Analysis of Non-Ionizing Radiation for a 4.5-Meter Earth Station System

This report analyzes the non-ionizing radiation levels for a 4.5-meter earth station system. The analysis and calculations performed in this report comply with the methods described in the FCC Office of Engineering and Technology Bulletin, No. 65 first published in 1985 and revised in 1997 in Edition 97-01. The radiation safety limits used in the analysis are in conformance with the FCC R&O 96-326. Bulletin No. 65 and the FCC R&O specifies that there are two separate tiers of exposure limits that are dependant on the situation in which the exposure takes place and/or the status of the individuals who are subject to the exposure. The Maximum Permissible Exposure (MPE) limits for persons in a General Population/Uncontrolled environment are shown in Table 1. The General Population/Uncontrolled MPE is a function of transmit frequency and is for an exposure period of thirty minutes or less. The MPE limits for persons in an Occupational/Controlled environment are shown in Table 2. The Occupational MPE is a function of transmit frequency and is for an exposure period of six minutes or less. The purpose of the analysis described in this report is to determine the power flux density levels of the earth station in the far-field, near-field, transition region, between the subreflector or feed and main reflector surface, at the main reflector surface, and between the antenna edge and the ground and to compare these levels to the specified MPEs.

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

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

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

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

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

Parameter	Symbol	Formula	Value	Units
Antenna Diameter	D	Input	4.5	m
Antenna Surface Area	$A_{surface}$	$\pi D^2 / 4$	15.90	m^2
Feed Flange Diameter	D_{fa}	Input	22.0	cm
Area of Feed Flange	A_{fa}	$\pi D_{fa}{}^2/4$	380.13	cm^2
Frequency	F	Input	6175	MHz
Wavelength	λ	300 / F	0.048583	m
Transmit Power	P	Input	450.00	W
Antenna Gain (dBi)	G_{es}	Input	46.5	dBi
Antenna Gain (factor)	G	$10^{Ges/10}$	44668.4	n/a
Pi	π	Constant	3.1415927	n/a
Antenna Efficiency	η	$G\lambda^2/(\pi^2D^2)$	0.53	n/a

1. Far Field Distance Calculation

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

Distance to the Far Field Region

$$R_{ff} = 0.60\ D^2 / \lambda \quad (1)$$
$$= 250.1\ \text{m}$$

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

On-Axis Power Density in the Far Field

$$S_{ff} = G\ P / (4\ \pi\ R_{ff}^{\ 2}) \quad (2)$$
$$= 25.575\ \text{W/m}^2$$
$$= 2.558\ \text{mW/cm}^2$$

2. Near Field Calculation

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

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

Extent of the Near Field

$$R_{nf} = D^2 / (4\ \lambda) \quad (3)$$
$$= 104.2\ \text{m}$$

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

Near Field Power Density

$$S_{nf} = 16.0\ \eta\ P / (\pi\ D^2) \quad (4)$$
$$= 59.704\ \text{W/m}^2$$
$$= 5.970\ \text{mW/cm}^2$$

3. Transition Region Calculation

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

Transition Region Power Density

$$S_t = S_{nf}\ R_{nf} / R_t \quad (5)$$
$$= 5.970\ \text{mW/cm}^2$$

4. Region between the Feed Assembly and the Antenna Reflector

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

Power Density at the Feed Flange

$$S_{fa} = 4000\ P / A_{fa} \quad (6)$$
$$= 4735.188\ mW/cm^2$$

5. Main Reflector Region

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

Power Density at the Reflector Surface

$$S_{surface} = 4\ P / A_{surface} \quad (7)$$
$$= 113.177\ W/m^2$$
$$= 11.318\ mW/cm^2$$

6. Region between the Reflector and the Ground

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

Power Density between Reflector and Ground

$$S_g = P / A_{surface} \quad (8)$$
$$= 28.294\ W/m^2$$
$$= 2.829\ mW/cm^2$$

7. Summary of Calculations

Table 4. Summary of Expected Radiation levels for Uncontrolled Environment

Region		Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Far Field (R_{ff} = 250.1 m)	S_{ff}	2.558	Potential Hazard
2. Near Field (R_{nf} = 104.2 m)	S_{nf}	5.970	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	5.970	Potential Hazard
4. Between Feed Assembly and Antenna Reflector	S_{fa}	4735.188	Potential Hazard
5. Main Reflector	$S_{surface}$	11.318	Potential Hazard
6. Between Reflector and Ground	S_g	2.829	Potential Hazard

Table 5. Summary of Expected Radiation levels for Controlled Environment

Region		Calculated Maximum Radiation Power Density Level (mW/cm^2)	Hazard Assessment
1. Far Field (R_{ff} = 250.1 m)	S_{ff}	2.558	Satisfies FCC MPE
2. Near Field (R_{nf} = 104.2 m)	S_{nf}	5.970	Potential Hazard
3. Transition Region ($R_{nf} < R_t < R_{ff}$)	S_t	5.970	Potential Hazard
4. Between Feed Assembly and Antenna Reflector	S_{fa}	4735.188	Potential Hazard
5. Main Reflector	$S_{surface}$	11.318	Potential Hazard
6. Between Reflector and Ground	S_g	2.829	Satisfies FCC MPE

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

8. Conclusions

Based on this analysis it is concluded that the FCC RF Guidelines have been exceeded in the specific regions of Tables 4 and 5. The applicant proposes to comply with the Maximum Permissible Exposure (MPE) limits of 1 mW/cm2 for the Uncontrolled areas and the MPE limits of 5 mW/cm2 for the Controlled areas by one or more of the following methods:

Means of Compliance Uncontrolled Areas

The area around this antenna will be roped off while this antenna is in operation. The roped area will be sufficient to prohibit access to the areas that exceed the MPE limited. The general public will not have access to areas within ½ diameter removed from the edge of the antenna.

Since one diameter removed from the main beam of the antenna or ½ diameter removed from the edge of the antenna the RF levels are reduced by a factor of 100 or 20 dB. None of the areas exceeding the MPE levels will be accessible by the general public.

Radiation hazard signs will be posted while this earth station is in operation.

The applicant will ensure that no buildings or other obstacles will be in the areas that exceed the MPE levels.

Means of Compliance Controlled Areas

The earth station's operational personnel will not have access to the areas that exceed the MPE levels while the earth station is in operation.

The transmitters will be turned off during antenna maintenance.

AvL TECHNOLOGIES

Model 2400C USA
2.4M C-Band SNG Satellite Antenna
RF Range Test Data

130 Roberts St. Asheville, NC 28801 ph (828) 250-9950 fx (828)-250-9938

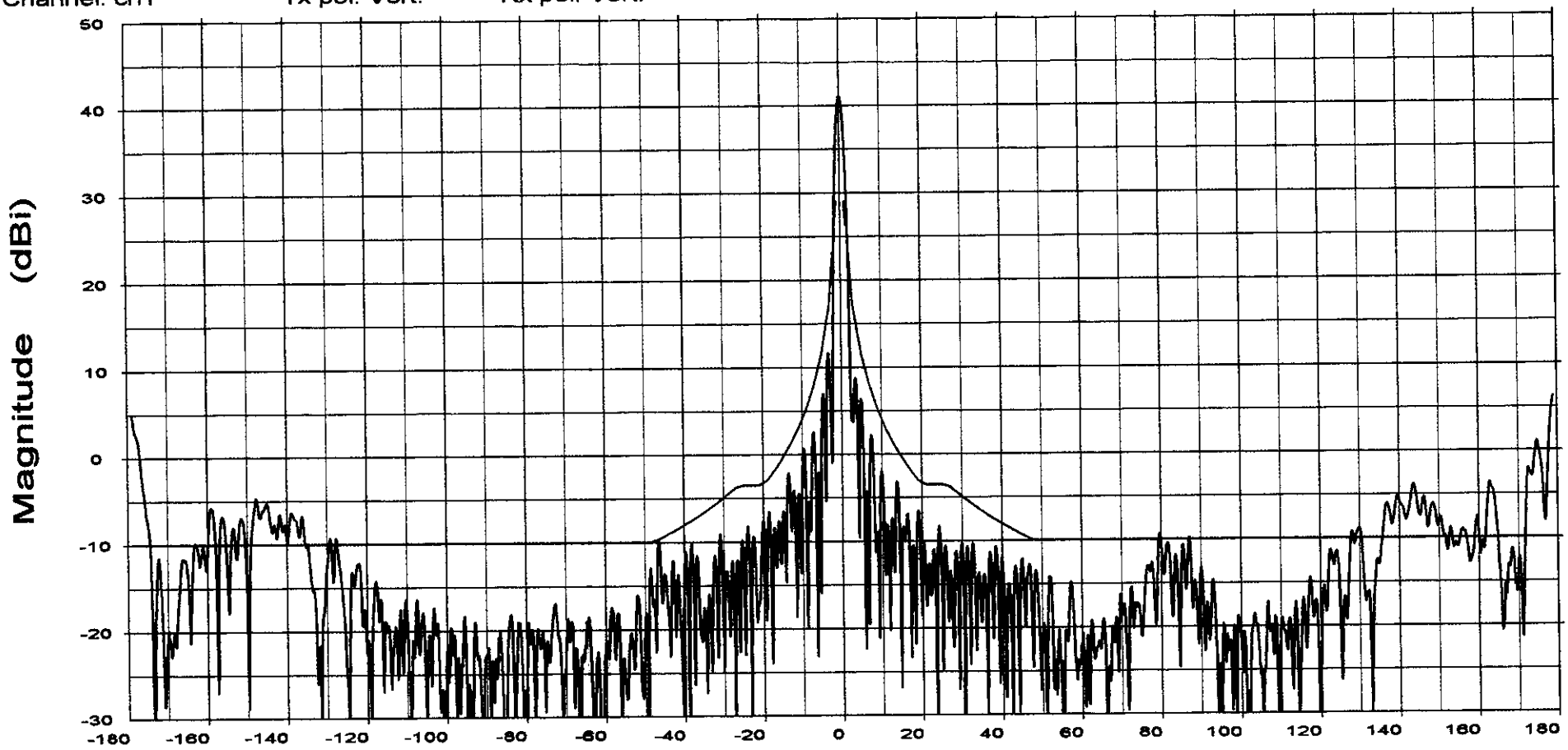
File: See Legend

AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 20 Deg
−3.5dBi~20 to 26.3 Deg | 32−25Log(Theta)~26.3 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays		Cal. file	units	Beam Peak Deg	Beam Peak dB
104636.dat-ant_under_test	——	104636.dat	dBi	0.00	41.01

Prode Corporation
East Ien Test Range
Maiden NC

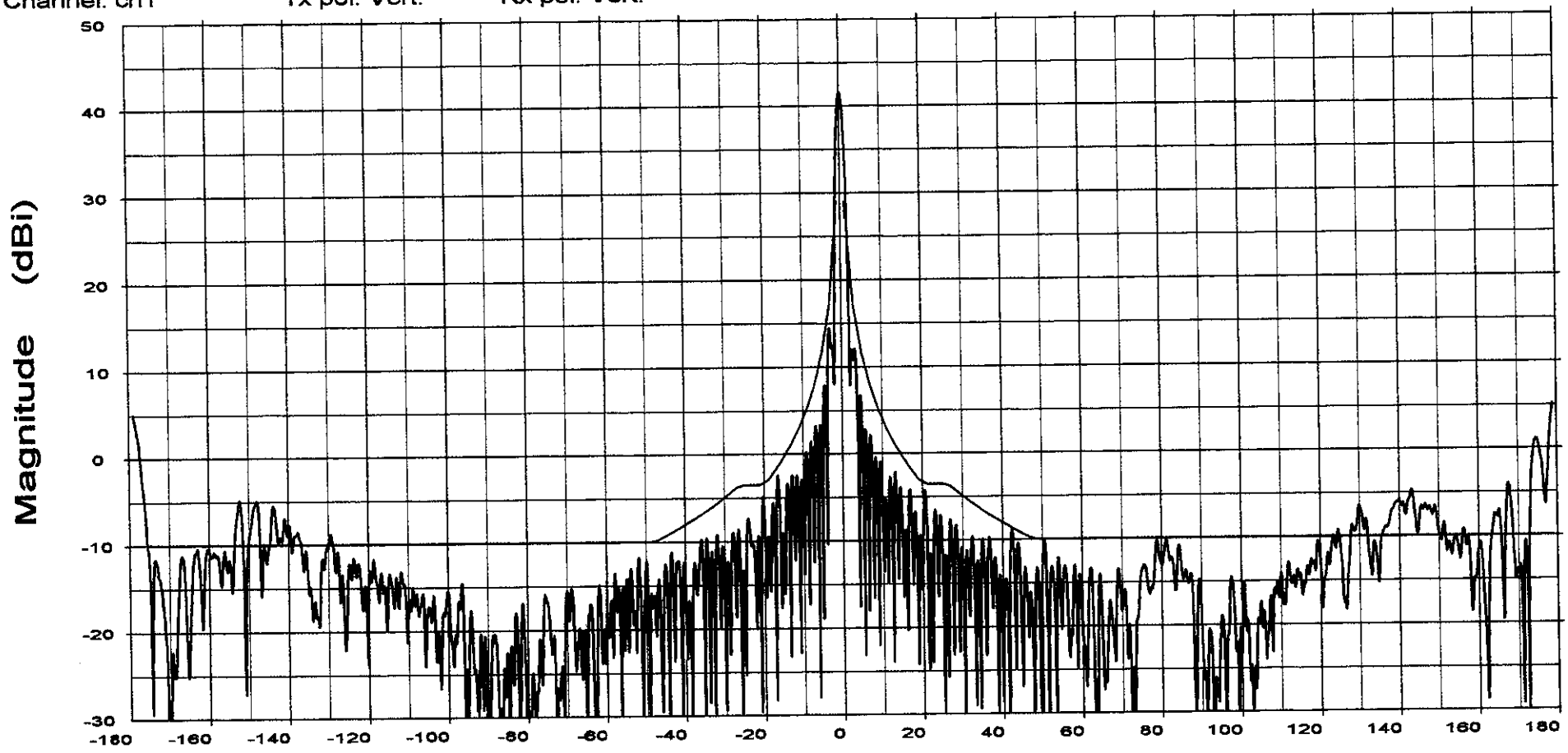
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



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−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104636.dat-ant_under_test ——	104636.dat	dBi	0.04	41.56

Prodr Corporation
East . len Test Range
Maiden NC

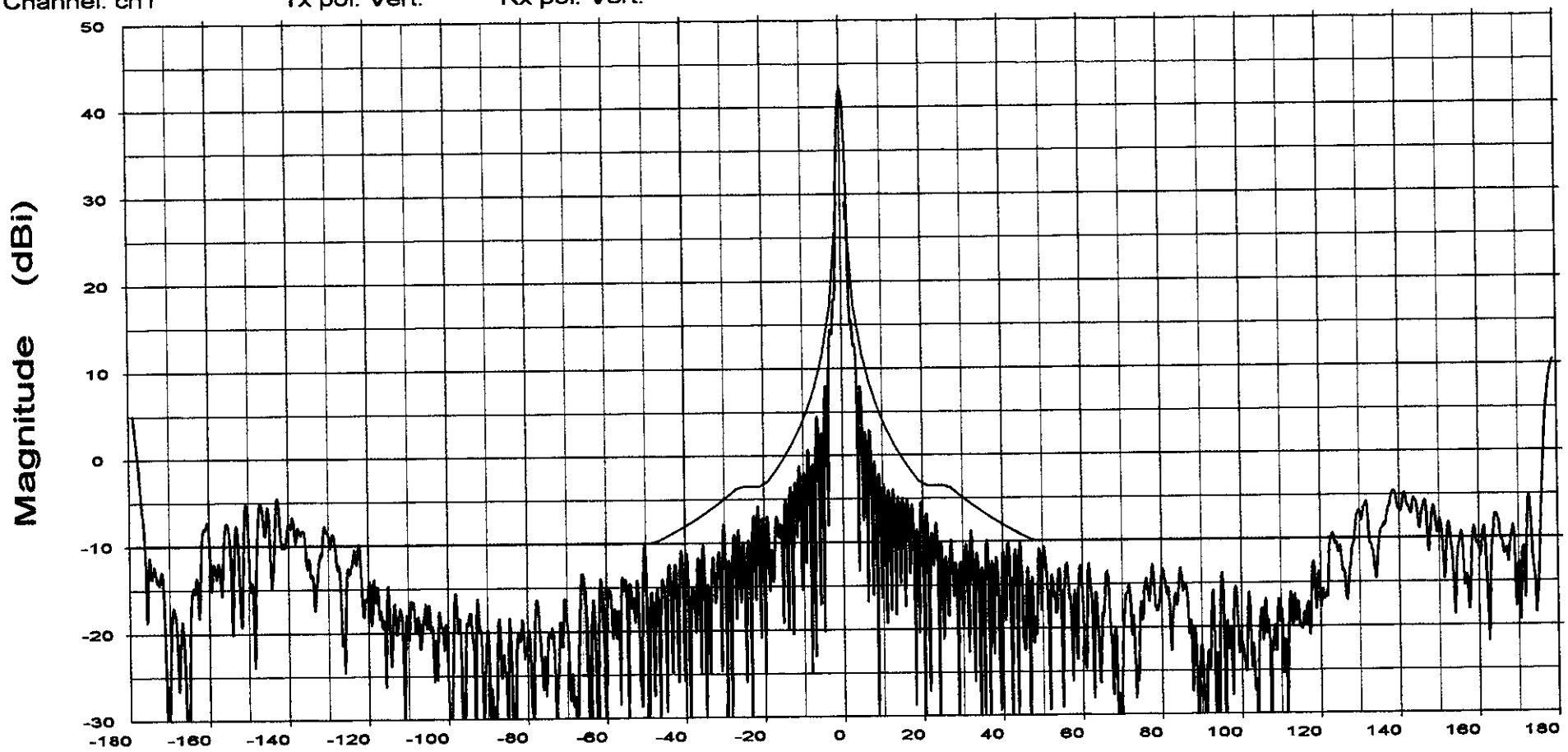
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 20 Deg
-3.5dBi~20 to 26.3 Deg | 32-25Log(Theta)~26.3 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104636.dat-ant_under_test ——	104636.dat	dBi	0.07	42.04

Prode Corporation
East len Test Range
Maiden NC

File: See Legend

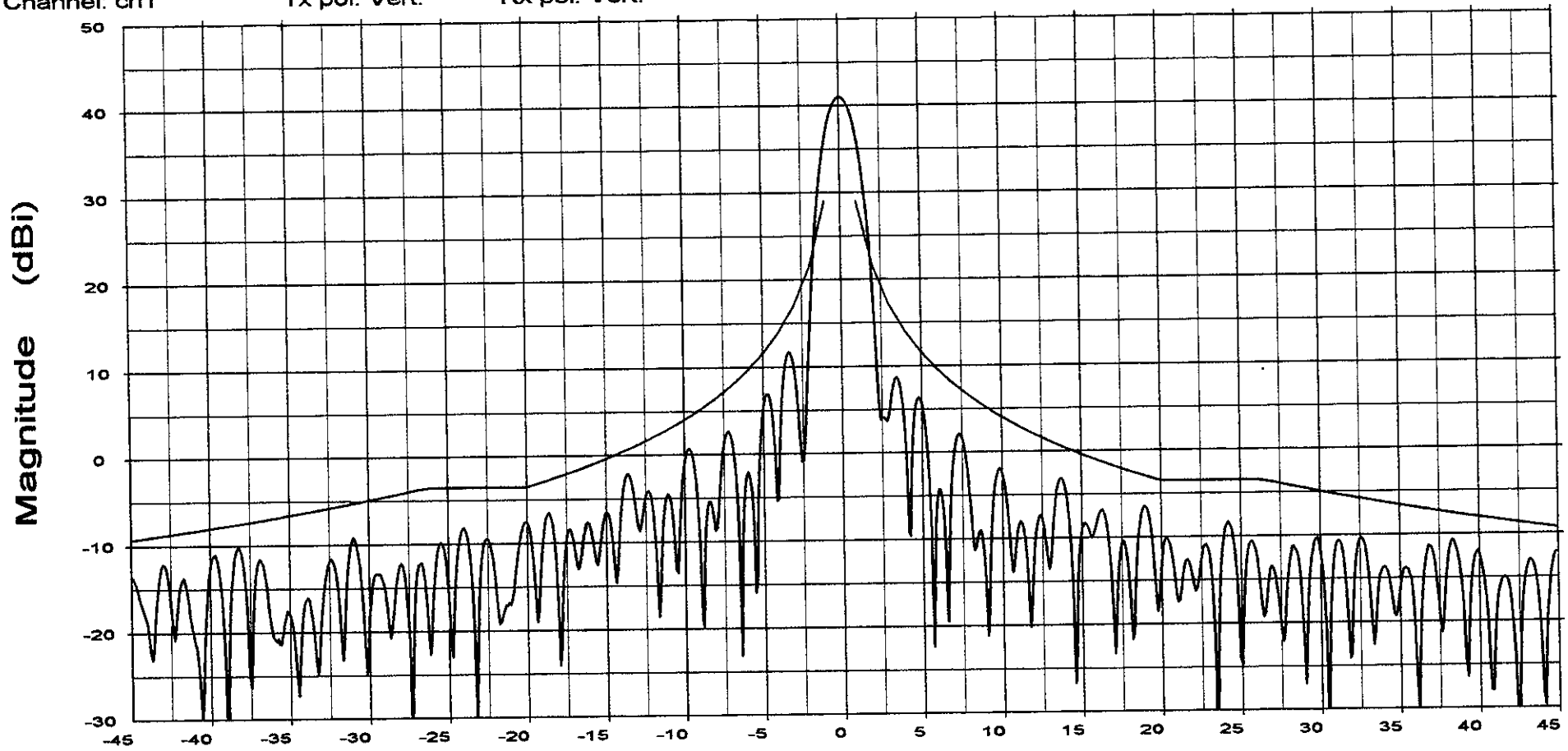
AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 20 Deg
−3.5dBi~20 to 26.3 Deg | 32−25Log(Theta)~26.3 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104636.dat-ant_under_test ——	104636.dat	dBi	0.00	41.01

Prode Corporation
East l len Test Range
Maiden NC

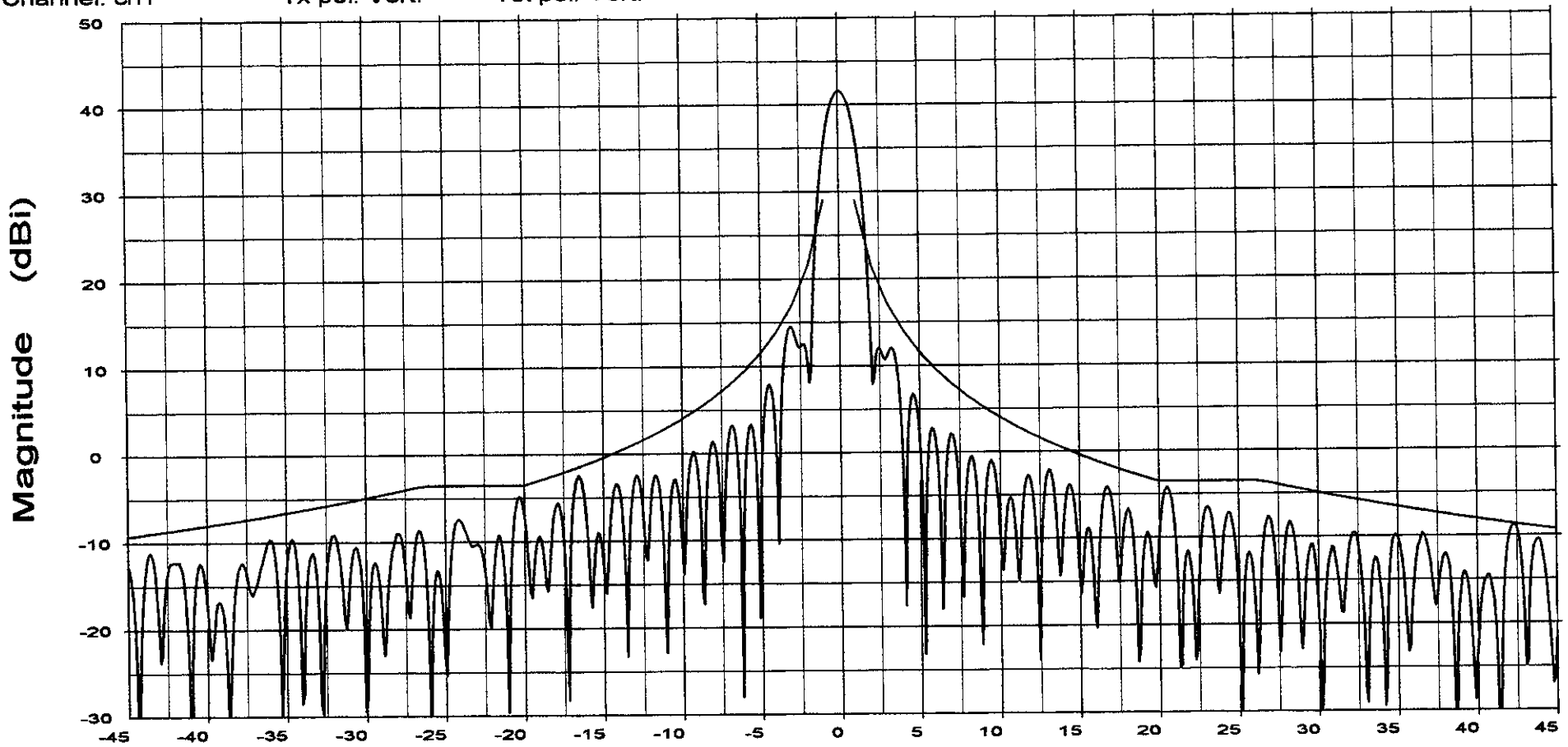
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 20 Deg
−3.5dBi~20 to 26.3 Deg | 32−25Log(Theta)~26.3 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays		Cal. file	units	Beam Peak Deg	Beam Peak dB
104636.dat-ant_under_test	——	104636.dat	dBi	0.04	41.56

Prode Corporation
East I len Test Range
Maiden NC

File: See Legend

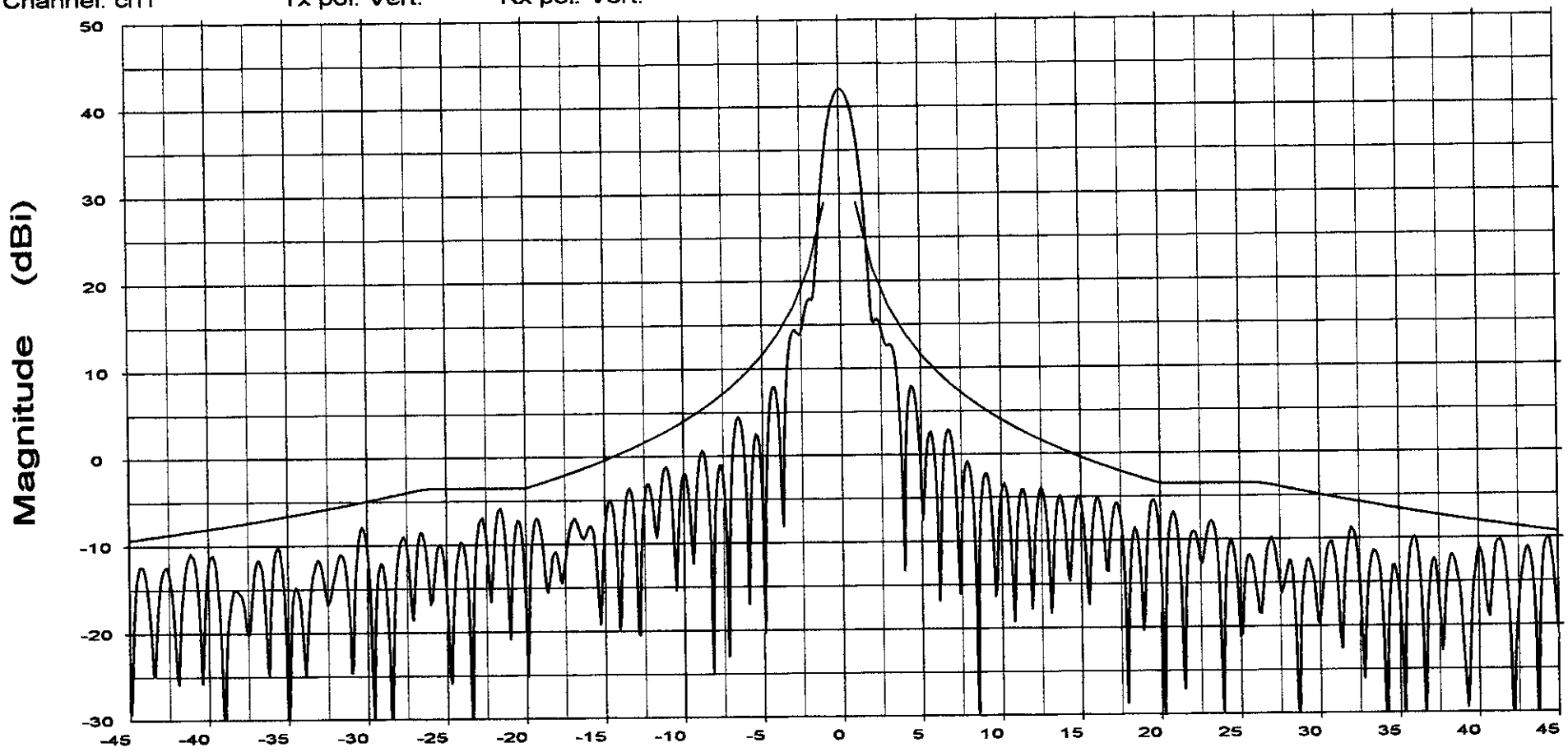
AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 20 Deg
−3.5dBi~20 to 26.3 Deg | 32−25Log(Theta)~26.3 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104636.dat-ant_under_test ——	104636.dat	dBi	0.07	42.04

Prode East Corporation
Test Range
Maiden NC

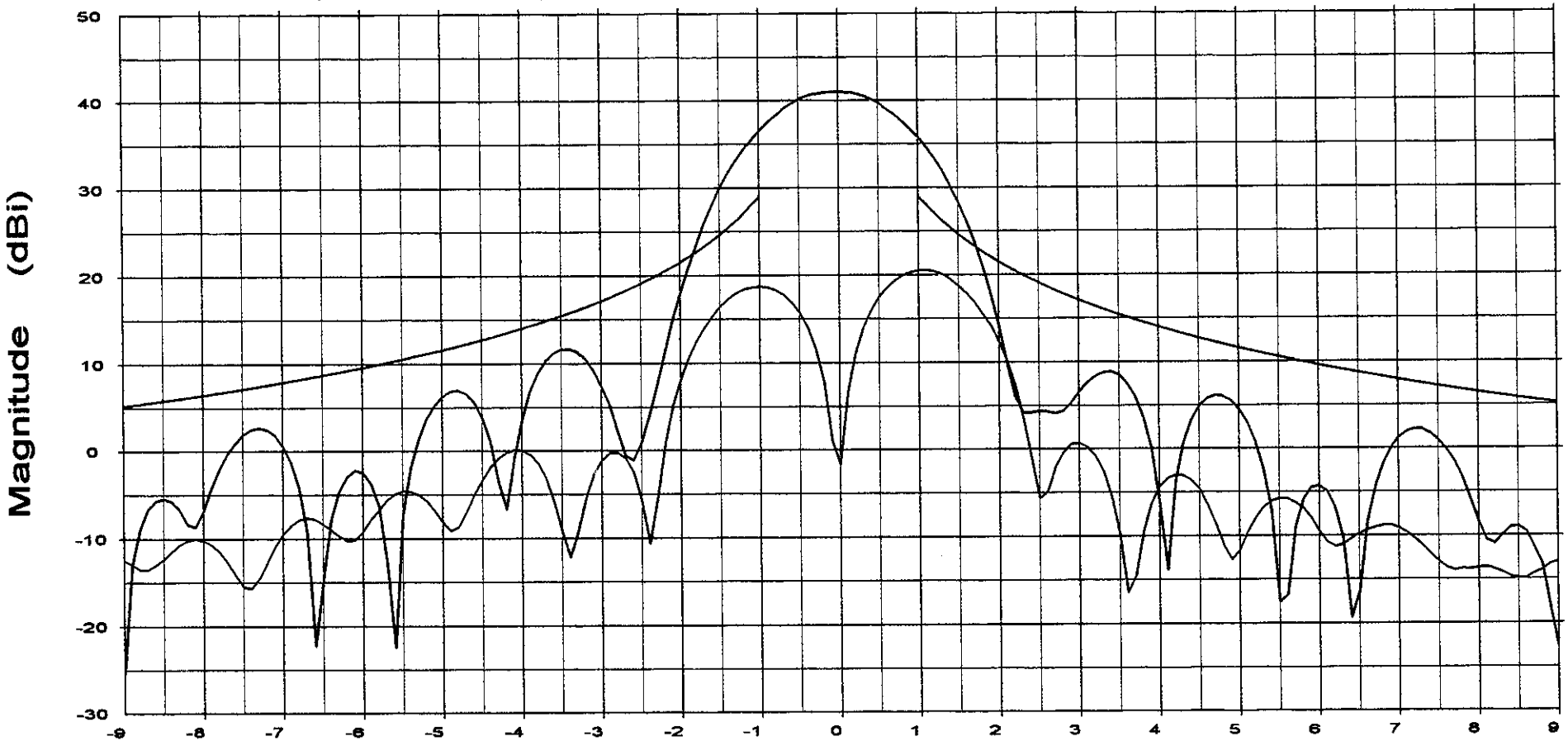
File: See Legend

AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 20 Deg
−3.5dBi~20 to 26.3 Deg | 32−25Log(Theta)~26.3 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104634.dat-ant_under_test ——	104634.dat	dBi	0.00	41.01
104639.dat-ant_under_test ——	104639.dat	dBi	1.01	20.46

Prode
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en Test Range
Maiden NC

