency	2690MHz
Horizontal (dBi) peak	-0.46
Vertical (dBi) peak	-1.06



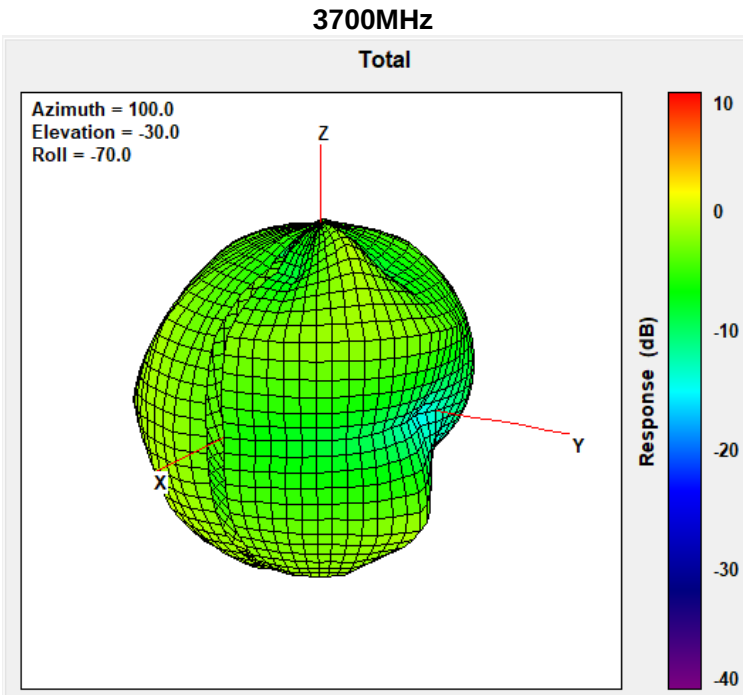
Center Frequency	3400MHz
Horizontal (dBi) peak	-1.09
Vertical (dBi) peak	0.17



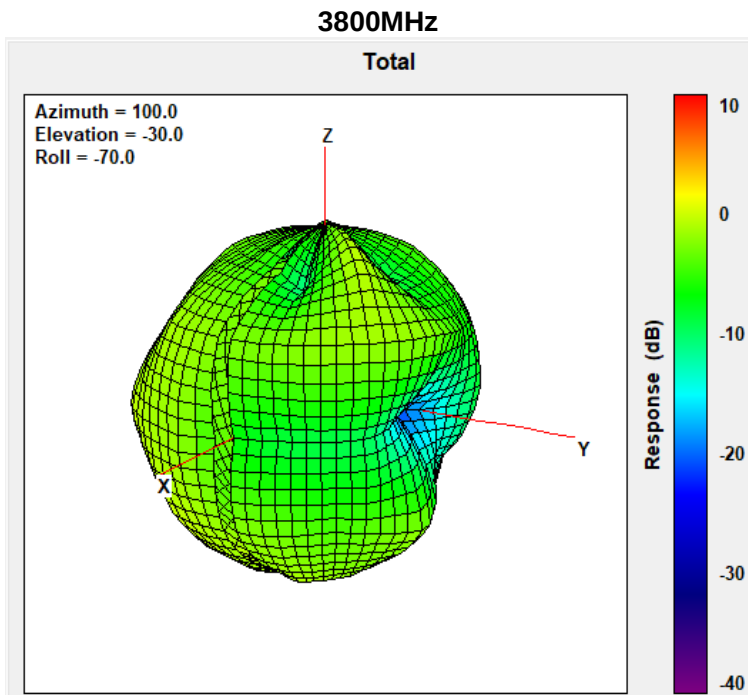
Center Frequency	3500MHz
Horizontal (dBi) peak	-1.25
Vertical (dBi) peak	-1.49



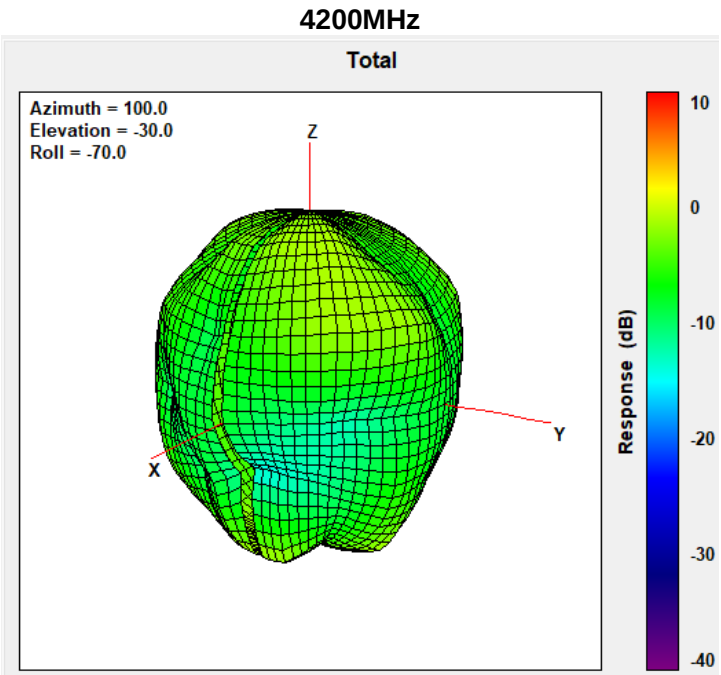
Center Frequency	3600MHz
Horizontal (dBi) peak	-2.54
Vertical (dBi) peak	-2.67



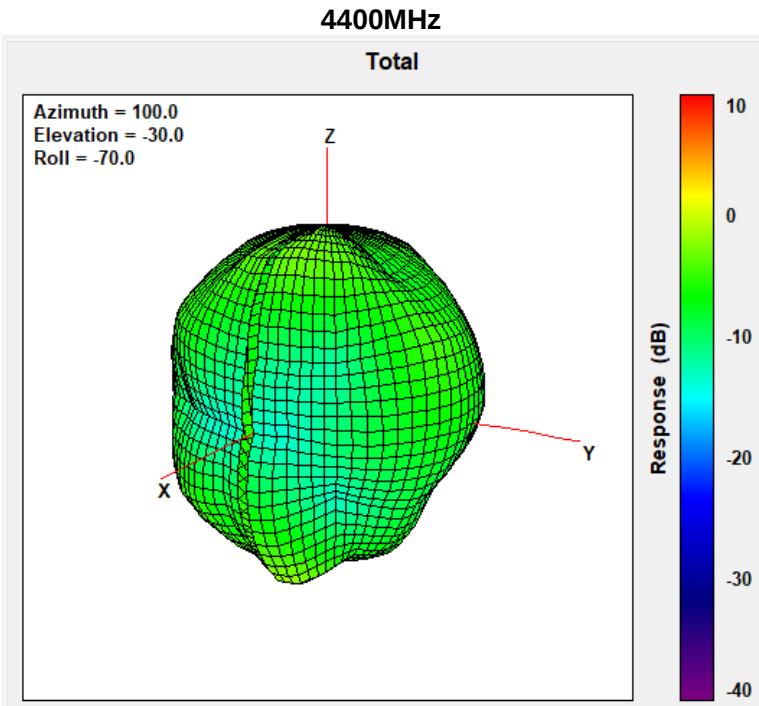
Center Frequency	3700MHz
Horizontal (dBi) peak	-0.27
Vertical (dBi) peak	-0.55



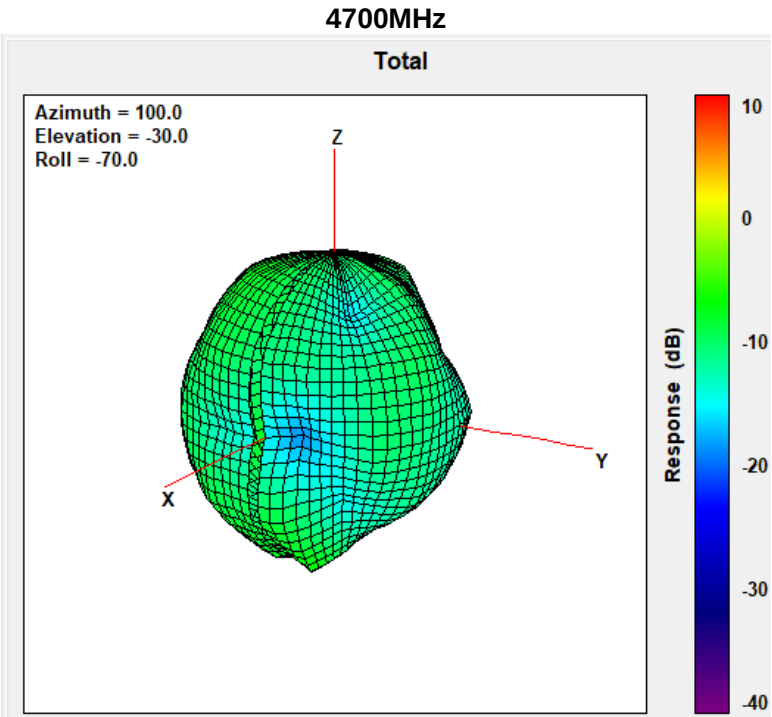
Center Frequency	3800MHz
Horizontal (dBi) peak	0.12
Vertical (dBi) peak	0.85



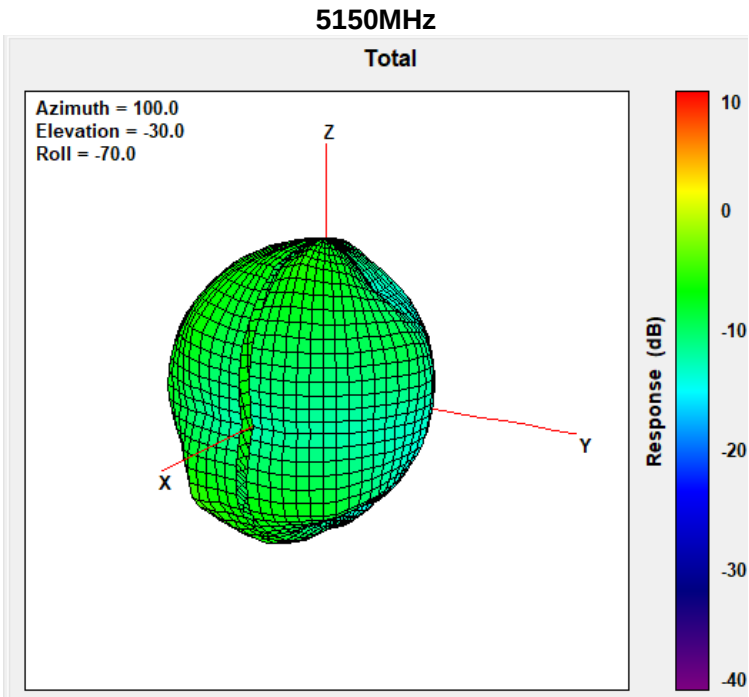
Center Frequency	4200MHz
Horizontal (dBi) peak	-1.28
Vertical (dBi) peak	-0.18



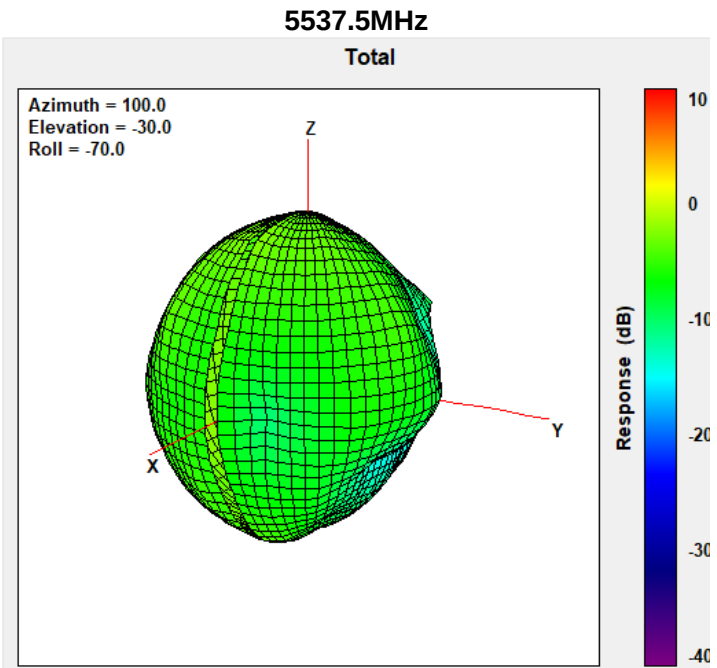
Center Frequency	4400MHz
Horizontal (dBi) peak	-3.28
Vertical (dBi) peak	-3.56



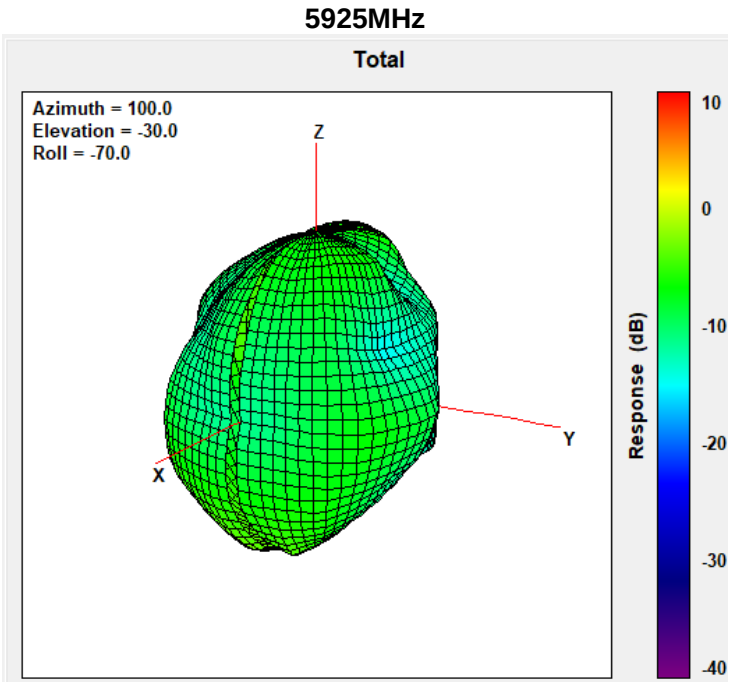
Center Frequency	4700MHz
Horizontal (dBi) peak	-7.76
Vertical (dBi) peak	-7.13



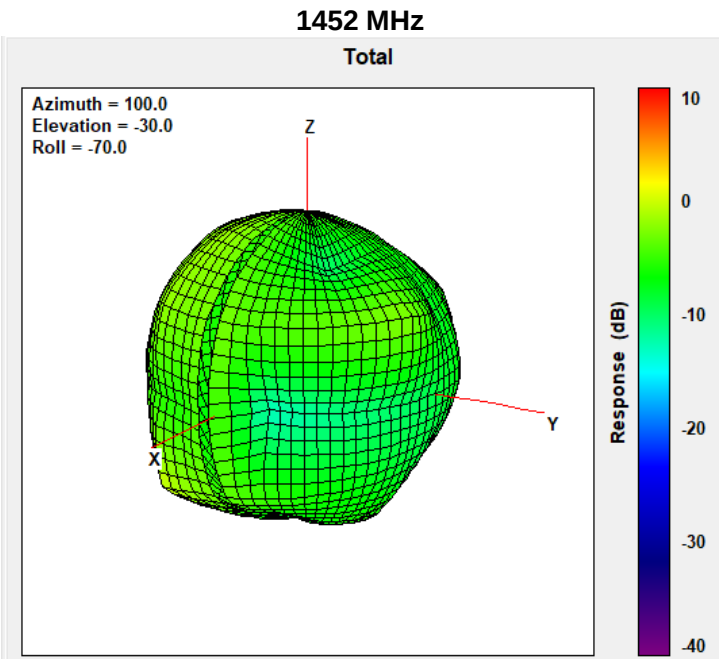
Center Frequency	5150MHz
Horizontal (dBi) peak	-6.42
Vertical (dBi) peak	-6.02



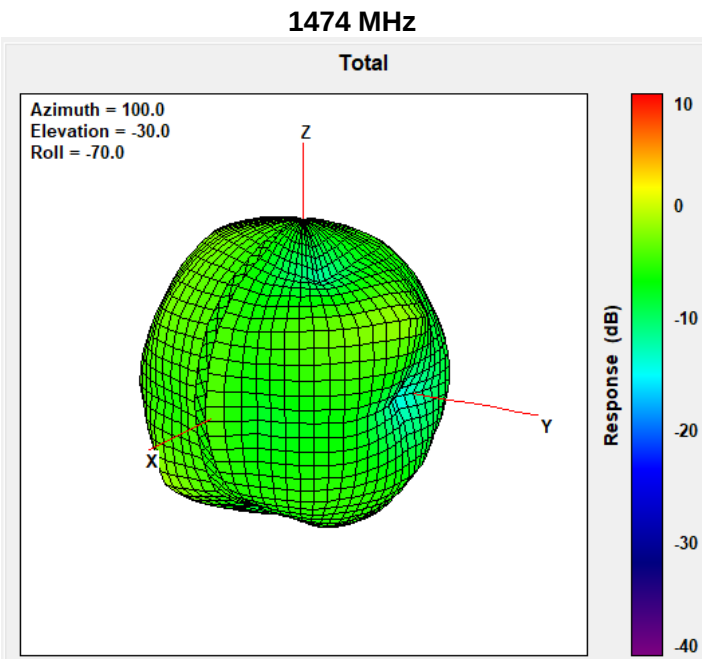
Center Frequency	5537.5MHz
Horizontal (dBi) peak	-3.85
Vertical (dBi) peak	-2.77



