

Technical Appendix
Intellian v240M ESV Terminal

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I. 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 @ 6.1375 GHz	49.0 dBi @14.125 GHz
EIRP	61.9 dBW @ 6.1375 GHz	66.2 dBW @ 14.125 GHz
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 Linear Horizontal/Vertical	Linear Horizontal/Vertical
Transmit Max PSD	24.9 dBW/4kHz	29.2 dBW/4kHz
Transmit Beamwidth	1.42 degrees	0.62 degrees
Receive G/T	17.3 dB/K	24.5 dB/K
Receive Bandwidth	Up to 72 MHz	Up to 72 MHz
Receive Polarization	LHCP/RHCP Linear Horizontal/Vertical	Linear Horizontal/Vertical
Feed Flange Power	112.5 Watts	62.6 Watts
ERP	.95 MW	2.5 MW
Signal Modulation	Up to 32 APSK	Up to 32 APSK

Final

C band EIRP Spectral Density

Model Name: Intellian v240M

Test Date: Jan 13, 2014

Prepared by

RF Engineering Department
Intellian Technologies, Inc.

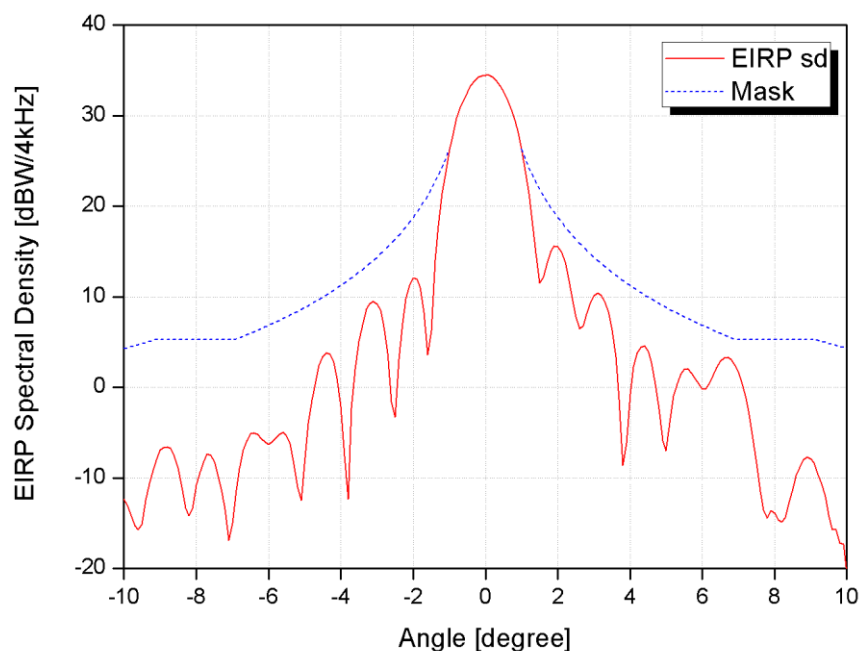
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1. C band EIRP Spectral Density of v240M

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

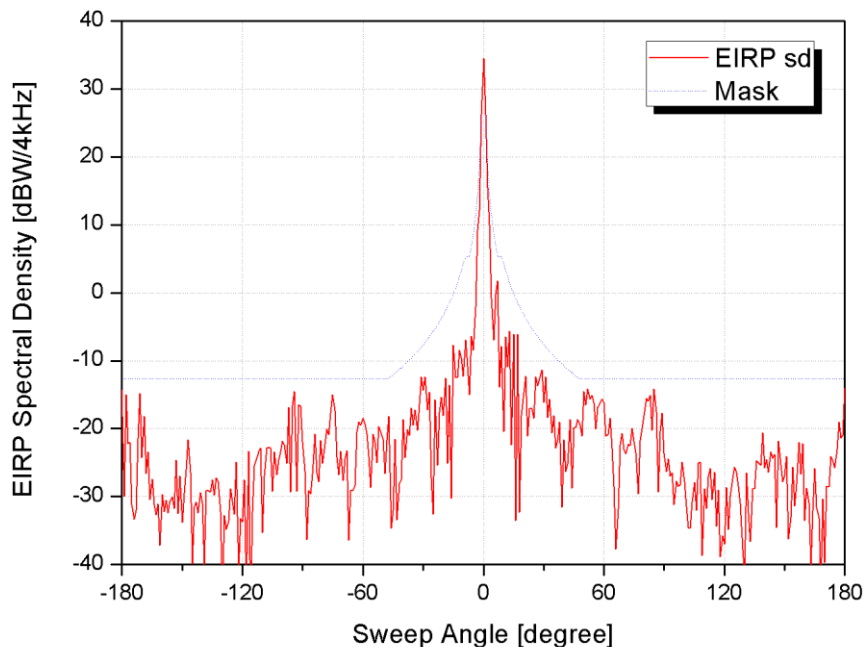
26.3-25log(θ)	dBW/4kHz	for	$1.0^{\circ} \leq \theta \leq 7.0^{\circ}$
-5.3	dBW/4kHz	for	$7.0^{\circ} \leq \theta \leq 9.2^{\circ}$
29.3-25log(θ)	dBW/4kHz	for	$9.2^{\circ} \leq \theta \leq 48^{\circ}$
-12.7	dBW/4kHz	for	$48^{\circ} \leq \theta \leq 180^{\circ}$

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.

