

Regulatory WWAN Antenna Information

(English Language Required for Intel Regulatory Review / Approval)

Platform	
Platform Owner	DELL
Brand Name	DELL
Model Name	P175G
ODM	COMPAL ELECTRONICS
Target Launch Date	
Antenna	
Manufacturer	Auden Techno Corp.
Part Number	■ Tx1/Rx1 Antenna WWAN Main: Antenna P/N: A22784-00 COMPAL P/N: DC33002RL1L
	■ Rx2 Antenna WWAN Aux: Antenna P/N: A22784-00 COMPAL P/N: DC33002RL1L
	■ Tx2/Rx3 Antenna WWAN Main : Antenna P/N: A23170-60 COMPAL P/N: DC33002WE0L
	■ Rx4 Antenna WWAN Aux: Antenna P/N: A23170-60 COMPAL P/N: DC33002WE0L
Manufacturer address	
Module	
With WWAN Module	SDX62, SDX12
(Check Box)	

Antenna Sample / Antenna Data

Requirements for worldwide regulatory approval

Section	Description of Required OEM / ODM Antenna Information	US / IC	EU	Japan	Taiwan	S.Korea
1A	Part Number for Antenna only	Required	Required	Required	Required	Required
1B	Antenna Manufacturer Name	Required	Required	Required	Required	Required
1C	Description of Antenna Type	Required	N/A	N/A	N/A	N/A
1D	Part number of Antenna Assembly / cable impedance, length & diameter.	Required	Desired	Desired	Desired	Desired
1E	Tx1, Tx2 & Tx3 antenna (Peak Gain W/ cable loss) *	Required	Required	Required	Required	Required
	1E OR 1F, 1G, 1H					
1F	Tx1, Tx2 & Tx3 antenna (Peak Gain only) *	Required	Required	Required	Required	Required
1G	VSWR of cable including connector	Required	Required	Required	Required	Required
1H	Tx1, Tx2 & Tx3 antenna (Cable loss W/ connector) *	Required	Required	Required	Required	Required
2	Dimensioned Photographs and Drawings of Tx1, Tx2, and Tx3 (or Rx3) antennas	Required	Required	Required	Required	Required
3	Radiation patterns of antennas loaded in the host platform.	Required	Desired	Required	N/A	Required
4	Platform model name / number - correlated to antenna manufacturer and antenna part number	Required	Required	Desired	Required	Desired
5	Photograph(s) or Drawings showing location of antennas in platform. (S. Korea requires photographs of antennas for approval submission). Taiwan requires pictures of each antenna type shown in the system.	Required	Required	Desired	<u>Required (Photos)</u>	<u>Required (Photos)</u>
6	Mech. drawings / photos with dimensions of antenna locations and distance from end-user (For evaluation of SAR testing requirement).	Required	N/A	N/A	N/A	N/A
7	Photograph(s) or Drawings showing the location of all antennas (WLAN, other) and distance between those transmitting antennas. Information will be used to evaluate whether co-location testing is required.	Required	N/A	N/A	N/A	N/A
8	Local representative contact information for LMA/ PARS process.	Required	N/A	N/A	N/A	N/A

Antenna Information

Section 1. Antenna Assembly Specifications

Communication System	Band	Frequency(MHz) from low to high spectrum		1A Part Number for Antenna Assembly	1B Antenna Manufacturer Name	1C Description of Antenna Type	1D *Peak Gain W/ Cable loss (dBi)
WCDMA/ LTE/5G NR FR1	1	1920	1980	Ant0 : A22784-00 (DC33002RL1L)	Auden Techno Corp.	PIFA	0.96
WCDMA/ LTE/5G NR FR1	2	1850	1910				-0.21
LTE/5G NR FR1	3	1710	1785				-2.59
WCDMA/ LTE	4	1710	1755				-2.96
WCDMA/ LTE/5G NR FR1	5	824	849				-2.08
LTE/5G NR FR1	7	2500	2570				0.04
WCDMA/ LTE/5G NR FR1	8	880	915				-2.37
LTE/5G NR FR1	12	699	716				-3.45
LTE/5G NR FR1	13	777	787				-0.87
LTE/5G NR FR1	14	788	798				-1.39
LTE	17	704	716				-5.53
LTE/5G NR FR1	18	815	830				-2.25
LTE	19	830	845				-2.11
LTE/5G NR FR1	20	832	862				-2.08
LTE/5G NR FR1	25	1850	1915				-0.21
LTE/5G NR FR1	26	814	849				-2.08
LTE/5G NR FR1	28	703	748				-2.59
LTE/5G NR FR1	30	2305	2315				0.54
LTE	34	2010	2025				0.71
LTE/5G NR FR1	38	2570	2620				-0.93
LTE	39	1880	1920				-0.06
LTE/5G NR FR1	40	2300	2400				1.04
LTE/5G NR FR1	41	2496	2690				0.10
LTE	42	3400	3600				-4.34
LTE	43	3600	3800				-3.44
LTE/5G NR FR1	48	3550	3700				-4.34
LTE/5G NR FR1	66	1710	1780				-2.61
LTE/5G NR FR1	71	663	698				-3.45
5G NR FR1	77	3300	4200				-3.44
5G NR FR1	78	3300	3800				-3.44
5G NR FR1	79	4400	5000				-3.28
5G NR FR1	53	2483.5	2495				0.10
5G NR FR1	70	1695	1710				-3.86

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

Communication System	Band	Frequency(MHz) from low to high spectrum		1A Part Number for Antenna Assembly	1B Antenna Manufacturer Name	1C Description of Antenna Type	Tx2 *Peak Gain W/ Cable loss (dBi)
WCDMA/ LTE FDD	1	1920	1980	Antenna P/N: A23170-60 COMPAL P/N: DC33002WE0L	Auden	MIMO	0.79
WCDMA/ LTE FDD	2	1850	1910				0
LTE FDD	3	1710	1785				-1.22
WCDMA/ LTE FDD	4	1710	1755				-1.22
LTE FDD	7	2500	2570				-0.39
LTE FDD	25	1850	1915				0.33
LTE FDD	30	2305	2315				0.59
LTE FDD	66	1710	1780				-1.22
LTE TDD	38	2570	2620				-0.13
LTE TDD	39	1880	1920				0.41
LTE TDD	40	2300	2400				0.59
LTE TDD	41	2496	2690				-0.07
LTE TDD	42	3400	3600				-0.72
LTE TDD	43	3600	3800				-1.05
LTE TDD	48	3550	3700				-1.05

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

Antenna Peak Gain Table:
Low and middle band

	Tx1 antenna
Frequency (MHz)	Peak Gain W/ Cable loss (dBi)
663	-5.25
680.5	-6.14
698	-3.45
699	-3.45
703	-5.74
704	-5.74
707.5	-5.96
710	-5.72
716	-5.53
725.5	-5.21
748	-2.59
777	-0.96
782	-0.87
787	-1.39
788	-1.39
793	-1.78
798	-2.03
814	-2.45
815	-2.46
822.5	-2.28
824	-2.25
830	-2.26
831.5	-2.26
832	-2.26
836.5	-2.13
837.5	-2.14
845	-2.11
847	-2.10
849	-2.08
862	-2.83
880	-2.94
897.5	-2.74
915	-2.37

High band

	Tx1 antenna	Tx2 antenna (Mimo2)
Frequency (MHz)	Peak Gain W/ Cable loss (dBi)	Peak Gain W/ Cable loss (dBi)
1695	-3.92	-0.89
1702.5	-3.90	-1.03
1710	-3.86	-1.22
1732.5	-2.99	-1.23
1745	-3.05	-1.33
1747.5	-3.06	-1.36
1755	-2.96	-1.62
1780	-2.61	-2.95
1785	-2.59	-3.09
1850	-1.74	-1.55
1880	-1.27	-0.96
1882.5	-1.28	-0.88
1900	-0.25	-0.27
1910	-0.21	0.00
1915	-0.13	0.33
1920	-0.06	0.41
1950	0.26	0.79
1980	0.96	0.57
2010	0.60	0.35
2017.5	0.65	0.38
2025	0.71	0.26
2300	0.20	0.34
2305	0.15	0.46
2310	0.33	0.51
2315	0.54	0.59
2350	0.37	0.41
2400	1.04	0.14
2483.5	0.10	-0.34
2489.25	0.04	-0.35
2495	0.09	-0.56
2496	0.10	-0.58
2500	0.04	-0.73
2535	-0.45	-0.55
2570	-0.93	-0.39
2593	-1.36	-0.13
2595	-1.40	-0.15
2620	-1.63	-0.14
2690	-0.45	-0.07

3300	-4.55	-0.38
3400	-4.81	-0.99
3500	-6.10	-0.72
3550	-5.39	-1.59
3600	-4.34	-2.17
3625	-4.47	-1.47
3700	-6.43	-1.05
3750	-4.96	-1.18
3800	-3.44	-1.30
4200	-5.64	-0.53
4400	-5.04	1.22
4700	-3.70	-1.44
5000	-3.28	0.78

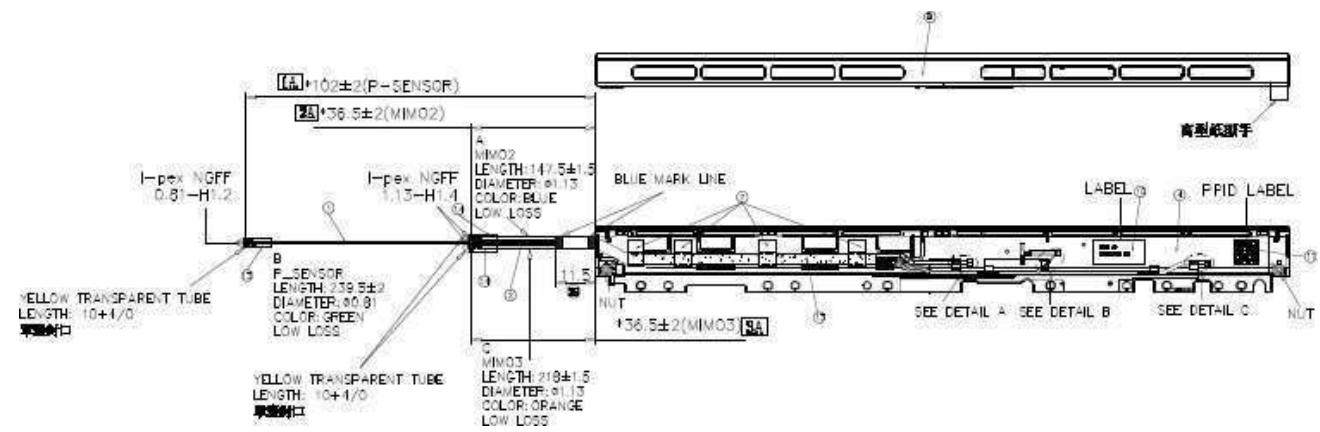
TPx Antenna Dimensioned Drawing:



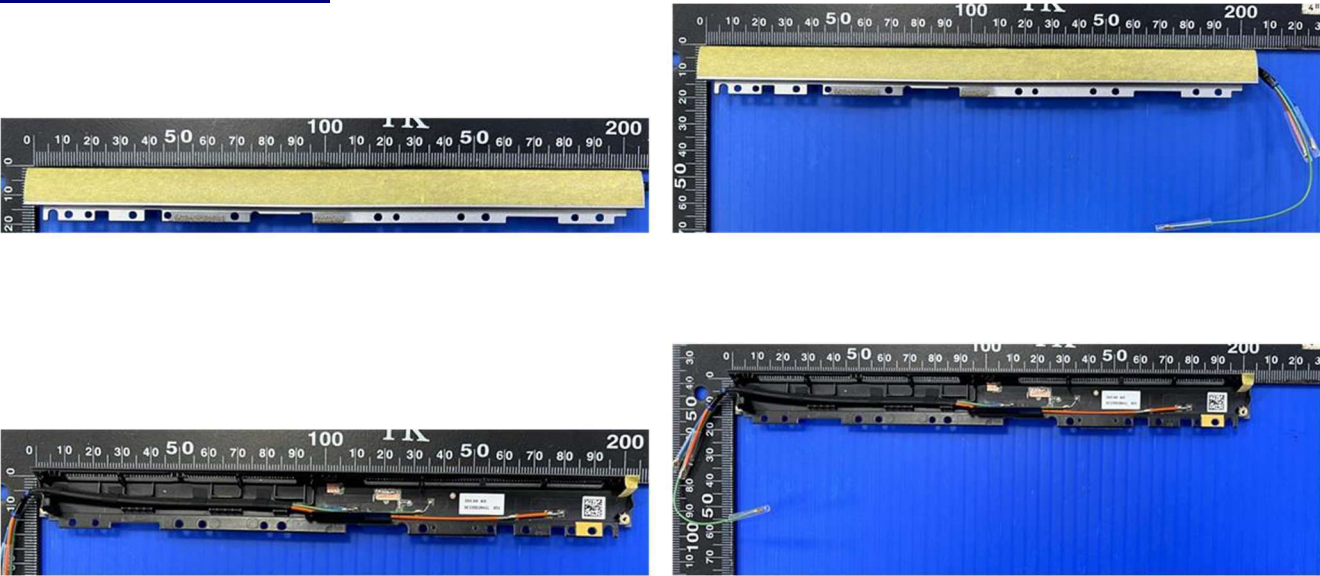
[illegible]

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

DRx2 Antenna Dimensioned Drawing:



DRx2 Antenna Photo:



Top View Dimensions:

- [1A] $\pm 102 \pm 2$ (P-SENSOR)
- [2A] $\pm 36.5 \pm 2$ (MIMO2)
- I-pev NGFF 0.81-H1.2
- I-pev NGFF 1.13-H1.4
- MIMO2 LENGTH: 147.5 ± 1.5 , DIAMETER: $\phi 1.13$, COLOR: BLUE, LOW LOSS
- P-SENSOR LENGTH: 239.5 ± 1.5 , DIAMETER: $\phi 0.81$, COLOR: GREEN, LOW LOSS
- MIMO3 LENGTH: 219 ± 1.5 , DIAMETER: $\phi 1.13$, COLOR: ORANGE, LOW LOSS
- NUT $\pm 36.5 \pm 2$ (MIMO3) [3A]

Side View Labels:

- 高型取手 (High Type Handle)
- BLUE MARK LINE.
- LABEL [3]
- FRID LABEL [4]
- SEE DETAIL A
- SEE DETAIL B
- SEE DETAIL C
- NUT

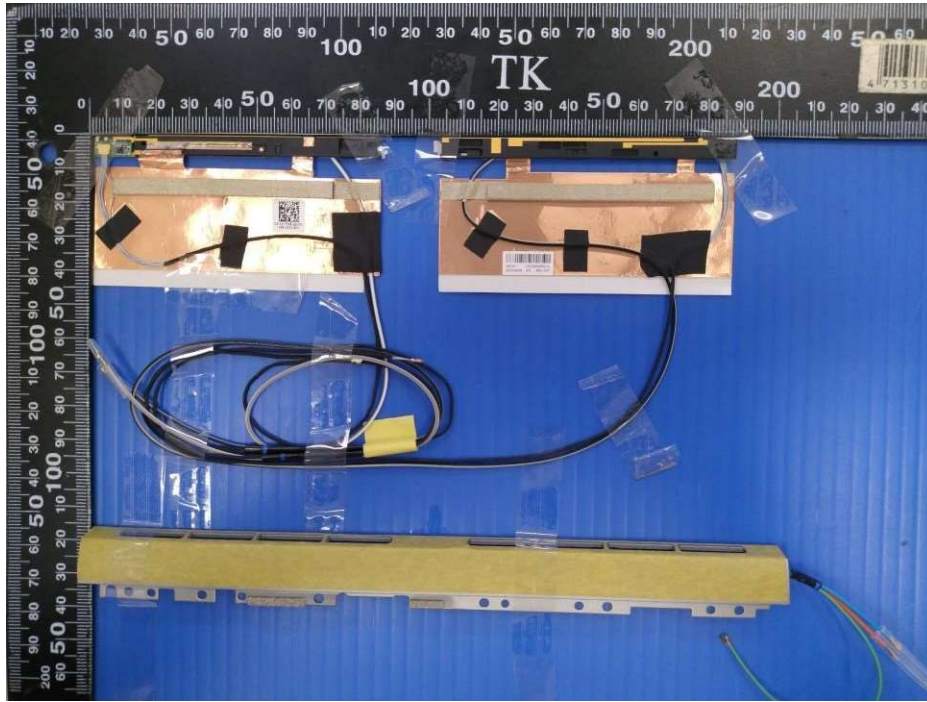
Other Labels:

- YELLOW TRANSPARENT TUBE LENGTH: $10 \pm 1/0$, 取付開口 (Mounting Opening)

Include front view photo of all 2 antennas here.