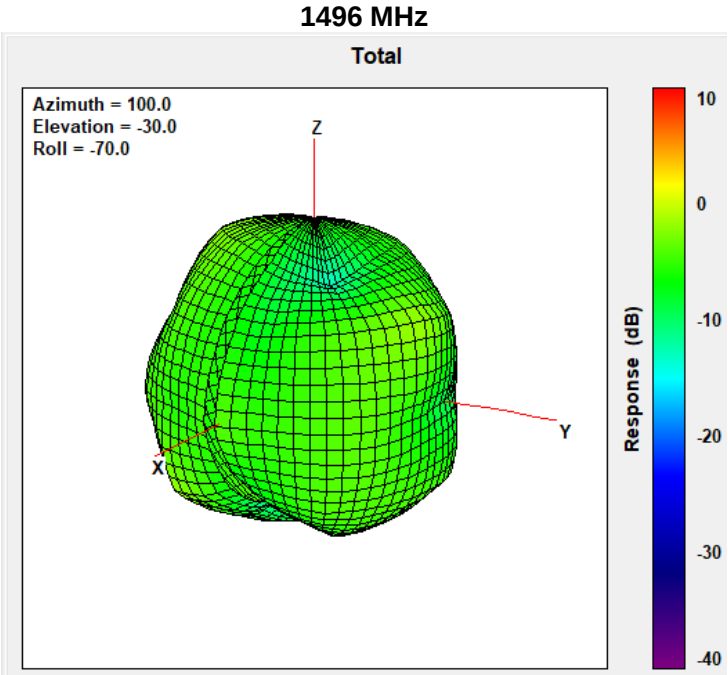
Center Frequency	5925MHz
Horizontal (dBi) peak	-5.02
Vertical (dBi) peak	-3.13



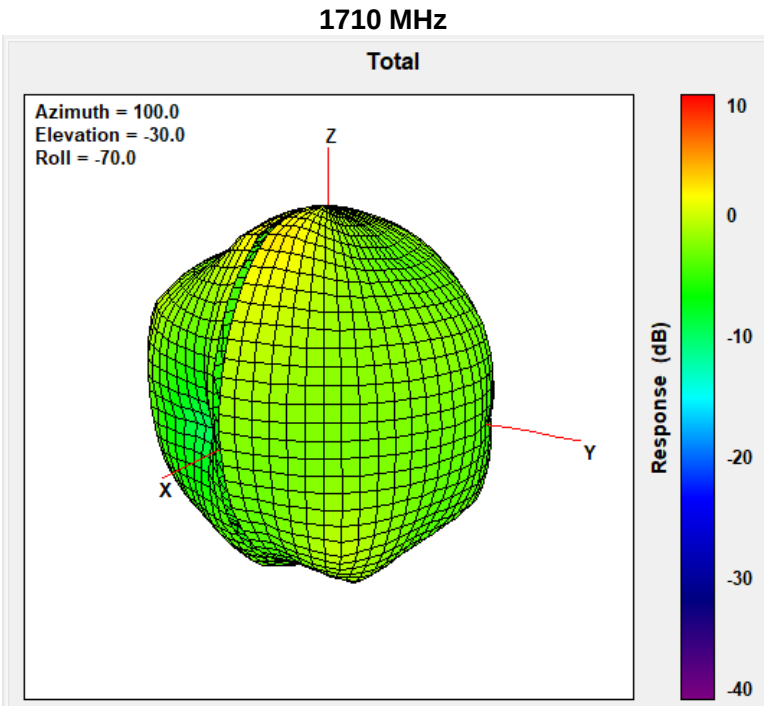
Center Frequency	1452 MHz
Horizontal (dBi) peak	-1.77
Vertical (dBi) peak	-2.44



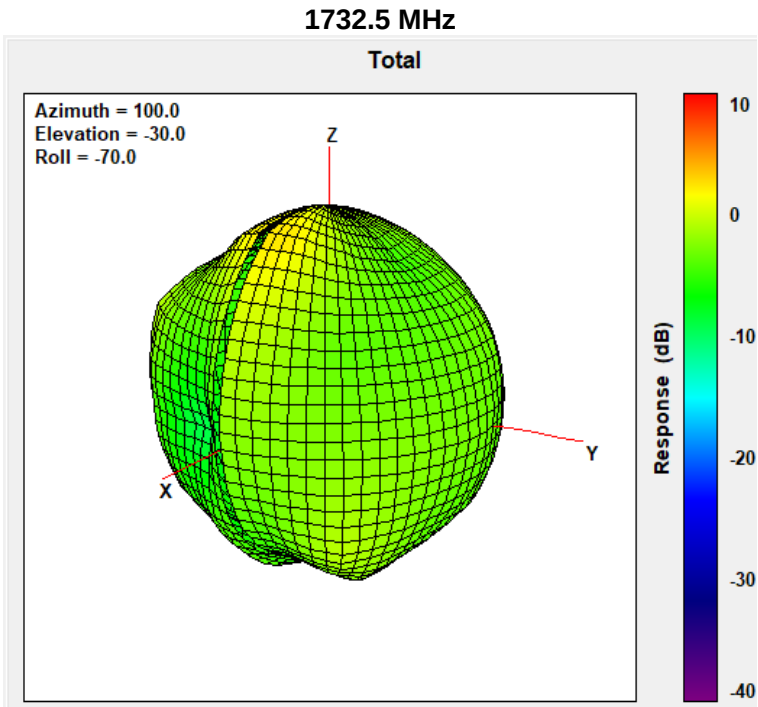
Center Frequency	1474 MHz
Horizontal (dBi) peak	-3.01
Vertical (dBi) peak	-2.75



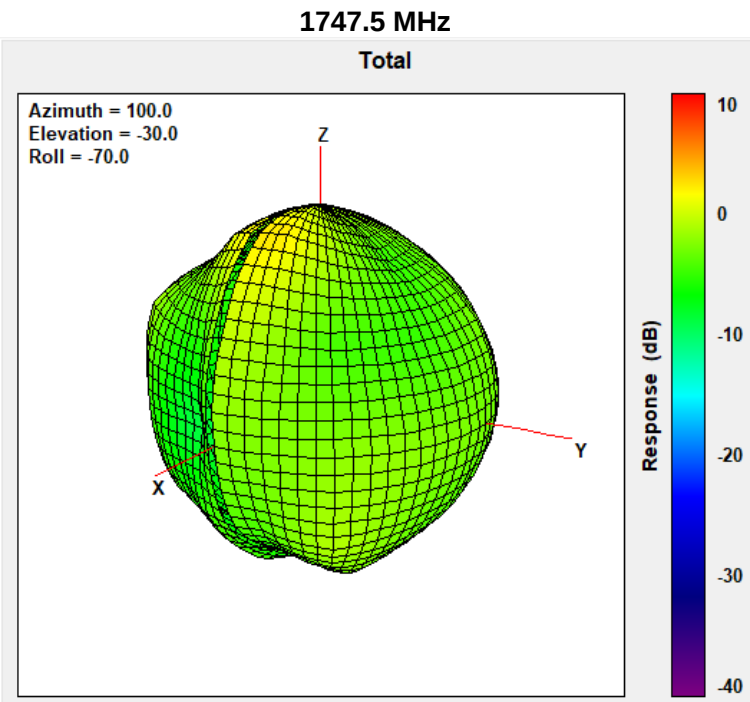
Center Frequency	1496 MHz
Horizontal (dBi) peak	-3.51
Vertical (dBi) peak	-3.09



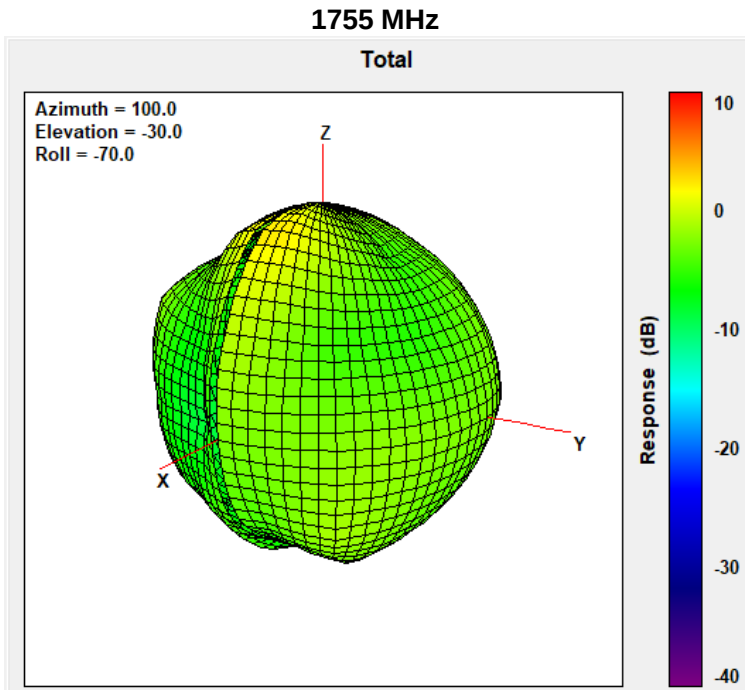
Center Frequency	1710 MHz
Horizontal (dBi) peak	1.58
Vertical (dBi) peak	-2.60



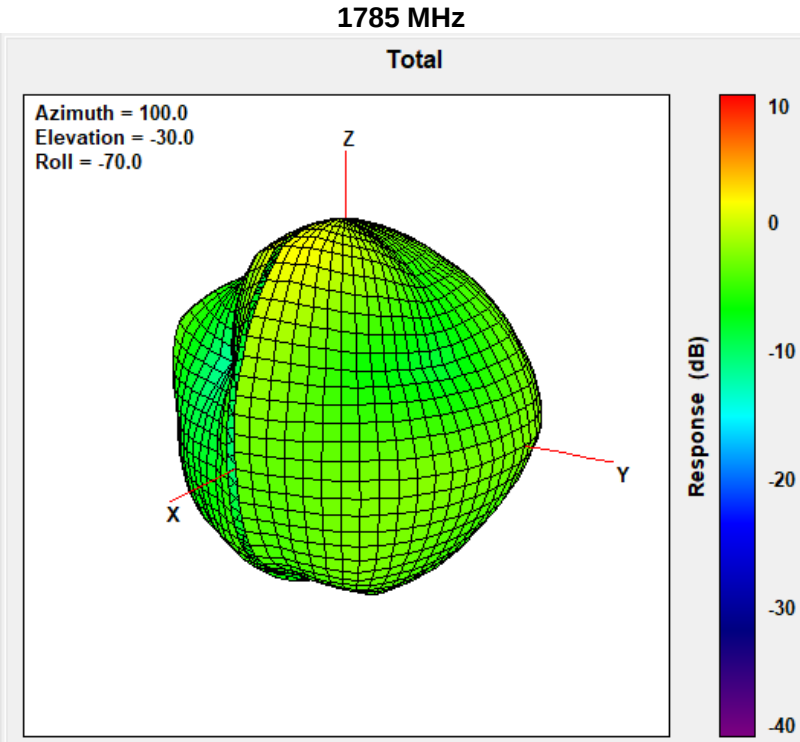
Center Frequency	1732.5 MHz
Horizontal (dBi) peak	1.71
Vertical (dBi) peak	-2.09



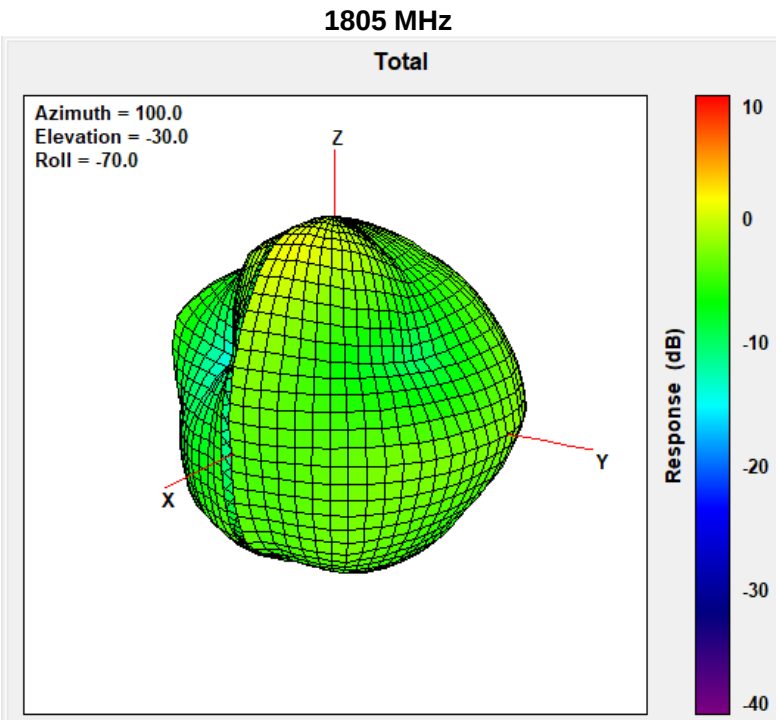
Center Frequency	1747.5 MHz
Horizontal (dBi) peak	1.62
Vertical (dBi) peak	-1.87



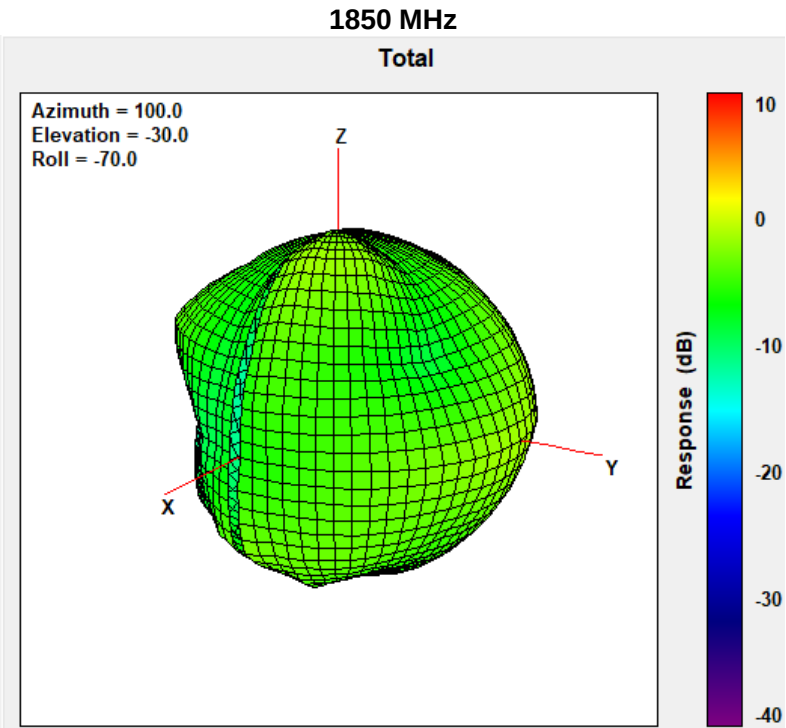
Center Frequency	1755 MHz
Horizontal (dBi) peak	1.48
Vertical (dBi) peak	-1.91



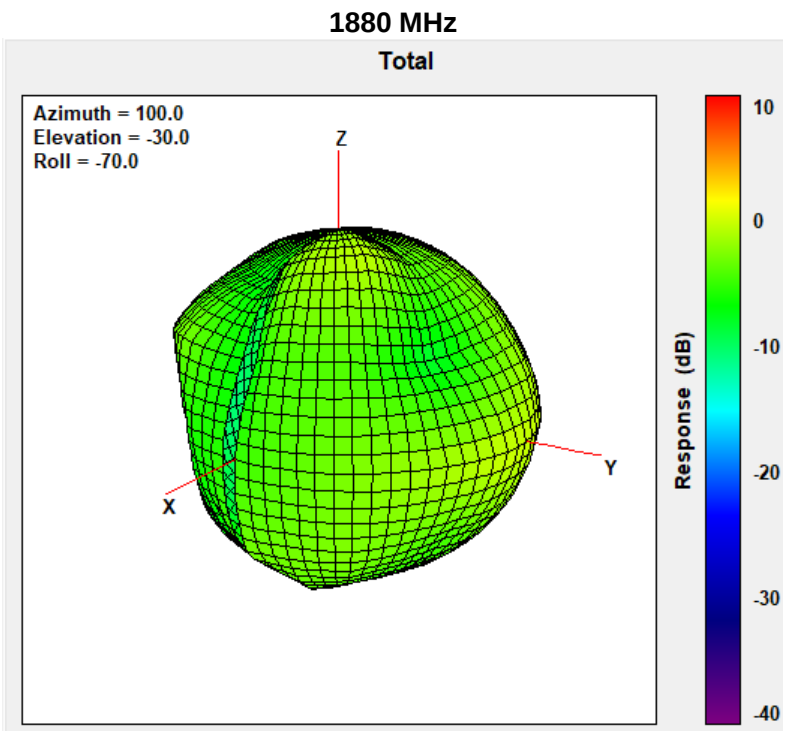
Center Frequency	1785 MHz
Horizontal (dBi) peak	1.73
Vertical (dBi) peak	-2.60



