EXHIBIT “A”

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

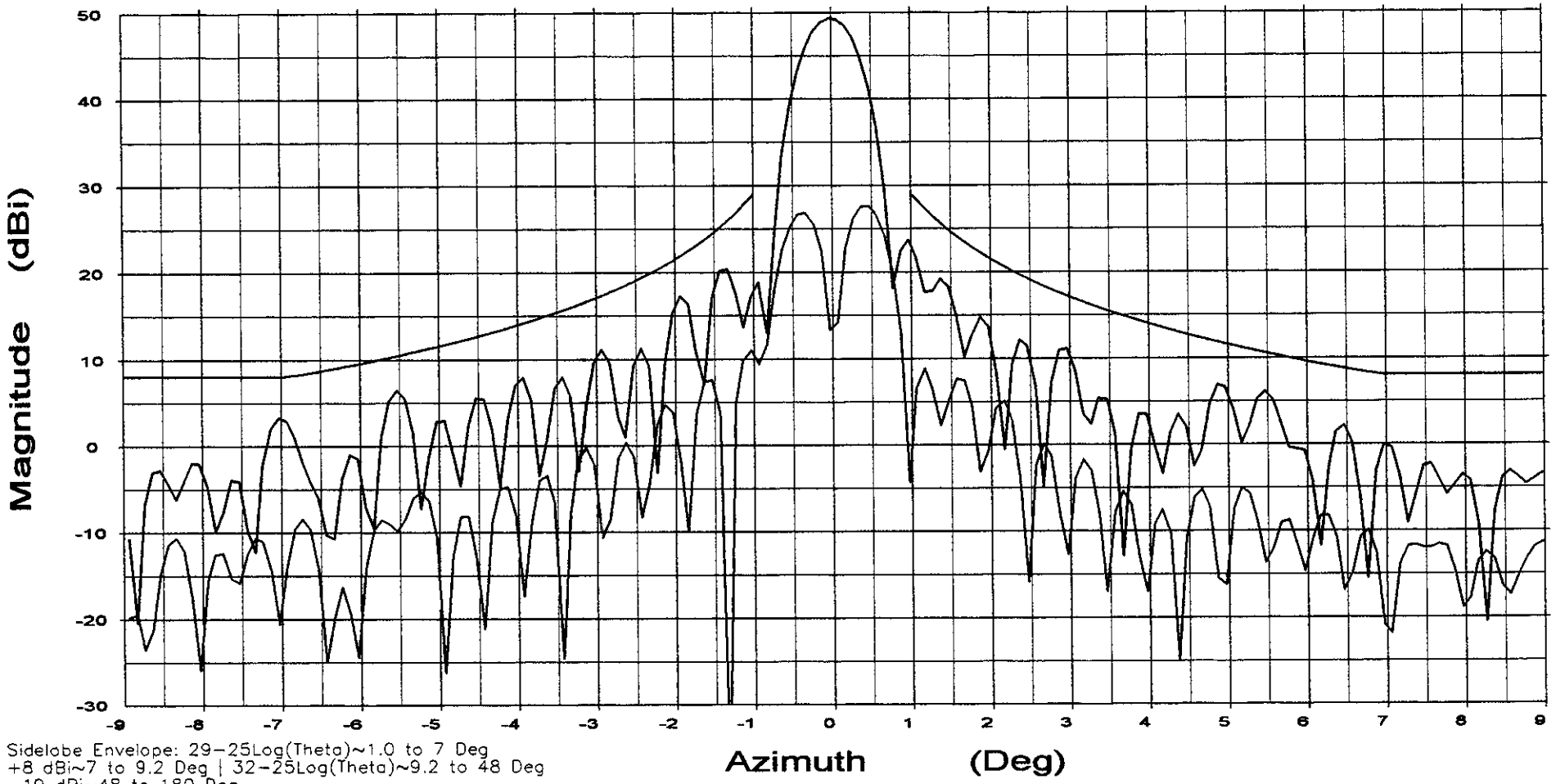
AVL Model 2400
Ku-Band

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

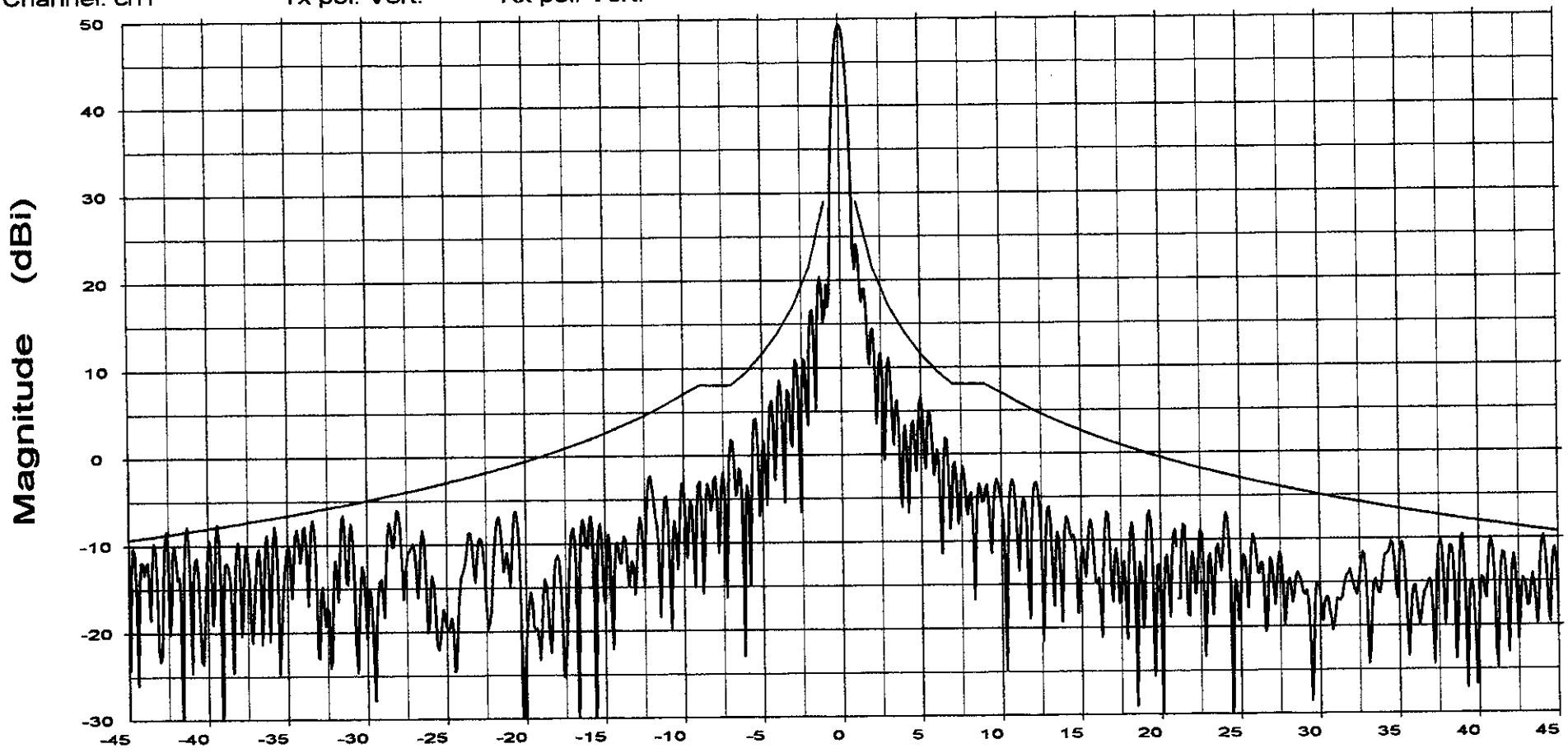
File: See Legend
Date: 11-Mar-02

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

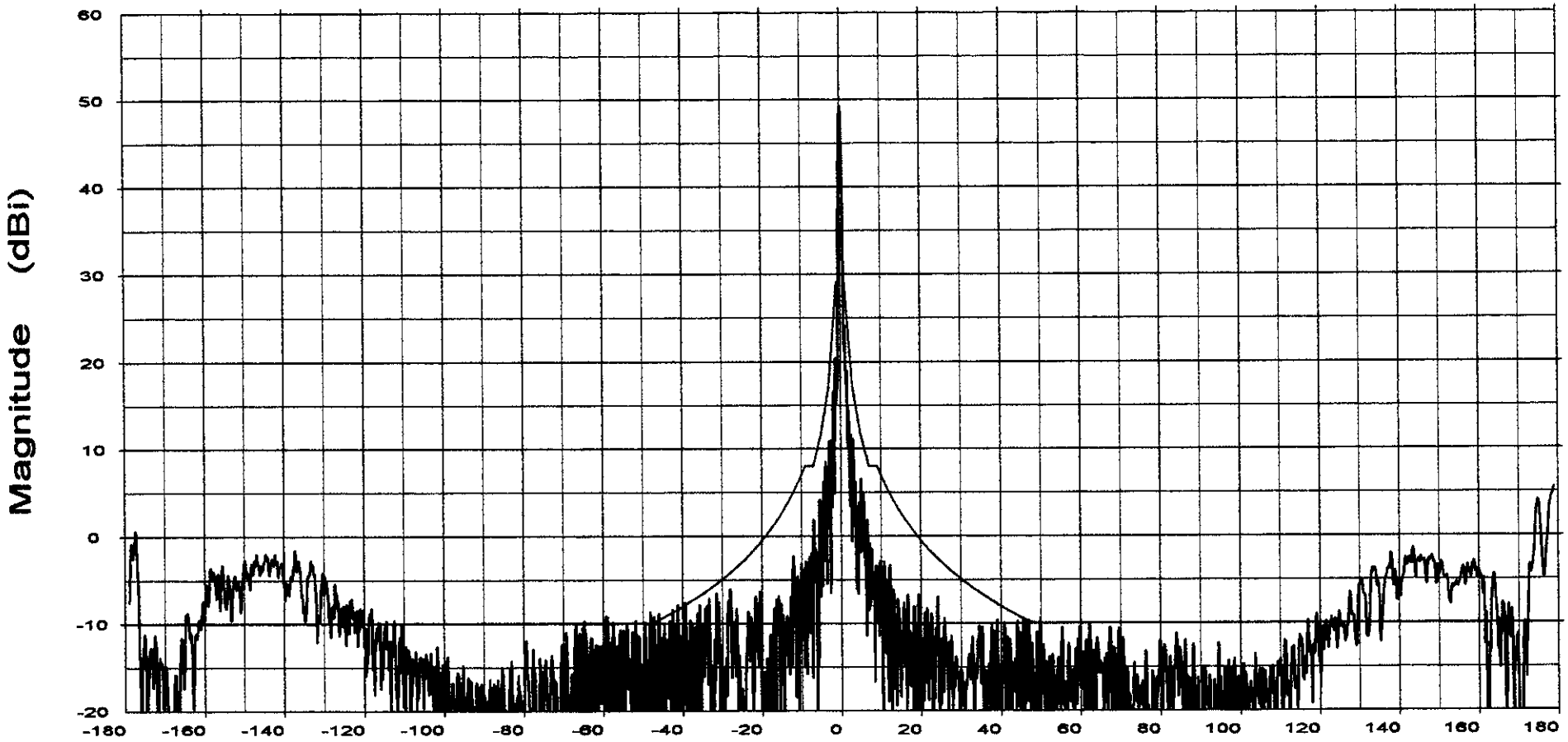
AVL Model 2400
Ku-Band

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

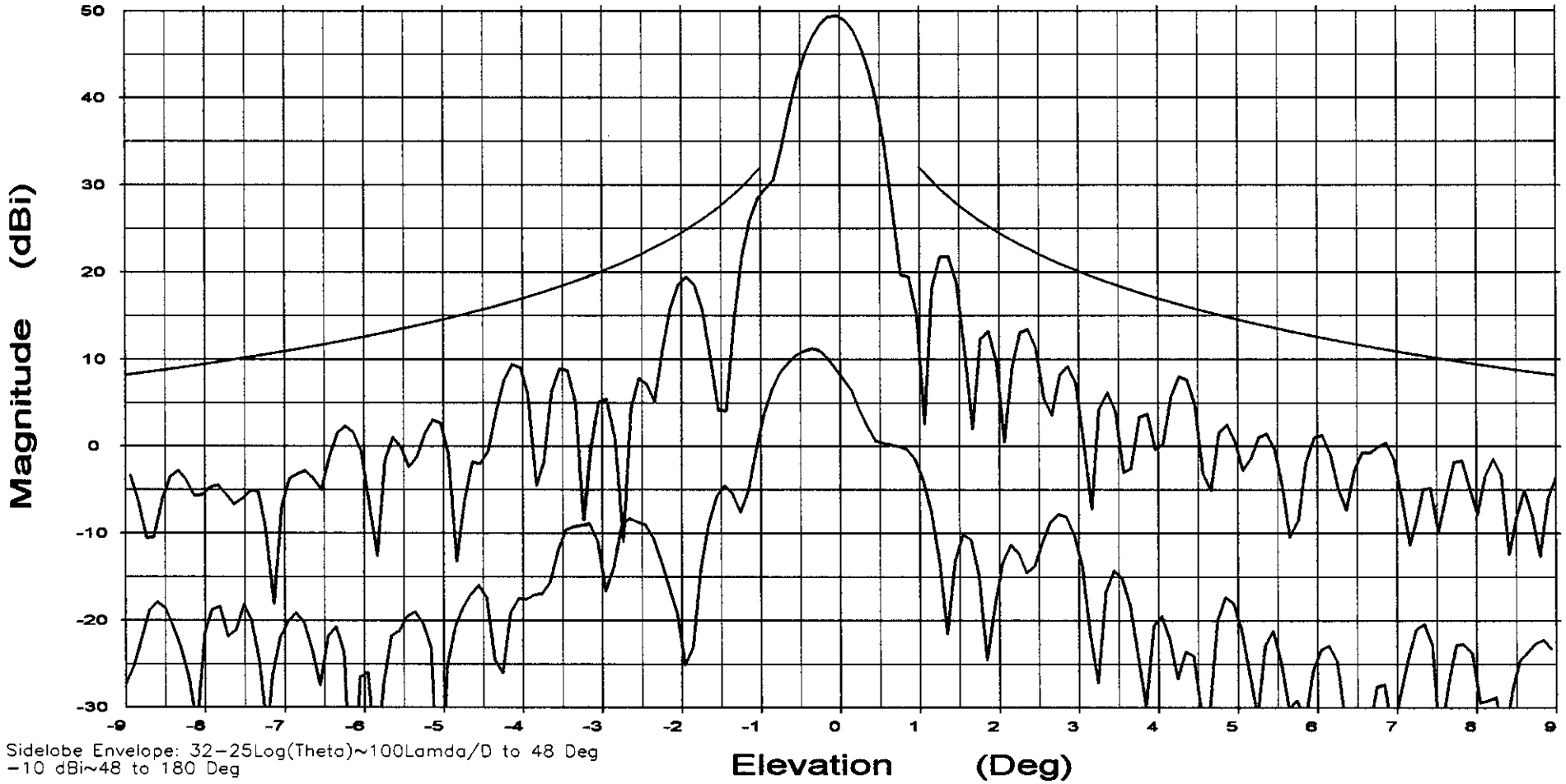
AVL Model 2400
Ku-Band

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

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Maiden NC

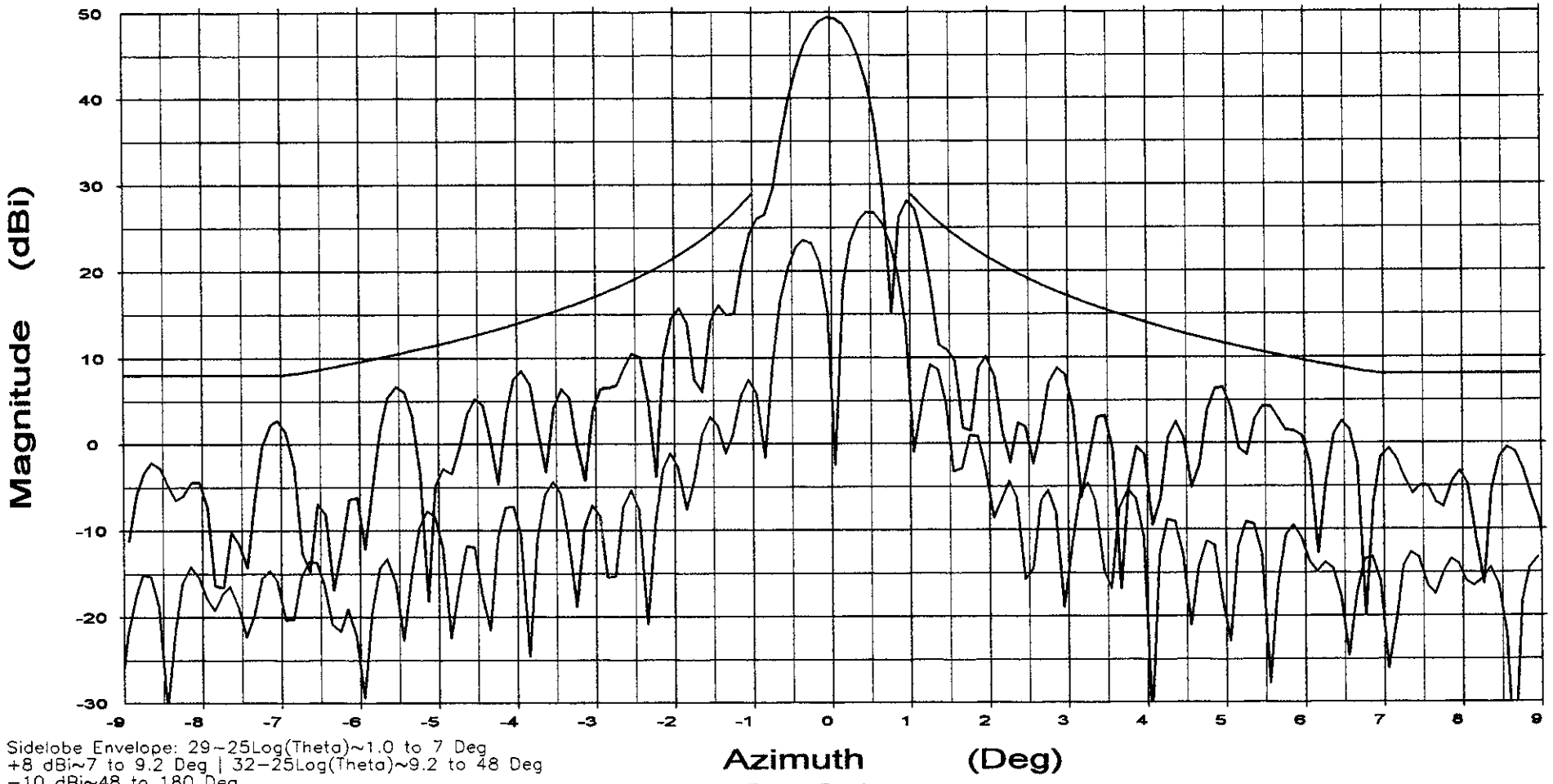
File: See Legend
Date: 12-Mar-02

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

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Maiden NC

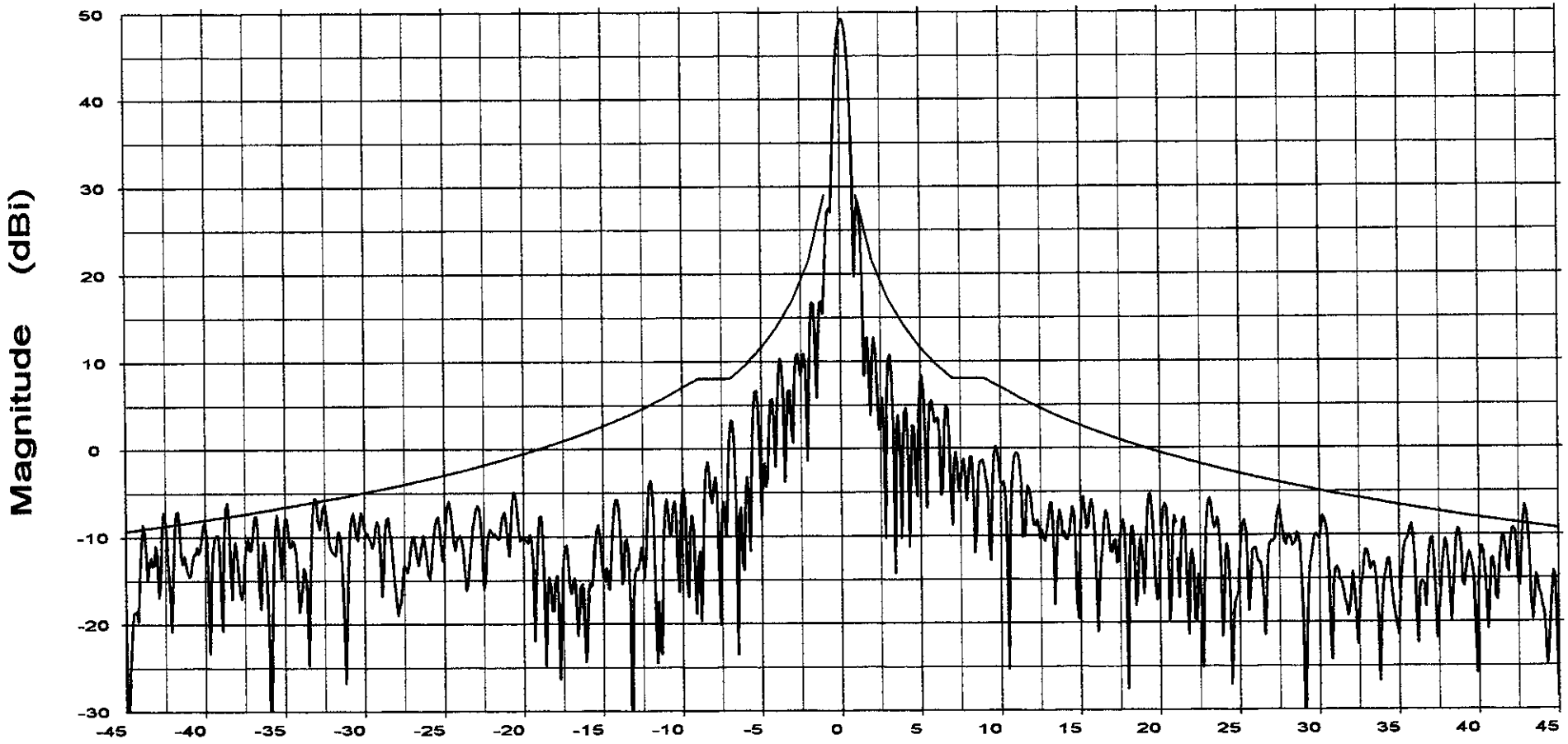
File: See Legend
Date: 12-Mar-02

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

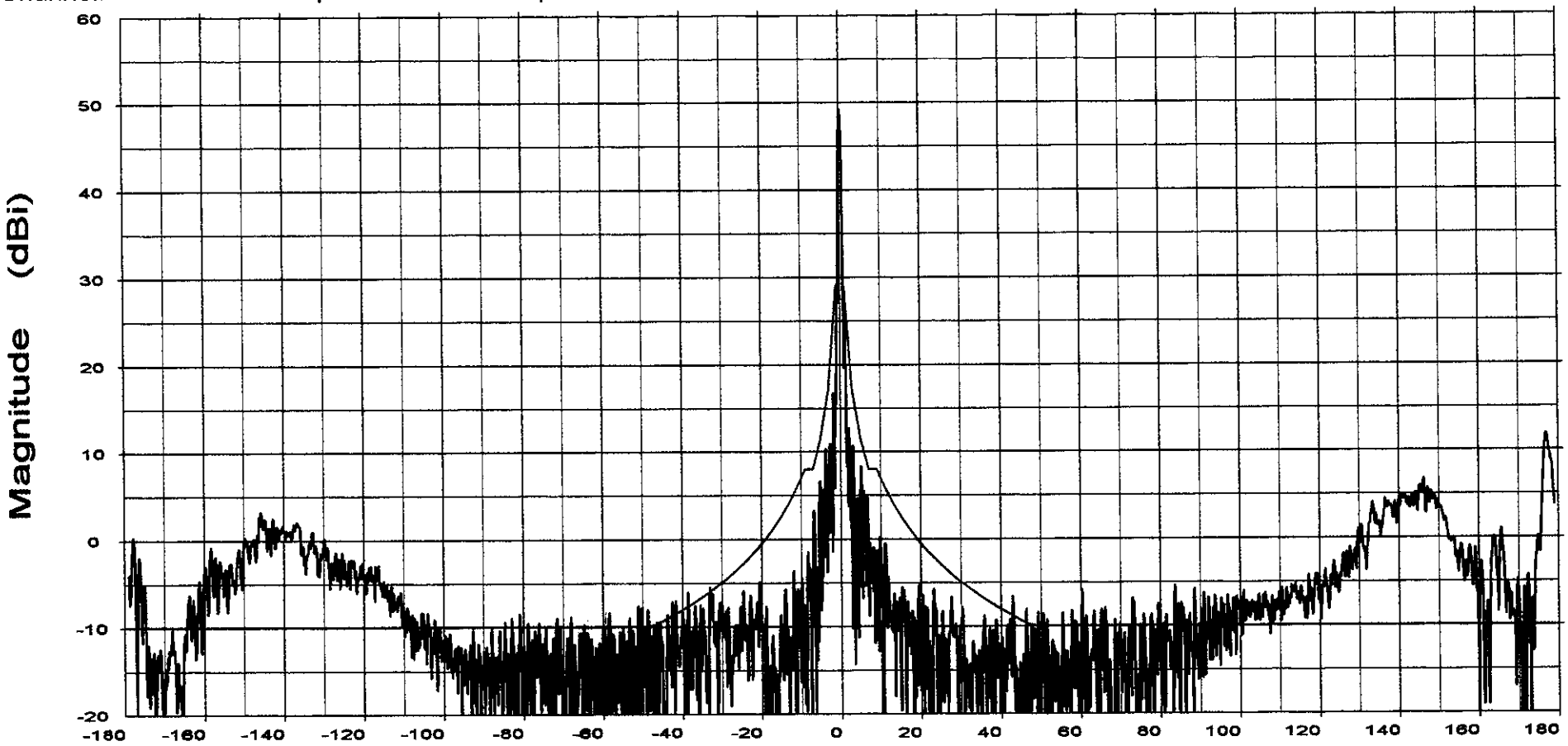
File: See Legend
Date: 12-Mar-02

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

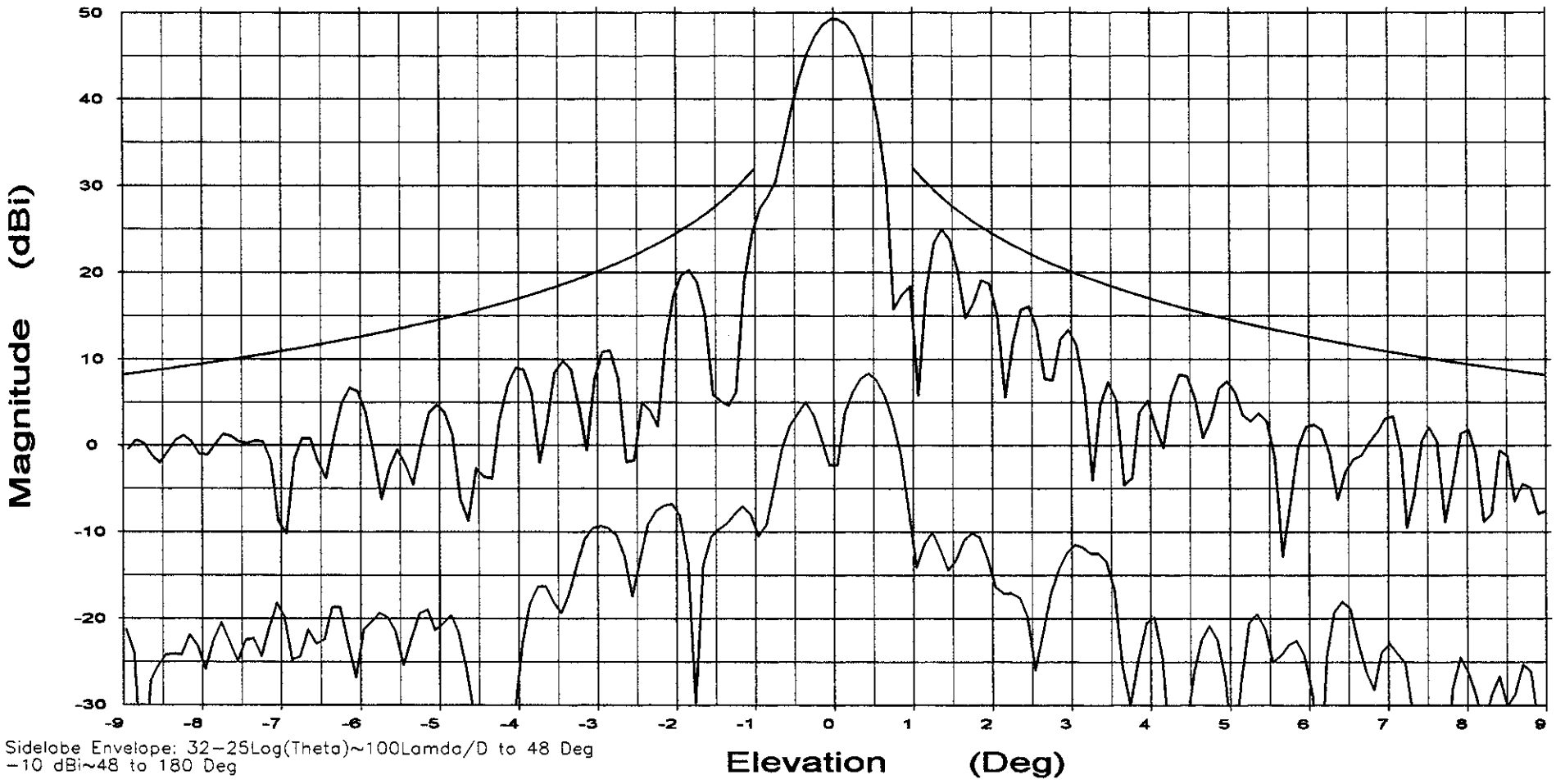
File: See Legend

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
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Maiden NC