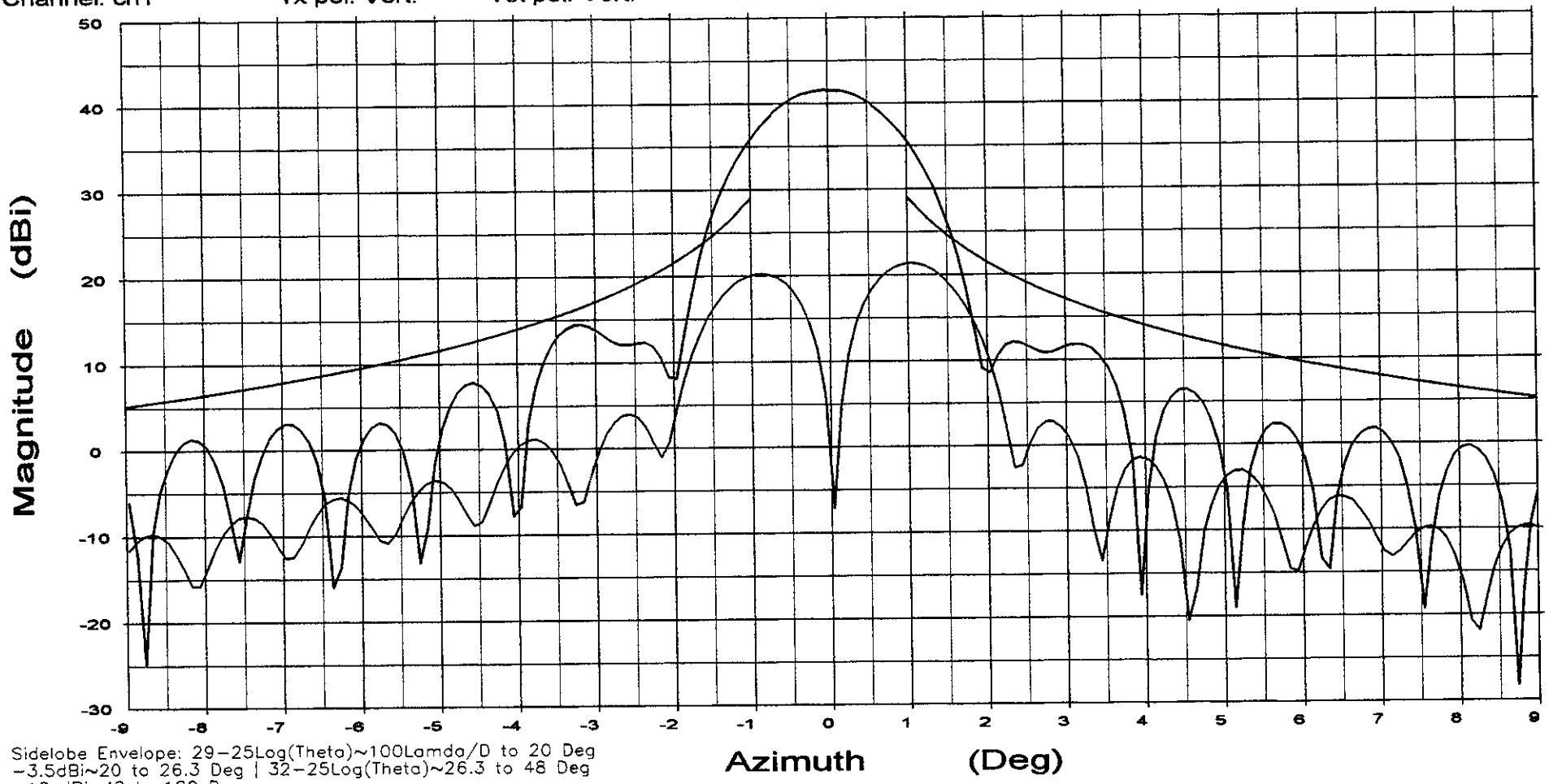
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~100Lamda/D to 20 Deg
−3.5dBi~20 to 26.3 Deg | 32−25Log(Theta)~26.3 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104634.dat-ant_under_test ——	104634.dat	dBi	-0.07	41.56
104639.dat-ant_under_test ——	104639.dat	dBi	1.04	21.30

Prode Corporation
East I ien Test Range
Maiden NC

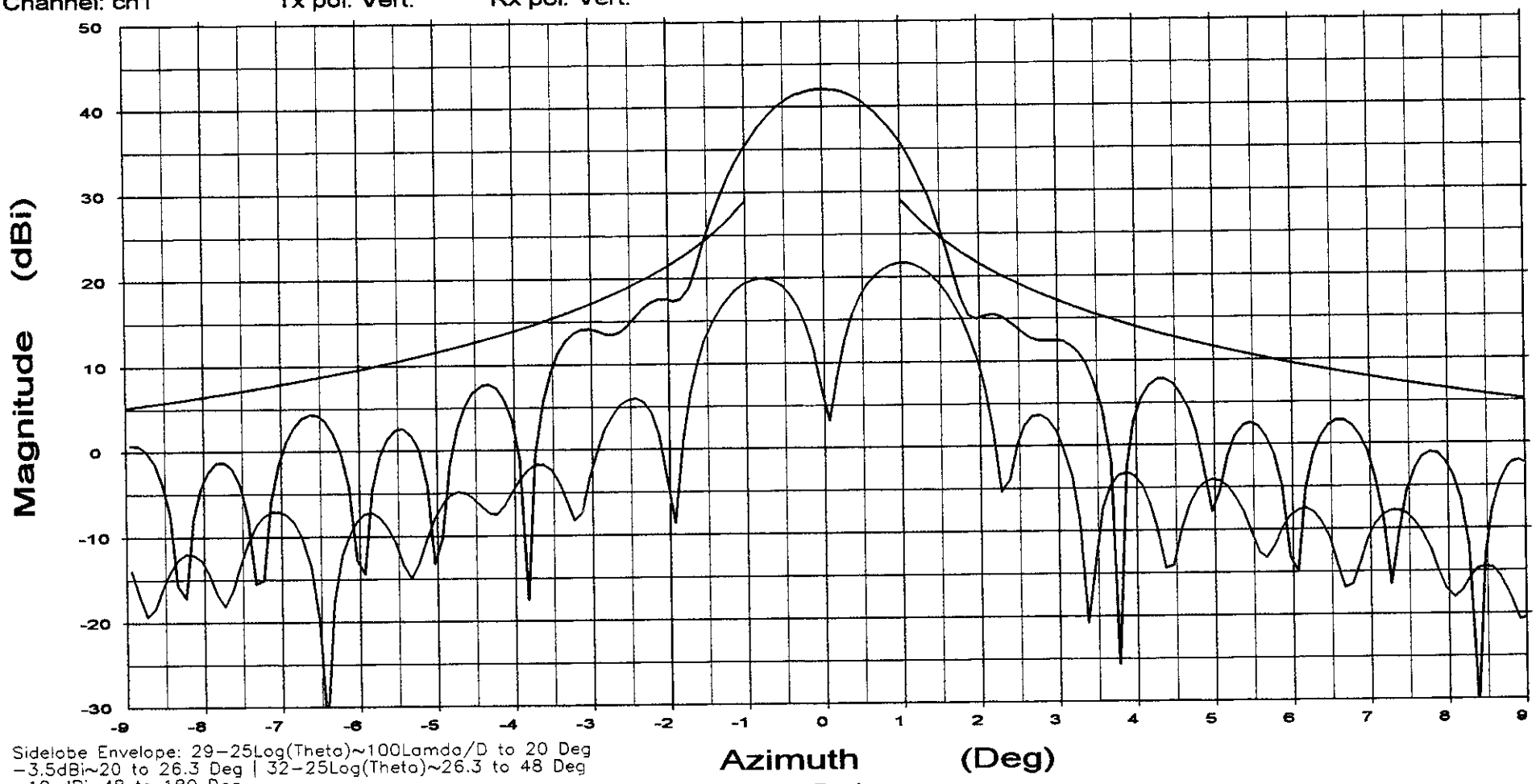
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~100Lamda/D to 20 Deg
-3.5dBi~20 to 26.3 Deg | 32-25Log(Theta)~26.3 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays		Cal. file	units	Beam Peak Deg	Beam Peak dB
104634.dat-ant_under_test	——	104634.dat	dBi	-0.04	42.04
104639.dat-ant_under_test	——	104639.dat	dBi	0.96	21.56

Prode Corporation
East len Test Range
Maiden NC

File: See Legend

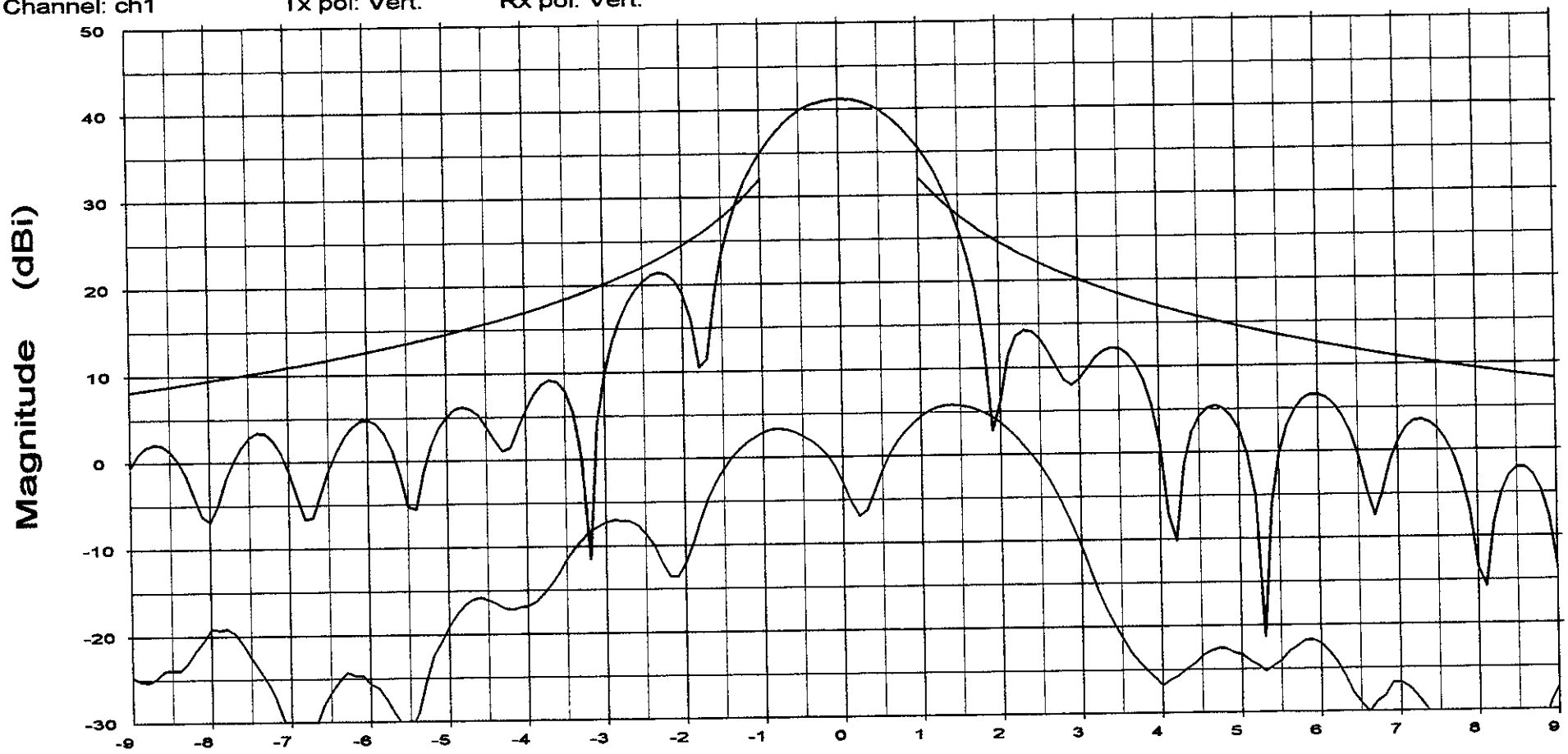
AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32−25Log(Theta)~100Lamda/D to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
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104640.dat-ant_under_test ——	104640.dat	dBi	1.40	5.74

Prode[illegible] Corporation
East [illegible]len Test Range
Maiden NC

File: See Legend

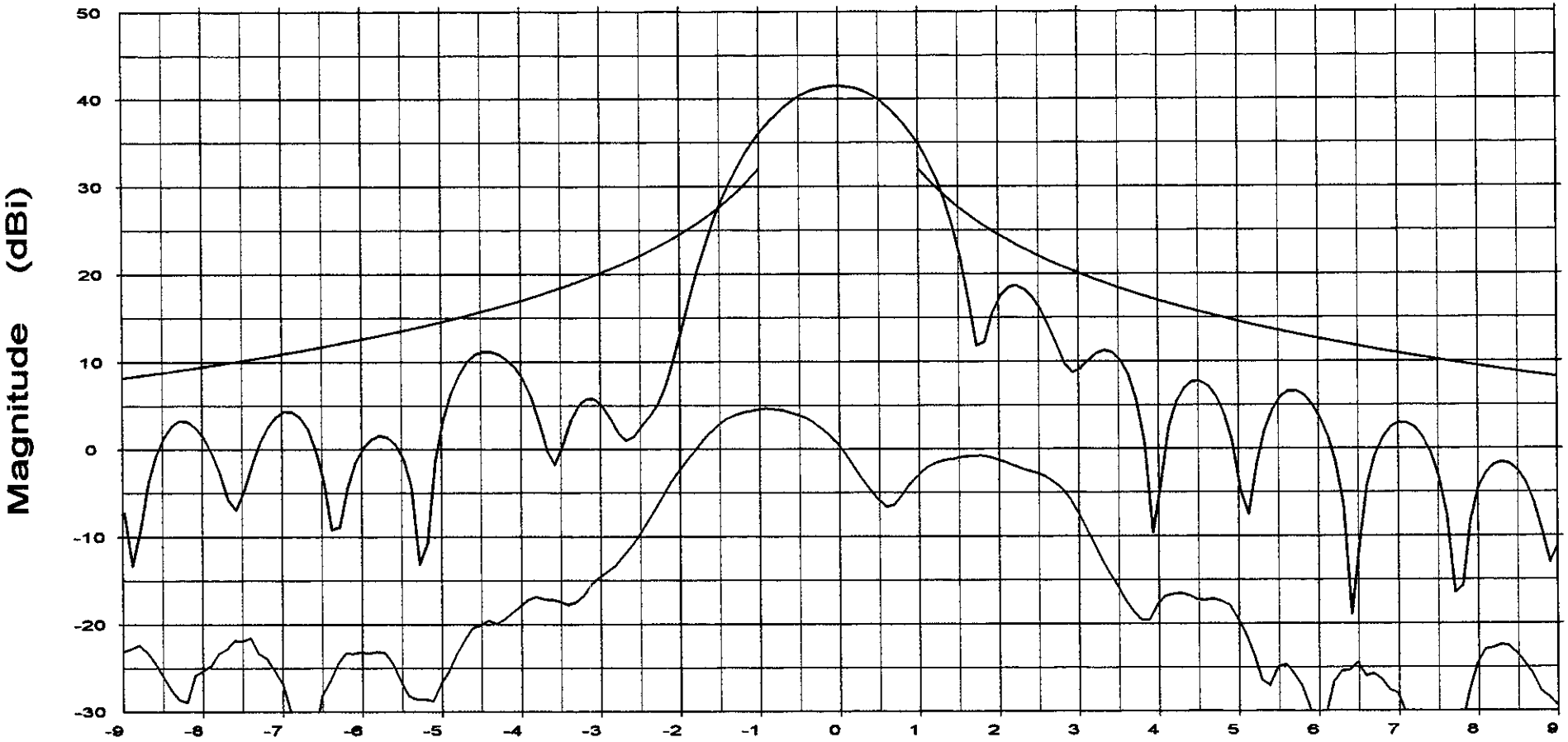
AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104635.dat-ant_under_test ——	104635.dat	dBi	0.03	41.46
104640.dat-ant_under_test ——	104640.dat	dBi	-0.93	4.59

Prode Corporation
East len Test Range
Maiden NC

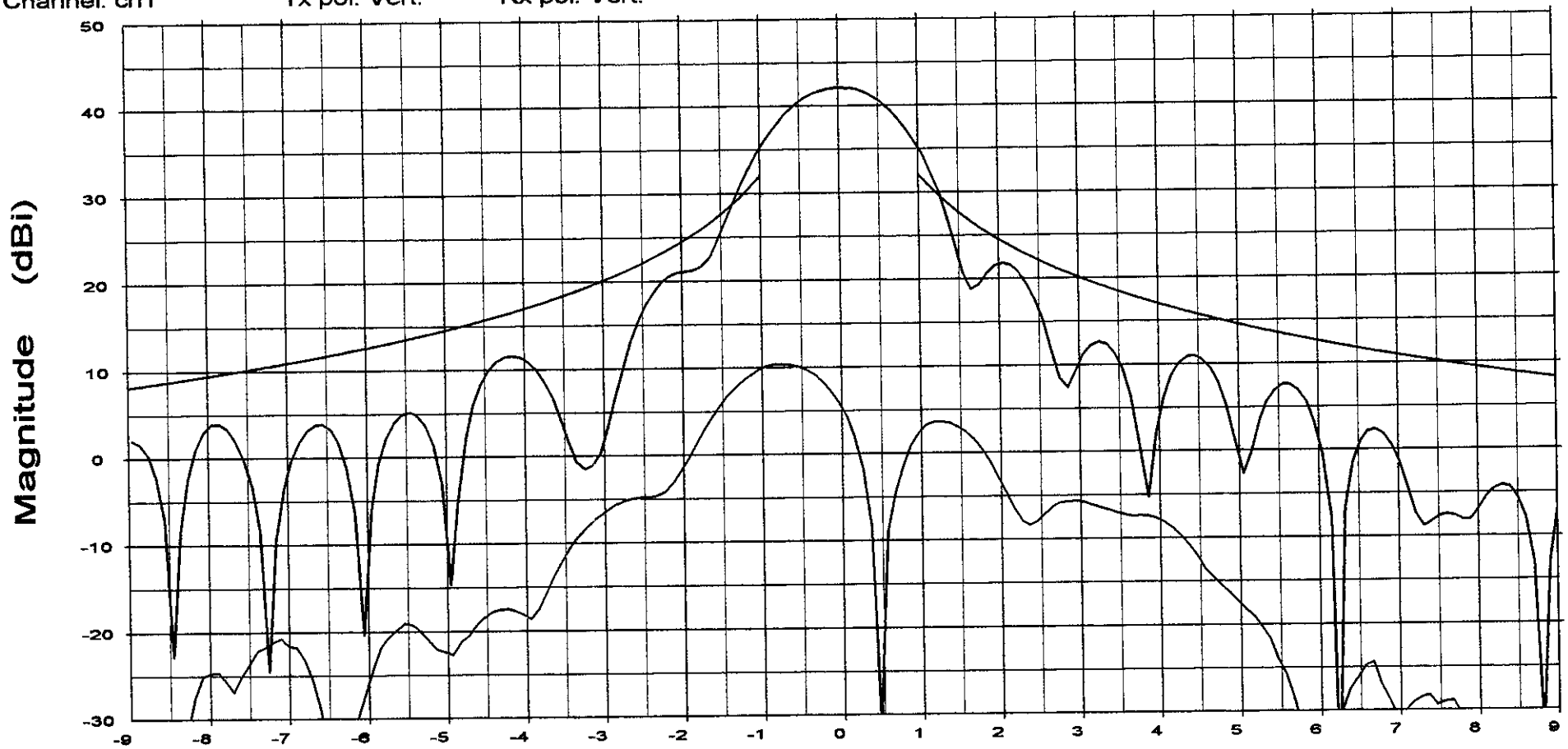
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 32−25Log(Theta)~100Lamda/D to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104635.dat-ant_under_test ——	104635.dat	dBi	0.05	42.08
104640.dat-ant_under_test ——	104640.dat	dBi	-0.85	10.31

Prode[illegible] Corporation
East [illegible]den Test Range
Maiden NC

File: See Legend

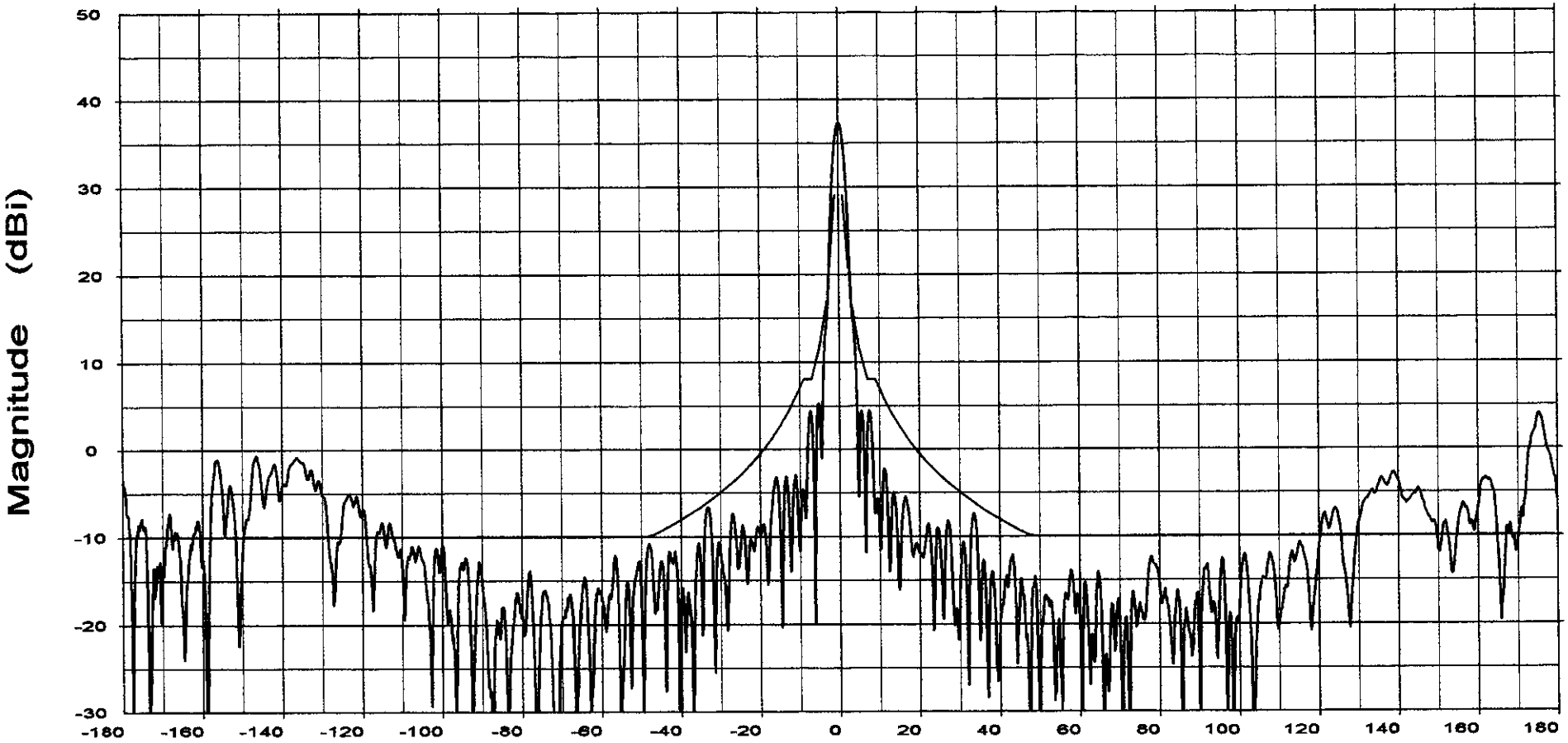
AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104665.dat-ant_under_test ——	104665.dat	dBi	0.00	37.35

Prode Corporation
East M en Test Range
Maiden NC

File: See Legend

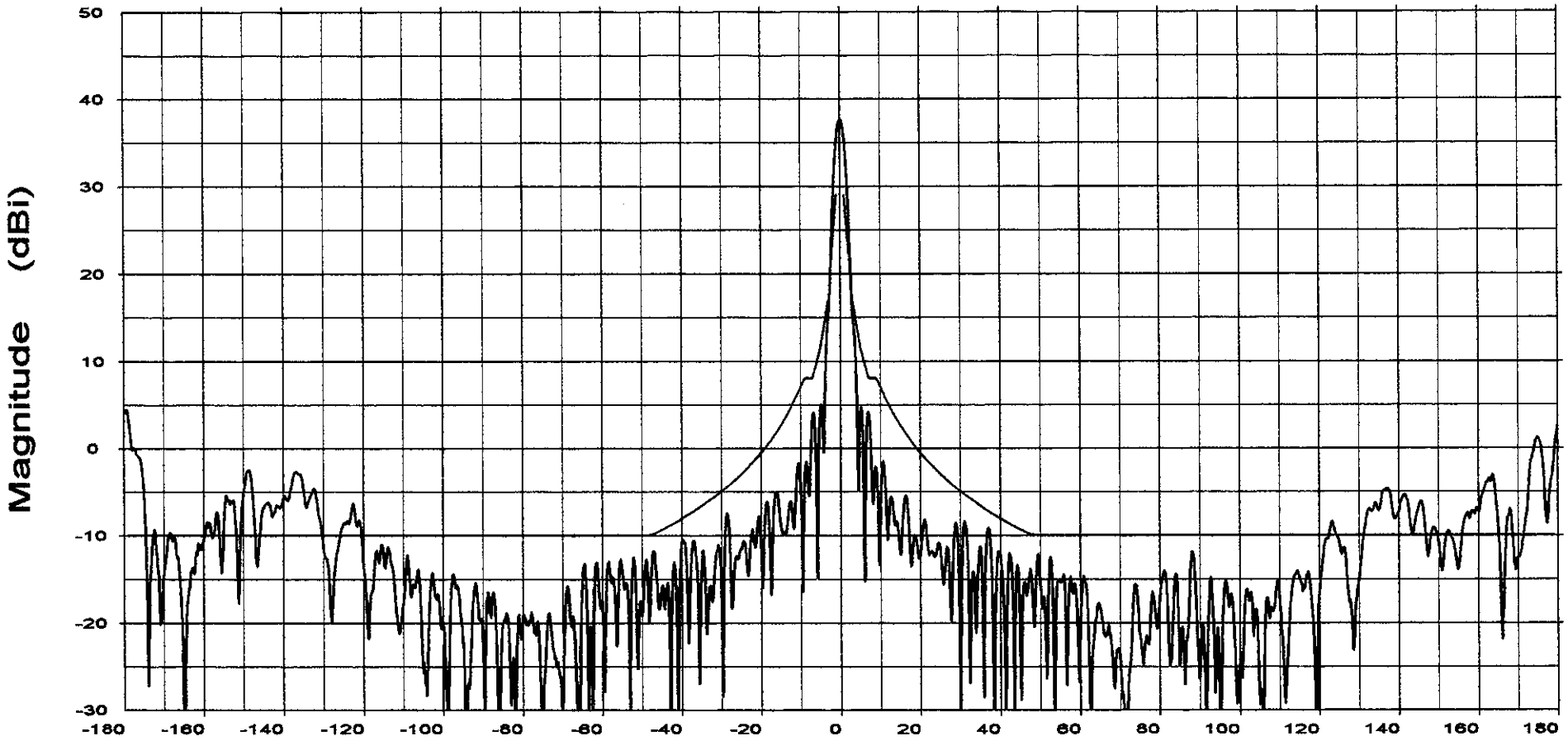
AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104665.dat-ant_under_test ——	104665.dat	dBi	-0.03	37.68

Prode Corporation
East N en Test Range
Maiden NC

File: See Legend

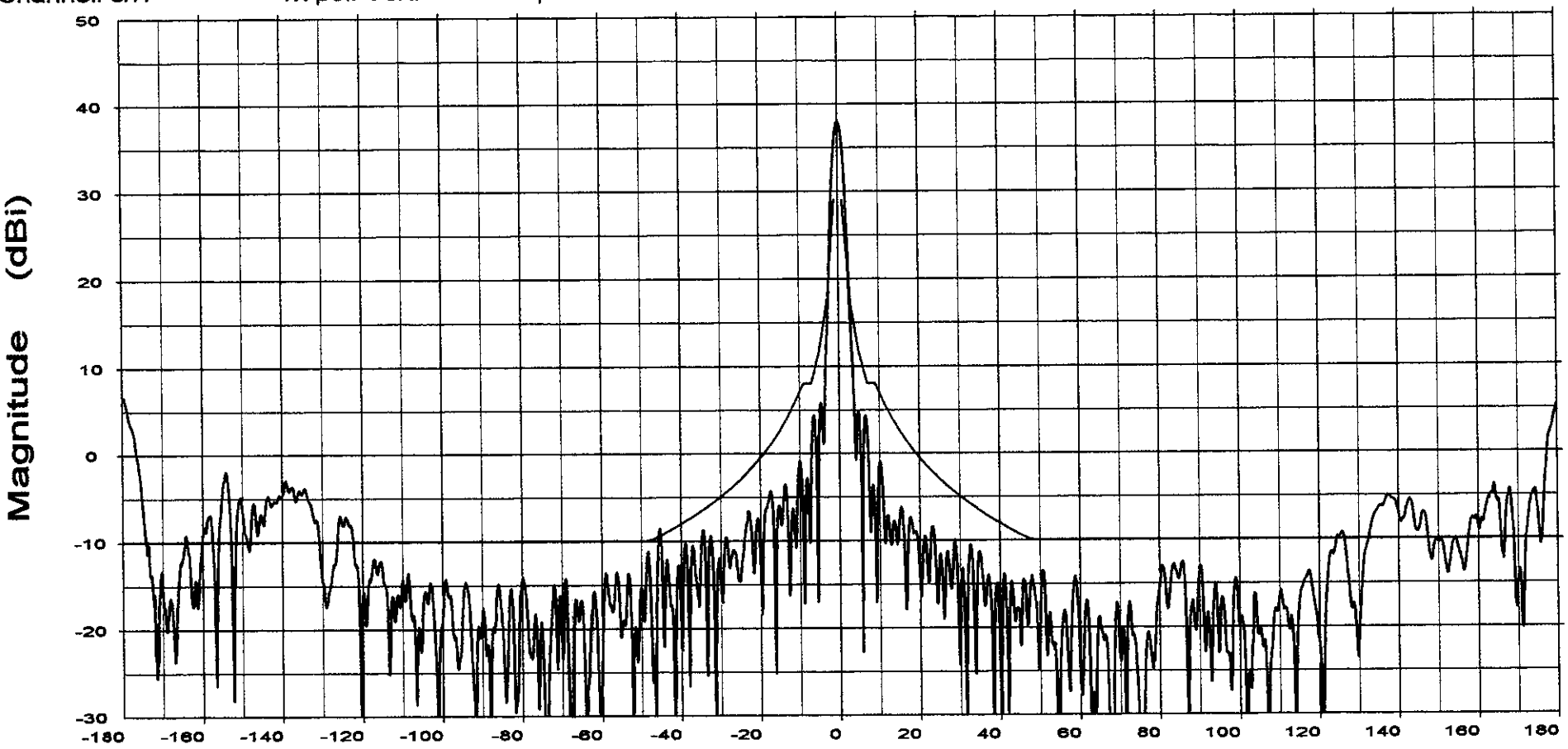
AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104665.dat-ant_under_test ——	104665.dat	dBi	0.04	38.00

Prode Corporation
East Ien Test Range
Maiden NC

File: See Legend

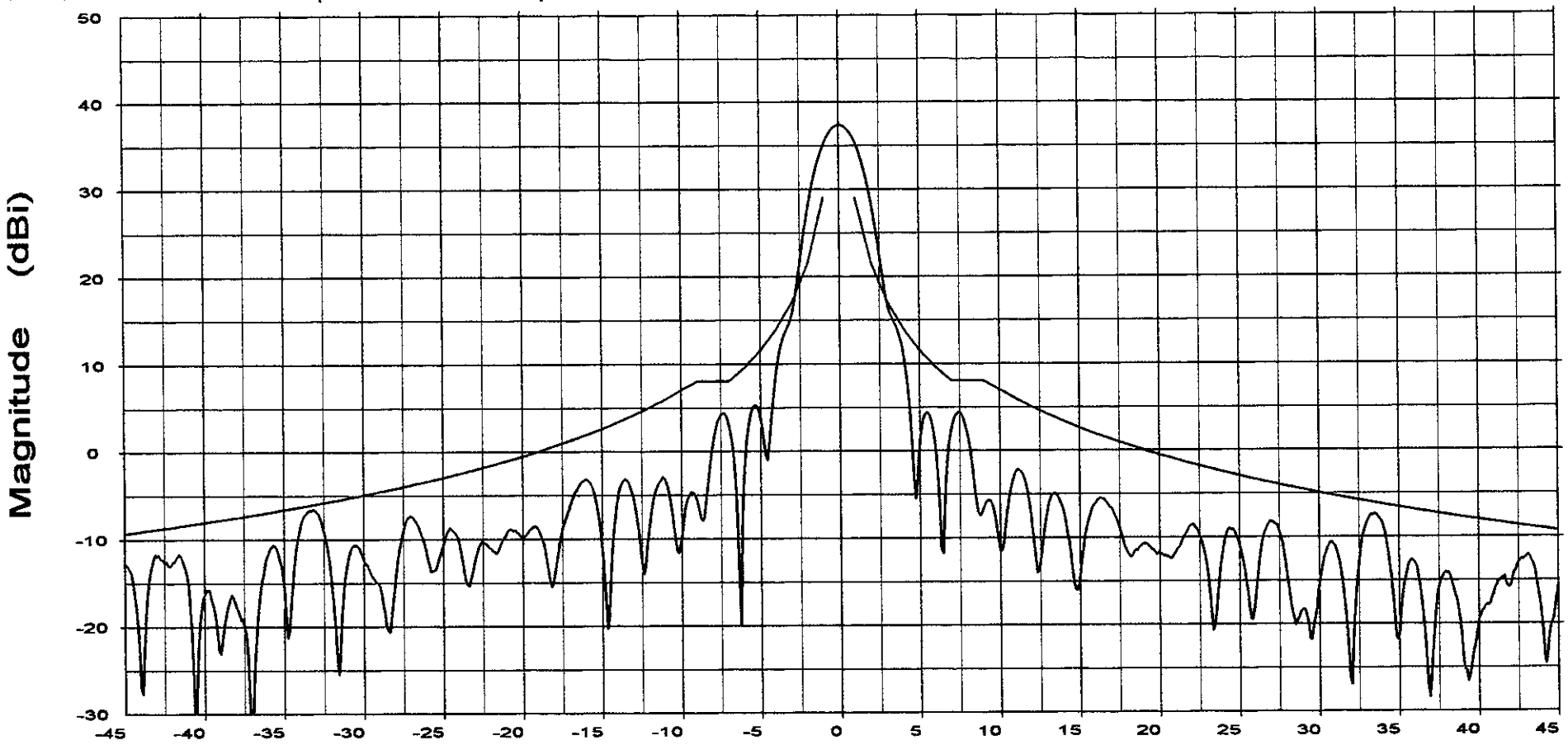
AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104665.dat-ant_under_test ——	104665.dat	dBi	0.00	37.35