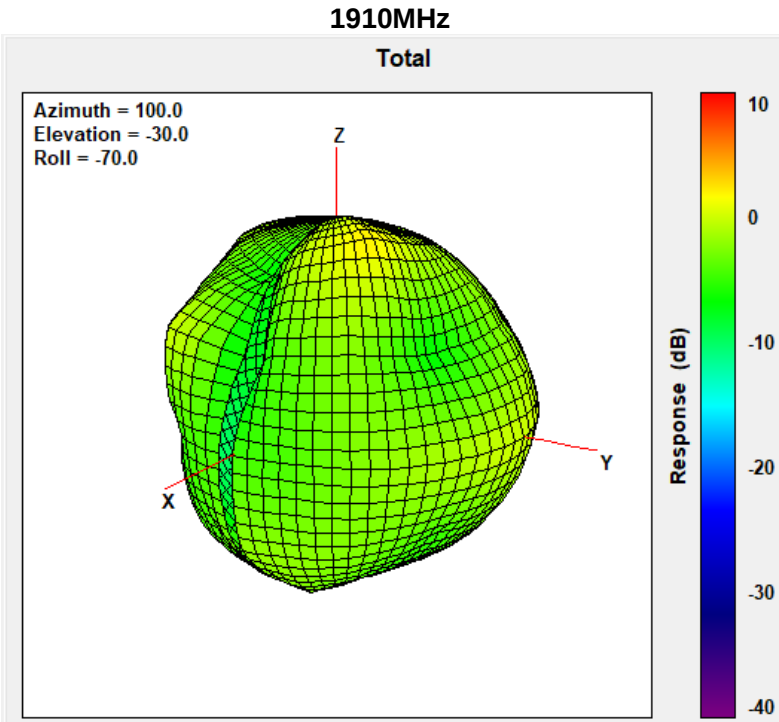
Center Frequency	1805 MHz
Horizontal (dBi) peak	1.23
Vertical (dBi) peak	-2.50



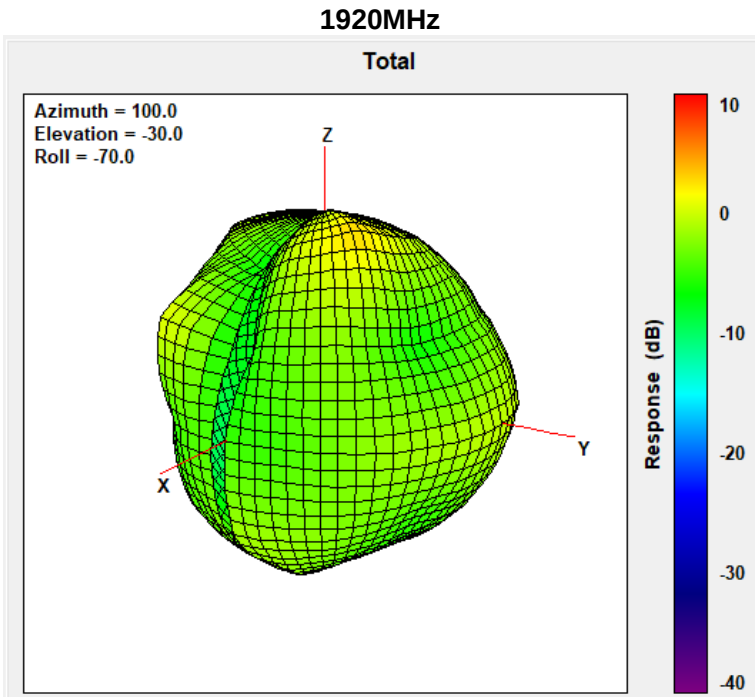
Center Frequency	1850 MHz
Horizontal (dBi) peak	-0.32
Vertical (dBi) peak	-1.28



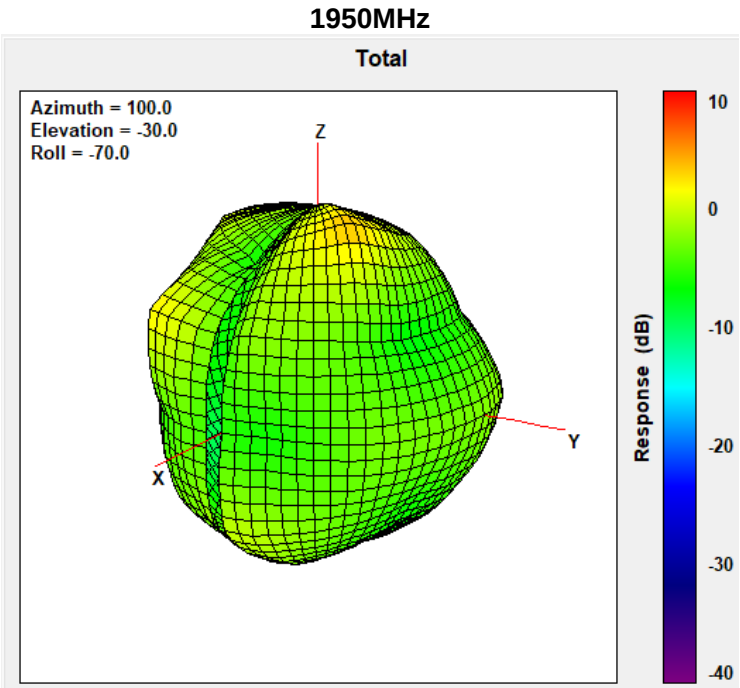
Center Frequency	1880 MHz
Horizontal (dBi) peak	-0.12
Vertical (dBi) peak	0.13



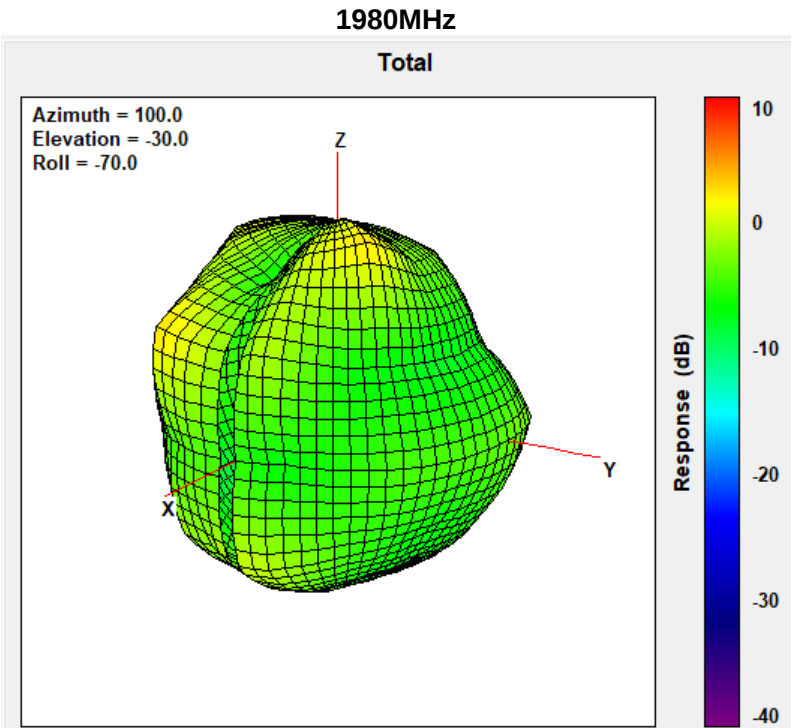
Center Frequency	1910MHz
Horizontal (dBi) peak	0.55
Vertical (dBi) peak	0.21



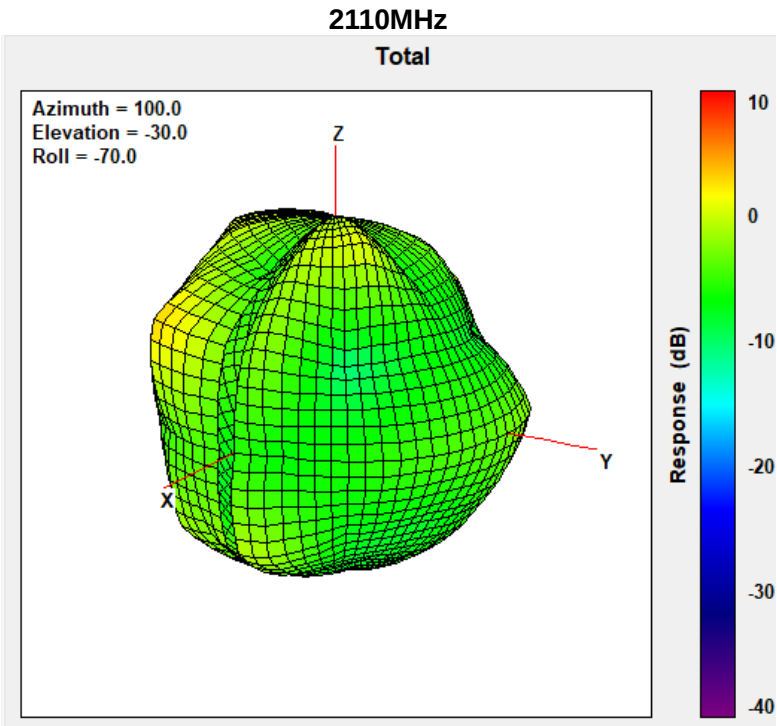
Center Frequency	1920MHz
Horizontal (dBi) peak	1.18
Vertical (dBi) peak	0.15



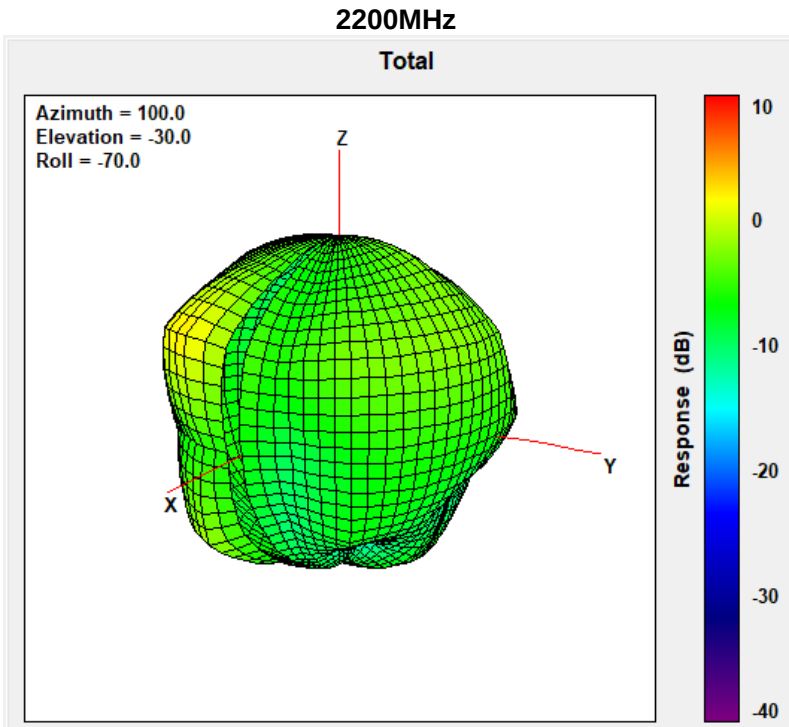
Center Frequency	1950MHz
Horizontal (dBi) peak	0.25
Vertical (dBi) peak	1.09



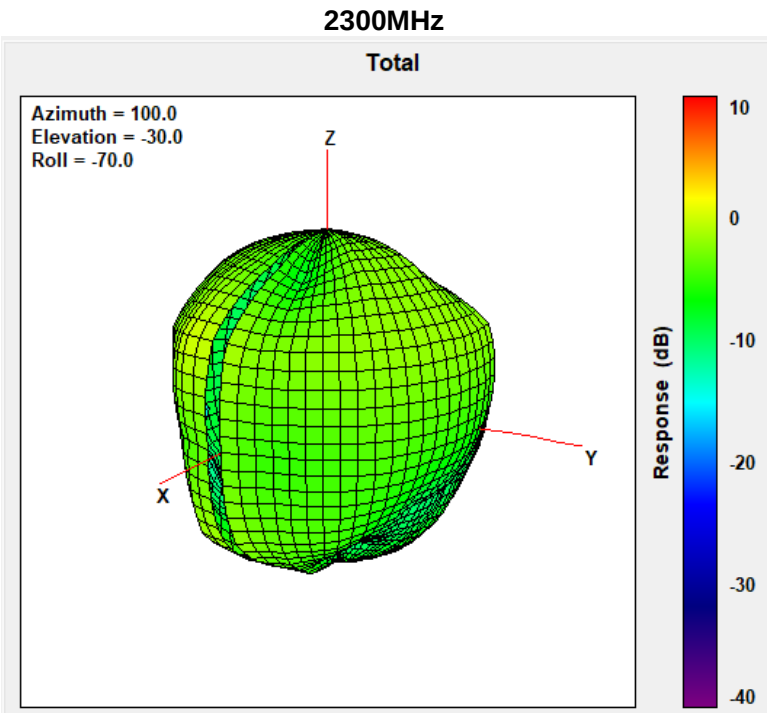
Center Frequency	1980MHz
Horizontal (dBi) peak	0.93
Vertical (dBi) peak	1.44



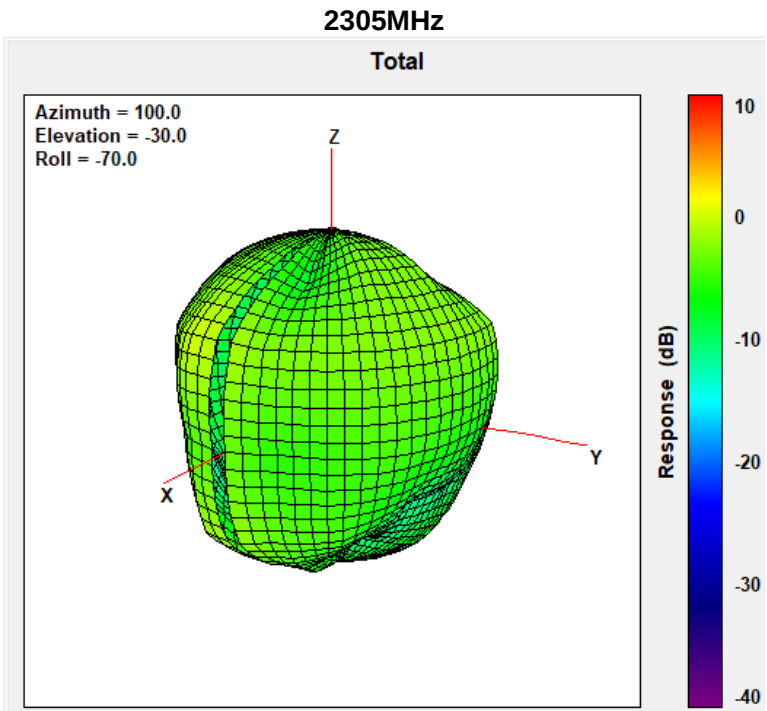
Center Frequency	2110MHz
Horizontal (dBi) peak	0.72
Vertical (dBi) peak	0.33



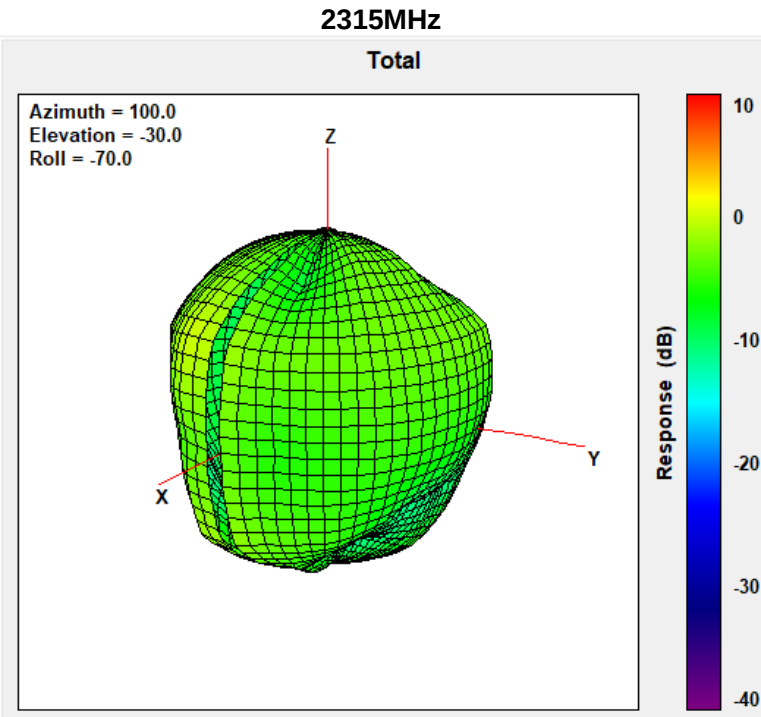
Center Frequency	2200MHz
Horizontal (dBi) peak	0.89
Vertical (dBi) peak	-2.92



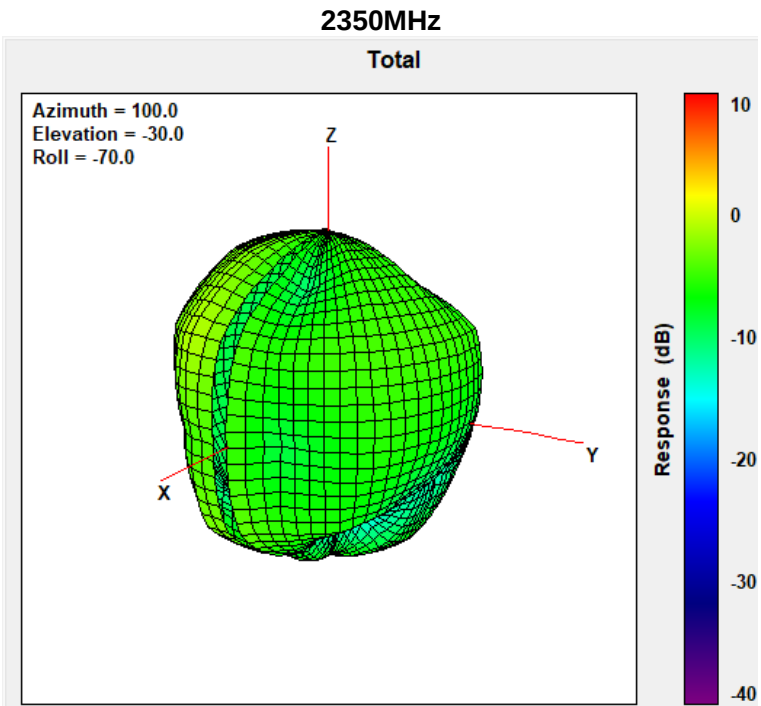
Center Frequency	2300MHz
Horizontal (dBi) peak	0.56
Vertical (dBi) peak	-1.79