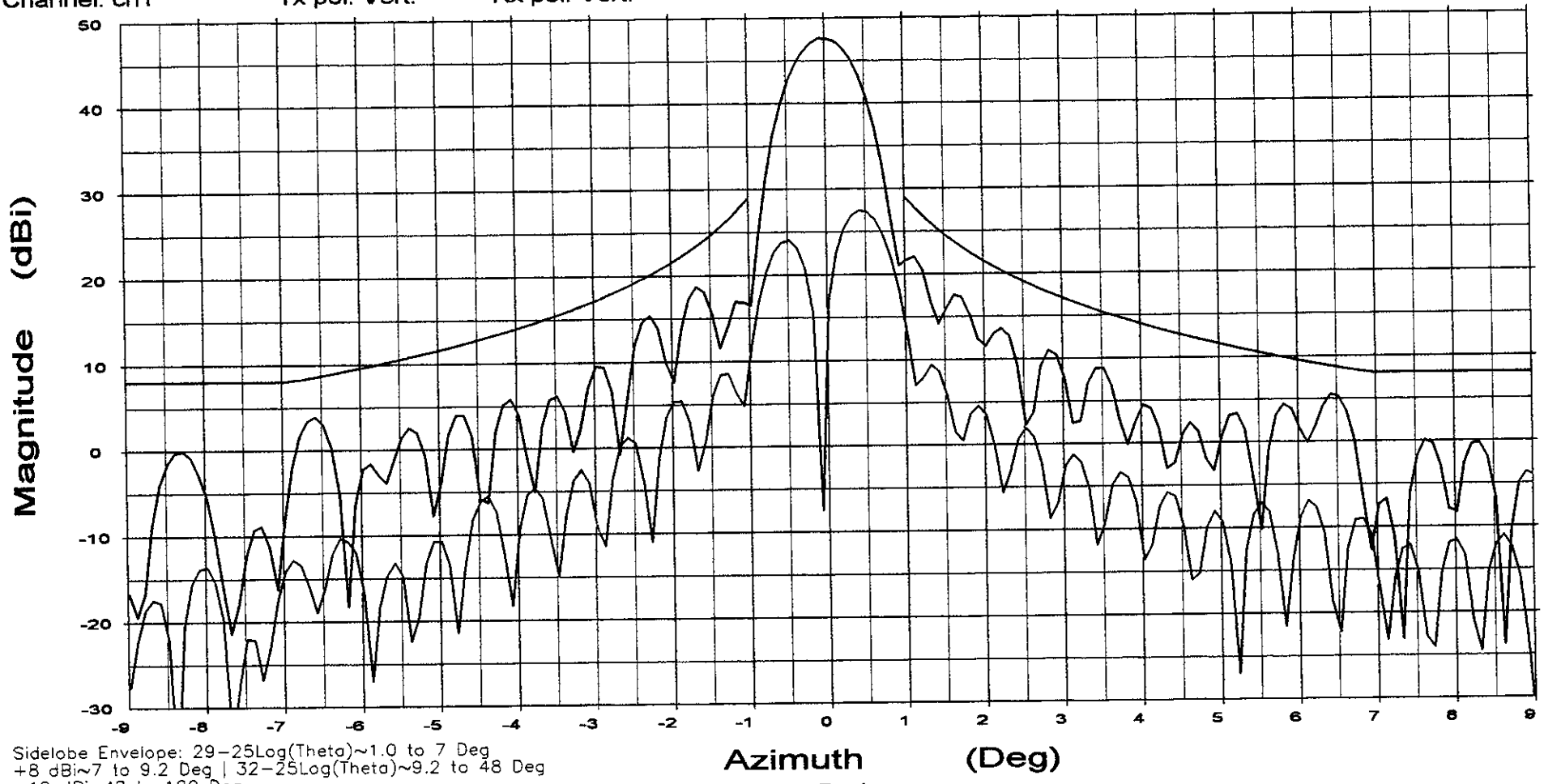
File: See Legend
Date: 11-Mar-02

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

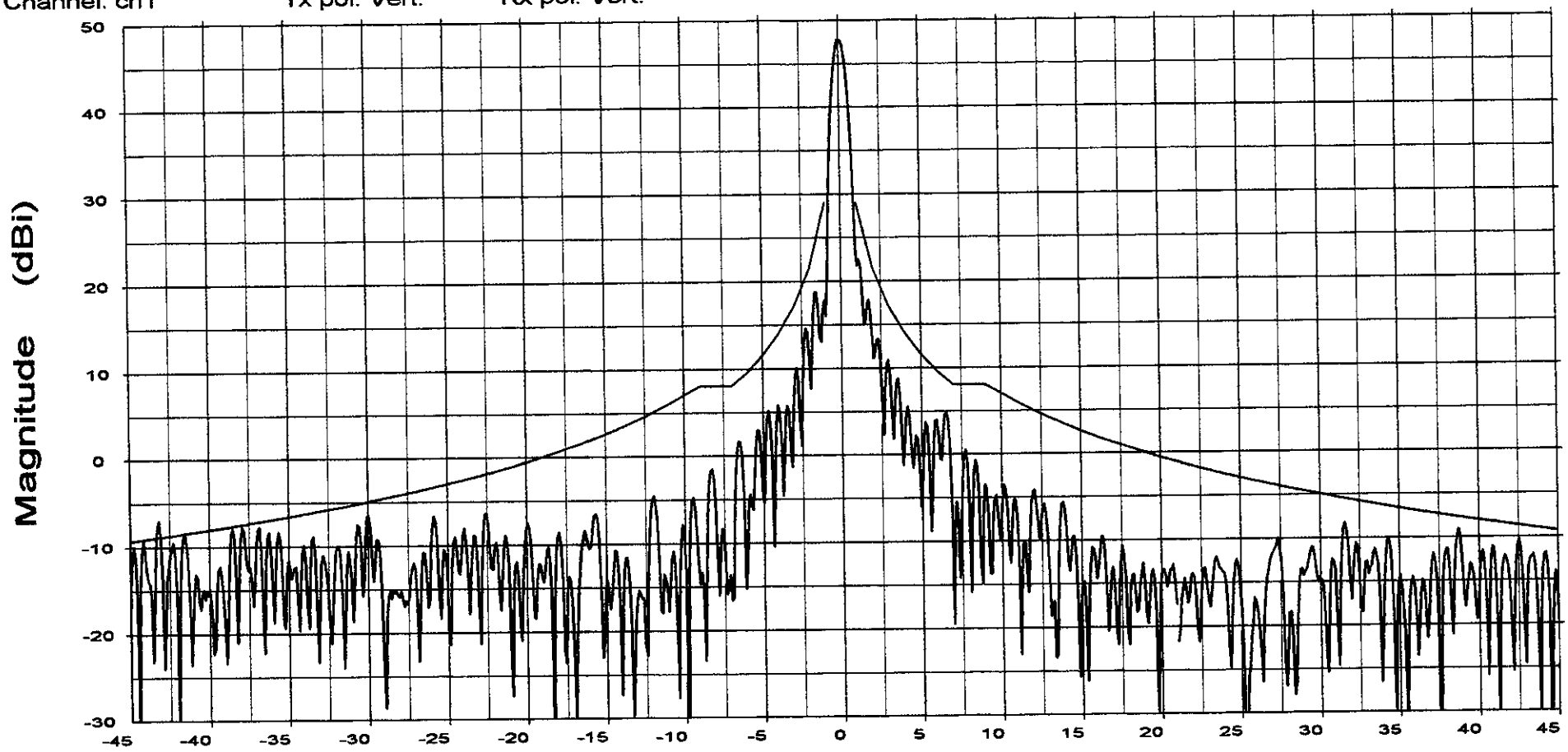
File: See Legend
Date: 11-Mar-02

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

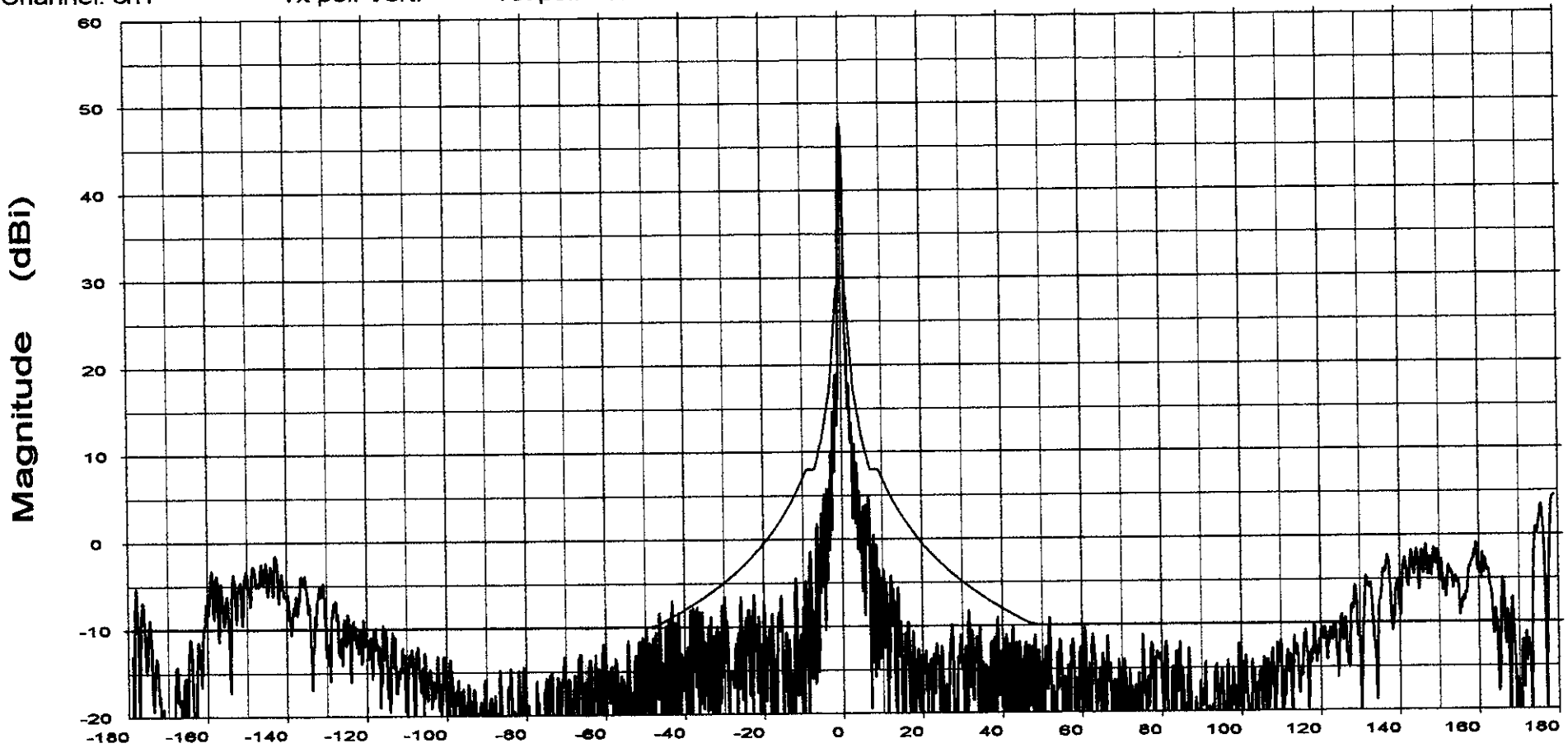
File: See Legend
Date: 11-Mar-02

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

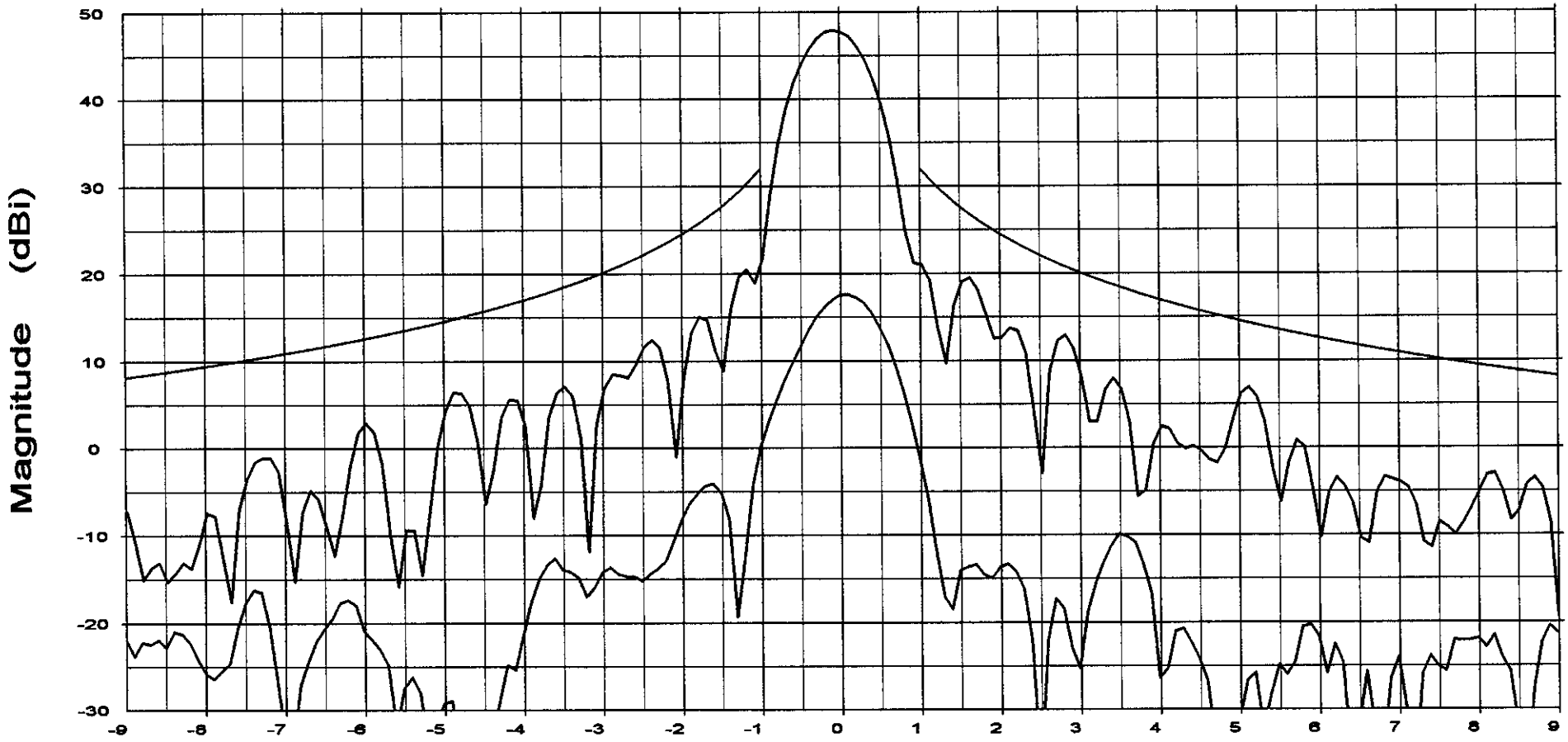
AVL Model 2400
Ku-Band

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

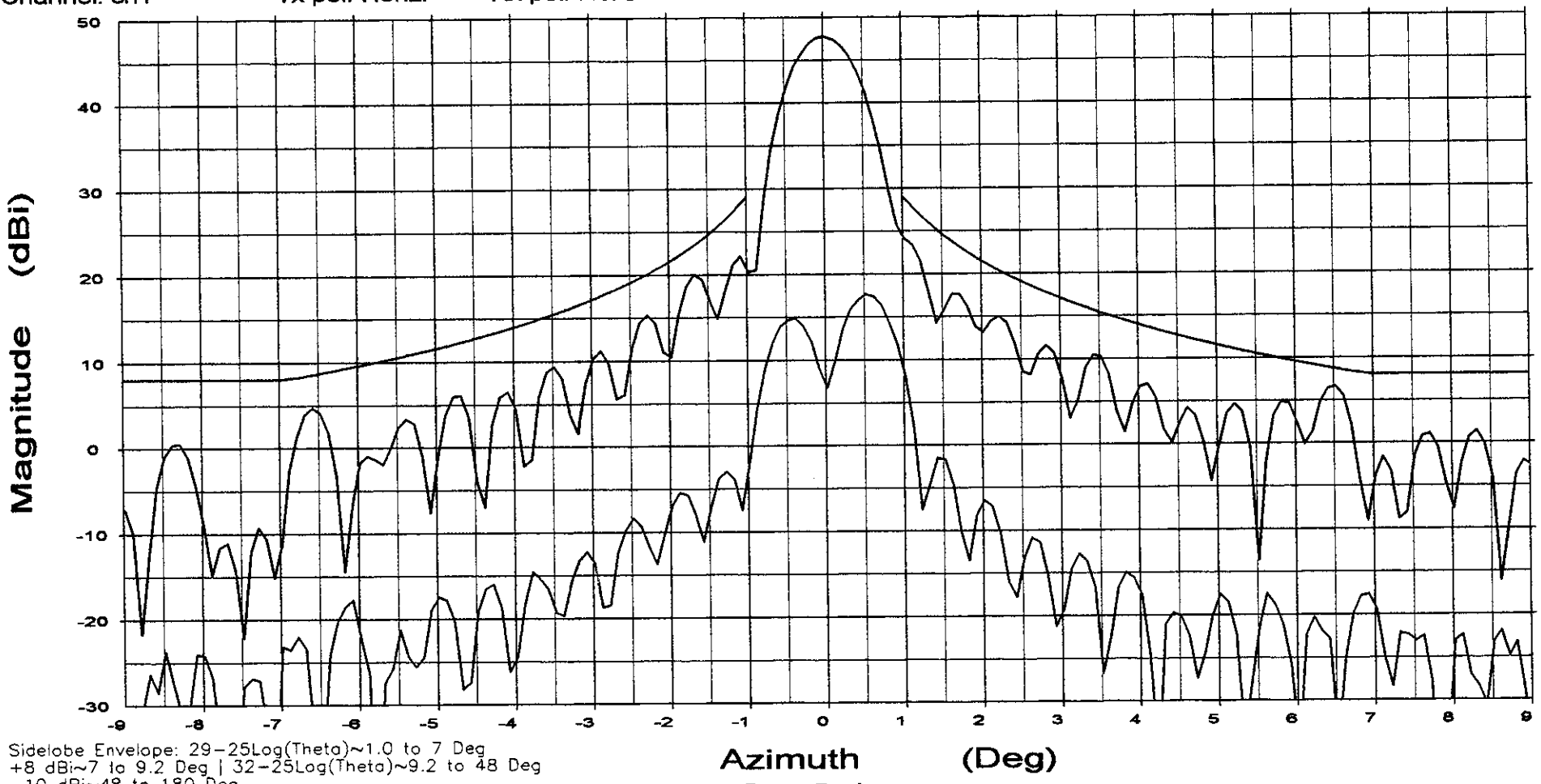
File: See Legend
Date: 12-Mar-02

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

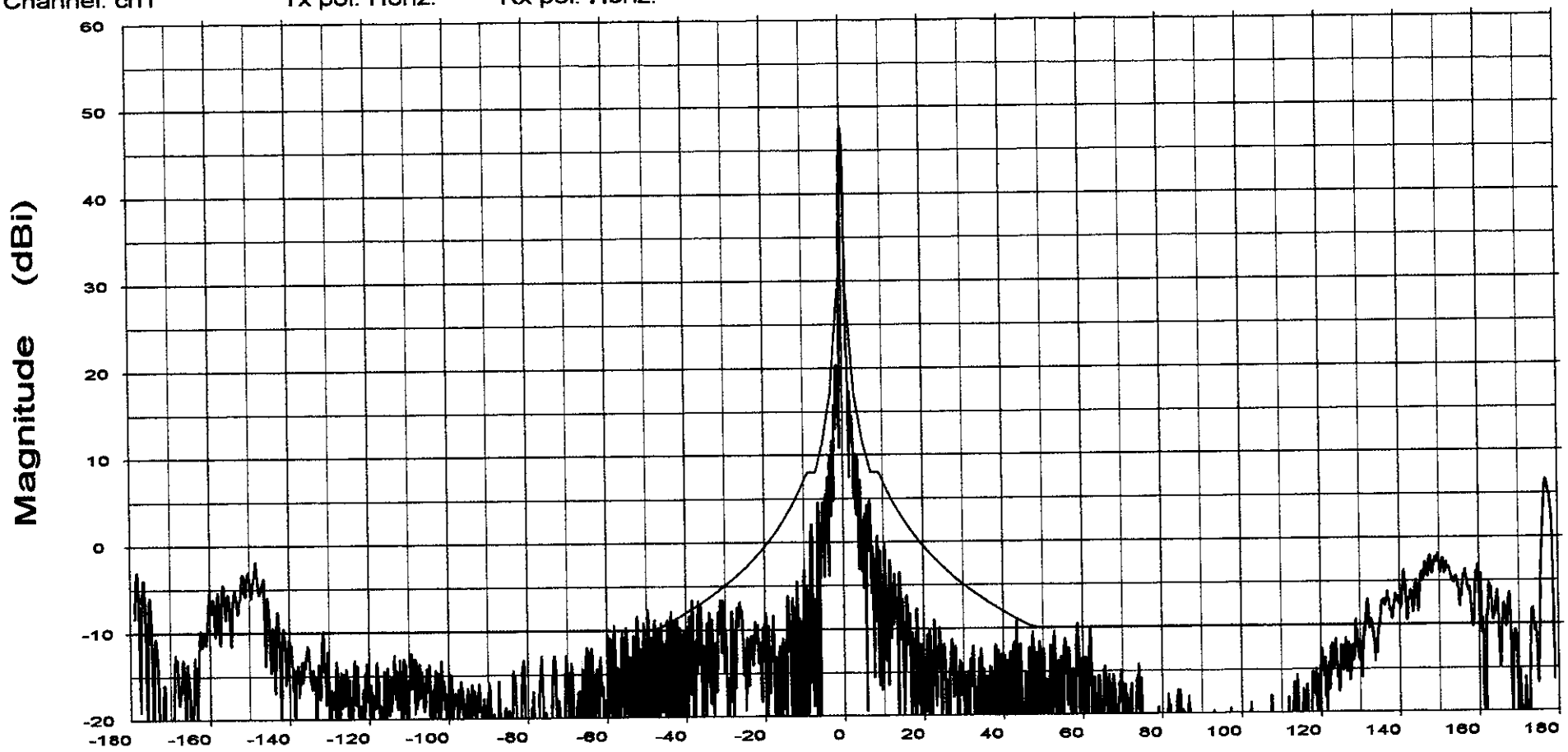
File: See Legend
Date: 12-Mar-02

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 [illegible]len Test Range
Maiden NC

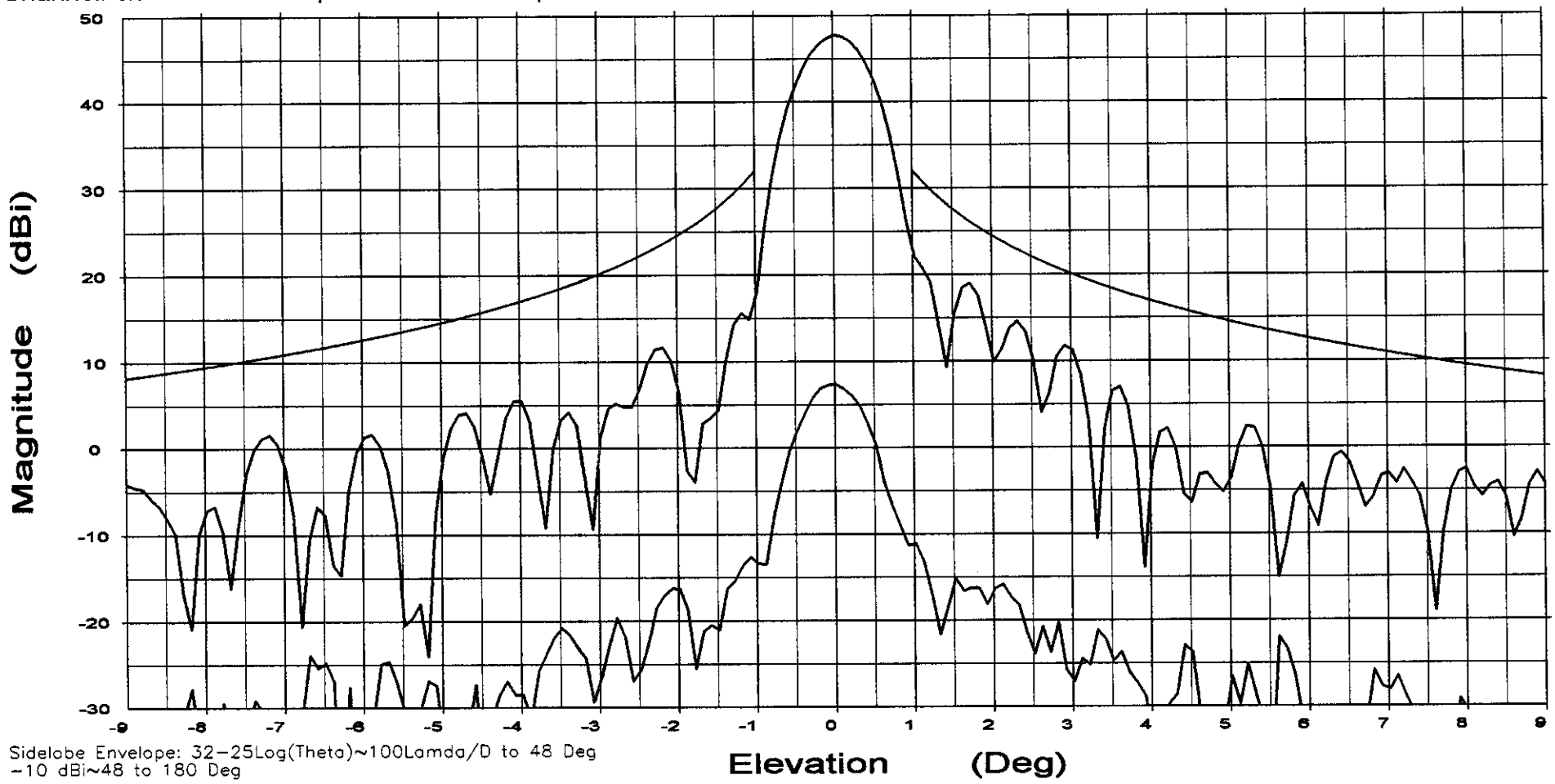
File: See Legend

AVL Model 2400
Ku-Band

Frequency : 11.950 GHz

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

Tx pol: 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

EXHIBIT “B”

Test Data
VAS DSNG

for
Gerling & Associates

24 July 2008

ANTEK SYSTEMS, LLC
5151 Mountville Rd, Frederick MD. USA

ANTEK SYSTEMS, LLC
5151 Mountville Road, Frederick, MD 21703 (301) 874-3175 (301) 831-4232 FAX (301) 874-3178

Gerling & Associates – VAS
22 July 2008

Waveguide Tests
(See Data Sheets)
☑ VSWR
☑ Insertion Loss

Antenna Checkout
☑ AZ Motor
East
West
☑ EL Motor
Up
Down
☑ Pol Motor
CW
CCW
☑ Limits
East -120.8°
West +120.8°
Up 89.6°
Down 3.5°
CW +50.2°
CCW -50.4°
Deploy ✓
Stow ✓

☑ Air Dehydrator
Cycle Time > 7 MIN

HPA Tests 1
Input Level -21.3 dBm
Output +55.6 dBm (360 W)
Gain 76.9 dB

HPA Tests 2
Input Level -20.5 dBm
Output +55.6 dBm (360 W)
Gain 76.1 dB

VPC SINGLE THREAD
Phasing ✓
Switching ✓

U/C	#1	#2
Freq	✓	✓
Level	✓	✓

Modulator	#1	#2
Deviation	N/A	N/A
Level		

SAT Receiver	#1	#2
Function	N/A	N/A

IRD	#1	#2
Function	✓	✓

Encoder	#1	#2
Function	SEE COMMENTS	

TLT
Function ✓

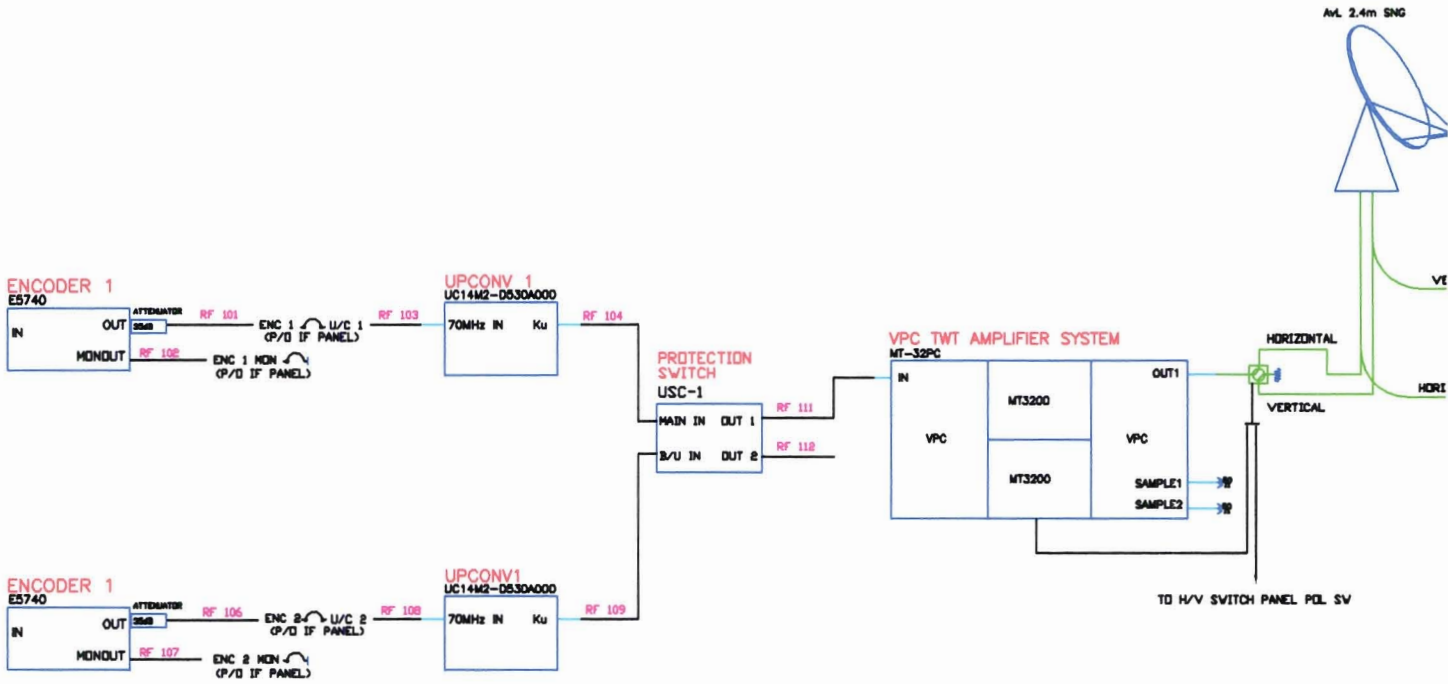
GPS
Function ✓

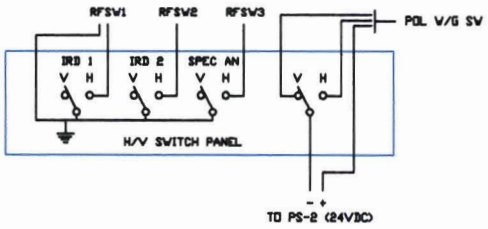
Flux Compass
Function ✓

Kit Carpenter

Comments:

ENCODERS NOT INSTALLED
WAVEGUIDE SWITCH ADDED AT OUTPUT OF SINGLE THREAD VPC TO ALLOW TRANSMISSION IN EITHER POL, BUT NOT SIMULTANEOUSLY.





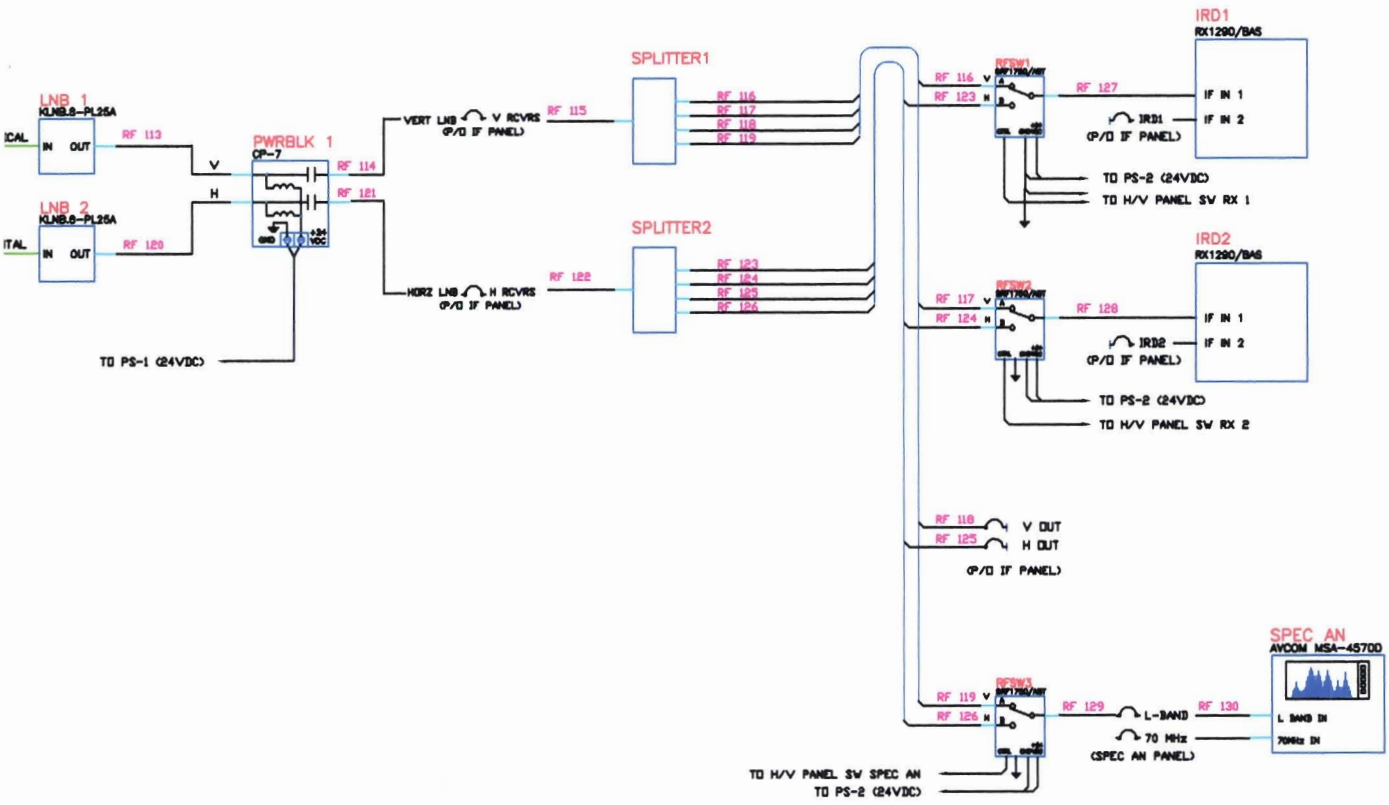
PS-1

ASTRODYNE RS35-24 — 24 VDC

PS-2

ASTRODYNE RS35-24 — 24 VDC

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	SINGLE THREAD VPC; POL WAVEGUIDE SWITCH	7/23/2008	GERLING



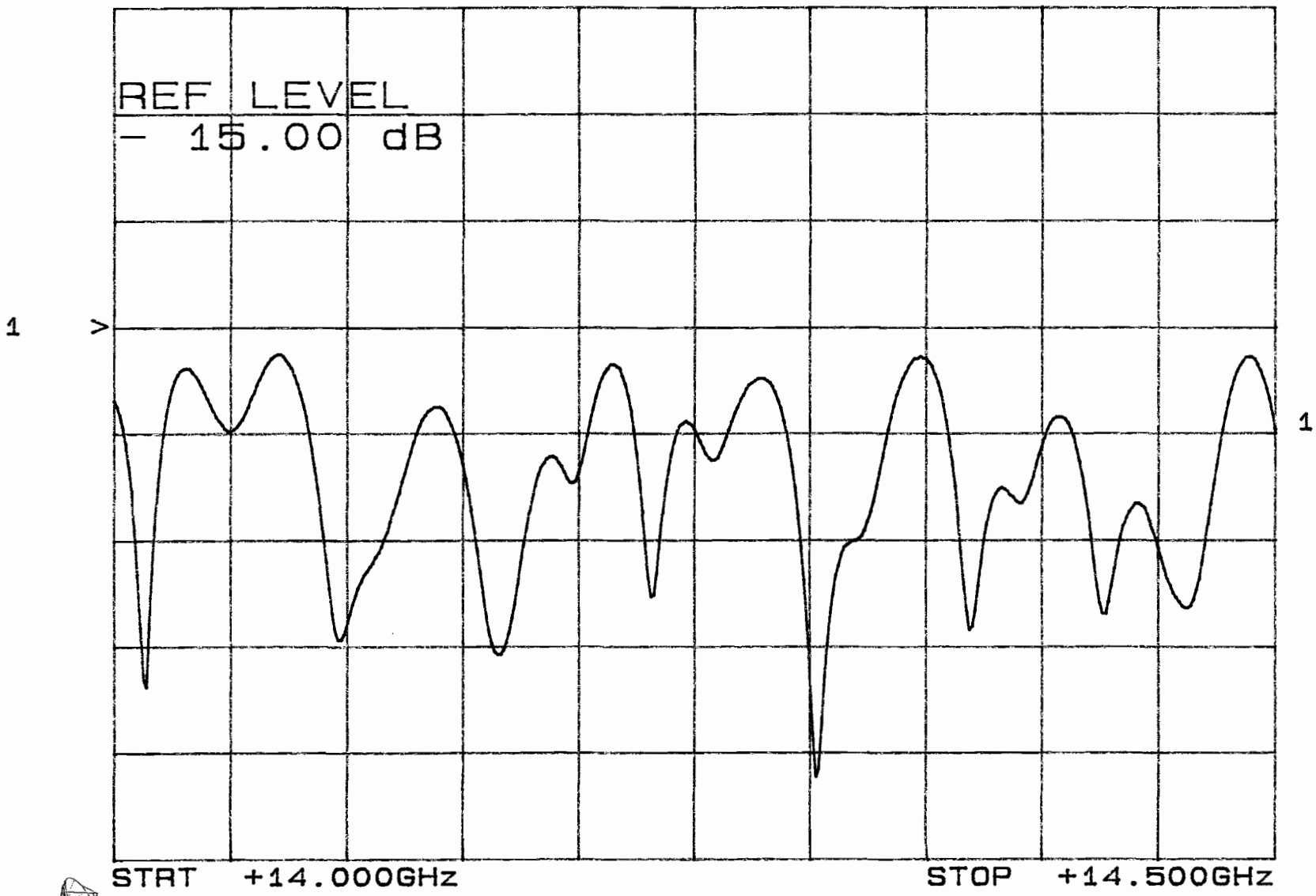
ANTEK SYSTEMS, LLC
5151 MOUNTVILLE ROAD FREDERICK, MD. 21703 (301) 874-3175

APPROVALS	DATE	VAS DSNG RF WIRING AS BUILT			
DRAWN R.F. HEFELE	7/23/2008				
CHECKED		SCALE	SIZE	DRAWING NO.	REV
PROJ. ENG		NONE			
	OCB56	DO NOT SCALE DRAWING		SHEET 1 OF 1	

PLOT: RETURN LOSS Date: 22 JULY 2008 Test Conductor: DS

CH1: A/R-M
5.0 dB/ REF - 15.00 dB

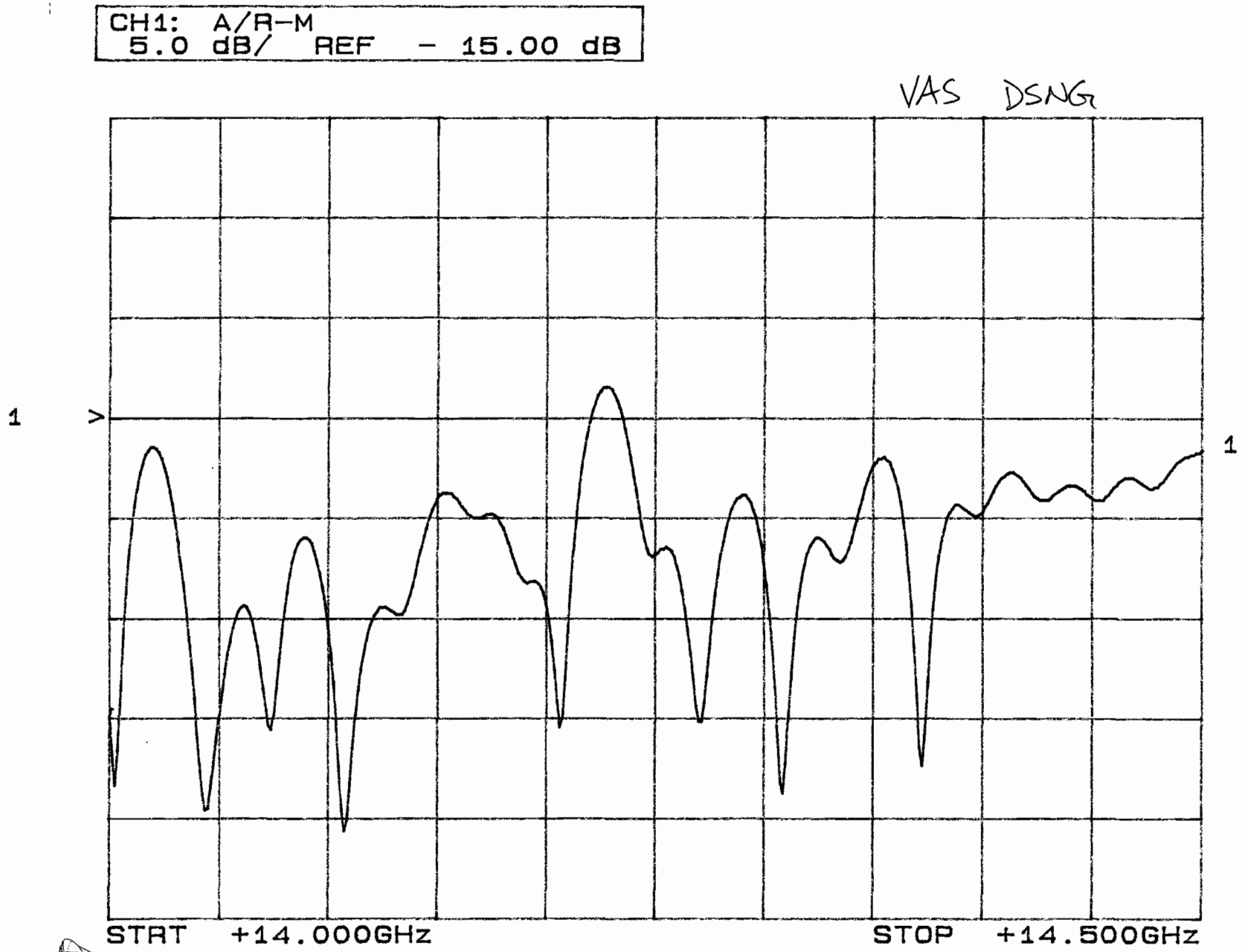
VAS DSNG



ANTEK SYSTEMS, LLC

Notes: HPA A OUT → ANT. VERT (FEED)

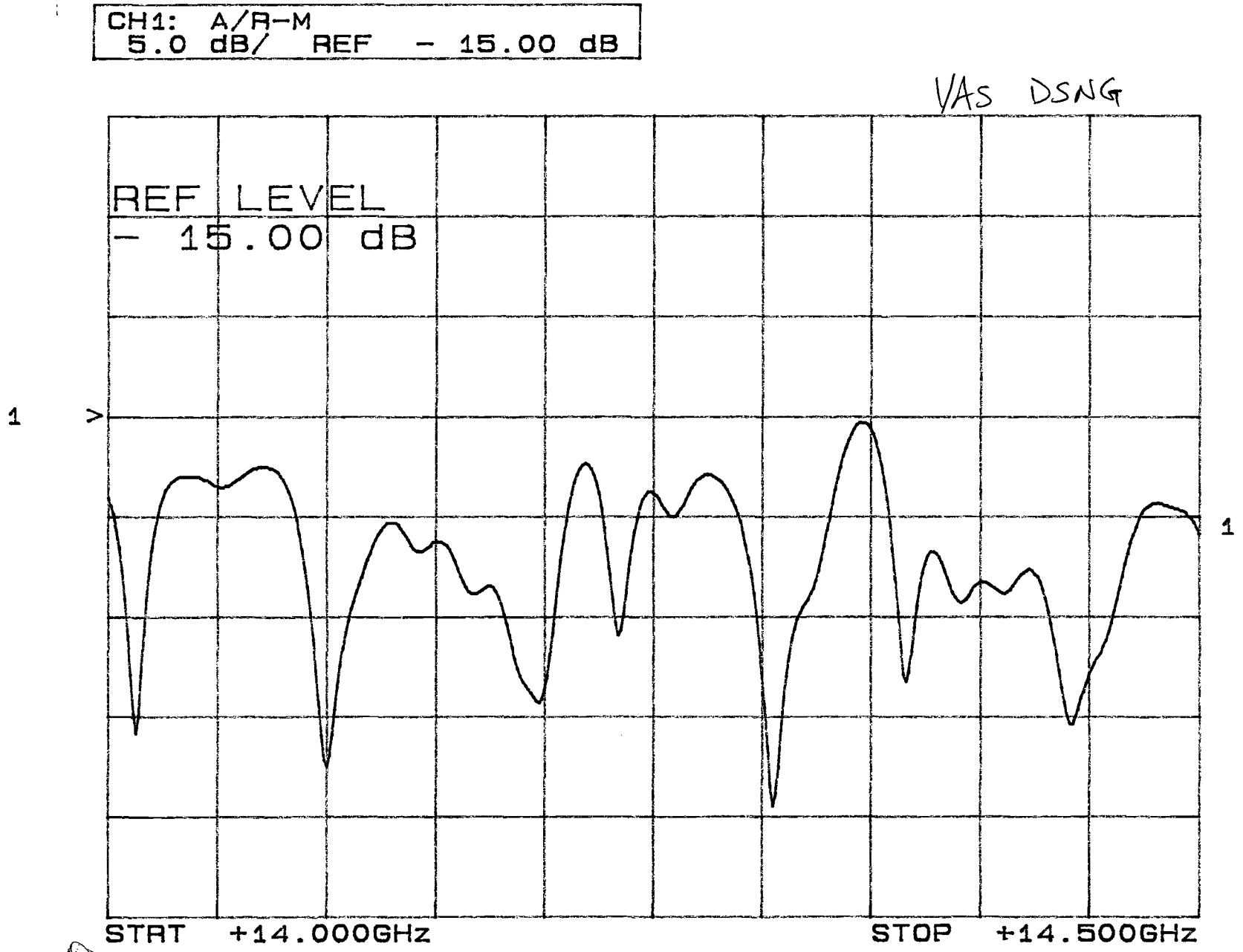
PLOT: RETURN LOSS Date: 22 JULY 2008 Test Conductor: DS



ANTEK SYSTEMS, LLC

Notes: HPA OUT A → ANT. HORZ (FEED)

PLOT: Return Loss Date: 22 July 2008 Test Conductor: DS



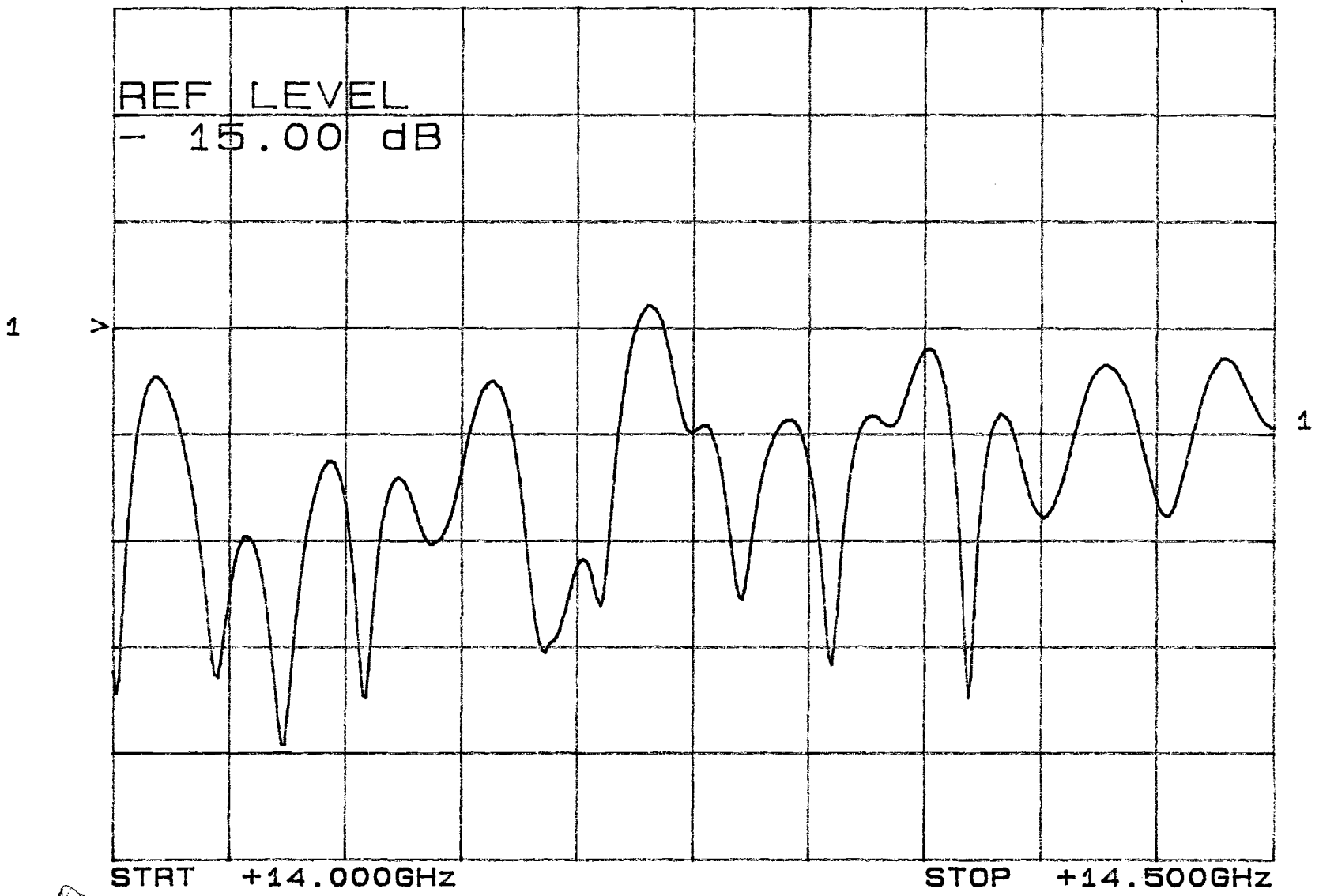
ANTEK SYSTEMS, LLC

Notes: HPA B OUT → Ant. Vert. (Feed)

