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
Brand Name	DELL
Model Name	Arches13
ODM	Wistron Corporation
Target Launch Date	
Antenna	
Manufacturer	Wistron Corp
Part Number	■ Tx1/Rx1 Antenna WWAN Main: 77C82
	■ Rx2 Antenna WWAN Aux: 77C82
Module	
With WWAN Module	
(Check Box)	

Table of contents

1. Applicable test method
2. Test & System Description
    a. Test setup
    b. Equipment list

Section 1. Antenna Assembly Specifications
Section 2. Dimensioned Photos or Drawings of Antennas
Section 3. Radiation characteristics of antenna loaded in Host Platform
Section 4. Antenna Host Platform Location Information
Section 5. Antenna dimensional information for SAR evaluation
Section 6. Diagram Example of Co-Location Antenna Separation

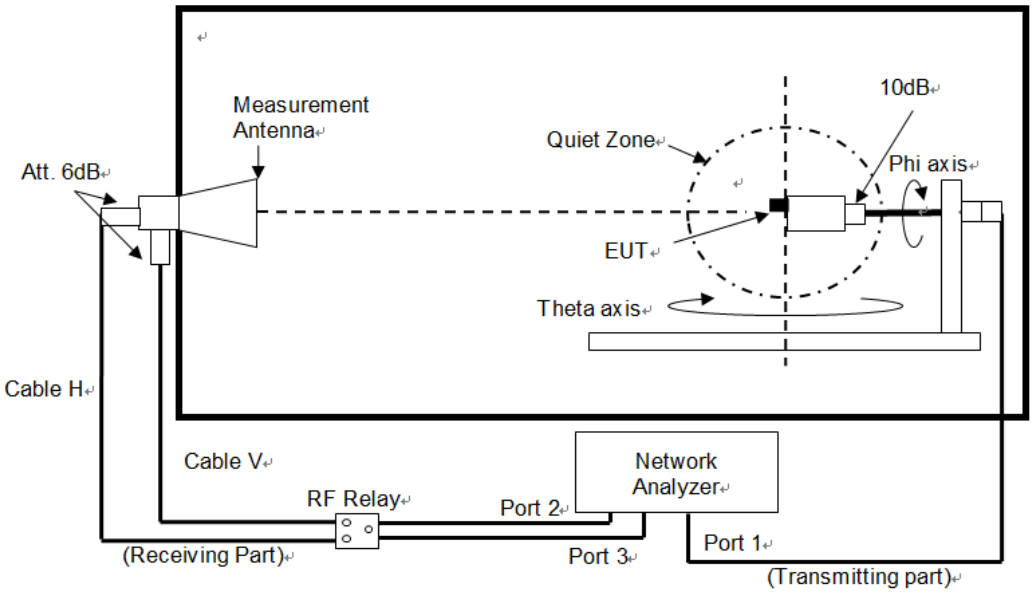
1. **Applicable test methods**

This test report is prepared for host antenna testing under a Full Anechoic Chamber.

2. **Test & System Description**

c. Test setup

<insert test diagram here for test site utilized>



b. Equipment list

<insert test diagram here for test site utilized>

Huaya-Sporton OTA03					
Name	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
ENA Series Network Analyzer	Keysight	E5080B	MY59101211	2022/5/23	2023/5/22
RF Switch	Keysight	3499A	MY42000955	NCR	NCR
Multi-Axis Positioner Controller	ETS-Lindgren	2090	N/A	NCR	NCR
Medium-Duty Positioner	ETS-Lindgren	2015	N/A	NCR	NCR
Measurement Horn Antenna	EMCO	3164-08	00086722	NCR	NCR
Anechoic chamber	ETS-Lindgren	AMS-8500	N/A	2022/1/6	2023/1/5
12GHz SMA(M)-SMA(M)+20core for 60cm RG316DS Cable Assembly	Woken Technology Inc.	RG316DS	N/A	N/A	N/A
12GHz SMA(M)-SMA(M)+30core for 300cm RG316DS Cable Assembly	Woken Technology Inc.	RG316DS	N/A	N/A	N/A
Note: Chamber calibration included full set of implement.					

Antenna Information

Section 1. Antenna Assembly Specifications

NB Mode

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)
Tx1/Rx1 Antenna P/N:77C82	Wistron Corp	Monopole coupling	50 ohm Coaxial length: 285mm diameter: 1.13mm Connector：IPEX	617-698MHz -1.99 dBi (peak)	617-698MHz -1.67 dBi (peak)	617-698MHz 4.5 max	617-698MHz 0.32 dBi (peak)
				698-821MHz 0.02 dBi (peak)	698-821MHz 0.4 dBi (peak)	698-821MHz 4.5 max	698-821MHz 0.38 dBi (peak)
				824-960MHz -0.98 dBi (peak)	824-960MHz -0.54 dBi (peak)	824-960MHz 4.5 max	824-960MHz 0.44 dBi (peak)
				1452-1515MHz -2.04 dBi (peak)	1452-1515MHz -1.57 dBi (peak)	1452-1515MHz 3 max	1452-1515MHz 0.47 dBi (peak)
				1710-2200MHz 1.23 dBi (peak)	1710-2200MHz 1.86 dBi (peak)	1710-2200MHz 3 max	1710-2200MHz 0.63 dBi (peak)
				2300-2690MHz 2.42 dBi (peak)	2300-2690MHz 3.1 dBi (peak)	2300-2690MHz 3 max	2300-2690MHz 0.68 dBi (peak)
				3300-3800MHz -0.04 dBi (peak)	3300-3800MHz 0.83 dBi (peak)	3300-3800MHz 3 max	3300-3800MHz 0.87 dBi (peak)
				4200-5000MHz -2.09 dBi (peak)	4200-5000MHz -1.12 dBi (peak)	4200-5000MHz 3 max	4200-5000MHz 0.97 dBi (peak)
				5150-5925MHz -2.64 dBi (peak)	5150-5925MHz -1.51 dBi (peak)	5150-5925MHz 3 max	5150-5925MHz 1.13 dBi (peak)
Rx2 Antenna P/N: 77C82	Wistron Corp	Monopole coupling	50 ohm Coaxial length: 485mm diameter: 1.13mm Connector：IPEX	617-698MHz -4.31 dBi (peak)	617-698MHz -3.76 dBi (peak)	617-698MHz 5 max	617-698MHz 0.55 dBi (peak)
				698-821MHz -1.98 dBi (peak)	698-821MHz -1.33 dBi (peak)	698-821MHz 5 max	698-821MHz 0.65 dBi (peak)
				716-821MHz -1.98 dBi (peak)	716-821MHz -1.33 dBi (peak)	716-821MHz 5 max	716-821MHz 0.65 dBi (peak)
				824-960MHz -0.62 dBi (peak)	824-960MHz 0.13 dBi (peak)	824-960MHz 4.5 max	824-960MHz 0.75 dBi (peak)
				1452-1515MHz -2.86 dBi (peak)	1452-1515MHz -2.05 dBi (peak)	1452-1515MHz 3 max	1452-1515MHz 0.81 dBi (peak)
				1557-1610 MHz -0.71 dBi (peak)	1557-1610 MHz 0.15 dBi (peak)	1557-1610 MHz 3 max	1557-1610 MHz 0.86 dBi (peak)
				1805-2200MHz -1.31 dBi (peak)	1805-2200MHz -0.25 dBi (peak)	1805-2200MHz 3 max	1805-2200MHz 1.06 dBi (peak)
				2300-2690MHzz 0.08 dBi (peak)	2300-2690MHzz 1.23 dBi (peak)	2300-2690MHzz 3 max	2300-2690MHzz 1.15 dBi (peak)
				3300-3800MHz -0.11 dBi (peak)	3300-3800MHz 1.36 dBi (peak)	3300-3800MHz 3 max	3300-3800MHz 1.47 dBi (peak)
				4200-5000MHz -0.81 dBi (peak)	4200-5000MHz 0.84 dBi (peak)	4200-5000MHz 3 max	4200-5000MHz 1.65 dBi (peak)
				5150-5925MHz -4.51 dBi (peak)	5150-5925MHz -2.58 dBi (peak)	5150-5925MHz 3 max	5150-5925MHz 1.93 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(I):
Low and middle band

Frequency (MHz)	Tx1/Rx1 antenna		Rx2 antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
617	-3.11	-3.50	-4.51	-4.31
634.5	-2.58	-3.53	-4.48	-4.80
652	-3.17	-3.14	-4.98	-4.66
663	-3.26	-3.24		
680.5	-2.62	-3.42		
698	-1.99	-2.91		
703	-1.70	-1.93		
707.5	-1.47	-1.62		
716	-1.23	-1.29		
717	-1.25	-0.96	-3.27	-2.21
722.5	-1.09	-0.66	-3.43	-2.14
725.5	-0.97	-1.18		
728	-1.38	-0.61	-3.35	-2.19
729	-1.45	-0.59	-3.33	-2.17
737.5	-1.08	-0.33	-2.71	-2.08
746	-1.23	-0.04	-2.86	-1.98
748	-0.61	-0.99		
751	-0.78	-0.03	-2.59	-2.15
756	-0.75	-0.05	-2.60	-2.33
758	-0.80	-0.11	-2.71	-2.40
763	-0.58	-0.10	-2.60	-2.43
768	-0.60	0.02	-2.74	-2.50
777	-0.74	-0.90		
780.5	-0.09	-0.15	-2.29	-2.59
782	-0.76	-1.06		
787	-0.93	-1.22		
788	-0.98	-1.24		
791	-0.23	-0.16	-2.36	-2.66
793	-1.19	-1.37		
798	-1.37	-1.54		
803	-0.10	-0.76	-2.27	-2.89
806	-0.01	-0.89	-2.15	-3.16
814	-1.98	-2.41		
815	-2.04	-2.45		
821	-0.22	-2.08	-2.10	-3.23
823	-2.53	-2.74		
824	-2.59	-2.77		
830	-2.81	-2.76		
831.5	-2.84	-2.73		
832	-2.85	-2.73		
835	-2.87	-2.65		
836.5	-2.87	-2.63		

838	-2.86	-2.60		
840	-2.81	-2.56		
845	-2.72	-2.48		
847	-2.67	-2.44		
849	-2.62	-2.41		
859	-2.11	-2.11	-1.25	-2.61
860	-2.20	-2.16	-1.28	-2.65
862	-2.29	-2.12		
868	-2.42	-2.28	-1.14	-2.51
869	-2.46	-2.25	-1.15	-2.44
875	-2.40	-2.10	-0.84	-2.19
876.5	-2.40	-2.12	-0.77	-2.14
880	-3.00	-2.29	-0.66	-2.11
881.5	-2.42	-2.19	-0.63	-2.15
883	-2.41	-2.24	-0.62	-2.21
885	-2.47	-2.26	-0.67	-2.30
890	-2.83	-2.31	-0.96	-2.30
894	-0.98	-2.30	-0.96	-2.23
897.5	-3.37	-2.19		
915	-3.82	-2.08		
925	-2.27	-3.17	-1.43	-2.54
942.5	-2.18	-3.11	-1.50	-2.96
960	-2.13	-2.98	-1.75	-3.44
1427.9				
1447.9				
1452	-2.04	-3.26	-5.09	-4.34
1455.4				
1462.9				
1474	-3.45	-4.98	-4.19	-3.49
1496	-3.04	-5.02	-3.05	-2.86
1510.9				
1557			-2.00	-2.03
1561			-2.00	-2.01
1565			-1.88	-1.89
1573			-1.84	-1.76
1575			-1.81	-1.76
1577			-1.83	-1.79
1594			-1.51	-2.03
1602			-0.87	-1.74
1610			-0.71	-1.83

High band

	Tx1/Rx1 antenna		Rx2 antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
1710	-1.33	-2.92		
1732.5	-0.85	-2.80		
1745	-0.92	-2.79		
1747.5	-0.93	-2.74		
1749.9	-0.98	-2.71		
1755	-1.09	-2.67		
1767.4	-1.38	-2.69		
1780	-1.39	-2.97		
1784.9	-1.44	-3.07		
1805	-2.52	-1.02	-2.53	-3.09
1842.5	-1.12	-0.07	-2.00	-2.48
1844.9	-1.11	-0.08	-2.10	-2.51
1850	-1.17	-3.33		
1862.4	-0.81	-3.08	-2.00	-2.37
1880	-0.85	-2.92	-1.89	-2.14
1882.5	-0.83	-2.88		
1900	-0.46	-2.24	-1.92	-1.94
1910	-0.25	-1.92		
1915	-0.19	-1.79		
1920	-0.12	-1.57	-1.91	-1.85
1930	-0.84	-0.38	-1.79	-1.68
1950	0.47	-0.79		
1960	-0.87	-0.09	-1.68	-2.16
1962.5	-0.92	-0.17	-1.75	-2.23
1980	0.95	-0.42		
1990	-0.31	-0.11	-2.06	-2.02
1995	-0.19	-0.06	-2.15	-2.15
2010	0.24	0.38	-1.92	-1.73
2018	1.15	-0.75	-1.82	-1.74
2025	1.18	-0.83	-1.84	-1.64
2110	0.57	0.69	-1.85	-1.58
2132.5	1.23	-0.87	-1.68	-1.46
2140	0.08	0.29	-1.37	-1.31
2155	-0.28	0.50	-1.35	-1.52
2170	-0.14	0.50	-1.45	-1.53
2200	0.13	0.47	-1.49	-1.72
2300	0.52	0.40	-1.48	-1.78
2305	0.64	0.41		
2310	2.42	0.02		
2315	0.97	0.11		
2350	0.94	0.17	-1.19	-1.90
2355	0.99	0.18	-1.14	-1.99
2360	1.72	-0.57	-0.65	-2.35

2400	1.46	-0.54	-0.83	-2.40
2496	1.25	-0.62	-0.84	-2.50
2500	0.96	-0.75		
2535	1.85	-0.17		
2570	1.73	-0.31	0.08	-1.62
2593	1.38	-1.15	0.03	-1.04
2595	0.98	-0.75	-0.07	-0.59
2620	0.64	-0.74	-0.28	-0.62
2655	0.57	-0.72	-0.42	-0.60
2690	-0.11	-0.57	-1.38	-1.26
3300	-0.07	-0.51	-2.29	-2.56
3400	-0.79	-0.46	-3.34	-2.68
3500	-0.04	-1.30	-0.84	-0.58
3550	-0.09	-1.31	-1.19	-1.03
3600	-0.30	-2.39	-0.11	-1.51
3625	-0.86	-3.10	-1.30	-2.60
3700	-1.57	-3.77	-0.95	-3.26
3750	-1.88	-3.59	-0.46	-2.48
3800	-2.05	-2.60	-0.18	-1.90
4200	-2.09	-2.77	-0.81	-1.33
4400	-3.44	-3.65	-1.02	-1.19
4700	-10.96	-10.76	-2.59	-3.29
5000	-4.14	-4.57	-7.22	-7.85
5150	-4.33	-4.46	-5.52	-5.83
5537.5	-2.64	-3.54	-4.54	-4.51
5925	-3.03	-3.98	-5.47	-5.64

Tablet Mode

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)
Tx1/Rx1 Antenna P/N:77C82	Wistron Corp	Monopole coupling	50 ohm Coaxial length: 285mm diameter: 1.13mm Connector：IPEX	617-698MHz -0.32 dBi (peak)	617-698MHz 0 dBi (peak)	617-698MHz 4.5 max	617-698MHz 0.32 dBi (peak)
				698-821MHz -0.07 dBi (peak)	698-821MHz 0.31 dBi (peak)	698-821MHz 4.5 max	698-821MHz 0.38 dBi (peak)
				824-960MHz -1.4 dBi (peak)	824-960MHz -0.96 dBi (peak)	824-960MHz 4.5 max	824-960MHz 0.44 dBi (peak)
				1452-1515MHz -1.13 dBi (peak)	1452-1515MHz -0.66 dBi (peak)	1452-1515MHz 3 max	1452-1515MHz 0.47 dBi (peak)
				1710-2200MHz -1 dBi (peak)	1710-2200MHz -0.37 dBi (peak)	1710-2200MHz 3 max	1710-2200MHz 0.63 dBi (peak)
				2300-2690MHz 0.88 dBi (peak)	2300-2690MHz 1.56 dBi (peak)	2300-2690MHz 3 max	2300-2690MHz 0.68 dBi (peak)
				3300-3800MHz -0.2 dBi (peak)	3300-3800MHz 0.67 dBi (peak)	3300-3800MHz 3 max	3300-3800MHz 0.87 dBi (peak)
				4200-5000MHz -3.31 dBi (peak)	4200-5000MHz -2.34 dBi (peak)	4200-5000MHz 3 max	4200-5000MHz 0.97 dBi (peak)
				5150-5925MHz -3.23 dBi (peak)	5150-5925MHz -2.1 dBi (peak)	5150-5925MHz 3 max	5150-5925MHz 1.13 dBi (peak)
Rx2 Antenna P/N:77C82	Wistron Corp	Monopole coupling	50 ohm Coaxial length: 485mm diameter: 1.13mm Connector：IPEX	617-698MHz -3.65 dBi (peak)	617-698MHz -3.1 dBi (peak)	617-698MHz 5 max	617-698MHz 0.55 dBi (peak)
				698-821MHz -2.80 dBi (peak)	698-821MHz -2.15 dBi (peak)	698-821MHz 5 max	698-821MHz 0.65 dBi (peak)
				716-821MHz -2.80 dBi (peak)	716-821MHz -2.15 dBi (peak)	716-821MHz 5 max	716-821MHz 0.65 dBi (peak)
				824-960MHz -2.56 dBi (peak)	824-960MHz -1.81 dBi (peak)	824-960MHz 4.5 max	824-960MHz 0.75 dBi (peak)
				1452-1515MHz -3.59 dBi (peak)	1452-1515MHz -2.78 dBi (peak)	1452-1515MHz 3 max	1452-1515MHz 0.81 dBi (peak)
				1557-1610 MHz 0.23 dBi (peak)	1557-1610 MHz 1.09 dBi (peak)	1557-1610 MHz 3 max	1557-1610 MHz 0.86 dBi (peak)
				1805-2200MHz -2.2 dBi (peak)	1805-2200MHz -1.14 dBi (peak)	1805-2200MHz 3 max	1805-2200MHz 1.06 dBi (peak)
				2300-2690MHzz 0.56 dBi (peak)	2300-2690MHzz 1.71 dBi (peak)	2300-2690MHzz 3 max	2300-2690MHzz 1.15 dBi (peak)
				3300-3800MHz 0.34 dBi (peak)	3300-3800MHz 1.81 dBi (peak)	3300-3800MHz 3 max	3300-3800MHz 1.47 dBi (peak)
				4200-5000MHz -0.74 dBi (peak)	4200-5000MHz 0.91 dBi (peak)	4200-5000MHz 3 max	4200-5000MHz 1.65 dBi (peak)
				5150-5925MHz -2.9 dBi (peak)	5150-5925MHz -0.97 dBi (peak)	5150-5925MHz 3 max	5150-5925MHz 1.93 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(I):
Low and middle band

Frequency (MHz)	Tx1/Rx1 antenna		Rx2 antenna	
	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
617	-4.00	-6.86	-4.22	-7.15
634.5	-2.63	-5.35	-4.03	-6.55
652	-1.62	-3.90	-3.65	-4.86
663	-1.11	-3.16		
680.5	-0.81	-2.37		
698	-0.32	-1.87		
703	-0.07	-1.64		
707.5	-0.07	-1.75		
716	-0.36	-2.02		
717	-0.37	-2.03	-3.20	-2.80
722.5	-0.54	-2.27	-3.36	-3.03
725.5	-0.72	-2.44		
728	-0.96	-2.64	-3.58	-3.27
729	-1.04	-2.75	-3.60	-3.31
737.5	-1.65	-2.78	-3.94	-3.34
746	-1.91	-2.72	-4.07	-3.40
748	-1.89	-2.70		
751	-1.90	-2.64	-3.78	-3.48
756	-1.82	-2.57	-3.78	-3.57
758	-1.82	-2.57	-3.83	-3.61
763	-1.54	-2.36	-3.73	-3.57
768	-1.56	-2.22	-3.90	-3.48
777	-1.29	-2.31		
780.5	-1.24	-2.29	-3.66	-3.37
782	-1.32	-2.29		
787	-1.50	-2.32		
788	-1.45	-2.30		
791	-1.40	-2.31	-3.87	-3.31
793	-1.39	-2.31		
798	-1.40	-2.27		
803	-1.41	-2.44	-4.05	-3.50
806	-1.27	-2.50	-3.94	-3.56
814	-1.52	-2.63		
815	-1.49	-2.64		
821	-1.57	-2.80	-4.03	-3.77
823	-1.58	-2.89		
824	-1.54	-2.91		
830	-1.40	-2.98		
831.5	-1.44	-3.00		
832	-1.44	-3.07		
835	-1.61	-3.11		
836.5	-1.70	-3.17		

838	-1.73	-3.21		
840	-1.73	-3.21		
845	-1.67	-3.18		
847	-1.60	-3.19		
849	-1.57	-3.23		
859	-1.40	-3.47	-3.12	-3.69
860	-1.49	-3.49	-3.16	-3.71
862	-1.55	-3.48		
868	-1.75	-3.56	-3.07	-3.34
869	-1.81	-3.60	-3.06	-3.34
875	-1.73	-3.69	-2.81	-3.23
876.5	-1.74	-3.75	-2.72	-3.19
880	-1.75	-3.80	-2.63	-3.16
881.5	-1.78	-3.82	-2.58	-3.14
883	-1.82	-3.85	-2.56	-3.10
885	-1.89	-3.84	-2.61	-3.06
890	-2.31	-3.90	-2.96	-3.03
894	-2.49	-3.97	-2.98	-3.01
897.5	-2.68	-4.05		
915	-3.40	-4.51		
925	-3.84	-4.81	-3.20	-3.35
942.5	-3.96	-5.14	-3.37	-3.90
960	-4.09	-5.52	-4.01	-4.46
1427.9				
1447.9				
1452	-1.76	-5.93	-6.57	-6.74
1455.4				
1462.9				
1474	-1.13	-6.38	-5.24	-5.25
1496	-2.03	-5.67	-3.59	-4.83
1510.9				
1557			-0.92	-3.60
1561			-0.84	-3.70
1565			-0.72	-3.56
1573			-0.66	-3.31
1575			-0.67	-3.26
1577			-0.71	-3.30
1594			-0.56	-3.26
1602			0.06	-2.96
1610			0.23	-2.90

High band

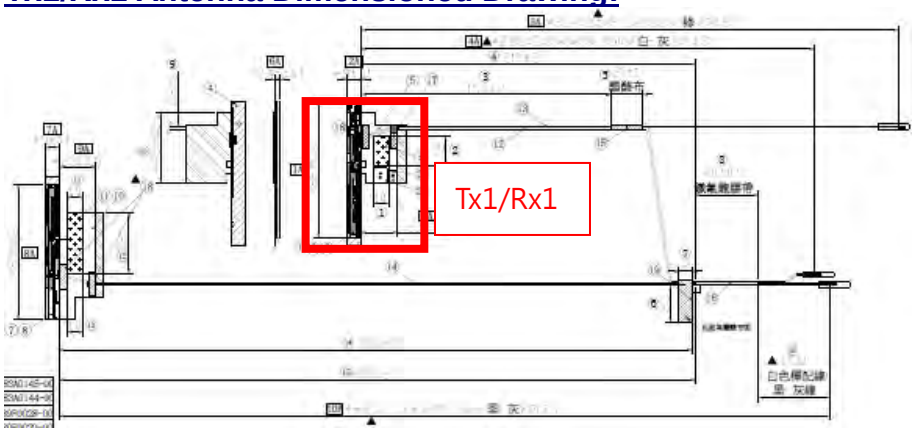
	Tx1/Rx1 antenna		Rx2 antenna	
Frequency (MHz)	Horizontal (dBi)	Vertical (dBi)	Horizontal (dBi)	Vertical (dBi)
1710	-1.00	-3.22		
1732.5	-1.30	-3.07		
1745	-1.52	-3.00		
1747.5	-1.55	-2.97		
1749.9	-1.55	-2.99		
1755	-1.82	-2.94		
1767.4	-1.86	-3.05		
1780	-2.03	-3.00		
1784.9	-2.07	-3.00		
1805	-2.26	-2.91	-2.92	-3.36
1842.5	-2.35	-2.41	-2.33	-2.75
1844.9	-2.34	-2.51	-2.28	-2.83
1850	-2.30	-2.55		
1862.4	-2.10	-2.48	-2.20	-2.80
1880	-1.96	-2.37	-2.28	-2.89
1882.5	-1.94	-2.36		
1900	-1.80	-2.27	-2.57	-2.65
1910	-1.64	-2.30		
1915	-1.63	-2.41		
1920	-1.70	-2.51	-2.64	-2.68
1930	-1.49	-2.39	-2.58	-2.57
1950	-1.59	-2.58		
1960	-1.62	-2.60	-2.99	-3.12
1962.5	-1.72	-2.61	-3.04	-3.02
1980	-1.87	-2.22		
1990	-2.02	-2.03	-3.69	-2.98
1995	-1.99	-1.94	-3.69	-3.01
2010	-1.81	-1.58	-3.61	-2.68
2018	-1.77	-1.51	-3.58	-2.67
2025	-1.66	-1.59	-3.58	-2.69
2110	-1.65	-1.47	-3.62	-2.70
2132.5	-1.51	-1.47	-3.52	-2.65
2140	-1.24	-2.90	-3.11	-2.75
2155	-1.03	-3.07	-3.20	-3.16
2170	-1.01	-3.17	-3.09	-3.16
2200	-1.09	-3.27	-3.07	-3.28
2300	-1.45	-3.18	-3.31	-3.23
2305	-1.47	-3.23		
2310	-0.77	-4.15		
2315	-0.64	-4.18		
2350	-0.51	-3.98	-1.89	-2.34
2355	-0.53	-4.06	-1.79	-2.38
2360	-0.36	-3.91	-0.71	-2.47

2400	-0.46	-3.79	-0.79	-2.71
2496	-0.54	-3.83	-0.79	-2.62
2500	-0.85	-3.58		
2535	0.00	-4.58		
2570	0.08	-4.56	0.49	-2.30
2593	0.26	-4.12	0.52	-1.95
2595	0.86	-2.94	0.56	-1.83
2620	0.88	-2.50	0.21	-2.18
2655	0.76	-2.48	0.13	-2.27
2690	0.69	-2.23	-0.81	-3.40
3300	-0.20	-2.55	-2.33	-5.50
3400	-1.34	-3.11	-2.87	-7.07
3500	-3.16	-4.38	-0.48	-4.91
3550	-1.41	-3.20	-0.78	-5.62
3600	-1.60	-2.88	0.34	-5.26
3625	-2.33	-2.72	-0.57	-5.46
3700	-3.95	-3.31	-0.35	-4.66
3750	-5.22	-4.11	-0.89	-4.54
3800	-6.12	-5.40	-0.75	-4.48
4200	-3.95	-3.31	-0.92	-4.44
4400	-7.28	-5.51	-0.74	-4.28
4700	-9.78	-5.51	-3.51	-3.17
5000	-5.27	-6.50	-7.23	-8.31
5150	-6.18	-6.21	-5.52	-5.97
5537.5	-4.77	-3.98	-3.86	-6.16
5925	-4.31	-3.23	-2.90	-7.24

Section 2. Dimensioned Photos or Drawings of Antennas

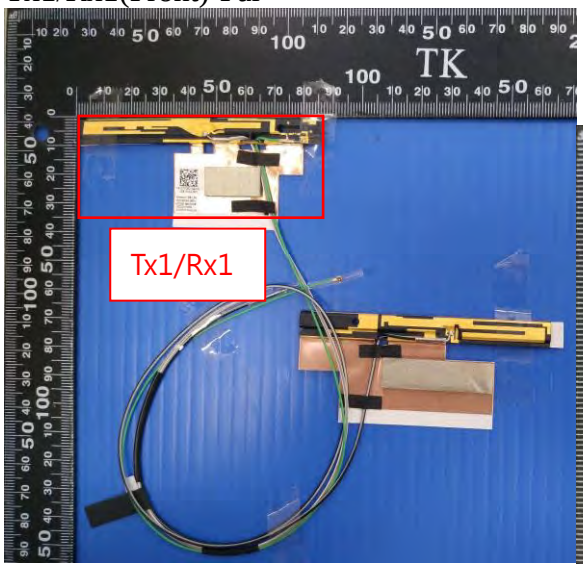
Include a dimensioned photo and dimensioned drawing of Tx1/Rx1 antenna here.

Tx1/Rx1 Antenna Dimensioned Drawing:

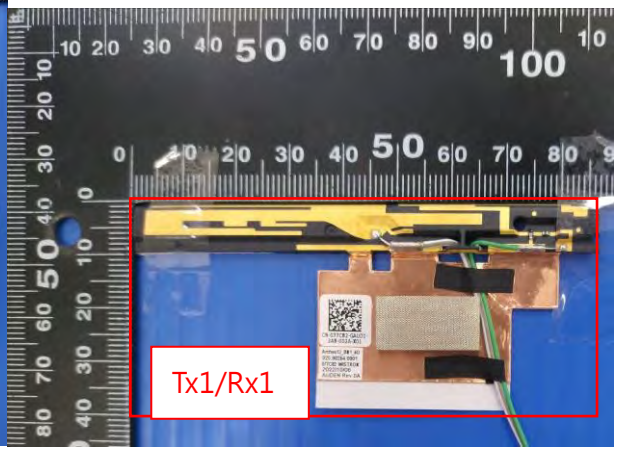


Tx1/Rx1 Antenna Photo:

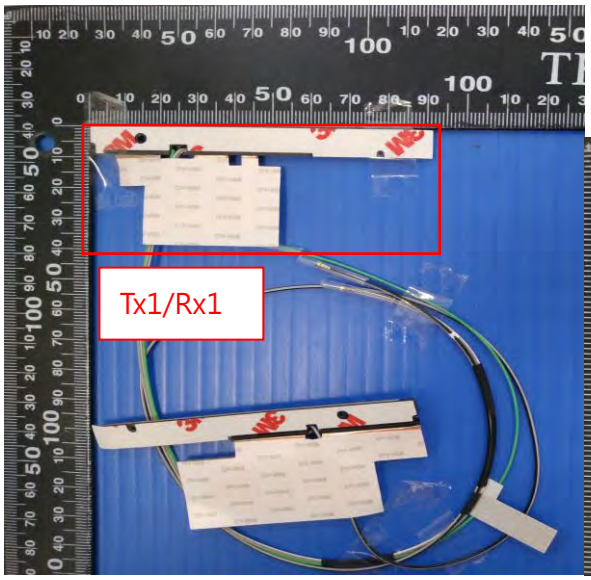
Tx1/Rx1(Front)-Far



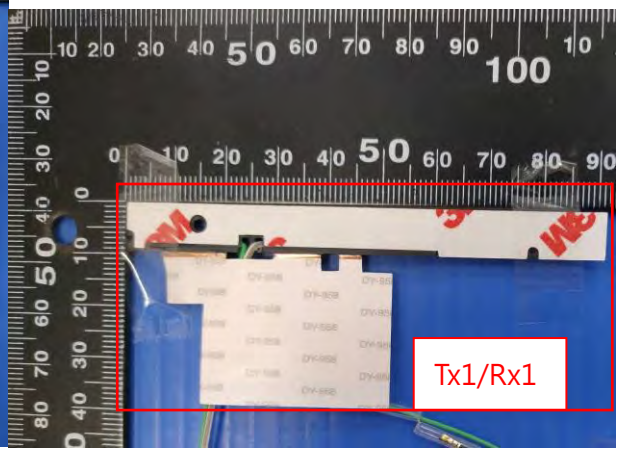
Tx1/Rx1 (Front)-Near



Tx1/Rx1 (Back)-Far

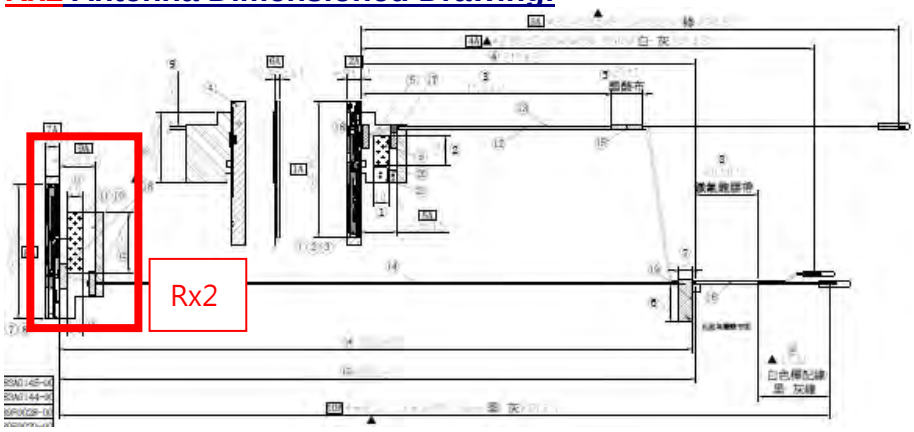


Tx1/Rx1 (Back)-Near



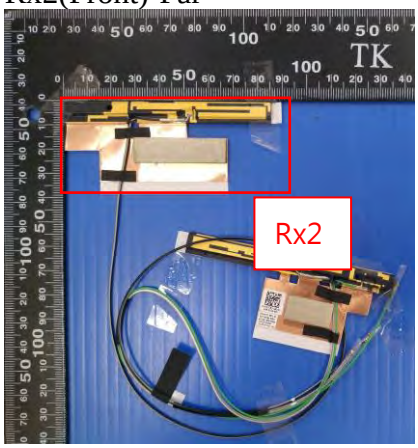
Include a dimensioned photo and dimensioned drawing of Rx2 antenna here.

Rx2 Antenna Dimensioned Drawing:

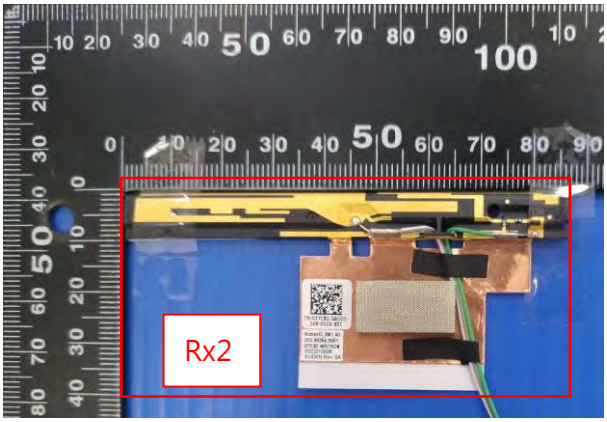


Rx2 Antenna Photo:

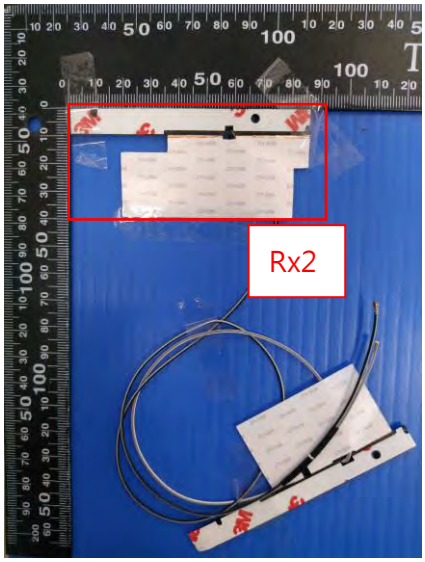
Rx2(Front)-Far



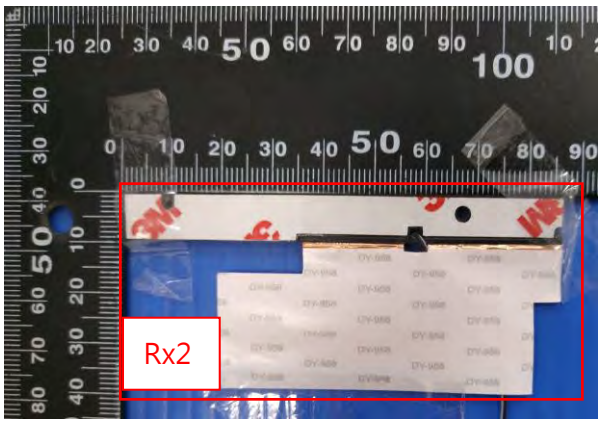
Rx2 (Front)-Near



Rx2 (Back)-Far

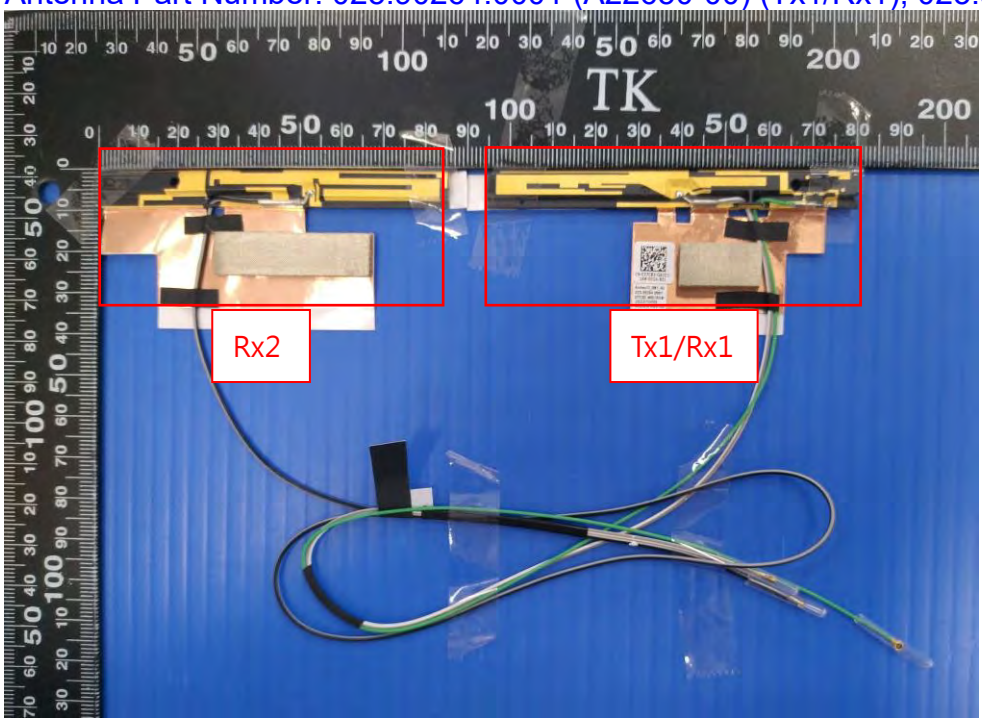


Rx2 (Front)-Near



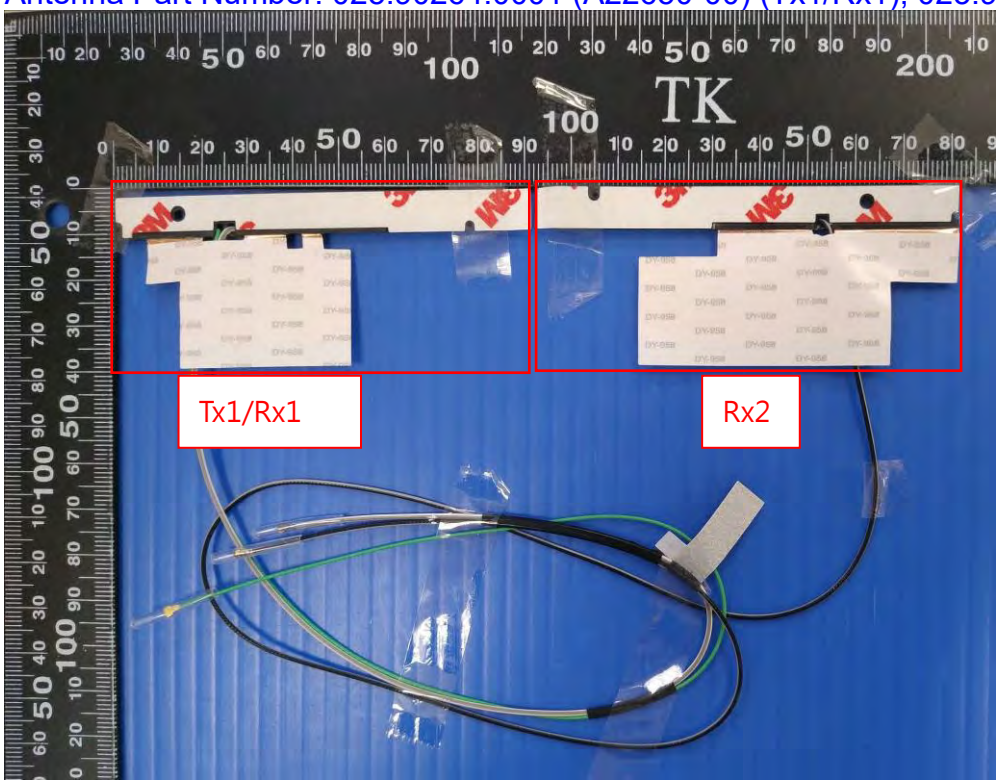
Include front view photo of all 2 antennas here.

Antenna Manufacturer: Auden Techno Corp.
Antenna Part Number: 025.90264.0001 (A22650-00) (Tx1/Rx1), 025.90264.0001 (A22650-00) (Rx2)



Include back view photo of all 2 antennas here.

Antenna Manufacturer: Auden Techno Corp.
Antenna Part Number: 025.90264.0001 (A22650-00) (Tx1/Rx1), 025.90264.0001 (A22650-00) (Rx2)

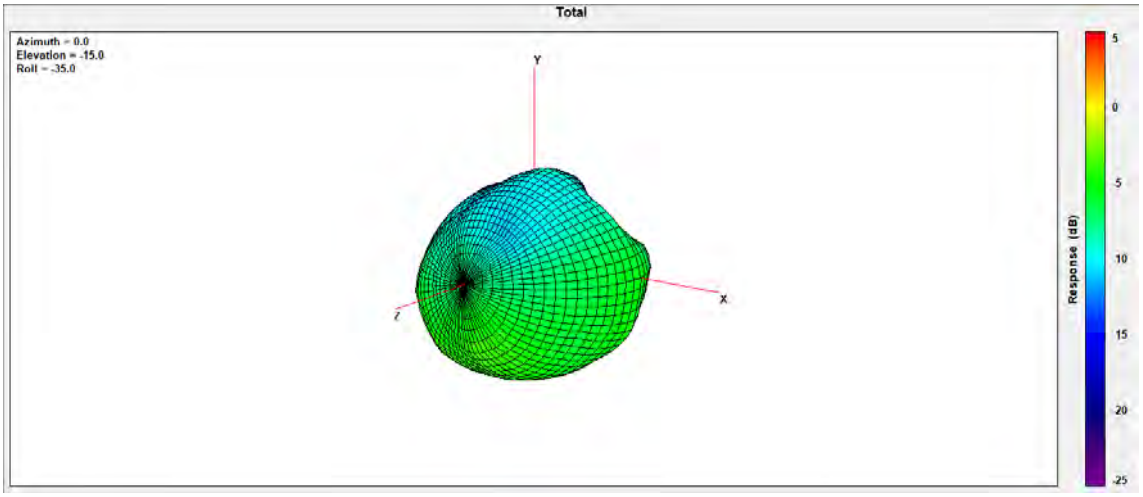


Section 3. Radiation characteristics of antennae Loaded in Host Platform

NB mode

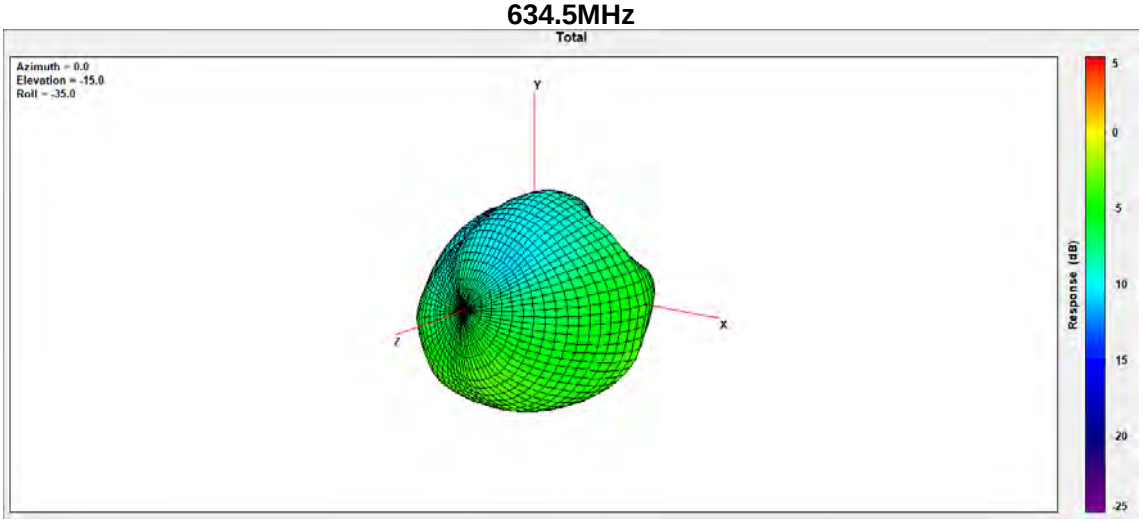
WWAN Main Antenna (Tx1/Rx1)