Prode Corporation
East I ,en Test Range
Maiden NC

File: See Legend

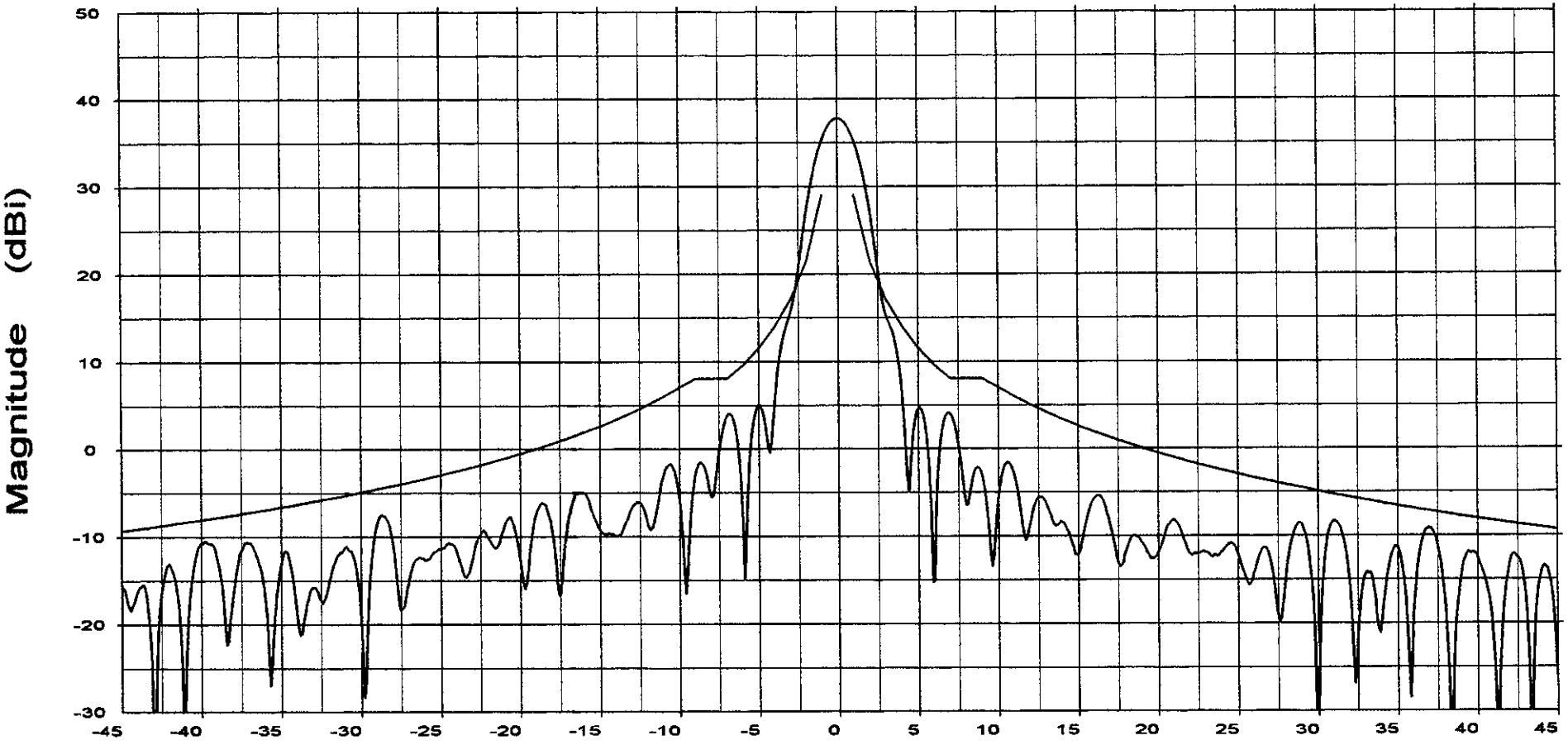
AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104665.dat-ant_under_test ——	104665.dat	dBi	-0.03	37.68

Prode Corporation
East M en Test Range
Maiden NC

File: See Legend

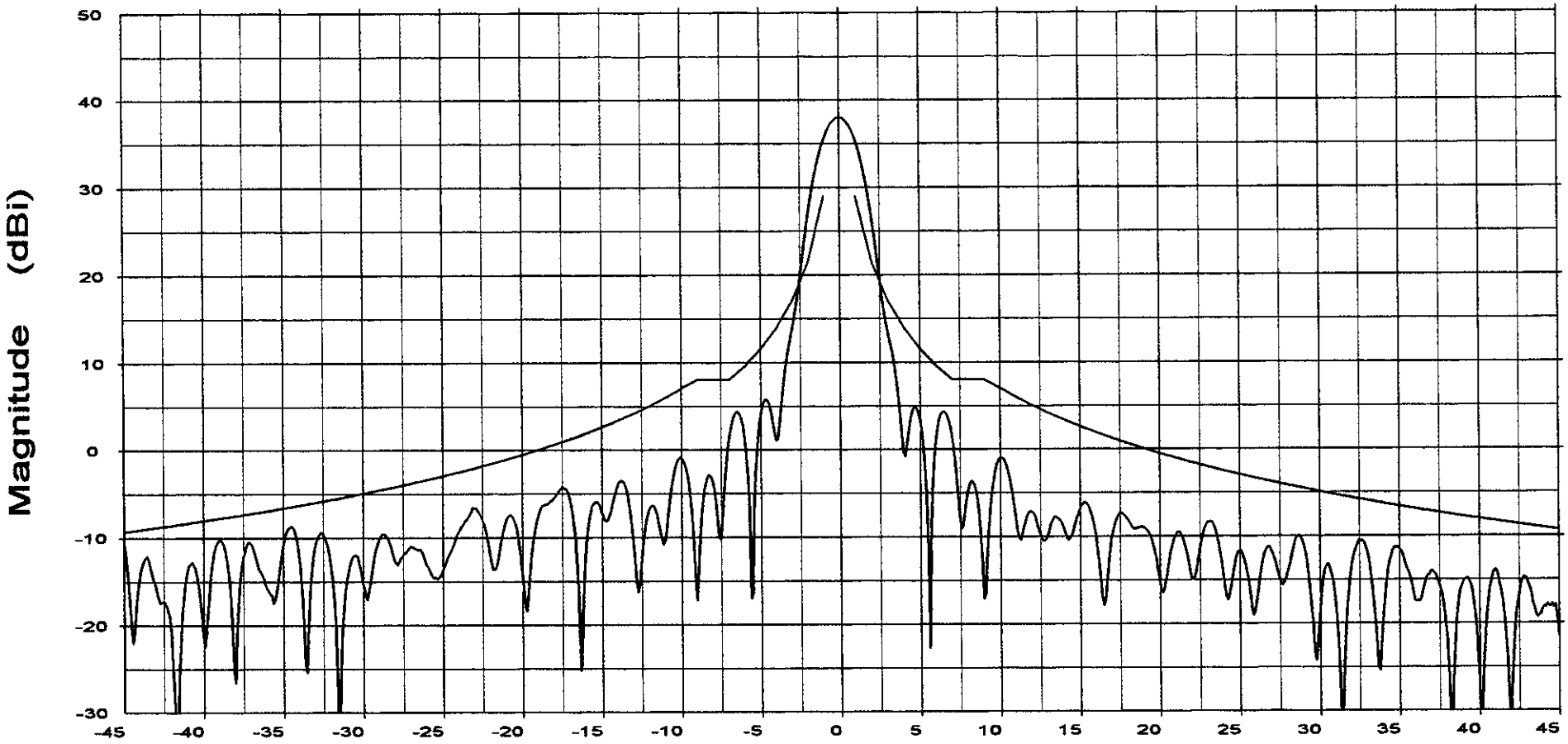
AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104665.dat-ant_under_test ——	104665.dat	dBi	0.04	38.00

Prode Corporation
East M en Test Range
Maiden NC

File: See Legend

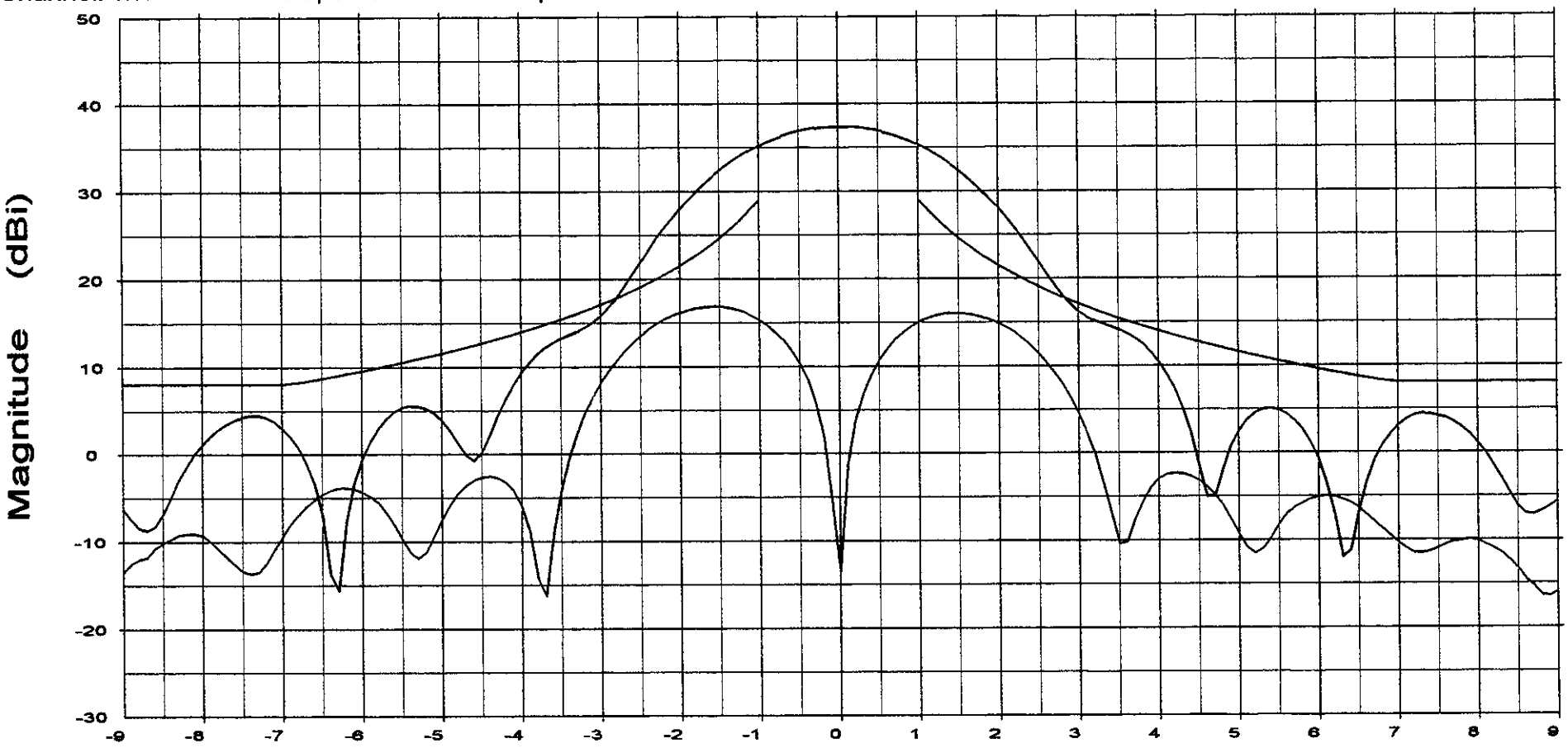
AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104666.dat-ant_under_test ——	104666.dat	dBi	0.00	37.35
104671.dat-ant_under_test ——	104671.dat	dBi	-1.60	16.81

Prode Corporation
East M en Test Range
Maiden NC

File: See Legend

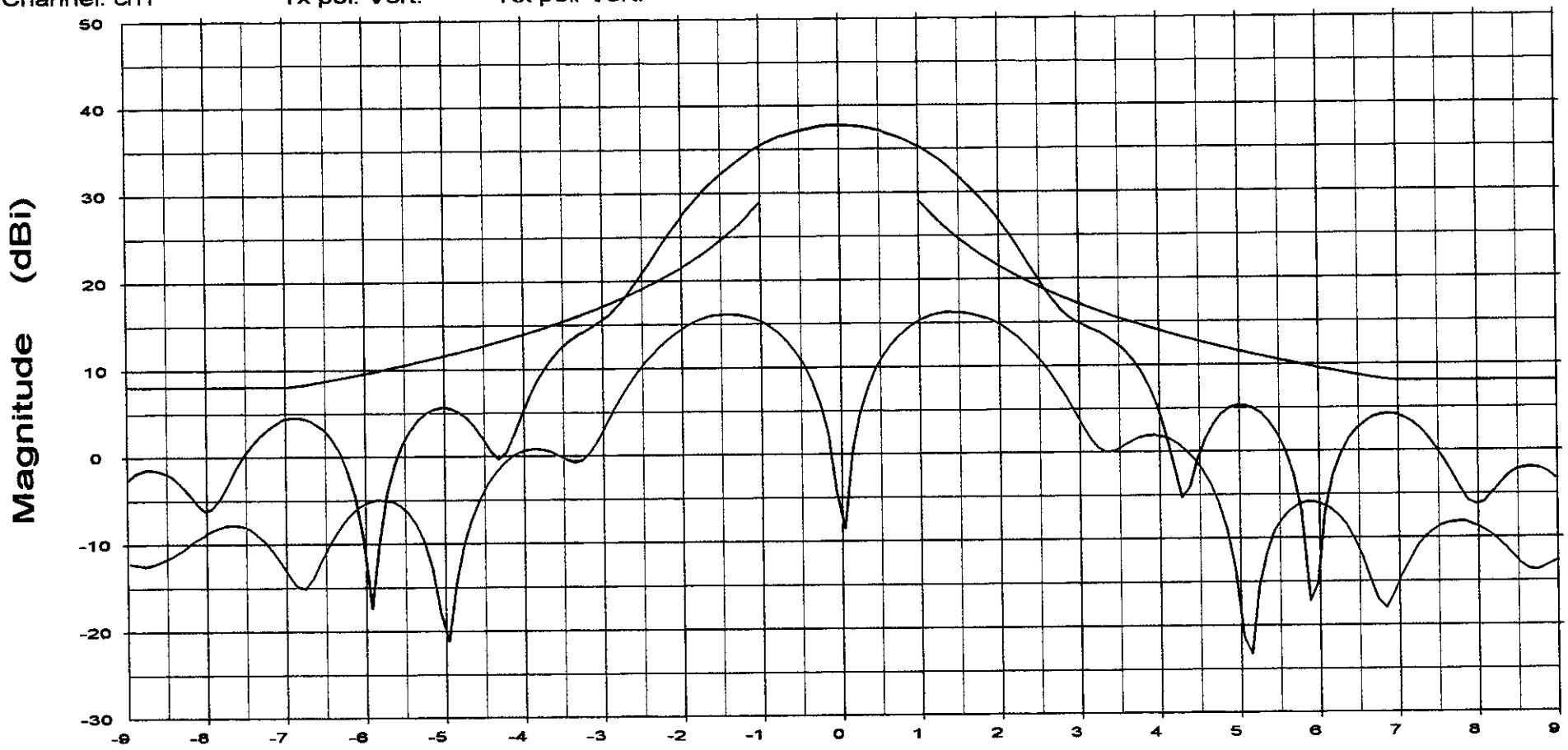
AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104666.dat-ant_under_test ——	104666.dat	dBi	-0.03	37.68
104669.dat-ant_under_test ——	104669.dat	dBi	1.43	16.19

Prode Corporation
East I len Test Range
Maiden NC

File: See Legend

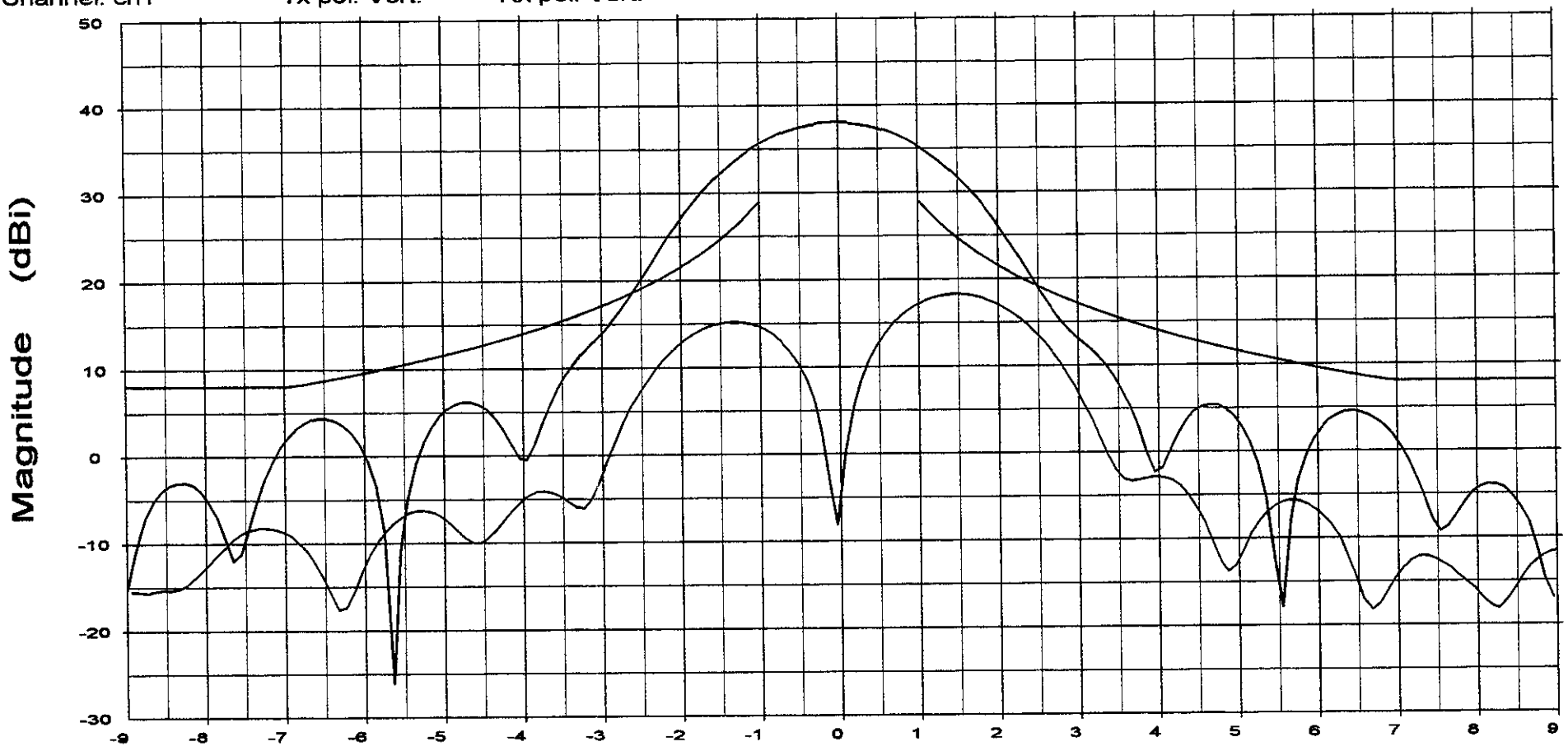
AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104666.dat-ant_under_test ——	104666.dat	dBi	-0.05	38.00
104670.dat-ant_under_test ——	104670.dat	dBi	1.46	18.18

Prode Corporation
East I en Test Range
Maiden NC

File: See Legend

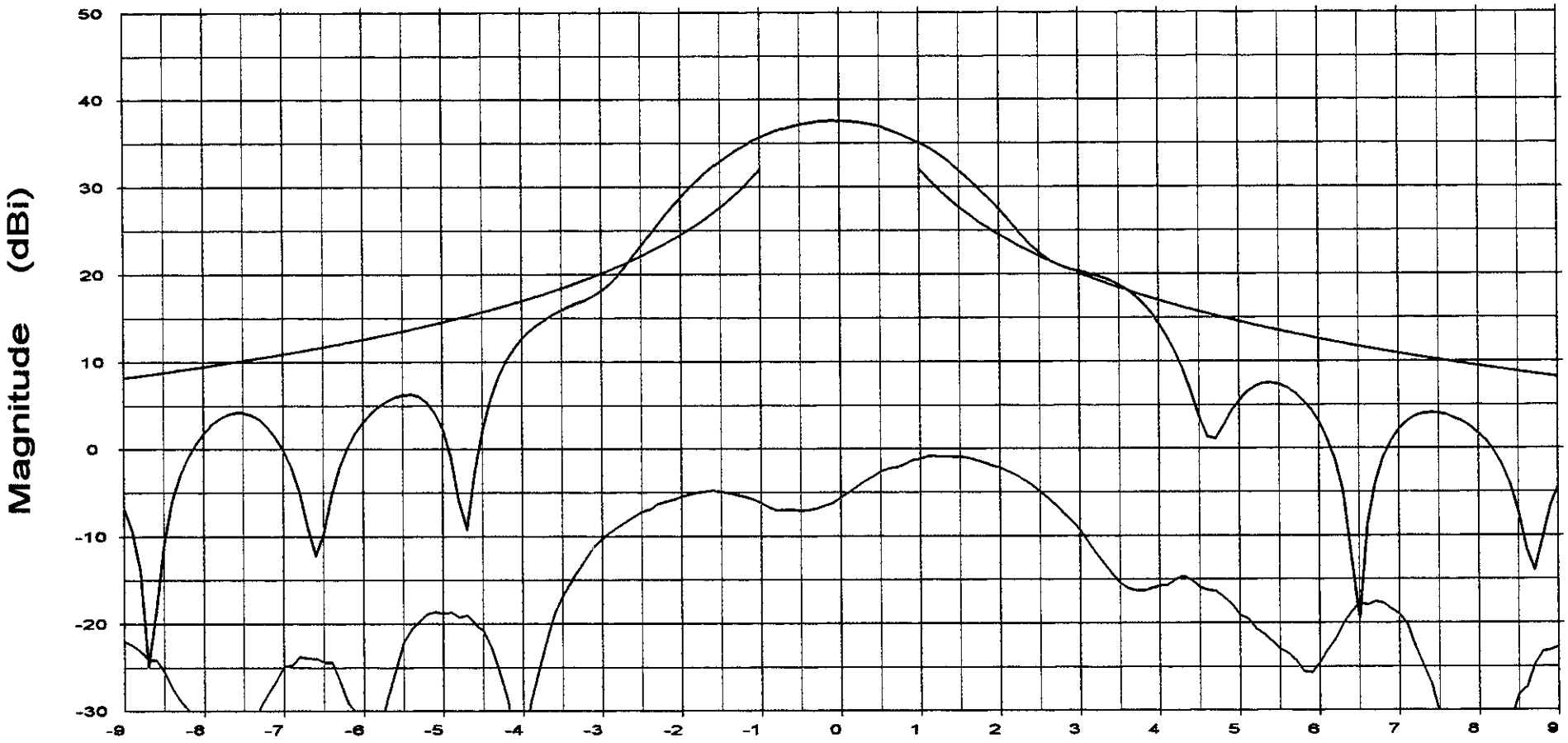
AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104667.dat-ant_under_test ——	104667.dat	dBi	-0.10	37.51
104672.dat-ant_under_test ——	104672.dat	dBi	1.10	-0.92

Prode Corporation
East I .en Test Range
Maiden NC

File: See Legend

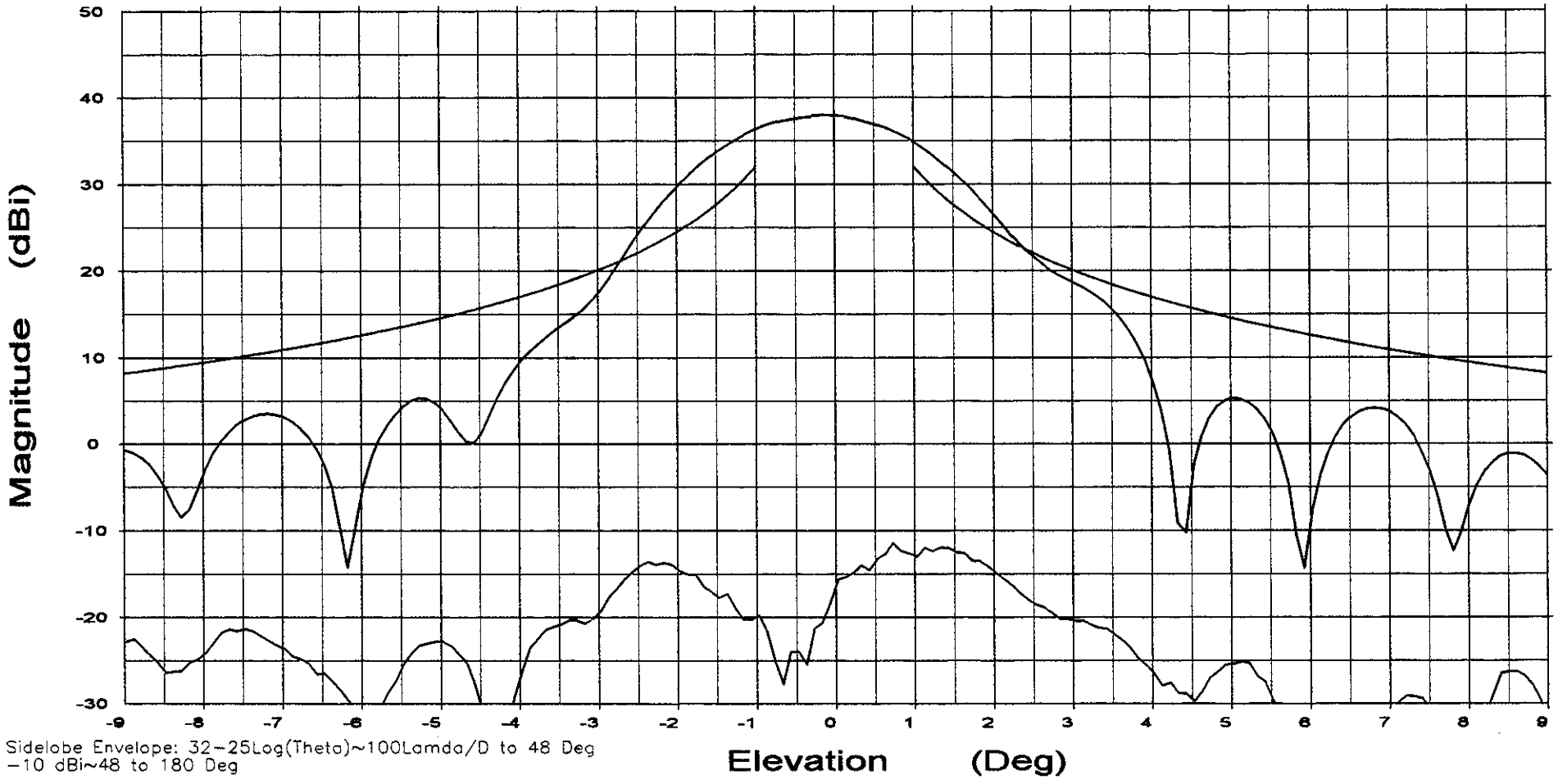
AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104667.dat-ant_under_test ——	104667.dat	dBi	-0.08	37.88
104673.dat-ant_under_test ——	104673.dat	dBi	0.72	-11.52

Prode Corporation
East N en Test Range
Maiden NC

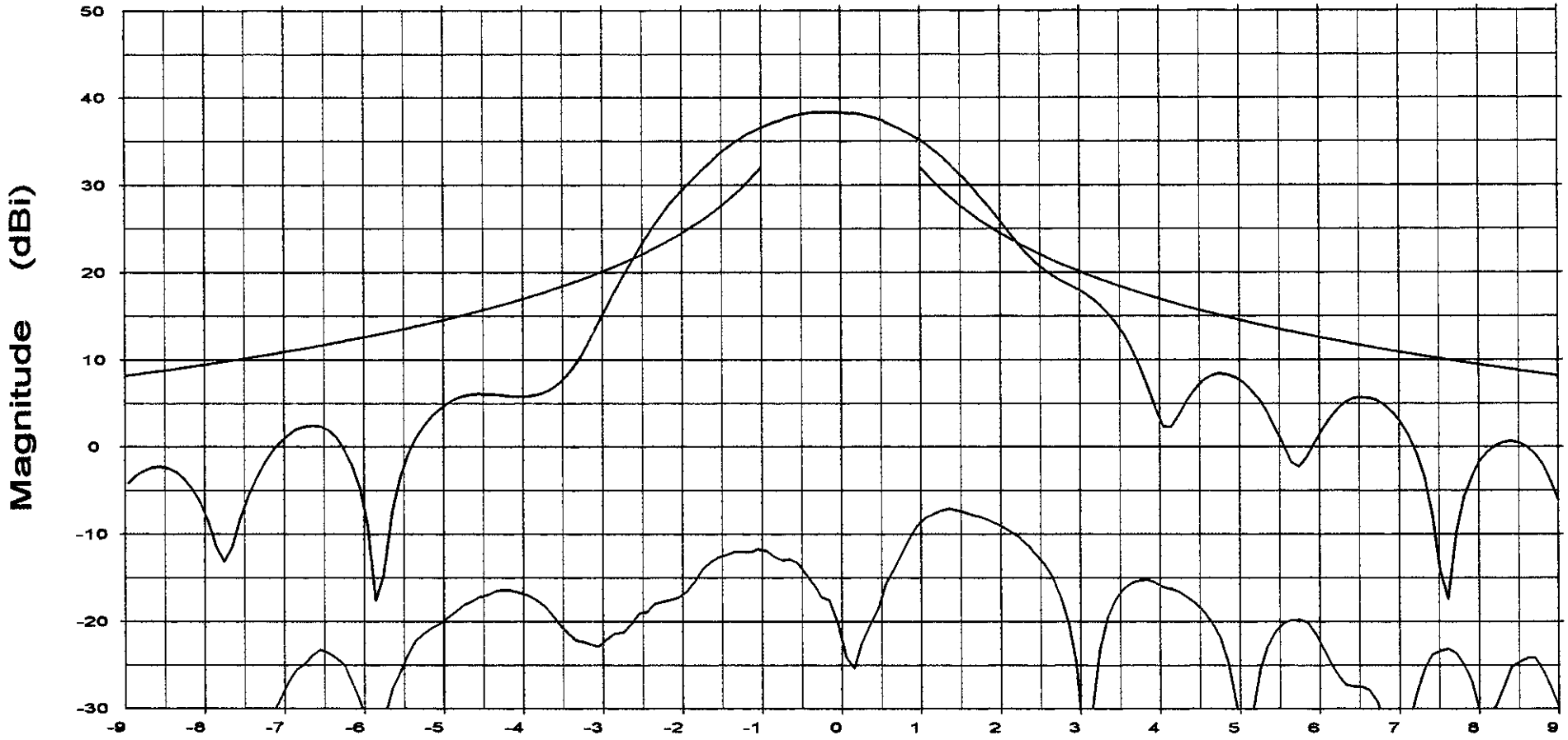
File: See Legend

AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104667.dat-ant_under_test ——	104667.dat	dBi	-0.16	38.32
104674.dat-ant_under_test ——	104674.dat	dBi	1.35	-7.20