PLOT: Return Loss Date: 22 July 2008 Test Conductor: DS

CH1: A/R-M
5.0 dB/ REF - 15.00 dB

VAS DSNG



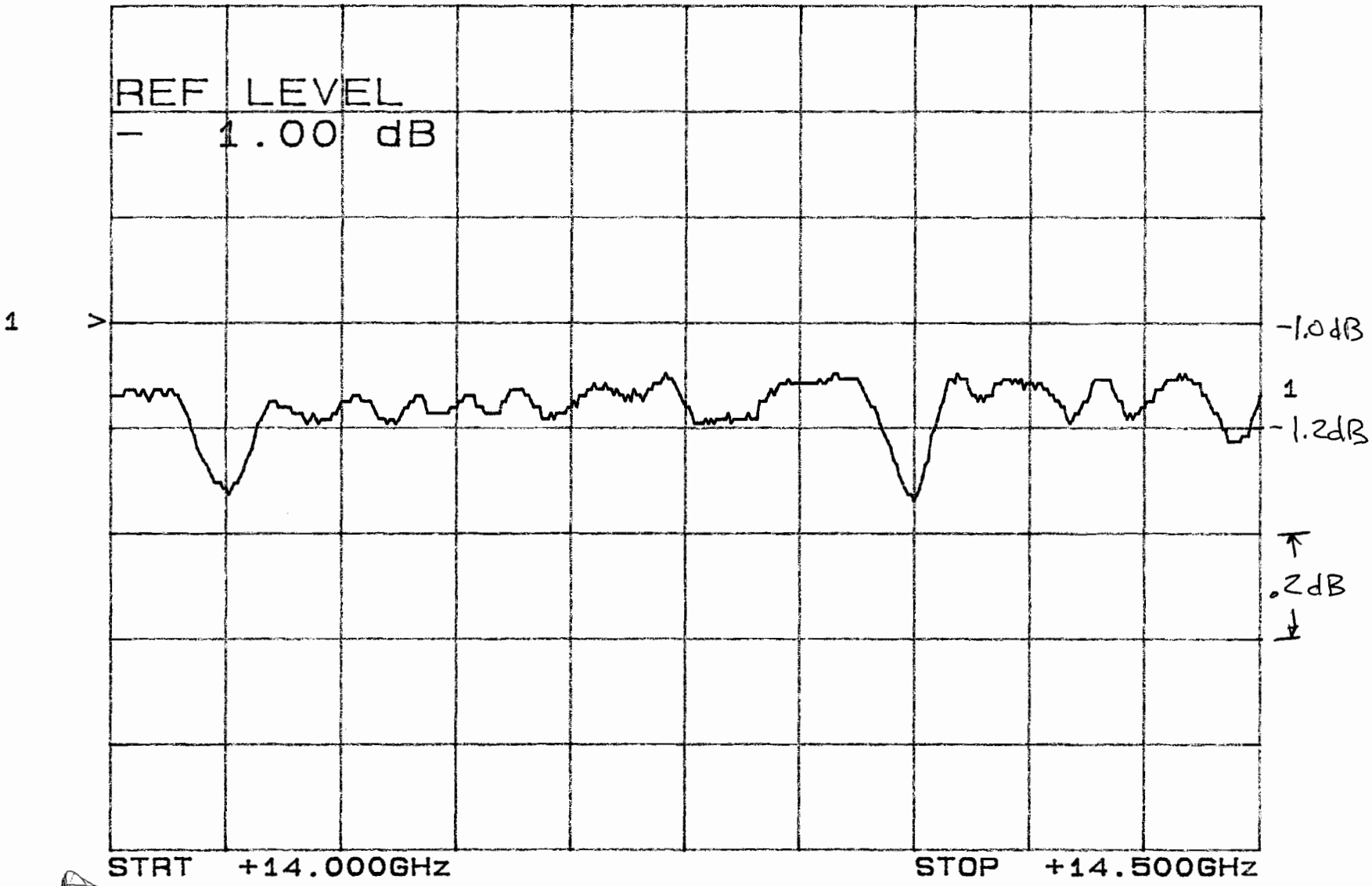
ANTEK SYSTEMS, LLC

Notes: HPA B → Ant. Horz. (FEED)

PLOT: INSERTION LOSS Date: 22 JULY 2008 Test Conductor: DS

CH1: A/R-M
.2 dB/ REF - 1.00 dB

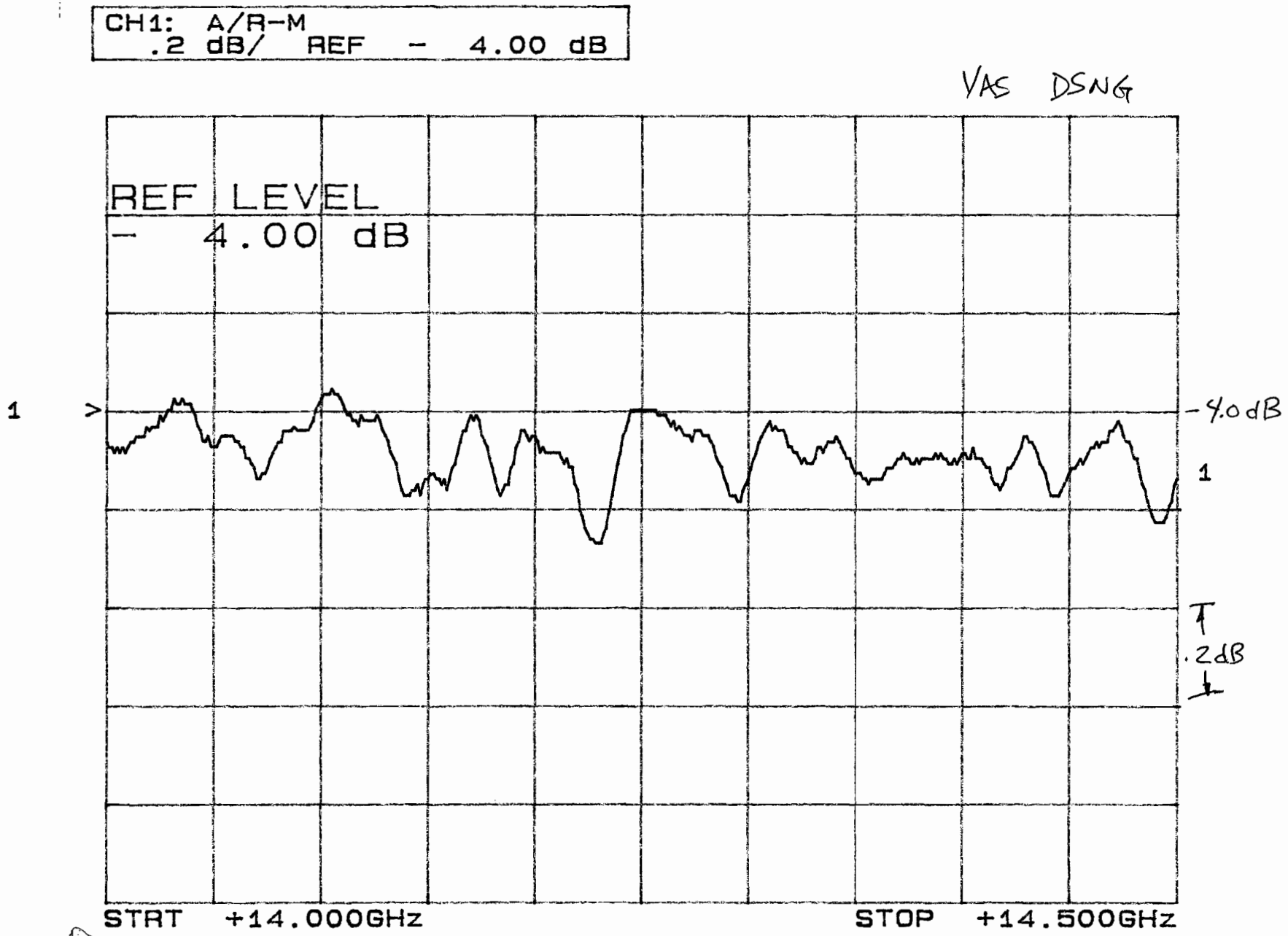
VAS DSNG



ANTEK SYSTEMS, LLC

Notes: HPA OUT A → ANT. VERT. (FEED)

PLOT: Insertion Loss Date: 22 July 2008 Test Conductor: DS



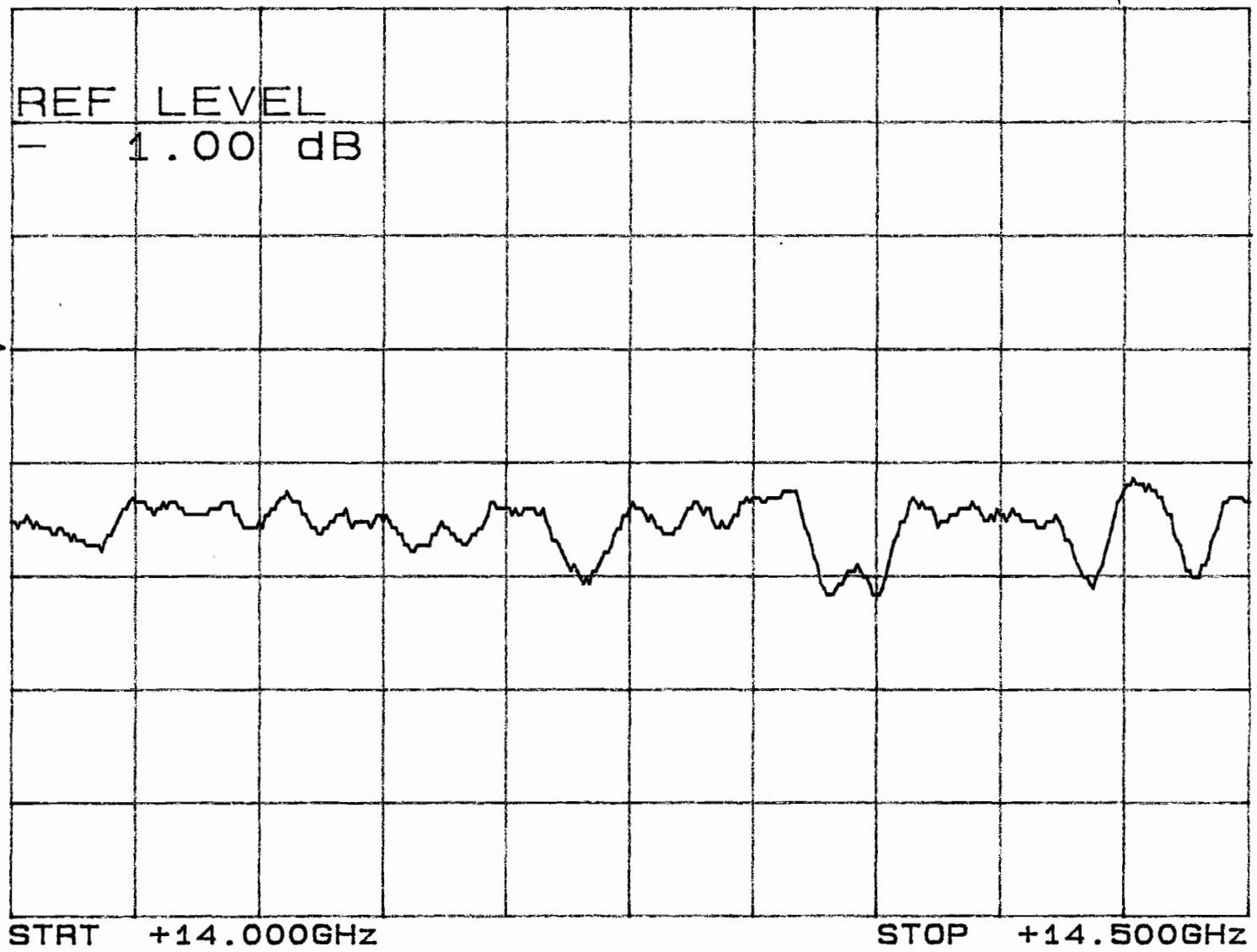
ANTEK SYSTEMS, LLC

Notes: HPA A OUT → Ant. Horz. (Thru VPC, combined) → Feed

PLOT: Insertion Loss Date: 22 July 2008 Test Conductor: DS

CH1: A/R-M
.2 dB/ REF - 1.00 dB

VAS DSNG



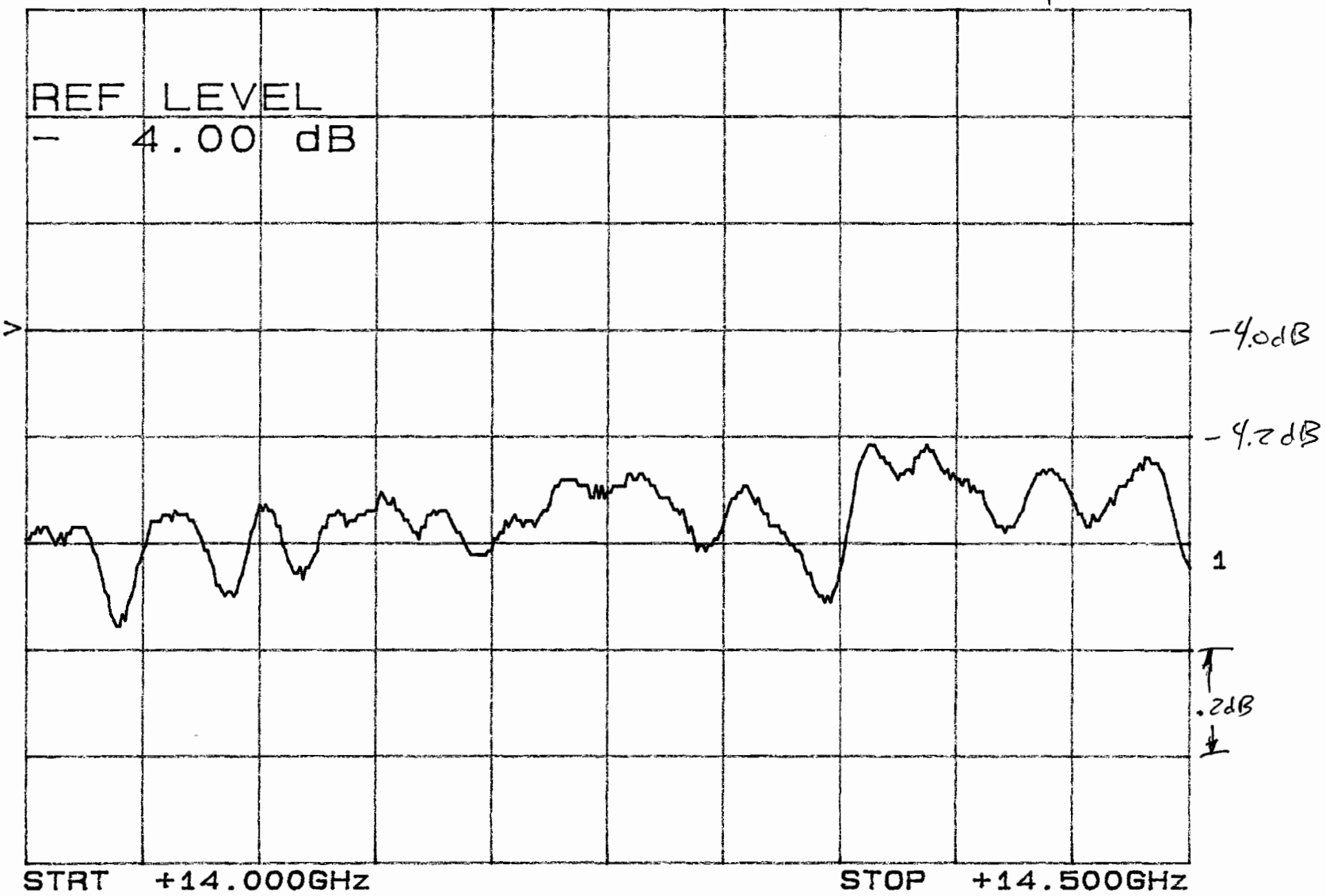
ANTEK SYSTEMS, LLC

Notes: HPA B OUT → ANT. HORZ

PLOT: INSERTION LOSS Date: 22 JULY 2008 Test Conductor: DS

CH1: A/R-M
.2 dB/ REF - 4.00 dB

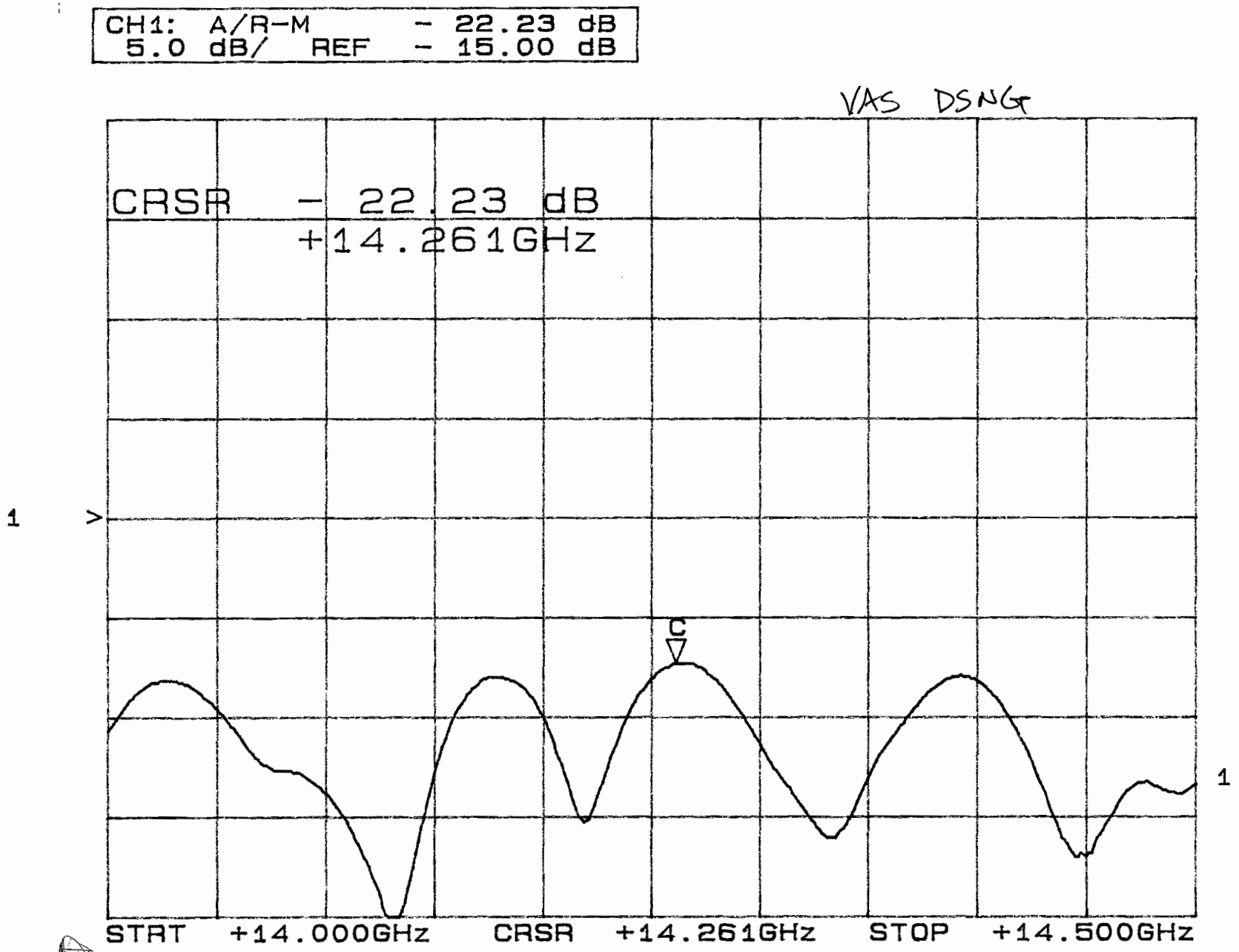
VAS DSNG



ANTEK SYSTEMS, LLC

Notes: HPA OUT B → ANT VERT (THRU VPC COMBINED) → FEED

PLOT: RETURN LOSS Date: 22 JULY 2008 Test Conductor: DS



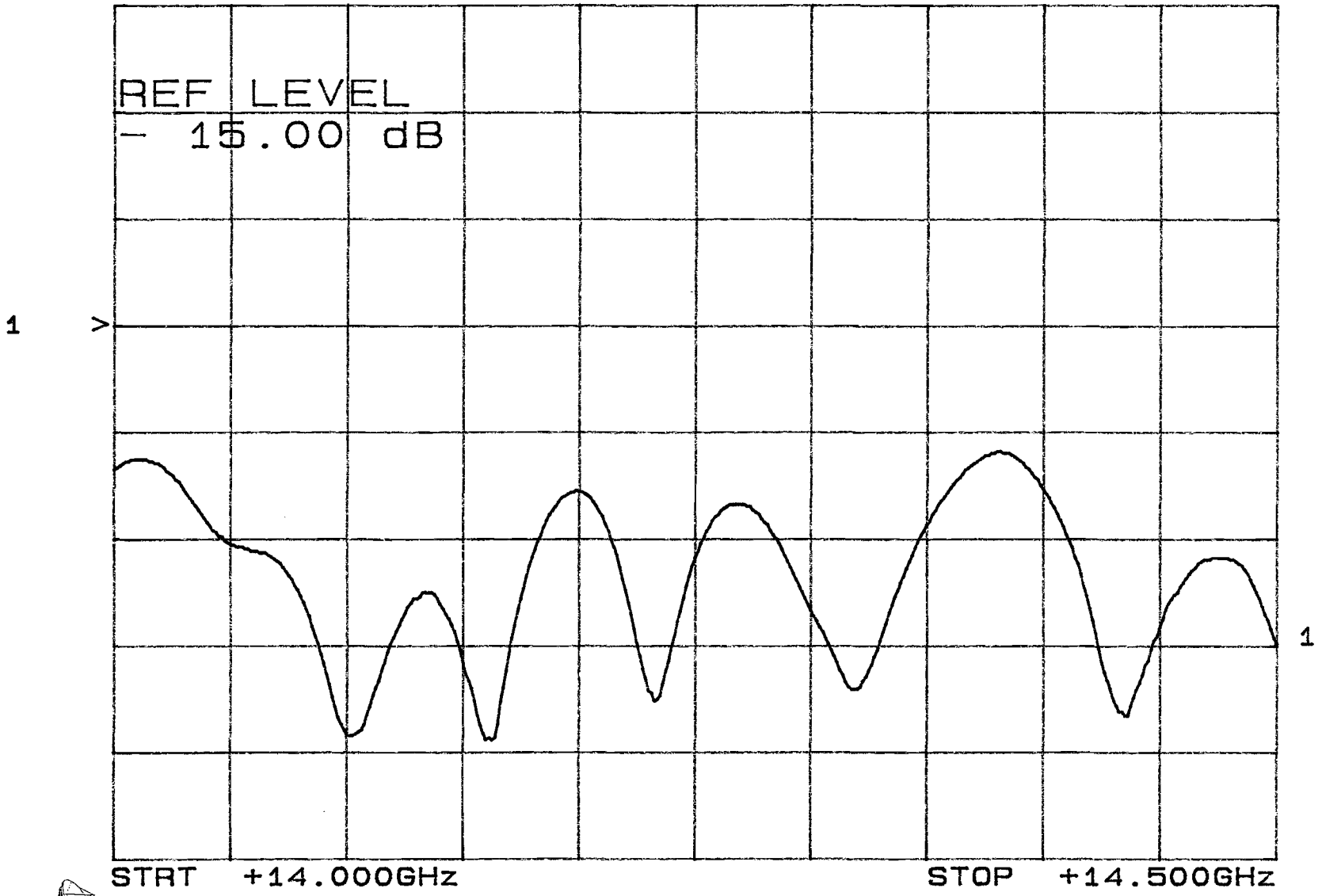
ANTEK SYSTEMS, LLC

Notes: HPA A → SYSTEM LOAD

PLOT: RETURN LOSS Date: 22 JULY 2008 Test Conductor: DS

CH1: A/R-M
5.0 dB/ REF - 15.00 dB

VAS DSNG



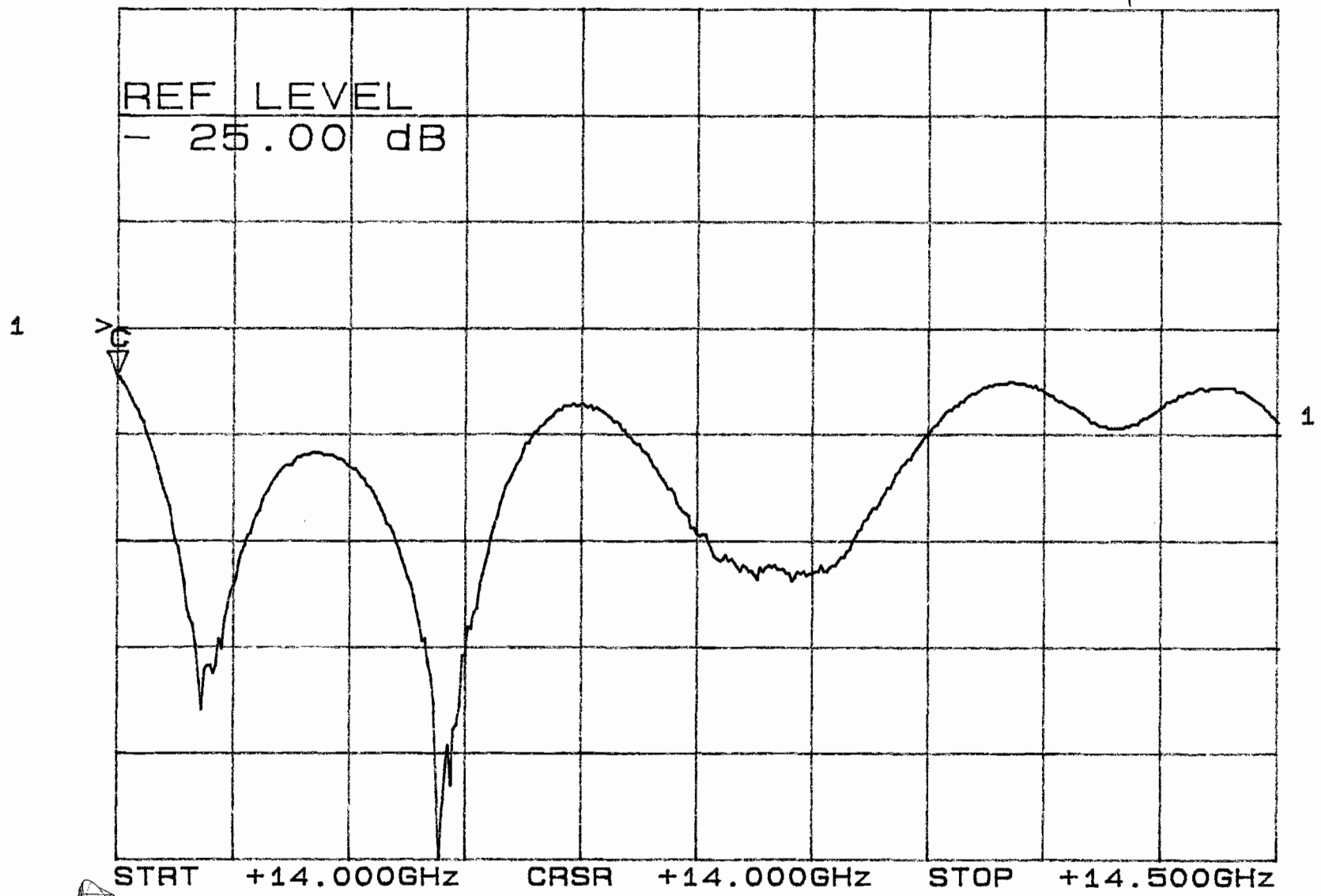
ANTEK SYSTEMS, LLC

Notes: HPA B → SYSTEM LOAD

PLOT: RETURN LOSS Date: 22 JULY 2008 Test Conductor: DS

CH1: A/R-M - 27.21 dB
5.0 dB/ REF - 25.00 dB

VAS DSNG



ANTEK SYSTEMS, LLC

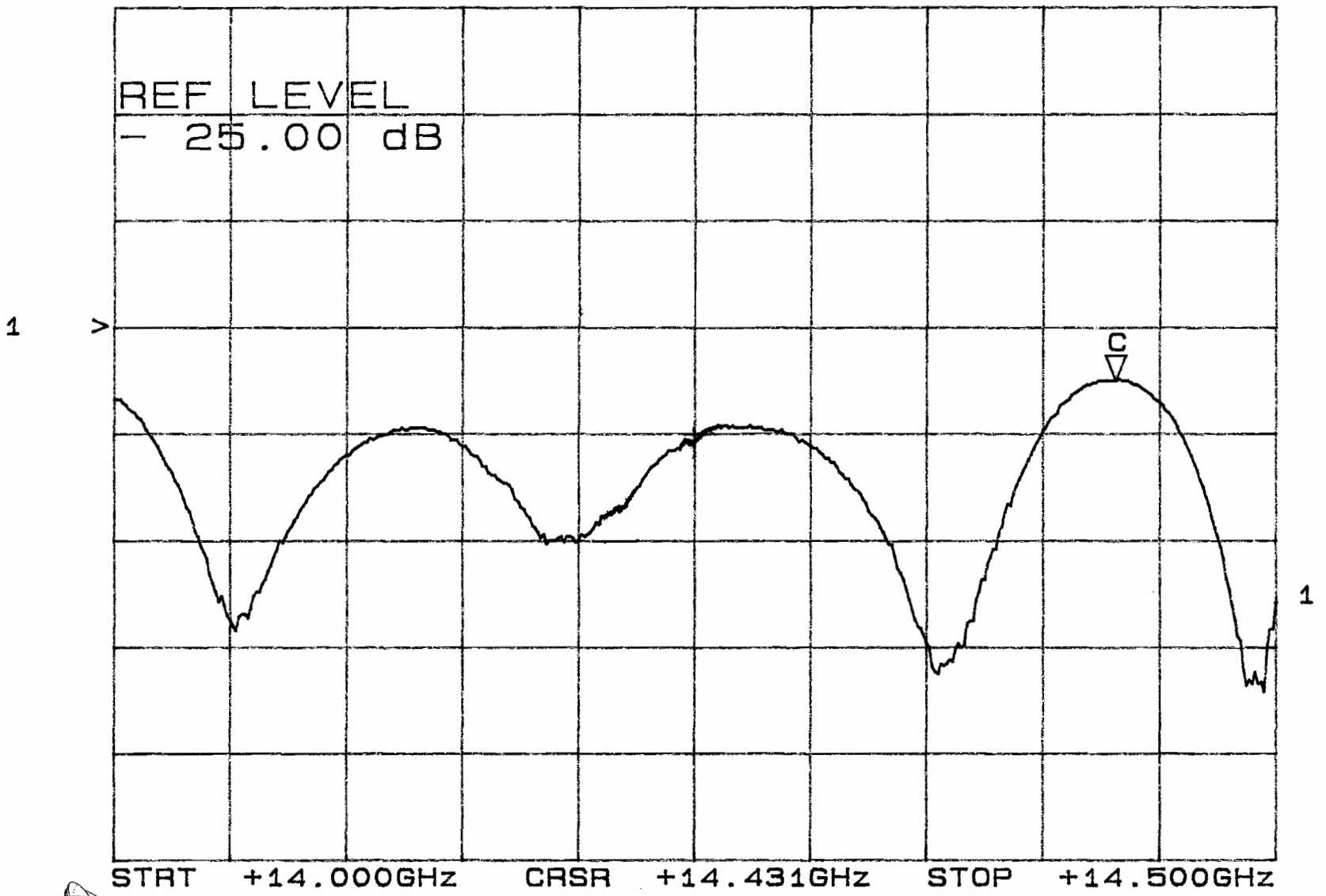
Notes: ANTEK W/G SECTION TO LOWER RJ/FROM SWITCH

PLOT: RETURN LOSS

Date: 22 JULY 2008 Test Conductor: DS

CH1: A/R-M - 27.41 dB
5.0 dB/ REF - 25.00 dB

VAS DSNG



ANTEK SYSTEMS, LLC

Notes: ANTEK W/G SECTION TO UPPER RJ/FROM SW

EXHIBIT “C”

4.0 TEST DATA

4.1 Equipment Identification

Table 3 – Equipment Identification

JOB NUMBER	2053
SYSTEM MODEL NUMBER	MT32PCA
SYSTEM SPECIFICATION NUMBER	40A2203
SYSTEM SERIAL NUMBER	1393871
TWTA "A" MODEL NUMBER	MT3200A
TWTA "A" SERIAL NUMBER	1390105
TWTA "B" MODEL NUMBER	MT3200A
TWTA "B" SERIAL NUMBER	1390106
VPC CONTROLLER MODEL NUMBER	MXC
VPC CONTROLLER SERIAL NUMBER	1393871
AC VOLTAGE	120V
AC FREQUENCY	60 HZ
TESTER/DATE	TY 7-11-08
Q.A. APPROVAL/DATE	JUL 11 2008
CABLE LENGTHS	A 20 IN. B 24 IN.

*Set Attenuation to 2.0 dB on B amp

4.2 Test Equipment

Table 4 – DC Test Equipment

ITEM NO	QTY	DESCRIPTION	MANUFACTURER & MODEL NO	SERIAL NO
1	1	Digital Voltmeter	Fluke 25*	110526
2	1	Resistive Dummy Load	MCL 10887*	N/A
3	1	Test PC	386-33 or better running Windows™ 3.1 or above	TEST3
* or equivalent				

Table 5 – RF Test Equipment

ITEM NO	QTY	DESCRIPTION	MANUFACTURER & MODEL NO	SERIAL NO
1	1	Sweep Generator w/Plug In	8350 A/83592 A*	01461
2	1	Test Cable	Gore*	N/A
3	1	Calibrated Waveguide Directional Coupler		052
4	1	Calibrated 3 dB, 10 dB and 20 dB Attenuator Pads		N/A
5	1	X-Y Plotter	HP 7015 B*	TEST
6	1	Oscilloscope Camera w/Adapter		N/A
7	1	2 kW Dummy Load	Waveline	N/A
8	1	Network Scalar Analyzer	HP 8756*	01483
9	1	Detector	HP 11664A	01481
10	1	Power Meter Dual Head	HP 438A*	01488
* or equivalent				

4.3 Data Sheets

Specification 40A2212 Model MT32PCA Serial Number 1393871

SPEC PARA	TEST	SPEC LIMIT	MEASURED DATA	REMARKS
1.0	HPA ATP 34A2746 TWTA-A TWTA-B	 Attached Attached	 ✓ ✓	 Check Check
2.0	Functional Test			
2.1.2	Switchover Turn On Voltage Frequency		✓	Check
2.1.3	Switchover LEDs		✓	Check
2.2	TWTAs Power On		✓	Check
2.3.1	Manual VPC Switching		✓	Check
2.3.2	On Line Statuses Correct		✓	Check
2.3.4	Auto Switching TWTA-A		✓	Check
2.3.6	Auto Switching TWTA-B		✓	Check
2.4	Communications		✓	Check
3.0	RF Test			
3.1.10	ANT-NULL Isolation Rated Power	-20 dB Photo	-25.0 dB ~	Worst Case Attached
3.1.11	Rated Power A+B Swept Response Gain Variation Gain Slope	 Photo 1 dB ±0.02 dB/MHz	 ~ _____dB _____dB/MHz	 Attached
3.1.12	Rated Power TWTA-A Swept Response Gain Variation Gain Slope Rated Power TWTA-B Swept Response Gain Variation Gain Slope	 Photo 1.2 dB ±0.02 dB/MHz Photo 1.2 dB ±0.02 dB/MHz	 ~ _____dB _____dB/MHz ~ _____dB _____dB/MHz	 Attached Attached
3.1.13	Rated Power -10 dB A+B Swept Response Gain Variation Gain Slope Rated Power -10 dB TWTA-A Swept Response Gain Variation Gain Slope Rated Power -10 dB TWTA-B Swept Response Gain Variation Gain Slope	TEST Photo 1.2 dB ±0.02 dB/MHz Photo 1.2 dB ±0.02 dB/MHz Photo 1.2 dB ±0.02 dB/MHz	 ~ _____dB _____dB/MHz DATA ~ _____dB _____dB/MHz ~ _____dB _____dB/MHz	 Attached Attached Attached

Model _____ Serial Number

PHASE COMBINED GAIN								
f (GHz)	PIN (dBm)	P_{OUT} (dBm)	GAIN (dB)	P_{OUT} (W)	ANT-SAMPLE (dBm)	NULL-SAMPLE (dBm)	ANT CAL (dB)	NULL CAL (dB)
			SEE		TEST	DATA		

TWTA-A GAIN					TWTA-B GAIN			
f (GHz)	PIN (dBm)	P_{OUT} (dBm)	GAIN (dB)	P_{OUT} (W)	PIN (dBm)	P_{OUT} (dBm)	GAIN (dB)	P_{OUT} (W)
			SEE		TEST	DATA.		

