



Technical Brief AVL Location

April 26, 2019



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Prepared by
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Approved by:

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Revision History

Revision History:	Date	Document Revision Description
V01.0	2019 04 26	Initial Release



2 INTRODUCTION

We are seeking an FCC experimental license for testing, evaluation, and certification of fixed earth stations.

As a commercial entity we are seeking a license to transmit within 28.5 to 31 GHz. Transmissions will be coordinated and approved in advance with the commercial and government satellite operators.

Since the 30-31 GHz band is assigned for federal use, we anticipate that FCC will need to coordinate with the NTIA via the IRAC Interdepartmental Radio Advisory Committee. The earth stations will be owned and tested and certified by a commercial entity. Future ARSTRAT certified earth stations will be manufactured and sold to the US Government for their use. We are including a statement of US government interest and a government point of contact supporting this activity.

The earth stations are compliant with **47CFR §25.209**.

Intellicom Technologies, Inc. is representing AVL in this matter. Please contact the following for additional information, comments, or clarifications:

Paul Moller
Intellicom Technologies, Inc.
480-993-2220
PMoller@ITCcom.net
www.ITCcom.net



3 SYSTEM DESCRIPTION

This section provides a description of the SATCOM system.

3.1 Satellites (Points of Communication)

We are requesting a license for U.S. licensed space stations.

Satellites include:

- Only with authorization from ARSTRAT
 - WGS3 at 12W
 - WGS5 at 52.5W
 - WGS6 at 135W
- Only with authorization from Inmarsat
 - Inmarsat I-5 F2 (55W)



3.2 Earth Stations

Location	AvL Technologies 15 North Merrimon Ave Asheville, NC 288804
Coordinates	35°38'24.5"N 82°34'30.9"W
Elevation Range	7 to 40 degrees
Azimuth Range	101 to 246 degrees

Earth Station Attributes															
20190329m12v01.0_Terminal_Specs.xlsx															
ID	Band	Terminal	Model	Antenna	HPA psat (dBm)	HPA sat (watts)	WG Loss (dB)	Power Into Feed (dBm)	Power Into Feed (watts)	Gtx (dBi)	EIRP (dBW)	EIRP kW	Grx (dBi)	G/T (dB/K)	Description
1	ka	AVL/Viasat	BAT-600 MMT	60cm	42.9	19.4	0.67	42.2	16.6	44.4	56.6	457	40.2	17	First Article
2	ka	AVL	Model 1315	130cm	41.3	13.5	0	41.3	13.5	50.9	62.2	1660	46.2	22	First Article

Earth Station Pointing Angles			
20190329m12v01.0_Terminal_Specs.xlsx			
AVL, Asheville			
35.640139N			
82.575251W			
Earth Station Pointing			
Satellites	Location (degrees)	Elevation (degrees)	True Azimuth (degrees)
WGS3 at 12W	12W	7.2	101.6
WGS5 at 52.5W	52.5W	37.8	135.2
Inmarsat I-5 F2 (55W)	55W	39.4	138.1
WGS6 at 135W	135W	21.7	245.9
	Min	7	101
	Max	40	246



3.3 Points of Contact

Primary Contact:

Ryan Gutierrez
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1 828-250-9950 ext. 3807
AvL Technologies
15 North Merrimon Ave
Asheville, NC 288804

Secondary Contact:

Paul Moller
PMoller@ITCcom.net
Office: 480993.2220
Cell: 480.993.2220
Intellicom Technologies, Inc



4 Antenna Patterns - AVL Model 1315

4.1 Summary

Transmit Gain and Axial Ratio			
	30.000 GHz	30.500 GHz	31.000 GHz
Gain, dBi LHCP	50.6	50.7	50.9
Gain, dBi RHCP	50.6	50.7	50.9
Axial Ratio, (dB) LHCP	0.8	0.9	0.7
Axial Ratio, (dB) RHCP	0.8	0.9	0.7

3 dB beamwidth in Azimuth is +/-0.3 or 0.6 degrees

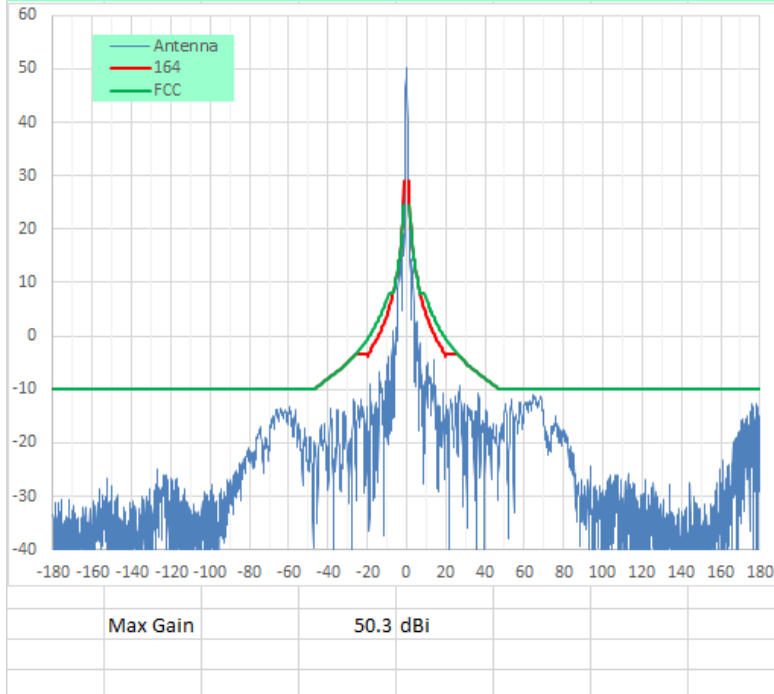
The antenna is compliant with:

- CFR-2010-title47-vol2-sec25-209
- Mil-Std-188-164

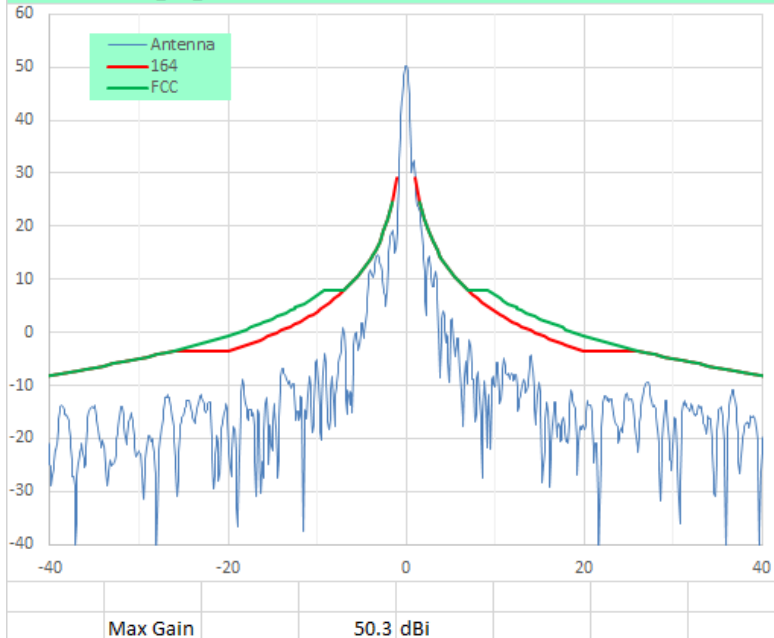


4.2 Tx LHCP Azimuth

Antenna Gain Pattern: Uplink Azimuth LHCP Low
Gain (dBi) vs Azimuth Angle (degrees)
20190426m01v01.0_135_AntennaPlots.xlsx XlowLHCPulaz