Prode Corporation
East M en Test Range
Maiden NC

File: See Legend

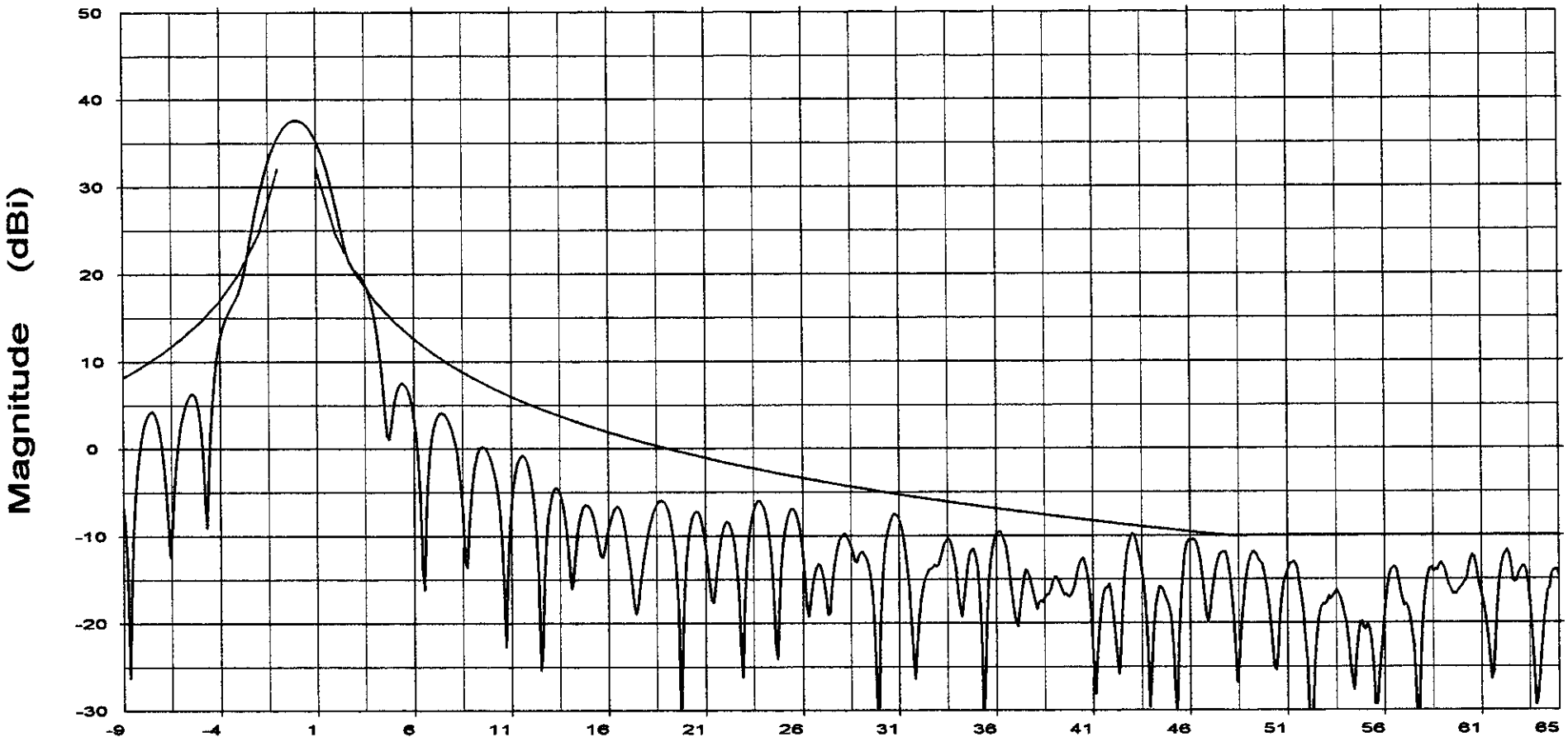
AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104668.dat-ant_under_test ——	104668.dat	dBi	-0.10	37.51

Prode
East M

Corporation
en Test Range
Maiden NC

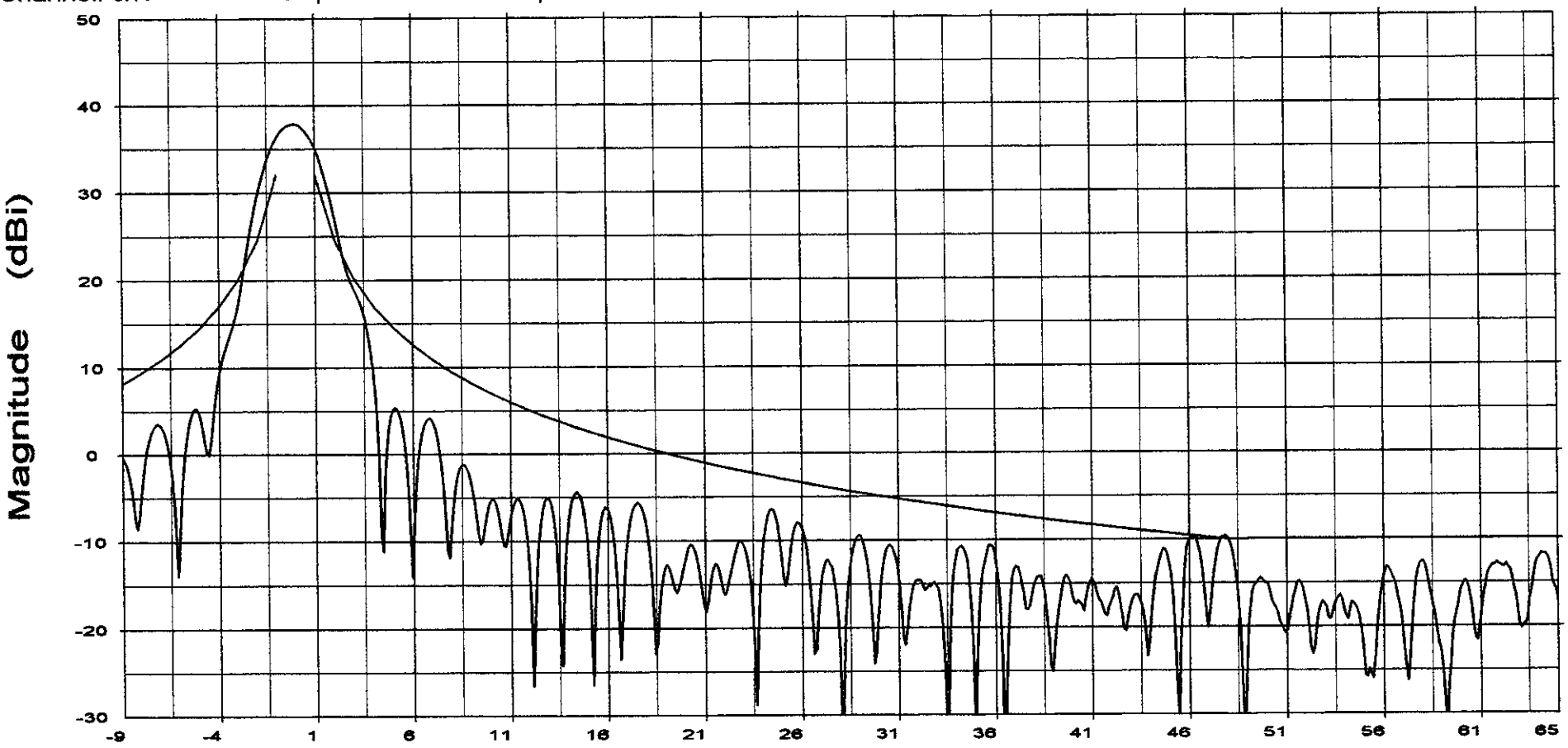
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104668.dat-ant_under_test ——	104668.dat	dBi	-0.08	37.88

Prode
East M

Corporation
en Test Range
Maiden NC

File: See Legend

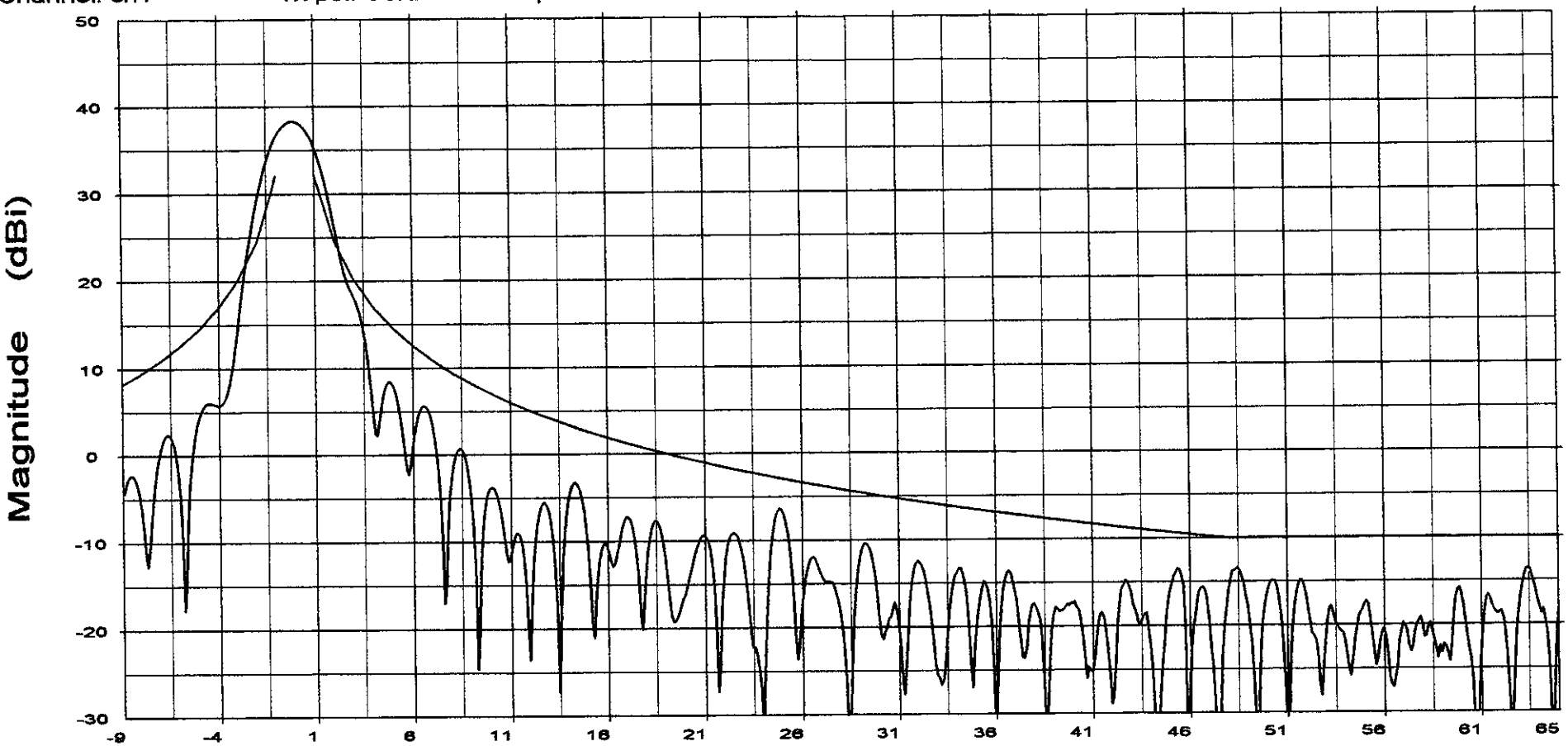
AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104668.dat-ant_under_test ——	104668.dat	dBi	-0.15	38.32

Prode Corporation
East I ien Test Range
Maiden NC

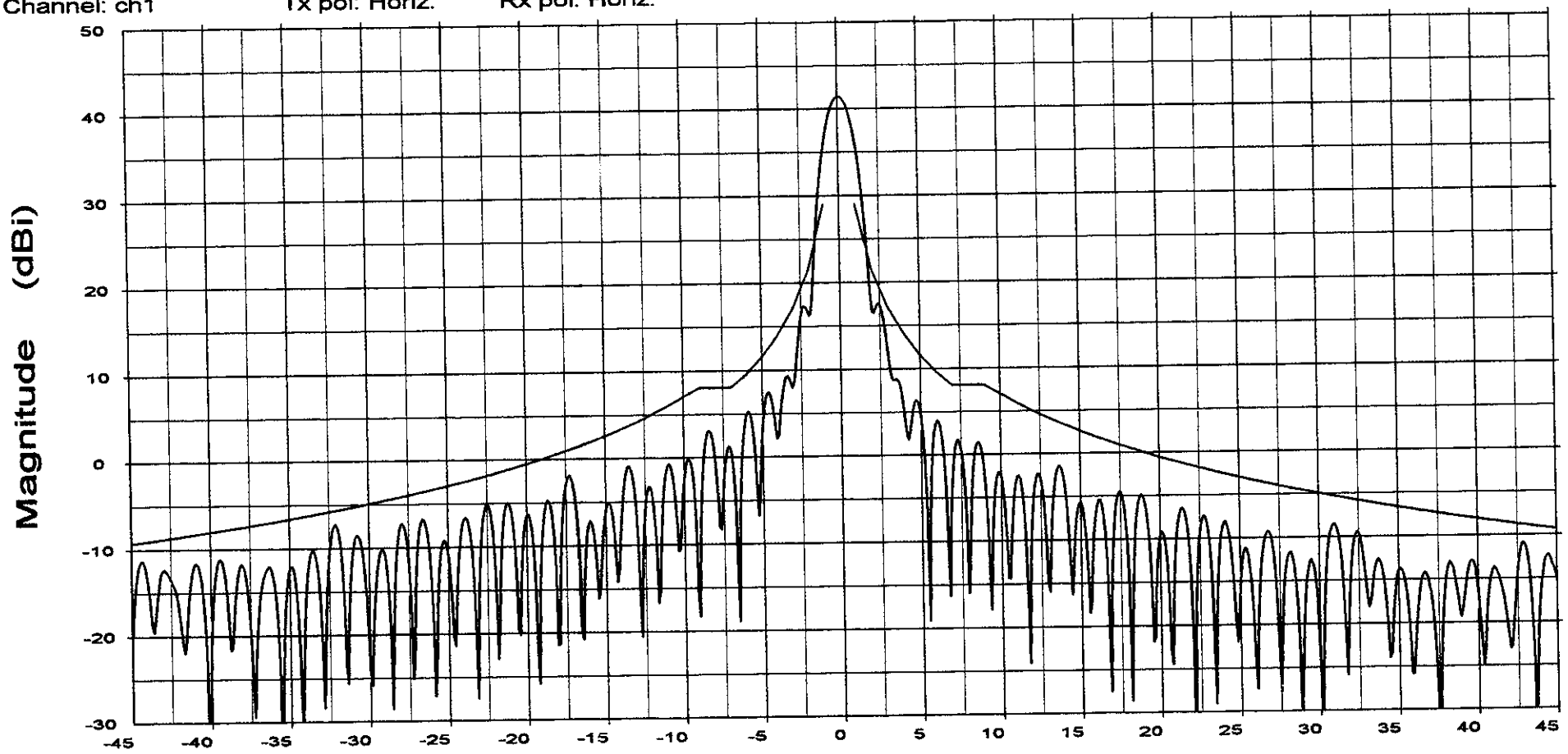
File: See Legend

AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104645.dat-ant_under_test ——	104645.dat	dBi	0.10	41.29

Prodel'n Corporation
East ' len Test Range
Maiden NC

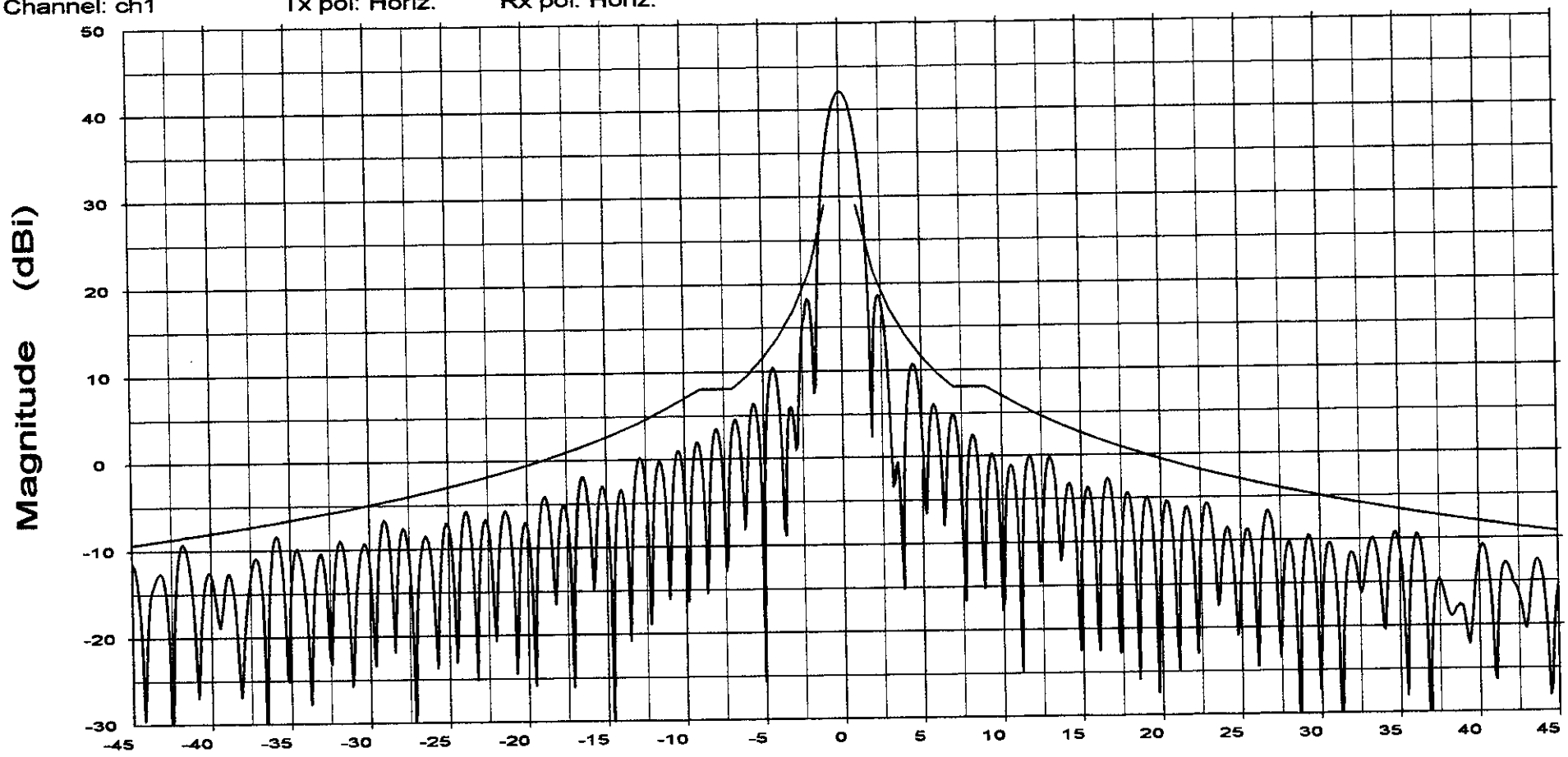
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104645.dat-ant_under_test ——	104645.dat	dBi	0.03	41.96

Prodelin Corporation
East [illegible]len Test Range
Maiden NC

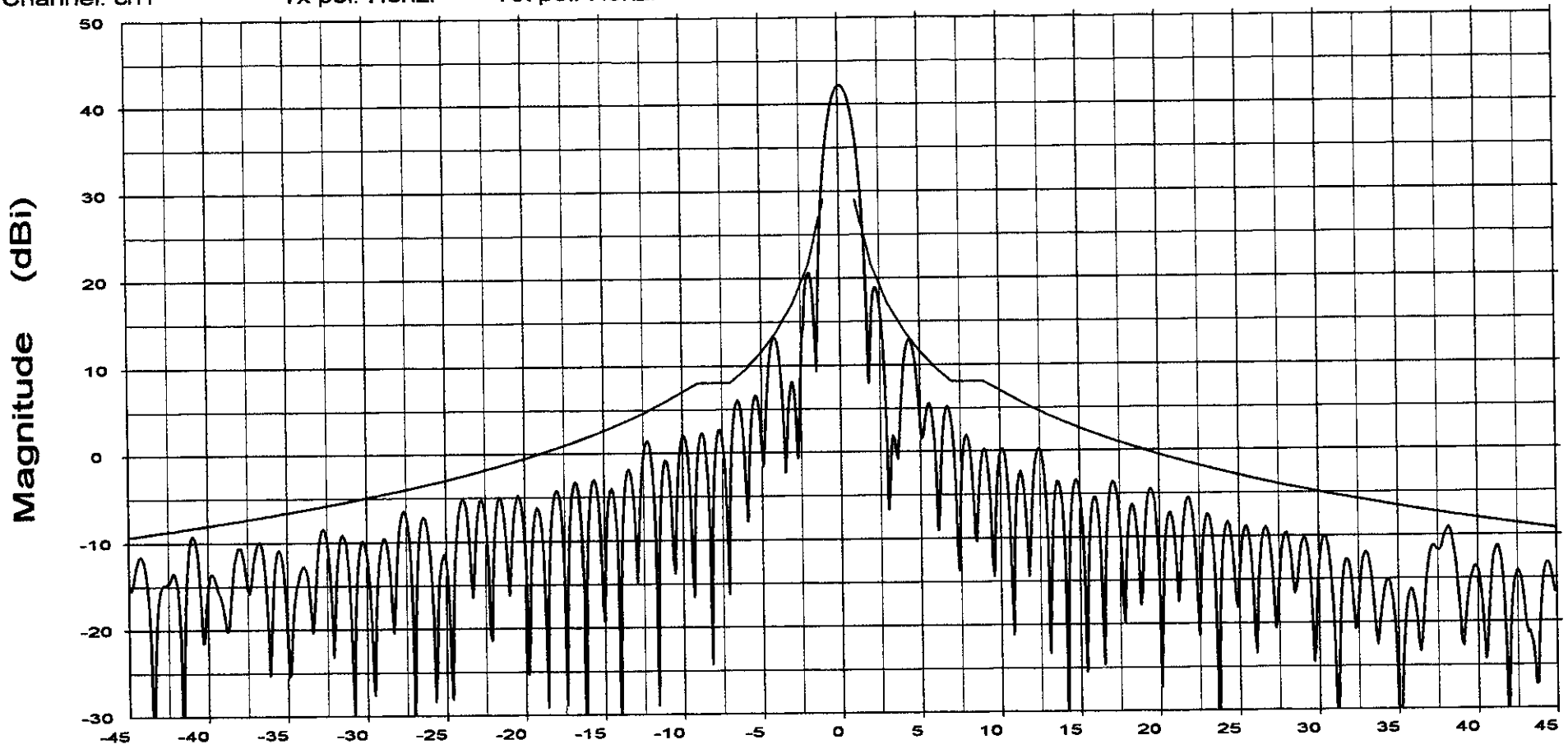
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104645.dat-ant_under_test ——	104645.dat	dBi	0.06	42.18

Prode'n Corporation
East len Test Range
Maiden NC

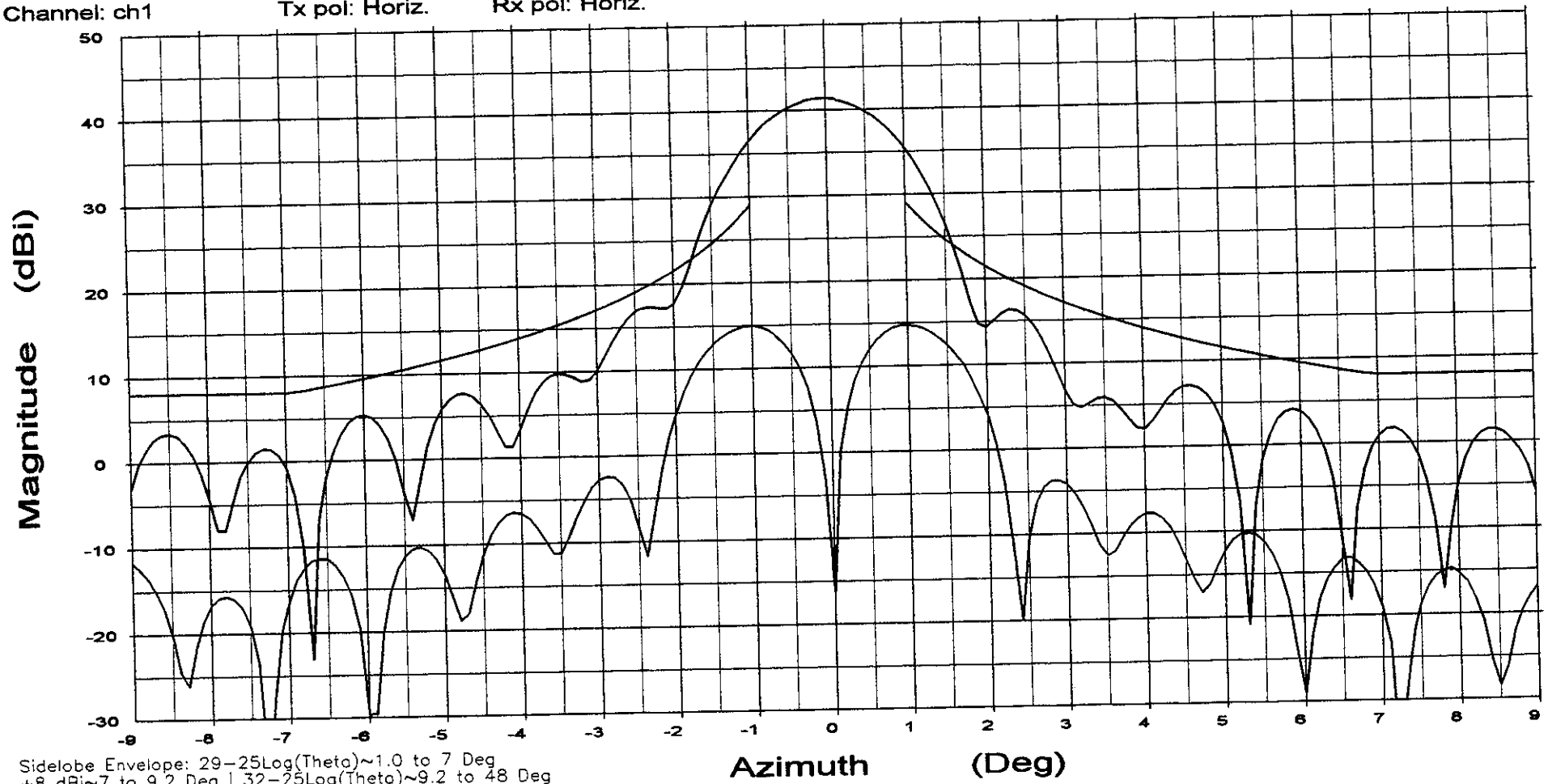
File: See Legend

AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104644.dat-ant_under_test ——	104644.dat	dBi	0.00	41.29
104647.dat-ant_under_test ——	104647.dat	dBi	-1.00	14.89

Prodelin Corporation
East den Test Range
Maiden NC

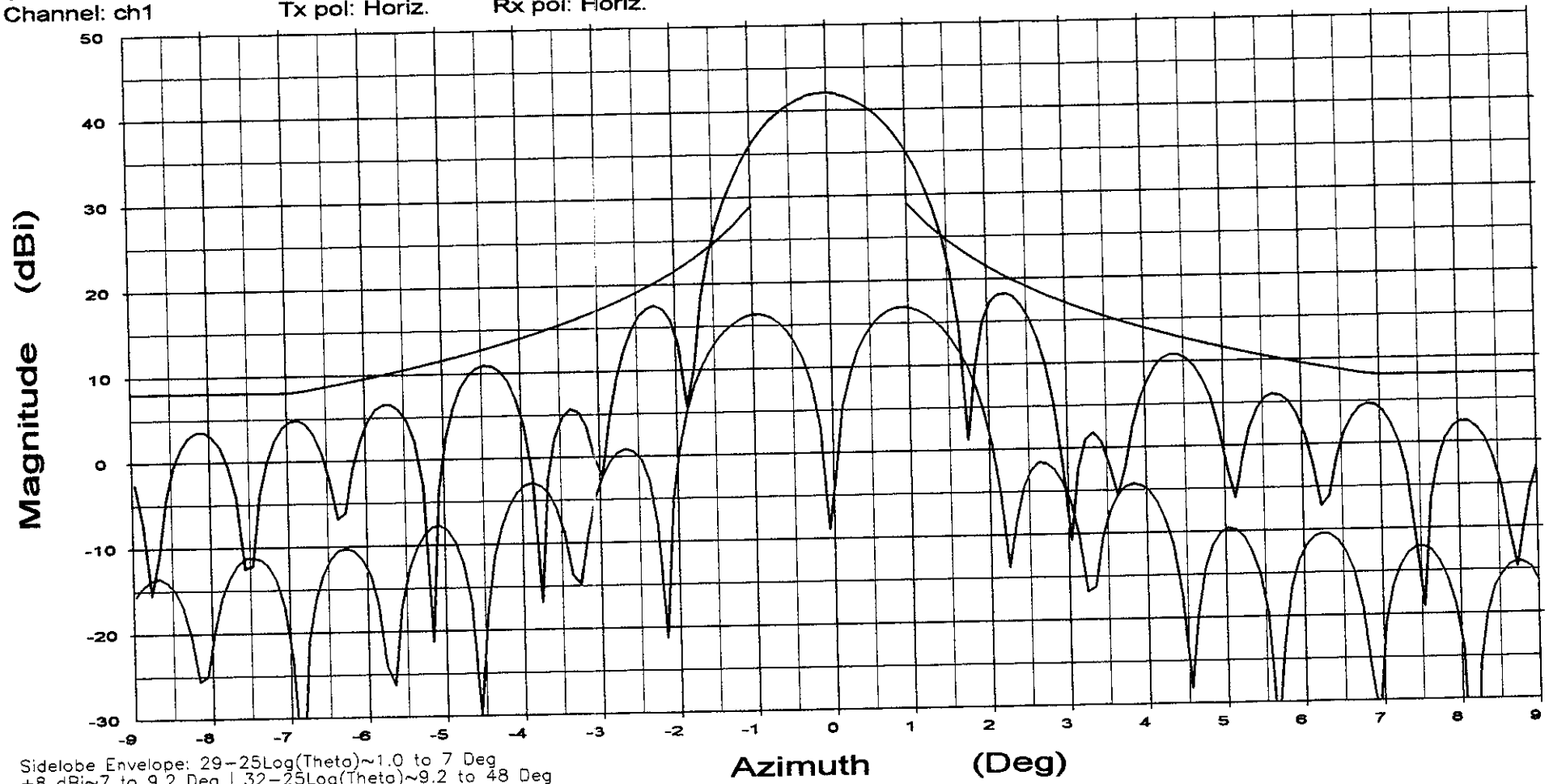
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104644.dat-ant_under_test ——	104644.dat	dBi	-0.06	41.96
104647.dat-ant_under_test ——	104647.dat	dBi	0.93	16.78

Prodelin Corporation
East den Test Range
Maiden NC

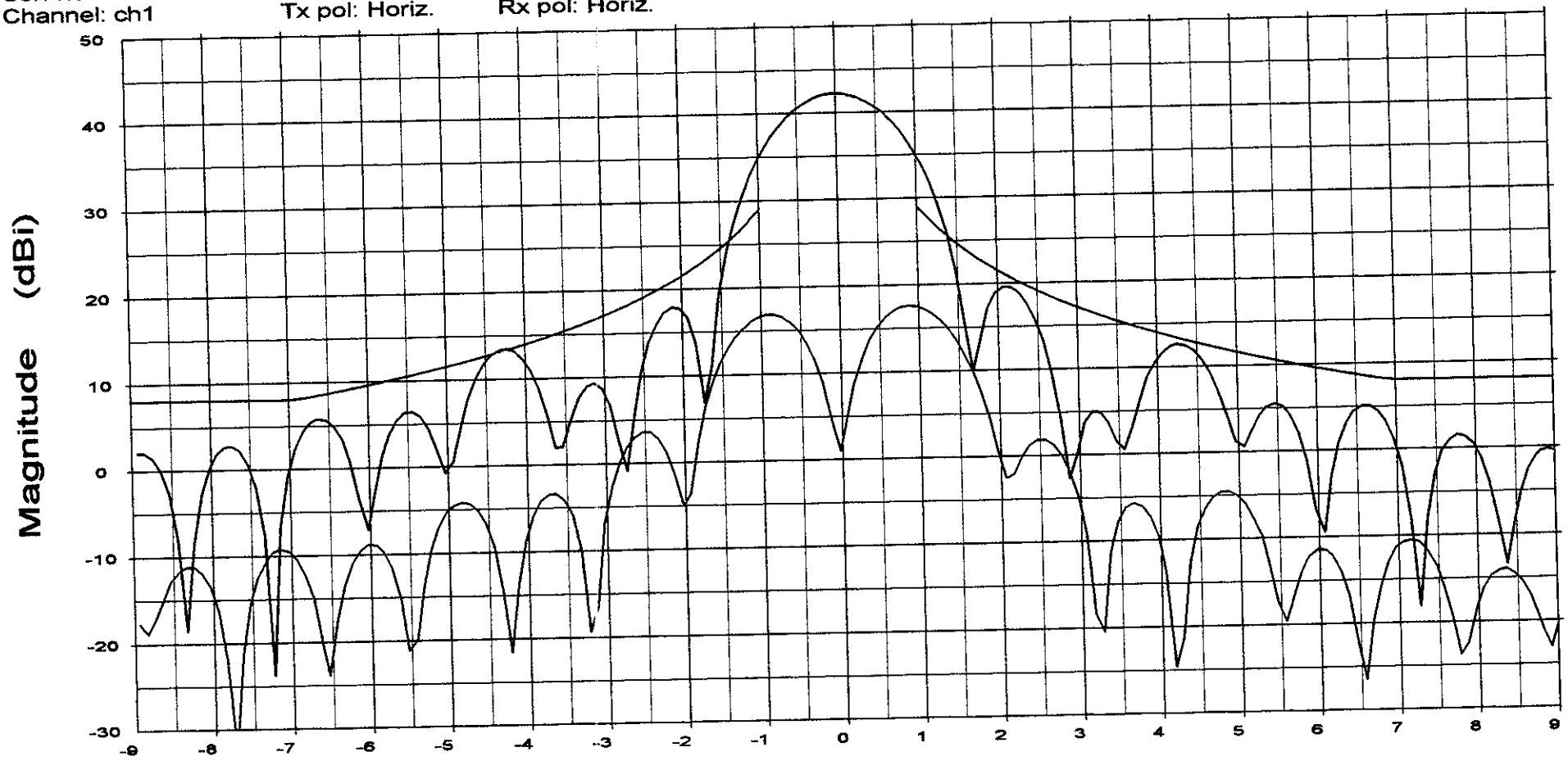
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104644.dat-ant_under_test ——	104644.dat	dBi	-0.03	42.18
104647.dat-ant_under_test ——	104647.dat	dBi	0.87	17.51