Model _____ Serial Number

SPEC PARA	TEST	SPEC LIMIT	MEASURED DATA	REMARKS
	Power Meter Cal			
	Output			
	Rated Power		☑	Check
	-0.5 dB		☑	Check
	-1.0 dB		☑	Check
	-1.5 dB		☑	Check
	-2.0 dB		☑	Check
	-3.0 dB		☑	Check
	-4.0 dB		☑	Check
	-6.0 dB		☑	Check
	-8.0 dB		☑	Check
	-10.0 dB		☑	Check
	-13.0 dB		☑	Check
	-16.0 dB		☑	Check
	-20.0 dB		☑	Check
	0 Watts		☑	Check
	Null			
	Rated Power		☑	Check
	-0.5 dB		☑	Check
	-1.0 dB		☑	Check
	-1.5 dB		☑	Check
	-2.0 dB		☑	Check
	-3.0 dB		☑	Check
	-4.0 dB		☑	Check
	-6.0 dB		☑	Check
	-8.0 dB		☑	Check
	-10.0 dB		☑	Check
	-13.0 dB		☑	Check
	-16.0 dB		☑	Check
	-20.0 dB		☑	Check
	0 Watts		☑	Check

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 10:56 AM
Job Number: 20153
Rated Power: 628 Watts
HPA: A+B

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF PLUG-IN	N/A	N/A	N/A
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
RF POWER SENSORS (CH B)	AGILENT E4412A	01393	11/05/09
RF POWER SENSORS	HP 8481D	N/A	N/A
PRINTER OR PLOTTER	HPTHINKJET OR COLORPRO*	N/A	N/A
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	5/19/09
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
NETWORK ANALYZER	HP 8757D	01483	11/08/09
RF DETECTOR	85025B	01481	11/08/09
SSA**	MCL	N/A	N/A
COAX DIRECTIONAL COUPLER	27C1771	899004	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E
Q.A. Approval:
Q.A. Date: JUL 11 2008

Tester: TY
Date: 7/14/2008
Time: 10:56 AM
Job Number: 20153
Rated Power: 628 Watts
HPA: A+B

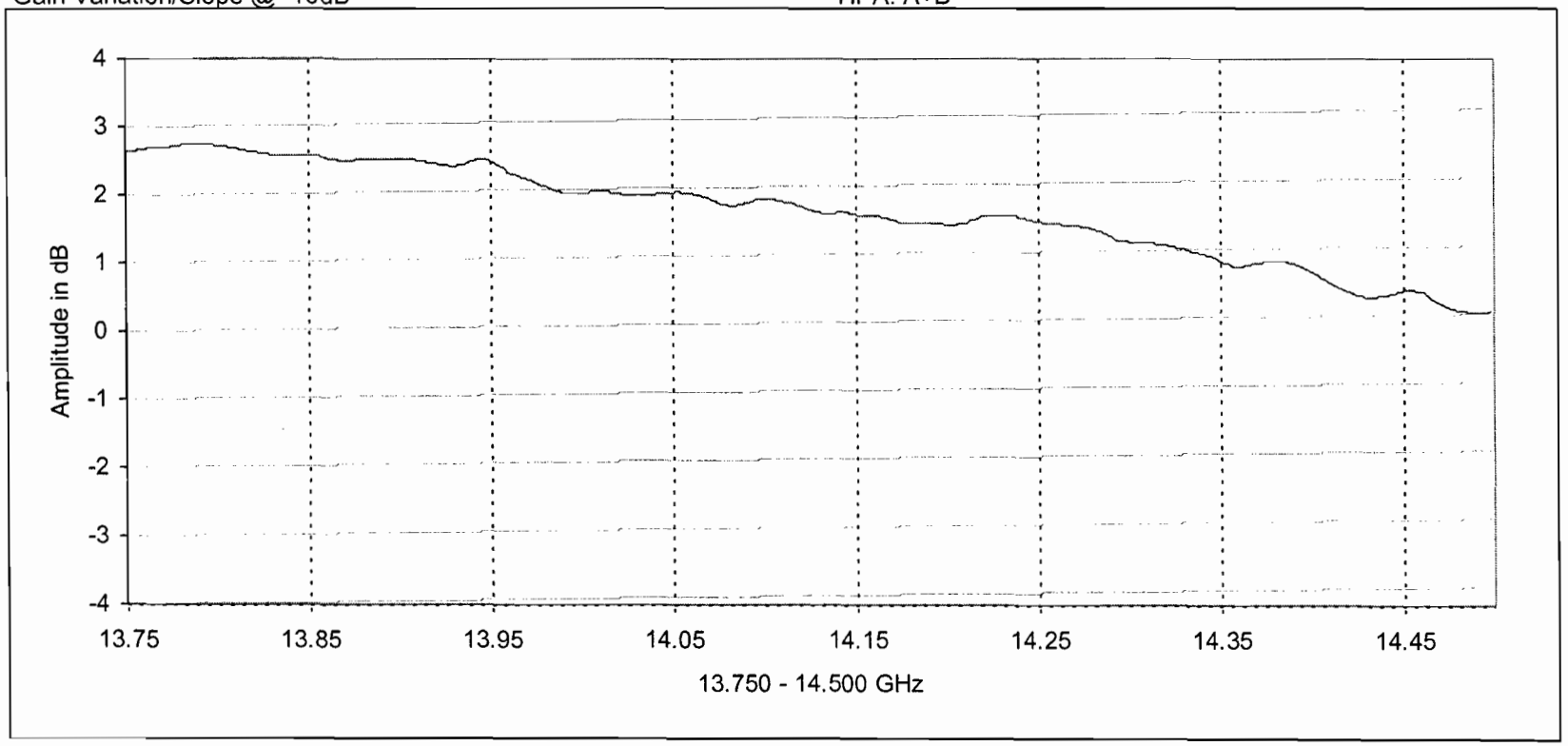
Rated Power Gain Measurement					
Frequency	Input Power	Output Power	Output Power	Gain	Sample Port
13.750GHz	-9.76dBm	58.49dBm	706W	68.24dB	51.09dB
13.800GHz	-9.76dBm	58.52dBm	711W	68.28dB	50.97dB
13.900GHz	-9.76dBm	58.59dBm	723W	68.35dB	51.11dB
14.000GHz	-9.76dBm	58.53dBm	713W	68.29dB	51.10dB
14.100GHz	-9.76dBm	58.67dBm	736W	68.43dB	51.05dB
14.200GHz	-9.76dBm	58.63dBm	730W	68.39dB	51.15dB
14.300GHz	-9.76dBm	58.58dBm	720W	68.33dB	51.09dB
14.400GHz	-9.76dBm	58.29dBm	675W	68.05dB	50.89dB
14.500GHz	-9.76dBm	58.10dBm	646W	67.86dB	50.65dB

Small Signal Gain Measurement				
Input Power	Test	Spec. Limit	Measured Gain	Pass/Fail
-24.59dBm	Gain@-10dB	NA	73.29dB	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 10:56 AM
Job Number: 20153
Rated Power: 628 Watts
HPA: A+B

Gain Variation/Slope @ -10dB



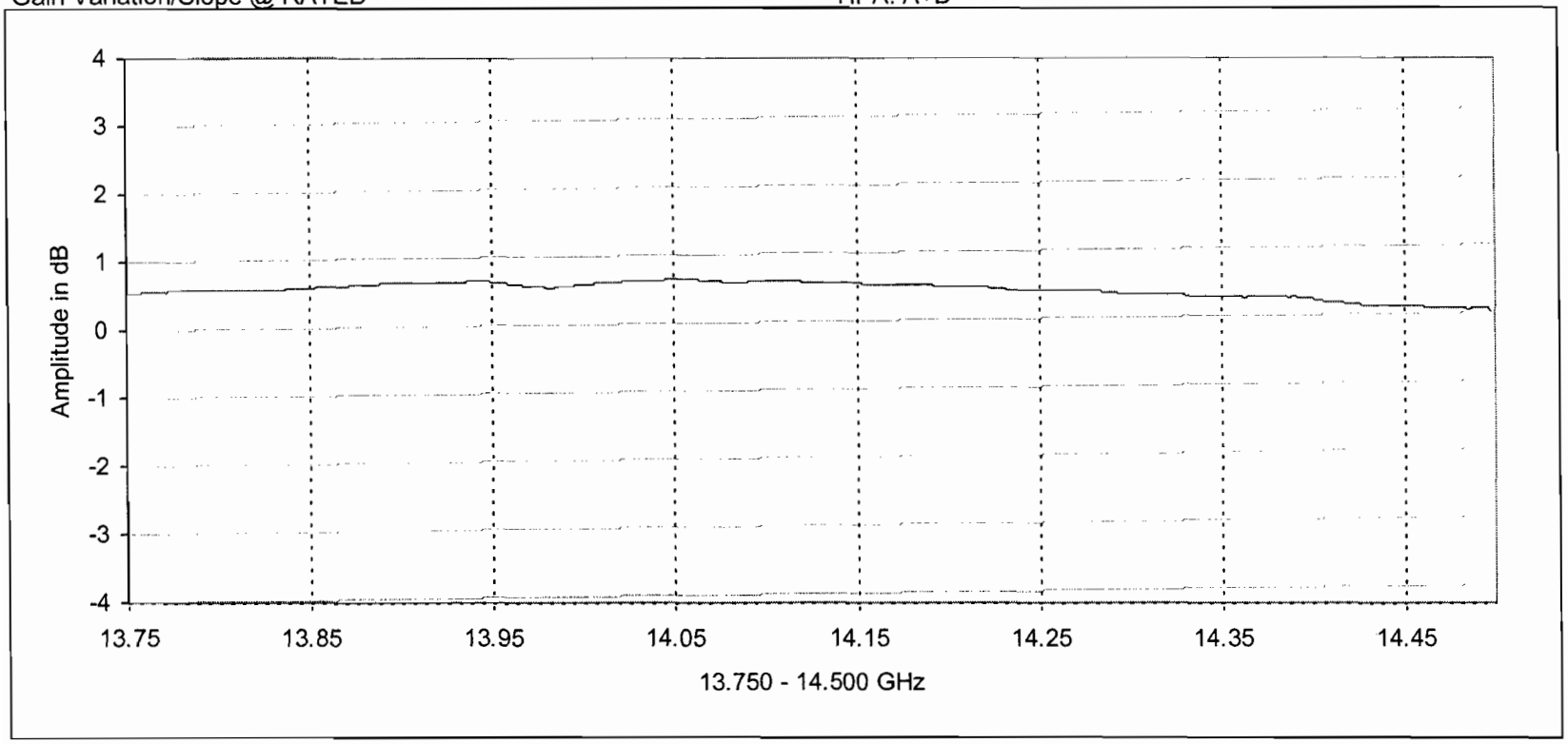
Gain Variation 40MHz	
Lower	14.390GHz
Upper	14.429GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***2.2dB/500MHz***	3.0dB/500MHz	Pass
Gain Variation	***0.5dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0168dB/MHz***	0.0500dB/MHz	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 10:56 AM
Job Number: 20153
Rated Power: 628 Watts
HPA: A+B

Gain Variation/Slope @ RATED



Gain Variation 40MHz	
Lower	14.390GHz
Upper	14.429GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***0.6dB/500MHz***	1.0dB/500MHz	Pass
Gain Variation	***0.1dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0048dB/MHz***	0.0200dB/MHz	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 11:24 AM
Job Number: 20153
Rated Power: 314 Watts
HPA: A

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF PLUG-IN	N/A	N/A	N/A
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
RF POWER SENSORS (CH B)	AGILENT E4412A	01393	11/05/09
RF POWER SENSORS	HP 8481D	N/A	N/A
PRINTER OR PLOTTER	HPTHINKJET OR COLORPRO*	N/A	N/A
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	5/19/09
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
NETWORK ANALYZER	HP 8757D	01483	11/08/09
RF DETECTOR	85025B	01481	11/08/09
SSA**	MCL	N/A	N/A
COAX DIRECTIONAL COUPLER	27C1771	899004	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E
Q.A. Approval:
Q.A. Date: JUL 11 2008

Tester: TY
Date: 7/14/2008
Time: 11:24 AM
Job Number: 20153
Rated Power: 314 Watts
HPA: A

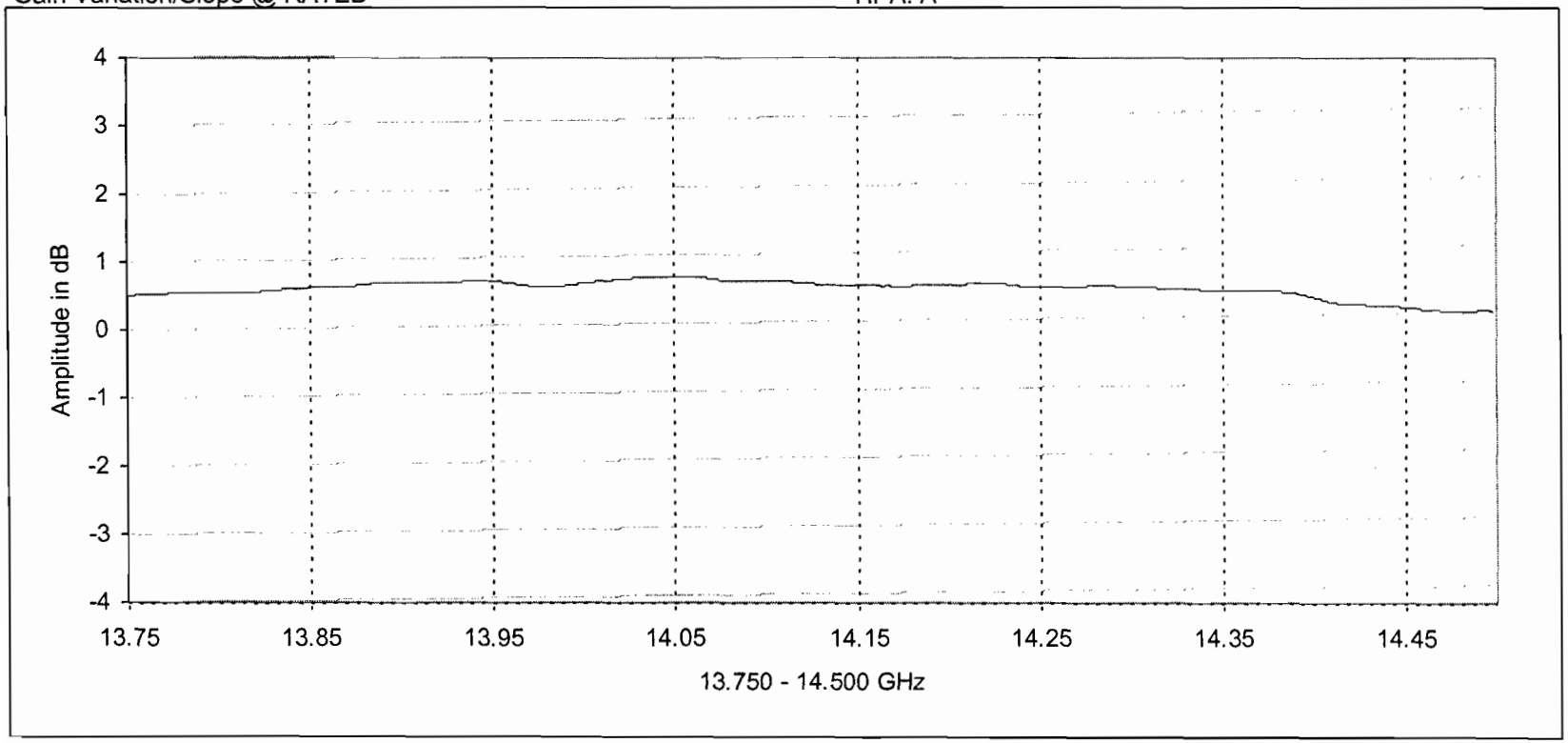
Rated Power Gain Measurement					
Frequency	Input Power	Output Power	Output Power	Gain	Sample Port
13.750GHz	-9.68dBm	55.51dBm	355W	65.18dB	N/A
13.800GHz	-9.68dBm	55.55dBm	359W	65.22dB	N/A
13.900GHz	-9.68dBm	55.61dBm	364W	65.28dB	N/A
14.000GHz	-9.68dBm	55.54dBm	358W	65.22dB	N/A
14.100GHz	-9.68dBm	55.70dBm	372W	65.38dB	N/A
14.200GHz	-9.68dBm	55.68dBm	370W	65.36dB	N/A
14.300GHz	-9.68dBm	55.64dBm	366W	65.31dB	N/A
14.400GHz	-9.68dBm	55.32dBm	340W	64.99dB	N/A
14.500GHz	-9.68dBm	55.12dBm	325W	64.79dB	N/A

Small Signal Gain Measurement				
Input Power	Test	Spec. Limit	Measured Gain	Pass/Fail
-24.03dBm	Gain@-10dB	NA	69.76dB	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 11:24 AM
Job Number: 20153
Rated Power: 314 Watts
HPA: A

Gain Variation/Slope @ RATED



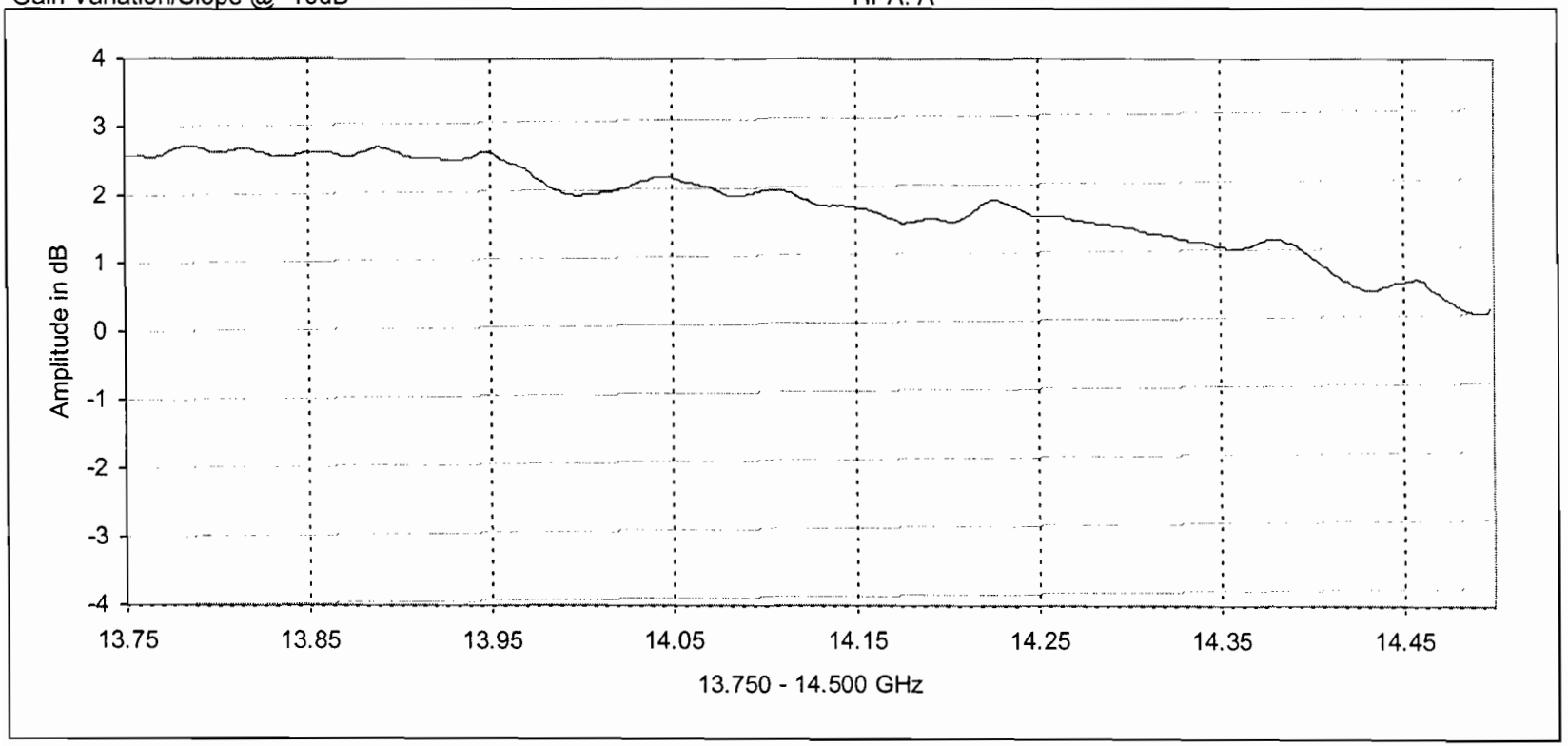
Gain Variation 80MHz	
Lower	14.382GHz
Upper	14.463GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***0.7dB/500MHz***	1.2dB/500MHz	Pass
Gain Variation	***0.3dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0077dB/MHz***	0.0200dB/MHz	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 11:24 AM
Job Number: 20153
Rated Power: 314 Watts
HPA: A

Gain Variation/Slope @ -10dB



Gain Variation 80MHz	
Lower	14.395GHz
Upper	14.476GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***2.1dB/500MHz***	3.5dB/500MHz	Pass
Gain Variation	***0.8dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0215dB/MHz***	0.0500dB/MHz	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 12:02 PM
Job Number: 20153
Rated Power: 314 Watts
HPA: B

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF PLUG-IN	N/A	N/A	N/A
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
RF POWER SENSORS (CH B)	AGILENT E4412A	01393	11/05/09
RF POWER SENSORS	HP 8481D	N/A	N/A
PRINTER OR PLOTTER	HPTHINKJET OR COLORPRO*	N/A	N/A
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	5/19/09
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
NETWORK ANALYZER	HP 8757D	01483	11/08/09
RF DETECTOR	85025B	01481	11/08/09
SSA**	MCL	N/A	N/A
COAX DIRECTIONAL COUPLER	27C1771	899004	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E
Q.A. Approval:
Q.A. Date: JUL 11 2008

Tester: TY
Date: 7/14/2008
Time: 12:02 PM
Job Number: 20153
Rated Power: 314 Watts
HPA: B

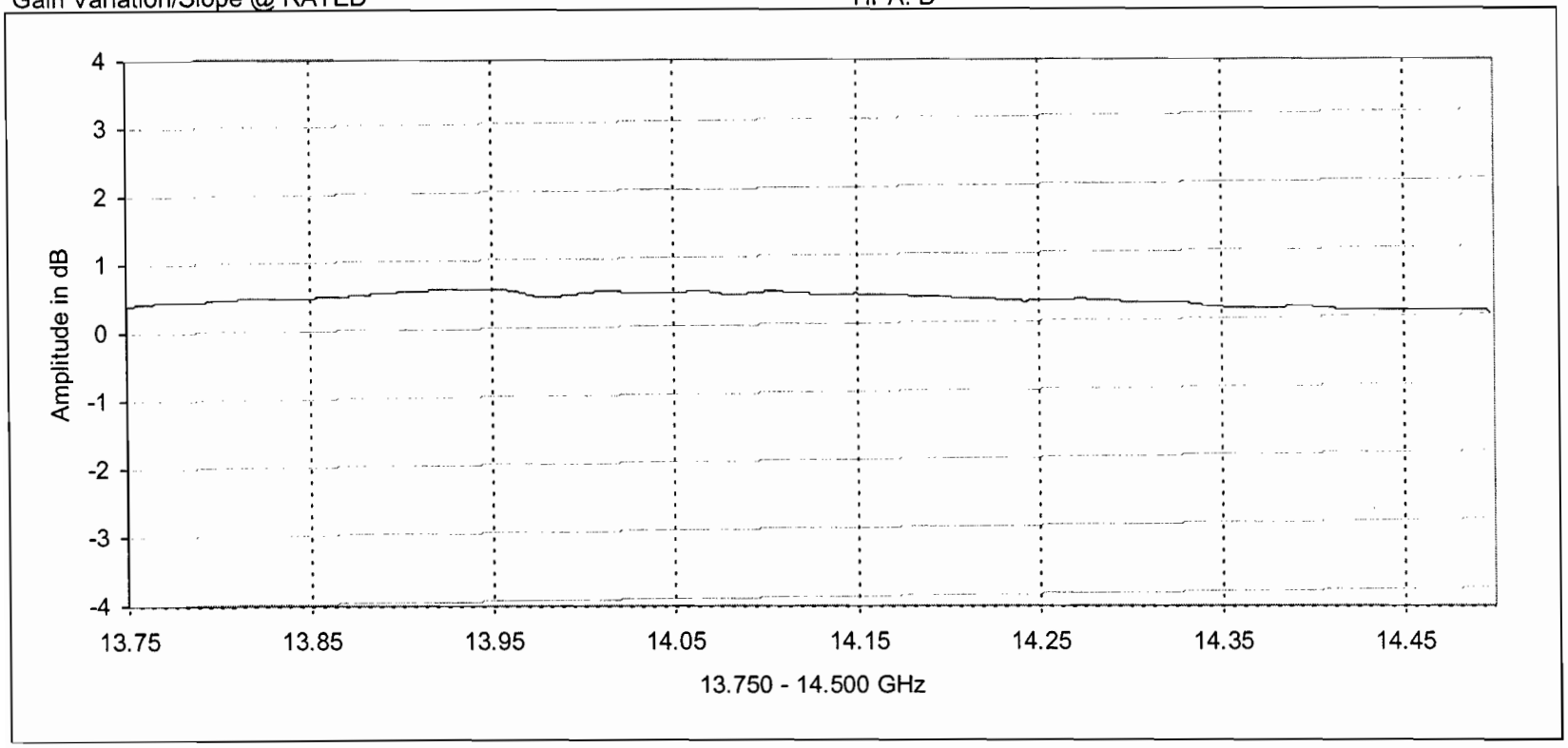
Rated Power Gain Measurement					
Frequency	Input Power	Output Power	Output Power	Gain	Sample Port
13.750GHz	-9.38dBm	55.37dBm	345W	64.75dB	N/A
13.800GHz	-9.38dBm	55.41dBm	348W	64.79dB	N/A
13.900GHz	-9.38dBm	55.49dBm	354W	64.87dB	N/A
14.000GHz	-9.38dBm	55.43dBm	349W	64.81dB	N/A
14.100GHz	-9.38dBm	55.56dBm	360W	64.94dB	N/A
14.200GHz	-9.38dBm	55.52dBm	357W	64.90dB	N/A
14.300GHz	-9.38dBm	55.47dBm	352W	64.85dB	N/A
14.400GHz	-9.38dBm	55.22dBm	333W	64.60dB	N/A
14.500GHz	-9.38dBm	55.05dBm	320W	64.43dB	N/A

Small Signal Gain Measurement				
Input Power	Test	Spec. Limit	Measured Gain	Pass/Fail
-24.82dBm	Gain@-10dB	N/A	70.44dB	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 12:02 PM
Job Number: 20153
Rated Power: 314 Watts
HPA: B

Gain Variation/Slope @ RATED



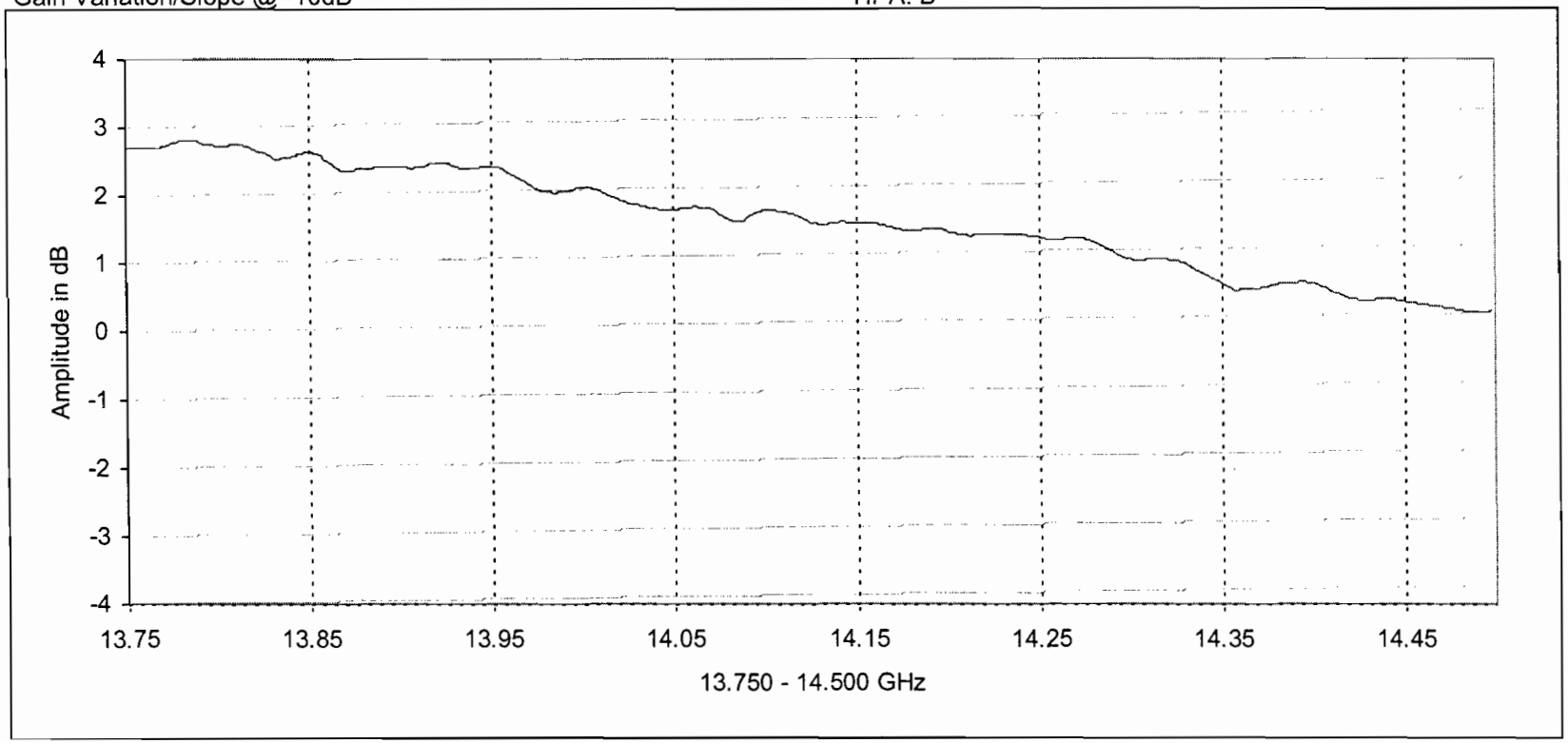
Gain Variation 80MHz	
Lower	14.277GHz
Upper	14.358GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***0.5dB/500MHz***	1.2dB/500MHz	Pass
Gain Variation	***0.2dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0059dB/MHz***	0.0200dB/MHz	Pass

ATP Number: 34A2628 Rev. E
Model Number: MT32PCA
Serial Number: 1393871
System Specification #: 40A2212 Rev. E

Tester: TY
Date: 7/14/2008
Time: 12:02 PM
Job Number: 20153
Rated Power: 314 Watts
HPA: B

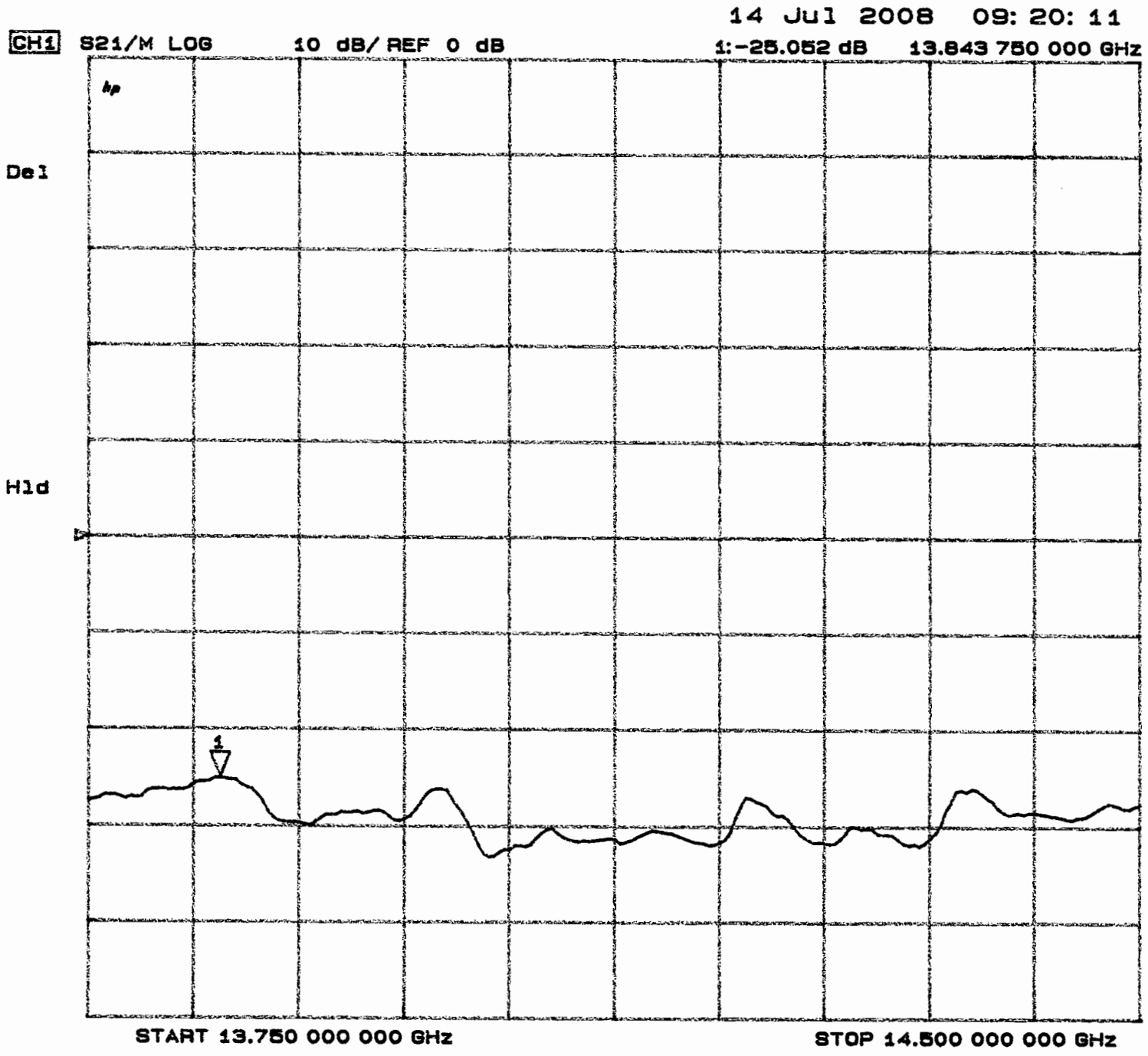
Gain Variation/Slope @ -10dB



Gain Variation 80MHz	
Lower	14.276GHz
Upper	14.356GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***2.2dB/500MHz***	3.5dB/500MHz	Pass
Gain Variation	***0.8dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0181dB/MHz***	0.0500dB/MHz	Pass

MT32PCA 1393871



ANT. TO NULL Isolation

9.0 TEST DATA

9.1 Equipment Identification

Table 5 – Equipment Identification

JOB NUMBER	20153
MODEL NUMBER	MT3200A
SERIAL NUMBER	1390106
FREQUENCY BAND (C, KU, OR KU-DBS)	Ku
TUBE MANF. PART NUMBER	TH3976
TUBE MANUFACTURER	Thales
TUBE MCL TAB NUMBER	2703785-001
TUBE SERIAL NUMBER	652128
SSA MANUFACTURER	ALC
SSA MCL TAB NUMBER	27C3325
SSA SERIAL NUMBER	0668
OPTIONAL LINEARIZER MANUFACTURER	NA
OPTIONAL LINEARIZER MCL NUMBER	NA
OPTIONAL LINEARIZER SERIAL NUMBER	NA
TESTER	TY
DATE	6-27-08
Q.A.	
DATE	JUL 11 2008

9.2 Test Equipment

Table 6 - Test Equipment

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER & MODEL NUMBER	SERIAL NUMBER
1	2	Digital Volt Meter	Fluke 25	110526
2	1	Storage Oscilloscope	Tektronix 2221*	0906
3	2	1000:1 Scope Probe (HV)	Ross VMP30-GH-WA-AL	01495
4	1	Filament Load	3.5 ohm 20W Precision	NA
5	1	MT3200A Resistive High Voltage Load	MCL	N/A
6	1	10:1 Scope Probe	Tektronix P6109*	N/A
7	1	Precision Digital Voltmeter	Fluke 8062A or Tektronix 34401A	NA
8	1	Power Meter	HP438A w/8481A	1488
9	1	RF Sweep Generator with Plug-In	HP 8350B HP 83592A	1461
10	1	Misc. Variable Attenuators	VAR*	N/A
11	1	Think-Jet Printer	HP 2225A	N/A
12	1	SMA 3 dB Power Splitter	27C1987*	N/A
13	1	Clamp-on Current Meter	Bell #GC-100D	2980
14	1	1kW Calibrated Coupler & Dummy Load	WR 75	052
15	1	PC with Diagnostic Program and Communications Program	45A0189 & 45A0163	N/A
16	1	HiPot Break Out Box	MCL	N/A
17	1	HiPot Tester	Hipotronix HD100	TEST1
* Or equivalent				

9.3 Data Sheets

Table 7 - Test Data

ATP PARA	TEST	LIMITS	DATA	REMARKS
1.2	Preliminary Requirements Completed	YES	✓ Check	
2.1	AC Input Voltage	120-240V	240 V	
2.2	HV Load, Break-out, & Divider	YES	✓ Check	
2.3	Parallel Interface Test Fixture	YES	✓ Check	
2.4	Interlock Switch is in Fault Position	YES	✓ Check	
2.5	RF Terminated	YES	✓ Check	
2.7	Switchover Configuration D161101 TAB# D161104 TAB#		-100 -100	
3.1.2	Ground Continuity	< 0.1 Ohm	.05 Ohm	
3.2.6	Dielectric Strength HiPot Test	1900VDC	✓ Pass	
3.2.7	Dielectric Leakage Current	< 2 µA	1 µA	
3.3	Initial Power Up VFD & LEDs SWOV +15V LEDs Local LED Filament Off B1 B2 B3 +5VDC +15VDC -15VDC HV stays OFF	 ON ON Illuminated Illuminated Full Speed Full Speed Full Speed 4.90 - 5.20 V ±1.0 V ±1.0 V 0V	 ✓ Check ✓ Check ✓ Check ✓ Check ✓ Check ✓ Check ✓ Check 5.1 VDC 14.8 VDC -15.0 VDC ✓ Passed	
3.4	Set Time & Date & Serial Number	N/A	✓ Check	
3.5	Chassis Interlock Fault SWOV Fault User Sum Fault Reset	YES YES YES YES	✓ Check ✓ Check ✓ Check ✓ Check	
3.6	RF Deck Interlock Fault	YES	✓ Check	
3.7	Blower Alarms B1 B2 B3	 YES YES YES	 ✓ Check ✓ Check ✓ Check	after 60 seconds
3.8	User Interlock Fault	YES	✓ Check	

ATP PARA	TEST	LIMITS	DATA	REMARKS
3.9	W.G. Pressure Fault	YES	✓ Check	
3.10	User RF Off RF On LED RF Off LED	 Illuminated Illuminated	 ✓ Check ✓ Check	
3.11	Exciter Alarm Switchover Fault LED	YES Illuminated	✓ Check ✓ Check	
3.12	Switchover RF Off RF On LED RF Off LED	 Illuminated Illuminated	 ✓ Check ✓ Check	
3.13	Switchover RF Switch positions Antenna LED Load LED Antenna button Load button	 Illuminated Illuminated YES YES	 ✓ Check ✓ Check ✓ Check ✓ Check	
3.14	Switchover 2nd HPA fault Event Log No Sum Fault	 YES YES	 ✓ Check ✓ Check	
3.15	Switchover RF Low Switching	YES	✓ Check	
3.16	Switchover Auto Switching Front Panel Auto LED Test Fixture Auto LED Auto button	 Illuminated Illuminated YES	 ✓ Check ✓ Check ✓ Check	N/A for D161104 -200 -300
3.17	Fault Log Chassis Interlock User Interlock W.G. Pressure	 YES YES YES	 ✓ Check ✓ Check ✓ Check	
3.18	Power Supply Temperature Alarm Level	YES 80°C	✓ Check ✓ Check	
3.19	Power Supply Temperature Fault	Yes 85°C	NA Check NA Check	
3.21	Tube Temperature Fault Single Band Level Dual Band Level	Yes 110°C 115°C	✓ Check ✓ Check NA Check	
3.22.1	Filament Under Current	0.5A	.5 A	
3.22.2	Tube Data Sheet Filament Voltage Run Current	 5.6 – 6.4 < 1.8 A	 6.3 V 1.1 A	

ATP PARA	TEST	LIMITS	DATA	REMARKS
3.22.3	Filament On Standby LED Delay LED Filament Off LED	 Flashing Illuminated Illuminated	 ✓ Check ✓ Check ✓ Check	
3.22.4	Filament Voltage Adjustment	±0.02 V	6.3 V	
3.22.5	Filament Current Meter HPA Meter Clamp-on meter Meter Error	 N/A N/A ±10%	 1.73 A 1.7 A 1.8 %	
4.0 BAND SETUP The following Data must be filled in for each band and sub-band calibrated in the HPA.				
4.1.1	**Band Parameters** **Config/RF** Number of Bands Number of Sub-bands		 1 -Band 1 Sub Bands	
4.1.2	Band Designation Band User Description		Ku	
4.1.3	Linearizer Type		NA Check	
4.1.4	Auto Power Maximum	HPA Rated	55.6 dBm	
4.1.5	Input Stage Type		✓ Check	
4.1.6	Attenuation		✓ Check	
4.1.7	HPA Gain Type		✓ Check	
4.1.8	Temp. Comp	Enabled	✓ Check	
4.2	Still have a Chassis Interlock Fault	YES	✓ Check	
4.2.1.2	Tube Data Sheet Helix Voltage Helix Run Current Collector #1 Voltage Collector #2 Voltage (If Required) Anode Voltage	 8.0 – 12.5 kV < 12mA <10mA Dual Band	 8.60 kV 1.3 mA 4.30 kV 2.752 kV NA kV	
4.2.1.3	Trip Level Adjustments Configuration/Power Supply Helix Run Current Helix Surge Current	 N/A Tube Spec mA Tube Spec mA	 10 mA 80 mA	

ATP PARA	TEST	LIMITS	DATA	REMARKS
4.2.1.4	Standby Clear all faults 180 Filament Delay No High Voltage End Filament Delay	 YES YES YES YES	 ✓ Check ✓ Check ✓ Check ✓ Check	
4.2.1.5	Transmit (HV) On Configuration/Power Supply Output = data sheet Actual Cathode Voltage Helix Voltage Set Point Cathode Meter Offset Used Cathode Setpoint Offset Used Helix Voltage HPA Meter	 YES 8.0-14.0kV ±0.2kV ±KV ±KV ±20VDC	 ✓ Check 8.60 kV 8.65 kV +10 kV -40 kV 8.60 kV	
4.2.1.6	Collector Voltages, On the Load Coll #1 wrt to Cathode Coll #2 wrt to Cathode		 4.30 kV 2.74 kV	
4.2.1.7	Helix Current Meter Measured HPA Meter Error	 ±2%	2.0 mA 2.0 mA 0 %	
4.2.2	Proportional Delay t_{off} + 6 seconds	+/- 2 seconds	✓ Passed	
4.2.3	Cathode-Helix Turn-On Time	< 10mS	5 mS	
4.2.4	Short Circuit Test		✓ Passed	
4.2.5	Helix Run Current Fault		✓ Check	
4.2.6	Helix Surge Current Fault		✓ Check	
4.2.7.3	Filament Volt Adjustment on the Tube	Tube data	6.3 V	
4.2.7.6	Cathode Turn-On, On the Tube On time No Overshoot Surge Current	 < 10ms YES ≤ 80mA,C,Ku, dBs, X	 6 ms ✓ Passed 50 mA	Plot attached
4.2.7.7	Helix Voltage HPA Met Helix Run Current	 Computer Port	 8.60 kV 1.2 mA	Fil I = 1.04A
4.2.7.8	Collector Voltages, On the Tube Coll #1 wrt to Cathode Coll #2 wrt to Cathode (If Required) Anode WRT Cathode	 ±0.05KV	 4.30 kV 2.73 kV NA kV	
	5.0 RF SET UP AND VERIFICATION			
5.0	Set Up			

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Bands		N/A GHz	
	Sub-Band		N/A GHz	
	Data Sheet Copies of next 2 pages		A Check	
	PAD & Operating Band of HPA			
	Low end of band		13.75 GHz	
5.1	High end of band		14.5 GHz	
	PAD part number		NA	
	PAD value	≤ 6dB	NA dB	
	Tube Drive Meter Calibration	Trimpot	3200	
	Center Frequency	Trimpot word	14.1GHz	
	Full Scale			
	Full Scale – 1.5 dB			
	Full Scale – 3.0 dB			
	Full Scale – 4.5 dB			
5.2	Full Scale – 6.0 dB			
	Full Scale – 9.0 dB			
	Full Scale – 12 dB			
	Full Scale – 15 dB			
	Full Scale – 20 dB			
	Uncal alarm cleared	YES	✓ Check	
	RF Off –30dBm	±0.3dBm	✓ Passed	
	Meter accuracy @ center freq			
	Tube Overdrive Fault Verification			
	Fault level		8.0 dBm	
5.3	Alarm level		7.0 dBm	
	Alarm and Fault does occur	YES	✓ Passed	
	RF Off during fault	YES	✓ Passed	
	Attenuator Calibration			
	TB1-10 @ 0.0 dB	9.90-10.9	10.48 V	
	TB1-10 @ 32.0 dB	0.0-0.5	0.0 V	
	Attenuation Range	≥30.0dB	33 dB	
	32.0 or 30.0	≥30.0dB		
	31.0 or 29.0	±0.2		
	30.0 or 28.0	±0.2		
	25.0	±0.5		
5.4	20.0	±0.5		
	15.0	±0.5		
	10.0	±0.5		
	5.0	±0.1		
	1.5	±0.1		
	0.8	±0.1		
	0.3	±0.1		
	0.0	±0.0		

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Meter accuracy @ center freq	±0.1dB	✓ Passed	
5.5	Reflected Power Meter Calibration Full Scale (FS) (rated power – 9.5dB) FS-1.0dB FS-2.0dB FS-4.0dB FS-6.0dB FS-9.0dB FS-12.0dB FS-15.0dB FS-20.0dB FS-25.0dB Uncal alarm cleared Meter accuracy @ center freq	Trimpot Trimpot Word YES ±0.5dB	3300 46dBm ✓ Check ✓ Passed	
5.6	Reflected Power Fault Verification Fault level Alarm & Fault does occur	 YES	 46 dBm ✓ Passed	
5.7	Forward Power Meter Calibration Full Scale (FS) FS-0.7dB FS-1.5dB FS-3.0dB FS-5.0dB FS-8.0dB FS-10.0dB FS-12.0dB FS-15.0dB FS-17.0dB FS-20.0dB FS-25.0dB	Trimpot Trimpot Word	3000 55.6dBm	

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Unical alarm cleared	YES	✓ Check	
	Meter accuracy @ center freq	±.5dB	✓ Passed	
5.8	RF Switch Attenuation	≥ 43.0dB	>60 dB	
5.9	Hold Power Verification		✓ Passed	
5.10	High/Low Line Turn-On			
	Xmt & Stby @ 100V	No Faults	✓ Passed	
	Xmt & Stby @ 264V	No Faults	✓ Passed	
5.11	Computer Interface Operation			
	Protocol	CSP	✓ Check	
	Address	07	✓ Check	
	Baud rate	9600	✓ Check	
	Com TX LED		✓ Passed	
	Com RX LED		✓ Passed	
	Report Date	Status must agree	✓ Passed	
	Report Time	with local panel.	✓ Passed	
	Report block status #1		✓ Passed	
	Report block status #2		✓ Passed	
	Report event log entry		✓ Passed	
	Report fault log entry		✓ Passed	
	RF On/Off control		✓ Passed	
	Flt Counter en/disable control		✓ Passed	
	Fault Reset control		✓ Passed	
	Standby/Filament On control		✓ Passed	
	Transmit control		✓ Passed	
	RF Dec/Inc control		✓ Passed	
	Remote control		✓ Passed	
	Computer control		✓ Passed	
	Filament Off control		✓ Passed	
	Set Auto Power control		✓ Passed	
5.12	Remote Interface Operation			
	Protocol	CSP	✓ Check	
	Address	07	✓ Check	
	Baud rate	9600	✓ Check	
	Com TX LED		✓ Passed	
	Com RX LED		✓ Passed	
	Report Date	Status must agree	✓ Passed	
	Report Time	with local panel.	✓ Passed	
	Report block status #1		✓ Passed	
	Report block status #2		✓ Passed	
	Report event log entry		✓ Passed	
	Report fault log entry		✓ Passed	
	RF On/Off control		✓ Passed	

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Flt Counter en/disable control		✓ Passed	
	Fault Reset control		✓ Passed	
	Standby/Filament On control		✓ Passed	
	Transmit control		✓ Passed	
	RF Dec/Inc control		✓ Passed	
	Remote control		✓ Passed	
	Computer control		✓ Passed	
	Filament Off control		✓ Passed	
	Set Auto Power control		✓ Passed	
5.13.2	Record MAC Address	MAC Address	00-20-4A-AF-21-6B	
5.13.3	Verify Ethernet Operation (Optional)	--	✓ Complete	
5.14	Manual Override Operation			
	No change in override		✓ Passed	
	Attenuator no change		✓ Passed	
	Override Standby		✓ Passed	
	Override Standby LED	Yellow	✓ Passed	
	Override Transmit		✓ Passed	
	Override Xmt LED	Green	✓ Passed	
	Override Reset		✓ Passed	
	Override Fault LED	Red	✓ Passed	
	Override RF Inhibit		✓ Passed	
	Override RF Enable		✓ Passed	
	No change Normal		✓ Passed	
	Attenuator no change		✓ Passed	
	Override Delay LED	Flashing Yellow	✓ Passed	
5.15	HPA Meter Readings			
	Helix voltage	N/A	8.60K V	
	Helix current		1.8 mA	
	Filament current		1.05 A	
	Attenuation		0 dB	
	Tube Drive power		2.8 dBm	
	Forward power		55.6 dBm	
	Reflected power		8 dBm	
	Tube Temperature		50 EC	
	PS Temperature		38 °C	
	Download Status		✓ Completed	Diskette attached
	Download Settings		✓ Completed	
	Download Calibration Tables		✓ Completed	

6.0 LEVEL A – STANDARD RF TESTS

Be sure each plot or printout is marked with the HPA model number, serial number, test procedure number, paragraph number, and the measurement of the parameter is clearly marked.

