EXHIBIT A

COMPLIANCE WITH THE OFF-AXIS MASK

Off-axis EIRP spectral density is managed on an individual Terminal basis. Only one Terminal transmits at a given time and in a given bandwidth, so management of aggregate emissions is not required. The off-axis EIRP spectral density of an individual Terminal is a function of its transmit signal bandwidth, input power to the antenna, the projection of the antenna gain pattern along the geostationary arc, and antenna pointing error. Input power to the Terminal is controlled by limiting the output power of the modem. Integrated software monitors the scan and skew angles and automatically adjusts the output power of the modem.

One attribute of an electronically steered flat panel antenna is its level of scan loss. Scan loss refers to the decrease in gain that occurs as a flat panel antenna operates at an increased scan angle. The antenna gain falls off nearly as the cosine of the scan angle. The design specifications for the Terminal allow for operating scan angles of up to 75° (*i.e.* 15° elevation angle). At a minimum, the Terminal can acquire and maintain track within a cone extending to a 75-degree scan from vertical over a full 360 degrees of azimuth.

Flat panel antennas by nature exhibit changes in antenna pattern (especially sidelobe content) as a function of scan angle. Kymeta conducted extensive testing of its antenna to ensure compliance with FCC regulations. In Table 1 below, Kymeta includes data for 16 test cases that are representative of the overall antenna performance. For these 16 test cases, Kymeta submits PSD plots and PSD vs. off-axis angle data. In Table 2 below, Kymeta submits a summary table of expected performance for a total of 96 test cases, evaluating two frequencies, four theta angles, three phi planes, two polarizations, and two skew orientations.

Explanation of Certain Defined Terms

Theta in the context of the Kymeta antenna (as referenced in Table 1) is the angle away from the broadside of the antenna. One can also think of theta as the on-axis angle. To describe beam position Kymeta uses the spherical coordinate system, which in turn uses theta and phi as standard angles of measurement.

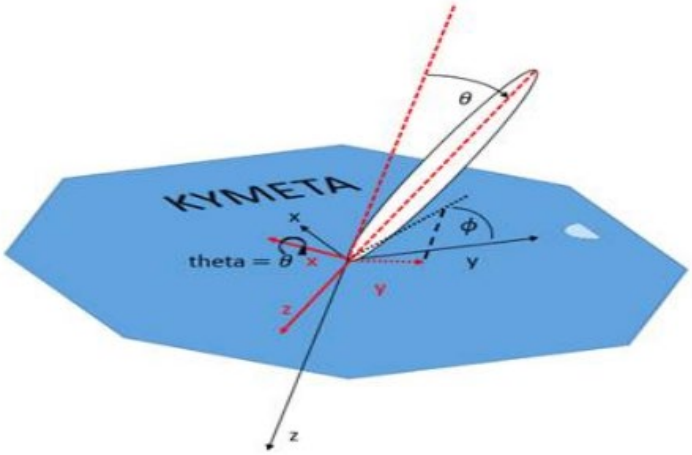
There is a difference between broadside and boresight with the Kymeta antenna. Broadside is the angle perpendicular to the surface of the antenna, while boresight is the on-axis direction of the beam. When the beam is commanded to theta = 0 position, broadside and boresight are the same. But for any other theta command, boresight and broadside will be different. This is different from traditional parabolic dish antennas, where broadside and boresight are often the same, even when mounted on a gimbal for tracking purposes.

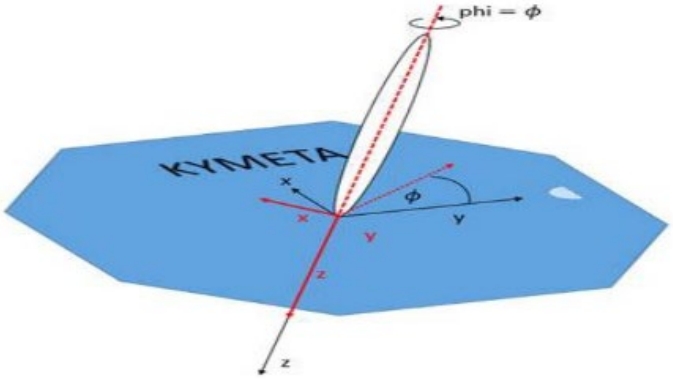
Phi is the angle of the beam as it is rotated around the broadside axis.

LPA is the Linear Polarization Angle of the Kymeta beam required to match the satellite's polarization.

Skew 90 is the cut of the 3D beam in the phi plane of scan, while skew 0 is the cut of the beam orthogonal to that of skew 90.

Set forth below are three drawings to help understand the antenna's spherical coordinate system.


KYMETA
θ
ϕ
theta = θ
x
y
z


KYMETA
phi = ϕ
ϕ
x
y
z

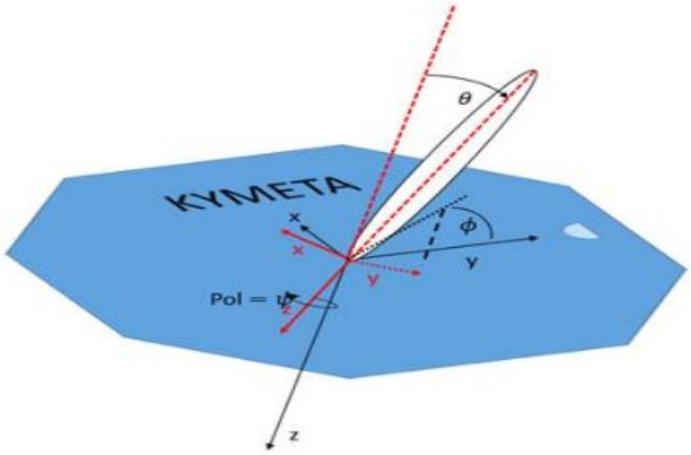

KYMETA
θ
ϕ
x
y
Pol = ψ
z

Table 1: Highlighted test cases and expected performance

Theta	Phi	LPA	Skew	Freq	PSD Max	% Exceedance Spurious Sidelobes
0	0	0	0	14	10.90	0
0	0	0	0	14.5	12.76	0
0	0	0	90	14	14.48	0
0	0	0	90	14.5	14.46	0
0	0	90	0	14	13.58	0
0	0	90	0	14.5	14.57	0
0	0	90	90	14	13.58	0
0	0	90	90	14.5	15.48	0
0	110	0	0	14	14.48	0
0	110	0	0	14.5	15.19	0
0	110	0	90	14	14.39	0
0	110	0	90	14.5	15.38	0
0	110	90	0	14	15.05	0
0	110	90	0	14.5	14.08	0
0	110	90	90	14	10.46	0
0	110	90	90	14.5	15.83	0

Table 2: Overall summary with 96 test cases

Theta	Phi	LPA	Skew	Freq	PSD Max	% Exceedance Spurious Sidelobes
0	0	0	0	14	10.90	0
0	0	0	0	14.5	12.76	0
0	0	0	90	14	14.48	0
0	0	0	90	14.5	14.46	0

Theta	Phi	LPA	Skew	Freq	PSD Max	% Exceedance Spurious Sidelobes
0	0	90	0	14	13.58	0
0	0	90	0	14.5	14.57	0
0	0	90	90	14	13.58	0
0	0	90	90	14.5	15.48	0
0	110	0	0	14	14.48	0
0	110	0	0	14.5	15.19	0
0	110	0	90	14	14.39	0
0	110	0	90	14.5	15.38	0
0	110	90	0	14	15.05	0
0	110	90	0	14.5	14.08	0
0	110	90	90	14	10.46	0
0	110	90	90	14.5	15.83	0
0	260	0	0	14	14.29	0
0	260	0	0	14.5	15.59	0
0	260	0	90	14	15.29	0
0	260	0	90	14.5	14.98	0
0	260	90	0	14	14.45	0
0	260	90	0	14.5	14.50	0
0	260	90	90	14	12.89	0
0	260	90	90	14.5	13.83	0
30	0	0	0	14	10.40	0
30	0	0	0	14.5	13.07	0
30	0	0	90	14	10.81	0
30	0	0	90	14.5	12.89	0
30	0	90	0	14	14.23	0
30	0	90	0	14.5	13.95	0
30	0	90	90	14	12.64	0

Theta	Phi	LPA	Skew	Freq	PSD Max	% Exceedance Spurious Sidelobes
30	0	90	90	14.5	13.58	0
30	110	0	0	14	14.59	0
30	110	0	0	14.5	12.83	0
30	110	0	90	14	13.96	0
30	110	0	90	14.5	14.23	0
30	110	90	0	14	13.30	0
30	110	90	0	14.5	15.41	0
30	110	90	90	14	12.89	0
30	110	90	90	14.5	14.05	0
30	260	0	0	14	8.29	0
30	260	0	0	14.5	15.65	0
30	260	0	90	14	12.54	0
30	260	0	90	14.5	13.38	0
30	260	90	0	14	12.14	0
30	260	90	0	14.5	15.14	0
30	260	90	90	14	12.40	0
30	260	90	90	14.5	13.03	0
45	0	0	0	14	10.83	0
45	0	0	0	14.5	12.45	0
45	0	0	90	14	8.63	0
45	0	0	90	14.5	10.38	0
45	0	90	0	14	12.14	0
45	0	90	0	14.5	14.21	0
45	0	90	90	14	9.83	0
45	0	90	90	14.5	11.11	0
45	110	0	0	14	12.83	0
45	110	0	0	14.5	15.33	0

Theta	Phi	LPA	Skew	Freq	PSD Max	% Exceedance Spurious Sidelobes
45	110	0	90	14	11.35	0
45	110	0	90	14.5	11.79	0
45	110	90	0	14	13.48	0
45	110	90	0	14.5	15.47	0
45	110	90	90	14	11.27	0
45	110	90	90	14.5	9.49	0
45	260	0	0	14	11.71	0
45	260	0	0	14.5	15.24	0
45	260	0	90	14	11.16	0
45	260	0	90	14.5	11.61	0
45	260	90	0	14	10.86	0
45	260	90	0	14.5	15.08	0
45	260	90	90	14	10.01	0
45	260	90	90	14.5	10.06	0
60	0	0	0	14	13.12	0
60	0	0	0	14.5	13.29	0
60	0	0	90	14	7.47	0
60	0	0	90	14.5	7.96	0
60	0	90	0	14	10.37	0
60	0	90	0	14.5	14.36	0
60	0	90	90	14	7.27	0
60	0	90	90	14.5	7.98	0
60	110	0	0	14	15.13	0
60	110	0	0	14.5	15.48	0
60	110	0	90	14	7.69	0
60	110	0	90	14.5	8.02	0
60	110	90	0	14	9.43	0

Theta	Phi	LPA	Skew	Freq	PSD Max	% Exceedance Spurious Sidelobes
60	110	90	0	14.5	15.22	0
60	110	90	90	14	7.16	0
60	110	90	90	14.5	8.03	0
60	260	0	0	14	14.18	0
60	260	0	0	14.5	15.67	0
60	260	0	90	14	7.35	0
60	260	0	90	14.5	7.80	0
60	260	90	0	14	10.44	0
60	260	90	0	14.5	14.96	0
60	260	90	90	14	5.63	0
60	260	90	90	14.5	6.22	0

Due to the blanket nature of this application, Kymeta focused on meeting the tangent-to-GEO-arc mask. Whether one applies the tangent or orthogonal mask will in large part depend on the geographic location of the Terminal in question. In high latitude areas, the stricter tangent mask is designed to protect neighboring satellites which are “left and “right” from the target satellite with respect to the Terminal. In low latitude areas, the stricter tangent mask is designed to protect the same neighboring satellites, which are now “back” and “forth” relative to the Terminal. In essence, the definition of “tangent” and “orthogonal” changes as a function of geographic area from where the Terminal is operating. Therefore, Kymeta performed all analyses against the stricter tangent mask, to demonstrate compliance regardless of the Terminal’s geographic location. See Figure 1 below for a comparison of tangent and orthogonal masks, with the reference antenna pattern applied.

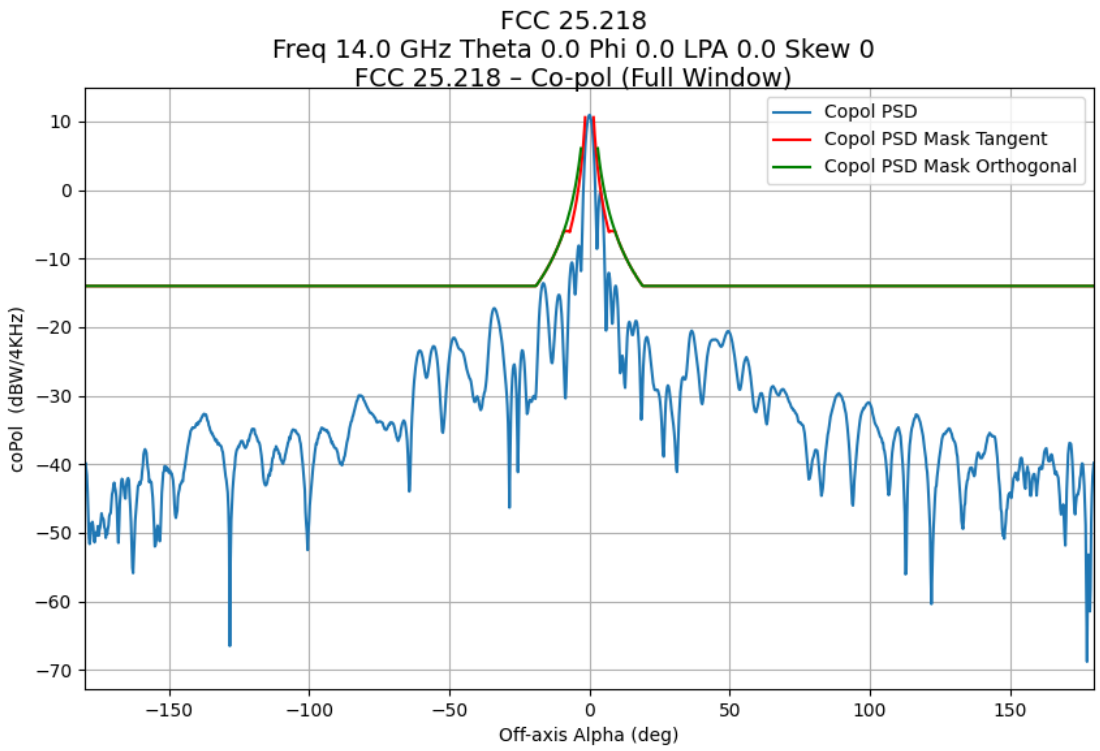


Figure 1: Comparison of Tangent and Orthogonal Masks

OFF-AXIS EIRP SPECTRAL DENSITY PATTERNS

The Terminal meets the off-axis limits on EIRP spectral density as defined in Section 25.218(f), and set forth below. Table 1, set forth above, includes data for 16 test cases that are representative of overall antenna performance. Patterns for the 16 test cases plotted against the relevant FCC off-axis PSD masks are set forth below. Table 2, set forth above, includes data for 96 test cases, evaluating two frequencies, four theta angles, three phi planes, two polarizations, and two skew orientations.

Off-Axis EIRP Spectral Density Limits

(b) Earth station applications subject to this section may be routinely processed if they meet the applicable off-axis EIRP density envelopes set for in this section.

(f)(1) For co-polarized transmissions in the plane tangent to the GSO arc:

$15-25\log\theta$	dBW/4 kHz	for $1.5° \leq \theta \leq 7°$.
-6	dBW/4 kHz	for $7° < \theta \leq 9.2°$.
$18-25\log\theta$	dBW/4 kHz	for $9.2° < \theta \leq 19.1°$.
-14	dBW/4 kHz	for $19.1° < \theta \leq 180°$.

Where theta (θ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. The EIRP density levels specified for $\theta > 7°$ may be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7-180°, and by up to 6 dB in the region of main reflector spillover energy.

(2) For co-polarized transmissions in the plane perpendicular to the GSO arc:

18-25logθ	dBW/4 kHz	for $3.0° \leq \theta \leq 19.1°$.
−14	dBW/4 kHz	for $19.1° < \theta \leq 180°$.

Where theta (θ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of θ angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc:

5-25logθ	dBW/4 kHz	for $1.8° \leq \theta \leq 7.0°$.

Where theta (θ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite.

Test Case Patterns Plotted against the Relevant FCC Off-Axis PSD Masks

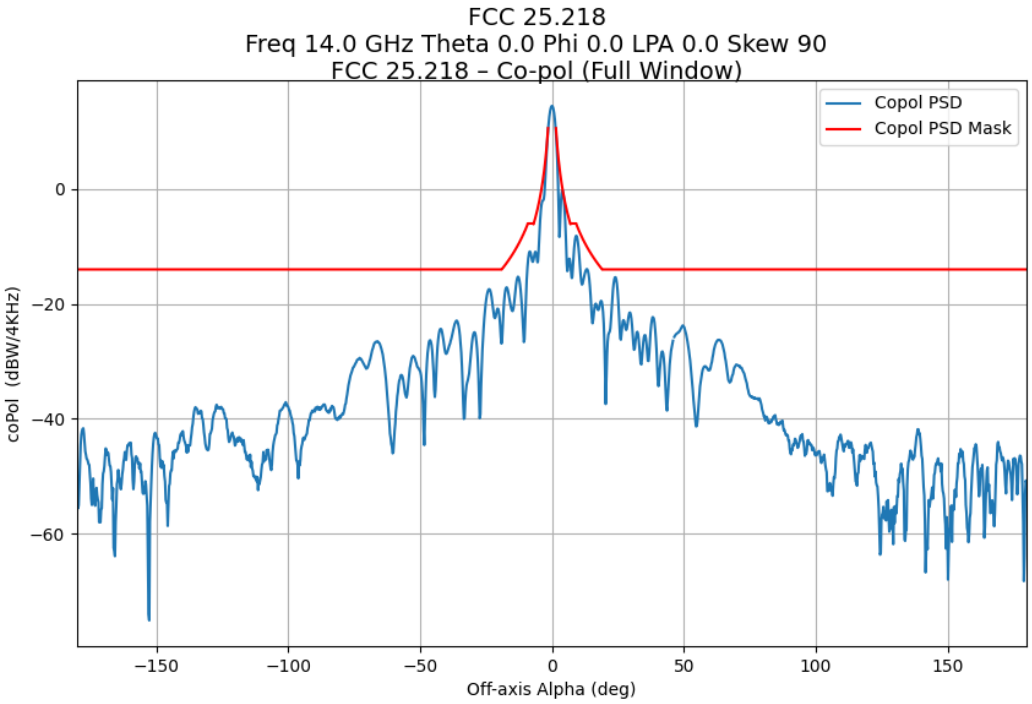


Figure 1: Full Window Copol – Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

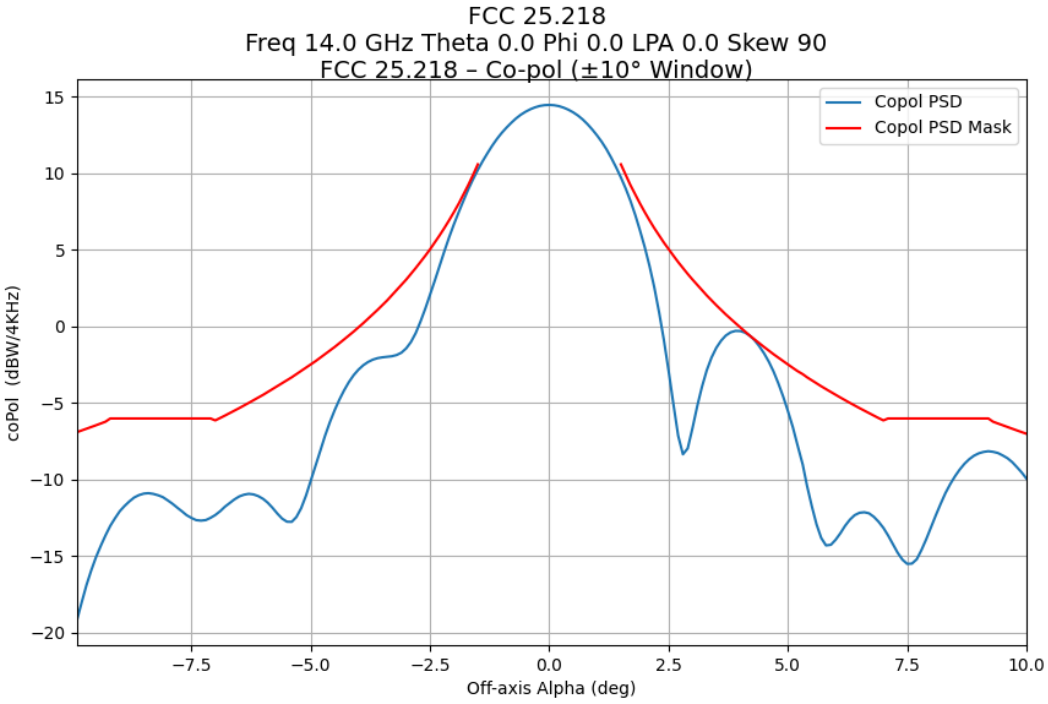


Figure 2: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

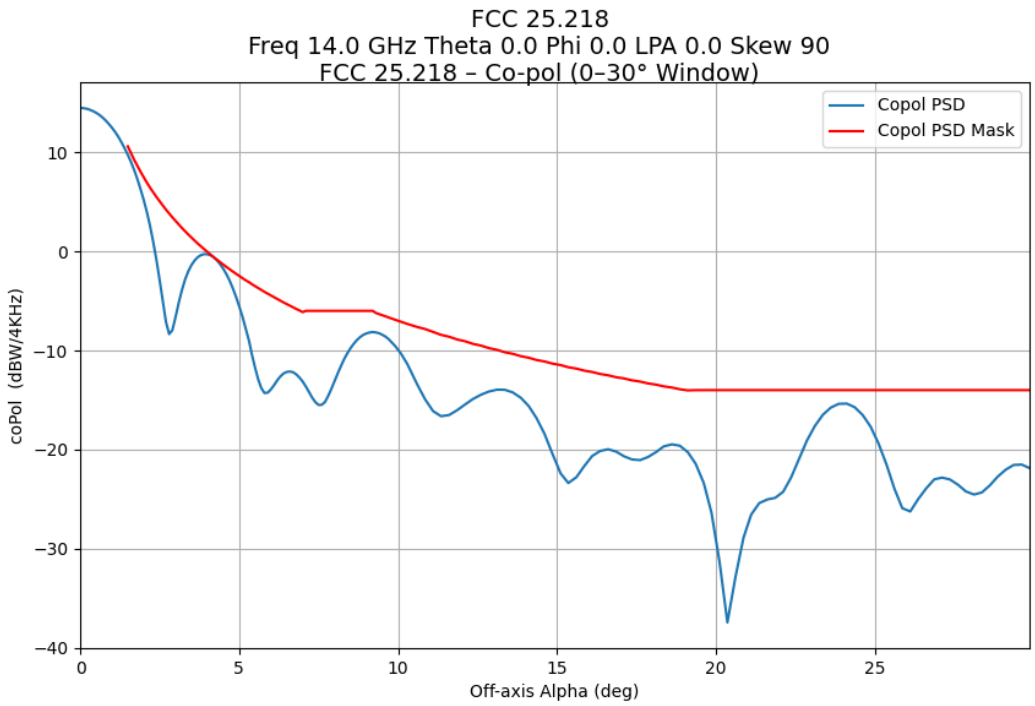


Figure 3: Thirty Degree Sector Copol - Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA= 0 Deg, Skew=90 Deg

