

TracStar Off-Axis EIRP

The TracStar antenna will transmit with EIRP density not to exceed 19.5 dBW/4kHz and with a maximum EIRP level of 41.2 dBW. The data rates transmitted from the terminal will vary from 64 kbps to 512 kbps. The off-axis EIRP spectral density of the TracStar antenna is set forth in Figures 1a through 1f below. These levels are fully consistent with the limitations set forth in Section 25.226 governing VMES operations. In addition, the TracStar antenna has a pointing accuracy of better than 0.2 degrees, which is also consistent with the Commission's VMES rules.

The foregoing off-axis EIRP density figures include plots for various "skew angles" between 0 and 40 degrees. "Skew angle" is the angular difference between the major axis of the antenna and the geostationary arc when the antenna is pointed at the serving satellite but located at a different longitudinal position than the satellite. Thus, at 0° skew angle, antenna performance is dictated solely by the azimuth gain pattern. As skew angle increases, the elevation gain pattern contributes to overall antenna performance and the combined pattern broadens to reflect this contribution. The skew angle will never exceed 40 degrees during the proposed operations and the effect of skew angle is fully taken into account in controlling off-axis EIRP density produced by the TracStar antenna. Additionally, various elevation angles between 20 degrees and 70 degrees for horizontal and vertical planes are included in the plots.

Table 1 below shows the Off-Axis EIRP performance relative for §25.226 for close-in angles (+/- 5 degrees) of operation.

The TracStar antenna is fully compliant with the FCC's two-degree spacing requirements, and off-axis EIRP spectral density levels associated with routinely licensed VSATs that have been applied to mobile Ku-band terminals in similar contexts (e.g., vehicle-mounted earth stations (VMESs), earth stations onboard vessels (ESVs) and Ku-band AMSS terminals).

