Far Field radiation patterns and gain

of Cobham EXPLORER 8100 Ku VSAT antenna

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Classification (*)	CO

Summary:

This report deals with the measurements of the Cobham Explorer 8100 Ku VSAT antenna, carried out in May 2015 in the Politecnico di Torino Antenna Laboratory (LACE). Measurements of gain and radiation patterns have been carried out, in various configurations, on the antenna ports (in transmission and reception), for V and H polarizations in the frequency ranges 10.7-12.75 GHz (RX) and 12.75-14.5 GHz (TX).

*Classification: PU-Public, LI-Limited, CO-Company Confidential

Document history

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1	June 17, 2015	Gain and pattern measurements (1st draft)	M. Orefice, G. Dassano

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U. Gothelf	Cobham SATCOM
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1. INTRODUCTION

In this document are reported the results of the tests on an antenna manufactured by Cobham, a Ka band antenna for satellite communication, indicated as **EXPLORER 8100 Ku VSAT Antenna**, P/N: 408147A. The antenna (an offset parabolic reflector manufactured in CFRP) has a circular aperture with diameter of 100 cm.

The feed is linearly polarized, and has two ports, one for reception and another for transmission. For the reception, the feed is connected to the input port through a flexible waveguide, so that it can be rotated mechanically to V and H (or to any other) polarization: The transmission port, on the contrary, is placed near the feed (as shown in fig. 8). As it will be seen in Sect.3.1, the flexguide introduces a small additional attenuation, that can be seen in the gain values at 12.5 GHz (a frequency that belongs to both RX and TX bands), showing a difference aof bout 0.4 dB.

This Report presents analyses and measurements of gain and radiation patterns of a prototype of the antenna tested in the frequency bands 10.7-12.75 GHz in reception, and 12.75-14.5 GHz in transmission.

The measurement was carried out in LACE's outdoor far field test range, with a distance SRC-AUT of 150 m. With this antenna the far field distance at the maximum frequency is less than 100 m.

This report, in particular, provides the following results:

- The swept frequency measurement of the maximum gain of the antenna, for vertical polarization, in the RX band 10.7-12.75 GHz and in the TX band 12.75-14.5 GHz. Both plots have value labels for the most significant frequencies (5 in RX, 8 in TX).

- For the RX band, the radiation pattern in the principal planes (vertical, or elevation, and horizontal, or azimuth) at 10.7, 10.95, 11.7, 12.5, 12.75 GHz (5 frequencies) for the direct and cross polarizations. For the vertical polarization, results are given for both azimuth and elevation planes (in the azimuth plane the scan is made over the full 360° angle, with zooms in the ±30°and ±10° ranges, in the other plane the scan is limited to ±10°). For the horizontal polarization, results are given in the elevation plane only (±10° range).

- In the TX band, the radiation pattern in the principal planes (vertical, or elevation, and horizontal, or azimuth) at 12.75, 13, 13.25, 13.5, 13.75,14, 14.25, 14.5 GHz (8 frequencies) for the direct and cross polarizations. For both vertical and horizontal polarization, results are given for azimuth and elevation planes (in the azimuth plane the scan is made over the full 360° angle, with zooms in the ±30°and ±10° ranges and numerical details of the overshoots, in the other plane the scan is limited to ±10°).

- Still in the TX band, for the vertical polarization, the raster plots for the overshoots on the cross-polar component (range of ±4° and zoom to about ±6°, i.e. the -1dB angle), and for the co-polar component (range of ±4° and zoom to about ±2°, i.e. the -3dB angle). More details are given in sect. 3.3, p.9.

• 2. MEASUREMENTS FACILITIES DESCRIPTION

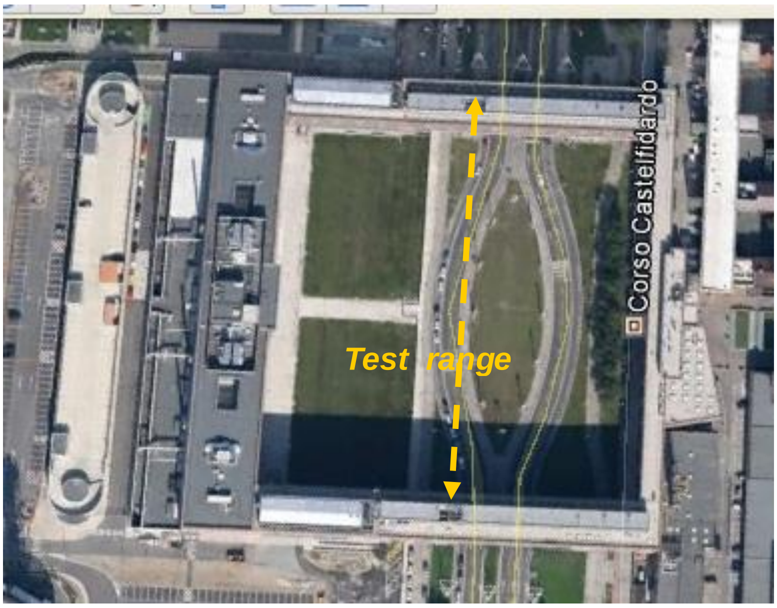
2.1 Gain and pattern measurements

The measurements have been performed in the outdoor test range of the Laboratory (see fig.1).

The present test range, who has replaced the old one used since the early '60es for pioneering works on space antennas, has been supplied from MI Technologies (formerly Scientific Atlanta) and installed in February 2008.

In this test range the Antenna Under Test (AUT), used as receiver, and Source (SRC) are placed on the roof of two different buildings, the Department of Electronics and Telecommunications and the Department of Control and Computer Engineering. The two buildings are far apart (more than 150 m) without obstacles in between, and the height of both AUT and SRC is 30 m above the ground; the range is schematically shown in fig.1 (plan and elevation). It is also possible to use a SRC at a slightly lower level, to reduce the scattering from the back of the range.

Due to the elevated range, there are many Fresnel zones without obstacles. The effects of the reflection on the ground can be removed by a time windowing, with some directivity of the source and also considering that the incidence angle on the ground is near to the Brewster angle.



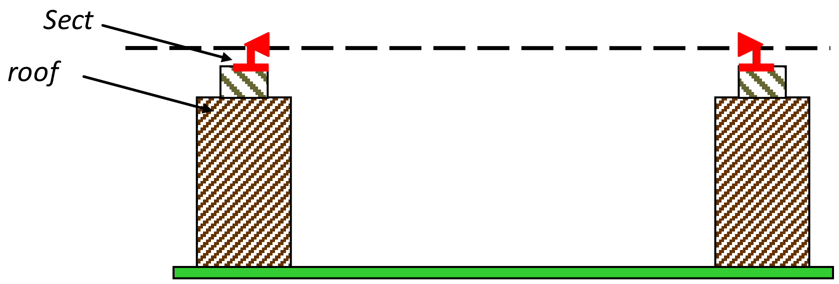


Fig.1: Plan view and vertical section of the outdoor test range

The design frequency interval is 100 MHz-50 GHz (the upgrade from 20 to 40 GHz has been added in 2011; from 40 to 50 GHz in 2015). The distance between SRC and AUT allows to test antennas up to 0.7m diameter at 40 GHz; at lower frequencies the maximum size in meters is given by $D \cong 4.7/f^{1/2}$, where f is the frequency in GHz.

The dynamic range is around 90 dB (depending on the frequency). The receiver can handle up to 16 measurements channels, with external switching system, and 1 reference channel measured simultaneously with each signal channel, with 100 dB isolation Channel to Channel (110 dB . Reference Channel to Signal Channel). The accuracy in amplitude (Logarithmic mode) is ±.05 dB/10 dB over the full dynamic range (excluding effects of temperature, cross-talk and noise) and ±0.4 °/10 dB in phase over full dynamic range; the noise figure is 17 dB at 0.1 to 18 GHz. The most recent calibration of the whole system has been in June 2014.

The positioning system of the AUT is a 3-axis system (roll over azimuth over elevation), consisting of: MI53150 Az/El and MI6111 rotary positioner (see fig.2, left). The Az/El accuracies are respectively 0.03° and 0.05° with max load 1136 kg and bending moment 3390 N·m; the roll accuracy is 0.05° with max load 455 kg and bending moment 678 N·m. As a practical guideline, the system can measure antennas up to 2m in size and to 70 kg in weight: actual limits depend however on the shape of the antenna. This positioning system allows to take pattern cuts as well as raster scan of the pattern, and to measure circular and linear polarization. The full system cabling diagram is shown in fig. 3. Examples of measured radiation patterns are shown in fig. 4.

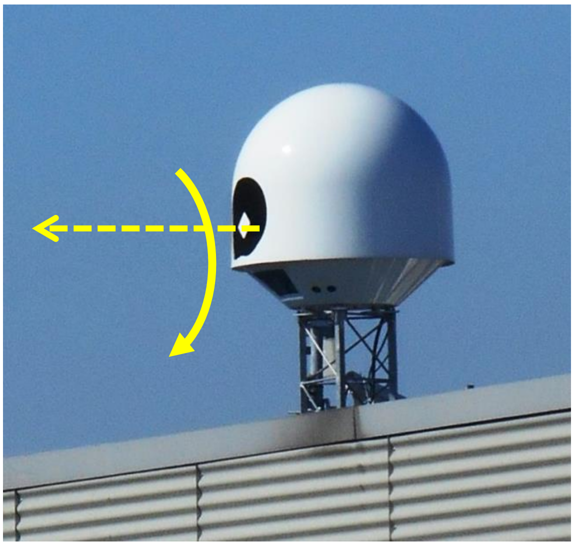
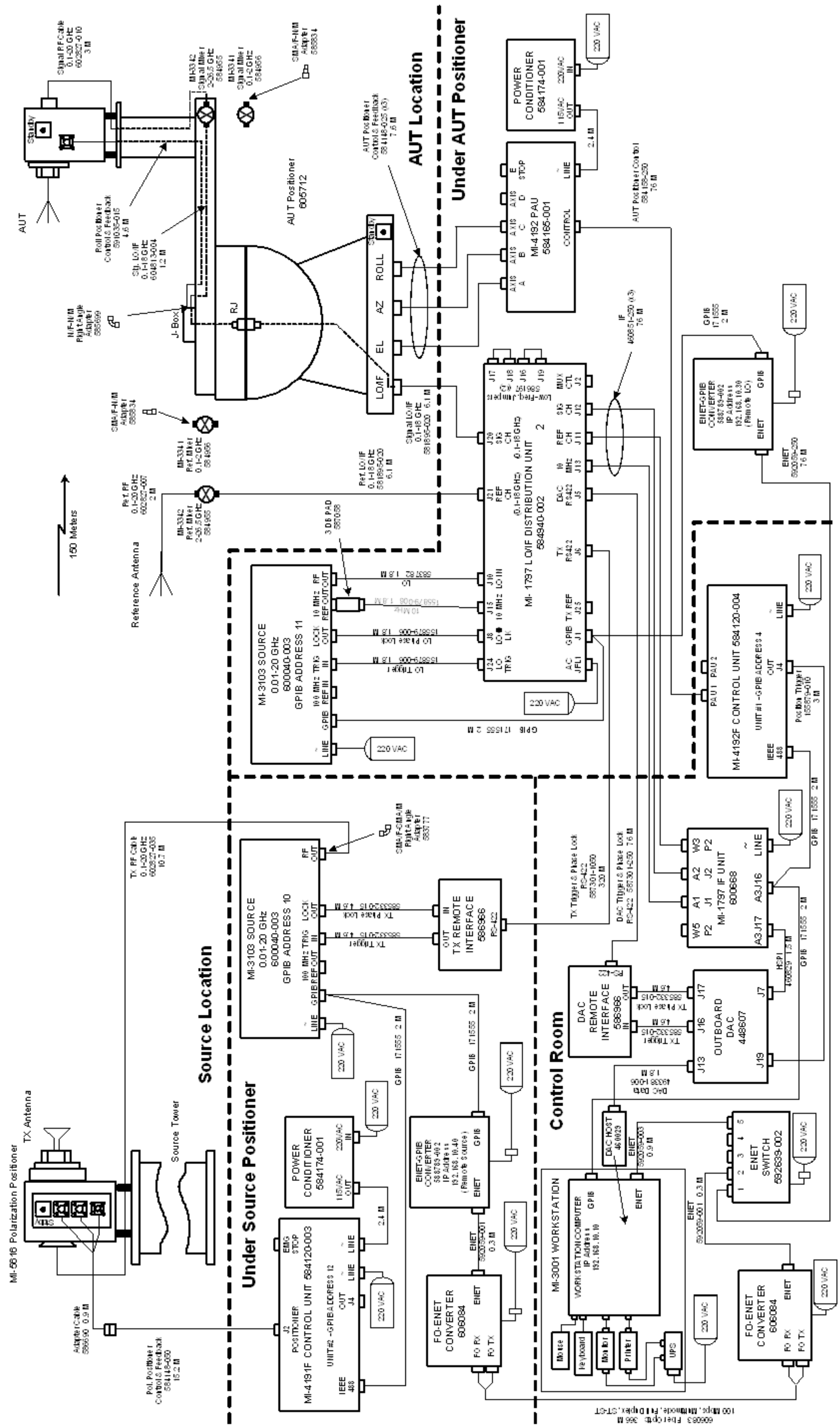


Fig.2: Outdoor test range: the AUT mount (left) and the upper SRC mount (right).



. Fig.3: The full system cabling diagram.

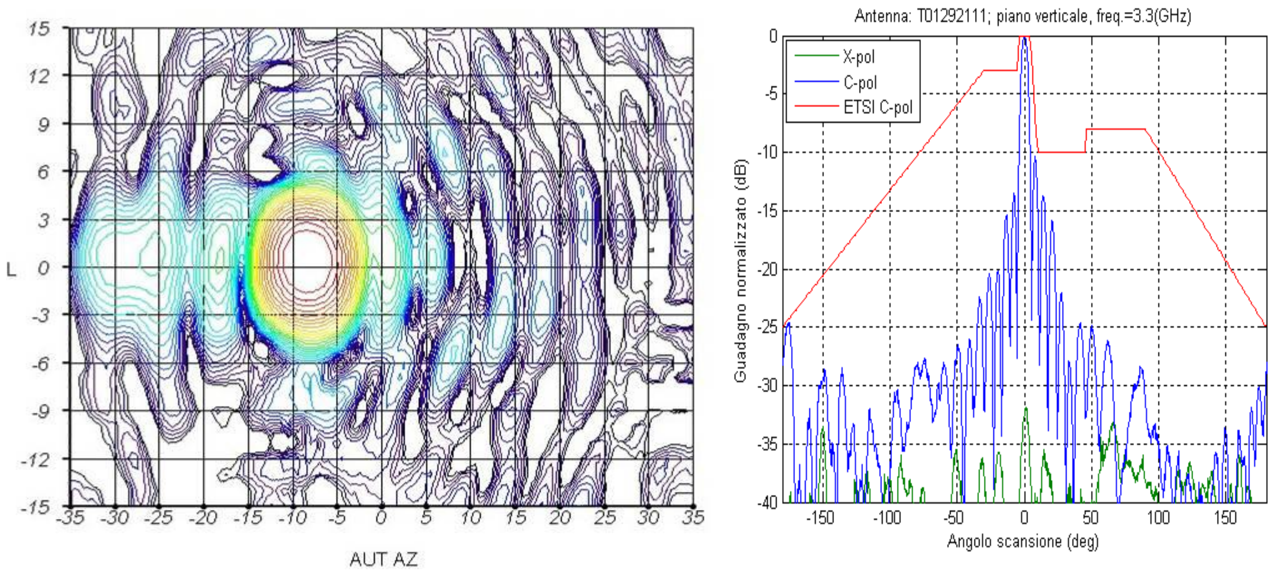


Fig.4: Examples of radiation patterns measured in the Outdoor Test Range.

3. MEASUREMENTS PROCEDURES

3.1 Gain measurement

The standard procedure for this type of measurement is the "substitution method". The Antenna Under Test (AUT) operates in reception. The maximum signal level received (at all ports) from the AUT, pointed with the maximum to the source antenna, is measured, with a frequency sweep in the required frequency band. Then the AUT is replaced by a Standard Gain Horn antenna (SGH) with known gain, with the maximum to the source antenna, and again the maximum signal level received from the is recorded. The gain of the AUT is derived from the simple formula (in dB)

$G_{AUT} = G_{SGH} + (P_{rAUT} - P_{rSGH})$

The gain vs frequency is plotted in Cartesian plot, in dB scale.

3.2. Radiation pattern measurements

Since the patterns are required in various phi-cuts (azimuth, elevation and ±45°) as well as in a raster scan around the main beam, the standard procedure is to measure, at discrete frequencies, the received power from the AUT from each port, when transmitting from the source three different linear polarizations (0°, 90°, 45°). The three received signals are then combined to obtain the two opposite circular components.

The radiation patterns are plotted in dB scale, in the desired angular range.

3.3. Raster scan measurements

The raster scan is obtained by an AZ scan for a variable EL angle for Co-pol and X-pol components . The data collected are plotted on 3D graphs that show AZ and EL axis and the X-pol component normalized respect the its max value increased of 1dB; and the Co-pol component overshoots with respect to the mask 29-25log(θ).

Examples and details about raster plots are summarized in Fig. 5 and Fig.6:

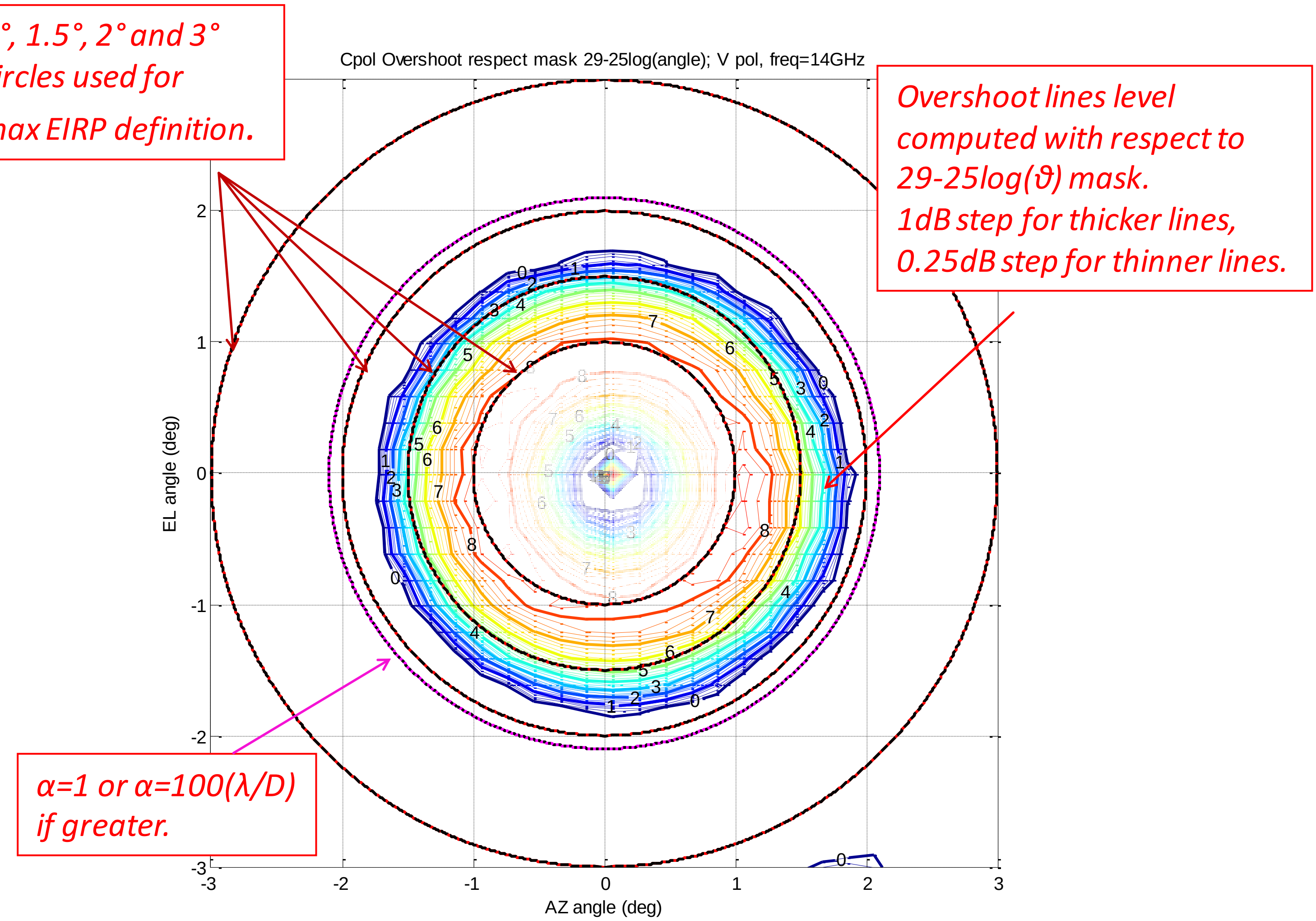


Fig.5: Co-pol raster plot.

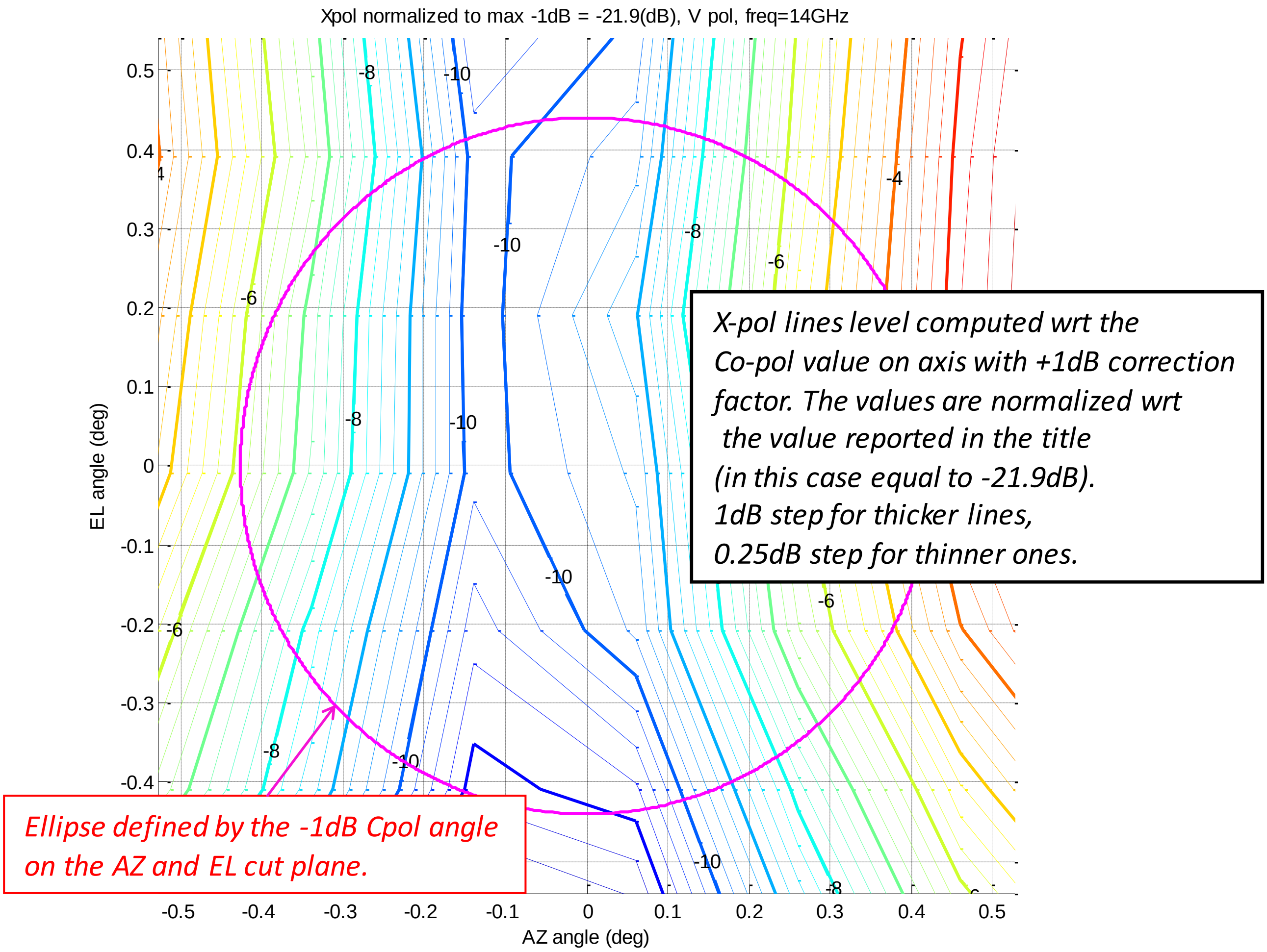


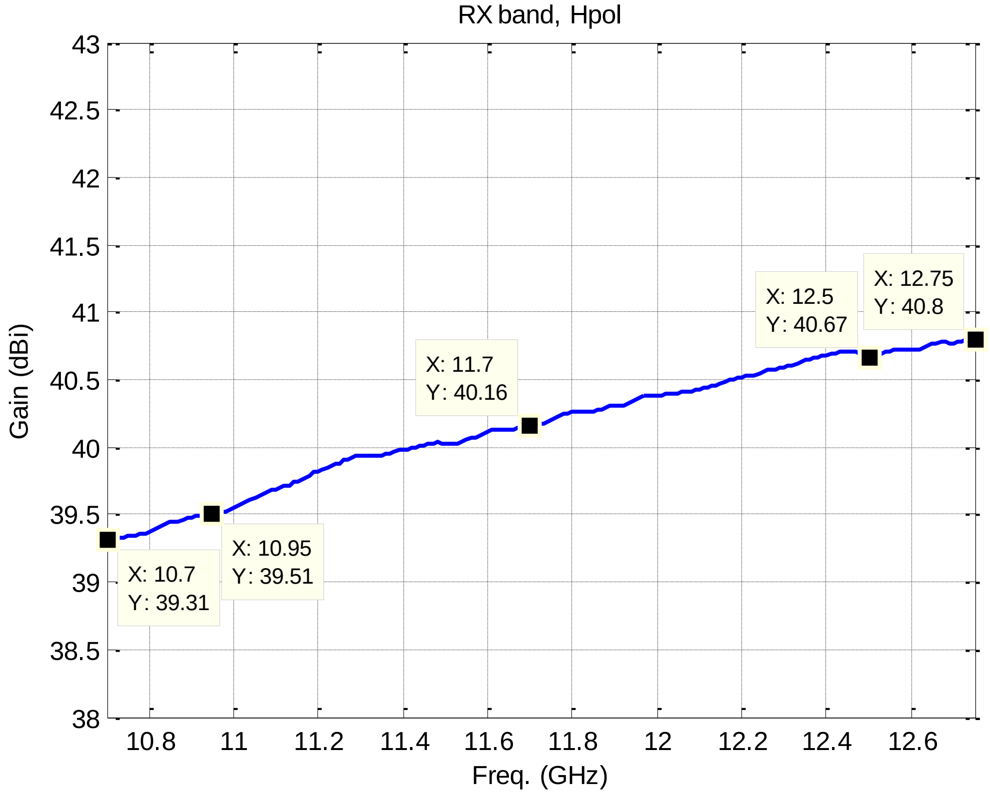
Fig.6: X-pol raster plot.

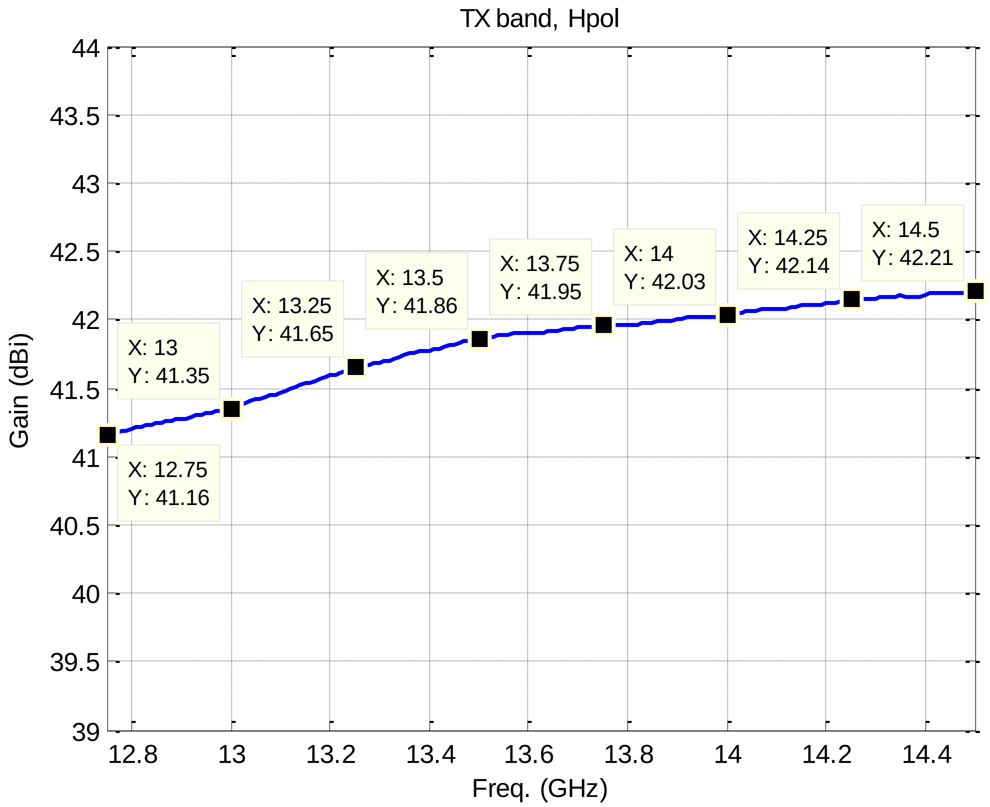
4. PICTURES OF THE MEASUREMENT CAMPAIGN

Fig. 7: The antenna mounted on the reclined and vertical mast.

Fig.8: two views of the feed with the ports and the feeding flexguide.

5. GAIN MEASUREMENTS (Rx and Tx band)

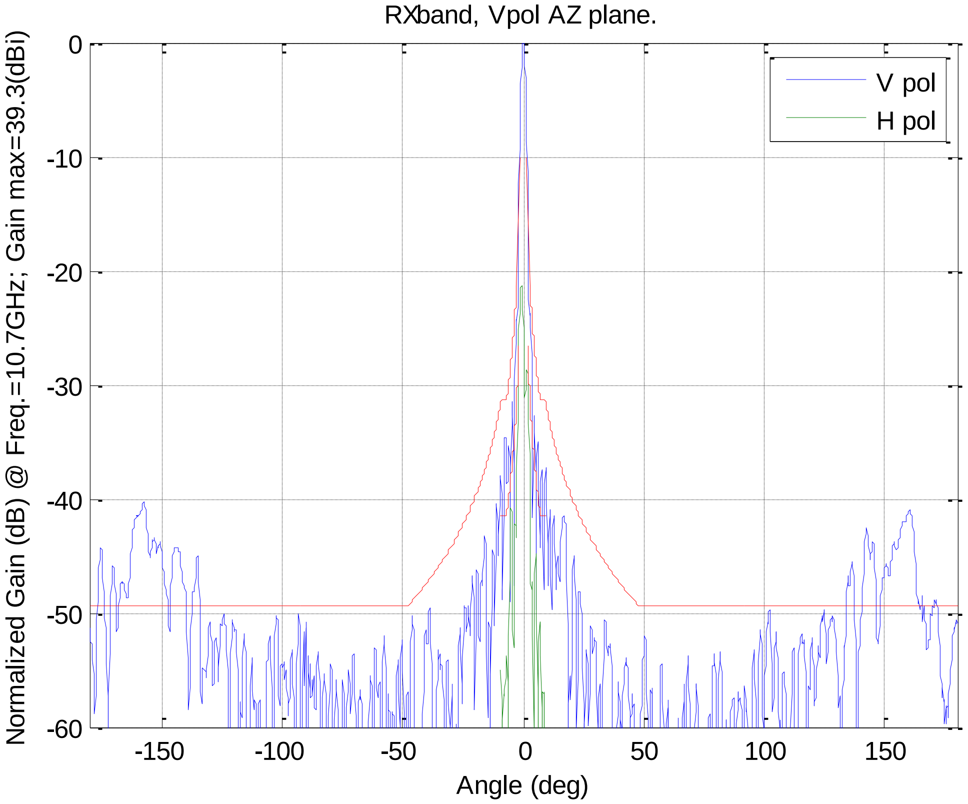


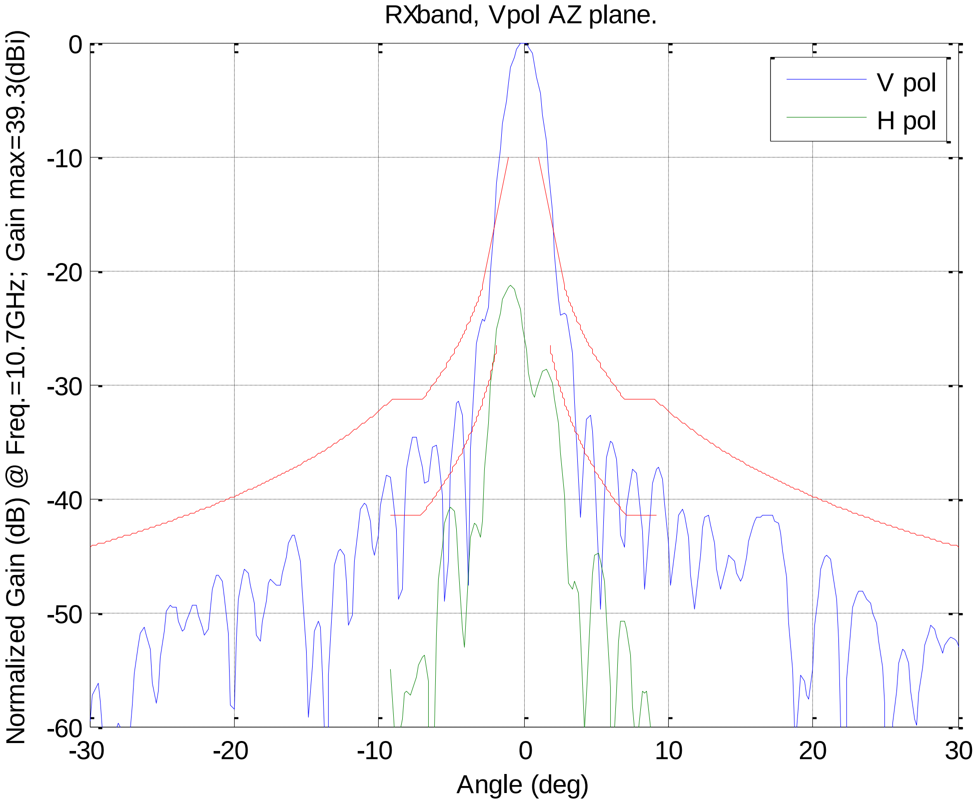


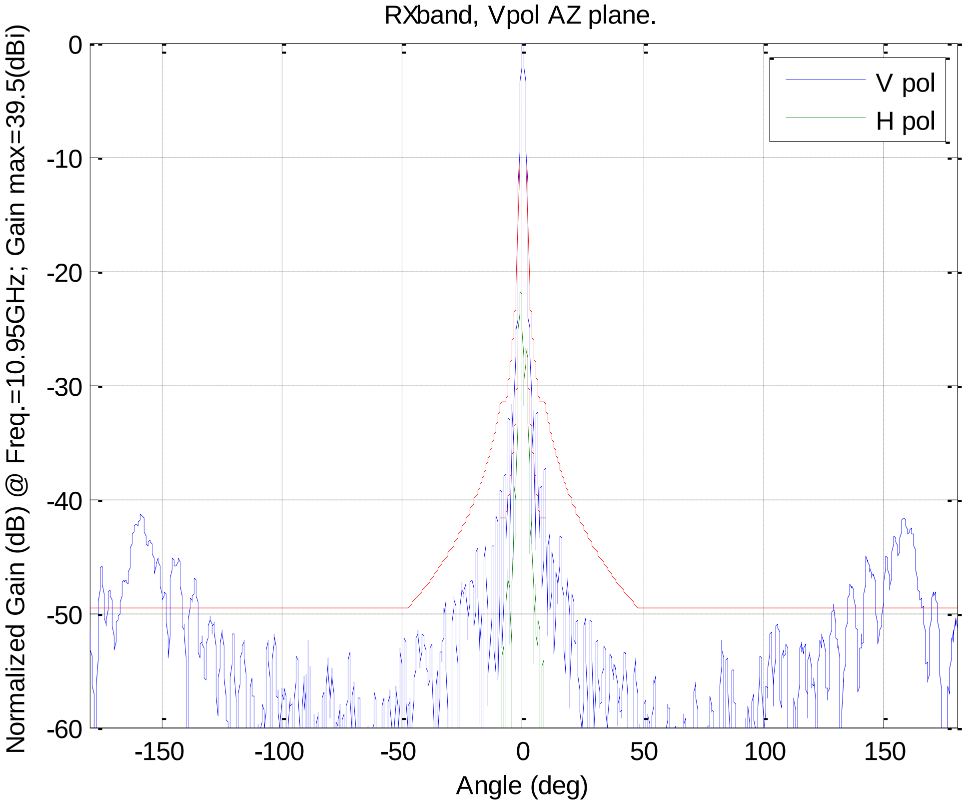
6. RADIATION PATTERN MEASUREMENTS

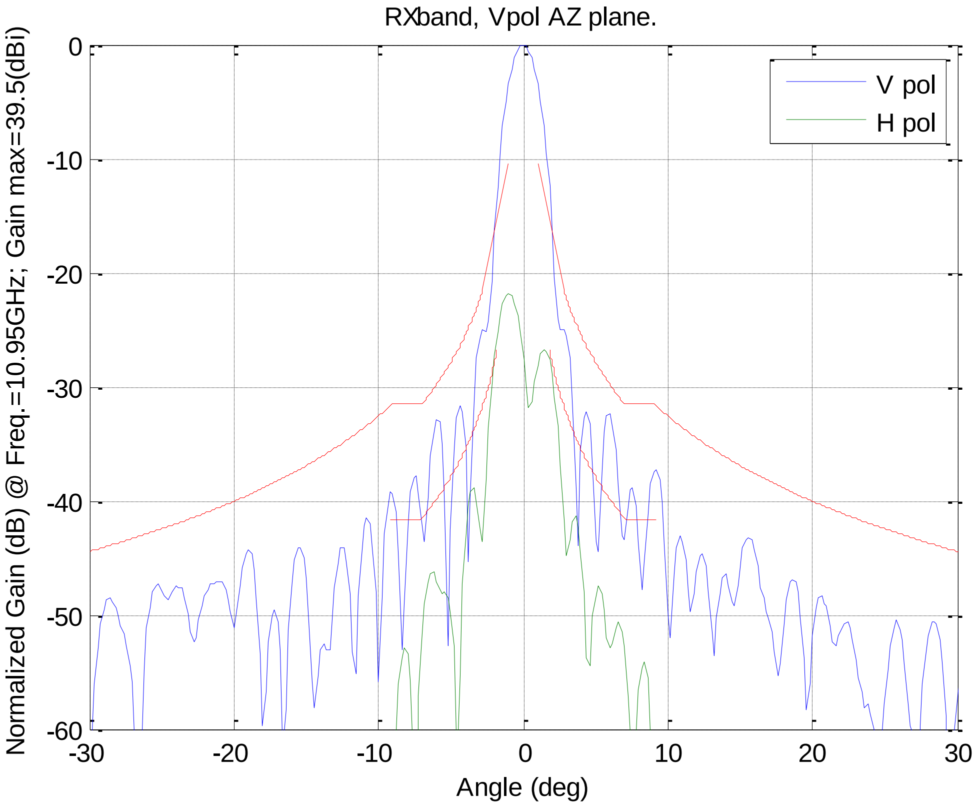
6.1: RADIATION PATTERNS IN RX BAND (10.7-12.75GHZ)