Antenna Gain Pattern: Uplink Azimuth LHCP Low
Gain (dBi) vs Azimuth Angle (degrees)
20190426m01v01.0_135_AntennaPlots.xlsx XlowLHCPulaz



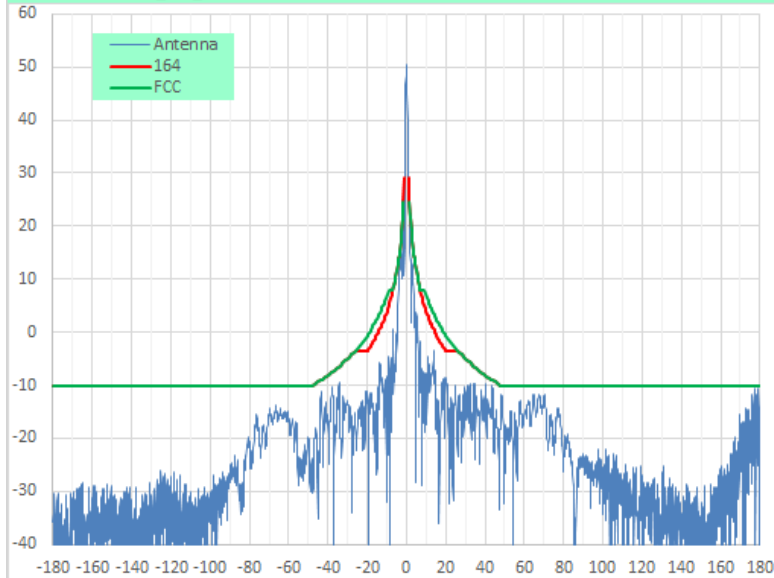


Antenna Gain Pattern: Uplink Azimuth LHCP Mid

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XmidLHCPulaz



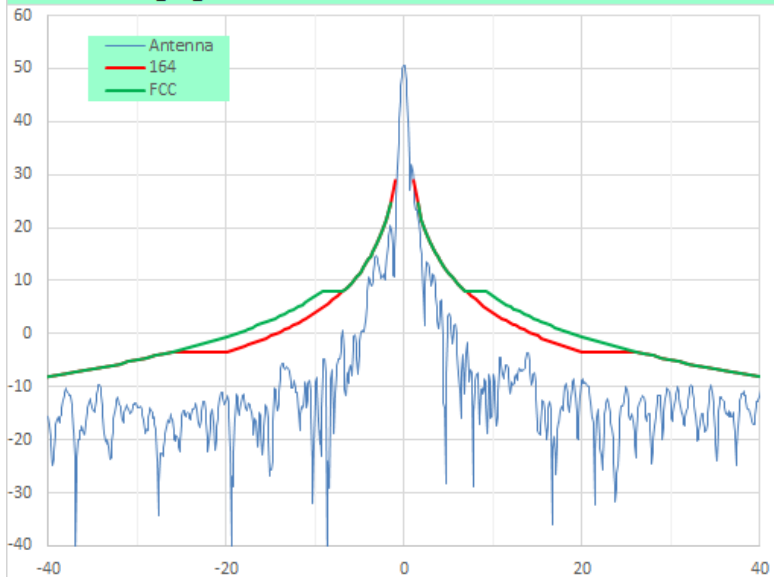
Max Gain	50.5 dBi
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Antenna Gain Pattern: Uplink Azimuth LHCP Mid

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XmidLHCPulaz



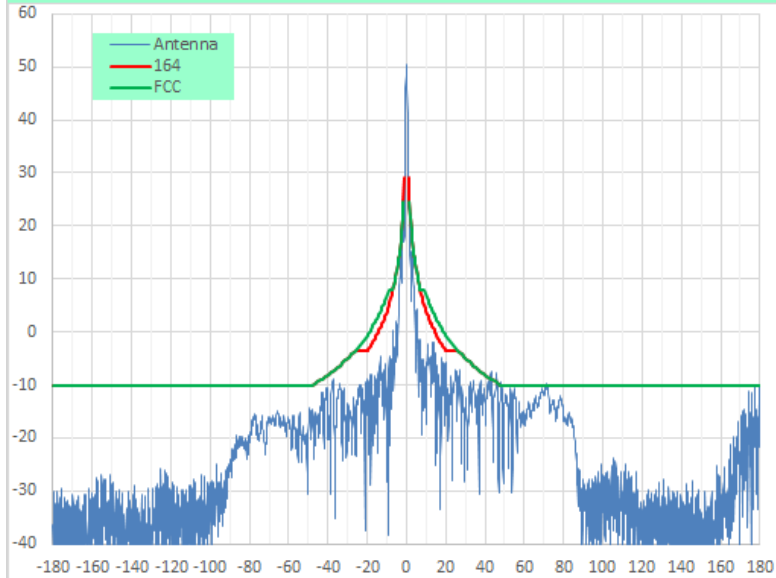
Max Gain	50.5 dBi
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**Antenna Gain Pattern: Uplink Azimuth LHCP High**

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XhighLHCPulaz



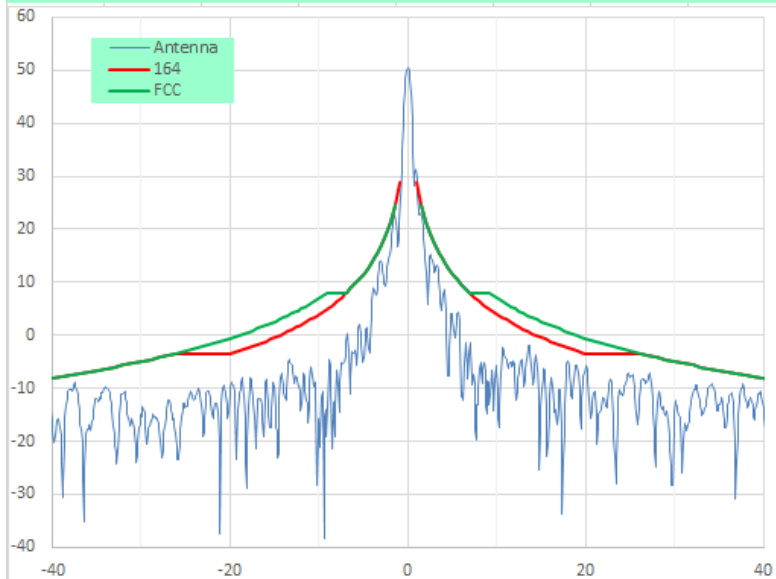
Max Gain	50.6 dBi
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Antenna Gain Pattern: Uplink Azimuth LHCP High

