GENERAL DYNAMICS
C4 Systems

Range Test Report
1.0m Single Offset
Antenna System

Feed Model #:	**K10MOTRLN**
Feed Serial #:	**Z335-120**
RF Specification:	**975-3396B**
Sidelobe Specification:	**FCC**
Test Plan:	**PRC000778_Rev. 2**
Test Engineer:	**Zukowski, Werner**

Test Report # 5090
Job #: 12866-12
6 June, 2006

For
NORSAT

Prepared By: Zukowski, Werner

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INTRODUCTION

The test data presented in this report represents an evaluation of a 1.0 meter Ku-band, Single Offset reflector system. The tests were conducted on the VertexRSI Test Range in accordance with test plan PRC000778 Rev. 2 and principles of the FCC Standard, 47 CFR Ch.1 §25.209 .

This report shows the antenna's performance for on axis cross polarization isolation, cross polarization side lobe suppression, and antenna gain using the precision beam width method.

Job No.: 12866-12		**FT No: 5090**		**Test Engineer: Zukowski, Werner**	
Zukowski, Werner	06/06/06	West, Timothy	06/06/06	Pollard, Alan B.	06/06/06
	6JUN06		6-6-06		6/6/06
Originator	**Date**	**Approval**	**Date**	**Approval**	**Date**

DATA REDUCTION FORMULAS

1. System Noise Temperature:

$T_s = [T_h + (T_{LNA} + T_i)] / Y'$ (°K)

where: T_s = system noise temperature in degrees K
T_h = hot load temperature in degrees K
T_{LNA} = LNA noise temperature in degrees K
T_i = sum of noise temperature contributions of device(s) installed between feed flange and LNA in degrees K

2. $Y' = 10 \exp (Y_{dB}/10)$

3. G/T_s:

$Ts(dB) = 10 LOG(T_s)$

Where: T_s = System noise temp.(°K)

4. $G/T_s(dB/°K) = G - T_s (dB)$

5. Antenna Gain:

$G_A = 10 LOG[(G_3+G_{10})/2]-L_{rms} -L_f$

$G_3 = 31,000/(_{az\ 3dB})(_{el\ 3dB})$
$G_{10} = 91,000/(_{az\ 10dB})(_{el\ 10dB})$

where: $_{az\ 3dB}$ = (cosine corrected) Azimuth Half Power Beamwidth, degrees
$_{el\ 3dB}$ = Elevation Half Power Beamwidth, degrees
$_{az\ 10dB}$ = (cosine corrected) Azimuth Beamwidth @ -10dB, degrees
$_{el\ 10dB}$ = Elevation Beamwidth @ -10dB, degrees
L_{rms} = Reflector Surface Accuracy Loss, dB
$L_{rms} = 4.92E^2F^2$
E = RMS Surface Accuracy of Reflector, inches
F = Frequency, GHz
L_f = Feed Insertion Loss, dB

6. Azimuth Angle Corrected for Elevation Angle:

$Az' = 2 SIN^{-1} [SIN(Az/2)COS El]$

Where: Az = Angle from 0° on axis

DATA REDUCTION FORMULAS CONTINUED

7. Sidelobe Envelope Specification: FCC

a. Azimuth Co-Pol

For Angle A from 1.25 degree to 7 degrees_____29-25 log(A)
For Angle A from 7 to 9.2 degrees_____+ 8 dBi
For Angle A from 9.2 to 48 degrees _____32-25 log(A)
For Angle A from 48 to 180 degrees_____-10 dBi

b. Elevation Co-Pol

For Angle A from 1.25 to 48 degrees _____32-25 log(A)
For Angle A from 48 to 180 degrees_____-10 dBi

c. Azimuth Cross-Pol

For Angle A from 1.8 to 7 degrees _____19-25 log(A)
For Angle A from 7 to 9.2 degrees_____-2 dBi

8. G/T : by Carrier to Noise Method

G/T dB/°K =

$C/N_{O\ dB\text{-}Hz}$ - 228.6 - Satellite $EIRP_{dBW}$ + Path $Loss_{dB}$ + Aspect $Correction_{dB}$

9. C/N_O =

C+N/N - 2.5dB + 10 $\log_{10}$ (NBW)

SUMMARY OF ANTENNA PERFORMANCE:

On-axis cross-pol isolation

Frequency (Mhz):	10700	11725	12750	13750	14000	14125	14500
Measured (dBi):							
Transmit							
HORZ AZ	NA	NA	NA	42.53	51.17	54.69	39.54
VERT AZ	NA	NA	NA	37.79	39.10	43.40	57.85
Receive							
HORZ AZ	58.58	53.79	39.43	NA	NA	NA	NA
VERT AZ	56.62	55.51	38.60	NA	NA	NA	NA

Spec. (dBi): RCV 27.0 dB on axis TX 35.0 dB on axis

Antenna Gain(Precision Beam Width)

Frequency (Mhz):	10700	11725	12750	13750	14000	14125	14500
Measured (dBi):							
Transmit							
HORZ AZ	NA	NA	NA	41.65	41.87	41.96	42.24
VERT AZ	NA	NA	NA	41.71	41.87	41.97	42.20
Receive							
HORZ AZ	39.62	40.42	41.37	NA	NA	NA	NA
VERT AZ	39.72	40.41	41.11	NA	NA	NA	NA
Spec. (dBi):	39.00	39.80	40.50	41.20	41.40	41.50	41.70

Measurement accuracy estimated at +/- 0.55 dBi

Vertex RSI
GENERAL DYNAMICS

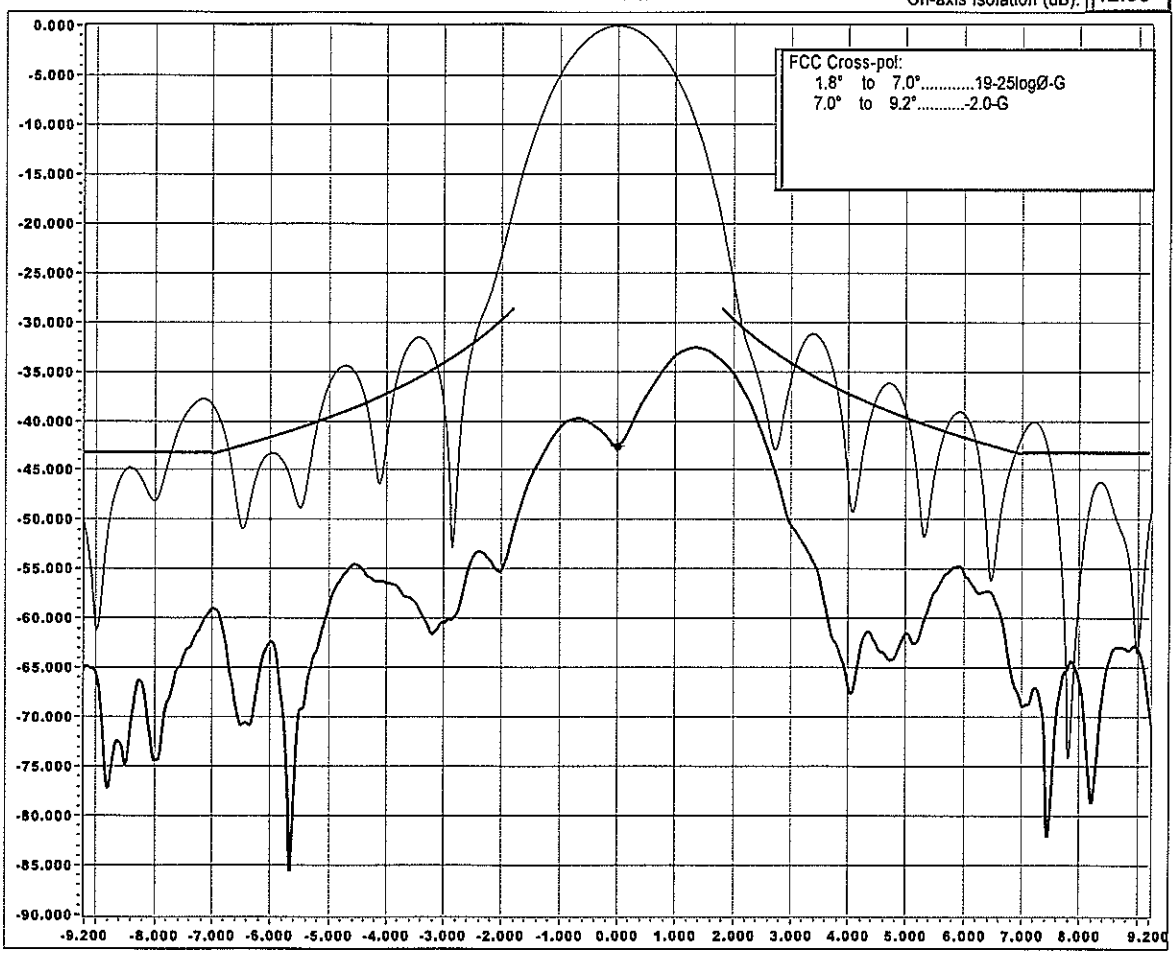
Customer.....	NORSAT
Date/Local Time.....	5-25-2006 at 135503
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...HORZ polarization...13.750 GHz

Azimuth

On-axis Isolation (dB): 42.53



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13749999950, AZ rate (deg/s)=2.962, EL rate (deg/s)=0.657, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060525 135731 12866_12 TC-10-HA-13.750.txt	Azimuth Beam Center (deg):	180.320
Cross-pol File:	% 060525 135503 12866_12 TX-10-HA-13.750.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	13.749999950	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-31.98	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	6983		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

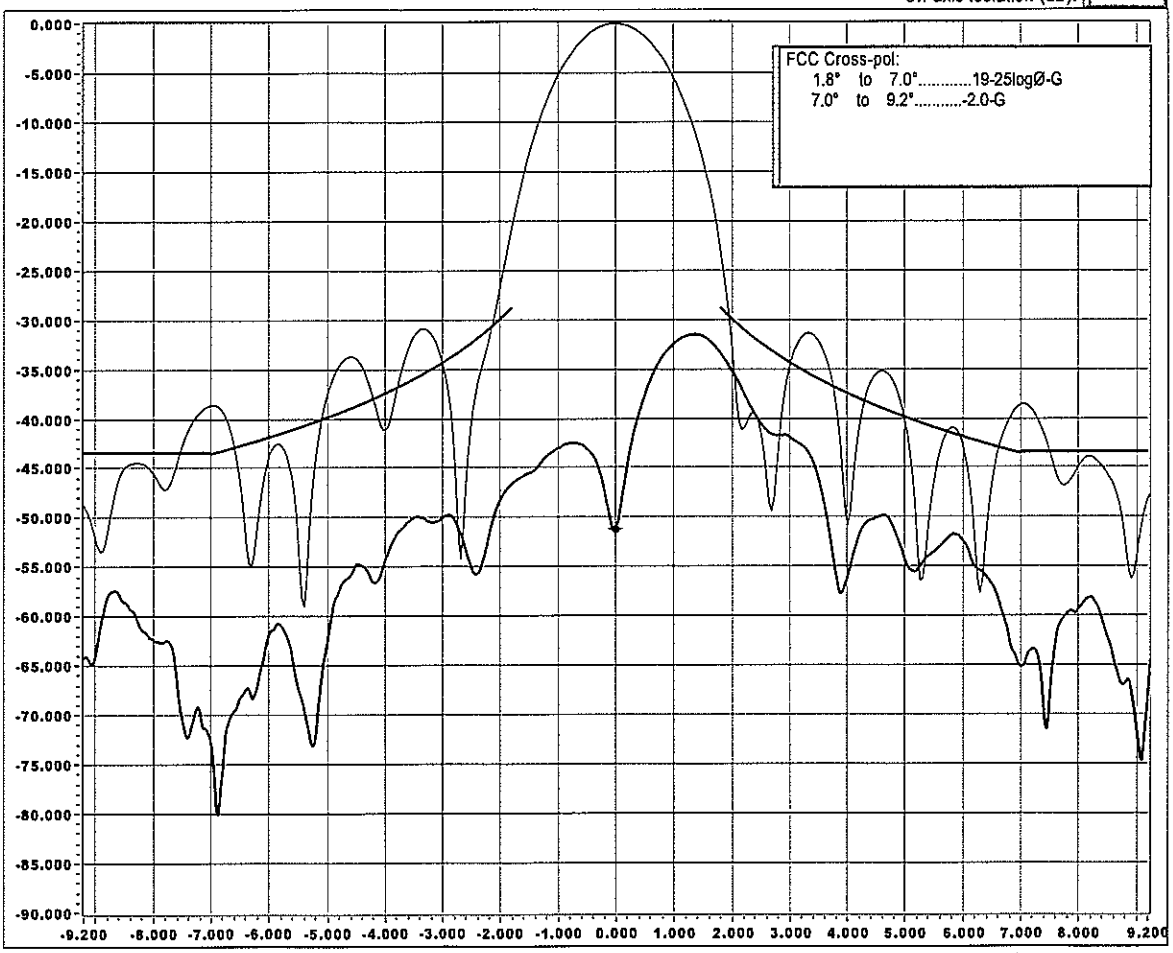
Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 095908
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...HORZ polarization...14.000 GHz

Azimuth

On-axis Isolation (dB): 51.17



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060601 111338 12866_12 TC-155-HA-14.000.txt	Azimuth Beam Center (deg):	180.530
Cross-pol File:	% 060530 095908 12866_12 TX-10-HA-14.000.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	14.000000143	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.57	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	8742		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

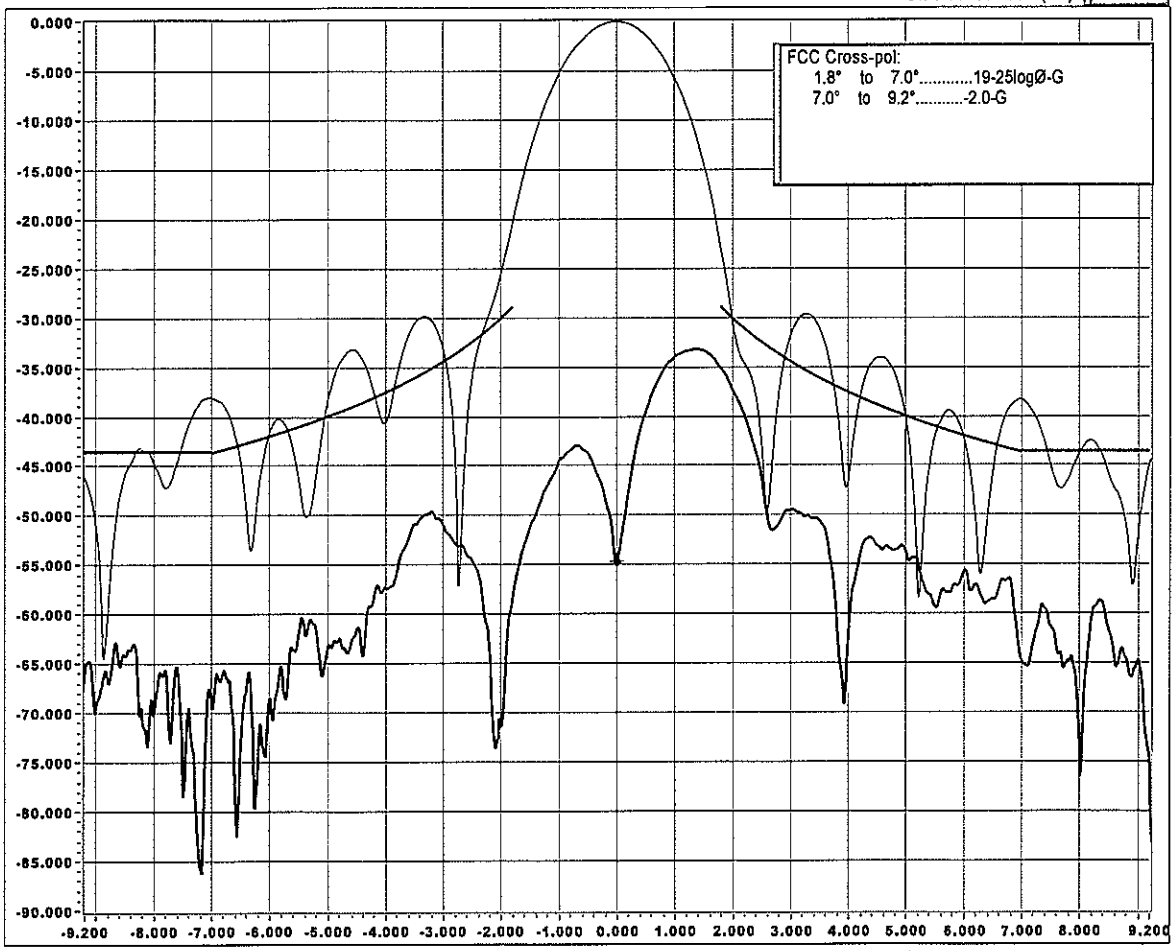
Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 121050
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...HORZ polarization...14.125 GHz

Azimuth

On-axis Isolation (dB): 54.69



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14124999993, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060523 121733 12866_12 TC-10-HA-14.125.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060523 121050 12866_12 TX-10-HA-14.125.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	14.124999993	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.34	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	6959		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

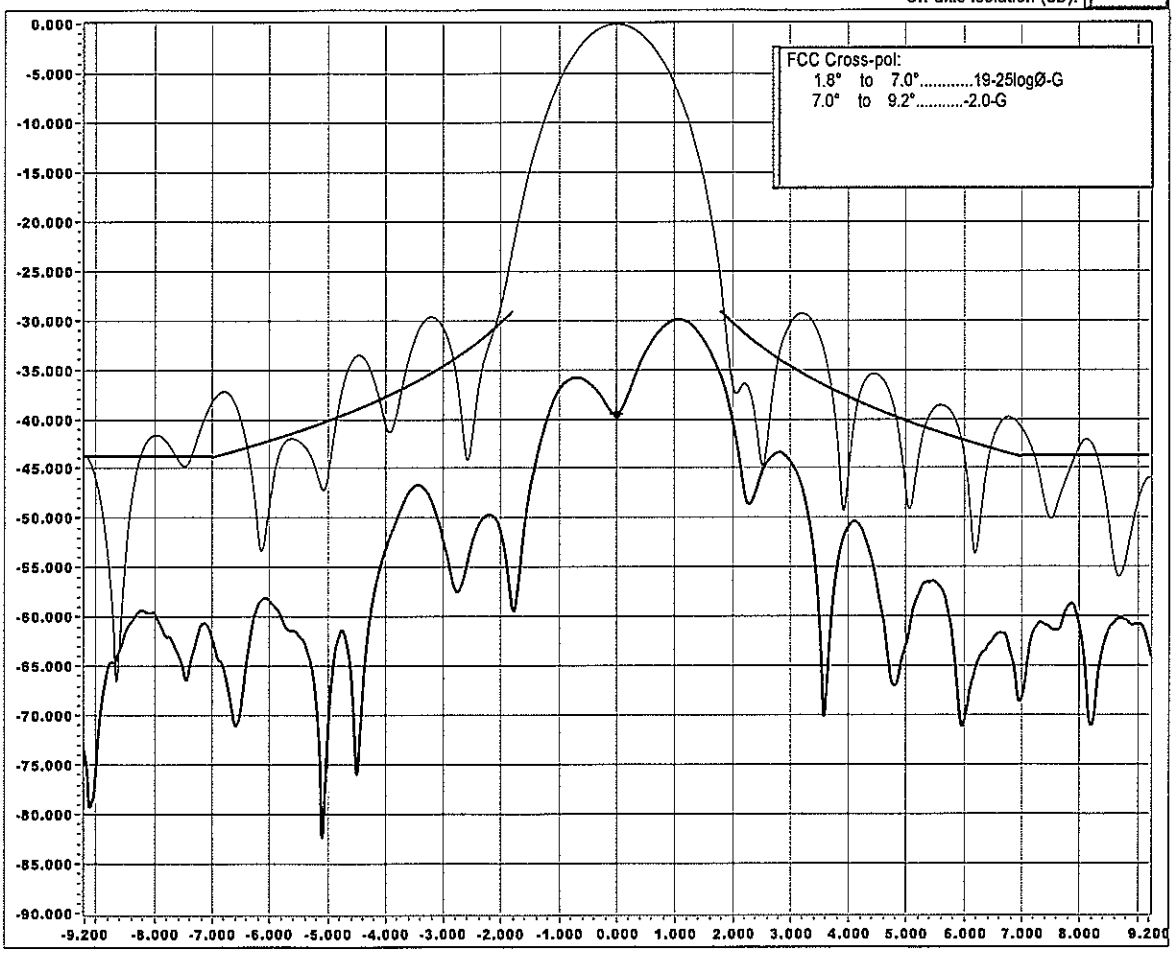
Customer.....	NORSAT
Date/Local Time.....	5-25-2006 at 134319
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...HORZ polarization...14.500 GHz

Azimuth

On-axis Isolation (dB): 39.54



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14499999948, AZ rate (deg/s)=2.962, EL rate (deg/s)=0.657, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060525 132106 12866_12 TC-10-HA-14.500.txt	Azimuth Beam Center (deg):	180.320
Cross-pol File:	% 060525 134319 12866_12 TX-10-HA-14.500.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	14.499999948	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.16	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	7025		

Versions
60227 FAST
60129 PACK

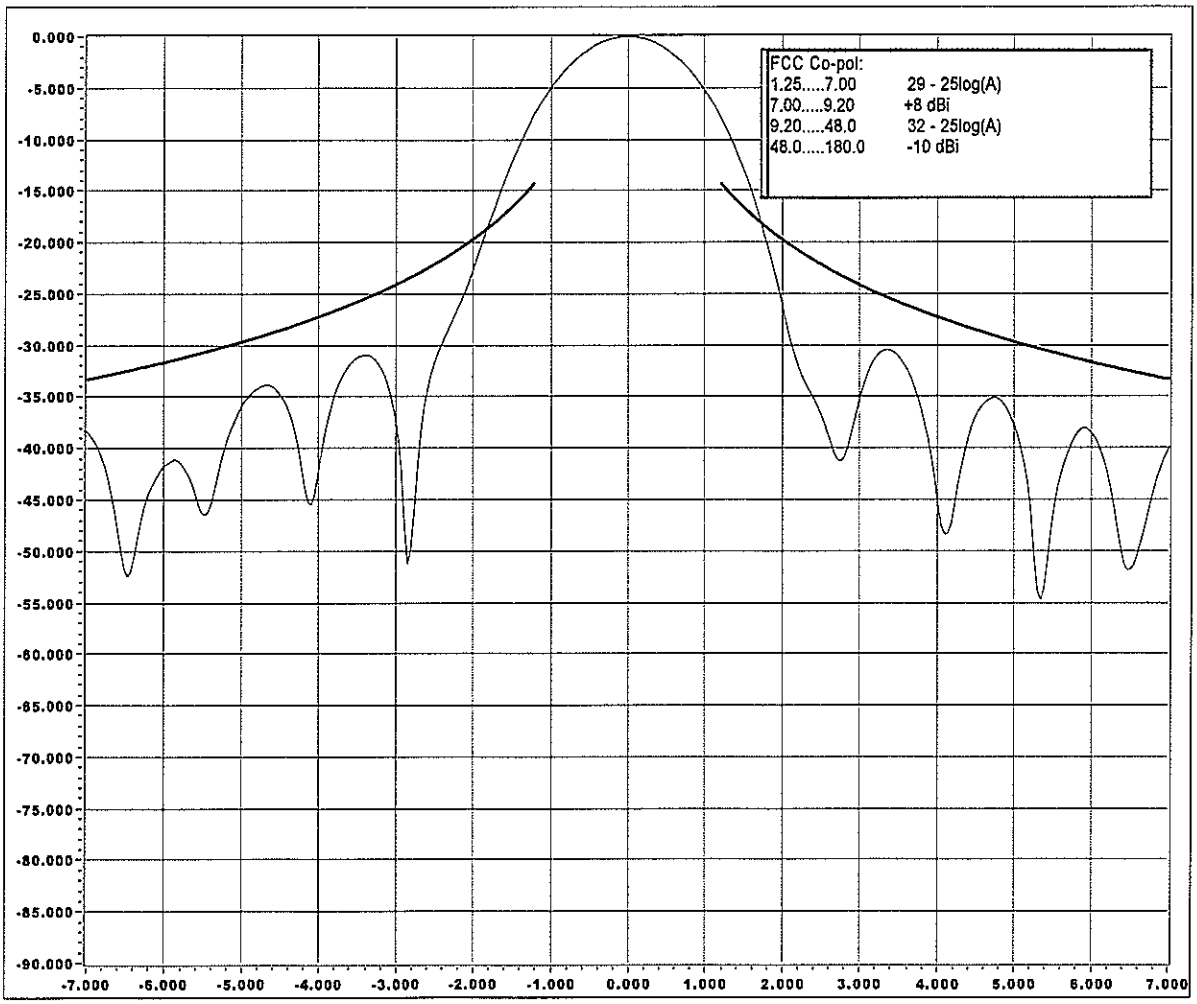
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 113638
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...13.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13750000001, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 113638 12866_12 TC-155-HA-13.750.txt		
Test Frequency (GHz):	13.750000001		
Ref. Level (dBm):	-32.42	Versions	
# Points Displayed:	2090	60227 FAST 60129 PACK	
Specified Gain (dB):	41.200		
Azimuth Beam Center (deg):	180.590		
Elevation Beam Center (deg):	12.000		
Margin Under Curved (dB):	None		

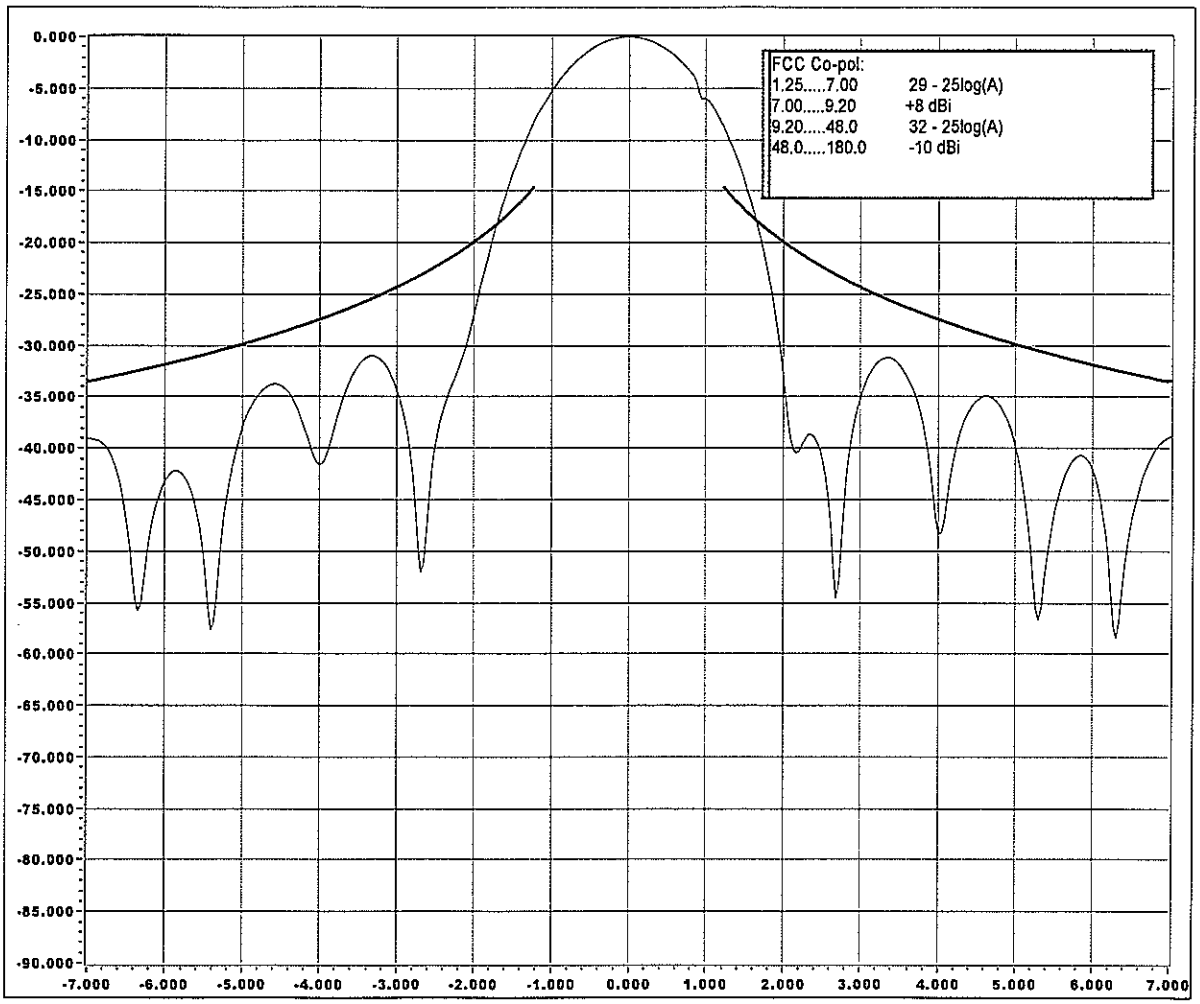
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 101449
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.000 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

File:	% 060530 101449 12866_12 TC-155-HA-14.000.txt		
Test Frequency (GHz):	14.000000143	Specified Gain (dB):	41.400
Ref. Level (dBm):	-30.95	Azimuth Beam Center (deg):	180.530
# Points Displayed:	9705	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

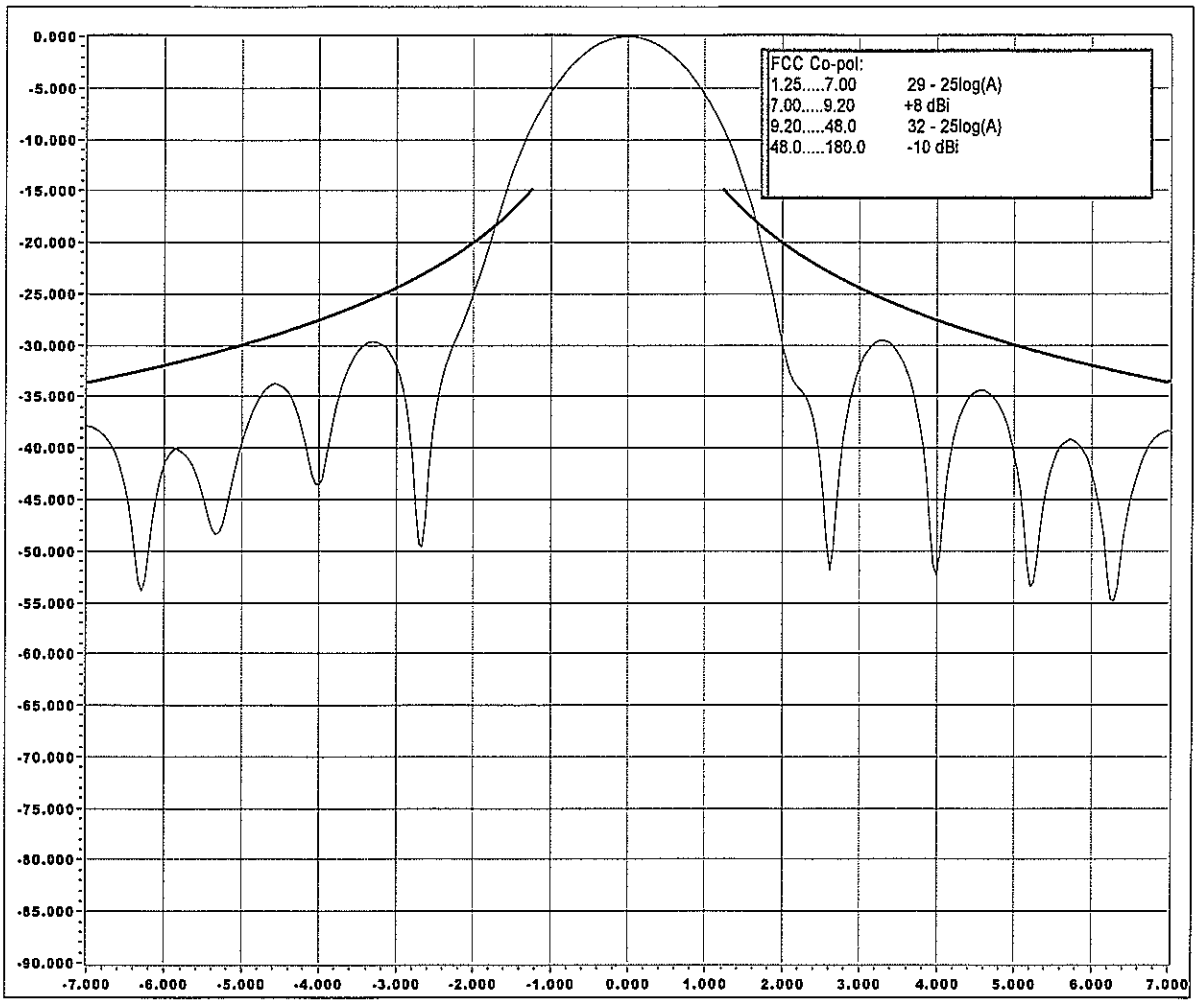
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 120155
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.125 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14124999997, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

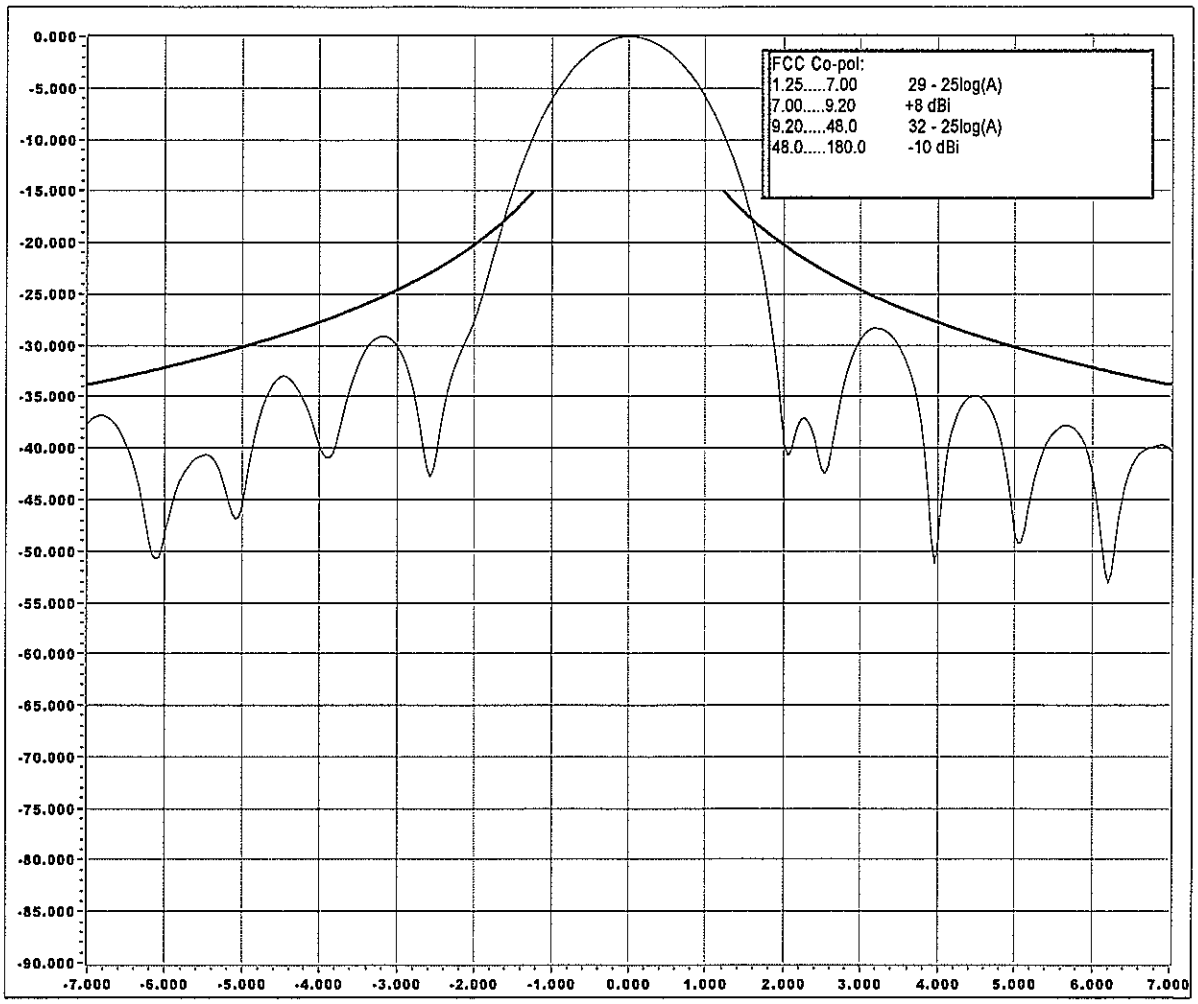
File:	% 060523 120155 12866_12 TC-155-HA-14.125.txt		
Test Frequency (GHz):	14.124999997	Specified Gain (dB):	41.500
Ref. Level (dBm):	-32.35	Azimuth Beam Center (deg):	180.590
# Points Displayed:	7847	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-23-2006 at 131450	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Cloudy/87F/ Wind 5 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.500 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000022, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 131450 12866_12 TC-155-HA-14.500.txt	Specified Gain (dB):	41.700
Test Frequency (GHz):	14.500000022	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.50	Elevation Beam Center (deg):	12.000
# Points Displayed:	7826	Margin Under Curved (dB):	None

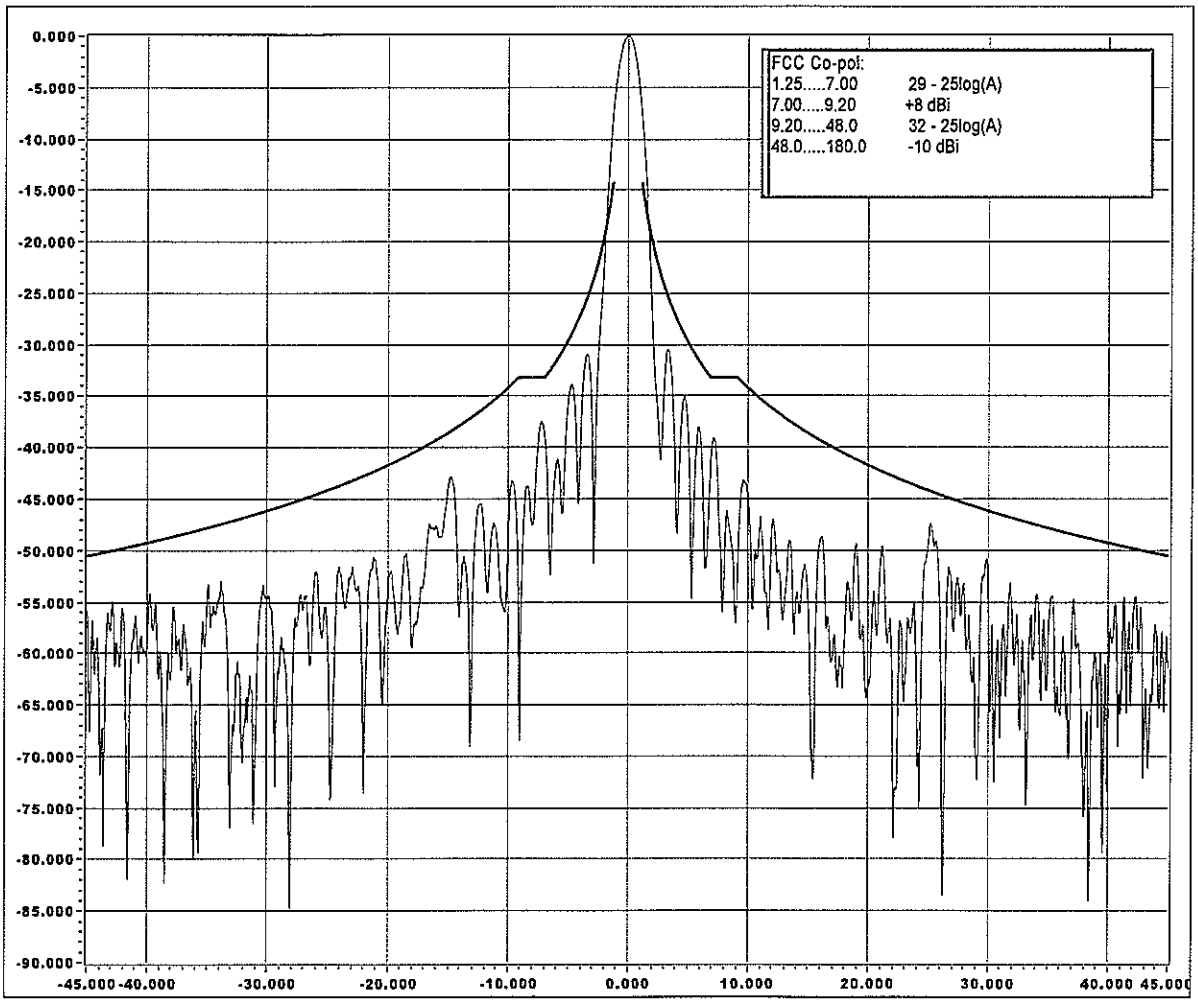
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 113638
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...13.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13750000001, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 113638 12866_12 TC-155-HA-13.750.txt	Specified Gain (dB):	41.200
Test Frequency (GHz):	13.750000001	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.42	Elevation Beam Center (deg):	12.000
# Points Displayed:	2090	Margin Under Curved (dB):	None

Versions
60227 FAST
60129 PACK

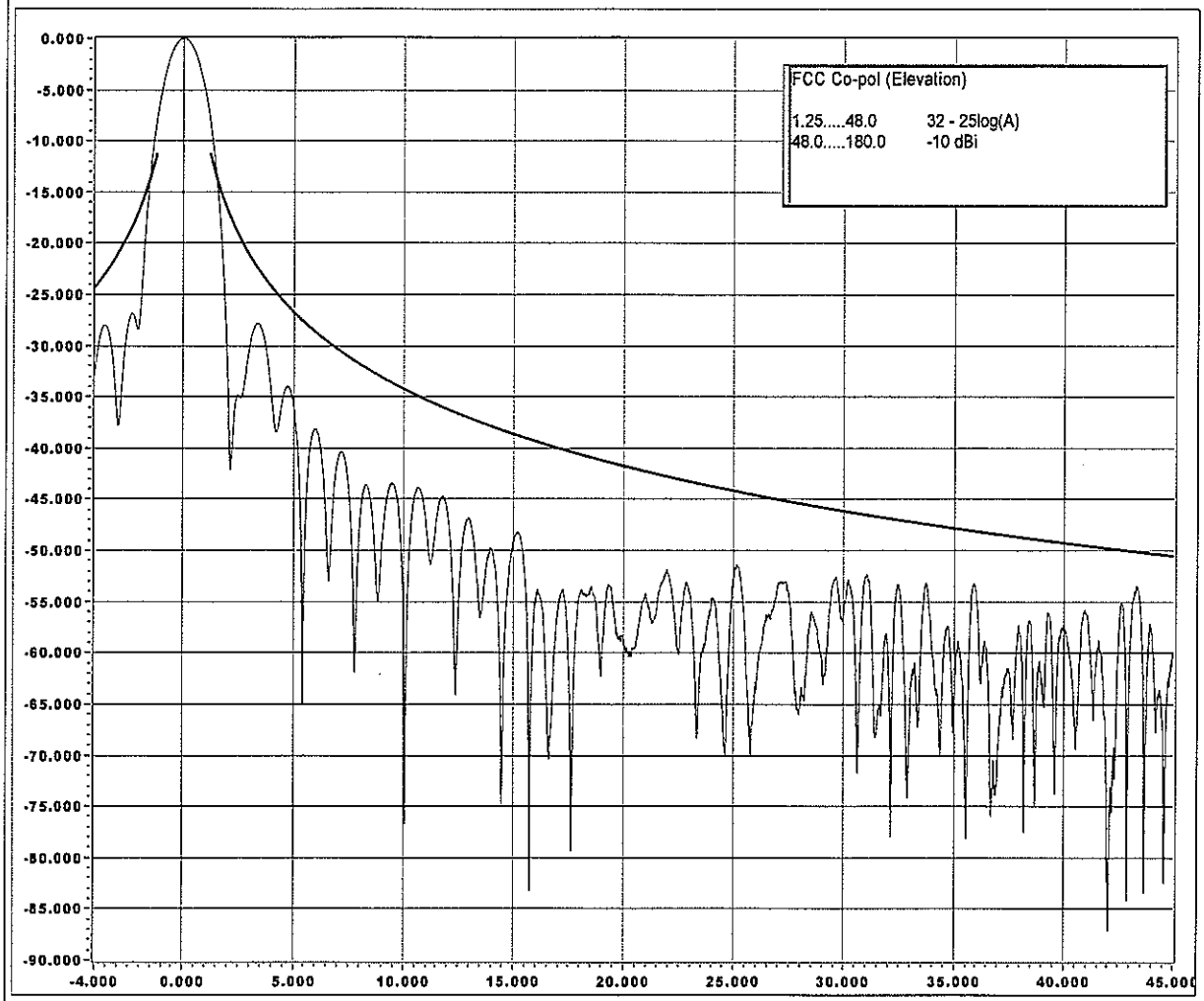
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 132915
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...13.750 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13749999968, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 132915 12866_12 TC-50-HE-13.750.txt		
Test Frequency (GHz):	13.749999968	Specified Gain:	41.200
Ref. Level (dBm):	-33.50	Azimuth Beam Center (deg):	180.590
# Points Displayed:	6957	Elevation Beam Center (deg):	12.000
		Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