617MHz



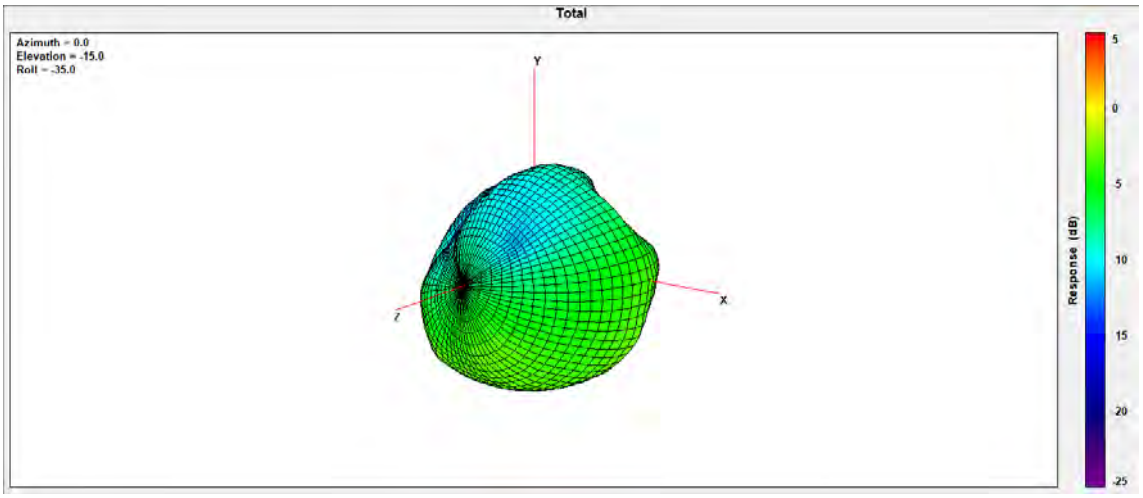
617MHz	H (Peak)	V (Peak)
	-3.11	-3.50

634.5MHz



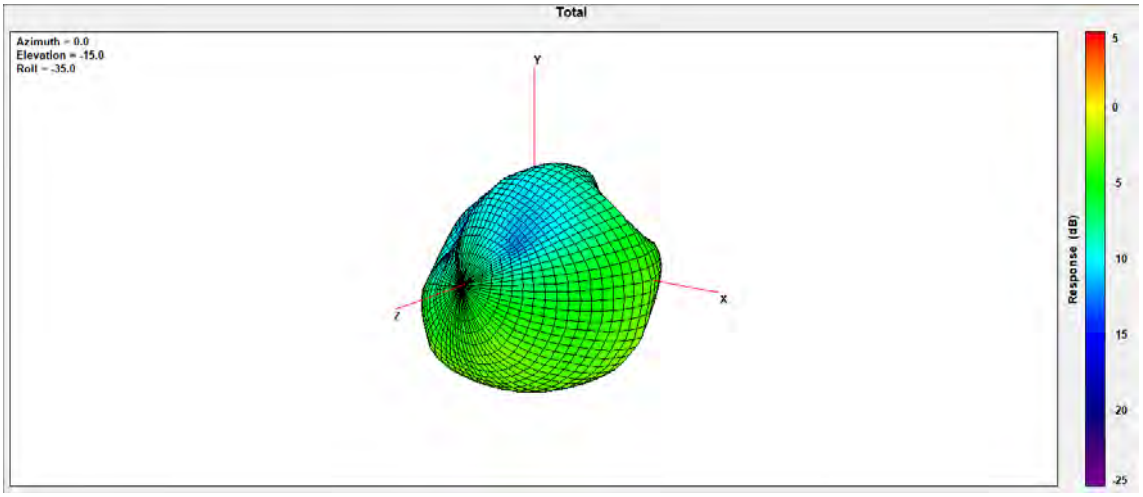
634.5MHz	H (Peak)	V (Peak)
	-2.58	-3.53

652MHz



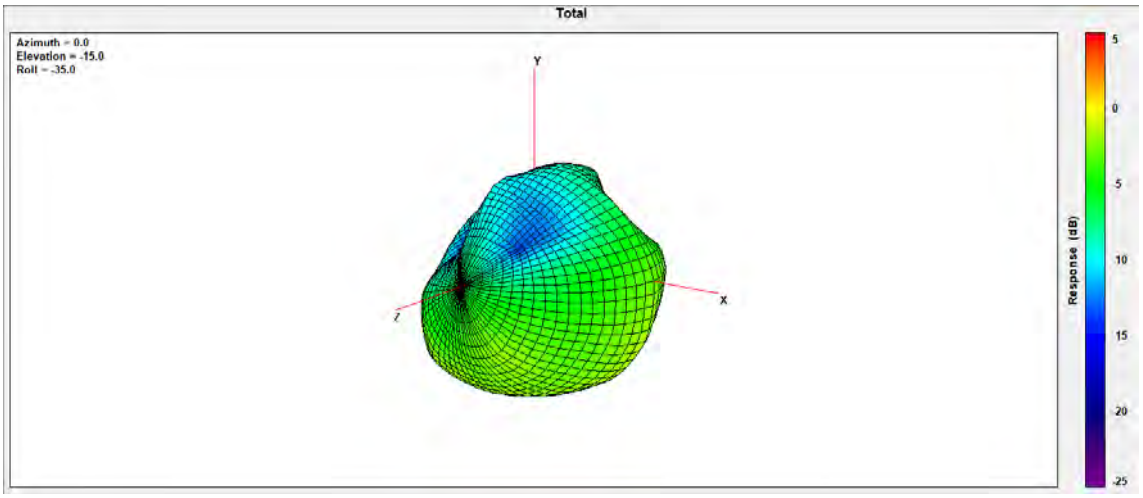
652MHz	H (Peak)	V (Peak)
	-3.17	-3.14

663MHz



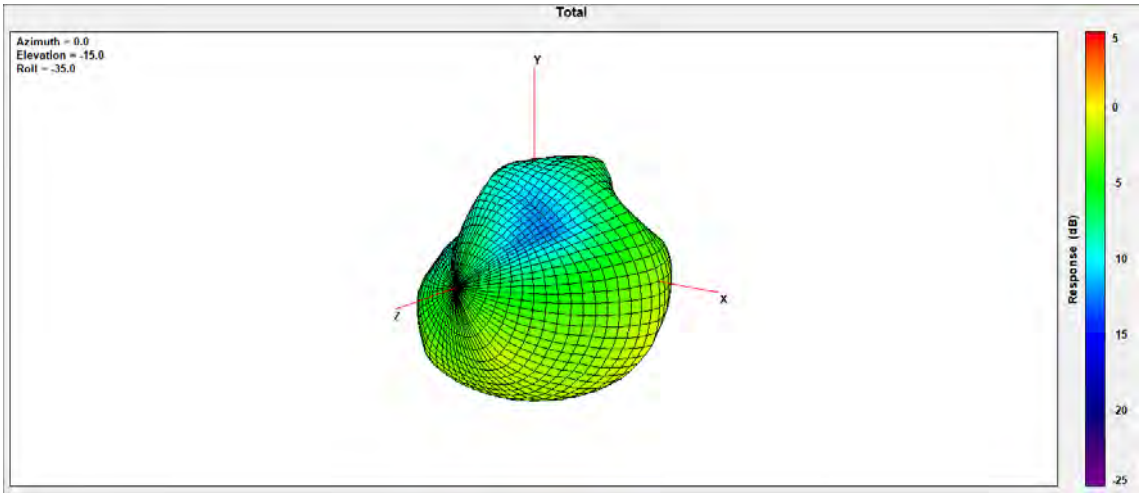
663MHz	H (Peak)	V (Peak)
	-3.26	-3.24

680.5MHz



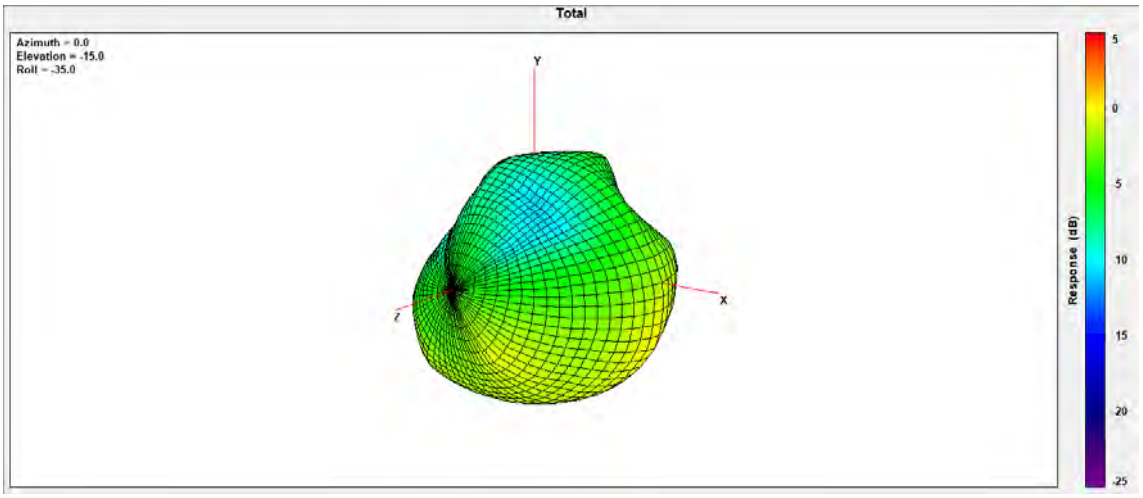
680.5Hz	H (Peak)	V (Peak)
	-2.62	-3.42

698MHz



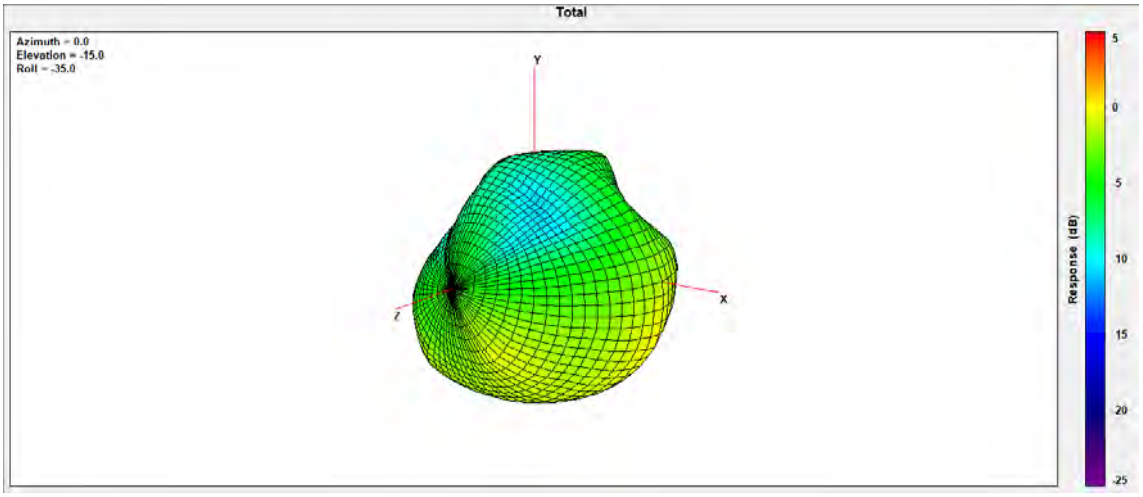
698MHz	H (Peak)	V (Peak)
	-1.99	-2.91

703MHz



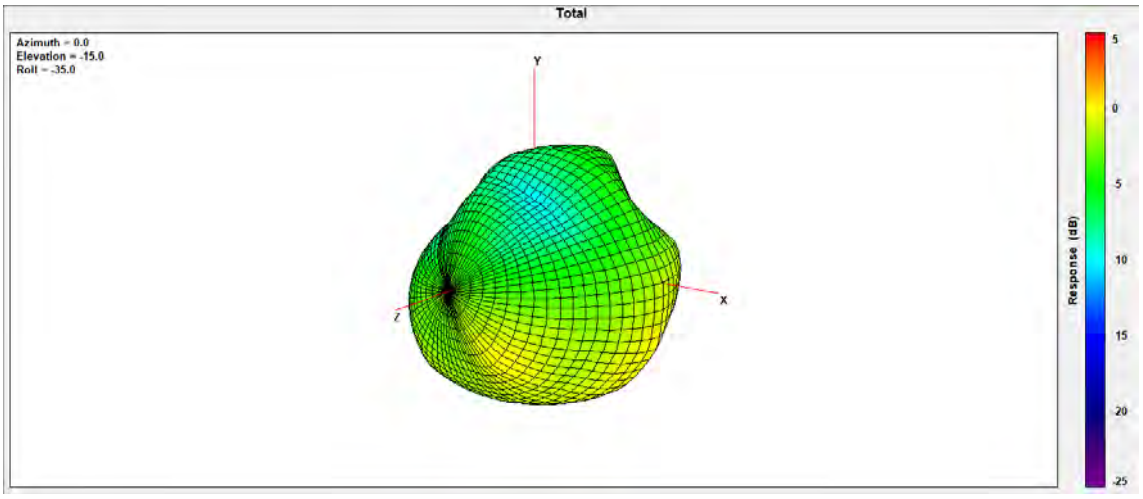
703MHz	H (Peak)	V (Peak)
	-1.70	-1.93

707.5MHz



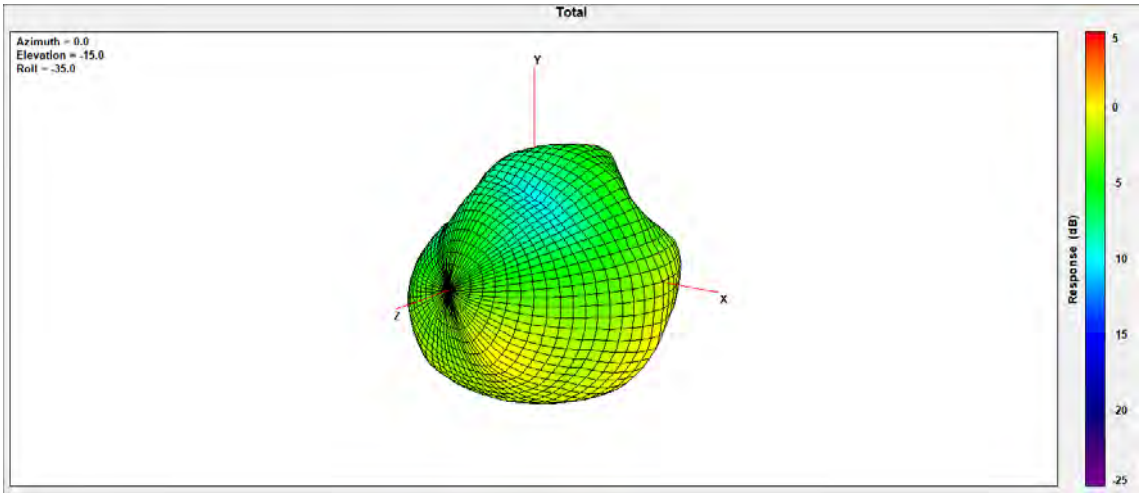
707.5MHz	H (Peak)	V (Peak)
	-1.47	-1.62

716MHz



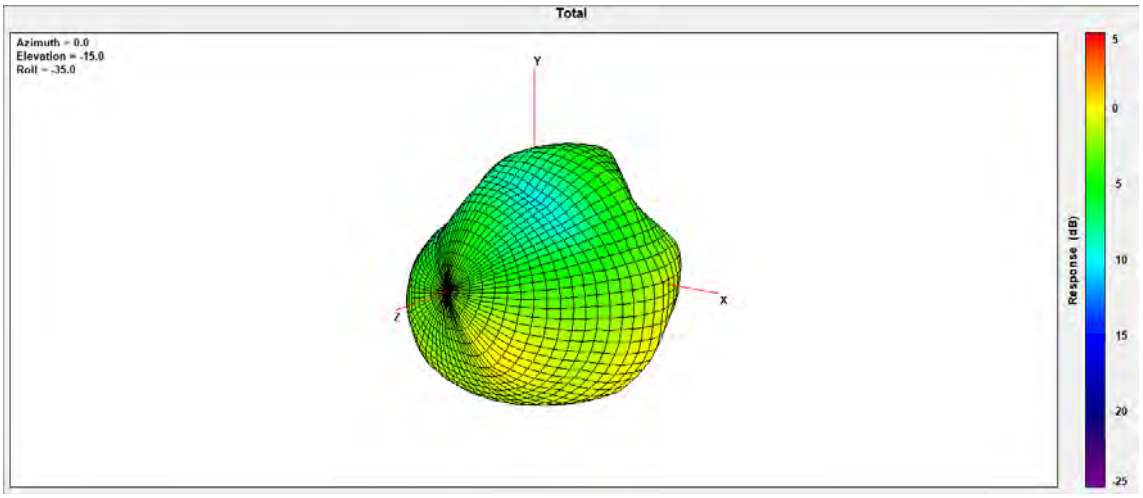
716MHz	H (Peak)	V (Peak)
	-1.23	-1.29

717MHz



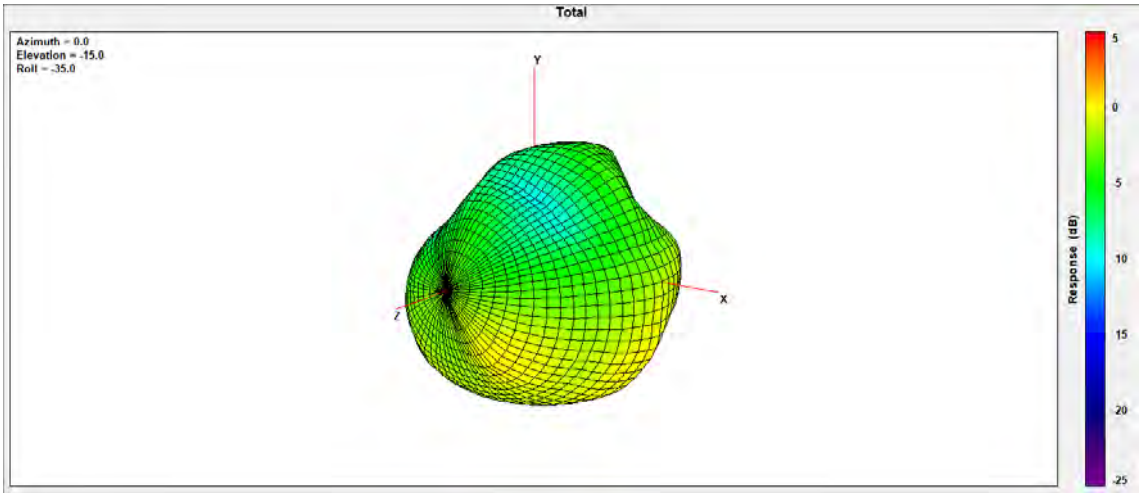
717MHz	H (Peak)	V (Peak)
	-1.25	-0.96

722.5MHz



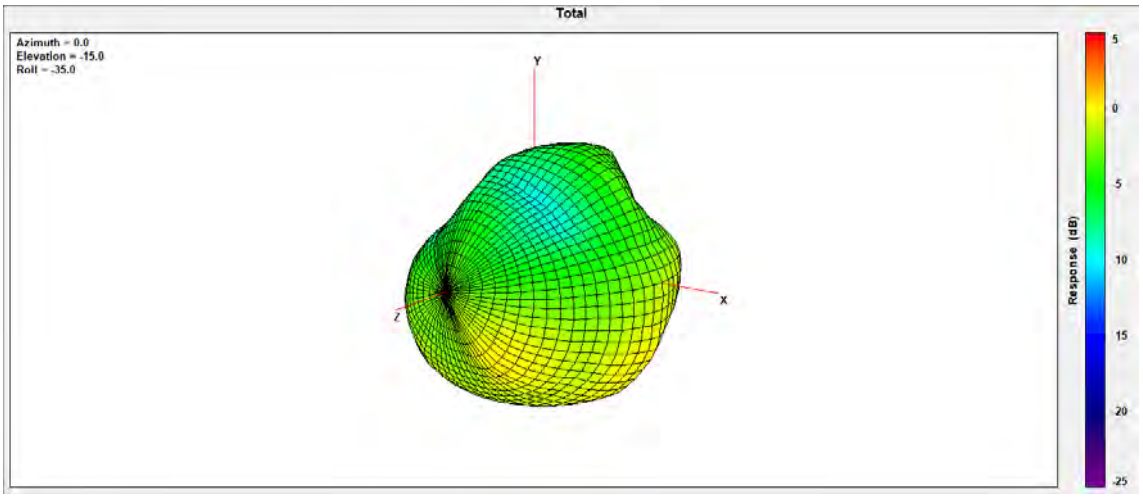
722.5MHz	H (Peak)	V (Peak)
	-1.09	-0.66

725.5MHz



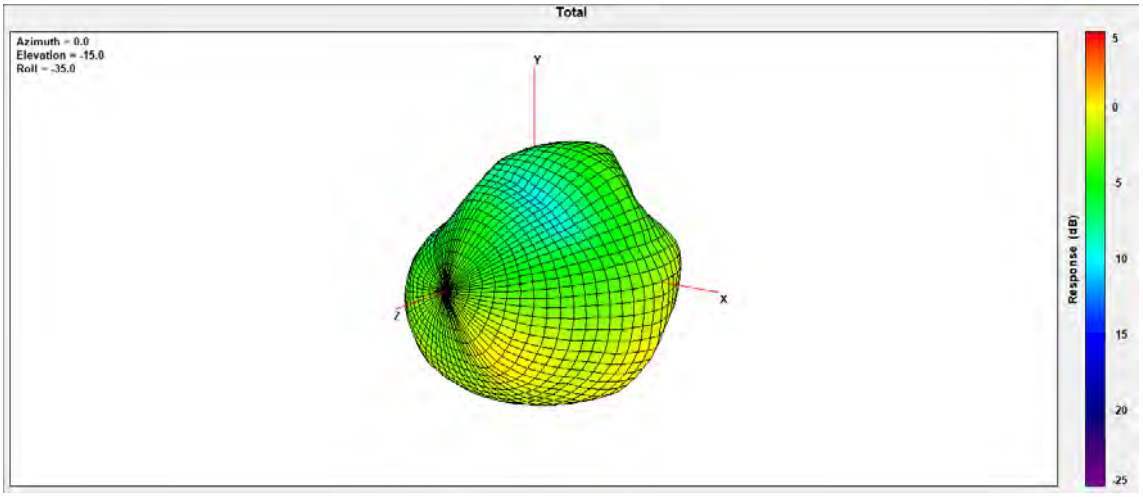
725.5MHz	H (Peak)	V (Peak)
	-0.97	-1.18

728MHz



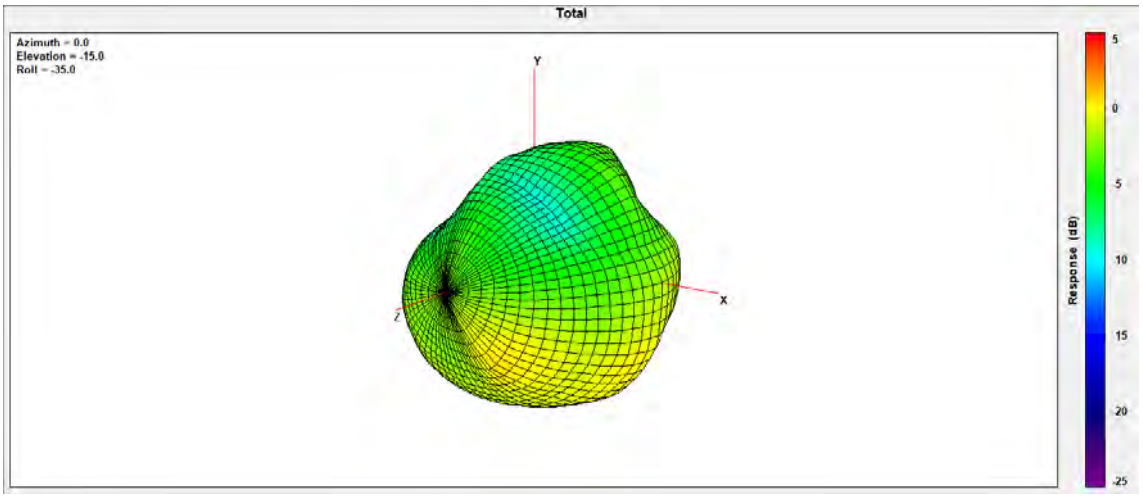
728MHz	H (Peak)	V (Peak)
	-1.38	-0.61

729MHz



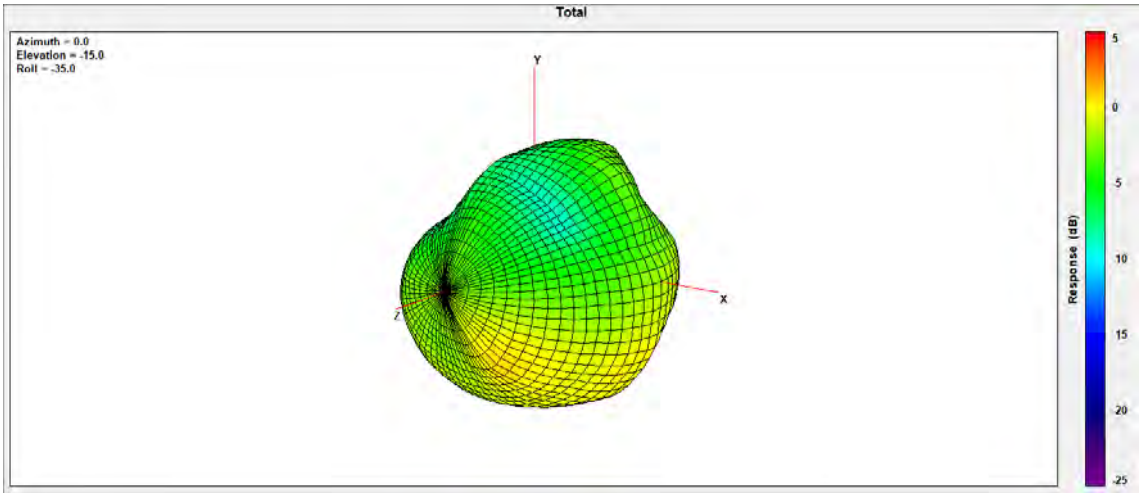
729MHz	H (Peak)	V (Peak)
	-1.45	-0.59

737.5MHz



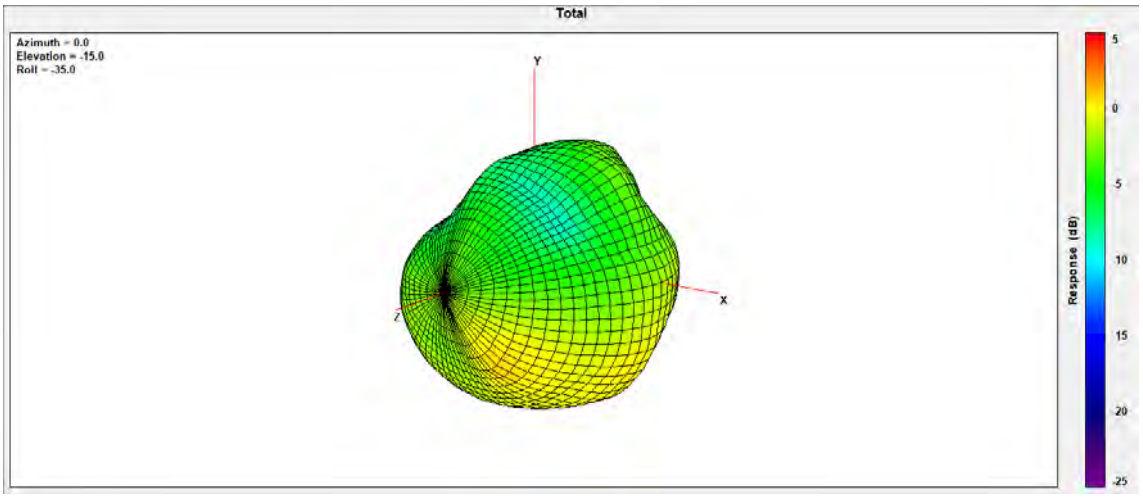
737.5MHz	H (Peak)	V (Peak)
	-1.08	-0.33

746MHz



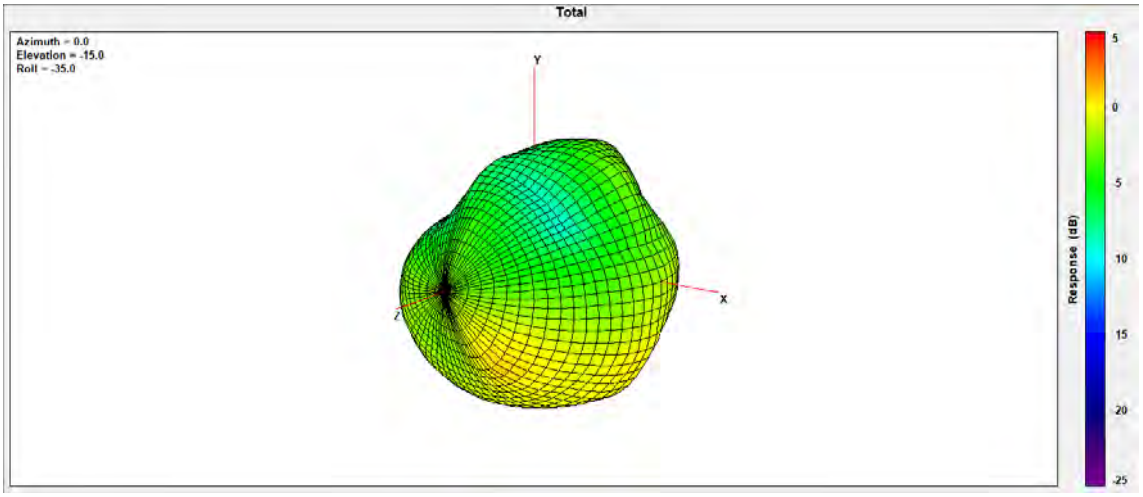
746MHz	H (Peak)	V (Peak)
	-1.23	-0.04

748MHz



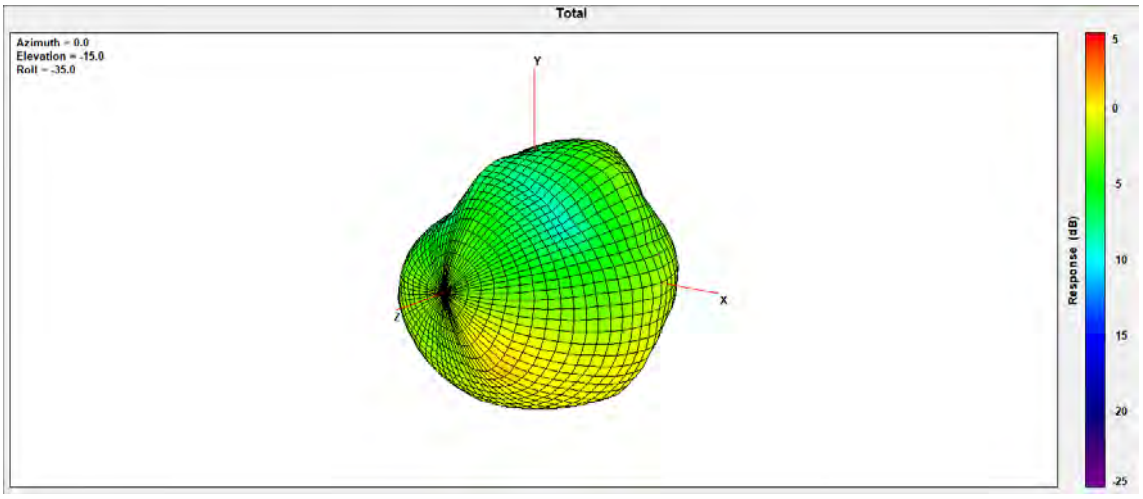
748MHz	H (Peak)	V (Peak)
	-0.61	-0.99

751MHz



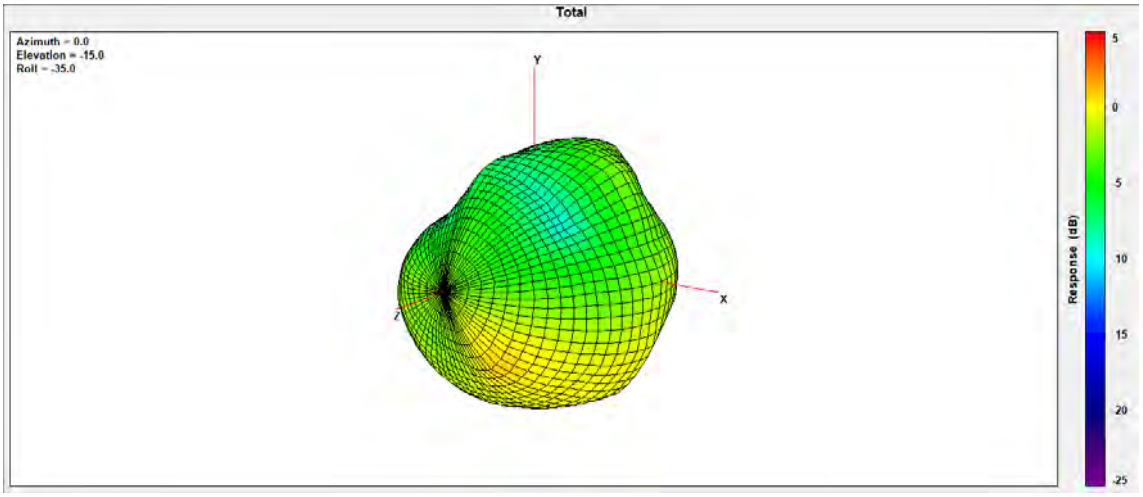
751MHz	H (Peak)	V (Peak)
	-0.78	-0.03

756MHz



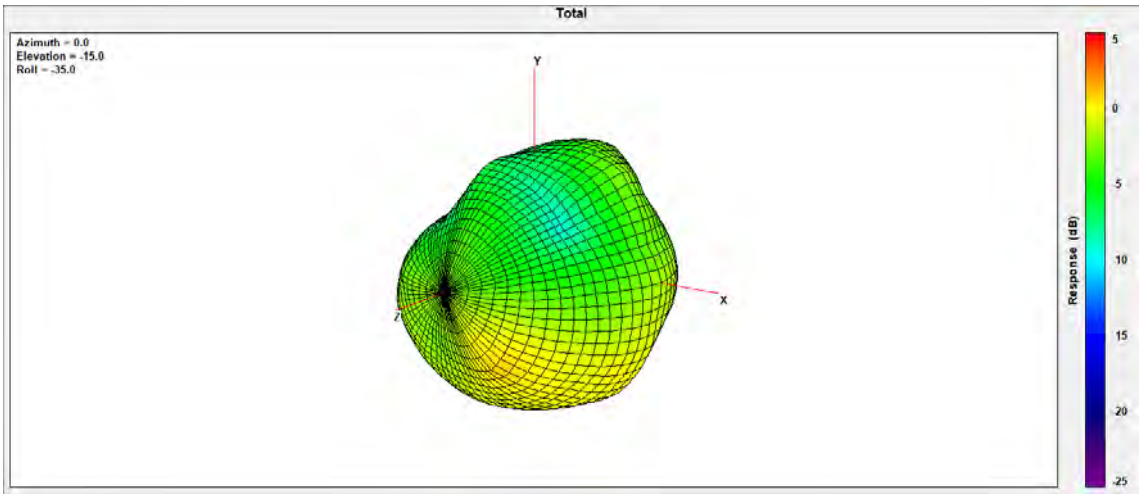
756MHz	H (Peak)	V (Peak)
	-0.75	-0.05

758MHz



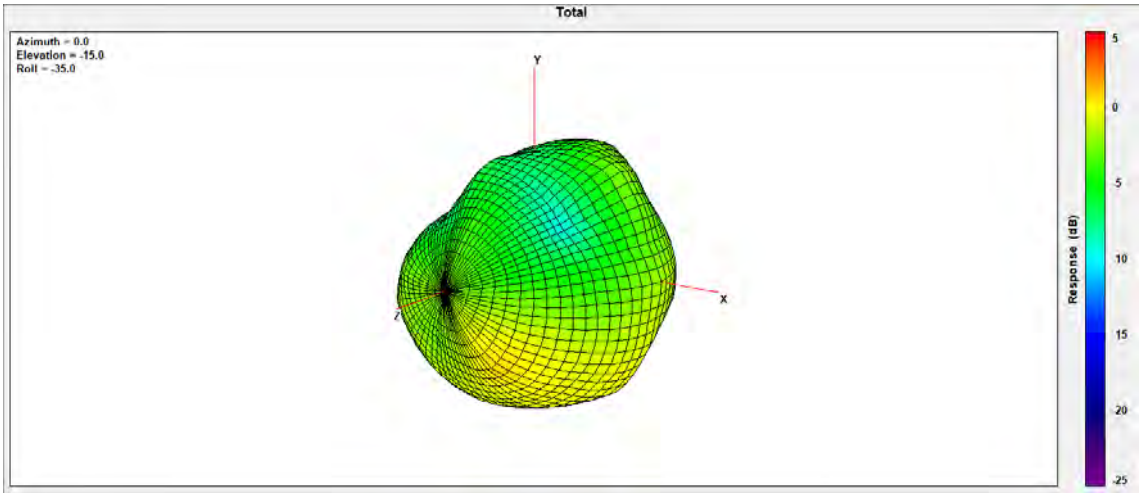
758MHz	H (Peak)	V (Peak)
	-0.80	-0.11

763MHz



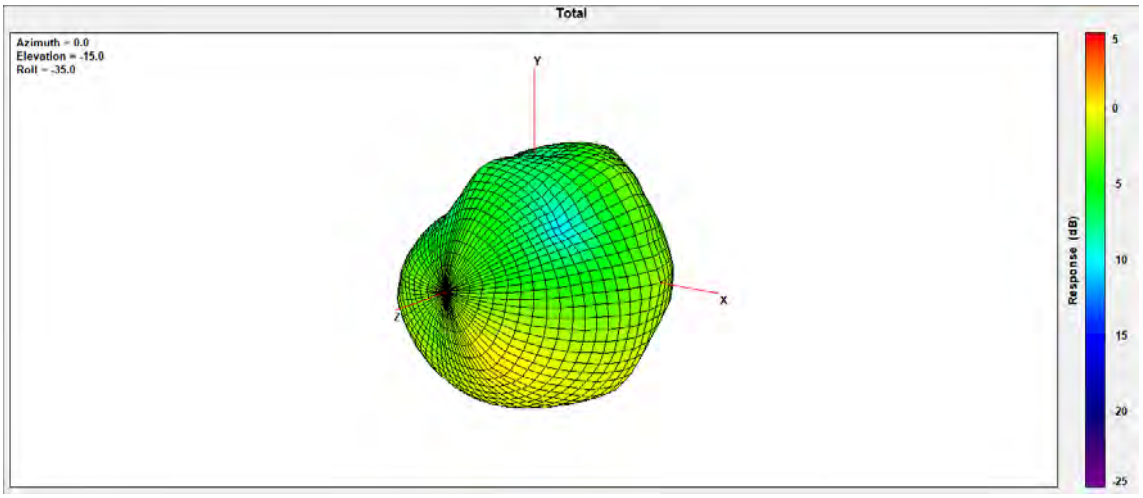
763MHz	H (Peak)	V (Peak)
	-0.58	-0.10

768MHz



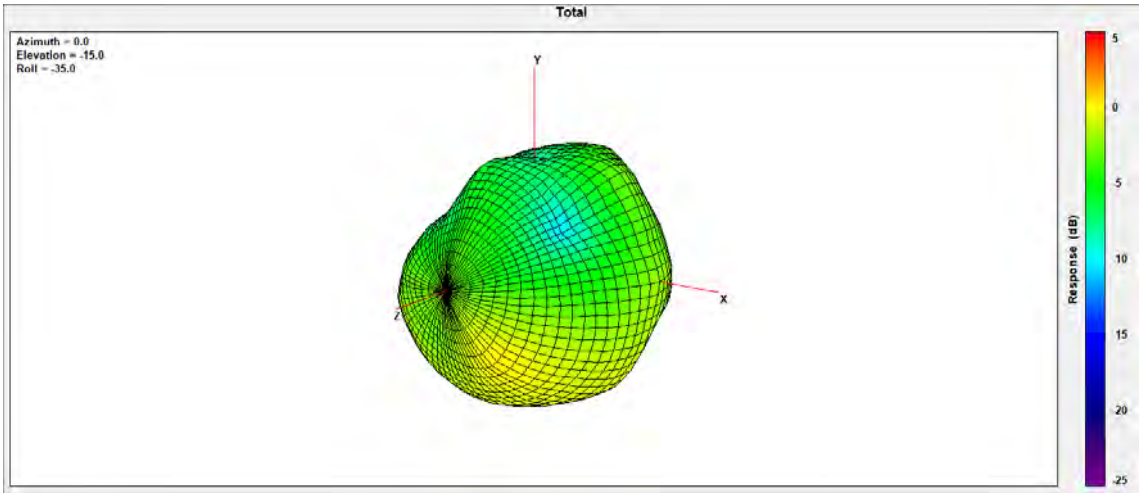
768MHz	H (Peak)	V (Peak)
	-0.60	0.02

777MHz



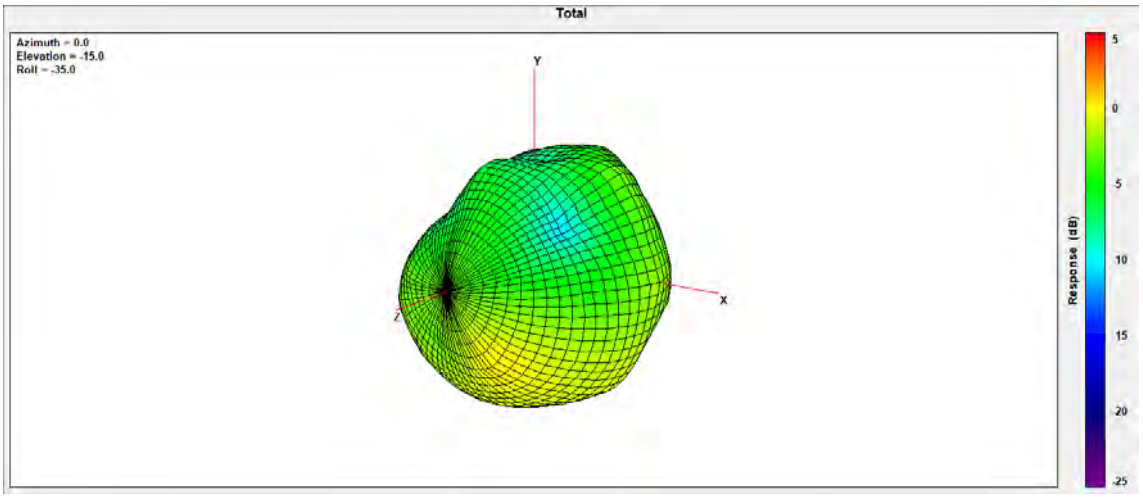
777MHz	H (Peak)	V (Peak)
	-0.74	-0.90

780.5MHz



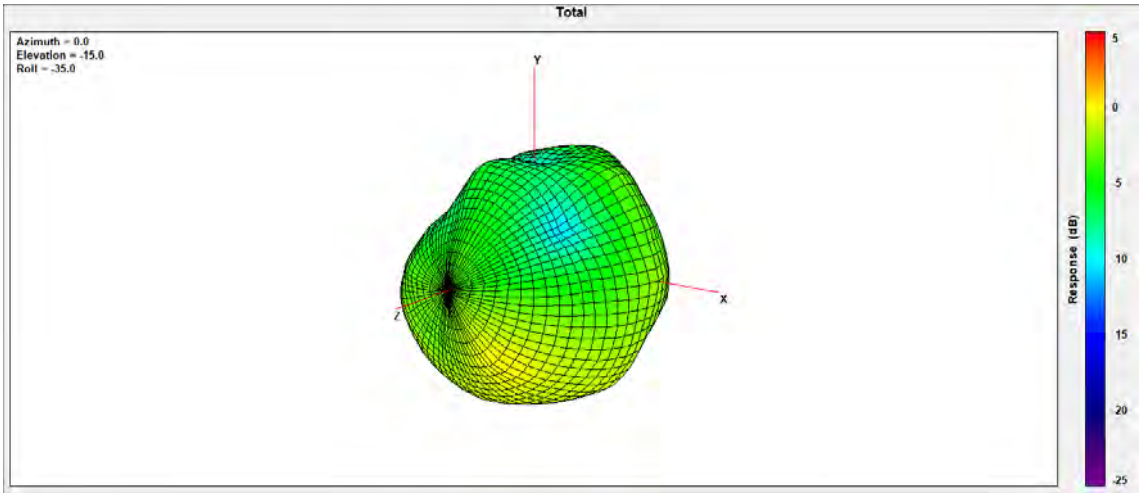
780.5MHz	H (Peak)	V (Peak)
	-0.09	-0.15

782MHz



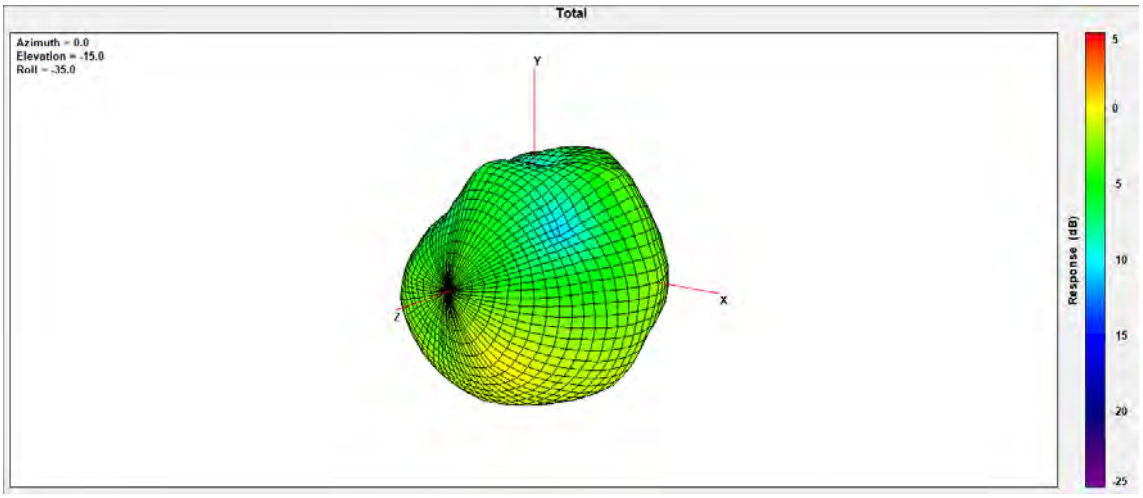
782MHz	H (Peak)	V (Peak)
	-0.76	-1.06

787MHz



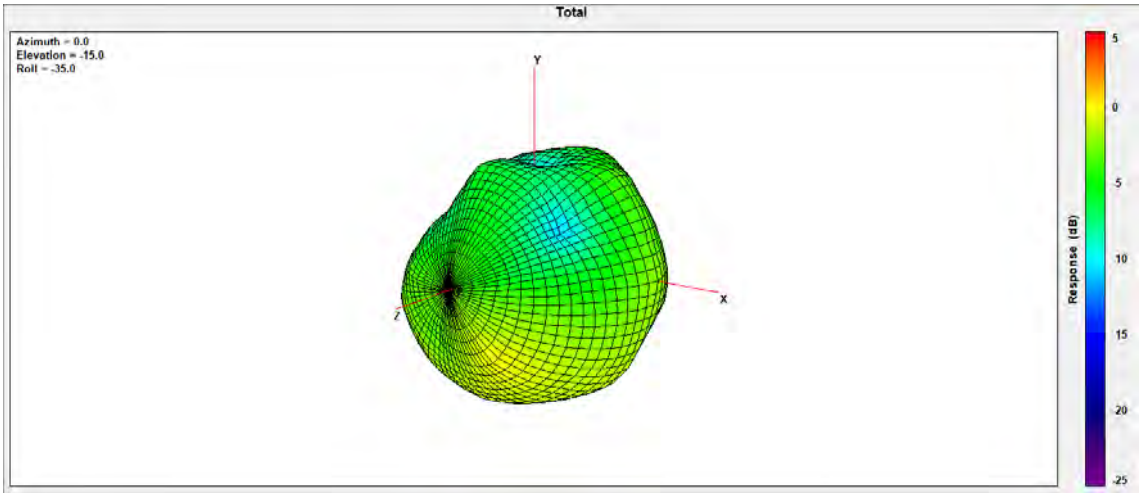
787MHz	H (Peak)	V (Peak)
	-0.93	-1.22

788MHz



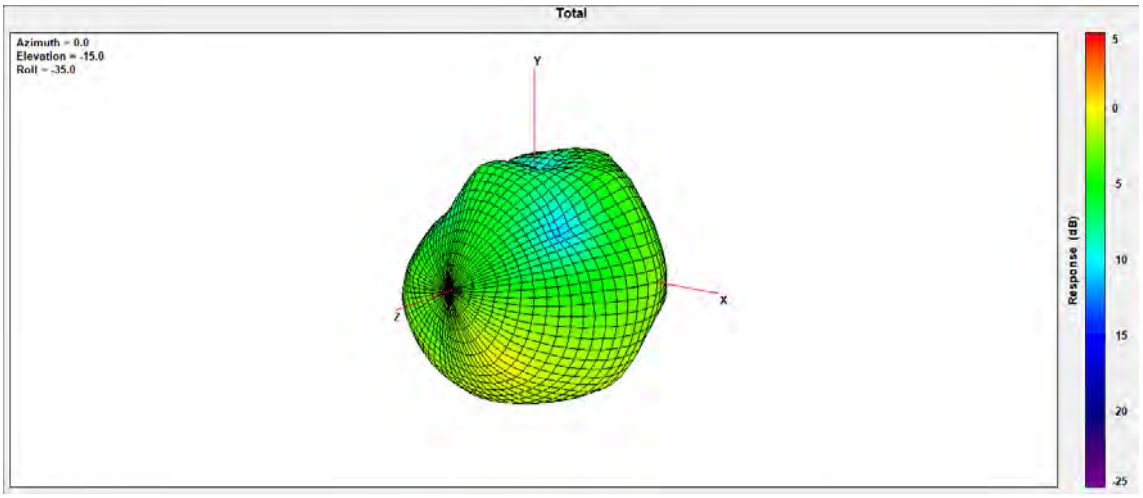
788MHz	H (Peak)	V (Peak)
	-0.98	-1.24

791MHz



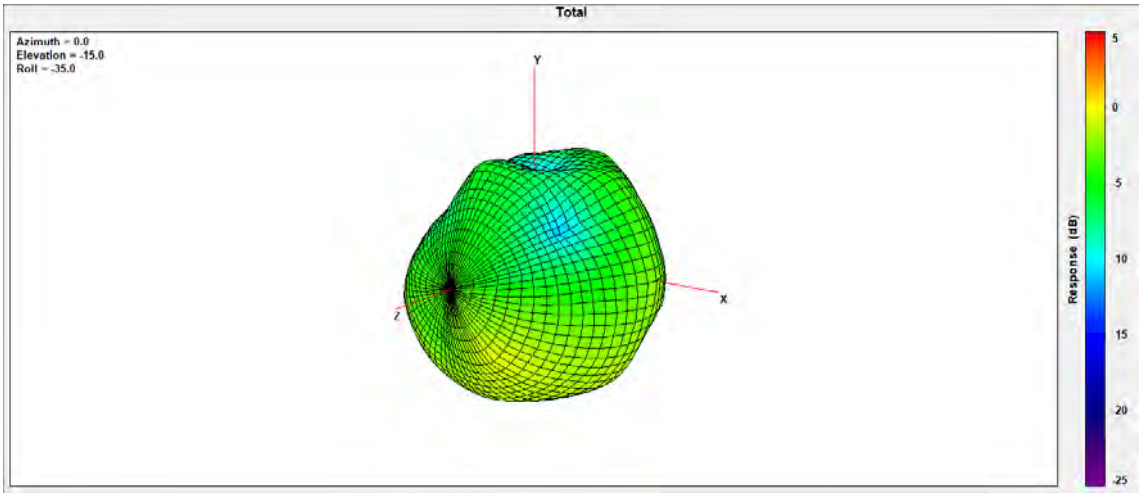
791MHz	H (Peak)	V (Peak)
	-0.23	-0.16

793MHz



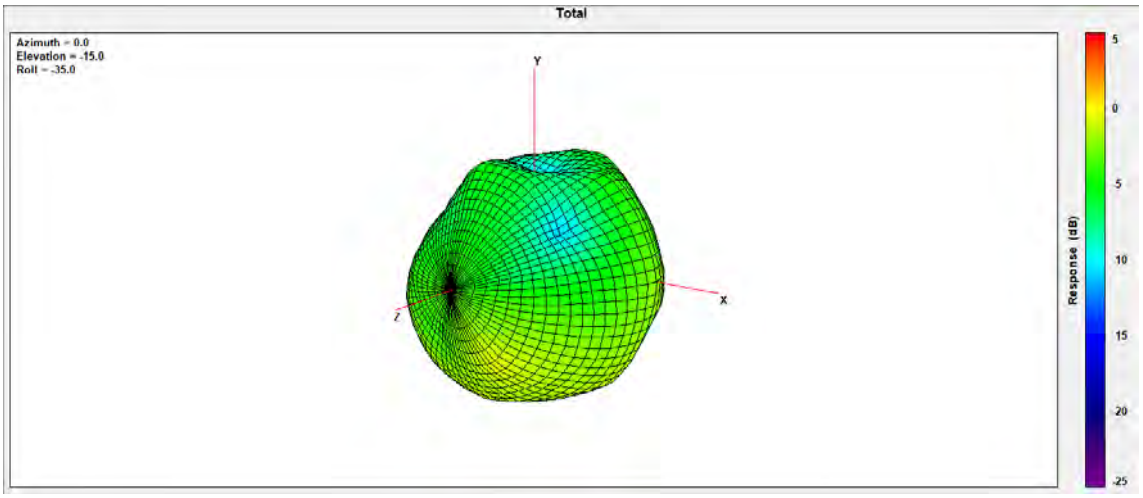
793MHz	H (Peak)	V (Peak)
	-1.19	-1.37

798MHz



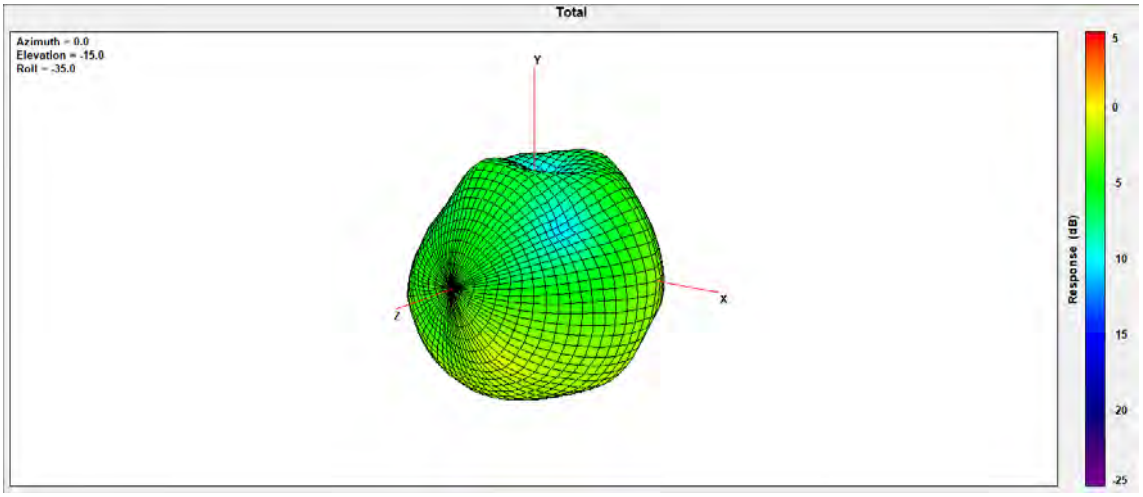
798MHz	H (Peak)	V (Peak)
	-1.37	-1.54

803MHz



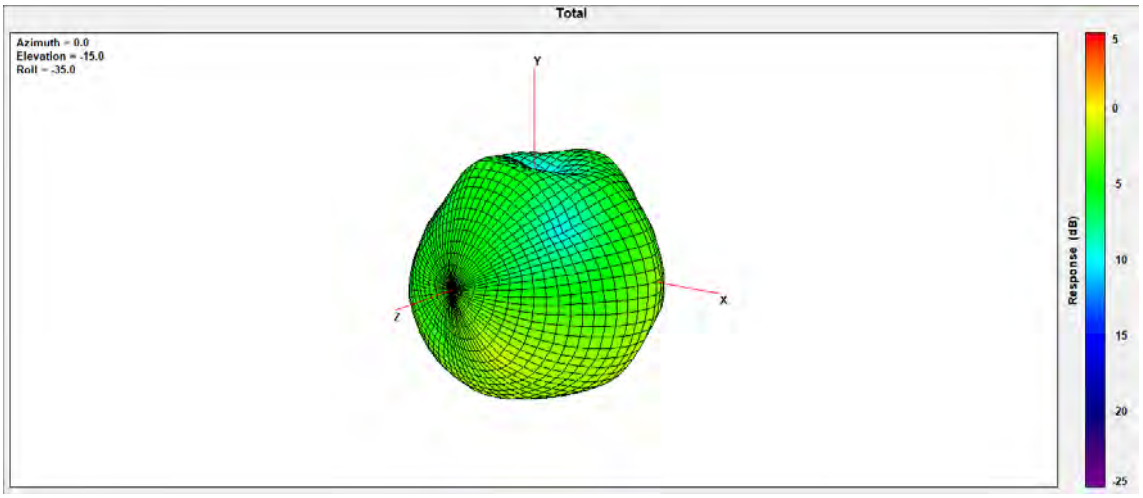
803MHz	H (Peak)	V (Peak)
	-0.10	-0.76

806MHz



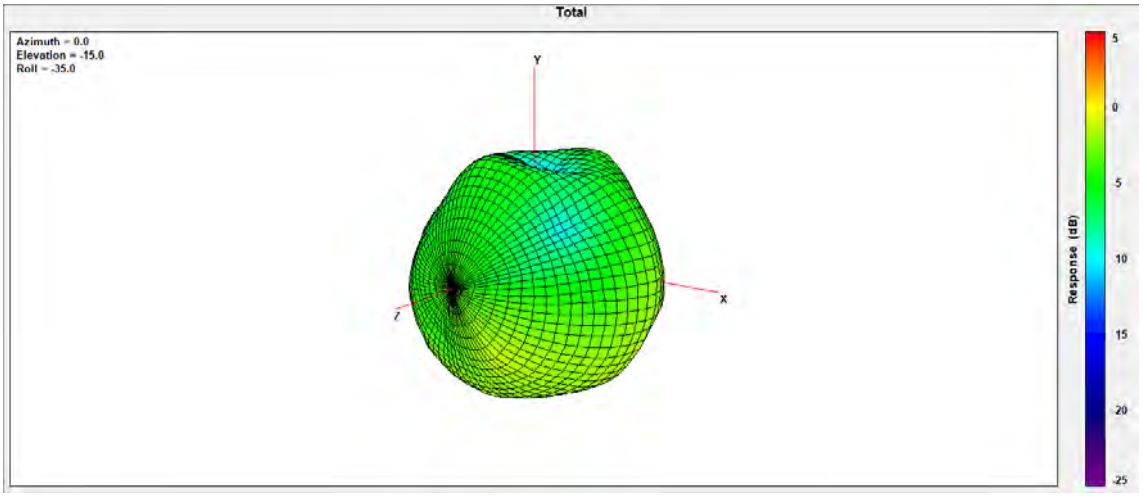
806MHz	H (Peak)	V (Peak)
	-0.01	-0.89

814MHz



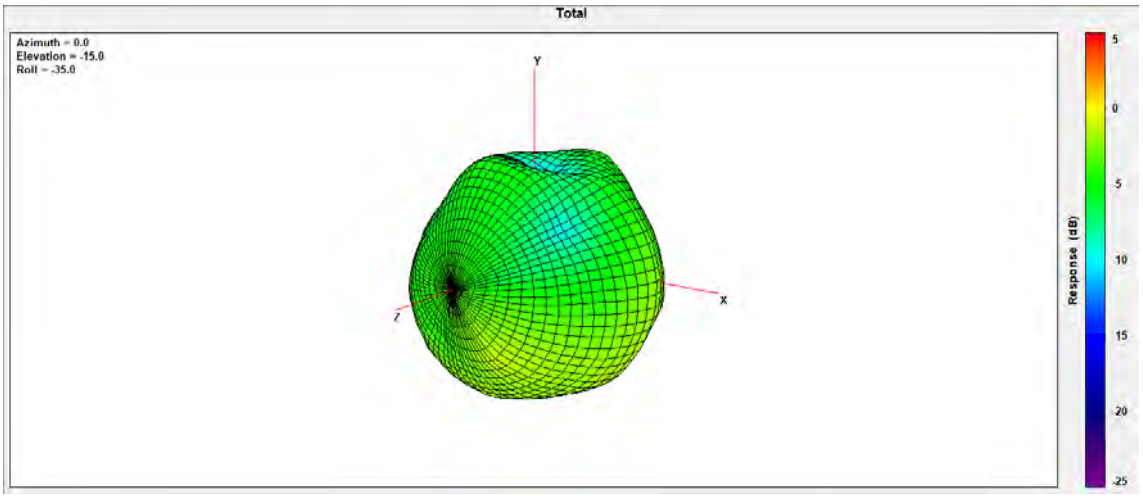
814MHz	H (Peak)	V (Peak)
	-1.98	-2.41

815MHz



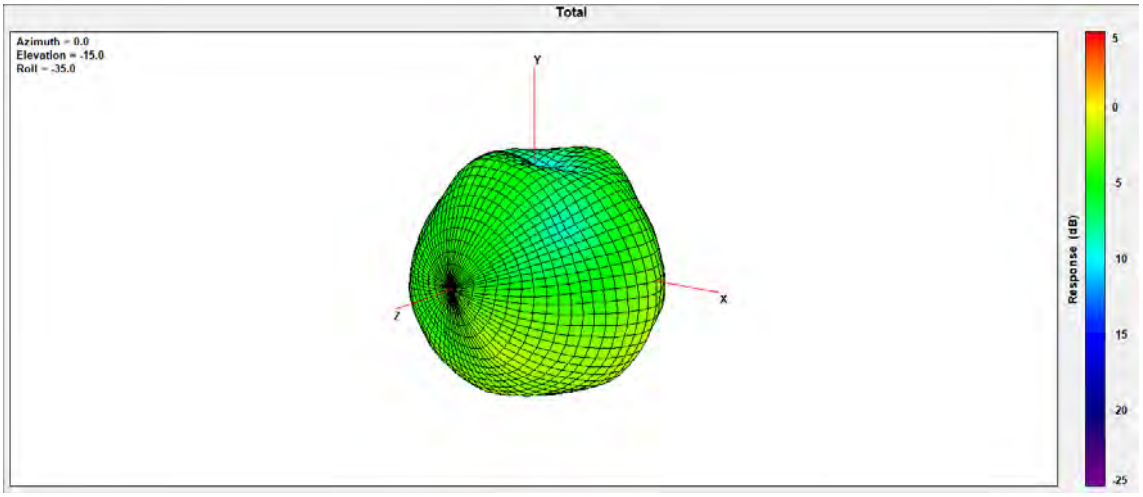
815MHz	H (Peak)	V (Peak)
	-2.04	-2.45

821MHz



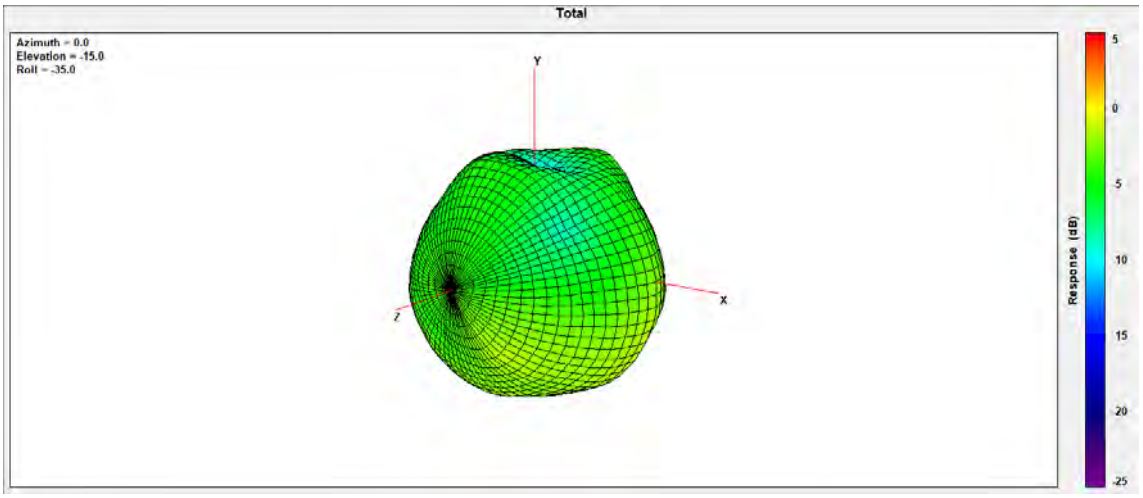
821MHz	H (Peak)	V (Peak)
	-0.22	-2.08

823MHz



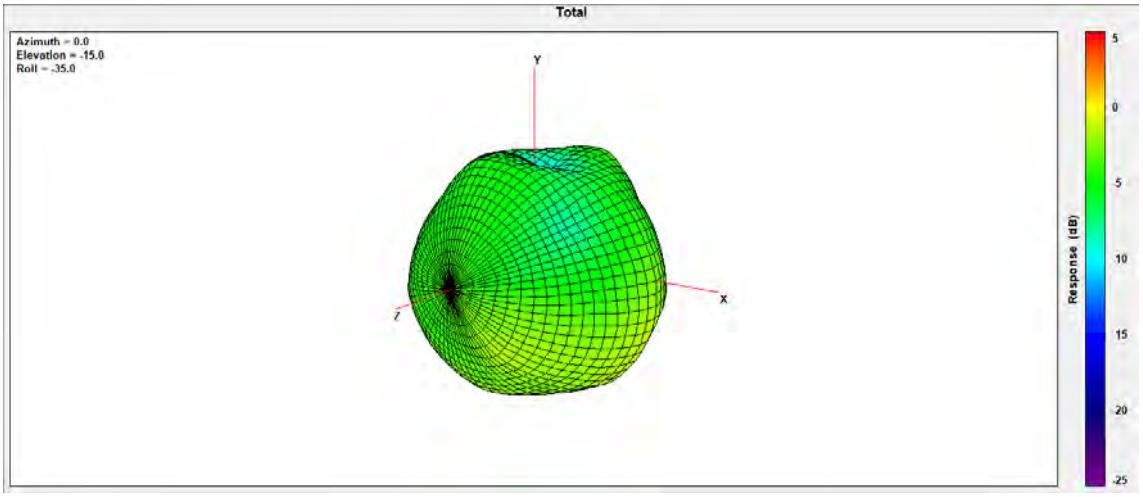
823MHz	H (Peak)	V (Peak)
	-2.53	-2.74

824MHz



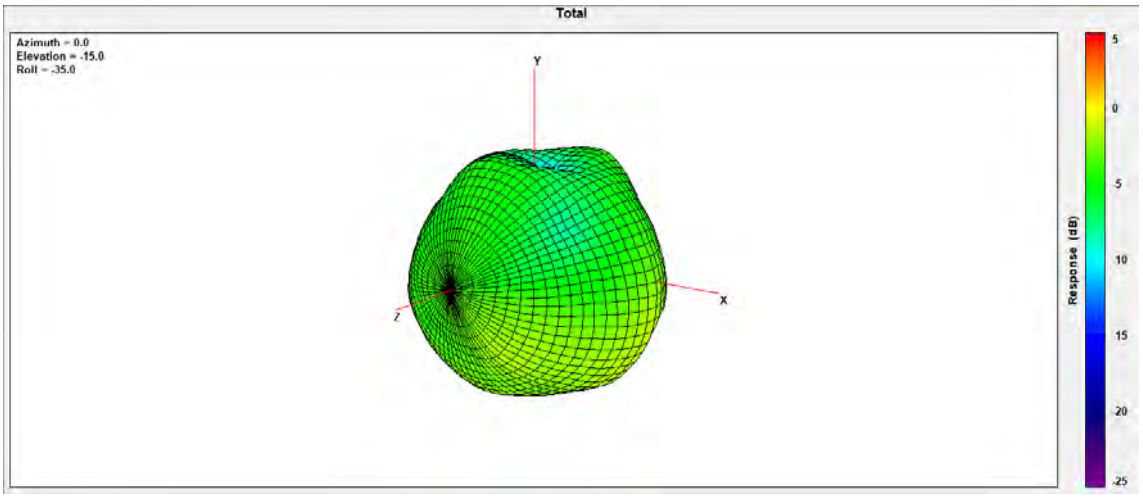
824MHz	H (Peak)	V (Peak)
	-2.59	-2.77

830MHz



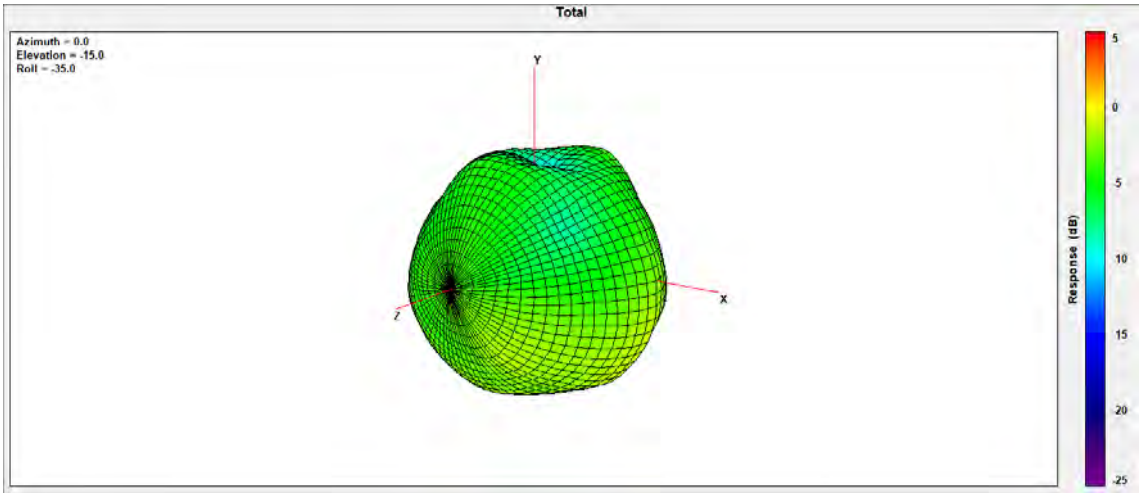
830MHz	H (Peak)	V (Peak)
	-2.81	-2.76

831.5MHz



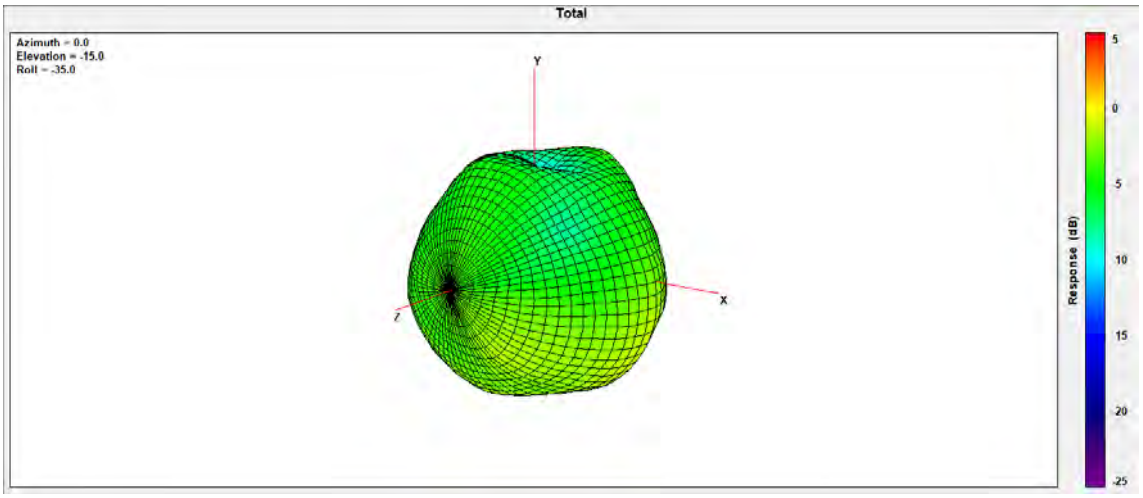
831.5MHz	H (Peak)	V (Peak)
	-2.84	-2.73

832MHz



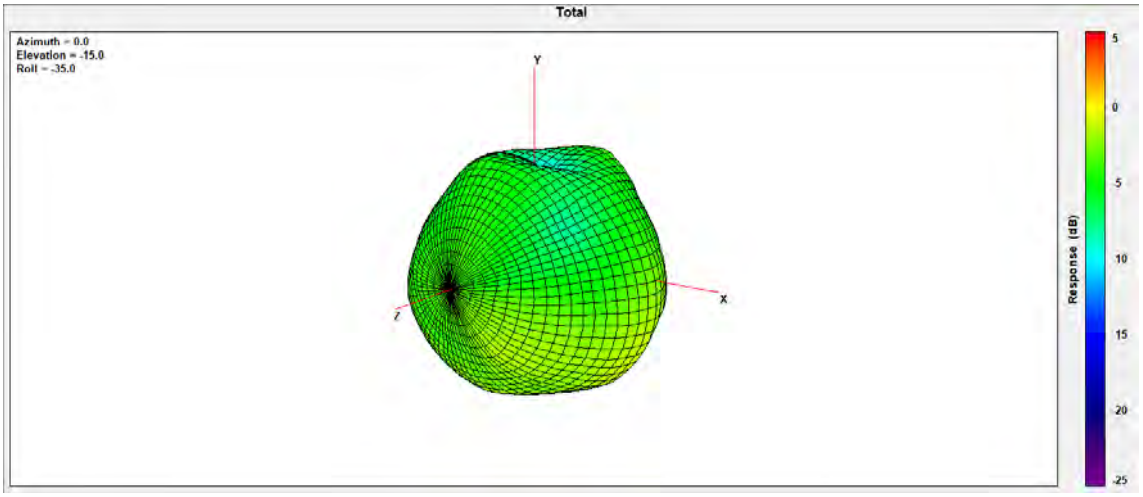
832MHz	H (Peak)	V (Peak)