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

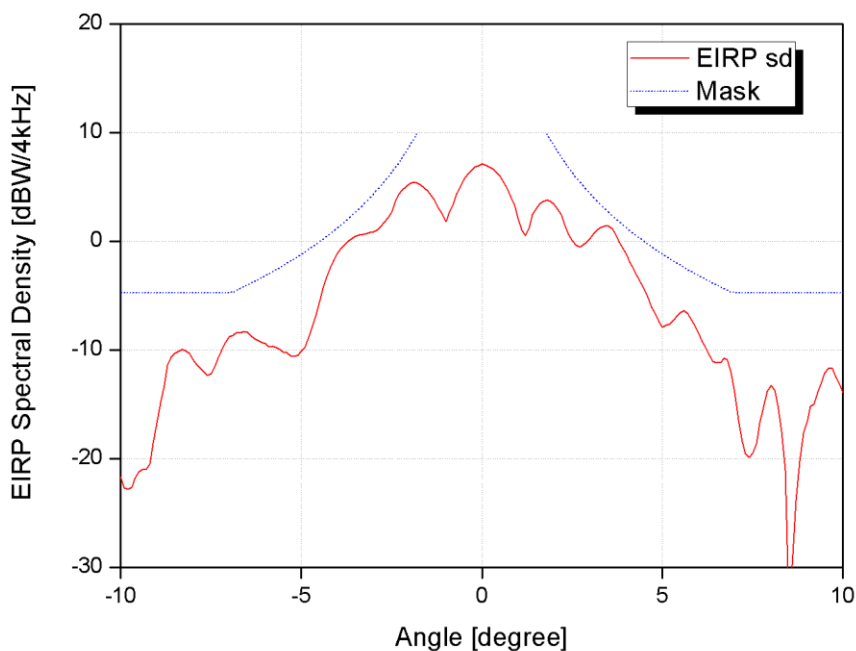
26.3-25log(θ)	dBW/4kHz	for	$1.0^\circ \leq \theta \leq 7.0^\circ$
-5.3	dBW/4kHz	for	$7.0^\circ \leq \theta \leq 9.2^\circ$
29.3-25log(θ)	dBW/4kHz	for	$9.2^\circ \leq \theta \leq 48^\circ$
-12.7	dBW/4kHz	for	$48^\circ \leq \theta \leq 180^\circ$

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.

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

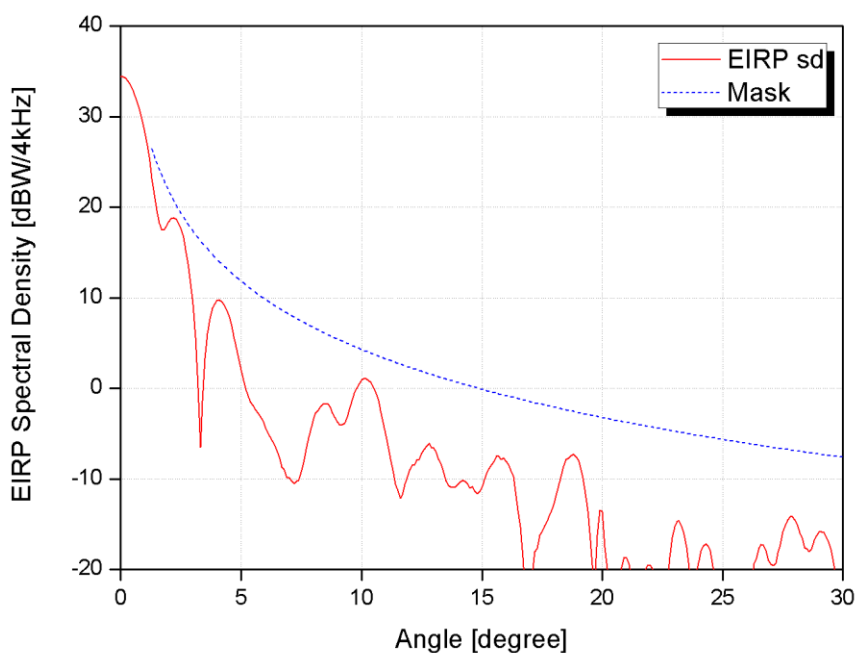
16.3-25log(θ)	dBW/4kHz	for	$1.8^\circ \leq \theta \leq 7.0^\circ$
-4.7	dBW/4kHz	for	$7.0^\circ \leq \theta \leq 9.2^\circ$

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

Final

Ku band EIRP Spectral Density

Model Name: Intellian v240M

Test Date: Jan 13, 2014

Prepared by

RF Engineering Department
Intellian Technologies, Inc.

