UltiSat Inc.
Application for Experimental
Special Temporary Authorization ("STA")

Technical Appendix

- BB30 Datasheet

- Off-axis EIRP Spectral Density Plots

SkyTech
an IDS Ingegneria Dei Sistemi company

BBIG30 Ku/Ka-Usat
Airborne

BroadBand Intelligence Gathering

30 cm Ku/Ka satellite antenna

INNOVATION AND TECHNOLOGY

Leader in combining multiple bands onto a single radiant system, SKYTECH proudly presents BBIG30, an extremely light, compact and efficient aeronautical U-Sat antenna system which is capable to simultaneously operate on Ku and Ka extended bands.

BBIG30, the smallest of BBIG antenna series and soon to be joined by BBIG45, ensures unmatched connectivity performances in relation to its size, due to its RF efficiency and tracking accuracy.

BBIG30 is specifically designed to fit existing aeronautical mountings like airplane upper tail stabilizer, fuselage top or drone nose.

- Extremely light and robust carbon fiber composite frame and dish
- Highly engineered mechanics by extensive use of titanium and aeronautical aluminum alloys
- First and only 12-inches aviation antenna with three-axis stabilization, ensuring superior tracking capability even in highly dynamic maneuvers on flight
- Capable of operating in Ku-band only, Ka-band only, combined Ku-Ka band or even contemporary
- Mechanical interfaces and swept volume allow easy installation and replacement of existing systems
- Extreme compactness of the whole RF package, consisting of a peculiar type coaxial concentric feed coupled with a double Ku-Ka OMT, designed and optimized to fit BBIG30 reflector and its 3-axis gimbal
- Best-in-class performance of antenna RF package and reflector, even if compared to competitors single band systems, whilst ensuring dual-band functionality
- Ka Band standard dual circular polarization extended band
- Ku Cross-Polar or Co-Polar configurable
- Configurable as TVRO TVsat Ku-band, while maintaining the operation U-Sat Ka-band

BBIG30 Ku/Ka-Usat
Airborne

TECHNICAL SPECS

Reflector:
30cm ADE RF tuned carbon fibre

Ku-Band:
TX: 13.75-14.5GHz, Gain 31.5dB @14.125GHz (without dome)

RX: 10.7-12.75GHz, Gain 29.3dB @11.7GHz (without dome)

G/T:
8 dB/K @ 30° elevation (without dome)

Linear polarization w/ rotating skew (plus co-pol or TVRO config on demand)

Ka-Band:
TX: 28.1-31.0 GHz, Gain 37.7 dBi @ 29.5 GHz (without dome)

RX: 18.3-21.2 GHz, Gain 34.8 dBi @ 20 GHz (without dome)

G/T:
11 dB/K @ 30° elevation (without dome)

LHCP/RHCP Circular polarization

Antenna weight:
9Kg \ 20 lb (with ACU)

Operating temperature:
-55°C/+60°C

Antenna power:
20 to 36 Volts DC - 10A peak

Performance:
Elevation range: 0° to 95° (65 deg/sec)

Roll range ± 20° (50 deg/sec)

Azimuth range: unlimited 360° (70 deg/sec)

Tracking accuracy:
<0.2°

Pedestal type:
4 axes: azimuth, cross-level, elevation, polarization skew

Mechanics:
60% carbon fiber composite

40% aluminium/titanum

GPS:
All in view 12 channels internal

Internal 3-axis gyro sensor:
with 9 sensors with Kalman filter or external reference