	-2.85	-2.73

835MHz



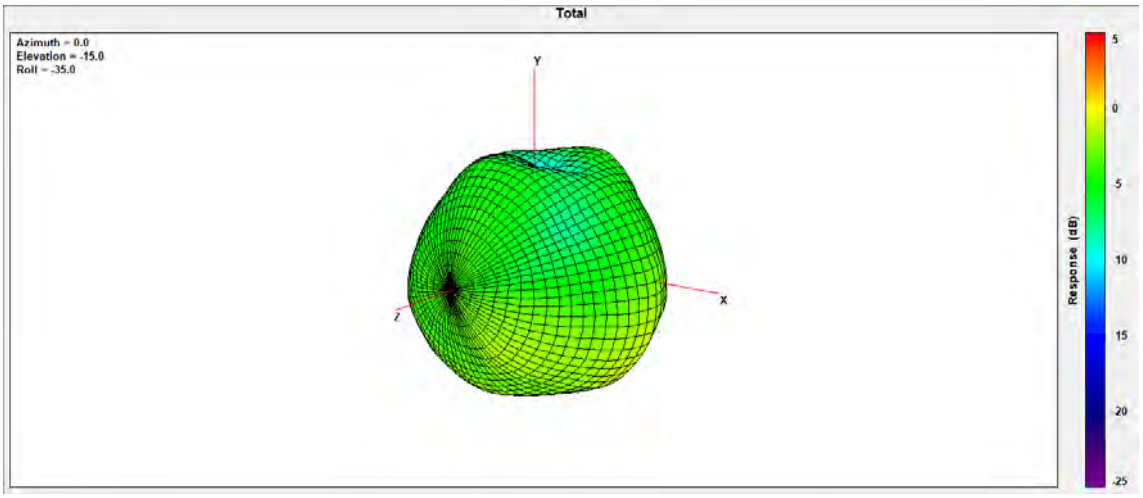
835MHz	H (Peak)	V (Peak)
	-2.87	-2.65

836.5MHz



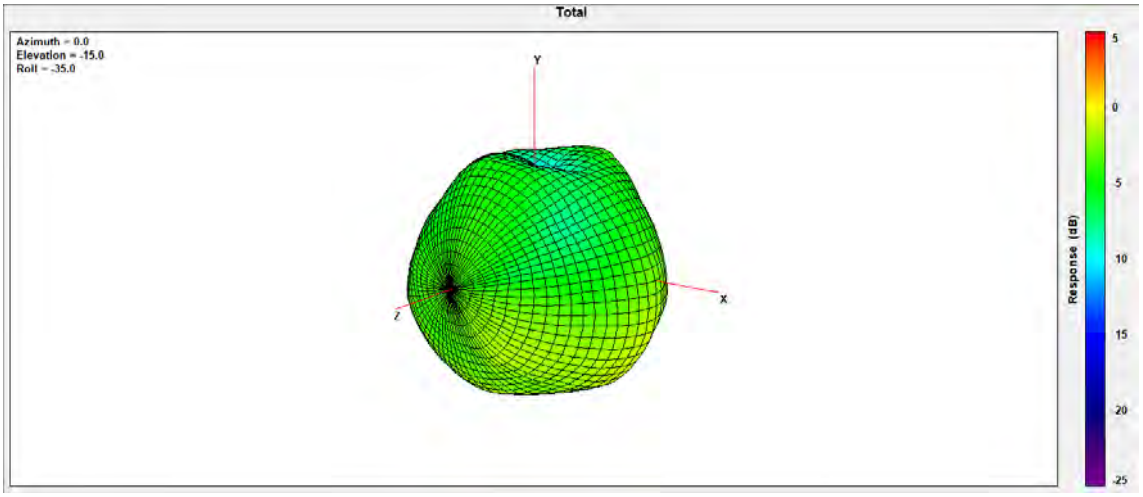
836.5MHz	H (Peak)	V (Peak)
	-2.87	-2.63

838MHz



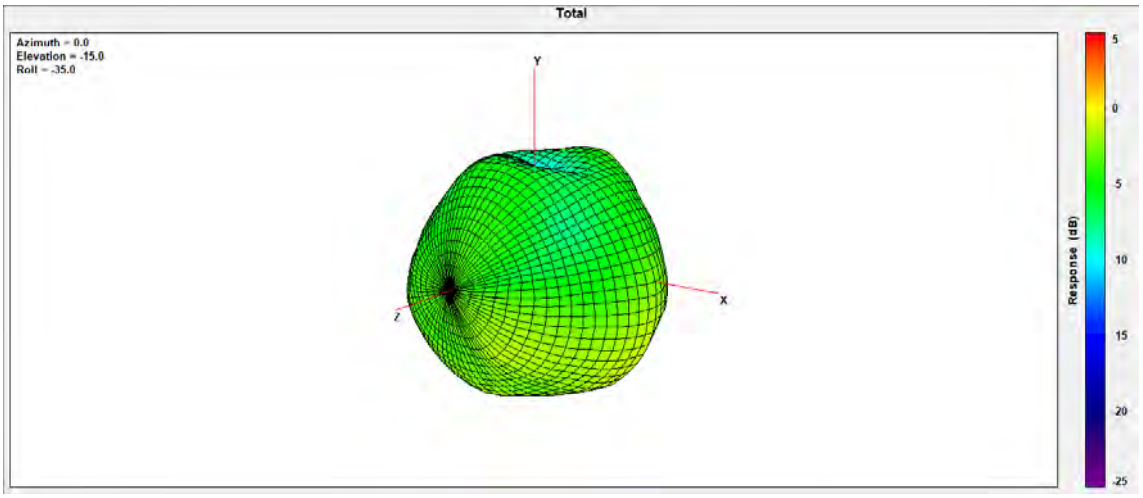
838MHz	H (Peak)	V (Peak)
	-2.86	-2.60

840MHz



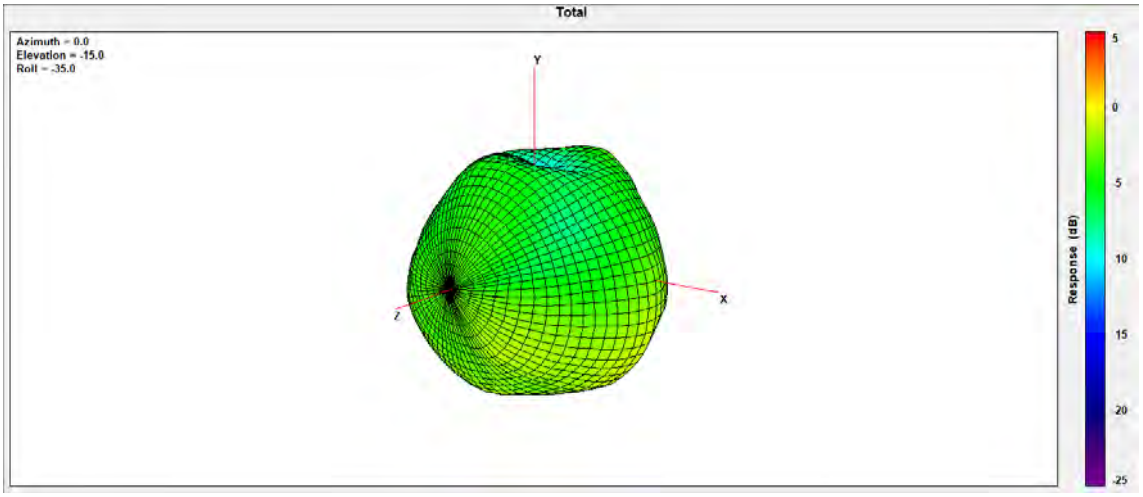
840MHz	H (Peak)	V (Peak)
	-2.81	-2.56

845MHz



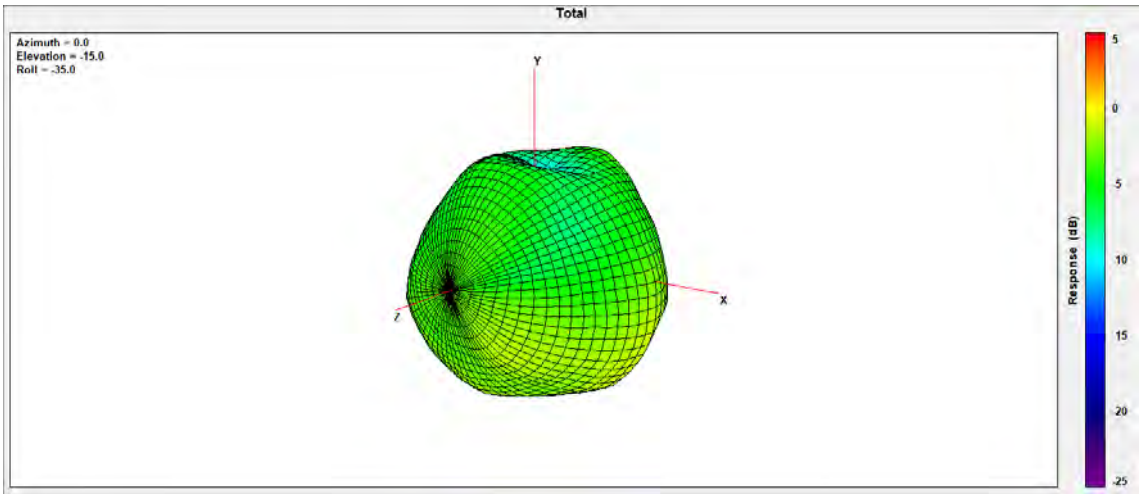
845MHz	H (Peak)	V (Peak)
	-2.72	-2.48

847MHz



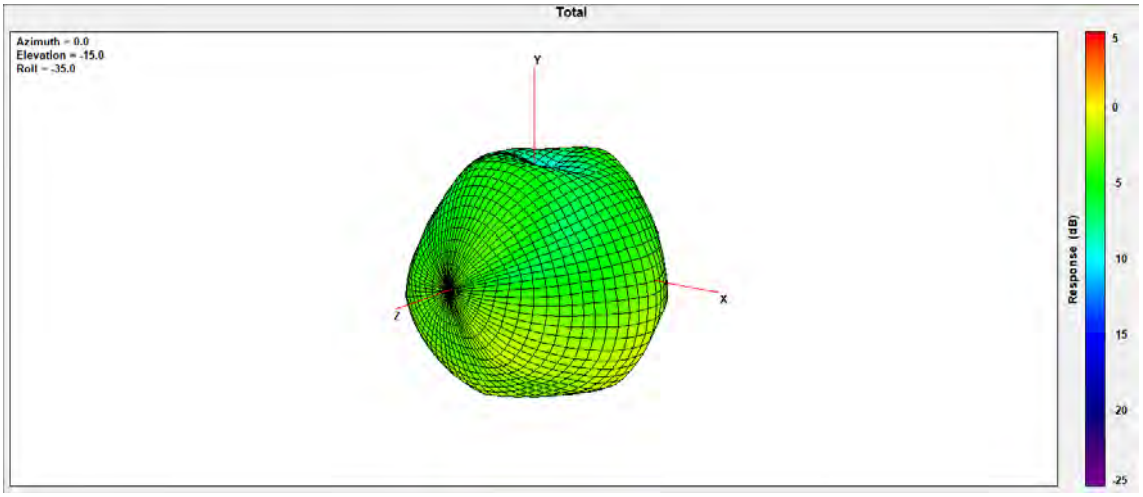
847MHz	H (Peak)	V (Peak)
	-2.67	-2.44

849MHz



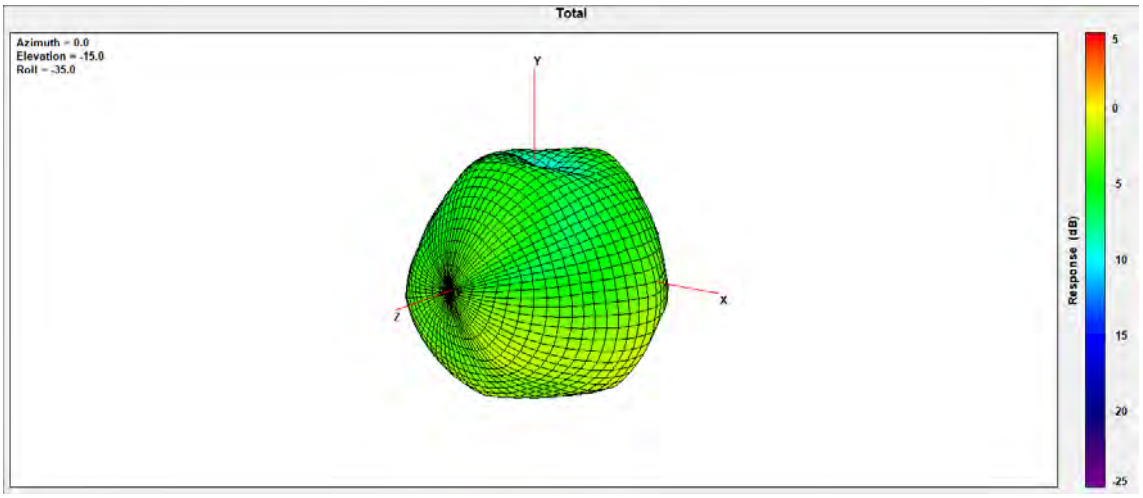
849MHz	H (Peak)	V (Peak)
	-2.62	-2.41

859MHz



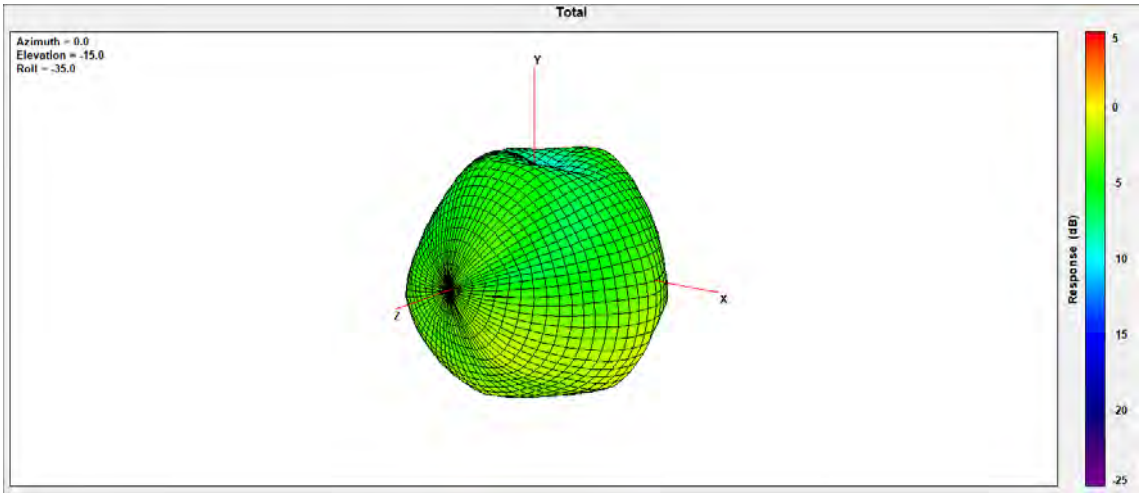
859MHz	H (Peak)	V (Peak)
	-2.11	-2.11

860MHz



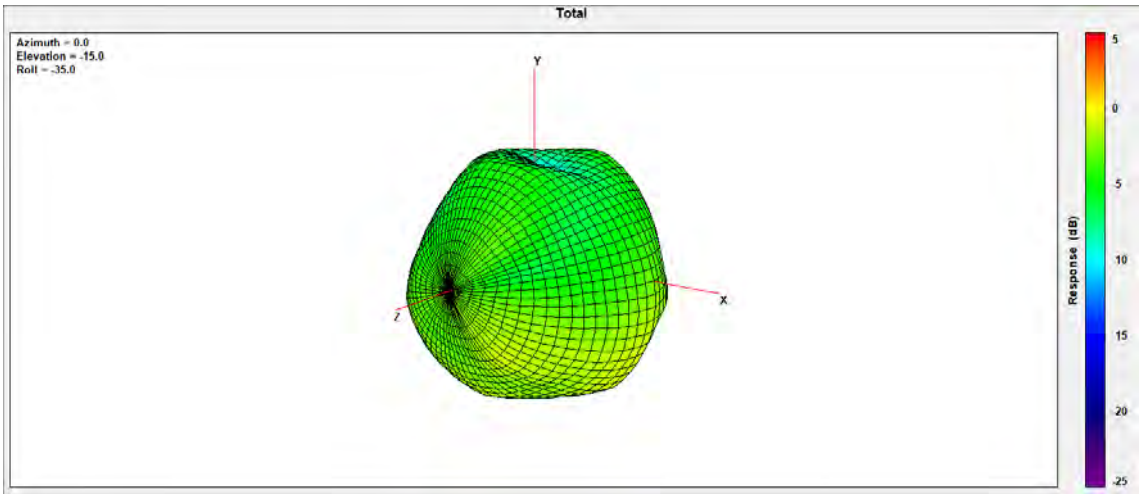
860MHz	H (Peak)	V (Peak)
	-2.20	-2.16

862MHz



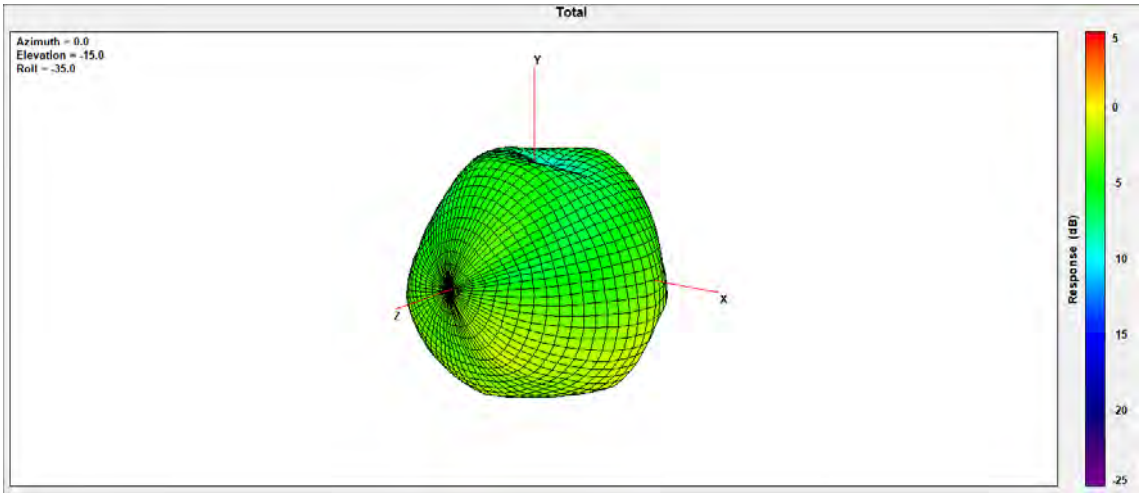
862MHz	H (Peak)	V (Peak)
	-2.29	-2.12

868MHz



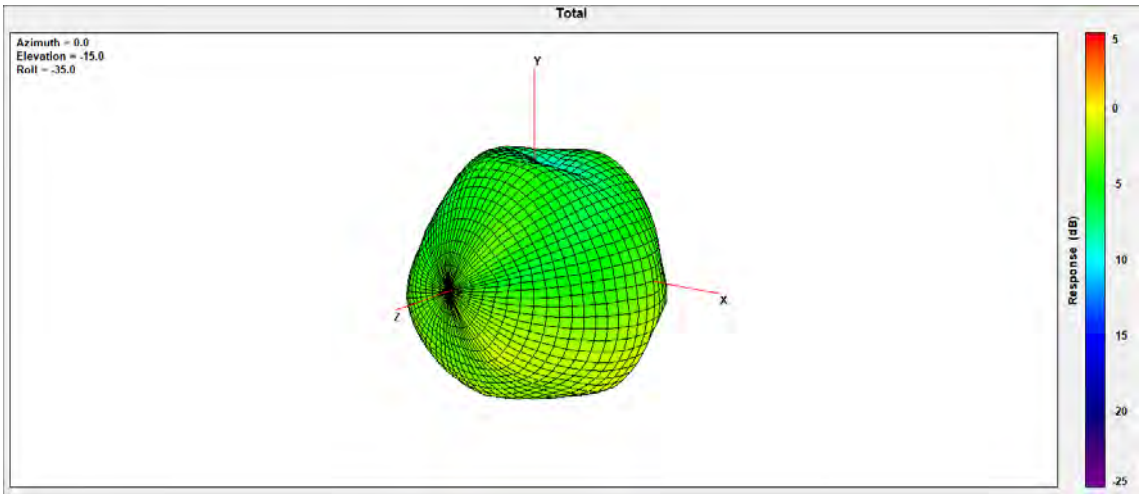
868MHz	H (Peak)	V (Peak)
	-2.42	-2.28

869MHz



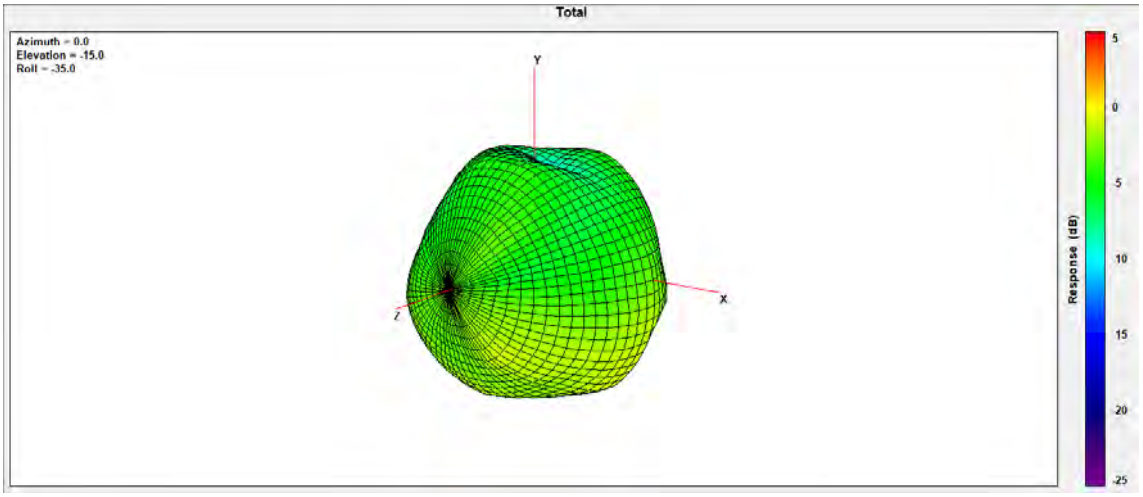
869MHz	H (Peak)	V (Peak)
	-2.46	-2.25

875MHz



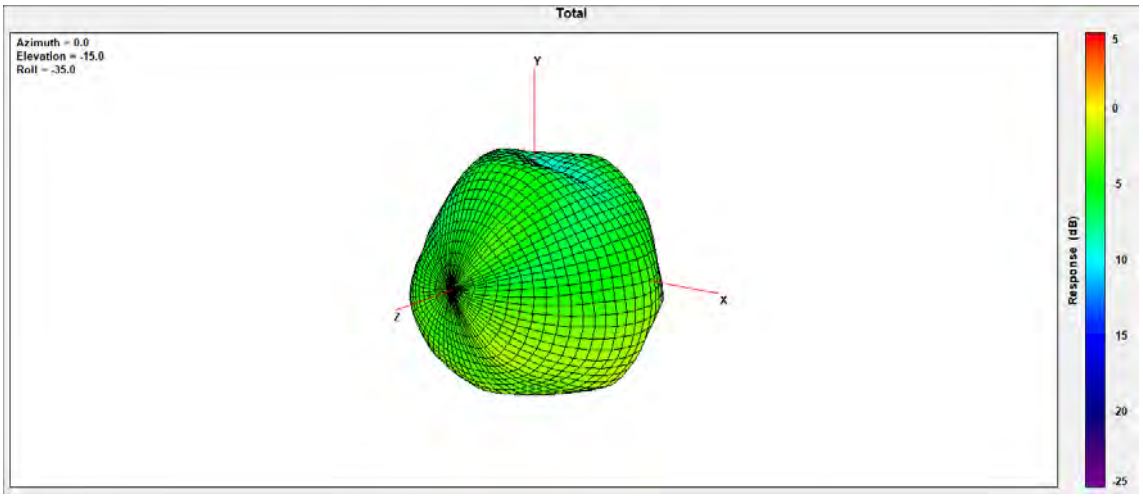
875MHz	H (Peak)	V (Peak)
	-2.40	-2.10

876.5MHz



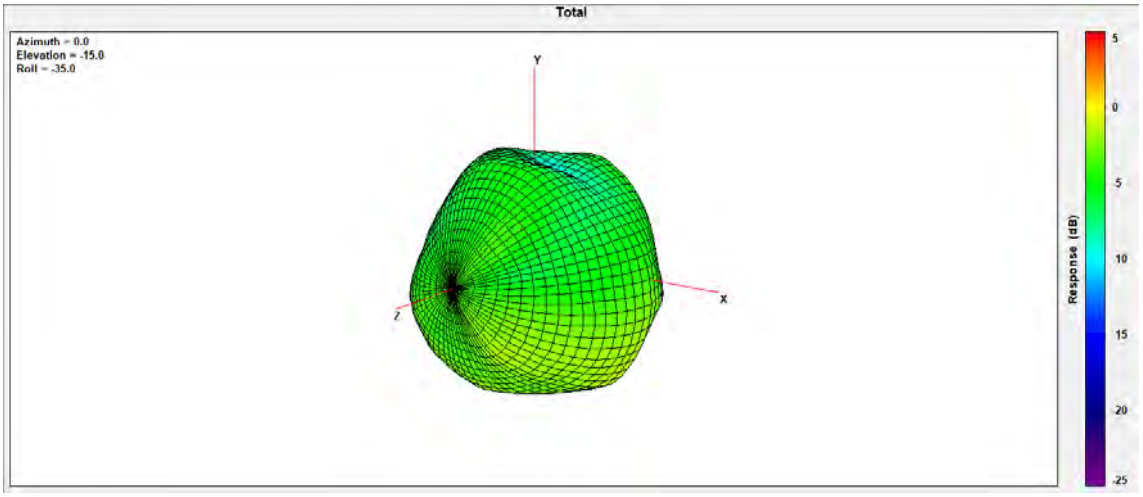
876.5MHz	H (Peak)	V (Peak)
	-2.40	-2.12

880MHz



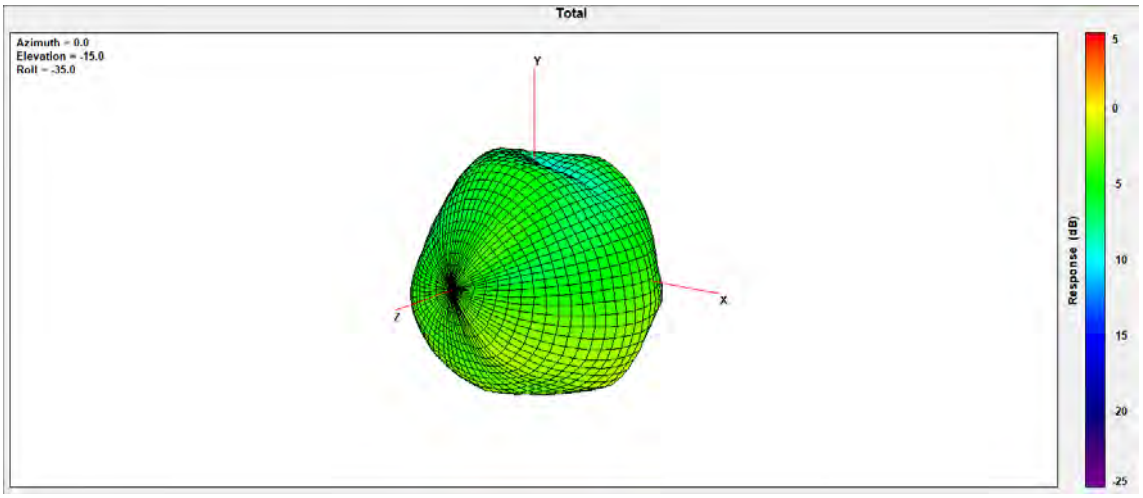
880MHz	H (Peak)	V (Peak)
	-3.00	-2.29

881.5MHz



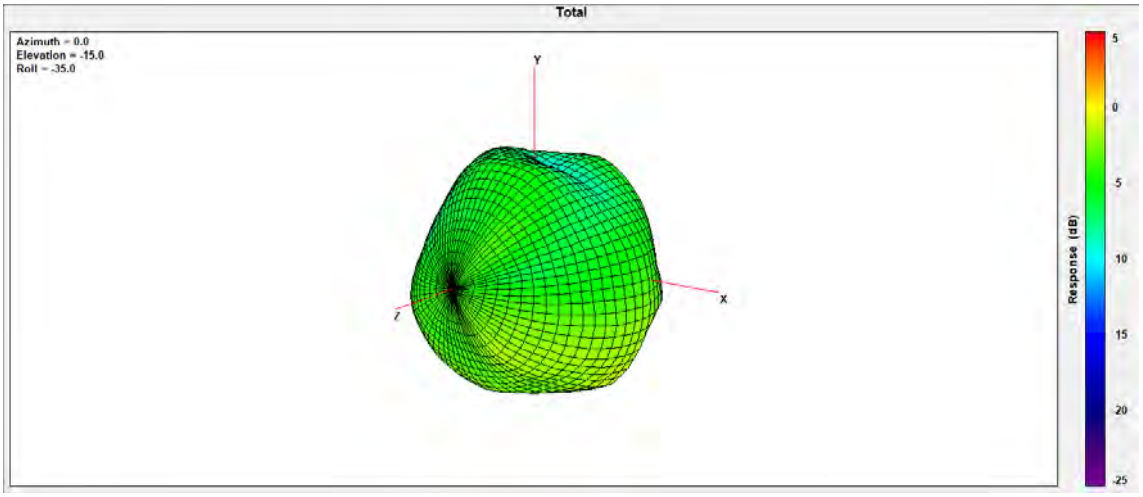
881.5MHz	H (Peak)	V (Peak)
	-2.42	-2.19

883MHz



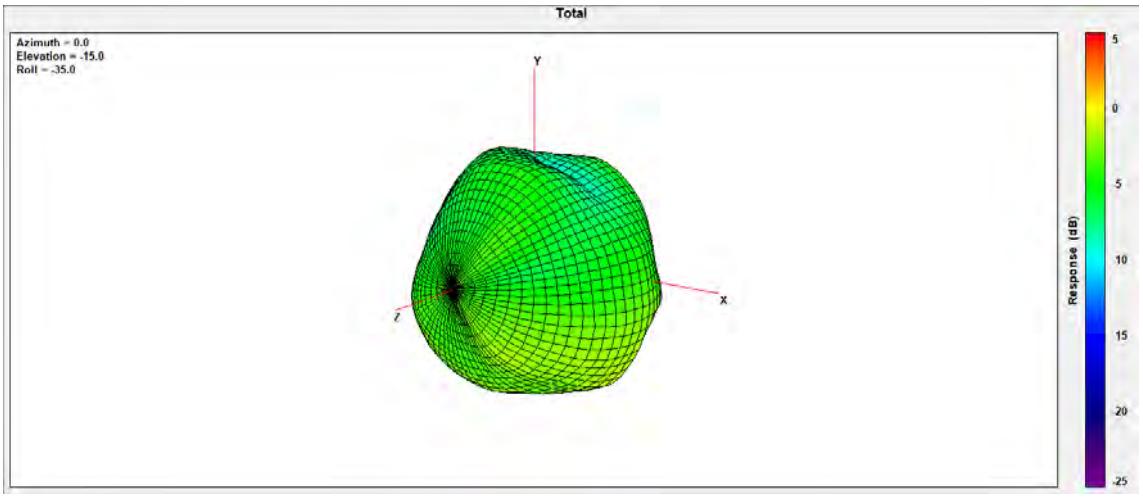
883MHz	H (Peak)	V (Peak)
	-2.41	-2.24

885MHz



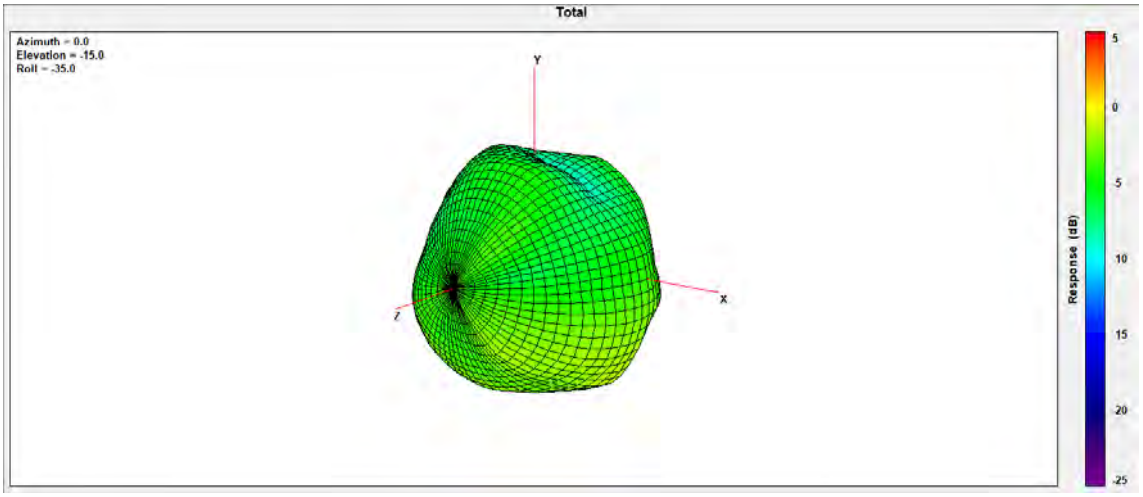
885MHz	H (Peak)	V (Peak)
	-2.47	-2.26

890MHz



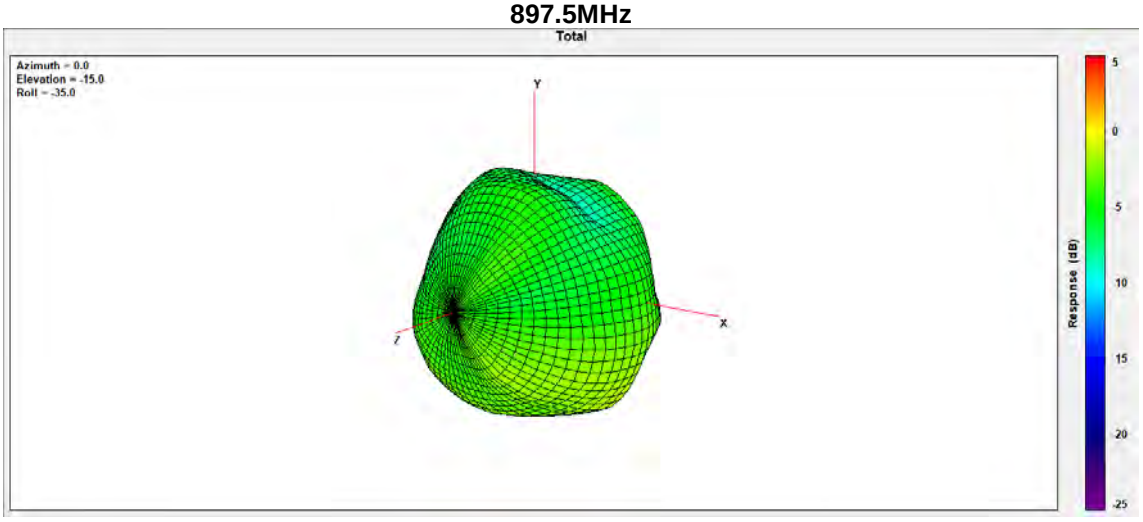
890MHz	H (Peak)	V (Peak)
	-2.83	-2.31

894MHz



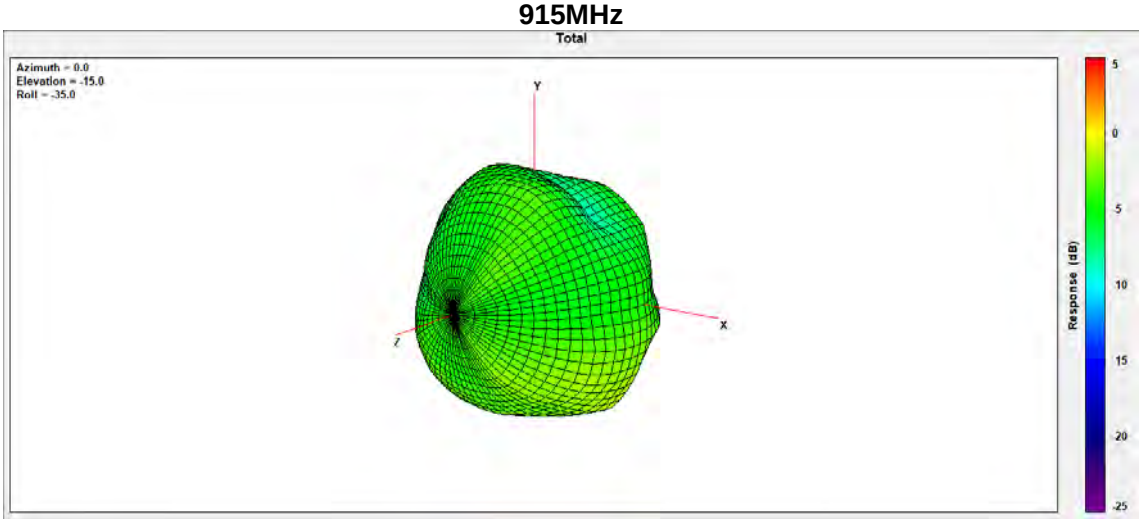
894MHz	H (Peak)	V (Peak)
	-0.98	-2.30

897.5MHz



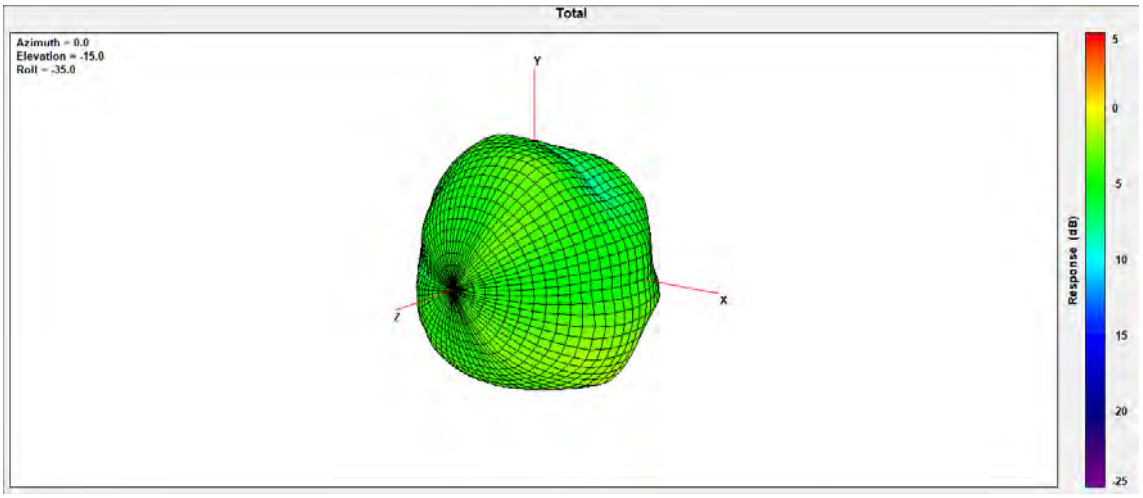
897.5MHz	H (Peak)	V (Peak)
	-3.37	-2.19

915MHz



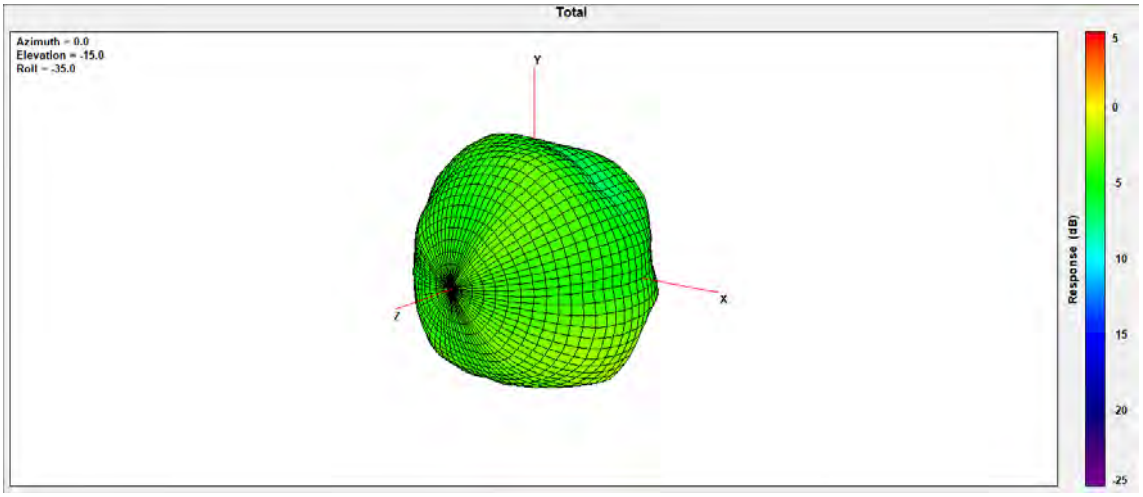
915MHz	H (Peak)	V (Peak)
	-3.82	-2.08

925MHz



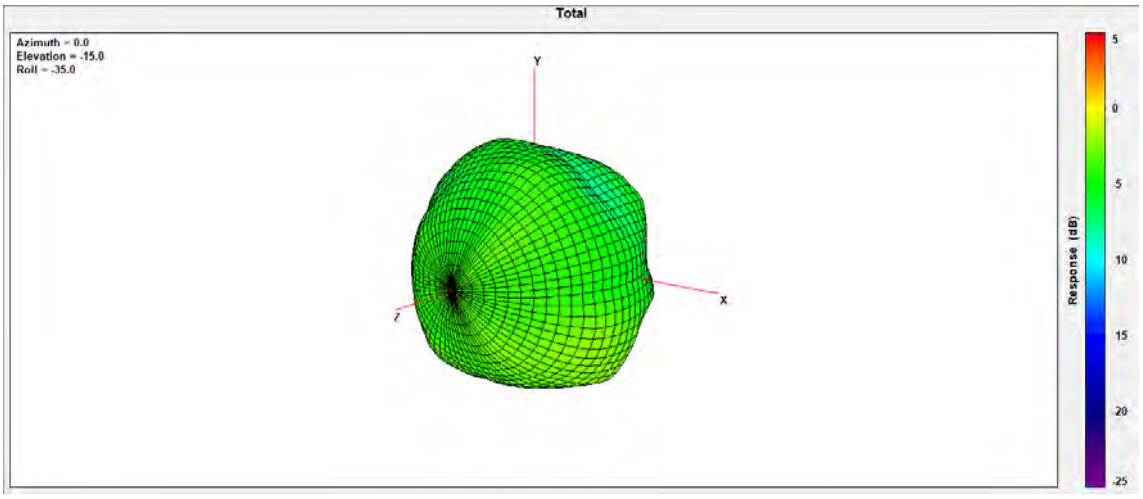
925MHz	H (Peak)	V (Peak)
	-2.27	-3.17

942.5MHz



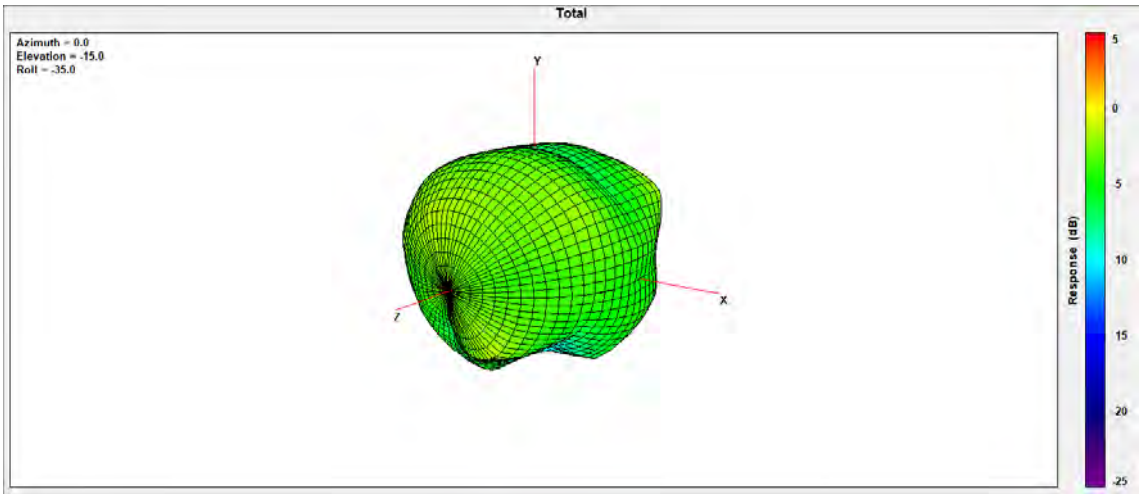
942.5MHz	H (Peak)	V (Peak)
	-2.18	-3.11

960MHz



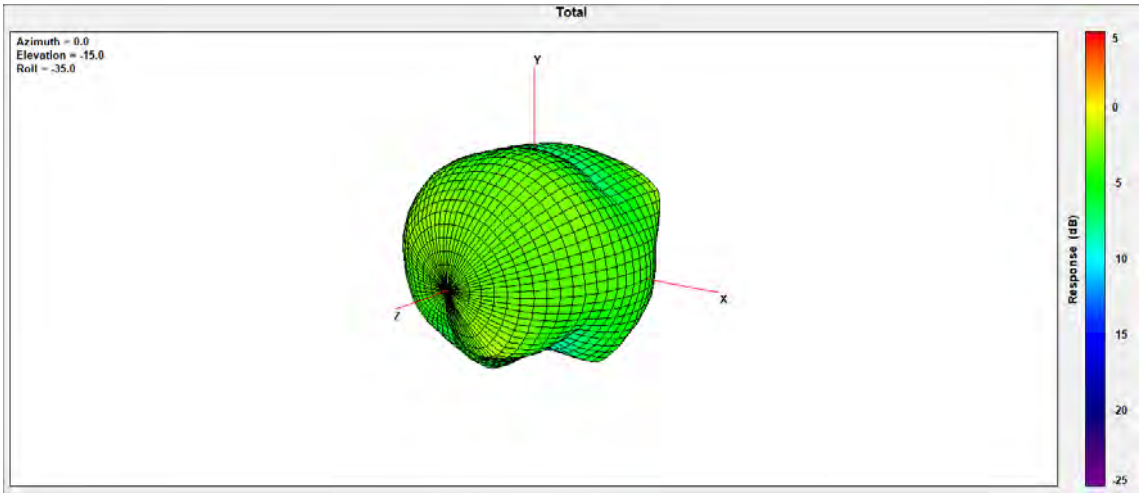
960MHz	H (Peak)	V (Peak)
	-2.13	-2.98

1452MHz



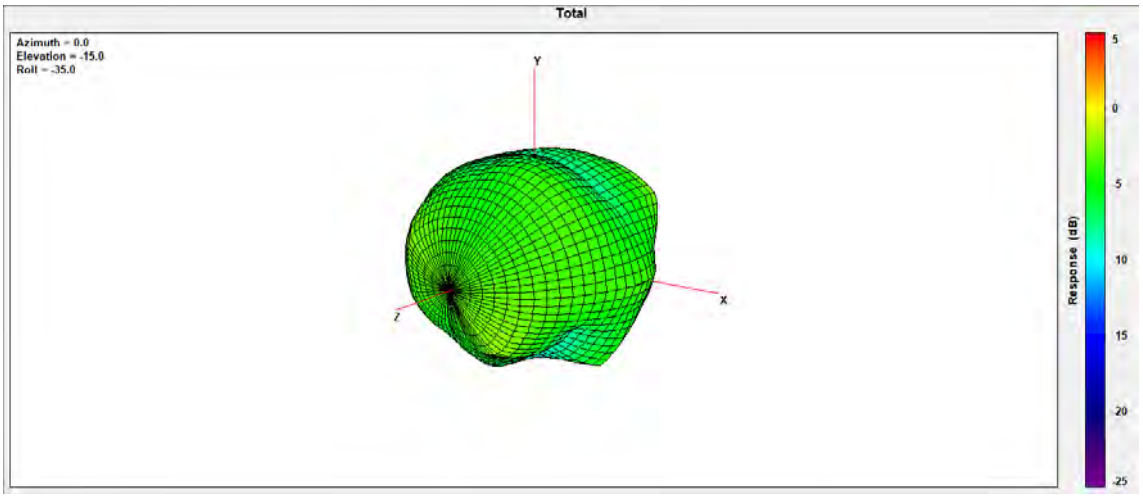
1452MHz	H (Peak)	V (Peak)
	-2.04	-3.26

1474MHz



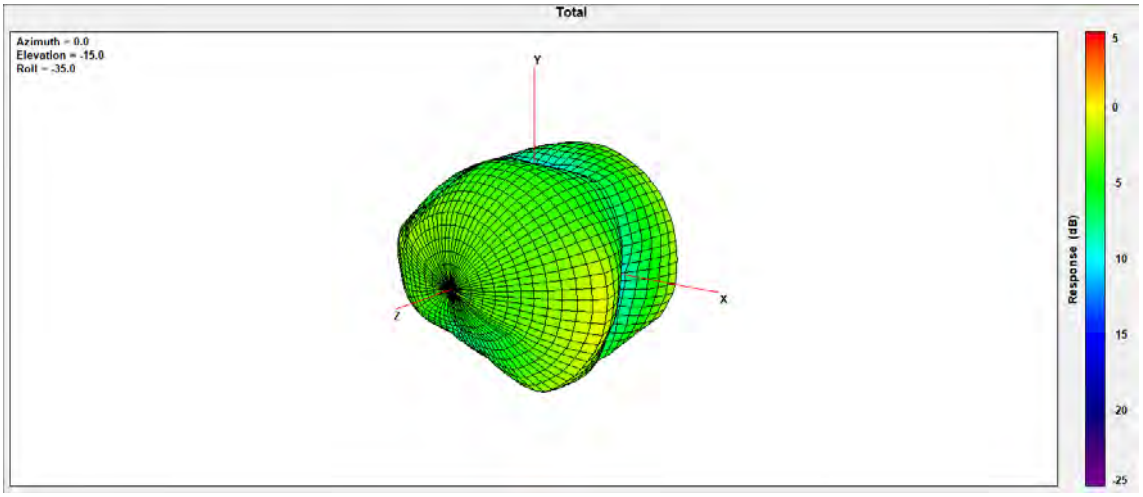
1474MHz	H (Peak)	V (Peak)
	-3.45	-4.98

1496MHz



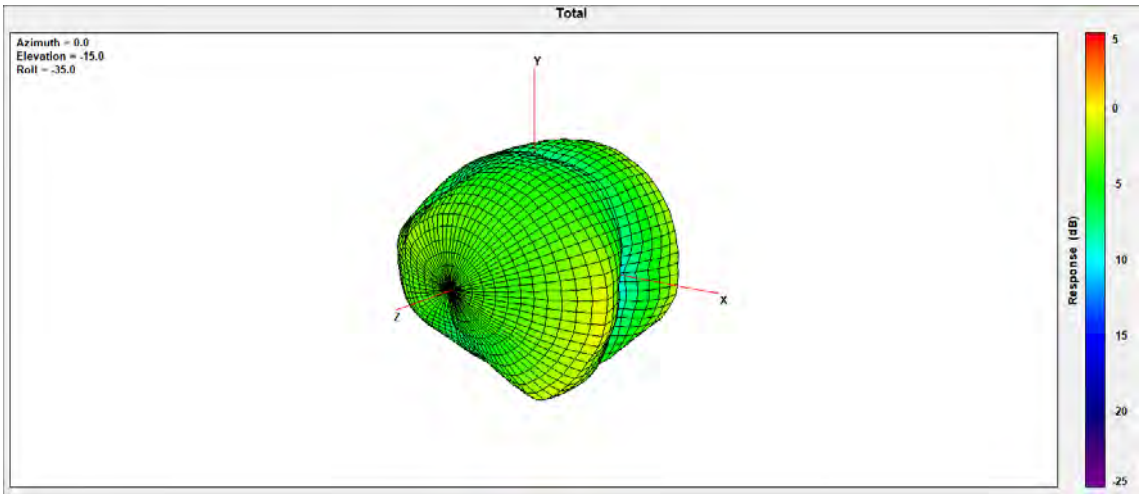
1496MHz	H (Peak)	V (Peak)
	-3.04	-5.02

1710MHz



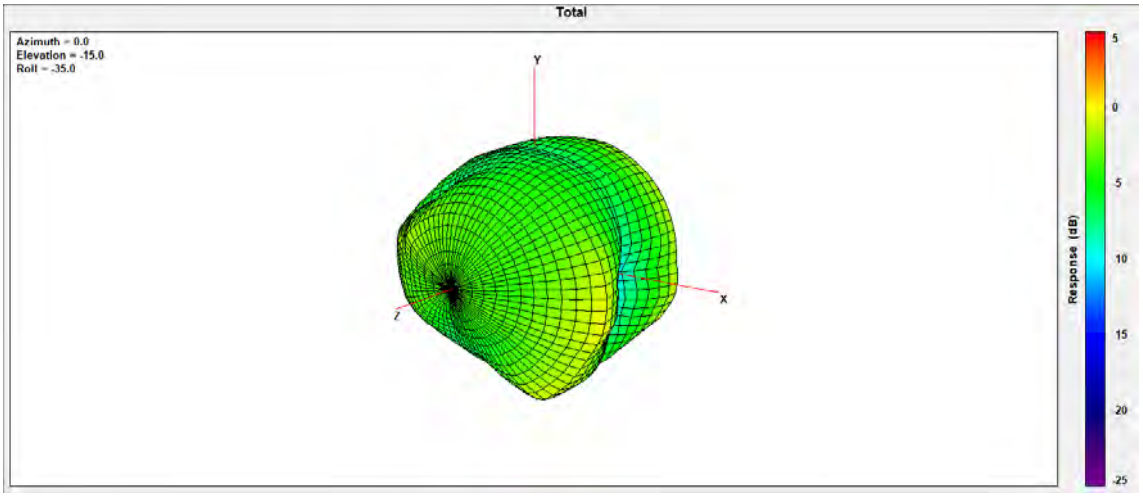
1710MHz	H (Peak)	V (Peak)
	-1.33	-2.92

1732.5MHz



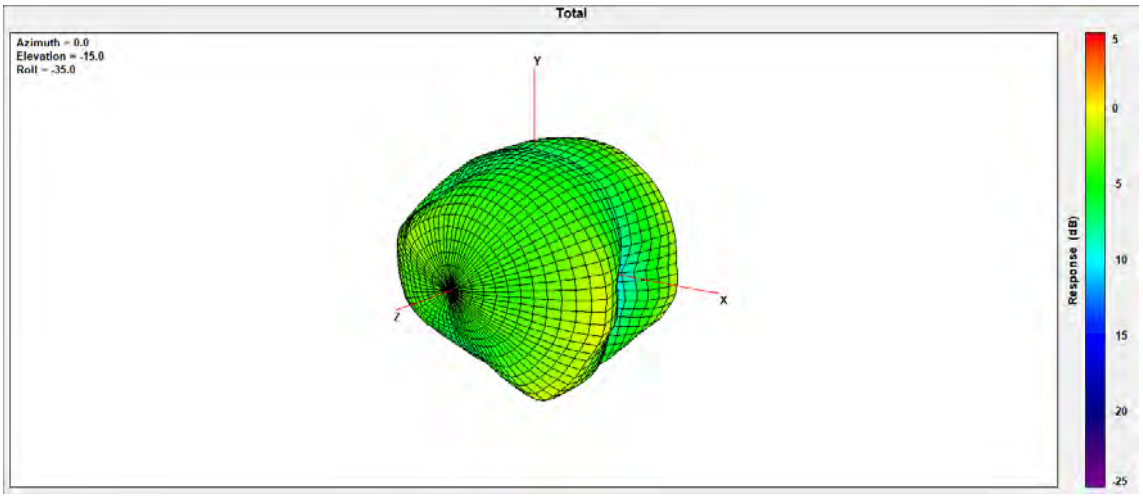
1732.5MHz	H (Peak)	V (Peak)
	-0.85	-2.80

1745MHz



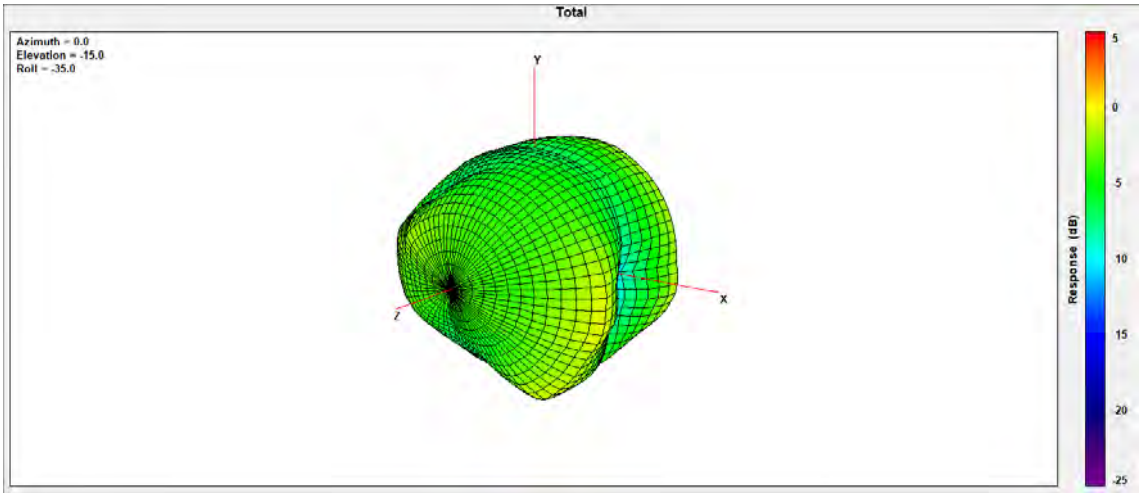
1745MHz	H (Peak)	V (Peak)
	-0.92	-2.79

1747.5MHz



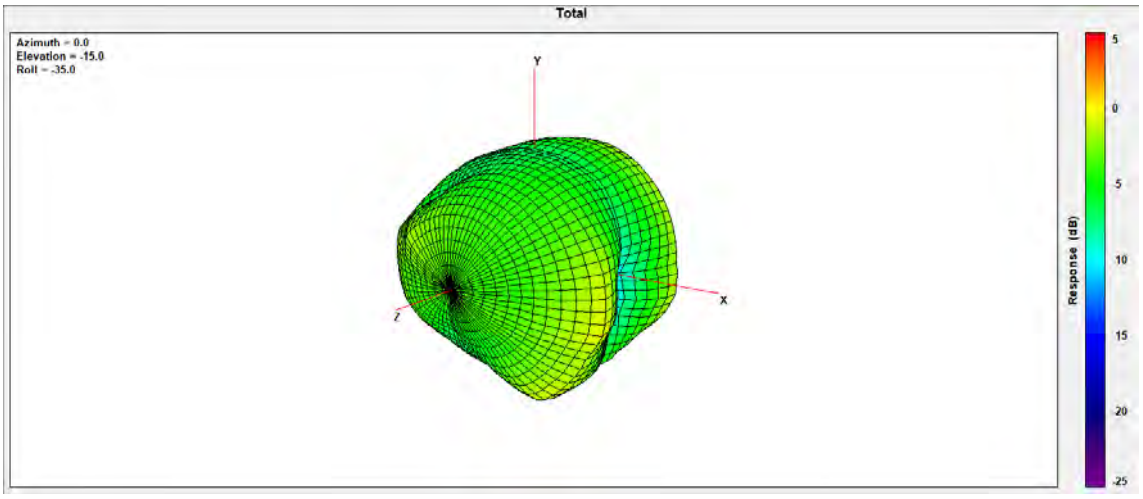
1747.5MHz	H (Peak)	V (Peak)
	-0.93	-2.74

1749.9MHz



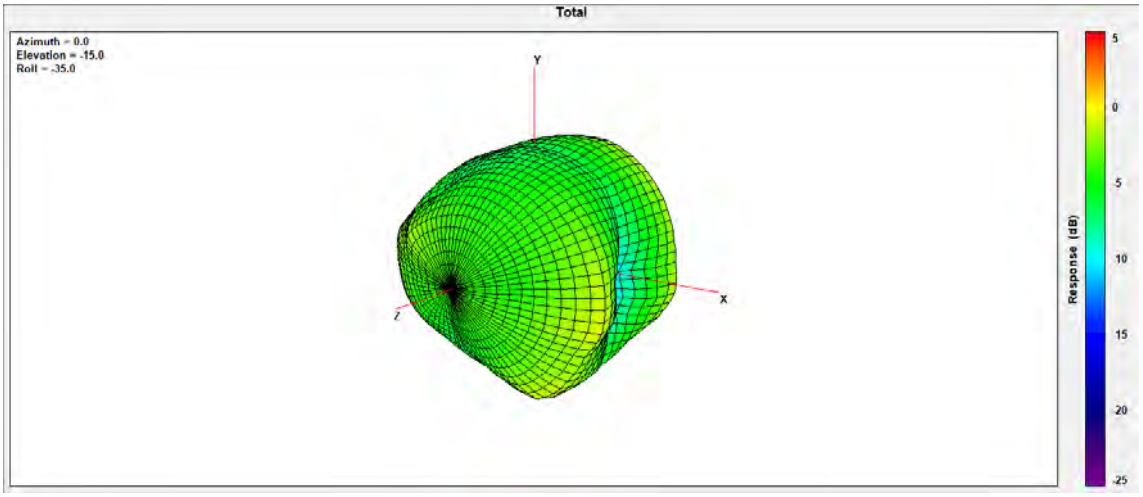
1749.9MHz	H (Peak)	V (Peak)
	-0.98	-2.71

1755MHz



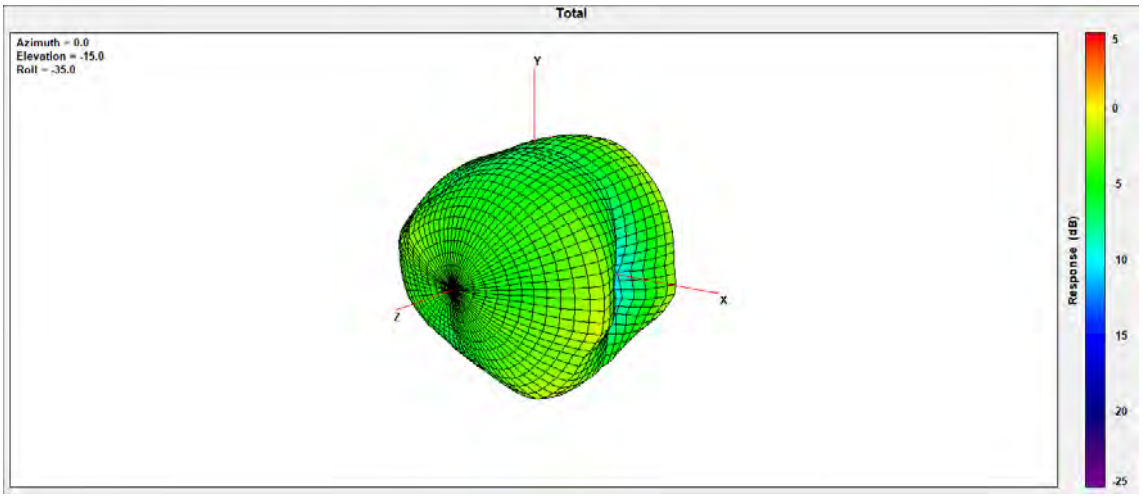
1755MHz	H (Peak)	V (Peak)
	-1.09	-2.67

1767.4MHz



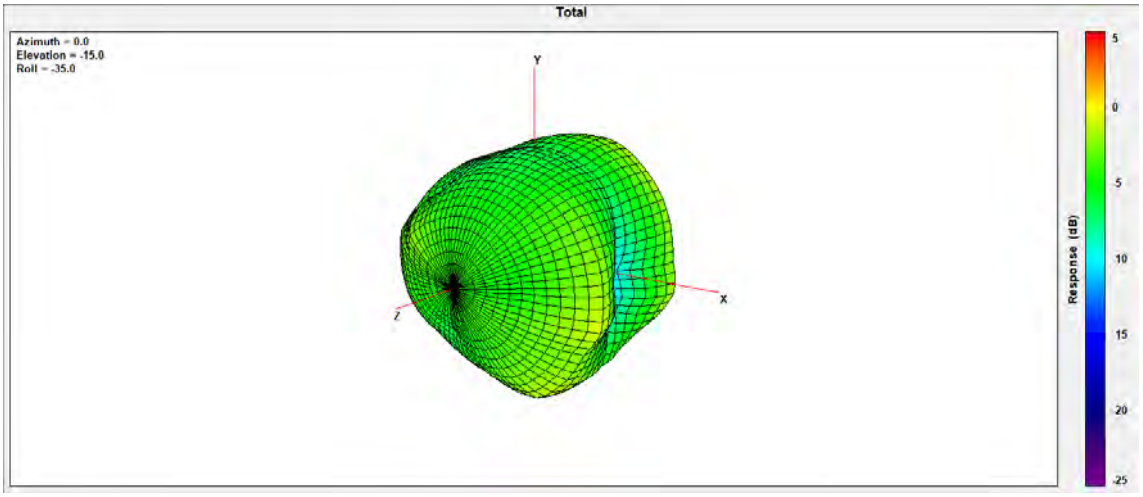
1767.4MHz	H (Peak)	V (Peak)
	-1.38	-2.69

1780MHz



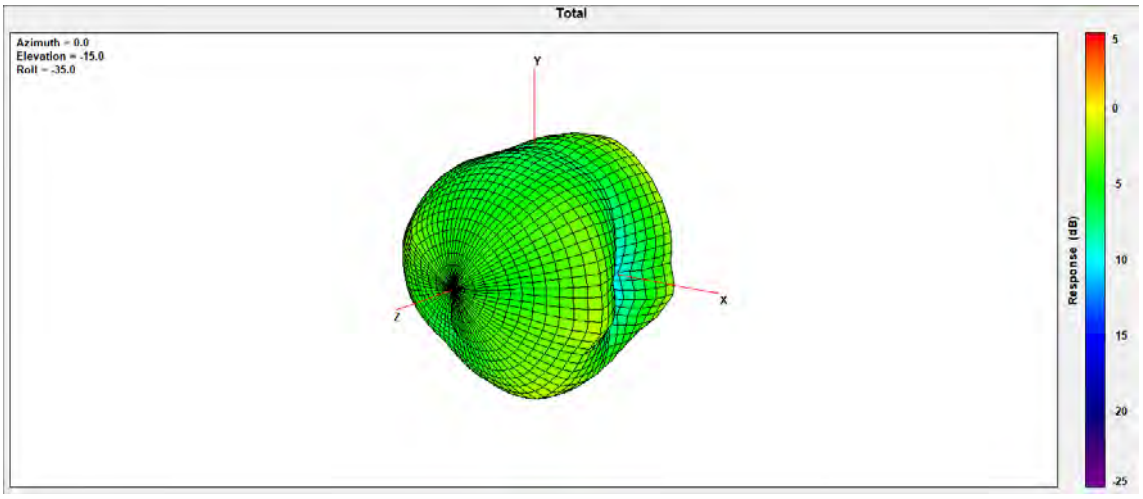
1780MHz	H (Peak)	V (Peak)
	-1.39	-2.97

1785MHz



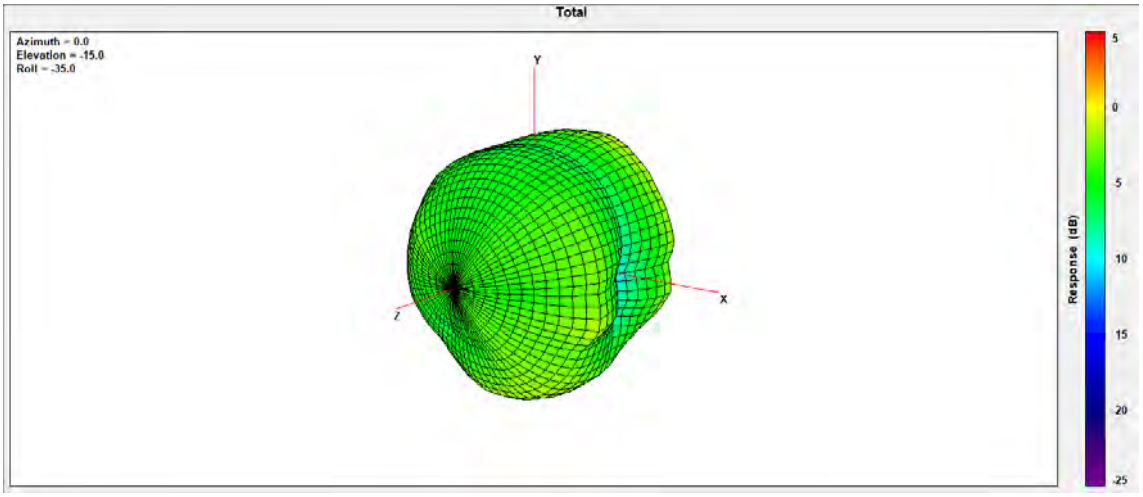
1785MHz	H (Peak)	V (Peak)
	-1.44	-3.07

1805MHz



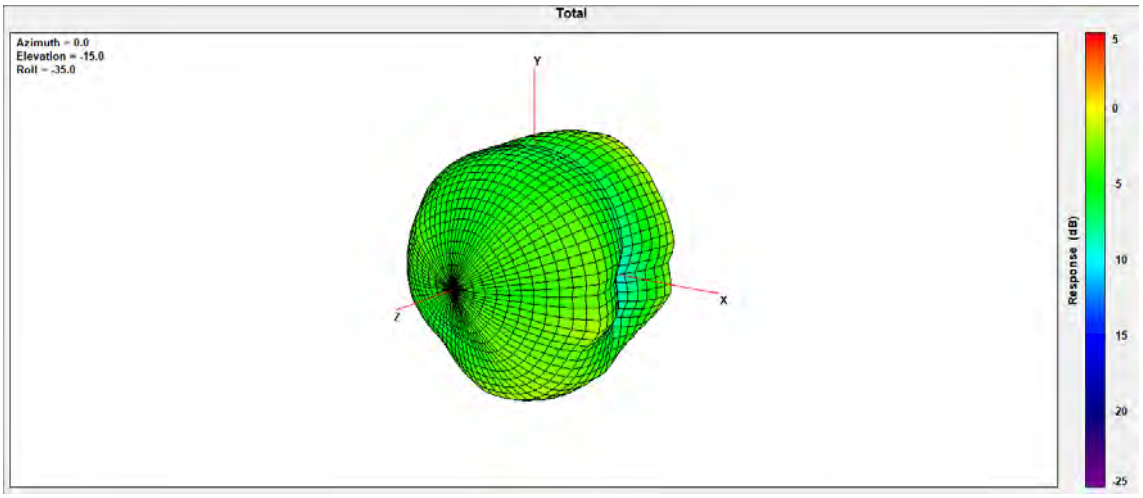
1805MHz	H (Peak)	V (Peak)
	-2.52	-1.02

1842.5MHz



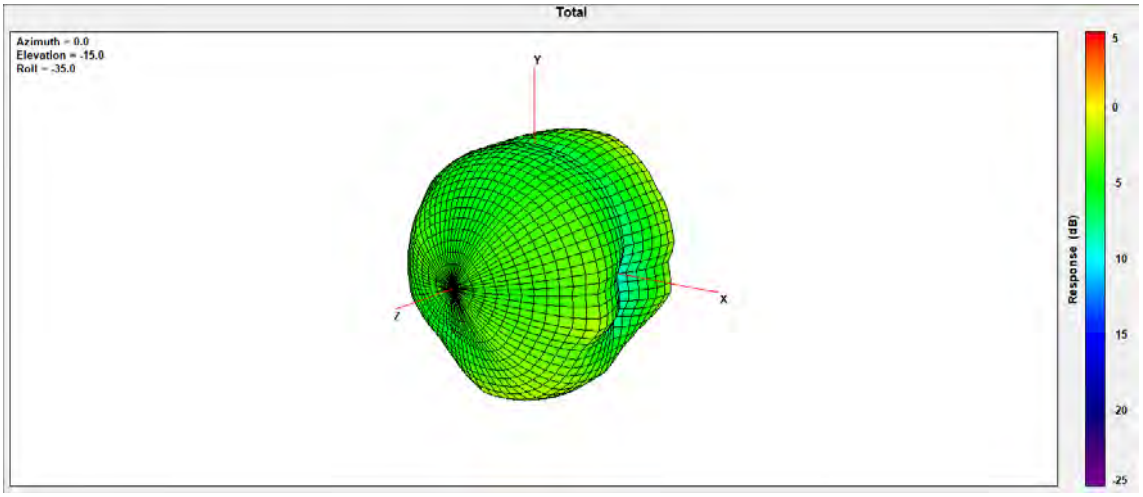
1842.5MHz	H (Peak)	V (Peak)
	-1.12	-0.07