Exhibit A

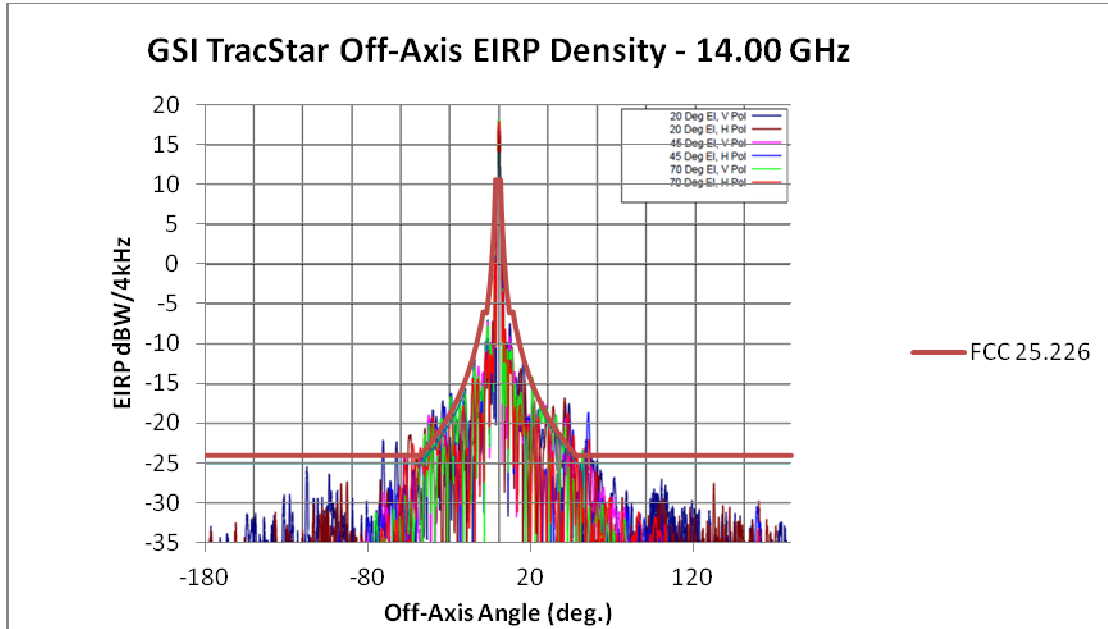


Figure 1a – Off-Axis Spectral Density Plot +/-180 degrees, 14.0 GHz

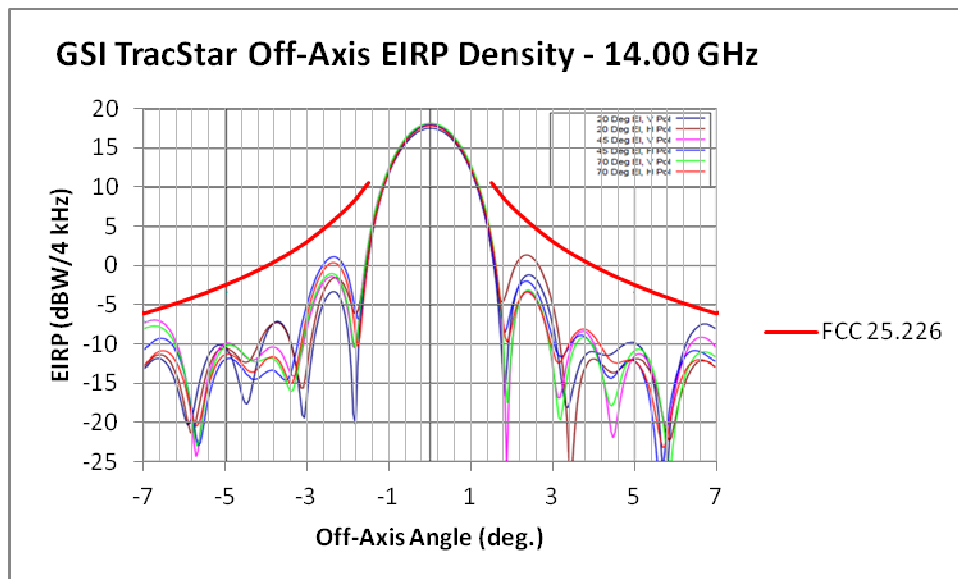


Figure 1b – Off-Axis Spectral Density Plot +/-7 degrees, 14.0 GHz

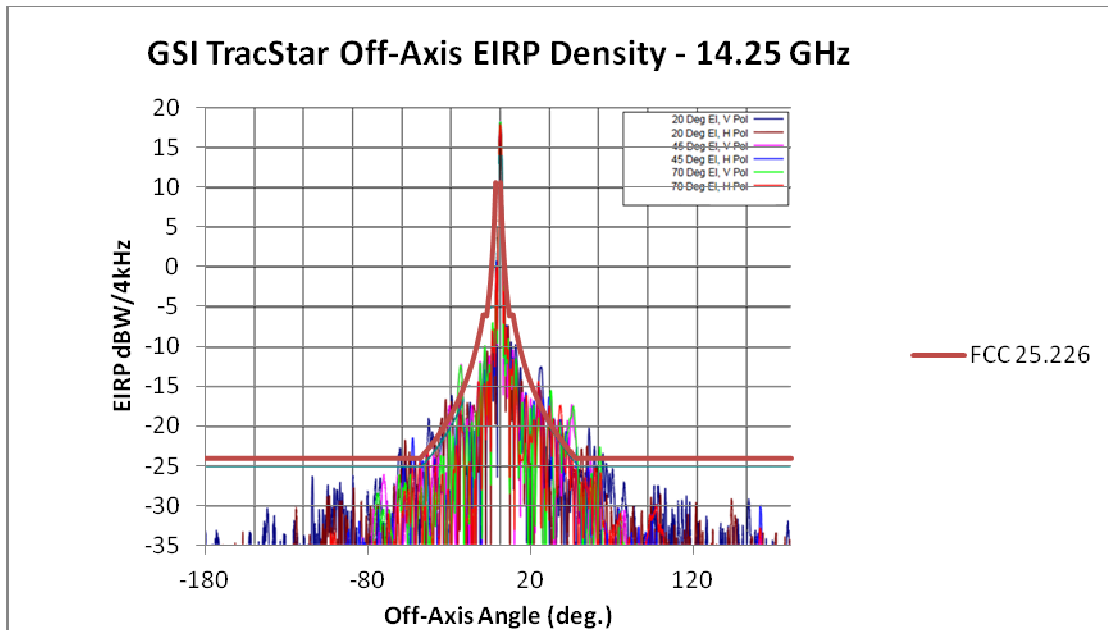


Figure 1c – Off-Axis Spectral Density Plot +/-180 degrees, 14.25 GHz

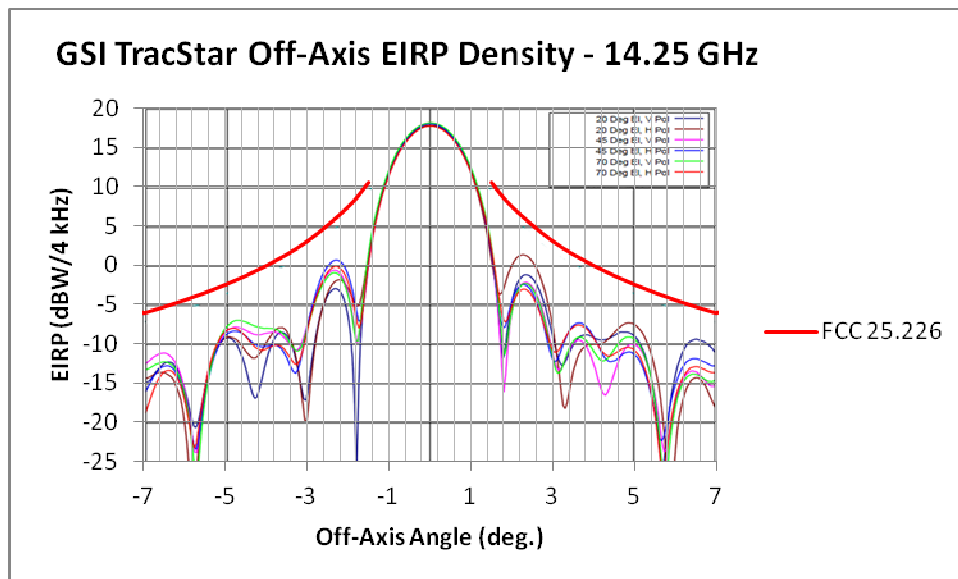


Figure 1d – Off-Axis Spectral Density Plot +/-7 degrees, 14.25 GHz

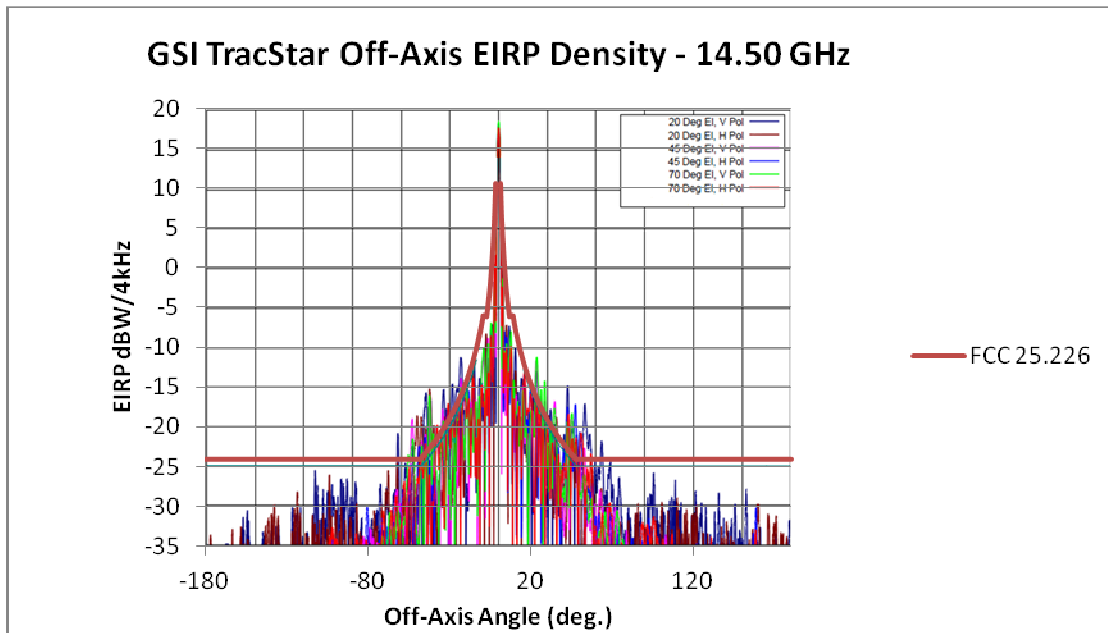


Figure 1e – Off-Axis Spectral Density Plot +/-180 degrees, 14.5 GHz

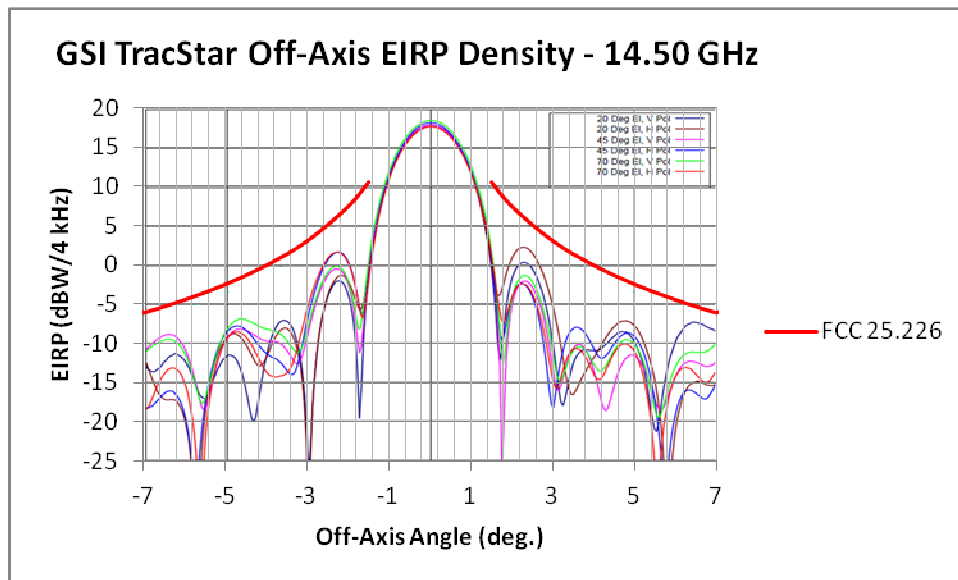


Figure 1f – Off-Axis Spectral Density Plot +/-7 degrees, 14.5 GHz

Data in support of claim that proposed operation meets off-axis criteria of FCC §25.226 VMES

Applicant:	CIE	Date of Application:	07/27/10	
Antenna Manufacturer:	TracStar	main bore gain:	32.50	dBi
Antenna Model:	i450M	frequency at which gain was measured:	14.25	GHz