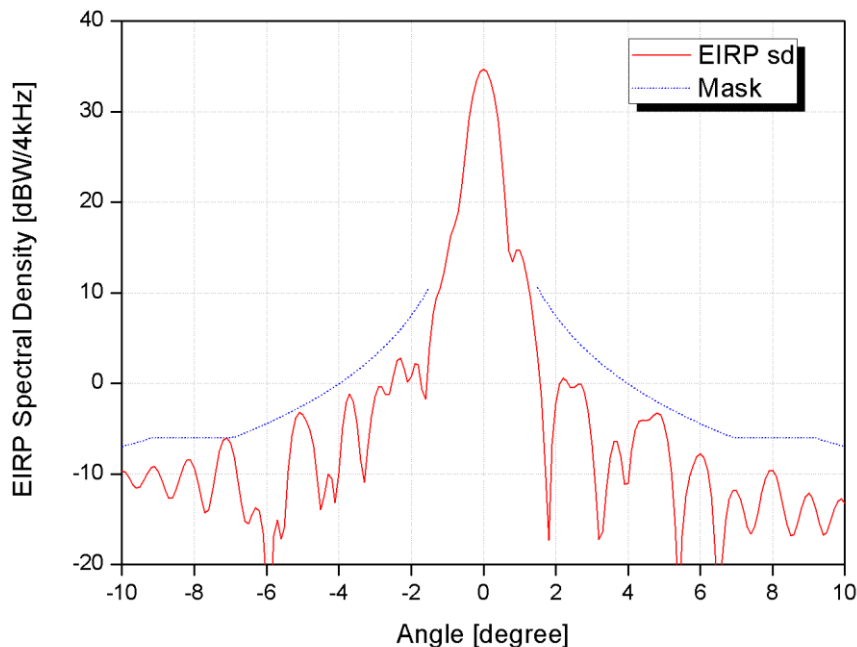
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1. EIRP Spectral Density of v240M

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



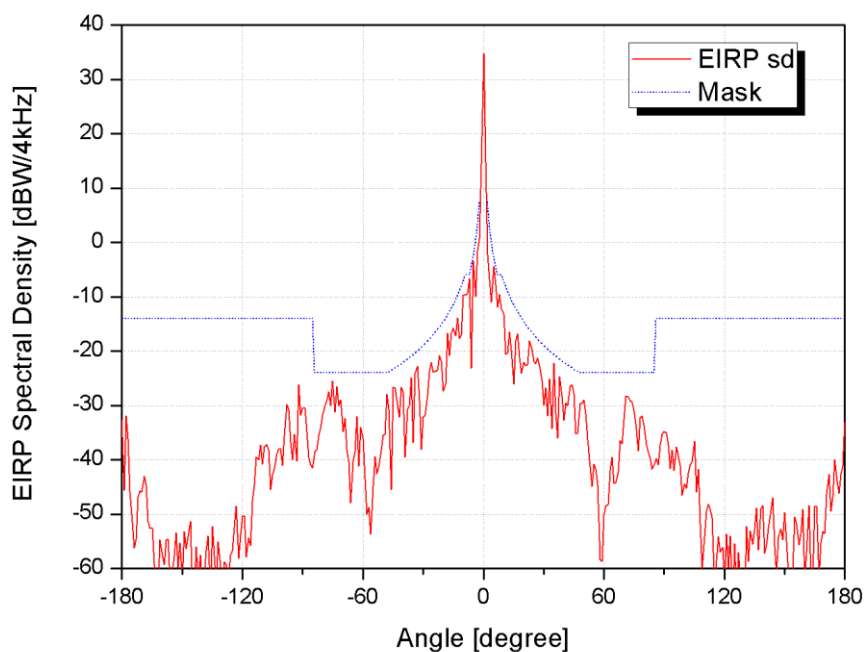
-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