Prodelin Corporation
East iden Test Range
Maiden NC

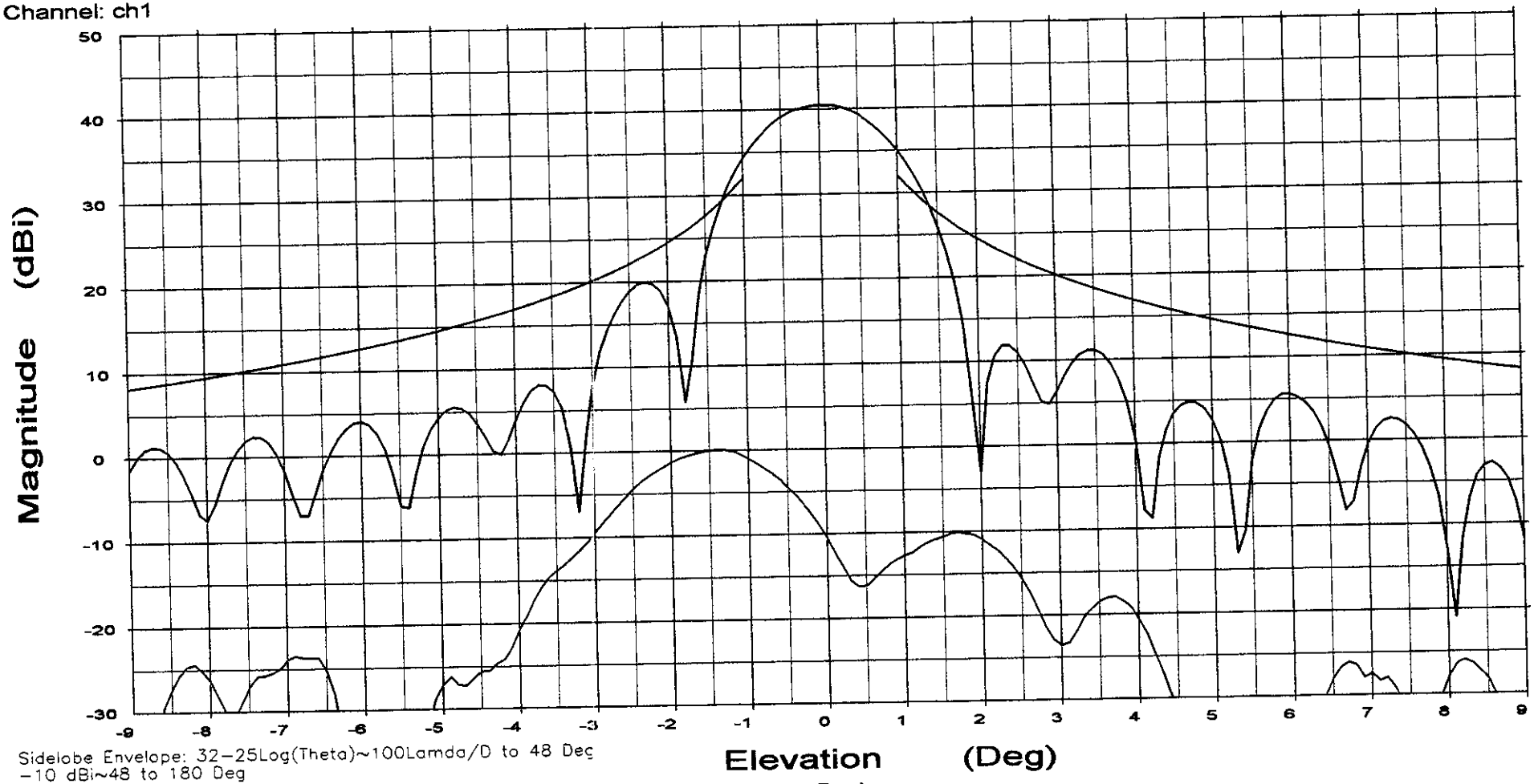
File: See Legend

AVL Model 2400
C-Band

Frequency : 5.850 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104642.dat-ant_under_test ——	104642.dat	dBi	0.00	40.46
104648.dat-ant_under_test ——	104648.dat	dBi	-1.40	0.02

Prodelin Corporation
East den Test Range
Maiden NC

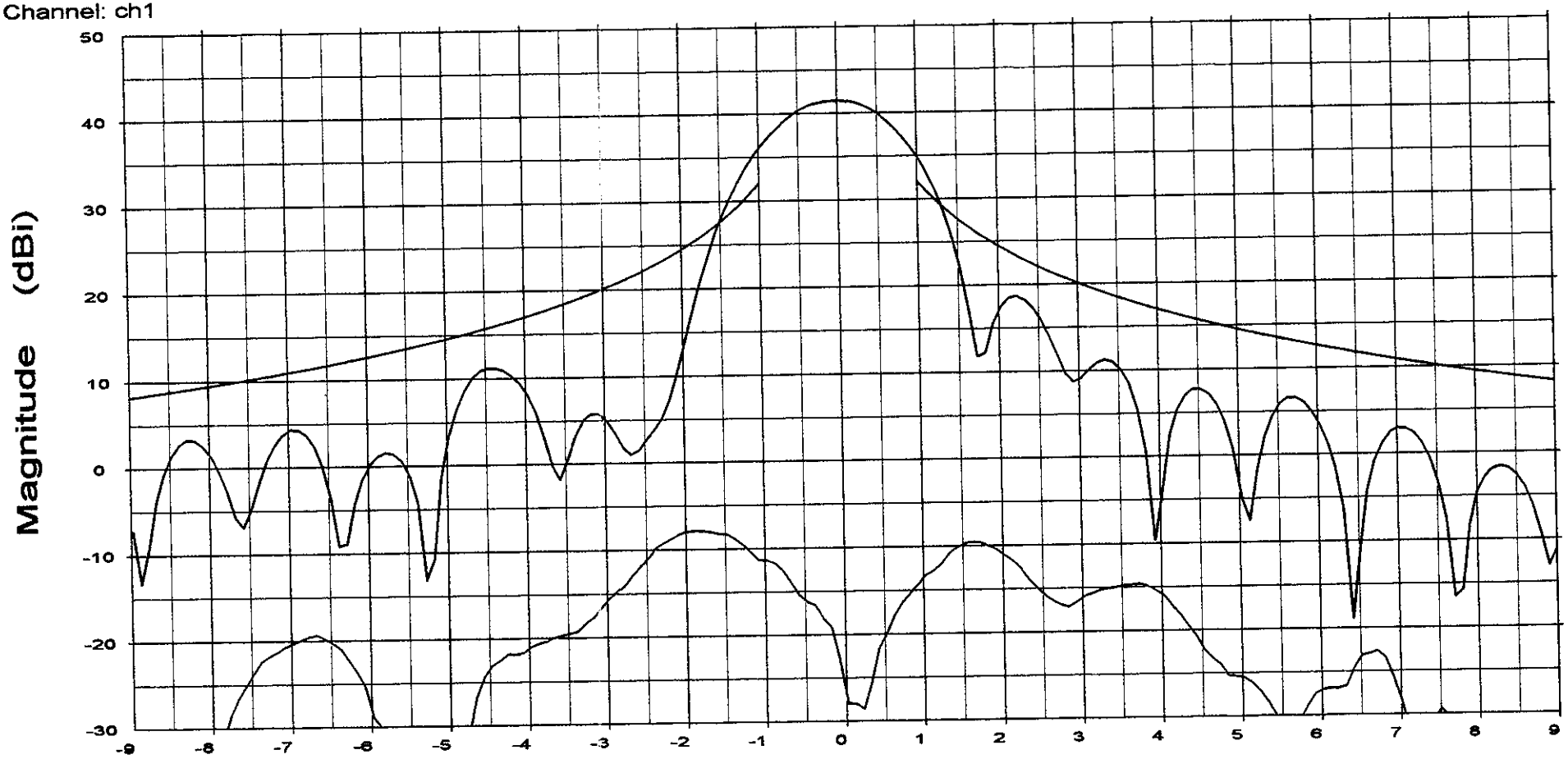
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.138 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104642.dat-ant_under_test ——	104642.dat	dBi	0.03	41.46
104648.dat-ant_under_test ——	104648.dat	dBi	-1.88	-7.90

Prodelin Corporation
East ...den Test Range
Maiden NC

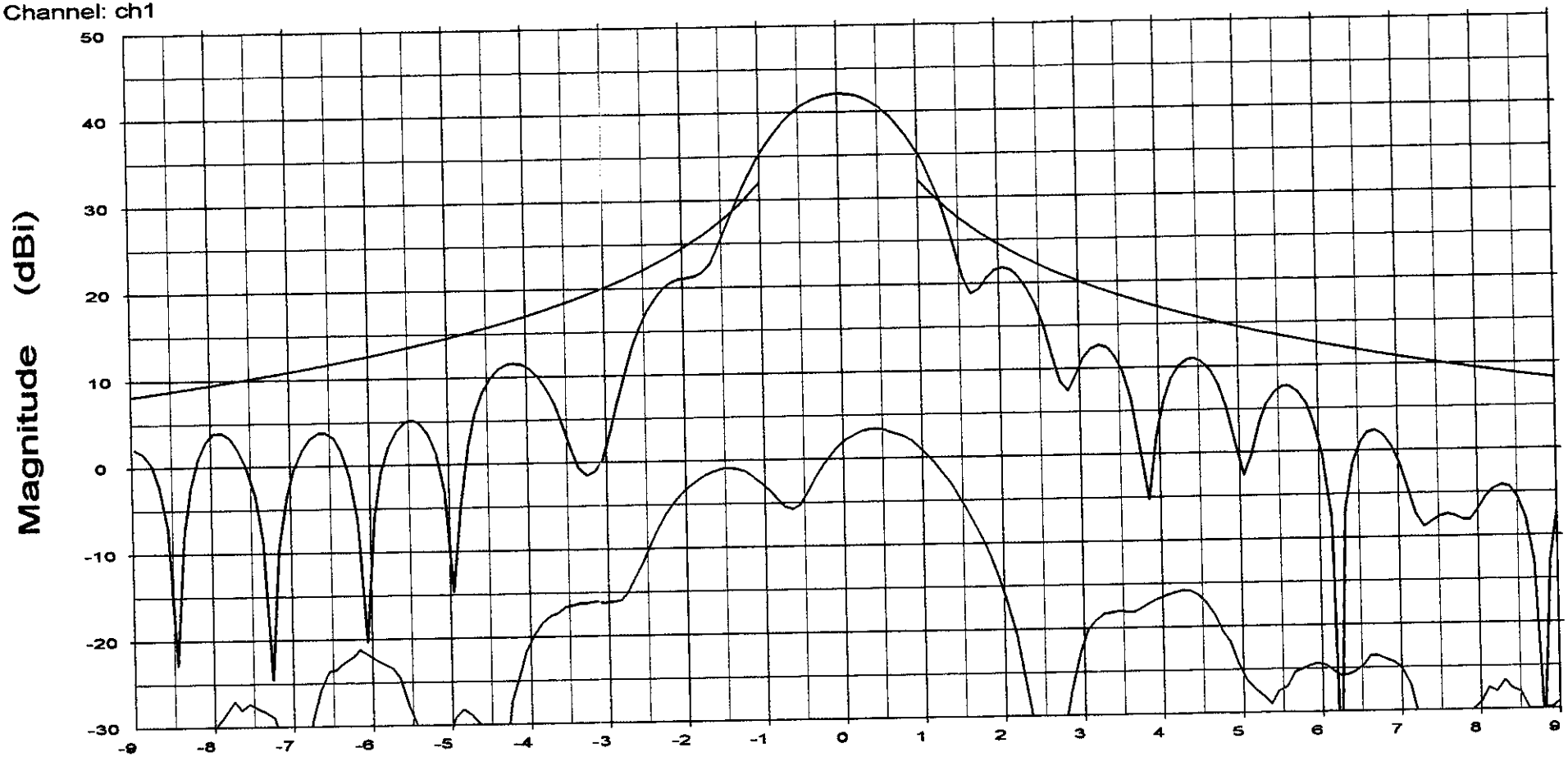
File: See Legend

AVL Model 2400
C-Band

Frequency : 6.425 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104642.dat-ant_under_test ——	104642.dat	dBi	0.05	42.08
104648.dat-ant_under_test ——	104648.dat	dBi	0.44	3.31

Prodelin Corporation
East den Test Range
Maiden NC

Horizontal Polarization

Receive Frequencies

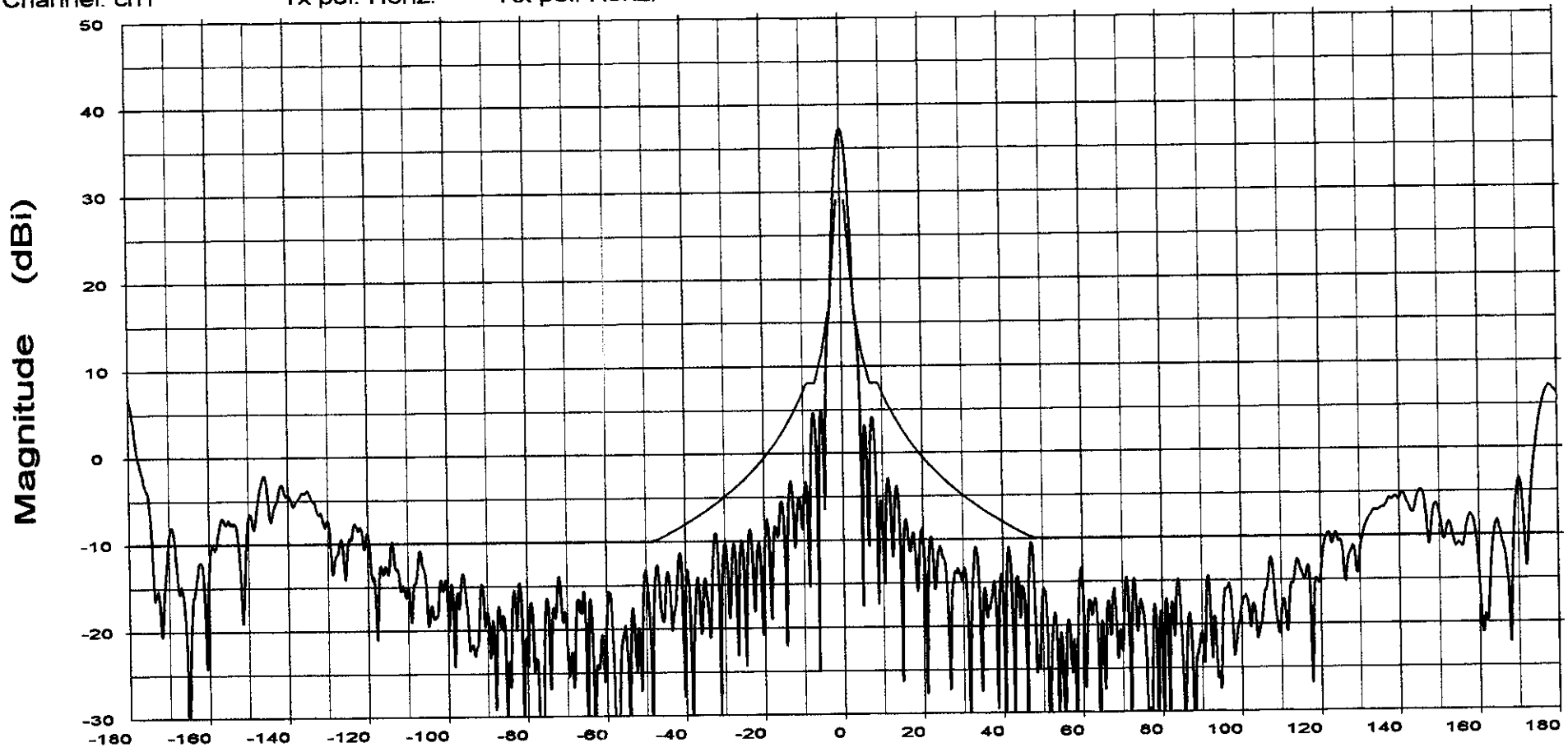
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104651.dat-ant_under_test ——	104651.dat	dBi	0.00	37.17

Prode[illegible]n Corporation
East [illegible]den Test Range
Maiden NC

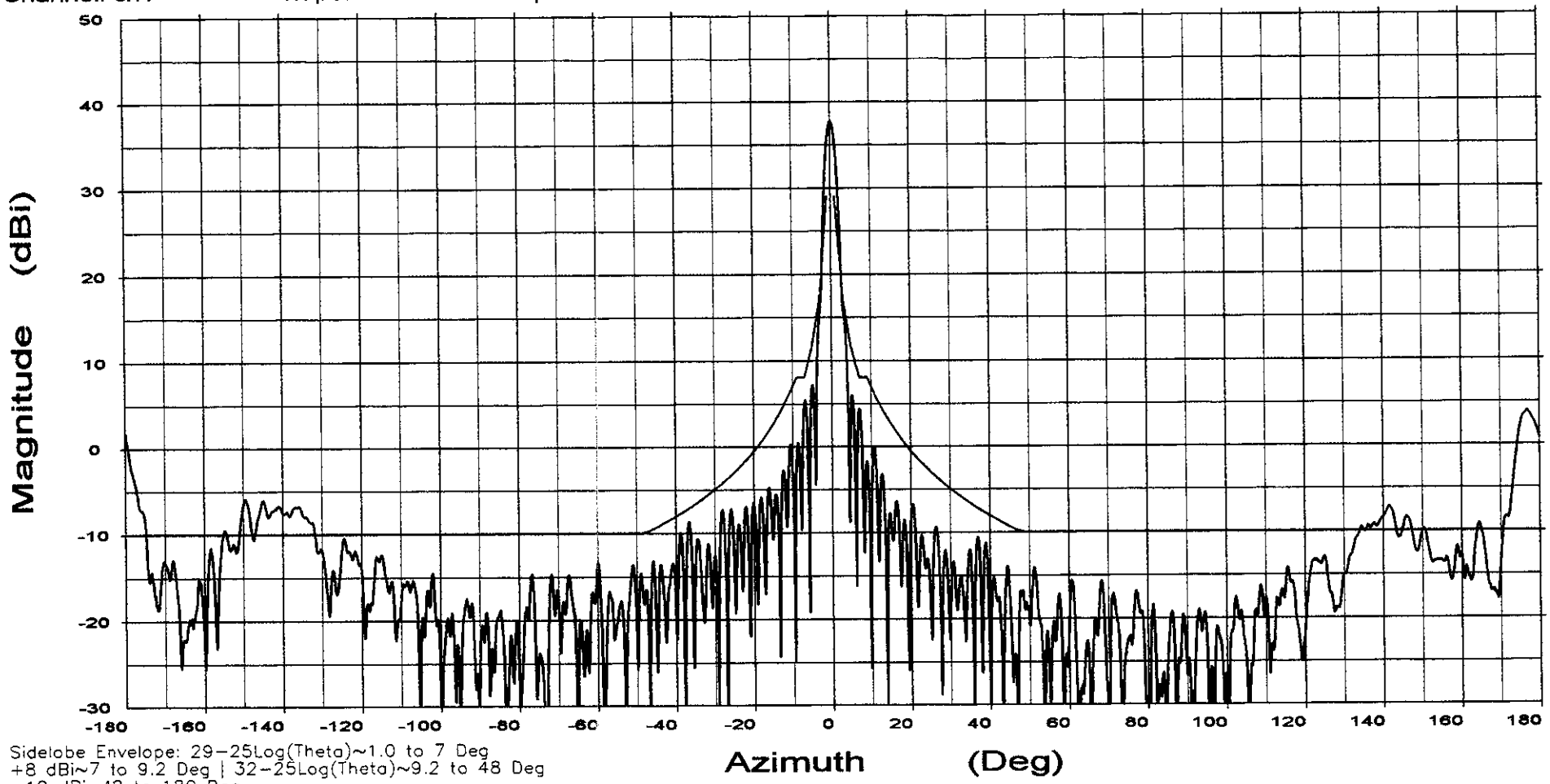
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays		Cal. file	units	Beam Peak Deg	Beam Peak dB
104651.dat-ant_under_test	——	104651.dat	dBi	0.03	37.67

Prode Corporation
East len Test Range
Maiden NC

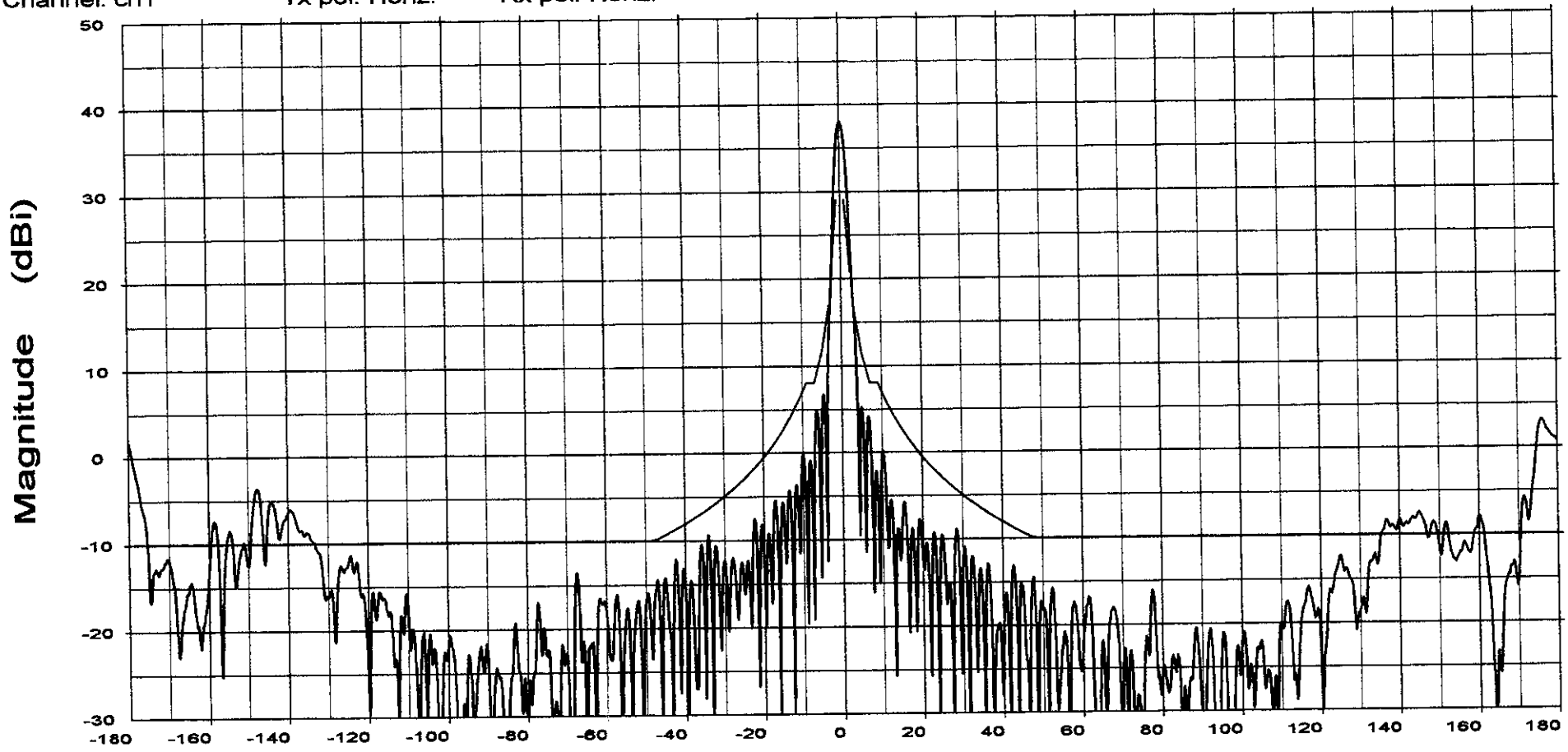
File: See Legend

AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays		Cal. file	units	Beam Peak Deg	Beam Peak dB
104651.dat-ant_under_test	——	104651.dat	dBi	0.06	37.94

Prode[illegible] Corporation
East [illegible]den Test Range
Maiden NC

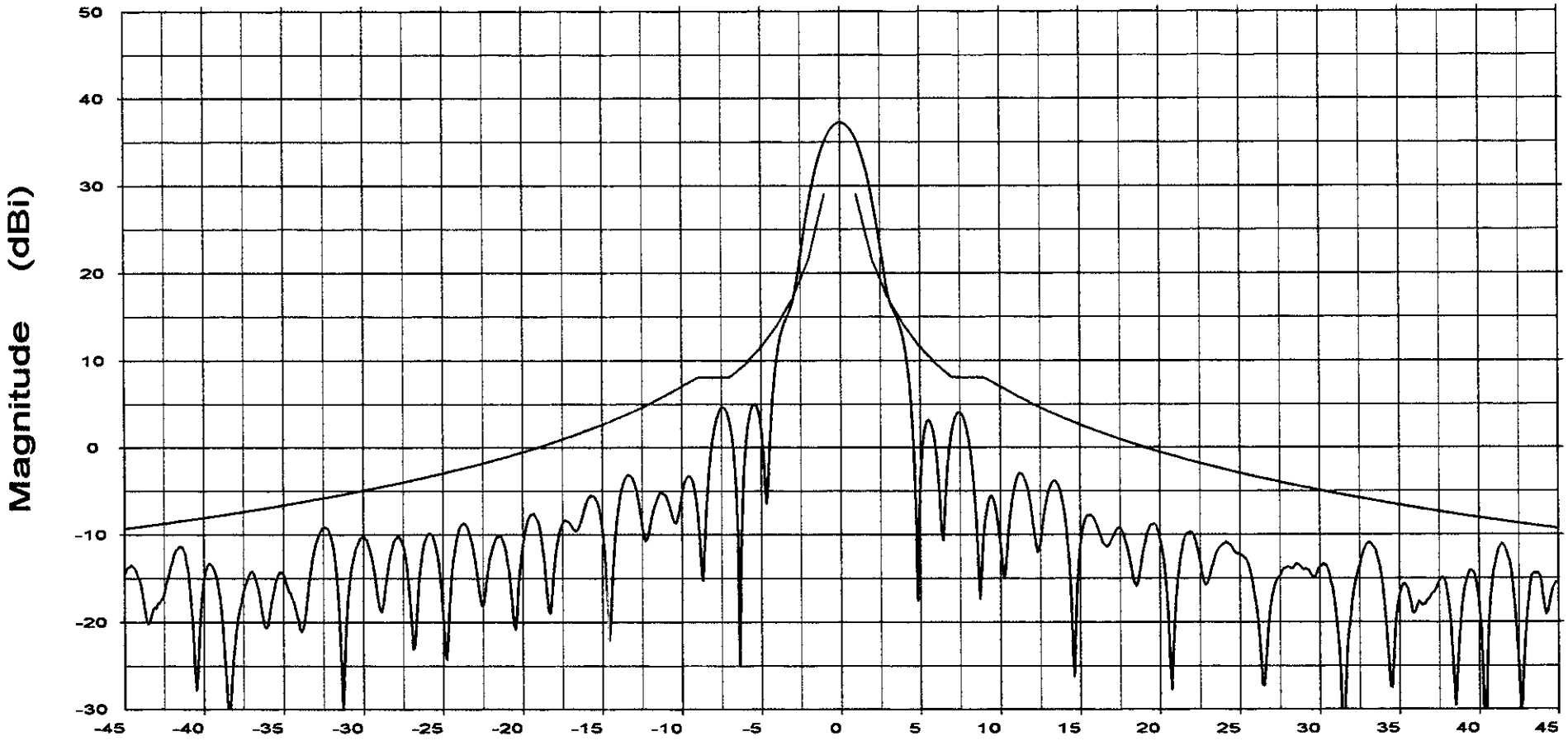
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104651.dat-ant_under_test ——	104651.dat	dBi	0.00	37.17

Prode Corporation
East M en Test Range
Maiden NC

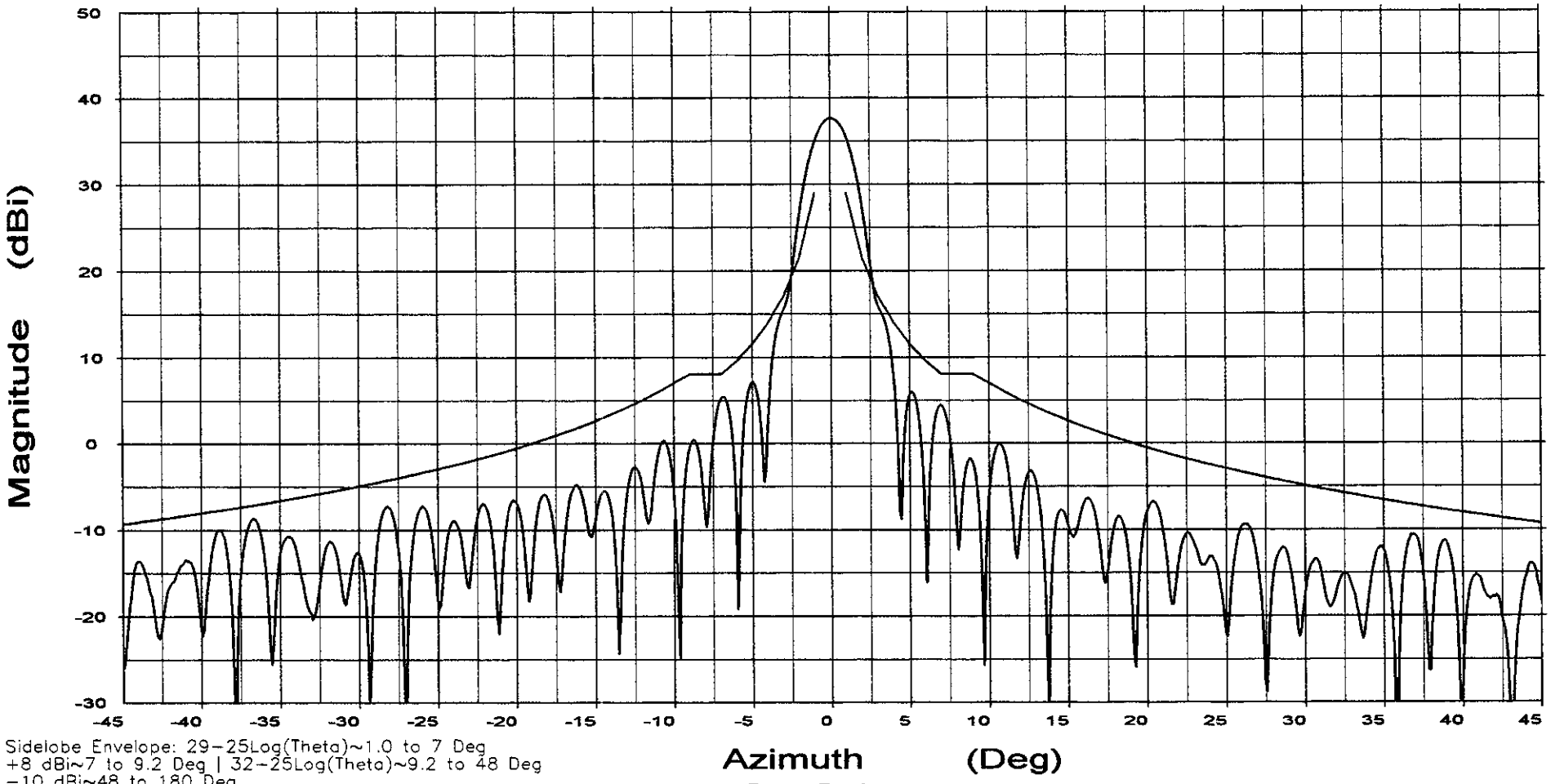
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104651.dat-ant_under_test ——	104651.dat	dBi	0.03	37.67

Prode Corporation
East M en Test Range
Maiden NC

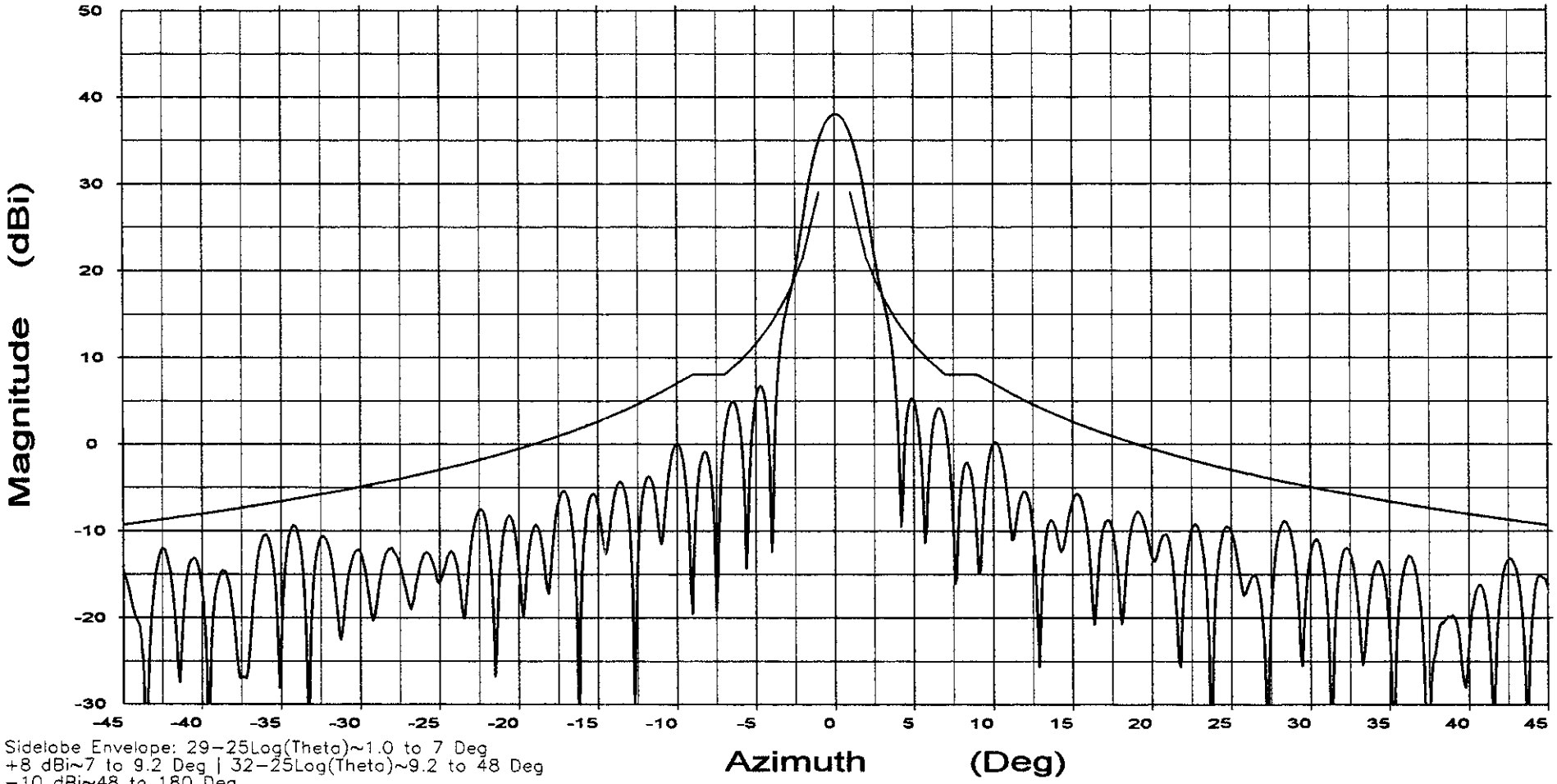
File: See Legend

AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104651.dat-ant_under_test ——	104651.dat	dBi	0.06	37.94