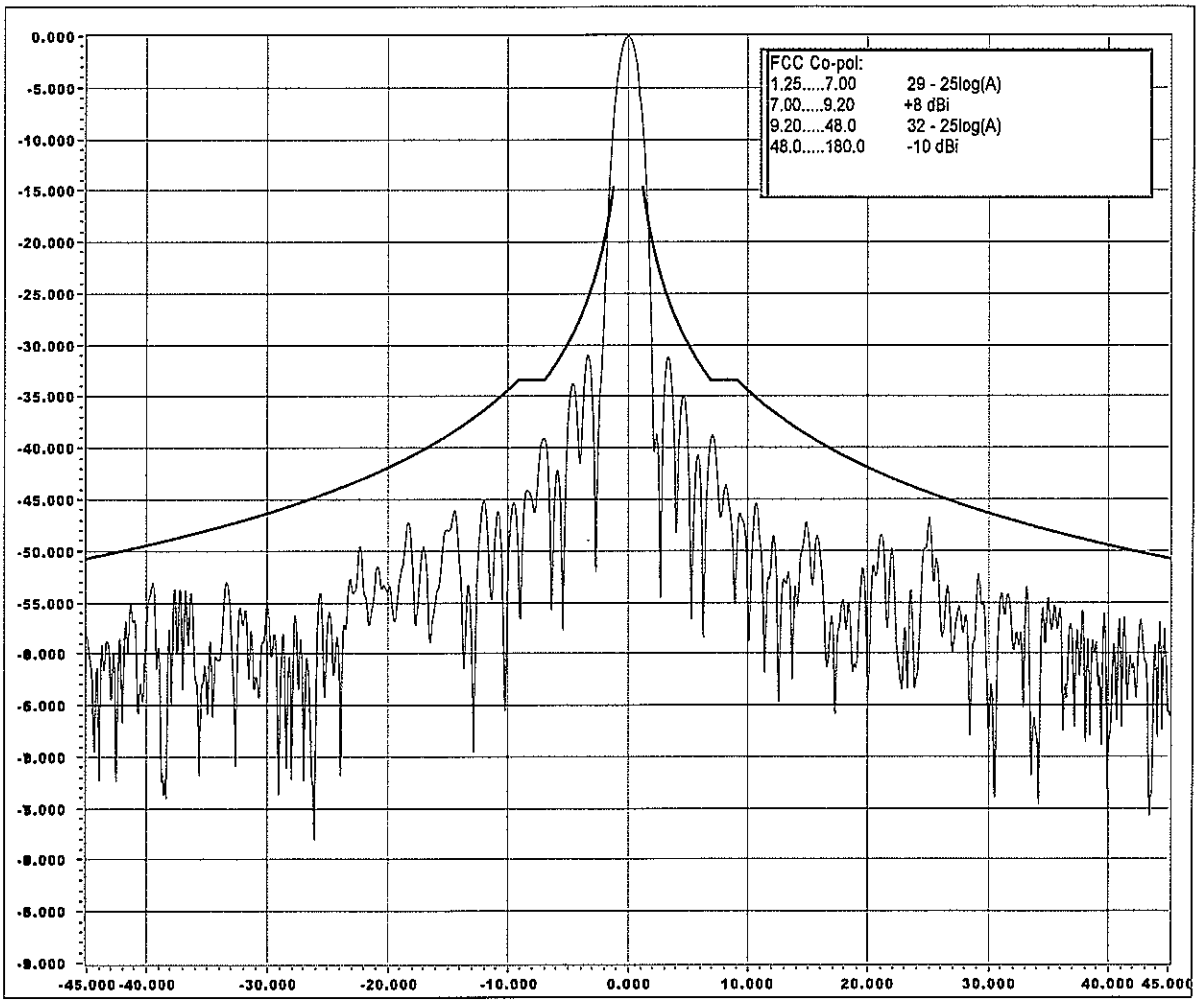
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 101449
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.000 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

File:	% 060530 101449 12866_12 TC-155-HA-14.000.txt		
Test Frequency (GHz):	14.000000143		
Ref. Level (dBm):	-30.95	Versions	
# Points Displayed:	9705	60227 FAST 60129 PACK	
Specified Gain (dB):			41.400
Azimuth Beam Center (deg):			180.530
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

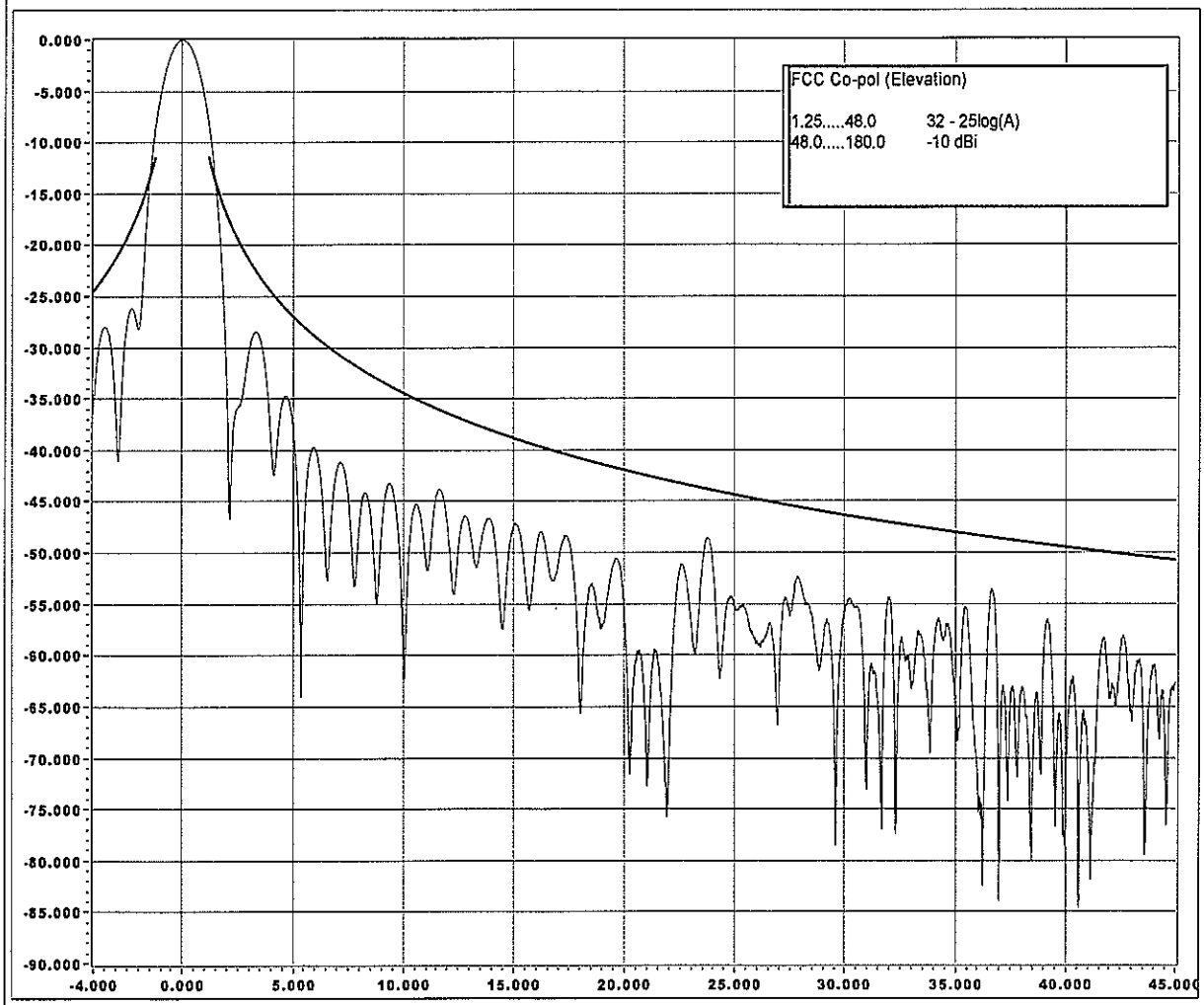
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	6-1-2006 at 111657
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.000 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

File:	% 060601 111657 12866_12 TC-50-HE-14.000.txt	Specified Gain:	41.400
Test Frequency (GHz):	14.000000045	Azimuth Beam Center (deg):	180.480
Ref. Level (dBm):	-32.64	Elevation Beam Center (deg):	12.000
# Points Displayed:	7074	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

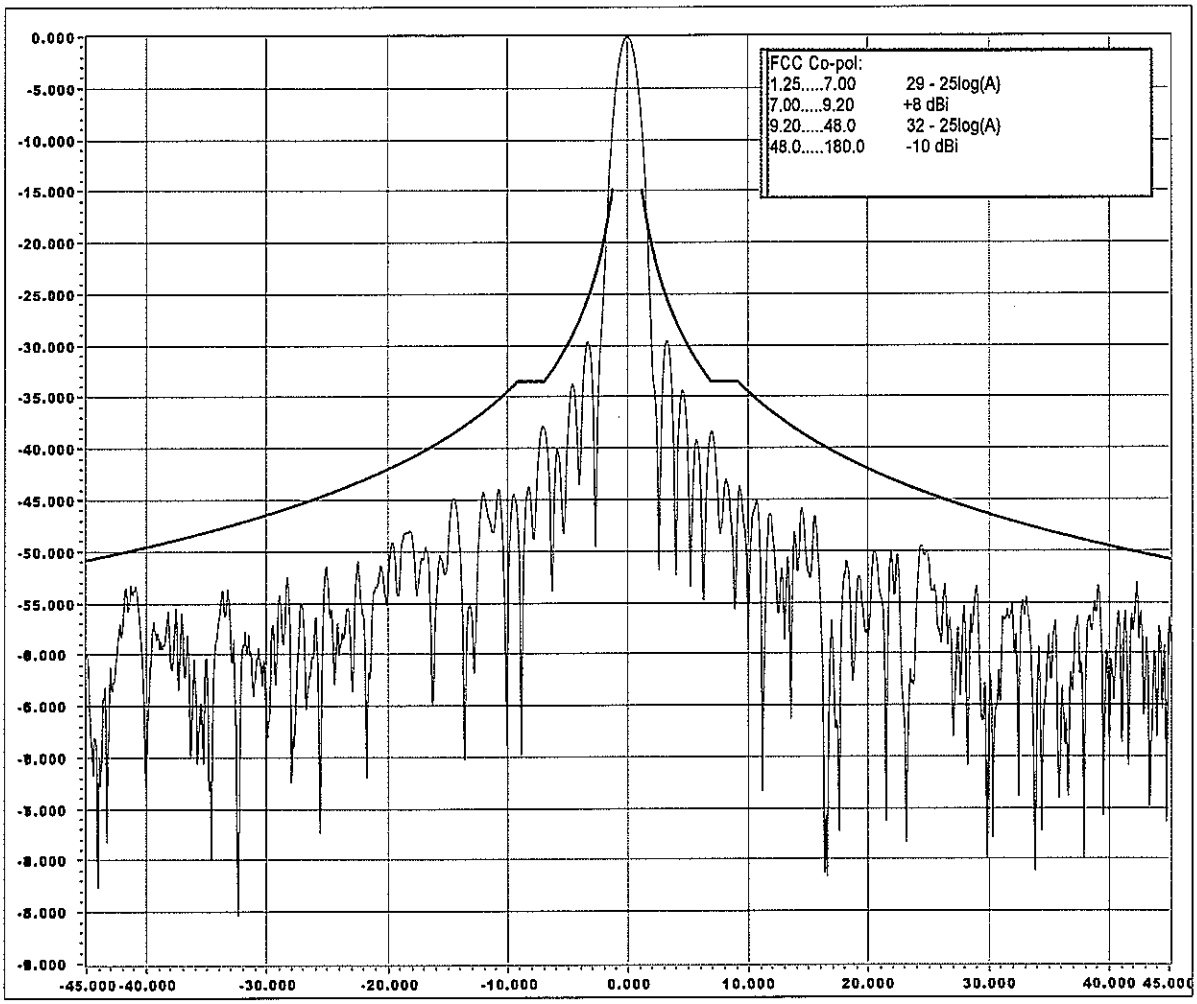
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 120155
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.125 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14124999997, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 120155 12866_12 TC-155-HA-14.125.txt		
Test Frequency (GHz):	14.124999997	Specified Gain (dB):	41.500
Ref. Level (dBm):	-32.35	Azimuth Beam Center (deg):	180.590
# Points Displayed:	7847	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

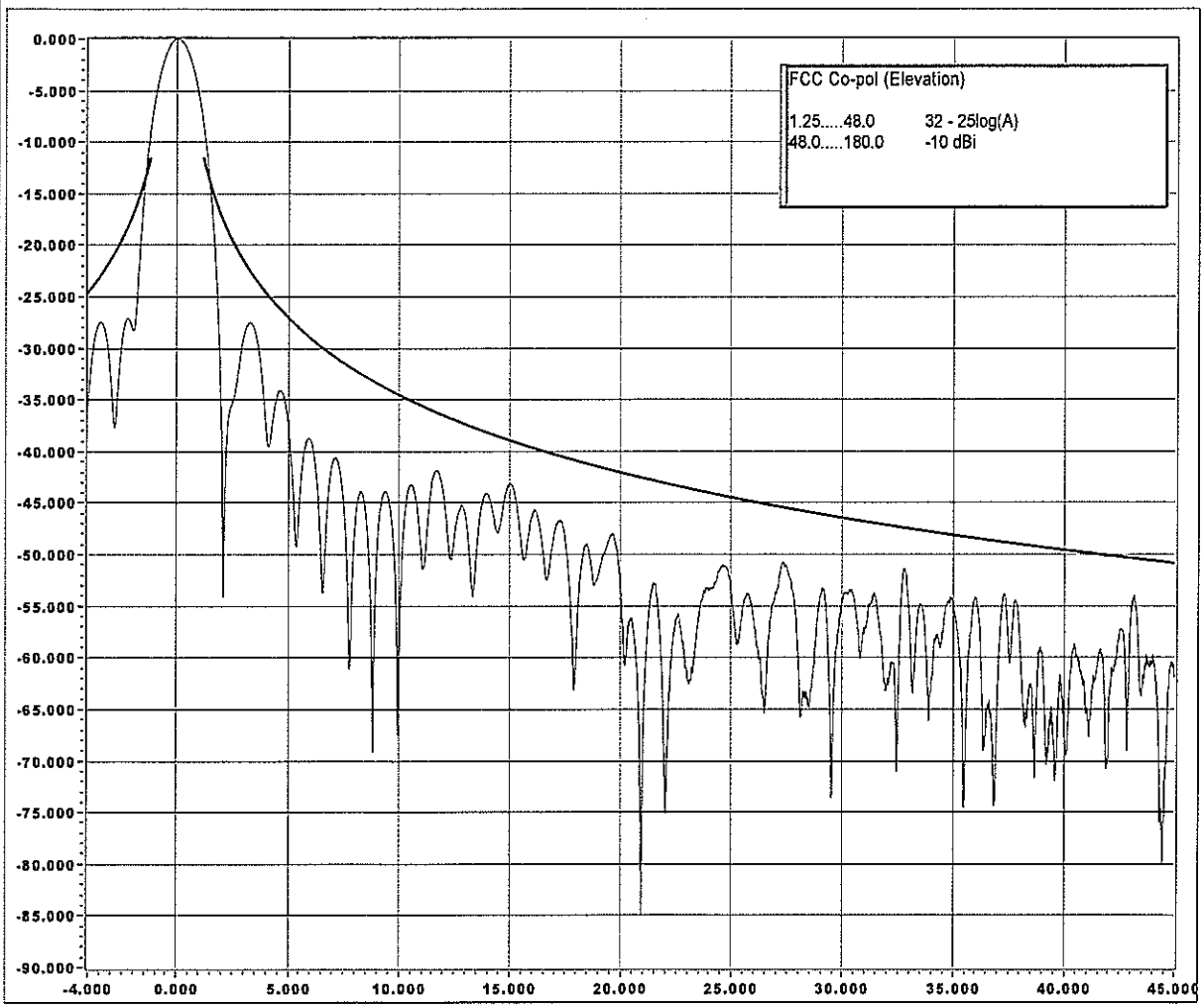
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 132516
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.125 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14124999968, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 132516 12866_12 TC-50-HE-14.125.txt	Specified Gain:	41.500
Test Frequency (GHz):	14.124999968	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.59	Elevation Beam Center (deg):	12.000
# Points Displayed:	6980	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

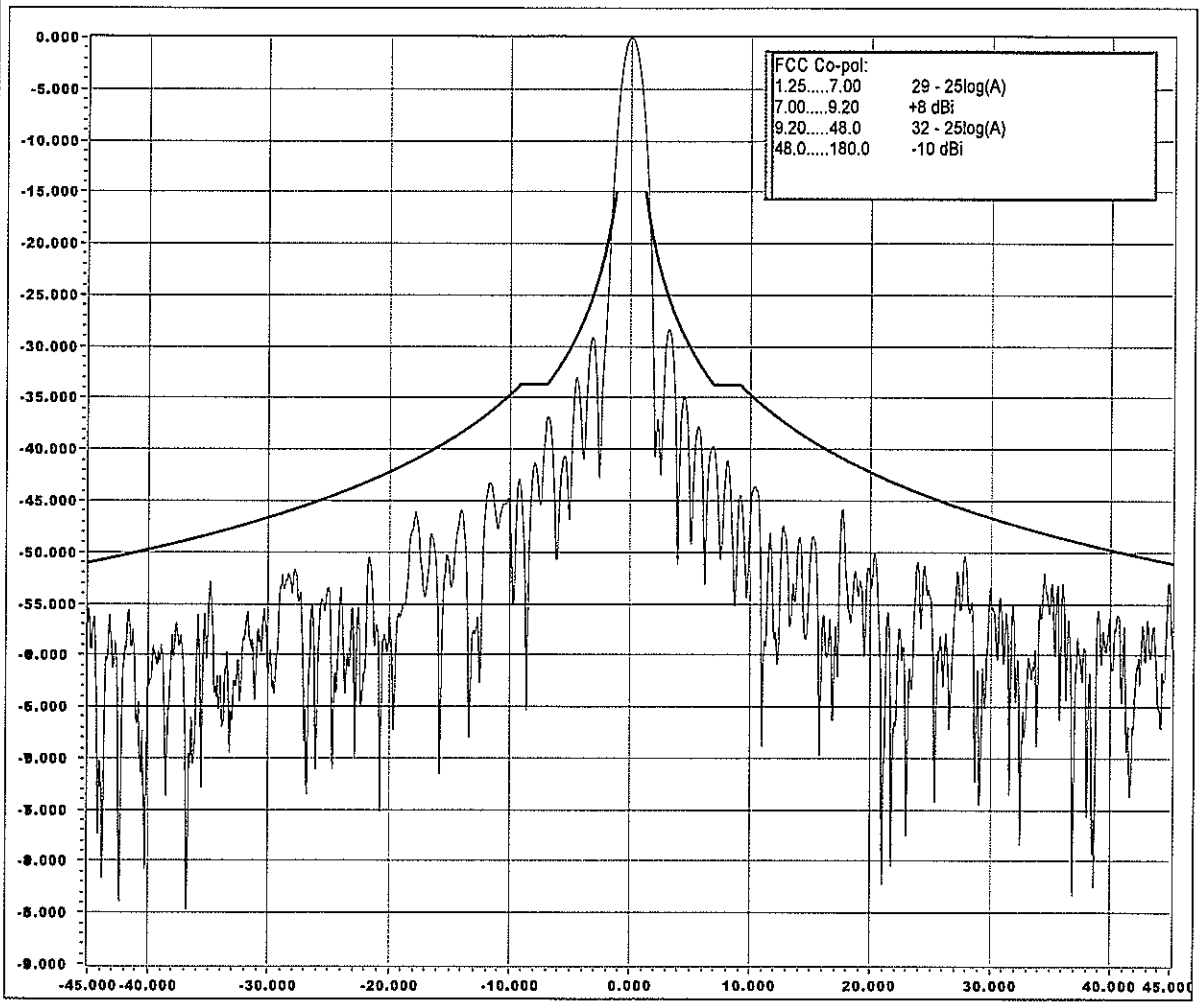
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 131450
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.500 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000022, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 131450 12866_12 TC-155-HA-14.500.txt		
Test Frequency (GHz):	14.500000022		
Ref. Level (dBm):	-32.50	Versions	
# Points Displayed:	7826	60227 FAST 60129 PACK	

Specified Gain (dB):	41.700
Azimuth Beam Center (deg):	180.590
Elevation Beam Center (deg):	12.000
Margin Under Curved (dB):	None

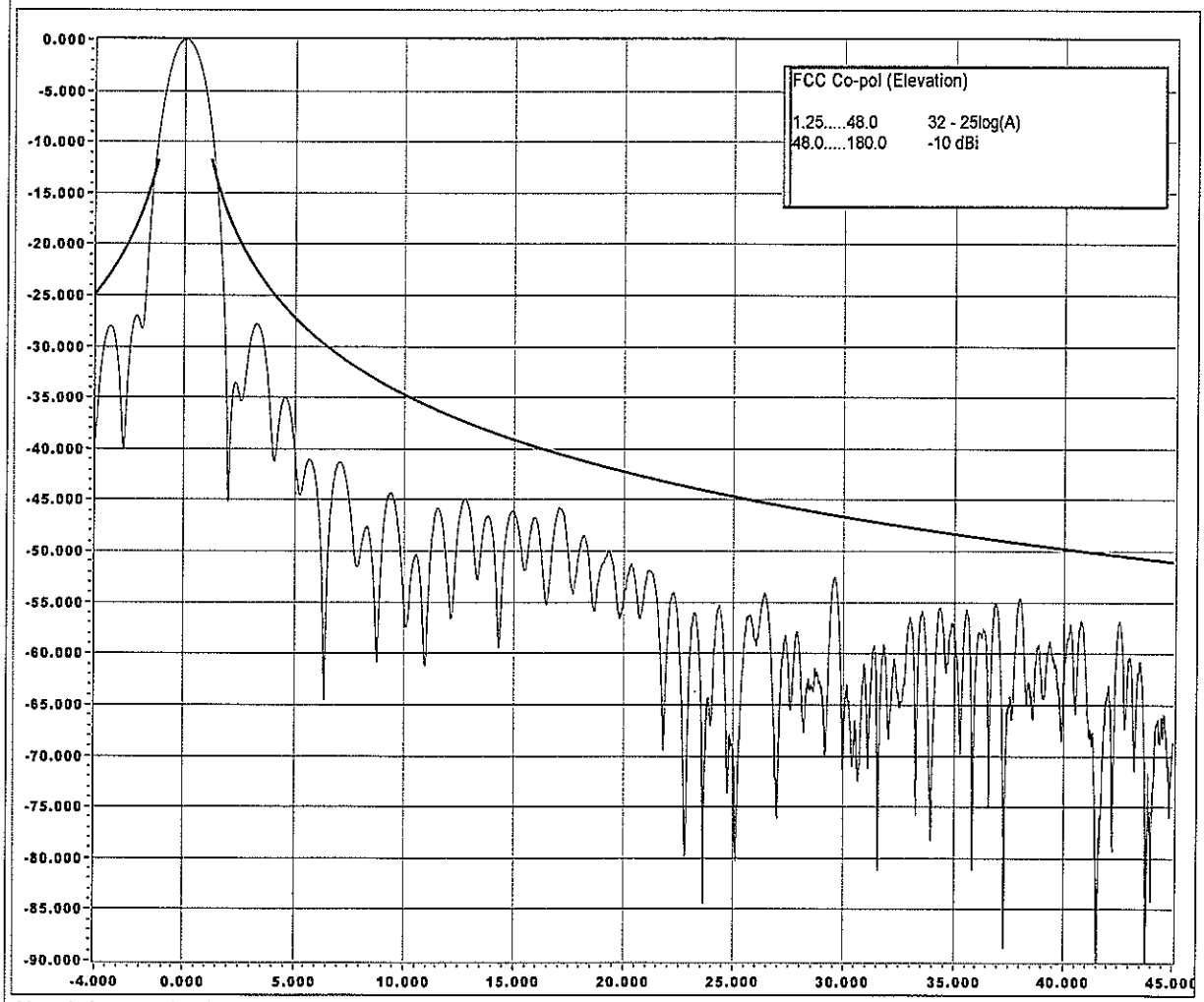
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 132053
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...HORZ polarization...14.500 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14499999967, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 132053 12866_12 TC-50-HE-14.500.txt	Specified Gain:	41.700
Test Frequency (GHz):	14.499999967	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.17	Elevation Beam Center (deg):	12.000
# Points Displayed:	6984	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

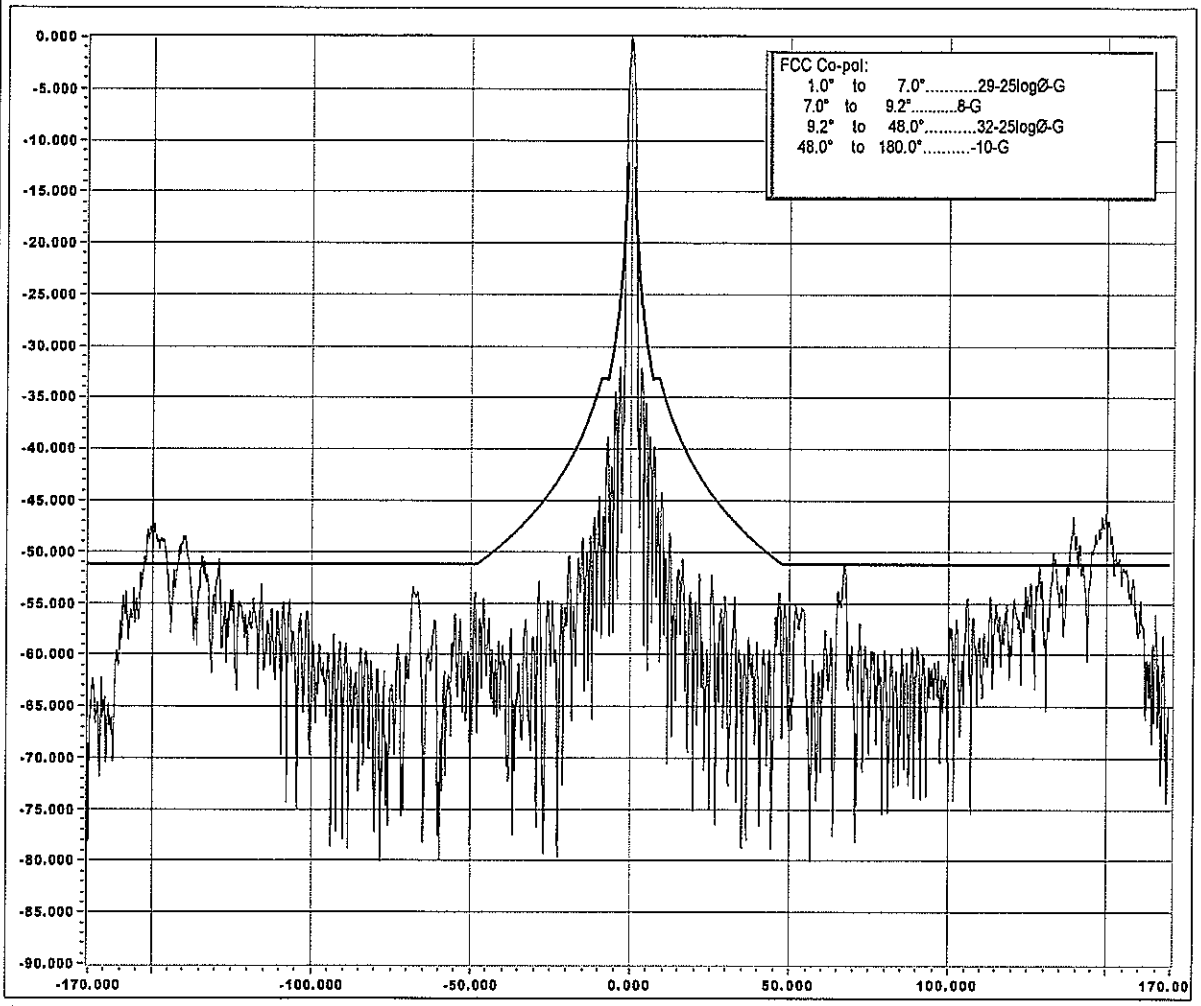
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-20-2006 at 093656
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...HORZ polarization...13.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13750000141, AZ rate (deg/s)=1.197, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060620 093656 12866 TC-175-HA-13.750.txt		
Test Frequency (GHz):	13.750000141	Specified Gain (dB):	41.200
Ref. Level (dBm):	-19.22	Azimuth Beam Center (deg):	180.000
# Points Displayed:	9845	Elevation Beam Center (deg):	1.800
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

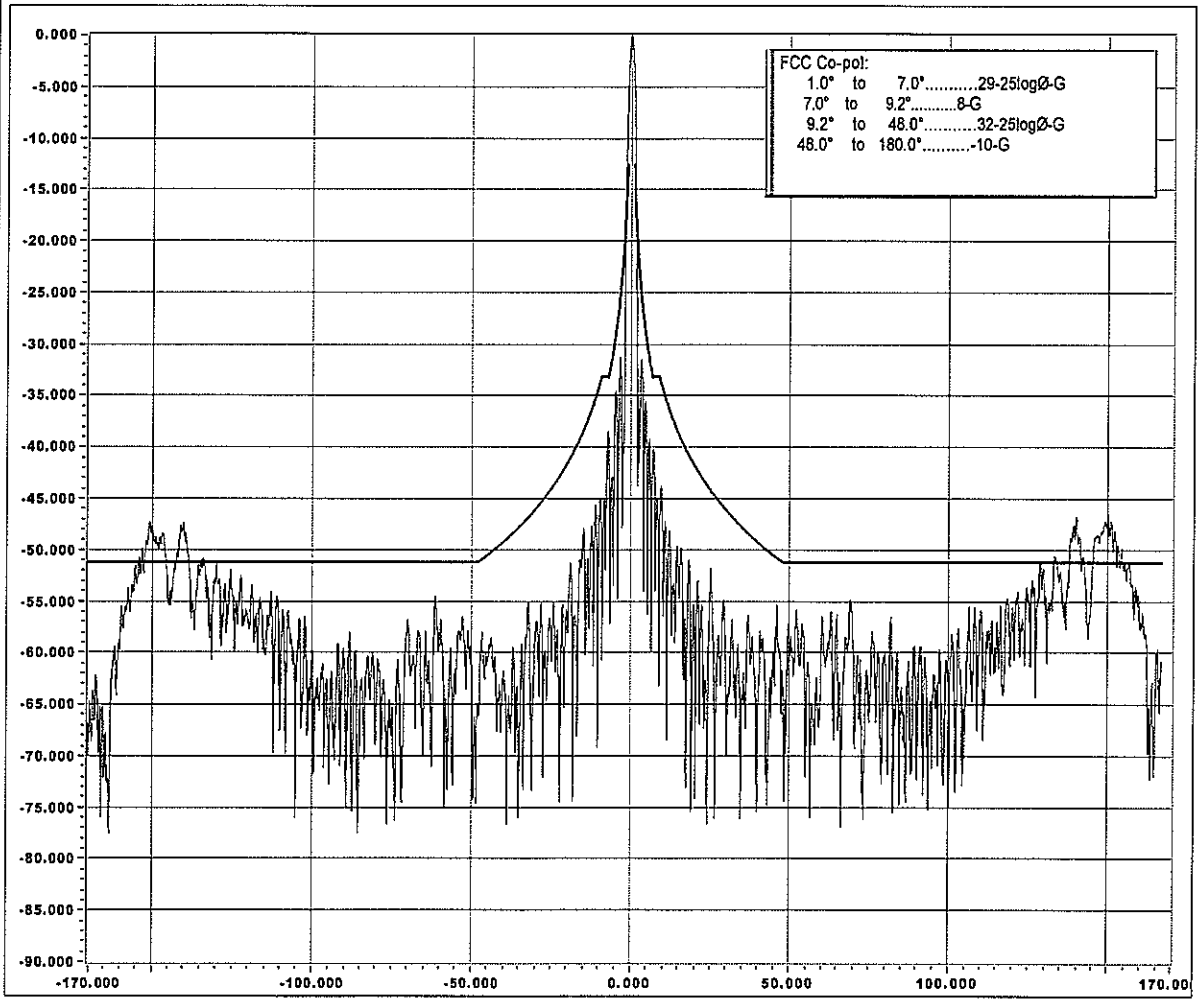
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-20-2006 at 094958
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...HORZ polarization...14.000 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000121, AZ rate (deg/s)=1.197, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060620 094958 12866 TC-175-HA-14.000.txt		
Test Frequency (GHz):	14.000000121	Specified Gain (dB):	41.200
Ref. Level (dBm):	-21.92	Azimuth Beam Center (deg):	180.000
# Points Displayed:	9845	Elevation Beam Center (deg):	1.800
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

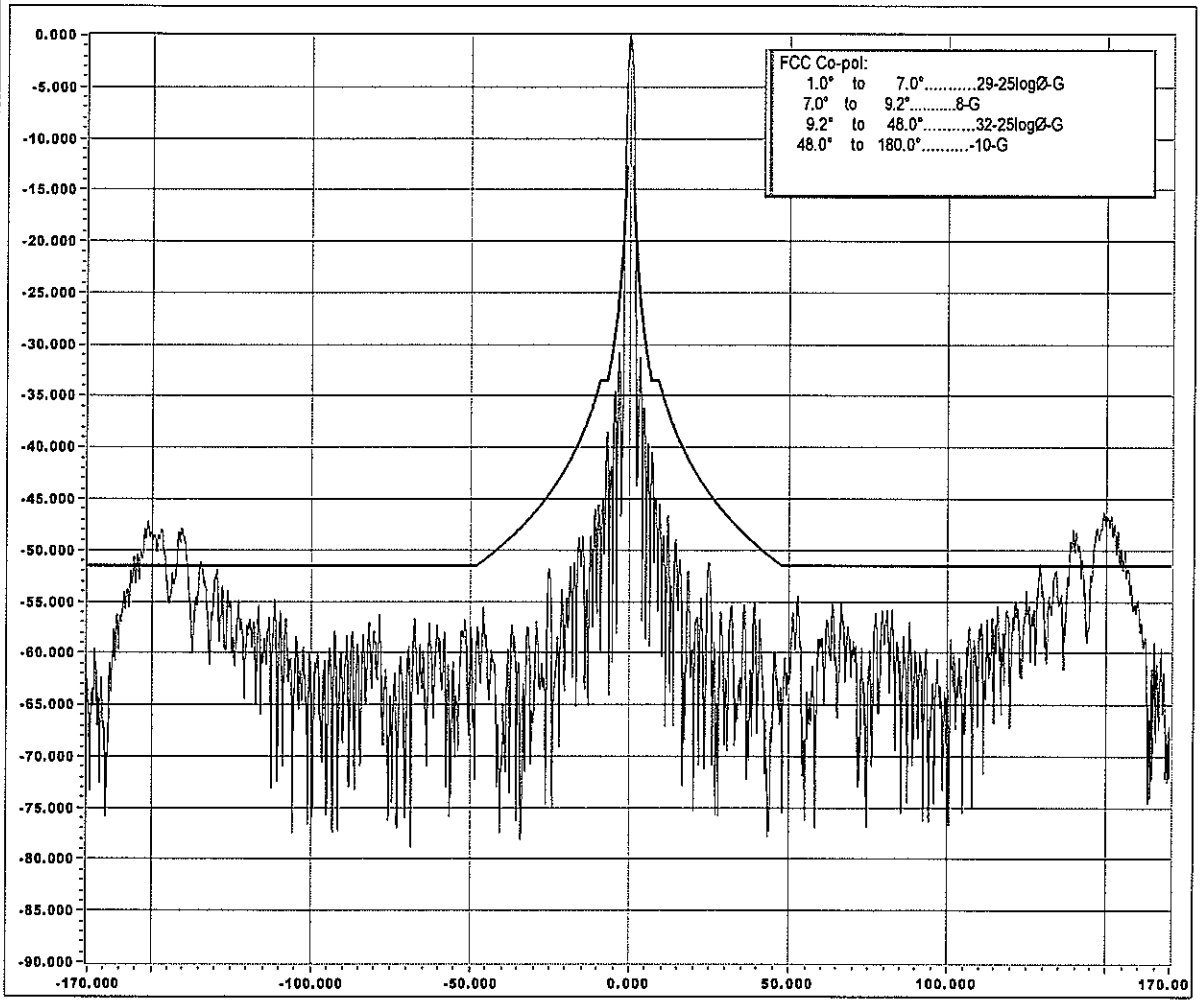
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-20-2006 at 100349
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...HORZ polarization...14.125 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14125000197, AZ rate (deg/s)=1.167, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060620 100349 12866 TC-175-HA-14.125.txt		
Test Frequency (GHz):	14.125000197		
Ref. Level (dBm):	-20.85	Versions	
# Points Displayed:	9713	60227 FAST 60129 PACK	
Specified Gain (dB):			41.500
Azimuth Beam Center (deg):			180.000
Elevation Beam Center (deg):			1.800
Margin Under Curved (dB):			None

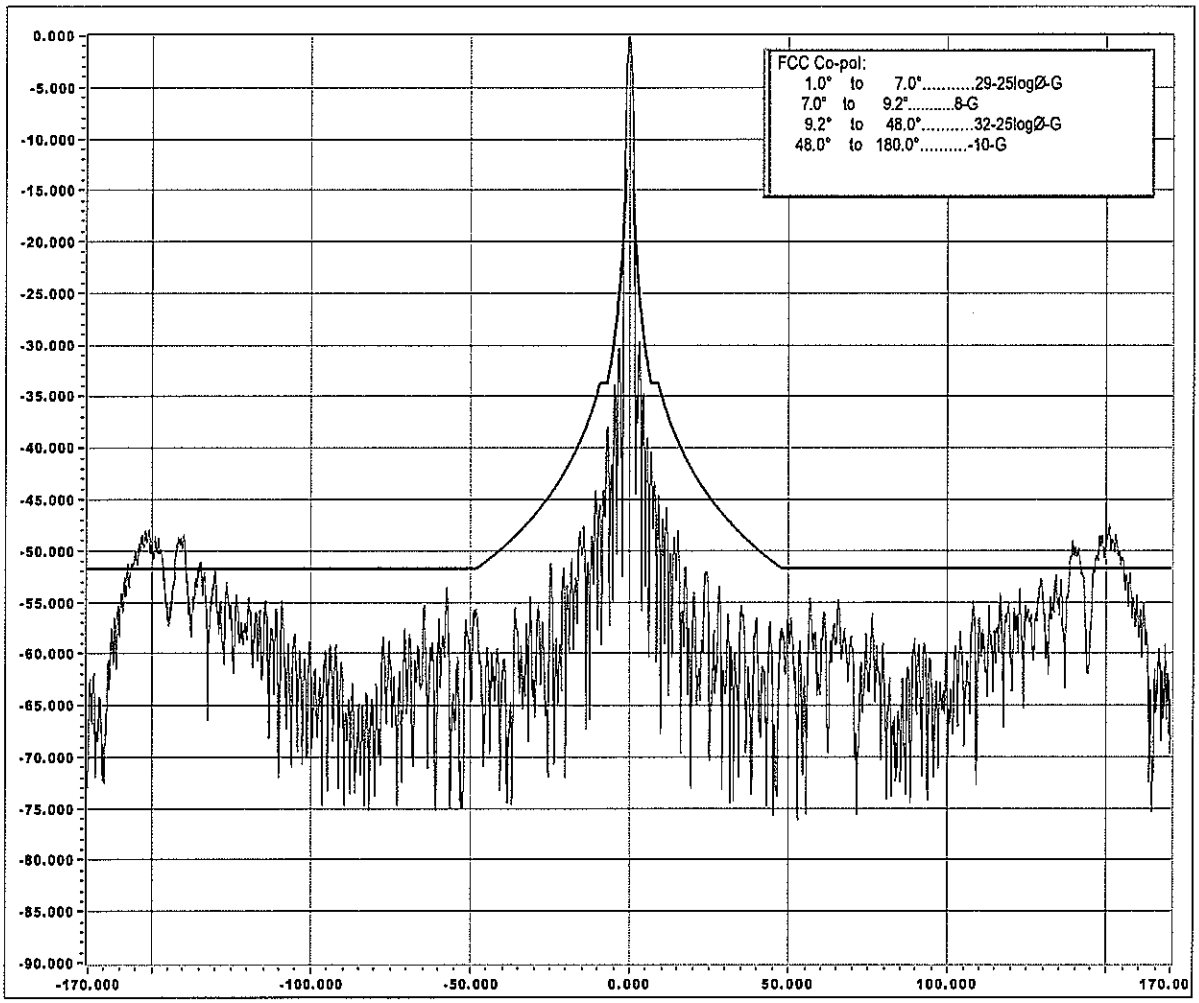
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-20-2006 at 101528
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...HORZ polarization...14.500 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000167, AZ rate (deg/s)=1.140, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060620 101528 12866 TC-175-HA-14.500.txt		
Test Frequency (GHz):	14.500000167	Specified Gain (dB):	41.700
Ref. Level (dBm):	-24.40	Azimuth Beam Center (deg):	180.000
# Points Displayed:	9537	Elevation Beam Center (deg):	1.800
Versions: 60227 FAST, 60129 PACK		Margin Under Curved (dB):	None

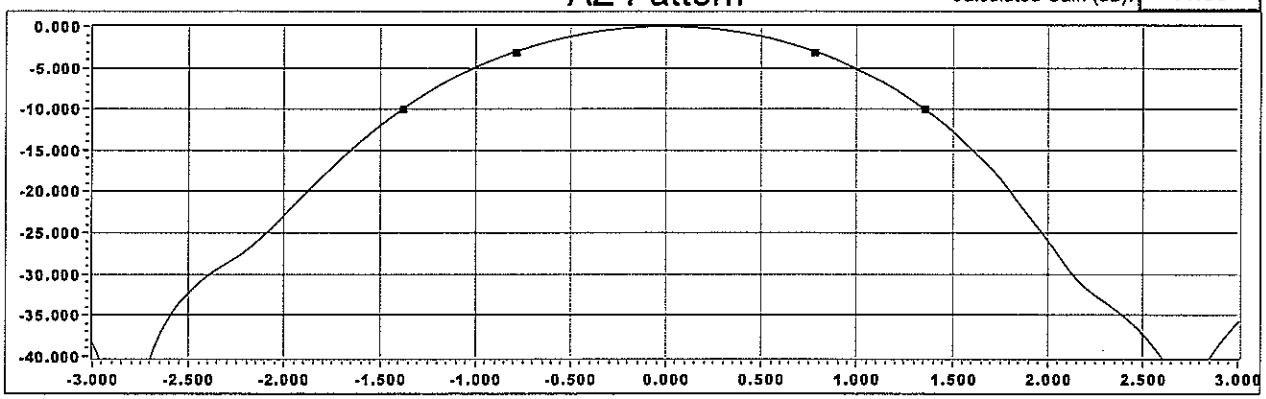
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-25-2006 at 135731	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

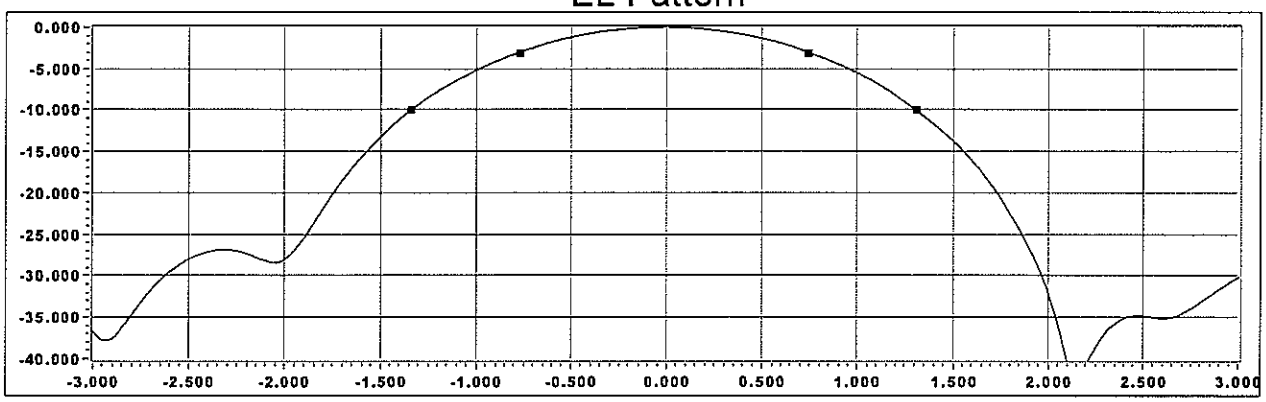
TX...HORZ Polarization...Gain by Beamwidth...13.750 GHz

Spec. Gain (dBi): 41.200
Calculated Gain (dB): 41.65

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=13749999950, AZ rate (deg/s)=2.962, EL rate (deg/s)=0.657, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060525 135731 12866_12 TC-10-HA-13.750.txt
EL Co-pol File	% 060524 132915 12866_12 TC-50-HE-13.750.txt

The calculated gain is greater than the specified gain by 0.45 dB.