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

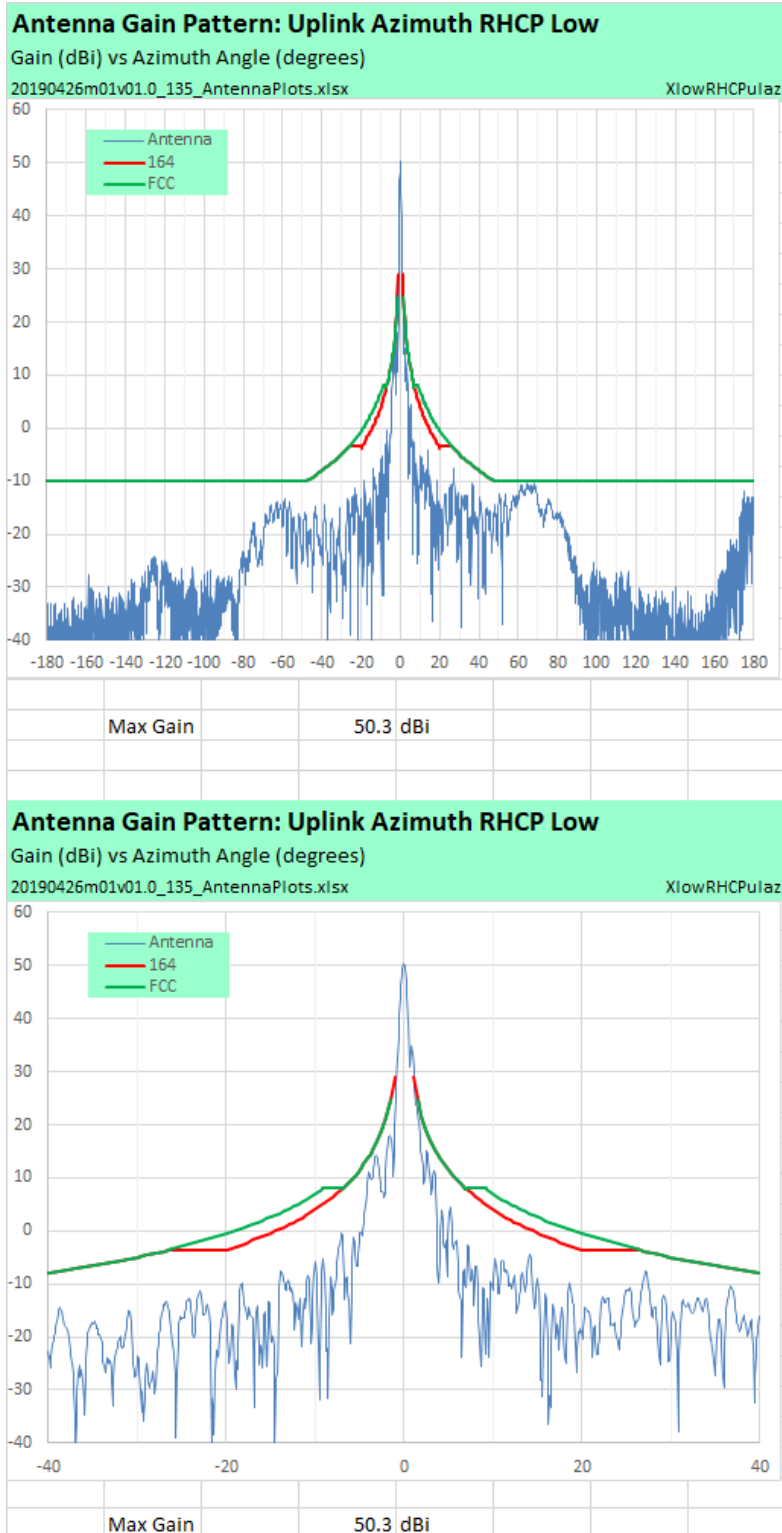
XhighLHCPulaz



Max Gain	50.6 dBi
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4.3 Tx RHCP Azimuth



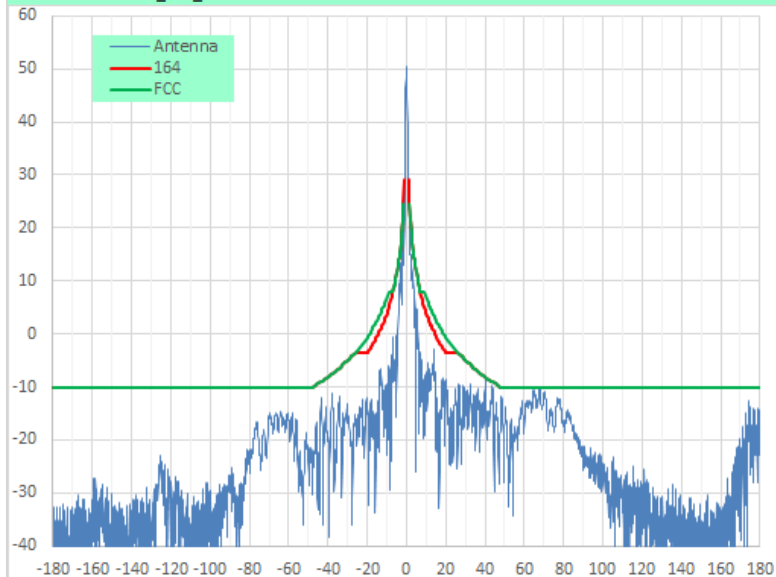


Antenna Gain Pattern: Uplink Azimuth RHCP Mid

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XmidRHCPulaz



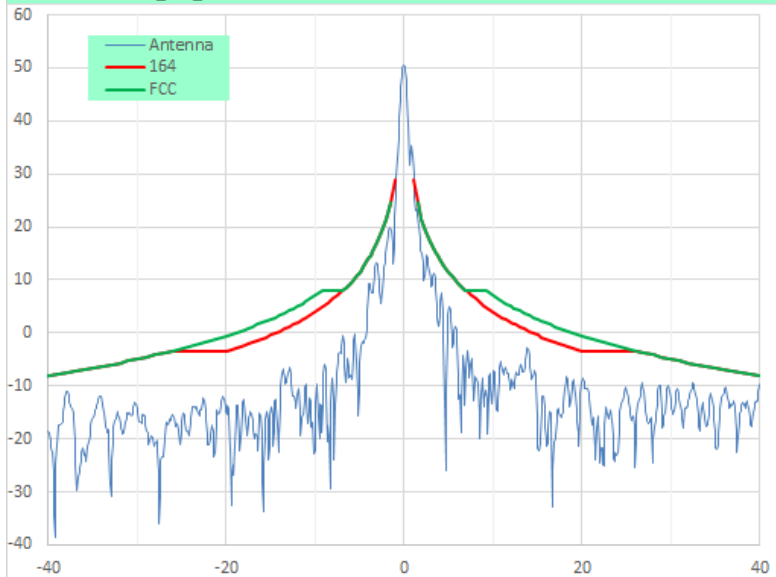
Max Gain	50.5 dBi
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Antenna Gain Pattern: Uplink Azimuth RHCP Mid