Tracking possibilities:
Geostationary satellites

Inclined orbit satellites

Lock sources:
Internal Broadband DVB-S2 Tuner

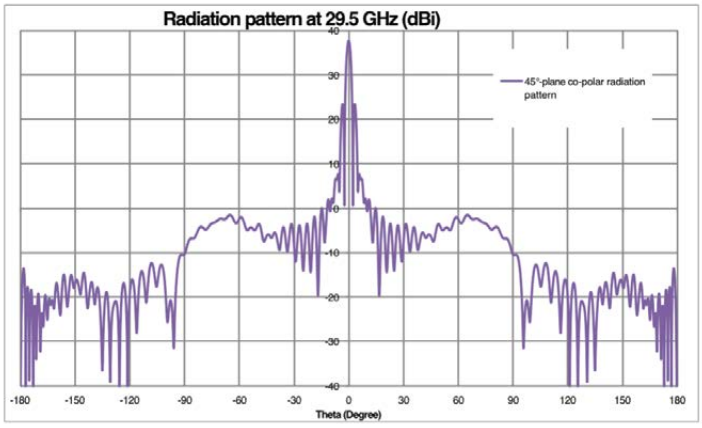
Internal Narrowband Tuner

External modem lock

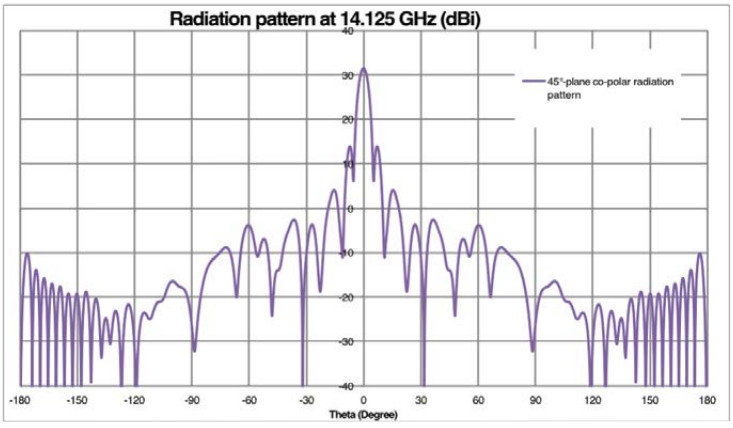
AGC carrier level

Standards:
D0-160 Compliant

Ka-Band Radiation Pattern

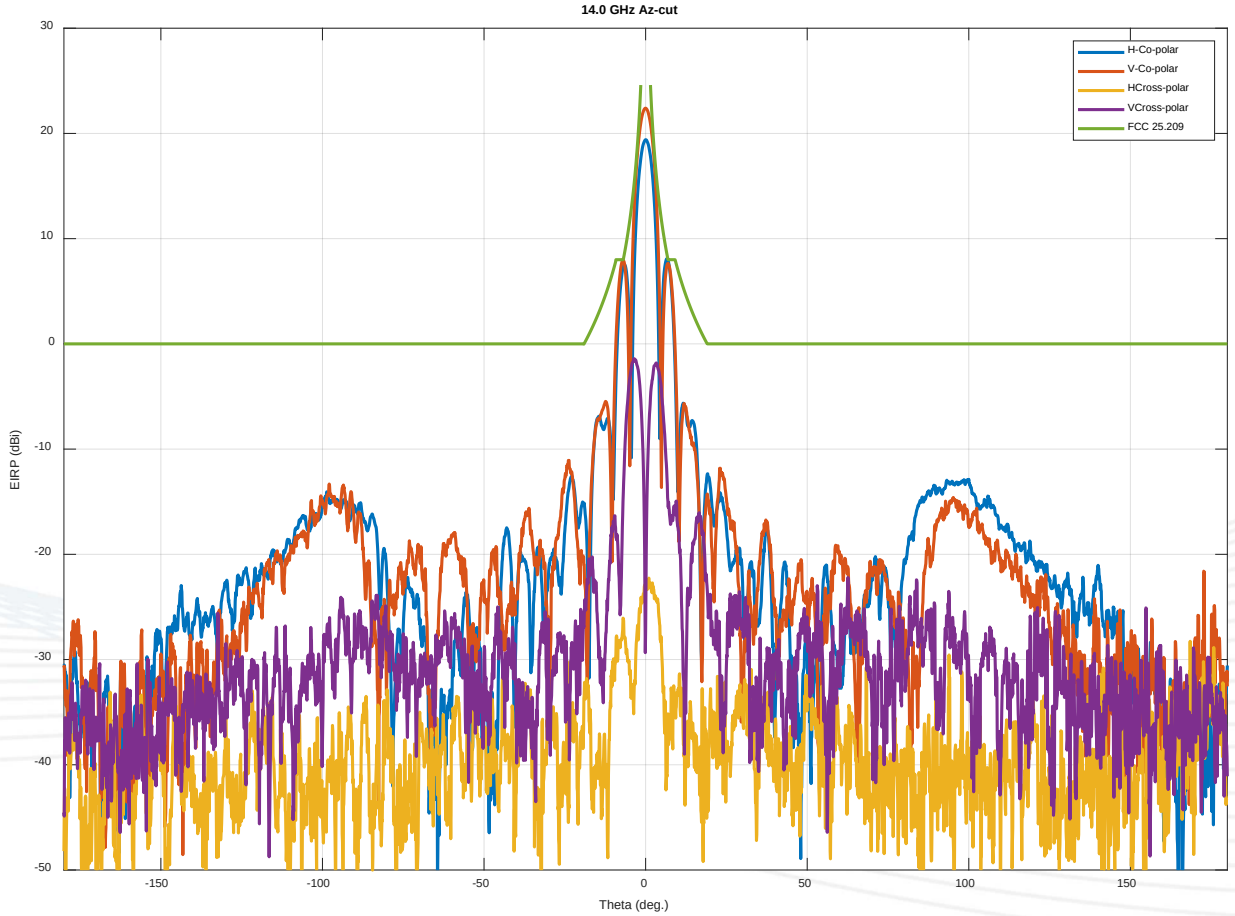


Ku-Band Radiation Pattern



All specifications are subject to change.