Test Frequency (GHz)	13.749999950	AZ 3dB BW (deg)	1.5622	# Points Displayed	8196
AZ Ref. Level (dBm)	-31.98	AZ 10dB BW (deg)	2.7332		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.2612		
RMS (in.)	0.005	EL 3dB BW (deg)	1.5086		
Azimuth (deg)	180.320	EL 10dB BW (deg)	2.6522	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.1297	10dB Factor	107000

Versions
60227 FAST
60129 PACK

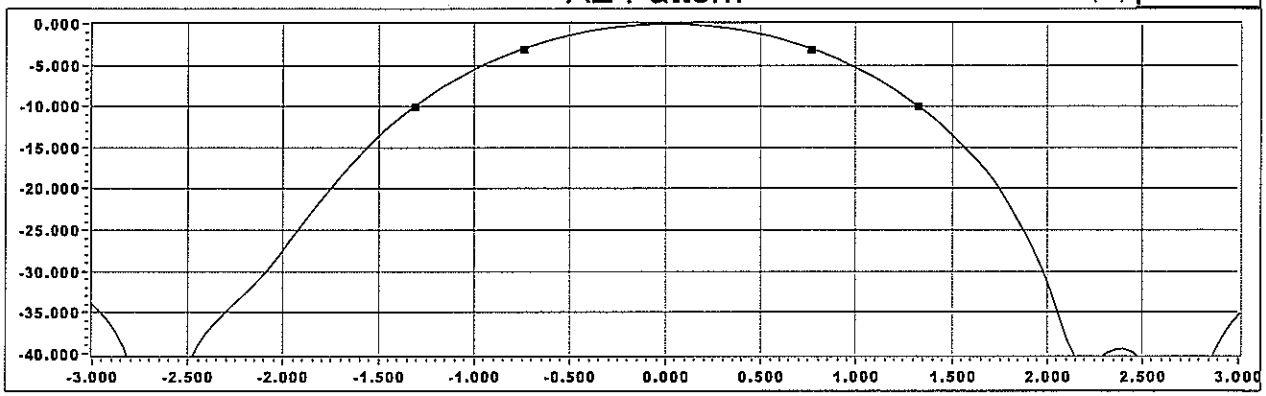
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	6-1-2006 at 111338	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

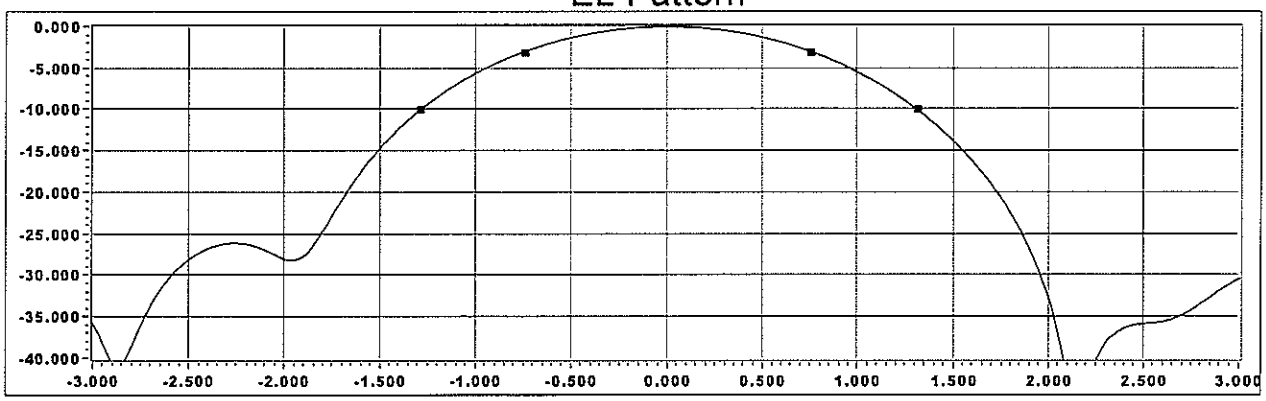
TX...HORZ Polarization...Gain by Beamwidth...14.000 GHz

Spec. Gain (dBi): 41.400
Calculated Gain (dB): 41.87

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=14000000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060601 111338 12866_12 TC-155-HA-14.000.txt
EL Co-pol File	% 060601 111657 12866_12 TC-50-HE-14.000.txt

The calculated gain is greater than the specified gain by 0.47 dB.

Test Frequency (GHz)	14.000000045	AZ 3dB BW (deg)	1.5086	# Points Displayed	469
AZ Ref. Level (dBm)	-32.57	AZ 10dB BW (deg)	2.6385		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.1280		
RMS (in.)	0.005	EL 3dB BW (deg)	1.4936		
Azimuth (deg)	180.480	EL 10dB BW (deg)	2.5960	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.0627	10dB Factor	107000

Versions
60227 FAST
60129 PACK

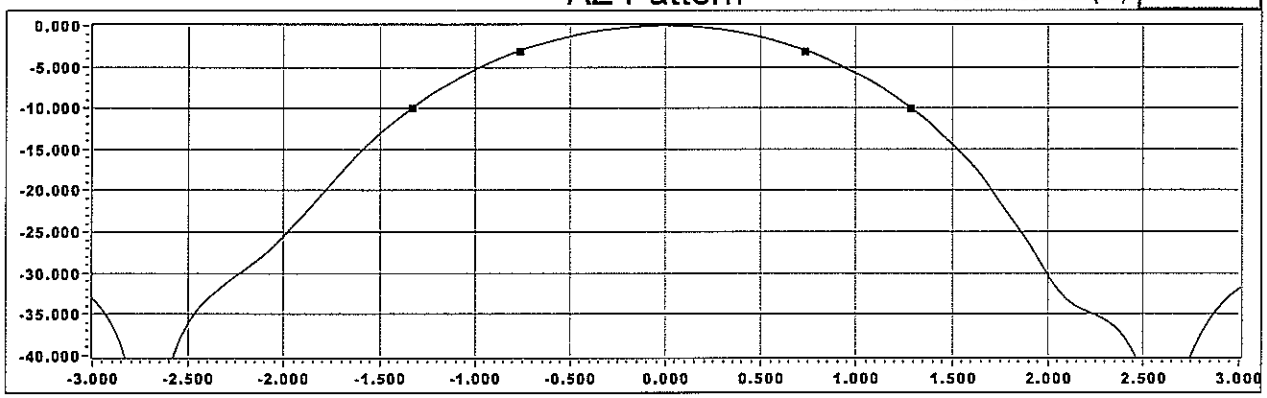
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-23-2006 at 121733	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Cloudy/87F/ Wind 5 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

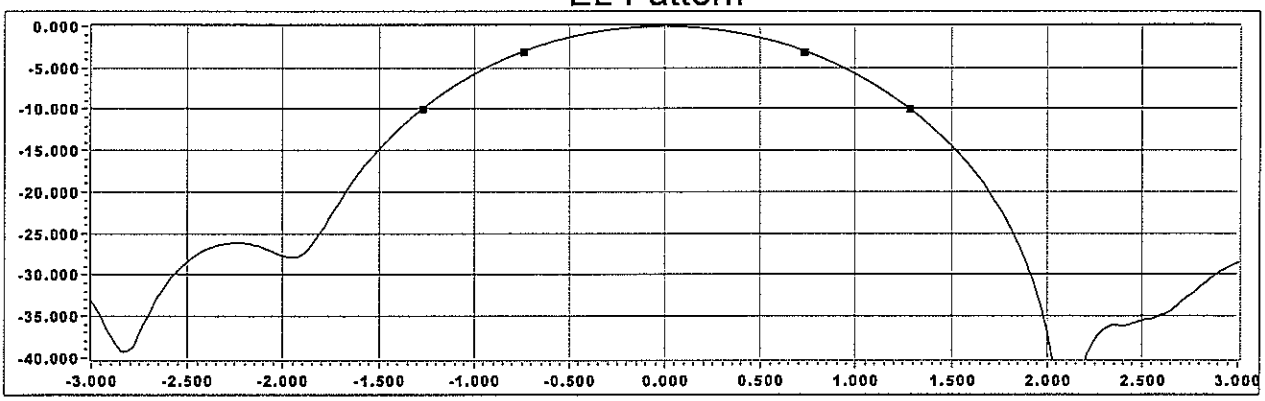
TX...HORZ Polarization...Gain by Beamwidth...14.125 GHz

Spec. Gain (dBi): 41.500
Calculated Gain (dB): 41.96

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=14124999991, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060523 121733 12866_12 TC-10-HA-14.125.txt
EL Co-pol File	% 060523 121842 12866_12 TC-10-HE-14.125.txt

The calculated gain is greater than the specified gain by 0.46 dB.

Test Frequency (GHz)	14.124999991	AZ 3dB BW (deg)	1.4933	# Points Displayed	6985
AZ Ref. Level (dBm)	-32.34	AZ 10dB BW (deg)	2.6207		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.1166		
RMS (in.)	0.005	EL 3dB BW (deg)	1.4782		
Azimuth (deg)	180.590	EL 10dB BW (deg)	2.5578	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.0340	10dB Factor	107000

Versions
60227 FAST
60129 PACK

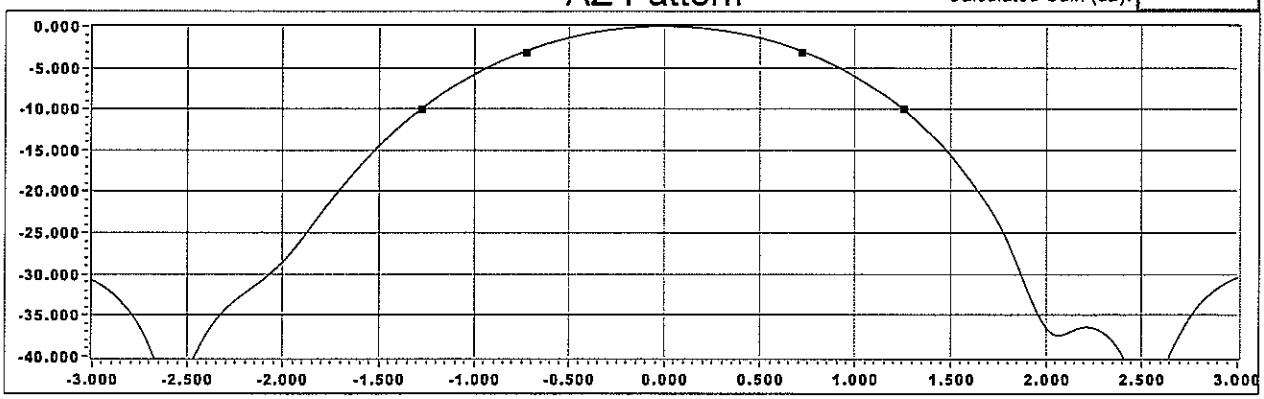
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-25-2006 at 132106	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

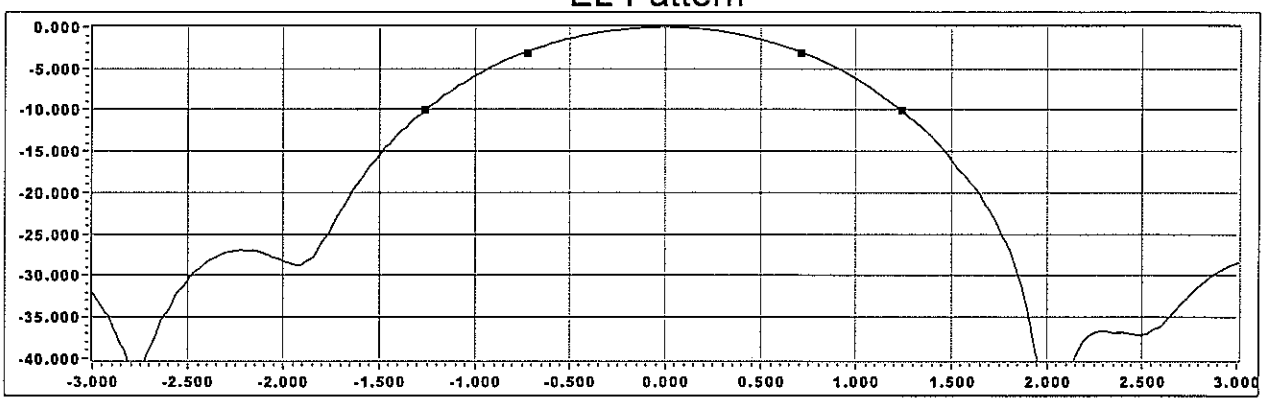
TX...HORZ Polarization...Gain by Beamwidth...14.500 GHz

Spec. Gain (dBi): 41.700
Calculated Gain (dB): 42.24

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=14499999947, AZ rate (deg/s)=2.962, EL rate (deg/s)=0.657, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060525 132106 12866_12 TC-10-HA-14.500.txt
EL Co-pol File	% 060525 132221 12866_12 TC-10-HE-14.500.txt

The calculated gain is greater than the specified gain by 0.54 dB.

Test Frequency (GHz)	14.499999947	AZ 3dB BW (deg)	1.4438	# Points Displayed	7052
AZ Ref. Level (dBm)	-32.16	AZ 10dB BW (deg)	2.5282		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.0012		
RMS (in.)	0.005	EL 3dB BW (deg)	1.4331		
Azimuth (deg)	180.320	EL 10dB BW (deg)	2.4951	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	2.9541	10dB Factor	107000

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

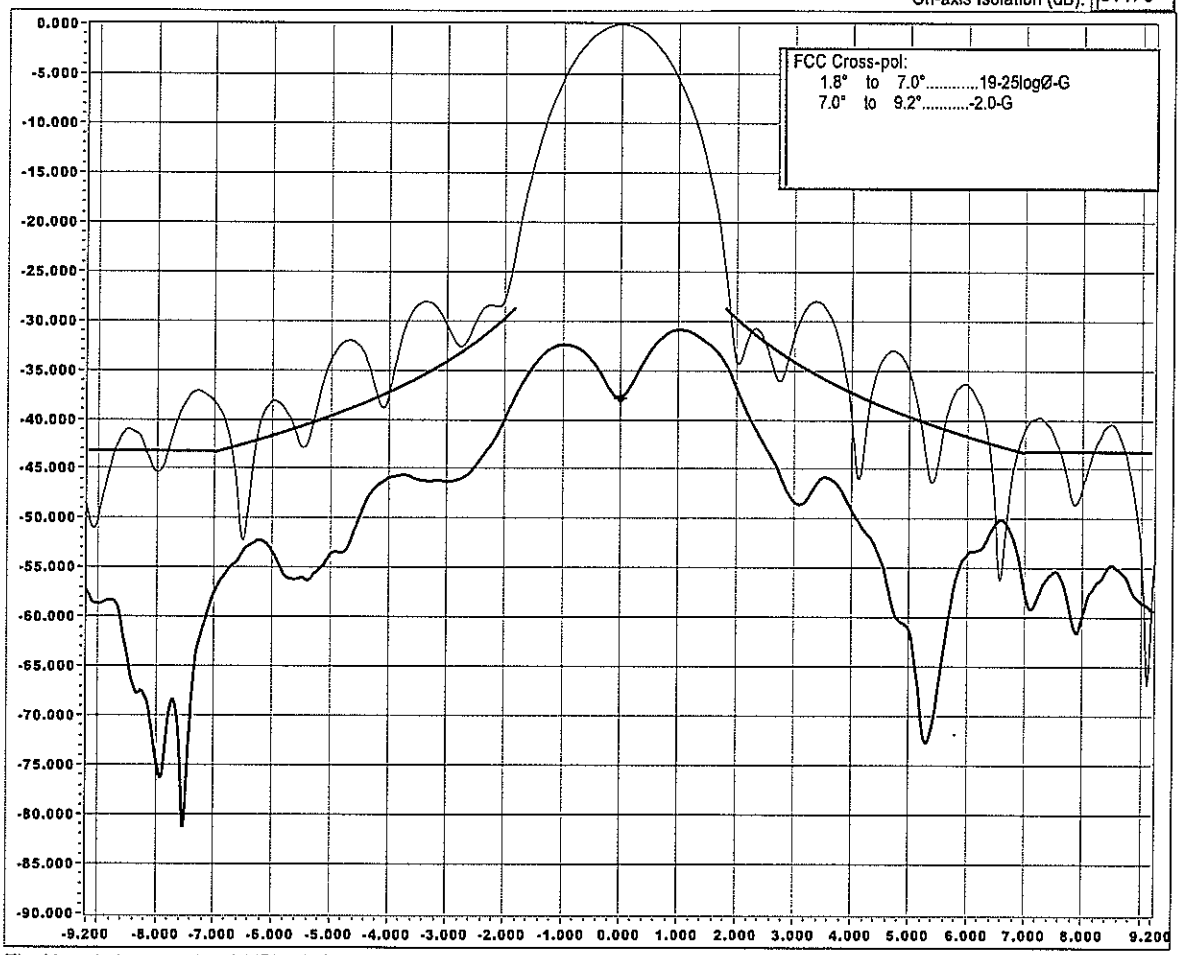
Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 114233
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/71F/ Wind 6 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...VERT polarization...13.750 GHz

Azimuth

On-axis Isolation (dB): 37.79



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13749999993, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060524 101148 12866_12 TC-90-VA-13.750.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060524 114233 12866_12 TX-90-VA-13.750.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	13.749999993	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.03	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	869		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

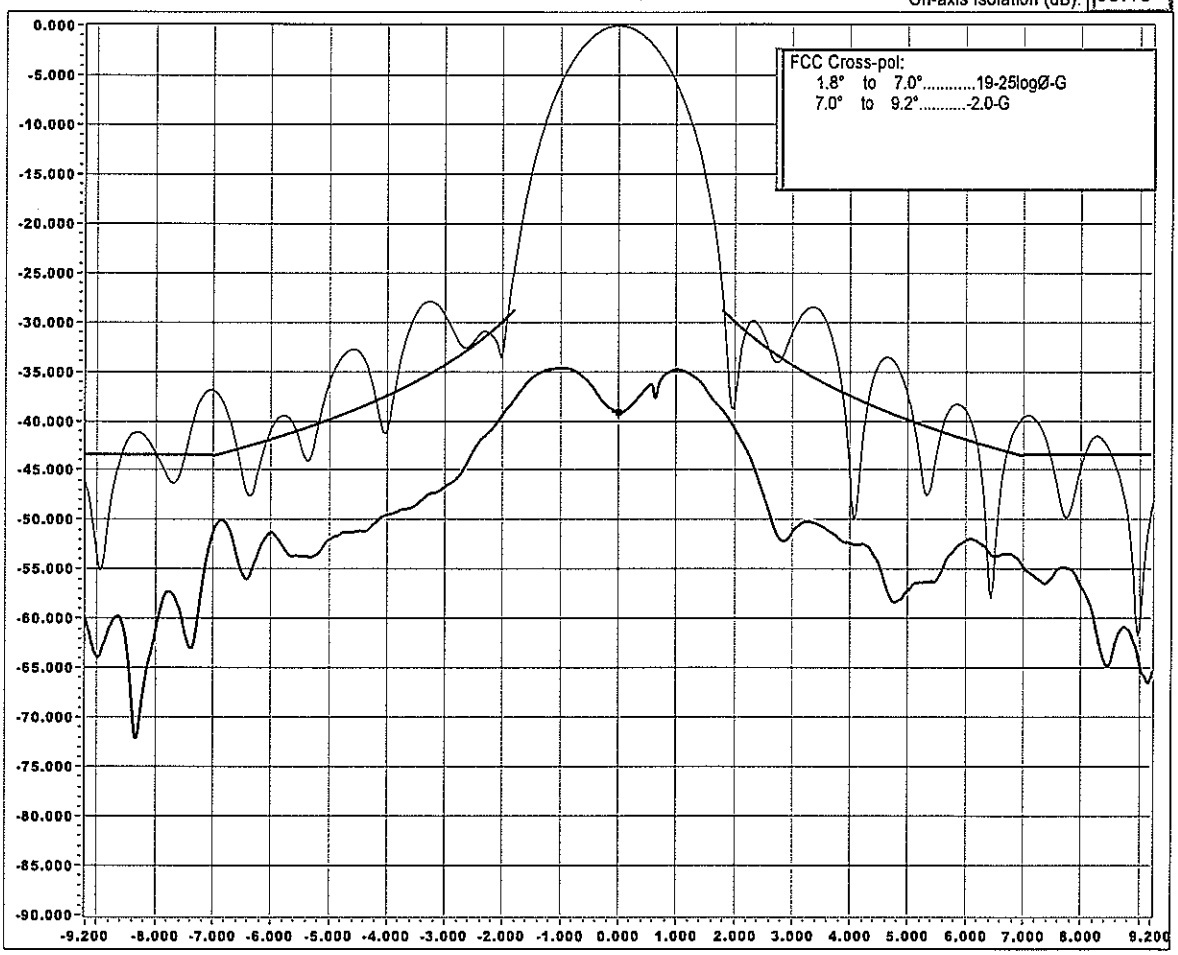
Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 112012
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...VERT polarization...14.000 GHz

Azimuth

On-axis Isolation (dB): 39.10



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060530 112907 12866_12 TC-155-VA-14.000.txt	Azimuth Beam Center (deg):	180.530
Cross-pol File:	% 060530 112012 12866_12 TX-10-VA-14.000.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	14.000000143	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-31.08	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	8687		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

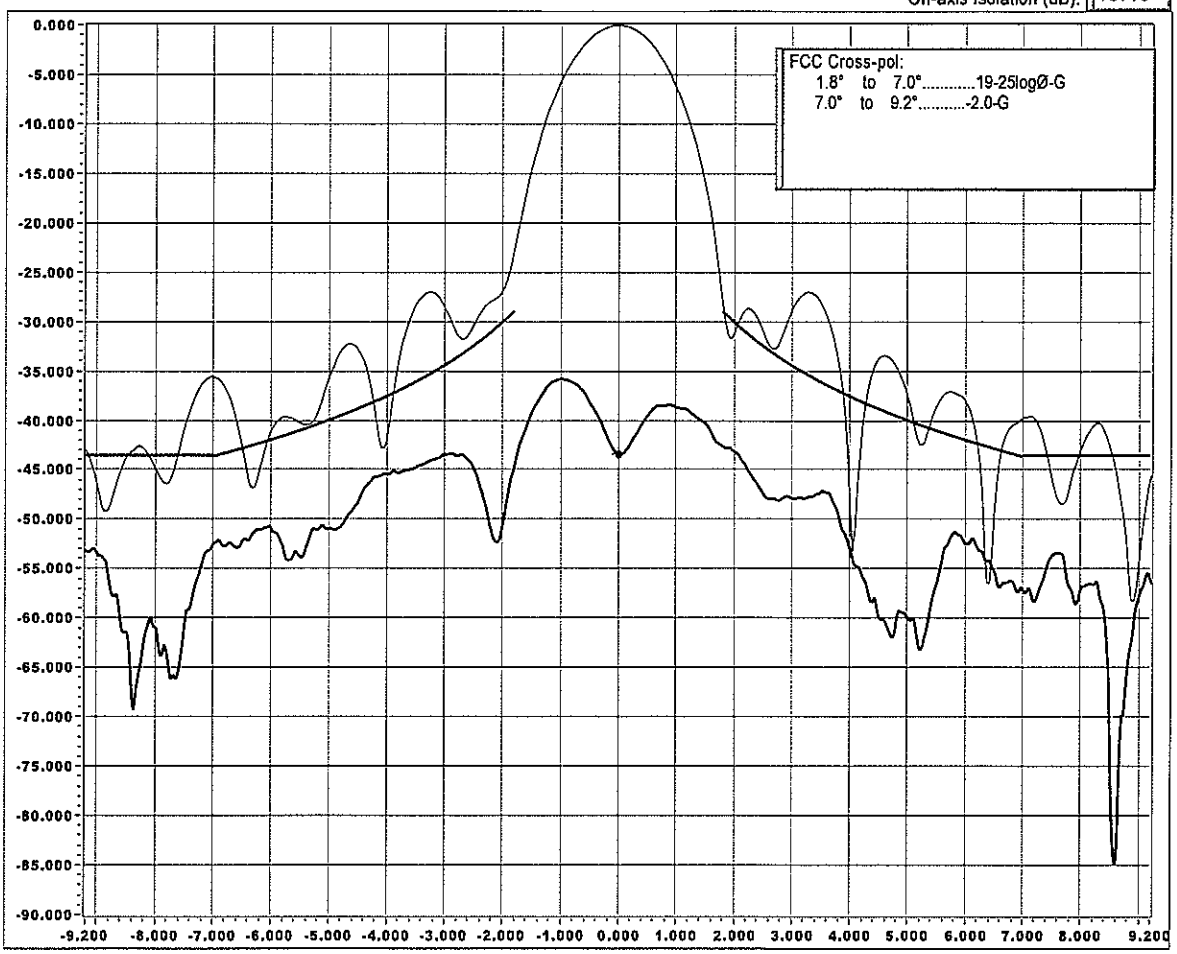
Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 095342
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/71F/ Wind 6 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...VERT polarization...14.125 GHz

Azimuth

On-axis Isolation (dB): 43.40



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14124999991, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060523 105211 12866_12 TC-155-VA-14.125.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060524 095342 12866_12 TX-90-VA-14.125.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	14.124999991	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.68	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	873		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

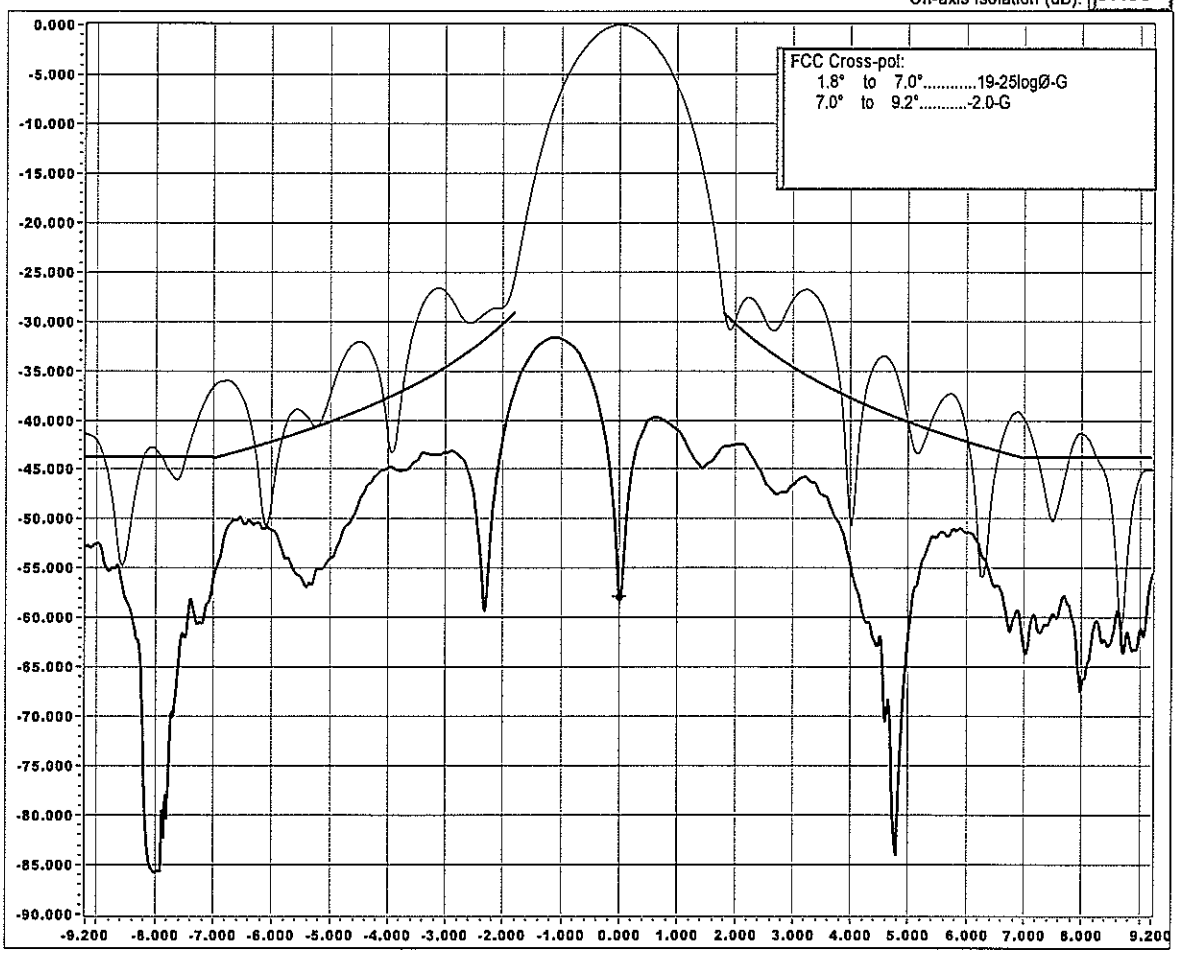
Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 102106
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Cross-pol under Co-pol...VERT polarization...14.500 GHz

Azimuth

On-axis Isolation (dB): 57.85



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000023, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060523 103124 12866_12 TC-155-VA-14.500.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060523 102106 12866_12 TX-10-VA-14.500.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	14.500000023	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.56	Off-axis Spec. Isolation (dB):	35.00
# Points Displayed:	7067		

Versions
60227 FAST
60129 PACK

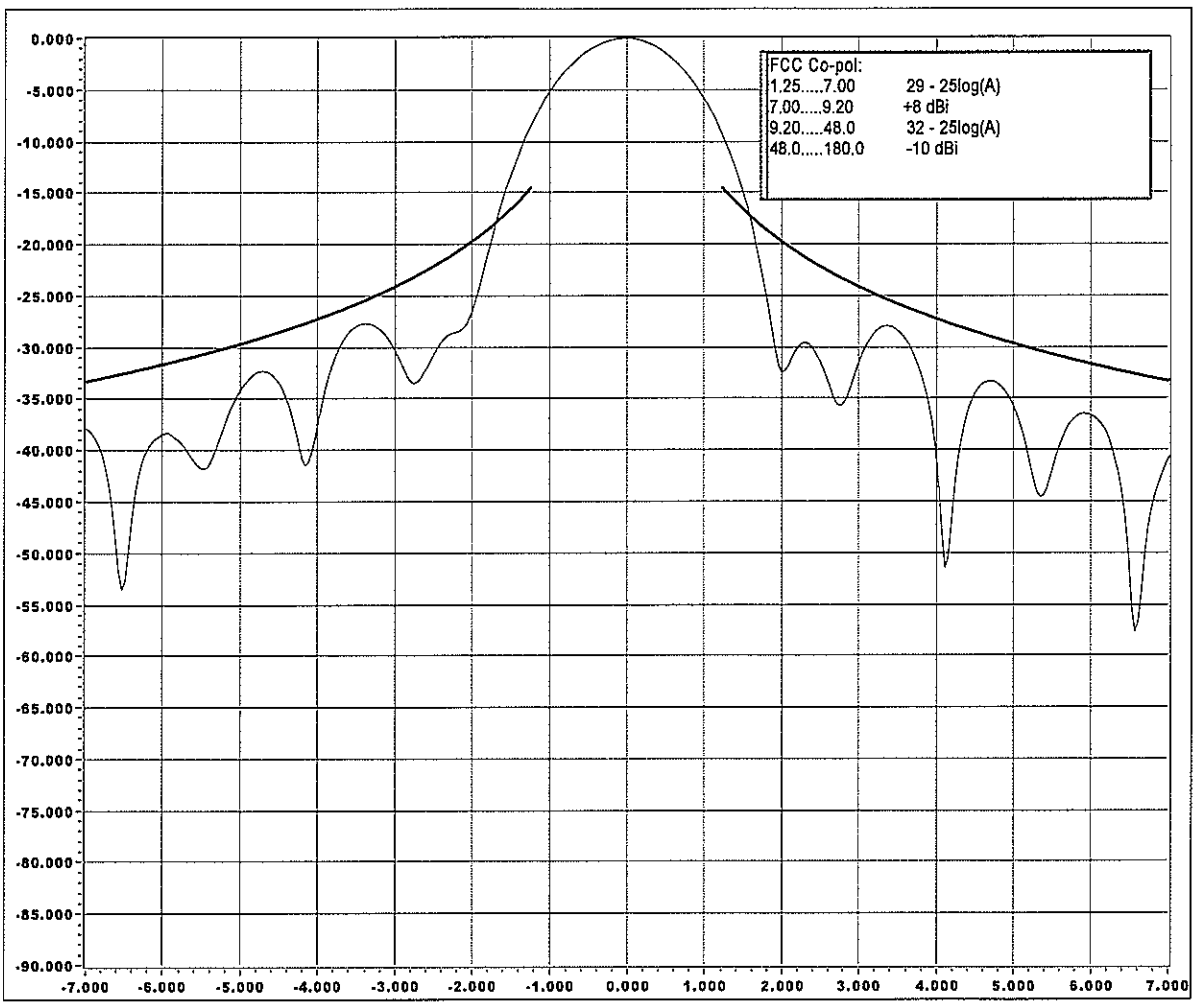
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 091431
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...13.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13750000036, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 091431 12866_12 TC-155-VA-13.750.txt		
Test Frequency (GHz):	13.750000036		
Ref. Level (dBm):	-32.59	Versions	
# Points Displayed:	7994	60227 FAST 60129 PACK	
Specified Gain (dB):			41.200
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

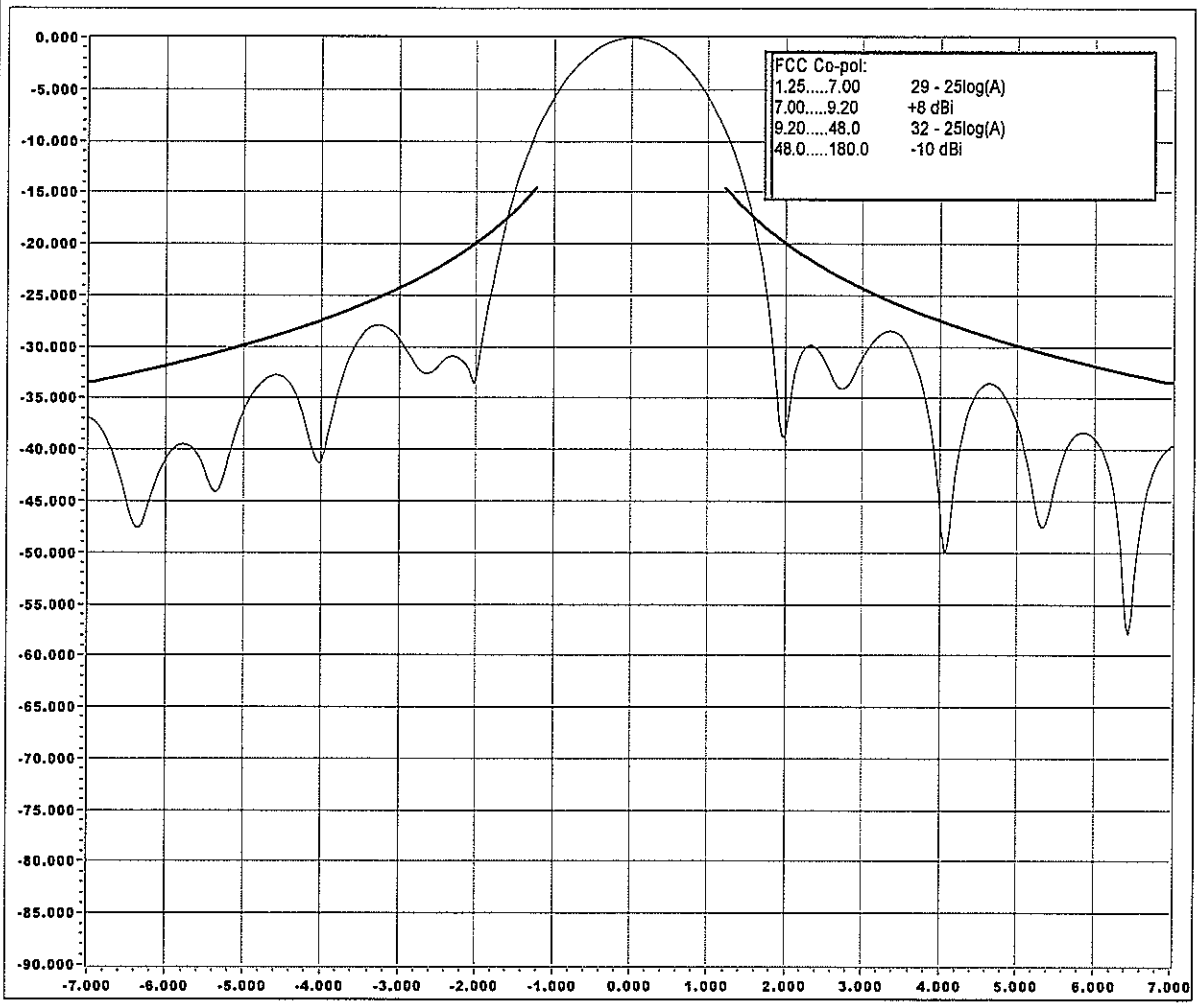
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 112907
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.000 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

File:	% 060530 112907 12866_12 TC-155-VA-14.000.txt		
Test Frequency (GHz):	14.000000143		
Ref. Level (dBm):	-31.08	Versions	
# Points Displayed:	9652	60227 FAST 60129 PACK	
Specified Gain (dB):			41.400
Azimuth Beam Center (deg):			180.530
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

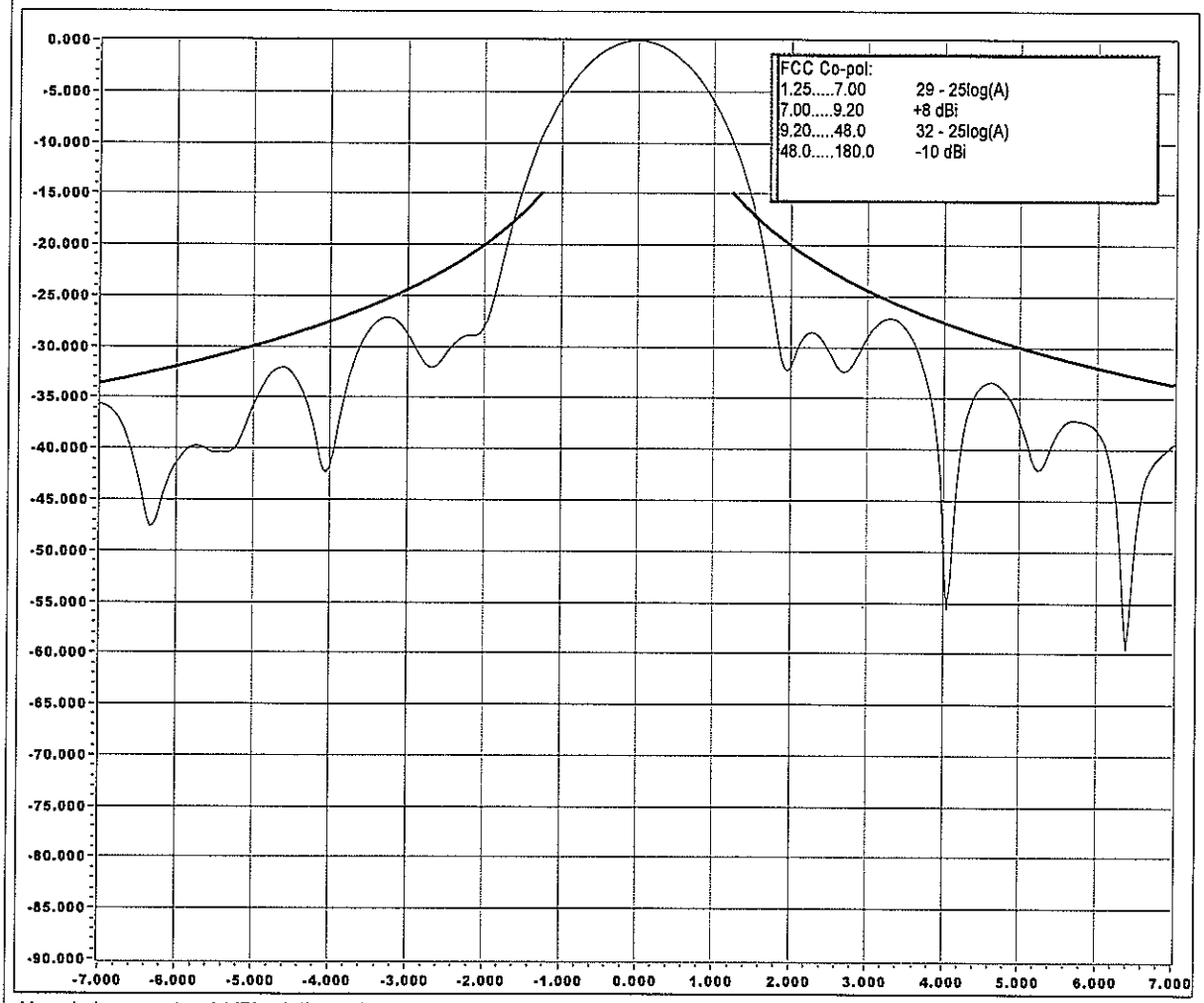
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 100757
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.125 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14125000025, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 100757 12866_12 TC-155-VA-14.125.txt		
Test Frequency (GHz):	14.125000025		
Ref. Level (dBm):	-32.89	Versions	
# Points Displayed:	7952	60227 FAST 60129 PACK	
Specified Gain (dB):			41.500
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

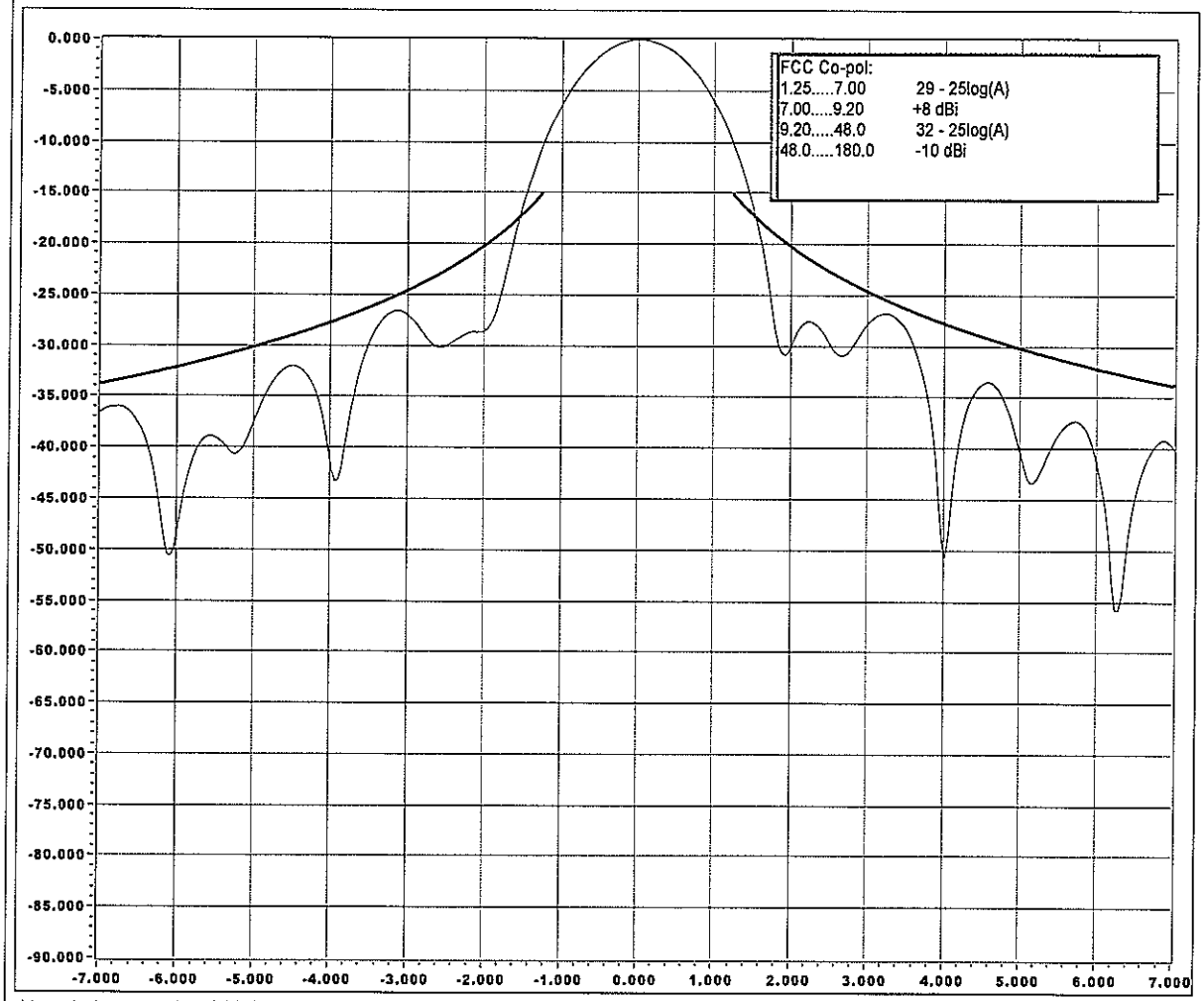
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 103124
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.500 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000021, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 103124 12866_12 TC-155-VA-14.500.txt		
Test Frequency (GHz):	14.500000021	Specified Gain (dB):	41.700
Ref. Level (dBm):	-32.56	Azimuth Beam Center (deg):	180.590
# Points Displayed:	7918	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

