

**REGARDING MODIFICATION OF LICENSE TO ADD EARTH STATION ON
VESSELS AUTHORITY TO COMMUNICATE WITH INTELLIAN
ANTENNAS**

I. Introduction

Telesat Network Services, Inc. ("Telesat") is filing the instant application to modify its existing authorization for a Ku-band transmit/receive earth station under Call Sign KA399, in order to add earth stations on vessels ("ESV") operations using the Intellian v100GX antenna type.

II. Compliance with Part 25 of the Commission's Rules

Telesat is herein seeking authority to license the Intellian v100GX antenna type ESV units, which do not strictly conform to the antenna pattern specified in Section 25.209 of the Commission's Rules.

The instant application requests authority for the remote antennas to communicate via any satellite on the Permitted Space Station List to provide ESV service. These remote ESVs will be located on vessels traveling in U.S. and international waters. They will operate with hub antennas that have already been licensed by the Commission and will be utilized to provide ESV service as previously authorized by the Commission. As with the other antennas previously authorized for ESV service, operation of these antennas will be in full compliance with the requirements of the Commission's ESV regulations as set forth in Part 25 of the Commission's Rules.

Telesat's showing of compliance with Part 25 of the Commission's Rules follows herewith and the exhibits required by Section 25.222 are included as attachments to this Exhibit.

Also submitted with the instant request is a declaration provided to Telesat by Intellian, manufacturer of the v100GX series of antennas, attesting that the antennas meet the spectral density envelope set forth in Section 25.222(a)(1)-(4) of the Commission's Rules, when the devices are limited to input power levels equal to or less than those identified in Schedule B to the instant application.

III. Waiver of Section 25.222(a) in order to receive in 12500-12750 MHz band

Telesat's ESV services are provided using capacity in multiple coverage beams on Telstar 11N (Call Sign S2357). Telstar 11N provides coverage of Europe, the northern Atlantic Ocean, portions of Africa, portions of the Continental United States (CONUS), and the Gulf of Mexico.

By the instant amendment application, Telesat seeks to add receive frequencies to its license for the subject antenna types, inclusive of the use of the 12500-12750 MHz band, which band is required for communication with vessels of U.S. registry as well as to non-U.S. registered vessels travelling in waters around the Telstar 11N Europe and Africa beams. Telesat hereby respectfully requests waiver of Section 25.222(a) to permit it to receive in that frequency band exclusively in the Europe and Africa regions.¹

Grant of the instant waiver requests is in the public interest in that it will permit the Commission to grant Telesat's pending application and to begin immediately providing service to various customers who rely upon and are awaiting expanded ESV services.

IV. Summary and Certifications

Telesat certifies that it will limit its pointing error to 0.5°.

Telesat further certifies that, pursuant to Section 25.222(b)(3) of the Commission's rules, the ESV antennas conform to the gain pattern criteria of 25.209(a) and (b) and that, combined with the input power density entered in Schedule B, the off-axis EIRP spectral density envelope in 25.222(a)(1) through (a)(4) will be met.

Telesat acknowledges that its proposed antenna will be protected from radio interference caused by other space stations only to the degree to which harmful interference would not be expected to be caused to an earth station employing an antenna conforming to the referenced patterns defined in Section 25.209.

For the foregoing reasons, Telesat respectfully requests that the modification application for new ESV authority be granted.

¹ The Commission previously granted Telesat such a waiver request when it granted a previous modification application for KA399 to operate SeaTel 4003A antennas and SeaTel 4006 antennas. *See* SES-MOD-20090206-00154.

SHOWING OF COMPLIANCE WITH PART 25 OF THE COMMISSION'S RULES§25.222 (a)(1)(i)(A-C) SPECTRAL DENSITY LIMITS

The transmitters have off-axis EIRP spectral densities less than or equal to the levels in paragraph 25.222(a)(1)(i)(A) and meet the requirements of 25.222 (a)(1)(i)(A-C), with an N value of 1. *See Attachment E, Declaration of Conformity.*

The v100GX's radiation pattern meets the FCC EIRP spectral density mask when the input power's spectral density is -16.66 dBW/4 kHz, which is also the value identified on the accompanying FCC Form 312. *See Attachment B, Spectral Density Report, Section 1.*

All are circular ESV antennas so 25.222 (a)(1)(i)(D) is not applicable.

§25.222 (a)(1)(ii)(A) ANTENNA POINTING ERROR

The v100GX will maintain a stabilization pointing accuracy of better than 0.2 degrees under specified ship motion conditions. *See Attachment E, Declaration of Conformity.*

§25.222 (a)(1)(iii)(A) AUTOMATIC SHUT-OFF

The v100GX will automatically cease the transmission with a mute command to the modem within 100 milliseconds if the pointing error should exceed 0.5 degrees and will not resume transmissions until the error drops below 0.2 degrees. *See Attachment C, Pointing Accuracy and Auto Shutdown, Section 4; and Attachment E, Declaration of Conformity.*

§25.222 (a)(2) OFF-AXIS EIRP SPECTRAL DENSITIES

Not applicable.

§25.222 (a)(3) U.S. CONTACT INFORMATION

Telesat has authority and ability to cease all emissions from ESVs through the facilities of its Mt. Jackson teleport located at 1305 Industrial Park Road, Mount Jackson (Shenandoah), VA. This point of contact is available 24 hours a day, seven days a week at 570-226-6688.

§ 25.222 (a)(4) VESSEL TRACKING

Telesat certifies that it will keep a record of the ship location (i.e. latitude/longitude), transmit frequency, channel bandwidth and satellite used shall be time annotated and that this information will be maintained for a period of not less than 1 year. Records will be recorded at time intervals no greater than every 20 minutes while the ESV is transmitting.

Telesat will make this data available upon request to a coordinator, fixed system operator, fixed-satellite system operator, NTIA, or the Commission within 24 hours of the request. *See* above response to Section 25.222(a)(3) for contact details.

§25.222 (a)(5) VESSELS OF FOREIGN REGISTRY

In the event Telesat must operate foreign-registered ESVs, it will maintain detailed information on each vessel as well as a point of contact for the relevant administration responsible for licensing the ESV.

§25.222 (a)(6) U.S. CONTROL OF ESV HUB EARTH STATION

All ESV hub operations are handled by Telesat's Mt. Jackson teleport located at 1305 Industrial Park Road, Mount Jackson (Shenandoah), VA.

§25.222 (a)(7) 10.95-11.2 GHz

Telesat will not claim protection from interference in the 10.95-11.2GHz from any authorized terrestrial stations to which frequencies are already assigned or may be assigned in the future.

§25.222 (b)(1)(i) EIRP DENSITY TABLES

Telesat has provided spectral density tables. Such tables have been generated by Intellian for the v100GX antenna. *See* Attachment B, Spectral Density Report, Section 2.

§25.222 (b)(1)(ii) TELESAT CERTIFICATION

See Section III of Exhibit 1.

§25.222 (b)(1)(iii) MANUFACTURER CERTIFICATION

See Attachment C, Pointing Accuracy and Auto Shutdown, Section 4; and Attachment E, Declaration of Conformity.

SPECTRAL DENSITY REPORT

Final

EIRP Spectral Density

Model Name: Intellian v100GX

Test Date: Oct 23, 2012

Prepared by

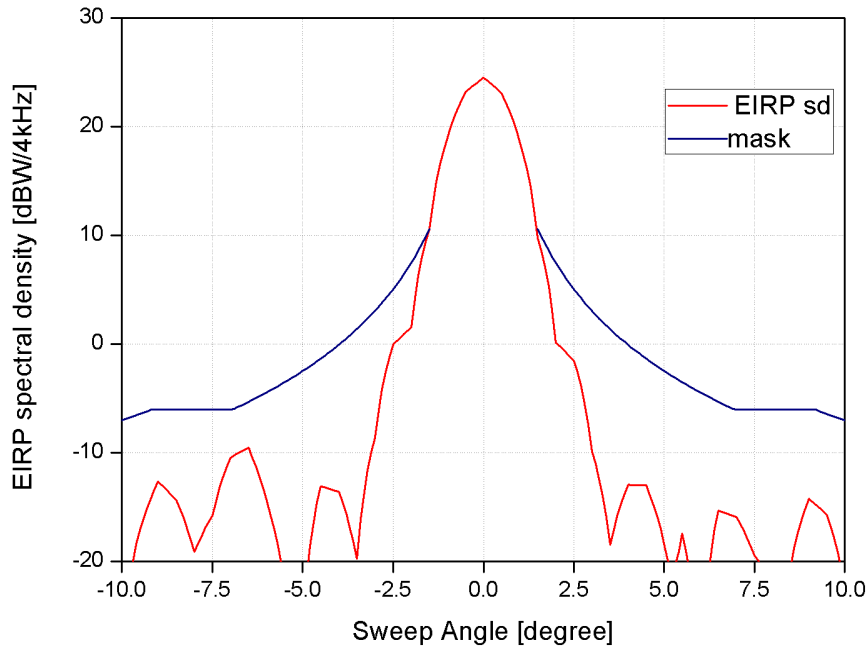
RF Engineering Department
Intellian Technologies, Inc.*Confidential and Intellian proprietary*

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1. EIRP Spectral Density of V100GX

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



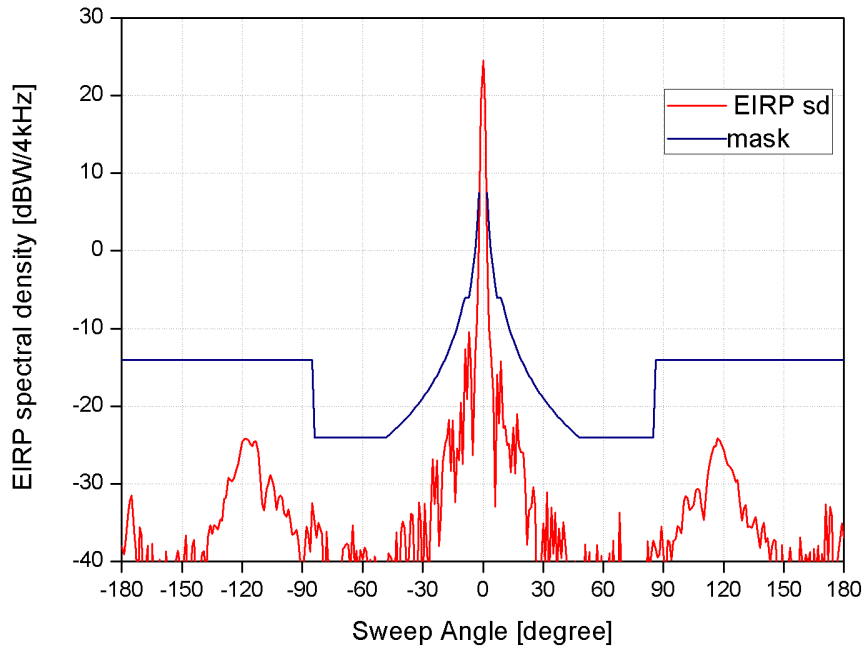
-16.66dBW/4kHz Input power spectral density @ f=14.25GHz & 0.6dB Radome loss