▪ FCC EIRP spectral density regulation

15-25log(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

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



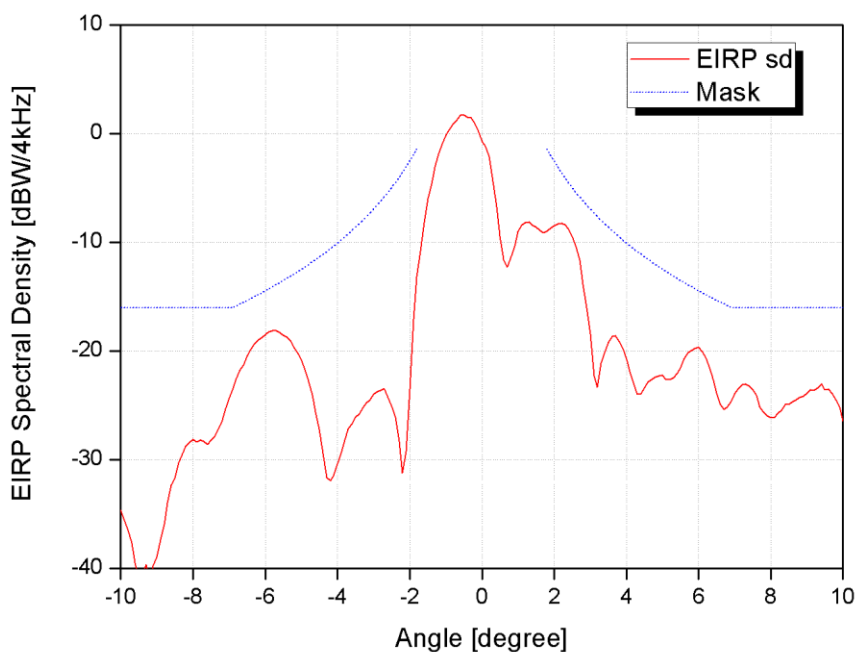
-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

▪ FCC EIRP spectral density regulation

$15-25\log(\theta)$	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

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



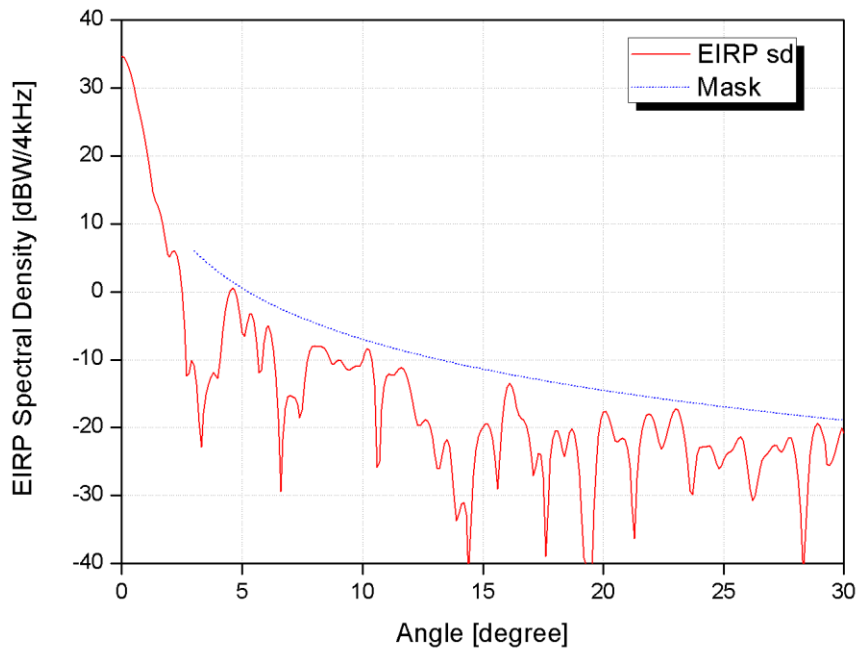
-13.7 dBW/4kHz Input power spectral density @ f=14.25GHz & 0.7dB Radome loss.

▪ 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

18-25log(θ)	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		
Angle (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

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: _____

A handwritten signature in black ink, appearing to be 'Steve Cha', written over a horizontal line.

Date: _____ June 2, 2014

V. C-band Radiation Hazard Study

Intellian v240M (C-band)

This study analyzes the non-ionizing radiation levels for the Intellian v240M antenna while operating in the C-band. This report is developed in accordance with the prediction methods contained in OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01.

Bulletin No. 65 specifies that there are two separate tiers of exposure limits that are depending on the area of exposure and/or the status of the individuals who are subject to the exposure -- the General Population/Uncontrolled Environment and the Controlled Environment, where the general population cannot access.

The maximum level of non-ionizing radiation to which individuals may be exposed is limited to a power density level of 5 milliwatts per square centimeter (5 mW/cm^2) averaged over any 6 minute period in a controlled environment, and the maximum level of non-ionizing radiation to which the general public is exposed is limited to a power density level of 1 milliwatt per square centimeter (1 mW/cm^2) averaged over any 30 minute period in a uncontrolled environment.