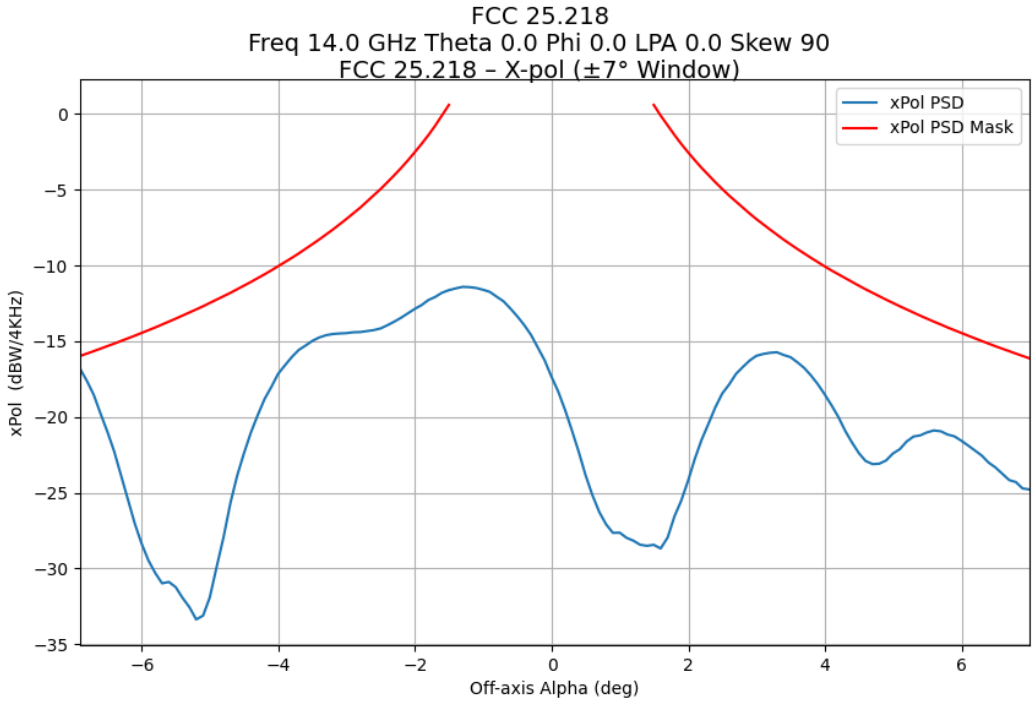


Figure 4: Seven Degree Sector XPol - Freq=14 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

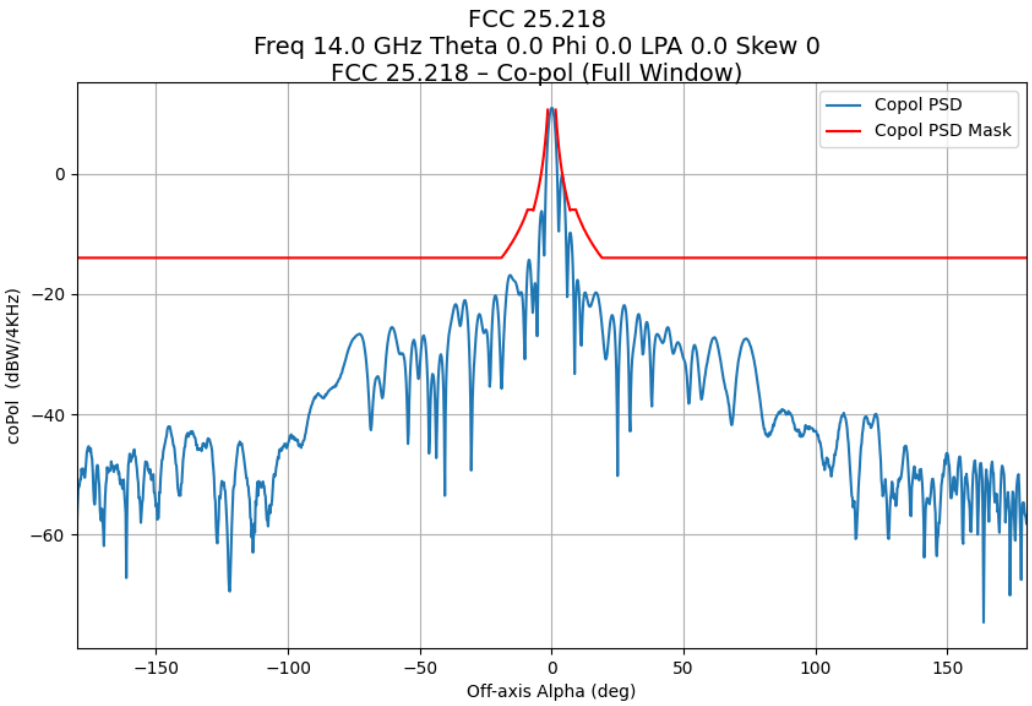


Figure 5: Full Window Copol - Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

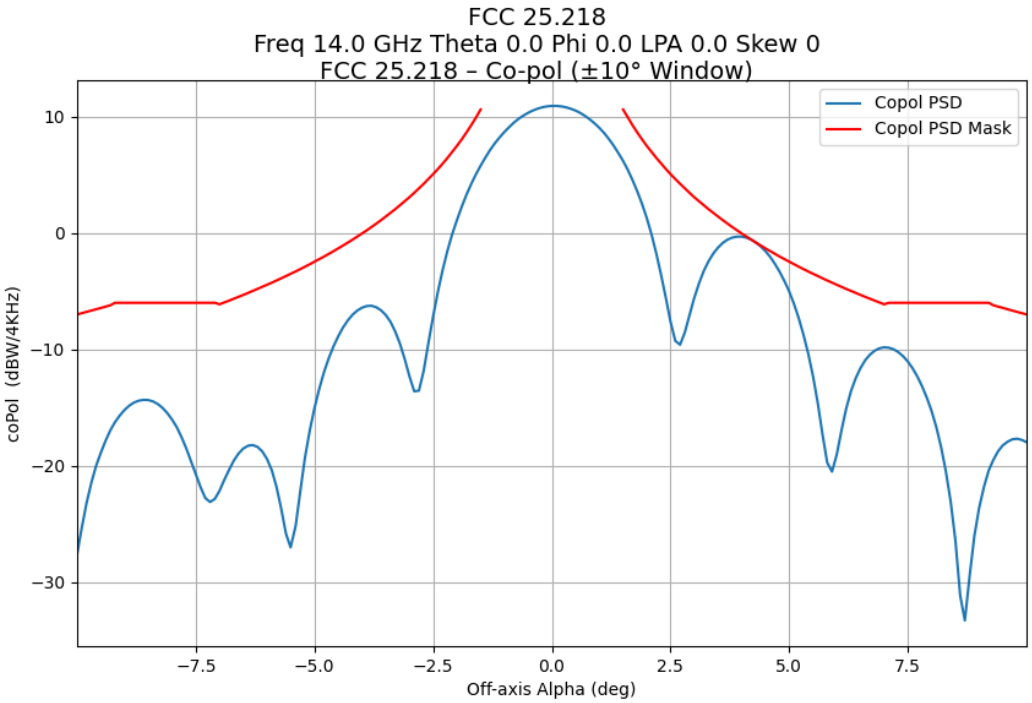


Figure 6: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

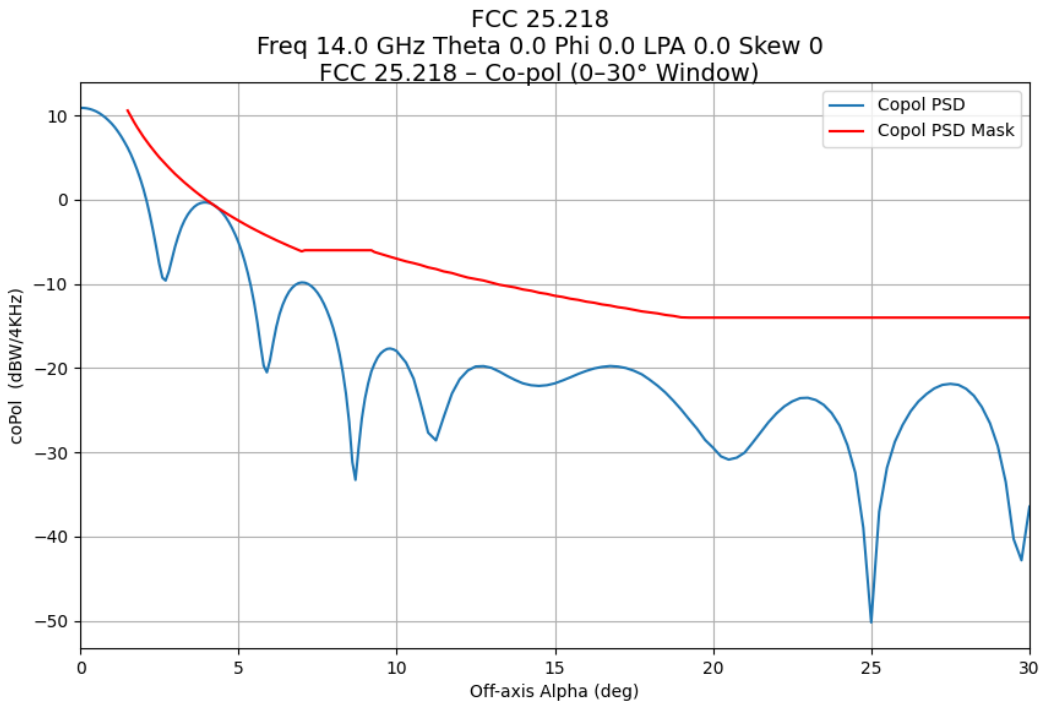


Figure 7: Thirty Degree Sector Copol - Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

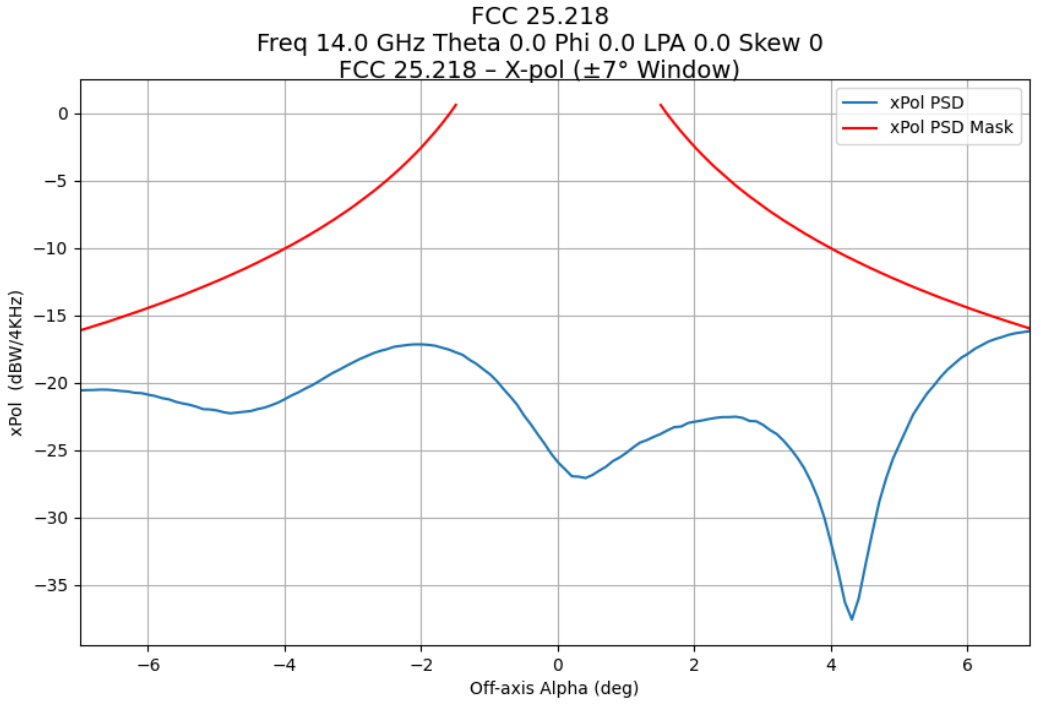


Figure 8: Seven Degree Sector XPol - Freq=14.0 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

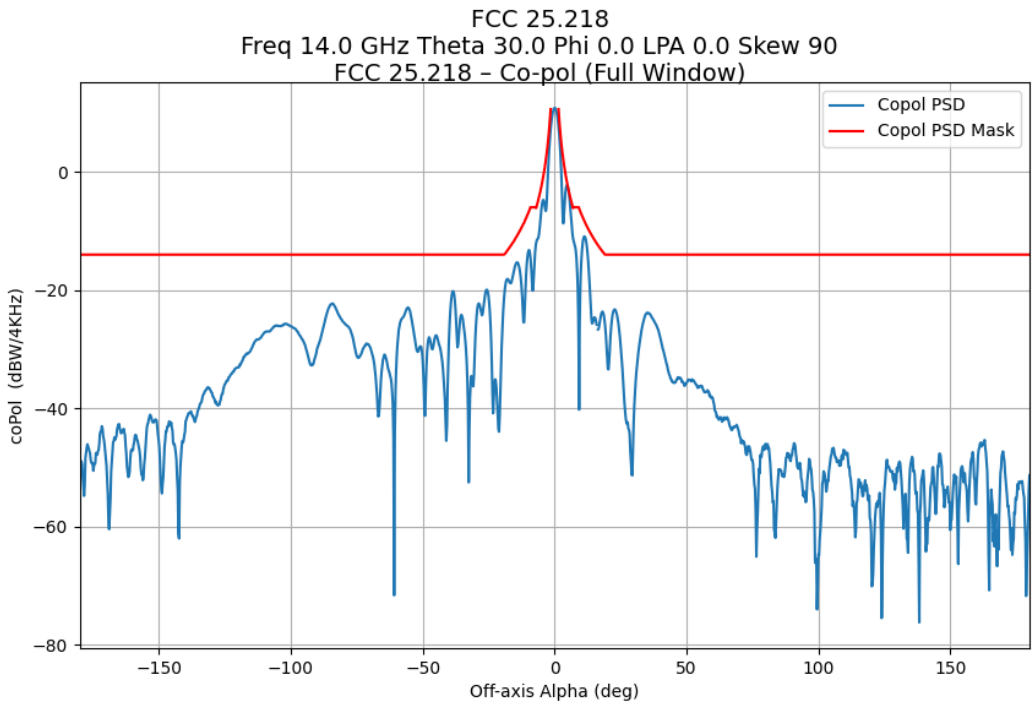


Figure 9: Full Window Copol - Freq=14.0 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

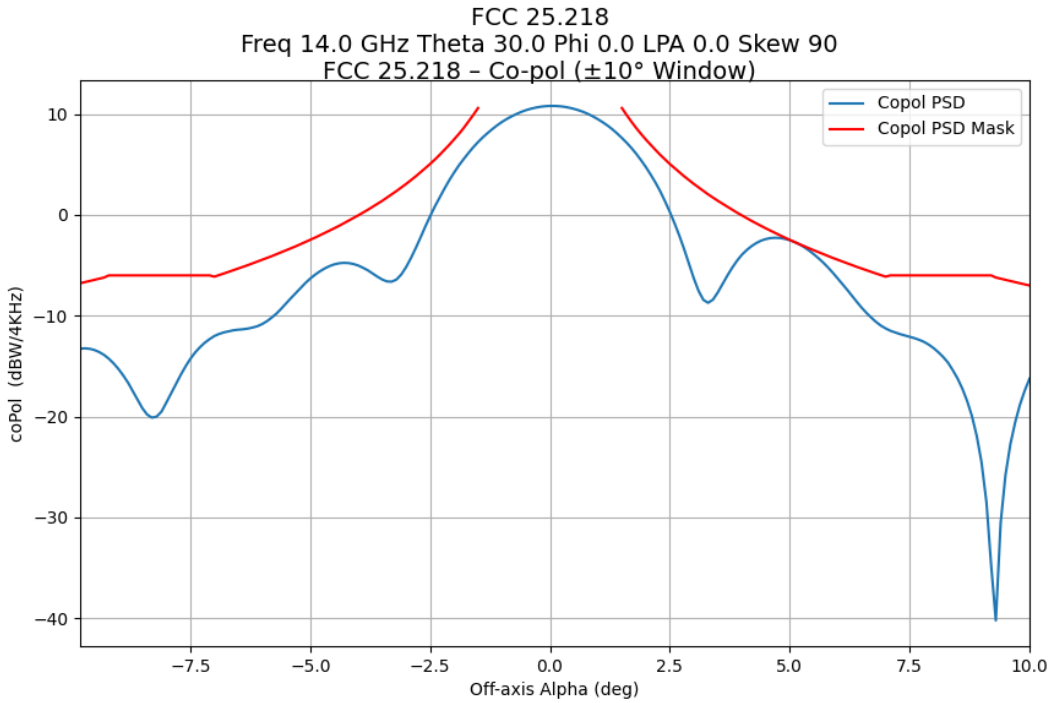


Figure 10: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

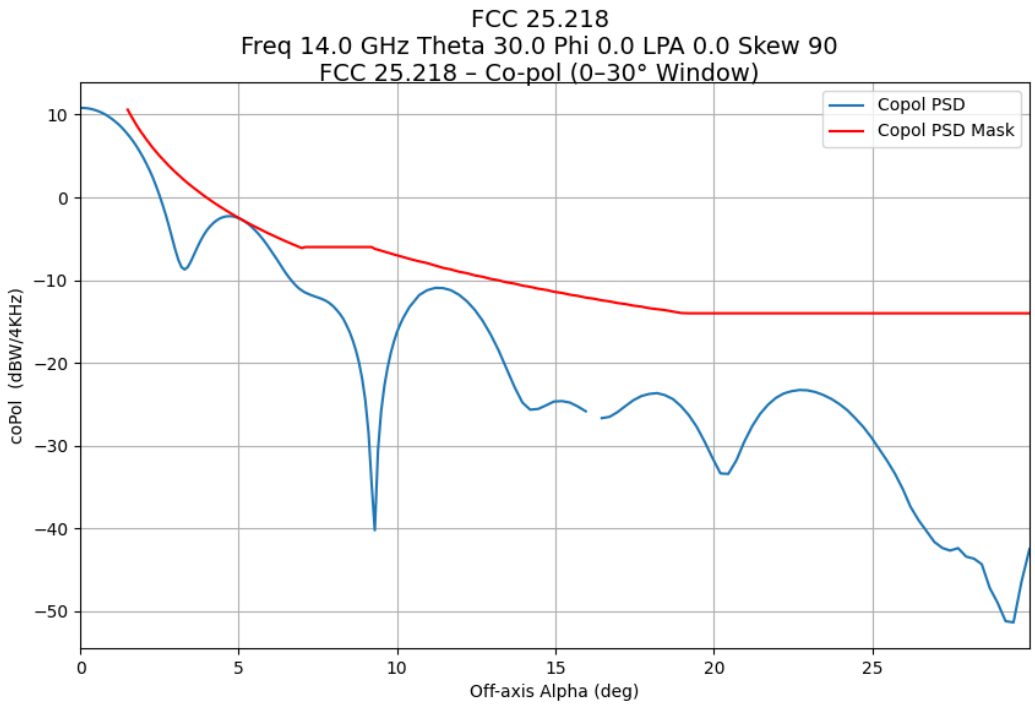


Figure 11: Thirty Degree Sector Copol – Freq=14.0 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