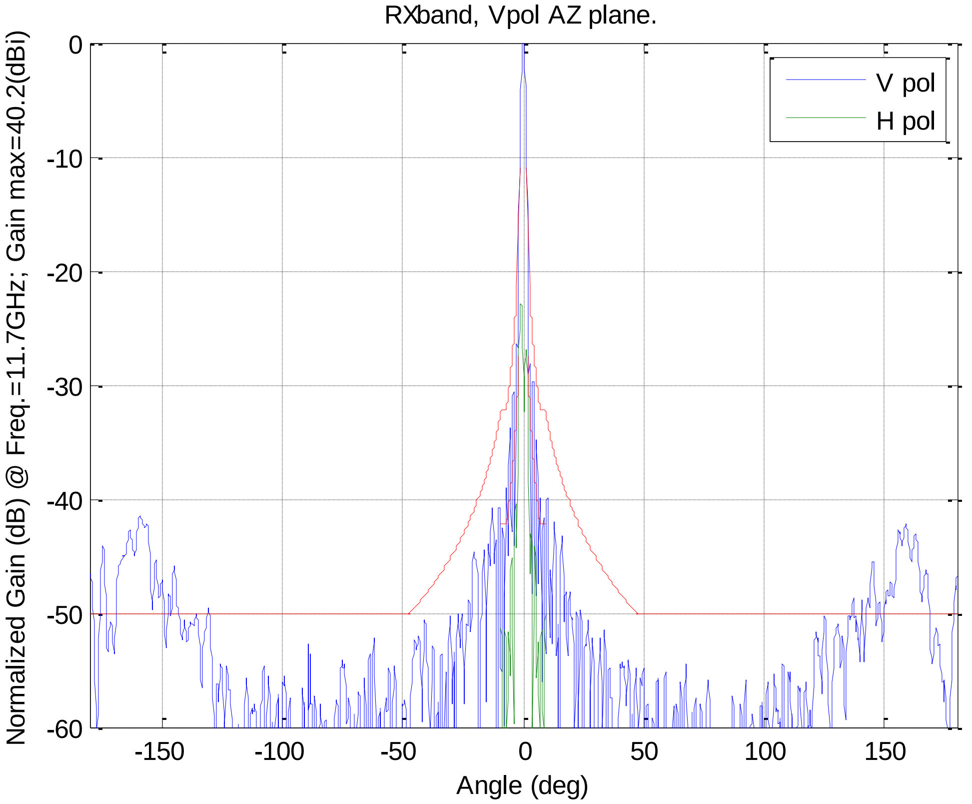
6.1.1: V-POL PORT, AZ PLANE

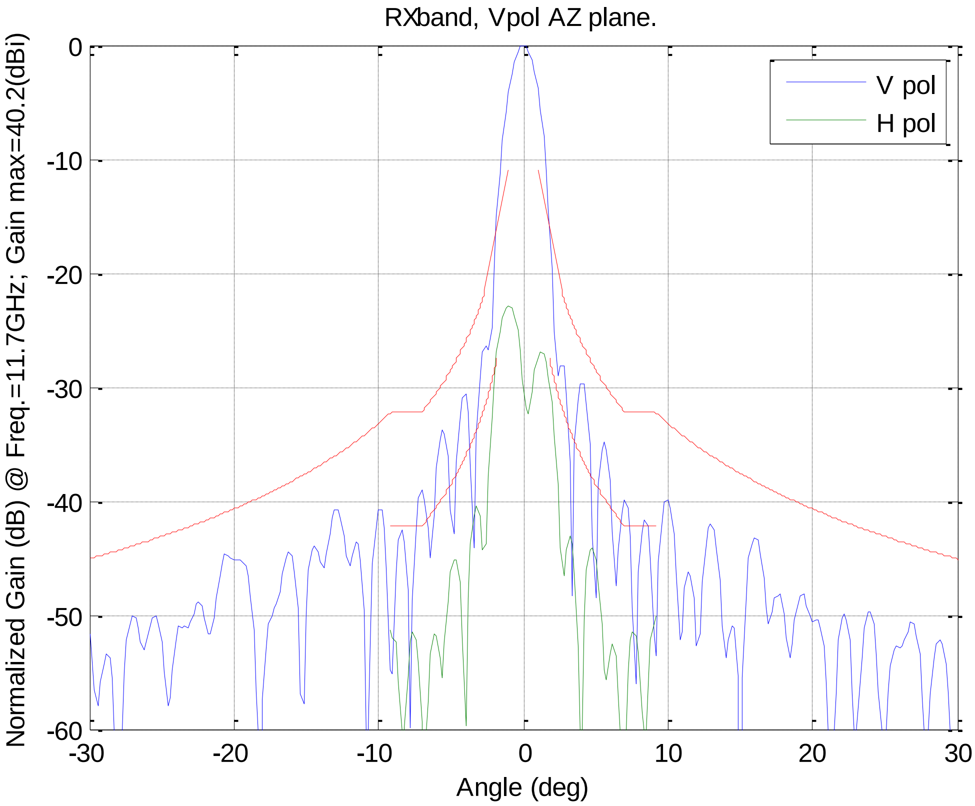


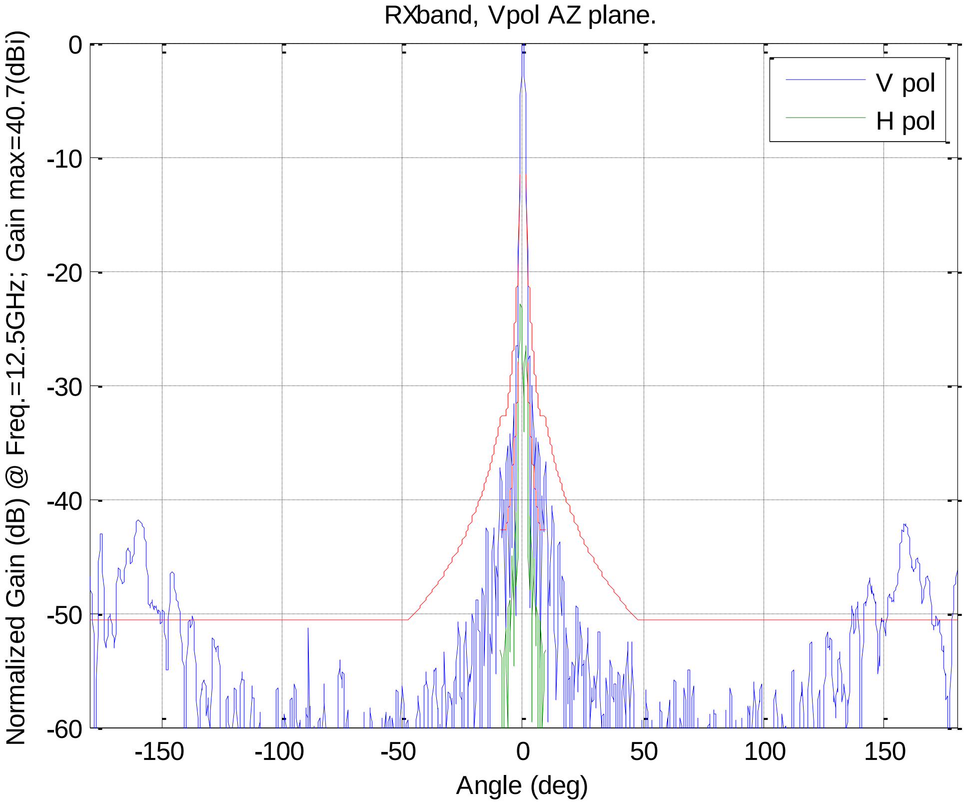


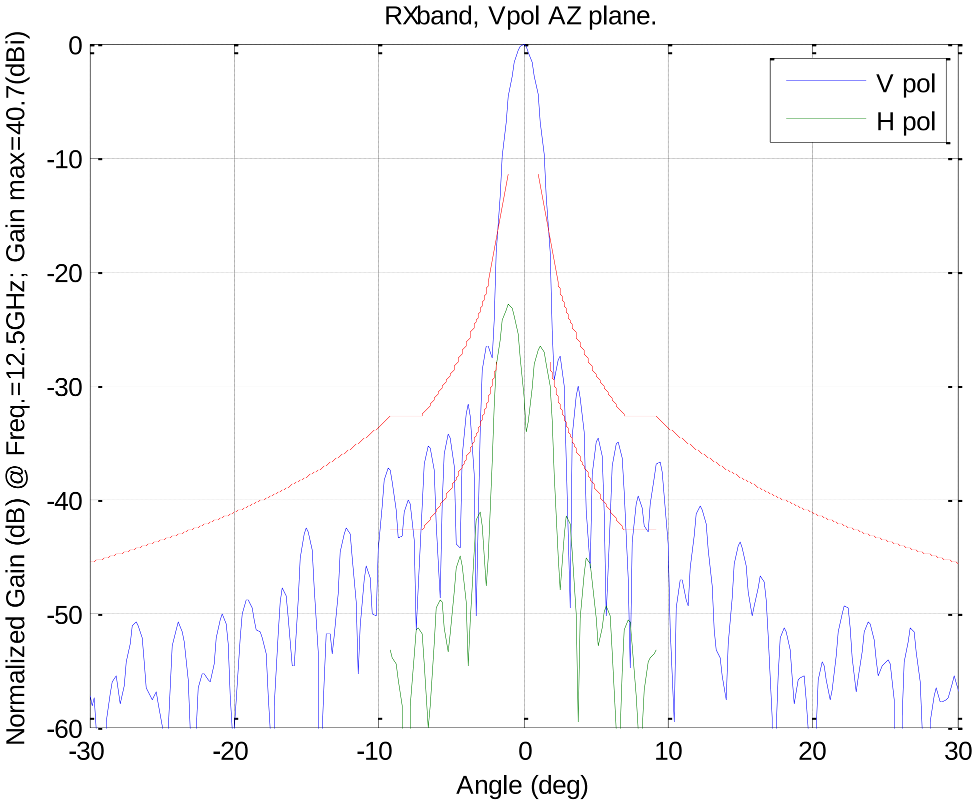

RXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=10.95GHz; Gain max=39.5(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)
V pol
H pol

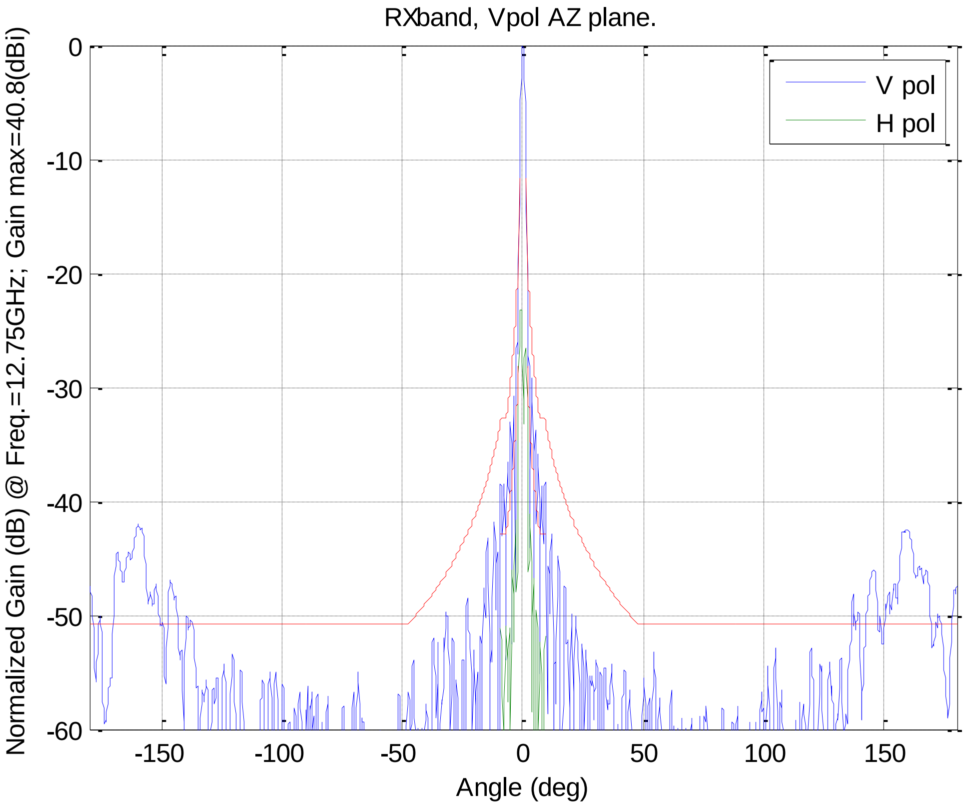

RXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=10.95GHz; Gain max=39.5(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)
V pol
H pol

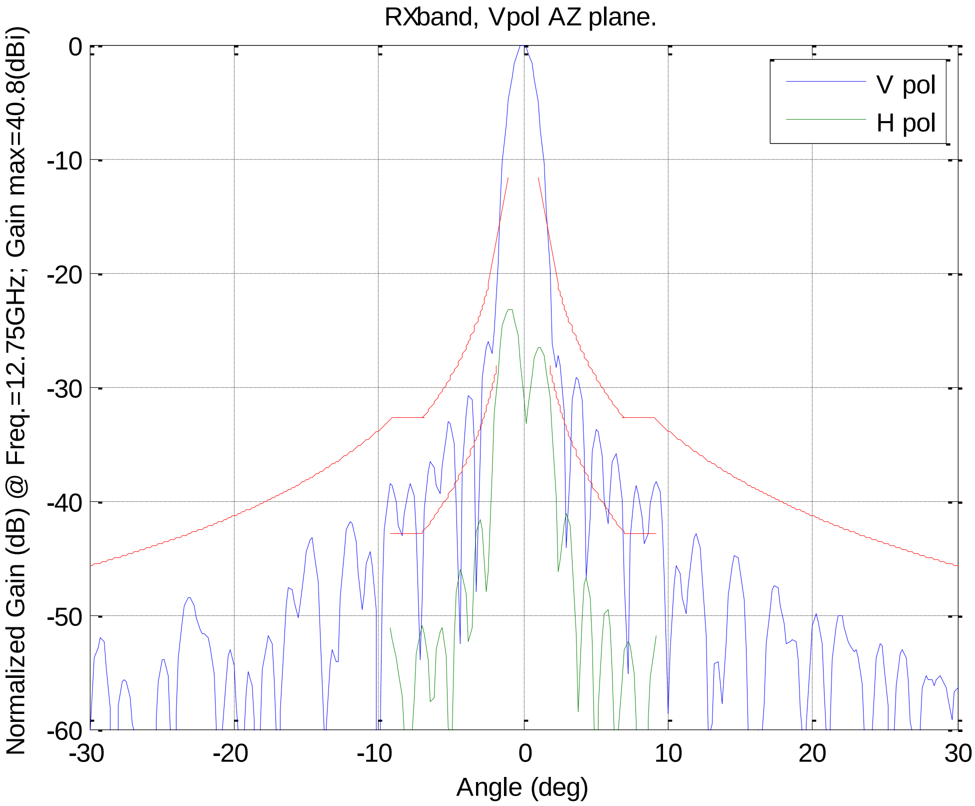

RXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=11.7GHz; Gain max=40.2(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)


RXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=11.7GHz; Gain max=40.2(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)

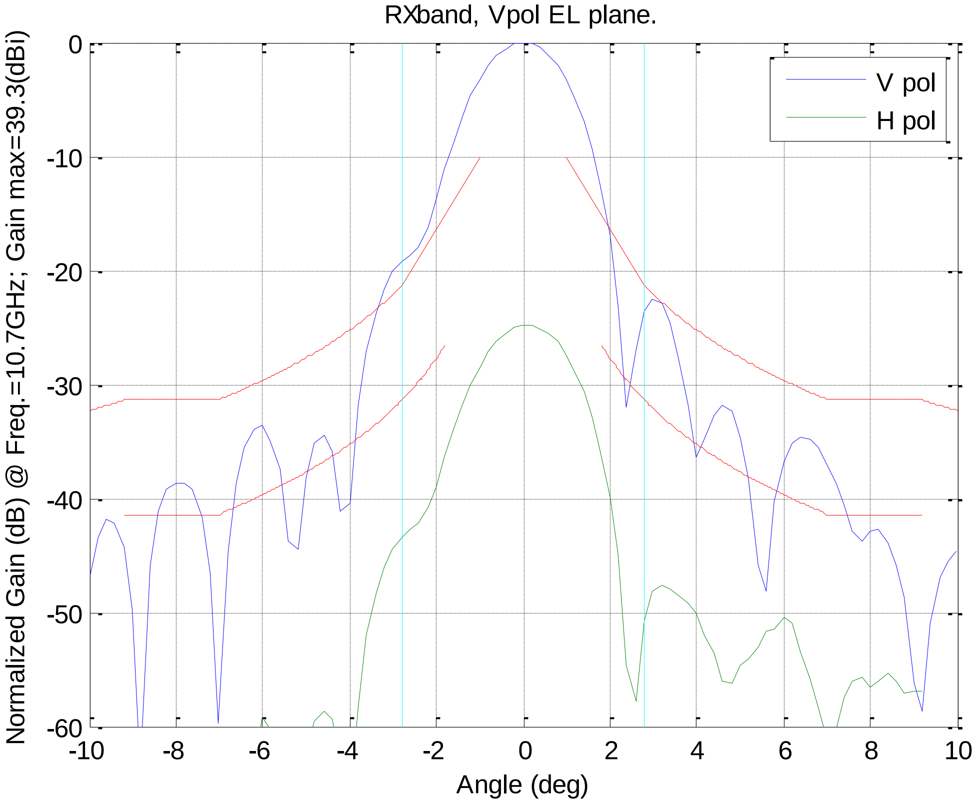

RXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=12.5GHz; Gain max=40.7(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150

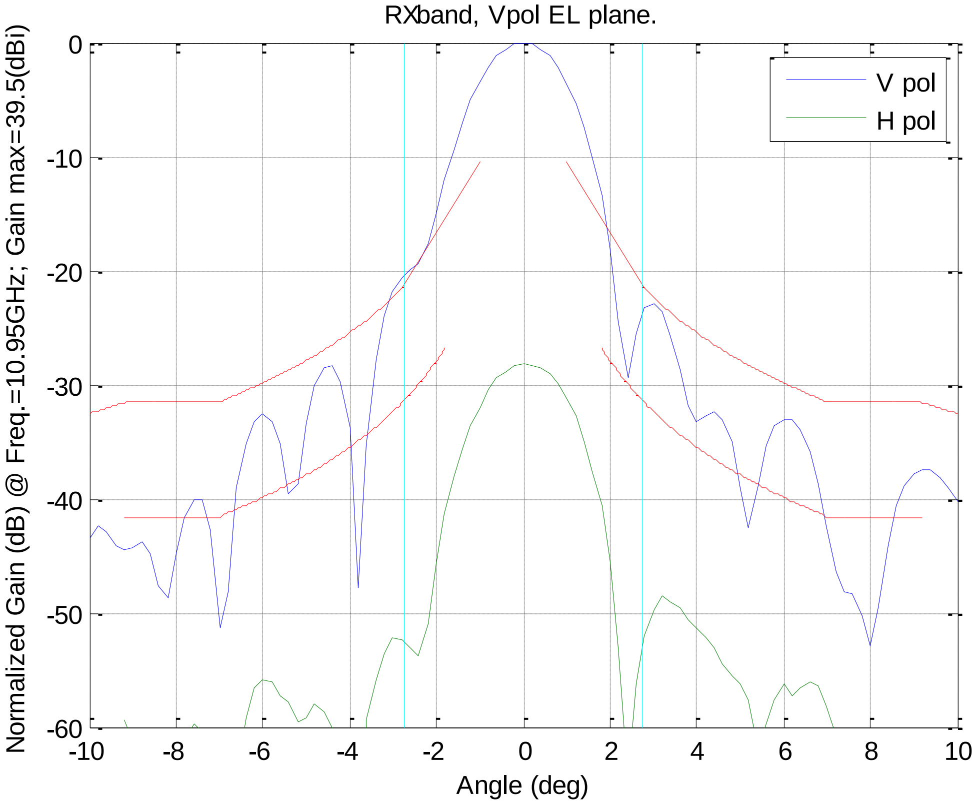

RXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=12.5GHz; Gain max=40.7(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30

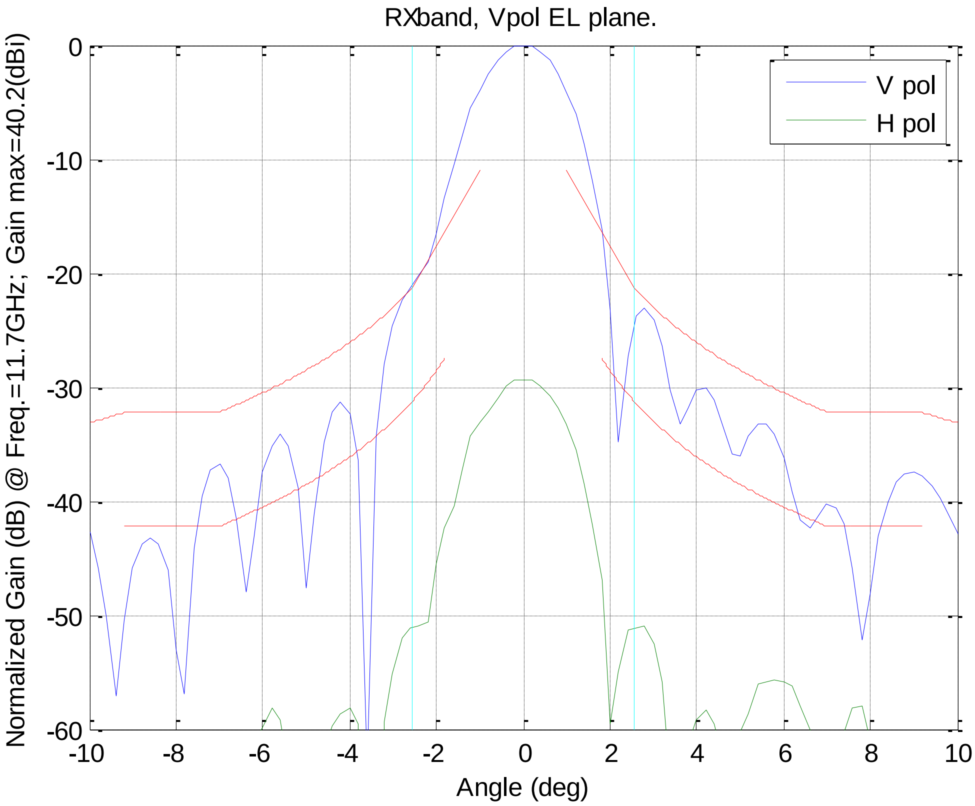

RXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=12.75GHz; Gain max=40.8(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)

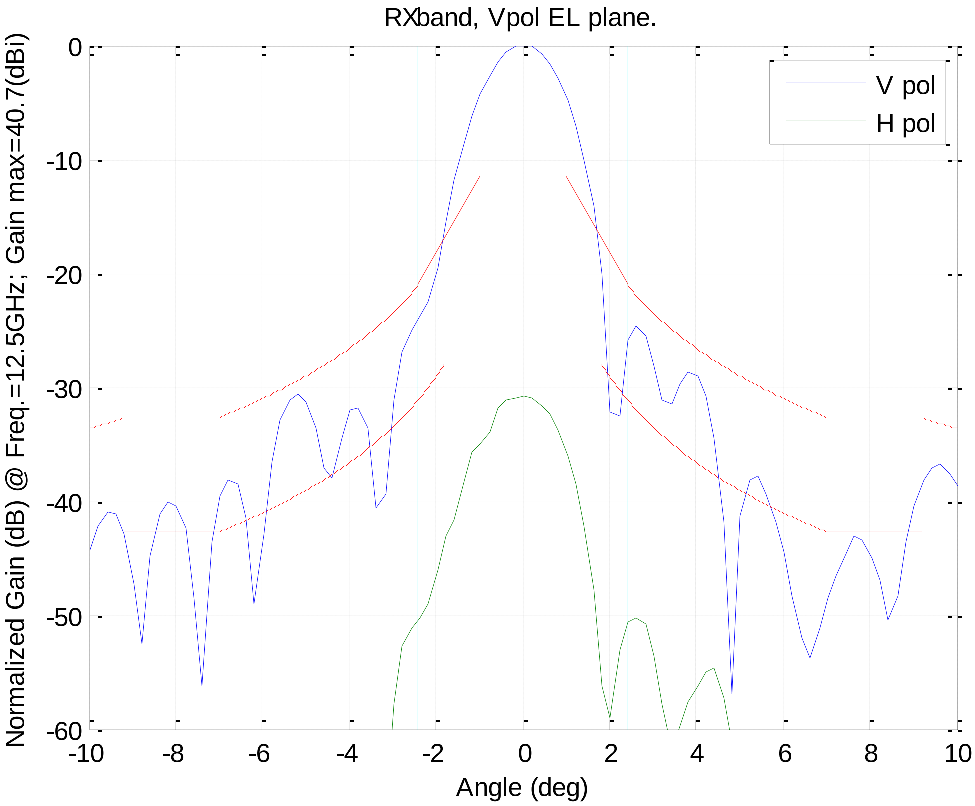

RXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=12.75GHz; Gain max=40.8(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)

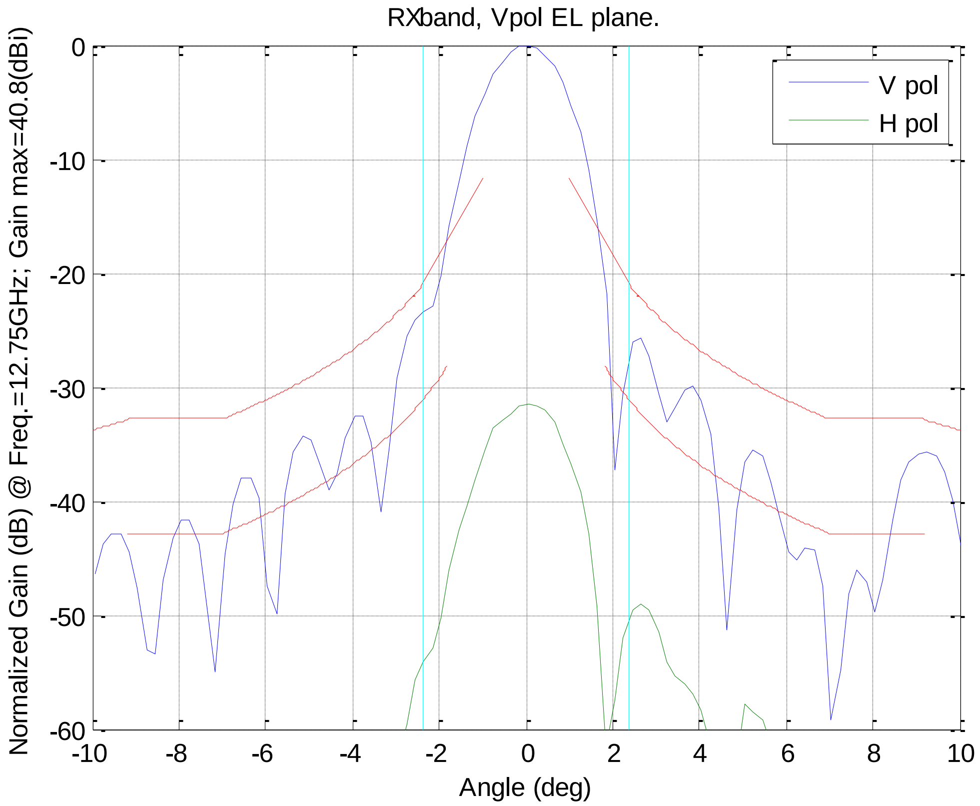
6.1.2: V-POL PORT, EL PLANE



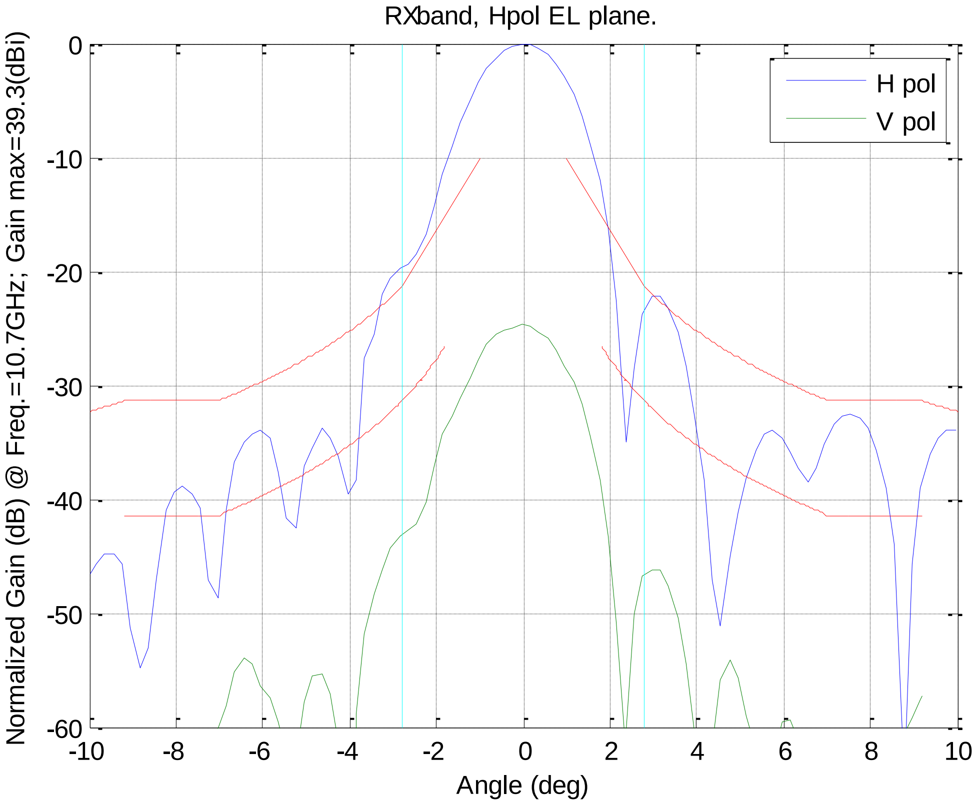


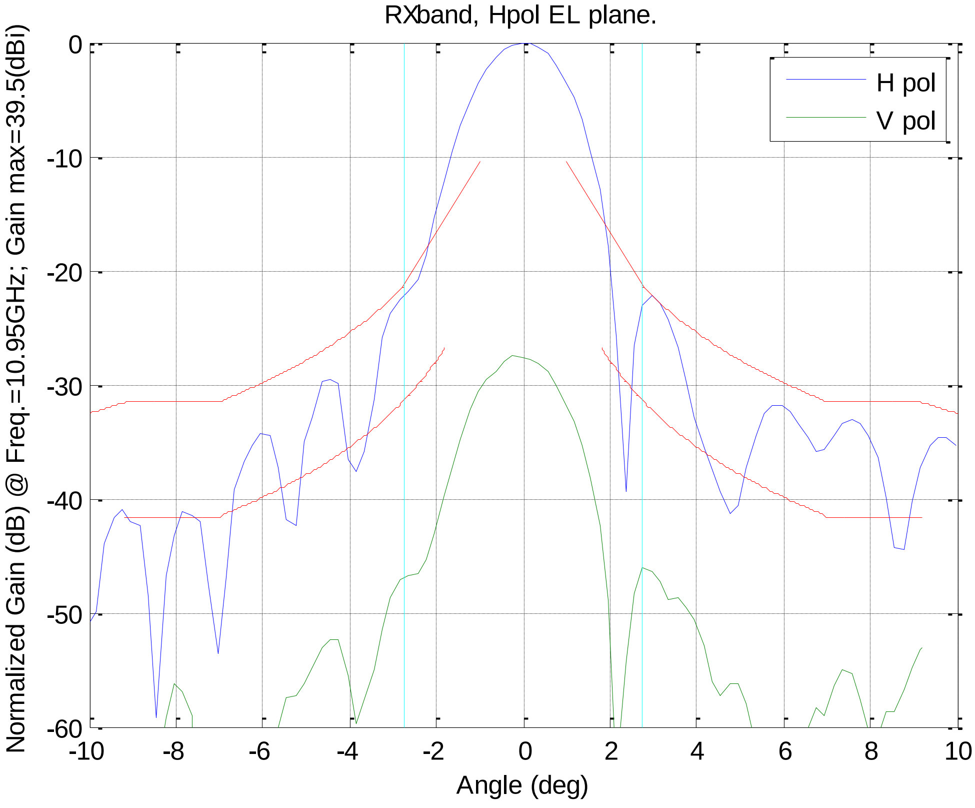

RXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=11.7GHz; Gain max=40.2(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

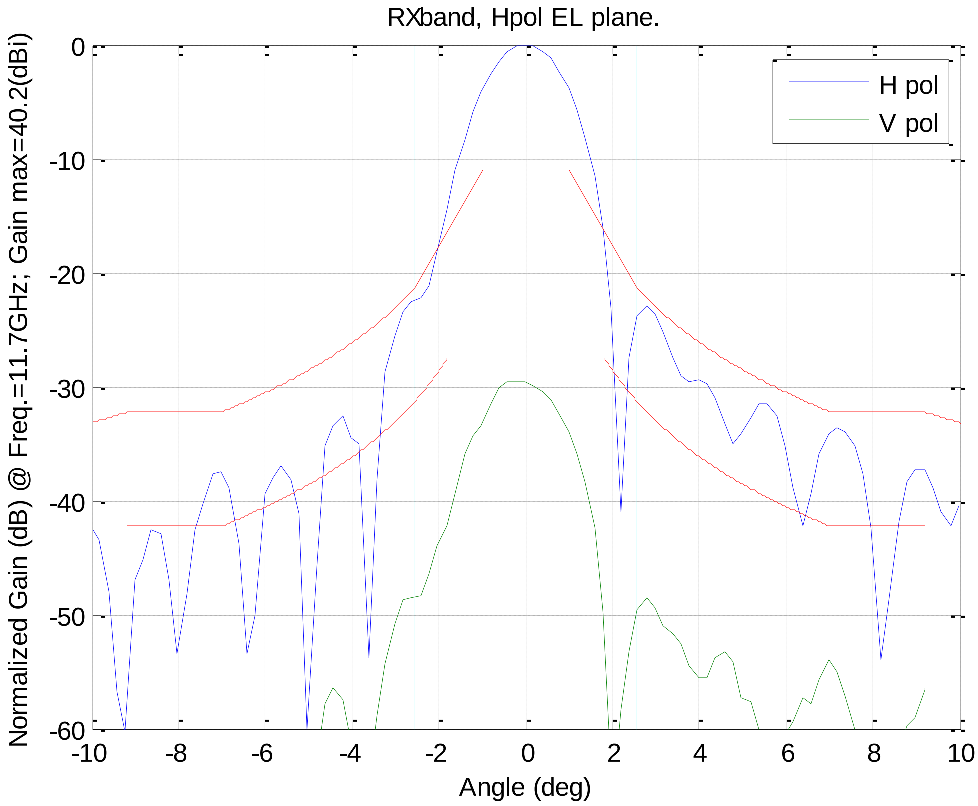

RXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=12.5GHz; Gain max=40.7(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

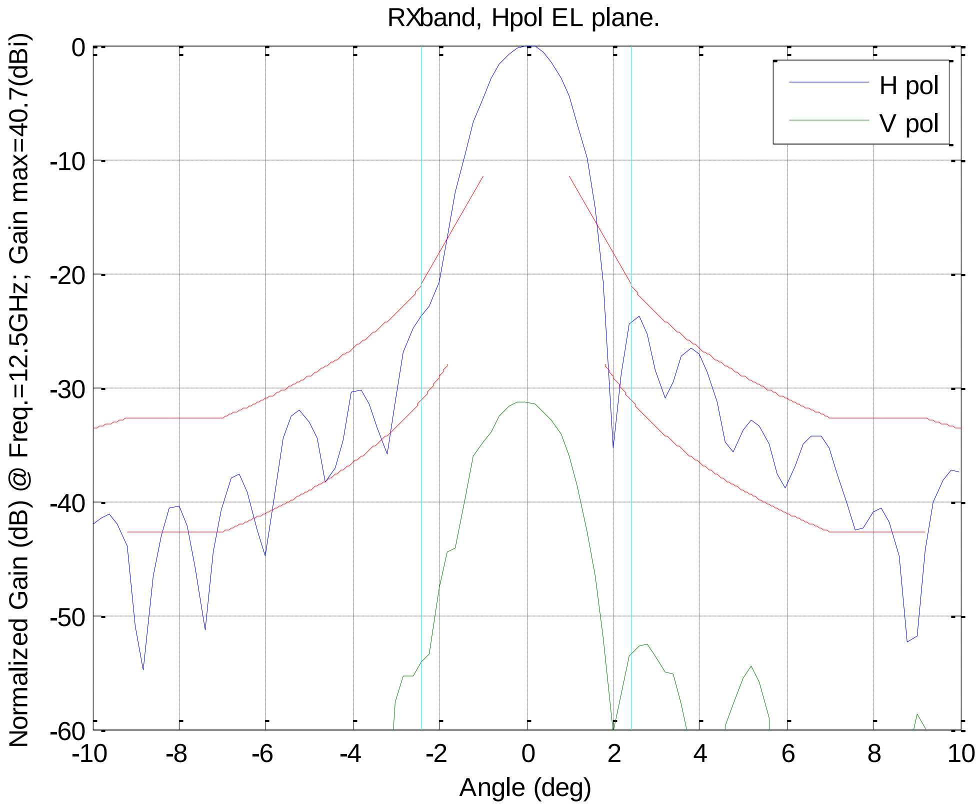

RXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=12.75GHz; Gain max=40.8(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

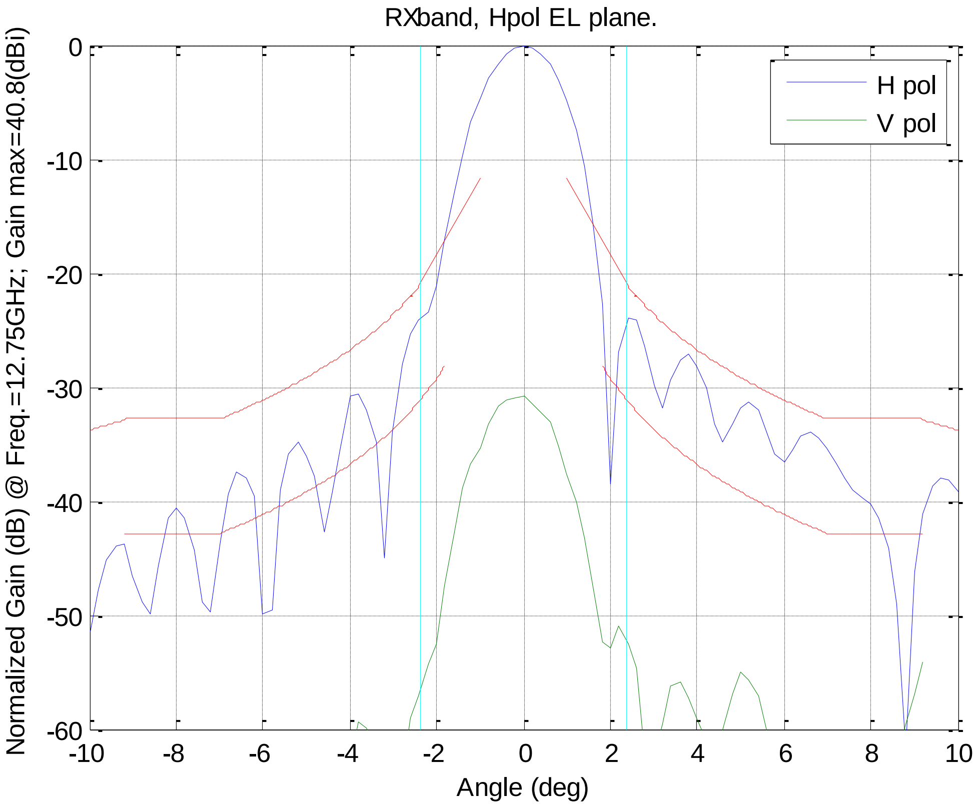
6.1.3: H-POL PORT, EL PLANE





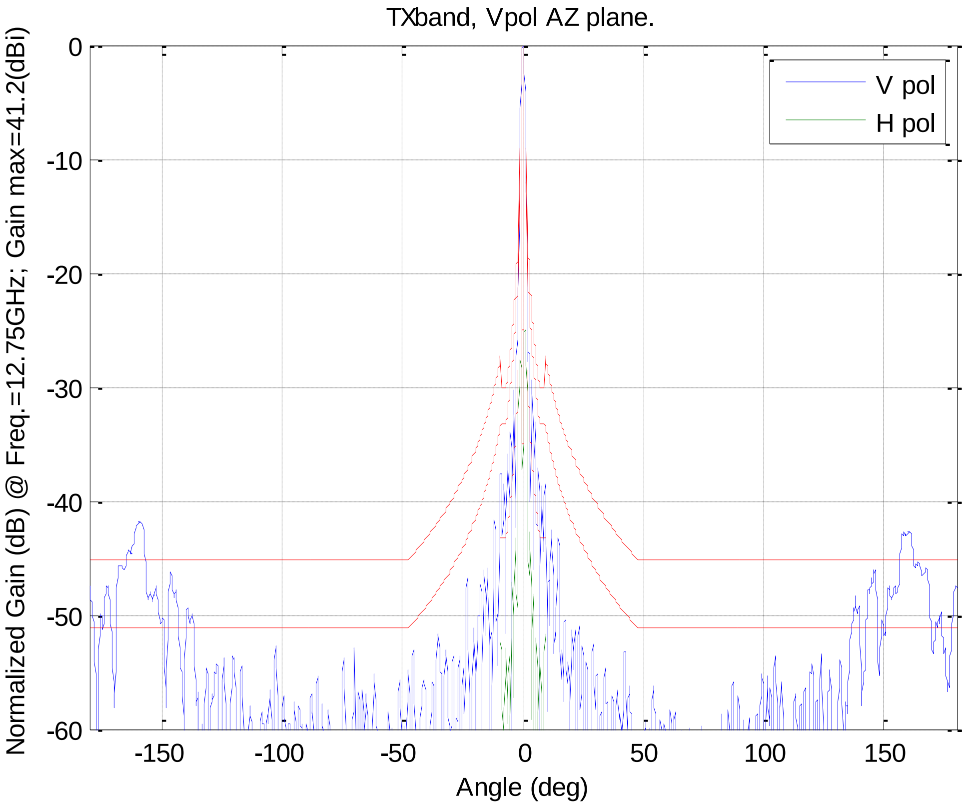

RXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=11.7GHz; Gain max=40.2(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

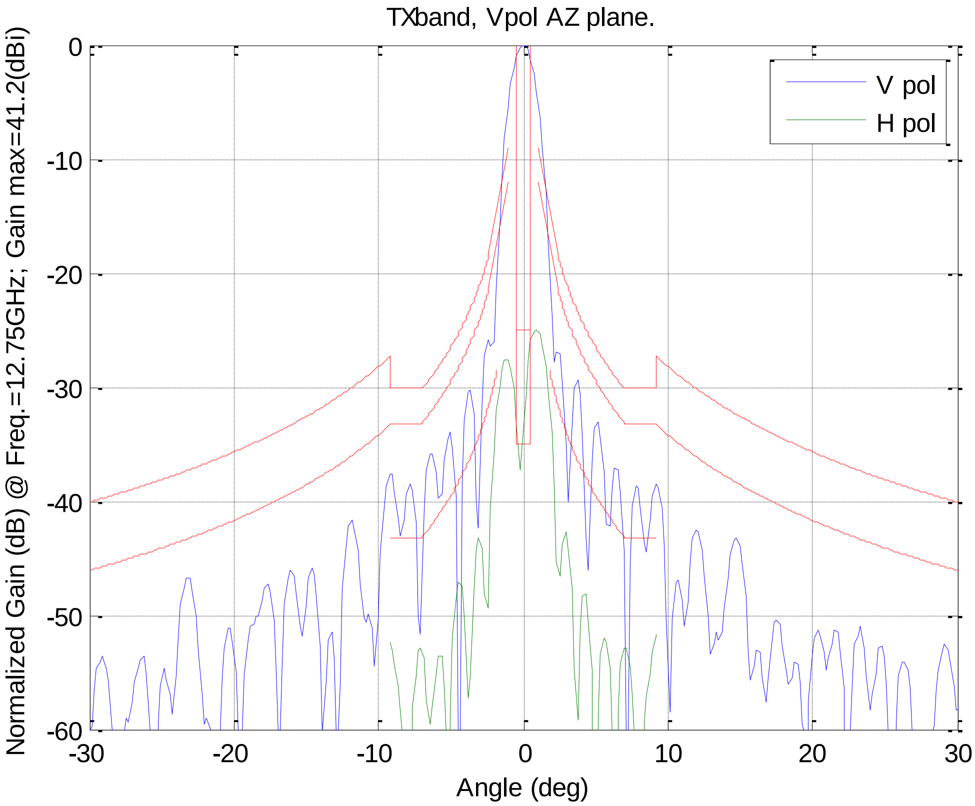

RXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=12.5GHz; Gain max=40.7(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