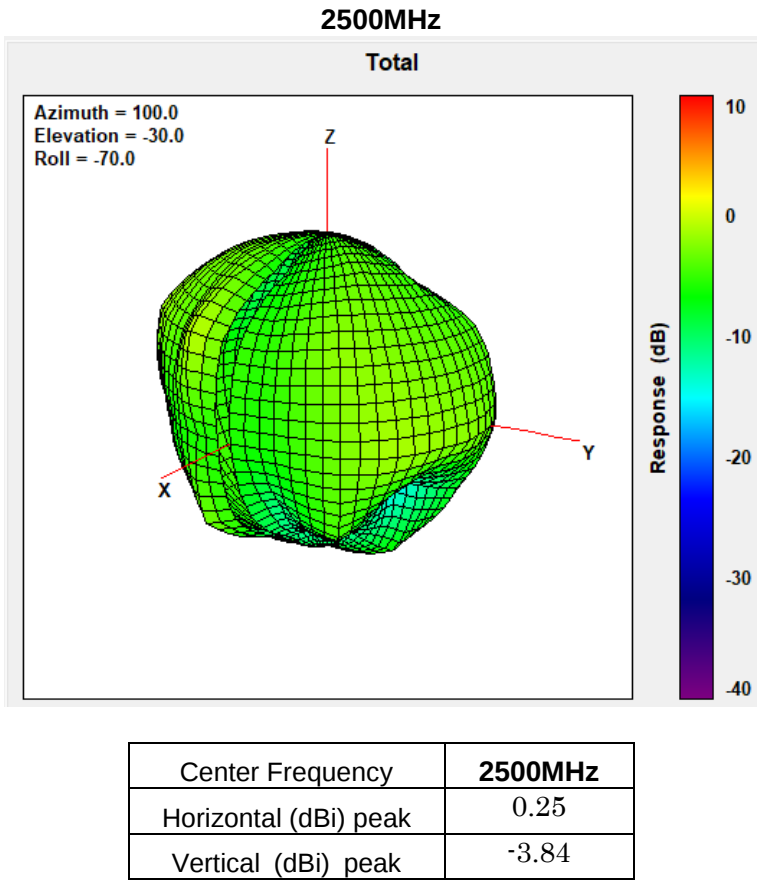
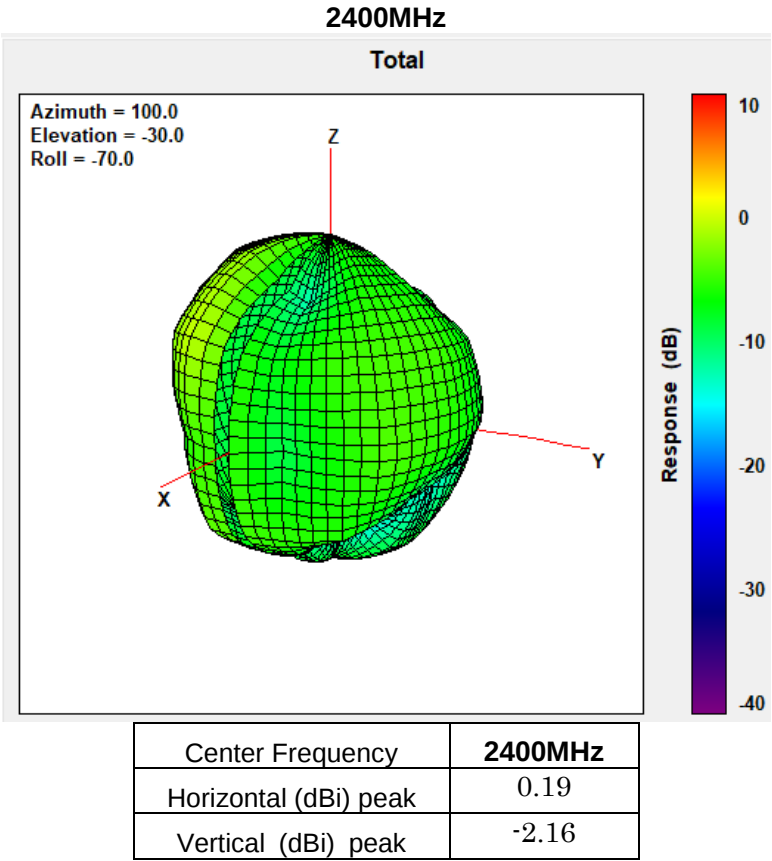
Center Frequency	2305MHz
Horizontal (dBi) peak	0.53
Vertical (dBi) peak	-1.89

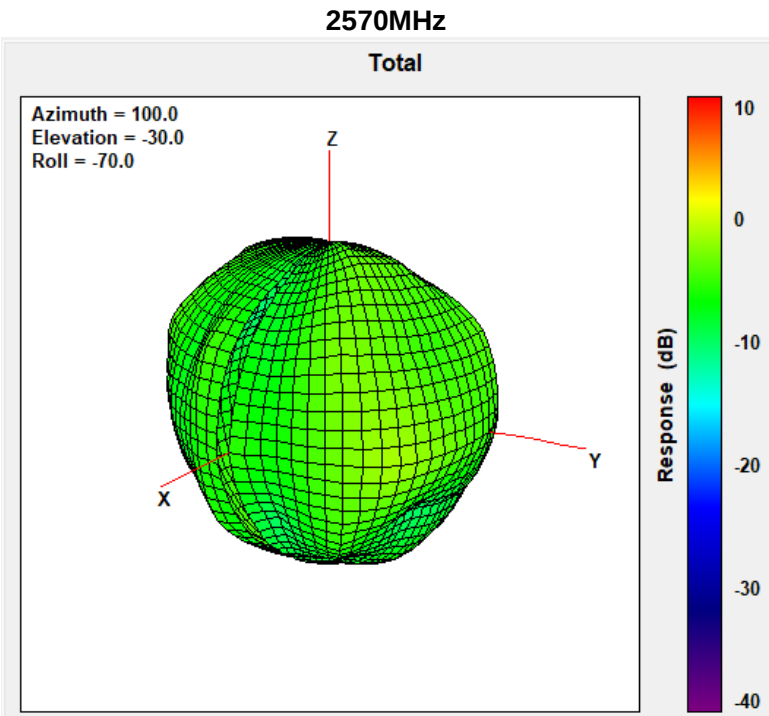


Center Frequency	2315MHz
Horizontal (dBi) peak	0.56
Vertical (dBi) peak	-1.62

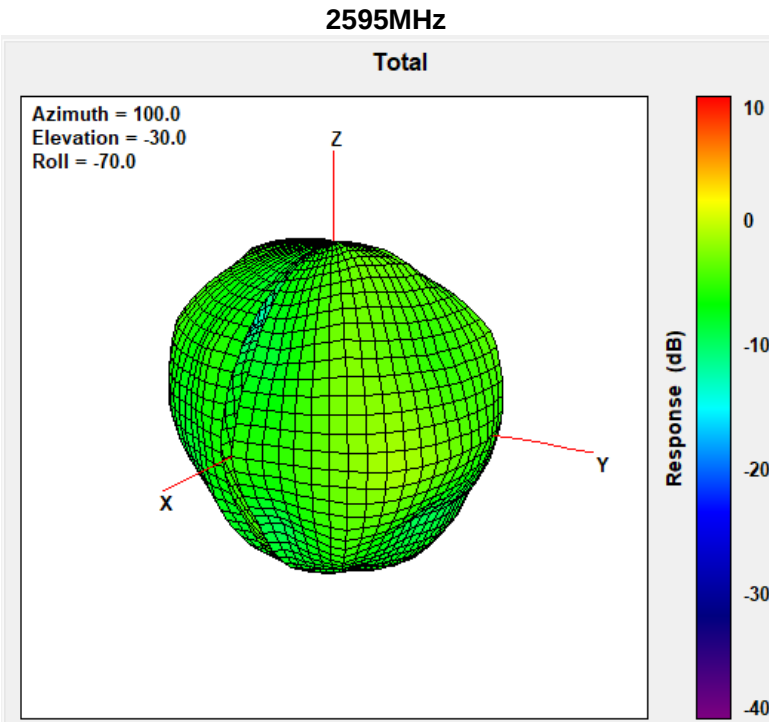


Center Frequency	2350MHz
Horizontal (dBi) peak	-0.24
Vertical (dBi) peak	-2.17

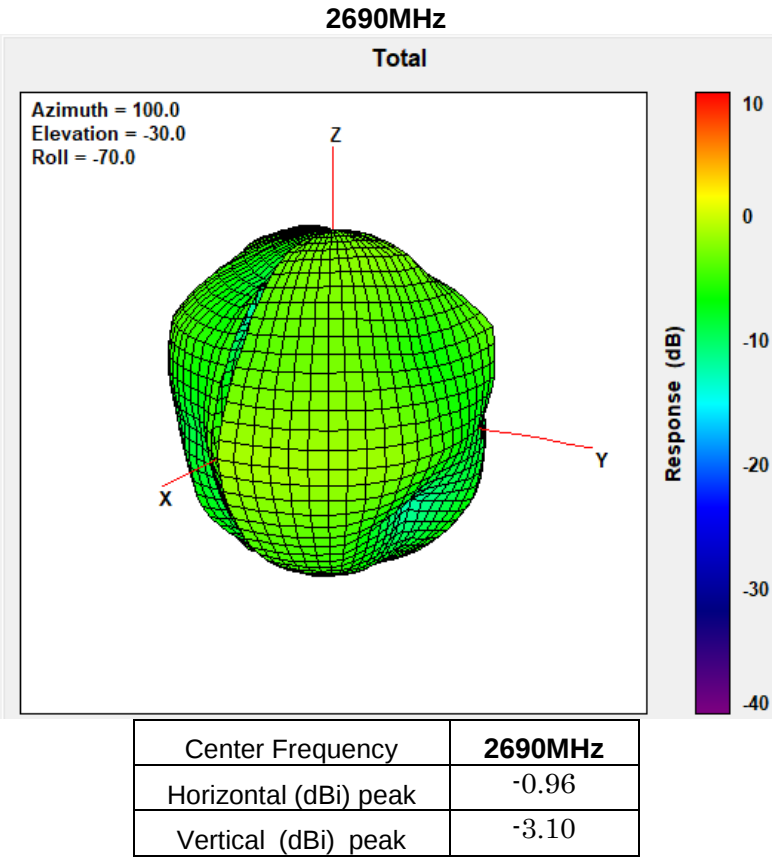
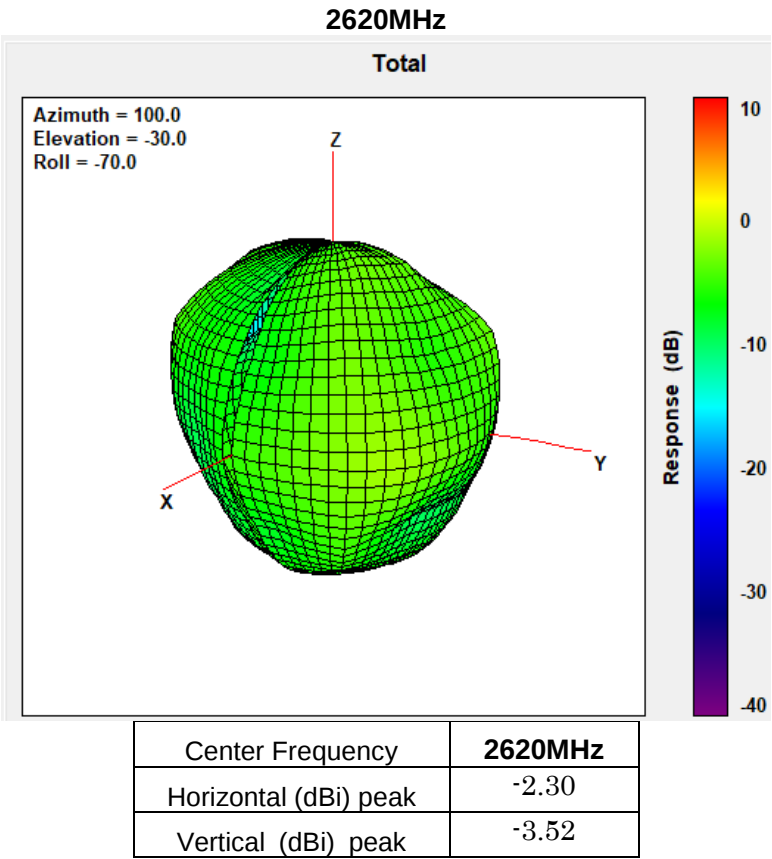