- **FCC EIRP spectral density regulation**

15-25log(θ)	dBW/4kHz	for	1.5° ≤ θ ≤ 7.0°
-6	dBW/4kHz	for	7.0° < θ ≤ 9.2°
18-25log(θ)	dBW/4kHz	for	9.2° < θ ≤ 48°
-24	dBW/4kHz	for	48° < θ ≤ 85°
-14	dBW/4kHz	for	85° < θ ≤ 180°

The v100GX's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -16.66 dBW/ 4kHz

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



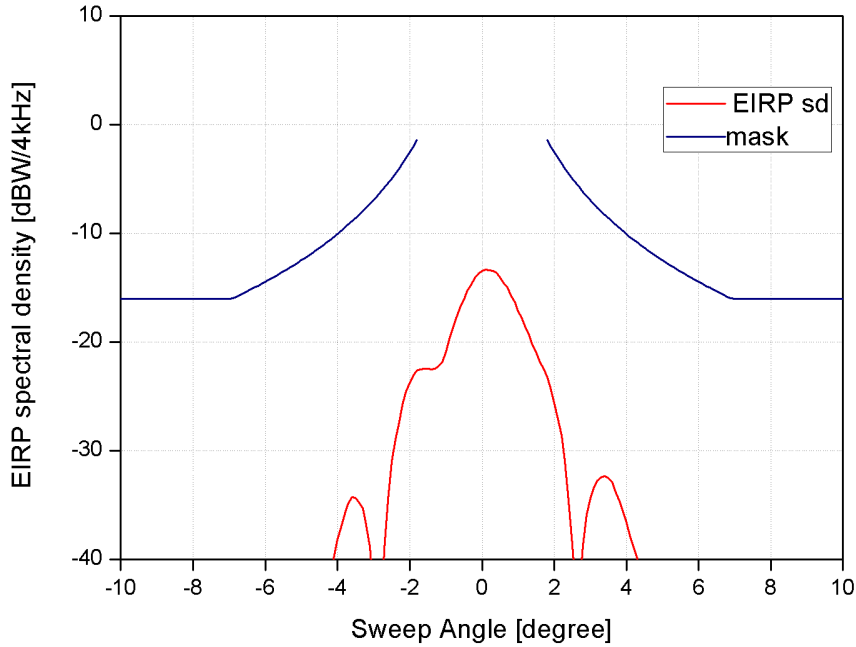
-16.66dBW/4kHz Input power spectral density @ f=14.25GHz & 0.6dB Radome loss

- 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 v100GX's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -16.66 dBW/ 4kHz

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



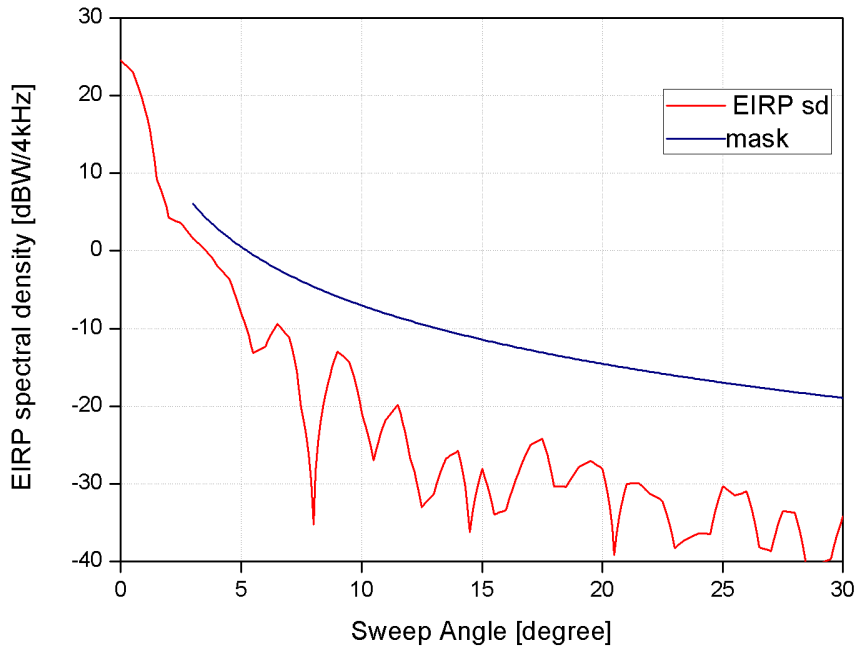
-16.66dBW/4kHz Input power spectral density @ f=14.25GHz & 0.6dB Radome loss

▪ **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 v100GX's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -16.66 dBW/ 4kHz

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



-16.66dBW/4kHz Input power spectral density @ f=14.25GHz & 0.6dB Radome loss

▪ **FCC EIRP spectral density regulation**

18-25log(θ)	dBW/4kHz	for	3.0° ≤ θ ≤ 48°
-24	dBW/4kHz	for	48° < θ ≤ 85°
-14	dBW/4kHz	for	85° < θ ≤ 180°

The v100GX's Radiation pattern meets the FCC EIRP spectral density mask when the input powers spectral density is @ -16.66 dBW/ 4kHz

2. EIRP Spectral Density Data

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

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-10.000	-27.513	-7.000
-9.900	-24.222	-6.891
-9.800	-21.840	-6.781
-9.700	-19.973	-6.669
-9.600	-18.438	-6.557
-9.500	-17.133	-6.443
-9.400	-16.027	-6.328
-9.300	-15.047	-6.212
-9.200	-14.165	-6.000
-9.100	-13.365	-6.000
-9.000	-12.633	-6.000
-8.900	-12.949	-6.000
-8.800	-13.277	-6.000
-8.700	-13.618	-6.000
-8.600	-13.973	-6.000
-8.500	-14.343	-6.000
-8.400	-15.111	-6.000
-8.300	-15.954	-6.000
-8.200	-16.888	-6.000
-8.100	-17.934	-6.000
-8.000	-19.123	-6.000
-7.900	-18.347	-6.000
-7.800	-17.635	-6.000
-7.700	-16.976	-6.000
-7.600	-16.365	-6.000
-7.500	-15.793	-6.000
-7.400	-14.427	-6.000
-7.300	-13.247	-6.000
-7.200	-12.209	-6.000
-7.100	-11.281	-6.000
-7.000	-10.443	-6.000
-6.900	-10.255	-5.971
-6.800	-10.072	-5.813
-6.700	-9.892	-5.652
-6.600	-9.716	-5.489
-6.500	-9.543	-5.323
-6.400	-10.323	-5.154
-6.300	-11.179	-4.984
-6.200	-12.129	-4.810
-6.100	-13.196	-4.633
-6.000	-14.413	-4.454
-5.900	-15.531	-4.271
-5.800	-16.814	-4.086
-5.700	-18.320	-3.897
-5.600	-20.143	-3.705
-5.500	-22.453	-3.509
-5.400	-23.107	-3.310
-5.300	-23.814	-3.107
-5.200	-24.583	-2.900
-5.100	-25.428	-2.689

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-5.000	-26.363	-2.474
-4.900	-21.634	-2.255
-4.800	-18.589	-2.031
-4.700	-16.339	-1.802
-4.600	-14.553	-1.569
-4.500	-13.073	-1.330
-4.400	-13.173	-1.086
-4.300	-13.273	-0.837
-4.200	-13.375	-0.581
-4.100	-13.479	-0.320
-4.000	-13.583	-0.051
-3.900	-14.515	0.223
-3.800	-15.558	0.505
-3.700	-16.745	0.795
-3.600	-18.119	1.092
-3.500	-19.753	1.398
-3.400	-16.105	1.713
-3.300	-13.544	2.037
-3.200	-11.568	2.371
-3.100	-9.960	2.716
-3.000	-8.603	3.072
-2.900	-6.084	3.440
-2.800	-4.134	3.821
-2.700	-2.542	4.216
-2.600	-1.197	4.626
-2.500	-0.033	5.051
-2.400	0.300	5.495
-2.300	0.621	5.957
-2.200	0.930	6.439
-2.100	1.228	6.945
-2.000	1.517	7.474
-1.900	4.244	8.031
-1.800	6.317	8.618
-1.700	7.989	9.239
-1.600	9.391	9.897
-1.500	10.597	10.598
-1.400	13.056	
-1.300	14.971	
-1.200	16.538	
-1.100	17.866	
-1.000	19.017	
-0.900	20.029	
-0.800	20.936	
-0.700	21.757	
-0.600	22.507	
-0.500	23.197	
-0.400	23.475	
-0.300	23.745	
-0.200	24.006	
-0.100	24.260	