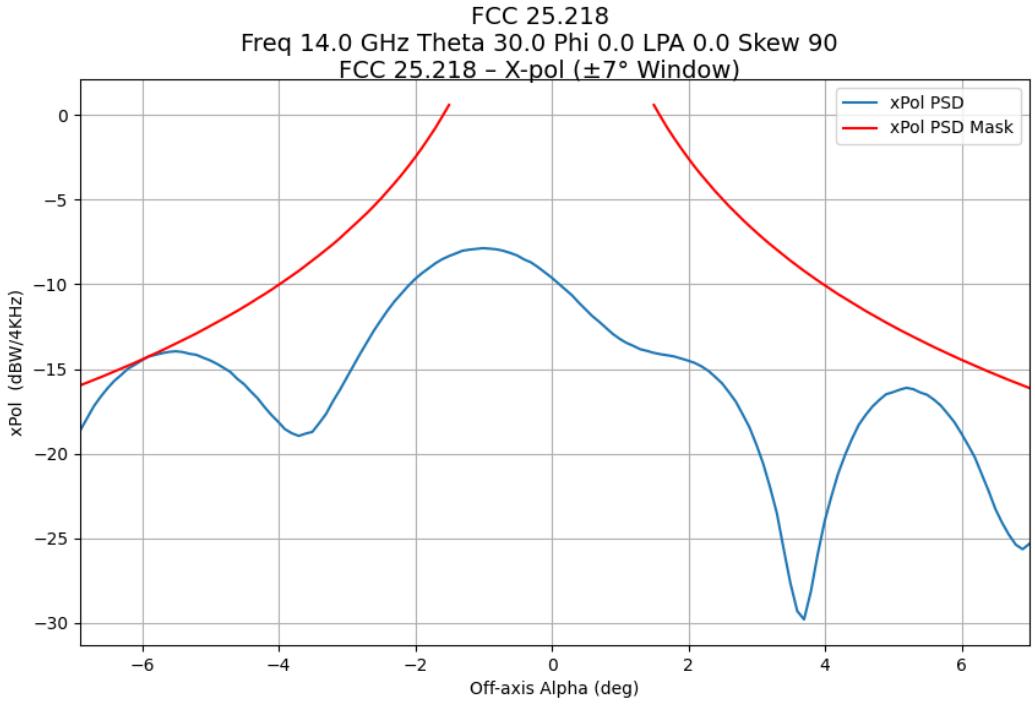


Figure 12: Seven Degree Sector XPol – Freq=14.0 GHz, Theta=30 Deg, Phi=0 Deg, LPA=90 Deg, Skew=90 Deg

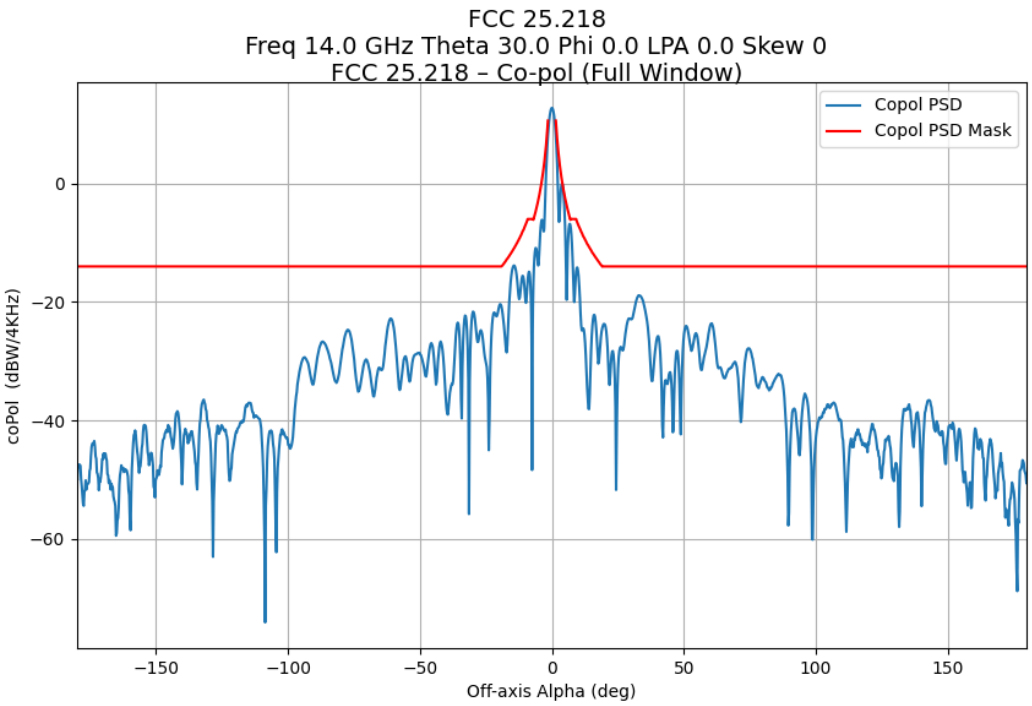


Figure 13: Full Window Copol - Freq=14.0 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

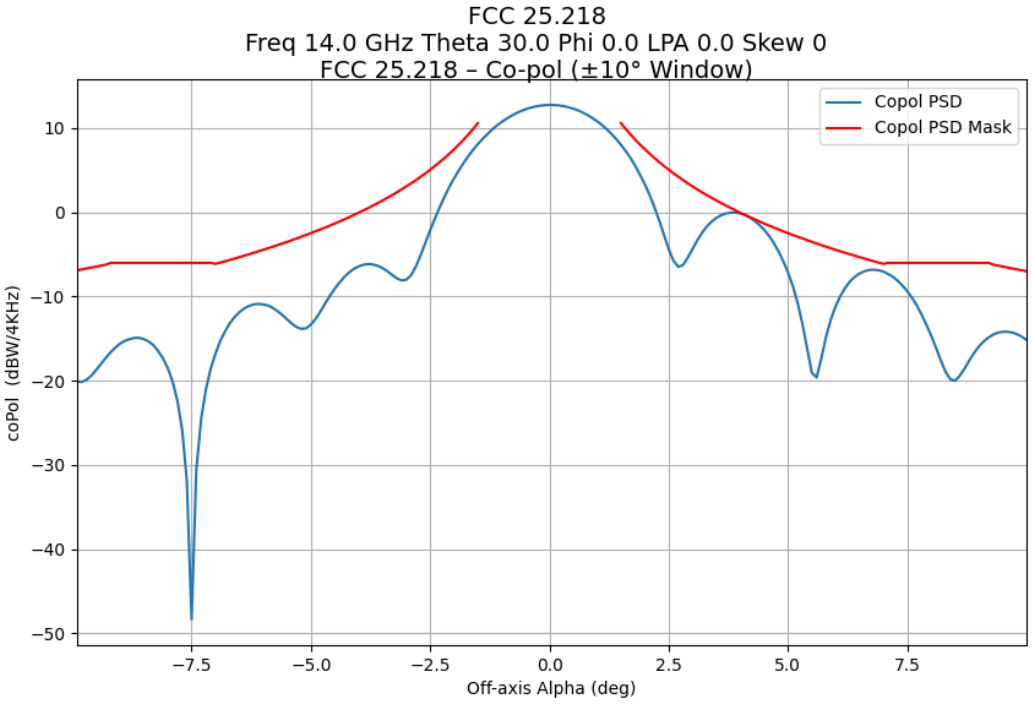


Figure 14: Ten Degree Sector Copol – Freq=14.0 GHz, Phi=0 Deg, Theta=30 Deg, LPA=0 Deg, Skew=0 Deg

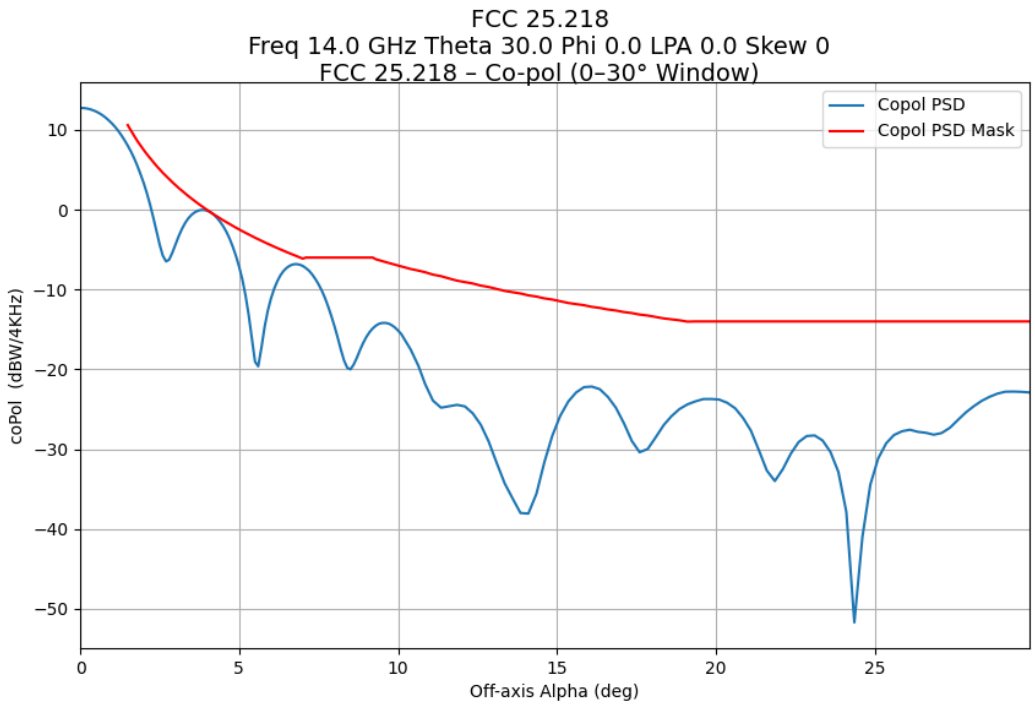


Figure 15: Thirty Degree Sector Copol – Freq=14.0 GHz, Phi=0 Deg, Theta=30 Deg, LPA=0 Deg, Skew=0 Deg

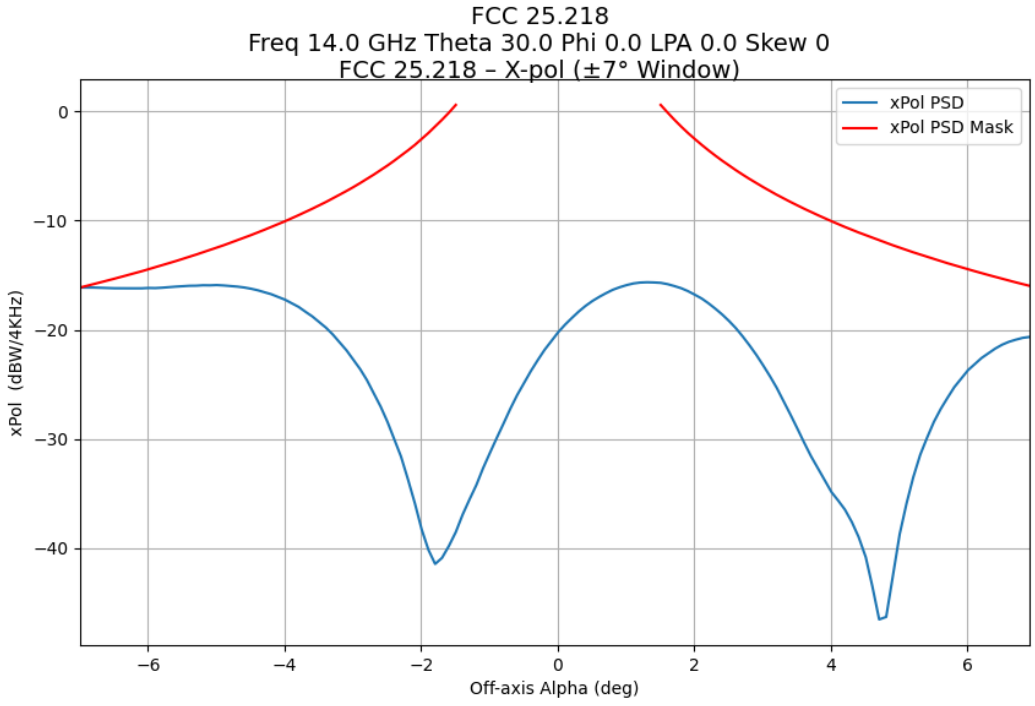


Figure 16: Seven Degree Sector XPol - Freq=14.0 GHz, Phi=0 Deg, Theta=30 Deg, LPA=0 Deg, Skew=0 Deg

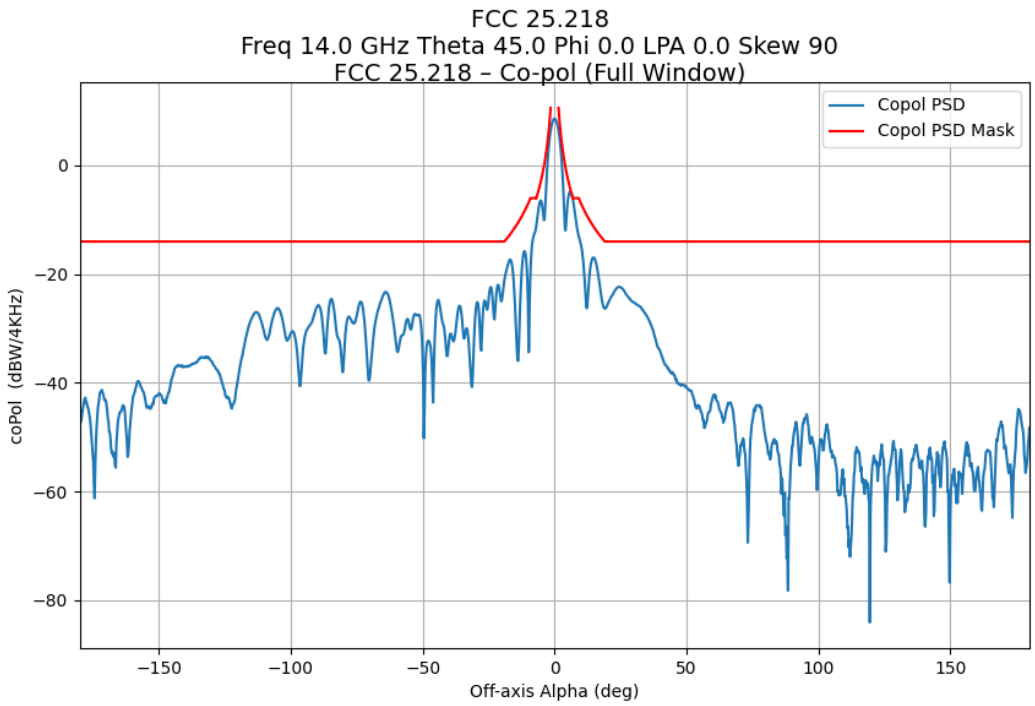


Figure 17: Full Window Copol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

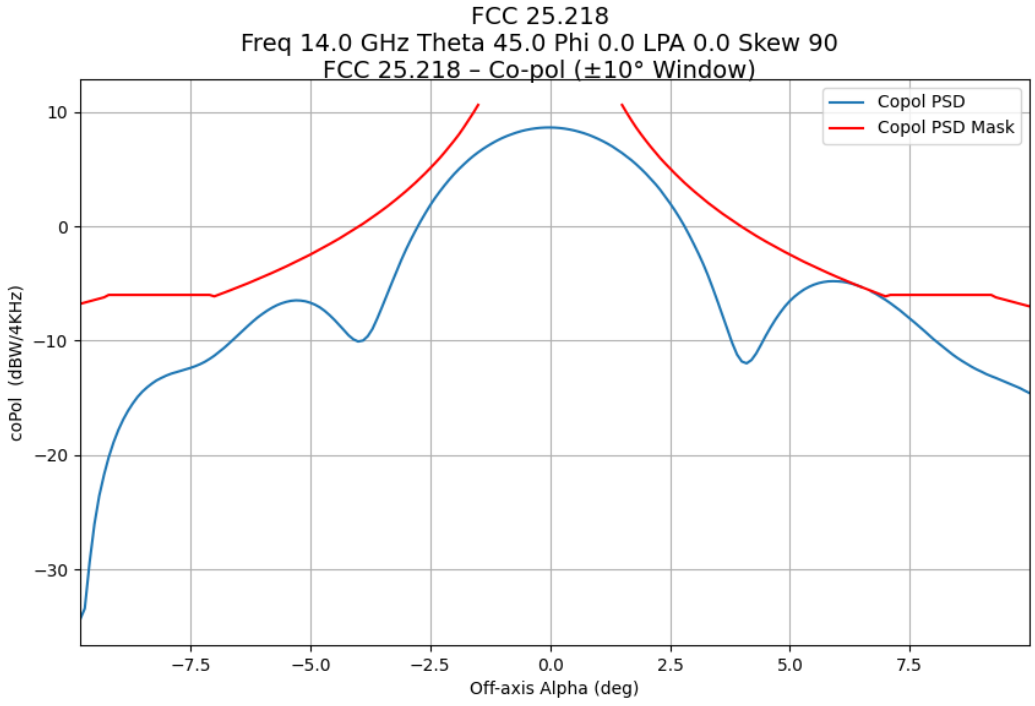


Figure 18: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

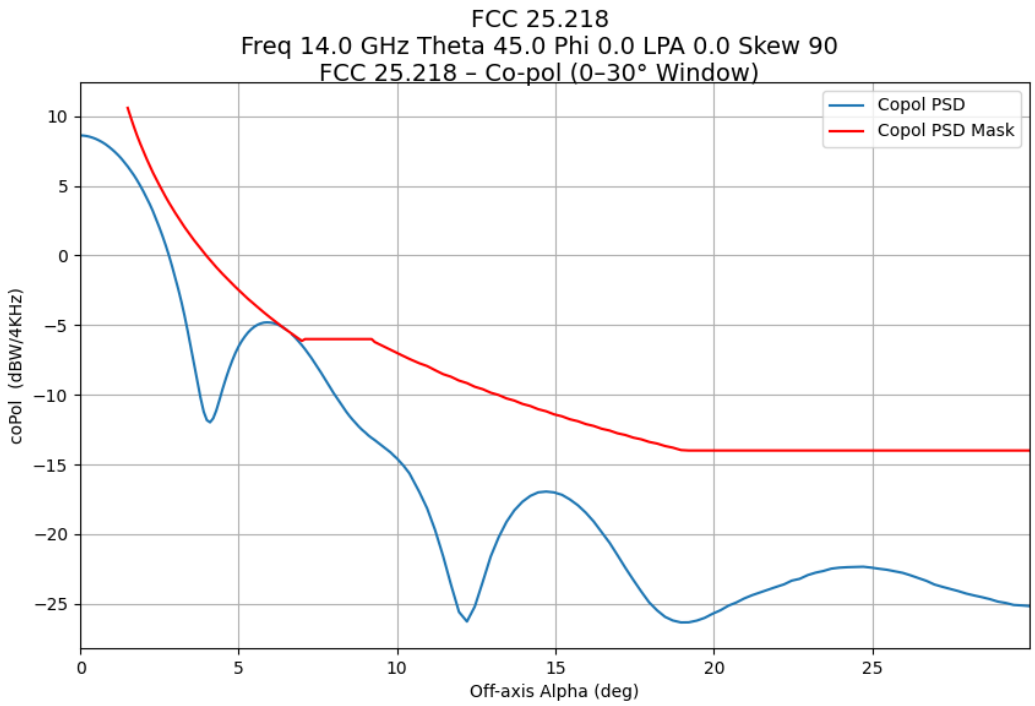


Figure 19: Thirty Degree Sector Copol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

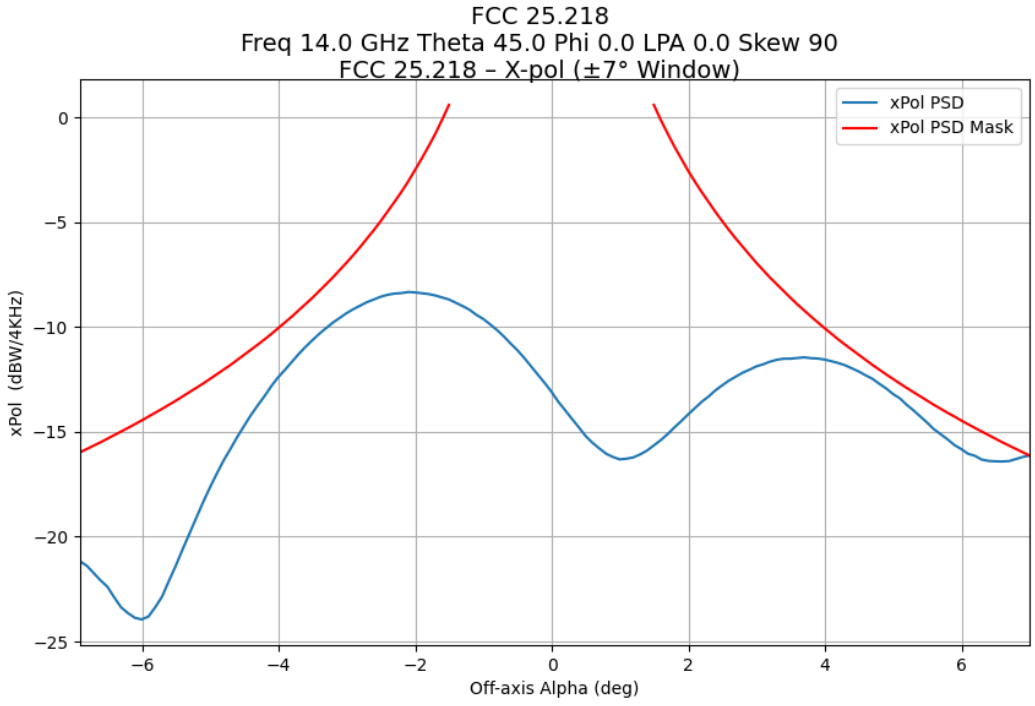


Figure 20: Seven Degree Sector XPol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