Antenna Manufacturer: Auden Techno Corp

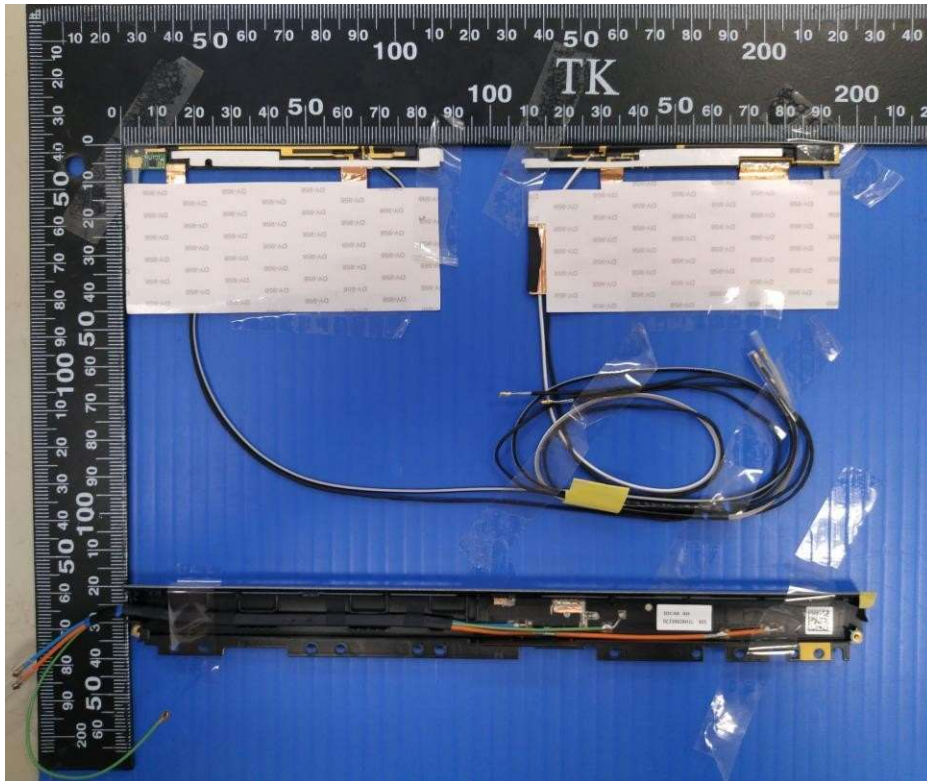
Antenna Part Number: DC33002RL1L (A22784-00), DC33002WE0L (A23170-60)



Include back view photo of all 2 antennas here.

Antenna Manufacturer: Auden Techno Corp

Antenna Part Number: DC33002RL1L (A22784-00), DC33002WE0L (A23170-60)

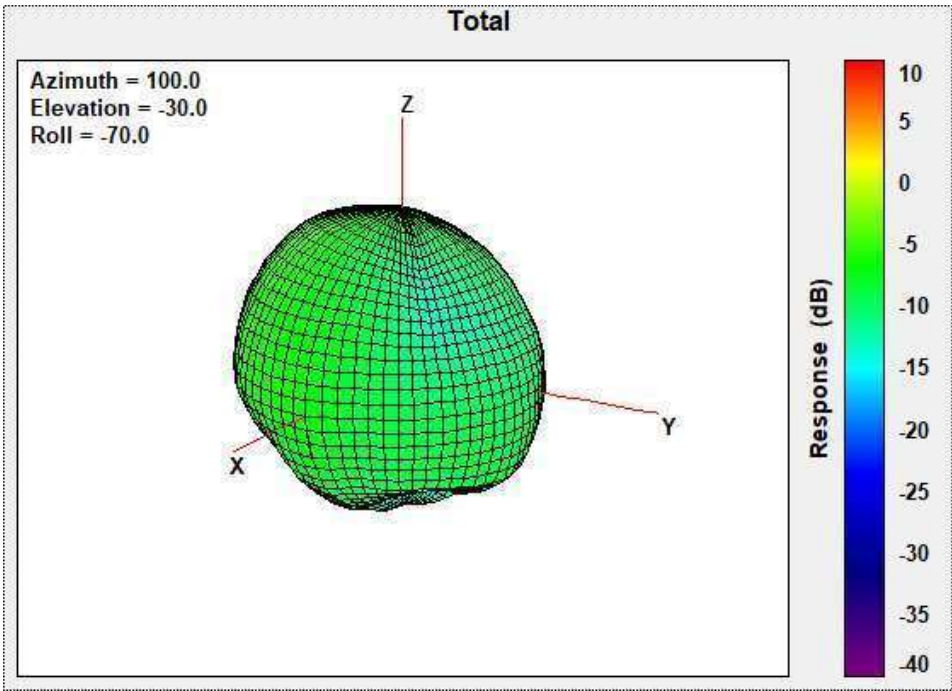


Note: antenna photo should include L type ruler

Section 3. Radiation characteristics of antennae Loaded in Host Platform

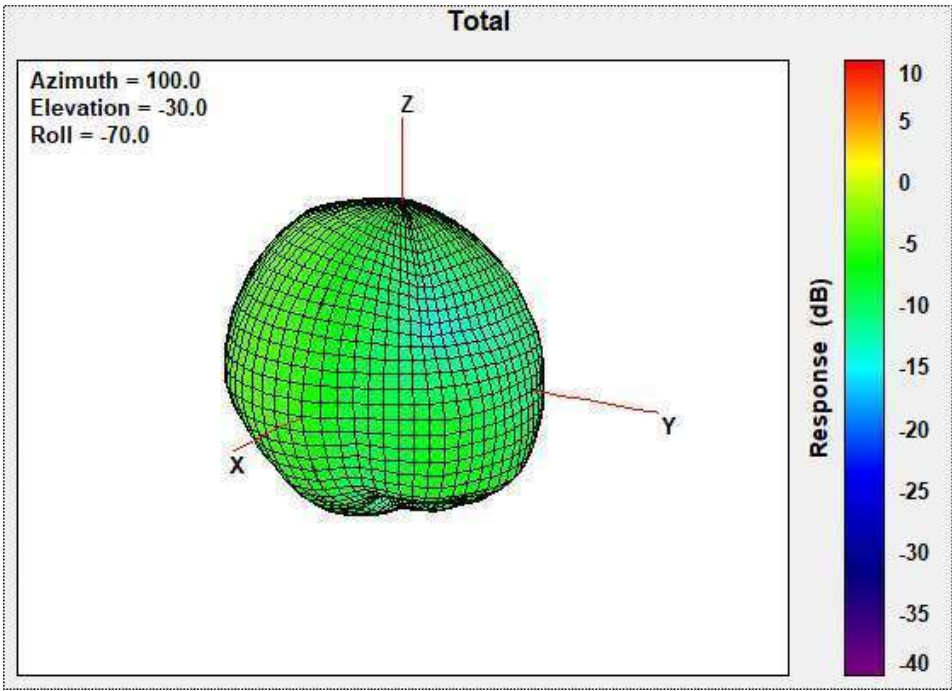
WWAN Main Antenna (Tx1)

663MHz



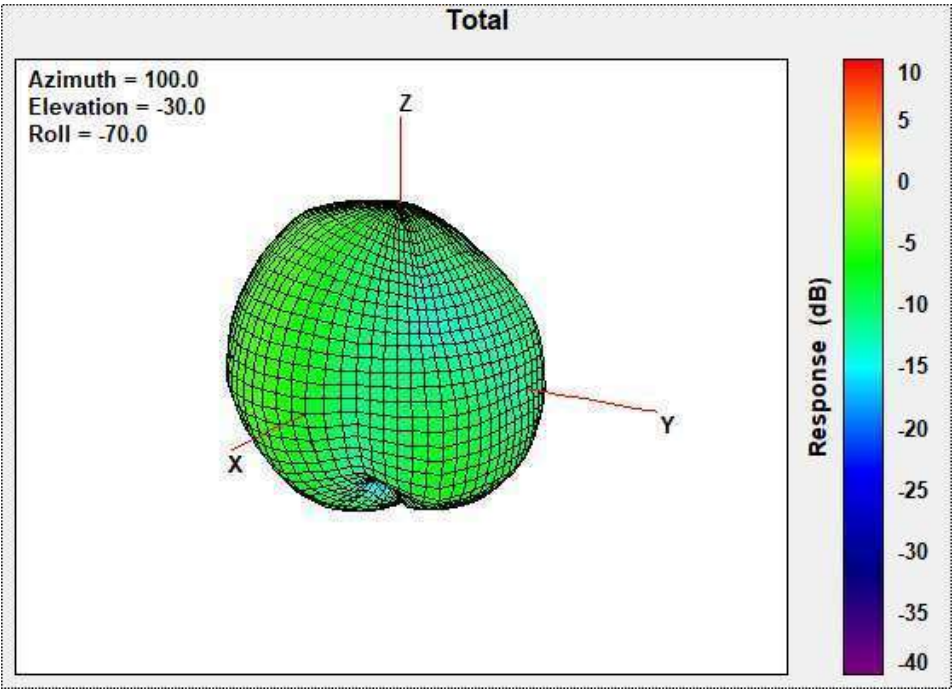
Center Frequency	663MHz
Peak Gain W/ Cable loss (dBi)	-5.25

680.5MHz



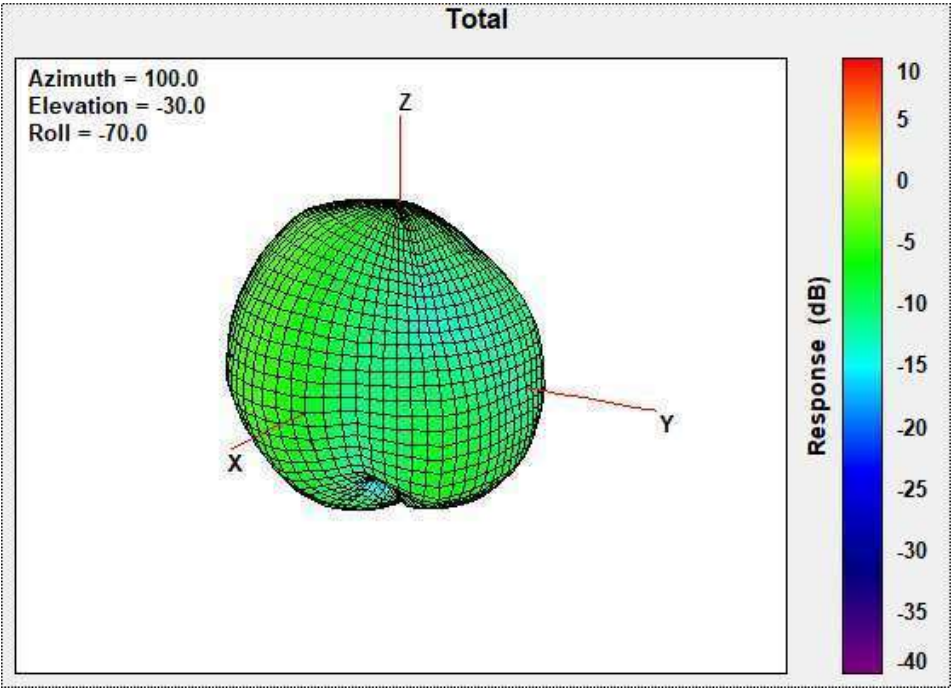
Center Frequency	680.5MHz
Peak Gain W/ Cable loss (dBi)	-6.14

698MHz



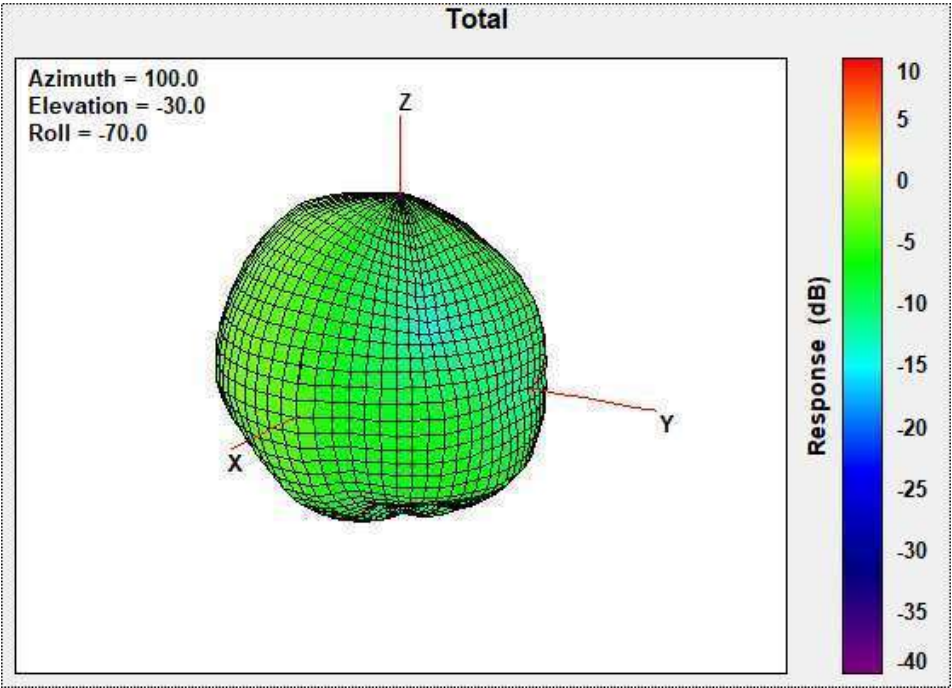
Center Frequency	698MHz
Peak Gain W/ Cable loss (dBi)	-3.45

699MHz



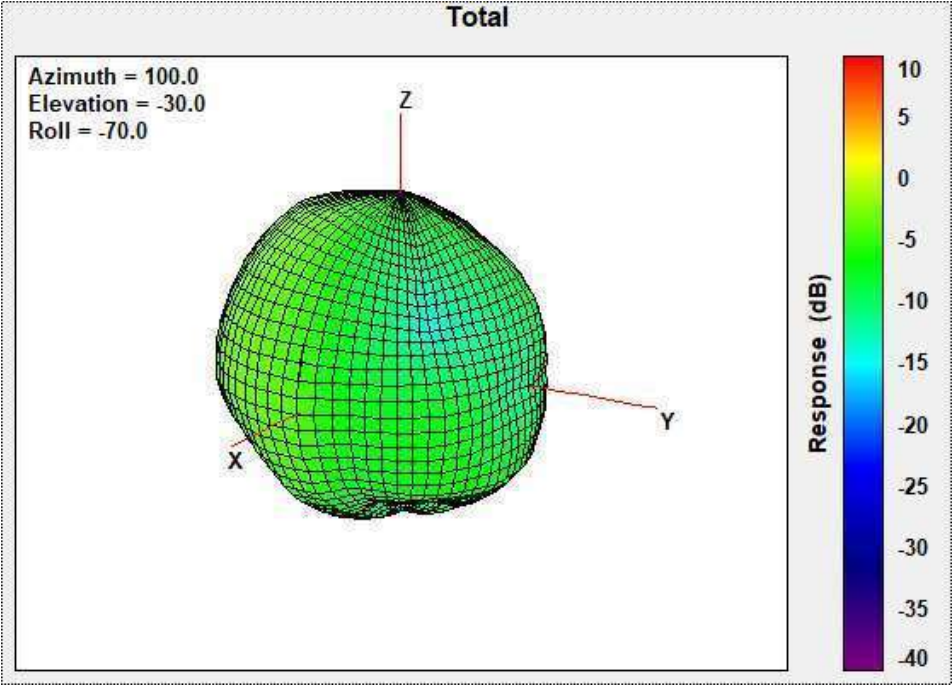
Center Frequency	699MHz
Peak Gain W/ Cable loss (dBi)	-3.45

703MHz



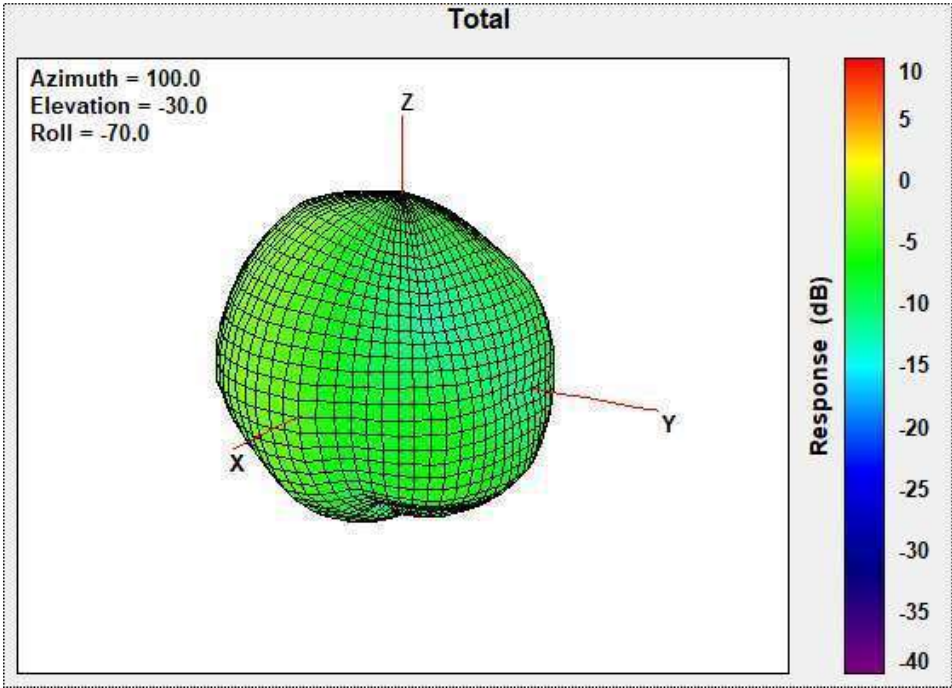
Center Frequency	703MHz
Peak Gain W/ Cable loss (dBi)	-5.74

