P-COM
FLORIDA

1801 Penn Street
Melbourne, FL 32901
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February 4, 1999

Attention: Bette Taube
Federal Communications Commission
Equipment Authorization Division
7435 Oakland Mills Road
Columbia, MD 21046

Phone 301 725-1585
Fax 301 344-2050
E-mail labinfo@fcc.gov

P-Com, Inc. has submitted a Form 731 application for certification under Parts 2, 101 and 15.b of point-to-multipoint equipment operating in the 38 GHz frequency band. P-Com is requesting a Class II permissive change to product FCC ID **L5X-PMP-04-000** and **Confirmation Number EA93100** that is currently under the Commissions review. P-Com, Inc. is both the manufacturer and applicant for this product with offices at:

P-Com, Inc.
1801 Penn Street
Melbourne, FL 32901

Phone 407 674-3600
Fax 407 674-3700

P-Com, Inc. has been issued FCC Grantee Code L5X.

P-Com has designed a new Remote Indoor Unit that remains functionality the same as the Unit currently under review but the new Remote Indoor Unit has been reduced in size. Per our conversation of Feb. 4, P-Com is submitting information that shall be amended to the application currently under review. Please find included in this package information that shall be amended to the following Exhibits:

~~Exhibit A, FCC ID~~ Label
Exhibit P, Product Schematic Diagrams
~~Exhibit Q, Product Photographs~~
~~Exhibit R, Independent Laboratory Results~~

Thank you.

Exhibit R

Independent Laboratory Results

RUBICOM SYSTEMS, INC.

FCC TEST REPORT

FOR THE

P-COM

COMPACT REMOTE INDOOR UNIT

COPY 1

JANUARY 1999

Rubicom Systems, Inc.
284 West Drive, Suite B
Melbourne, FL 32904

FCC TEST REPORT

FOR THE

P-COM

COMPACT REMOTE INDOOR UNIT

S/N: 0100

Prepared by: Joseph G. Barbee 1-29-99

Joseph G. Barbee

Tested by: 1-29-99

Alex Belardinelli

Performed by:

RUBICOM SYSTEMS INC.
284 West Drive, Suite B
Melbourne, Florida 32904

Performed for:

P-COM
1801 Penn Street
Melbourne, Florida 32901

Received: January 11, 1999

Completed: January 19, 1999

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CERTIFICATION

Rubicom Systems, Inc. certifies the information obtained in this report was performed consistent with the requirements of ANSI C63.4-1992. The P-COM Compact Remote Indoor Unit (IDU) complies with the requirements of CFR 47 Part 15, Subpart B for Unintentional Radiators.

This data was obtained while testing a Compact Remote Indoor Unit (IDU) furnished by P-COM as described in Paragraph 1.3 of this document. Any modifications to the unit as tested may invalidate the data and void this certification.

Joseph G Barbee 1-29-99

Joseph G. Barbee
President

ABSTRACT

This report presents test results of the emanations found emitting from an P-COM Compact Remote Indoor Unit (IDU) and the comparison of these emissions to the requirements of the FCC, Title 47, Part 15, Subpart B for Unintentional Radiators. The serial number referenced on the data sheets is 0100.

This testing was performed on a 3-meter open field test site at Rubicom Systems, Inc. (RSI). The testing was performed for P-COM under purchase order no. F63810 and is on file at RSI under JA Number 1629. The results of this test effort demonstrate compliance of the Compact Remote Indoor Unit (IDU) to the FCC, Title 47, Part 15, Subpart B, Unintentional Radiators. The unit was powered from 120 VAC power with ground.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to show compliance of the P-COM Compact Remote Indoor Unit (IDU) to the requirements for 47CFR Part 15, Subpart B, Unintentional Radiators.

1.2 Requirements

The test requirements are as follows:

CONDUCTED

Freq. (MHZ)	μVolts	dB>μV
.450-30MHz	250	48

RADIATED

Freq. (MHZ)	Distance Meters	Field Strength μV/M	20 3 Meter dBμV/m
30 - 88	10	100	40.0
88 - 216	10	150	43.5
216 - 960	10	200	46.0
960 - Above	10	500	54.0

1.3 Unit Under Test Description

The Compact Remote Indoor Unit (IDU) is a one rack space high remote IDU that provides up to 8T1/E1's in less space. The IDU is common to all PTM frequency bands. It contains all the baseband electronics including the interface, digital multiplexing, modulation and frequency generation, alarms and diagnostics and network management interfaces. Power to the unit is 90 to 260 VAC or -20 to 56 VDC power source.

1.4 Summary of Results

Power line conducted data is presented in Data Sheets 6.1-1 and 6.1-2. No failures were experienced during the conducted testing. Therefore no modifications were required.

The electric field data presented in Data Sheets 6.2.2-1 through 6.2.2-10. provide in graphic form, the levels of signals emanating from the EUT with respect to the appropriate limit. Each division of the amplitude scale (Y-Axis) of the data sheet is equal to 10dB. The EUT is compliant to the radiated requirements of FCC, Title 47, Part 15, Subpart B for Unintentional Radiators. All signals are below the Class A limit without modifications.

Paragraph 6.2 contains the tabular listing of frequencies where the levels are within 10dB of the requirements.

2.0 APPLICABLE DOCUMENTS

The following documents form a part of this report to the extent expressed herein:

FCC Code of Federal Regulations Title 47, Part 15,

FCC Procedure for Measuring RF Emissions from Computing Devices FCC/OET MP-4, July 1987

ANSI C63.4-1992

FCC Characteristics of Open Field Test Sites Bulletin OET 55, October 1989

3.0 TEST SITE DESCRIPTION

This testing was performed at Rubicom Systems, Inc. 3-meter test site. The description of the measurement facility was found to be compliant with the requirements of Section 2.948 of the FCC Rules. A copy of the compliance letter is attached to this report as Appendix A.

3.1 Environmental Conditions

Environmental conditions during testing of the EUT were as follows:

Date: **January 19, 1999**

Temperature: **78°F**

Barometer: **29.70 inches**

Humidity: **60%**

4.0 TEST INSTRUMENTATION

The following test equipment was used to perform this testing.

Qty.	Description	Manufacturer	Model No.	Last Cal.	Cal Cycle
1	Spectrum Analyzer	Advantest	R3271	09/09/98	1 yr
1	Bilog	Chase	CLB6111B	07/24/98	1 yr
1	Biconical Antenna	A.H. Systems	SAS-200/ 540	NCR	
1	Ridged Guide Horn Ant.	Electro Metrics	RGA-180	01/15/99	1 yr
1	Power Line Stab. Network	Solar Elect.	8012-50-5-24-BNC	NCR	
1	Plotter	Hewlett Packard	7440A	NCR	

5.0 TEST SAMPLE SETUP AND CONFIGURATIONS

The Compact Remote Indoor Unit (IDU) was placed on a nonconductive 80cm high manual turntable. Power to the unit was 120 VAC/60Hz. The unit was operated in a receive/transmit mode. The output of the IDU was loaded with a 24GHz Outdoor Unit. The data connector was loaded with a load fixture.

The test setup for conducted testing is shown in Photo #1. Photo #2 is representative of the radiated test setup.

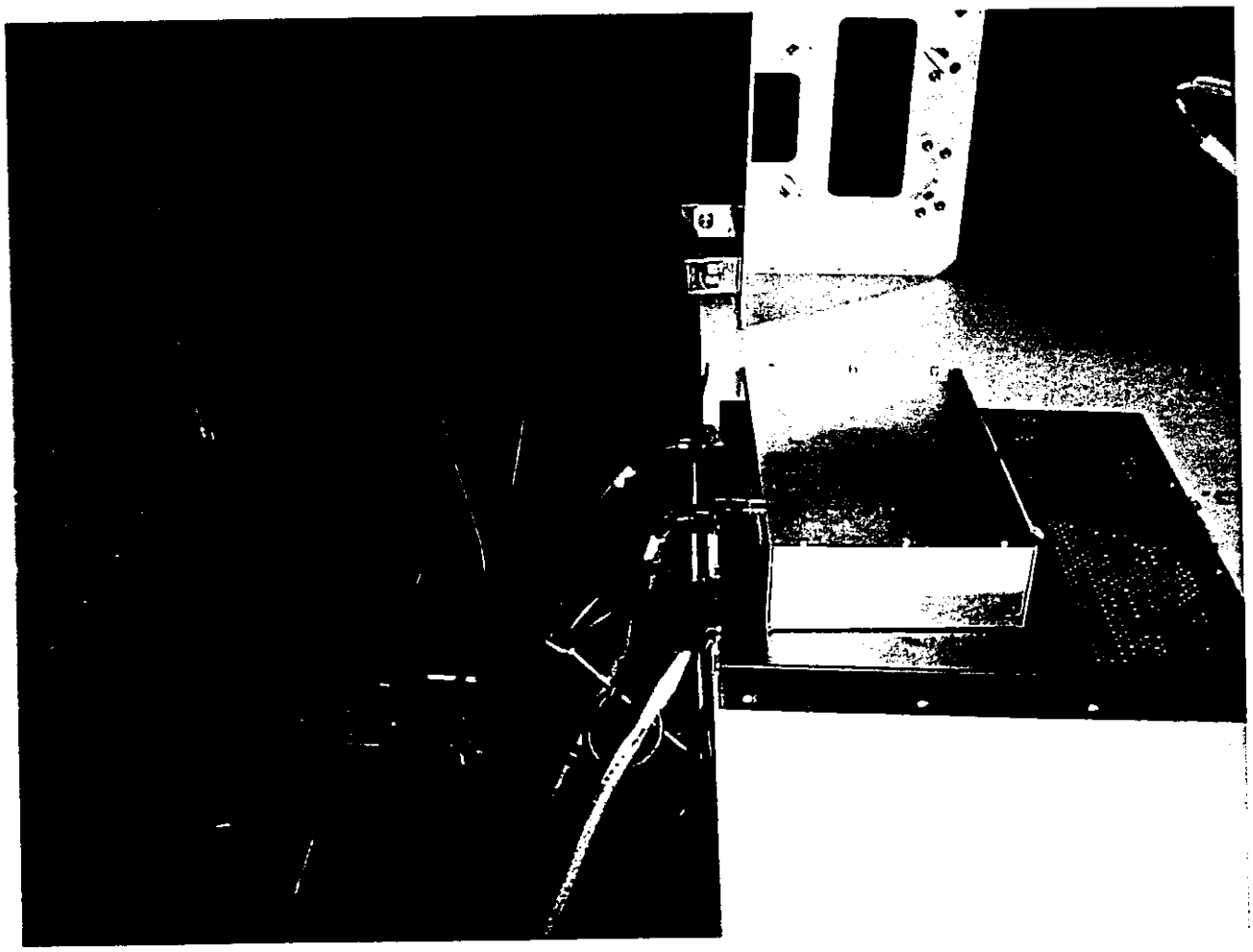


PHOTO #1

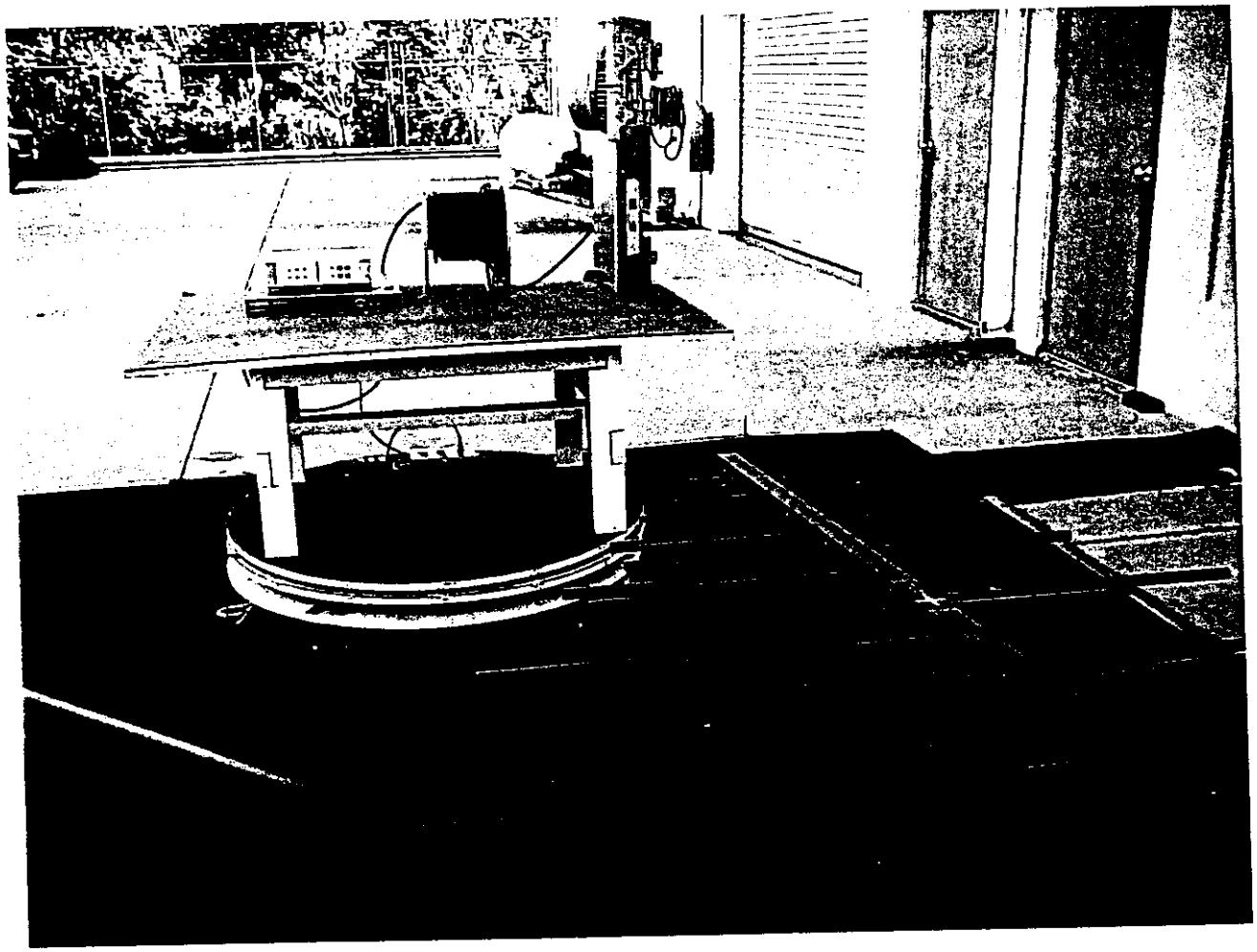


PHOTO #2

6.0 PROCEDURES AND RESULTS

6.1 Power Line Conducted

The unit was tested in the shielded enclosure using the Solar Model 8012-50-R-24-BNC PLISN (50μH/50ohm). Both the phase and neutral leads were tested. As can be seen in conducted Data Sheets 6.1-1 and 6.1-2, signals were 20dB or greater below the requirement.

6.2 Radiated Emissions

The following procedures are used to the extent required to ensure that all significant signals emanating from the EUT are identified in frequency and amplitude. These procedures are used for electric field emissions due to the high ambients. The following is the tabular listing of signals emitting from the unit within 10dB of the requirement

Frequency (MHZ)	Antenna Pol.	Elevation	Azimuth	Measured (dBμV/m)	Q.P. Limit (dBμV/m @ 3 Meters	Margin (dB)
210MHz	H	1.0	100°	33.0	43.5	-10.5
240MHz	H	1.25	157°	35.0	46.0	-11.0
296MHz	H	1.25	180°	35.0	46.0	-11.0
300MHz	H	1.25	180°	36.0	46.0	-10.0
320MHz	H	1.0	180°	36.5	46.0	-9.5
320MHz	V	1.0	180°	34.0	46.0	-12.0
338MHz	H	1.0	180°	38.0	46.0	-8.0
340MHz	H	1.0	180°	37.5	46.0	-8.5
380MHz	H	1.25	180°	35.5	46.0	-10.5
4GHz	V	1.0	180°	44.0	54.0	-10.0
4.737GHz	H	1.0	180°	44.0	54.0	-10.0

6.2.1 Pretest

An initial pretest for electric field signals is performed inside a shielded room to identify frequencies emanating from the EUT without the test site ambient interference. This data is presented in Data Sheets 6.2.1-1 through 6.2.1-8.

6.2.2 Official Quasi-Peak Scans

This testing involves maximizing the radiated emissions for peak amplitude levels in antenna height and equipment under test azimuth. This peaking is performed using the frequencies noted during pretest but not limited to those frequencies. The maximized height and azimuth are noted on each frequency band. The maximization is performed for each polarization and frequency band. This data is presented in Data Sheets 6.2.2-1 through 6.2.2-10. If required, the following paragraphs are performed to assist in determining the true signals from the EUT. EUT signals are identified on the graph by circles and a number above the signal. Each signal identified as being from the EUT is maximized in elevation and azimuth. Example; a signal at 65MHz is 5dB below the specification and would be noted as: 65-5.

6.2.3 Peak Ambient (EUT Off/Support Equipment "On")

This paragraph is Quasi-peak plots of the ambient for the purpose of allowing for normalization and to allow viewing the emission without the ambients. Data is presented in Data Sheets 6.2.3-1 through 6.2.3-10 of the environmental ambient.

6.2.4 Normalized Ambient (EUT Off/Support "On")

This data shows the normalized ambient with the EUT in the "off" state and support equipment (if applicable) turned on. The new signals are identified as being from the support equipment.

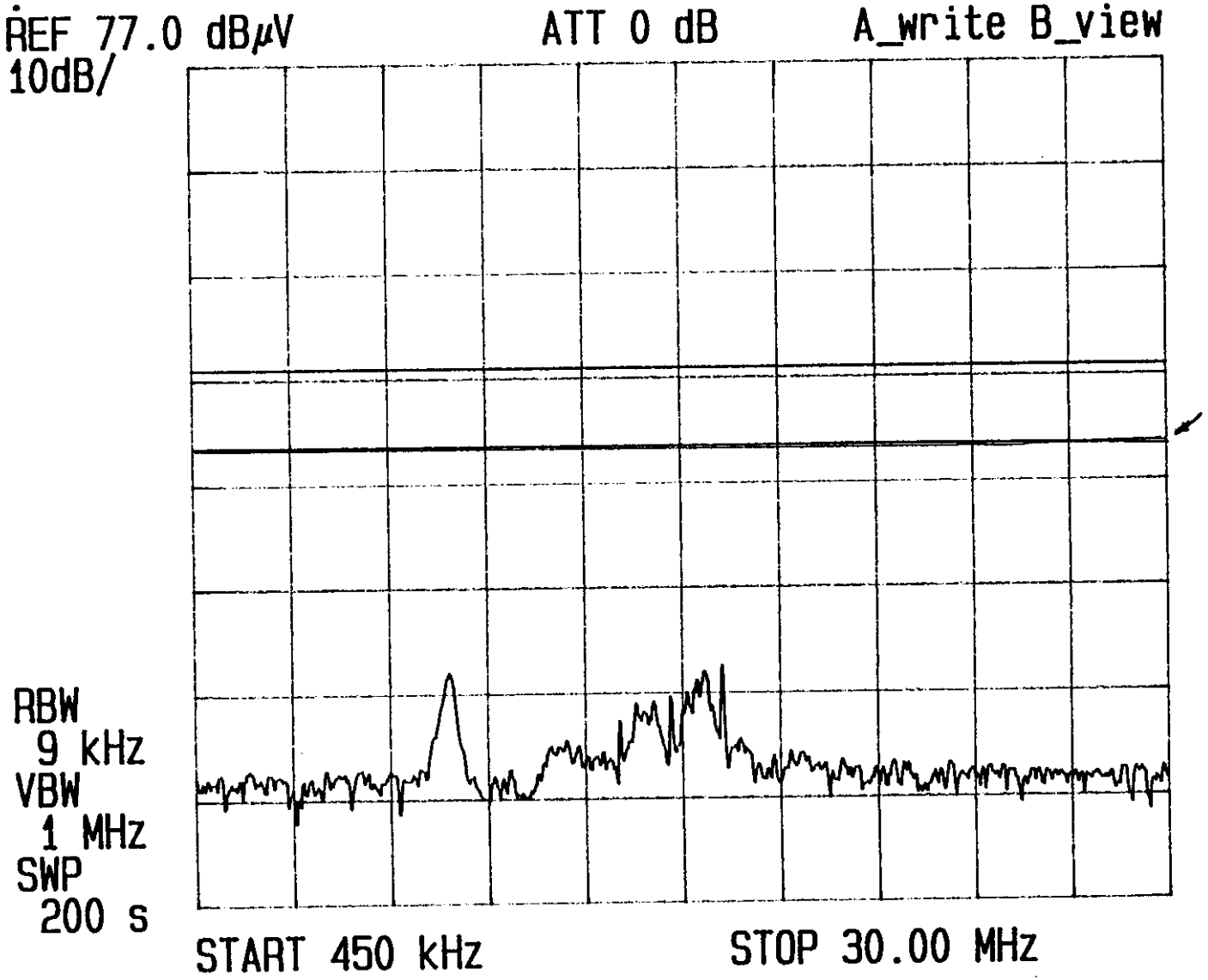
6.2.5 Normalized EUT Scan (EUT and Support "On")

This data is performed to show the new signals generated above the environmental ambient. The delta signals found in these scans can be attributed to the EUT. This information is used to identify the signals in the plot of Paragraph 6.2.2.

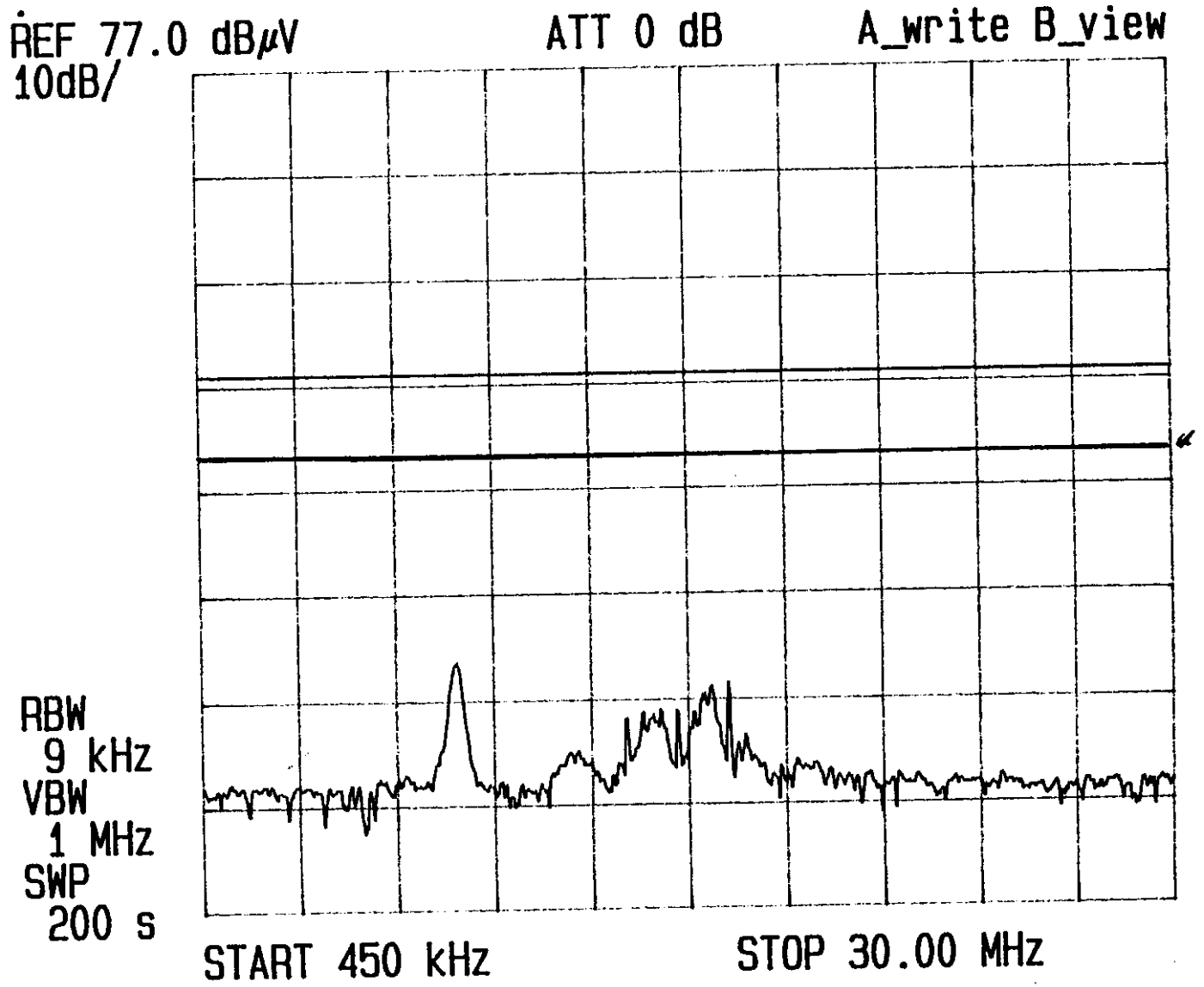
6.2.6 High Ambient Investigation

In the 85MHz to 110MHz range the analyzer is used in the normalized mode to subtract out the ambient signals for a better resolution of the high ambient frequency band.

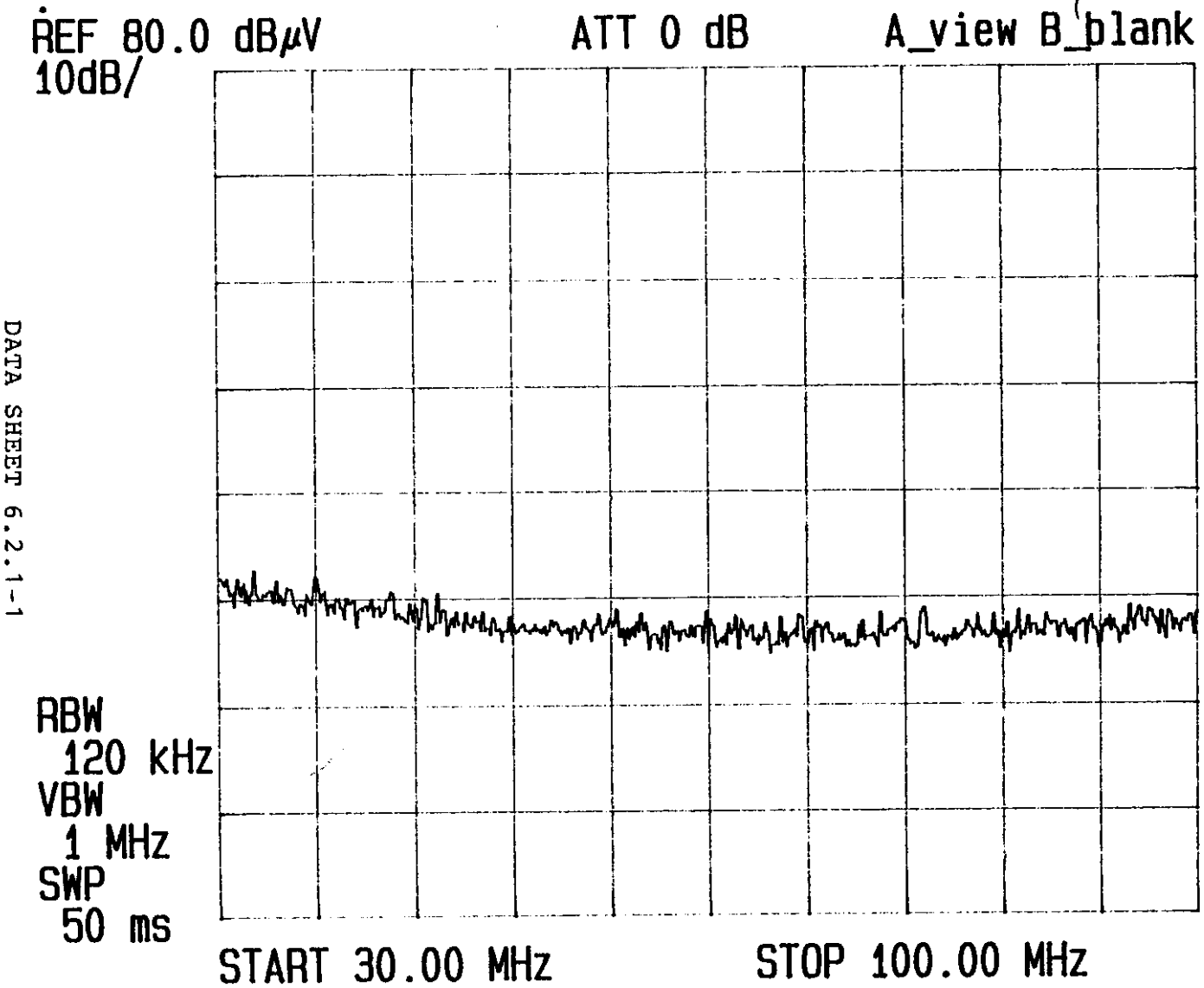
TEST: FCC CONDUCTED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 450K-30MHz	SPEC: 15.209 (A)	ANT.HT/POL: N/A
DETECTOR: PEAK	LINE UNDER TEST: PHASE	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE; ROOM 1	TESTER:



TEST: FCC CONDUCTED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 450K-30MHz	SPEC: 15.209 (A)	ANT.HT/POL: N/A
DETECTOR: PEAK	LINE UNDER TEST: NEUTRAL	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE; ROOM 1	TESTER



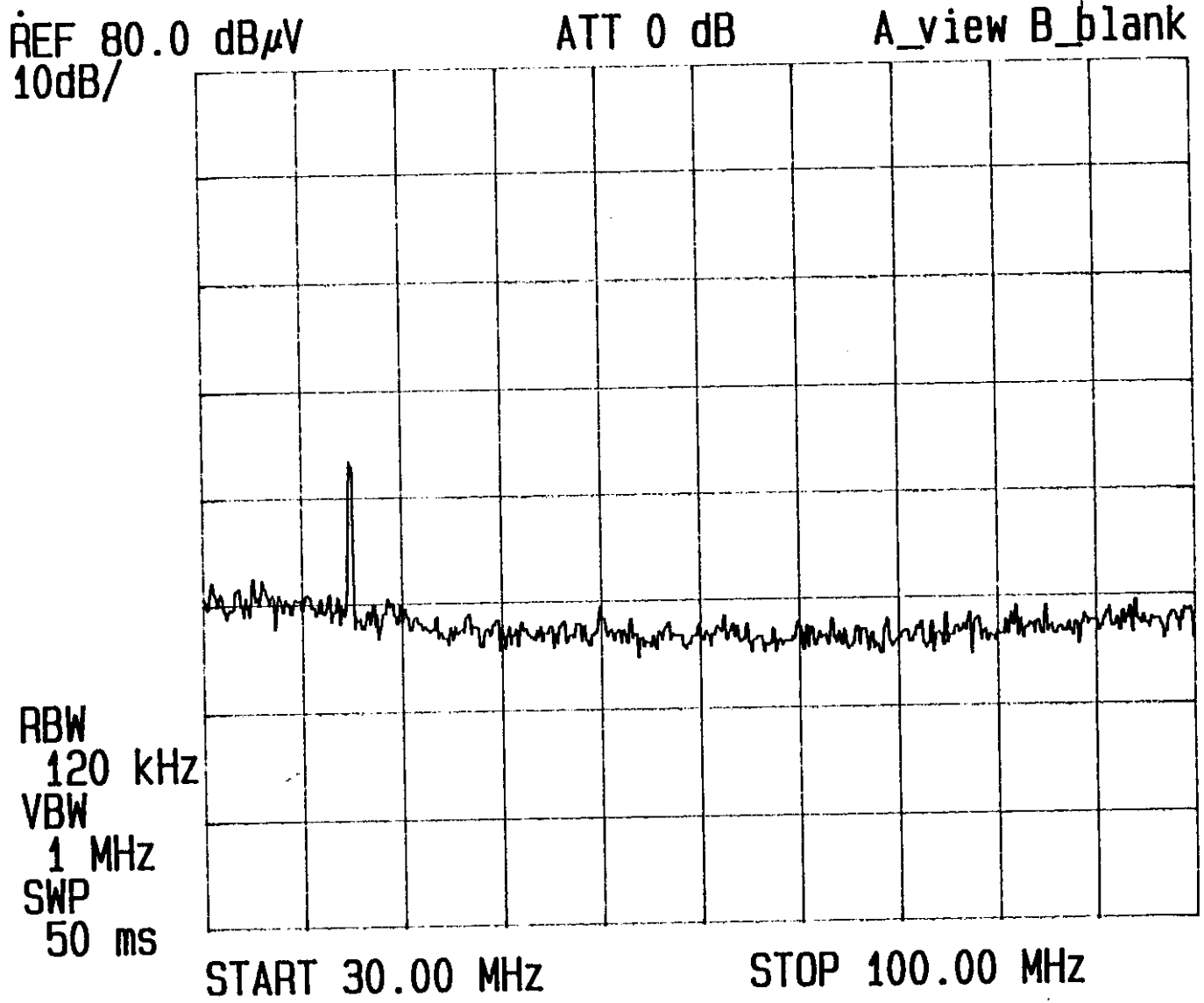
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 30M-100MHz	SPEC: 15.209 (A)	ANT.HT/POL: 1M/ H
DETECTOR: PEAK	LINE UNDER TEST: N/A	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER:



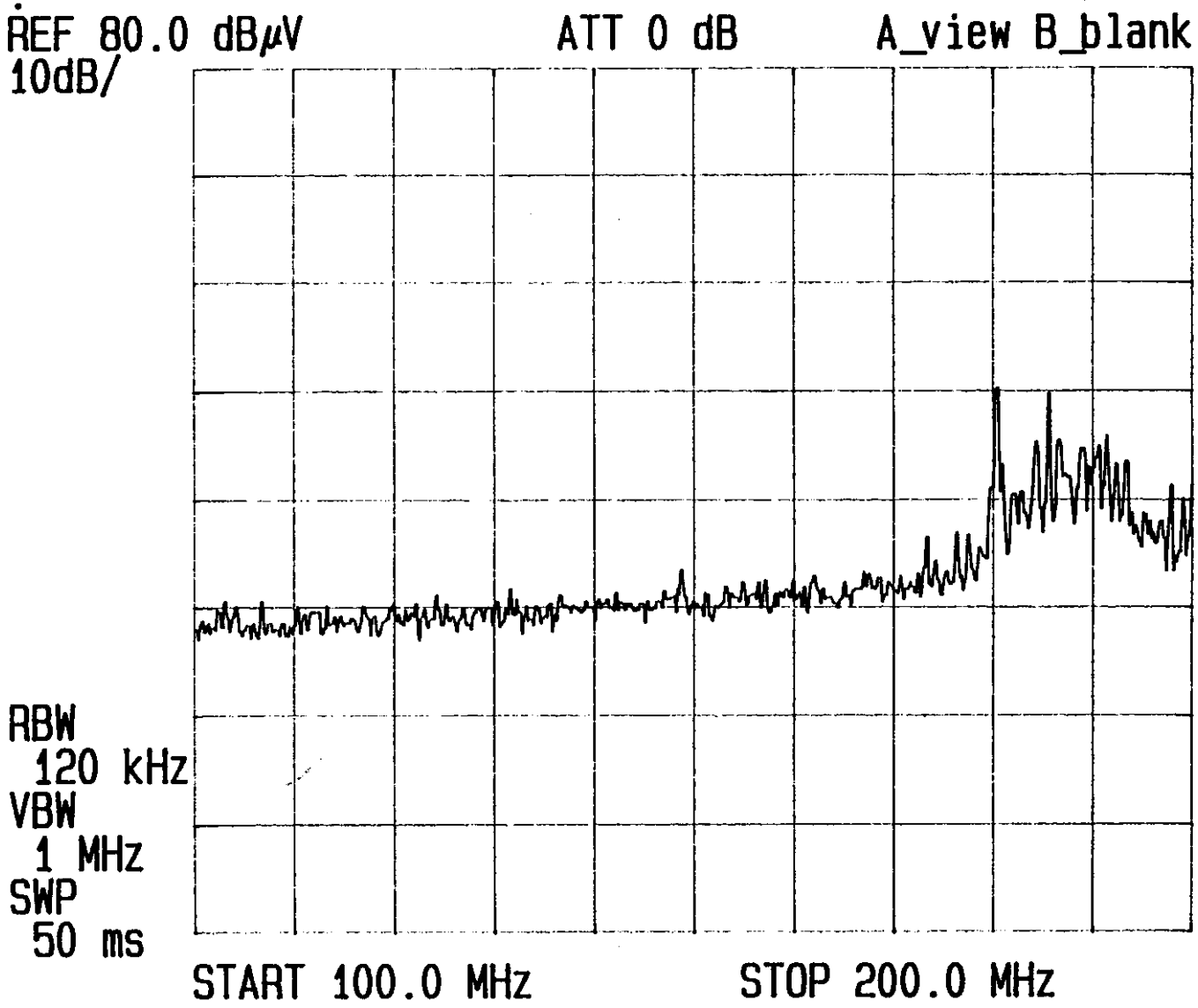
DATA SHEET 6.2.1-1

JA-1629

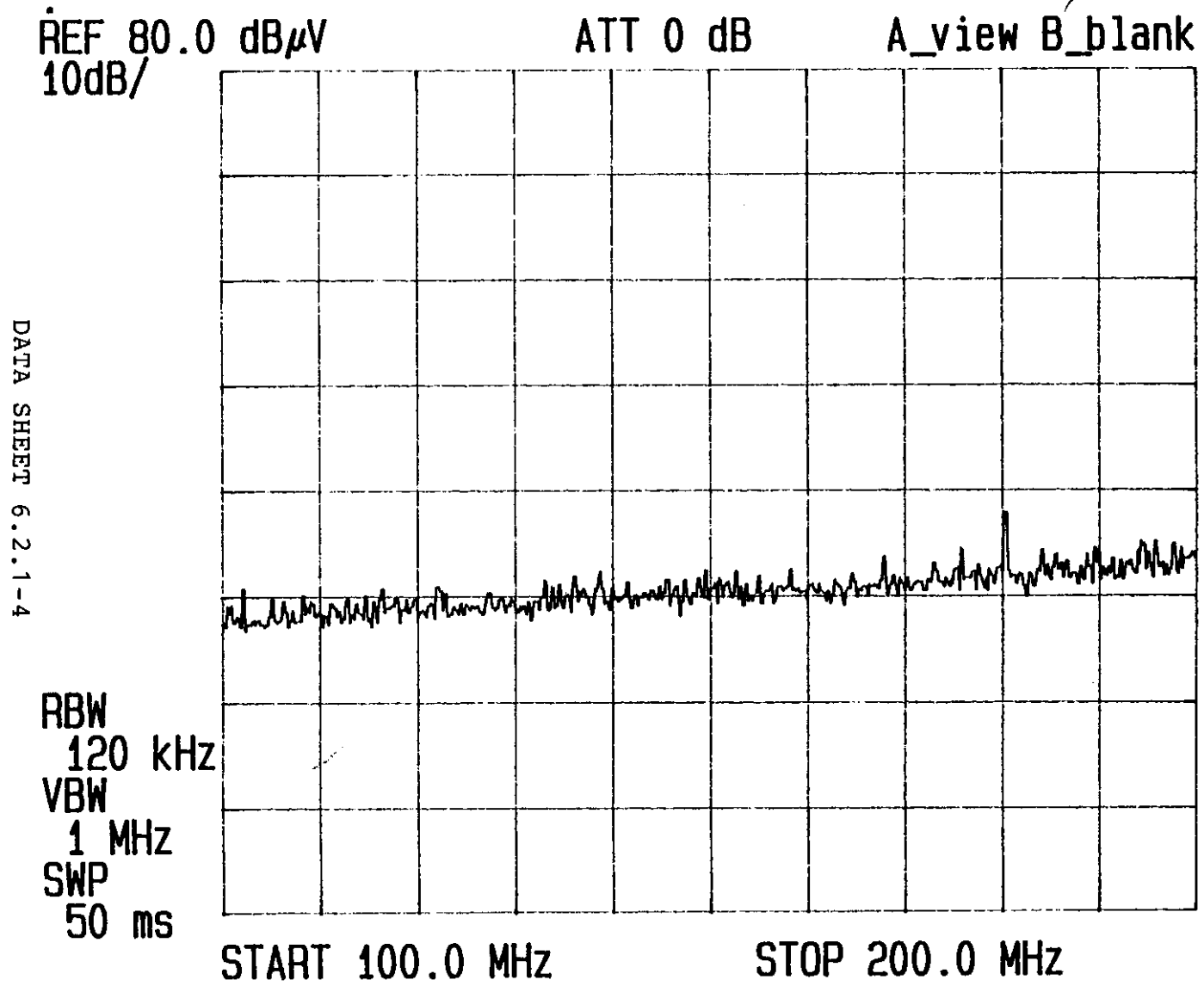
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 30M-100MHz	SPEC: 15.209 (A)	ANT.HT/POL: 1M/ V
DETECTOR: PEAK	LINE UNDER TEST: N/A	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER: AB