ATP PARA	TEST	LIMITS	DATA	REMARKS
6.1	STP Burn-In	N/A	✓ Completed	34A2268 data attached
6.2	Optional Linearizer Adjustment Phase Voltage Mag Voltage	N/A N/A	N/A V N/A V	
6.3	STP Intermodulation		NA Completed	If a Linearizer and/or peak power TWT is installed, the intermodulation procedure must be performed.
6.4	STP Gain & Power Output Coupling Factors Enterd		✓ Completed ✓ Completed	34A2272 data attached
6.5	STP Spectral Purity	N/A	✓ Completed	34A2304 data attached
6.6	Fault Counter Fault Counter Enabled Window Number	 True 30 Seconds 3	 ✓ Complete ✓ Complete ✓ Complete	
7.0 LEVEL B – SPECIAL PRODUCTION TESTS Be sure each plot or printout is marked with the HPA model number, serial number, test procedure number, paragraph number, and the measurement of the parameter is clearly marked.				
These tests are special production tests performed only when ordered by purchase order.			N/A Level B Tests Are Ordered	
7.1	STP Gain Stability vs. Time		____Completed	34A2273 data attached
7.2	Output Power Stability vs. AC Line 100V 208V 240V 264V Total Change		 _____V _____V _____V _____V _____V	 _____dB _____dB _____dB _____dB dB
7.3	STP Noise Power Output		____Completed	34A2284 data attached
7.4	STP Harmonics		____Completed	34A2295 data attached
7.5	STP Input/Output VSWR		____Completed	34A2267 data attached

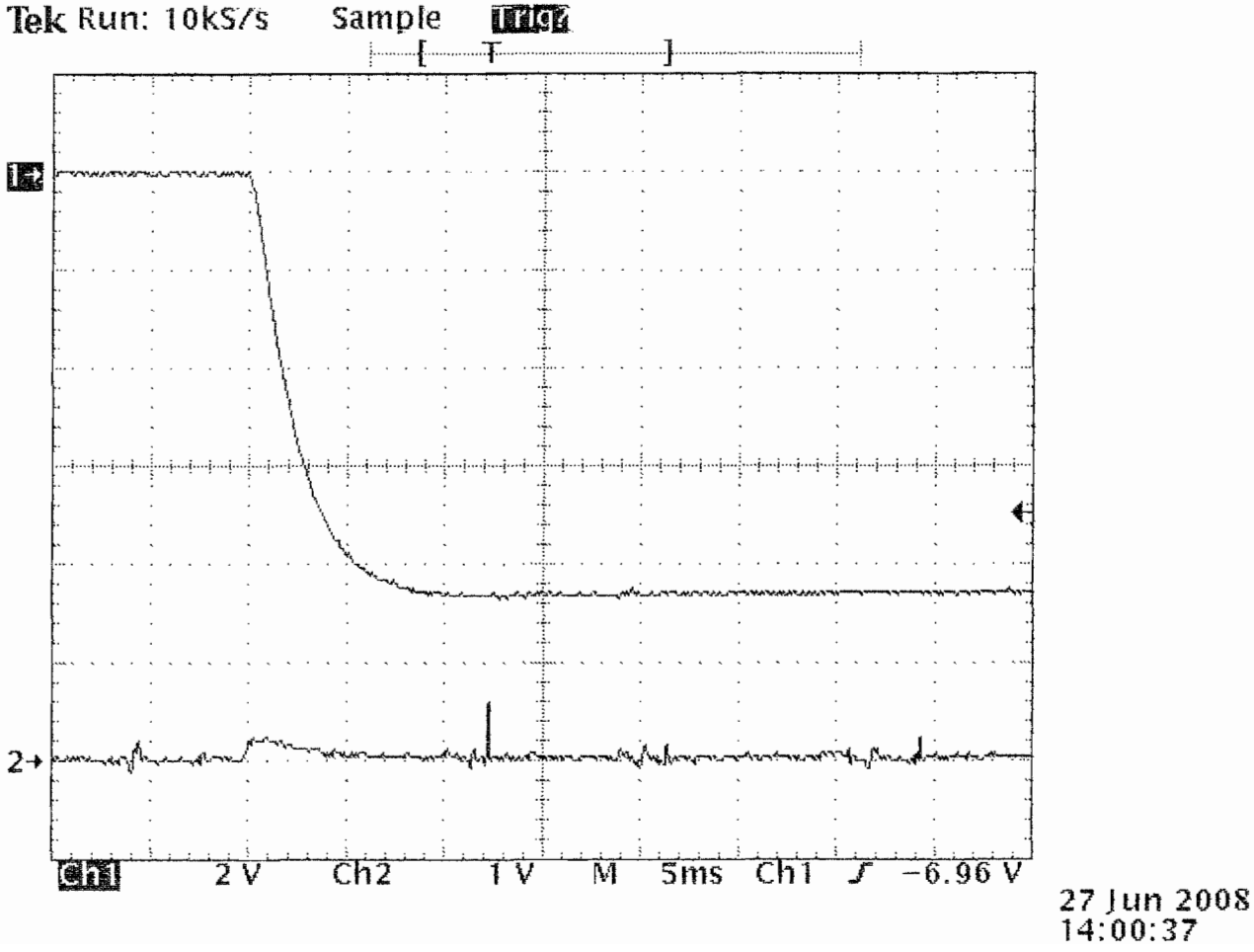
ATP PARA	TEST	LIMITS	DATA	REMARKS
7.6	STP Group Delay		____Completed	34A2274 data attached
7.7	STP AM to PM Conversion		____Completed	34A2277 data attached
7.8	STP Residual AM		____Completed	34A2239 data attached
7.9	STP Phase Noise		____Completed	34A2102 data attached
8.0 LEVEL C – DESIGN VERIFICATION TESTS Be sure each plot or printout is marked with the HPA model number, serial number, test procedure number, paragraph number, and the Measurement of the parameter is clearly marked.				
These design verification tests are special production tests performed only when ordered by purchase order.			N/A Level C Tests Are Ordered	
8.1	Powerline Conducted EMI		____Completed	34A2235 attached
8.2	Acoustic Noise		____Completed	34A2237 attached
8.3	Non-Ionizing Radiation		____Completed	34A2256 attached
8.4	AC Inrush Current		____Completed	34A2238 data attached
8.5	Power Factor		____Completed	34A2253 data attached

DIAGNOSTIC INTERFACE DATA DISK FOR YOUR HPA.

PLACE A 3-1/2 INCH DISC
POCKET HERE ON THIS PAGE.

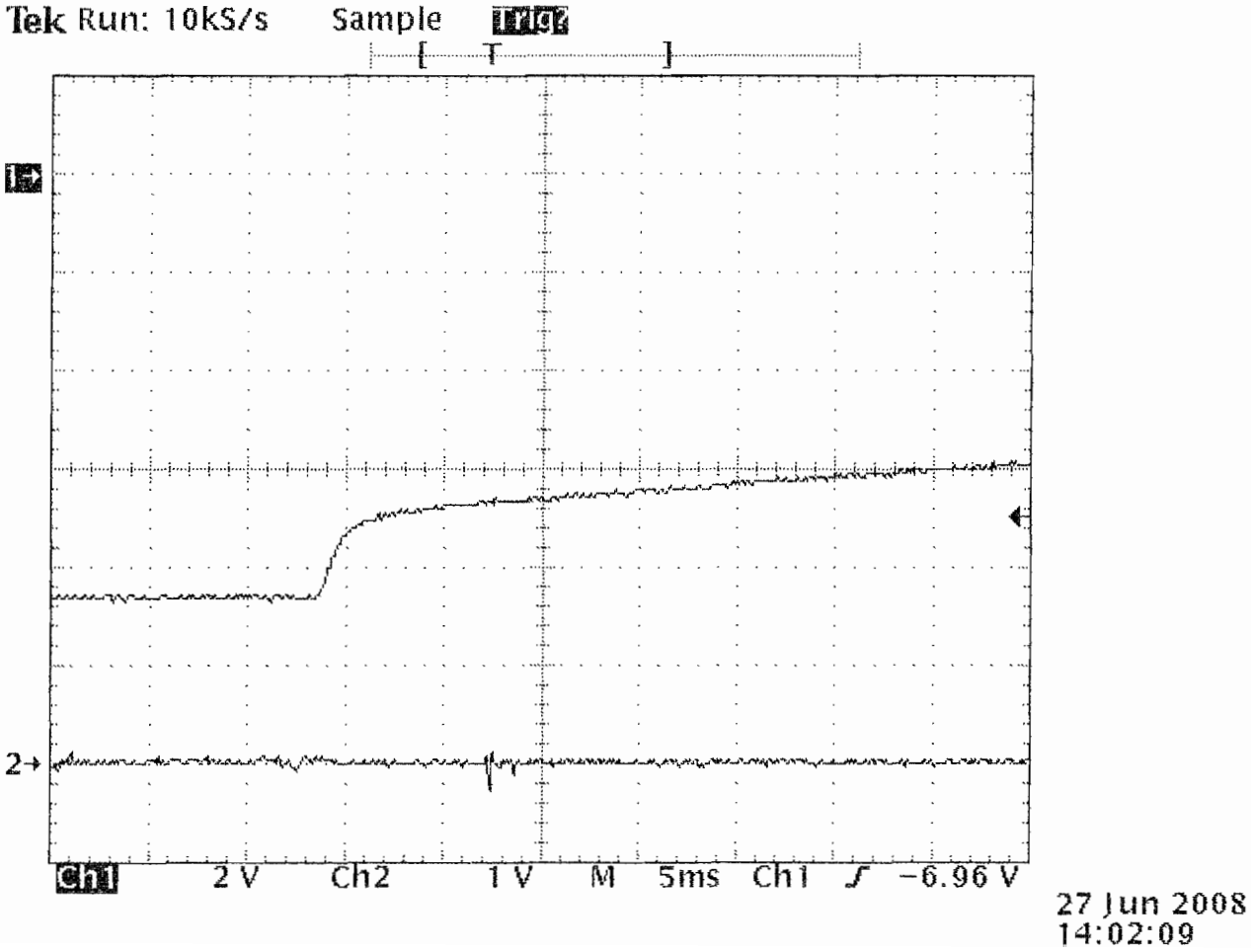
MT3200A 1390106

TURN ON LOAD



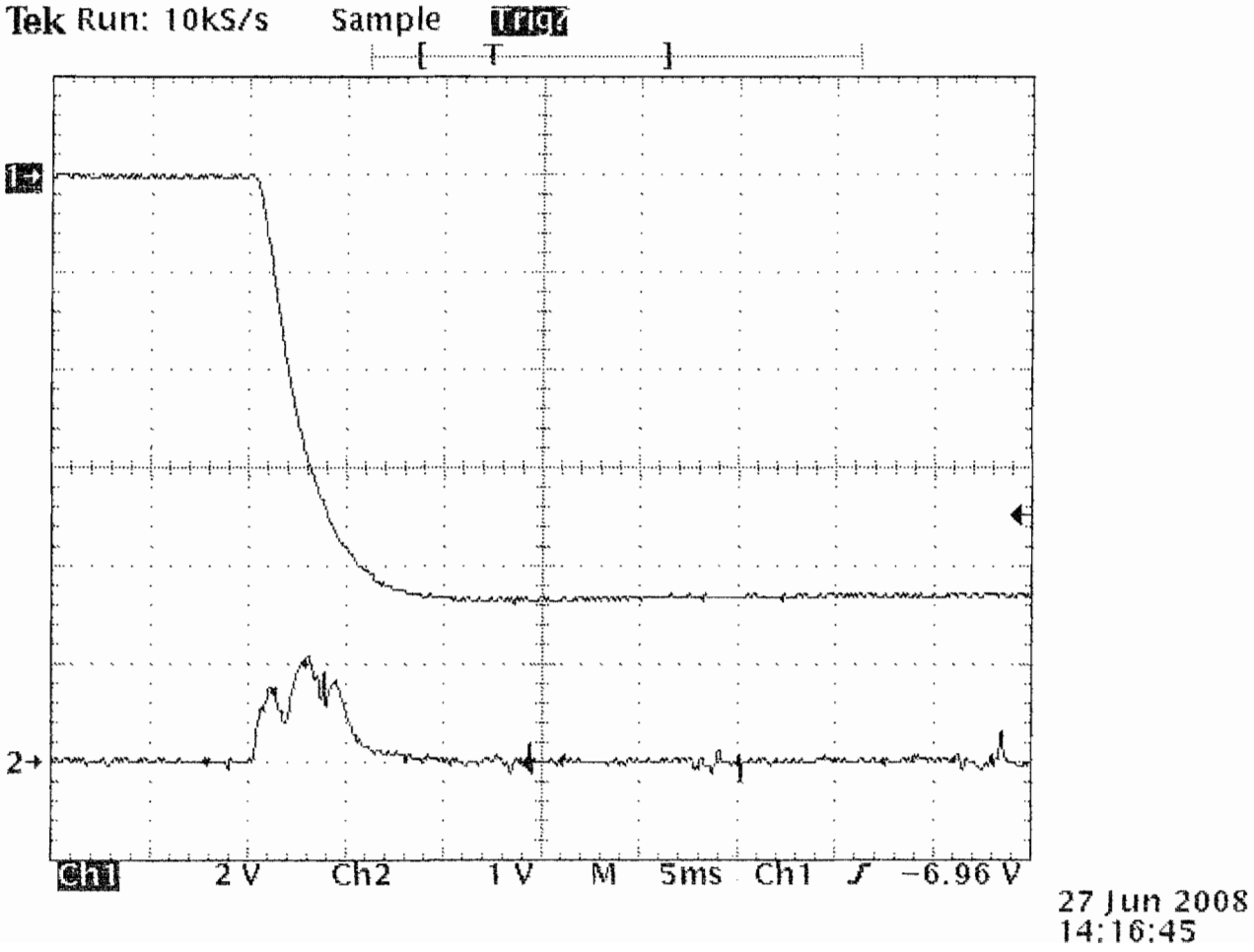
MT3200A B90106

TURN off LOAD



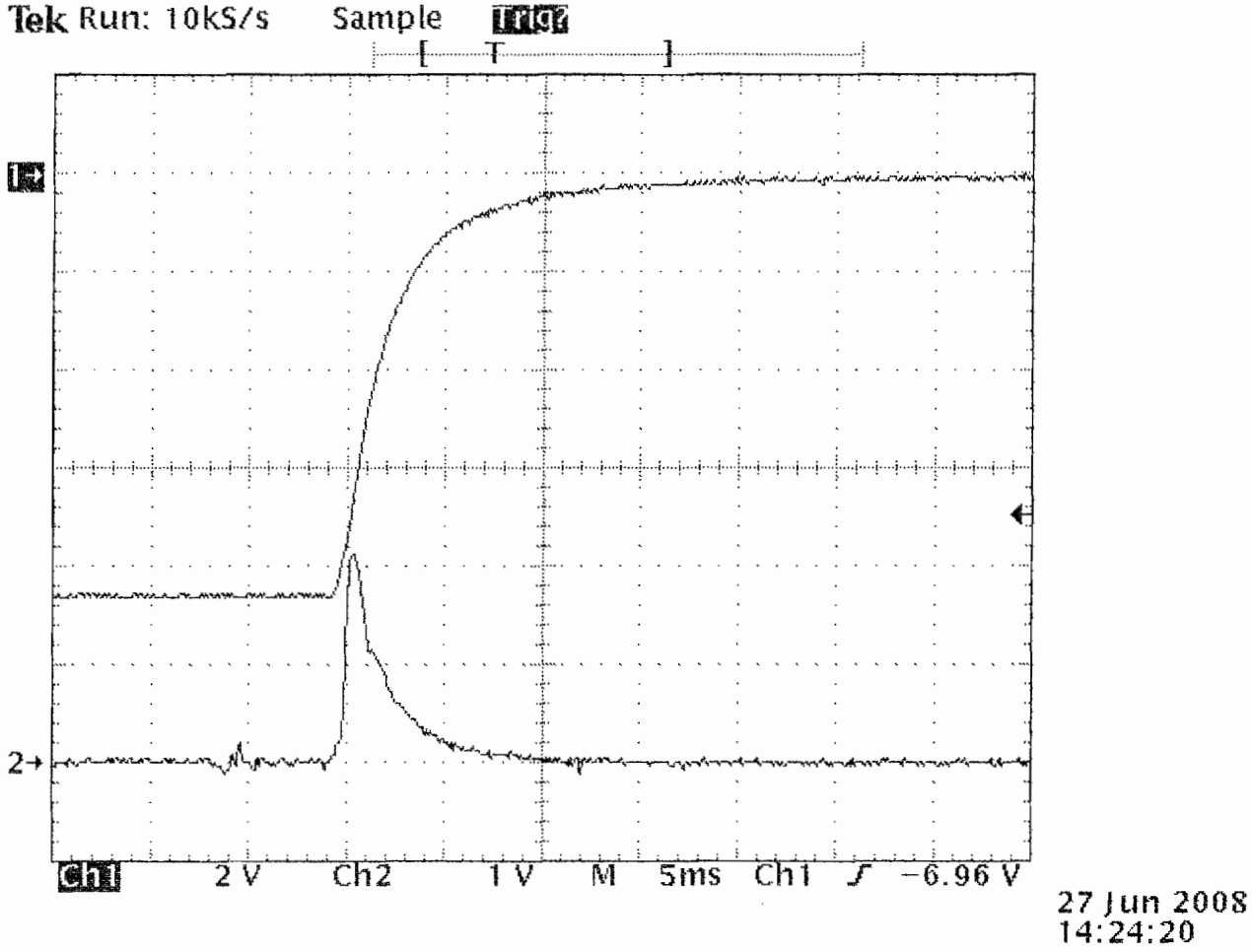
MT3200A 1390106

TURN ON TUBE



MT3200A 1390106

TURN off TUBE



ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106
System Specification #: TN3200A-1 Rev. 8/07

Tester: TY
Date: 6/27/2008
Time: 4:20 PM
Job Number: 20153
Rated Power: 360 Watts

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF PLUG-IN	N/A	N/A	N/A
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
RF POWER SENSORS (CH B)	AGILENT E4412A	01393	11/05/09
RF POWER SENSORS	HP 8481D	N/A	N/A
PRINTER OR PLOTTER	HPTHINKJET OR COLORPRO*	N/A	N/A
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	12/5/08
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
NETWORK ANALYZER	HP 8757D	01483	11/08/09
RF DETECTOR	85025B	01481	11/08/09
SSA**	MCL	N/A	N/A
COAX DIRECTIONAL COUPLER	27C1771	899004	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106
System Specification #: TN3200A-1 Rev. 8/07
Q.A. Approval:
Q.A. Date: JUL 11 2008

Tester: TY
Date: 6/27/2008
Time: 4:20 PM
Job Number: 20153
Rated Power: 360 Watts

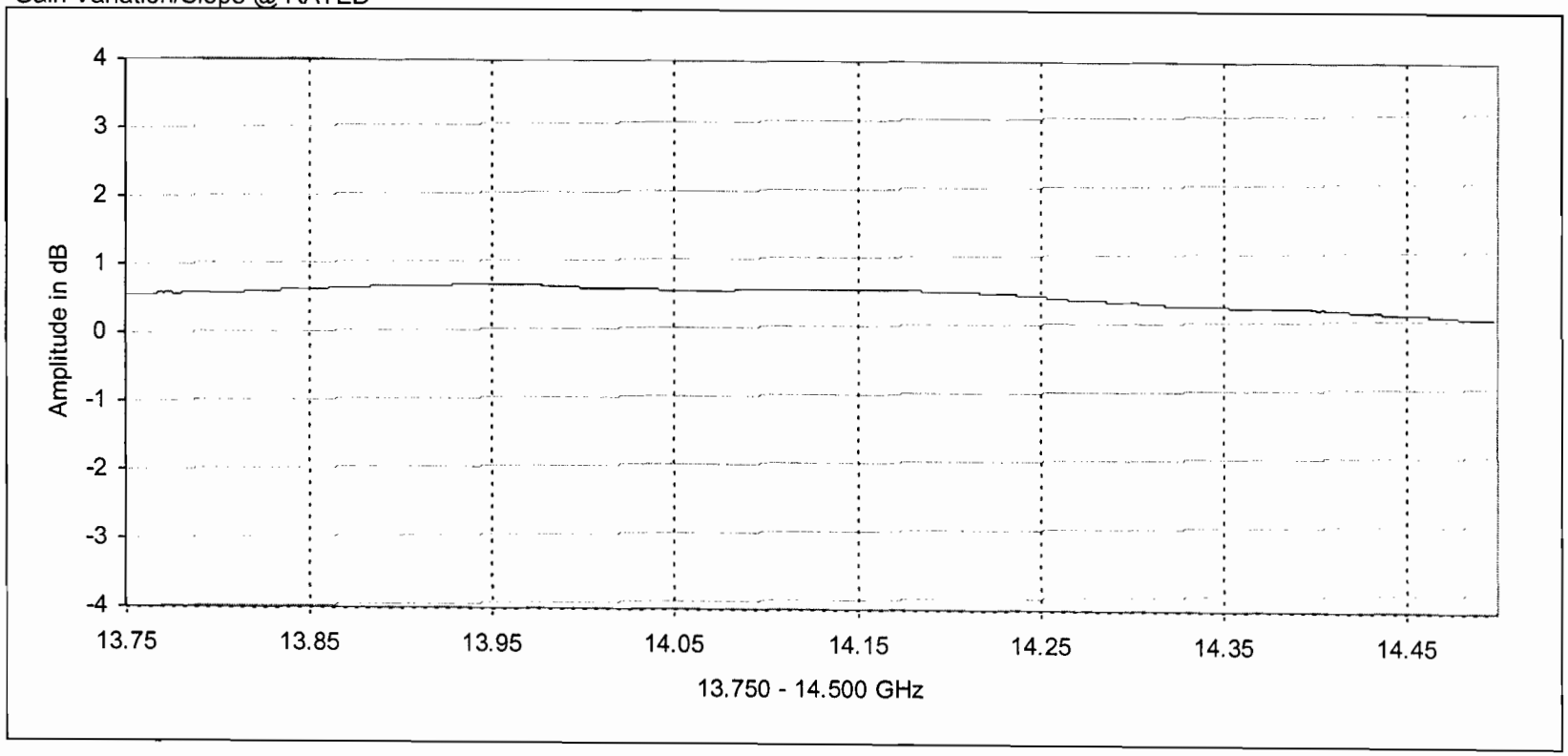
Rated Power Gain Measurement					
Frequency	Input Power	Output Power	Output Power	Gain	Sample Port
13.750GHz	-19.61dBm	56.00dBm	398W	75.61dB	46.71dB
13.800GHz	-19.61dBm	56.01dBm	399W	75.62dB	46.69dB
13.900GHz	-19.61dBm	56.06dBm	404W	75.67dB	46.67dB
14.000GHz	-19.61dBm	56.02dBm	400W	75.63dB	46.62dB
14.100GHz	-19.61dBm	56.14dBm	411W	75.74dB	46.76dB
14.200GHz	-19.61dBm	56.13dBm	411W	75.74dB	46.72dB
14.300GHz	-19.61dBm	56.05dBm	403W	75.66dB	46.66dB
14.400GHz	-19.61dBm	55.83dBm	382W	75.43dB	46.45dB
14.500GHz	-19.61dBm	55.60dBm	363W	75.21dB	46.37dB

Small Signal Gain Measurement				
Input Power	Test	Spec. Limit	Measured Gain	Pass/Fail
-33.97dBm	Gain@-10dB	86.00dB Max.	80.17dB	Pass

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106
System Specification #: TN3200A-1 Rev. 8/07

Tester: TY
Date: 6/27/2008
Time: 4:20 PM
Job Number: 20153
Rated Power: 360 Watts

Gain Variation/Slope @ RATED



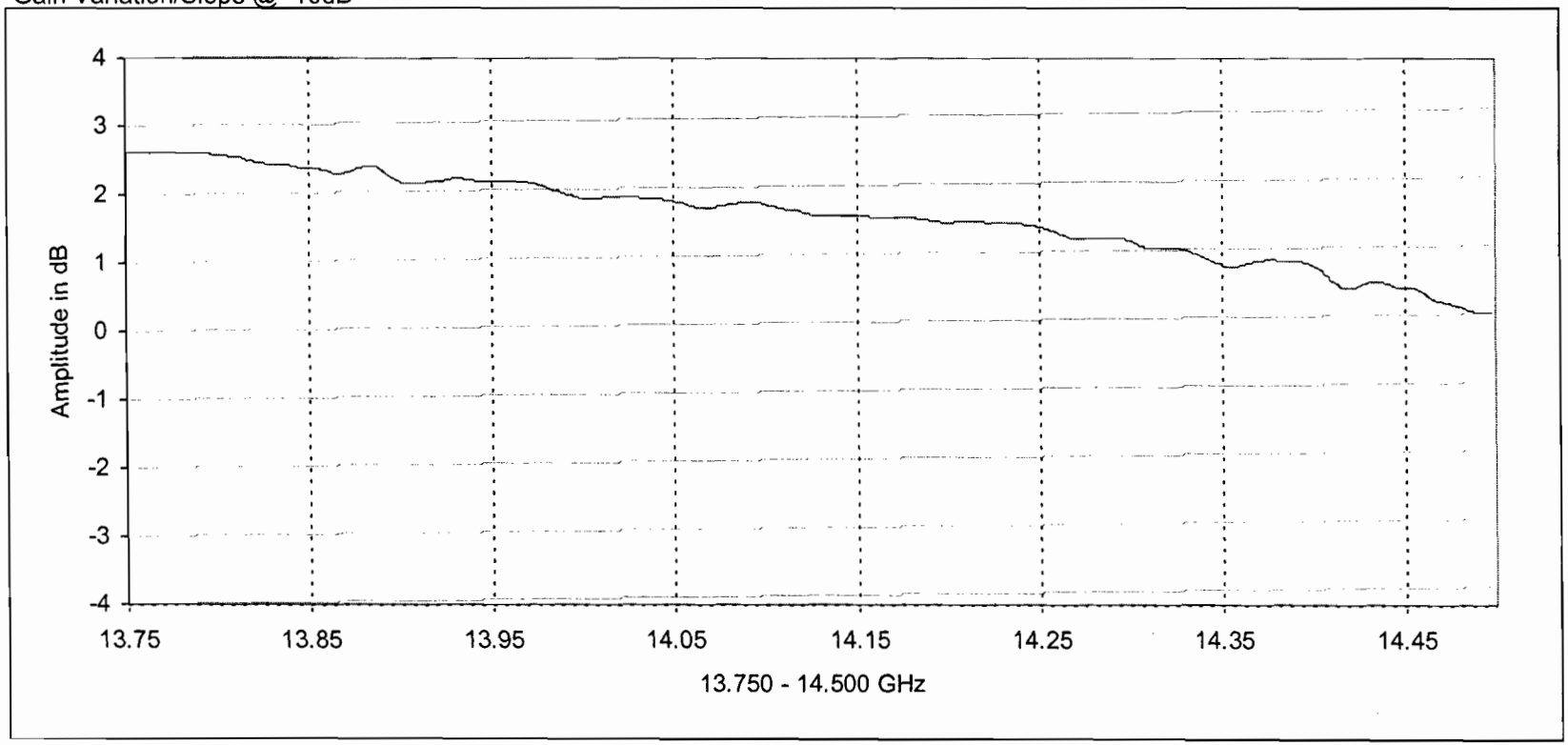
Gain Variation 80MHz	
Lower	14.229GHz
Upper	14.309GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***0.6dB/500MHz***	2.5dB/500MHz	Pass
Gain Variation	***0.2dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0031dB/MHz***	0.0400dB/MHz	Pass

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106
System Specification #: TN3200A-1 Rev. 8/07

Tester: TY
Date: 6/27/2008
Time: 4:20 PM
Job Number: 20153
Rated Power: 360 Watts

Gain Variation/Slope @ -10dB



Gain Variation 80MHz	
Lower	14.395GHz
Upper	14.476GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***1.9dB/500MHz***	2.5dB/500MHz	Pass
Gain Variation	***0.6dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0204dB/MHz***	0.0400dB/MHz	Pass

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106

Tester: TY
Date: 6/27/2008
Time: 4:34 PM
Job Number: 20153

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	12/5/08
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A
RF SPECTRUM ANALYZER	AGILENT 8564EC	1341	01/09

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106

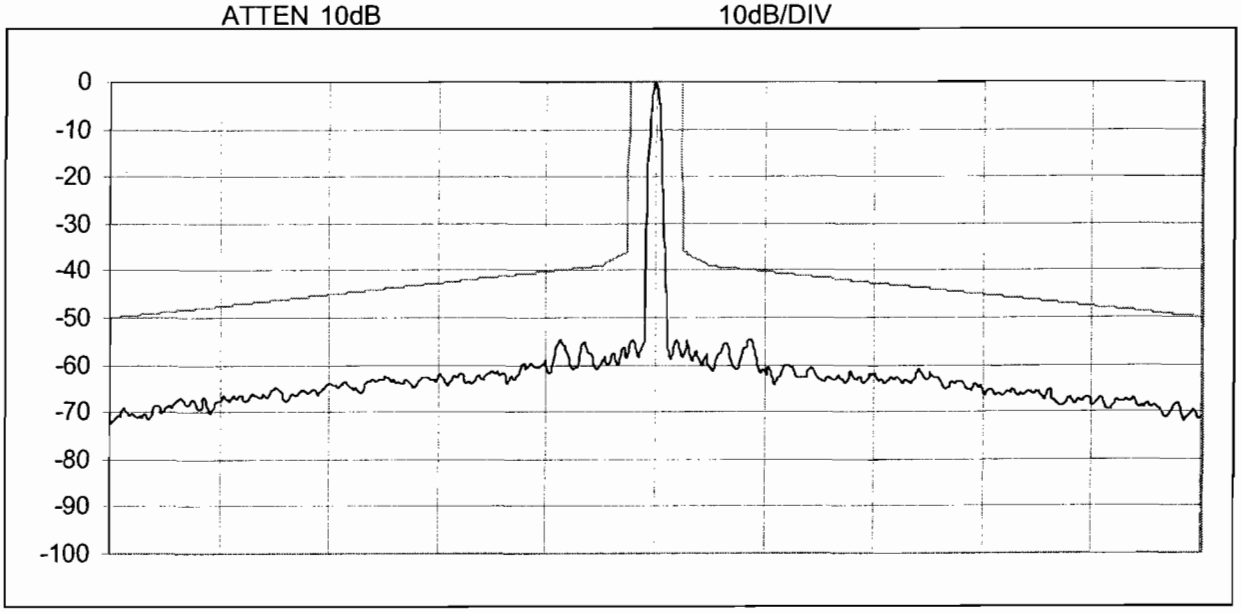
Tester: TY
Date: 6/27/2008
Time: 4:34 PM
Job Number: 20153

STP Para	Test Description	Specification MAX. Limits	***Measured Data***	Pass/Fail
3.1	Rated power of DUT	Rated	***360 Watts***	Pass
	Noise Level/ Hz			
4.4	100 Hz to 1 kHz	-50 dBc @ 100 Hz	***-66 dBc @ 100 Hz***	Pass
	-60 dBc @ 1 kHz	-60 dBc @ 1 kHz	***-78 dBc @ 1.0 kHz***	Pass
4.8	1 kHz to 25 kHz	-60 dBc @ 1 kHz	***-74 dBc @ 1.0 kHz***	Pass
	-85 dBc @ 25 kHz	-85 dBc @ 25 kHz	***-105 dBc @ 25.0 kHz***	Pass
4.12	25 kHz to 100 kHz	-85 dBc @ 25 kHz	***-104 dBc @ 25.0 kHz***	Pass
	-90 dBc @ 100 kHz	-90 dBc @ 100 kHz	***-106 dBc @ 100.0 kHz***	Pass
4.16	100 kHz to 2.5 MHz	-90 dBc	***-100 dBc @ 100.0 kHz***	Pass
4.2	2 MHz to 9.9 MHz	-90 dBc	***-122 dBc @ 2.0 MHz***	Pass
4.24	9 MHz to 20 MHz	-90 dBc	***-121 dBc @ 9.0 MHz***	Pass
	Spur Level			
4.5	50/60Hz	-36 dBc	***-55 dBc @ 60 Hz***	Pass
	100 Hz to 1 kHz	-39 dBc	***-55 dBc @ 177 Hz***	Pass
4.9	1 kHz to 25 kHz	-50 dBc	***-59 dBc @ 1.0 kHz***	Pass
4.13	25 kHz to 100 kHz	-60 dBc	***-71 dBc @ 75.3 kHz***	Pass
4.17	100 kHz to 2.5 MHz	-60 dBc	***-65 dBc @ 116.6 kHz***	Pass
4.21	2 MHz to 9.9 MHz	-70 dBc	***-78 dBc @ 4.9 MHz***	Pass
4.25	9 MHz to 25 MHz	-70 dBc	***-74 dBc @ 11.5 MHz***	Pass
4.26	Integrated sum of spurs	-42 dBc	***-53 dBc***	Pass
	4.5, 4.9, 4.13, 4.17, 4.21, 4			

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106

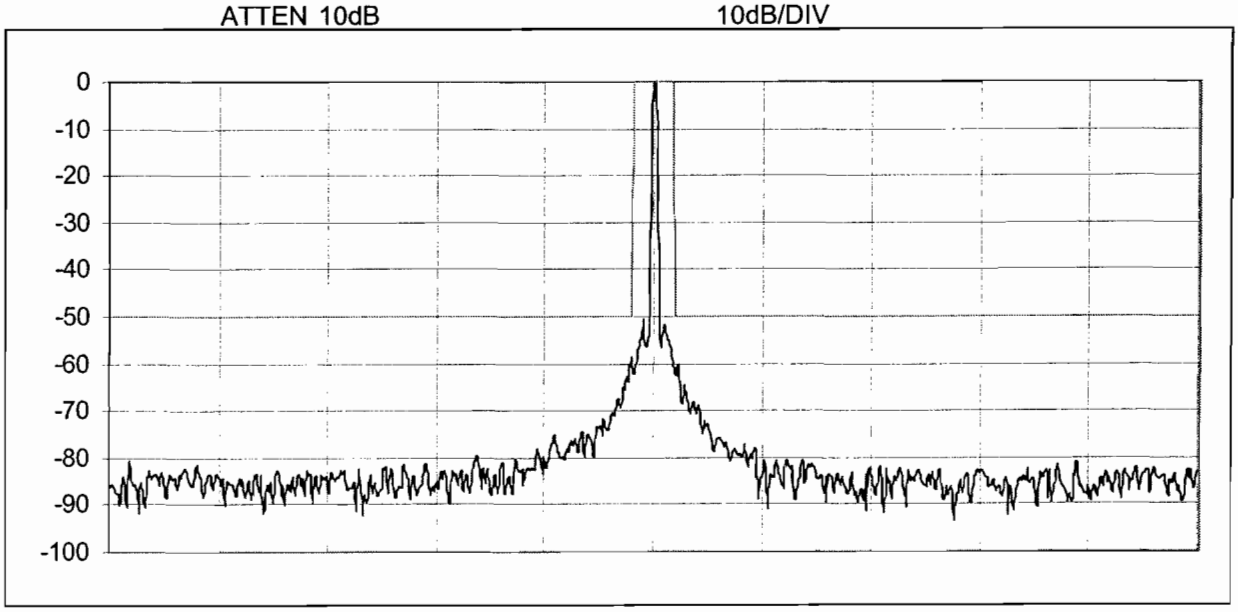
Tester: TY
Date: 6/27/2008
Time: 4:34 PM
Job Number: 20153