Antenna ID:	Ant1	maximum input power density:	-15.00	dBW/4kHz
Transmit band:	14 GHz	Pattern ID:	TX Co-pol (20)	
<i>1.0 to 5.0 degrees calculated maximum difference in off-axis eirp density:</i>			-1.00	dBW/4kHz

TABLE

EIRP for Antenna Conforming to 25.209 operating under 25.226 Power density limits			Gain and EIRP for Antenna Not Conforming to 25.209(a) operating at stated maximum power density				
1	2	3	4	5	6	7	
Angle (deg.)	25.209 Gain (dBi)	25.226 Off-Axis EIRP Density (dBW/4kHz)	Gain relative to main bore gain (dB)	Actual Gain (dbi)	Off-Axis EIRP Density for Operating Power	Difference in Off-Axis EIRP Density (6) minus (3)	
						Conforms (Y/N)	
-5.00	11.53	-2.47	-26.50	6.00	-9.00	-6.53	Y
-4.90	11.75	-2.25	-26.90	5.60	-9.40	-7.15	Y
-4.80	11.97	-2.03	-27.40	5.10	-9.90	-7.87	Y
-4.70	12.20	-1.80	-27.50	5.00	-10.00	-8.20	Y
-4.60	12.43	-1.57	-27.00	5.50	-9.50	-7.93	Y