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XmidRHCPulaz



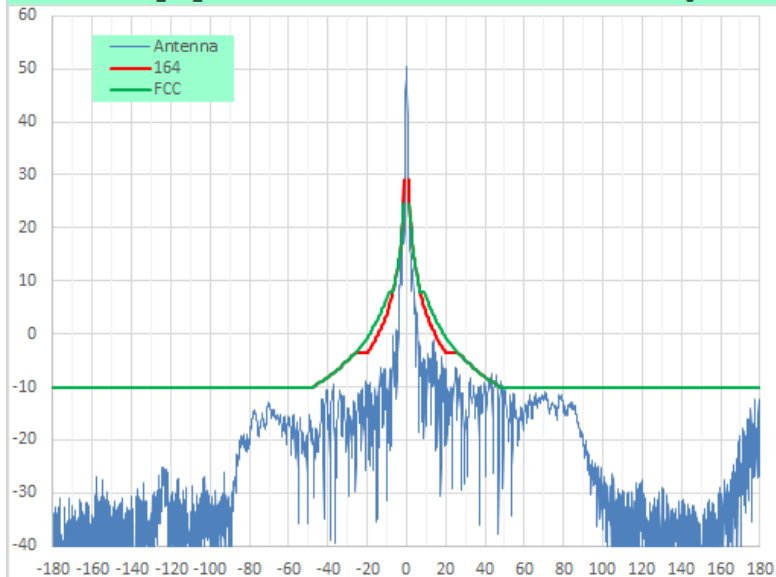
Max Gain	50.5 dBi
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**Antenna Gain Pattern: Uplink Azimuth RHCP High**

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XhighRHCPulaz



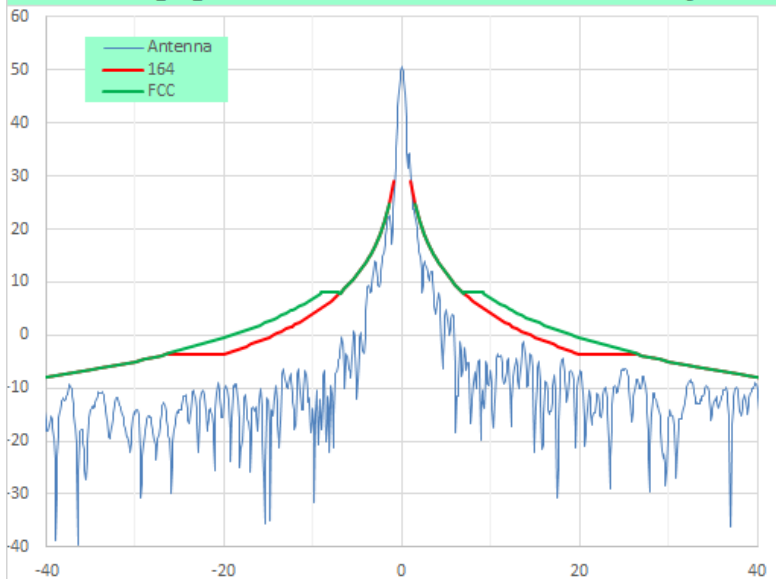
Max Gain	50.6 dBi
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Antenna Gain Pattern: Uplink Azimuth RHCP High

