

Exhibit A
ST5000-2.4 Terminal

Description and Technical Parameters – ST5000-2.4

The ST5000-2.4 terminal is comprised of a 2.4m circular reflector antenna, an antenna positioner, and an antenna control module. The antenna positioner and control module are the same as those used in Harris CapRock’s SpaceTrack 4000 series of stabilized antennas. The SpaceTrack 4000 has been previously licensed by the FCC in C-band and Ku-band ESV configurations and has years of proven experience in the field. Thus, the FCC can be assured that ST5000-2.4 will operate as designed to avoid potential interference to adjacent satellites.

SUMMARY OF TECHNICAL PARAMETERS – ST5000-2.4

Characteristic	C-band	Ku-band
Antenna diameter	2.4m	2.4m
Type of Antenna	Circular reflector	Circular reflector
Peak Power (SSPA)	200 watts	125 watts
Transmit Bandwidth	1 MHz to 72 MHz	1 MHz to 72 MHz
Transmit Gain	38 dBi	43 dBi
EIRP	58.3 dBW	62.2 dBW
Data Rate	20 Mbps Tx / 100 Mbps Rx	20 Mbps Tx / 100 Mbps Rx
Emission Designators	1M00G7D to 20M0G7D	1M00G7D to 20M0G7D
Transmit Polarization	LHCP/RHCP Horizontal/Vertical	Horizontal/Vertical
Transmit Max PSD	21.3 dBW/4kHz	25.2 dBW/4kHz
Transmit Beamwidth	0.57 degrees	0.3 degrees
Receive G/T	16.4 dB/K	24.5 dB/K
Receive Bandwidth	Up to 72 MHz	Up to 72 MHz
Receive Polarization	LHCP/RHCP Horizontal/Vertical	Horizontal/Vertical
Feed Flange Power	106.2 Watts	74.5 Watts
ERP	409 kW	1.02 MW
Signal Modulation	Up to 32 APSK	Up to 32 APSK

The ST5000-2.4 positioner system is designed to provide stable pointing to GSO satellites during range of motion associated with maritime operations, as well as track predictable NGSO satellite orbit paths under the same maritime operational conditions. Harris CapRock's current test program confirms the terminal's ability to successfully track and communicate with O3b satellites, and there have been no reported cases of interference in connection with ST-5000-2.4 operations.

Harris CapRock's ST5000-2.4 terminal is designed to meet the FCC's ESV operational requirements for communication with GSO satellites, which have been extended by analogy to full-motion antennas communicating with the O3b system. These parameters include: (i) maintaining off-axis EIRP to the levels set forth in the applicable FCC mask; (ii) pointing accuracy of 0.2° or better; (iii) automatic cessation of emissions within 100 ms if pointing offset exceeds 0.5°; and (iv) transmissions will not resume until pointing accuracy is within 0.2°. The technical characteristics of the terminal's positioner system are set forth in the follow tables.

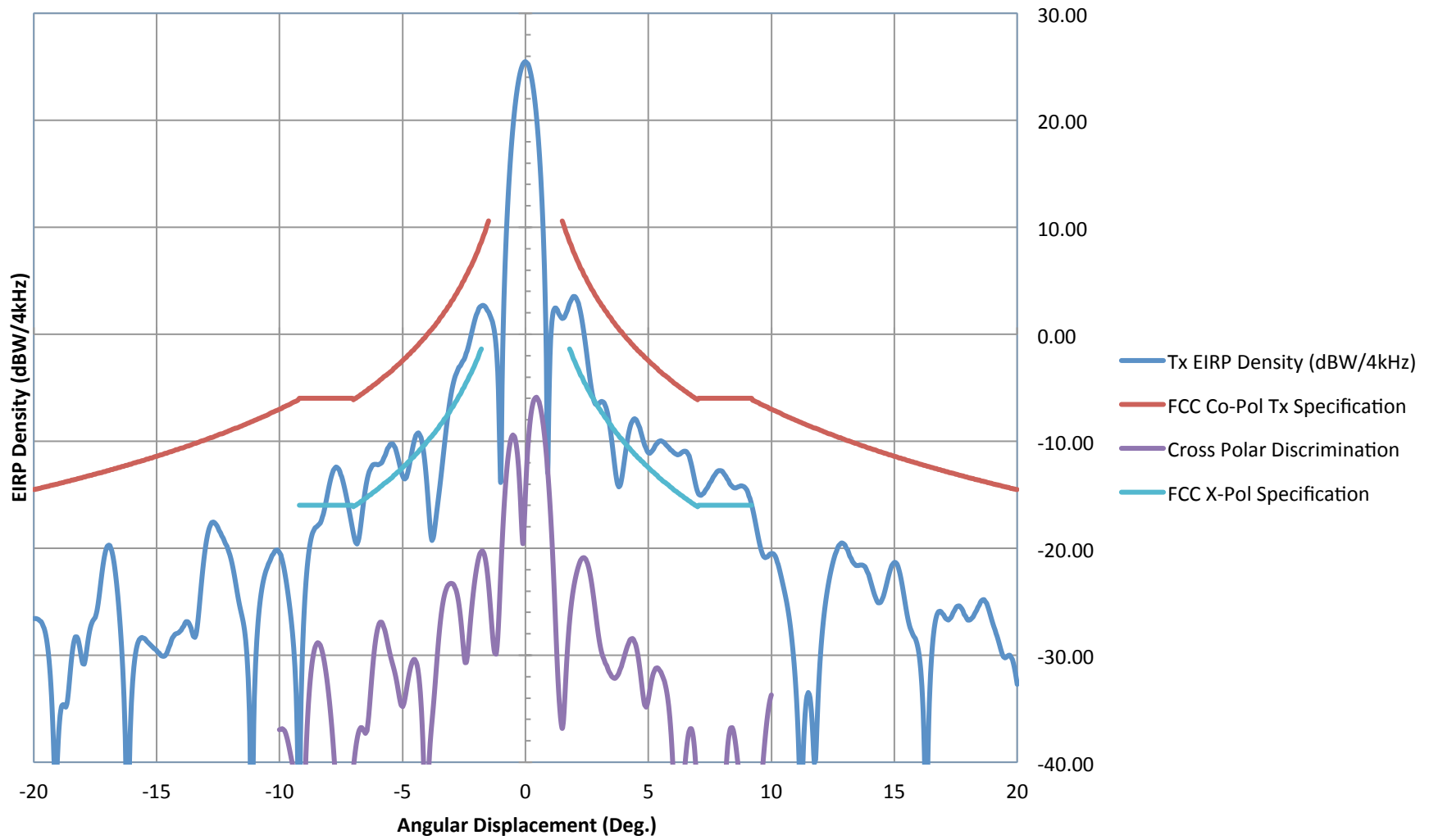
ANTENNA MOTION PARAMETERS - ST5000-2.4

Azimuth	Continuous coverage over 360°
Elevation	0 to 90° antenna elevation
Position accuracy	0.2° (auto-disable at 0.5 ° offset)
Tracking capability	8°/sec

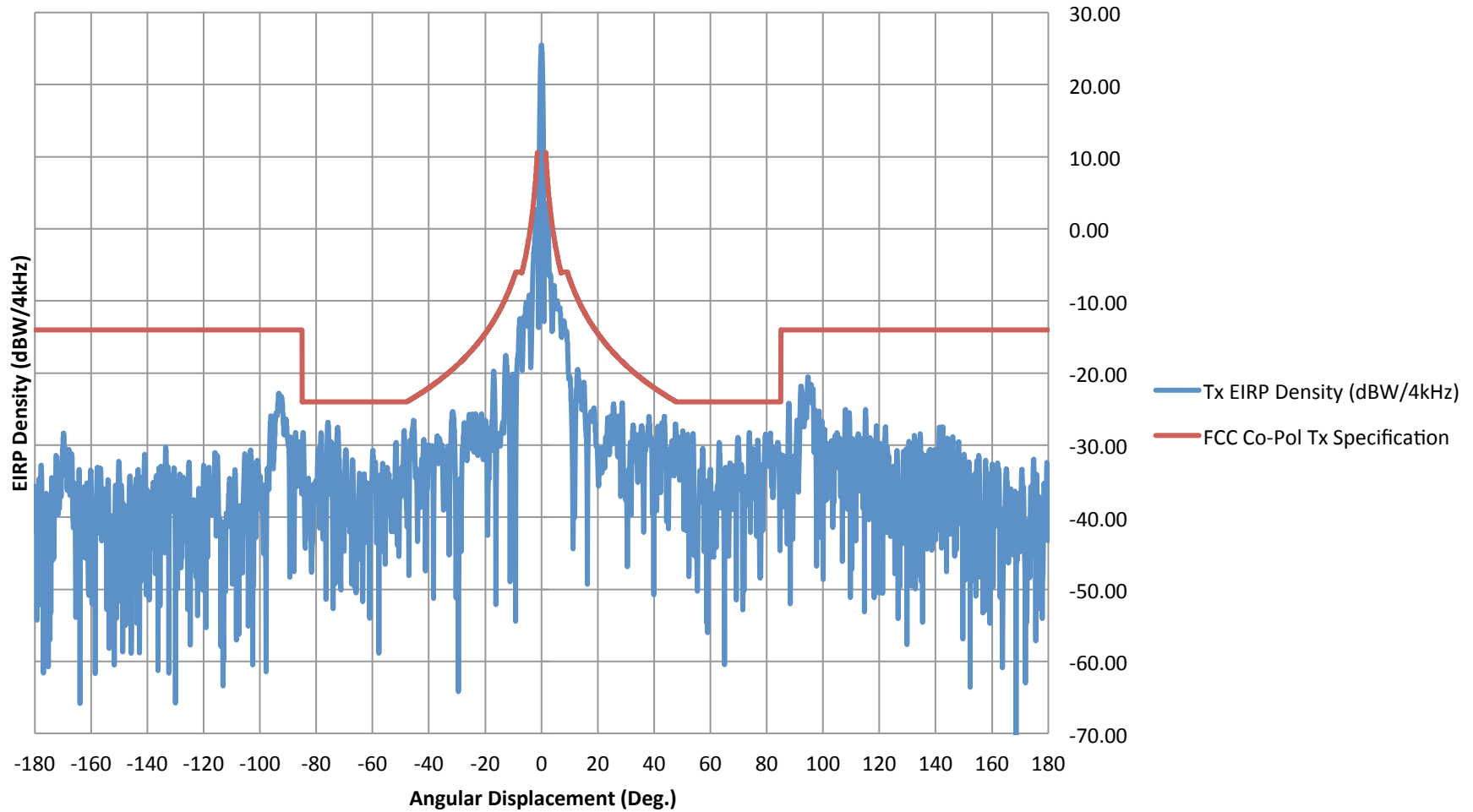
Additional information regarding the ST5000-2.4 terminal, including antenna performance plots, link budgets, and a radiofrequency hazard assessment are included as attachments hereto.

Annex 1 – Antenna Performance Plots

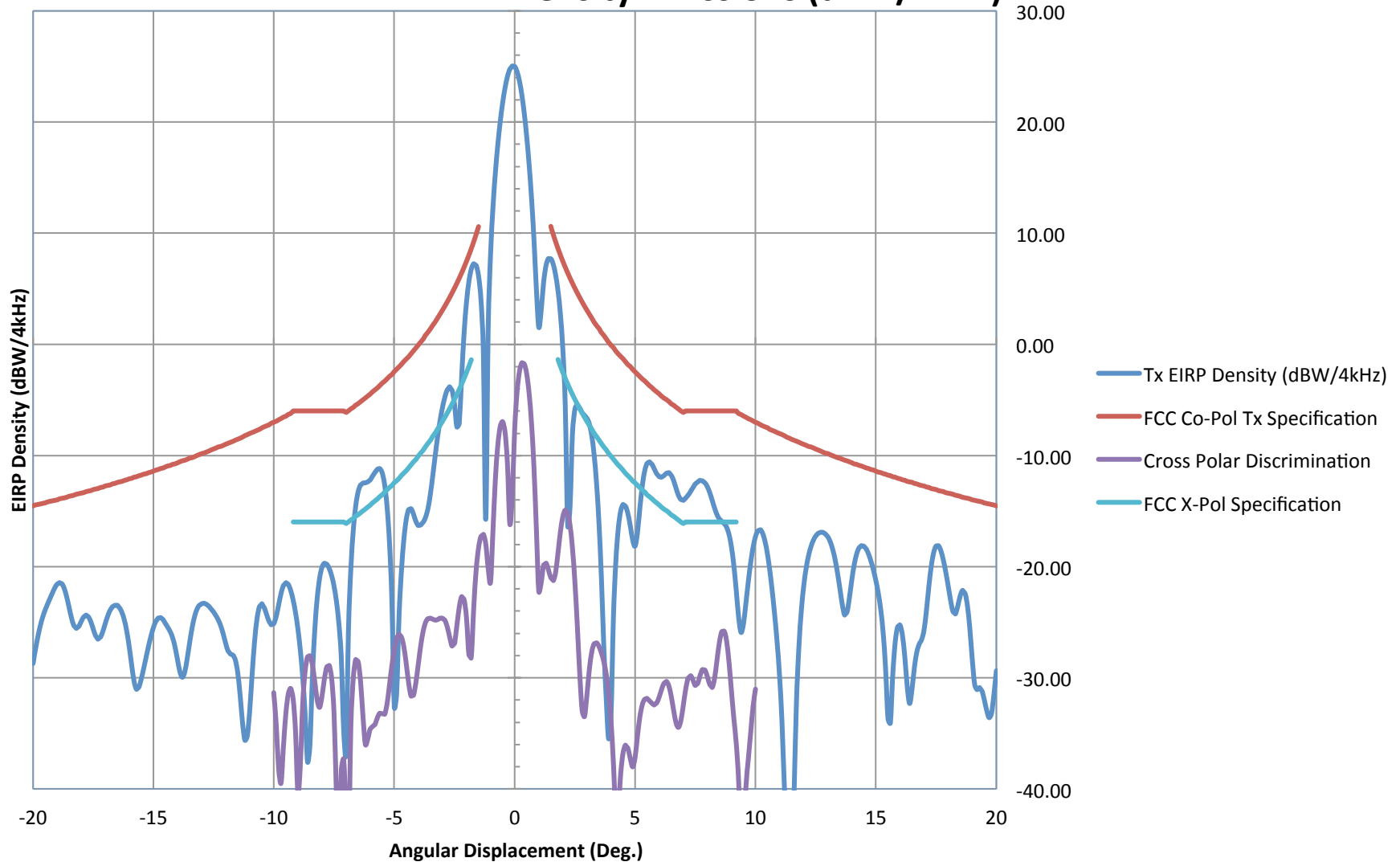
LP/Horiz-Horiz (Az) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



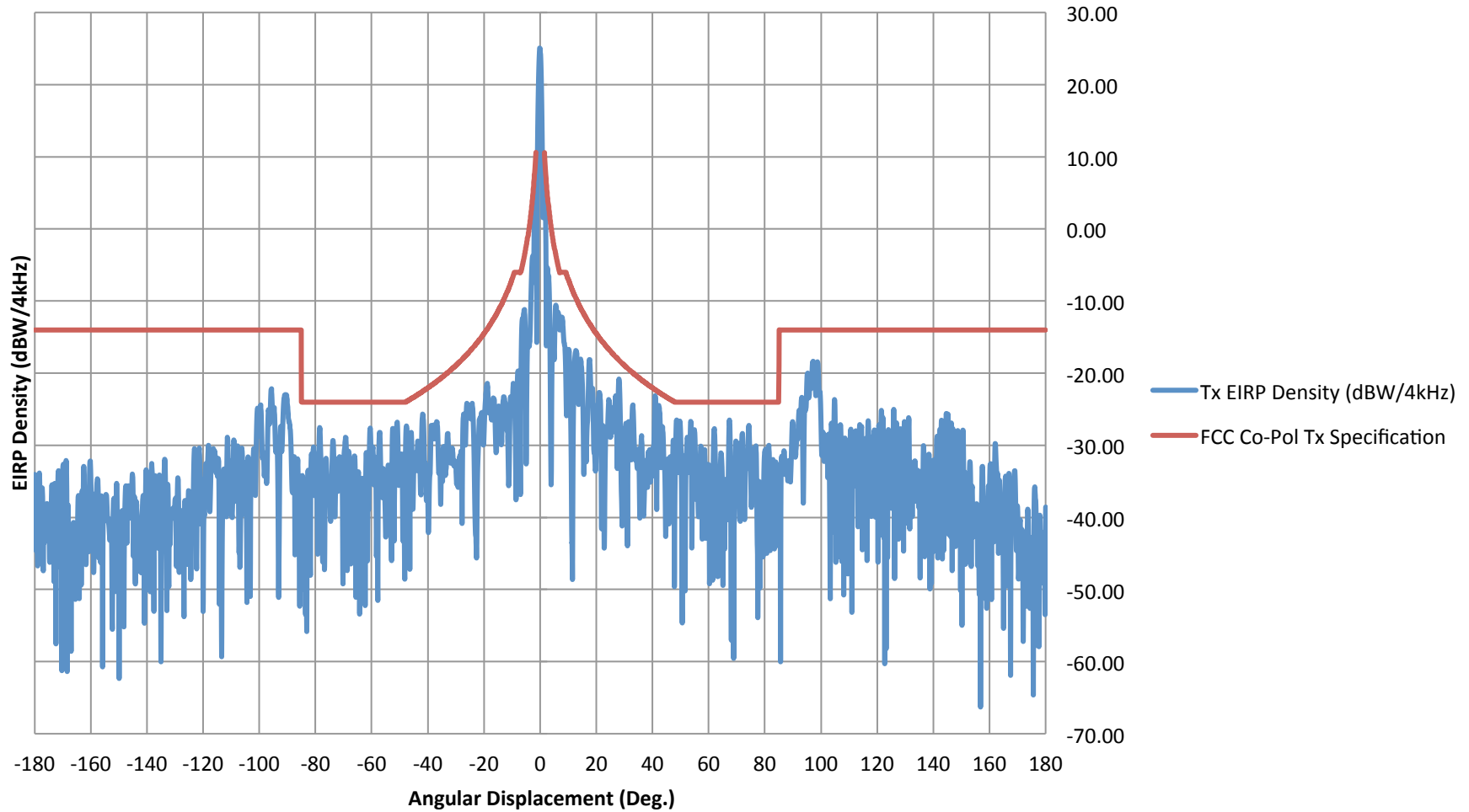
LP/Horiz-Horiz (Az) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



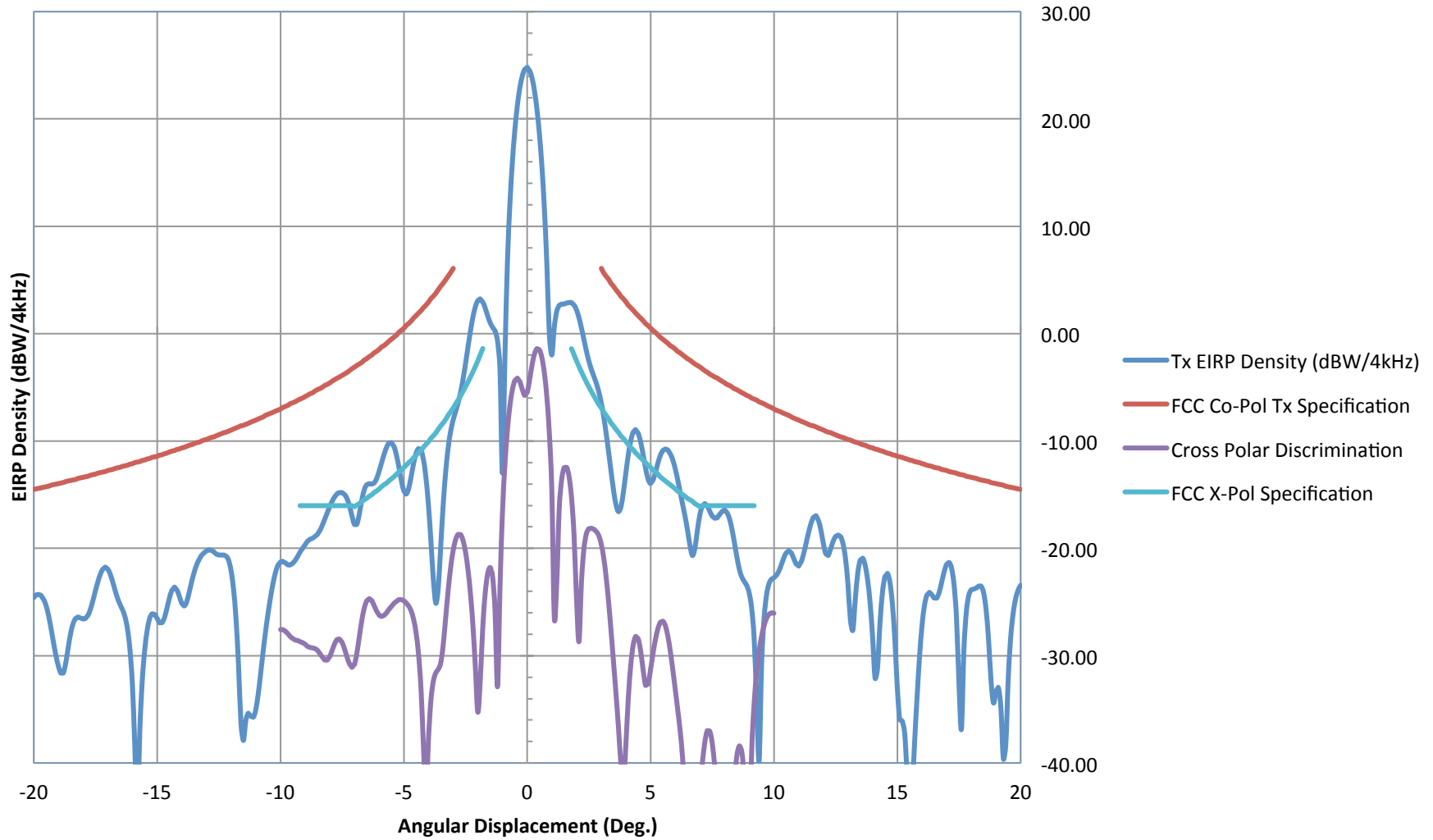
LP Vert-Horiz (Az) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



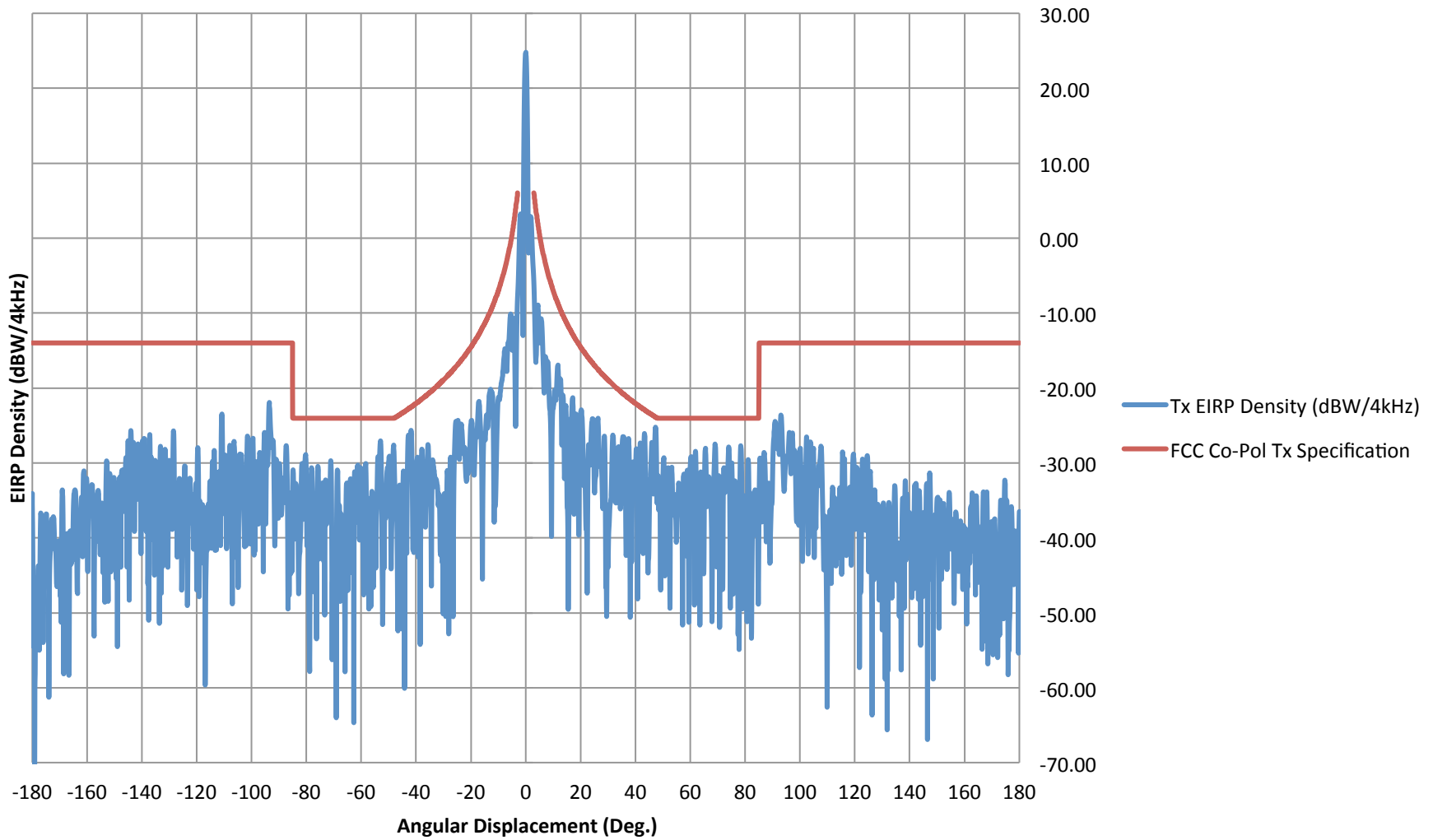
LP Vert-Horiz (Az) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



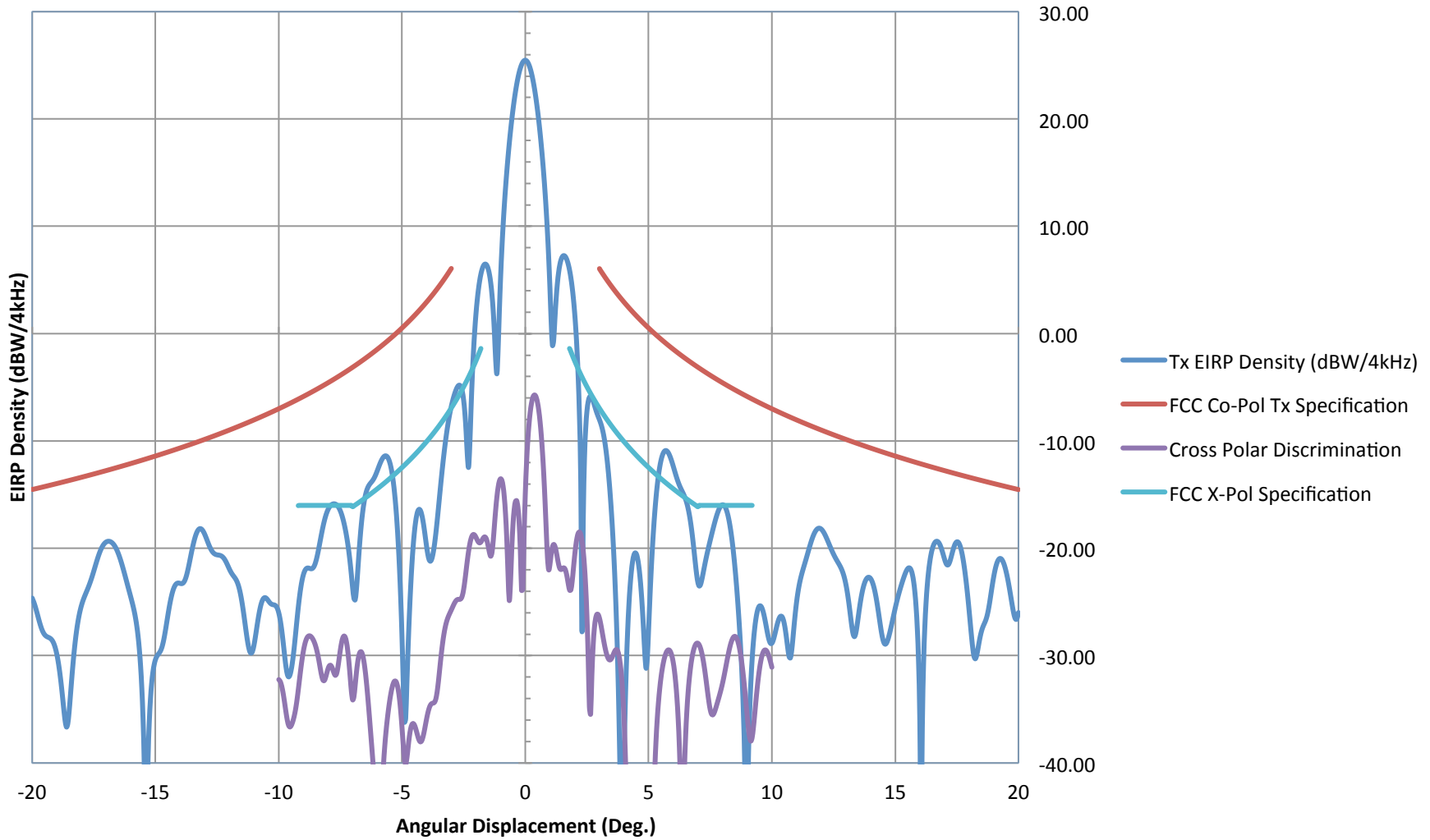
LP/Vert-Vert (EI) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