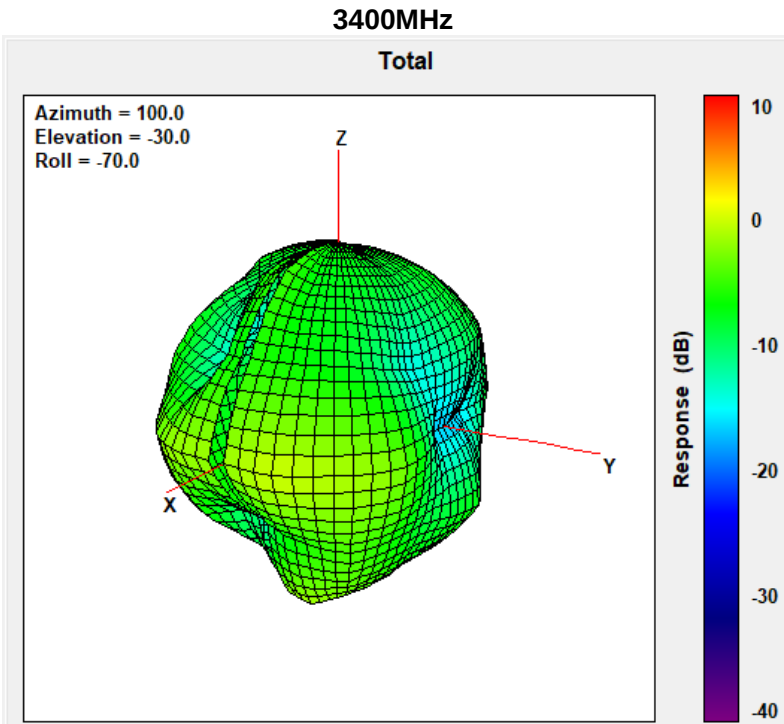


Center Frequency	2570MHz
Horizontal (dBi) peak	-2.56
Vertical (dBi) peak	-3.97

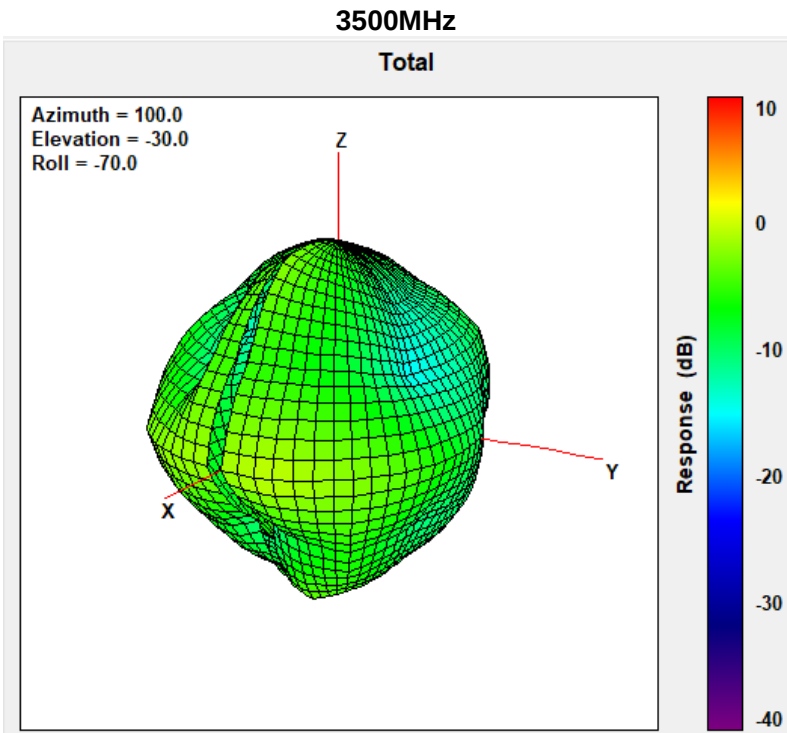


Center Frequency	2595MHz
Horizontal (dBi) peak	-2.50
Vertical (dBi) peak	-3.73

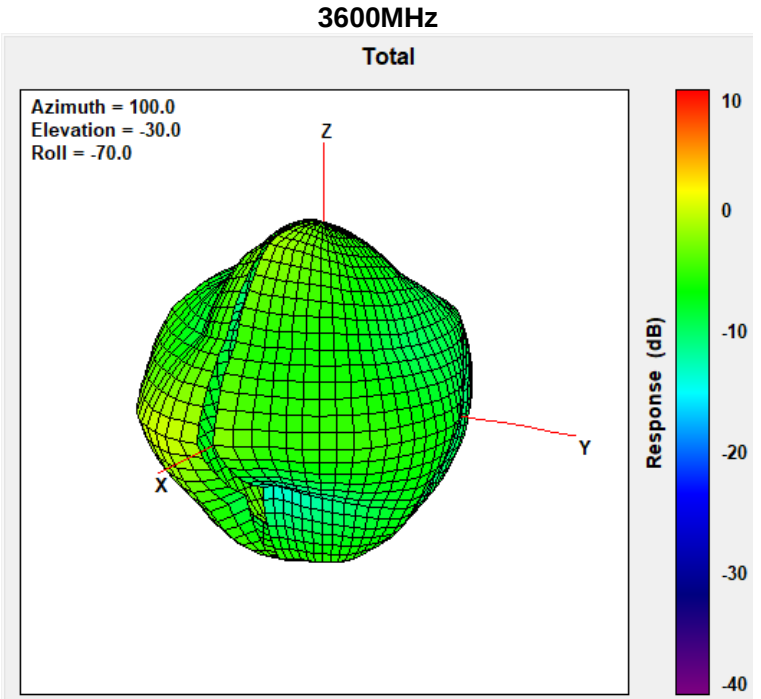




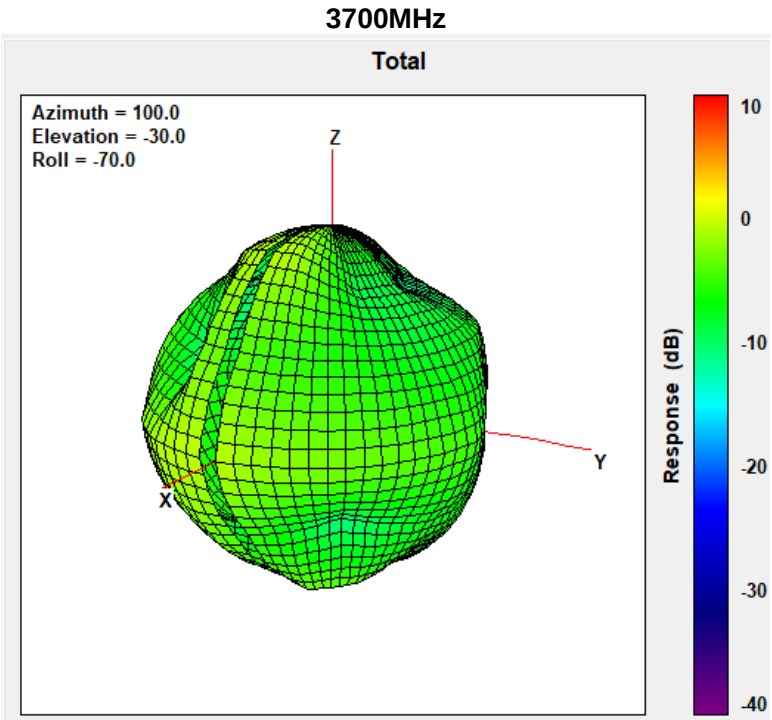
Center Frequency	3400MHz
Horizontal (dBi) peak	0.52
Vertical (dBi) peak	-5.16



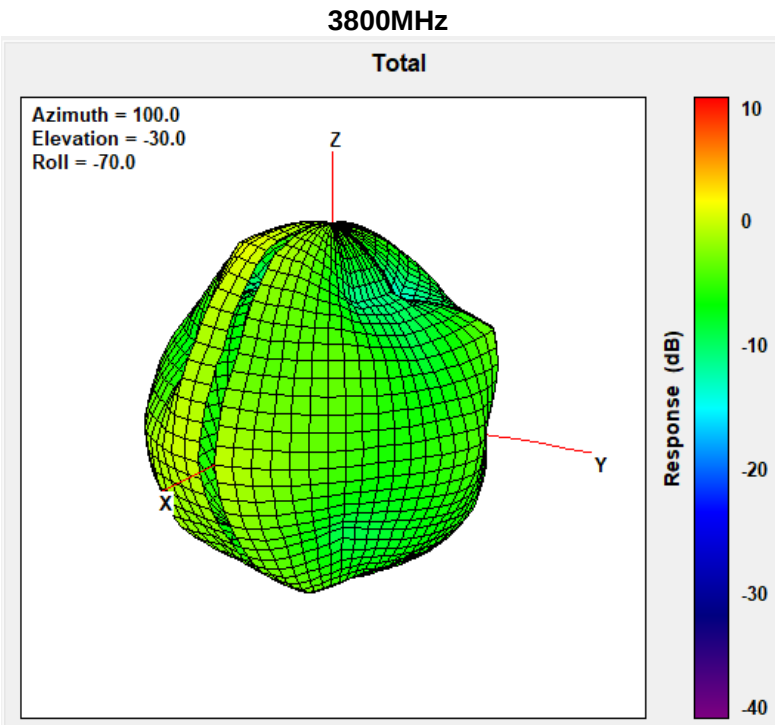
Center Frequency	3500MHz
Horizontal (dBi) peak	0.15
Vertical (dBi) peak	-4.10



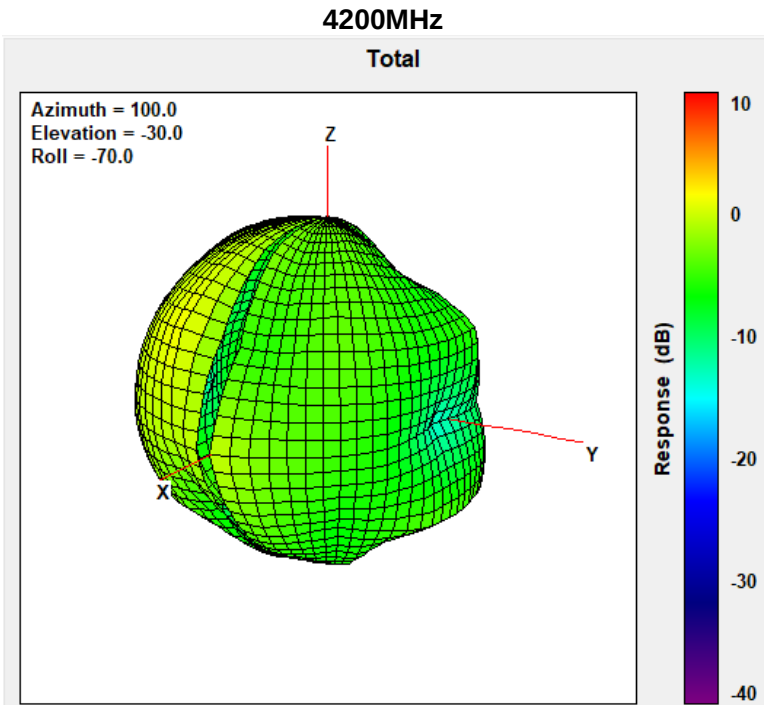
Center Frequency	3600MHz
Horizontal (dBi) peak	0.53
Vertical (dBi) peak	-2.99



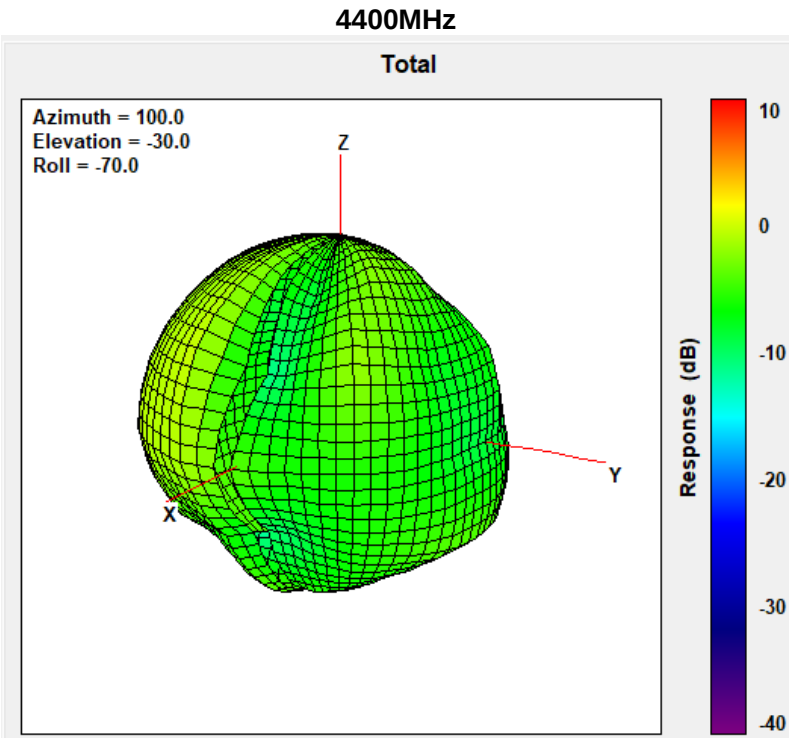
Center Frequency	3700MHz
Horizontal (dBi) peak	-0.33
Vertical (dBi) peak	-4.37



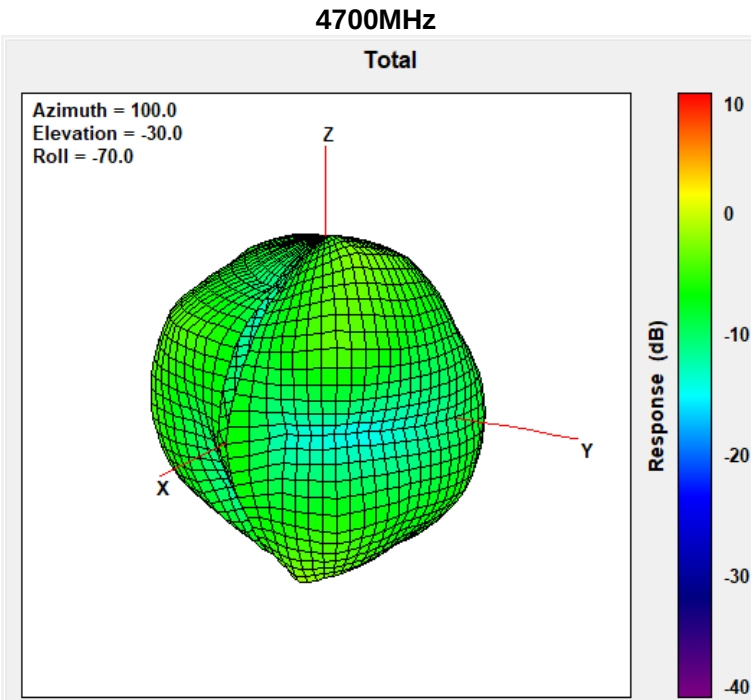
Center Frequency	3800MHz
Horizontal (dBi) peak	0.03
Vertical (dBi) peak	-2.34



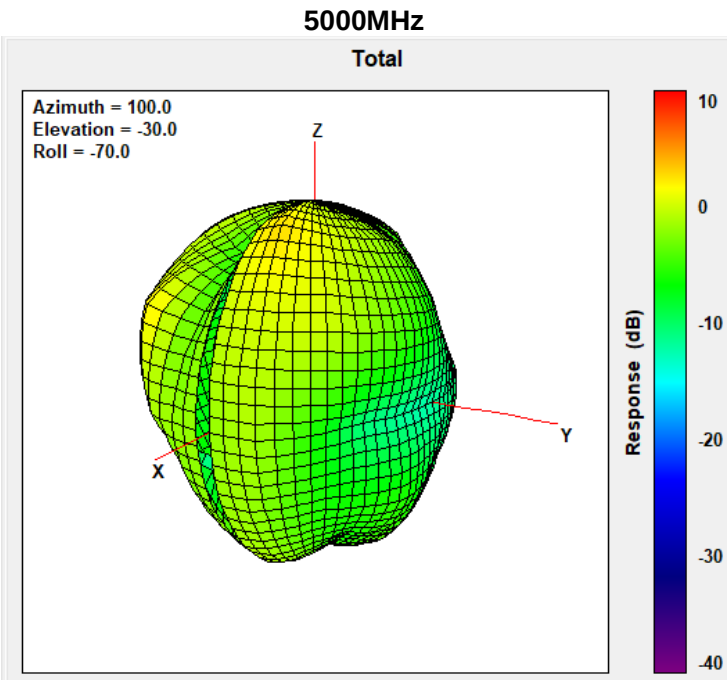
Center Frequency	4200MHz
Horizontal (dBi) peak	1.52
Vertical (dBi) peak	-1.70



Center Frequency	4400MHz
Horizontal (dBi) peak	-0.40
Vertical (dBi) peak	-3.19

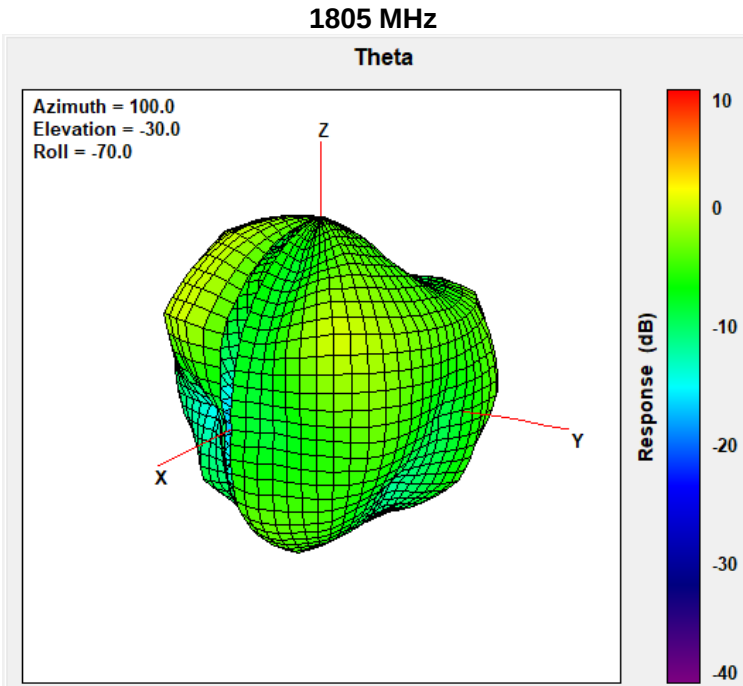


Center Frequency	4700MHz
Horizontal (dBi) peak	-3.41
Vertical (dBi) peak	-1.13

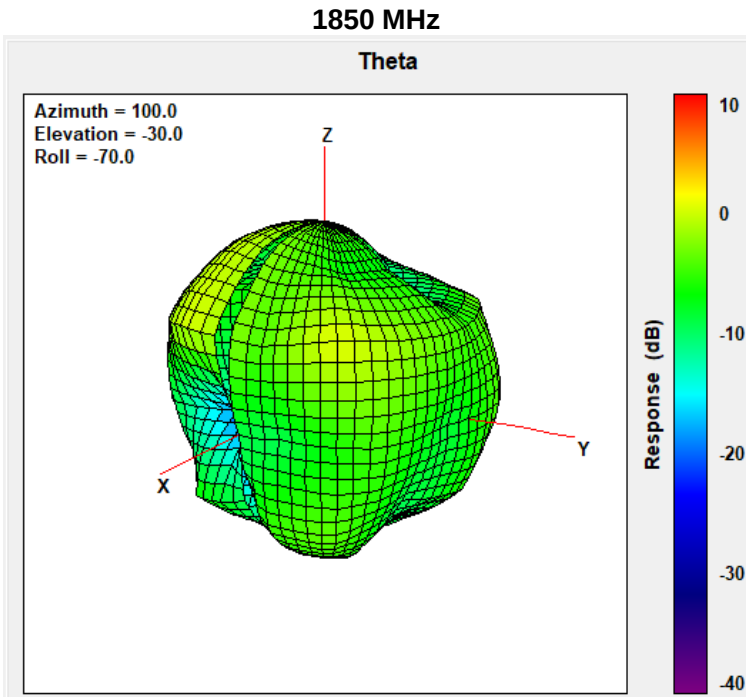


Center Frequency	5000MHz
Horizontal (dBi) peak	0.89
Vertical (dBi) peak	-2.22

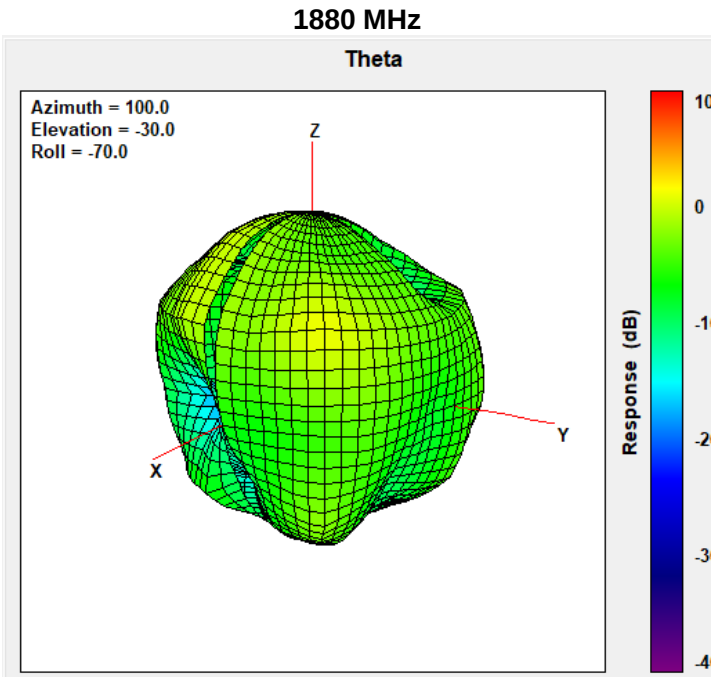




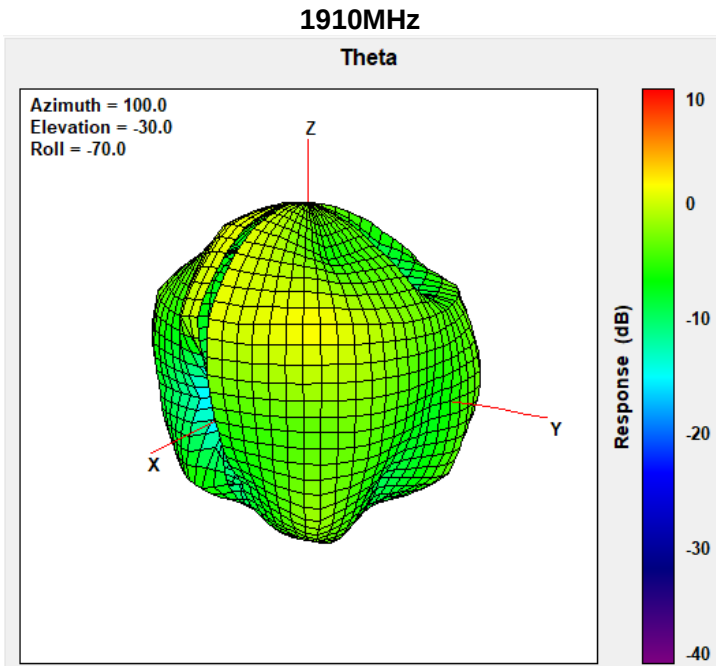
Center Frequency	1805 MHz
Horizontal (dBi) peak	1.24
Vertical (dBi) peak	1.06



