



G/T Calculation (Spectrum Analyzer Direct Method)

ES CODE:

CPE-31

DATE: 05/03/2003

SPACECRAFT:

706 307.00deg

ELEVATION: 16.7

G/T Test (LHCP, RHCP, RX Port 1, RX Port 2):

RX Port 1

Testing Freq.:

Diameter:

3.7 m.

Beacon OR
Test Crx:

System Temperature (Tant+Tlna) (deg.Kelvin):

K

Mhz
4114 Mhz

Bandwidth Filter(KHz.):

1 KHz

Correction Factor(0.75 or 1.2):

1.2

Non-Direct Reading Specan:

Measured CRX Level(C+N)

19.4 dBm

Measured Noise Floor:

84.58 dBm/Hz

Measured Noise Floor Level(N) : OR

dBm

C/No Measured:

65.18 dB/Hz

Measured (C+N)/N:

dB

Direct Reading Specan:

D/L Path Loss

196.4 dB

D/L Aspect Correction

1.91 dB

D/L EIRP at Beam Center

10.4 dBW

Is polarization correction of 3.0 dBW required?(Y/N)

N

Standard Applied:

F1

Standard Met:

F1

Results:

C/N = dB/Hz

G/T 24.4900 dB/K

C/No = 65.1800 dB/Hz

@ 4 GHz 24.2459 dB/K

Gain(Rx) = #NUM! dBi

Efficiency #NUM! %

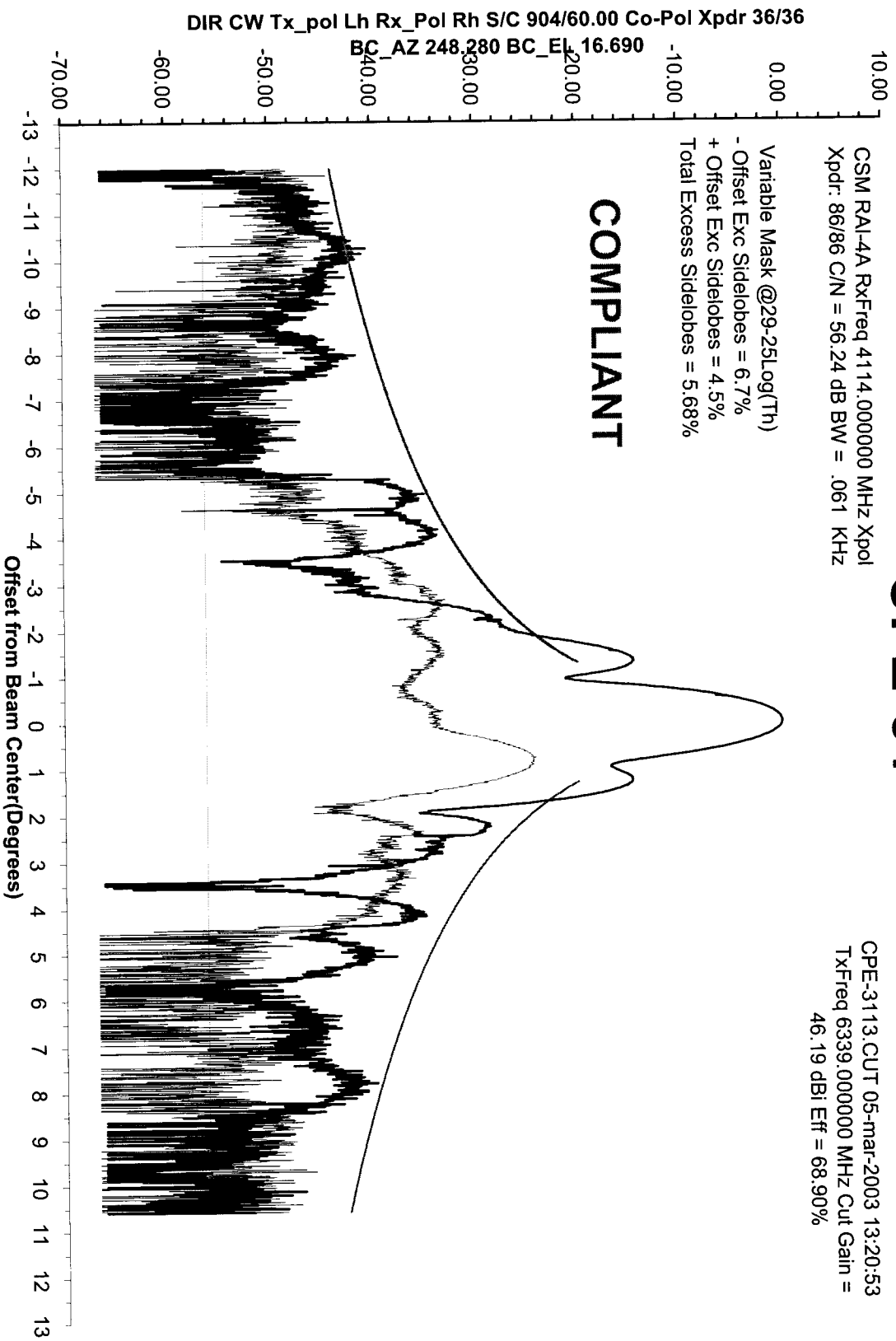
CPE-31

CSM RAI-4A RxFreq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.24 dB BW = .061 KHz

CPE-3113.CUT 05-mar-2003 13:20:53
TxFreq 6339.000000 MHz Cut Gain =
46.19 dBi Eff = 68.90%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 6.7%
+ Offset Exc Sidelobes = 4.5%
Total Excess Sidelobes = 5.68%