In the normal range of transmit powers for satellite antennas, the power densities at or around the antenna surface are expected to exceed safe levels. 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>Parameters:</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>
<i>Antenna Diameter</i>	2.4	m	<i>D</i>
<i>Antenna Transmit Gain</i>	41.9	dBi	<i>G</i>
<i>Transmit Frequency</i>	6137.5	MHz	<i>f</i>
<i>Antenna Feed Flange diameter</i>	20	cm	<i>d</i>
<i>Power Input to the Antenna</i>	222	W	<i>P</i>

Calculated Parameters:

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

Parameter	Value	Unit	Symbol	Formula
Antenna Surface Area	4.524	m ²	A	$\pi D^2/4$
Area of Antenna Flange	314.159	cm ²	a	$\pi d^2/4$
Antenna Efficiency	0.65		η	$G\lambda^2/(\pi^2 D^2)$
Gain Factor	15488.17		g	$10^{G/10}$
Wavelength	0.0489	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.

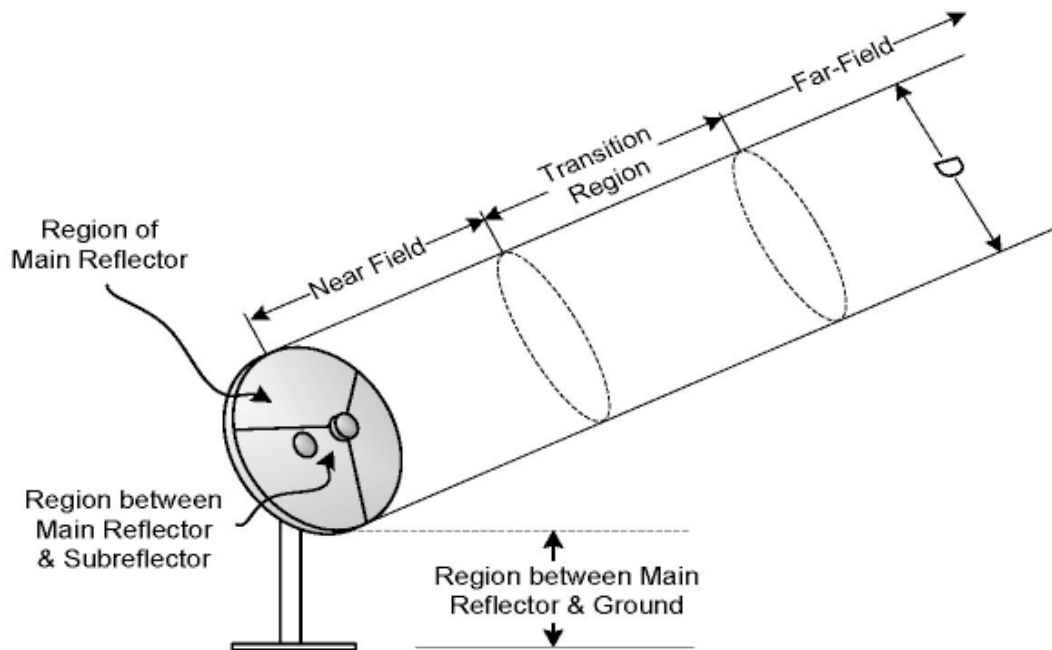


Figure 1. EM Fields as a Function of Distance

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

Parameter	Value	Unit	Formula
Near-Field Distance	29.46	m	$R_{nf} = D^2/(4\lambda)$
Distance to Far-Field	70.70	m	$R_{ff} = 0.60D^2/(\lambda)$
Distance of Transition Region	29.46	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>
<i>Power Density in the Near-Field</i>	12.76	mW/cm ²	S_{nf}	$16.0 \eta P / (\pi D^2)$
<i>Power Density in the Far-Field</i>	5.466	mW/cm ²	S_{ff}	$GP / (4\pi R_{ff}^2)$
<i>Power Density in the Transition Region</i>	12.76	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>
<i>Power Density at the Feed Flange</i>	2822.69	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>
<i>Power Density at Main Reflector</i>	19.60	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>
<i>Power Density b/w Reflector and Ground</i>	4.90	mW/cm ²	S_g	P / A

The below table 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.

<u>Power Density</u>	<u>Value</u>	<u>Unit</u>	<u>Controlled Environment</u>
<i>Far Field Calculation</i>	5.466	mW/cm ²	Exceeds Limits
<i>Near Field Calculation</i>	12.76	mW/cm ²	Exceeds Limits
<i>Transition Region</i>	12.76	mW/cm ²	Exceeds Limits
<i>Region b/w feed iris and reflector</i>	2822.69	mW/cm ²	Exceeds Limits
<i>Main Reflector Region</i>	19.60	mW/cm ²	Exceeds Limits
<i>Region b/w Main Reflector & Ground</i>	4.90	mW/cm ²	Satisfies FCC MPE

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.

VI. Ku-band Radiation Hazard Study

Intellian v240M (Ku-band)

This study analyzes the non-ionizing radiation levels for the Intellian v240M antenna while operating in the Ku-band. This report is developed in accordance with the prediction methods contained in OET Bulletin No. 65, Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields, Edition 97-01.

