

CERTIFICATION TEST REPORT
FOR THE
FIELD DISTURBANCE SENSOR, MPS4001
FCC PART 15, SUBPART B
CLASS B COMPLIANCE

MAY 21, 1996

PREPARED FOR:

Perimeter Products, Inc.
1130 Terra Bella Avenue
Mountain View, CA 94043

P.O. No : 5057

Job No : 61704

Report No : FB96-104

DOCUMENTATION CONTROL:

Tracy Phillips

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ADMINISTRATIVE INFORMATION

DATE OF TEST: Apr 29 & May 21, 1996

PURPOSE OF TEST: To demonstrate the compliance of the Field Disturbance Sensor, MPS4001 with the FCC Part 15, Subpart B requirements for Class B devices.

MANUFACTURER: Perimeter Products, Inc.
1130 Terra Bella Avenue
Mountain View, CA 94043

REPRESENTATIVE: Bob Williams

TEST LOCATION: CKC Laboratories, Inc.
5473A Clouds Rest Rd.
Mariposa, CA 95338

TEST PERSONNEL: Craig Mullis

TEST METHOD: ANSI C63.4 1992

FREQUENCY RANGE TESTED: 450 kHz - 1000 MHz
10.5 GHz, 2nd and 3rd Harmonics

EQUIPMENT UNDER TEST:

<u>Sensor</u>	
Manuf:	Perimeter
Model:	MPS4001
Serial:	Prototype
FCC ID:	FL9MPS4100

SUMMARY OF RESULTS

The Perimeter Products, Inc. Field Disturbance Sensor, MPS4001 was tested in accordance with ANSI C63.4 1992 for compliance with the Class B requirements of Part 15, Subpart B of the FCC Rules.

As received, the above equipment was found to be fully compliant with the Class B limits of FCC Part 15, Subpart B for both radiated and conducted emissions.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The Perimeter Field Disturbance Sensor, MPS4001, is a low power, outdoor, microwave transmitter. Transmission frequency is 10.525 GHz, modulated with 50% duty cycle at one of six user selectable frequencies from 3 kHz to 27 kHz. Supply power is 12VDC.

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

REPORT OF MEASUREMENTS

The following Tables 1 and 2 report the four highest radiated and six highest conducted emissions levels recorded during the tests performed on the Field Disturbance Sensor, MPS4001. The data sheets from which these tables were compiled are contained in Appendix B.

TABLE 1: FOUR HIGHEST RADIATED EMISSION LEVELS

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
10517.170	87.6	42.4	-35.0	8.0	0.0	103.0	128.0	-25.0	V
10517.190	73.8	42.4	-35.0	8.0	0.0	89.2	128.0	-38.8	H
21034.360	47.7	40.7	-34.8	12.7	0.0	66.3	77.5	-11.2	V
21034.400	45.5	40.7	-34.8	12.7	0.0	64.1	77.5	-13.4	H

Test Method: ANSI C63.4 1992
 Spec Limit : FCC B
 Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
 V = Vertical Polarization
 N = No Polarization
 D = Dipole Reading
 Q = Quasi Peak Reading
 A = Average Reading

COMMENTS: Unit turned on and operating. Fundamental frequency is 10.525GHz. Unable to find any signal at 31.575 GHz (vert or horiz) and unable to find any signals 30-1000MHz.

TABLE 2: SIX HIGHEST CONDUCTED EMISSION LEVELS

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Lisn dB							
15.429490	43.1	0.0				43.1	48.0	-4.9	R
16.554120	43.0	0.0				43.0	48.0	-5.0	B
16.835270	44.7	0.0				44.7	48.0	-3.3	R
17.099890	44.5	0.0				44.5	48.0	-3.5	B
17.414120	45.4	0.0				45.4	48.0	-2.6	R
17.562970	45.7	0.0				45.7	48.0	-2.3	R

Test Method: ANSI C63.4 1992
 Spec Limit : FCC B
 Test Distance: No Distance

NOTES: Q = Quasi Peak Reading
 A = Average Reading
 B = Black Lead
 W = White Lead

COMMENTS: Unit turned on and operating. Fundamental frequency is 10.525GHz.

TABLE A

LIST OF TEST EQUIPMENT USED AT MARIPOSA BARN SITE

VCCI Acceptance No. R-302T & C315T

1. Spectrum Analyzer, Hewlett Packard, Model No. HP 8568A, CKC 1 - S/N 2237A04323 (Display Unit), S/N - 2235A02425 (rf Unit). Date Calibration due, December, 1996.
2. Preamp, Hewlett Packard, Model No. 8447D, S/N -1937A02604, (range 2 -1300 MHz noise figure 3.5 - 4.0 dB, flatness of 1.5 - 2.0 dB, and an average gain of 28 dB). Date Calibration due, December, 1996.
3. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N - 2043A00231. Date Calibration due, December, 1996.
4. Biconical Antenna, A. H. Systems, Model No. SAS-200/542, S/N - 156. Date Calibration due, December, 1996.
5. Log Periodic Antenna, A. H. Systems, Model No. SAS200/510, S/N - 154. Date Calibration due, December, 1996.
6. LISN, Solar Electronics, Model No. 8028-50-TS-24-BNC.
7. 1-18 GHz Horn Antenna, ARA, Model No. 3115, S/N - 4085. Date Calibration due, April, 1997.
8. 18 GHz Horn Antenna, ARA, Model No. MWH-1826/B, S/N - 1005. Date Calibration due, January, 1997.
9. 26 GHz Horn Antenna, ARA, Model No. MWH-2640B, S/N - 1012. Date Calibration due, January, 1997.
10. Spectrum Analyzer, Hewlett Packard, Model No. HP 8564E, S/N - 3610A00454. Date Calibration due, April, 1997.

EUT SETUP

In general, the equipment under test (EUT) listed was setup in a manner that represented its normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Table 1 for radiated emissions, and Table 2 for conducted emissions. Additionally, a complete description of all the ports and I/O cables is included on the information sheets contained in Appendix A.

During radiated emissions testing, the EUT was mounted on a nonconductive rotating table 1 meter above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters. This configuration is typical for radiated emissions testing of table top devices.