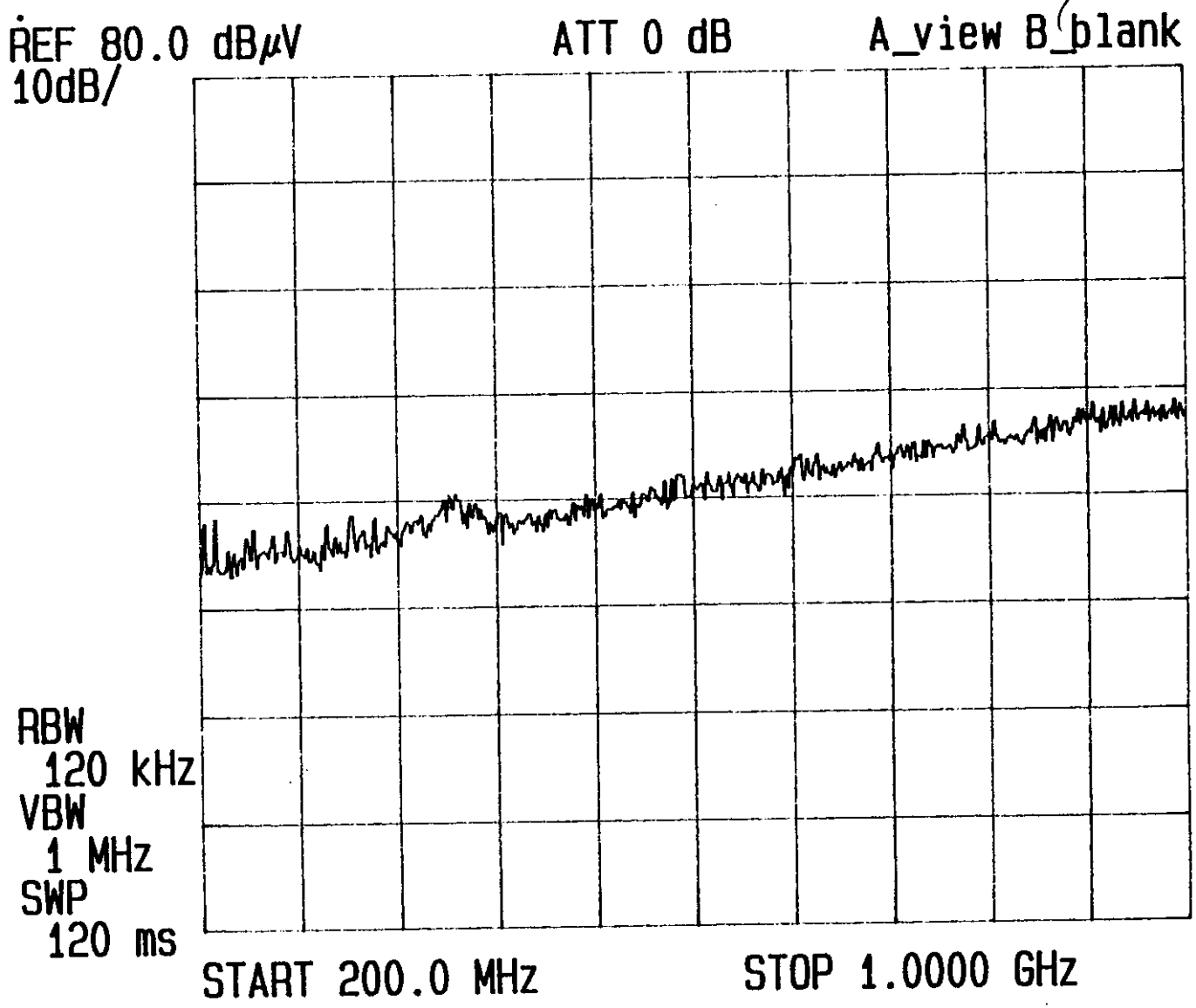
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 100M-200MHz	SPEC: 15.209 (A)	ANT.HT/POL: 1M/ H
DETECTOR: PEAK	LINE UNDER TEST: N/A	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER:



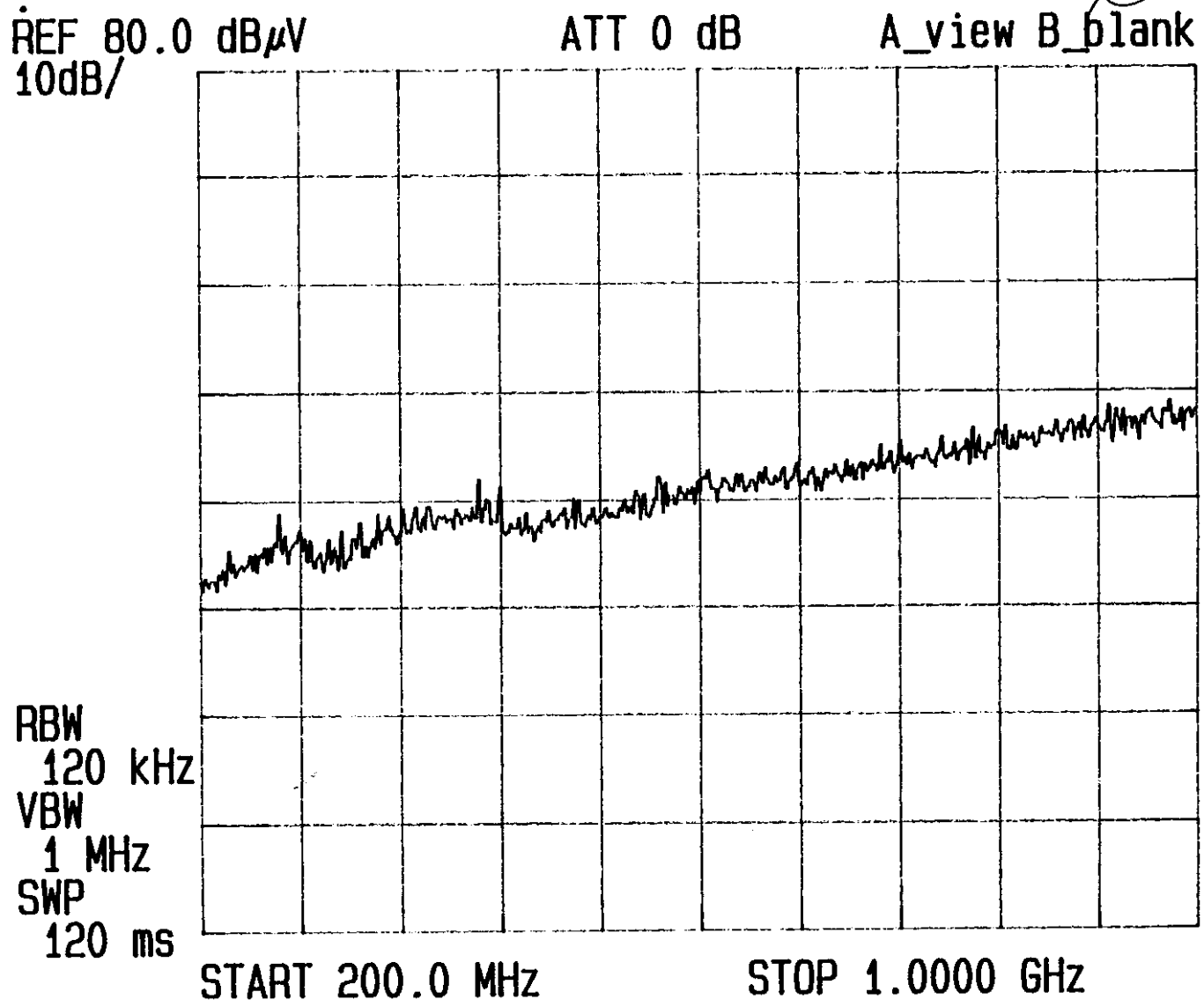
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 100M-200MHz	SPEC: 15.209 (A)	ANT.HT/POL: 1M/ V
DETECTOR: PEAK	LINE UNDER TEST: N/A	EUT POSITION: FRONT
DATE: 1-11-94	TEST SITE: ROOM 1	TESTER:



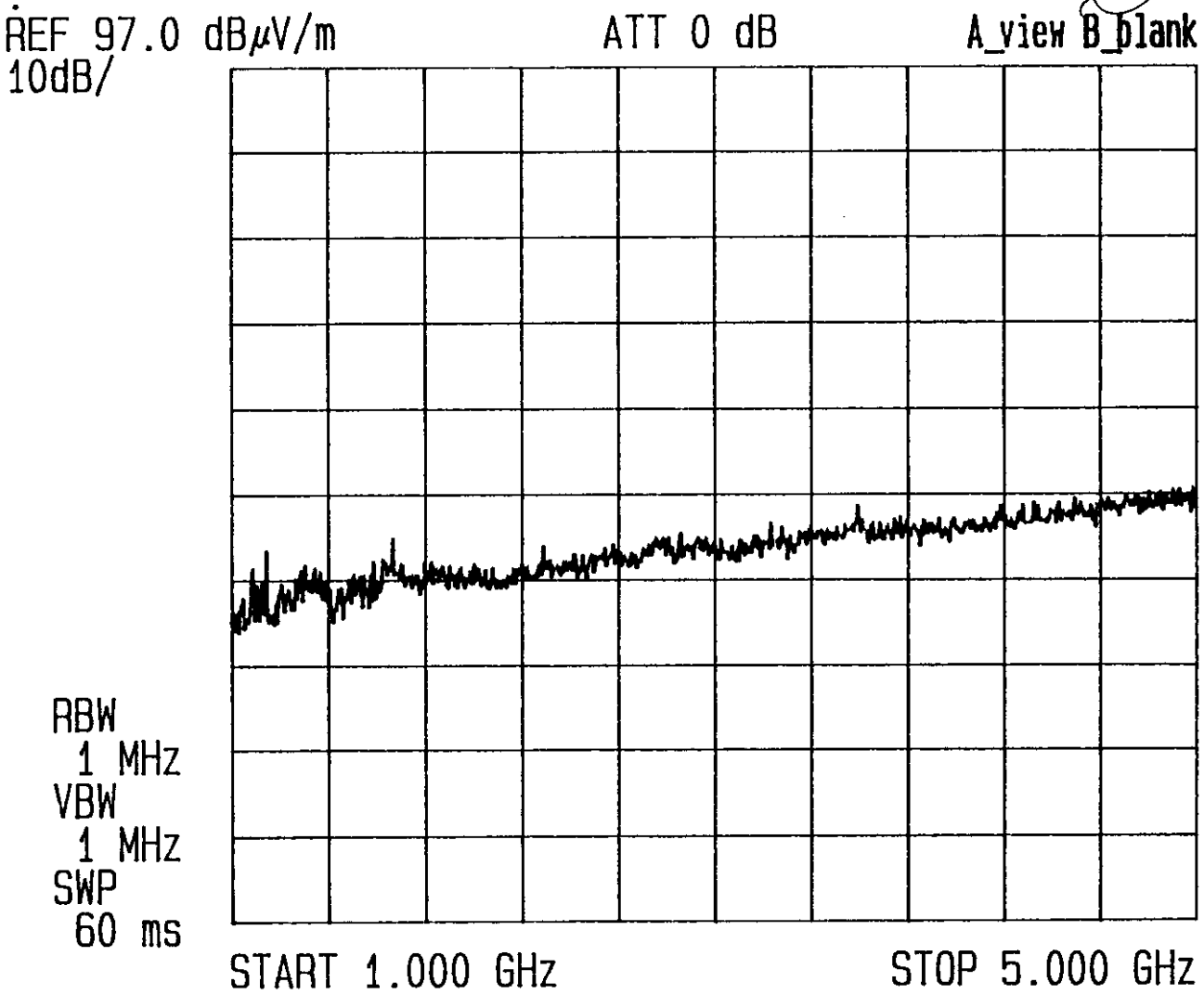
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 200M-1GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1M/ H
DETECTION: PEAK	LINE UNDER TEST: N/A	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER:



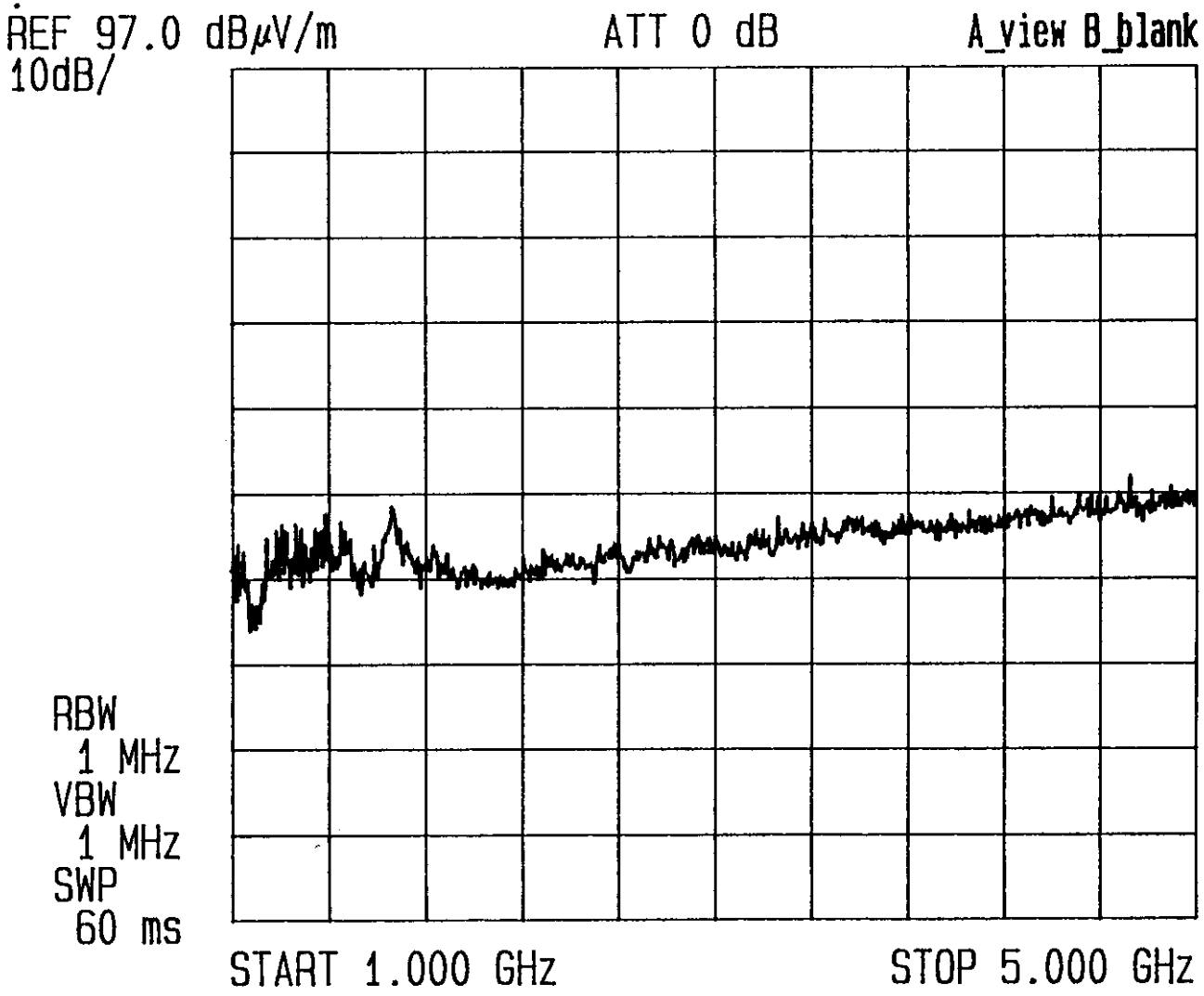
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 200M-1GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1M/ V
DETECTION: PEAK	LINE UNDER TEST: N/A	EUT POSITION: FRONT
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER:

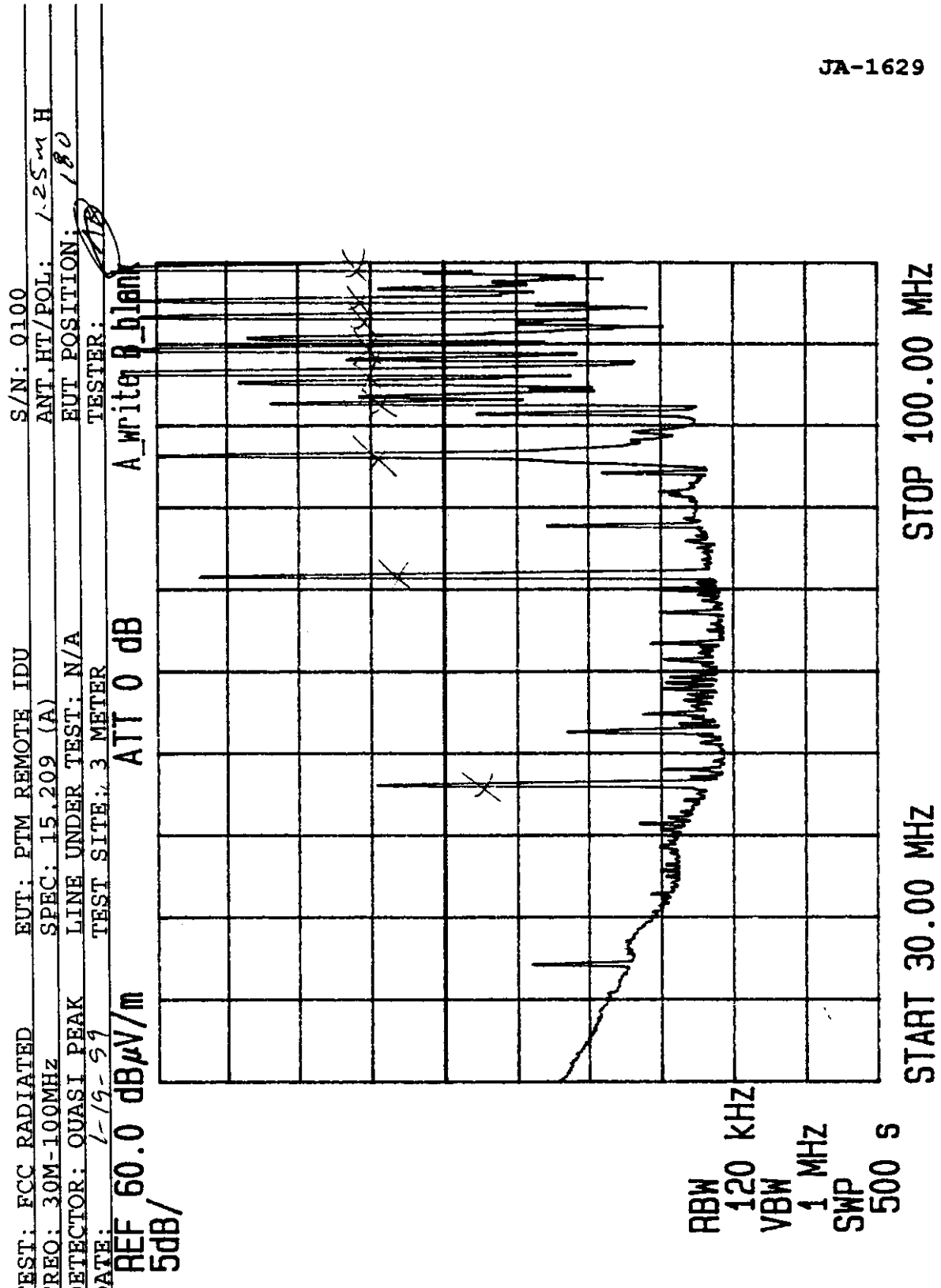


TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1G-5GHz	SPEC: 15.209(A)	ANT.HT/POL: - H
DETECT: PEAK	LINE UNDER TEST: N/A	EUT POSITION: -
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER:



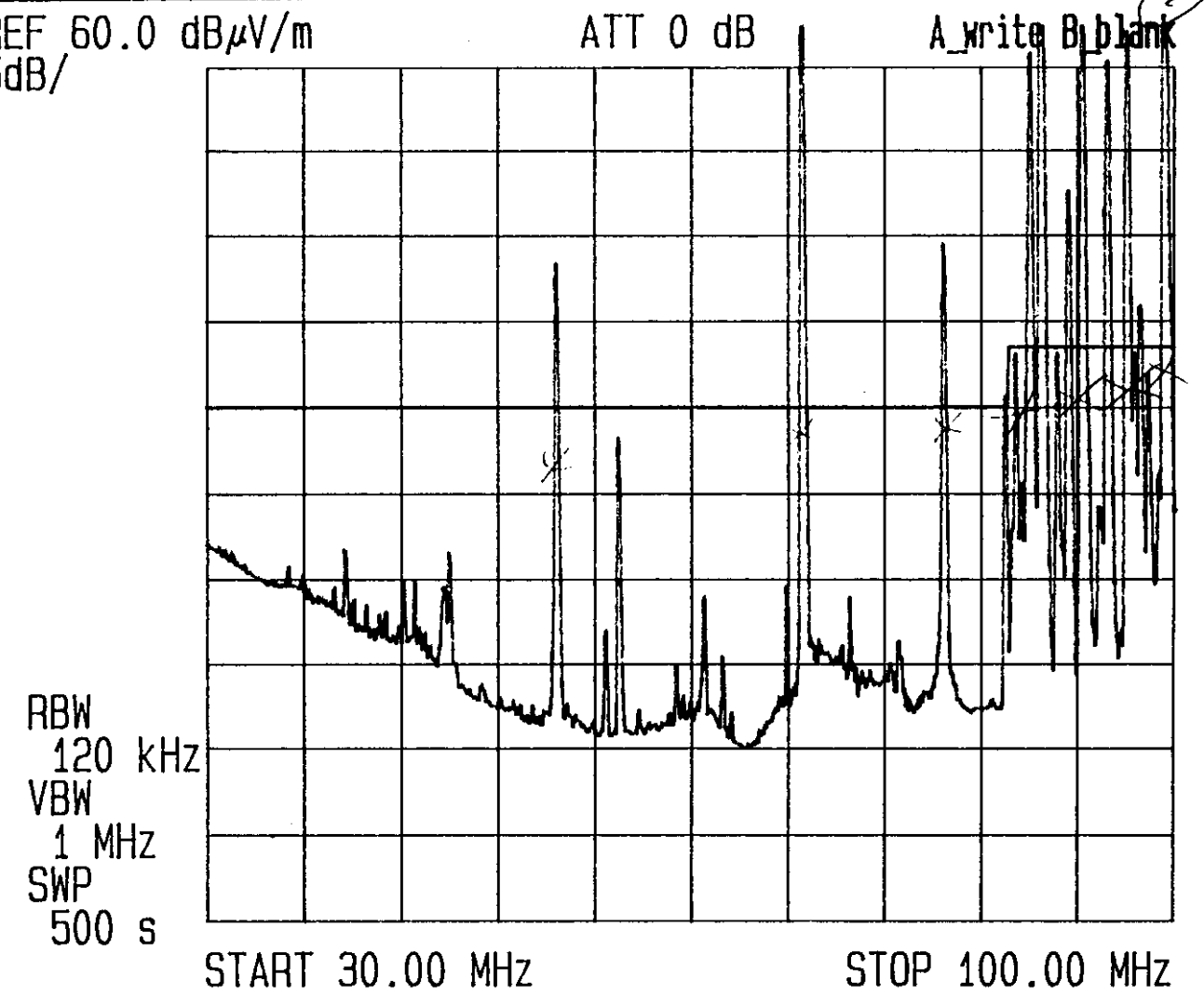
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1G-5GHz	SPEC: 15.209(A)	ANT.HT/POL: — V
DETECT: PEAK	LINE UNDER TEST: N/A	EUT POSITION: —
DATE: 1-11-99	TEST SITE: ROOM 1	TESTER: AB



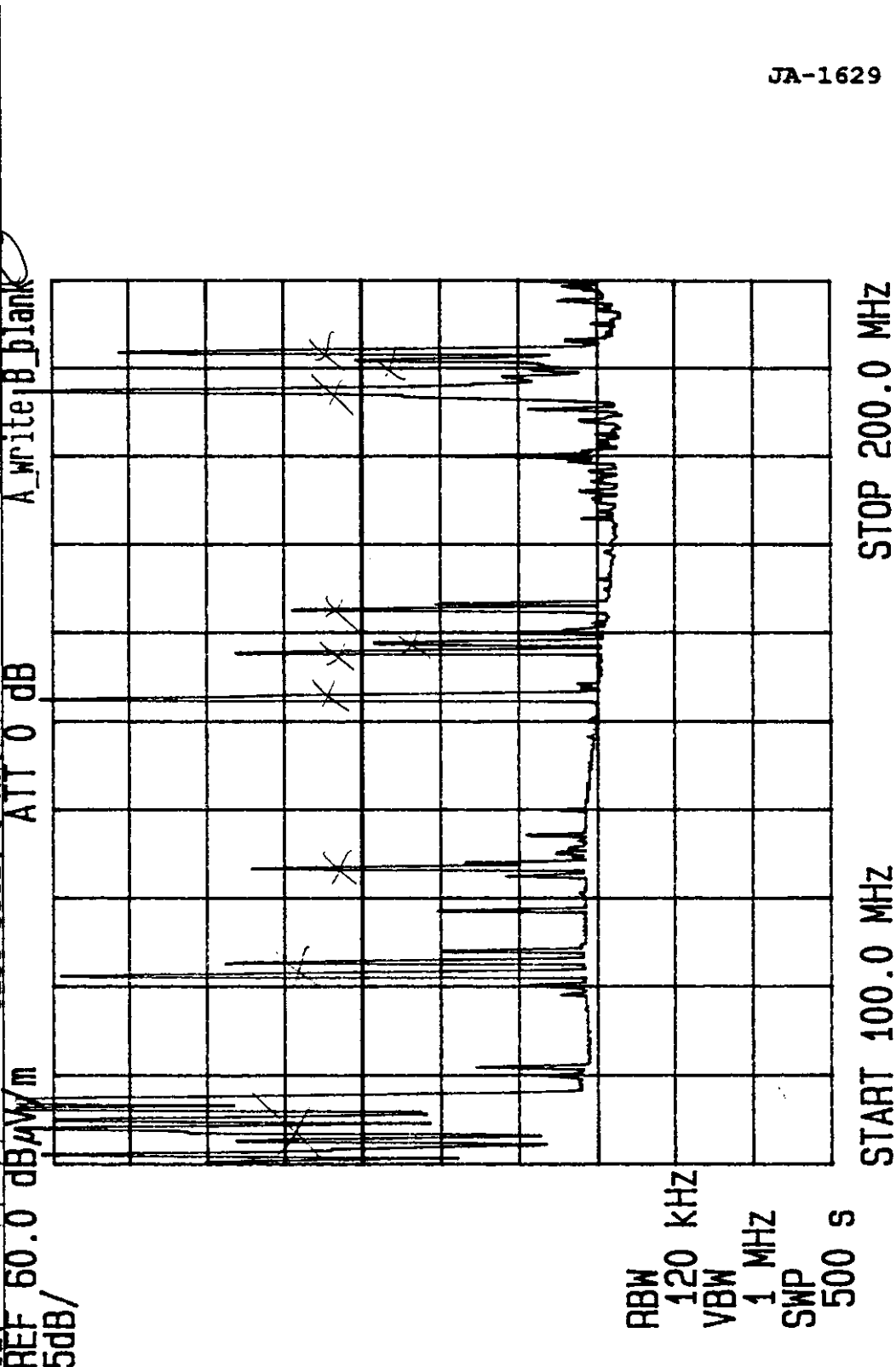


DATA SHEET 6.2.2-1

TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 30M-100MHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.25m / V
DETECTOR: QUASI PEAK	LINE UNDER TEST: N/A	EUT POSITION: 180°
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:

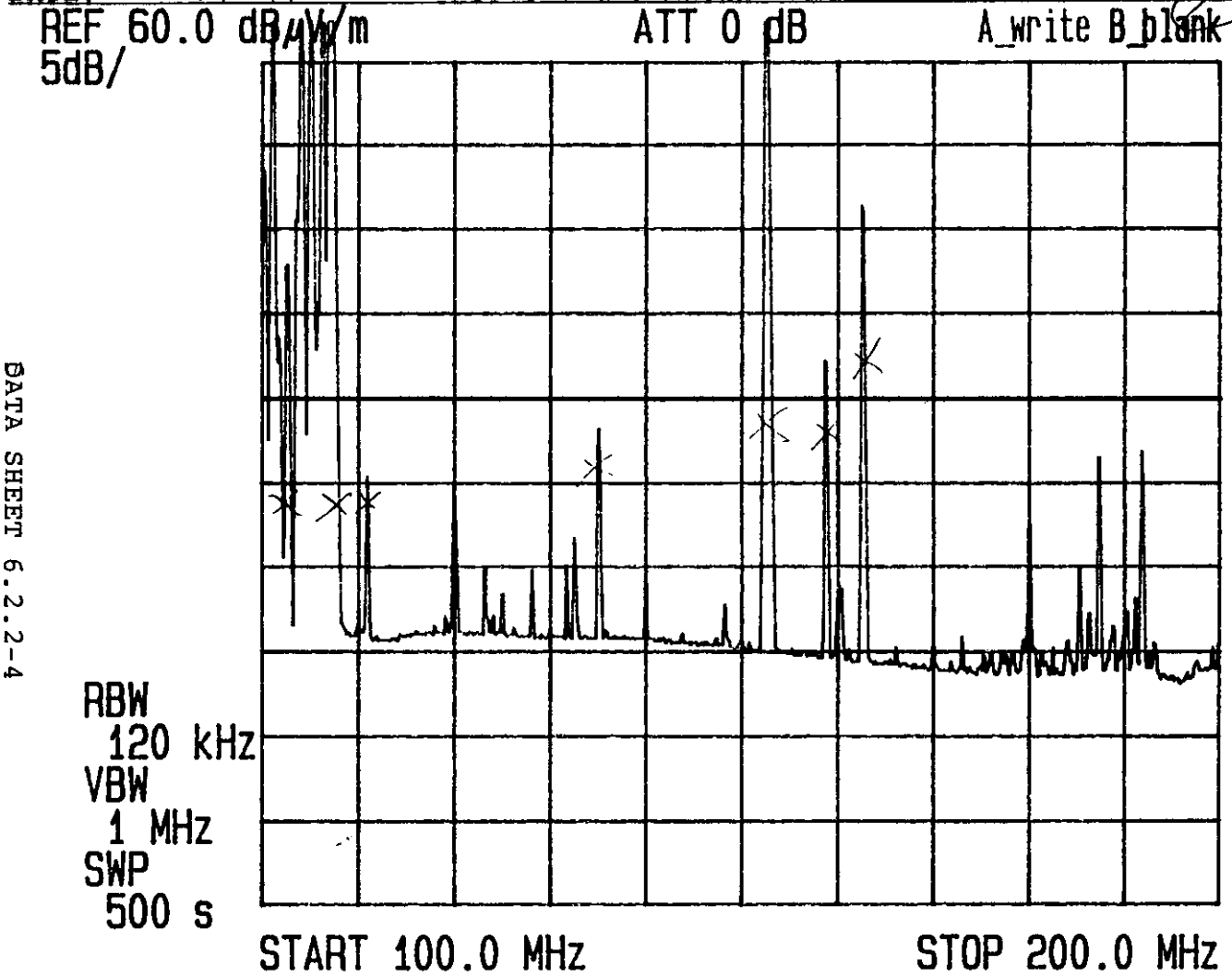


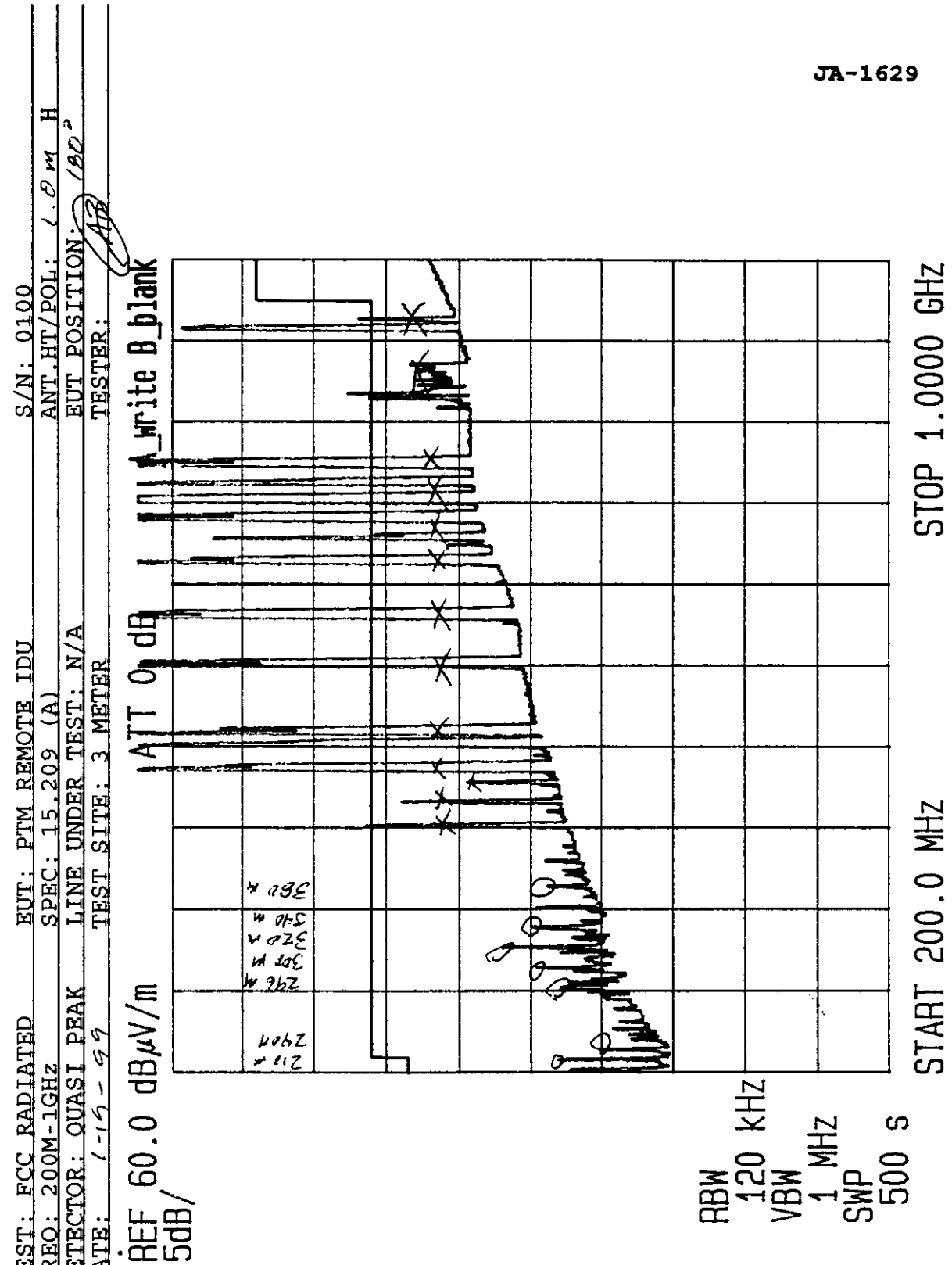
TEST: FCC RADIATED EUT: PTM REMOTE IDU S/N: 0100
FREQ: 100M-200MHz SPEC: 15.209 (A) ANT.HT/POL: 1.25m \ H
DETECTOR: QUASI PEAK LINE UNDER TEST: N/A EUT POSITION: 113 180
DATE: 1-19-99 TEST SITE: 3 METER TESTER:



DATA SHEET 6.2.2-3

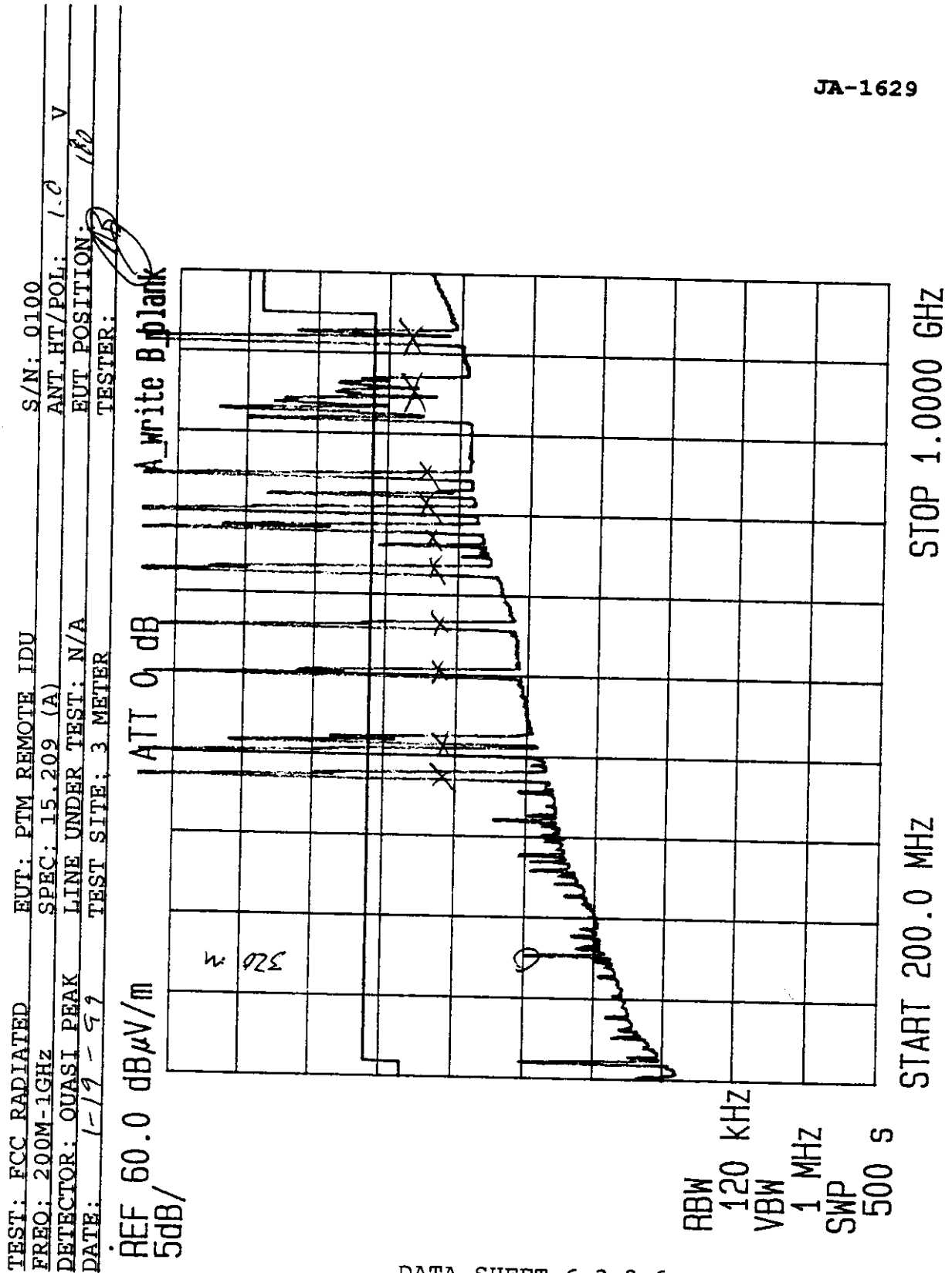
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 100M-200MHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.25m V
DETECTOR: QUASI PEAK	LINE UNDER TEST: N/A	EUT POSITION: 180
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:





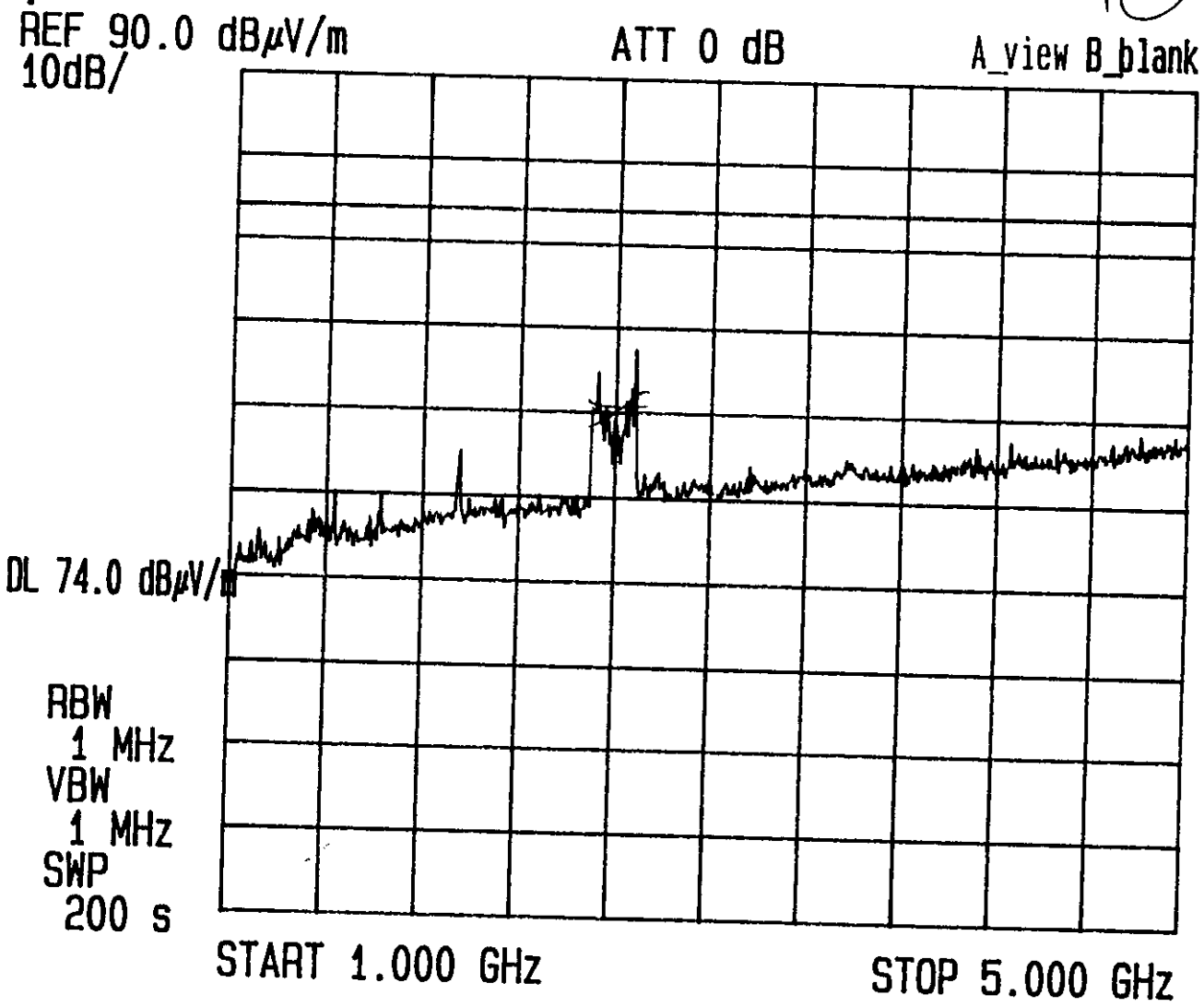
DATA SHEET 6.2.2-5

TEST: FCC RADIATED EUT: PTM REMOTE IDU S/N: 0100
FREQ: 200M-1GHz SPEC: 15.209 (A) ANT.HT/POL: 1.0 V
DETECTOR: QUASI PEAK LINE UNDER TEST: N/A EUT POSITION: 180
DATE: 1-19-99 TEST SITE: 3 METER TESTER:

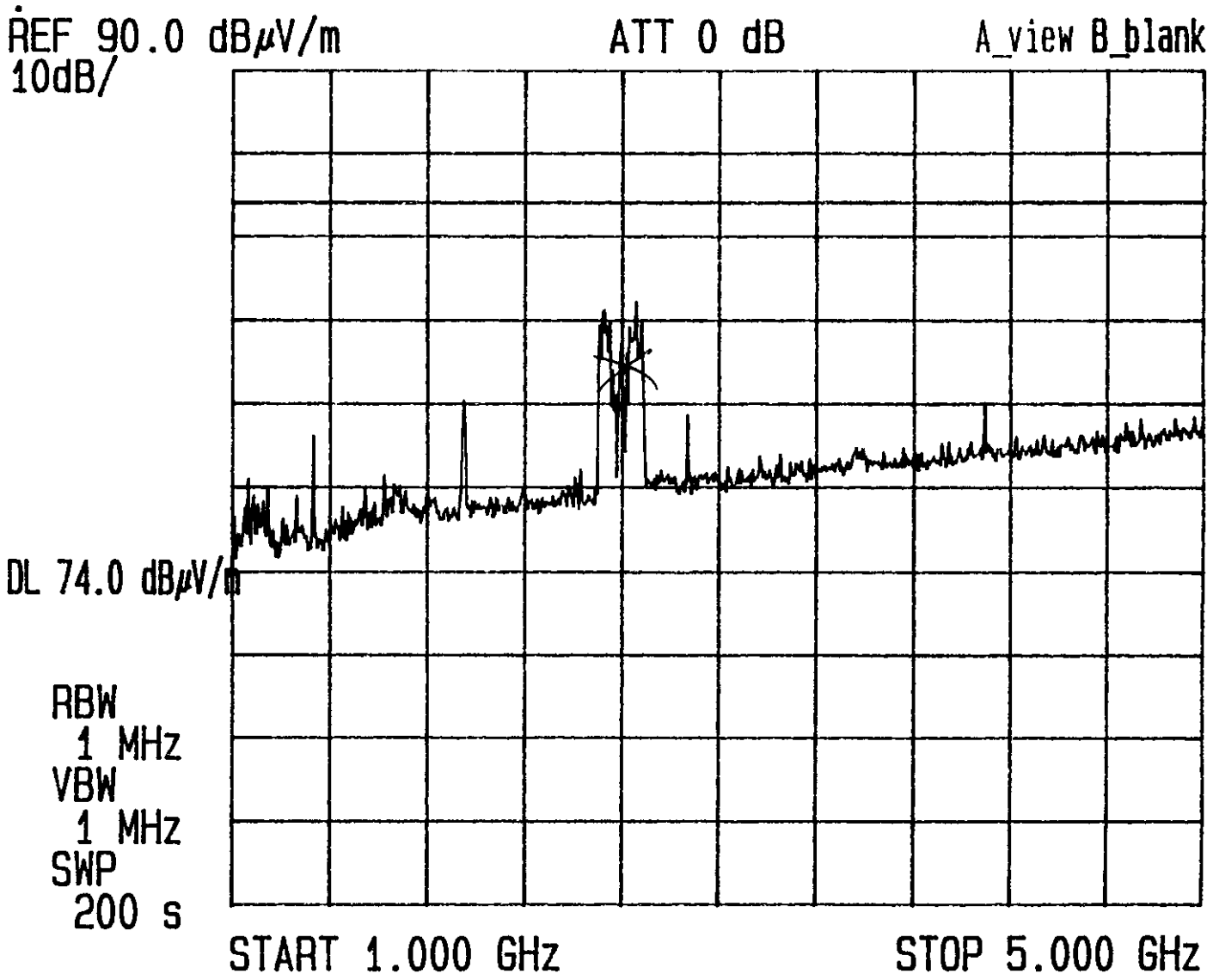


DATA SHEET 6.2.2-6

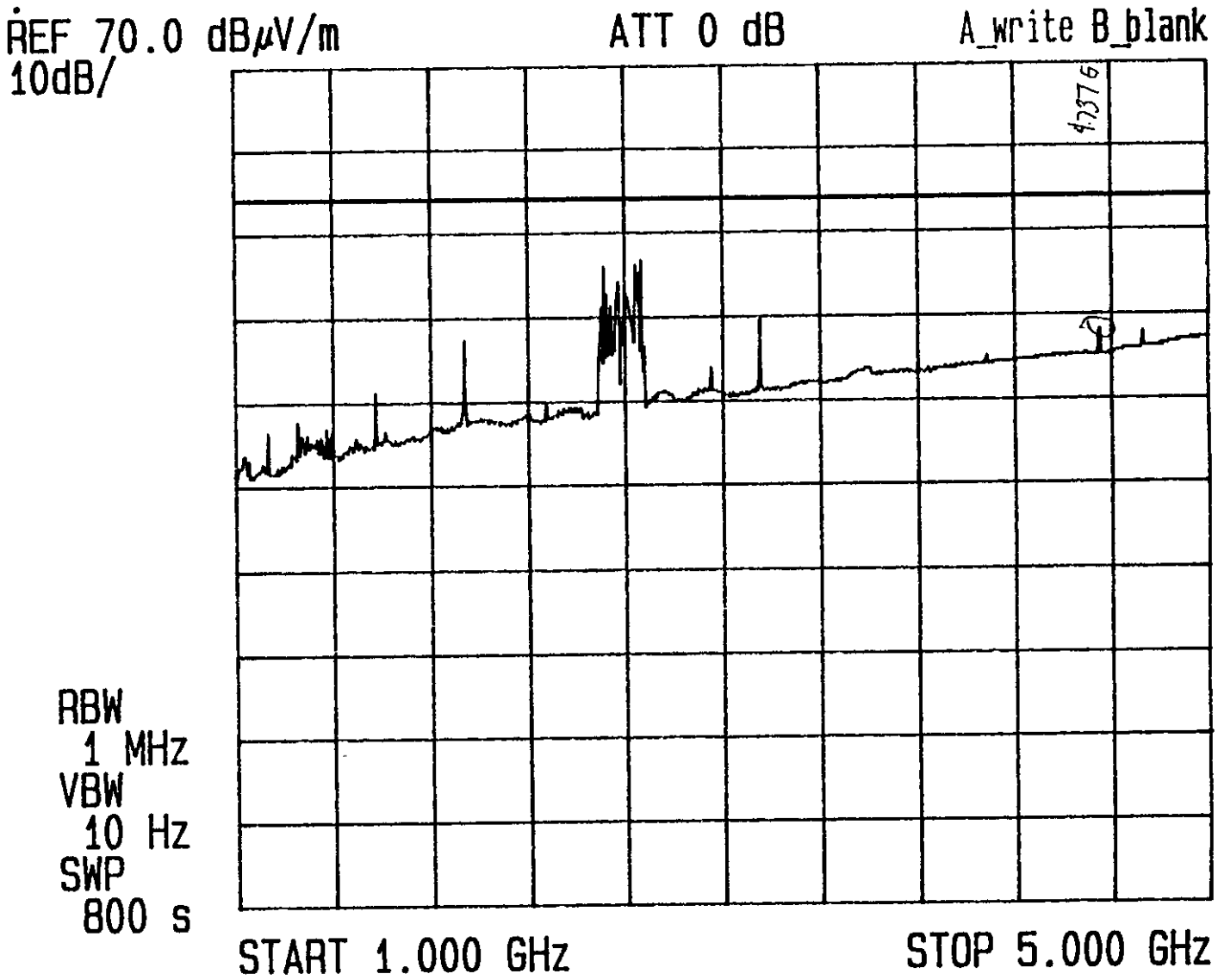
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0m H
DETECTOR: PEAK	LINE UNDER TEST: N/A	EUT POSITION: 180
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:



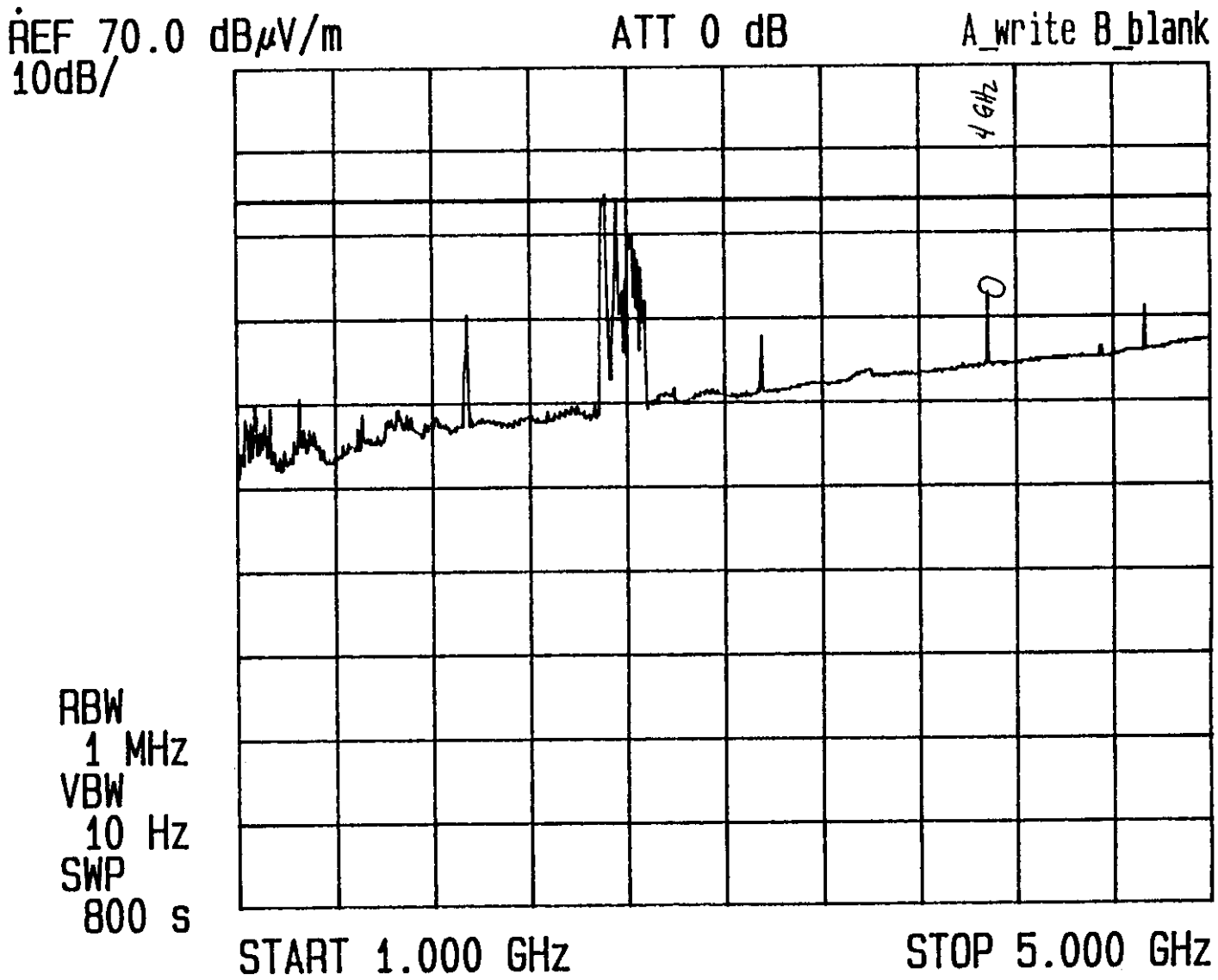
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0m V
DETECTOR: PEAK	LINE UNDER TEST: N/A	EUT POSITION: 180
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:



TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0m / H
DETECTOR: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION:
DATE: 1-18-99	TEST SITE: 3 METER	TESTER:

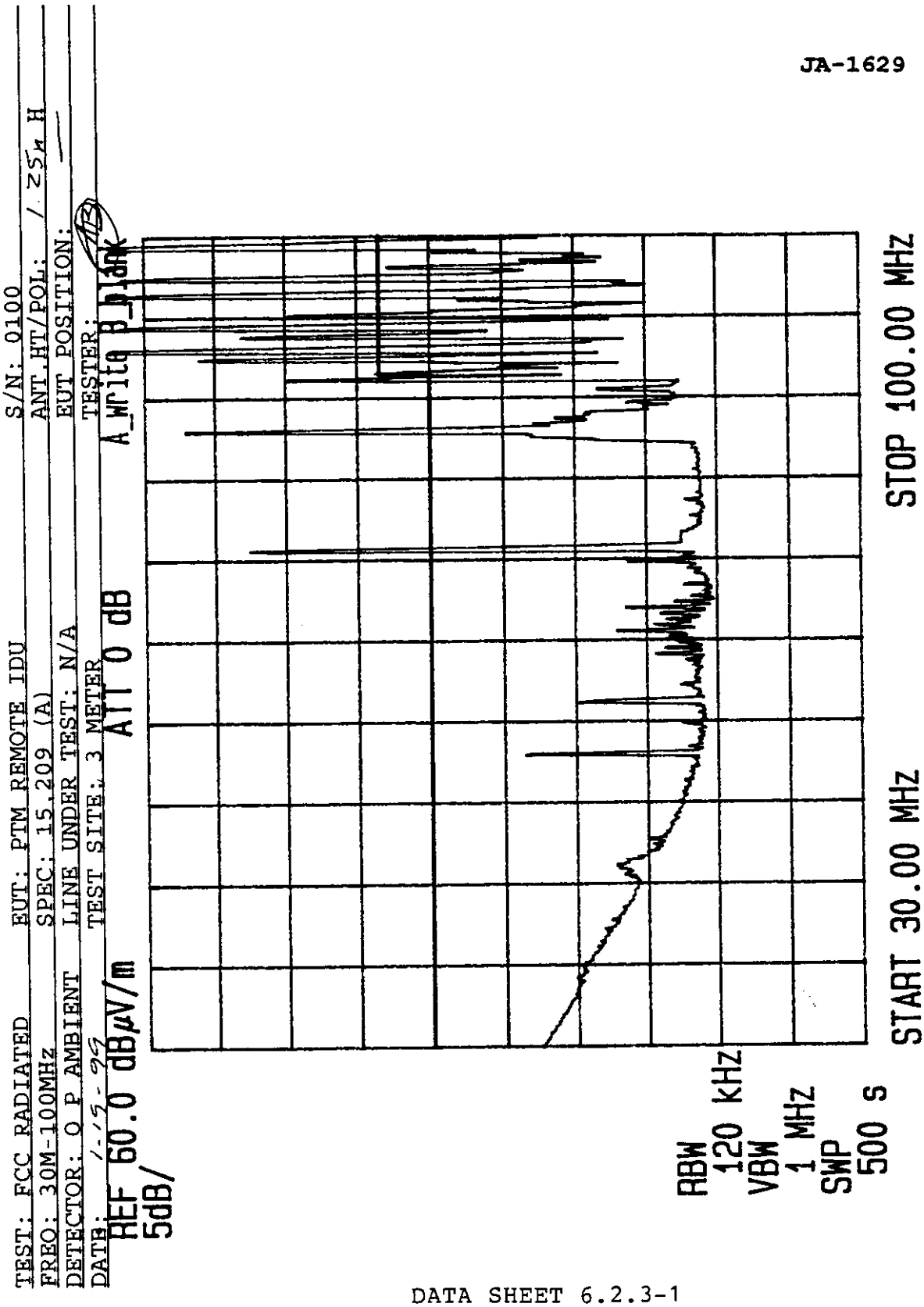


TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0 m V
DETECTOR: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: 180
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:

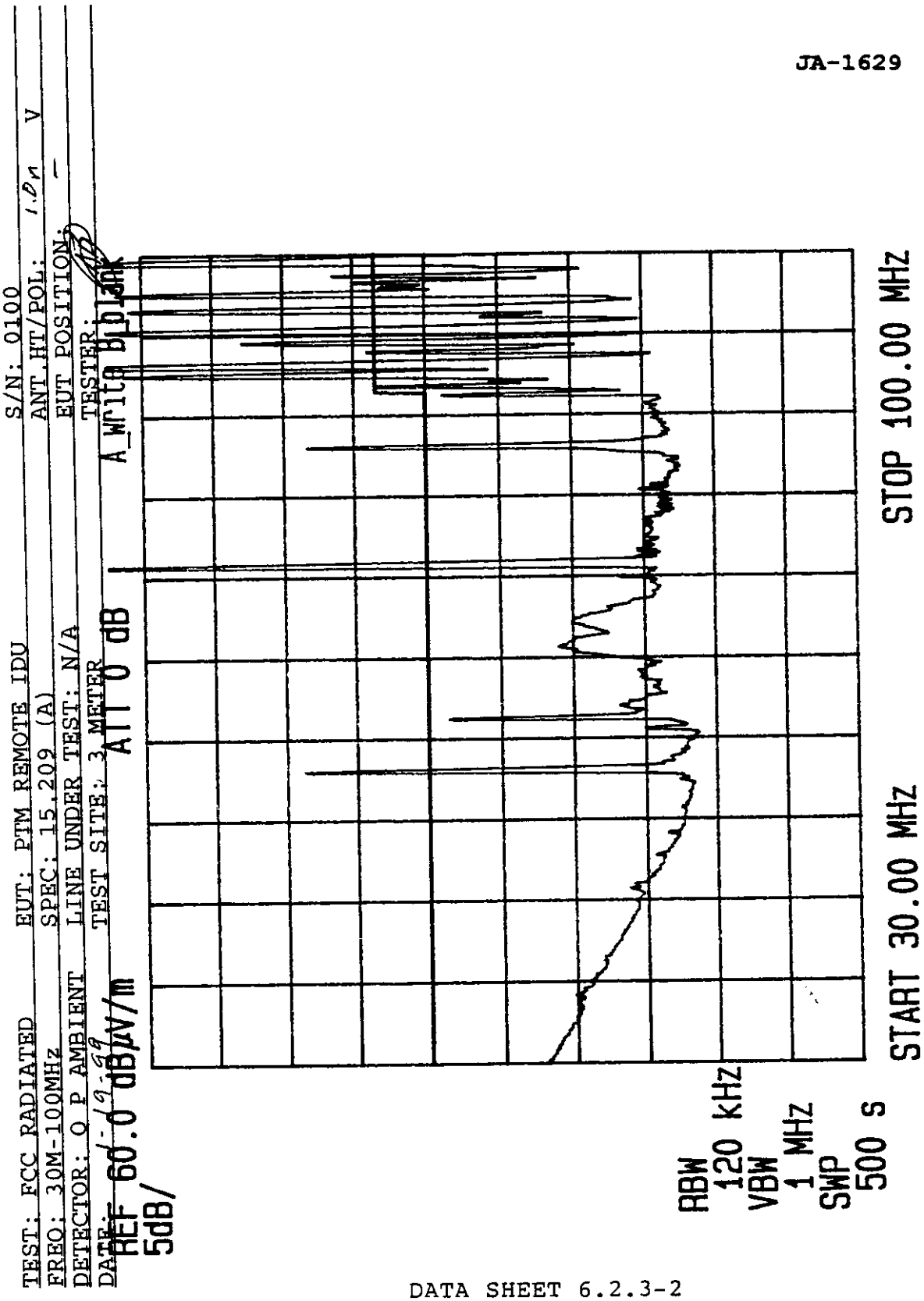


DATA SHEET 6.2.2-10

JA-1629

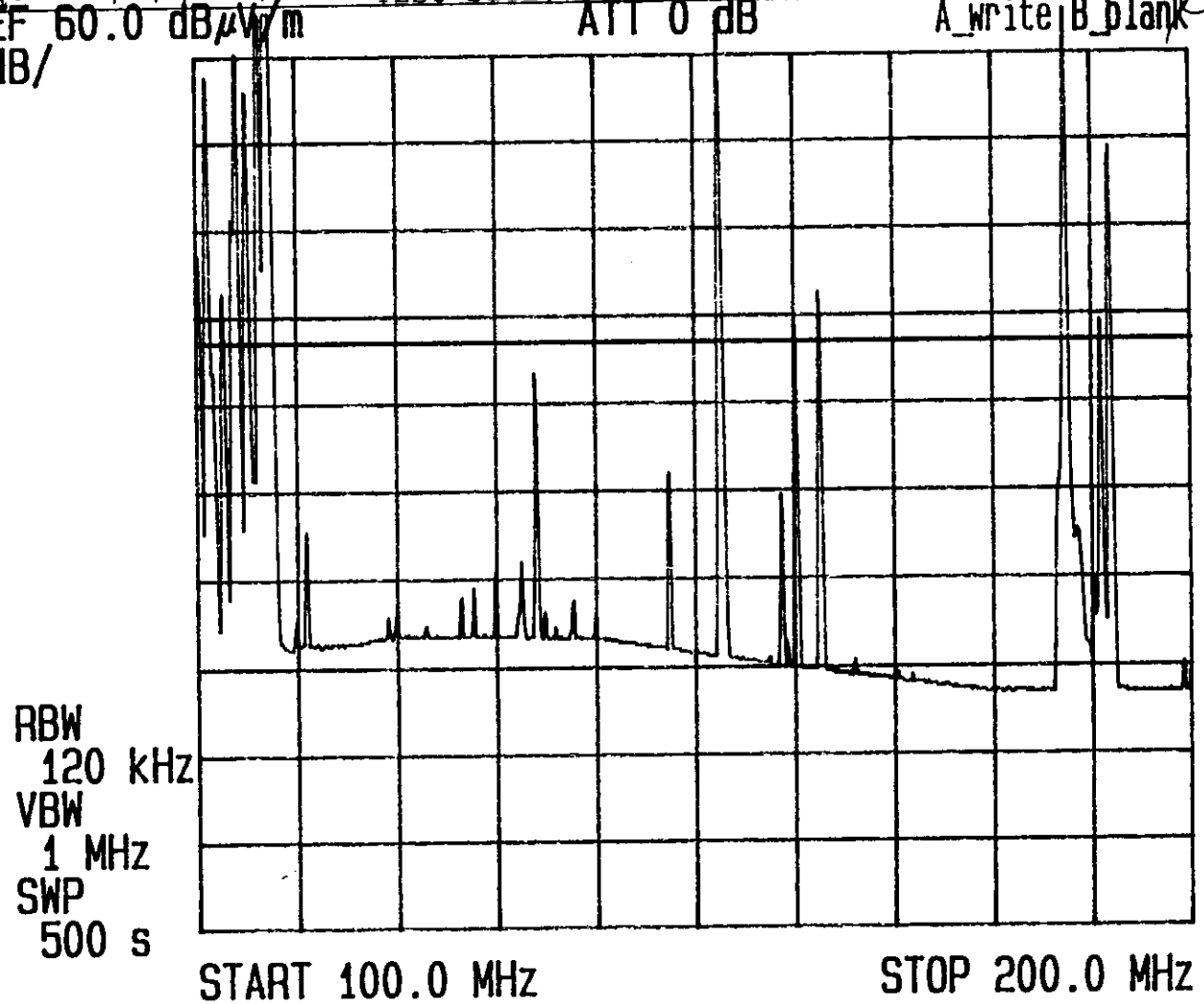


DATA SHEET 6.2.3-1



DATA SHEET 6.2.3-2

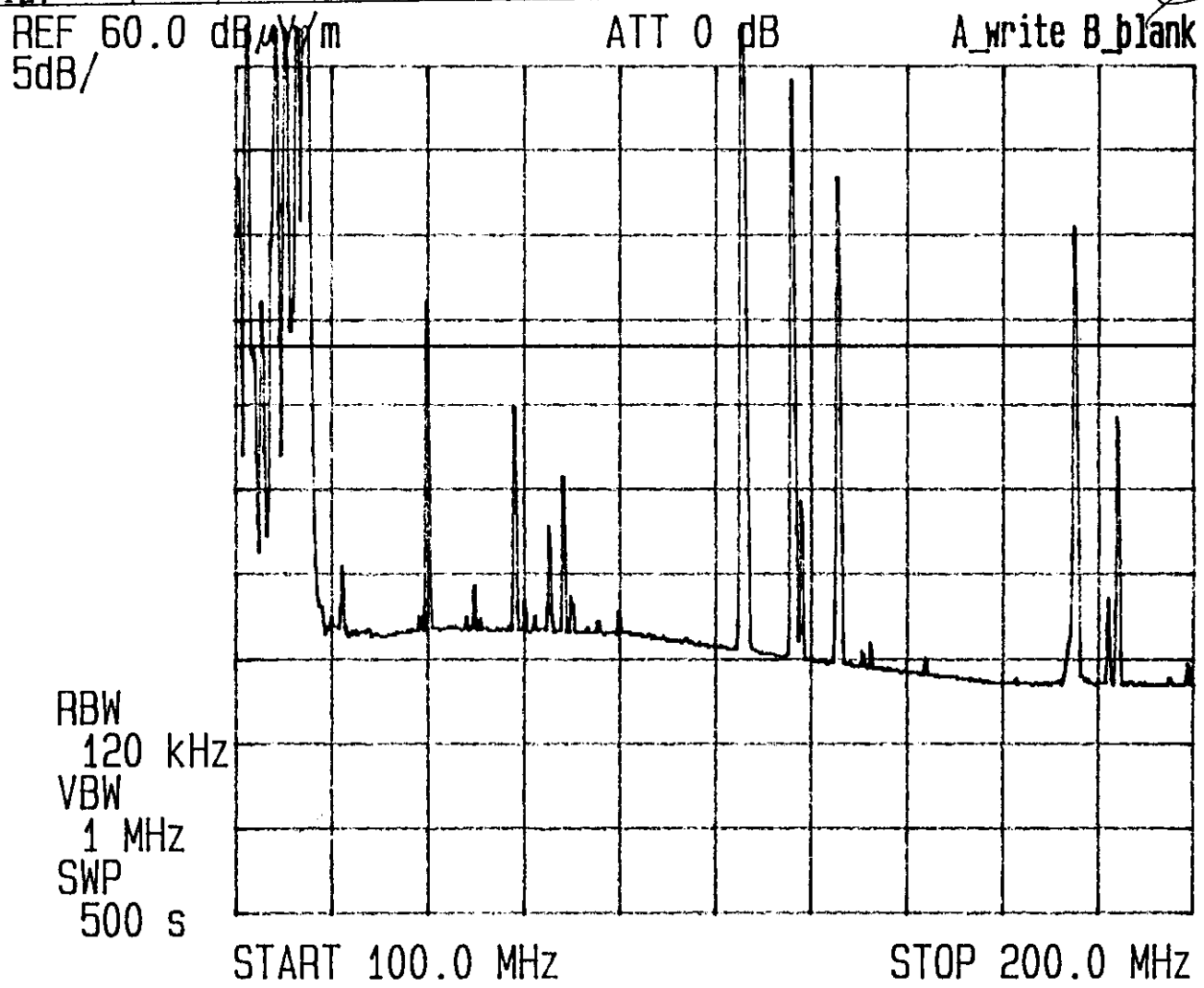
TEST: FCC RADIATED | EUT: PTM REMOTE IDU | S/N: 0100
FREQ: 100M-200MHz | SPEC: 15.209 (A) | ANT.HT/POL: H
DETECTOR: Q P AMBIENT | LINE UNDER TEST: N/A | EUT POSITION:
DATE: 1-19-99 | TEST SITE: 3 METER | TESTER: AB



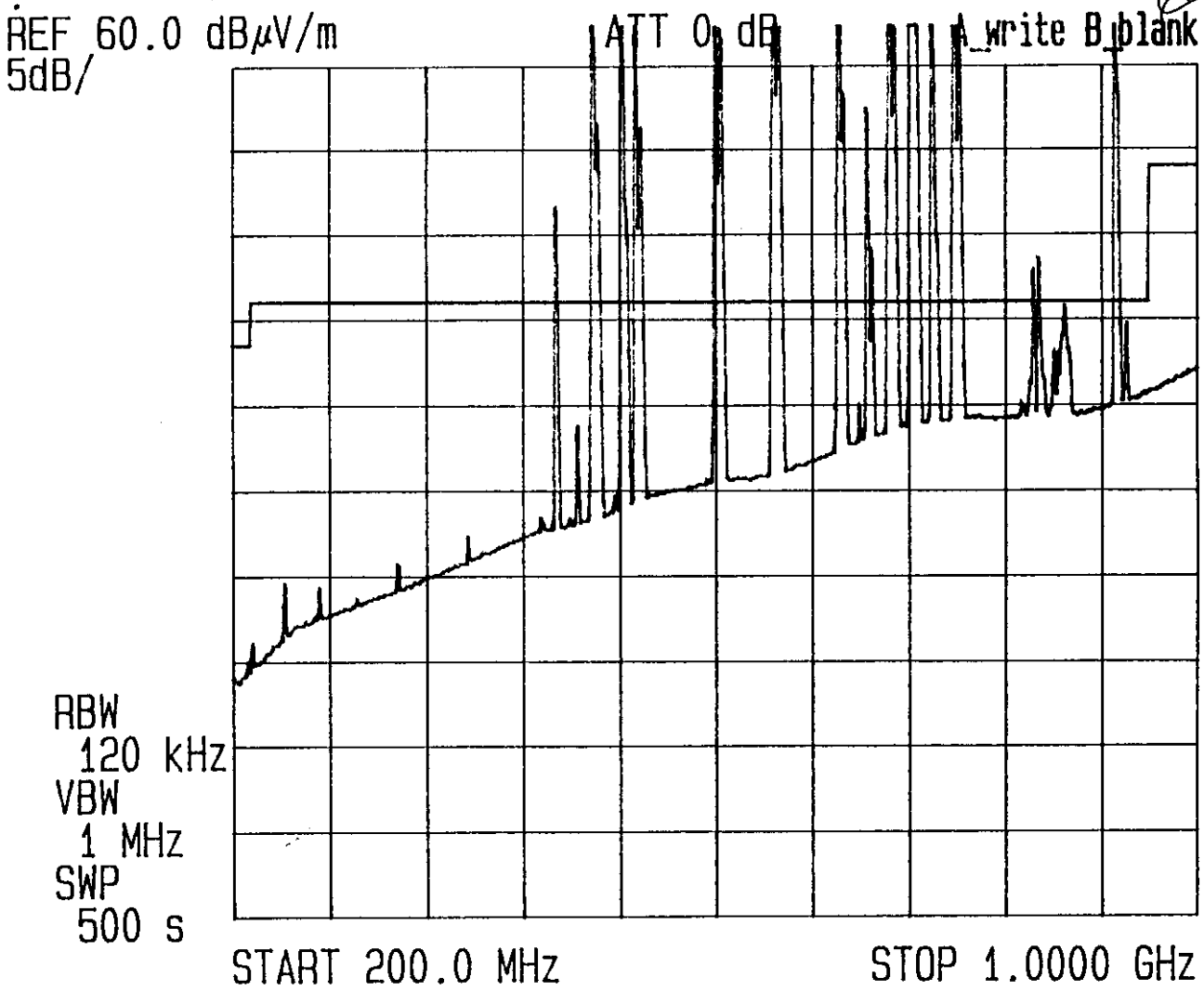
DATA SHEET 6.2.3-3

JA-1629

TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100	
FREQ: 100M-200MHz	SPEC: 15.209 (A)	ANT.HT/POL:	V
DETECTOR: Q P AMBIENT	LINE UNDER TEST: N/A	EUT POSITION:	
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:	



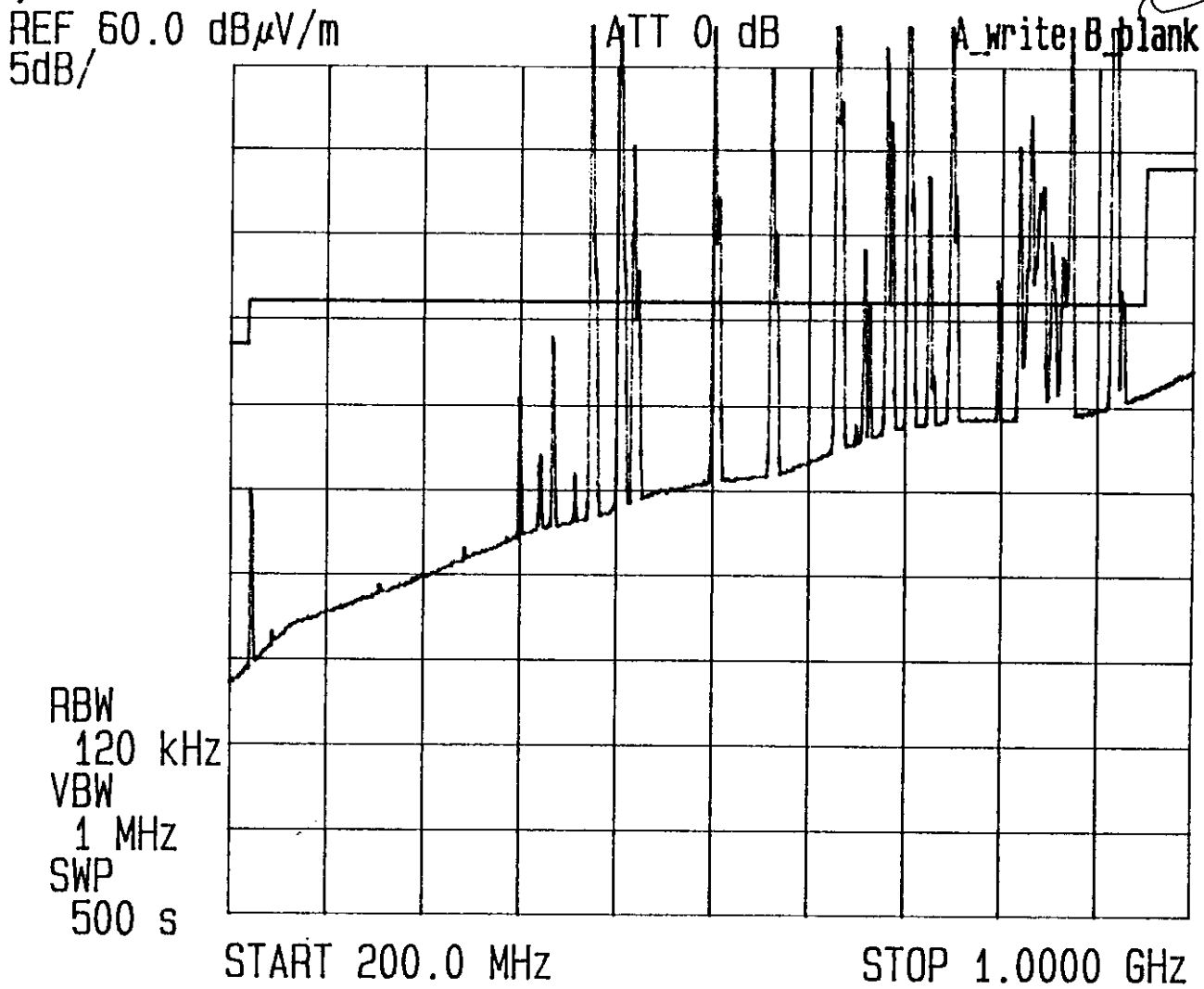
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100	
FREQ: 200M-1GHz	SPEC: 15.209 (A)	ANT.HT/POL:	H
DETECTOR: Q P AMBIENT	LINE UNDER TEST: N/A	EUT POSITION:	
DATE: 1-15-99	TEST SITE: 3 METER	TESTER:	