COMPLIANT



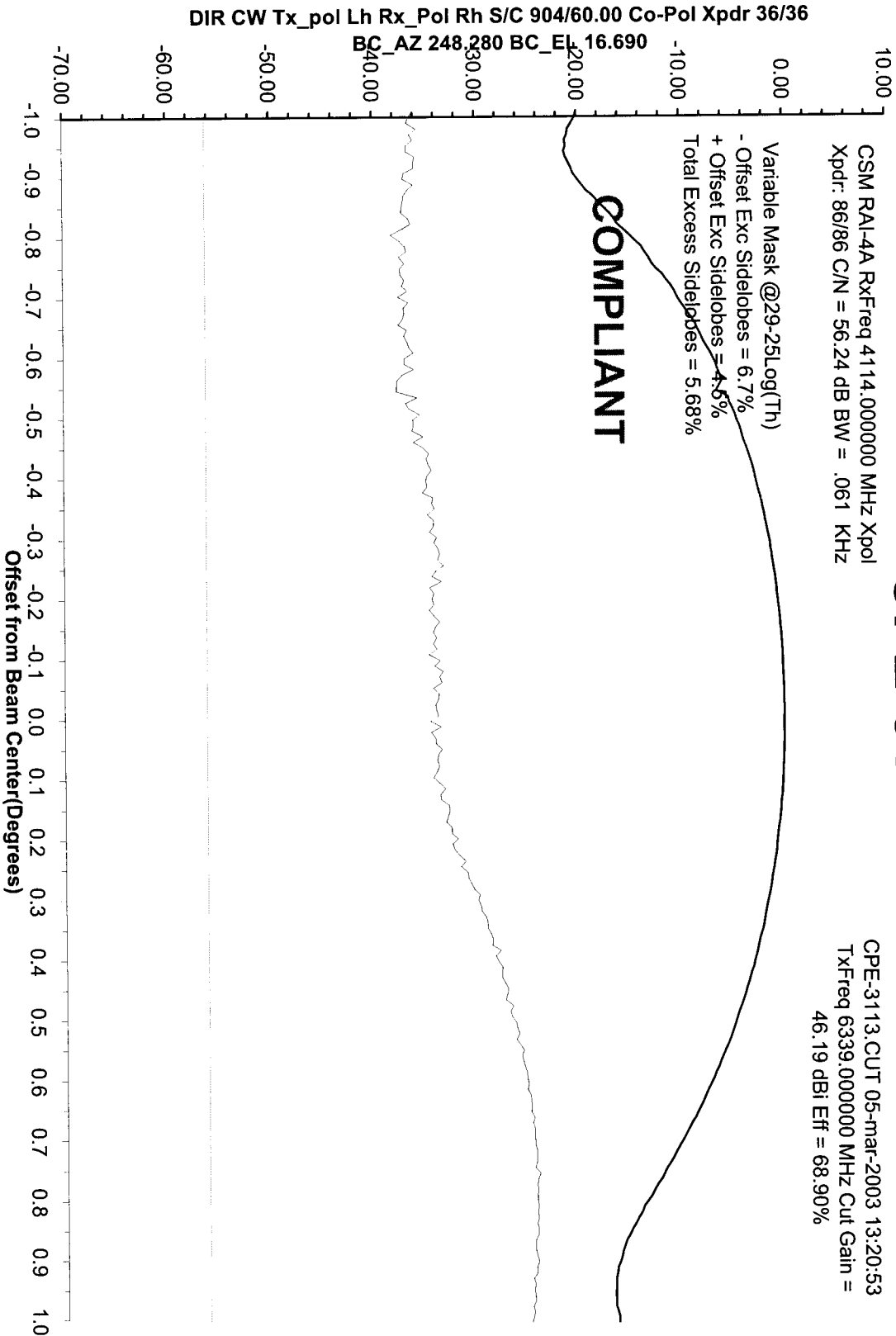
CPE-31

CSM RAI-4A RxFreq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.24 dB BW = .061 KHz

CPE-3113.CUT 05-mar-2003 13:20:53
TxFreq 6339.000000 MHz Cut Gain =
46.19 dBi Eff = 68.90%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 6.7%
+ Offset Exc Sidelobes = ~~4.5~~6%
Total Excess Sidelobes = 5.68%

COMPLIANT



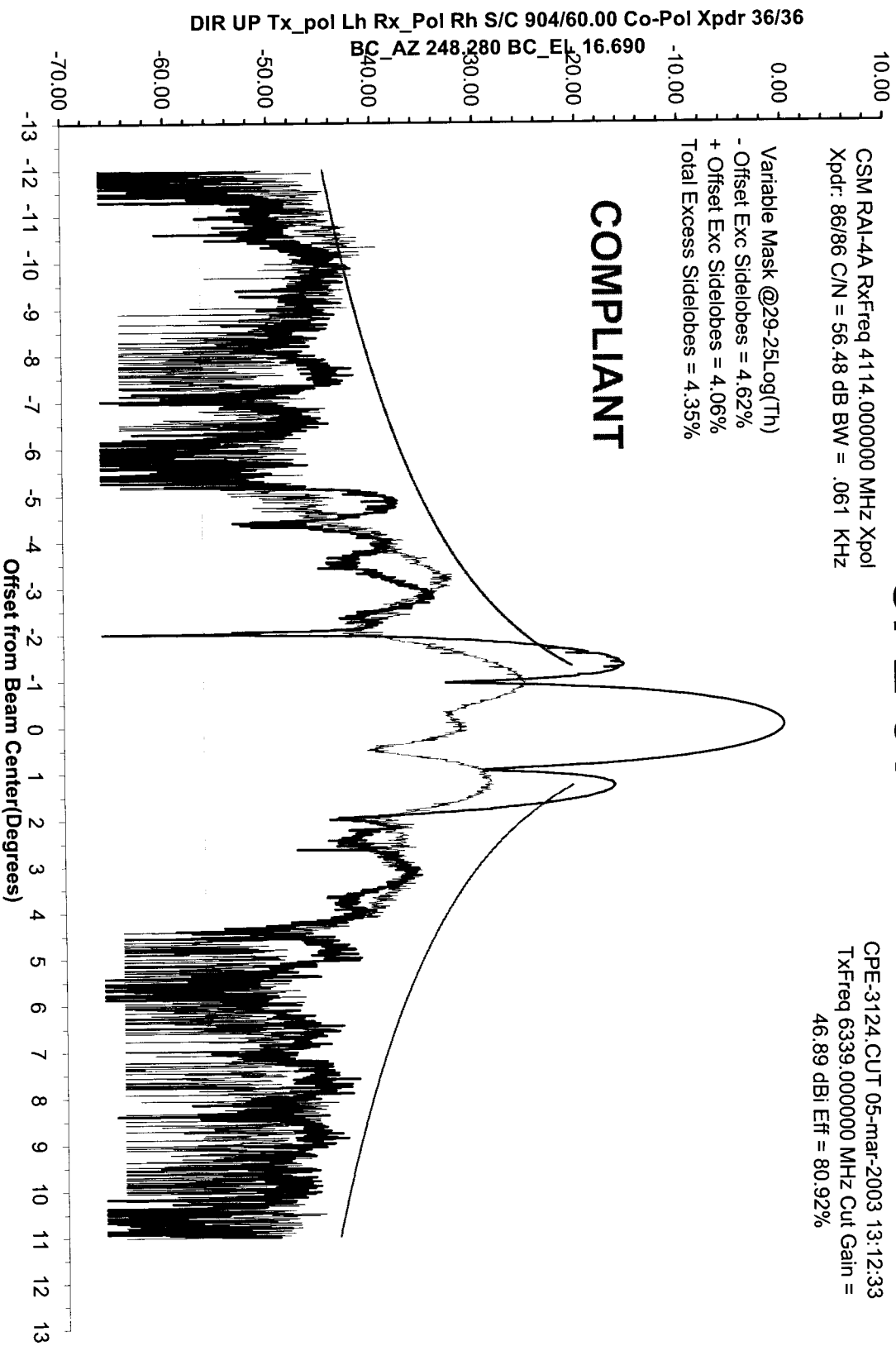
CPE-31

CSM RA1-4A Rx Freq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.48 dB BW = .061 KHz

CPE-3124.CUT 05-mar-2003 13:12:33
Tx Freq 6339.000000 MHz Cut Gain =
46.89 dBi Eff = 80.92%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 4.62%
+ Offset Exc Sidelobes = 4.06%
Total Excess Sidelobes = 4.35%