I/O cables were connected to the EUT in the manner required for normal operation of the system. Excess cabling was bundled in the center in a serpentine fashion using 30-40 centimeter lengths.

During conducted emissions testing the EUT was located 80 centimeters above the conducting ground plane on the same nonconducting table as was used for radiated testing. The metal plane was grounded to the earth through the green wire safety ground. Power to the EUT was provided via 3 meters of shielded power cable from a filter grounded to the metal plane to a LISN. The LISN was also grounded to the plane and attached to the LISN was a 4 ganged grounded outlet whose source was also shielded and 60 centimeters in length. All other objects were kept a minimum of 1 meter away from the EUT during the conducted test.

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A was used to collect both the radiated and conducted emissions data for the Field Disturbance Sensor, MPS4001. For radiated measurements below 300 MHz, the Biconical type antenna listed was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. All antennas were located at a distance of 3 meters from the edge of the EUT. Conducted emissions tests required the use of the FCC type LISN's.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, a reference level of 100 dB μ V and a vertical scale size of 10 dB per division was used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dB μ V, and a vertical scale of 10 dB per division.

TABLE B : ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	450 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1 and 2 indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in Table 1 or Table 2. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Field Disturbance Sensor, MPS4001.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP 85650A Quasi-Peak Adapter for the HP 8568B Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

When the frequencies exceed 1 GHz, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

TEST METHODS

The radiated and conducted emissions data of the Field Disturbance Sensor, MPS4001 was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the "Sample Calculations". The corrected data was then compared to the FCC Part 15, Subpart B, emissions limits to determine compliance.

Preliminary and final measurements were taken in order to better ensure that all emissions from the EUT were found and maximized.

Radiated Emissions Testing

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode with the I/O cables and line cords facing the antenna. The frequency range of 30 MHz - 88 MHz was then scanned with the Biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks which were at or near the limit were recorded. Next, the frequency range of 100 - 300 MHz was scanned in the same manner, with the biconical antenna, and the peaks recorded. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced frequency span. The Biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 - 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 - 1000 MHz was again scanned. The horn antennas were used to check the harmonic frequencies at 10, 21, and 31 GHz. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

For the final radiated scan, the equipment was again positioned with its I/O and power cables facing the antenna, and a thorough scan of all frequencies using a small frequency span was manually made. The turntable was rotated as needed. Comparison with the previously recorded measurements was then made.

Using the peak readings from both scans as a guide, the test engineer then maximizes the readings with respect to the table rotation, antenna height and configuration of the peripherals and cables. Maximizing of the cables was achieved by monitoring the spectrum analyzer on a closed circuit television monitor while the EUT cables were being moved and rearranged on the EUT table for maximum emissions. Figures and photographs showing the final worst case configuration of the EUT are contained in Appendix A.

Conducted Emissions Testing

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

Tables 1 and 2 show the corrected values of the four highest radiated readings and the six highest conducted readings obtained for the Perimeter Products, Inc. Field Disturbance Sensor, MPS4001.

SAMPLE CALCULATIONS

An example of how the basic spectrum analyzer reading is converted using correction factors is given for the four highest radiated emissions readings in Table 1 and the six highest conducted emissions readings in Table 2. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ V is corrected by using the following formula :

$$\begin{aligned} & \text{Meter reading (dB}\mu\text{V)} \\ & + \text{Antenna Factor (dB)} \\ & + \text{Cable Loss (dB)} \\ & - \text{Distance Correction (dB)} \\ & - \text{Pre-amplifier Gain (dB)} \\ & = \text{Corrected Reading(dB}\mu\text{V/m)} \end{aligned}$$

This reading is then compared to the applicable specification limit to determine compliance. For conducted emissions, no correction factors are needed when 50 μ H LISN's are used.

APPENDIX A
INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

Test Software/Firmware:	N/A
CRT was displaying:	N/A
Power Supply Manufacturer:	N/A
Power Supply Part Number:	N/A
AC Line Filter Manufacturer:	N/A
AC Line Filter Part Number:	N/A

The AC power cord is NOT removable and is NOT shielded

Line voltage used during testing: 120V 60Hz

I/O PORTS

Type	#
Not Provided	

CRYSTAL OSCILLATORS

Type	Freq In MHz
Oscillator	10.525 GHz

PRINTED CIRCUIT BOARDS

Function	Model & Rev	Clocks, MHz	Layers	Location
Provides modulation signal	06-220100	N/A	2	Within cylindrical enclosure
Transmits signal	06-220300	10.525 GHz	2	Within cylindrical enclosure

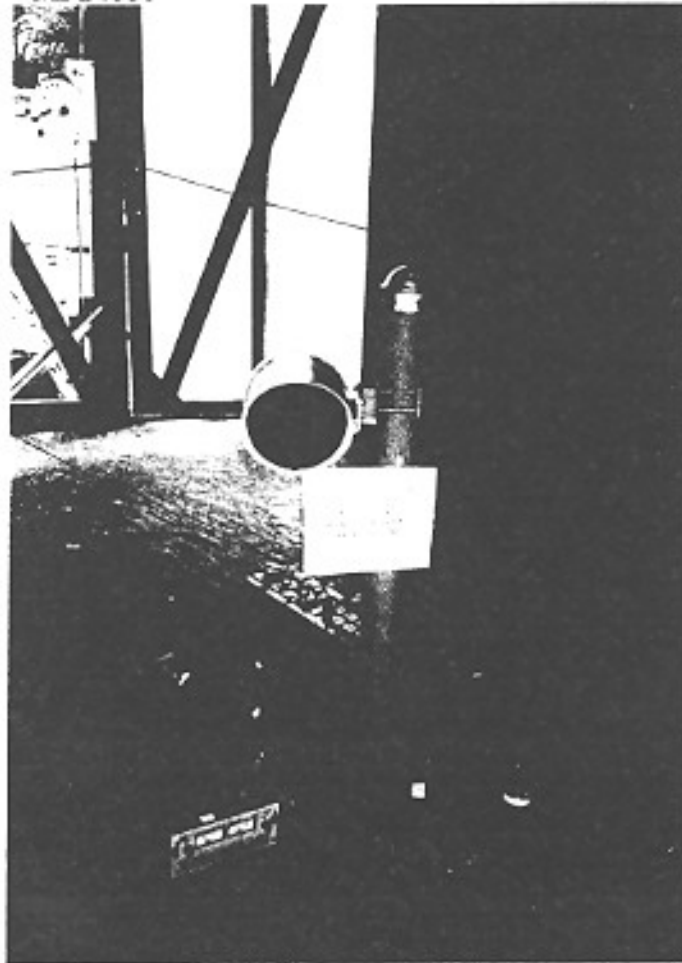
REQUIRED EUT CHANGES TO COMPLY:

None.