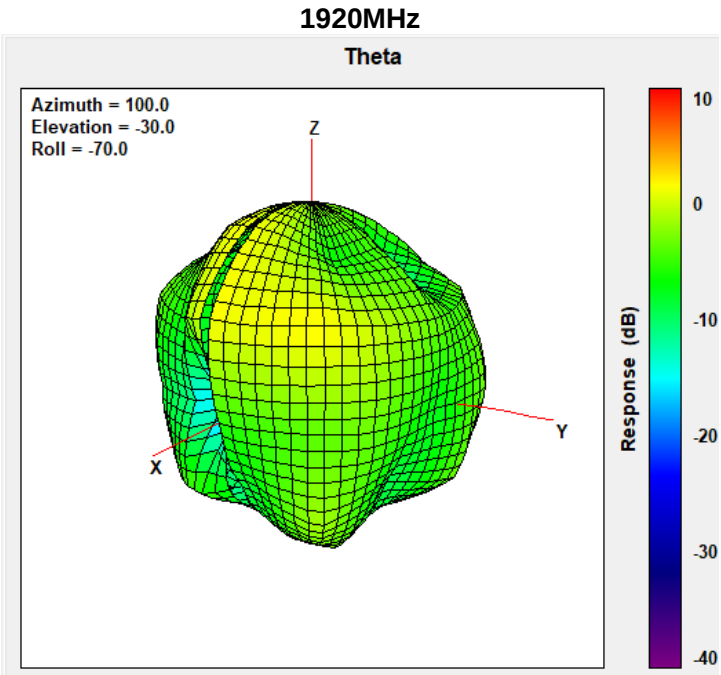
Center Frequency	1850 MHz
Horizontal (dBi) peak	1.44
Vertical (dBi) peak	0.51



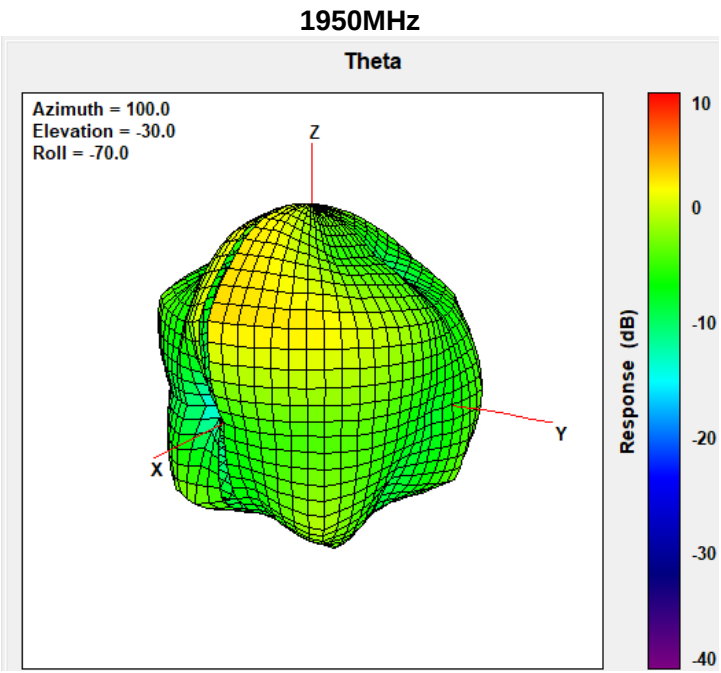
Center Frequency	1880 MHz
Horizontal (dBi) peak	1.03
Vertical (dBi) peak	1.79



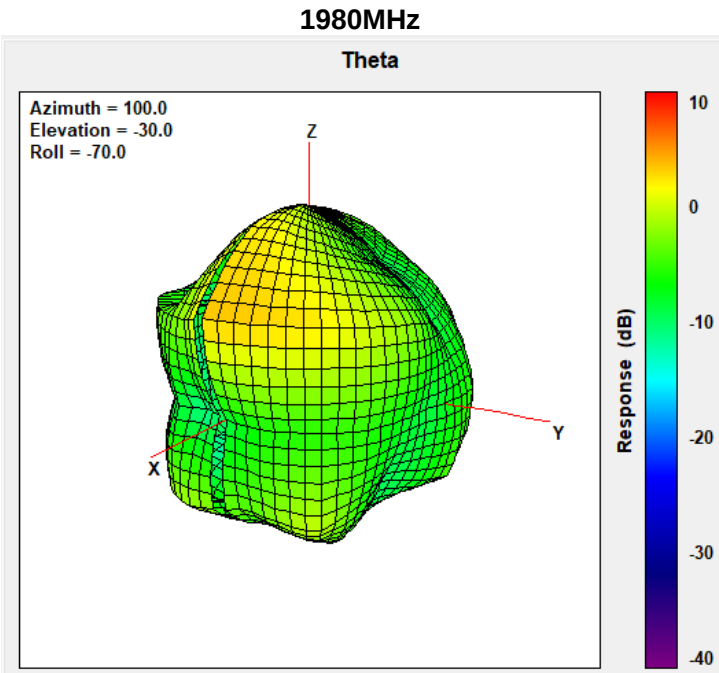
Center Frequency	1910MHz
Horizontal (dBi) peak	1.36
Vertical (dBi) peak	1.06



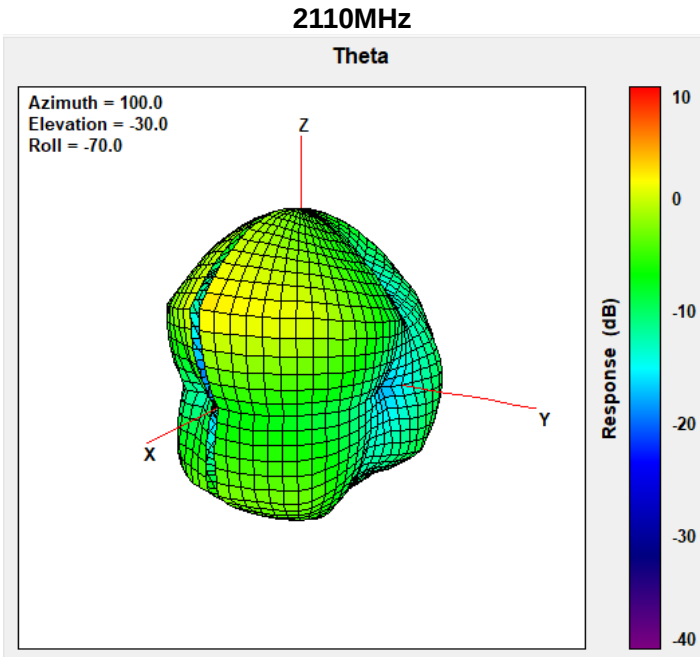
Center Frequency	1920MHz
Horizontal (dBi) peak	1.37
Vertical (dBi) peak	1.96



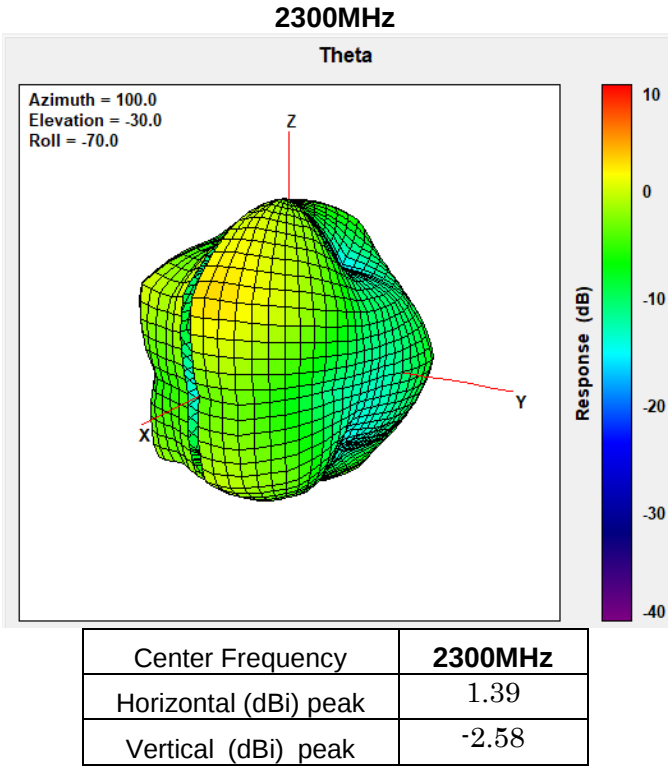
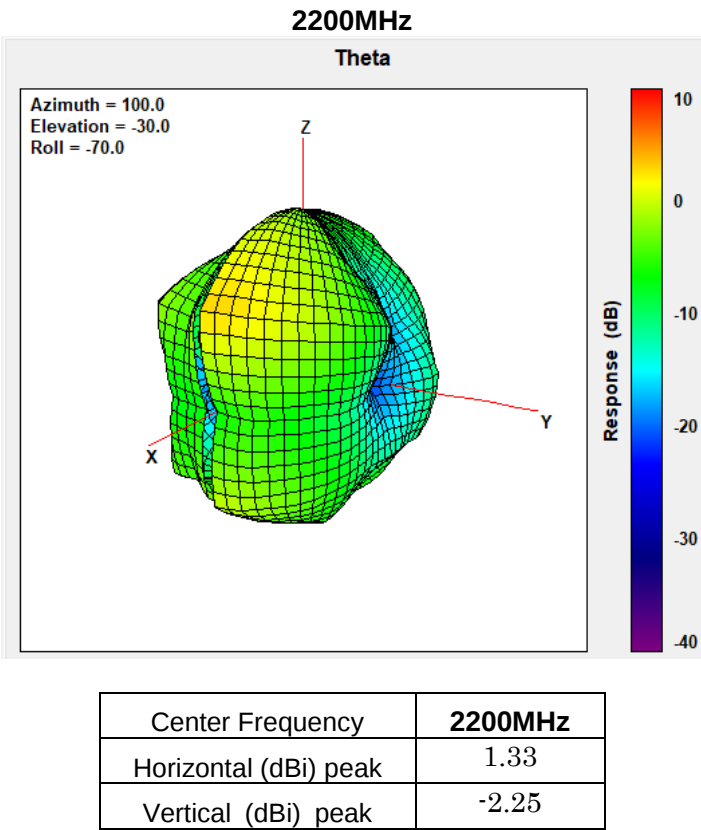
Center Frequency	1950MHz
Horizontal (dBi) peak	1.00
Vertical (dBi) peak	1.68

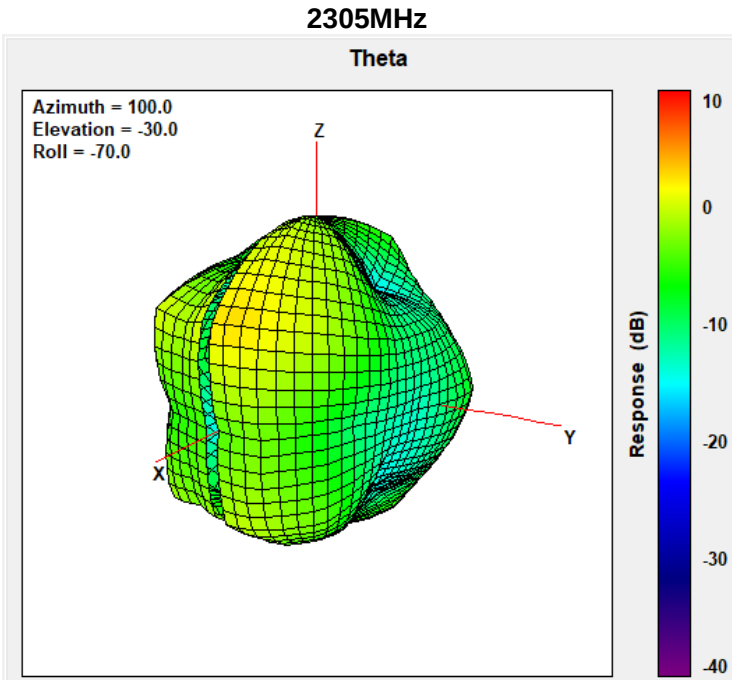


Center Frequency	1980MHz
Horizontal (dBi) peak	1.65
Vertical (dBi) peak	1.54

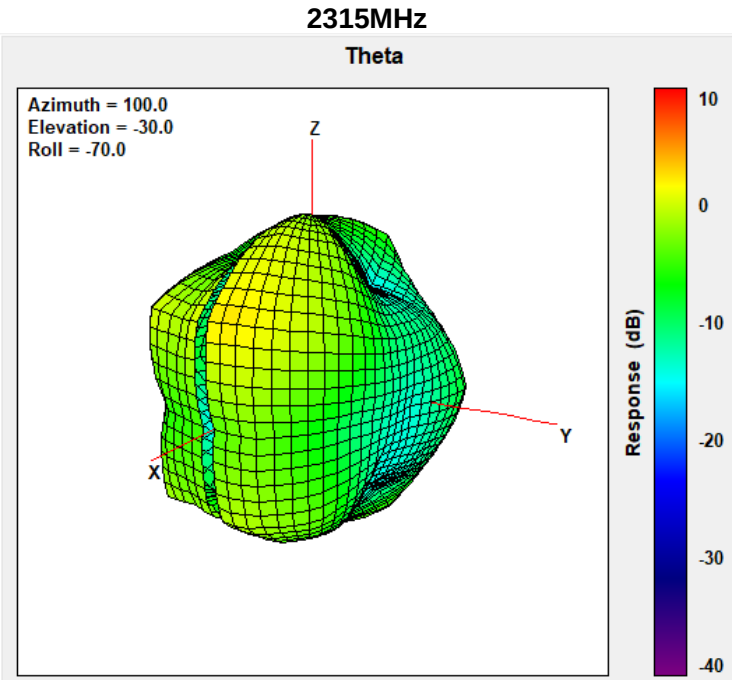


Center Frequency	2110MHz
Horizontal (dBi) peak	1.81
Vertical (dBi) peak	0.56

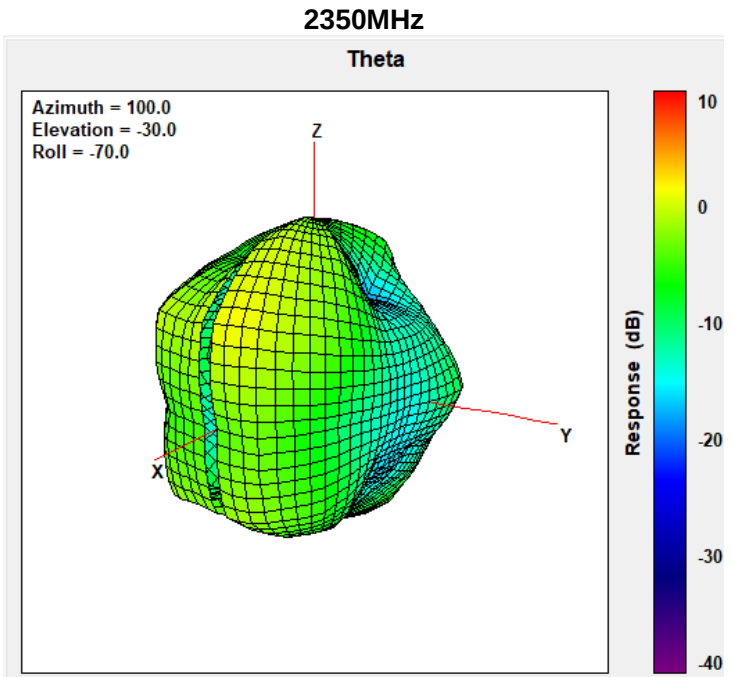




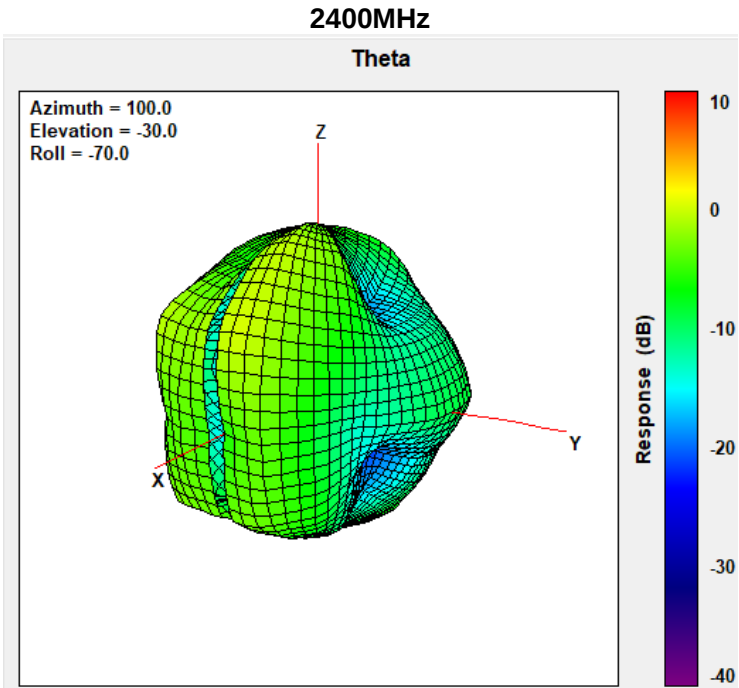
Center Frequency	2305MHz
Horizontal (dBi) peak	1.19
Vertical (dBi) peak	-2.45