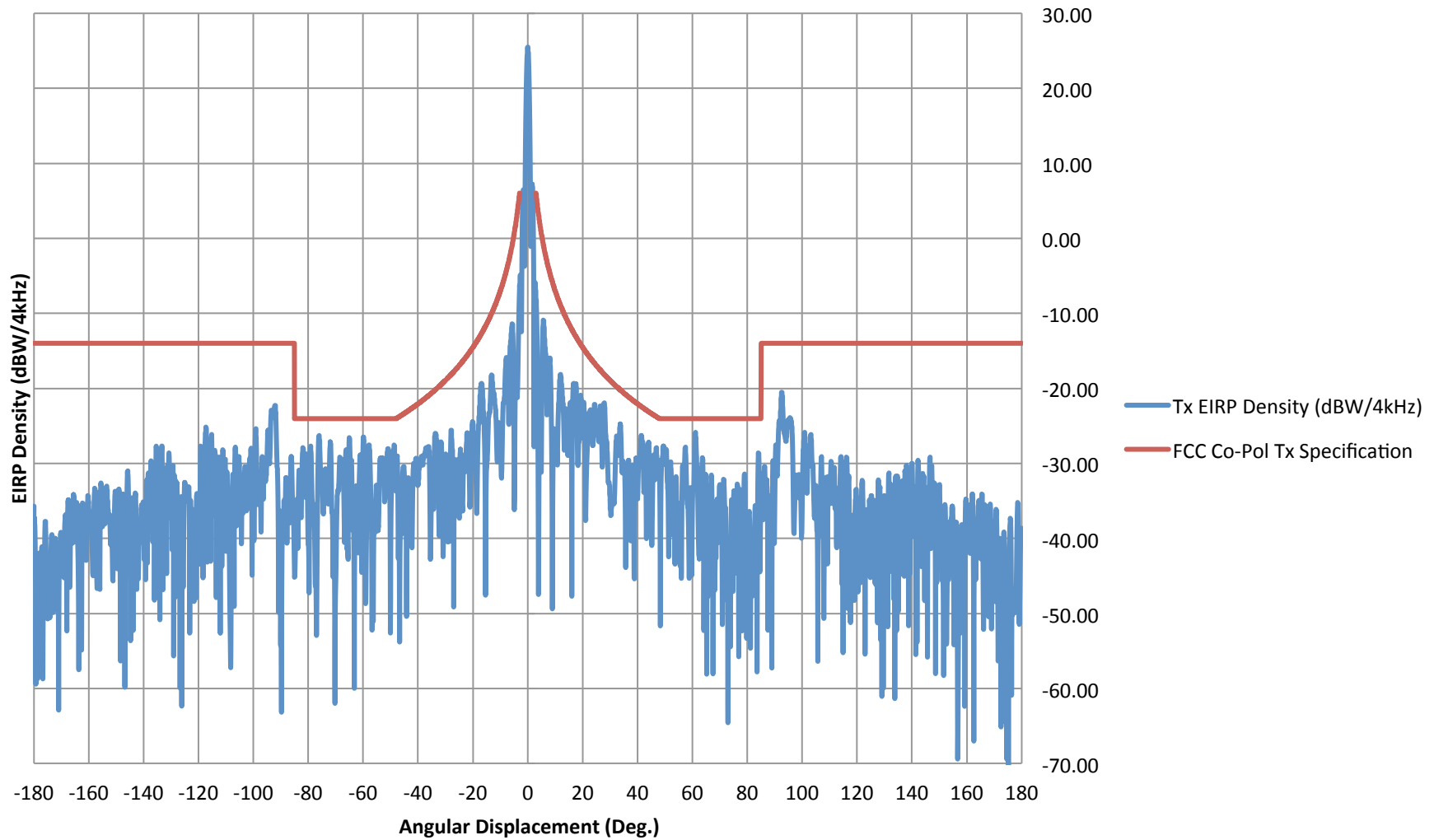
LP/Vert-Vert (E) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



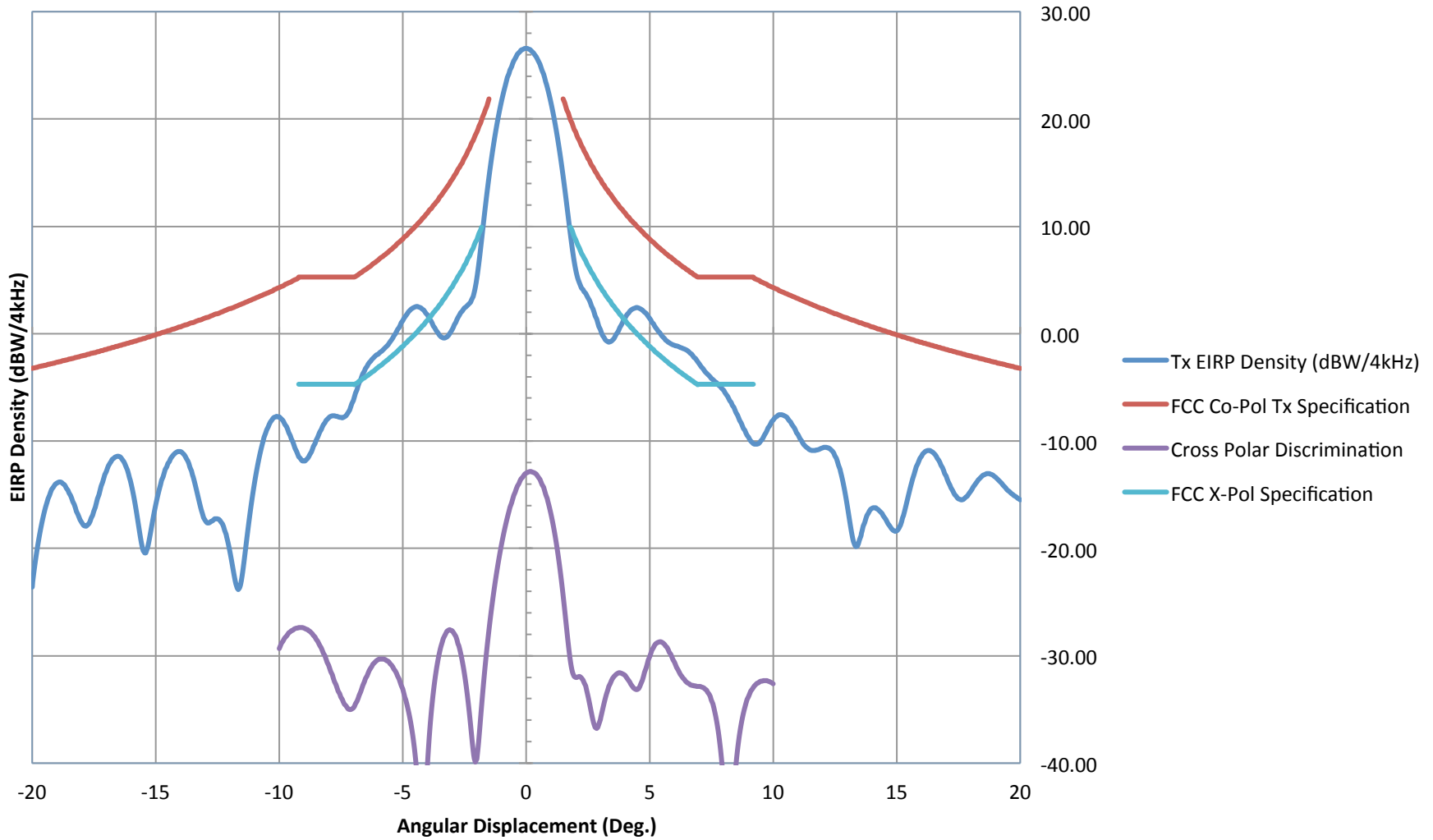
LP/Horiz-Vert (EI) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



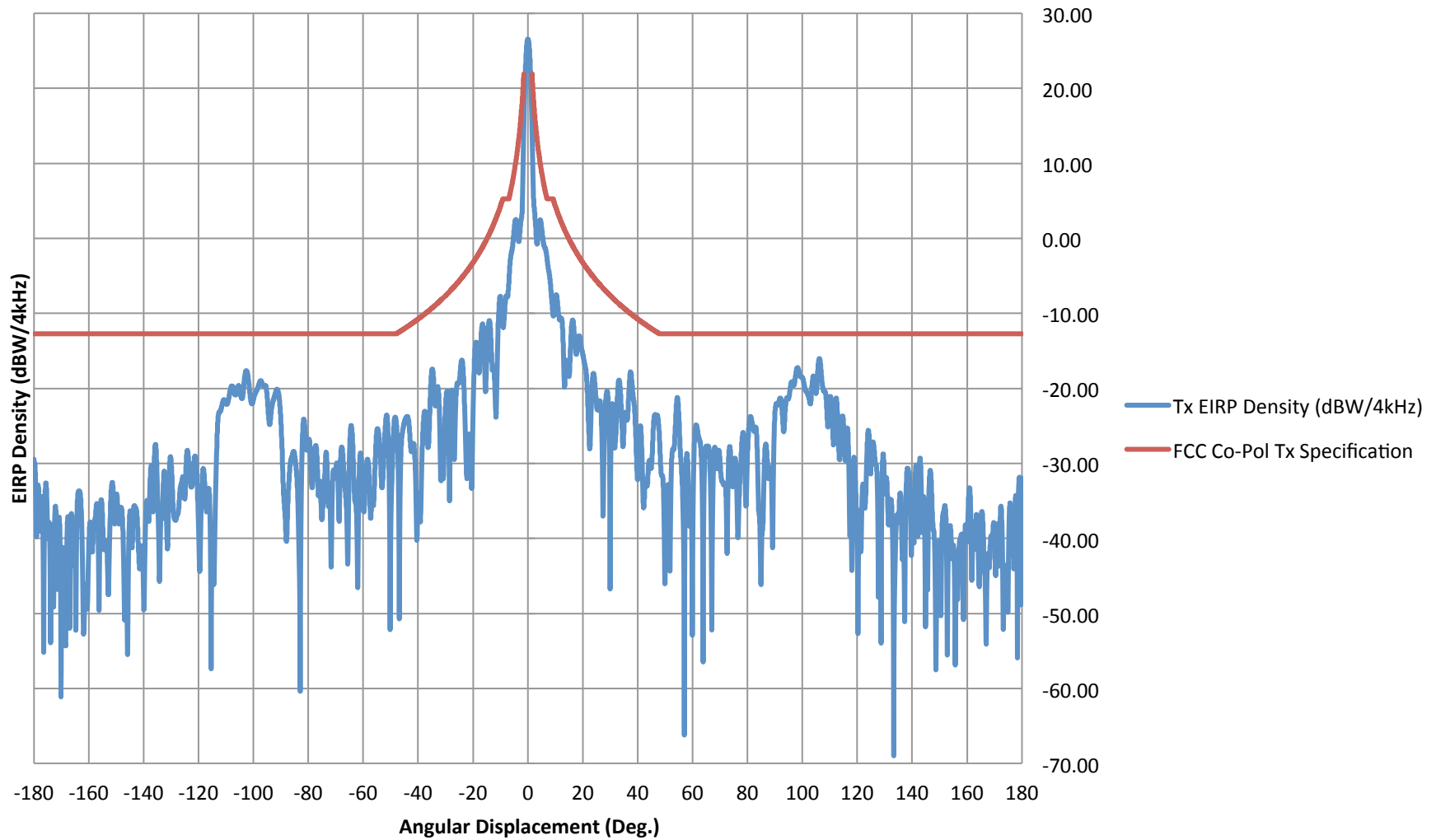
LP/Horiz-Vert (EI) Plane/14.125 GHz Tx EIRP Density Emissions (dBW/4kHz)



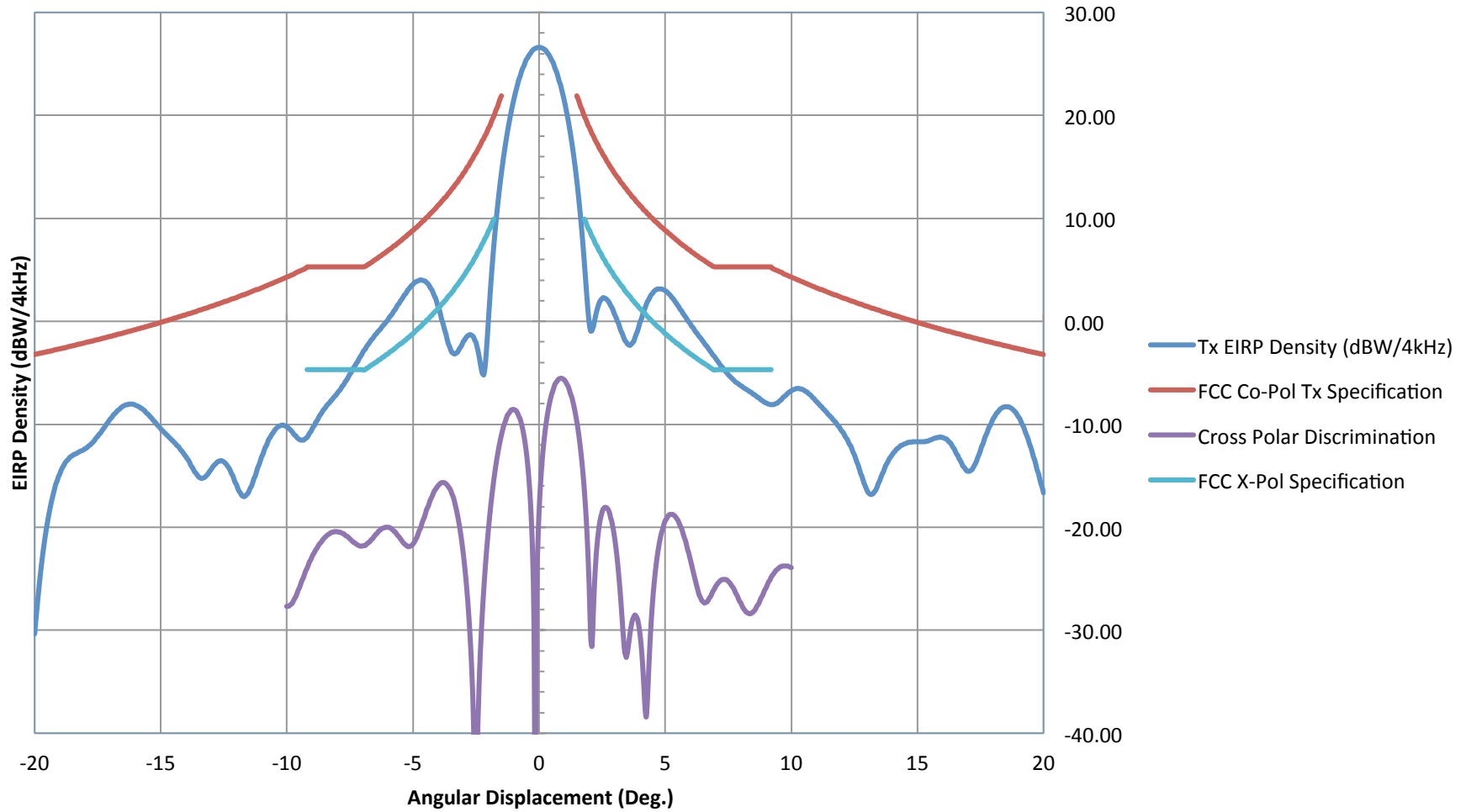
LP/Horiz-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



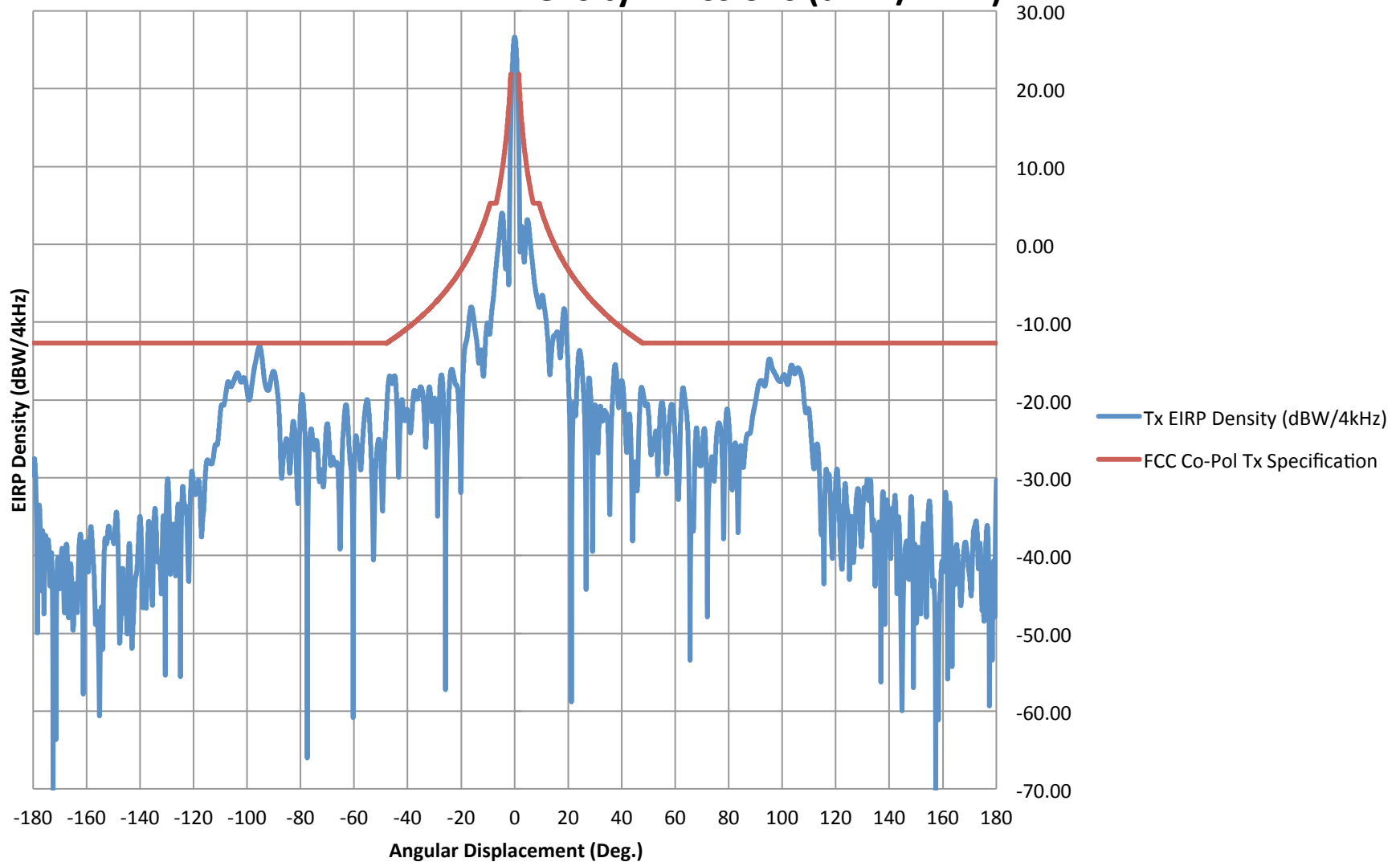
LP/Horiz-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



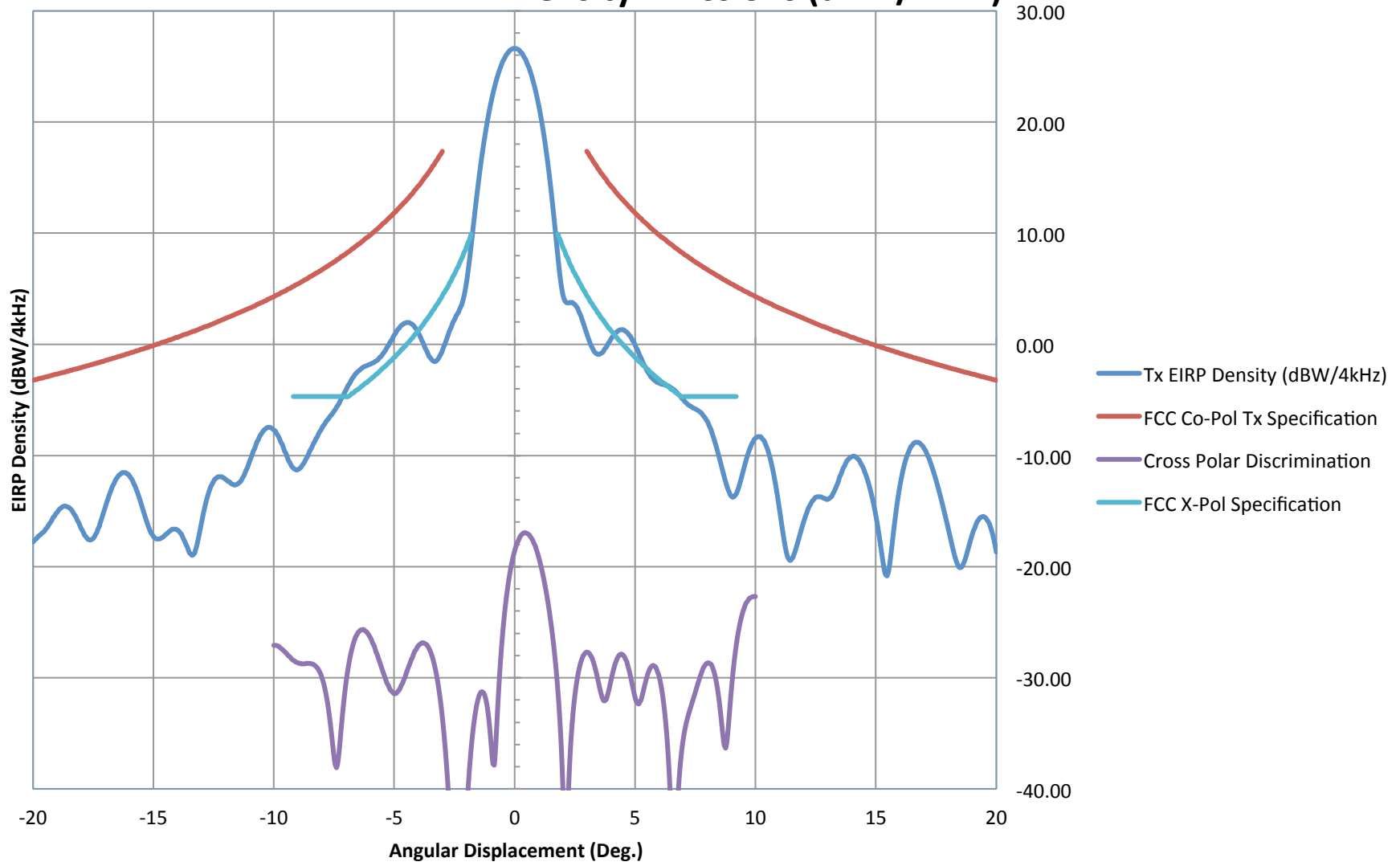
LP/Vert-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



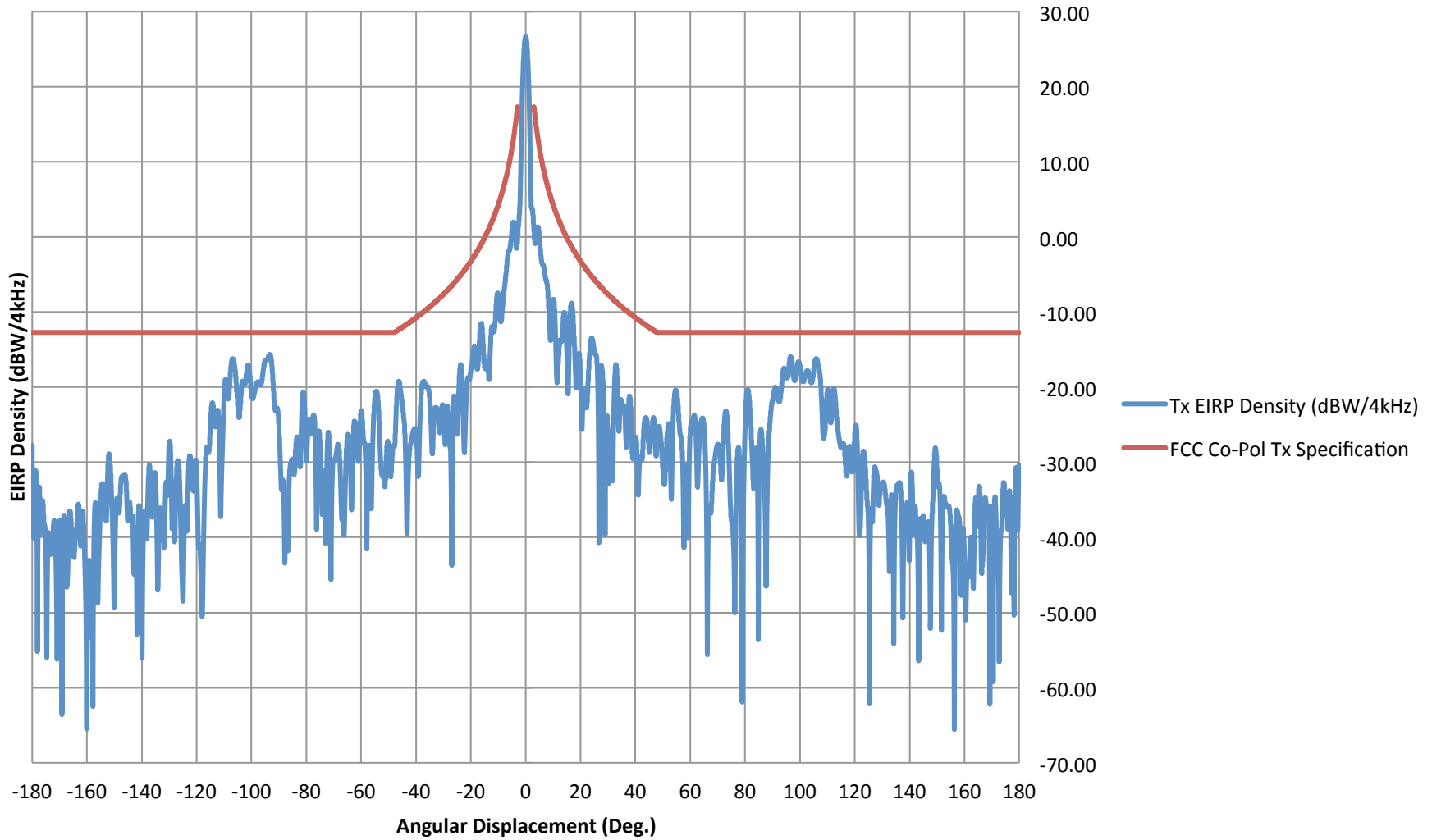
LP/Vert-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



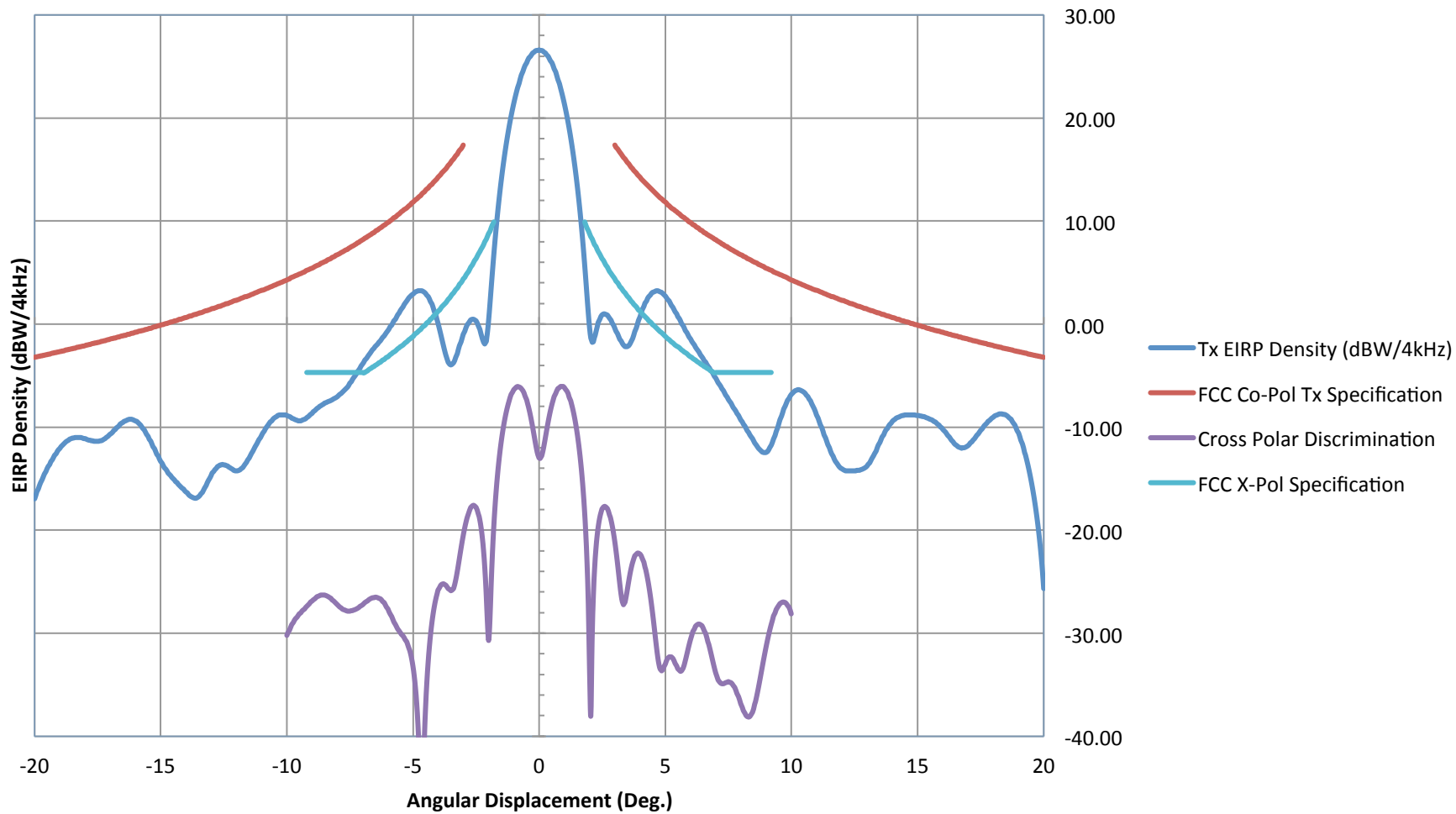
LP/Vert-Vert (EI) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