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

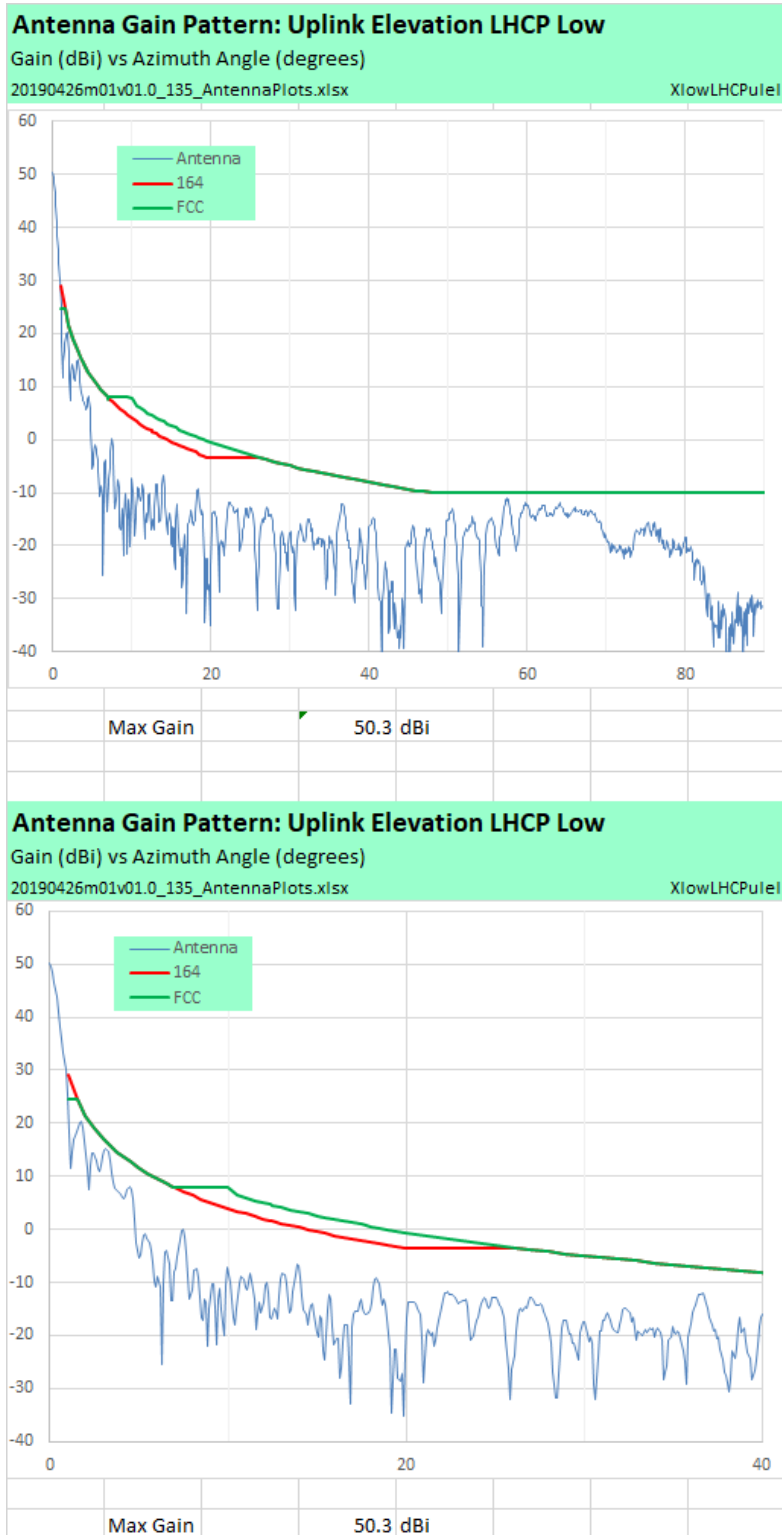
XhighRHCPulaz

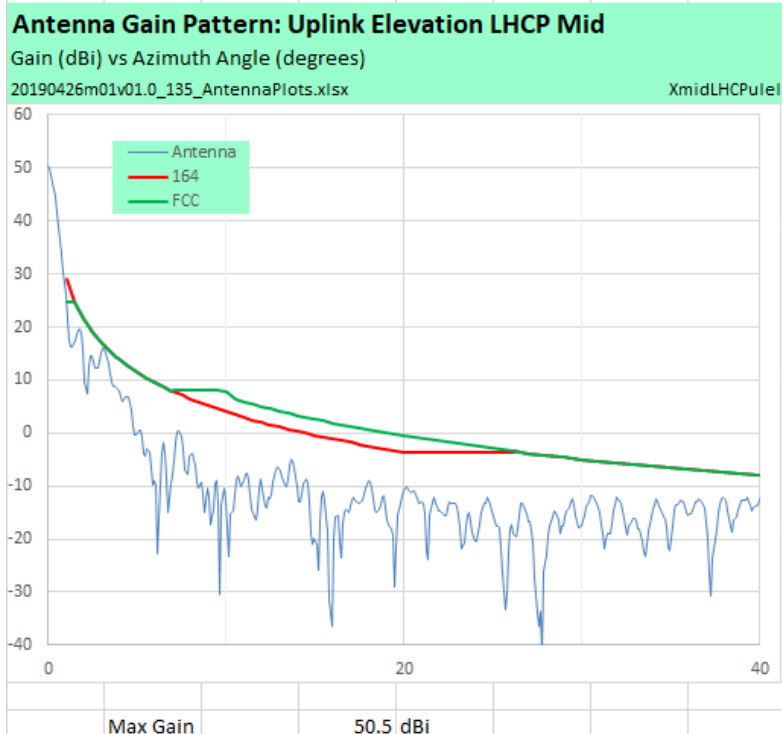
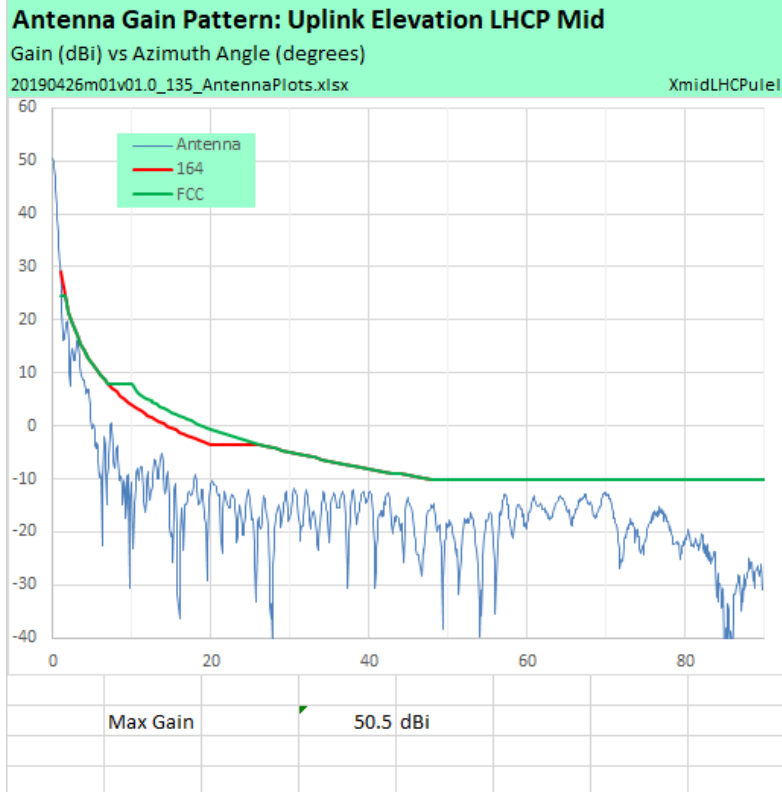


Max Gain	50.6 dBi
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4.4 Tx LHCP Elevation