PHOTOGRAPH SHOWING I/O CABLE PLACEMENT

Applicant:
Equipment:
Model Number:

Perimeter Products, Inc.
Field Disturbance Sensor
MPS4001

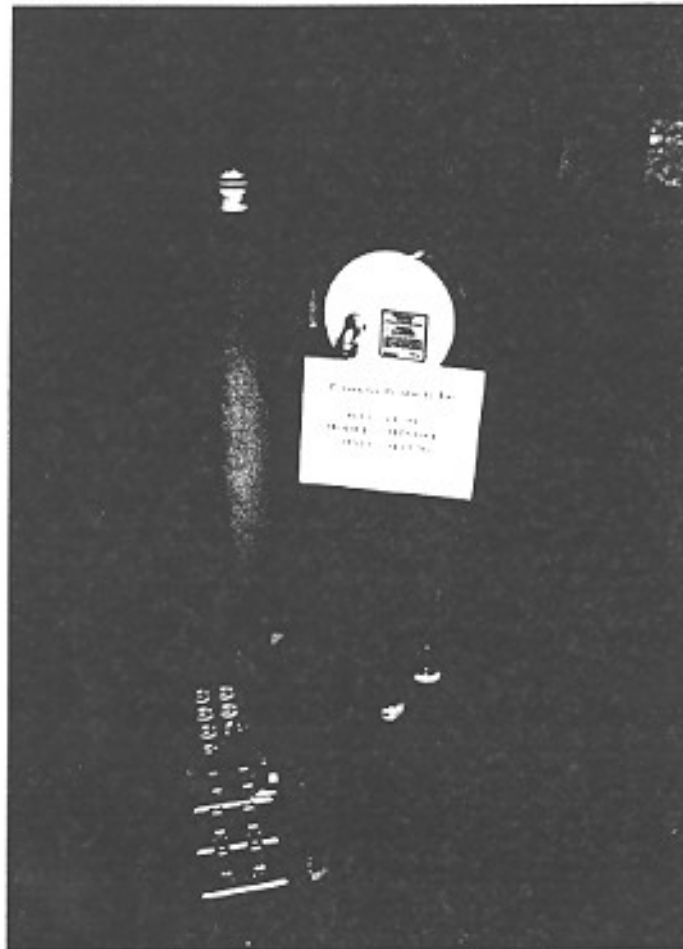


Radiated Emissions - Front View

NOTES:

PHOTOGRAPH SHOWING I/O CABLE PLACEMENT

Applicant: Perimeter Products, Inc.
Equipment: Field Disturbance Sensor
Model Number: MPS4001

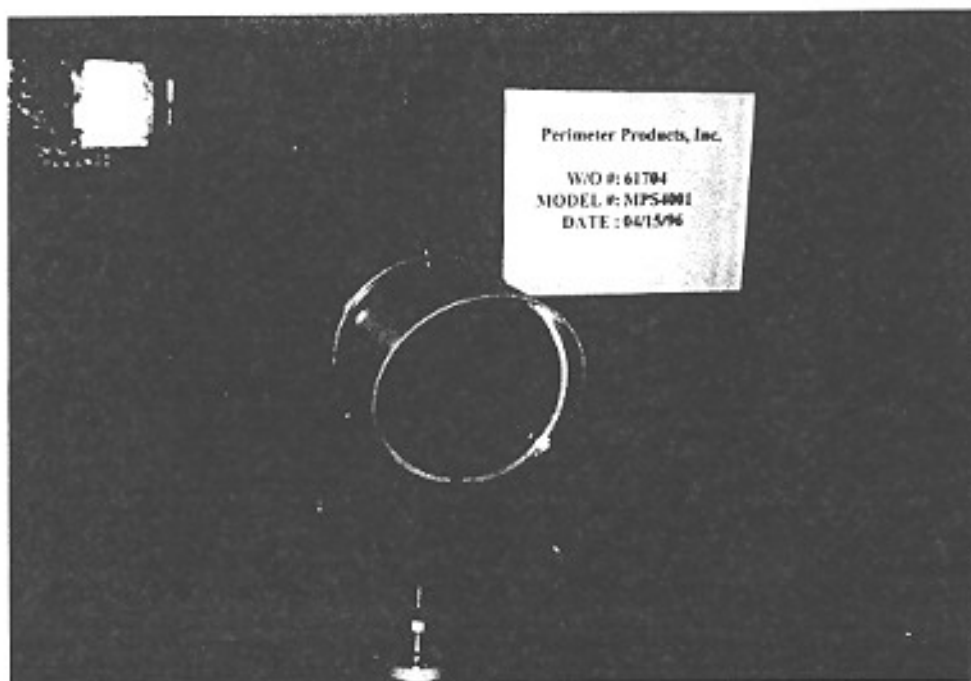


Radiated Emissions - Back View

NOTES:

PHOTOGRAPH SHOWING I/O CABLE PLACEMENT

Applicant: Perimeter Products, Inc.
Equipment: Field Disturbance Sensor
Model Number: MPS4001



Conducted Emissions - Front View

NOTES:

APPENDIX B
MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories • 5473A Clouds Rest Rd. • Mariposa, CA 95338 • 209-966-5240

Customer: Perimeter Products, Inc. Date: May-21-96
Specification: FCC B RADIATED Time: 09:20
Test Type: Maximized Emissions Sequence#: 3
Equipment: Field Disturbance Sensor
Manufacturer: Perimeter Products Tested By: Craig Mullis
Model: MPS4100
S/N: Prototype

