

MEASUREMENT AND TECHNICAL REPORT

HUGHES NETWORK SYSTEMS
10450 Pacific Center Court
San Diego, CA 92121

DATE: 14 March 2005

This Report Concerns:	Original Grant: X	Class II Change:
Equipment Type: Satellite IP Modem, Mode HNS9201		
Deferred grant requested per 47 CFR 0.457(d)(1)(ii)?	Yes: Defer until:	No: X
Company Name agrees to notify the Commission by:	N/A	
of the intended date of announcement of the product so that the grant can be issued on that date.		
Transition Rules Request per 15.37?	Yes:	No: X*
(*) FCC Part 15, Paragraph(s) 15.107(a), 15.109(a), 15.207(a), 15.209(a), 15.247(a), 15.247(b), 15.247(c), 15.247(d)		
Report Prepared by: TÜV AMERICA, INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone: 858 678 1400 Fax: 858 546 0364		

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1.0 GENERAL INFORMATION

1.1 Product Description

None

1.2 Related Submittal Grant

None

1.3 Tested System Details

The FCC ID's for all equipment, plus descriptions of all cables used in the tested system are:

None

1.4 Test Methodology

Purpose of Test: To demonstrate compliance with the following tests.

Test Summary		Summary of Results			Pass/Fail
Test Description	Paragraph Number	Low Channel	Mid Channel	High Channel	
Bandwidth (6dB)	15.247(a)(1)(i)	9.6MHz	9.8MHz	9.9MHz	Pass
Power Output	15.247(b)	13.0dBm	14.1dBm	14.8dBm	Pass
RF Conducted Spurious	15.247(c)	Alternative Methods	Alternative Methods	Alternative Methods	N/A
Radiated Spurious Emissions – Restricted Bands and Bandedge (1GHz to 25GHz)	15.247(c)/ 15.209(a)	No detectable emissions	No detectable emissions	No detectable emissions	Pass
Power Spectral Density	15.247(d)		-22.5dBm		Pass
Radiated Spurious Emissions – Alternative Methods (1GHz to 25GHz) 20dBc	15.247(c)/ 15.209(a)	No detectable emissions	No detectable emissions	No detectable emissions	Pass
Radiated Emissions (30 to 1000 MHz)	15.209(a)		-1.0dB @ 75.9MHz		Pass
Conducted Emissions Transmit Mode – Power Line	15.207(a)		-9.3dB @ .395MHz		Pass
Receiver Spurious Emissions	15.109(a)		-1.8dB @ 376MHz		Pass
Conducted Emissions Receive Mode – Power Line	15.107(a)		-9.5dB @ .395MHz		Pass

Testing was performed according to the procedures in FCC/ANSI C63.4 and CSA 108.8-M1983.

1.5 Test Facility

The open area test site and conducted measurement data were tested by:

TÜV AMERICA, INC
10040 Mesa Rim Road
San Diego, CA 92121-2912
Phone: 858 678 1400
Fax: 858 546 0364

The Test Site Data and performance comply with ANSI C63.4 and are registered with the FCC, 7435 Oakland Mills Road, Columbia Maryland 21046. All Measurement Data is acquired according to the content of FCC Measurement Procedure and ANSI C63.4, unless supplemented with additional requirements as noted in the test report.

2.0 SYSTEM TEST CONFIGURATION

2.1 Justification

The EUT was initially tested for FCC emissions in the following configuration:

See Test Setup Photos Exhibit

2.2 EUT Exercise Software

None

2.3 Special Accessories

None

2.4 Equipment Modifications

None

2.5 Configuration of Test System

See Test Setup Photos Exhibit

3.0 CONDUCTED EMISSIONS EQUIPMENT/DATA**Test Conditions: CONDUCTED EMISSIONS: FCC Part 15.107(a) and 15.207(a)****The measurements were performed at the San Diego Testing Facility:**☐ - Test not applicable☒ - SR-5, Shielded Room, 16' x 28' x 15', Metal, Semi-Anechoic Chamber**Test Equipment Used:**

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
9252-50-R-24-BNC	458	LISN, 50 μ H /250 μ H/50 Ω / 0.25 μ F	Solar Electronics Co.	941719	02/05
ESHS 30	459	EMI Test Receiver	Rhode & Schwarz	832354/004	06/04
CAT-20	610	20 dB Attenuator	Mini-Circuits	--	VBU*

Remarks: One year calibration cycle for all test equipment and sites. (*) Verified Before Use.

TUV America Conducted Emissions

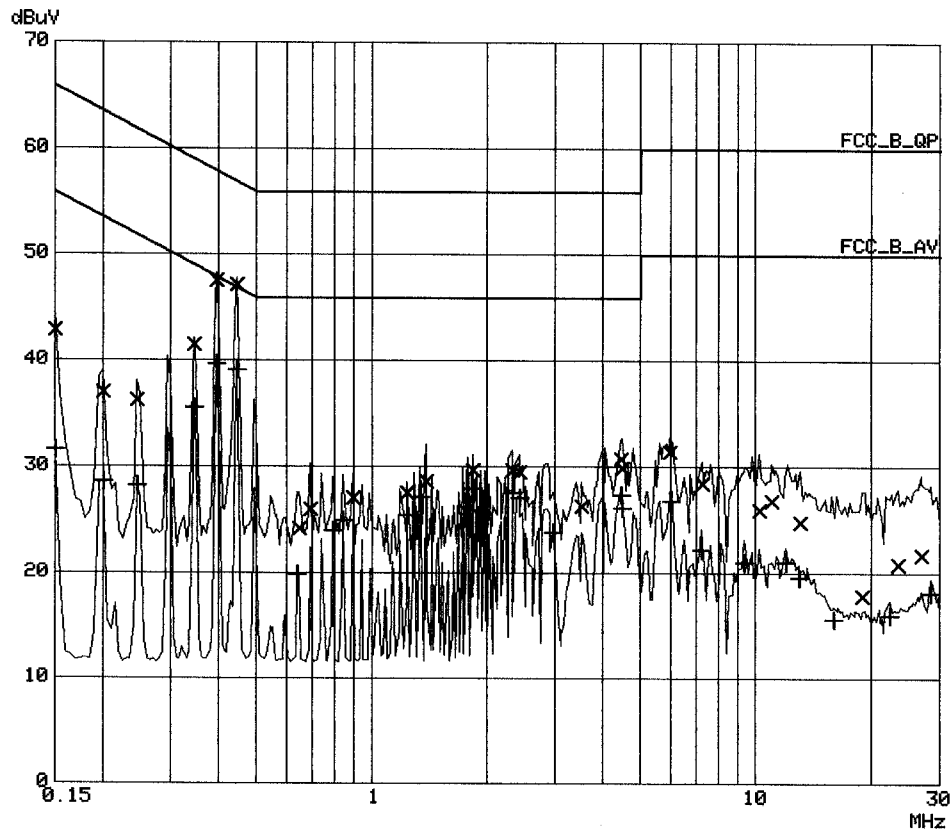
EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 1
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 1
 15.107 Conducted
 Date: 08. Mar 05 09:22

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 1
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 1
 15.107 Conducted
 Date: 08. Mar 05 09:22

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.8	66.0
0.20000	37.0	63.6
0.24500	36.2	61.9
0.34500	41.5	59.1
0.39500	47.6	57.9
0.44500	47.2	56.9
0.64500	24.1	56.0
0.69000	26.0	56.0
0.89000	27.1	56.0
1.23500	27.5	56.0
1.38500	28.6	56.0
1.83000	29.7	56.0
2.32500	29.6	56.0
2.42000	29.5	56.0
3.51000	26.3	56.0
4.45000	30.7	56.0
4.49500	29.9	56.0
5.98000	31.4	60.0
7.26500	28.5	60.0
10.23000	25.9	60.0
10.97500	26.8	60.0
13.05000	24.8	60.0
18.95500	17.8	60.0
23.41500	20.8	60.0
26.94000	21.7	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	31.6	56.0
0.20000	28.6	53.6
0.24500	28.2	51.9
0.34500	35.6	49.1
0.39500	39.7	47.9
0.44500	39.1	46.9
0.64000	19.9	46.0
0.79000	24.0	46.0
0.84000	25.0	46.0
1.23500	25.4	46.0
1.33500	27.1	46.0
1.83000	27.9	46.0
2.32500	27.6	46.0

Date: 08. Mar 05 09:22

2.42000	27.1	46.0
2.96500	23.8	46.0
4.45000	27.4	46.0
4.49500	26.1	46.0
6.03000	26.7	50.0
7.21500	22.2	50.0
9.34000	21.0	50.0
12.01000	21.0	50.0
13.00000	19.6	50.0
15.91500	15.6	50.0
22.34000	16.0	50.0
28.53500	18.1	50.0

* limit exceeded

TUV America
Conducted Emissions

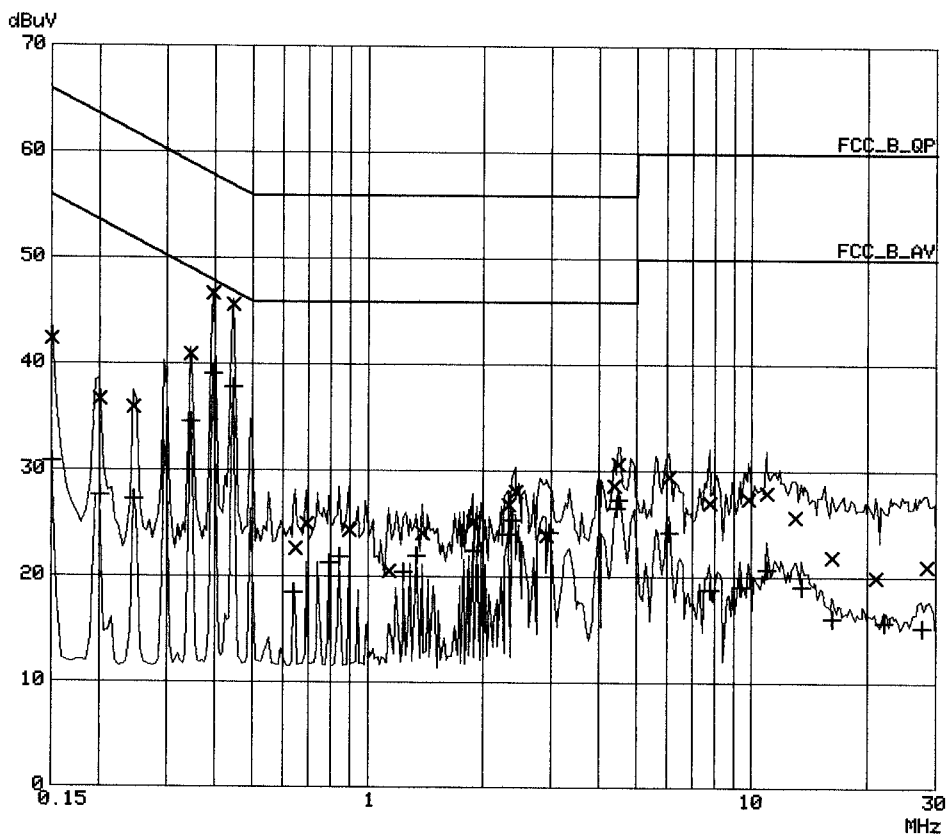
EUT: 9201
Manuf: Hughes Network Syst
Op Cond: Receive Ch 1
Operator: Frank Harkins
Test Spec: Part 15.107
Comment: 120Vac 60Hz Line 2
15.1.07 Conducted
Date: 08. Mar 05 09:36

Scan Settings (2 Ranges)

----- Frequencies -----			----- Receiver Settings -----					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dBLISN

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 1
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 2
 15.107 Conducted
 Date: 08. Mar 05 09:36

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.4	66.0
0.20000	36.7	63.6
0.24500	35.9	61.9
0.34500	40.9	59.1
0.39500	46.7	57.9
0.44500	45.6	56.9
0.64500	22.6	56.0
0.69000	24.9	56.0
0.89000	24.4	56.0
1.13500	20.5	56.0
1.38500	24.1	56.0
1.88000	25.1	56.0
2.32000	26.8	56.0
2.42000	28.1	56.0
2.92000	23.9	56.0
4.39500	28.6	56.0
4.49500	30.6	56.0
6.07500	29.4	60.0
7.75500	26.9	60.0
9.78500	27.3	60.0
10.92000	27.9	60.0
12.94500	25.6	60.0
16.15500	21.9	60.0
21.04500	19.9	60.0
28.56500	21.0	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.9	56.0
0.20000	27.7	53.6
0.24500	27.3	51.9
0.34500	34.6	49.1
0.39500	39.1	47.9
0.44500	37.9	46.9
0.64000	18.5	46.0
0.79000	21.3	46.0
0.84000	21.8	46.0
1.23500	20.4	46.0
1.33500	22.0	46.0
1.87500	22.4	46.0
2.32000	24.0	46.0

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2.37000	25.4	46.0
2.96500	24.2	46.0
4.44500	26.5	46.0
4.49500	27.3	46.0
6.07500	24.1	50.0
7.75500	18.8	50.0
9.34000	19.1	50.0
10.92000	20.7	50.0
13.44000	19.1	50.0
16.20500	16.1	50.0
22.08000	15.7	50.0
27.66500	15.2	50.0

* limit exceeded

TUV America Conducted Emissions

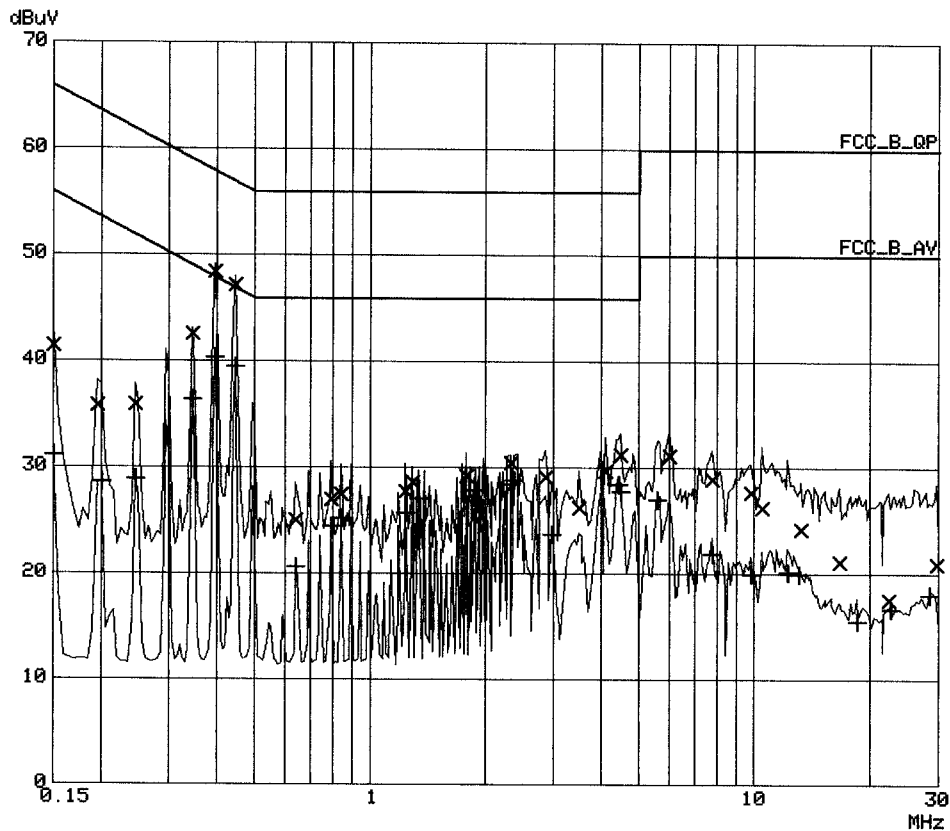
EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 6
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 1
 15.107 Conducted
 Date: 08. Mar 05 10:01

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 6
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 1
 15.107 Conducted
 Date: 08. Mar 05 10:01

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	41.4	66.0
0.19500	35.9	63.9
0.24500	35.9	61.9
0.34500	42.6	59.1
0.39500	48.4	57.9
0.44500	47.2	56.9
0.64000	25.1	56.0
0.79000	26.9	56.0
0.84000	27.4	56.0
1.23500	27.7	56.0
1.28500	28.6	56.0
1.78000	29.2	56.0
2.32000	30.4	56.0
2.86500	29.1	56.0
3.50500	26.2	56.0
4.10000	29.7	56.0
4.49500	31.2	56.0
6.02500	31.1	60.0
7.75500	28.9	60.0
9.78000	27.7	60.0
10.47000	26.2	60.0
13.23500	24.1	60.0
16.64500	21.1	60.0
22.30500	17.6	60.0
29.78500	20.9	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	31.1	56.0
0.20000	28.6	53.6
0.24500	28.9	51.9
0.34500	36.4	49.1
0.39500	40.3	47.9
0.44500	39.5	46.9
0.64000	20.6	46.0
0.79000	24.4	46.0
0.84000	25.2	46.0
1.23500	25.7	46.0
1.33500	27.1	46.0
1.87500	27.9	46.0
2.32000	28.5	46.0

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2.37000	28.8	46.0
2.96500	23.7	46.0
4.44500	28.4	46.0
4.49500	27.8	46.0
5.58000	27.0	50.0
7.75500	21.8	50.0
9.78000	19.9	50.0
12.20000	20.1	50.0
13.04000	19.9	50.0
18.42000	15.5	50.0
22.57500	16.7	50.0
28.53500	18.0	50.0

* limit exceeded

TUV America
Conducted Emissions

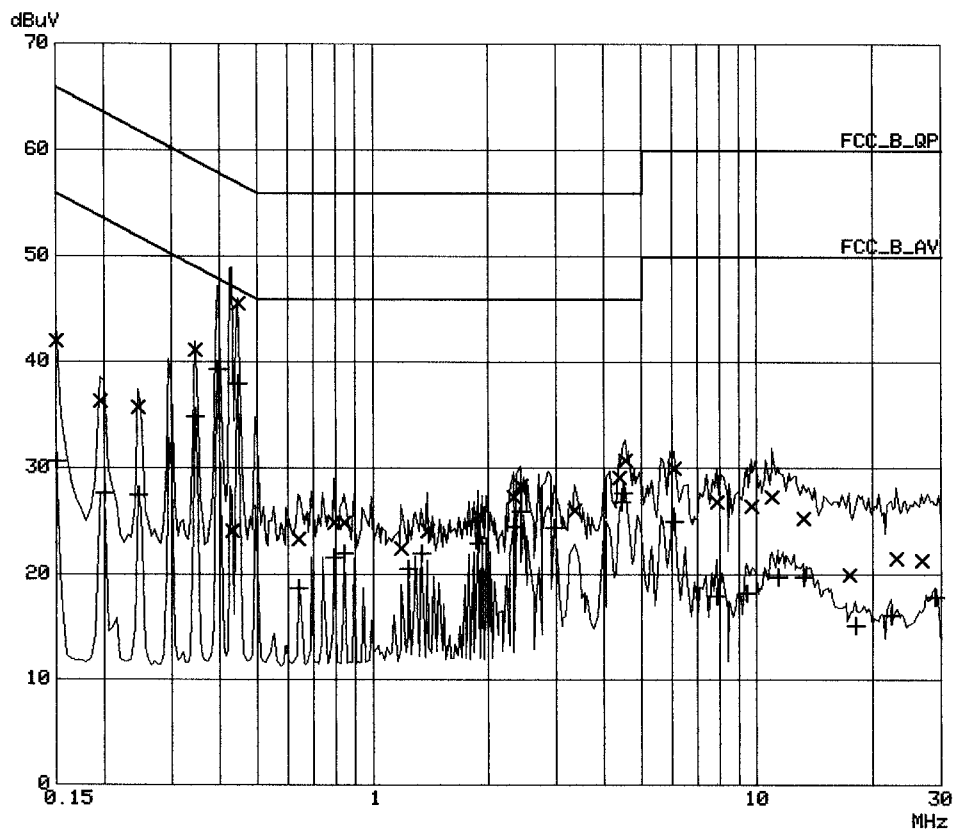
EUT: 9201
Manuf: Hughes Network Syst
Op Cond: Receive Ch 6
Operator: Frank Harkins
Test Spec: Part 15.107
Comment: 120Vac 60Hz Line 2
15.107 Conducted
Date: 08. Mar 05 09:48

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dBLISN

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 6
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 2
 15.107 Conducted
 Date: 08. Mar 05 09:48

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.0	66.0
0.19500	36.3	63.9
0.24500	35.7	61.9
0.34500	41.1	59.1
0.43000	24.0	57.3
0.44500	45.5	56.9
0.64000	23.3	56.0
0.79000	24.8	56.0
0.84000	24.9	56.0
1.18500	22.5	56.0
1.38500	24.1	56.0
1.87500	25.5	56.0
2.32000	27.3	56.0
2.42000	28.3	56.0
3.36000	26.0	56.0
4.39500	29.0	56.0
4.54500	30.7	56.0
6.07500	30.0	60.0
7.85500	26.8	60.0
9.68000	26.4	60.0
10.97000	27.3	60.0
13.19000	25.2	60.0
17.34500	19.9	60.0
23.02000	21.5	60.0
26.78500	21.3	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.7	56.0
0.20000	27.6	53.6
0.24500	27.5	51.9
0.34500	34.8	49.1
0.39500	39.3	47.9
0.44500	38.0	46.9
0.64000	18.7	46.0
0.79000	21.6	46.0
0.84000	21.9	46.0
1.23500	20.5	46.0
1.33500	22.0	46.0
1.87500	22.9	46.0
2.32000	24.4	46.0