Prode Corporation
East N en Test Range
Maiden NC

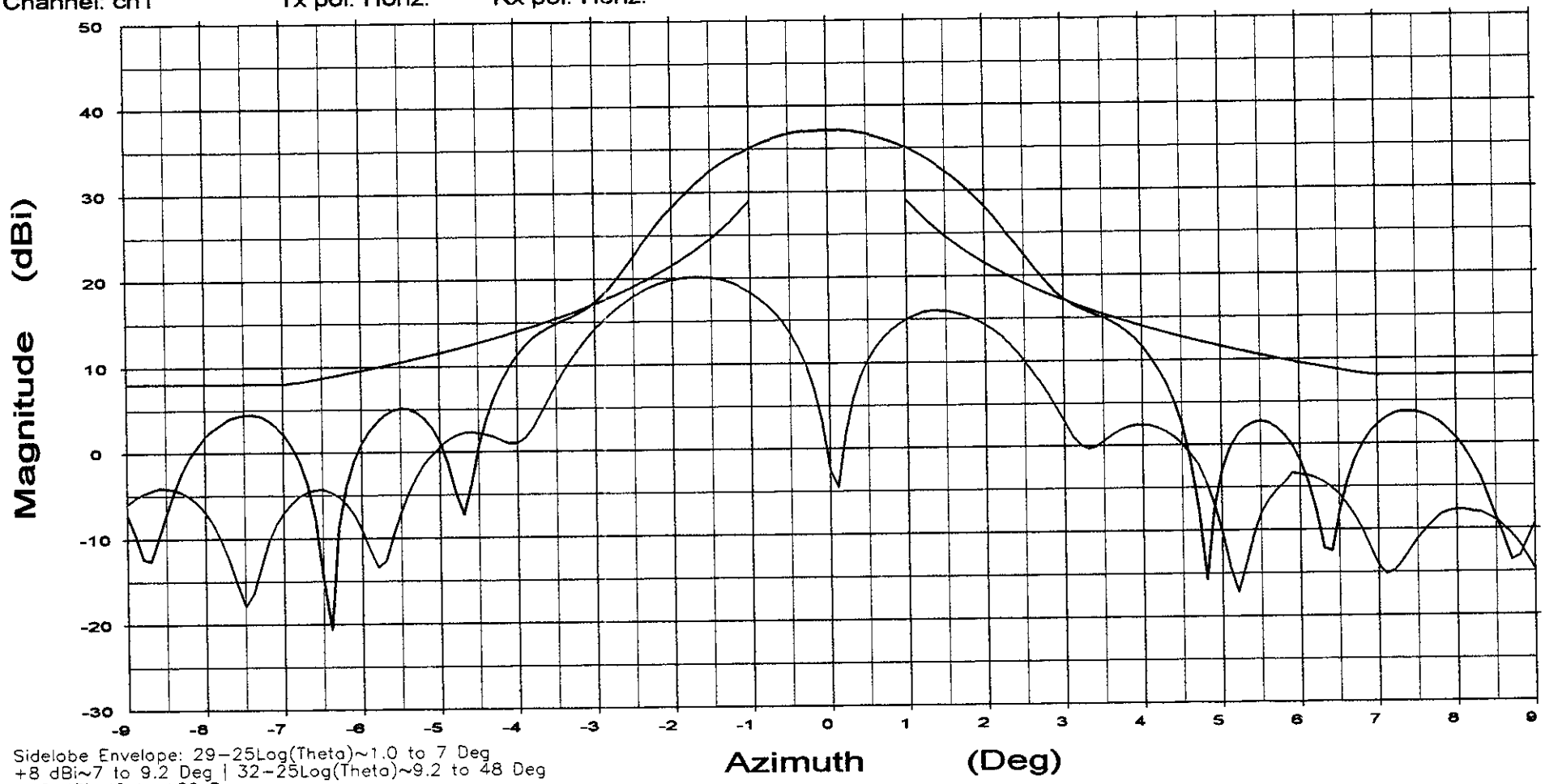
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104653.dat-ant_under_test ——	104653.dat	dBi	0.00	37.17
104656.dat-ant_under_test ——	104656.dat	dBi	-1.70	20.08

Prode[illegible]n Corporation
East [illegible]den Test Range
Maiden NC

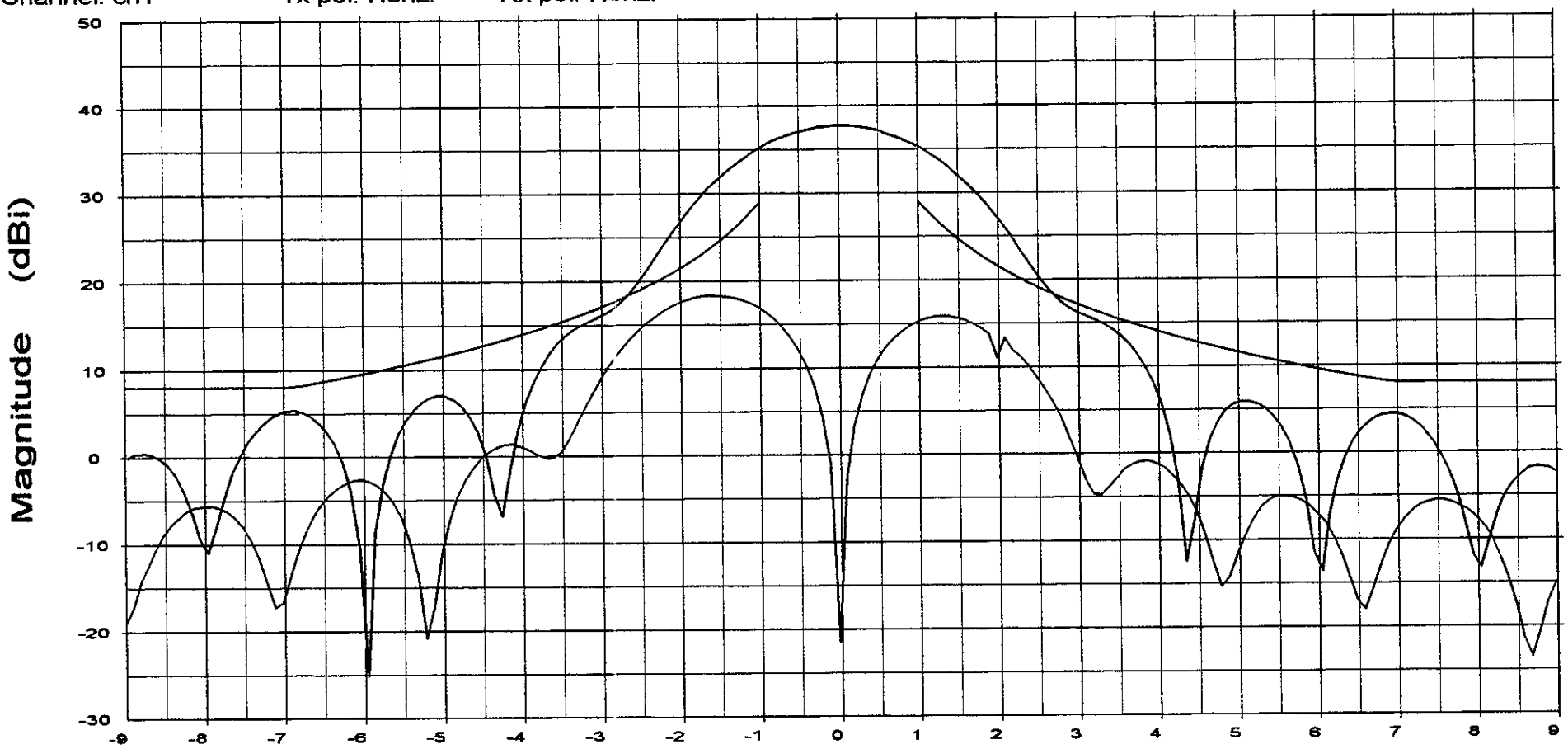
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104653.dat-ant_under_test ——	104653.dat	dBi	0.03	37.67
104654.dat-ant_under_test ——	104654.dat	dBi	-1.64	18.27

Prode[illegible] Corporation
East I[illegible]en Test Range
Maiden NC

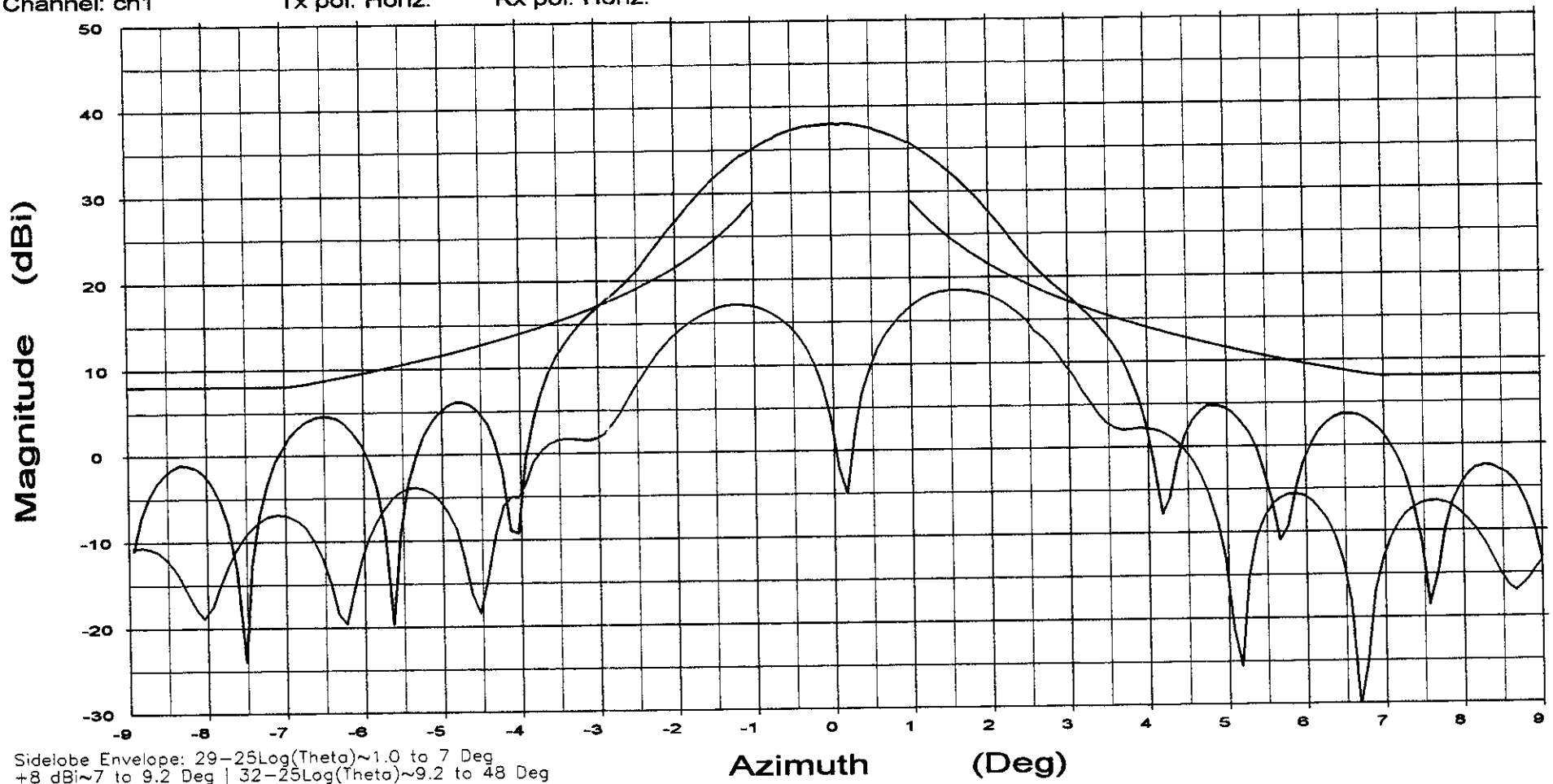
File: See Legend

AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104653.dat-ant_under_test ——	104653.dat	dBi	0.06	37.94
104655.dat-ant_under_test ——	104655.dat	dBi	1.57	18.51

Prode[illegible]n Corporation
East [illegible]den Test Range
Maiden NC

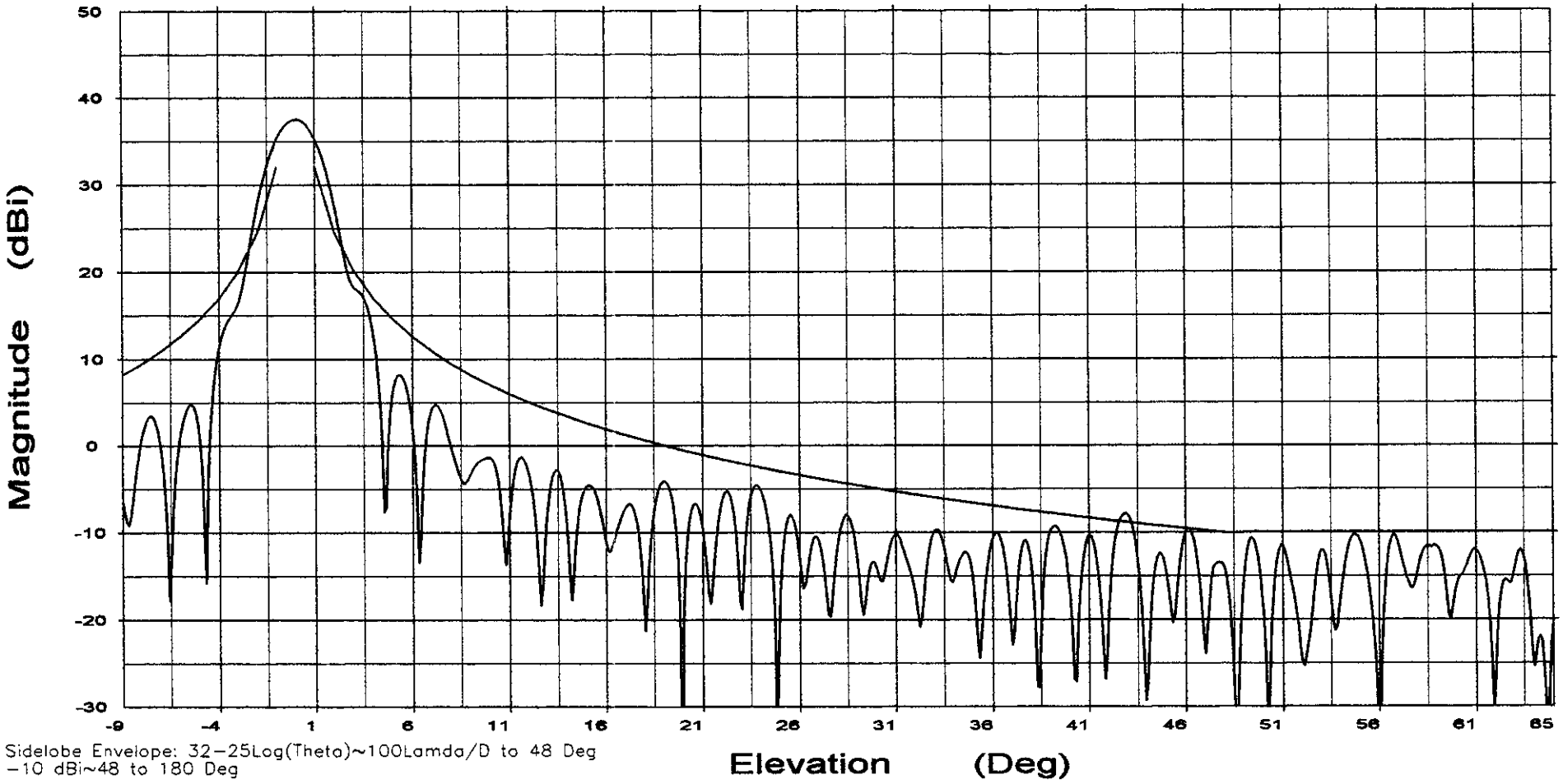
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104652.dat-ant_under_test ——	104652.dat	dBi	0.00	37.45

Prode Corporation
East N .en Test Range
Maiden NC

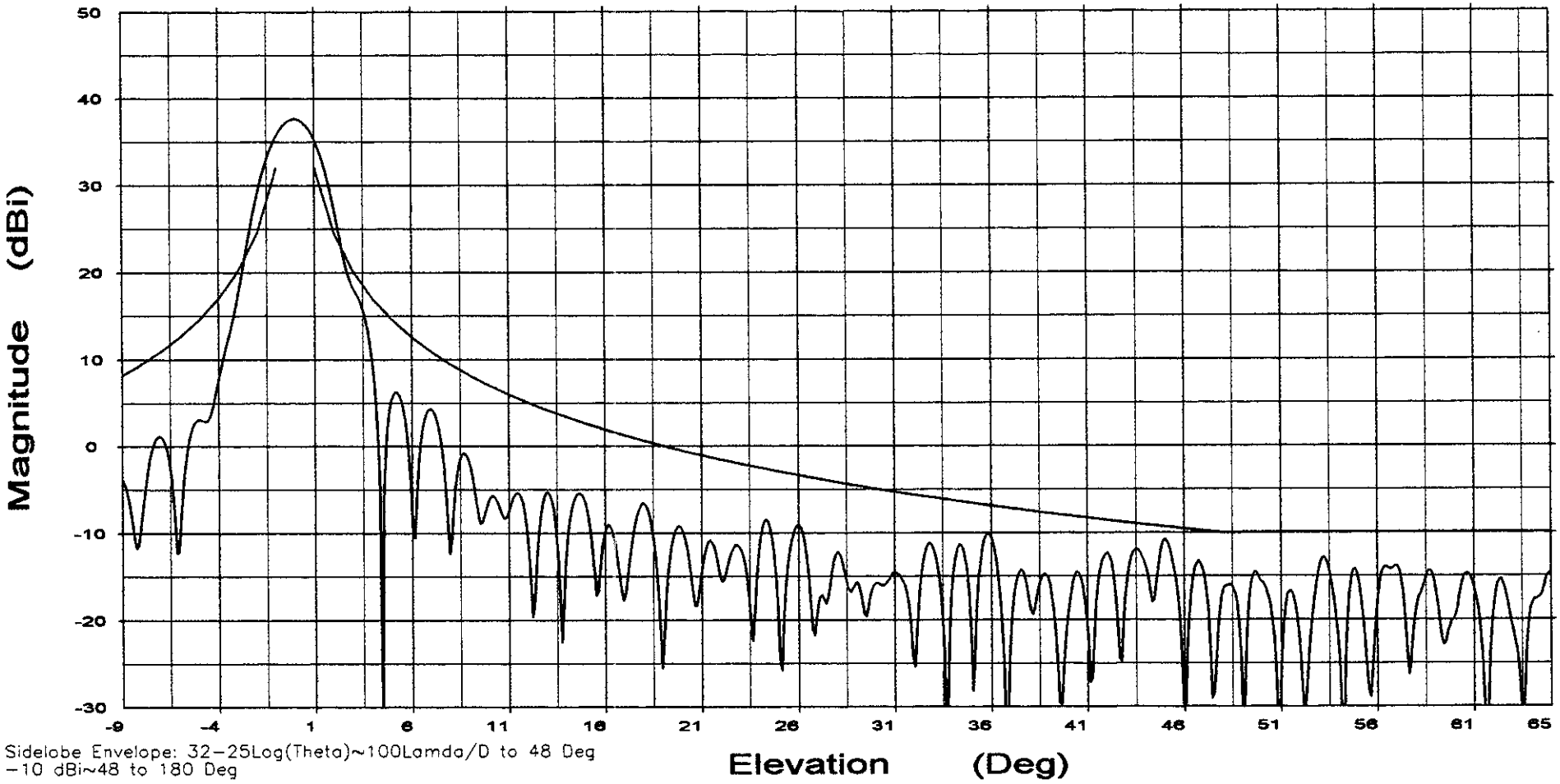
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104652.dat-ant_under_test ——	104652.dat	dBi	-0.08	37.67

Prode Corporation
East M .en Test Range
Maiden NC

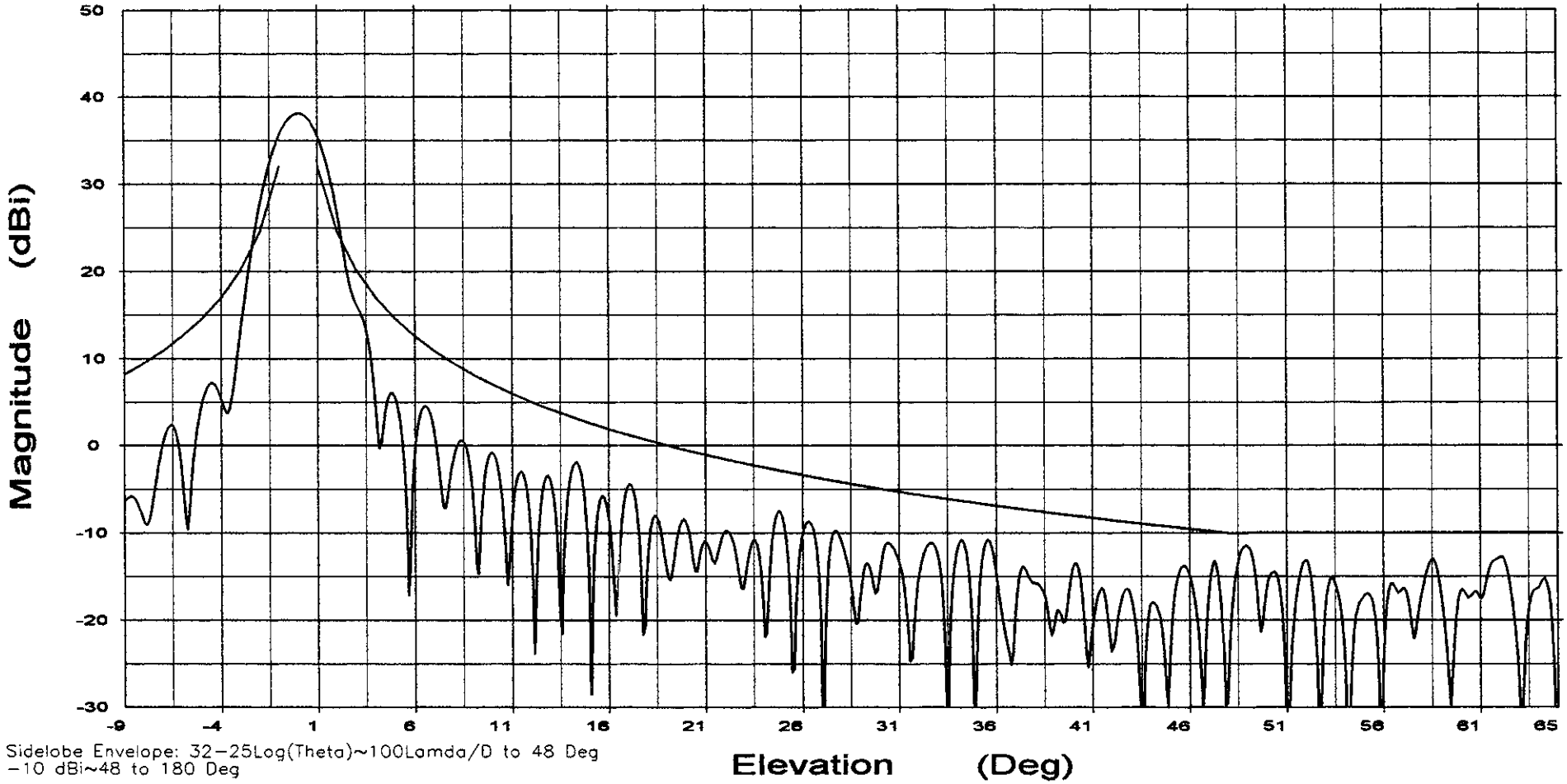
File: See Legend

AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104652.dat-ant_under_test ——	104652.dat	dBi	-0.06	38.01

Prode Corporation
East M .en Test Range
Maiden NC

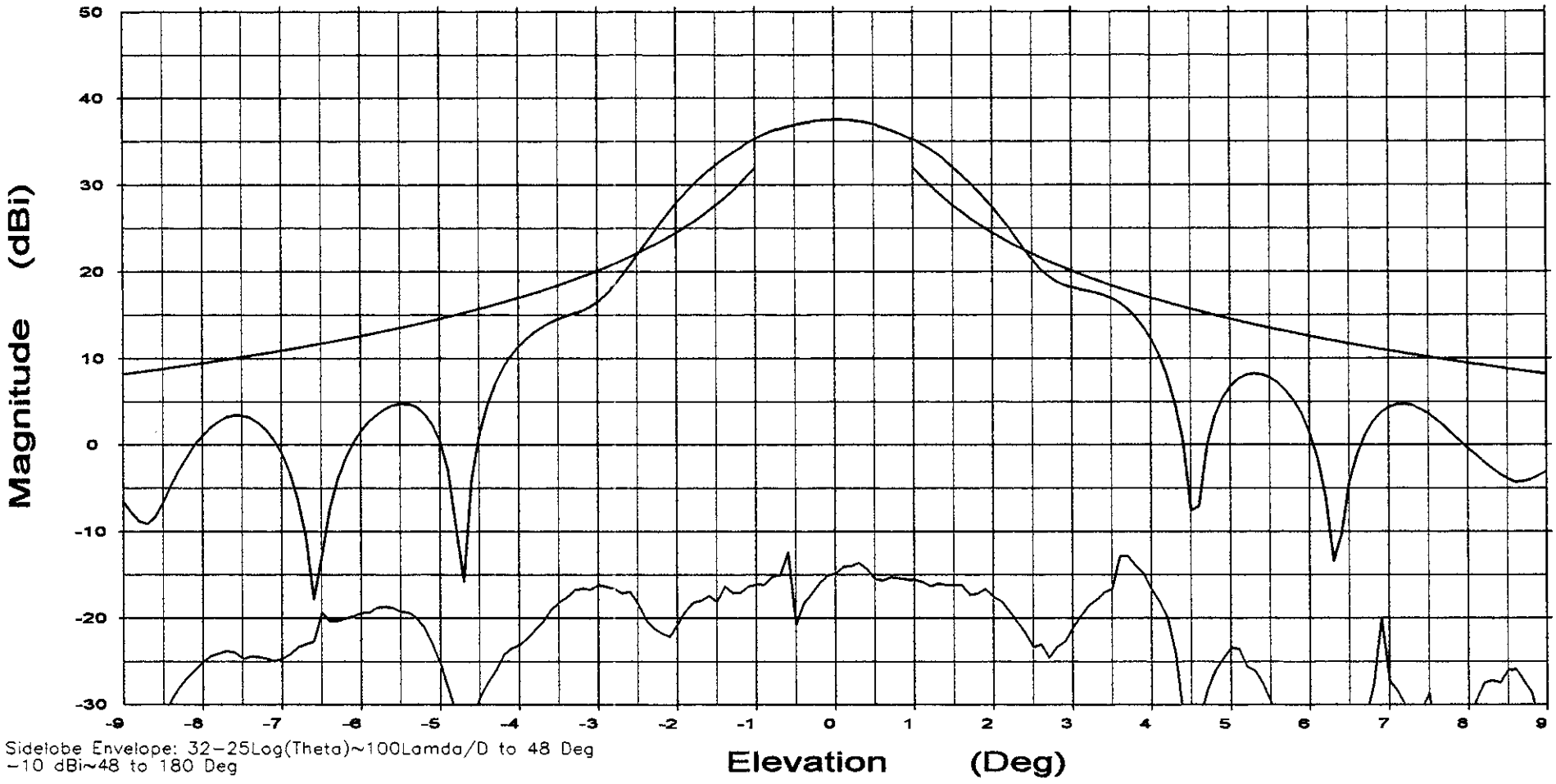
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.700 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104652.dat-ant_under_test ——	104652.dat	dBi	0.00	37.45
104657.dat-ant_under_test ——	104657.dat	dBi	-0.60	-12.44

Prode Corporation
East M .en Test Range
Maiden NC

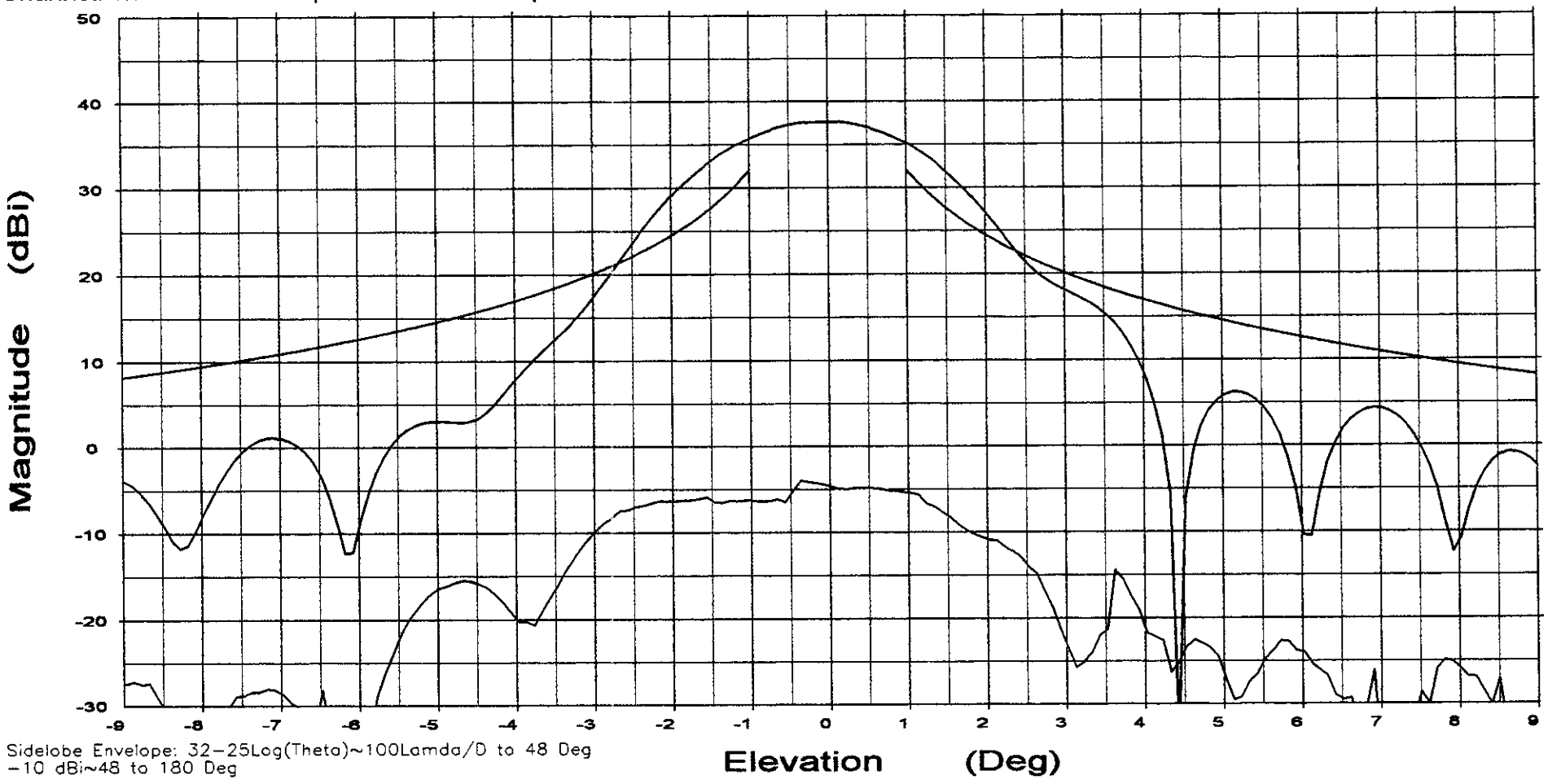
File: See Legend

AVL Model 2400
C-Band

Frequency : 3.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104652.dat-ant_under_test ——	104652.dat	dBi	-0.08	37.67
104657.dat-ant_under_test ——	104657.dat	dBi	-0.38	-4.06

Prode Corporation
East I en Test Range
Maiden NC

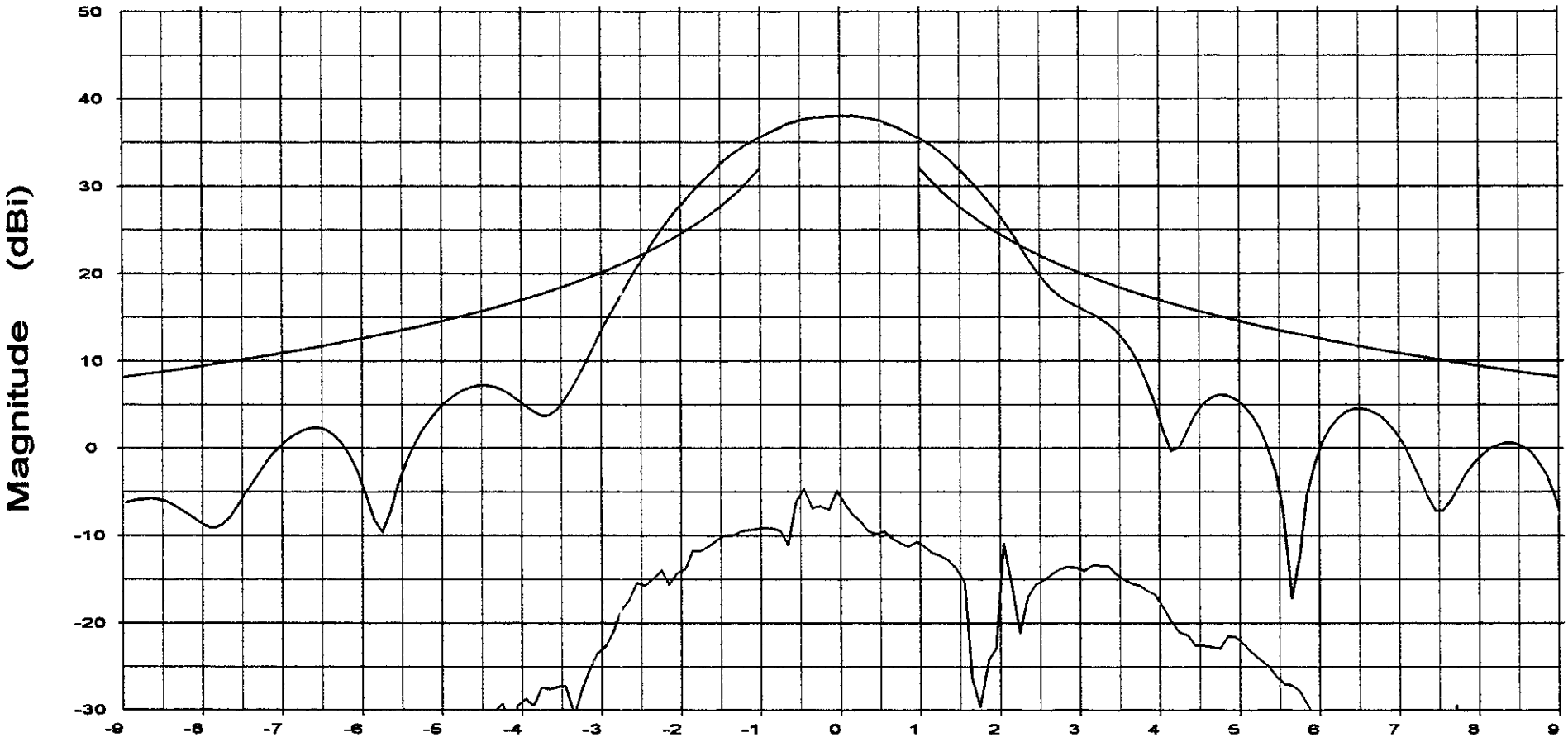
File: See Legend

AVL Model 2400
C-Band

Frequency : 4.200 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104652.dat-ant_under_test ——	104652.dat	dBi	-0.06	38.01
104658.dat-ant_under_test ——	104658.dat	dBi	-0.46	-4.74

Prode Corporation
East M en Test Range
Maiden NC

AvL TECHNOLOGIES

Model 2400K USA
2.4M Ku-Band SNG Satellite Antenna
RF Range Test Data

130 Roberts St. Asheville, NC 28801 ph (828) 250-9950 fx (828)-250-9938

Declaration of Conformity

in accordance FCC Rules and Regulations

We, **AvL Technologies, Inc.** of 130 Roberts St., Asheville, NC 28801 USA declare that the earth station antenna

Make: AvL Technologies
Model: 2400 USA Ku-Band SNG Antenna
Year of Construction: 2003

has been designed, verified by testing and manufactured to meet the Federal Communications Rules and Regulations for Earth Station Antennas as stated in 47 C.F.R. 25.209 (a) and (b) for transmit frequencies 14.0-14.5 GHz and receive frequencies of 11.7-12.2 Ghz.