704MHz



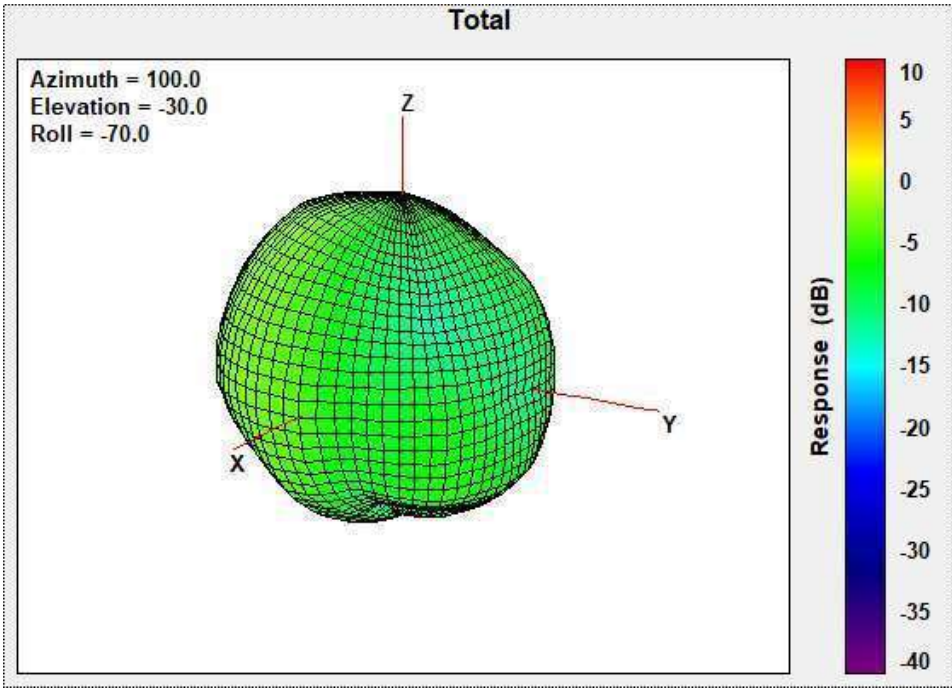
Center Frequency	704MHz
Peak Gain W/ Cable loss (dBi)	-5.74

707.5MHz



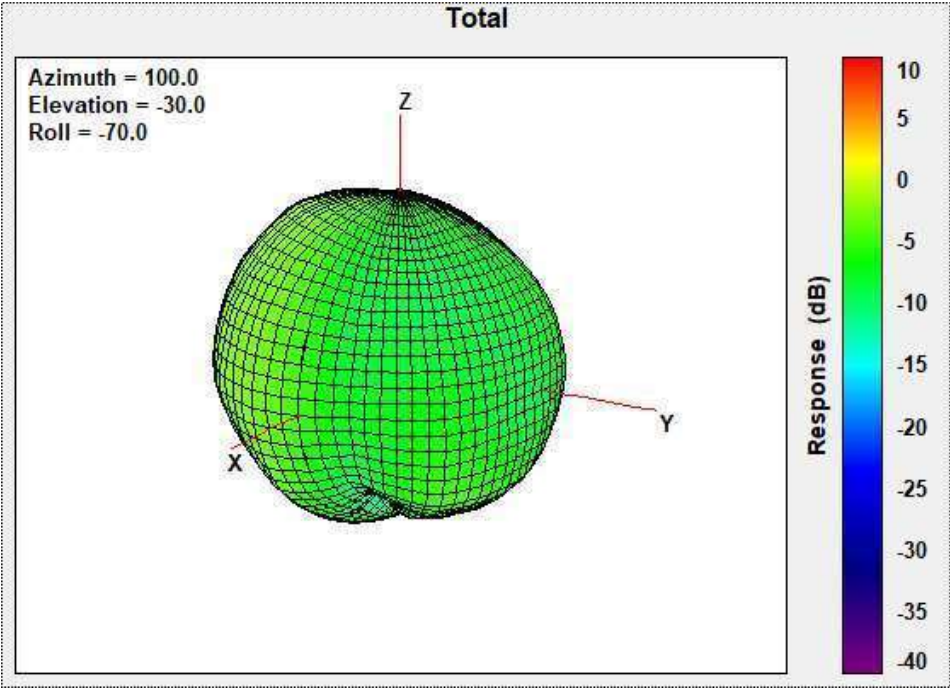
Center Frequency	707.5MHz
Peak Gain W/ Cable loss (dBi)	-5.96

710MHz



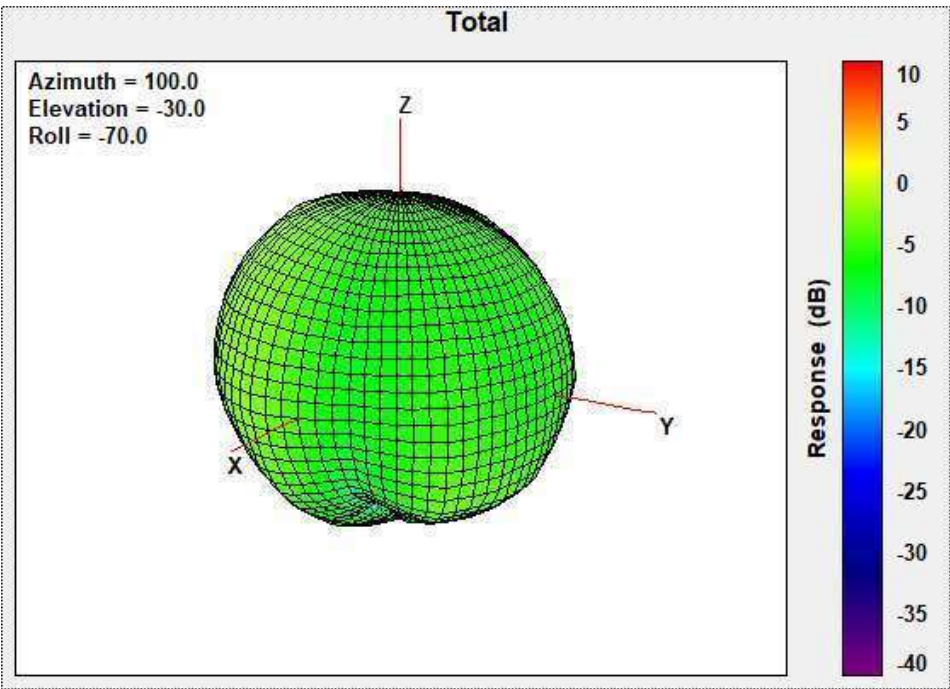
Center Frequency	710MHz
Peak Gain W/ Cable loss (dBi)	-5.72

716MHz



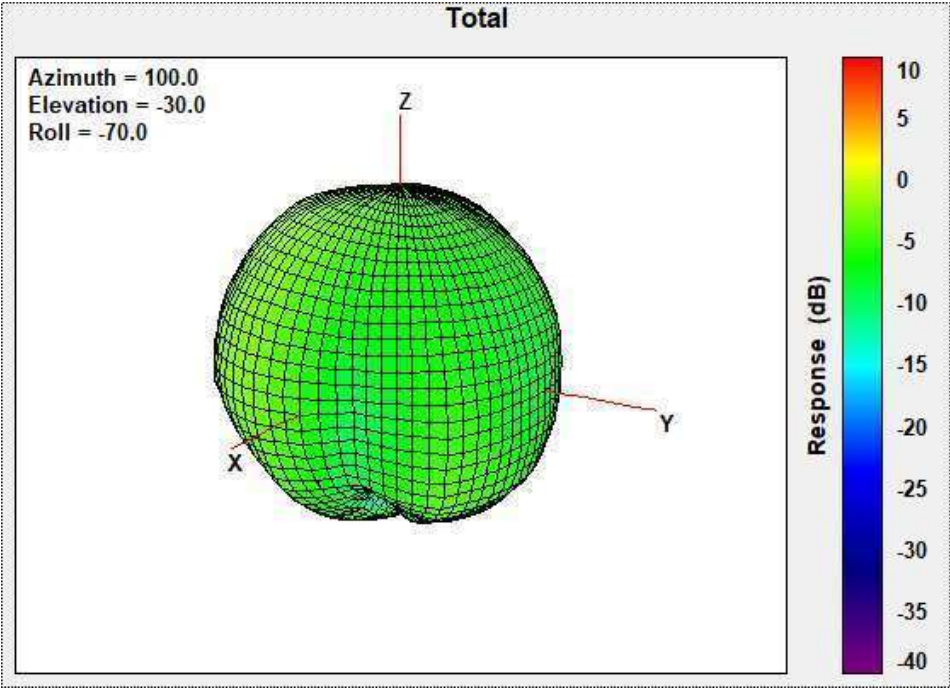
Center Frequency	716MHz
Peak Gain W/ Cable loss (dBi)	-5.53

725.5MHz



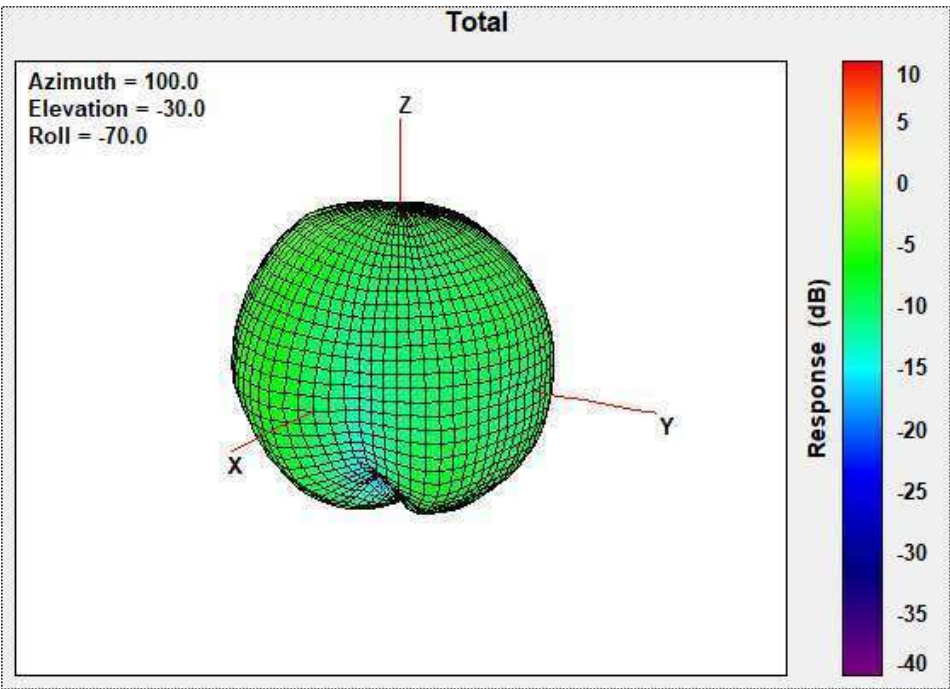
Center Frequency	725.5MHz
Peak Gain W/ Cable loss (dBi)	-5.21

748MHz



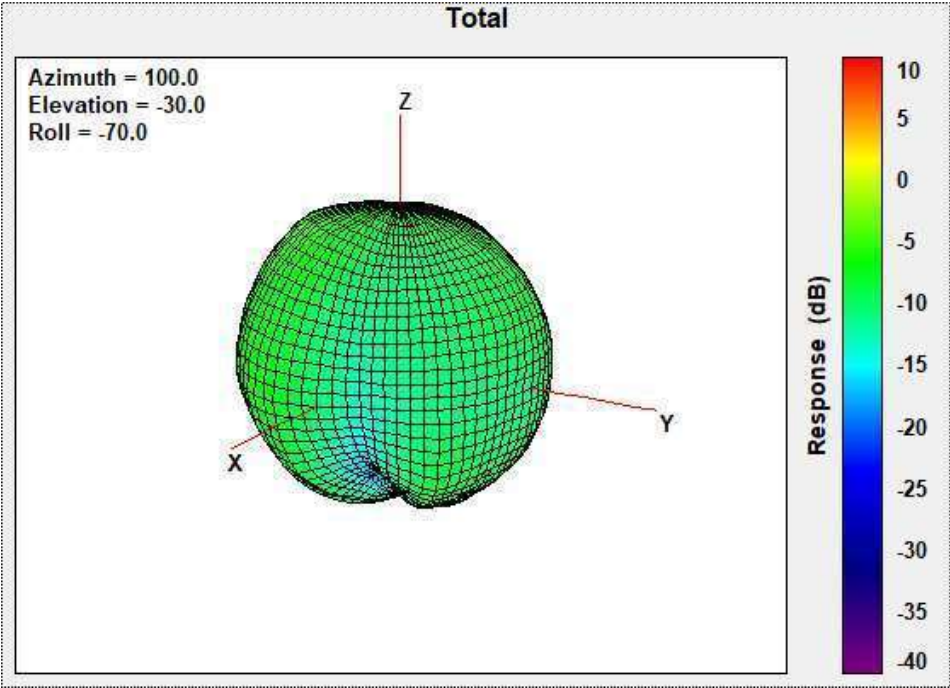
Center Frequency	748MHz
Peak Gain W/ Cable loss (dBi)	-2.59

777MHz



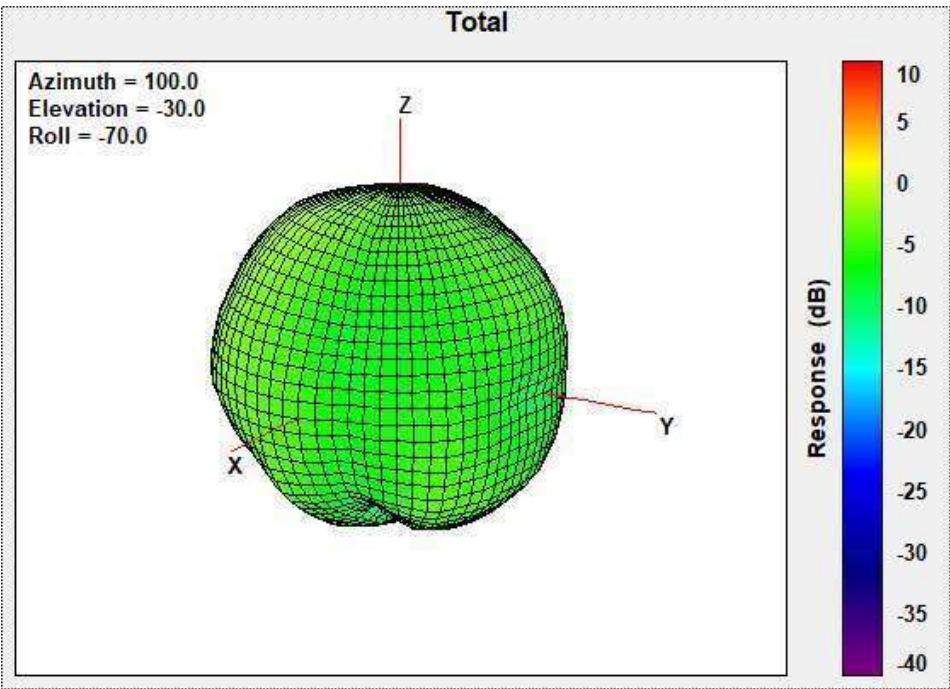
Center Frequency	777MHz
Peak Gain W/ Cable loss (dBi)	-0.96

782MHz



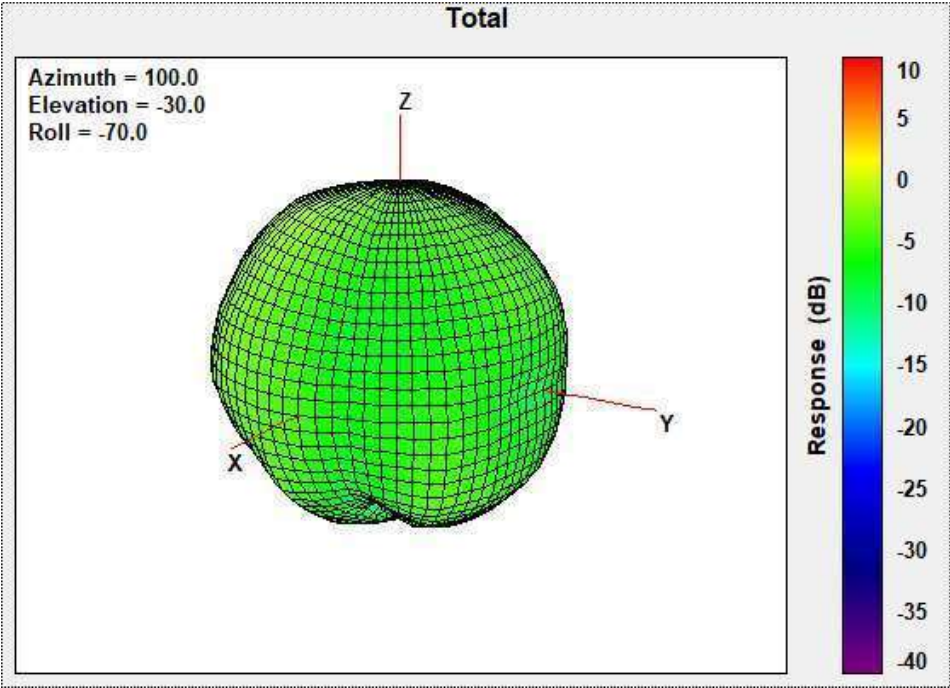
Center Frequency	782MHz
Peak Gain W/ Cable loss (dBi)	-0.87

787MHz



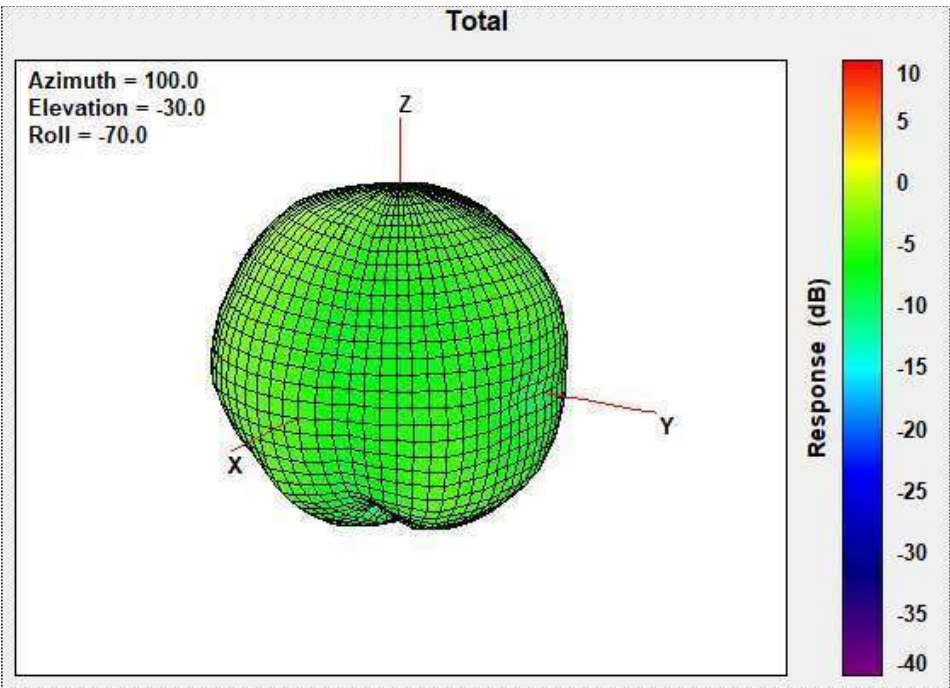
Center Frequency	787MHz
Peak Gain W/ Cable loss (dBi)	-1.39

