

FCC PART 15 Subpart C
EMI MEASUREMENT AND TEST REPORT

For

2Wire, Inc.

1704 Automation Parkway
San Jose, CA 95131

FCC ID: PGRHPL000W

May 29, 2001

This Report Concerns: <input checked="" type="checkbox"/> Original Report	Equipment Type: HomePortal Wireless Residential Gateway - ITE
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1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

2Wire, Inc.'s product, FCC ID: *PGRHPL000W* or the "EUT" as referred to in this report is a homeportal wireless residential gateway which measures approximately 12.5" L x 2.5" W x 10.0" H.

The EUT is a representative for customer's all homeportal wireless residential gateways:

HomePortal 100W
HoemPortal 1000W, HoemPortal 1000CW
HoemPortal 1500W, HoemPortal 1500CW
HoemPortal 1600W, HoemPortal 1600CW
HoemPortal 2000W, HoemPortal 2000CW

1.2 Objective

This type approval report is prepared on behalf of 2Wire, Inc. in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to demonstrate compliance with FCC rules for Output Power, Antenna Requirement, 6 dB Bandwidth, power density, 100 kHz Bandwidth of Band Edges Measurement, Conducted and Spurious Radiated Emission.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 –1992, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.4 Test Facility

The Open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Suite 2, Sunnyvale, California, USA.

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-1992.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1998, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.5 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
HP	Spectrum Analyzer	8566B	2610A02165	12/6/01
HP	Spectrum Analyzer	8593B	2919A00242	12/20/01
HP	Amplifier	8349B	2644A02662	12/20/01
HP	Quasi-Peak Adapter	85650A	917059	12/6/01
HP	Amplifier	8447E	1937A01046	12/6/01
A.H. System	Horn Antenna	SAS0200/571	261	12/27/01
Com-Power	Log Periodic Antenna	AL-100	16005	11/2/01
Com-Power	Biconical Antenna	AB-100	14012	11/2/01
Solar Electronics	LISN	8012-50-R-24-BNC	968447	12/28/01
Com-Power	LISN	LI-200	12208	12/20/01
Com-Power	LISN	LI-200	12005	12/20/01
BACL	Data Entry Software	DES1	0001	12/20/01
Rohde & Schwarz	Signal Generator	SMIQ03B	1125.5555.03	7/10/02
Rohde & Schwarz	I/Q Modulation Generator	AMIQ	1110.2003.02	8/10/01

1.6 Equipment Under Test (EUT)

Manufacturer	Description	Model	Serial Number	FCC ID
2Wire, Inc.	Homeportal Wireless Transceiver	HomePortal 100W HoemPortal 1000W, HoemPortal 1000CW HoemPortal 1500W, HoemPortal 1500CW HoemPortal 1600W, HoemPortal 1600CW HoemPortal 2000W, HoemPortal 2000CW	None	PGRHPL000W

1.7 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number	FCC ID
Eos	AC Adapter	XLT36-3100 S1	00000-AAK-8908	None

1.8 Remote Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Omni Tech	PC System	OTC-8100D1815	1097784	DOC

1.9 External I/O Cabling List and Details

Cable Description	Length (M)	Port/From	To
Phone Line Cable	15.0	RJ11 Port/Base	Telephone Wall Jack
Ethernet Cable	30.0	Ethernet Port/EUT	Computer Ethernet Port

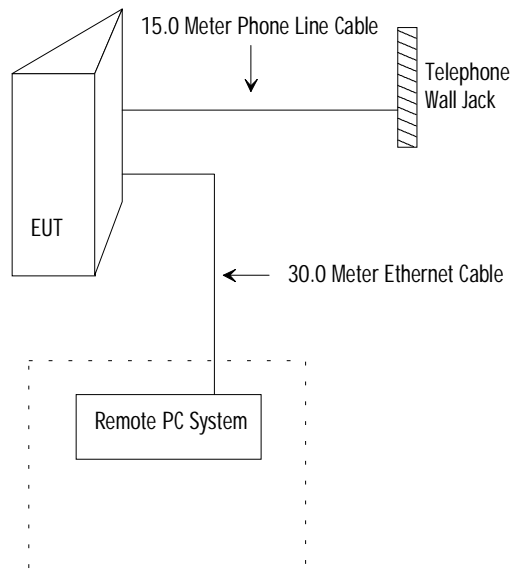
2 - SYSTEM TEST CONFIGURATION AND REQUIREMENTS

2.1 Description of Test Configuration

The EUT was configured for testing in a typical fashion (as normally used by a typical user).

The test software, provided by the customer, was used to exercise during conducted and radiated testing. No other test data as transmitted to the EUT during testing.

2.2 Configuration of Test System



2.3 Equipment Modification

No modification(s) were made to ensure EUT comply with applicable limits.

3 - SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§ 2.1091	RF Safety Requirements	Passed
§15.203	Antenna Requirement	Passed
§ 15.205	Restricted Bands	Passed
§15.207 (a)	Conducted Emission	Passed
§15.209 (a)	Radiated Emission	Passed
§15.209 (f)	Spurious Emission	Passed
§15.247 (a) (2)	6 dB Bandwidth	Passed
§15.247 (b) (2)	Output Power	Passed
§ 15.247 (c)	100 kHz Bandwidth of Frequency Band Edges	Passed
§15.247 (d)	Peak Power Spectral Density	Passed

4 - Conducted Output Power Measurement

4.1 Standard Applicable

According to §15.247(b) (2), the maximum peak output power of the transmitter shall not exceed 1 Watt.

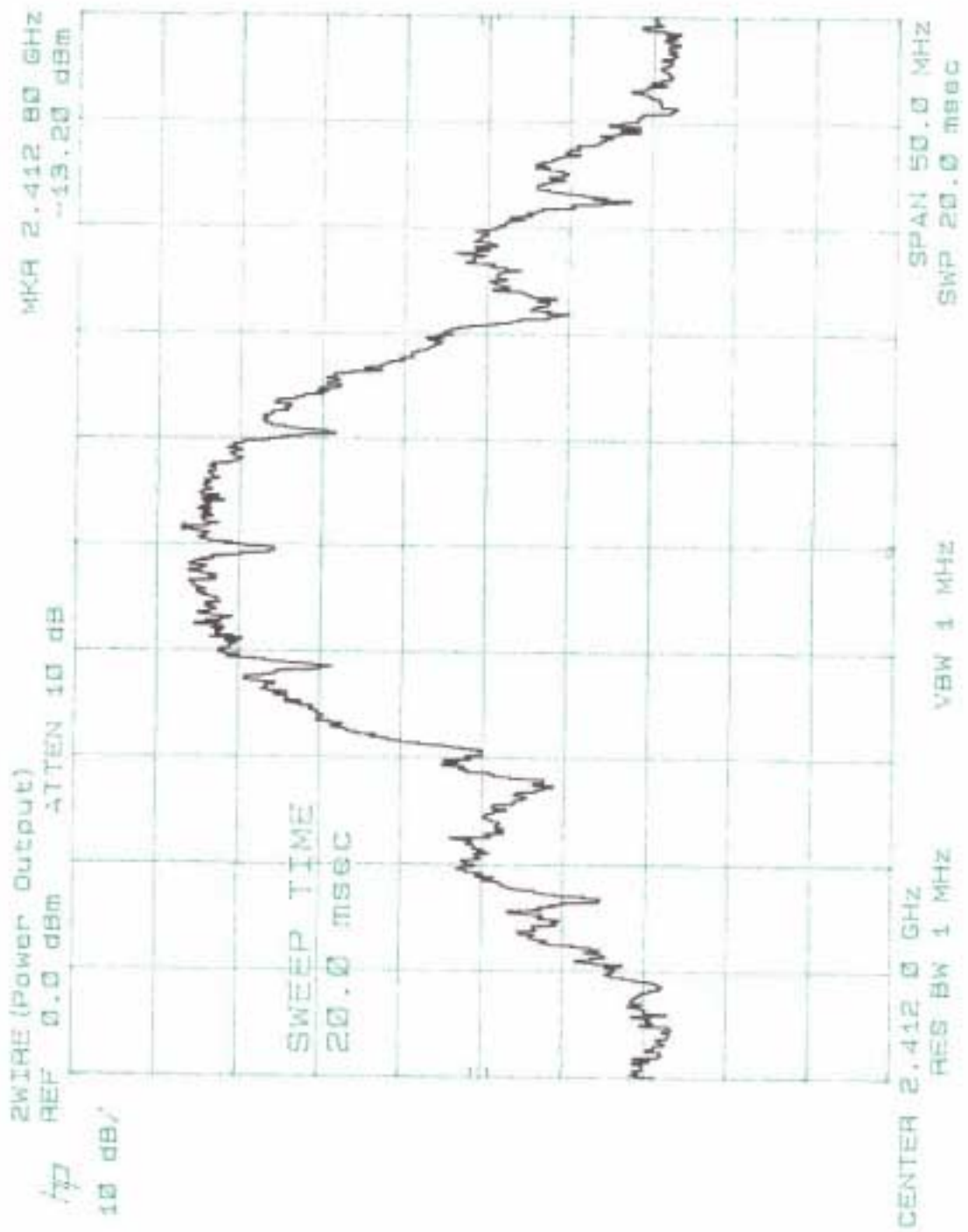
4.2 Measurement Procedure

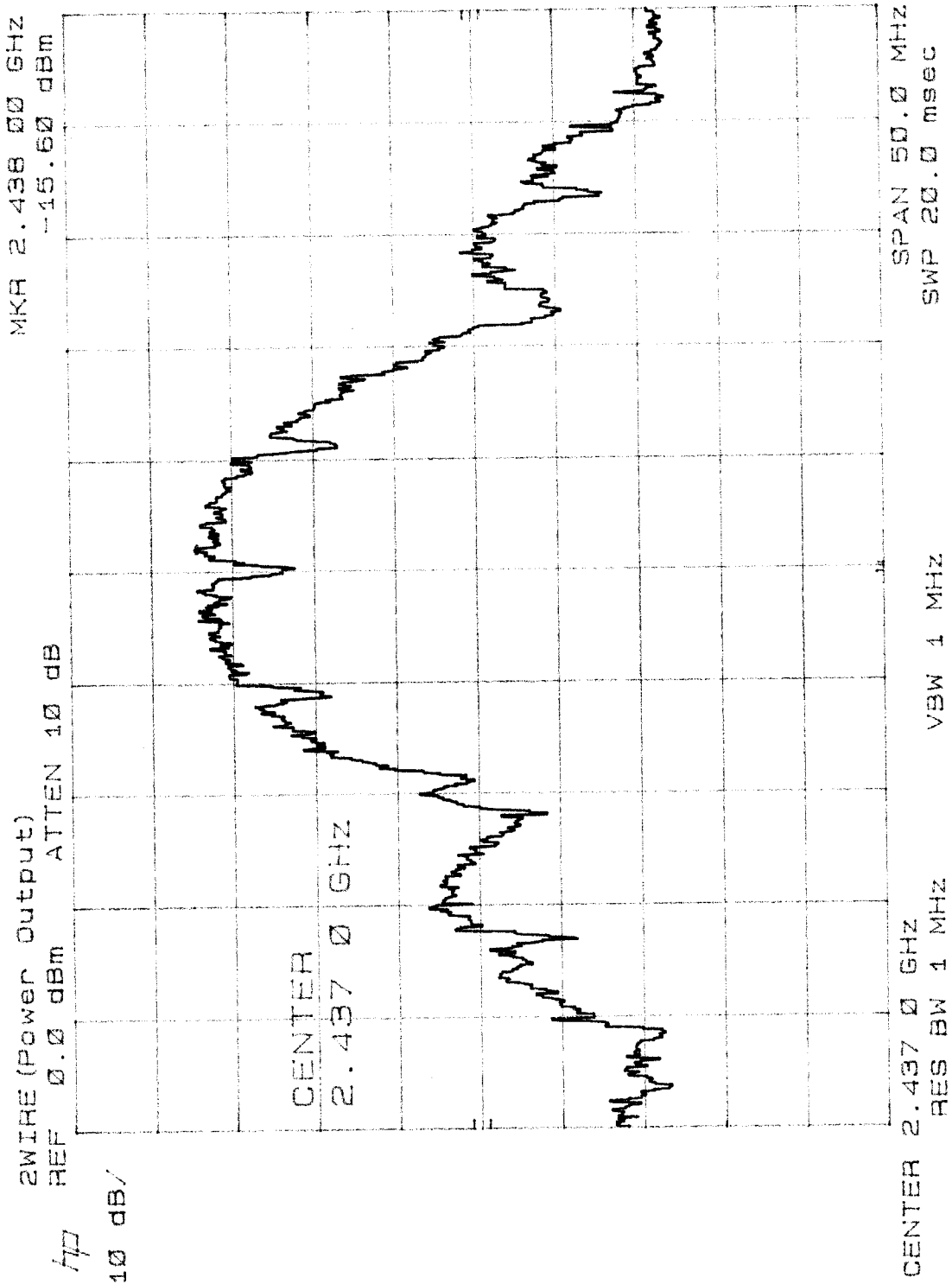
1. Place the EUT on the turntable and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