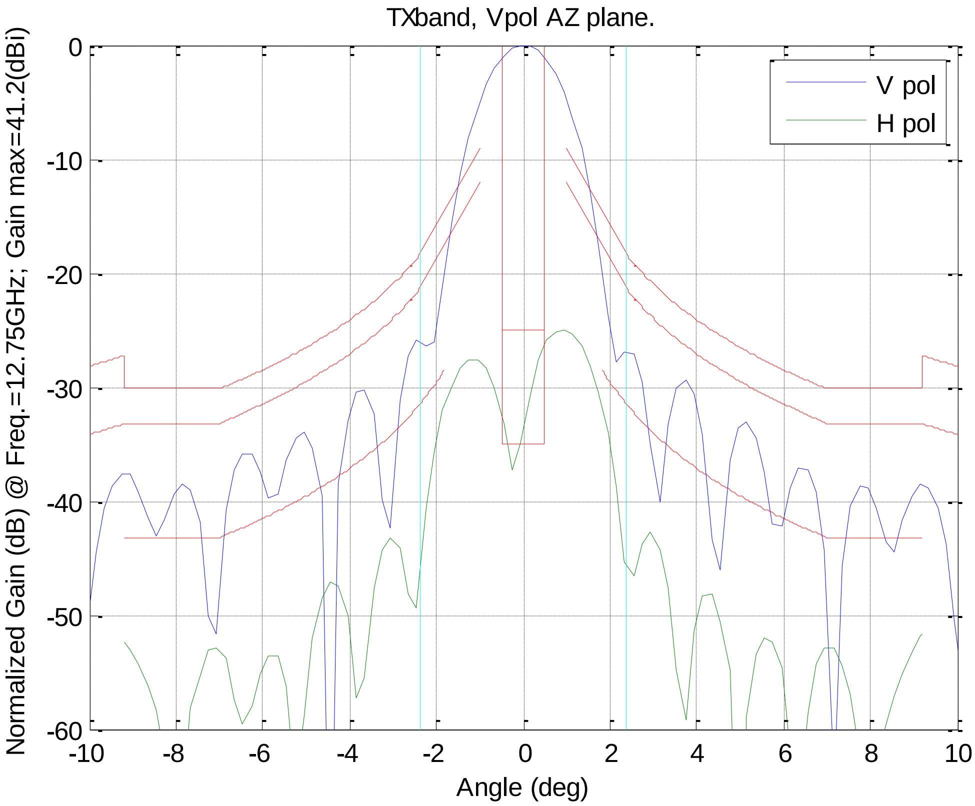

RXband, Hpol EL plane.
H pol
V pol
Normalized Gain (dB) @ Freq.=12.75GHz; Gain max=40.8(dBi)
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10
Angle (deg)

6.2: RADIATION PATTERNS IN TX BAND (12.75-14.5GHZ)

6.2.1: V-POL PORT, AZ PLANE PLOTS AND OVERSHOOTS







\Zplane Vpol @ 12.75GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =18.6%

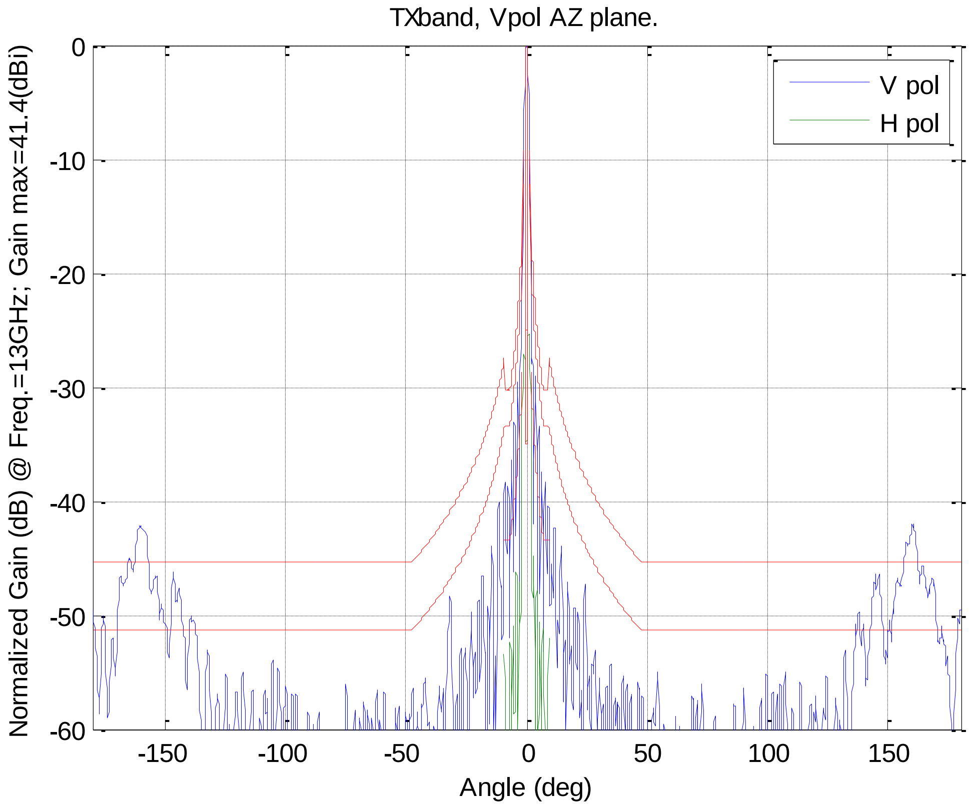
1.0<|α°|<=2.4	2.4<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.4(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	18.5(%)

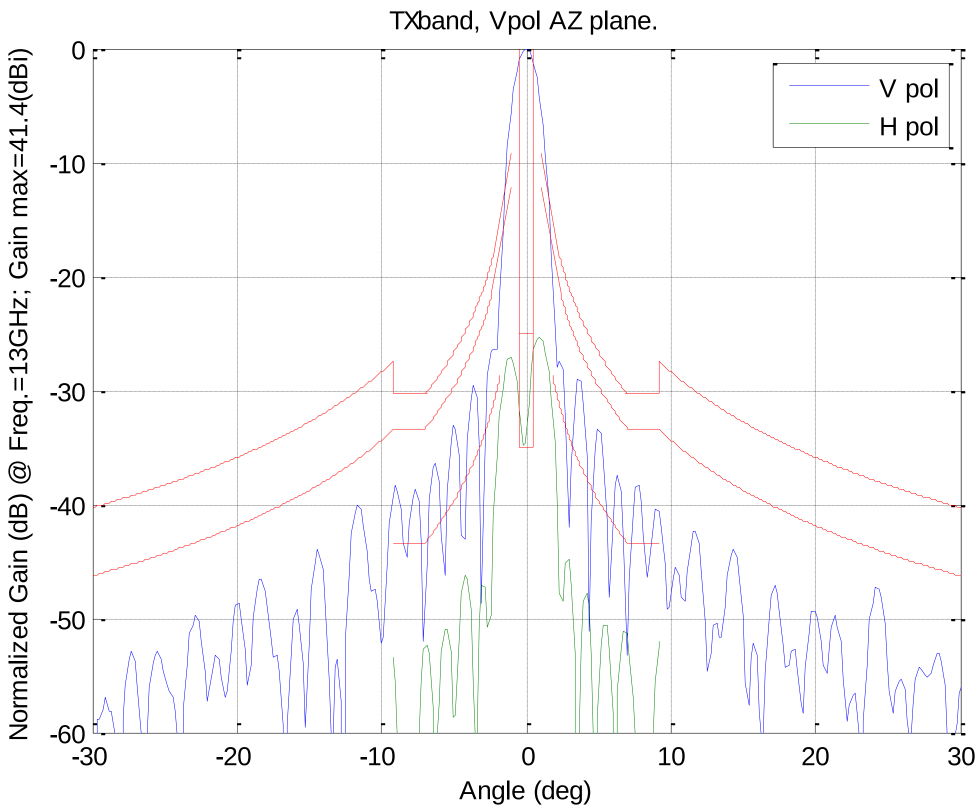
AZplane Vpol @12.75GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =3.9%]

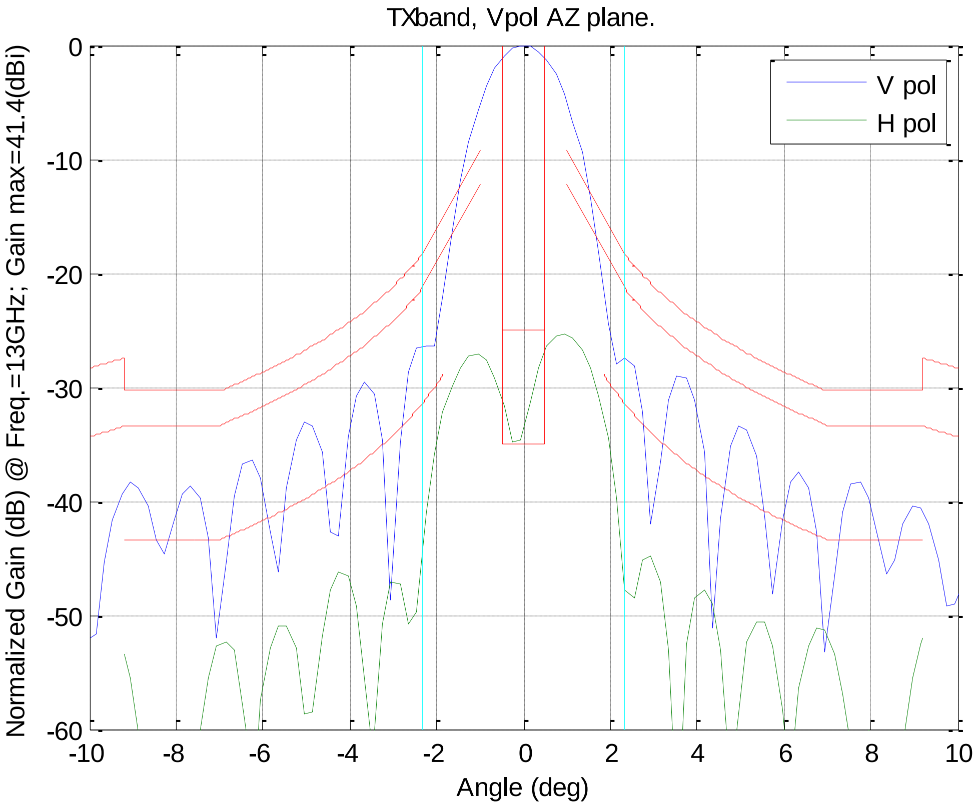
1.0<|α°|<=2.4	2.4<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.4(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	3.8(%)

AZplane, Vpol @ 12.75GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.5<|α°|<=-0.5 (respect -35.0dB)	-0.46<|α°|<=-0.46 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
8.47	0.0	0.0	0.0


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=13GHz; Gain max=41.4(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=13GHz; Gain max=41.4(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Vpol @ 13GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =16.9%]

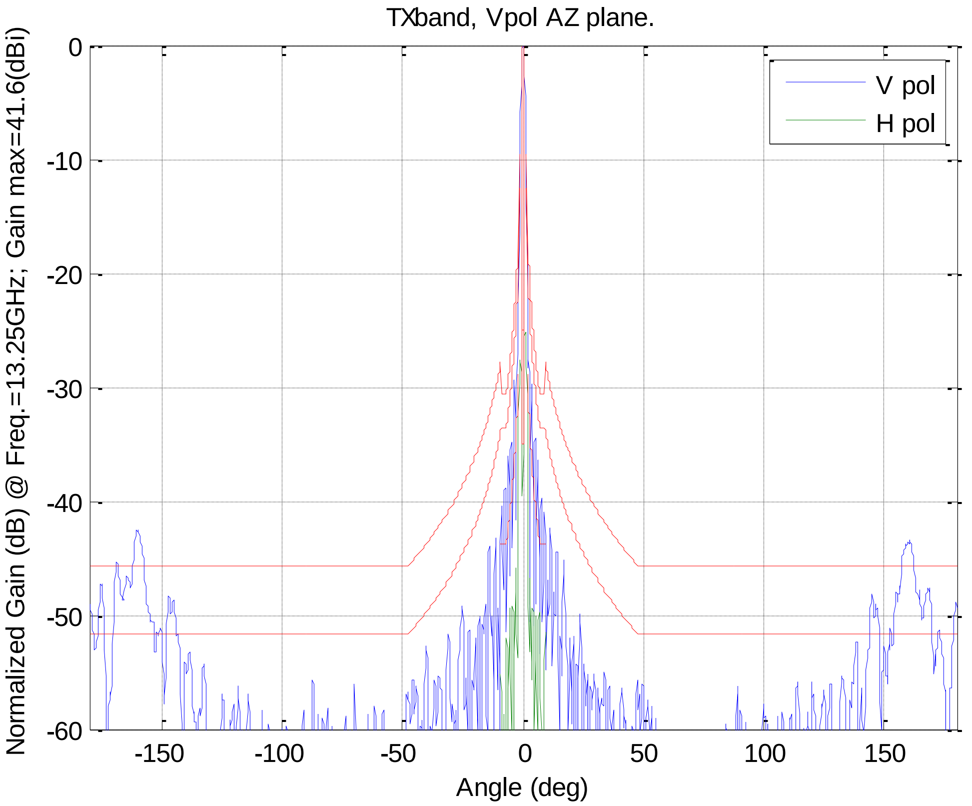
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	16.8(%)

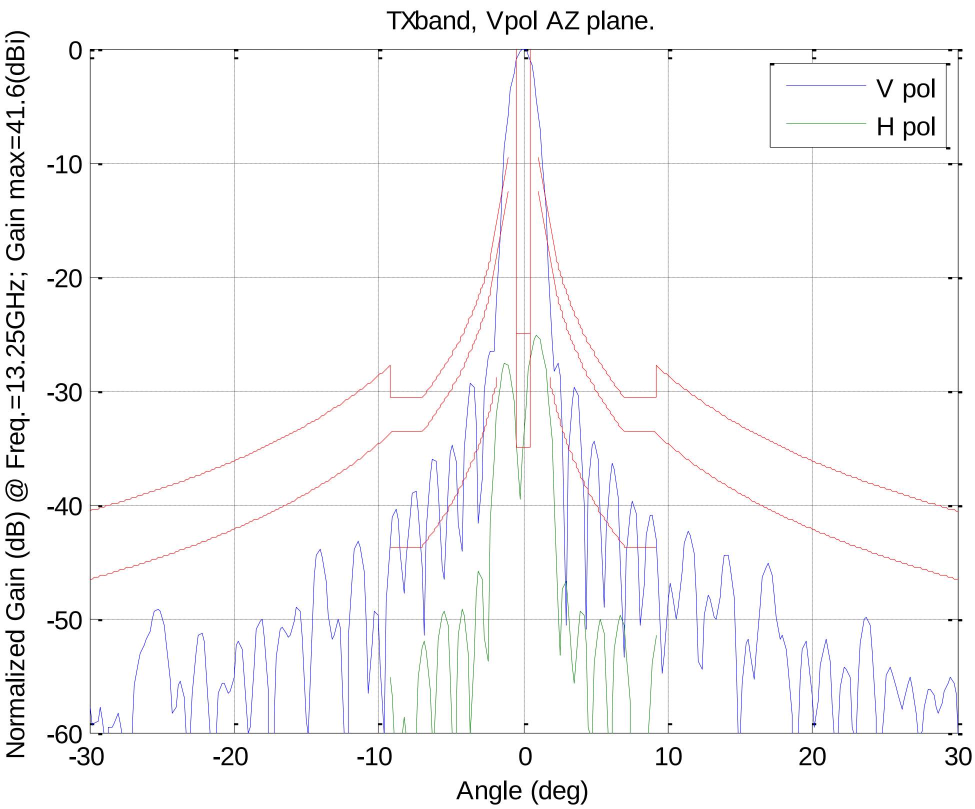
AZplane Vpol @13GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =3.5%]

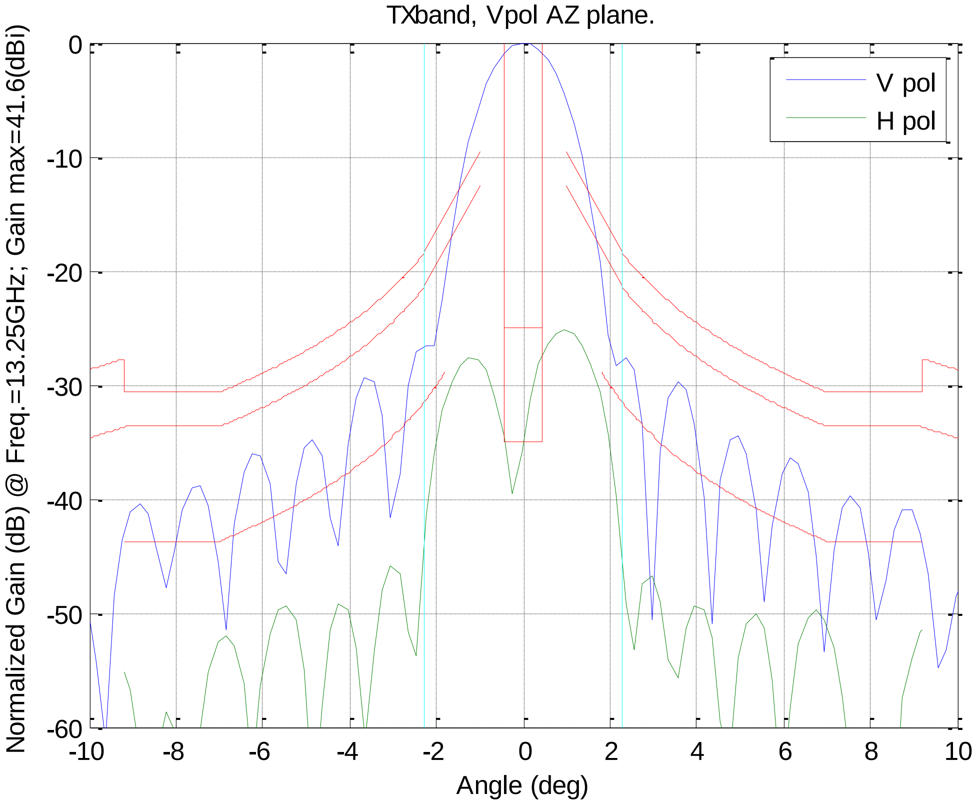
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	3.5(%)

AZplane, Vpol @ 13GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.5<|α°|<=-0.5 (respect -35.0dB)	-0.46<|α°|<=-0.46 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.89	0.0	0.0	0.0


TXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=13.25GHz; Gain max=41.6(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)


TXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=13.25GHz; Gain max=41.6(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)



AZplane Vpol @ 13.25GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =14.0%]

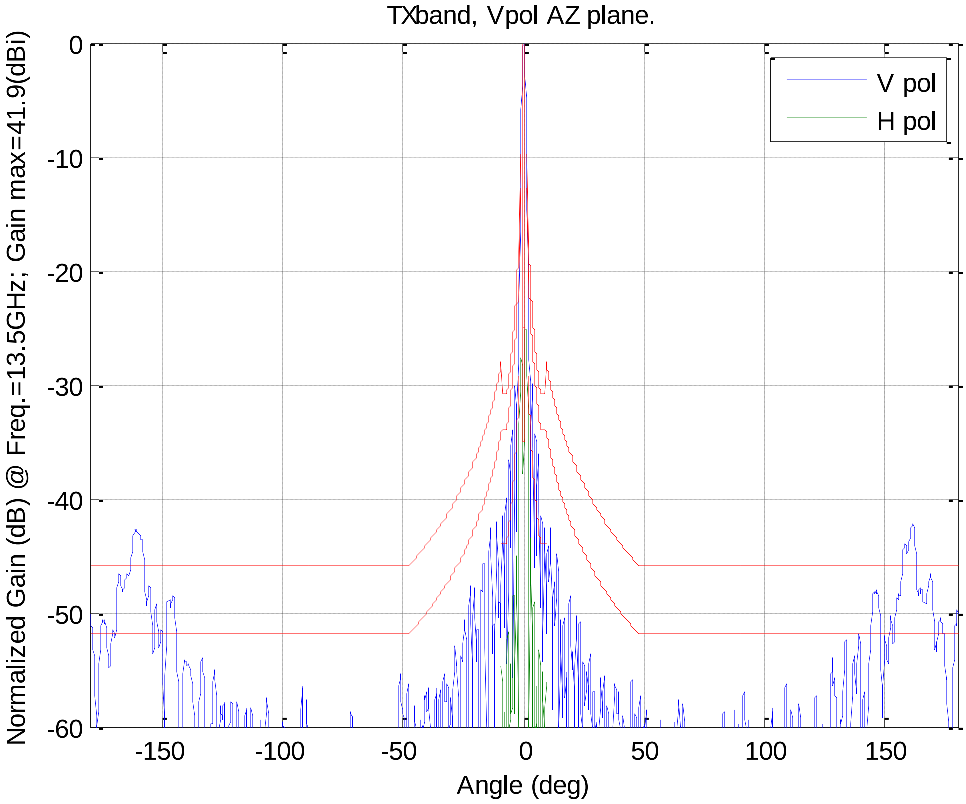
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.4(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.1(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	14.0(%)

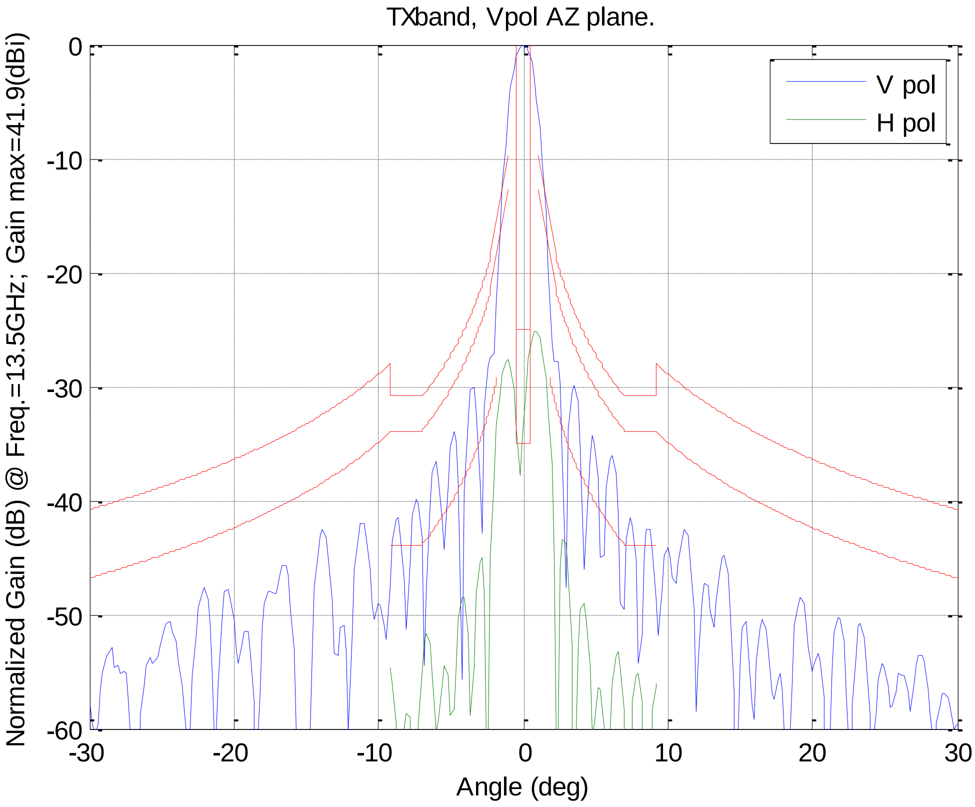
AZplane Vpol @13.25GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =2.9%]

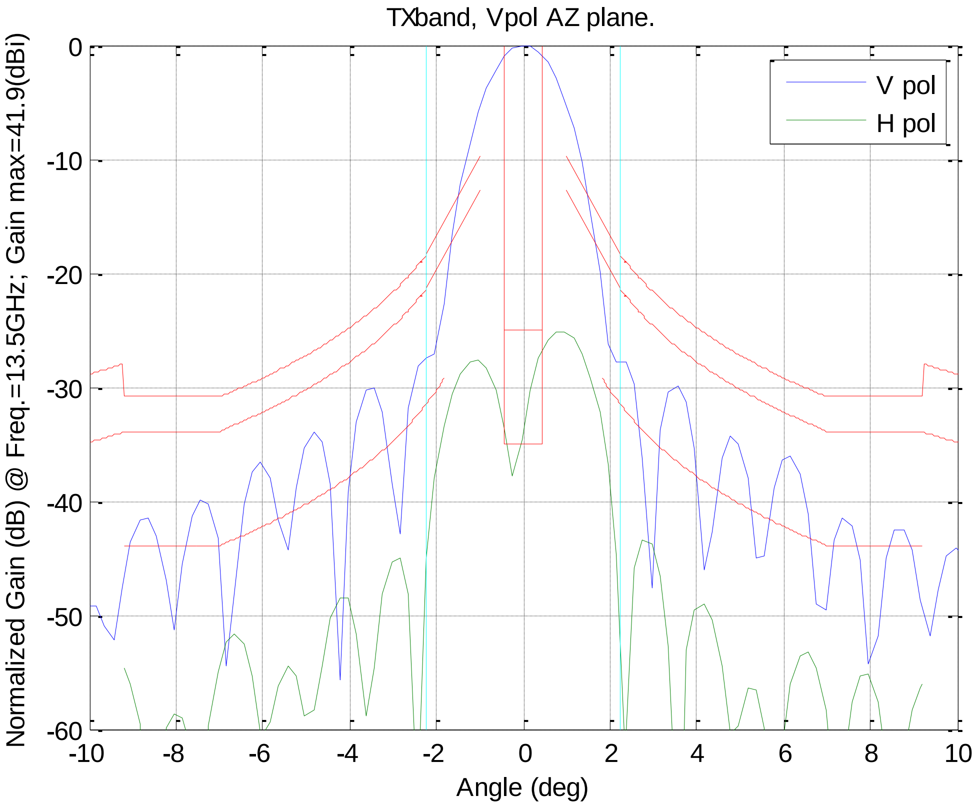
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.4(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.1(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	2.9(%)

AZplane, Vpol @ 13.25GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.45<|α°|<=-0.45 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.78	0.0	0.0	0.0


TXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=13.5GHz; Gain max=41.9(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)


TXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=13.5GHz; Gain max=41.9(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)



AZplane Vpol @ 13.5GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =14.6%]

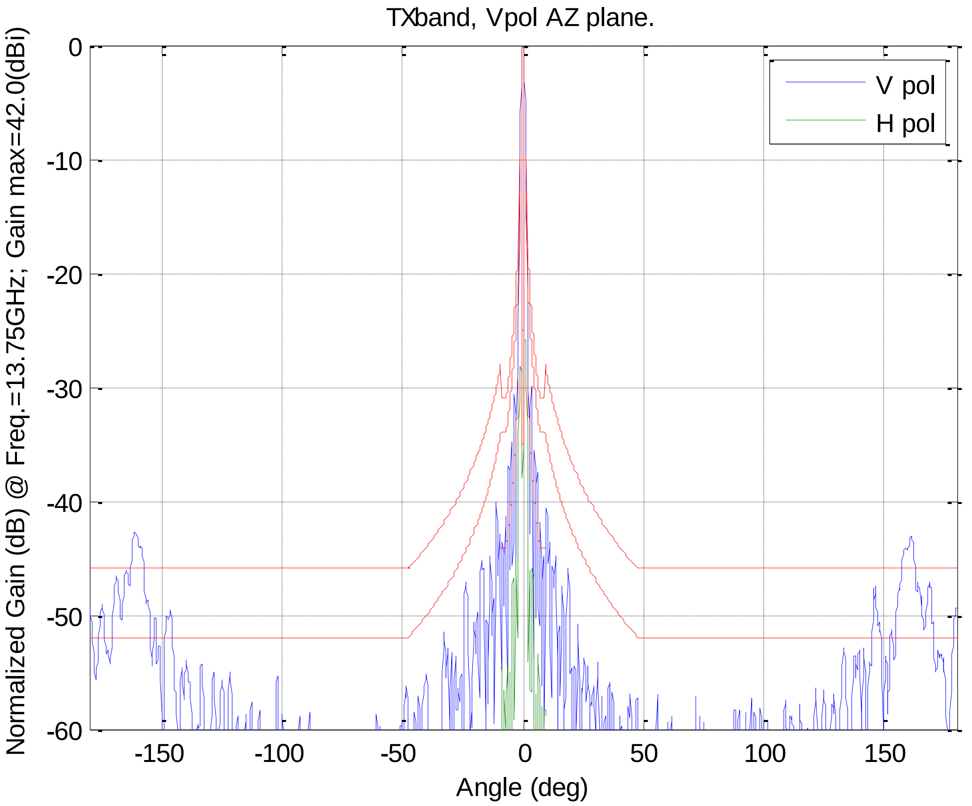
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.5(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.7(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	14.6(%)

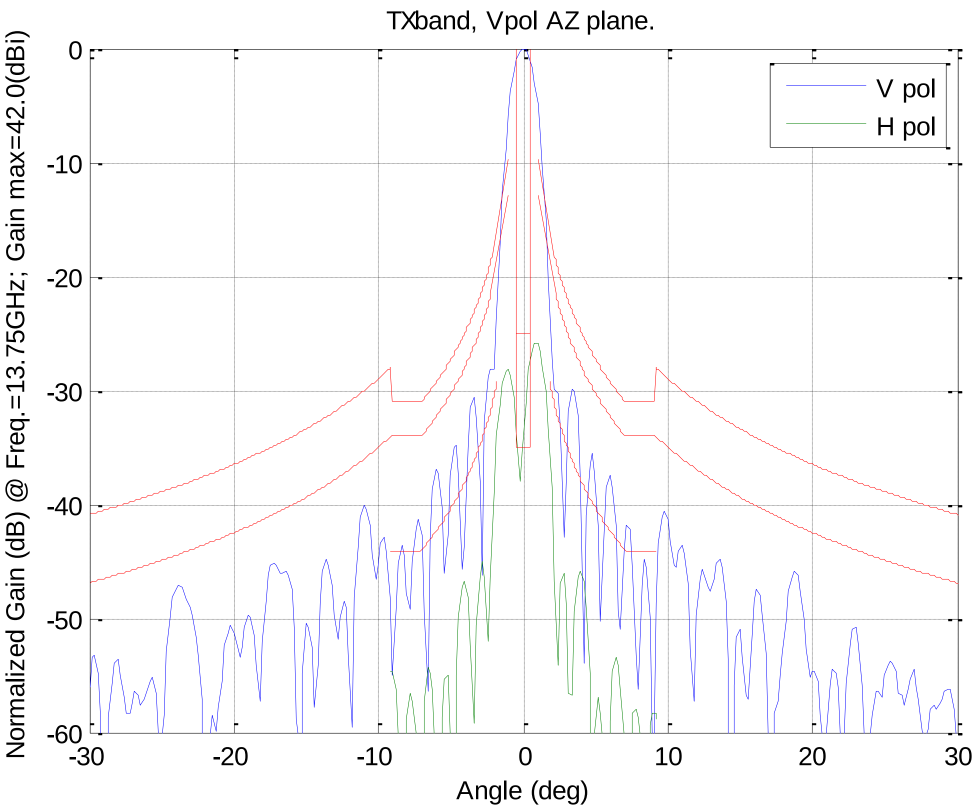
AZplane Vpol @13.5GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =3.2%]

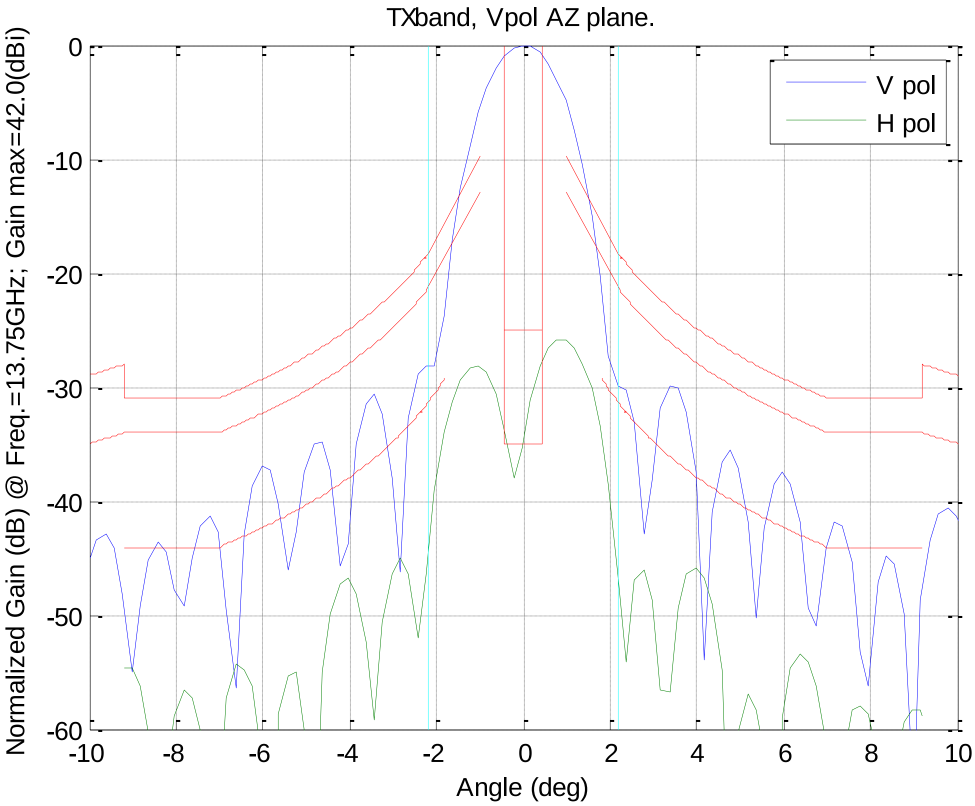
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.5(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.7(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	3.2(%)

AZplane, Vpol @ 13.5GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.44<|α°|<=-0.44 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
8.33	0.0	0.0	0.0


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=13.75GHz; Gain max=42.0(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=13.75GHz; Gain max=42.0(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Vpol @ 13.75GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =13.0%]

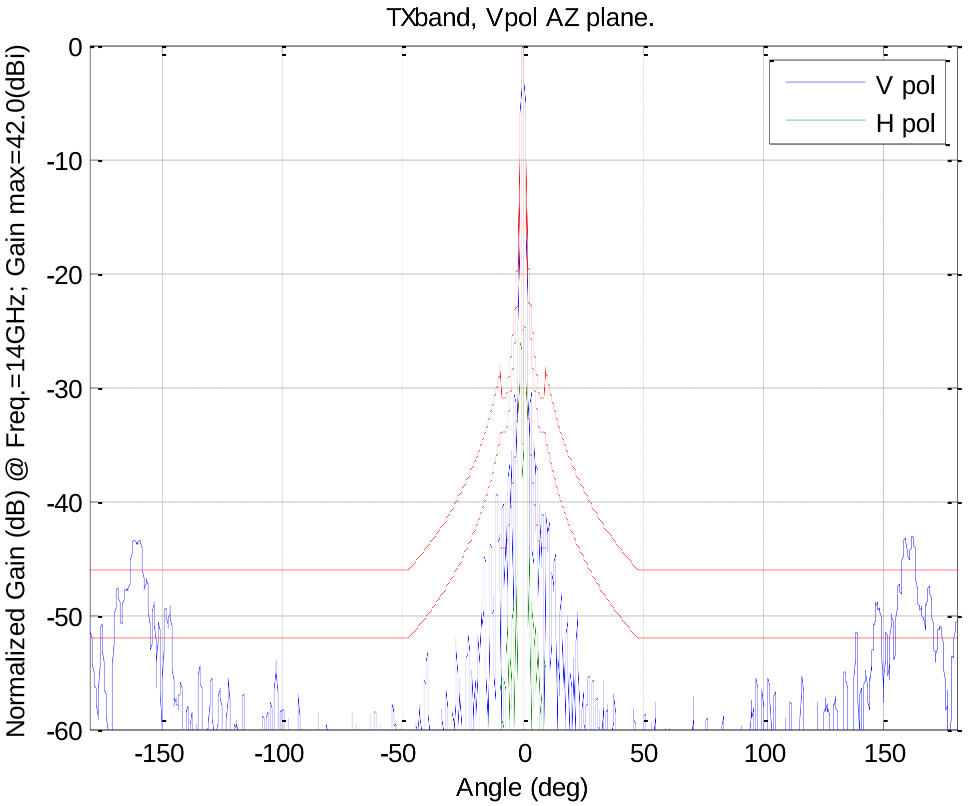
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.6(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	13.0(%)

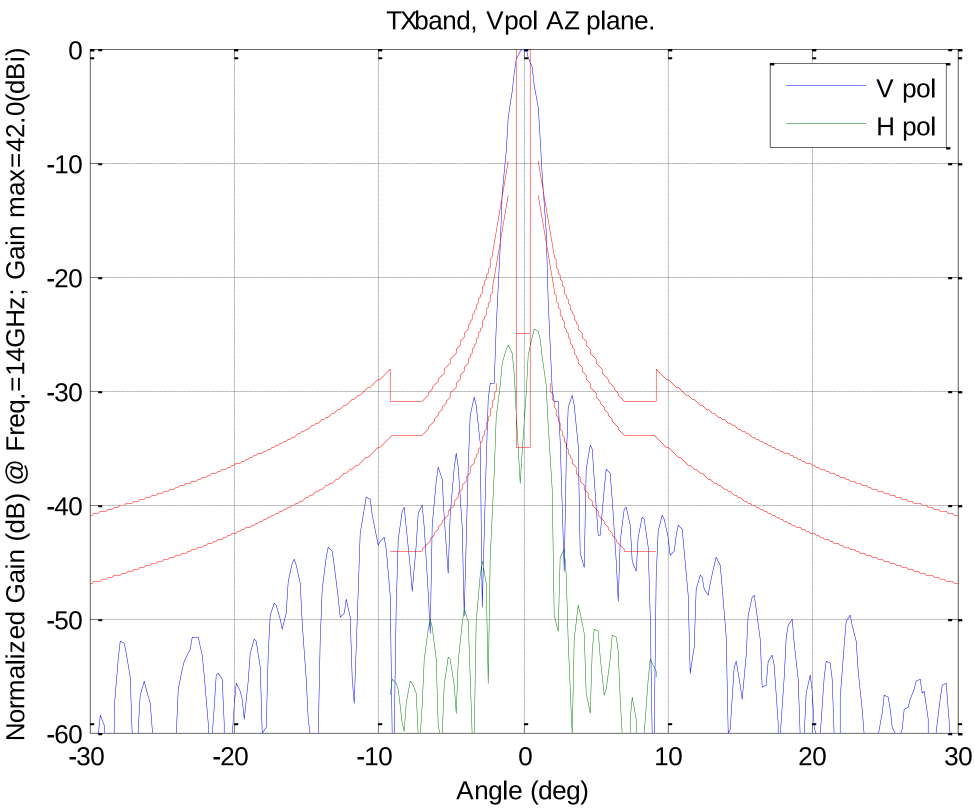
AZplane Vpol @13.75GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =3.0%]

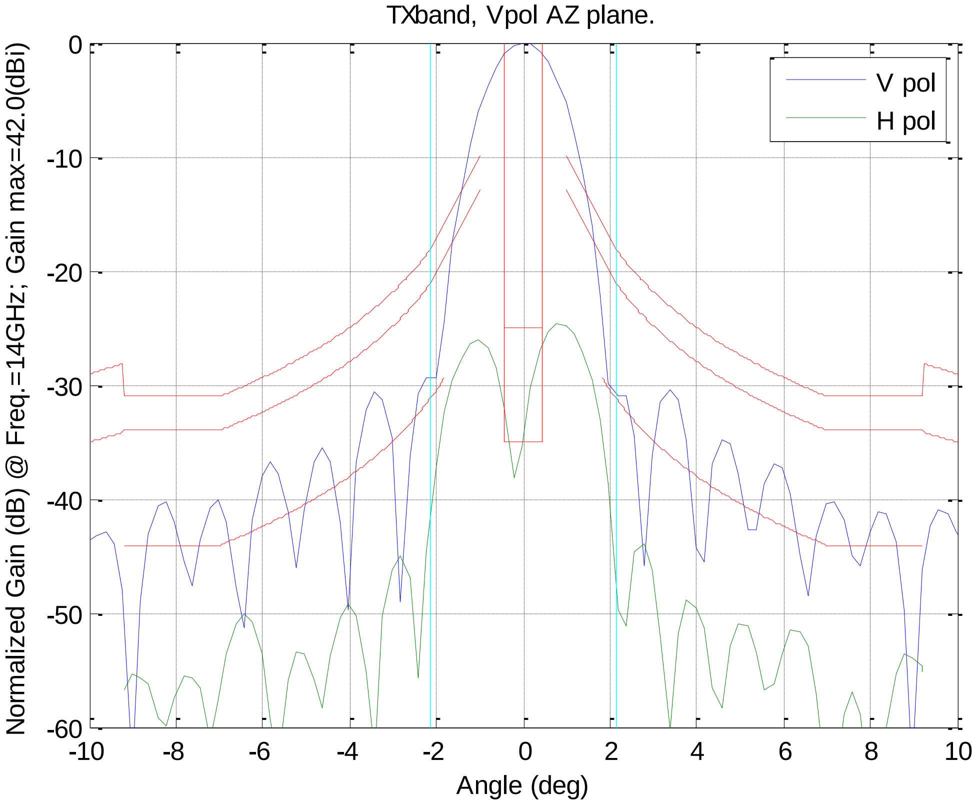
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.6(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	3.0(%)

AZplane, Vpol @ 13.75GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.44<|α°|<=-0.44 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.56	0.0	0.0	0.0


TXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=14GHz; Gain max=42.0(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)


TXband, Vpol AZ plane.
V pol
H pol
Normalized Gain (dB) @ Freq.=14GHz; Gain max=42.0(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)



AZplane Vpol @ 14GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =13.5%]