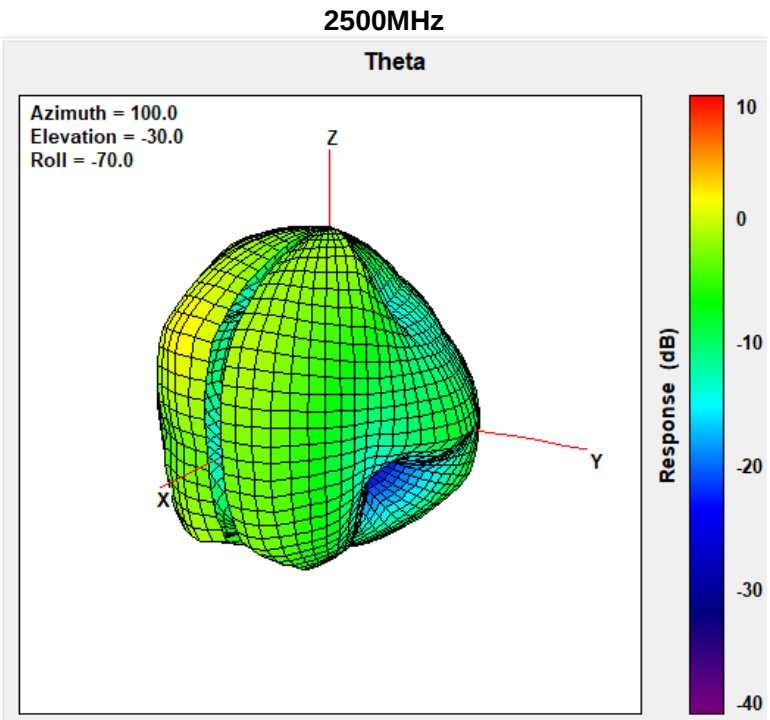
Center Frequency	2315MHz
Horizontal (dBi) peak	0.85
Vertical (dBi) peak	-2.23



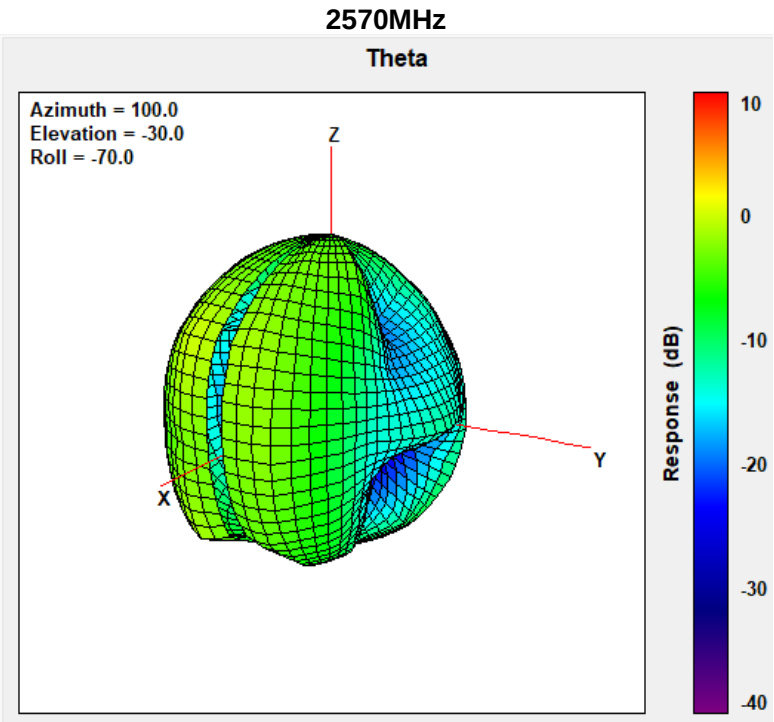
Center Frequency	2350MHz
Horizontal (dBi) peak	1.96
Vertical (dBi) peak	-2.17



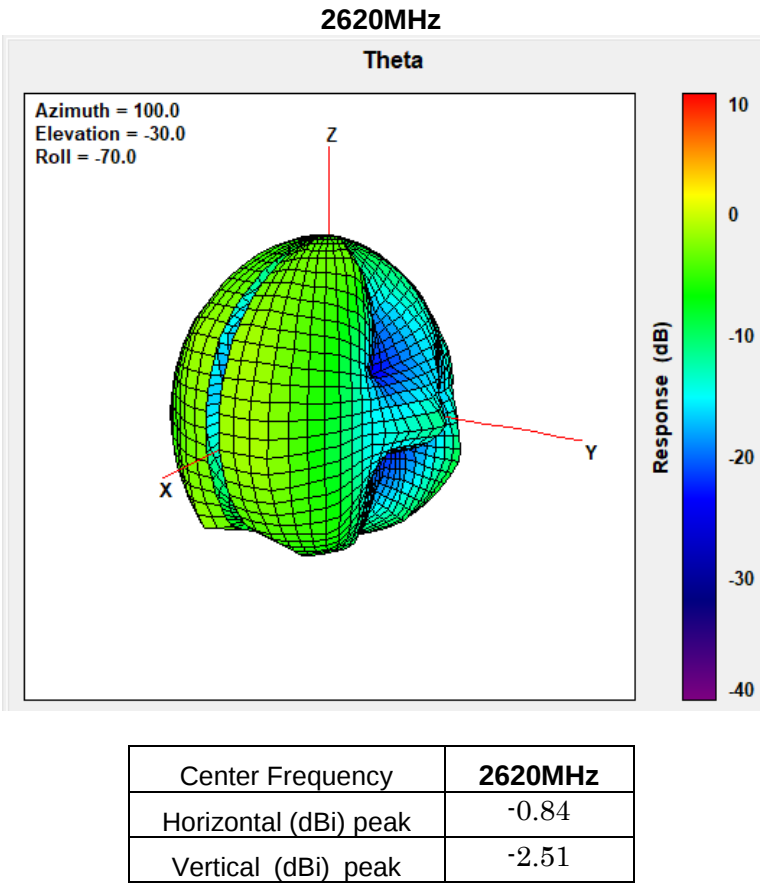
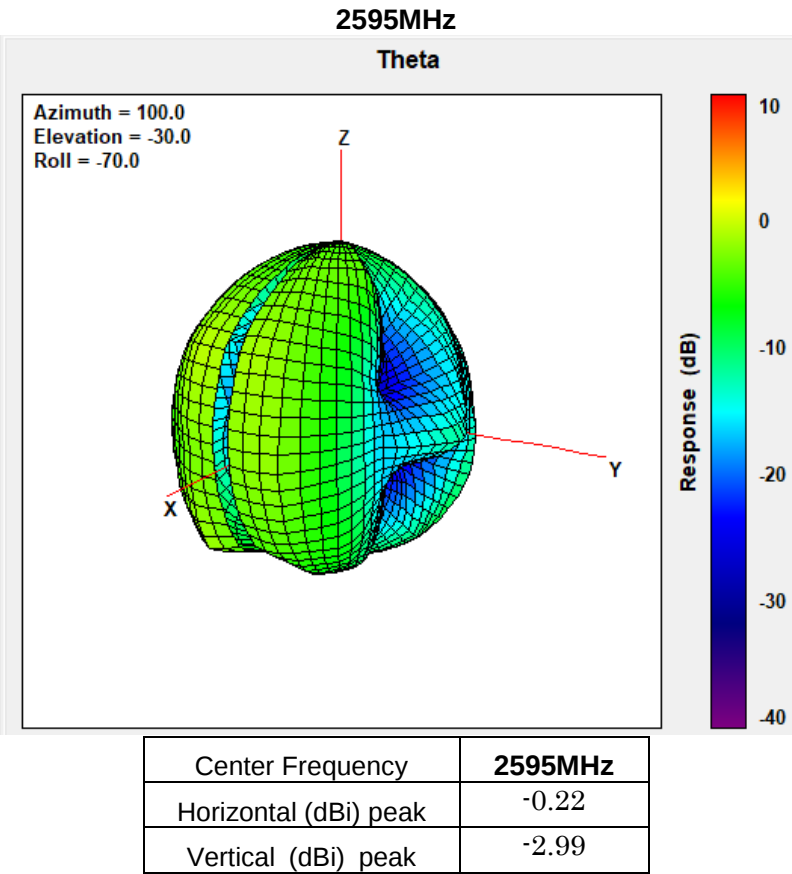
Center Frequency	2400MHz
Horizontal (dBi) peak	0.94
Vertical (dBi) peak	-2.50

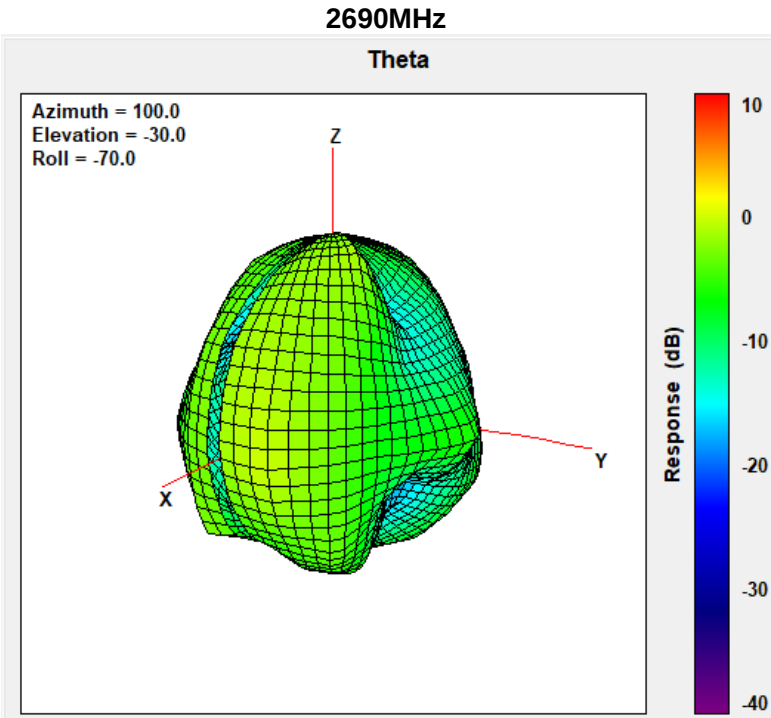


Center Frequency	2500MHz
Horizontal (dBi) peak	0.77
Vertical (dBi) peak	-3.11

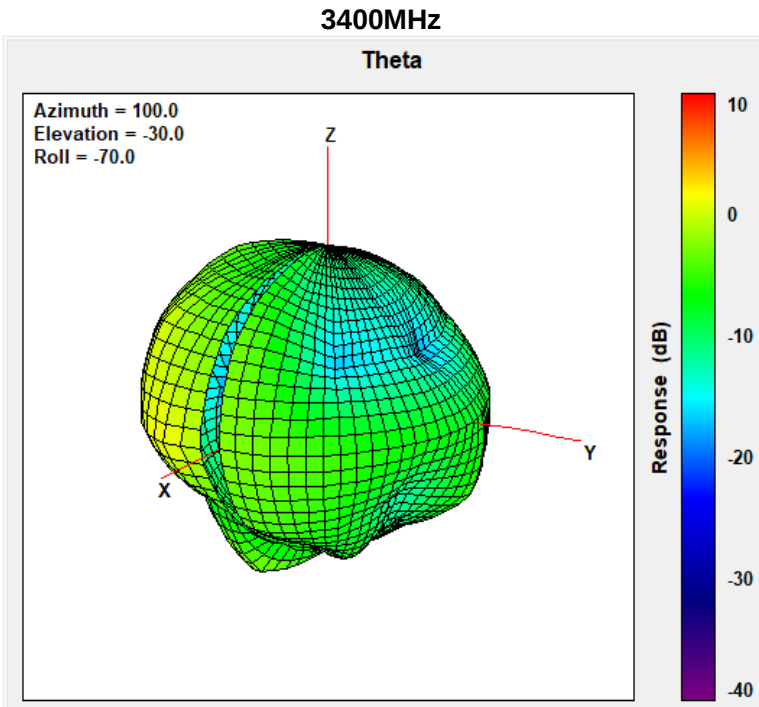


Center Frequency	2570MHz
Horizontal (dBi) peak	0.53
Vertical (dBi) peak	-2.85

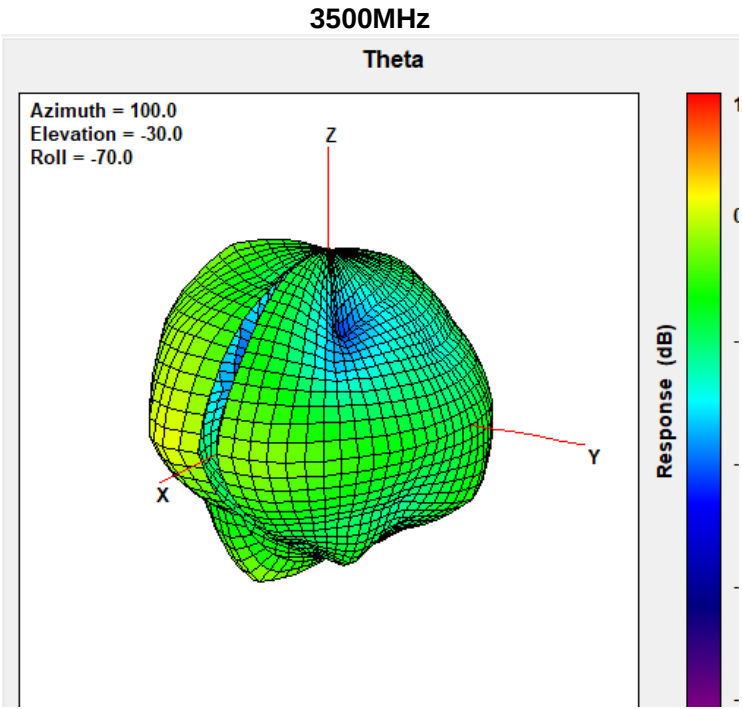




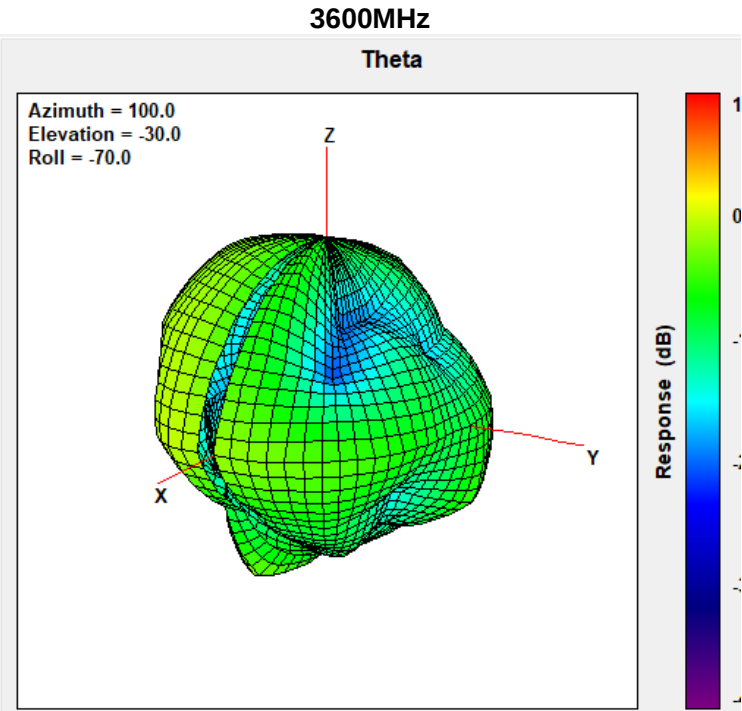
Center Frequency	2690MHz
Horizontal (dBi) peak	0.45
Vertical (dBi) peak	-0.67