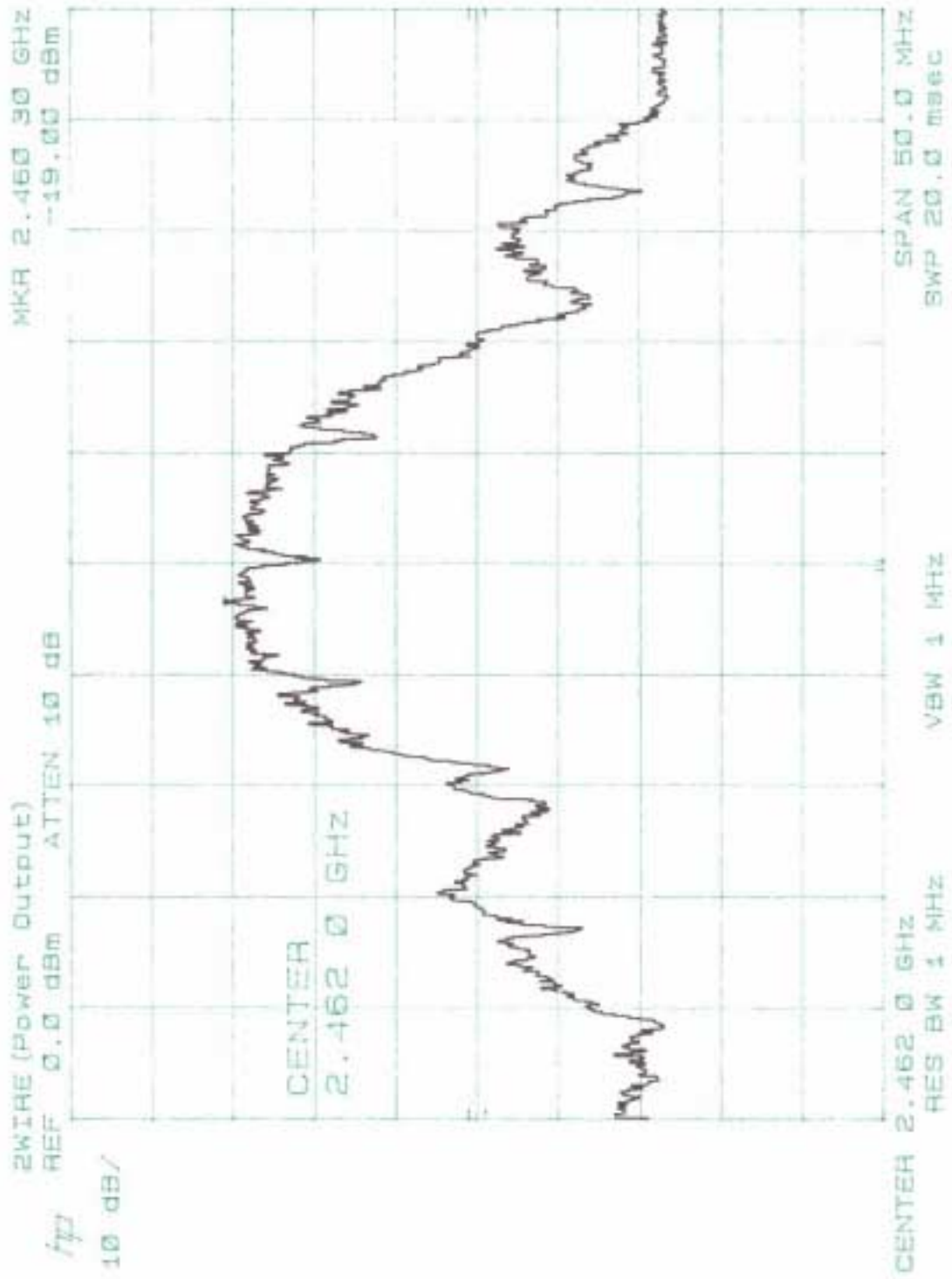
4.3 Measurement Result

Refer to the attached to the following plots:

Peak Output Power	Page Reference	Test Result
Low Channel	Page 9	Pass
Middle Channel	Page 10	Pass
High Channel	Page 11	Pass







5 – 6 dB BANDWIDTH

5.1 Standard Applicable

According to §15.247(a)(2), for direct sequence systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

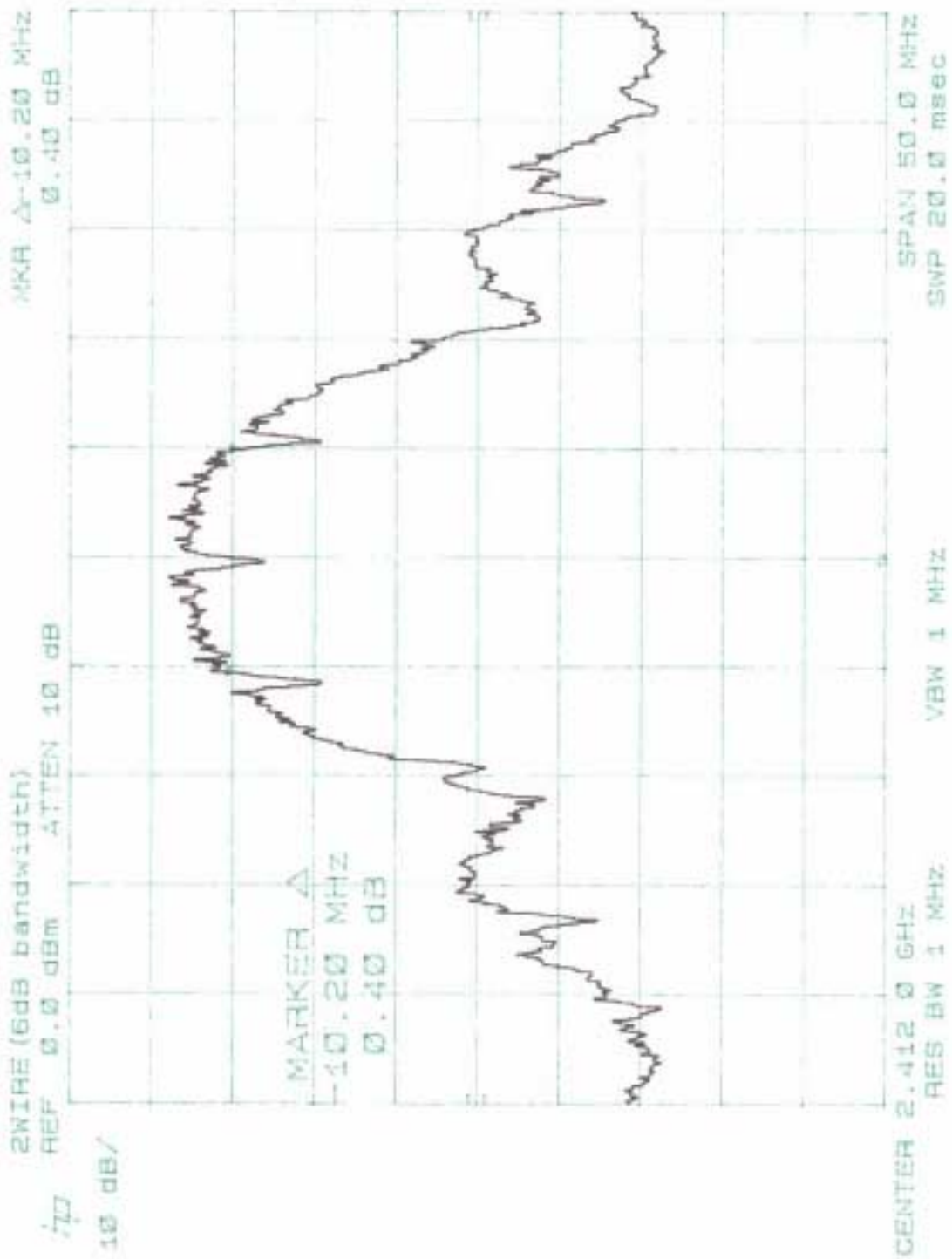
5.2 Measurement Procedure

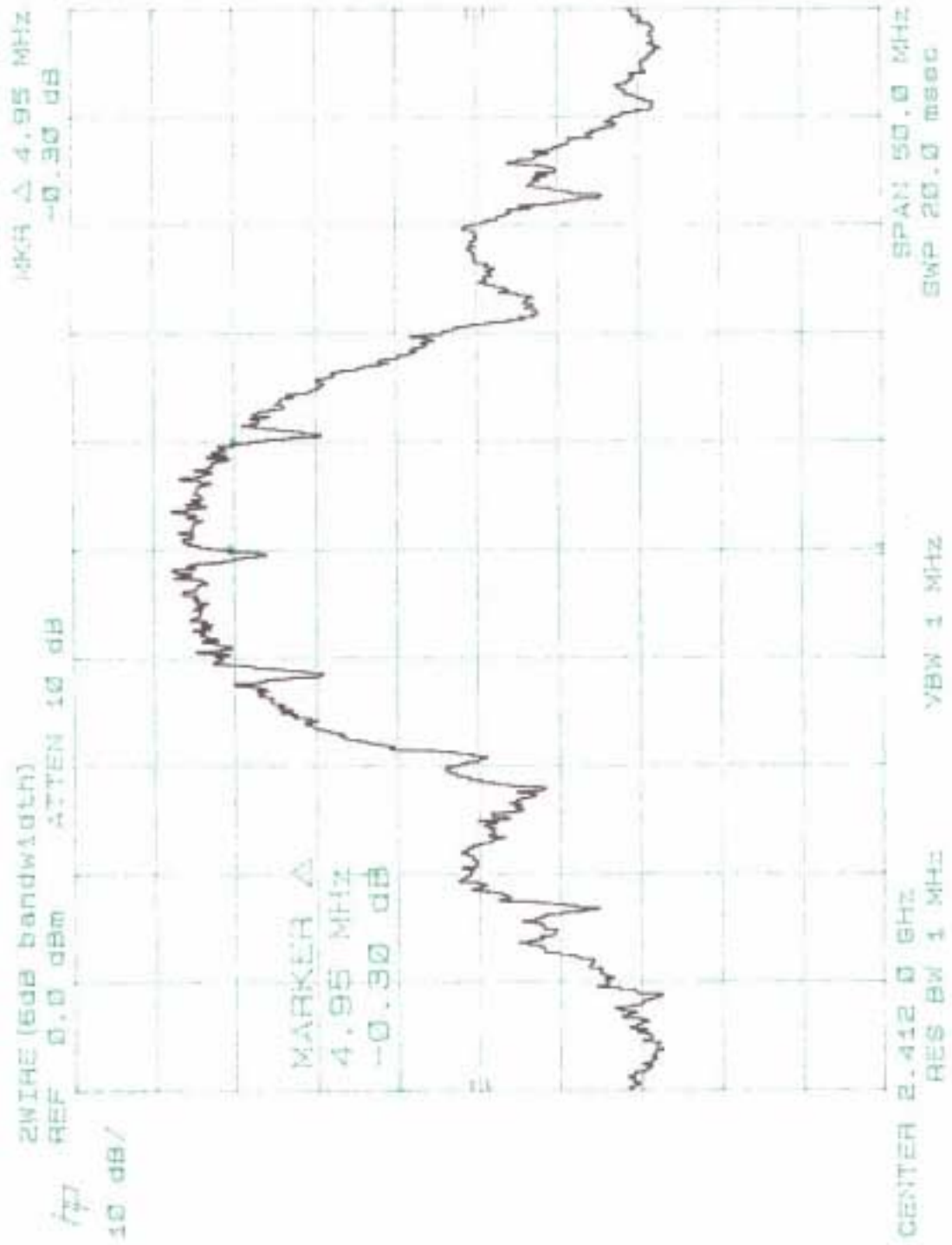
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