-4.50	12.67	-1.33	-26.50	6.00	-9.00	-7.67	Y
-4.40	12.91	-1.09	-26.00	6.50	-8.50	-7.41	Y
-4.30	13.16	-0.84	-25.50	7.00	-8.00	-7.16	Y
-4.20	13.42	-0.58	-25.00	7.50	-7.50	-6.92	Y
-4.10	13.68	-0.32	-25.00	7.50	-7.50	-7.18	Y
-4.00	13.95	-0.05	-25.00	7.50	-7.50	-7.45	Y
-3.90	14.22	0.22	-25.00	7.50	-7.50	-7.72	Y
-3.80	14.51	0.51	-23.00	9.50	-5.50	-6.01	Y
-3.70	14.79	0.79	-22.50	10.00	-5.00	-5.79	Y
-3.60	15.09	1.09	-21.50	11.00	-4.00	-5.09	Y
-3.50	15.40	1.40	-20.50	12.00	-3.00	-4.40	Y
-3.40	15.71	1.71	-18.50	14.00	-1.00	-2.71	Y
-3.30	16.04	2.04	-17.50	15.00	0.00	-2.04	Y
-3.20	16.37	2.37	-16.50	16.00	1.00	-1.37	Y
-3.10	16.72	2.72	-16.50	16.00	1.00	-1.72	Y
-3.00	17.07	3.07	-16.50	16.00	1.00	-2.07	Y
-2.90	17.44	3.44	-16.50	16.00	1.00	-2.44	Y
-2.80	17.82	3.82	-16.50	16.00	1.00	-2.82	Y
-2.70	18.22	4.22	-16.50	16.00	1.00	-3.22	Y
-2.60	18.63	4.63	-16.40	16.10	1.10	-3.53	Y
-2.50	19.05	5.05	-16.40	16.10	1.10	-3.95	Y