Signed in Asheville, NC USA on the May 1, 2003

James L. Oliver, President

File: See Legend
Date: 11-Mar-02

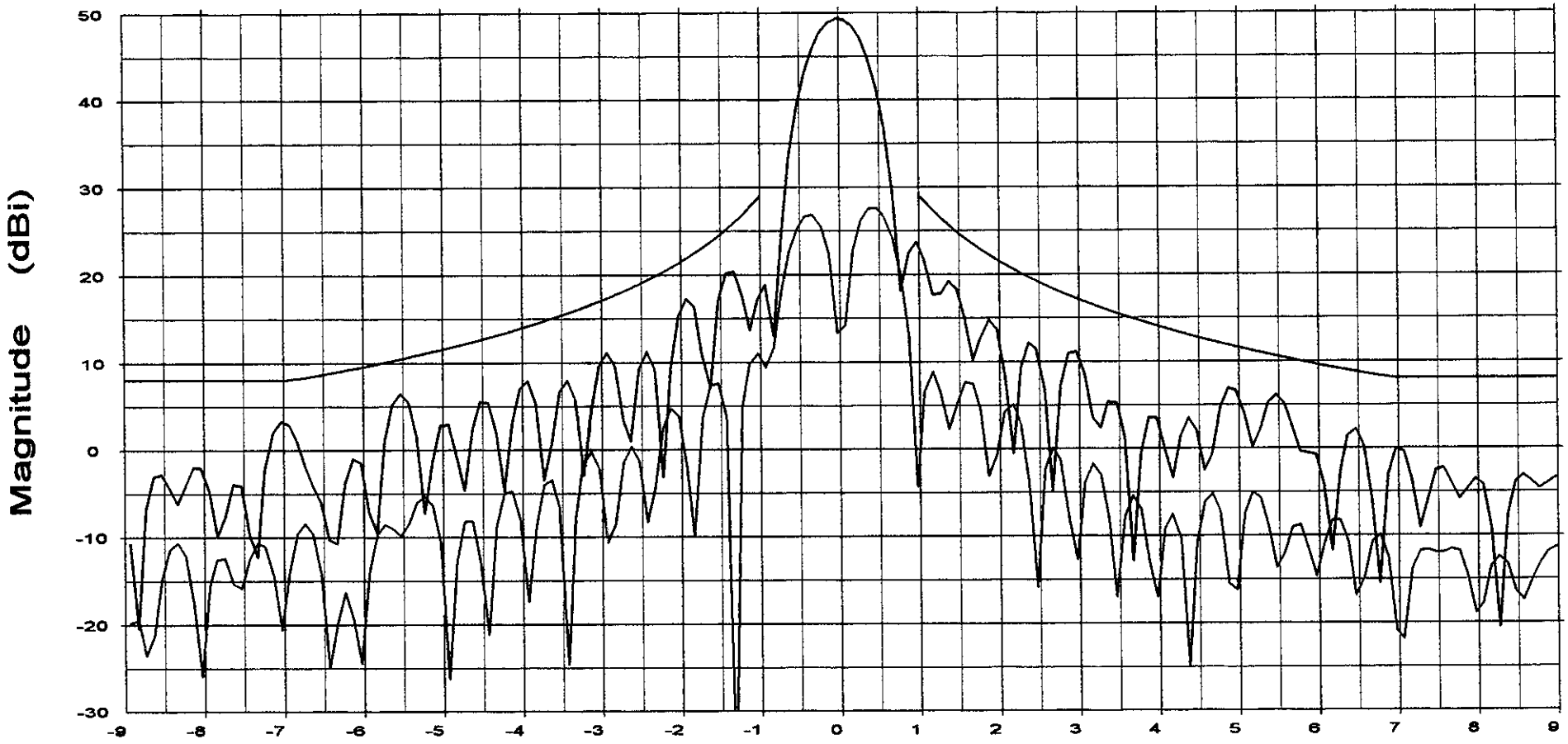
AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104611.dat-ant_under_test ——	104611.dat	dBi	-0.03	49.33
104613.dat-ant_under_test ——	104613.dat	dBi	0.46	27.53

Prode[illegible] Corporation
East [illegible]ien Test Range
Maiden NC

File: See Legend
Date: 11-Mar-02

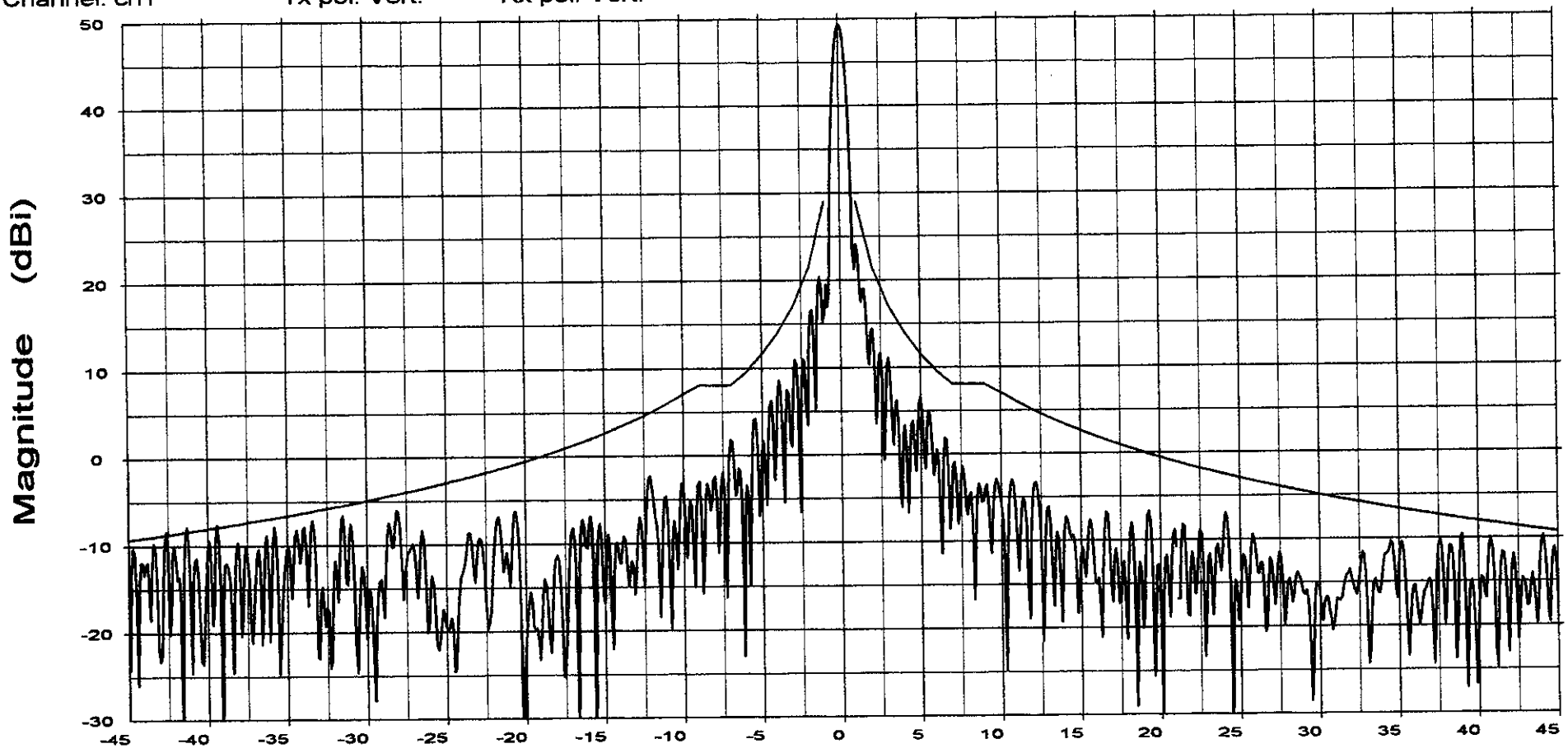
AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104610.dat-ant_under_test ——	104610.dat	dBi	0.06	49.29

Prodelin Corporation
East den Test Range
Maiden NC

File: See Legend
Date: 11-Mar-02

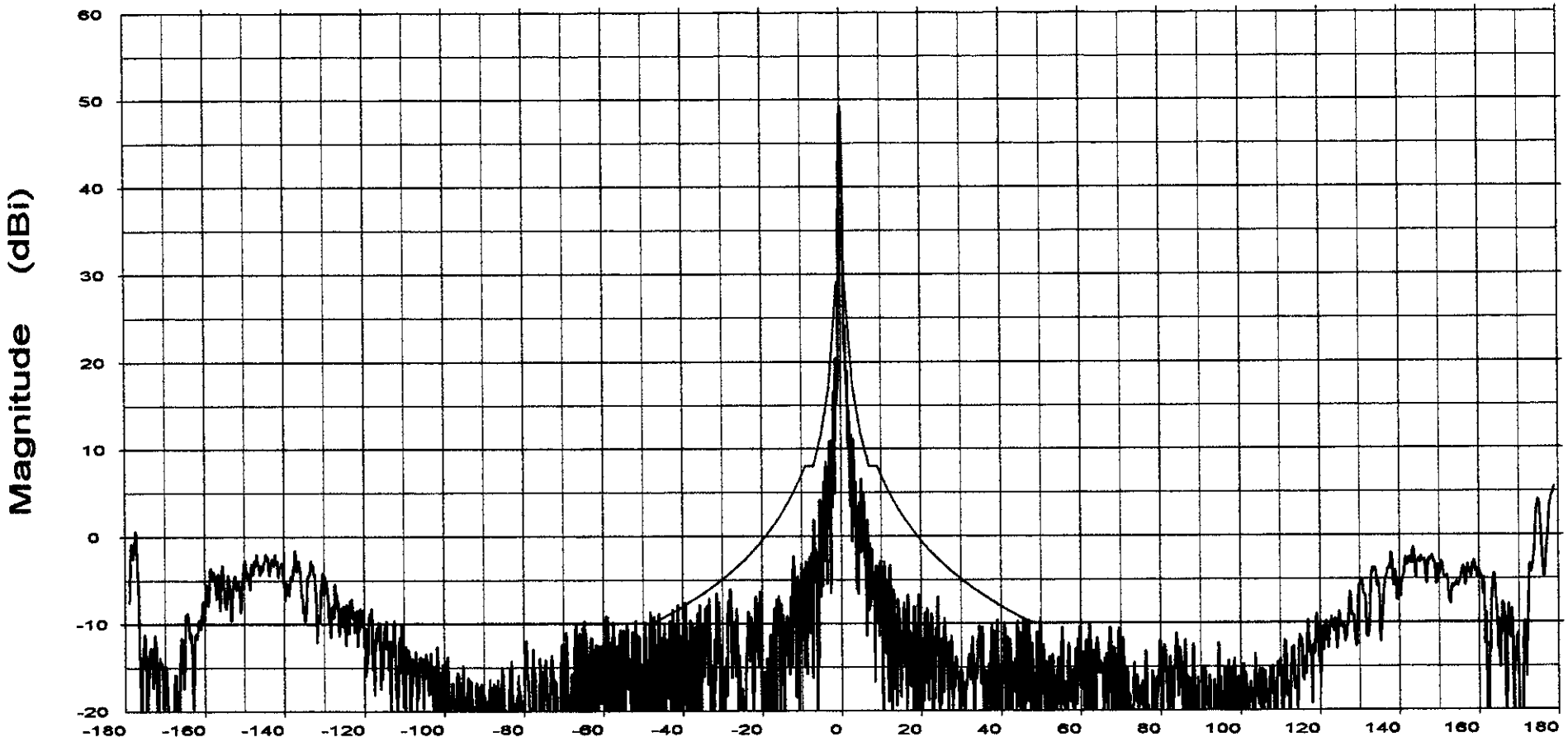
AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104610.dat-ant_under_test ——	104610.dat	dBi	0.06	49.29

Prode[illegible] Corporation
East [illegible]len Test Range
Maiden NC

File: See Legend

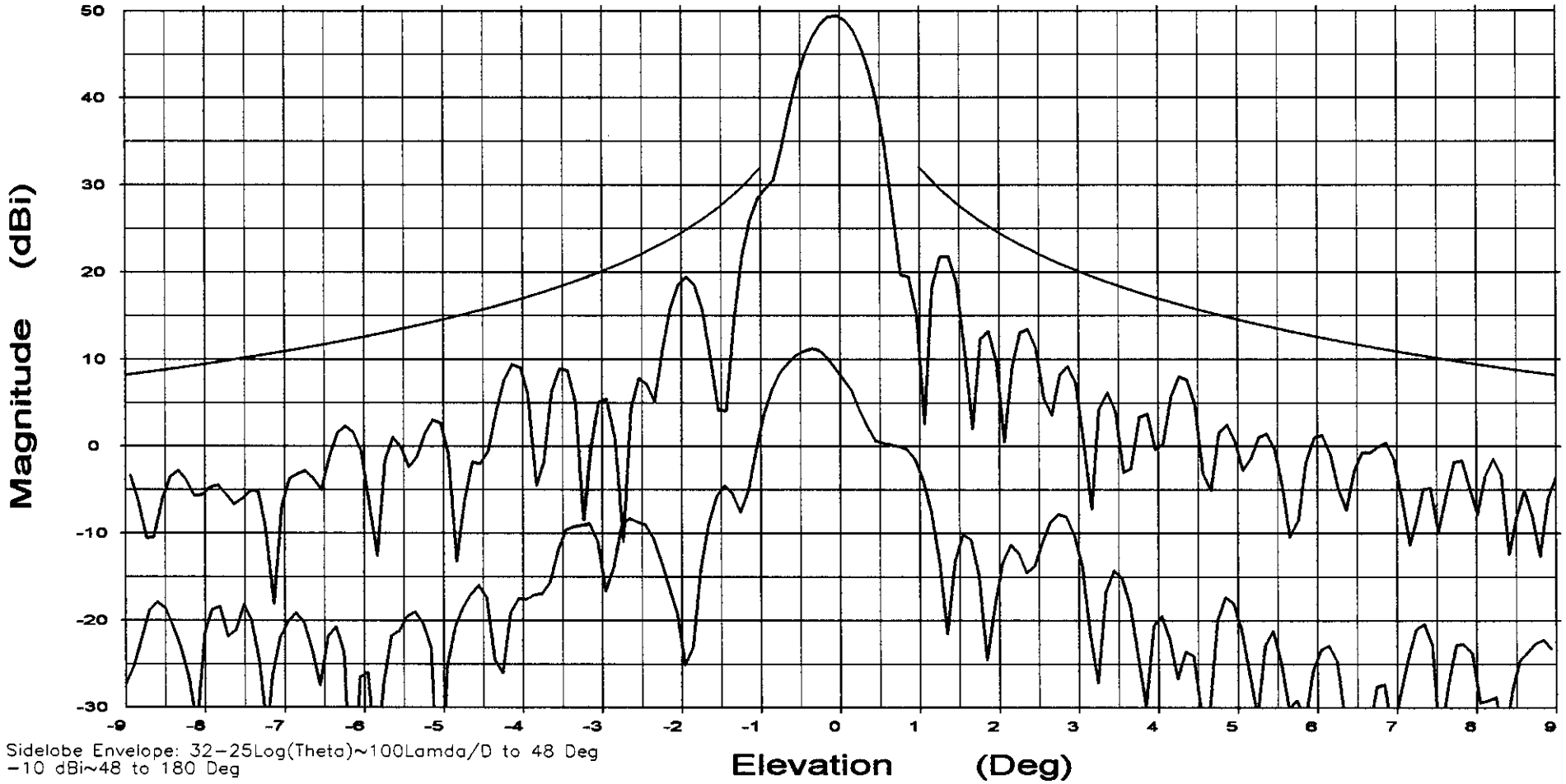
AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104612.dat-ant_under_test ——	104612.dat	dBi	-0.04	49.39
104614.dat-ant_under_test ——	104614.dat	dBi	-0.35	11.16

Prode Corporation
East ... en Test Range
Maiden NC

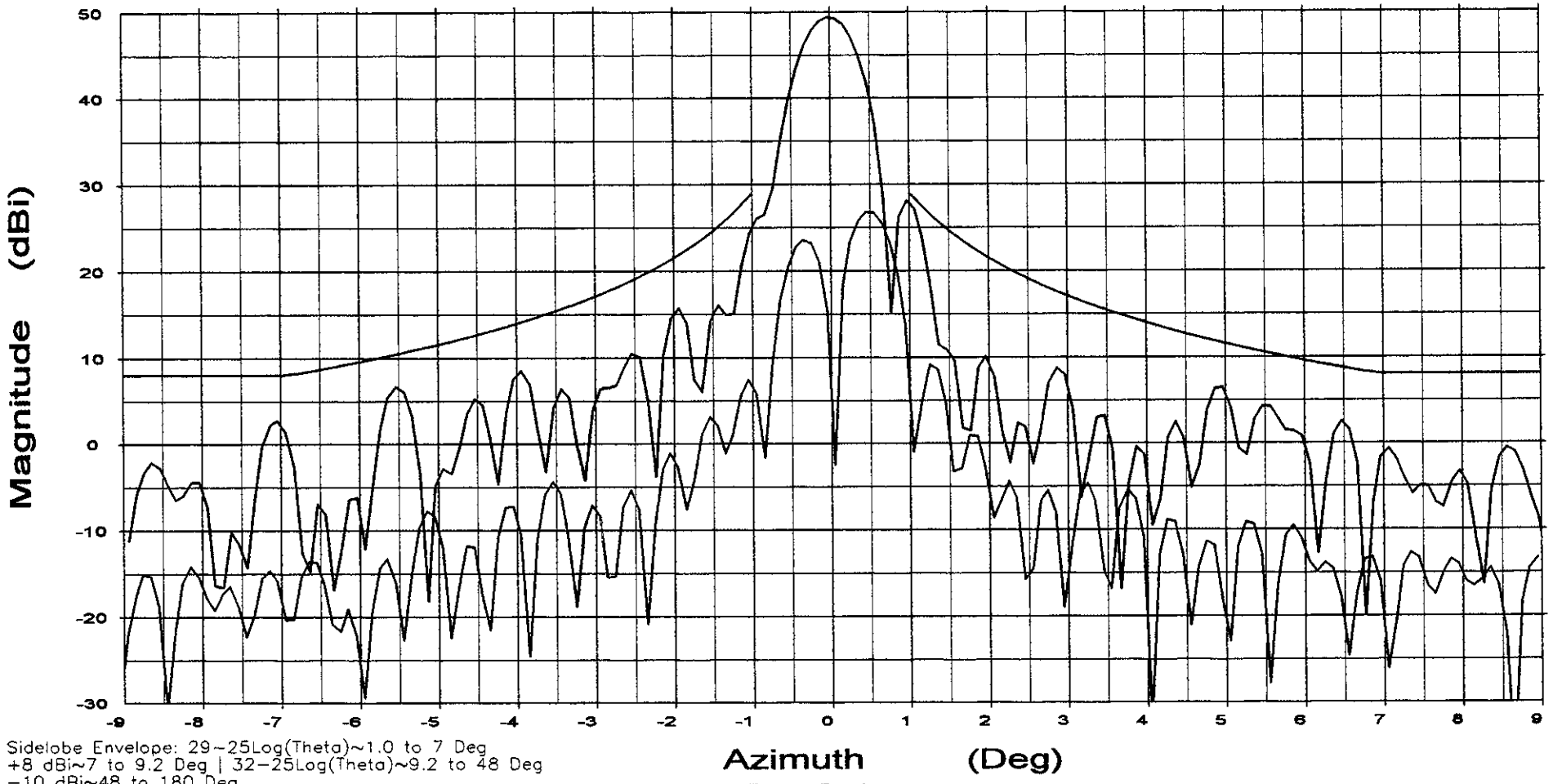
File: See Legend
Date: 12-Mar-02

AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104617.dat-ant_under_test ——	104617.dat	dBi	-0.04	49.38
104622.dat-ant_under_test ——	104622.dat	dBi	0.44	26.70

Prode' Corporation
East M en Test Range
Maiden NC

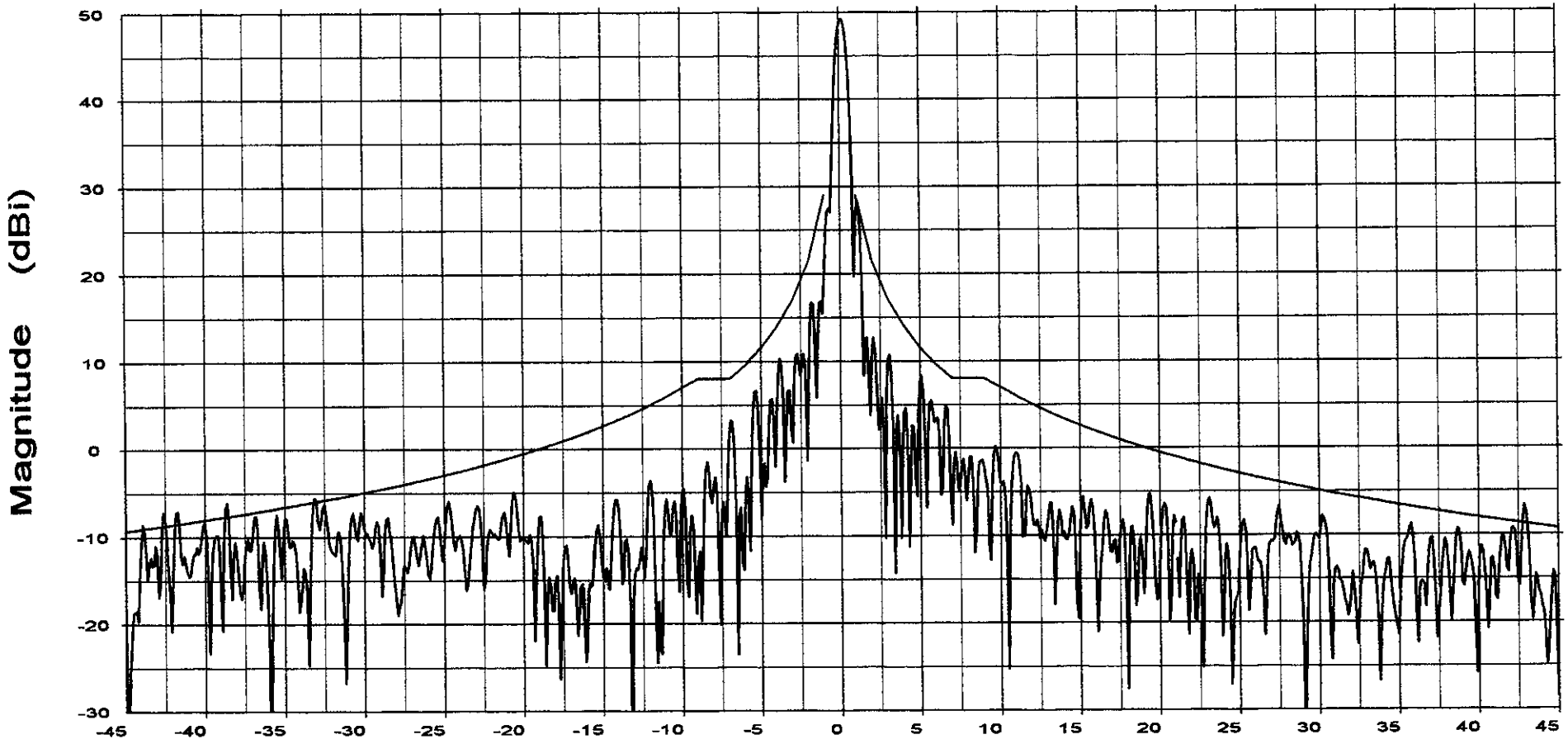
File: See Legend
Date: 12-Mar-02

AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104615.dat-ant_under_test ——	104615.dat	dBi	0.16	49.24

Prode' Corporation
East I en Test Range
Maiden NC

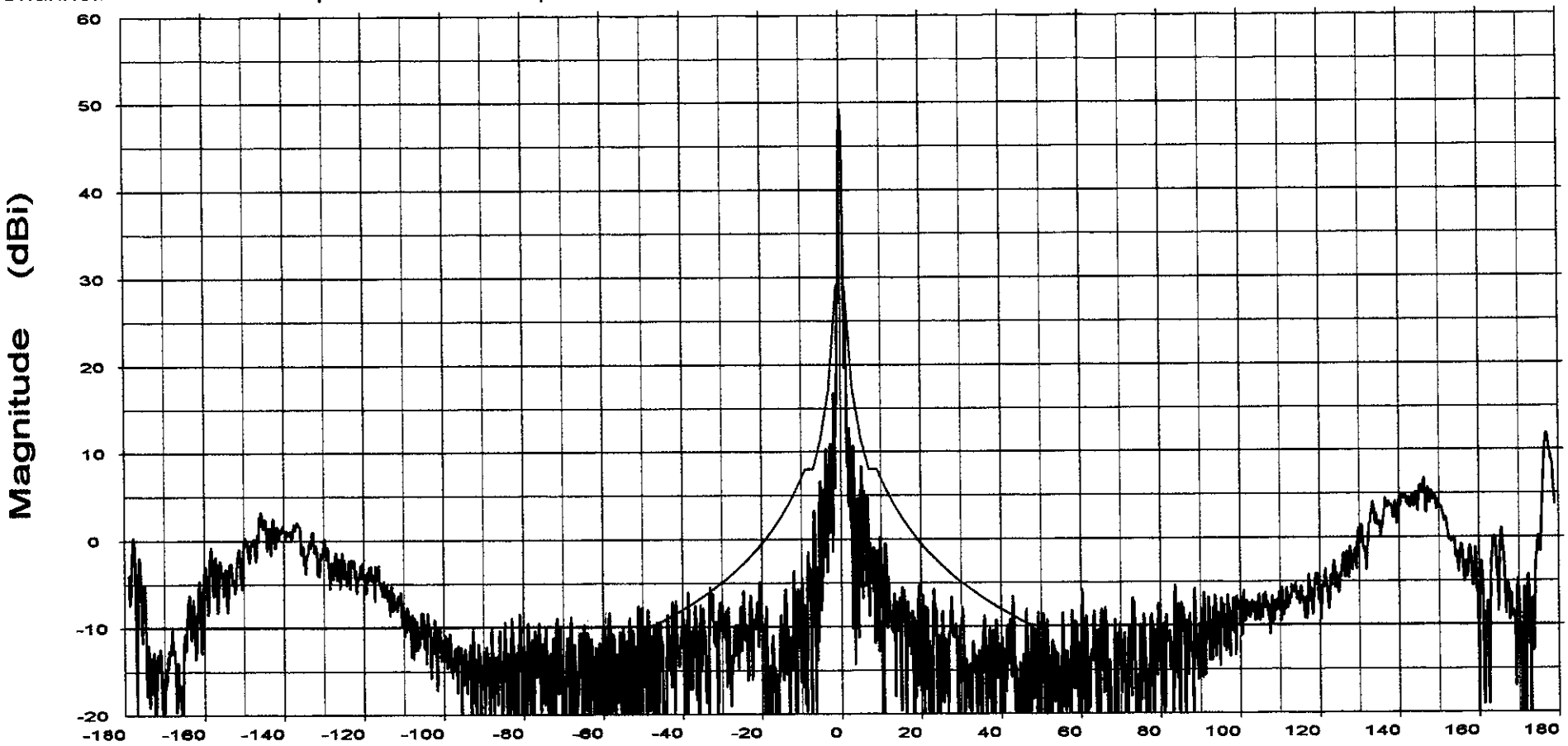
File: See Legend
Date: 12-Mar-02

AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104615.dat-ant_under_test ——	104615.dat	dBi	0.16	49.24

Prode" Corporation
East I en Test Range
Maiden NC

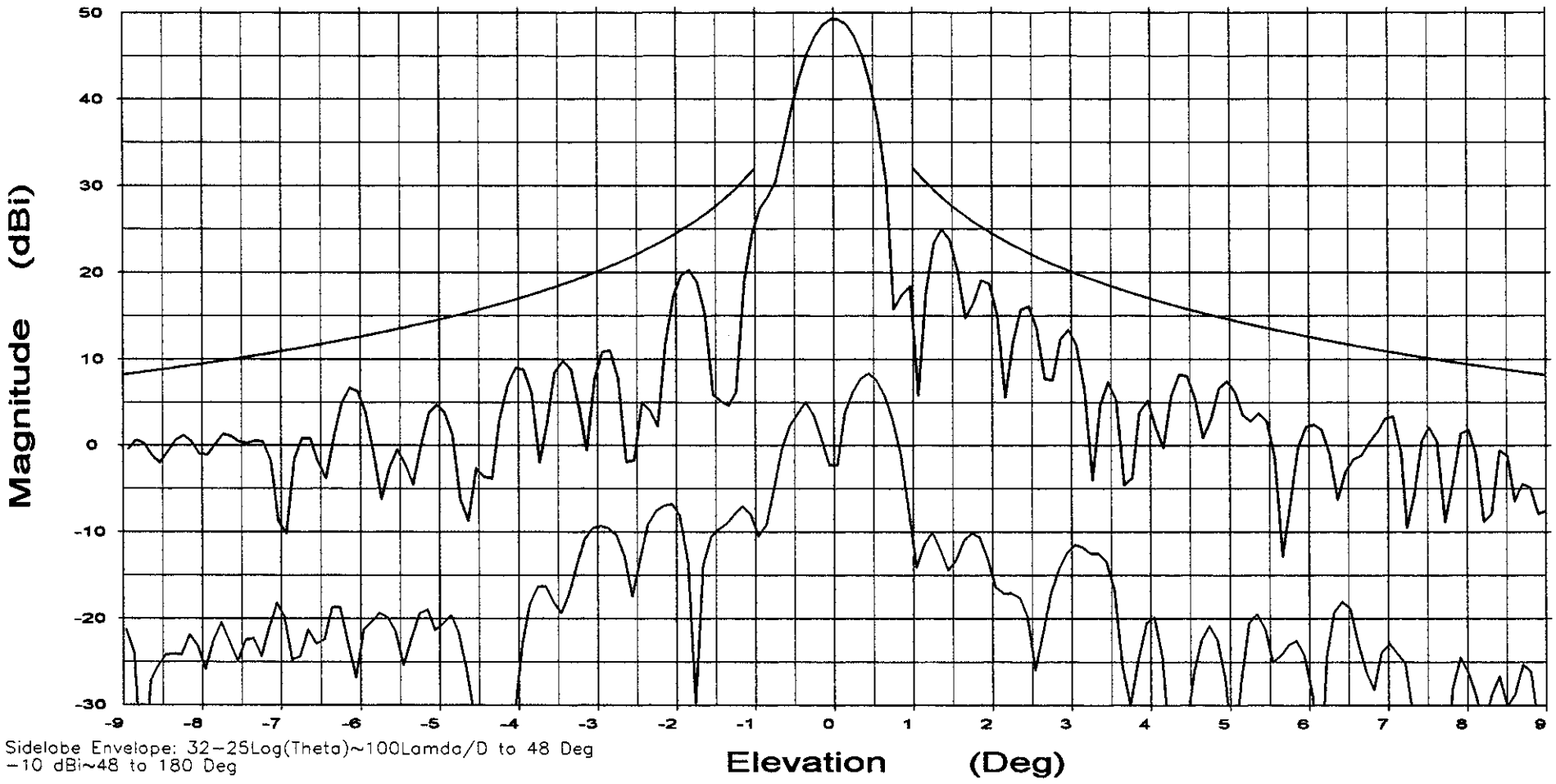
File: See Legend

AVL Model 2400
Ku-Band

Frequency : 14.250 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104619.dat-ant_under_test ——	104619.dat	dBi	0.06	49.22
104624a.dat-ant_under_test ——	104624a.dat	dBi	0.43	8.24