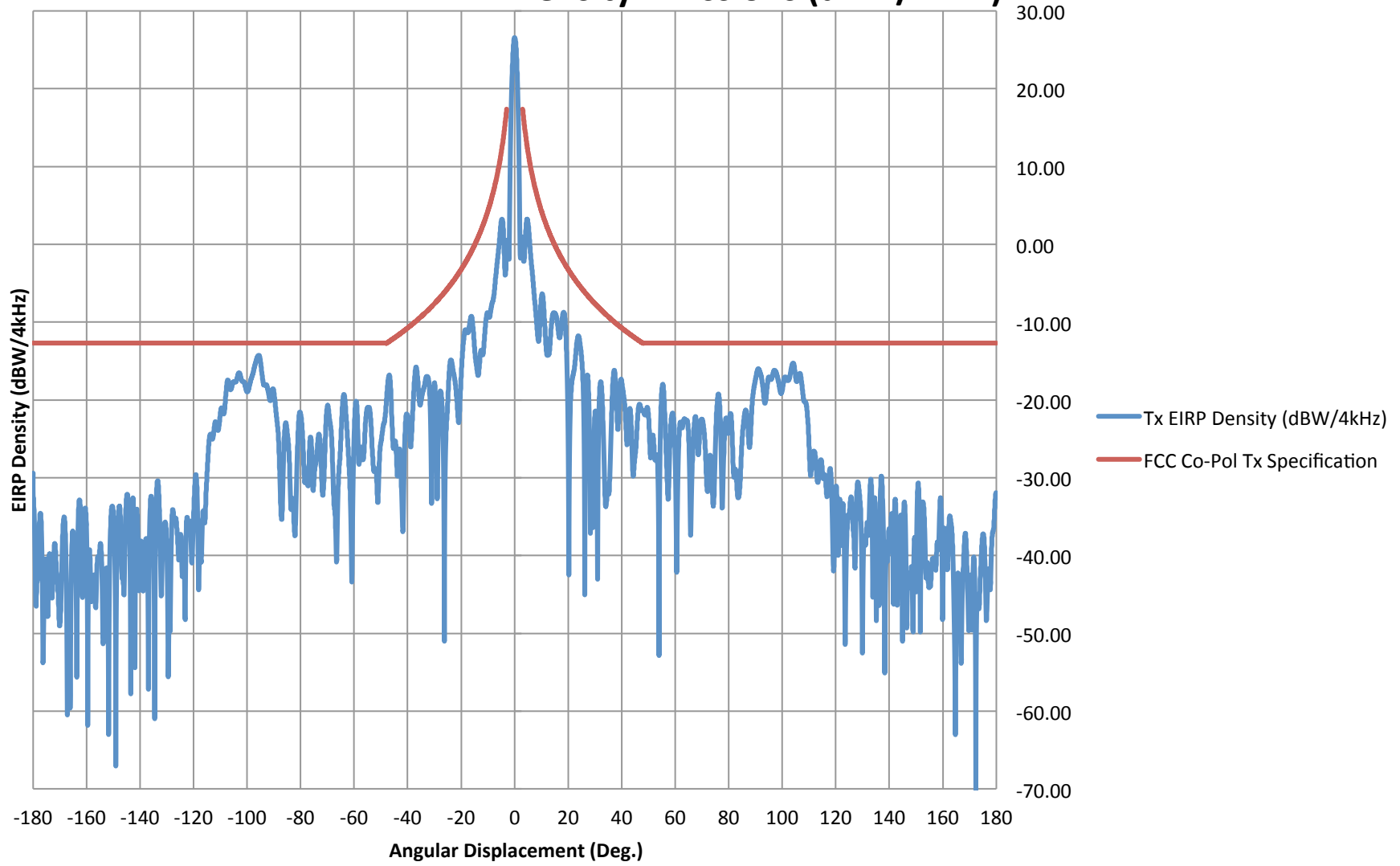
LP/Vert-Vert (EI) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



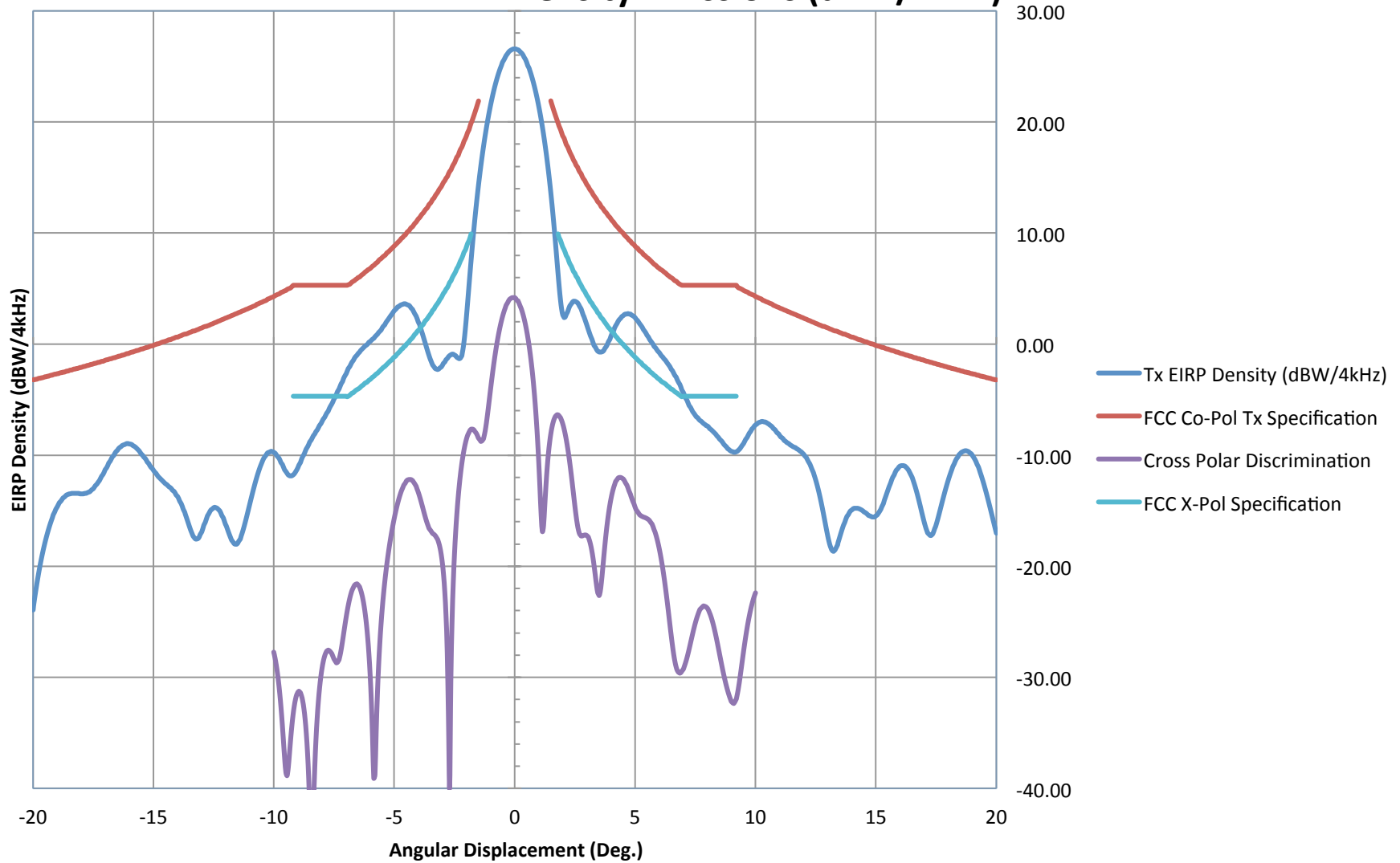
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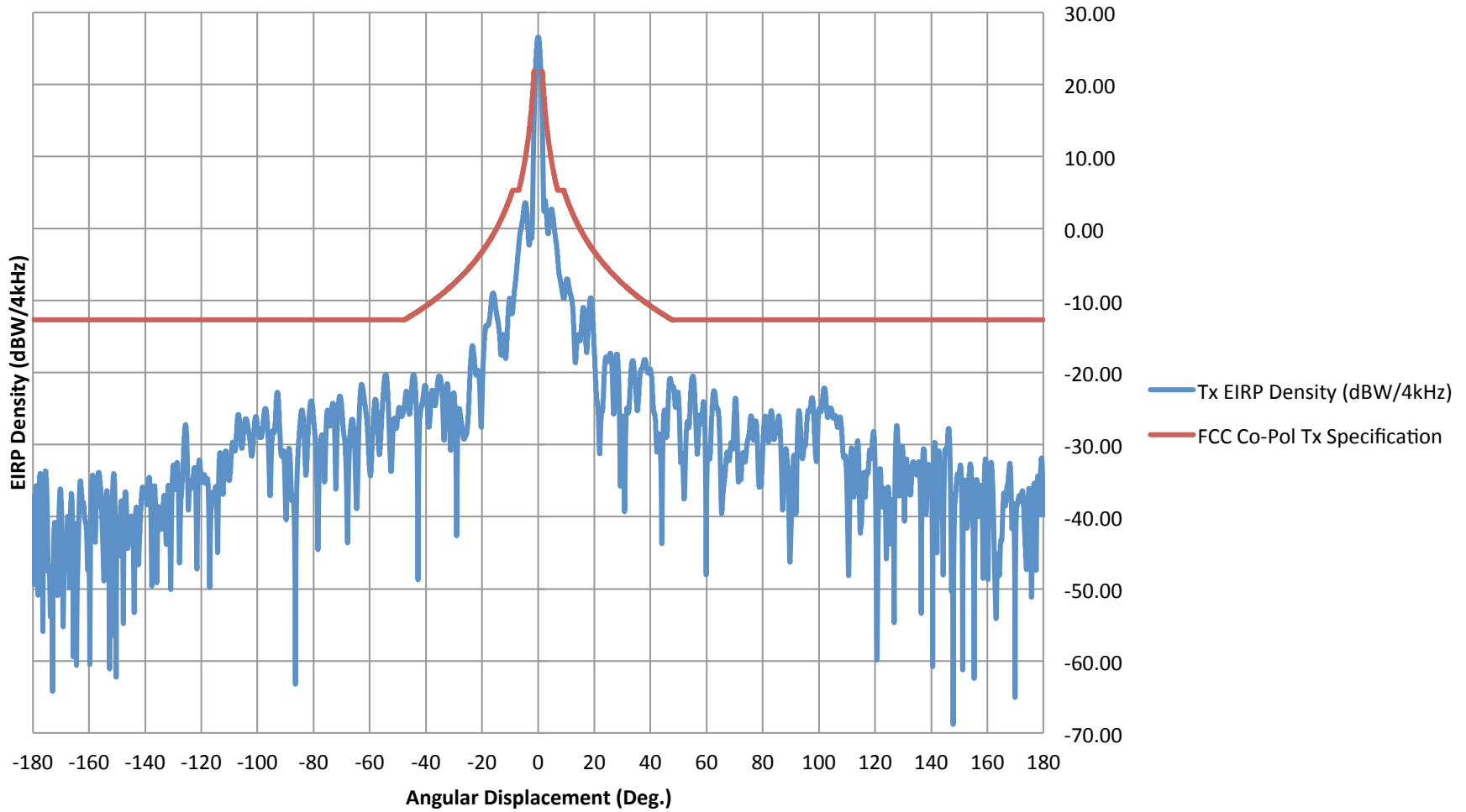
LP/Horiz-Vert (EI) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



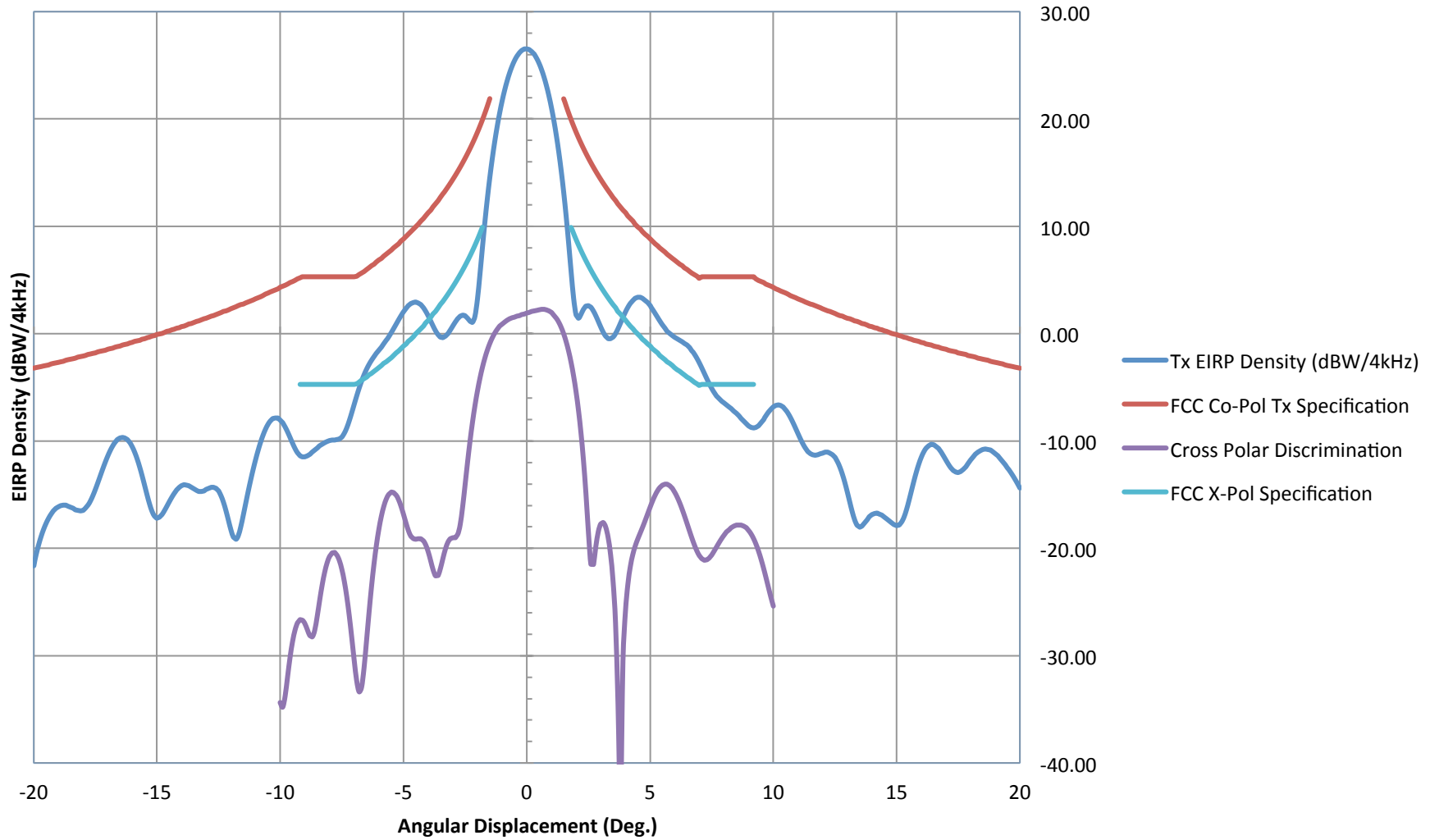
CP/LHCP-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



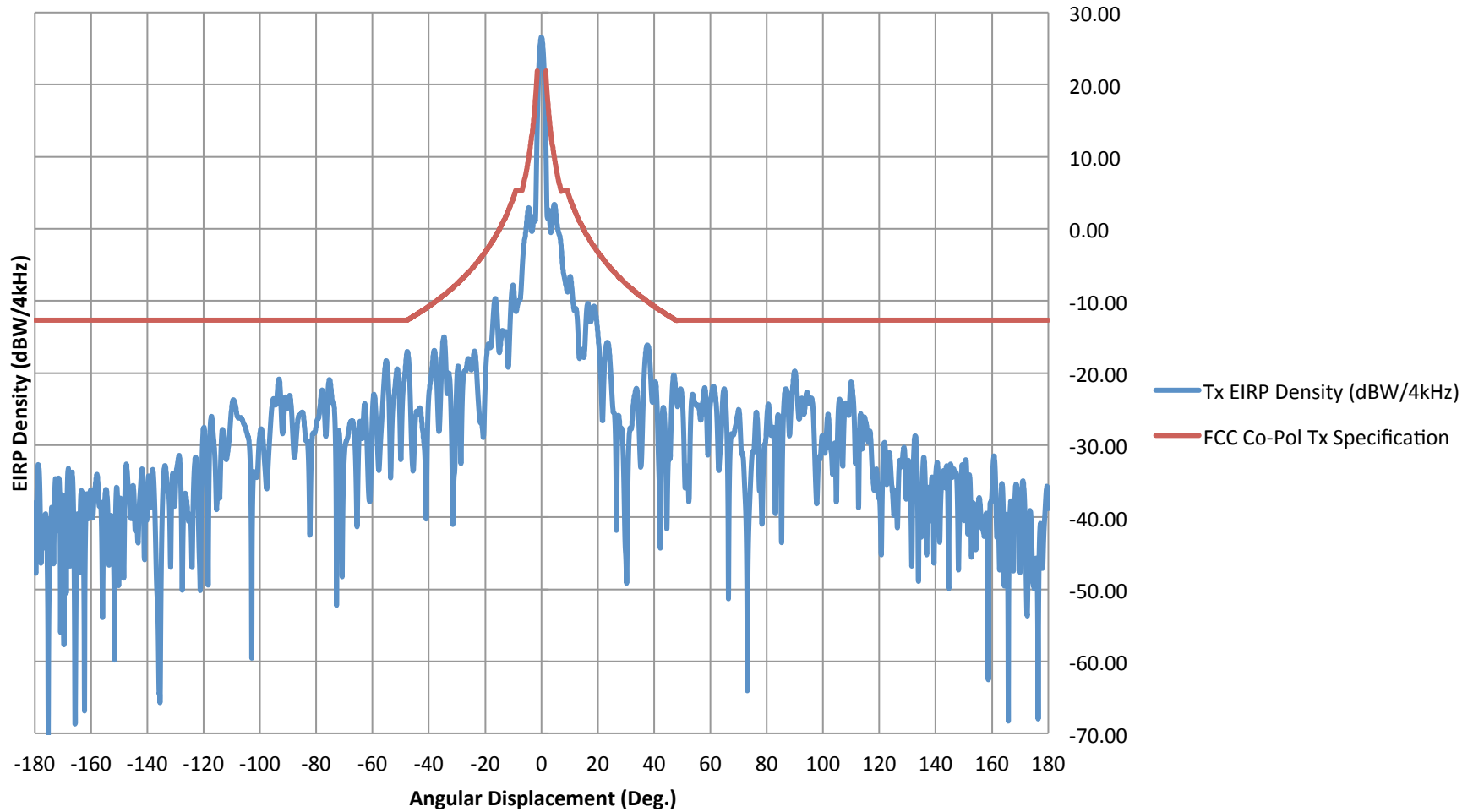
CP/LHCP-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



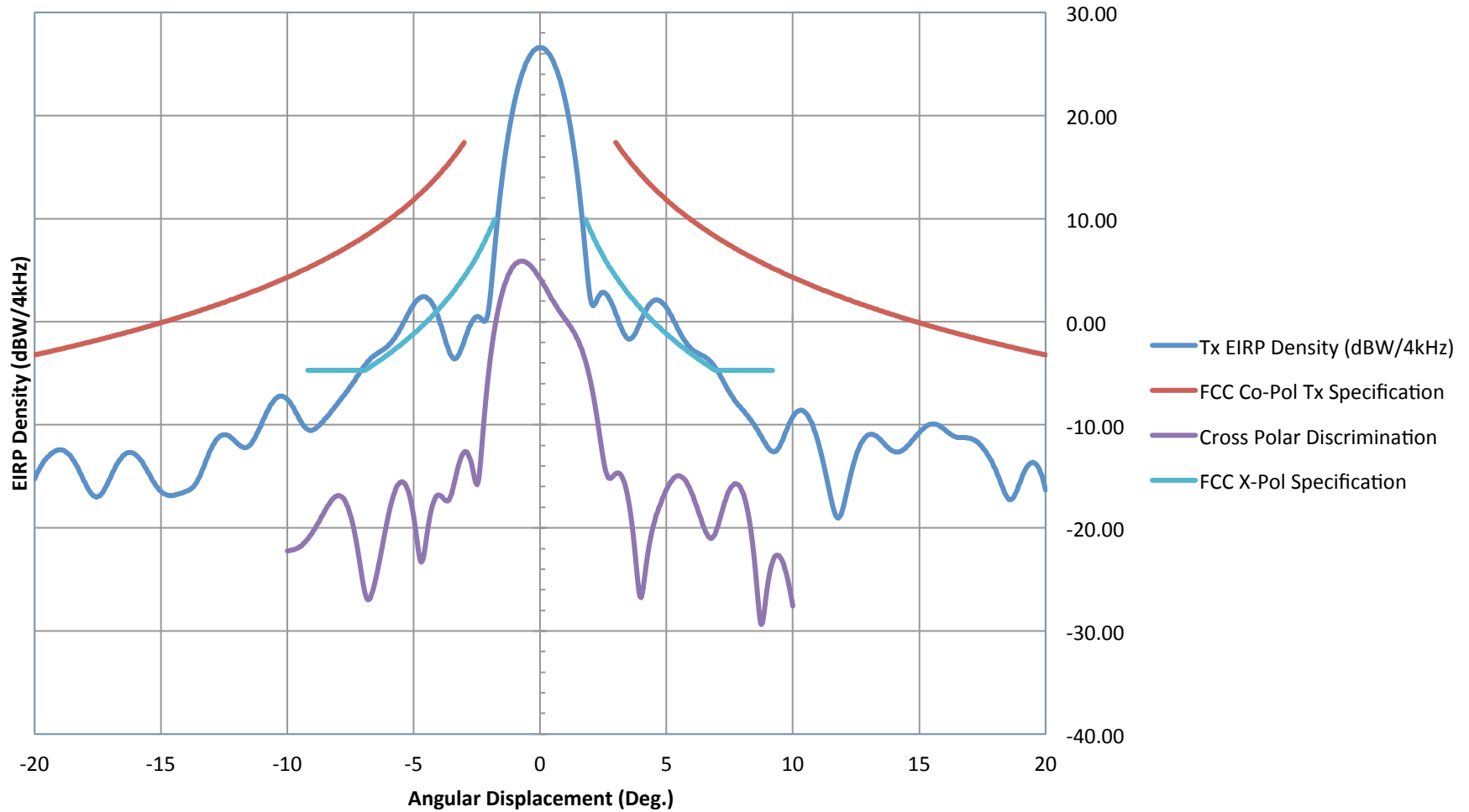
CP/RHCP-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



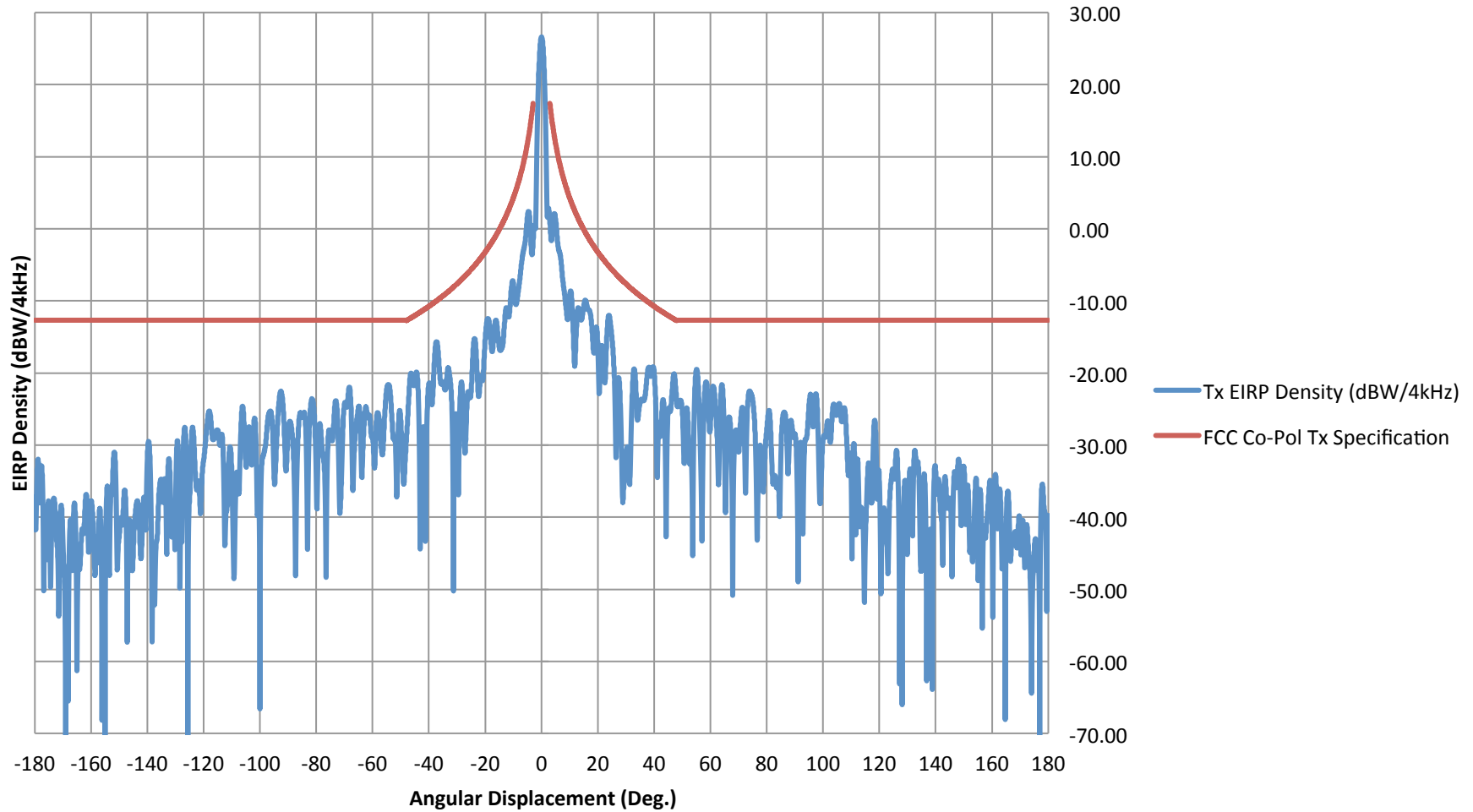
CP/RHCP-Horiz (Az) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