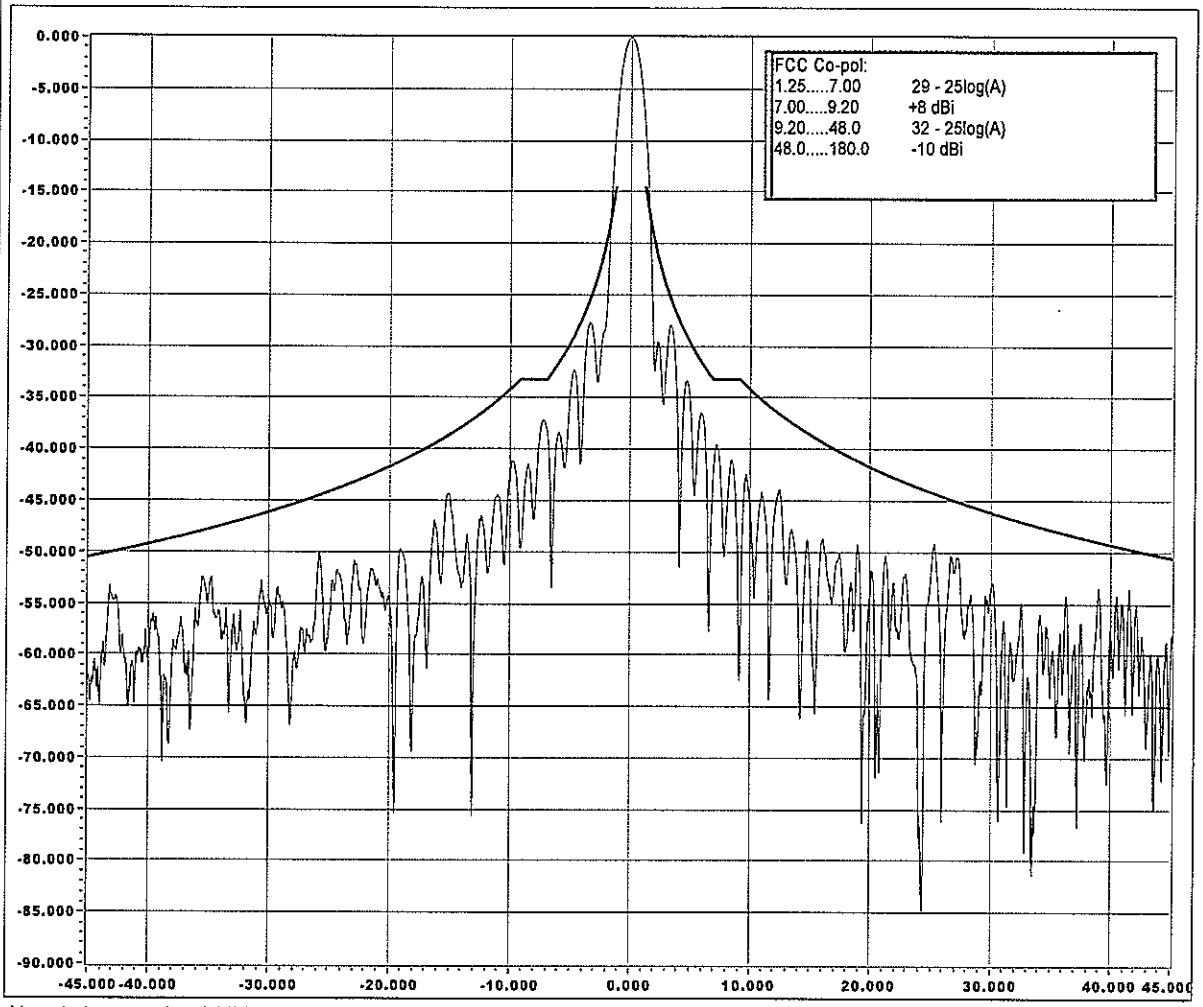
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 091431
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...13.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13750000036, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 091431 12866_12 TC-155-VA-13.750.txt		
Test Frequency (GHz):	13.750000036		
Ref. Level (dBm):	-32.59	Versions	
# Points Displayed:	7994	60227 FAST 60129 PACK	

Specified Gain (dB):	41.200
Azimuth Beam Center (deg):	180.590
Elevation Beam Center (deg):	12.000
Margin Under Curved (dB):	None

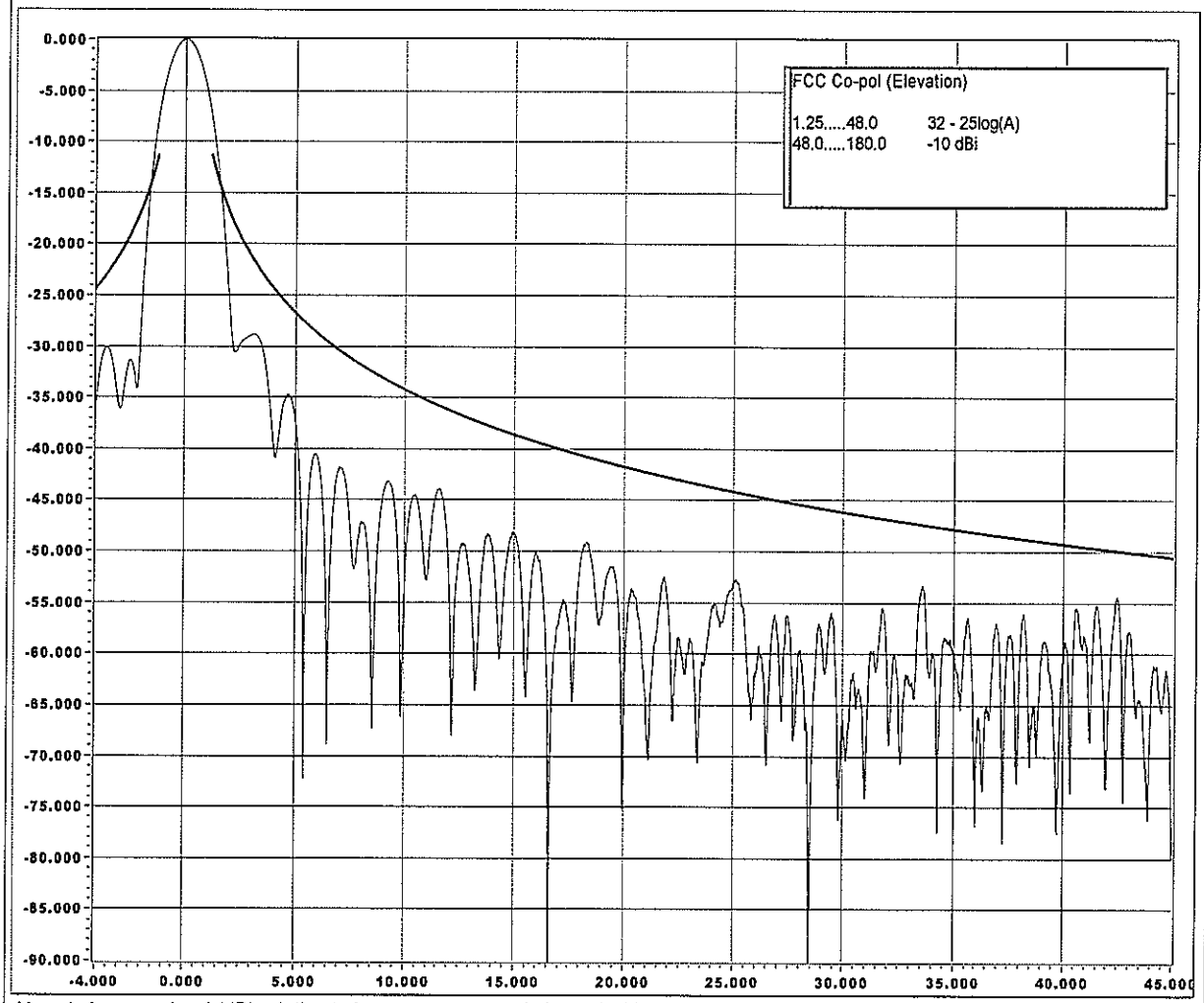
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 114937
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/71F/ Wind 6 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...13.750 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=13749999995, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 114937 12866_12 TC-50-VE-13.750.txt		
Test Frequency (GHz):	13.749999995		
Ref. Level (dBm):	-32.35	Versions	
# Points Displayed:	7061	60227 FAST 60129 PACK	
		Specified Gain:	41.200
		Azimuth Beam Center (deg):	180.590
		Elevation Beam Center (deg):	12.000
		Margin Under Curve (dB):	None

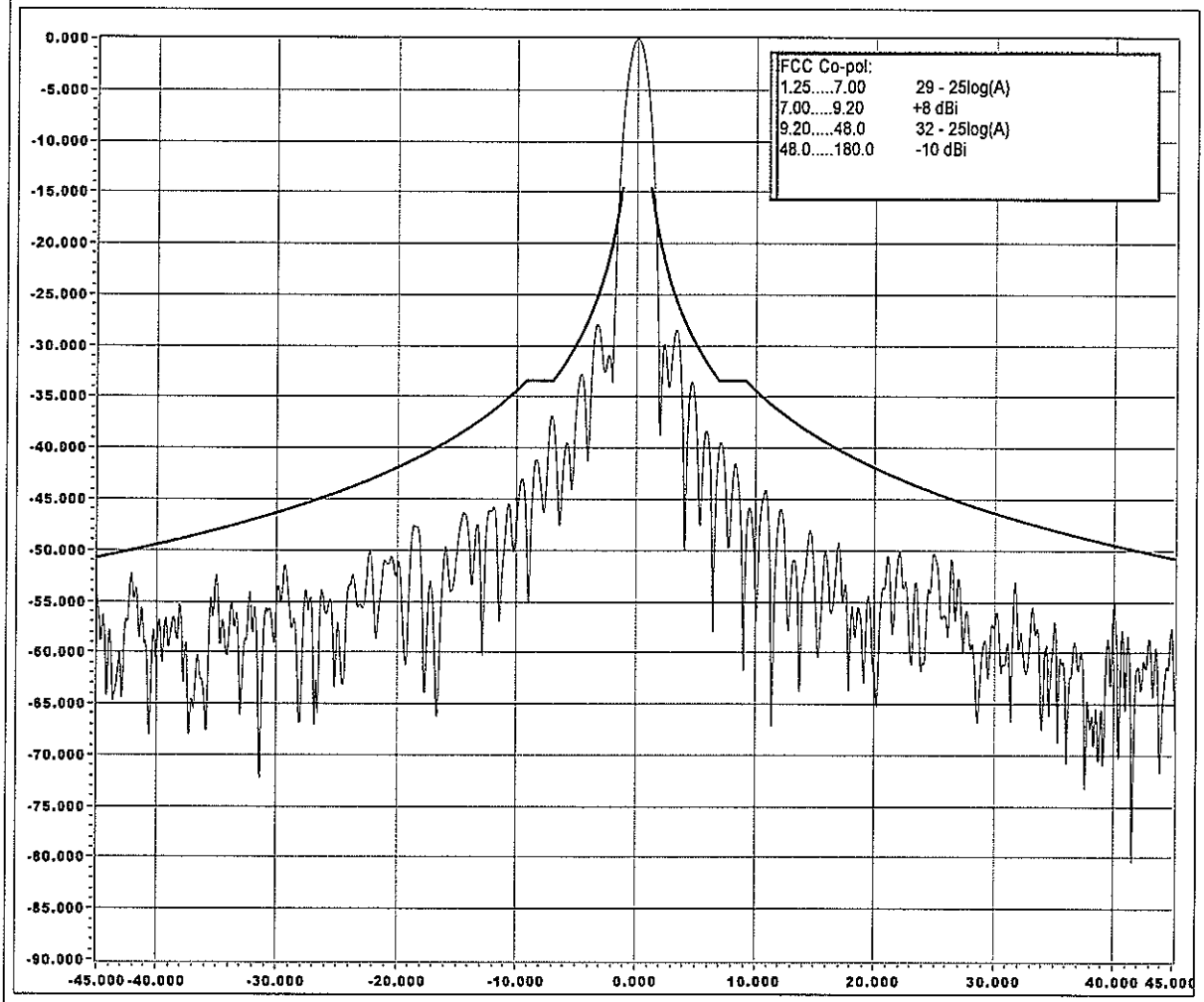
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 112907
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.000 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

File:	% 060530 112907 12866_12 TC-155-VA-14.000.txt		
Test Frequency (GHz):	14.000000143	Specified Gain (dB):	41.400
Ref. Level (dBm):	-31.08	Azimuth Beam Center (deg):	180.530
# Points Displayed:	9652	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

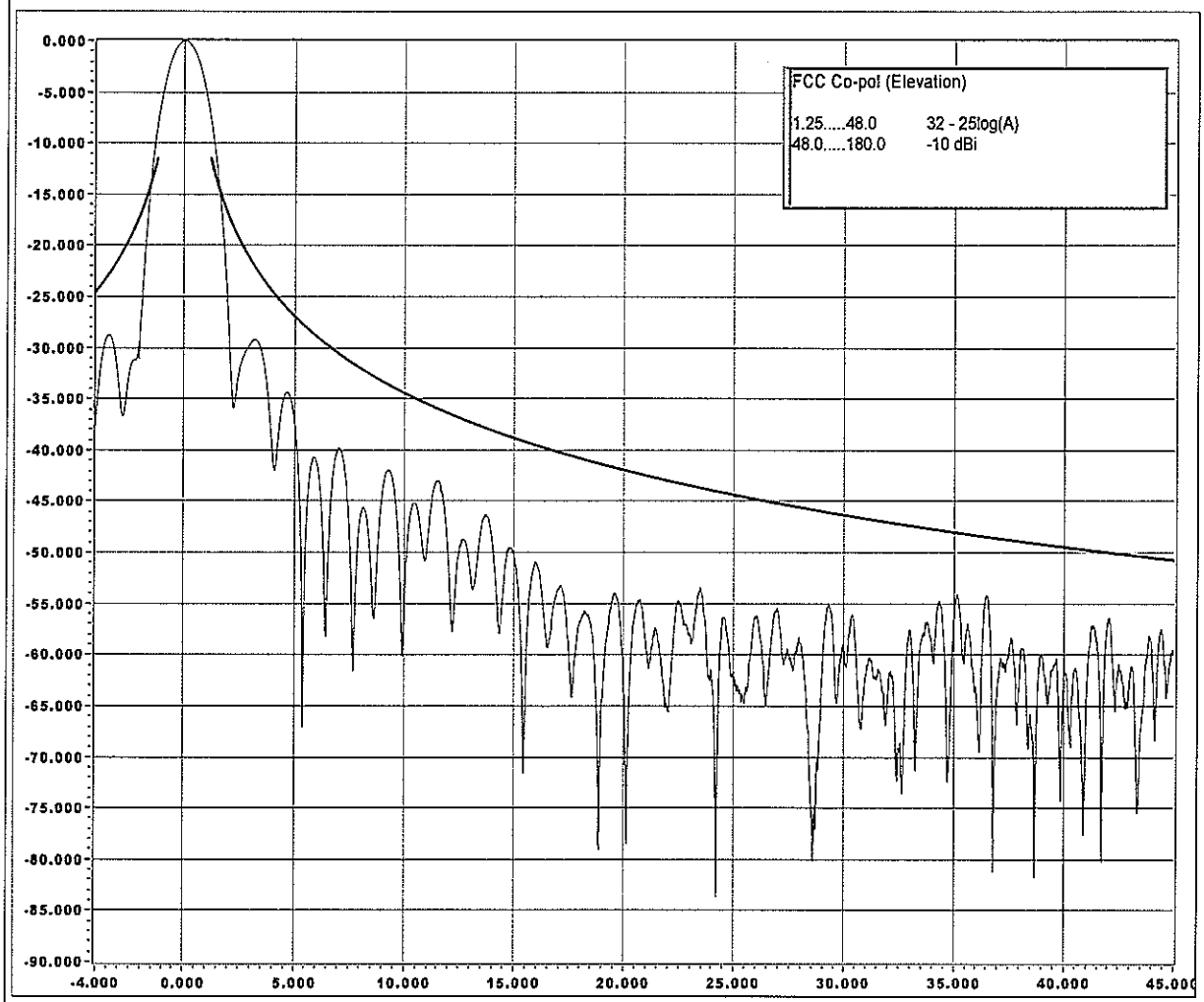
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-30-2006 at 113224
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.000 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

File:	% 060530 113224 12866_12 TC-50-VE-14.000.txt	Specified Gain:	41.400
Test Frequency (GHz):	14.000000143	Azimuth Beam Center (deg):	180.530
Ref. Level (dBm):	-31.04	Elevation Beam Center (deg):	12.000
# Points Displayed:	8606	Margin Under Curve (dB):	None

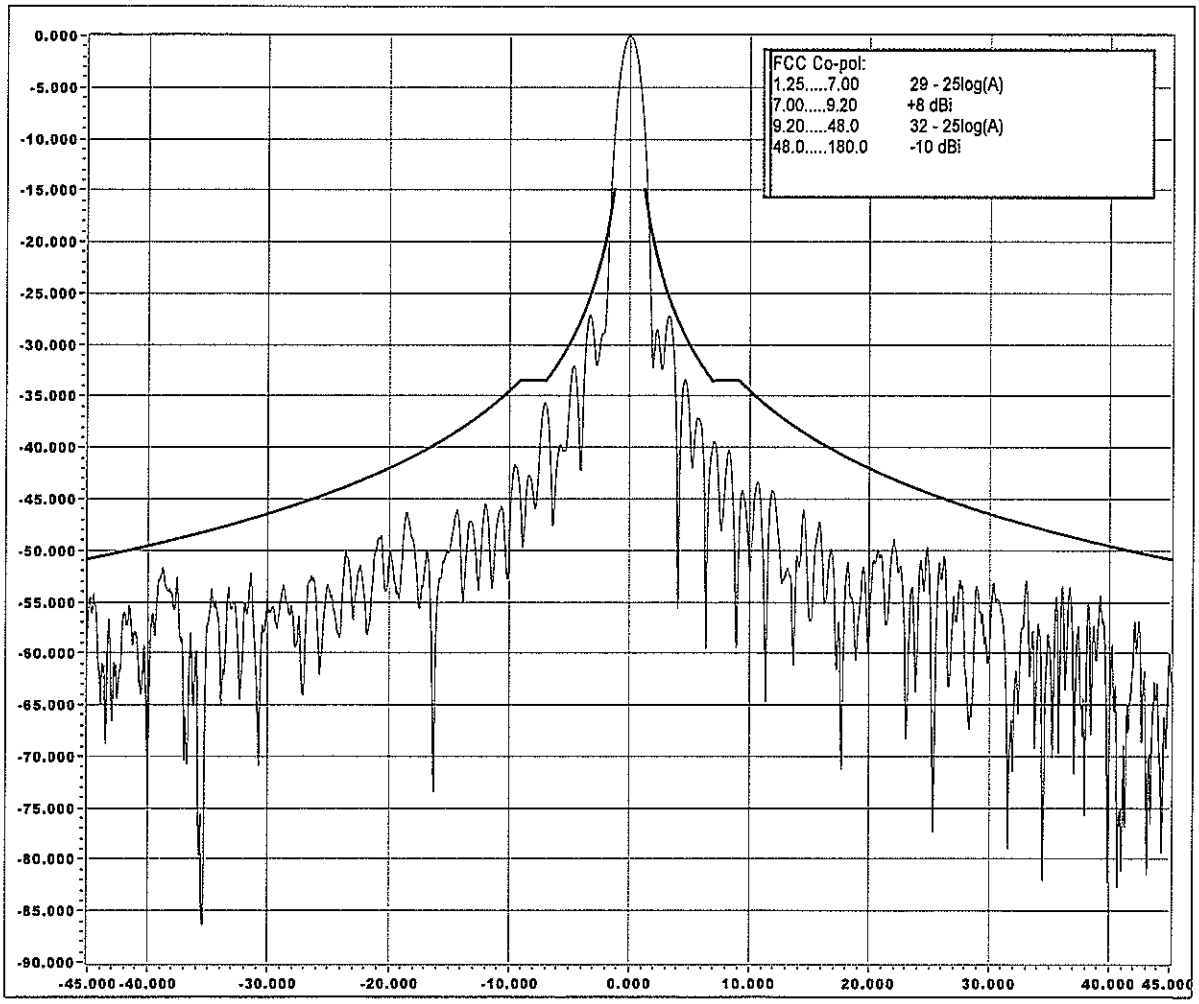
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 100757
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.125 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14125000025, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 100757 12866_12 TC-155-VA-14.125.txt		
Test Frequency (GHz):	14.125000025		
Ref. Level (dBm):	-32.89	Versions	
# Points Displayed:	7952	60227 FAST 60129 PACK	
Specified Gain (dB):			41.500
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

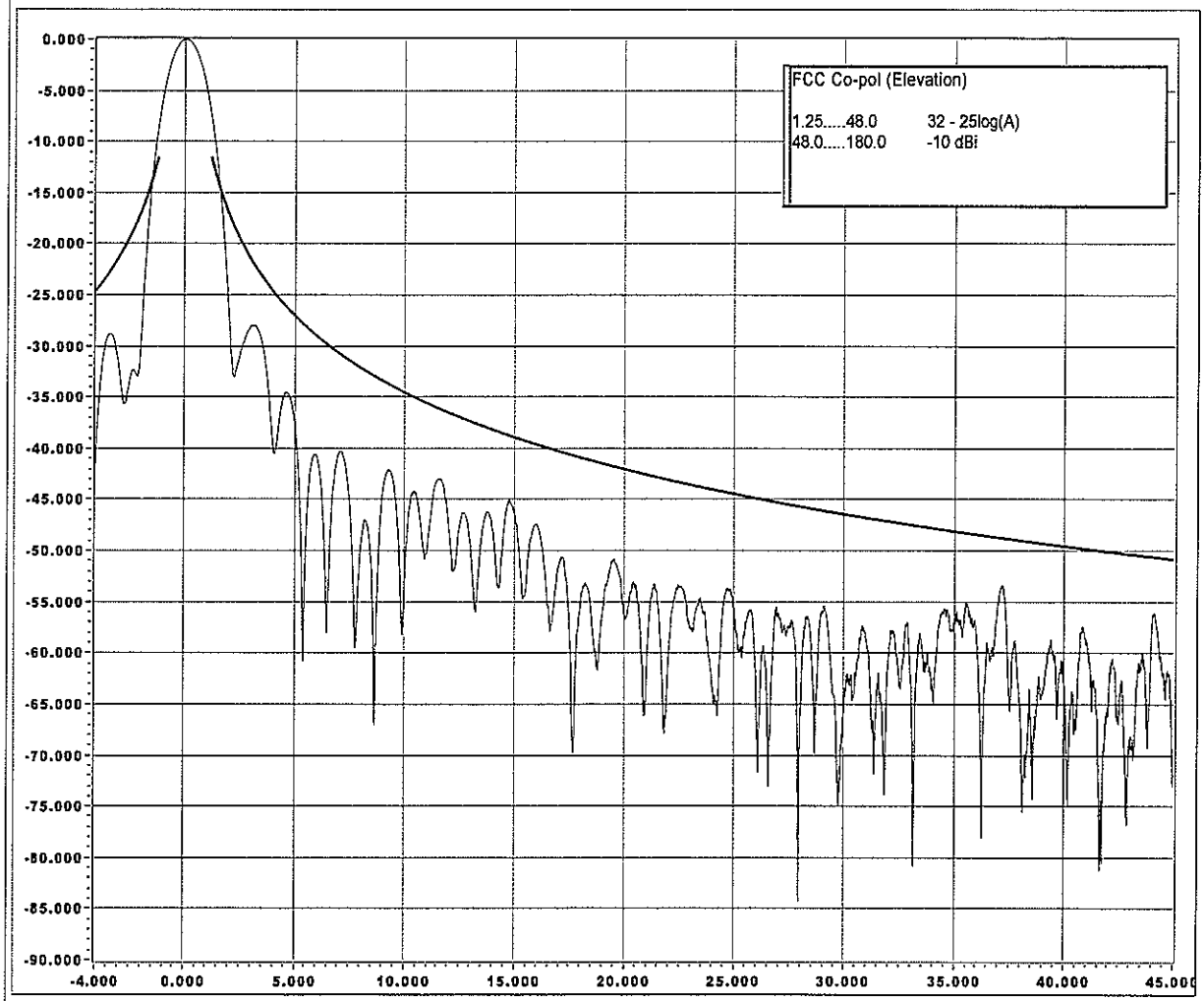
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 115528
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/71F/ Wind 6 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.125 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14124999992, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 115528 12866_12 TC-50-VE-14.125.txt	Specified Gain:	41.500
Test Frequency (GHz):	14.124999992	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.67	Elevation Beam Center (deg):	12.000
# Points Displayed:	7033	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

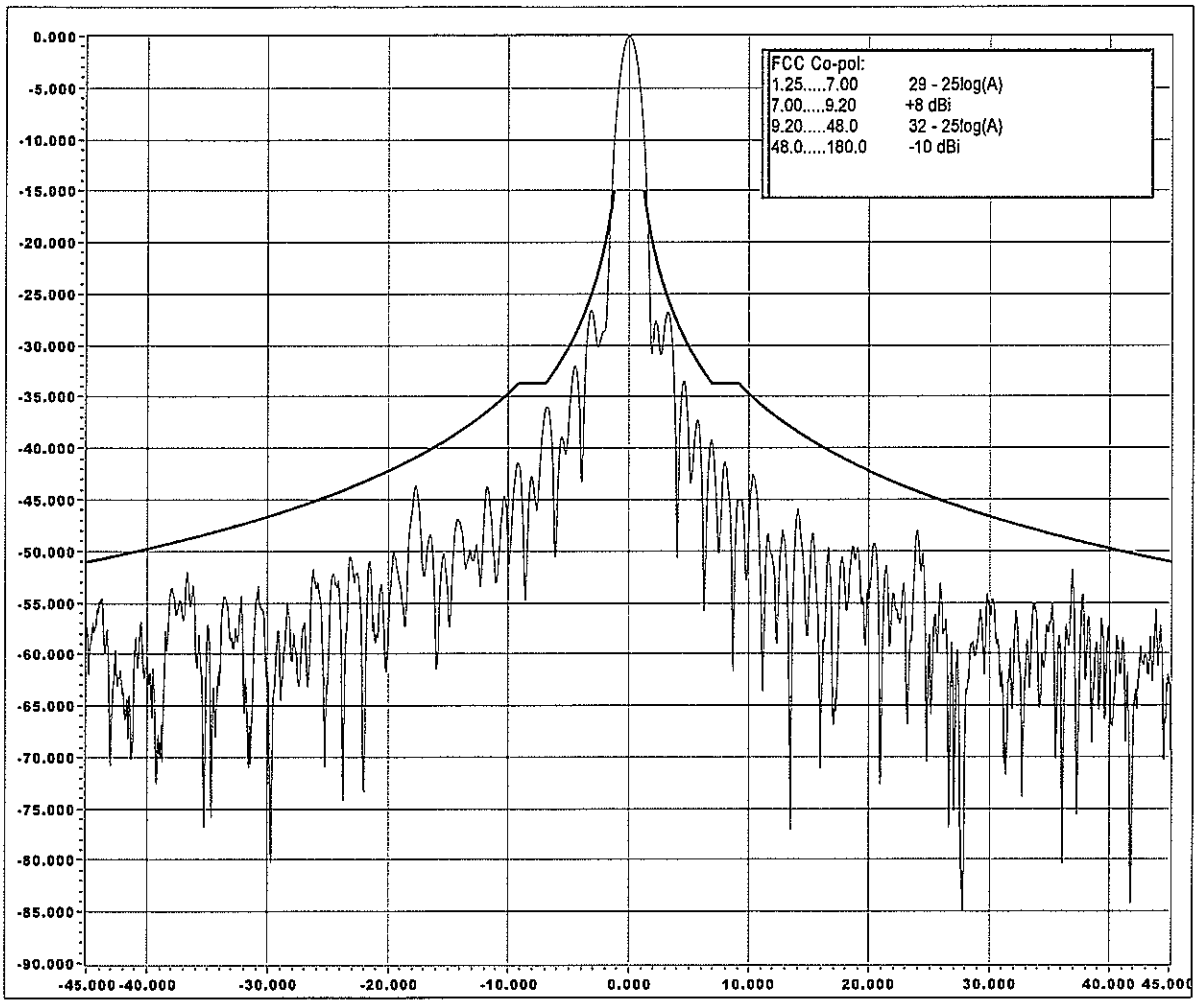
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-23-2006 at 103124
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Cloudy/87F/ Wind 5 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.500 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000021, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

File:	% 060523 103124 12866_12 TC-155-VA-14.500.txt	Specified Gain (dB):	41.700
Test Frequency (GHz):	14.500000021	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.56	Elevation Beam Center (deg):	12.000
# Points Displayed:	7918	Margin Under Curved (dB):	None

Versions
60227 FAST
60129 PACK

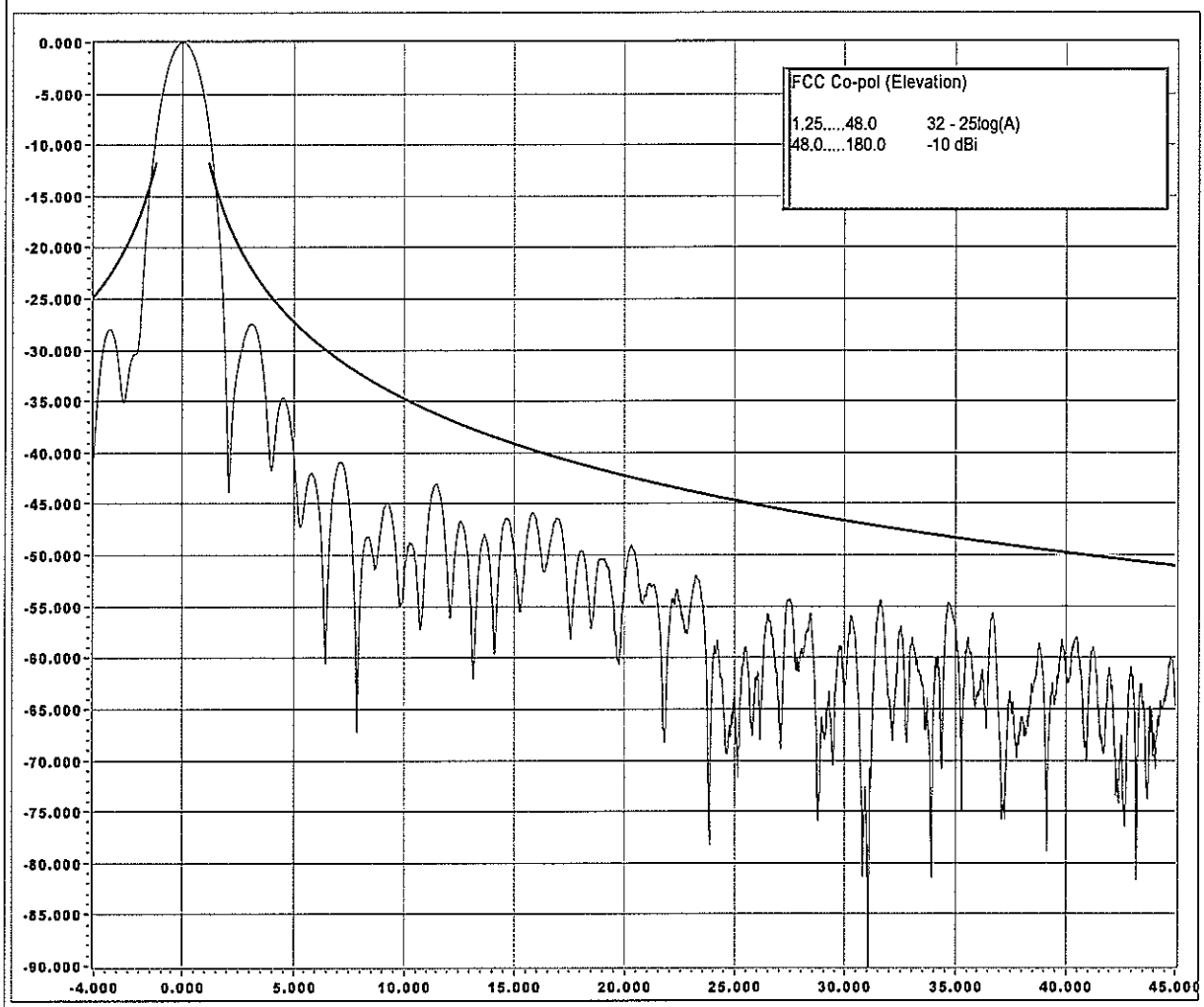
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 131343
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

TX...Co-pol...VERT polarization...14.500 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14499999968, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 131343 12866_12 TC-50-VE-14.500.txt	Specified Gain:	41.700
Test Frequency (GHz):	14.499999968	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.27	Elevation Beam Center (deg):	12.000
# Points Displayed:	6996	Margin Under Curve (dB):	None

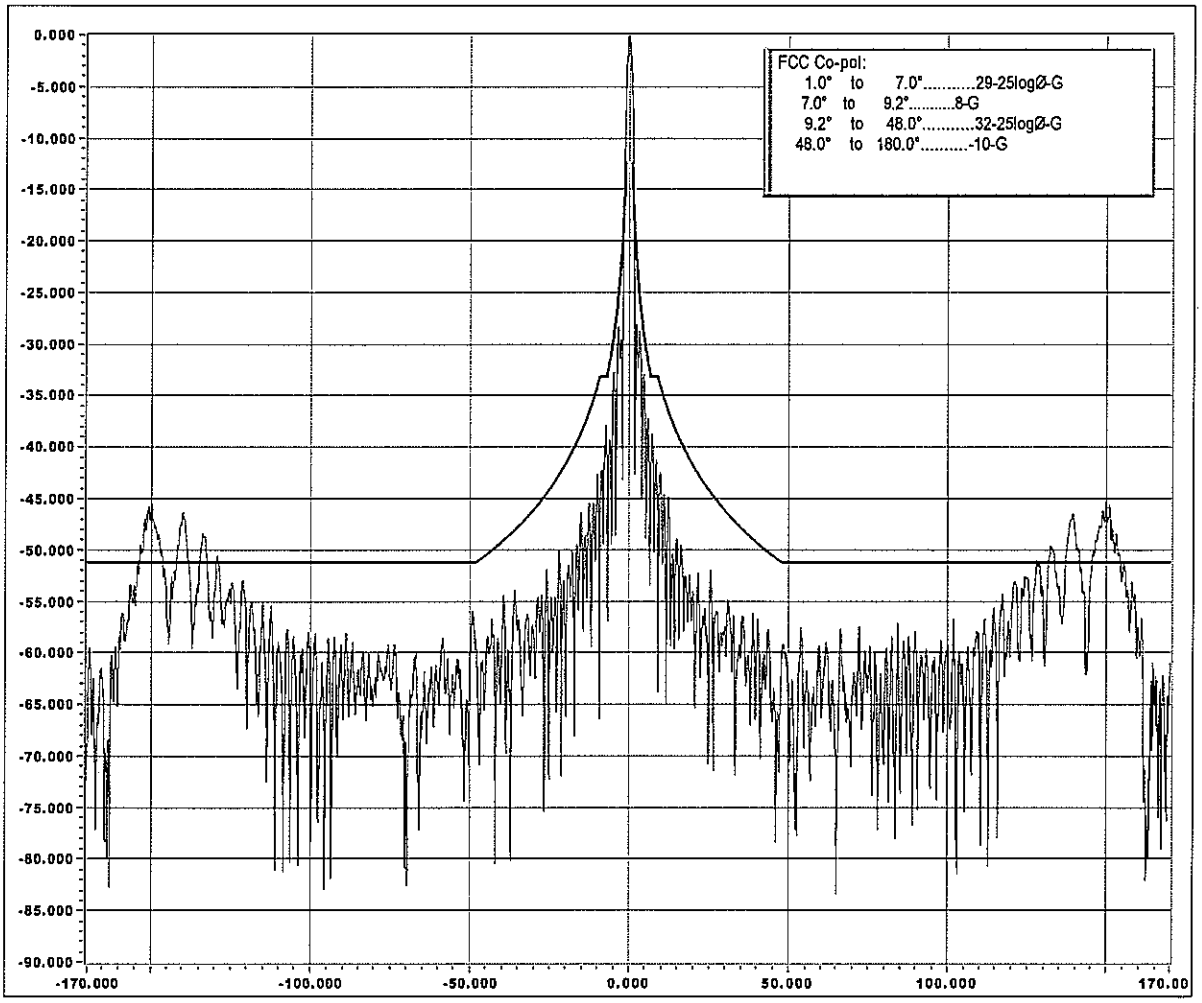
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-16-2006 at 104653
Job Number.....	12866
Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...VERT polarization...13.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

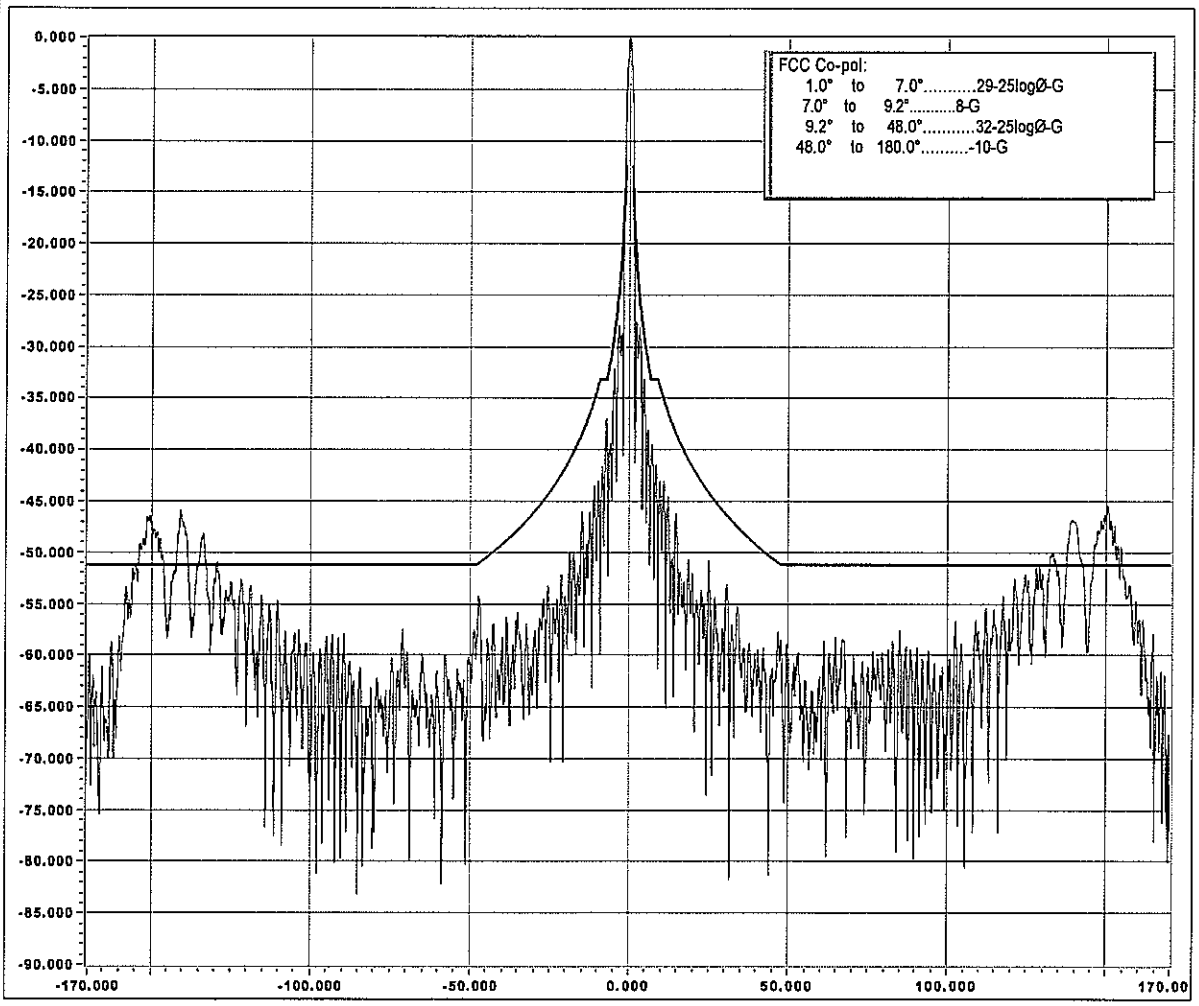
SA Freq (Hz)=13750000121, AZ rate (deg/s)=1.183, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060616 104653 12866 TC-175-VA-13.750.txt		
Test Frequency (GHz):	13.750000121		
Ref. Level (dBm):	-14.16	Versions	
# Points Displayed:	9755	60227 FAST 60129 PACK	
Specified Gain (dB):			41.200
Azimuth Beam Center (deg):			180.000
Elevation Beam Center (deg):			1.800
Margin Under Curved (dB):			None

Customer.....	Norsat	Model.....	1.0m Single Offset
Date/Local Time.....	6-16-2006 at 110648	Location.....	Test Range
Job Number.....	12866	Weather.....	Partly cloudy
		Test Engineer.....	Dustin Cummings
		Spacecraft.....	Long Range
		Transponder.....	none

TX...Co-pol...VERT polarization...14.000 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14000000157, AZ rate (deg/s)=1.183, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060616 110648 12866 TC-175-VA-14.000.txt	Specified Gain (dB):	41.200
Test Frequency (GHz):	14.000000157	Azimuth Beam Center (deg):	180.000
Ref. Level (dBm):	-17.03	Elevation Beam Center (deg):	1.800
# Points Displayed:	9703	Margin Under Curved (dB):	None

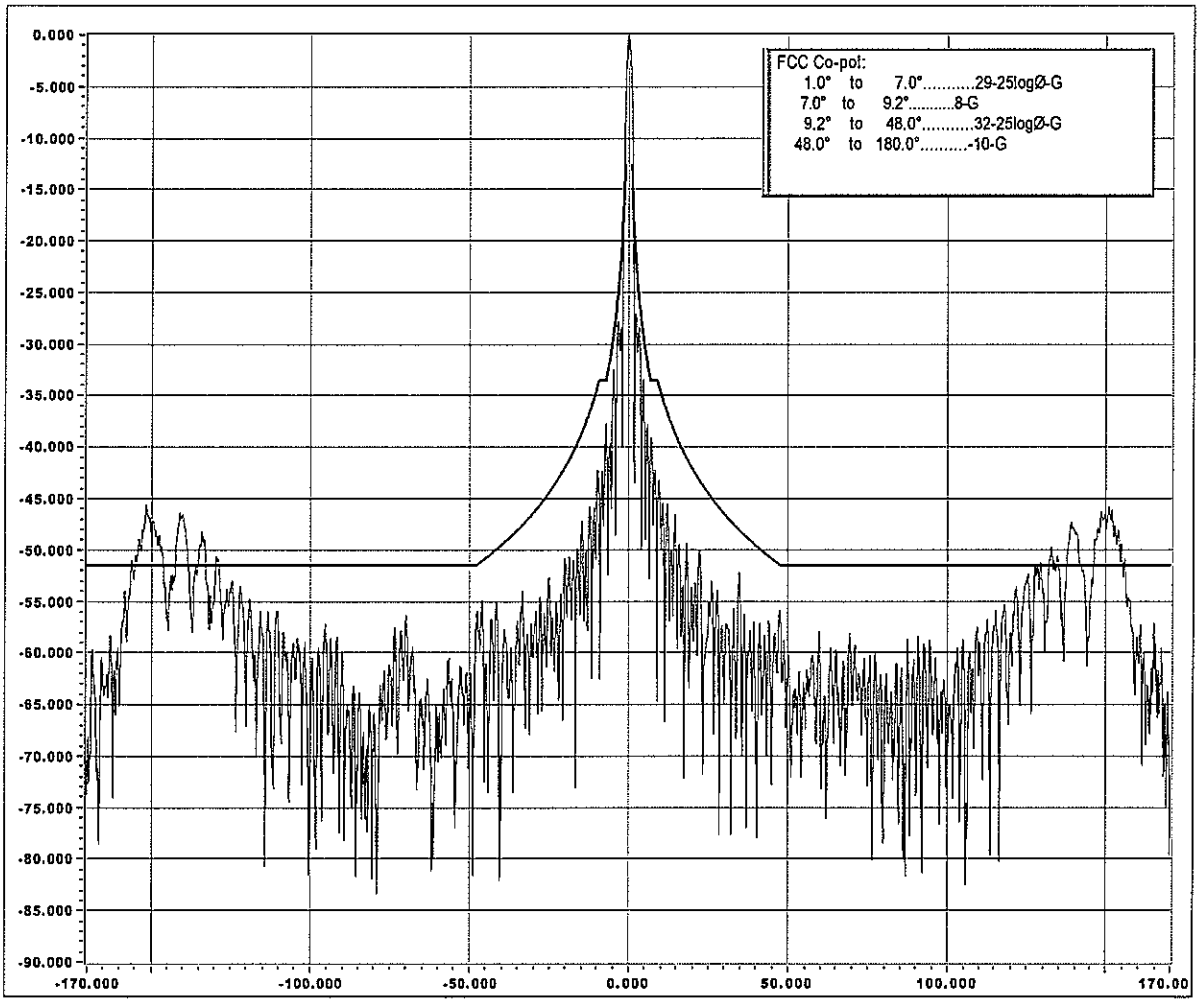
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-16-2006 at 111810
Job Number.....	12866
Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...VERT polarization...14.125 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14125000207, AZ rate (deg/s)=1.183, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060616 111810 12866 TC-175-VA-14.125.txt		
Test Frequency (GHz):	14.125000207	Specified Gain (dB):	41.500
Ref. Level (dBm):	-15.78	Azimuth Beam Center (deg):	180.000
# Points Displayed:	9791	Elevation Beam Center (deg):	1.800
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