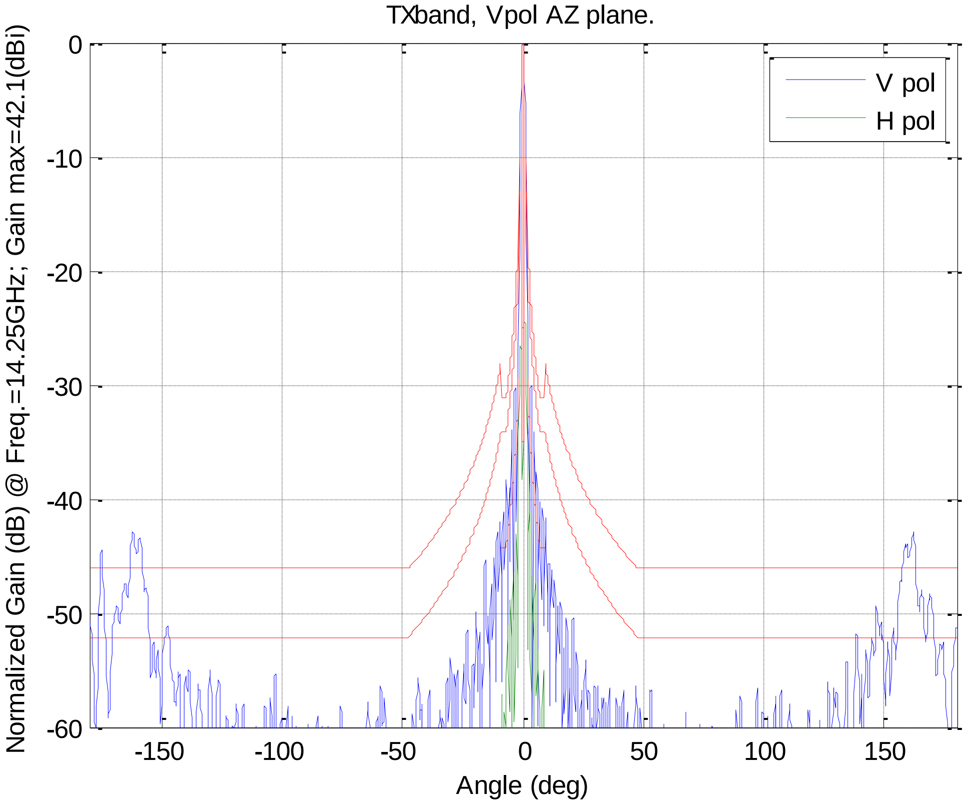
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.0(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	13.5(%)

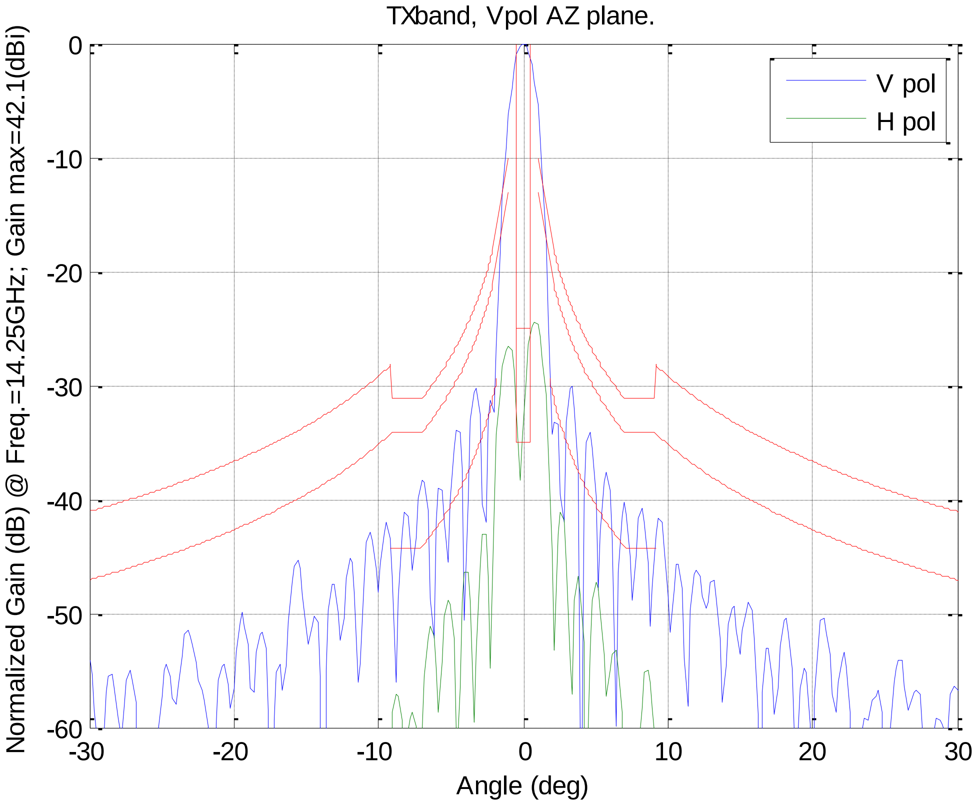
AZplane Vpol @14GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =3.0%]

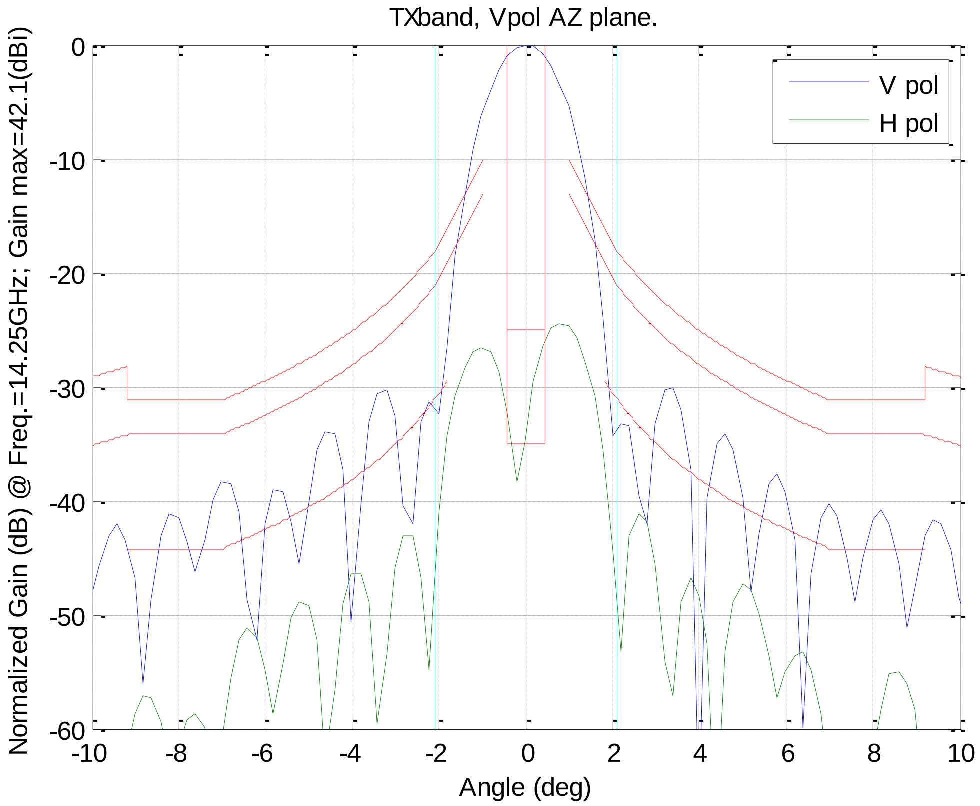
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.0(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	3.0(%)

AZplane, Vpol @ 14GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.43<|α°|<=-0.43 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
8.64	0.0	0.0	0.0


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=14.25GHz; Gain max=42.1(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=14.25GHz; Gain max=42.1(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



Zplane Vpol @ 14.25GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =11.5%

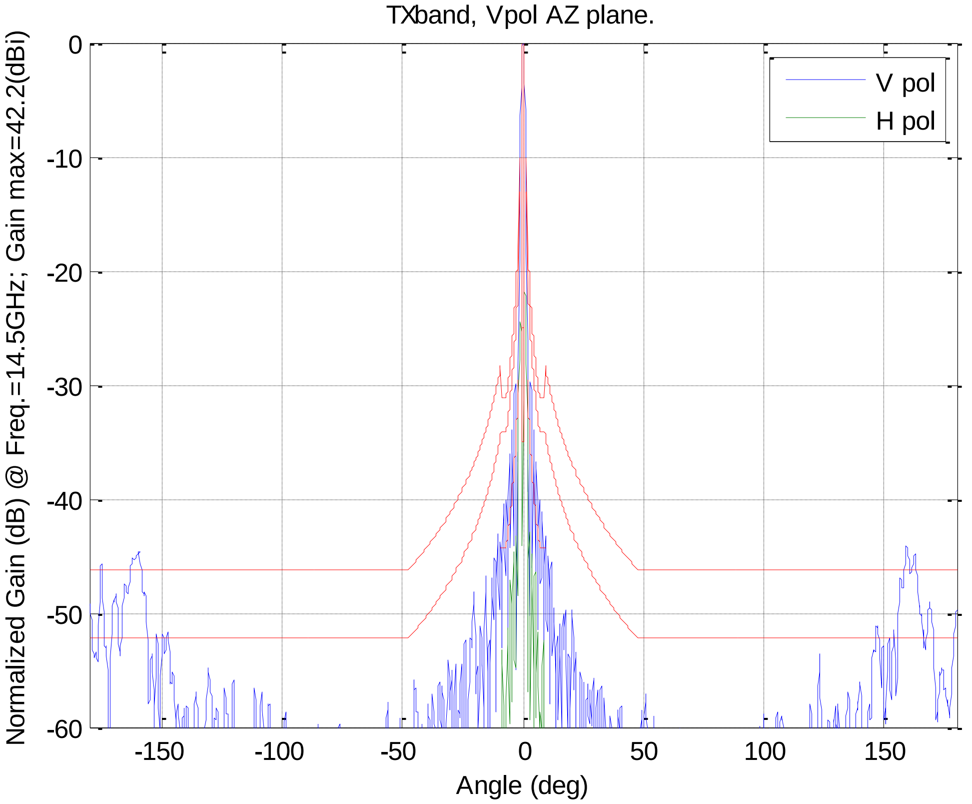
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	9.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	11.5(%)

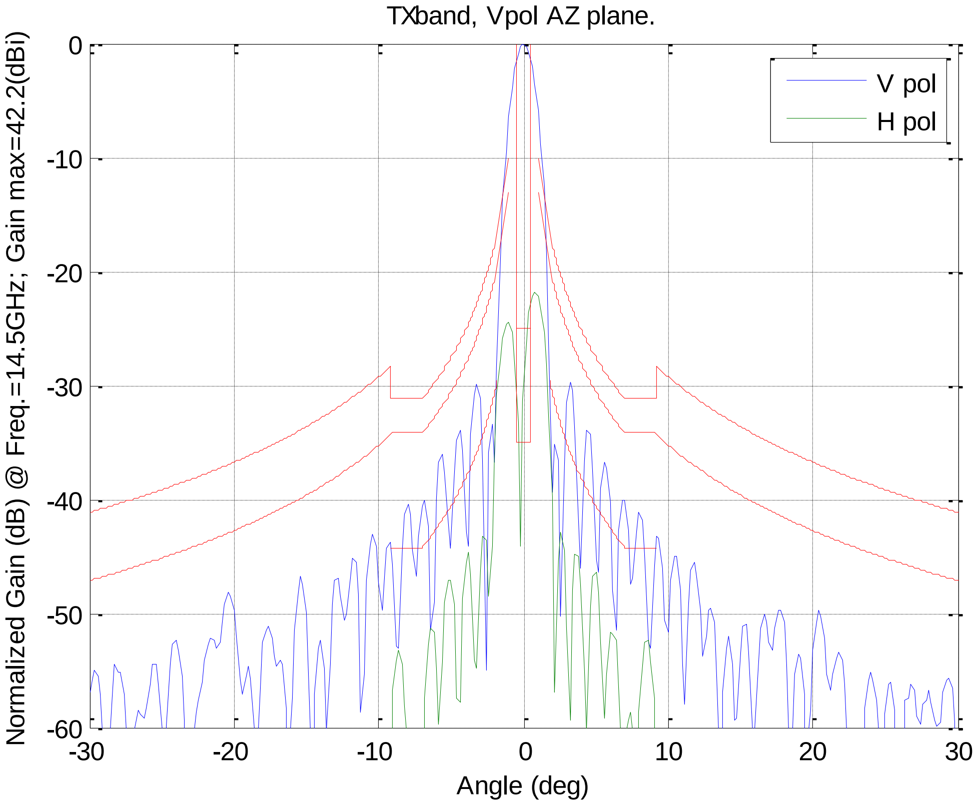
AZplane Vpol @14.25GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =3.4%]

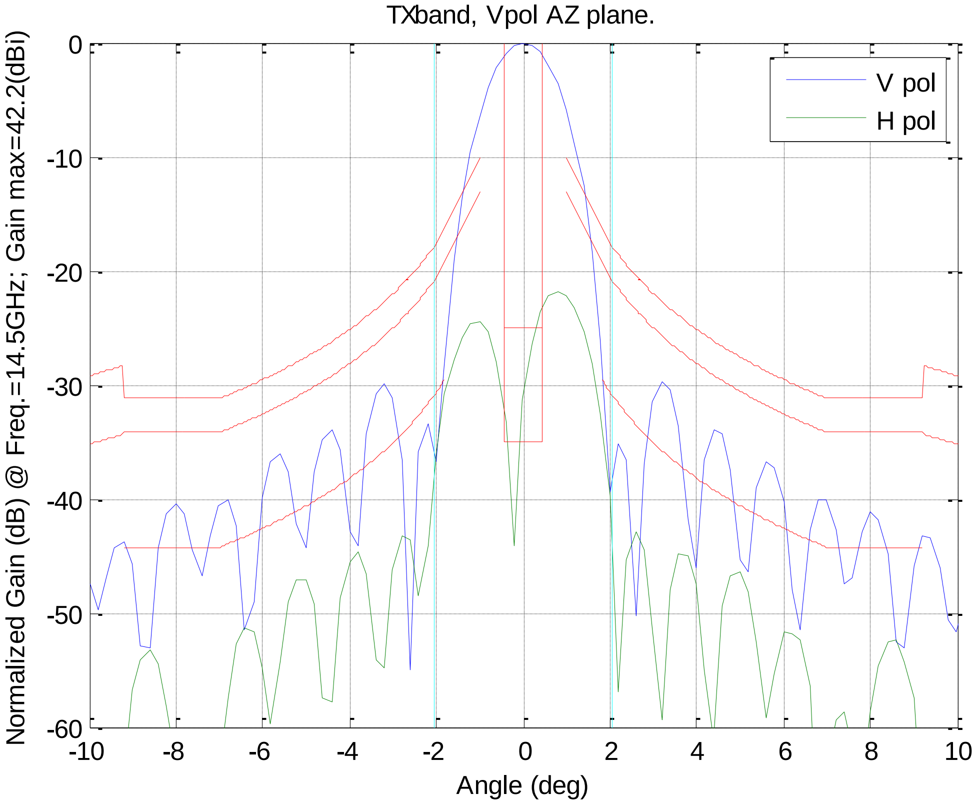
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	3.4(%)

AZplane, Vpol @ 14.25GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.43<|α°|<=-0.43 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
9.07	0.0	0.0	0.0


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=14.5GHz; Gain max=42.2(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Vpol AZ plane.
Normalized Gain (dB) @ Freq.=14.5GHz; Gain max=42.2(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Vpol @ 14.5GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =10.1%]

1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.1(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	8.1(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	10.0(%)

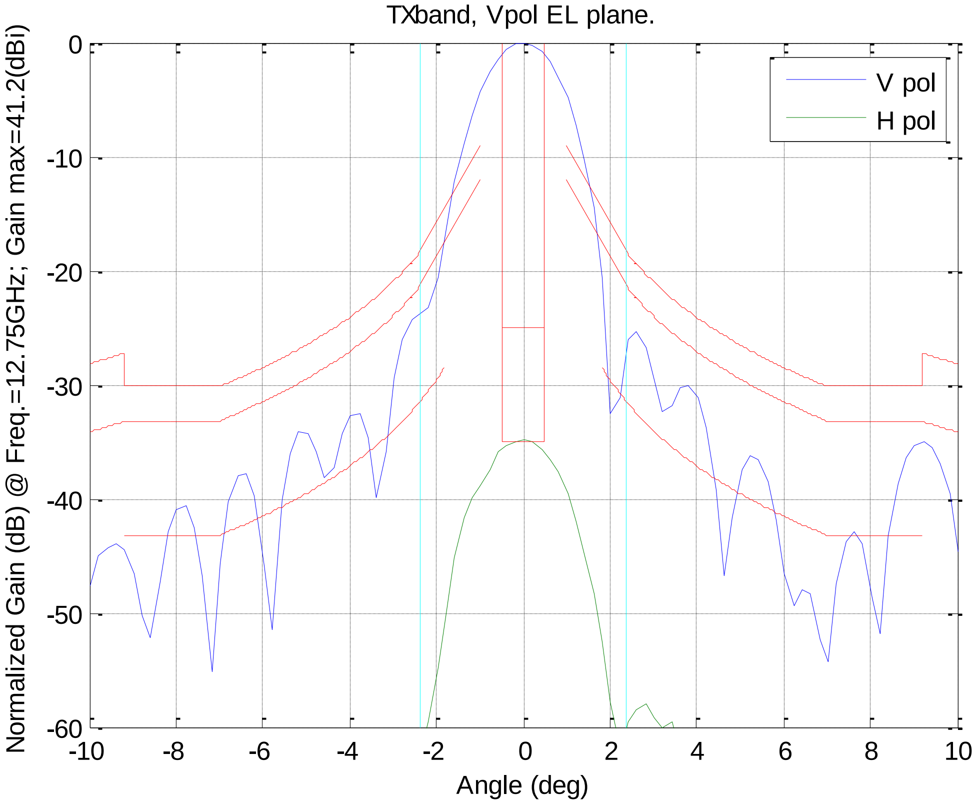
AZplane Vpol @14.5GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =2.6%]

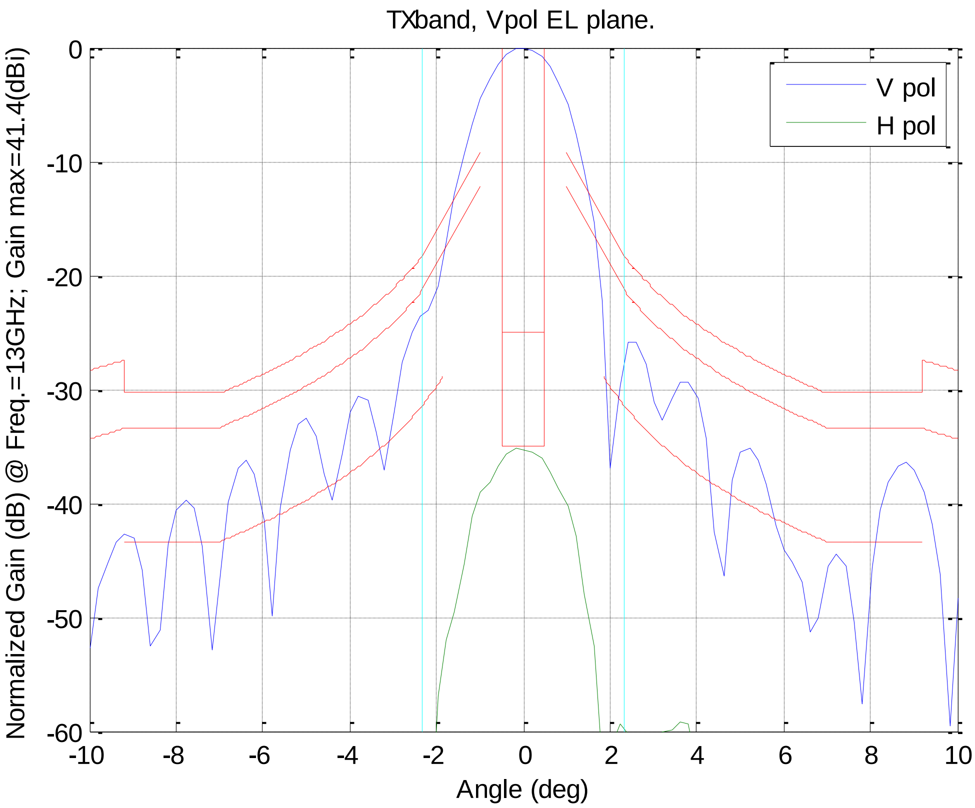
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.1(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	2.1(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	2.5(%)

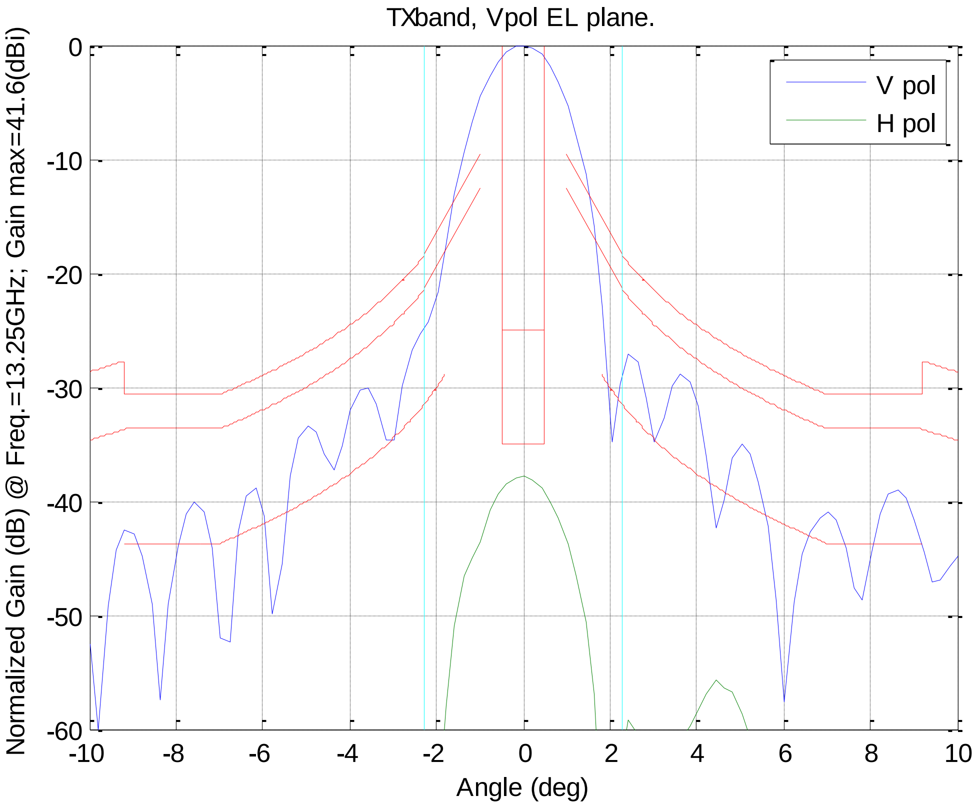
AZplane, Vpol @ 14.5GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

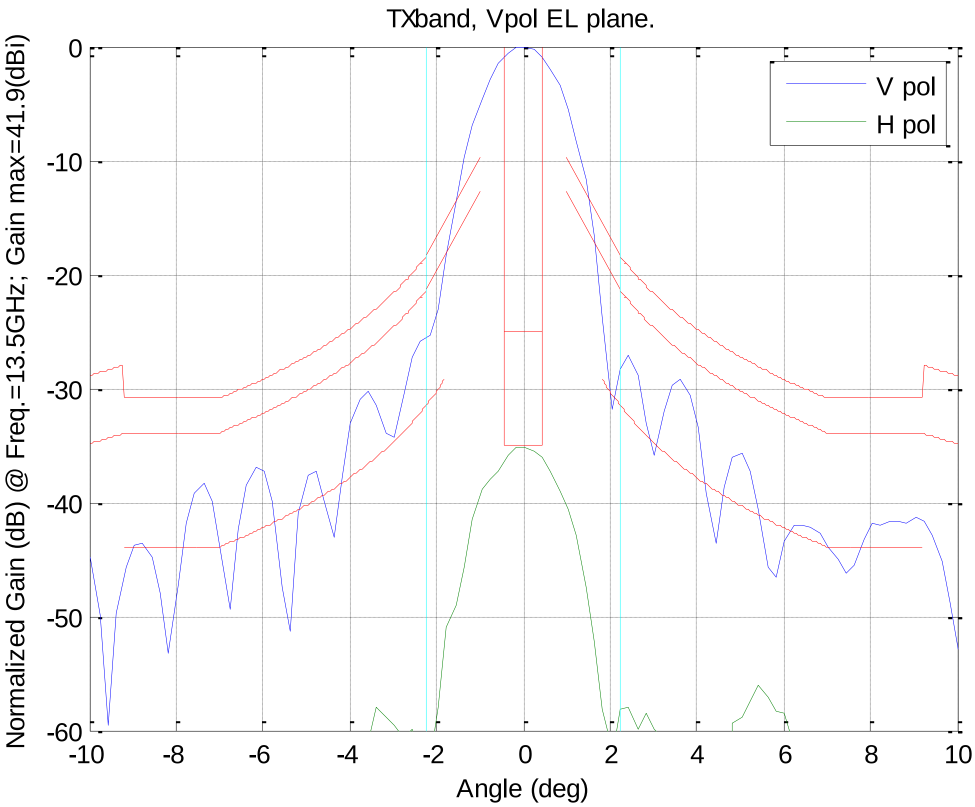
-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.42<|α°|<=-0.42 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
11.70	1.7	0.0	0.0

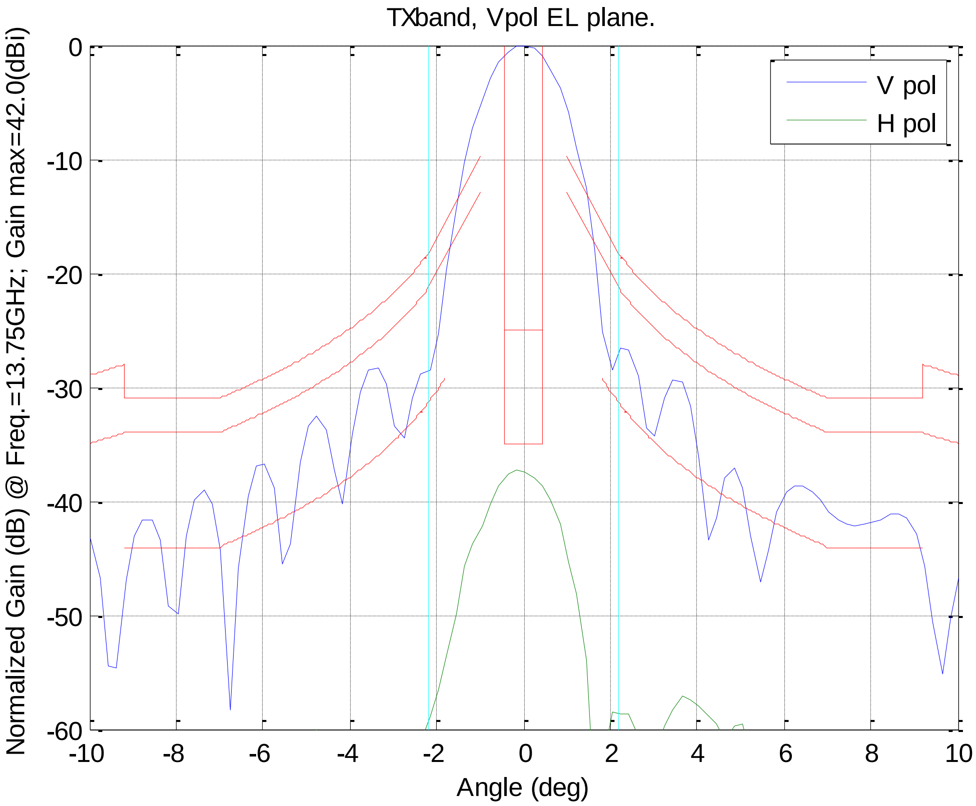
6.2.2: V-POL PORT, EL PLANE PLOTS

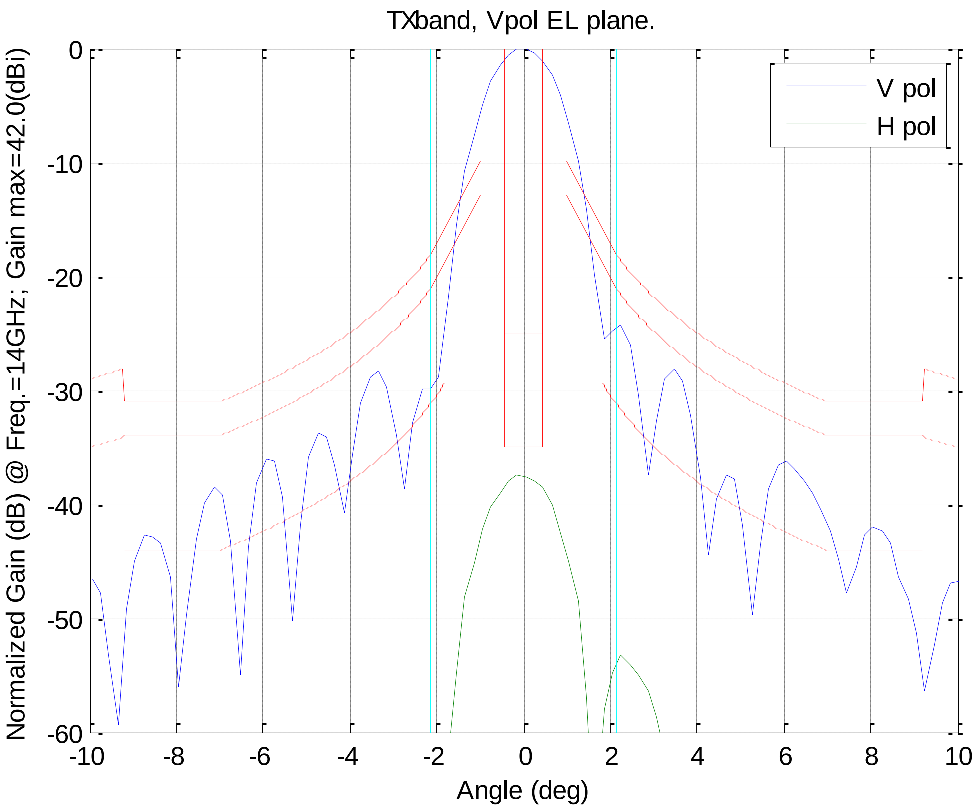


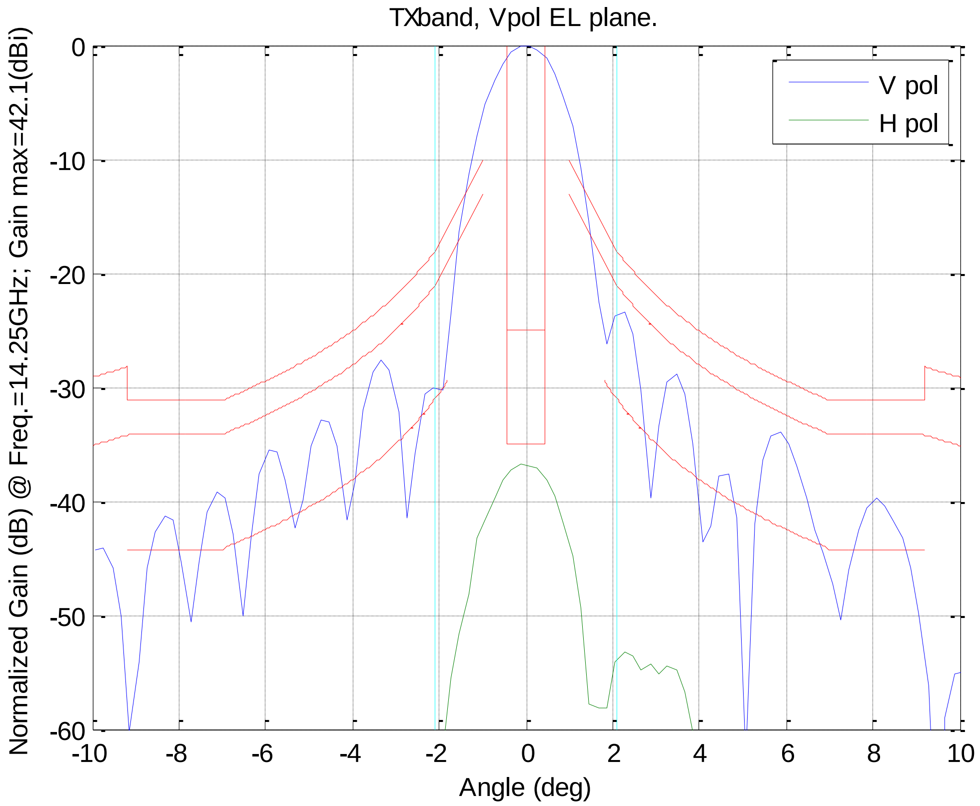


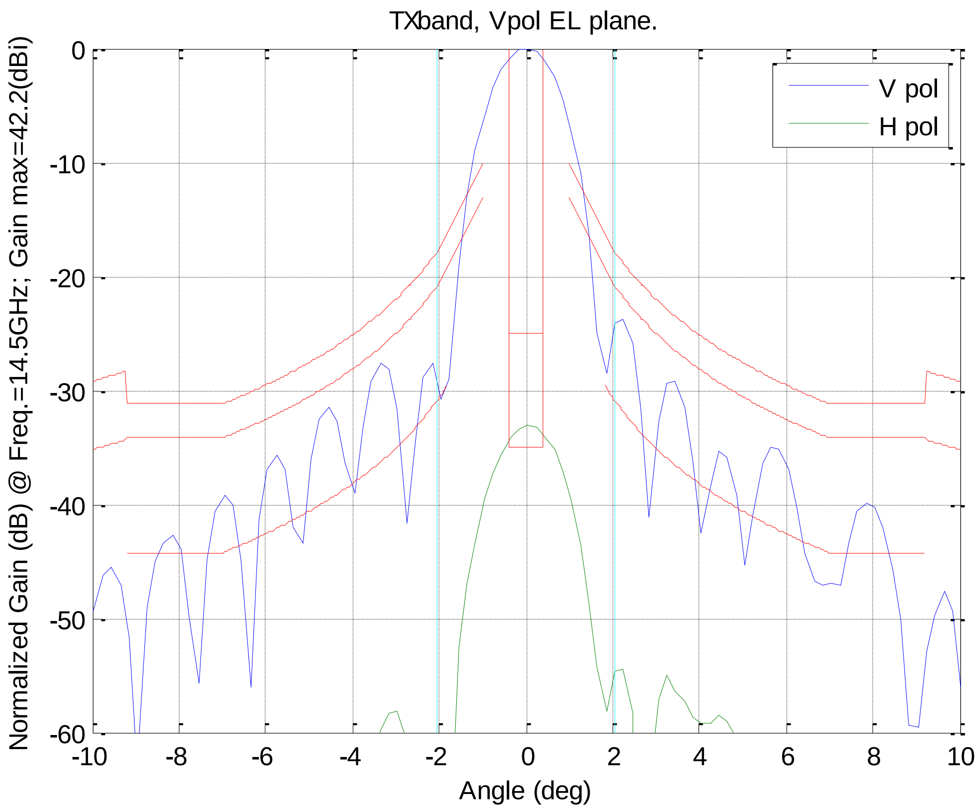

TXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=13.25GHz; Gain max=41.6(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10


TXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=13.5GHz; Gain max=41.9(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

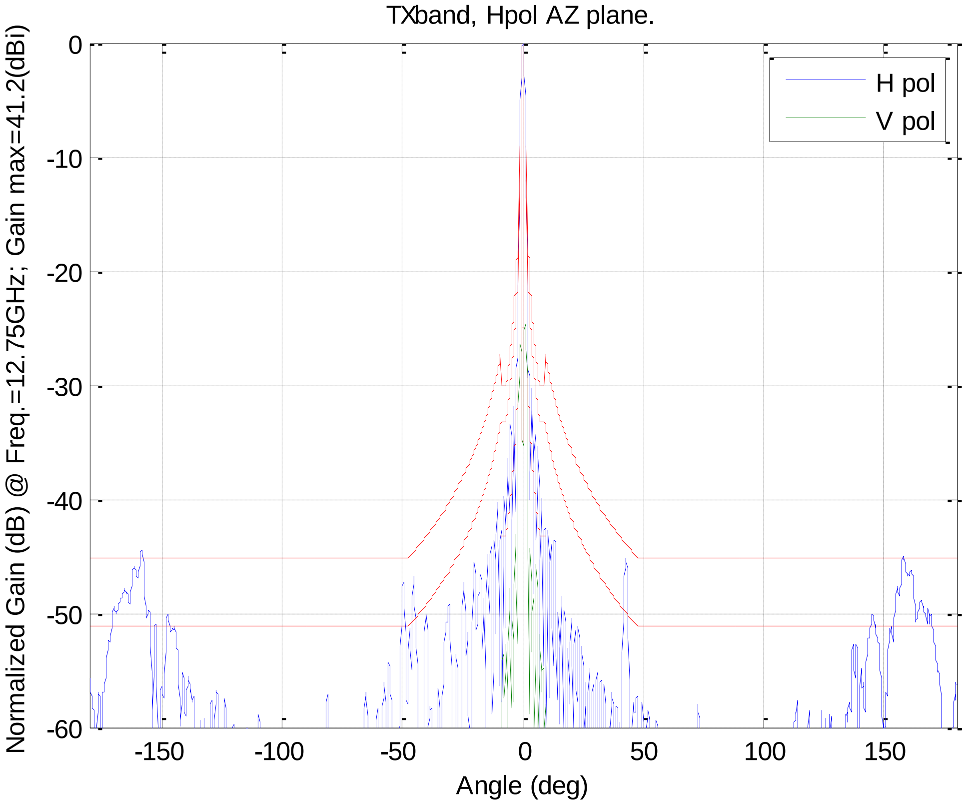

TXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=13.75GHz; Gain max=42.0(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

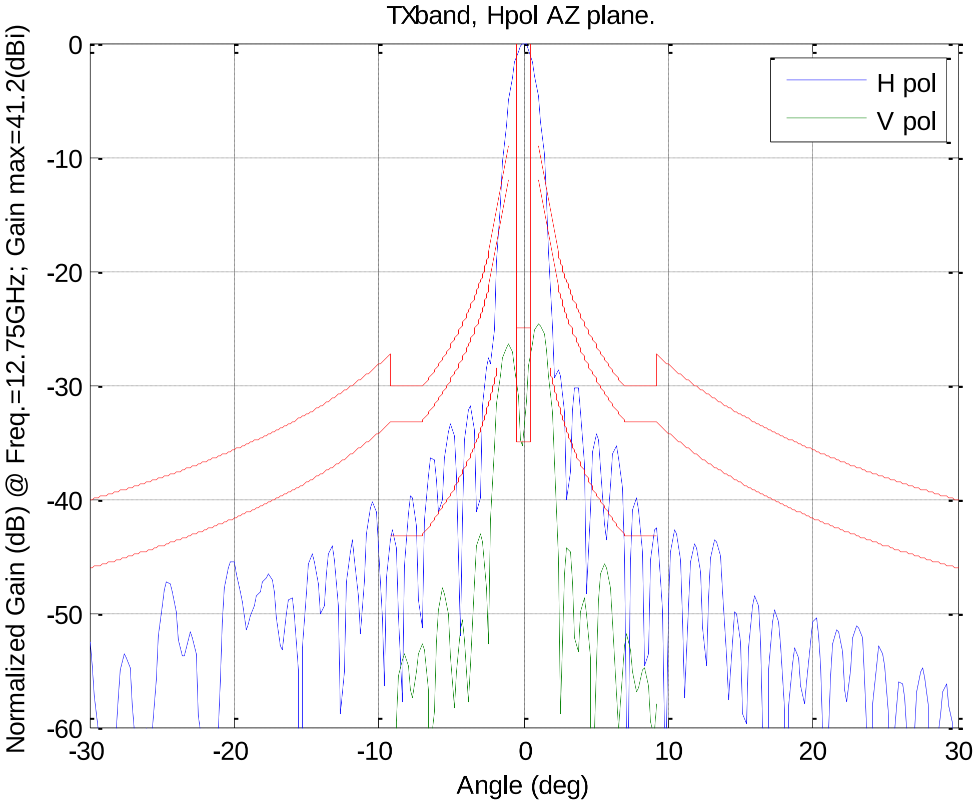

TXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=14GHz; Gain max=42.0(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

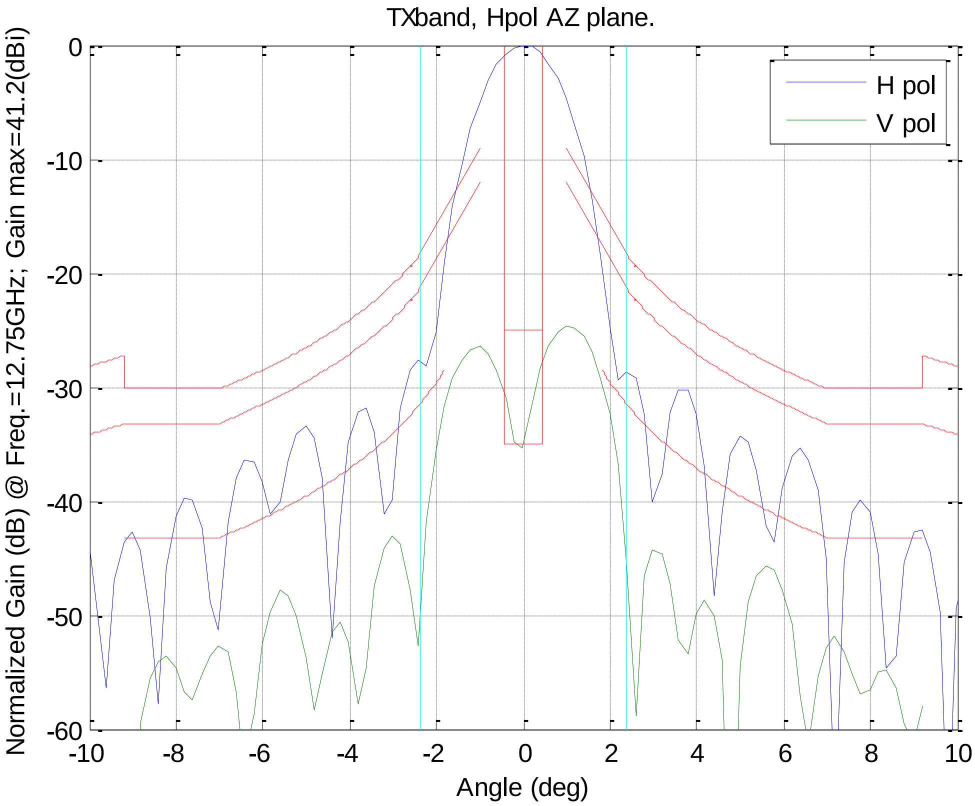

TXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=14.25GHz; Gain max=42.1(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10