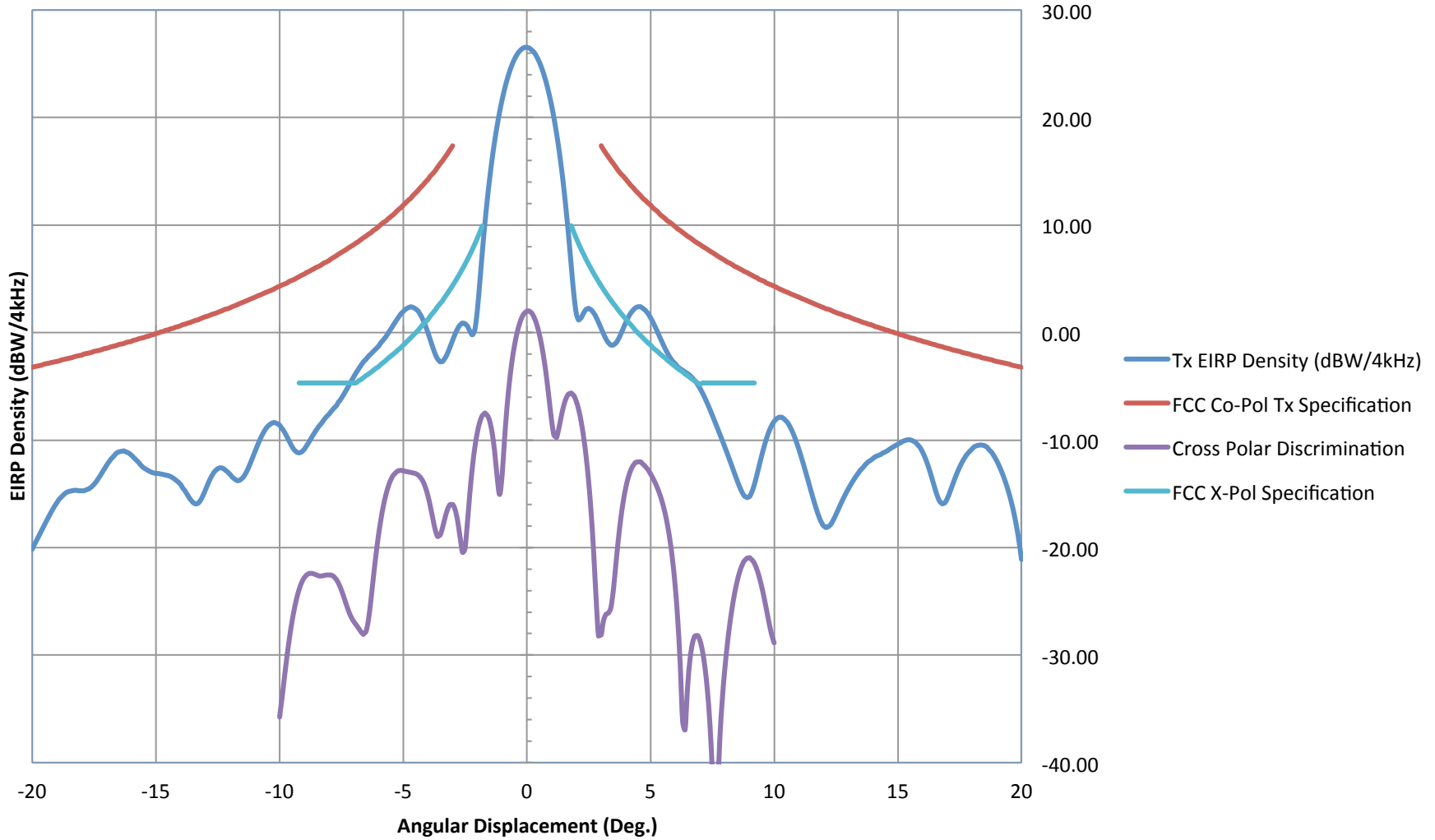
CP/LHCP-Vert (EI) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



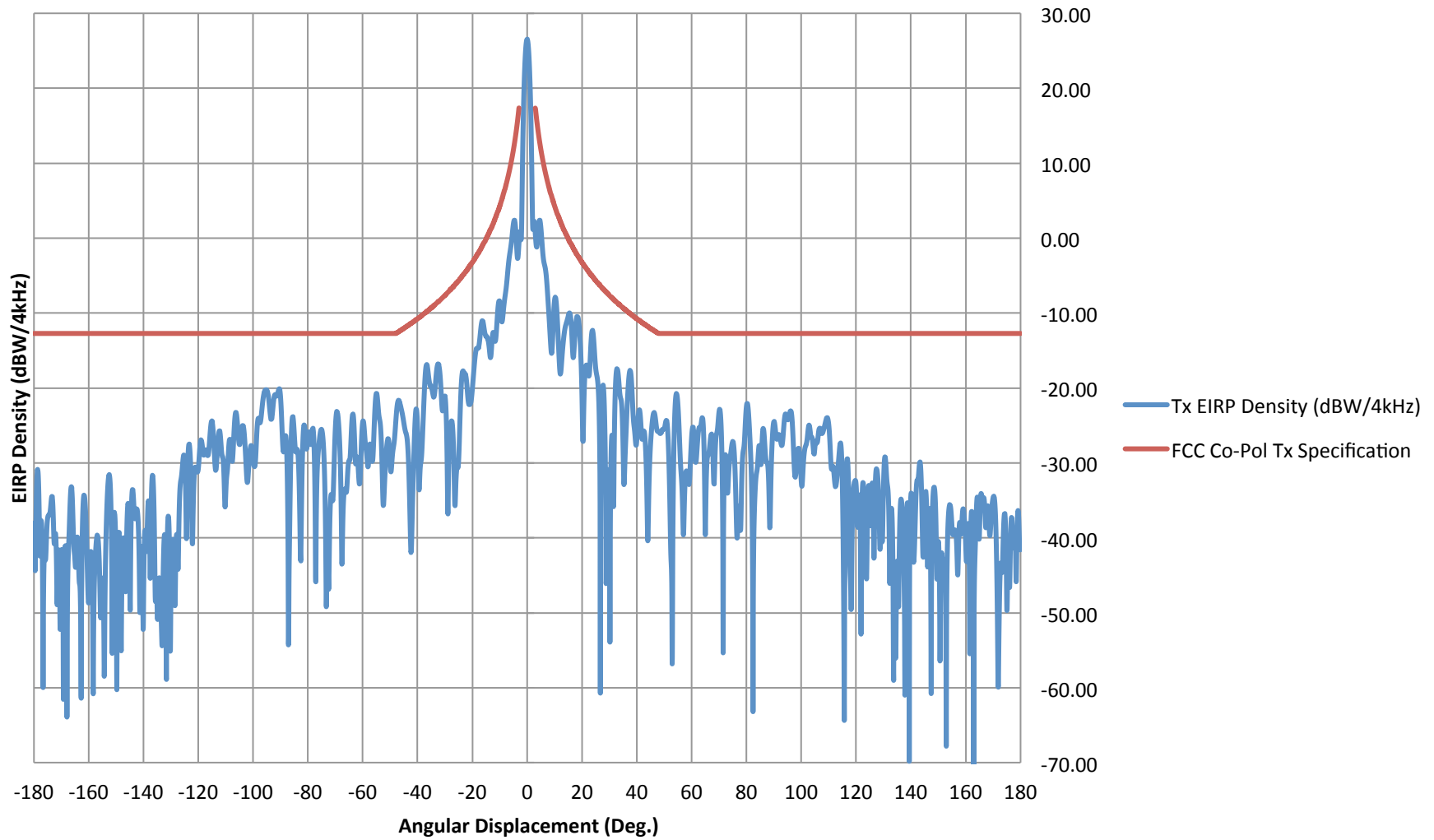
CP/LHCP-Vert (EI) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



CP/RHCP-Vert (E) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



CP/RHCP-Vert (E) Plane/6.1375 GHz Tx EIRP Density Emissions (dBW/4kHz)



Annex 2 – Link Budgets

Carrier Analysis

2 7760

Antenna Model	ST5000 Ku		Imported values				
Frequency	14250.00	MHz	Entered values				
Antenna Gain (no radome)	43.50	dBi	Calculated values				
Max HPA power	55.00						
Elevation Angle	40.1	°					
Azimuth Angle	124.5	°					
Satellite Longitude	115.00	W					
Data Rate	15800	Kbps					
FEC	1.000						
Modulation (BPSK = 1, QPSK = 2, 8PSK = 4, 16PSK = 8)	2		9				
Spacing Factor	1.00						
Uplink EIRP	60.20	dBW					
Gain towards the horizon (frequency coord.)	-10.00	dB					
Earth Station Latitude	28.00	1.00	51.00	North	28.03	Theta	0.755
Earth Station Longitude	80	35.00	56.00	West	80.60		55.54

		X1	+2dB X2	+6dB X4	+9dB X8	+12dB X16
EIRP	dBW	60.20	62.20	65.2	68.2	71.2
Occupied BW	KHz	7900.0	15800	31600	63200	126400
Power density at flange	dBW/4KHz	-16.26	-17.27	-17.28	-17.29	-17.30
Power density at flange	dBW/Hz	-52.26	-53.27	-53.28	-53.29	-53.30
E38 Total Input Power at Antenna Flange	W	46.77	74.13	147.91	295.12	588.84
E49 Maximum EIRP Density per Carrier	dBW/4KHz	27.244	26.23	26.22	26.21	26.20
E48 Maximum EIRP per Carrier	dBW	60.20	62.20	65.20	68.20	71.20
E60 Max. EIRP Density towards the Horizon (from elev. Angle)	dBW/4KHz	-24.34	-25.35	-25.36	-25.37	-25.38
E60 Max. EIRP Density towards the Horizon (if freq. coord.)	dBW/4KHz	-26.26	-27.27	-27.28	-27.29	-27.30

E40 Total EIRP for all Carriers (at max HPA)

60.90 dBW

ST5000 C-Band Link Budget Analysis

Carrier Analysis

		2.5		9700				
Antenna Model	ST5000 C					Imported values		
Frequency	6175.00	MHz					Entered values	
Antenna Gain (no radome)	38.00	dBi					Calculated values	
Max HPA power	55.00							
Elevation Angle	56.0	°						
Azimuth Angle	162.6	°						
Satellite Longitude	89.00	W						
Data Rate	1250	Kbps						
FEC	0.500							
Modulation (BPSK = 1, QPSK = 2, 8PSK = 4, 16PSK = 8)	8					9		
Spacing Factor	1.60							
Uplink EIRP	55.30	dBW						
Gain towards the horizon (frequency coord.)	-10.00	dB						
Earth Station Latitude	28.00	1.00	51.00	North	28.03	Theta	0.509	
Earth Station Longitude	80	35.00	56.00	West	80.60		17.45	

		X1	+3dB X2	+6dB X4	+9dB X8	+12dB X16
EIRP	dBW	55.30	58.3	61.3	64.3	67.3
Occupied BW	KHz	500.0	1000	2000	4000	8000
Power density at flange	dBW/4KHz	-3.67	-3.68	-3.69	-3.70	-3.71
Power density at flange	dBW/Hz	-39.67	-39.68	-39.69	-39.70	-39.71
E38 Total Input Power at Antenna Flange	W	53.70	107.15	213.80	426.58	851.14
E49 Maximum EIRP Density per Carrier	dBW/4KHz	34.331	34.32	34.31	34.30	34.29
E48 Maximum EIRP per Carrier	dBW	55.30	58.30	61.30	64.30	67.30
E60 Max. EIRP Density towards the Horizon (from elev. Angle)	dBW/4KHz	-15.37	-15.38	-15.39	-15.40	-15.41
E60 Max. EIRP Density towards the Horizon (if freq. coord.)	dBW/4KHz	-13.67	-13.68	-13.69	-13.70	-13.71

E40 Total EIRP for all Carriers (at max HPA) **55.40** dBW

- The Maximum Power Input to the Antenna to pass the Rad Hazard Analysis is 55W.
- The desired EIRP(58.3dBW) that you submit to me exceeds the safe Total Input Power at the antenna flange, using the half transmit bandwidth of the desired one (500Khz instead of 1Mhz) we can safely use this antenna at 55.3 dBW at 1250 Kbps (0.5Mbps).
- In Red Color is the desired analysis at 58.3dBW EIRP with probes to be unreliable, suggested EIRP (55.30 dBW) usage analysis is in Green.

Annex 3 – Radiation Hazard Study

Radiation Hazard Study

ST5000 C

This study analyzes the potential Radio Frequency (RF) human exposure levels caused by the Electro Magnetic (EM) fields of the above-captioned antenna. The mathematical analysis performed below complies with the methods described in the Federal Communications Commission Office of Engineering and Technology Bulletin No. 65 (1985 rev. 1997) R&O 96-326.

Maximum Permissible Exposure

There are two separate levels of exposure limits. The first applies to persons in the general population who are in an uncontrolled environment. The second applies to trained personnel in a controlled environment. According to 47 C.F.R. § 1.1310, the Maximum Permissible Exposure (MPE) limits for frequencies above 1.5 GHz are as follows:

- General Population / Uncontrolled Exposure 1.0 mW/cm²
- Occupational / Controlled Exposure 5.0 mW/cm²

The purpose of this study is to determine the power flux density levels for the earth station under study as compared with the MPE limits. This comparison is done in each of the following regions:

1. Far-field region
2. Near-field region
3. Transition region
4. The region between the feed and the antenna surface
5. The main reflector region
6. The region between the antenna edge and the ground

Input Parameters

The following input parameters were used in the calculations:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>
Antenna Diameter:	2.4	m	<i>D</i>
Antenna Transmit Gain:	38.00	dBi	<i>G</i>
Transmit Frequency:	6175	MHz	<i>f</i>
Feed Flange Diameter:	10.00	cm	<i>d</i>
Power Input to the Antenna:	55.00	W	<i>P</i>

Calculated Parameters

The following values were calculated using the above input parameters and the corresponding formulas.

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Antenna Surface Area:	4.52	m ²	<i>A</i>	$\pi D^2/4$
Area of Feed Flange:	78.54	cm ²	<i>a</i>	$\pi d^2/4$
Antenna Efficiency:	0.26		η	$G\lambda^2/(\pi^2 D^2)$
Gain Factor:	6309.57		<i>g</i>	$10^{G/10}$
Wavelength:	0.0486	m	λ	$300/f$

Behavior of EM Fields as a Function of Distance

The behavior of the characteristics of EM fields varies depending on the distance from the radiating antenna. These characteristics are analyzed in three primary regions: the near-field region, the far-field region and the transition region. Of interest also are the region between the antenna main reflector and the subreflector, the region of the main reflector area and the region between the main reflector and ground.

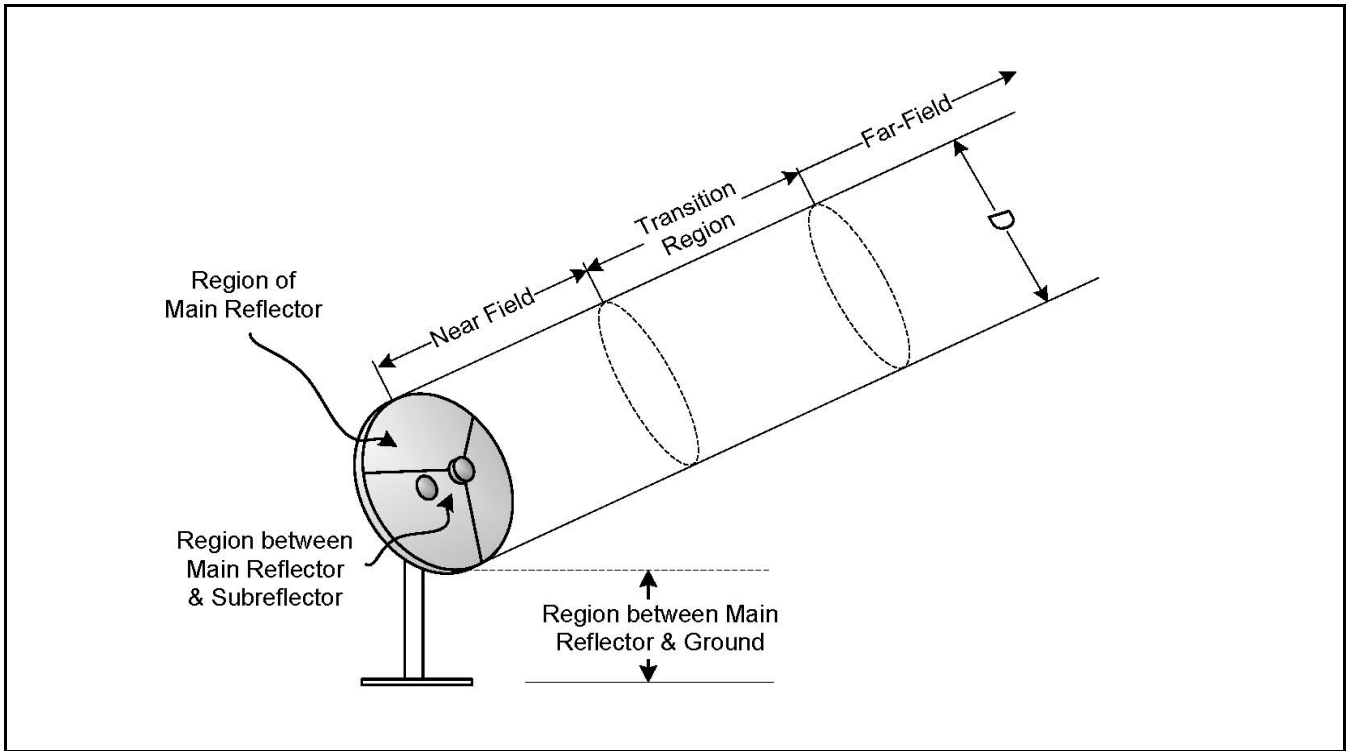


Figure 1. EM Fields as a Function of Distance

For parabolic aperture antennas with circular cross sections, such as the antenna under study, the near-field, far-field and transition region distances are calculated as follows:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Formula</u>
Near Field Distance:	29.640	m	$R_{nf} = D^2/(4\lambda)$
Distance to Far Field:	71.136	m	$R_{ff} = 0.60D^2/(\lambda)$
Distance of Transition Region	29.640	m	$R_t = R_{nf}$

The distance in the transition region is between the near and far fields. Thus, $R_{nf} \leq R_t \leq R_{ff}$. However, the power density in the transition region will not exceed the power density in the near-field. Therefore, for purposes of the present analysis, the distance of the transition region can equate the distance to the near-field.

Power Flux Density Calculations

The power flux density is considered to be at a maximum through the entire length of the near-field. This region is contained within a cylindrical volume with a diameter, D, equal to the diameter of the antenna. In the transition region and the far-field, the power density decreases inversely with the square of the distance. The following equations are used to calculate power density in these regions.

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density in the Near-Field	1.274	mW/cm ²	S_{nf}	$16.0 \eta P / (\pi D^2)$
Power Density in the Far-Field	0.546	mW/cm ²	S_{ff}	$GP / (4\pi R_{ff}^2)$
Power Density in the Trans. Region	1.274	mW/cm ²	S_t	$S_{nf} R_{nf} / (R_t)$

The region between the main reflector and the subreflector is confined within a conical shape defined by the feed assembly. The most common feed assemblies are waveguide flanges. This energy is determined as follows:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density at the Feed Flange	2801.1	mW/cm ²	S_{fa}	$4P / a$

The power density in the main reflector is determined similarly to the power density at the feed flange; except that the area of the reflector is used.

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density at Main Reflector	4.863	mW/cm ²	$S_{surface}$	$4P / A$

The power density between the reflector and ground, assuming uniform illumination of the reflector surface, is calculated as follows:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density between Reflector and Ground	1.216	mW/cm ²	S_g	P / A

Table 1 summarizes the calculated power flux density values for each region. In a controlled environment, the only regions that exceed FCC limitations are shown below. These regions are only accessible by trained technicians who, as a matter of procedure, turn off transmit power before performing any work in these areas.

Power Densities	mW/cm2	Controlled Environment (5 mW/cm2)
Far Field Calculation	0.546	Satisfies FCC Requirements
Near Field Calculation	1.274	Satisfies FCC Requirements
Transition Region	1.274	Satisfies FCC Requirements
Region between Main and Subreflector	2801.1	Exceeds Limitations
Main Reflector Region	4.863	Satisfies FCC Requirements
Region between Main Reflector and Ground	1.216	Satisfies FCC Requirements

Table 1. Power Flux Density for Each Region

In conclusion, the results show that the antenna, in a controlled environment, and under the proper mitigation procedures, meets the guidelines specified in 47 C.F.R. § 1.1310.

Radiation Hazard Study

ST5000 Ku

This study analyzes the potential Radio Frequency (RF) human exposure levels caused by the Electro Magnetic (EM) fields of the above-captioned antenna. The mathematical analysis performed below complies with the methods described in the Federal Communications Commission Office of Engineering and Technology Bulletin No. 65 (1985 rev. 1997) R&O 96-326.

Maximum Permissible Exposure

There are two separate levels of exposure limits. The first applies to persons in the general population who are in an uncontrolled environment. The second applies to trained personnel in a controlled environment. According to 47 C.F.R. § 1.1310, the Maximum Permissible Exposure (MPE) limits for frequencies above 1.5 GHz are as follows:

- General Population / Uncontrolled Exposure 1.0 mW/cm²
- Occupational / Controlled Exposure 5.0 mW/cm²

The purpose of this study is to determine the power flux density levels for the earth station under study as compared with the MPE limits. This comparison is done in each of the following regions:

1. Far-field region
2. Near-field region
3. Transition region
4. The region between the feed and the antenna surface
5. The main reflector region
6. The region between the antenna edge and the ground

Input Parameters

The following input parameters were used in the calculations:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>
Antenna Diameter:	2.4	m	<i>D</i>
Antenna Transmit Gain:	43.50	dBi	<i>G</i>
Transmit Frequency:	14250	MHz	<i>f</i>
Feed Flange Diameter:	10.00	cm	<i>d</i>
Power Input to the Antenna:	55.00	W	<i>P</i>

Calculated Parameters

The following values were calculated using the above input parameters and the corresponding formulas.

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Antenna Surface Area:	4.52	m ²	<i>A</i>	$\pi D^2/4$
Area of Feed Flange:	78.54	cm ²	<i>a</i>	$\pi d^2/4$
Antenna Efficiency:	0.17		η	$G\lambda^2/(\pi^2 D^2)$
Gain Factor:	22387.21		<i>g</i>	$10^{G/10}$
Wavelength:	0.0211	m	λ	$300/f$

Behavior of EM Fields as a Function of Distance

The behavior of the characteristics of EM fields varies depending on the distance from the radiating antenna. These characteristics are analyzed in three primary regions: the near-field region, the far-field region and the transition region. Of interest also are the region between the antenna main reflector and the subreflector, the region of the main reflector area and the region between the main reflector and ground.

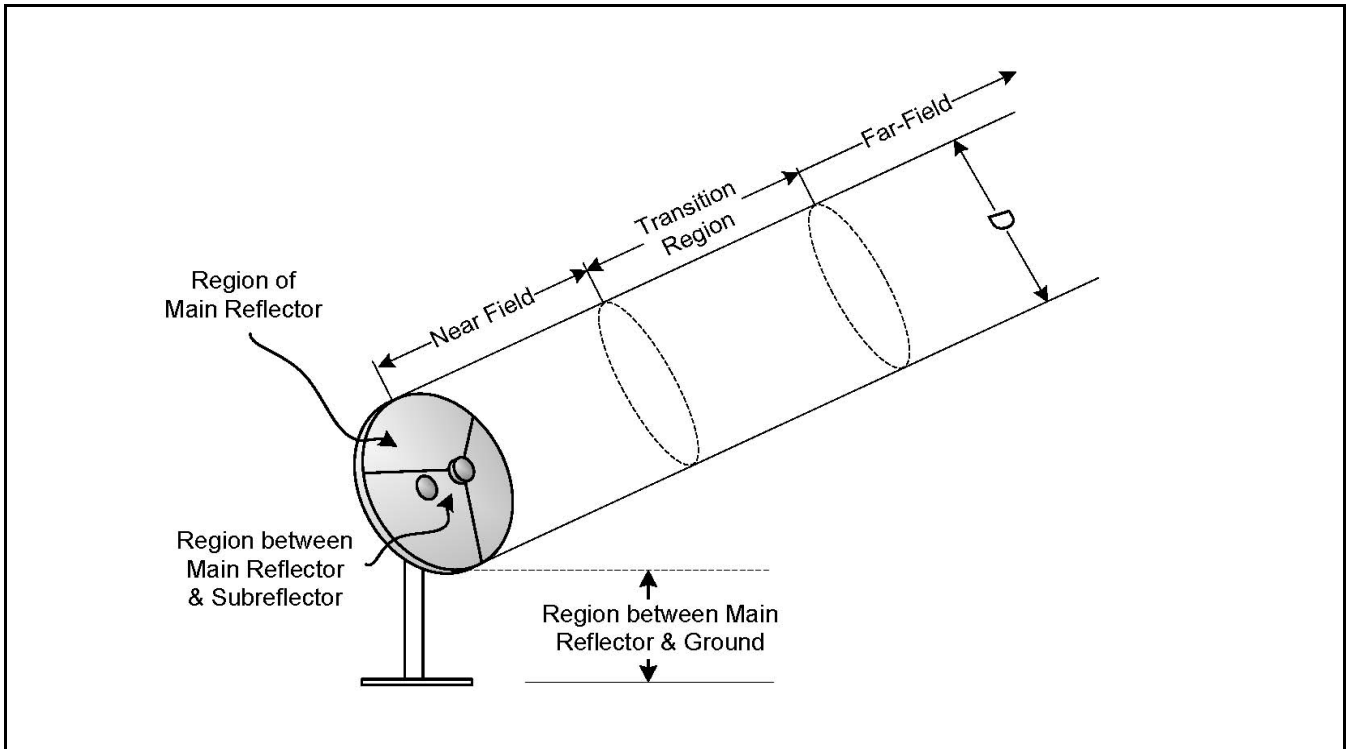


Figure 1. EM Fields as a Function of Distance

For parabolic aperture antennas with circular cross sections, such as the antenna under study, the near-field, far-field and transition region distances are calculated as follows:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Formula</u>
Near Field Distance:	68.400	m	$R_{nf} = D^2/(4\lambda)$
Distance to Far Field:	164.160	m	$R_{ff} = 0.60D^2/(\lambda)$
Distance of Transition Region	68.400	m	$R_t = R_{nf}$

The distance in the transition region is between the near and far fields. Thus, $R_{nf} \leq R_t \leq R_{ff}$. However, the power density in the transition region will not exceed the power density in the near-field. Therefore, for purposes of the present analysis, the distance of the transition region can equate the distance to the near-field.

Power Flux Density Calculations

The power flux density is considered to be at a maximum through the entire length of the near-field. This region is contained within a cylindrical volume with a diameter, D, equal to the diameter of the antenna. In the transition region and the far-field, the power density decreases inversely with the square of the distance. The following equations are used to calculate power density in these regions.

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density in the Near-Field	0.849	mW/cm ²	S_{nf}	$16.0 \eta P / (\pi D^2)$
Power Density in the Far-Field	0.364	mW/cm ²	S_{ff}	$GP / (4\pi R_{ff}^2)$
Power Density in the Trans. Region	0.849	mW/cm ²	S_t	$S_{nf} R_{nf} / (R_t)$

The region between the main reflector and the subreflector is confined within a conical shape defined by the feed assembly. The most common feed assemblies are waveguide flanges. This energy is determined as follows:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density at the Feed Flange	2801.1	mW/cm ²	S_{fa}	$4P / a$

The power density in the main reflector is determined similarly to the power density at the feed flange; except that the area of the reflector is used.

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density at Main Reflector	4.863	mW/cm ²	$S_{surface}$	$4P / A$

The power density between the reflector and ground, assuming uniform illumination of the reflector surface, is calculated as follows:

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>	<u>Formula</u>
Power Density between Reflector and Ground	1.216	mW/cm ²	S_g	P / A

Table 1 summarizes the calculated power flux density values for each region. In a controlled environment, the only regions that exceed FCC limitations are shown below. These regions are only accessible by trained technicians who, as a matter of procedure, turn off transmit power before performing any work in these areas.

Power Densities	mW/cm2	Controlled Environment (5 mW/cm2)
Far Field Calculation	0.364	Satisfies FCC Requirements
Near Field Calculation	0.849	Satisfies FCC Requirements
Transition Region	0.849	Satisfies FCC Requirements
Region between Main and Subreflector	2801.1	Exceeds Limitations
Main Reflector Region	4.863	Satisfies FCC Requirements
Region between Main Reflector and Ground	1.216	Satisfies FCC Requirements

Table 1. Power Flux Density for Each Region

In conclusion, the results show that the antenna, in a controlled environment, and under the proper mitigation procedures, meets the guidelines specified in 47 C.F.R. § 1.1310.

**Annex 4 – C-band Coordination Report, Port Canaveral,
Florida**

COMSEARCH
Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>



COMSEARCH[®]
A CommScope Company

July 17, 2015

Re: Harris CapRock Communications
PORT CANAVERAL, FL
Temporary Transmit-Only Earth Station
Operation Dates: 07/20/2015 - 01/20/2016
Job Number: 150717COMSGE11

Dear Frequency Coordinator:

On behalf of Harris CapRock Communications, we are forwarding the attached coordination data for a Temporary Transmit-Only Earth Station to be located at the site referenced above.

This earth station will transmit only on the satellite(s) and frequency or frequencies as described in the attached data. Please do not report cases involving 4 GHz facilities or problems involving non-active paths or frequencies outside the specified range.

If there are any questions concerning this coordination notice, please contact Comsearch.