Equipment Under Test (= EUT):*

Function	Manufacturer	Model #	S/N
Sensor	Perimeter	MPS4100	Prototype

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

Unit turned on and operating. Fundamental frequency is 10.525GHz. Unable to find any signal at 31.575GHz (vert or horiz) and unable to find any signals 30-1000MHz.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	8449B dB	Chamb dB	18-26 dB	Chamb dB	Dist dB	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar
1	21034.400	45.5	-34.8	+2.7	+40.7	+10.0	+0.0	64.1	77.5	-13.4	Horiz
2	21034.360	47.7	-34.8	+2.7	+40.7	+10.0	+0.0	66.3	77.5	-11.2	Vert

Test Location: CKC Laboratories • 5473A Clouds Rest Rd. • Mariposa, CA 95338 • 209-966-5240

Customer: Perimeter Products, Inc.
Specification: FCC B RADIATED
Test Type: Maximized Emissions
Equipment: Field Disturbance Sensor
Manufacturer: Perimeter Products
Model: MPS4001
S/N: Prototype

Date: May-21-96
Time: 09:43
Sequence#: 4
Tested By: Craig Mullis

Equipment Under Test (= EUT):*

Function	Manufacturer	Model #	S/N
Sensor	Perimeter	MPS4001	Prototype

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

Unit turned on and operating. Fundamental frequency is 10.525GHz. Unable to find any signal at 31.575GHz (vert or horiz) and unable to find any signals 30-1000MHz.

Measurement Data:

Sorted by Margin

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	1-18G dB	8449B dB	Chamb dB	Chamb dB	Dist dB	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar
1	10517.170	87.6	+42.4	-35.0	+7.1	+0.9	+0.0	103.0	128.0	-25.0	Vert
2	10517.190	73.8	+42.4	-35.0	+7.1	+0.9	+0.0	89.2	128.0	-38.8	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest Rd, Barn • Mariposa, CA 95338 • (800)-500-4EMC

Customer: Perimeter Products, Inc.
 Specification: FCC B COND
 Test Type: Conducted Emissions
 Equipment: Field Disturbance Sensor
 Manufacturer: Perimeter Products
 Model: MPS4001
 S/N: Prototype

Date: Apr-29-96
 Time: 12:09
 Sequence#: 1
 Tested By: Craig Mullis

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Sensor	Perimeter	MPS4001	Prototype

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

Unit turned on and operating. Fundamental frequency is 10.525GHz.

Measurement Data:

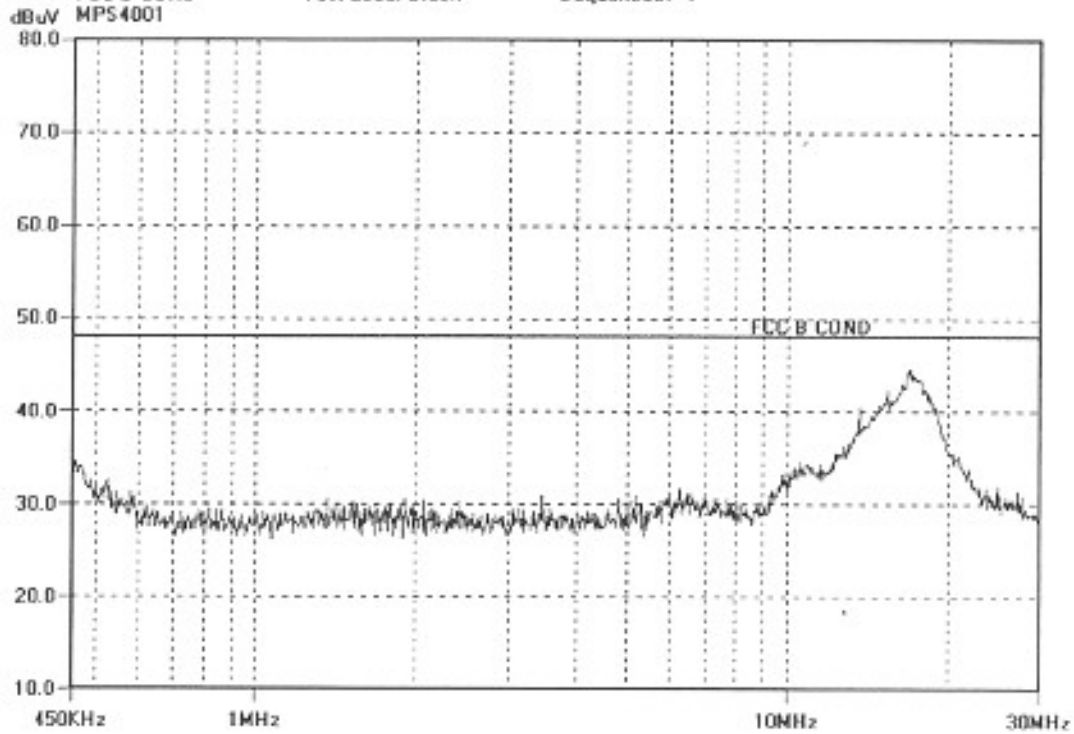
Sorted by Margin

Test Lead: Black

#	Freq	Rdng dB μ V	dB	dB	dB	dB	Dist dB	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar
1	17.100M	44.5					+0.0	44.5	48.0	-3.5	Black
2	16.935M	44.5					+0.0	44.5	48.0	-3.5	Black
3	16.554M	43.0					+0.0	43.0	48.0	-5.0	Black
4	15.429M	42.2					+0.0	42.2	48.0	-5.8	Black
5	18.423M	41.9					+0.0	41.9	48.0	-6.1	Black
6	18.588M	41.5					+0.0	41.5	48.0	-6.5	Black
7	15.611M	41.2					+0.0	41.2	48.0	-6.8	Black
8	14.966M	40.7					+0.0	40.7	48.0	-7.3	Black
9	19.002M	40.6					+0.0	40.6	48.0	-7.4	Black
10	13.660M	40.6					+0.0	40.6	48.0	-7.4	Black
11	17.296M	40.0					+0.0	40.0	48.0	-8.0	Black
	Quasi Peak 4MHz span										