788MHz



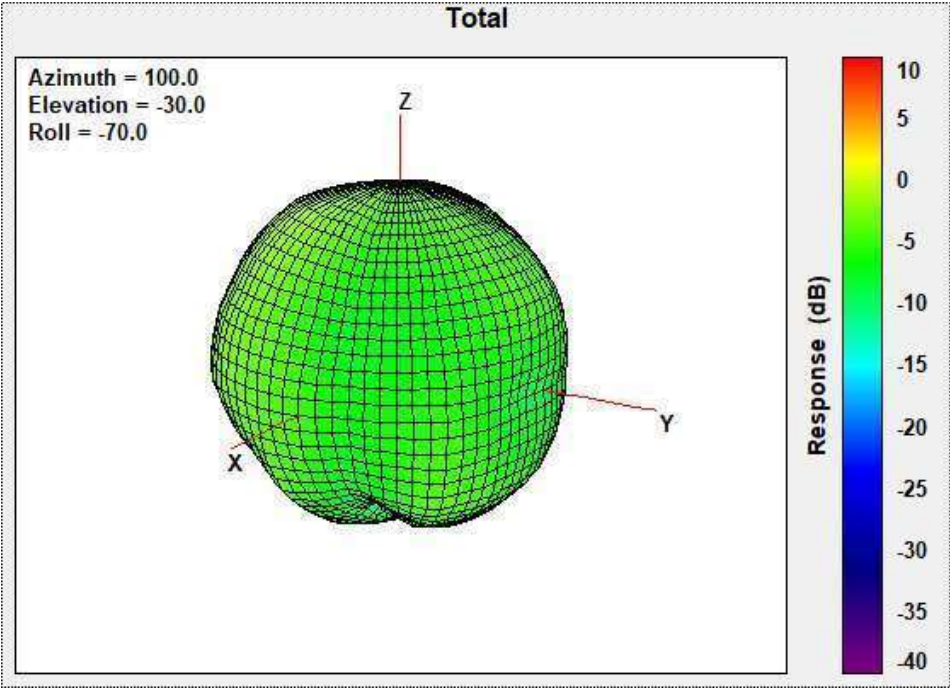
Center Frequency	788MHz
Peak Gain W/ Cable loss (dBi)	-1.39

793MHz



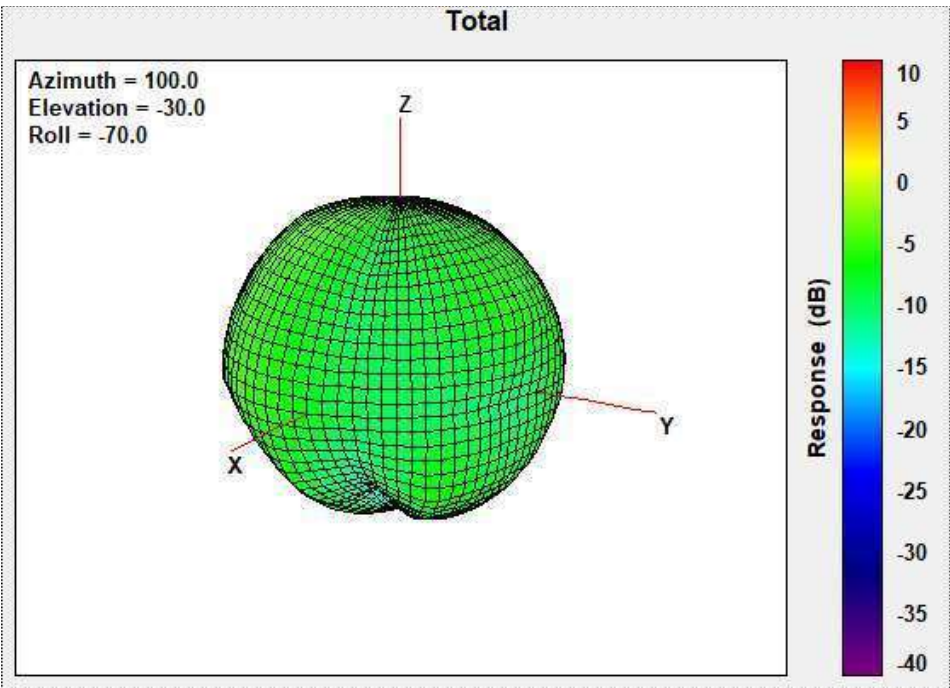
Center Frequency	793MHz
Peak Gain W/ Cable loss (dBi)	-1.78

798MHz



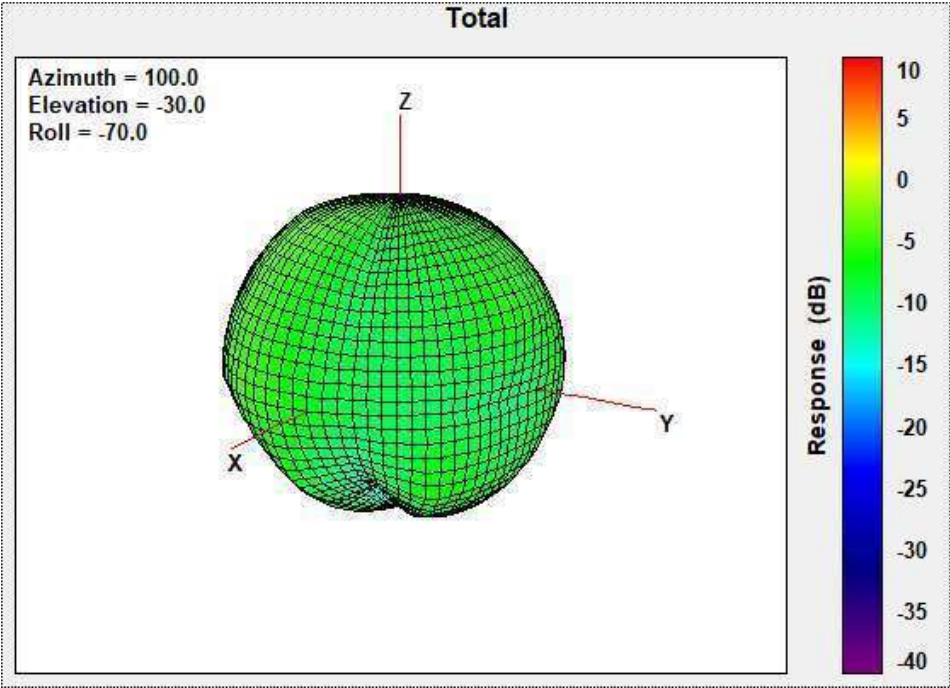
Center Frequency	798MHz
Peak Gain W/ Cable loss (dBi)	-2.03

814MHz



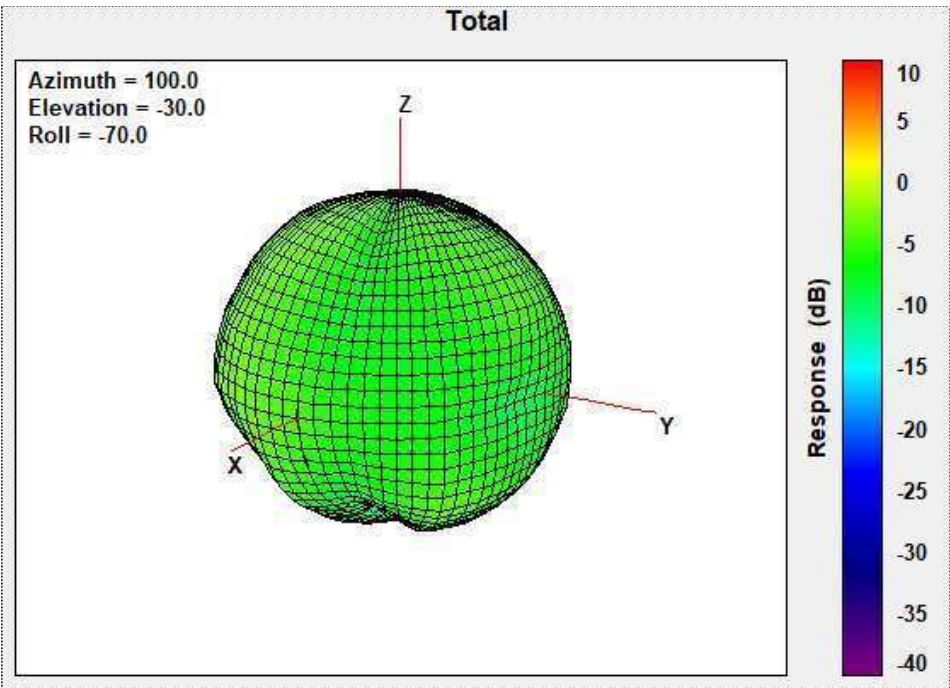
Center Frequency	814MHz
Peak Gain W/ Cable loss (dBi)	-2.45

815MHz



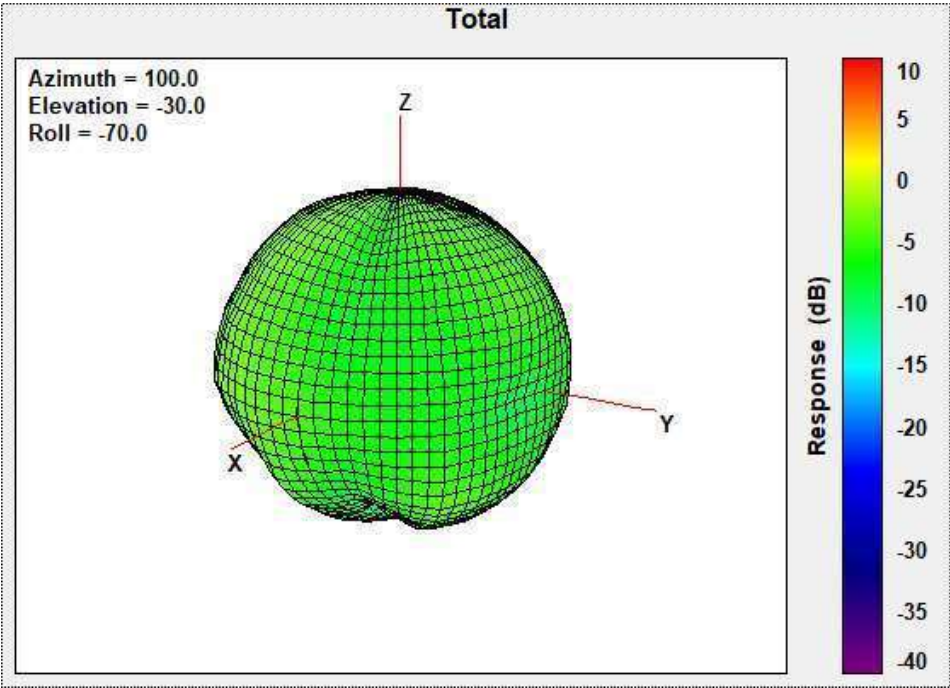
Center Frequency	815MHz
Peak Gain W/ Cable loss (dBi)	-2.46

822.5MHz



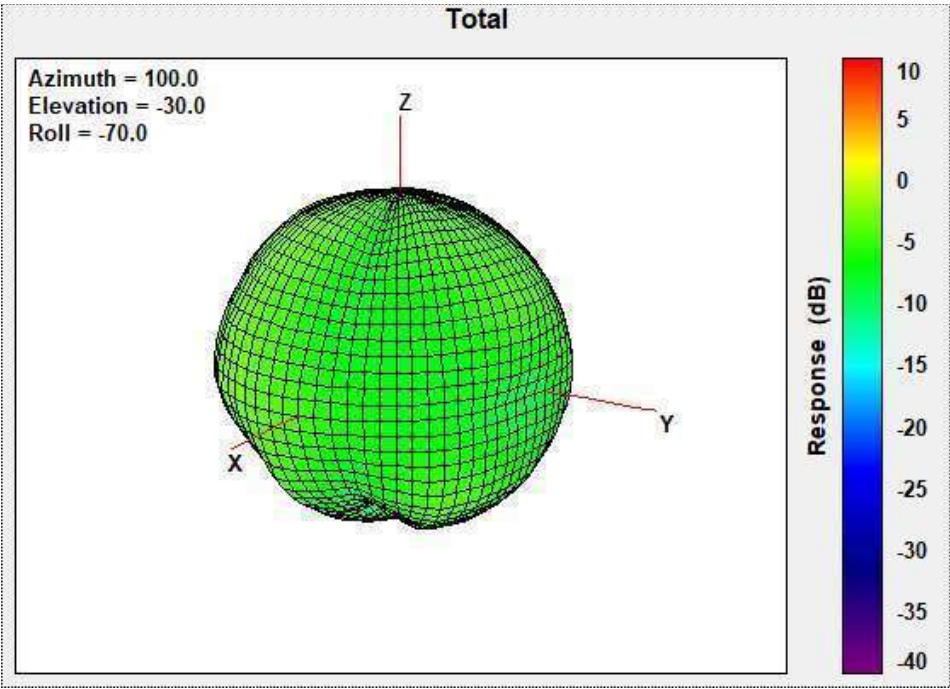
Center Frequency	822.5MHz
Peak Gain W/ Cable loss (dBi)	-2.28

824MHz



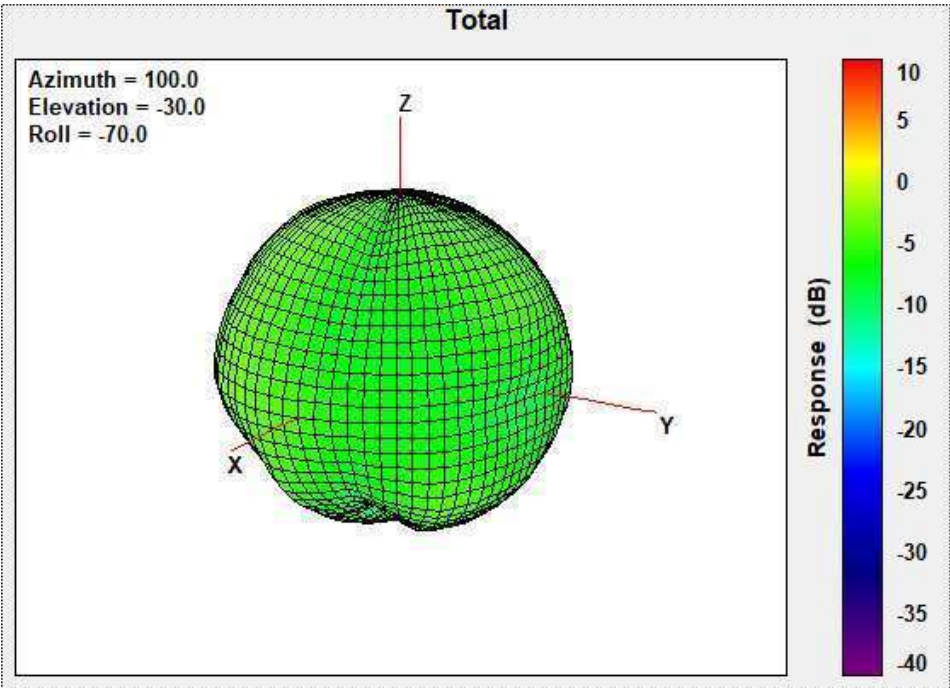
Center Frequency	824MHz
Peak Gain W/ Cable loss (dBi)	-2.25

830MHz



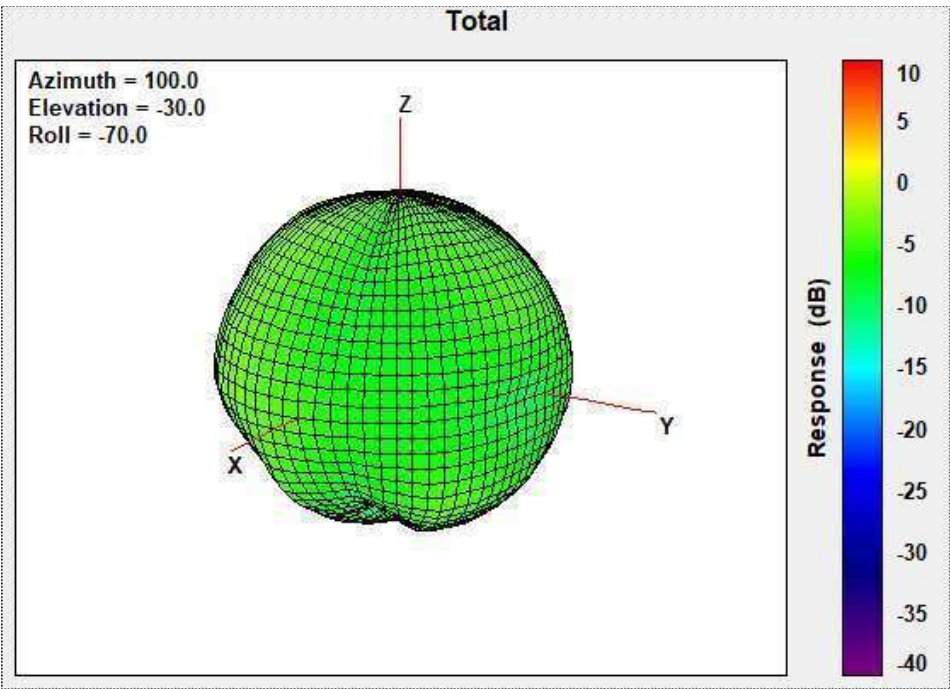
Center Frequency	830MHz
Peak Gain W/ Cable loss (dBi)	-2.26