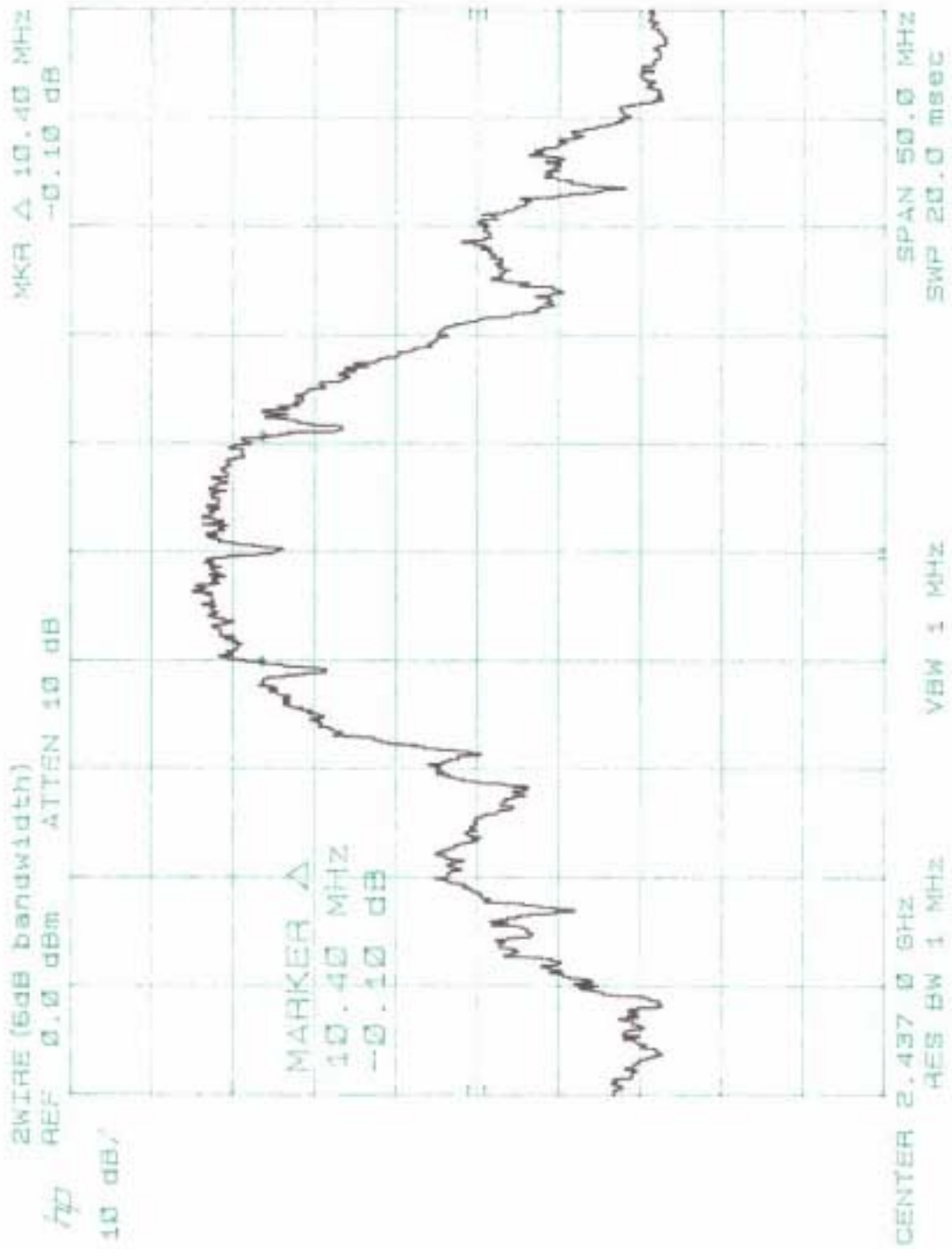
5.3 Measurement Data

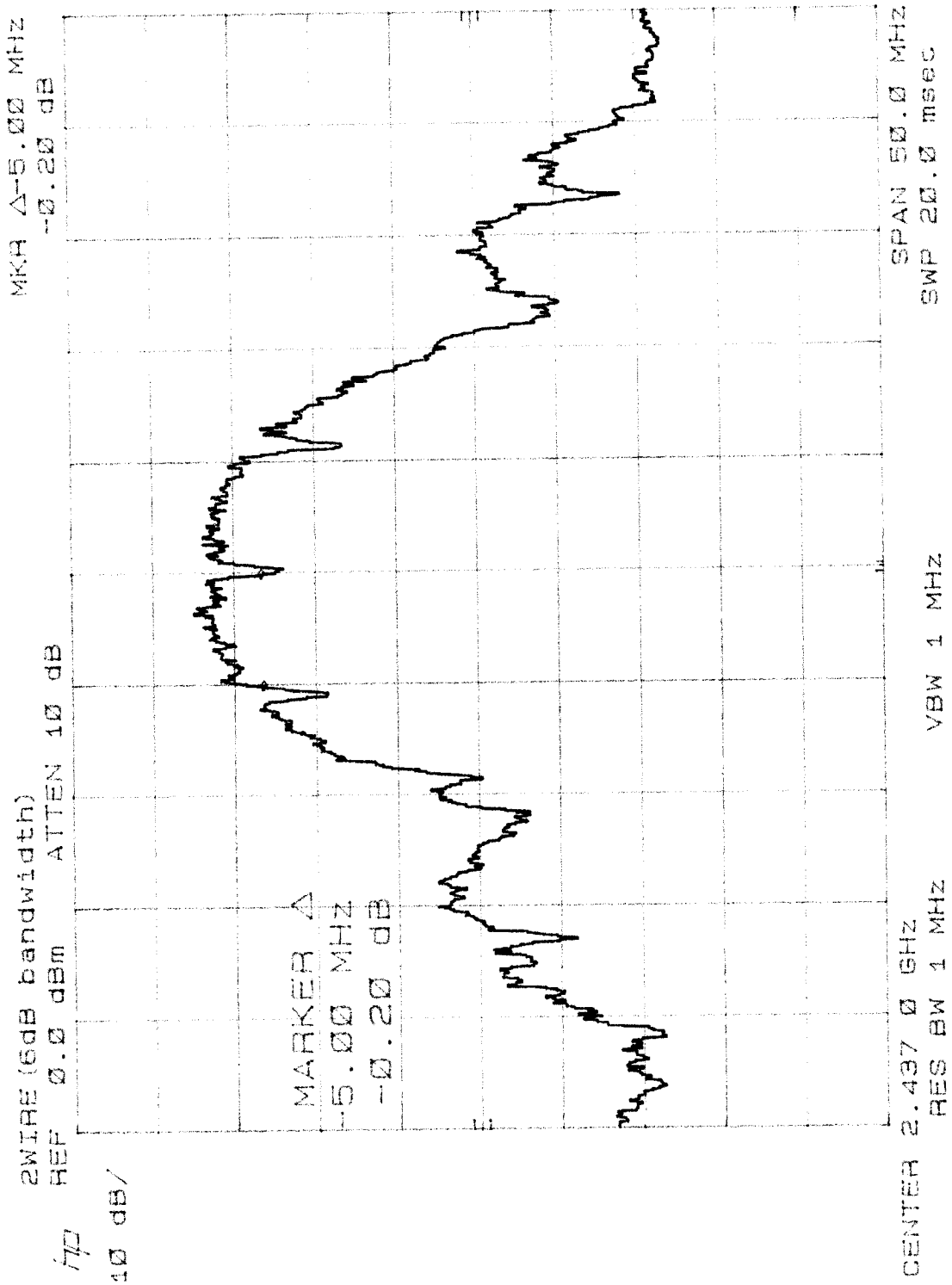
The following are plots of 6 dB Bandwidth for low, middle and high channel.

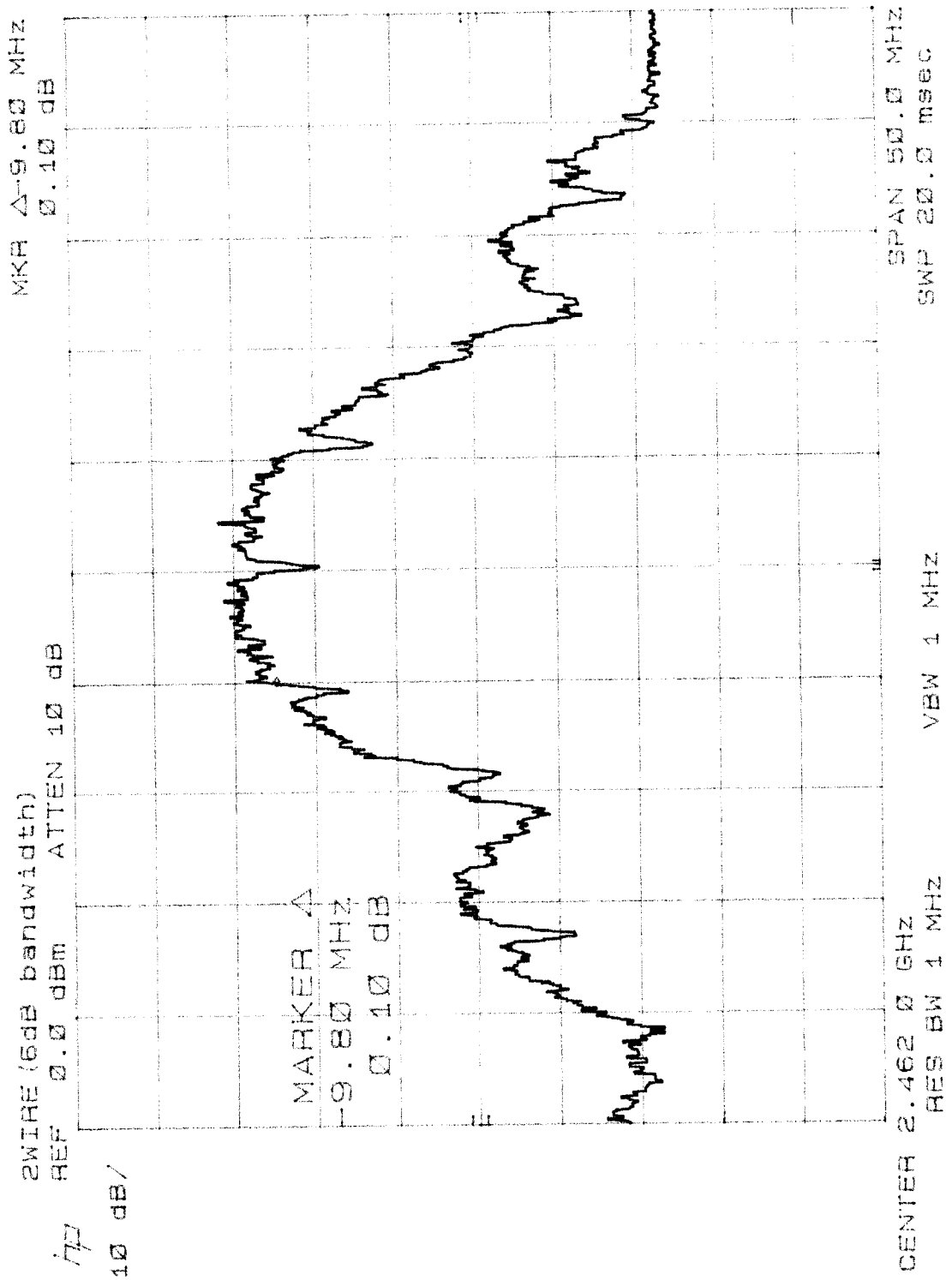
Channel Bandwidth	Page Reference	Test Result
Low Channel	Page 14, 15	Passed
Middle Channel	Page 16, 17	Passed
High Channel	Page 18, 19	Passed