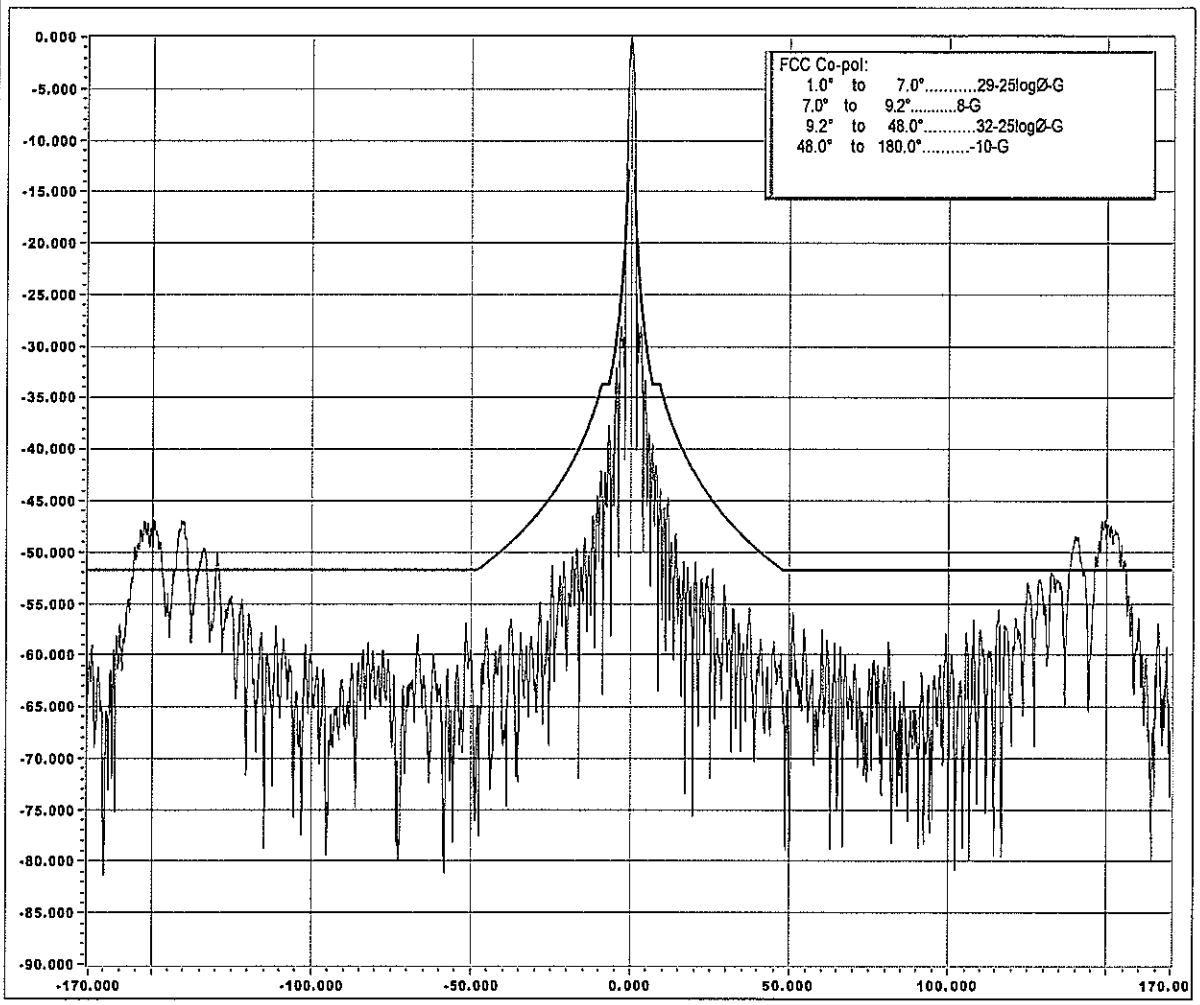
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-16-2006 at 113101
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

TX...Co-pol...VERT polarization...14.500 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=14500000177, AZ rate (deg/s)=1.173, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060616 113101 12866 TC-175-VA-14.500.txt		
Test Frequency (GHz):	14.500000177		
Ref. Level (dBm):	-19.31	Versions	
# Points Displayed:	9692	60227 FAST 60129 PACK	

Specified Gain (dB):	41.700
Azimuth Beam Center (deg):	180.000
Elevation Beam Center (deg):	1.800
Margin Under Curved (dB):	None

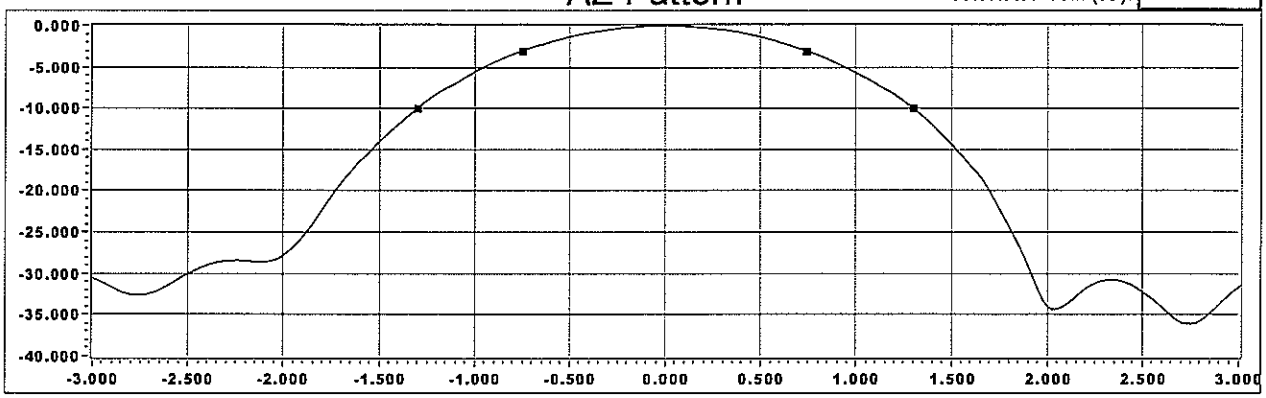
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-24-2006 at 101148	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/71F/ Wind 6 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

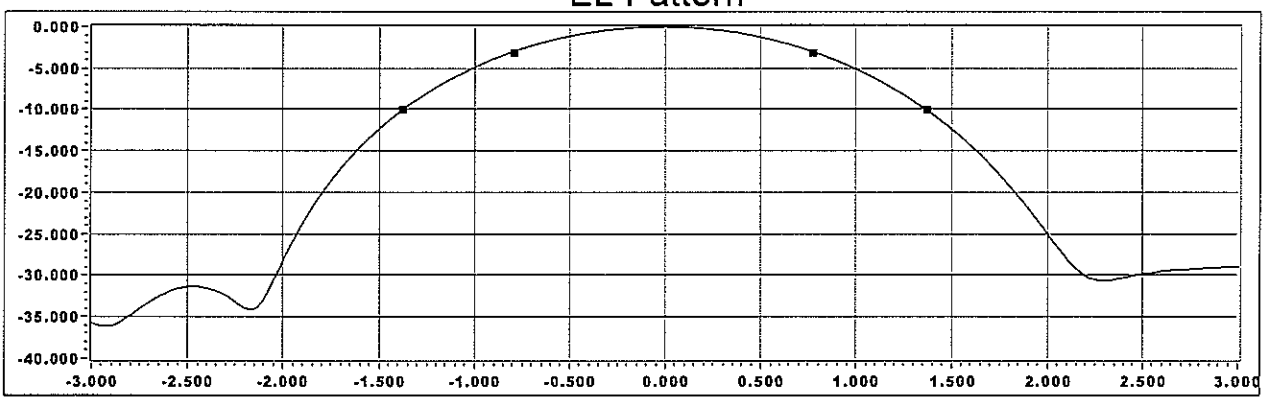
TX...VERT Polarization...Gain by Beamwidth...13.750 GHz

Spec. Gain (dBi): 41.200
Calculated Gain (dB): 41.71

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=13749999982, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060524 101148 12866_12 TC-90-VA-13.750.txt
EL Co-pol File	% 060524 114937 12866_12 TC-50-VE-13.750.txt

The calculated gain is greater than the specified gain by 0.51 dB.

Test Frequency (GHz)	13.749999982	AZ 3dB BW (deg)	1.4882	# Points Displayed	874
AZ Ref. Level (dBm)	-32.03	AZ 10dB BW (deg)	2.6003		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.0674		
RMS (in.)	0.005	EL 3dB BW (deg)	1.5659		
Azimuth (deg)	180.590	EL 10dB BW (deg)	2.7441	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.2522	10dB Factor	107000

Versions
60227 FAST
60129 PACK

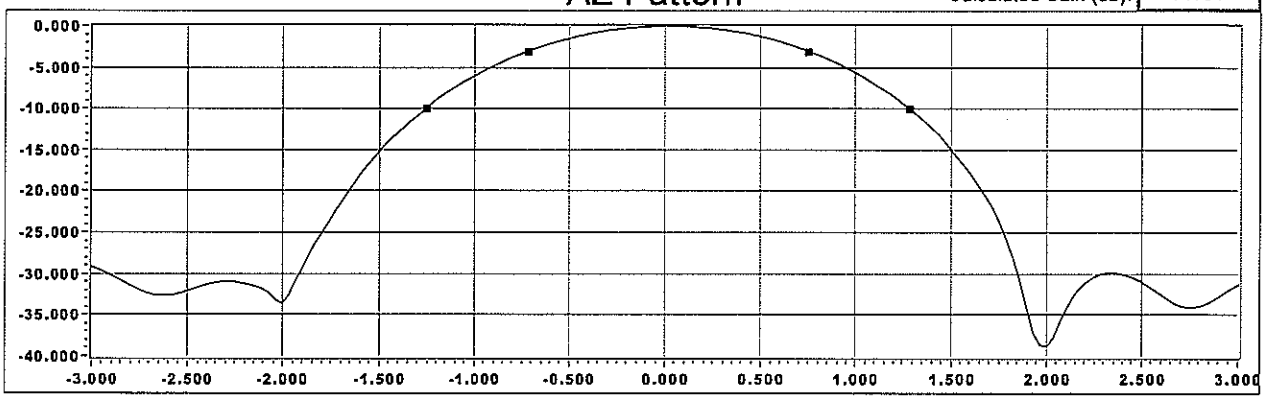
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-30-2006 at 112907	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

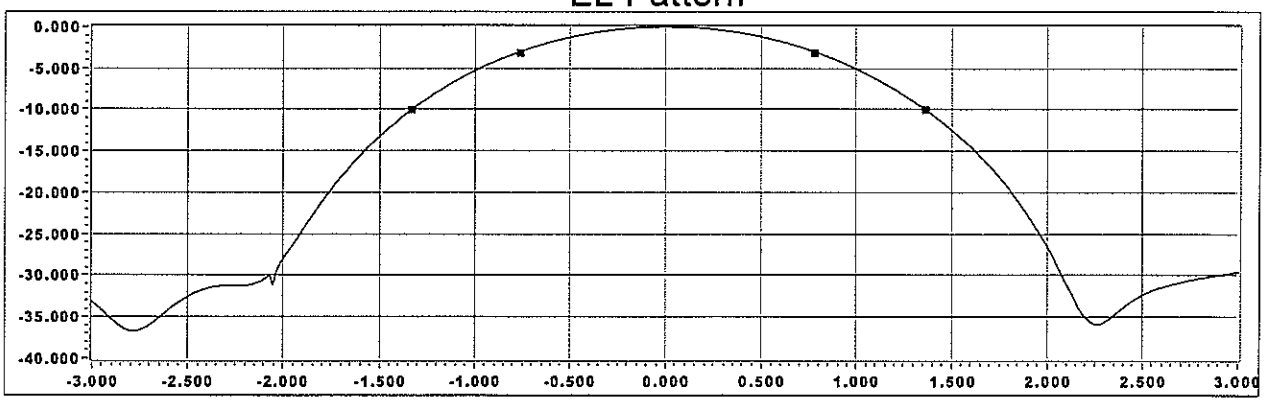
TX...VERT Polarization...Gain by Beamwidth...14.000 GHz

Spec. Gain (dBi): 41.400
Calculated Gain (dB): 41.87

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=14000000143, AZ rate (deg/s)=2.884, EL rate (deg/s)=0.627, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060530 112907 12866_12 TC-155-VA-14.000.txt
EL Co-pol File	% 060530 113224 12866_12 TC-50-VE-14.000.txt

The calculated gain is greater than the specified gain by 0.47 dB.

Test Frequency (GHz)	14.000000143	AZ 3dB BW (deg)	1.4602	# Points Displayed	573
AZ Ref. Level (dBm)	-31.08	AZ 10dB BW (deg)	2.5377		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	2.9948		
RMS (in.)	0.005	EL 3dB BW (deg)	1.5438		
Azimuth (deg)	180.530	EL 10dB BW (deg)	2.6969	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.2047	10dB Factor	107000

Versions
60227 FAST
60129 PACK

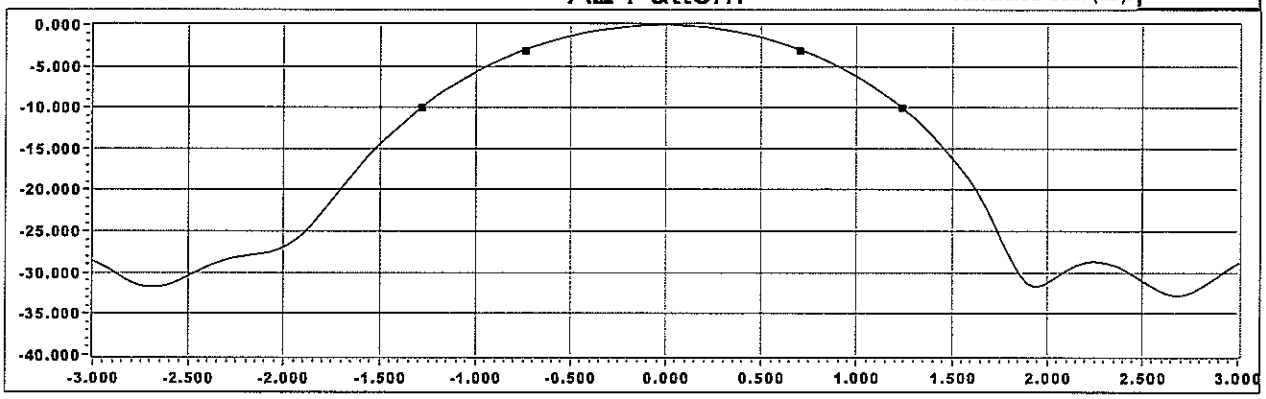
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-23-2006 at 105211	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Cloudy/87F/ Wind 5 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

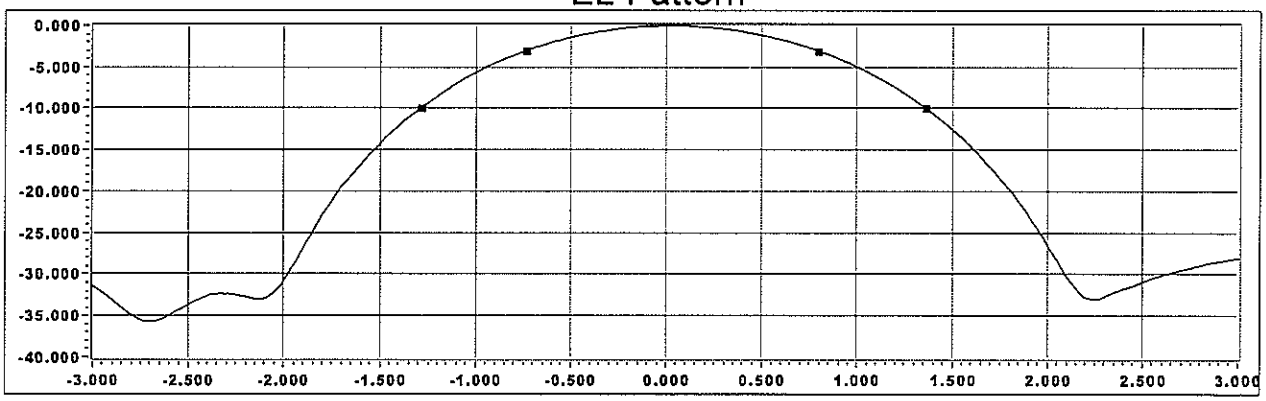
TX...VERT Polarization...Gain by Beamwidth...14.125 GHz

Spec. Gain (dBi): 41.500
Calculated Gain (dB): 41.97

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2] - Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=14125000014, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060523 105211 12866_12 TC-155-VA-14.125.txt
EL Co-pol File	% 060524 115528 12866_12 TC-50-VE-14.125.txt

The calculated gain is greater than the specified gain by 0.47 dB.

Test Frequency (GHz)	14.125000014	AZ 3dB BW (deg)	1.4430	# Points Displayed	469
AZ Ref. Level (dBm)	-32.68	AZ 10dB BW (deg)	2.5222		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	2.9821		
RMS (in.)	0.005	EL 3dB BW (deg)	1.5282		
Azimuth (deg)	180.590	EL 10dB BW (deg)	2.6557	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.1468	10dB Factor	107000

Versions
60227 FAST
60129 PACK

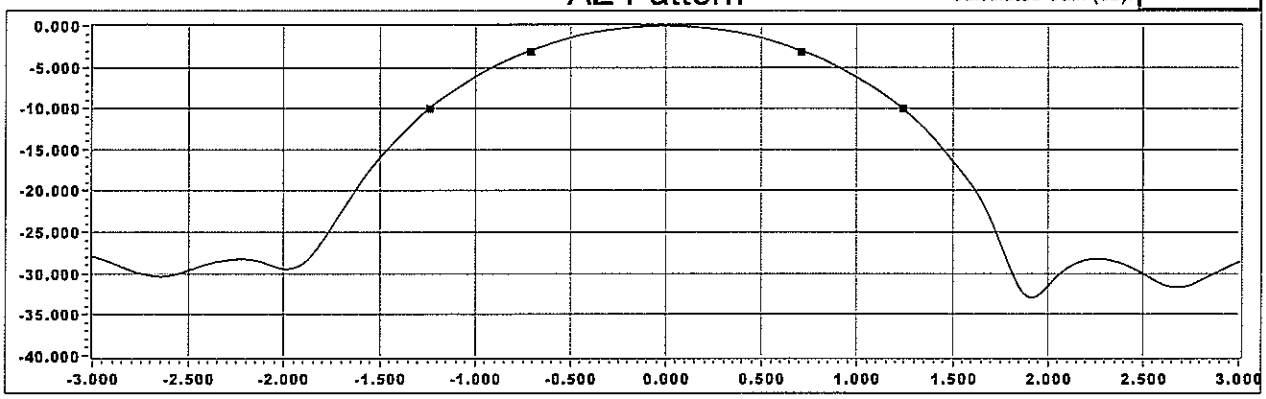
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-23-2006 at 103623	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Cloudy/87F/ Wind 5 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

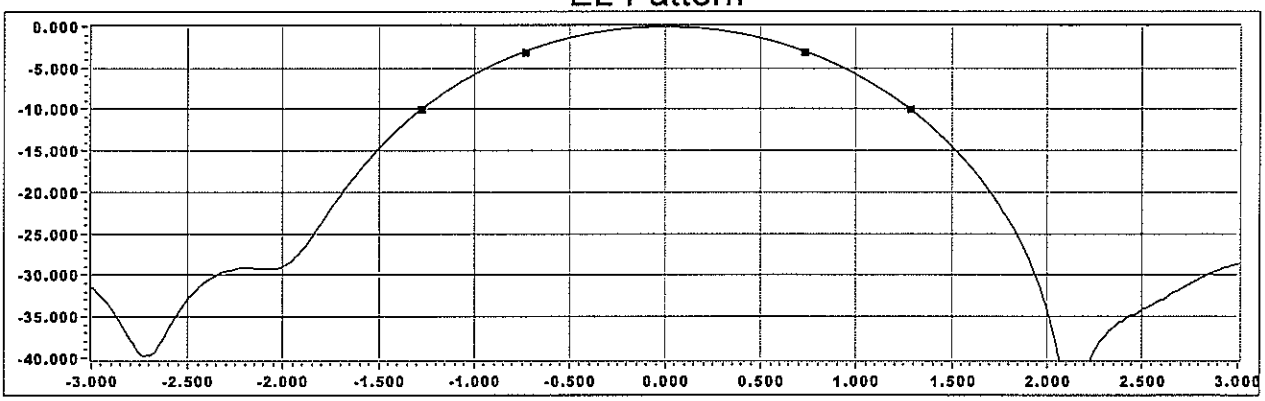
TX...VERT Polarization...Gain by Beamwidth...14.500 GHz

Spec. Gain (dBi): 41.700
Calculated Gain (dB): 42.20

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=14500000020, AZ rate (deg/s)=2.917, EL rate (deg/s)=0.635, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060523 103623 12866_12 TC-5-VA-14.500.txt
EL Co-pol File	% 060523 103731 12866_12 TC-5-VE-14.500.txt

The calculated gain is greater than the specified gain by 0.50 dB.

Test Frequency (GHz)	14.500000020	AZ 3dB BW (deg)	1.4175	# Points Displayed	8196
AZ Ref. Level (dBm)	-32.59	AZ 10dB BW (deg)	2.4807		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	2.9140		
RMS (in.)	0.005	EL 3dB BW (deg)	1.4701		
Azimuth (deg)	180.590	EL 10dB BW (deg)	2.5624	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.0367	10dB Factor	107000

Versions
60227 FAST
60129 PACK

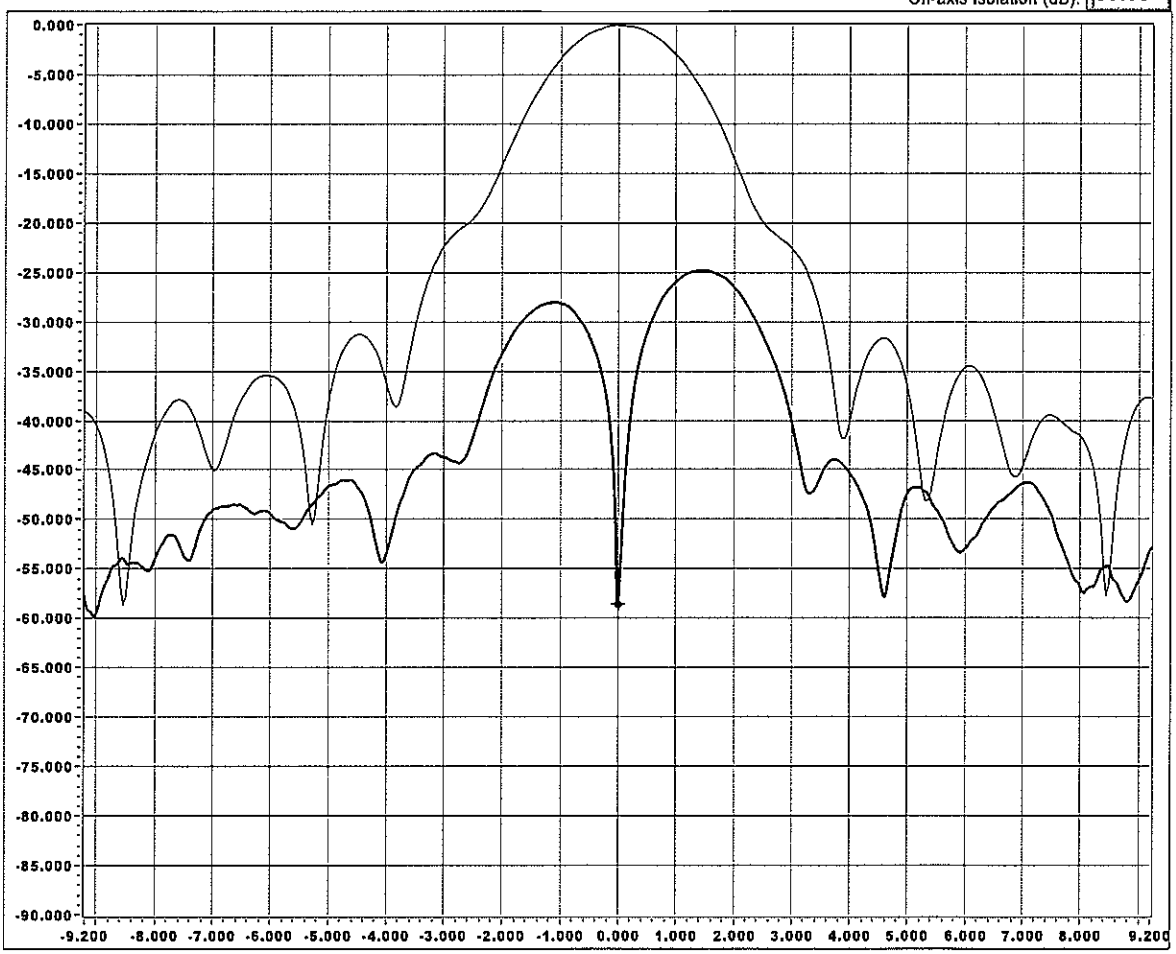
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 141734
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Cross-pol under Co-pol...HORZ polarization...10.700 GHz

Azimuth

On-axis Isolation (dB): 58.58



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999971, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060524 143328 12866_12 RC-155-HA-10.700.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060524 141734 12866_12 RX-10-HA-10.700.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	10.699999971	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-33.10	Off-axis Spec. Isolation (dB):	27.00
# Points Displayed:	7007		

Versions
60227 FAST
60129 PACK

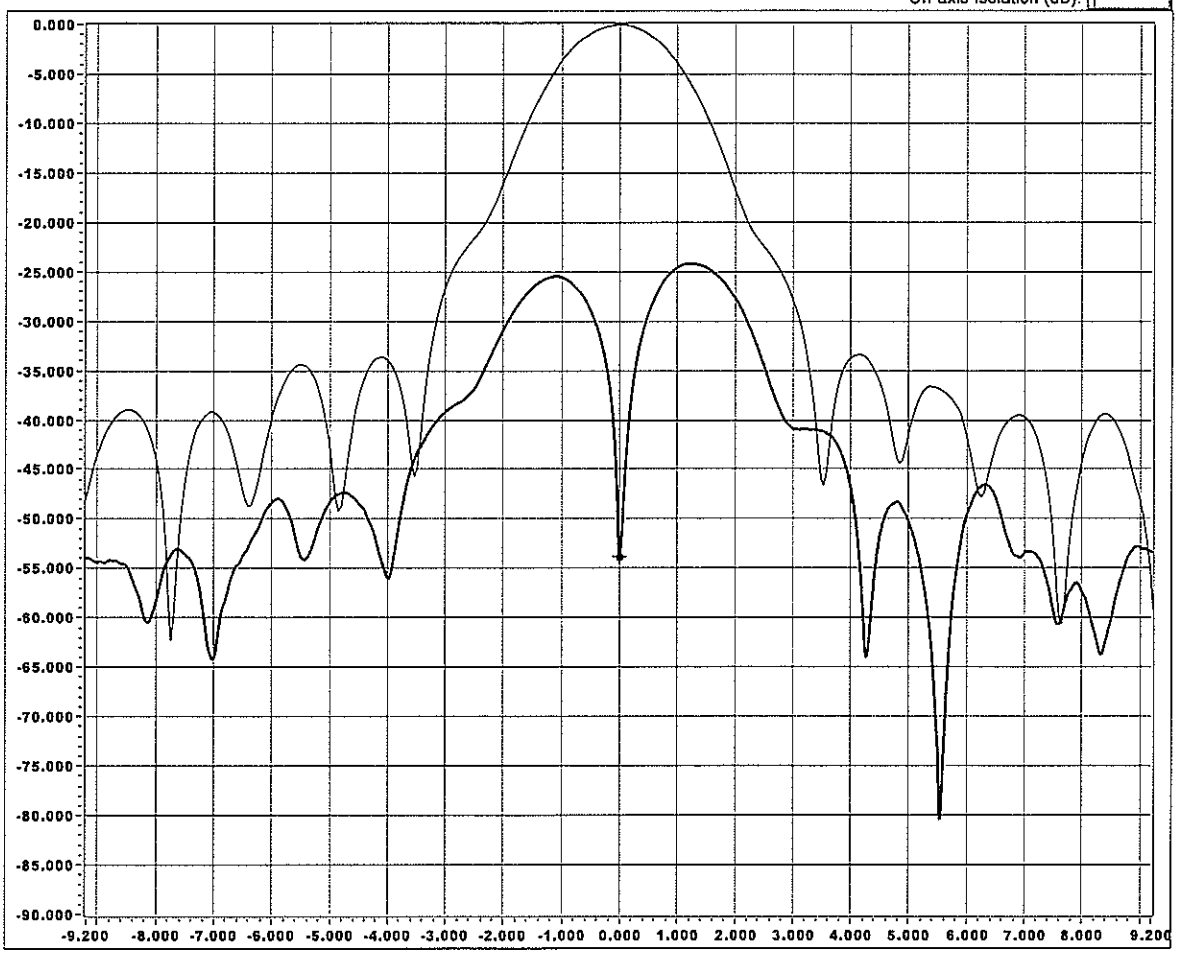
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 145921
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Cross-pol under Co-pol...HORZ polarization...11.725 GHz

Azimuth

On-axis Isolation (dB): 53.79



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11724999971, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060524 144855 12866_12 RC-155-HA-11.725.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060524 145921 12866_12 RX-10-HA-11.725.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	11.724999971	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-33.27	Off-axis Spec. Isolation (dB):	27.00
# Points Displayed:	8192		

Versions
60227 FAST
60129 PACK

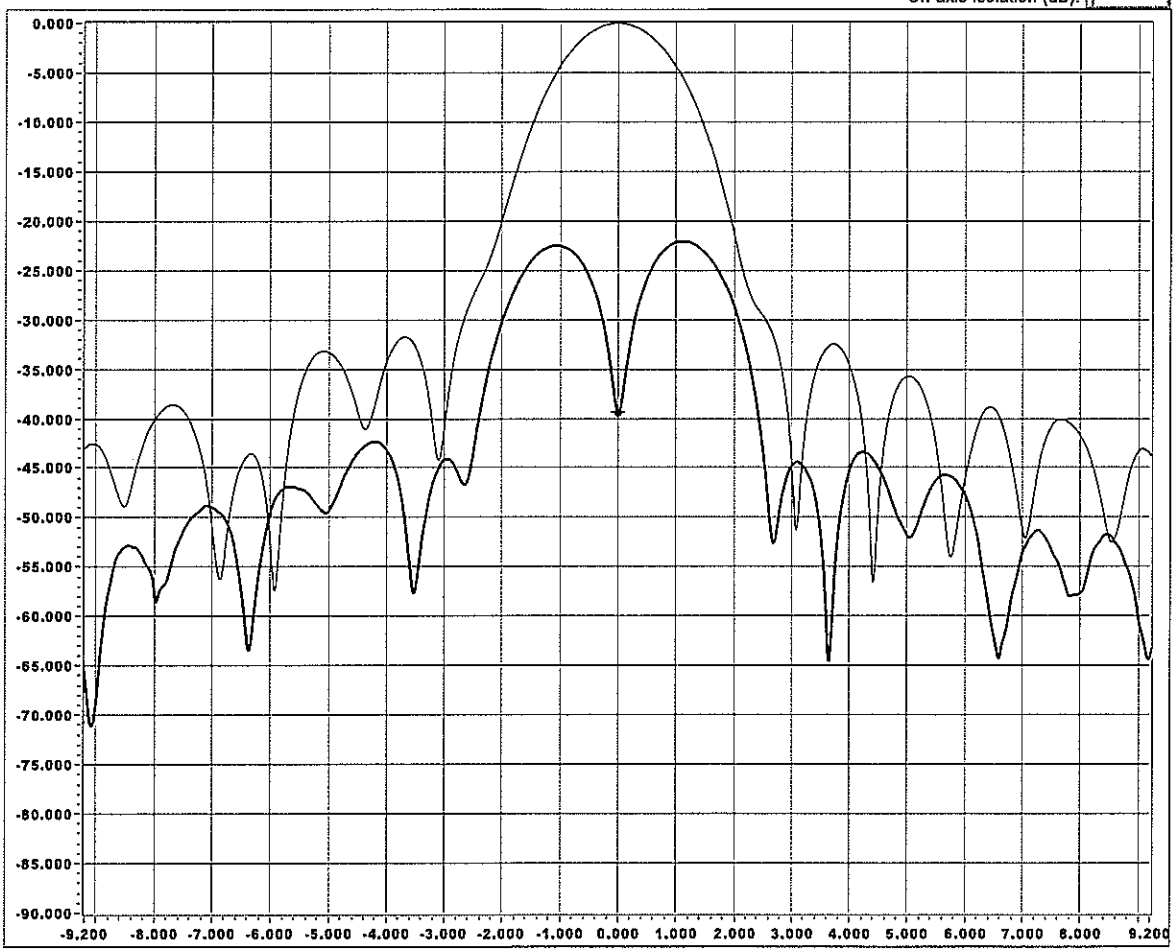
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-26-2006 at 134133
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Cross-pol under Co-pol...HORZ polarization...12.750 GHz

Azimuth

On-axis Isolation (dB): 39.43



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12750000135, AZ rate (deg/s)=2.903, EL rate (deg/s)=0.640, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060526 134721 12866_12 RC-10-HA-12.750.txt	Azimuth Beam Center (deg):	180.570
Cross-pol File:	% 060526 134133 12866_12 RX-10-HA-12.750.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	12.750000135	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.64	Off-axis Spec. Isolation (dB):	27.00
# Points Displayed:	10001		

Versions
60227 FAST
60129 PACK

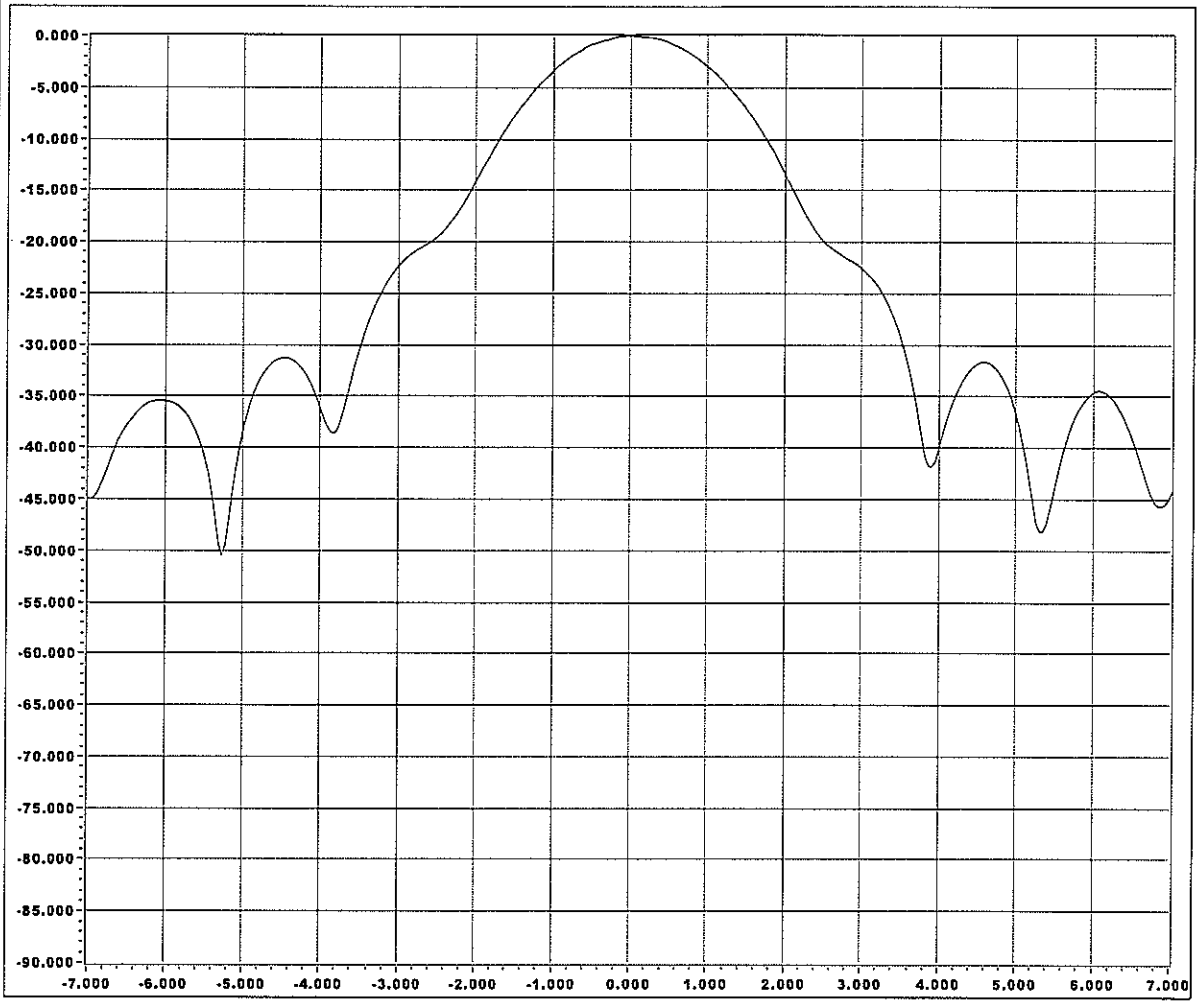
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 143328
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...10.700 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999976, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 143328 12866_12 RC-155-HA-10.700.txt		
Test Frequency (GHz):	10.699999976		
Ref. Level (dBm):	-33.10	Versions	
# Points Displayed:	7763	60227 FAST 60129 PACK	
Specified Gain (dB):			39.000
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

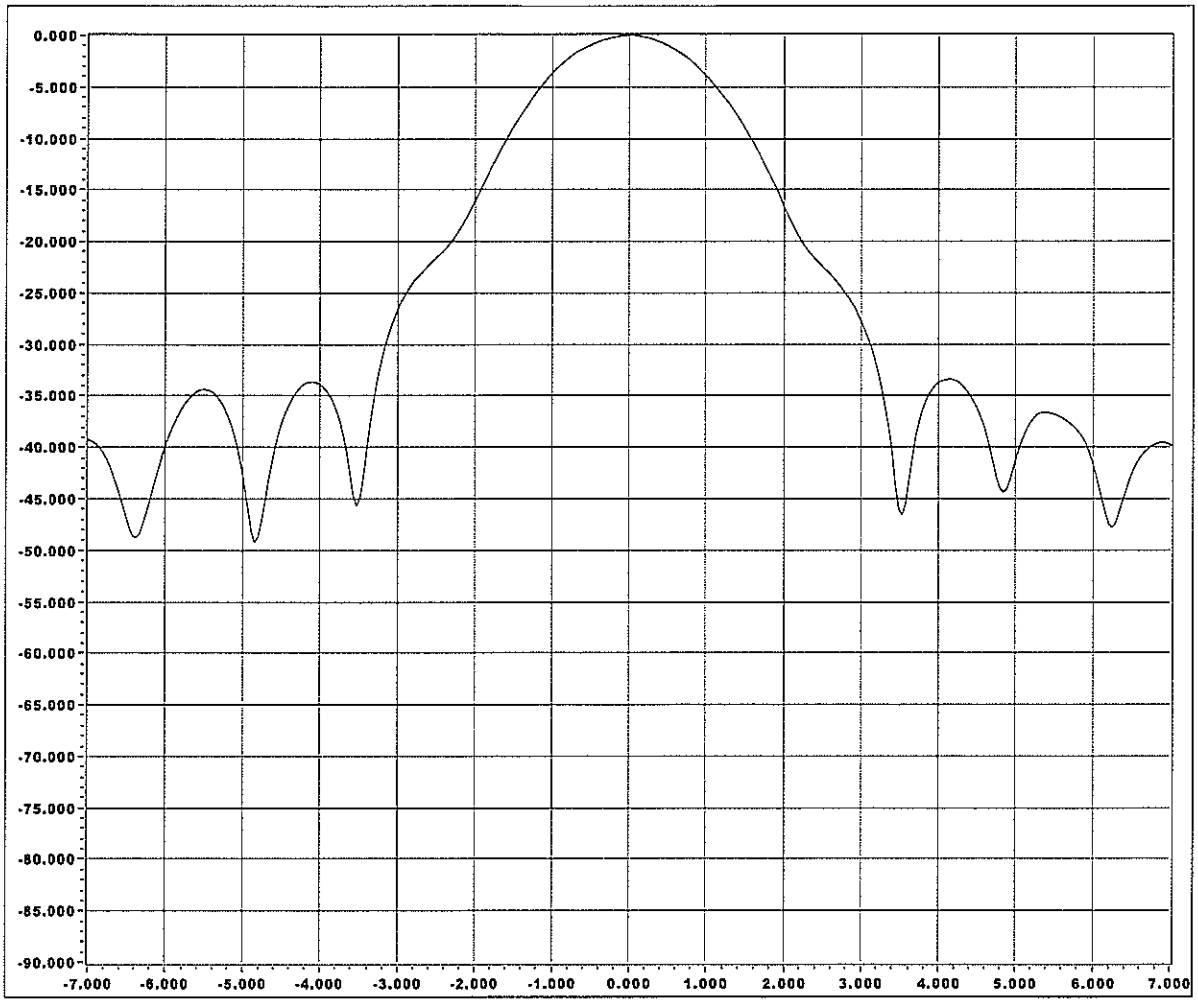
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 144855
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...11.725 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11724999974, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