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
0.000	24.507	
0.100	24.244	
0.200	23.974	
0.300	23.694	
0.400	23.406	
0.500	23.107	
0.600	22.380	
0.700	21.586	
0.800	20.712	
0.900	19.741	
1.000	18.647	
1.100	17.459	
1.200	16.083	
1.300	14.447	
1.400	12.430	
1.500	9.797	10.598
1.600	8.544	9.897
1.700	7.080	9.239
1.800	5.318	8.618
1.900	3.104	8.031
2.000	0.127	7.474
2.100	-0.172	6.945
2.200	-0.482	6.439
2.300	-0.803	5.957
2.400	-1.136	5.495
2.500	-1.483	5.051
2.600	-2.630	4.626
2.700	-3.952	4.216
2.800	-5.511	3.821
2.900	-7.414	3.440
3.000	-9.853	3.072
3.100	-11.023	2.716
3.200	-12.376	2.371
3.300	-13.979	2.037
3.400	-15.946	1.713
3.500	-18.493	1.398
3.600	-17.060	1.092
3.700	-15.831	0.795
3.800	-14.754	0.505
3.900	-13.796	0.223
4.000	-12.933	-0.051
4.100	-12.945	-0.320
4.200	-12.957	-0.581
4.300	-12.969	-0.837
4.400	-12.981	-1.086
4.500	-12.993	-1.330
4.600	-13.832	-1.569
4.700	-14.761	-1.802
4.800	-15.802	-2.031
4.900	-16.984	-2.255

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
5.000	-18.353	-2.474
5.100	-19.867	-2.689
5.200	-20.694	-2.900
5.300	-20.341	-3.107
5.400	-19.038	-3.310
5.500	-17.393	-3.509
5.600	-18.977	-3.705
5.700	-20.917	-3.897
5.800	-23.417	-4.086
5.900	-26.942	-4.271
6.000	-32.973	-4.454
6.100	-25.621	-4.633
6.200	-21.698	-4.810
6.300	-19.005	-4.984
6.400	-16.952	-5.154
6.500	-15.293	-5.323
6.600	-15.414	-5.489
6.700	-15.536	-5.652
6.800	-15.660	-5.813
6.900	-15.785	-5.971
7.000	-15.913	-6.000
7.100	-16.518	-6.000
7.200	-17.168	-6.000
7.300	-17.870	-6.000
7.400	-18.635	-6.000
7.500	-19.473	-6.000
7.600	-19.959	-6.000
7.700	-20.474	-6.000
7.800	-21.022	-6.000
7.900	-21.606	-6.000
8.000	-22.233	-6.000
8.100	-21.835	-6.000
8.200	-21.454	-6.000
8.300	-21.090	-6.000
8.400	-20.739	-6.000
8.500	-20.403	-6.000
8.600	-18.763	-6.000
8.700	-17.383	-6.000
8.800	-16.193	-6.000
8.900	-15.147	-6.000
9.000	-14.213	-6.000
9.100	-14.483	-6.000
9.200	-14.761	-6.000
9.300	-15.048	-6.212
9.400	-15.345	-6.328
9.500	-15.653	-6.443
9.600	-16.683	-6.557
9.700	-17.851	-6.669
9.800	-19.201	-6.781
9.900	-20.801	-6.891
10.000	-22.763	-7.000

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

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-180	-37.993	-14
-179	-39.113	-14
-178	-36.993	-14
-177	-34.193	-14
-176	-32.303	-14
-175	-31.463	-14
-174	-35.973	-14
-173	-38.733	-14
-172	-44.023	-14
-171	-35.563	-14
-170	-36.643	-14
-169	-49.553	-14
-168	-40.443	-14
-167	-37.943	-14
-166	-59.063	-14
-165	-37.733	-14
-164	-46.343	-14
-163	-63.133	-14
-162	-41.233	-14
-161	-39.703	-14
-160	-45.933	-14
-159	-46.093	-14
-158	-38.673	-14
-157	-42.733	-14
-156	-40.453	-14
-155	-40.653	-14
-154	-46.833	-14
-153	-39.893	-14
-152	-38.583	-14
-151	-40.133	-14
-150	-48.713	-14
-149	-39.613	-14
-148	-36.623	-14
-147	-43.493	-14
-146	-42.963	-14
-145	-38.083	-14
-144	-37.243	-14
-143	-42.573	-14
-142	-40.413	-14
-141	-40.783	-14
-140	-38.953	-14
-139	-38.673	-14
-138	-42.503	-14
-137	-36.933	-14
-136	-35.343	-14

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-135	-36.483	-14
-134	-35.343	-14
-133	-35.493	-14
-132	-35.853	-14
-131	-34.543	-14
-130	-34.763	-14
-129	-31.963	-14
-128	-31.813	-14
-127	-29.203	-14
-126	-29.513	-14
-125	-29.703	-14
-124	-29.253	-14
-123	-28.403	-14
-122	-27.343	-14
-121	-25.913	-14
-120	-24.593	-14
-119	-24.273	-14
-118	-24.173	-14
-117	-24.353	-14
-116	-24.863	-14
-115	-25.173	-14
-114	-24.583	-14
-113	-24.513	-14
-112	-26.033	-14
-111	-29.153	-14
-110	-32.523	-14
-109	-33.453	-14
-108	-30.713	-14
-107	-29.933	-14
-106	-28.863	-14
-105	-29.493	-14
-104	-30.473	-14
-103	-33.393	-14
-102	-31.913	-14
-101	-31.483	-14
-100	-31.673	-14
-99	-33.753	-14
-98	-34.223	-14
-97	-33.283	-14
-96	-34.643	-14
-95	-36.553	-14
-94	-36.463	-14
-93	-35.853	-14
-92	-37.373	-14
-91	-40.103	-14

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-90.000	-43.263	-14.000
-89.000	-38.673	-14.000
-88.000	-35.503	-14.000
-87.000	-36.533	-14.000
-86.000	-38.753	-14.000
-85.000	-32.423	-14.000
-84.000	-35.023	-24.000
-83.000	-36.983	-24.000
-82.000	-34.963	-24.000
-81.000	-35.713	-24.000
-80.000	-36.483	-24.000
-79.000	-47.953	-24.000
-78.000	-36.133	-24.000
-77.000	-40.443	-24.000
-76.000	-47.633	-24.000
-75.000	-42.493	-24.000
-74.000	-48.523	-24.000
-73.000	-49.443	-24.000
-72.000	-43.183	-24.000
-71.000	-45.253	-24.000
-70.000	-38.453	-24.000
-69.000	-38.123	-24.000
-68.000	-37.663	-24.000
-67.000	-37.893	-24.000
-66.000	-41.193	-24.000
-65.000	-35.283	-24.000
-64.000	-40.403	-24.000
-63.000	-38.603	-24.000
-62.000	-43.563	-24.000
-61.000	-38.533	-24.000
-60.000	-39.743	-24.000
-59.000	-38.223	-24.000
-58.000	-38.743	-24.000
-57.000	-42.583	-24.000
-56.000	-39.703	-24.000
-55.000	-44.173	-24.000
-54.000	-39.373	-24.000
-53.000	-40.413	-24.000
-52.000	-47.723	-24.000
-51.000	-41.953	-24.000
-50.000	-41.493	-24.000
-49.000	-44.213	-24.000
-48.000	-43.933	-24.000
-47.000	-38.903	-23.802
-46.000	-39.463	-23.569

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-45.000	-40.063	-23.330
-44.000	-42.843	-23.086
-43.000	-36.203	-22.837
-42.000	-47.283	-22.581
-41.000	-36.373	-22.320
-40.000	-34.853	-22.051
-39.000	-35.733	-21.777
-38.000	-42.133	-21.495
-37.000	-39.093	-21.205
-36.000	-33.823	-20.908
-35.000	-33.983	-20.602
-34.000	-41.453	-20.287
-33.000	-44.893	-19.963
-32.000	-32.353	-19.629
-31.000	-35.093	-19.284
-30.000	-46.103	-18.928
-29.000	-32.563	-18.560
-28.000	-38.993	-18.179
-27.000	-41.403	-17.784
-26.000	-33.473	-17.374
-25.000	-26.853	-16.949
-24.000	-32.593	-16.505
-23.000	-26.953	-16.043
-22.000	-37.993	-15.561
-21.000	-34.053	-15.055
-20.000	-27.333	-14.526
-19.000	-24.833	-13.969
-18.000	-24.083	-13.382
-17.000	-21.773	-12.761
-16.000	-28.393	-12.103
-15.000	-21.813	-11.402
-14.000	-32.343	-10.653
-13.000	-25.413	-9.849
-12.000	-26.963	-8.980
-11.000	-19.493	-8.035
-10.000	-27.513	-7.000
-9.000	-12.633	-6.000
-8.000	-19.123	-6.000
-7.000	-10.443	-6.000
-6.000	-14.413	-4.454
-5.000	-26.363	-2.474
-4.000	-13.583	-0.051
-3.000	-8.603	3.072
-2.000	1.517	7.474
-1.000	19.017	

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
0.000	24.507	
1.000	18.647	
2.000	0.127	7.474
3.000	-9.853	3.072
4.000	-12.933	-0.051
5.000	-18.353	-2.474
6.000	-32.973	-4.454
7.000	-15.913	-6.000
8.000	-22.233	-6.000
9.000	-14.213	-6.000
10.000	-22.763	-7.000
11.000	-22.563	-8.035
12.000	-25.053	-8.980
13.000	-24.873	-9.849
14.000	-28.513	-10.653
15.000	-22.753	-11.402
16.000	-28.713	-12.103
17.000	-20.973	-12.761
18.000	-25.113	-13.382
19.000	-25.953	-13.969
20.000	-26.013	-14.526
21.000	-29.933	-15.055
22.000	-37.853	-15.561
23.000	-33.443	-16.043
24.000	-32.903	-16.505
25.000	-30.393	-16.949
26.000	-32.873	-17.374
27.000	-46.683	-17.784
28.000	-43.033	-18.179
29.000	-39.683	-18.560
30.000	-35.113	-18.928
31.000	-40.173	-19.284
32.000	-31.083	-19.629
33.000	-43.433	-19.963
34.000	-33.053	-20.287
35.000	-39.023	-20.602
36.000	-33.713	-20.908
37.000	-41.663	-21.205
38.000	-35.763	-21.495
39.000	-39.593	-21.777
40.000	-34.903	-22.051
41.000	-37.533	-22.320
42.000	-40.563	-22.581
43.000	-41.093	-22.837
44.000	-44.853	-23.086