TXband, Vpol EL plane.
Normalized Gain (dB) @ Freq.=14.5GHz; Gain max=42.2(dBi)
Angle (deg)
V pol
H pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

6.2.3: H-POL PORT, AZ PLANE PLOTS AND OVERSHOOTS







Zplane Hpol @ 12.75GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =11.4%

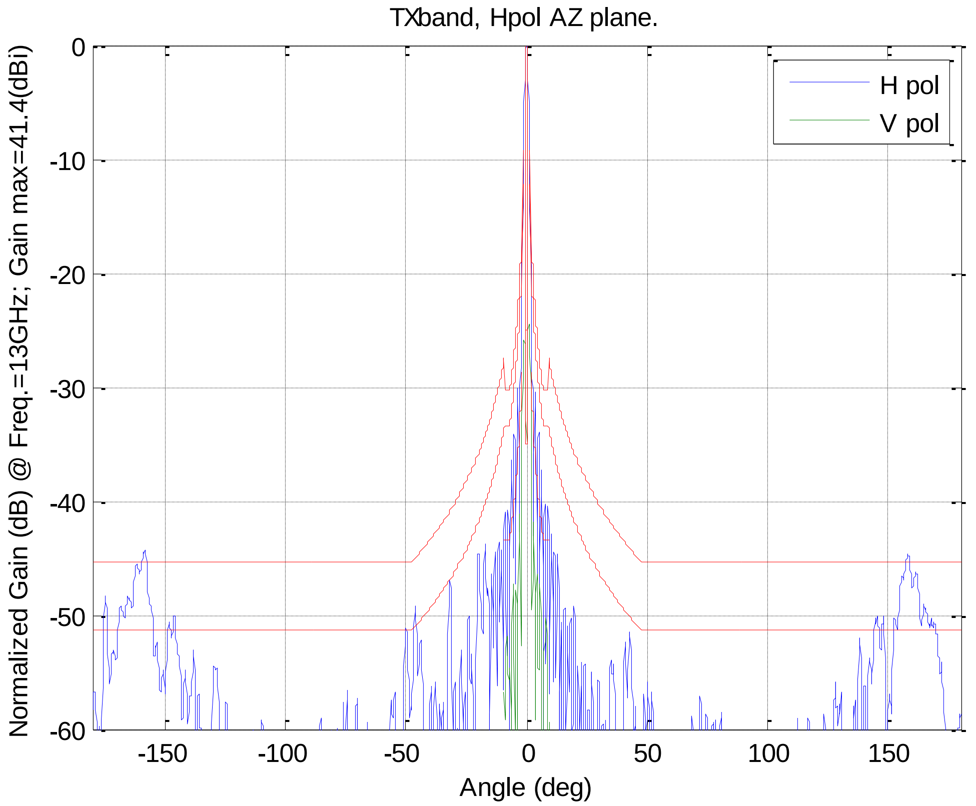
1.0<|α°|<=2.4	2.4<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	4.8(dB)	6.8(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.9(%)	10.4(%)

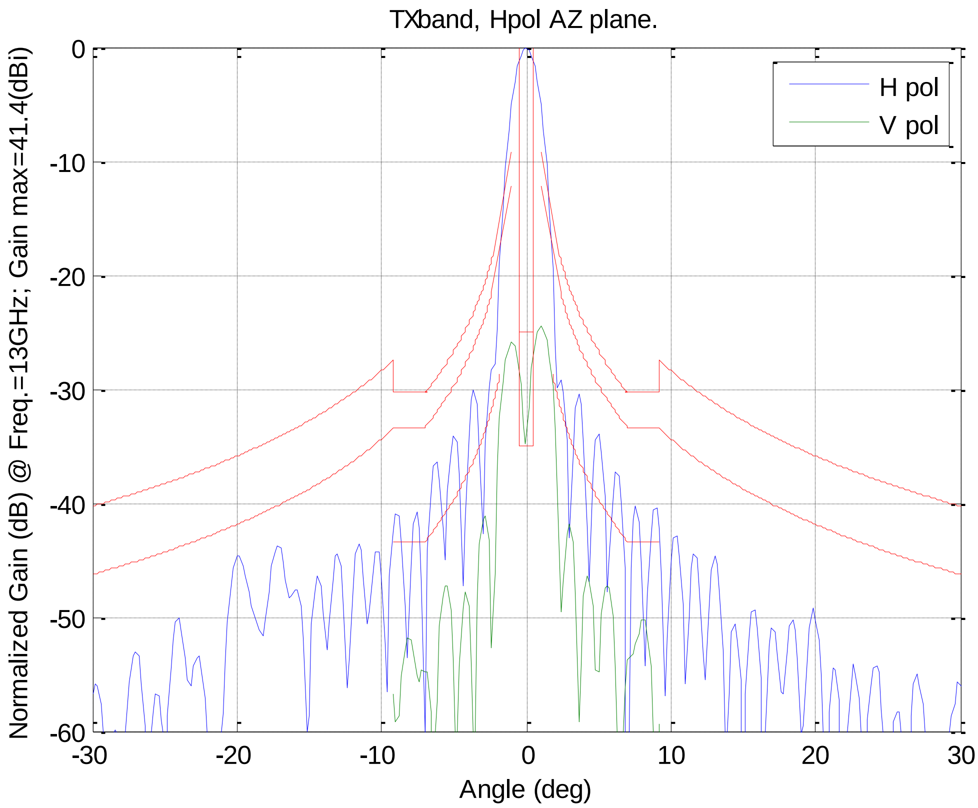
AZplane Hpol @12.75GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.4%]

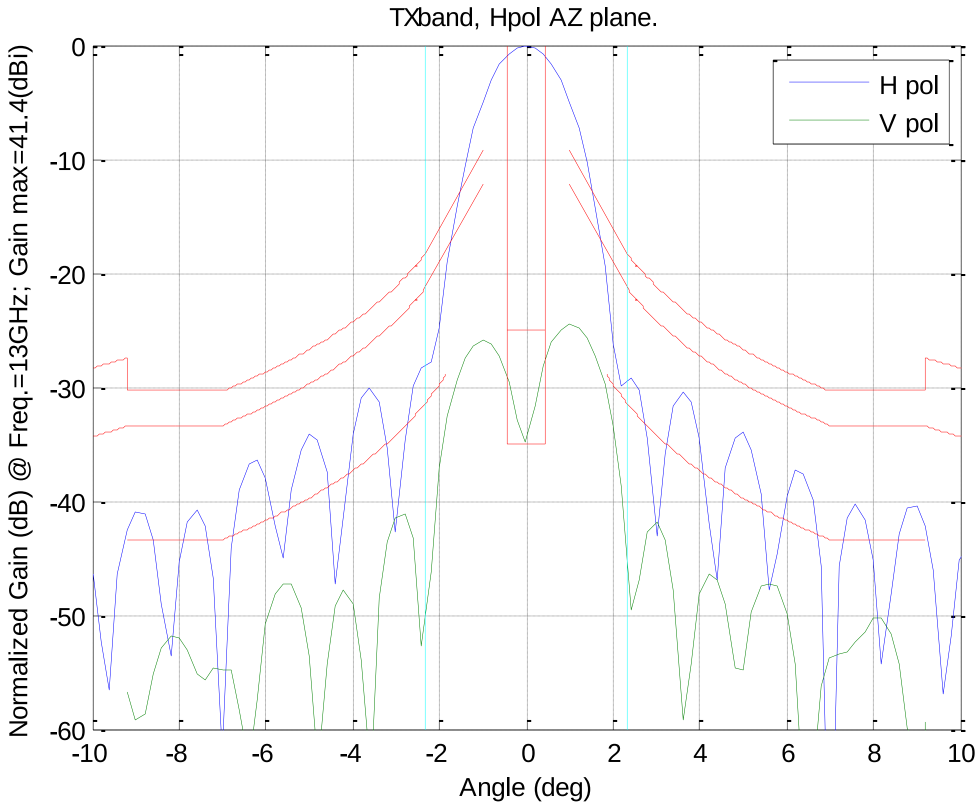
1.0<|α°|<=2.4	2.4<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.8(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.4(%)

AZplane, Hpol @ 12.75GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.5<|α°|<=-0.5 (respect -35.0dB)	-0.46<|α°|<=-0.46 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.53	0.0	0.0	0.0


TXband, Hpol AZ plane.
H pol
V pol
Normalized Gain (dB) @ Freq.=13GHz; Gain max=41.4(dBi)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150
Angle (deg)


TXband, Hpol AZ plane.
H pol
V pol
Normalized Gain (dB) @ Freq.=13GHz; Gain max=41.4(dBi)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30
Angle (deg)



AZplane Hpol @ 13GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =11.4%]

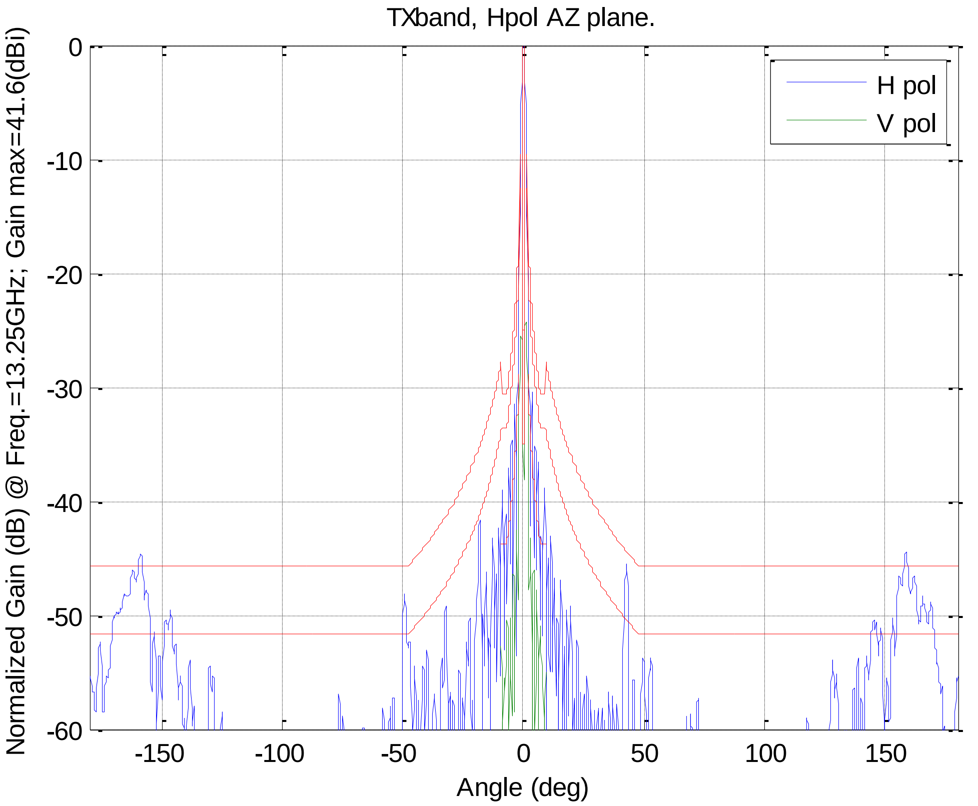
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	1.7(dB)	7.0(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.3(%)	11.1(%)

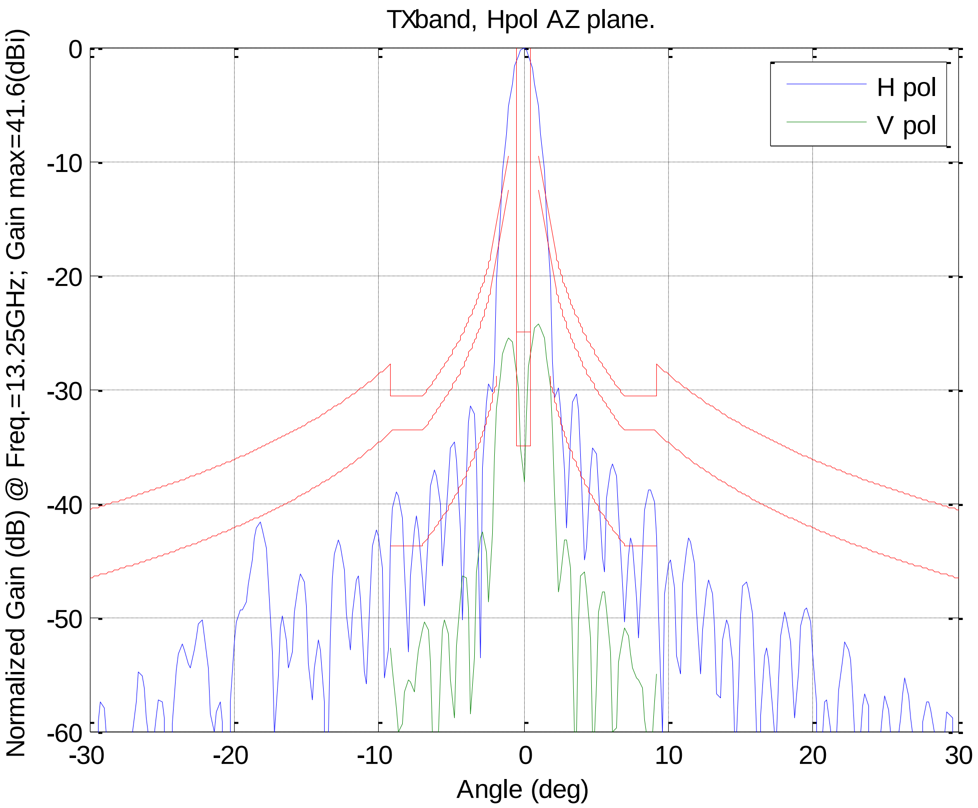
AZplane Hpol @13GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.9%]

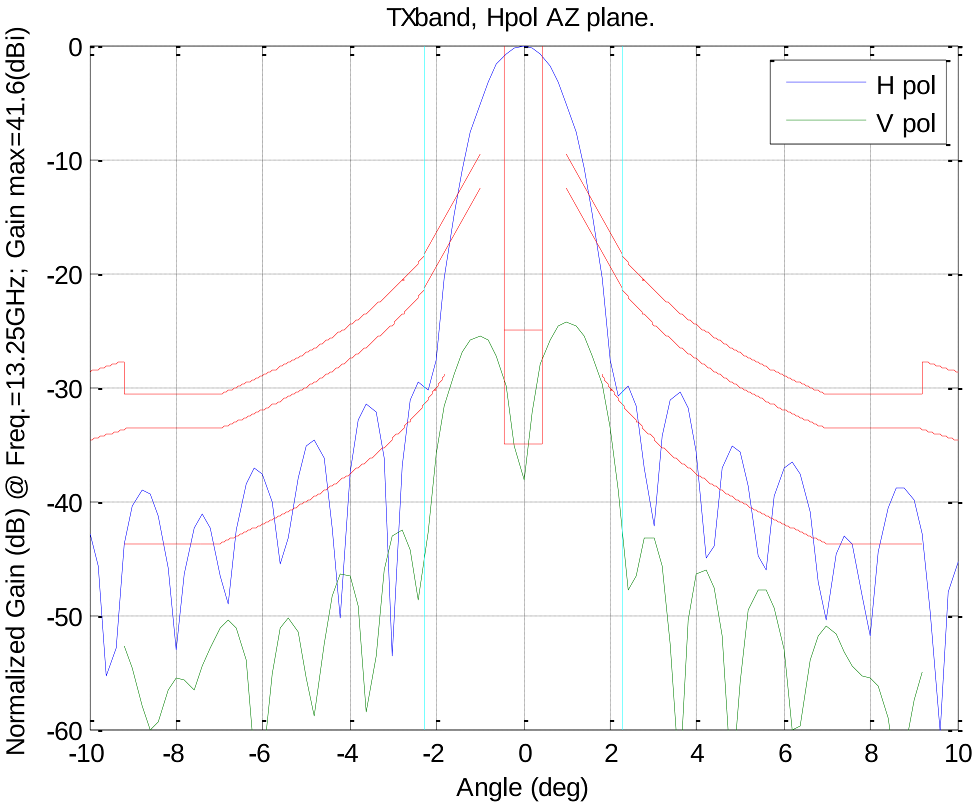
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.3(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	1.0(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.9(%)

AZplane, Hpol @ 13GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.5<|α°|<=-0.5 (respect -35.0dB)	-0.45<|α°|<=-0.45 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.45	0.0	0.0	0.0


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=13.25GHz; Gain max=41.6(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=13.25GHz; Gain max=41.6(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Hpol @ 13.25GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =12.2%]

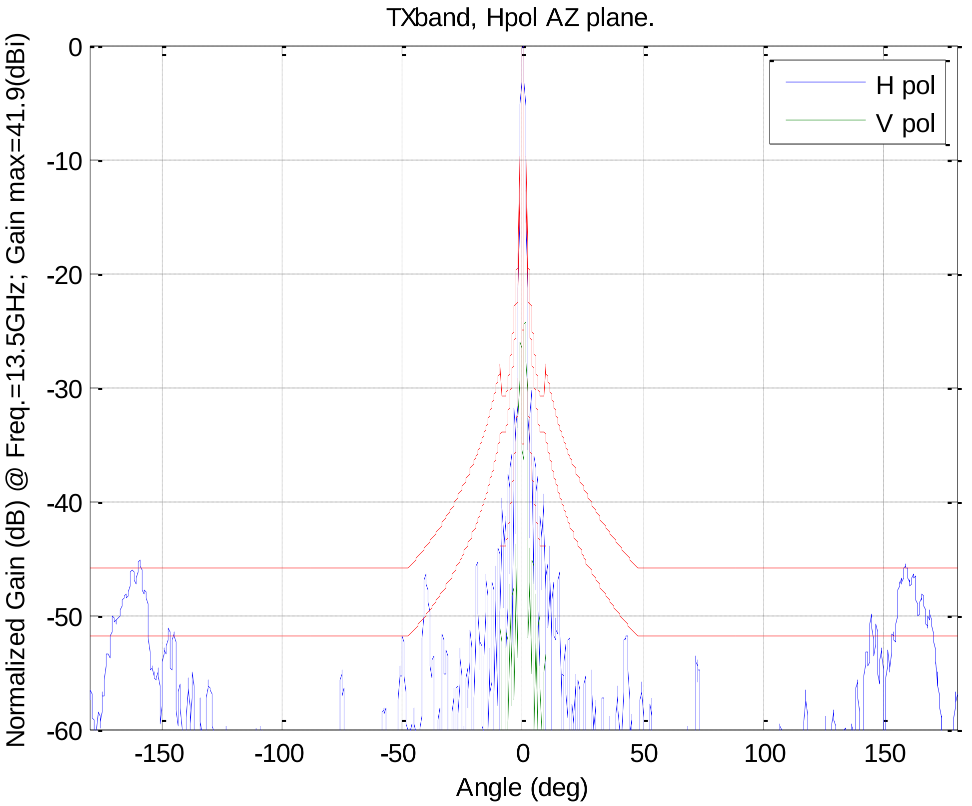
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.4(dB)	0.0(dB)	0.0(dB)	0.0(dB)	4.9(dB)	7.2(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.5(%)	11.7(%)

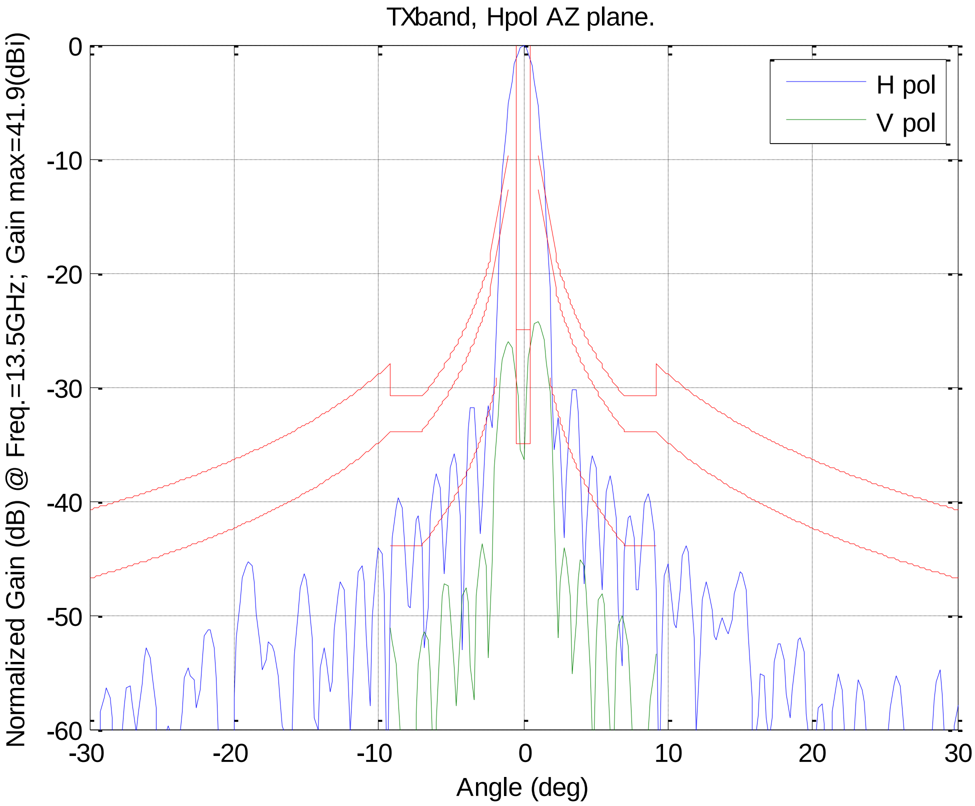
AZplane Hpol @13.25GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.9%]

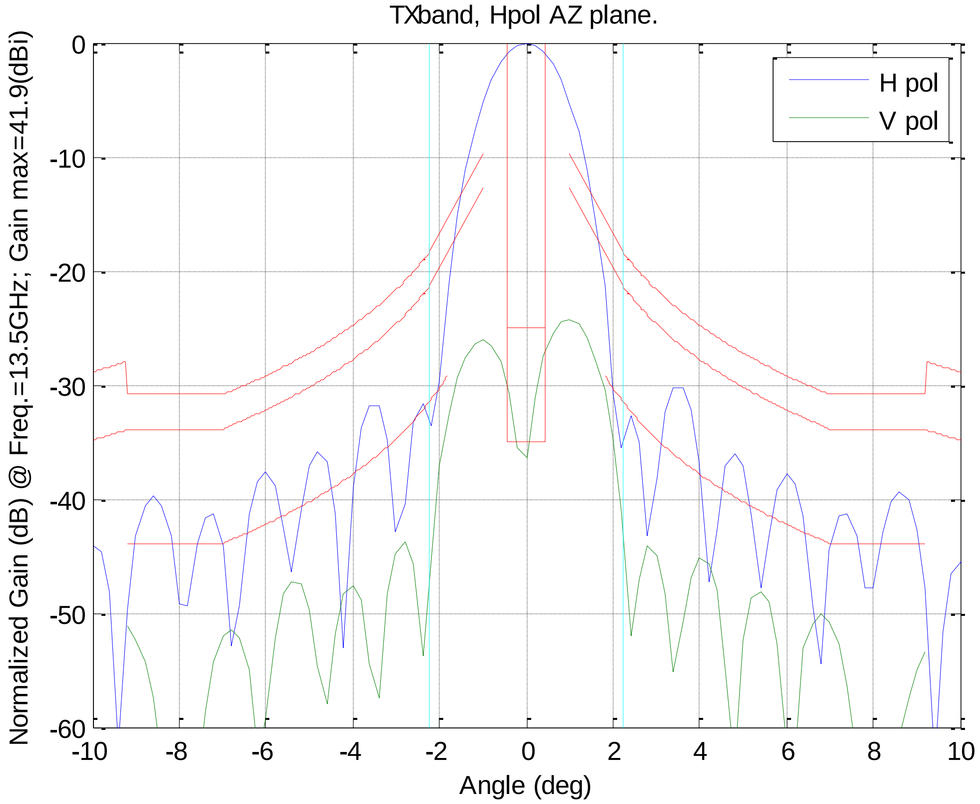
1.0<|α°|<=2.3	2.3<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.4(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	1.2(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.9(%)

AZplane, Hpol @ 13.25GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.45<|α°|<=-0.45 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.55	0.0	0.0	0.0


TXband, Hpol AZ plane.
H pol
V pol
Normalized Gain (dB) @ Freq.=13.5GHz; Gain max=41.9(dBi)
Angle (deg)
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Hpol AZ plane.
H pol
V pol
Normalized Gain (dB) @ Freq.=13.5GHz; Gain max=41.9(dBi)
Angle (deg)
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Hpol @ 13.5GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =10.8%]

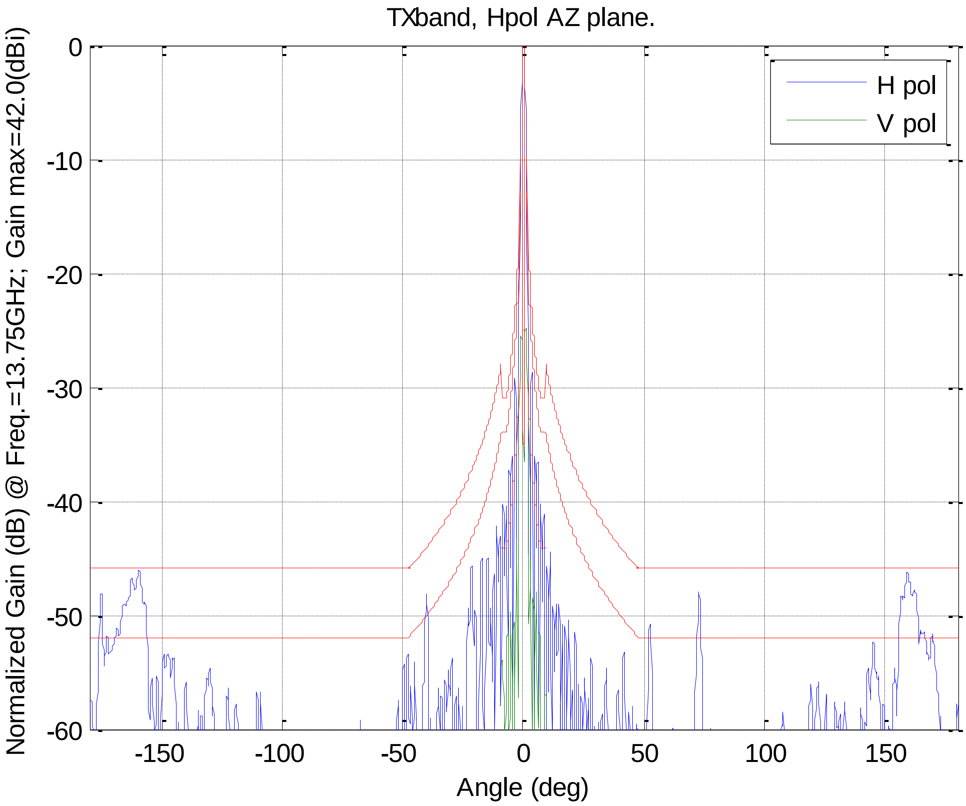
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.5(dB)	0.0(dB)	0.0(dB)	0.0(dB)	3.7(dB)	6.7(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.7(%)	10.1(%)

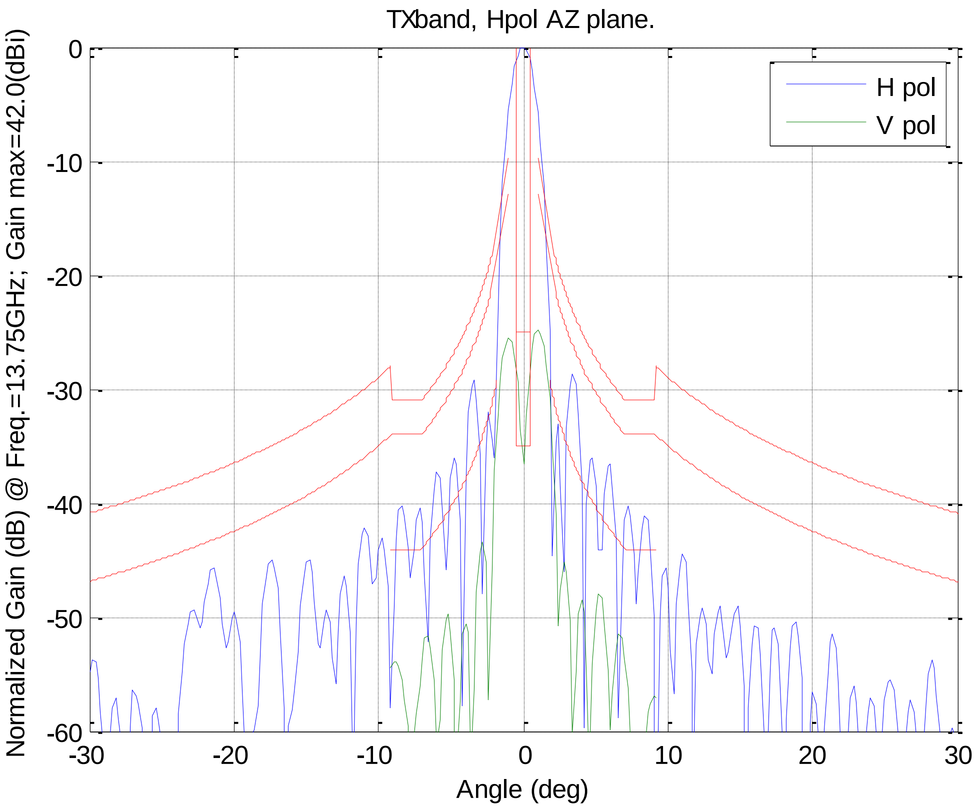
AZplane Hpol @13.5GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.6%]

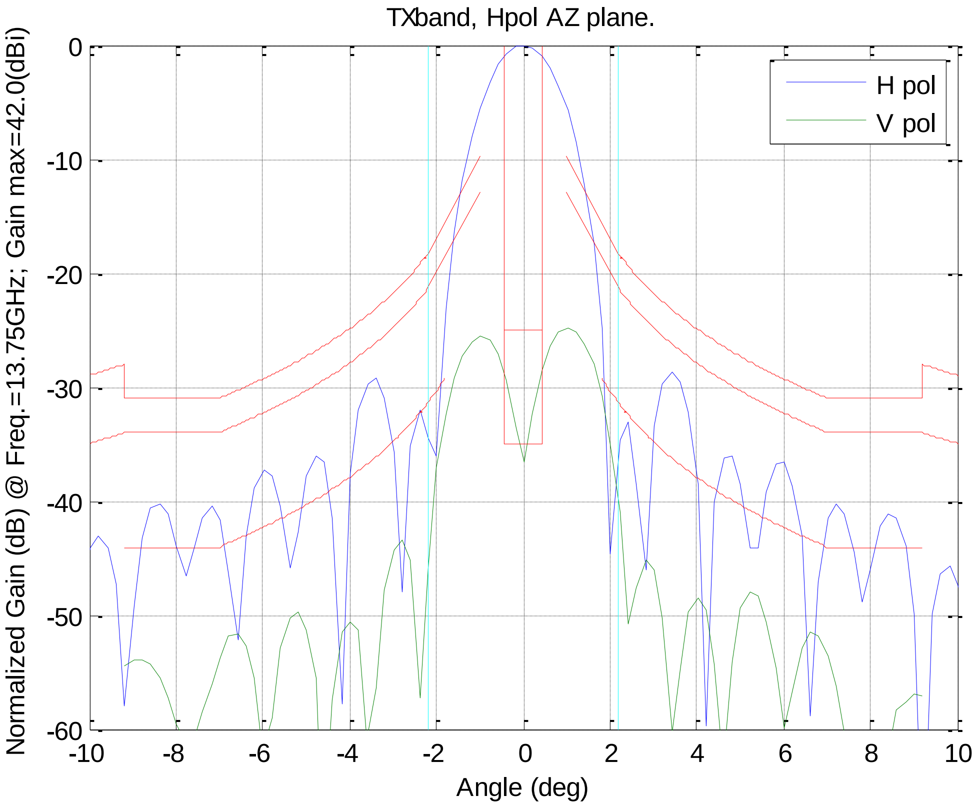
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.5(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.7(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.6(%)

AZplane, Hpol @ 13.5GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.44<|α°|<=-0.44 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.96	0.0	0.0	0.0


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=13.75GHz; Gain max=42.0(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=13.75GHz; Gain max=42.0(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Hpol @ 13.75GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =8.4%]

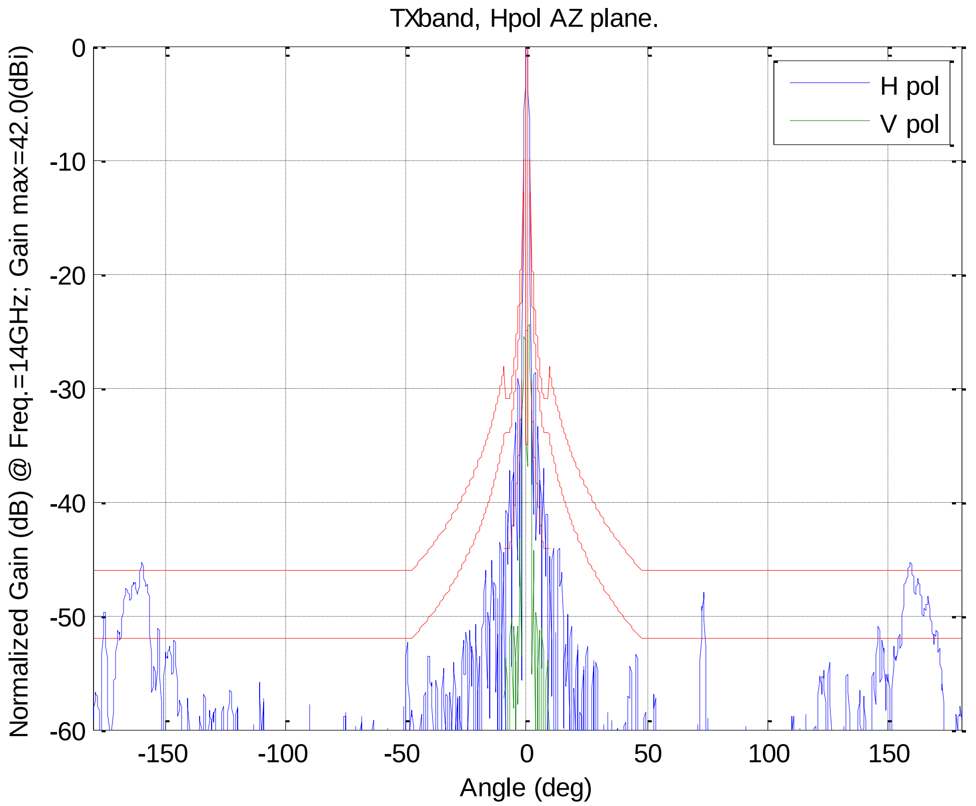
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
7.2(dB)	0.0(dB)	0.0(dB)	0.0(dB)	1.8(dB)	5.9(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.2(%)	8.2(%)

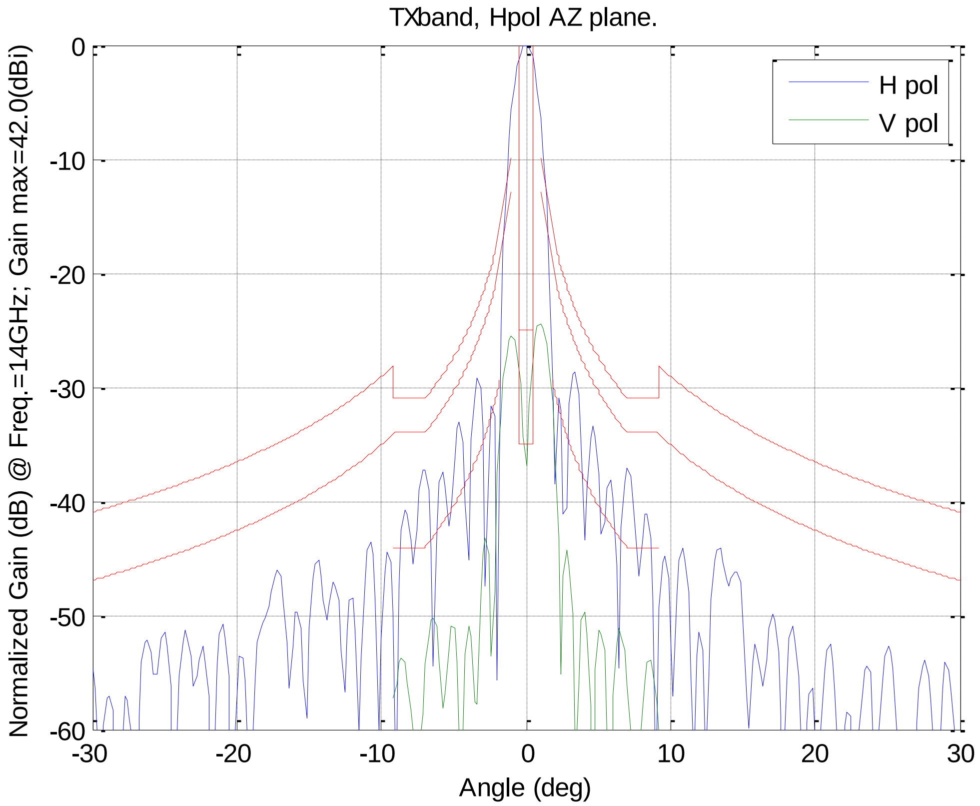
AZplane Hpol @13.75GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.0%]

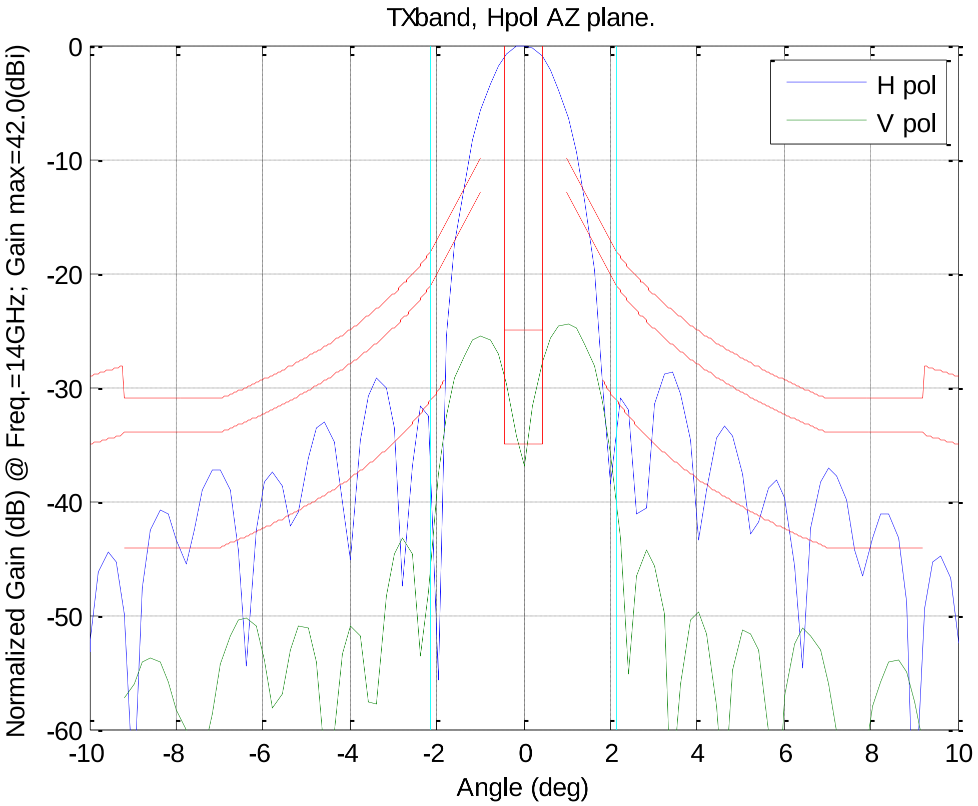
1.0<|α°|<=2.2	2.2<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
4.2(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)

AZplane, Hpol @ 13.75GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.43<|α°|<=-0.43 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
6.72	0.0	0.0	0.0


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=14GHz; Gain max=42.0(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=14GHz; Gain max=42.0(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Hpol @ 14GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =9.3%]

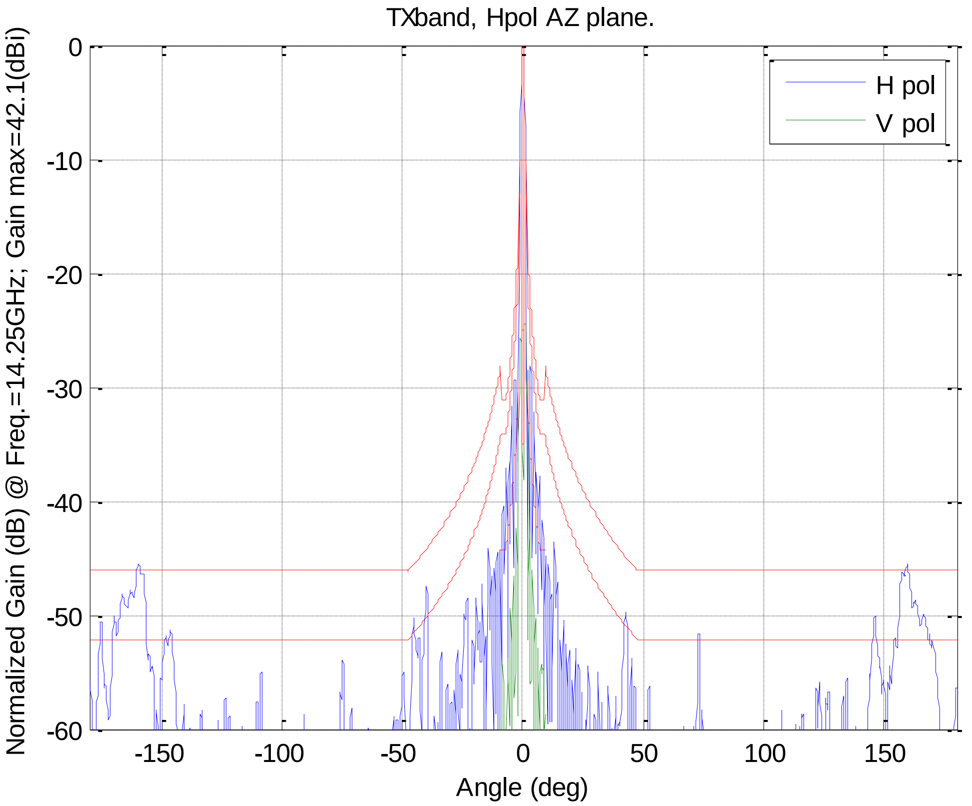
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
6.9(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	6.7(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	9.3(%)