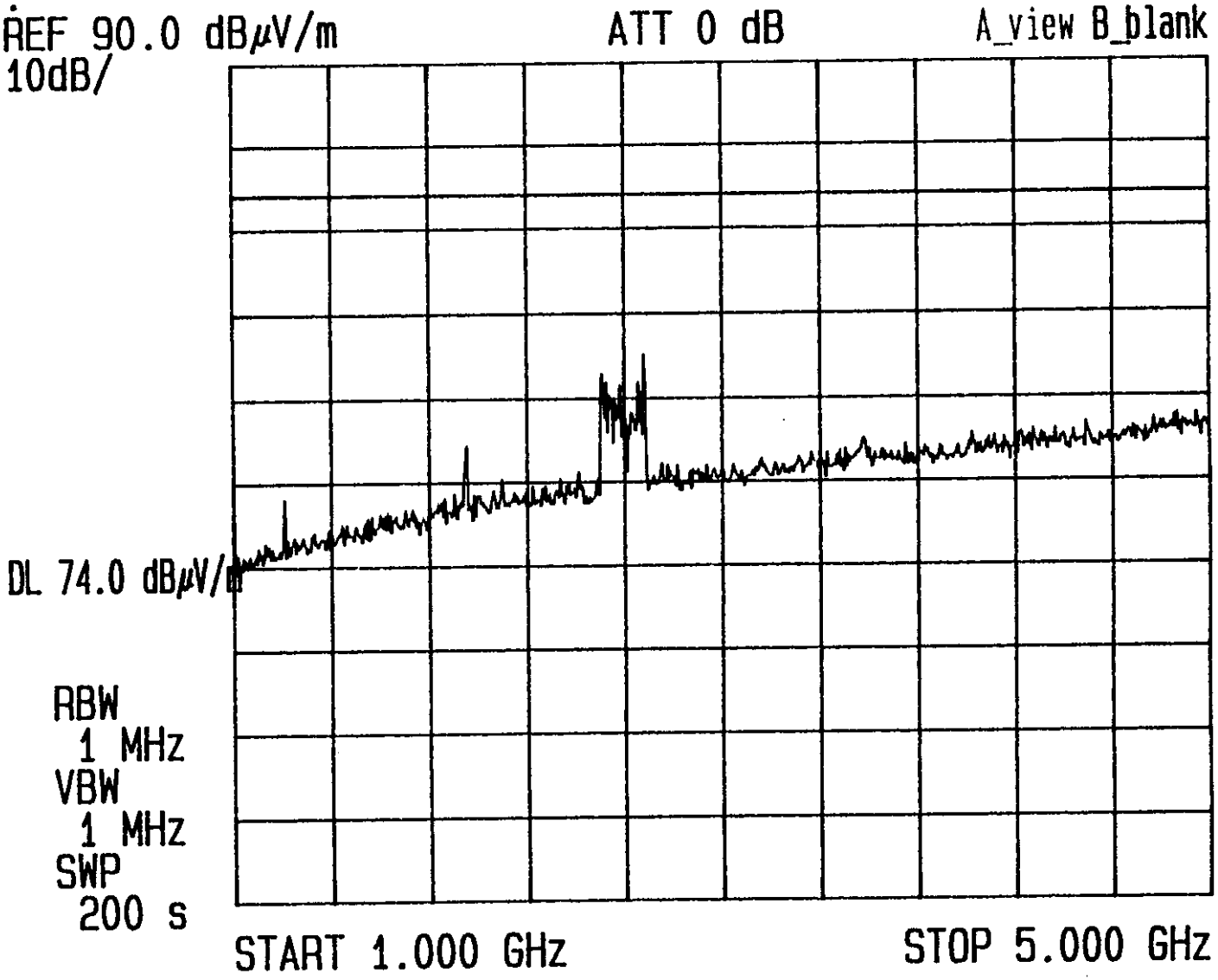
DATA SHEET 6.2.3-5

JA-1629

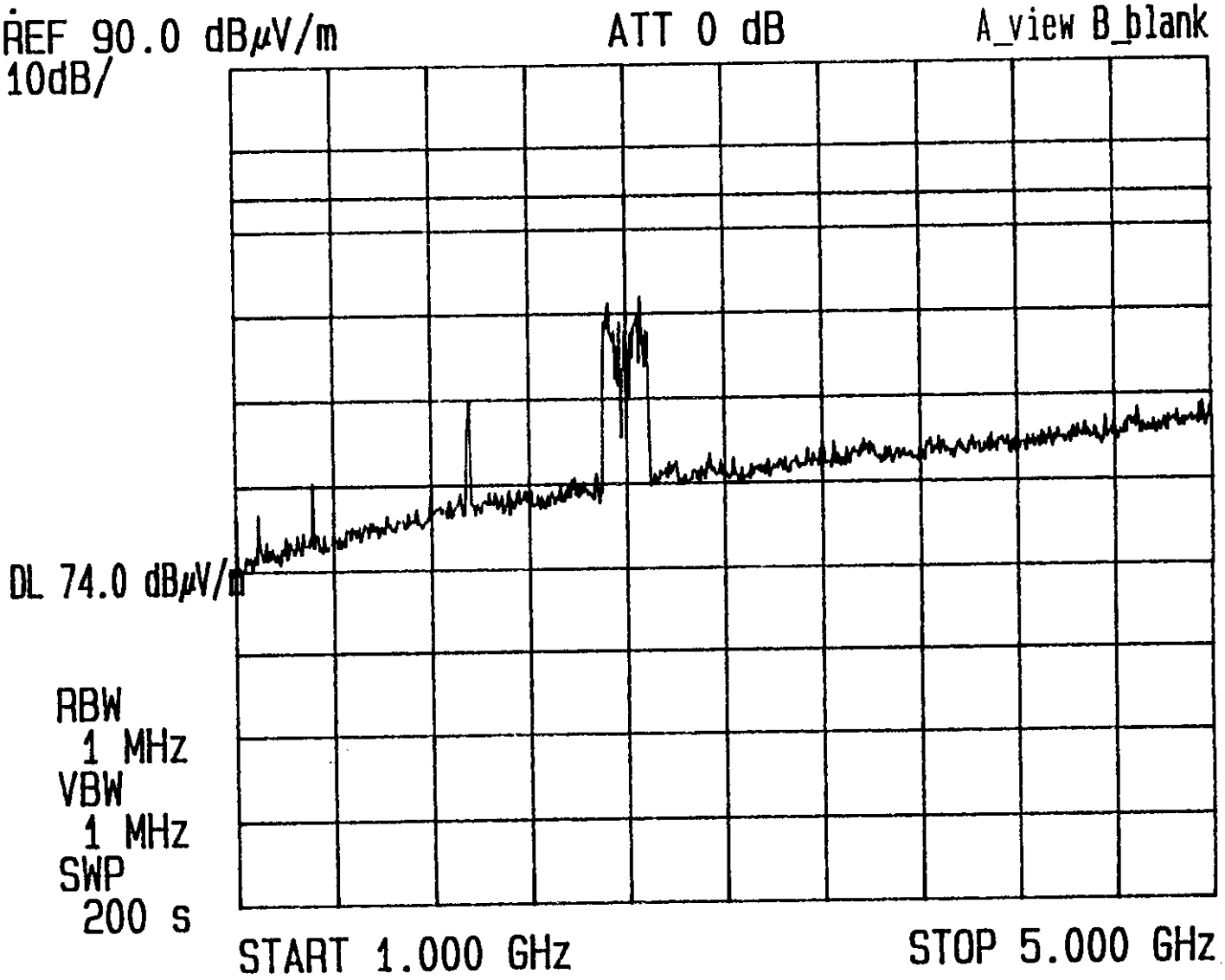
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 200M-1GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0 m V
DETECTOR: Q P AMBIENT	LINE UNDER TEST: N/A	EUT POSITION: -
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:



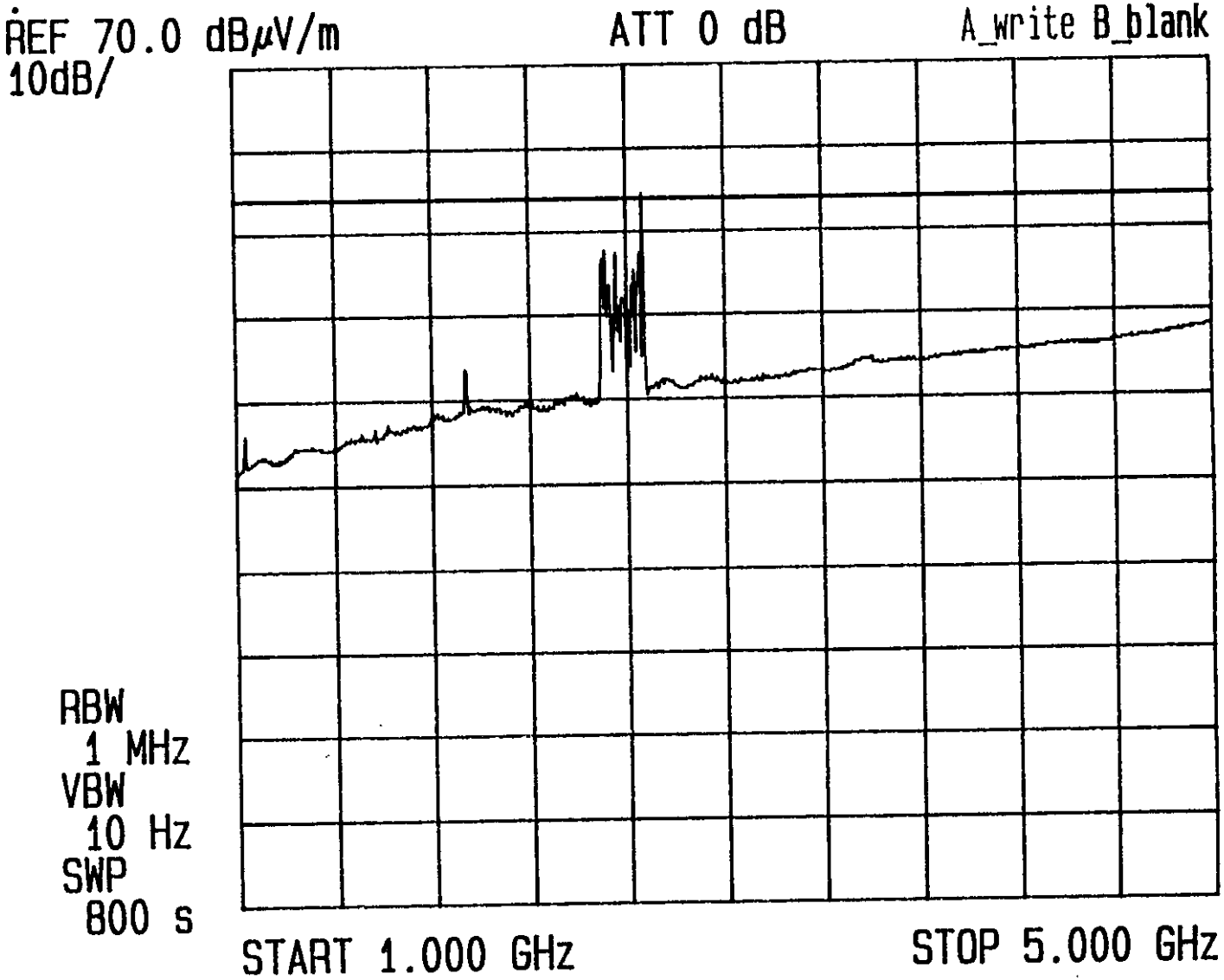
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1 ow H
DETECTOR: PEAK AMBIENT	LINE UNDER TEST: N/A	EUT POSITION: —
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:



TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0m V
DETECTOR: PEAK AMBIENT	LINE UNDER TEST: N/A	EUT POSITION: -
DATE: 1-19-99	TEST SITE: 3 METER	TESTER:



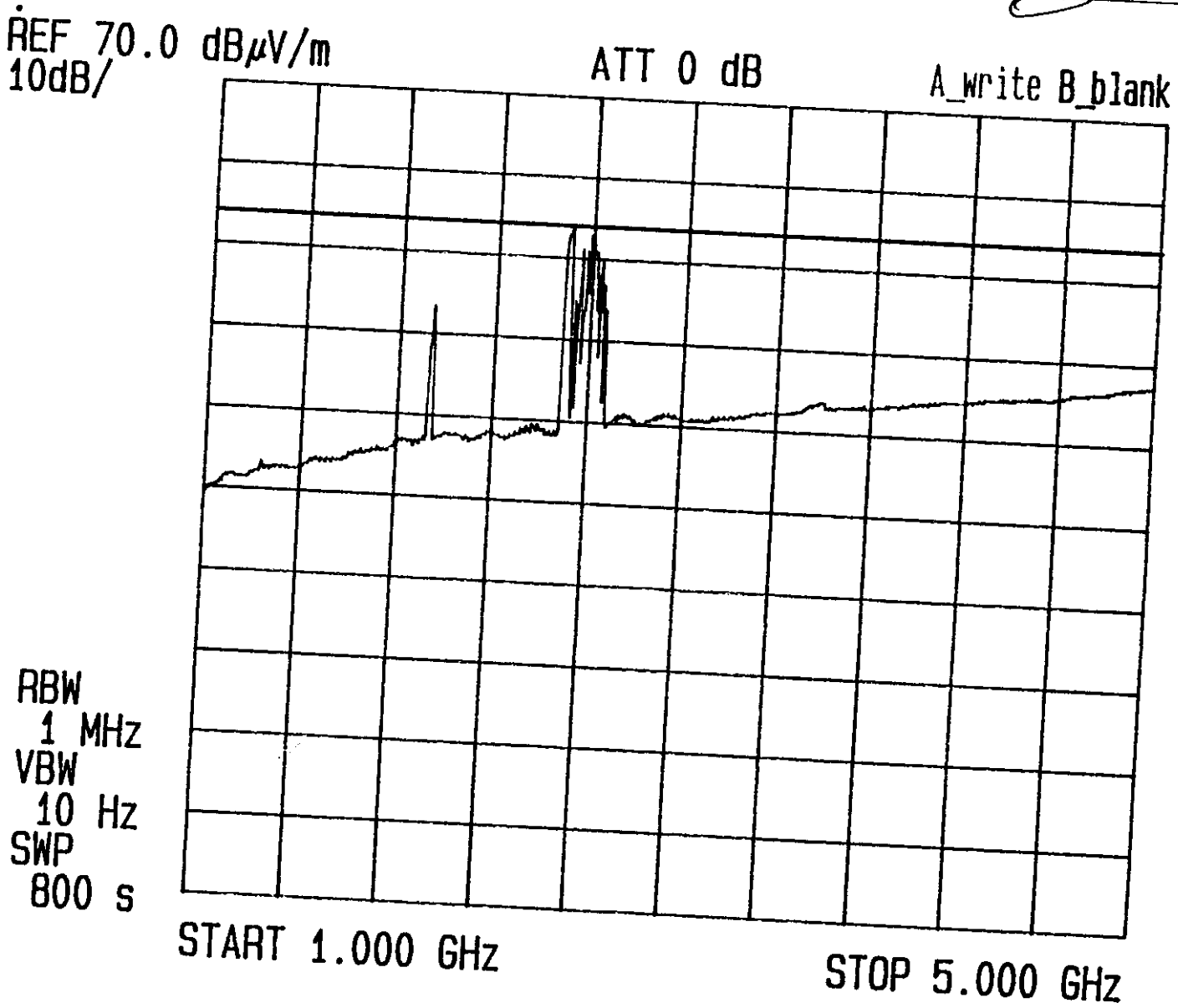
TEST: FCC RADIATED	EUT: PTM REMOTE IDU	S/N: 0100
FREQ: 1GHz-5GHz	SPEC: 15.209 (A)	ANT.HT/POL: 1.0m H
DETECTOR: AVG. AMBIENT	LINE UNDER TEST: N/A	EUT POSITION: -
DATE: 1-18-99	TEST SITE: 3 METER	TESTER:



TEST: FCC RADIATED
FREQ: 1GHz-5GHz
DETECTOR: AVG. AMBIENT
DATE: 1-19-99

EUT: PTM REMOTE IDU
SPEC: 15.209 (A)
LINE UNDER TEST: N/A
TEST SITE: 3 METER

S/N: 0100
ANT.HT/POL: 1.0m V
EUT POSITION: —
TESTER: AB



APPENDIX A

COMPLIANCE LETTER

FEDERAL COMMUNICATIONS COMMISSION

7435 Oakland Mills Road
Columbia, MD 21046
Telephone: 301-725-1585 (ext-218)
Facsimile: 301-344-2050

JA-1629

December 5, 1996

IN REPLY REFER TO
31040/SIT
1300F2

Rubicom Systems, Inc.
284 West Drive, Suite B
Melbourne, FL 32904

Attention: Joseph G. Barbee

Re: Measurement facility located at above address
(3 meter site)

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for certification or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is published periodically and is also available on the Laboratory's Public Access Link as described in the enclosed Public Notice.

Sincerely,

Thomas W. Phillips
Electronics Engineer
Customer Service Branch

Enclosure:
PAL PN

Exhibit R

L5X-PMP-04-000

INDIPENDENT LABORATORY RESULTS

RUBICOM SYSTEMS, INC.

FCC INTENTIONAL RADIATOR

TEST REPORT

FOR THE

P-COM

POINT TO MULTIPOINT REMOTE TERMINAL

JANUARY 1999

Rubicom Systems, Inc.
284 West Drive, Suite B
Melbourne, FL 32904

FCC INTENTIONAL RADIATOR

TEST REPORT

FOR THE

P-COM

POINT TO MULTIPOINT REMOTE TERMINAL

Prepared by: Joseph G. Barbee 1/14/99
Joseph G. Barbee

Tested by: Joseph G. Barbee 1/14/99
Joseph G. Barbee

Performed by:
RUBICOM SYSTEMS INC.
284 West Drive, Suite B
Melbourne, Florida 32904

Performed for:
P-COM
1801 Penn Street
Melbourne, Florida 32901

Received: December 9, 1998

Completed: January 5, 1999

TABLE OF CONTENTS

ABSTRACT

This report presents test results of the emanations found emitting from the P-Com Point to Multipoint Remote Terminal and the comparison of these emissions to the requirements of FCC, Title 47, Part 101 Fixed Point to Multipoint Microwave Service as required for a Digital Electronics Message Service. In accordance with Part 2.99(a)(3) radiated measurements were extended to 200GHz. The indoor unit (IDU) was tested to Part 15 requirements.

This testing was performed at Rubicom Systems, Inc. (RSI). The testing was performed for P-Com under purchase order F63737. The results of this test effort indicates compliance of the P-Com Remote Terminal to FCC, Title 47 requirements.

1.0 INTRODUCTION

1.1 Propose

The purpose of this report is to show compliance of the Multipoint Remote Terminal to the requirements of CFR 47, Part 101 Subpart C for Fixed Point to Multipoint Microwave Service and Part 15.209(a) and 15.207 for the IDU low frequency. The band of operation is 38.6GHz to 40GHz. The Remote Terminal test was performed in a semi-anechoic chamber at a distance of 1 meter and .33 meters. Other emissions test were performed on a 3 meter O.A.T.S. Distances are noted on the data plots.

1.2 Requirements

This report is to provide results of testing to CFR 47, Part 101 Subpart C (specifically 101.109, 101.111(2)(ii) and 101.113) for a 38.6GHz to 40GHz common carrier fixed point to multipoint microwave service terminal.

Bandwidth 101.109 (50MHz Max)

Emission Limitation 101.111(2)(ii)(iii)

Transmitter Power Limitation 100.113 (+55dBw EIRP)

Signals outside the intended band must be attenuated by 56dB at 250% of bandwidth, and 33dB of attenuation below the measured transmit level (123dBμV/m) for harmonics and spurious signals above the transmitter.

Signals appearing in the restricted bands must meet the requirements of 15.209.

1.3 Unit Under Test Description

The P-Com Point to Multipoint Remote Terminal consists of an indoor unit (IDU) and outdoor unit (ODU). The IDU controls the transmit modulation, IF frequencies, 10MHz power output level plus a 10MHz reference signal and DC power to the ODU. The IDU also demodulates the incoming signals during receive mode.

The ODU performs the UP/down conversion of the 38.6GHz-40GHz plus amplification. The ODU has a transmit band of 39.95-40GHz and receive band of 38.95-39.3GHz.

The two units are connected using 100 ft. Of LMR 400 communications cable 50 ohms.

The system was configured as follows:

IDU S/N 109	ODU S/N 38RH4A00002
1 ea. Control PCB	1 ea. P-Com PTM 38GHz High 4
1 ea. Demodulator PCB	
1 ea. Modulator PCB	
5 ea. E1/T1 PCB	
1 ea. IDU Power Supply	
1 ea. ODU Power Supply	

1.4 Modifications

The IDU required a power line filter be added and I/O connectors required filtering at the bulkhead.

Power Filter	Manufacturer:	Schurter
	Part No.	KFB 4302.5313
I/O Filter	Manufacturer:	Amphenal
	Part No.	FCC 57-22500-430

1.5 Summary of Results

Paragraph 6.0 of this document presents the results of the tabulated levels detected during testing of the Point to Multipoint Remote Terminal. There were no failures after modifications were made to the IDU. Those modifications are noted above in Paragraph 1.4 above. Both the applicable paragraphs of Part 15 and Part 101 are within the limits determined in this report.

2.0 APPLICABLE DOCUMENTS

The following documents form a part of this report to the extent expressed herein:

FCC Code of Federal Regulations Title 47, Part 15 and 101

ANSI C63.4-1992

FCC Characteristics of open Field Test Sites Bulletin OET 55, October 1989

3.0 TEST SITE DESCRIPTION

This testing was performed at Rubicom Systems, Inc. 3 meter test site and in a semi-anechoic chamber above 18GHz. The description of the measurement facility was found to be compliant with the requirements of section 2.948 of the FCC Rules. A copy of the compliance letter is attached to this report as Appendix A.

3.1 Environmental Conditions

This test effort was performed between December 9, 1998 through January 8, 1999. Typical conditions in the laboratory during this testing were:

Temperature: **78°**

Barometer: **29.75 in.**

Humidity: **50%**

4.0 TEST INSTRUMENTATION

The following test equipment was used to perform this testing.

Qty.	Description	Manufacturer	Model No.	Cal Date
1	Coax Attenuator	Hewlett Packard	8494B	03/13/98
1	Bilog Antenna	Chase	CLB6111B	07/24/98
1	Standard Gain Horn	Flann	23240-20	NCR
1	Ridge Guide Horn	Electro Metrics	RGA-180	10/23/98
1	Standard Gain Horn	NARDA	Model 638	NCR
1	Standard Gain Horn	NARDA	V637	NCR
1	Standard Gain Horn	Flann Microwave	25240-20	NCR
1	Standard Gain Horn	Flann Microwave	27240-20	NCR
1	Spectrum Analyzer	Advantest	R3271	09/09/98
1	Harmonic Mixer	Hewlett Packard	11970Q	NCR
1	Harmonic Mixer	Hewlett Packard	11970A	NCR
1	Harmonic Mixer	Hewlett Packard	11970V	06/20/98
1	Harmonic Mixer	Hewlett Packard	11970W	06/20/98
1	Harmonic Mixer	OML	M06HW	NCR
1	Waveguide Adapter	OMNI	WR28-SMA	NCR
1	Preamplifier 1-18GHz	Pacific Microwave	W2063-01	05/07/99
1	Preamplifier 8-18GHz	Pacific Microwave	W5053-01	05/07/99
1	Spectrum Analyzer	Hewlett Packard	HP8563A	11/17/98
1	Spectrum Analyzer	Hewlett Packard	HP8566BA	05/12/98

Qty.	Description	Manufacturer	Model No.	Cal Date
1	Coax Attenuator	Hewlett Packard	8494B	03/13/98
1	Standard Gain Horn	Custom Microwave	H06R	NCR
1	Meter	Hewlett Packard	436A	04/24/98
1	Sensor	Hewlett Packard	8487A	04/24/98
1	Antenna Adapter	Hill Manufacturing	1781702	NCR
1	WG to Coaxial Adapter	Hewlett Packard	P281A	NCR

5.0 TEST SAMPLE SETUP AND CONFIGURATIONS

The unit was placed on a nonconductive table on the 3 meter OATS. The unit was powered from 120 VAC 60Hz filtered power. Measurements from 30MHz-8GHz were performed on the 3 meter site at 3 meter distance.

During radiated emissions above 8GHz the unit was placed on a table inside a test chamber (semi-anechoic) and rotated for maximum level at 1 meter distance. Above 18GHz the measurements were performed at .3 meter distance.

Photo 1 shows the typical radiated test setup on the OATS.

The configuration of the IDU and ODU were as listed below:

Indoor Unit PCB's	Outdoor Unit	100 Ft. I/O Cable
1 ea. Controller	1 ea. PTM	LMR-400, 50 ohm
1 ea. Demodulator	PTM 38GHz High 4	Communication Cable
1 ea. Modulator	S/N: 38R H&A 0002	
5 ea. E1/T1 Channel	TX 39.95-40GHz	
1 Indoor Power Supply		
1 Outdoor Power Supply		

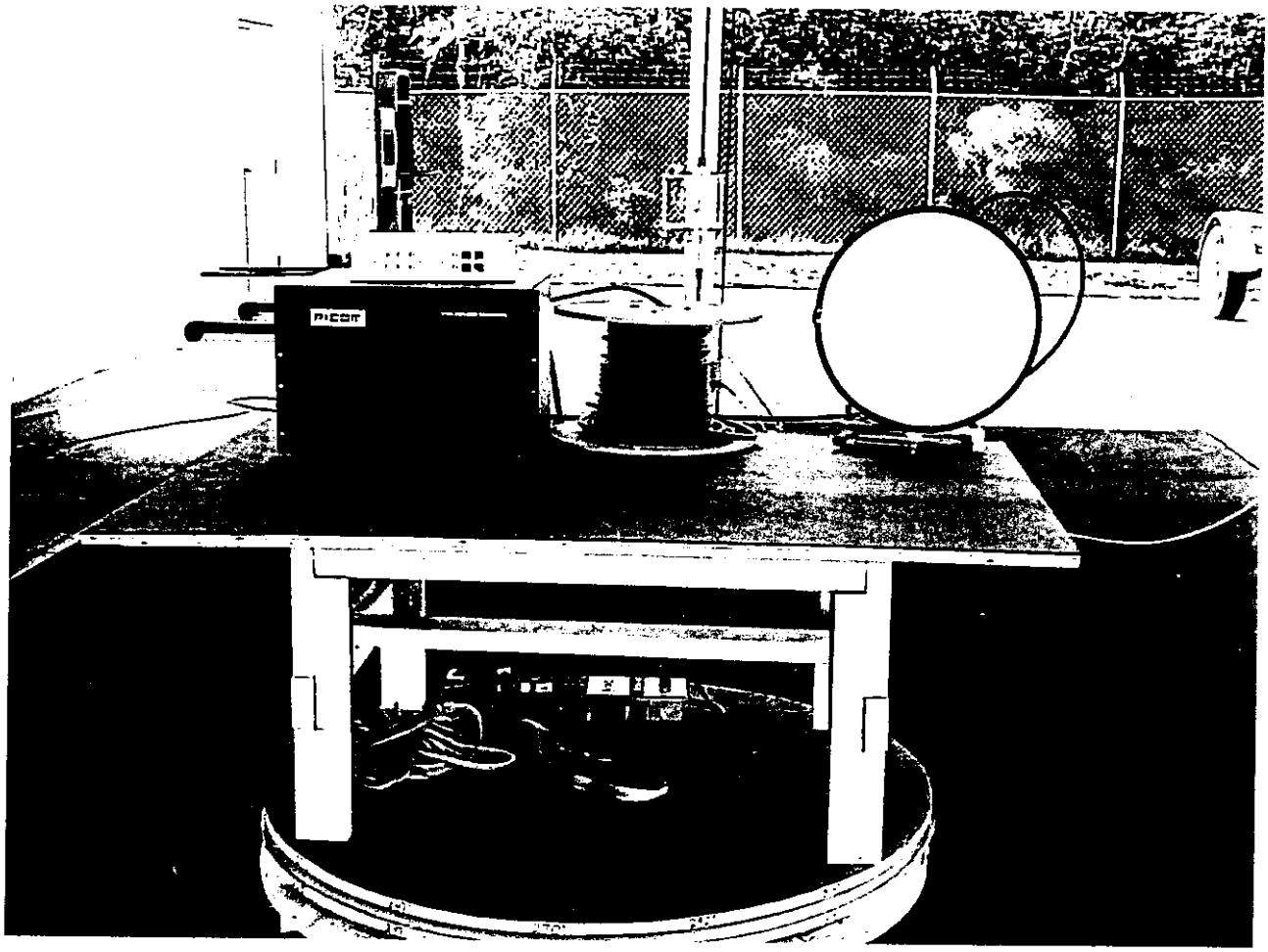


PHOTO 1

6.0 PROCEDURES AND RESULTS

6.1 General

The IDU and ODU were tested for radiated emissions on the 3 meter test site up to 18GHz. Above 18GHz the unit was tested inside a semi-anechoic chamber where the high frequency radiated measurements were completed to 200GHz and the power and bandwidth measurements were performed in the chamber.

The IDU was tested for power line conduction and radiated emission up to 5GHz (10 x highest frequency generated of 490MHz). Since the transmitter is at 38GHz the gap between 5GHz and 38GHz was tested for any spurious emissions that would be generated by the receiver or transmitter. The IDU was compared to Part 15.209. The ODU was tested to part 101. The following paragraphs present the test results and procedures for the testing.

6.1.1 Occupied Bandwidth (101.109)

Bandwidth requirements applicable to the 38.6GHz to 40GHz range is 50MHz maximum. Table 6.1-1 presents the 99.5% bandwidth measurements at the minimum , mid and maximum transmit frequencies with the minimum, mid and maximum modulation rates. Data Sheets 6.1.1-1 through 6.1.1-9 are included for reference.

NOTE: The IF signal (321MHz) of the HP mixer was input to an amplifier and then to the Advantest 3271 to allow the spectrum analyzer to calculate the occupied bandwidth.

RESULT: The maximum bandwidth measured was 17.29MHz. The unit complies with the <50MHz requirement.

EUT Remote IDU/38GHz High 4 ODU S/N 109/0002

MIN TX FREQ. 39.665 GHz MODULATION MIN 15.36 MHZ

MID 16.07 MHZ

MAX 13.00 MHZ

MID TX FREQ. 39.835 GHz MODULATION MIN 15.93 MHZ

MID 16.36 MHZ

MAX 12.71 MHZ

MIX TX FREQ. 40.005 GHz MODULATION MIN 17.29 MHZ

MID 15.29 MHZ

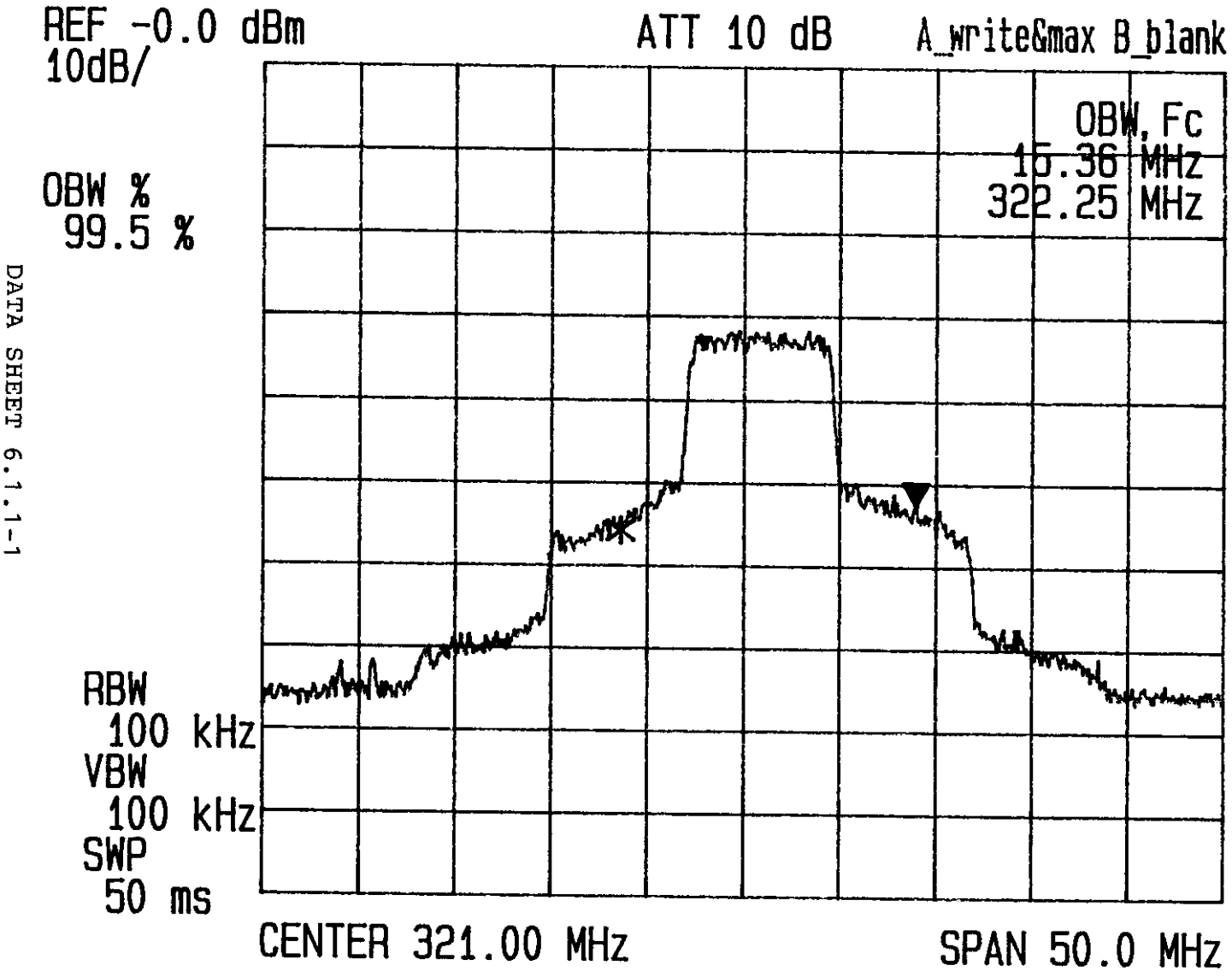
MAX 12.14 MHZ

REQUIREMENT: <50MHz

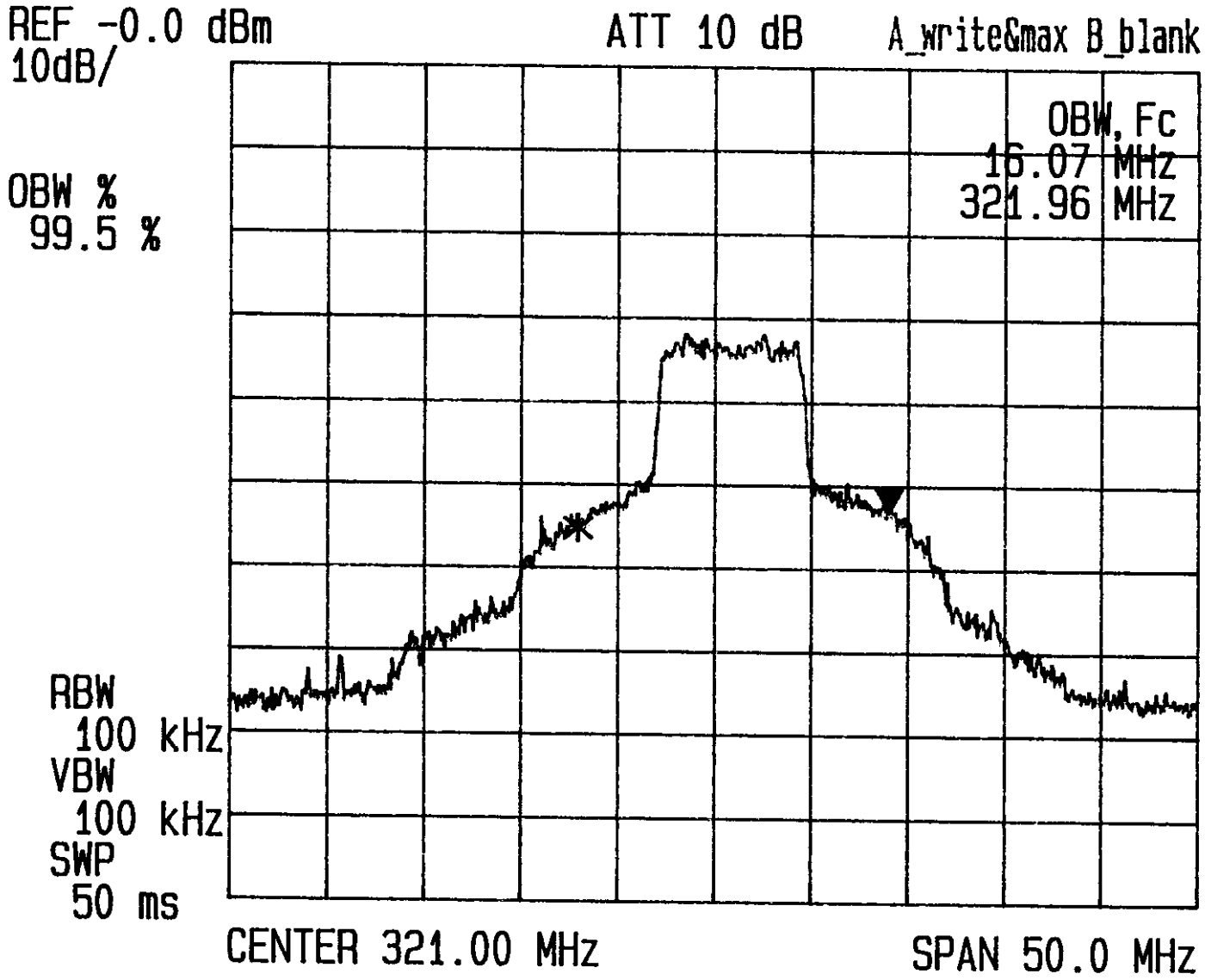
TABULATED BANDWIDTHS

TABLE 6.1.1-1

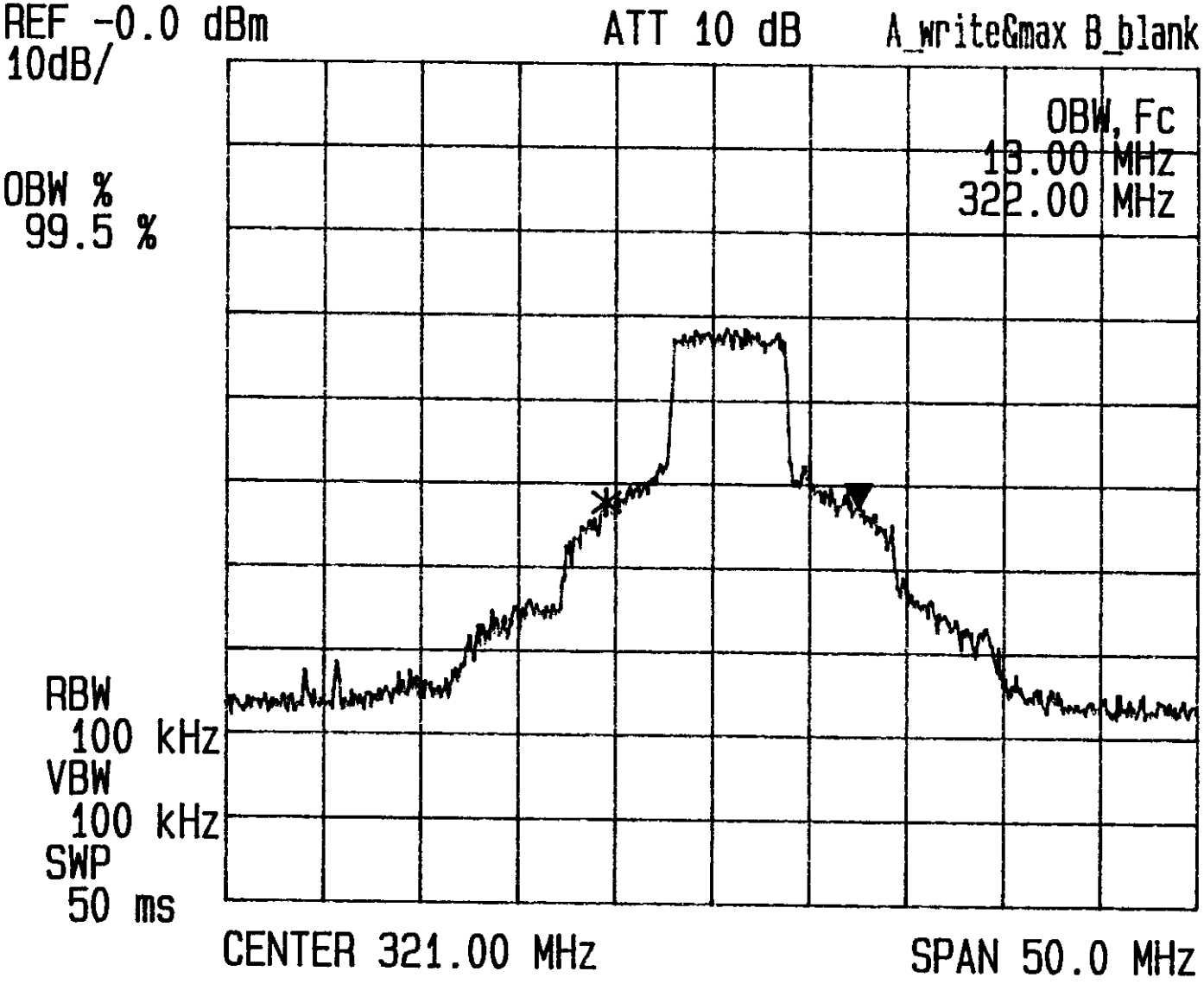
TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: L-FREQ L-MID	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-07-99	TEST SITE: OATS/ROOM 1	TESTER:



TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: L-FREQ M-MID	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-07-99	TEST SITE: OATS/ROOM 1	TESTER:



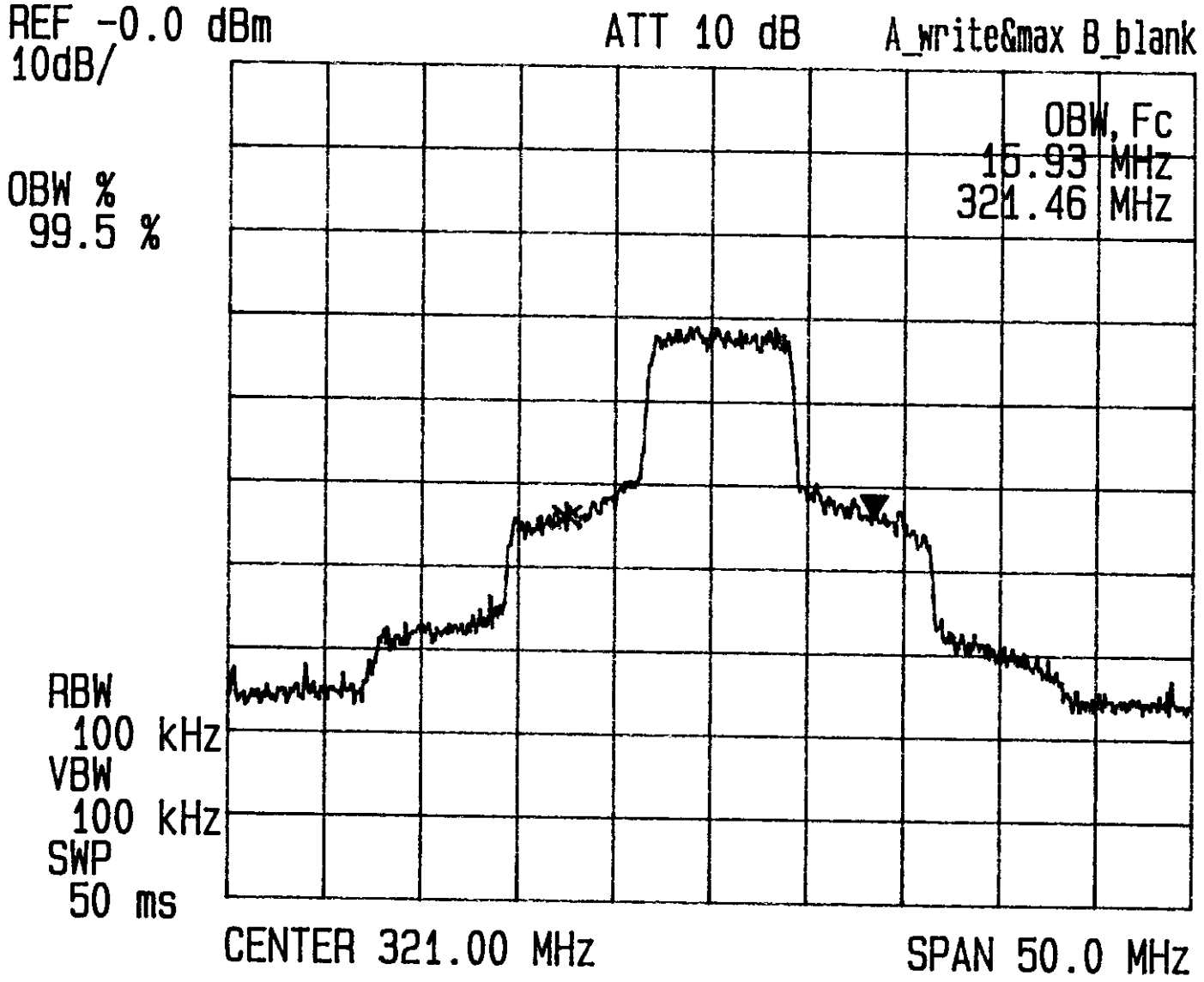
TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: L-Ant. H-mid	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-07-99	TEST SITE: OATS/ROOM 1	TESTER:



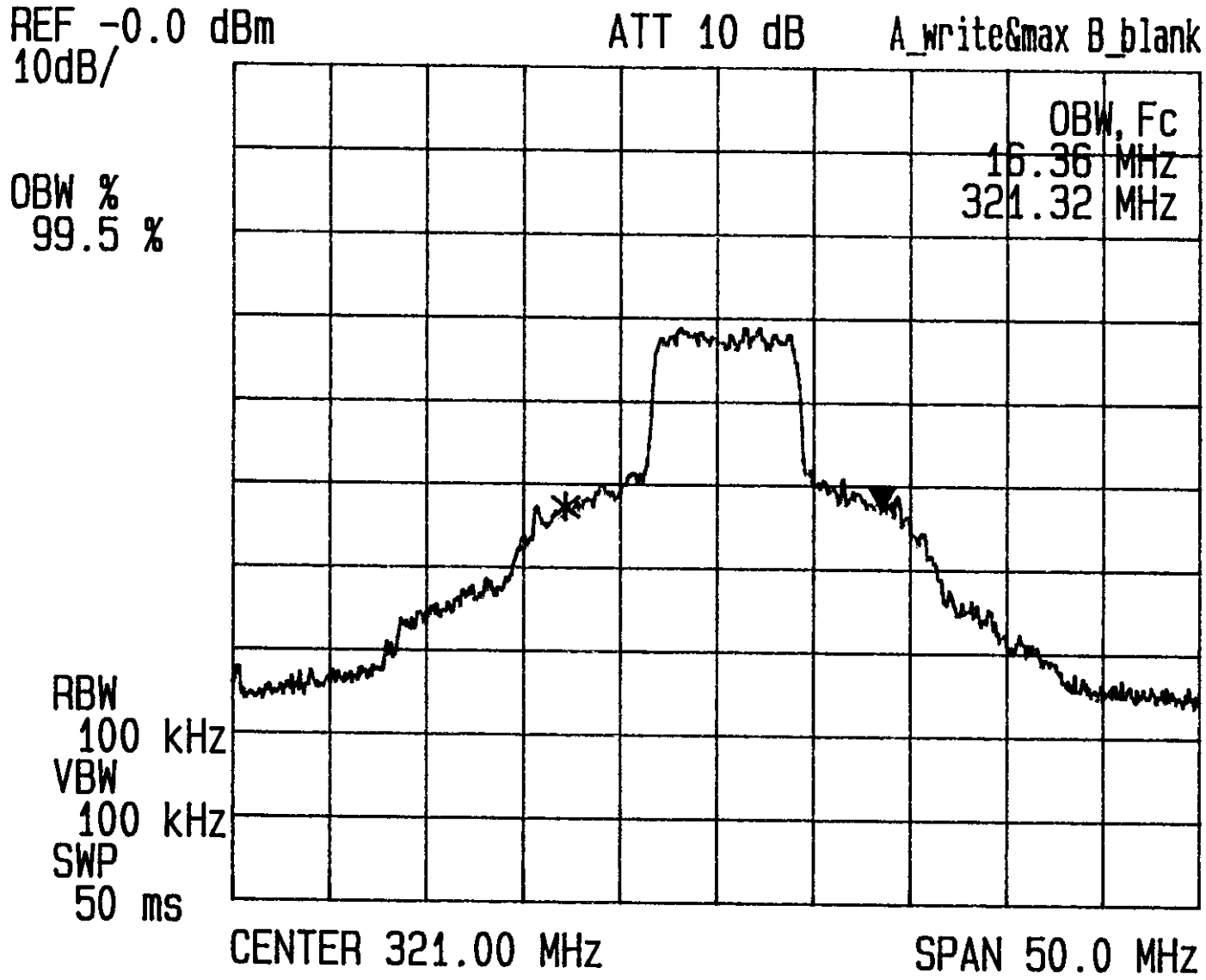
DATA SHEET 6.1.1-3

JA-1578

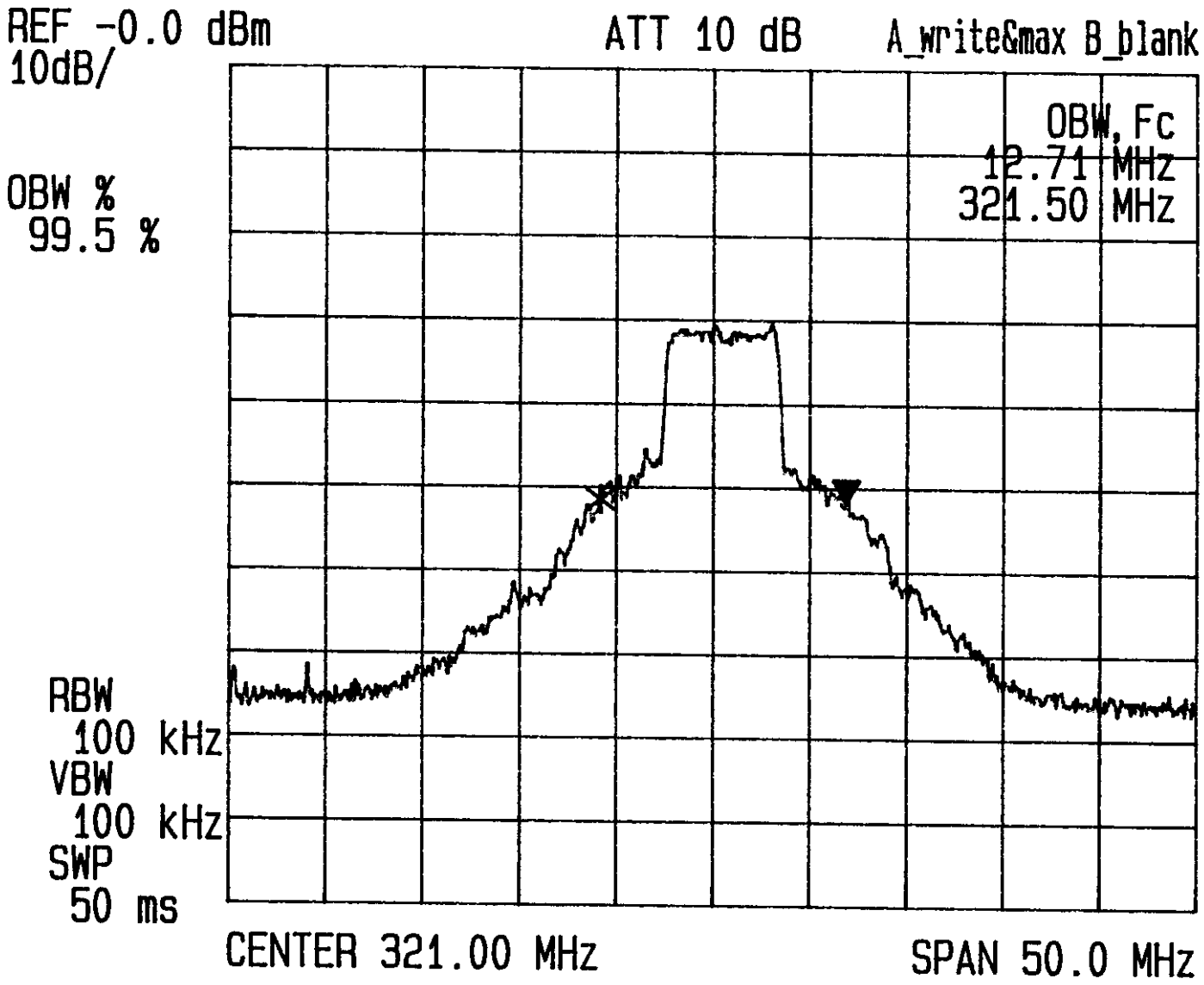
TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: M-FREQ L-MOD	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-07-99	TEST SITE: OATS/ROOM 1	TESTER:



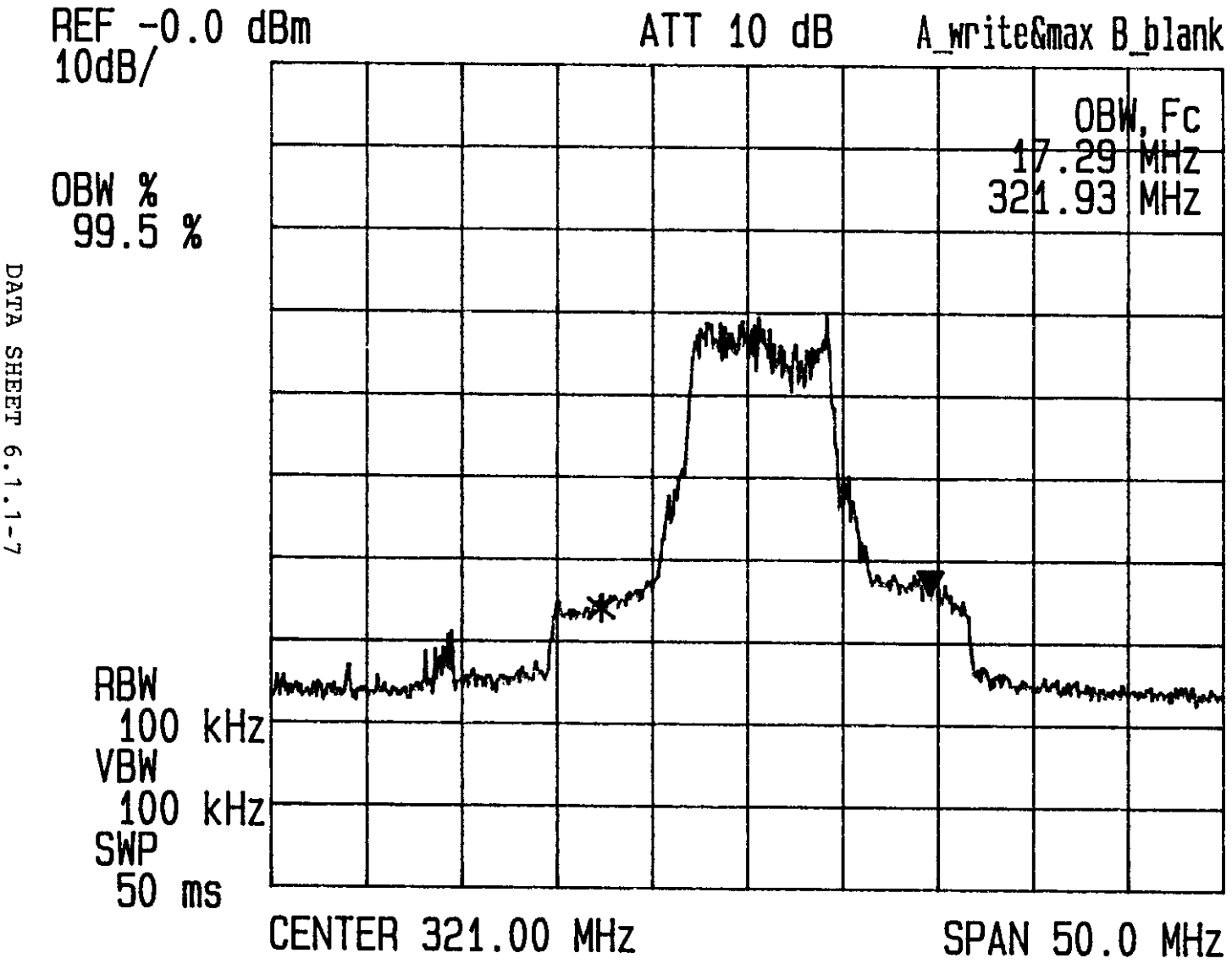
TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: MID-FREQ MID-MOD	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 1-7-99	TEST SITE: OATS/ROOM 1	TESTER: JB



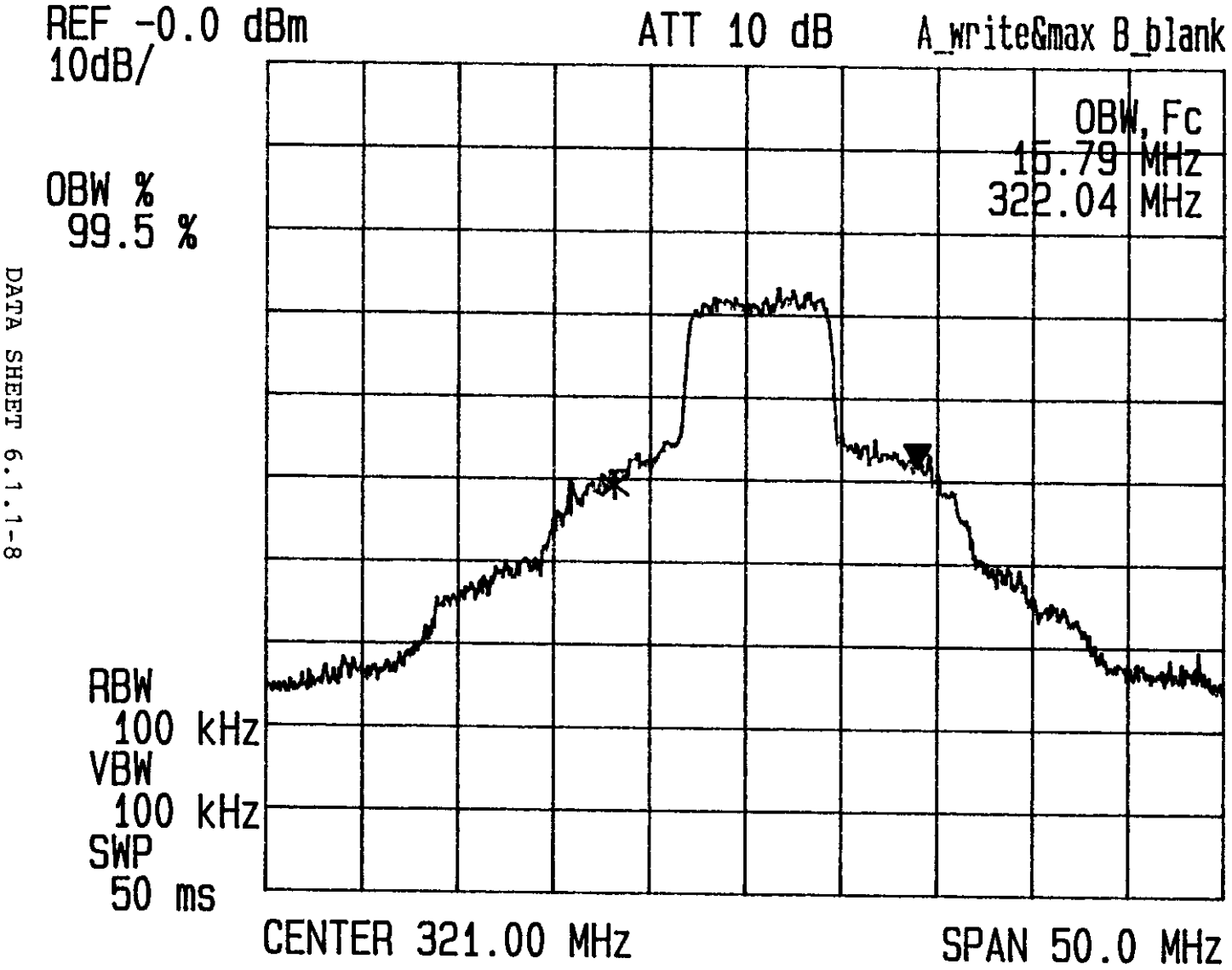
TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: MID FREQ. H. MOD	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-02-12	TEST SITE: OATS/ROOM 1	TESTER:



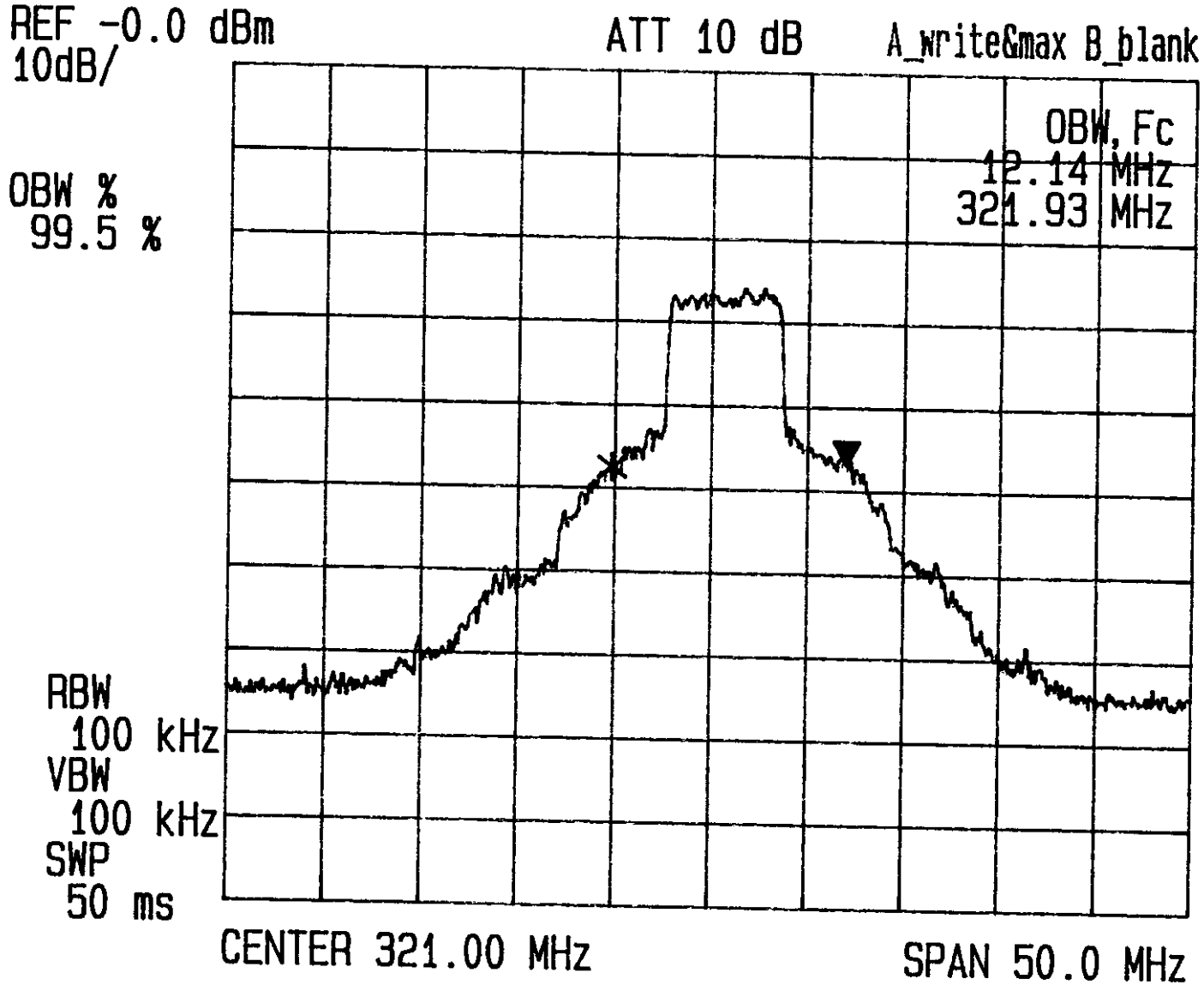
TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: H-FREQ, L-MOD	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-06-99	TEST SITE: OATS/ROOM 1	TESTER:



TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: H-FREQ M1-M00	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 01-06-99	TEST SITE: OATS/ROOM 1	TESTER:



TEST: OCCUPIED B.W.	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: H-FREQ. H-MOD.	SPEC: FCC	ANT.HT/POL:
DETECTOR:	ANTENNA:	EUT POSITION:
DATE: 04-06-99	TEST SITE: OATS/ROOM 1	TESTER:



6.1.2 Transmitter Power Limitations

Power measurements were made at the input to the antenna. Measurements were made using a Hewlett Packard Model 436A power meter with a Model 8487A power sensor. An antenna adapter for conversion to 2.9mm connector by Hill Mfg. (Model 1781702).

Antenna gain (dBi) was added to the measurements in dBw to obtain the EIRP.

Table 6.1.2-1 presents the tabulated results.

Results: The output was compliant to the required 55dBw by greater than 20dB.

Power Output Measurement

Frequencies: Min = 39.665, Mid = 39.835, Max = 40.002GHz
Modulation Min = Mid = Max =

Freq.	Modulation	Measured Power dBw	Ant. Gain	ERIP dBw	Ref. 55dBw
Min	Min	-10	40.1	30.1	-24.9
	Mid	-10	40.1	30.1	-24.9
	Max	-10	40.1	30.1	-24.9
Mid	Min	-14.5	40.1	25.6	-29.4
	Mid	-14.5	40.1	25.6	-29.4
	Max	-14.3	40.1	25.8	-29.2
Max	Min	-15.1	40.1	25.0	-30.0
	Mid	-15.2	40.1	24.9	-30.1
	Max	-15.3	40.1	24.8	-30.2

Table 6.1.2-1

6.1.3 Conducted and Radiated Emissions, Part 15 and Part 101

This paragraph presents the conducted and radiated emissions for the 38GHz remote terminal which includes the IDU as a separate unintentional radiator and tested to the requirements of part 15.207 and 209, plus the ODU transmitter requirements to Part 101.111. Figure 6.1.3-1 presents the mixer setups used to cover the 200GHz range.

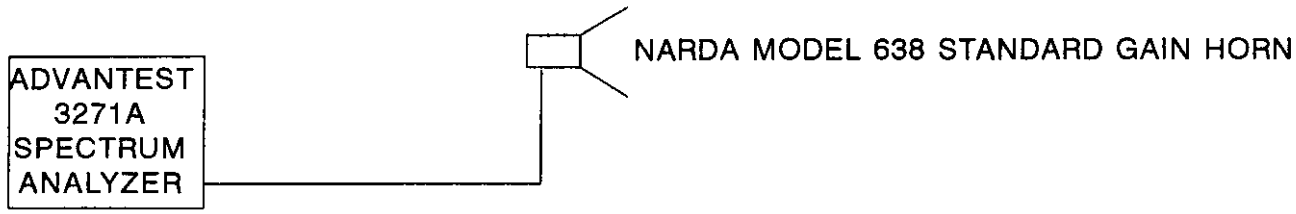
6.1.3.1 Conducted (15.207)

Conducted measurements are shown in Data Sheets 6.1.3.1-1 and 6.1.3.1-2. Photo 6.1.3.1-1 is the setup for power line conducted.

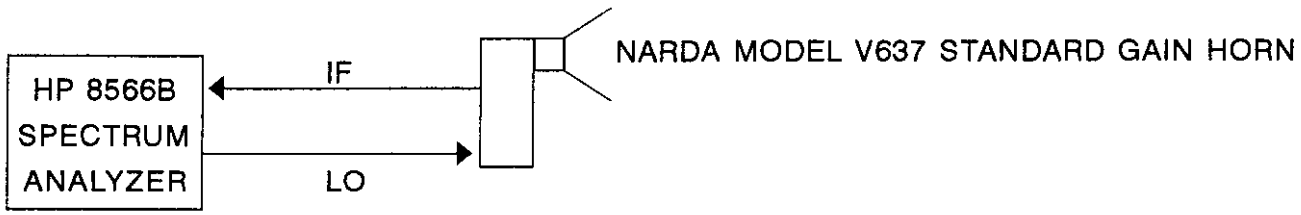
Results - No signals were measured within 20dB of the requirement.

18-26.5GHZ EQUIPMENT SETUP

JA-1578

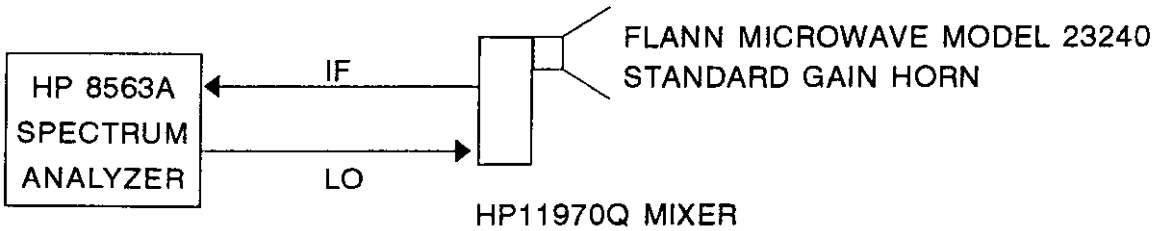


26.5-40GHz EQUIPMENT SETUP



HP11970A MIXER

33-50GHz EQUIPMENT SETUP

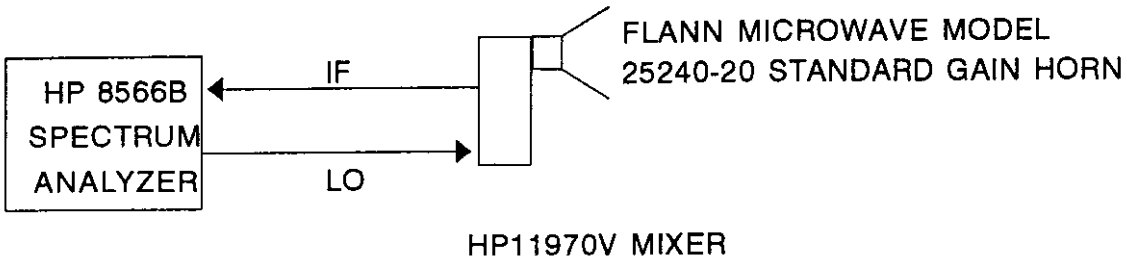


HP11970Q MIXER
33-50GHz

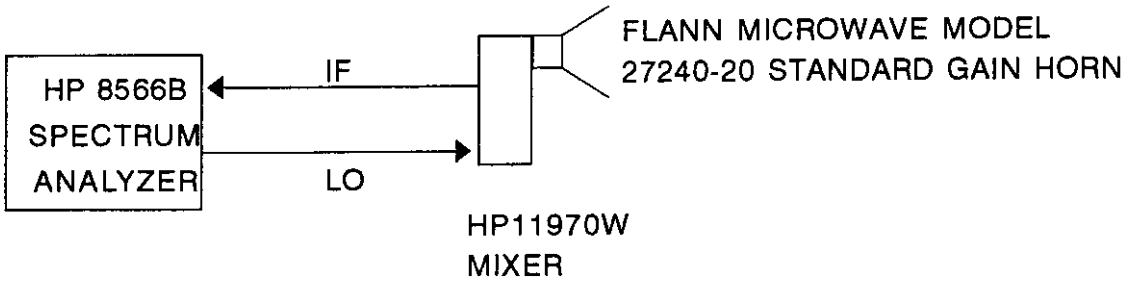
FIGURE 6.1.3-1

50-75GHz EQUIPMENT SETUP

JA-1578



75-110GHz EQUIPMENT SETUP



110-170GHz EQUIPMENT SETUP

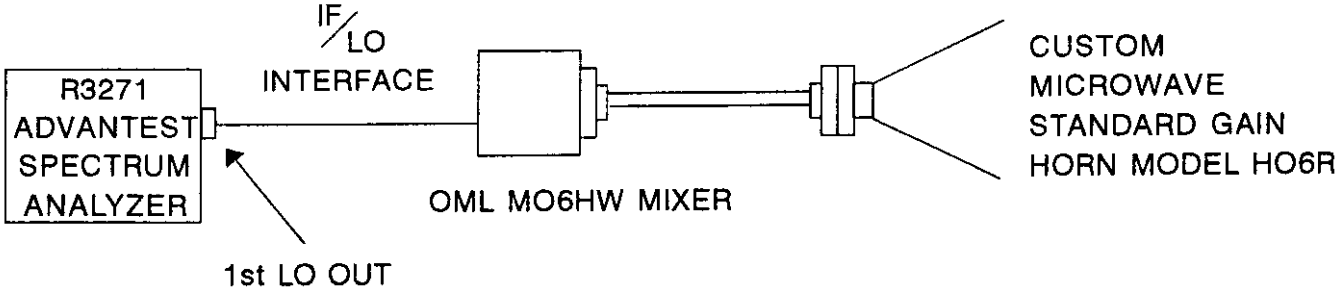
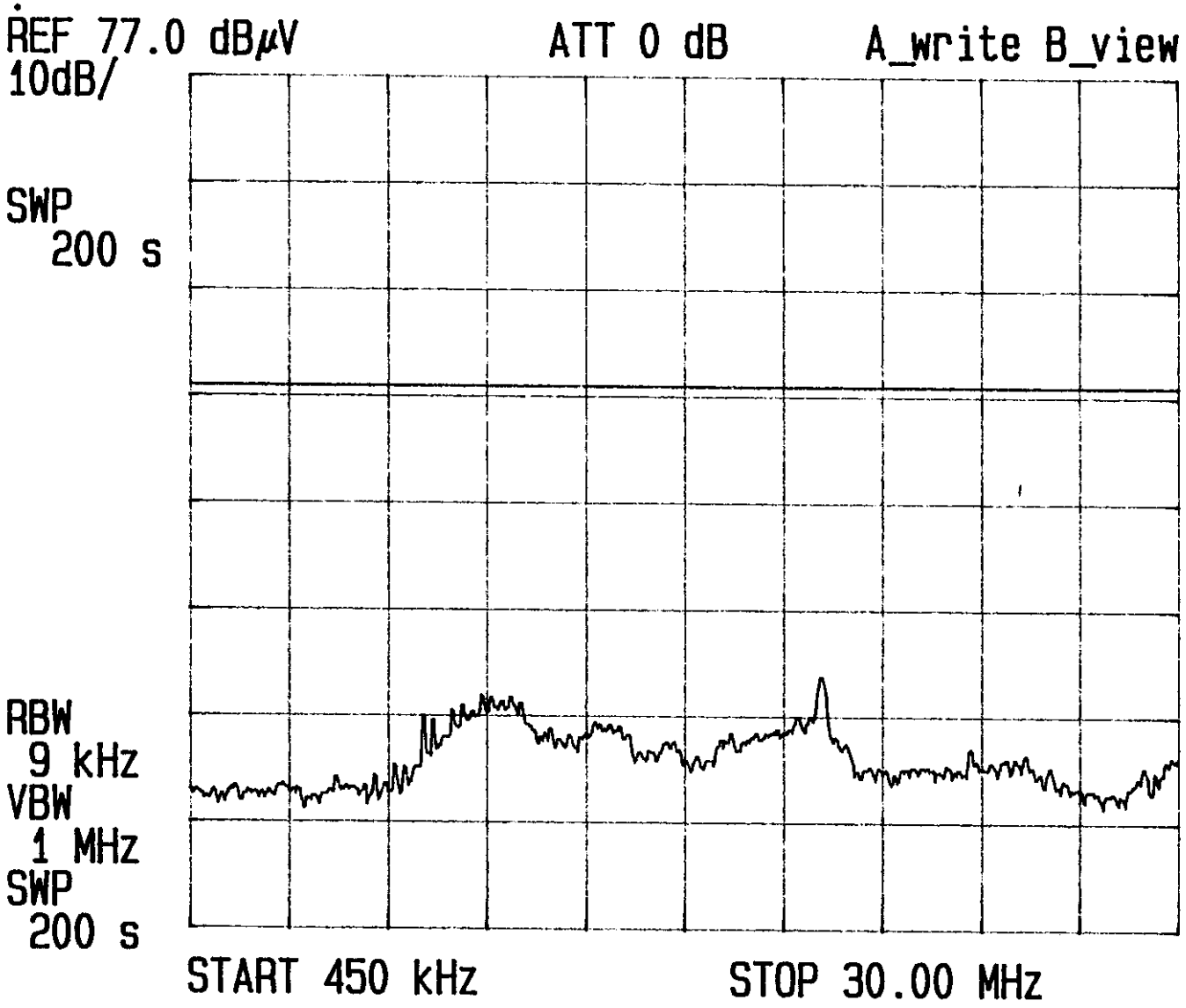
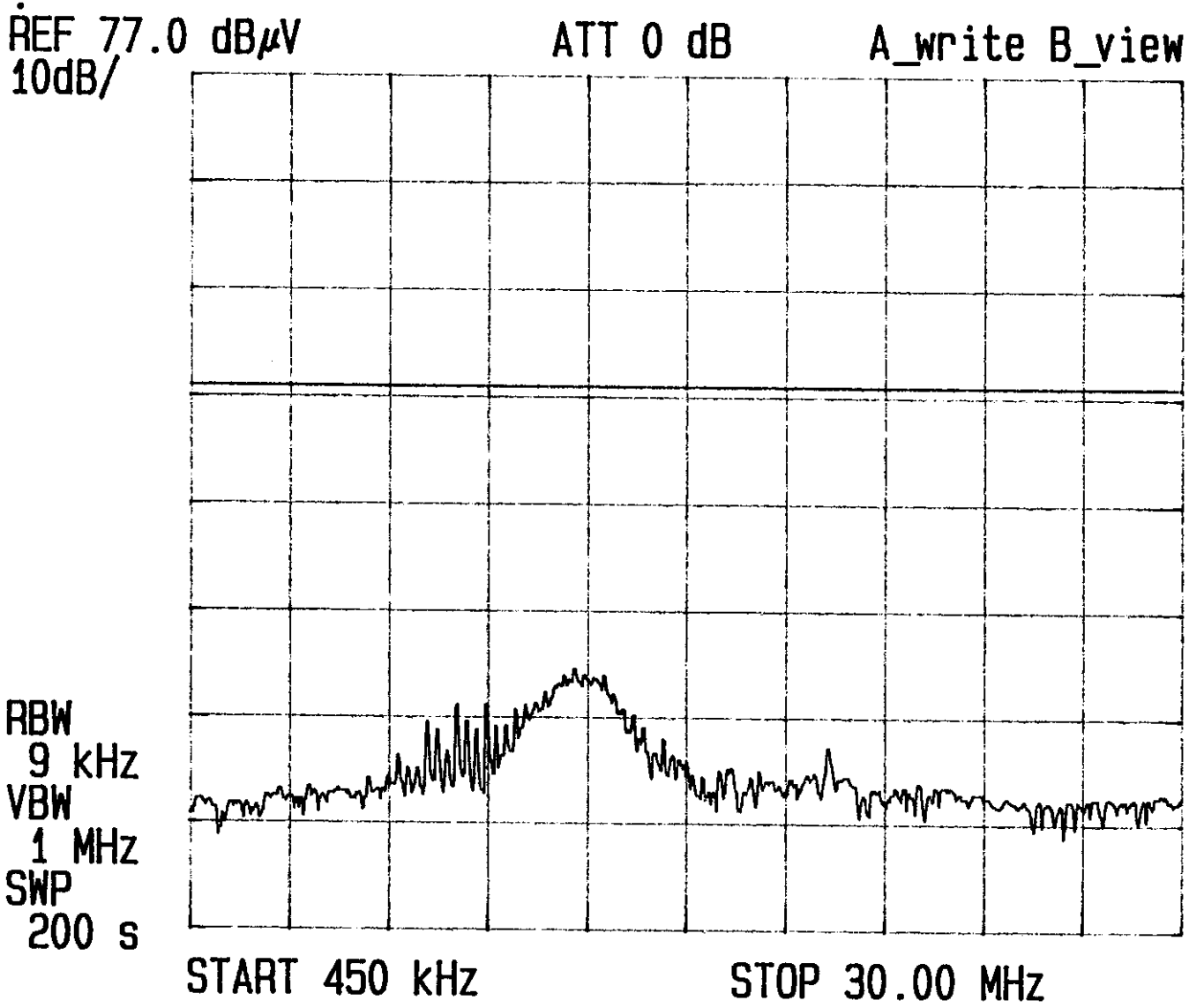


FIGURE 6.1.3-1 CONT.