Date:	08. Mar 05	09:48
2.42000	25.9	46.0
2.96500	24.3	46.0
4.44500	26.8	46.0

TUV America Conducted Emissions

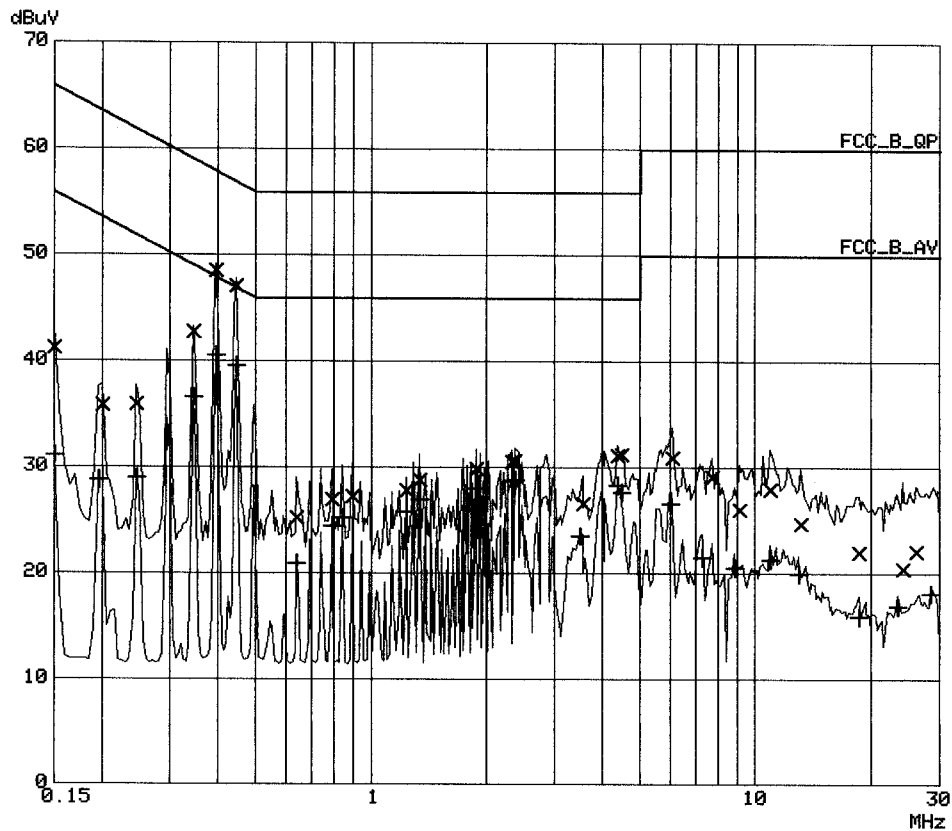
EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 11
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 1
 15.107 Conducted
 Date: 08. Mar 05 10:20

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 11
 Operator: Frank Harkins
 Test Spec: Part 15./07
 Comment: 120Vac 60Hz Line 1
 15./07 Conducted
 Date: 08. Mar 05 10:20

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	41.2	66.0
0.20000	35.8	63.6
0.24500	35.9	61.9
0.34500	42.7	59.1
0.39500	48.6	57.9
0.44500	47.1	56.9
0.64000	25.2	56.0
0.79000	27.0	56.0
0.89000	27.2	56.0
1.23500	27.9	56.0
1.33500	28.8	56.0
1.87500	29.9	56.0
2.32000	30.6	56.0
2.37000	30.7	56.0
3.55500	26.6	56.0
4.39500	31.1	56.0
4.49500	31.2	56.0
6.07500	31.0	60.0
7.70500	29.1	60.0
9.09000	26.0	60.0
10.96500	27.9	60.0
13.13500	24.7	60.0
18.62000	22.0	60.0
24.16500	20.4	60.0
26.17500	22.1	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	31.1	56.0
0.19500	28.8	53.9
0.24500	29.0	51.9
0.34500	36.6	49.1
0.39500	40.5	47.9
0.44500	39.6	46.9
0.64000	20.9	46.0
0.79000	24.5	46.0
0.84000	25.2	46.0
1.23500	25.8	46.0
1.33500	27.0	46.0
1.87500	28.0	46.0
2.32000	28.7	46.0

Date: 08. Mar 05 10:20

2.37000	28.8	46.0
3.50500	23.5	46.0
4.39500	28.3	46.0
4.49500	27.6	46.0
6.02500	26.6	50.0
7.26000	21.5	50.0
8.84000	20.6	50.0
10.96500	21.3	50.0
12.99000	20.0	50.0
18.62000	15.9	50.0
23.41000	16.8	50.0
28.53500	18.1	50.0

* limit exceeded

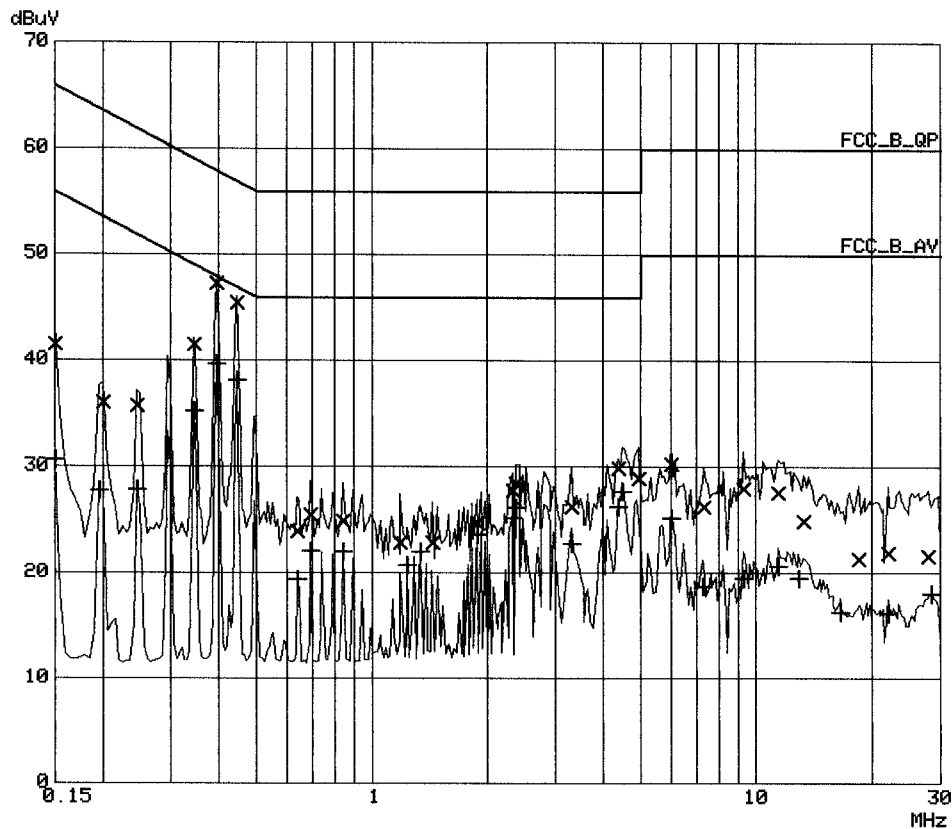
TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 11
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 2
 15.107 Conducted
 Date: 08. Mar 05 10:30

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Receive Ch 11
 Operator: Frank Harkins
 Test Spec: Part 15.107
 Comment: 120Vac 60Hz Line 2
 15.107 Conducted
 Date: 08. Mar 05 10:30

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	41.5	66.0
0.20000	36.0	63.6
0.24500	35.7	61.9
0.34500	41.5	59.1
0.39500	47.3	57.9
0.44500	45.5	56.9
0.64000	23.9	56.0
0.69000	25.5	56.0
0.84000	24.9	56.0
1.18500	22.8	56.0
1.43500	22.9	56.0
1.88000	24.6	56.0
2.32000	27.7	56.0
2.37000	28.4	56.0
3.31000	26.2	56.0
4.39500	29.9	56.0
4.94000	28.8	56.0
6.02500	30.2	60.0
7.31000	26.2	60.0
9.28500	27.9	60.0
11.41000	27.5	60.0
13.28500	24.8	60.0
18.52000	21.2	60.0
22.02500	21.8	60.0
27.96000	21.6	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.6	56.0
0.19500	27.8	53.9
0.24500	27.8	51.9
0.34500	35.2	49.1
0.39500	39.7	47.9
0.44500	38.1	46.9
0.64000	19.4	46.0
0.69000	22.0	46.0
0.84000	22.0	46.0
1.23500	20.7	46.0
1.33500	21.9	46.0
1.87500	23.6	46.0
2.32000	25.2	46.0

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Date: 08. Mar 05 10:30

2.37000	26.1	46.0
3.31000	22.7	46.0
4.39500	26.2	46.0
4.49500	27.7	46.0
6.02500	25.2	50.0
7.26000	18.6	50.0
9.28500	19.4	50.0
11.41000	20.6	50.0
12.89000	19.5	50.0
16.59500	16.3	50.0
22.02500	16.2	50.0
28.53500	18.0	50.0

* limit exceeded

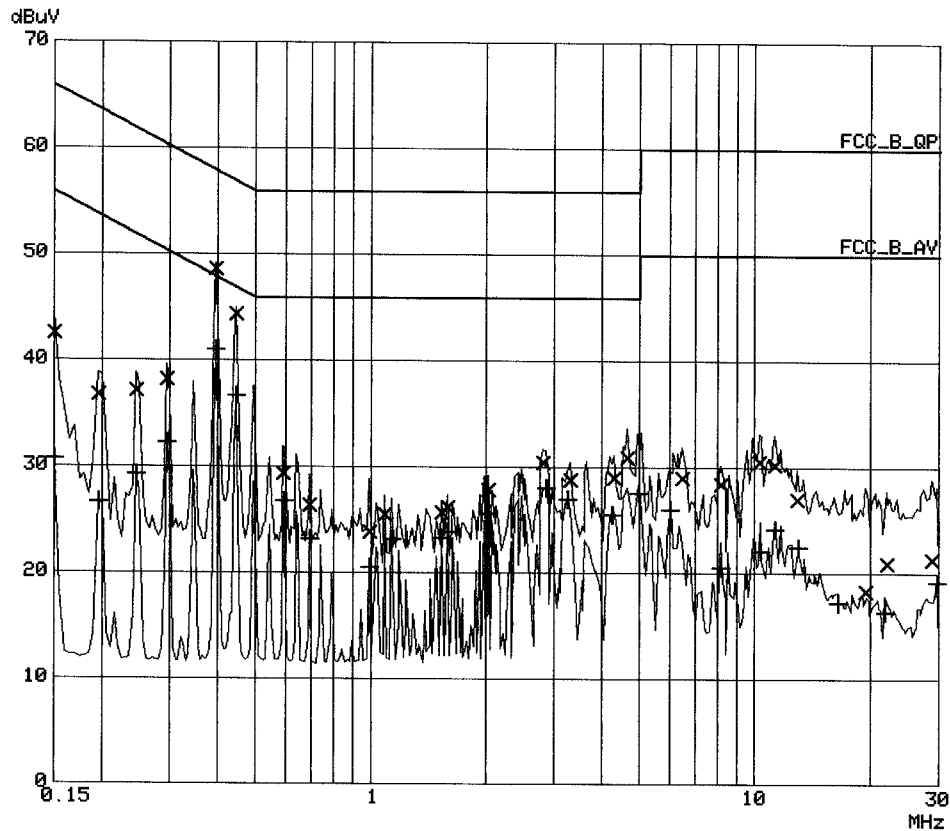
TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 1
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 1
 15.207 Conducted
 Date: 07. Mar 05 16:02

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dBLISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 1
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 1
 15.207 Conducted
 Date: 07. Mar 05 16:02

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.6	66.0
0.19500	36.8	63.9
0.24500	37.2	61.9
0.29500	38.2	60.3
0.39500	48.7	57.9
0.44500	44.4	56.9
0.59000	29.4	56.0
0.69000	26.4	56.0
0.99000	23.9	56.0
1.08500	25.5	56.0
1.53000	25.7	56.0
1.58000	26.2	56.0
2.02500	27.8	56.0
2.81500	30.4	56.0
3.31000	28.7	56.0
4.29500	29.0	56.0
4.64500	30.9	56.0
6.47000	29.0	60.0
8.15000	28.4	60.0
10.27500	30.5	60.0
11.26000	30.3	60.0
12.89000	27.0	60.0
19.44000	18.3	60.0
22.03500	20.9	60.0
28.79000	21.3	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.7	56.0
0.19500	26.7	53.9
0.24500	29.2	51.9
0.29500	32.3	50.3
0.39500	41.0	47.9
0.44500	36.7	46.9
0.59500	26.8	46.0
0.69000	23.2	46.0
0.99000	20.5	46.0
1.13500	23.2	46.0
1.53000	23.3	46.0
1.58000	23.8	46.0
2.02500	25.7	46.0

PAGE 2

Date: 07. Mar 05 16:02

2.86500	28.0	46.0
3.26000	27.0	46.0
4.24500	25.5	46.0
4.99000	27.6	46.0
6.02500	26.0	50.0
8.15000	20.5	50.0
10.32500	22.1	50.0
11.26000	24.1	50.0
12.99000	22.4	50.0
16.49500	17.2	50.0
21.78500	16.4	50.0
29.77500	19.2	50.0

* limit exceeded

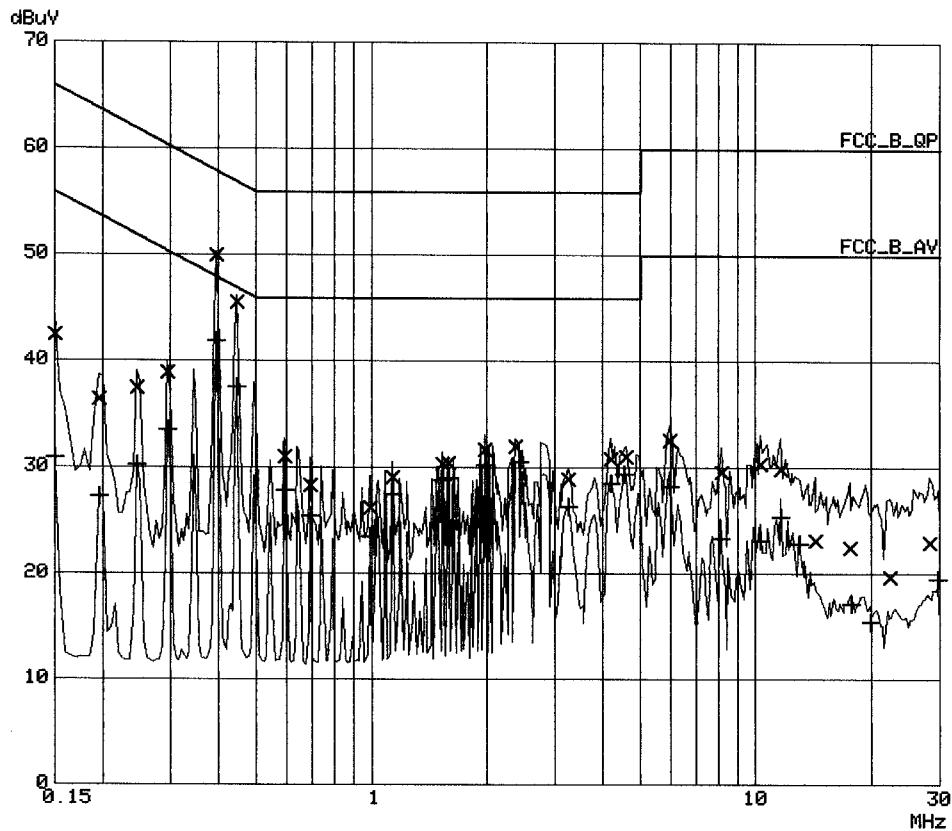
TUV America
Conducted Emissions
EUT: 9201
Manuf: Hughes Network Syst
Op Cond: Transmit chan 1
Operator: Frank Harkins
Test Spec: Part 15.207
Comment: 120Vac 60Hz Line 2
15.207 Conducted
Date: 07. Mar 05 16:16

Scan Settings (2 Ranges)

----- Frequencies -----			----- Receiver Settings -----					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
Meas Time: 1 s
Subranges: 25
Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 1
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 2
 15.207 Conducted
 Date: 07. Mar 05 16:16

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.5	66.0
0.19500	36.4	63.9
0.24500	37.4	61.9
0.29500	38.9	60.3
0.39500	49.9	57.9
0.44500	45.5	56.9
0.59500	31.0	56.0
0.69000	28.3	56.0
0.99000	26.2	56.0
1.13500	29.1	56.0
1.53000	30.3	56.0
1.58000	30.4	56.0
1.97500	31.7	56.0
2.37000	32.0	56.0
3.26000	28.9	56.0
4.20000	30.8	56.0
4.59000	31.0	56.0
5.97500	32.6	60.0
8.15000	29.5	60.0
10.27500	30.3	60.0
11.65500	29.9	60.0
14.27000	23.1	60.0
17.63000	22.4	60.0
22.37000	19.6	60.0
28.30000	22.9	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.9	56.0
0.19500	27.2	53.9
0.24500	30.2	51.9
0.29500	33.5	50.3
0.39500	41.9	47.9
0.44500	37.6	46.9
0.59500	27.8	46.0
0.69000	25.4	46.0
0.99000	23.5	46.0
1.13500	27.5	46.0
1.53000	28.8	46.0
1.58000	28.9	46.0
1.97500	30.2	46.0

PAGE 2

Date: 07. Mar 05 16:16

2.42000	30.5	46.0
3.26000	26.2	46.0
4.20000	28.5	46.0
4.54500	29.4	46.0
5.97500	28.2	50.0
8.10000	23.3	50.0
10.27500	23.1	50.0
11.65500	25.4	50.0
12.94000	22.8	50.0
17.73000	17.2	50.0
19.85500	15.4	50.0
29.77500	19.4	50.0

* limit exceeded

TUV America Conducted Emissions

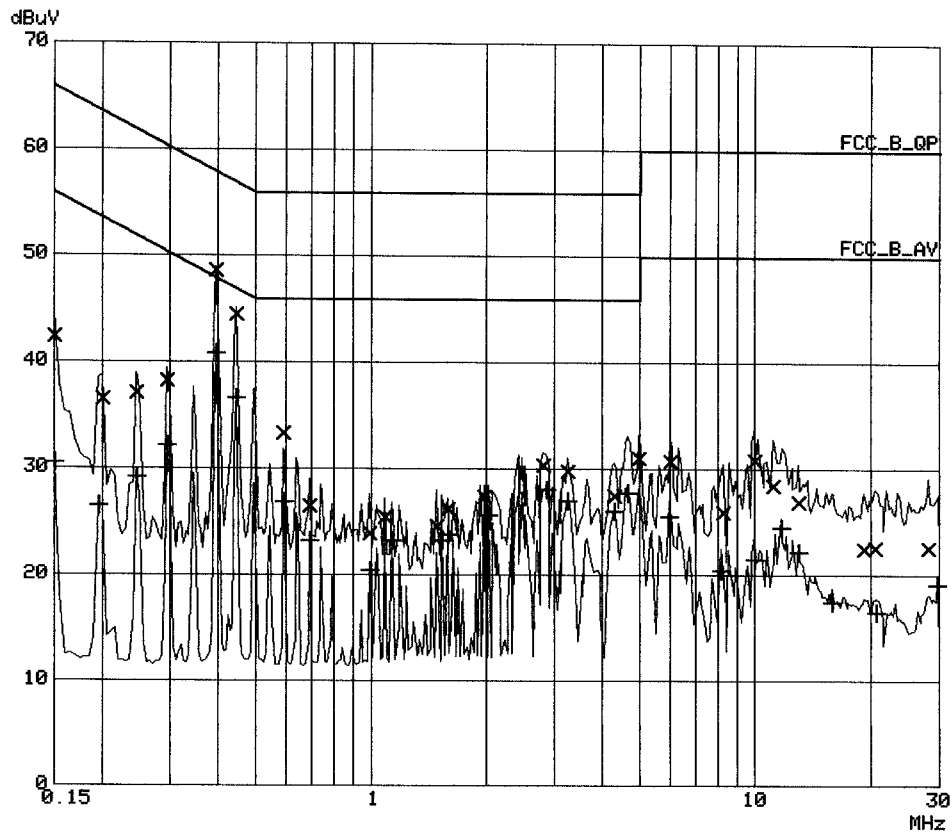
EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 6
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 1
 15.207 Conducted
 Date: 07. Mar 05 16:42

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 6
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 1
 15.207 Conducted
 Date: 07. Mar 05 16:42

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.4	66.0
0.20000	36.5	63.6
0.24500	37.1	61.9
0.29500	38.2	60.3
0.39500	48.6	57.9
0.44500	44.5	56.9
0.59000	33.3	56.0
0.69000	26.4	56.0
0.99000	23.9	56.0
1.08500	25.5	56.0
1.48000	24.6	56.0
1.58000	26.2	56.0
1.97500	27.4	56.0
2.81500	30.4	56.0
3.26000	29.7	56.0
4.30000	27.5	56.0
4.99000	31.1	56.0
6.02500	30.8	60.0
8.24500	25.9	60.0
9.97500	30.8	60.0
11.16500	28.4	60.0
12.94000	26.8	60.0
19.16000	22.5	60.0
20.55000	22.5	60.0
28.20500	22.5	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.5	56.0
0.19500	26.5	53.9
0.24500	29.2	51.9
0.29500	32.2	50.3
0.39500	40.9	47.9
0.44500	36.6	46.9
0.59500	26.9	46.0
0.69000	23.3	46.0
0.99000	20.4	46.0
1.13500	23.2	46.0
1.53000	23.2	46.0
1.58000	23.8	46.0
2.02500	25.6	46.0