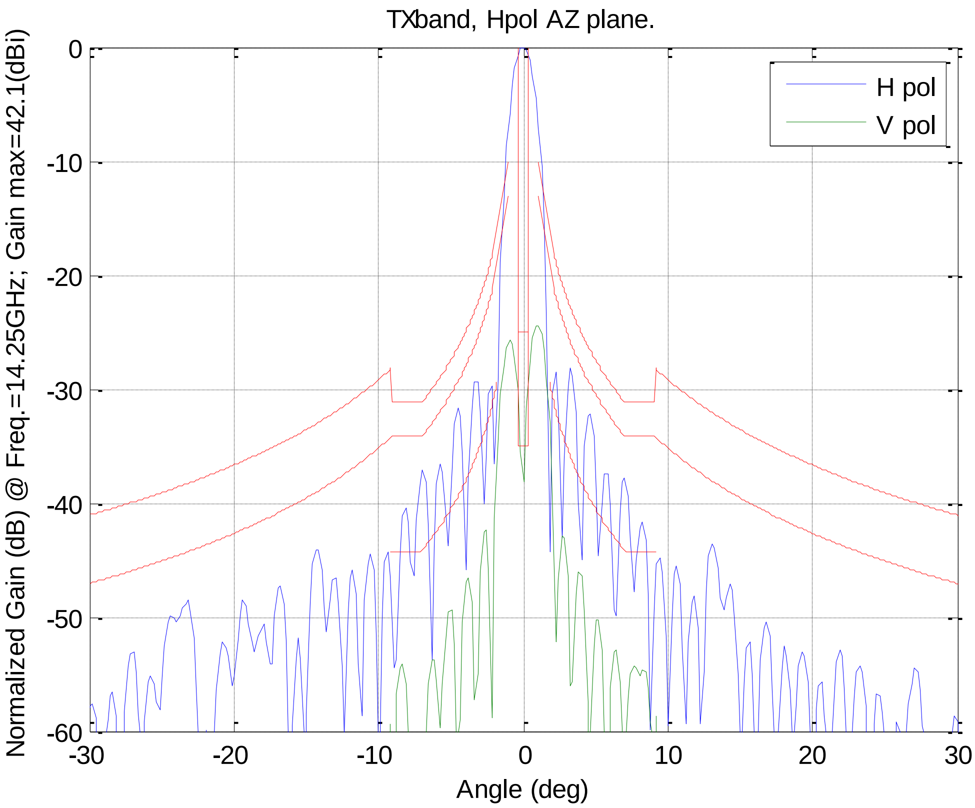
AZplane Hpol @14GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.8%]

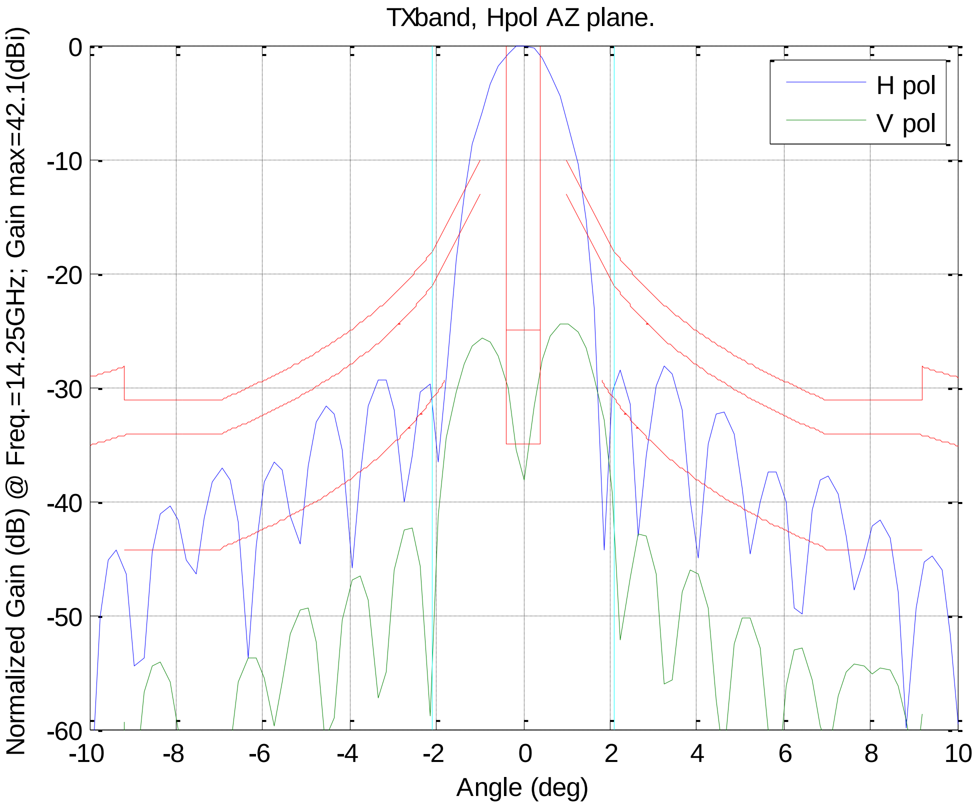
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
3.9(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.7(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.8(%)

AZplane, Hpol @ 14GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.42<|α°|<=-0.42 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
7.14	0.0	0.0	0.0


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=14.25GHz; Gain max=42.1(dBi)
Angle (deg)
H pol
V pol


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=14.25GHz; Gain max=42.1(dBi)
Angle (deg)
H pol
V pol



\Zplane Hpol @ 14.25GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =10.2%

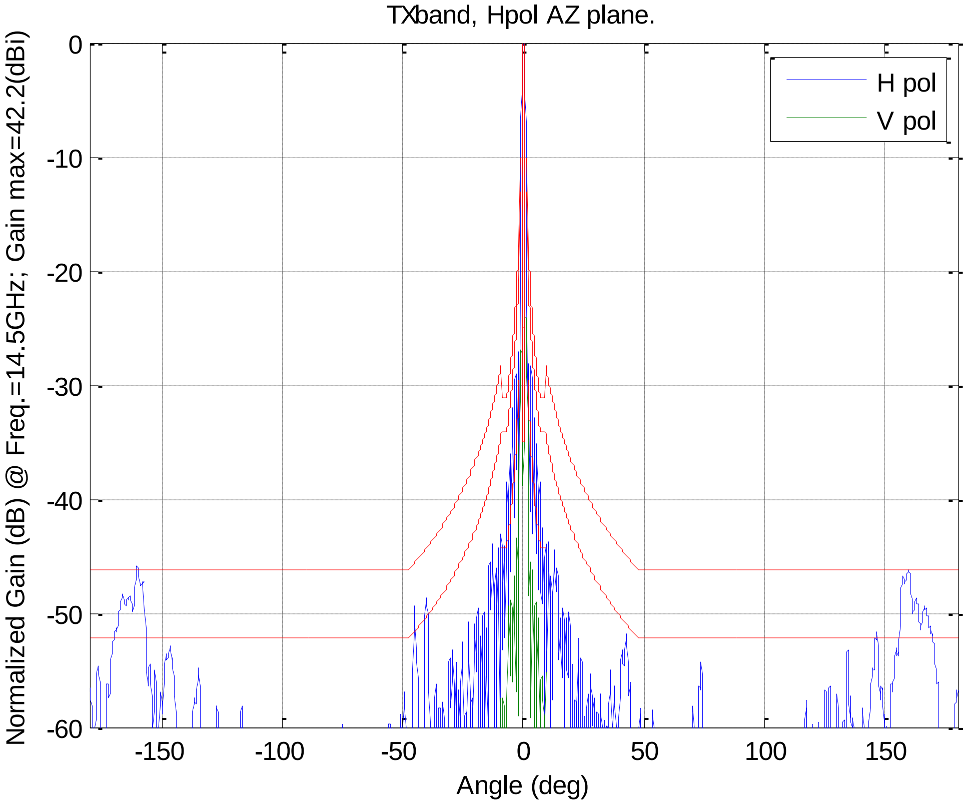
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
6.6(dB)	0.0(dB)	0.0(dB)	0.0(dB)	2.7(dB)	6.6(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.9(%)	9.3(%)

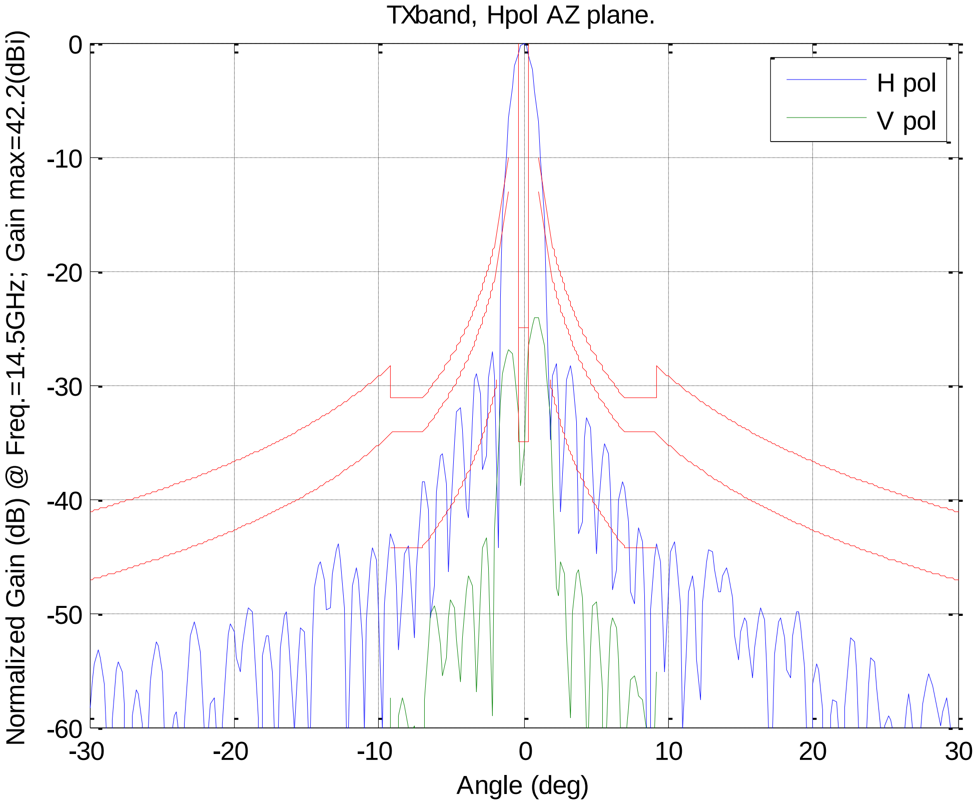
AZplane Hpol @14.25GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.7%]

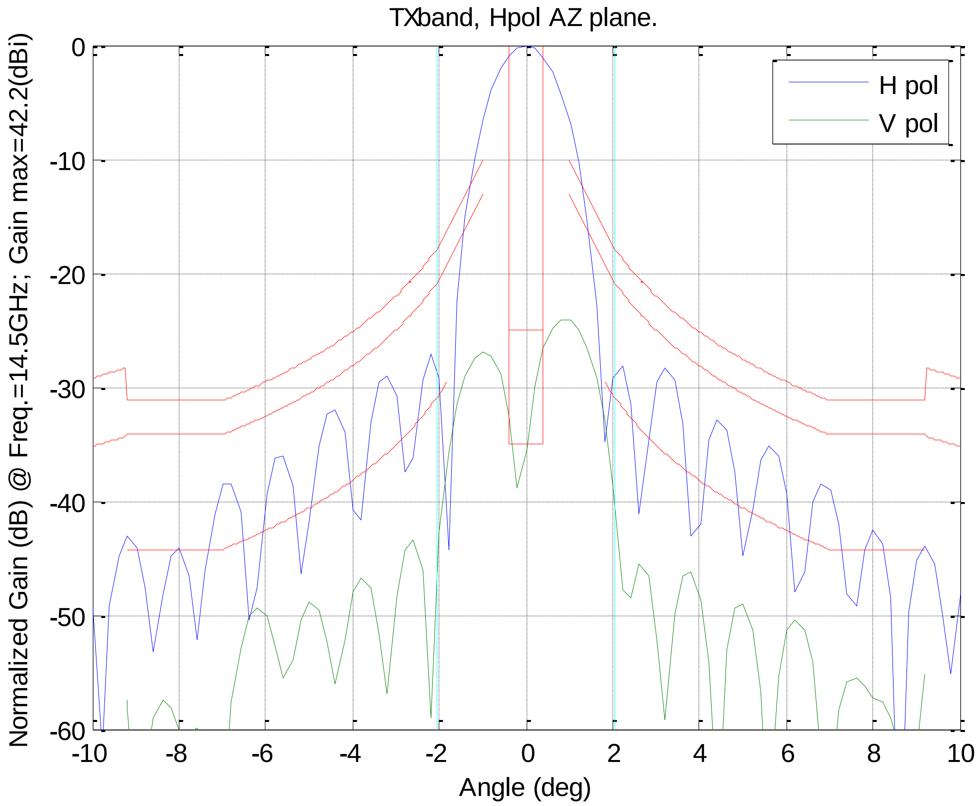
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
3.6(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.6(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.7(%)

AZplane, Hpol @ 14.25GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.41<|α°|<=-0.41 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
6.91	0.0	0.0	0.0


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=14.5GHz; Gain max=42.2(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-150
-100
-50
0
50
100
150


TXband, Hpol AZ plane.
Normalized Gain (dB) @ Freq.=14.5GHz; Gain max=42.2(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-30
-20
-10
0
10
20
30



AZplane Hpol @ 14.5GHz. Overshoot vs mask C-Pol: 29-25log(α°) (dB). [Total overshoot =8.4%]

1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
6.4(dB)	0.0(dB)	0.0(dB)	0.0(dB)	2.2(dB)	6.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.5(%)	7.9(%)

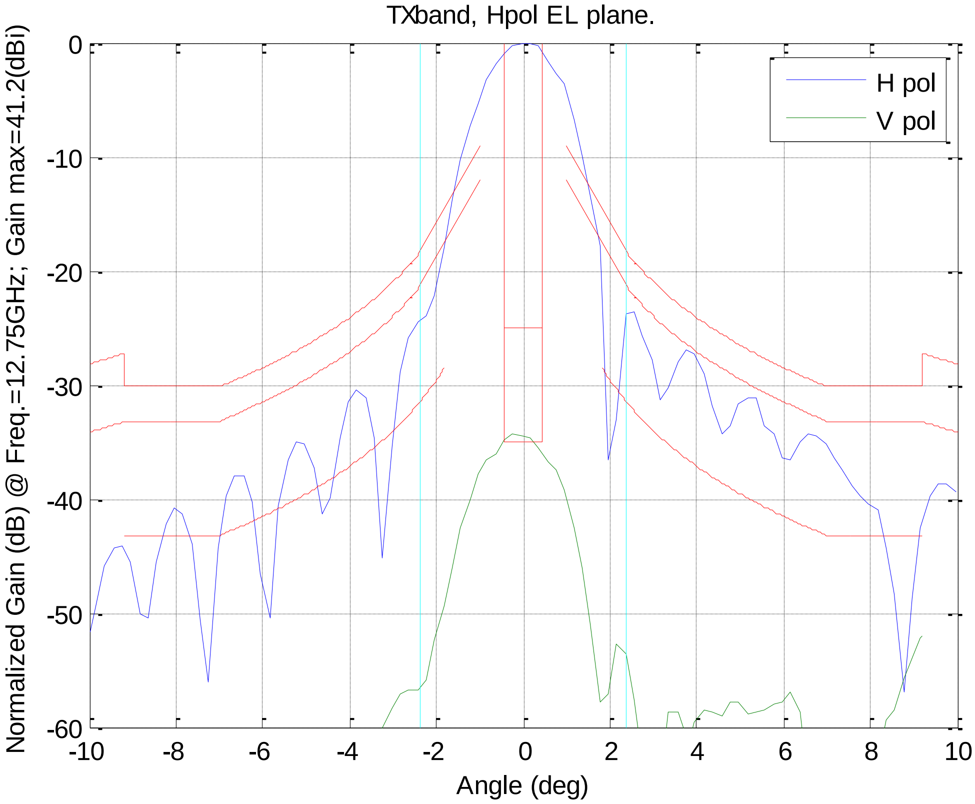
AZplane Hpol @14.5GHz. Overshoot vs mask C-Pol: 32-25log(α°) (dB). [Total overshoot =0.2%]

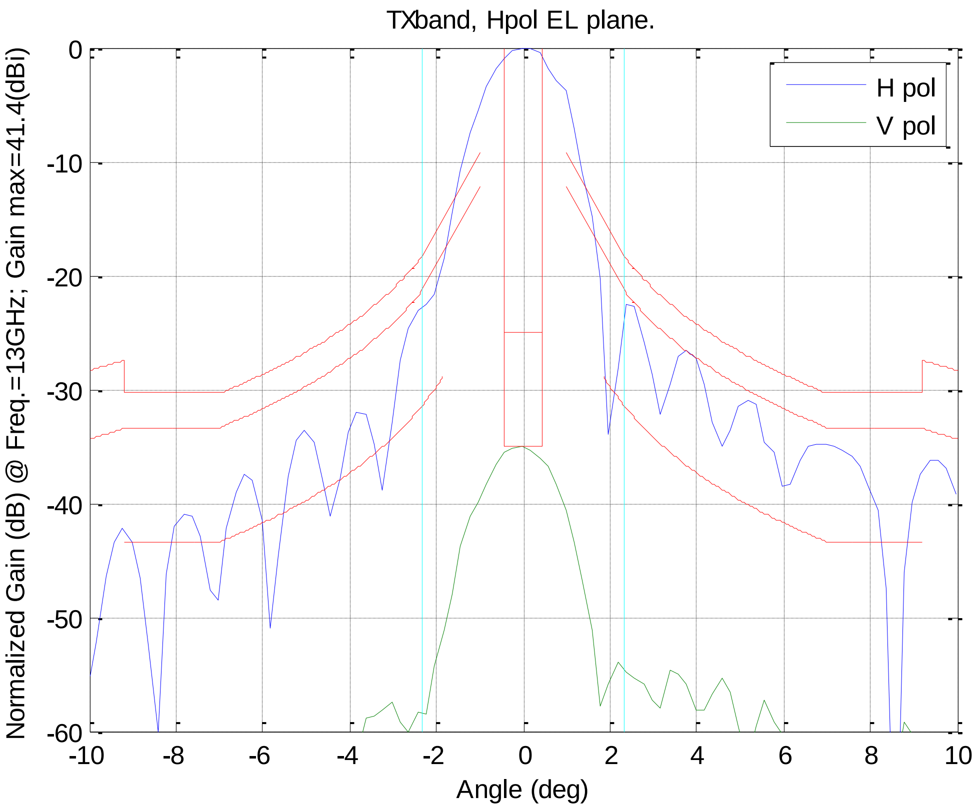
1.0<|α°|<=2.1	2.1<|α°|<=7.0	7.0<|α°|<=9.2	9.2<|α°|<=30.0	30.0<|α°|<=48.0	48.0<|α°|<=180
3.4(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.0(dB)	0.3(dB)
0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.0(%)	0.2(%)

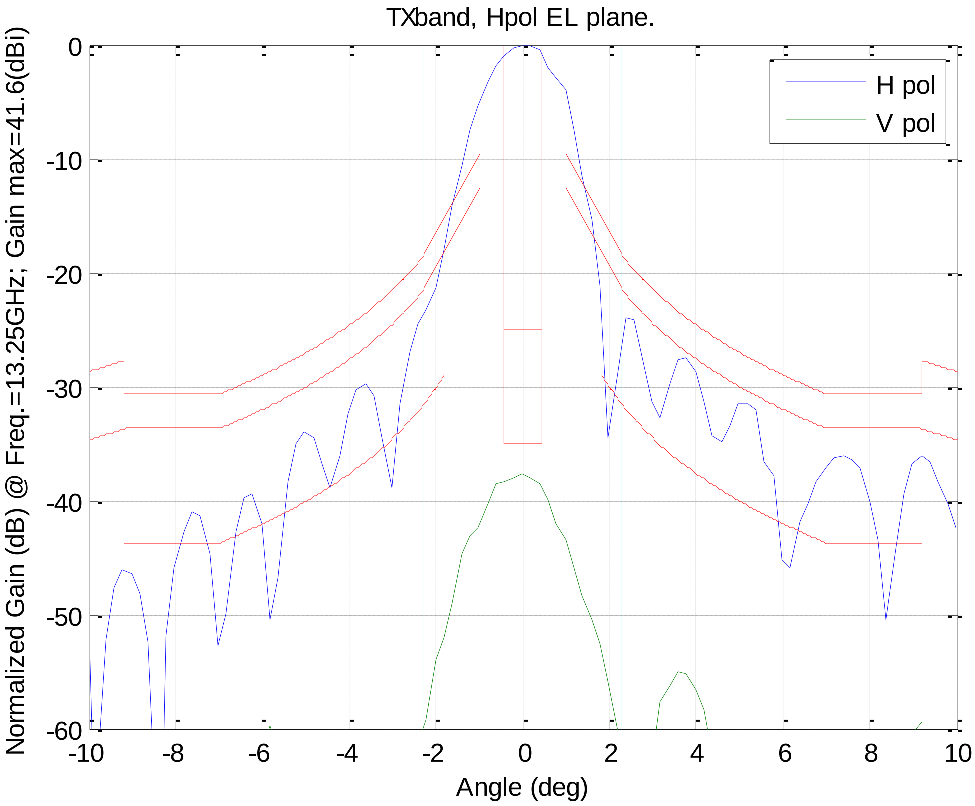
AZplane, Hpol @ 14.5GHz. Overshoot into -1dB Cpol angle and mask X-Pol: 19-25log(α°) (dB).

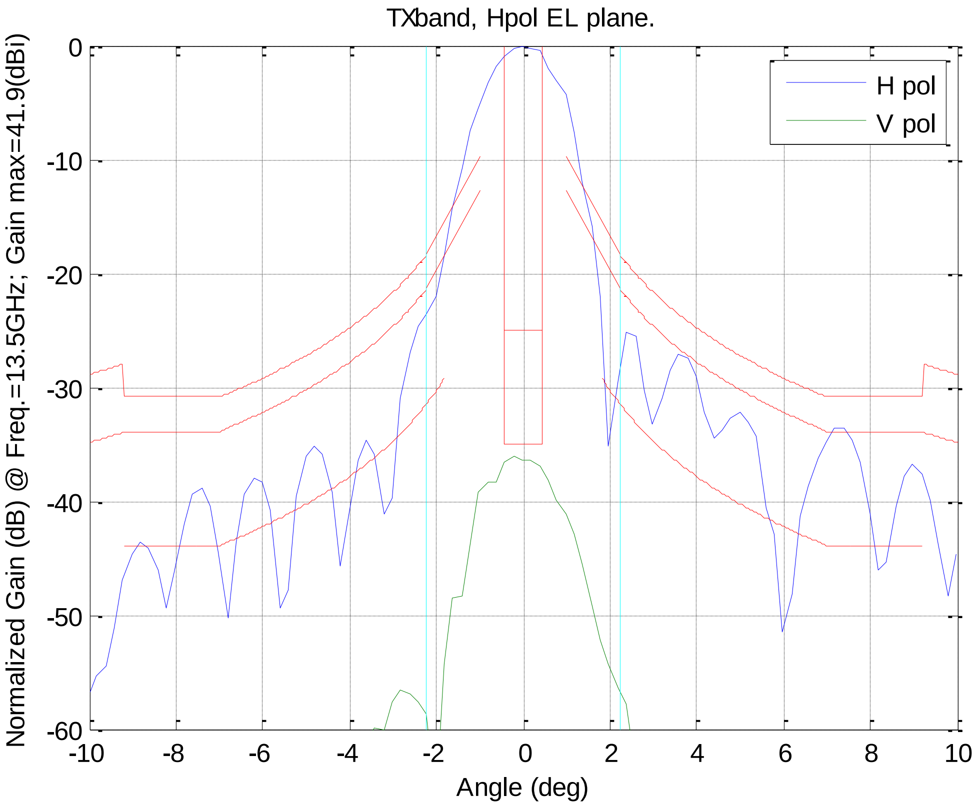
-0.4<|α°|<=-0.4 (respect -35.0dB)	-0.40<|α°|<=-0.40 (respect -25.0dB)	1.8<|α°|<=7.0	7.0<|α°|<=9.2
8.22	0.0	0.0	0.0

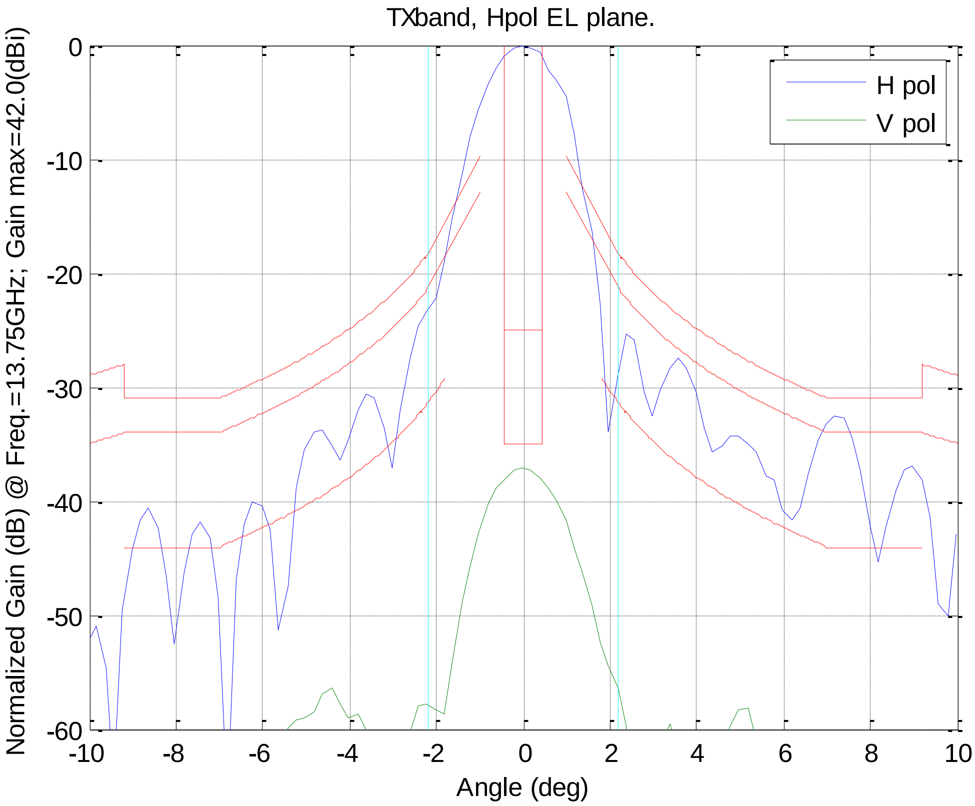
6.2.4: H-POL PORT, EL PLANE PLOTS

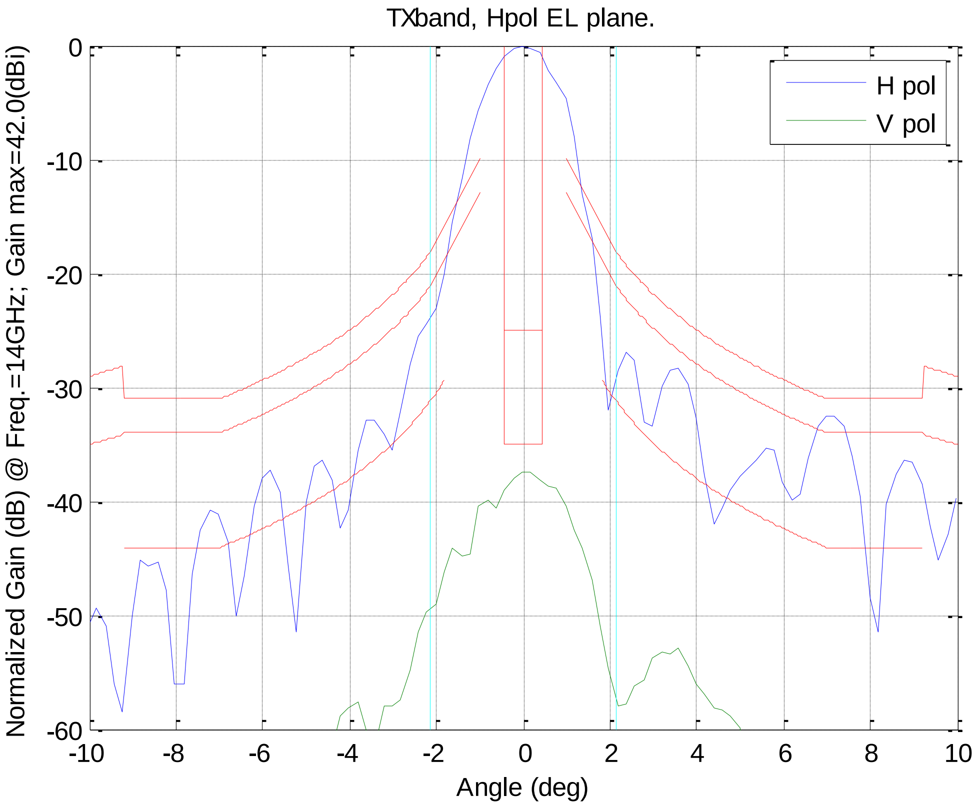


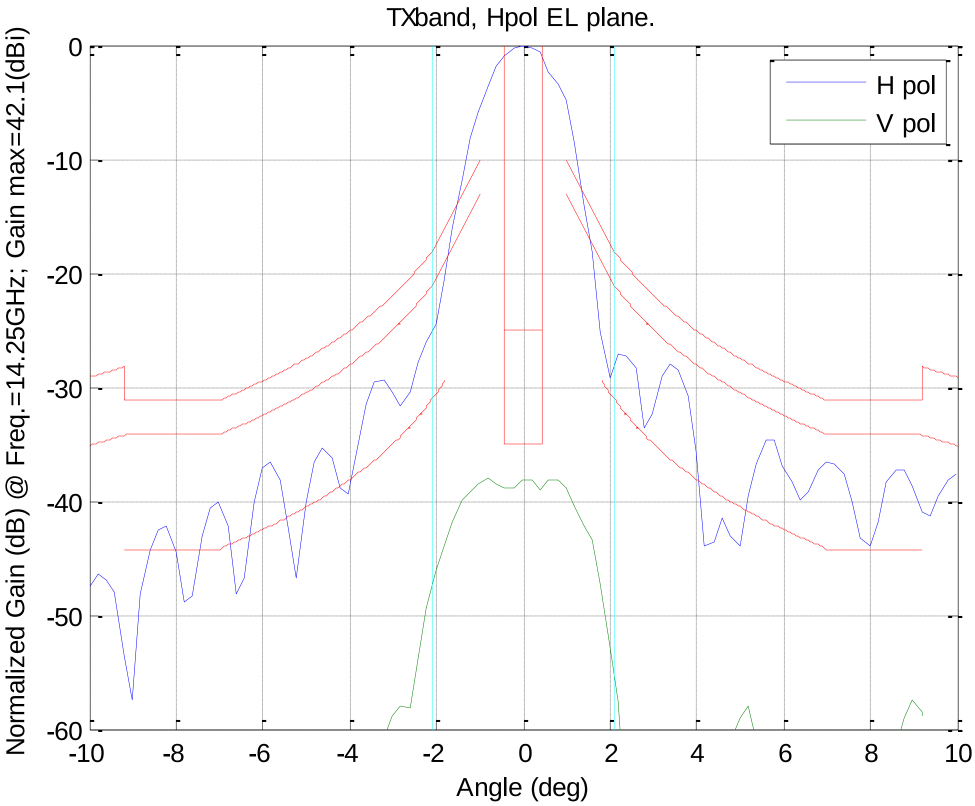


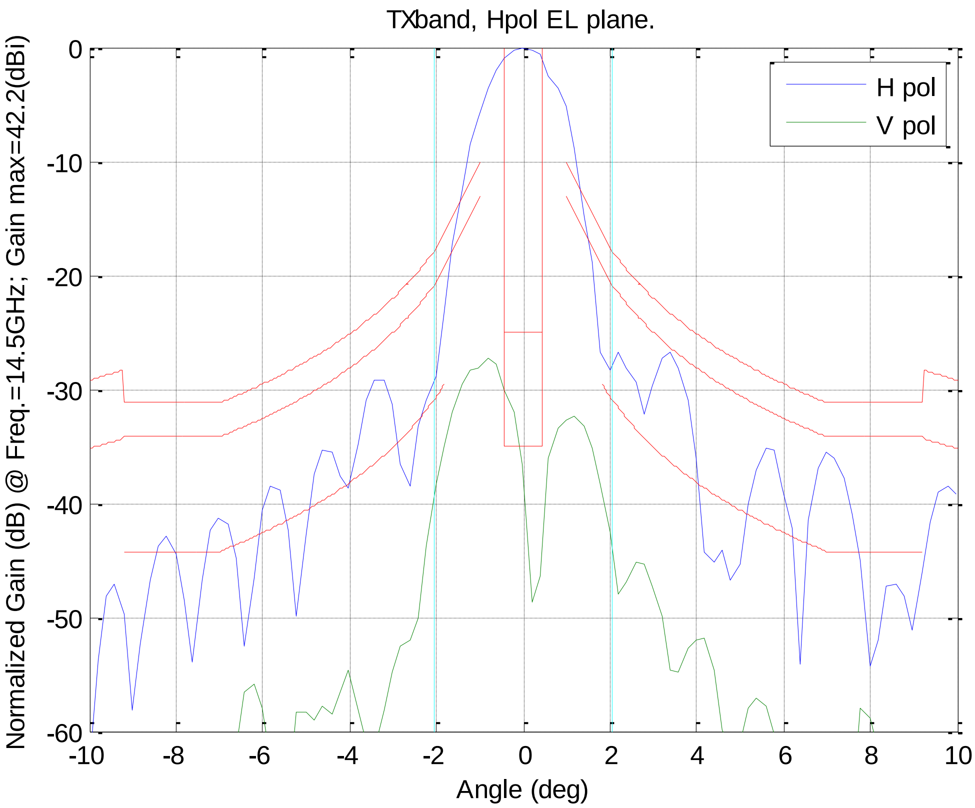

TXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=13.25GHz; Gain max=41.6(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10


TXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=13.5GHz; Gain max=41.9(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10


TXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=13.75GHz; Gain max=42.0(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

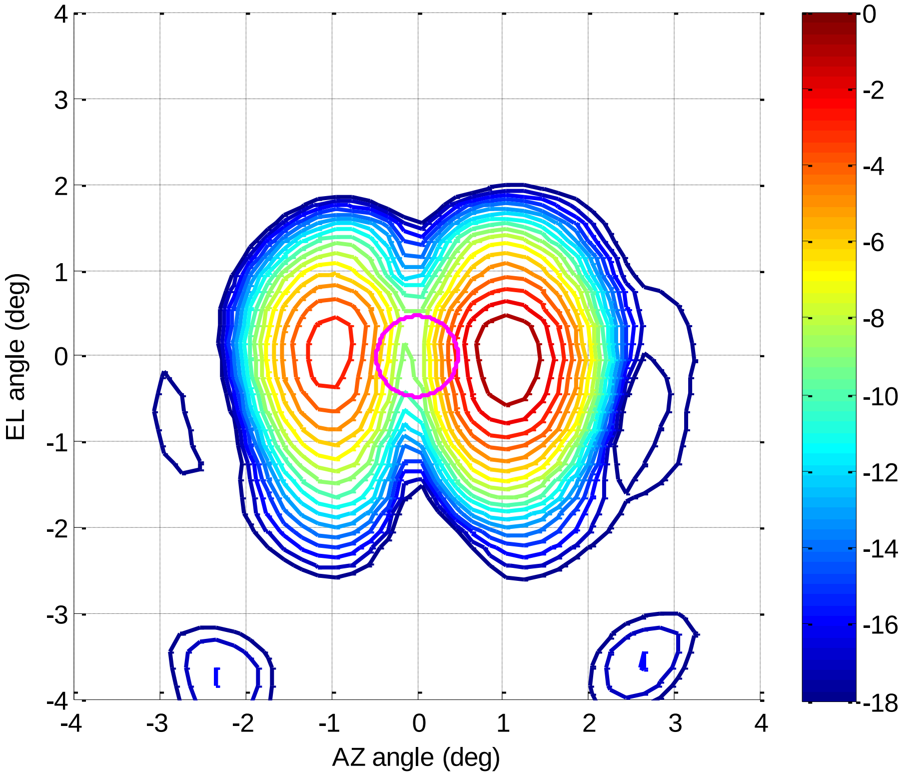

TXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=14GHz; Gain max=42.0(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10


TXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=14.25GHz; Gain max=42.1(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

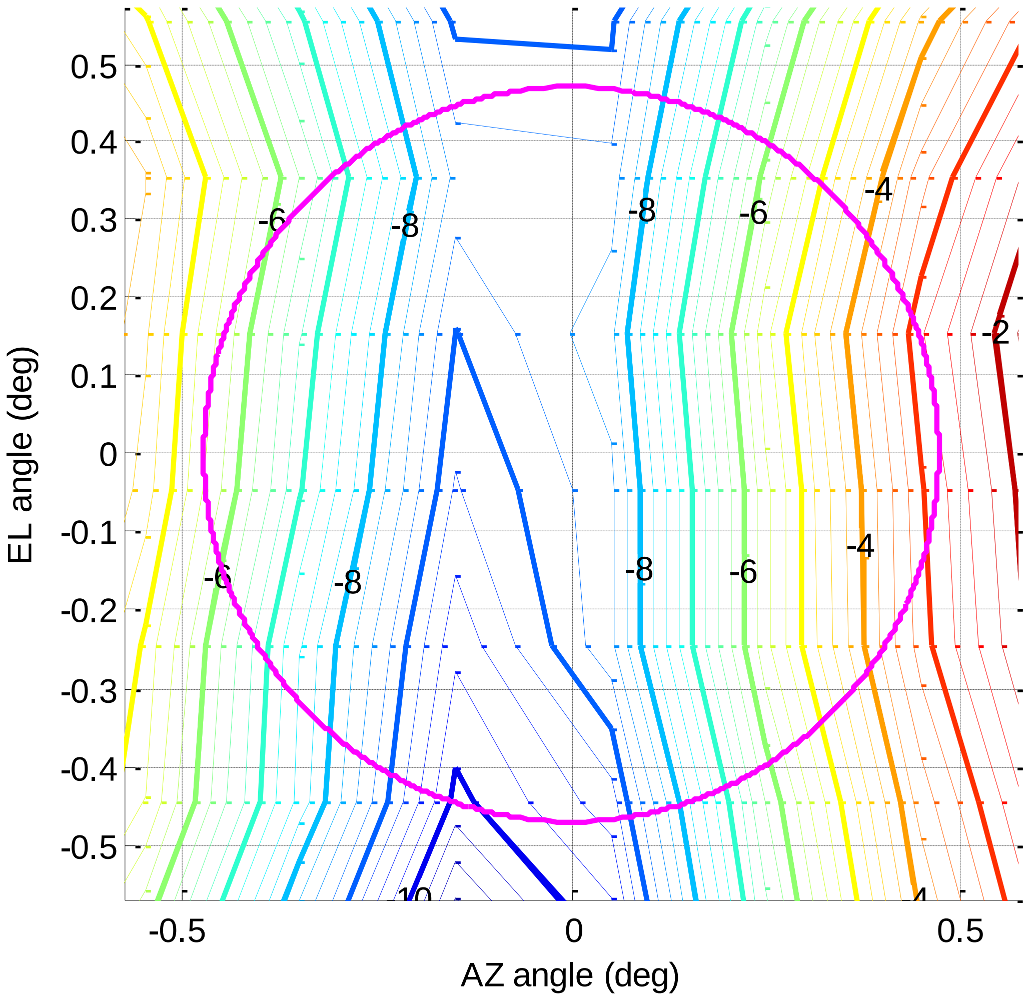

TXband, Hpol EL plane.
Normalized Gain (dB) @ Freq.=14.5GHz; Gain max=42.2(dBi)
Angle (deg)
H pol
V pol
0
-10
-20
-30
-40
-50
-60
-10
-8
-6
-4
-2
0
2
4
6
8
10