STP Para. 4.5



Center Frequency 14.099 GHz
RBW 10 Hz
Span 2.000 kHz
VBW 1 Hz
Sweep 3.78sec

STP Para. 4.9

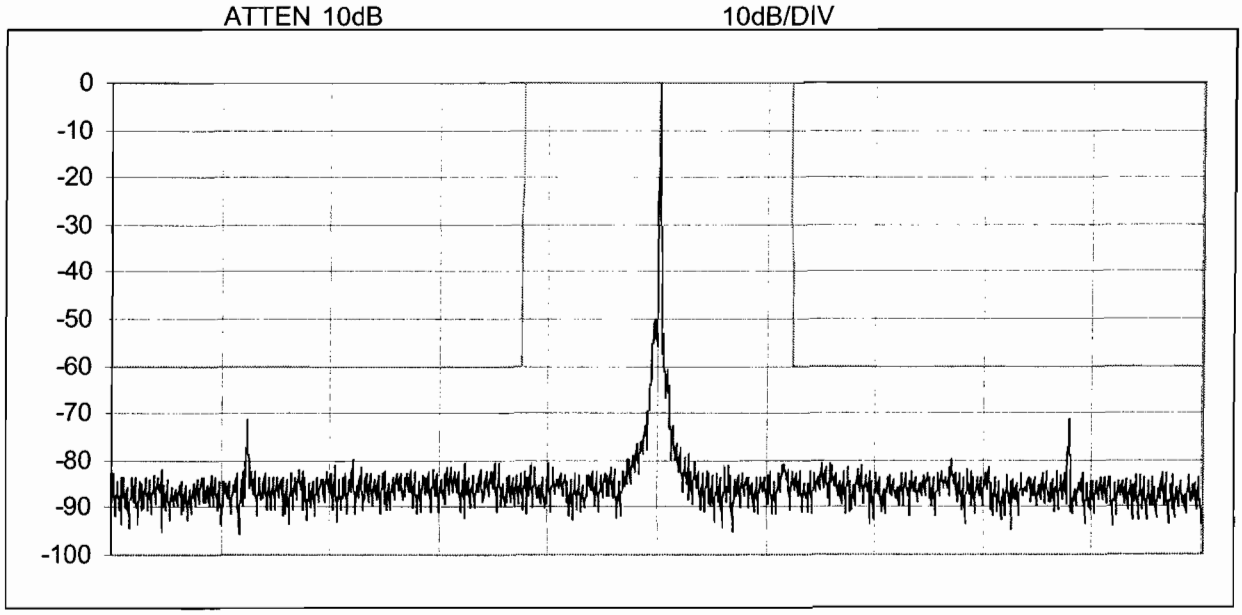


Center Frequency 14.099 GHz
RBW 100 Hz
Span 50.000 kHz
VBW 10 Hz
Sweep 20.00sec

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106

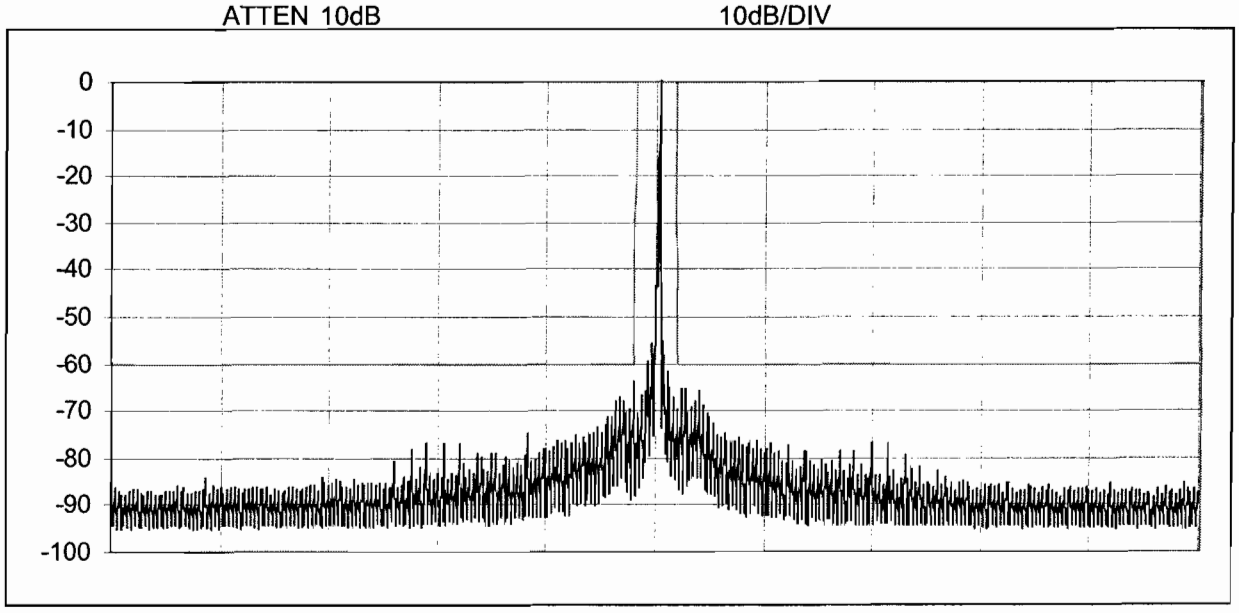
Tester: TY
Date: 6/27/2008
Time: 4:34 PM
Job Number: 20153

STP Para. 4.13



Center Frequency 14.099 GHz
RBW 100 Hz
Span 200.000 kHz
VBW 10 Hz
Sweep 80.00sec

STP Para. 4.17

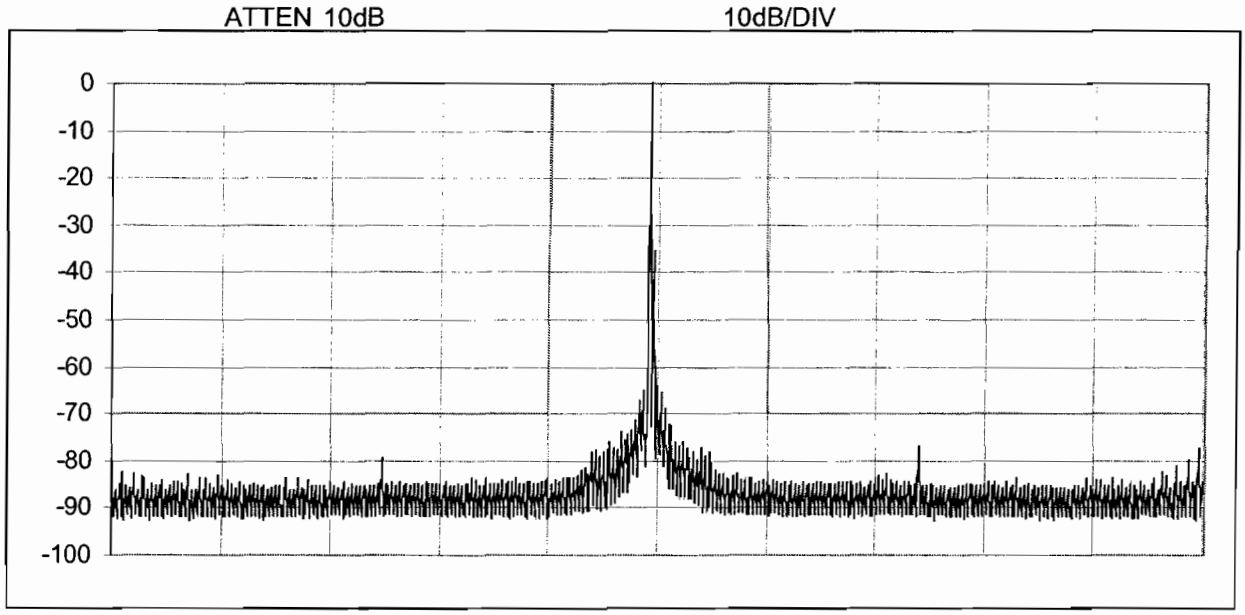


Center Frequency 14.099 GHz
RBW 1.0 kHz
Span 5.000 MHz
VBW 300 Hz
Sweep 42.00sec

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390106

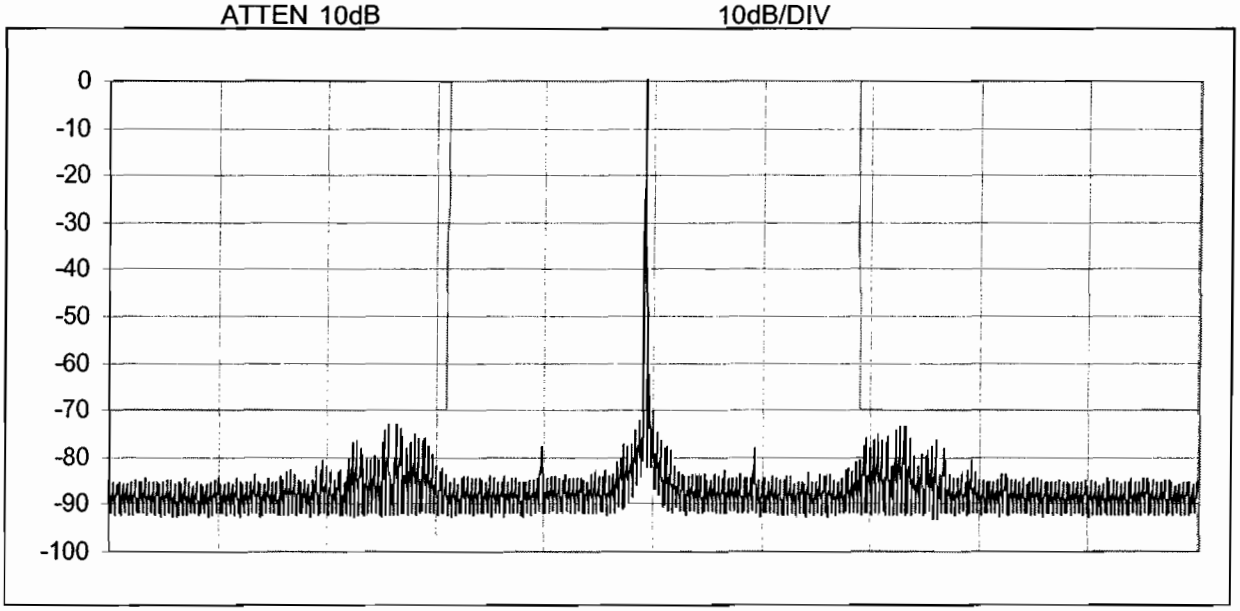
Tester: TY
Date: 6/27/2008
Time: 4:34 PM
Job Number: 20153

STP Para. 4.21



Center Frequency 14.099 GHz
RBW 3.0 kHz
Span 20.000 MHz
VBW 300 Hz
Sweep 56.00sec

STP Para. 4.25



Center Frequency 14.099 GHz
RBW 3.0 kHz
Span 50.000 MHz
VBW 300 Hz
Sweep 140.00sec

Table 2 - Manufacturing TWTA Burn-in Log

Model Number MT3200A Serial Number 1390106 ATP Number 34A2746 Job Number 20153 Date 6/27/08

Burn-in Step	DC Tests Complete	8 Hour Burn-In (Optional)	RF Tests Complete	Start Final Burn-In @+50°C	Stop Final Burn-In @+50°C	Optional RF TEST	Optional	Final Checkout
Date	6-27-08		6-27-08	6-27-08	6/30/08	7-14-08		7-14-08
Time	1430		1645	1700	0715	1445		1445
Helix V (Cath V)	8.60KV		8.60KV	8.60KV	8.60KV	8.60KV		8.60KV
Helix I	1.1mA		1.8mA	1.1mA	0.9mA	1.7mA		1.7mA
Fil I	1.05A		1.05A	1.05A	1.05A	1.05A		1.05A
TWT Temp	46°C		50°C	40°C	83°C	52°C		52°C
PS Temp	39°C		39°C	35°C	65°C	40°C		40°C
Input Power	—		-20dBm	—	NA	-12.6dBm		-12.6dBm
Tube Drive Power	∅		2.8dBm	∅	~~0~~	2.0mW		2.0mW
Output Power	∅		55.6dBm	∅	~~0~~	314W		314W
Reflected Power	∅		8dBm	∅	~~0~~	1CW		1W
Frequency (GHz)	—		14.1	—	NA	14.1		14.1
Filament ET Hrs.	.7		2.6	2.9	64.9	150.8		150.8
Beam ET Hrs.	.2		1.4	1.5	63.6	133.8		133.8
Transmit Count	18		30	31	31	48		48
						MT32PCA		
Initials	TY		TY	TY	LORI	TY		TY

TOTAL BURN IN HOURS 133 Q.A. _____

NOTE Final checkout must be done with RF applied and the meter readings noted.

JUL 11 2008

THALES ELECTRON DEVICES	PV D'ESSAIS D'ACCEPTATION ACCEPTANCE TEST DATA SHEET TH 3976 Date : **21/04/08** N° : **652_128**	CA 3976 vers. B 4065506 indice E Date : 04/26/04 Page : 1/2

GENERAL TESTS CONDITIONS AND ACCEPTANCE TESTS

ACCEPTANCE TEST BENCH IDENTIFICATION : 4067122 ATP REFERENCE : 4067111

PARAMETERS		SYMBOL	UNIT	OPERATING RANGE		
				MIN	MEASURED VALUES	MAX
HEATER VOLTAGE		Vf	V	6.2	**6.3**	6.4
HEATER CURRENT		If	A	0.9	**1.1**	1.4
HELIX VOLTAGE		Vh	KV	8.2	**8.60**	9
HELIX CURRENT		Ih	mA	-	**1.3**	8
COLLECTOR 1 VOLTAGE		Vcol 1	% Vh	48	**50**	51
COLLECTOR 1 CURRENT	Without RF	Icol 1	mA	3	**7**	-
	With RF	Icol 1	mA	-	**151**	180
COLLECTOR 2 VOLTAGE		Vcol 2	% Vh	30	**32**	33
COLLECTOR 2 CURRENT	Without RF	Icol 2	mA	-	**278**	290
	With RF	Icol 2	mA	90	**130**	-
CATHODE CURRENT		Ik	mA	-	**286**	300
FREQUENCY RANGE		F	GHz	13.75	**-**	14.5
RF DRIVE POWER		Pe	dBm	-	**5.9**	6
OUTPUT POWER FOR Pe = Vn		Ps	W	400	**418** **441**	500
OUTPUT VARIATION (Pe = constant)	Any 500 Mhz band	Δ Ps	dB	-	**0.2**	1
	Any 80 MHz band	Δ Ps	dB	-	**0.1**	0.4
SMALL SIGNAL GAIN (Ps ≤ 40 W)		G	dB	-	**56.2**	65
SMALL SIGNAL GAIN VARIATION (Ps ≤ 40 W)	Any 500 Mhz band	Δ G	dB	-	**0.7**	2
	Any 80 MHz band	Δ G	dB	-	**0.3**	0.7
GAIN SLOPE (Ps ≤ 40 W)		Δ G / Δ F	dB/MHz	-	**0.01**	0.02
THERMAL DISSIPATION NO DRIVE OR WITH RF		-	W	-	**805**	850
PRIME POWER	No drive	-	W	-	**805**	850
	With RF	-	W	-	**1025**	1200

MECHANICAL AND FINISHING INSPECTION

Date : 21 AVR. 2008

TDH HE 22

ELECTRICAL INSPECTION

Date : 21 AVR. 2008

TDH HE 22

QUALITY ASSURANCE

21 AVR. 2008

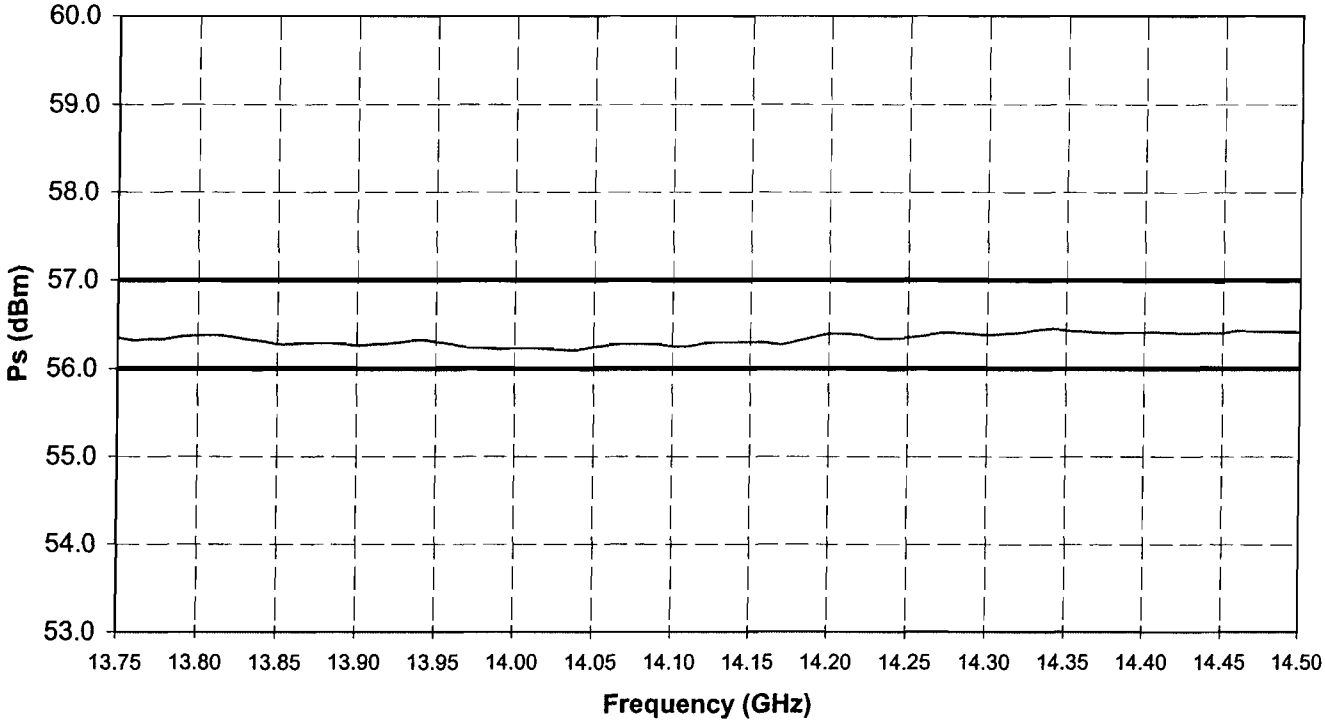
Date :

RFMS-V DQ 12

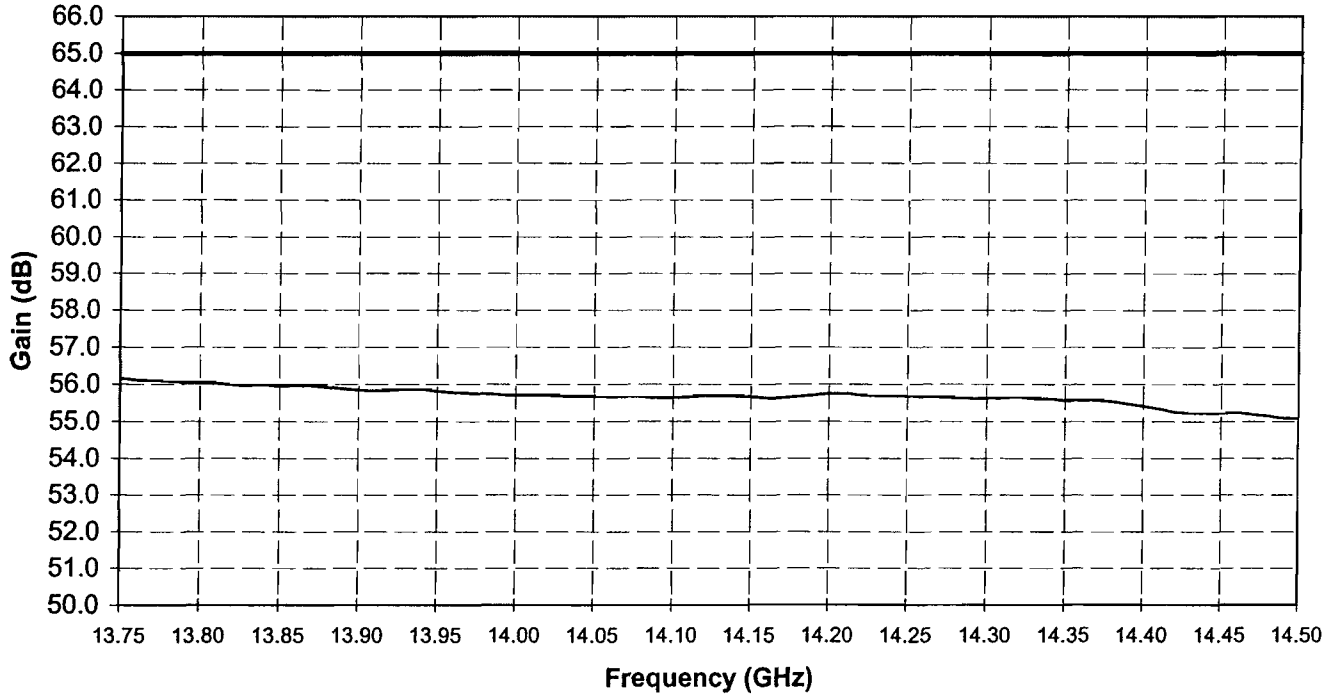
Remarks :

THALES ELECTRON DEVICES	PV D'ESSAIS D'ACCEPTATION ACCEPTANCE TEST DATA SHEET TH 3976 Date : **21/04/08** N° : **652_128**	CA 3976 vers. B 4065506 indice E Date : 04/26/04 Page : 2/2

OUTPUT POWER



SMALL VARIATION GAIN



9.0 TEST DATA

9.1 Equipment Identification

Table 5 – Equipment Identification

JOB NUMBER	20153
MODEL NUMBER	MT3200A
SERIAL NUMBER	1390105
FREQUENCY BAND (C, KU, OR KU-DBS)	KU
TUBE MANF. PART NUMBER	TH 3976
TUBE MANUFACTURER	THALES
TUBE MCL TAB NUMBER	27D3785-001
TUBE SERIAL NUMBER	652-135
SSA MANUFACTURER	ALC
SSA MCL TAB NUMBER	27C3325
SSA SERIAL NUMBER	0676
OPTIONAL LINEARIZER MANUFACTURER	N/A
OPTIONAL LINEARIZER MCL NUMBER	N/A
OPTIONAL LINEARIZER SERIAL NUMBER	N/A
TESTER	B.S.
DATE	6-25-08
Q.A.	
DATE	JUL 11 2008

9.2 Test Equipment

Table 6 - Test Equipment

ITEM NO.	QTY	DESCRIPTION	MANUFACTURER & MODEL NUMBER	SERIAL NUMBER
1	2	Digital Volt Meter	Fluke 25	H0100449
2	1	Storage Oscilloscope	Tektronix 2221*	H103201
3	2	1000:1 Scope Probe (HV)	Ross VMP30-GH-WA-AL	051028-19
4	1	Filament Load	3.5 ohm 20W Precision	N/A
5	1	MT3200A Resistive High Voltage Load	MCL	N/A
6	1	10:1 Scope Probe	Tektronix P6109*	N/A
7	1	Precision Digital Voltmeter	Fluke 8062A or Tektronix 34401A	N/A
8	1	Power Meter	HP438A w/8481A	01488
9	1	RF Sweep Generator with Plug-In	HP 8350B HP 83592A	01461
10	1	Misc. Variable Attenuators	VAR*	N/A
11	1	Think-Jet Printer	HP 2225A	N/A
12	1	SMA 3 dB Power Splitter	27C1987*	N/A
13	1	Clamp-on Current Meter	Bell #GC-100D	Q02980
14	1	1kW Calibrated Coupler & Dummy Load	WR 75	052
15	1	PC with Diagnostic Program and Communications Program	45A0189 & 45A0163	N/A
16	1	HiPot Break Out Box	MCL	N/A
17	1	HiPot Tester	Hipotronix HD100	Test 1
* Or equivalent				

9.3 Data Sheets

Table 7 - Test Data

ATP PARA	TEST	LIMITS	DATA	REMARKS
1.2	Preliminary Requirements Completed	YES	✓ Check	
2.1	AC Input Voltage	120-240V	208 V	
2.2	HV Load, Break-out, & Divider	YES	✓ Check	
2.3	Parallel Interface Test Fixture	YES	✓ Check	
2.4	Interlock Switch is in Fault Position	YES	✓ Check	
2.5	RF Terminated	YES	✓ Check	
2.7	Switchover Configuration C161101 TAB# D161104 TAB#		-100 -100	
3.1.2	Ground Continuity	< 0.1 Ohm	.003 Ohm	
3.2.6	Dielectric Strength HiPot Test	1900VDC	✓ Pass	
3.2.7	Dielectric Leakage Current	< 2 µA	1 µA	
3.3	Initial Power Up VFD & LEDs SWOV +15V LEDs Local LED Filament Off B1 B2 B3 +5VDC +15VDC -15VDC HV stays OFF	 ON ON Illuminated Illuminated Full Speed Full Speed Full Speed 4.90 - 5.20 V ±1.0 V ±1.0 V 0V	 ✓ Check ✓ Check ✓ Check ✓ Check ✓ Check ✓ Check ✓ Check +5.21 VDC +14.79 VDC -14.86 VDC ✓ Passed	
3.4	Set Time & Date & Serial Number	N/A	✓ Check	
3.5	Chassis Interlock Fault SWOV Fault User Sum Fault Reset	YES YES YES YES	✓ Check ✓ Check ✓ Check ✓ Check	
3.6	RF Deck Interlock Fault	YES	✓ Check	
3.7	Blower Alarms B1 B2 B3	 YES YES YES	 ✓ Check ✓ Check ✓ Check	after 60 seconds
3.8	User Interlock Fault	YES	✓ Check	

ATP PARA	TEST	LIMITS	DATA	REMARKS
3.9	W.G. Pressure Fault	YES	✓ Check	
3.10	User RF Off			
	RF On LED	Illuminated	✓ Check	
	RF Off LED	Illuminated	✓ Check	
3.11	Exciter Alarm	YES	✓ Check	
	Switchover Fault LED	Illuminated	✓ Check	
3.12	Switchover RF Off			
	RF On LED	Illuminated	✓ Check	
	RF Off LED	Illuminated	✓ Check	
3.13	Switchover RF Switch positions			
	Antenna LED	Illuminated	✓ Check	
	Load LED	Illuminated	✓ Check	
	Antenna button	YES	✓ Check	
	Load button	YES	✓ Check	
3.14	Switchover 2nd HPA fault			
	Event Log	YES	✓ Check	
	No Sum Fault	YES	✓ Check	
3.15	Switchover RF Low Switching	YES	✓ Check	
3.16	Switchover Auto Switching			N/A for D161104 -200 -300
	Front Panel Auto LED	Illuminated	✓ Check	
	Test Fixture Auto LED	Illuminated	✓ Check	
	Auto button	YES	✓ Check	
3.17	Fault Log			
	Chassis Interlock	YES	✓ Check	
	User Interlock	YES	✓ Check	
	W.G. Pressure	YES	✓ Check	
3.18	Power Supply Temperature Alarm	YES	✓ Check	
	Level	80°C	✓ Check	
3.19	Power Supply Temperature Fault	Yes	NA Check	
		85°C	NA Check	
3.21	Tube Temperature Fault	Yes	✓ Check	
	Single Band Level	110°C	✓ Check	
	Dual Band Level	115°C	NA Check	
3.22.1	Filament Under Current	0.5A	.5 A	
3.22.2	Tube Data Sheet Filament			
	Voltage	5.6 – 6.4	6.3 V	
	Run Current	< 1.8 A	1.2 A	

ATP PARA	TEST	LIMITS	DATA	REMARKS
3.22.3	Filament On Standby LED Delay LED Filament Off LED	 Flashing Illuminated Illuminated	 ✓ Check ✓ Check ✓ Check	
3.22.4	Filament Voltage Adjustment	±0.02 V	6.3 V	
3.22.5	Filament Current Meter HPA Meter Clamp-on meter Meter Error	 N/A N/A ±10%	 1.71 A 1.7 A 1.0 %	
	4.0 BAND SETUP The following Data must be filled in for each band and sub-band calibrated in the HPA.			
4.1.1	**Band Parameters** **Config/RF** Number of Bands Number of Sub-bands		 1 -Band 1 Sub Bands	
4.1.2	Band Designation Band User Description		Ku	
4.1.3	Linearizer Type		NA Check	
4.1.4	Auto Power Maximum	HPA Rated	55.6 dBm	
4.1.5	Input Stage Type		✓ Check	
4.1.6	Attenuation		✓ Check	
4.1.7	HPA Gain Type		✓ Check	
4.1.8	Temp. Comp	Enabled	✓ Check	
4.2	Still have a Chassis Interlock Fault	YES	✓ Check	
4.2.1.2	Tube Data Sheet Helix Voltage Helix Run Current Collector #1 Voltage Collector #2 Voltage (If Required) Anode Voltage	 8.0 – 12.5 kV < 12mA <10mA Dual Band	 8.75 kV 1.4 mA 4.375 kV 2.80 kV NA kV	
4.2.1.3	Trip Level Adjustments Configuration/Power Supply Helix Run Current Helix Surge Current	 N/A Tube Spec mA Tube Spec mA	 10 mA 80 mA	

ATP PARA	TEST	LIMITS	DATA	REMARKS
4.2.1.4	Standby Clear all faults 180 Filament Delay No High Voltage End Filament Delay	 YES YES YES YES	 ✓ Check ✓ Check ✓ Check ✓ Check	
4.2.1.5	Transmit (HV) On Configuration/Power Supply Output = data sheet Actual Cathode Voltage Helix Voltage Set Point Cathode Meter Offset Used Cathode Setpoint Offset Used Helix Voltage HPA Meter	 YES 8.0-14.0kV ±0.2kV ±KV ±KV ±20VDC	 ✓ Check 8.75 kV 8.80 kV -10 kV -40 kV 8.75 kV	
4.2.1.6	Collector Voltages, On the Load Coll #1 wrt to Cathode Coll #2 wrt to Cathode		 4.35 kV 2.77 kV	
4.2.1.7	Helix Current Meter Measured HPA Meter Error	 ±2%	 2.1 mA 2.1 mA 0 %	
4.2.2	Proportional Delay t_{off} + 6 seconds	+/- 2 seconds	✓ Passed	
4.2.3	Cathode-Helix Turn-On Time	< 10mS	5 mS	
4.2.4	Short Circuit Test		✓ Passed	
4.2.5	Helix Run Current Fault		✓ Check	
4.2.6	Helix Surge Current Fault		✓ Check	
4.2.7.3	Filament Volt Adjustment on the Tube	Tube data	6.3 V	
4.2.7.6	Cathode Turn-On, On the Tube On time No Overshoot Surge Current	 < 10ms YES ≤ 80mA,C,Ku, dBs, X	 5 ms ✓ Passed 60 mA	Plot attached
4.2.7.7	Helix Voltage HPA Met Helix Run Current	 Computer Port	 8.75 kV 1.0 mA	Fil I = 1.10A
4.2.7.8	Collector Voltages, On the Tube Coll #1 wrt to Cathode Coll #2 wrt to Cathode (If Required) Anode WRT Cathode	 ±0.05KV	 4.34 kV 2.75 kV NA kV	
	5.0 RF SET UP AND VERIFICATION			
5.0	Set Up			

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Bands		____ GHz	
	Sub-Band		N/A GHz	
	Data Sheet Copies of next 2 pages		NA Check	
	PAD & Operating Band of HPA			
	Low end of band		13.75 GHz	
5.1	High end of band		14.50 GHz	
	PAD part number		NA	
	PAD value	≤ 6dB	NA dB	
	Tube Drive Meter Calibration	Trimpot	3300	
	Center Frequency	Trimpot word	14.16 MHz	
	Full Scale			
	Full Scale – 1.5 dB			
	Full Scale – 3.0 dB			
	Full Scale – 4.5 dB			
5.2	Full Scale – 6.0 dB			
	Full Scale – 9.0 dB			
	Full Scale – 12 dB			
	Full Scale – 15 dB			
	Full Scale – 20 dB			
	Uncal alarm cleared	YES	✓ Check	
	RF Off –30dBm	±0.3dBm	✓ Passed	
	Meter accuracy @ center freq			
	Tube Overdrive Fault Verification			
	Fault level		8.0 dBm	
5.3	Alarm level		7.0 dBm	
	Alarm and Fault does occur	YES	✓ Passed	
	RF Off during fault	YES	✓ Passed	
	Attenuator Calibration			
	TB1-10 @ 0.0 dB	9.90-10.9	10.5 V	
	TB1-10 @ 32.0 dB	0.0-0.5	0.0 V	
	Attenuation Range	≥30.0dB	32 dB	
	32.0 or 30.0	≥30.0dB		
	31.0 or 29.0	±0.2		
	30.0 or 28.0	±0.2		
	25.0	±0.5		
5.4	20.0	±0.5		
	15.0	±0.5		
	10.0	±0.5		
	5.0	±0.1		
	1.5	±0.1		
	0.8	±0.1		
	0.3	±0.1		
	0.0	±0.0		

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Meter accuracy @ center freq	±0.1dB	✓ Passed	
5.5	Reflected Power Meter Calibration Full Scale (FS) (rated power – 9.5dB) FS-1.0dB FS-2.0dB FS-4.0dB FS-6.0dB FS-9.0dB FS-12.0dB FS-15.0dB FS-20.0dB FS-25.0dB Uncal alarm cleared Meter accuracy @ center freq	Trimpot Trimpot Word YES ±0.5dB	3300 46dBm ✓ Check ✓ Passed	
5.6	Reflected Power Fault Verification Fault level Alarm & Fault does occur	 YES	 46 dBm ✓ Passed	
5.7	Forward Power Meter Calibration Full Scale (FS) FS-0.7dB FS-1.5dB FS-3.0dB FS-5.0dB FS-8.0dB FS-10.0dB FS-12.0dB FS-15.0dB FS-17.0dB FS-20.0dB FS-25.0dB	Trimpot Trimpot Word	3000 55.6dBm	

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Unical alarm cleared	YES	✓ Check	
	Meter accuracy @ center freq	±.5dB	✓ Passed	
5.8	RF Switch Attenuation	≥ 43.0dB	>60 dB	
5.9	Hold Power Verification		✓ Passed	
5.10	High/Low Line Turn-On			
	Xmt & Stby @ 100V	No Faults	✓ Passed	
	Xmt & Stby @ 264V	No Faults	✓ Passed	
5.11	Computer Interface Operation			
	Protocol	CSP	✓ Check	
	Address	07	✓ Check	
	Baud rate	9600	✓ Check	
	Com TX LED		✓ Passed	
	Com RX LED		✓ Passed	
	Report Date	Status must agree	✓ Passed	
	Report Time	with local panel.	✓ Passed	
	Report block status #1		✓ Passed	
	Report block status #2		✓ Passed	
	Report event log entry		✓ Passed	
	Report fault log entry		✓ Passed	
	RF On/Off control		✓ Passed	
	Flt Counter en/disable control		✓ Passed	
	Fault Reset control		✓ Passed	
	Standby/Filament On control		✓ Passed	
	Transmit control		✓ Passed	
	RF Dec/Inc control		✓ Passed	
	Remote control		✓ Passed	
	Computer control		✓ Passed	
	Filament Off control		✓ Passed	
	Set Auto Power control		✓ Passed	
5.12	Remote Interface Operation			
	Protocol	CSP	✓ Check	
	Address	07	✓ Check	
	Baud rate	9600	✓ Check	
	Com TX LED		✓ Passed	
	Com RX LED		✓ Passed	
	Report Date	Status must agree	✓ Passed	
	Report Time	with local panel.	✓ Passed	
	Report block status #1		✓ Passed	
	Report block status #2		✓ Passed	
	Report event log entry		✓ Passed	
	Report fault log entry		✓ Passed	
	RF On/Off control		✓ Passed	

ATP PARA	TEST	LIMITS	DATA	REMARKS
	Flt Counter en/disable control		✓ Passed	
	Fault Reset control		✓ Passed	
	Standby/Filament On control		✓ Passed	
	Transmit control		✓ Passed	
	RF Dec/Inc control		✓ Passed	
	Remote control		✓ Passed	
	Computer control		✓ Passed	
	Filament Off control		✓ Passed	
	Set Auto Power control		✓ Passed	
5.13.2	Record MAC Address	MAC Address	00-20-4A-AF-21-78	
5.13.3	Verify Ethernet Operation (Optional)	--	✓ Complete	
5.14	Manual Override Operation			
	No change in override		✓ Passed	
	Attenuator no change		✓ Passed	
	Override Standby		✓ Passed	
	Override Standby LED	Yellow	✓ Passed	
	Override Transmit		✓ Passed	
	Override Xmt LED	Green	✓ Passed	
	Override Reset		✓ Passed	
	Override Fault LED	Red	✓ Passed	
	Override RF Inhibit		✓ Passed	
	Override RF Enable		✓ Passed	
	No change Normal		✓ Passed	
	Attenuator no change		✓ Passed	
	Override Delay LED	Flashing Yellow	✓ Passed	
5.15	HPA Meter Readings			
	Helix voltage	N/A	8.75k V	
	Helix current		1.7 mA	
	Filament current		1.10 A	
	Attenuation		0 dB	
	Tube Drive power		3.7 dBm	
	Forward power		55.6 dBm	
	Reflected power		9 dBm	
	Tube Temperature		53 EC	
	PS Temperature		39 °C	
	Download Status		✓ Completed	Diskette attached
	Download Settings		✓ Completed	
	Download Calibration Tables		✓ Completed	

6.0 LEVEL A – STANDARD RF TESTS

Be sure each plot or printout is marked with the HPA model number, serial number, test procedure number, paragraph number, and the measurement of the parameter is clearly marked.

ATP PARA	TEST	LIMITS	DATA	REMARKS
6.1	STP Burn-In	N/A	✓ Completed	34A2268 data attached
6.2	Optional Linearizer Adjustment Phase Voltage Mag Voltage	 N/A N/A	 N/A V V	
6.3	STP Intermodulation		NA Completed	If a Linearizer and/or peak power TWT is installed, the intermodulation procedure must be performed.
6.4	STP Gain & Power Output Coupling Factors Enterd		✓ Completed ✓ Completed	34A2272 data attached
6.5	STP Spectral Purity	N/A	✓ Completed	34A2304 data attached
6.6	Fault Counter Fault Counter Enabled Window Number	 True 30 Seconds 3	 ✓ Complete ✓ Complete ✓ Complete	

7.0 LEVEL B – SPECIAL PRODUCTION TESTS

Be sure each plot or printout is marked with the HPA model number, serial number, test procedure number, paragraph number, and the measurement of the parameter is clearly marked.

These tests are special production tests performed only when ordered by purchase order.			N/A Level B Tests Are Ordered	
7.1	STP Gain Stability vs. Time		____Completed	34A2273 data attached
7.2	Output Power Stability vs. AC Line 100V 208V 240V 264V Total Change		 _____V _____V _____V _____V _____V	 _____dB _____dB _____dB _____dB _____dB
7.3	STP Noise Power Output		____Completed	34A2284 data attached
7.4	STP Harmonics		____Completed	34A2295 data attached
7.5	STP Input/Output VSWR		____Completed	34A2267 data attached

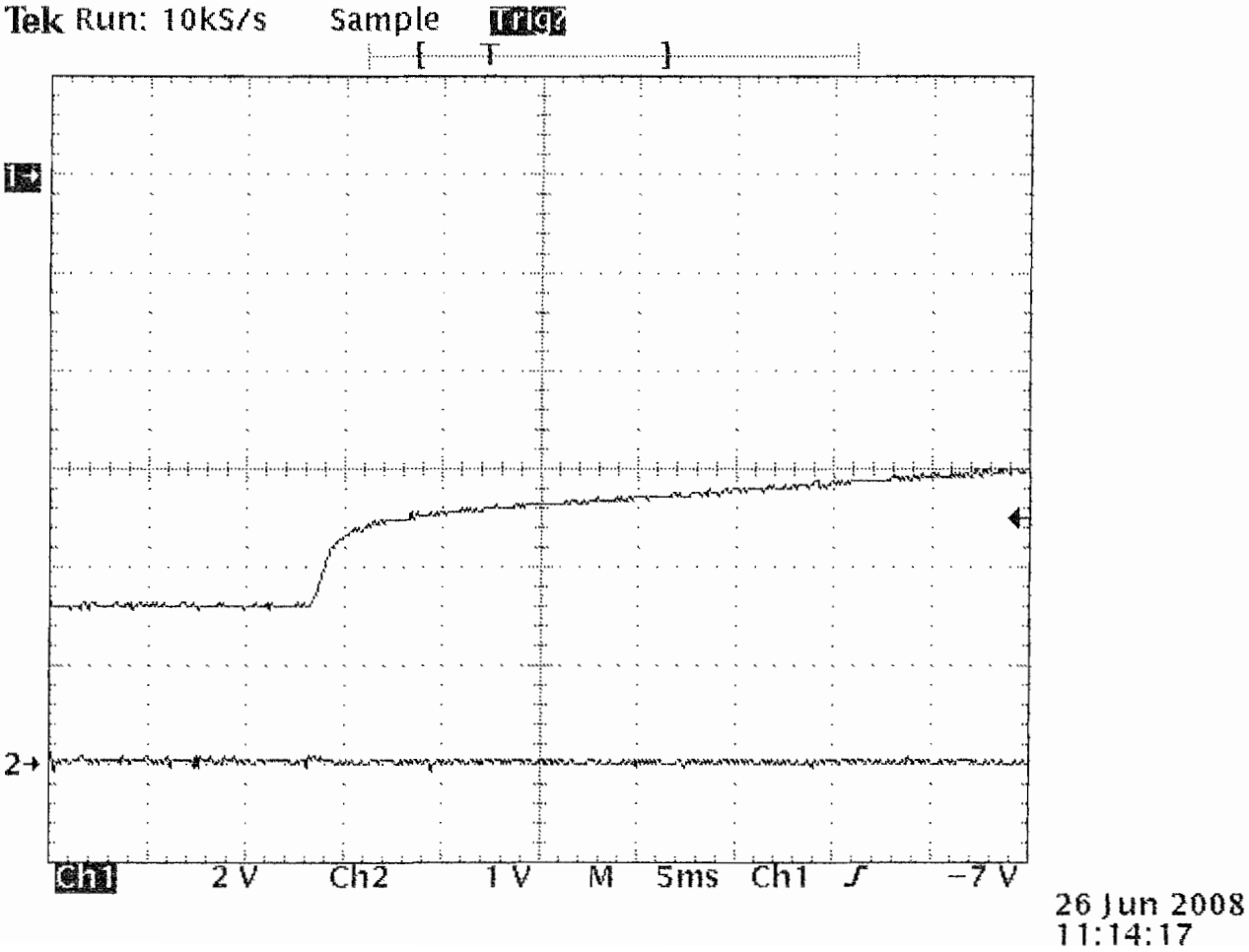
ATP PARA	TEST	LIMITS	DATA	REMARKS
7.6	STP Group Delay		____Completed	34A2274 data attached
7.7	STP AM to PM Conversion		____Completed	34A2277 data attached
7.8	STP Residual AM		____Completed	34A2239 data attached
7.9	STP Phase Noise		____Completed	34A2102 data attached
8.0 LEVEL C – DESIGN VERIFICATION TESTS Be sure each plot or printout is marked with the HPA model number, serial number, test procedure number, paragraph number, and the Measurement of the parameter is clearly marked.				
These design verification tests are special production tests performed only when ordered by purchase order.			N/A Level C Tests Are Ordered	
8.1	Powerline Conducted EMI		____Completed	34A2235 attached
8.2	Acoustic Noise		____Completed	34A2237 attached
8.3	Non-Ionizing Radiation		____Completed	34A2256 attached
8.4	AC Inrush Current		____Completed	34A2238 data attached
8.5	Power Factor		____Completed	34A2253 data attached

DIAGNOSTIC INTERFACE DATA DISK FOR YOUR HPA.