EIRP per FCC 25.209 Tangent to GEO Arc


14.0 GHz Az-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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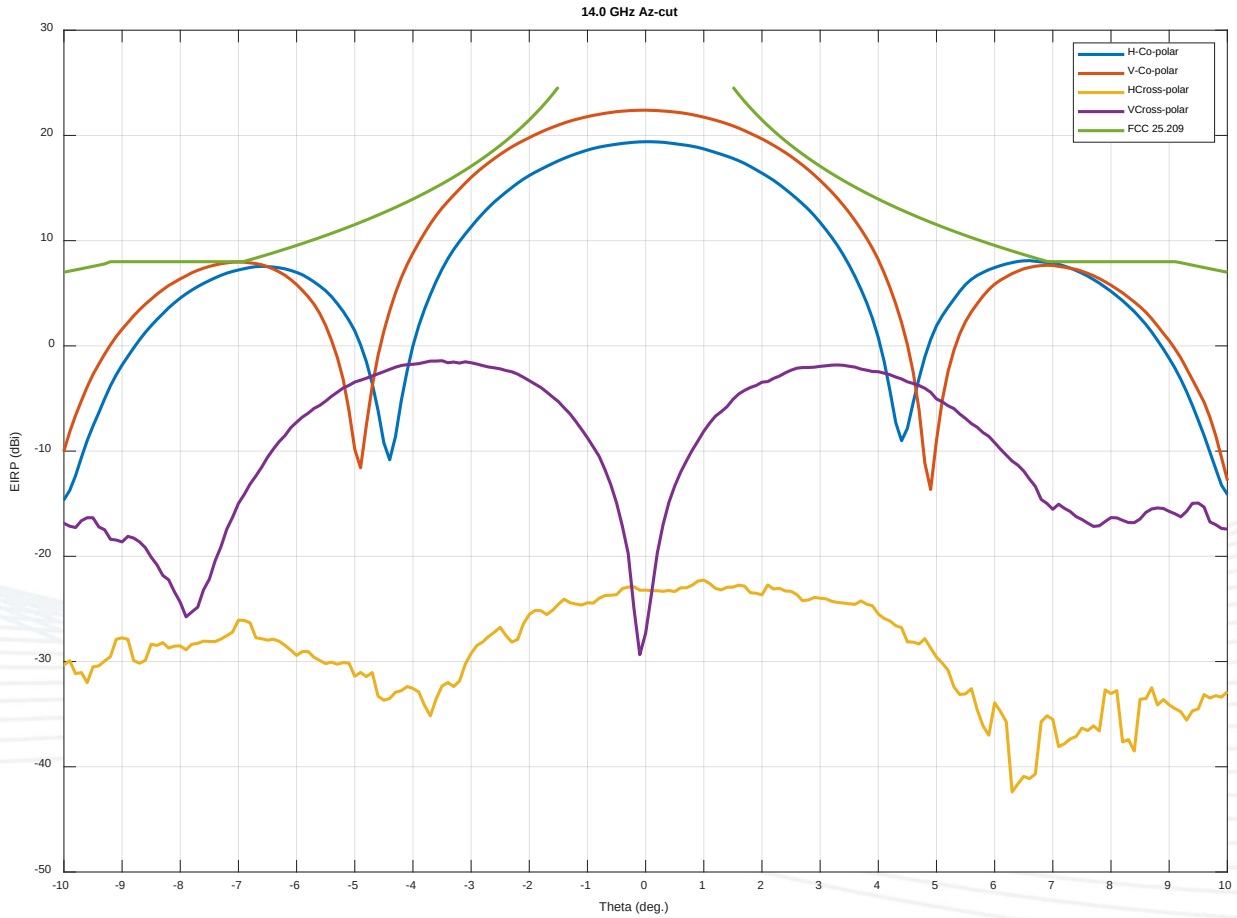
14.0 GHz Az-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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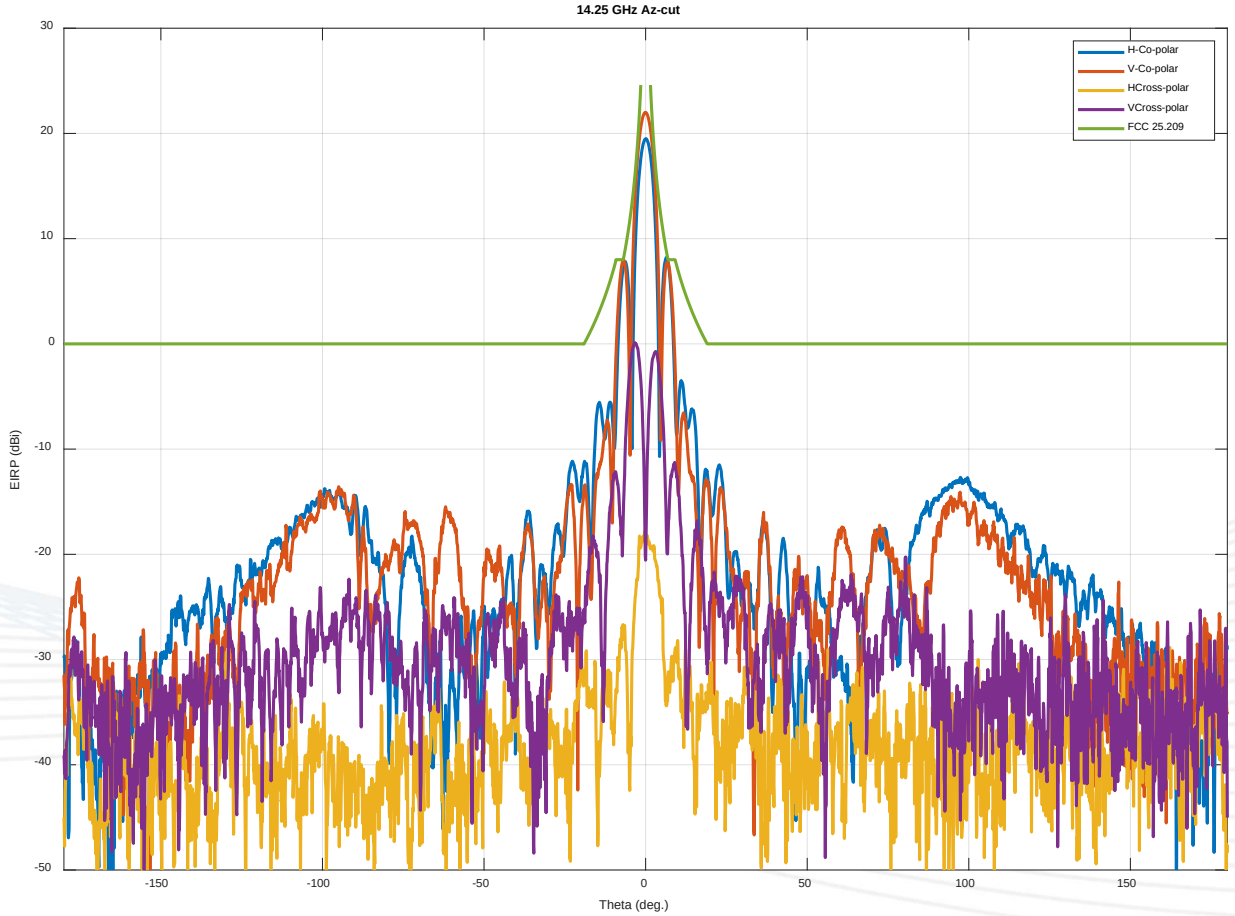