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
45.000	-41.113	-23.330
46.000	-39.963	-23.569
47.000	-41.833	-23.802
48.000	-53.533	-24.000
49.000	-44.973	-24.000
50.000	-47.043	-24.000
51.000	-37.743	-24.000
52.000	-43.033	-24.000
53.000	-38.763	-24.000
54.000	-56.683	-24.000
55.000	-42.793	-24.000
56.000	-44.603	-24.000
57.000	-37.893	-24.000
58.000	-43.623	-24.000
59.000	-39.283	-24.000
60.000	-57.433	-24.000
61.000	-40.263	-24.000
62.000	-42.343	-24.000
63.000	-38.963	-24.000
64.000	-45.393	-24.000
65.000	-37.253	-24.000
66.000	-48.413	-24.000
67.000	-48.863	-24.000
68.000	-33.703	-24.000
69.000	-41.623	-24.000
70.000	-48.543	-24.000
71.000	-42.533	-24.000
72.000	-44.323	-24.000
73.000	-41.453	-24.000
74.000	-45.733	-24.000
75.000	-44.633	-24.000
76.000	-47.543	-24.000
77.000	-49.423	-24.000
78.000	-48.623	-24.000
79.000	-40.133	-24.000
80.000	-59.333	-24.000
81.000	-50.163	-24.000
82.000	-37.363	-24.000
83.000	-41.593	-24.000
84.000	-38.913	-24.000
85.000	-37.323	-24.000
86.000	-38.473	-14.000
87.000	-39.493	-14.000
88.000	-39.103	-14.000
89.000	-35.503	-14.000

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
90.000	-38.733	-14.000
91.000	-42.393	-14.000
92.000	-37.313	-14.000
93.000	-37.463	-14.000
94.000	-39.793	-14.000
95.000	-37.393	-14.000
96.000	-37.133	-14.000
97.000	-35.373	-14.000
98.000	-35.713	-14.000
99.000	-36.353	-14.000
100.000	-32.283	-14.000
101.000	-31.553	-14.000
102.000	-31.863	-14.000
103.000	-33.393	-14.000
104.000	-33.173	-14.000
105.000	-32.643	-14.000
106.000	-30.933	-14.000
107.000	-30.613	-14.000
108.000	-30.803	-14.000
109.000	-32.893	-14.000
110.000	-34.653	-14.000
111.000	-31.703	-14.000
112.000	-29.003	-14.000
113.000	-27.493	-14.000
114.000	-26.343	-14.000
115.000	-25.143	-14.000
116.000	-25.183	-14.000
117.000	-24.093	-14.000
118.000	-24.383	-14.000
119.000	-25.093	-14.000
120.000	-25.693	-14.000
121.000	-26.743	-14.000
122.000	-27.523	-14.000
123.000	-27.743	-14.000
124.000	-28.173	-14.000
125.000	-28.823	-14.000
126.000	-29.753	-14.000
127.000	-29.523	-14.000
128.000	-32.043	-14.000
129.000	-34.743	-14.000
130.000	-33.223	-14.000
131.000	-32.683	-14.000
132.000	-35.593	-14.000
133.000	-35.493	-14.000
134.000	-35.623	-14.000

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
135	-34.813	-14
136	-34.253	-14
137	-36.193	-14
138	-38.283	-14
139	-35.783	-14
140	-34.953	-14
141	-37.503	-14
142	-36.973	-14
143	-40.063	-14
144	-38.123	-14
145	-37.193	-14
146	-37.343	-14
147	-43.543	-14
148	-56.213	-14
149	-37.863	-14
150	-45.113	-14
151	-47.753	-14
152	-41.913	-14
153	-38.183	-14
154	-41.103	-14
155	-46.913	-14
156	-40.563	-14
157	-45.883	-14
158	-36.873	-14
159	-39.773	-14
160	-41.443	-14
161	-39.123	-14
162	-40.283	-14
163	-38.733	-14
164	-61.613	-14
165	-38.343	-14
166	-42.093	-14
167	-37.903	-14
168	-45.313	-14
169	-39.013	-14
170	-41.853	-14
171	-32.643	-14
172	-40.063	-14
173	-32.963	-14
174	-34.243	-14
175	-46.203	-14
176	-42.193	-14
177	-38.983	-14
178	-37.083	-14
179	-35.093	-14
180	-36.983	-14

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

f= 14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-10.000	-49.583	-16.000
-9.900	-49.543	-16.000
-9.800	-49.753	-16.000
-9.700	-50.413	-16.000
-9.600	-50.463	-16.000
-9.500	-50.243	-16.000
-9.400	-50.363	-16.000
-9.300	-48.343	-16.000
-9.200	-48.473	-16.000
-9.100	-46.833	-16.000
-9.000	-45.643	-16.000
-8.900	-45.783	-16.000
-8.800	-46.013	-16.000
-8.700	-46.153	-16.000
-8.600	-45.993	-16.000
-8.500	-47.593	-16.000
-8.400	-48.473	-16.000
-8.300	-49.583	-16.000
-8.200	-51.733	-16.000
-8.100	-54.863	-16.000
-8.000	-58.723	-16.000
-7.900	-65.553	-16.000
-7.800	-70.153	-16.000
-7.700	-69.123	-16.000
-7.600	-60.653	-16.000
-7.500	-55.013	-16.000
-7.400	-51.033	-16.000
-7.300	-48.653	-16.000
-7.200	-47.553	-16.000
-7.100	-46.343	-16.000
-7.000	-45.723	-16.000
-6.900	-46.003	-15.971
-6.800	-45.583	-15.813
-6.700	-46.063	-15.652
-6.600	-45.083	-15.489
-6.500	-44.943	-15.323
-6.400	-43.923	-15.154
-6.300	-43.823	-14.984
-6.200	-42.983	-14.810
-6.100	-42.873	-14.633
-6.000	-43.203	-14.454
-5.900	-43.433	-14.271
-5.800	-43.673	-14.086
-5.700	-43.143	-13.897
-5.600	-43.093	-13.705
-5.500	-42.583	-13.509
-5.400	-41.913	-13.310
-5.300	-41.733	-13.107
-5.200	-41.253	-12.900
-5.100	-41.223	-12.689

f= 14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
-5.000	-41.253	-12.474
-4.900	-41.963	-12.255
-4.800	-41.953	-12.031
-4.700	-42.713	-11.802
-4.600	-43.133	-11.569
-4.500	-43.903	-11.330
-4.400	-43.643	-11.086
-4.300	-43.073	-10.837
-4.200	-41.523	-10.581
-4.100	-39.903	-10.320
-4.000	-38.153	-10.051
-3.900	-37.003	-9.777
-3.800	-35.753	-9.495
-3.700	-34.903	-9.205
-3.600	-34.273	-8.908
-3.500	-34.303	-8.602
-3.400	-34.793	-8.287
-3.300	-35.323	-7.963
-3.200	-36.803	-7.629
-3.100	-38.803	-7.284
-3.000	-43.243	-6.928
-2.900	-51.473	-6.560
-2.800	-46.803	-6.179
-2.700	-39.113	-5.784
-2.600	-34.463	-5.374
-2.500	-31.013	-4.949
-2.400	-28.963	-4.505
-2.300	-27.343	-4.043
-2.200	-25.813	-3.561
-2.100	-24.523	-3.055
-2.000	-23.723	-2.526
-1.900	-23.043	-1.969
-1.800	-22.643	-1.382
-1.700	-22.513	
-1.600	-22.453	
-1.500	-22.463	
-1.400	-22.493	
-1.300	-22.443	
-1.200	-22.243	
-1.100	-21.823	
-1.000	-20.863	
-0.900	-19.743	
-0.800	-18.643	
-0.700	-17.643	
-0.600	-16.683	
-0.500	-15.993	
-0.400	-15.253	
-0.300	-14.693	
-0.200	-14.083	
-0.100	-13.663	

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
0.000	-13.443	
0.100	-13.353	
0.200	-13.373	
0.300	-13.443	
0.400	-13.643	
0.500	-14.033	
0.600	-14.543	
0.700	-14.983	
0.800	-15.703	
0.900	-16.303	
1.000	-17.103	
1.100	-17.793	
1.200	-18.663	
1.300	-19.353	
1.400	-20.243	
1.500	-20.903	
1.600	-21.803	
1.700	-22.453	
1.800	-23.183	-1.382
1.900	-24.203	-1.969
2.000	-25.623	-2.526
2.100	-27.063	-3.055
2.200	-28.603	-3.561
2.300	-30.933	-4.043
2.400	-34.583	-4.505
2.500	-38.673	-4.949
2.600	-43.263	-5.374
2.700	-42.453	-5.784
2.800	-38.723	-6.179
2.900	-35.863	-6.560
3.000	-34.373	-6.928
3.100	-33.343	-7.284
3.200	-32.763	-7.629
3.300	-32.413	-7.963
3.400	-32.323	-8.287
3.500	-32.523	-8.602
3.600	-32.883	-8.908
3.700	-33.723	-9.205
3.800	-34.533	-9.495
3.900	-35.573	-9.777
4.000	-36.683	-10.051
4.100	-37.753	-10.320
4.200	-38.823	-10.581
4.300	-39.913	-10.837
4.400	-41.073	-11.086
4.500	-42.313	-11.330
4.600	-44.383	-11.569
4.700	-47.093	-11.802
4.800	-50.043	-12.031
4.900	-53.643	-12.255

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
5.000	-52.363	-12.474
5.100	-49.793	-12.689
5.200	-46.663	-12.900
5.300	-44.883	-13.107
5.400	-43.623	-13.310
5.500	-43.243	-13.509
5.600	-43.223	-13.705
5.700	-43.373	-13.897
5.800	-44.763	-14.086
5.900	-46.713	-14.271
6.000	-49.763	-14.454
6.100	-51.623	-14.633
6.200	-49.683	-14.810
6.300	-47.463	-14.984
6.400	-45.453	-15.154
6.500	-44.733	-15.323
6.600	-44.593	-15.489
6.700	-44.343	-15.652
6.800	-43.953	-15.813
6.900	-44.343	-15.971
7.000	-44.753	-16.000
7.100	-44.683	-16.000
7.200	-44.913	-16.000
7.300	-44.373	-16.000
7.400	-44.283	-16.000
7.500	-43.653	-16.000
7.600	-42.973	-16.000
7.700	-42.003	-16.000
7.800	-41.313	-16.000
7.900	-41.243	-16.000
8.000	-41.453	-16.000
8.100	-41.753	-16.000
8.200	-42.193	-16.000
8.300	-43.103	-16.000
8.400	-43.923	-16.000
8.500	-44.923	-16.000
8.600	-46.193	-16.000
8.700	-48.243	-16.000
8.800	-48.953	-16.000
8.900	-51.643	-16.000
9.000	-53.863	-16.000
9.100	-57.583	-16.000
9.200	-57.963	-16.000
9.300	-54.753	-16.000
9.400	-52.193	-16.000
9.500	-49.313	-16.000
9.600	-48.373	-16.000
9.700	-48.023	-16.000
9.800	-47.873	-16.000
9.900	-48.593	-16.000
10.000	-49.143	-16.000