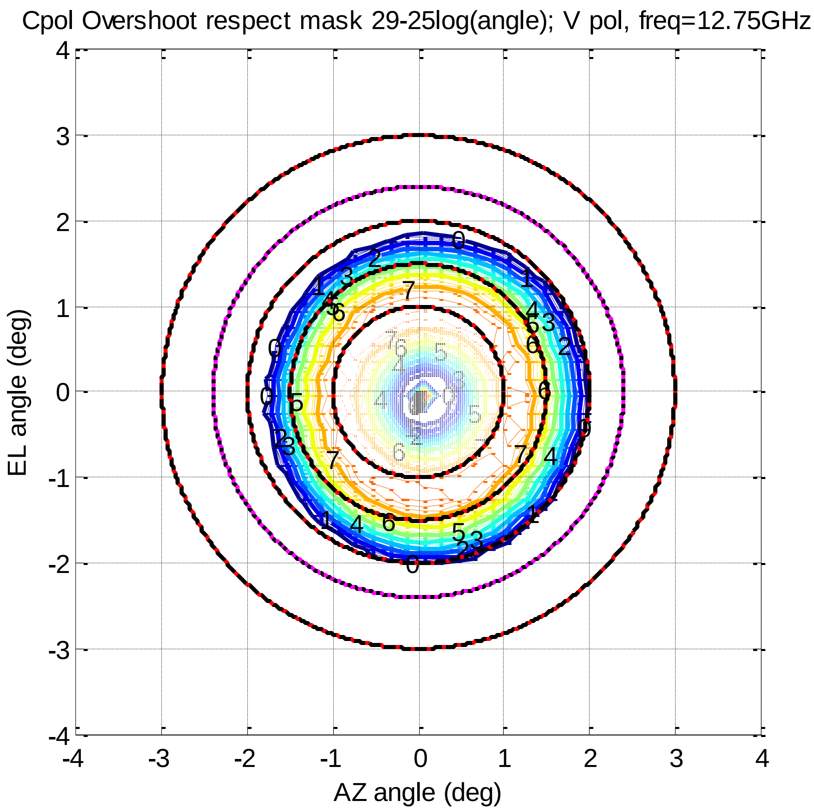
6.3.1: TX BAND, V-POL, RASTER SCANS

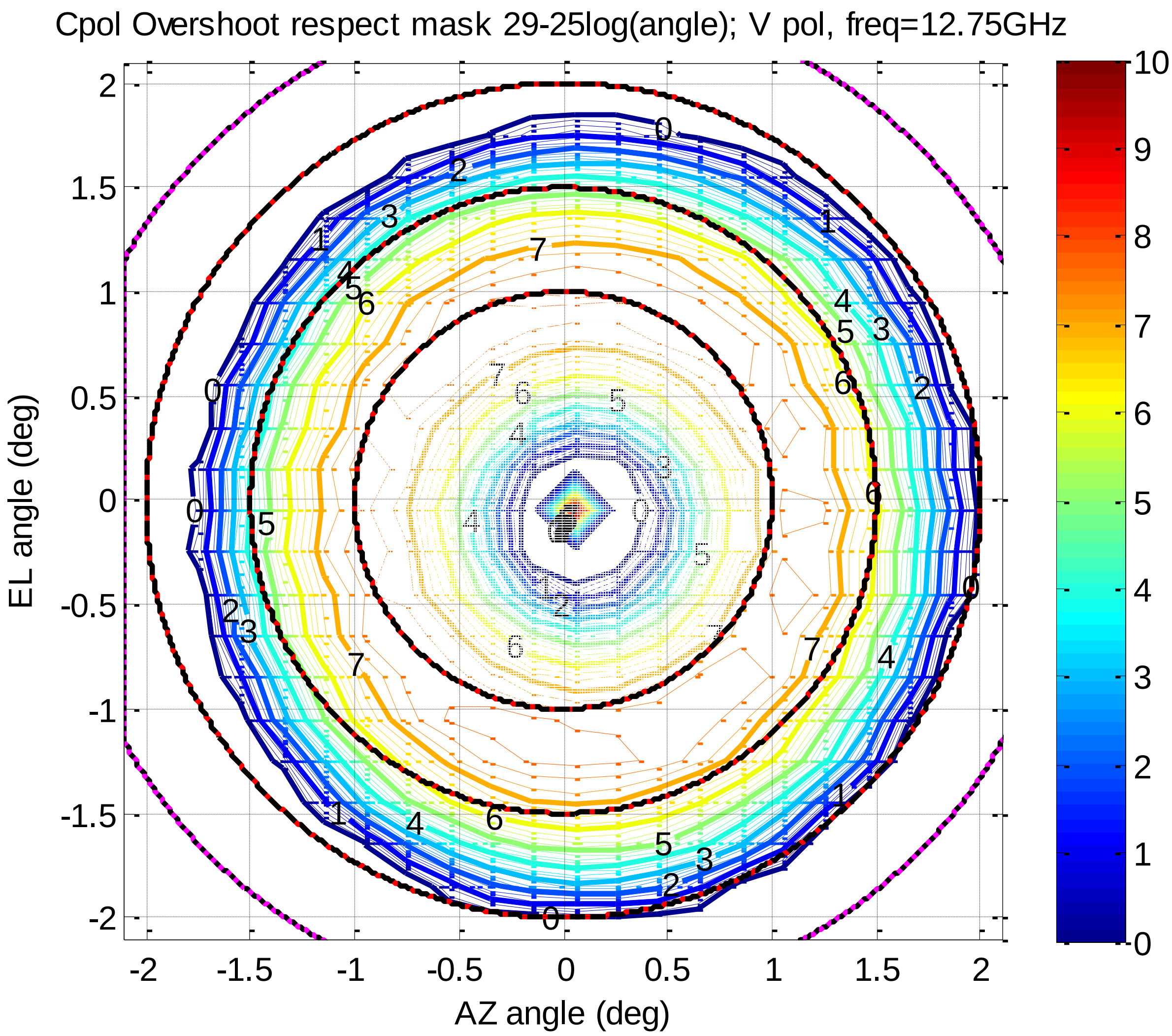
Xpol normalized to max -1dB = -22.6(dB), V pol, freq=12.75GHz

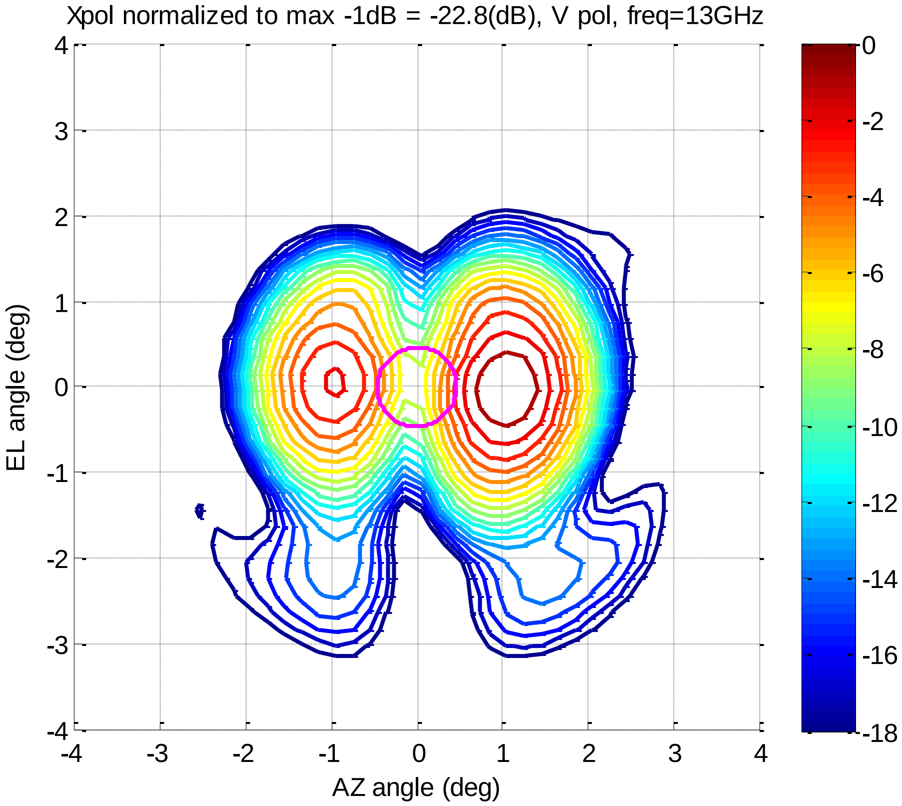


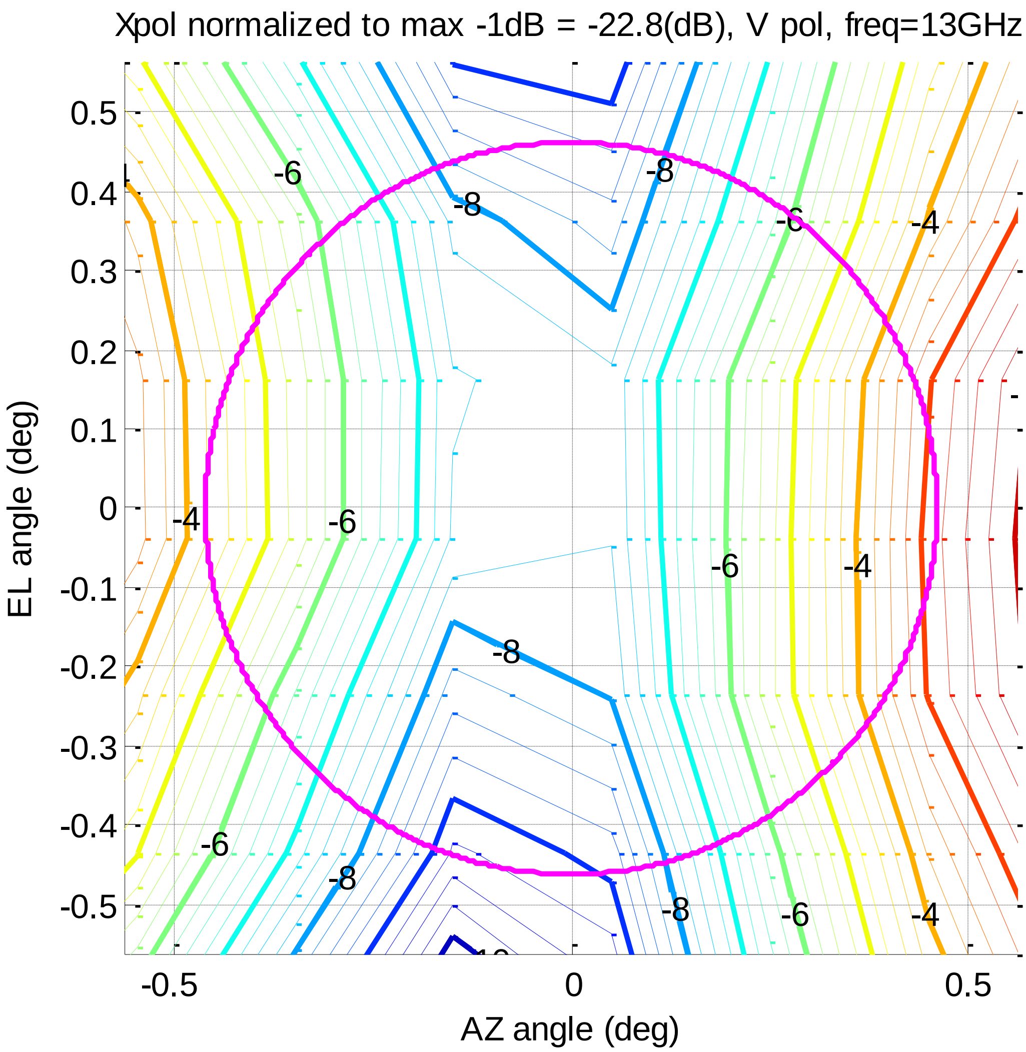
Xpol normalized to max -1dB = -22.6(dB), V pol, freq=12.75GHz

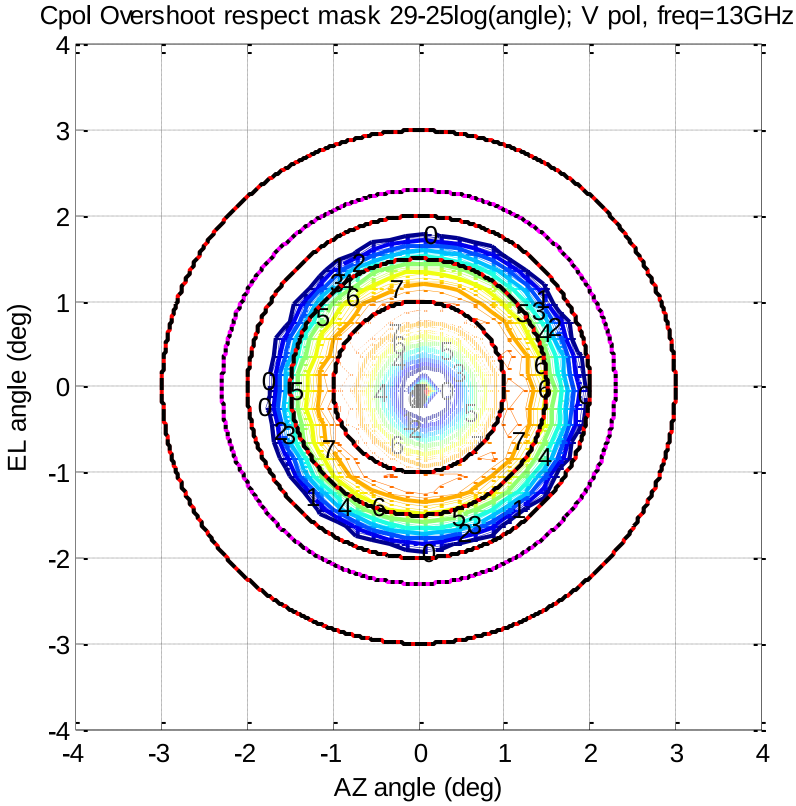


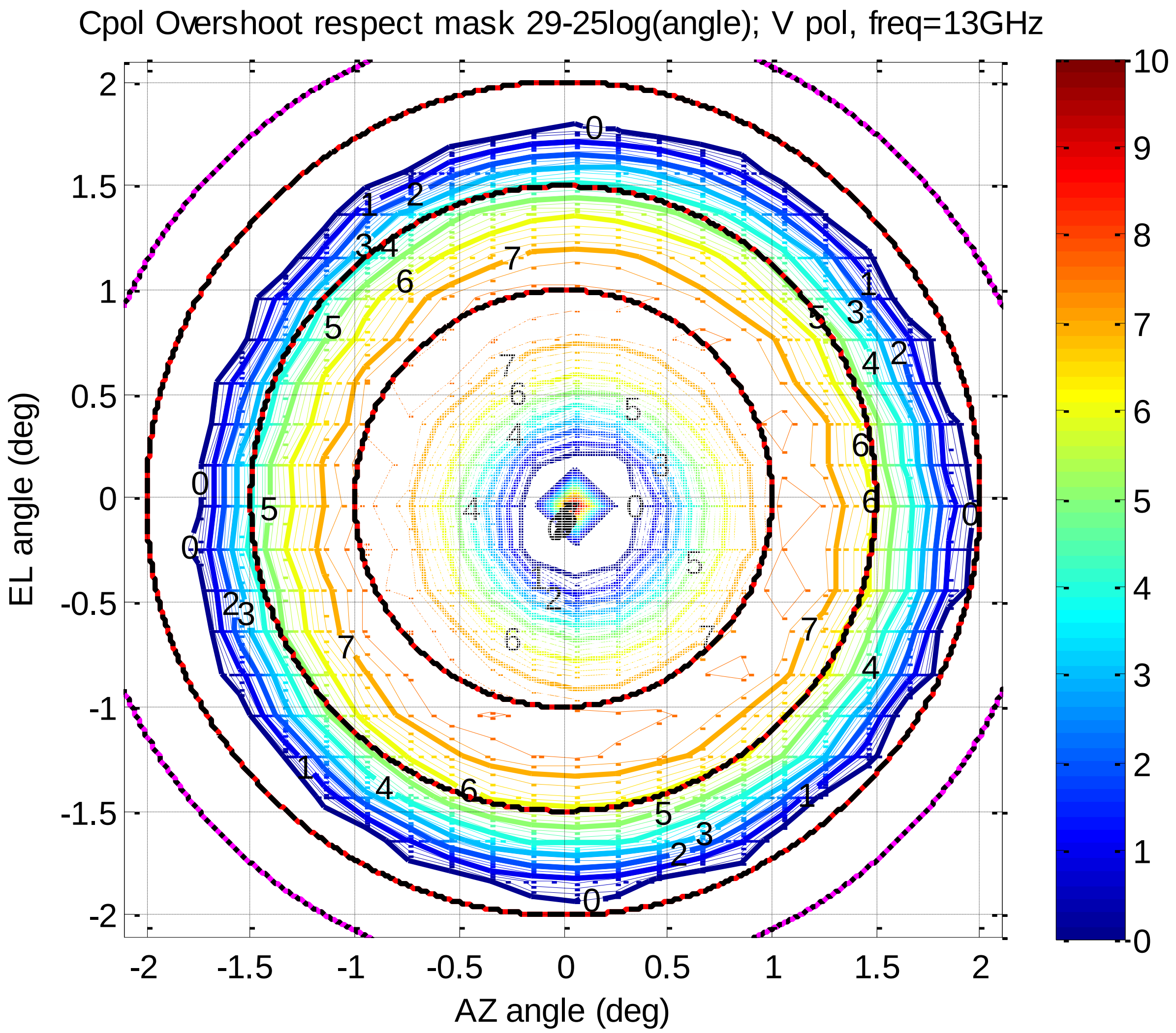

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=12.75GHz
EL angle (deg)
AZ angle (deg)

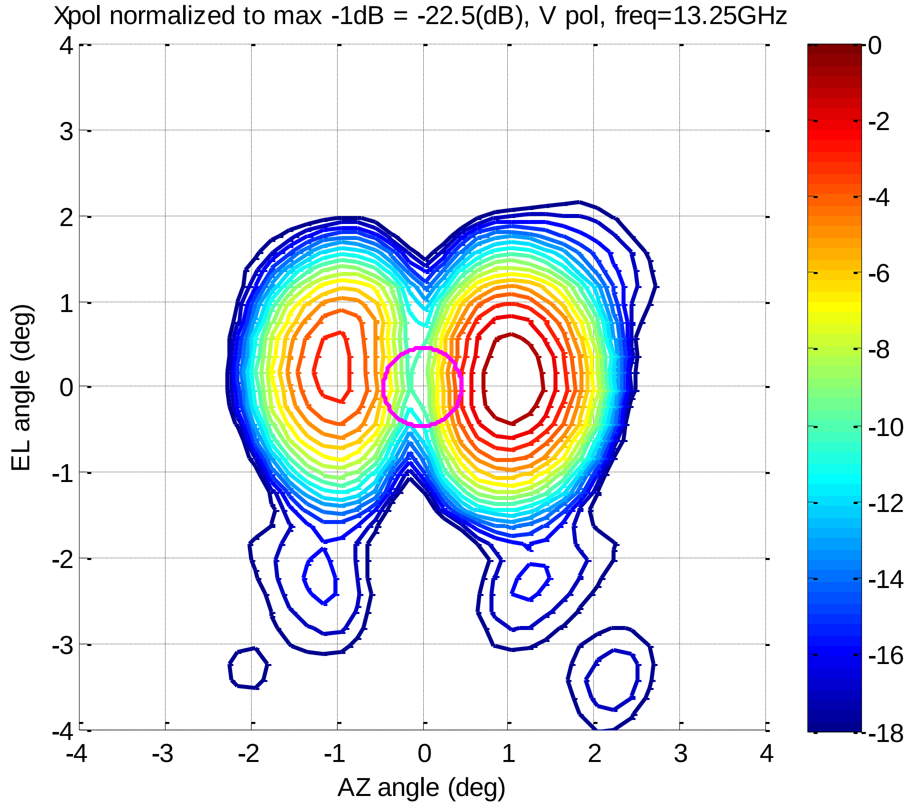

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=12.75GHz
EL angle (deg)
AZ angle (deg)

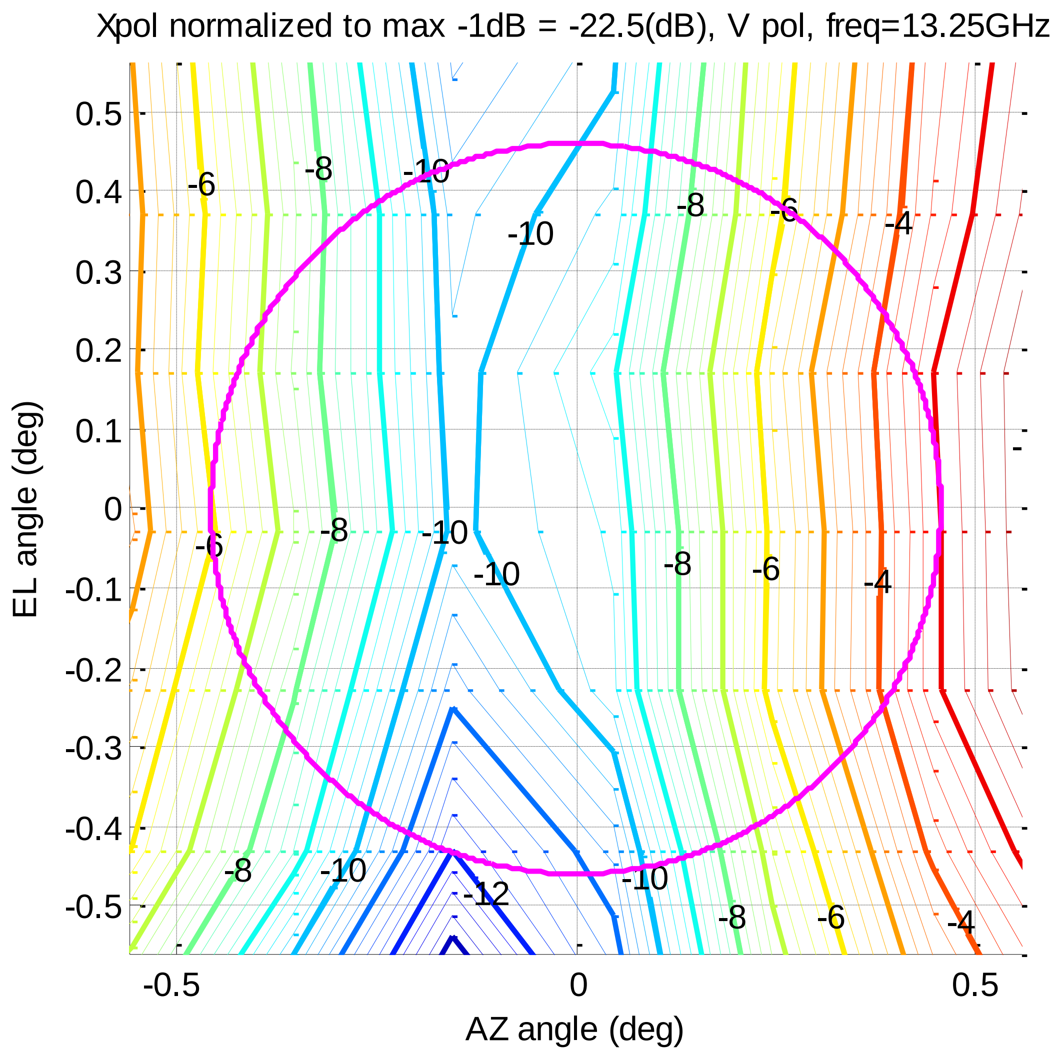

Xpol normalized to max -1dB = -22.8(dB), V pol, freq=13GHz
EL angle (deg)
AZ angle (deg)

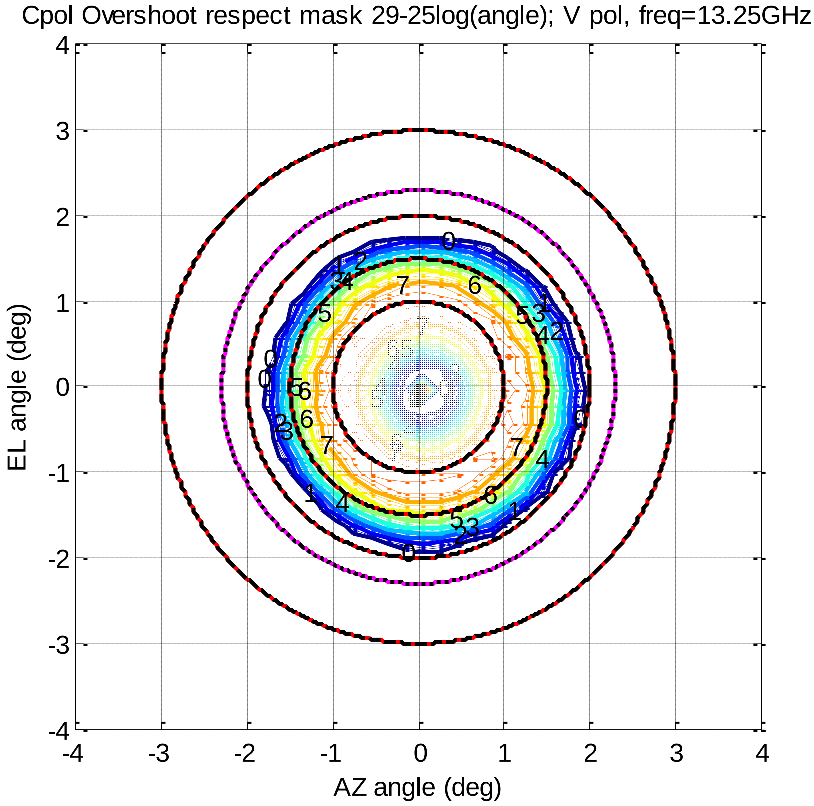

Xpol normalized to max -1dB = -22.8(dB), V pol, freq=13GHz
EL angle (deg)
AZ angle (deg)

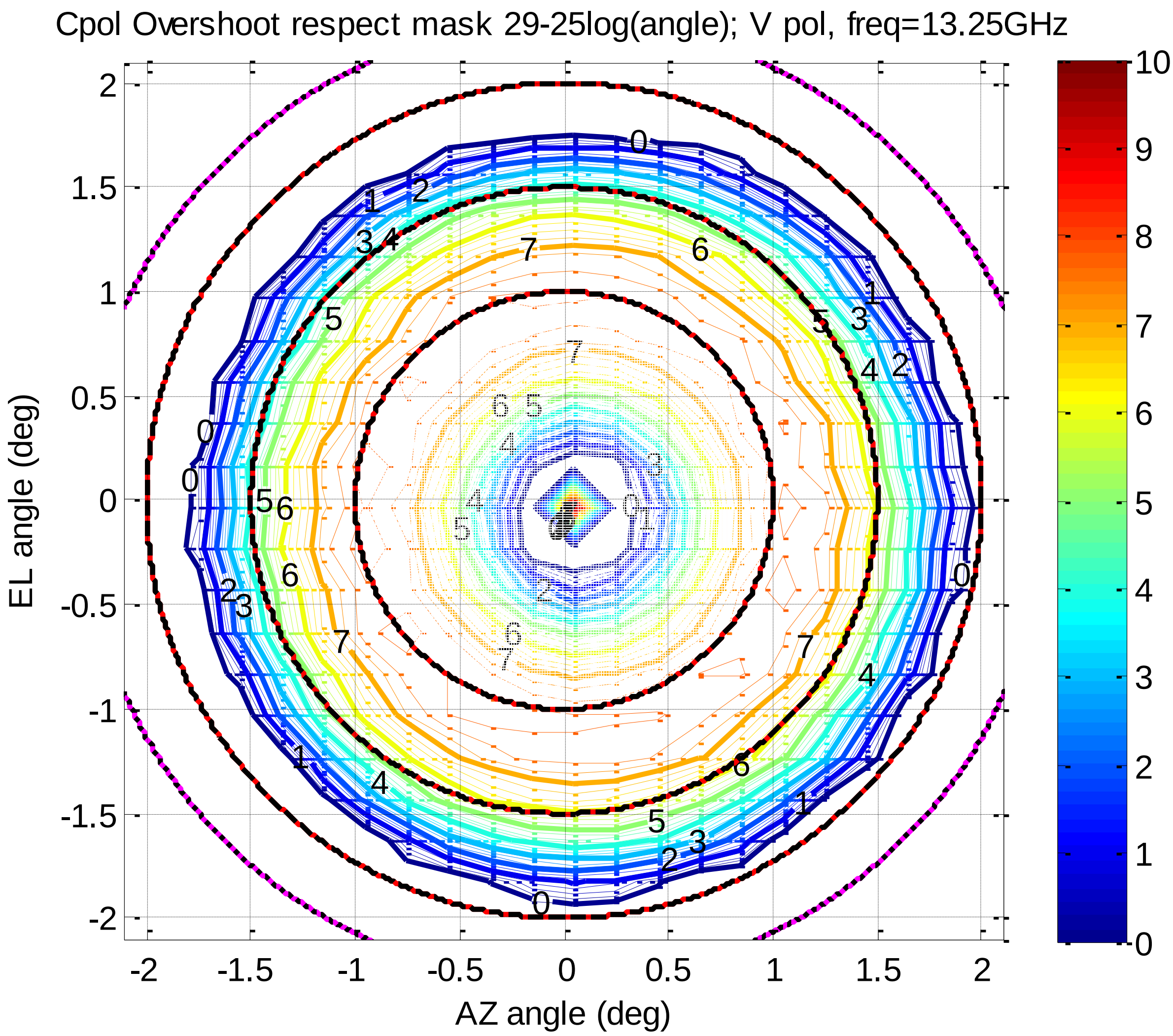

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13GHz
EL angle (deg)
AZ angle (deg)

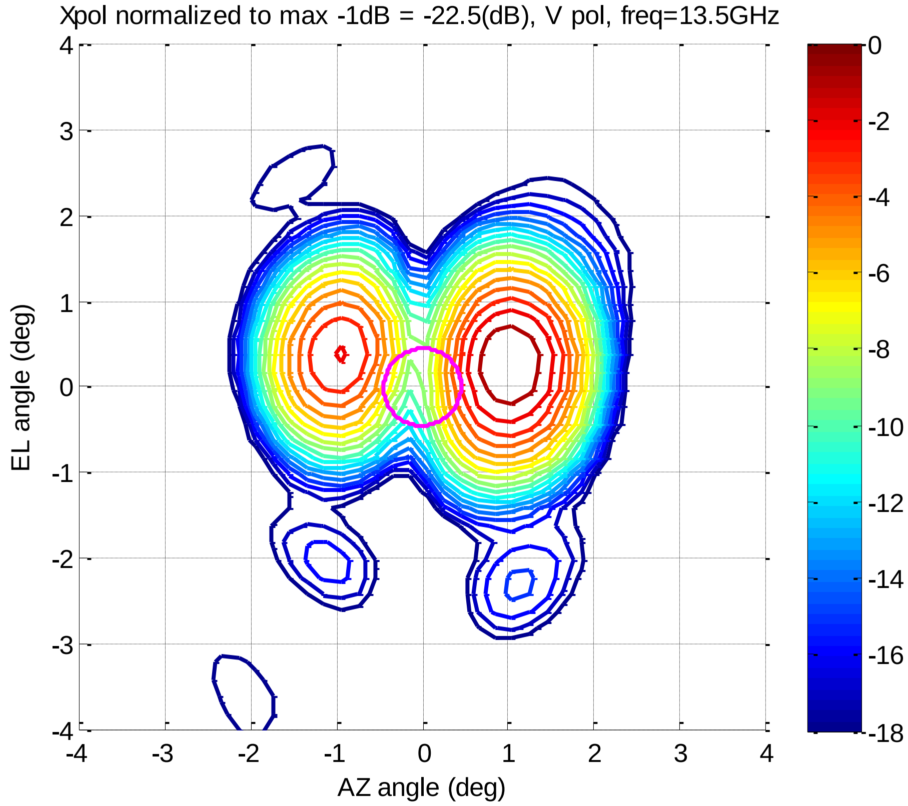

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13GHz
EL angle (deg)
AZ angle (deg)

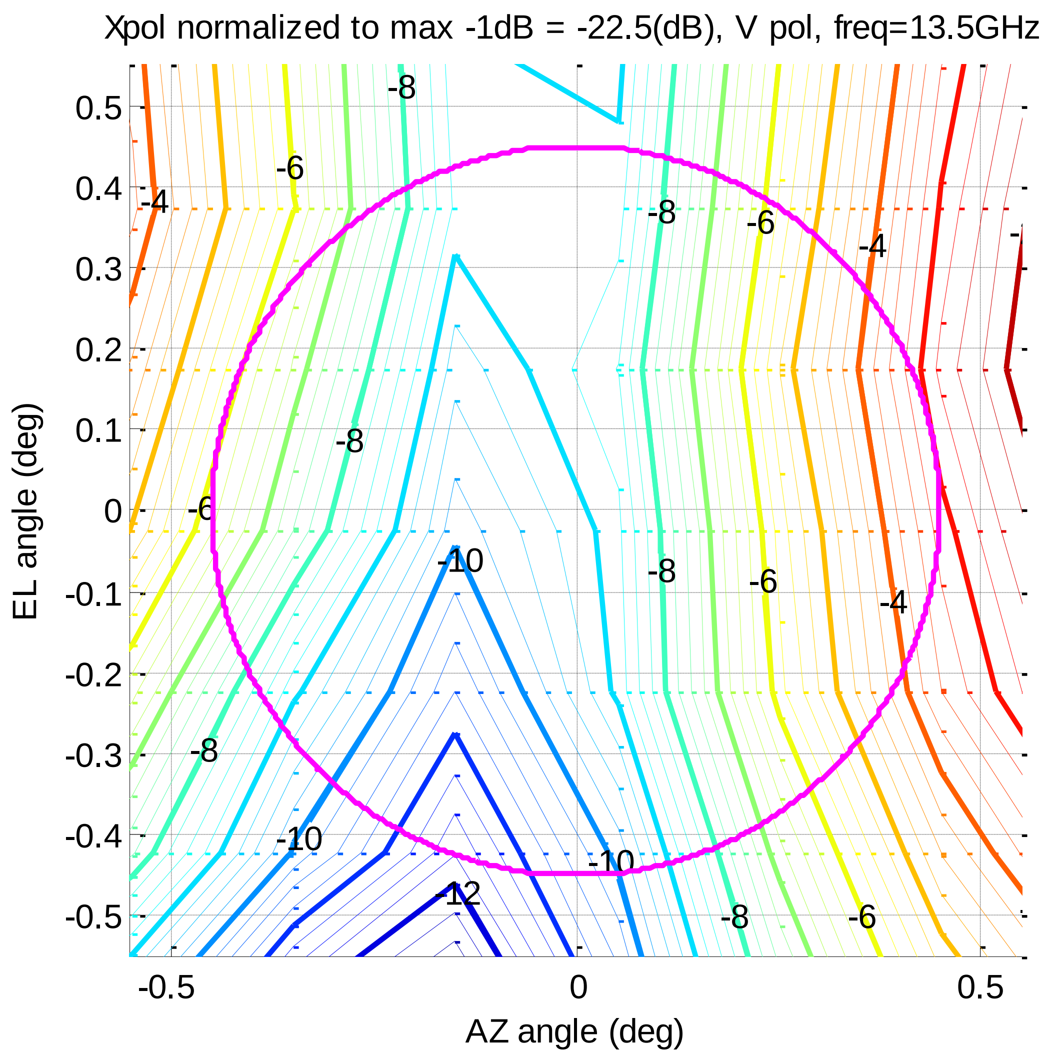

Xpol normalized to max -1dB = -22.5(dB), V pol, freq=13.25GHz
EL angle (deg)
AZ angle (deg)

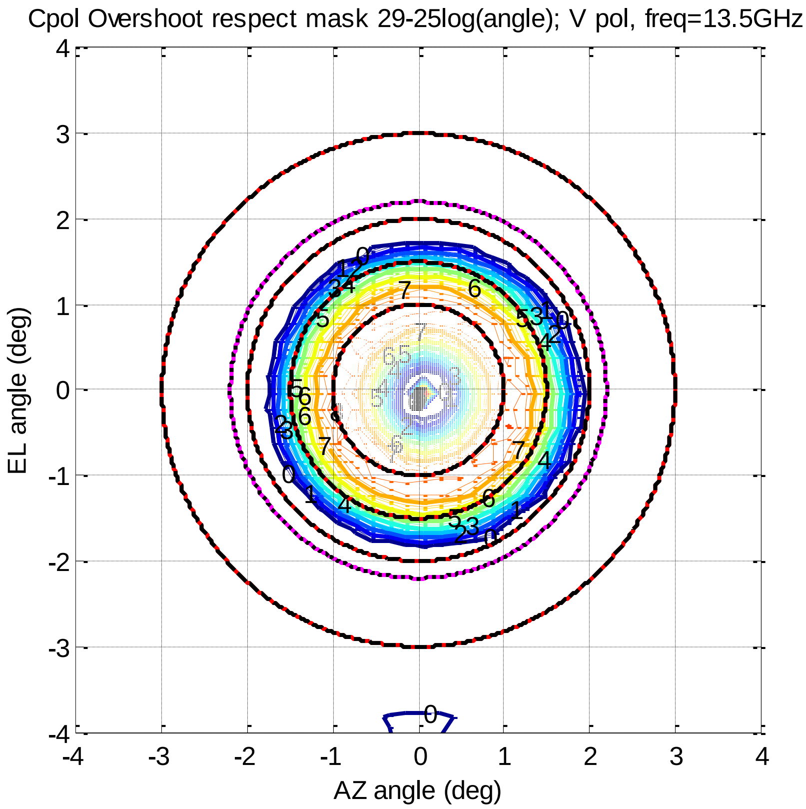

Xpol normalized to max -1dB = -22.5(dB), V pol, freq=13.25GHz
EL angle (deg)
AZ angle (deg)

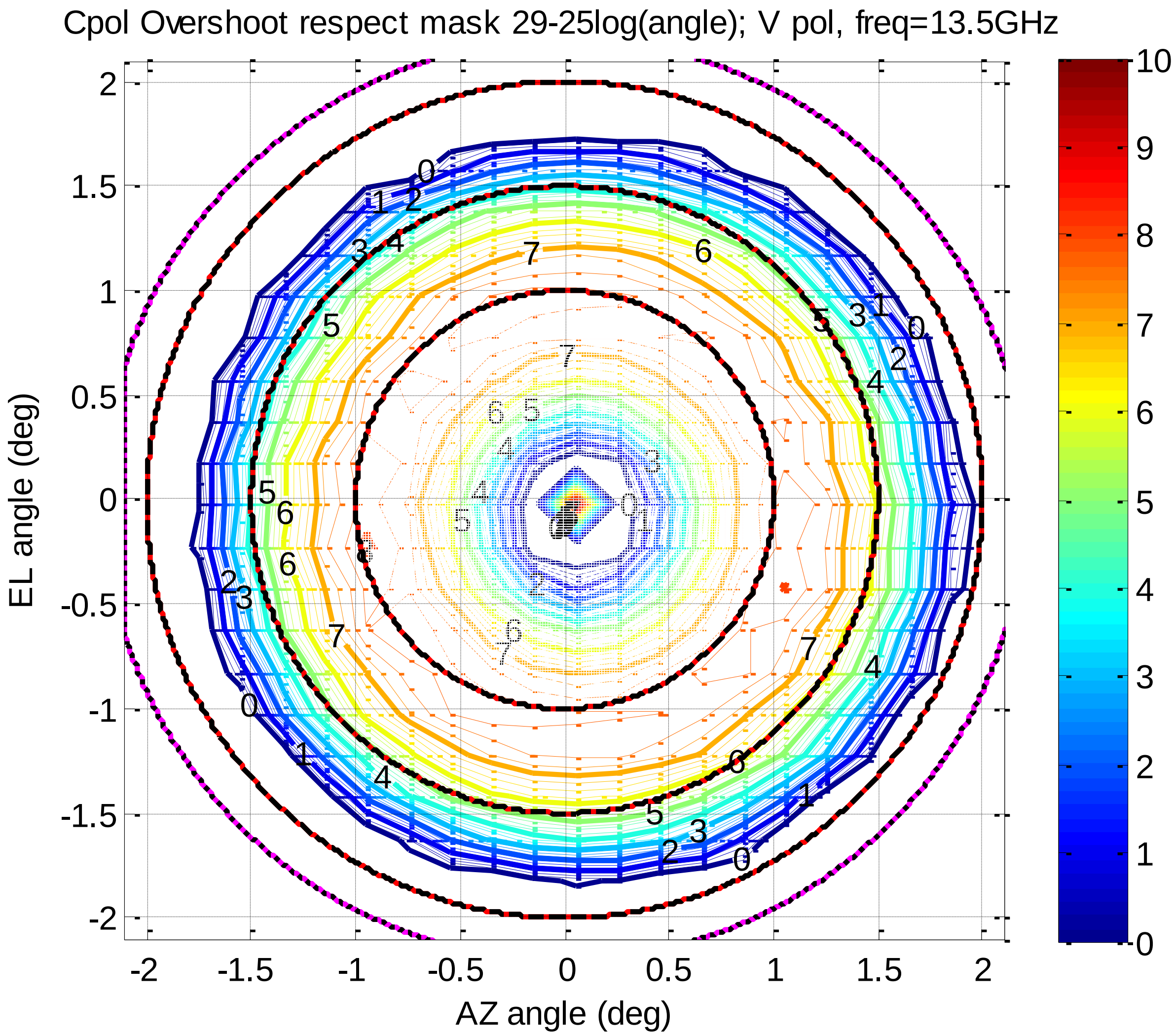

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13.25GHz
EL angle (deg)
AZ angle (deg)

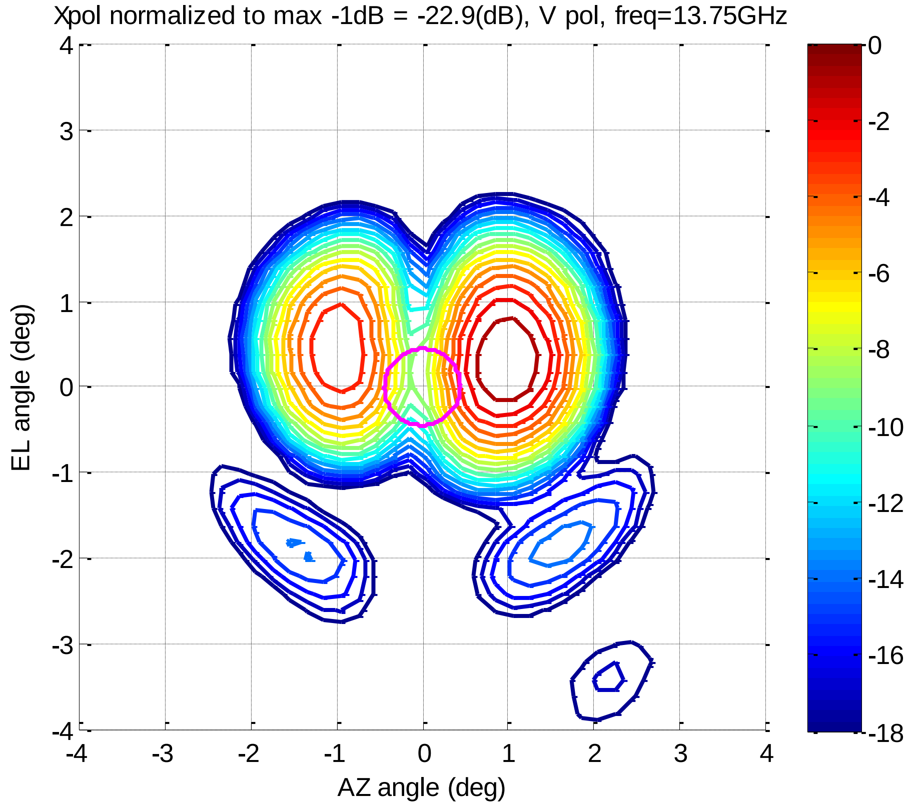

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13.25GHz
EL angle (deg)
AZ angle (deg)