14.25 GHz Az-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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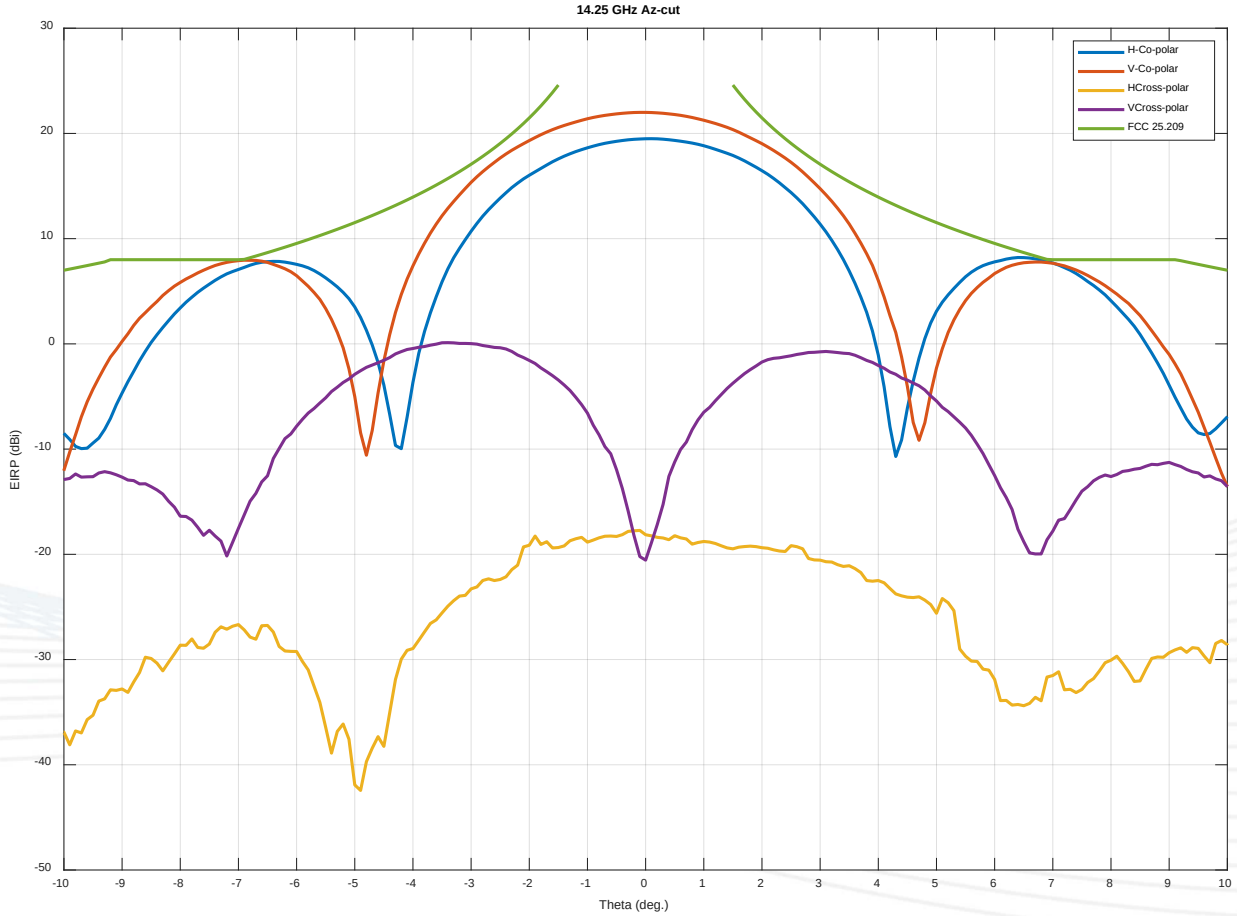
14.25 GHz Az-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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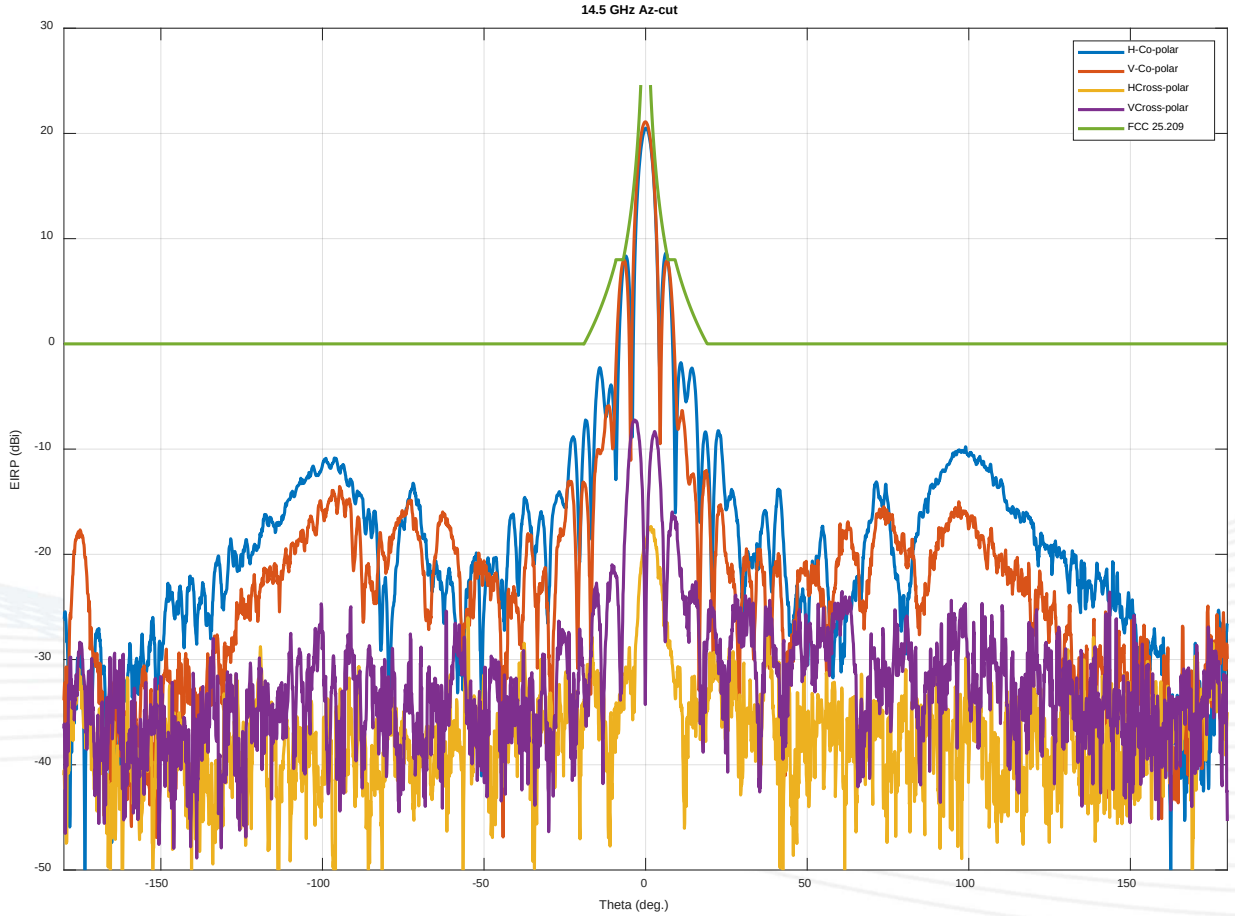