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

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
0.000	24.507	
0.100	24.237	
0.200	23.959	
0.300	23.672	
0.400	23.375	
0.500	23.067	
0.600	22.294	
0.700	21.445	
0.800	20.504	
0.900	19.449	
1.000	18.247	
1.100	17.043	
1.200	15.645	
1.300	13.977	
1.400	11.912	
1.500	9.197	
1.600	8.411	
1.700	7.547	
1.800	6.588	
1.900	5.509	
2.000	4.277	
2.100	4.136	
2.200	3.992	
2.300	3.846	
2.400	3.698	
2.500	3.547	
2.600	3.187	
2.700	2.812	
2.800	2.419	
2.900	2.008	
3.000	1.577	6.072
3.100	1.318	5.716
3.200	1.051	5.371
3.300	0.776	5.037
3.400	0.491	4.713
3.500	0.197	4.398
3.600	-0.176	4.092
3.700	-0.566	3.795
3.800	-0.974	3.505
3.900	-1.402	3.223
4.000	-1.853	2.949
4.100	-2.181	2.680
4.200	-2.522	2.419
4.300	-2.877	2.163
4.400	-3.247	1.914
4.500	-3.633	1.670
4.600	-4.356	1.431
4.700	-5.145	1.198
4.800	-6.013	0.969
4.900	-6.978	0.745

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
5.000	-8.063	0.526
5.100	-8.870	0.311
5.200	-9.759	0.100
5.300	-10.750	-0.107
5.400	-11.869	-0.310
5.500	-13.153	-0.509
5.600	-12.987	-0.705
5.700	-12.824	-0.897
5.800	-12.664	-1.086
5.900	-12.507	-1.271
6.000	-12.353	-1.454
6.100	-11.672	-1.633
6.200	-11.041	-1.810
6.300	-10.452	-1.984
6.400	-9.901	-2.154
6.500	-9.383	-2.323
6.600	-9.714	-2.489
6.700	-10.059	-2.652
6.800	-10.418	-2.813
6.900	-10.792	-2.971
7.000	-11.183	-3.127
7.100	-12.388	-3.281
7.200	-13.787	-3.433
7.300	-15.456	-3.583
7.400	-17.524	-3.731
7.500	-20.243	-3.877
7.600	-21.803	-4.020
7.700	-23.705	-4.162
7.800	-26.144	-4.302
7.900	-29.547	-4.441
8.000	-35.223	-4.577
8.100	-28.452	-4.712
8.200	-24.694	-4.845
8.300	-22.079	-4.977
8.400	-20.072	-5.107
8.500	-18.443	-5.235
8.600	-17.045	-5.362
8.700	-15.842	-5.488
8.800	-14.785	-5.612
8.900	-13.843	-5.735
9.000	-12.993	-5.856
9.100	-13.236	-5.976
9.200	-13.486	-6.095
9.300	-13.744	-6.212
9.400	-14.009	-6.328
9.500	-14.283	-6.443
9.600	-15.254	-6.557
9.700	-16.348	-6.669
9.800	-17.600	-6.781
9.900	-19.063	-6.891

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
10.000	-20.823	-7.000
10.100	-21.757	-7.108
10.200	-22.803	-7.215
10.300	-23.993	-7.321
10.400	-25.373	-7.426
10.500	-27.013	-7.530
10.600	-25.701	-7.633
10.700	-24.561	-7.735
10.800	-23.553	-7.836
10.900	-22.651	-7.936
11.000	-21.833	-8.035
11.100	-21.399	-8.133
11.200	-20.986	-8.230
11.300	-20.592	-8.327
11.400	-20.215	-8.423
11.500	-19.853	-8.517
11.600	-20.842	-8.611
11.700	-21.959	-8.705
11.800	-23.240	-8.797
11.900	-24.743	-8.889
12.000	-26.563	-8.980
12.100	-27.525	-9.070
12.200	-28.607	-9.159
12.300	-29.842	-9.248
12.400	-31.284	-9.336
12.500	-33.013	-9.423
12.600	-32.655	-9.509
12.700	-32.310	-9.595
12.800	-31.979	-9.680
12.900	-31.661	-9.765
13.000	-31.353	-9.849
13.100	-30.221	-9.932
13.200	-29.219	-10.014
13.300	-28.321	-10.096
13.400	-27.507	-10.178
13.500	-26.763	-10.258
13.600	-26.558	-10.338
13.700	-26.358	-10.418
13.800	-26.162	-10.497
13.900	-25.970	-10.575
14.000	-25.783	-10.653
14.100	-27.093	-10.730
14.200	-28.635	-10.807
14.300	-30.512	-10.883
14.400	-32.910	-10.959
14.500	-36.233	-11.034
14.600	-33.857	-11.109
14.700	-31.993	-11.183
14.800	-30.459	-11.257
14.900	-29.156	-11.330

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
15.000	-28.023	-11.402
15.100	-28.927	-11.474
15.200	-29.936	-11.546
15.300	-31.078	-11.617
15.400	-32.393	-11.688
15.500	-33.943	-11.758
15.600	-33.828	-11.828
15.700	-33.715	-11.897
15.800	-33.603	-11.966
15.900	-33.492	-12.035
16.000	-33.383	-12.103
16.100	-32.245	-12.171
16.200	-31.238	-12.238
16.300	-30.336	-12.305
16.400	-29.520	-12.371
16.500	-28.773	-12.437
16.600	-27.885	-12.503
16.700	-27.080	-12.568
16.800	-26.343	-12.633
16.900	-25.663	-12.697
17.000	-25.033	-12.761
17.100	-24.867	-12.825
17.200	-24.704	-12.888
17.300	-24.544	-12.951
17.400	-24.387	-13.014
17.500	-24.233	-13.076
17.600	-25.151	-13.138
17.700	-26.179	-13.199
17.800	-27.344	-13.261
17.900	-28.690	-13.321
18.000	-30.283	-13.382
18.100	-30.299	-13.442
18.200	-30.315	-13.502
18.300	-30.331	-13.561
18.400	-30.347	-13.620
18.500	-30.363	-13.679
18.600	-29.815	-13.738
18.700	-29.299	-13.796
18.800	-28.812	-13.854
18.900	-28.351	-13.912
19.000	-27.913	-13.969
19.100	-27.738	-14.026
19.200	-27.567	-14.083
19.300	-27.399	-14.139
19.400	-27.235	-14.195
19.500	-27.073	-14.251
19.600	-27.259	-14.306
19.700	-27.448	-14.362
19.800	-27.642	-14.417
19.900	-27.840	-14.471

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
20.000	-28.043	-14.526
20.100	-29.399	-14.580
20.200	-31.006	-14.634
20.300	-32.981	-14.687
20.400	-35.540	-14.741
20.500	-39.183	-14.794
20.600	-36.397	-14.847
20.700	-34.291	-14.899
20.800	-32.597	-14.952
20.900	-31.181	-15.004
21.000	-29.963	-15.055
21.100	-29.957	-15.107
21.200	-29.951	-15.158
21.300	-29.945	-15.209
21.400	-29.939	-15.260
21.500	-29.933	-15.311
21.600	-30.183	-15.361
21.700	-30.441	-15.411
21.800	-30.706	-15.461
21.900	-30.980	-15.511
22.000	-31.263	-15.561
22.100	-31.438	-15.610
22.200	-31.616	-15.659
22.300	-31.797	-15.708
22.400	-31.983	-15.756
22.500	-32.173	-15.805
22.600	-33.097	-15.853
22.700	-34.131	-15.901
22.800	-35.305	-15.948
22.900	-36.663	-15.996
23.000	-38.273	-16.043
23.100	-38.024	-16.090
23.200	-37.782	-16.137
23.300	-37.546	-16.184
23.400	-37.317	-16.230
23.500	-37.093	-16.277
23.600	-36.946	-16.323
23.700	-36.802	-16.369
23.800	-36.660	-16.414
23.900	-36.520	-16.460
24.000	-36.383	-16.505
24.100	-36.397	-16.550
24.200	-36.411	-16.595
24.300	-36.425	-16.640
24.400	-36.439	-16.685
24.500	-36.453	-16.729
24.600	-34.819	-16.773
24.700	-33.445	-16.817
24.800	-32.258	-16.861
24.900	-31.215	-16.905

f=14.25GHz, -16.66dBW/4kHz EIRP sd (0.6dB radome loss)		
25.000	-30.283	-16.949
25.100	-30.508	-16.992
25.200	-30.740	-17.035
25.300	-30.977	-17.078
25.400	-31.222	-17.121
25.500	-31.473	-17.164
25.600	-31.377	-17.206
25.700	-31.282	-17.248
25.800	-31.188	-17.290
25.900	-31.095	-17.332
26.000	-31.003	-17.374
26.100	-32.036	-17.416
26.200	-33.208	-17.458
26.300	-34.563	-17.499
26.400	-36.170	-17.540
26.500	-38.143	-17.581
26.600	-38.243	-17.622
26.700	-38.343	-17.663
26.800	-38.445	-17.703
26.900	-38.549	-17.744
27.000	-38.653	-17.784
27.100	-37.353	-17.824
27.200	-36.223	-17.864
27.300	-35.223	-17.904
27.400	-34.326	-17.944
27.500	-33.513	-17.983
27.600	-33.553	-18.023
27.700	-33.592	-18.062
27.800	-33.632	-18.101
27.900	-33.673	-18.140
28.000	-33.713	-18.179
28.100	-34.813	-18.218
28.200	-36.074	-18.256
28.300	-37.548	-18.295
28.400	-39.326	-18.333
28.500	-41.563	-18.371
28.600	-41.289	-18.409
28.700	-41.024	-18.447
28.800	-40.766	-18.485
28.900	-40.516	-18.522
29.000	-40.273	-18.560
29.100	-40.152	-18.597
29.200	-40.032	-18.635
29.300	-39.914	-18.672
29.400	-39.798	-18.709
29.500	-39.683	-18.746
29.600	-38.276	-18.782
29.700	-37.065	-18.819
29.800	-36.003	-18.855
29.900	-35.056	-18.892
30.000	-34.203	-18.928

POINTING ACCURACY AND AUTO SHUTDOWN REPORT

Final

Pointing Accuracy & Auto TX Shut-off

Model Name: Intellian v100GX

Test Date: October 23, 2012

Prepared by

RF Engineering Department
Intellian Technologies, Inc.*Confidential and Intellian proprietary*

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1. Introduction

The FCC regulation, 47 C.F.R § 25.222 (a) (1) (iii) states that: all emissions from the ESV (Earth Station on Vessel) shall automatically cease within 100 milliseconds 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 0.2 °.