1844.9MHz



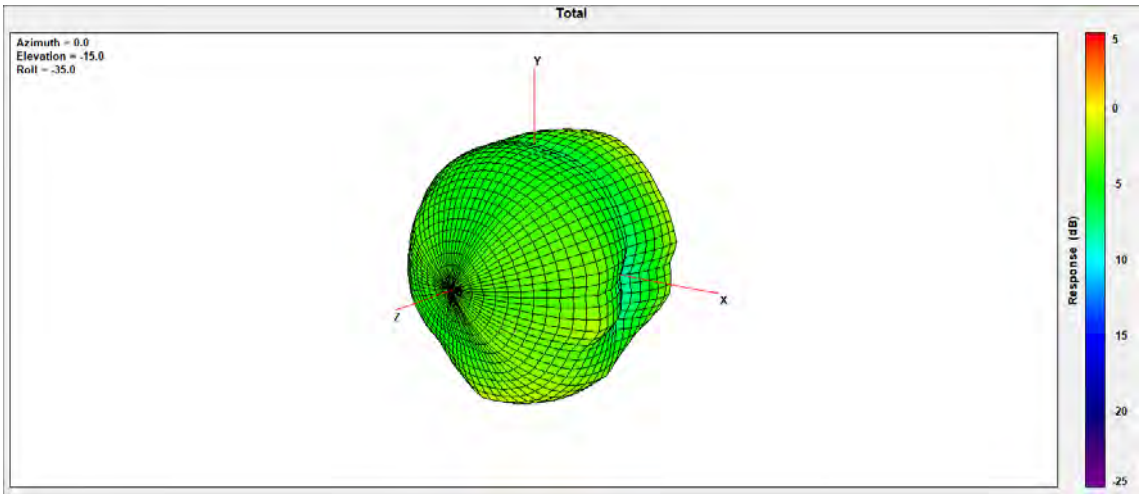
1844.9MHz	H (Peak)	V (Peak)
	-1.11	-0.08

1850MHz



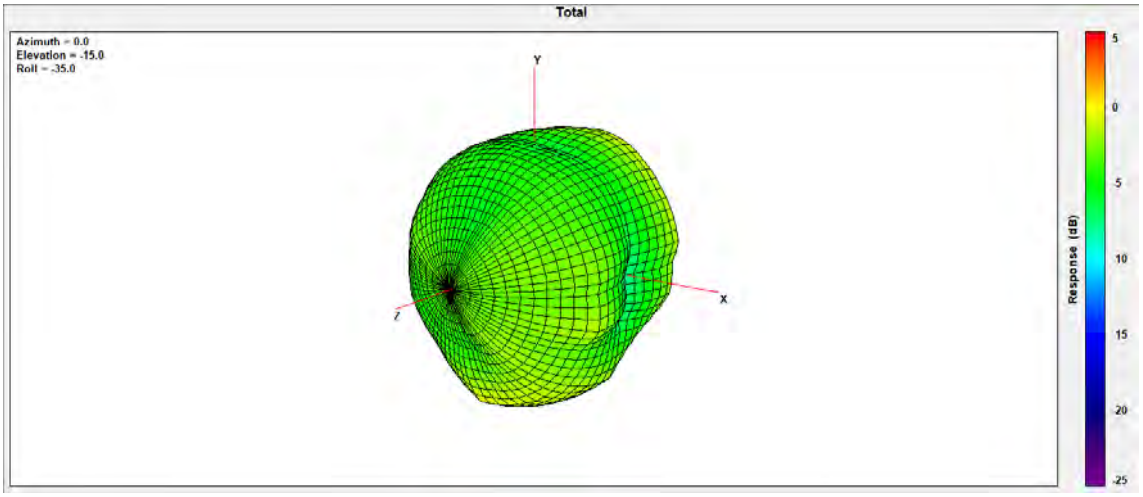
1850MHz	H (Peak)	V (Peak)
	-1.17	-3.33

1862.4MHz



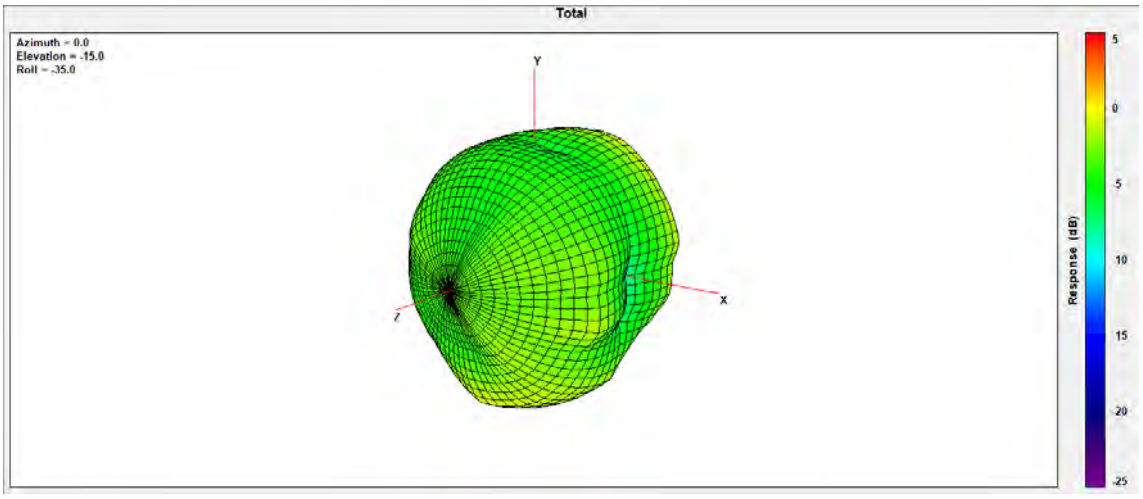
1862.4MHz	H (Peak)	V (Peak)
	-0.81	-3.08

1880MHz



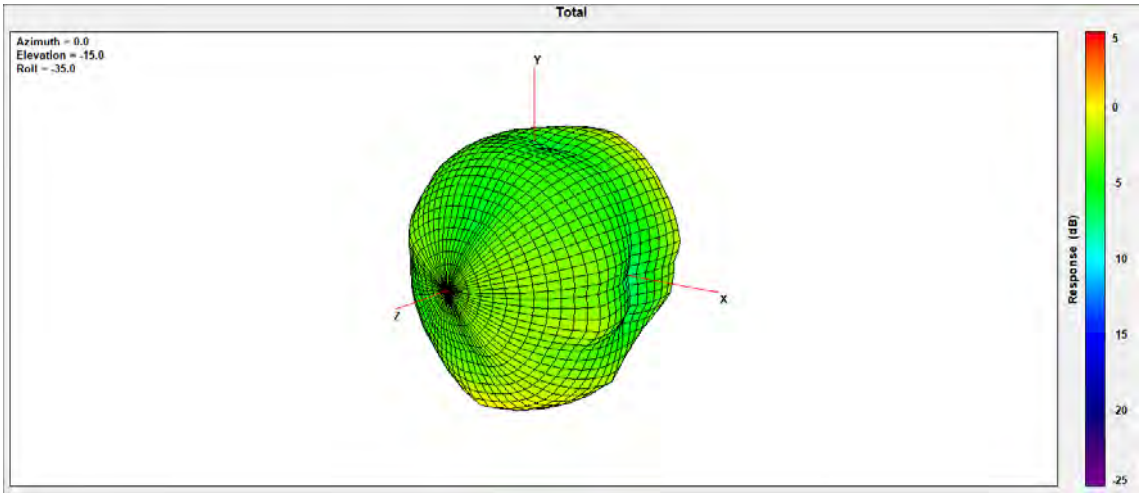
1880MHz	H (Peak)	V (Peak)
	-0.85	-2.92

1882.5MHz



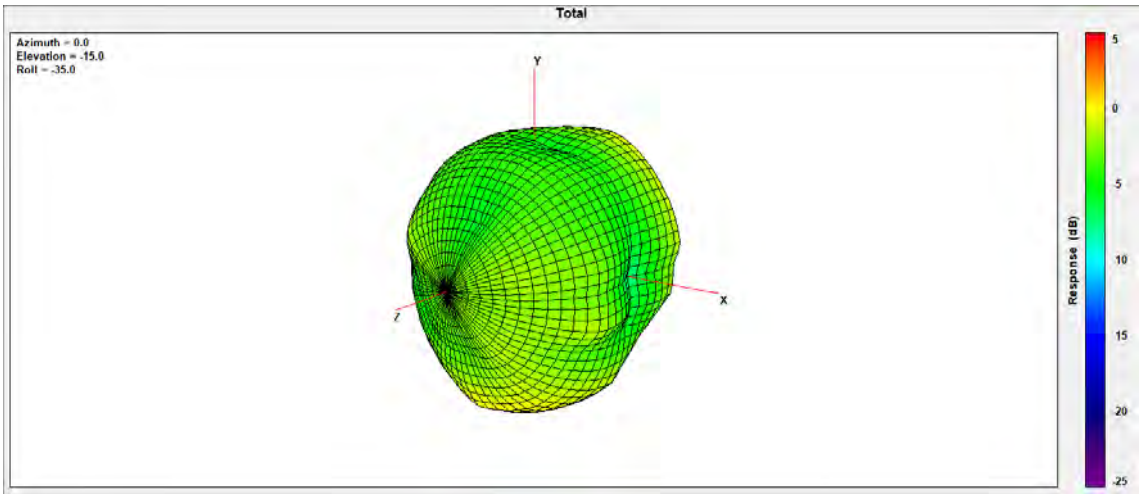
1882.5MHz	H (Peak)	V (Peak)
	-0.83	-2.88

1900MHz



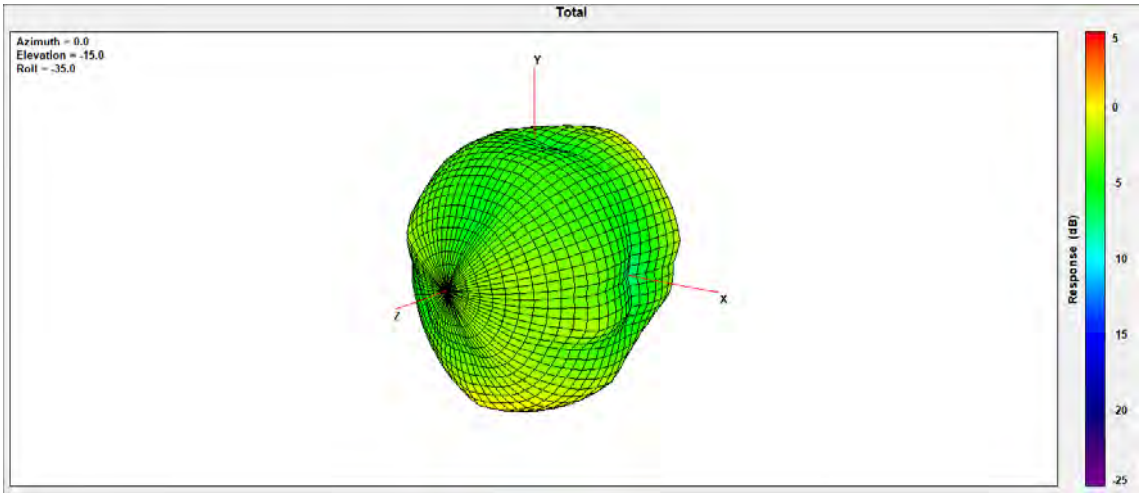
1900MHz	H (Peak)	V (Peak)
	-0.46	-2.24

1910MHz



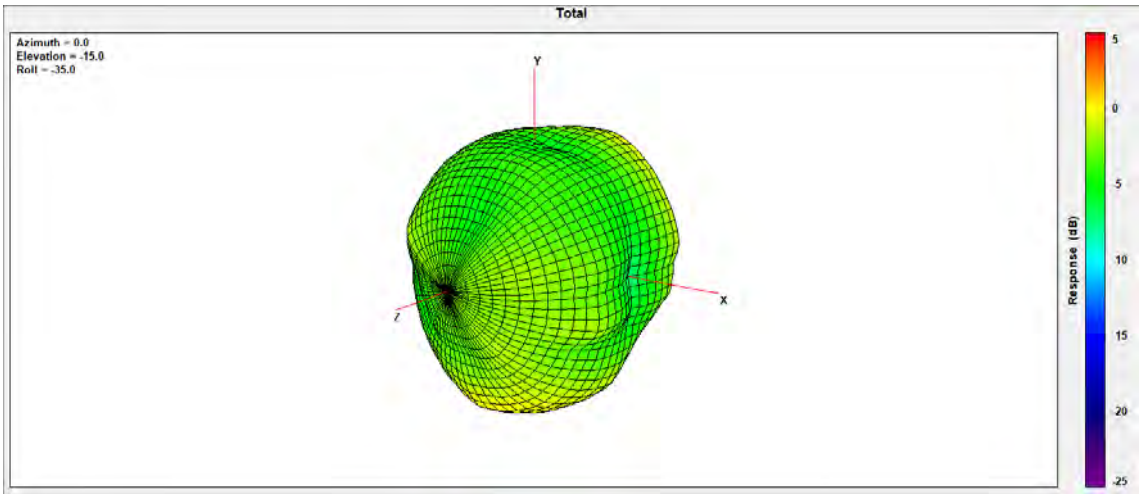
1910MHz	H (Peak)	V (Peak)
	-0.25	-1.92

1915MHz



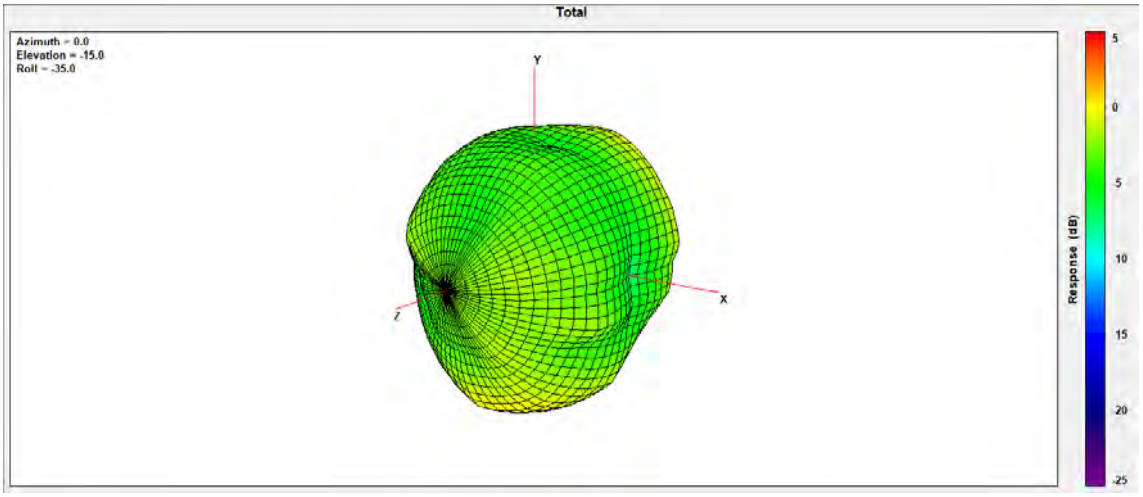
1915MHz	H (Peak)	V (Peak)
	-0.19	-1.79

1920MHz



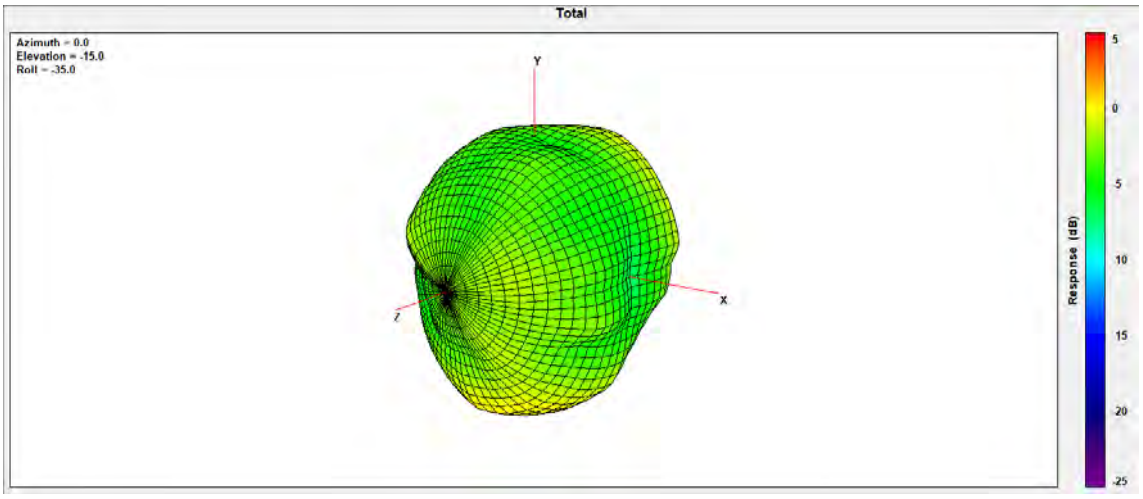
1920MHz	H (Peak)	V (Peak)
	-0.12	-1.57

1930MHz



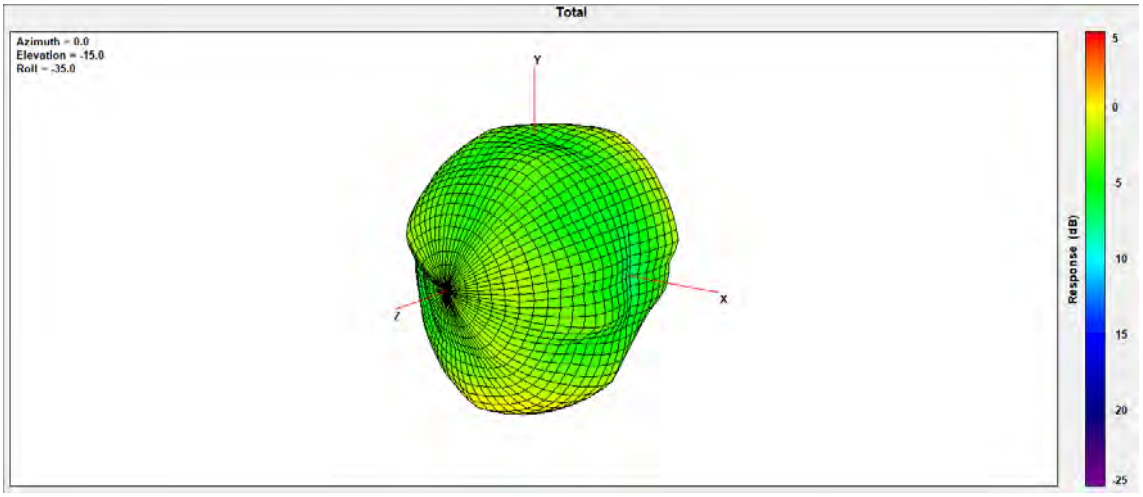
1930MHz	H (Peak)	V (Peak)
	-0.84	-0.38

1950MHz



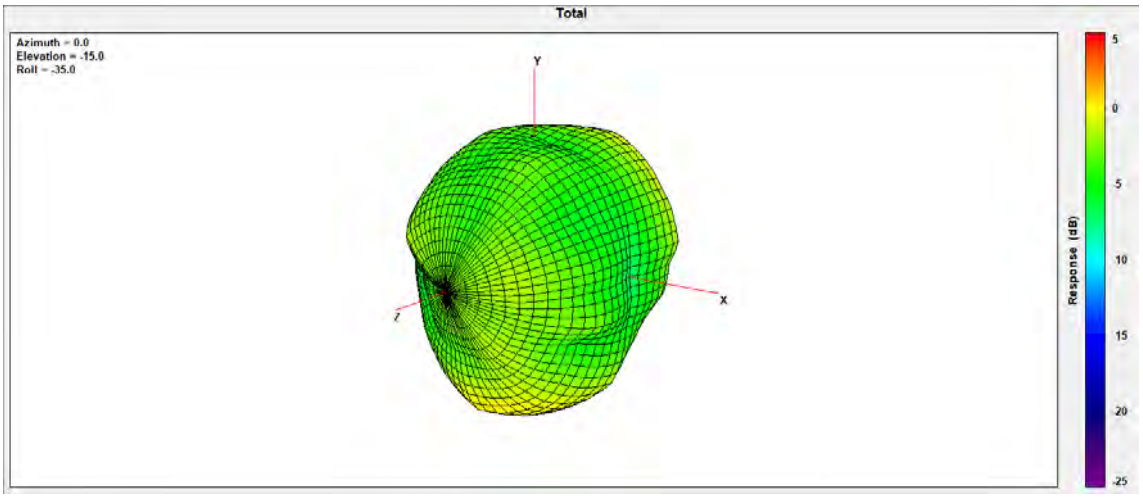
1950MHz	H (Peak)	V (Peak)
	0.47	-0.79

1960MHz



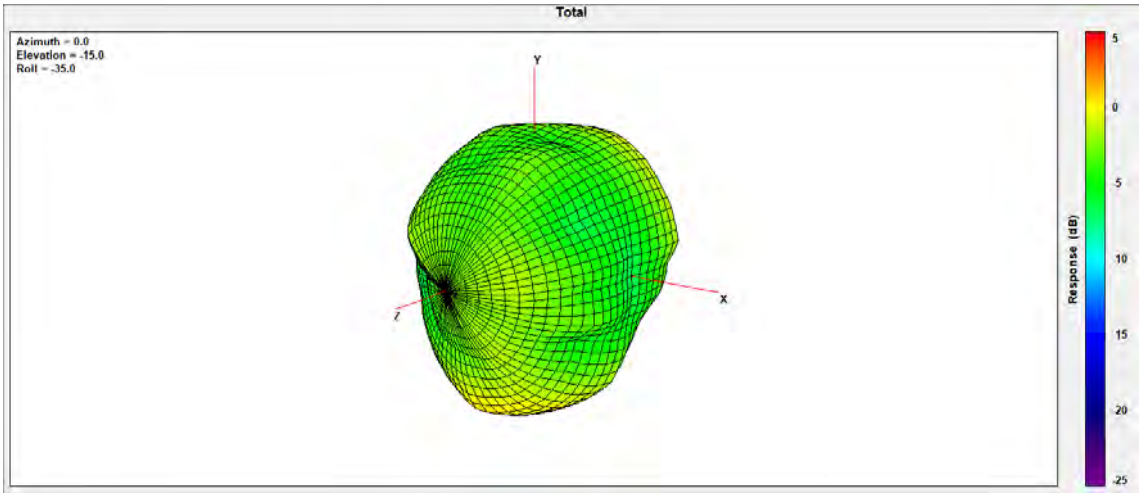
1960MHz	H (Peak)	V (Peak)
	-0.87	-0.09

1962.5MHz



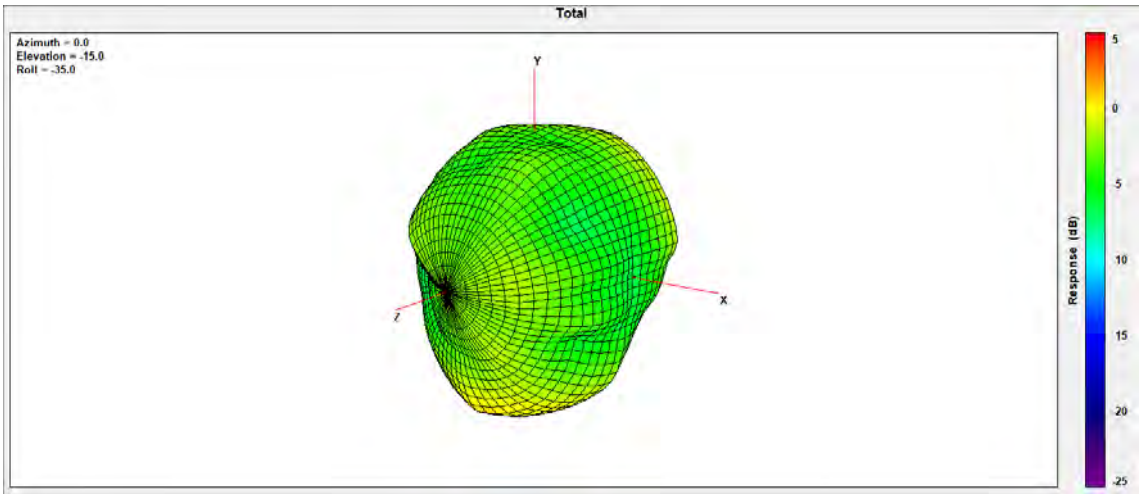
1962.5MHz	H (Peak)	V (Peak)
	-0.92	-0.17