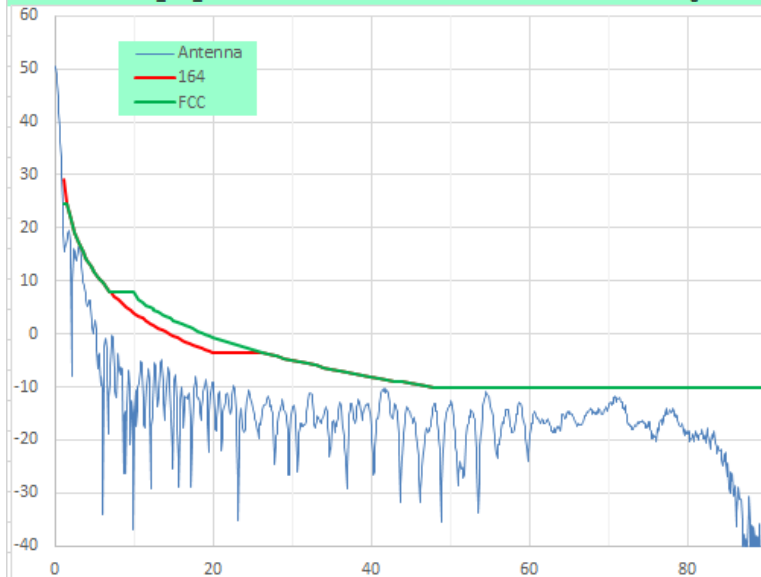


**Antenna Gain Pattern: Uplink Elevation LHCP High**

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XhighLHCPuleI



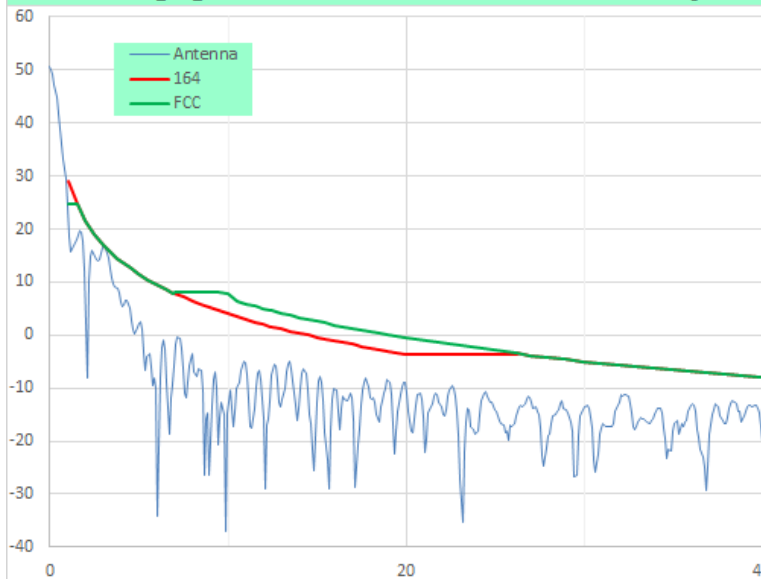
Max Gain 50.6 dBi

Antenna Gain Pattern: Uplink Elevation LHCP High

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

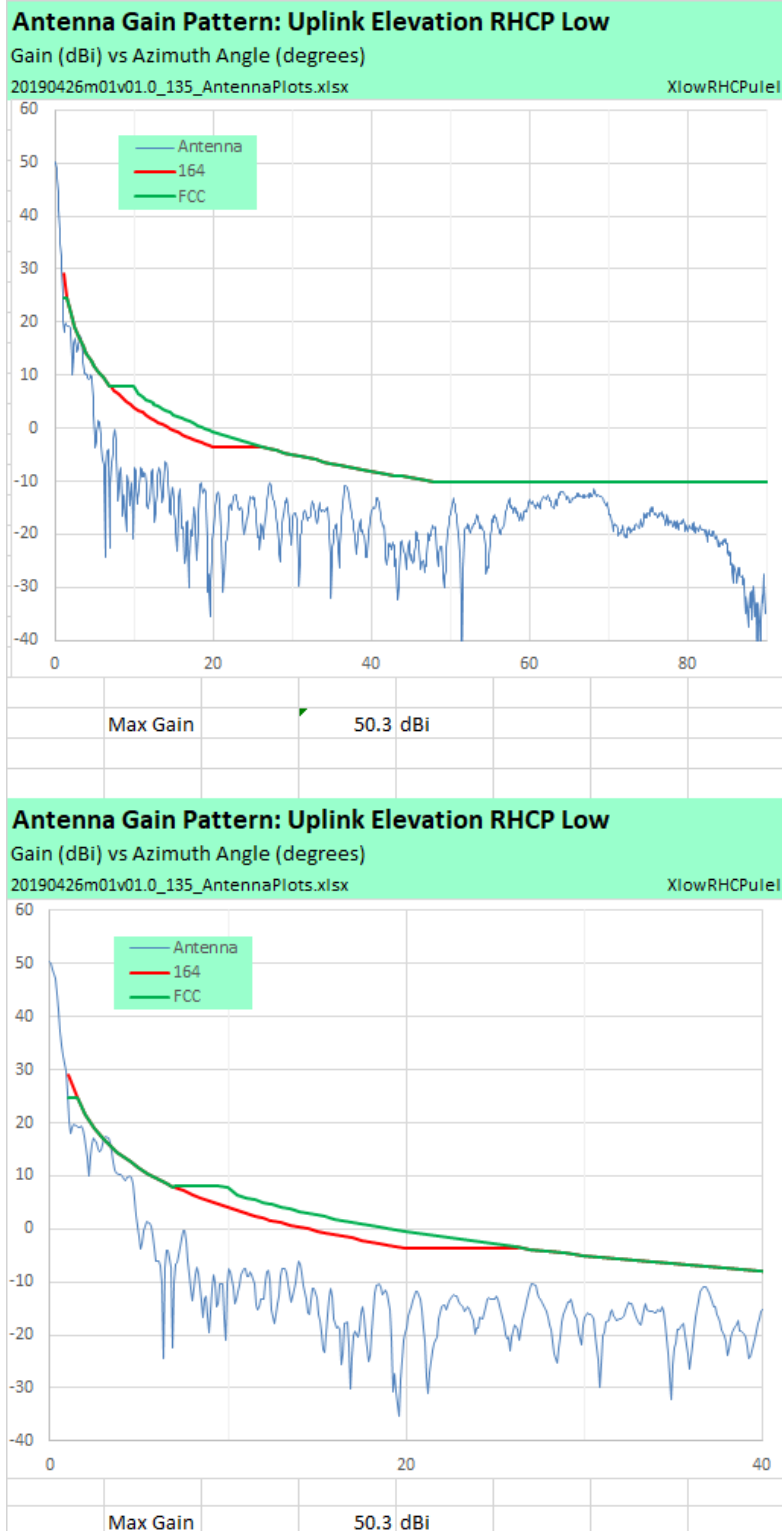
XhighLHCPuleI



Max Gain 50.6 dBi



4.5 Tx RHCP Elevation

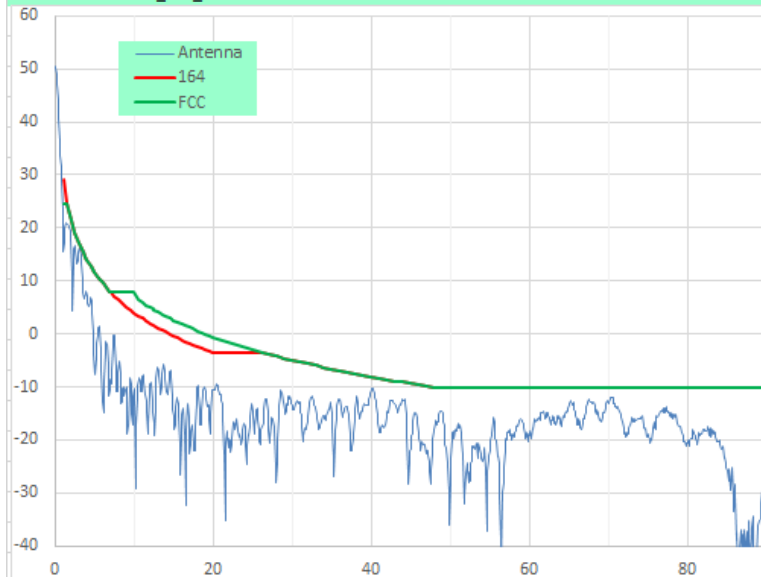


**Antenna Gain Pattern: Uplink Elevation RHCP Mid**

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XmidRHCPuleI



Max Gain 50.5 dBi

Antenna Gain Pattern: Uplink Elevation RHCP Mid

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XmidRHCPuleI