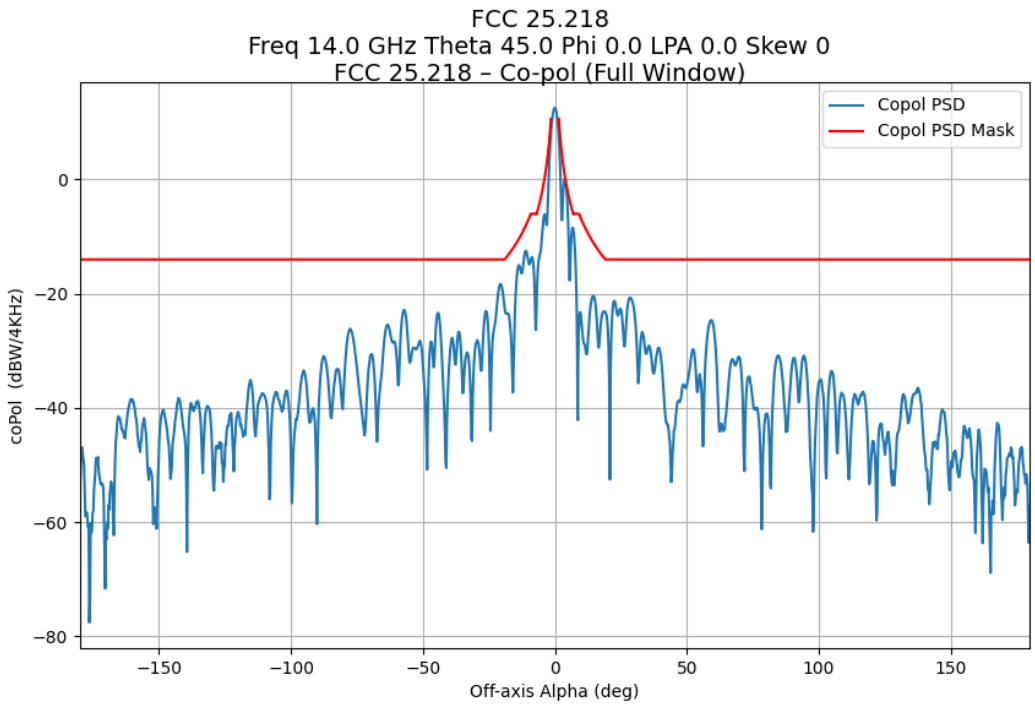


Figure 21: Full Window Copol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

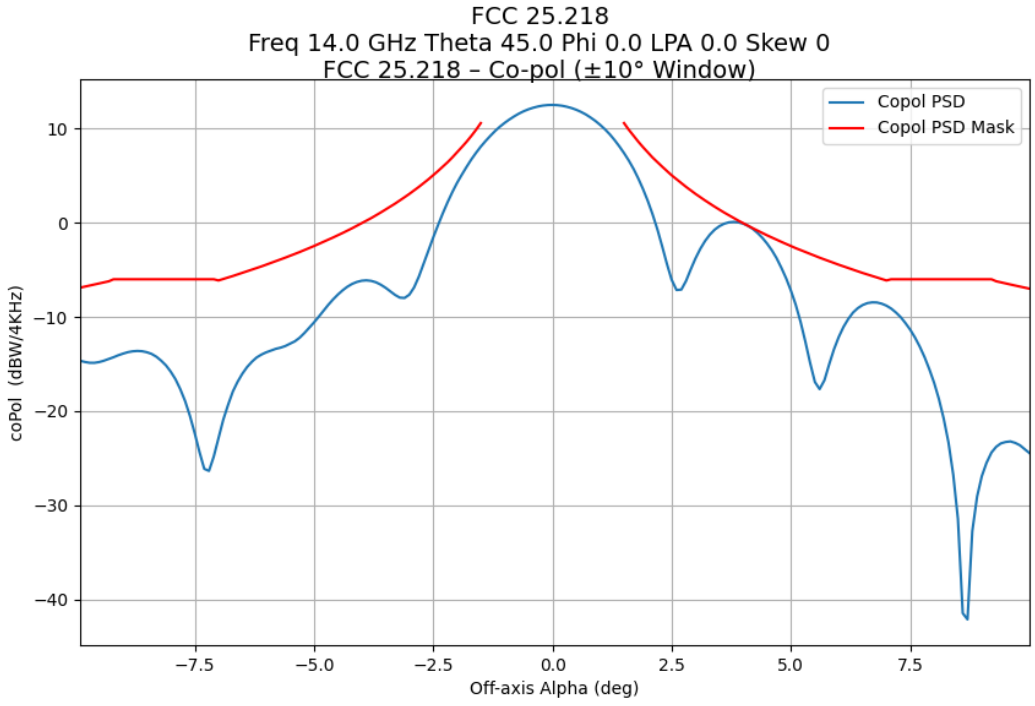


Figure 22: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

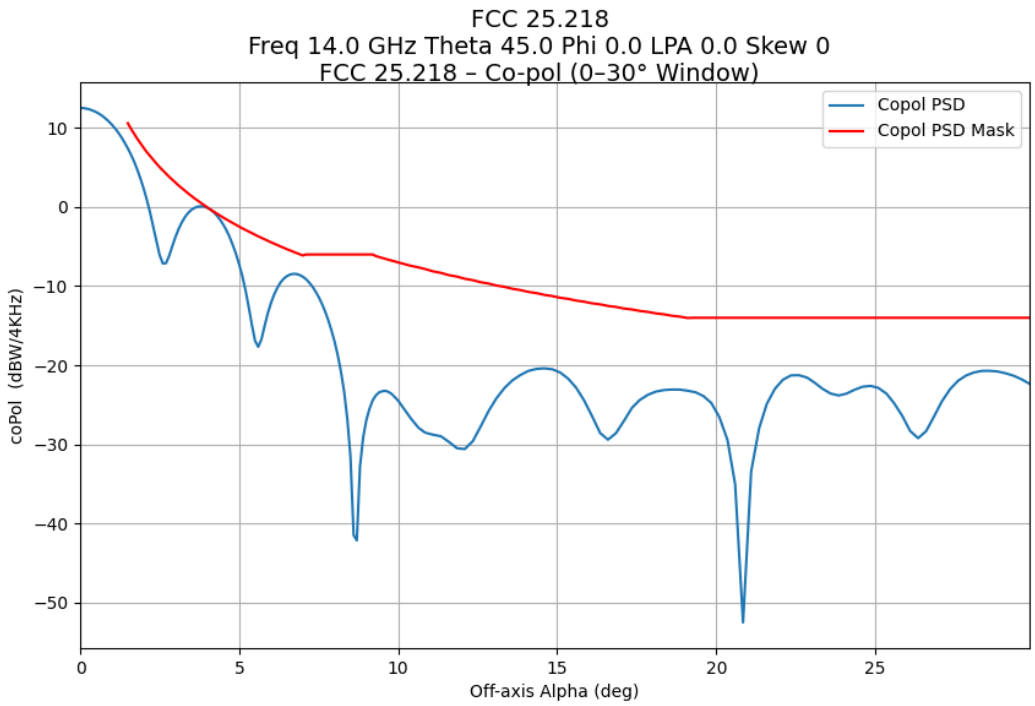


Figure 23: Thirty Degree Sector Copol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

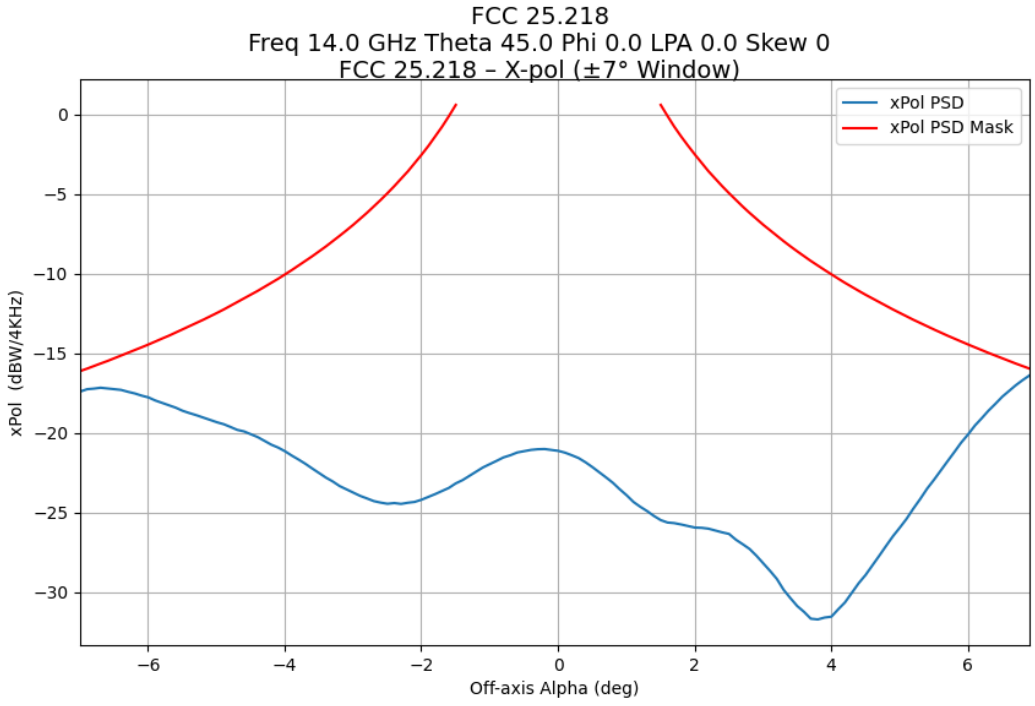


Figure 24: Seven Degree Sector XPol - Freq=14.0 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

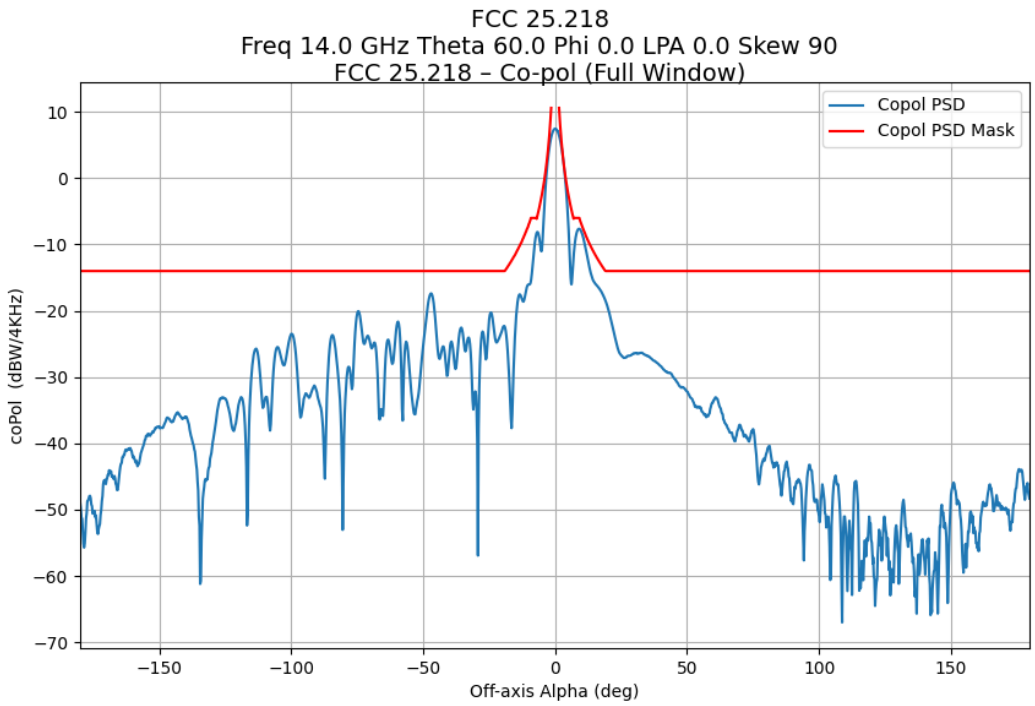


Figure 25: Full Window Copol - Freq=14.0 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

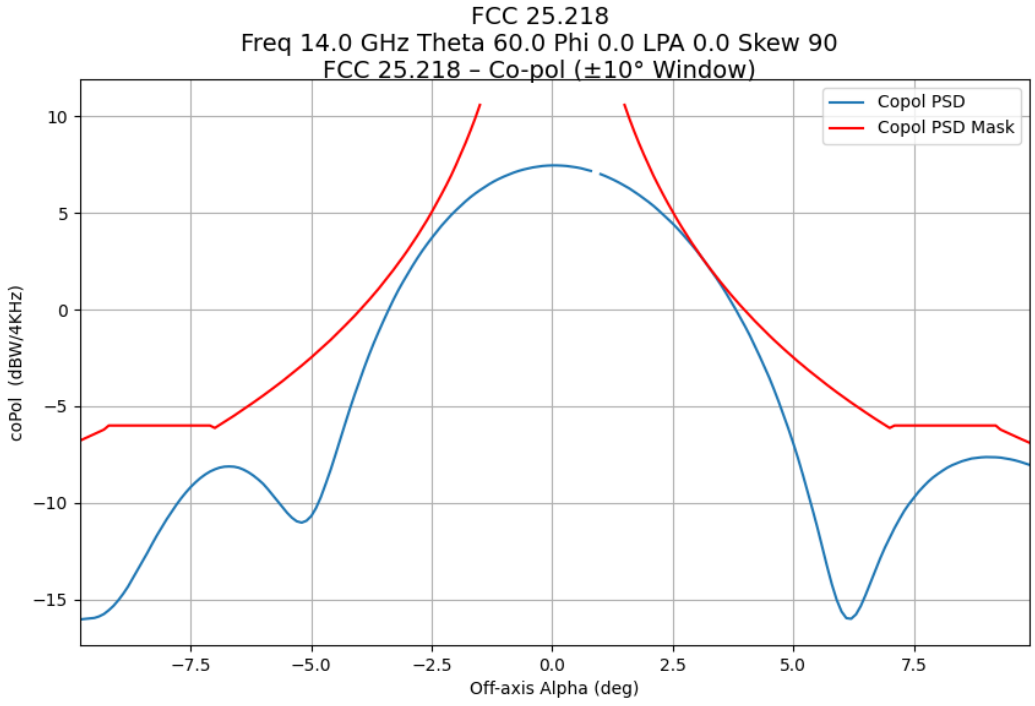


Figure 26: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

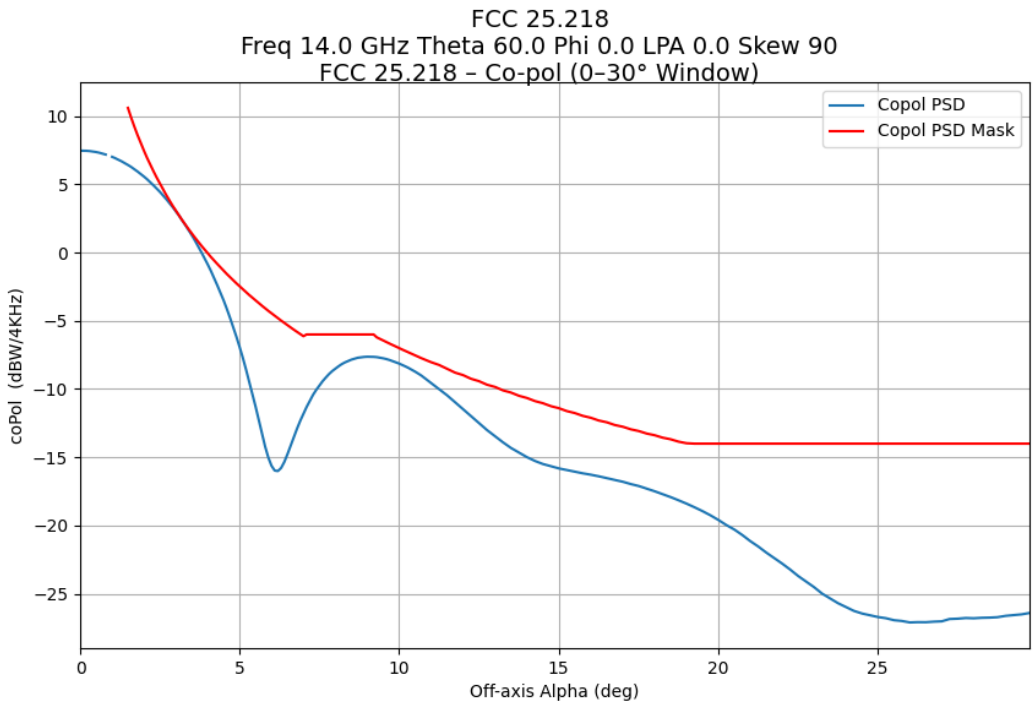


Figure 27: Thirty Degree Sector Copol - Freq=14.0 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

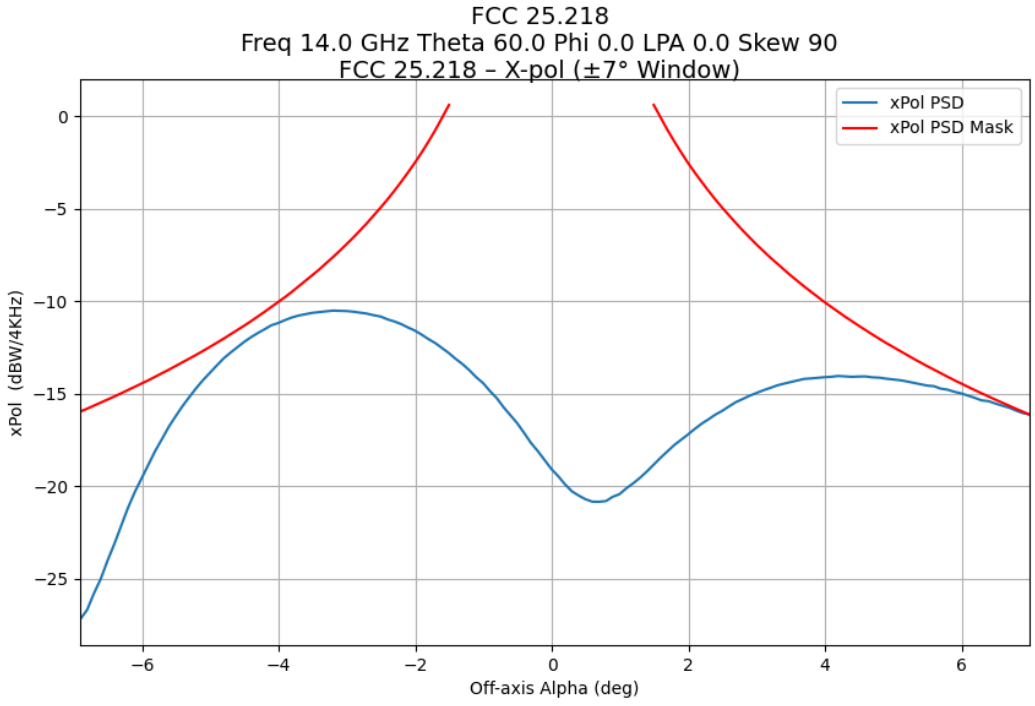


Figure 28: Seven Degree Sector XPol - Freq=14.0 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

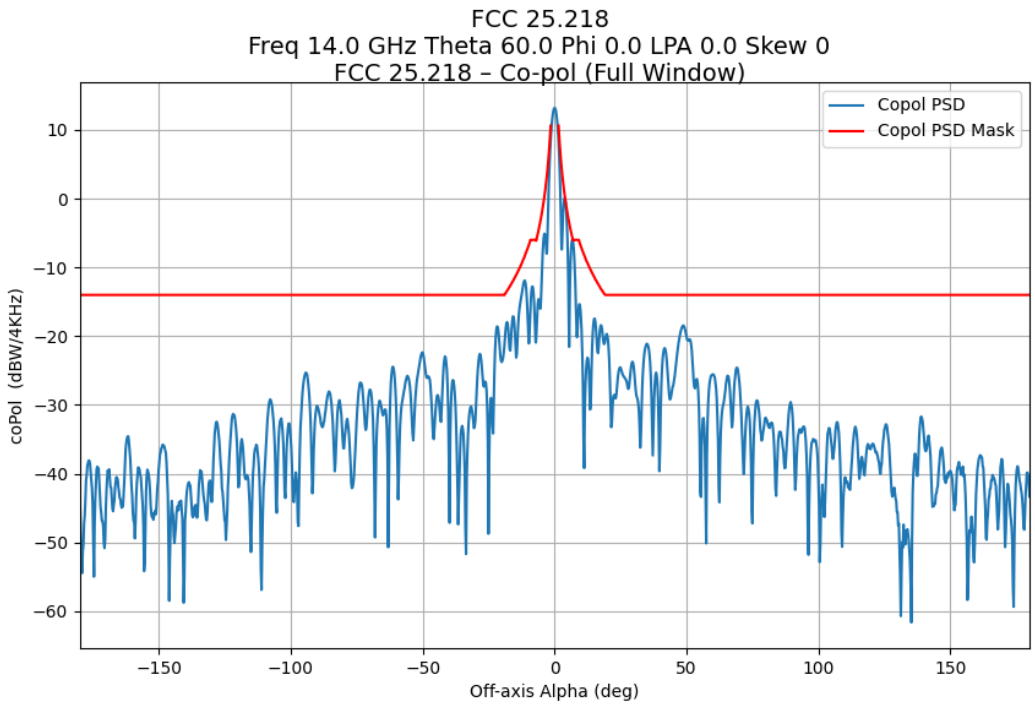


Figure 29: Full Window Copol - Freq=14.0 GHz, Theta=60 Deg, Phi= 0 Deg, LPA=0 Deg, Skew=0 Deg