This document presents a proposal for insuring that Intellian V100GX antennas, when used in a two way satellite transmission environment, will accurately point at the target satellite. If the antenna should become miss-pointed by exceeding 0.5° from the axis of the main lobe of the target satellite, the system will provide a signal to immediately cease the transmitter to prevent interference with adjacent satellite transmissions, and the transmission will not resume until such angle is less than 0.2°, thus meeting the requirements of the foregoing FCC regulation.

2. Background

Intellian V100GX antenna systems employs closed loop servo systems to keep the antenna pointed accurately at the satellite. The closed loop servo system includes highly accurate sensors continuously to monitor the antenna's position in inertial space. In the normal operation, the servo mechanism keeps the antenna pointing within $\pm 0.1^\circ$ degrees RMS and the pointing accuracy is approximately 0.2° peak. However there always exists the possibility that unexpected conditions will cause the antenna to deviate outside this normal operation.

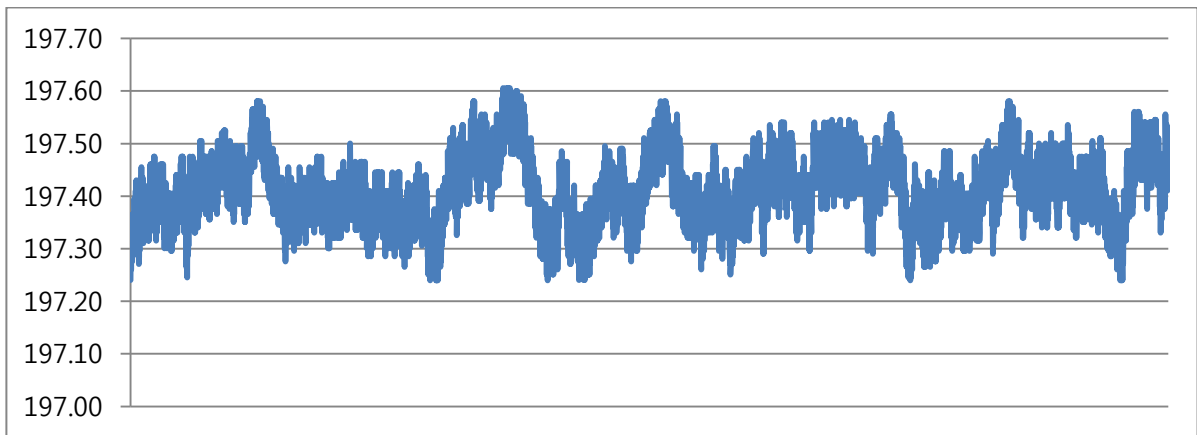
Examples of some possible conditions are:

- Unexpected mechanical disturbance from an external source.
- Mechanical malfunction.
- Ship motions beyond the pedestal specifications which cause very large accelerations on the axes.
- Failure of one or more drive motors.
- Sensor malfunction (Rate Sensors, GPS, Gyrocompass).

3. Antenna Pointing Accuracy

At all times, the antenna control unit (ACU) continually monitors the antenna position as part of the normal servo loop operation of the antenna and compares a running average of the measured azimuth and elevation to the desired azimuth and elevation positions. If the antenna becomes miss-pointed by exceeding 0.5° from the axis of the main lobe of the target satellite, then the ACU will send a “cease transmissions” signal by providing a TX MUTE instruction to the below-deck satellite modem within 100 milliseconds. The ACU will suppress the signal until the off-axis angle is within 0.2° of the target satellite.

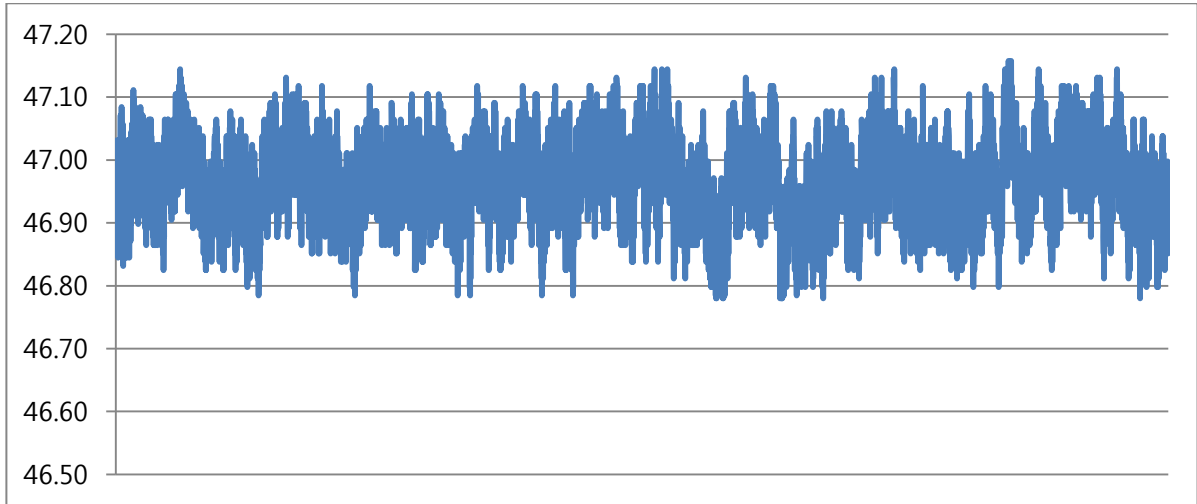
3.1. Azimuth Stability Accuracy Test



Max. Azimuth Angle	197.61°
Min. Azimuth Angle	197.24°
MAX-MIN Angle	0.37°
Average Angle	197.41°
Number of Data	5,000
Percentage of Data Within ± 0.2°	5,000 (100.0%)

- During the tracking period, the variation of the AZ angle was within ±0.18°
- Conformance rate within the standard spec of ±0.2° was 100.0%

3.2. Elevation Stability Accuracy Test



Max. Azimuth Angle	47.16°
Min. Azimuth Angle	46.78°
MAX-MIN Angle	0.38°
Average Angle	46.97°
Number of Data	5,000
Percentage of Data Within $\pm 0.2^\circ$	5,000 (100.0%)

- During the tracking period, the variation of the AZ angle was $\pm 0.19^\circ$
- Conformance rate within the standard spec of $\pm 0.2^\circ$ was 100.0%

4. Auto Tx Shut-off

Below is the expected system and error detector performance

Feature	Performance
Normal operation system pointing error	0.05° RMS, +/-0.1° Peak
Nominal error detector limit	<0.5°
Response time (from pointing error occurs to Tx-off)	Less than 100 milliseconds

Event	Time to go from Tx-on to Tx-off	Comment
Antenna position deviation > 0.5°	<60 msec	Delay caused by master clock.
GPS-error	<60 msec	Will re-activate when GPS error is cleared.
HEADING-error	<60 msec	Will re-activate as the external heading sensor error is cleared.
Correction vector > 0.5°	<60 msec	The antenna control unit can detect the antenna's position with a resolution of 10ms and can react within 10ms of the antenna being disturbed from boresight
Go to parking position or shutdown	10 msec	
Satellite signal lock lost	<100 msec	The external mute is used if the modem cannot comply with the <100msec.

RADIATION PATTERN REPORT

Final

Radiation Pattern

Model Name: Intellian v100GX

Test Date: May 09 ~ 14, 2012

Prepared by

RF Engineering Department
Intellian Technologies, Inc.*Confidential and Intellian proprietary*

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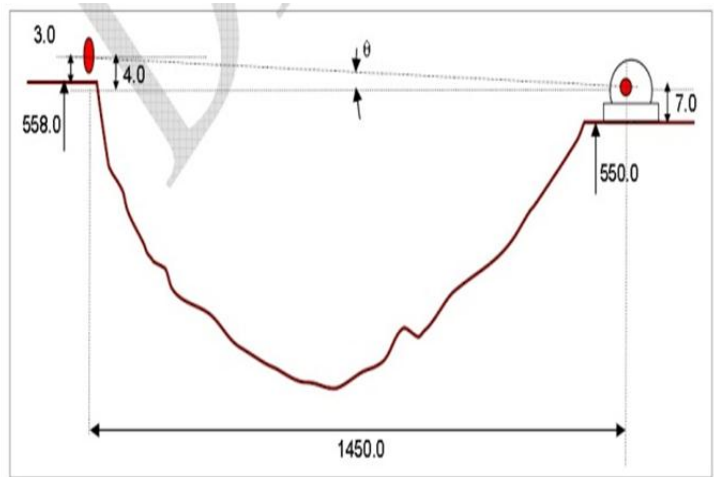
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1. Introduction

This document presents the measurement results of the Intellian V100GX's radiation characteristics. The V100GX works in Receive and Transmit Ku bands in two linear polarizations, vertical and horizontal. The radiation patterns in co and cross polarization in the horizontal and vertical plane and the gains are measured and displayed in this document.

2. Far Field Facility

The configuration of the measurement site is given on the picture below. The V100GX is on the right of the picture and is considered as a receiving antenna. The emitting antenna is at a distance of 1,450 m.