PLACE A 3-1/2 INCH DISC
POCKET HERE ON THIS PAGE.

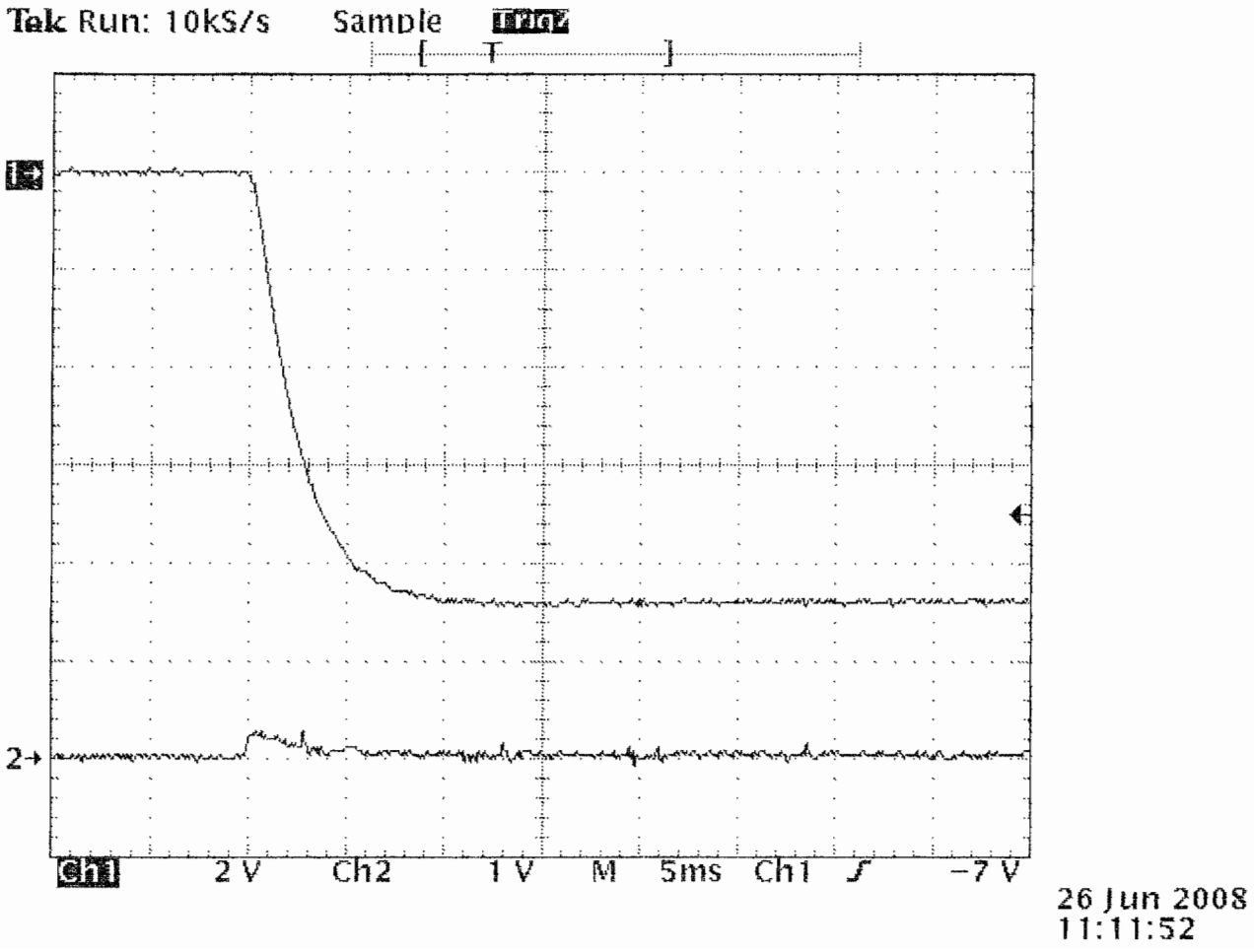
MT3200A 1390105

TURN Off LOAD



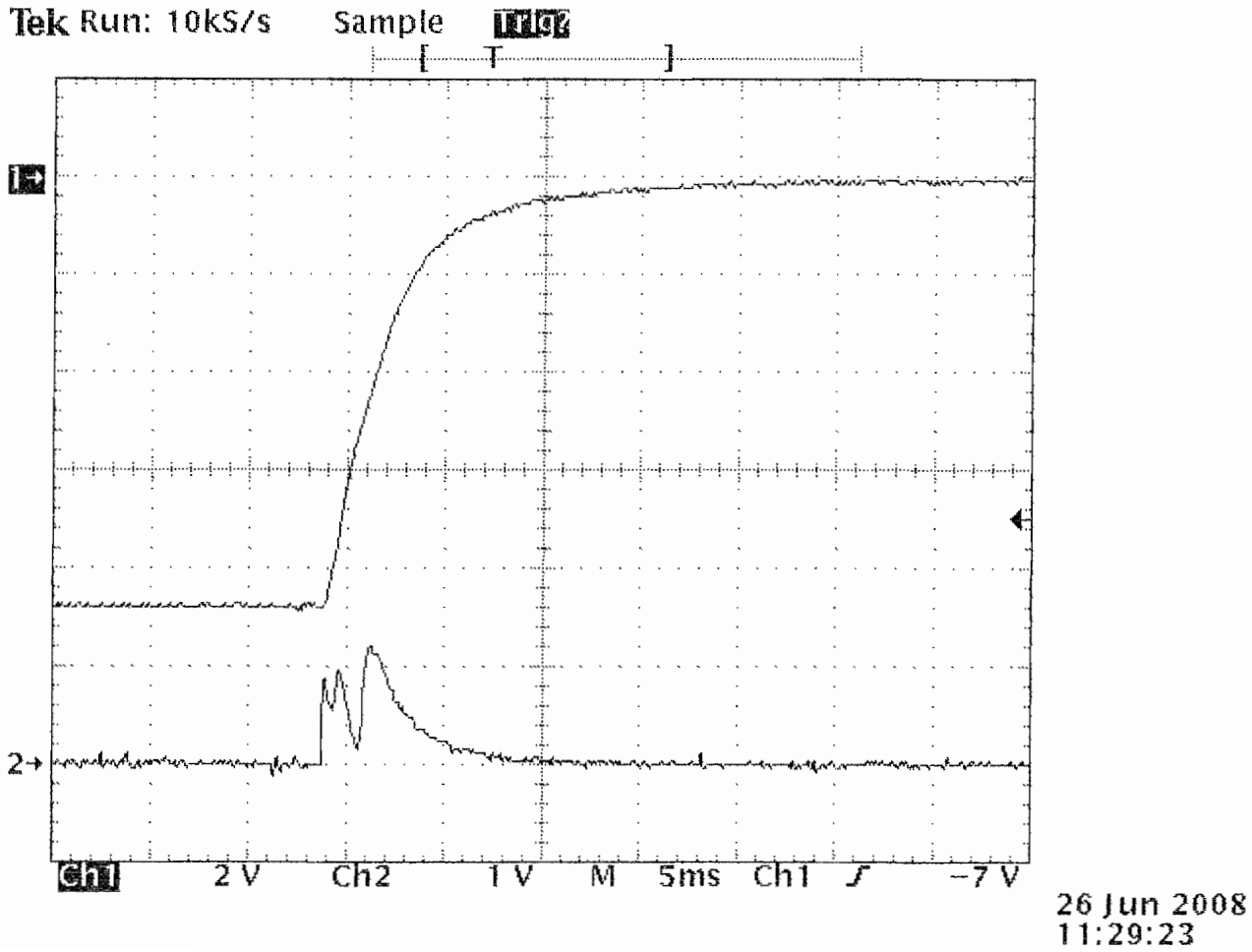
MT3200A 1390105

TURN ON LOAD



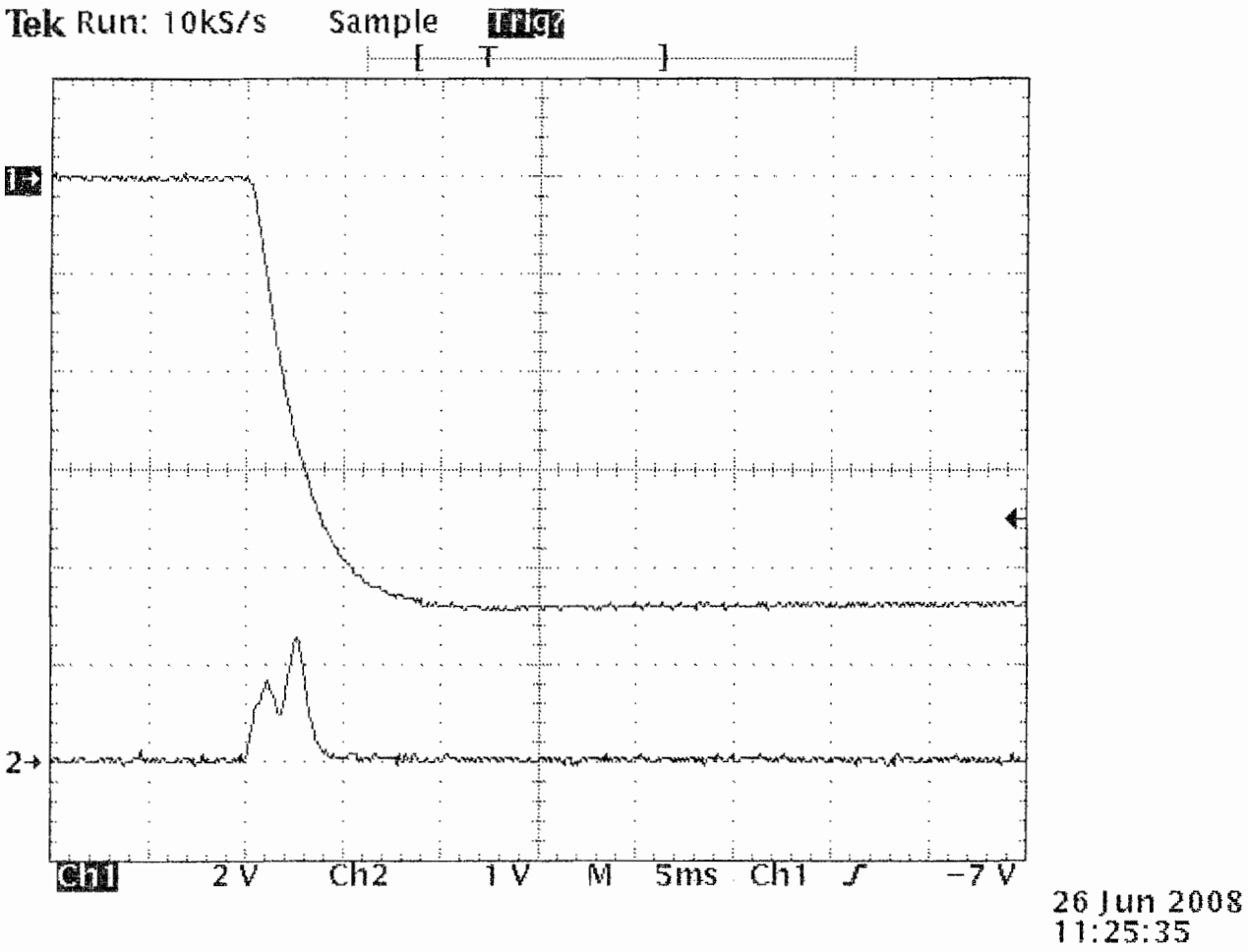
MT3200A 1390105

TURN off TUBE



MT3200A 1390105

TURN ON TUBE



ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105
System Specification #: TN3200A-1 Rev. 8/07
Q.A. Approval:
Q.A. Date: JUL 11 2008

Tester: TY
Date: 6/26/2008
Time: 2:24 PM
Job Number: 20153
Rated Power: 360 Watts

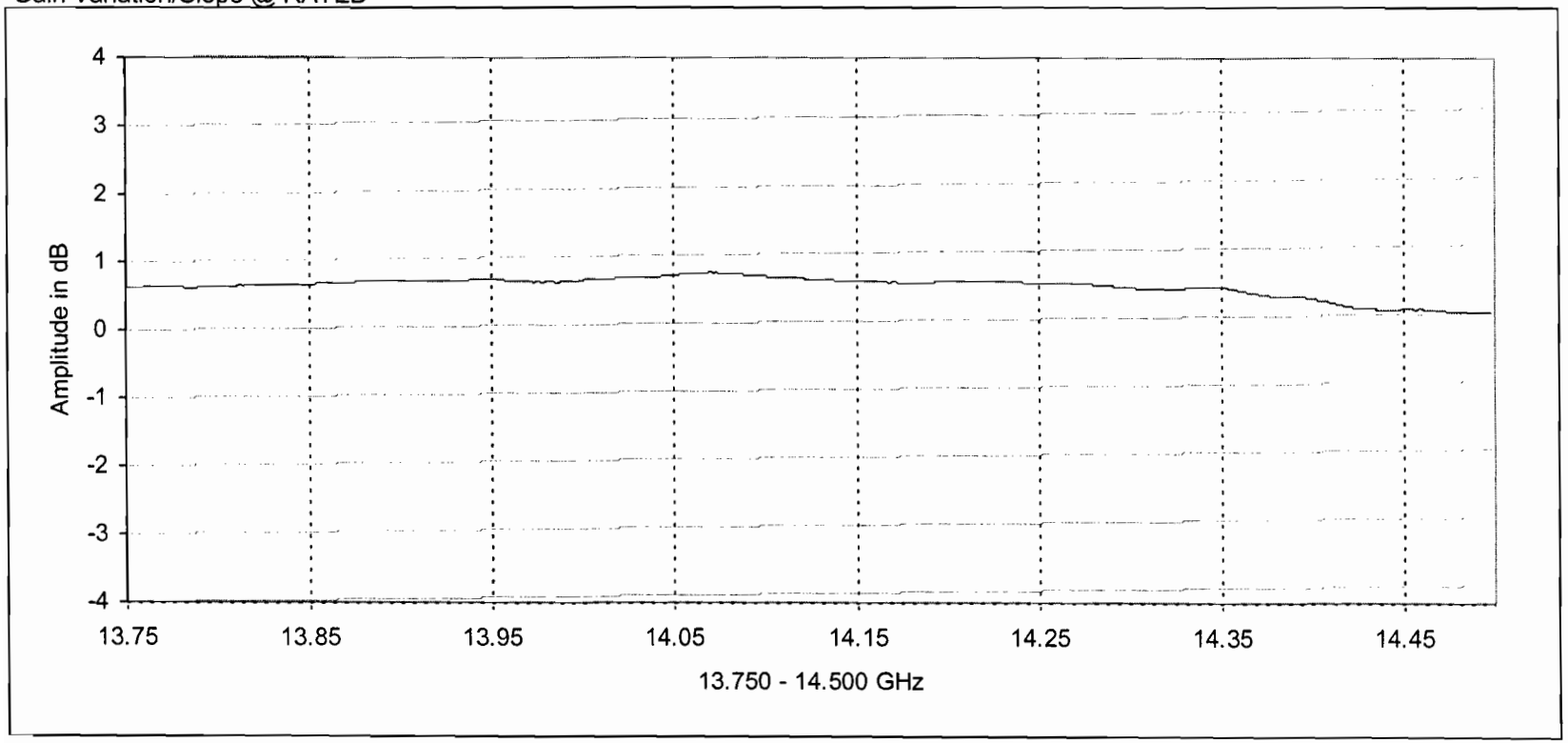
Rated Power Gain Measurement					
Frequency	Input Power	Output Power	Output Power	Gain	Sample Port
13.750GHz	-18.82dBm	56.14dBm	411W	74.95dB	47.29dB
13.800GHz	-18.82dBm	56.14dBm	412W	74.96dB	47.34dB
13.900GHz	-18.82dBm	56.19dBm	416W	75.00dB	47.29dB
14.000GHz	-18.82dBm	56.15dBm	412W	74.96dB	47.26dB
14.100GHz	-18.82dBm	56.30dBm	427W	75.11dB	47.35dB
14.200GHz	-18.82dBm	56.29dBm	426W	75.11dB	47.36dB
14.300GHz	-18.82dBm	56.23dBm	420W	75.05dB	47.28dB
14.400GHz	-18.82dBm	55.87dBm	387W	74.69dB	47.05dB
14.500GHz	-18.82dBm	55.65dBm	368W	74.47dB	46.95dB

Small Signal Gain Measurement				
Input Power	Test	Spec. Limit	Measured Gain	Pass/Fail
-32.21dBm	Gain@-10dB	86.00dB Max.	78.58dB	Pass

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105
System Specification #: TN3200A-1 Rev. 8/07

Tester: TY
Date: 6/26/2008
Time: 2:24 PM
Job Number: 20153
Rated Power: 360 Watts

Gain Variation/Slope @ RATED



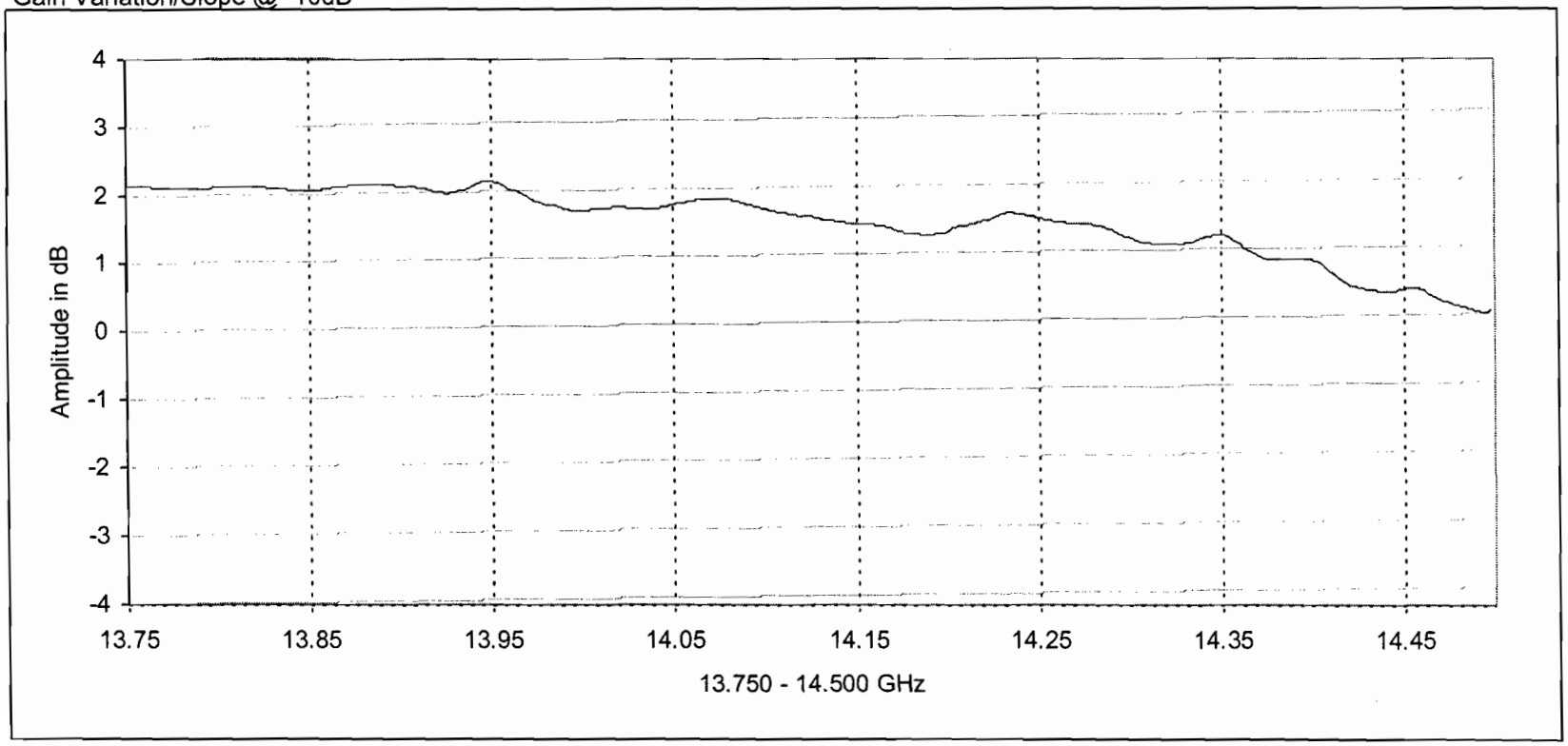
Gain Variation 80MHz	
Lower	14.349GHz
Upper	14.429GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***0.7dB/500MHz***	2.5dB/500MHz	Pass
Gain Variation	***0.3dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0067dB/MHz***	0.0400dB/MHz	Pass

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105
System Specification #: TN3200A-1 Rev. 8/07

Tester: TY
Date: 6/26/2008
Time: 2:24 PM
Job Number: 20153
Rated Power: 360 Watts

Gain Variation/Slope @ -10dB



Gain Variation 80MHz	
Lower	14.352GHz
Upper	14.433GHz

	Measurement	Specification	Pass / Fail
Gain Variation	***1.8dB/500MHz***	2.5dB/500MHz	Pass
Gain Variation	***0.8dB/80MHz***	1.0dB/80MHz	Pass
Gain Slope	***0.0211dB/MHz***	0.0400dB/MHz	Pass

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105

Tester: TY
Date: 6/26/2008
Time: 2:04 PM
Job Number: 20153

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	12/5/08
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A
RF SPECTRUM ANALYZER	AGILENT 8564EC	1341	01/09

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105

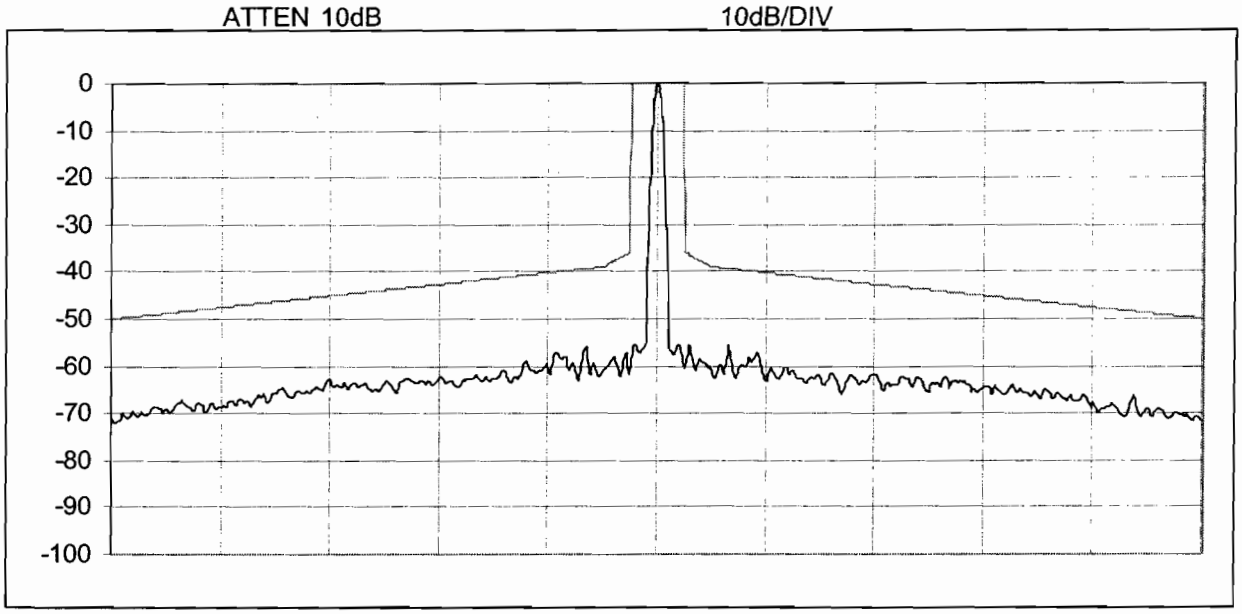
Tester: TY
Date: 6/26/2008
Time: 2:04 PM
Job Number: 20153

STP Para	Test Description	Specification MAX. Limits	***Measured Data***	Pass/Fail
3.1	Rated power of DUT	Rated	***360 Watts***	Pass
	Noise Level/ Hz			
4.4	100 Hz to 1 kHz	-50 dBc @ 100 Hz	***-68 dBc @ 100 Hz***	Pass
	-60 dBc @ 1 kHz	-60 dBc @ 1 kHz	***-79 dBc @ 1.0 kHz***	Pass
4.8	1 kHz to 25 kHz	-60 dBc @ 1 kHz	***-73 dBc @ 1.0 kHz***	Pass
	-85 dBc @ 25 kHz	-85 dBc @ 25 kHz	***-103 dBc @ 25.0 kHz***	Pass
4.12	25 kHz to 100 kHz	-85 dBc @ 25 kHz	***-104 dBc @ 25.0 kHz***	Pass
	-90 dBc @ 100 kHz	-90 dBc @ 100 kHz	***-106 dBc @ 100.0 kHz***	Pass
4.16	100 kHz to 2.5 MHz	-90 dBc	***-100 dBc @ 100.0 kHz***	Pass
4.2	2 MHz to 9.9 MHz	-90 dBc	***-122 dBc @ 2.0 MHz***	Pass
4.24	9 MHz to 20 MHz	-90 dBc	***-121 dBc @ 9.1 MHz***	Pass
	Spur Level			
4.5	50/60Hz	-36 dBc	***-56 dBc @ 60 Hz***	Pass
	100 Hz to 1 kHz	-39 dBc	***-56 dBc @ 133 Hz***	Pass
4.9	1 kHz to 25 kHz	-50 dBc	***-62 dBc @ 1.2 kHz***	Pass
4.13	25 kHz to 100 kHz	-60 dBc	***-71 dBc @ 75.3 kHz***	Pass
4.17	100 kHz to 2.5 MHz	-60 dBc	***-66 dBc @ 200.0 kHz***	Pass
4.21	2 MHz to 9.9 MHz	-70 dBc	***-79 dBc @ 4.9 MHz***	Pass
4.25	9 MHz to 25 MHz	-70 dBc	***-70 dBc @ 11.6 MHz***	Pass
4.26	Integrated sum of spurs	-42 dBc	***-54 dBc***	Pass
	4.5, 4.9, 4.13, 4.17, 4.21, 4			

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105

Tester: TY
Date: 6/26/2008
Time: 2:04 PM
Job Number: 20153

STP Para. 4.5

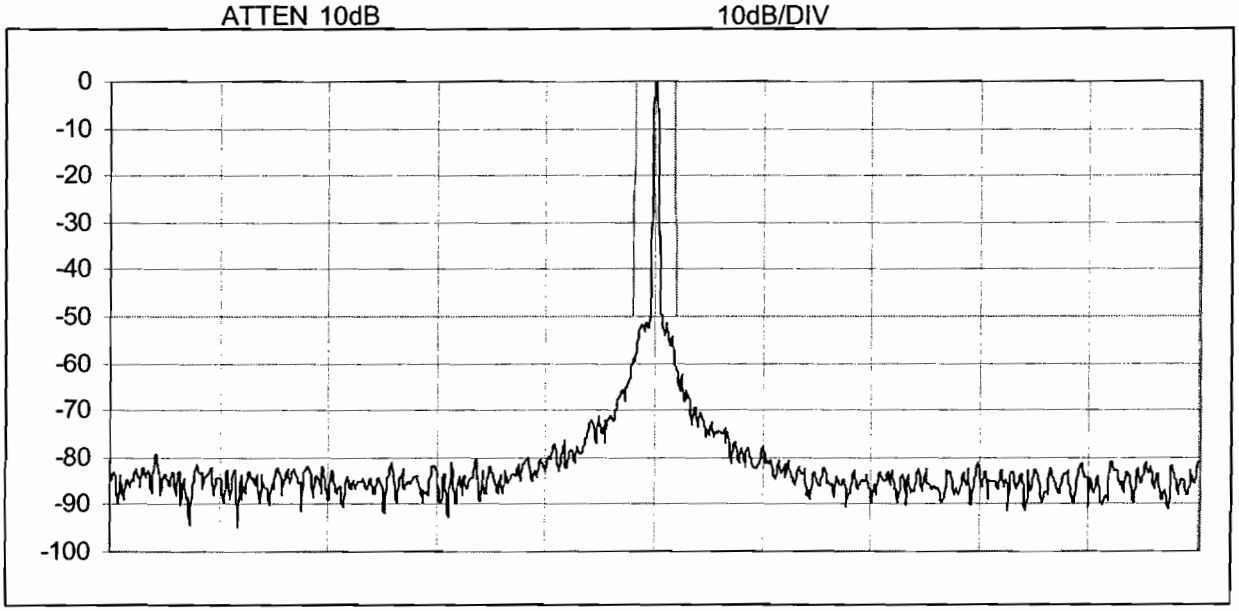


Center Frequency 14.099 GHz
RBW 10 Hz

Span 2.000 kHz
VBW 1 Hz

Sweep 3.78sec

STP Para. 4.9



Center Frequency 14.099 GHz
RBW 100 Hz

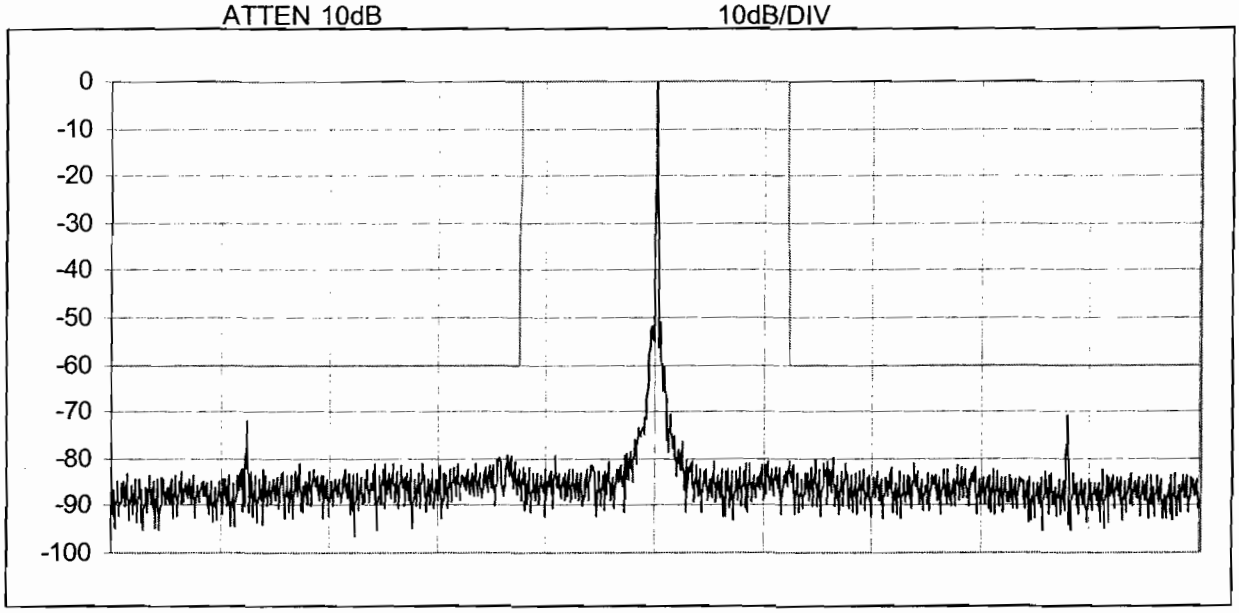
Span 50.000 kHz
VBW 10 Hz

Sweep 20.00sec

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105

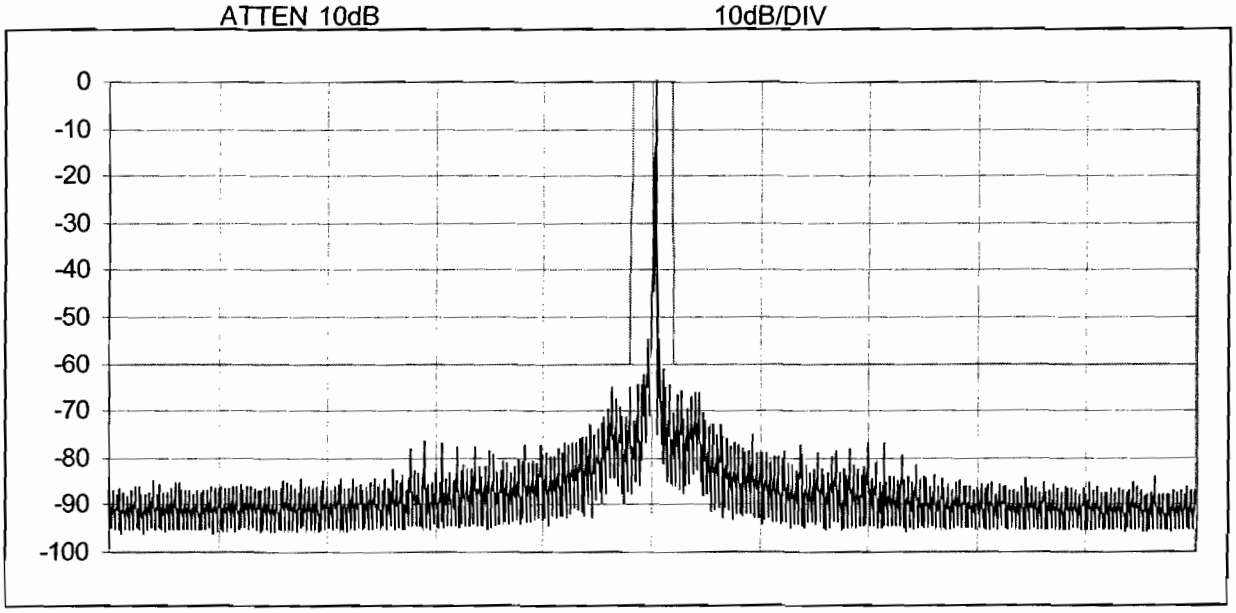
Tester: TY
Date: 6/26/2008
Time: 2:04 PM
Job Number: 20153

STP Para. 4.13



Center Frequency 14.099 GHz
RBW 100 Hz
Span 200.000 kHz
VBW 10 Hz
Sweep 80.00sec

STP Para. 4.17

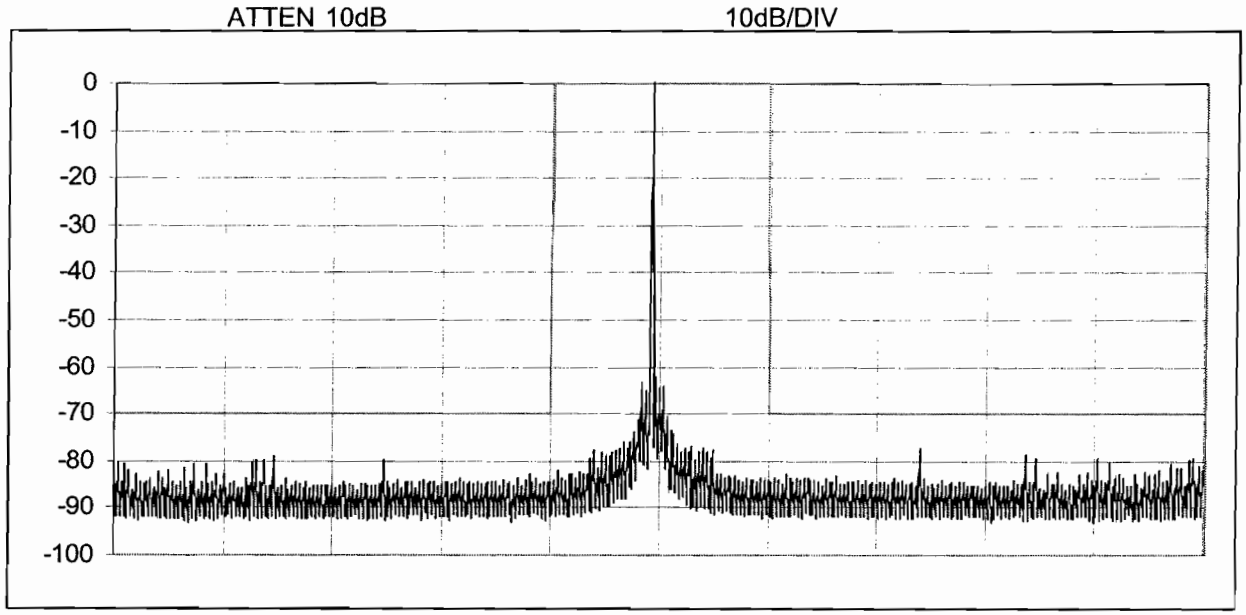


Center Frequency 14.099 GHz
RBW 1.0 kHz
Span 5.000 MHz
VBW 300 Hz
Sweep 42.00sec

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105

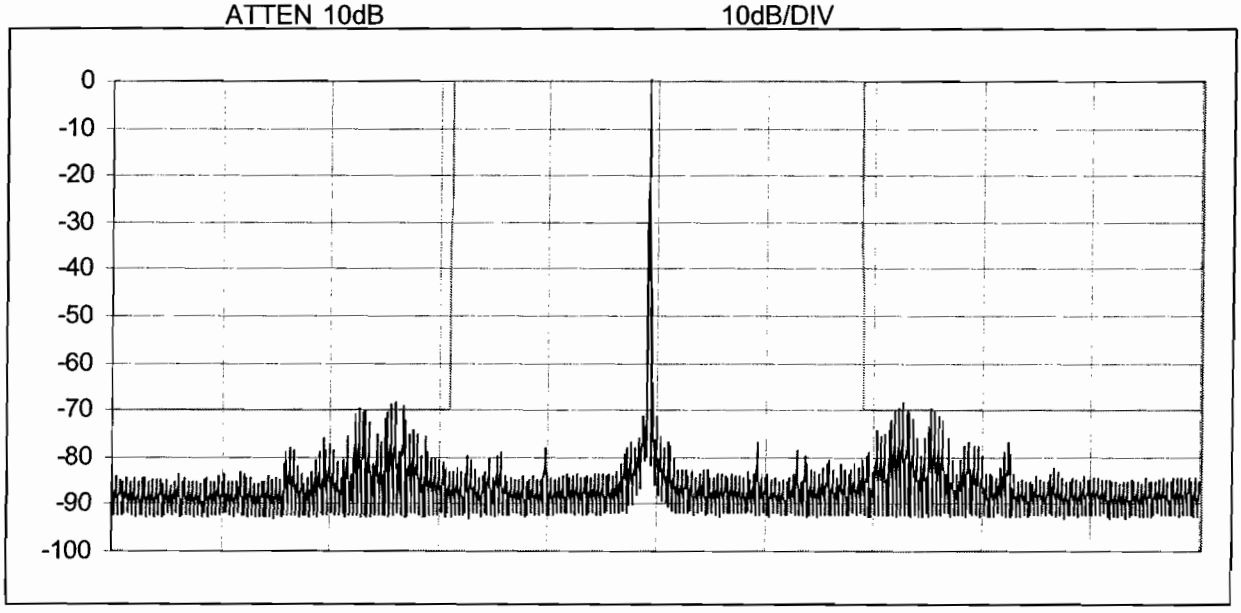
Tester: TY
Date: 6/26/2008
Time: 2:04 PM
Job Number: 20153

STP Para. 4.21



Center Frequency 14.099 GHz
RBW 3.0 kHz
Span 20.000 MHz
VBW 300 Hz
Sweep 56.00sec

STP Para. 4.25



Center Frequency 14.099 GHz
RBW 3.0 kHz
Span 50.000 MHz
VBW 300 Hz
Sweep 140.00sec

ATP Number: 34A2746 Rev. D
Model Number: MT3200A
Serial Number: 1390105
System Specification #: TN3200A-1 Rev. 8/07

Tester: TY
Date: 6/26/2008
Time: 2:24 PM
Job Number: 20153
Rated Power: 360 Watts

DESCRIPTION	MANUFACTURER & MODEL #	SERIAL #	CAL DUE DATE
RF SWEEP GENERATOR	HP E8257D	01461	02/22/09
RF PLUG-IN	N/A	N/A	N/A
RF POWER METER	AGILENT E4419B	01488	11/5/09
RF POWER SENSORS (CH A)	HP 8481A	Q2568	10/30/09
RF POWER SENSORS (CH B)	AGILENT E4412A	01393	11/05/09
RF POWER SENSORS	HP 8481D	N/A	N/A
PRINTER OR PLOTTER	HPTHINKJET OR COLORPRO*	N/A	N/A
DIRECTIONAL COUPLER W/LOAD	MCL NO P/N**	052	12/5/08
MISC RF CONNECTORS	MCL NO P/N**	N/A	N/A
MISC RF CABLES	MCL NO P/N**	N/A	N/A
NETWORK ANALYZER	HP 8757D	01483	11/08/09
RF DETECTOR	85025B	01481	11/08/09
SSA**	MCL	N/A	N/A
COAX DIRECTIONAL COUPLER	27C1771	899004	N/A
COMPUTER SYSTEM	DELL	MCL-TEST-3	N/A