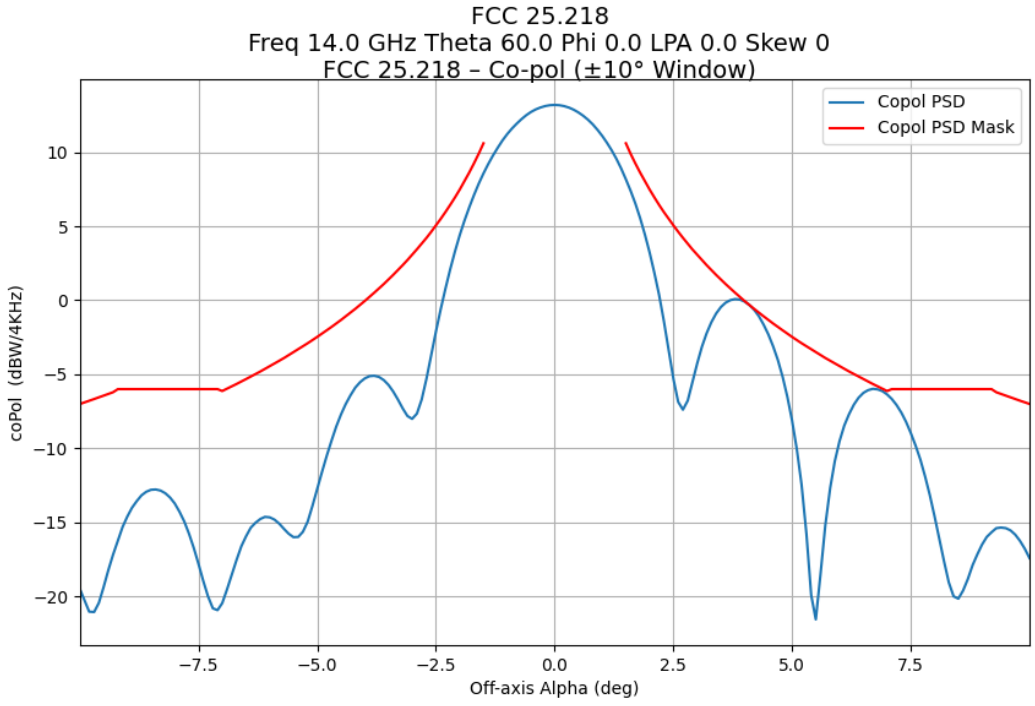


Figure 30: Ten Degree Sector Copol - Freq=14.0 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

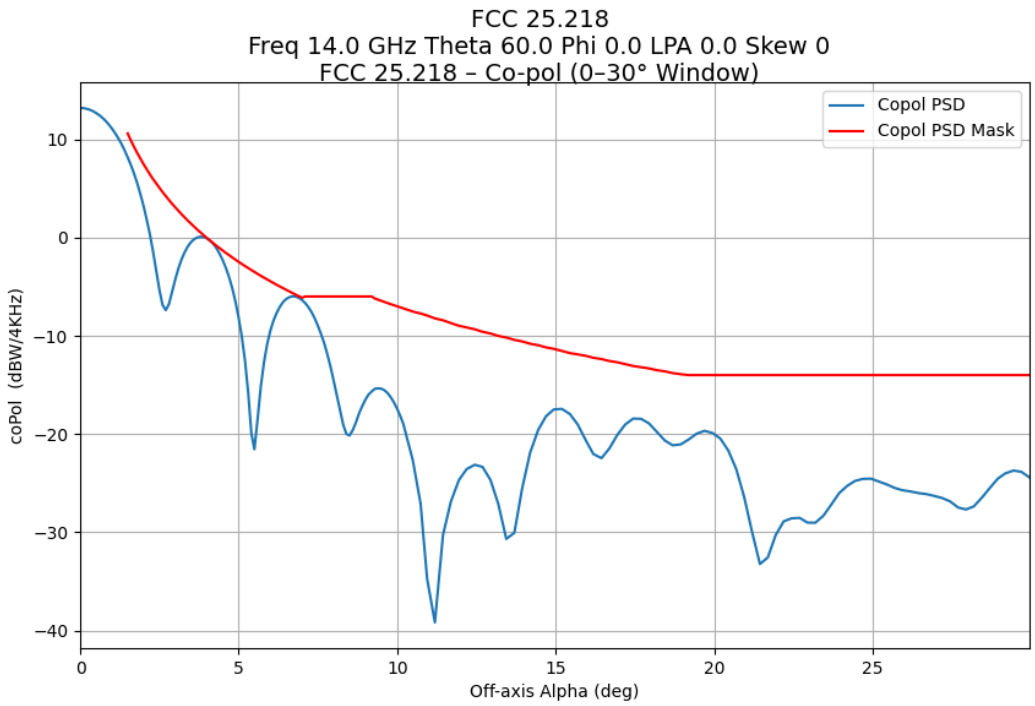


Figure 31: Thirty Degree Sector Copol - Freq=14.0 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

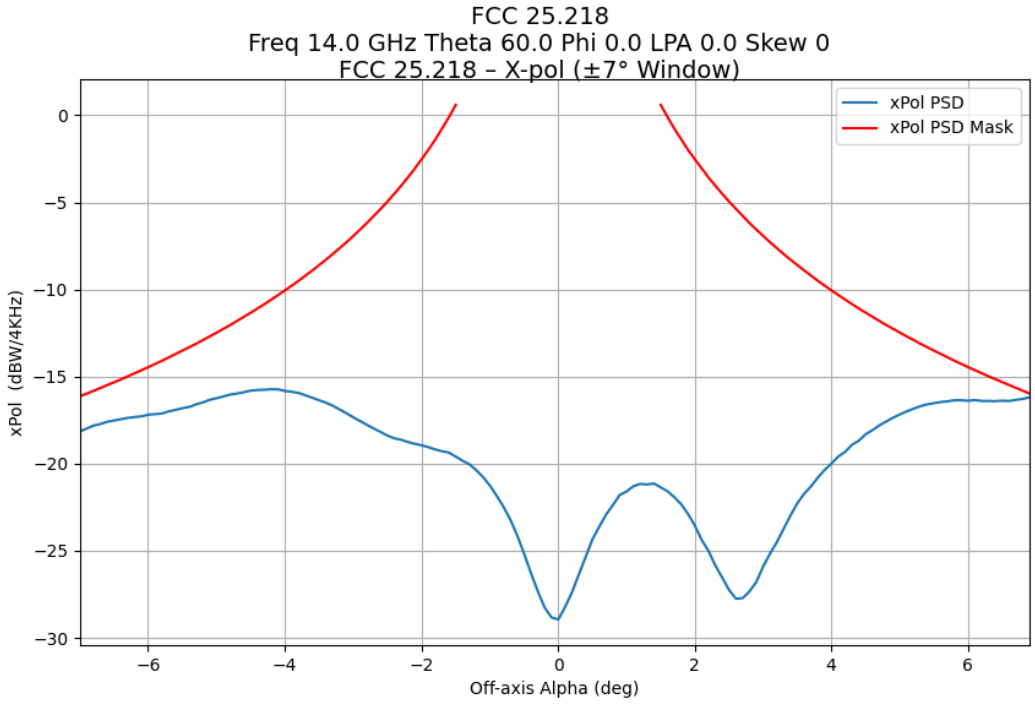


Figure 32: Seven Degree Sector XPol - Freq=14.0 Deg, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

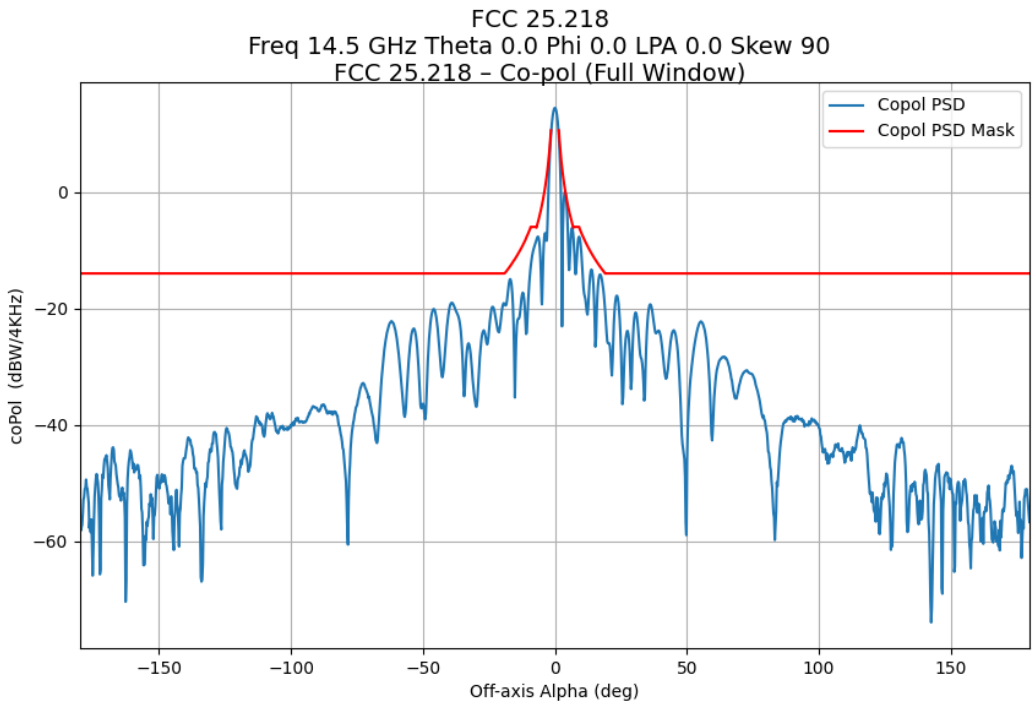


Figure 33: Full Window Copol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

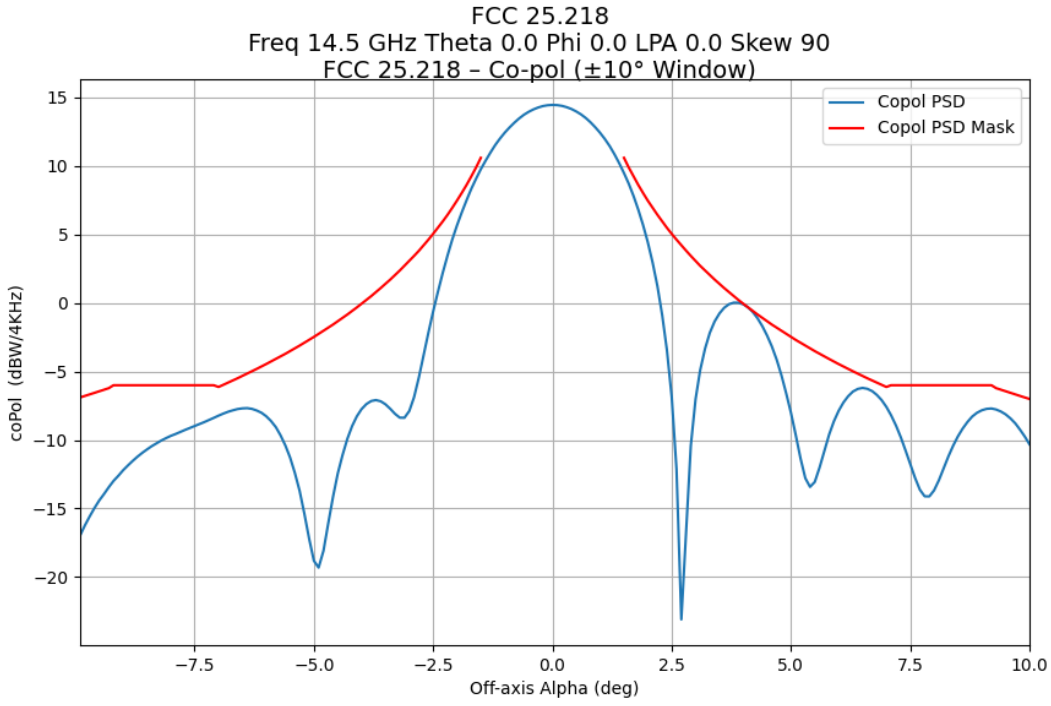


Figure 34: Ten Degree Sector Copol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

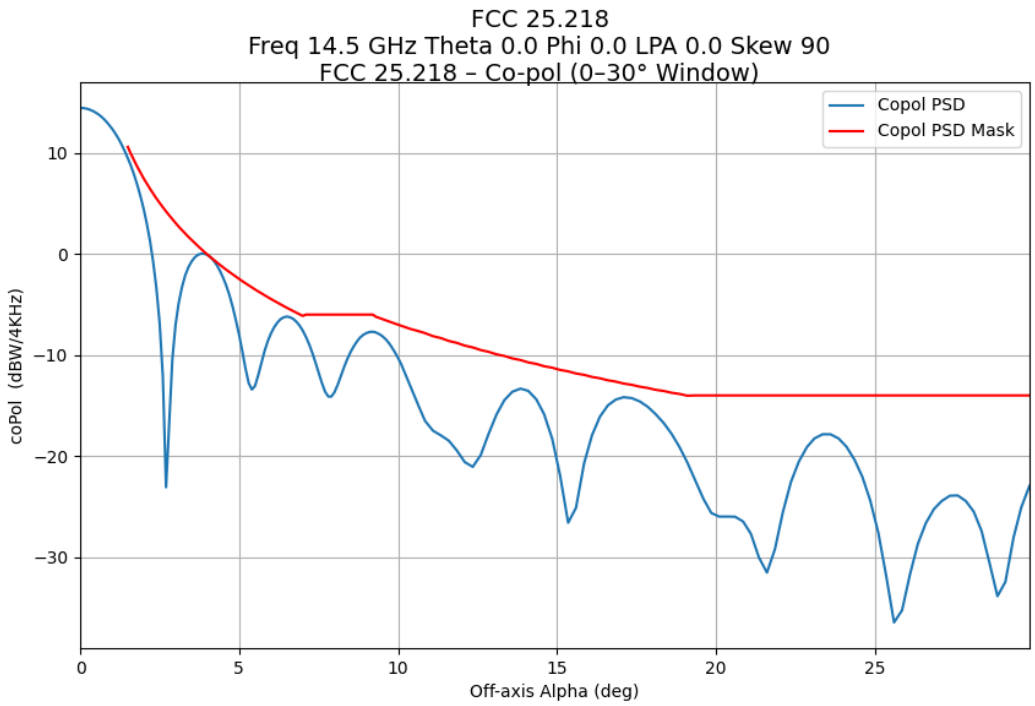


Figure 35: Thirty Degree Sector Copol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

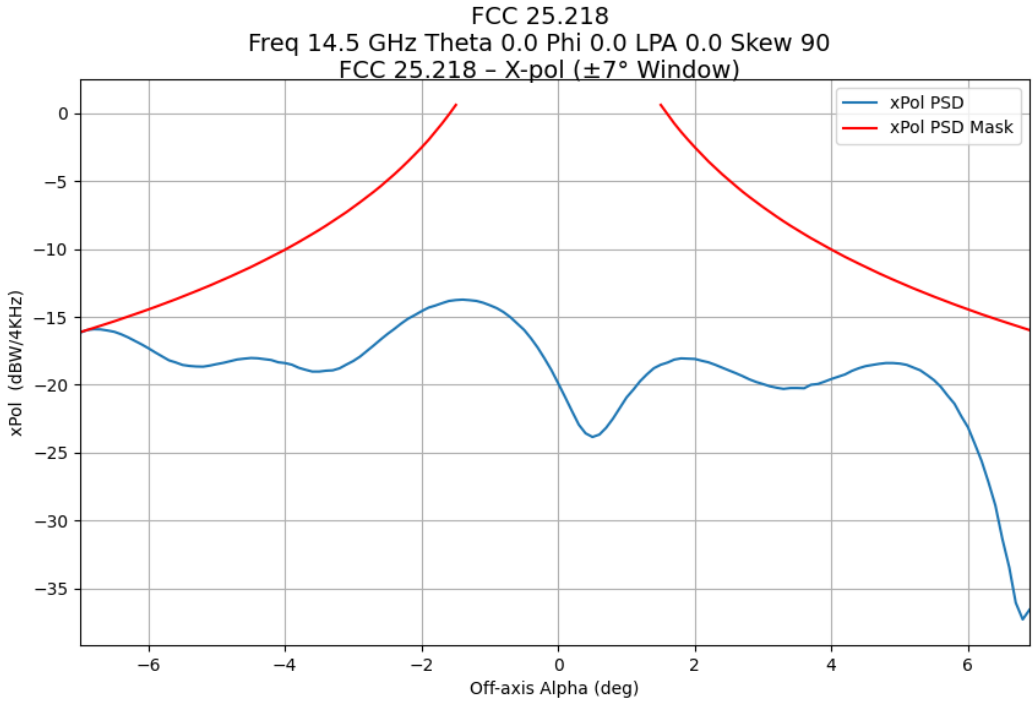


Figure 36: Seven Degree Sector XPol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

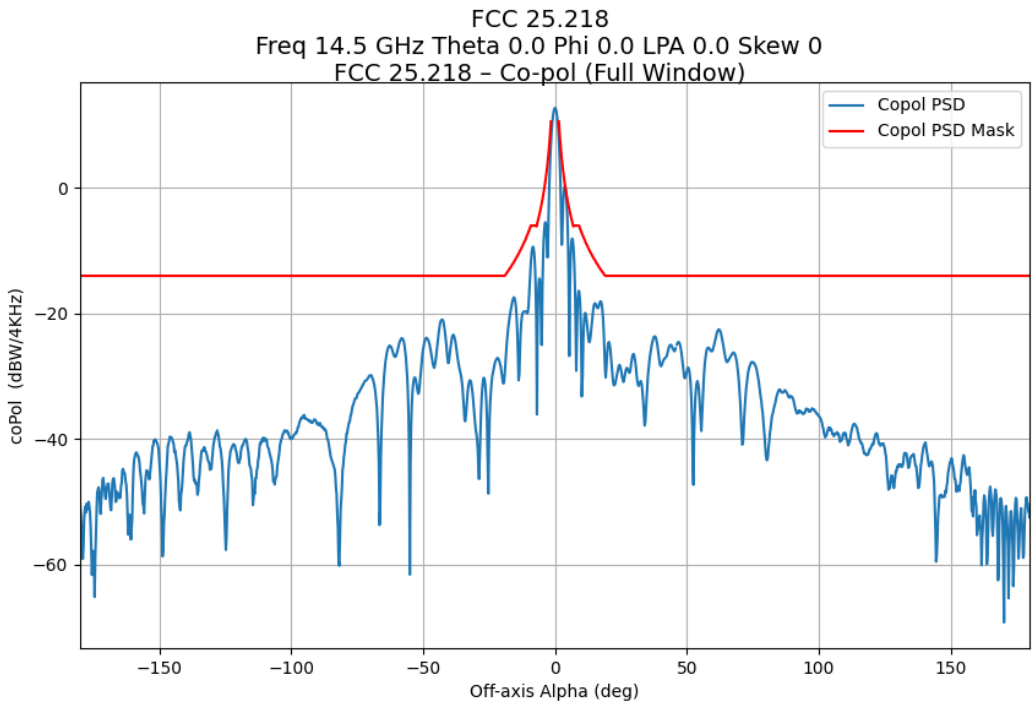


Figure 37: Full Window Copol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