3. Measurement Results

3.1. Summary

	Frequency	Gain
Tx band	13.75 GHz	41.2 dBi
	14.00 GHz	41.6 dBi
	14.25 GHz	41.8 dBi
	14.50 GHz	41.6 dBi
Rx band	10.95 GHz	39.4 dBi
	11.85 GHz	40.6 dBi
	12.75 GHz	40.8 dBi

Note: Antenna pattern is measured without radome.

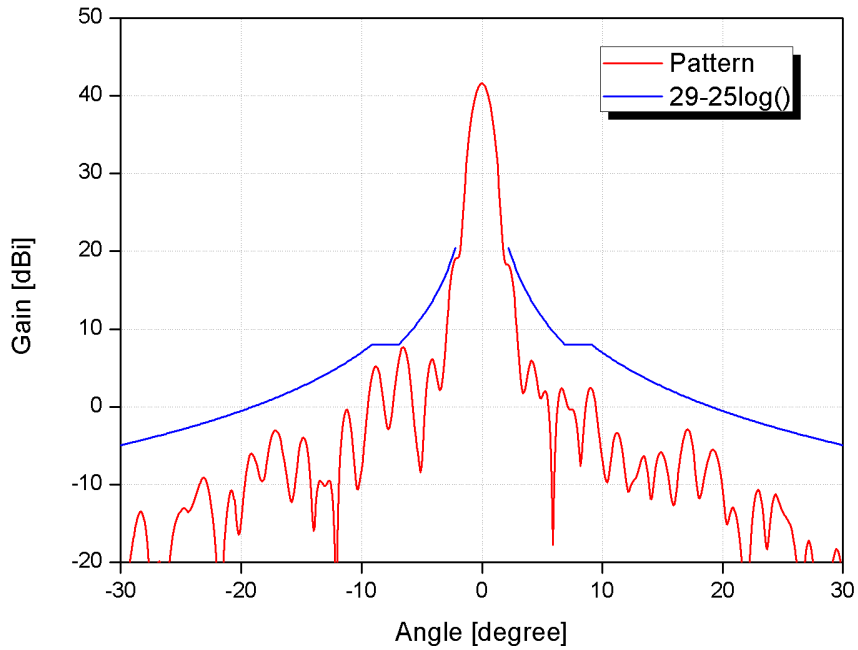
3.2. Radiation Pattern Regulation

Envelope formula defined by Eutelsat:

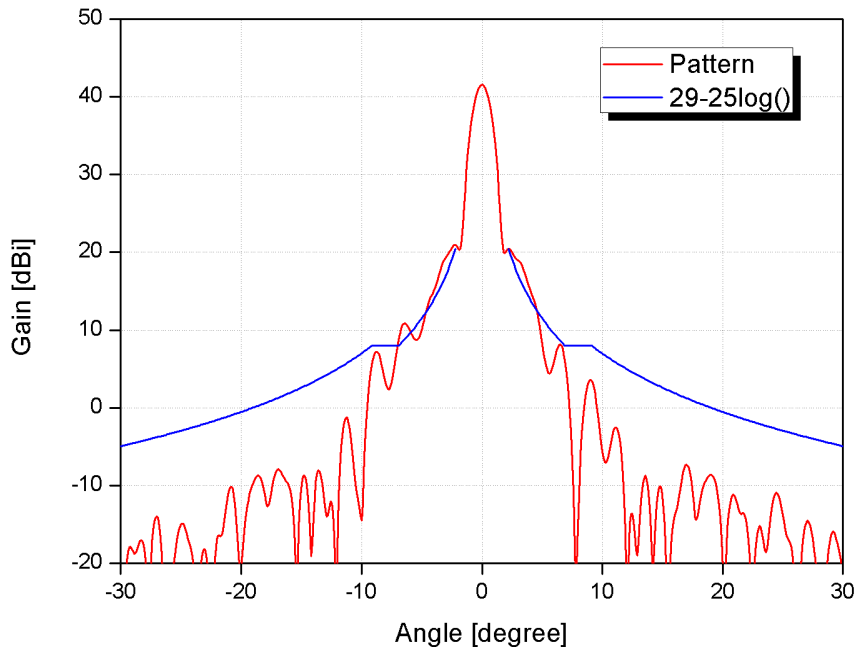
29-25log10(θ)	dBi	for	$\alpha^* < \theta < 7.0^\circ$	($\alpha^* = 100\lambda/D$)
8	dBi	for	$7.0^\circ \leq \theta < 9.2^\circ$	
32-25log10(θ)	dBi	for	$9.2^\circ \leq \theta \leq 48^\circ$	
-10	dBi	for	$48^\circ < \theta$	

3.3. Radiation Pattern

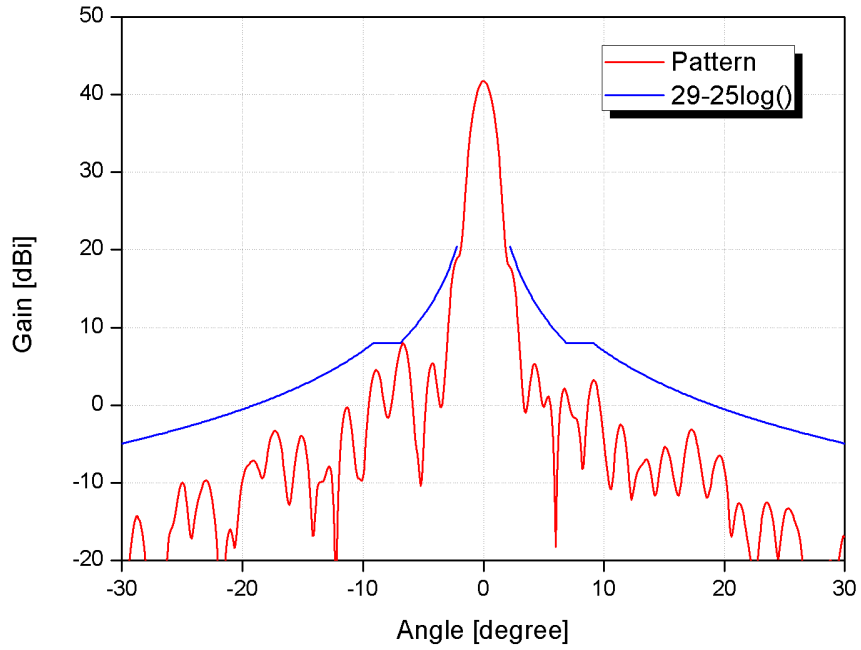
3.3.1. f=14.5GHz, E Plane Radiation Pattern



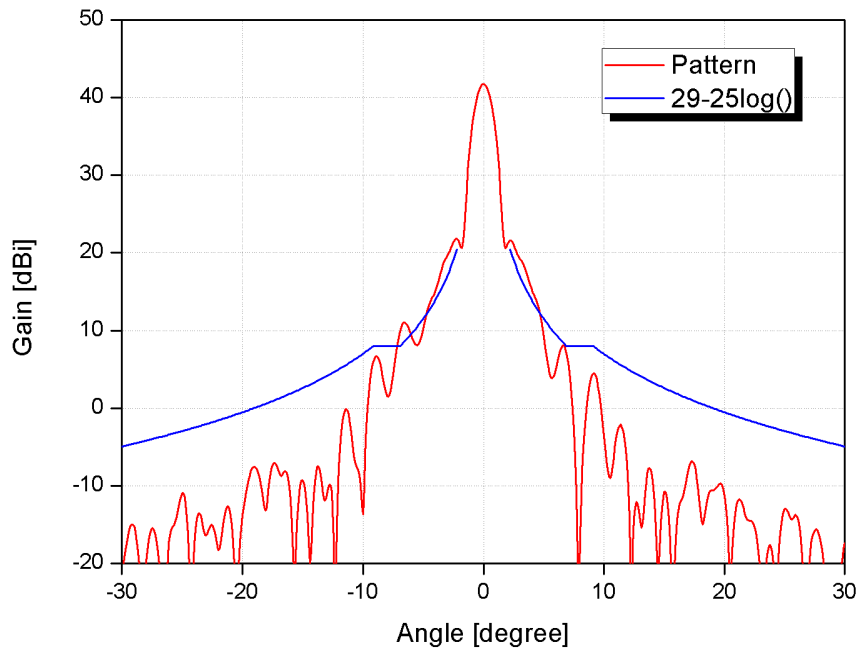
3.3.2. f=14.5GHz, H Plane Radiation Pattern



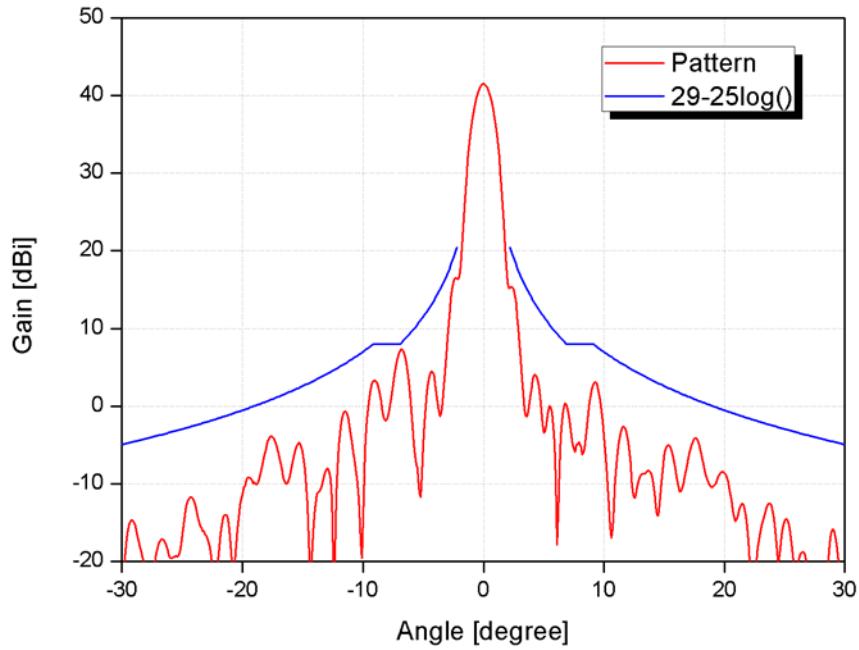
3.3.3. f=14.25GHz, E Plane Radiation Pattern