Sincerely,

COMSEARCH

Gary K. Edwards
Senior Manager
gedwards@comsearch.com

Enclosure(s)

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Date: 07/17/2015
Job Number: 150717COMSGE11

Administrative Information

Status: TEMPORARY (Operation from 07/20/2015 to 01/20/2016)
Call Sign: TEMP01
Licensee Code: SPACLK
Licensee Name: Harris CapRock Communications

Site Information

PORT CANAVERAL, FL

Venue Name
Latitude (NAD 83): 28° 24' 31.8" N
Longitude (NAD 83): 80° 36' 37.9" W
Climate Zone: B
Rain Zone: 1
Ground Elevation (AMSL): 0.0 m / 0.0 ft

Link Information

Satellite Type: Geostationary
Mode: TO - Transmit-Only
Modulation: Digital
Satellite Arc: 29.5° W to 129° West Longitude
Azimuth Range: 111.0° to 247.1°
Corresponding Elevation Angles: 25.7° / 28.1°
Antenna Centerline (AGL): 3.66 m / 12.0 ft

Antenna Information

Transmit - FCC32

Antenna Model: Harris 2.4 Meter
Gain / Diameter: 38.0 dBi / 2.4 m
3-dB / 15-dB Beamwidth: 1.00° / 2.00°

Max Available RF Power (dBW/4 kHz): -18.7
(dBW/MHz): 5.3

Maximum EIRP (dBW/4 kHz): 19.3
(dBW/MHz): 43.3

Interference Objectives: Long Term: -154.0 dBW/4 kHz 20%
Short Term: -131.0 dBW/4 kHz 0.0025%

Frequency Information

Transmit 6.1 GHz

Emission / Frequency Range (MHz): 1M00G7D - 20M0G7D / 5925.0 - 6425.0

Max Great Circle Coordination Distance: 154.3 km / 95.9 mi
Precipitation Scatter Contour Radius: 100.0 km / 62.1 mi

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values	PORT CANAVERAL, FL		
Licensee Name	Harris CapRock Communications		
Latitude (NAD 83)	28° 24' 31.8" N		
Longitude (NAD 83)	80° 36' 37.9" W		
Ground Elevation (AMSL)	0.0 m / 0.0 ft		
Antenna Centerline (AGL)	3.66 m / 12.0 ft		
Antenna Model	Harris 2.4 Meter		
Antenna Mode	Transmit 6.1 GHz		
Interference Objectives:	Long Term	-154.0 dBW/4 kHz	20%
	Short Term	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power	-18.7 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	108.84	-10.00	129.28
5	0.00	104.38	-10.00	129.28
10	0.00	99.90	-10.00	129.28
15	0.00	95.40	-10.00	129.28
20	0.00	90.90	-10.00	129.28
25	0.00	86.39	-10.00	129.28
30	0.00	81.89	-10.00	129.28
35	0.00	77.40	-10.00	129.28
40	0.00	72.94	-10.00	129.28
45	0.00	68.49	-10.00	129.28
50	0.00	64.09	-10.00	129.28
55	0.00	59.74	-10.00	129.28
60	0.00	55.45	-10.00	129.28
65	0.00	51.24	-10.00	129.28
70	0.00	47.14	-9.84	129.81
75	0.22	43.08	-8.86	130.83
80	0.00	39.42	-7.89	136.39
85	0.00	35.90	-6.88	140.05
90	0.00	32.72	-5.87	143.85
95	0.00	29.97	-4.92	147.57
100	0.00	27.79	-4.10	150.76
105	0.00	26.33	-3.51	153.20
110	0.00	25.70	-3.25	154.30
115	0.00	25.98	-3.36	153.82
120	0.00	27.12	-3.83	151.86
125	0.00	29.03	-4.57	148.84
130	0.00	31.56	-5.48	145.36
135	0.00	34.59	-6.47	141.56
140	0.00	37.99	-7.49	137.83
145	0.00	41.62	-8.48	134.34
150	0.00	45.09	-9.35	131.40
155	0.00	48.29	-10.00	129.28
160	0.00	51.13	-10.00	129.28
165	0.00	53.50	-10.00	129.28
170	0.00	55.32	-10.00	129.28
175	0.00	56.46	-10.00	129.28
180	0.00	56.85	-10.00	129.28
185	0.00	56.46	-10.00	129.28

COMSEARCH

Earth Station Data Sheet

19700 Janelia Farm Boulevard, Ashburn, VA 20147
(703)726-5662 <http://www.comsearch.com>

Coordination Values

PORT CANAVERAL, FL

Licensee Name	Harris CapRock Communications		
Latitude (NAD 83)	28° 24' 31.8" N		
Longitude (NAD 83)	80° 36' 37.9" W		
Ground Elevation (AMSL)	0.0 m / 0.0 ft		
Antenna Centerline (AGL)	3.66 m / 12.0 ft		
Antenna Model	Harris 2.4 Meter		
Antenna Mode	Transmit 6.1 GHz		
Interference Objectives:	Long Term	-154.0 dBW/4 kHz	20%
	Short Term	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power	-18.7 (dBW/4 kHz)		

Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Transmit 6.1 GHz	
			Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	55.32	-10.00	129.28
195	0.00	53.50	-10.00	129.28
200	0.00	51.13	-10.00	129.28
205	0.00	48.29	-10.00	129.28
210	0.00	45.09	-9.35	131.39
215	0.00	41.62	-8.48	134.34
220	0.00	38.23	-7.56	137.58
225	0.00	35.16	-6.65	140.90
230	0.00	32.50	-5.80	144.13
235	0.00	30.37	-5.06	147.00
240	0.00	28.88	-4.52	149.06
245	0.00	28.14	-4.23	150.20
250	0.00	28.21	-4.26	150.10
255	0.00	29.08	-4.59	148.76
260	0.00	30.68	-5.17	146.57
265	0.00	32.90	-5.93	143.62
270	0.00	35.63	-6.80	140.36
275	0.00	38.76	-7.71	137.04
280	0.00	42.20	-8.63	133.82
285	0.00	45.88	-9.54	130.78
290	0.00	49.74	-10.00	129.28
295	0.00	53.74	-10.00	129.28
300	0.00	57.85	-10.00	129.28
305	0.00	62.05	-10.00	129.28
310	0.00	66.31	-10.00	129.28
315	0.00	70.62	-10.00	129.28
320	0.00	74.97	-10.00	129.28
325	0.00	79.35	-10.00	129.28
330	0.00	83.75	-10.00	129.28
335	0.00	88.16	-10.00	129.28
340	0.00	92.57	-10.00	129.28
345	0.00	96.97	-10.00	129.28
350	0.00	101.37	-10.00	129.28
355	0.00	105.74	-10.00	129.28

Exhibit B
V240M Terminal

Exhibit A

TECHNICAL PARAMETERS – Intellian v240M

Characteristic	C-band	Ku-band
Antenna diameter	2.4m	2.4m
Type of Antenna	Circular reflector	Circular reflector
Peak Power (SSPA)	200 watts	125 watts
Transmit Bandwidth	1 MHz to 72 MHz	1 MHz to 72 MHz
Transmit Gain	41.9 dBi	48.4 dBi
EIRP	66.6 dBW	71.2 dBW
Data Rate	20 Mbps Tx / 100 Mbps Rx	20 Mbps Tx / 100 Mbps Rx
Emission Designators	1M00G7D to 20M0G7D	1M00G7D to 20M0G7D
Transmit Polarization	LHCP/RHCP Horizontal/Vertical	Horizontal/Vertical
Transmit Max PSD	29.6 dBW/4kHz	34.2 dBW/4kHz
Transmit Beamwidth	0.57 degrees	0.3 degrees
Receive G/T	20.3 dB/K	28.0 dB/K
Receive Bandwidth	Up to 72 MHz	Up to 72 MHz
Receive Polarization	LHCP/RHCP Horizontal/Vertical	Horizontal/Vertical
Feed Flange Power	159.9 Watts	82.6 Watts
ERP	1.5 MW	3.5 MW
Signal Modulation	Up to 32 APSK	Up to 32 APSK

Annex 1 – Antenna Performance Plots

Final

Ku band EIRP Spectral Density

Model Name: Intellian v240M

Test Date: Jan 13, 2014

Prepared by

RF Engineering Department
Intellian Technologies, Inc.

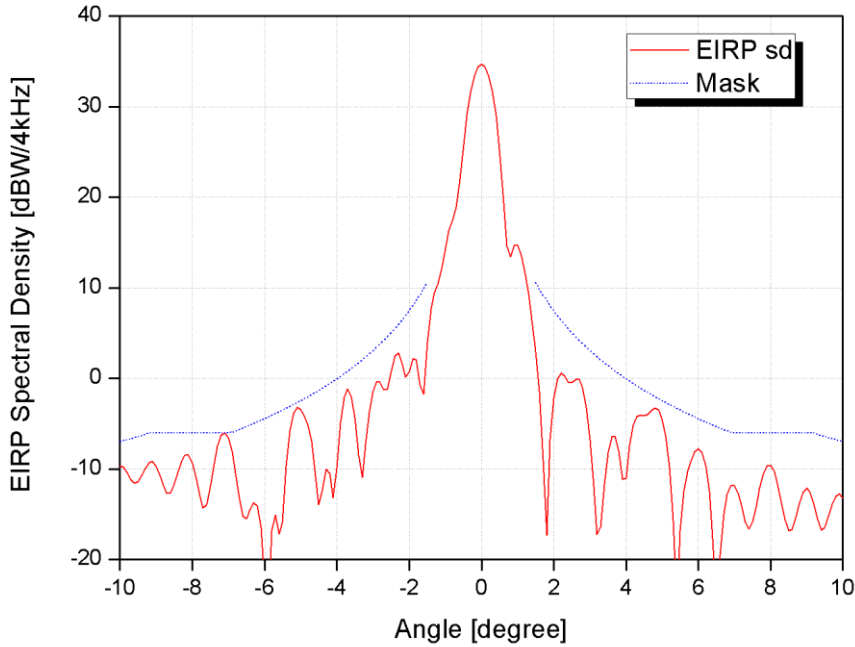
Confidential and Intellian proprietary

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1. EIRP Spectral Density of v240M

1.1. Azimuth Pattern for Co-pol, Narrow Angle (-10°~10°)



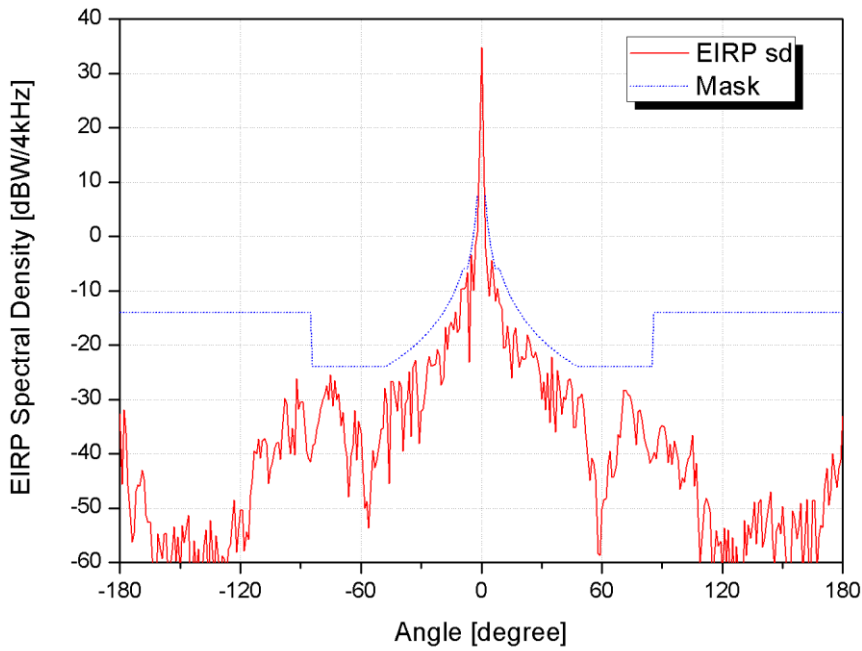
-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

▪ **FCC EIRP spectral density regulation**

$15-25\log(\theta)$	dBW/4kHz	for	$1.5^\circ \leq \theta \leq 7.0^\circ$
-6	dBW/4kHz	for	$7.0^\circ < \theta \leq 9.2^\circ$
$18-25\log(\theta)$	dBW/4kHz	for	$9.2^\circ < \theta \leq 48^\circ$
-24	dBW/4kHz	for	$48^\circ < \theta \leq 85^\circ$
-14	dBW/4kHz	for	$85^\circ < \theta \leq 180^\circ$

The v240M's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -14.0 dBW/ 4kHz

1.2. Azimuth Pattern for Co-pol, Wide Angle (-180°~180°)



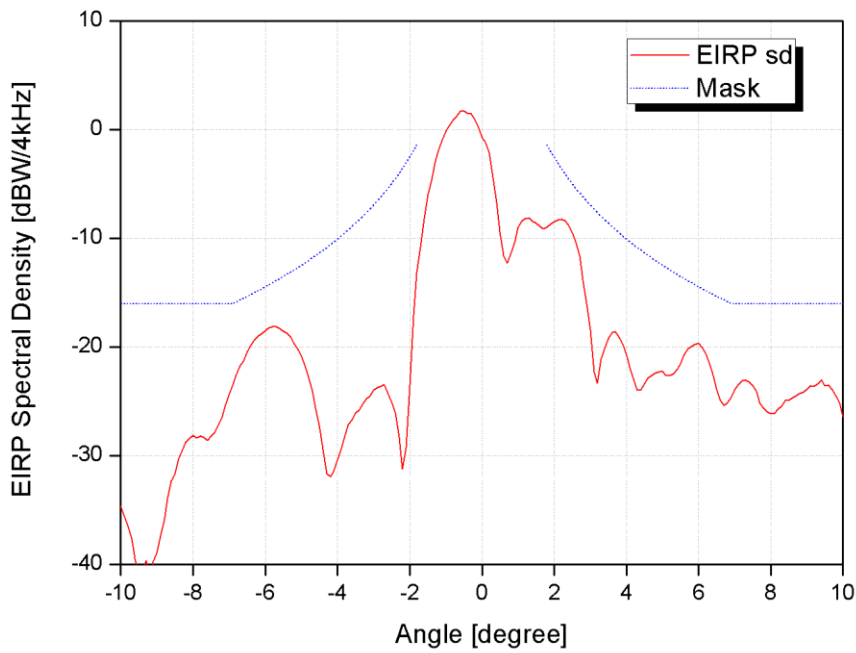
-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

▪ **FCC EIRP spectral density regulation**

15-25log(θ)	dBW/4kHz	for	$1.5^\circ \leq \theta \leq 7.0^\circ$
-6	dBW/4kHz	for	$7.0^\circ < \theta \leq 9.2^\circ$
18-25log(θ)	dBW/4kHz	for	$9.2^\circ < \theta \leq 48^\circ$
-24	dBW/4kHz	for	$48^\circ < \theta \leq 85^\circ$
-14	dBW/4kHz	for	$85^\circ < \theta \leq 180^\circ$

The v240M's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -14.0 dBW/ 4kHz

1.3. Azimuth Pattern for Cross-pol, Narrow angle (-10°~10°)



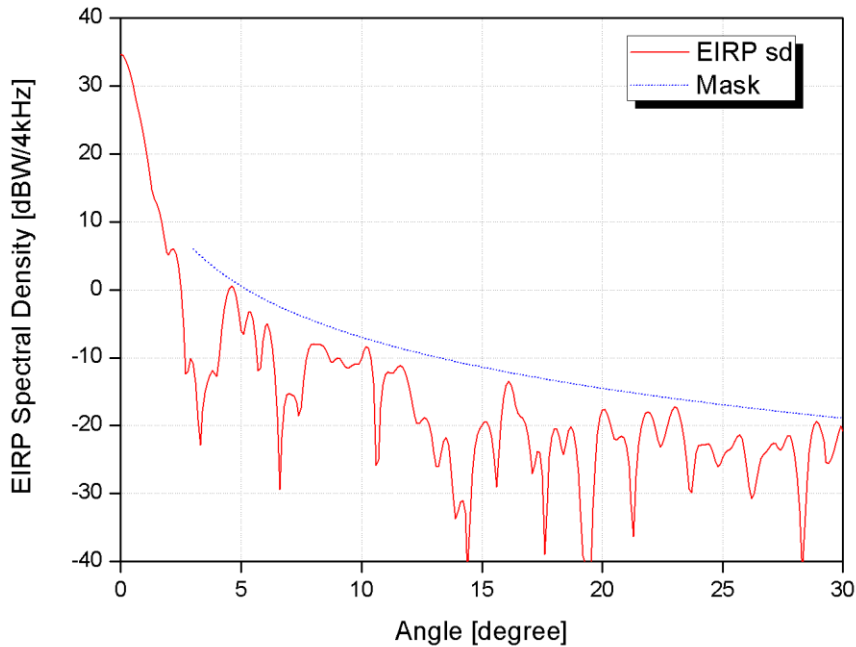
-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

▪ **FCC EIRP spectral density regulation**

$5-25\log(\theta)$	dBW/4kHz	for	$1.8^\circ \leq \theta \leq 7.0^\circ$
-16	dBW/4kHz	for	$7.0^\circ < \theta \leq 9.2^\circ$

The v240M's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -14.0 dBW/ 4kHz

1.4. Elevation Pattern for Co-pol, Narrow Angle (0°~30°)



-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

- FCC EIRP spectral density regulation**

$18-25\log(\theta)$	dBW/4kHz	for	$3.0^\circ \leq \theta \leq 48^\circ$
-24	dBW/4kHz	for	$48^\circ < \theta \leq 85^\circ$
-14	dBW/4kHz	for	$85^\circ < \theta \leq 180^\circ$

The v240M's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -14.0 dBW/ 4kHz

2. Ku band EIRP Spectral Density Data

2.1. Azimuth Pattern for Co-pol (-10°~10°)

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-10.000	-9.699	-7.000
-9.900	-9.843	-6.891
-9.800	-10.470	-6.781
-9.700	-11.196	-6.669
-9.600	-11.591	-6.557
-9.500	-11.414	-6.443
-9.400	-10.751	-6.328
-9.300	-9.930	-6.212
-9.200	-9.324	-6.000
-9.100	-9.200	-6.000
-9.000	-9.670	-6.000
-8.900	-10.669	-6.000
-8.800	-11.878	-6.000
-8.700	-12.708	-6.000
-8.600	-12.654	-6.000
-8.500	-11.736	-6.000
-8.400	-10.402	-6.000
-8.300	-9.181	-6.000
-8.200	-8.474	-6.000
-8.100	-8.498	-6.000
-8.000	-9.335	-6.000
-7.900	-10.922	-6.000
-7.800	-12.895	-6.000
-7.700	-14.296	-6.000
-7.600	-13.927	-6.000
-7.500	-11.902	-6.000
-7.400	-9.457	-6.000
-7.300	-7.473	-6.000
-7.200	-6.288	-6.000
-7.100	-6.000	-6.000
-7.000	-6.627	-6.000
-6.900	-8.143	-5.971
-6.800	-10.433	-5.813
-6.700	-13.105	-5.652
-6.600	-15.184	-5.489
-6.500	-15.516	-5.323
-6.400	-14.534	-5.154
-6.300	-13.713	-4.984
-6.200	-14.066	-4.810
-6.100	-16.451	-4.633
-6.000	-23.090	-4.454
-5.900	-27.028	-4.271
-5.800	-16.860	-4.086
-5.700	-15.051	-3.897
-5.600	-17.162	-3.705
-5.500	-15.900	-3.509
-5.400	-9.696	-3.310
-5.300	-5.839	-3.107
-5.200	-3.872	-2.900
-5.100	-3.205	-2.689

14.25 GHz @ -13.7 dBW/4kHz		
Angl (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-5.000	-3.413	-2.474
-4.900	-4.125	-2.255
-4.800	-5.204	-2.031
-4.700	-6.988	-1.802
-4.600	-10.156	-1.569
-4.500	-13.943	-1.330
-4.400	-12.359	-1.086
-4.300	-10.056	-0.837
-4.200	-10.518	-0.581
-4.100	-13.158	-0.320
-4.000	-9.959	-0.051
-3.900	-4.889	0.223
-3.800	-2.109	0.505
-3.700	-1.205	0.795
-3.600	-1.936	1.092
-3.500	-4.351	1.398
-3.400	-8.515	1.713
-3.300	-10.950	2.037
-3.200	-7.306	2.371
-3.100	-3.794	2.716
-3.000	-1.489	3.072
-2.900	-0.353	3.440
-2.800	-0.410	3.821
-2.700	-1.279	4.216
-2.600	-1.218	4.626
-2.500	0.704	5.051
-2.400	2.439	5.495
-2.300	2.836	5.957
-2.200	1.767	6.439
-2.100	0.184	6.945
-2.000	0.680	7.474
-1.900	2.190	8.031
-1.800	2.072	8.618
-1.700	-0.684	9.239
-1.600	-1.716	9.897
-1.500	3.980	10.598
-1.400	7.687	
-1.300	9.455	
-1.200	10.480	
-1.100	12.134	
-1.000	14.413	
-0.900	16.268	
-0.800	17.426	
-0.700	18.882	
-0.600	21.955	
-0.500	25.763	
-0.400	29.083	
-0.300	31.607	
-0.200	33.349	
-0.100	34.367	

14.25 GHz @ -13.7 dBW/4kHz		
Angl (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	34.703	
0.100	34.370	
0.200	33.350	
0.300	31.589	
0.400	28.974	
0.500	25.306	
0.600	20.303	
0.700	14.626	
0.800	13.425	
0.900	14.678	
1.000	14.709	
1.100	13.587	
1.200	11.685	
1.300	9.260	
1.400	6.387	
1.500	2.945	10.598
1.600	-1.493	9.897
1.700	-9.047	9.239
1.800	-17.334	8.618
1.900	-6.714	8.031
2.000	-2.225	7.474
2.100	-0.066	6.945
2.200	0.604	6.439
2.300	0.266	5.957
2.400	-0.390	5.495
2.500	-0.515	5.051
2.600	-0.153	4.626
2.700	-0.139	4.216
2.800	-1.062	3.821
2.900	-3.210	3.440
3.000	-6.787	3.072
3.100	-11.889	2.716
3.200	-17.272	2.371
3.300	-16.444	2.037
3.400	-11.731	1.713
3.500	-8.233	1.398
3.600	-6.455	1.092
3.700	-6.376	0.795
3.800	-8.076	0.505
3.900	-11.151	0.223
4.000	-10.980	-0.051
4.100	-7.496	-0.320
4.200	-5.173	-0.581
4.300	-4.183	-0.837
4.400	-4.032	-1.086
4.500	-4.133	-1.330
4.600	-3.984	-1.569
4.700	-3.579	-1.802
4.800	-3.309	-2.031
4.900	-3.534	-2.255

14.25 GHz @ -13.7 dBW/4kHz		
Angl (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
5.000	-4.487	-2.474
5.100	-6.404	-2.689
5.200	-9.732	-2.900
5.300	-15.739	-3.107
5.400	-25.575	-3.310
5.500	-16.826	-3.509
5.600	-12.510	-3.705
5.700	-10.348	-3.897
5.800	-9.019	-4.086
5.900	-8.152	-4.271
6.000	-7.812	-4.454
6.100	-8.220	-4.633
6.200	-9.637	-4.810
6.300	-12.464	-4.984
6.400	-17.640	-5.154
6.500	-25.500	-5.323
6.600	-19.519	-5.489
6.700	-15.010	-5.652
6.800	-12.795	-5.813
6.900	-11.849	-5.971
7.000	-11.859	-6.000
7.100	-12.711	-6.000
7.200	-14.230	-6.000
7.300	-15.878	-6.000
7.400	-16.607	-6.000
7.500	-15.823	-6.000
7.600	-14.073	-6.000
7.700	-12.145	-6.000
7.800	-10.586	-6.000
7.900	-9.695	-6.000
8.000	-9.597	-6.000
8.100	-10.316	-6.000
8.200	-11.782	-6.000
8.300	-13.743	-6.000
8.400	-15.654	-6.000
8.500	-16.808	-6.000
8.600	-16.693	-6.000
8.700	-15.381	-6.000
8.800	-13.721	-6.000
8.900	-12.524	-6.000
9.000	-12.134	-6.000
9.100	-12.625	-6.000
9.200	-13.905	-6.000
9.300	-15.591	-6.212
9.400	-16.752	-6.328
9.500	-16.506	-6.443
9.600	-15.278	-6.557
9.700	-13.954	-6.669
9.800	-13.031	-6.781
9.900	-12.754	-6.891
10.000	-13.247	-7.000

2.2. Azimuth Pattern for Co-pol (-180°~180°)

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-180.000	-32.664	-14.000
-179.000	-45.616	-14.000
-178.000	-31.959	-14.000
-177.000	-36.124	-14.000
-176.000	-45.864	-14.000
-175.000	-50.061	-14.000
-174.000	-56.206	-14.000
-173.000	-54.553	-14.000
-172.000	-46.838	-14.000
-171.000	-45.654	-14.000
-170.000	-45.948	-14.000
-169.000	-43.048	-14.000
-168.000	-44.617	-14.000
-167.000	-51.380	-14.000
-166.000	-52.573	-14.000
-165.000	-52.574	-14.000
-164.000	-59.169	-14.000
-163.000	-62.778	-14.000
-162.000	-65.051	-14.000
-161.000	-54.705	-14.000
-160.000	-57.573	-14.000
-159.000	-59.320	-14.000
-158.000	-54.843	-14.000
-157.000	-54.629	-14.000
-156.000	-61.826	-14.000
-155.000	-60.431	-14.000
-154.000	-57.714	-14.000
-153.000	-53.426	-14.000
-152.000	-59.788	-14.000
-151.000	-55.341	-14.000
-150.000	-61.850	-14.000
-149.000	-53.141	-14.000
-148.000	-56.313	-14.000
-147.000	-54.116	-14.000
-146.000	-51.374	-14.000
-145.000	-65.342	-14.000
-144.000	-64.379	-14.000
-143.000	-55.950	-14.000
-142.000	-62.002	-14.000
-141.000	-57.549	-14.000
-140.000	-68.575	-14.000
-139.000	-61.158	-14.000
-138.000	-56.650	-14.000
-137.000	-54.063	-14.000
-136.000	-64.535	-14.000

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-135.000	-52.295	-14.000
-134.000	-57.649	-14.000
-133.000	-63.095	-14.000
-132.000	-55.094	-14.000
-131.000	-59.692	-14.000
-130.000	-76.889	-14.000
-129.000	-58.812	-14.000
-128.000	-59.267	-14.000
-127.000	-61.479	-14.000
-126.000	-57.582	-14.000
-125.000	-56.741	-14.000
-124.000	-52.410	-14.000
-123.000	-48.495	-14.000
-122.000	-58.115	-14.000
-121.000	-53.758	-14.000
-120.000	-50.354	-14.000
-119.000	-50.250	-14.000
-118.000	-57.851	-14.000
-117.000	-54.316	-14.000
-116.000	-55.728	-14.000
-115.000	-47.607	-14.000
-114.000	-44.685	-14.000
-113.000	-39.569	-14.000
-112.000	-40.051	-14.000
-111.000	-37.255	-14.000
-110.000	-40.825	-14.000
-109.000	-37.663	-14.000
-108.000	-37.133	-14.000
-107.000	-38.206	-14.000
-106.000	-45.527	-14.000
-105.000	-42.754	-14.000
-104.000	-41.674	-14.000
-103.000	-38.903	-14.000
-102.000	-37.969	-14.000
-101.000	-37.966	-14.000
-100.000	-40.994	-14.000
-99.000	-35.519	-14.000
-98.000	-29.848	-14.000
-97.000	-30.807	-14.000
-96.000	-36.744	-14.000
-95.000	-40.014	-14.000
-94.000	-35.354	-14.000
-93.000	-40.218	-14.000
-92.000	-26.152	-14.000
-91.000	-31.853	-14.000

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-90.000	-30.459	-14.000
-89.000	-30.471	-14.000
-88.000	-34.817	-14.000
-87.000	-39.526	-14.000
-86.000	-40.938	-14.000
-85.000	-41.544	-14.000
-84.000	-38.435	-24.000
-83.000	-38.180	-24.000
-82.000	-35.568	-24.000
-81.000	-34.196	-24.000
-80.000	-31.793	-24.000
-79.000	-30.056	-24.000
-78.000	-29.144	-24.000
-77.000	-27.433	-24.000
-76.000	-30.061	-24.000
-75.000	-25.503	-24.000
-74.000	-31.252	-24.000
-73.000	-26.521	-24.000
-72.000	-30.080	-24.000
-71.000	-28.947	-24.000
-70.000	-34.865	-24.000
-69.000	-32.400	-24.000
-68.000	-38.178	-24.000
-67.000	-40.396	-24.000
-66.000	-47.957	-24.000
-65.000	-40.375	-24.000
-64.000	-38.568	-24.000
-63.000	-32.005	-24.000
-62.000	-41.157	-24.000
-61.000	-34.080	-24.000
-60.000	-36.190	-24.000
-59.000	-43.476	-24.000
-58.000	-50.083	-24.000
-57.000	-48.727	-24.000
-56.000	-53.692	-24.000
-55.000	-44.832	-24.000
-54.000	-39.403	-24.000
-53.000	-42.588	-24.000
-52.000	-41.293	-24.000
-51.000	-38.293	-24.000
-50.000	-35.581	-24.000
-49.000	-35.345	-24.000
-48.000	-27.971	-24.000
-47.000	-30.635	-23.802
-46.000	-45.424	-23.569

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-45.000	-26.611	-23.330
-44.000	-26.809	-23.086
-43.000	-29.131	-22.837
-42.000	-32.147	-22.581
-41.000	-26.707	-22.320
-40.000	-27.603	-22.051
-39.000	-39.518	-21.777
-38.000	-30.803	-21.495
-37.000	-30.038	-21.205
-36.000	-24.850	-20.908
-35.000	-36.894	-20.602
-34.000	-24.099	-20.287
-33.000	-22.797	-19.963
-32.000	-29.121	-19.629
-31.000	-38.168	-19.284
-30.000	-32.121	-18.928
-29.000	-31.786	-18.560
-28.000	-28.117	-18.179
-27.000	-23.835	-17.784
-26.000	-22.054	-17.374
-25.000	-23.843	-16.949
-24.000	-23.685	-16.505
-23.000	-23.479	-16.043
-22.000	-20.809	-15.561
-21.000	-21.805	-15.055
-20.000	-27.392	-14.526
-19.000	-26.010	-13.969
-18.000	-16.646	-13.382
-17.000	-20.832	-12.761
-16.000	-16.648	-12.103
-15.000	-15.778	-11.402
-14.000	-17.116	-10.653
-13.000	-13.880	-9.849
-12.000	-17.652	-8.980
-11.000	-17.015	-8.035
-10.000	-9.699	-7.000
-9.000	-9.670	-6.000
-8.000	-9.335	-6.000
-7.000	-6.627	-6.000
-6.000	-23.090	-4.454
-5.000	-3.413	-2.474
-4.000	-9.959	-0.051
-3.000	-1.489	3.072
-2.000	0.680	7.474
-1.000	14.413	