COMPLIANT



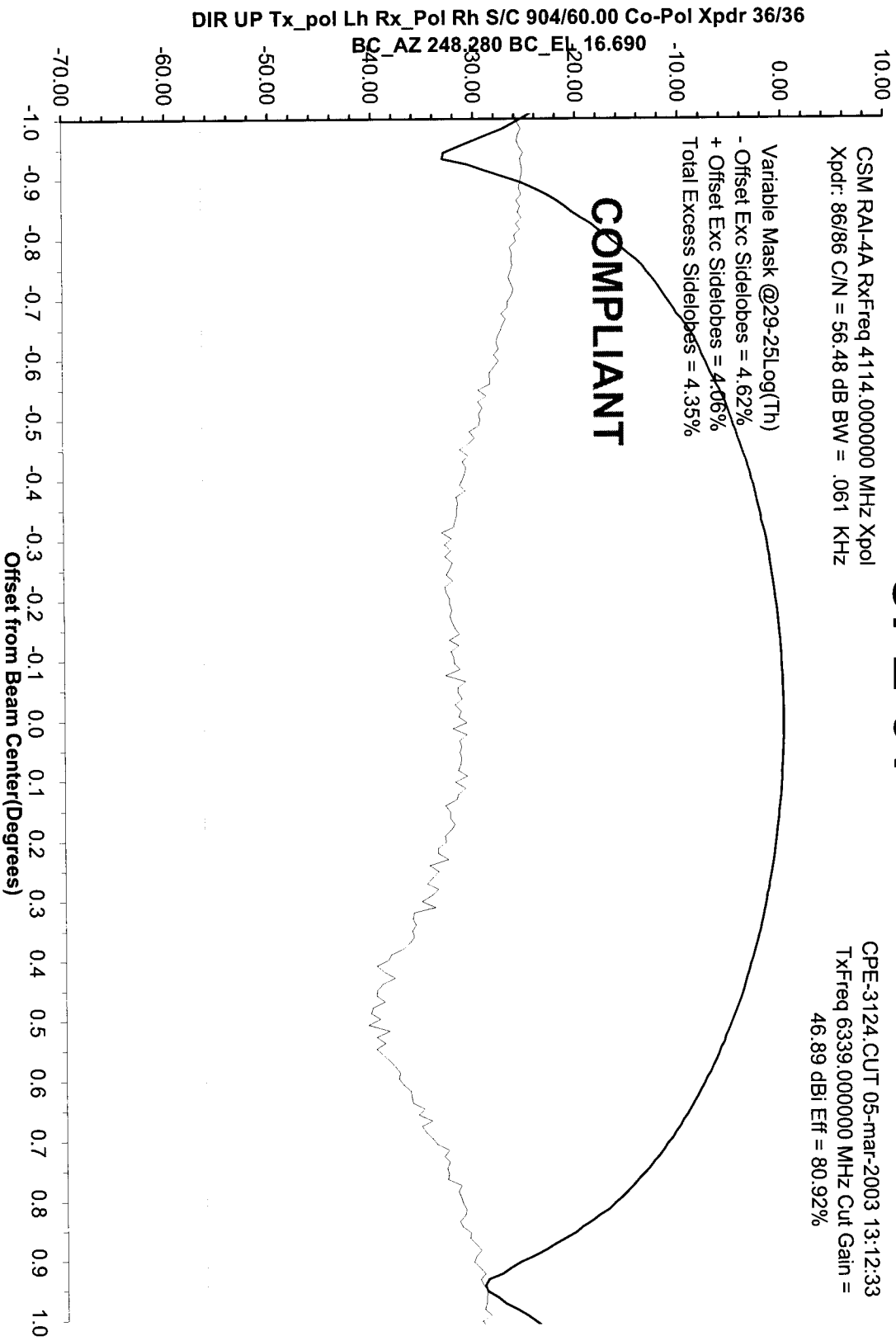
CPE-31

CSM RAI-4A RxFreq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.48 dB BW = .061 KHz

CPE-3124.CUT 05-mar-2003 13:12:33
TxFreq 6339.000000 MHz Cut Gain =
46.89 dBi Eff = 80.92%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 4.62%
+ Offset Exc Sidelobes = 4.06%
Total Excess Sidelobes = 4.35%

COMPLIANT



Antenna Verif Isolation Contour

EUT Code	CPE-31	CSM	4,114.000
CSM Code	RAI -4A	Nominal downlink carrier frequency (MHz)	0.719
Test Performed On Date/Time (UTC)	05-MAR-2003 12:37:23	Downlink Frequency Error (KHz)	56.44
Earth Station Switching polarizations	CSM	Reference C/N (dB)	61
		Reference C/N bandwidth (Hz)	Clear
Satellite/Location (Degrees East)	904 /60.00	Weather	
Transponder			
Co-pol * (Up/Dn)	36/36		
Polarization (Up/Dn)	L / R		
Gain (dB)	155.70		
LO Offset (Hz)	44	EUT	C
Gain Check Date / Time (UTC)	05-MAR-2003 12:10:34	Antenna Shape	3.70/ 3.70
Cross-pol ** (Up/Dn)	86/86	Antenna dimensions, Dim1/Dim2*** (m)	0.00
Polarization (Up/Dn)	R / L	Power at Feed Flange (dBW)	248.30
Gain (dB)	151.49	Azimuth at Beam Center (Deg CCW)	16.70
LO Offset (Hz)	-735	Elevation at Beam Center (Deg UP)	Light Snow
Gain Check Date/Time (UTC)	05-MAR-2003 12:13:55	Weather	6,339,000
		Nominal Uplink test carrier frequency (MHz)	

Step	Az-Offset (deg)	El-Offset (deg)	Co-pol (dBW) ****	Cross-pol (dBW)****	Isolation (dB)	Comment
1	0.000	0.000	10.20	-27.61	33.60	
1	0.000	0.000	10.10	-28.45	34.34	
2	0.191	0.000	9.67	-29.57	35.03	
3	0.191	0.183	9.15	-25.38	30.32	
4	0.000	0.183	9.47	-26.14	31.40	
5	-0.191	0.183	9.01	-25.50	30.30	
6	-0.191	0.000	9.85	-23.77	29.41	
7	-0.191	-0.183	8.96	-23.80	28.55	
8	0.000	-0.183	9.65	-27.32	32.76	
9	0.191	-0.183	9.10	-37.47	42.36	TX PORT #1 IS COMPLIANT - APOL

* Transponder monitored during copol level measurements
** Transponder monitored during cross-pol level measurements
*** Dim1/Dim2 = Horizontal/Vertical Dimensions
**** Level referred to transponder beam center at satellite



G/T Calculation (Spectrum Analyzer Direct Method)

ES-CODE:

CPE-33

DATE: 05/03/2003

SPACECRAFT:

904 60.00deg

ELEVATION: 16.7

G/T Test (LHCP, RHCP, RX Port 1, RX Port 2):

RHCP

Testing Freq.:

Diameter:

3.7 m.

**Beacon OR
Test Crx:**

System Temperature(Tant+TLna) (deg.Kelvin):

K

**Mhz
4114 MHz**

Bandwidth Filter(KHz.):

1 KHz

Correction Factor(0.75 or 1.2):

1.2

Non-Direct Reading Specan:

Measured CRX Level(C+N)

19.9 dBm

Measured Noise Floor:

84.08 dBm/Hz

Measured Noise Floor Level(N) : OR

dBm

C/No Measured:

64.18 dB/Hz

Measured (C+N)/N:

dB

Direct Reading Specan:

D/L Path Loss

196.4 dB

D/L Aspect Correction

1.91 dB

D/L EIRP at Beam Center

9.8 dBW

Is polarization correction of 3.0 dBW required?(Y/N)

N

Standard Applied:

F1

Standard Met:

F1

Results:

C/N = dB/Hz

G/T 24.0900 dB/K

C/No = 64.1800 dB/Hz

@ 4 GHz 23.8459 dB/K

Gain(Rx) = #NUM! dBi

Efficiency #NUM! %

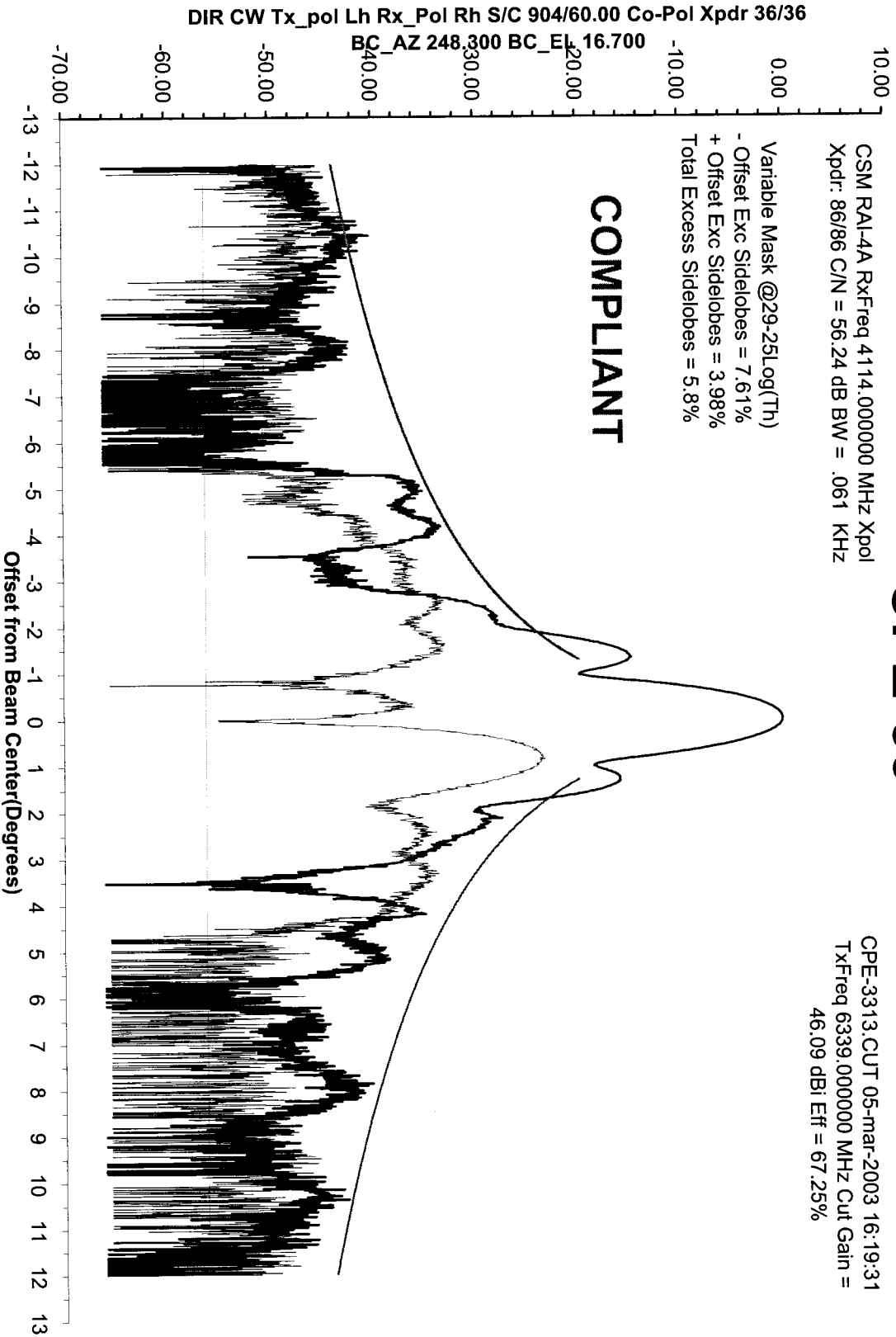
CPE-33

CSM RAL-4A RxFreq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.24 dB BW = .061 KHz

CPE-3313.CUT 05-mar-2003 16:19:31
TxFreq 6339.000000 MHz Cut Gain =
46.09 dBi Eff = 67.25%

Variable Mask @29-25Llog(Th)
- Offset Exc Sidelobes = 7.61%
+ Offset Exc Sidelobes = 3.98%
Total Excess Sidelobes = 5.8%

COMPLIANT



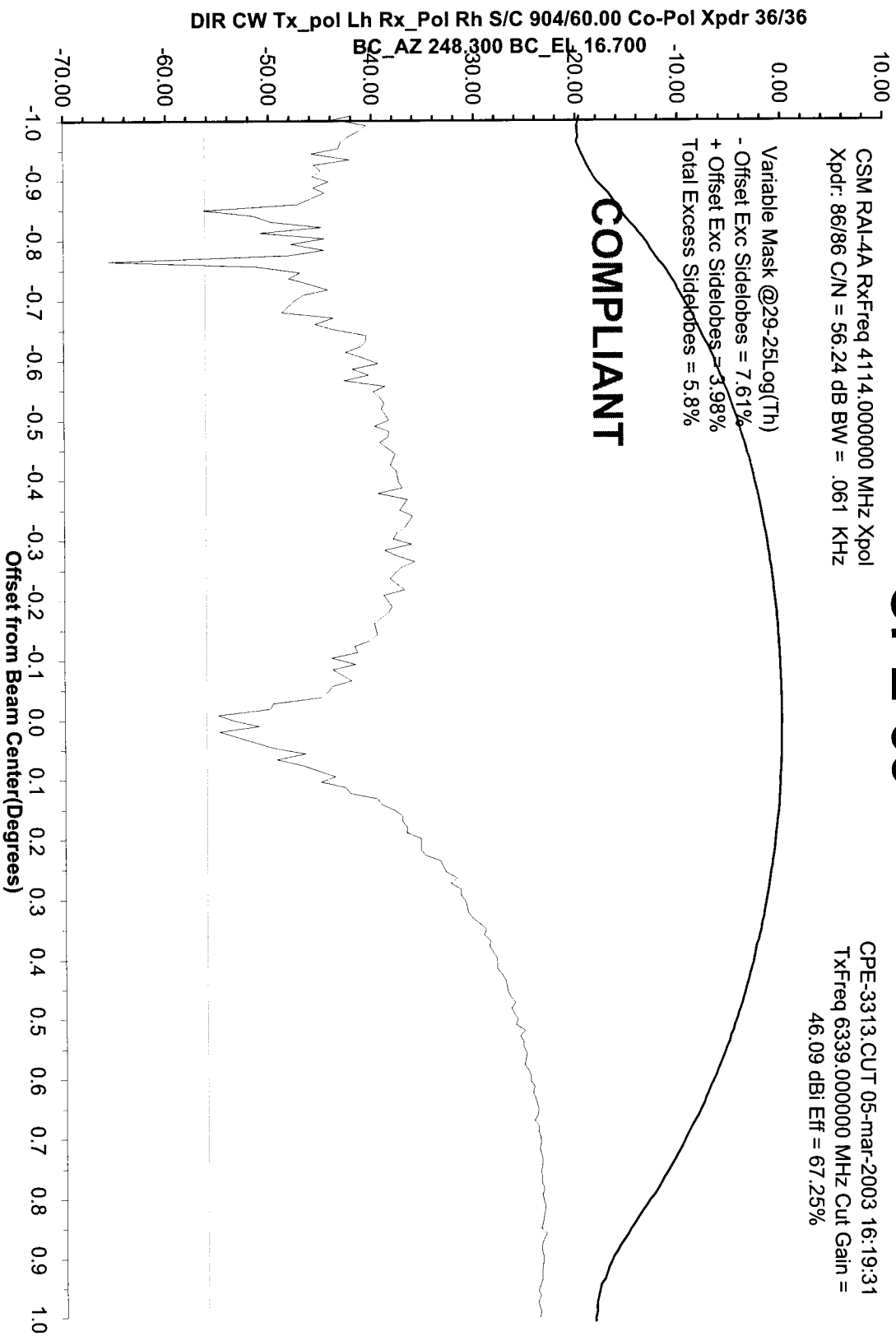
CPE-33

CSM RAI-4A Rx Freq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.24 dB BW = .061 KHz

CPE-3313.CUT 05-mar-2003 16:19:31
Tx Freq 6339.000000 MHz Cut Gain =
46.09 dBi Eff = 67.25%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 7.61%
+ Offset Exc Sidelobes = 3.98%
Total Excess Sidelobes = 5.8%