831.5MHz



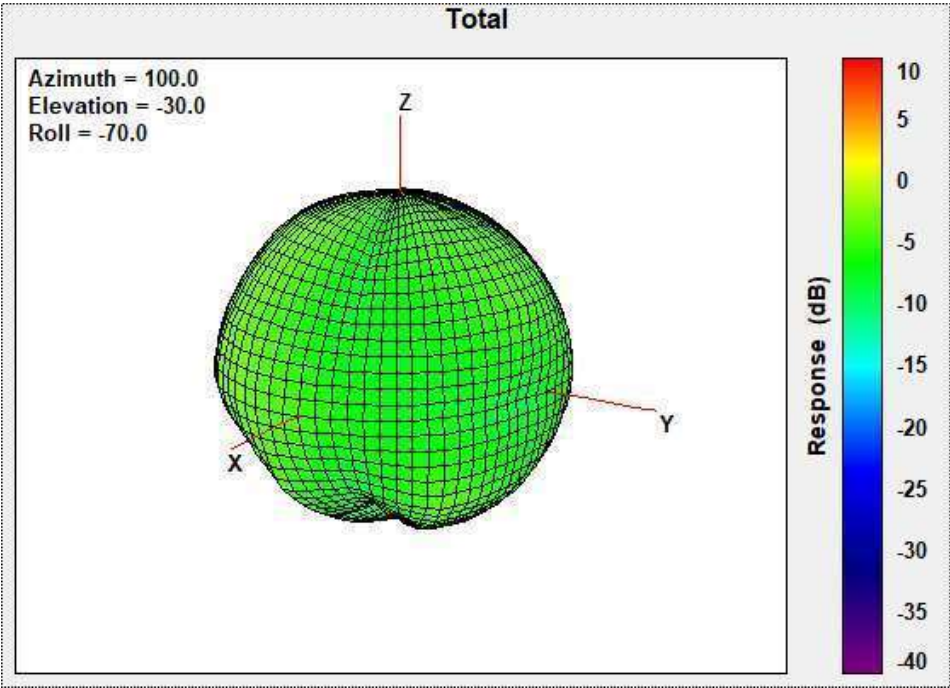
Center Frequency	831.5MHz
Peak Gain W/ Cable loss (dBi)	-2.26

832MHz



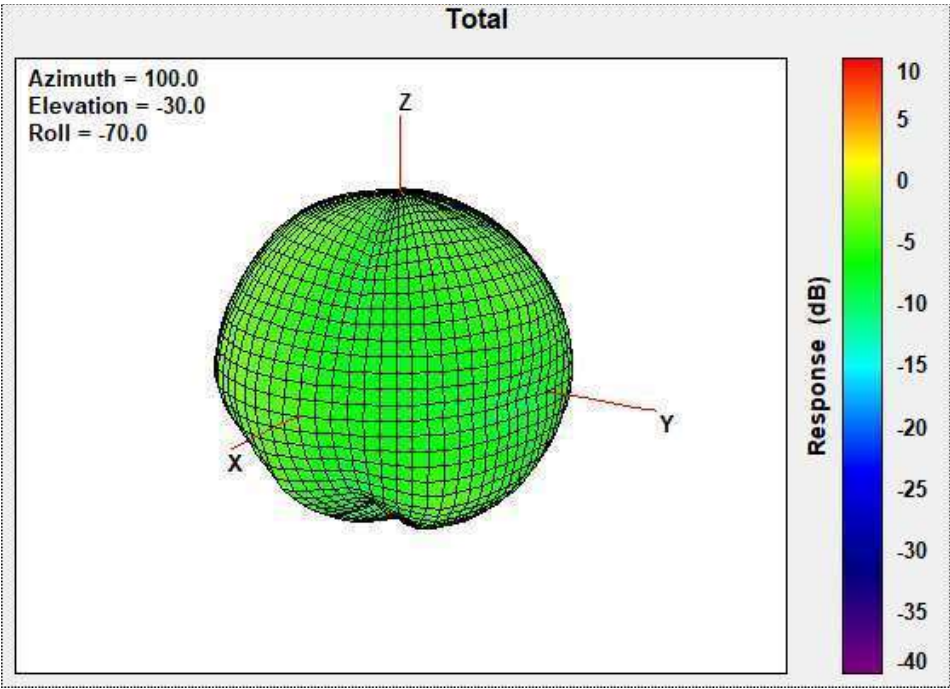
Center Frequency	832MHz
Peak Gain W/ Cable loss (dBi)	-2.26

836.5MHz



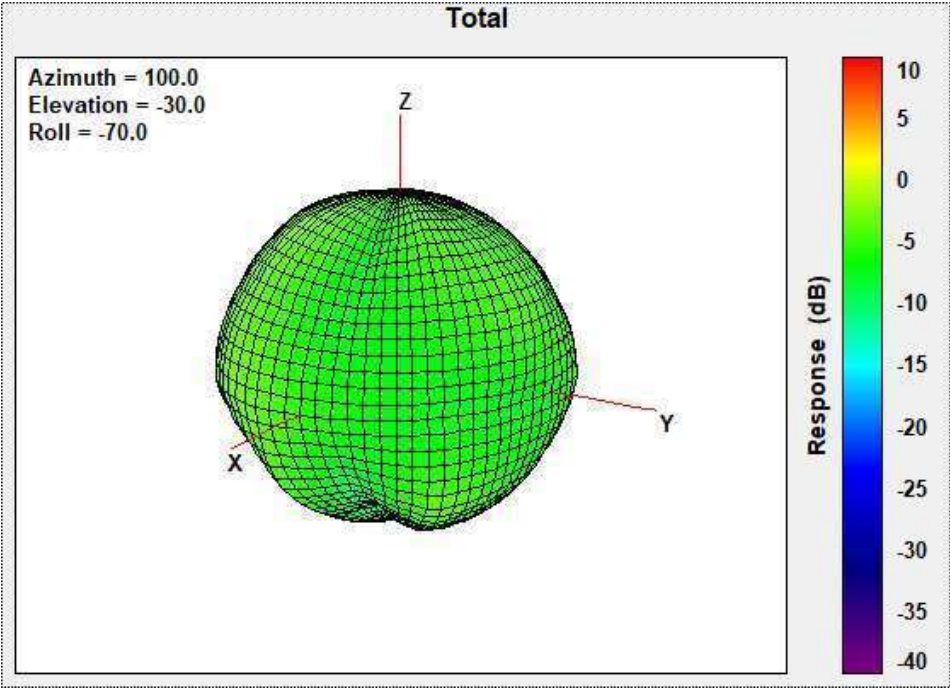
Center Frequency	836.5MHz
Peak Gain W/ Cable loss (dBi)	-2.13

837.5MHz



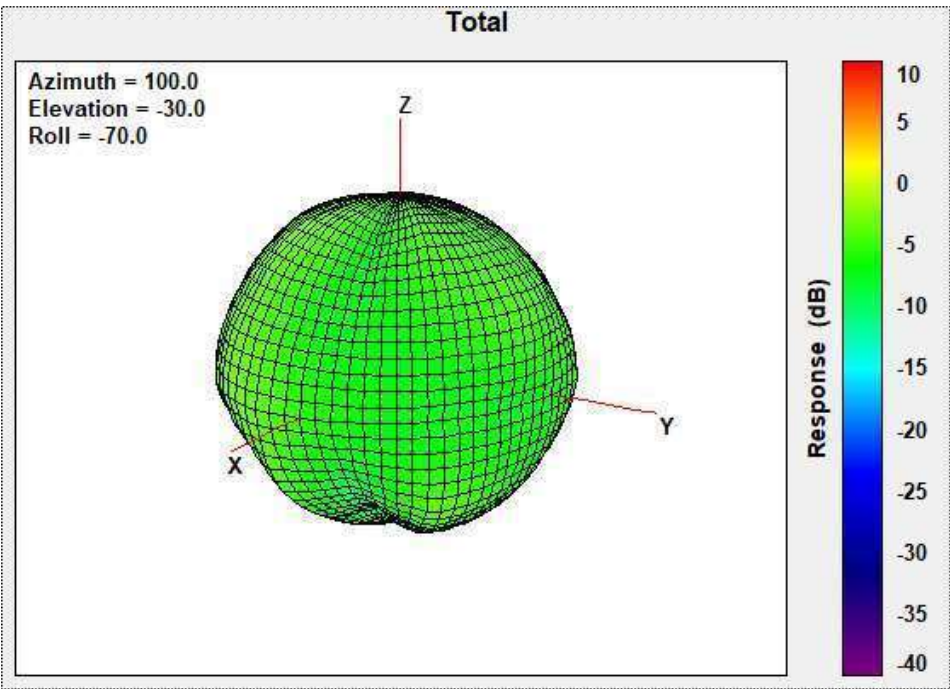
Center Frequency	837.5MHz
Peak Gain W/ Cable loss (dBi)	-2.14

845MHz



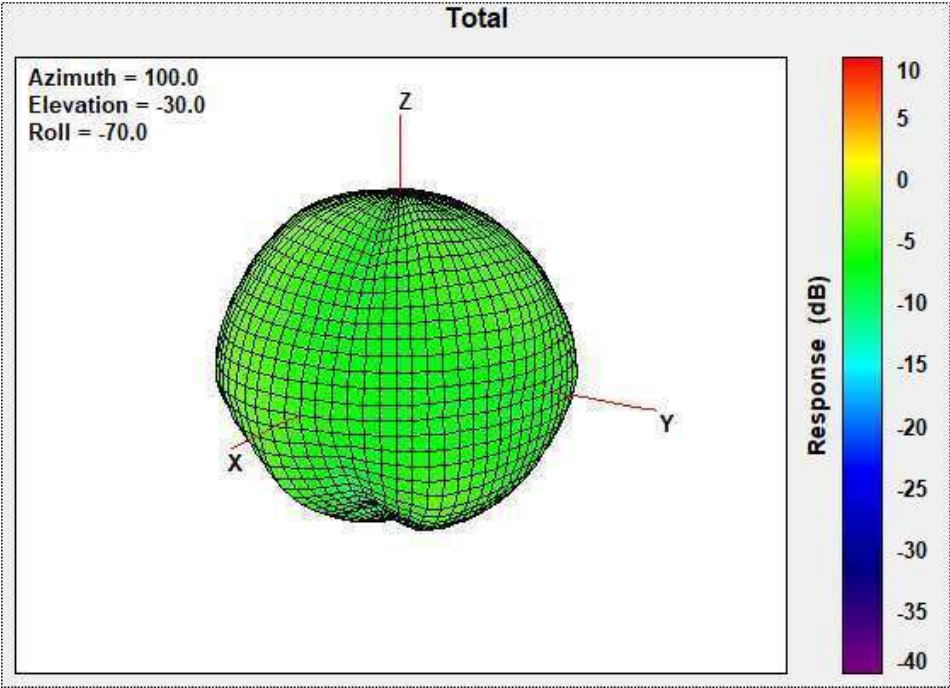
Center Frequency	845MHz
Peak Gain W/ Cable loss (dBi)	-2.11

847MHz



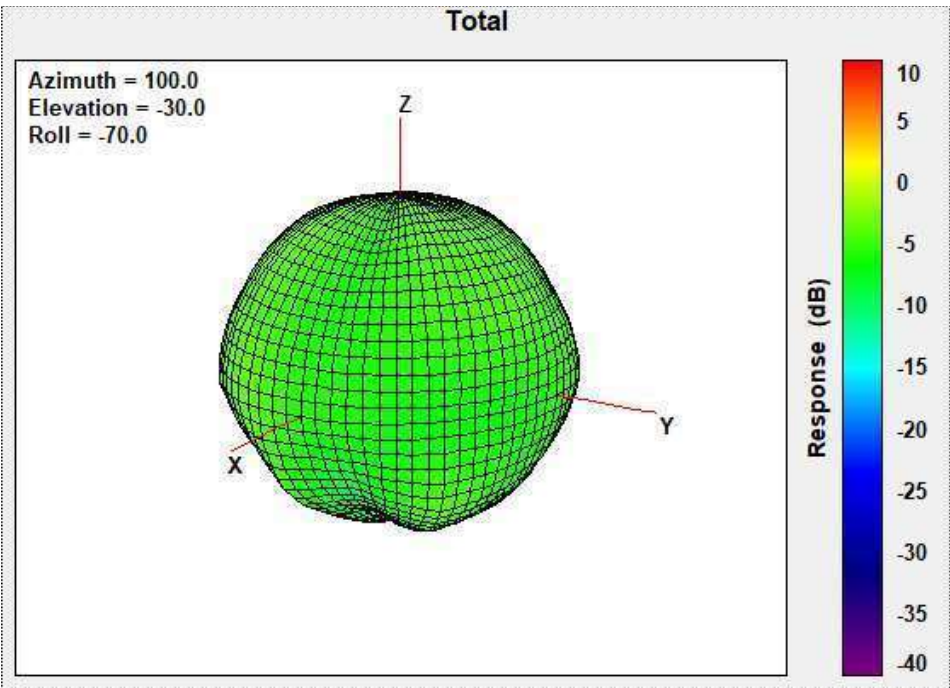
Center Frequency	847MHz
Peak Gain W/ Cable loss (dBi)	-2.10

849MHz



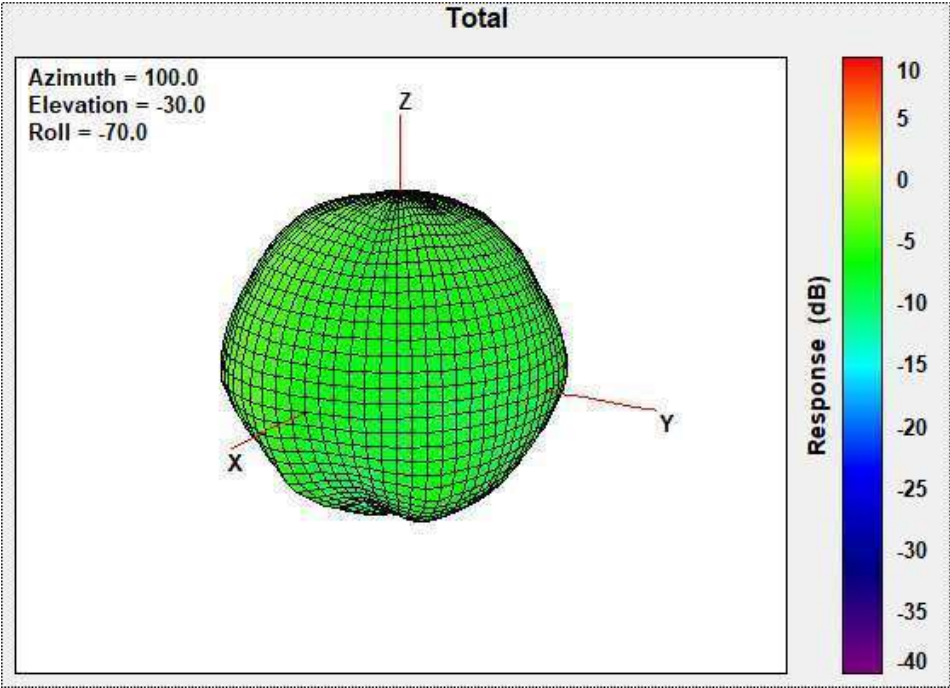
Center Frequency	849MHz
Peak Gain W/ Cable loss (dBi)	-2.08

862MHz



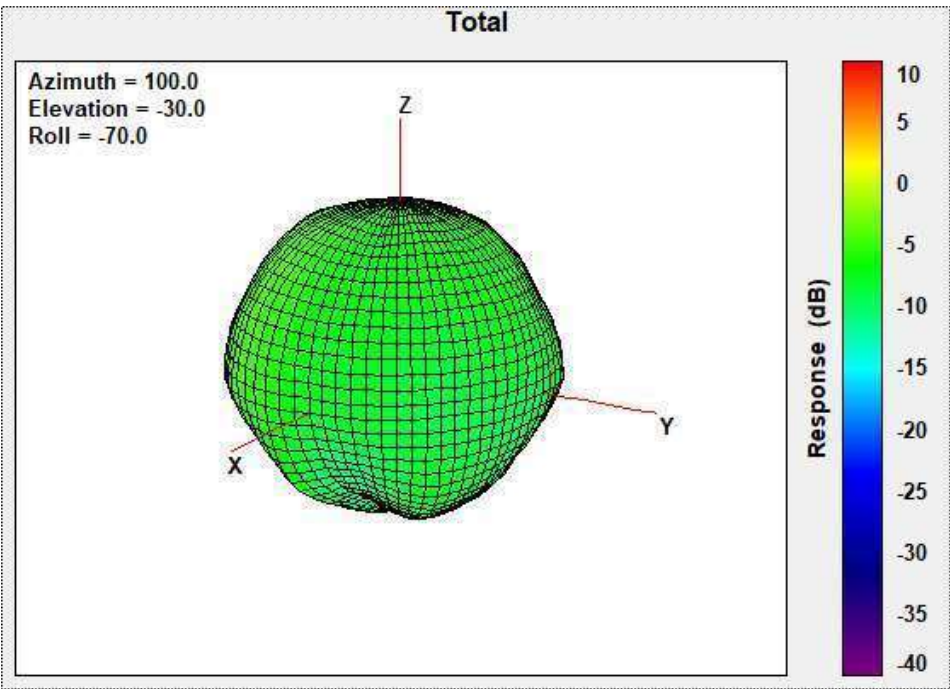
Center Frequency	862MHz
Peak Gain W/ Cable loss (dBi)	-2.83