Date: 07. Mar 05 16:42

2.86500	28.0	46.0
3.26000	26.9	46.0
4.29500	26.0	46.0
4.64500	27.8	46.0
5.97500	25.5	50.0
8.15000	20.4	50.0
9.97500	21.5	50.0
11.70500	24.4	50.0
12.94000	22.1	50.0
15.90500	17.4	50.0
20.60000	16.5	50.0
29.77500	19.1	50.0

* limit exceeded

TUV America Conducted Emissions

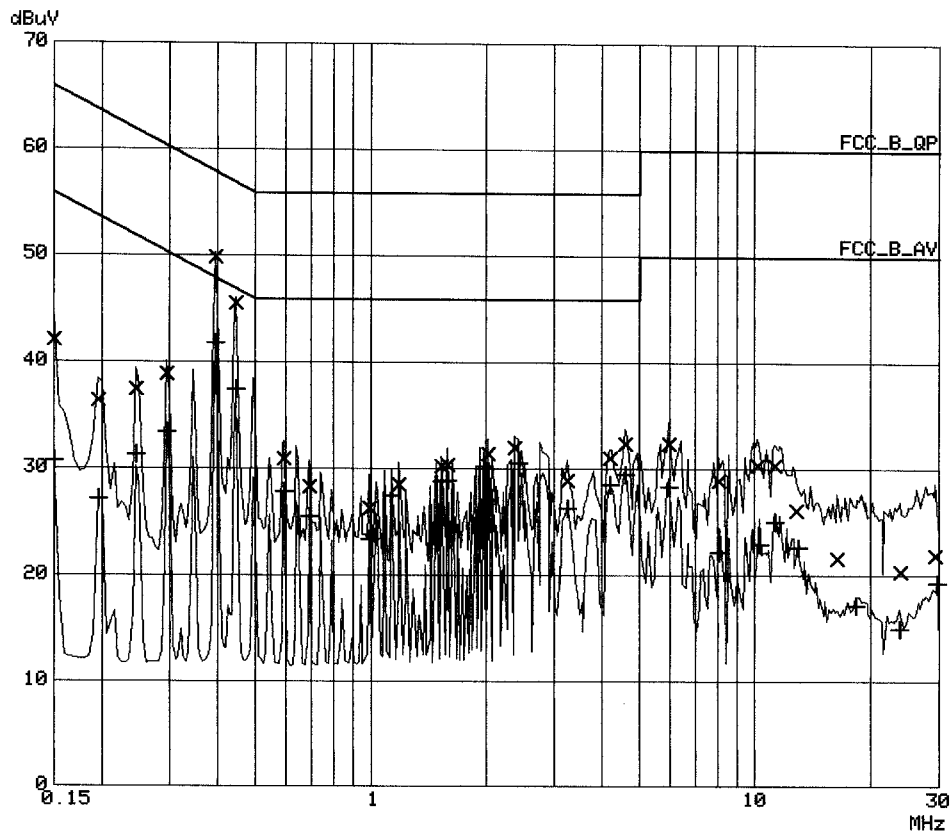
EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 6
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 2
 15.207 Conducted
 Date: 07. Mar 05 16:30

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dB LISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 6
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 2
 15.207 Conducted
 Date: 07. Mar 05 16:30

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.1	66.0
0.19500	36.4	63.9
0.24500	37.4	61.9
0.29500	38.9	60.3
0.39500	49.9	57.9
0.44500	45.5	56.9
0.59500	31.0	56.0
0.69000	28.3	56.0
0.99000	26.3	56.0
1.18500	28.5	56.0
1.53000	30.3	56.0
1.58000	30.4	56.0
2.02500	31.4	56.0
2.37000	32.0	56.0
3.26000	28.9	56.0
4.20000	31.0	56.0
4.59500	32.4	56.0
5.97500	32.4	60.0
8.05000	28.9	60.0
10.17500	30.3	60.0
11.26000	30.4	60.0
12.84000	26.1	60.0
16.40000	21.6	60.0
23.80500	20.3	60.0
29.40000	21.9	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.7	56.0
0.19500	27.2	53.9
0.24500	31.3	51.9
0.29500	33.4	50.3
0.39500	41.8	47.9
0.44500	37.5	46.9
0.59500	27.8	46.0
0.69000	25.5	46.0
0.99000	23.4	46.0
1.13500	27.5	46.0
1.53000	28.8	46.0
1.58000	28.9	46.0
1.97500	30.2	46.0

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Date:	07. Mar 05	16:30
2.42000	30.5	46.0
3.26000	26.3	46.0

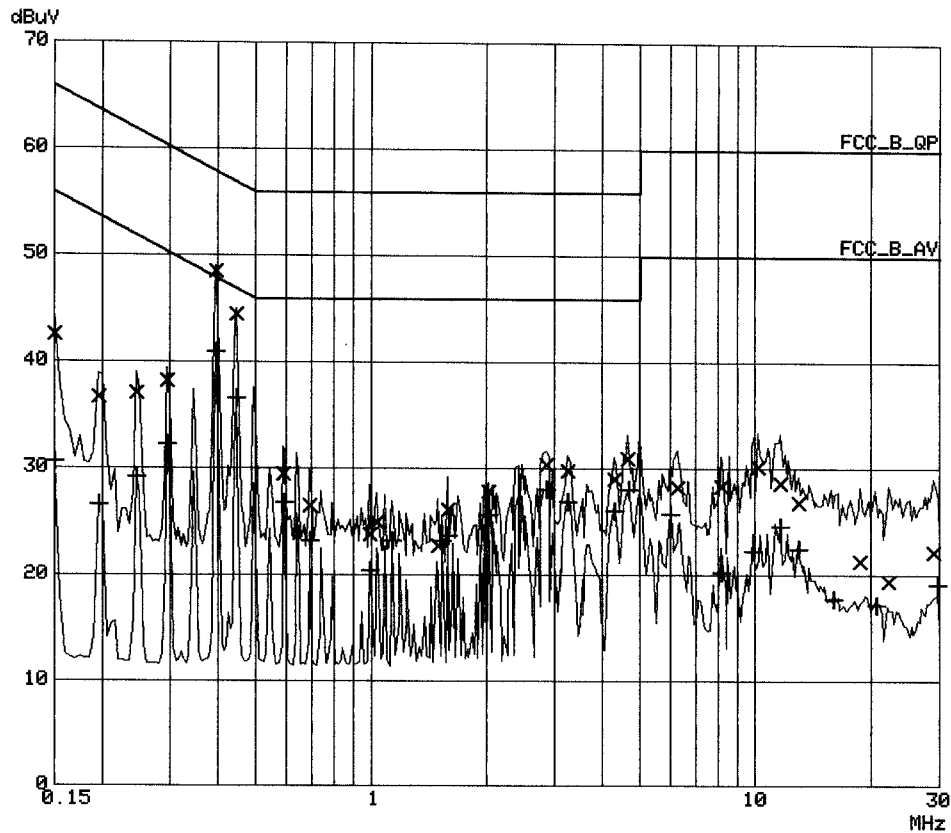
TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 11
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 1
 15.207 Conducted
 Date: 07. Mar 05 16:52

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dBLISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 11
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 1
 15.207 Conducted
 Date: 07. Mar 05 16:52

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.5	66.0
0.19500	36.7	63.9
0.24500	37.1	61.9
0.29500	38.2	60.3
0.39500	48.6	57.9
0.44500	44.5	56.9
0.59000	29.5	56.0
0.69000	26.5	56.0
0.99000	23.8	56.0
1.03500	25.0	56.0
1.48500	22.7	56.0
1.58000	26.1	56.0
2.02500	27.8	56.0
2.86500	30.4	56.0
3.26000	29.7	56.0
4.29500	29.0	56.0
4.64500	30.9	56.0
6.27000	28.2	60.0
8.15000	28.3	60.0
10.17500	30.2	60.0
11.61000	28.6	60.0
12.99000	26.8	60.0
18.71500	21.3	60.0
22.22000	19.3	60.0
28.95000	22.2	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.6	56.0
0.19500	26.5	53.9
0.24500	29.1	51.9
0.29500	32.2	50.3
0.39500	40.9	47.9
0.44500	36.6	46.9
0.59500	26.8	46.0
0.69000	23.2	46.0
0.99000	20.5	46.0
1.13500	23.2	46.0
1.53000	23.2	46.0
1.58000	23.7	46.0
2.02500	25.6	46.0

PAGE 2

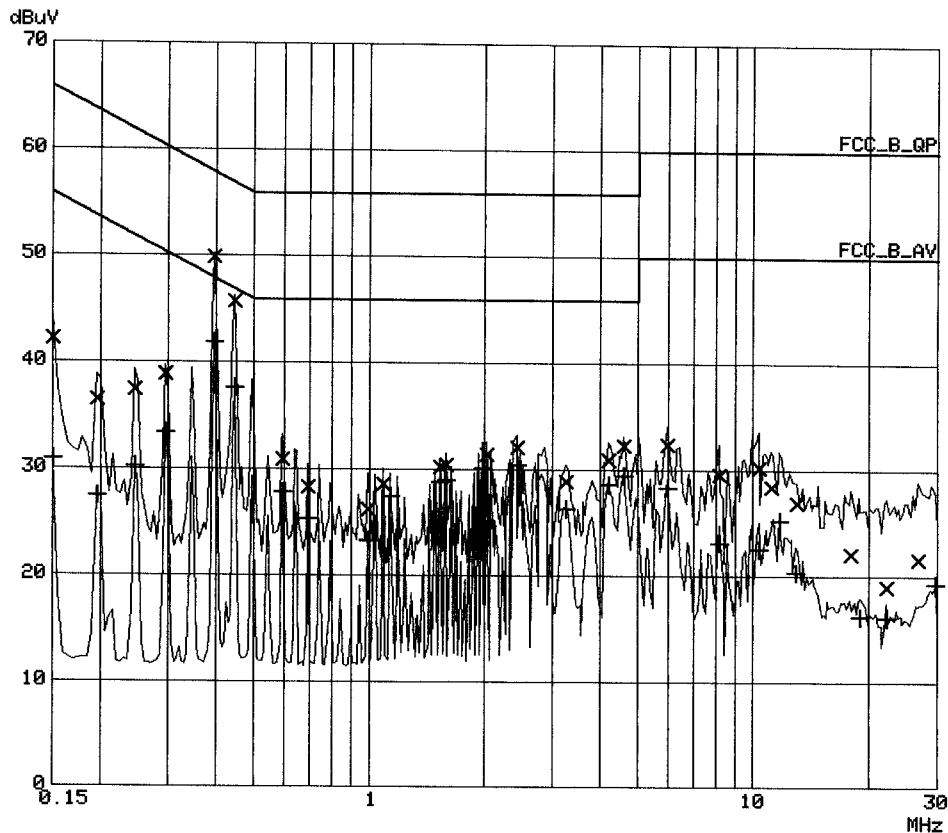
TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 11
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 2
 15.207 Conducted
 Date: 07. Mar 05 17:06

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150k	1M	5k	10k	PK+AV	100ms	AUTO	LN OFF	60dB
1M	30M	5k	10k	PK+AV	2ms	AUTO	LN OFF	60dB

Transducer No.	Start	Stop	Name
1	20k	30M	20dBLISN

Final Measurement: x QP / + AV
 Meas Time: 1 s
 Subranges: 25
 Acc Margin: 35dB



TUV America
 Conducted Emissions
 EUT: 9201
 Manuf: Hughes Network Syst
 Op Cond: Transmit chan 11
 Operator: Frank Harkins
 Test Spec: Part 15.207
 Comment: 120Vac 60Hz Line 2
 15.207 Conducted
 Date: 07. Mar 05 17:06

Final Measurement Results:

Frequency MHz	QP Level dBuV	QP Limit dBuV
0.15000	42.2	66.0
0.19500	36.5	63.9
0.24500	37.4	61.9
0.29500	38.9	60.3
0.39500	49.8	57.9
0.44500	45.8	56.9
0.59500	31.0	56.0
0.69000	28.3	56.0
0.99000	26.2	56.0
1.08500	28.6	56.0
1.53000	30.3	56.0
1.58000	30.4	56.0
2.02500	31.4	56.0
2.42000	32.1	56.0
3.26000	28.9	56.0
4.20000	30.9	56.0
4.59500	32.3	56.0
5.97500	32.3	60.0
8.15000	29.6	60.0
10.32500	30.2	60.0
11.11500	28.5	60.0
12.99000	26.9	60.0
17.93000	22.1	60.0
22.18500	19.0	60.0
26.77000	21.6	60.0

Frequency MHz	AV Level dBuV	AV Limit dBuV
0.15000	30.9	56.0
0.19500	27.4	53.9
0.24500	30.2	51.9
0.29500	33.5	50.3
0.39500	41.9	47.9
0.44500	37.6	46.9
0.59500	27.8	46.0
0.69000	25.3	46.0
0.99000	23.3	46.0
1.13500	27.4	46.0
1.53000	28.7	46.0
1.58000	28.9	46.0
1.97500	30.1	46.0

Date: 07. Mar 05 17:06

2.42000	30.5	46.0
3.26000	26.2	46.0
4.20000	28.6	46.0
4.59500	29.5	46.0
5.97500	28.3	50.0
8.15000	23.1	50.0
10.37000	22.5	50.0
11.70500	25.2	50.0
12.89000	20.3	50.0
18.91500	16.2	50.0
22.13000	16.1	50.0
29.77500	19.3	50.0

* limit exceeded

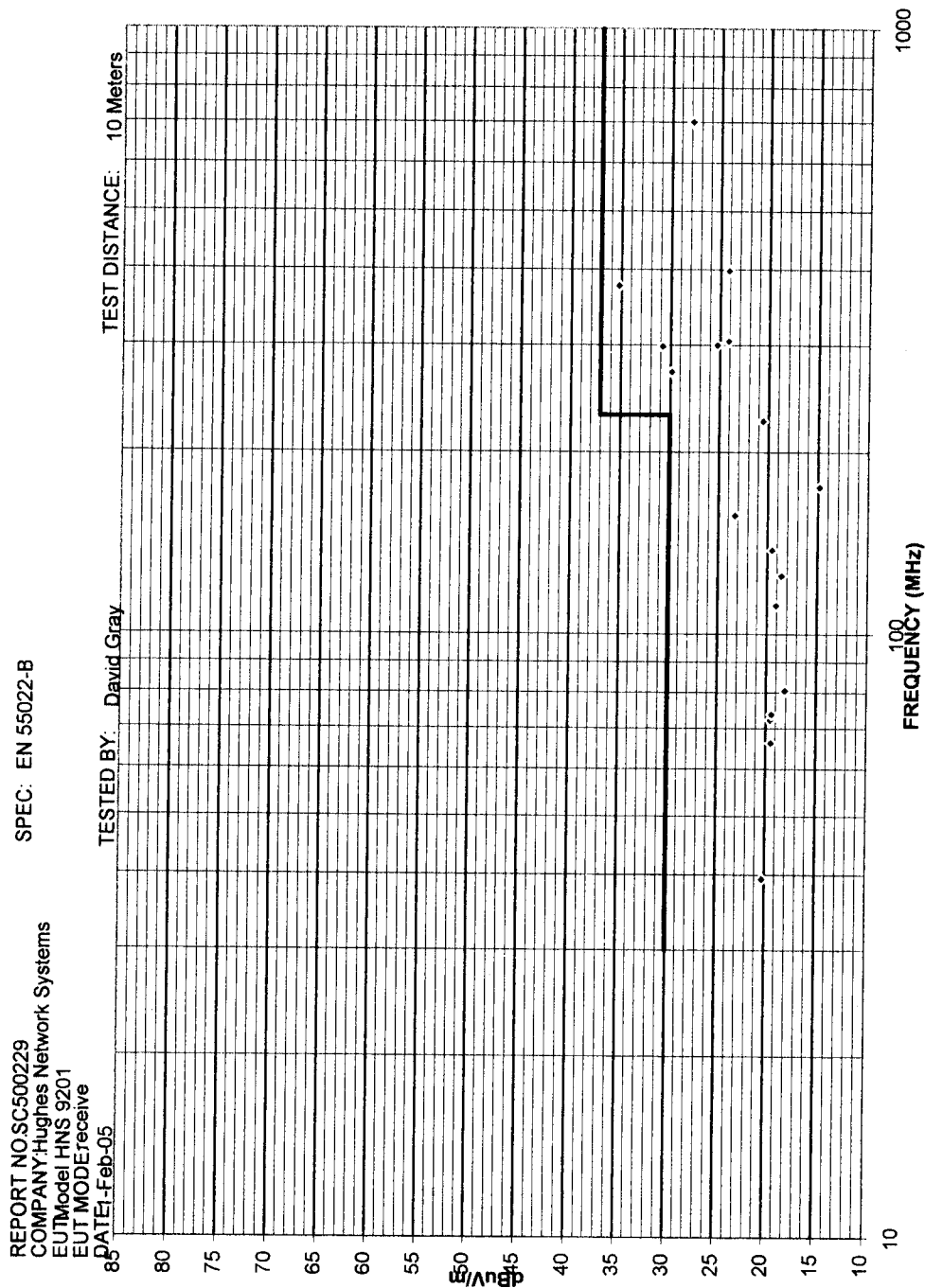
4.0 RADIATED EMISSIONS EQUIPMENT/DATA**Test Conditions: RADIATED EMISSIONS: FCC Part 15.109(a) and 15.209(a)****The measurements were performed at the San Diego Testing Facility:**☐ - Test not applicable

- - Roof (Small Open Area Test Site)
- - Canyon #1 (10- and 30-Meter Open Area Test Site), Carroll Canyon, San Diego

Test Equipment Used:

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
LPB 2520/A	739	Antenna, Bilog	Antenna Research	1170	06/04
ESVS 30	427	EMI Test Receiver	Rhode & Schwarz	830350/006	01/05
8566B	6675	Spectrum Analyzer	Hewlett Packard	2332A02751	08/04
3146	6670	Log Periodic Antenna	EMCO	1063	07/04

Remarks: One year calibration cycle for all test equipment and sites.