14.5 GHz Az-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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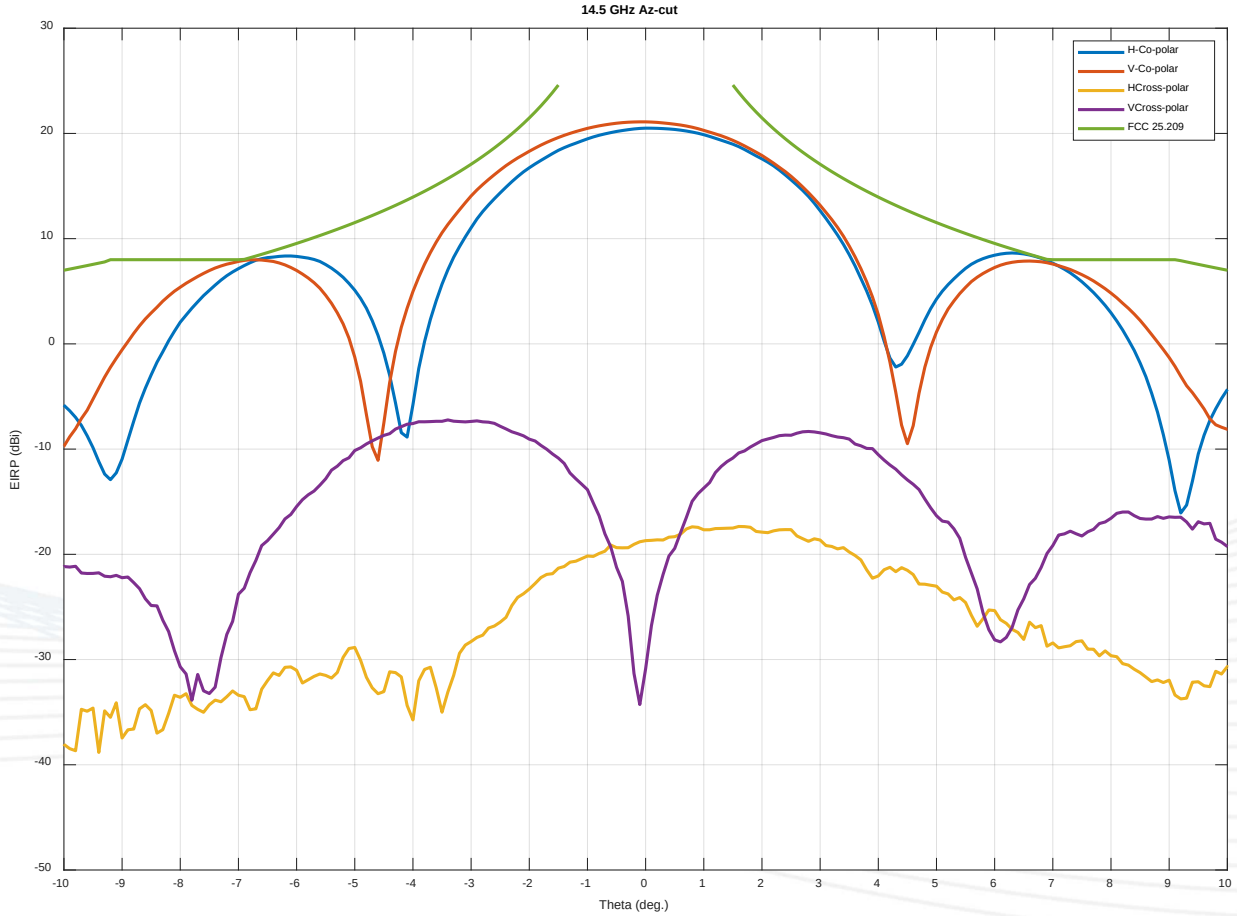
14.5 GHz Az-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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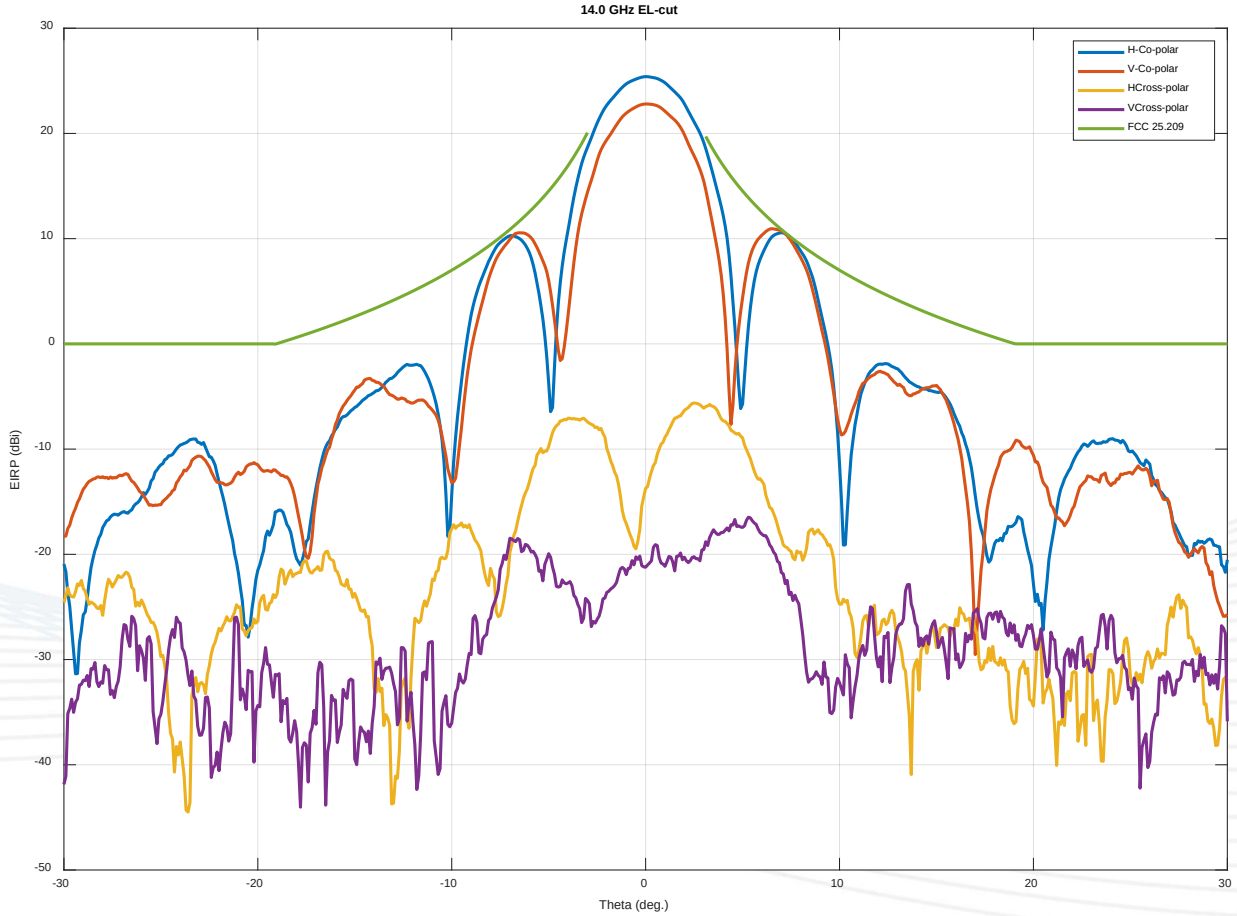
EIRP per FCC 25.209 Perpendicular to GEO Arc