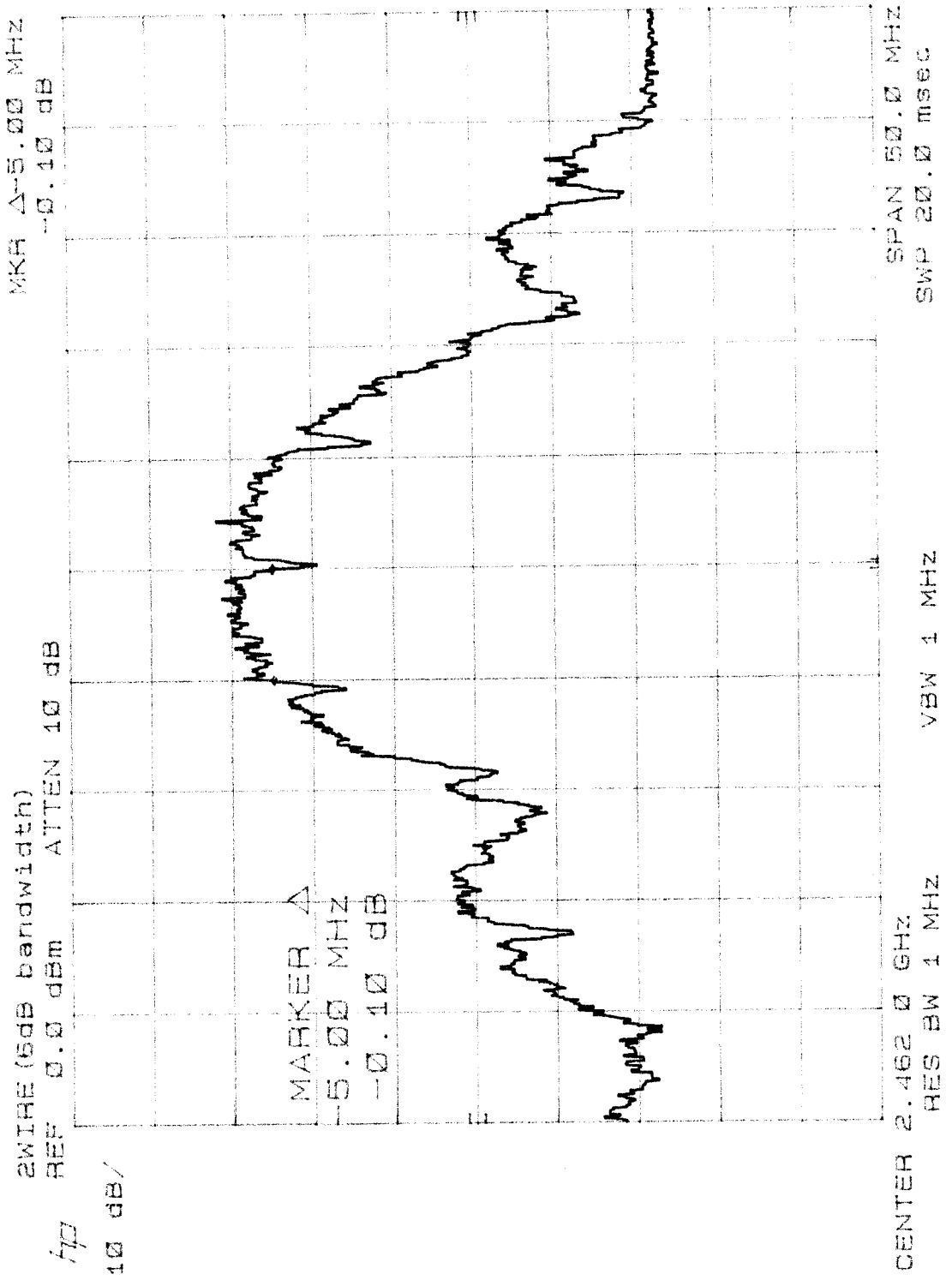












6 – SPURIOUS EMISSION

6.1 Standard Applicable

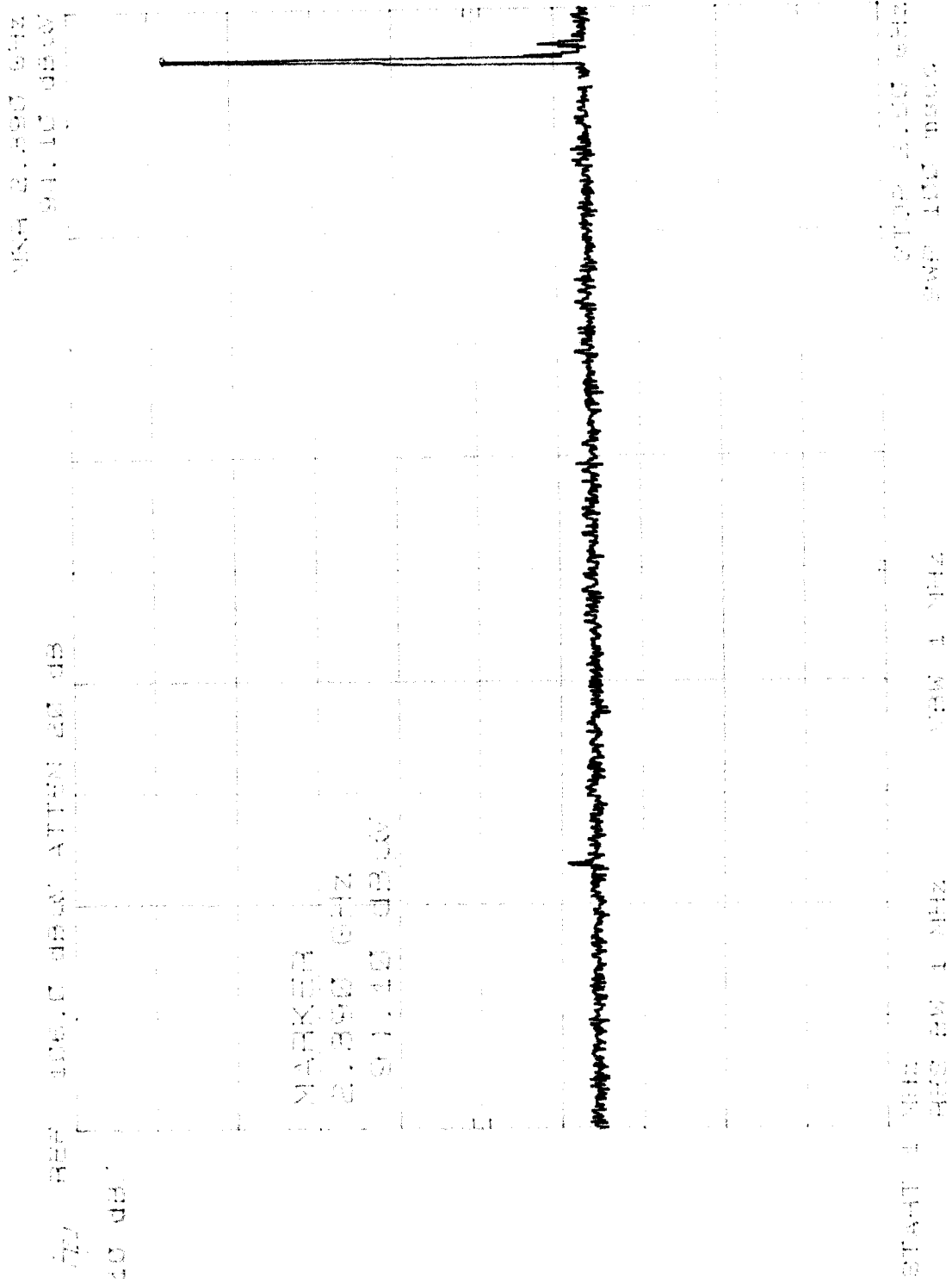
According to §15.209 (f) and §15.33(a), in some cases the emissions from an intentional radiator must be measured to beyond the tenth harmonic of the highest fundamental frequency designed to be emitted by the intentional radiator because of the incorporation of a digital device. If measurements above the tenth harmonic are so required, the radiated emissions above the tenth harmonic shall comply with the general radiated emission limits applicable to the incorporated digital device, as shown in §15.109 and as based on the frequency of the emission being measured, or, except for emissions contained in the restricted frequency bands shown in §15.205, the limit on spurious emissions specified for the intentional radiator, whichever is the higher limit.

6.2 Measurement Procedure

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 4 without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set the SA on Max-Hold Mode, and then keep the EUT in direct sequence mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

6.3 Measurement Data

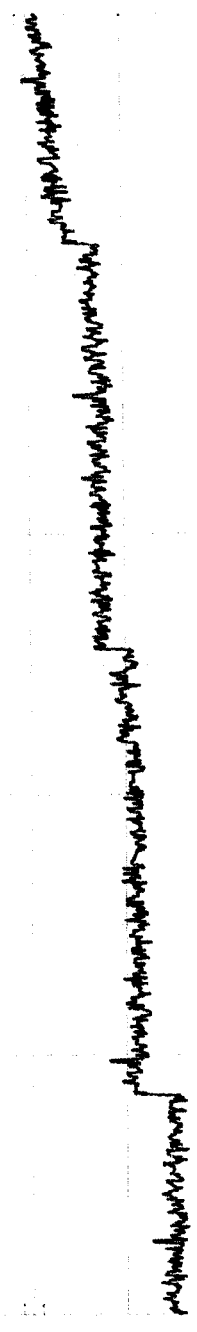
Spurious Emission	Page Reference	Test Results
	P22-P27	Passed