TEST: FCC CONDUCTED	EUT: REMOTE IDU/38GHZ HIGH 4 ODU	S/N: 109/00002
FREQ: 450K-30MHz	SPEC: FCC 15.207	ANT.HT/POL: N/A
DETECTOR: PEAK	LINE UNDER TEST: PHASE	EUT POSITION: FRONT
DATE: 12/21/98	TEST SITE: ROOM 1	TESTER:



TEST: FCC CONDUCTED	EUT: REMOTE IDU/38GHZ HIGH 4 ODU	S/N: 109/00002
FREQ: 450K-30MHz	SPEC: FCC 15.207	ANT.HT/POL: N/A
DETECTOR: PEAK	LINE UNDER TEST: NEUTRAL	EUT POSITION: FRONT
DATE: 12/21/98	TEST SITE: ROOM 1	TESTER: JJ



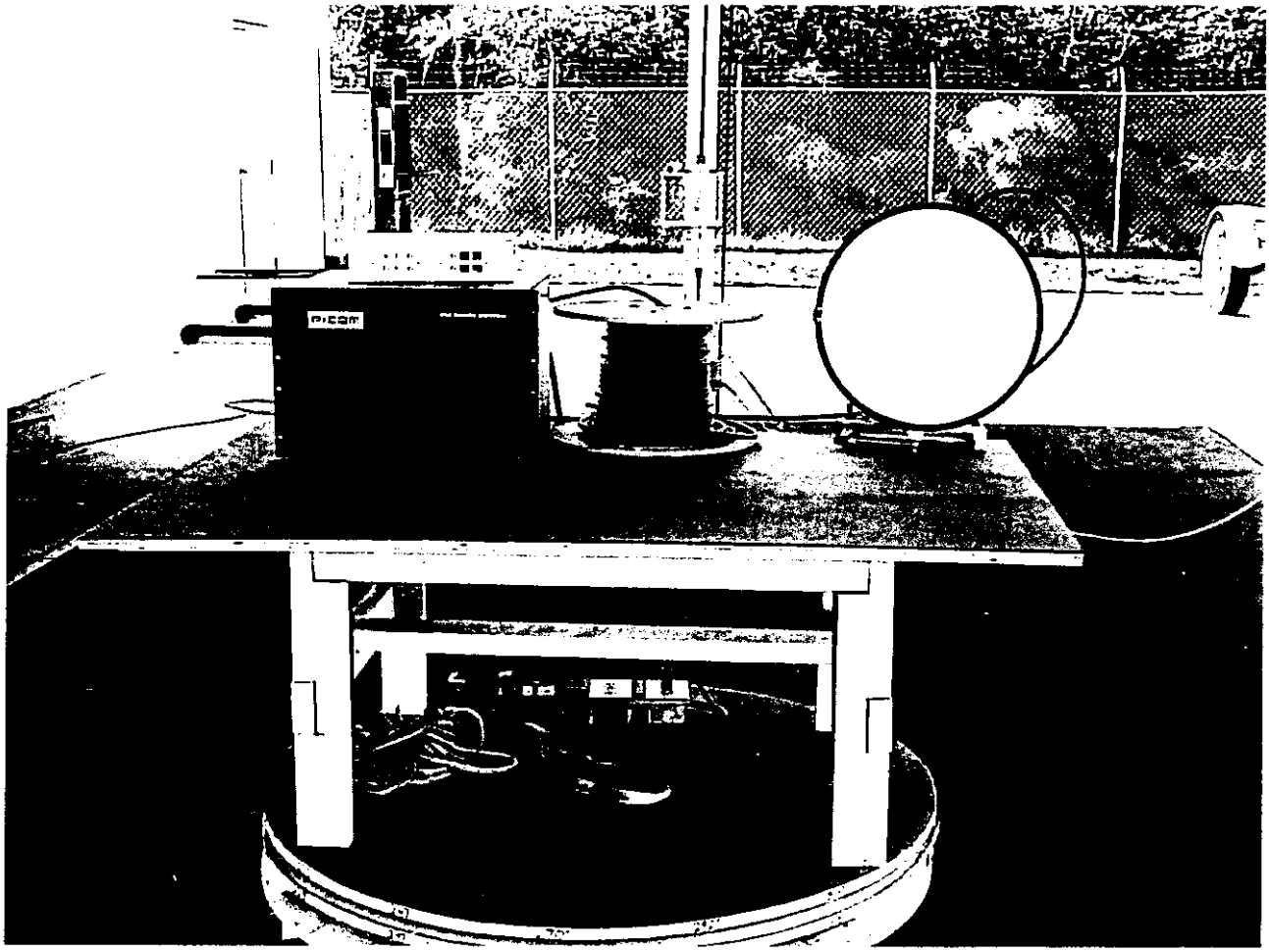


PHOTO 6.1.3.1-1

6.1.3.2 Radiated 15.209(a)/101.111)

Radiated measurements were performed starting at 30MHz and extended out to 200GHz to include the requirements for covering the 38GHz transmitter harmonics and spurious emissions. Quasi-peak detection was used from 30MHz to 1GHz and from 1GHz to 40GHz. Both peak and average measurements were performed. Above 40GHz the peak measurements at 1MHz bandwidth were measured. The harmonics were measured at the min, mid and max TX frequencies. A scan at mid frequency was performed to 200GHz for spurious content. Both vertical and horizontal polarization is included in the data.

Table 6.1.3.2-1 is a tabulated list of the signals detected including the transmitter frequency and harmonics.

Results - The terminal does not have signals that appear above the requirement of Part 15 or Part 101 as tested in this report. Best engineering practice was used in the 110GHz to 200GHz range. Absolute levels can not be determined due to lack of technology advances. The lower frequencies up to 110GHz were measured using standard receivers, mixers, filters and amplifiers with proven methods. The manufacturer of the 110GHz-170GHz mixer supplied an application note for guidance in this area. The range of 170GHz-200GHz was performed by using the same mixer but the 11th harmonic instead of the 10th. Hoping to extend the mixer by 20% the high and L.O. frequency was also increased by 800MHz (20%).

RSI is confident that the methods used show the unit compliant.

The MASK requirement of 101.111(2)(ii) is shown in Data Sheet 6.1.3.2-1. The maximum attenuation requirement of 56dB at the 250% points is applicable.

Outside the 250% bandwidth the limit was established at 33dB attenuation required below transmitter. The measurements were made using the radiated technique. The transmitter output for this application is approximately 25dB below the allowed 55dB EIRP.

Plotted data for the peak scans over the entire 30MHz-200GHz range are presented on Data Sheets 6.1.3.2-2 through 6.2.3.2-25.

Average data plots to 40GHz are presented on Data Sheets 6.1.3.2-26 through 6.1.3.2-51.

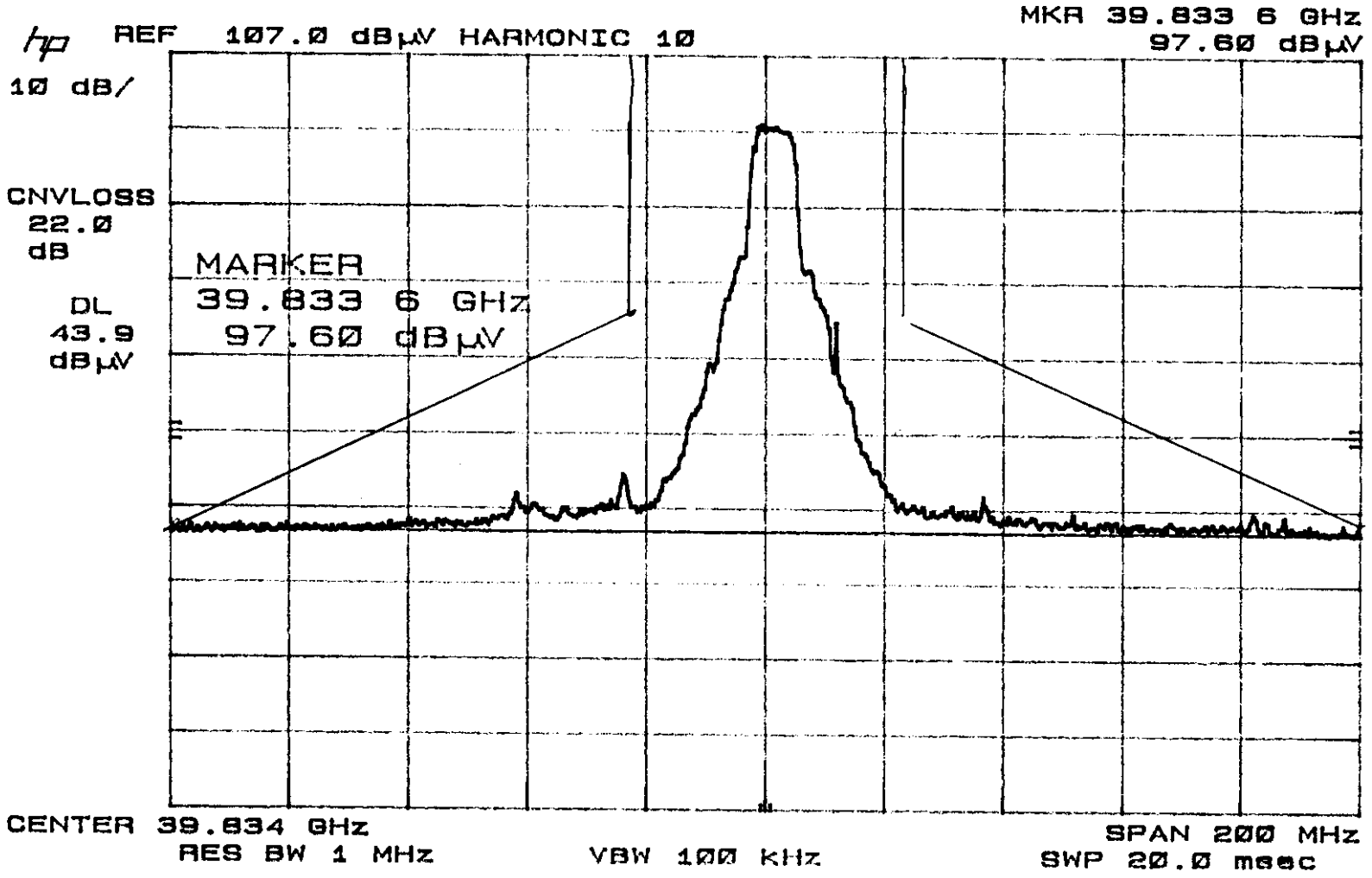
Preliminary data is shown on Data Sheets 6.1.3.2-52 through 6.1.3.2-57.

TABULATED E-FIELD

	Frequency	Polarization	dBμv/m	Limit	Δ Limit
	319MHz	H	38	46	-8
	490MHz	H	37	46	-9
	319MHz	V	44.6	46	-1.4
First	39.6GHz	H	131	156	-25
Harmonics	39.6GHz	V	105	156	-51
	39.8GHz	H	124	156	-32
	39.8GHz	V	98	156	-58
	40.0GHz	H	125	156	-31
	40.0GHz	V	99	156	-57
Second	79.3GHz	H	<92	123	-31
Harmonics	79.6GHz	H	<92	123	-31
	80.0GHz	H	<92	123	-31
Third	118.8GHz	H	<115	123	-8
Harmonics	119.4GHz	H	<115	123	-8
	120.0GHz	H	<115	123	-8
Fourth	158.4GHz	H	<110	123	-13
Harmonics	159.2GHz	H	<110	123	-13
	160.0GHz	H	<110	123	-13
Fifth	198.0GHz	H	<115	123	-8
Harmonics	199.0GHz	H	<115	123	-8
	200.0GHz	H	<115	123	-8

TABLE 6.1.3.2-1

TEST: EMISSION MAKS	EUT: P-COM PTM REMOTE UNIT/ODU	S/N: 109/00200
FREQ: 39.8 ±100MHz	SPEC: FCC	ANT.HT/POL: Max at Ant Beam
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE:	TEST SITE: OATS/ROOM 1	TESTER:



DATA SHEET 6.1.3.2-1

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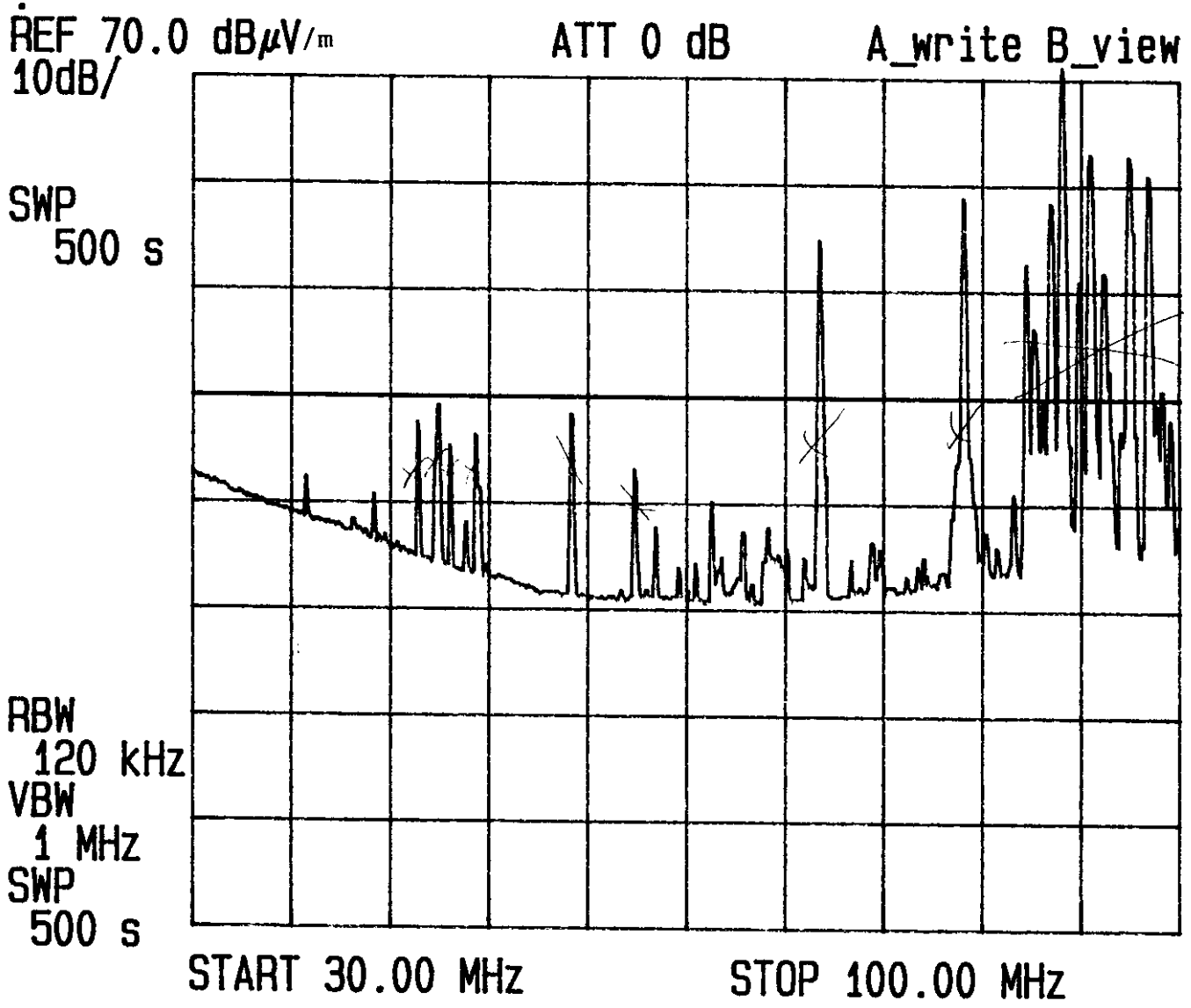
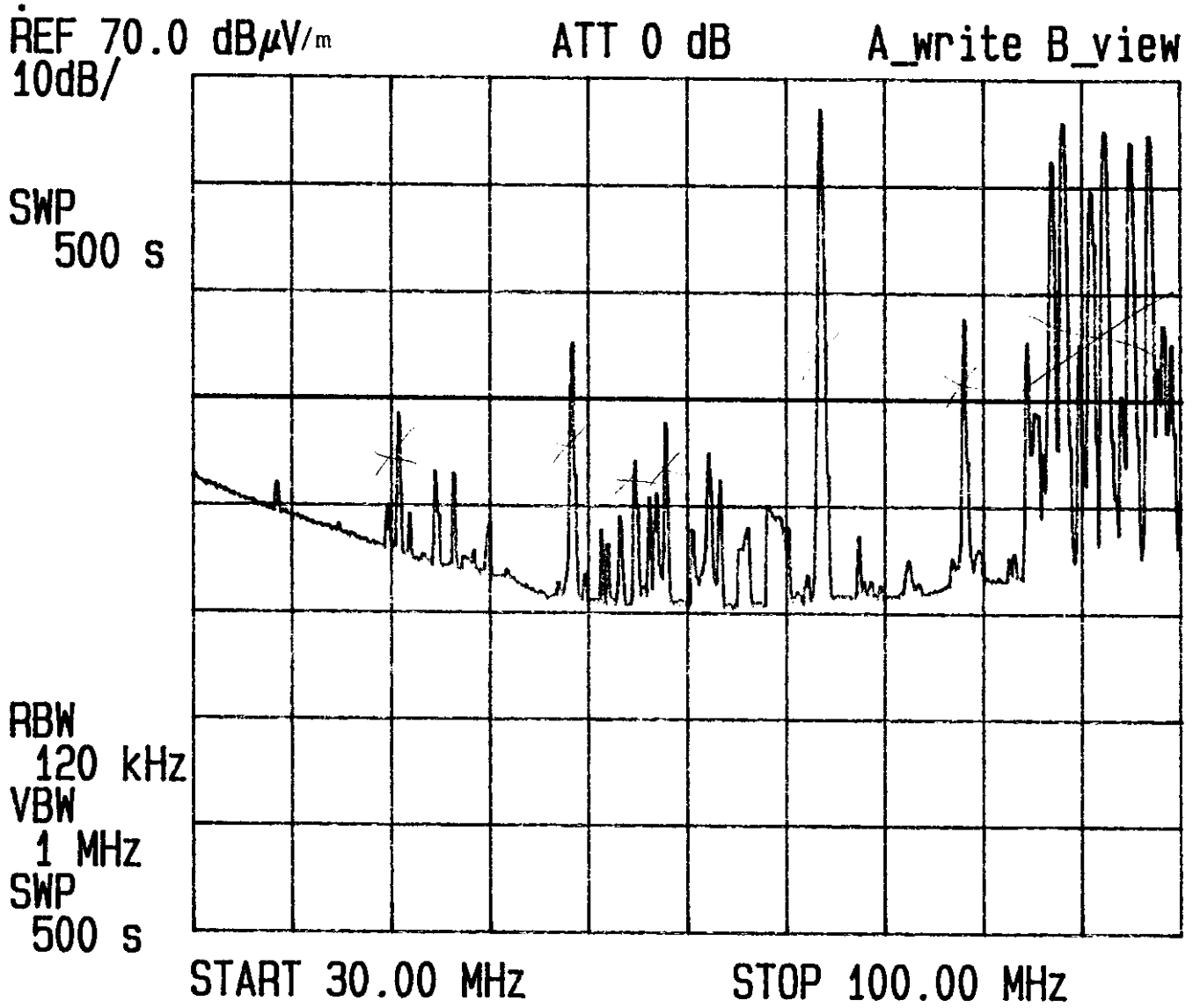
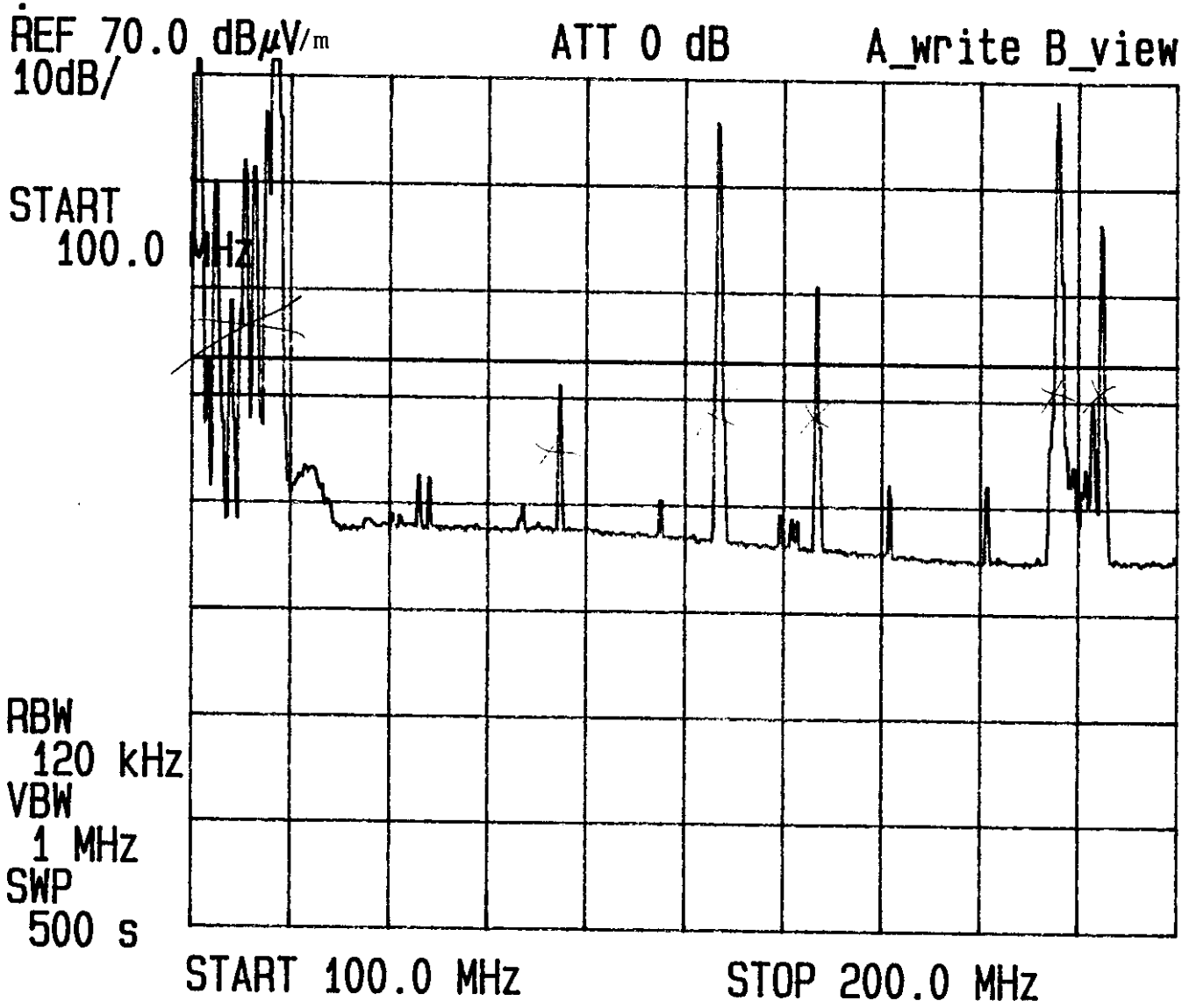
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ 4 ODU	S/N: 109/00002
FREQ: 30M-100MHz	SPEC: 15.209(a)	ANT.HT/POL: H 1.5
DETECTOR: Q-PEAK	ANTENNA: INTERNAL	EUT POSITION: 270°
DATE: 12/30/96	TEST SITE: 3 METER	TESTER:



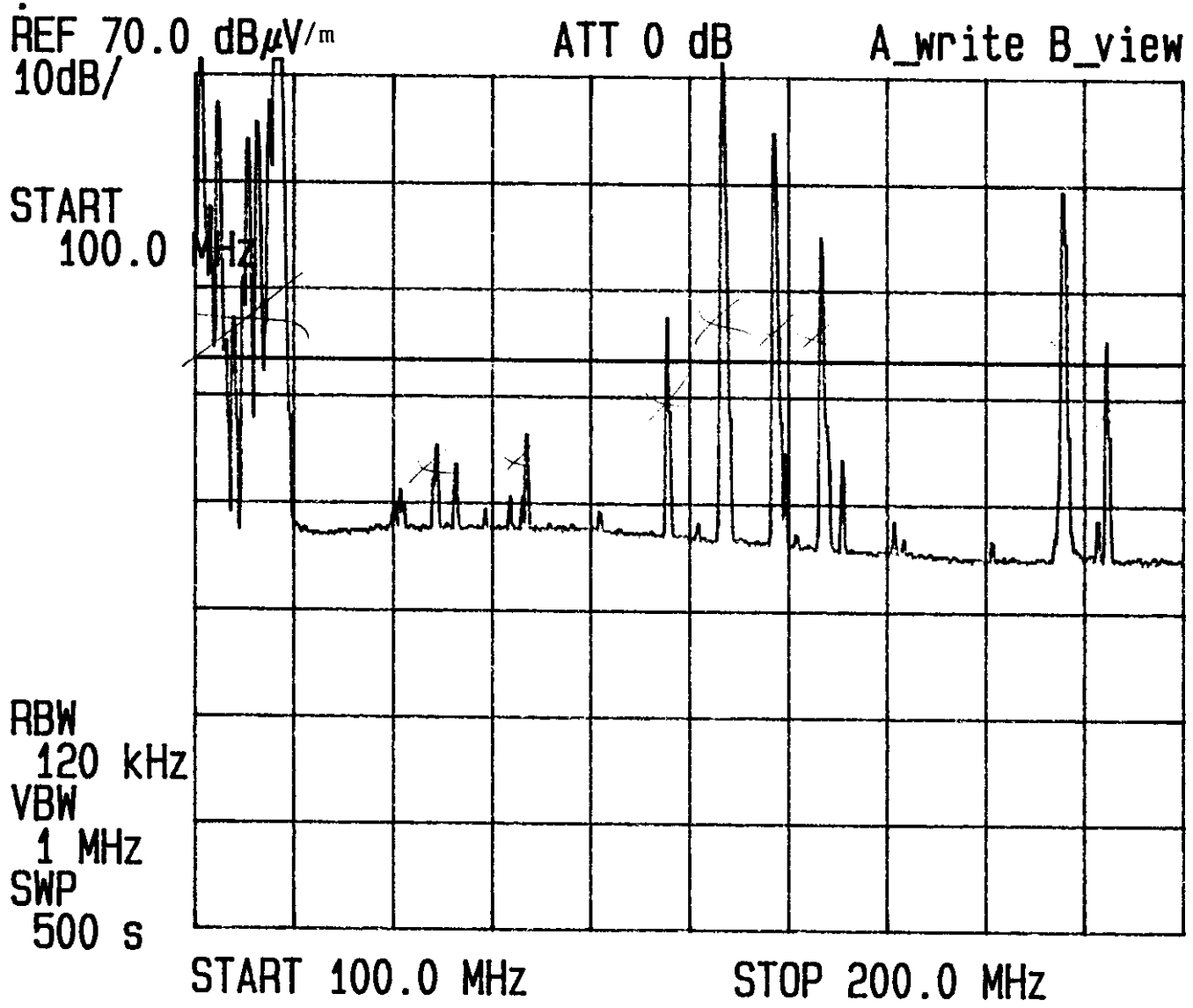
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ 4 ODU	S/N: 109/00002
FREQ: 30M-100MHz	SPEC: 15.209(a)	ANT.HT/POL: V 1.75
DETECTOR: Q-PEAK	ANTENNA: INTERNAL	EUT POSITION: 247°
DATE: 12/30/97	TEST SITE: 3 METER	TESTER:



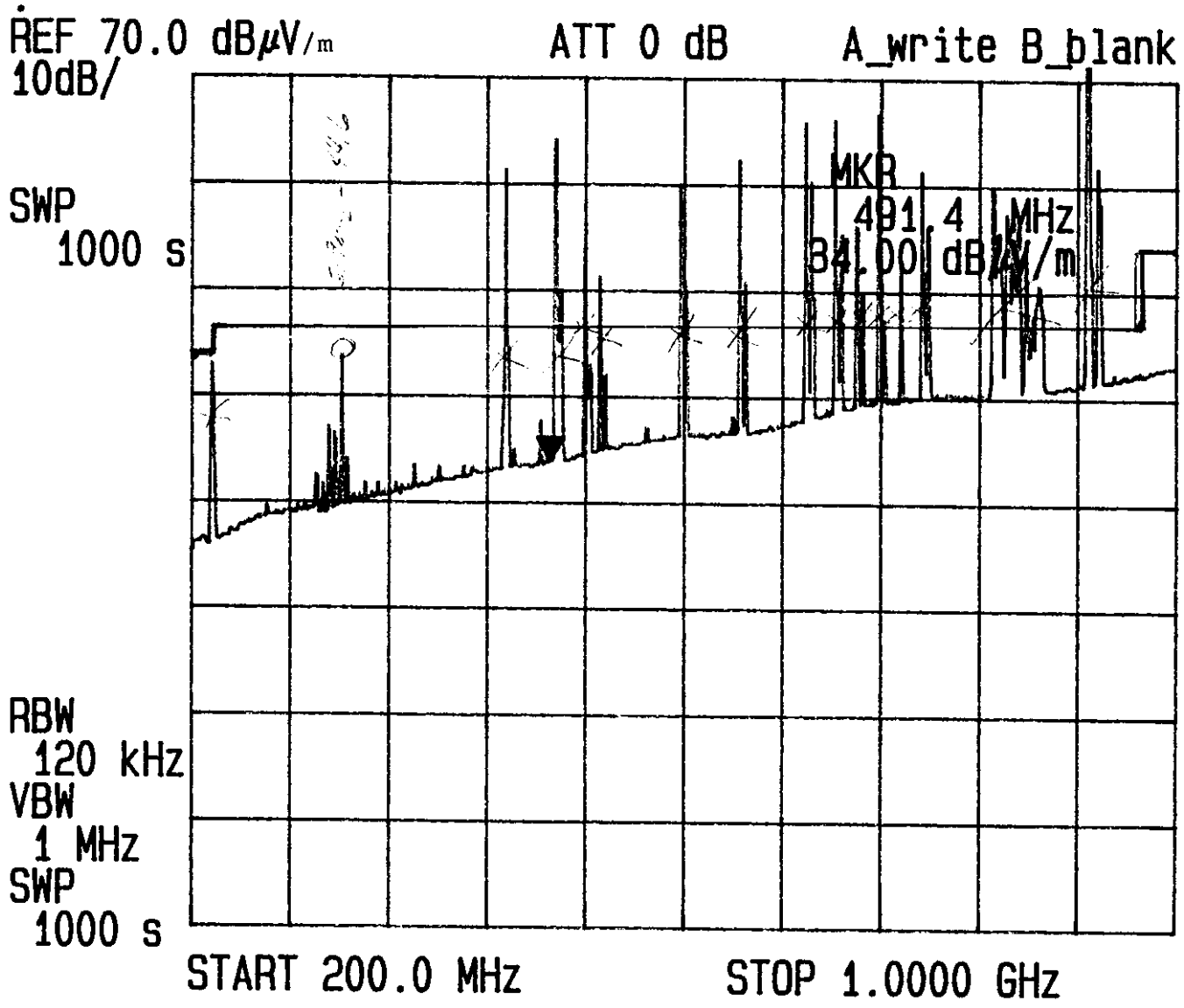
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ 4 ODU	S/N: 109/00002
FREQ: 100M-200MHz	SPEC: 15.209(a)	ANT.HT/POL: H 1.5m
DETECTOR: Q-PEAK	ANTENNA: INTERNAL	EUT POSITION: 247°
DATE: 12/20/05	TEST SITE: 3 METER	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ 4 0DU	S/N: 109/00002
FREQ: 100M-200MHz	SPEC: 15.209(a)	ANT.HT/POL: V 1.75
DETECTOR: Q-PEAK	ANTENNA: INTERNAL	EUT POSITION: 269°
DATE: 12/30/13	TEST SITE: 3 METER	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ 4 ODU	S/N: 109/00002
FREQ: 200M-1GHz	SPEC: 15.209(a)	ANT.HT/POL: V 1.5m
DETECTOR: Q-PEAK	ANTENNA: INTERNAL	EUT POSITION: 180°
DATE: 12/30/97	TEST SITE: 3 METER	TESTER:



DATA SHEET 6.1.3.2-6

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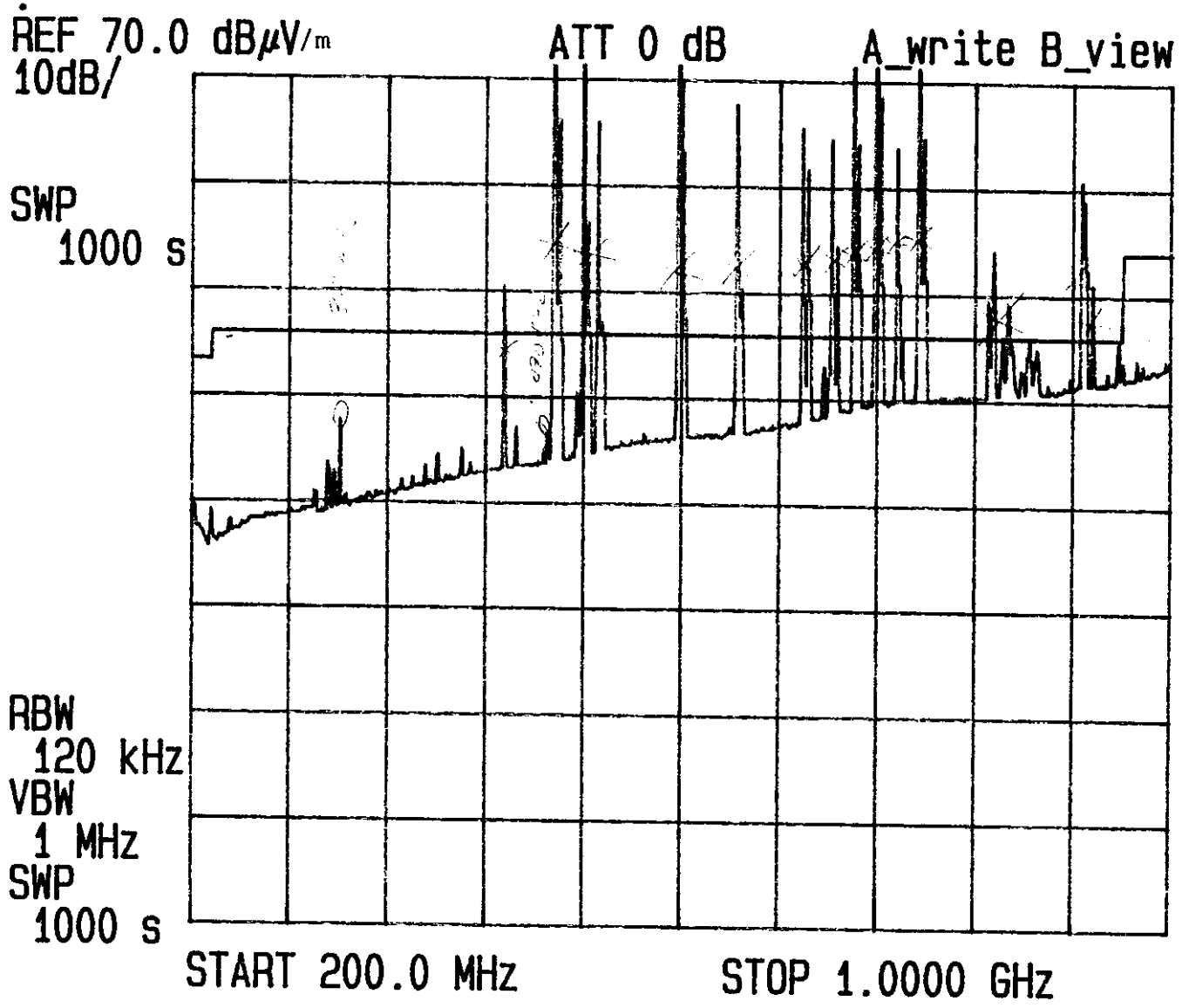
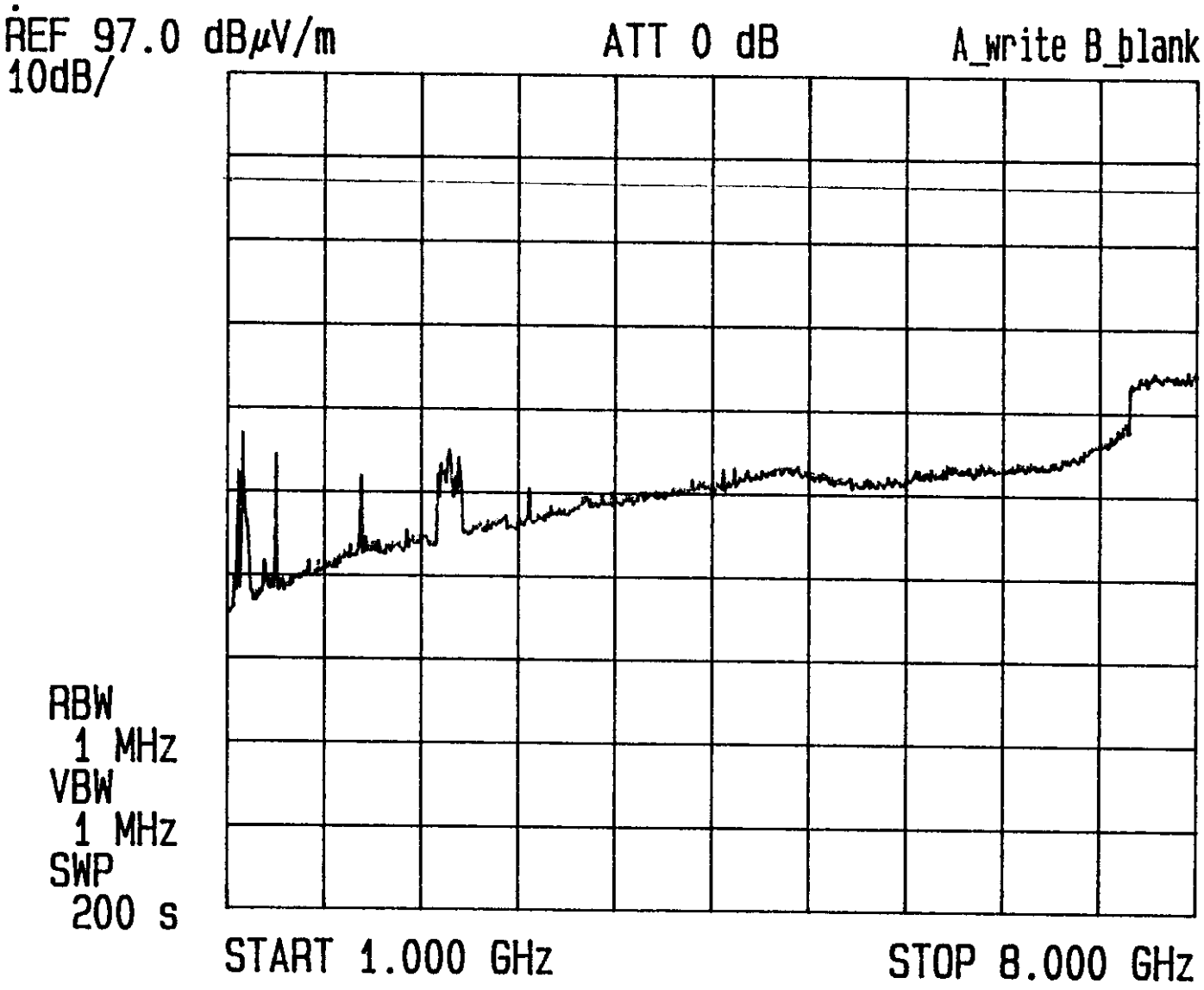
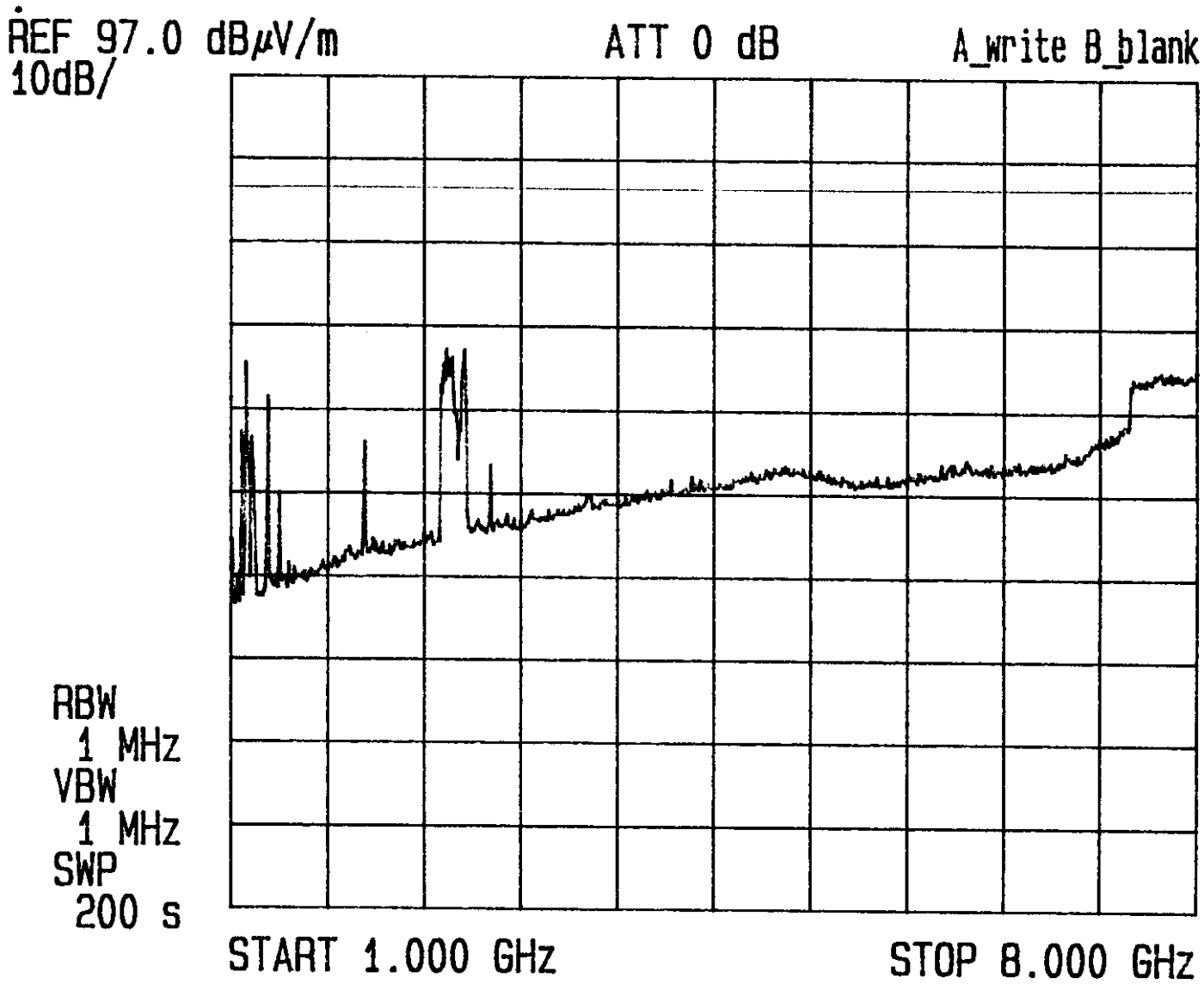
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ 4 ODU	S/N: 109/00002
FREQ: 200M-1GHz	SPEC: 15.209(a)	ANT.HT/POL: H 1.5m
DETECTOR: Q-PEAK	ANTENNA: INTERNAL	EUT POSITION: 180°
DATE: 12/30/98	TEST SITE: 3 METER	TESTER:



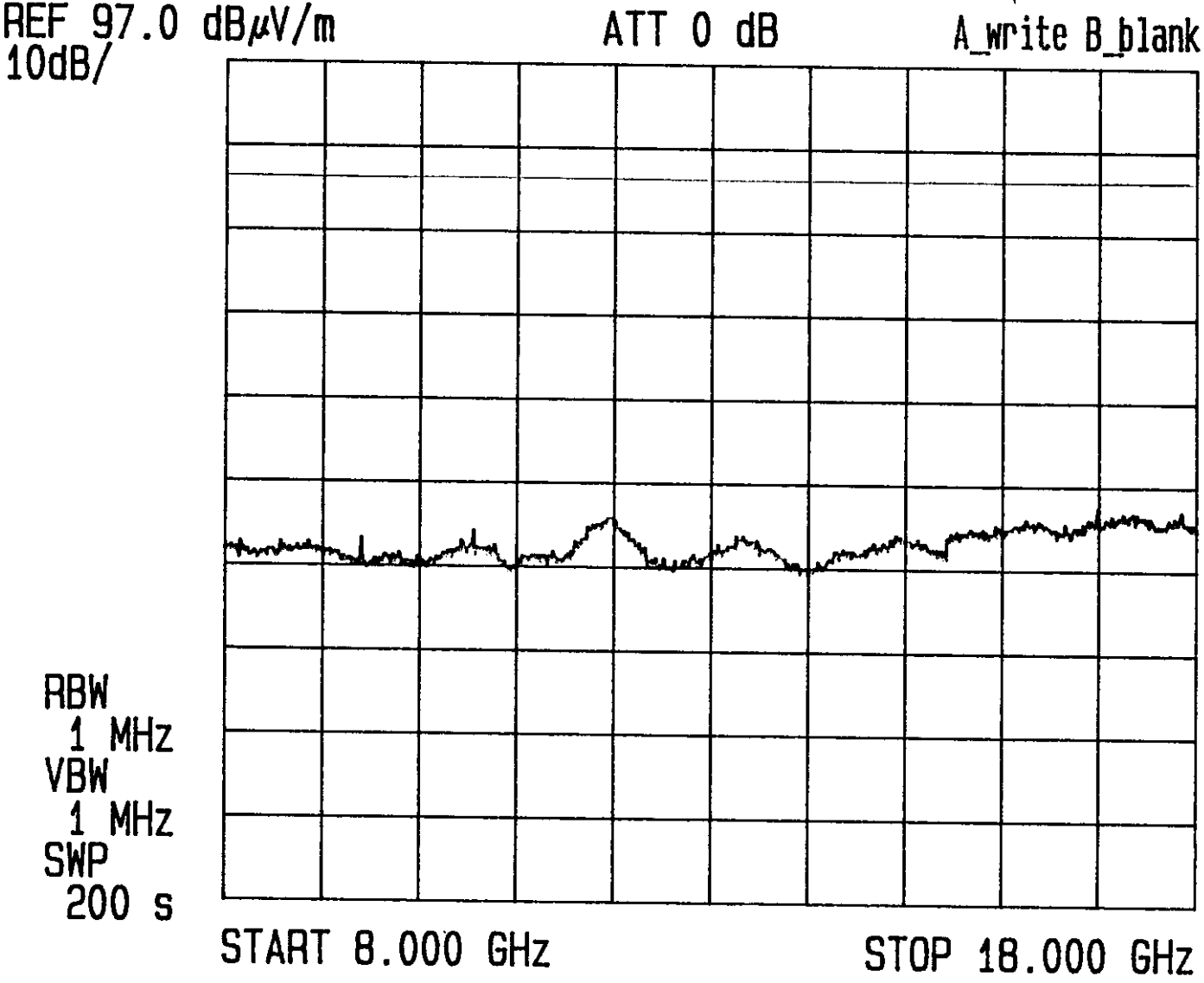
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 1G-8GHz	SPEC: FCC	ANT.HT/POL: 1m H
DETECT: PEAK	ANTENNA:	EUT POSITION: 0
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



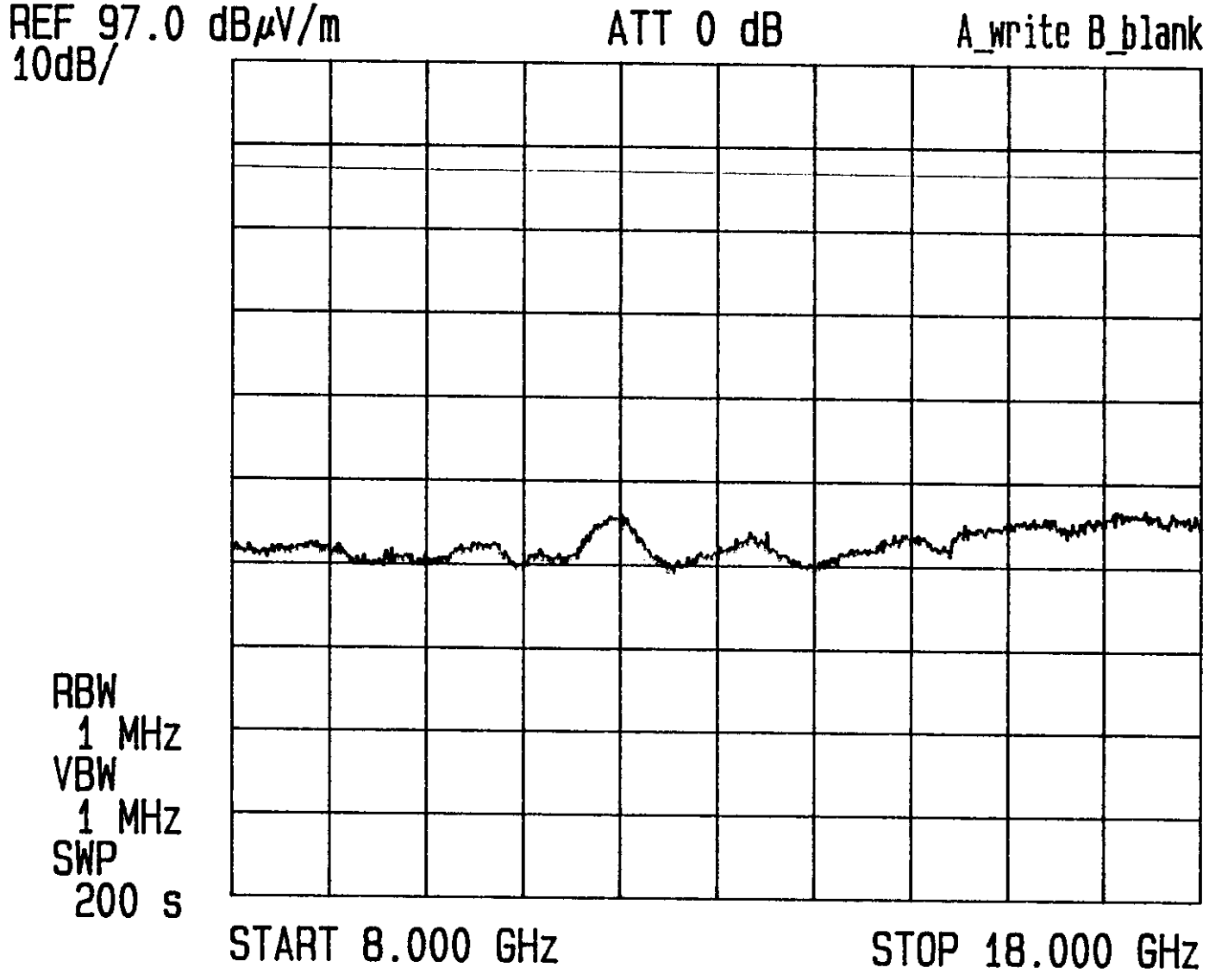
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 1G-8GHz	SPEC:	ANT.HT/POL: / M V
DETECT: PEAK	ANTENNA:	EUT POSITION: O
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER: AB



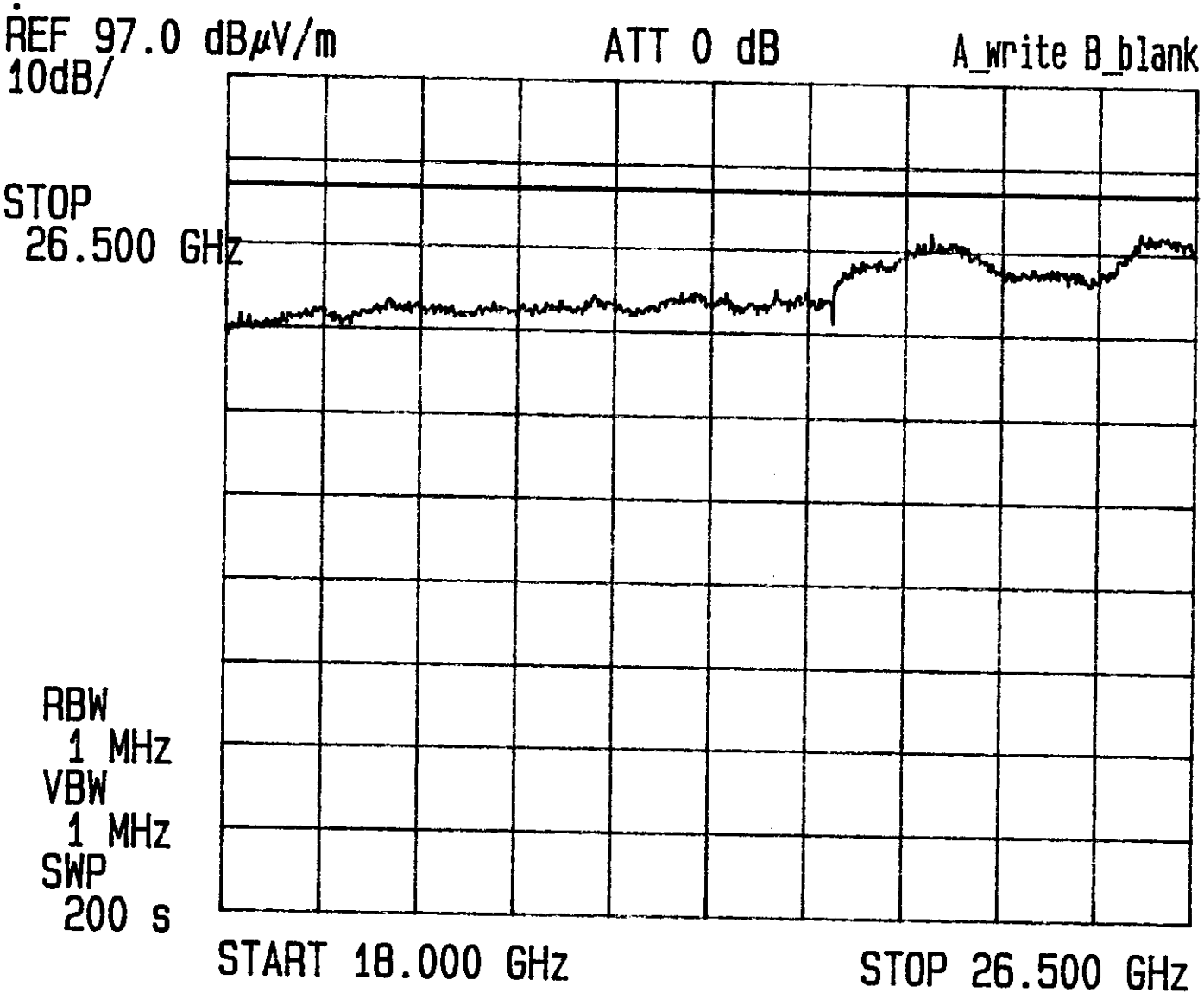
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 8G-18GHz	SPEC: FCC	ANT.HT/POL: 1m H
DETECT: PEAK	ANTENNA:	EUT POSITION: Ø
DATE: 12-22-96	TEST SITE: O.A.T.S	TESTER:



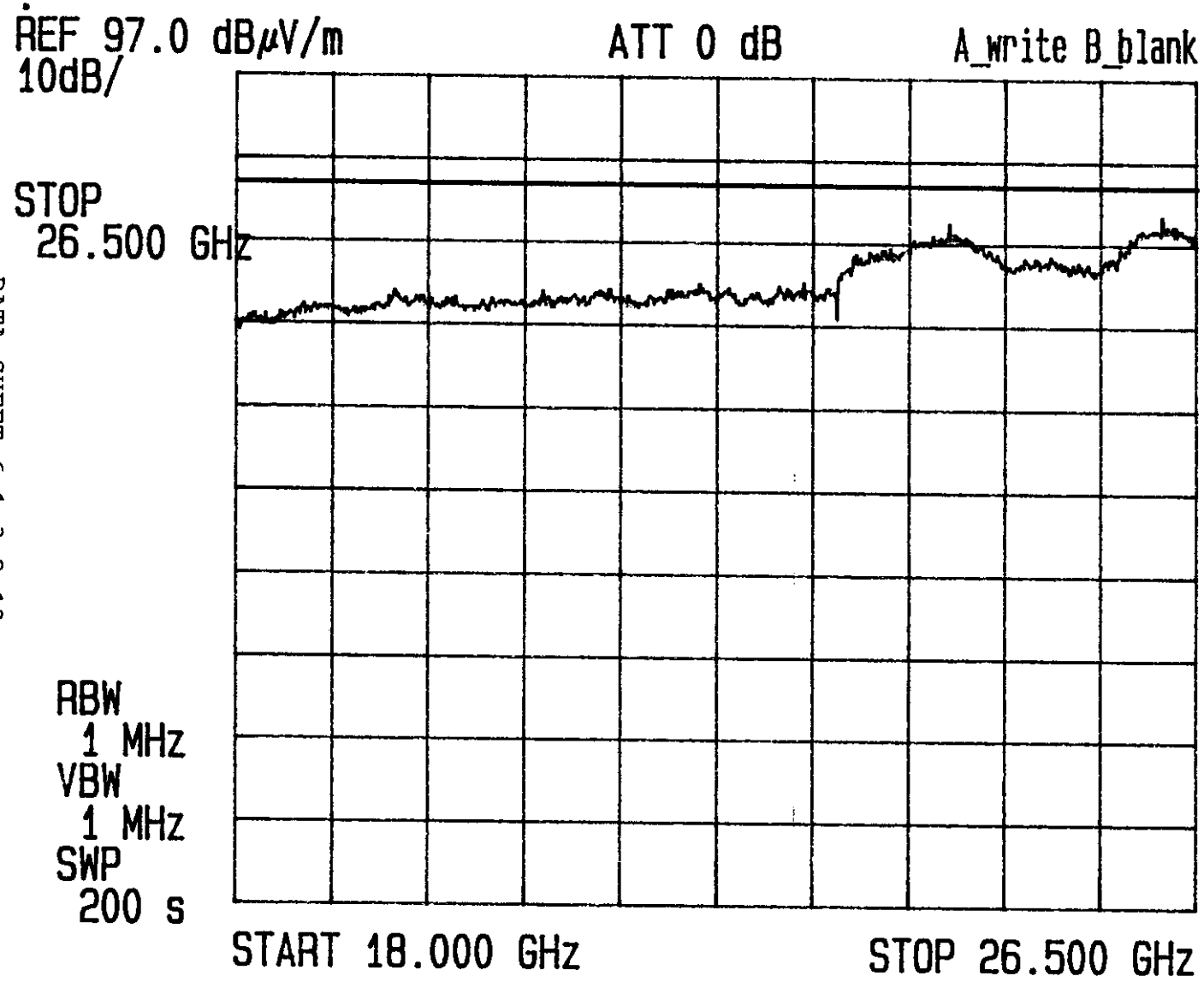
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 8G-18GHz	SPEC: FCC	ANT.HT/POL: 1m V
DETECT: PEAK	ANTENNA:	EUT POSITION: 0
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



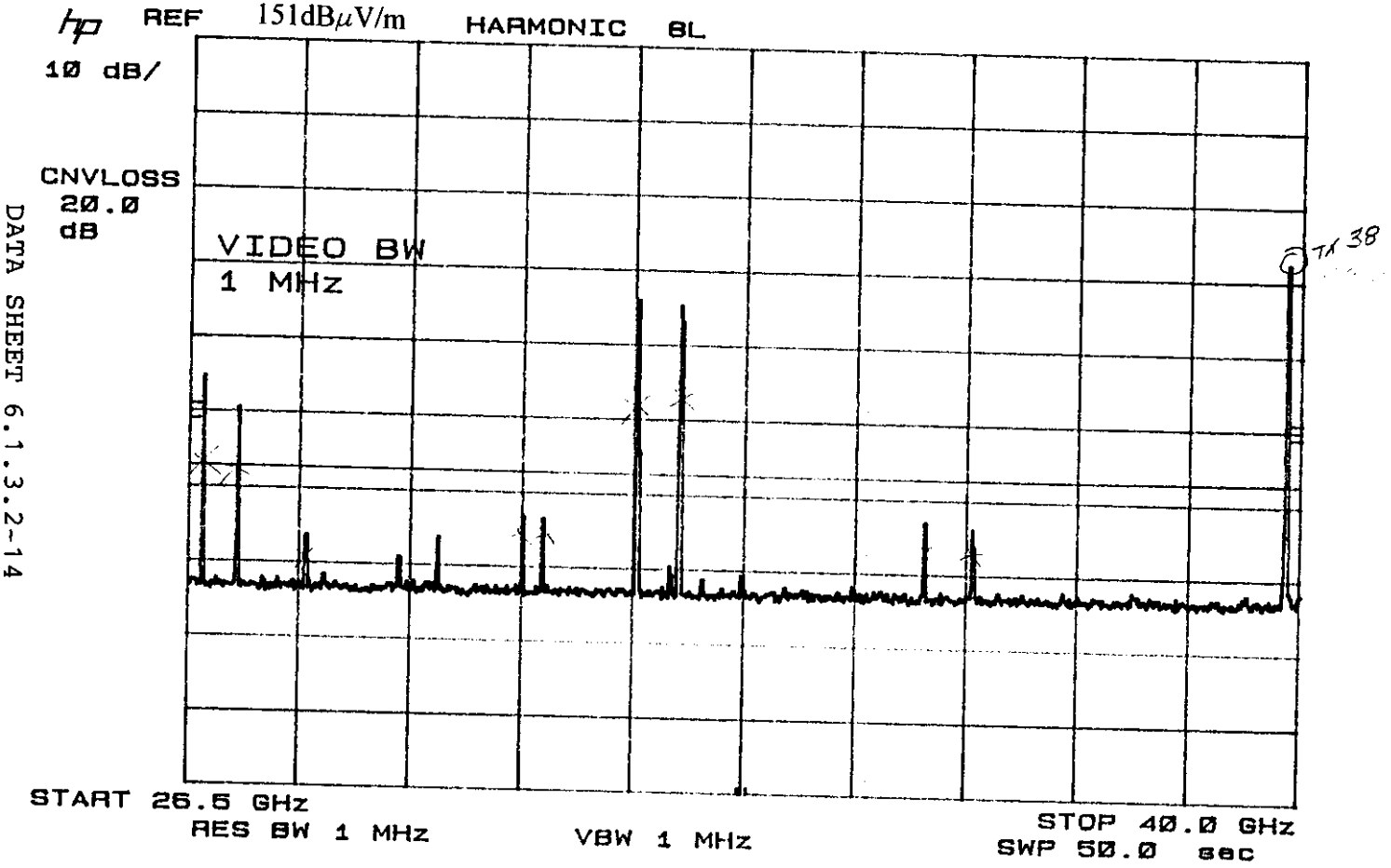
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 18G-26.5GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 8-21-98	TEST SITE: 1 METER	TESTER:



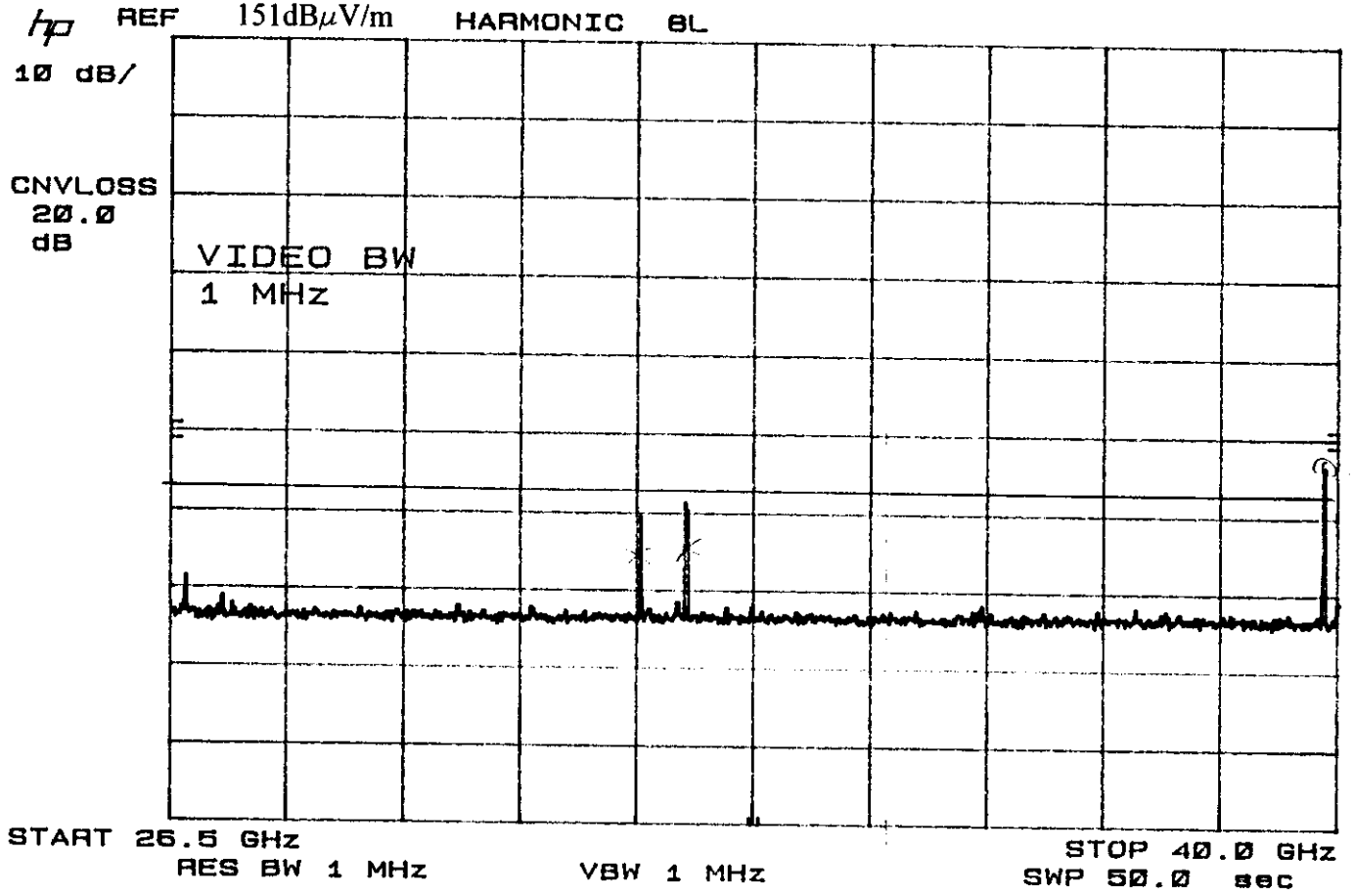
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 18G-26.5GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12-21-98	TEST SITE: 1 METER	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 26.5G-40GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12/16/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 26.5G-40GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12/14/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-15

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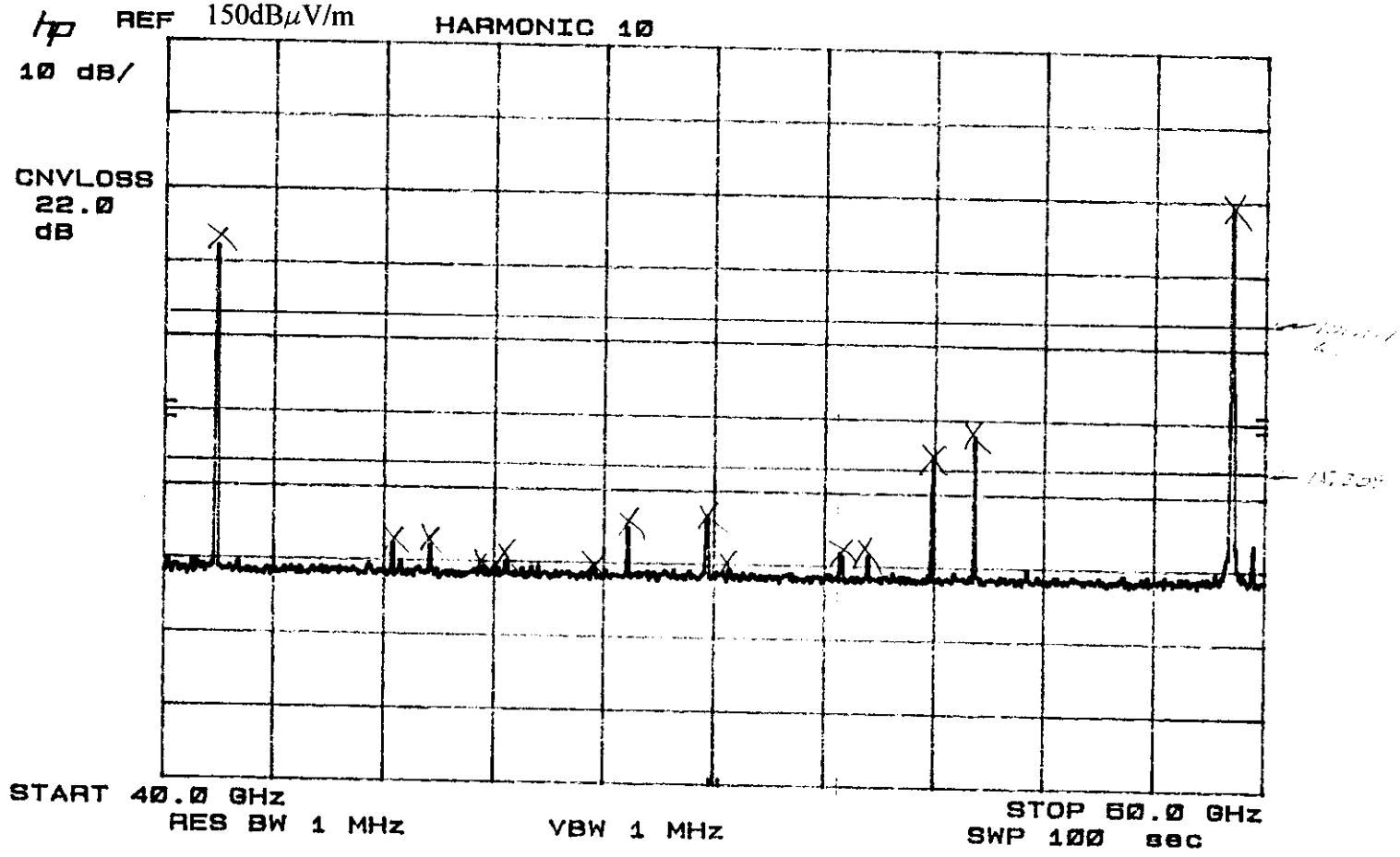
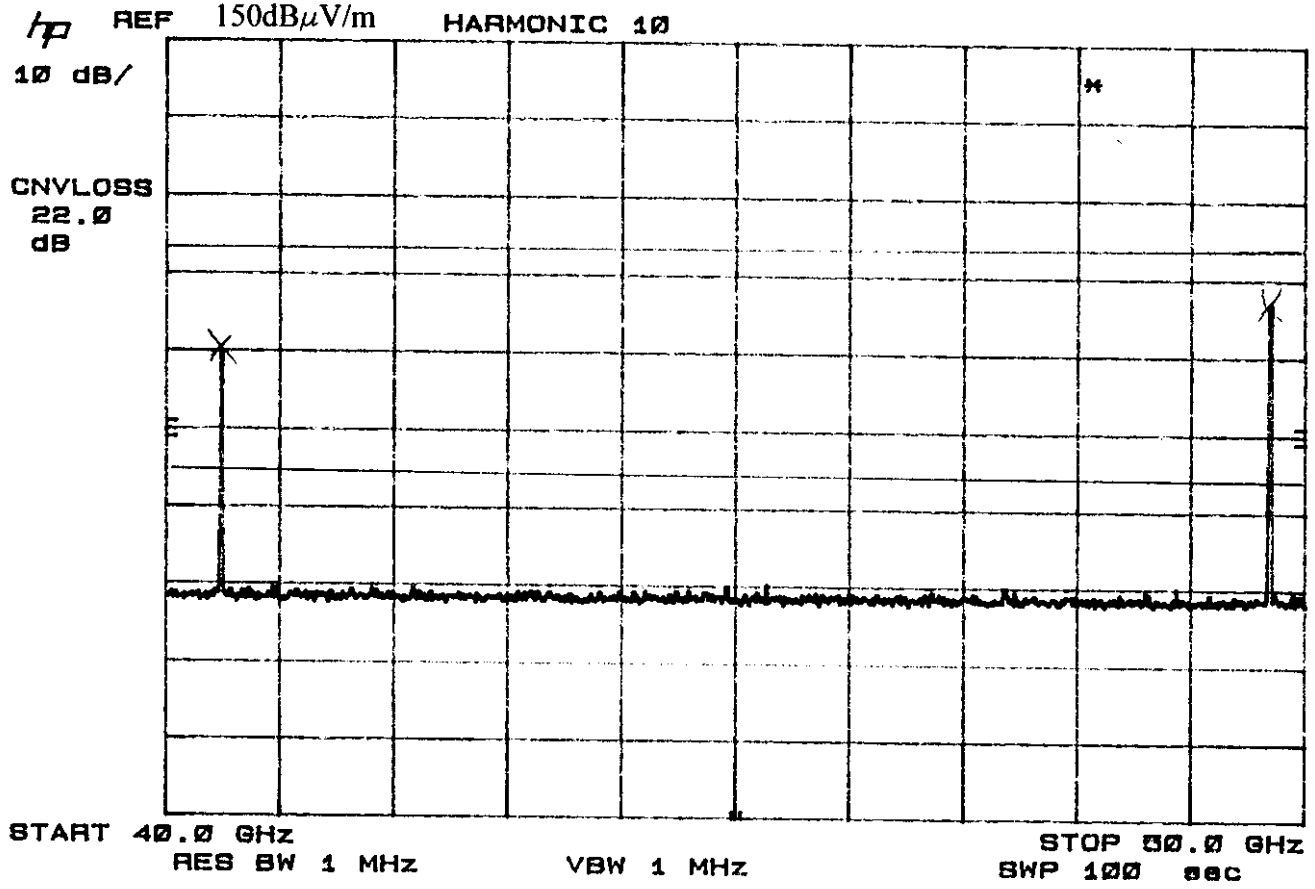
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 40G-50GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