14.0 GHz EL-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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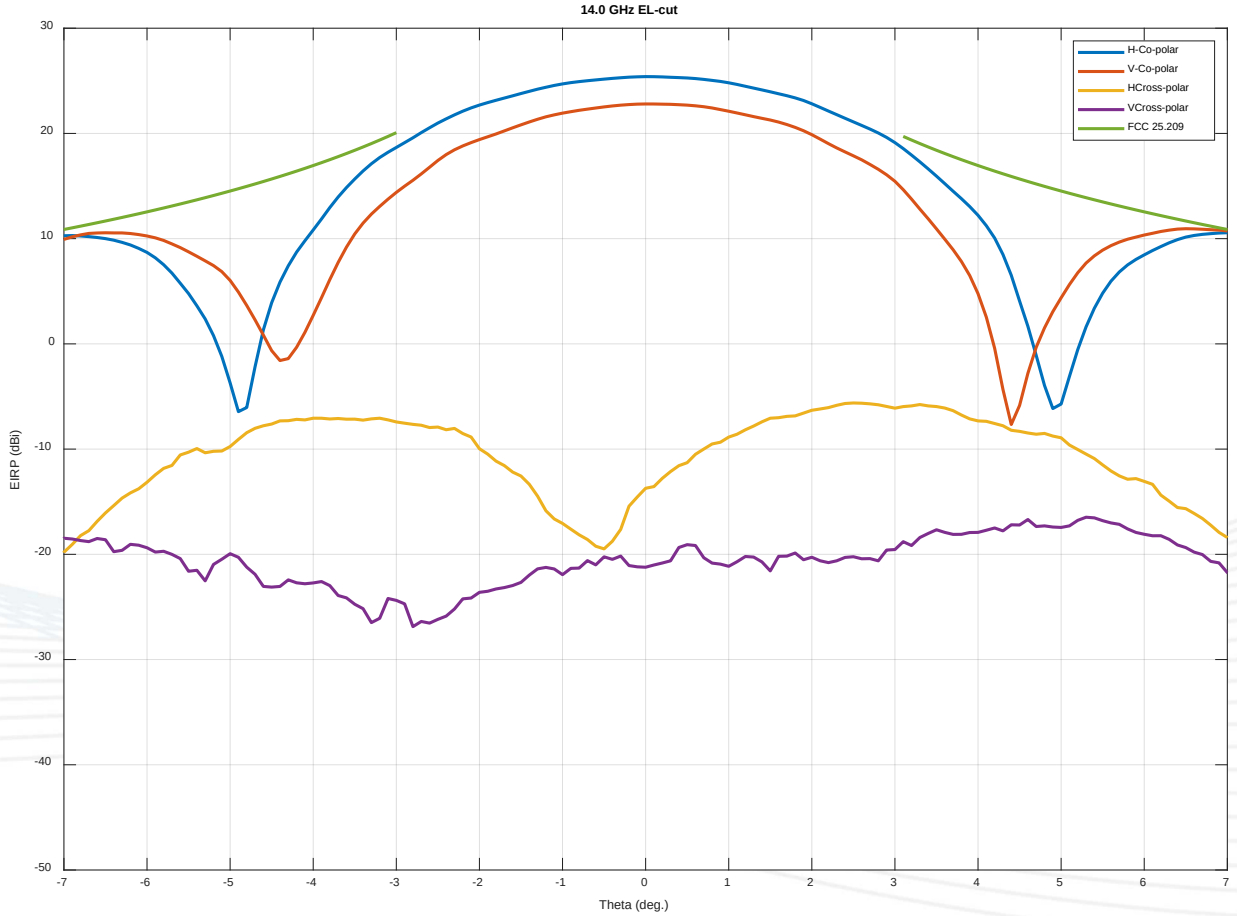
14.0 GHz EL-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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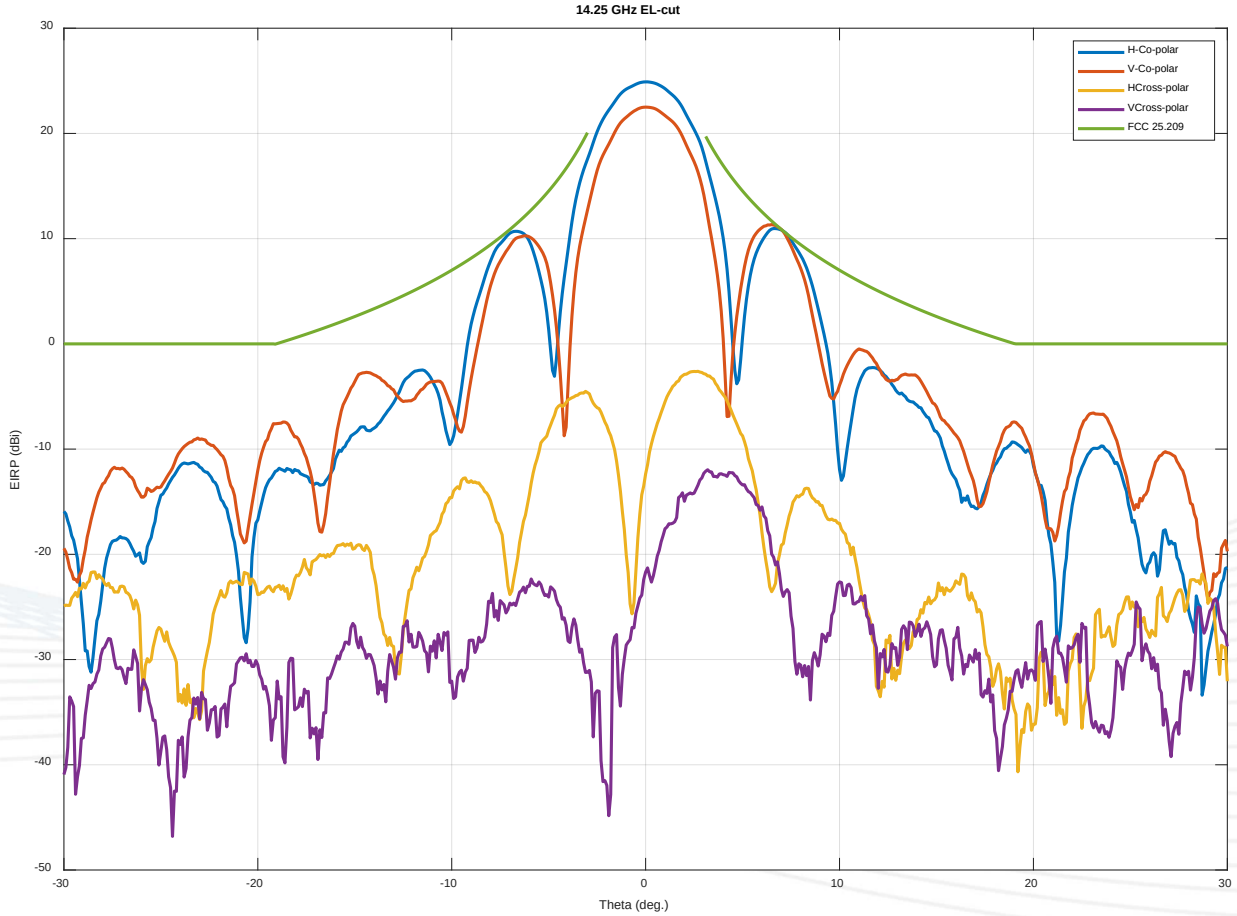