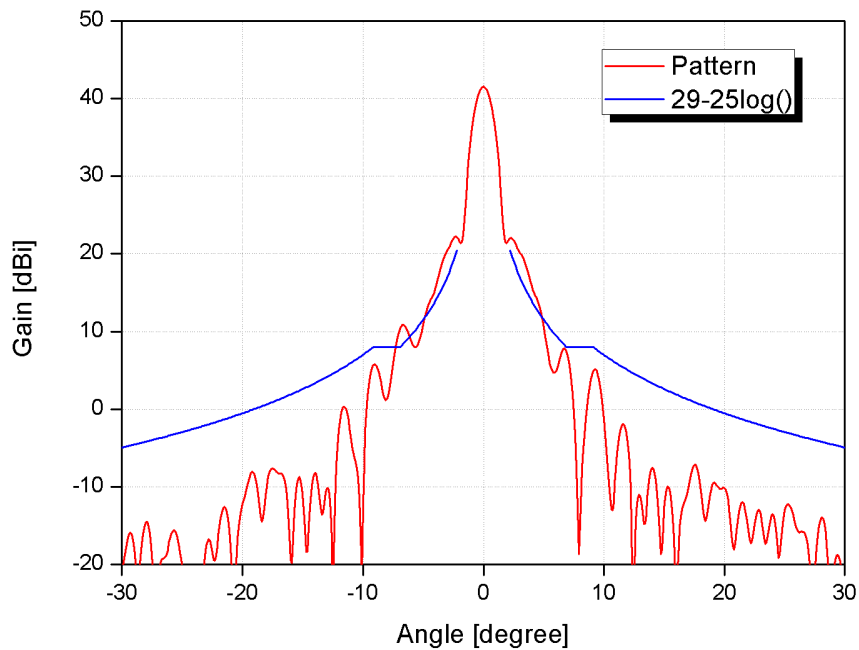
3.3.4. f=14.25GHz, H Plane Radiation Pattern



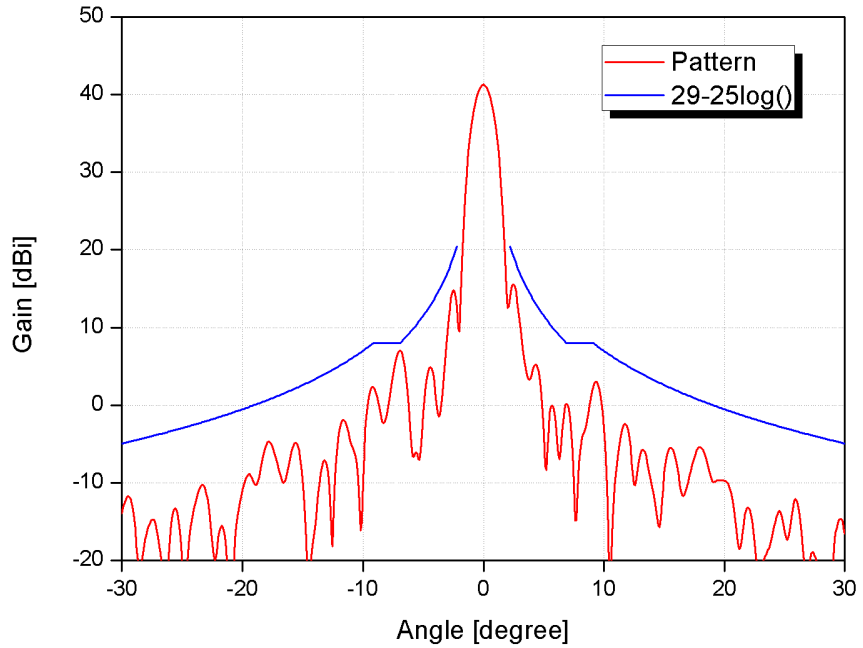
3.3.5. f=14.0GHz, E Plane Radiation Pattern



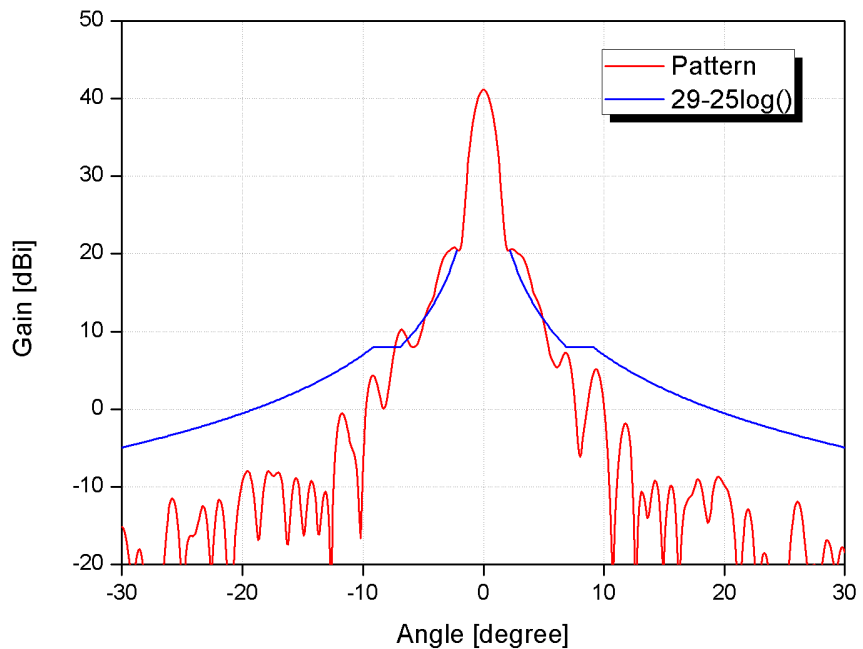
3.3.6. f=14.0GHz, H Plane Radiation Pattern



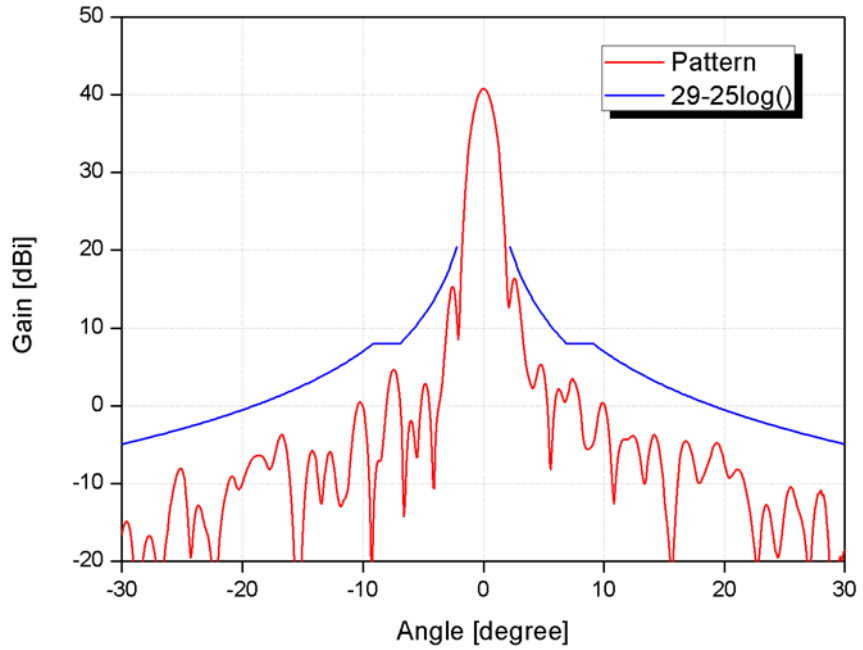
3.3.7. f=13.75GHz, E Plane Radiation Pattern



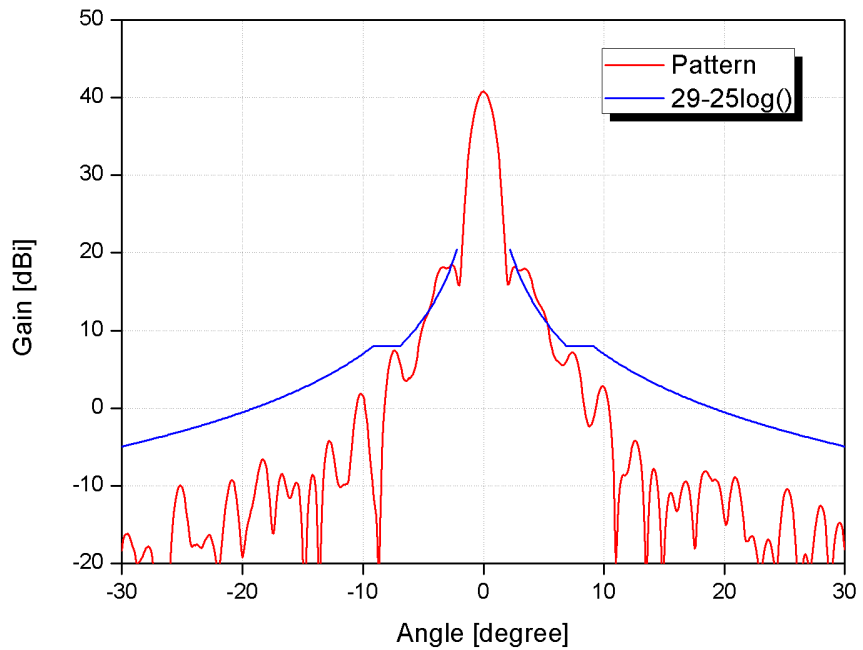
3.3.8. f=13.75GHz, H Plane Radiation Pattern



3.3.9. f=12.75GHz, E Plane Radiation Pattern



3.3.10. f=12.75GHz, H Plane Radiation Pattern



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

Intellian Technologies, Inc. declares that v100GX complies with the threshold level as defined in §25.222(a)(1)(i)(A):, and declares that v100GX is in accordance with all defined regulations 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 v100GX, 103cm Ku-band maritime VSAT antenna system
EIRP spectral density limit	-16.66 dBW/ 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 §25.222 (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 §25.222 (a)(1)(iii)

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

Authority: Steve Cha
Director, Research & Development



Signature: _____


Date: _____
October 23, 2012