SPEC: EN 55022-B

TEST DIST: 10 Meters

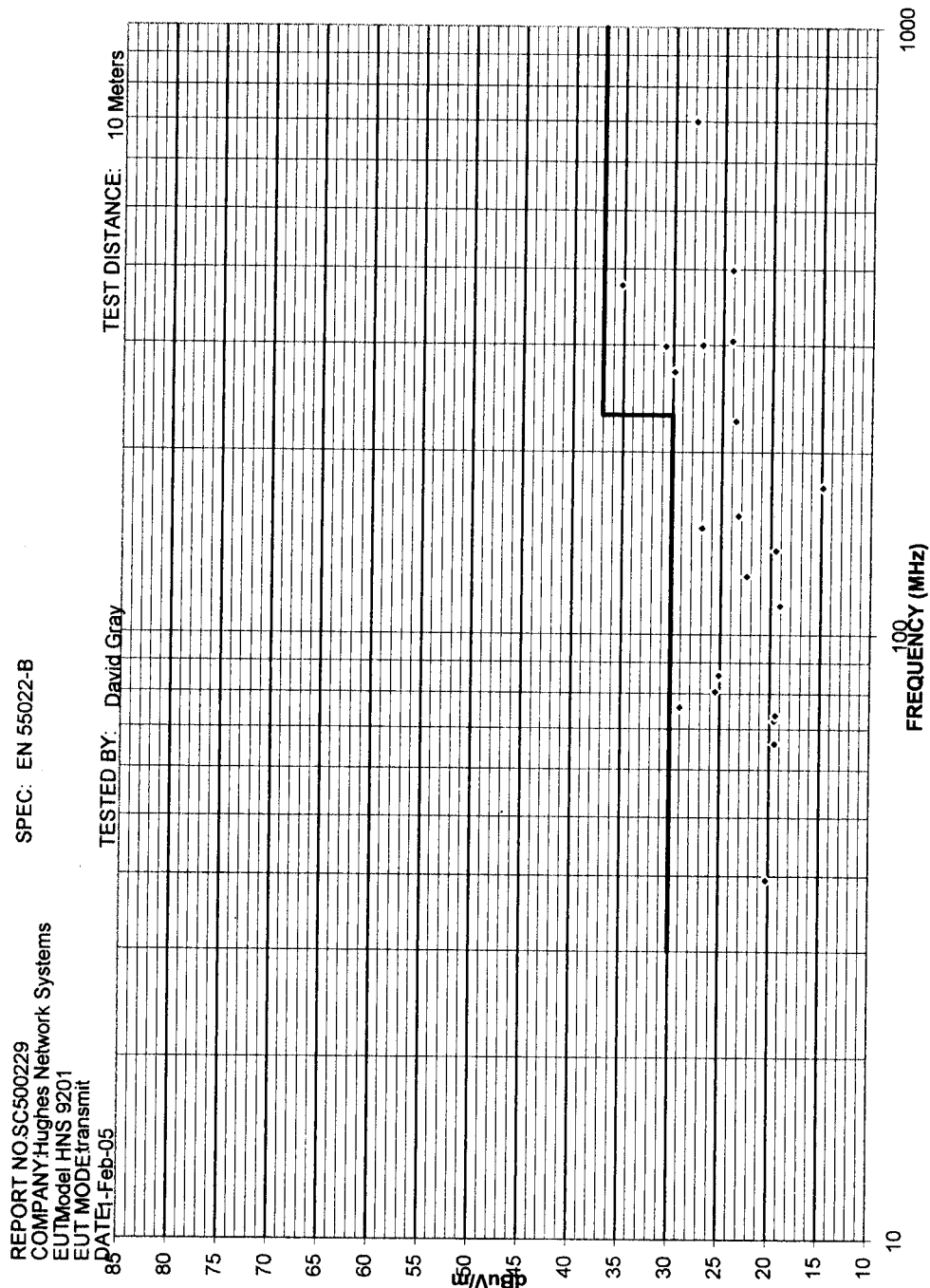
TEST SITE: 1

BICONICAL: 739

LOG PERIODIC: 739

RCVR: 427

TÜV AMERICA INC 10040 Mesa Rim Road San Diego, CA 92121-2912 Phone 858 678 1400 FAX 858 546 0364



SPEC: EN 55022-B

TEST DIST: 10 Meters

TEST SITE: 1

BICONICAL: 739

LOG PERIODIC: 739

NOTES: Quasi-Peak with 120 KHz measurement bandwidth. RCVR: 427
230Vac input

[illegible]

[illegible]

**5.0 BANDWIDTH EMISSIONS EQUIPMENT/DATA
POWER OUTPUT EMISSIONS EQUIPMENT/DATA
RADIATED SPURIOUS EMISSIONS EQUIPMENT/DATA
RESTRICTED BANDS AND BANDEDGE EQUIPMENT/DATA
POWER SPECTRAL DENSITY EQUIPMENT/DATA**

**Test Conditions: BANDWIDTH EMISSIONS EQUIPMENT/DATA: FCC Part 15.247(a)
POWER OUTPUT EMISSIONS EQUIPMENT/DATA: FCC Part 15.247(b)
RADIATED SPURIOUS EMISSIONS EQUIPMENT/DATA: FCC Part 15.247(c)
RESTRICTED BANDS AND BANDEDGE EQUIPMENT/DATA: FCC Part 15.247(c)
POWER SPECTRAL DENSITY EQUIPMENT/DATA: FCC Part 15.247(d)**

The measurements were performed at the San Diego Testing Facility:

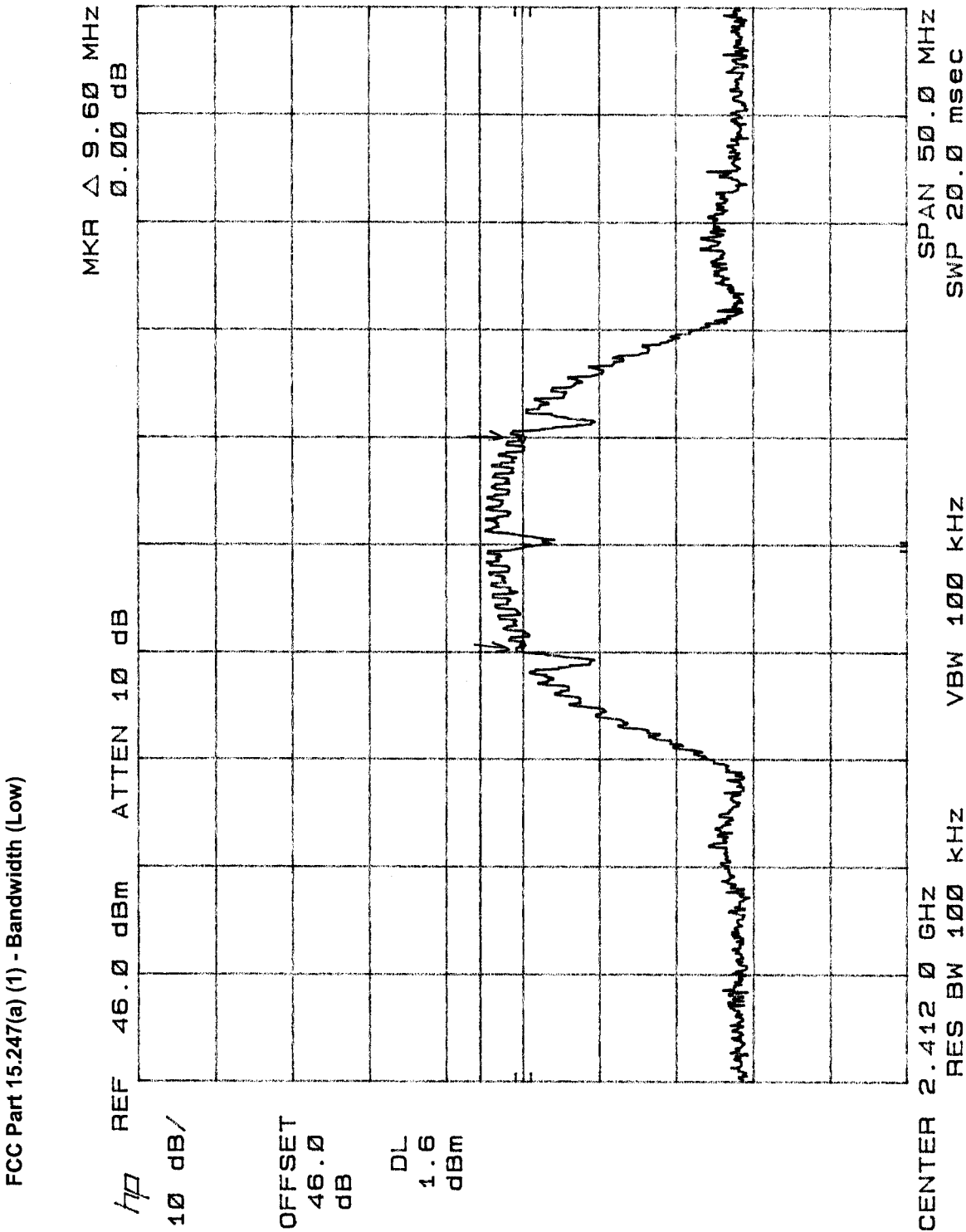
☐ - Test not applicable

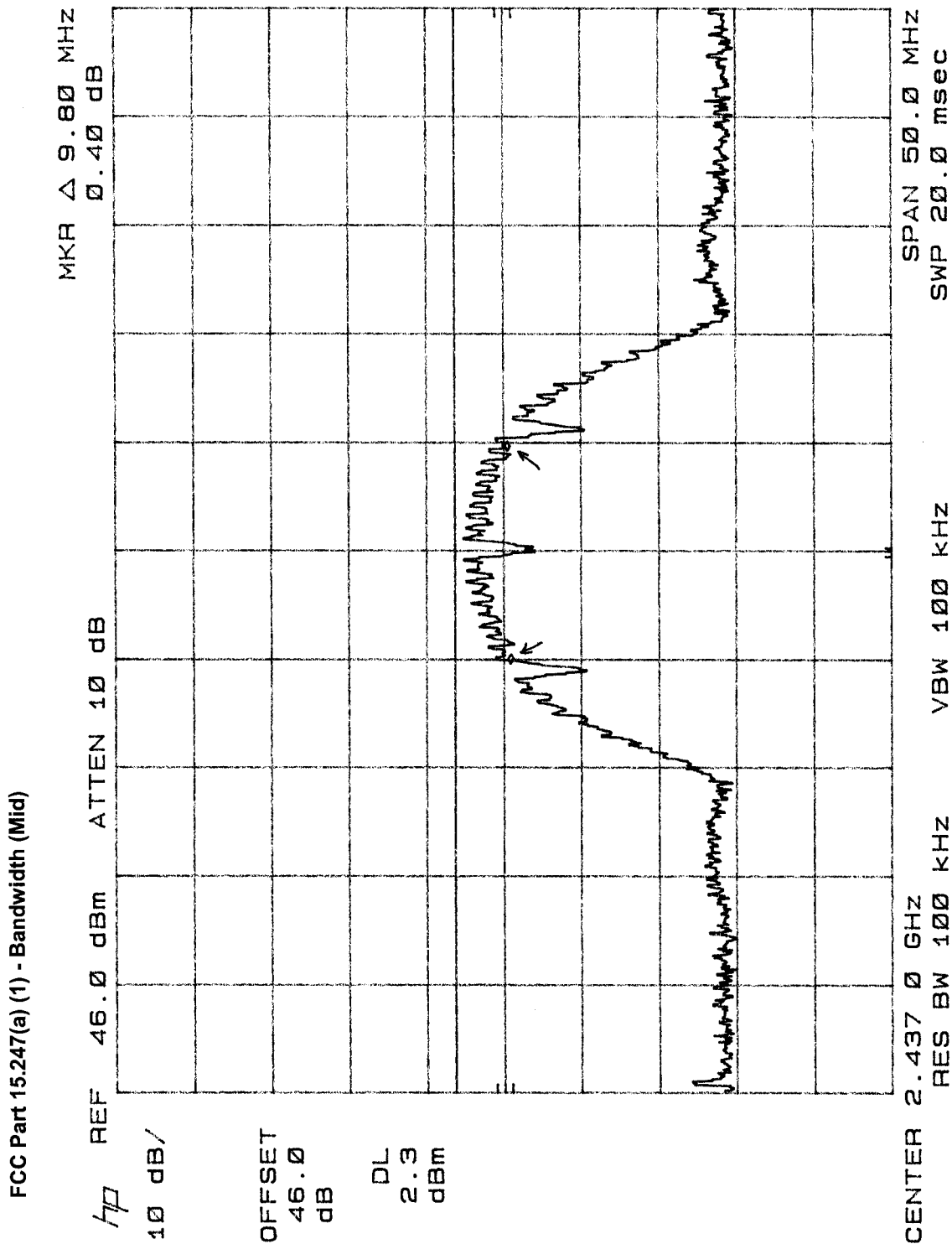
■ - Roof (Small Open Area Test Site)

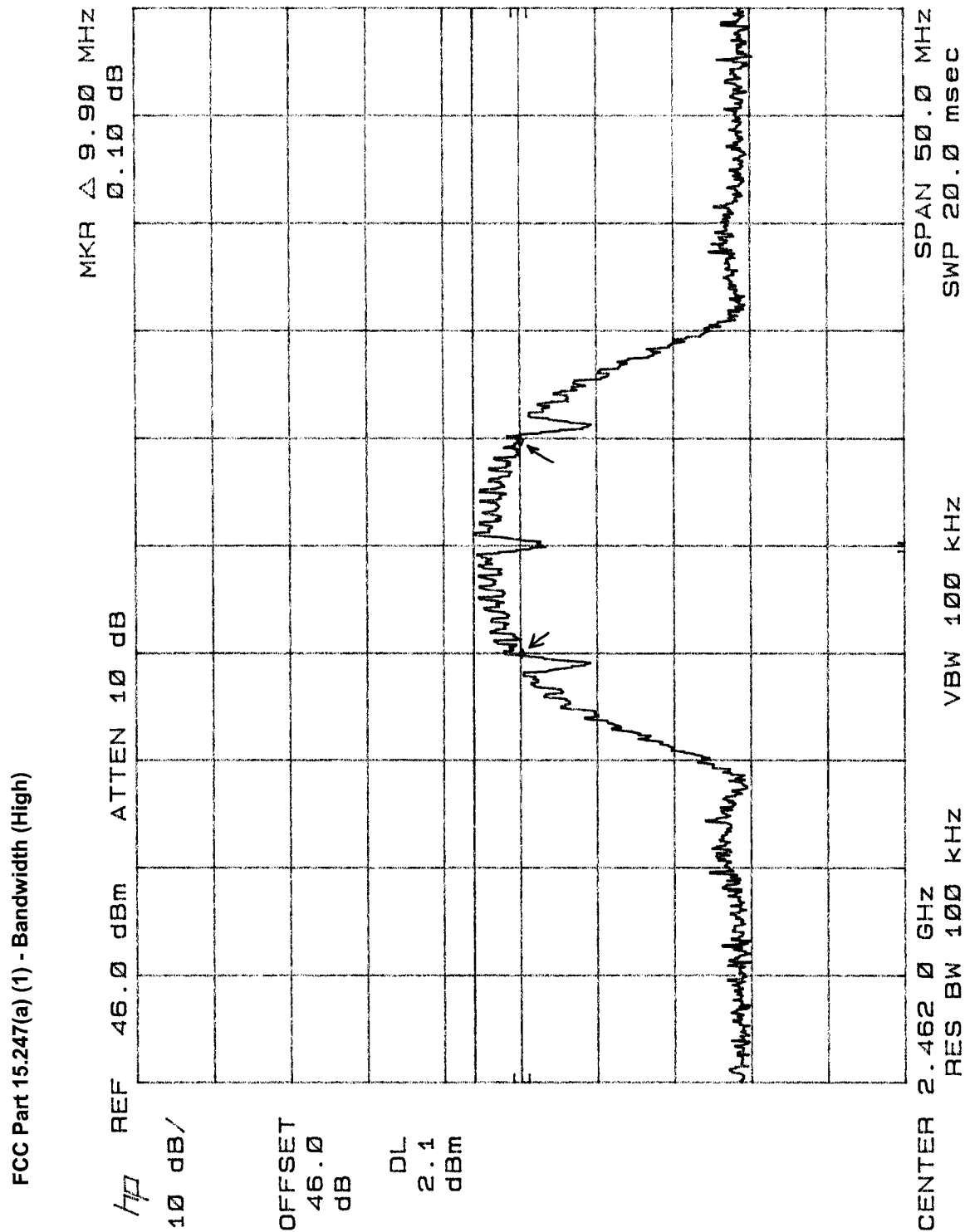
Test Equipment Used:

Model No.	Prop. No.	Description	Manufacturer	Serial No.	Cal Date
3115	453	Horn Antenna	Electro Mechanics Co	3564	02/05
8566B	6675	Spectrum Analyzer	Hewlett Packard	2332A02751	08/04
AMF-5D-010180-35-10P	719	PreAmplifier	Miteq	549460	04/04
BRM50702	6815	2.4 to 2.5 GHz Band Reject Filter	Micro-Tronics	008	08/04

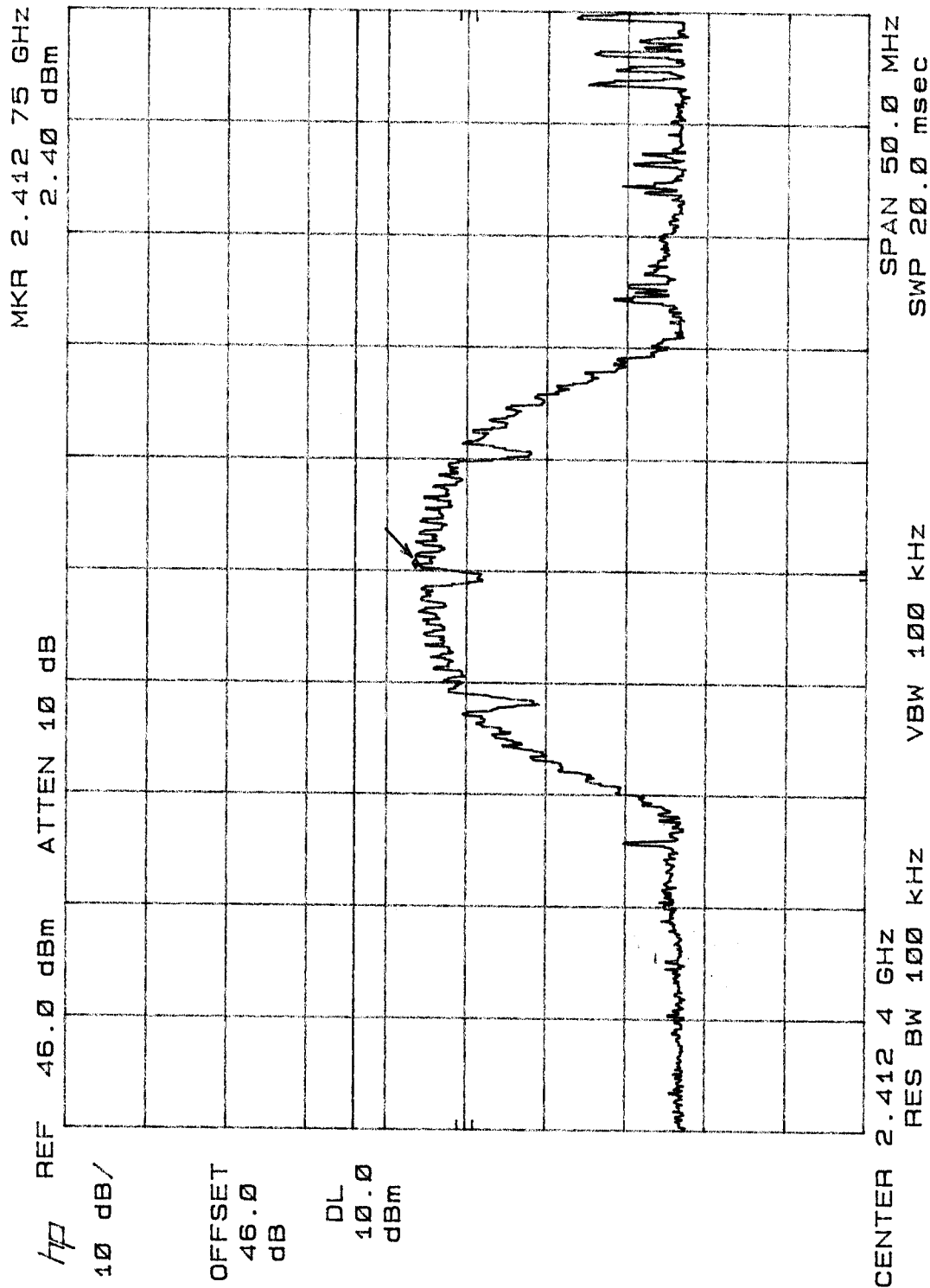
Remarks: One year calibration cycle for all test equipment and sites.