14.25 GHz EL-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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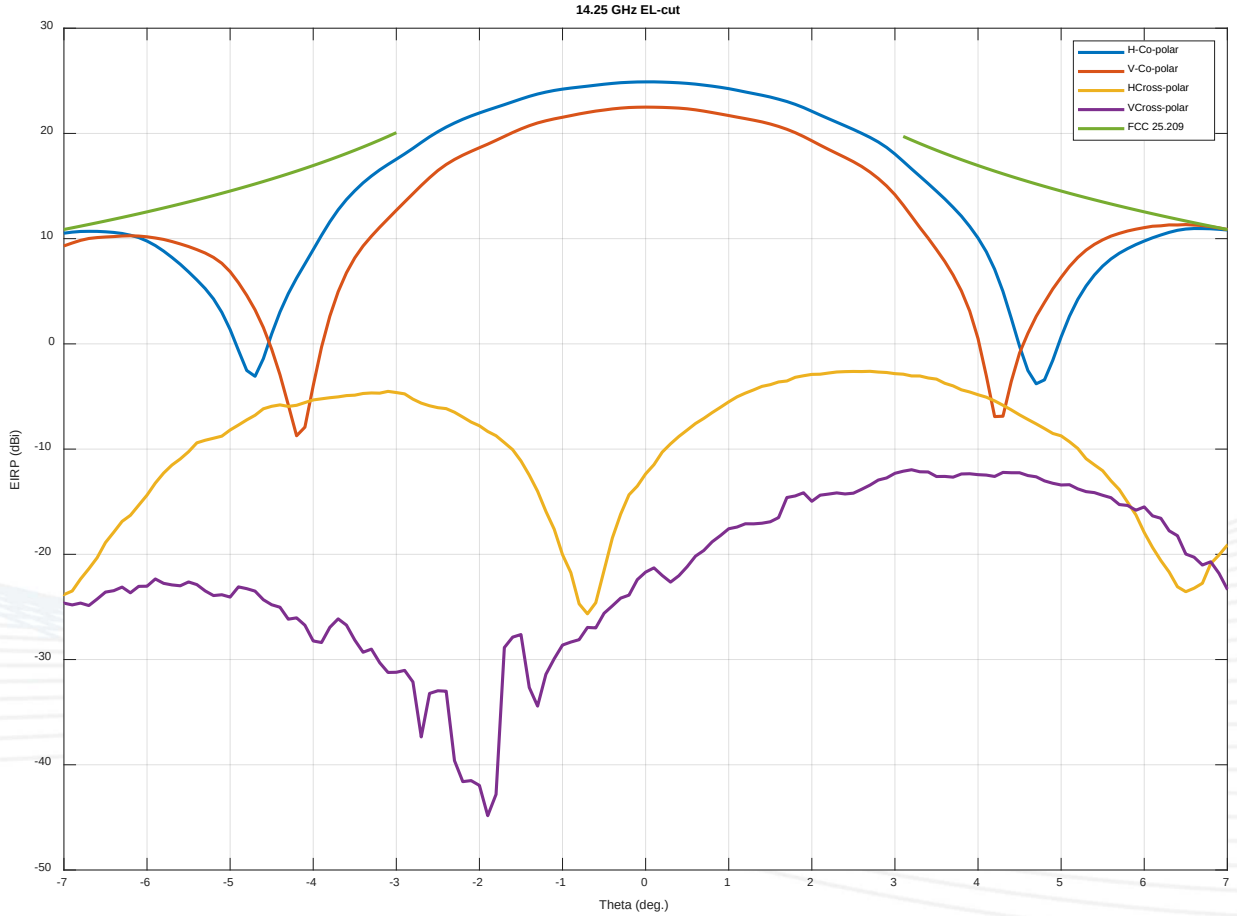
14.25 GHz EL-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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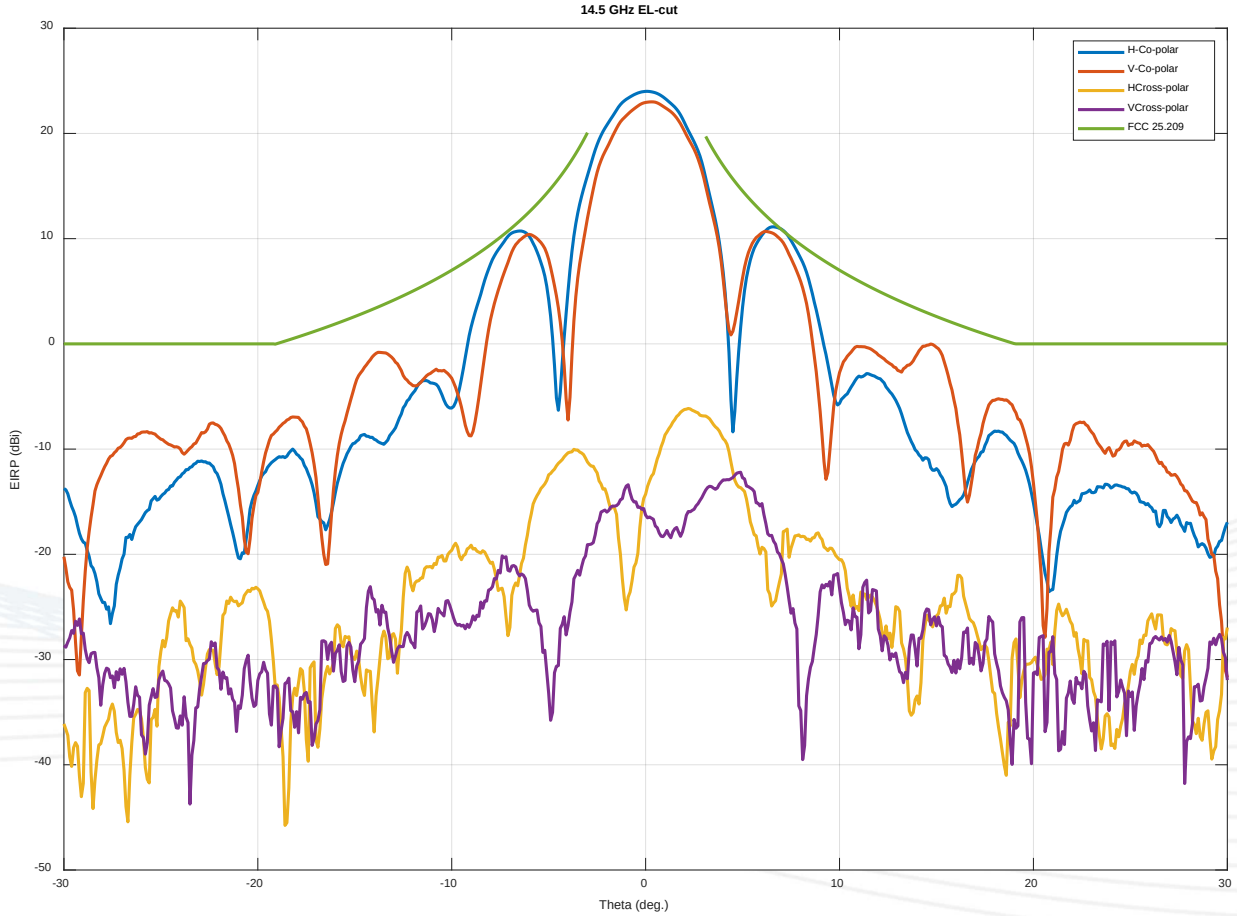