COMPLIANT



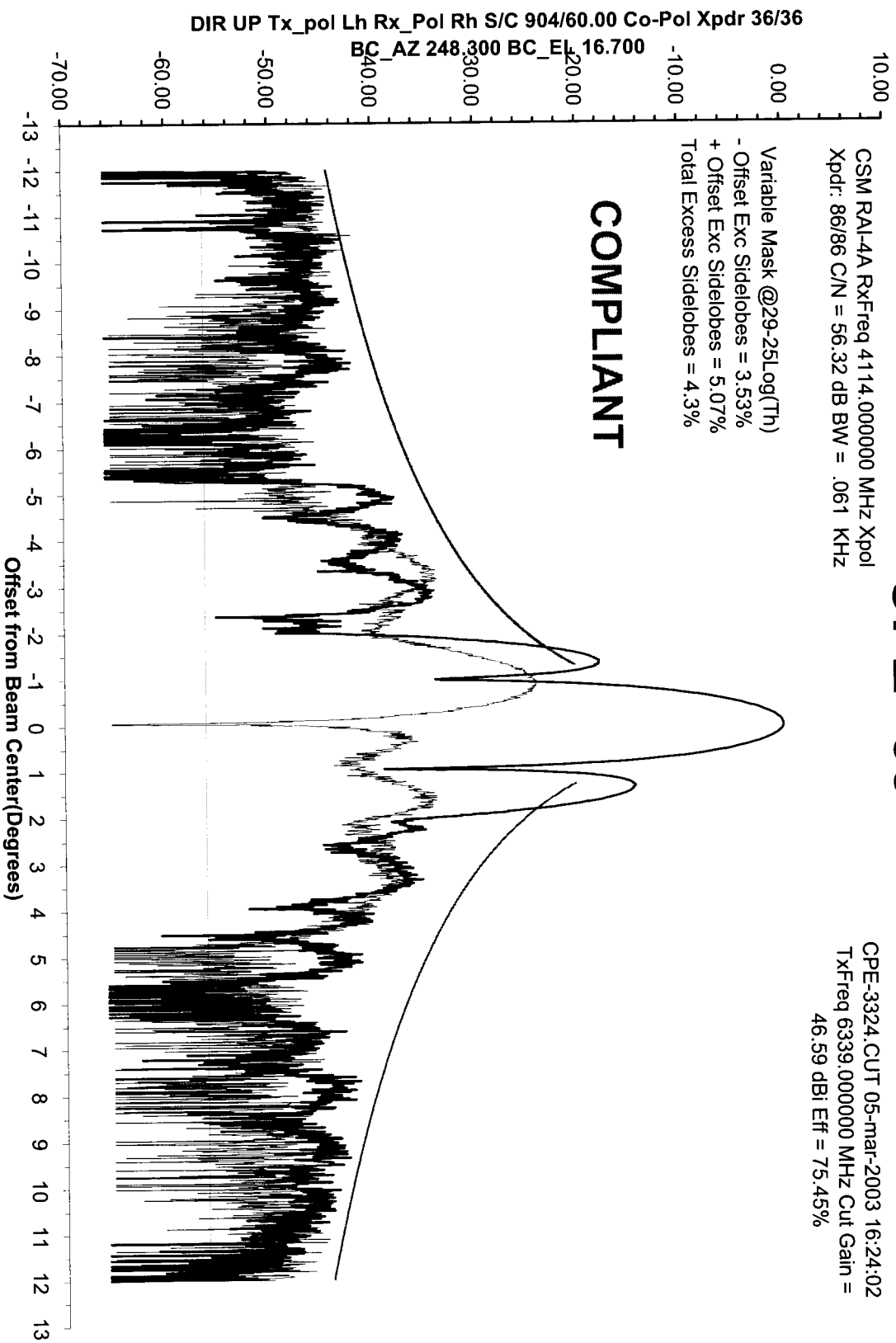
CPE--33

CSM RAI-4A Rx Freq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.32 dB BW = .061 KHz

CPE-3324.CUT 05-mar-2003 16:24:02
Tx Freq 6339.000000 MHz Cut Gain =
46.59 dBi Eff = 75.45%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 3.53%
+ Offset Exc Sidelobes = 5.07%
Total Excess Sidelobes = 4.3%

COMPLIANT



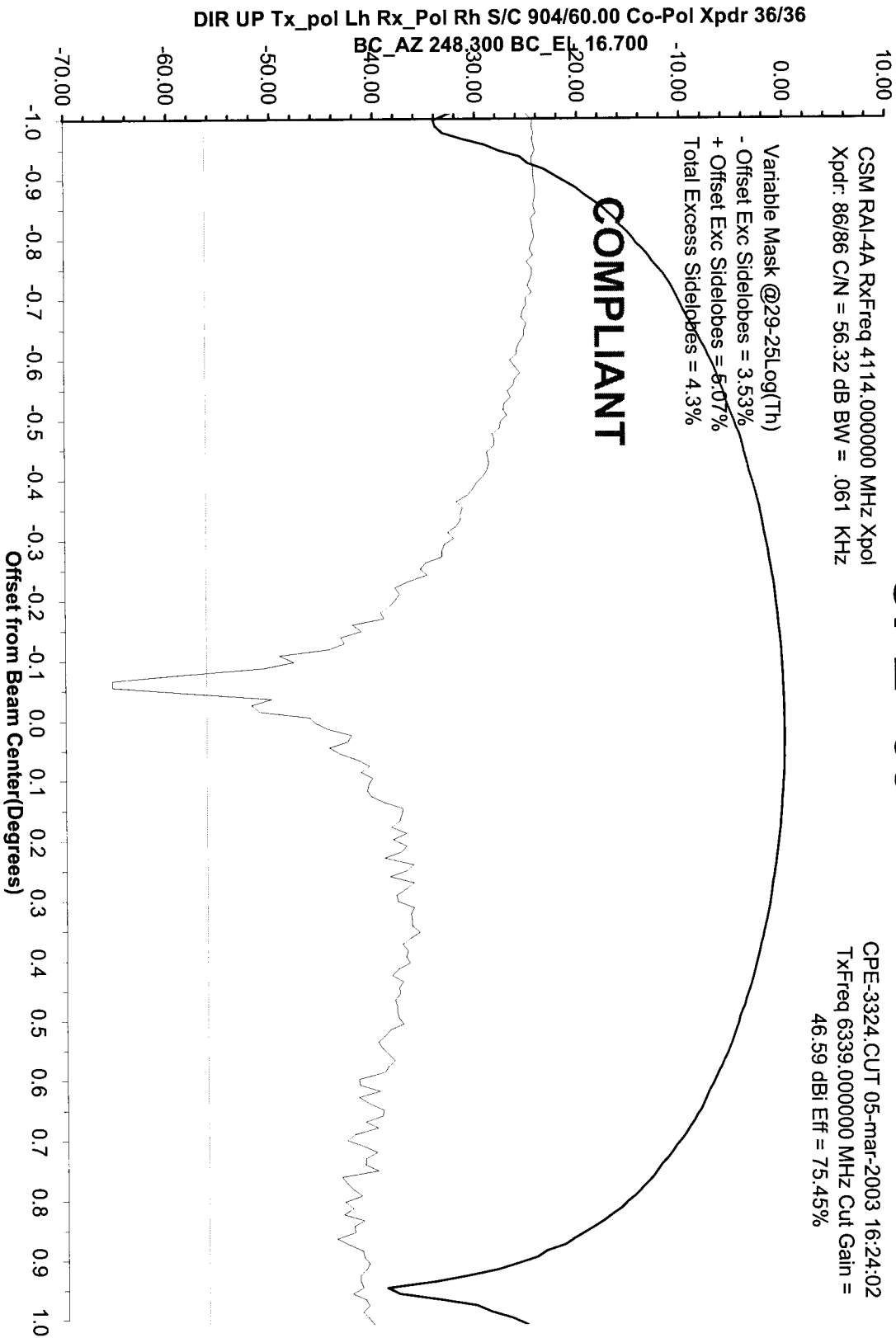
CPE--33

CSM RAL-4A RxFreq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.32 dB BW = .061 KHz