1980MHz



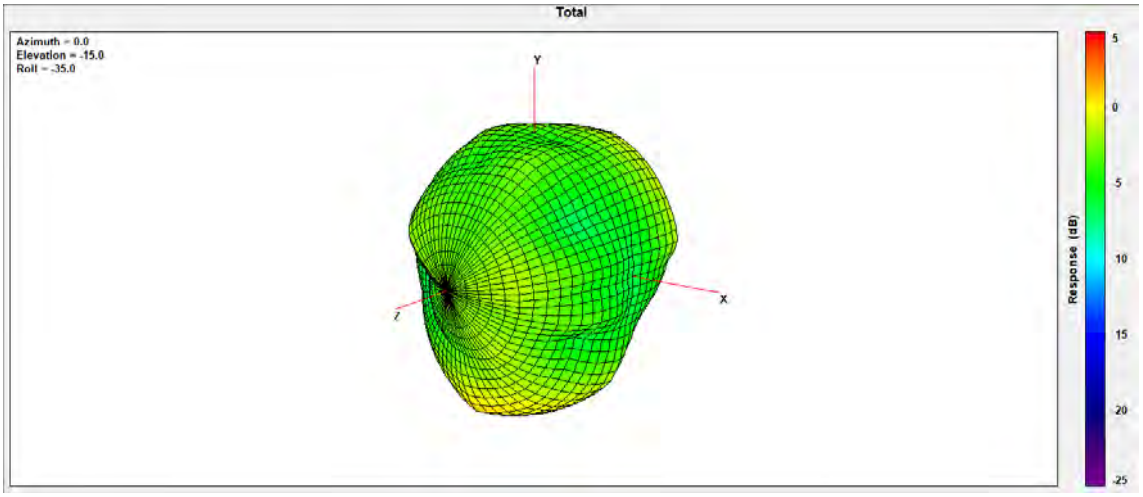
1980MHz	H (Peak)	V (Peak)
	0.95	-0.42

1990MHz



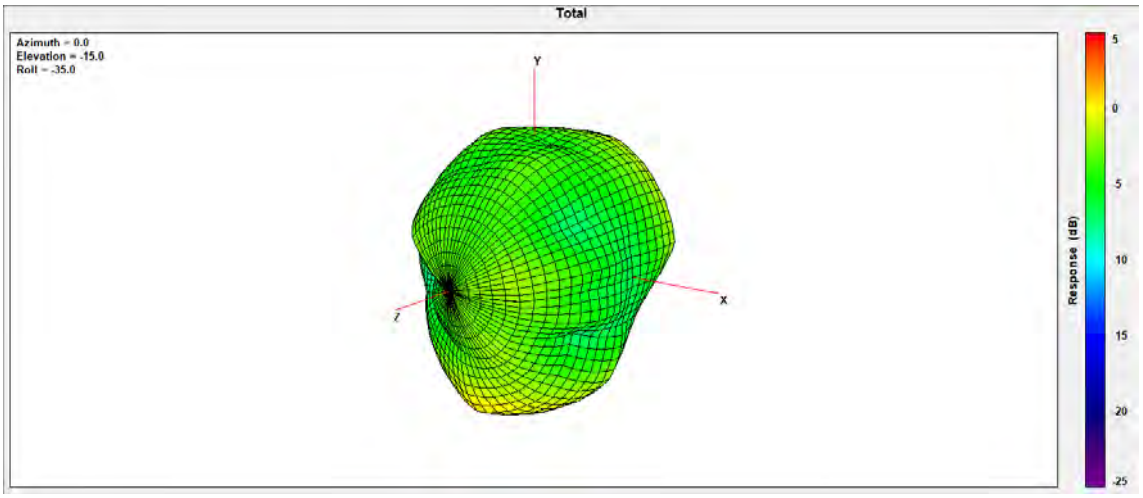
1990MHz	H (Peak)	V (Peak)
	-0.31	-0.11

1995MHz



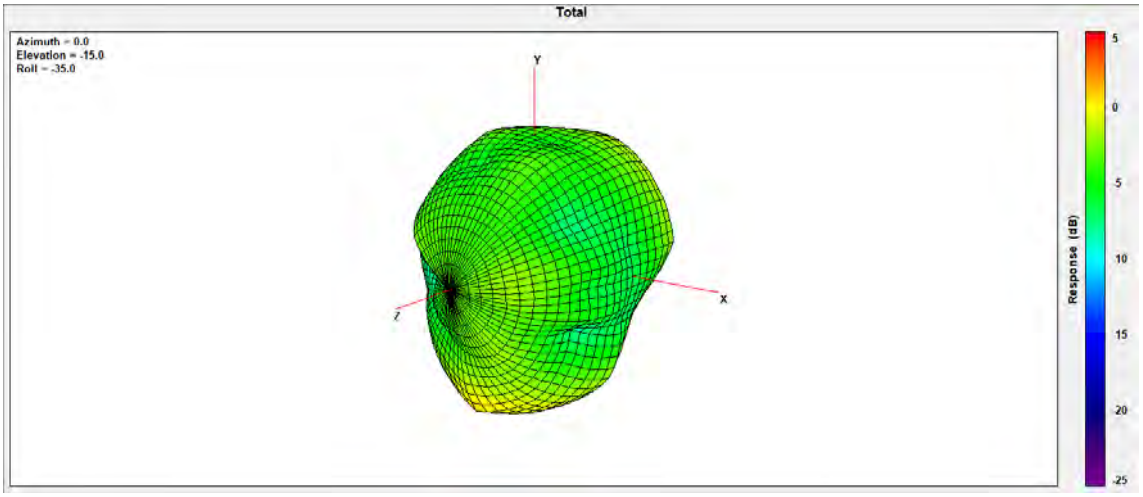
1995MHz	H (Peak)	V (Peak)
	-0.19	-0.06

2010MHz



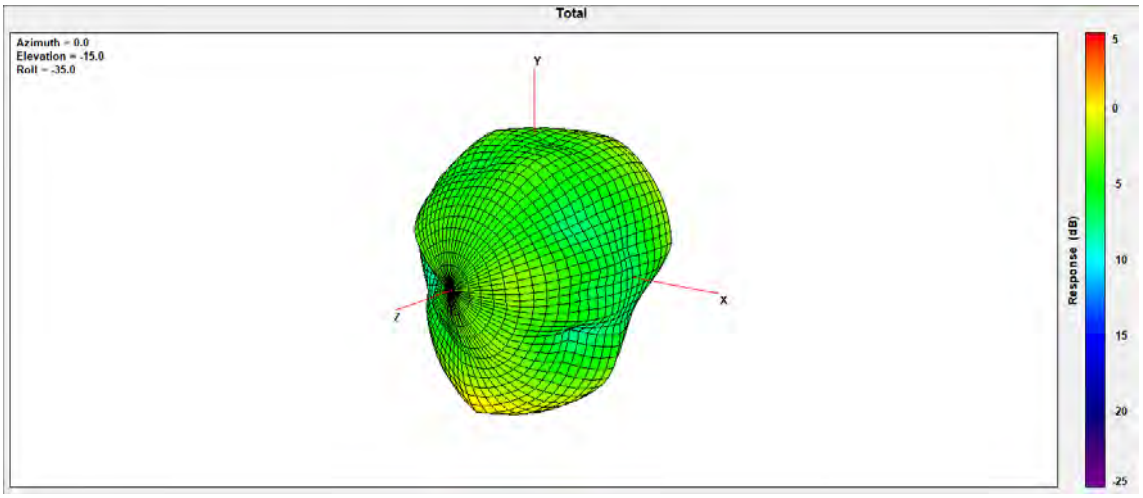
2010MHz	H (Peak)	V (Peak)
	0.24	0.38

2018MHz



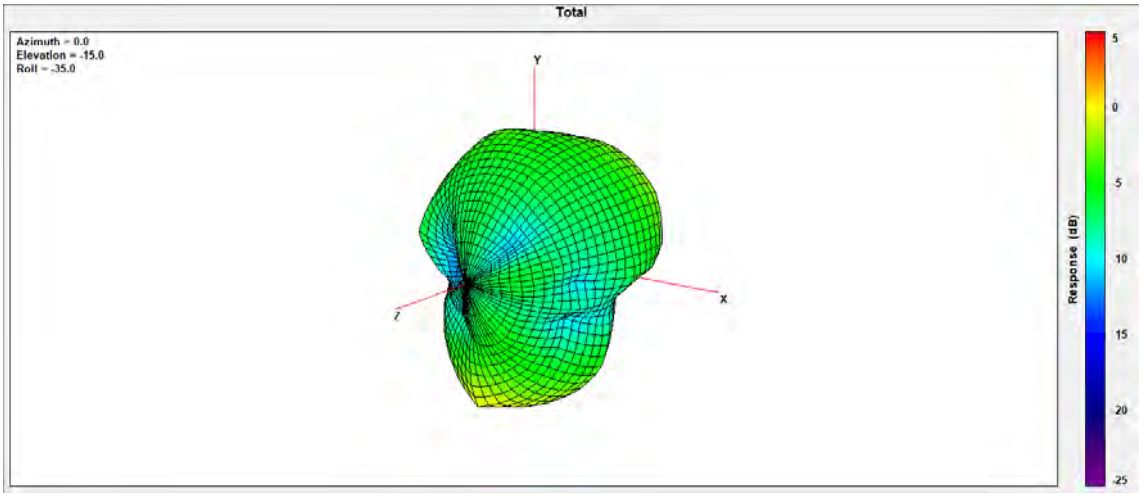
2018MHz	H (Peak)	V (Peak)
	1.15	-0.75

2025MHz



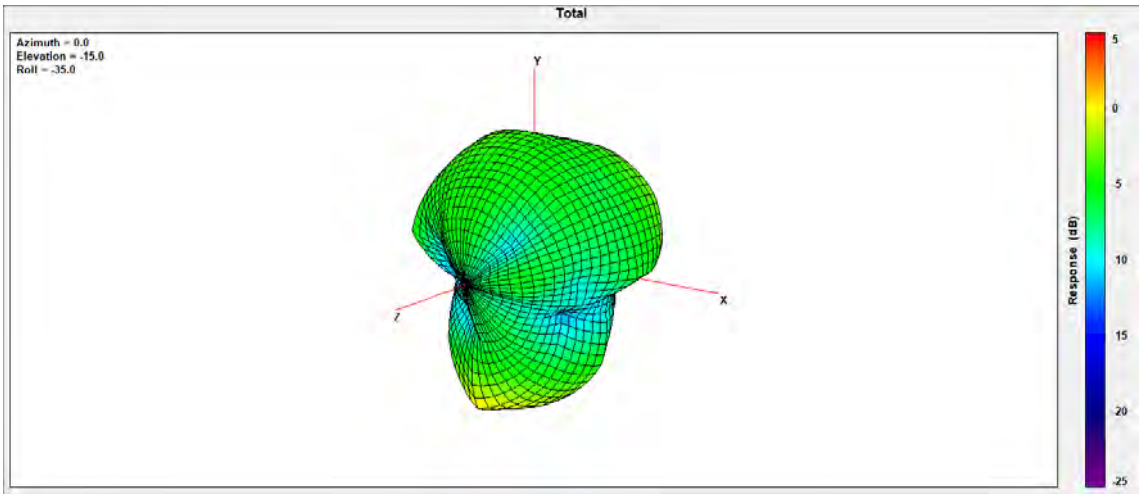
2025MHz	H (Peak)	V (Peak)
	1.18	-0.83

2110MHz



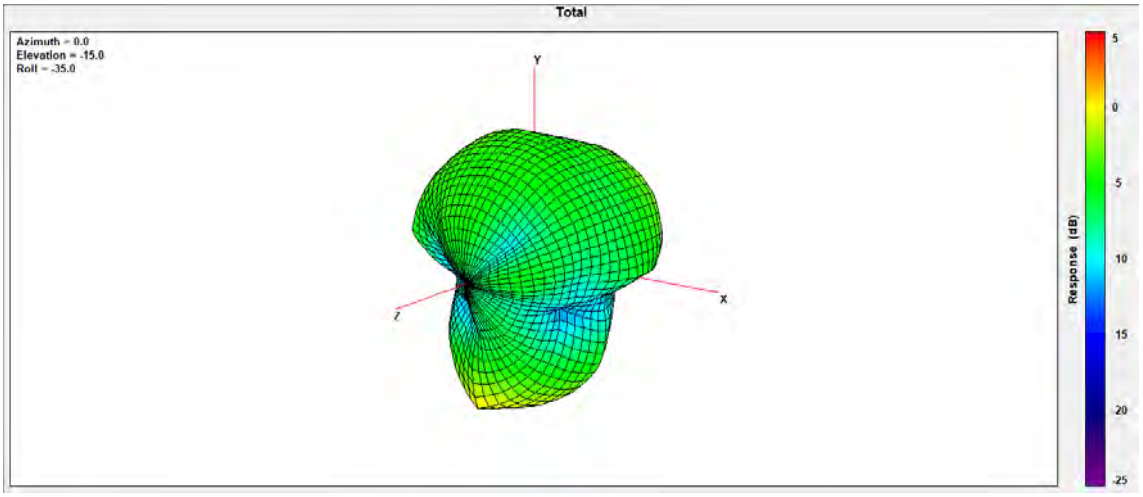
2110MHz	H (Peak)	V (Peak)
	0.57	0.69

2132.5MHz



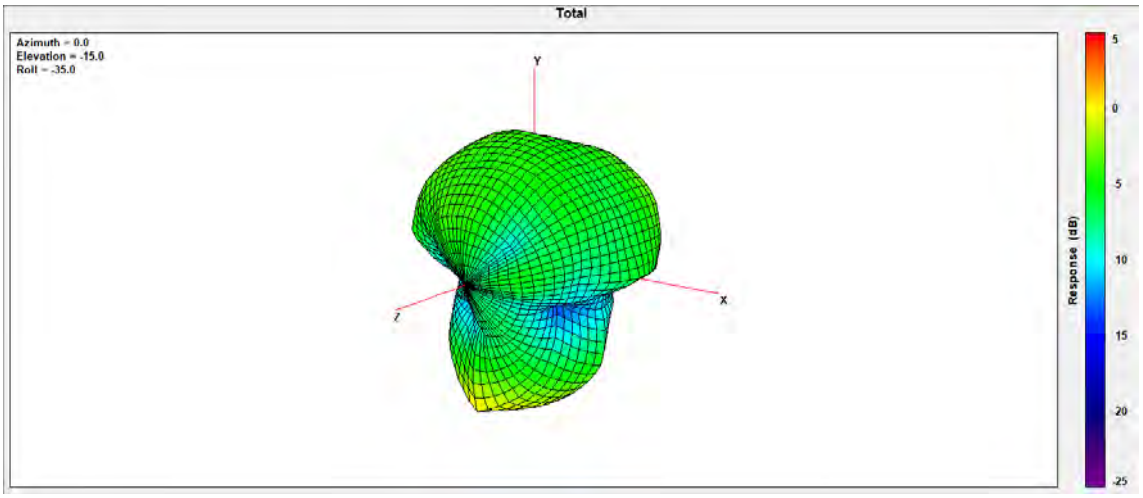
2132.5MHz	H (Peak)	V (Peak)
	1.23	-0.87

2140MHz



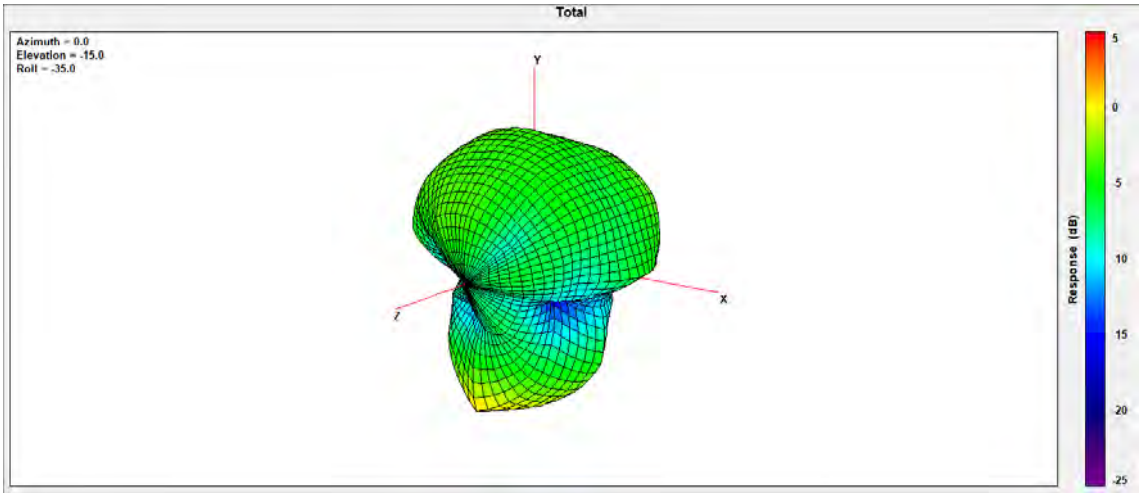
2140MHz	H (Peak)	V (Peak)
	0.08	0.29

2155MHz



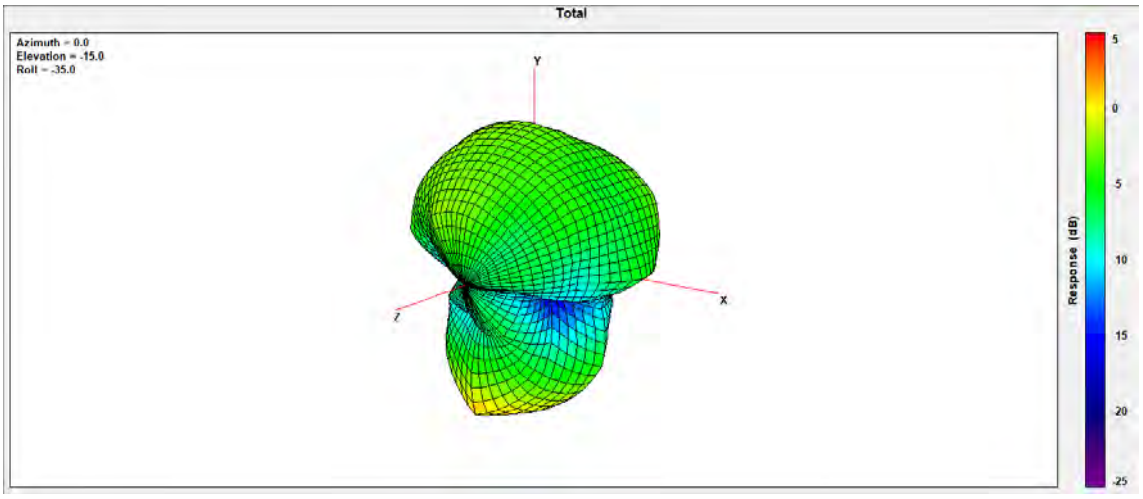
2155MHz	H (Peak)	V (Peak)
	-0.28	0.50

2170MHz



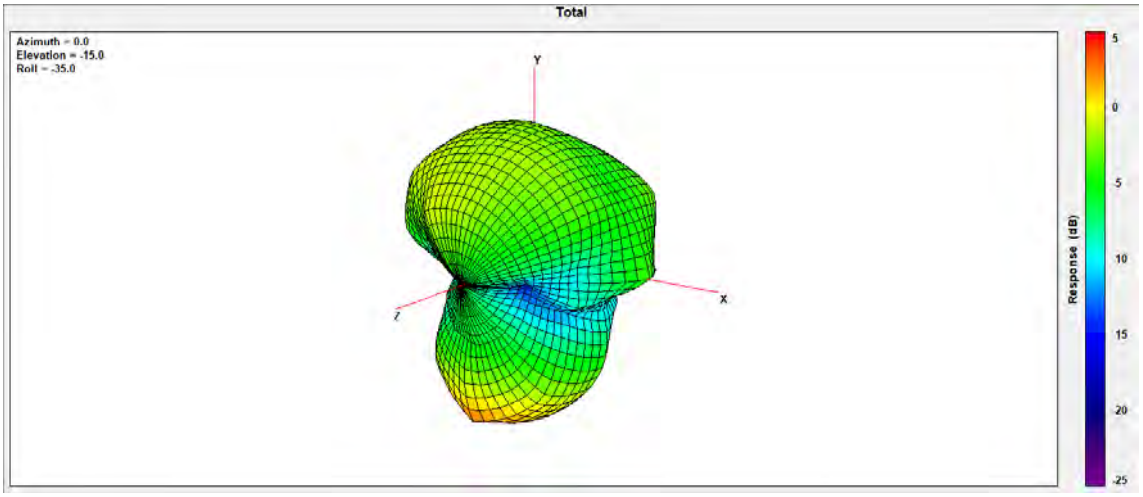
2170MHz	H (Peak)	V (Peak)
	-0.14	0.50

2200MHz



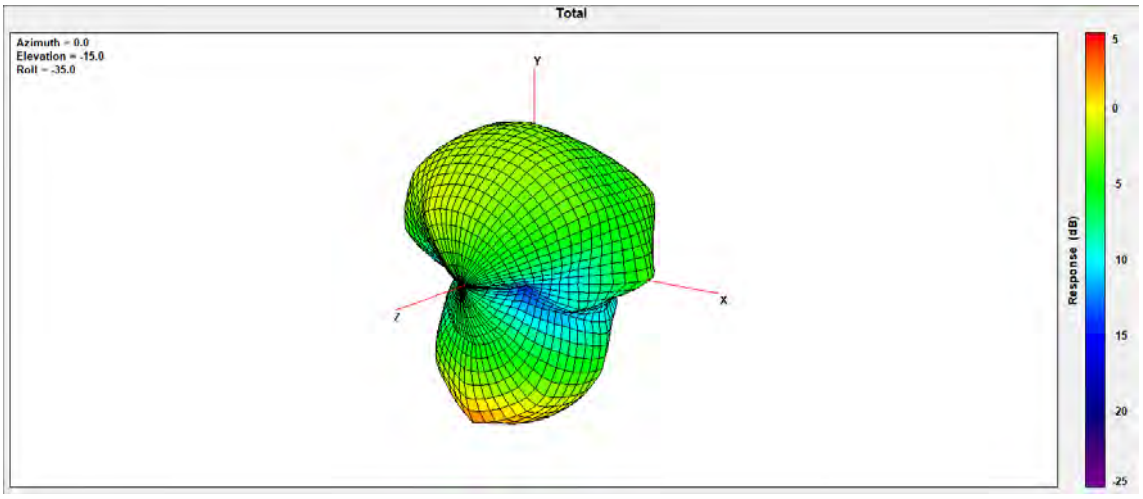
2200MHz	H (Peak)	V (Peak)
	0.13	0.47

2300MHz



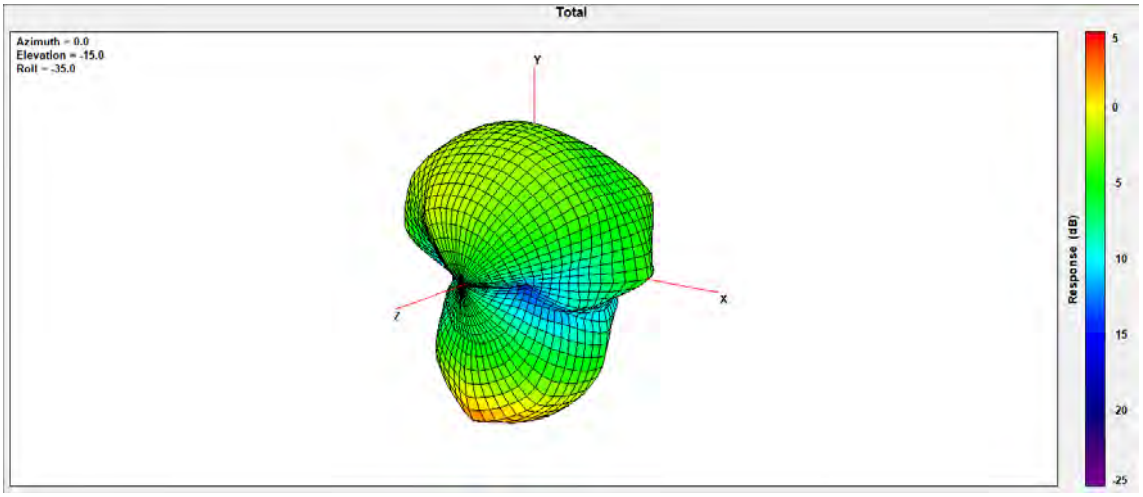
2300MHz	H (Peak)	V (Peak)
	0.52	0.40

2305MHz



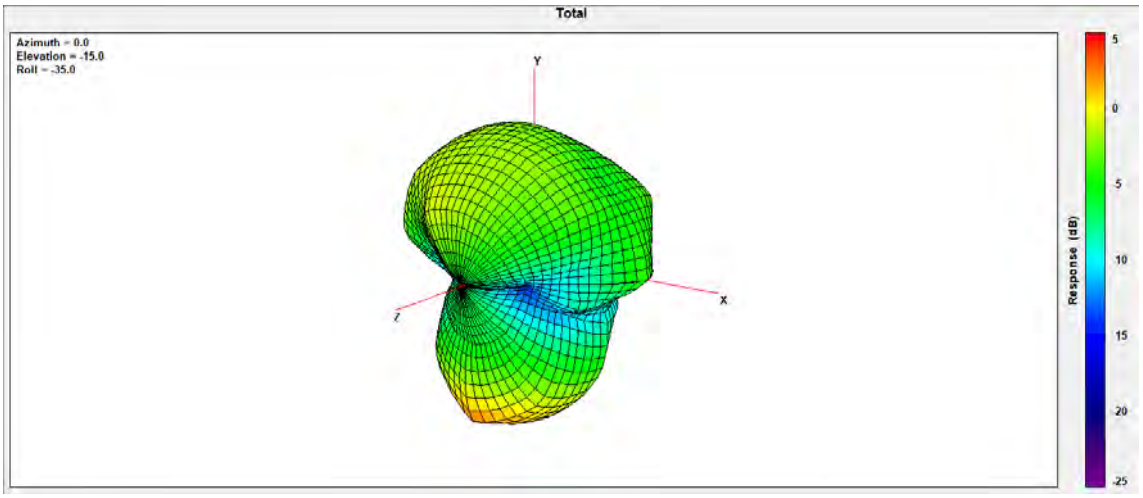
2305MHz	H (Peak)	V (Peak)
	0.64	0.41

2310MHz



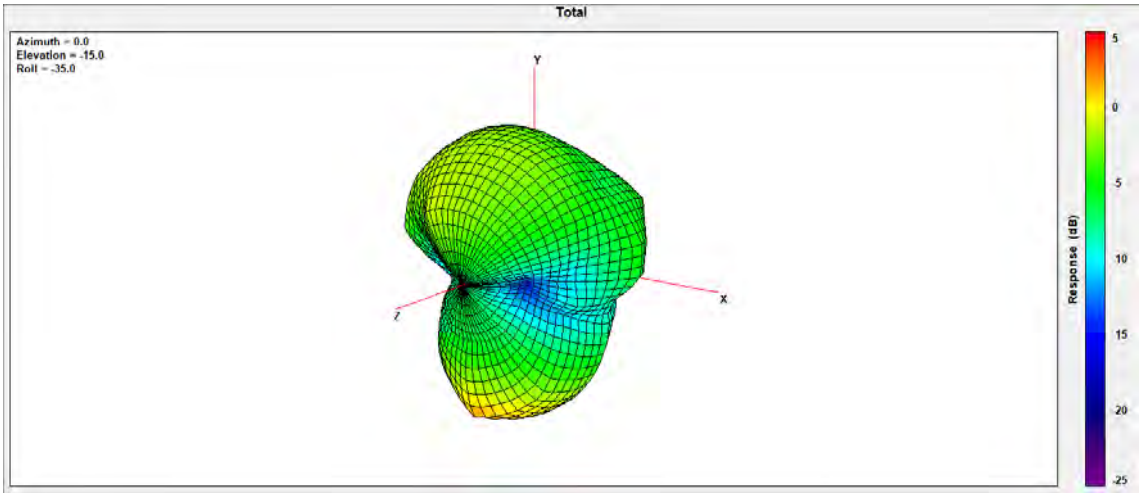
2310MHz	H (Peak)	V (Peak)
	2.42	0.02

2315MHz



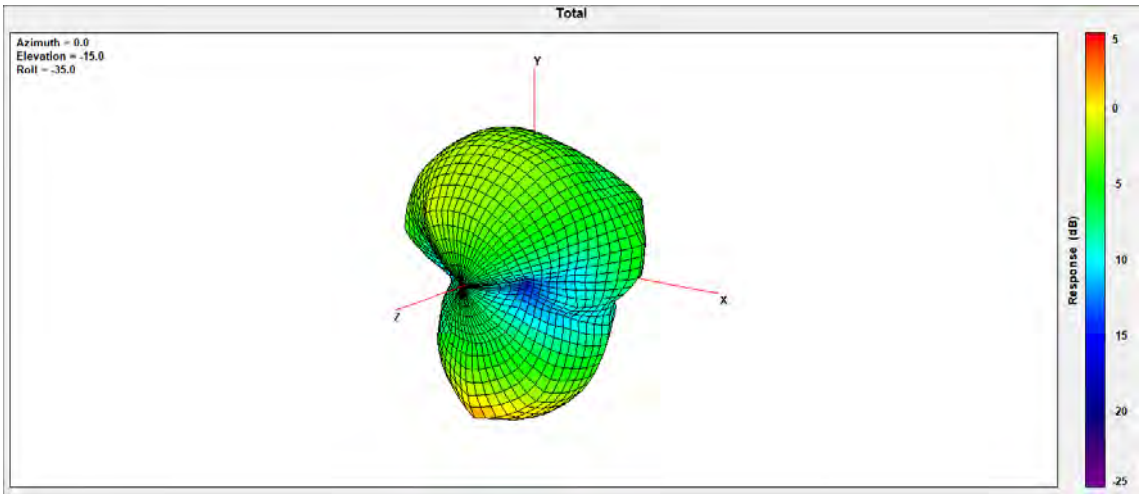
2315MHz	H (Peak)	V (Peak)
	0.97	0.11

2350MHz



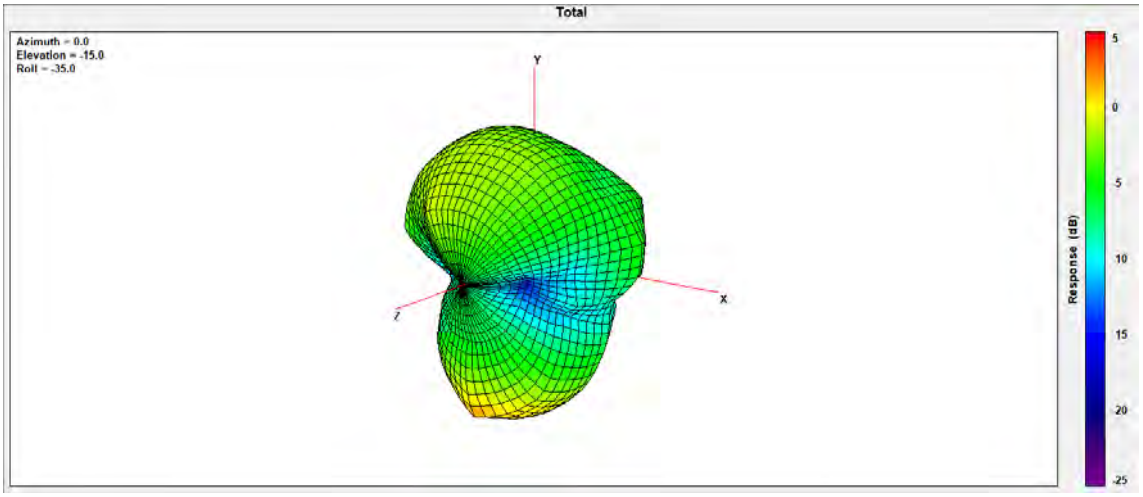
2350MHz	H (Peak)	V (Peak)
	0.94	0.17

2355MHz



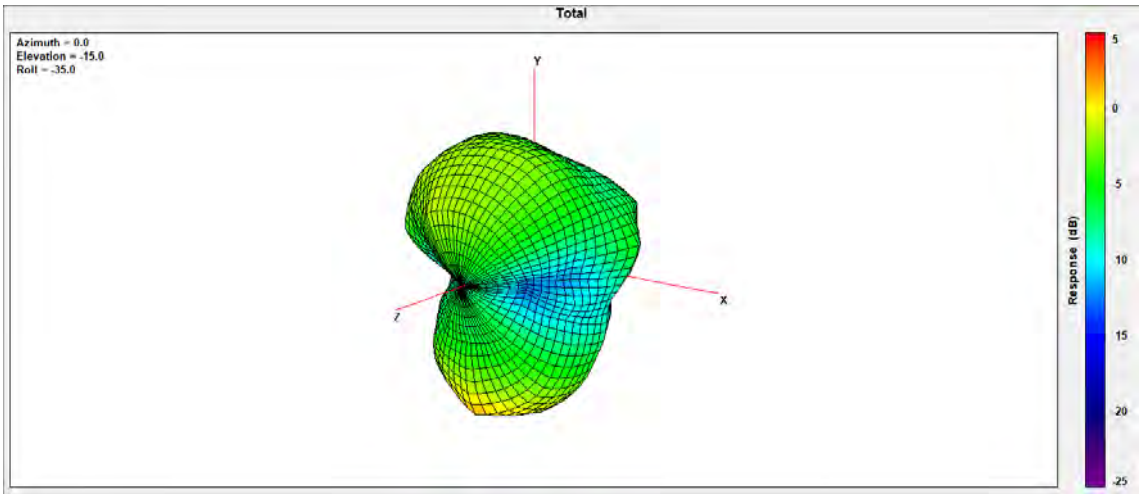
2355MHz	H (Peak)	V (Peak)
	0.99	0.18

2360MHz



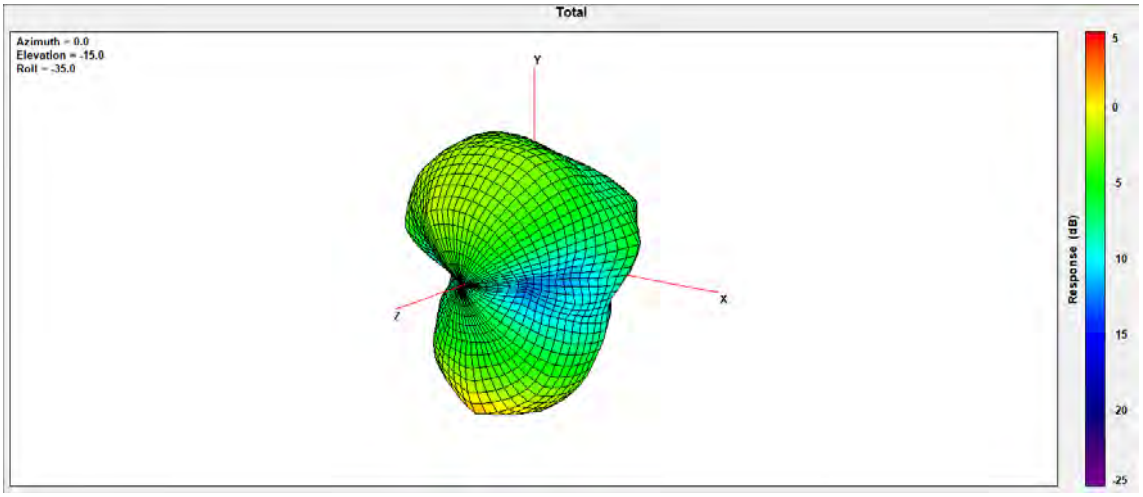
2360MHz	H (Peak)	V (Peak)
	1.72	-0.57

2400MHz



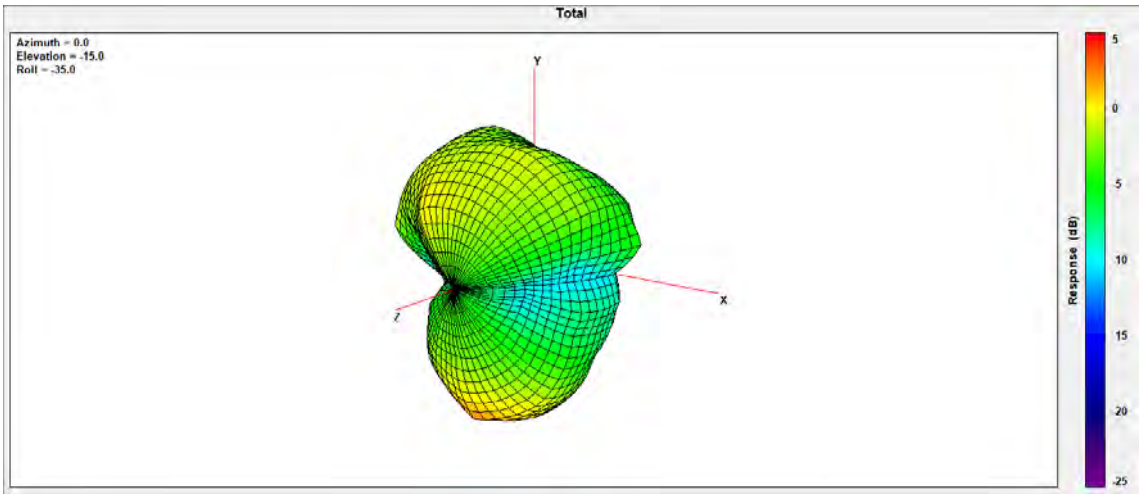
2400MHz	H (Peak)	V (Peak)
	1.46	-0.54

2496MHz



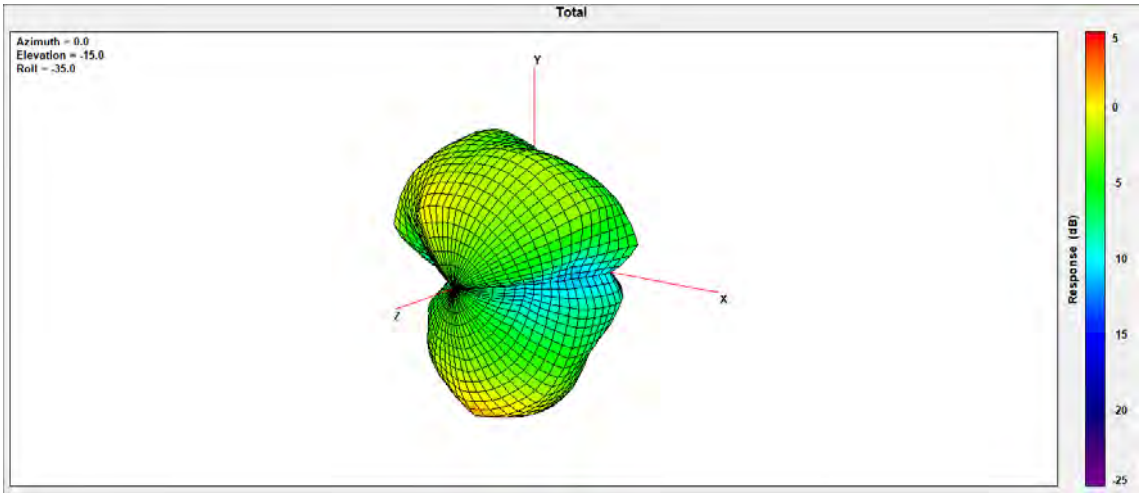
2496MHz	H (Peak)	V (Peak)
	1.25	-0.62

2500MHz



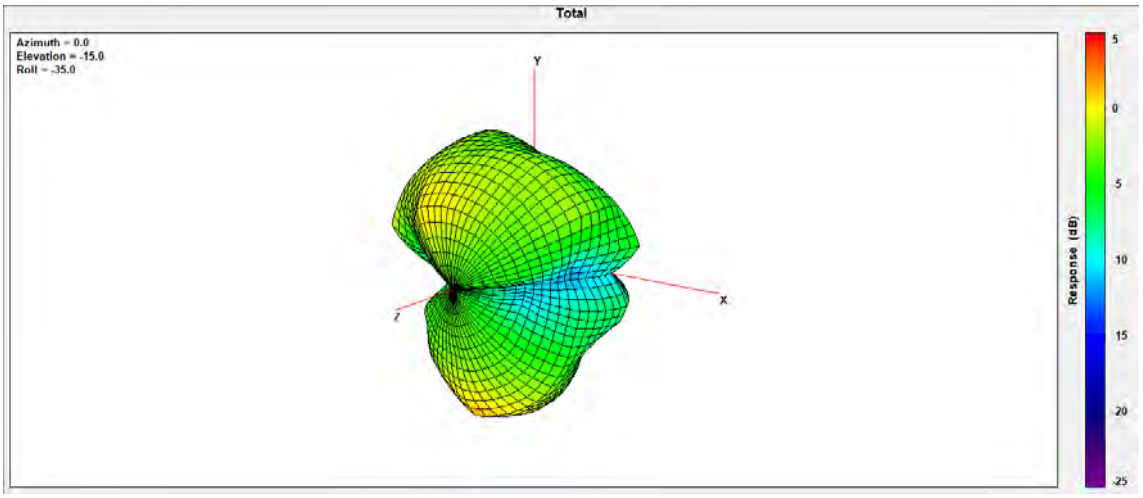
2500MHz	H (Peak)	V (Peak)
	0.96	-0.75

2535MHz



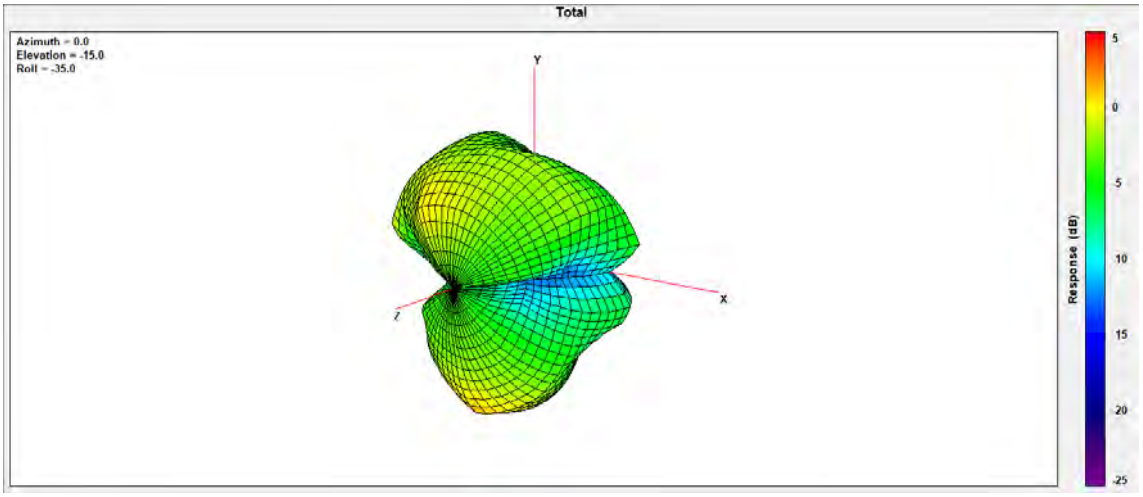
2535MHz	H (Peak)	V (Peak)
	1.85	-0.17

2570MHz



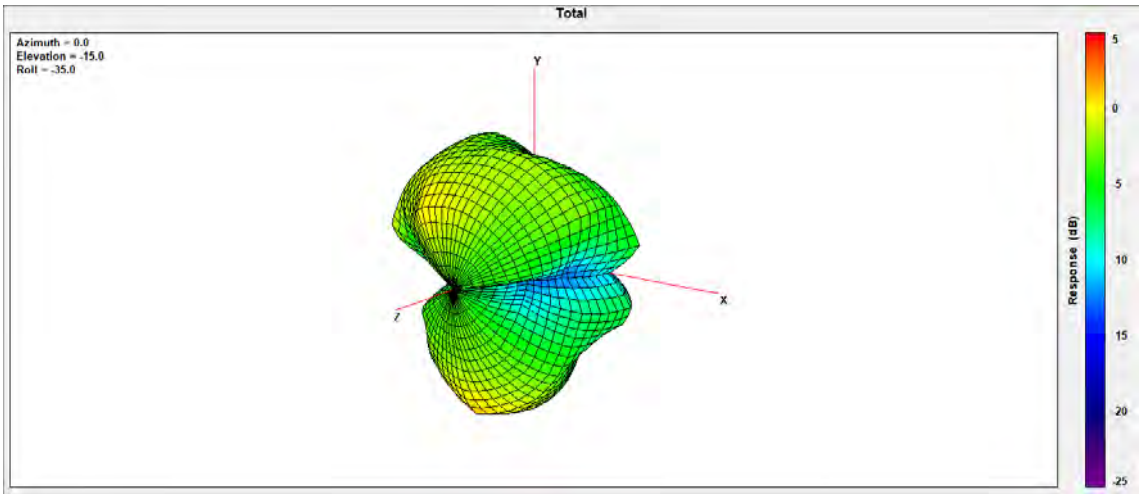
2570MHz	H (Peak)	V (Peak)
	1.73	-0.31

2593MHz



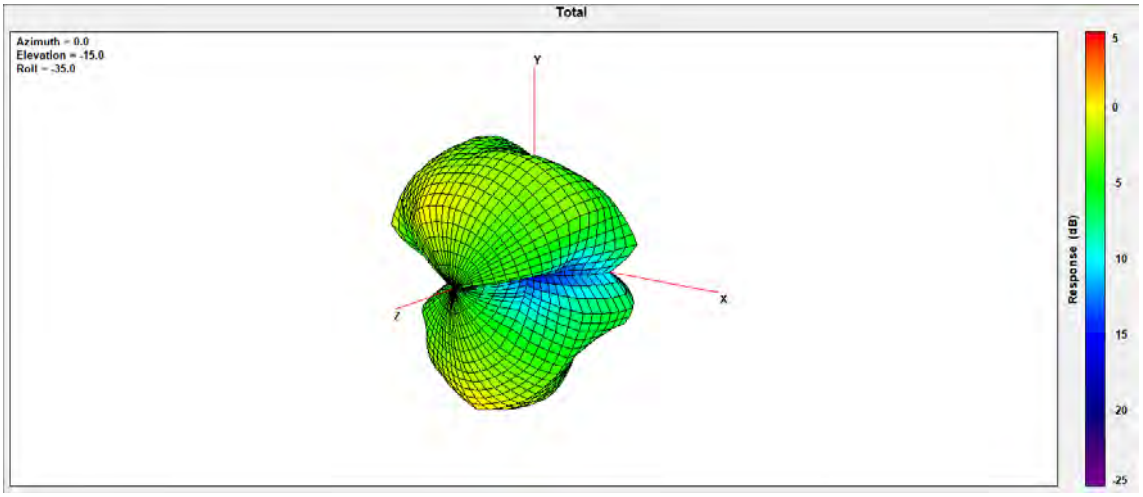
2593MHz	H (Peak)	V (Peak)
	1.38	-1.15

2595MHz



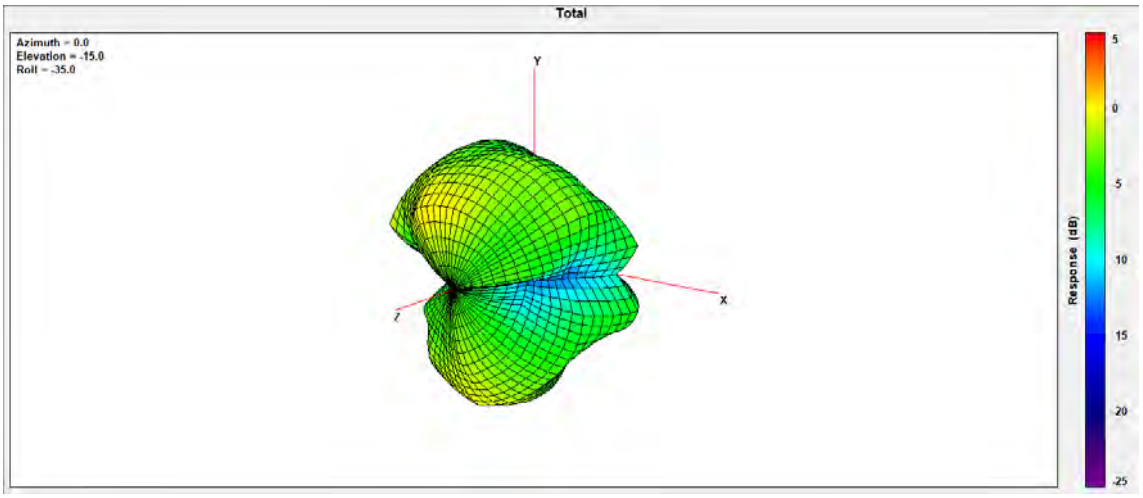
2595MHz	H (Peak)	V (Peak)
	0.98	-0.75

2620MHz



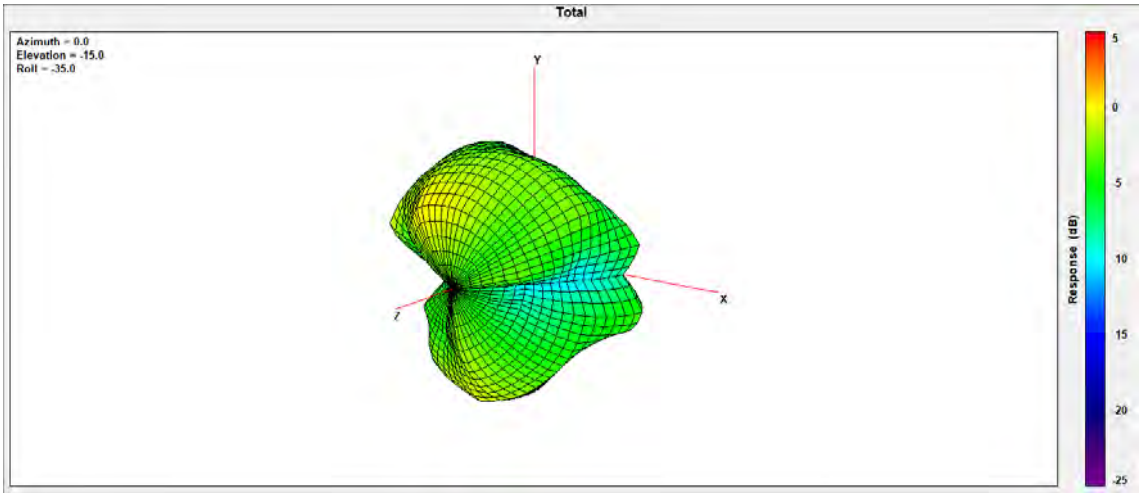
2620MHz	H (Peak)	V (Peak)
	0.64	-0.74

2655MHz



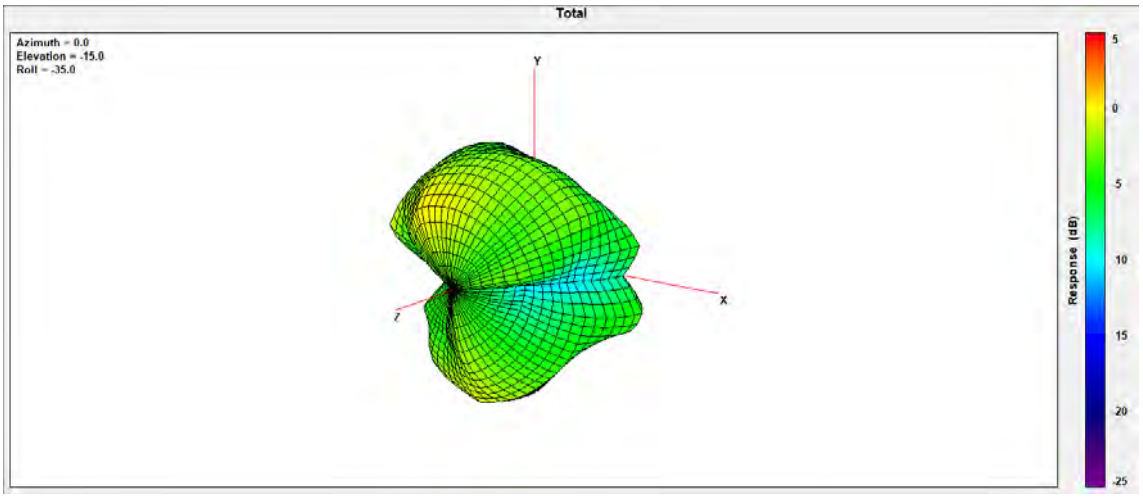
2655MHz	H (Peak)	V (Peak)
	0.57	-0.72

2690MHz



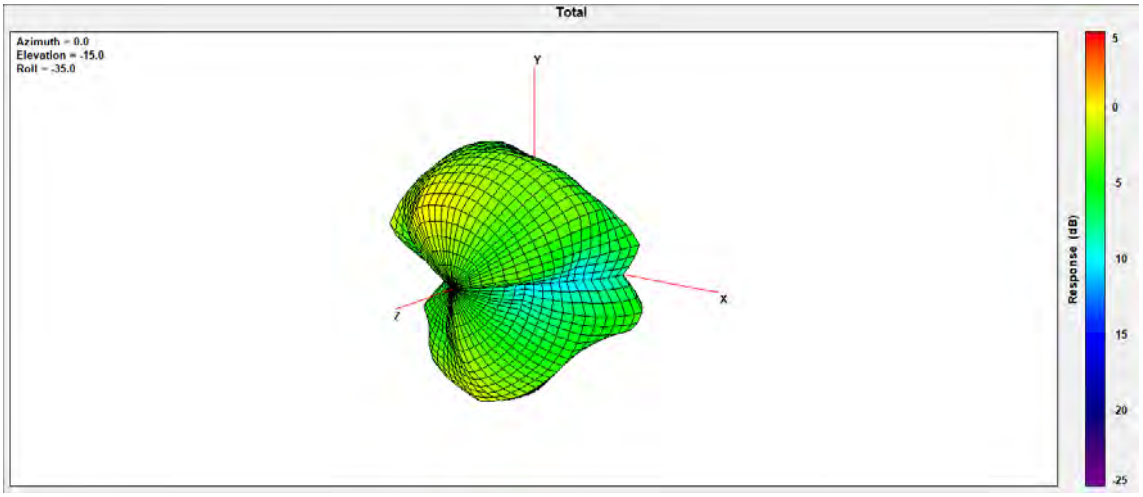
2690MHz	H (Peak)	V (Peak)
	-0.11	-0.57

3300MHz



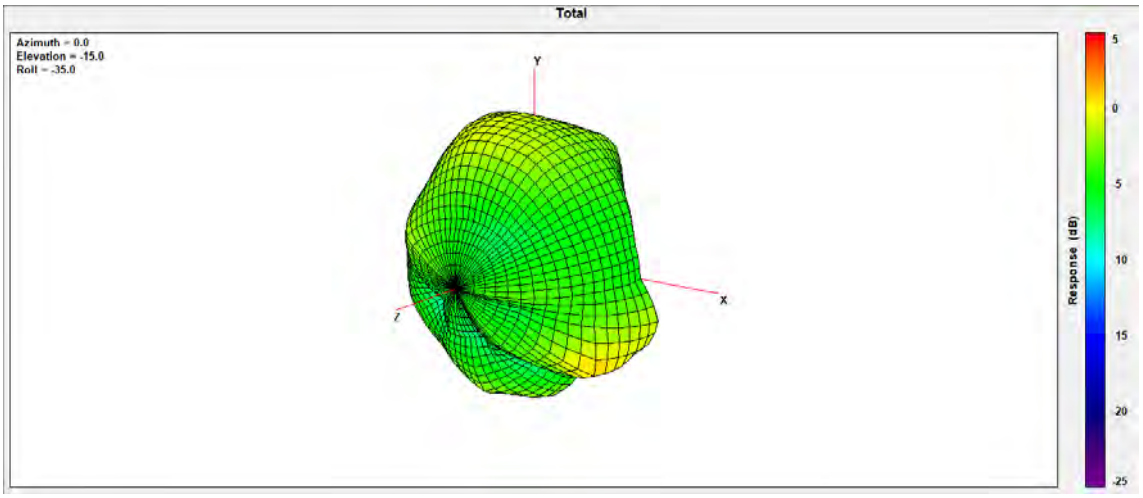
3300MHz	H (Peak)	V (Peak)
	-0.07	-0.51

3400MHz



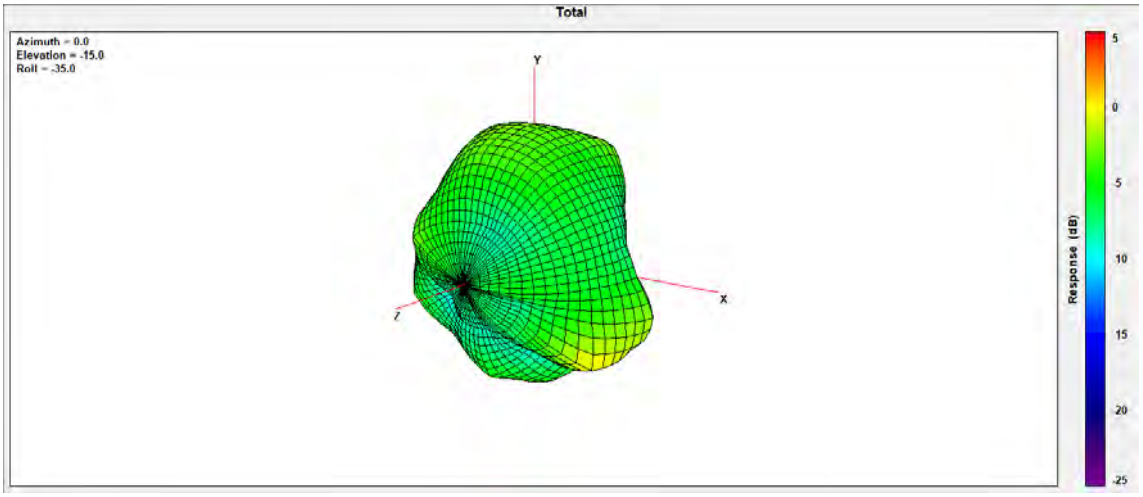
3400MHz	H (Peak)	V (Peak)
	-0.79	-0.46

3500MHz



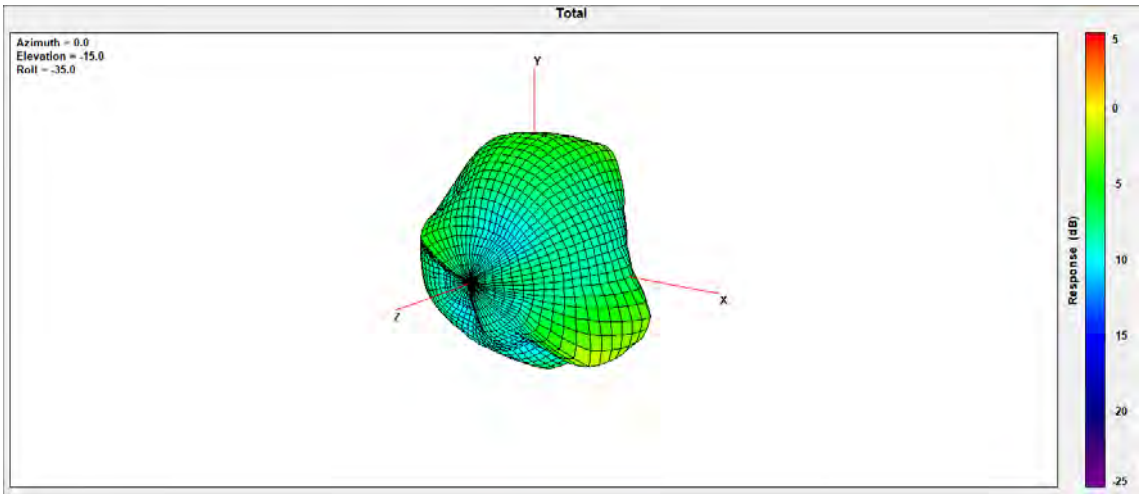
3500MHz	H (Peak)	V (Peak)
	-0.04	-1.30

3550MHz



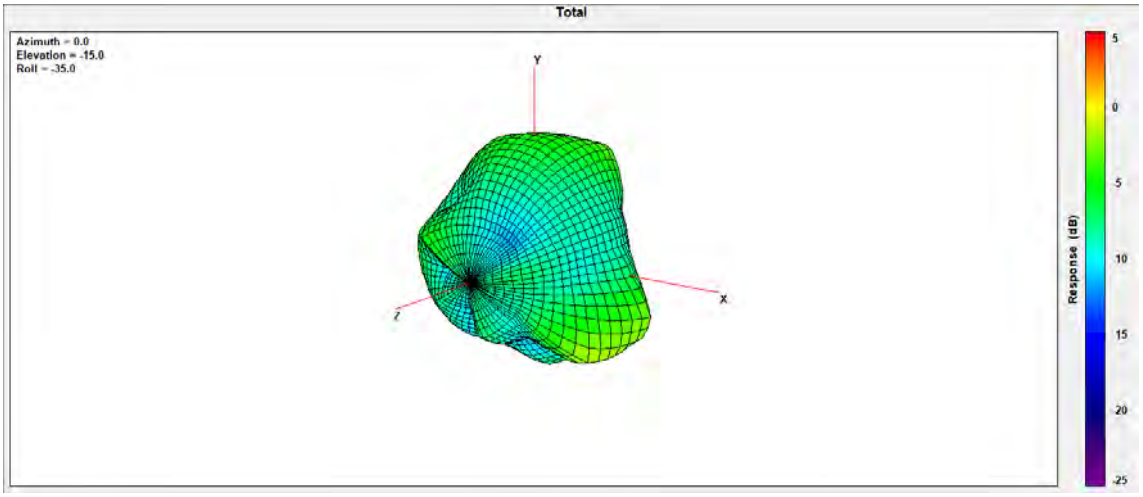
3550MHz	H (Peak)	V (Peak)
	-0.09	-1.31

3600MHz



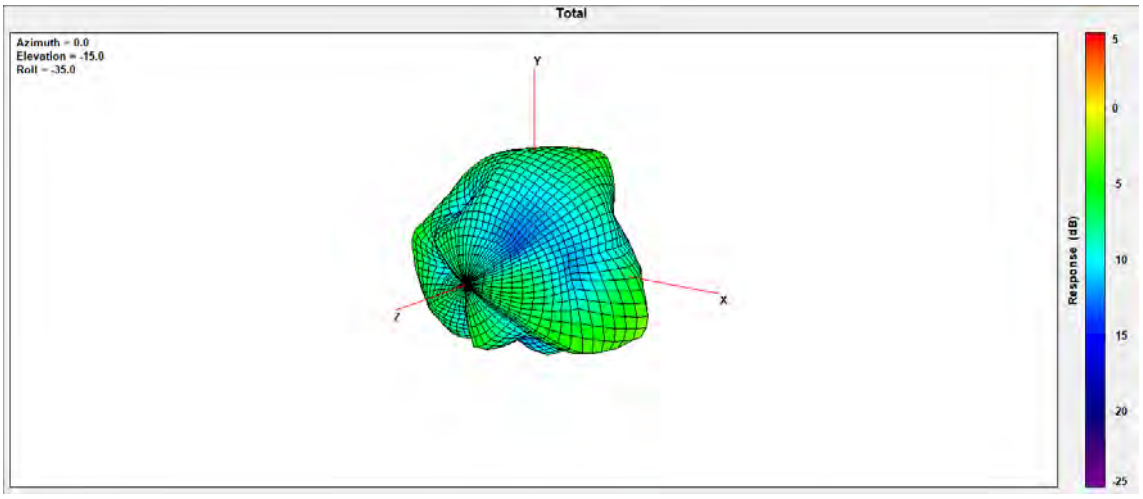
3600MHz	H (Peak)	V (Peak)
	-0.30	-2.39

3625MHz



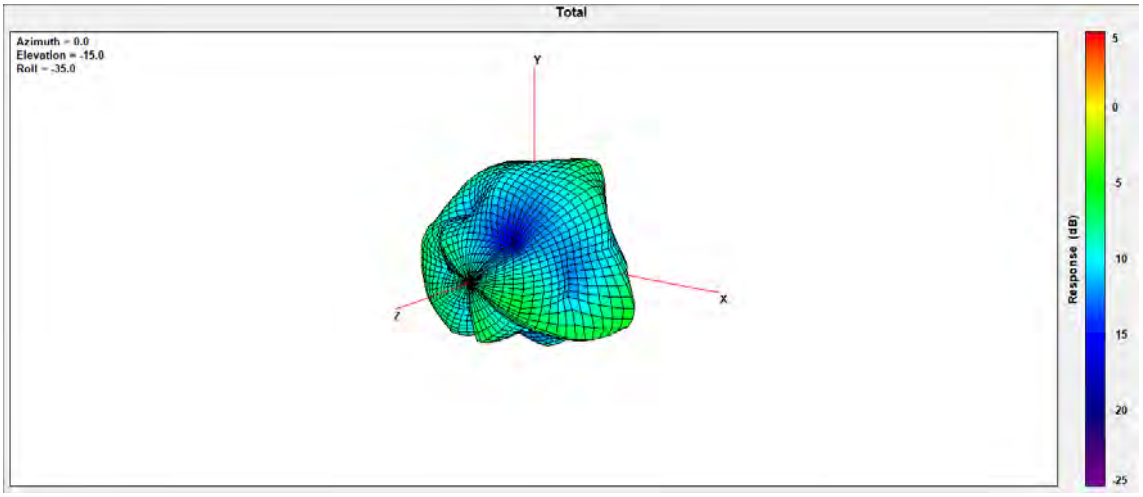
3625MHz	H (Peak)	V (Peak)
	-0.86	-3.10

3700MHz



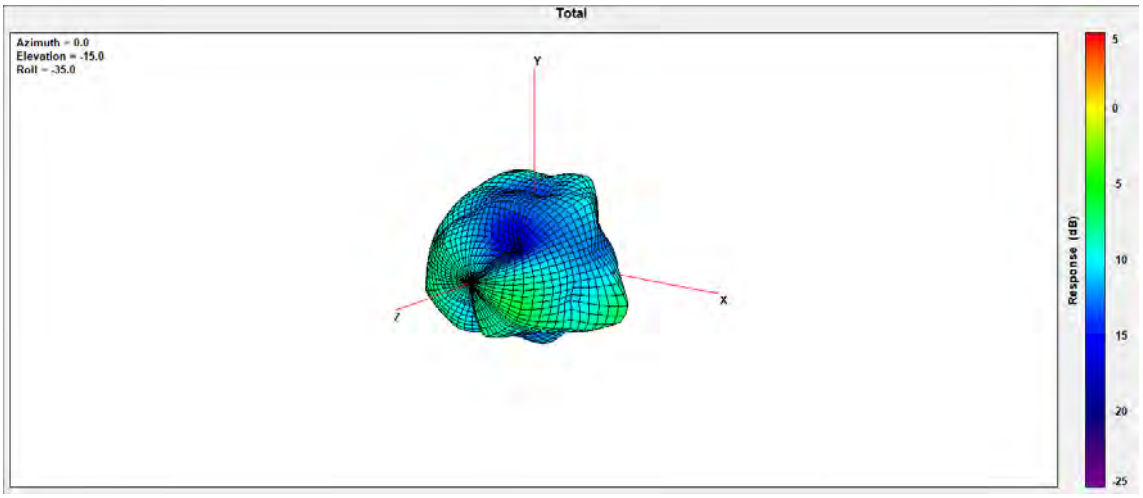
3700MHz	H (Peak)	V (Peak)
	-1.57	-3.77

3750MHz



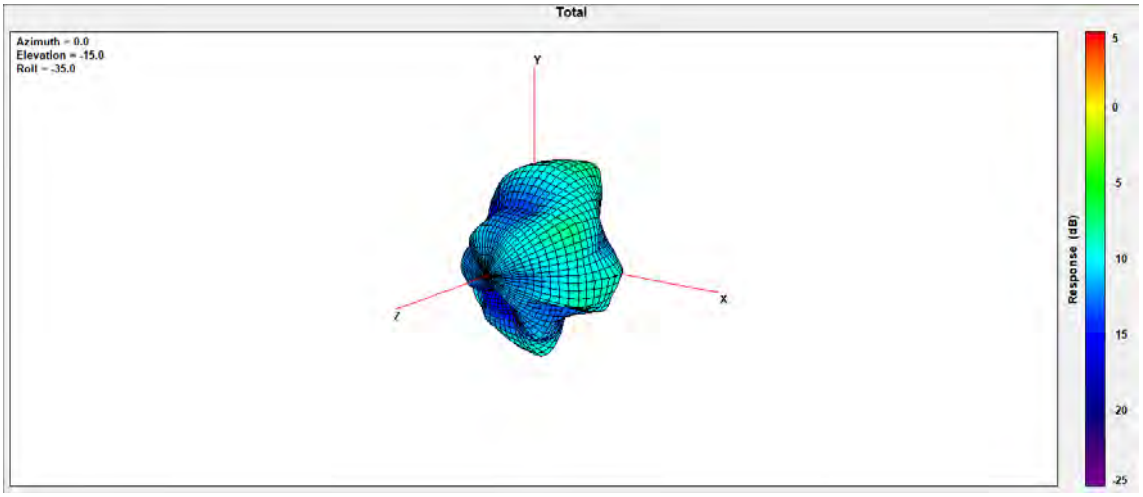
3750MHz	H (Peak)	V (Peak)
	-1.88	-3.59

3800MHz



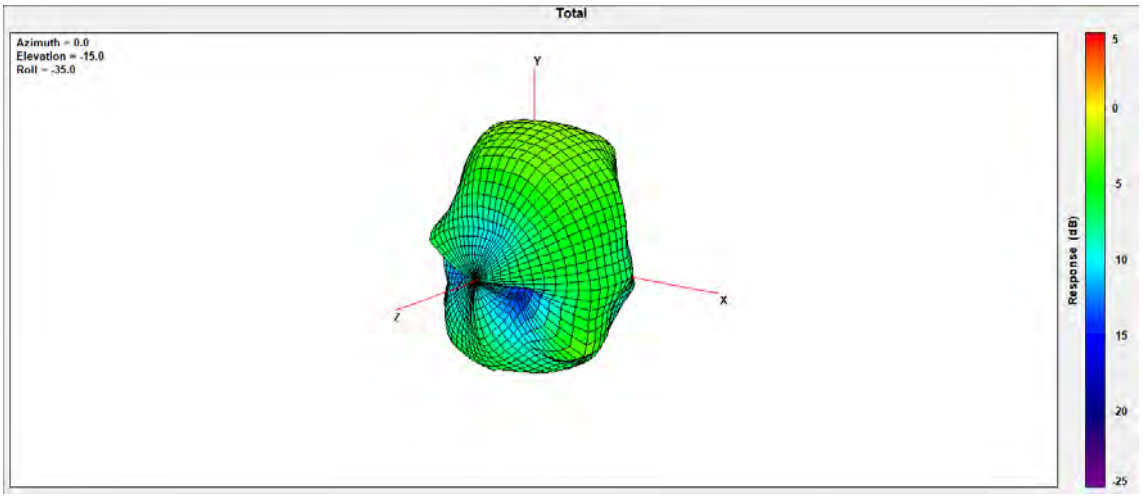
3800MHz	H (Peak)	V (Peak)
	-2.05	-2.60

4200MHz



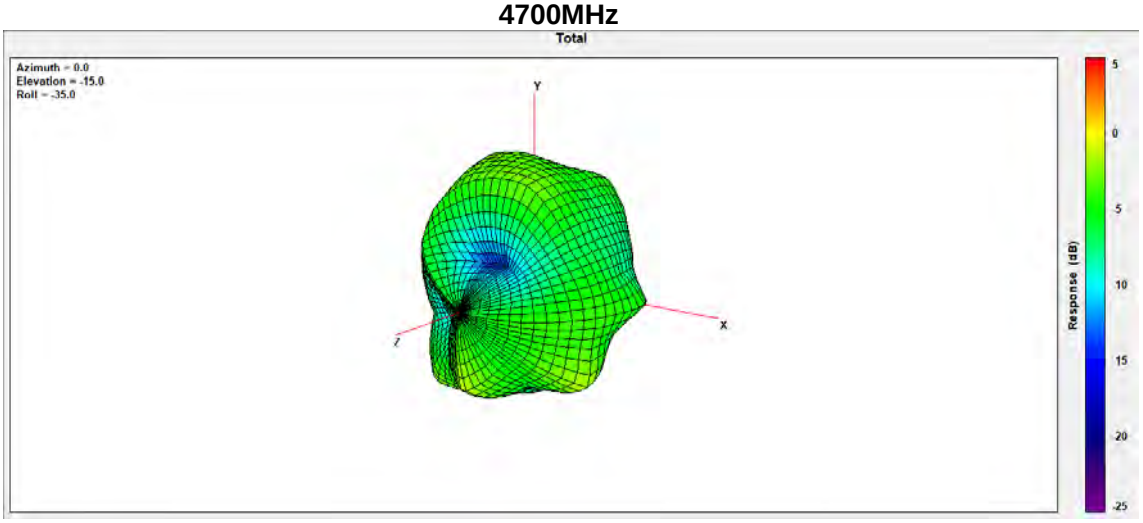
4200MHz	H (Peak)	V (Peak)
	-2.09	-2.77

4400MHz



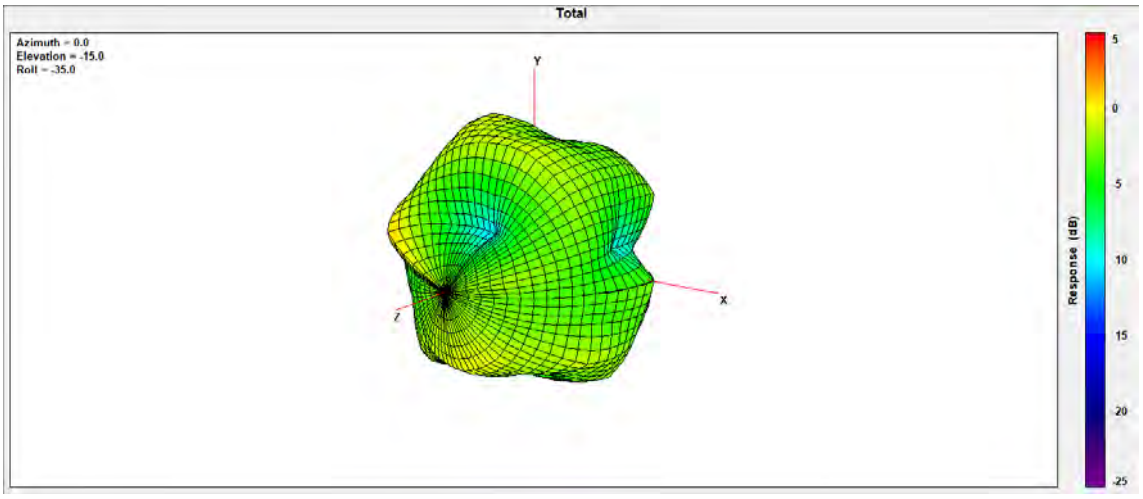
4400MHz	H (Peak)	V (Peak)
	-3.44	-3.65

4700MHz



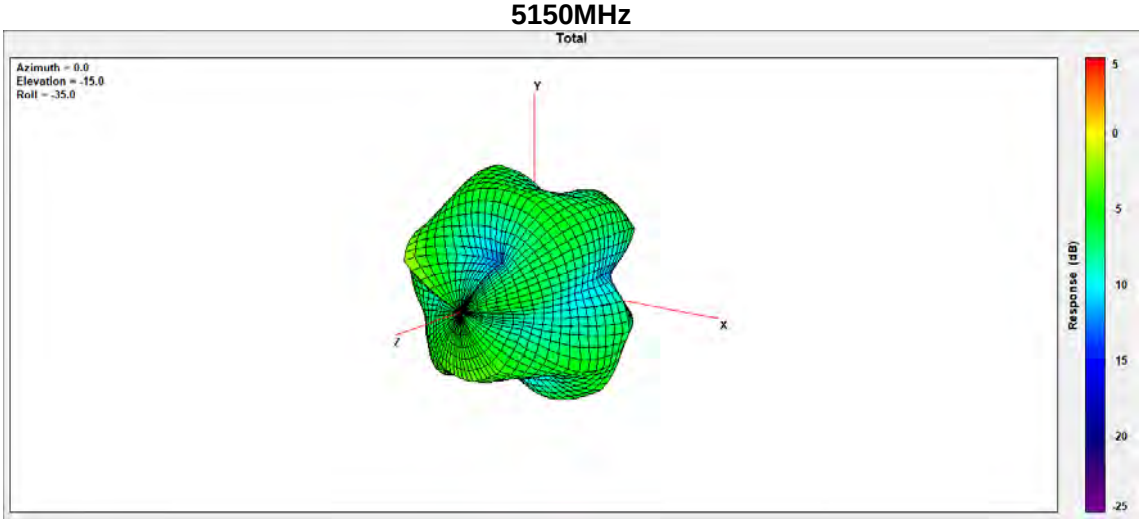
4700MHz	H (Peak)	V (Peak)
	-10.96	-10.76

5000MHz



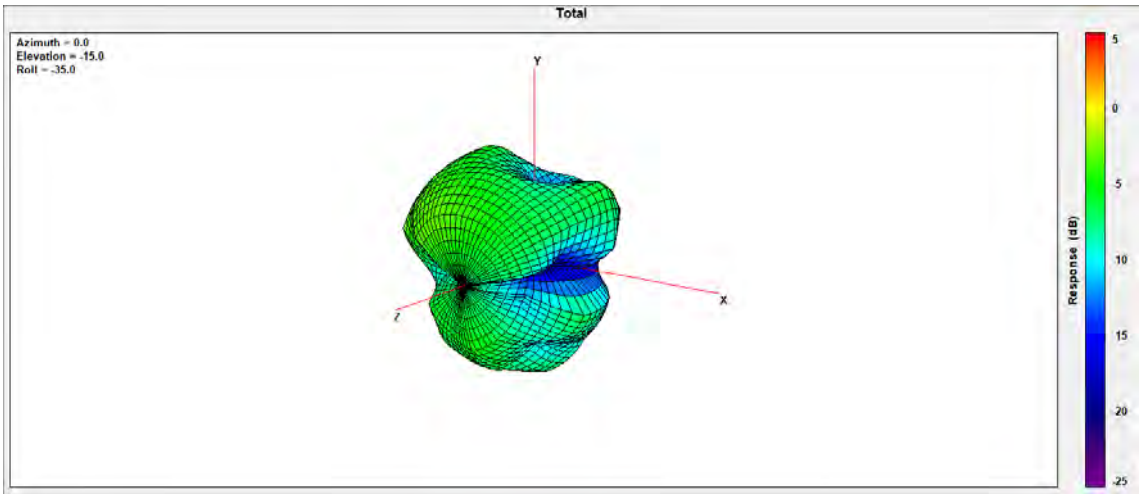
5000MHz	H (Peak)	V (Peak)
	-4.14	-4.57

5150MHz



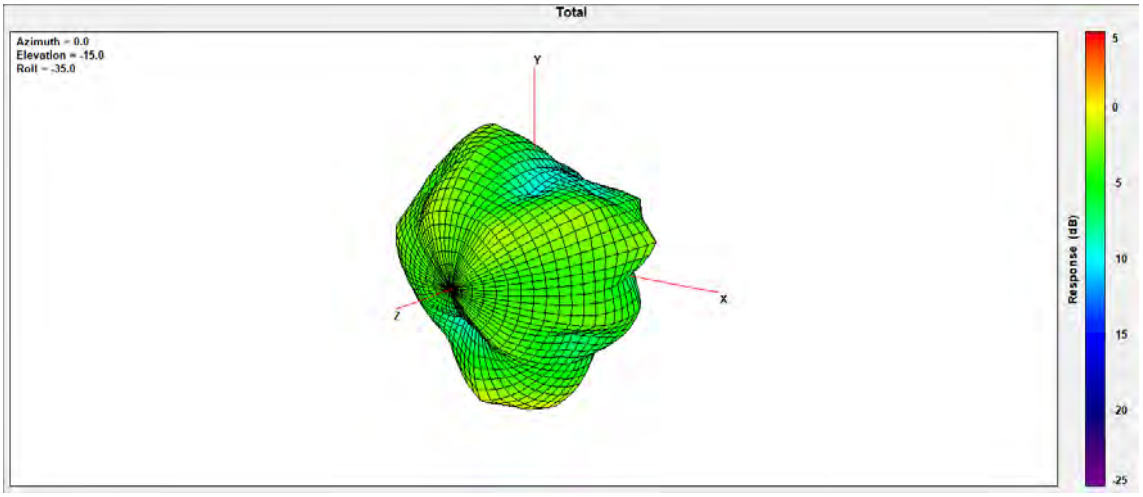
5150MHz	H (Peak)	V (Peak)
	-4.33	-4.46

5537.5MHz



5537.5MHz	H (Peak)	V (Peak)
	-2.64	-3.54

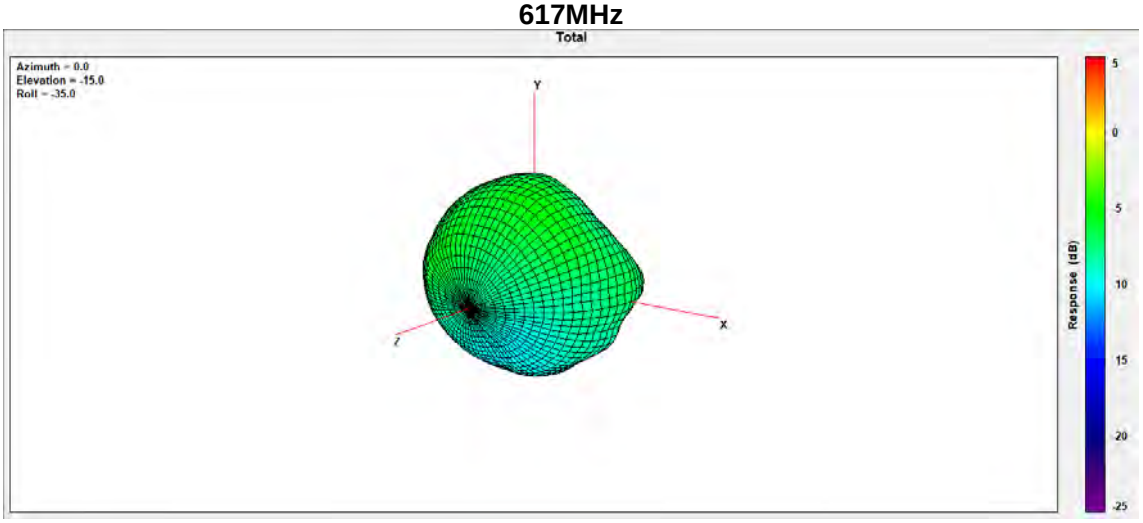
5925MHz



5925MHz	H (Peak)	V (Peak)
	-3.03	-3.98

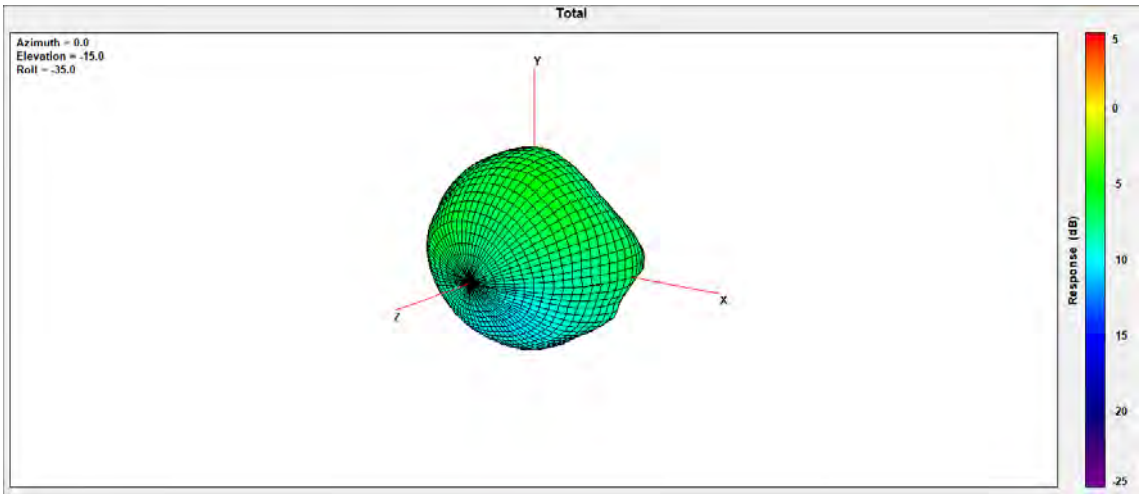
WWAN Aux1 Antenna (Rx2)