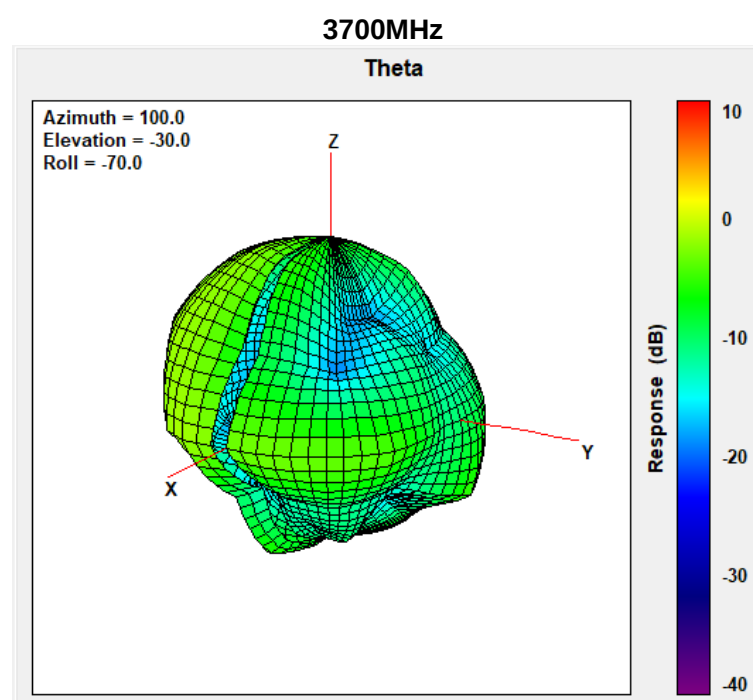
Center Frequency	3400MHz
Horizontal (dBi) peak	0.04
Vertical (dBi) peak	-2.70



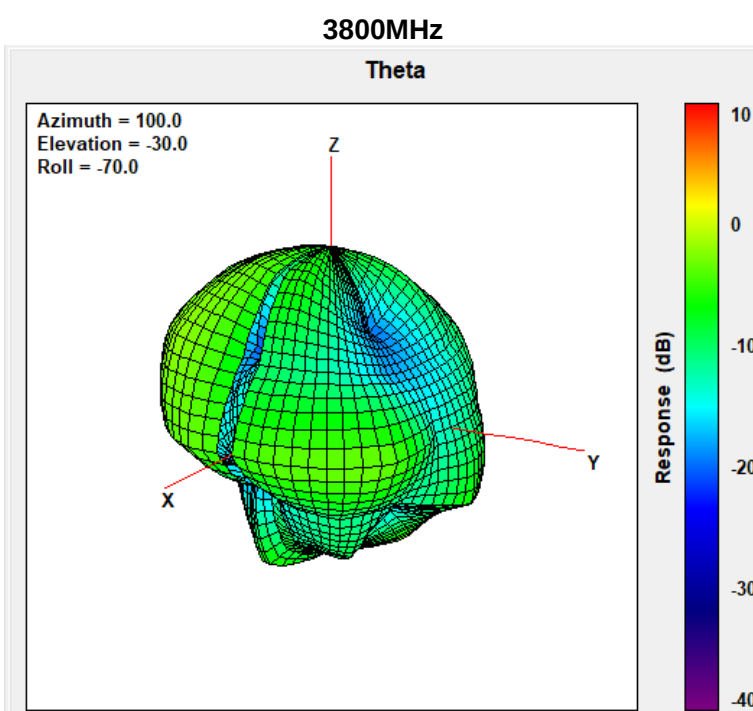
Center Frequency	3500MHz
Horizontal (dBi) peak	1.73
Vertical (dBi) peak	-2.73



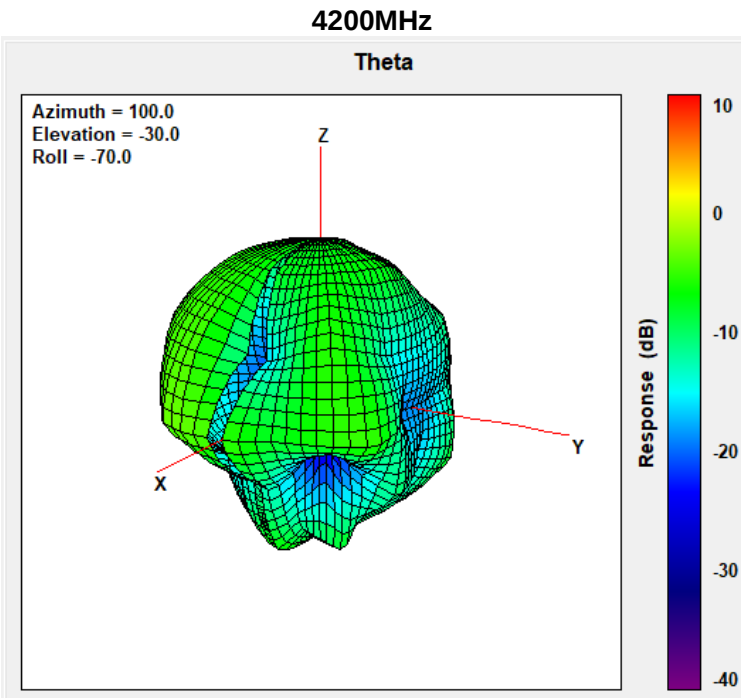
Center Frequency	3600MHz
Horizontal (dBi) peak	-0.03
Vertical (dBi) peak	-2.48



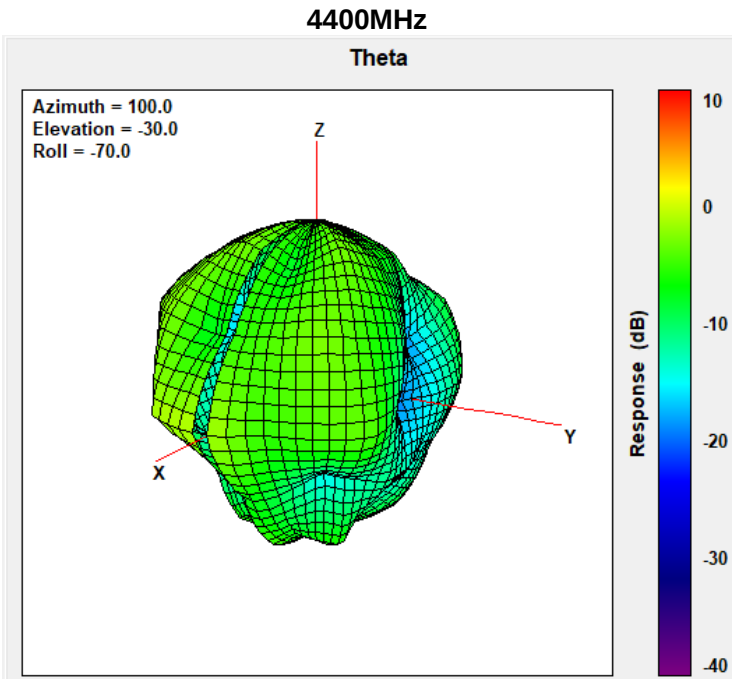
Center Frequency	3700MHz
Horizontal (dBi) peak	-1.02
Vertical (dBi) peak	-2.60



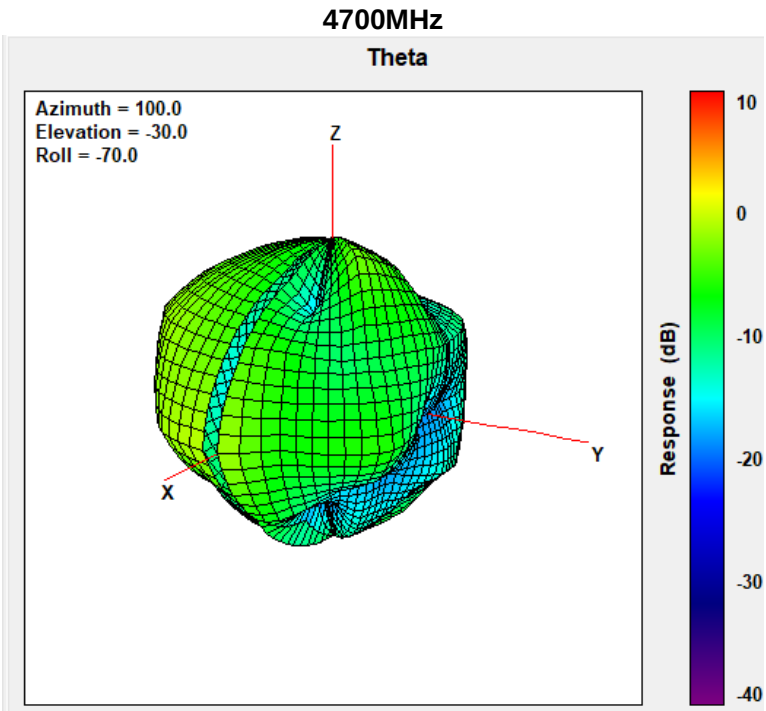
Center Frequency	3800MHz
Horizontal (dBi) peak	-1.67
Vertical (dBi) peak	-2.54



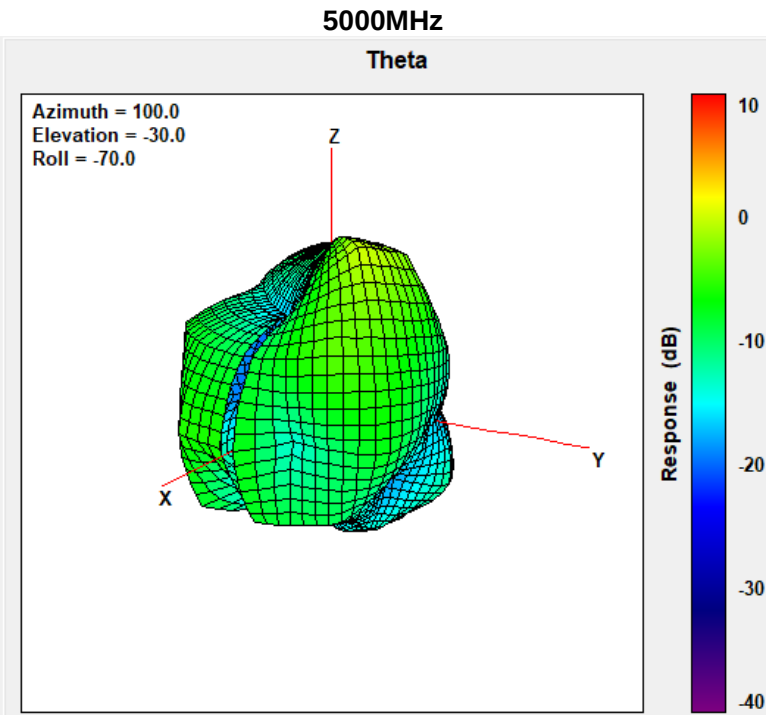
Center Frequency	4200MHz
Horizontal (dBi) peak	-3.05
Vertical (dBi) peak	-2.68



Center Frequency	4400MHz
Horizontal (dBi) peak	-0.30
Vertical (dBi) peak	-1.49



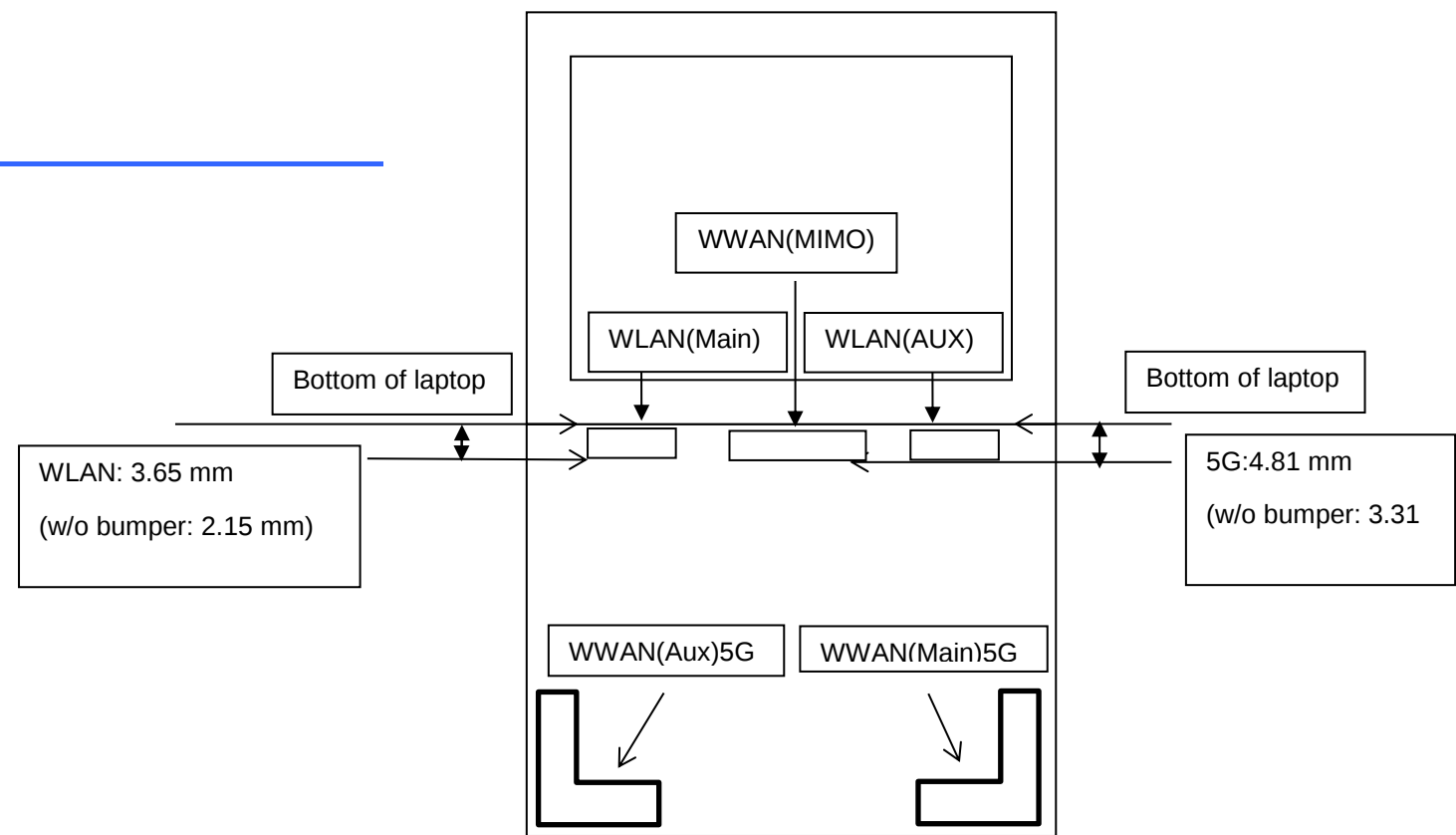
Center Frequency	4700MHz
Horizontal (dBi) peak	-0.24
Vertical (dBi) peak	-1.92



Center Frequency	5000MHz
Horizontal (dBi) peak	0.76
Vertical (dBi) peak	-0.18

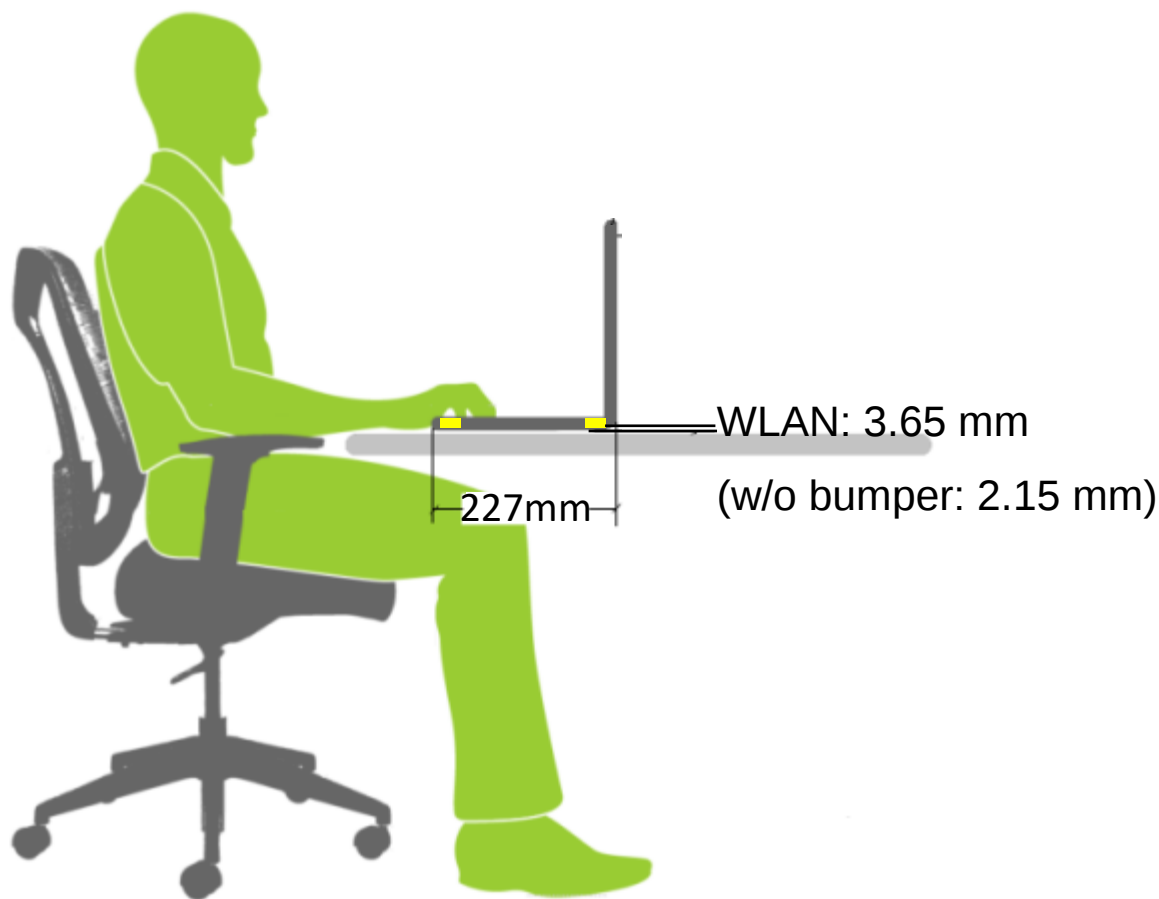
Section 4. Antenna Host Platform Location Information

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)