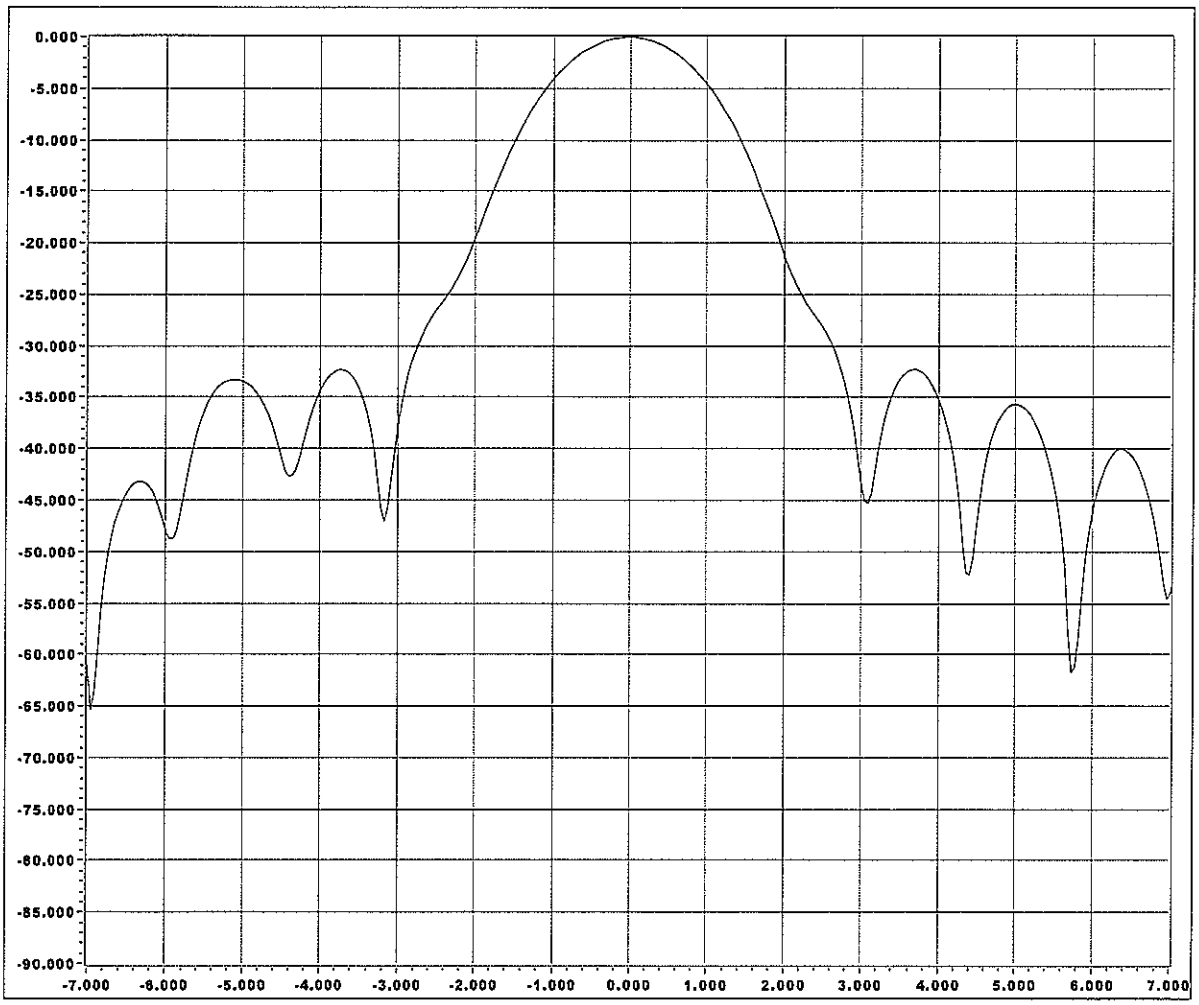
File:	% 060524 144855 12866_12 RC-155-HA-11.725.txt		
Test Frequency (GHz):	11.724999974		
Ref. Level (dBm):	-33.27	Versions	
# Points Displayed:	7730	60227 FAST 60129 PACK	
Specified Gain (dB):			39.800
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 151135
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...12.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12749999966, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 151135 12866_12 RC-155-HA-12.750.txt		
Test Frequency (GHz):	12.749999966		
Ref. Level (dBm):	-33.29	Versions	
# Points Displayed:	7702	60227 FAST 60129 PACK	
Specified Gain (dB):			40.500
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

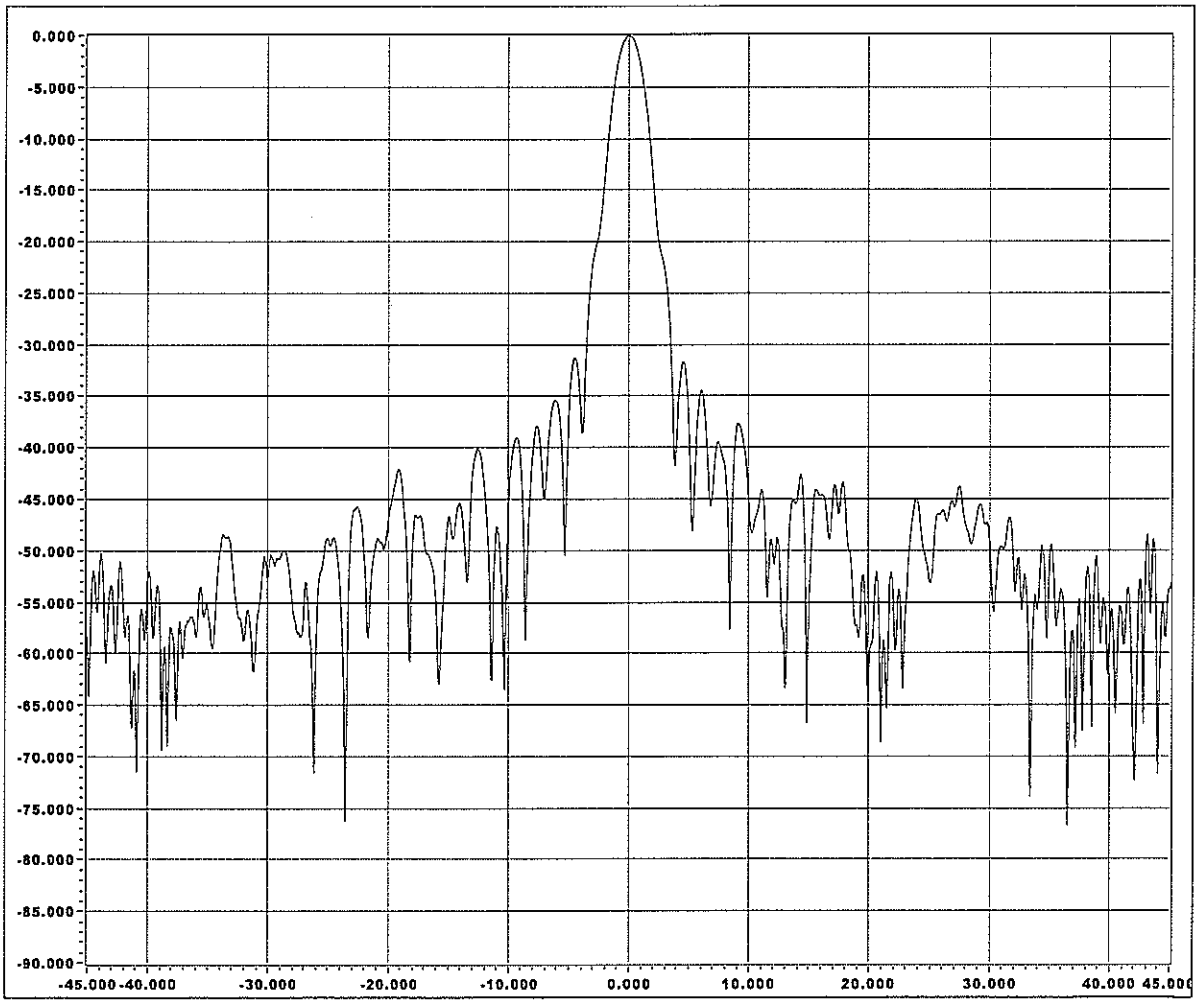
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 143328
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...10.700 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999976, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 143328 12866_12 RC-155-HA-10.700.txt	Specified Gain (dB):	39.000
Test Frequency (GHz):	10.699999976	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-33.10	Elevation Beam Center (deg):	12.000
# Points Displayed:	7763	Margin Under Curved (dB):	None

Versions
60227 FAST
60129 PACK

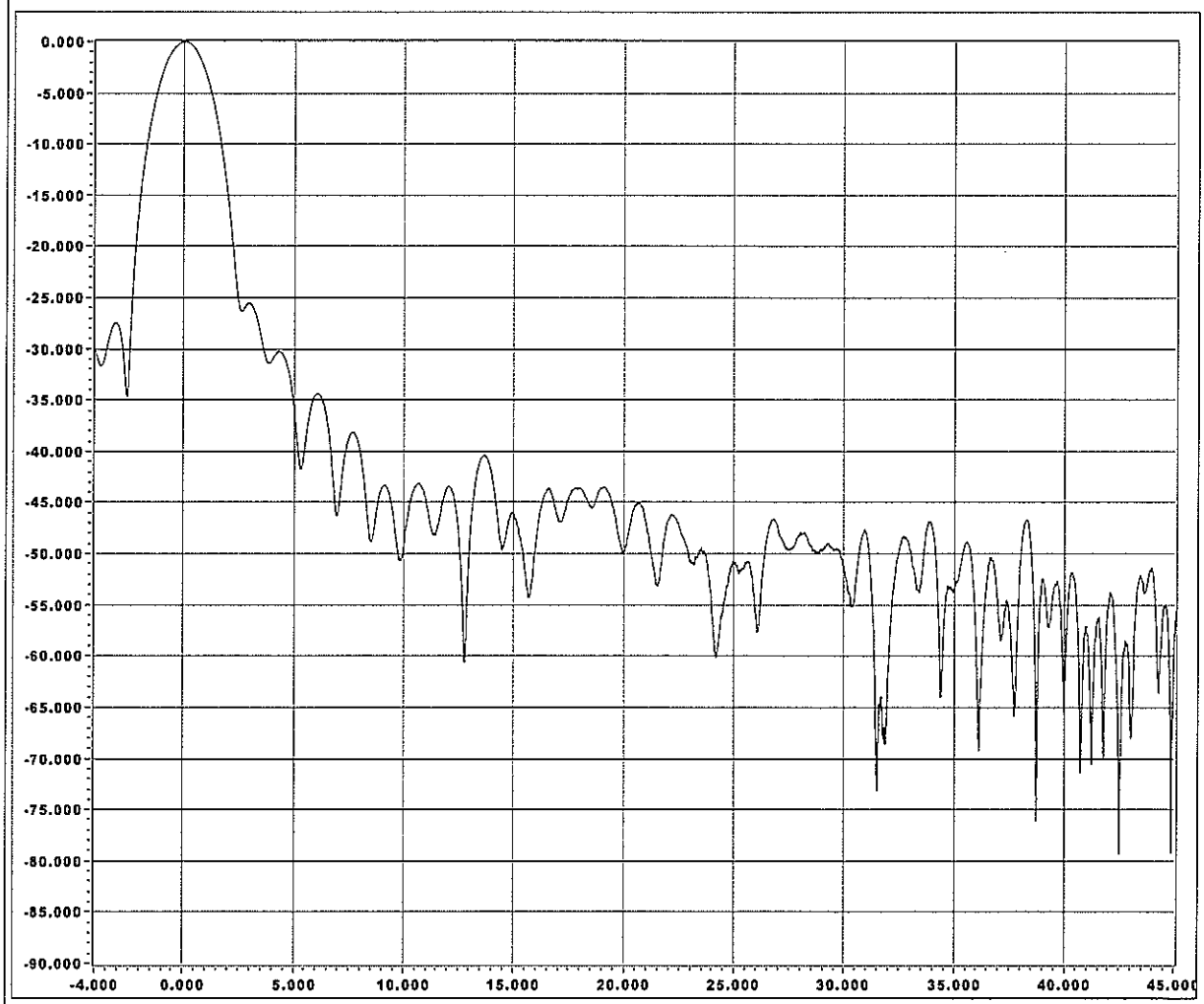
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 143643
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...10.700 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999976, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 143643 12866_12 RC-50-HE-10.700.txt	Specified Gain:	39.000
Test Frequency (GHz):	10.699999976	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.19	Elevation Beam Center (deg):	12.000
# Points Displayed:	7922	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

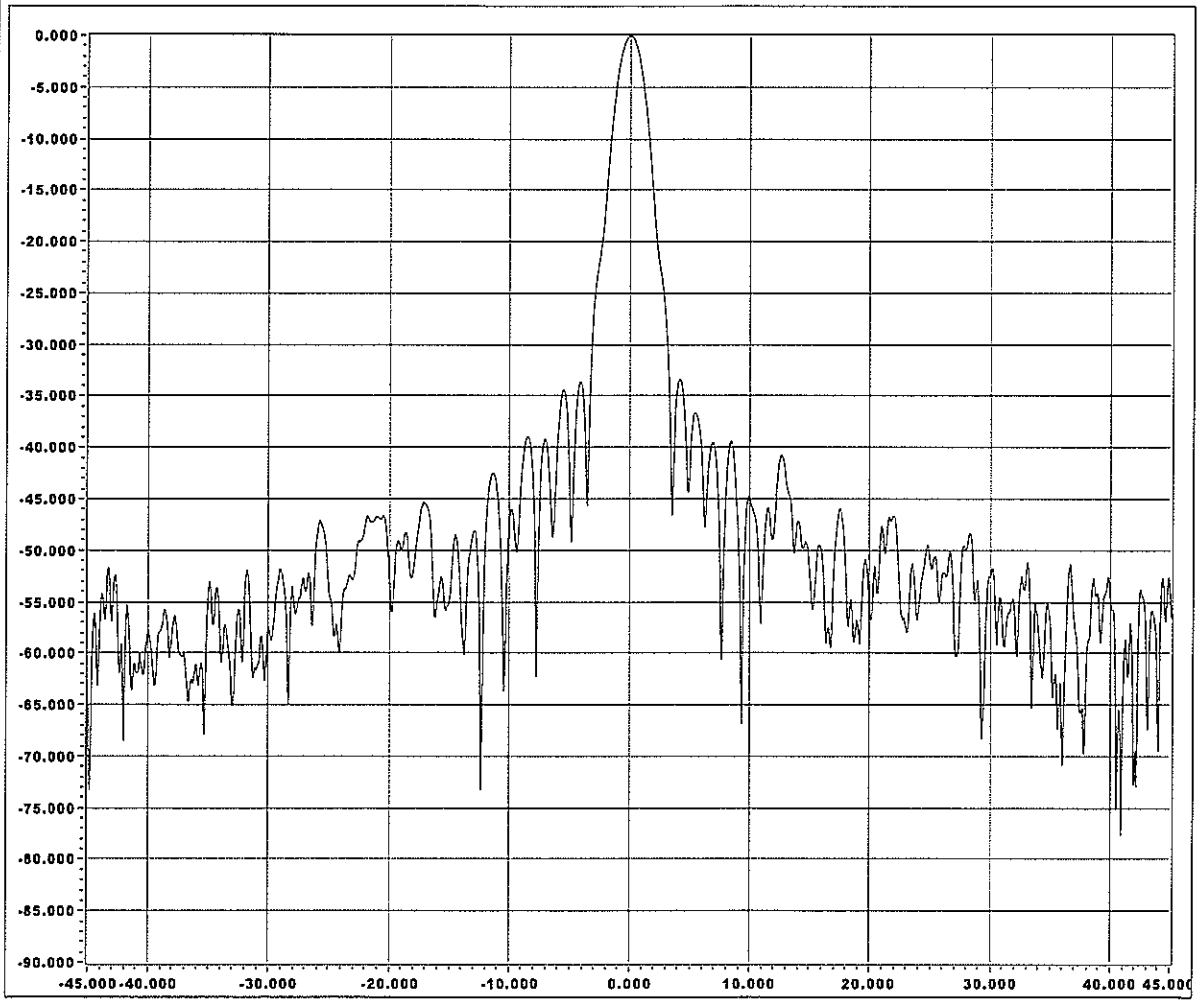
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 144855
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...11.725 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11724999974, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 144855 12866_12 RC-155-HA-11.725.txt		
Test Frequency (GHz):	11.724999974	Specified Gain (dB):	39.800
Ref. Level (dBm):	-33.27	Azimuth Beam Center (deg):	180.590
# Points Displayed:	7730	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

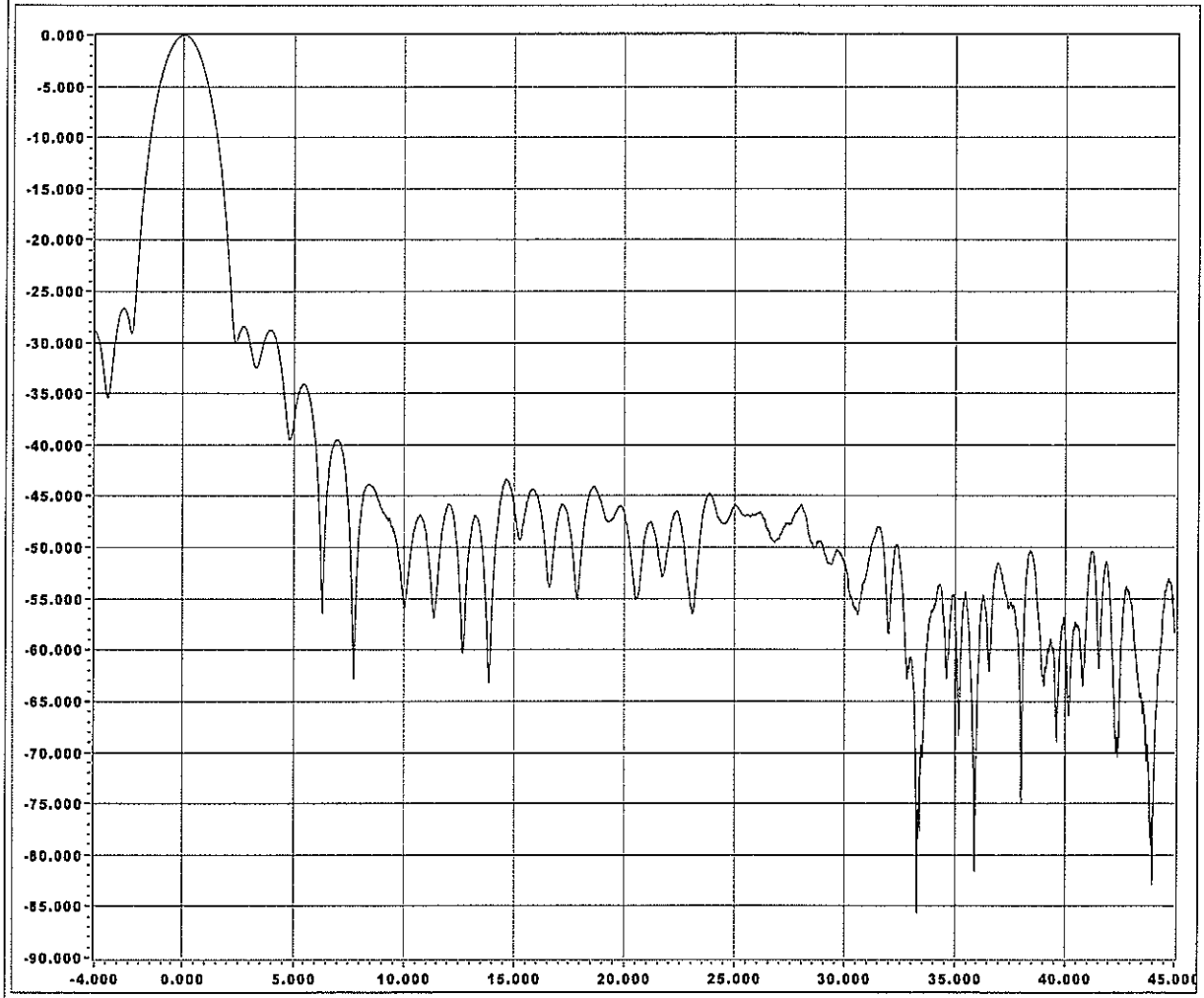
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 145212
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...11.725 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11724999974, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 145212 12866_12 RC-50-HE-11.725.txt	Specified Gain:	39.800
Test Frequency (GHz):	11.724999974	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.50	Elevation Beam Center (deg):	12.000
# Points Displayed:	6916	Margin Under Curve (dB):	None

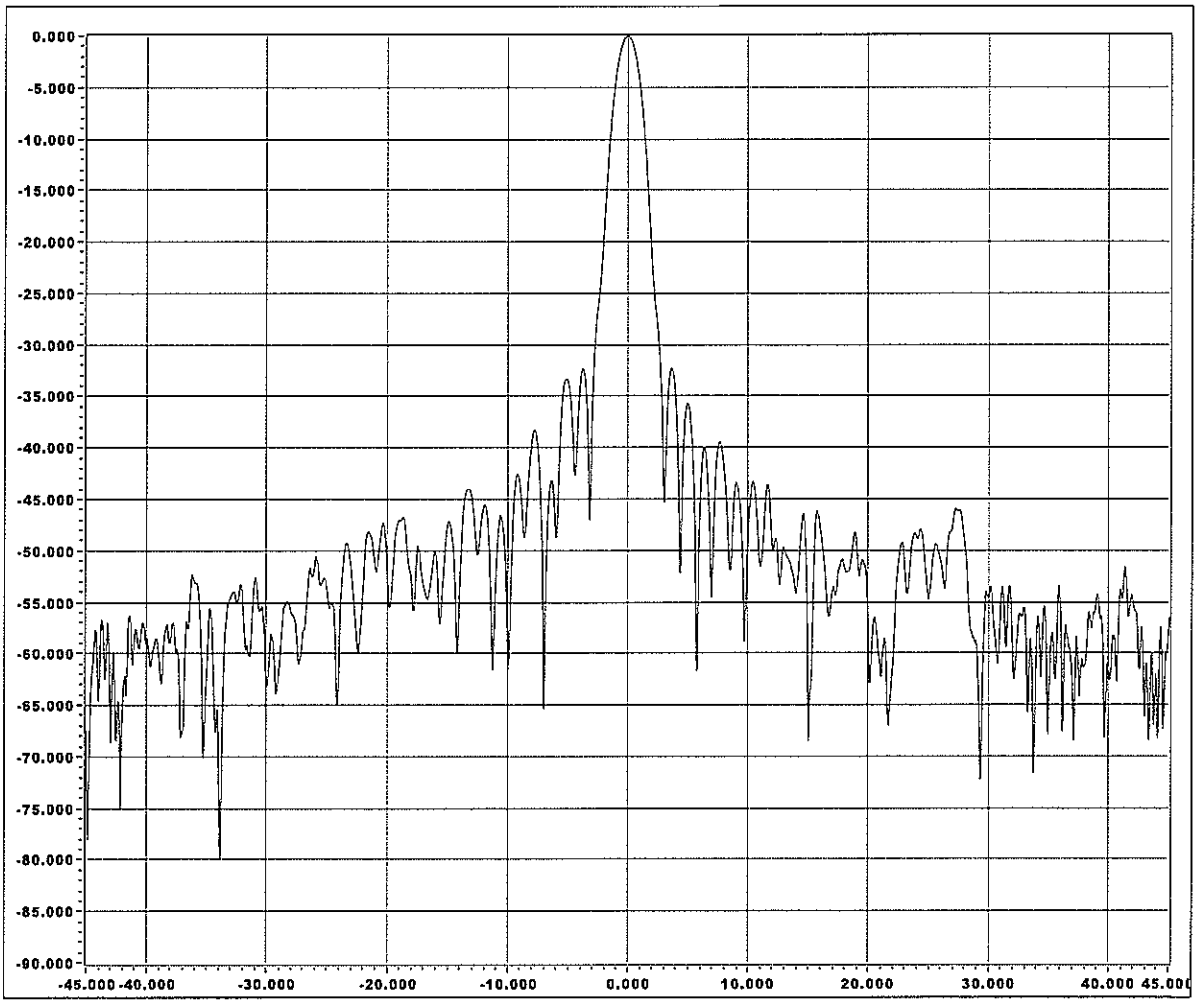
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 151135
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...12.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12749999966, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 151135 12866_12 RC-155-HA-12.750.txt		
Test Frequency (GHz):	12.749999966		
Ref. Level (dBm):	-33.29	Versions	
# Points Displayed:	7702	60227 FAST 60129 PACK	
Specified Gain (dB):			40.500
Azimuth Beam Center (deg):			180.590
Elevation Beam Center (deg):			12.000
Margin Under Curved (dB):			None

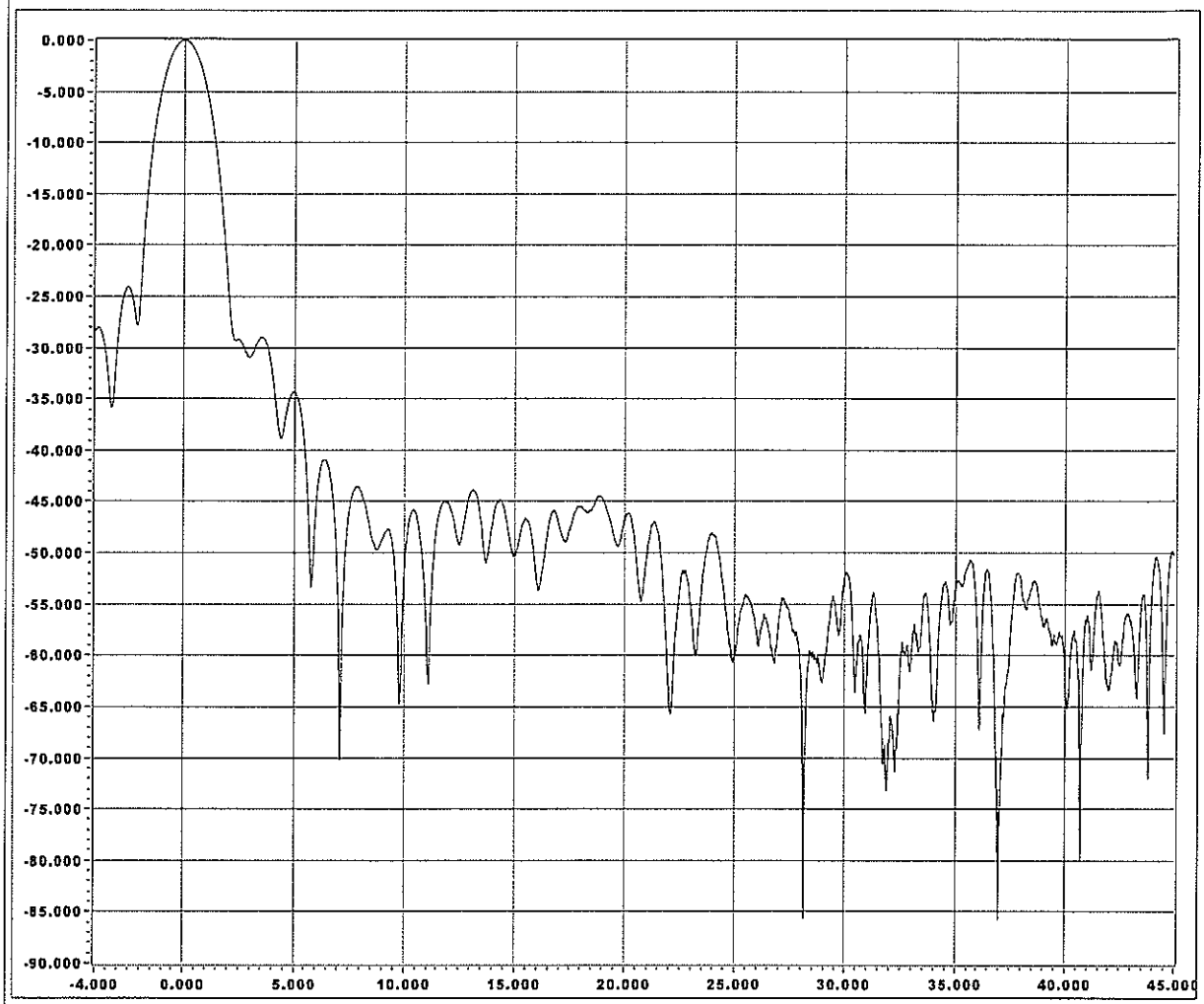
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 151452
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...HORZ polarization...12.750 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12749999966, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 151452 12866_12 RC-50-HE-12.750.txt	Specified Gain:	40.500
Test Frequency (GHz):	12.749999966	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.23	Elevation Beam Center (deg):	12.000
# Points Displayed:	6922	Margin Under Curve (dB):	None

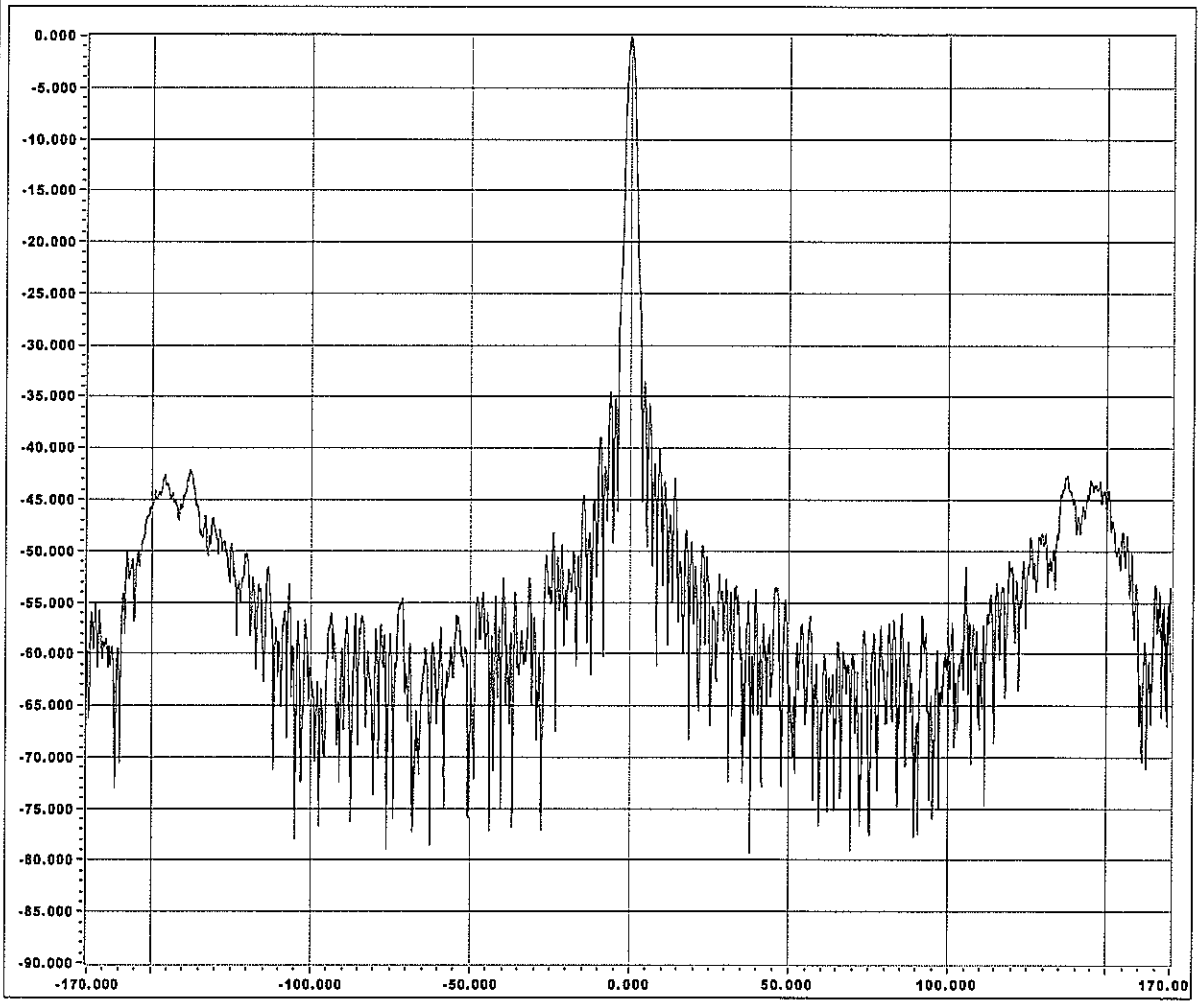
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-16-2006 at 180246
Job Number.....	12866
Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

RX...Co-pol...HORZ polarization...10.700 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10700000121, AZ rate (deg/s)=1.160, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060616 180246 12866 RC-175-HA-10.700.txt		
Test Frequency (GHz):	10.700000121	Specified Gain (dB):	39.000
Ref. Level (dBm):	-14.39	Azimuth Beam Center (deg):	180.000
# Points Displayed:	9663	Elevation Beam Center (deg):	1.800
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

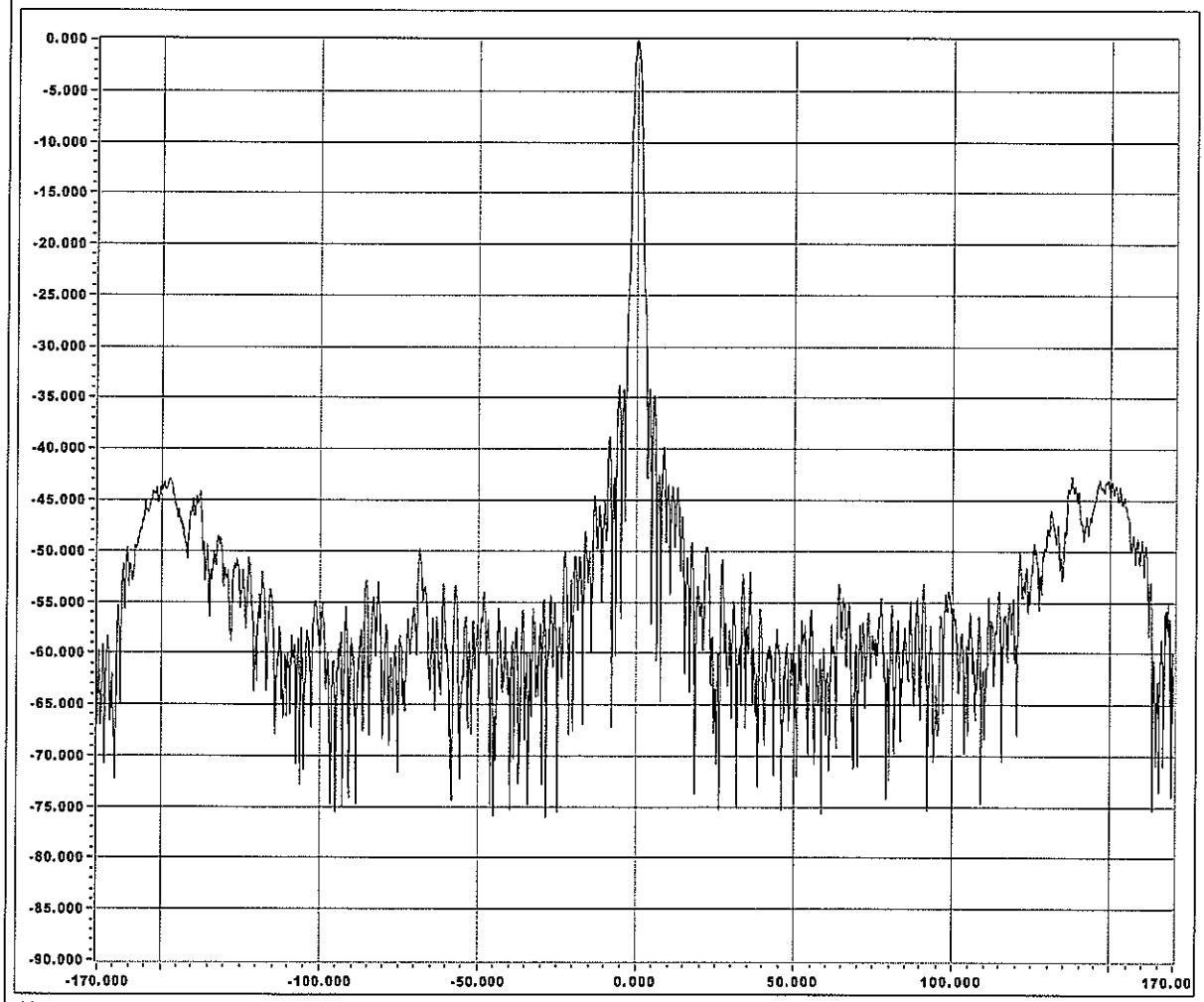
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-16-2006 at 175004
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

RX...Co-pol...HORZ polarization...11.725 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11725000172, AZ rate (deg/s)=1.160, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

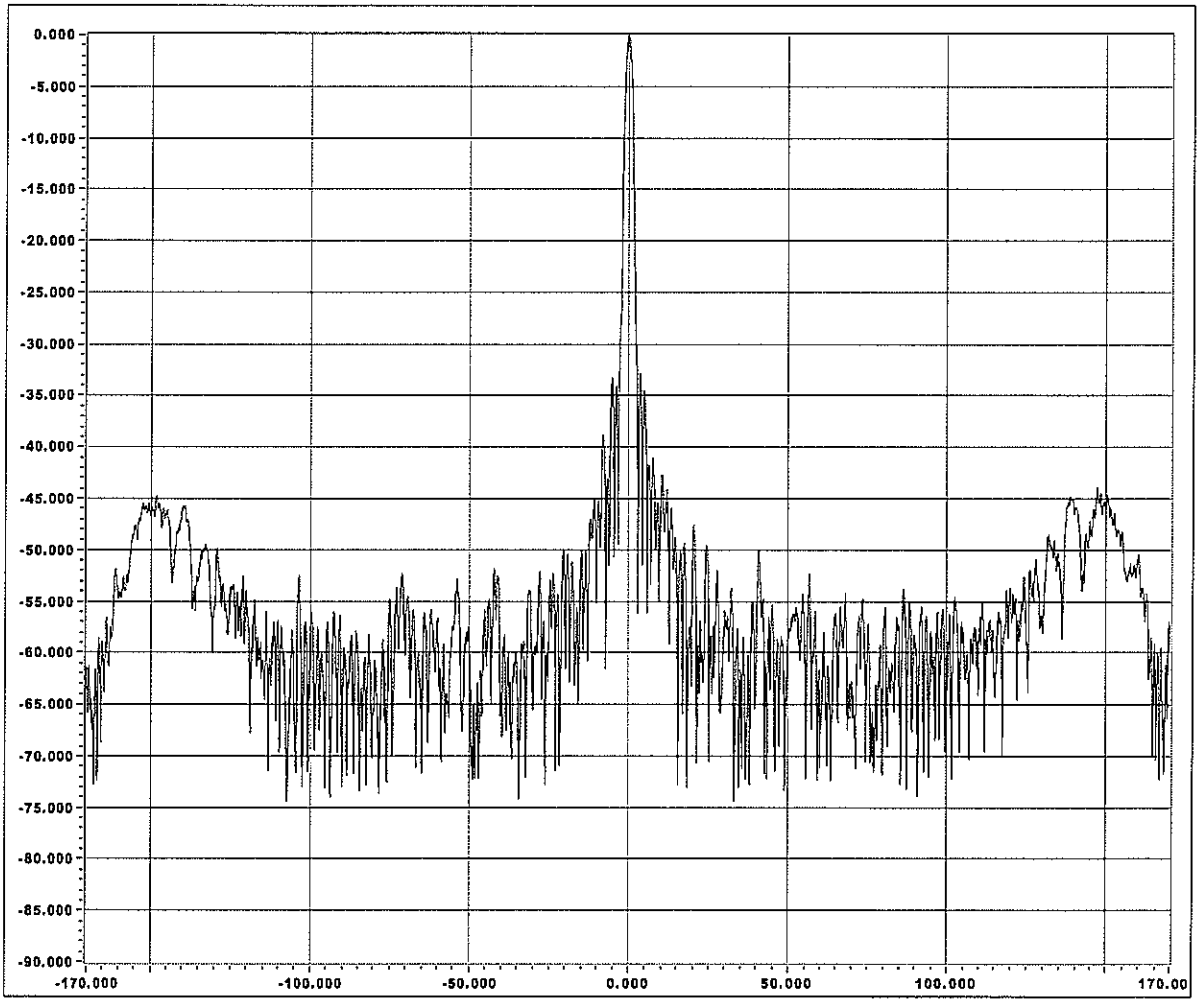
File:	% 060616 175004 12866 RC-175-HA-11.725.txt		
Test Frequency (GHz):	11.725000172		
Ref. Level (dBm):	-16.80	Versions	
# Points Displayed:	9680	60227 FAST 60129 PACK	
Specified Gain (dB):			39.800
Azimuth Beam Center (deg):			180.000
Elevation Beam Center (deg):			1.800
Margin Under Curved (dB):			None

Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-16-2006 at 181425
Job Number.....	12866
Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

RX...Co-pol...HORZ polarization...12.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12750000156, AZ rate (deg/s)=1.160, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060616 181425 12866 RC-175-HA-12.750.txt		
Test Frequency (GHz):	12.750000157		
Ref. Level (dBm):	-18.65	Versions	
# Points Displayed:	9674	60227 FAST 60129 PACK	
Specified Gain (dB):			40.500
Azimuth Beam Center (deg):			180.000
Elevation Beam Center (deg):			1.800
Margin Under Curved (dB):			None

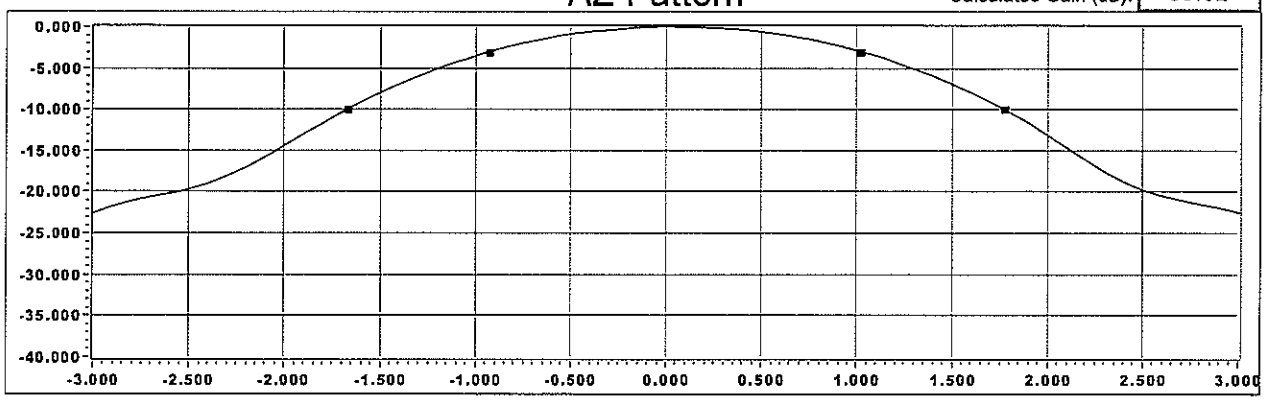
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-24-2006 at 143328	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

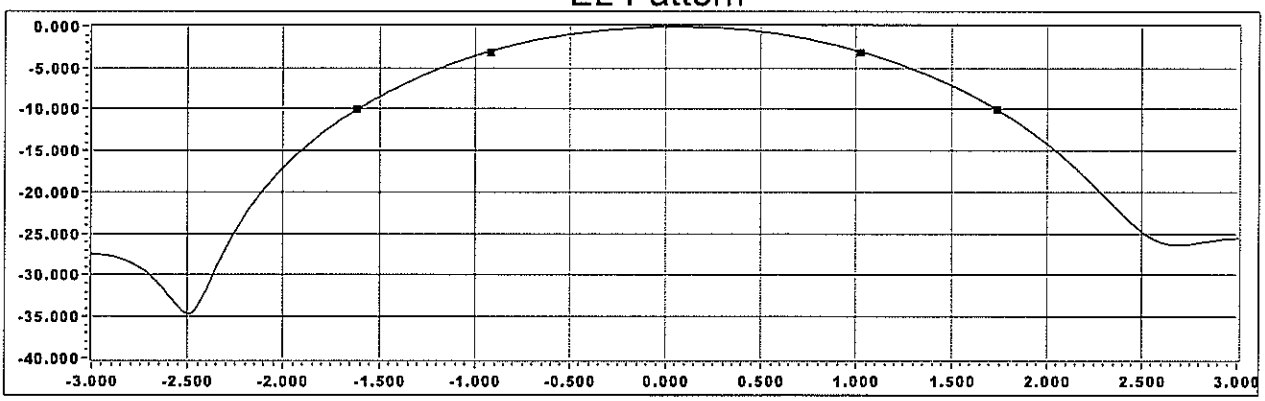
RX...HORZ Polarization...Gain by Beamwidth...10.700 GHz

Spec. Gain (dBi): 39.000
Calculated Gain (dB): 39.62

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=10699999976, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File: % 060524 143328 12866_12 RC-155-HA-10.700.txt
EL Co-pol File: % 060524 143643 12866_12 RC-50-HE-10.700.txt

The calculated gain is greater than the specified gain by 0.62 dB.