617MHz



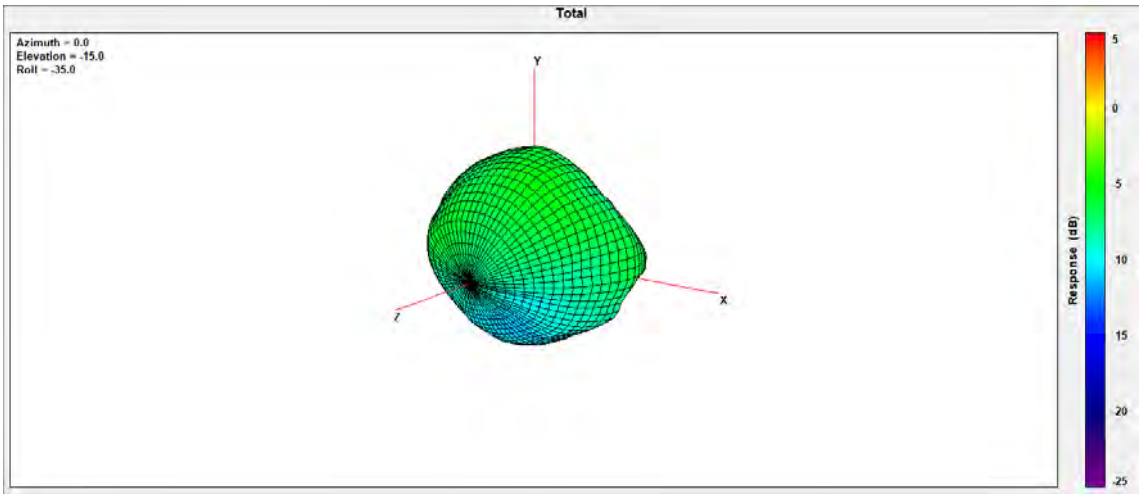
617MHz	H (Peak)	V (Peak)
	-4.51	-4.31

634.5MHz



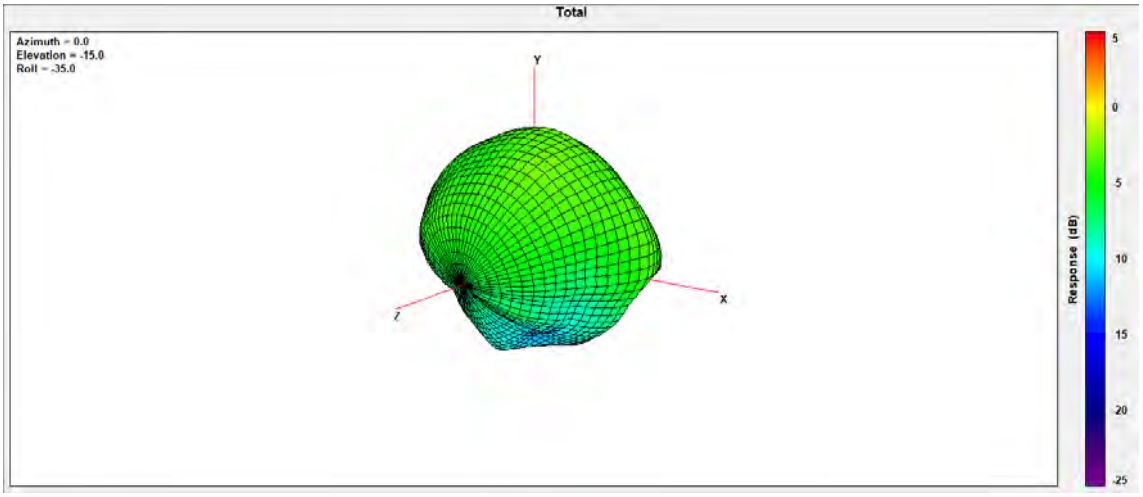
634.5MHz	H (Peak)	V (Peak)
	-4.48	-4.80

652MHz



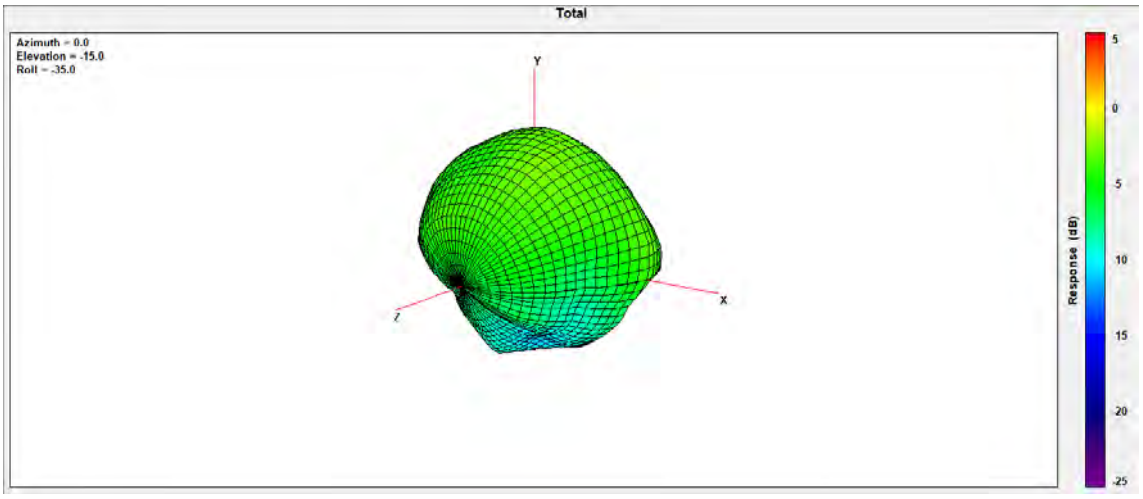
652MHz	H (Peak)	V (Peak)
	-4.98	-4.66

717MHz



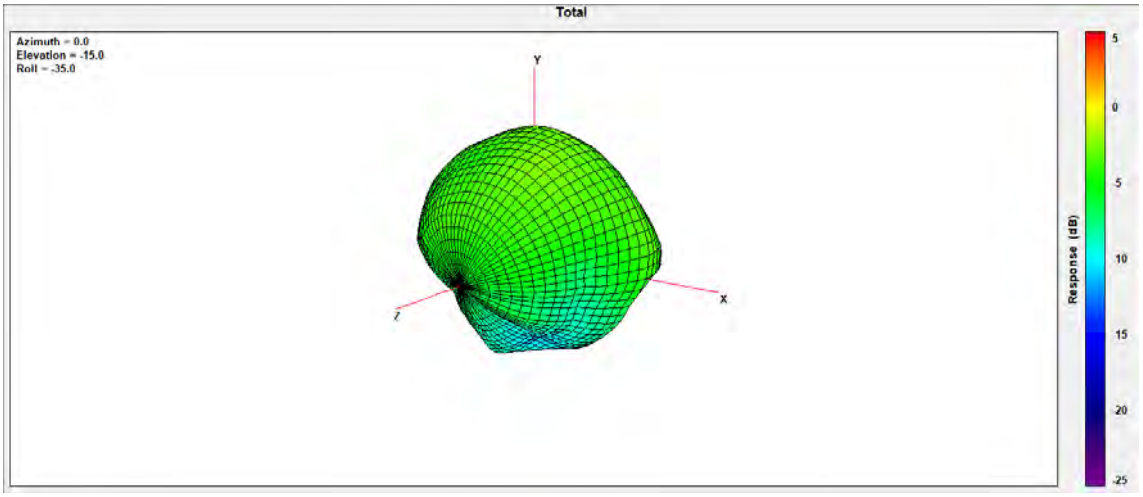
717MHz	H (Peak)	V (Peak)
	-3.27	-2.21

722.5MHz



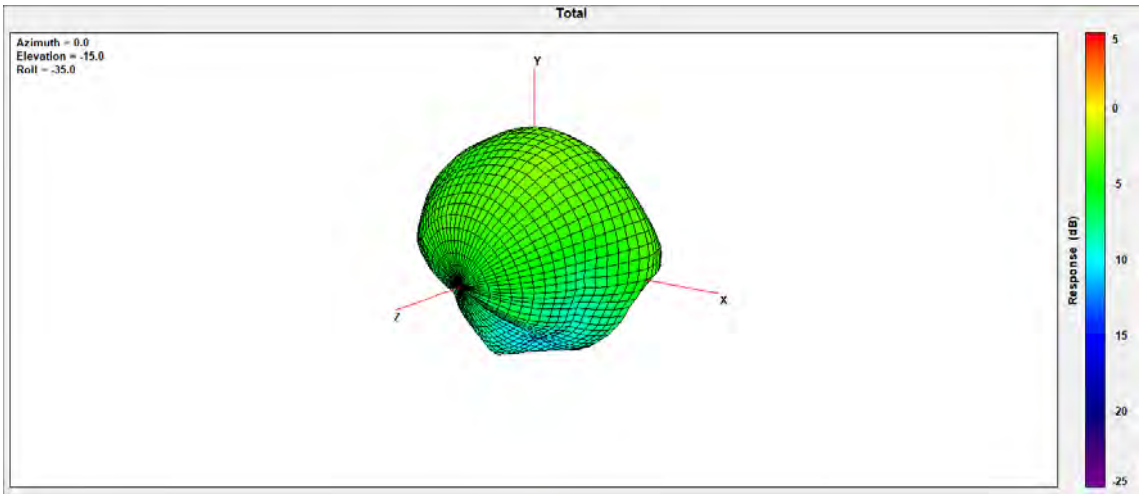
722.5MHz	H (Peak)	V (Peak)
	-3.43	-2.14

728MHz



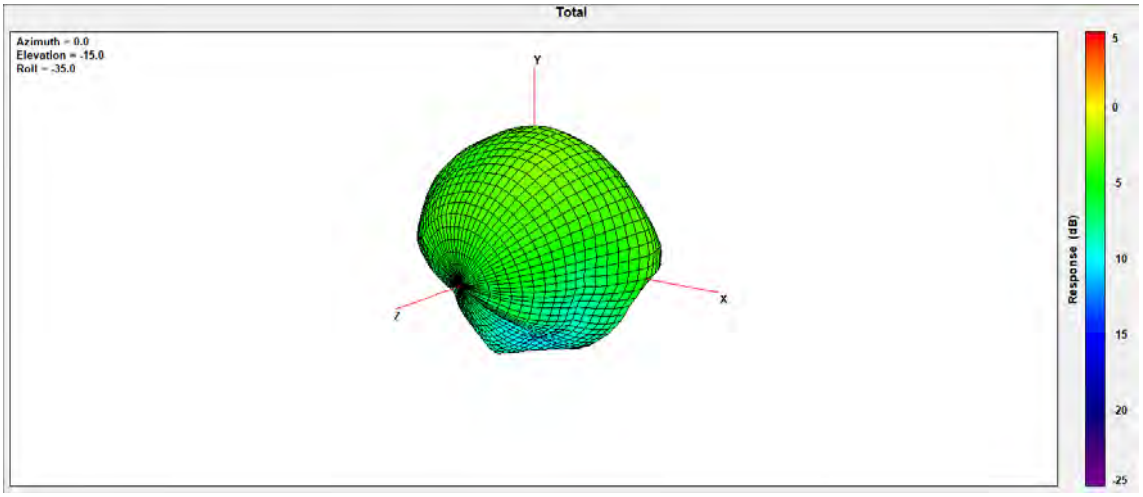
728MHz	H (Peak)	V (Peak)
	-3.35	-2.19

729MHz



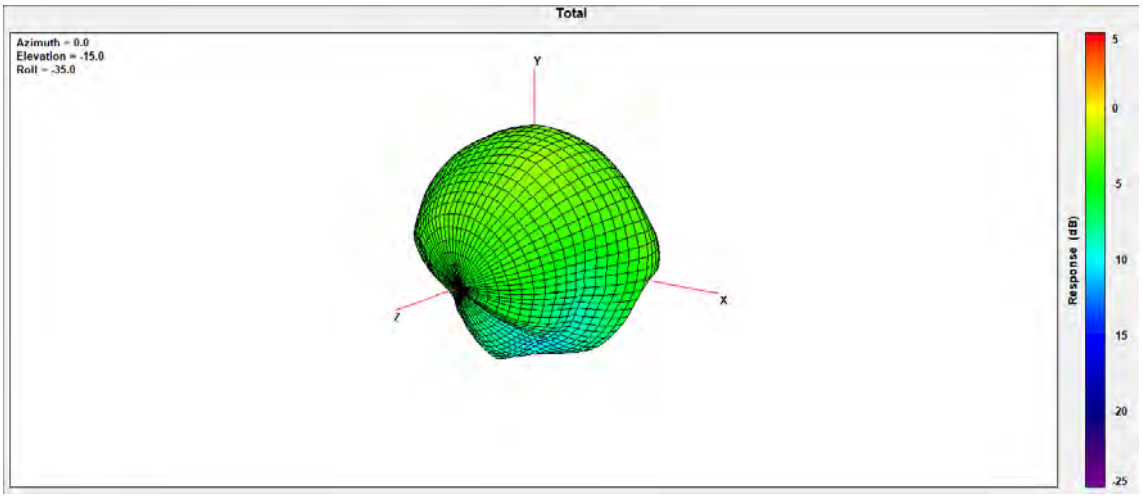
729MHz	H (Peak)	V (Peak)
	-3.33	-2.17

737.5MHz



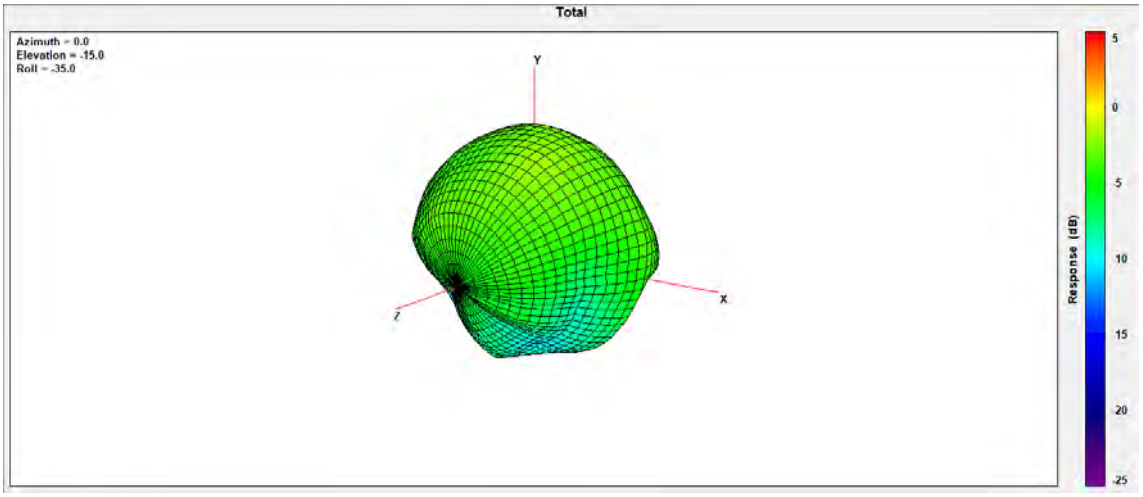
737.5MHz	H (Peak)	V (Peak)
	-2.71	-2.08

746MHz



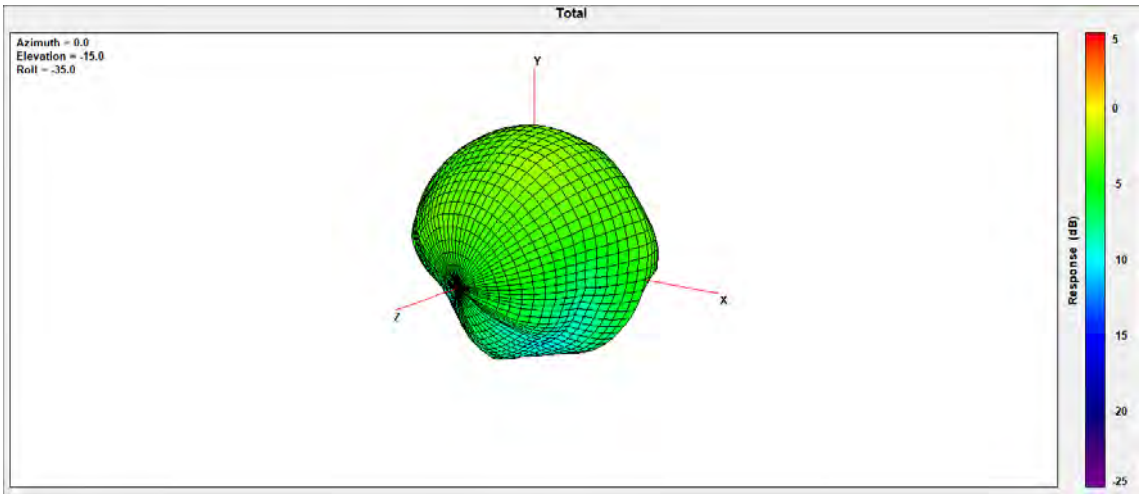
746MHz	H (Peak)	V (Peak)
	-2.86	-1.98

751MHz



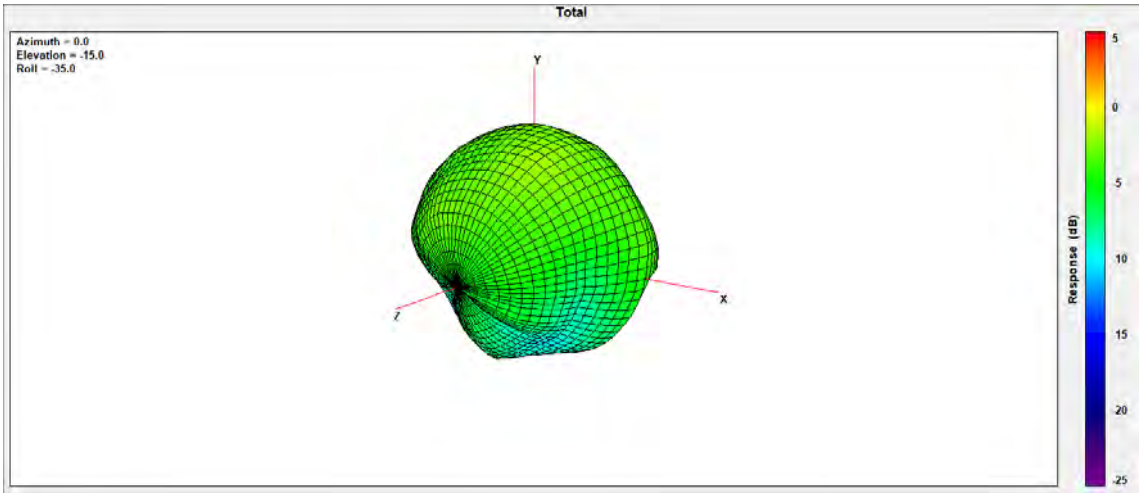
751MHz	H (Peak)	V (Peak)
	-2.59	-2.15

756MHz



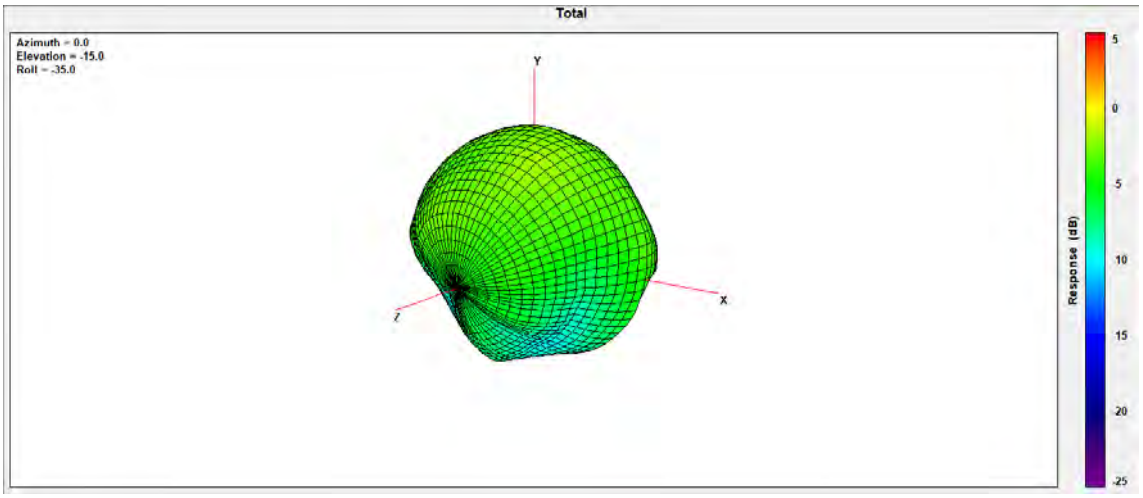
756MHz	H (Peak)	V (Peak)
	-2.60	-2.33

758MHz



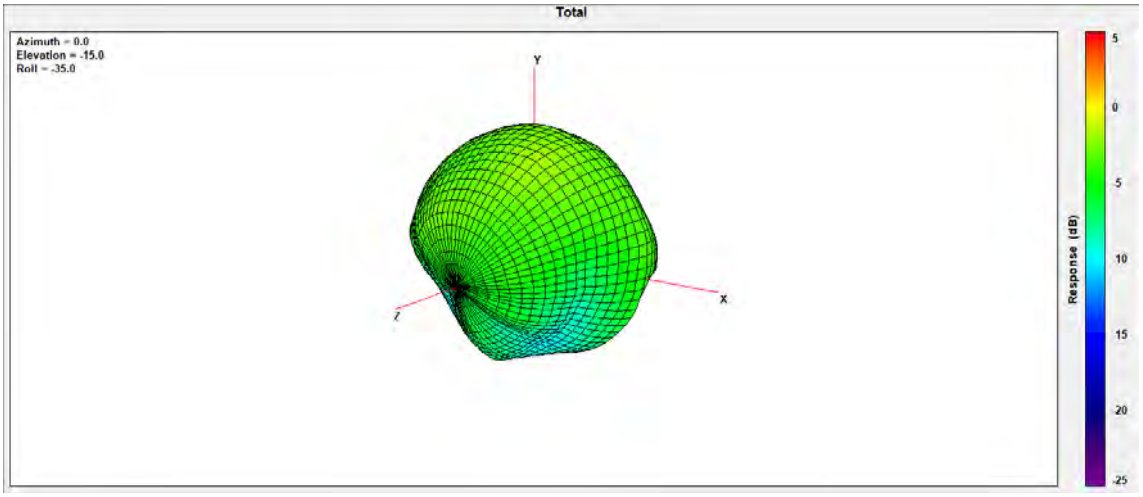
758MHz	H (Peak)	V (Peak)
	-2.71	-2.40

763MHz



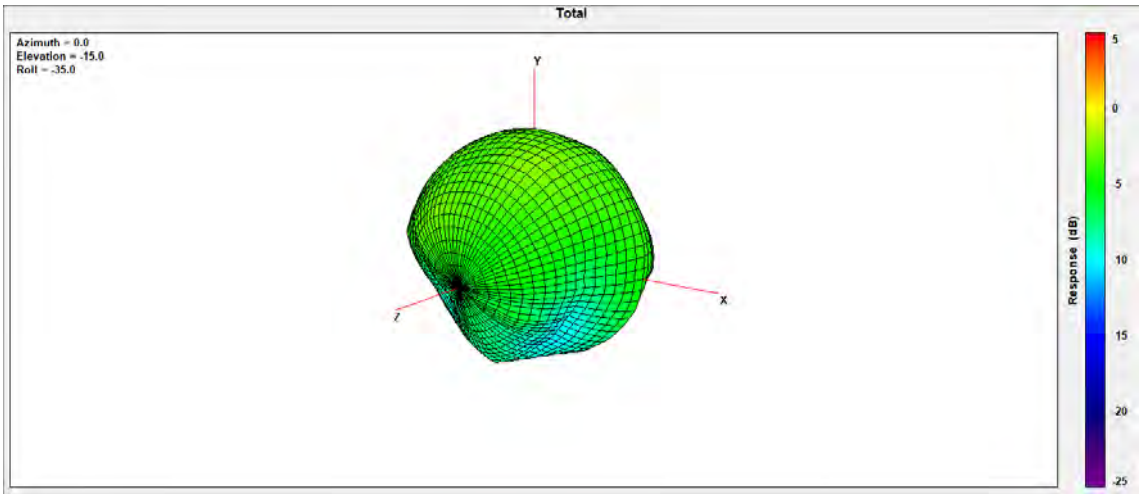
763MHz	H (Peak)	V (Peak)
	-2.60	-2.43

768MHz



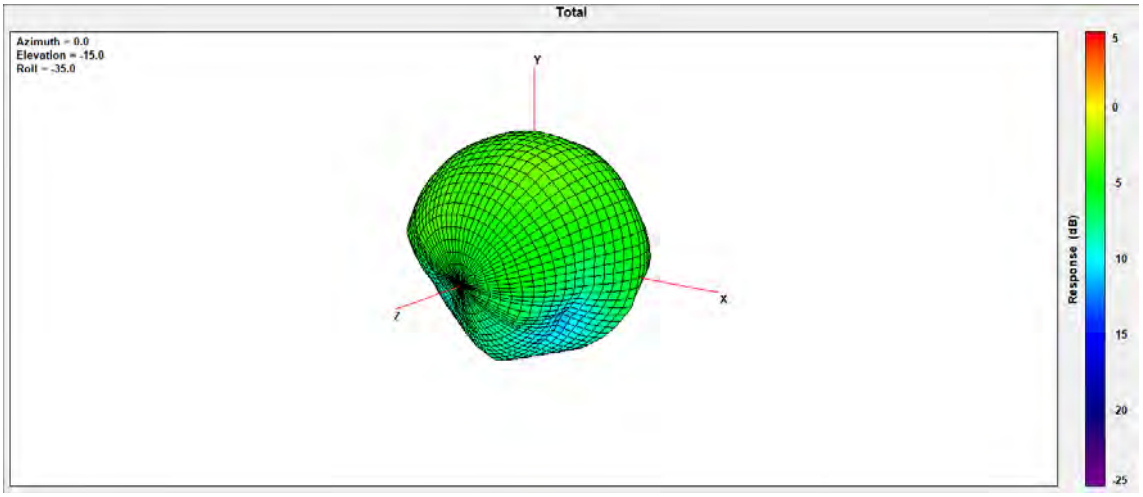
768MHz	H (Peak)	V (Peak)
	-2.74	-2.50

780.5MHz



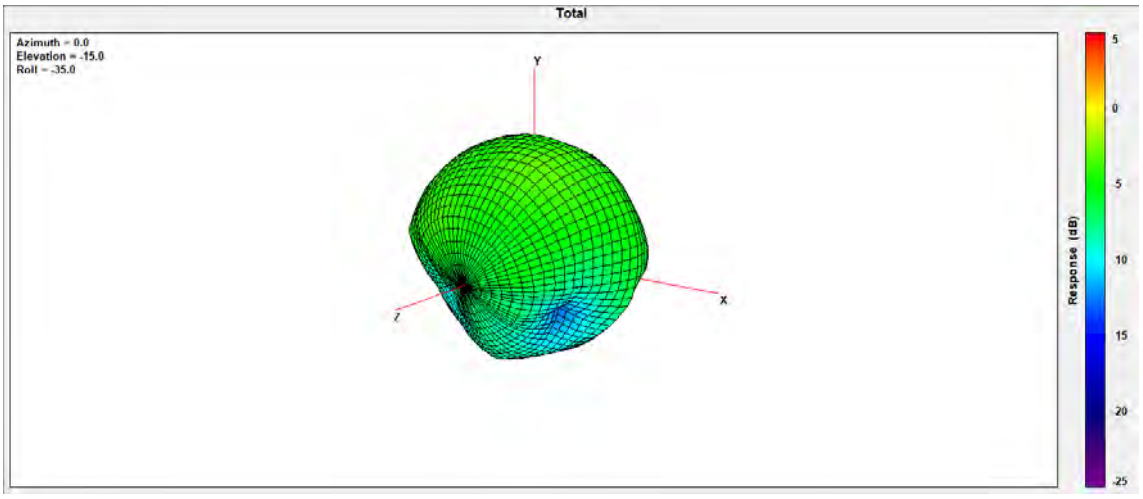
780.5MHz	H (Peak)	V (Peak)
	-2.29	-2.59

791MHz



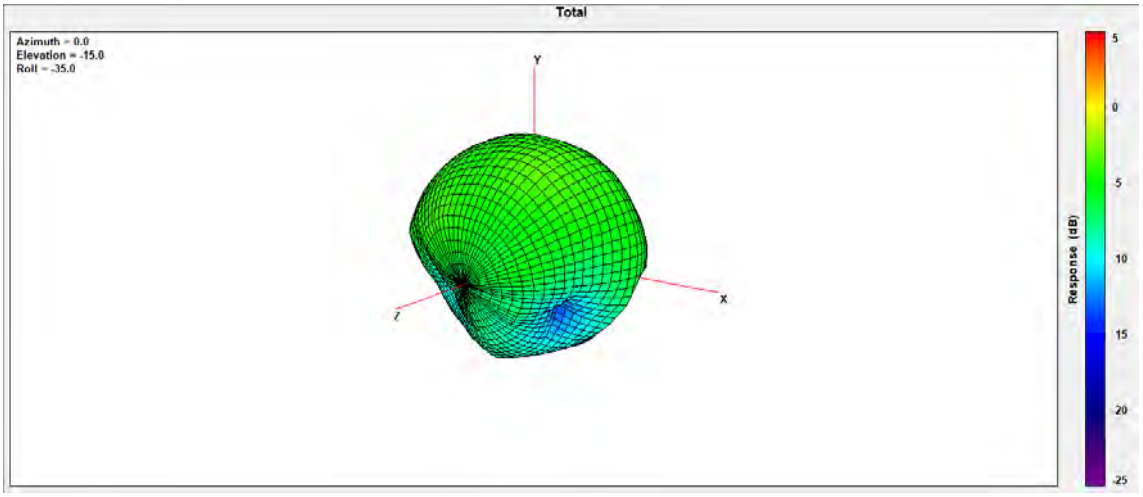
791MHz	H (Peak)	V (Peak)
	-2.36	-2.66

803MHz



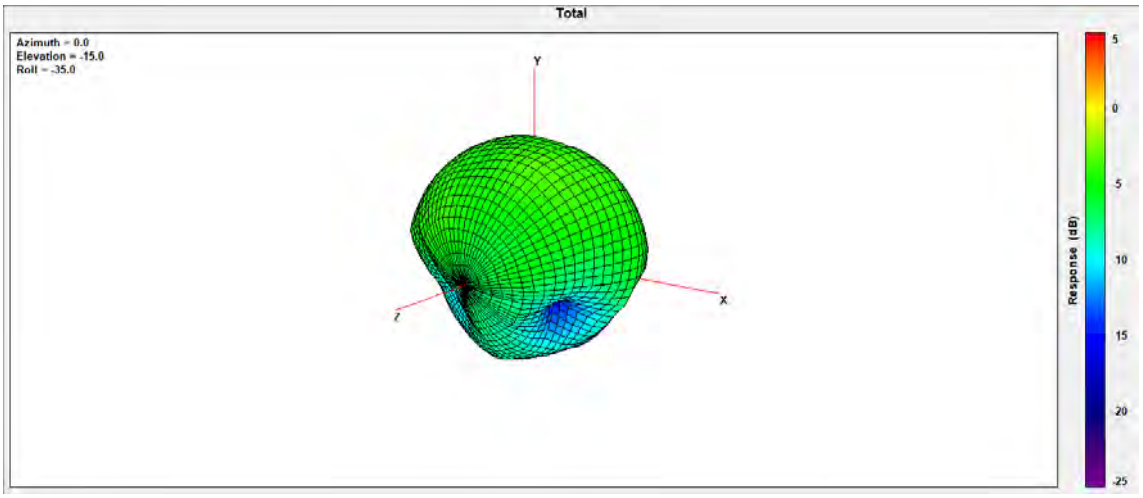
803MHz	H (Peak)	V (Peak)
	-2.27	-2.89

806MHz



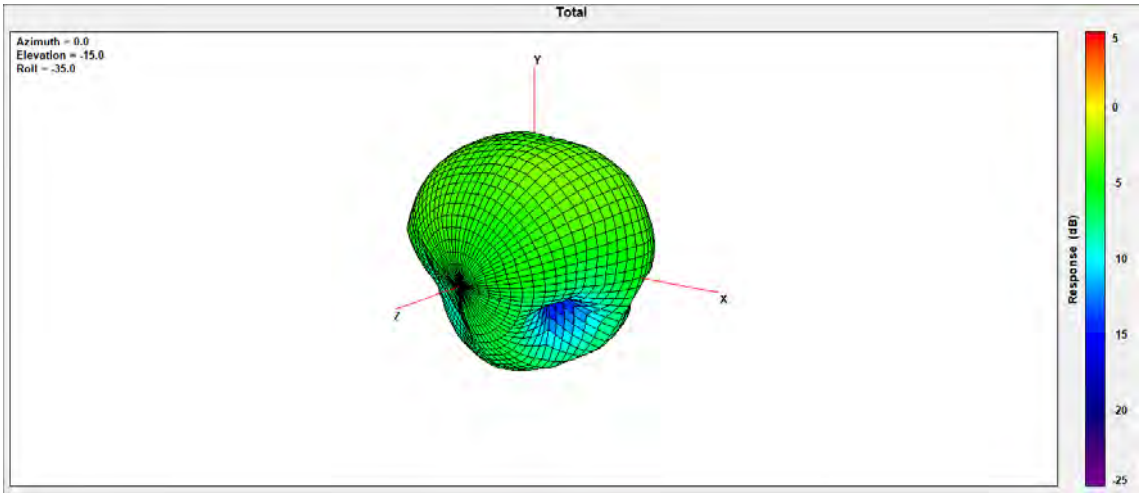
806MHz	H (Peak)	V (Peak)
	-2.15	-3.16

821MHz



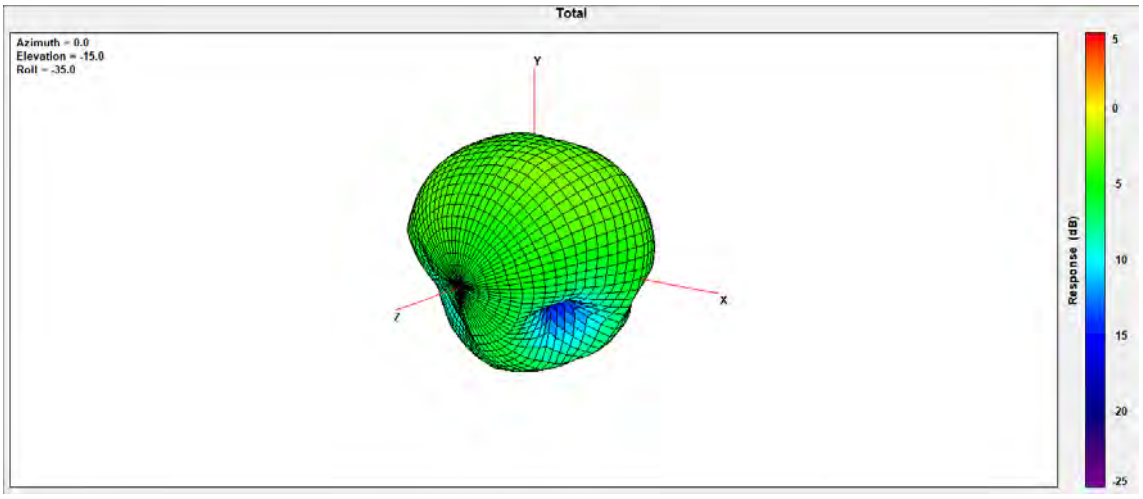
821MHz	H (Peak)	V (Peak)
	-2.10	-3.23

859MHz



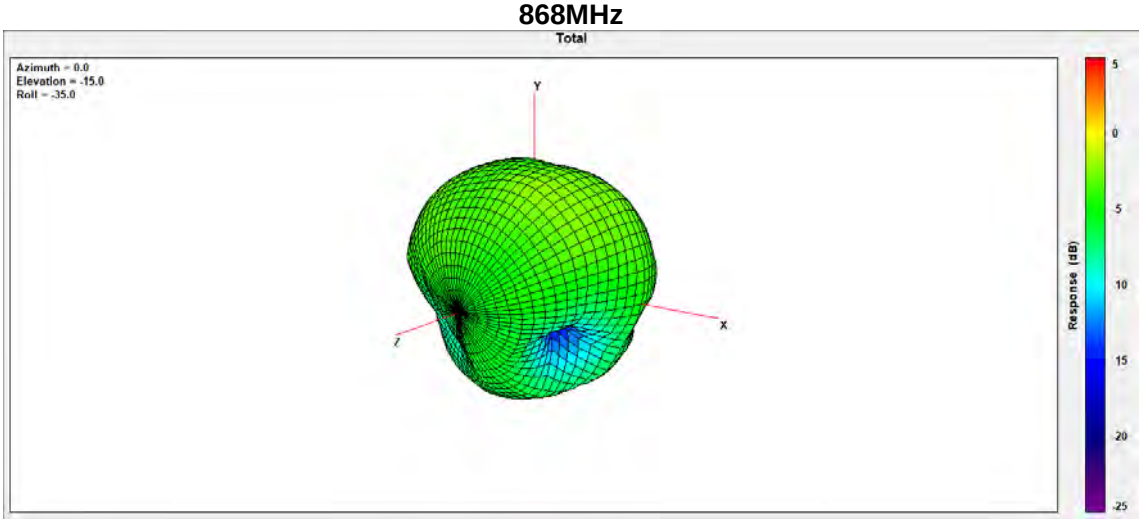
859MHz	H (Peak)	V (Peak)
	-1.25	-2.61

860MHz



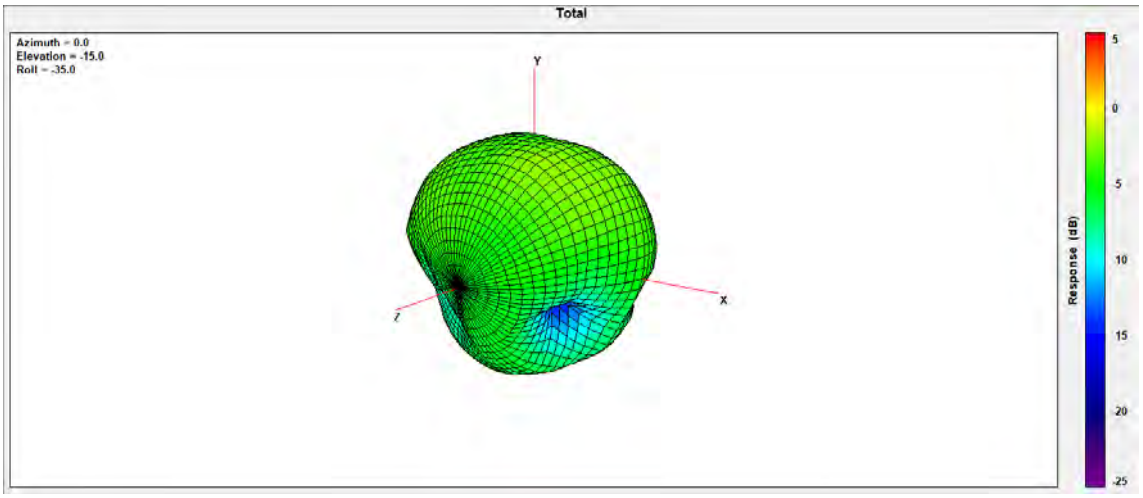
860MHz	H (Peak)	V (Peak)
	-1.28	-2.65

868MHz



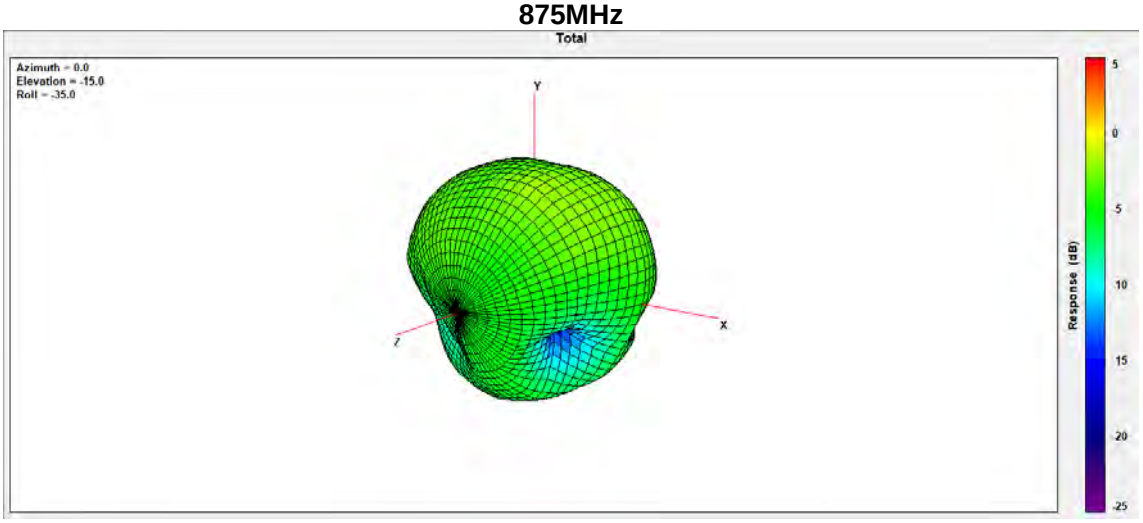
868MHz	H (Peak)	V (Peak)
	-1.14	-2.51

869MHz



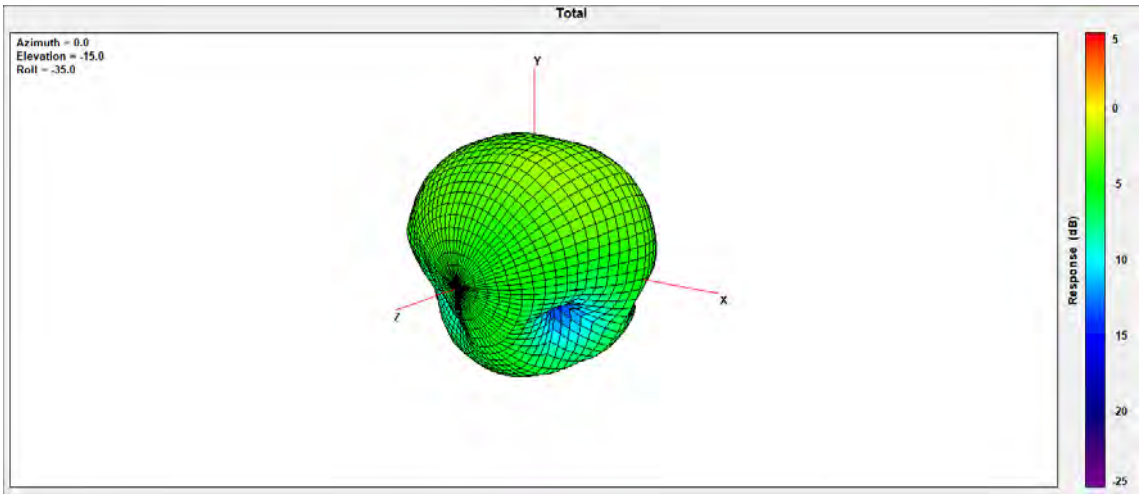
869MHz	H (Peak)	V (Peak)
	-1.15	-2.44

875MHz



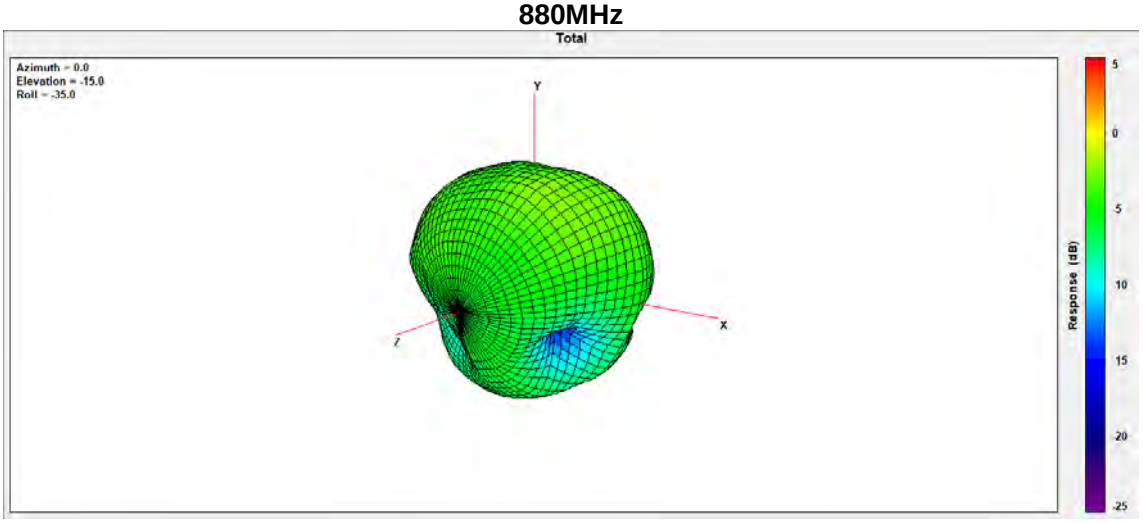
875MHz	H (Peak)	V (Peak)
	-0.84	-2.19

876.5MHz



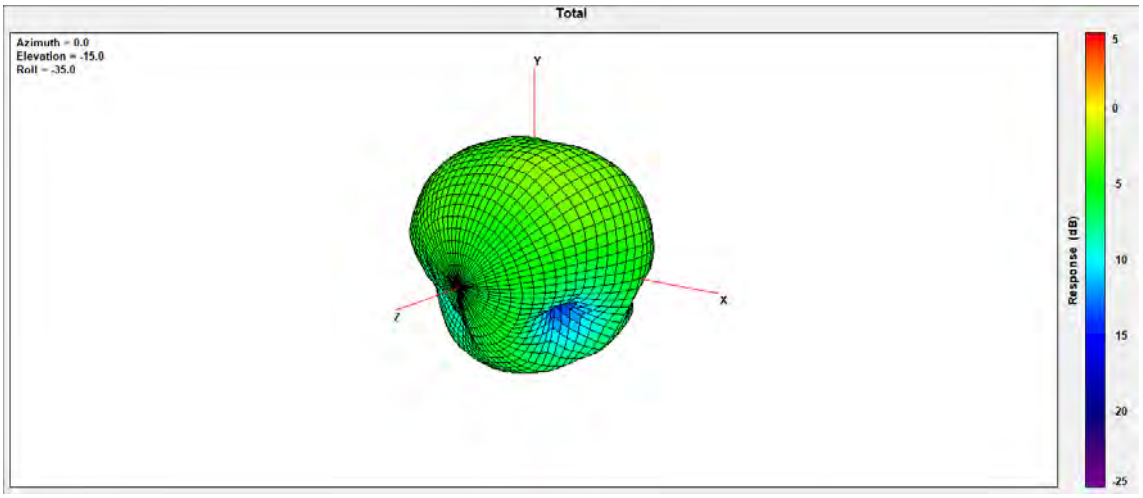
876.5MHz	H (Peak)	V (Peak)
	-0.77	-2.14

880MHz



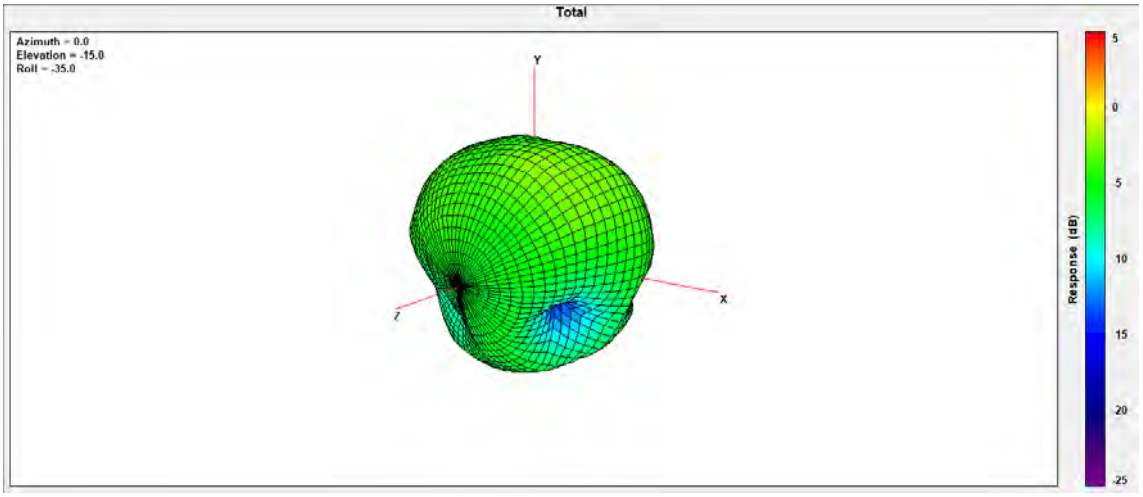
880MHz	H (Peak)	V (Peak)
	-0.66	-2.11

881.5MHz



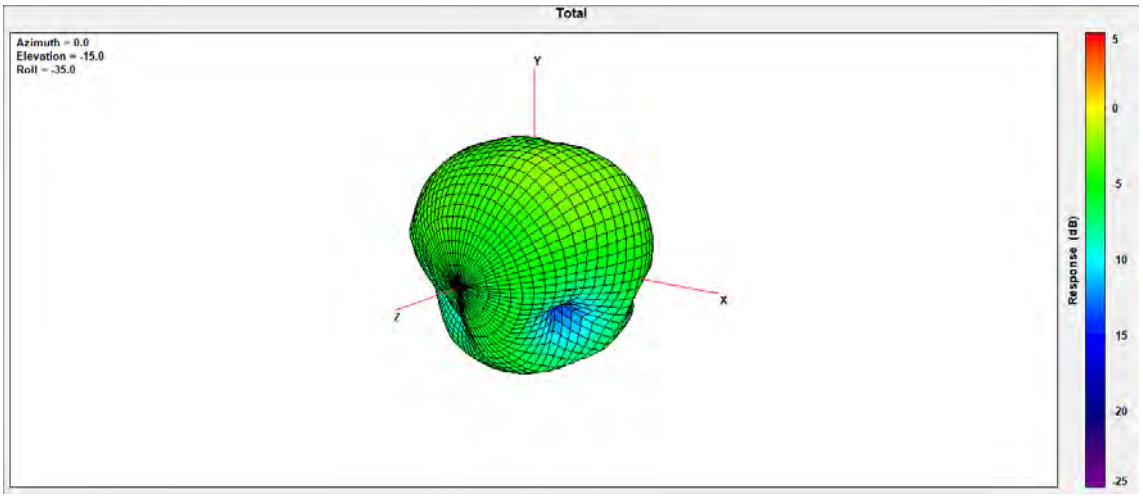
881.5MHz	H (Peak)	V (Peak)
	-0.63	-2.15

883MHz



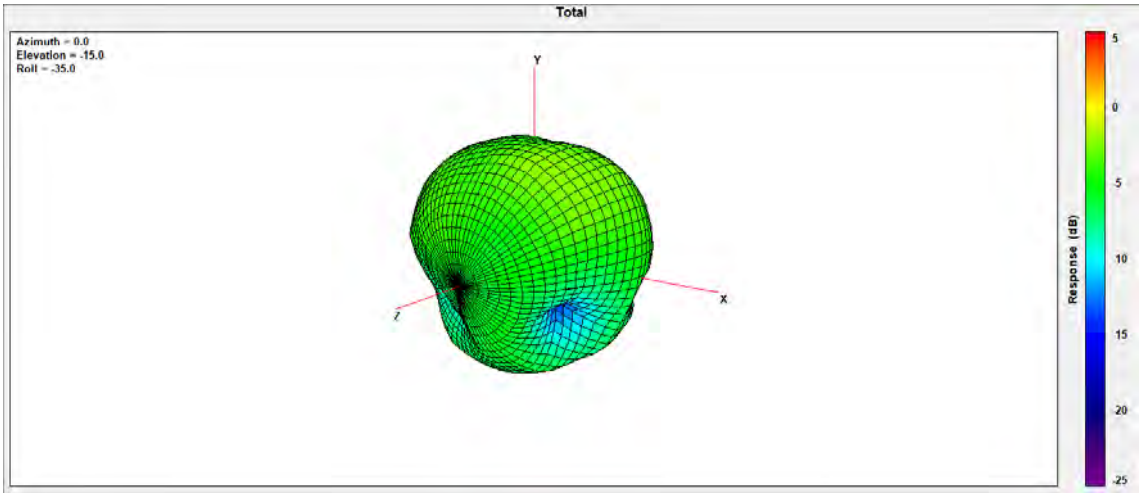
883MHz	H (Peak)	V (Peak)
	-0.62	-2.21

885MHz



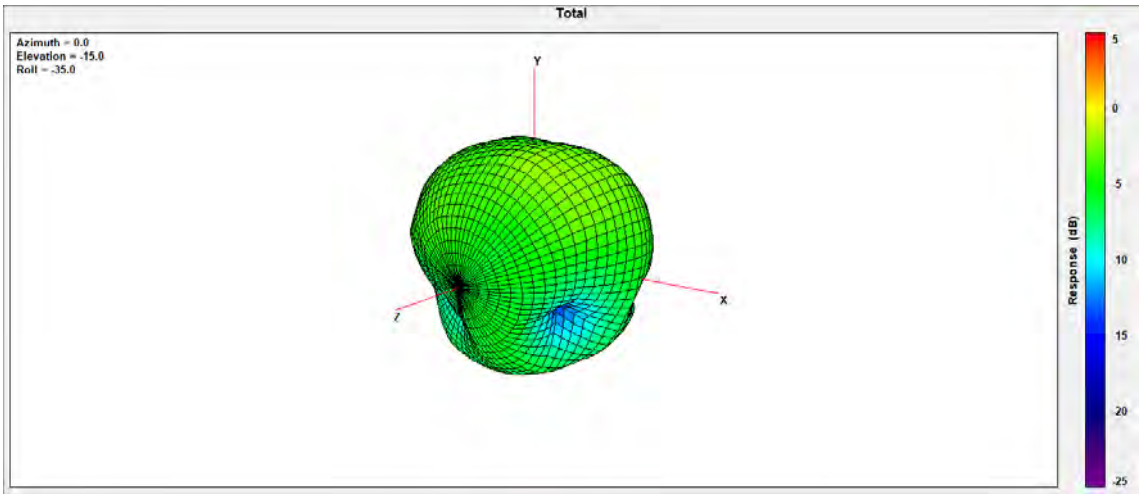
885MHz	H (Peak)	V (Peak)
	-0.67	-2.30

890MHz



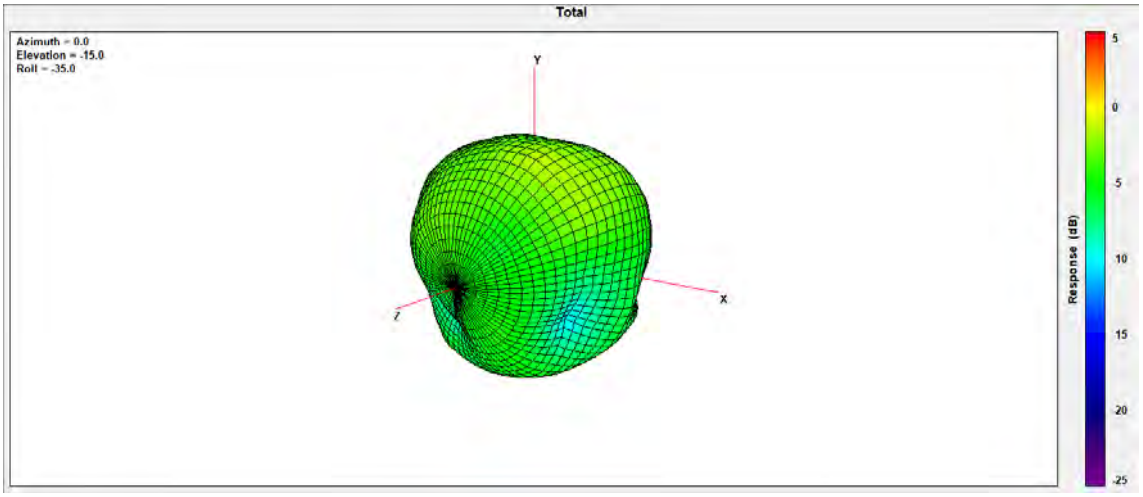
890MHz	H (Peak)	V (Peak)
	-0.96	-2.30

894MHz



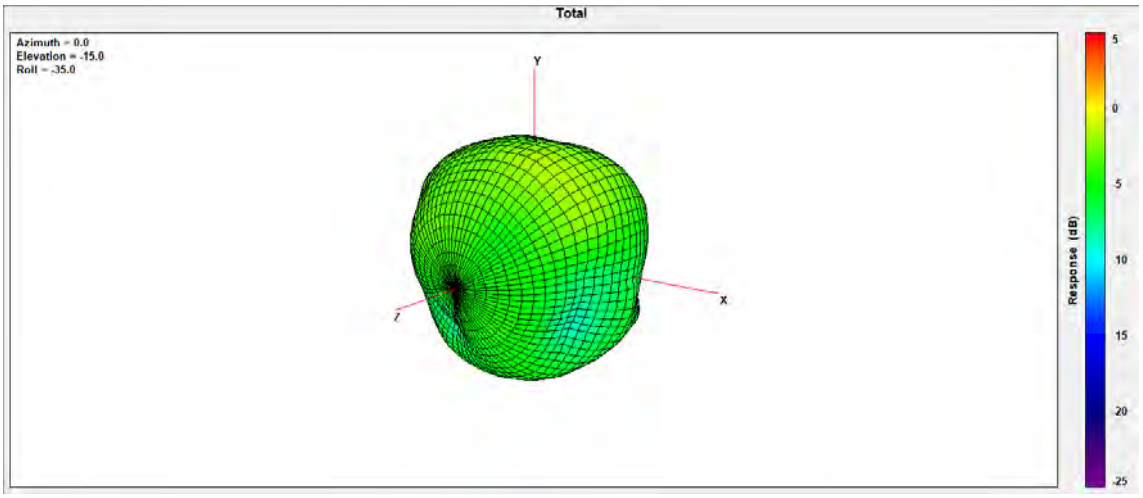
894MHz	H (Peak)	V (Peak)
	-0.96	-2.23

925MHz



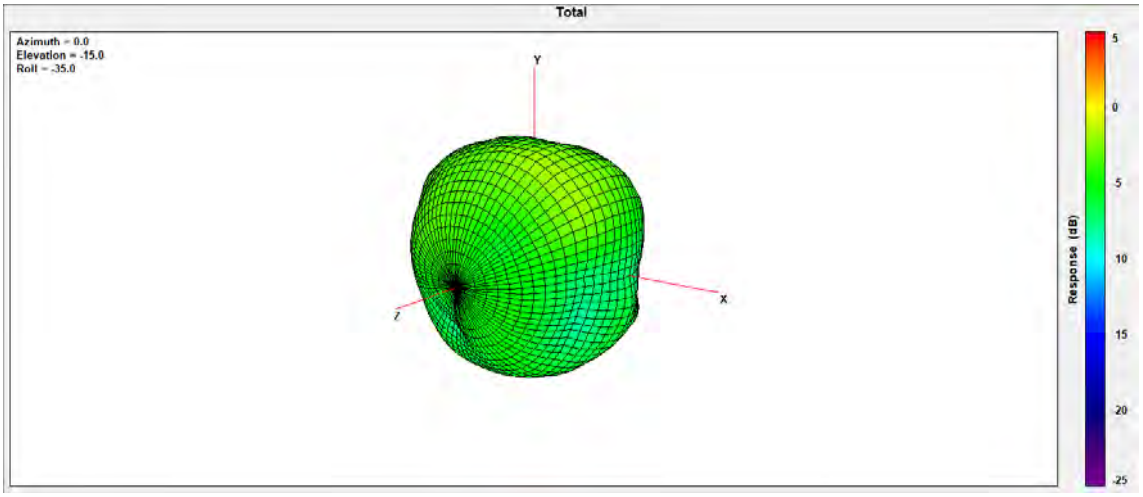
925MHz	H (Peak)	V (Peak)
	-1.43	-2.54

942.5MHz



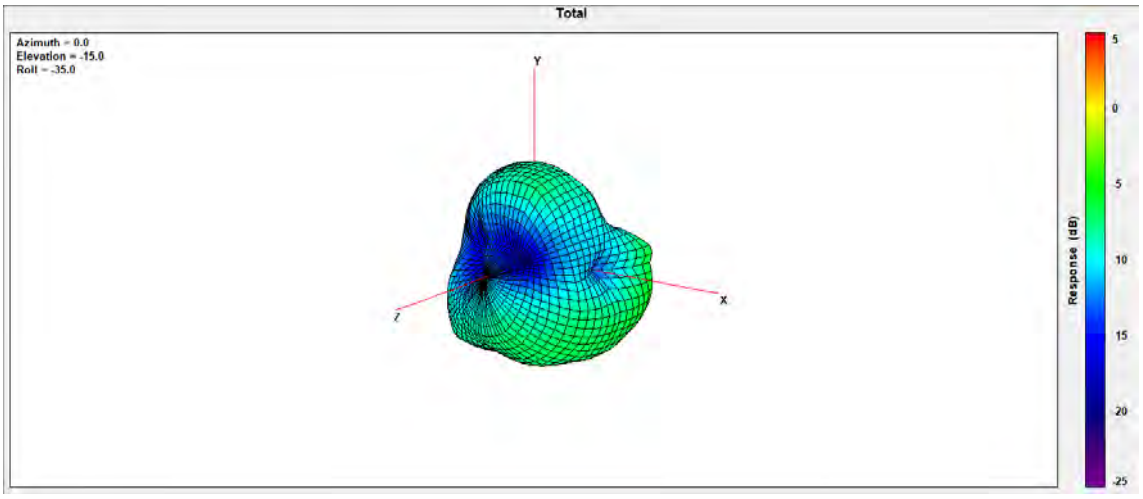
942.5MHz	H (Peak)	V (Peak)
	-1.50	-2.96

960MHz



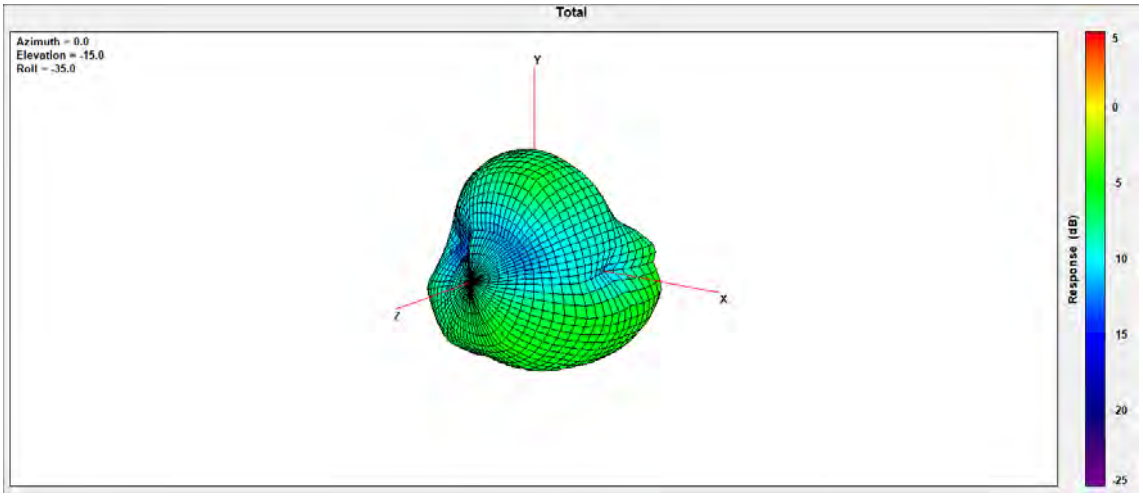
960MHz	H (Peak)	V (Peak)
	-1.75	-3.44

1452MHz



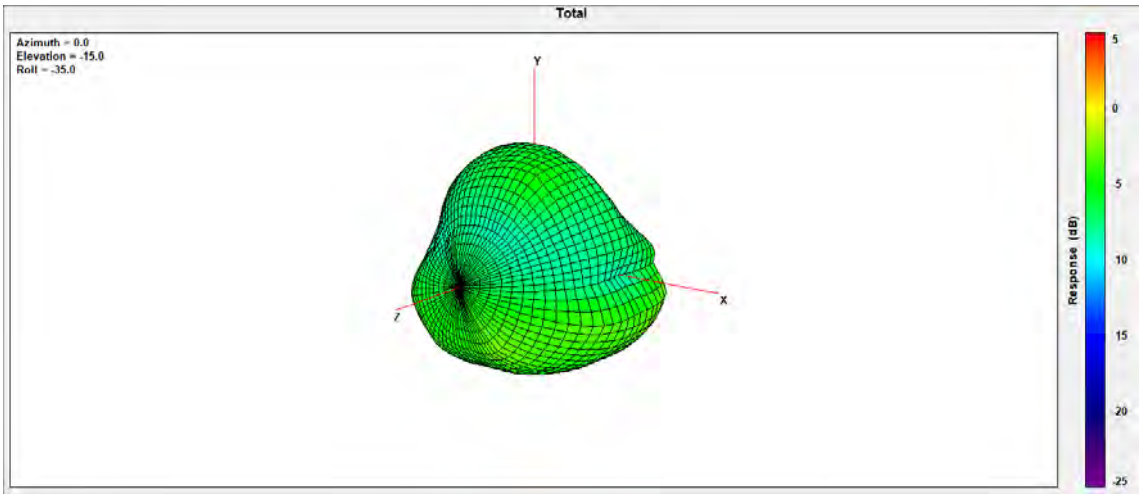
1452MHz	H (Peak)	V (Peak)
	-5.09	-4.34

1474MHz



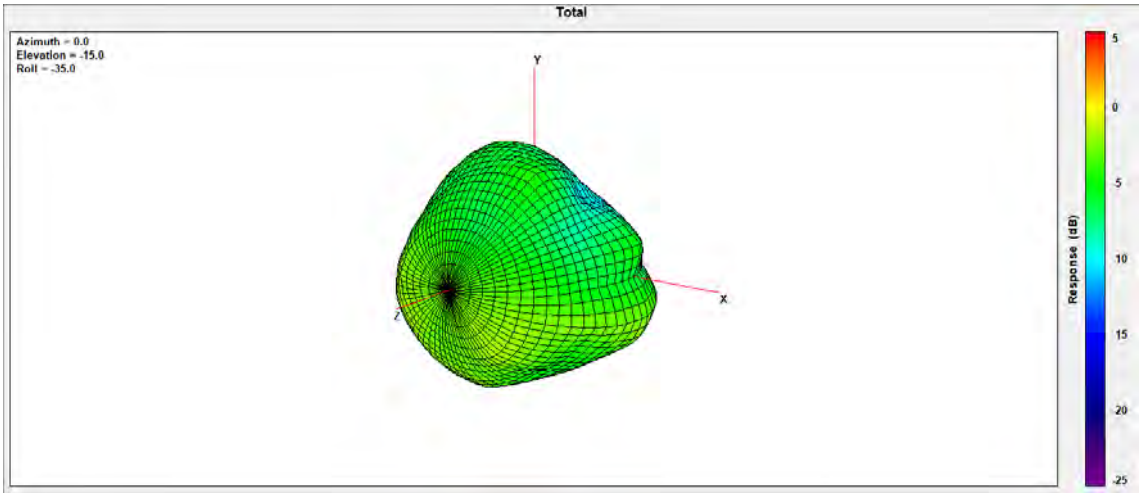
1474MHz	H (Peak)	V (Peak)
	-4.19	-3.49

1496MHz



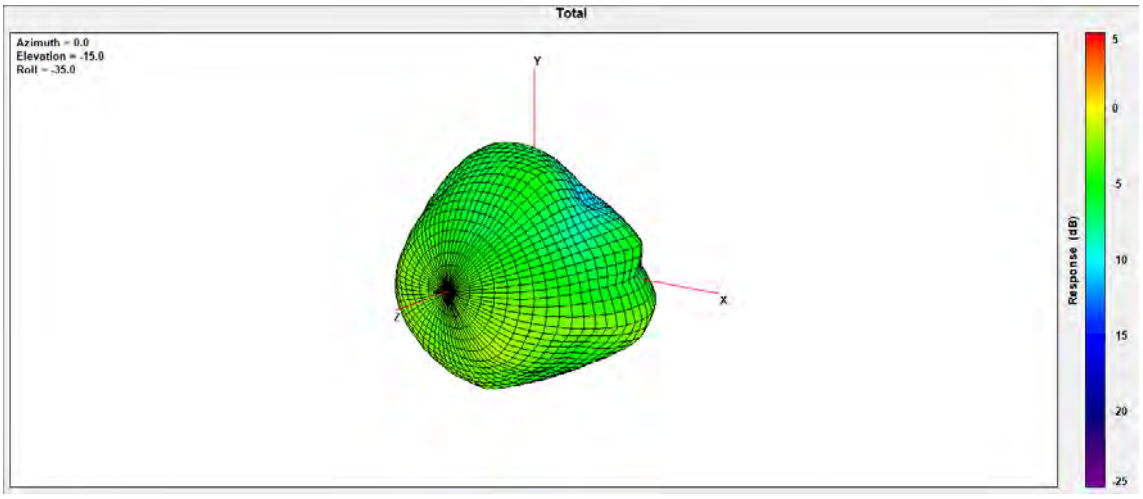
1496MHz	H (Peak)	V (Peak)
	-3.05	-2.86

1557MHz



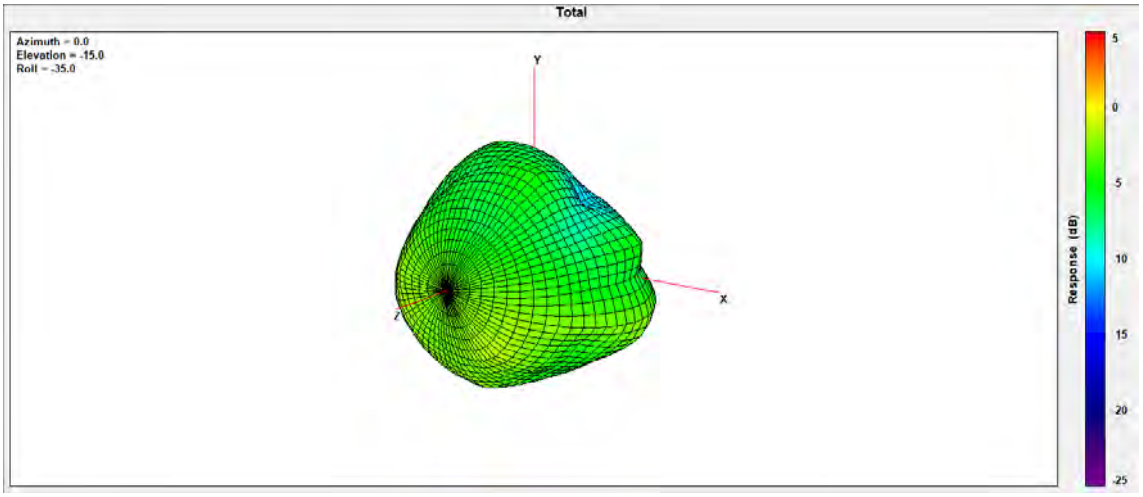
1557MHz	H (Peak)	V (Peak)
	-2.00	-2.03

1561MHz



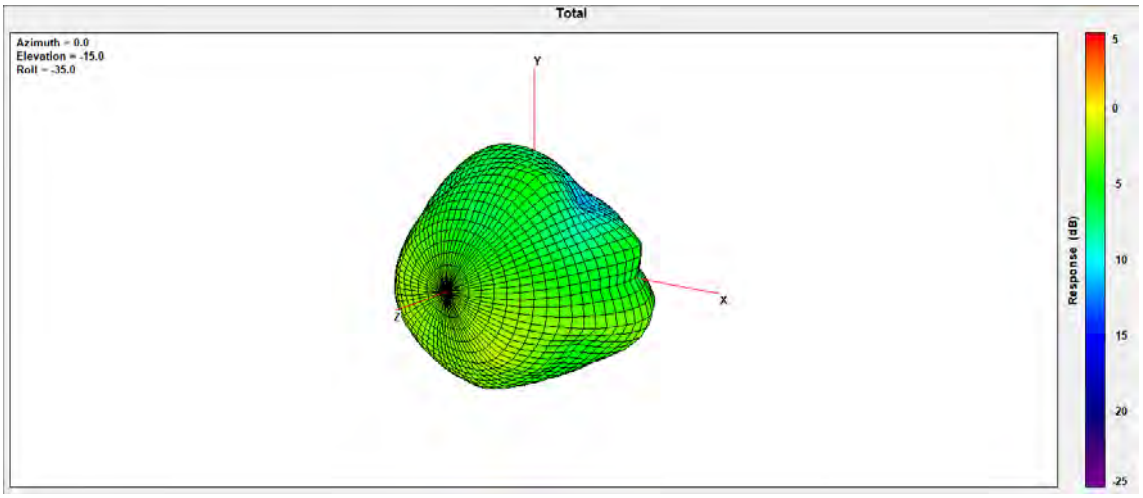
1561MHz	H (Peak)	V (Peak)
	-2.00	-2.01

1565MHz



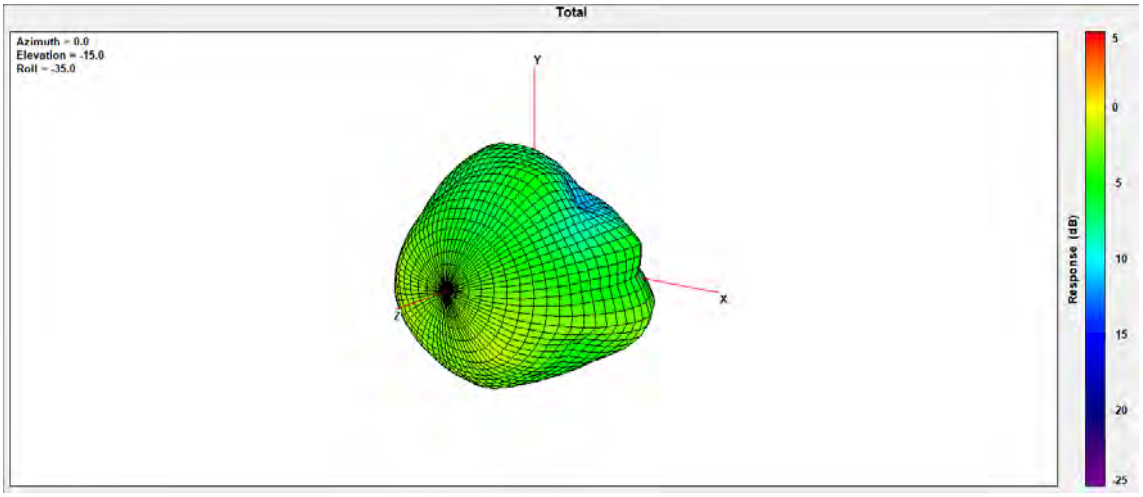
1565MHz	H (Peak)	V (Peak)
	-1.88	-1.89

1573MHz



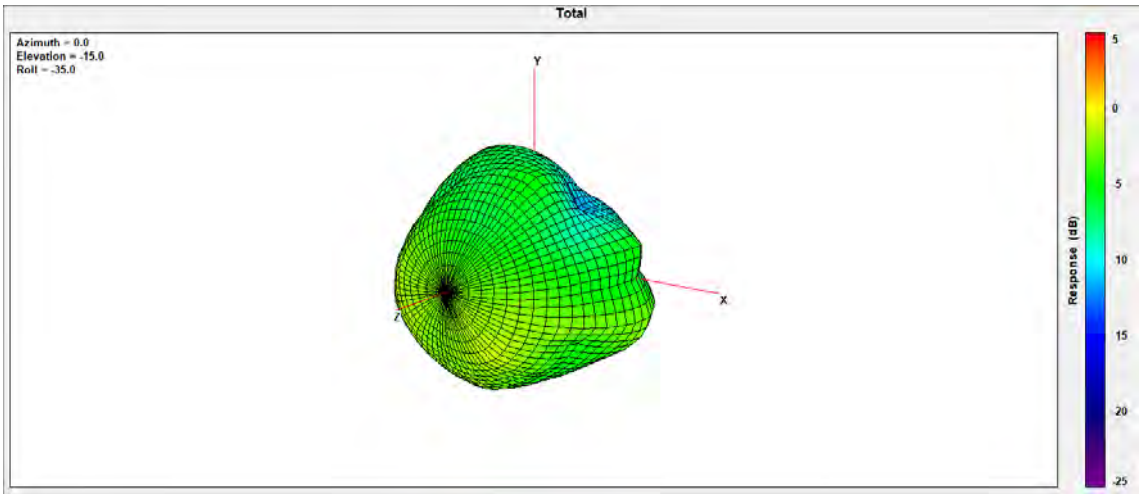
1573MHz	H (Peak)	V (Peak)
	-1.84	-1.76

1575MHz



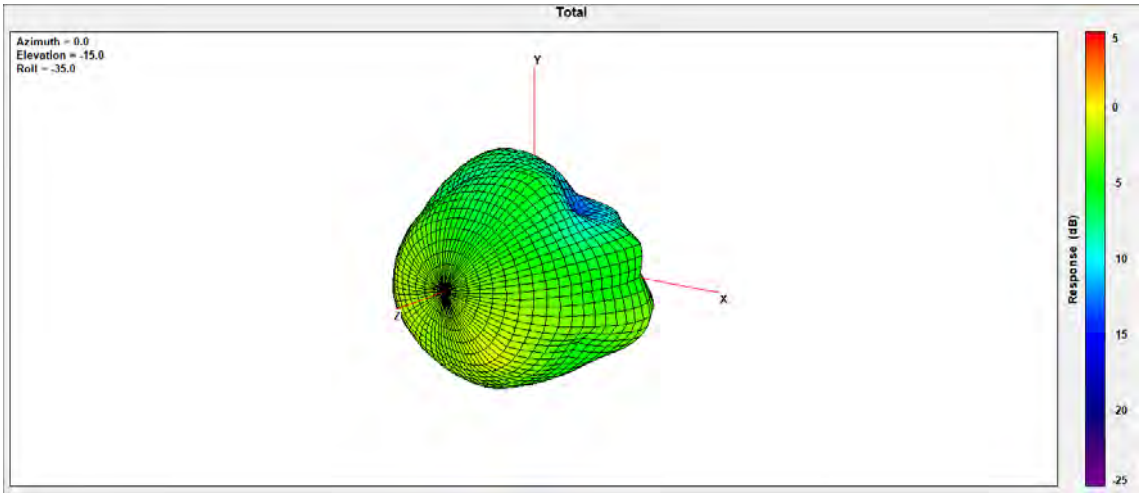
1575MHz	H (Peak)	V (Peak)
	-1.81	-1.76

1577MHz



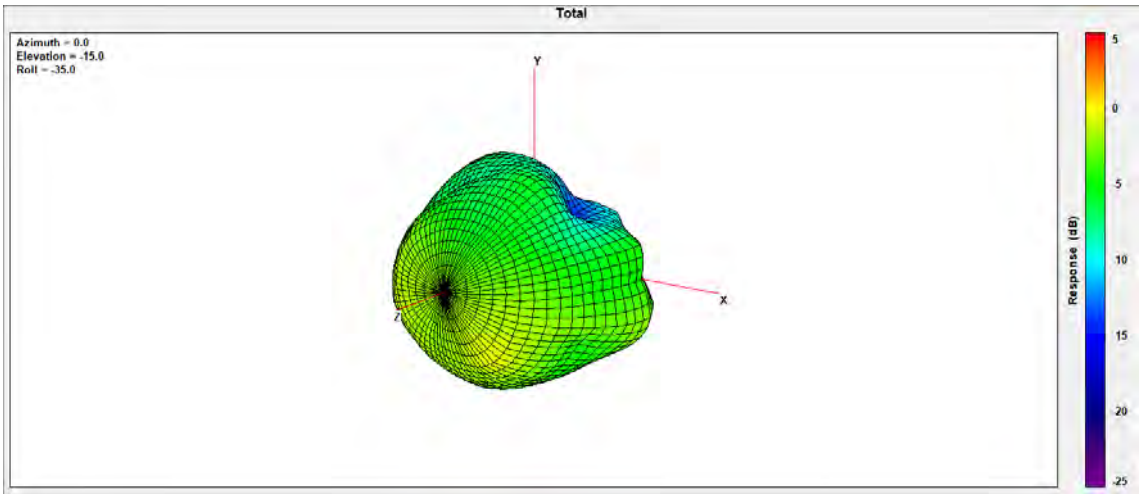
1577MHz	H (Peak)	V (Peak)
	-1.83	-1.79

1594MHz



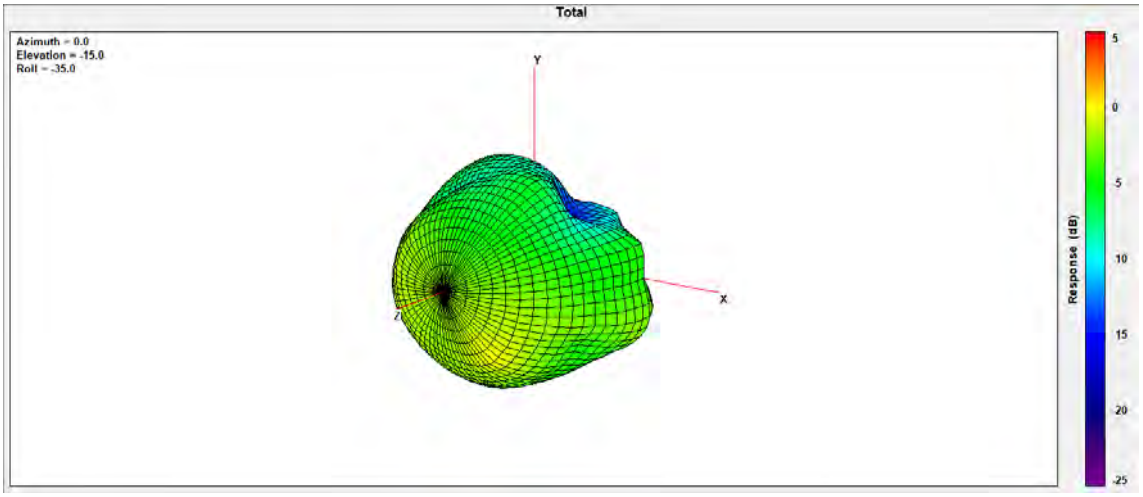
1594MHz	H (Peak)	V (Peak)
	-1.51	-2.03

1602MHz



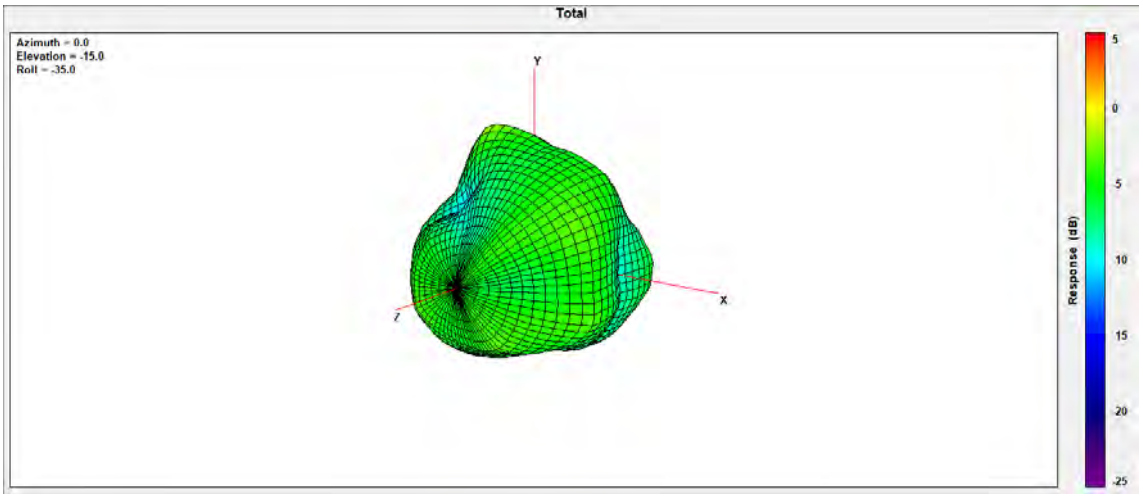
1602MHz	H (Peak)	V (Peak)
	-0.87	-1.74

1610MHz



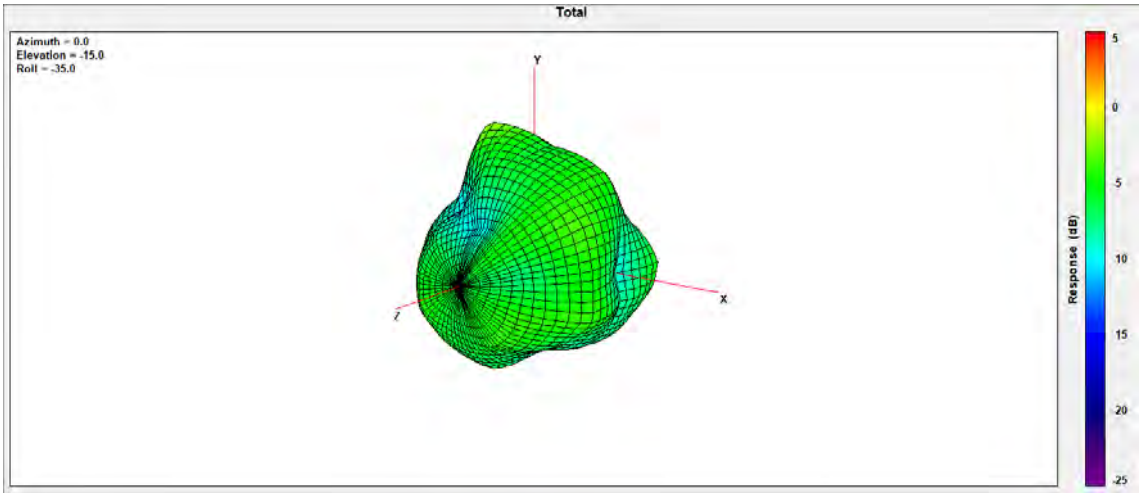
1610MHz	H (Peak)	V (Peak)
	-0.71	-1.83

1805MHz



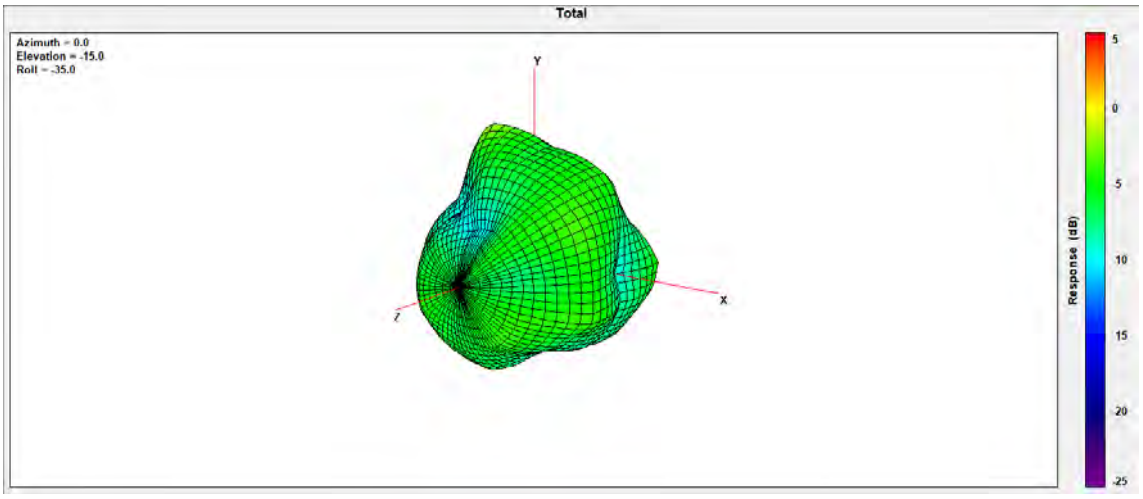
1805MHz	H (Peak)	V (Peak)
	-2.53	-3.09

1842.5MHz



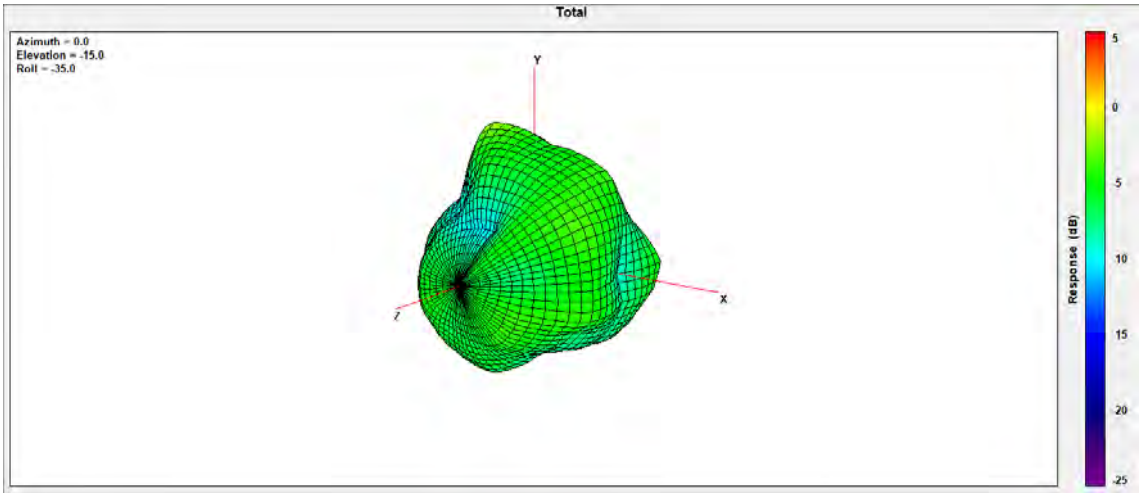
1842.5MHz	H (Peak)	V (Peak)
	-2.00	-2.48