Bulletin No. 65 specifies that there are two separate tiers of exposure limits that are depending on the area of exposure and/or the status of the individuals who are subject to the exposure -- the General Population/ Uncontrolled Environment and the Controlled Environment, where the general population cannot access.

The maximum level of non-ionizing radiation to which individuals may be exposed is limited to a power density level of 5 milliwatts per square centimeter (5 mW/cm^2) averaged over any 6 minute period in a controlled environment, and the maximum level of non-ionizing radiation to which the general public is exposed is limited to a power density level of 1 milliwatt per square centimeter (1 mW/cm^2) averaged over any 30 minute period in a uncontrolled environment.

In the normal range of transmit powers for satellite antennas, the power densities at or around the antenna surface are expected to exceed safe levels. 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>Parameters:</u>	<u>Value</u>	<u>Unit</u>	<u>Symbol</u>
<i>Antenna Diameter</i>	2.4	m	<i>D</i>
<i>Antenna Transmit Gain</i>	49	dBi	<i>G</i>
<i>Transmit Frequency</i>	14125	MHz	<i>f</i>
<i>Antenna Feed Flange diameter</i>	15	cm	<i>d</i>
<i>Power Input to the Antenna</i>	222	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>
<i>Antenna Surface Area</i>	4.524	m ²	<i>A</i>	$\pi D^2/4$
<i>Area of Antenna Flange</i>	176.715	cm ²	<i>a</i>	$\pi d^2/4$
<i>Antenna Efficiency</i>	0.63		η	$G\lambda^2/(\pi^2 D^2)$
<i>Gain Factor</i>	79432.82		<i>g</i>	$10^{G/10}$
<i>Wavelength</i>	0.0212	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.

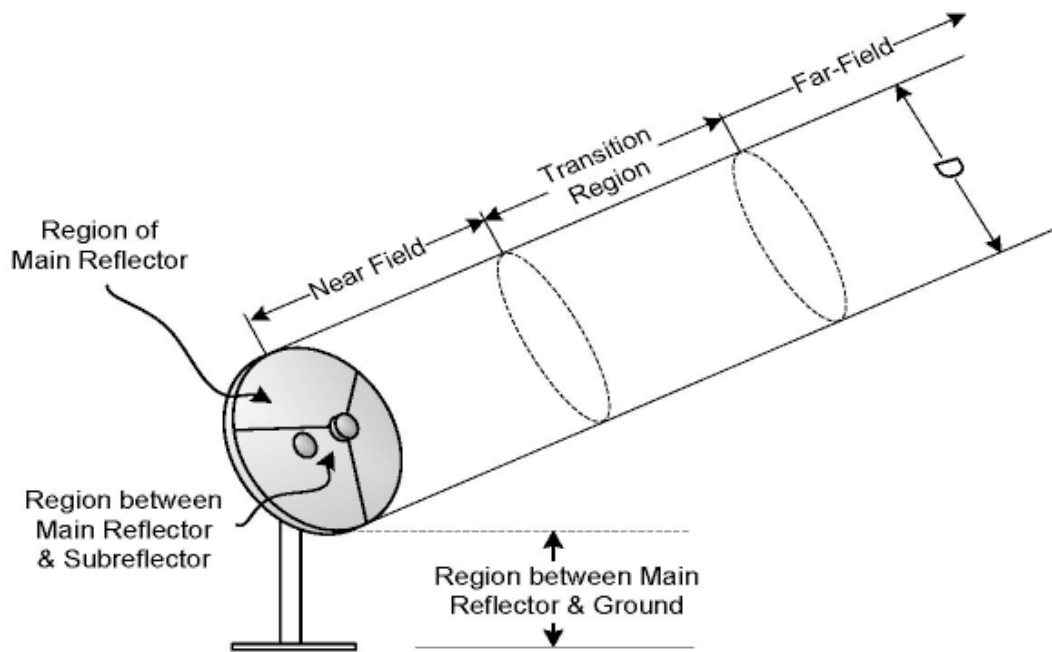


Figure 1. EM Fields as a Function of Distance

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

<u>Parameter</u>	<u>Value</u>	<u>Unit</u>	<u>Formula</u>
<i>Near-Field Distance</i>	67.8	m	$R_{nf} = D^2/(4\lambda)$
<i>Distance to Far-Field</i>	162.72	m	$R_{ff} = 0.60D^2/(\lambda)$
<i>Distance of Transition Region</i>	67.8	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>
<i>Power Density in the Near-Field</i>	12.354	mW/cm ²	S_{nf}	$16.0 \eta P / (\pi D^2)$
<i>Power Density in the Far-Field</i>	5.292	mW/cm ²	S_{ff}	$GP / (4\pi R_{ff}^2)$
<i>Power Density in the Transition Region</i>	12.354	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>
<i>Power Density at the Feed Flange</i>	5017.6	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>
<i>Power Density at Main Reflector</i>	19.6	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>
<i>Power Density b/w Reflector and Ground</i>	4.9	mW/cm ²	S_g	P / A

The below table 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.