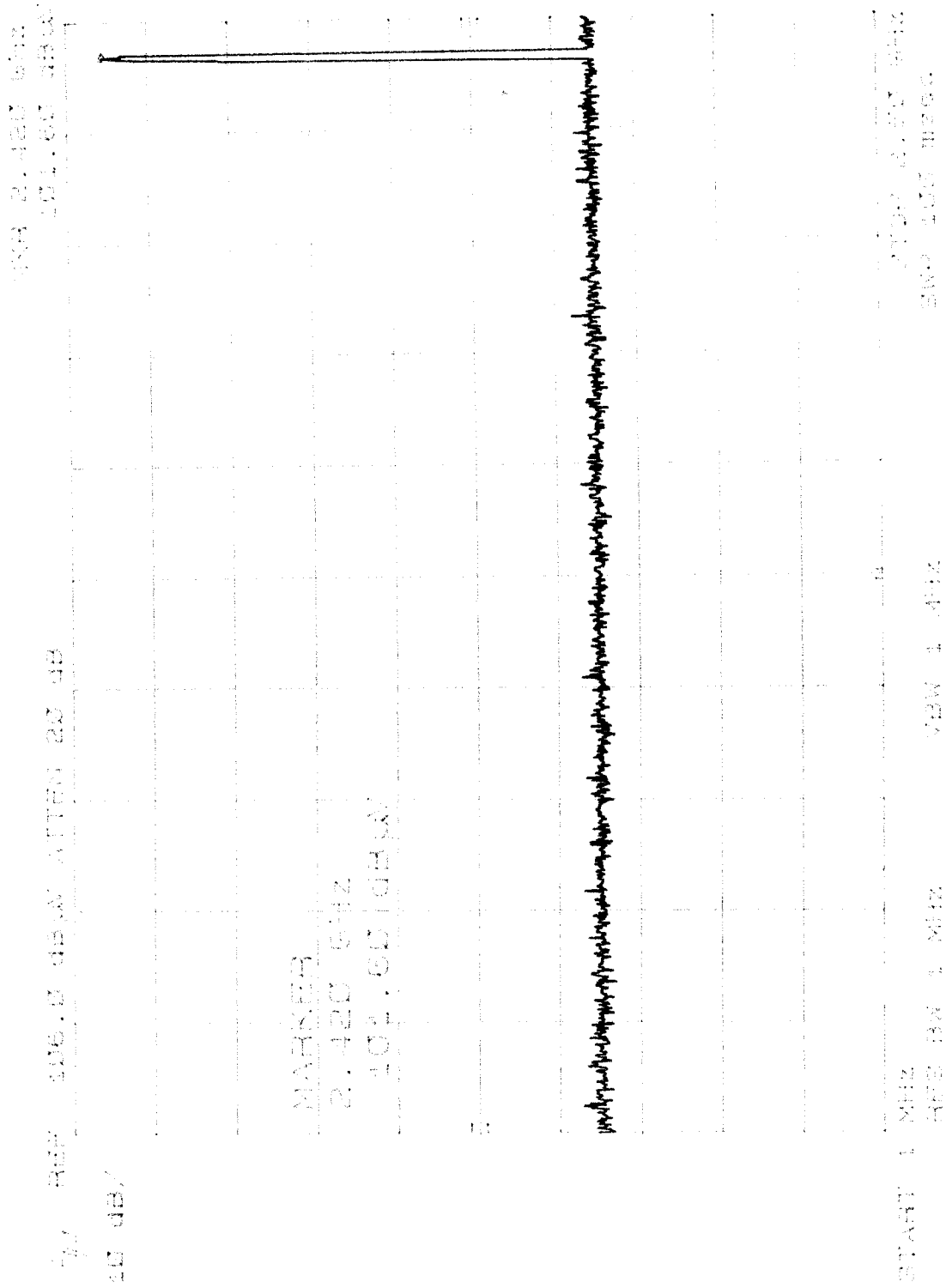
2014-01-21 10:10 AM

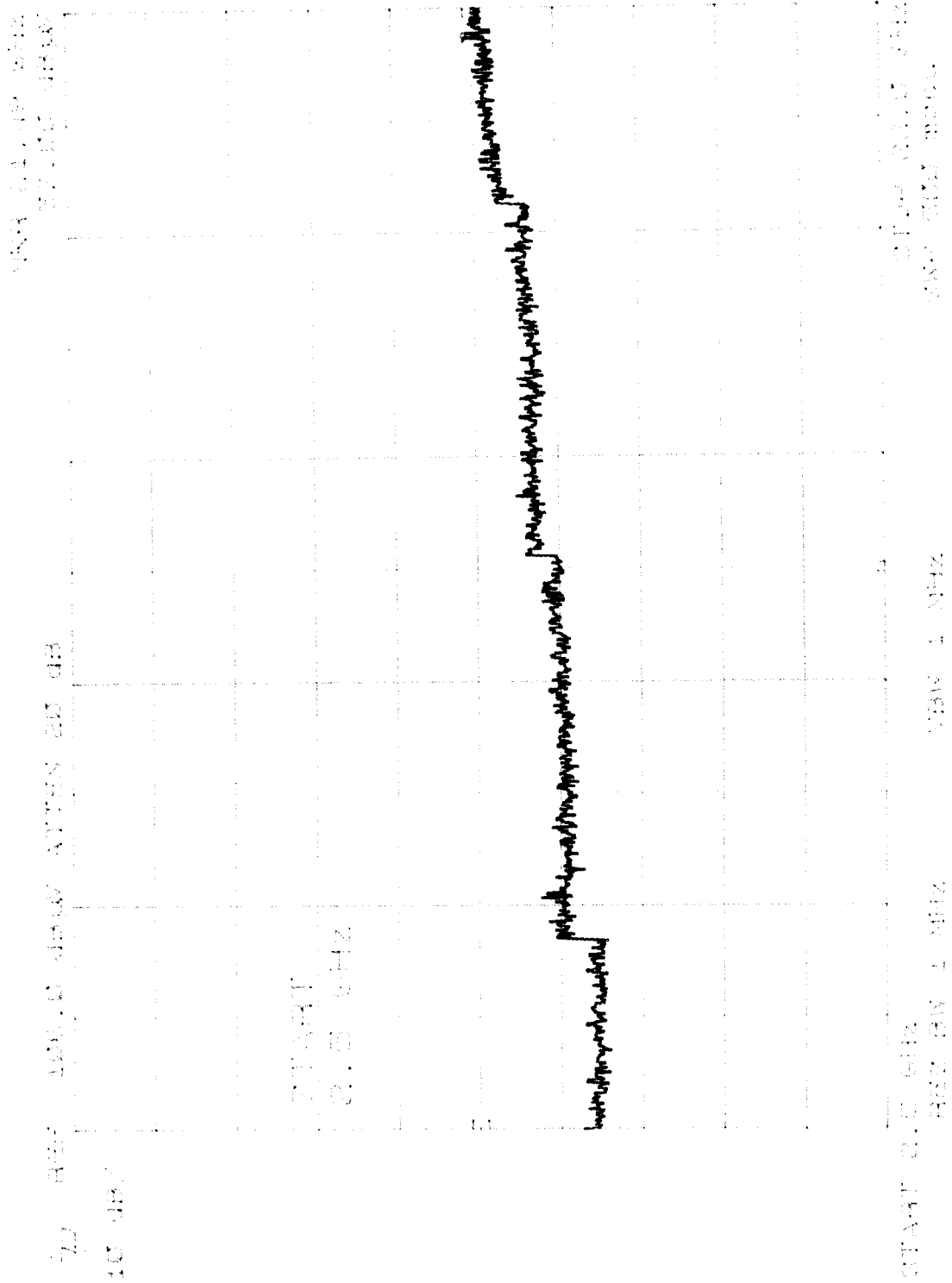
700 MHz 100.0 dBm ATTN: 400 dB
100 MHz

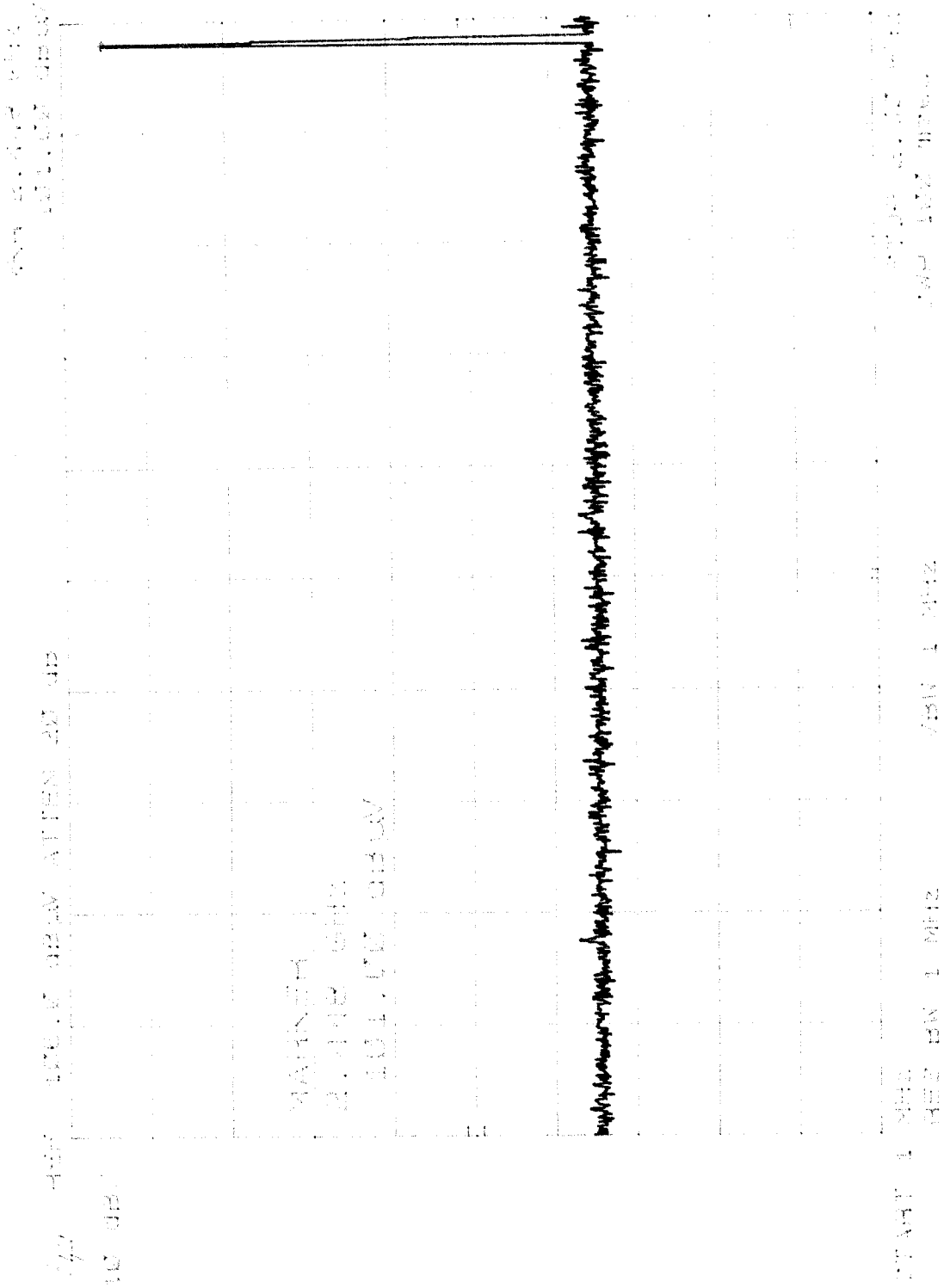
2014-01-21 10:10 AM
2014-01-21 10:10 AM

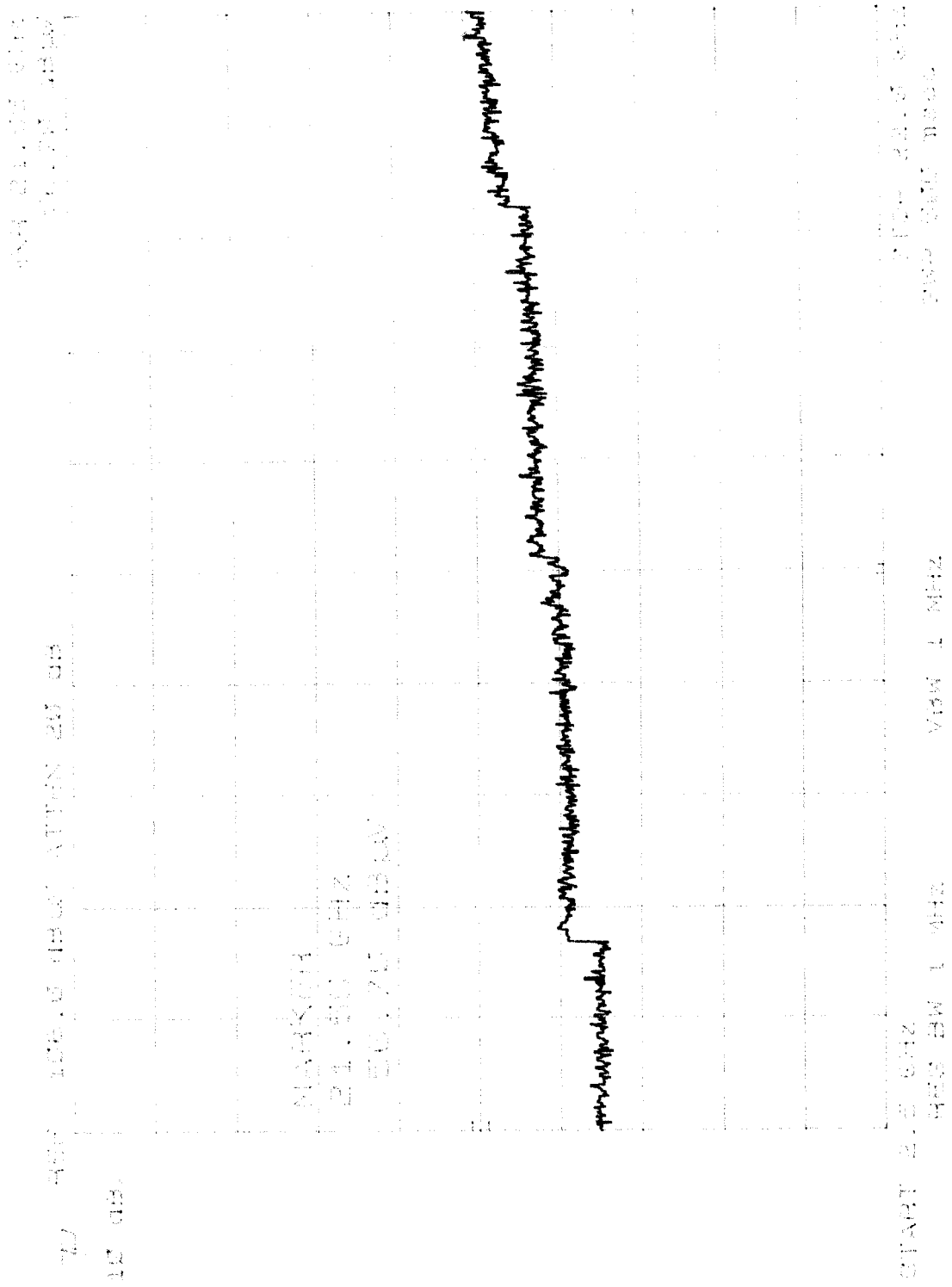


START: 2.0 GHz
STOP: 100.0 MHz









8 - 100 kHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable

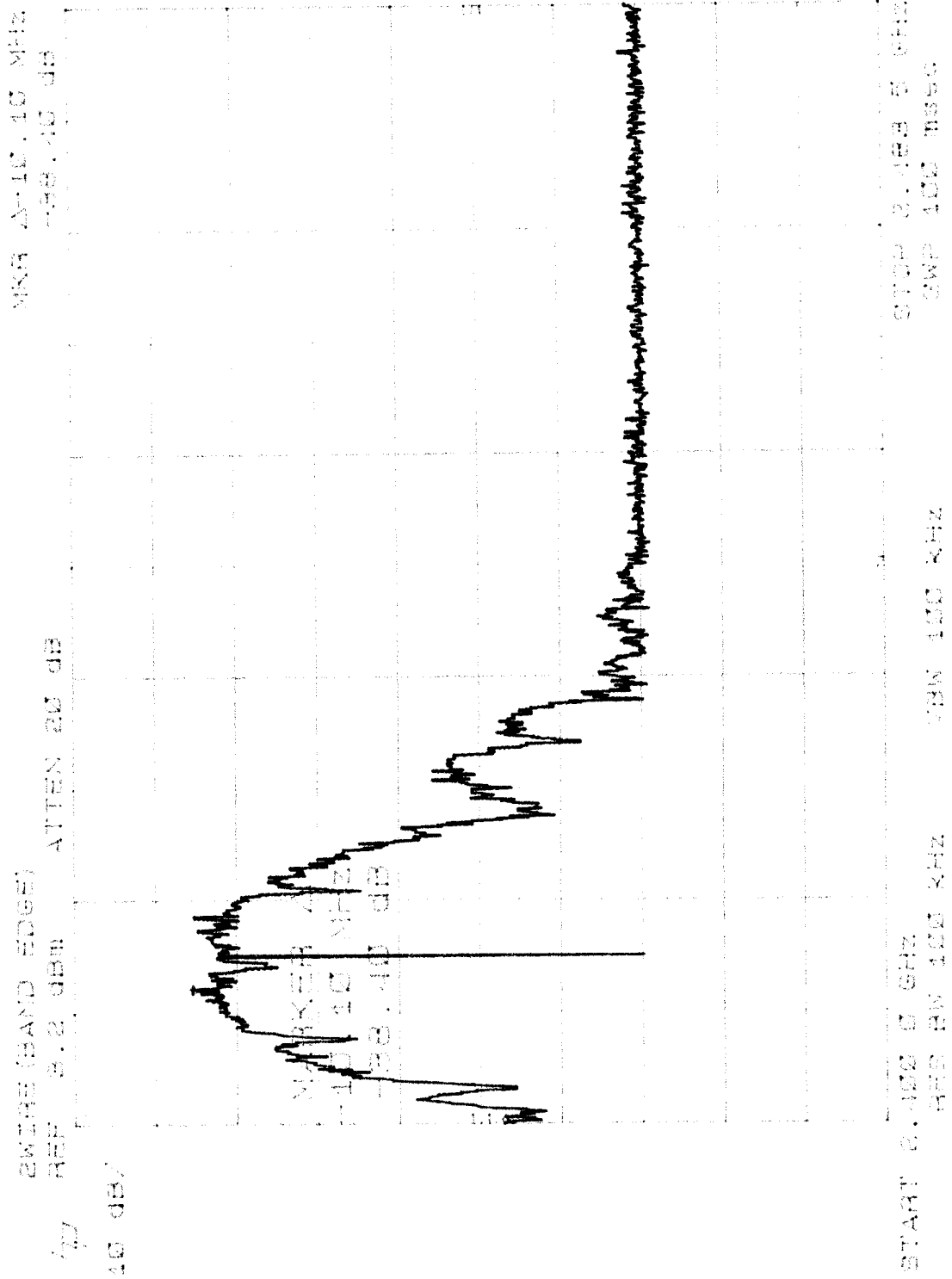
According to §15.247(c), if *any* 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified in § 15.209(a), whichever results in the lesser attenuation.