	17.298M	43.8	+0.0	43.8	48.0	-4.2	Black
13	13.858M	38.5	+0.0	38.5	48.0	-9.5	Black
14	13.297M	37.2	+0.0	37.2	48.0	-10.8	Black
15	13.023M	36.5	+0.0	36.5	48.0	-11.5	Black
16	12.750M	36.3	+0.0	36.3	48.0	-11.7	Black
17	12.449M	35.5	+0.0	35.5	48.0	-12.5	Black
18	12.339M	35.4	+0.0	35.4	48.0	-12.6	Black
19	20.920M	35.1	+0.0	35.1	48.0	-12.9	Black
20	10.551M	34.6	+0.0	34.6	48.0	-13.4	Black
21	460.416k	34.5	+0.0	34.5	48.0	-13.5	Black
22	11.509M	34.3	+0.0	34.3	48.0	-13.7	Black
23	10.906M	34.3	+0.0	34.3	48.0	-13.7	Black
24	12.147M	34.2	+0.0	34.2	48.0	-13.8	Black
25	466.098k	34.1	+0.0	34.1	48.0	-13.9	Black
26	450.947k	34.0	+0.0	34.0	48.0	-14.0	Black
27	21.995M	33.8	+0.0	33.8	48.0	-14.2	Black
28	10.614M	33.8	+0.0	33.8	48.0	-14.2	Black
29	10.332M	33.8	+0.0	33.8	48.0	-14.2	Black
30	10.167M	33.5	+0.0	33.5	48.0	-14.5	Black
31	9.894M	33.3	+0.0	33.3	48.0	-14.7	Black

CXC Laboratories, Inc. Date: Mon Apr-29-1996 Time: 11:40:45
FCC B COND Test Lead: Black Sequence#: 1
MPS4001



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest Rd, Barn • Mariposa, CA 95338 • (800)-500-4EMC

Customer: Perimeter Products, Inc.
 Specification: FCC B COND
 Test Type: Conducted Emissions
 Equipment: Field Disturbance Sensor
 Manufacturer: Perimeter Products
 Model: MPS4001
 S/N: Prototype

Date: Apr-29-96
 Time: 12:05
 Sequence#: 2
 Tested By: Craig Mullis

Equipment Under Test (= EUT):*

Function	Manufacturer	Model #	S/N
Sensor	Perimeter	MPS4001	Prototype

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

Unit turned on and operating. Fundamental frequency is 10.525GHz.

Measurement Data:

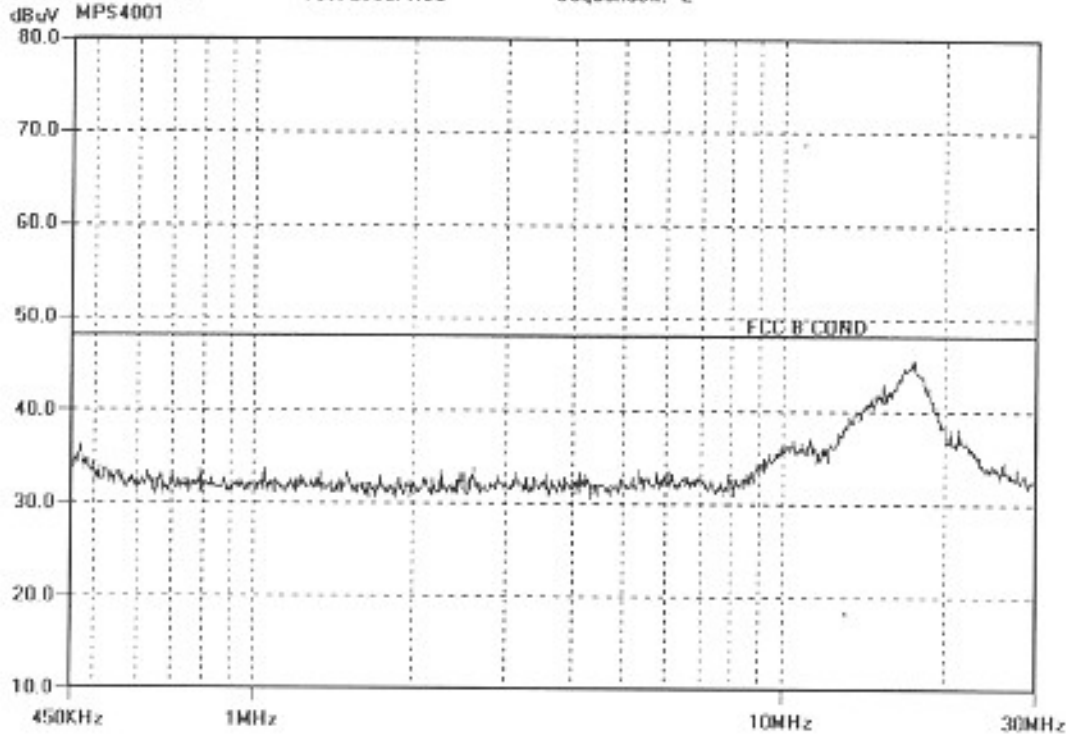
Sorted by Margin

Test Lead: Red

#	Freq MHz	Rdng dB μ V	dB	dB	dB	dB	Dist dB	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar
1	17.563	45.7					+0.0	45.7	48.0	-2.3	Red
2	17.414	45.4					+0.0	45.4	48.0	-2.6	Red
3	16.835	44.7					+0.0	44.7	48.0	-3.3	Red
4	15.429	43.1					+0.0	43.1	48.0	-4.9	Red
5	18.638	42.6					+0.0	42.6	48.0	-5.4	Red
6	16.091	42.6					+0.0	42.6	48.0	-5.4	Red
7	15.843	42.3					+0.0	42.3	48.0	-5.7	Red
8	15.016	42.0					+0.0	42.0	48.0	-6.0	Red
9	15.611	41.9					+0.0	41.9	48.0	-6.1	Red
10	15.132	41.7					+0.0	41.7	48.0	-6.3	Red
11	14.685	41.6					+0.0	41.6	48.0	-6.4	Red