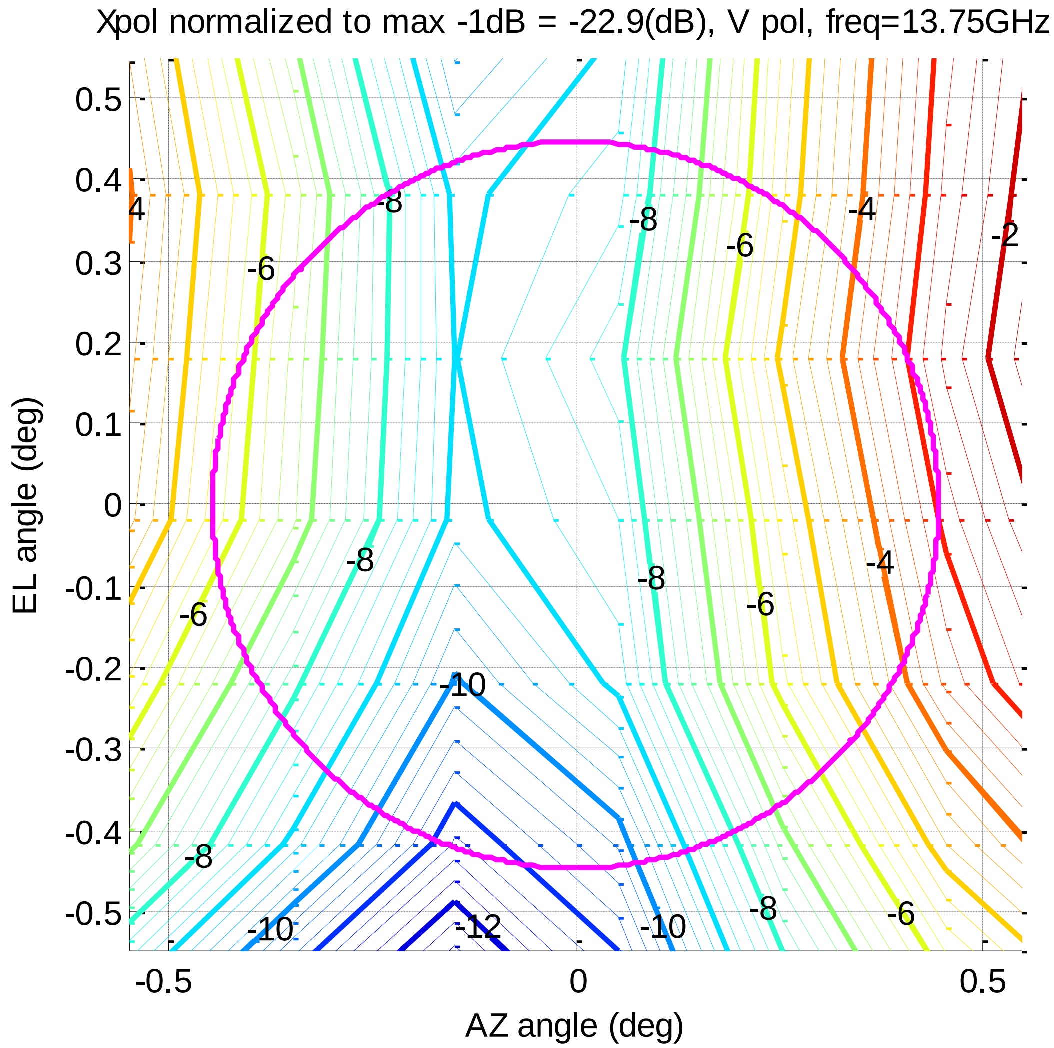

Xpol normalized to max -1dB = -22.5(dB), V pol, freq=13.5GHz
EL angle (deg)
AZ angle (deg)
4
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4
0
-2
-4
-6
-8
-10
-12
-14
-16
-18

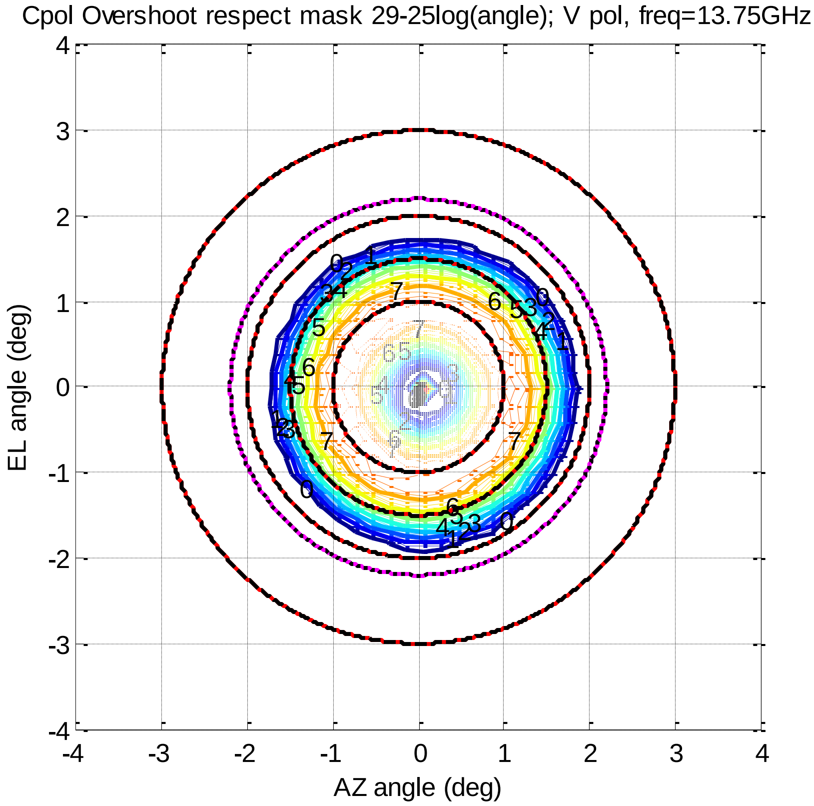

Xpol normalized to max -1dB = -22.5(dB), V pol, freq=13.5GHz
EL angle (deg)
AZ angle (deg)
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.5
0
0.5
-8
-6
-4
-8
-6
-4
-8
-6
-10
-8
-6
-4
-8
-10
-10
-12
-8
-6

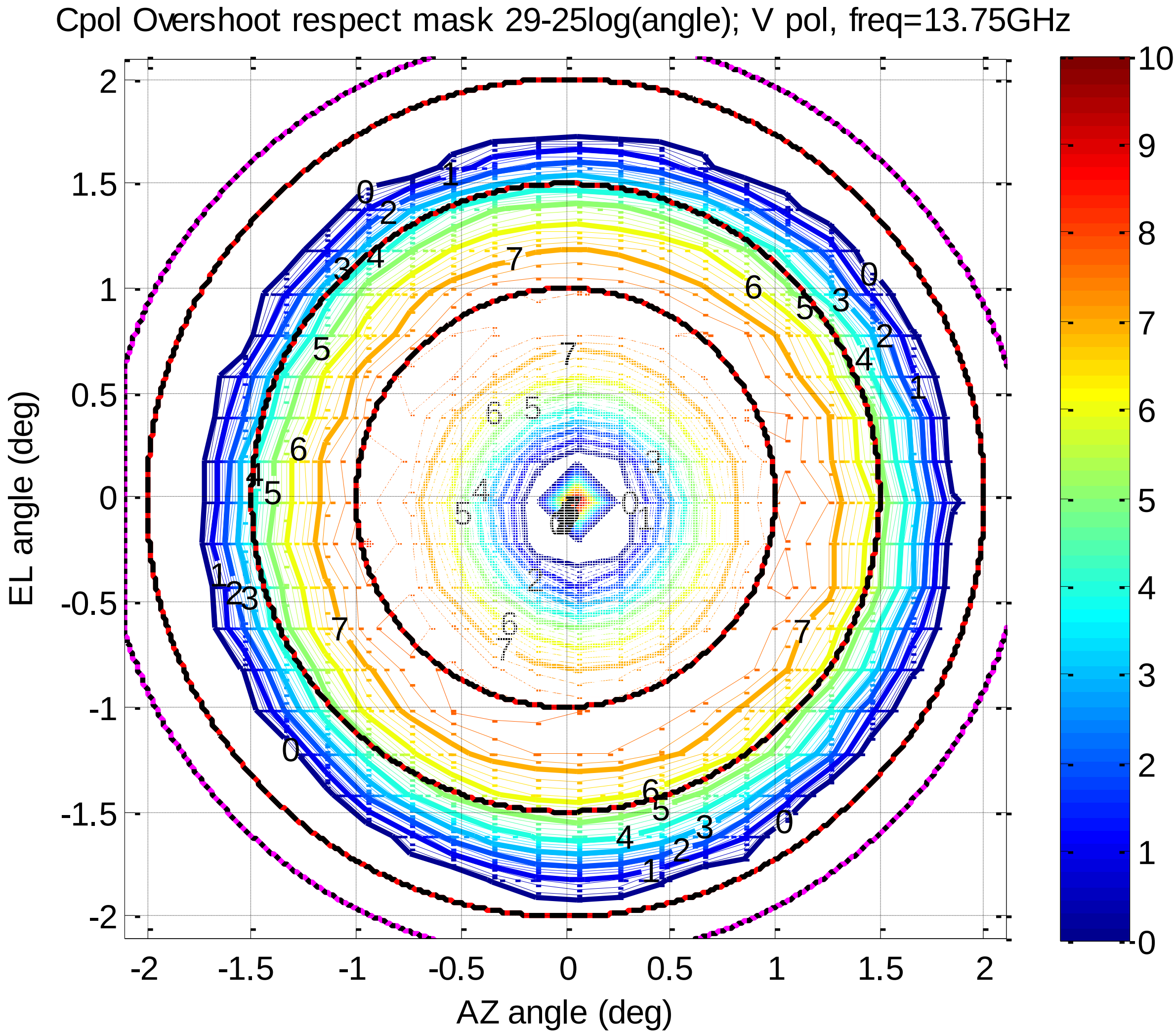

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13.5GHz
EL angle (deg)
AZ angle (deg)

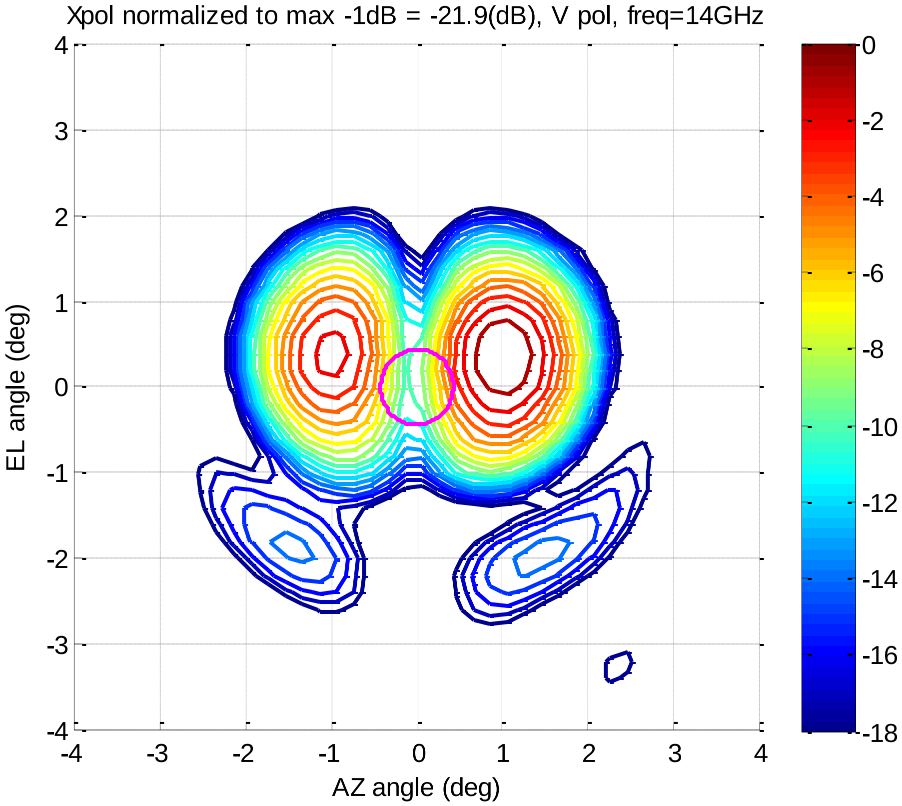

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13.5GHz
EL angle (deg)
AZ angle (deg)

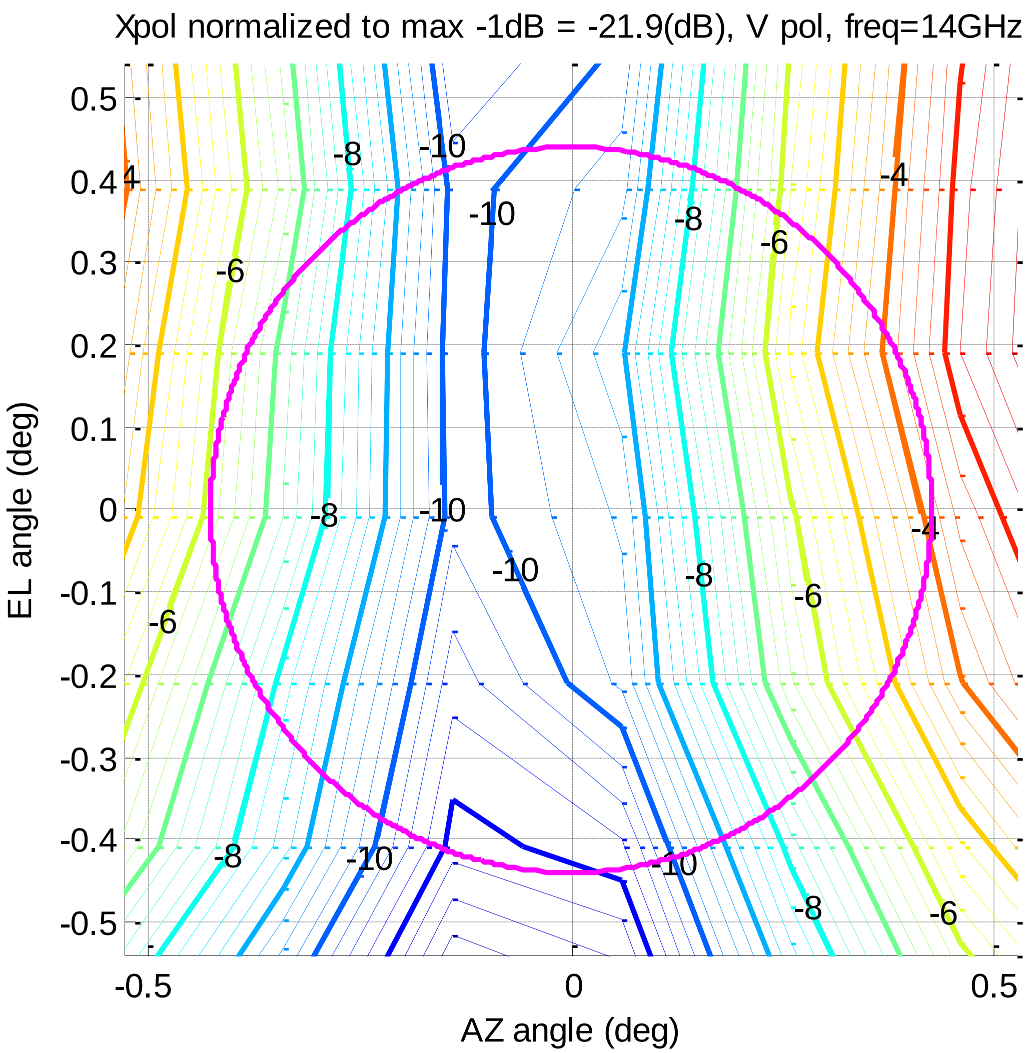

Xpol normalized to max -1dB = -22.9(dB), V pol, freq=13.75GHz
EL angle (deg)
AZ angle (deg)
4
3
2
1
0
-1
-2
-3
-4
0
-2
-4
-6
-8
-10
-12
-14
-16
-18

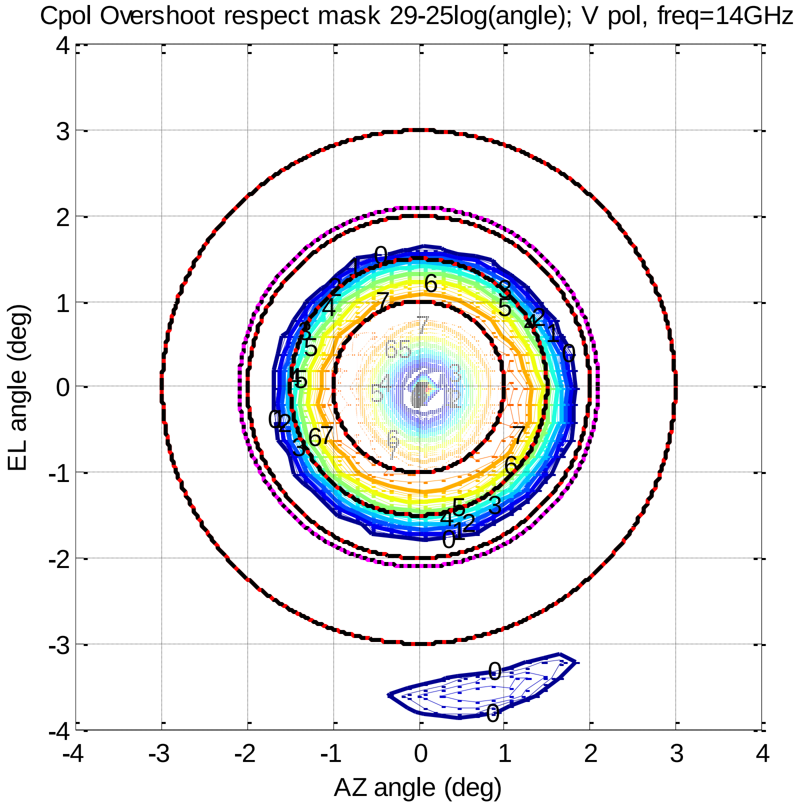

Xpol normalized to max -1dB = -22.9(dB), V pol, freq=13.75GHz
EL angle (deg)
AZ angle (deg)
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-2
-4
-6
-8
-10
-12

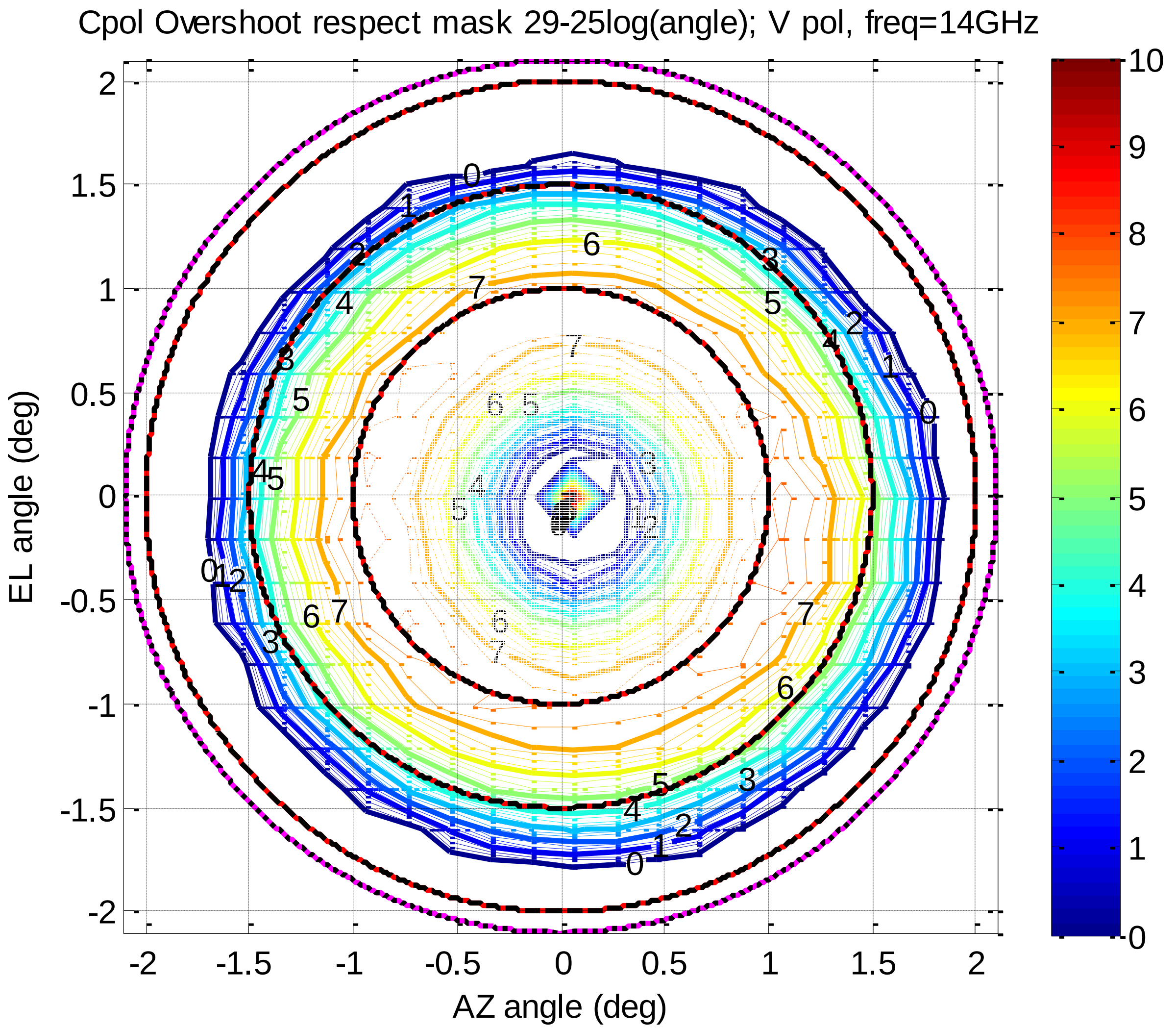

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13.75GHz
EL angle (deg)
AZ angle (deg)

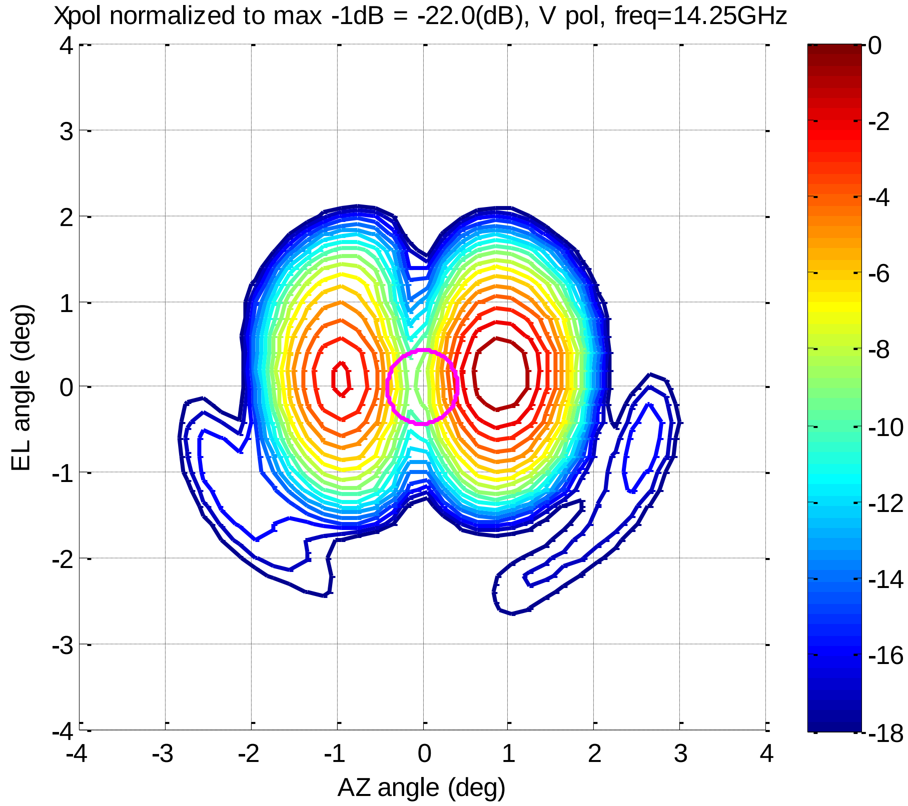

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=13.75GHz
EL angle (deg)
AZ angle (deg)

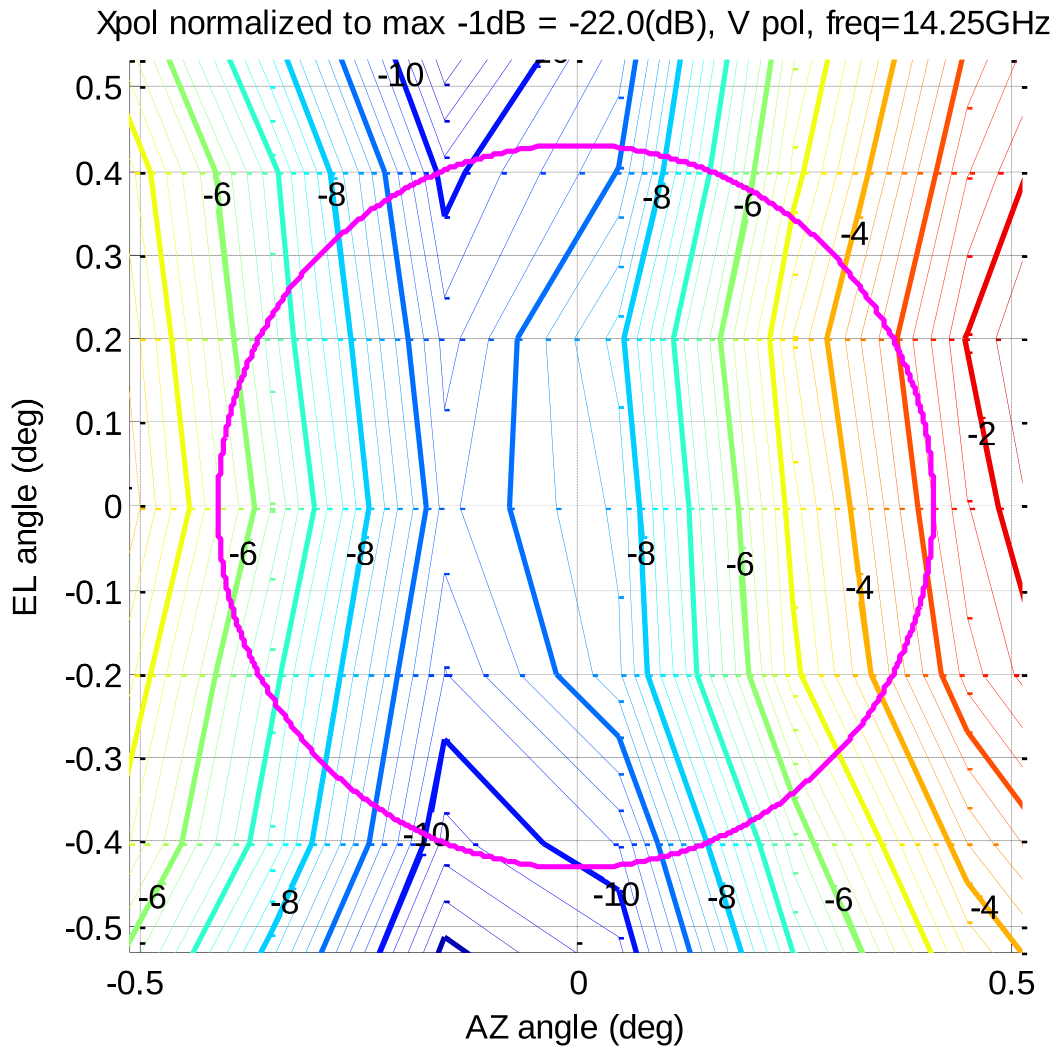

Xpol normalized to max -1dB = -21.9(dB), V pol, freq=14GHz
EL angle (deg)
AZ angle (deg)

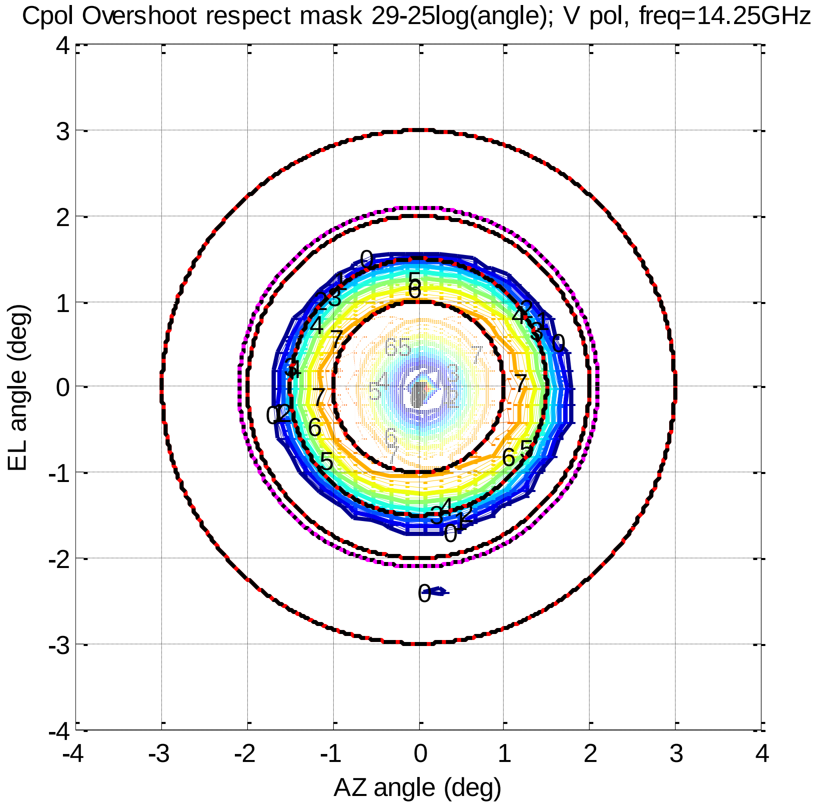

Xpol normalized to max -1dB = -21.9(dB), V pol, freq=14GHz
EL angle (deg)
AZ angle (deg)

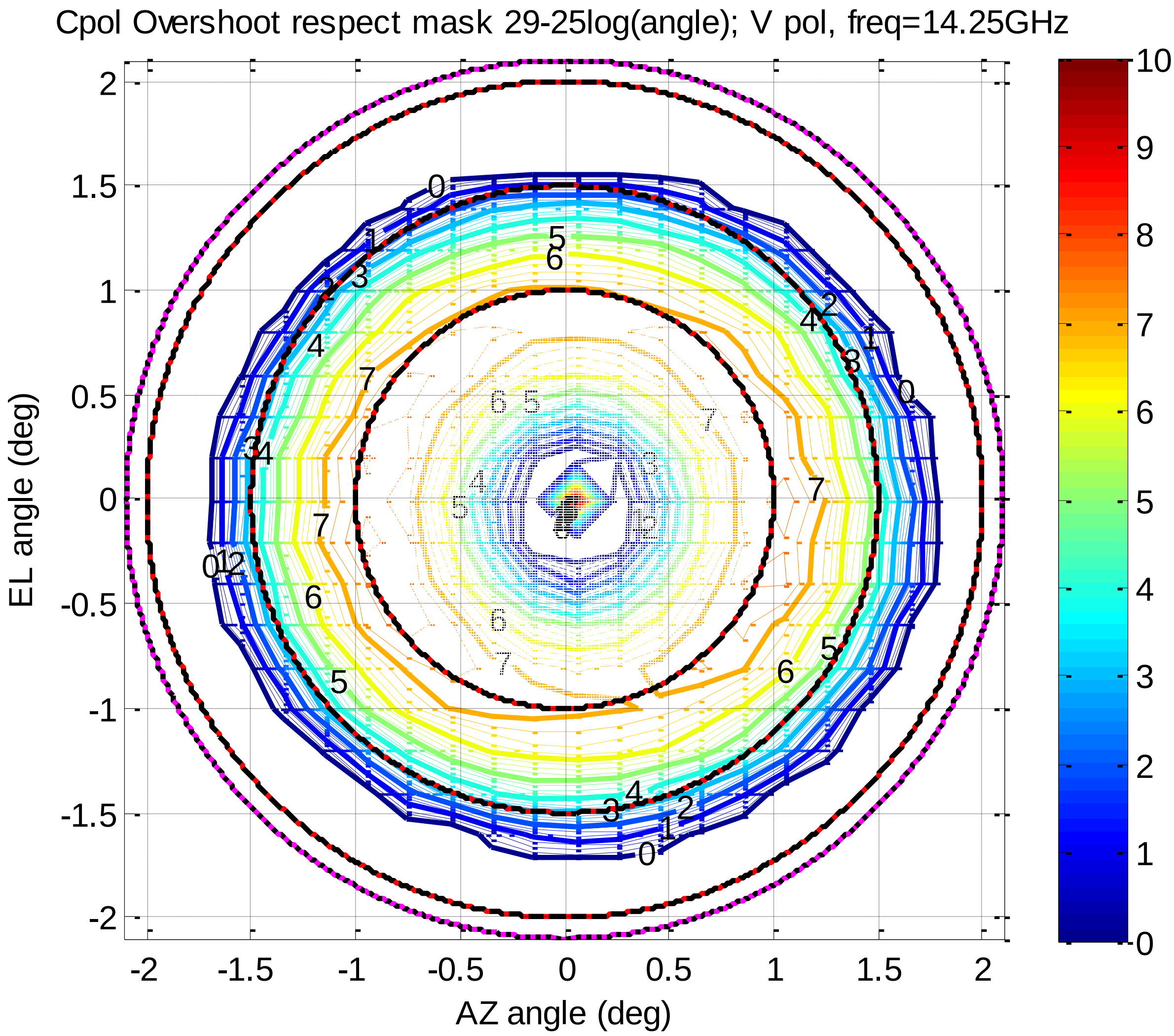

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=14GHz
EL angle (deg)
AZ angle (deg)

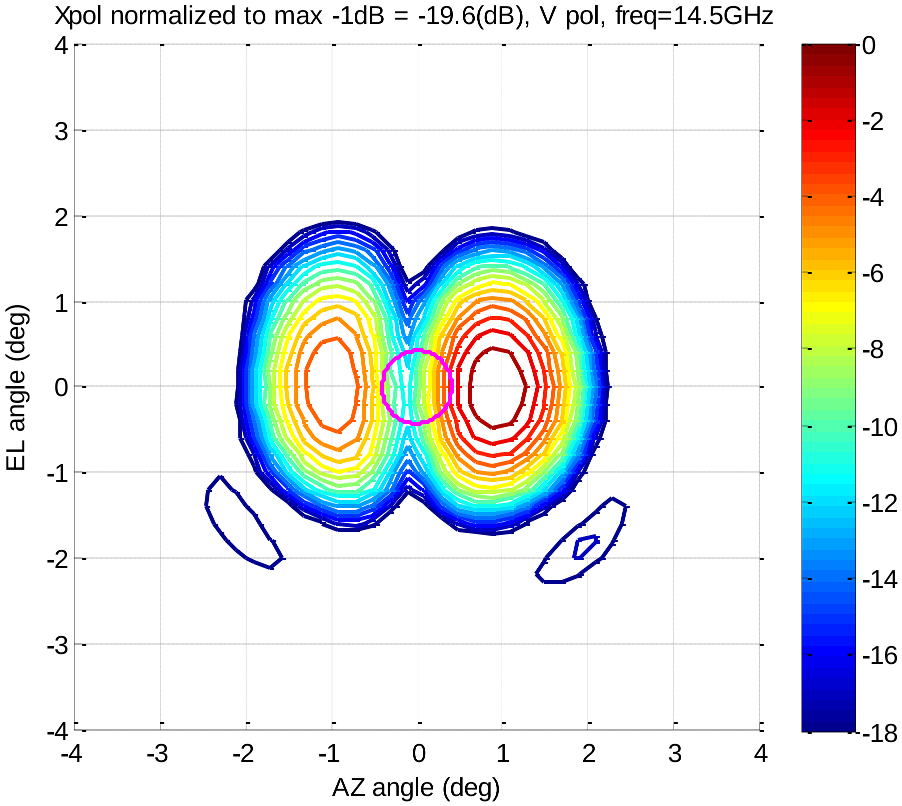

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=14GHz
EL angle (deg)
AZ angle (deg)

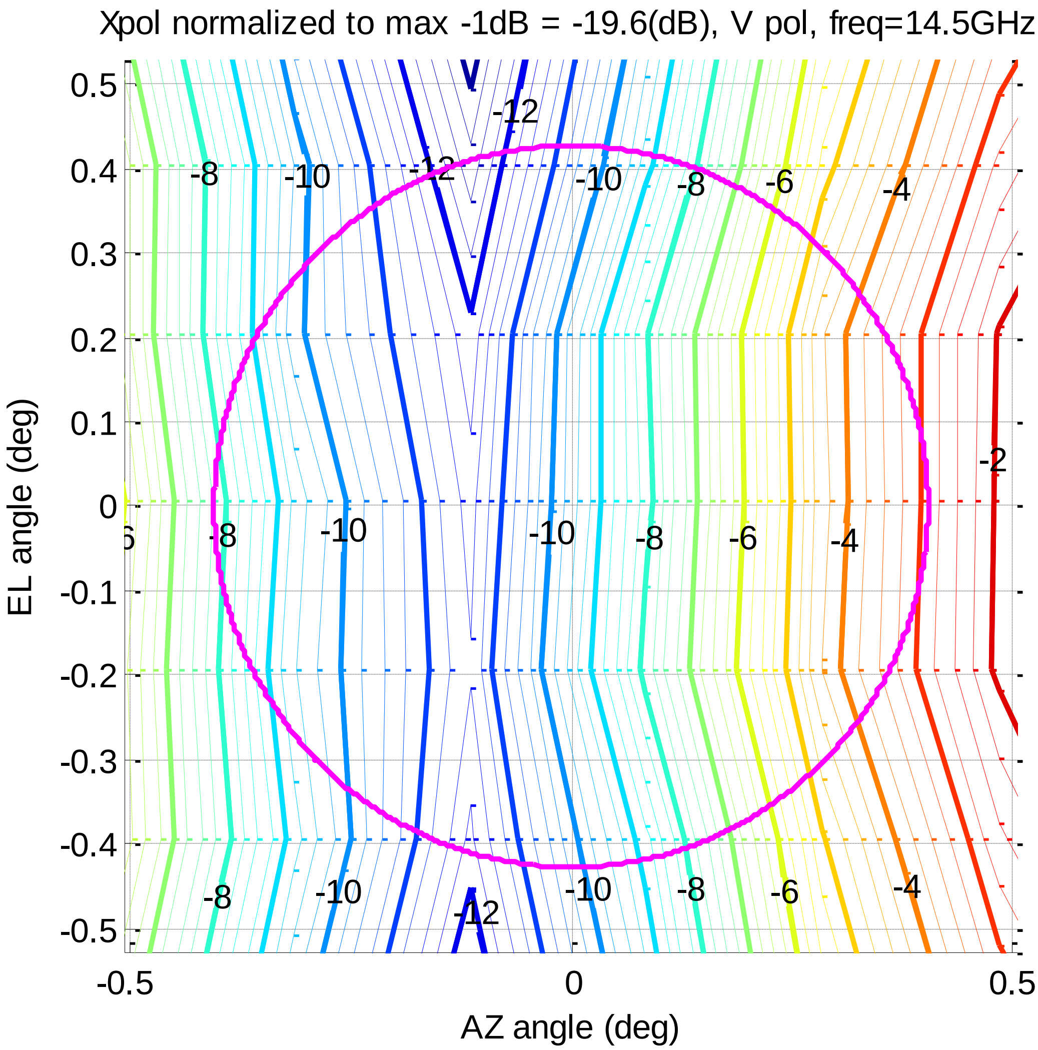

Xpol normalized to max -1dB = -22.0(dB), V pol, freq=14.25GHz
EL angle (deg)
AZ angle (deg)
4
3
2
1
0
-1
-2
-3
-4
0
-2
-4
-6
-8
-10
-12
-14
-16
-18


Xpol normalized to max -1dB = -22.0(dB), V pol, freq=14.25GHz
EL angle (deg)
AZ angle (deg)
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-10
-6
-8
-4
-2

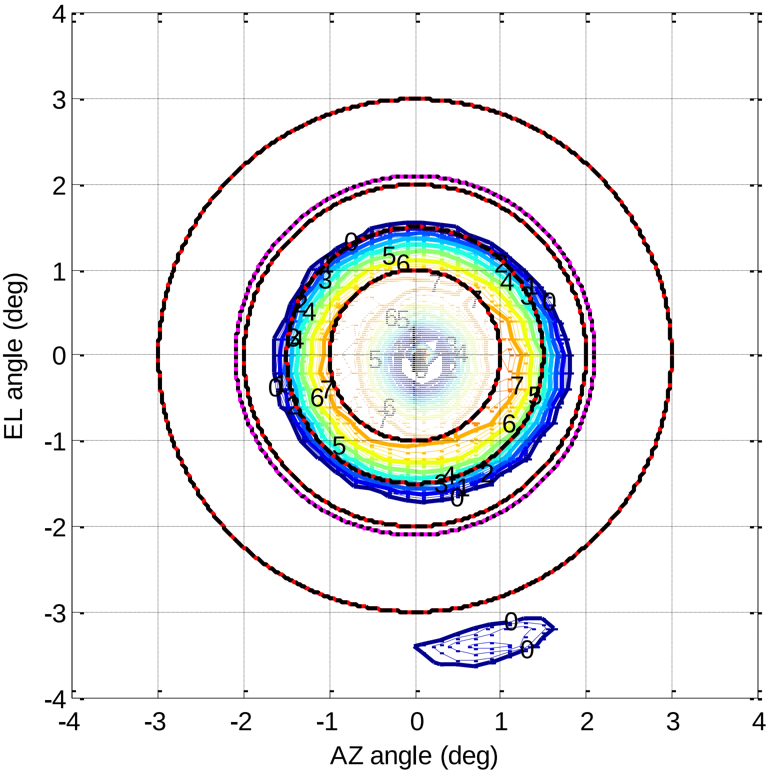

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=14.25GHz
EL angle (deg)
AZ angle (deg)


Cpol Overshoot respect mask 29-25log(angle); V pol, freq=14.25GHz
EL angle (deg)
AZ angle (deg)


Xpol normalized to max -1dB = -19.6(dB), V pol, freq=14.5GHz
EL angle (deg)
AZ angle (deg)
4
3
2
1
0
-1
-2
-3
-4
-4
-3
-2
-1
0
1
2
3
4
0
-2
-4
-6
-8
-10
-12
-14
-16
-18


Xpol normalized to max -1dB = -19.6(dB), V pol, freq=14.5GHz
EL angle (deg)
AZ angle (deg)
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
-0.5
-0.5
0
0.5
-12
-8
-10
-12
-10
-8
-6
-4
-2
-8
-10
-10
-8
-6
-4
-8
-10
-12
-10
-8
-6
-4

Cpol Overshoot respect mask 29-25log(angle); V pol, freq=14.5GHz



Cpol Overshoot respect mask 29-25log(angle); V pol, freq=14.5GHz