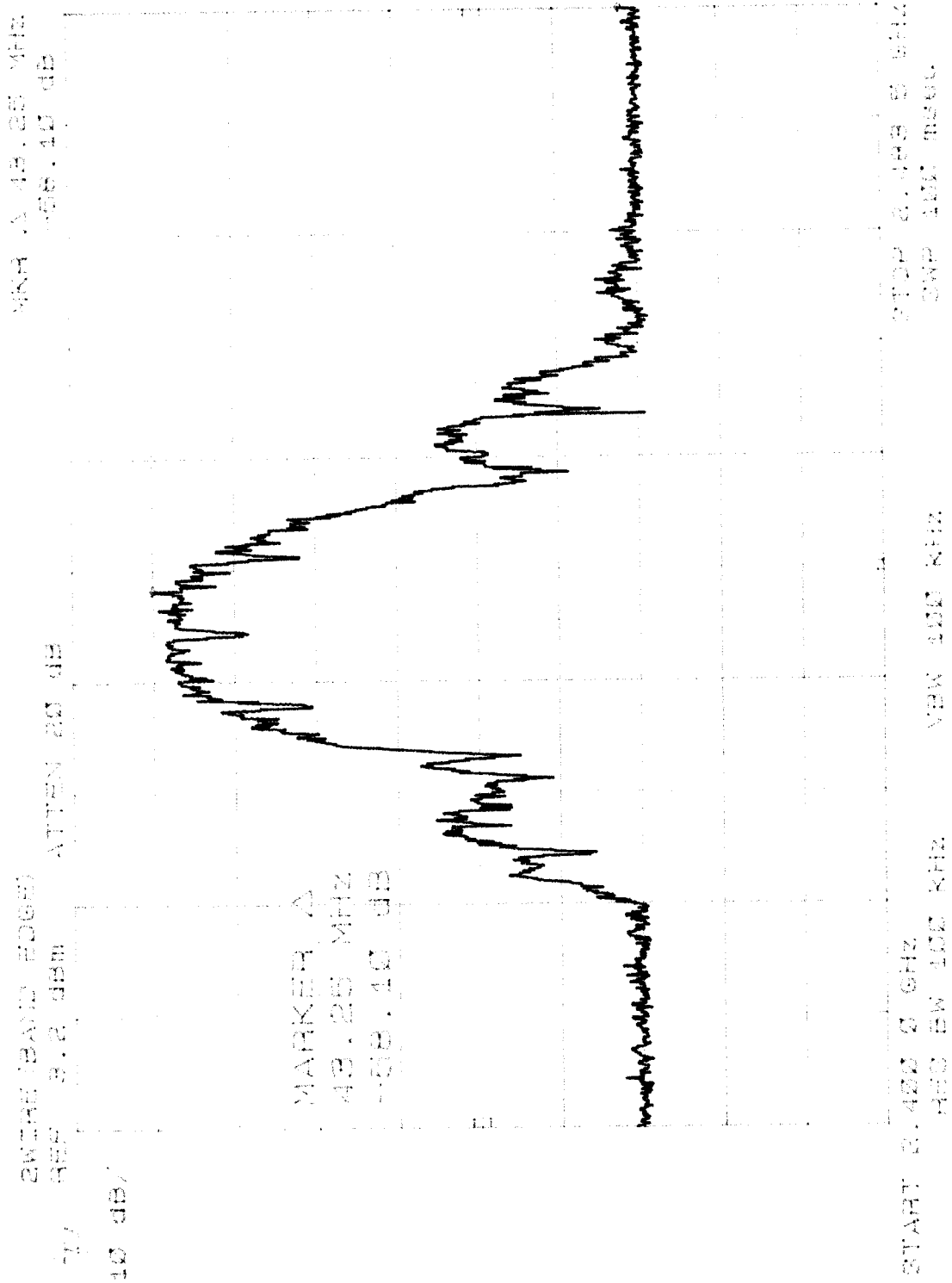
8.2 Measurement Procedure

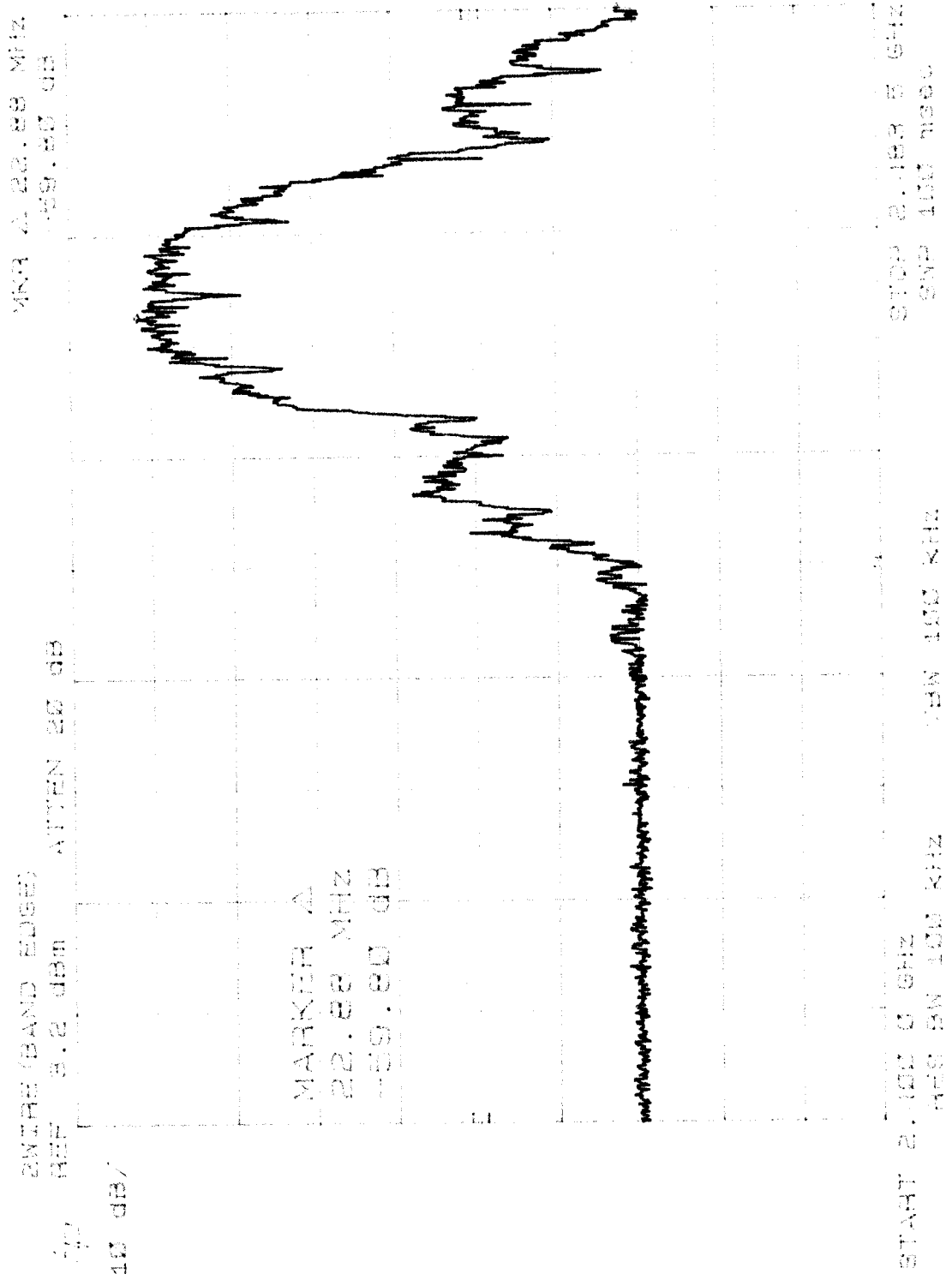
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

8.3 Test Results

Band Edge Bandwith	Page Reference	Test Result
Low Channel	Page 28	Passed
Middle Channel	Page 29	Passed
High Channel	Page 30	Passed







9 – POWER DENSITY

9.1 Standard Applicable

According to §15.247 (d), for direct sequence systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