Prode Corporation
East M en Test Range
Maiden NC

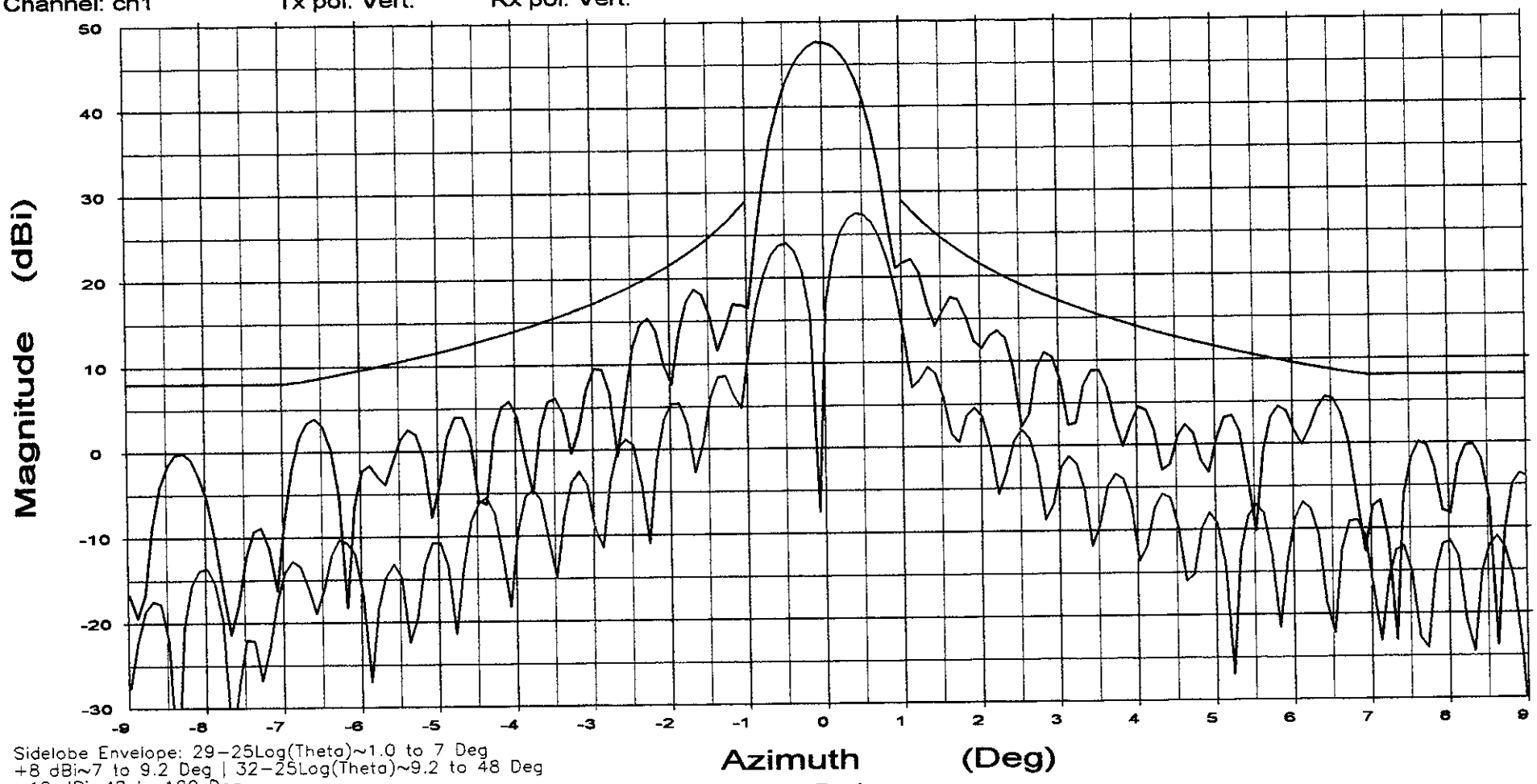
File: See Legend
Date: 11-Mar-02

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104611.dat-ant_under_test ——	104611.dat	dBi	-0.08	47.59
104613.dat-ant_under_test ——	104613.dat	dBi	0.42	27.41

Prodel[illegible] Corporation
East M[illegible]en Test Range
Maiden NC

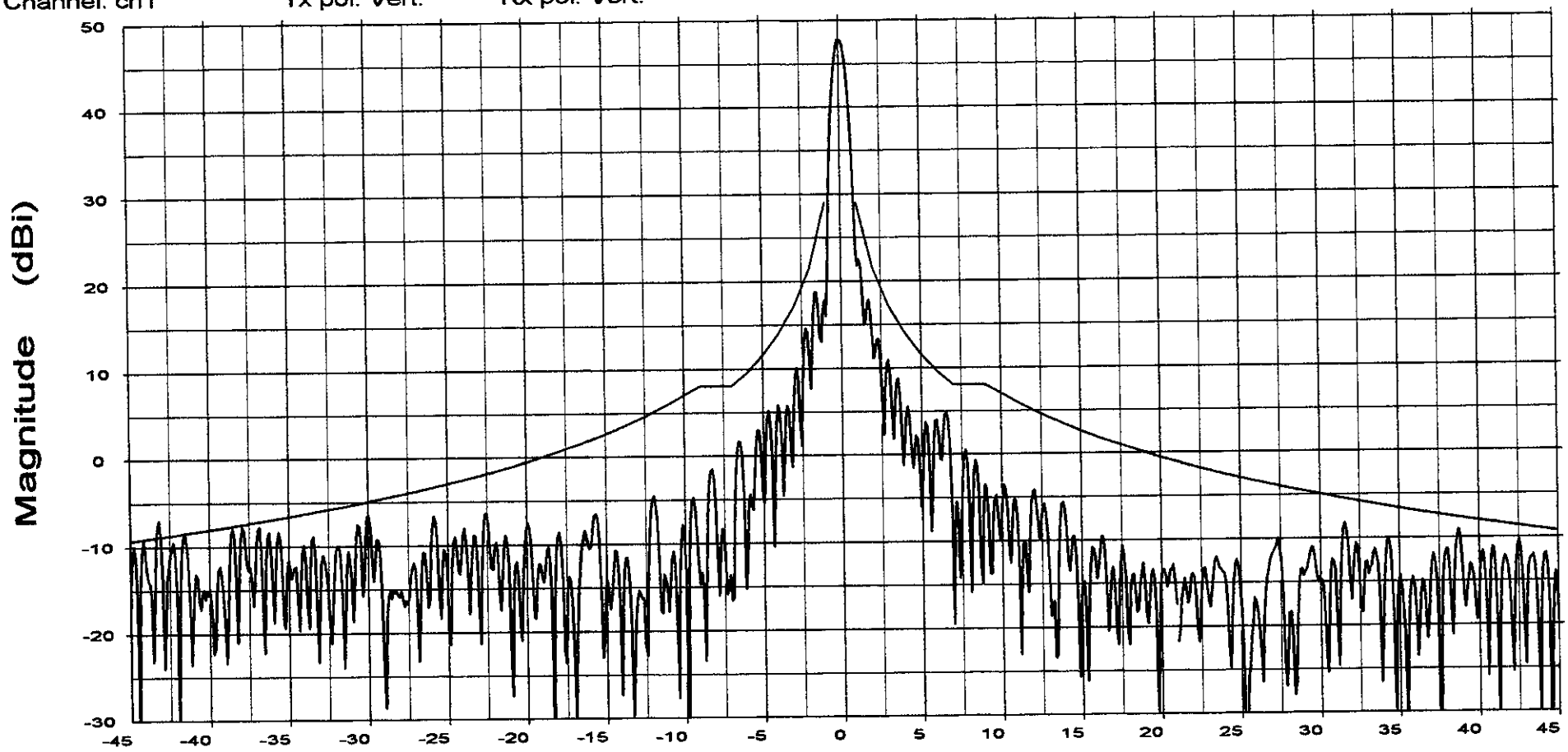
File: See Legend
Date: 11-Mar-02

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29-25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32-25Log(Theta)~9.2 to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104610.dat-ant_under_test ——	104610.dat	dBi	0.02	47.69

Prodelin Corporation
East [illegible]len Test Range
Maiden NC

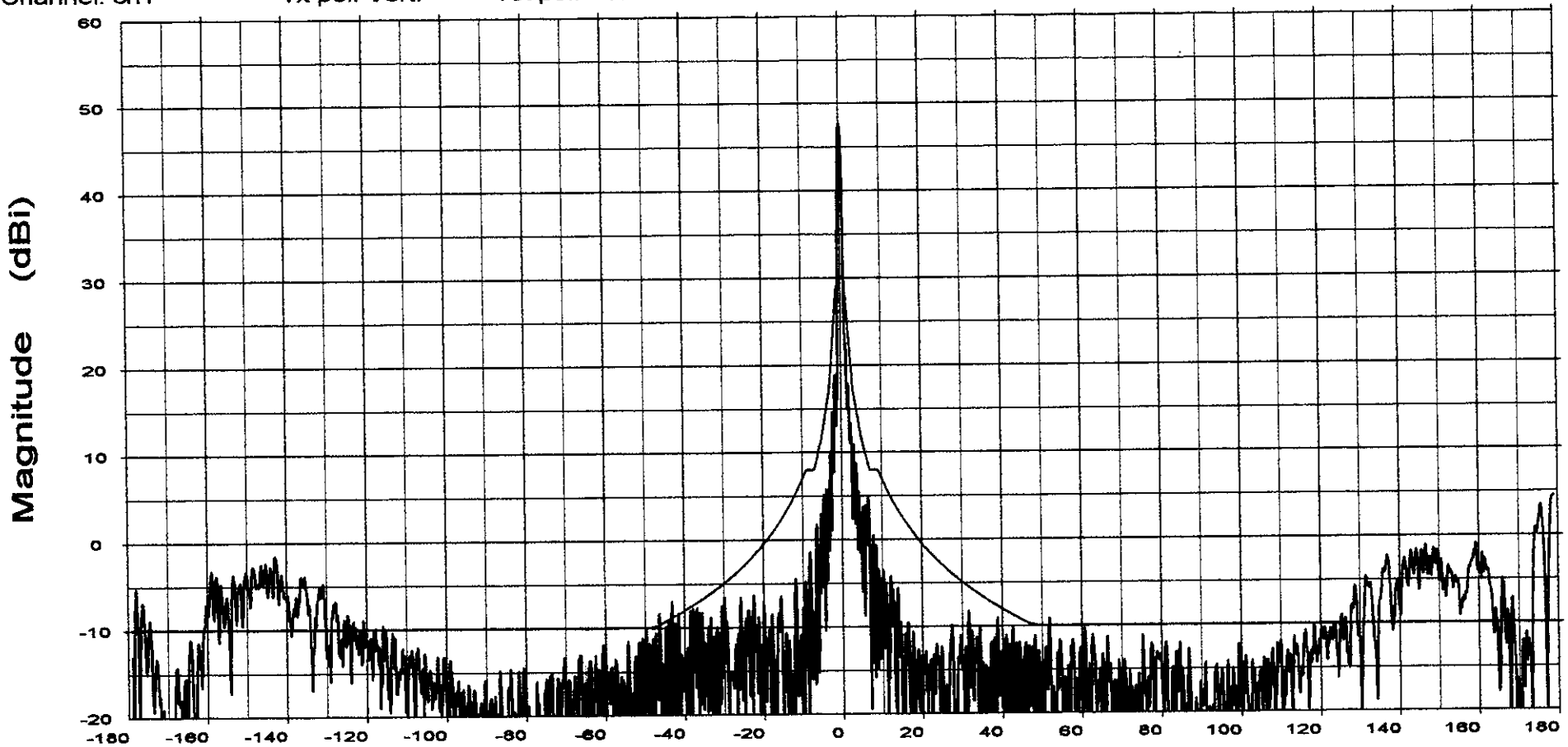
File: See Legend
Date: 11-Mar-02

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert. Rx pol: Vert.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104610.dat-ant_under_test ——	104610.dat	dBi	0.02	47.69

Prodelin Corporation
East [illegible]len Test Range
Maiden NC

File: See Legend

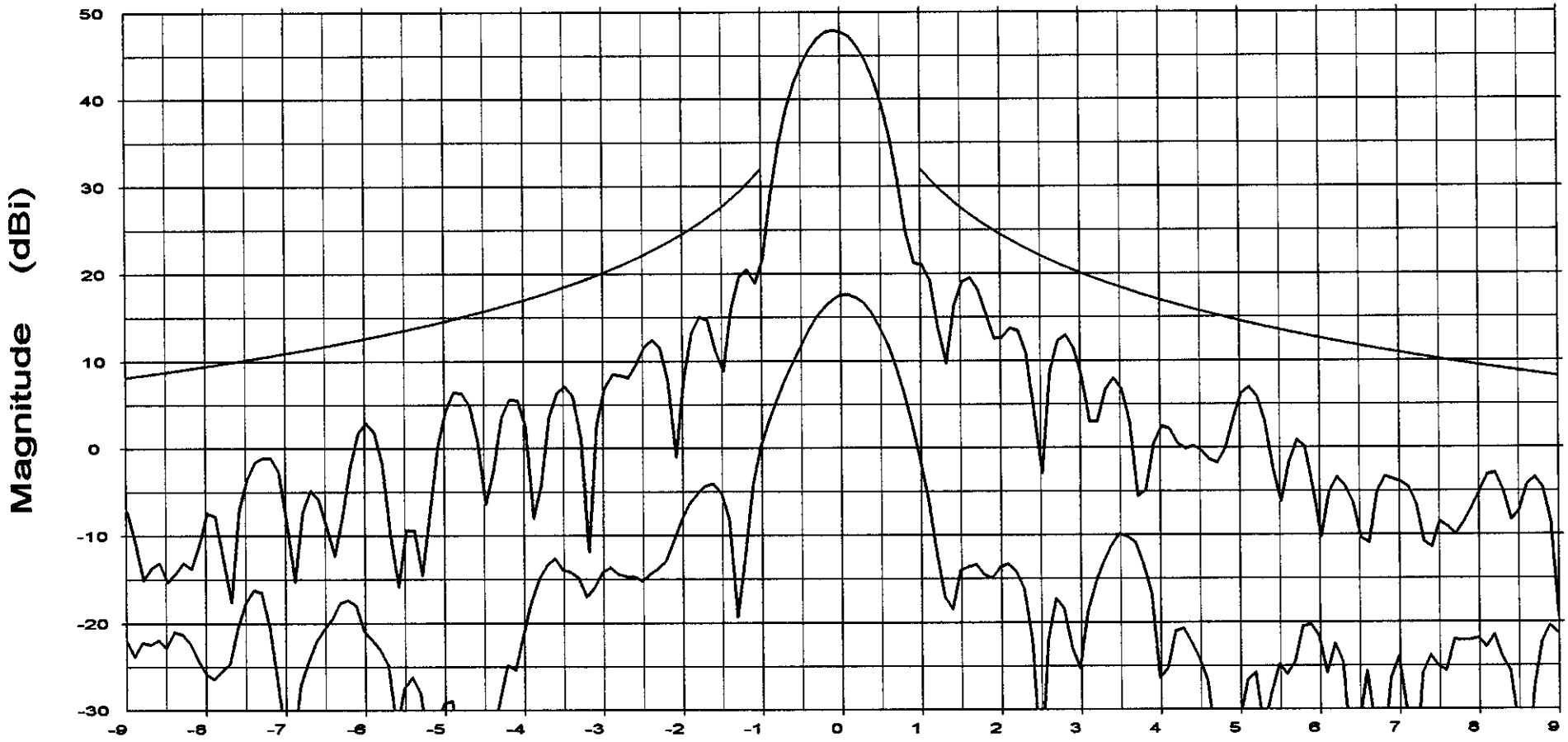
AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Vert.

Rx pol: Vert.



Sidelobe Envelope: 32−25Log(Theta)~100Lamda/D to 48 Deg
−10 dBi~48 to 180 Deg

Overlays		Cal. file	units	Beam Peak Deg	Beam Peak dB
104612.dat-ant_under_test	——	104612.dat	dBi	-0.08	47.85
104614.dat-ant_under_test	——	104614.dat	dBi	0.08	17.57

Prode Corporation
East I ien Test Range
Maiden NC

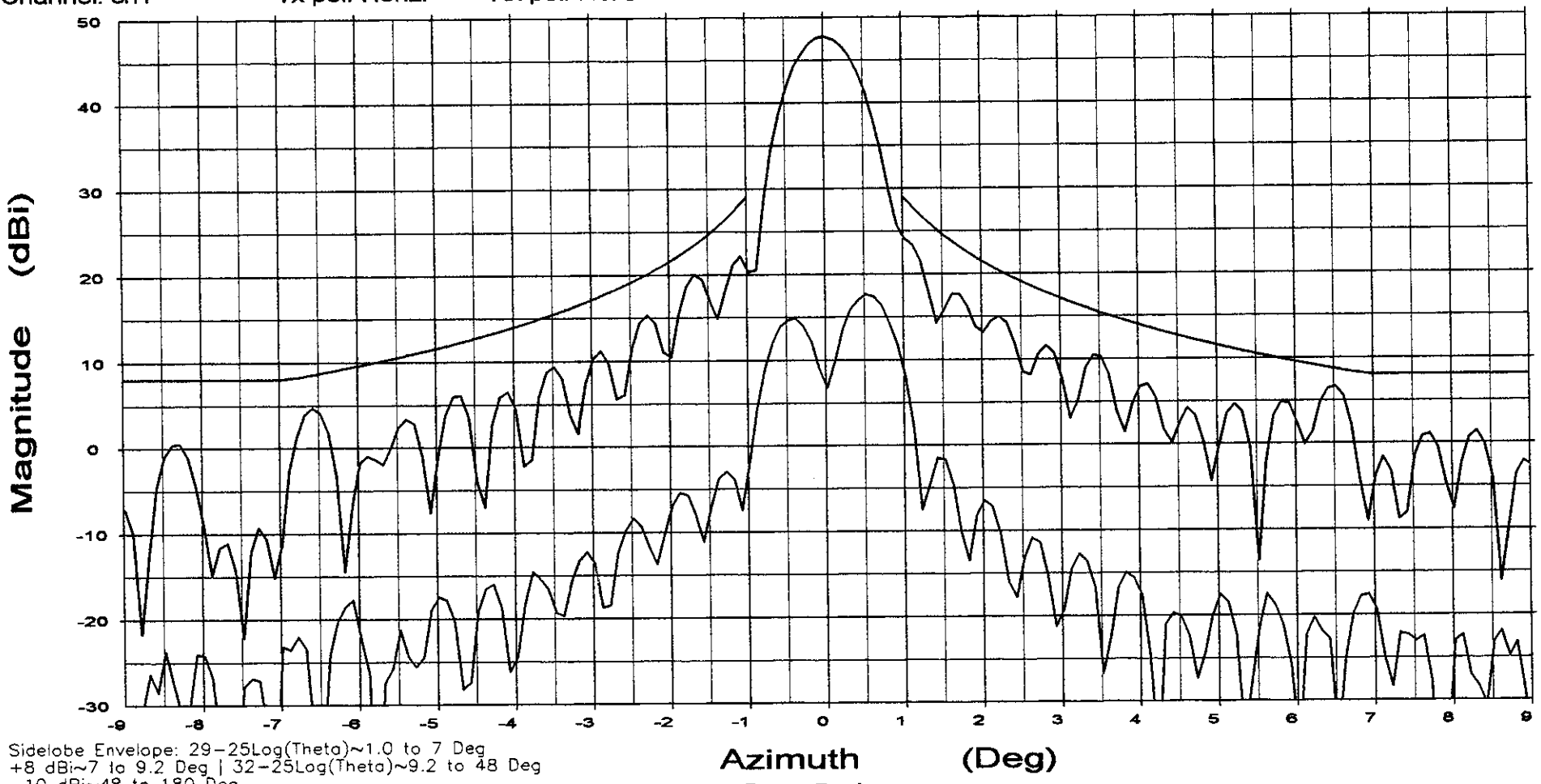
File: See Legend
Date: 12-Mar-02

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104616.dat-ant_under_test ——	104616.dat	dBi	0.02	47.70
104621.dat-ant_under_test ——	104621.dat	dBi	0.52	17.55

Prode Corporation
East I en Test Range
Maiden NC

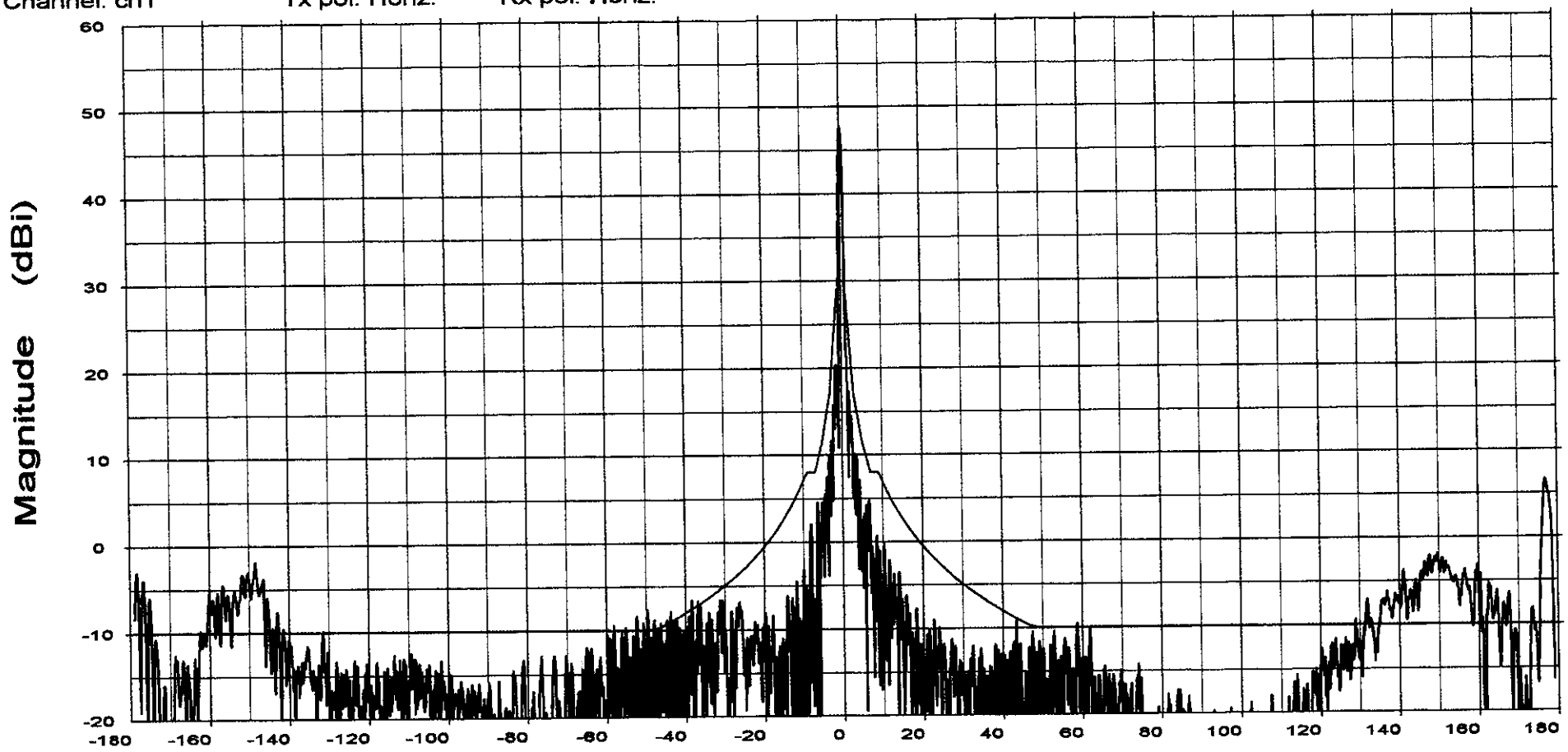
File: See Legend
Date: 12-Mar-02

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



Sidelobe Envelope: 29−25Log(Theta)~1.0 to 7 Deg
+8 dBi~7 to 9.2 Deg | 32−25Log(Theta)~9.2 to 48 Deg
−10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104615.dat-ant_under_test ——	104615.dat	dBi	0.12	47.72

Prodelin Corporation
East ! len Test Range
Maiden NC

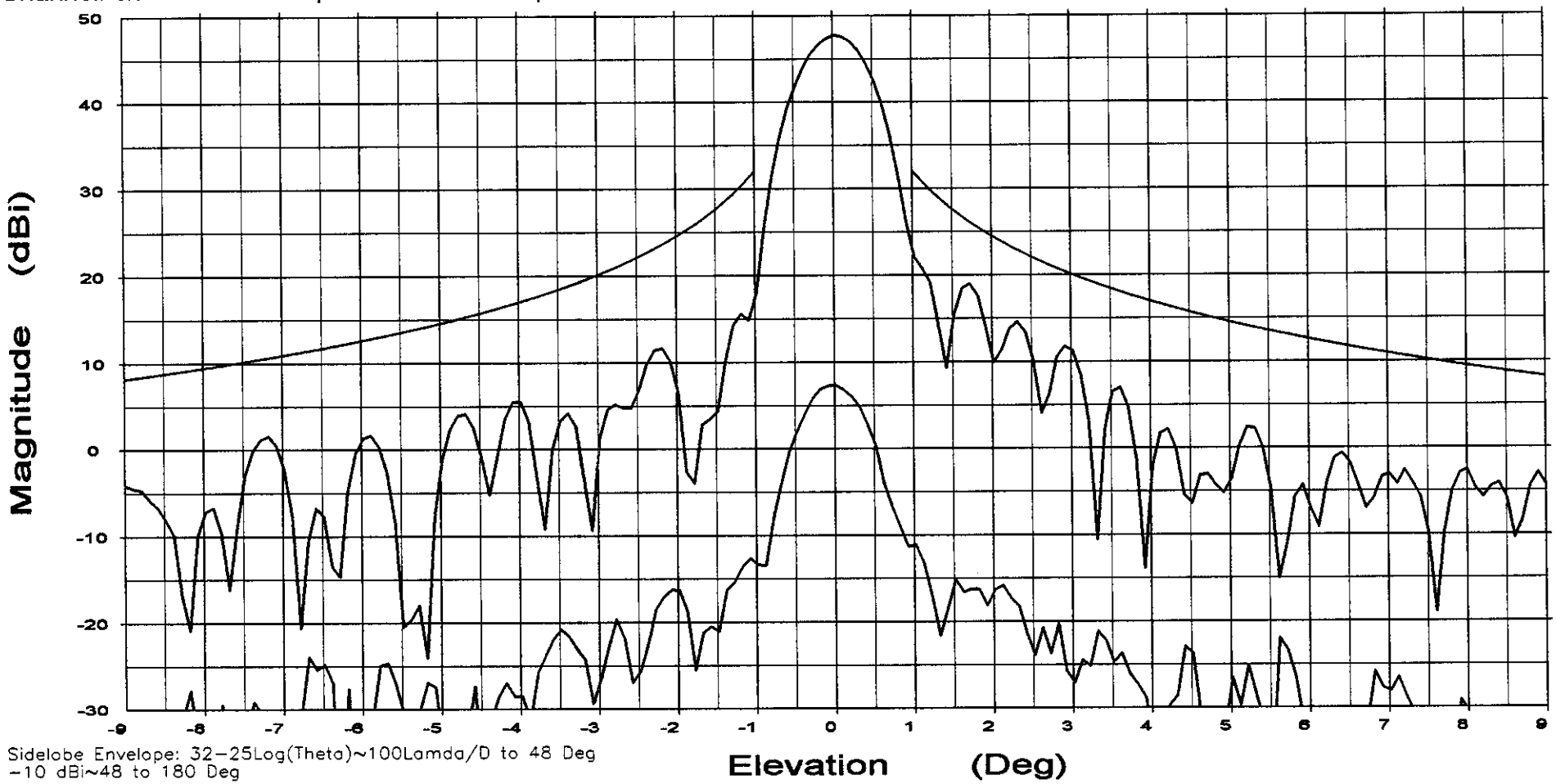
File: See Legend

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

Operator: KP
Ser. no.: 002
Channel: ch1

Tx pol: Horiz. Rx pol: Horiz.



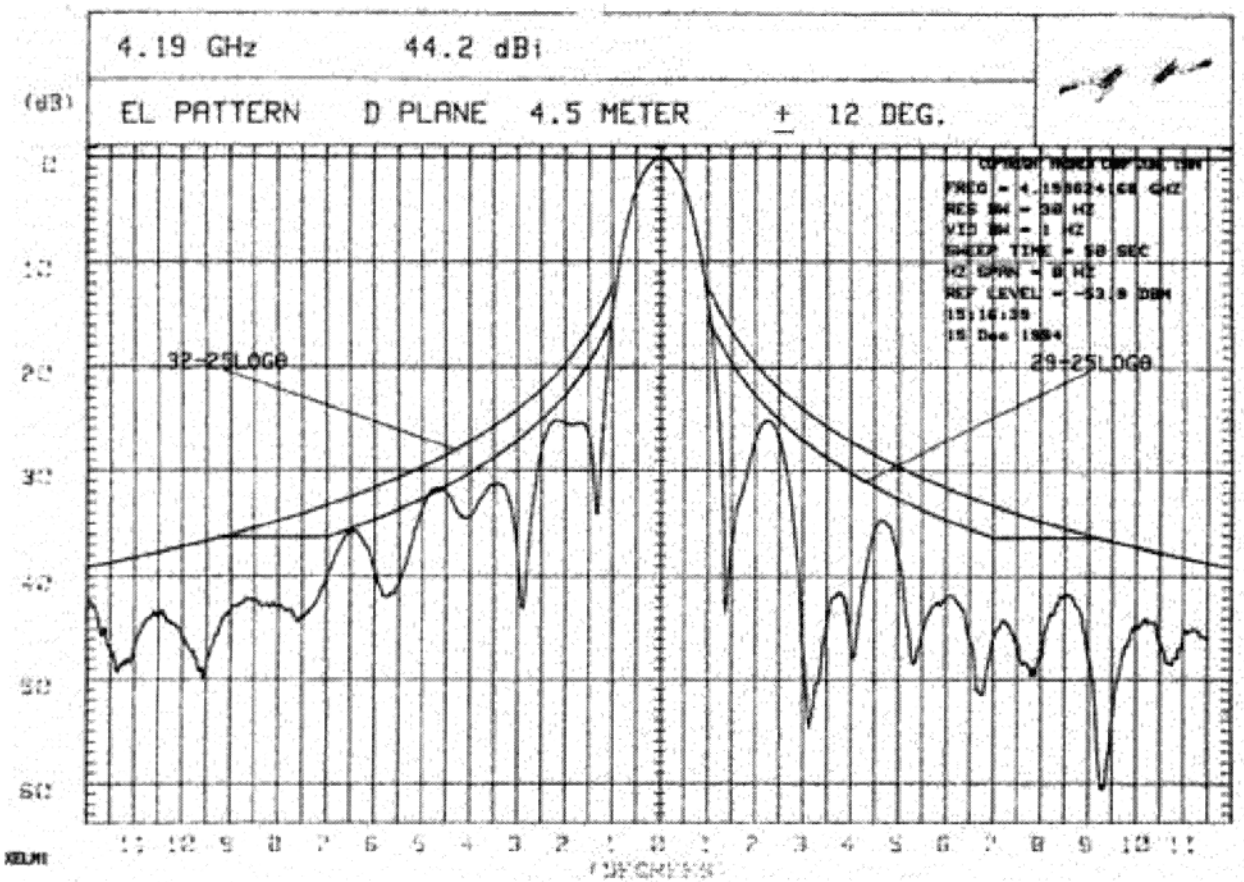
Sidelobe Envelope: 32-25Log(Theta)~100Lamda/D to 48 Deg
-10 dBi~48 to 180 Deg

Overlays	Cal. file	units	Beam Peak Deg	Beam Peak dB
104618.dat-ant_under_test ——	104618.dat	dBi	0.02	47.71
104624.dat-ant_under_test ——	104624.dat	dBi	0.01	7.31

Prode[illegible] Corporation
East [illegible]len Test Range
Maiden NC

Typical Antenna Patterns - C Band

4.5M C-Band Elevation RCV @ 4.19



4.5M C-Band Azimuth TX @ 6.0

Andrew Earth Station Antennas - ES45MPJ-1 4.5 Meter ESA