14.5 GHz EL-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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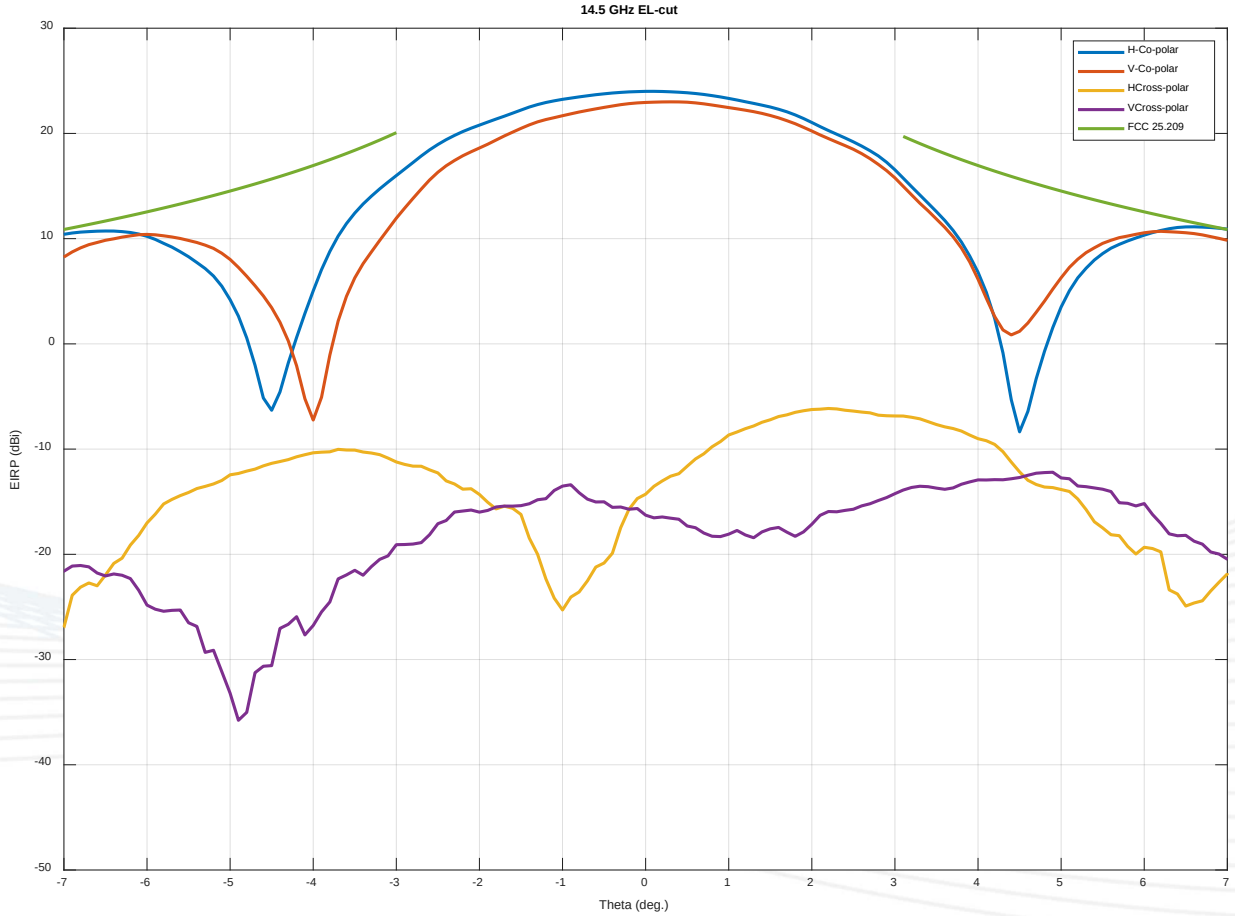
14.5 GHz EL-cut
H-Co-polar
V-Co-polar
HCross-polar
VCross-polar
FCC 25.209
EIRP (dBi)
Theta (deg.)
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