Table 2 - Manufacturing TWTA Burn-in Log

Model Number MT3200A Serial Number 1390105 ATP Number 34A2746 Job Number 20153 Date 6/26/08

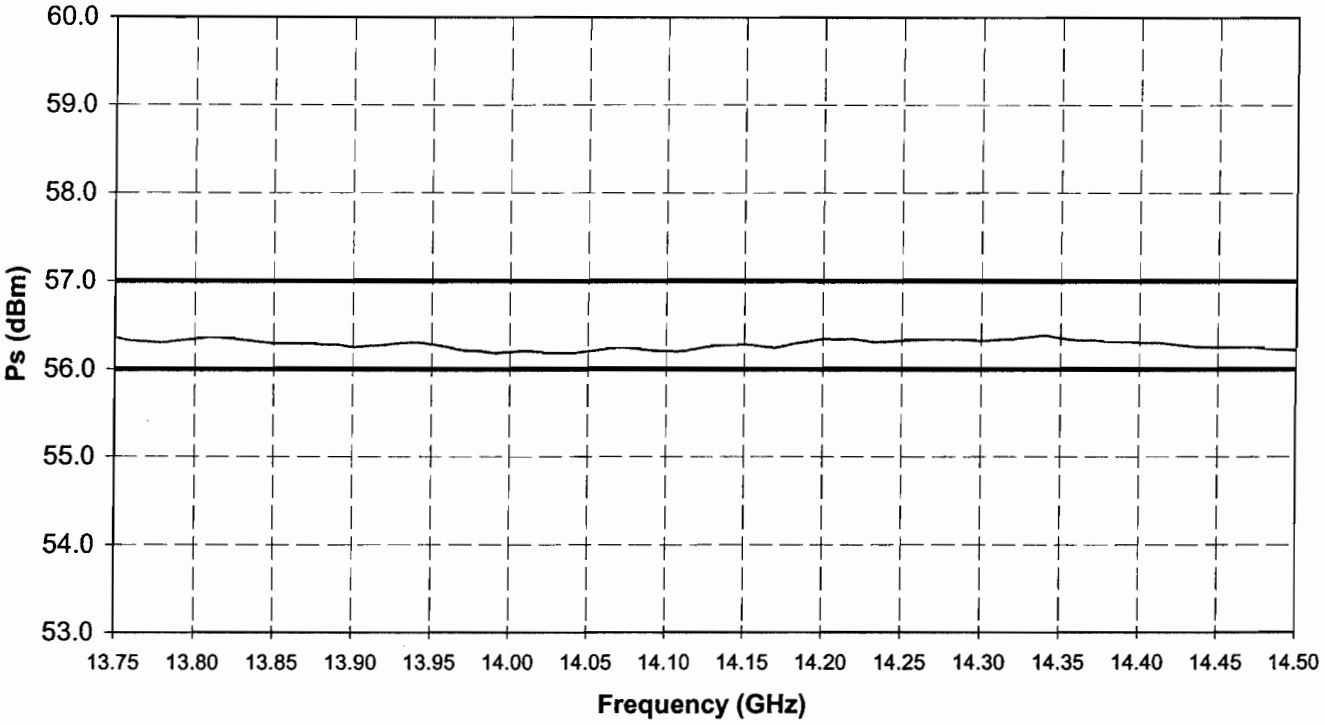
Burn-in Step	DC Tests Complete	8 Hour Burn-In (Optional)	RF Tests Complete	Start Final Burn-In @+50°C	Stop Final Burn-In @+50°C	Optional RF TEST	Optional	Final Checkout
Date	6-26-08		6-26-08	6/27/08	6/30/08	7-14-08		7-14-08
Time	1145		1430	1445	0715	1345		1345
Helix V (Cath V)	8.75KV		8.75KV	8.75KV	8.75	8.75KV		8.75KV
Helix I	1.0mA		1.7mA	1.0mA	1.2mA	1.9mA		1.9mA
Fil I	1.10A		1.10A	1.11A	1.10A	1.10A		1.10A
TWT Temp	48°C		53°C	41°C	85°C	56°C		56°C
PS Temp	39°C		40°C	31°C	64°C	41°C		41°C
Input Power	—		-19dBm	NA	NA	-12dBm		-12dBm
Tube Drive Power	Ø		3.7dBm	Ø	Ø	2.4mW		2.4mW
Output Power	Ø		55.6dBm	Ø	Ø	314W		314W
Reflected Power	Ø		10dBm	Ø	Ø	ØW		ØW
Frequency (GHz)	—		14.1	NA	NA	14.1		14.1
Filament ET Hrs.	.8		3.4	9.2	73.5	158		158
Beam ET Hrs.	.3		2.7	7.9	72.2	141		141
Transmit Count	18		28	30	30	40		40
						MT32PCA		
Initials	TY		TY	VORI	VORI	TY		TY

TOTAL BURN IN HOURS 141 Q.A. _____

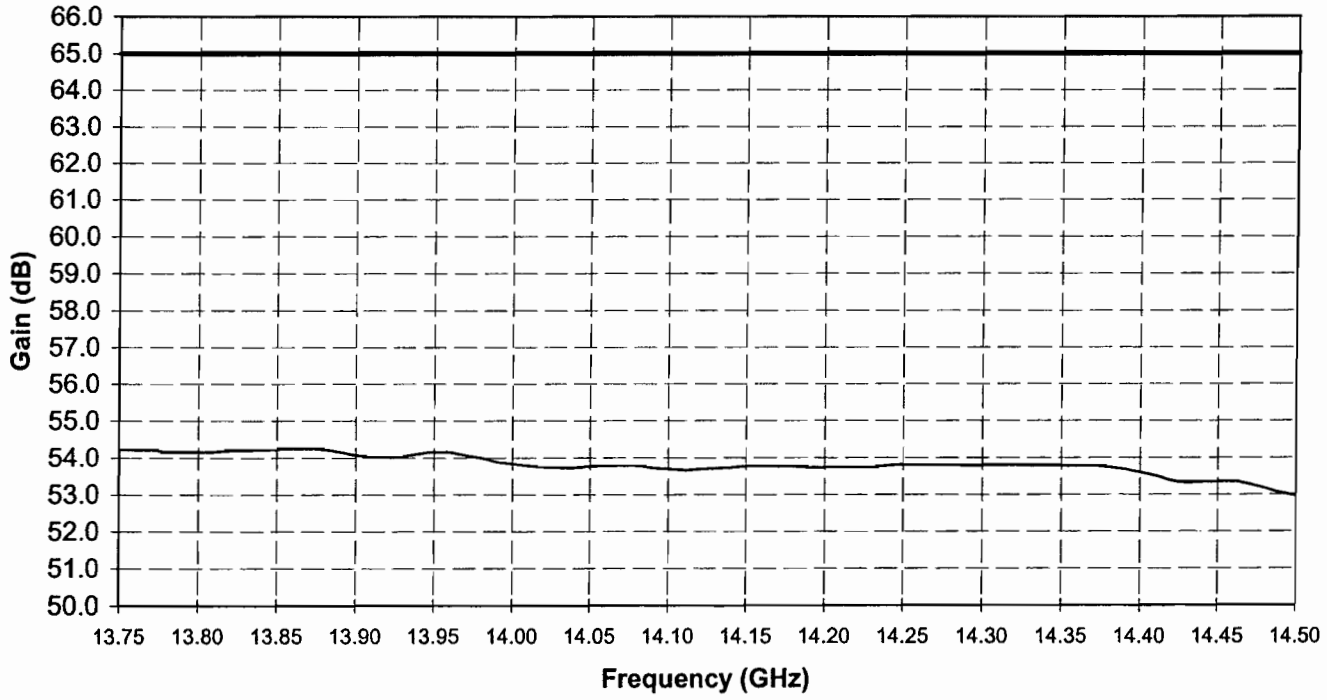
NOTE Final checkout must be done with RF applied and the meter readings noted.

JUL 11 2008

OUTPUT POWER



SMALL VARIATION GAIN



THALES ELECTRON DEVICES	PV D'ESSAIS D'ACCEPTATION ACCEPTANCE TEST DATA SHEET TH 3976 Date : **21/04/08** N° : **652_135**	CA 3976 vers. B 4065506 indice E Date : 04/26/04 Page : 1/2

GENERAL TESTS CONDITIONS AND ACCEPTANCE TESTS

ACCEPTANCE TEST BENCH IDENTIFICATION : 4067122 ATP REFERENCE : 4067111

PARAMETERS		SYMBOL	UNIT	OPERATING RANGE		
				MIN	MEASURED VALUES	MAX
HEATER VOLTAGE		Vf	V	6.2	**6.3**	6.4
HEATER CURRENT		If	A	0.9	**1.2**	1.4
HELIX VOLTAGE		Vh	KV	8.2	**8.75**	9
HELIX CURRENT		Ih	mA	-	**1.4**	8
COLLECTOR 1 VOLTAGE		Vcol 1	% Vh	48	**50**	51
COLLECTOR 1 CURRENT	Without RF	Icol 1	mA	3	**7**	-
	With RF	Icol 1	mA	-	**154**	180
COLLECTOR 2 VOLTAGE		Vcol 2	% Vh	30	**32**	33
COLLECTOR 2 CURRENT	Without RF	Icol 2	mA	-	**288**	290
	With RF	Icol 2	mA	90	**138**	-
CATHODE CURRENT		Ik	mA	-	**296**	300
FREQUENCY RANGE		F	GHz	13.75	-	14.5
RF DRIVE POWER		Pe	dBm	-	**5.9**	6
OUTPUT POWER FOR Pe = Vn		Ps	W	400	**415** **434**	500
OUTPUT VARIATION (Pe = constant)	Any 500 Mhz band	Δ Ps	dB	-	**0.2**	1
	Any 80 MHz band	Δ Ps	dB	-	**0.1**	0.4
SMALL SIGNAL GAIN (Ps ≤ 40 W)		G	dB	-	**54.3**	65
SMALL SIGNAL GAIN VARIATION (Ps ≤ 40 W)	Any 500 Mhz band	Δ G	dB	-	**0.8**	2
	Any 80 MHz band	Δ G	dB	-	**0.5**	0.7
GAIN SLOPE (Ps ≤ 40 W)		Δ G / Δ F	dB/MHz	-	**0.01**	0.02
THERMAL DISSIPATION NO DRIVE OR WITH RF		-	W	-	**847**	850
PRIME POWER	No drive	-	W	-	**847**	850
	With RF	-	W	-	**1082**	1200

MECHANICAL AND FINISHING INSPECTION	*ELECTRICAL INSPECTION*	*QUALITY ASSURANCE*
Date : 21 AVR. 2008 TDH HE 22	Date : 21 AVR. 2008 TDH HE 22	Date 21 AVR. 2008 RFMS-V DQ 14

Remarks :

EXHIBIT “D”

FREQUENCY CONVERTER

CONVERTER MODEL: UC14M2-D5(70)

SERIES: VROMS NA

P/N: UC14M2-430A000

S/N: 4365

PROJECT NO. : 86919

CUSTOMER: Gerling & Associates, Inc.

SYSTEM TESTED PER TEST PROCEDURE 119015745
AND ATTACHED DATA SHEETS

BY: _____

TITLE: Engineering Associate

CO: L3 Comm. Satellite Networks

DATE: 6/2/08

WITNESSED AND/OR
REVIEWED: _____

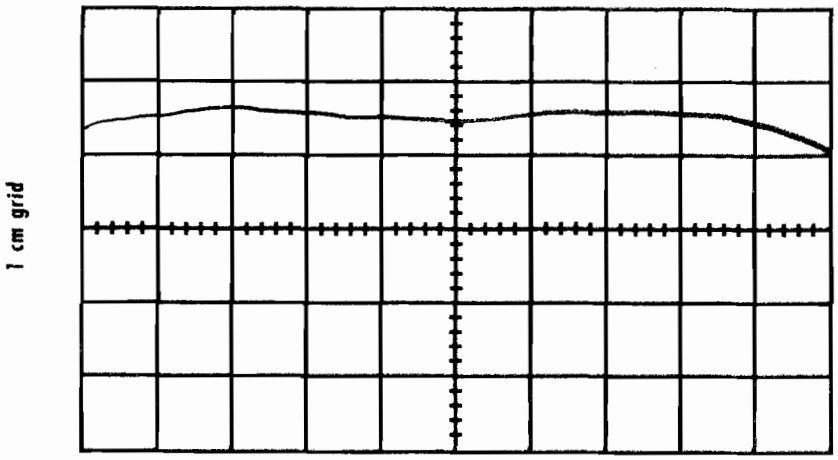
TITLE: :Supervisor

CO: L3 Comm. Satellite Networks

DATE : 6/2/08

L3 communications Satellite Networks		CODE IDENT NO. 9U450	TEST DATA
	SCALE		SHEET REV

2.0.1 GAIN, BANDWIDTH, RIPPLE AND GAIN SLOPE



DATA

Vertical ___ μm volts/cm
☐ Attenuation x 10
Horizontal ___ μm sec/cm
☐ Magnifier x ____
Engr. ____
Date ____
0.5db/div

-20 mHz 13770mHz +20 mHz

PARAMETER	SPECIFICATION	TEST RESULTS
GAIN MIN.	30 dB	31.90 dB
GAIN MAX.	* dB	32.20 dB
GAIN RIPPLE (max.)	< ±0.25 dB/ 40 MHz	< ±0.15 dB/40 MHz
GAIN SLOPE (max.)	<* dB/MHz	* dB/MHz
F_{IN}	70 MHz ± 20 MHz	F_{OUT} 13770 MHz ± 20 MHz

Comment(s): *

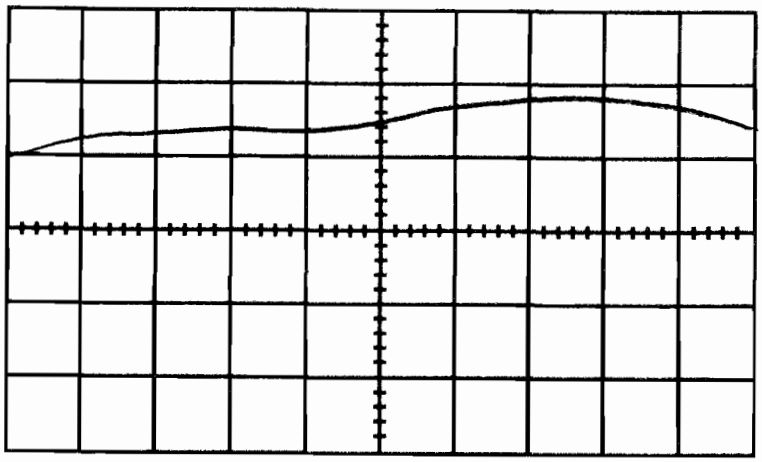
TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: [illegible] MODEL: UC14M2-DS

AMB. TEMP = ROOM

WITNESSED BY: * * indicates that N/A is assumed if blank

2.0.1 GAIN, BANDWIDTH, RIPPLE AND GAIN SLOPE



DATA

Vertical ___ μ volts/cm

☐ Attenuation x 10

Horizontal ___ μ sec/cm

☐ Magnifier x ___

Engr. ___

Date ___

0.5 dB/div

-20 MHz 14125 MHz +20 MHz

PARAMETER	SPECIFICATION	TEST RESULTS
GAIN MIN.	30 dB	31.90 dB
GAIN MAX.	* dB	*32.30 dB
GAIN RIPPLE (max.)	< ±0.25 dB/ 40 MHz	<±0.20 dB/40 MHz
GAIN SLOPE (max.)	<* dB/MHz	* dB/MHz
F_{IN}	70 MHz ± 20 MHz	F_{OUT} 14125 MHz ± 20 MHz

Comment(s): *

TEST DATE: 5/30/08 UNIT S/N: 4865

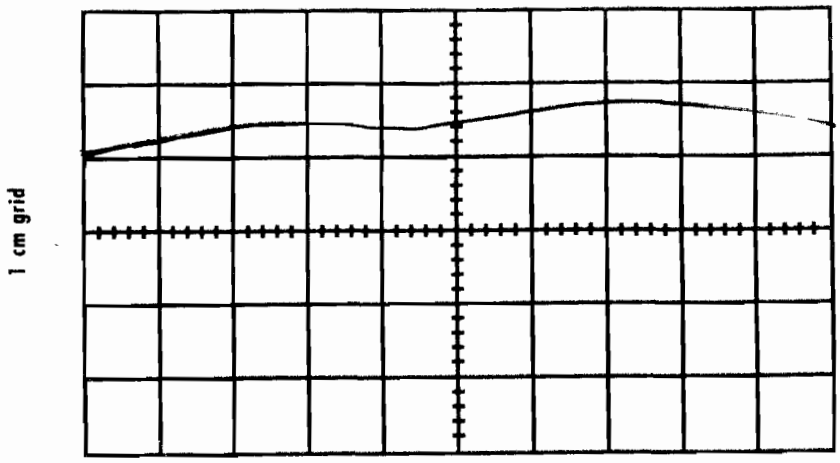
ENG/TECH: VP MODEL: UC-14M2-05

AMB. TEMP = ROOM

WITNESSED BY: * ___

* indicates that N/A is assumed if blank

2.0.1 GAIN, BANDWIDTH, RIPPLE AND GAIN SLOPE



DATA

Vertical ___ m volts/cm
Attenuation x 10
Horizontal ___ m sec/cm
Magnifier x ___
Engr. ___
Date ___
0.5 db/div

-20 MHz 14480 MHz +20 MHz

PARAMETER	SPECIFICATION	TEST RESULTS
GAIN MIN.	30 dB	31.60 dB
GAIN MAX.	* dB	32.00 dB
GAIN RIPPLE (max.)	< ±0.25 dB/ 40 MHz	< ±0.20 dB/ 40 MHz
GAIN SLOPE (max.)	<* dB/MHz	* dB/MHz
F IN	70 MHz ± 20 MHz	F OUT 14480 MHz ± 20 MHz

Comment(s): * ___

TEST DATE: 5/30/08 UNIT S/N: 4365

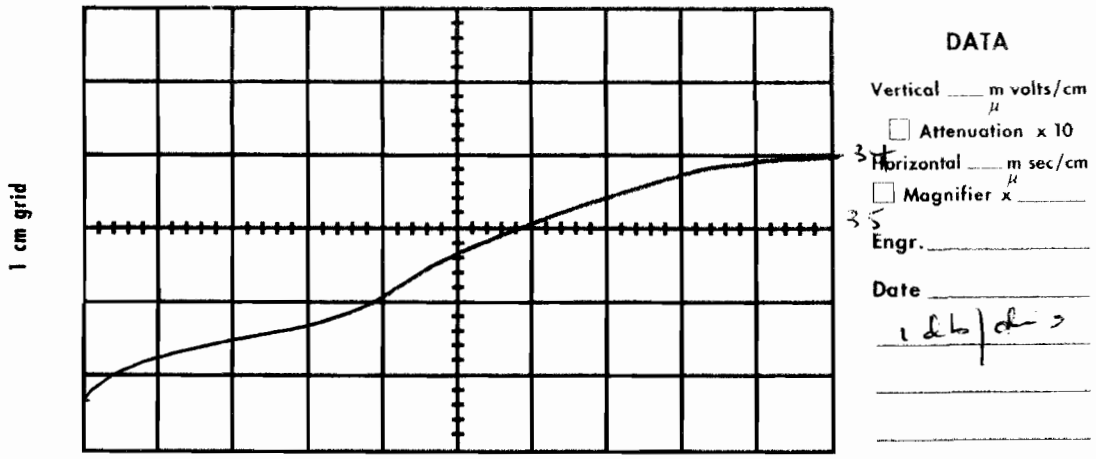
ENG/TECH: M MODEL: UC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * ___

* indicates that N/A is assumed if blank

2.1.1 SWEPT FREQUENCY VSWR MEASUREMENT - INPUT



-20 MHz 70 MHz +20 MHz

PARAMETER	SPECIFICATION	TEST RESULTS
RETURN LOSS	23 dBr MIN. ---->	-34 dBr
FREQ RANGE --	Fmin. 50 MHz Fmax. 90 MHz ---	as shown

Comment(s): * _____

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: _____ MODEL: DC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

2.2.1 SWEPT FREQUENCY VSWR MEASUREMENT - OUTPUT

13.75 GHz 14.5 GHz

PARAMETER	SPECIFICATION	TEST RESULTS
RETURN LOSS	15 dBr min	----> -19.55 dBr
FREQ RANGE --	Fmin. 13.75 GHz Fmax. 14.5 GHz	--- as shown

Comment(s): *

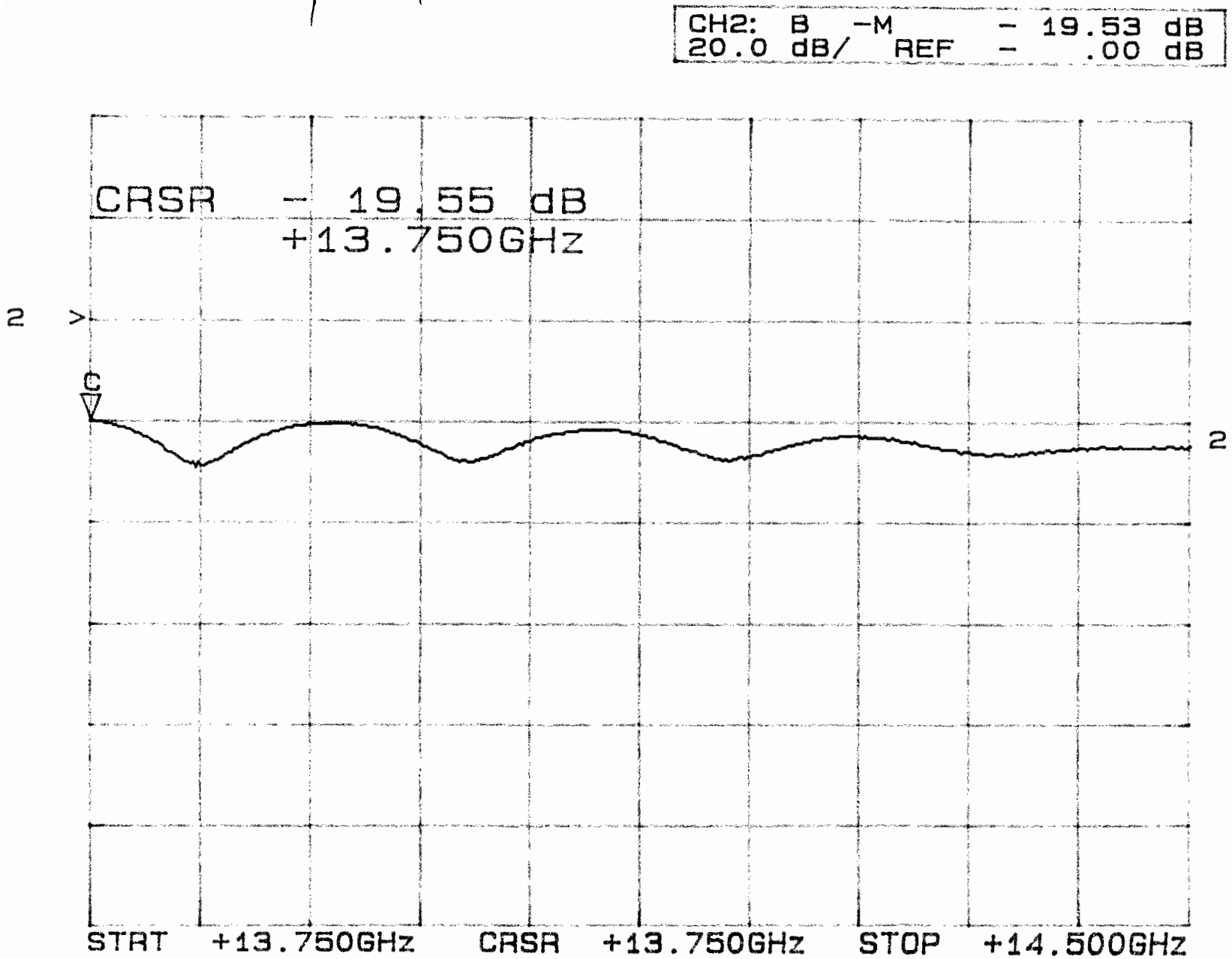
TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: [illegible] MODEL: UC14M2-B5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

S/N - 4365


CH2: B -M - 19.53 dB
20.0 dB/ REF - .00 dB
CRSR - 19.55 dB
+13.750GHz
2
C
2
START +13.750GHz
CRSR +13.750GHz
STOP +14.500GHz

2.4.1 OUTPUT 3RD ORDER INTERCEPT POINTS

PARAMETER	SPECIFICATION	TEST RESULTS
Based on 3rd Order Intermodulation REJ (R) with 2 tone input. Each signal level to unit @ -40 dBm. Total PWR= -37 dBm. F 1= 70 MHz F 2 = 75 MHz	P INT= + 20 dBm min 3rd order IM REJ at N/A dBm output = N/A dBm min	R + P in + G t = P int 2 48 2 + -30 + 30 = 24 dBm
PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Based on 3rd Order Intermodulation REJ (R) with 2 tone input. Each signal level to unit @ * dBm. Total PWR=* dBm. F 1= * F 2 =*	P INT= *+ dBm min 3rd order IM REJ at * dBm output = * dBm min	R + P in + G t = P int 2 * 2 + * + * = * dBm
PARAMETER	**SPECIFICATION**	**TEST RESULTS**
Based on 3rd Order Intermodulation REJ (R) with 2 tone input. Each signal level to unit @ * dBm. Total PWR=* dBm. F 1= * F 2 =*	P INT= *+ dBm min 3rd order IM REJ at * dBm output = * dBm min	R + P in + G t = P int 2 * 2 + * + * = * dBm

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: JP MODEL: OC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____

* indicates that N/A is assumed if blank

2.5.1 1 dB COMPRESSION POINT – DYNAMIC RANGE

MEASUREMENT FREQUENCY		SPECIFICATION		TEST RESULTS	
14.125 GHz	-	1.0 dB max	-	1.0 dB	
	@	+10 dBm out	@	+16.0 dBm out	

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: M MODEL: UC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

2.6.1 SPURIOUS FREQUENCY EMISSIONS (OUTPUT)

PARAMETER	SPECIFICATION	TEST RESULTS
Output Spurious Freq. observed as a function of In-Band input carrier frequencies	-* 65 dBc with a -* +6 dBm input/output (circle) signal present.	-* <65 dBc at Freq.out = * 14.125GHz
Output Spurious Freq. observed as a non-carrier related signal.	-*_____dBm.	-*_____ dBm at Freq.out =*_____

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: MP MODEL: UC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____

* indicates that N/A is assumed if blank

2.7.1 PHASE NOISE vs CARRIER OFFSET

OFFSET	SPECIFICATION		LOCAL OSCILLATOR FREQUENCY		
			LOW	MID	HIGH
100Hz	- -65	dBc/Hz	* -78	-78	* -79
* 1KHz	*- -75	dBc/Hz	* -90	* -89	* -90
* 10KHz	*- -83	dBc/Hz	* -94	* -93	* -95
* 100KHz	*- -95	dBc/Hz	* -110	* -110	* -111
*	*-	dBc/Hz	*	*	*
*	*-	dBc/Hz	*	*	*
*	*-	dBc/Hz	*	*	*
*	*-	dBc/Hz	*	*	*

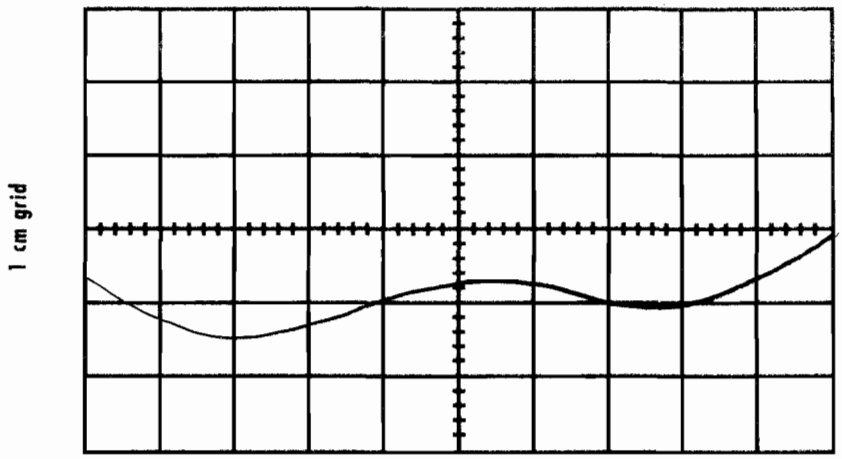
TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: [illegible] MODEL: OC14M2-15

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

2.8.1 GROUP DELAY



DATA

Vertical ____ μ volts/cm

☐ Attenuation x 10

Horizontal ____ μ sec/cm

☐ Magnifier x ____

Engr. ____

Date ____

insidi

- 20 MHz 13770 MHz + 20 MHz

THE GROUP DELAY COEFFICIENTS SHALL NOT EXCEED THE FOLLOWING OVER ANY 40 MHz SEGMENT OF THE SPECIFIED BAND

LINEAR	0.02 nSEC/MHz	LINEAR	0.05 nSEC/MHz
PARABOLIC	0.004 nSEC/MHz^2	PARABOLIC	0.008 nSEC/MHz^2
RIPPLE	<1.5 Nsec P-P	RIPPLE	1.5 Nsec P-P
TEST DATA		Fc = 13770 MHz	

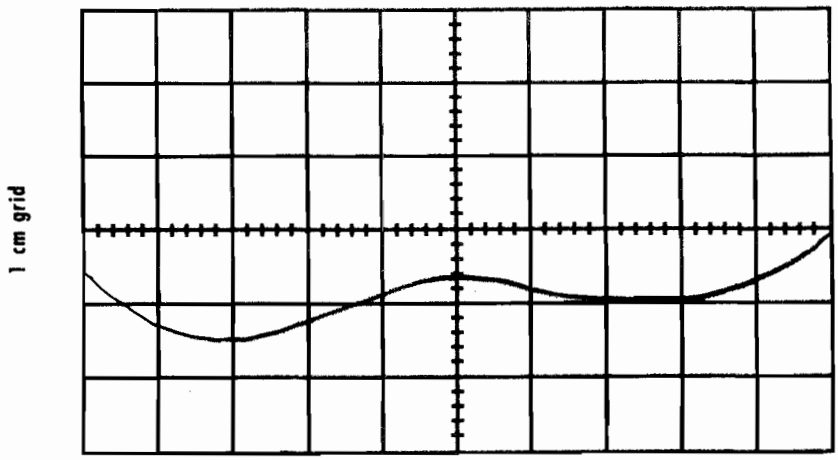
TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: M MODEL: UC1472-A5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

2.8.1 GROUP DELAY



DATA

Vertical ___ μ volts/cm

☐ Attenuation x 10

Horizontal ___ μ sec/cm

☐ Magnifier x ___

Engr. ___

Date ___

1 ns/div

-20 MHz 14125 MHz +20 MHz

THE GROUP DELAY COEFFICIENTS SHALL NOT EXCEED THE FOLLOWING OVER ANY 40 MHz SEGMENT OF THE SPECIFIED BAND

		LINEAR 0.05 nSEC/MHz	
LINEAR 0.02 nSEC/MHz	TEST DATA	PARABOLIC 0.008 nSEC/MHz^2	
PARABOLIC 0.004 nSEC/MHz^2		RIPPLE 1.5 Nsec P-P	
RIPPLE <1.5 Nsec P-P		Fc = 14125 MHz	

TEST DATE: 5/30/08 UNIT S/N: 4365

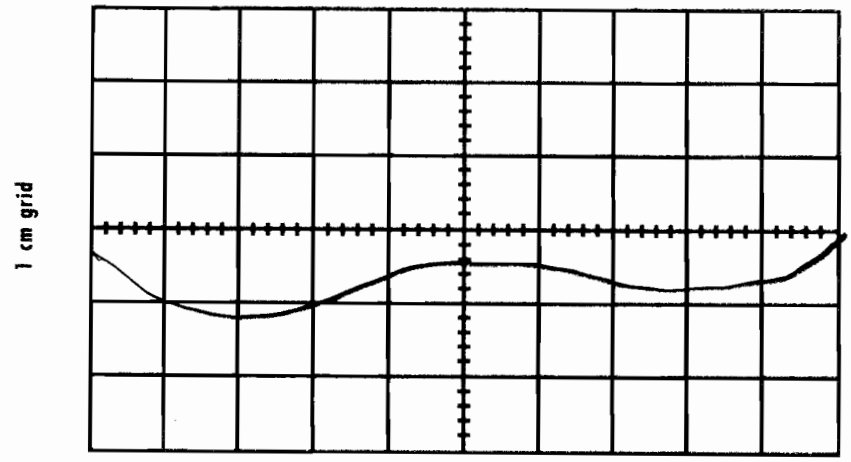
ENG/TECH: [illegible] MODEL: JC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * ___

* indicates that N/A is assumed if blank

2.8.1 GROUP DELAY



DATA

Vertical ____ m volts/cm
Attenuation x 10
Horizontal ____ m sec/cm
Magnifier x ____
Engr. ____
Date 5/30/08

-20 MHz 14480 MHz +20 MHz

THE GROUP DELAY COEFFICIENTS SHALL NOT EXCEED THE FOLLOWING OVER ANY 40 MHz SEGMENT OF THE SPECIFIED BAND

TEST DATA	
LINEAR 0.02 nSEC/MHz	PARABOLIC 0.008 nSEC/MHz^2
PARABOLIC 0.003 nSEC/MHz^2	RIPPLE 1.5 Nsec P-P
RIPPLE <1.5 Nsec P-P	Fc = 14480 MHz

LINEAR 0.05 nSEC/MHz

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: [illegible] MODEL: UC14M2-B5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

2.9.1 LOCAL OSCILLATOR LEAKAGE

PARAMETER	SPECIFICATION	TEST RESULTS
RF LOCAL OSCILLATOR FREQUENCY AT 12625 MHz	- 60 dBm max at ☐ INPUT ☑ OUTPUT	- <60 dBm

PARAMETER	SPECIFICATION	TEST RESULTS
RF LOCAL OSCILLATOR FREQUENCY AT * 1430 MHz	*- 60 dBm max at ☐ INPUT ☑ OUTPUT	*- <60 dBm

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: [illegible] MODEL: UC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

3.0.1 AM TO PM CALCULATION

P_{int} = VALUE MEASURED IN 3RD ORDER INTERCEPT TEST

P_I = INPUT LEVEL (dBm) IN ACCORDANCE WITH SPECIFICATION

G_t = UNIT GAIN

$$K_p\ (°/dB) = 13.2\ \text{ANTILOG}\ \frac{P_1 + G_t - P_{int}}{10}$$

$$K_p\ (°/dB) = 13.2\ \text{ANTILOG}\ \frac{-40+30 - 24}{10}$$

K_p (°/dB) = 0.01 °/dB at -10 dBm (OUT)/IN (circle)

SPECIFICATION = 0.1 °/dB at -10 dBm (OUT)/IN (circle)

TEST DATE: 5/30/08 UNIT S/N: 4365

ENG/TECH: [illegible] MODEL: UC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

3.2.1 MONITOR / TEST / UNIT CHARACTERISTICS

AT UNIT FRONT PANEL		
A.	RF LOCAL OSCILLATOR FREQUENCY.....	* 12625 MHz
	POWER LEVEL AT ABOVE.....	* _____ dBm
B.	IF LOCAL OSCILLATOR FREQUENCY	* 1430 MHz
	POWER LEVEL	* _____ dBm
C.	CRYSTAL OSCILLATOR FREQUENCY.....	* 10 MHz
	POWER LEVEL.....	* -21.60 dBm
	+24V POWER SUPPLY.....	* 24.00 VDC
	+6V POWER SUPPLY.....	* 6.04 VDC
	*+___ POWER SUPPLY.....	* _____ VDC

CHECK THE FOLLOWING IF APPLICABLE

☑ RF LO ALARM IND	☑ RS 422A	☐ HIGH POWER OPT.	☐ 115 VAC
☑ LO ALARM IND	☐ IEEE488	☐ HIGH GAIN OPT.	☐ 230 VAC
☑ SUM ALARM IND	☐ 1 : N	☐ EXT INPUT REF.	☐ -48 VAC
☑ FORM C SUM ALM	☐ RS 232C	☐ AUX IF COUP OUT	☑ B.E.R.

☑ MUTE
☑ STEP ATT.

Comment(s): *

PROM Firmware Revision # :* Rev*. 19.02K

TEST DATE: 5/30/19 UNIT S/N: 4365

ENG/TECH: MV MODEL: UC14M2-D5

AMB. TEMP = ROOM

WITNESSED BY: * _____ * indicates that N/A is assumed if blank

EXHIBIT “E”

TANDBERG
Television

Engineers Report

Call Number 34276

Customer Details

Customer: Heartland Video System

Contact: Dennis Klas

Telephone: 920-893-4204

Service Details

Date Call Logged: 7/18/2008

SLA Employed: VChen

Service Contract No:

Fault Reported: HD 4:2:0 Upgrade

Product Information

Type:	E5784	**Serial No:**	TB30035
Build:		**Hardware:**	
Software:		**Firmware:**	

Repair Summary

1. Installed UPG/HWO/420 HD upgrade kit
2. License Keys installed
3. software to 3.13.1
4. Passed Operational testing
5. Passed Soak testing

END OF REPORT

Note: configuration may have changed during testing. Please check your settings before placing unit on air.

Please power unit and check your configuration prior to putting on air. If you have any questions please contact TANDBERGTV BNOC at 1-888-671-1268

Tandberg Television Ltd, Strategic Park, Comines Way, Hedge End, Southampton, Hampshire, SO30 4DA, United Kingdom

EXHIBIT “F”

TANDBERG
Television

Engineers Report

Call Number 32549

Customer Details

Customer: Heartland Video System

Contact: Dennis Klas

Telephone: 920-893-4204

Service Details

Date Call Logged: 7/18/2008

SLA Employed: VChen

Service Contract No:

Fault Reported: HD 4:2:0 Upgrade

Product Information

Type:	E5784	**Serial No:**	TB30031
Build:		**Hardware:**	
Software:		**Firmware:**	

Repair Summary

1. Installed UPG/HWO/420 HD upgrade kit
2. License Keys installed
3. software to 3.13.1
4. Passed Operational testing
5. Passed Soak testing

END OF REPORT

Note: configuration may have changed during testing. Please check your settings before placing unit on air.

Please power unit and check your configuration prior to putting on air. If you have any questions please contact TANDBERGTV BNOC at 1-888-671-1268

Tandberg Television Ltd, Strategic Park, Comines Way, Hedge End, Southampton, Hampshire, SO30 4DA, United Kingdom

EXHIBIT “G”

MCL INC ISO 9001
A MITEQ COMPANY

CERTIFICATE OF COMPLIANCE

MCL INCORPORATED

Hereby certifies that the goods supplied are in all respects in compliance with the quality and conditions stipulated in the agreement and that they comply in all respects with the contractual requirements including applicable specifications.

MCL JOB NUMBER 20153

Model Number MT32BCA

Serial Number (s) 1393871

JFT

James F. Teska
Quality Assurance Manager

501 SOUTH WOODCREEK DRIVE • BOLINGBROOK, IL 60440-4999
PHONE: 630-759-9500 • FAX: 630-759-5018 SALES • 630-771-7175 PURCHASING • WWW.MCL.COM

EXHIBIT “H”

ISO 9001

MCL INC
A MITEQ COMPANY

Declaration of Conformity

(According to ISO / IEC Guide 22 and EN 45014)

Manufacturer's Name:	MCL Inc.
Manufacturer's Address:	501 S. Woodcreek Road Bolingbrook, IL 60440 USA
Model Number(s):	MT3200A

In accordance with the following directives:

99/5/EC	The Radio and Telecommunications Terminal Equipment Directive
73/23/EEC	The Low Voltage Directive
89/336/EEC	The Electromagnetic Directive

Has been designed and manufactured to meet the following specifications:

EN 60215: 1989	Safety Requirements for Radio Transmitting Equipment
EN 301 489 –12 V1.2.1	Electromagnetic compatibility and Radio spectrum Matters (ERM); ElectroMagnetic Compatibility (EMC) standard for radio equipment and services; Part 12: Specific conditions for Very Small Aperture Terminal, Satellite Interactive Earth Stations operated in the frequency ranges between 4 GHz and 30 GHz in Fixed Satellite Service (FSS)
EN 55022:1998	Class B - Rated and Conducted
EN 61000-4-2	4KV CD, 8KV AD
EN 61000-4-3	80-2000 MHz, 400Hz 80% Mod.
EN 61000-4-4	1 KV Power Lines, .5 KV Signal Lines
EN 61000-4-5	2 KV L-G, 1 KV L-L
EN 61000-4-6	150kHz –80 MHz, 400Hz 80% Mod. 3V rms
EN 61000-4-11	30% for 10msec, 60% for 100msec
EN 61000-3-2: 2000 +A2: 2005	Electromagnetic Compatibility (EMC) – Part 3: Limits- Section 2: Limits for harmonic current emissions
EN 61000-3-3	Flicker Emissions

James F. Teska
Quality Assurance Manager
MCL Inc.
Rev. 8/3/06