1844.9MHz



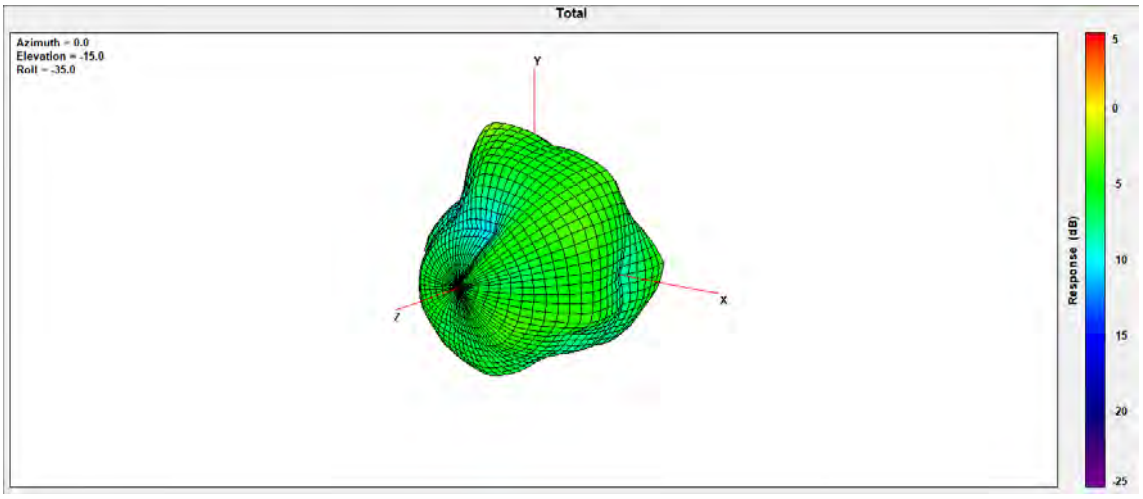
1844.9MHz	H (Peak)	V (Peak)
	-2.10	-2.51

1862.4MHz



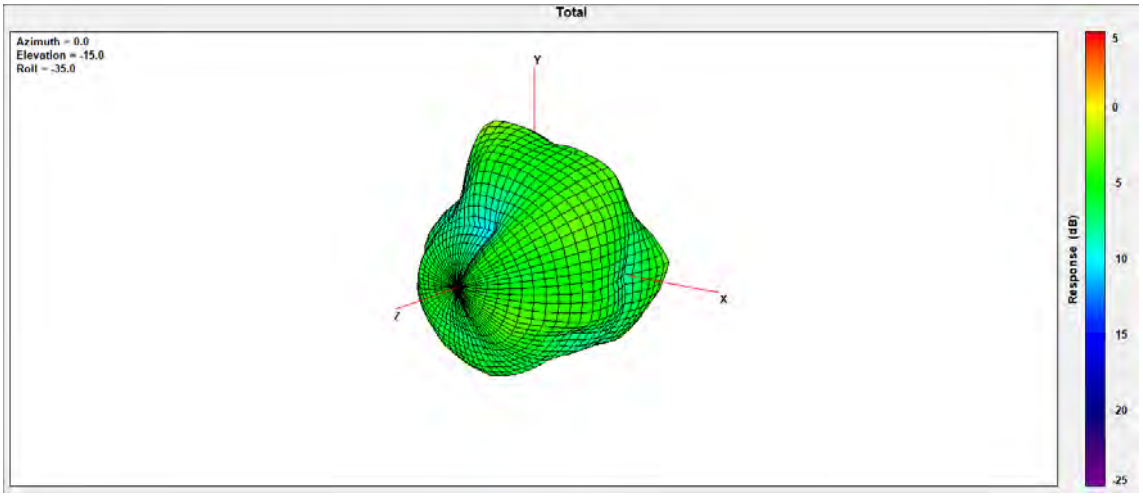
1862.4MHz	H (Peak)	V (Peak)
	-2.00	-2.37

1880MHz



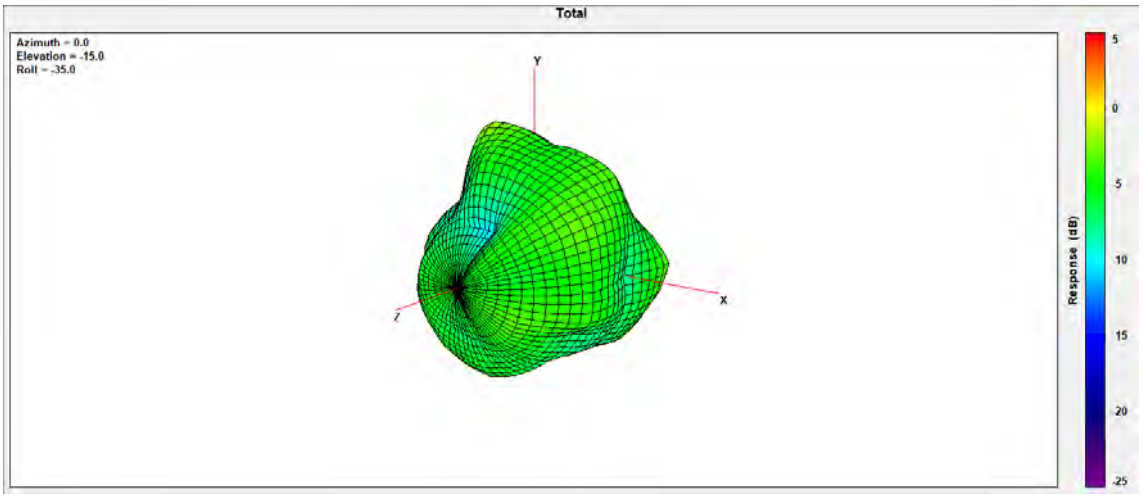
1880MHz	H (Peak)	V (Peak)
	-1.89	-2.14

1900MHz



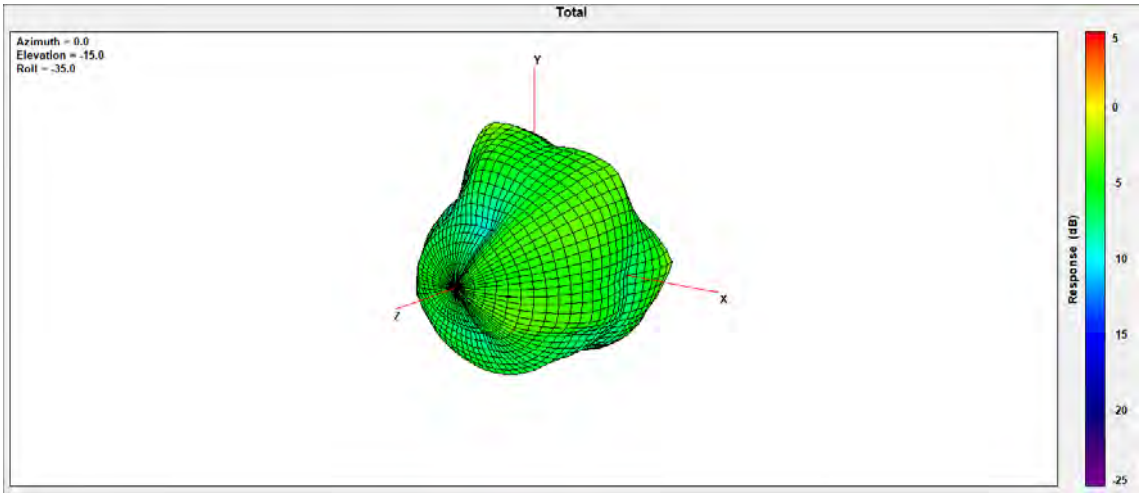
1900MHz	H (Peak)	V (Peak)
	-1.92	-1.94

1920MHz



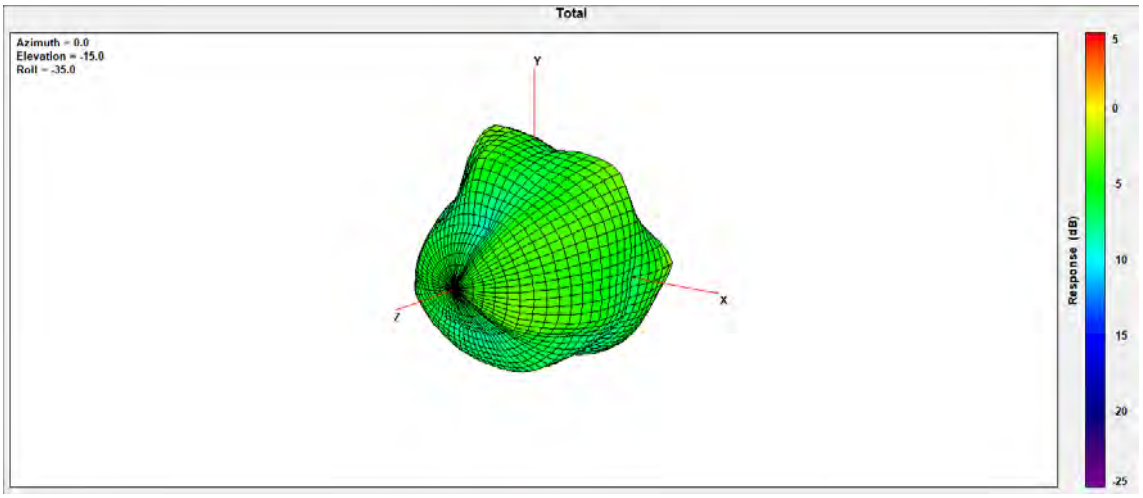
1920MHz	H (Peak)	V (Peak)
	-1.91	-1.85

1930MHz



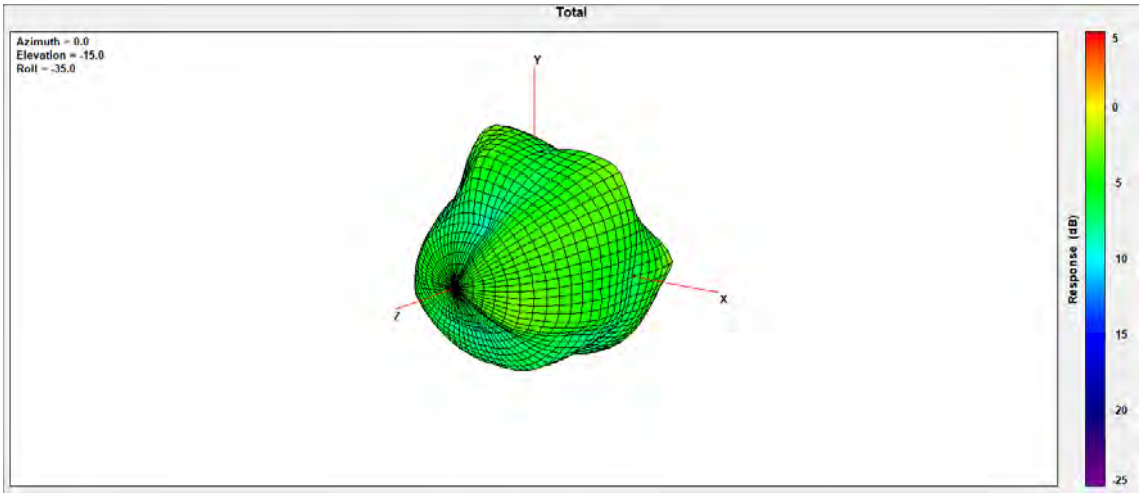
1930MHz	H (Peak)	V (Peak)
	-1.79	-1.68

1960MHz



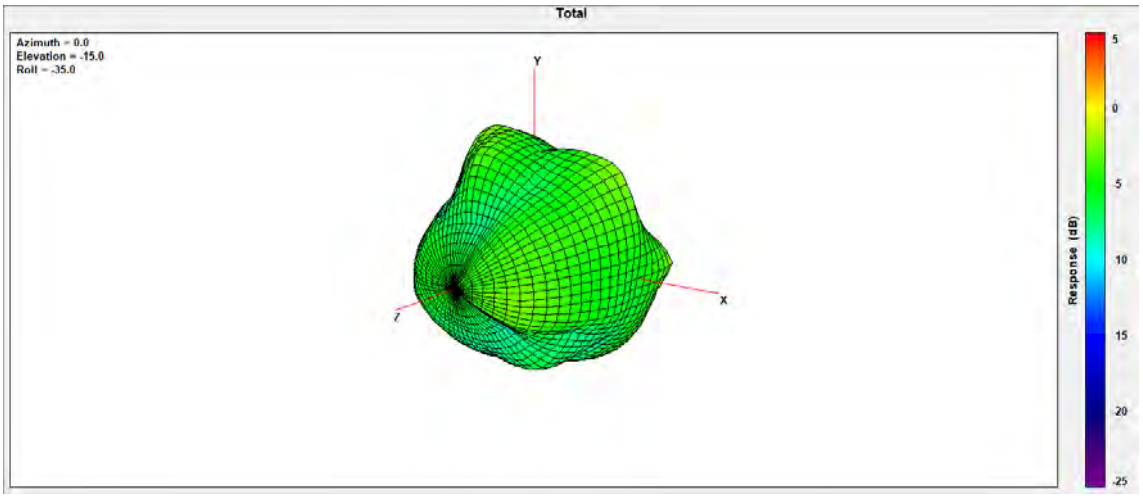
1960MHz	H (Peak)	V (Peak)
	-1.68	-2.16

1962.5MHz



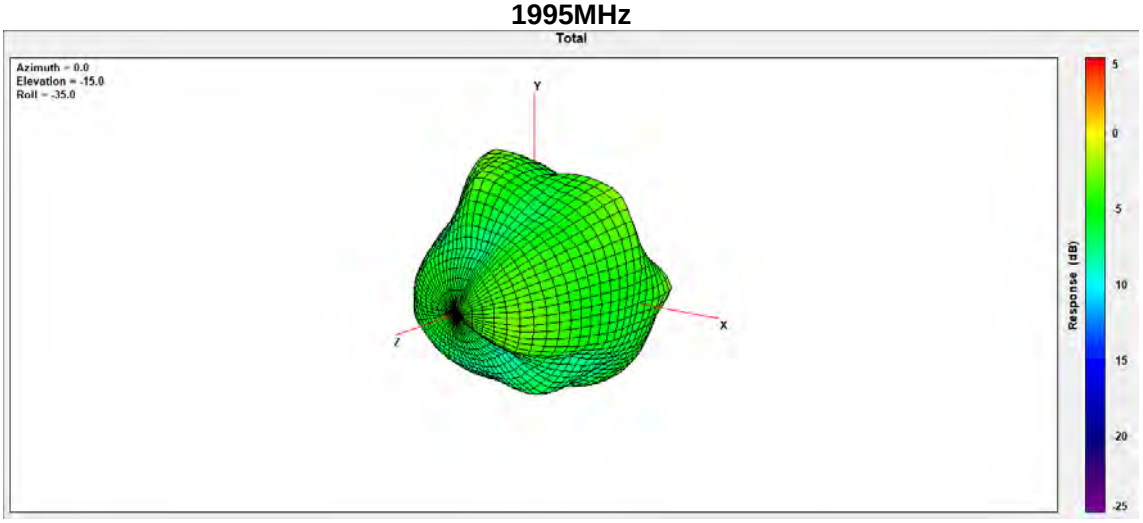
1962.5MHz	H (Peak)	V (Peak)
	-1.75	-2.23

1990MHz



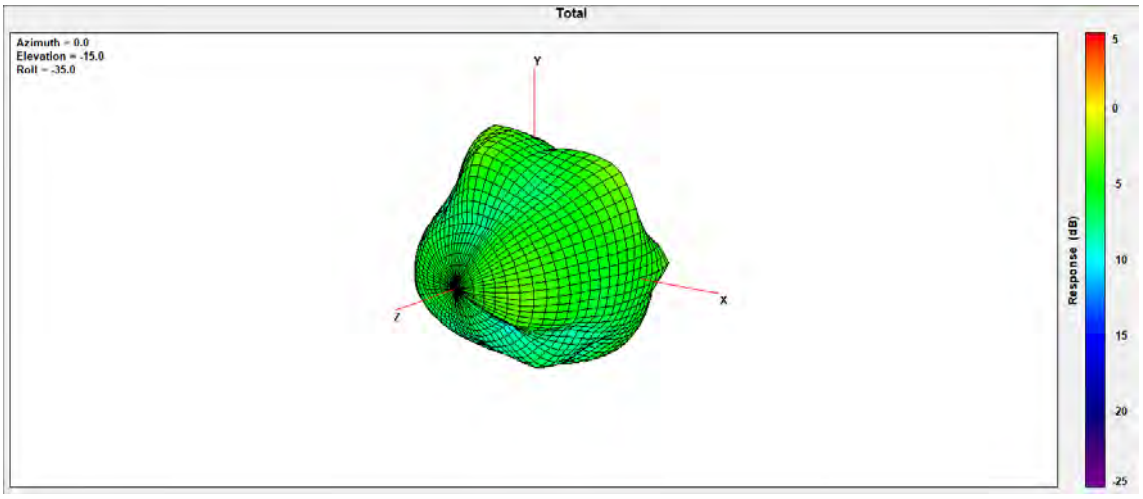
1990MHz	H (Peak)	V (Peak)
	-2.06	-2.02

1995MHz



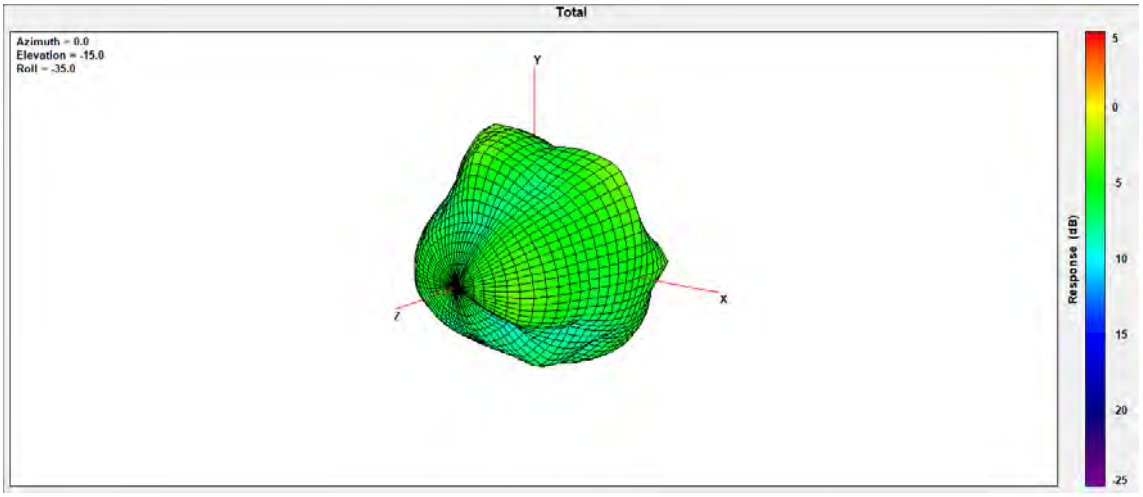
1995MHz	H (Peak)	V (Peak)
	-2.15	-2.15

2010MHz



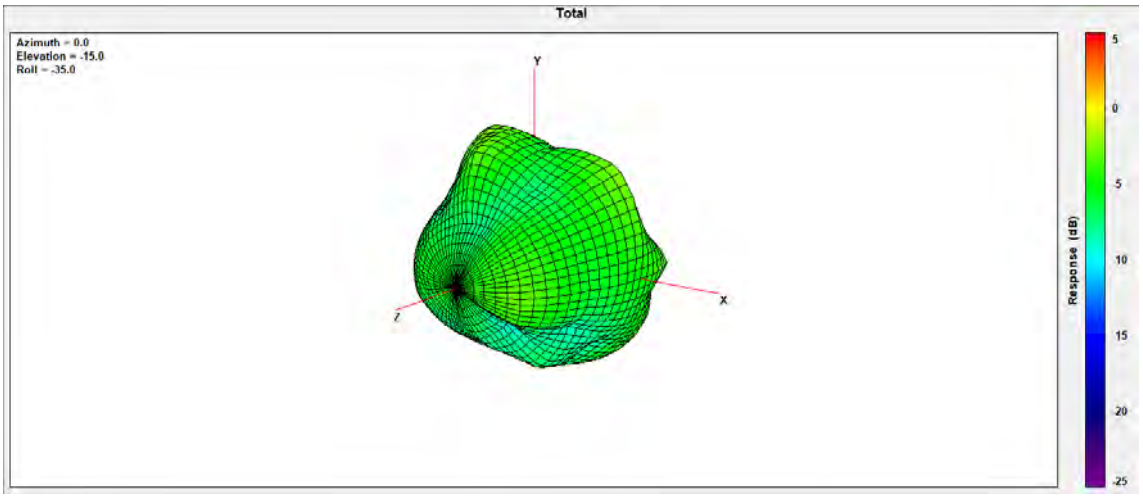
2010MHz	H (Peak)	V (Peak)
	-1.92	-1.73

2018MHz



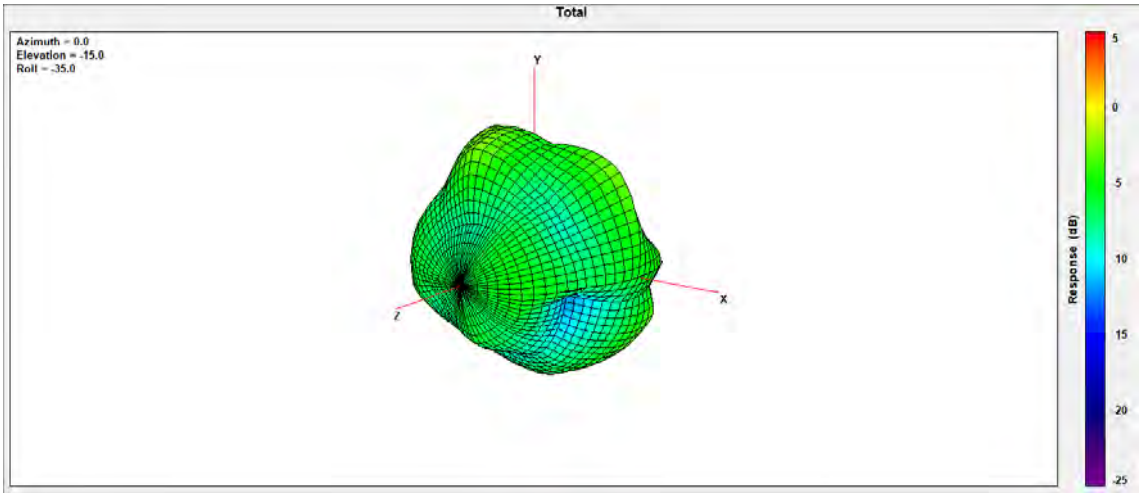
2018MHz	H (Peak)	V (Peak)
	-1.82	-1.74

2025MHz



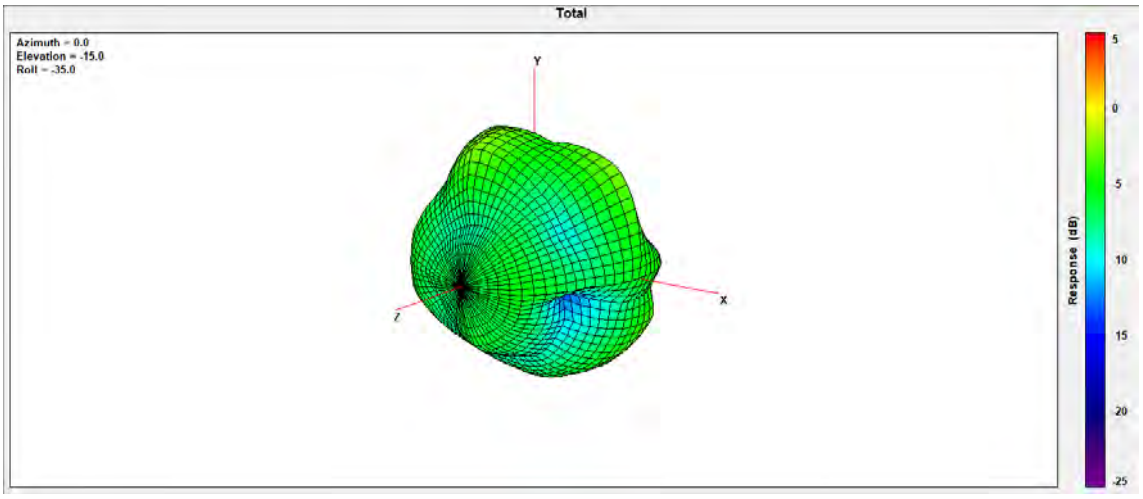
2025MHz	H (Peak)	V (Peak)
	-1.84	-1.64

2110MHz



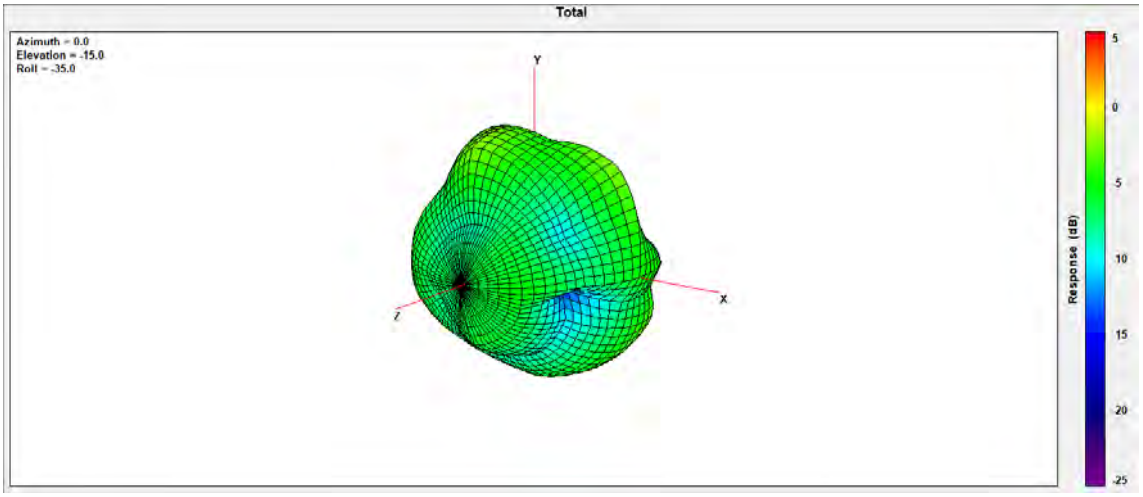
2110MHz	H (Peak)	V (Peak)
	-1.85	-1.58

2132.5MHz



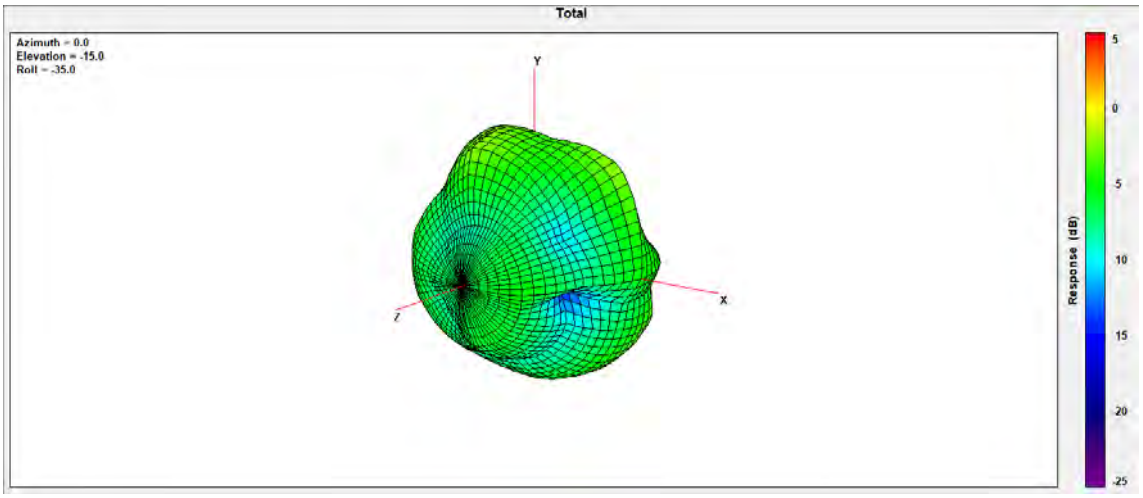
2132.5MHz	H (Peak)	V (Peak)
	-1.68	-1.46