880MHz



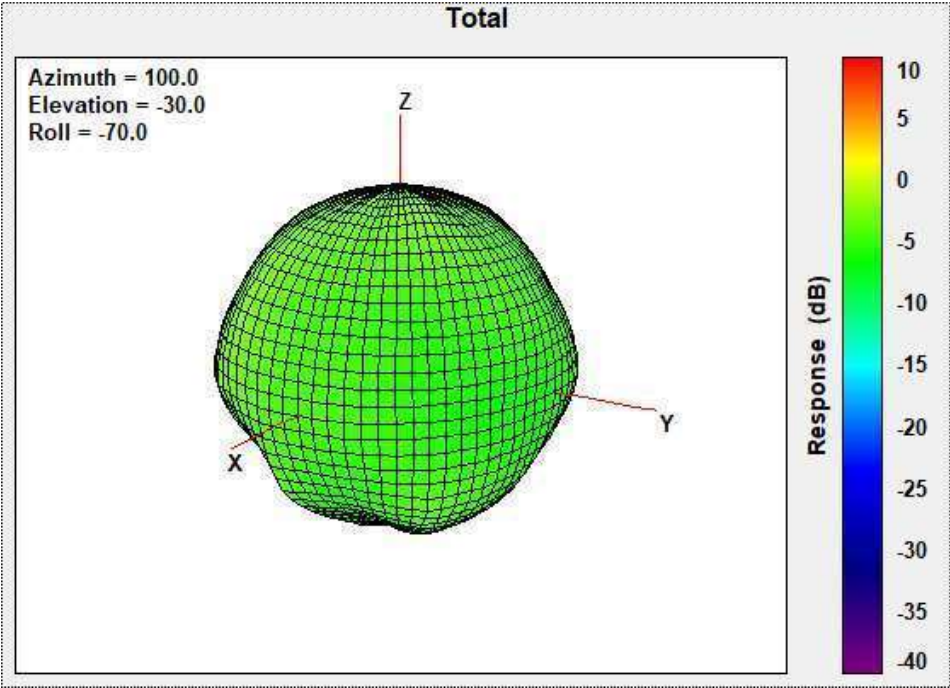
Center Frequency	880MHz
Peak Gain W/ Cable loss (dBi)	-2.94

897.5MHz



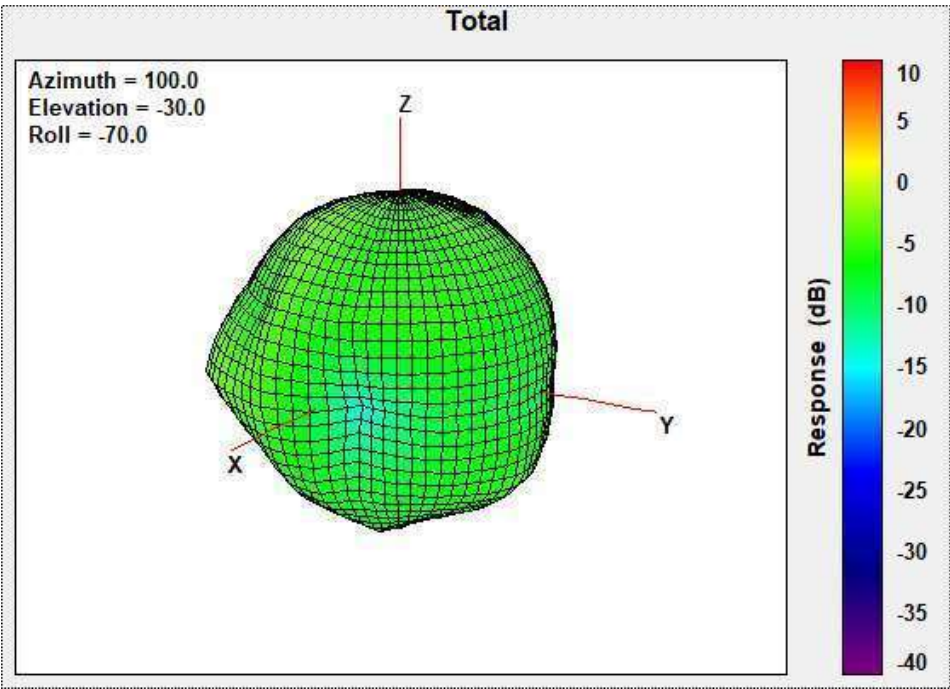
Center Frequency	897.5MHz
Peak Gain W/ Cable loss (dBi)	-2.74

915MHz



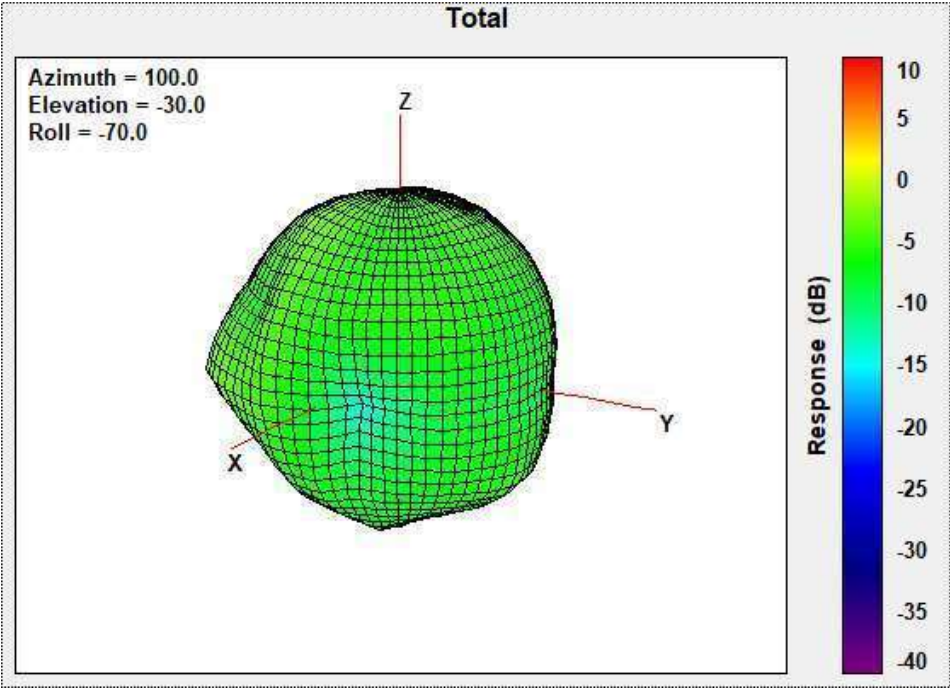
Center Frequency	915MHz
Peak Gain W/ Cable loss (dBi)	-2.37

1695MHz



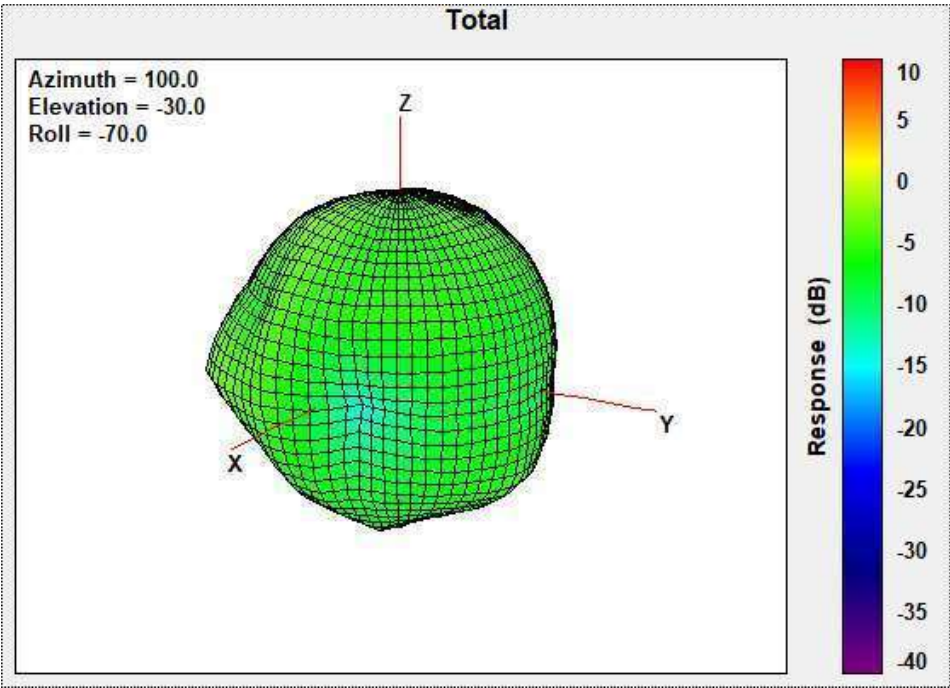
Center Frequency	1695MHz
Peak Gain W/ Cable loss (dBi)	-3.92

1702.5MHz



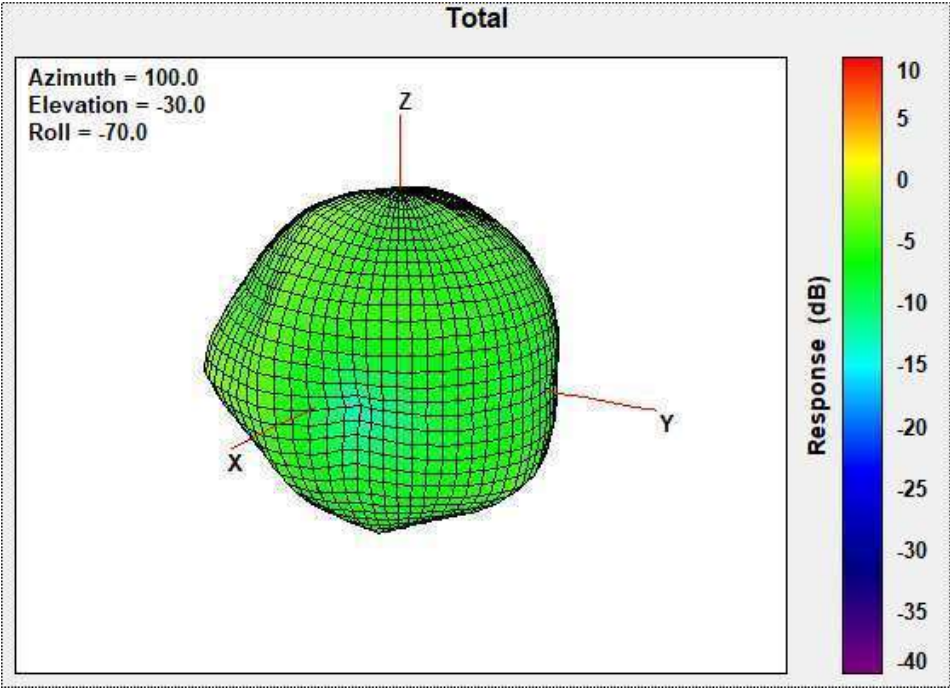
Center Frequency	1702.5MHz
Peak Gain W/ Cable loss (dBi)	-3.90

1710MHz



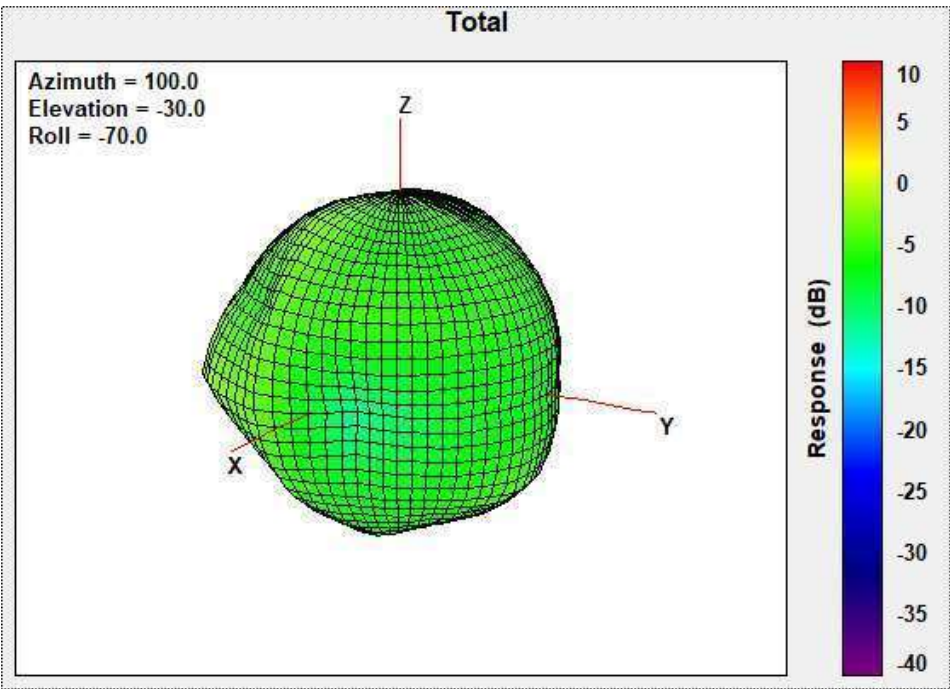
Center Frequency	1710MHz
Peak Gain W/ Cable loss (dBi)	-3.86

1732.5MHz



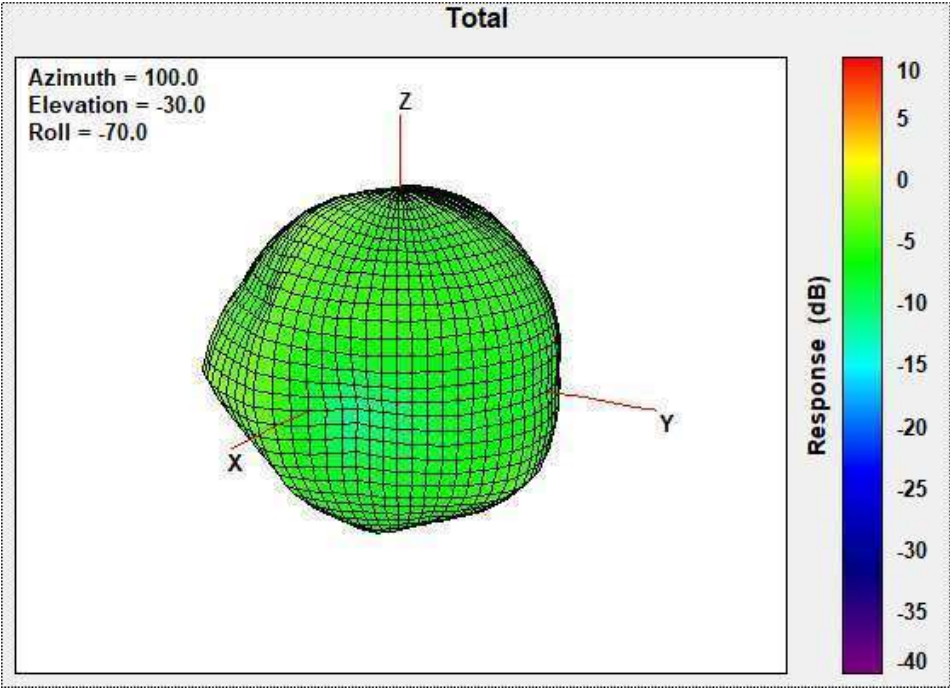
Center Frequency	1732.5MHz
Peak Gain W/ Cable loss (dBi)	-2.99

1745MHz



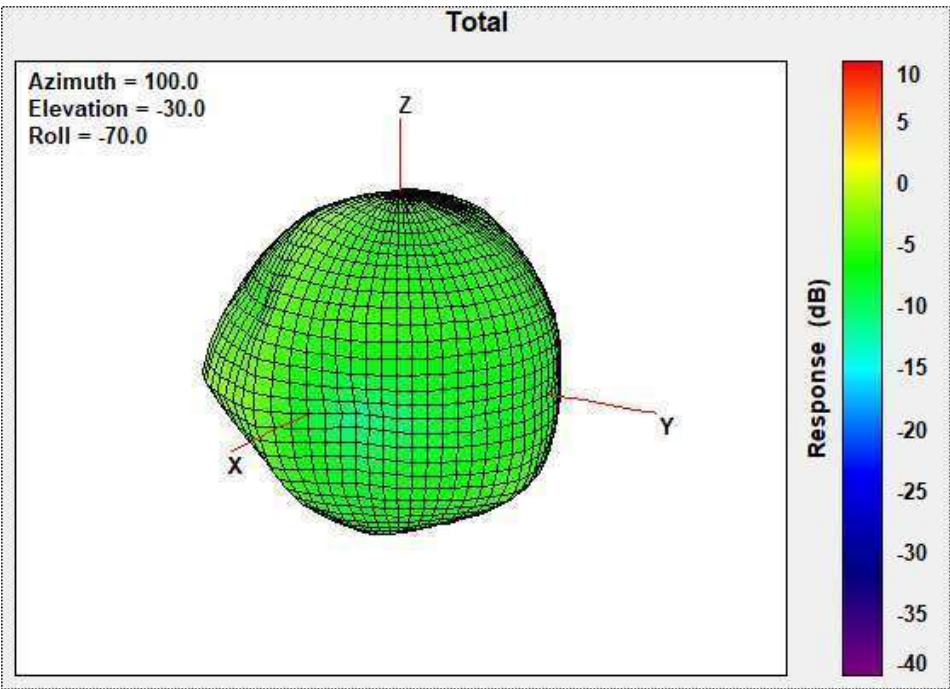
Center Frequency	1745MHz
Peak Gain W/ Cable loss (dBi)	-3.05