Test Frequency (GHz)	10.699999976	AZ 3dB BW (deg)	1.9496	# Points Displayed	462
AZ Ref. Level (dBm)	-33.10	AZ 10dB BW (deg)	3.4458		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	4.1724		
RMS (in.)	0.005	EL 3dB BW (deg)	1.9379		
Azimuth (deg)	180.590	EL 10dB BW (deg)	3.3588	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.9584	10dB Factor	107000

Versions
60227 FAST
60129 PACK

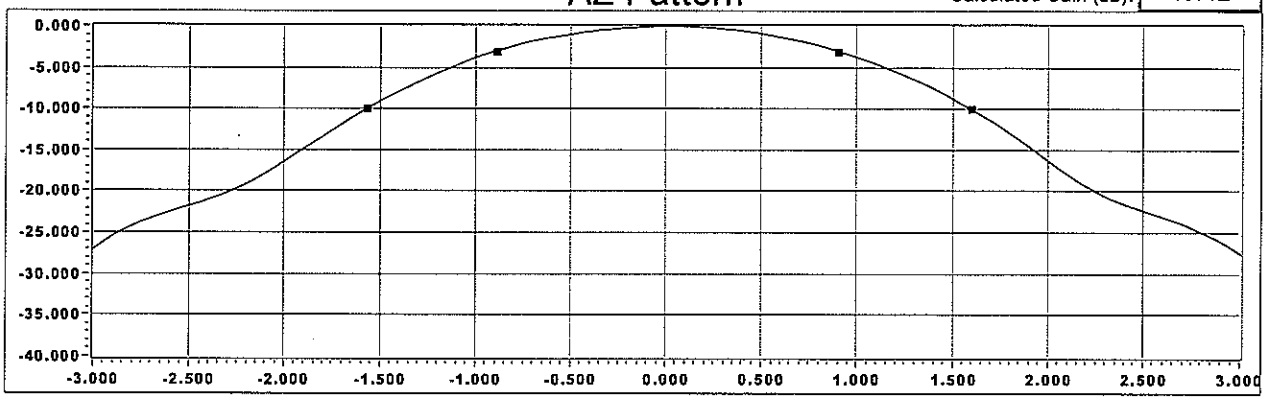
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-24-2006 at 144855	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

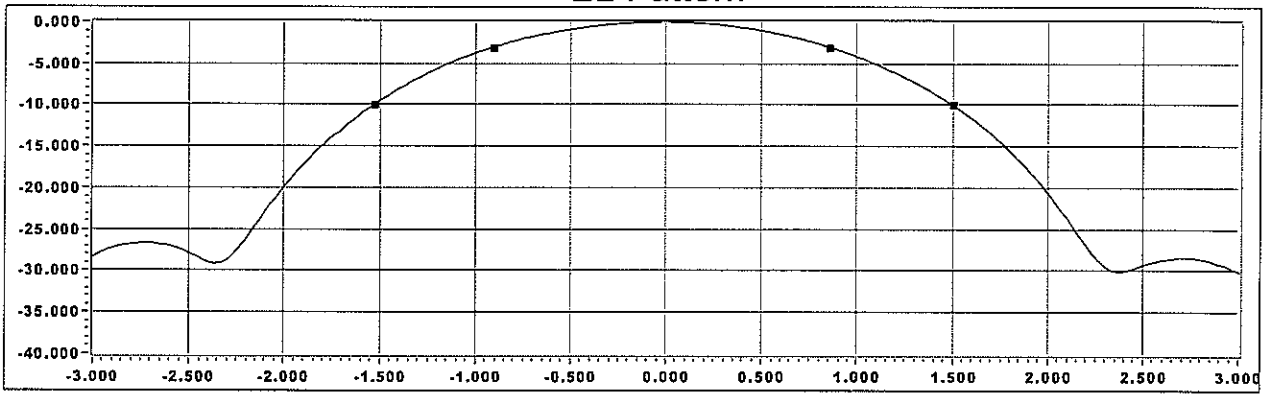
RX...HORZ Polarization...Gain by Beamwidth...11.725 GHz

Spec. Gain (dBi): 39.800
Calculated Gain (dB): 40.42

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=11724999974, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060524 144855 12866_12 RC-155-HA-11.725.txt
EL Co-pol File	% 060524 145212 12866_12 RC-50-HE-11.725.txt

The calculated gain is greater than the specified gain by 0.62 dB.

Test Frequency (GHz)	11.724999974	AZ 3dB BW (deg)	1.7894	# Points Displayed	2057
AZ Ref. Level (dBm)	-33.27	AZ 10dB BW (deg)	3.1629		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.8373		
RMS (in.)	0.005	EL 3dB BW (deg)	1.7636		
Azimuth (deg)	180.590	EL 10dB BW (deg)	3.0304	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.5844	10dB Factor	107000

Versions
60227 FAST
60129 PACK

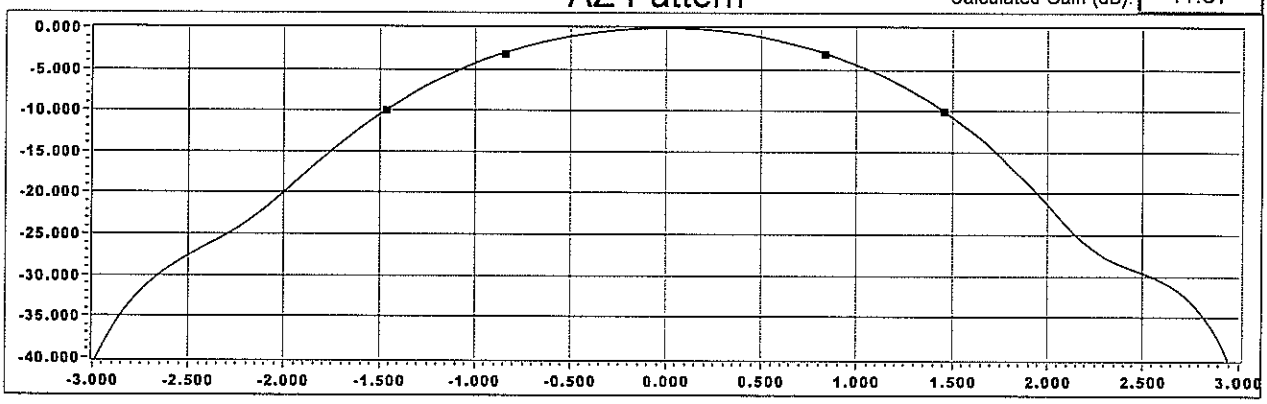
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-26-2006 at 134721
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

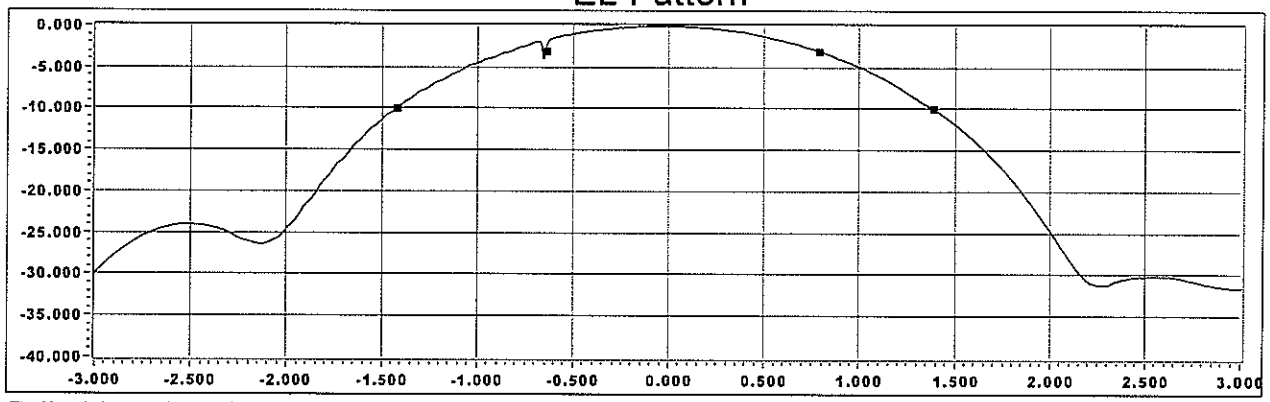
RX...HORZ Polarization...Gain by Beamwidth...12.750 GHz

Spec. Gain (dBi): 40.500
Calculated Gain (dB): 41.37

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=12750000135, AZ rate (deg/s)=2.903, EL rate (deg/s)=0.640, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060526 134721 12866_12 RC-10-HA-12.750.txt
EL Co-pol File	% 060526 134837 12866_12 RC-10-HE-12.750.txt

The calculated gain is greater than the specified gain by 0.87 dB.

Test Frequency (GHz)	12.750000135	AZ 3dB BW (deg)	1.6728	# Points Displayed	10005
AZ Ref. Level (dBm)	-32.64	AZ 10dB BW (deg)	2.9205		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.4886		
RMS (in.)	0.005	EL 3dB BW (deg)	1.4296		
Azimuth (deg)	180.570	EL 10dB BW (deg)	2.8065	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.3220	10dB Factor	107000

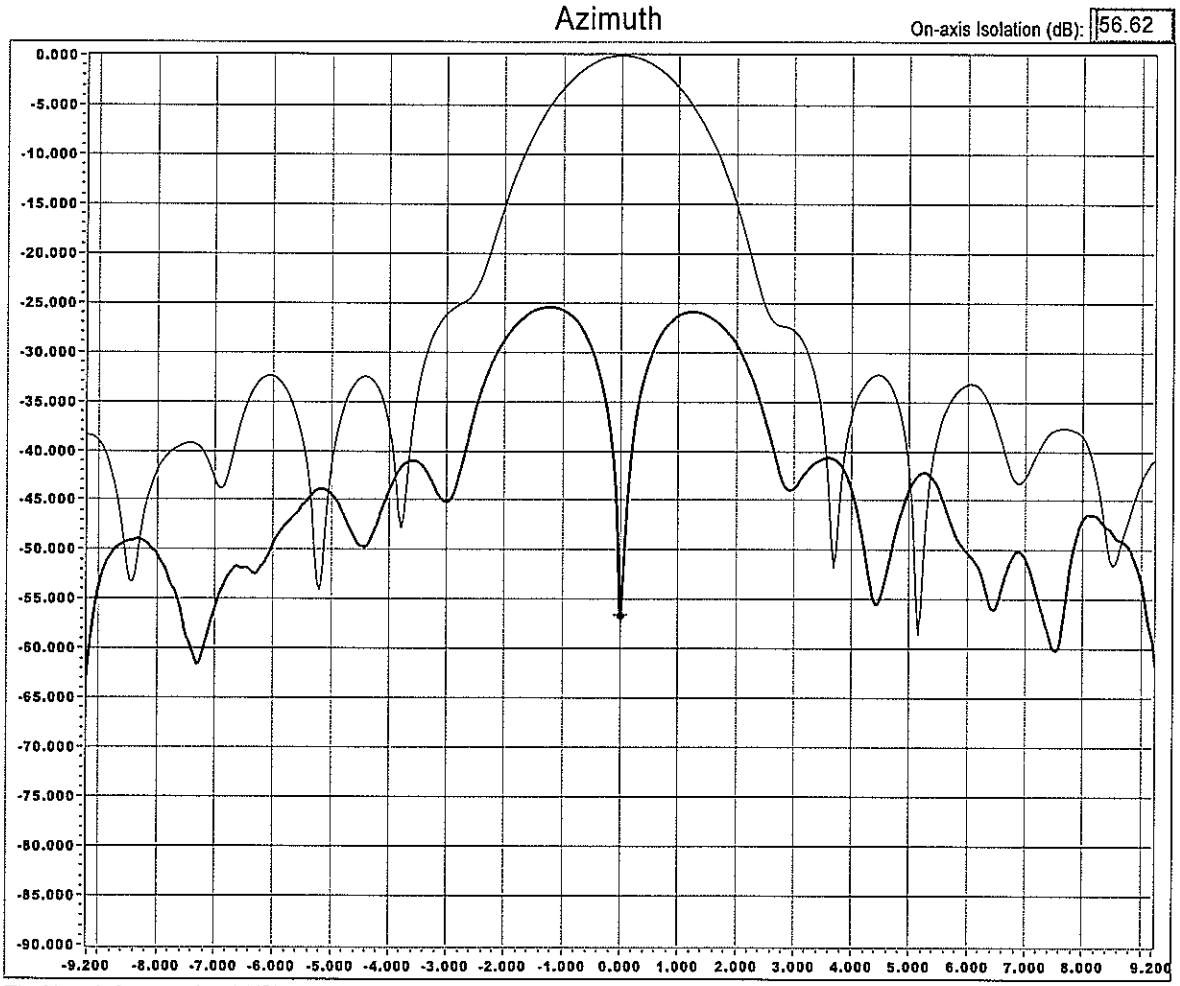
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 162418
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Cross-pol under Co-pol...VERT polarization...10.700 GHz



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999964, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060524 161333 12866_12 RC-155-VA-10.700.txt	Azimuth Beam Center (deg):	180.590
Cross-pol File:	% 060524 162418 12866_12 RX-10-VA-10.700.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	10.699999964	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.72	Off-axis Spec. Isolation (dB):	27.00
# Points Displayed:	8192		

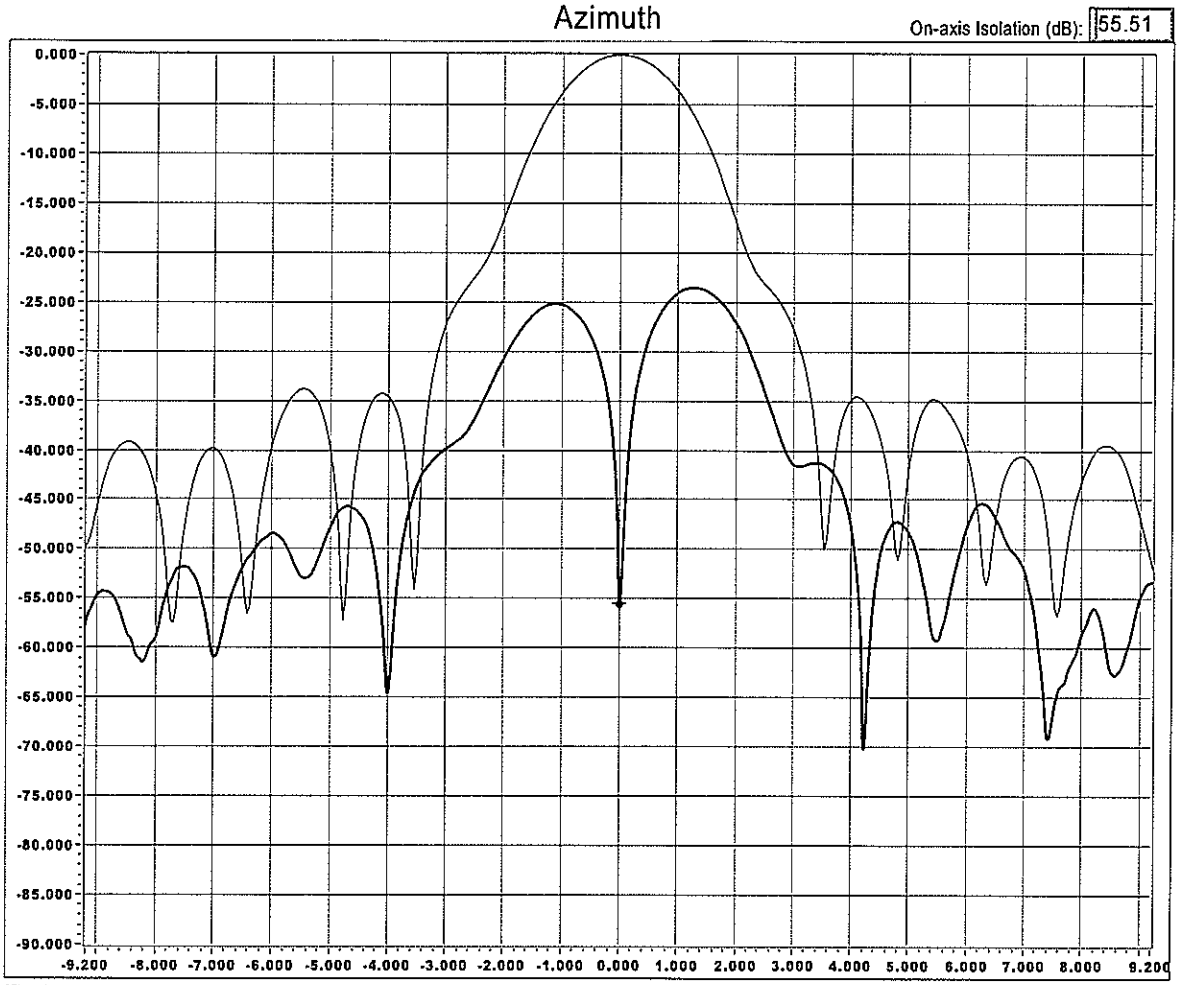
Versions
60227 FAST
50129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	6-1-2006 at 100056
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Cross-pol under Co-pol...VERT polarization...11.725 GHz



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11725000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060601 101638 12866_12 RC-155-VA-11.725.txt	Azimuth Beam Center (deg):	180.480
Cross-pol File:	% 060601 100056 12866_12 RX-11-VA-11.725.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	11.725000045	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-32.11	Off-axis Spec. Isolation (dB):	27.00
# Points Displayed:	8192		

Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

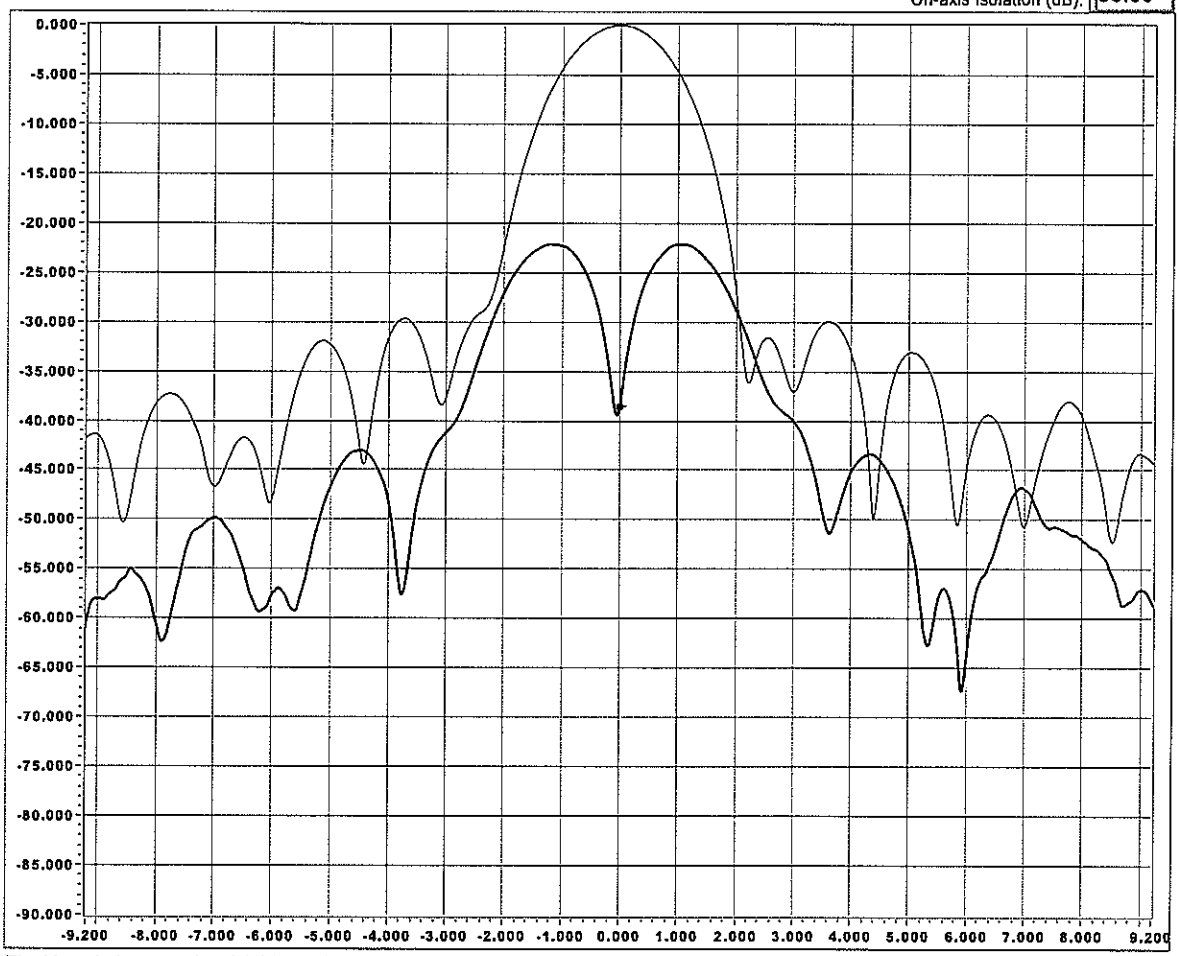
Customer.....	NORSAT
Date/Local Time.....	5-26-2006 at 140916
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Cross-pol under Co-pol...VERT polarization...12.750 GHz

Azimuth

On-axis Isolation (dB): 38.60



The Y-scale is power level (dB) relative to beam center; the X-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12750000135, AZ rate (deg/s)=2.903, EL rate (deg/s)=0.640, RBW (Hz)=30, VBW (Hz)=10

Co-pol File:	% 060526 141628 12866_12 RC-10-VA-12.750.txt	Azimuth Beam Center (deg):	180.570
Cross-pol File:	% 060526 140916 12866_12 RX-10-VA-12.750.txt	Elevation Beam Center (deg):	12.000
Test Frequency (GHz):	12.750000135	On-axis Spec. Isolation (dB):	35.000
Ref. Level (dBm):	-30.11	Off-axis Spec. Isolation (dB):	27.00
# Points Displayed:	10001		

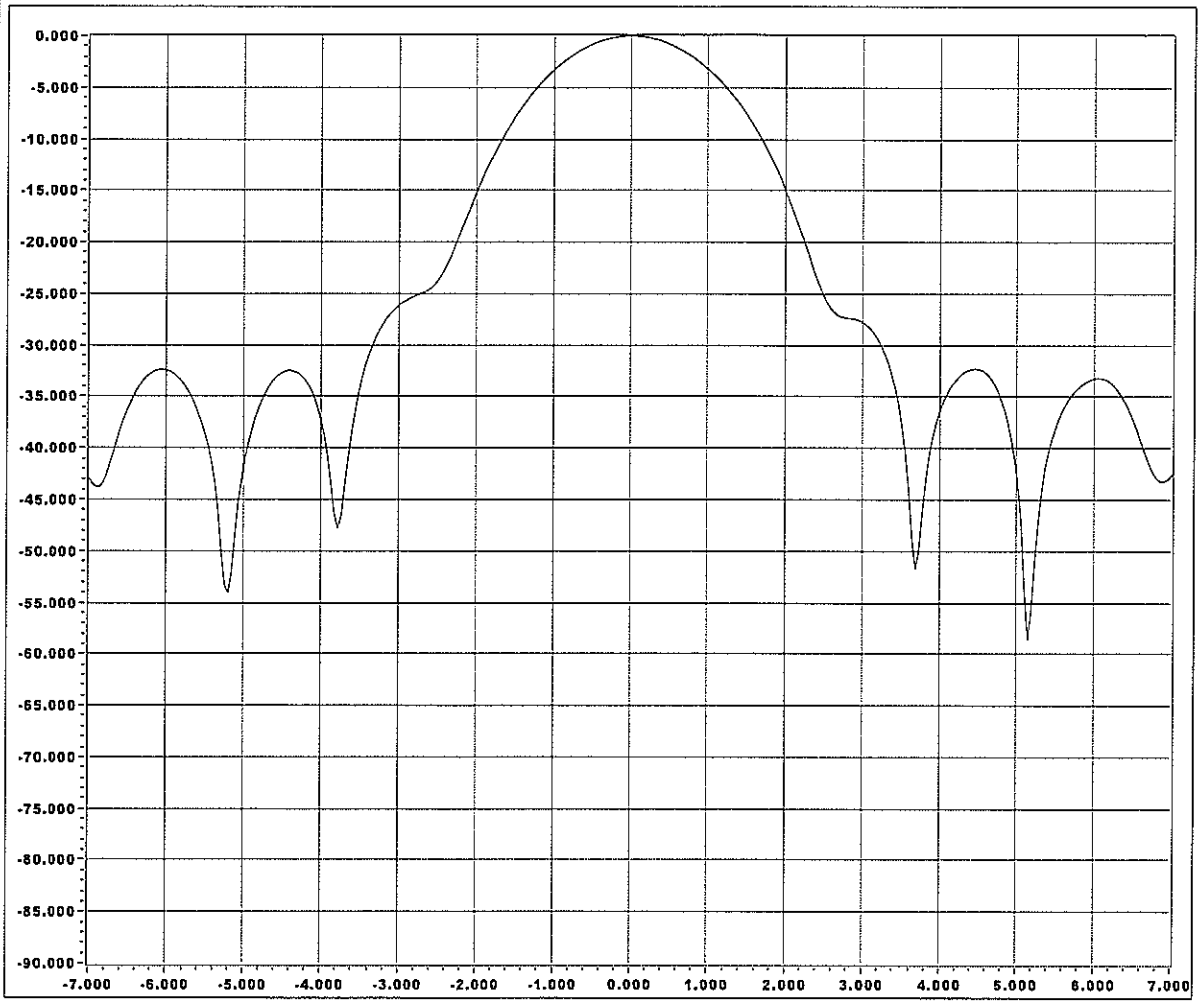
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 161333
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...10.700 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999965, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

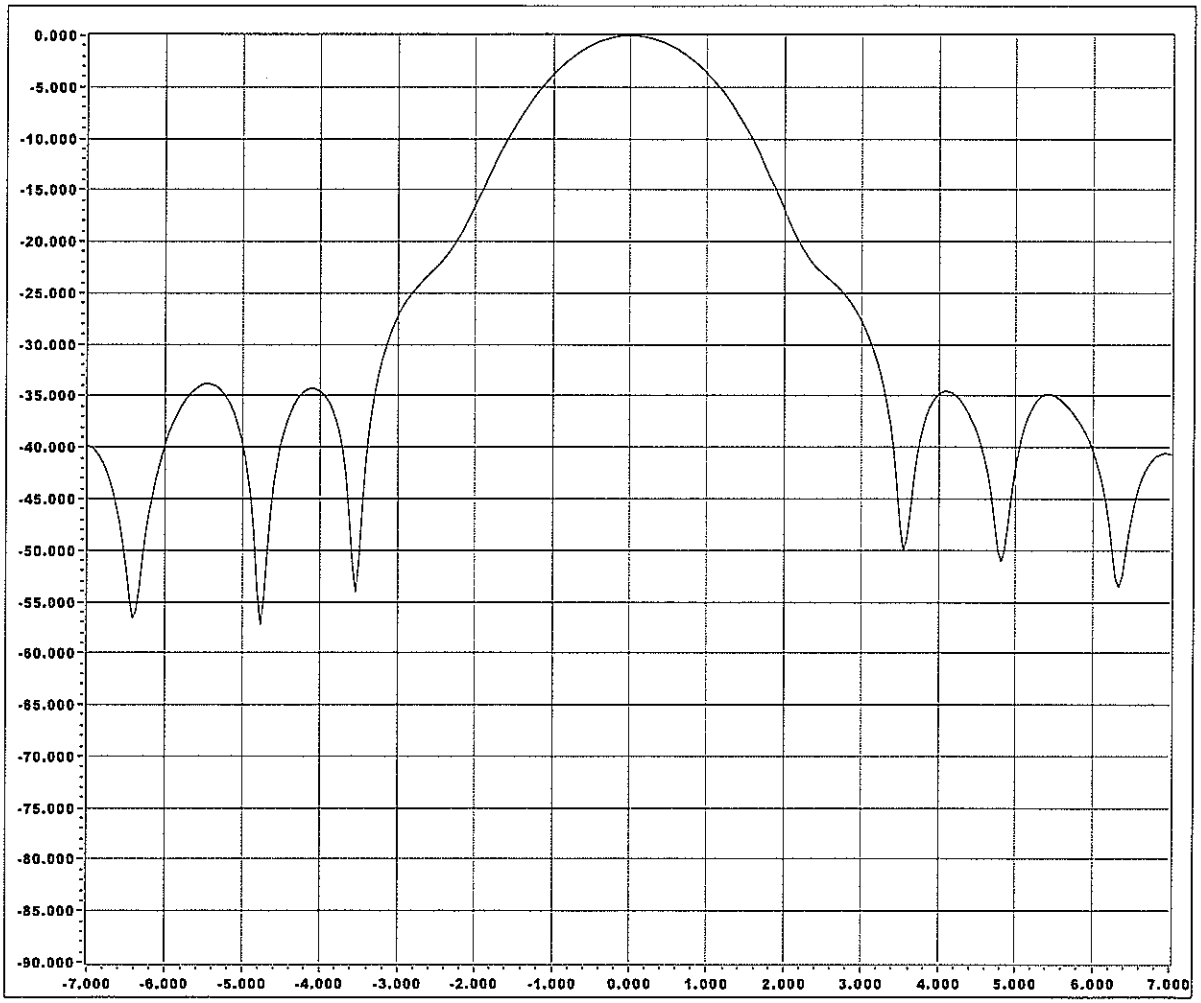
File:	% 060524 161333 12866_12 RC-155-VA-10.700.txt		
Test Frequency (GHz):	10.699999965		
Ref. Level (dBm):	-32.72	Versions	
# Points Displayed:	7675	60227 FAST 60129 PACK	
Specified Gain (dB):	39.000		
Azimuth Beam Center (deg):	180.590		
Elevation Beam Center (deg):	12.000		
Margin Under Curved (dB):	None		

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	6-1-2006 at 101638
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...11.725 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11725000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

File:	% 060601 101638 12866_12 RC-155-VA-11.725.txt	Specified Gain (dB):	39.800
Test Frequency (GHz):	11.725000045	Azimuth Beam Center (deg):	180.480
Ref. Level (dBm):	-32.11	Elevation Beam Center (deg):	12.000
# Points Displayed:	7988	Margin Under Curved (dB):	None

Versions
60227 FAST
60129 PACK

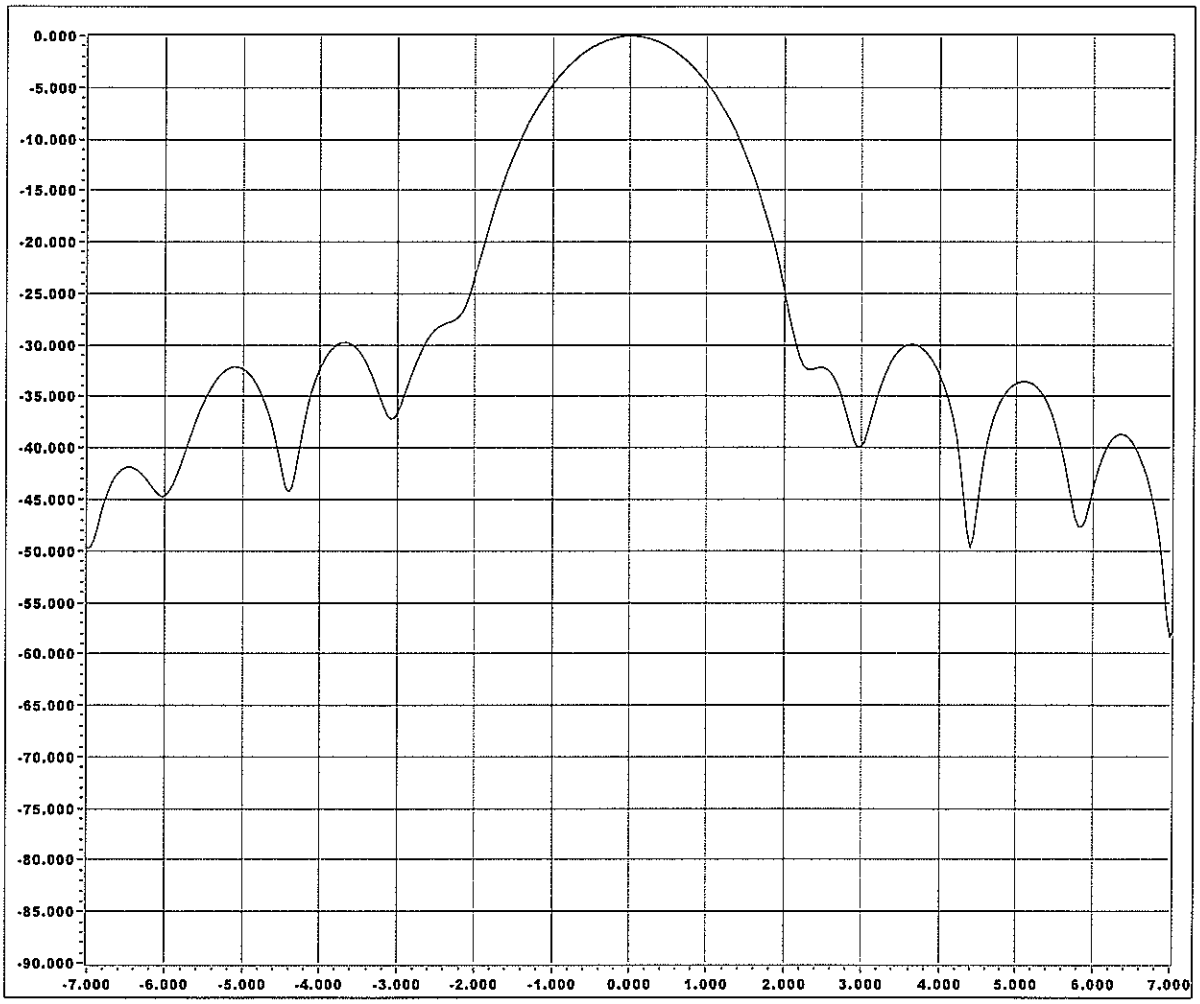
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 154441
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...12.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12749999960, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 154441 12866_12 RC-155-VA-12.750.txt	Specified Gain (dB):	40.500
Test Frequency (GHz):	12.749999960	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.70	Elevation Beam Center (deg):	12.000
# Points Displayed:	7700	Margin Under Curved (dB):	None

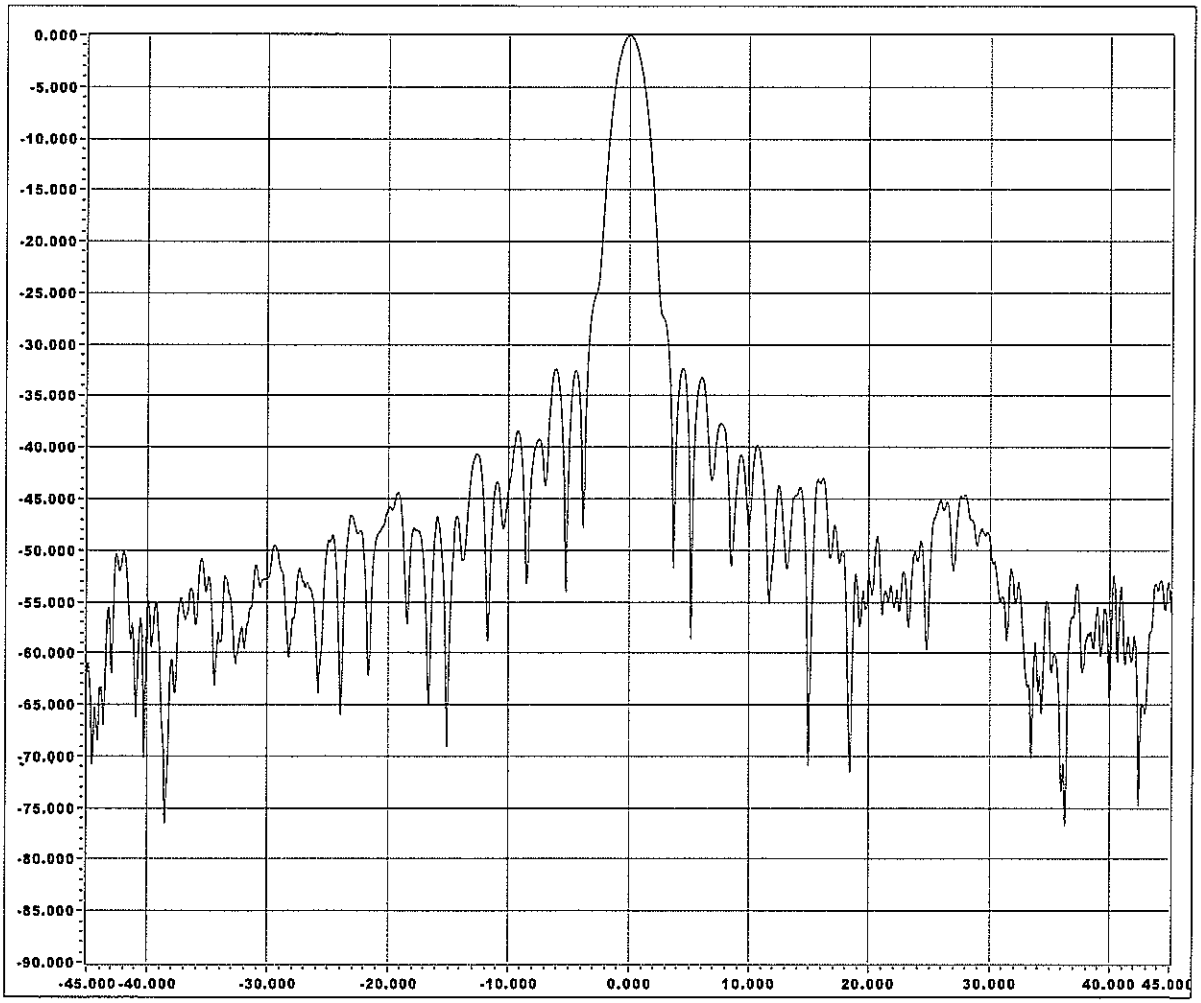
Versions
60227 FAST
60129 PACK

Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 161333
Job Number.....	12866_12
Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...10.700 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999965, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 161333 12866_12 RC-155-VA-10.700.txt	Specified Gain (dB):	39.000
Test Frequency (GHz):	10.699999965	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.72	Elevation Beam Center (deg):	12.000
# Points Displayed:	7675	Margin Under Curved (dB):	None

Versions
60227 FAST
60129 PACK

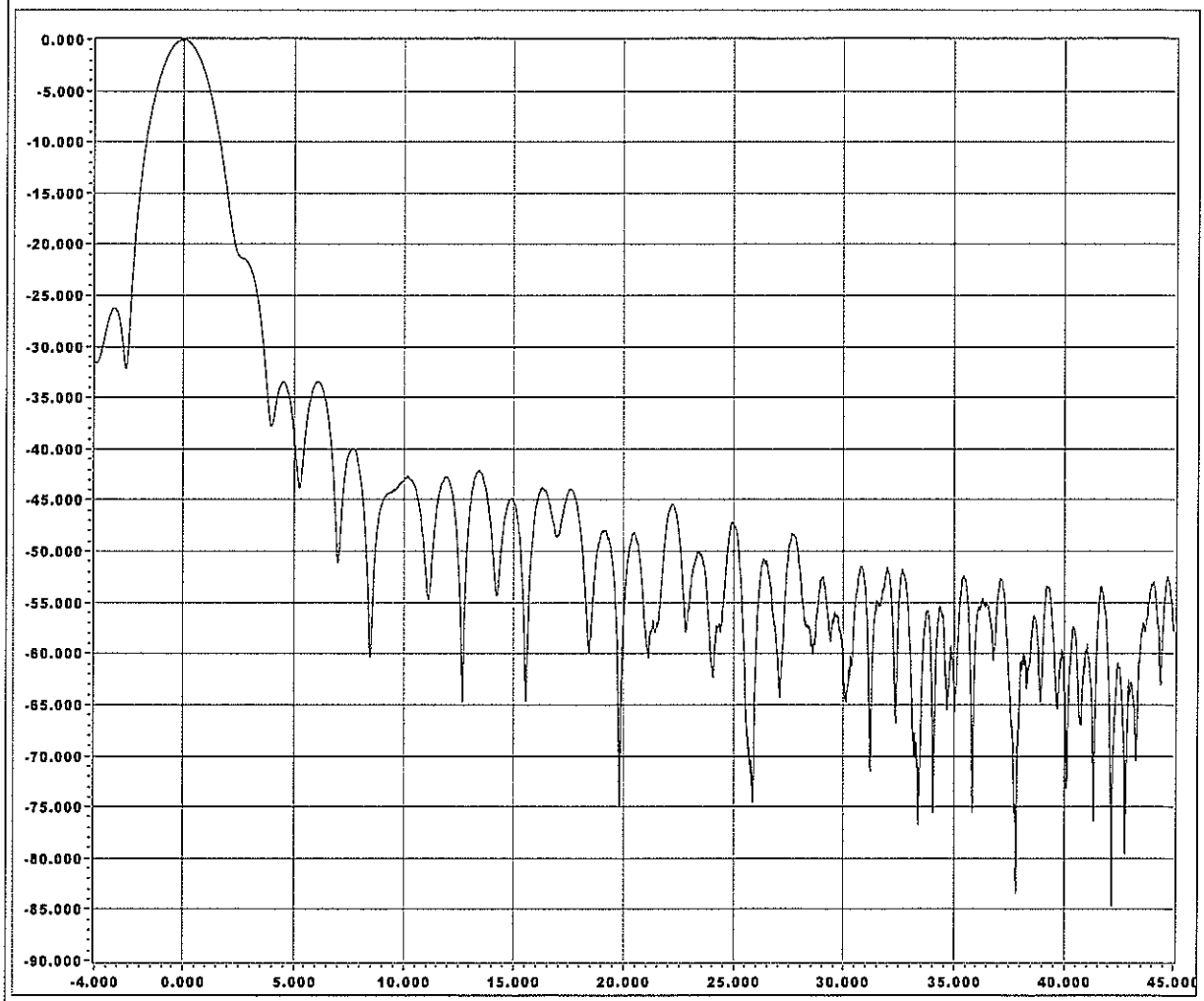
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 161647
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...10.700 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10699999965, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 161647 12866_12 RC-50-VE-10.700.txt	Specified Gain:	39.000
Test Frequency (GHz):	10.699999965	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.65	Elevation Beam Center (deg):	12.000
# Points Displayed:	6910	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

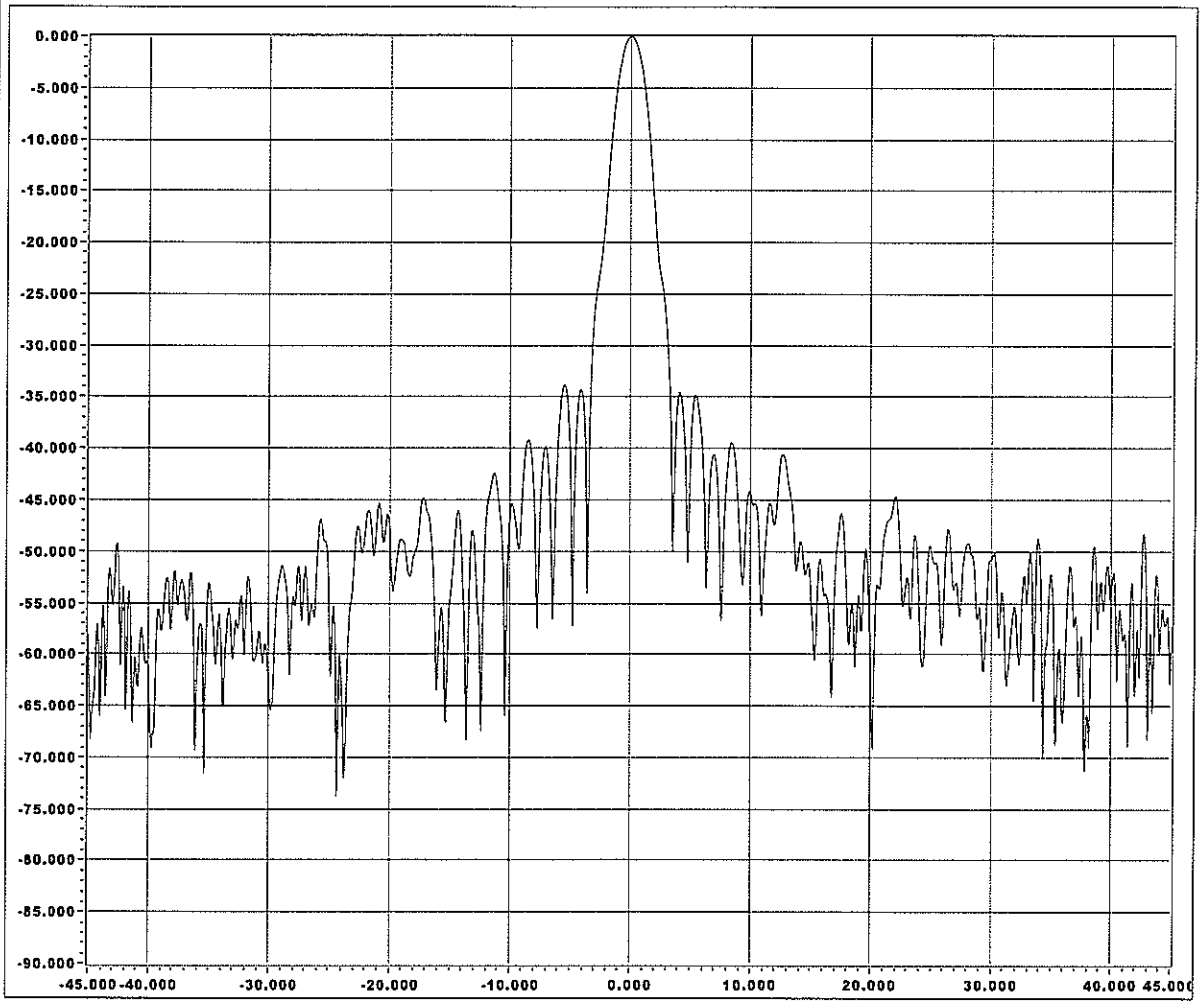
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	6-1-2006 at 101638
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...11.725 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11725000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

File:	% 060601 101638 12866_12 RC-155-VA-11.725.txt		
Test Frequency (GHz):	11.725000045	Specified Gain (dB):	39.800
Ref. Level (dBm):	-32.11	Azimuth Beam Center (deg):	180.480
# Points Displayed:	7988	Elevation Beam Center (deg):	12.000
Versions: 60227 FAST, 60129 PACK		Margin Under Curved (dB):	None