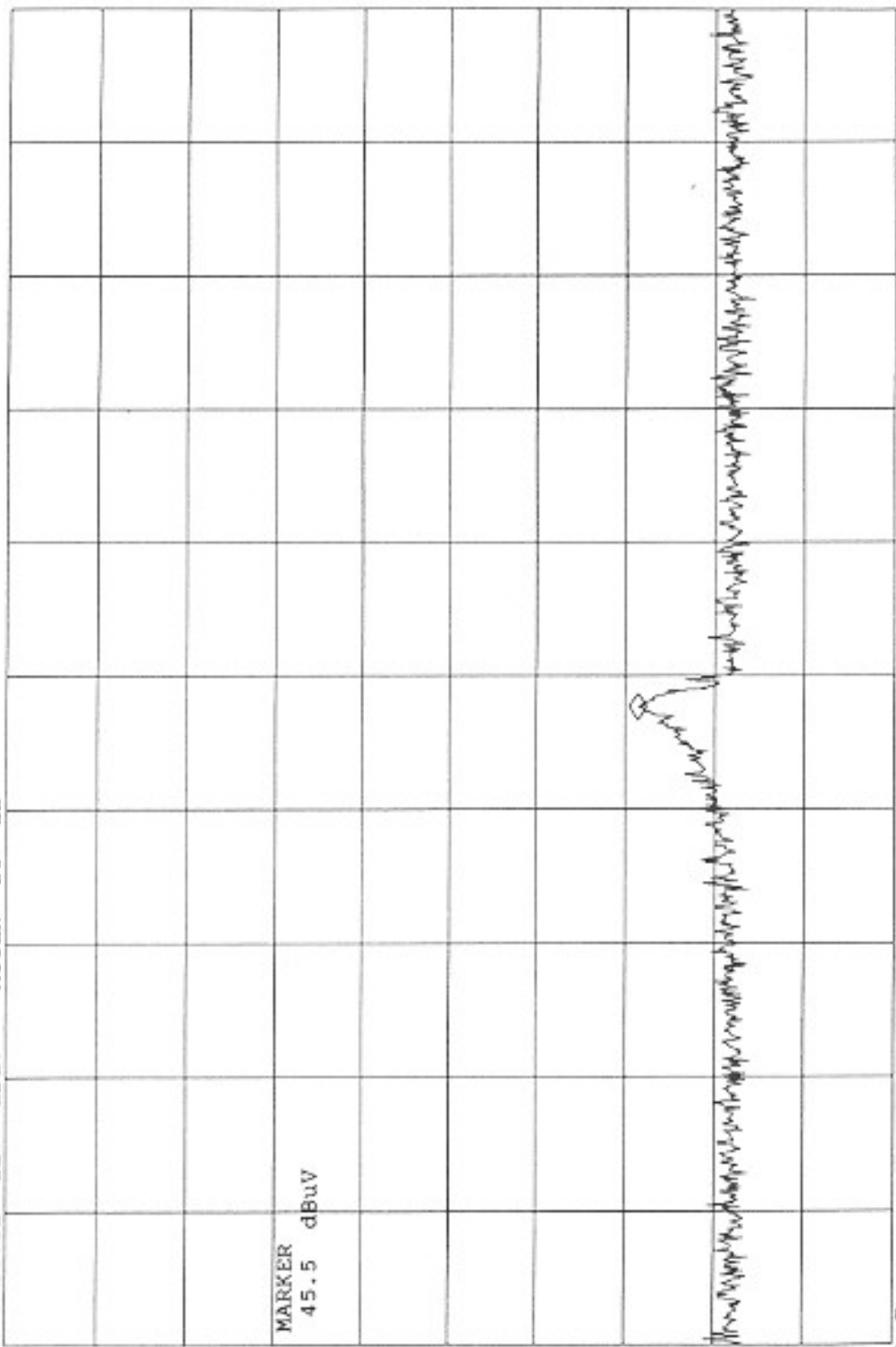
12	17.437	40.8	+0.0	40.8	48.0	-7.2	Red
Quasi Peak 3MHz span							
13	14.305	40.8	+0.0	40.8	48.0	-7.2	Red
14	19.498	40.7	+0.0	40.7	48.0	-7.3	Red
15	14.106	40.5	+0.0	40.5	48.0	-7.5	Red
16	13.809	39.9	+0.0	39.9	48.0	-8.1	Red
17	13.297	39.5	+0.0	39.5	48.0	-8.5	Red
18	13.461	39.2	+0.0	39.2	48.0	-8.8	Red
19	19.796	38.8	+0.0	38.8	48.0	-9.2	Red
20	13.106	38.6	+0.0	38.6	48.0	-9.4	Red
21	21.367	38.2	+0.0	38.2	48.0	-9.8	Red
22	20.656	38.1	+0.0	38.1	48.0	-9.9	Red
23	12.668	37.7	+0.0	37.7	48.0	-10.3	Red
24	21.565	37.1	+0.0	37.1	48.0	-10.9	Red
25	11.235	37.0	+0.0	37.0	48.0	-11.0	Red
26	10.441	36.8	+0.0	36.8	48.0	-11.2	Red
27	10.797	36.7	+0.0	36.7	48.0	-11.3	Red
28	12.284	36.6	+0.0	36.6	48.0	-11.4	Red
29	11.098	36.4	+0.0	36.4	48.0	-11.6	Red
30	10.386	36.4	+0.0	36.4	48.0	-11.6	Red
31	10.222	36.3	+0.0	36.3	48.0	-11.7	Red

CKC Laboratories, Inc. Date: Mon Apr 29 1996 Time: 11:57:12
FCC B COND Test Lead: Red Sequence#: 2
MPS4001



Title: Perimeter Products/MPS4100/CFR47, 15.245 (Horiz)
Ref Level 117 dBuV ATTEN 20 dB