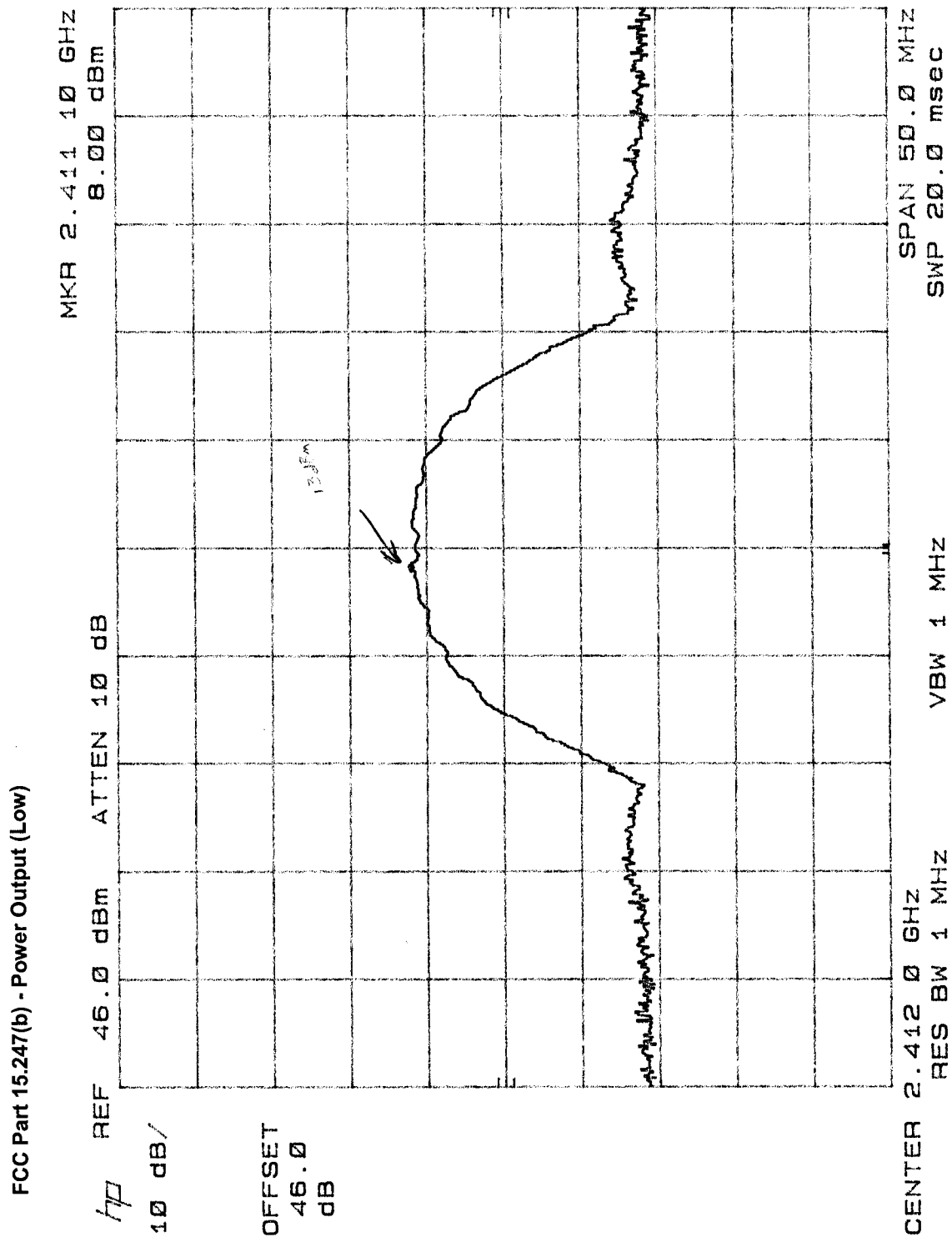


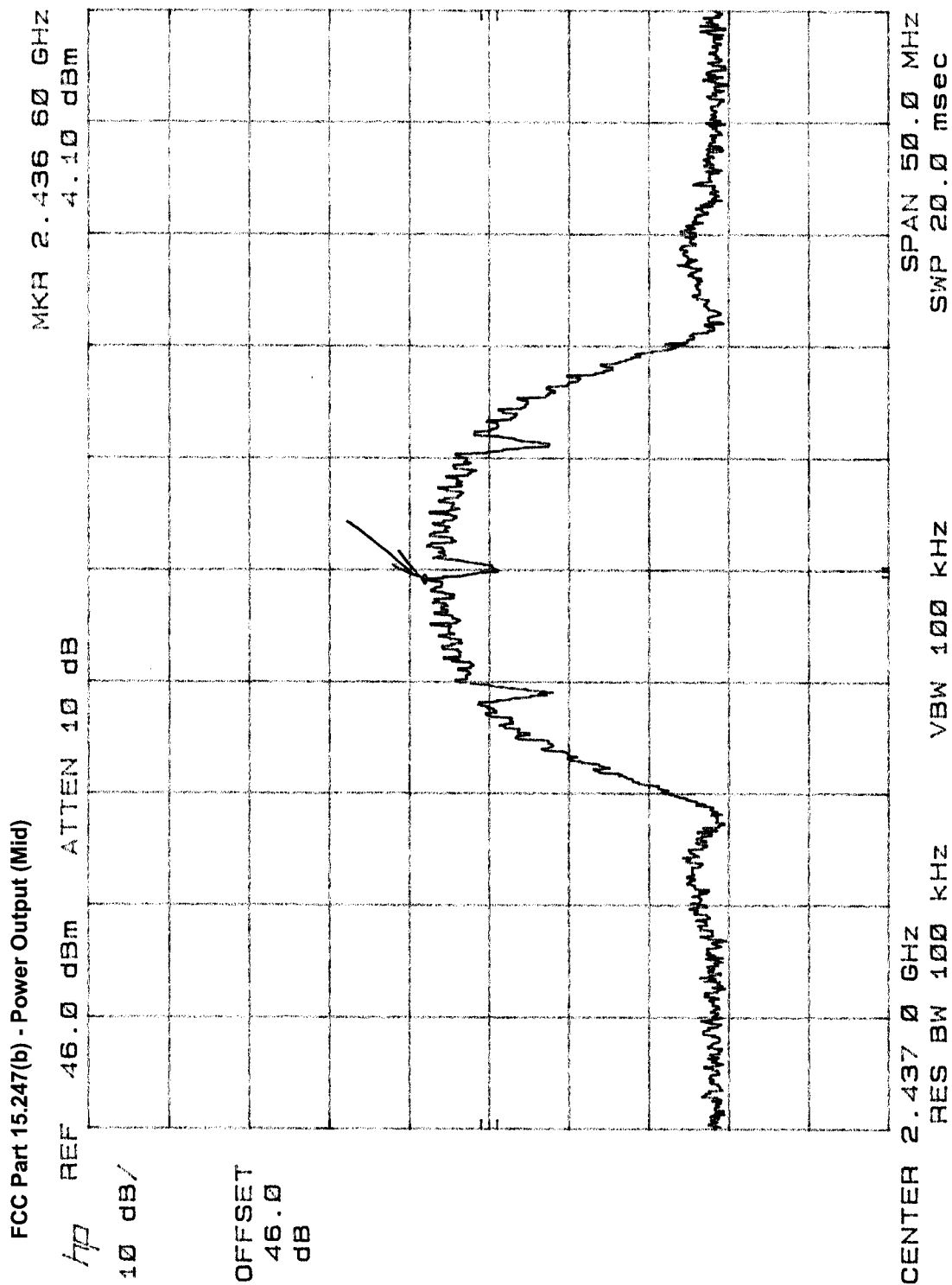


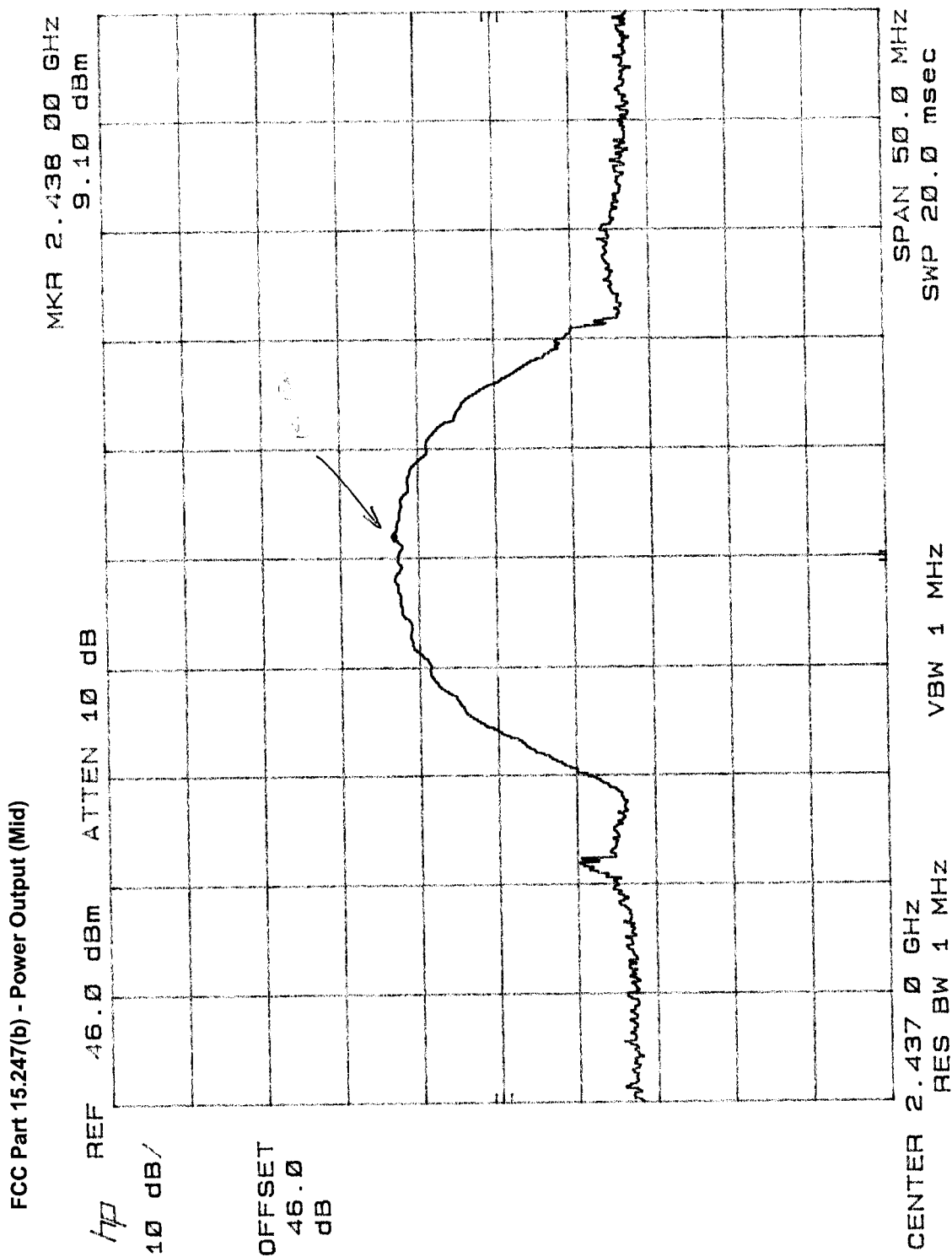


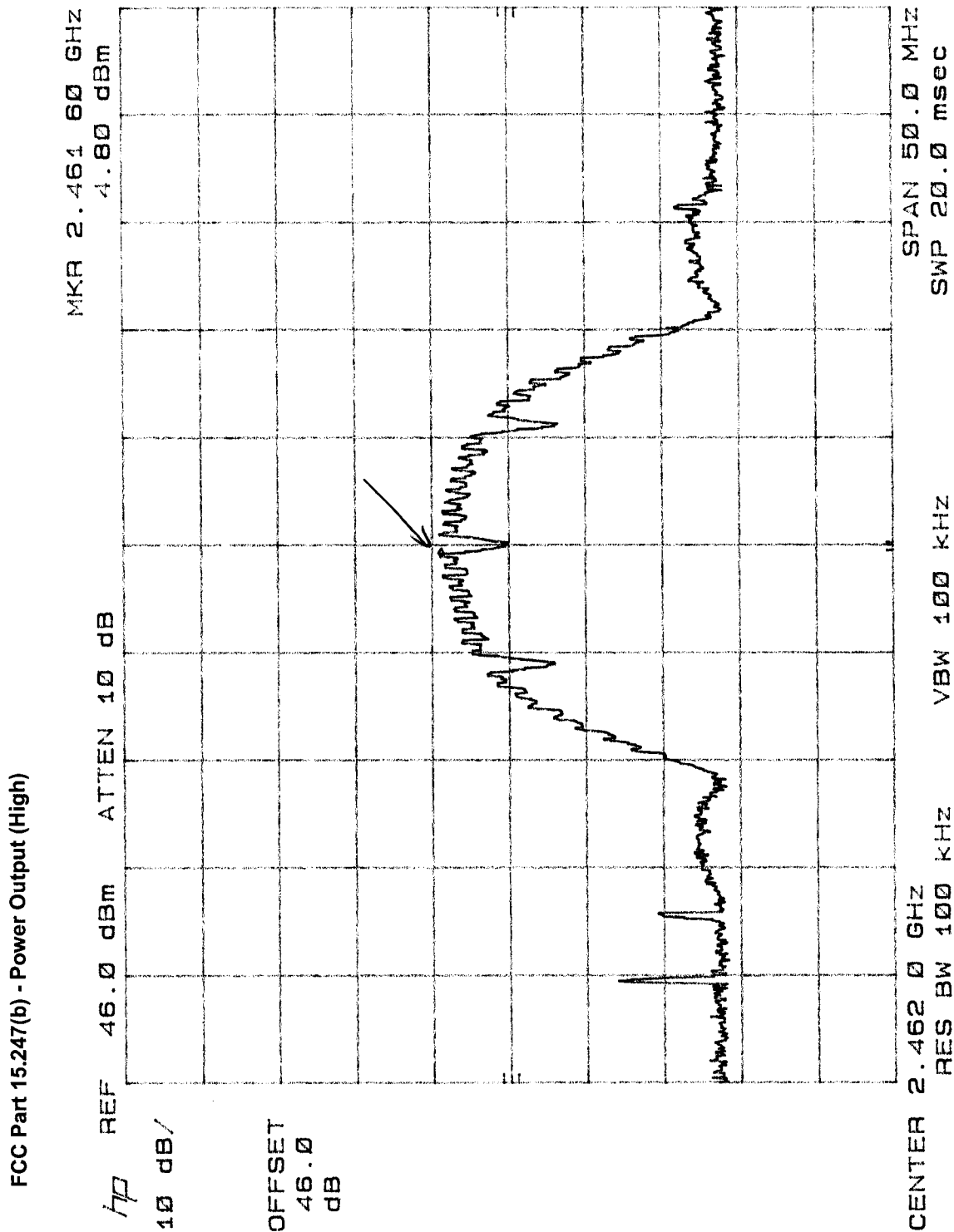
FCC Part 15.247(b) - Power Output (Low)