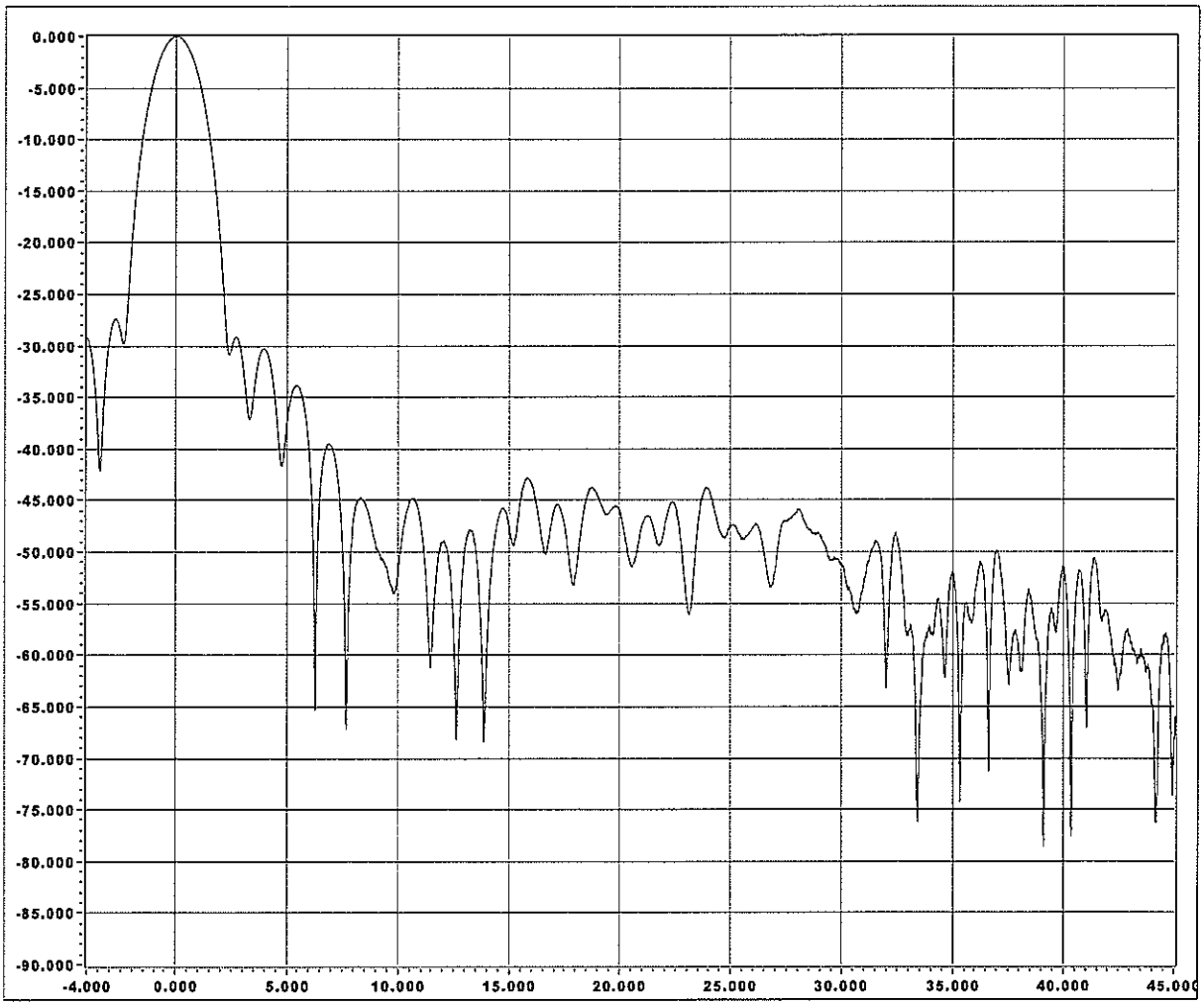
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	6-1-2006 at 102213
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...11.725 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11725000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

File:	% 060601 102213 12866_12 RC-50-VE-11.725.txt	Specified Gain:	39.800
Test Frequency (GHz):	11.725000045	Azimuth Beam Center (deg):	180.480
Ref. Level (dBm):	-32.15	Elevation Beam Center (deg):	12.000
# Points Displayed:	8192	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

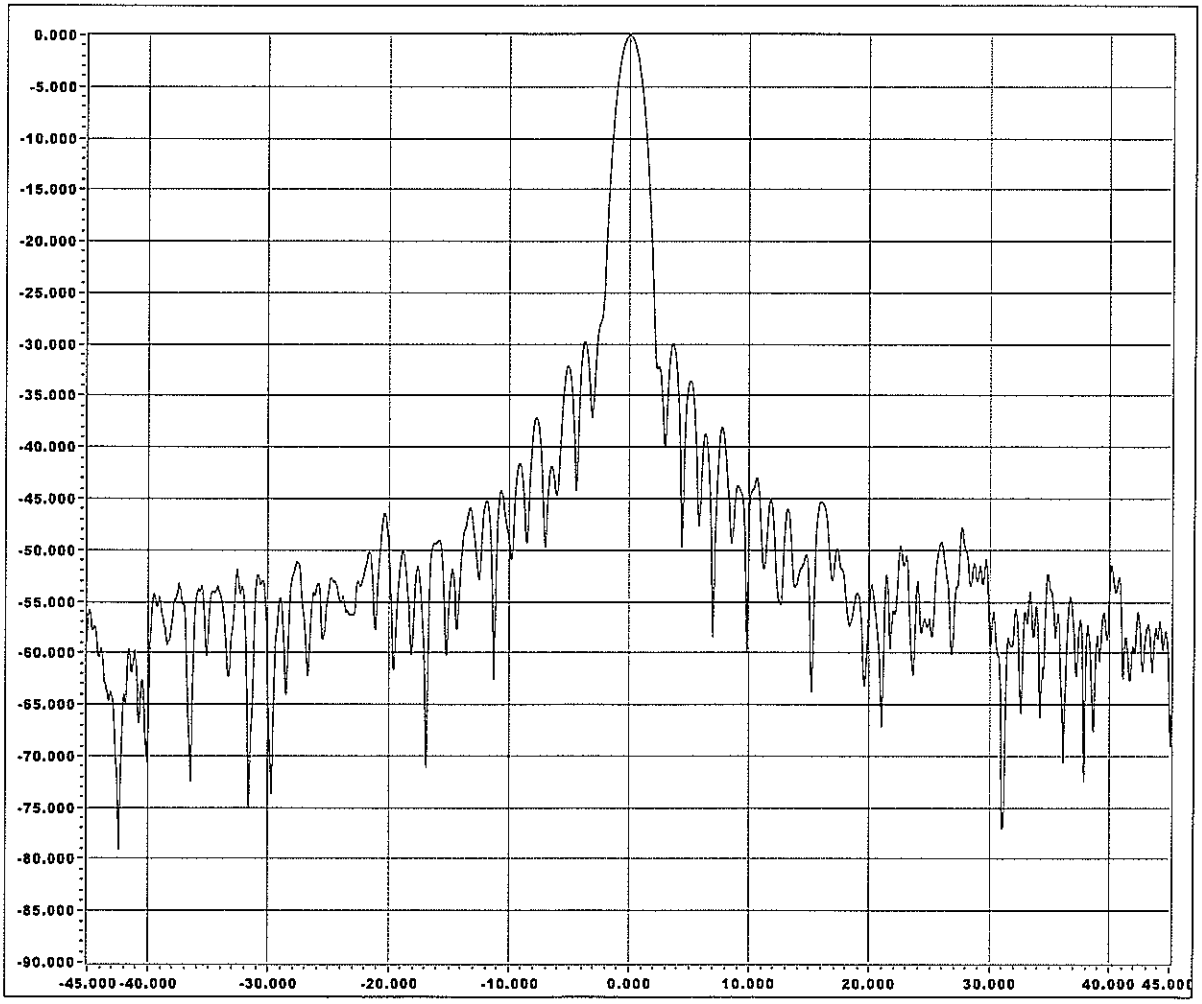
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 154441
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...12.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12749999960, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 154441 12866_12 RC-155-VA-12.750.txt		
Test Frequency (GHz):	12.749999960	Specified Gain (dB):	40.500
Ref. Level (dBm):	-32.70	Azimuth Beam Center (deg):	180.590
# Points Displayed:	7700	Elevation Beam Center (deg):	12.000
Versions	60227 FAST 60129 PACK	Margin Under Curved (dB):	None

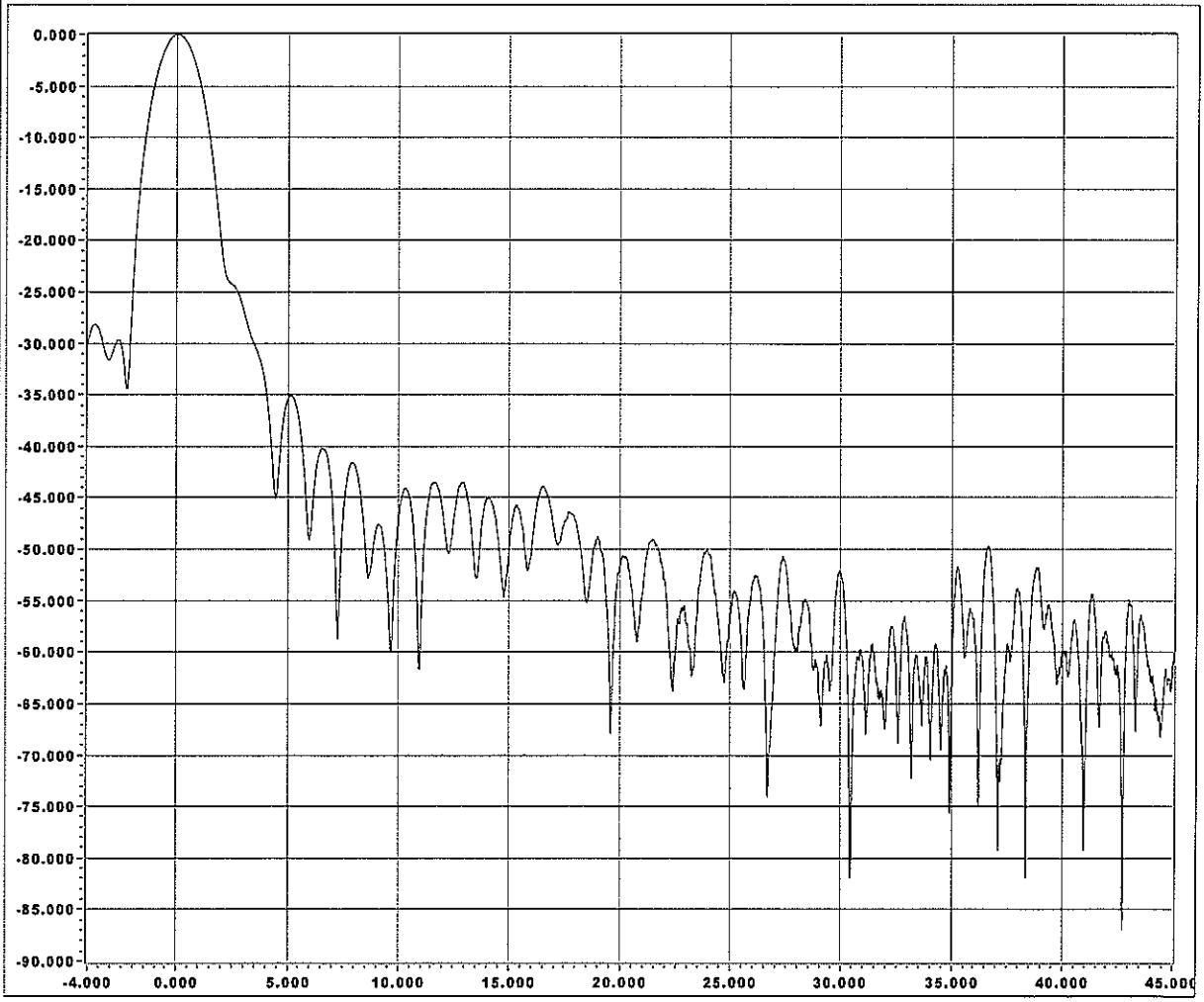
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT
Date/Local Time.....	5-24-2006 at 154750
Job Number.....	12866_12

Model.....	1.0m KU
Location.....	Test Range
Weather.....	Clear/84F/ Wind 12 mph
Test Engineer.....	Zukowski, Werner
Spacecraft.....	Short Range
Transponder.....	N/A

RX...Co-pol...VERT polarization...12.750 GHz

Elevation



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12749999960, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

File:	% 060524 154750 12866_12 RC-50-VE-12.750.txt	Specified Gain:	40.500
Test Frequency (GHz):	12.749999960	Azimuth Beam Center (deg):	180.590
Ref. Level (dBm):	-32.68	Elevation Beam Center (deg):	12.000
# Points Displayed:	7832	Margin Under Curve (dB):	None

Versions
60227 FAST
60129 PACK

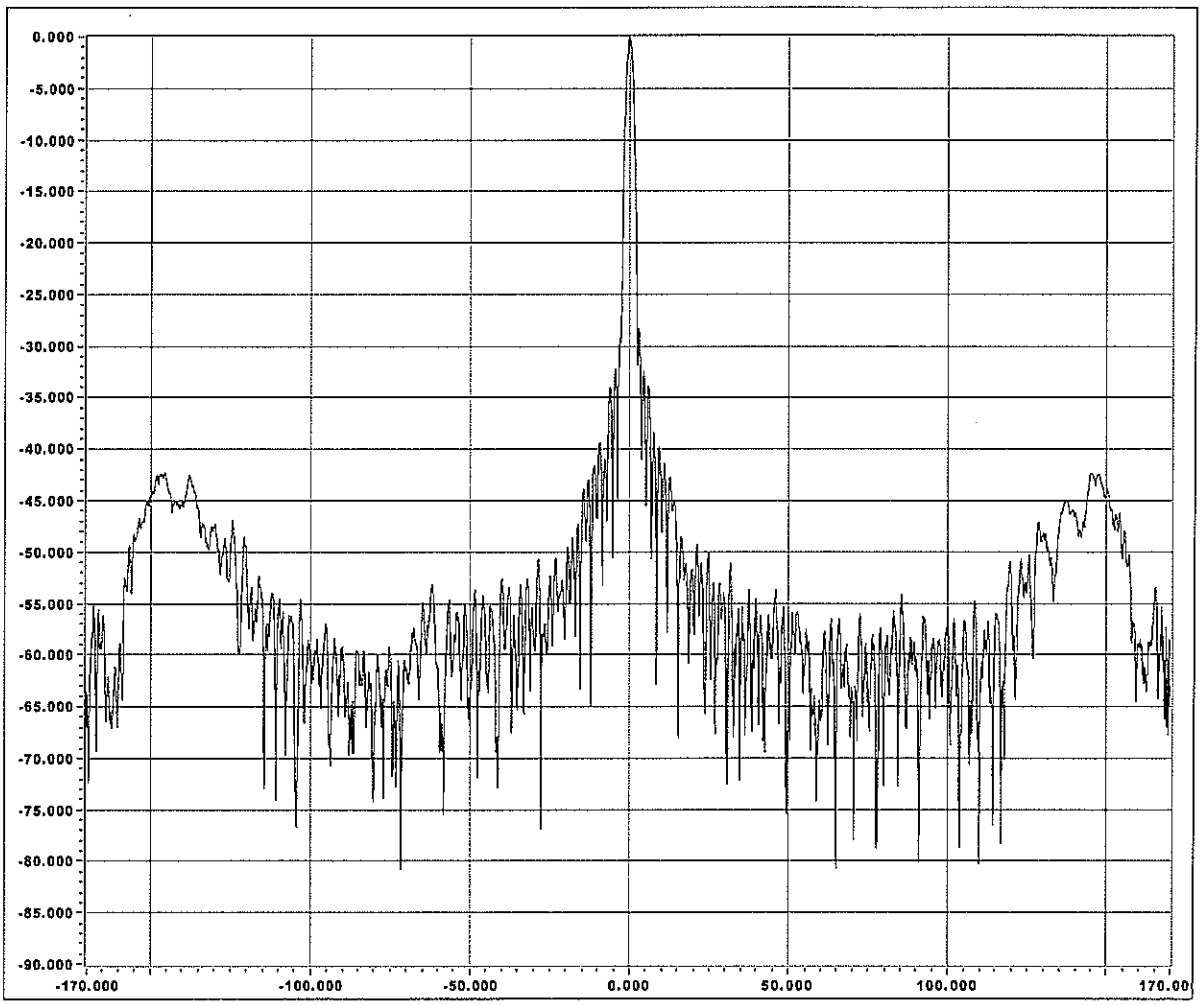
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-20-2006 at 090721
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

RX...Co-pol...VERT polarization...10.700 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=10700000146, AZ rate (deg/s)=1.083, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060620 090721 12866 RC-175-VA-10.700.txt		
Test Frequency (GHz):	10.700000147		
Ref. Level (dBm):	-12.64	Versions	
# Points Displayed:	8985	60227 FAST 60129 PACK	
Specified Gain (dB):			39.000
Azimuth Beam Center (deg):			180.000
Elevation Beam Center (deg):			1.800
Margin Under Curved (dB):			None

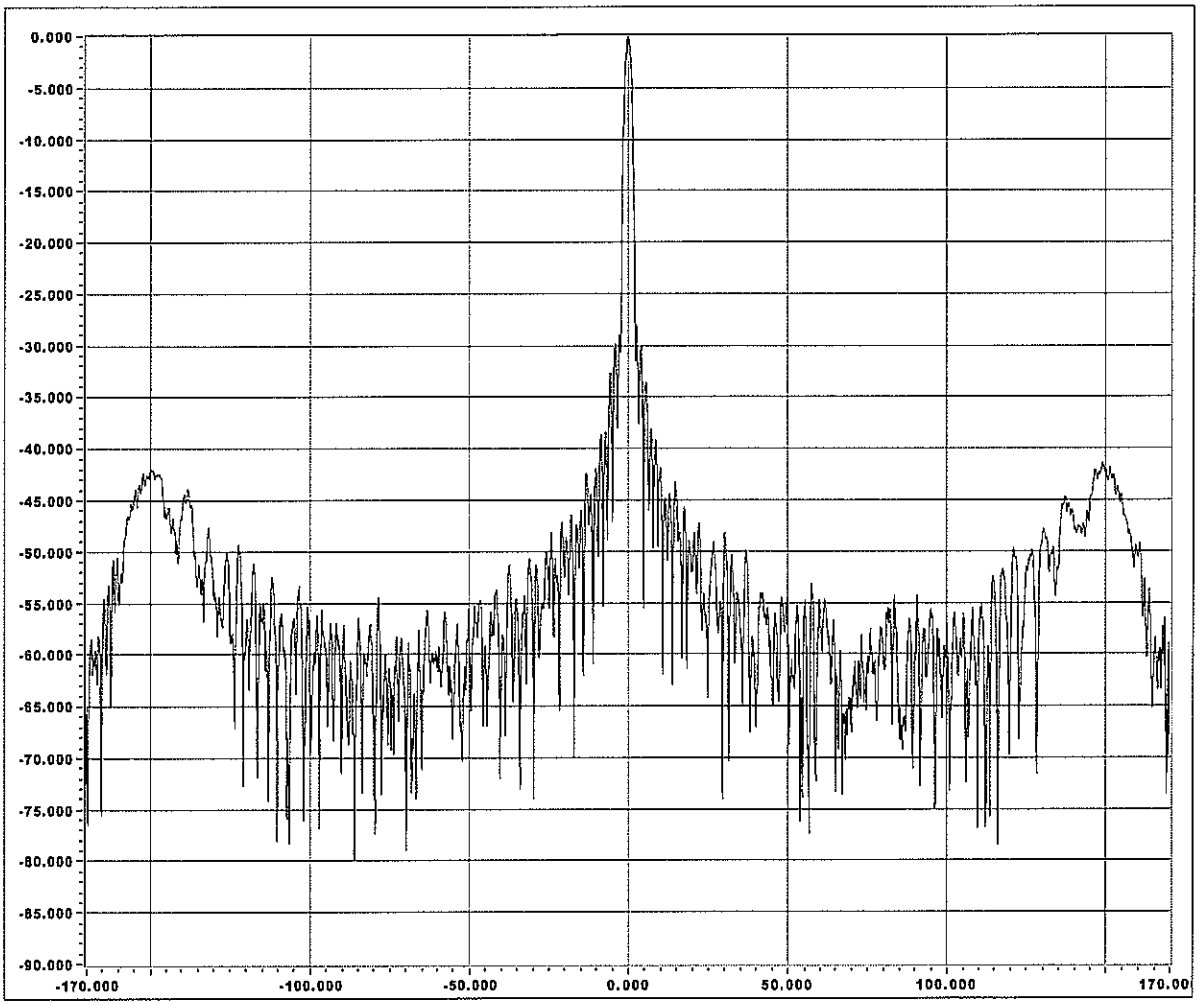
Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat
Date/Local Time.....	6-20-2006 at 084534
Job Number.....	12866

Model.....	1.0m Single Offset
Location.....	Test Range
Weather.....	Partly cloudy
Test Engineer.....	Dustin Cummings
Spacecraft.....	Long Range
Transponder.....	none

RX...Co-pol...VERT polarization...11.725 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=11725000106, AZ rate (deg/s)=1.083, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

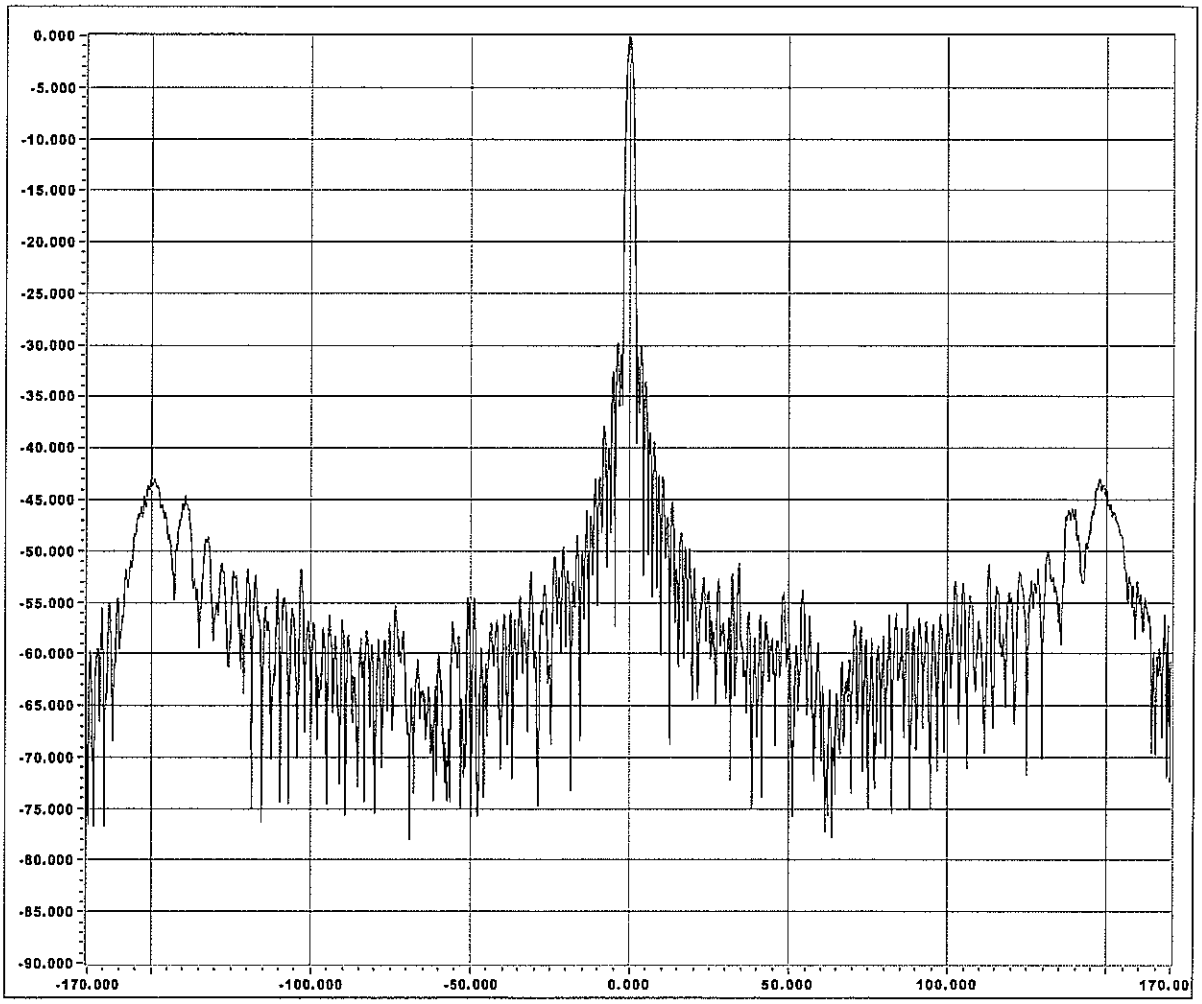
File:	% 060620 084534 12866 RC-175-VA-11.725.txt		
Test Frequency (GHz):	11.725000106		
Ref. Level (dBm):	-17.58	Versions	
# Points Displayed:	8989	60227 FAST 60129 PACK	
Specified Gain (dB):			39.800
Azimuth Beam Center (deg):			180.000
Elevation Beam Center (deg):			1.800
Margin Under Curved (dB):			None

Vertex RSI
GENERAL DYNAMICS

Customer.....	Norsat	Model.....	1.0m Single Offset
Date/Local Time.....	6-20-2006 at 081544	Location.....	Test Range
Job Number.....	12866	Weather.....	Partly cloudy
		Test Engineer.....	Dustin Cummings
		Spacecraft.....	Long Range
		Transponder.....	none

RX...Co-pol...VERT polarization...12.750 GHz

Azimuth



Y-scale is power level (dB) relative to beam center; x-scale is angle (degrees, cosine corrected) relative to beam center.

SA Freq (Hz)=12750000127, AZ rate (deg/s)=1.083, EL rate (deg/s)=0.000, RBW (Hz)=1000, VBW (Hz)=10

File:	% 060620 081544 12866 RC-175-VA-12.750.txt	Specified Gain (dB):	40.500
Test Frequency (GHz):	12.750000127	Azimuth Beam Center (deg):	180.000
Ref. Level (dBm):	-20.24	Elevation Beam Center (deg):	1.800
# Points Displayed:	9366	Margin Under Curved (dB):	None

Versions
60227 FAST
60129 PACK

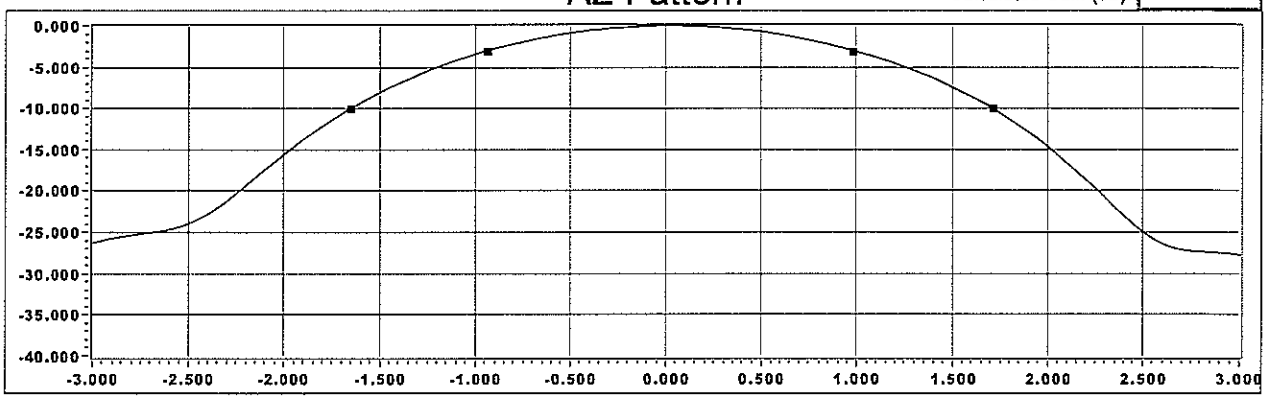
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-24-2006 at 161333	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

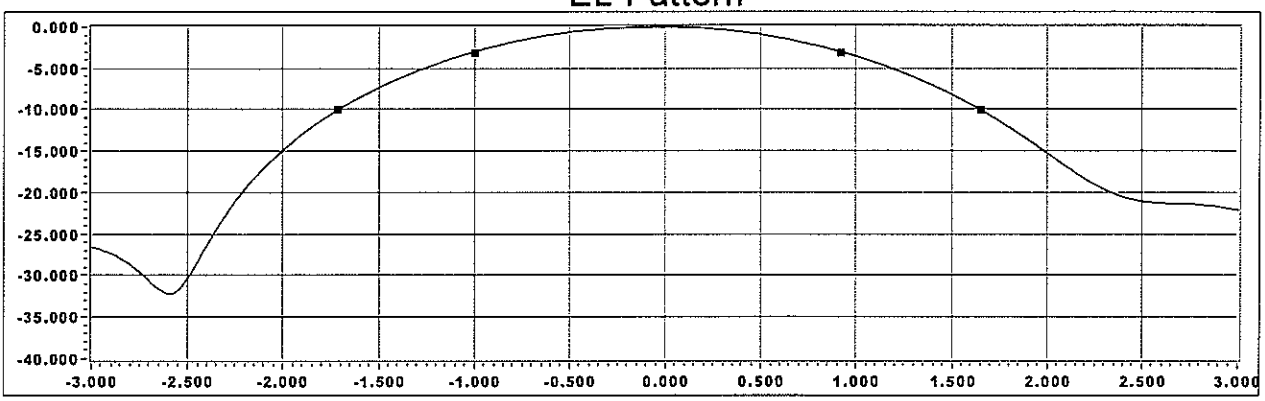
RX...VERT Polarization...Gain by Beamwidth...10.700 GHz

Spec. Gain (dBi): 39.000
Calculated Gain (dB): 39.72

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=10699999965, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060524 161333 12866_12 RC-155-VA-10.700.txt
EL Co-pol File	% 060524 161647 12866_12 RC-50-VE-10.700.txt

The calculated gain is greater than the specified gain by 0.72 dB.

Test Frequency (GHz)	10.699999965	AZ 3dB BW (deg)	1.9189	# Points Displayed	2042
AZ Ref. Level (dBm)	-32.72	AZ 10dB BW (deg)	3.3656		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.9927		
RMS (in.)	0.005	EL 3dB BW (deg)	1.9194		
Azimuth (deg)	180.590	EL 10dB BW (deg)	3.3653	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.9953	10dB Factor	107000

Versions
60227 FAST
60129 PACK

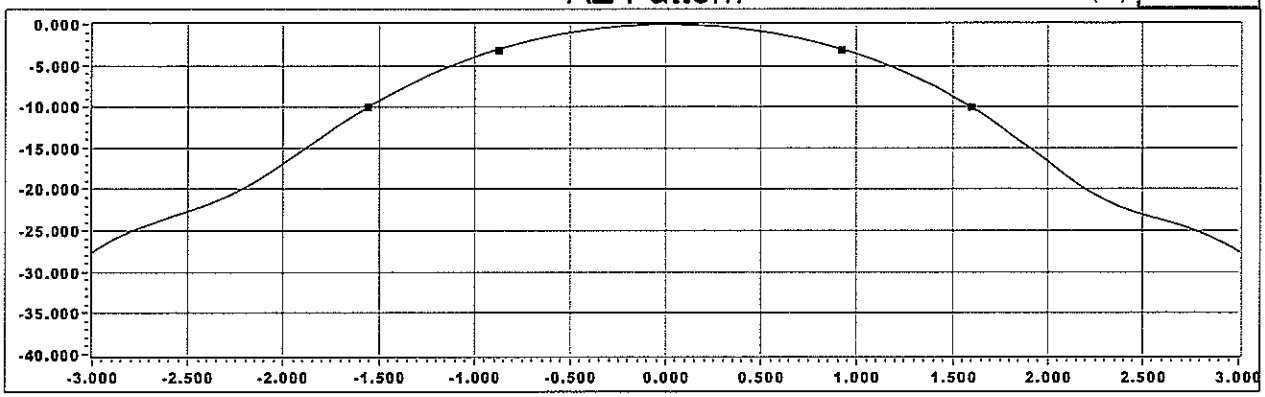
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	6-1-2006 at 101638	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

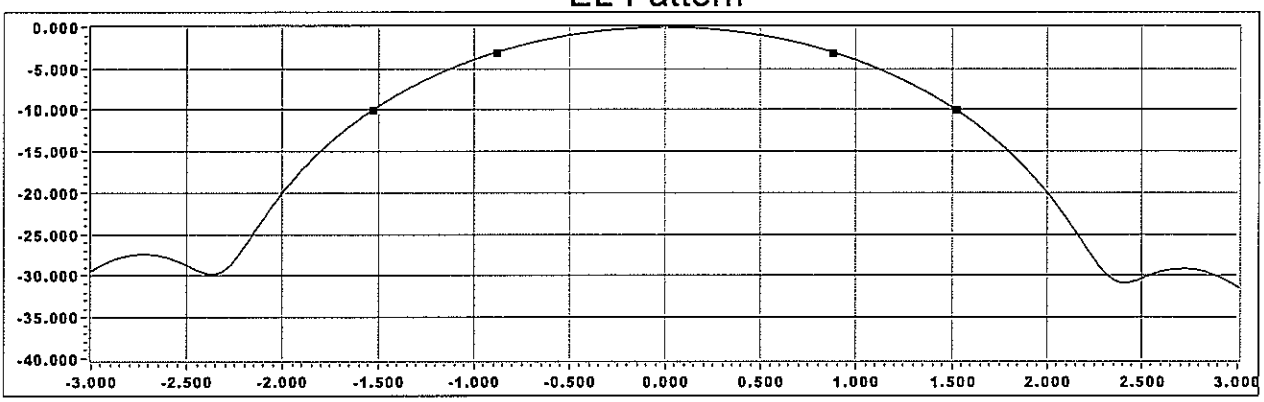
RX...VERT Polarization...Gain by Beamwidth...11.725 GHz

Spec. Gain (dBi): 39.800
Calculated Gain (dB): 40.41

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2]
- Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=11725000045, AZ rate (deg/s)=2.890, EL rate (deg/s)=0.630, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060601 101638 12866_12 RC-155-VA-11.725.txt
EL Co-pol File	% 060601 102213 12866_12 RC-50-VE-11.725.txt

The calculated gain is greater than the specified gain by 0.61 dB.

Test Frequency (GHz)	11.725000045	AZ 3dB BW (deg)	1.7951	# Points Displayed	7992
AZ Ref. Level (dBm)	-32.11	AZ 10dB BW (deg)	3.1527		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.7956		
RMS (in.)	0.005	EL 3dB BW (deg)	1.7584		
Azimuth (deg)	180.480	EL 10dB BW (deg)	3.0551	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.6071	10dB Factor	107000

Versions
60227 FAST
60129 PACK

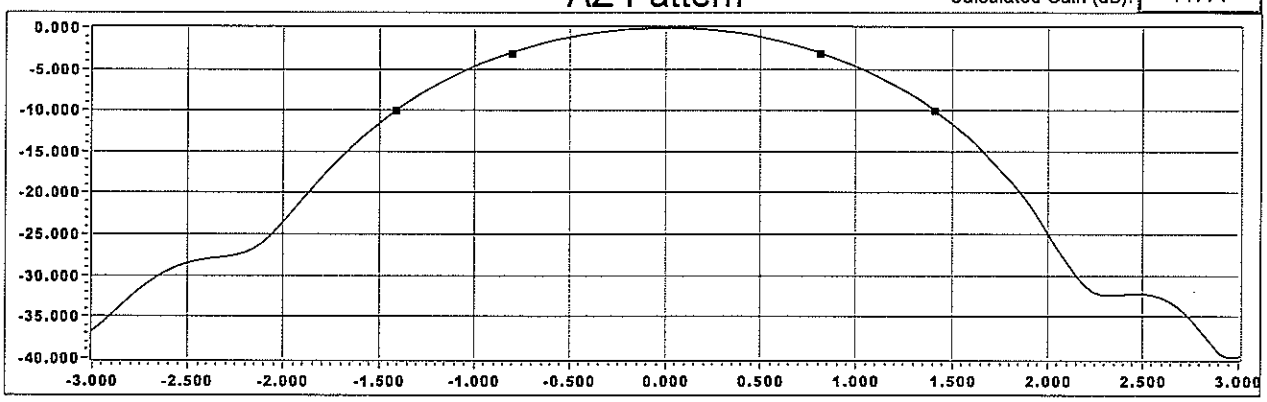
Vertex RSI
GENERAL DYNAMICS

Customer.....	NORSAT	Model.....	1.0m KU
Date/Local Time.....	5-24-2006 at 154441	Location.....	Test Range
Job Number.....	12866_12	Weather.....	Clear/84F/ Wind 12 mph
		Test Engineer.....	Zukowski, Werner
		Spacecraft.....	Short Range
		Transponder.....	N/A

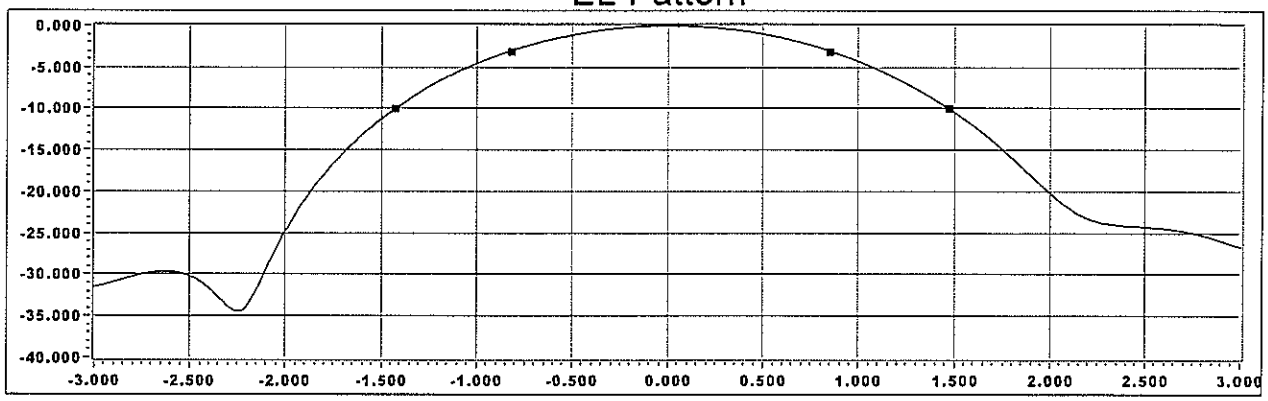
RX...VERT Polarization...Gain by Beamwidth...12.750 GHz

Spec. Gain (dBi): 40.500
Calculated Gain (dB): 41.11

AZ Pattern



EL Pattern



The Y-scale is power level (dB) relative to beam center; the X -scale is angle (degrees, AZ cosine corrected) relative to beam center.

Gain by Beamwidth dBi = 10 log[((3dB factor / (AZ 3dB BW * EL 3dB BW)) + (10dB factor / (AZ 10dB BW * EL 10dB BW))) / 2] - Feed Loss dB - 4.923(RMS inches * Freq GHz)²

SA Freq (Hz)=12749999960, AZ rate (deg/s)=2.900, EL rate (deg/s)=0.632, RBW (Hz)=30, VBW (Hz)=10

AZ Co-pol File	% 060524 154441 12866_12 RC-155-VA-12.750.txt
EL Co-pol File	% 060524 154750 12866_12 RC-50-VE-12.750.txt

The calculated gain is greater than the specified gain by 0.61 dB.

Test Frequency (GHz)	12.749999960	AZ 3dB BW (deg)	1.6130	# Points Displayed	7704
AZ Ref. Level (dBm)	-32.70	AZ 10dB BW (deg)	2.8187		
Feed Loss (dB)	0.15	AZ 15dB BW (deg)	3.3332		
RMS (in.)	0.005	EL 3dB BW (deg)	1.6665		
Azimuth (deg)	180.590	EL 10dB BW (deg)	2.8992	3dB Factor	37000
Elevation (deg)	12.000	EL 15dB BW (deg)	3.4433	10dB Factor	107000

Versions
60227 FAST
60129 PACK

Table 1: Antenna Range Testing Full Test Matrix – Ku-Band

Pol	Angular Scale	dB Scale	Cut	Pol	Frequency					
					10.7	11.725	12.75	13.75	14.125	14.5
V	+/- 9.2 deg.	90 dB	Az	Co + Cross	Y	Y	Y	Y	Y	Y
H	+/- 9.2 deg.	90 dB	Az	Co + Cross	Y	Y	Y	Y	Y	Y
V	+/- 45 deg.	90 dB	Az	Co	Y	Y	Y	Y	Y	Y
V	-4 to +45 deg.	90 dB	El	Co	Y	Y	Y	Y	Y	Y
H	+/- 45 deg.	90 dB	Az	Co	Y	Y	Y	Y	Y	Y
H	-4 to +45 deg.	90 dB	El	Co	Y	Y	Y	Y	Y	Y
V	+/- 180 deg.	90 dB	Az	Co	Y	Y	Y	Y	Y	Y
H	+/- 180 deg.	90 dB	Az	Co	Y	Y	Y	Y	Y	Y
V	+/- 3.0 deg.	40 dB	Az	Co (Gain)	Y	Y	Y	Y	Y	Y
H	+/- 3.0 deg.	40 dB	Az	Co (Gain)	Y	Y	Y	Y	Y	Y

Note: that Co + Cross means that both the co-polar and cross polar measurements are plotted on the same chart.

Envelope Specification as per FCC performance standards set in 47 CFR Ch. I §25.209

Azimuth Co-Pol:

29-25log(f) dBi	$1.25° \leq f \leq 7°$
+8 dBi	$7° < f \leq 9.2°$
32-25log(f) dBi	$9.2° < f \leq 48°$
-10 dBi	$48° < f \leq 180°$

Elevation Co-Pol:

32-25log(f) dBi	$1.25° \leq f \leq 48°$
-10 dBi	$48° < f \leq 180°$

Azimuth Cross-Pol:

19-25 log(f) dBi	$1.8° < f \leq 7°$
-2 dBi	$7° < f \leq 9.2°$

R.F.Specification

for

VertexRSI 1.00 Meter Single Offset Antenna
With Two Port Transmit/Receive Linearly Polarized Feed
Preliminary Specification, No Filters

	Receive	Transmit
Frequency In GHz	10.700-12.750	13.750-14.500
Port Type	Rx1	Tx1
Polarization	Linear	Linear
Feed Port Polarizations	VLP or HLP	HLP or VLP
Antenna Gain (+/- 0.2 dB)		
10.700 / 13.750 GHz	39.00 dBi	41.20 dBi
11.725 / 14.125 GHz	39.80 dBi	41.50 dBi
12.750 / 14.500 GHz	40.50 dBi	41.70 dBi
Antenna Noise Temperture		
5 degree Elevation	62 K	
10 degree Elevation	46 K	
20 degree Elevation	38 K	
40 degree Elevation	37 K	
Typical G/T at 20 deg Elevation 11.725 GHz , clear horizon		
70 degree K LNA	19.1 dB/K	
90 degree K LNA	18.4 dB/K	
Pattern Beamwidth in degrees at 11.725 / 14.125 GHz		
-3 dB Beamwidth	1.75	1.44
-15 dB Beamwidth	3.68	3.02
Sidelobes		
For Angle A from 1.0 to 30.0 Degrees	29 - 25 log A	
For Angle A from 30.0 to 130.0 Degrees	-10 dBi	-10 dBi
For Angles from 130.0 to 180 Degrees	0 dBi	0 dBi
Cross Polarization Isolation		
On Axis	35.0 dB	35.0 dB
Within 1.0 dB Beamwidth	27.0 dB	35.0 dB
VSWR (Return Loss)	1.35:1(16.5dB)	1.30:1(17.7dB)

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R.F.Specification

for

VertexRSI 1.00 Meter Single Offset Antenna
With Two Port Transmit/Receive Linearly Polarized Feed
Preliminary Specification, No Filters

	Receive	Transmit
Feed Insertion or Ohmic Loss	0.15 dB	0.15 dB
Port to Port Isolation	0.0 dB (Input)	-35.0 dB
Port to Port Isolation	-35.0 dB	0.0 dB (Input)
Output Waveguide Flange Interface	WR-75 Flat	WR-75 Flat
Total Power Handling Capability		1.00 kW CW

Notes - Other operational frequencies available
- 10% of sidelobes may exceed the sidelobe specifications where applicable.
- Power handling capability is based on and limited by the physical characteristics in the feed components. Microwave power at these levels may contribute to the radiation hazard or exceed certain offaxis EIRP specifications.

-G/T is calculated by bolting single LNA directly to the feed.It does not allow for any post LNA effects.

All values are at the rear feed output flange.

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