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	34.703	
1.000	14.709	
2.000	-2.225	7.474
3.000	-6.787	3.072
4.000	-10.980	-0.051
5.000	-4.487	-2.474
6.000	-7.812	-4.454
7.000	-11.859	-6.000
8.000	-9.597	-6.000
9.000	-12.134	-6.000
10.000	-13.247	-7.000
11.000	-20.529	-8.035
12.000	-20.349	-8.980
13.000	-16.448	-9.849
14.000	-19.809	-10.653
15.000	-26.020	-11.402
16.000	-18.109	-12.103
17.000	-16.863	-12.761
18.000	-21.163	-13.382
19.000	-24.063	-13.969
20.000	-22.081	-14.526
21.000	-22.726	-15.055
22.000	-22.464	-15.561
23.000	-18.162	-16.043
24.000	-19.654	-16.505
25.000	-21.800	-16.949
26.000	-22.328	-17.374
27.000	-21.301	-17.784
28.000	-22.623	-18.179
29.000	-25.336	-18.560
30.000	-29.940	-18.928
31.000	-26.819	-19.284
32.000	-31.868	-19.629
33.000	-25.161	-19.963
34.000	-34.317	-20.287
35.000	-22.208	-20.602
36.000	-31.399	-20.908
37.000	-36.016	-21.205
38.000	-24.703	-21.495
39.000	-28.317	-21.777
40.000	-32.788	-22.051
41.000	-29.610	-22.320
42.000	-30.092	-22.581
43.000	-26.572	-22.837
44.000	-26.222	-23.086

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
45.000	-27.857	-23.330
46.000	-35.212	-23.569
47.000	-35.091	-23.802
48.000	-29.694	-24.000
49.000	-29.554	-24.000
50.000	-29.022	-24.000
51.000	-31.552	-24.000
52.000	-36.292	-24.000
53.000	-41.283	-24.000
54.000	-44.869	-24.000
55.000	-40.797	-24.000
56.000	-41.804	-24.000
57.000	-44.608	-24.000
58.000	-58.353	-24.000
59.000	-58.657	-24.000
60.000	-50.098	-24.000
61.000	-48.456	-24.000
62.000	-48.128	-24.000
63.000	-42.034	-24.000
64.000	-39.529	-24.000
65.000	-44.309	-24.000
66.000	-44.154	-24.000
67.000	-42.227	-24.000
68.000	-36.514	-24.000
69.000	-37.120	-24.000
70.000	-32.664	-24.000
71.000	-28.347	-24.000
72.000	-28.383	-24.000
73.000	-29.091	-24.000
74.000	-29.314	-24.000
75.000	-30.836	-24.000
76.000	-33.317	-24.000
77.000	-38.388	-24.000
78.000	-32.311	-24.000
79.000	-31.888	-24.000
80.000	-33.684	-24.000
81.000	-37.148	-24.000
82.000	-38.610	-24.000
83.000	-39.678	-24.000
84.000	-41.772	-24.000
85.000	-41.012	-24.000
86.000	-39.786	-14.000
87.000	-40.926	-14.000
88.000	-37.290	-14.000
89.000	-35.364	-14.000

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
90.000	-34.851	-14.000
91.000	-35.133	-14.000
92.000	-37.253	-14.000
93.000	-41.693	-14.000
94.000	-38.272	-14.000
95.000	-41.999	-14.000
96.000	-37.703	-14.000
97.000	-39.295	-14.000
98.000	-40.999	-14.000
99.000	-46.570	-14.000
100.000	-44.412	-14.000
101.000	-45.217	-14.000
102.000	-42.509	-14.000
103.000	-40.934	-14.000
104.000	-40.352	-14.000
105.000	-36.556	-14.000
106.000	-45.934	-14.000
107.000	-41.790	-14.000
108.000	-51.672	-14.000
109.000	-59.943	-14.000
110.000	-54.153	-14.000
111.000	-49.506	-14.000
112.000	-48.128	-14.000
113.000	-49.115	-14.000
114.000	-50.568	-14.000
115.000	-63.648	-14.000
116.000	-58.578	-14.000
117.000	-54.095	-14.000
118.000	-56.891	-14.000
119.000	-56.084	-14.000
120.000	-62.616	-14.000
121.000	-53.651	-14.000
122.000	-59.926	-14.000
123.000	-54.044	-14.000
124.000	-67.298	-14.000
125.000	-55.470	-14.000
126.000	-65.227	-14.000
127.000	-57.026	-14.000
128.000	-61.334	-14.000
129.000	-62.313	-14.000
130.000	-67.863	-14.000
131.000	-52.246	-14.000
132.000	-58.714	-14.000
133.000	-53.120	-14.000
134.000	-55.583	-14.000

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
135.000	-52.703	-14.000
136.000	-48.842	-14.000
137.000	-56.619	-14.000
138.000	-48.975	-14.000
139.000	-48.423	-14.000
140.000	-57.188	-14.000
141.000	-55.687	-14.000
142.000	-52.636	-14.000
143.000	-49.328	-14.000
144.000	-46.980	-14.000
145.000	-55.839	-14.000
146.000	-61.016	-14.000
147.000	-54.235	-14.000
148.000	-52.709	-14.000
149.000	-54.684	-14.000
150.000	-49.647	-14.000
151.000	-55.087	-14.000
152.000	-60.683	-14.000
153.000	-60.293	-14.000
154.000	-60.175	-14.000
155.000	-50.475	-14.000
156.000	-51.806	-14.000
157.000	-55.650	-14.000
158.000	-53.523	-14.000
159.000	-49.134	-14.000
160.000	-62.020	-14.000
161.000	-56.888	-14.000
162.000	-48.455	-14.000
163.000	-61.790	-14.000
164.000	-61.515	-14.000
165.000	-48.682	-14.000
166.000	-48.459	-14.000
167.000	-61.615	-14.000
168.000	-55.354	-14.000
169.000	-53.219	-14.000
170.000	-53.562	-14.000
171.000	-46.448	-14.000
172.000	-42.738	-14.000
173.000	-49.462	-14.000
174.000	-46.910	-14.000
175.000	-39.967	-14.000
176.000	-43.987	-14.000
177.000	-46.187	-14.000
178.000	-42.722	-14.000
179.000	-41.221	-14.000
180.000	-33.097	-14.000

2.3. Azimuth Pattern for Cross-pol (-10°~10°)

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-10.000	-34.603	-16.000
-9.900	-35.567	-16.000
-9.800	-36.468	-16.000
-9.700	-37.652	-16.000
-9.600	-39.452	-16.000
-9.500	-40.881	-16.000
-9.400	-40.644	-16.000
-9.300	-39.643	-16.000
-9.200	-41.533	-16.000
-9.100	-39.757	-16.000
-9.000	-38.934	-16.000
-8.900	-37.373	-16.000
-8.800	-35.930	-16.000
-8.700	-33.967	-16.000
-8.600	-32.301	-16.000
-8.500	-31.671	-16.000
-8.400	-30.307	-16.000
-8.300	-29.446	-16.000
-8.200	-28.746	-16.000
-8.100	-28.406	-16.000
-8.000	-28.120	-16.000
-7.900	-28.334	-16.000
-7.800	-28.172	-16.000
-7.700	-28.274	-16.000
-7.600	-28.621	-16.000
-7.500	-28.158	-16.000
-7.400	-27.845	-16.000
-7.300	-27.258	-16.000
-7.200	-26.519	-16.000
-7.100	-25.312	-16.000
-7.000	-24.309	-16.000
-6.900	-23.468	-15.971
-6.800	-22.554	-15.813
-6.700	-21.757	-15.652
-6.600	-21.299	-15.489
-6.500	-20.419	-15.323
-6.400	-19.863	-15.154
-6.300	-19.370	-14.984
-6.200	-18.970	-14.810
-6.100	-18.733	-14.633
-6.000	-18.449	-14.454
-5.900	-18.217	-14.271
-5.800	-18.144	-14.086
-5.700	-18.133	-13.897
-5.600	-18.305	-13.705
-5.500	-18.500	-13.509
-5.400	-18.728	-13.310
-5.300	-19.037	-13.107
-5.200	-19.697	-12.900
-5.100	-20.239	-12.689

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-5.000	-20.776	-12.474
-4.900	-21.685	-12.255
-4.800	-22.780	-12.031
-4.700	-24.044	-11.802
-4.600	-25.581	-11.569
-4.500	-27.191	-11.330
-4.400	-29.419	-11.086
-4.300	-31.637	-10.837
-4.200	-31.915	-10.581
-4.100	-31.434	-10.320
-4.000	-30.405	-10.051
-3.900	-29.393	-9.777
-3.800	-28.187	-9.495
-3.700	-27.198	-9.205
-3.600	-26.742	-8.908
-3.500	-26.049	-8.602
-3.400	-25.756	-8.287
-3.300	-25.212	-7.963
-3.200	-24.797	-7.629
-3.100	-24.520	-7.284
-3.000	-23.948	-6.928
-2.900	-23.763	-6.560
-2.800	-23.616	-6.179
-2.700	-23.445	-5.784
-2.600	-24.278	-5.374
-2.500	-25.057	-4.949
-2.400	-26.065	-4.505
-2.300	-28.306	-4.043
-2.200	-31.234	-3.561
-2.100	-29.265	-3.055
-2.000	-23.483	-2.526
-1.900	-17.086	-1.969
-1.800	-13.151	-1.382
-1.700	-10.814	
-1.600	-8.166	
-1.500	-5.970	
-1.400	-4.606	
-1.300	-3.105	
-1.200	-1.857	
-1.100	-0.950	
-1.000	-0.129	
-0.900	0.385	
-0.800	0.872	
-0.700	1.221	
-0.600	1.721	
-0.500	1.696	
-0.400	1.545	
-0.300	1.477	
-0.200	0.946	
-0.100	0.175	

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	-0.741	
0.100	-1.129	
0.200	-2.117	
0.300	-4.400	
0.400	-6.737	
0.500	-9.393	
0.600	-11.602	
0.700	-12.267	
0.800	-11.351	
0.900	-10.353	
1.000	-9.016	
1.100	-8.419	
1.200	-8.154	
1.300	-8.139	
1.400	-8.397	
1.500	-8.591	
1.600	-8.893	
1.700	-9.114	
1.800	-8.951	-1.382
1.900	-8.681	-1.969
2.000	-8.476	-2.526
2.100	-8.304	-3.055
2.200	-8.211	-3.561
2.300	-8.356	-4.043
2.400	-8.774	-4.505
2.500	-9.480	-4.949
2.600	-10.412	-5.374
2.700	-11.623	-5.784
2.800	-13.840	-6.179
2.900	-16.029	-6.560
3.000	-18.397	-6.928
3.100	-22.262	-7.284
3.200	-23.309	-7.629
3.300	-21.121	-7.963
3.400	-20.083	-8.287
3.500	-19.146	-8.602
3.600	-18.663	-8.908
3.700	-18.595	-9.205
3.800	-19.090	-9.495
3.900	-19.753	-9.777
4.000	-20.726	-10.051
4.100	-21.873	-10.320
4.200	-22.919	-10.581
4.300	-23.978	-10.837
4.400	-23.915	-11.086
4.500	-23.345	-11.330
4.600	-22.837	-11.569
4.700	-22.641	-11.802
4.800	-22.416	-12.031
4.900	-22.246	-12.255

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
5.000	-22.203	-12.474
5.100	-22.648	-12.689
5.200	-22.628	-12.900
5.300	-22.431	-13.107
5.400	-22.049	-13.310
5.500	-21.583	-13.509
5.600	-20.701	-13.705
5.700	-20.169	-13.897
5.800	-19.929	-14.086
5.900	-19.734	-14.271
6.000	-19.626	-14.454
6.100	-20.045	-14.633
6.200	-20.643	-14.810
6.300	-21.567	-14.984
6.400	-22.510	-15.154
6.500	-23.869	-15.323
6.600	-24.891	-15.489
6.700	-25.388	-15.652
6.800	-25.141	-15.813
6.900	-24.696	-15.971
7.000	-23.918	-16.000
7.100	-23.459	-16.000
7.200	-23.072	-16.000
7.300	-23.022	-16.000
7.400	-23.224	-16.000
7.500	-23.555	-16.000
7.600	-24.070	-16.000
7.700	-25.166	-16.000
7.800	-25.633	-16.000
7.900	-25.985	-16.000
8.000	-26.108	-16.000
8.100	-26.075	-16.000
8.200	-25.705	-16.000
8.300	-25.408	-16.000
8.400	-24.932	-16.000
8.500	-24.914	-16.000
8.600	-24.690	-16.000
8.700	-24.479	-16.000
8.800	-24.235	-16.000
8.900	-24.130	-16.000
9.000	-23.835	-16.000
9.100	-23.577	-16.000
9.200	-23.598	-16.000
9.300	-23.410	-16.000
9.400	-23.056	-16.000
9.500	-23.554	-16.000
9.600	-23.512	-16.000
9.700	-23.932	-16.000
9.800	-24.501	-16.000
9.900	-25.142	-16.000
10.000	-26.425	-16.000

2.4. Elevation Pattern for Co pol (0°~30°)

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.0000	34.7030	
0.1000	34.4647	
0.2000	33.8433	
0.3000	32.8846	
0.4000	31.6449	
0.5000	30.1999	
0.6000	28.6390	
0.7000	27.0327	
0.8000	25.3834	
0.9000	23.6096	
1.0000	21.5961	
1.1000	19.2920	
1.2000	16.8547	
1.3000	14.7693	
1.4000	13.4735	
1.5000	12.6483	
1.6000	11.6021	
1.7000	9.9173	
1.8000	7.6025	
1.9000	5.5185	
2.0000	5.1470	
2.1000	5.8335	
2.2000	6.0664	
2.3000	5.2969	
2.4000	3.3398	
2.5000	-0.0546	
2.6000	-5.4166	
2.7000	-12.4227	
2.8000	-11.9984	
2.9000	-10.1691	
3.0000	-10.7963	6.0720
3.1000	-13.6234	5.7160
3.2000	-19.1576	5.3713
3.3000	-22.8974	5.0372
3.4000	-17.9230	4.7130
3.5000	-15.1627	4.3983
3.6000	-13.7341	4.0924
3.7000	-12.5962	3.7950
3.8000	-11.9543	3.5054
3.9000	-12.3843	3.2234
4.0000	-12.7967	2.9485
4.1000	-9.8560	2.6804
4.2000	-5.8220	2.4188
4.3000	-2.8444	2.1633
4.4000	-0.9259	1.9137
4.5000	0.1697	1.6697
4.6000	0.5621	1.4311
4.7000	0.2230	1.1976
4.8000	-0.9907	0.9690
4.9000	-3.2260	0.7451

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
5.0000	-5.9989	0.5257
5.1000	-6.5868	0.3107
5.2000	-4.7169	0.0999
5.3000	-3.3249	-0.1069
5.4000	-3.1860	-0.3098
5.5000	-4.4221	-0.5091
5.6000	-7.3267	-0.7047
5.7000	-11.8713	-0.8969
5.8000	-11.5053	-1.0857
5.9000	-7.5052	-1.2713
6.0000	-5.4035	-1.4538
6.1000	-5.0238	-1.6332
6.2000	-6.0827	-1.8098
6.3000	-8.5077	-1.9835
6.4000	-12.4351	-2.1545
6.5000	-18.6550	-2.3228
6.6000	-29.4315	-2.4886
6.7000	-21.7310	-2.6519
6.8000	-17.1528	-2.8127
6.9000	-15.5071	-2.9712
7.0000	-15.2752	-3.1275
7.1000	-15.4378	-3.2815
7.2000	-15.6461	-3.4333
7.3000	-16.6290	-3.5831
7.4000	-18.5743	-3.7308
7.5000	-17.3974	-3.8765
7.6000	-13.2902	-4.0203
7.7000	-10.3365	-4.1623
7.8000	-8.7295	-4.3024
7.9000	-8.0611	-4.4407
8.0000	-7.9449	-4.5772
8.1000	-8.0385	-4.7121
8.2000	-8.1051	-4.8453
8.3000	-8.1138	-4.9770
8.4000	-8.2376	-5.1070
8.5000	-8.7044	-5.2355
8.6000	-9.5771	-5.3625
8.7000	-10.4885	-5.4880
8.8000	-10.7405	-5.6121
8.9000	-10.3378	-5.7348
9.0000	-10.0071	-5.8561
9.1000	-10.1448	-5.9760
9.2000	-10.6747	-6.0947
9.3000	-11.2727	-6.2121
9.4000	-11.5843	-6.3282
9.5000	-11.4818	-6.4431
9.6000	-11.1722	-6.5568
9.7000	-10.9846	-6.6693
9.8000	-11.0264	-6.7807
9.9000	-10.9274	-6.8909

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
10.0000	-10.1780	-7.0000
10.1000	-9.0762	-7.1080
10.2000	-8.3989	-7.2150
10.3000	-8.6519	-7.3209
10.4000	-10.1857	-7.4258
10.5000	-13.6857	-7.5297
10.6000	-25.9020	-7.6326
10.7000	-24.9968	-7.7346
10.8000	-17.3228	-7.8356
10.9000	-13.9716	-7.9357
11.0000	-12.5094	-8.0348
11.1000	-12.1496	-8.1331
11.2000	-12.2783	-8.2305
11.3000	-12.2455	-8.3270
11.4000	-11.8151	-8.4226
11.5000	-11.3232	-8.5174
11.6000	-11.1232	-8.6114
11.7000	-11.3480	-8.7046
11.8000	-12.0284	-8.7971
11.9000	-13.1896	-8.8887
12.0000	-14.8337	-8.9795
12.1000	-16.8125	-9.0696
12.2000	-18.6573	-9.1590
12.3000	-19.6949	-9.2476
12.4000	-19.7124	-9.3355
12.5000	-19.2010	-9.4228
12.6000	-18.8167	-9.5093
12.7000	-18.9917	-9.5951
12.8000	-19.9017	-9.6802
12.9000	-21.5536	-9.7647
13.0000	-23.7984	-9.8486
13.1000	-25.9381	-9.9318
13.2000	-26.0695	-10.0143
13.3000	-24.1134	-10.0963
13.4000	-22.3421	-10.1776
13.5000	-21.7933	-10.2583
13.6000	-22.7716	-10.3385
13.7000	-25.4869	-10.4180
13.8000	-29.9706	-10.4970
13.9000	-33.6861	-10.5754
14.0000	-32.7171	-10.6532
14.1000	-31.2727	-10.7305
14.2000	-30.9590	-10.8072
14.3000	-32.7687	-10.8834
14.4000	-41.7781	-10.9591
14.5000	-34.5637	-11.0342
14.6000	-27.1174	-11.1088
14.7000	-23.3151	-11.1829
14.8000	-21.3548	-11.2565
14.9000	-20.4046	-11.3297

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
15.0000	-19.8766	-11.4023
15.1000	-19.5362	-11.4744
15.2000	-19.5415	-11.5461
15.3000	-20.1748	-11.6173
15.4000	-21.7545	-11.6880
15.5000	-24.8441	-11.7583
15.6000	-29.0211	-11.8281
15.7000	-24.8371	-11.8975
15.8000	-19.3271	-11.9664
15.9000	-15.9289	-12.0349
16.0000	-14.0863	-12.1030
16.1000	-13.4967	-12.1706
16.2000	-13.9783	-12.2379
16.3000	-15.2962	-12.3047
16.4000	-16.9585	-12.3711
16.5000	-18.1895	-12.4371
16.6000	-18.6724	-12.5027
16.7000	-18.9610	-12.5679
16.8000	-19.6993	-12.6327
16.9000	-21.3397	-12.6972
17.0000	-24.2093	-12.7612
17.1000	-27.0661	-12.8249
17.2000	-25.7928	-12.8882
17.3000	-23.8261	-12.9512
17.4000	-23.9889	-13.0137
17.5000	-27.2201	-13.0760
17.6000	-38.9831	-13.1378
17.7000	-31.4716	-13.1993
17.8000	-24.5854	-13.2605
17.9000	-21.7042	-13.3213
18.0000	-20.5127	-13.3818
18.1000	-20.4820	-13.4420
18.2000	-21.5243	-13.5018
18.3000	-23.4001	-13.5613
18.4000	-24.2874	-13.6204
18.5000	-22.5584	-13.6793
18.6000	-20.7177	-13.7378
18.7000	-20.1424	-13.7960
18.8000	-20.9826	-13.8539
18.9000	-23.2443	-13.9115
19.0000	-27.0206	-13.9688
19.1000	-32.5532	-14.0258
19.2000	-39.1156	-14.0825
19.3000	-40.3394	-14.1389
19.4000	-41.3008	-14.1950
19.5000	-43.8055	-14.2509
19.6000	-32.1203	-14.3064
19.7000	-25.3279	-14.3617
19.8000	-21.2467	-14.4166
19.9000	-18.8565	-14.4713

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
20.0000	-17.7248	-14.5257
20.1000	-17.5982	-14.5799
20.2000	-18.2726	-14.6338
20.3000	-19.5109	-14.6874
20.4000	-20.9340	-14.7408
20.5000	-21.9523	-14.7938
20.6000	-22.1303	-14.8467
20.7000	-21.7643	-14.8993
20.8000	-21.5163	-14.9516
20.9000	-21.8618	-15.0037
21.0000	-23.1336	-15.0555
21.1000	-25.8544	-15.1071
21.2000	-31.5676	-15.1584
21.3000	-36.3798	-15.2095
21.4000	-27.4045	-15.2603
21.5000	-22.8853	-15.3110
21.6000	-20.3946	-15.3613
21.7000	-18.9768	-15.4115
21.8000	-18.2259	-15.4614
21.9000	-17.9799	-15.5111
22.0000	-18.2363	-15.5606
22.1000	-19.0655	-15.6098
22.2000	-20.4713	-15.6588
22.3000	-22.1284	-15.7076
22.4000	-23.1293	-15.7562
22.5000	-22.8038	-15.8046
22.6000	-21.6324	-15.8527
22.7000	-20.1880	-15.9006
22.8000	-18.7863	-15.9484
22.9000	-17.7206	-15.9959
23.0000	-17.2215	-16.0432
23.1000	-17.4009	-16.0903
23.2000	-18.2706	-16.1372
23.3000	-19.7976	-16.1839
23.4000	-22.0188	-16.2304
23.5000	-25.1885	-16.2767
23.6000	-29.3033	-16.3228
23.7000	-29.9078	-16.3687
23.8000	-26.4351	-16.4144
23.9000	-24.0511	-16.4599
24.0000	-23.0122	-16.5053
24.1000	-22.8289	-16.5504
24.2000	-22.9121	-16.5954
24.3000	-22.8170	-16.6402
24.4000	-22.6817	-16.6847
24.5000	-22.9671	-16.7292
24.6000	-23.9101	-16.7734
24.7000	-25.2617	-16.8174
24.8000	-26.0883	-16.8613
24.9000	-25.6490	-16.9050

14.25 GHz @ -13.7 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
25.0000	-24.6707	-16.9485
25.1000	-23.9833	-16.9918
25.2000	-23.7093	-17.0350
25.3000	-23.5459	-17.0780
25.4000	-23.1141	-17.1208
25.5000	-22.3541	-17.1635
25.6000	-21.6204	-17.2060
25.7000	-21.3751	-17.2483
25.8000	-21.9581	-17.2905
25.9000	-23.5474	-17.3325
26.0000	-26.0964	-17.3743
26.1000	-29.0150	-17.4160
26.2000	-30.7342	-17.4575
26.3000	-30.0277	-17.4989
26.4000	-27.9718	-17.5401
26.5000	-26.0626	-17.5811
26.6000	-24.8505	-17.6220
26.7000	-24.2630	-17.6628
26.8000	-23.9294	-17.7034
26.9000	-23.4753	-17.7438
27.0000	-22.9078	-17.7841
27.1000	-22.5690	-17.8242
27.2000	-22.7192	-17.8642
27.3000	-23.2656	-17.9041
27.4000	-23.6261	-17.9438
27.5000	-23.1683	-17.9833
27.6000	-22.2023	-18.0227
27.7000	-21.5153	-18.0620
27.8000	-21.5630	-18.1011
27.9000	-22.5220	-18.1401
28.0000	-24.4817	-18.1790
28.1000	-27.5987	-18.2177
28.2000	-32.5376	-18.2562
28.3000	-41.8351	-18.2947
28.4000	-35.0135	-18.3330
28.5000	-28.0950	-18.3711
28.6000	-24.0174	-18.4092
28.7000	-21.4147	-18.4470
28.8000	-19.9156	-18.4848
28.9000	-19.3907	-18.5224
29.0000	-19.7592	-18.5599
29.1000	-20.8723	-18.5973
29.2000	-22.3435	-18.6346
29.3000	-25.4472	-18.6717
29.4000	-25.6320	-18.7087
29.5000	-25.0520	-18.7456
29.6000	-23.9953	-18.7823
29.7000	-22.6212	-18.8189
29.8000	-21.1903	-18.8554
29.9000	-20.0431	-18.8918
30.0000	-20.8520	-18.9280

Final

C band EIRP Spectral Density

Model Name: Intellian v240M

Test Date: Jan 13, 2014

Prepared by

RF Engineering Department
Intellian Technologies, Inc.

Confidential and Intellian proprietary

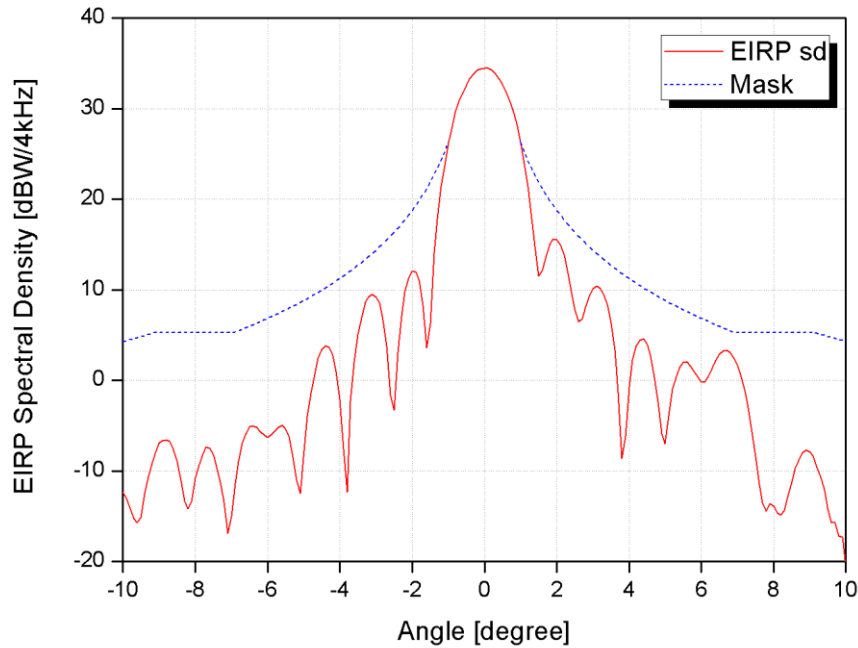
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1. C band EIRP Spectral Density of v240M

1.1. Azimuth Pattern for Co-pol, Narrow Angle (-10°~10°)



-7.415 dBW/4kHz Input power spectral density @ f=6.14 GHz & 0.7dB Radome loss.

- FCC EIRP spectral density regulation**

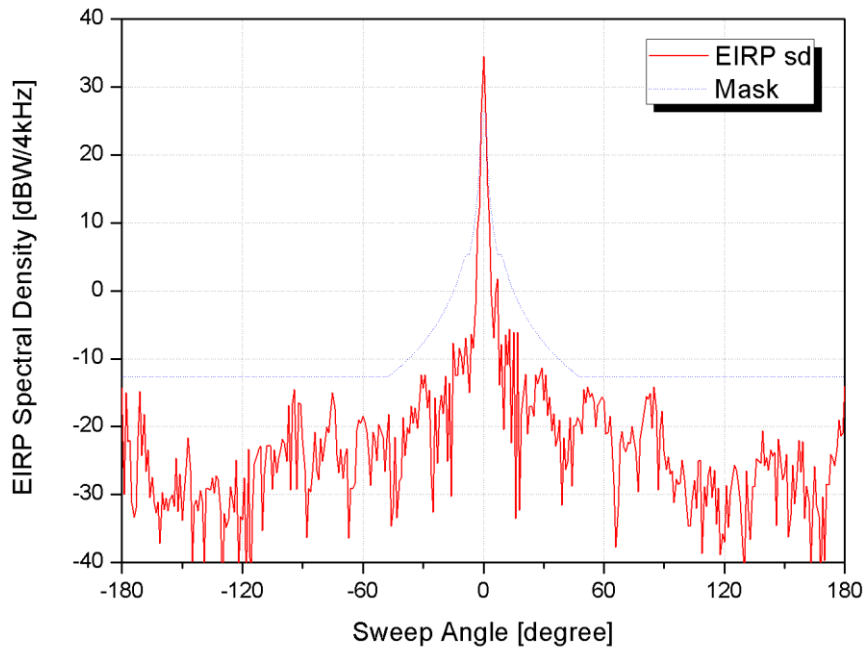
26.3-25log(θ)	dBW/4kHz	for	1.0° ≤ θ ≤ 7.0°
-5.3	dBW/4kHz	for	7.0° ≤ θ ≤ 9.2°
29.3-25log(θ)	dBW/4kHz	for	9.2° ≤ θ ≤ 48°
-12.7	dBW/4kHz	for	48° ≤ θ ≤ 180°

The v240M's C band Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -7.415 dBW/ 4kHz.