1747.5MHz



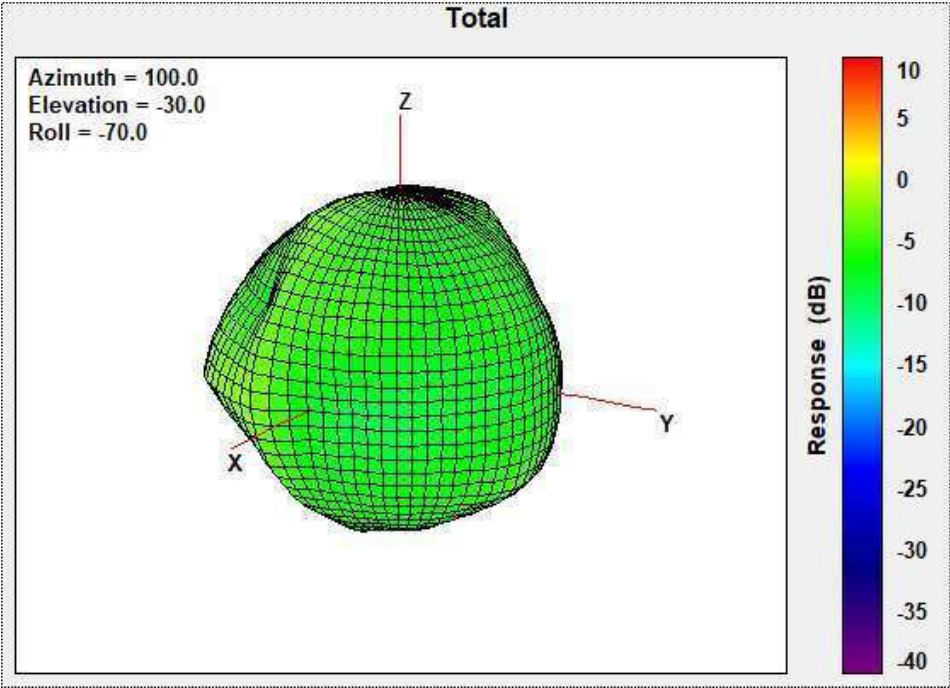
Center Frequency	1747.5MHz
Peak Gain W/ Cable loss (dBi)	-3.06

1755MHz



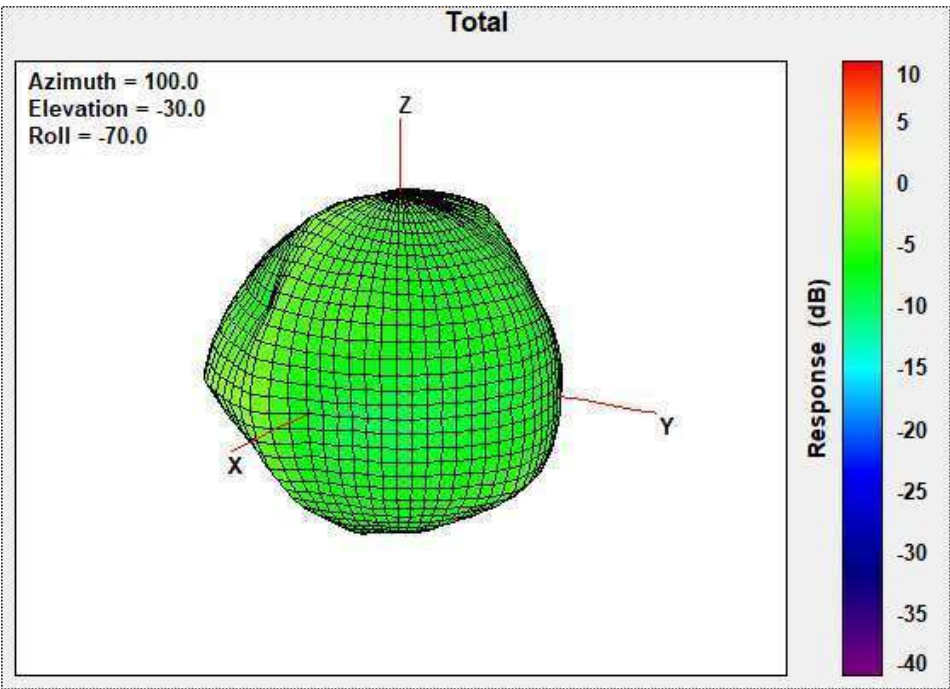
Center Frequency	1755MHz
Peak Gain W/ Cable loss (dBi)	-2.96

1780MHz



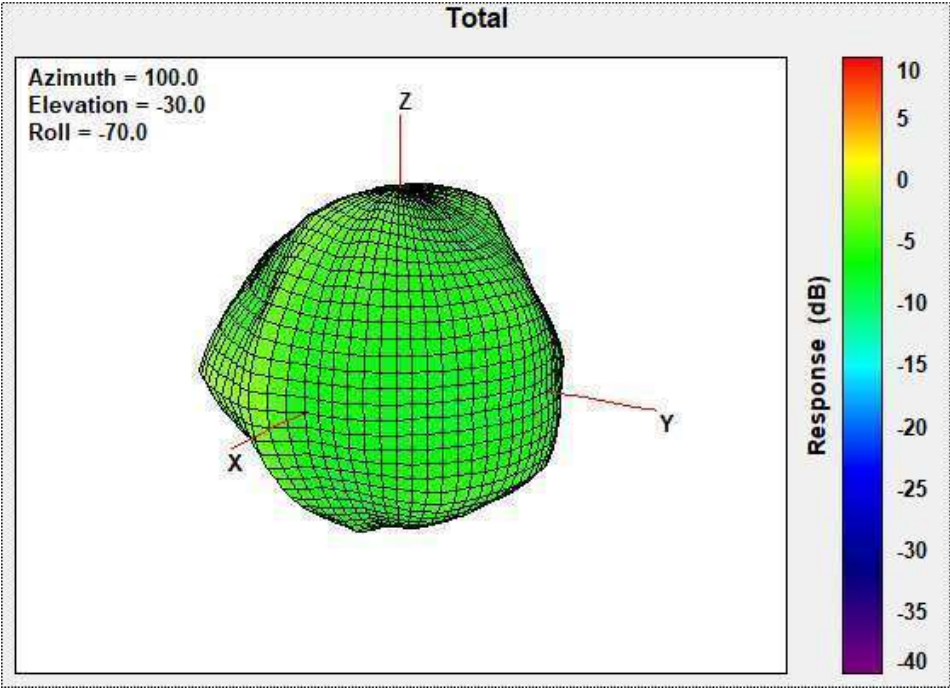
Center Frequency	1780MHz
Peak Gain W/ Cable loss (dBi)	-2.61

1785MHz



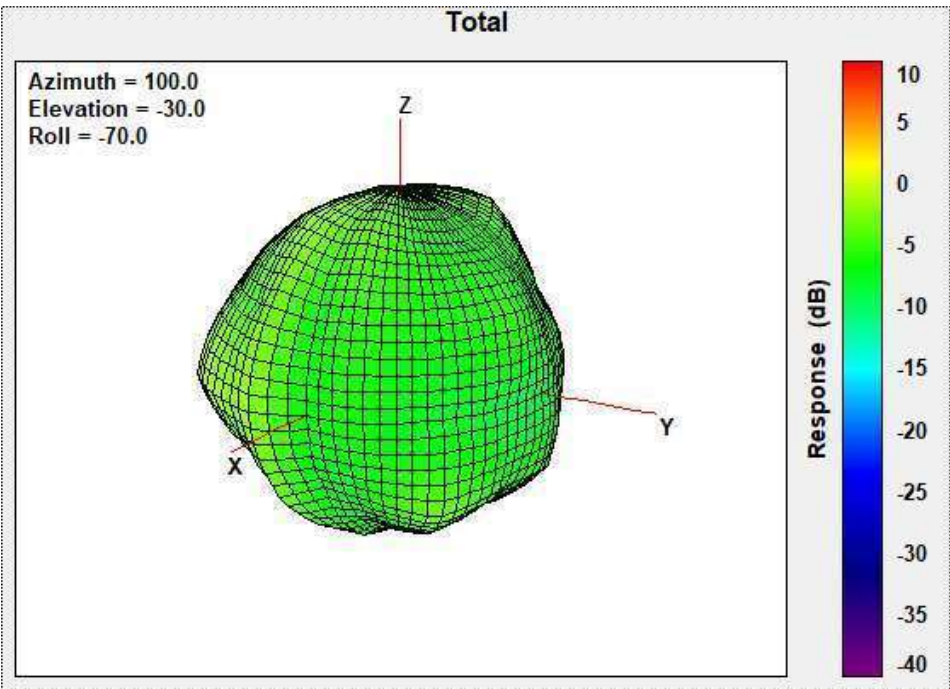
Center Frequency	1785MHz
Peak Gain W/ Cable loss (dBi)	-2.59

1850MHz



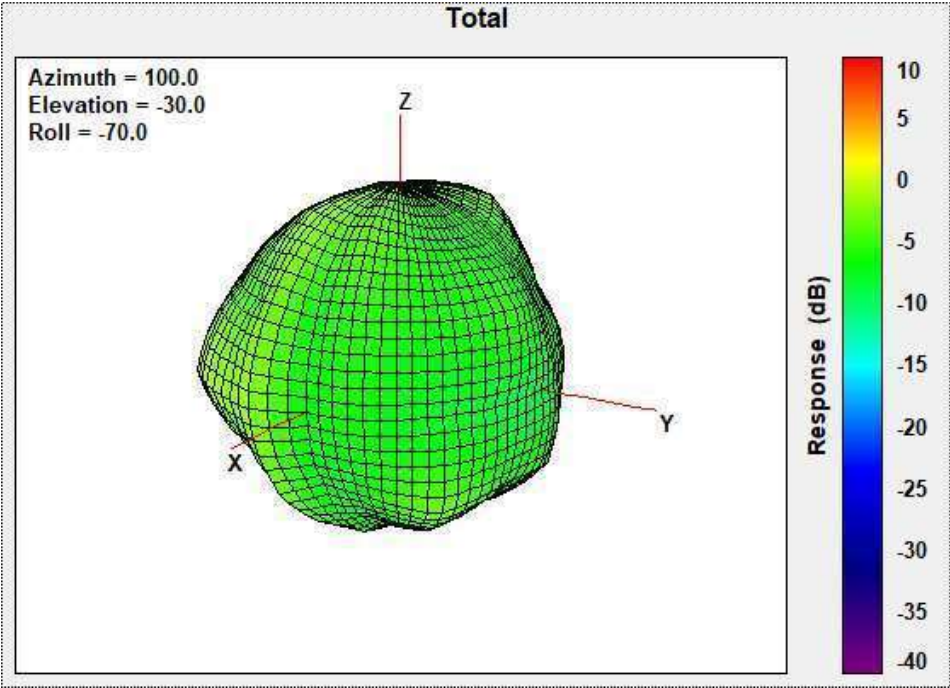
Center Frequency	1850MHz
Peak Gain W/ Cable loss (dBi)	-1.74

1880MHz



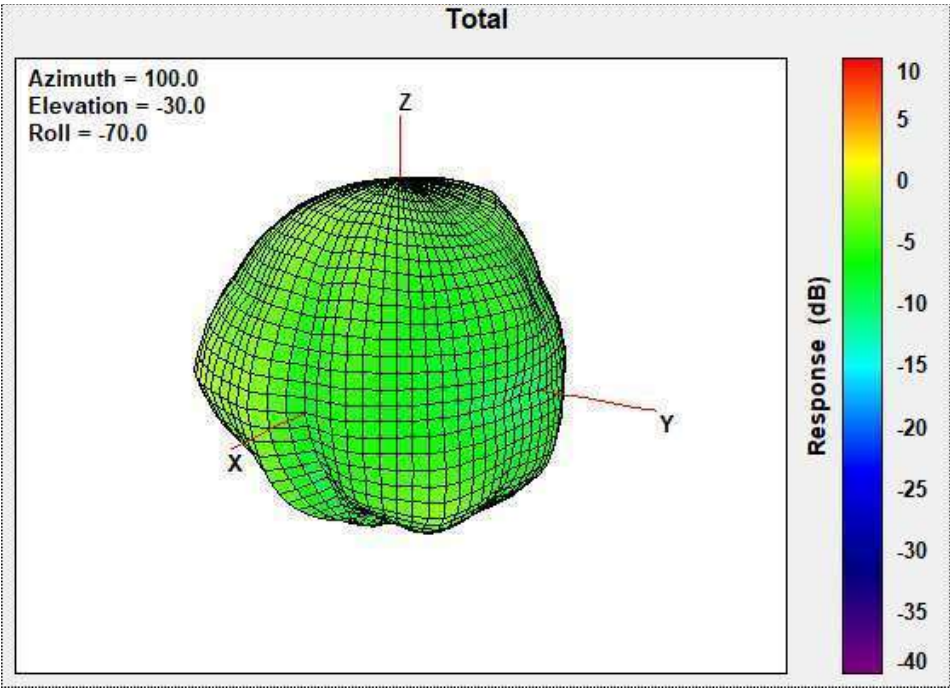
Center Frequency	1880MHz
Peak Gain W/ Cable loss (dBi)	-1.27

1882.5MHz



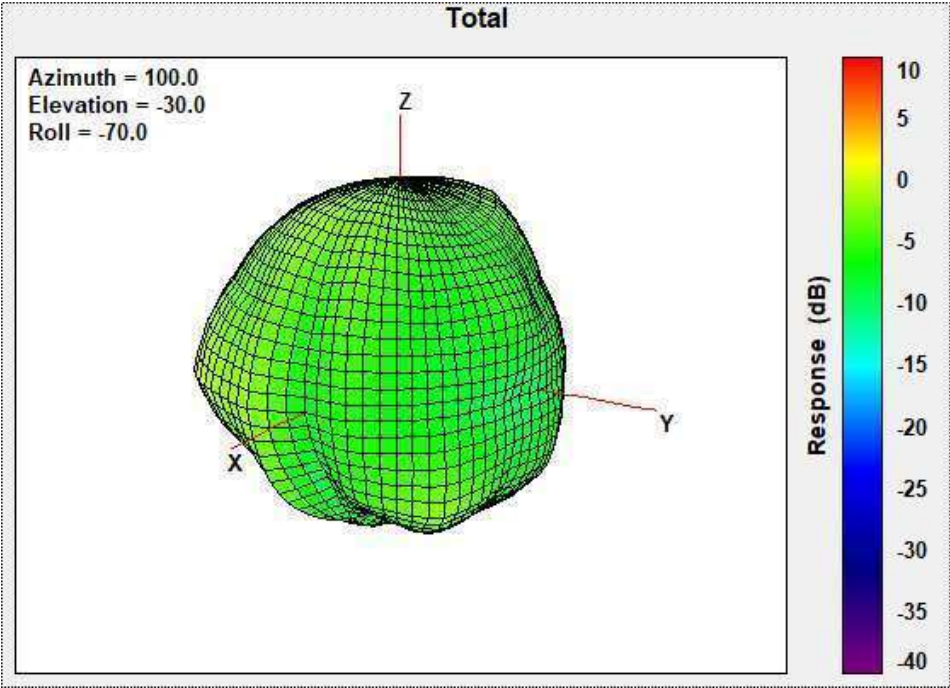
Center Frequency	1882.5MHz
Peak Gain W/ Cable loss (dBi)	-1.28

1900MHz



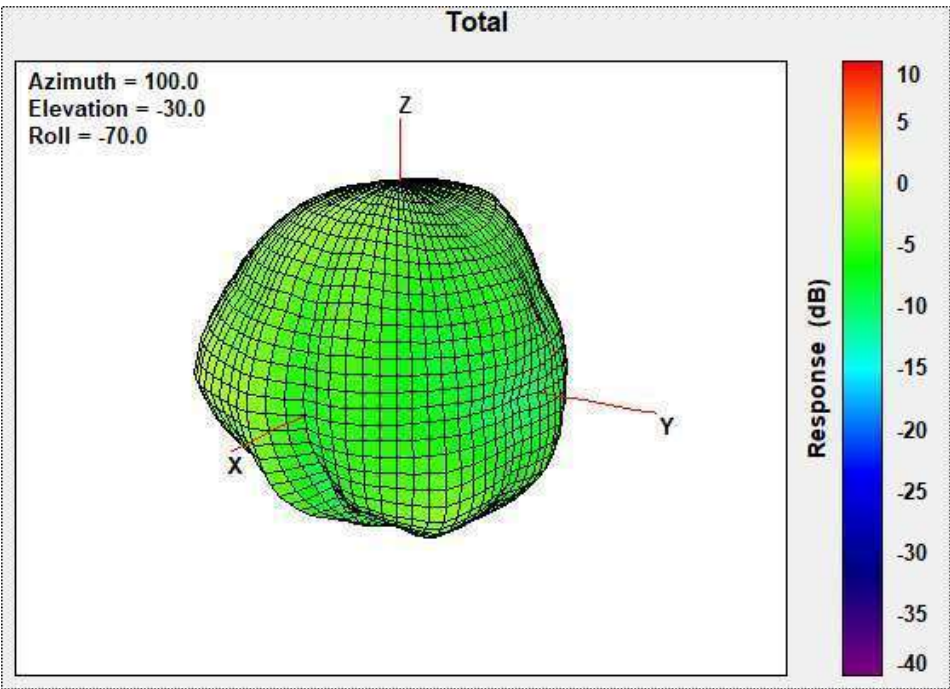
Center Frequency	1900MHz
Peak Gain W/ Cable loss (dBi)	-0.25