<u>Power Density</u>	<u>Value</u>	<u>Unit</u>	<u>Controlled Environment</u>
<i>Far Field Calculation</i>	5.292	mW/cm ²	Exceeds Limits
<i>Near Field Calculation</i>	12.354	mW/cm ²	Exceeds Limits
<i>Transition Region</i>	12.354	mW/cm ²	Exceeds Limits
<i>Region b/w feed iris and reflector</i>	5017.6	mW/cm ²	Exceeds Limits
<i>Main Reflector Region</i>	19.6	mW/cm ²	Exceeds Limits
<i>Region b/w Main Reflector & Ground</i>	4.9	mW/cm ²	Satisfies FCC MPE

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.

VII.
§ 25.221 Compliance Statement

As part of its application to modify its existing commercial earth station onboard vessel (“ESV”) blanket license (Call Sign: E090176) to add a new dual-band terminal – the Intellian v240M – Harris CapRock Communications, Inc. (“Harris CapRock”) certifies in the following section and associated appendices that the proposed C-band ESV terminal operations of the v240M comply with the relevant requirements of Section 25.221 of the Commission’s Rules, 47 C.F.R. § 25.221.

(a)(1)(i)(A-C): Comply. (*See* Technical Appendix, II.)

(a)(1)(ii): Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna. (*See* Technical Appendix, IV).

(a)(1)(iii): Harris CapRock certifies that all emissions from the ESV will automatically cease within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°, and transmission will not resume until such angle is less than or equal to 0.2. (*See* Technical Appendix, IV).

(a)(2): Not applicable.

(a)(3): Not applicable.

(a)(4): Comply. The primary contact for Harris CapRock ESV operational issues is the Harris CapRock Network Control Center, which is available 24 hours a day, seven days a week:

Harris CapRock Network Control Center
Managed Network Services 24x7 support
4400 S. Sam Houston Pkwy, E.
Houston, Texas 77046

Office: (832) 668-2775
Fax: (713) 987-2894
Email Address: hcc-hou-csc@harris.com

(a)(5): Comply. Harris CapRock has designed a system to record the vessel's location, transmit frequency, channel bandwidth and satellite. The system records this information every 20 minutes; this data will be stored locally and will be uploaded to Harris CapRock's Network Management System (NMS) on a regular basis. Harris CapRock can make this data available within 24 hours of a request by a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission.

(a)(6): Comply. In the event Harris CapRock must communicate with vessels of foreign registry, it will maintain detailed information on each vessel as well as a point of contact for the relevant administration responsible for licensing the ESV.

(a)(7): Comply. The proposed ESV terminal operated by Harris CapRock will be controlled by various hub earth stations located in the United States and licensed to Harris CapRock.

(a)(8): Not applicable. Harris CapRock is not seeking to coordinate route or port operations in the context of this application.

(a)(9): Comply. Harris CapRock certifies it will not operate ESVs in the 5.925-6.425 GHz and 3.700-4.200 GHz bands on vessels smaller than 300 gross tons.

(a)(10): Not applicable. Harris CapRock does not seek receive protection for in-port C-band ESV terminal operations in this application.

(a)(11): Comply. When operating ESVs in motion, Harris CapRock will not claim protection from harmful interference from any authorized terrestrial stations or lawfully operating satellites to which frequencies are either already assigned, or may be assigned in the future in the 3.700-4.200 GHz band.

(a)(12): Not applicable. Harris CapRock is not seeking to coordinate route or port operations in the context of this application, and certifies that the subject ESVs will not operate within 200 km of the U.S. coastline or fixed service offshore facilities unless prior coordination has been completed. Harris CapRock is in the process of coordinating certain C-band ESV routes with potentially affected U.S.-licensed fixed service operators and anticipates filing a separate application for authority to operate U.S.-licensed ESV terminals on these routes pursuant to established Commission procedures.

(a)(13): Not applicable. See above.

(b)(1)(i)(A-C): Comply. (*See* Technical Appendix, II.)

(b)(1)(ii): Comply.

(b)(1)(iii): Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna and that all emissions will automatically cease within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5° . (*See* Technical Appendix, IV.)

(b)(2): Not Applicable.

(b)(3): Not Applicable.

(b)(4): Not Applicable. There is no change to the proposed area of operations. The geographic area where the ESVs will operate includes U.S. territorial waters and waterways, the Gulf of Mexico, Caribbean Sea, Atlantic Ocean, and Pacific Ocean. (Also note discussion of 25.221(a)(12), above, with respect to limitation on C-band operations of the v240M terminal.)