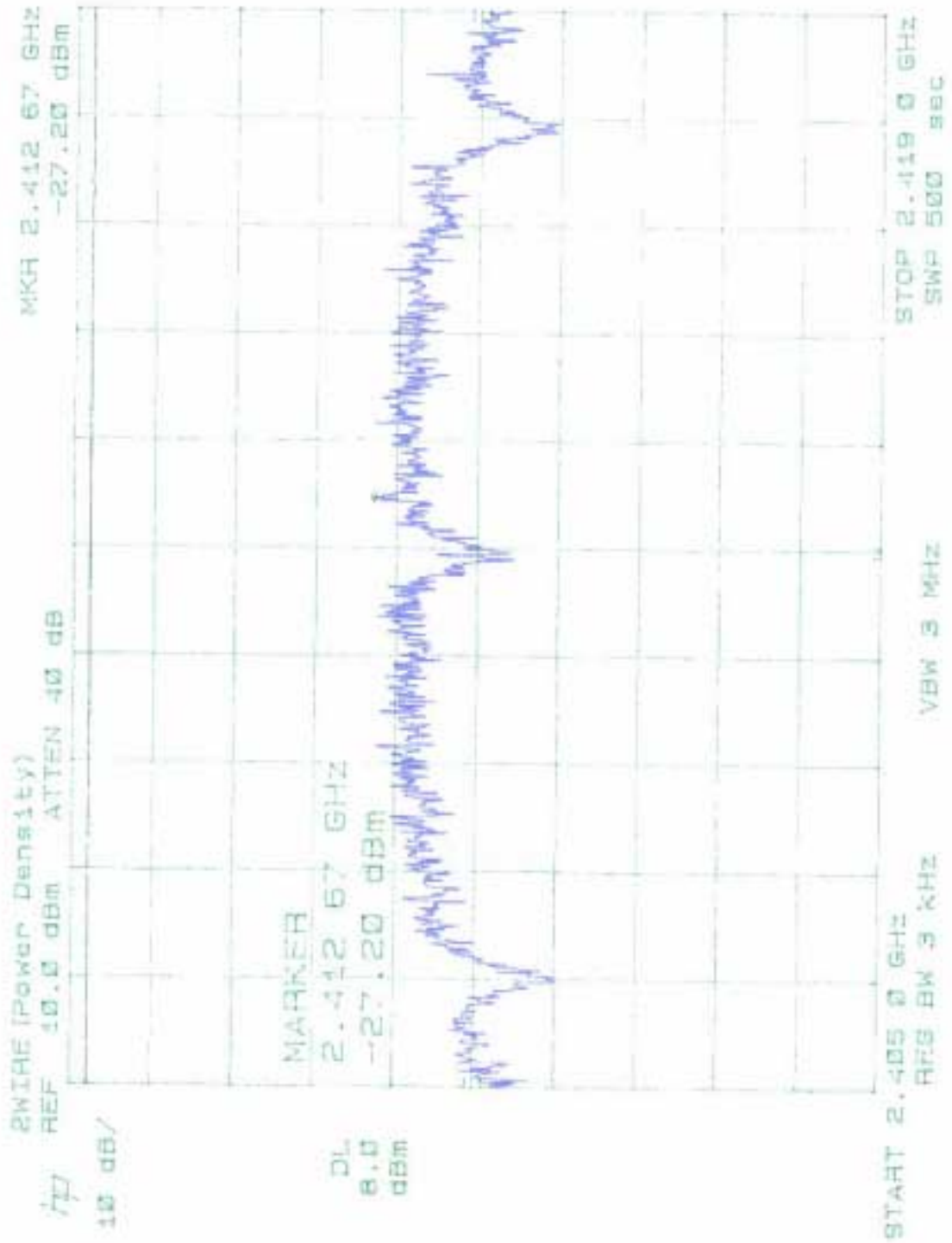
9.2 Measurement Procedure

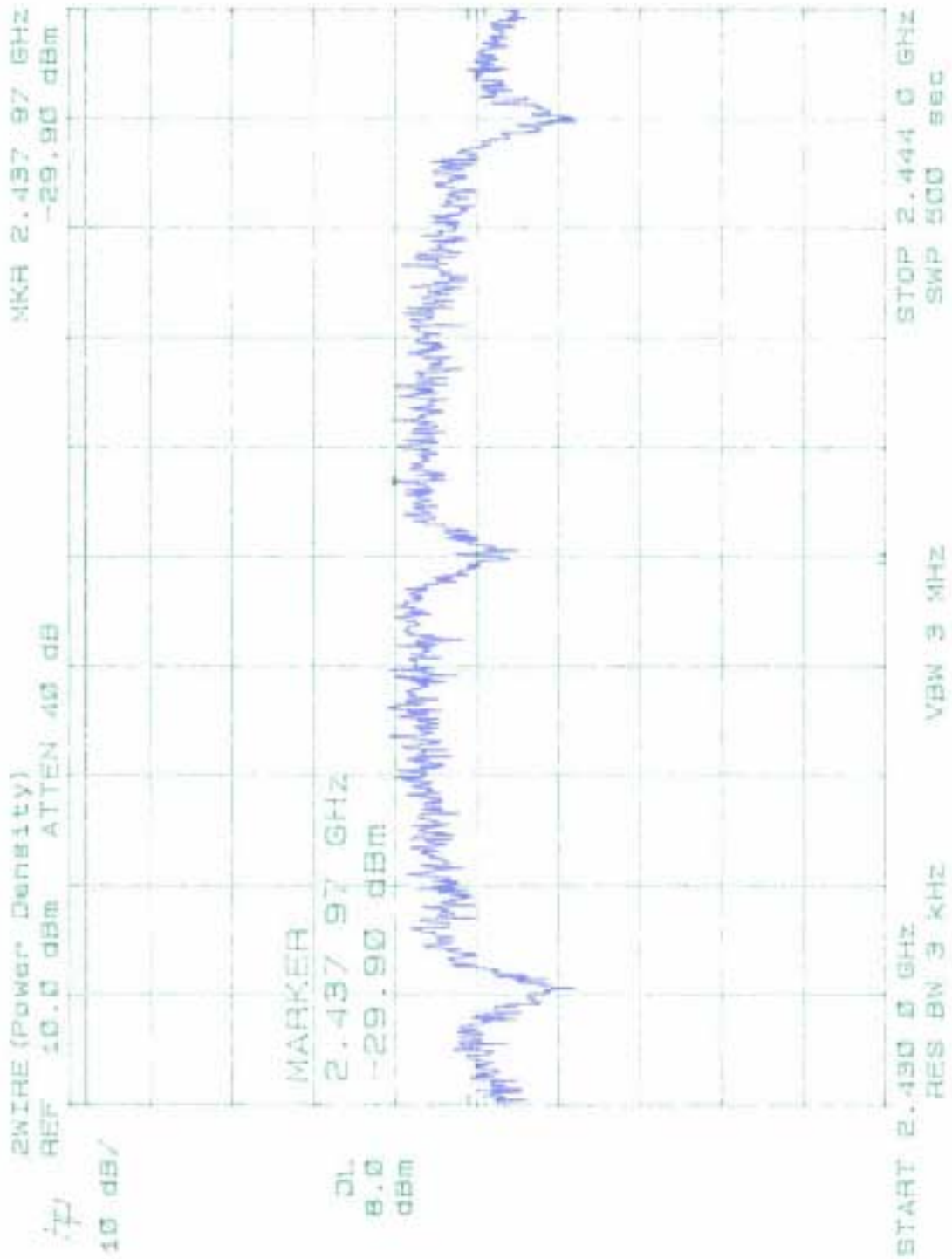
1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Repeat above procedures until all frequencies measured were complete.

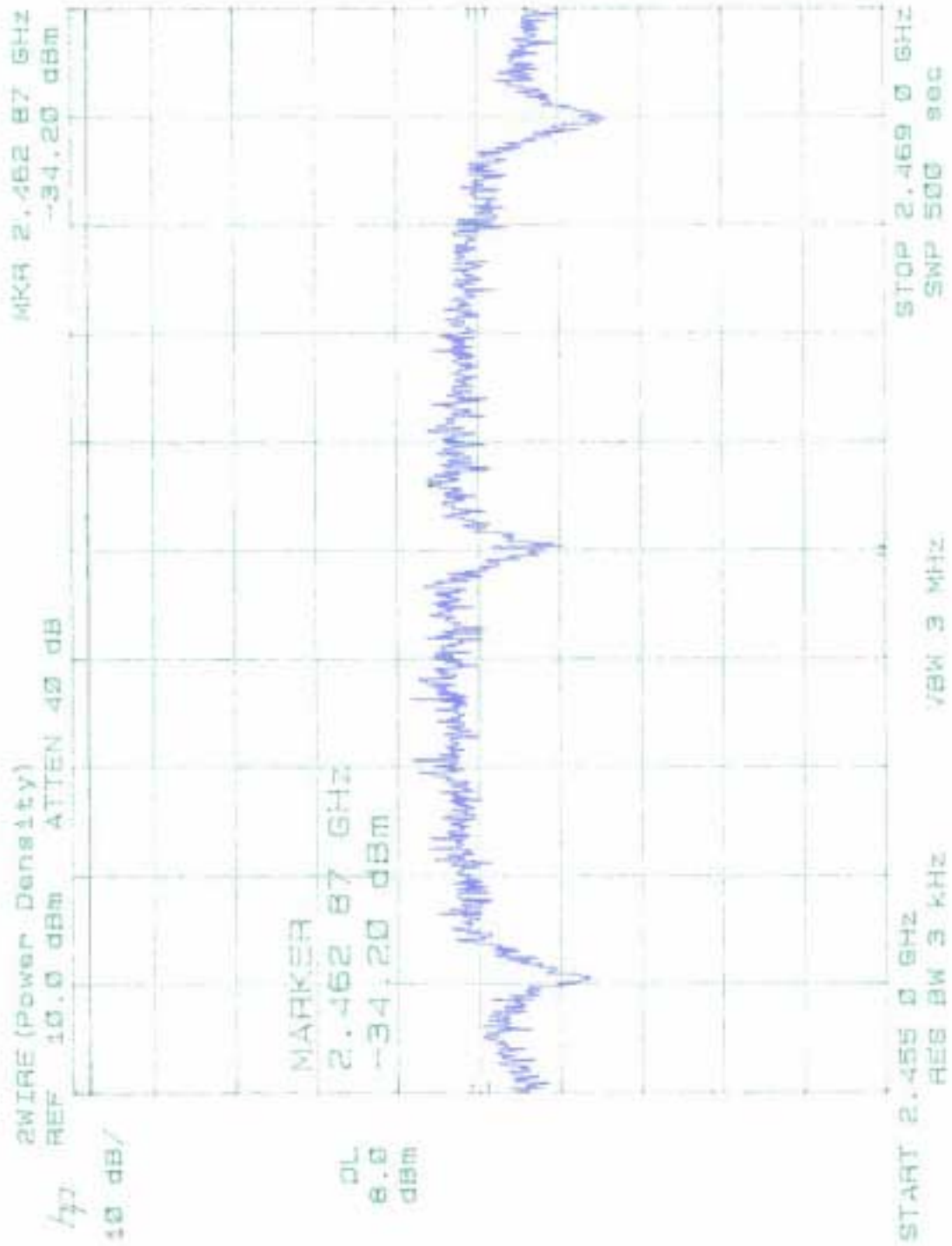
9.3 Test Results

Please refer to the following plot(s).

Power Density	Page Reference	Test Result
Low Channel	Page 32	Passed
Middle Channel	Page 33	Passed
High Channel	Page 34	Passed







10 - ANTENNA REQUIREMENT

10.1 Standard Applicable

For intentional device, according to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to § 15.247 (1), if transmitting antennas of directional gain greater than 6 dBi are used the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.2 Antenna Connected Construction

The directional gain of antenna used for transmitting is 0 dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Please see EUT photo for details.

11 – RF SAFETY REQUIREMENTS TO 2.1091

According to section 3 of Supplement C to OET Bulletin 65, Part 15 Transmitters are categorically excluded from Routine Environmental Evaluation by measurement or precise computations unless otherwise required by the Commissions.

The unit under evaluation has an external antenna of 0 dBi gain with a measured output power of 0.039 Watts at the antenna terminals.

Due to the low power of the EUT, environmental evaluation should be deemed unnecessary since the EUT's operational frequency range is 2400-248305 MHz and the Effective radiated power (ERP) is considerably less than 3 Watts.

A warning statement is also included in the user manual.

12 – SPURIOUS RADIATED EMISSION DATA

12.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BAEL is ± 4.0 dB.

12.2 EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup in accordance with the ANSI C63.4 - 1992. The specification used was the FCC 15 Subpart C limits.

The EUT was connected to a 110 VAC / 60 Hz power source and it was placed center and the back edge of the test table. The rear of the EUT was placed flushed with the rear of the tabletop.

The spacing between the peripherals was 10 centimeters.

Input / Output cables were draped along the edge of the test table and bundled if necessary.

12.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR §15.33 (a) (1), the system was tested to 10000 MHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Start Frequency	30 MHz
Stop Frequency	10000 MHz
Sweep Speed	Auto
IF Bandwidth	1 MHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth.....	120 kHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth.....	1MHz

12.4 Test Procedure

For the radiated emissions test, both the EUT and all support equipment power cords were connected to the AC floor outlet since the power supply used in the EUT did not provide an accessory power outlet.

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB μ V of specification limits), and are distinguished with a "Qp" in the data table.

12.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB μ V means the emission is 7dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

12.6 Summary of Test Results

According to the data in section 11.7, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.205, 15.207, and 15.247, and had the worst margin of:

- **7.8 dB μ V at 4824.00 MHz (Peak) in the Vertical polarization at Low Channel, 30 to 10000MHz, 3 meters.**

- **19.1 dB μ V at 7311.00 MHz (Ave.) in the Vertical polarization at Middle Channel, 30 to 10000MHz, 3 meters.**

- **10.3 dB μ V at 4924.00 MHz (Ave.) in the Horizontal polarization at High Channel, 30 to 10000MHz, 3 meters.**

- **3.0 dB μ V at 125.00 MHz in the Horizontal polarization at Local Unintentional Used, 30 to 10000MHz, 3 meters.**

12.7.3.a Final Scan, Low Channel.