1910MHz



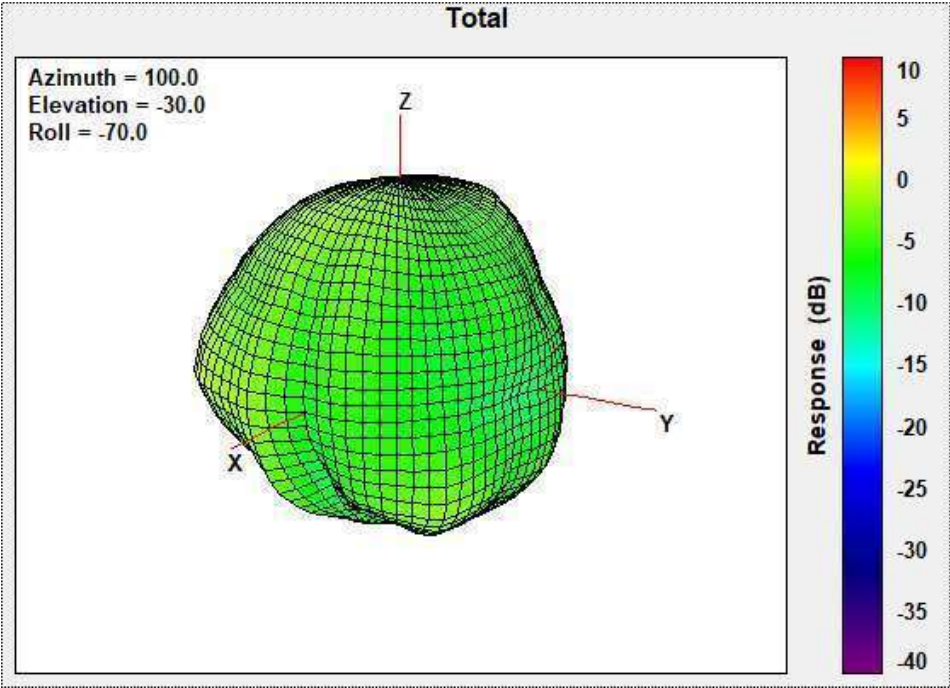
Center Frequency	1910MHz
Peak Gain W/ Cable loss (dBi)	-0.21

1915MHz



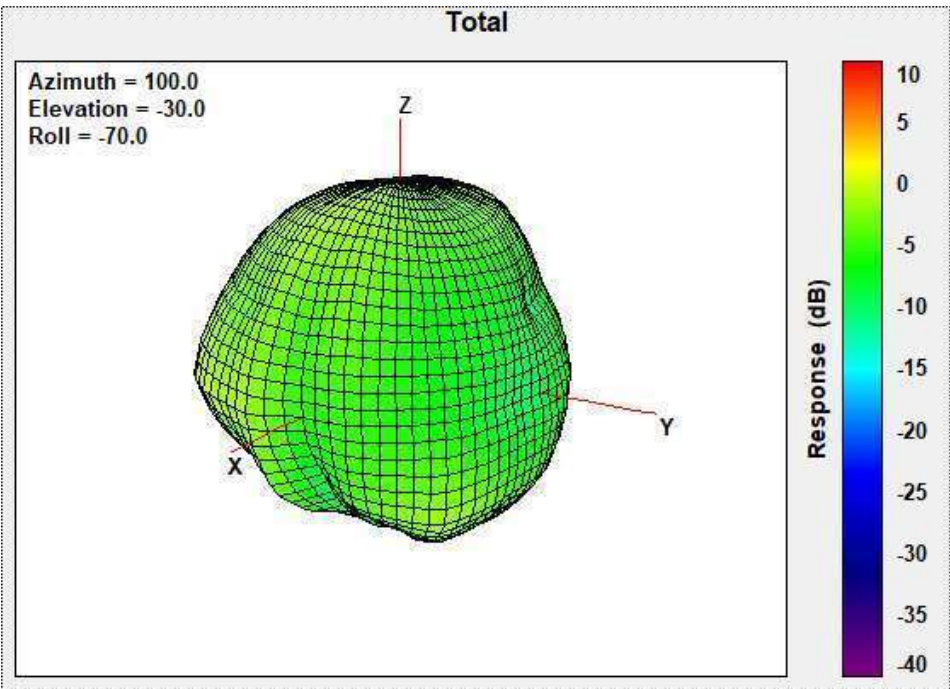
Center Frequency	1915MHz
Peak Gain W/ Cable loss (dBi)	-0.13

1920MHz



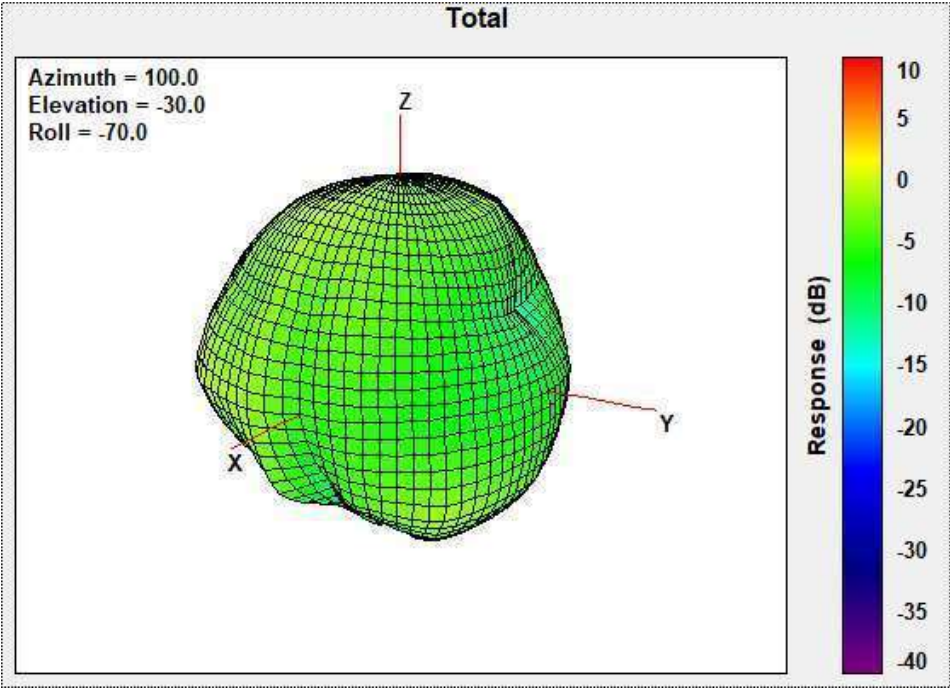
Center Frequency	1920MHz
Peak Gain W/ Cable loss (dBi)	-0.06

1950MHz



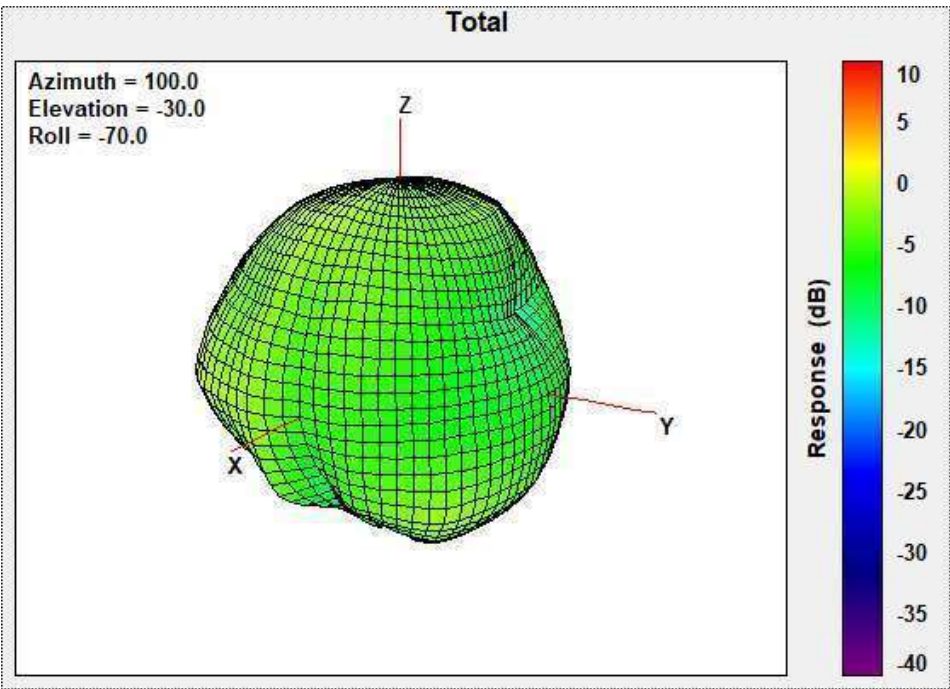
Center Frequency	1950MHz
Peak Gain W/ Cable loss (dBi)	0.26

1980MHz



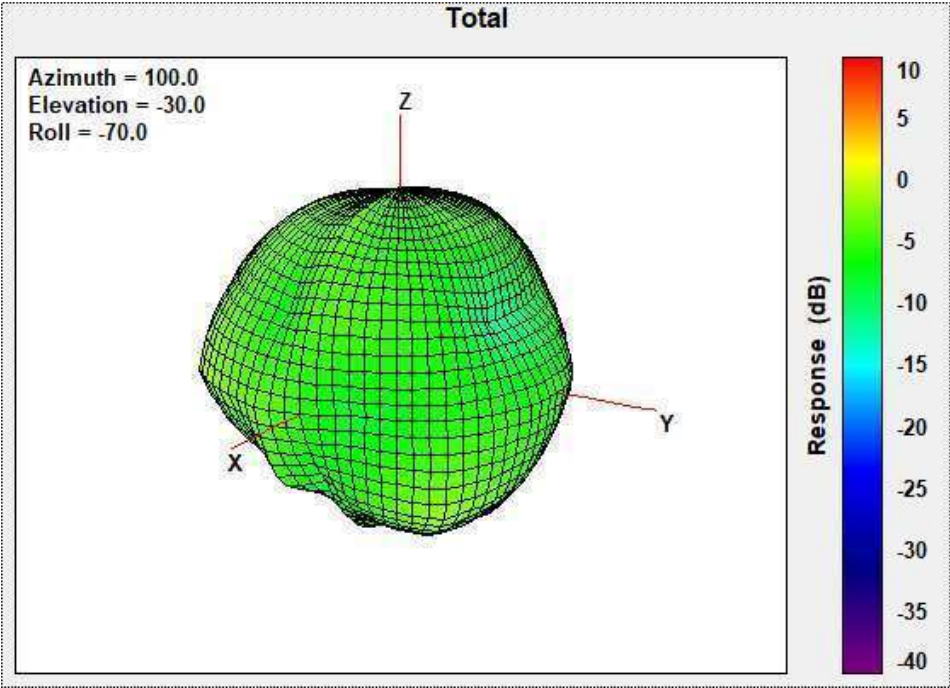
Center Frequency	1980MHz
Peak Gain W/ Cable loss (dBi)	0.96

2010MHz



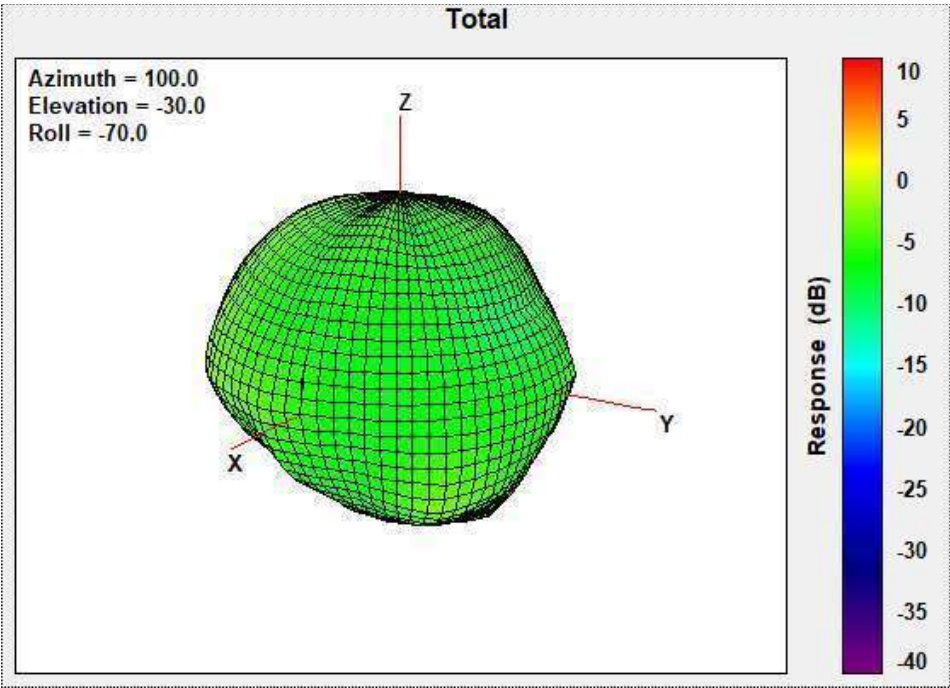
Center Frequency	2010MHz
Peak Gain W/ Cable loss (dBi)	0.60

2017.5MHz



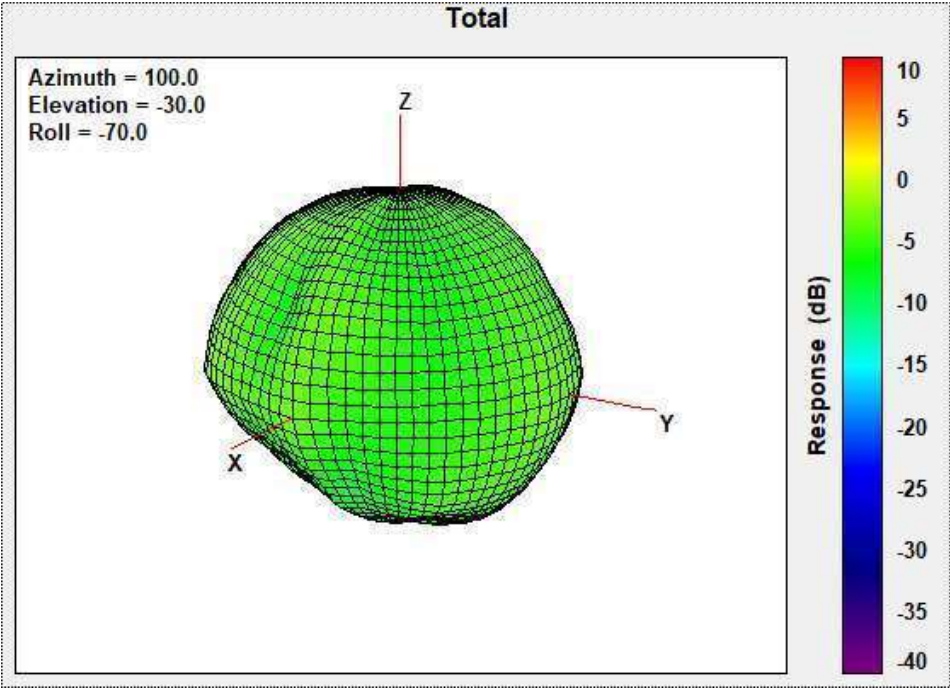
Center Frequency	2017.5MHz
Peak Gain W/ Cable loss (dBi)	0.65

2025MHz



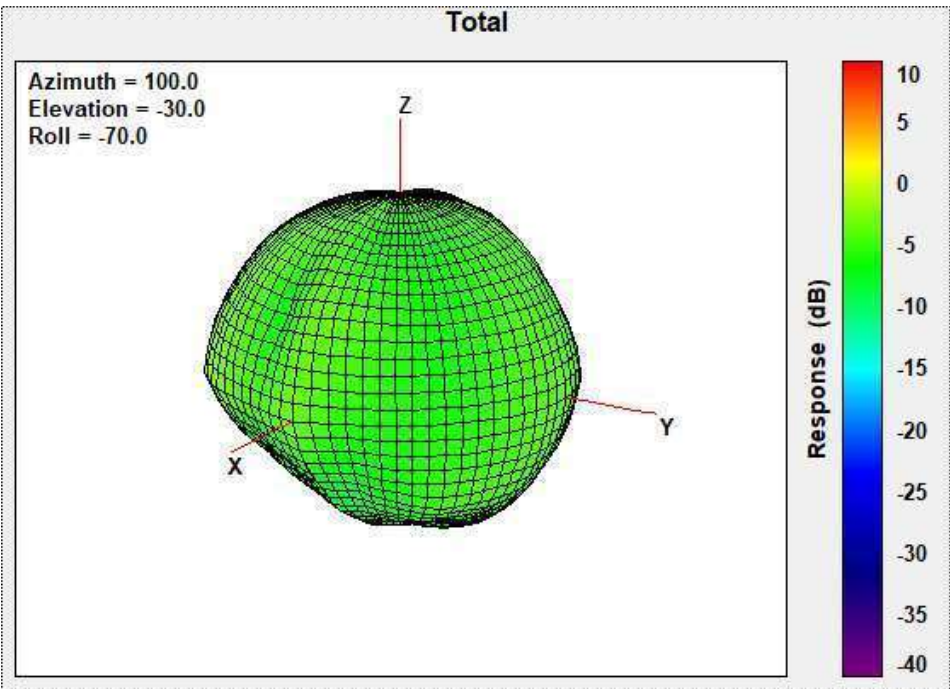
Center Frequency	2025MHz
Peak Gain W/ Cable loss (dBi)	0.71

2300MHz



Center Frequency	2300MHz
Peak Gain W/ Cable loss (dBi)	0.20

2305MHz



Center Frequency	2305MHz
Peak Gain W/ Cable loss (dBi)	0.15