Max Gain 50.5 dBi

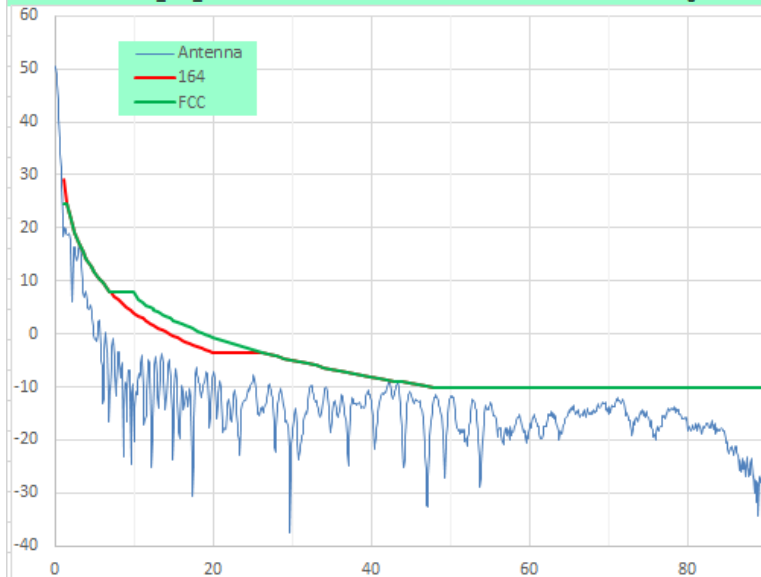


Antenna Gain Pattern: Uplink Elevation RHCP High

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XhighRHCPuleI



Max Gain 50.6 dBi

Antenna Gain Pattern: Uplink Elevation RHCP High

Gain (dBi) vs Azimuth Angle (degrees)

20190426m01v01.0_135_AntennaPlots.xlsx

XhighRHCPuleI



Max Gain 50.6 dBi



5 Antenna Patterns - AVL/Viasat BAT-600

5.1 Summary

Transmit Gain and Axial Ratio			
	30.0GHz	30.5GHz	31.0GHz
Gain,dBi LHCP	43.9	43.9	44.4
Gain,dBi RHCP	44.1	43.9	44.2
Axial Ratio,dB LHCP	0.51	0.45	0.69
Axial Ratio, dB RHCP	0.42	0.49	0.77

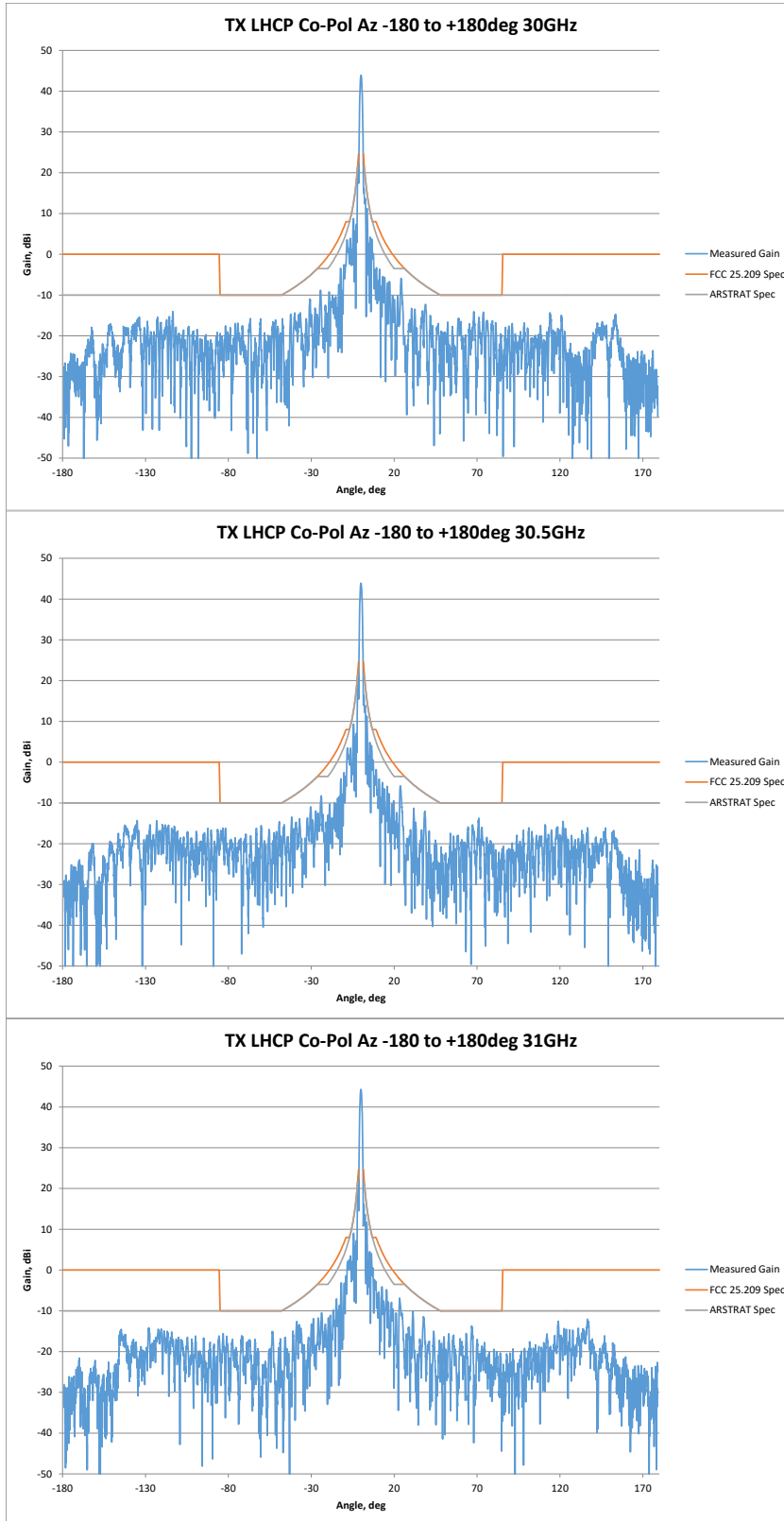
3 dB beamwidth in Azimuth is 0.9 degrees

The antenna is compliant with:

- CFR-2010-title47-vol2-sec25-209
- Mil-Std-188-164

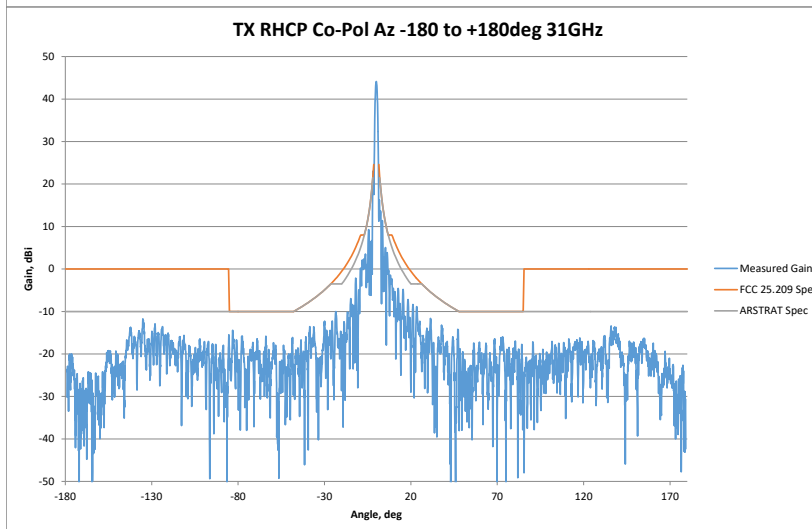
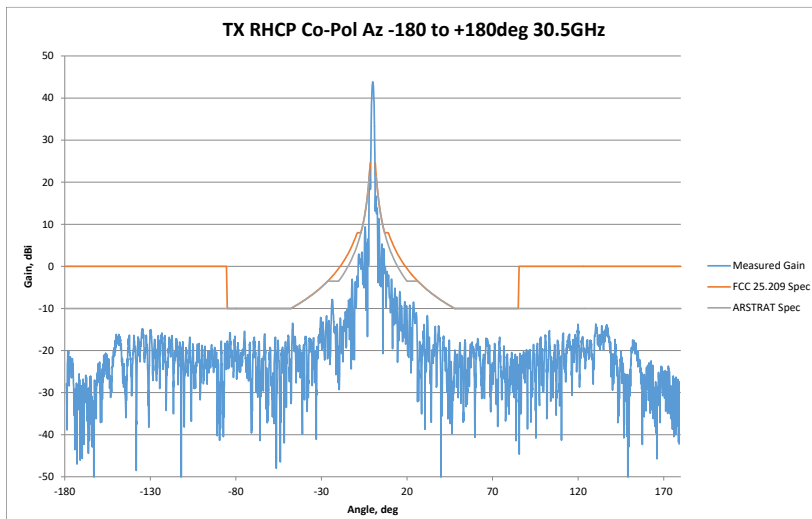
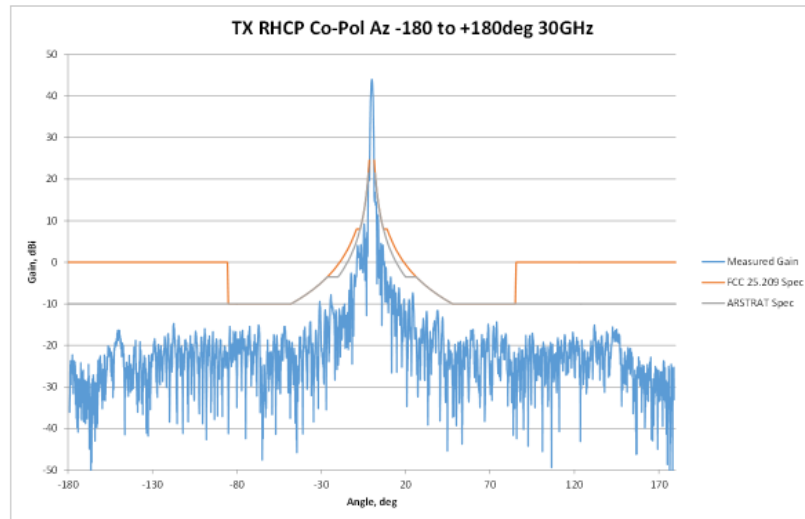


5.2 Tx LHCP Azimuth



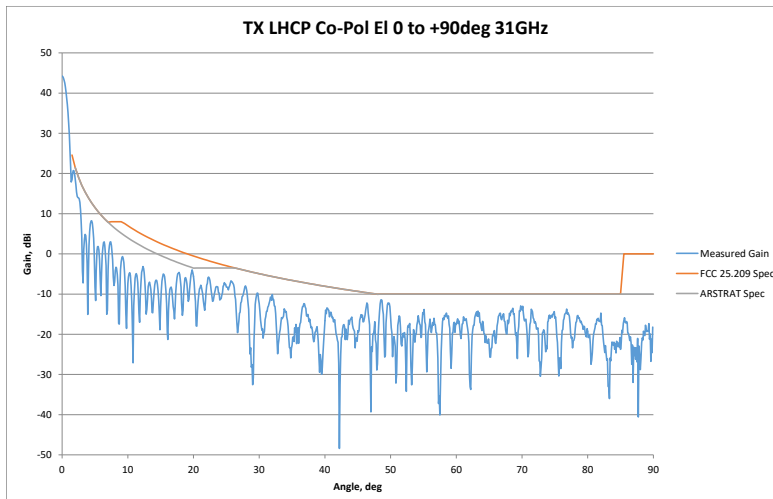
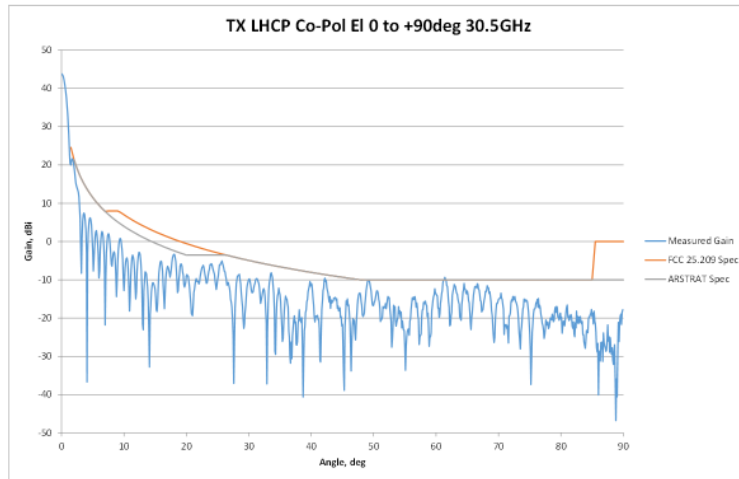
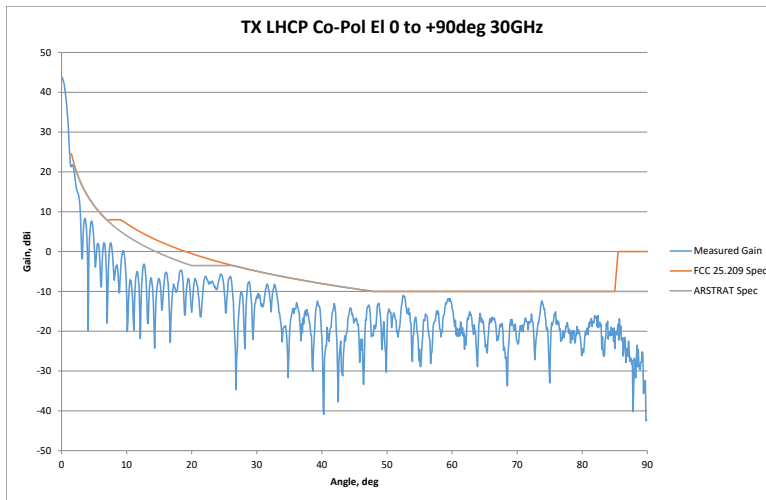


5.3 Tx RHCP Azimuth





5.4 Tx LHCP Elevation





5.5 Tx RHCP Elevation