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart C		
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Mode
MHz	dB μ V/m	Degree	Meter	H/V	dB μ V/m	dB μ V/m	dB	dB μ V/m	dB μ V/m	dB	
2412.00	96.4	360	1.2	V	28.1	3.4	30.0	97.9			
2412.00	94.8	180	1.6	H	28.1	3.4	30.0	96.3			
4824.00	58.8	230	1.2	V	32.5	4.9	30.0	66.2	74.0	-7.8	Peak
4824.00	35.3	230	1.2	V	32.5	4.9	30.0	42.7	54.0	-11.3	Ave
4824.00	52.9	230	1.6	H	32.5	4.9	30.0	60.3	74.0	-13.7	Peak
4824.00	32.8	230	1.6	H	32.5	4.9	30.0	40.2	54.0	-13.8	Ave
7236.00	28.2	180	1.2	V	35.1	5.6	30.0	38.9	54.0	-15.1	Ave
7236.00	45.6	180	1.2	V	35.1	5.6	30.0	56.3	74.0	-17.7	Peak
7236.00	25.30	180	1.6	H	35.1	5.6	30.0	36.0	54.0	-18.0	Ave
7236.00	40.8	180	1.6	H	35.1	5.6	30.0	51.5	74.0	-22.5	Peak

12.7.3.b Final Scan, Middle Channel.

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart C		
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Mode
MHz	dB μ V/m	Degree	Meter	H/V	dB μ V/m	dB μ V/m	dB	dB μ V/m	dB μ V/m	dB	
2437.00	85.0	360	1.2	V	28.1	3.4	30.0	86.5			
2437.00	83.5	150	1.4	H	28.1	3.4	30.0	85.0			
7311.00	24.2	45	1.2	V	35.1	5.6	30.0	34.9	54.0	-19.1	Ave
7311.00	40.6	45	1.2	V	35.1	5.6	30.0	51.3	74.0	-22.7	Peak
4874.00	23.9	180	1.4	H	32.5	4.9	30.0	31.3	54.0	-22.7	Ave
4874.00	23.6	180	1.2	V	32.5	4.9	30.0	31.0	54.0	-23.0	Ave
4874.00	42.7	180	1.4	H	32.5	4.9	30.0	50.1	74.0	-23.9	Peak
4874.00	42.0	180	1.2	V	32.5	4.9	30.0	49.4	74.0	-24.6	Peak
7311.00	18.3	45	1.2	V	35.1	5.6	30.0	29.0	54.0	-25.0	Ave
7311.00	30.5	45	1.2	V	35.1	5.6	30.0	41.2	74.0	-32.8	Peak

12.7.3.c Final Scan, High Channel.

Indicated			Table	Antenna		Correction Factor			FCC 15 Subpart C		
Frequency	Ampl.	Direction	Height	Polar	Antenna	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin	Mode
MHz	dBμV/m	Degree	Meter	H/V	dBμV/m	dBμV/m	dB	dBμV/m	dBμV/m	dB	
2462.00	80.6	45	1.4	V	28.1	3.4	30.0	82.1			
2462.00	93.0	45	1.4	H	28.1	3.4	30.0	94.5			
4924.00	36.3	180	1.2	H	32.5	4.9	30.0	43.7	54.0	-10.3	Ave
4924.00	56.1	180	1.2	H	32.5	4.9	30.0	63.5	74.0	-10.5	Peak
7386.00	24.8	45	1.4	H	35.1	5.6	30.0	35.5	54.0	-18.5	Ave
4924.00	26.0	180	1.2	V	32.5	4.9	30.0	33.4	54.0	-20.6	Ave
7386.00	19.4	45	1.4	H	35.1	5.6	30.0	30.1	54.0	-23.9	Ave
7386.00	38.5	45	1.4	H	35.1	5.6	30.0	49.2	74.0	-24.8	Peak
4924.00	38.2	180	1.2	V	32.5	4.9	30.0	45.6	74.0	-28.4	Peak
7386.00	31.1	45	1.4	H	35.1	5.6	30.0	41.8	74.0	-32.2	Peak

12.7.3.d Final Test Result, Local Unintentional Use, 30 MHz – 10000 MHz

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC 15 SUBPART C	
Frequency	Ampl.	Angle	Height	Polar	Antenna	Cable	Amp.	Corr. Ampl.	Limit	Margin
MHz	dBμV/m	Degree	Meter	H/V	dBμV/m	dB	dB	dBμV/m	dBμV/m	dB
125.00	51.4	180	2.2	H	12.3	1.8	25.0	40.5	43.5	-3.0
50.00	49.0	270	2.2	V	10.5	1.0	25.0	35.5	40	-4.5
175.00	43.9	90	1.2	H	13.4	3.9	25.0	36.2	43.5	-7.3
275.00	43.9	180	1.8	H	13.9	5.2	25.0	38.0	46	-8.0
175.00	42.9	90	1.2	V	13.4	3.9	25.0	35.2	43.5	-8.3
280.00	41.3	300	1.8	H	14.6	5.8	25.0	36.7	46	-9.3
250.00	44.8	240	2.2	V	13.1	3.0	25.0	35.9	46	-10.1
375.00	39.3	320	1.8	H	15.8	5.3	25.0	35.4	46	-10.6
275.00	40.8	270	1.2	V	13.9	5.2	25.0	34.9	46	-11.1
120.00	42.5	180	2.2	V	12.1	2.2	25.0	31.8	43.5	-11.7
225.00	43.2	90	1.8	H	12.1	3.9	25.0	34.2	46	-11.8
375.00	37.2	320	1.2	V	15.8	5.3	25.0	33.3	46	-12.7
225.00	41.9	270	1.2	V	12.1	3.9	25.0	32.9	46	-13.1
600.00	34.1	270	1.8	H	20.1	3.0	25.0	32.2	46	-13.8
425.00	32.7	270	1.2	V	17.2	3.0	25.0	27.9	46	-18.1

13 - CONDUCTED EMISSIONS TEST DATA

13.1 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BAEL is ± 2.4 dB.

13.2 EUT Setup

The measurement was performed at the **Open Area Test Site**, using the same setup per ANSI C63.4 - 1992 measurement procedure. The specification used was FCC Class B limits.

13.3 Spectrum Analyzer Setup

The spectrum analyzer was set with the following configurations during the conduction test:

Start Frequency	450 kHz
Stop Frequency	30 MHz
Sweep Speed.....	Auto
IF Bandwidth	100 kHz
Video Bandwidth.....	100 kHz
Quasi-Peak Adapter Bandwidth.....	9 kHz
Quasi-Peak Adapter Mode.....	Normal

13.4 Test Procedure

During the conducted emission test, the power cord of the host system was connected to the auxiliary outlet of the first LISN.

Maximizing procedure was performed on the six (6) highest emissions of each modes tested to ensure EUT is compliant with all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dB μ V of specification limits). Quasi-peak readings are distinguished with a "Qp".

13.5 Summary of Test Results

According to the data in section 12.6, the EUT complied with the FCC Conducted margin for a Class B device and these test results is deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations, with the *worst* margin reading of:

-16.2 dB μ V at 0.450 MHz in the Neutral mode.

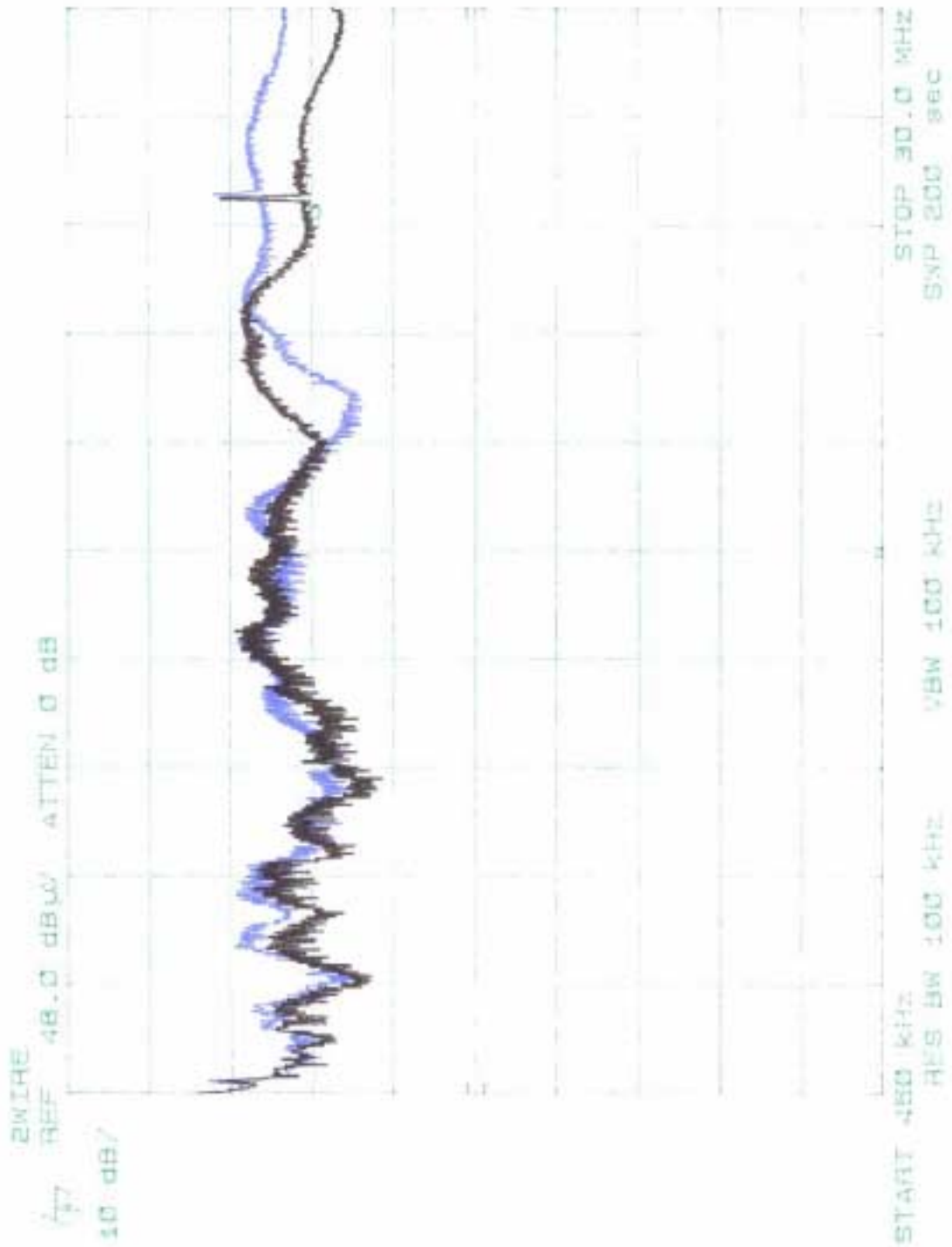
13.6 Conducted Emissions Test Data

12.6.1 Test Data, 0.45 - 30 MHz.

LINE CONDUCTED EMISSIONS				FCC CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dB μ V	Qp/Ave/Peak	Line/Neutral	dB μ V	dB
0.450	31.8	QP	Neutral	48	-16.2
0.450	31.0	QP	Line	48	-17.0
24.950	30.0	QP	Line	48	-18.0
24.860	29.3	QP	Neutral	48	-18.7
4.440	27.6	QP	Line	48	-20.4
13.070	27.4	QP	Neutral	48	-20.6

13.7 Plot of Conducted Emissions Test Data

Plot(s) of Conducted Emissions Test Data is presented in the following page as reference.



Appendix A – AGENT AUTHORIZATION LETTER



2Wire, Inc.
1704 Automation Parkway
San Jose CA 95131 USA

Tel: 408.428.9500
Fax: 408.428.9590
www.2Wire.com

May 30, 2001

Federal Communications Commission
7435 Oakland Mills Road
Columbia, Maryland, 21046

Sir/Madam,

Reg: FCC grand for HomePortal Wireless Residential Gateways:
HomePortal 100W
HomePortal 1000W, HomePortal 1000CW
HomePortal 1500W, HomePortal 1500CW
HomePortal 1600W, HomePortal 1600CW
HomePortal 2000W, HomePortal 2000CW

This letter is an authorization to accept Bay Area Compliance Lab. Corporation as an agent for 2Wire, Inc., 1704 Automation Parkway, San Jose, CA 95131, to sign applications before the Commission on our behalf, to make representations to you on our behalf, and to receive and exchange data between our company and the commission in connection with certification of the following 2Wire, Inc. product:

HomePortal 100W
HomePortal 1000W, HomePortal 1000CW
HomePortal 1500W, HomePortal 1500CW
HomePortal 1600W, HomePortal 1600CW
HomePortal 2000W, HomePortal 2000CW

Under FCC docket number 20780 and general docket number 80-284 pursuant to part 15, FCC rules and regulations.

Sincerely,

A handwritten signature in black ink, appearing to read "Jim Nallan", is written over a horizontal line.

Jim Nallan
Director of Quality
408-321-1438 (Direct)
408-321-1538 (fax)