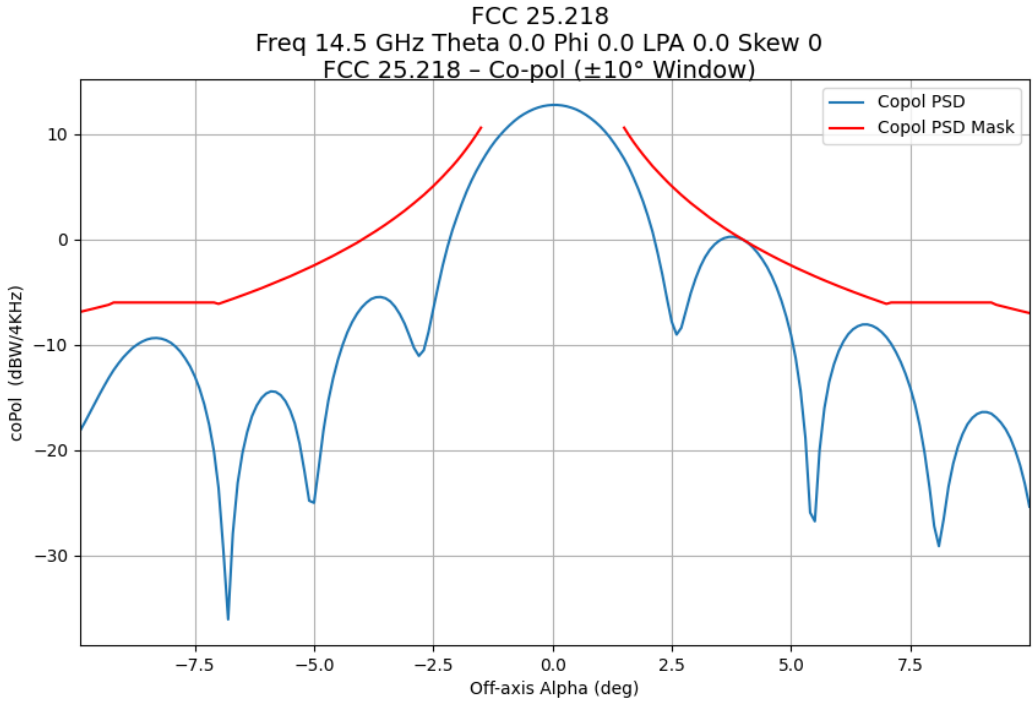


Figure 38: Ten Degree Sector Copol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

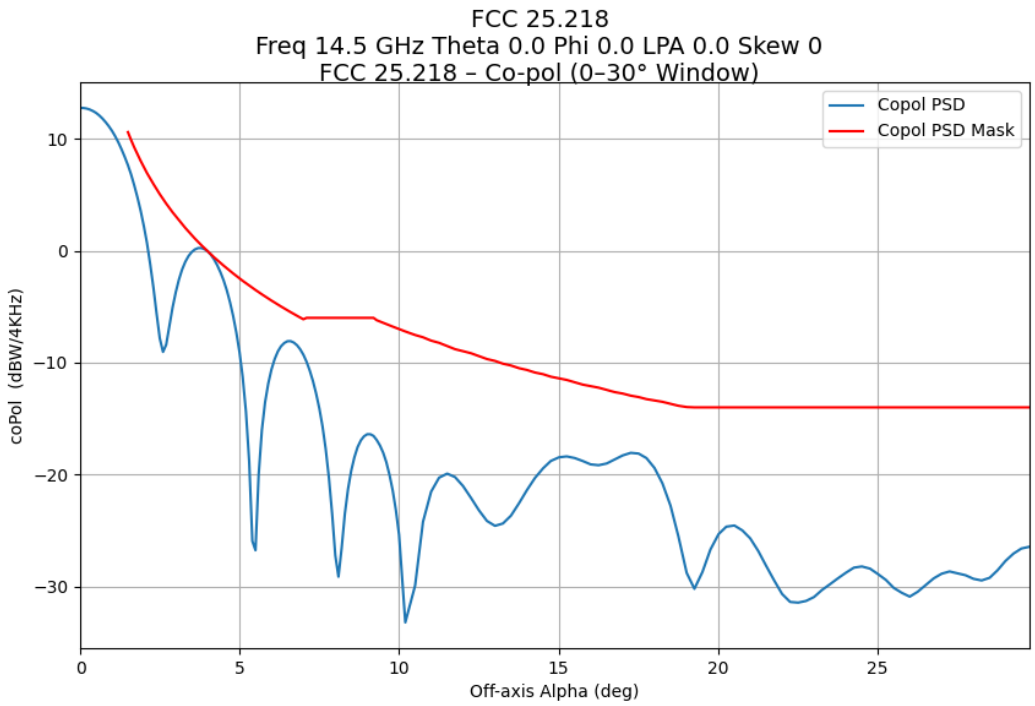


Figure 39: Thirty Degree Sector Copol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

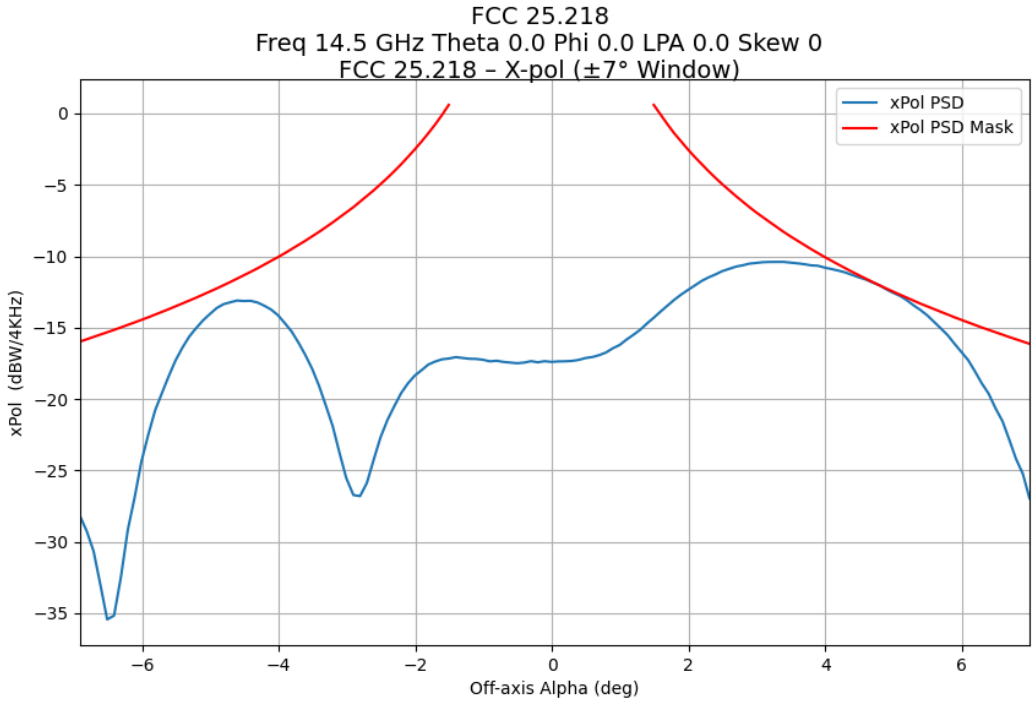


Figure 40: Seven Degree Sector XPol - Freq=14.5 GHz, Theta=0 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

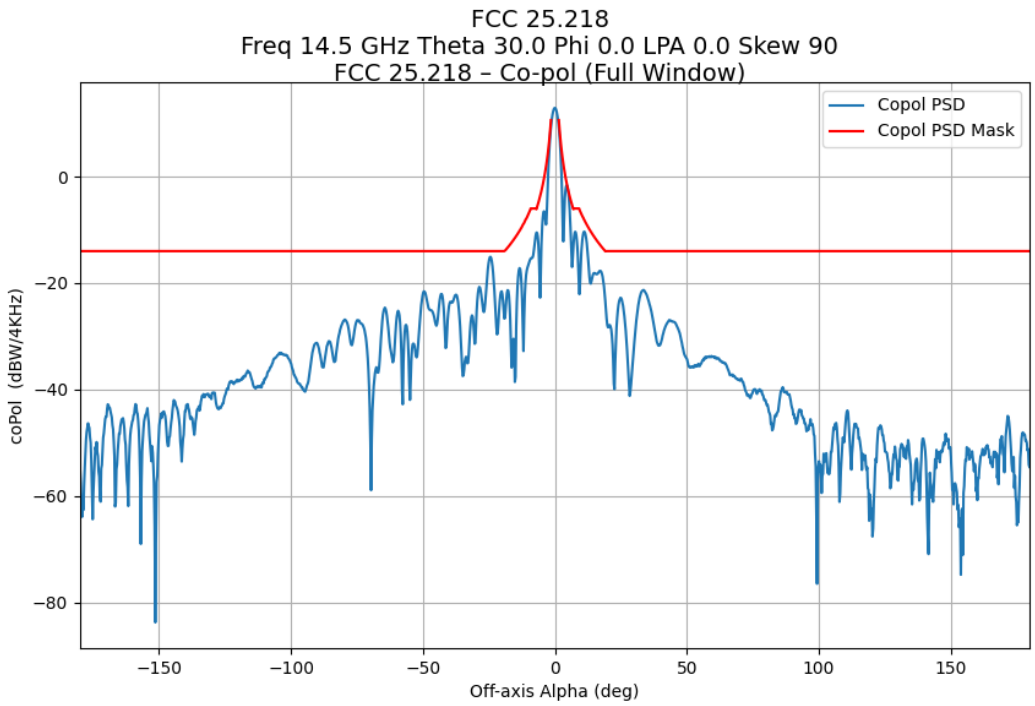


Figure 41: Full Window Copol -Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

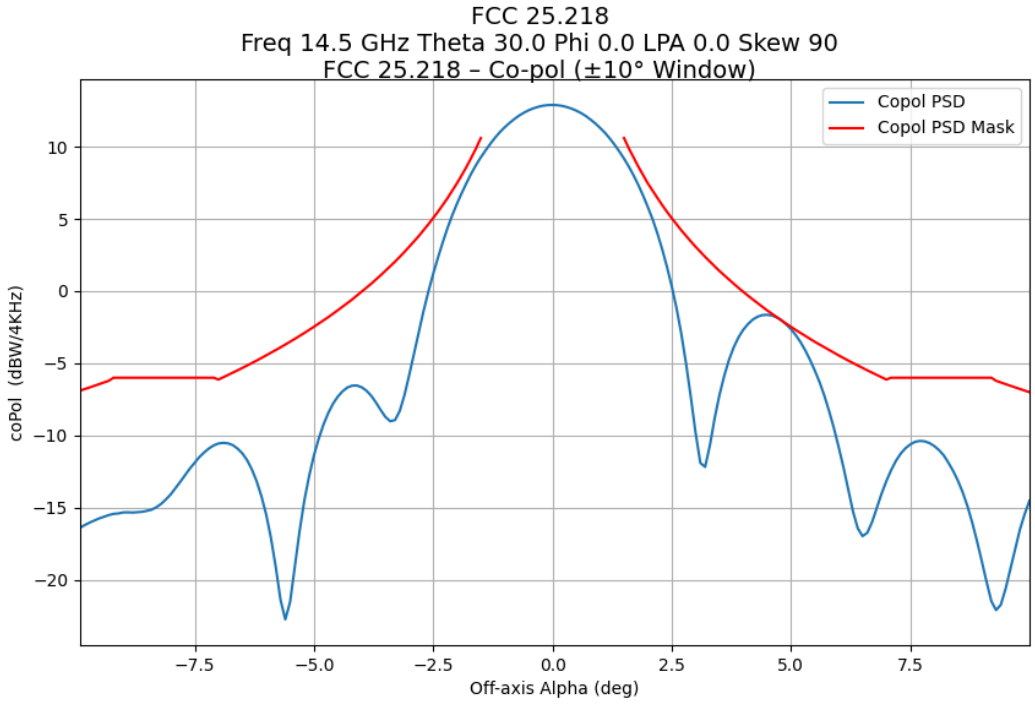


Figure 42: Ten Degree Sector Copol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

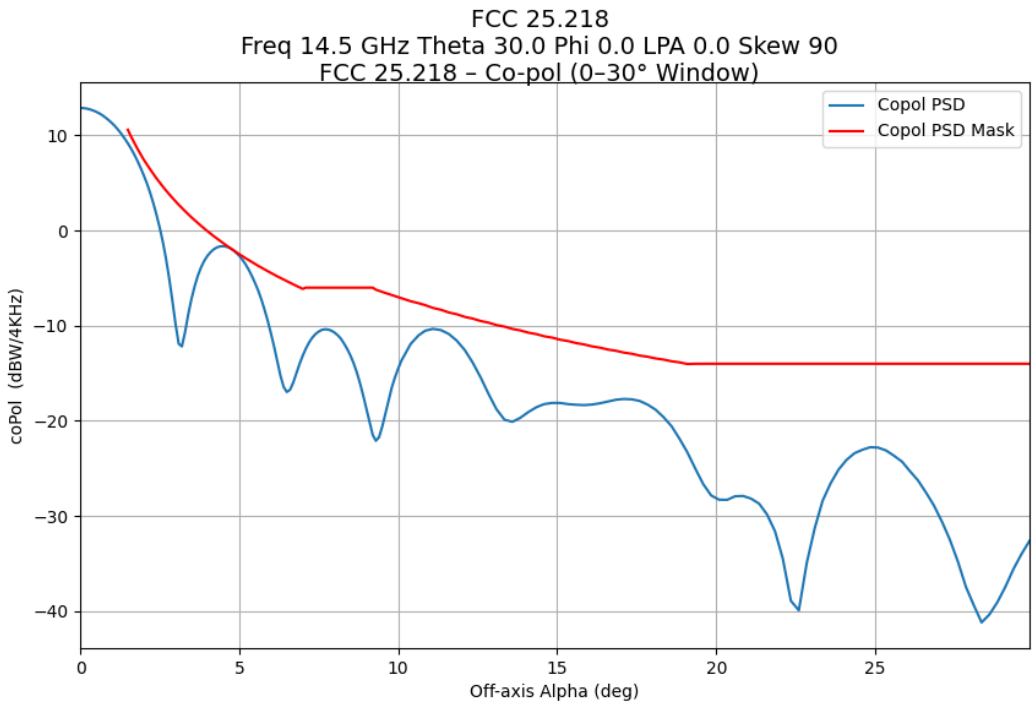


Figure 43: Thirty Degree Sector Copol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

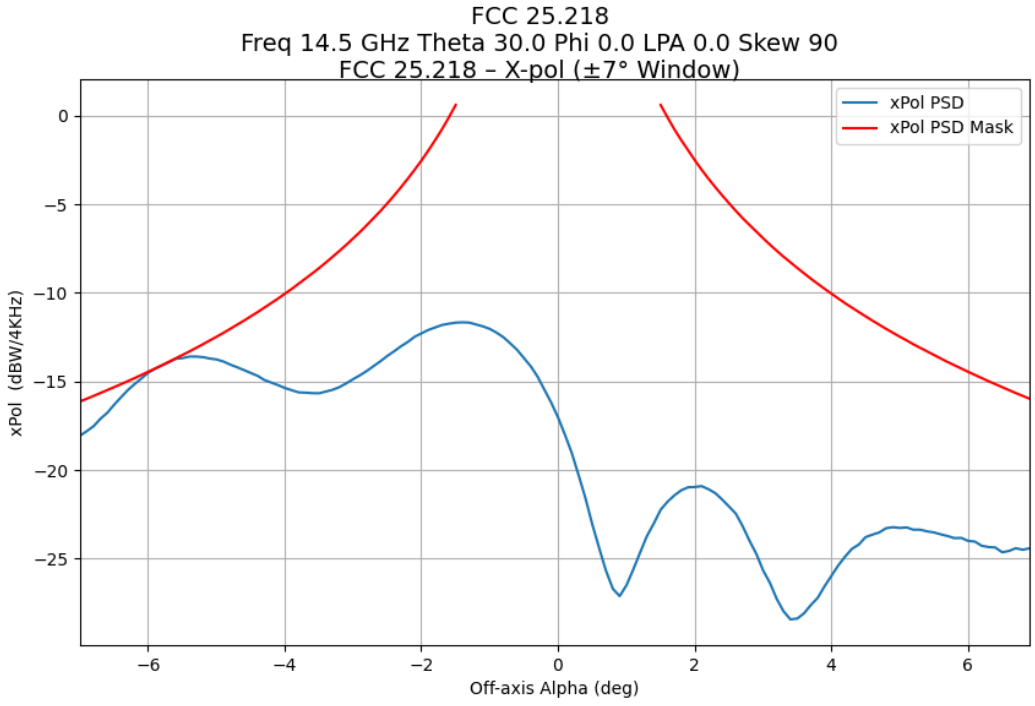


Figure 44: Seven Degree Sector XPol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

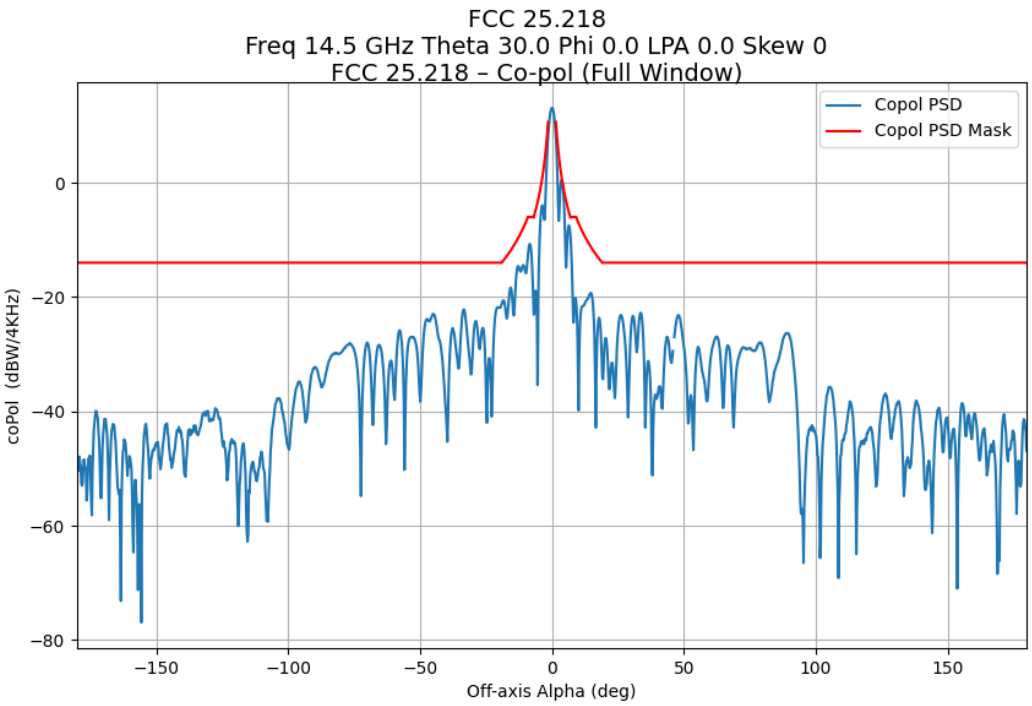


Figure 45: Full Window Copol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

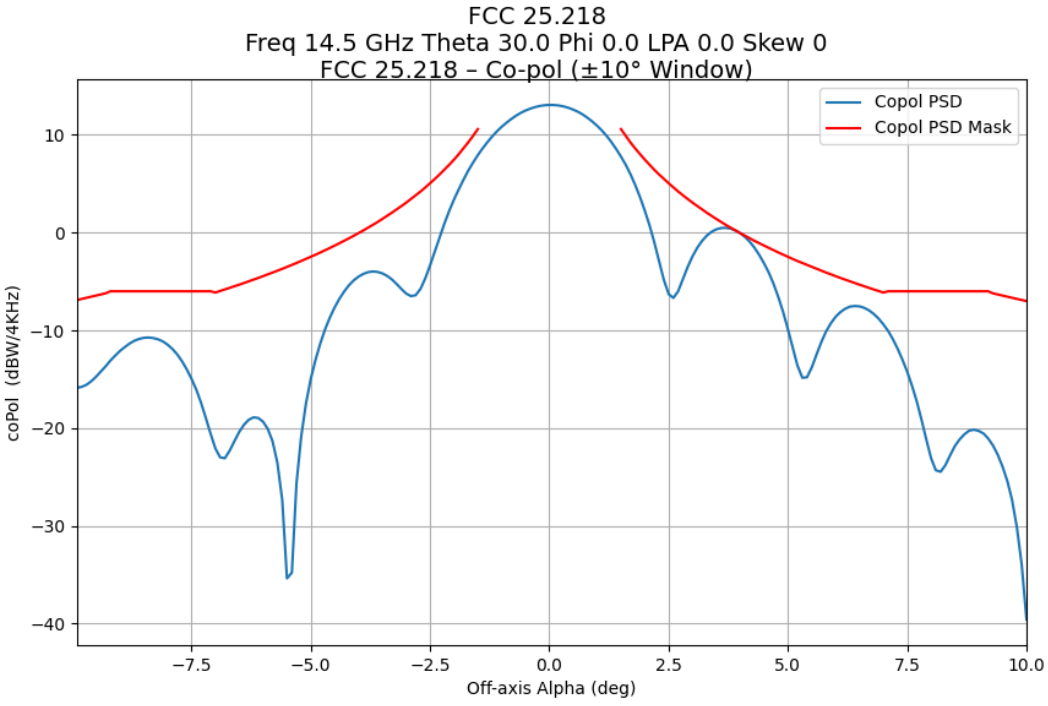


Figure 46: Ten Degree Sector Copol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