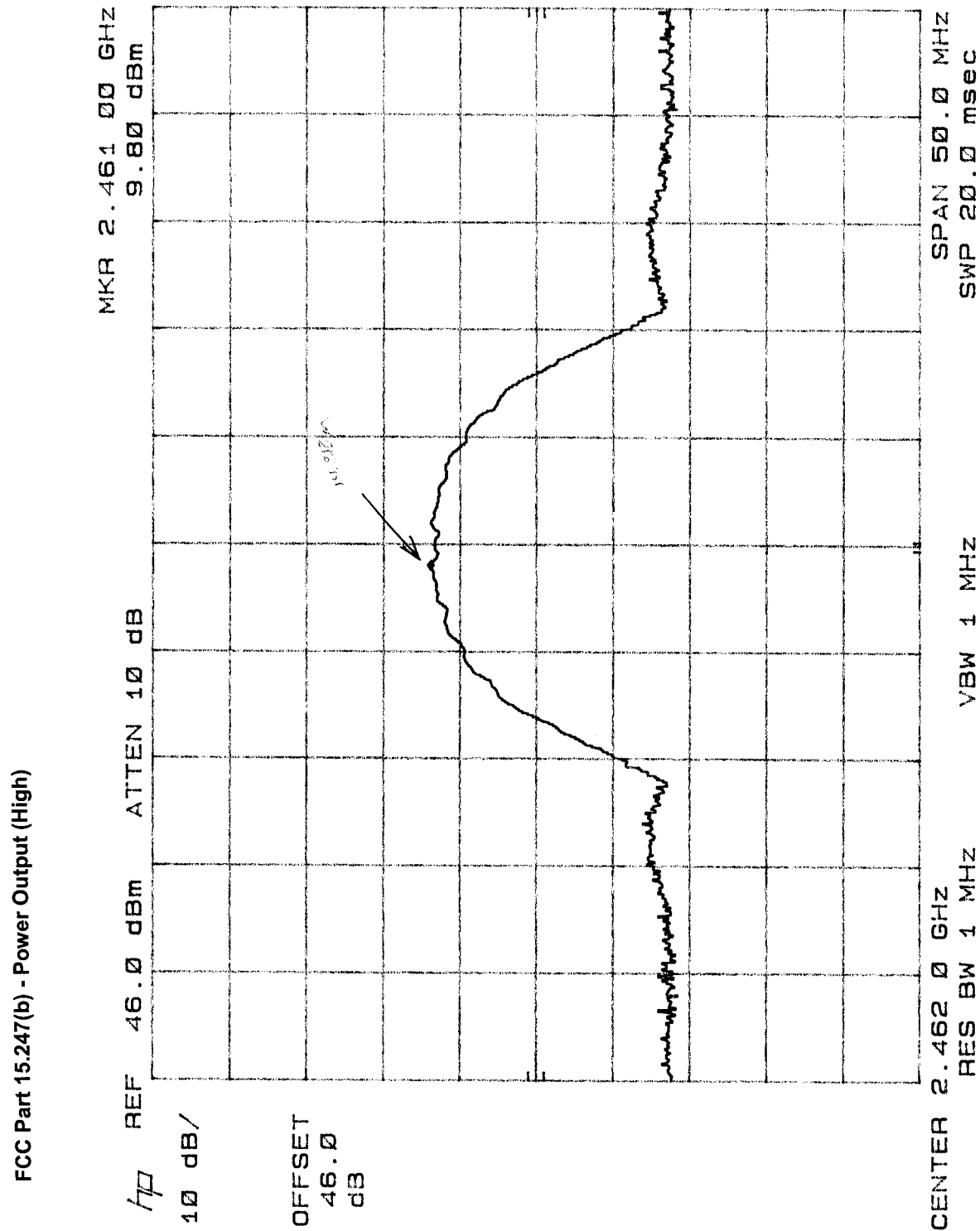


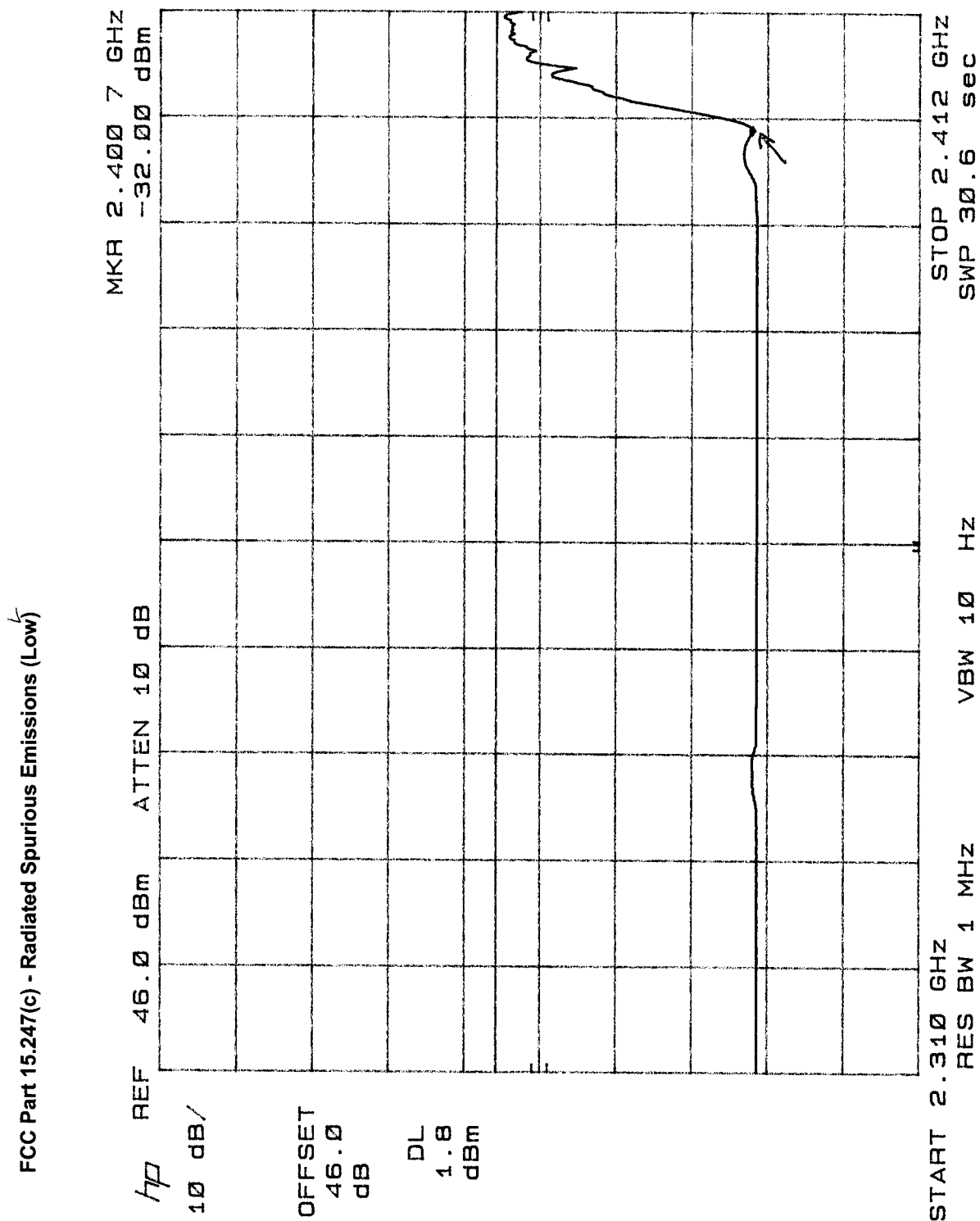


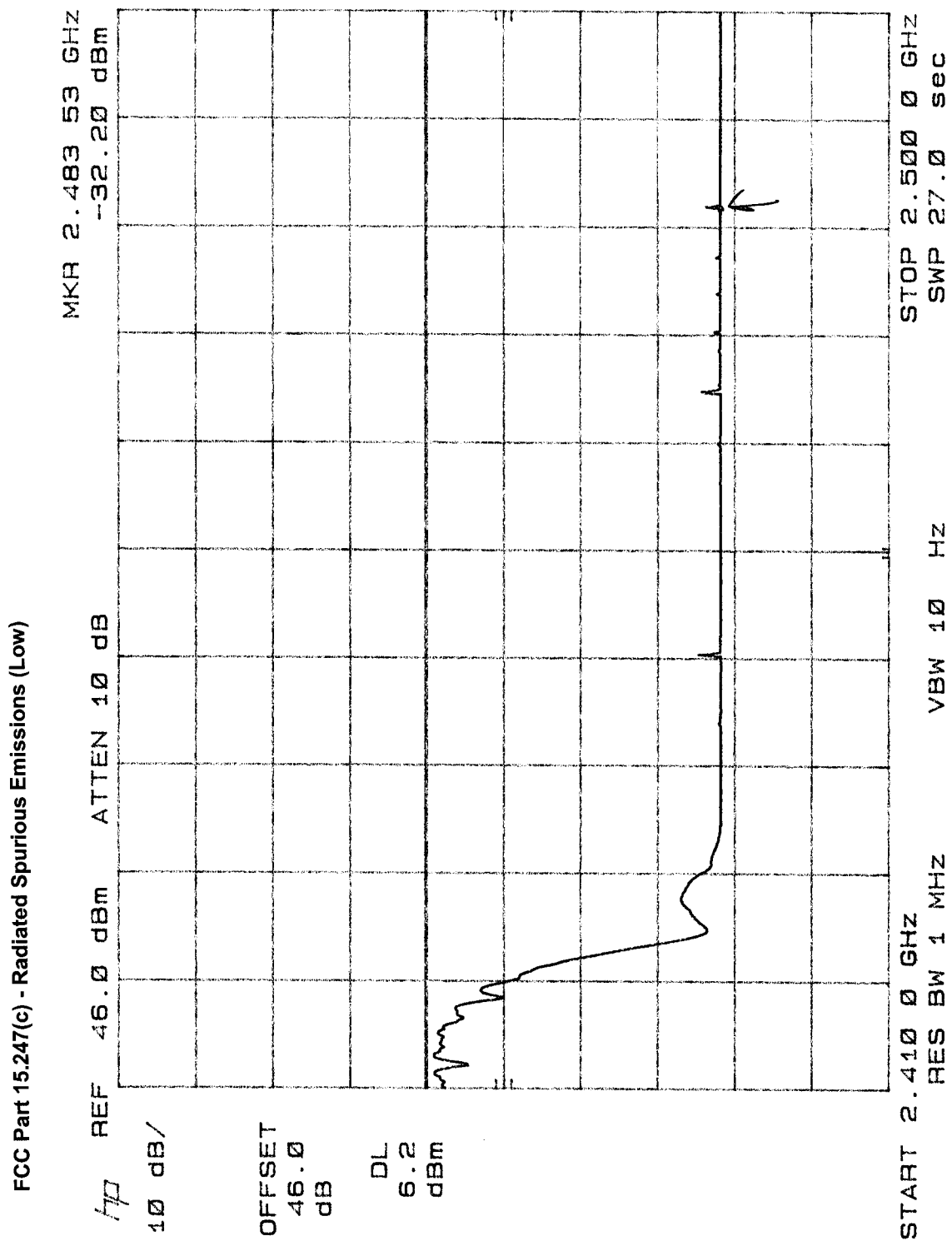


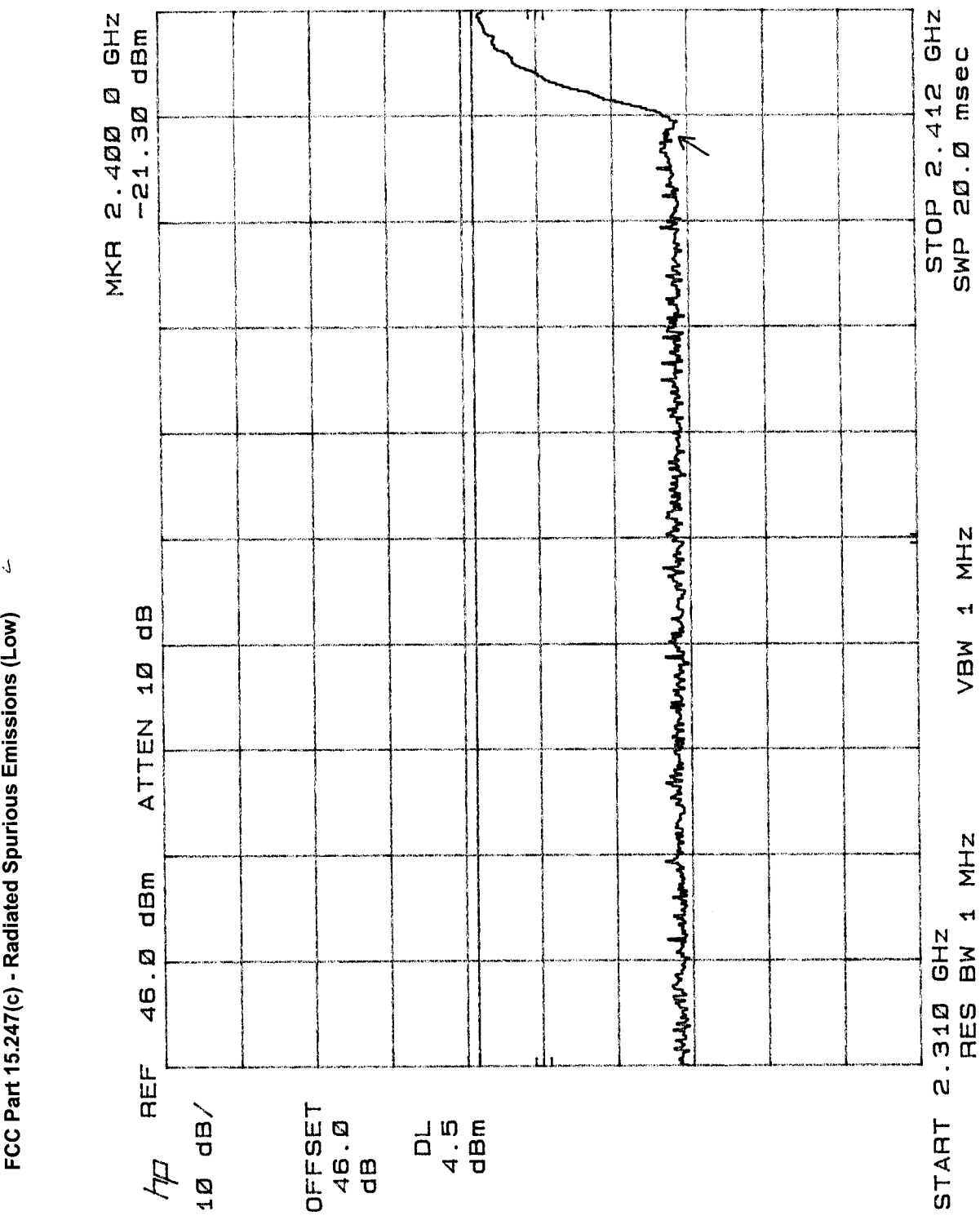




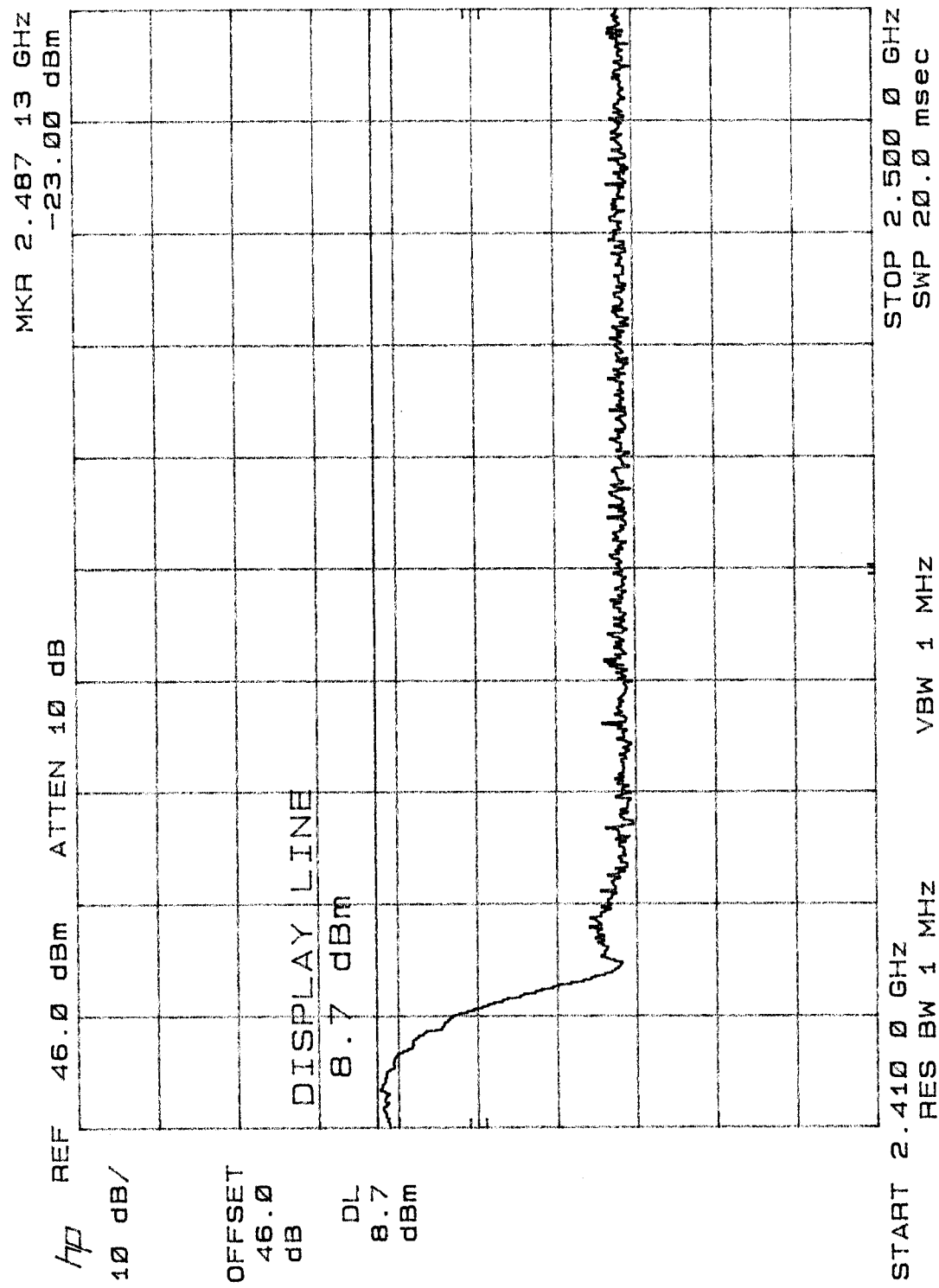




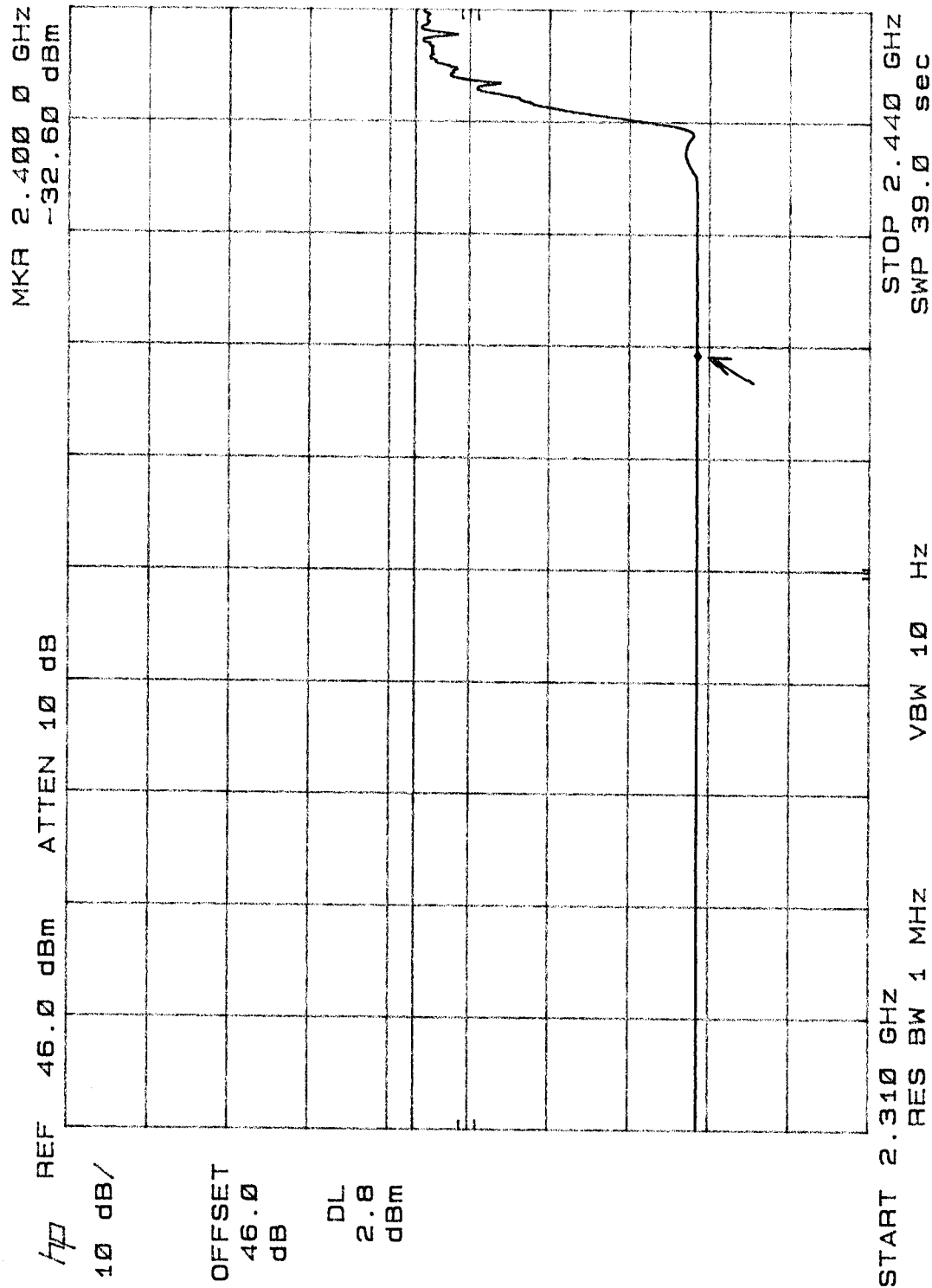




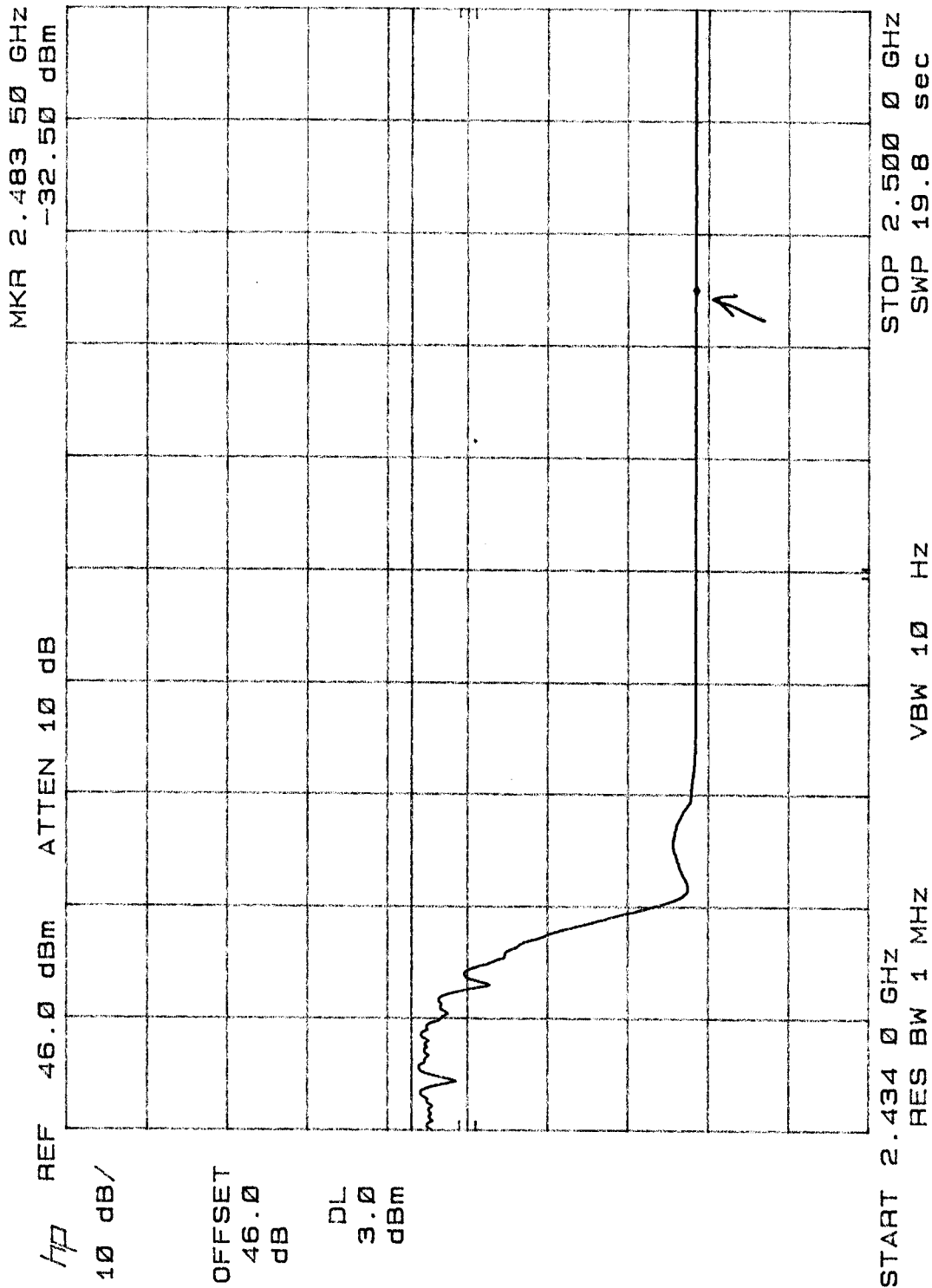
FCC Part 15.247(c) - Radiated Spurious Emissions (Low)



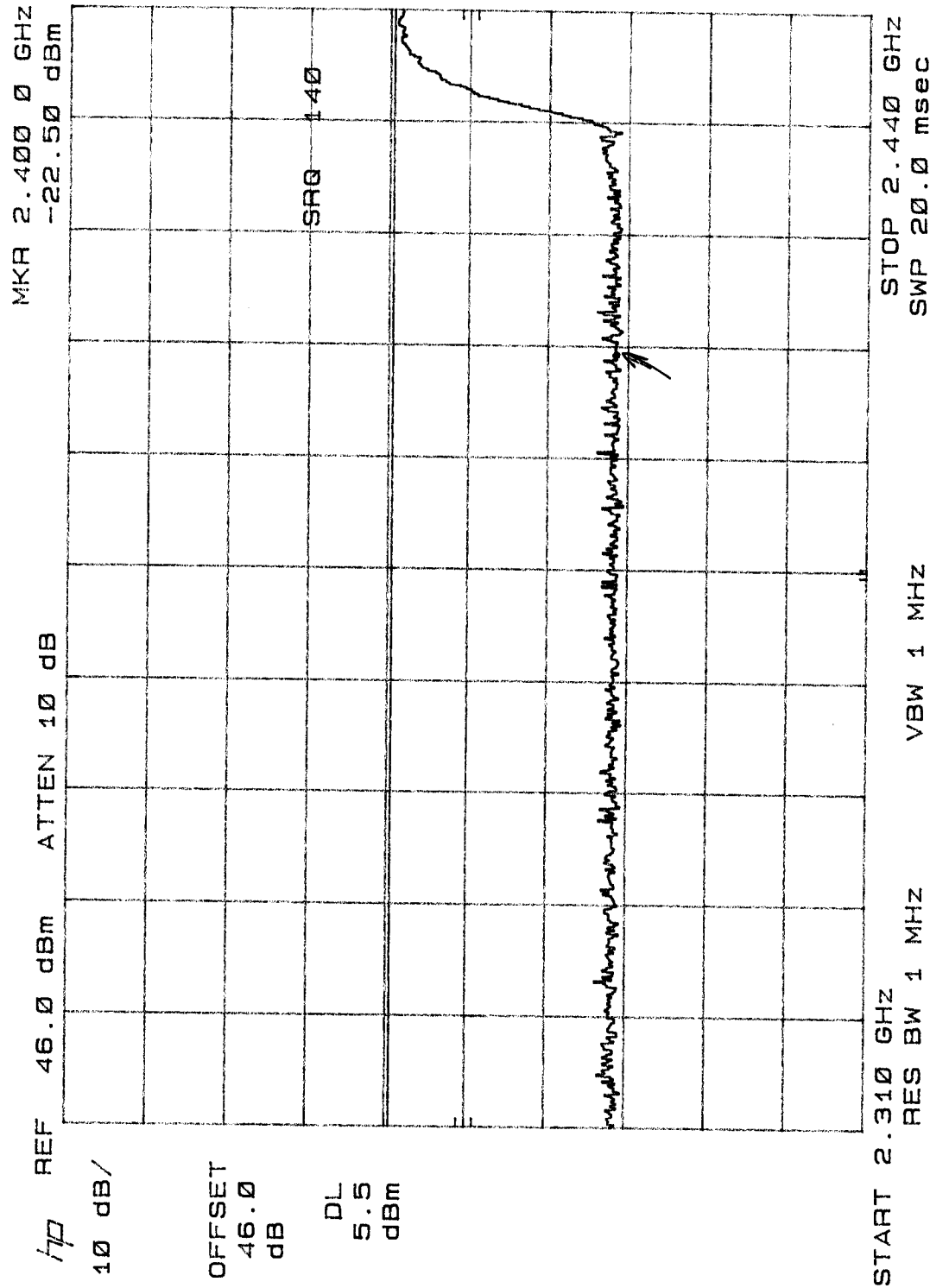
FCC Part 15.247(c) - Radiated Spurious Emissions (Mid)