CPE-3324.CUT 05-mar-2003 16:24:02
TxFreq 6339.000000 MHz Cut Gain =
46.59 dBi Eff = 75.45%

Variable Mask (@29-25Log(Th))
- Offset Exc Sidelobes = 3.53%
+ Offset Exc Sidelobes = ~~5.07~~%
Total Excess Sidelobes = 4.3%

COMPLIANT



Antenna Verif Isolation Contour

EUT Code	CPE-33	CSM	4,114.000
CSM Code	RAI -4A	Nominal downlink carrier frequency (MHz)	0.743
Test Performed On Date/Time (UTC)	05-MAR-2003 15:59:11	Downlink Frequency Error (kHz)	56.47
Earth Station Switching polarizations	CSM	Reference C/N (dB)	61
		Reference C/N bandwidth (Hz)	Clear
Satellite/Location (Degrees East)	904 /60.00	Weather	
Transponder			
Co-pol * (Up/Dn)	36/36		
Polarization (Up/Dn)	L / R		
Gain (dB)	155.70		
LO Offset (Hz)	44	EUT	C
Gain Check Date / Time (UTC)	05-MAR-2003 12:10:34	Antenna Shape	3.70/ 3.70
Cross-pol ** (Up/Dn)	86/86	Antenna dimensions, Dim1/Dim2*** (m)	0.00
Polarization (Up/Dn)	R / L	Power at Feed Flange (dBW)	248.70
Gain (dB)	151.49	Azimuth at Beam Center (Deg CCW)	16.30
LO Offset (Hz)	-735	Elevation at Beam Center (Deg UP)	
Gain Check Date/Time (UTC)	05-MAR-2003 12:13:55	Weather	Light Snow
		Nominal Uplink test carrier frequency (MHz)	6,339,000

Step	Az-Offset (deg)	El-Offset (deg)	Co-pol (dBW) ****	Cross-pol (dBW)****	Isolation (dB)	Comment
1	0.000	0.000	9.73			
2	0.190	0.000	9.52	-31.54	36.85	
3	0.190	0.183	9.11	-26.30	31.20	
4	0.000	0.183	9.27	-27.44	32.50	
5	-0.190	0.183	8.87	-32.33	36.99	
6	-0.190	0.000	9.27	-25.95	31.01	
7	-0.190	-0.183	8.75	-24.14	28.68	
8	0.000	-0.183	9.05	-25.91	30.75	
9	0.190	-0.183	8.71	-33.25	37.75	TX PORT #1 IS COMPLIANT - BPOL

* Transponder monitored during copol level measurements
** Transponder monitored during cross-pol level measurements
*** Dim1/Dim2 = Horizontal/Vertical Dimensions
**** Level referred to transponder beam center at satellite



G/T Calculation (Spectrum Analyzer Direct Method)

ES-CODE:

CPE-32

DATE: 05/03/2003

SPACECRAFT:

904 60.00deg

ELEVATION: 16.7

G/T Test (LHCP, RHCP, RX Port 1, RX Port 2):

RHCP

Testing Freq.:

Diameter:

3.7 m.

Beacon OR
Test Crx:

Mhz
4114 Mhz

System Temperature(Tant+TLna) (deg.Kelvin):

K

Bandwidth Filter(KHz.):

1 KHz

Correction Factor(0.75 or 1.2):

1.2

Non-Direct Reading Specan:

Measured CRX Level(C+N)

19.73 dBm

Measured Noise Floor:

84.74 dBm/Hz

Measured Noise Floor Level(N) : OR

dBm

C/No Measured:

65.01 dB/Hz

Measured (C+N)/N:

dB

Direct Reading Specan:

D/L Path Loss

196.4 dB

D/L Aspect Correction

1.1 dB

D/L EIRP at Beam Center

10 dBW

Is polarization correction of 3.0 dBW required?(Y/N)

N

Standard Applied:

F1

Standard Met:

F1

Results:

C/N = dB/Hz

G/T 23.9100 dB/K

C/No = 65.0100 dB/Hz

@ 4 GHz 23.6659 dB/K

Gain(Rx) = #NUM! dBi

Efficiency #NUM! %

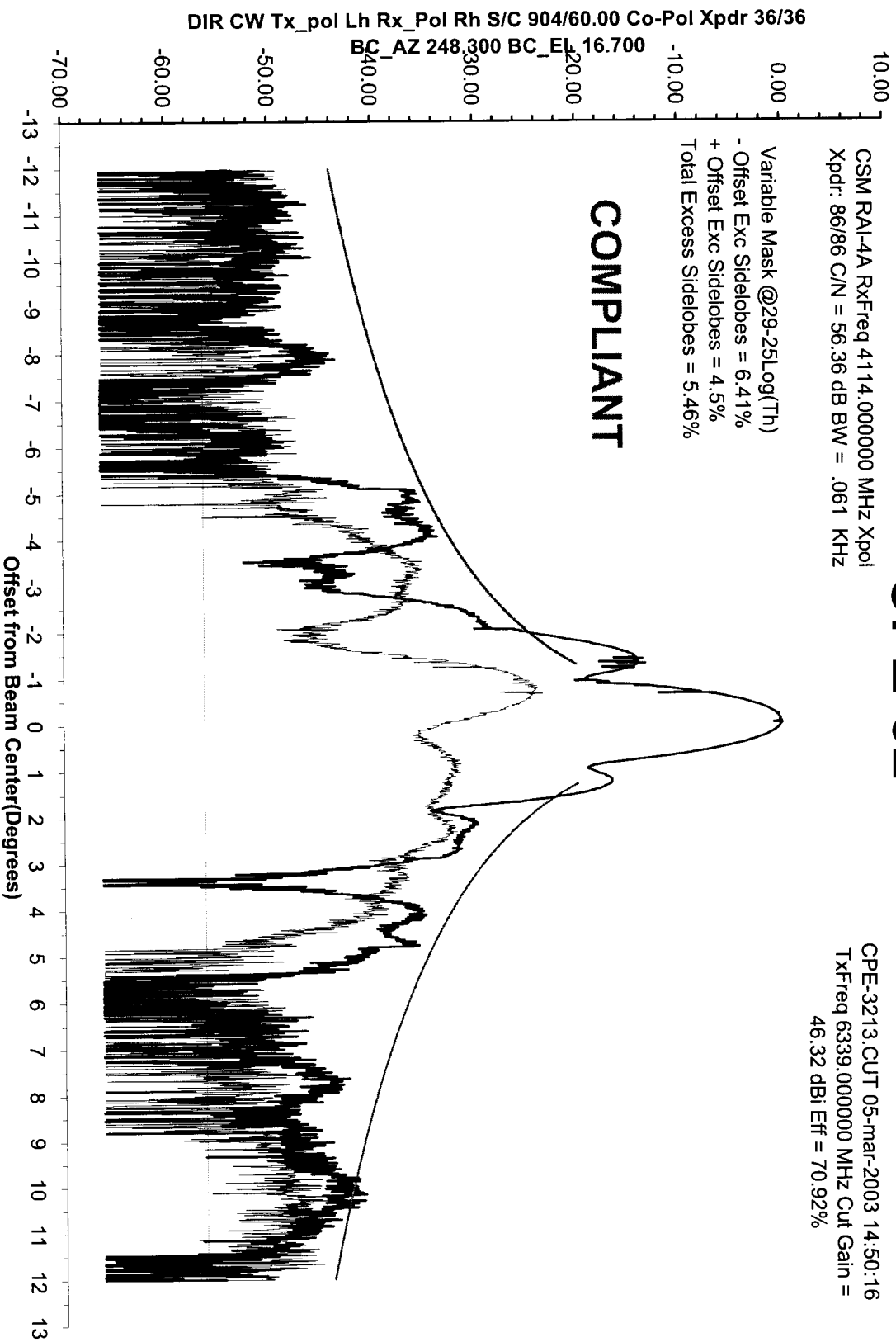
CPE-32

CSM RAI-4A Rx Freq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.36 dB BW = .061 KHz