Note.

The EIRP spectral density pattern above is measured in Circular Polarization.

1.2. Azimuth Pattern for Co-pol, Wide Angle (-180°~180°)



-7.415 dBW/4kHz Input power spectral density @ f=6.14 GHz & 0.7 dB Radome loss.

▪ **FCC EIRP spectral density regulation**

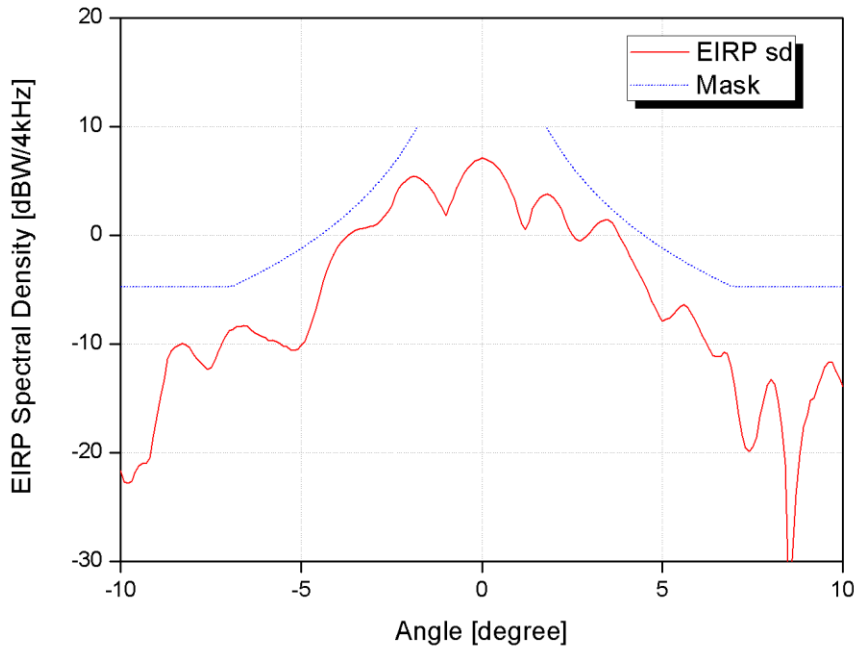
26.3-25log(θ)	dBW/4kHz	for	1.0° ≤ θ ≤ 7.0°
-5.3	dBW/4kHz	for	7.0° ≤ θ ≤ 9.2°
29.3-25log(θ)	dBW/4kHz	for	9.2° ≤ θ ≤ 48°
-12.7	dBW/4kHz	for	48° ≤ θ ≤ 180°

The v240M's C band Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -7.415 dBW/ 4kHz.

Note.

The EIRP spectral density pattern above is measured in Circular Polarization.

1.3. Azimuth Pattern for Cross-pol, Narrow angle (-10°~10°)



-7.415 dBW/4kHz Input power spectral density @ f=6.14 GHz & 0.7dB Radome loss.

- FCC EIRP spectral density regulation**

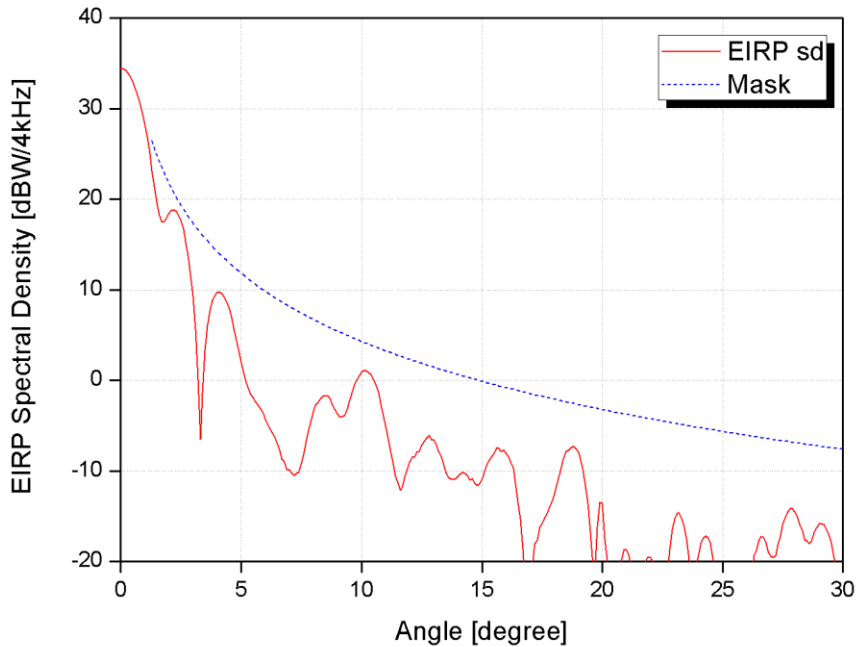
16.3-25log(θ)	dBW/4kHz	for	$1.8^\circ \leq \theta \leq 7.0^\circ$
-4.7	dBW/4kHz	for	$7.0^\circ \leq \theta \leq 9.2^\circ$

The v240M's C band Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -7.415 dBW/ 4kHz.

Note.

The EIRP spectral density pattern above is measured in Circular Polarization.

1.4. Elevation Pattern for Co-pol, Narrow Angle (0°~30°)



-7.415 dBW/4kHz Input power spectral density @ f=6.14 GHz & 0.7dB Radome loss.

- FCC EIRP spectral density regulation**

29.3-25log(θ)	dBW/4kHz	for	$1.25^\circ \leq \theta \leq 48^\circ$
-12.7	dBW/4kHz	for	$48^\circ \leq \theta \leq 180^\circ$

The v240M's C band Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -7.415 dBW/ 4kHz.

Note.

The EIRP spectral density pattern above is measured in Circular Polarization.

2. C band EIRP Spectral Density Data

2.1. Azimuth Pattern for Co-pol (-10°~10°)

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-10.000	-12.301	4.300
-9.900	-13.068	4.409
-9.800	-14.129	4.519
-9.700	-15.277	4.631
-9.600	-15.710	4.743
-9.500	-15.162	4.857
-9.400	-12.454	4.972
-9.300	-10.655	5.088
-9.200	-9.159	5.205
-9.100	-8.072	5.300
-9.000	-6.966	5.300
-8.900	-6.644	5.300
-8.800	-6.574	5.300
-8.700	-6.754	5.300
-8.600	-7.642	5.300
-8.500	-8.940	5.300
-8.400	-11.026	5.300
-8.300	-13.310	5.300
-8.200	-14.130	5.300
-8.100	-13.362	5.300
-8.000	-10.802	5.300
-7.900	-9.376	5.300
-7.800	-8.229	5.300
-7.700	-7.401	5.300
-7.600	-7.499	5.300
-7.500	-8.228	5.300
-7.400	-9.819	5.300
-7.300	-11.185	5.300
-7.200	-13.438	5.300
-7.100	-16.926	5.300
-7.000	-14.978	5.300
-6.900	-11.356	5.329
-6.800	-8.976	5.487
-6.700	-6.977	5.648
-6.600	-5.884	5.811
-6.500	-5.141	5.977
-6.400	-5.017	6.146
-6.300	-5.211	6.316
-6.200	-5.697	6.490
-6.100	-6.047	6.667
-6.000	-6.346	6.846
-5.900	-6.032	7.029
-5.800	-5.597	7.214
-5.700	-5.173	7.403
-5.600	-5.010	7.595
-5.500	-5.320	7.791
-5.400	-6.259	7.990
-5.300	-8.466	8.193
-5.200	-10.976	8.400
-5.100	-12.503	8.611

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-5.000	-8.467	8.826
-4.900	-3.980	9.045
-4.800	-1.395	9.269
-4.700	0.620	9.498
-4.600	2.381	9.731
-4.500	3.378	9.970
-4.400	3.825	10.214
-4.300	3.679	10.463
-4.200	2.753	10.719
-4.100	1.011	10.980
-4.000	-2.079	11.249
-3.900	-7.579	11.523
-3.800	-12.302	11.805
-3.700	-2.327	12.095
-3.600	1.996	12.392
-3.500	5.072	12.698
-3.400	6.918	13.013
-3.300	8.656	13.337
-3.200	9.216	13.671
-3.100	9.475	14.016
-3.000	9.243	14.372
-2.900	8.484	14.740
-2.800	6.709	15.121
-2.700	3.799	15.516
-2.600	-1.623	15.926
-2.500	-3.280	16.351
-2.400	3.083	16.795
-2.300	7.132	17.257
-2.200	9.755	17.739
-2.100	11.242	18.245
-2.000	12.086	18.774
-1.900	11.954	19.331
-1.800	11.039	19.918
-1.700	8.282	20.539
-1.600	3.614	21.197
-1.500	6.253	21.898
-1.400	14.032	22.647
-1.300	17.850	23.451
-1.200	21.420	24.320
-1.100	23.735	25.265
-1.000	26.276	26.300
-0.900	27.717	
-0.800	29.709	
-0.700	30.893	
-0.600	31.738	
-0.500	32.640	
-0.400	33.353	
-0.300	33.800	
-0.200	34.252	
-0.100	34.410	

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	34.460	
0.100	34.426	
0.200	34.221	
0.300	33.851	
0.400	33.289	
0.500	32.686	
0.600	31.851	
0.700	30.791	
0.800	29.602	
0.900	28.080	
1.000	26.300	26.300
1.100	23.932	25.265
1.200	21.402	24.320
1.300	17.862	23.451
1.400	14.830	22.647
1.500	11.515	21.898
1.600	12.158	21.197
1.700	13.701	20.539
1.800	14.996	19.918
1.900	15.584	19.331
2.000	15.513	18.774
2.100	14.920	18.245
2.200	13.823	17.739
2.300	12.126	17.257
2.400	9.943	16.795
2.500	7.786	16.351
2.600	6.452	15.926
2.700	6.803	15.516
2.800	8.066	15.121
2.900	9.312	14.740
3.000	10.109	14.372
3.100	10.410	14.016
3.200	10.218	13.671
3.300	9.460	13.337
3.400	8.354	13.013
3.500	6.315	12.698
3.600	3.365	12.392
3.700	-1.322	12.095
3.800	-8.665	11.805
3.900	-6.159	11.523
4.000	-0.777	11.249
4.100	2.285	10.980
4.200	3.813	10.719
4.300	4.425	10.463
4.400	4.546	10.214
4.500	3.955	9.970
4.600	2.683	9.731
4.700	0.332	9.498
4.800	-2.397	9.269
4.900	-5.858	9.045

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
5.000	-6.984	8.826
5.100	-3.922	8.611
5.200	-0.987	8.400
5.300	0.381	8.193
5.400	1.495	7.990
5.500	1.976	7.791
5.600	2.051	7.595
5.700	1.564	7.403
5.800	0.916	7.214
5.900	0.402	7.029
6.000	-0.181	6.846
6.100	-0.134	6.667
6.200	0.466	6.490
6.300	1.442	6.316
6.400	2.188	6.146
6.500	2.865	5.977
6.600	3.235	5.811
6.700	3.276	5.648
6.800	3.068	5.487
6.900	2.474	5.329
7.000	1.689	5.300
7.100	0.390	5.300
7.200	-1.212	5.300
7.300	-3.041	5.300
7.400	-5.675	5.300
7.500	-8.388	5.300
7.600	-11.507	5.300
7.700	-13.543	5.300
7.800	-14.408	5.300
7.900	-13.621	5.300
8.000	-13.909	5.300
8.100	-14.627	5.300
8.200	-14.860	5.300
8.300	-14.372	5.300
8.400	-12.657	5.300
8.500	-11.185	5.300
8.600	-9.751	5.300
8.700	-8.818	5.300
8.800	-7.965	5.300
8.900	-7.747	5.300
9.000	-7.925	5.300
9.100	-8.341	5.300
9.200	-9.609	5.205
9.300	-10.659	5.088
9.400	-12.027	4.972
9.500	-14.025	4.857
9.600	-15.686	4.743
9.700	-15.738	4.631
9.800	-17.206	4.519
9.900	-17.321	4.409
10.0000	-20.4440	4.3000

2.2. Azimuth Pattern for Co-pol (-180°~180°)

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-180.000	-14.258	-12.700
-179.000	-30.013	-12.700
-178.000	-14.974	-12.700
-177.000	-22.249	-12.700
-176.000	-21.990	-12.700
-175.000	-31.184	-12.700
-174.000	-33.357	-12.700
-173.000	-32.004	-12.700
-172.000	-21.514	-12.700
-171.000	-14.844	-12.700
-170.000	-24.317	-12.700
-169.000	-18.214	-12.700
-168.000	-26.654	-12.700
-167.000	-23.449	-12.700
-166.000	-30.443	-12.700
-165.000	-27.424	-12.700
-164.000	-31.167	-12.700
-163.000	-32.670	-12.700
-162.000	-31.047	-12.700
-161.000	-37.215	-12.700
-160.000	-29.725	-12.700
-159.000	-32.217	-12.700
-158.000	-30.553	-12.700
-157.000	-32.401	-12.700
-156.000	-30.699	-12.700
-155.000	-30.027	-12.700
-154.000	-31.789	-12.700
-153.000	-24.655	-12.700
-152.000	-32.475	-12.700
-151.000	-27.020	-12.700
-150.000	-33.811	-12.700
-149.000	-29.484	-12.700
-148.000	-26.078	-12.700
-147.000	-21.642	-12.700
-146.000	-26.425	-12.700
-145.000	-39.927	-12.700
-144.000	-31.549	-12.700
-143.000	-30.857	-12.700
-142.000	-32.422	-12.700
-141.000	-29.361	-12.700
-140.000	-30.953	-12.700
-139.000	-40.005	-12.700
-138.000	-29.130	-12.700
-137.000	-29.110	-12.700
-136.000	-29.358	-12.700

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-135.000	-27.526	-12.700
-134.000	-29.747	-12.700
-133.000	-27.242	-12.700
-132.000	-27.691	-12.700
-131.000	-32.190	-12.700
-130.000	-45.121	-12.700
-129.000	-32.758	-12.700
-128.000	-34.829	-12.700
-127.000	-33.629	-12.700
-126.000	-28.883	-12.700
-125.000	-30.676	-12.700
-124.000	-32.590	-12.700
-123.000	-24.961	-12.700
-122.000	-40.800	-12.700
-121.000	-33.225	-12.700
-120.000	-33.705	-12.700
-119.000	-27.577	-12.700
-118.000	-43.522	-12.700
-117.000	-23.385	-12.700
-116.000	-47.355	-12.700
-115.000	-32.180	-12.700
-114.000	-25.528	-12.700
-113.000	-24.693	-12.700
-112.000	-23.447	-12.700
-111.000	-22.830	-12.700
-110.000	-35.352	-12.700
-109.000	-26.974	-12.700
-108.000	-22.882	-12.700
-107.000	-22.745	-12.700
-106.000	-22.901	-12.700
-105.000	-29.235	-12.700
-104.000	-23.474	-12.700
-103.000	-26.805	-12.700
-102.000	-24.682	-12.700
-101.000	-23.405	-12.700
-100.000	-21.813	-12.700
-99.000	-22.423	-12.700
-98.000	-25.118	-12.700
-97.000	-16.872	-12.700
-96.000	-29.311	-12.700
-95.000	-16.588	-12.700
-94.000	-14.530	-12.700
-93.000	-29.249	-12.700
-92.000	-16.516	-12.700
-91.000	-16.672	-12.700

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-90.000	-21.966	-12.700
-89.000	-26.281	-12.700
-88.000	-36.311	-12.700
-87.000	-29.148	-12.700
-86.000	-29.560	-12.700
-85.000	-26.735	-12.700
-84.000	-20.808	-12.700
-83.000	-26.514	-12.700
-82.000	-27.840	-12.700
-81.000	-21.737	-12.700
-80.000	-25.113	-12.700
-79.000	-22.284	-12.700
-78.000	-20.057	-12.700
-77.000	-20.939	-12.700
-76.000	-17.709	-12.700
-75.000	-15.054	-12.700
-74.000	-17.372	-12.700
-73.000	-24.212	-12.700
-72.000	-26.852	-12.700
-71.000	-23.309	-12.700
-70.000	-27.668	-12.700
-69.000	-24.424	-12.700
-68.000	-23.250	-12.700
-67.000	-36.442	-12.700
-66.000	-29.122	-12.700
-65.000	-29.046	-12.700
-64.000	-28.349	-12.700
-63.000	-20.491	-12.700
-62.000	-19.062	-12.700
-61.000	-19.527	-12.700
-60.000	-18.449	-12.700
-59.000	-19.333	-12.700
-58.000	-20.812	-12.700
-57.000	-24.051	-12.700
-56.000	-28.656	-12.700
-55.000	-20.812	-12.700
-54.000	-21.985	-12.700
-53.000	-25.041	-12.700
-52.000	-19.730	-12.700
-51.000	-20.727	-12.700
-50.000	-21.587	-12.700
-49.000	-26.589	-12.700
-48.000	-21.721	-12.700
-47.000	-18.210	-12.502
-46.000	-34.655	-12.269

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-45.000	-32.055	-12.030
-44.000	-21.608	-11.786
-43.000	-33.478	-11.537
-42.000	-28.054	-11.281
-41.000	-27.506	-11.020
-40.000	-18.691	-10.751
-39.000	-24.265	-10.477
-38.000	-20.181	-10.195
-37.000	-21.039	-9.905
-36.000	-17.002	-9.608
-35.000	-19.517	-9.302
-34.000	-17.260	-8.987
-33.000	-20.209	-8.663
-32.000	-16.385	-8.329
-31.000	-12.387	-7.984
-30.000	-14.370	-7.628
-29.000	-12.398	-7.260
-28.000	-17.273	-6.879
-27.000	-14.610	-6.484
-26.000	-27.272	-6.074
-25.000	-32.566	-5.649
-24.000	-15.758	-5.205
-23.000	-25.393	-4.743
-22.000	-17.652	-4.261
-21.000	-15.344	-3.755
-20.000	-18.143	-3.226
-19.000	-12.561	-2.669
-18.000	-25.075	-2.082
-17.000	-13.646	-1.461
-16.000	-30.221	-0.803
-15.000	-7.679	-0.102
-14.000	-12.504	0.647
-13.000	-12.457	1.451
-12.000	-8.465	2.320
-11.000	-9.581	3.265
-10.000	-12.301	4.300
-9.000	-6.966	5.300
-8.000	-10.802	5.300
-7.000	-14.978	5.300
-6.000	-6.346	6.846
-5.000	-8.467	8.826
-4.000	-2.079	11.249
-3.000	9.243	14.372
-2.000	12.086	18.774
-1.000	26.276	26.300

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	34.460	
1.000	26.300	26.300
2.000	15.513	18.774
3.000	10.109	14.372
4.000	-0.776	11.249
5.000	-6.984	8.826
6.000	-0.181	6.846
7.000	1.689	5.300
8.000	-13.909	5.300
9.000	-7.925	5.300
10.000	-20.444	4.300
11.000	-6.495	3.265
12.000	-10.931	2.320
13.000	-5.599	1.451
14.000	-22.374	0.647
15.000	-6.153	-0.102
16.000	-33.523	-0.803
17.000	-6.150	-1.461
18.000	-32.319	-2.082
19.000	-18.065	-2.669
20.000	-14.758	-3.226
21.000	-12.326	-3.755
22.000	-21.070	-4.261
23.000	-17.060	-4.743
24.000	-17.085	-5.205
25.000	-18.433	-5.649
26.000	-12.390	-6.074
27.000	-13.668	-6.484
28.000	-12.664	-6.879
29.000	-11.328	-7.260
30.000	-16.160	-7.628
31.000	-12.425	-7.984
32.000	-18.424	-8.329
33.000	-15.617	-8.663
34.000	-20.583	-8.987
35.000	-18.071	-9.302
36.000	-22.833	-9.608
37.000	-21.786	-9.905
38.000	-19.067	-10.195
39.000	-31.592	-10.477
40.000	-21.611	-10.751
41.000	-26.337	-11.020
42.000	-25.249	-11.281
43.000	-18.620	-11.537
44.000	-28.748	-11.786

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
45.000	-19.874	-12.030
46.000	-19.913	-12.269
47.000	-18.622	-12.502
48.000	-19.469	-12.700
49.000	-21.059	-12.700
50.000	-14.510	-12.700
51.000	-16.500	-12.700
52.000	-14.164	-12.700
53.000	-15.623	-12.700
54.000	-15.096	-12.700
55.000	-16.199	-12.700
56.000	-20.046	-12.700
57.000	-16.913	-12.700
58.000	-16.218	-12.700
59.000	-15.649	-12.700
60.000	-16.159	-12.700
61.000	-21.132	-12.700
62.000	-20.802	-12.700
63.000	-18.514	-12.700
64.000	-22.920	-12.700
65.000	-28.500	-12.700
66.000	-37.696	-12.700
67.000	-31.800	-12.700
68.000	-22.439	-12.700
69.000	-20.744	-12.700
70.000	-23.104	-12.700
71.000	-23.723	-12.700
72.000	-22.304	-12.700
73.000	-22.510	-12.700
74.000	-20.015	-12.700
75.000	-21.831	-12.700
76.000	-23.528	-12.700
77.000	-29.577	-12.700
78.000	-21.791	-12.700
79.000	-20.000	-12.700
80.000	-18.052	-12.700
81.000	-15.578	-12.700
82.000	-15.947	-12.700
83.000	-15.110	-12.700
84.000	-20.239	-12.700
85.000	-14.149	-12.700
86.000	-17.490	-12.700
87.000	-29.283	-12.700
88.000	-20.465	-12.700
89.000	-17.694	-12.700

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
90.000	-23.655	-12.700
91.000	-26.324	-12.700
92.000	-24.479	-12.700
93.000	-26.963	-12.700
94.000	-26.484	-12.700
95.000	-31.206	-12.700
96.000	-27.733	-12.700
97.000	-28.444	-12.700
98.000	-28.297	-12.700
99.000	-24.889	-12.700
100.000	-27.852	-12.700
101.000	-31.428	-12.700
102.000	-34.594	-12.700
103.000	-34.642	-12.700
104.000	-30.788	-12.700
105.000	-27.866	-12.700
106.000	-32.019	-12.700
107.000	-25.126	-12.700
108.000	-24.959	-12.700
109.000	-38.656	-12.700
110.000	-28.803	-12.700
111.000	-31.720	-12.700
112.000	-27.103	-12.700
113.000	-25.913	-12.700
114.000	-30.476	-12.700
115.000	-26.400	-12.700
116.000	-34.367	-12.700
117.000	-29.025	-12.700
118.000	-38.862	-12.700
119.000	-35.734	-12.700
120.000	-37.022	-12.700
121.000	-28.655	-12.700
122.000	-34.852	-12.700
123.000	-29.964	-12.700
124.000	-27.317	-12.700
125.000	-25.647	-12.700
126.000	-26.414	-12.700
127.000	-28.436	-12.700
128.000	-30.956	-12.700
129.000	-37.700	-12.700
130.000	-41.389	-12.700
131.000	-26.535	-12.700
132.000	-32.434	-12.700
133.000	-36.656	-12.700
134.000	-28.837	-12.700

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
135.000	-28.811	-12.700
136.000	-24.780	-12.700
137.000	-25.002	-12.700
138.000	-25.414	-12.700
139.000	-20.664	-12.700
140.000	-25.743	-12.700
141.000	-24.565	-12.700
142.000	-26.445	-12.700
143.000	-23.418	-12.700
144.000	-24.402	-12.700
145.000	-23.808	-12.700
146.000	-34.537	-12.700
147.000	-21.864	-12.700
148.000	-25.275	-12.700
149.000	-27.837	-12.700
150.000	-26.854	-12.700
151.000	-24.114	-12.700
152.000	-36.214	-12.700
153.000	-33.012	-12.700
154.000	-25.705	-12.700
155.000	-31.410	-12.700
156.000	-28.210	-12.700
157.000	-22.035	-12.700
158.000	-26.722	-12.700
159.000	-22.263	-12.700
160.000	-33.503	-12.700
161.000	-28.740	-12.700
162.000	-30.900	-12.700
163.000	-40.309	-12.700
164.000	-32.101	-12.700
165.000	-25.917	-12.700
166.000	-31.555	-12.700
167.000	-33.110	-12.700
168.000	-43.390	-12.700
169.000	-30.339	-12.700
170.000	-39.691	-12.700
171.000	-28.509	-12.700
172.000	-28.521	-12.700
173.000	-24.105	-12.700
174.000	-24.714	-12.700
175.000	-25.756	-12.700
176.000	-23.086	-12.700
177.000	-19.010	-12.700
178.000	-21.351	-12.700
179.000	-20.960	-12.700
180.000	-14.079	-12.700

2.3. Azimuth Pattern for Cross-pol (-10°~10°)

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-10.000	-21.664	-4.700
-9.900	-22.704	-4.700
-9.800	-22.794	-4.700
-9.700	-22.634	-4.700
-9.600	-21.824	-4.700
-9.500	-21.204	-4.700
-9.400	-21.004	-4.700
-9.300	-21.014	-4.700
-9.200	-20.494	-4.700
-9.100	-18.594	-4.700
-9.000	-16.724	-4.700
-8.900	-14.824	-4.700
-8.800	-13.274	-4.700
-8.700	-11.394	-4.700
-8.600	-10.654	-4.700
-8.500	-10.254	-4.700
-8.400	-10.104	-4.700
-8.300	-9.904	-4.700
-8.200	-10.044	-4.700
-8.100	-10.284	-4.700
-8.000	-10.864	-4.700
-7.900	-11.364	-4.700
-7.800	-11.674	-4.700
-7.700	-11.954	-4.700
-7.600	-12.354	-4.700
-7.500	-12.174	-4.700
-7.400	-11.524	-4.700
-7.300	-10.754	-4.700
-7.200	-9.984	-4.700
-7.100	-9.264	-4.700
-7.000	-8.744	-4.700
-6.900	-8.654	-4.671
-6.800	-8.394	-4.513
-6.700	-8.394	-4.352
-6.600	-8.284	-4.189
-6.500	-8.374	-4.023
-6.400	-8.644	-3.854
-6.300	-8.944	-3.684
-6.200	-9.134	-3.510
-6.100	-9.284	-3.333
-6.000	-9.414	-3.154
-5.900	-9.674	-2.971
-5.800	-9.664	-2.786
-5.700	-9.764	-2.597
-5.600	-9.924	-2.405
-5.500	-10.154	-2.209
-5.400	-10.234	-2.010
-5.300	-10.514	-1.807
-5.200	-10.554	-1.600
-5.100	-10.464	-1.389

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
-5.000	-10.114	-1.174
-4.900	-9.734	-0.955
-4.800	-8.794	-0.731
-4.700	-7.824	-0.502
-4.600	-6.934	-0.269
-4.500	-5.634	-0.030
-4.400	-4.354	0.214
-4.300	-3.294	0.463
-4.200	-2.424	0.719
-4.100	-1.734	0.980
-4.000	-1.134	1.249
-3.900	-0.624	1.523
-3.800	-0.284	1.805
-3.700	-0.004	2.095
-3.600	0.246	2.392
-3.500	0.456	2.698
-3.400	0.586	3.013
-3.300	0.626	3.337
-3.200	0.696	3.671
-3.100	0.836	4.016
-3.000	0.876	4.372
-2.900	1.046	4.740
-2.800	1.356	5.121
-2.700	1.736	5.516
-2.600	2.156	5.926
-2.500	2.716	6.351
-2.400	3.686	6.795
-2.300	4.366	7.257
-2.200	4.746	7.739
-2.100	5.066	8.245
-2.000	5.326	8.774
-1.900	5.446	9.331
-1.800	5.416	9.918
-1.700	5.196	
-1.600	4.916	
-1.500	4.606	
-1.400	4.146	
-1.300	3.726	
-1.200	3.056	
-1.100	2.514	
-1.000	1.790	
-0.900	2.626	
-0.800	3.361	
-0.700	4.370	
-0.600	5.063	
-0.500	5.749	
-0.400	6.152	
-0.300	6.530	
-0.200	6.830	
-0.100	6.993	

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	7.125	
0.100	7.026	
0.200	6.856	
0.300	6.651	
0.400	6.345	
0.500	6.051	
0.600	5.433	
0.700	4.848	
0.800	4.030	
0.900	3.303	
1.000	2.177	
1.100	1.054	
1.200	0.535	
1.300	1.251	
1.400	2.486	
1.500	3.016	
1.600	3.476	
1.700	3.686	
1.800	3.786	9.918
1.900	3.676	9.331
2.000	3.396	8.774
2.100	2.936	8.245
2.200	2.376	7.739
2.300	1.536	7.257
2.400	0.656	6.795
2.500	0.056	6.351
2.600	-0.374	5.926
2.700	-0.544	5.516
2.800	-0.354	5.121
2.900	-0.074	4.740
3.000	0.326	4.372
3.100	0.756	4.016
3.200	1.046	3.671
3.300	1.266	3.337
3.400	1.406	3.013
3.500	1.426	2.698
3.600	1.186	2.392
3.700	0.706	2.095
3.800	-0.044	1.805
3.900	-0.614	1.523
4.000	-1.204	1.249
4.100	-1.904	0.980
4.200	-2.514	0.719
4.300	-3.204	0.463
4.400	-3.834	0.214
4.500	-4.484	-0.030
4.600	-5.124	-0.269
4.700	-6.044	-0.502
4.800	-6.654	-0.731
4.900	-7.394	-0.955