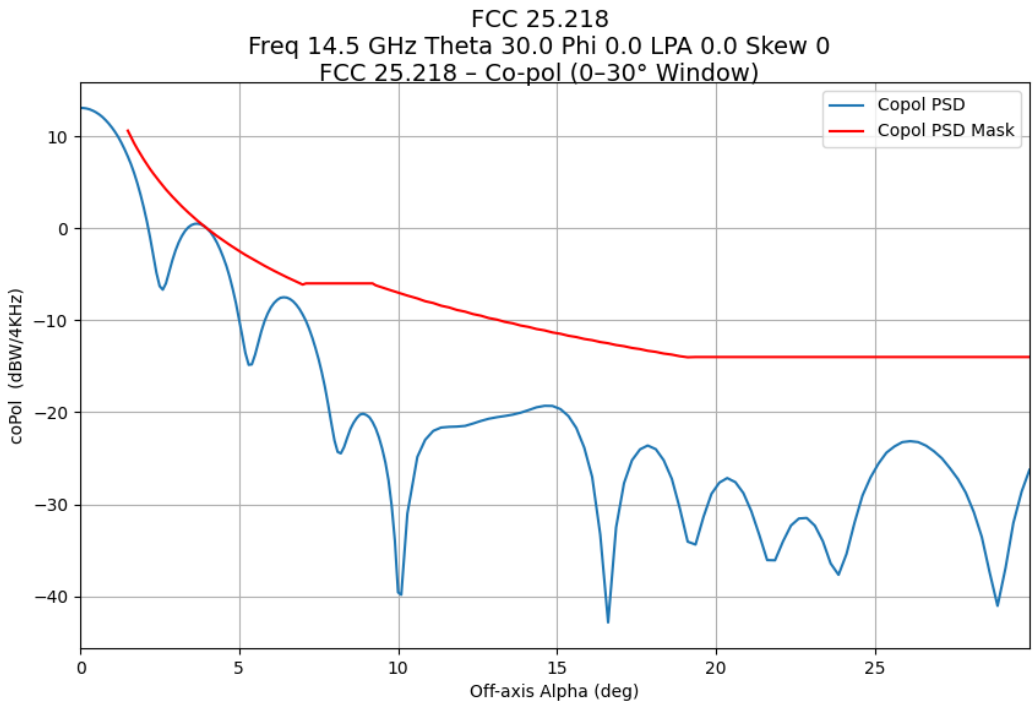


Figure 47: Thirty Degree Sector Copol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

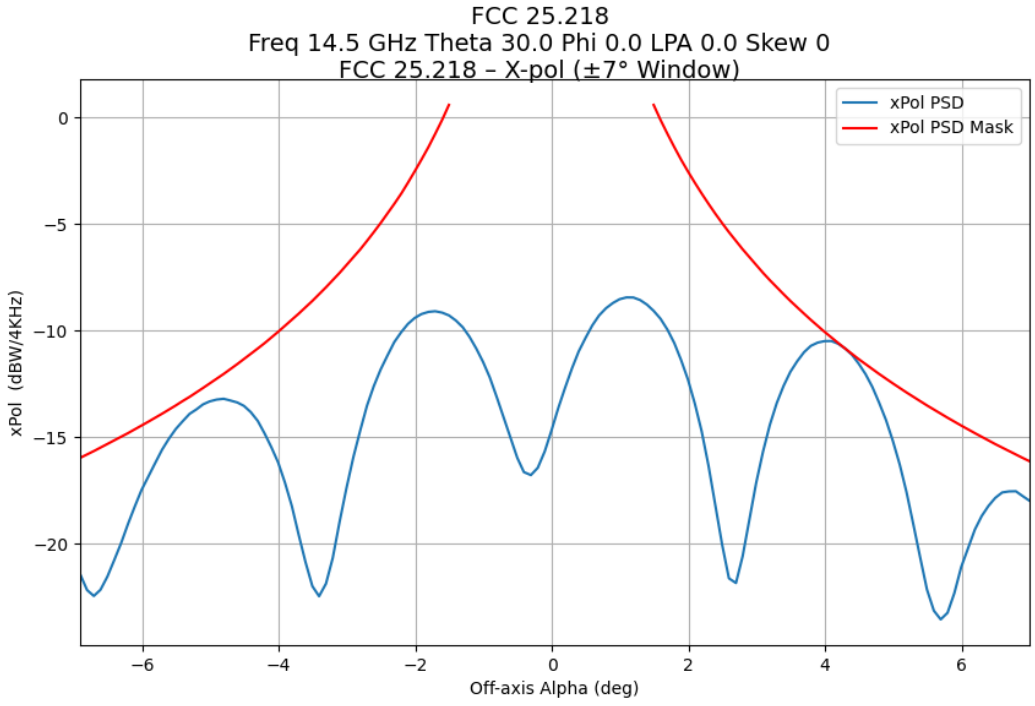


Figure 48: Seven Degree Sector XPol – Freq=14.5 GHz, Theta=30 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

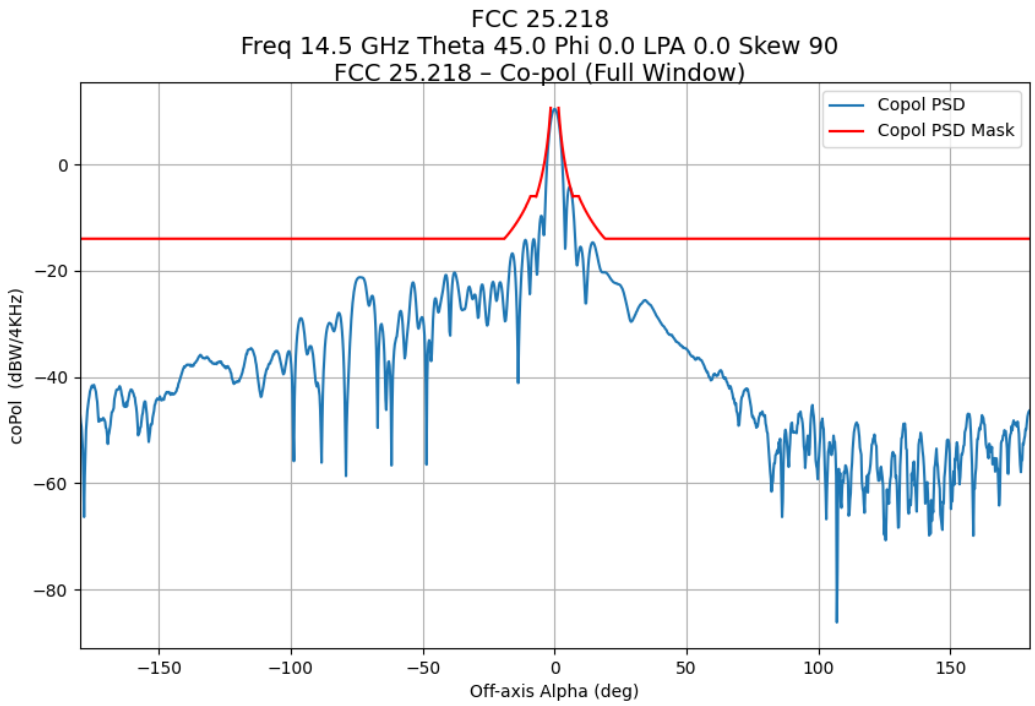


Figure 49: Full Window Copol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

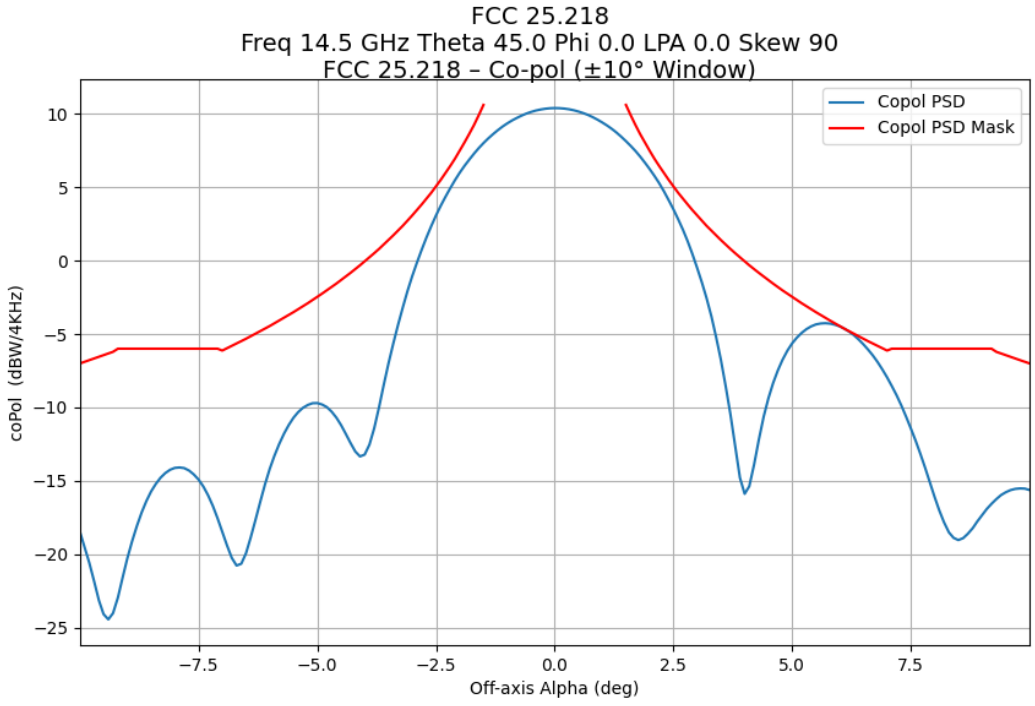


Figure 50: Ten Degree Sector Copol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

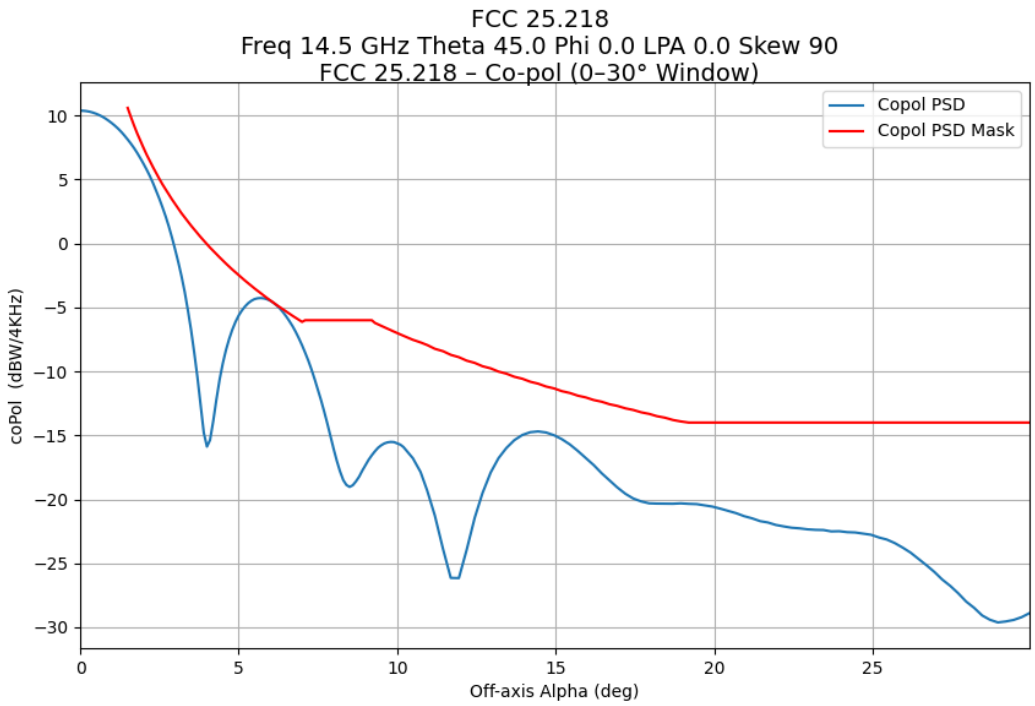


Figure 51: Thirty Degree Sector Copol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

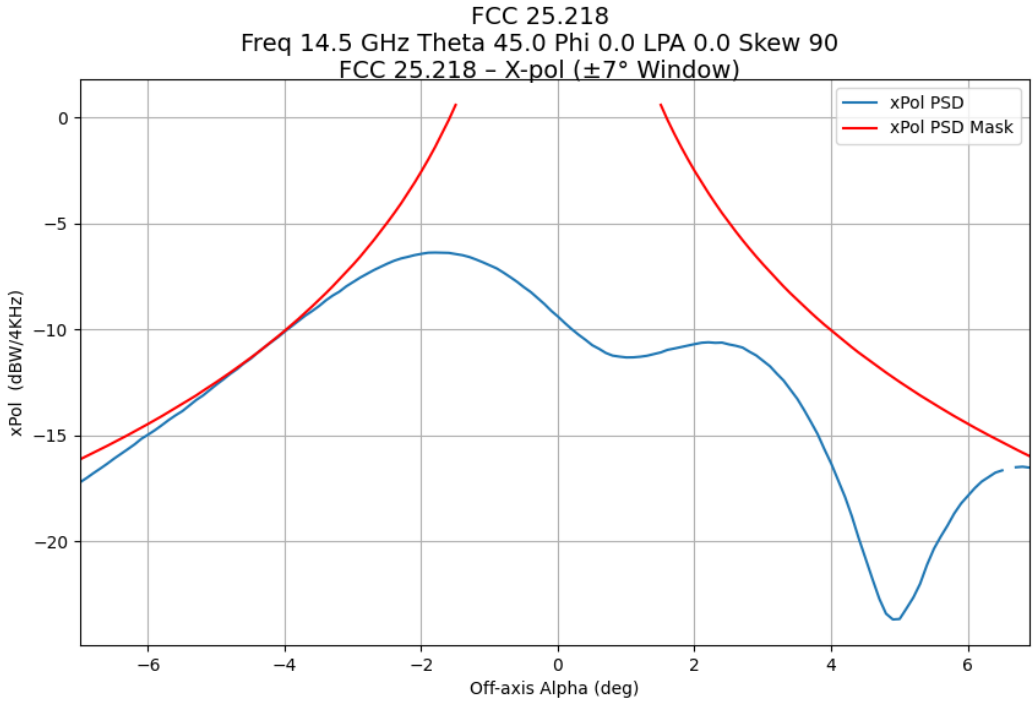


Figure 52: Seven Degree Sector XPol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

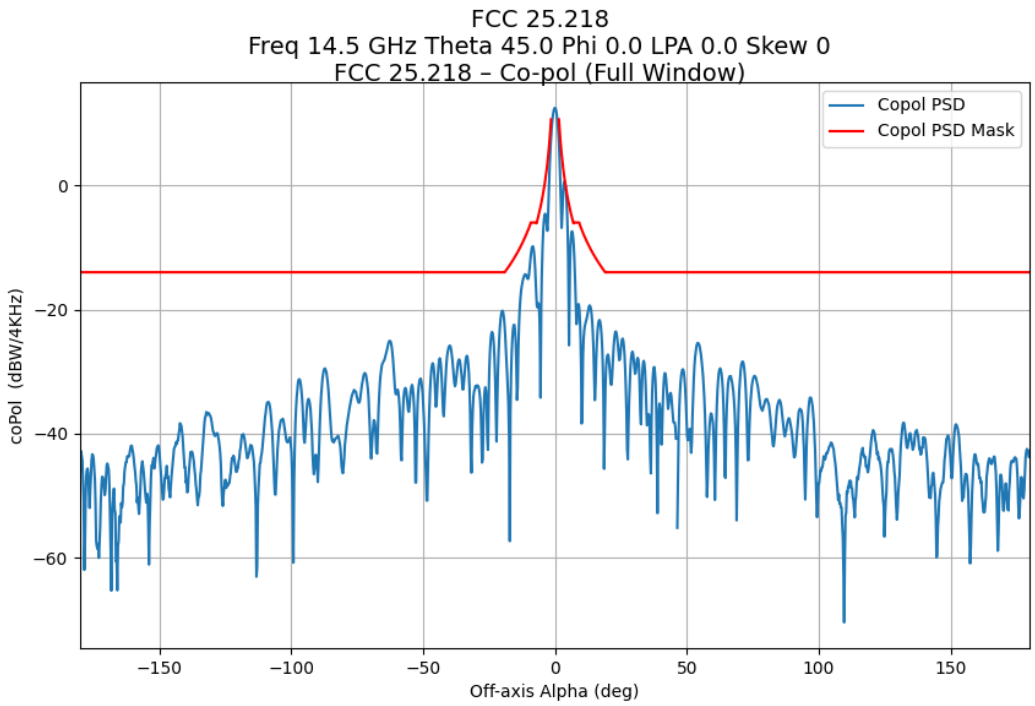


Figure 53: Full Window Copol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

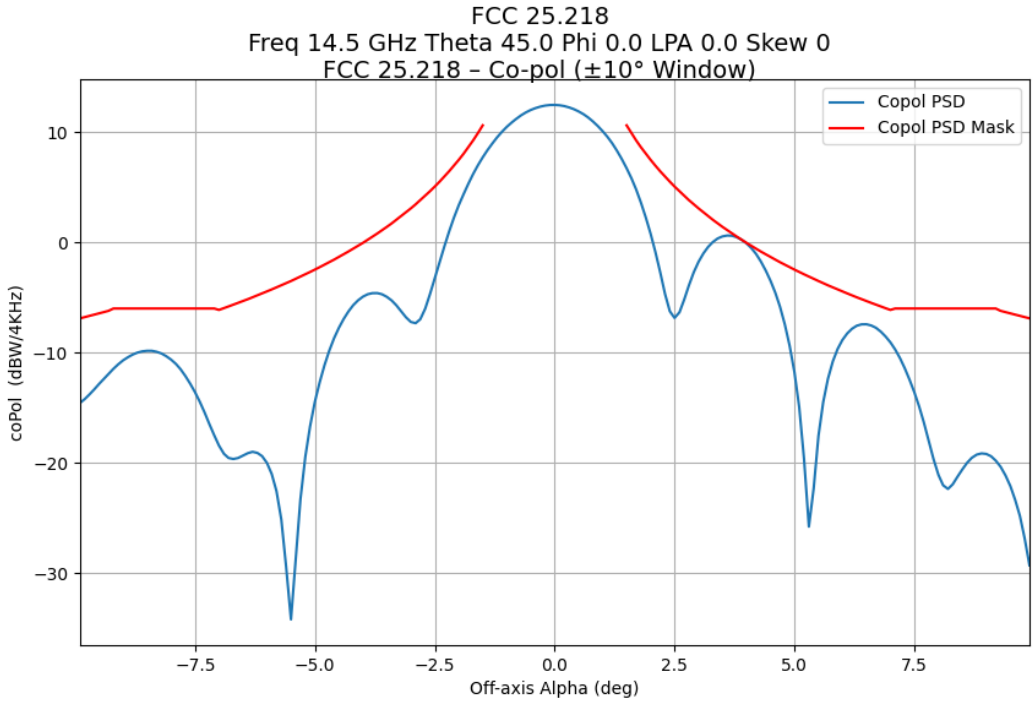


Figure 54: Ten Degree Sector Copol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

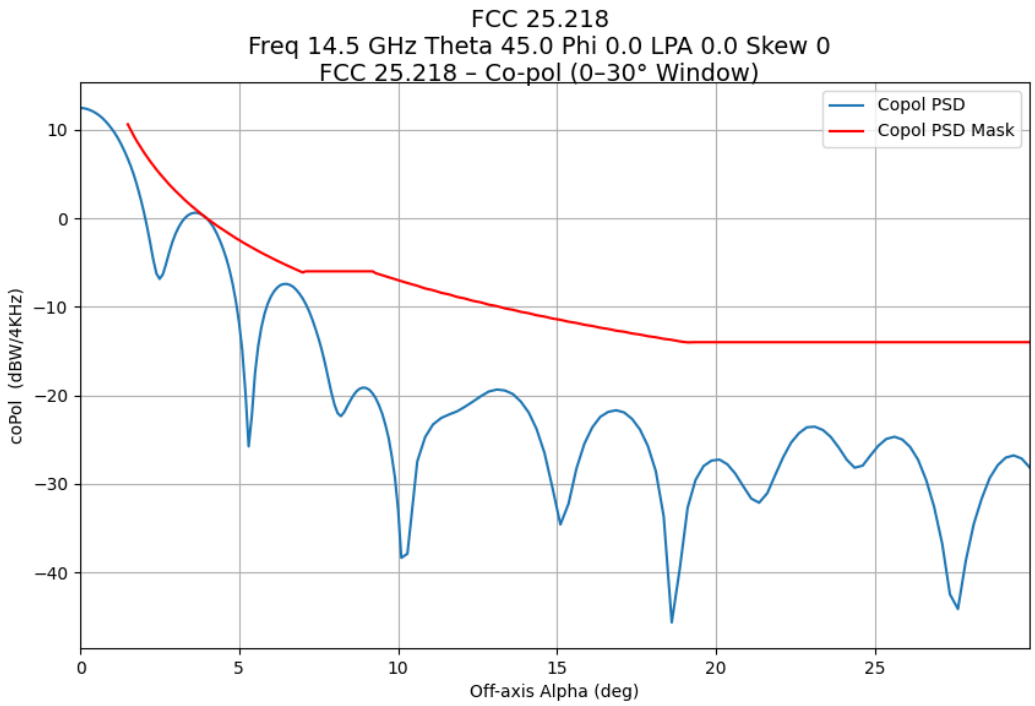


Figure 55: Thirty Degree Sector Copol – Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