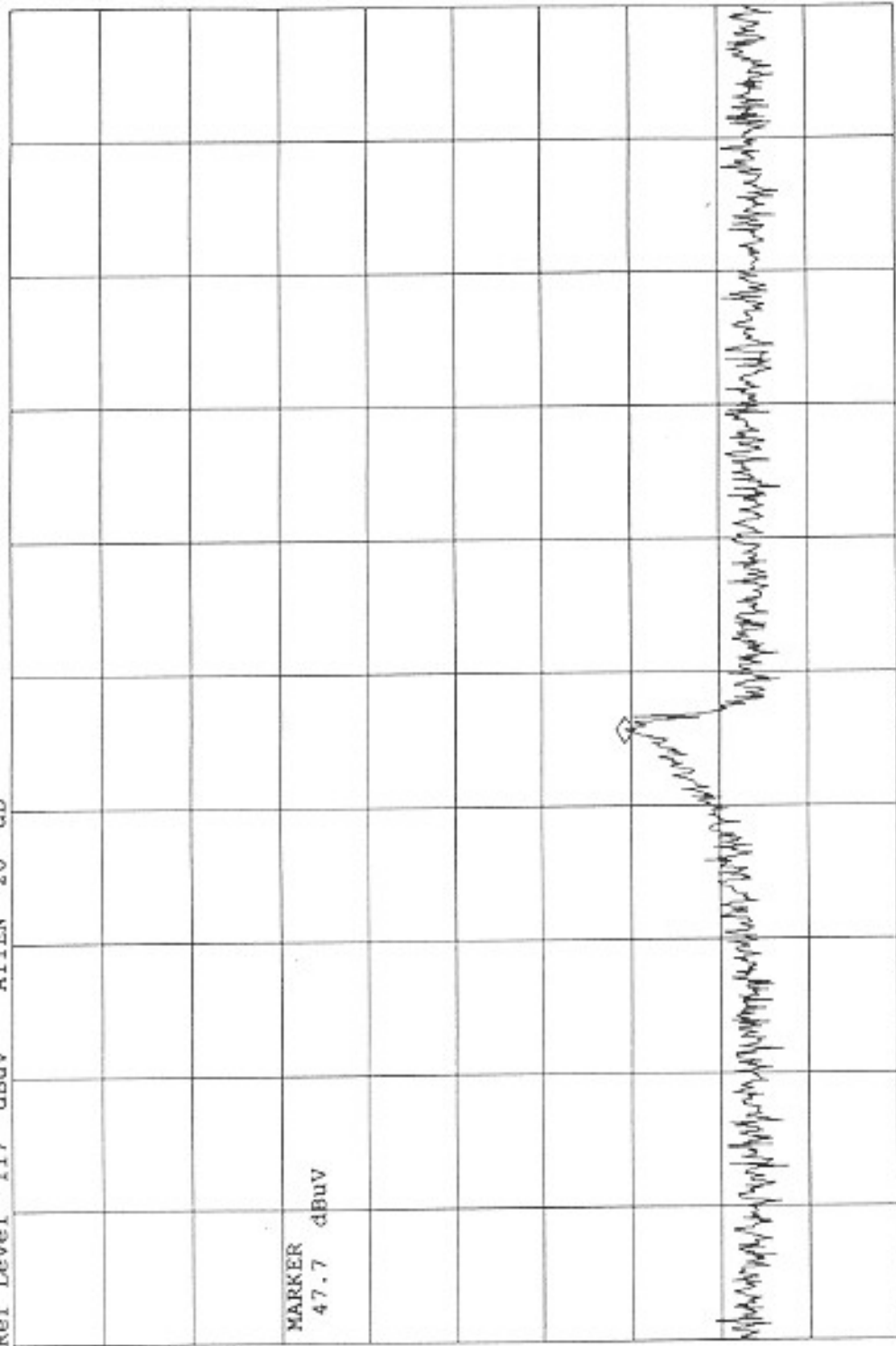
10 dB/



Start Freq 21033.45 MHz RES BW 1000
Center Freq 21034.45 MHz VID BW 3000
Stop Freq 21035.45 MHz SWP 10

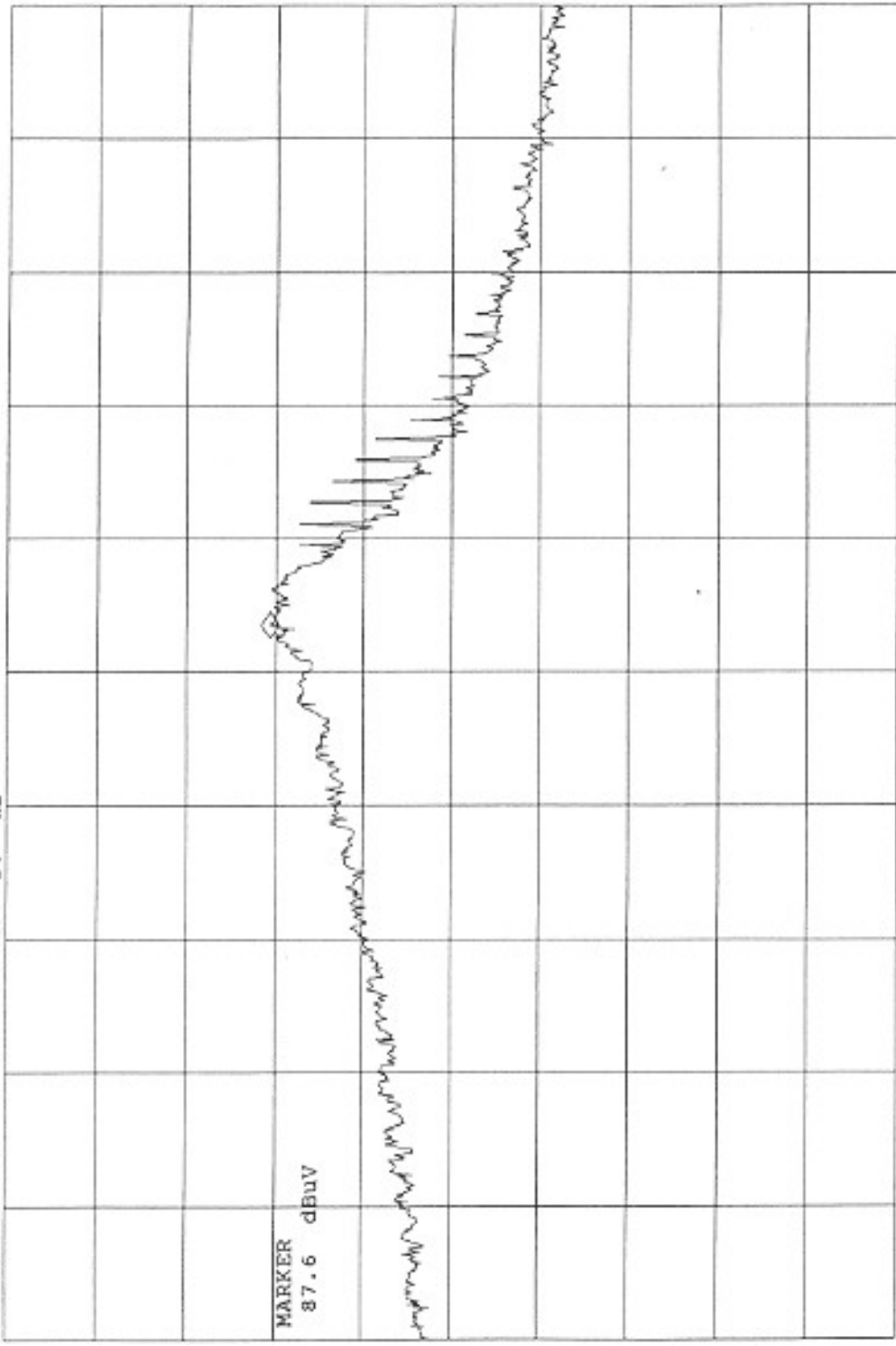
Title: Perimeter Products/MPS4100/CFR47, 15.245 (Vert)
Ref Level 117 dBuV ATTEN 20 dB