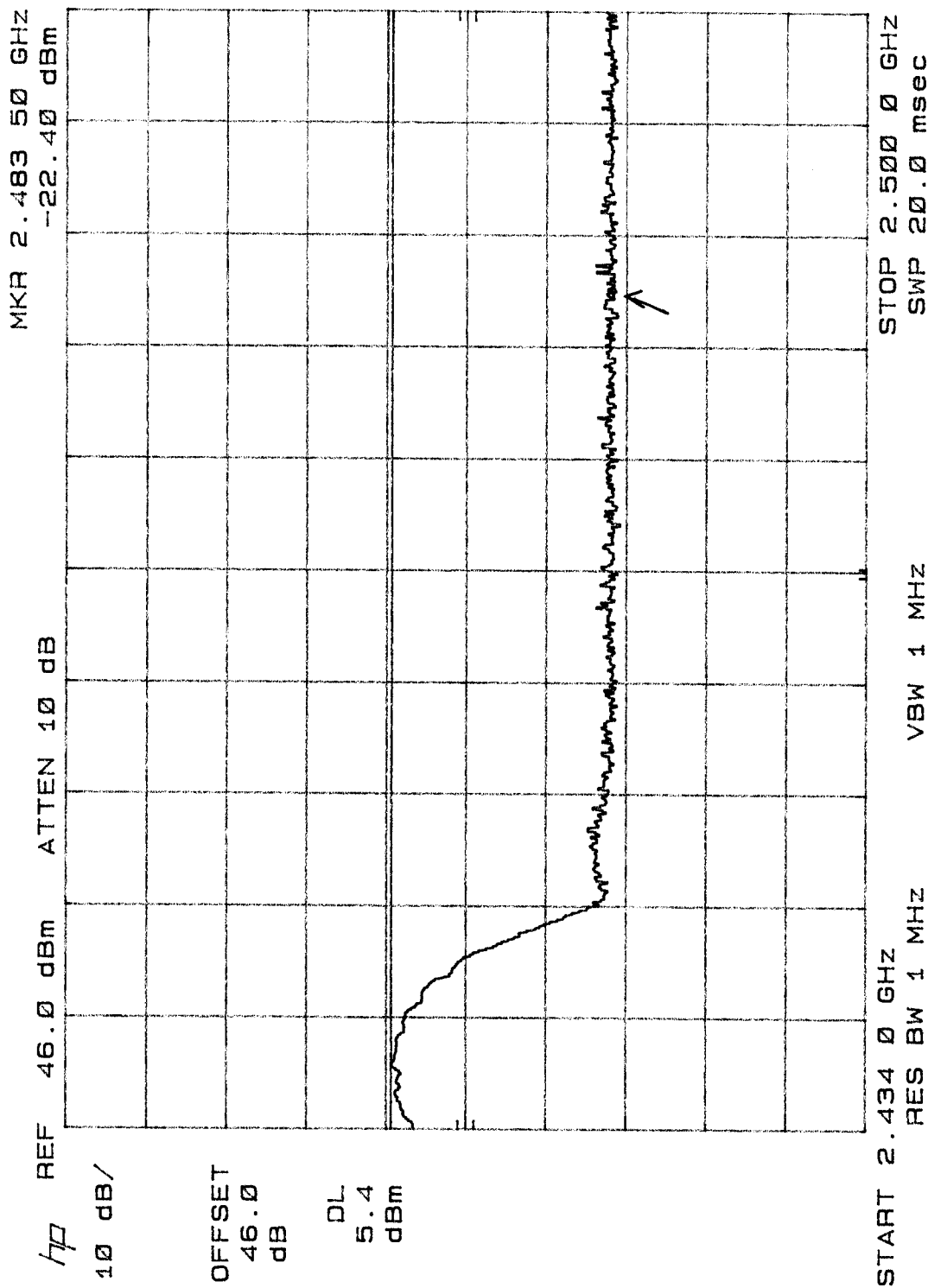
FCC Part 15.247(c) - Radiated Spurious Emissions (Mid)



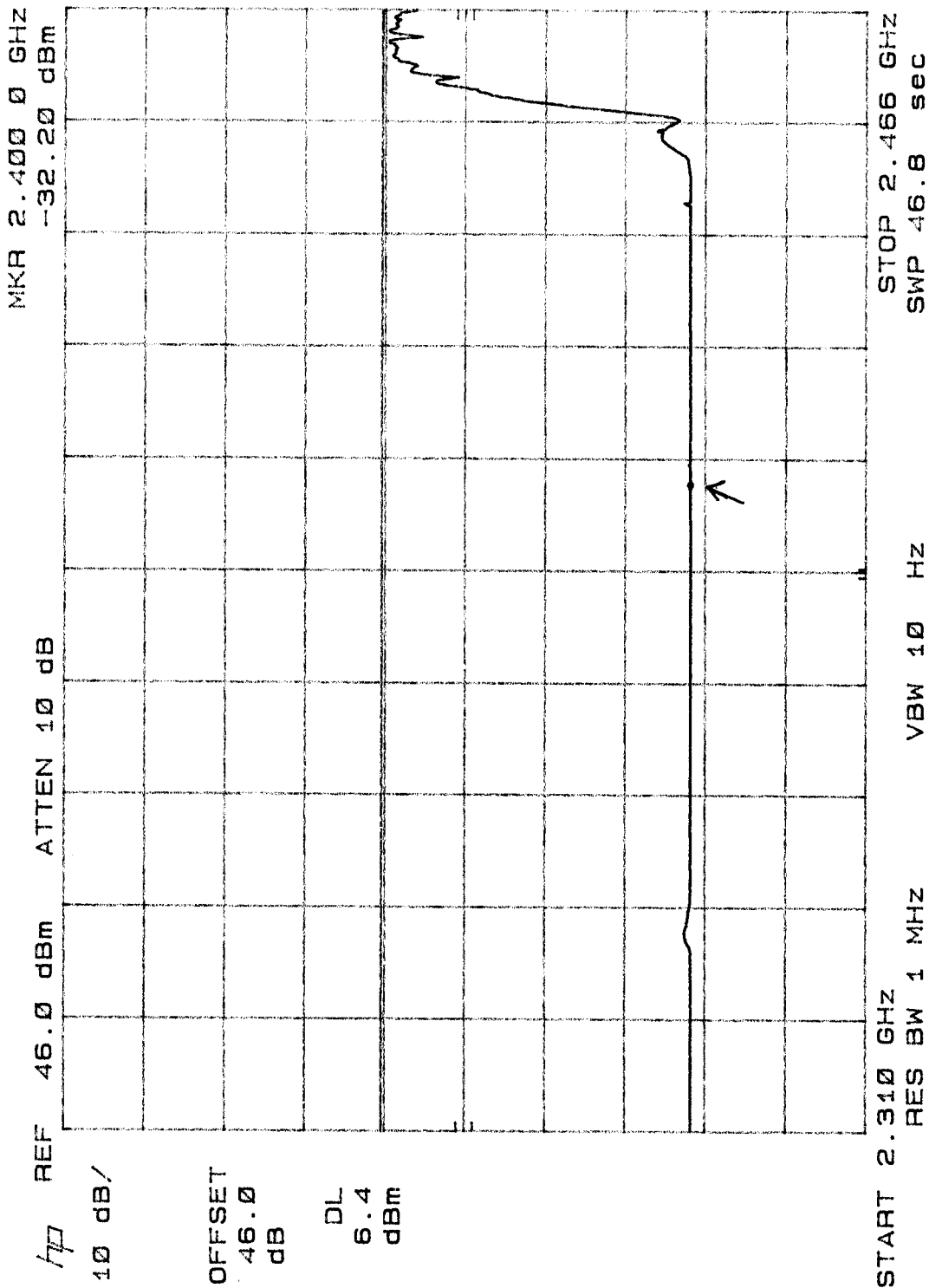
FCC Part 15.247(c) - Radiated Spurious Emissions (Mid)



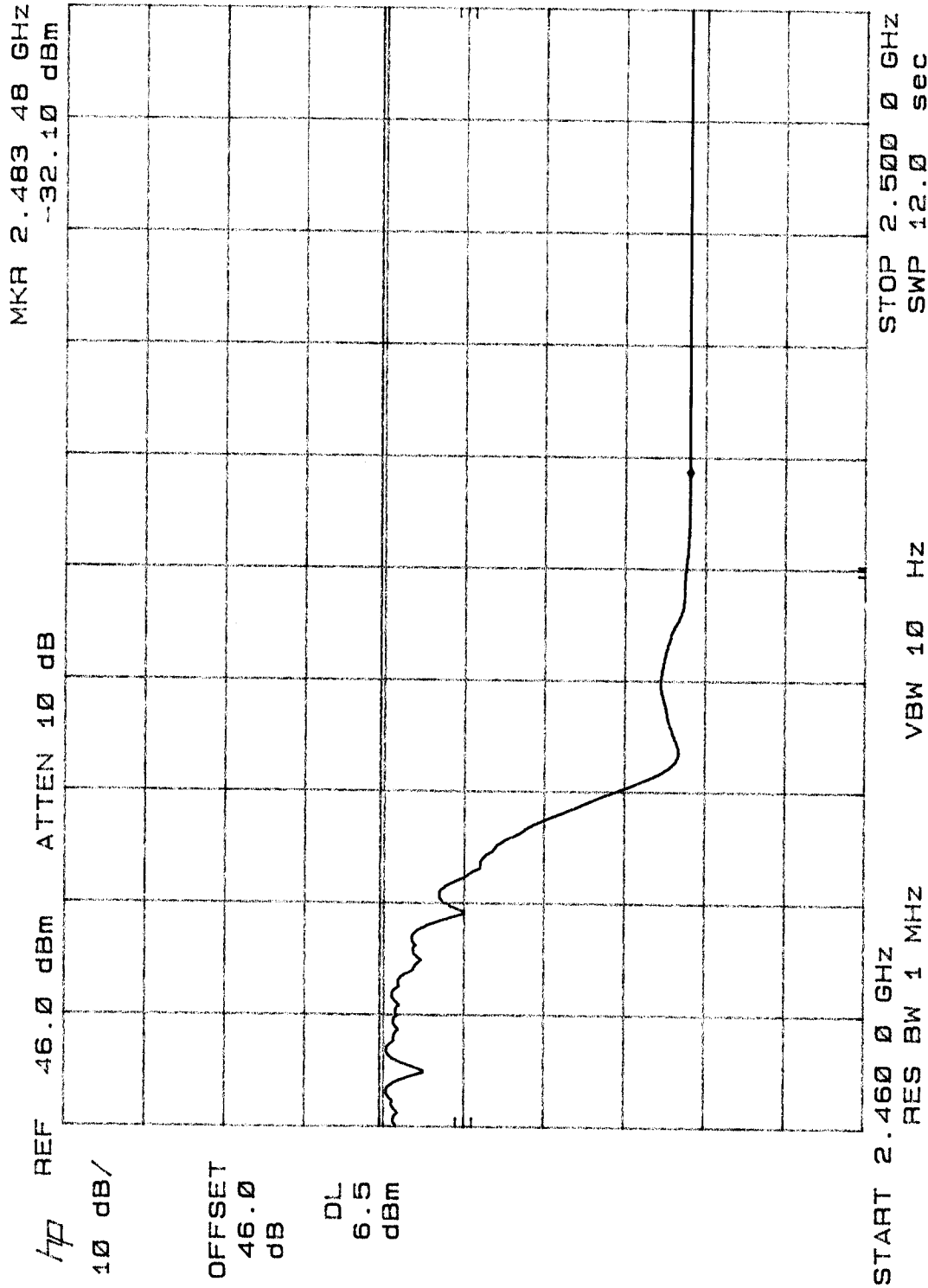
FCC Part 15.247(c) - Radiated Spurious Emissions (Mid)



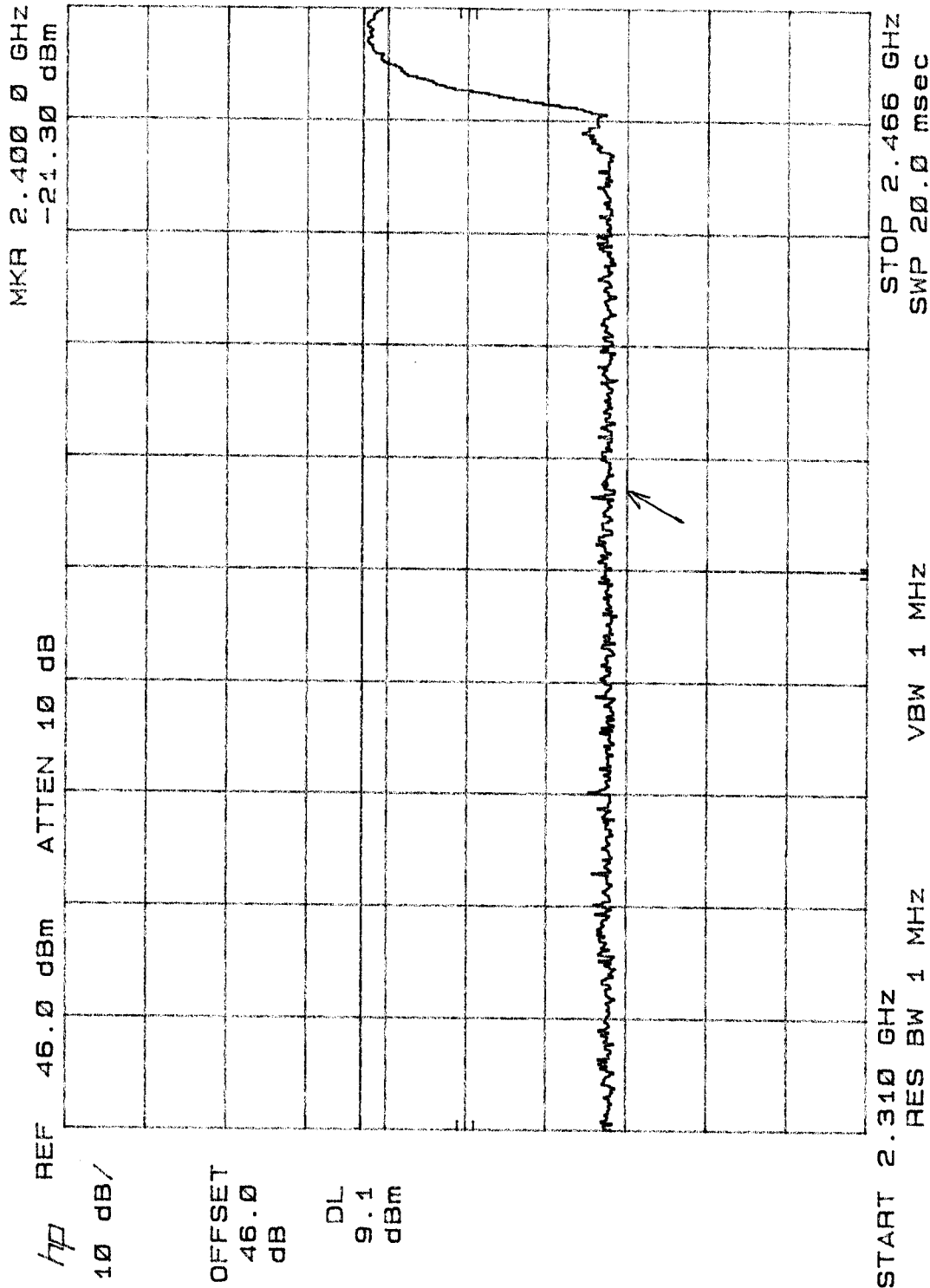
FCC Part 15.247(c) - Radiated Spurious Emissions (High)



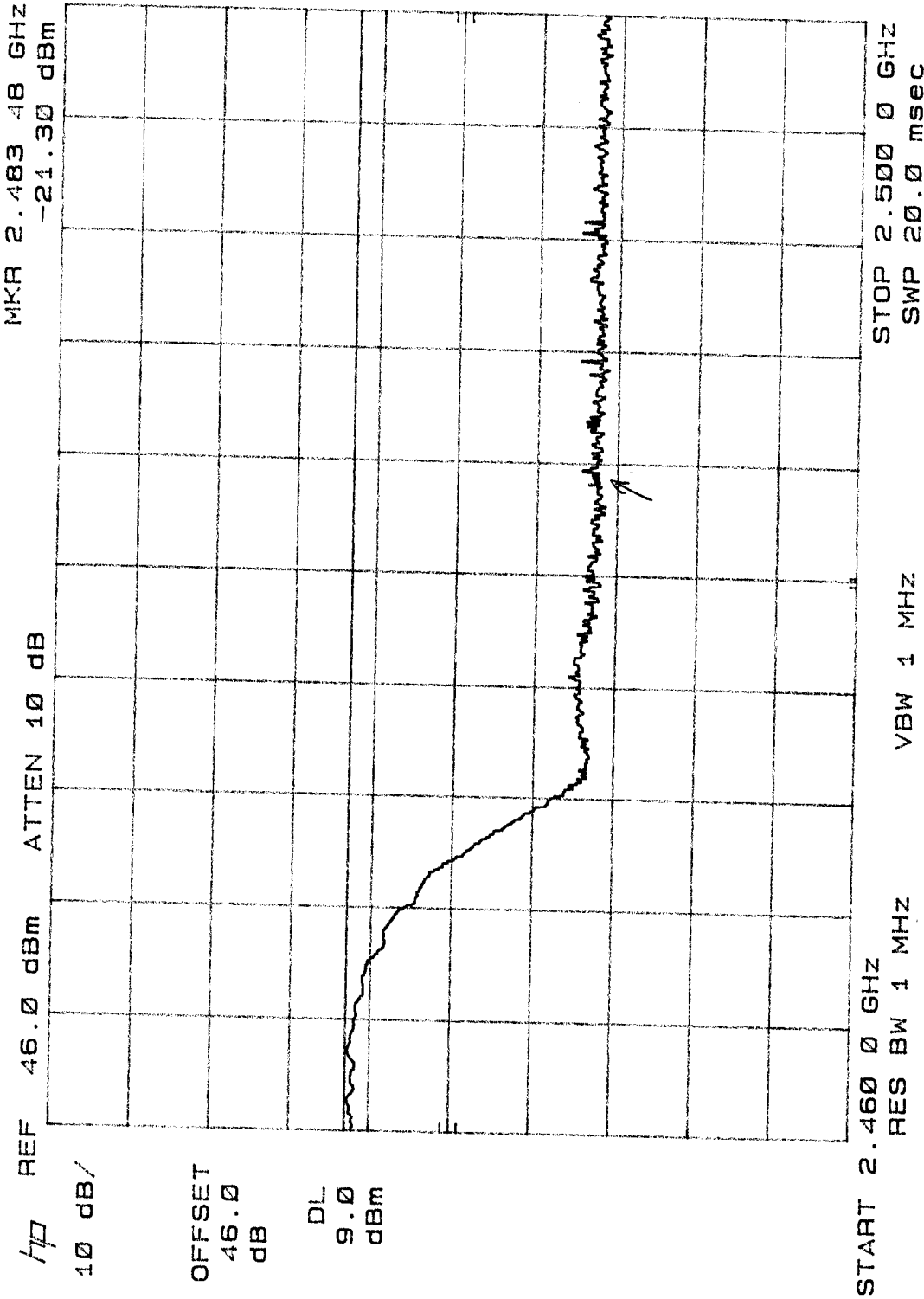
FCC Part 15.247(c) - Radiated Spurious Emissions (High)



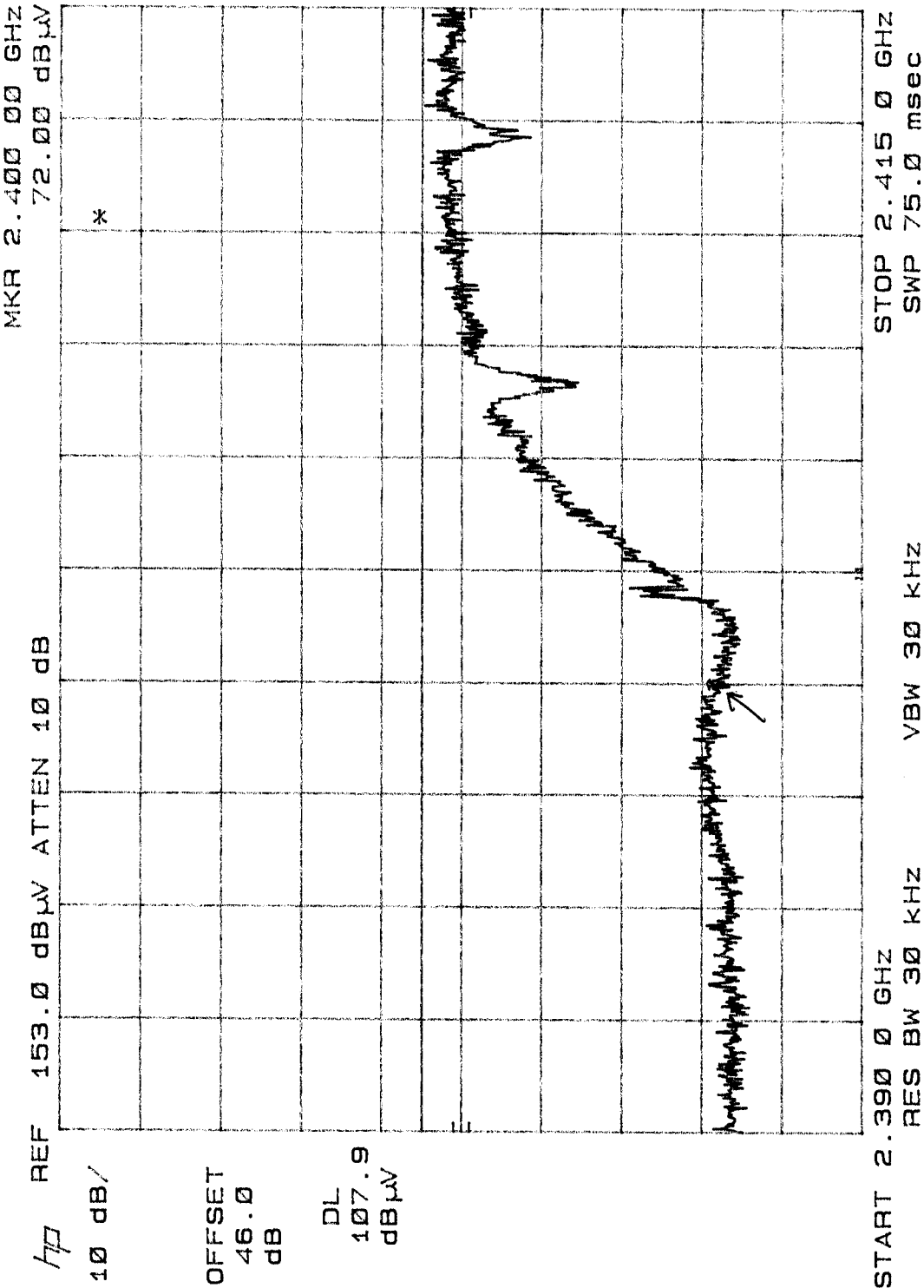
FCC Part 15.247(c) - Radiated Spurious Emissions (High)