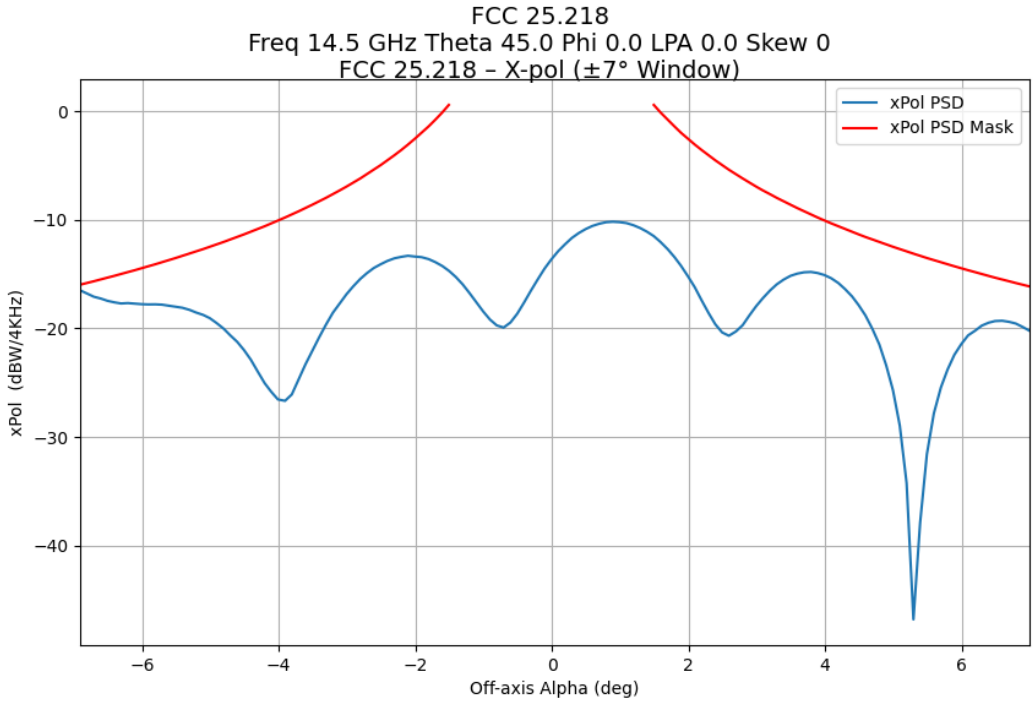


Figure 56: Seven Degree Sector XPol -Freq=14.5 GHz, Theta=45 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

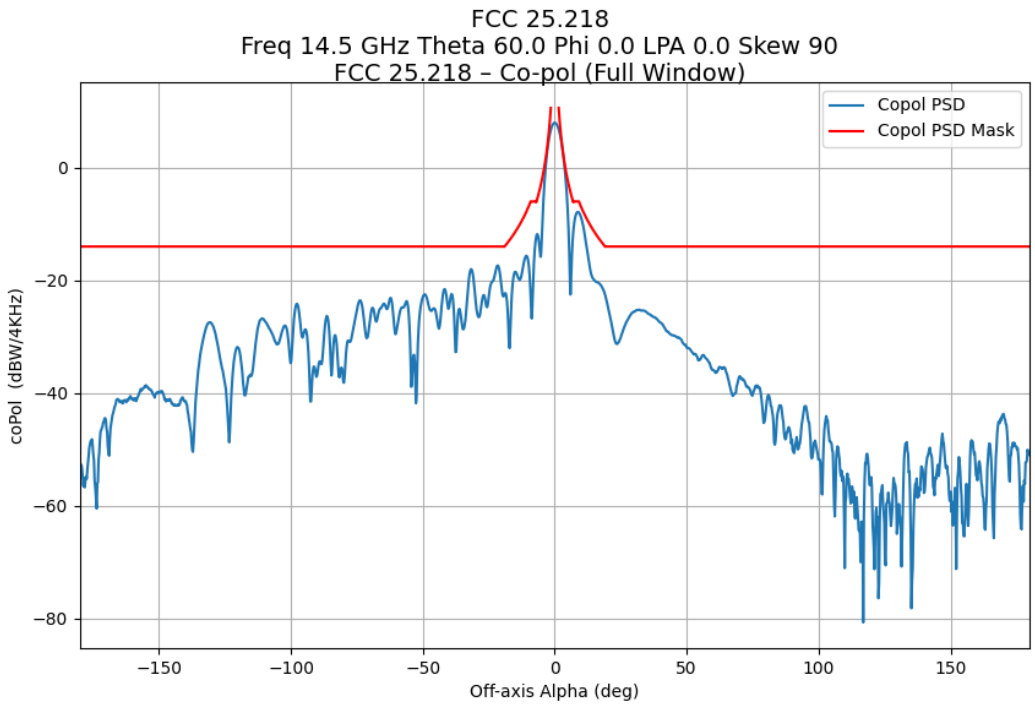


Figure 57: Full Window Copol – Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

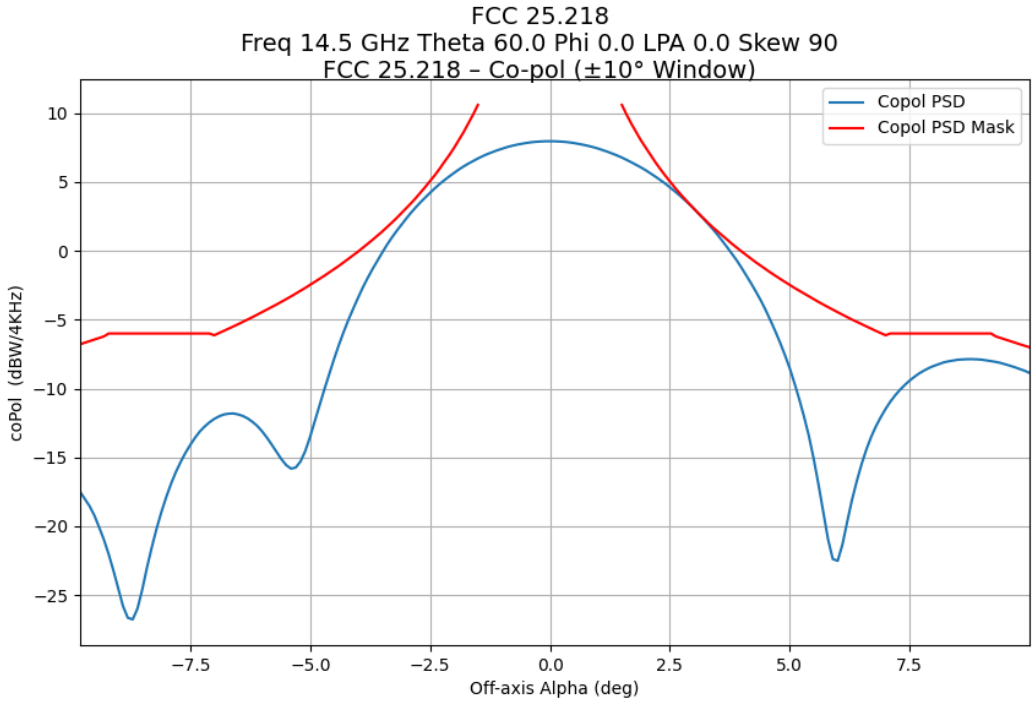


Figure 58: Ten Degree Sector Copol – Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

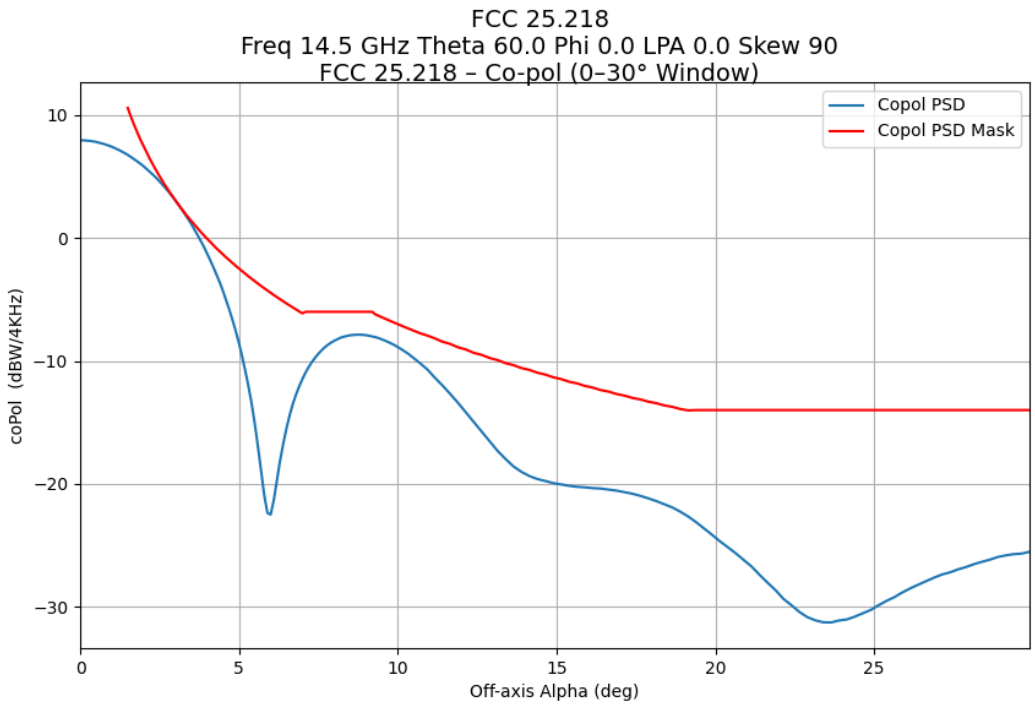


Figure 59: Thirty Degree Sector Copol – Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

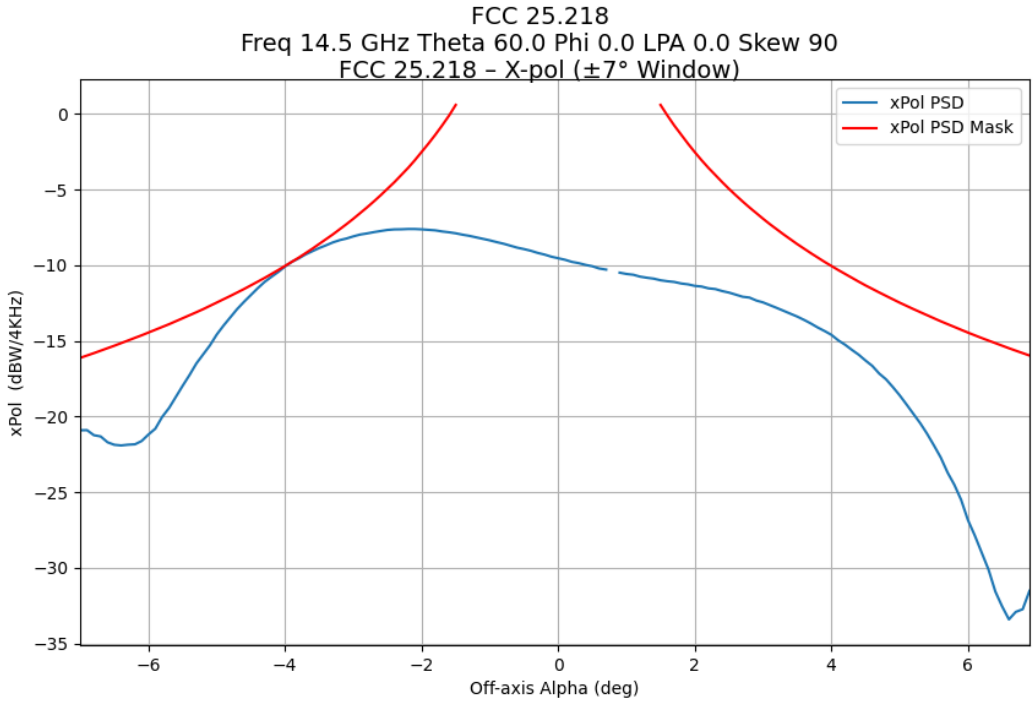


Figure 60: Seven Degree Sector XPol - Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=90 Deg

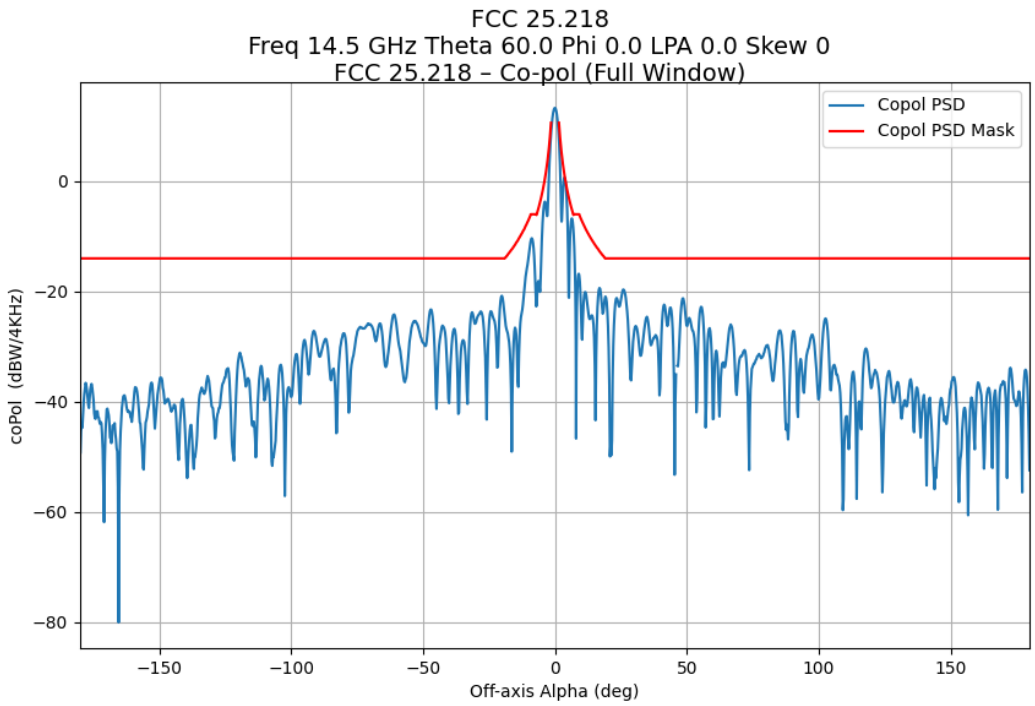


Figure 61: Full Window Copol – Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

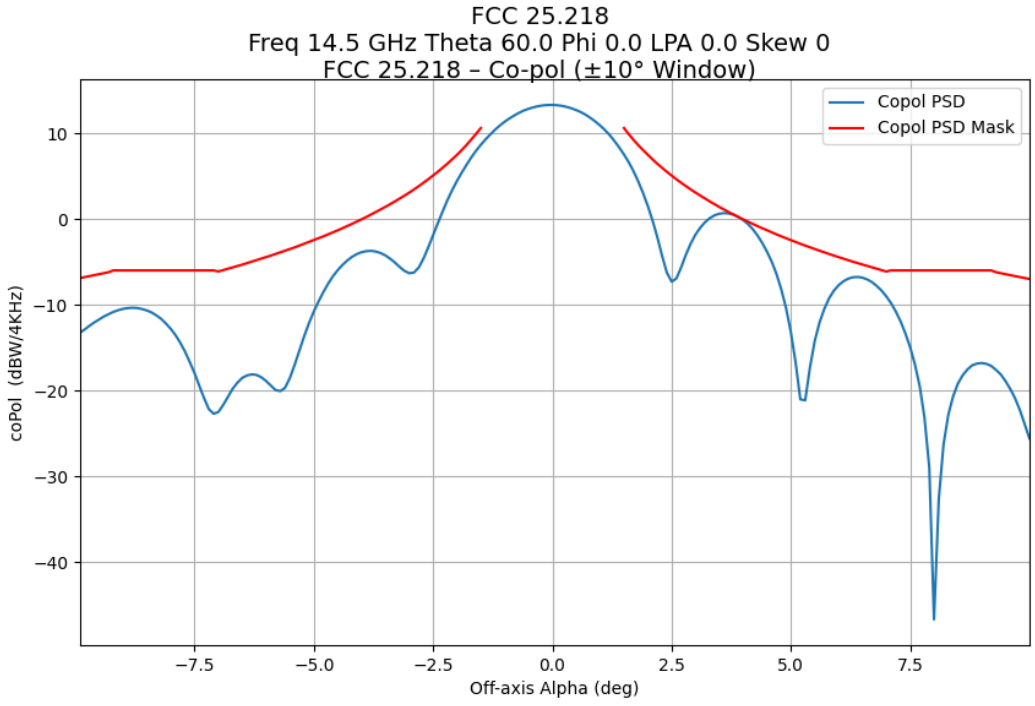


Figure 62: Ten Degree Sector Copol - Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

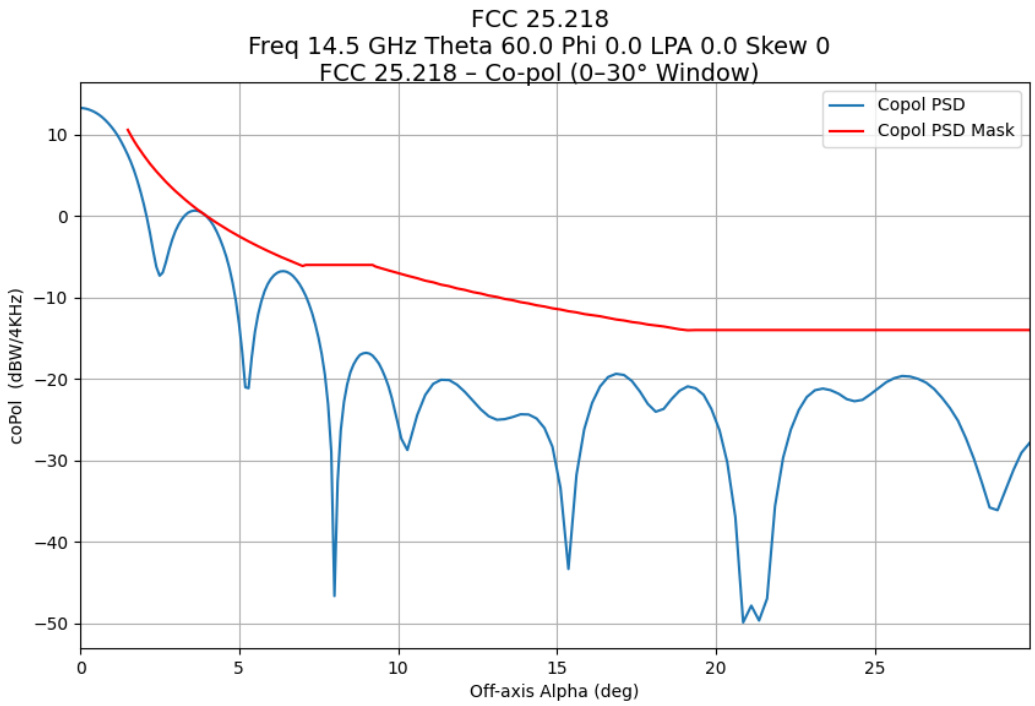


Figure 63: Thirty Degree Sector Copol – Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg

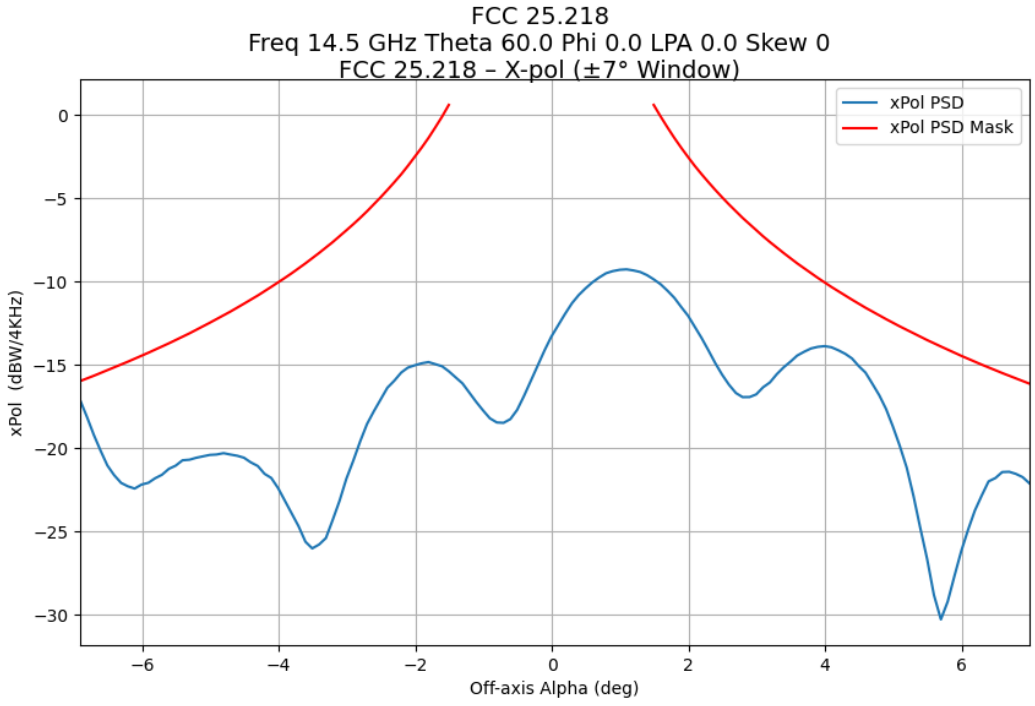


Figure 64: Seven Degree Sector XPol – Freq=14.5 GHz, Theta=60 Deg, Phi=0 Deg, LPA=0 Deg, Skew=0 Deg