CPE-32 13: CUT 05-mar-2003 14:50:16
Tx Freq 6339.000000 MHz Cut Gain =
46.32 dBi Eff = 70.92%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 6.41%
+ Offset Exc Sidelobes = 4.5%
Total Excess Sidelobes = 5.46%

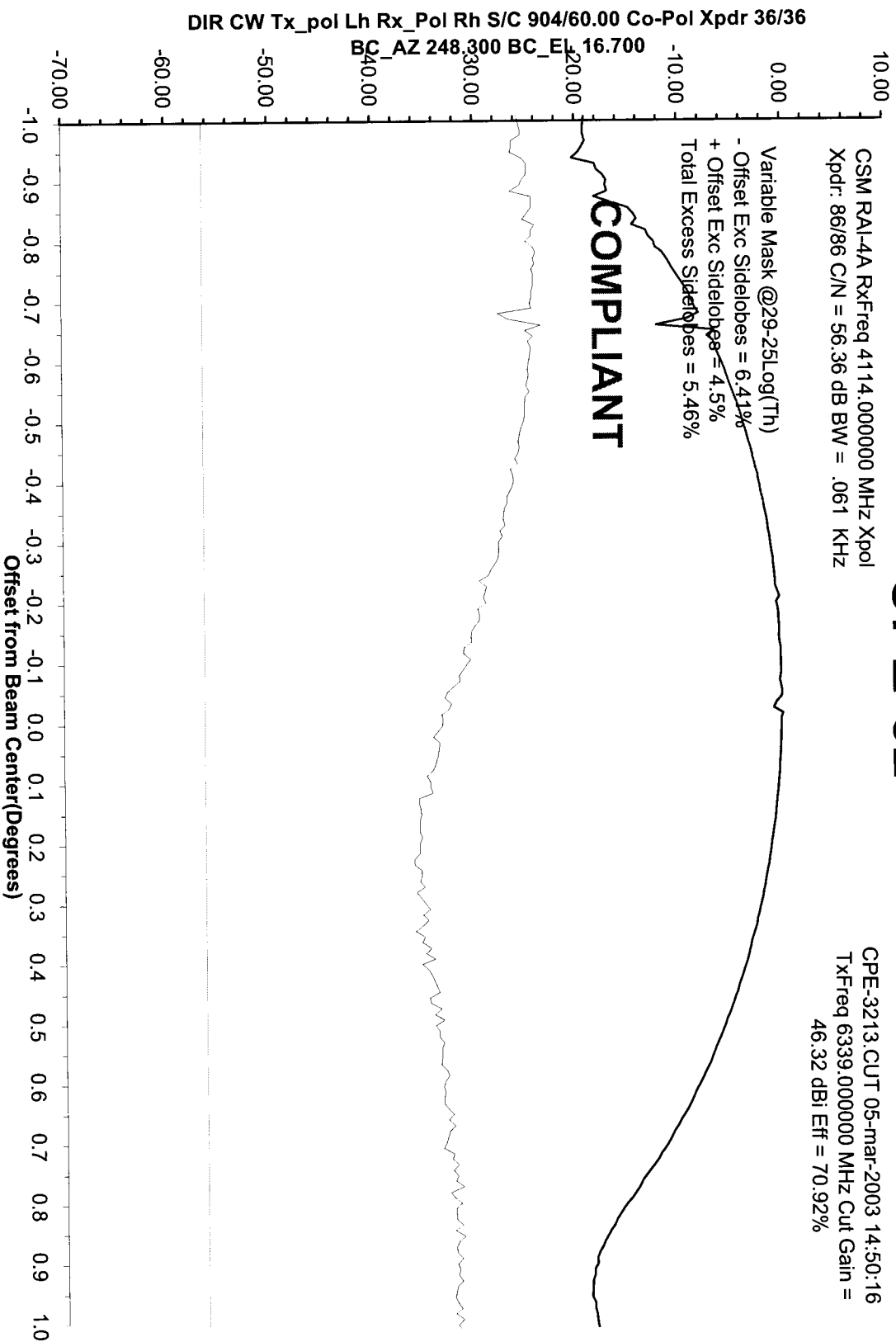
COMPLIANT



CPE-32

CSM RAI-4A Rx Freq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.36 dB BW = .061 KHz

CPE-3213.CUT 05-mar-2003 14:50:16
Tx Freq 6339.000000 MHz Cut Gain =
46.32 dBi Eff = 70.92%



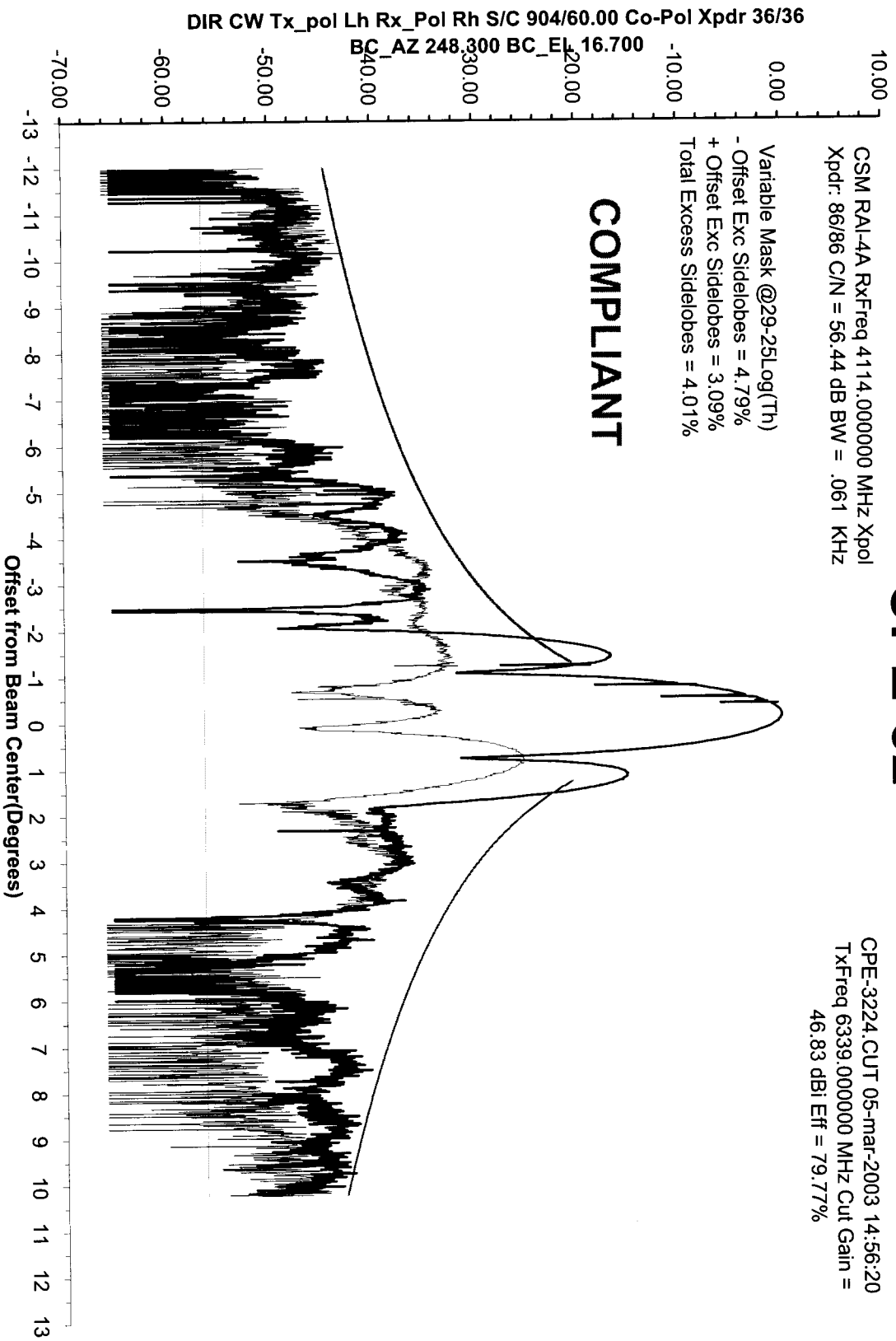
CPE-32

CSM RAI-4A RxFreq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.44 dB BW = .061 KHz