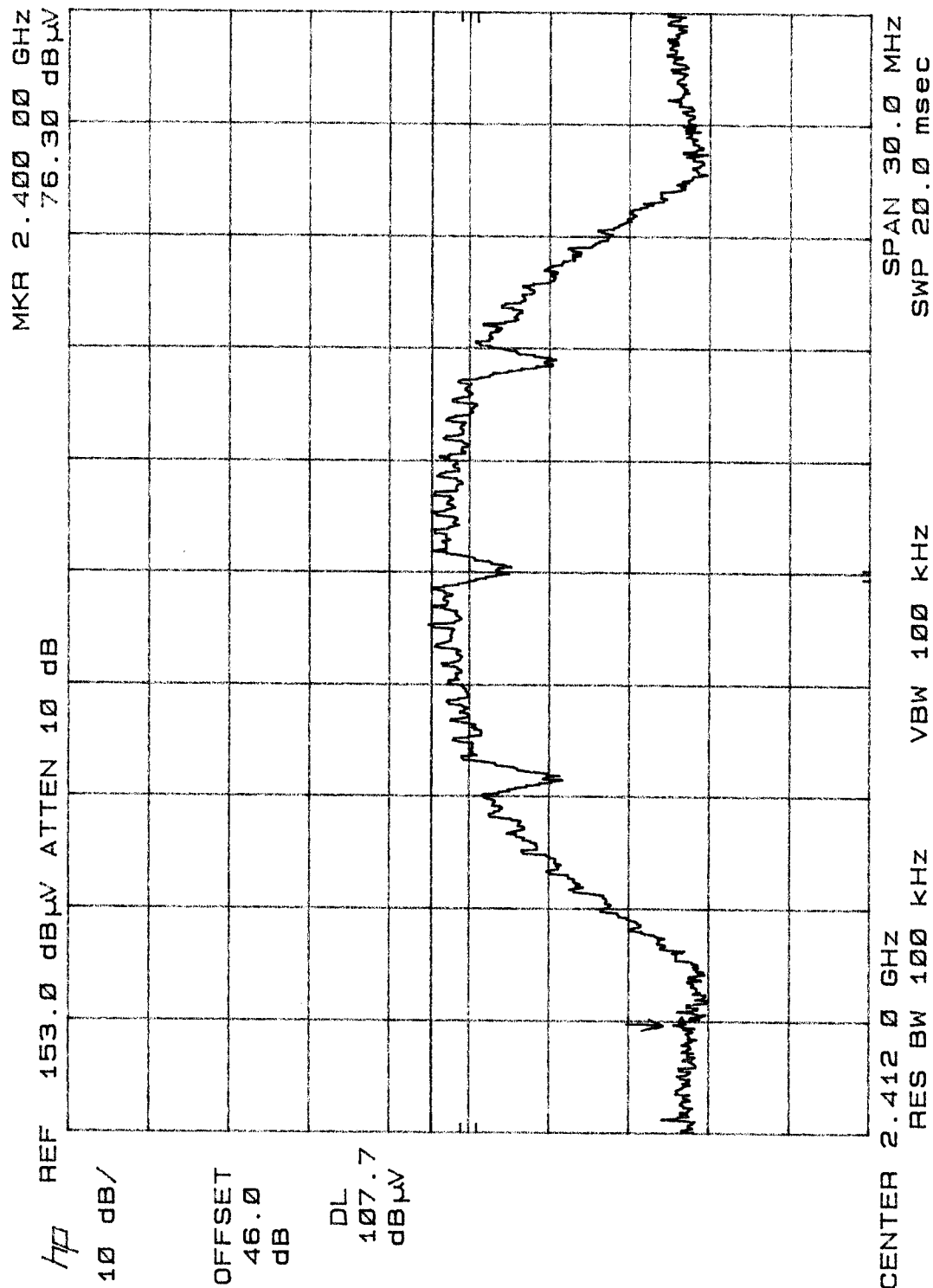
FCC Part 15.247(c) - Radiated Spurious Emissions (High)



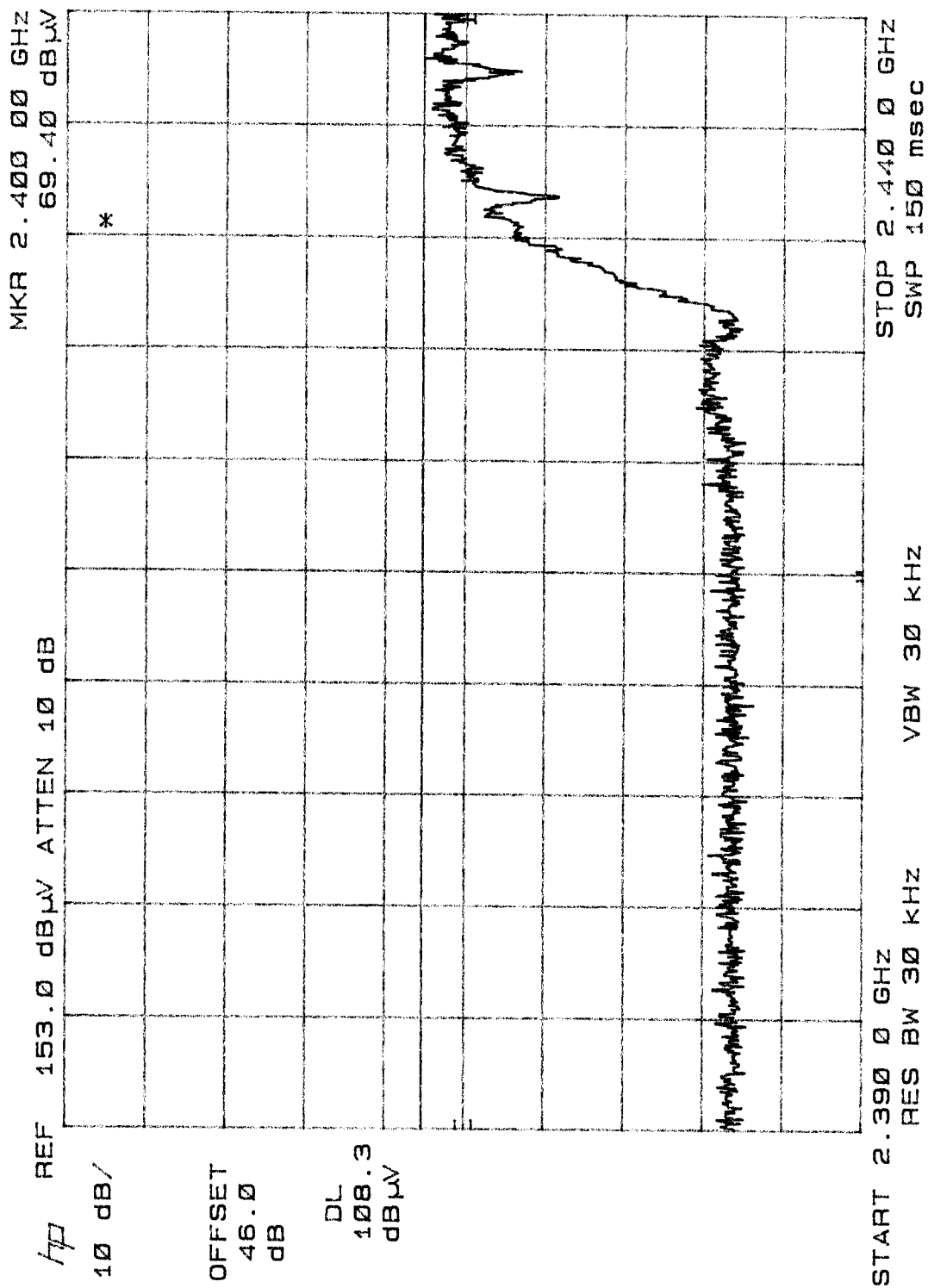
FCC Part 15.247(c) - Restricted Bands and Bandedge (Low)

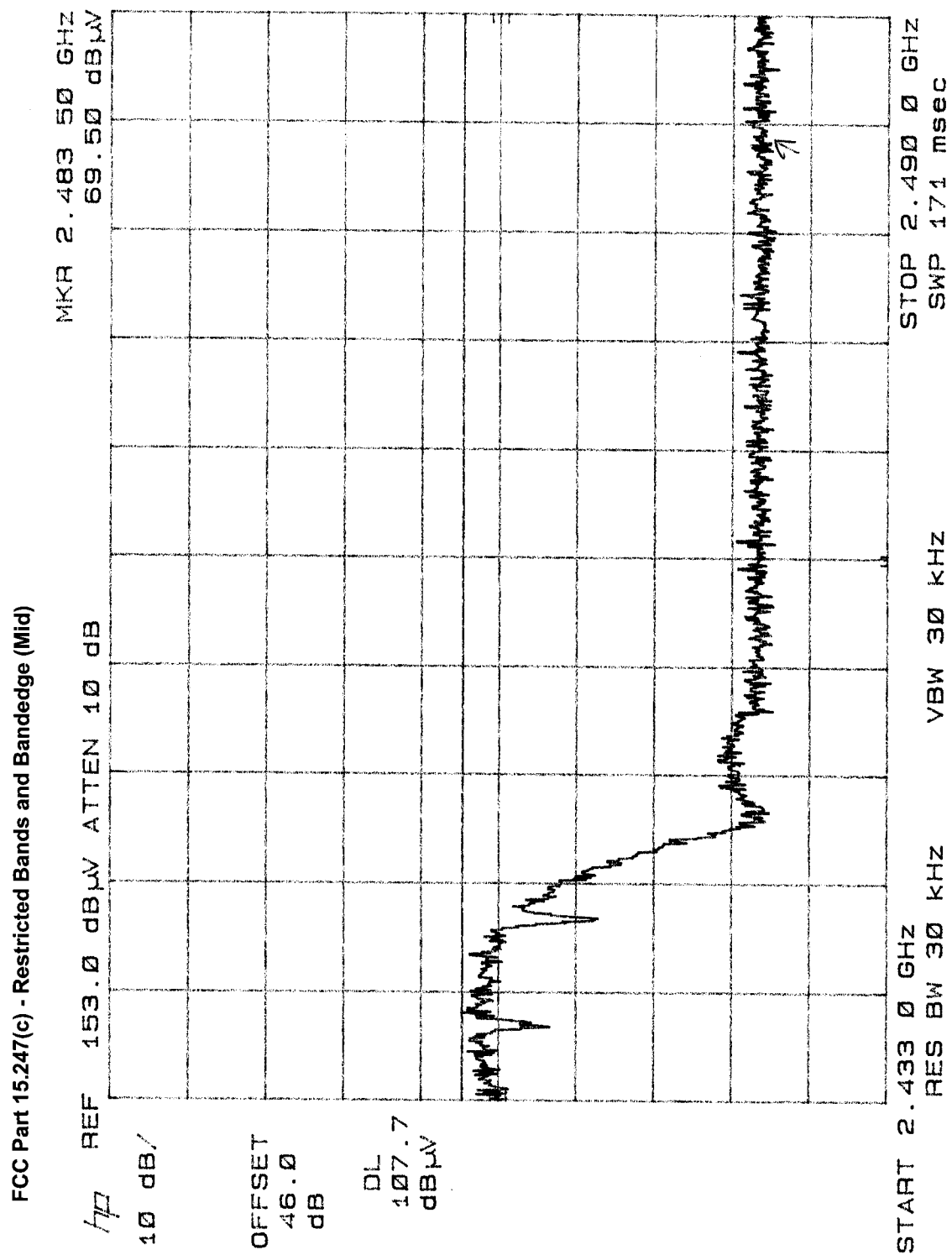


FCC Part 15.247(c) - Restricted Bands and Bandedge (Low)

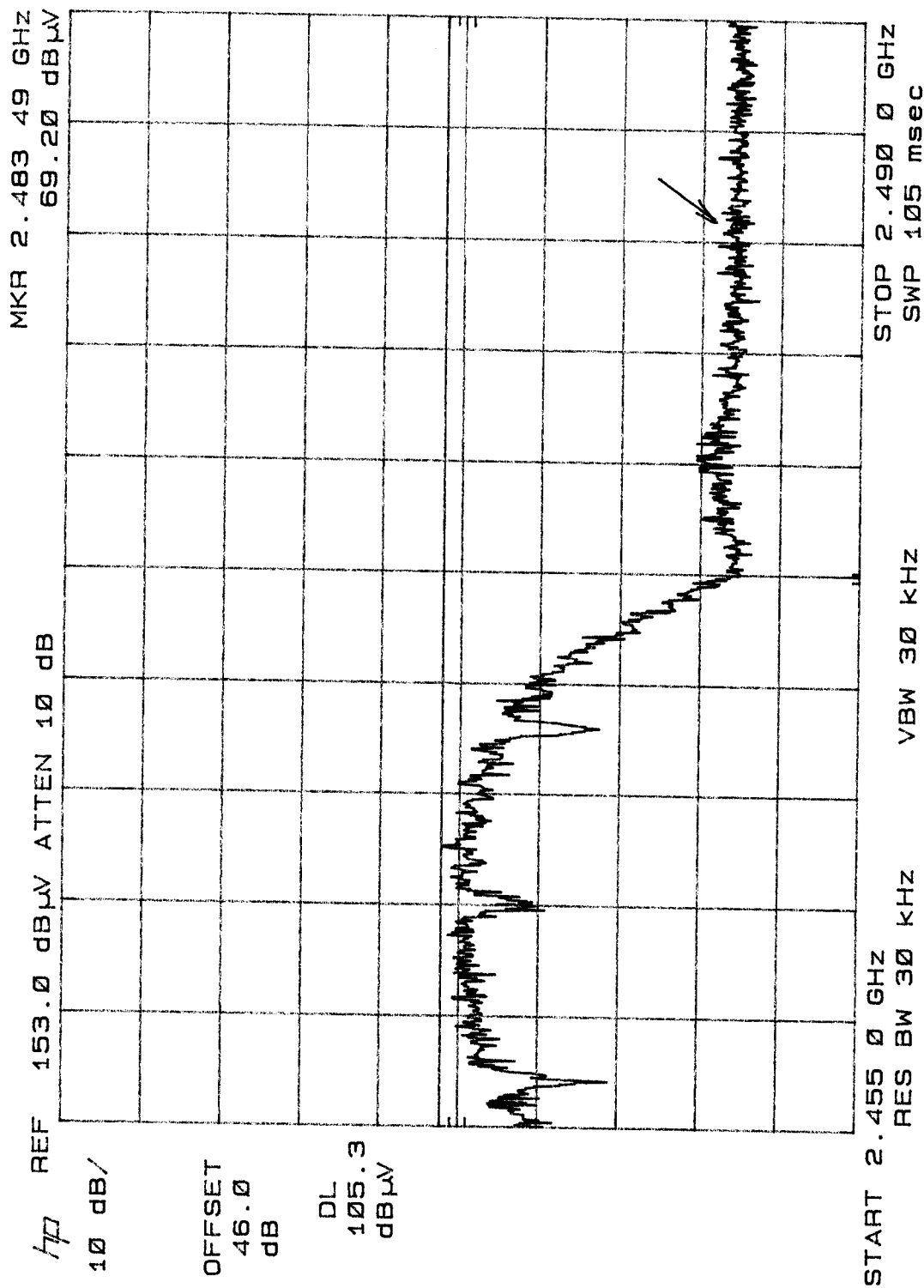


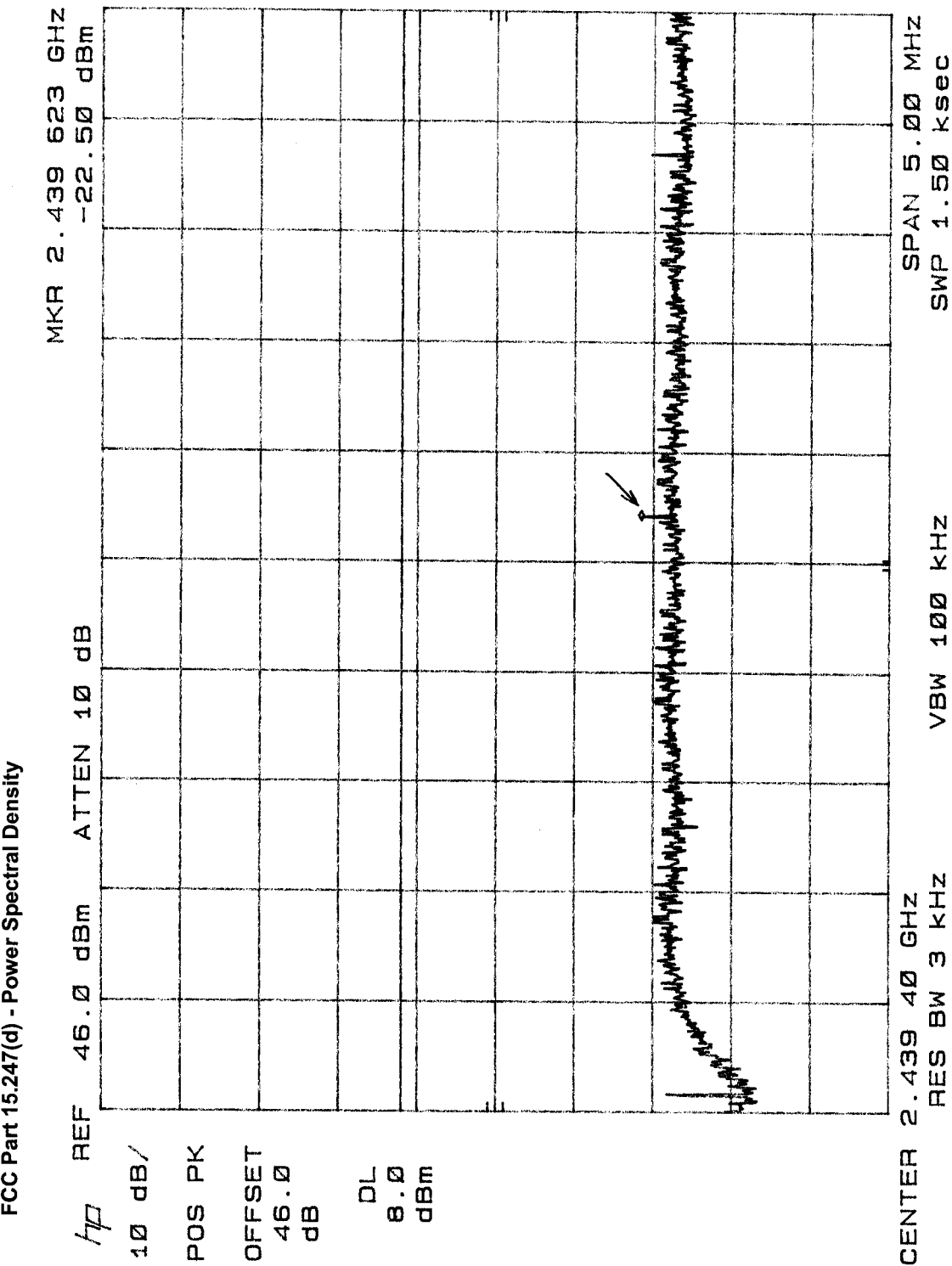
FCC Part 15.247(c) - Restricted Bands and Bandedge (Mid)





FCC Part 15.247(c) - Restricted Bands and Bandedge (High)





6.0 ATTESTATION STATEMENT

GENERAL REMARKS:

SUMMARY:

All tests were performed per CFR 47, Part(s) **15.107(a), 15.109(a), 15.207(a), 15.209(a), 15.247(a), 15.247(b), 15.247(c), 15.247(d)**

■ - Performed

The Equipment Under Test

■ - **Fulfills** the requirements of CFR 47, Part(s) **15.107(a), 15.109(a), 15.207(a), 15.209(a), 15.247(a), 15.247(b), 15.247(c), 15.247(d)**

Testing Start Date: 01 February 2005

Testing End Date: 10 March 2005

- TÜV AMERICA, INC. -

Responsible Engineer:



Jim Owen
(EMC Manager)

Responsible Engineer:



Frank Harkins
(EMC Engineer)