2140MHz



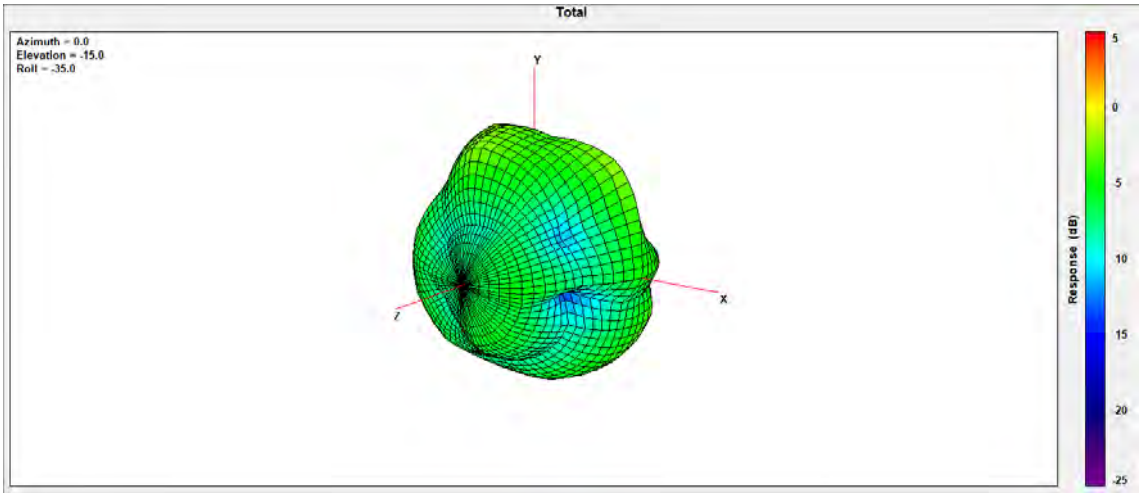
2140MHz	H (Peak)	V (Peak)
	-1.37	-1.31

2155MHz



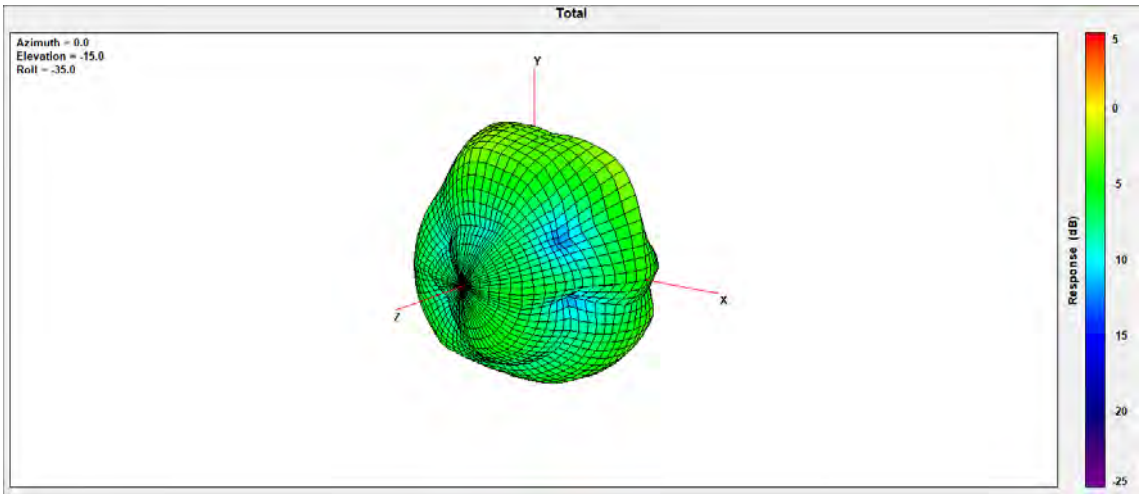
2155MHz	H (Peak)	V (Peak)
	-1.35	-1.52

2170MHz



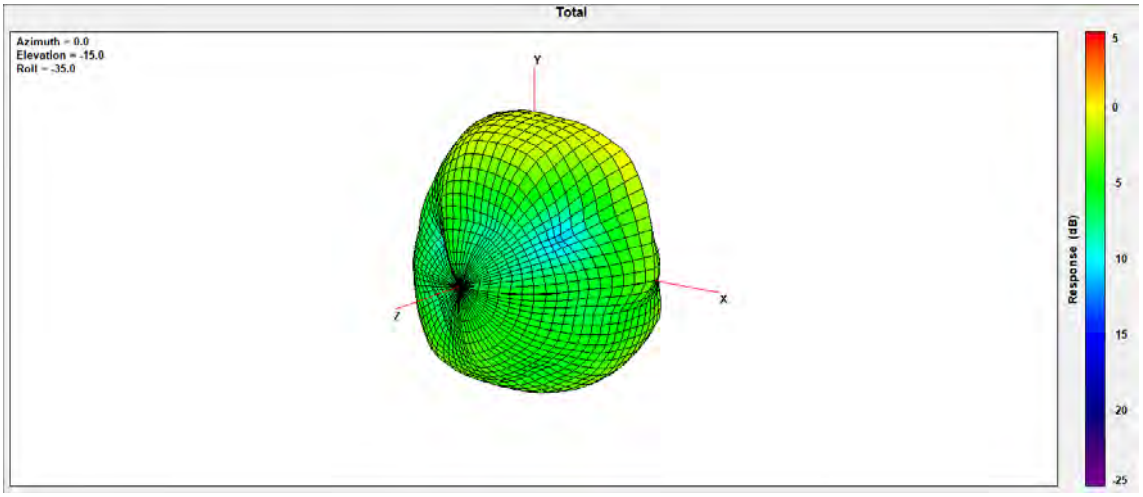
2170MHz	H (Peak)	V (Peak)
	-1.45	-1.53

2200MHz



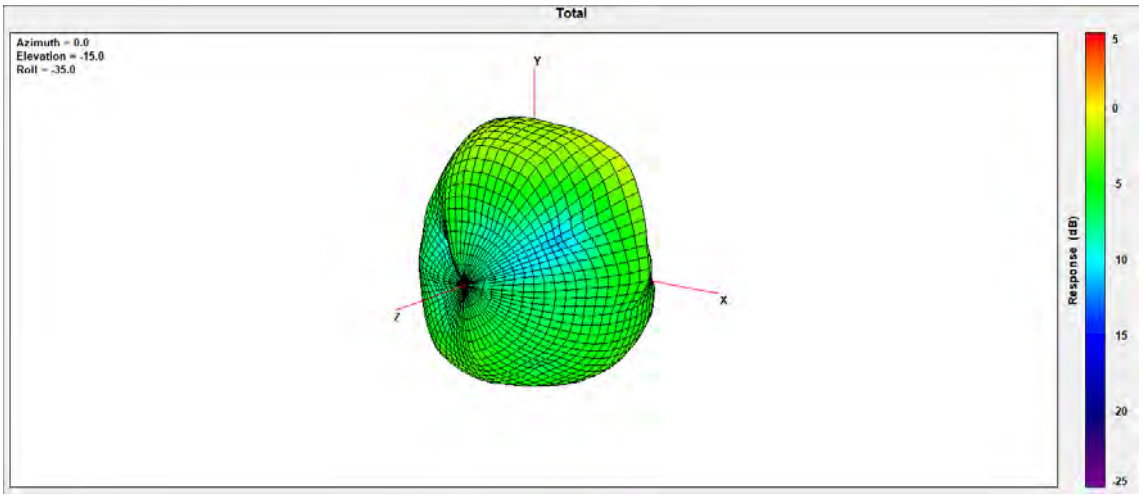
2200MHz	H (Peak)	V (Peak)
	-1.49	-1.72

2300MHz



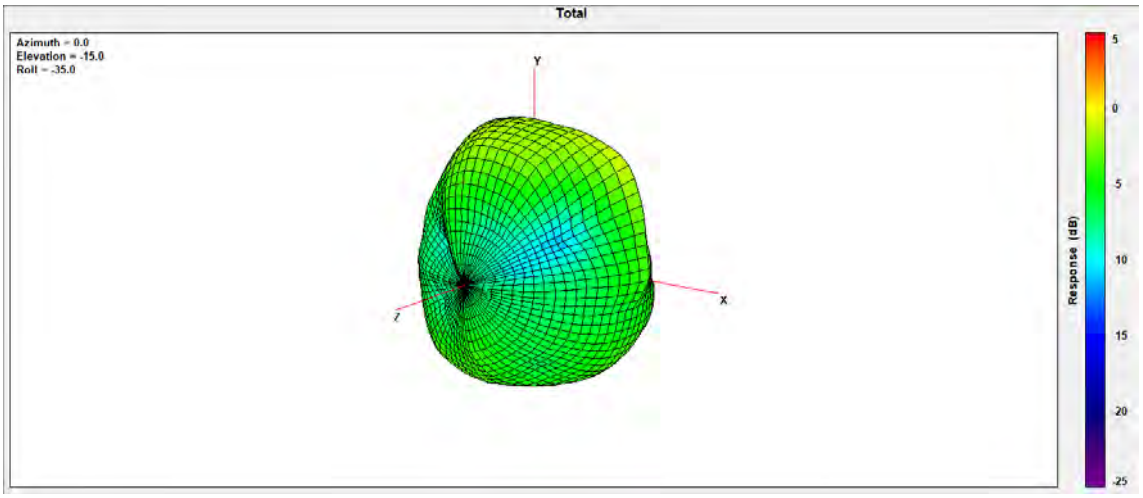
2300MHz	H (Peak)	V (Peak)
	-1.48	-1.78

2350MHz



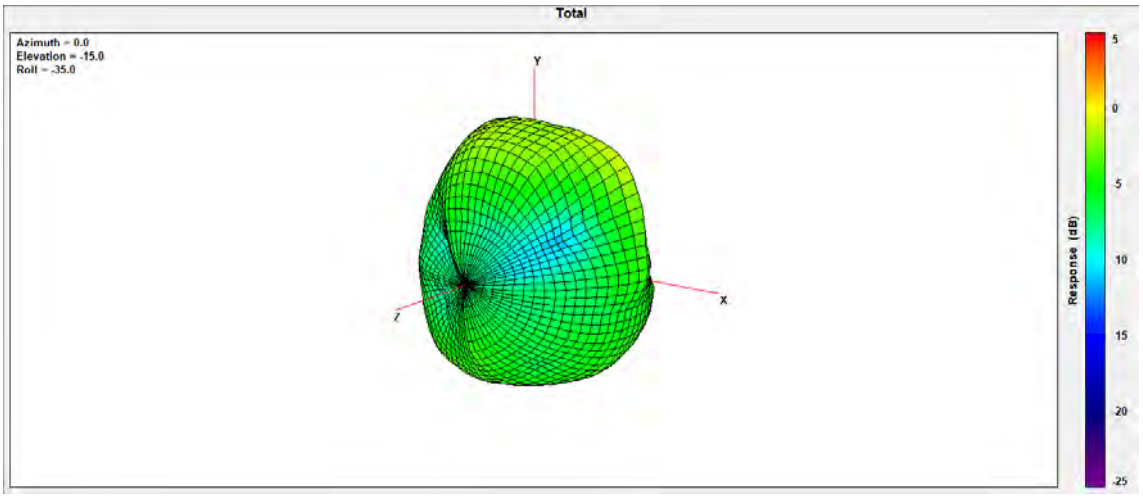
2350MHz	H (Peak)	V (Peak)
	-1.19	-1.90

2355MHz



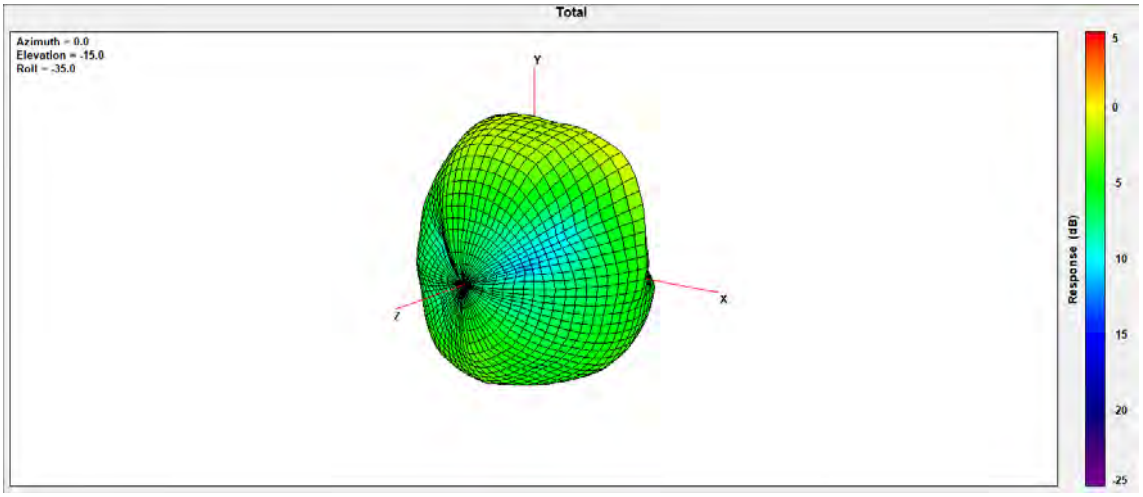
2355MHz	H (Peak)	V (Peak)
	-1.14	-1.99

2360MHz



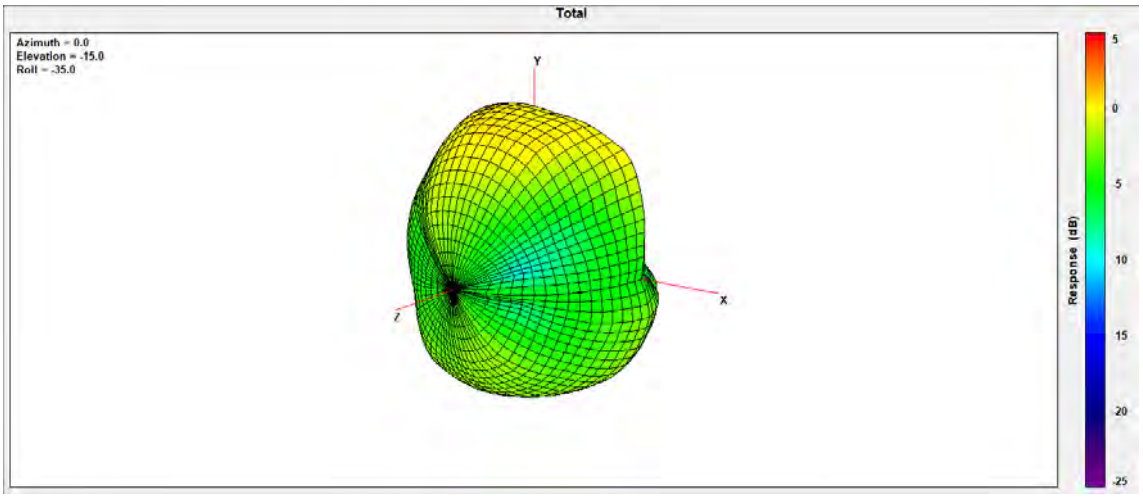
2360MHz	H (Peak)	V (Peak)
	-0.65	-2.35

2400MHz



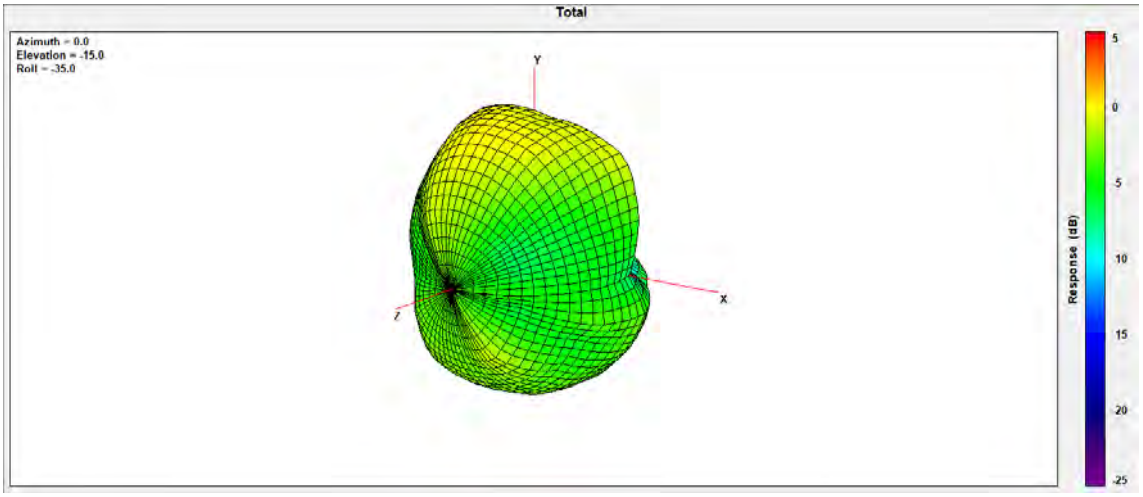
2400MHz	H (Peak)	V (Peak)
	-0.83	-2.40

2496MHz



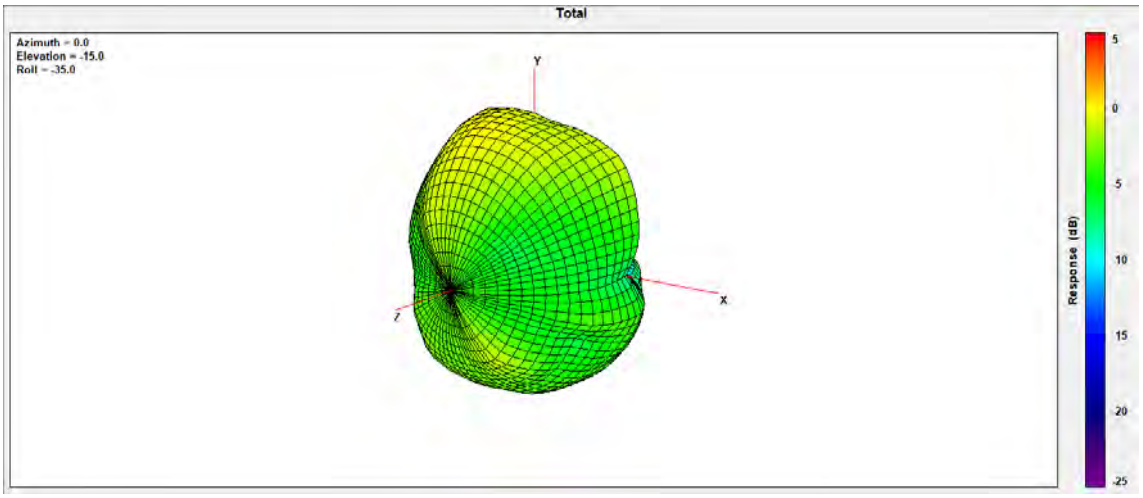
2496MHz	H (Peak)	V (Peak)
	-0.84	-2.50

2570MHz



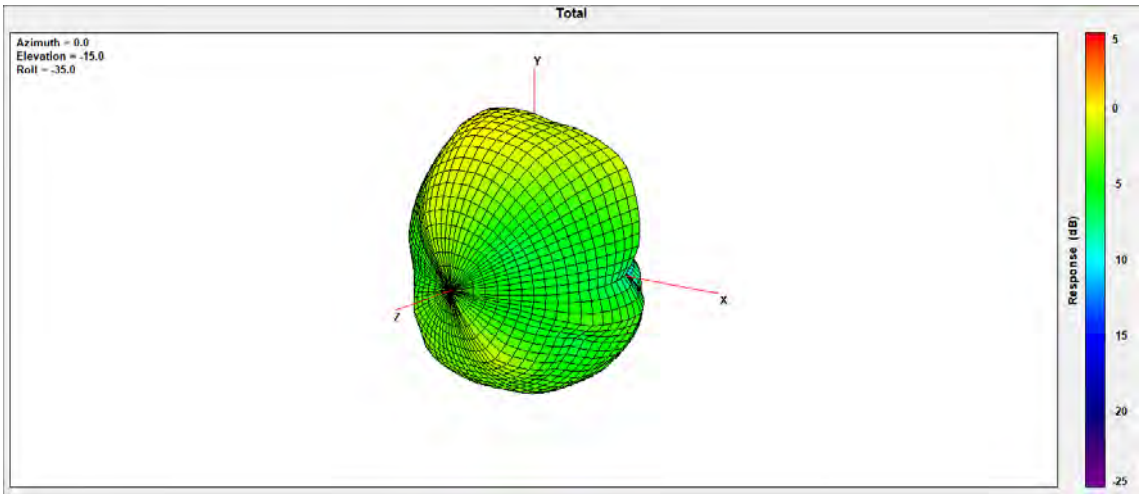
2570MHz	H (Peak)	V (Peak)
	0.08	-1.62

2593MHz



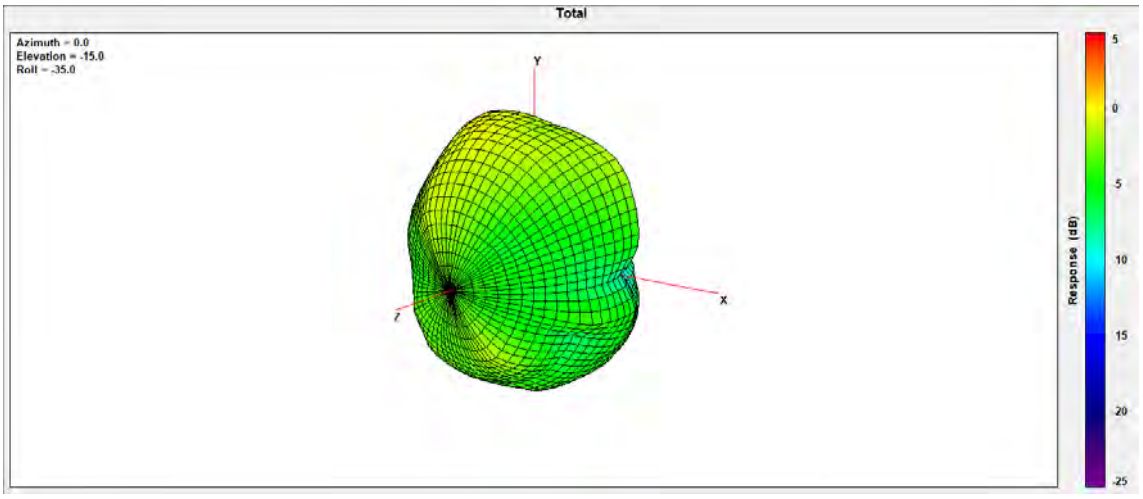
2593MHz	H (Peak)	V (Peak)
	0.03	-1.04

2595MHz



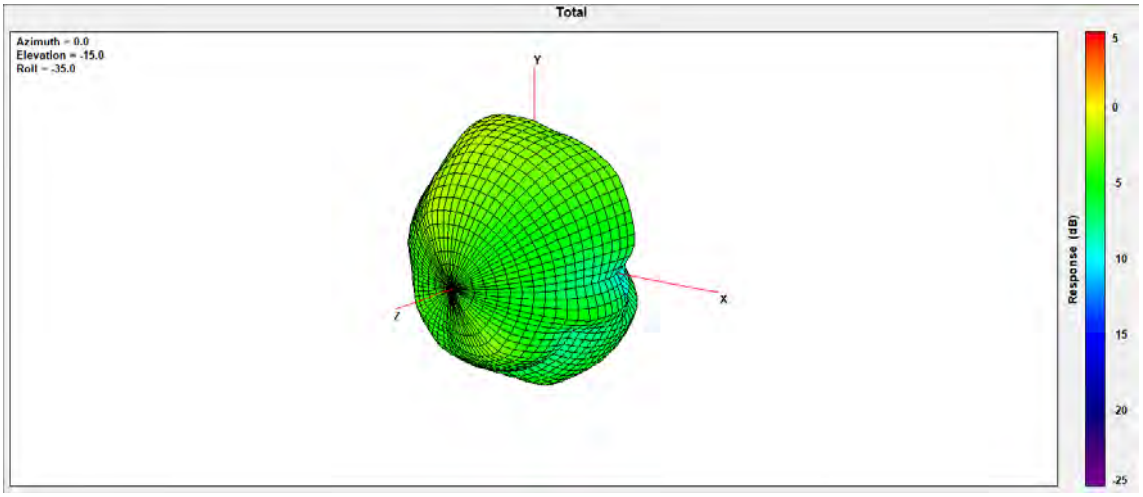
2595MHz	H (Peak)	V (Peak)
	-0.07	-0.59

2620MHz



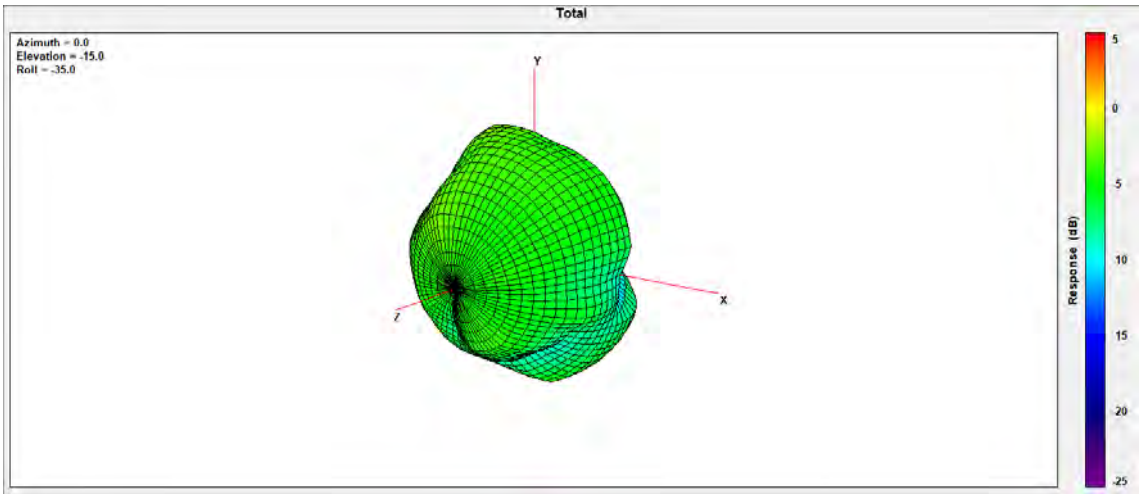
2620MHz	H (Peak)	V (Peak)
	-0.28	-0.62

2655MHz



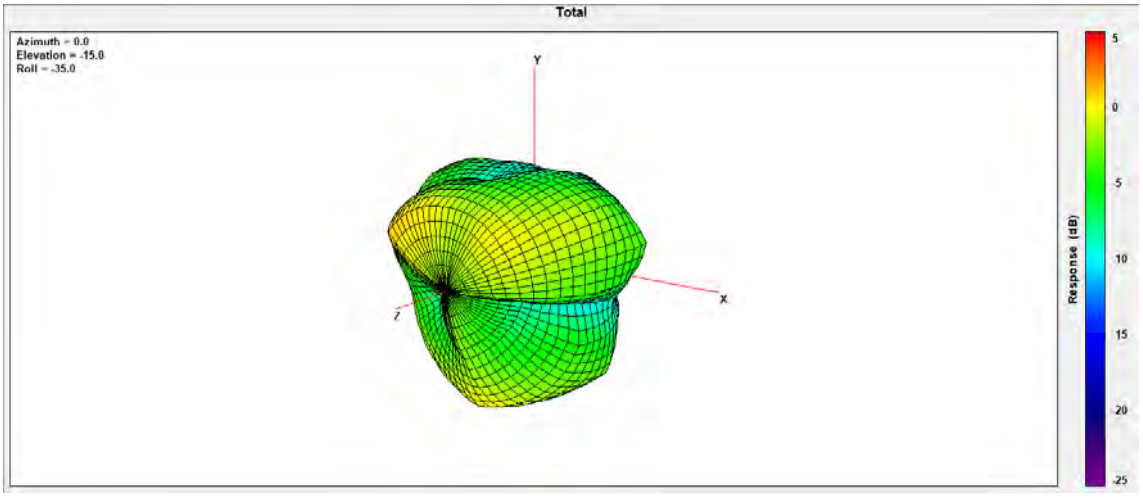
2655MHz	H (Peak)	V (Peak)
	-0.42	-0.6

2690MHz



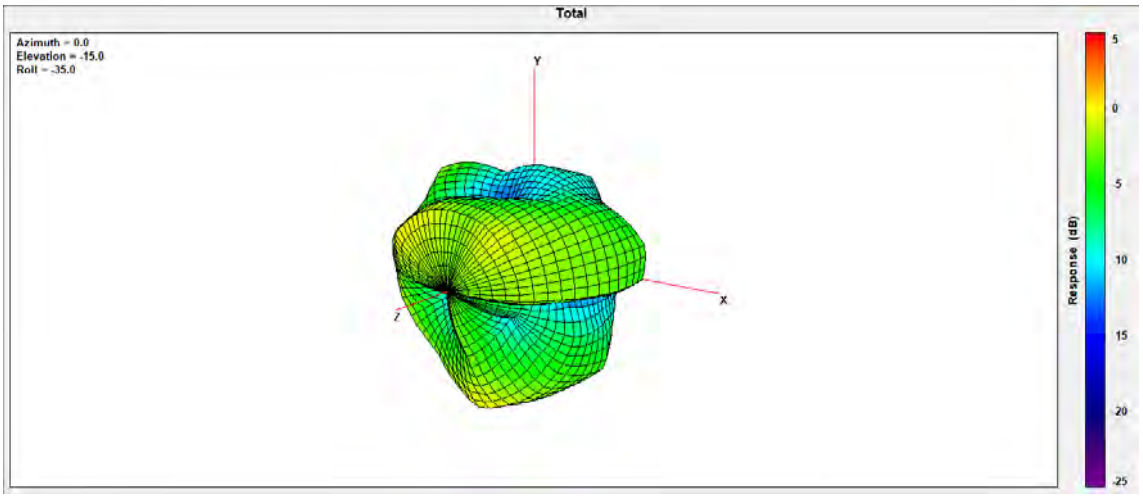
2690MHz	H (Peak)	V (Peak)
	-1.38	-1.26

3300MHz



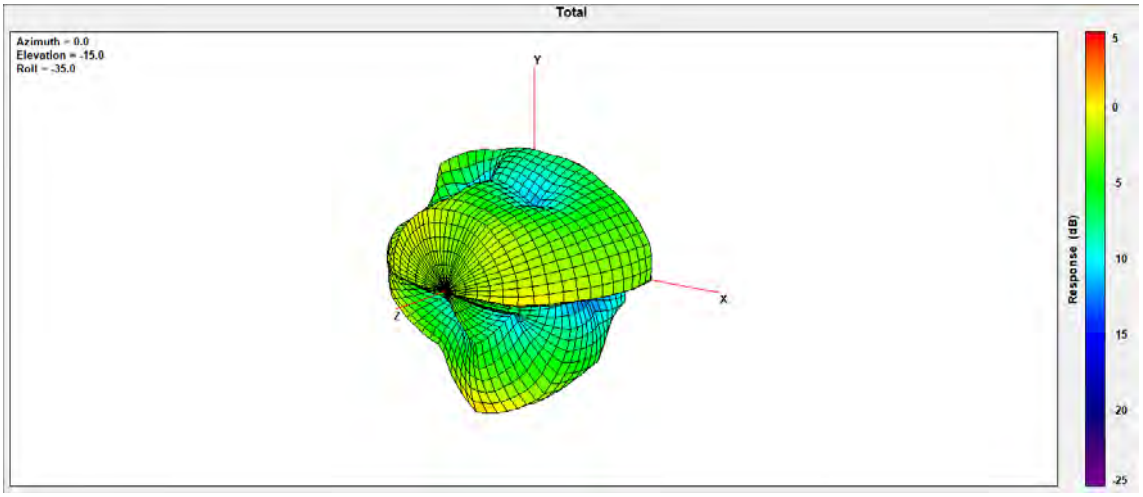
3300MHz	H (Peak)	V (Peak)
	-2.29	-2.56

3400MHz



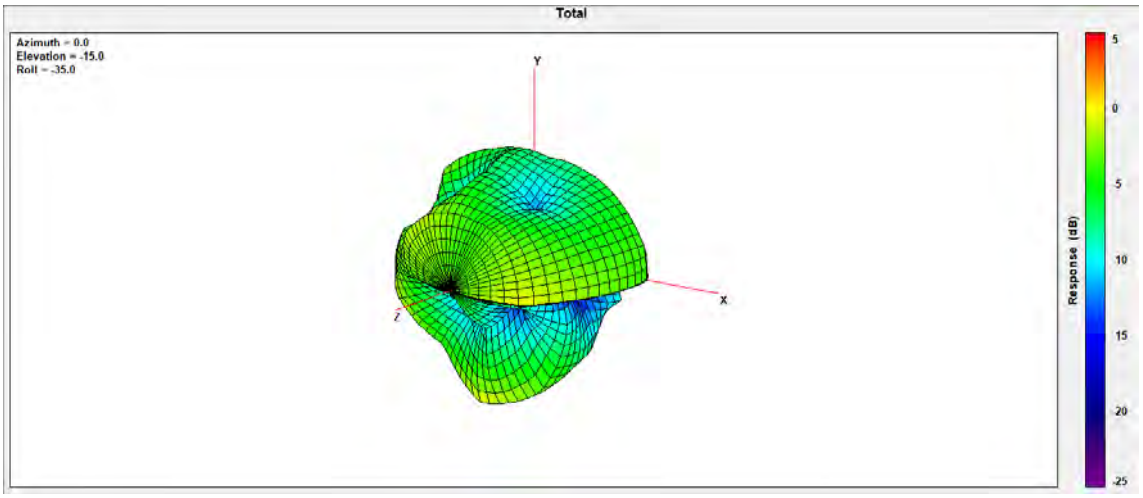
3400MHz	H (Peak)	V (Peak)
	-3.34	-2.68

3500MHz



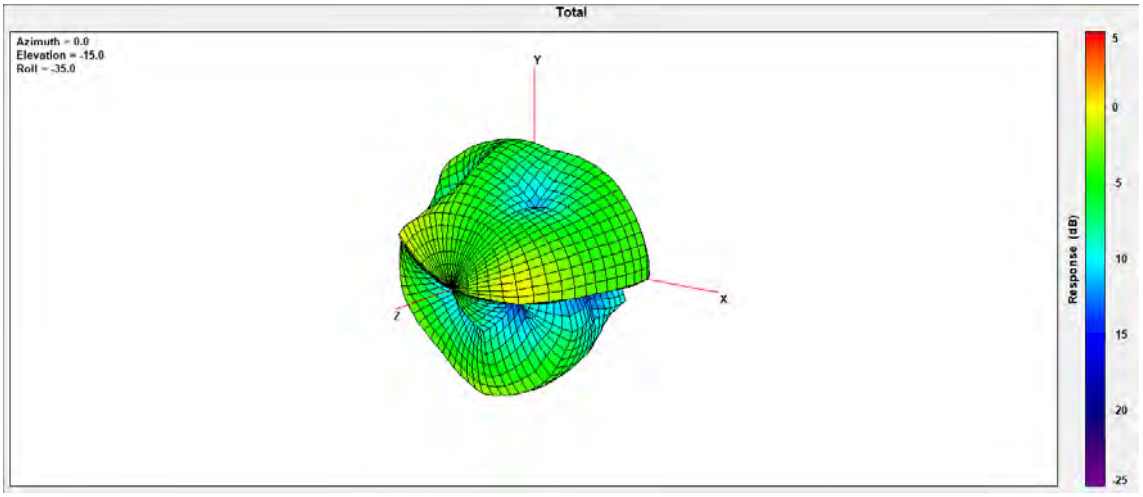
3500MHz	H (Peak)	V (Peak)
	-0.84	-0.58

3550MHz



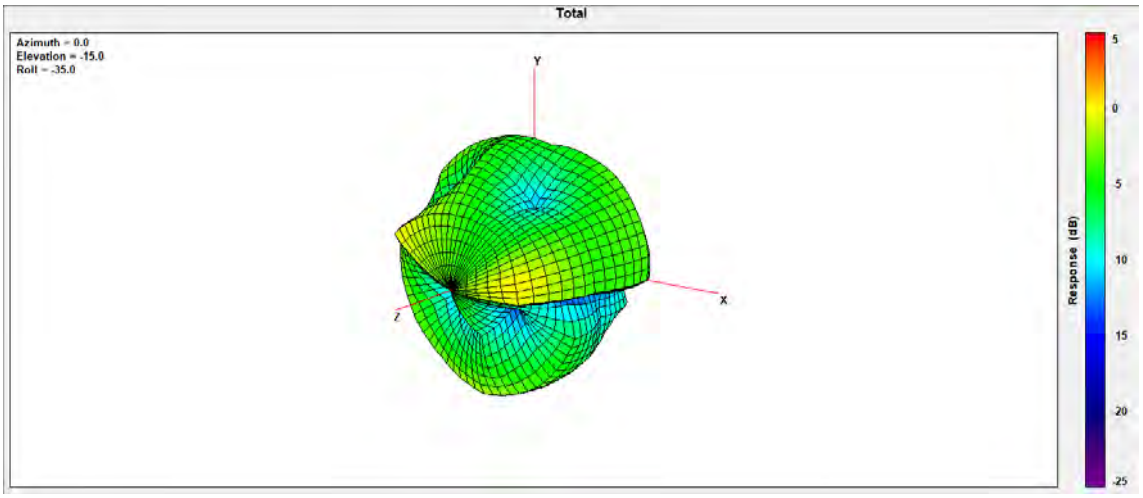
3550MHz	H (Peak)	V (Peak)
	-1.19	-1.03

3600MHz



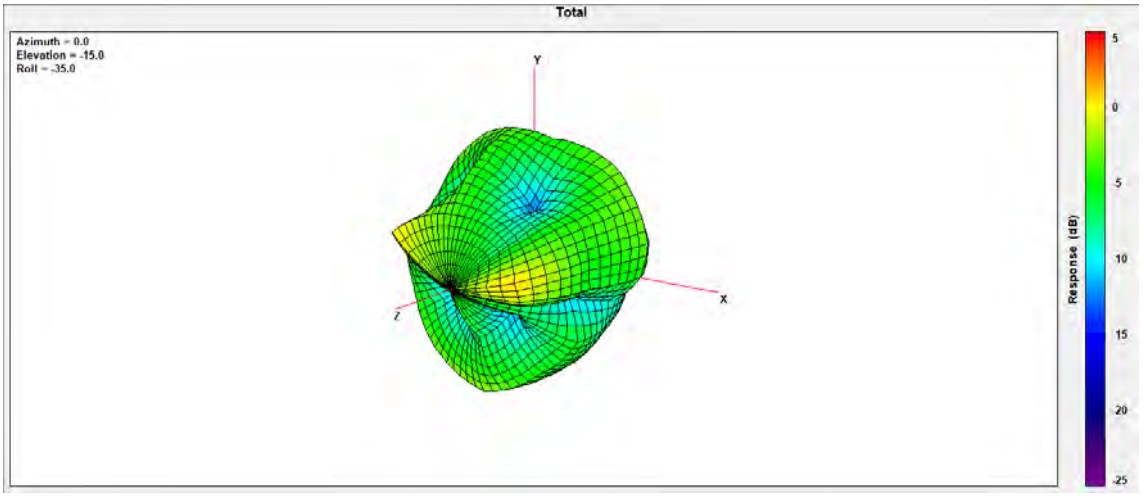
3600MHz	H (Peak)	V (Peak)
	-0.11	-1.51

3625MHz



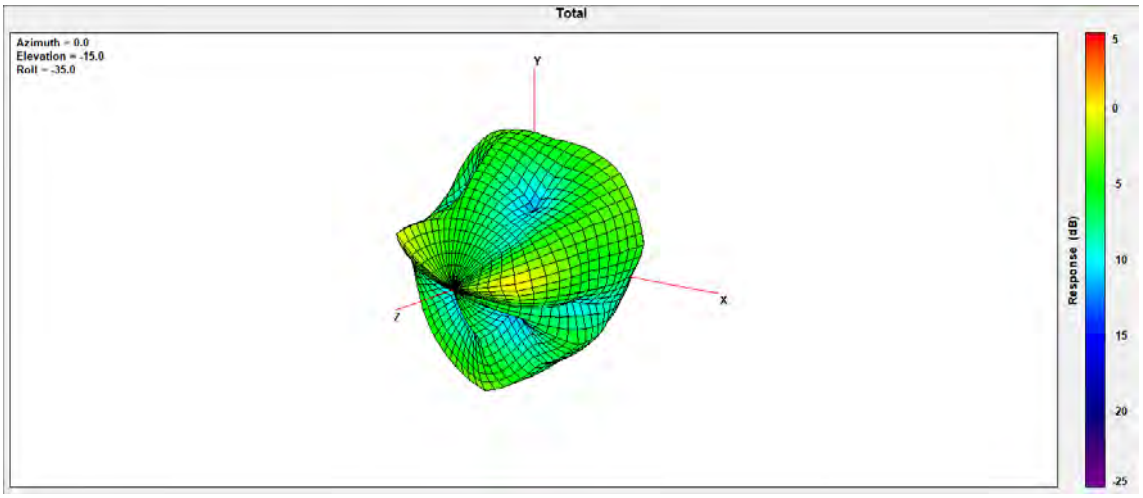
3625MHz	H (Peak)	V (Peak)
	-1.3	-2.6

3700MHz



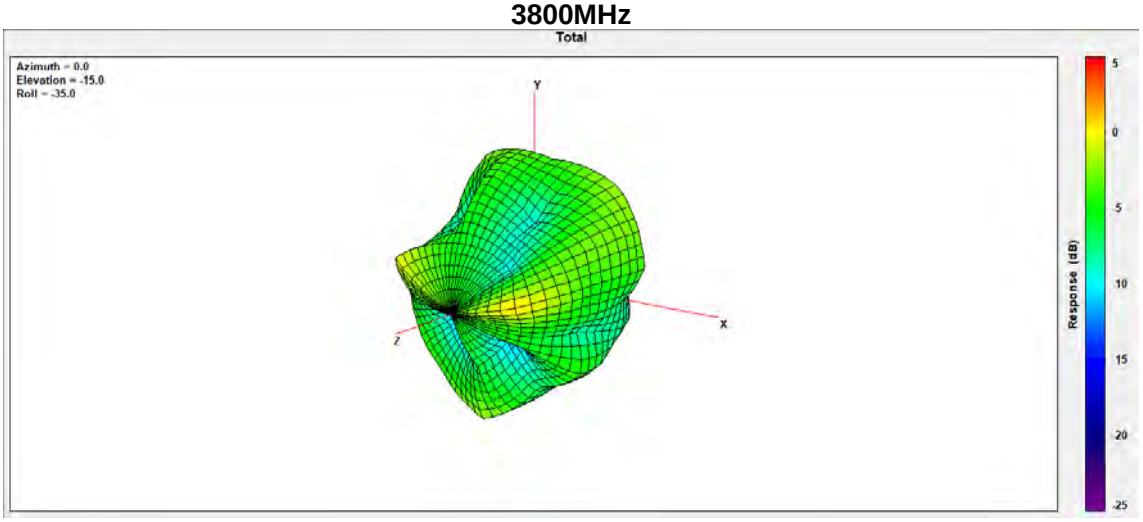
3700MHz	H (Peak)	V (Peak)
	-0.95	-3.26

3750MHz



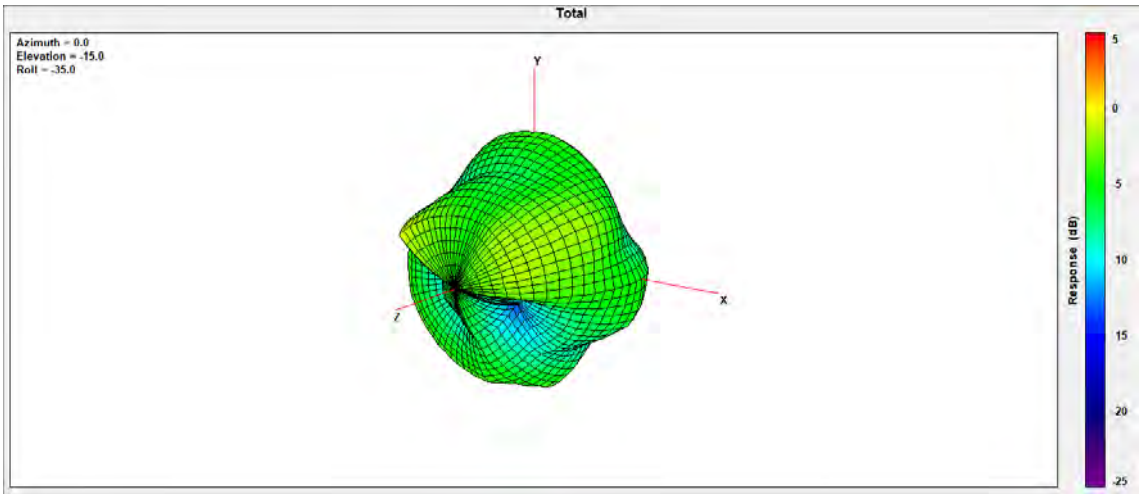
3750MHz	H (Peak)	V (Peak)
	-0.46	-2.48

3800MHz



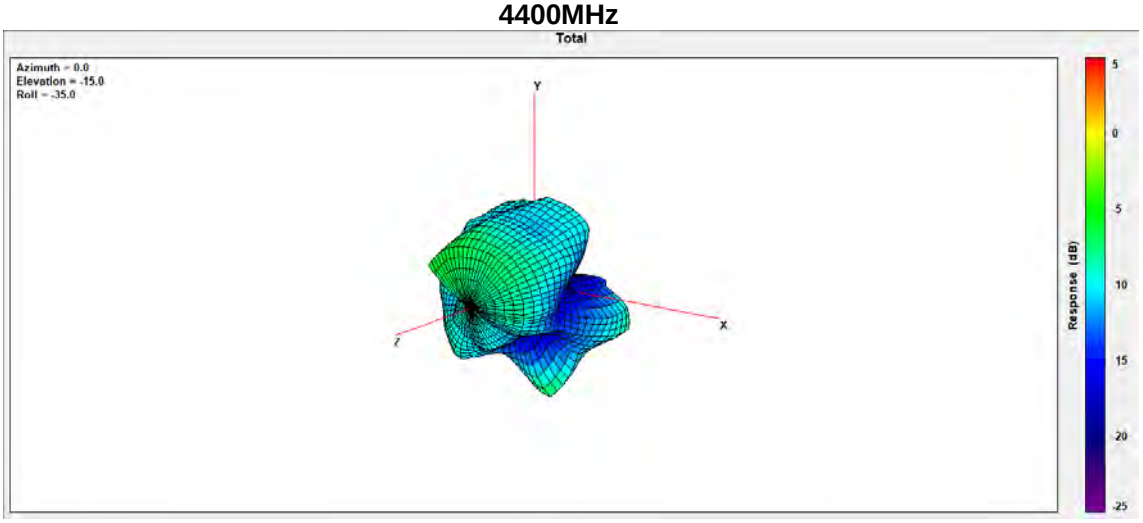
3800MHz	H (Peak)	V (Peak)
	-0.18	-1.9

4200MHz



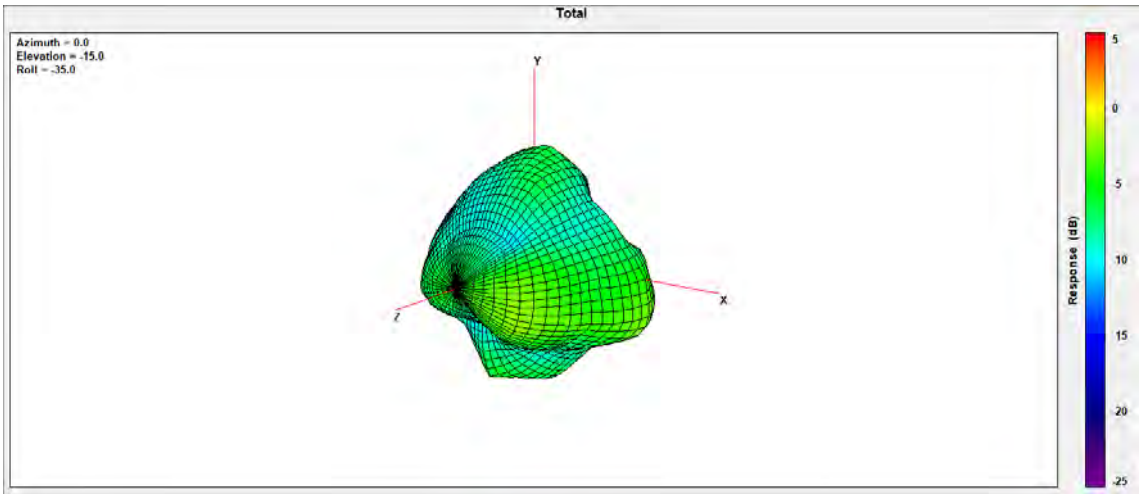
4200MHz	H (Peak)	V (Peak)
	-0.81	-1.33

4400MHz



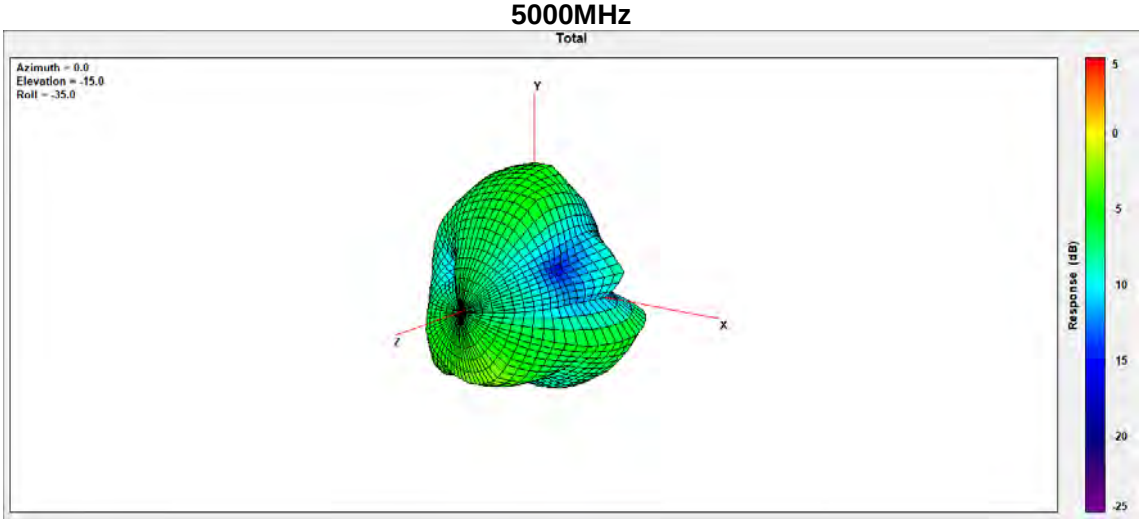
4400MHz	H (Peak)	V (Peak)
	-1.02	-1.19

4700MHz



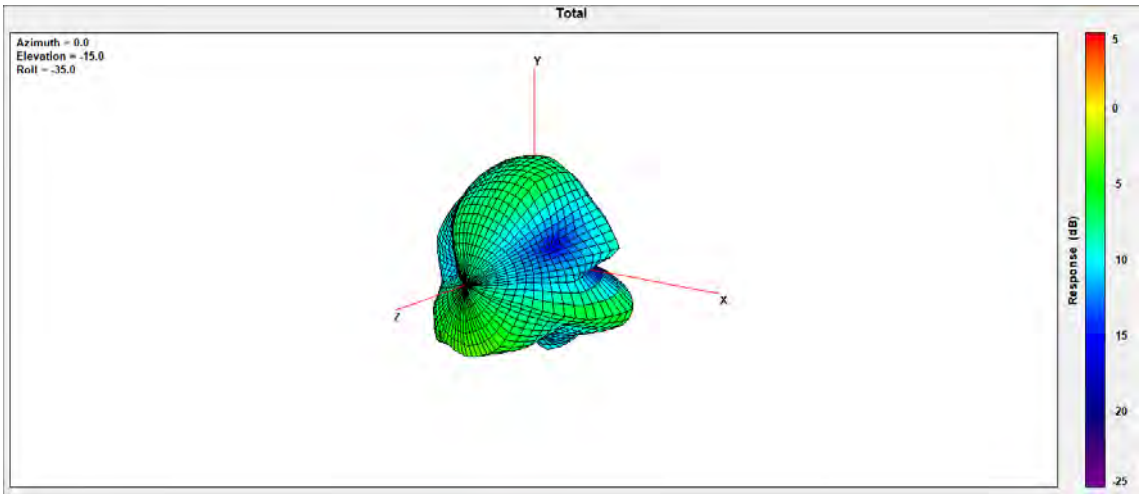
4700MHz	H (Peak)	V (Peak)
	-2.59	-3.29

5000MHz



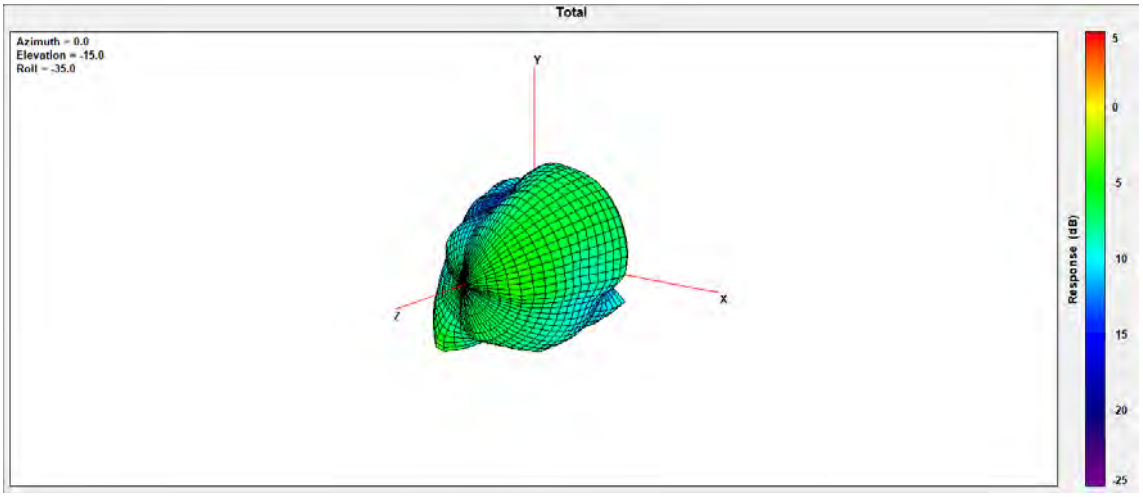
5000MHz	H (Peak)	V (Peak)
	-7.22	-7.85

5150MHz



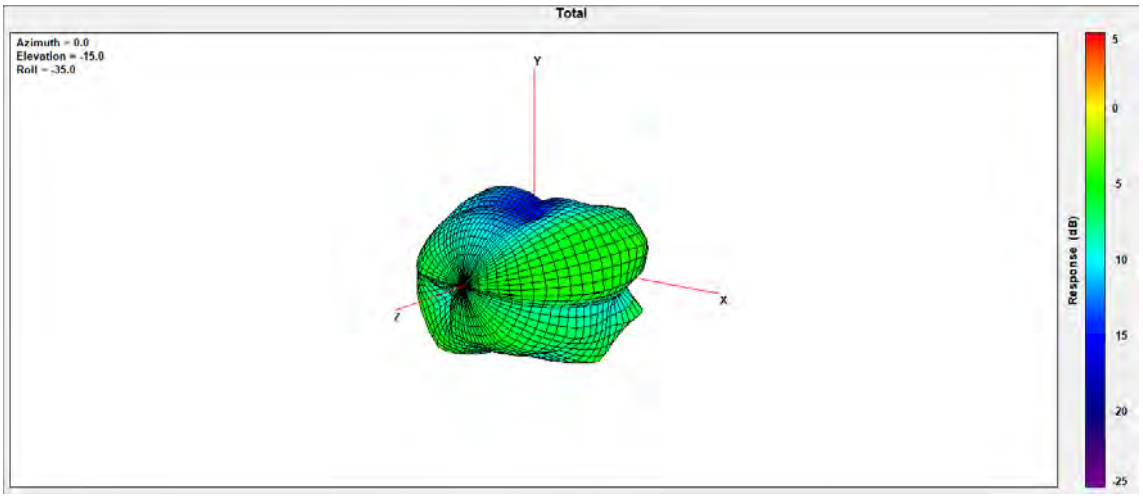
5150MHz	H (Peak)	V (Peak)
	-5.52	-5.83

5537.5MHz



5537.5MHz	H (Peak)	V (Peak)
	-4.54	-4.51

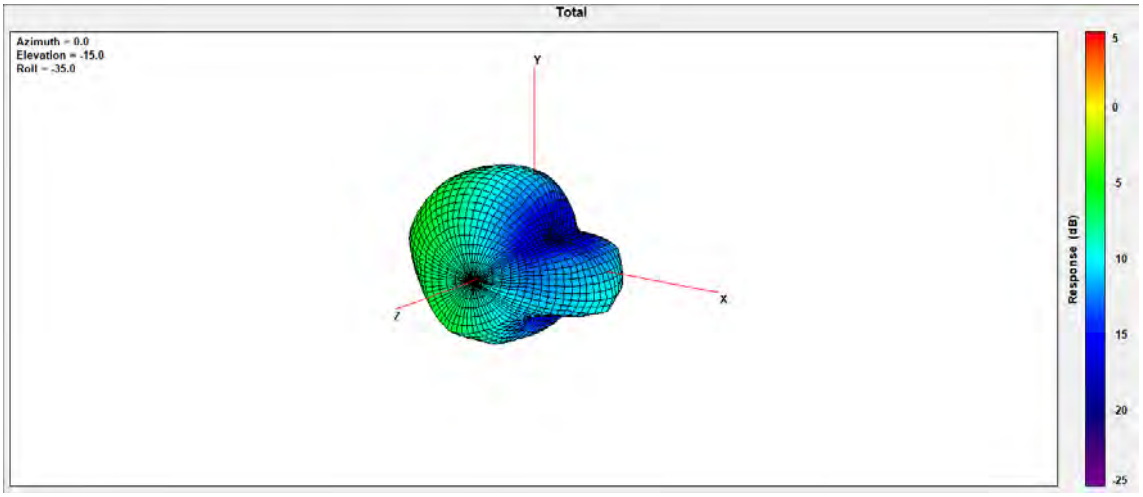
5925MHz



5925MHz	H (Peak)	V (Peak)
	-5.47	-5.64

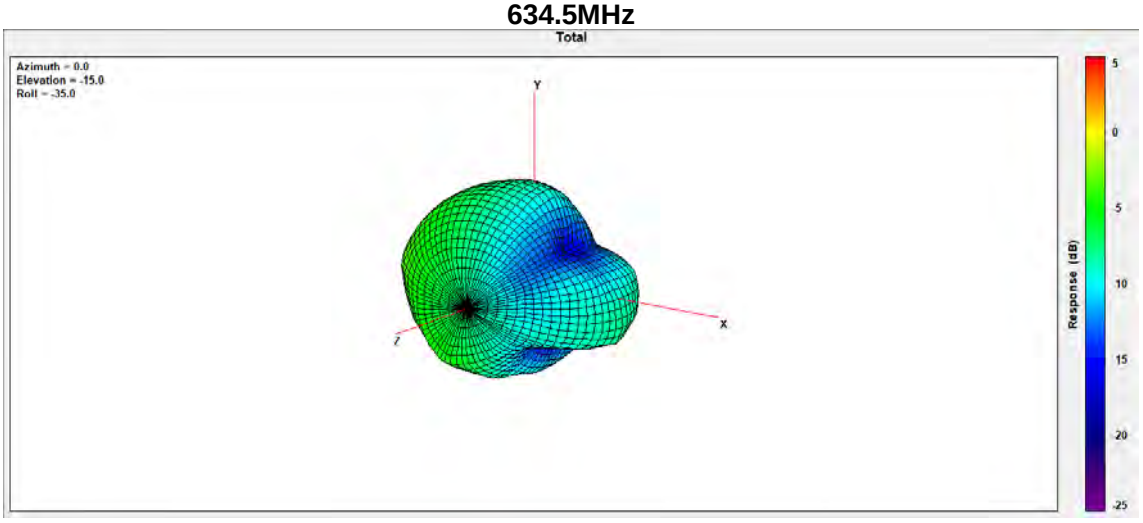
Tablet mode
WWAN Main Antenna (Tx1/Rx1)

617MHz



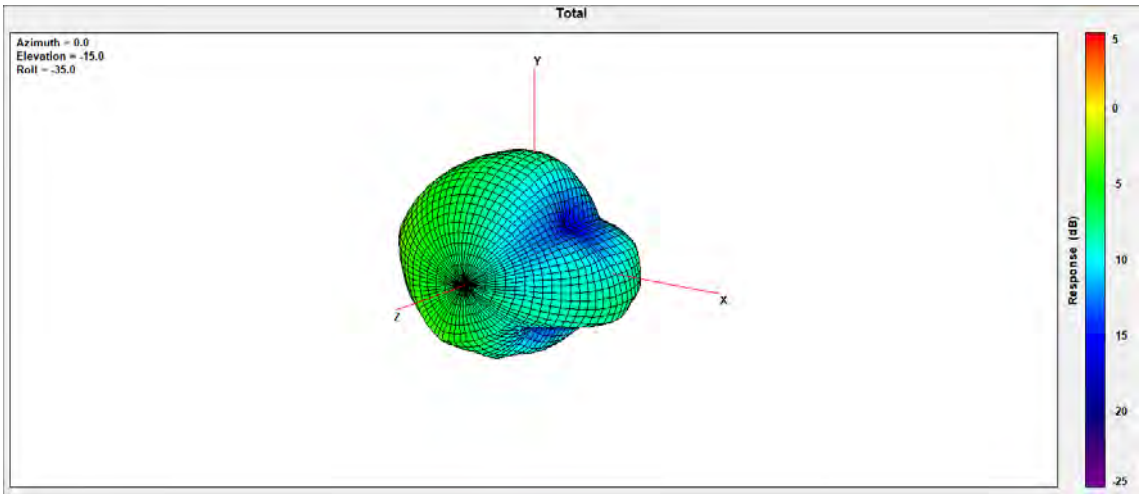
617MHz	H (Peak)	V (Peak)
	-4.00	-6.86

634.5MHz



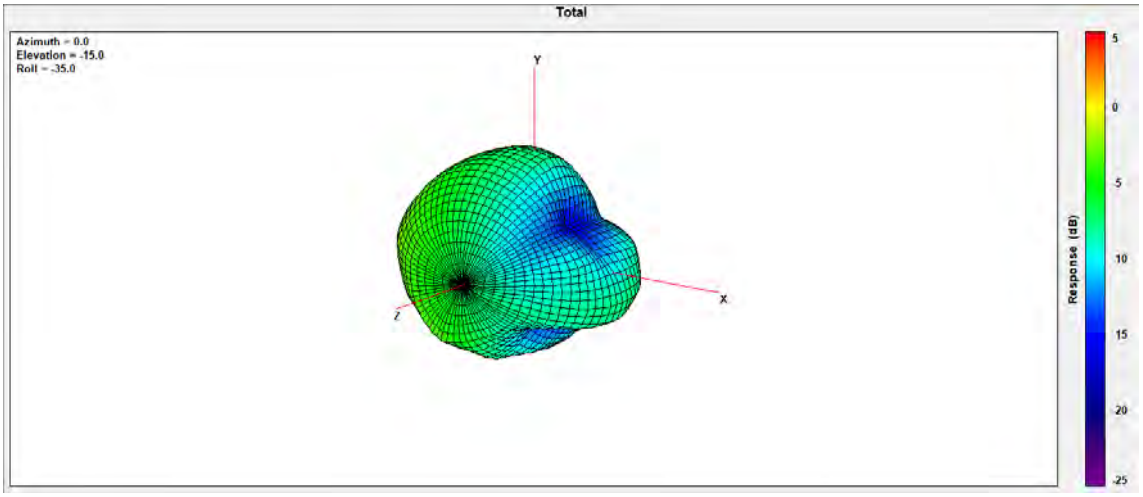
634.5MHz	H (Peak)	V (Peak)
	-2.63	-5.35

652MHz



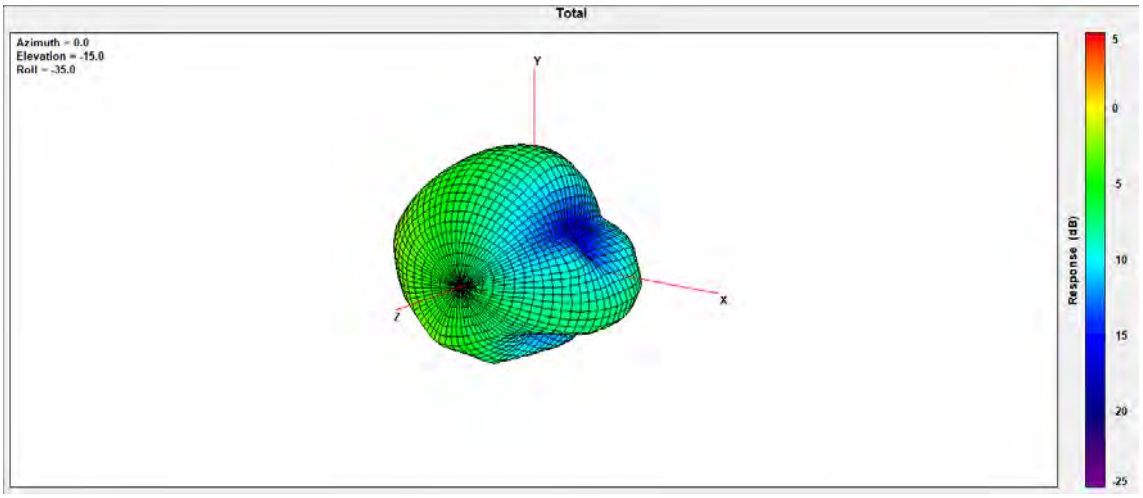
652MHz	H (Peak)	V (Peak)
	-1.62	-3.90

663MHz



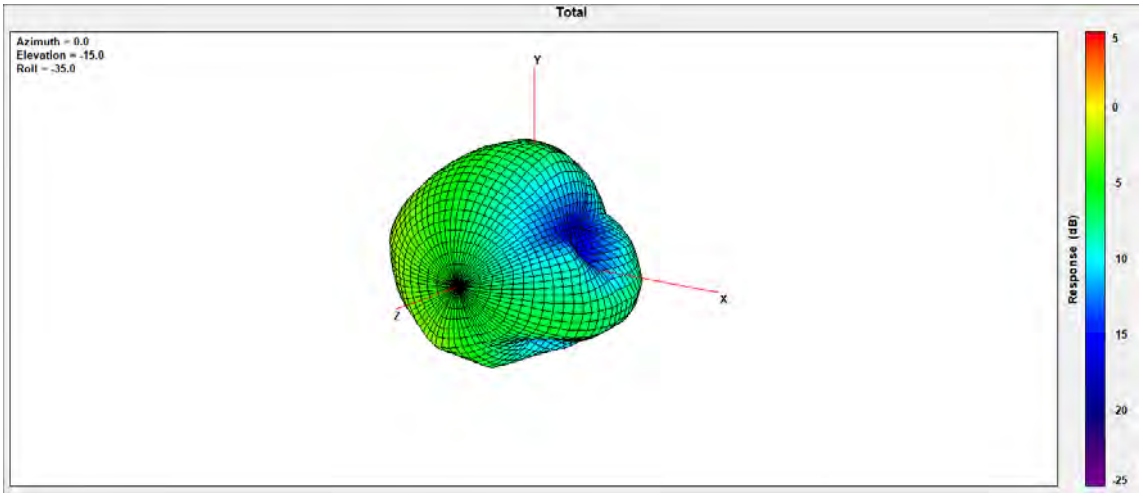
663MHz	H (Peak)	V (Peak)
	-1.11	-3.16

680.5MHz



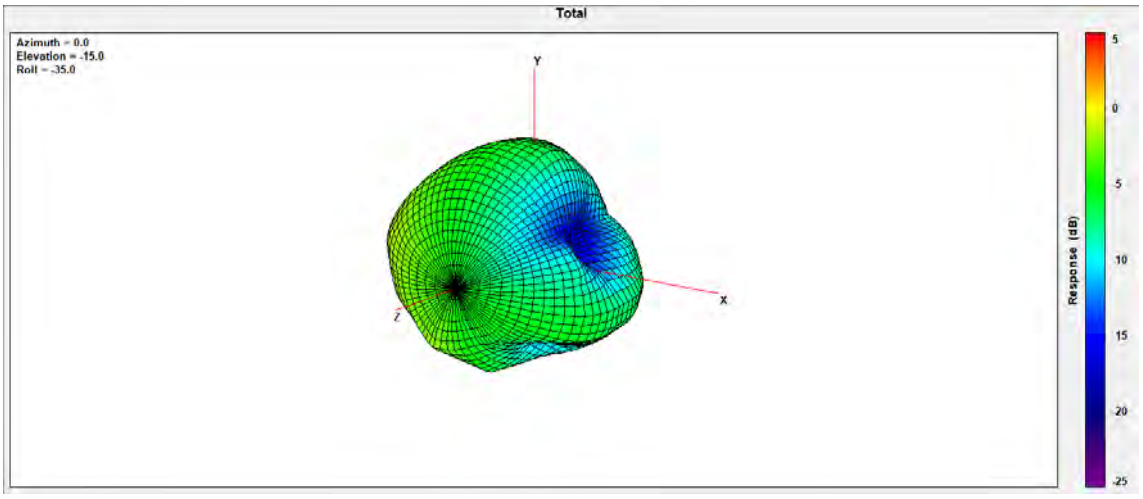
680.5Hz	H (Peak)	V (Peak)
	-0.81	-2.37

698MHz



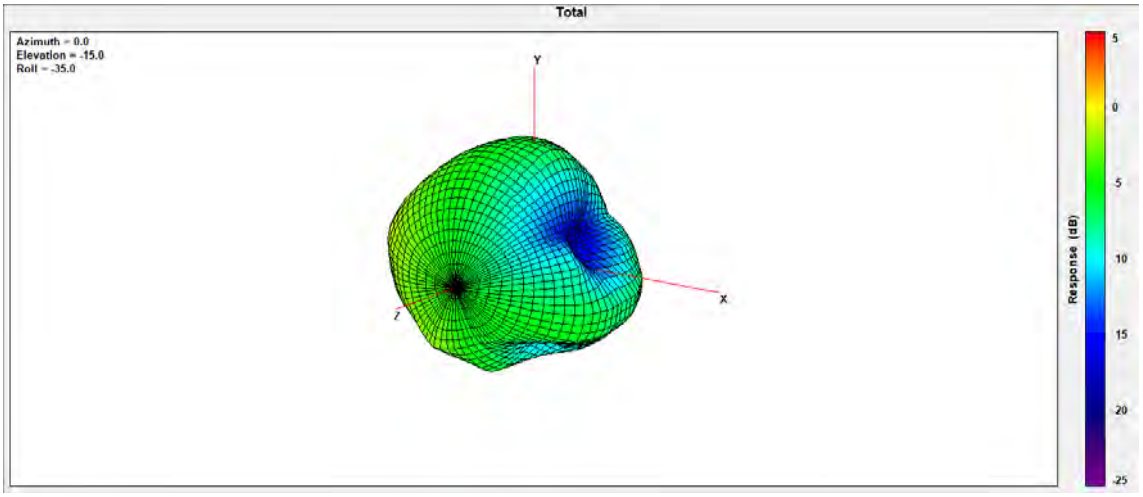
698MHz	H (Peak)	V (Peak)
	-0.32	-1.87

703MHz



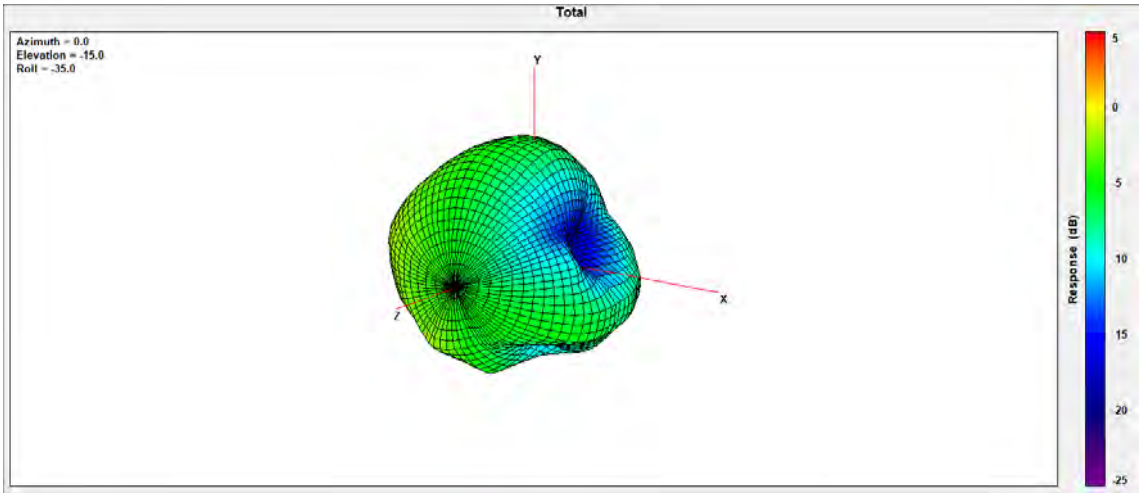
703MHz	H (Peak)	V (Peak)
	-0.07	-1.64

707.5MHz



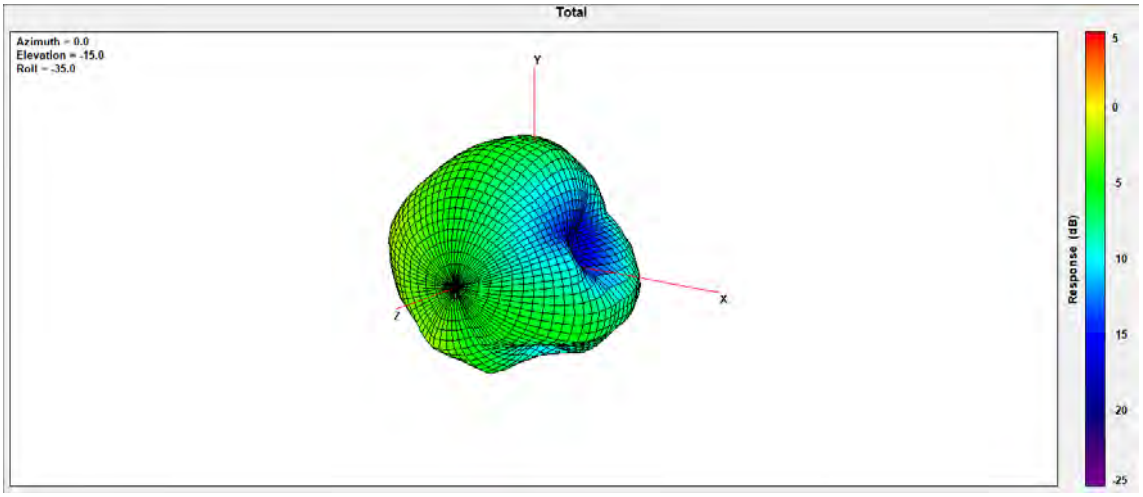
707.5MHz	H (Peak)	V (Peak)
	-0.07	-1.75

716MHz



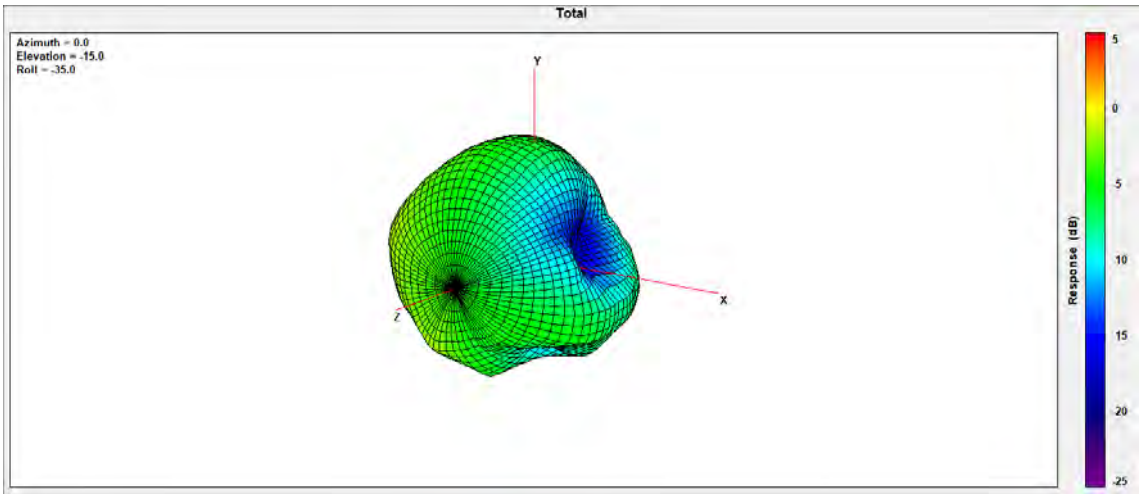
716MHz	H (Peak)	V (Peak)
	-0.36	-2.02

717MHz



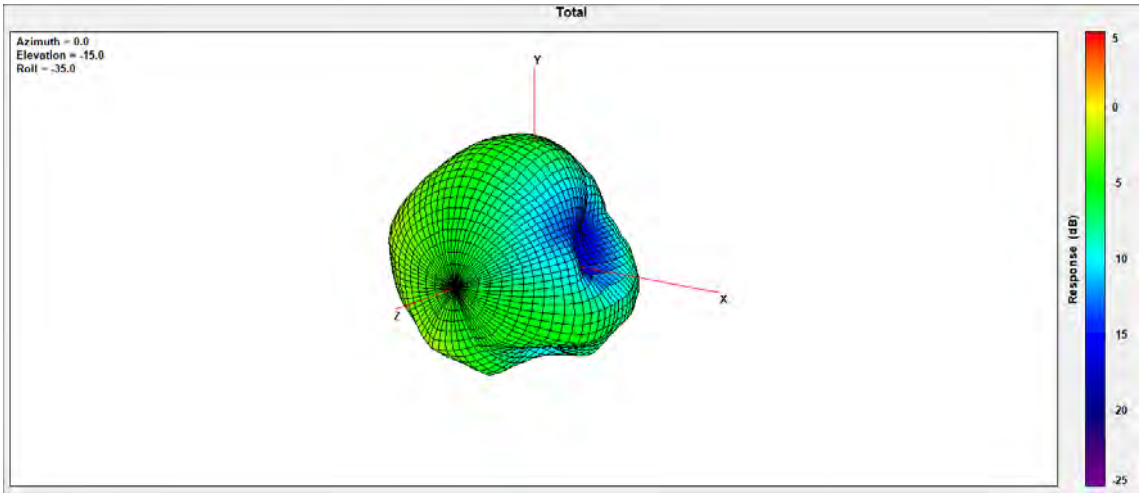
717MHz	H (Peak)	V (Peak)
	-0.37	-2.03

722.5MHz



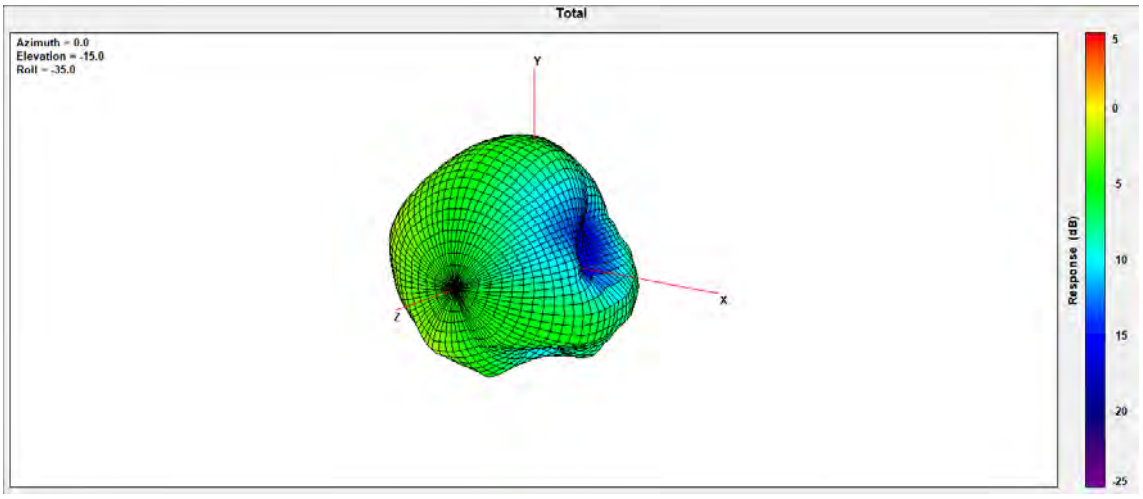
722.5MHz	H (Peak)	V (Peak)
	-0.54	-2.27

725.5MHz



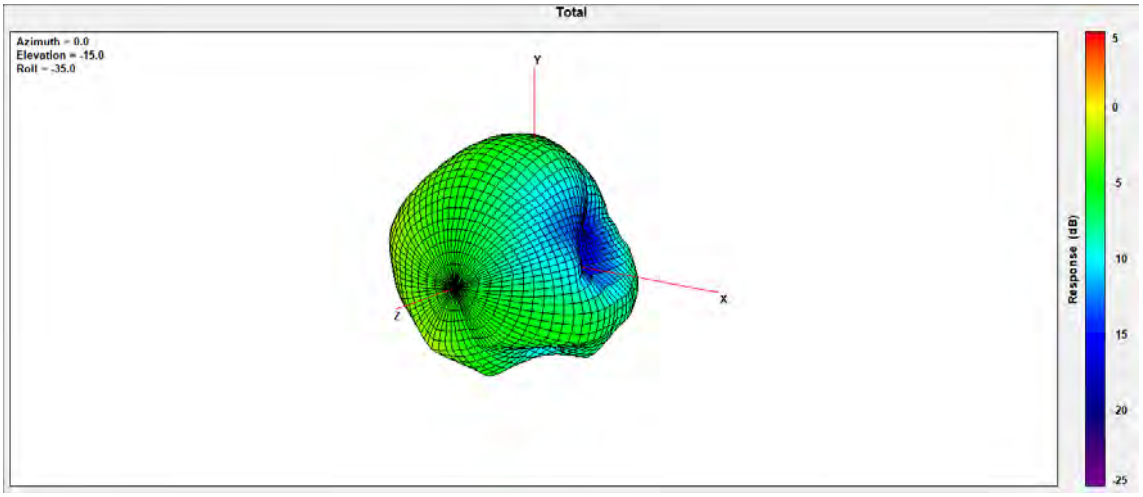
725.5MHz	H (Peak)	V (Peak)
	-0.72	-2.44

728MHz



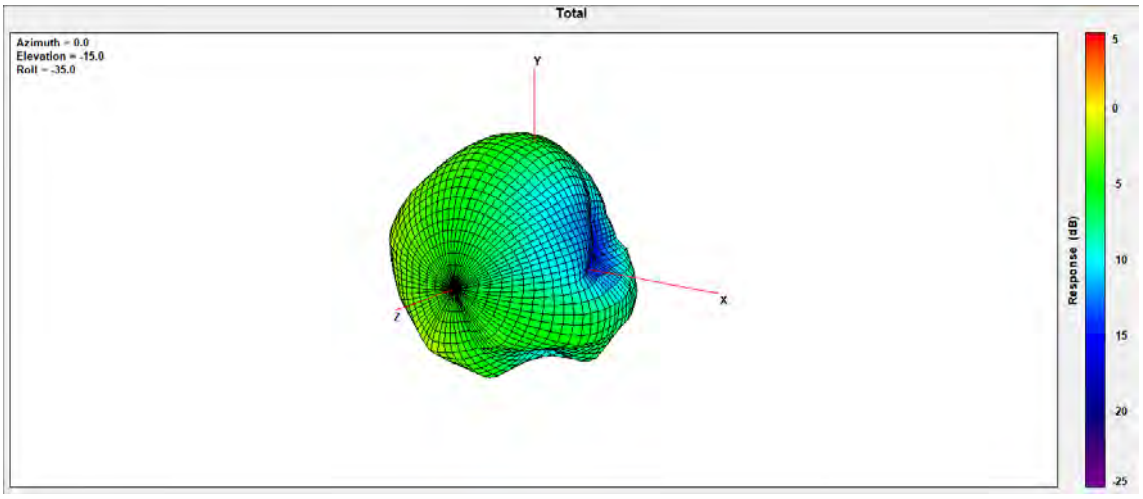
728MHz	H (Peak)	V (Peak)
	-0.96	-2.64

729MHz



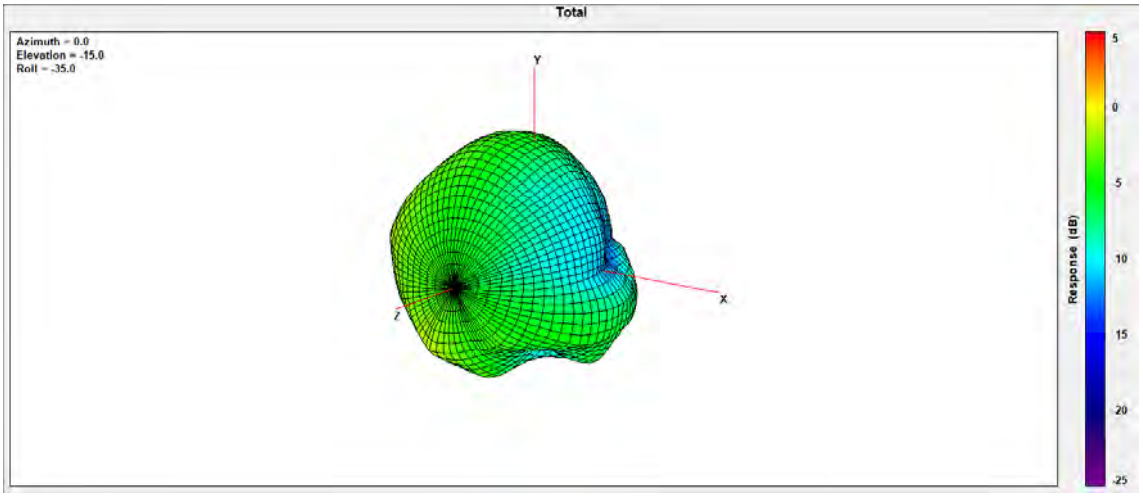
729MHz	H (Peak)	V (Peak)
	-1.04	-2.75

737.5MHz



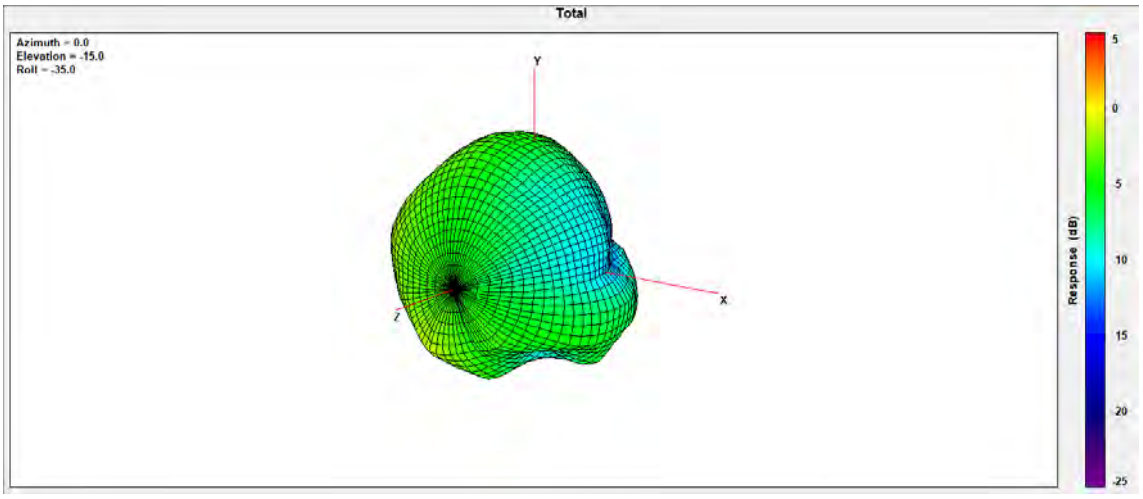
737.5MHz	H (Peak)	V (Peak)
	-1.65	-2.78

746MHz



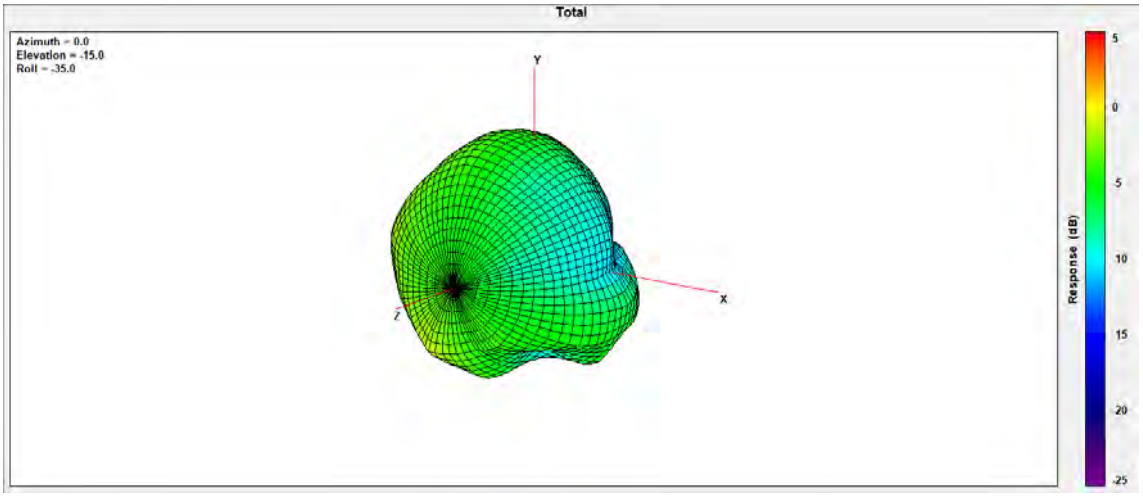
746MHz	H (Peak)	V (Peak)
	-1.91	-2.72

748MHz



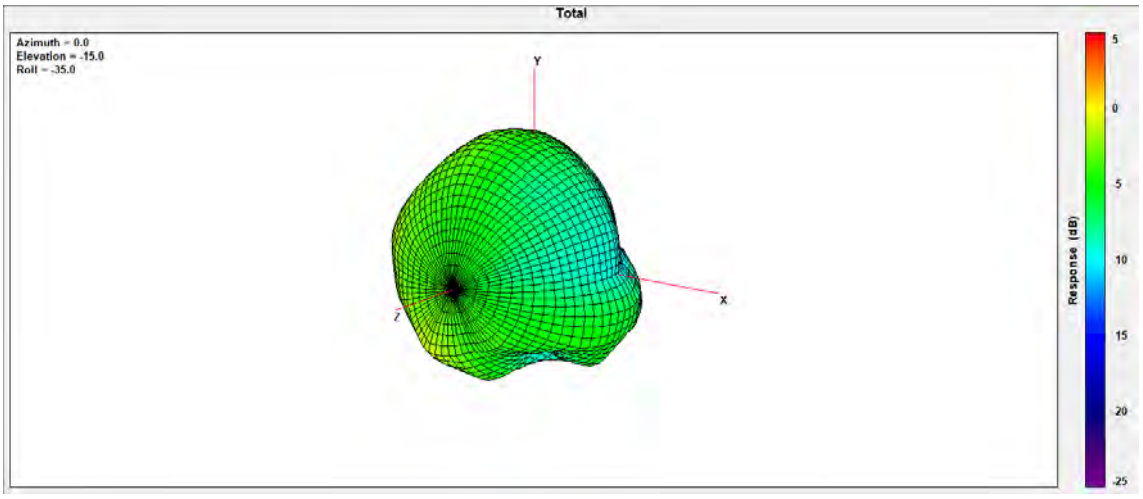
748MHz	H (Peak)	V (Peak)
	-1.89	-2.70

751MHz



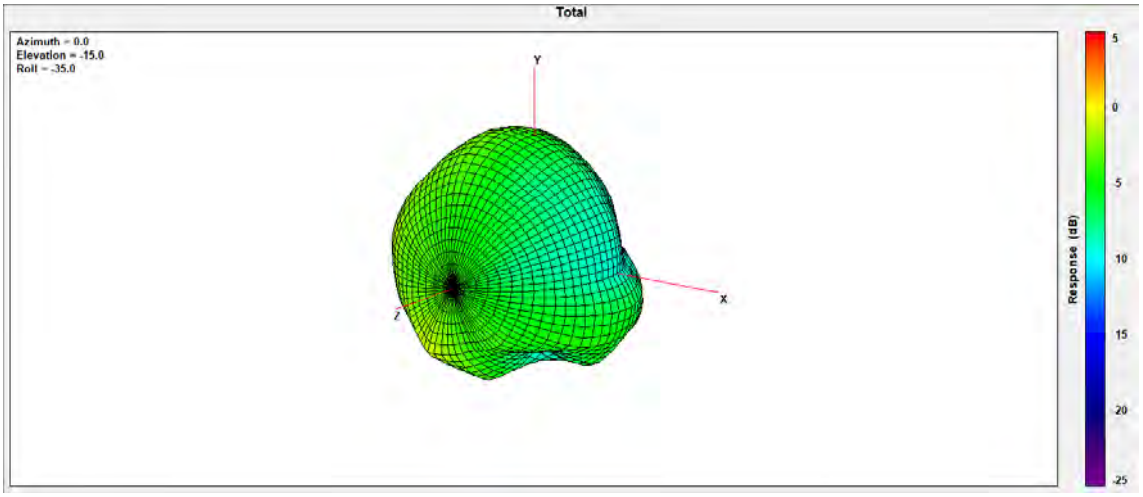
751MHz	H (Peak)	V (Peak)
	-1.90	-2.64

756MHz



756MHz	H (Peak)	V (Peak)
	-1.82	-2.57

758MHz



758MHz	H (Peak)	V (Peak)
	-1.82	-2.57