10 dB/



Title: Perimeter Products/MPS4100/CFR47, 15.245 (Vert)
Ref Level 117 dBuV ATTEN 20 dB

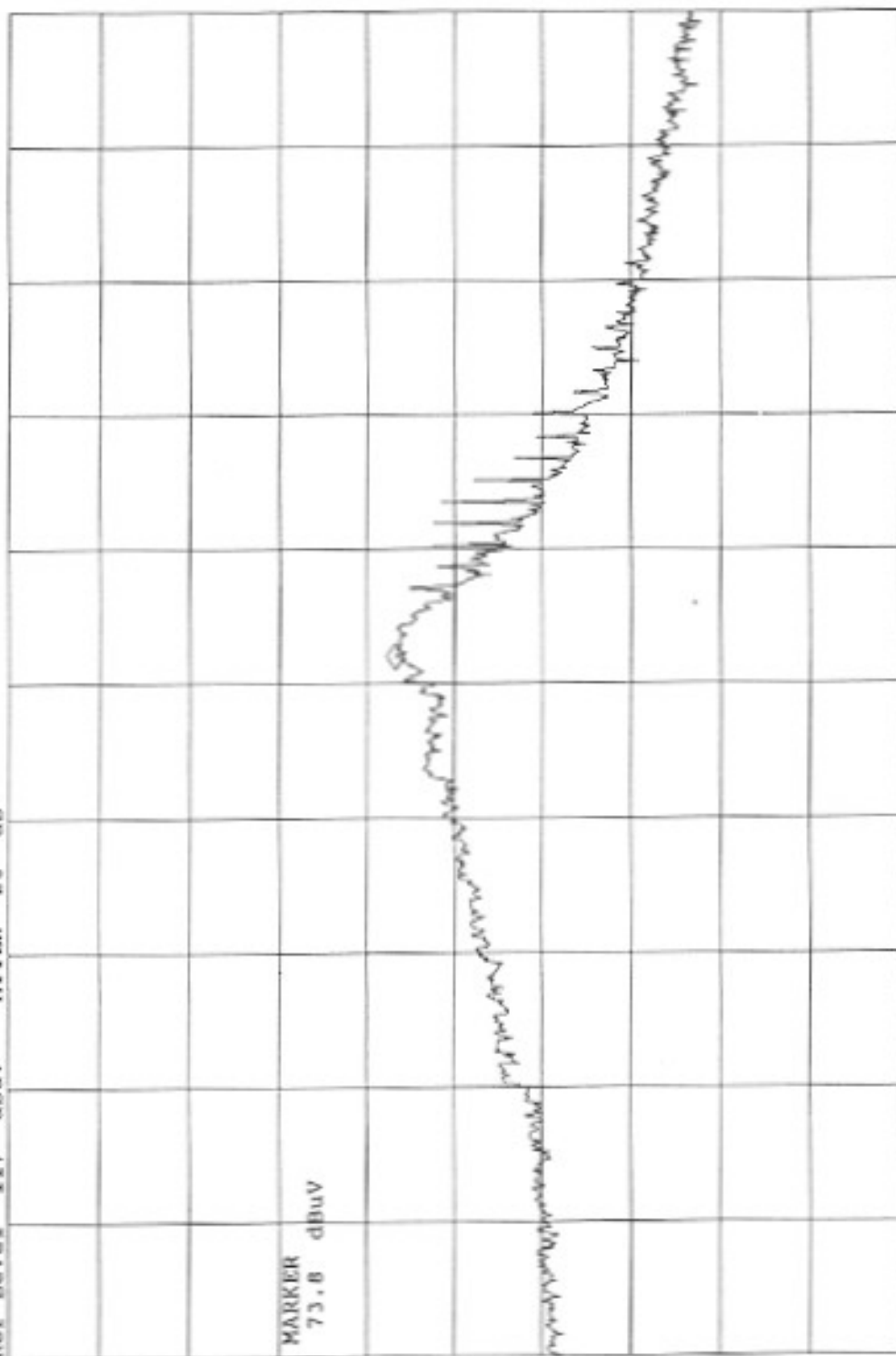
10 dB/



MARKER
87.6 dBuV

Start Freq 10517.06 MHz RES BW 1000
Center Freq 10517.16 MHz VID BW 3000
Stop Freq 10517.26 MHz SWP 10

Title: Perimeter Products/MPS4100/CFR47, 15.245 (Horiz)
Ref Level 117 dBuV ATTEN 20 dB



10 dB/

MARKER
73.8 dBuV

Start Freq 10517.09 MHz RES BW 1000
Center Freq 10517.19 MHz VID BW 3000
Stop Freq 10517.29 MHz SWP 10