(b)(5): Comply. (Also note discussion of 25.221(a)(4).)

(b)(6): Comply. (*See* Technical Appendix, V.)

VIII.
§ 25.222 Compliance Statement

As part of its application to modify its existing commercial earth station onboard vessel (“ESV”) blanket license (Call Sign: E090176) to add a new dual-band terminal – the Intellian v240M – Harris CapRock Communications, Inc. (“Harris CapRock”) certifies in the following section and associated appendices that the proposed Ku-band ESV terminal operations of the v240M comply with the relevant requirements of Section 25.222 of the Commission’s Rules, 47 C.F.R. § 25.222.

(a)(1)(i)(A-C): Comply. (*See* Technical Appendix, III.)

(a)(1)(ii): Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna. (*See* Technical Appendix, IV.)

(a)(1)(iii): Harris CapRock certifies that all emissions from the ESV will automatically cease within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°, and transmission will not resume until such angle is less than or equal to 0.2. (*See* Technical Appendix, IV.)

(a)(2): Not applicable.

(a)(3): Not applicable.

(a)(4): Comply. The primary contact for Harris CapRock ESV operational issues is the Harris CapRock Network Control Center, which is available 24 hours a day, seven days a week:

Harris CapRock Network Control Center
Managed Network Services 24x7 support
4400 S. Sam Houston Pkwy, E.
Houston, Texas 77046

Office: (832) 668-2775
Fax: (713) 987-2894
Email Address: hcc-hou-csc@harris.com

(a)(5): Comply. Harris CapRock has designed a system to record the vessel's location, transmit frequency, channel bandwidth and satellite. The system records this information every 20 minutes; this data will be stored locally and will be uploaded to Harris CapRock's Network Management System (NMS) on a regular basis. Harris CapRock can make this data available within 24 hours of a request by a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission.

(a)(6): Comply. In the event Harris CapRock must communicate with vessels of foreign registry, it will maintain detailed information on each vessel as well as a point of contact for the relevant administration responsible for licensing the ESV.

(a)(7): Comply. The proposed ESV terminal operated by Harris CapRock will be controlled by various hub earth stations located in the United States and licensed to Harris CapRock.

(a)(8): Comply. Harris CapRock certifies that not claim protection from interference from any authorized terrestrial stations to which frequencies are either already assigned, or may be assigned in the future in the 10.95-11.2 GHz (space-to-Earth) and 11.45-11.7 GHz (space-to-Earth) frequency bands.

(b)(1)(i)(A-C): Comply. (*See* Technical Appendix, III.)

(b)(1)(ii): Comply.

(b)(1)(iii): Harris CapRock certifies that the terminal will maintain a pointing error of less than or equal to 0.2° between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna and that that all emissions will automatically cease

within 100 ms if the angle between the orbital location of the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5°. (*See* Technical Appendix, Annex 3.)

(b)(2): Not Applicable.

(b)(3): Not Applicable.

(b)(4): Not Applicable. There is no change to the proposed area of operations. The geographic area where the ESVs will operate includes U.S. territorial waters and waterways, the Gulf of Mexico, Caribbean Sea, Atlantic Ocean, and Pacific Ocean.

(b)(5) Comply. (Also note discussion of 25.222(a)(4).)

(b)(6): Comply. (*See* Technical Appendix, VI.)

(c): Harris CapRock certifies that it does not anticipate conducting operations in the 14.0-14.2 GHz band within: 125 km of the NASA TDRSS facilities on Guam (located at latitude: 13°36'55" N, longitude 144°51'22" E) or White Sands, New Mexico (latitude: 32°20'59" N, longitude 106°36'31" W and latitude: 32°32'40" N, longitude 106°36'48" W). Furthermore, Harris CapRock certifies that it does not plan to conduct operations in the 14.0-14.2 GHz band within 125 km of the NASA TDRSS facilities in Blossom Point, MD (latitude: 38°25'44" N, longitude: 77°05'02" W).¹ Harris CapRock acknowledges that operations within the regions defined above are subject to coordination with relevant federal agencies and may pursue such coordination in the future.

(d): Harris CapRock certifies that it does not anticipate conducting operations during observations in the 14.47-14.5 GHz band within: (a) 45 km of the radio observatory on St. Croix, Virgin Islands (latitude 17°46' N, longitude 64°35' W); (b) 125 km of the radio observatory on Mauna Kea, Hawaii (at latitude 19°48' N, longitude 155°28' W); and (c) 90 km of the Arecibo Observatory on Puerto Rico (latitude 18°20'46" W, longitude

¹ *See* Public Notice, DA 14-992 (July 11, 2014).

66°45'11" N). Harris CapRock acknowledges that operations within the regions defined above are subject to coordination with relevant federal agencies and may pursue such coordination in the future.