Exhibit A

-2.40	19.49	5.49		-17.40	15.10	0.10	-5.39	Y
-2.30	19.96	5.96		-19.90	12.60	-2.40	-8.36	Y
-2.20	20.44	6.44		-22.10	10.40	-4.60	-11.04	Y
-2.10	20.94	6.94		-19.70	12.80	-2.20	-9.14	Y
-2.00	21.47	7.47		-17.30	15.20	0.20	-7.27	Y
-1.90	22.03	8.03		-15.00	17.50	2.50	-5.53	Y
-1.80	22.62	8.62		-13.00	19.50	4.50	-4.12	Y
-1.70	23.24	9.24		-11.25	21.25	6.25	-2.99	Y
-1.60	23.90	9.90		-9.60	22.90	7.90	-2.00	Y
-1.50	24.60	10.60		-7.90	24.60	9.60	-1.00	Y
1.50	24.60	10.60		-7.90	24.60	9.60	-1.00	Y
1.60	23.90	9.90		-9.60	22.90	7.90	-2.00	Y
1.70	23.24	9.24		-11.25	21.25	6.25	-2.99	Y
1.80	22.62	8.62		-13.00	19.50	4.50	-4.12	Y
1.90	22.03	8.03		-15.00	17.50	2.50	-5.53	Y
2.00	21.47	7.47		-17.30	15.20	0.20	-7.27	Y
2.10	20.94	6.94		-19.70	12.80	-2.20	-9.14	Y
2.20	20.44	6.44		-22.10	10.40	-4.60	-11.04	Y
2.30	19.96	5.96		-19.90	12.60	-2.40	-8.36	Y
2.40	19.49	5.49		-17.40	15.10	0.10	-5.39	Y
2.50	19.05	5.05		-16.40	16.10	1.10	-3.95	Y
2.60	18.63	4.63		-16.40	16.10	1.10	-3.53	Y
2.70	18.22	4.22		-16.50	16.00	1.00	-3.22	Y
2.80	17.82	3.82		-16.50	16.00	1.00	-2.82	Y
2.90	17.44	3.44		-16.50	16.00	1.00	-2.44	Y
3.00	17.07	3.07		-16.50	16.00	1.00	-2.07	Y
3.10	16.72	2.72		-16.50	16.00	1.00	-1.72	Y
3.20	16.37	2.37		-16.50	16.00	1.00	-1.37	Y
3.30	16.04	2.04		-17.50	15.00	0.00	-2.04	Y
3.40	15.71	1.71		-18.50	14.00	-1.00	-2.71	Y
3.50	15.40	1.40		-20.50	12.00	-3.00	-4.40	Y
3.60	15.09	1.09		-21.50	11.00	-4.00	-5.09	Y
3.70	14.79	0.79		-22.50	10.00	-5.00	-5.79	Y
3.80	14.51	0.51		-23.00	9.50	-5.50	-6.01	Y
3.90	14.22	0.22		-25.00	7.50	-7.50	-7.72	Y
4.00	13.95	-0.05		-25.00	7.50	-7.50	-7.45	Y
4.10	13.68	-0.32		-25.00	7.50	-7.50	-7.18	Y
4.20	13.42	-0.58		-25.00	7.50	-7.50	-6.92	Y
4.30	13.16	-0.84		-25.50	7.00	-8.00	-7.16	Y
4.40	12.91	-1.09		-26.00	6.50	-8.50	-7.41	Y
4.50	12.67	-1.33		-26.50	6.00	-9.00	-7.67	Y
4.60	12.43	-1.57		-27.00	5.50	-9.50	-7.93	Y
4.70	12.20	-1.80		-27.50	5.00	-10.00	-8.20	Y
4.80	11.97	-2.03		-27.40	5.10	-9.90	-7.87	Y
4.90	11.75	-2.25		-26.90	5.60	-9.40	-7.15	Y
5.00	11.53	-2.47		-26.50	6.00	-9.00	-6.53	Y