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
5.000	-7.854	-1.174
5.100	-7.694	-1.389
5.200	-7.574	-1.600
5.300	-7.254	-1.807
5.400	-6.834	-2.010
5.500	-6.564	-2.209
5.600	-6.364	-2.405
5.700	-6.634	-2.597
5.800	-7.254	-2.786
5.900	-7.724	-2.971
6.000	-8.434	-3.154
6.100	-9.234	-3.333
6.200	-9.814	-3.510
6.300	-10.504	-3.684
6.400	-11.024	-3.854
6.500	-11.184	-4.023
6.600	-11.134	-4.189
6.700	-10.774	-4.352
6.800	-10.864	-4.513
6.900	-12.064	-4.671
7.000	-13.884	-4.700
7.100	-16.424	-4.700
7.200	-18.434	-4.700
7.300	-19.544	-4.700
7.400	-19.904	-4.700
7.500	-19.444	-4.700
7.600	-18.574	-4.700
7.700	-16.724	-4.700
7.800	-15.254	-4.700
7.900	-13.774	-4.700
8.000	-13.284	-4.700
8.100	-13.684	-4.700
8.200	-15.104	-4.700
8.300	-17.474	-4.700
8.400	-21.044	-4.700
8.500	-34.764	-4.700
8.600	-29.754	-4.700
8.700	-23.854	-4.700
8.800	-20.214	-4.700
8.900	-17.634	-4.700
9.000	-16.614	-4.700
9.100	-15.214	-4.700
9.200	-14.964	-4.700
9.300	-13.834	-4.700
9.400	-12.954	-4.700
9.500	-12.094	-4.700
9.600	-11.674	-4.700
9.700	-11.614	-4.700
9.800	-12.504	-4.700
9.900	-13.154	-4.700
10.000	-13.934	-4.700

2.4. Elevation Pattern for Co-pol (0°~30°)

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
0.000	34.460	
0.100	34.408	
0.200	34.222	
0.300	33.915	
0.400	33.470	
0.500	32.936	
0.600	32.260	
0.700	31.492	
0.800	30.599	
0.900	29.472	
1.000	28.259	
1.100	26.852	
1.200	25.083	
1.300	23.189	26.451
1.400	21.438	25.647
1.500	19.631	24.898
1.600	18.220	24.197
1.700	17.512	23.539
1.800	17.520	22.918
1.900	17.967	22.331
2.000	18.381	21.774
2.100	18.724	21.245
2.200	18.792	20.739
2.300	18.641	20.257
2.400	18.196	19.795
2.500	17.520	19.351
2.600	16.631	18.926
2.700	15.338	18.516
2.800	13.786	18.121
2.900	11.608	17.740
3.000	9.314	17.372
3.100	5.624	17.016
3.200	0.076	16.671
3.300	-6.532	16.337
3.400	-1.417	16.013
3.500	3.324	15.698
3.600	6.016	15.392
3.700	7.665	15.095
3.800	8.840	14.805
3.900	9.380	14.523
4.000	9.718	14.249
4.100	9.760	13.980
4.200	9.559	13.719
4.300	9.211	13.463
4.400	8.668	13.214
4.500	7.915	12.970
4.600	6.857	12.731
4.700	5.776	12.498
4.800	4.587	12.269
4.900	3.306	12.045

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
5.000	2.013	11.826
5.100	0.836	11.611
5.200	-0.190	11.400
5.300	-0.947	11.193
5.400	-1.559	10.990
5.500	-1.862	10.791
5.600	-2.382	10.595
5.700	-2.698	10.403
5.800	-3.158	10.214
5.900	-3.588	10.029
6.000	-4.364	9.846
6.100	-4.748	9.667
6.200	-5.306	9.490
6.300	-5.839	9.316
6.400	-6.301	9.146
6.500	-7.012	8.977
6.600	-7.780	8.811
6.700	-8.718	8.648
6.800	-8.984	8.487
6.900	-9.824	8.329
7.000	-9.924	8.173
7.100	-10.257	8.019
7.200	-10.520	7.867
7.300	-10.265	7.717
7.400	-10.154	7.569
7.500	-9.230	7.423
7.600	-8.174	7.280
7.700	-6.758	7.138
7.800	-5.504	6.998
7.900	-4.402	6.859
8.000	-3.349	6.723
8.100	-2.732	6.588
8.200	-2.475	6.455
8.300	-2.030	6.323
8.400	-1.741	6.193
8.500	-1.727	6.065
8.600	-1.723	5.938
8.700	-2.127	5.812
8.800	-2.703	5.688
8.900	-3.206	5.565
9.000	-3.704	5.444
9.100	-4.054	5.324
9.200	-4.012	5.205
9.300	-3.863	5.088
9.400	-3.169	4.972
9.500	-2.357	4.857
9.600	-1.434	4.743
9.700	-0.553	4.631
9.800	-0.014	4.519
9.900	0.490	4.409

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
10.000	0.919	4.300
10.100	1.088	4.192
10.200	1.064	4.085
10.300	0.868	3.979
10.400	0.632	3.874
10.500	0.048	3.770
10.600	-0.527	3.667
10.700	-1.348	3.565
10.800	-2.447	3.464
10.900	-3.715	3.364
11.000	-5.013	3.265
11.100	-6.291	3.167
11.200	-7.791	3.070
11.300	-9.076	2.973
11.400	-10.560	2.877
11.500	-11.289	2.783
11.600	-12.111	2.689
11.700	-11.751	2.595
11.800	-10.573	2.503
11.900	-9.812	2.411
12.000	-8.971	2.320
12.100	-8.484	2.230
12.200	-8.399	2.141
12.300	-7.933	2.052
12.400	-7.842	1.964
12.500	-7.127	1.877
12.600	-6.703	1.791
12.700	-6.354	1.705
12.800	-6.092	1.620
12.900	-6.606	1.535
13.000	-6.562	1.451
13.100	-7.045	1.368
13.200	-7.885	1.286
13.300	-8.329	1.204
13.400	-9.257	1.122
13.500	-10.250	1.042
13.600	-10.741	0.962
13.700	-10.859	0.882
13.800	-10.949	0.803
13.900	-10.871	0.725
14.000	-10.589	0.647
14.100	-10.327	0.570
14.200	-10.203	0.493
14.300	-10.310	0.417
14.400	-10.527	0.341
14.500	-10.988	0.266
14.600	-10.893	0.191
14.700	-11.381	0.117
14.800	-11.649	0.043
14.900	-11.361	-0.030

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
15.000	-10.834	-0.102
15.100	-10.202	-0.174
15.200	-9.401	-0.246
15.300	-8.826	-0.317
15.400	-8.409	-0.388
15.500	-8.036	-0.458
15.600	-7.456	-0.528
15.700	-7.493	-0.597
15.800	-7.833	-0.666
15.900	-7.687	-0.735
16.000	-8.103	-0.803
16.100	-8.424	-0.871
16.200	-9.094	-0.938
16.300	-9.760	-1.005
16.400	-11.332	-1.071
16.500	-13.442	-1.137
16.600	-15.303	-1.203
16.700	-18.690	-1.268
16.800	-22.977	-1.333
16.900	-26.866	-1.397
17.000	-23.727	-1.461
17.100	-20.482	-1.525
17.200	-18.051	-1.588
17.300	-17.678	-1.651
17.400	-16.193	-1.714
17.500	-15.780	-1.776
17.600	-15.145	-1.838
17.700	-14.682	-1.899
17.800	-14.068	-1.961
17.900	-13.480	-2.021
18.000	-12.708	-2.082
18.100	-11.528	-2.142
18.200	-10.486	-2.202
18.300	-9.501	-2.261
18.400	-8.639	-2.320
18.500	-7.847	-2.379
18.600	-7.751	-2.438
18.700	-7.419	-2.496
18.800	-7.268	-2.554
18.900	-7.544	-2.612
19.000	-7.926	-2.669
19.100	-8.705	-2.726
19.200	-9.888	-2.783
19.300	-11.632	-2.839
19.400	-13.535	-2.895
19.500	-16.780	-2.951
19.600	-20.419	-3.006
19.700	-20.074	-3.062
19.800	-16.211	-3.117
19.900	-13.473	-3.171

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
20.000	-13.629	-3.226
20.100	-17.540	-3.280
20.200	-19.929	-3.334
20.300	-21.642	-3.387
20.400	-25.271	-3.441
20.500	-25.666	-3.494
20.600	-23.328	-3.547
20.700	-20.859	-3.599
20.800	-19.748	-3.652
20.900	-18.631	-3.704
21.000	-18.728	-3.755
21.100	-19.439	-3.807
21.200	-20.711	-3.858
21.300	-23.878	-3.909
21.400	-26.356	-3.960
21.500	-26.770	-4.011
21.600	-25.056	-4.061
21.700	-22.117	-4.111
21.800	-20.047	-4.161
21.900	-19.533	-4.211
22.000	-19.567	-4.261
22.100	-20.024	-4.310
22.200	-20.908	-4.359
22.300	-24.593	-4.408
22.400	-29.588	-4.456
22.500	-32.919	-4.505
22.600	-25.740	-4.553
22.700	-21.626	-4.601
22.800	-18.643	-4.648
22.900	-16.499	-4.696
23.000	-15.296	-4.743
23.100	-14.673	-4.790
23.200	-14.646	-4.837
23.300	-15.206	-4.884
23.400	-16.152	-4.930
23.500	-17.508	-4.977
23.600	-19.851	-5.023
23.700	-21.189	-5.069
23.800	-21.891	-5.114
23.900	-20.585	-5.160
24.000	-19.311	-5.205
24.100	-17.935	-5.250
24.200	-17.389	-5.295
24.300	-17.148	-5.340
24.400	-17.434	-5.385
24.500	-17.937	-5.429
24.600	-19.615	-5.473
24.700	-20.741	-5.517
24.800	-24.099	-5.561
24.900	-29.215	-5.605

6.14 GHz @ -7.54 dBW/4kHz		
Angle (Degree)	EIRP SD(dBW/4kHz)	Mask(dBW/4kHz)
25.000	-35.287	-5.649
25.100	-34.648	-5.692
25.200	-30.219	-5.735
25.300	-28.298	-5.778
25.400	-26.961	-5.821
25.500	-26.724	-5.864
25.600	-29.254	-5.906
25.700	-33.278	-5.948
25.800	-37.901	-5.990
25.900	-33.516	-6.032
26.000	-27.595	-6.074
26.100	-23.020	-6.116
26.200	-21.480	-6.158
26.300	-19.374	-6.199
26.400	-18.700	-6.240
26.500	-17.603	-6.281
26.600	-17.258	-6.322
26.700	-17.304	-6.363
26.800	-17.881	-6.403
26.900	-19.022	-6.444
27.000	-19.420	-6.484
27.100	-19.571	-6.524
27.200	-19.274	-6.564
27.300	-18.171	-6.604
27.400	-17.230	-6.644
27.500	-15.857	-6.683
27.600	-15.160	-6.723
27.700	-14.536	-6.762
27.800	-14.189	-6.801
27.900	-14.189	-6.840
28.000	-14.506	-6.879
28.100	-14.971	-6.918
28.200	-15.914	-6.956
28.300	-16.490	-6.995
28.400	-17.620	-7.033
28.500	-17.764	-7.071
28.600	-18.046	-7.109
28.700	-17.728	-7.147
28.800	-16.851	-7.185
28.900	-16.300	-7.222
29.000	-15.867	-7.260
29.100	-15.856	-7.297
29.200	-15.948	-7.335
29.300	-16.355	-7.372
29.400	-16.900	-7.409
29.500	-17.753	-7.446
29.600	-19.205	-7.482
29.700	-20.759	-7.519
29.800	-22.581	-7.555
29.900	-22.669	-7.592
30.000	-22.818	-7.628

Annex 2 – Declaration of Conformity

FCC Declaration of Conformity

Intellian Technologies, manufactures of stabilized maritime VSAT antenna systems for satellite communication at sea, supplies stabilized maritime VSAT antenna systems to the satellite communication service providers for their ESV (Earth Station on Vessels) networks.

FCC §25.221 defines the provisions for blanket licensing of ESV antennas operation in the C-band. It defines the antennas radiation, and each article regulates the followings;

§25.221 (a)(1)(i)(A): Regulation for Azimuth Direction & Co Polarization
§25.221 (a)(1)(i)(B): Regulation for Other Direction & Co Polarization
§25.221 (a)(1)(i)(C): Regulation for Cross Polarization

FCC §25.222 defines the provisions for blanket licensing of ESV antennas operation in the Ku-band. It defines the antennas radiation, and each article regulates the followings;

§25.222 (a)(1)(i)(A): Regulation for Azimuth Direction & Co Polarization
§25.222 (a)(1)(i)(B): Regulation for Other Direction & Co Polarization
§25.222 (a)(1)(i)(C): Regulation for Cross Polarization

Intellian Technologies, Inc. declares that v240M complies with the threshold level as defined in §25.221(a)(1)(i)(A)/ §25.222(a)(1)(i)(A);, and declares that v240M is in accordance with all defined regulations from §25.221(a)(1)(i)(B) to §25.221(a)(1)(i)(C) / from §25.222(a)(1)(i)(B) to §25.222(a)(1)(i)(C) at the below stated input power spectral density, with an N value of 1.

Product description	Intellian v240M, 2.4m Multi-band maritime VSAT antenna system
EIRP spectral density limit	C-band: -7.415dBW/ 4KHz
	Ku-band: -14.0dBW/ 4KHz

Intellian Technologies, Inc. declares that the above antenna will maintain a pointing error of less than or equal to 0.2 degree under specified ship motion conditions in accordance with the requirements of §25.221 (a)(1)(ii) / §25.222 (a)(1)(ii).


Intellian Technologies, Inc. declares that the above antennas will automatically cease the transmission with a mute command to the modem within 100 milliseconds if the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5 degree and will not resume until such angle is less than or equal to 0.2 degree in accordance with the requirements of §25.221 (a)(1)(iii) / §25.222 (a)(1)(iii).

Radiation pattern data is available upon request to verify the conformance.

Authority: Steve Cha
Vice President, Research & Development



Signature: _____



Date: June 2, 2014

Annex 3 – Radiation Hazard Study

Analysis of Non-Ionizing Radiation for a 2.4-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 2.4-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

Table 1. Limits for General Population/Uncontrolled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	0.2
300-1500	Frequency (MHz)*(0.8/1200)
1500-100,000	1.0

Table 2. Limits for Occupational/Controlled Exposure (MPE)

Frequency Range (MHz)	Power Density (mW/cm ²)
30-300	1.0
300-1500	Frequency (MHz)*(4.0/1200)
1500-100,000	5.0

Table 3. Formulas and Parameters Used for Determining Power Flux Densities

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	2.4	m
Antenna Surface Area	A _{surface}	$\pi D^2 / 4$	4.52	m ²
Feed Flange Diameter	D _{fa}	Input	2.9	cm
Area of Feed Flange	A _{fa}	$\pi D_{fa}^2 / 4$	6.61	cm ²
Frequency	F	Input	6175	MHz
Wavelength	λ	$300 / F$	0.048583	m
Transmit Power	P	Input	79.43	W
Antenna Gain (dBi)	G _{es}	Input	41.7	dBi
Antenna Gain (factor)	G	$10^{G_{es}/10}$	14791.1	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2 / (\pi^2 D^2)$	0.61	n/a

1. Far Field Distance Calculation

The distance to the beginning of the far field can be determined from the following equation:

$$\begin{aligned} \text{Distance to the Far Field Region} \quad R_{ff} &= 0.60 D^2 / \lambda \\ &= 71.1 \text{ m} \end{aligned} \quad (1)$$

The maximum main beam power density in the far field can be determined from the following equation:

$$\begin{aligned} \text{On-Axis Power Density in the Far Field} \quad S_{ff} &= G P / (4 \pi R_{ff}^2) \\ &= 18.475 \text{ W/m}^2 \\ &= 1.848 \text{ mW/cm}^2 \end{aligned} \quad (2)$$

2. Near Field Calculation

Power flux density is considered to be at a maximum value throughout the entire length of the defined Near Field region. The region is contained within a cylindrical volume having the same diameter as the antenna. Past the boundary of the Near Field region, the power density from the antenna decreases linearly with respect to increasing distance.

The distance to the end of the Near Field can be determined from the following equation:

$$\begin{aligned} \text{Extent of the Near Field} \quad R_{nf} &= D^2 / (4 \lambda) \\ &= 29.6 \text{ m} \end{aligned} \quad (3)$$

The maximum power density in the Near Field can be determined from the following equation:

$$\begin{aligned} \text{Near Field Power Density} \quad S_{nf} &= 16.0 \eta P / (\pi D^2) \\ &= 43.130 \text{ W/m}^2 \\ &= 4.313 \text{ mW/cm}^2 \end{aligned} \quad (4)$$

3. Transition Region Calculation

The Transition region is located between the Near and Far Field regions. The power density begins to decrease linearly with increasing distance in the Transition region. While the power density decreases inversely with distance in the Transition region, the power density decreases inversely with the square of the distance in the Far Field region. The maximum power density in the Transition region will not exceed that calculated for the Near Field region. The power density calculated in Section 1 is the highest power density the antenna can produce in any of the regions away from the antenna. The power density at a distance R_t can be determined from the following equation:

$$\begin{aligned} \text{Transition Region Power Density} \quad S_t &= S_{nf} R_{nf} / R_t \\ &= 4.313 \text{ mW/cm}^2 \end{aligned} \quad (5)$$

4. Region between the Feed Assembly and the Antenna Reflector

Transmissions from the feed assembly are directed toward the antenna reflector surface, and are confined within a conical shape defined by the type of feed assembly. The most common feed assemblies are waveguide flanges, horns or subreflectors. The energy between the feed assembly and reflector surface can be calculated by determining the power density at the feed assembly surface. This can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Feed Flange} \quad S_{fa} &= 4000 P / A_{fa} & (6) \\ &= 48101.506 \text{ mW/cm}^2 \end{aligned}$$

5. Main Reflector Region

The power density in the main reflector is determined in the same manner as the power density at the feed assembly. The area is now the area of the reflector aperture and can be determined from the following equation:

$$\begin{aligned} \text{Power Density at the Reflector Surface} \quad S_{\text{surface}} &= 4 P / A_{\text{surface}} & (7) \\ &= 70.232 \text{ W/m}^2 \\ &= 7.023 \text{ mW/cm}^2 \end{aligned}$$

6. Region between the Reflector and the Ground

Assuming uniform illumination of the reflector surface, the power density between the antenna and the ground can be determined from the following equation:

$$\begin{aligned} \text{Power Density between Reflector and Ground} \quad S_g &= P / A_{\text{surface}} & (8) \\ &= 17.558 \text{ W/m}^2 \\ &= 1.756 \text{ mW/cm}^2 \end{aligned}$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)		Hazard Assessment
1. Far Field ($R_{ff} = 71.1$ m)	S_{ff}	1.848	Potential Hazard
2. Near Field ($R_{nf} = 29.6$ m)	S_{nf}	4.313	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	4.313	Potential Hazard
4. Between Feed Assembly and Antenna Reflector	S_{fa}	48101.506	Potential Hazard
5. Main Reflector	$S_{surface}$	7.023	Potential Hazard
6. Between Reflector and Ground	S_g	1.756	Potential Hazard

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region	Calculated Maximum Radiation Power Density Level (mW/cm ²)		Hazard Assessment
1. Far Field ($R_{ff} = 71.1$ m)	S_{ff}	1.848	Satisfies FCC MPE
2. Near Field ($R_{nf} = 29.6$ m)	S_{nf}	4.313	Satisfies FCC MPE
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	4.313	Satisfies FCC MPE
4. Between Feed Assembly and Antenna Reflector	S_{fa}	48101.506	Potential Hazard
5. Main Reflector	$S_{surface}$	7.023	Potential Hazard
6. Between Reflector and Ground	S_g	1.756	Satisfies FCC MPE

It is the applicant's responsibility to ensure that the public and operational personnel are not exposed to harmful levels of radiation.

8. Conclusions

Based upon the above analysis, it is concluded that harmful levels of radiation may exist in those regions noted for the Uncontrolled (Table 4) and Controlled (Table 5) environments.

The earth station will be mounted aboard a ship, and it is recommended that the lower edge of the antenna should be at least 2 meters above the deck. If this is not the case, additional procedures will be instituted to insure the safety of the Public in the vicinity of the antenna.

The applicant will ensure that the main beam of the antenna will be pointed at least one diameter away from any buildings, or other obstacles in those areas that exceed the MPE levels. Since one diameter removed from the center of the main beam the levels are down at least 20 dB, or by a factor of 100, public safety will be ensured.

The earth station will be marked with the standard radiation hazard warnings, as well as the area in the vicinity of the earth station, to inform those in the general population, who may be working, or otherwise present on the ship, and in or near, the main beam of the antenna.

Finally, occupational exposure will be limited, and the transmitter will be turned off during periods of maintenance, so that the MPE standard of 5.0 mw/cm² will be complied with for those regions in close proximity to the main reflector, and subreflector, which could be occupied by operating personnel.

The applicant agrees to abide by the conditions specified in Condition 5208 provided below:

Condition 5208 - The licensee shall take all necessary measures to ensure that the antenna does not create potential exposure of humans to radiofrequency radiation in excess of the FCC exposure limits defined in 47 CFR 1.1307(b) and 1.1310 wherever such exposures might occur. Measures must be taken to ensure compliance with limits for both occupational/controlled exposure and for general population/uncontrolled exposure, as defined in these rule sections. Compliance can be accomplished in most cases by appropriate restrictions such as fencing. Requirements for restrictions can be determined by predictions based on calculations, modeling or by field measurements. The FCC's OET Bulletin 65 (available on-line at www.fcc.gov/oet/rfsafety) provides information on predicting exposure levels and on methods for ensuring compliance, including the use of warning and alerting signs and protective equipment for worker.

Annex 4 – C-band Coordination Report, Miami, FL



COMSEARCH[®]

A CommScope Company

July 22, 2015

Re: Harris CapRock Communications
MIAMI, FL - PORT
Temporary Transmit-Only Earth Station
Operation Dates: 08/01/2015 - 02/01/2016
Job Number: 150722COMSGE04

Dear Frequency Coordinator:

On behalf of Harris CapRock Communications, we are forwarding the attached coordination data for a Temporary Transmit-Only Earth Station to be located at the site referenced above.

This earth station will transmit only on the satellite(s) and frequency or frequencies as described in the attached data. Please do not report cases involving 4 GHz facilities or problems involving non-active paths or frequencies outside the specified range.

If there are any questions concerning this coordination notice, please contact Comsearch.

Sincerely,

COMSEARCH

Gary K. Edwards
Senior Manager
gedwards@comsearch.com

Enclosure(s)

Date: 07/22/2015
Job Number: <PCNJobCode>

Administrative Information

Status TEMPORARY (Operation from 08/01/2015 to 02/01/2016)
Call Sign <PCNCallSign>
Licensee Code SPACLK
Licensee Name Harris CapRock Communications

Site Information

MIAMI, FL
Venue Name PORT
Latitude (NAD 83) 25° 46' 37.2" N
Longitude (NAD 83) 80° 10' 11.3" W
Climate Zone B
Rain Zone 1
Ground Elevation (AMSL) 0.0 m / 0.0 ft

Link Information

Satellite Type Geostationary
Mode TO - Transmit-Only
Modulation Digital
Satellite Arc 29.5° W to 29.5° West Longitude
Azimuth Range 109.6° to 109.6°
Corresponding Elevation Angles 27.1° / 27.1°
Antenna Centerline (AGL) 15.54 m / 51.0 ft

Antenna Information

Transmit - FCC32
Manufacturer Intellian
Model v240
Gain / Diameter 42.6 dBi / 2.4 m
3-dB / 15-dB Beamwidth 1.00° / 2.00°

Max Available RF Power (dBW/4 kHz) -18.7
(dBW/MHz) 5.3

Maximum EIRP (dBW/4 kHz) 23.9
(dBW/MHz) 47.9

Interference Objectives: Long Term -154.0 dBW/4 kHz 20%
Short Term -131.0 dBW/4 kHz 0.0025%

Frequency Information

Transmit 6.1 GHz
Emission / Frequency Range (MHz) 1M00G7D - 20M0G7D / 6105.0 - 6105.0
1M00G7D - 20M0G7D / 6165.0 - 6185.0
1M00G7D - 20M0G7D / 6325.0 - 6425.0

Max Great Circle Coordination Distance 151.9 km / 94.4 mi
Precipitation Scatter Contour Radius 100.0 km / 62.1 mi

Coordination Values		MIAMI, FL	
Licensee Name		Harris CapRock Communications	
Latitude (NAD 83)		25° 46' 37.2" N	
Longitude (NAD 83)		80° 10' 11.3" W	
Ground Elevation (AMSL)		0.0 m / 0.0 ft	
Antenna Centerline (AGL)		15.54 m / 51.0 ft	
Antenna Model		Intellian 2.4 meter	
Antenna Mode		Transmit 6.1 GHz	
Interference Objectives: Long Term		-154.0 dBW/4 kHz	20%
	Short Term	-131.0 dBW/4 kHz	0.0025%
Max Available RF Power		-18.7 (dBW/4 kHz)	

Transmit 6.1 GHz				
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
0	0.00	107.39	-10.00	129.28
5	0.00	102.98	-10.00	129.28
10	0.00	98.55	-10.00	129.28
15	0.00	94.11	-10.00	129.28
20	0.00	89.66	-10.00	129.28
25	0.00	85.21	-10.00	129.28
30	0.00	80.76	-10.00	129.28
35	0.00	76.33	-10.00	129.28
40	0.00	71.93	-10.00	129.28
45	0.00	67.56	-10.00	129.28
50	0.00	63.23	-10.00	129.28
55	0.00	58.96	-10.00	129.28
60	0.00	54.76	-10.00	129.28
65	0.00	50.66	-10.00	129.28
70	0.00	46.68	-9.73	130.16
75	0.00	42.87	-8.80	133.24
80	0.00	39.27	-7.85	136.54
85	0.00	35.94	-6.89	140.01
90	0.00	32.98	-5.96	143.52
95	0.00	30.49	-5.10	146.83
100	0.00	28.60	-4.41	149.49
105	0.00	27.42	-3.95	151.36
110	0.00	27.06	-3.81	151.95
115	0.00	27.55	-4.00	151.15
120	0.00	28.84	-4.50	149.11
125	0.00	30.84	-5.23	146.34
130	0.00	33.41	-6.10	142.98
135	0.00	36.43	-7.04	139.47
140	0.00	39.81	-8.00	136.02
145	0.00	43.45	-8.95	132.75
150	0.00	47.29	-9.87	129.71
155	0.00	51.29	-10.00	129.28
160	0.00	55.40	-10.00	129.28
165	0.00	59.61	-10.00	129.28
170	0.00	63.89	-10.00	129.28
175	0.00	68.23	-10.00	129.28
180	0.00	72.61	-10.00	129.28
185	0.00	77.02	-10.00	129.28

Coordination Values**MIAMI, FL**

Licensee Name Harris CapRock Communications
Latitude (NAD 83) 25° 46' 37.2" N
Longitude (NAD 83) 80° 10' 11.3" W
Ground Elevation (AMSL) 0.0 m / 0.0 ft
Antenna Centerline (AGL) 15.54 m / 51.0 ft
Antenna Model Intellian 2.4 meter
Antenna Mode Transmit 6.1 GHz
Interference Objectives: Long Term -154.0 dBW/4 kHz 20%
Short Term -131.0 dBW/4 kHz 0.0025%
Max Available RF Power -18.7 (dBW/4 kHz)

Transmit 6.1 GHz				
Azimuth (°)	Horizon Elevation (°)	Antenna Discrimination (°)	Horizon Gain (dBi)	Coordination Distance (km)
190	0.00	81.45	-10.00	129.28
195	0.00	85.89	-10.00	129.28
200	0.00	90.34	-10.00	129.28
205	0.00	94.79	-10.00	129.28
210	0.00	99.24	-10.00	129.28
215	0.00	103.67	-10.00	129.28
220	0.00	108.07	-10.00	129.28
225	0.00	112.44	-10.00	129.28
230	0.00	116.77	-10.00	129.28
235	0.00	121.04	-10.00	129.28
240	0.00	125.24	-10.00	129.28
245	0.00	129.34	-10.00	129.28
250	0.00	133.32	-10.00	129.28
255	0.00	137.13	-10.00	129.28
260	0.00	140.73	-10.00	129.28
265	0.00	144.06	-10.00	129.28
270	0.00	147.02	-10.00	129.28
275	0.00	149.51	-10.00	129.28
280	0.00	151.40	-10.00	129.28
285	0.00	152.58	-10.00	129.28
290	0.00	152.94	-10.00	129.28
295	0.00	152.45	-10.00	129.28
300	0.00	151.16	-10.00	129.28
305	0.00	149.16	-10.00	129.28
310	0.00	146.59	-10.00	129.28
315	0.00	143.57	-10.00	129.28
320	0.00	140.19	-10.00	129.28
325	0.00	136.55	-10.00	129.28
330	0.00	132.71	-10.00	129.28
335	0.00	128.71	-10.00	129.28
340	0.00	124.60	-10.00	129.28
345	0.00	120.39	-10.00	129.28
350	0.00	116.11	-10.00	129.28
355	0.00	111.77	-10.00	129.28