CPE-3224.CUT 05-mar-2003 14:56:20
TxFreq 6339.000000 MHz Cut Gain =
46.83 dBi Eff = 79.77%

Variable Mask @29-25Log(Th)
- Offset Exc Sidelobes = 4.79%
+ Offset Exc Sidelobes = 3.09%
Total Excess Sidelobes = 4.01%

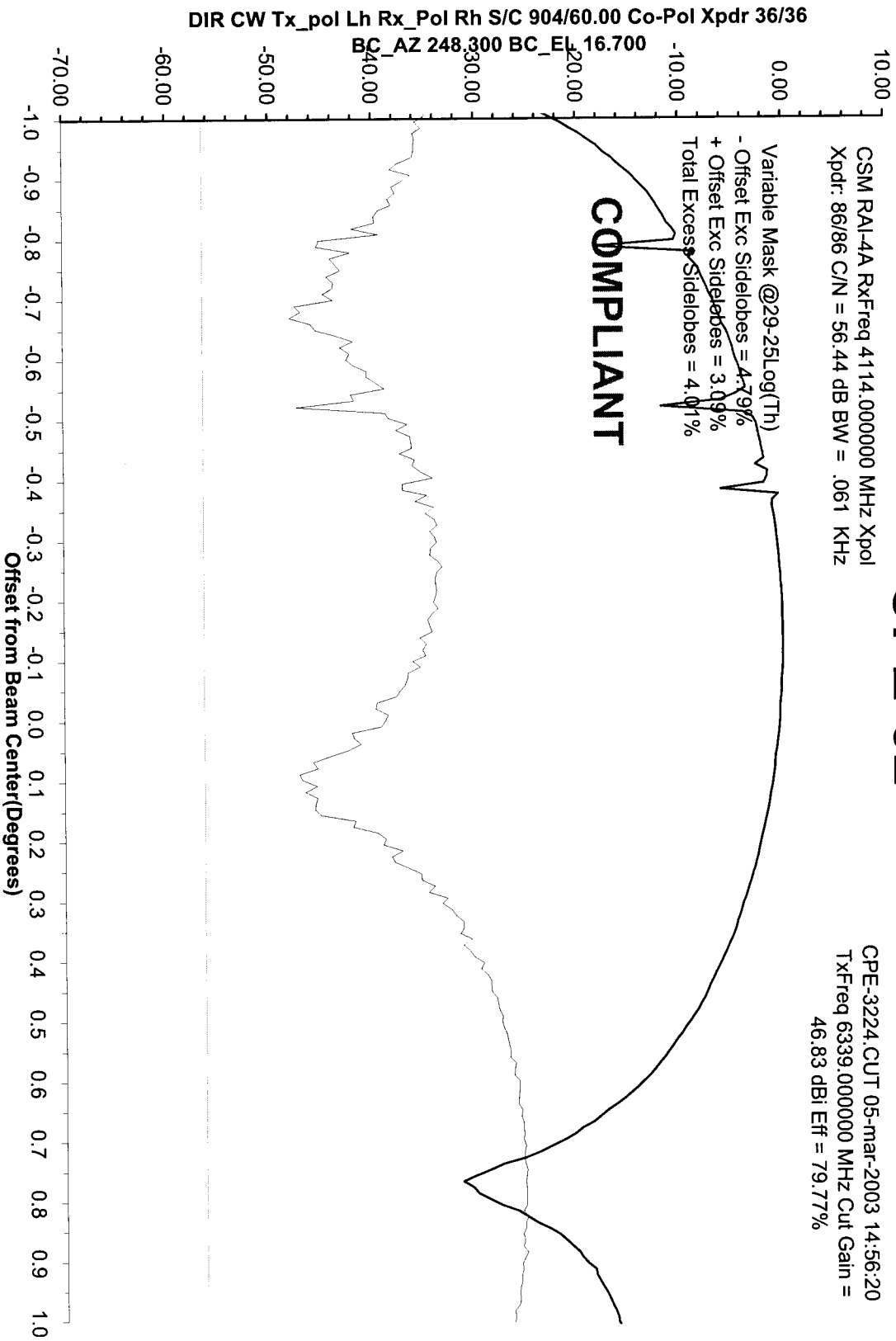
COMPLIANT



CPE-32

CSM RA1-4A Rx Freq 4114.000000 MHz Xpol
Xpdr: 86/86 C/N = 56.44 dB BW = .061 KHz

CPE-3224.CUT 05-mar-2003 14:56:20
Tx Freq 6339.000000 MHz Cut Gain =
46.83 dBi Eff = 79.77%



Antenna Verif Isolation Contour

EUT Code	CPE-32	CSM	4,114.000
CSM Code	RAI -4A	Nominal downlink carrier frequency (MHz)	0.718
Test Performed On Date/Time (UTC)	05-MAR-2003 14:31:35	Downlink Frequency Error (kHz)	56.48
Earth Station Switching polarizations	CSM	Reference C/N (dB)	61
		Reference C/N bandwidth (Hz)	Clear
Satellite/Location (Degrees East)	904 /60.00	Weather	
Transponder			
Co-pol * (Up/Dn)	36/36		
Polarization (Up/Dn)	L / R		
Gain (dB)	155.70		
LO Offset (Hz)	44	EUT	C
Gain Check Date / Time (UTC)	05-MAR-2003 12:10:34	Antenna Shape	3.70/ 3.70
Cross-pol ** (Up/Dn)	86/86	Antenna dimensions, Dim1/Dim2*** (m)	0.00
Polarization (Up/Dn)	R / L	Power at Feed Flange (dBW)	248.28
Gain (dB)	151.49	Azimuth at Beam Center (Deg CCW)	16.69
LO Offset (Hz)	-735	Elevation at Beam Center (Deg UP)	
Gain Check Date/Time (UTC)	05-MAR-2003 12:13:55	Weather	Light Snow
		Nominal Uplink test carrier frequency (MHz)	6,339.000

Step	Az-Offset (deg)	El-Offset (deg)	Co-pol (dBW) ****	Cross-pol (dBW)****	Isolation (dB)	Comment
1	0.000	0.000	10.04	-24.91	30.74	
2	0.191	0.000	9.58	-20.76	26.13	
3	0.191	0.183	9.31	-21.21	26.31	
4	0.000	0.183	9.75	-22.84	28.38	
5	-0.191	0.183	9.34	-25.52	30.65	
6	-0.191	0.000	9.63	-26.93	32.35	
7	-0.191	-0.183	9.16	-26.53	31.48	
8	0.000	-0.183	9.61	-24.95	30.35	
9	0.191	-0.183	9.34	-22.78	27.91	TX PORT #1 IS COMPLIANT - APOL

* Transponder monitored during copol level measurements
** Transponder monitored during cross-pol level measurements
*** Dim1/Dim2 = Horizontal/Vertical Dimensions
**** Level referred to transponder beam center at satellite