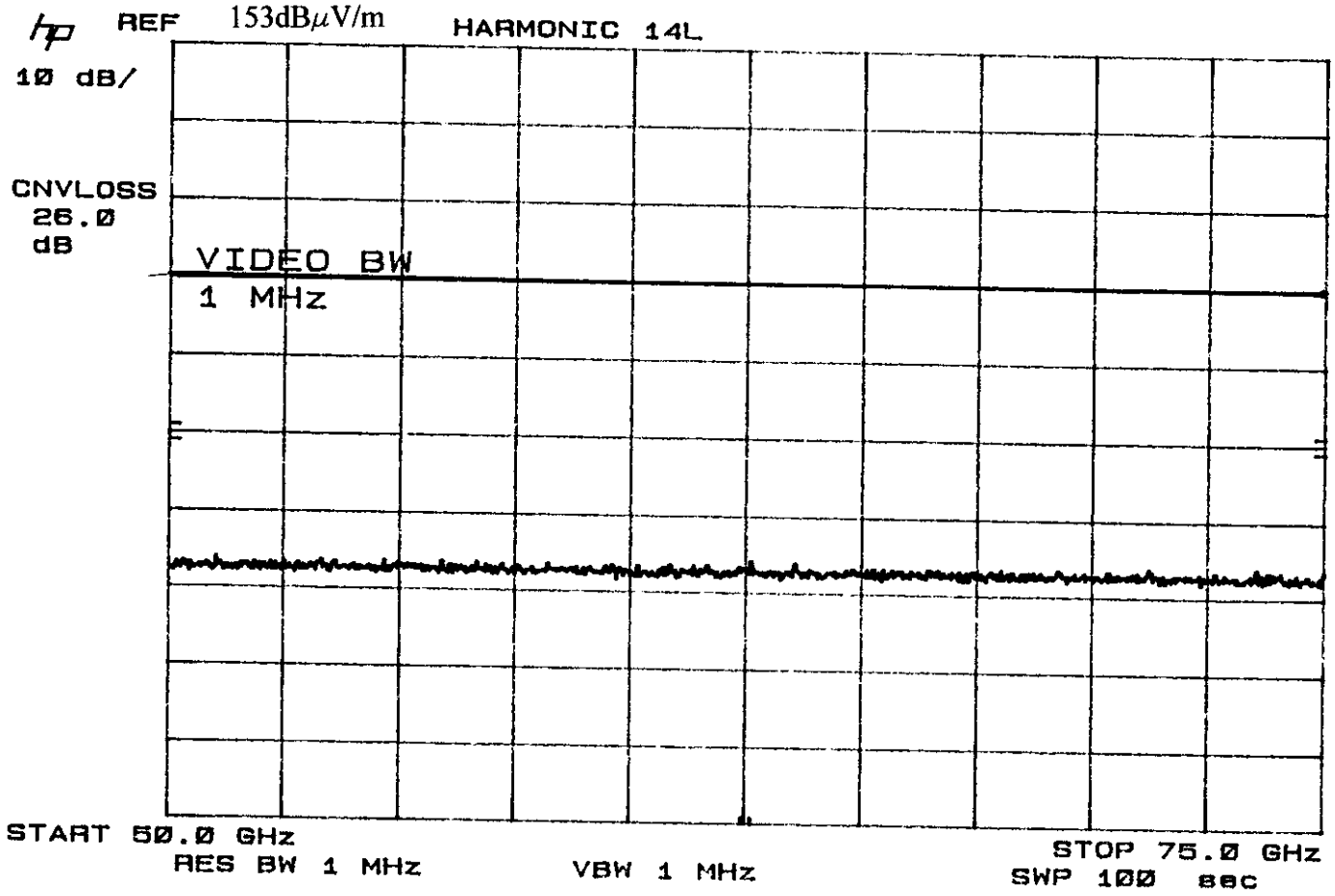
DATA SHEET 6.1.3.2-16

JA-1578

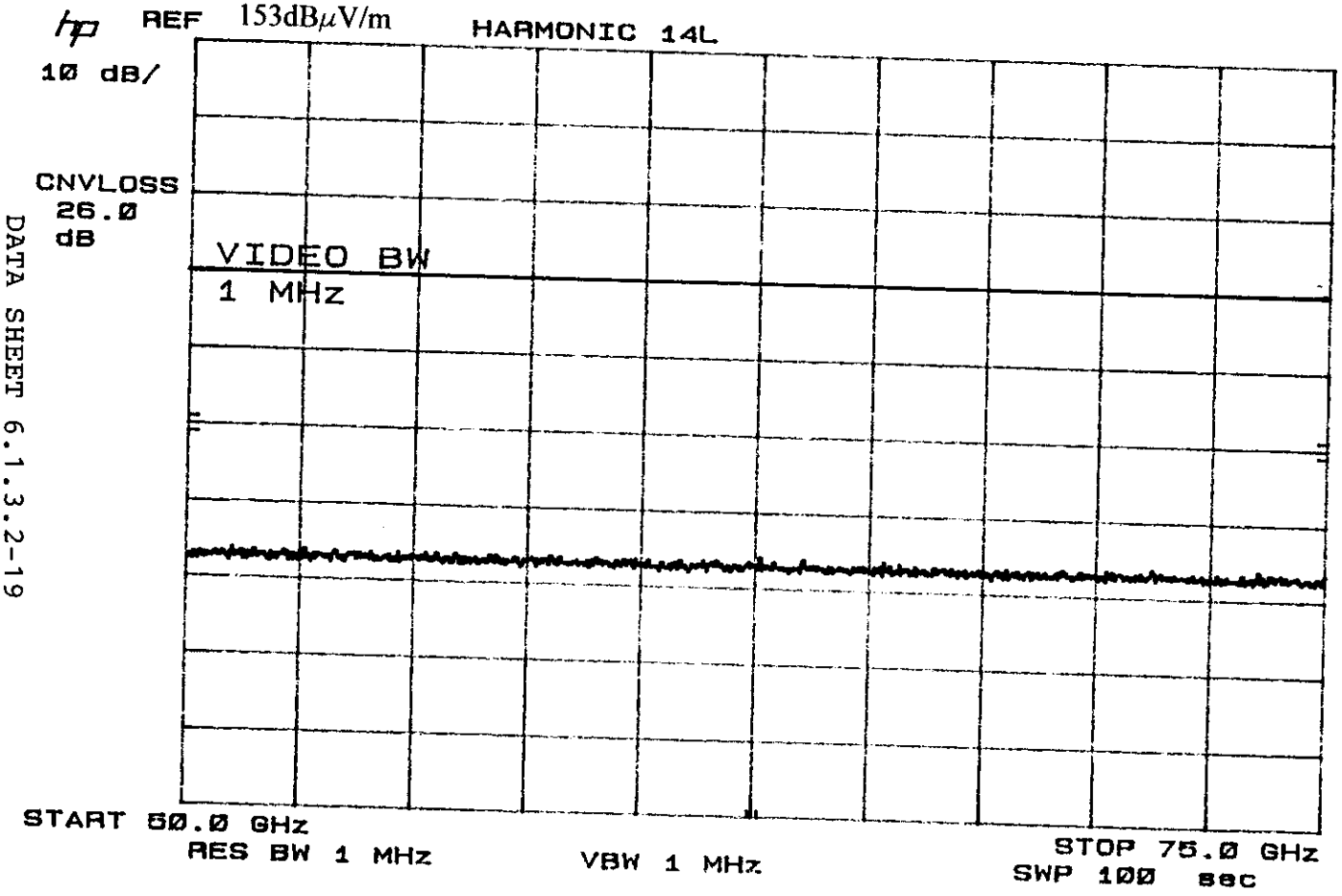
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 40G-50GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



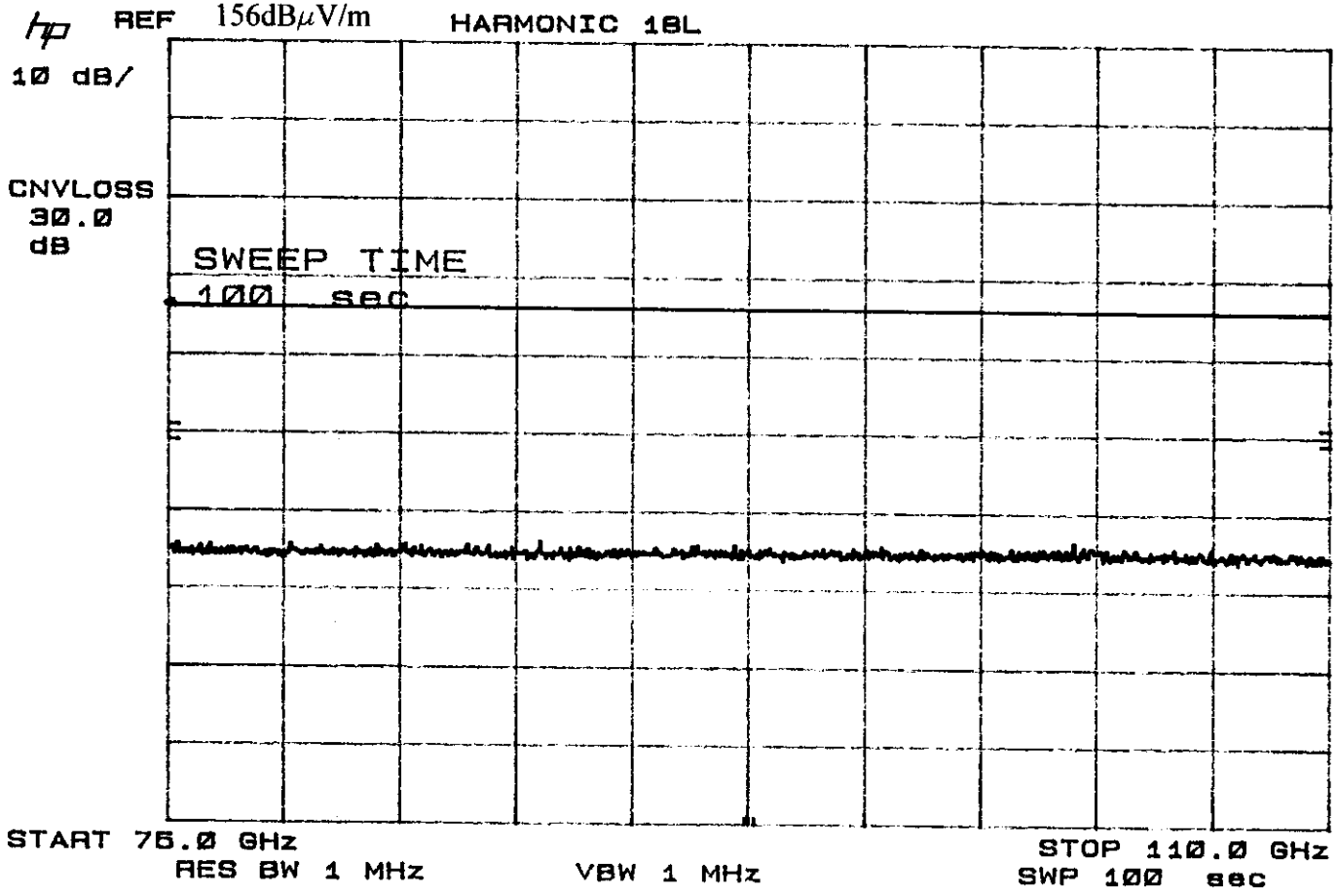
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 50G-75GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12/16/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 50G-75GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: [illegible]	TEST SITE: OATS/ROOM 1 .3 M	TESTER: [illegible]



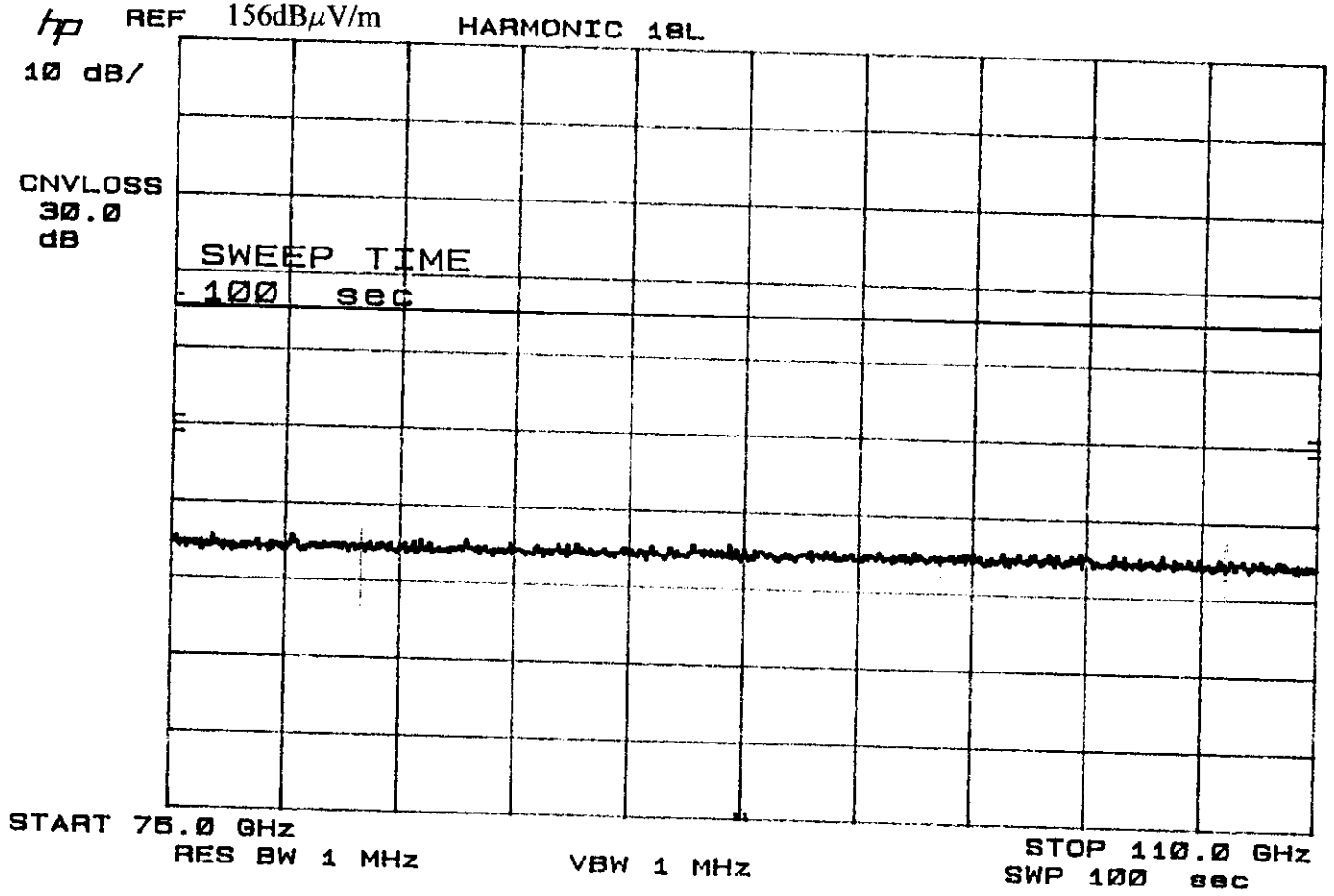
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 75G-110GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12/16/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



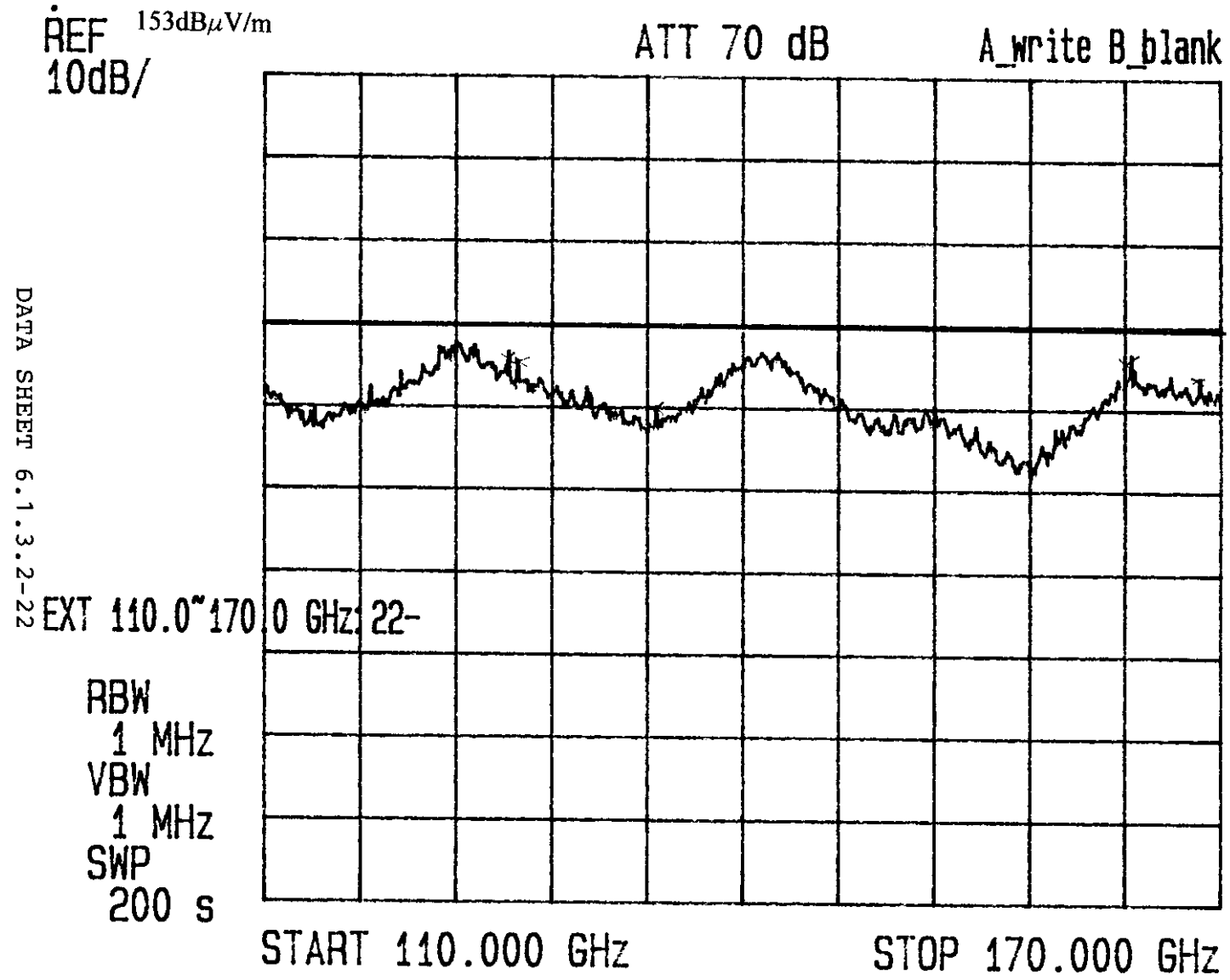
DATA SHEET 6.1.3.2-20

JA-1578

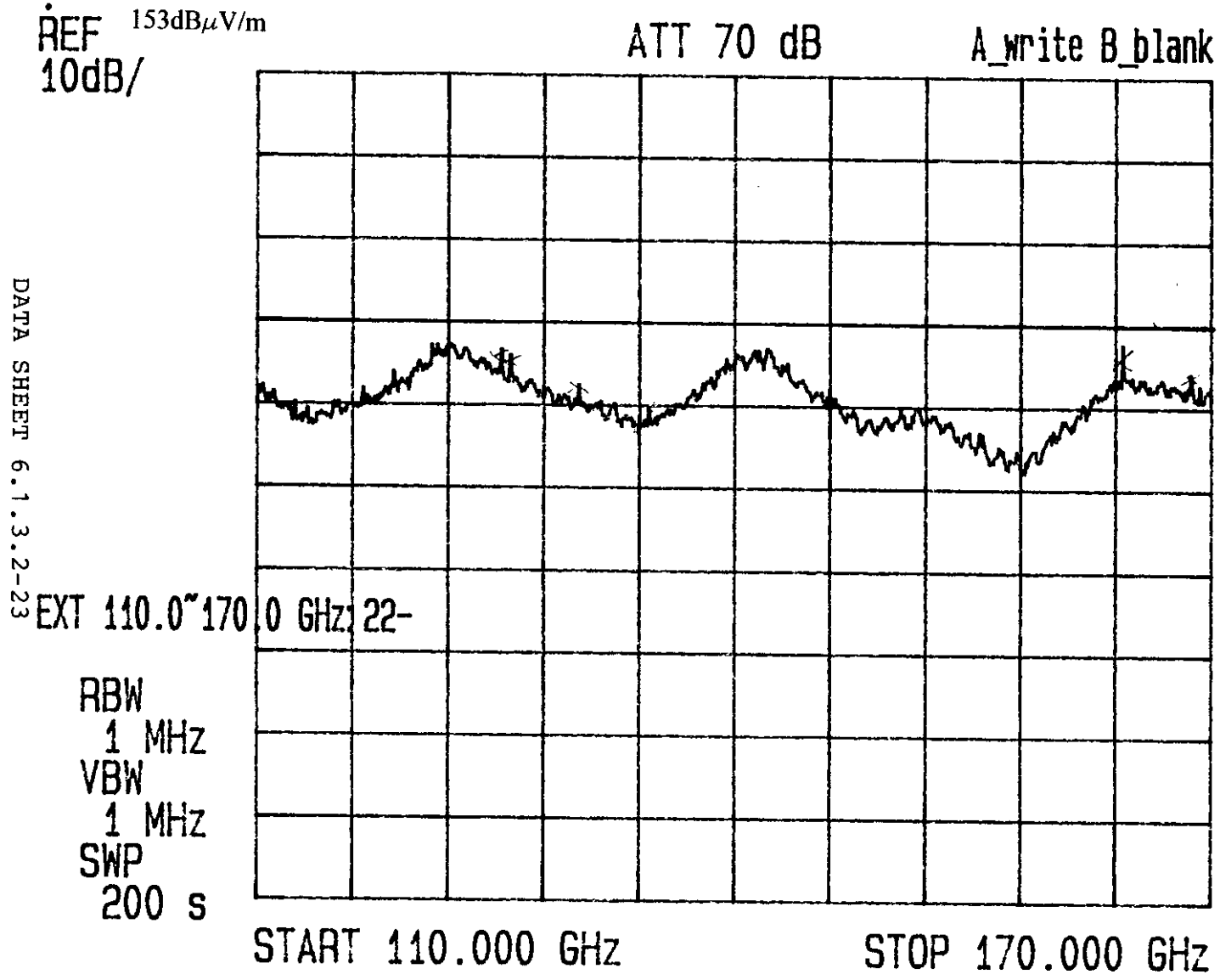
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 75-110GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 12/16/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



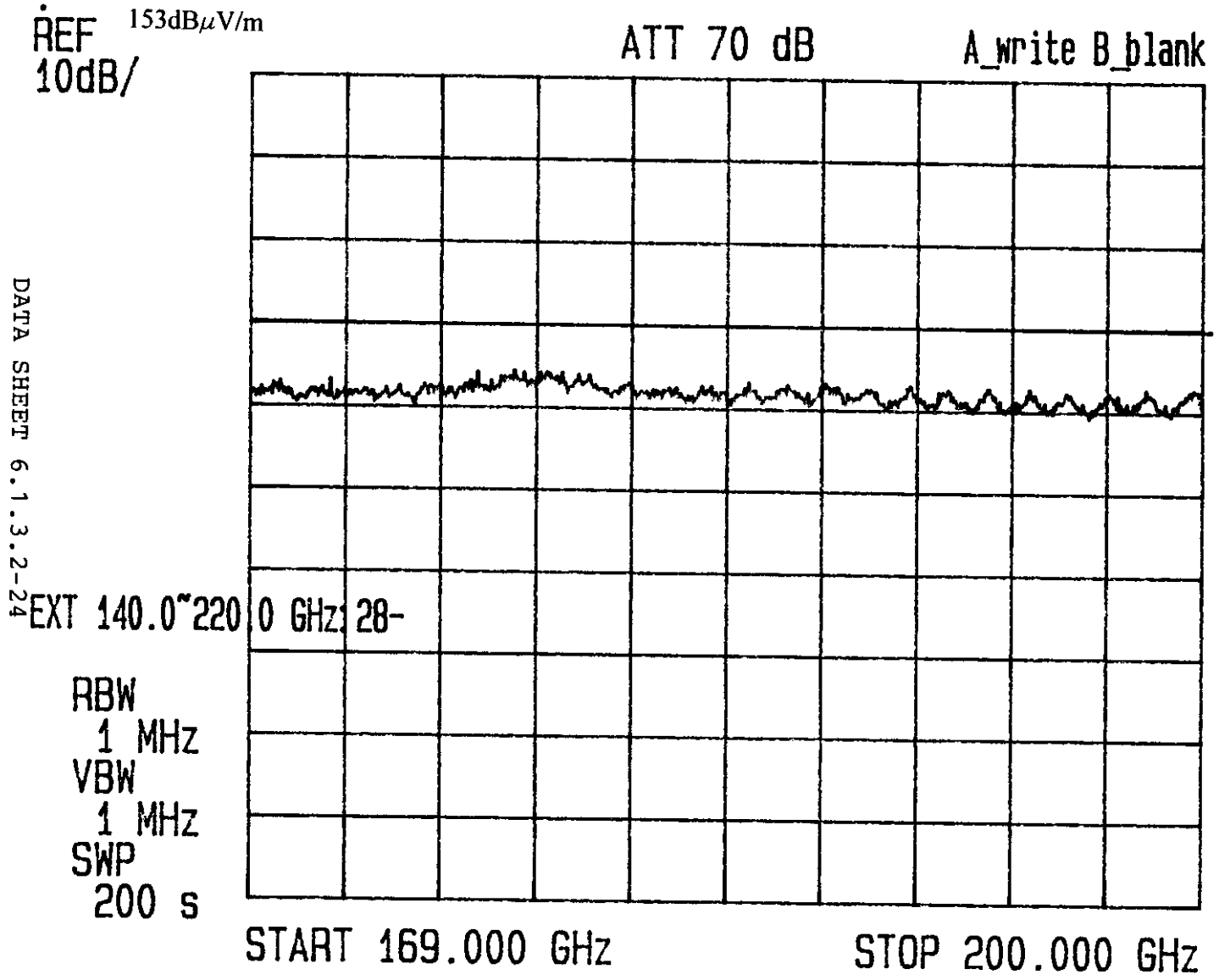
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ HIGH 4 ODU	S/N: 109/00002
FREQ: 110-170GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 01-05-99	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



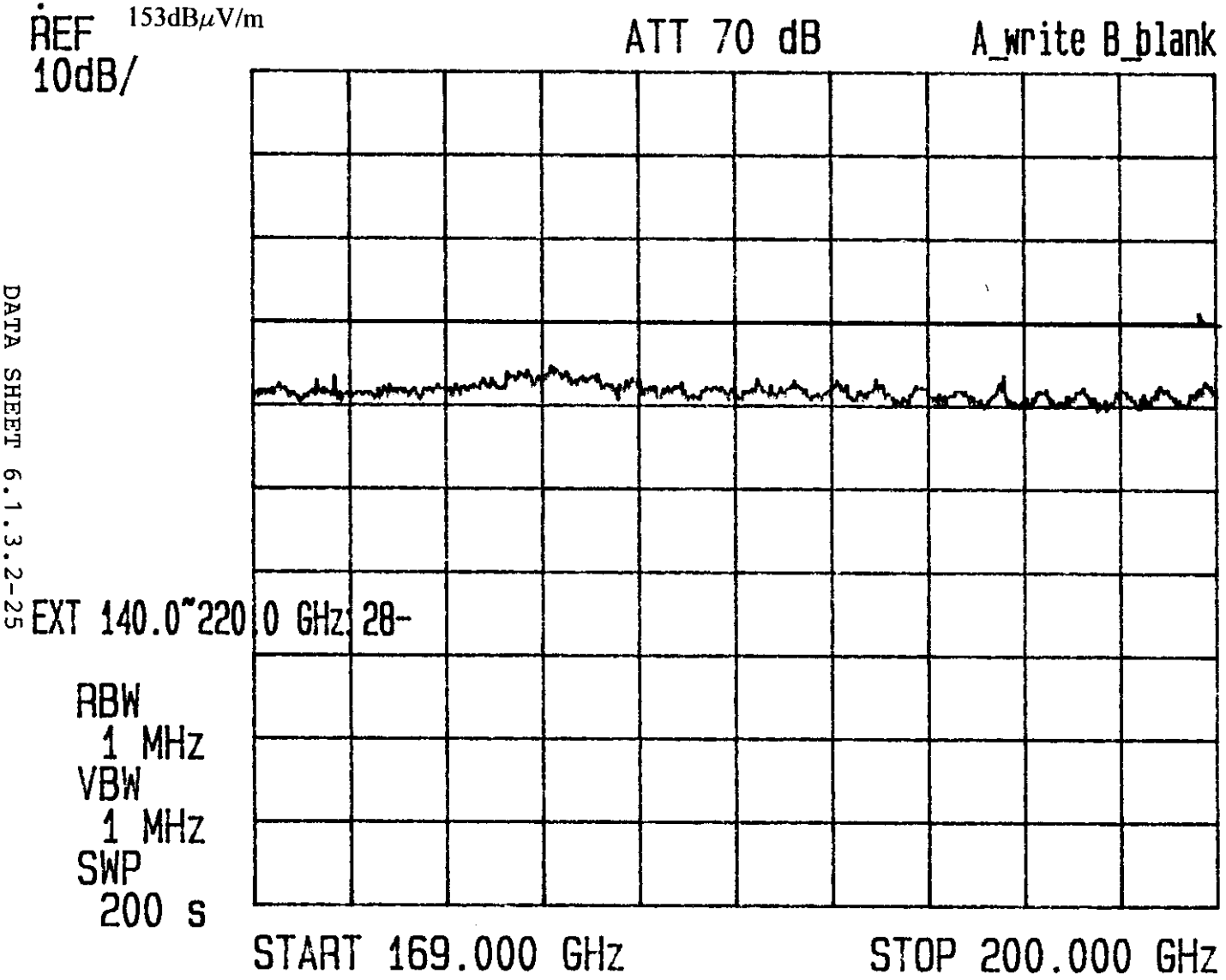
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ HIGH 4 ODU	S/N: 109/00002
FREQ: 110-170GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 01-05-99	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



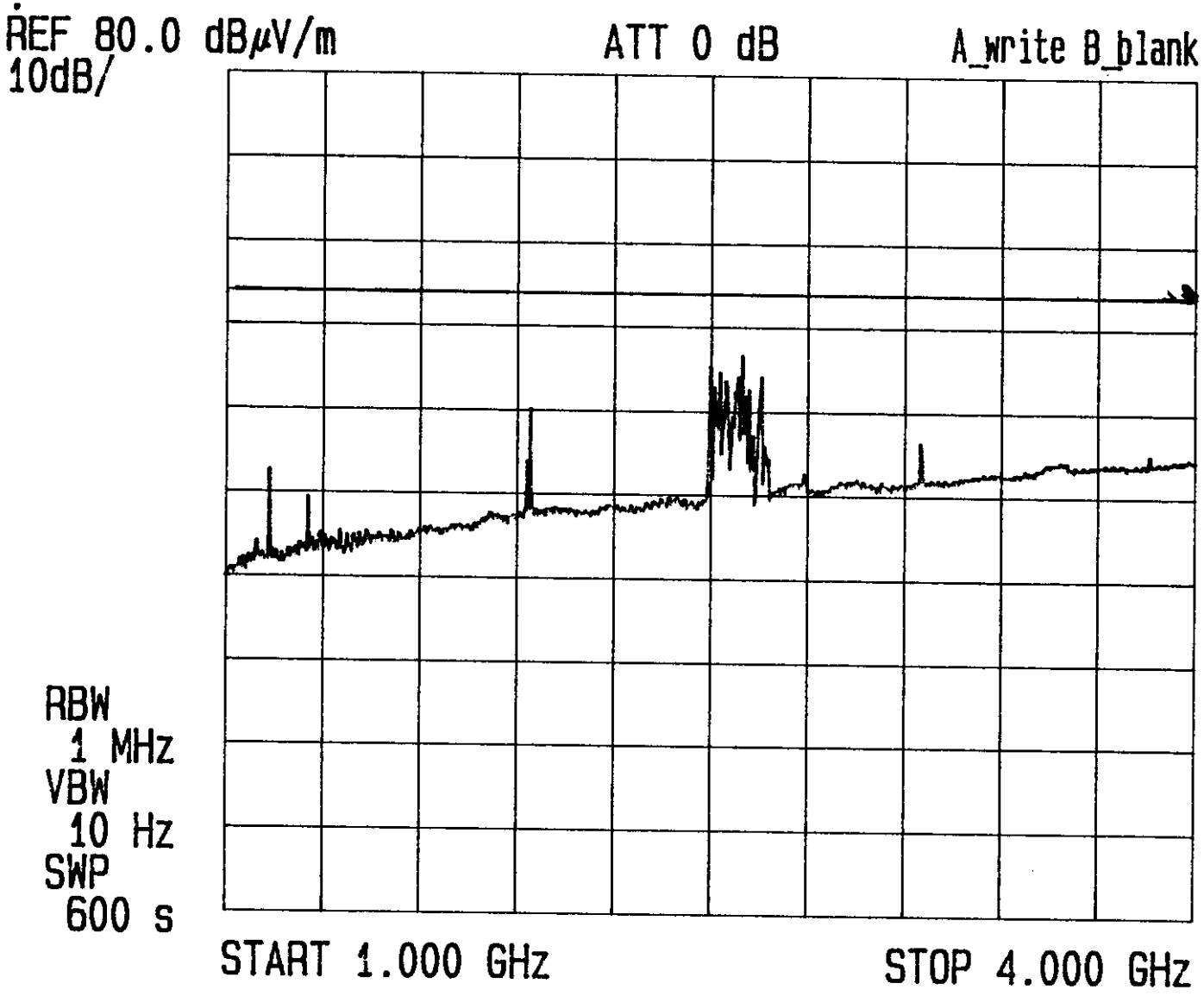
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ HIGH 4 ODU	S/N: 109/00002
FREQ: 170-200GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 01-05-99	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHZ HIGH 4 ODU	S/N: 109/00002
FREQ: 170-200GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: PEAK	ANTENNA:	EUT POSITION:
DATE: 4-05-02	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 1GHz-4GHz	SPEC: FCC	ANT.HT/POL: 1M H
DETECTIOR: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION:
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



DATA SHEET 6.1.3.2-26

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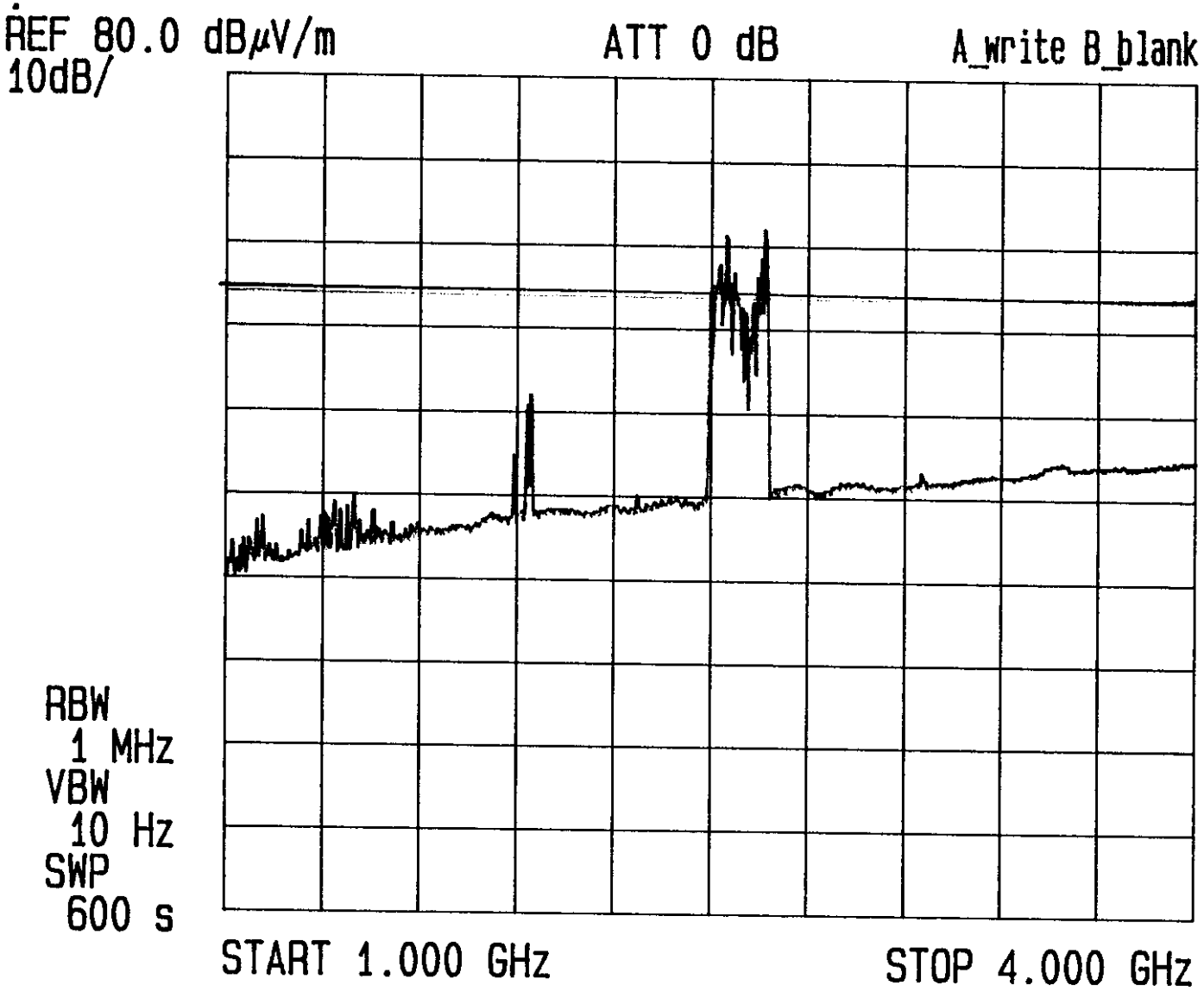
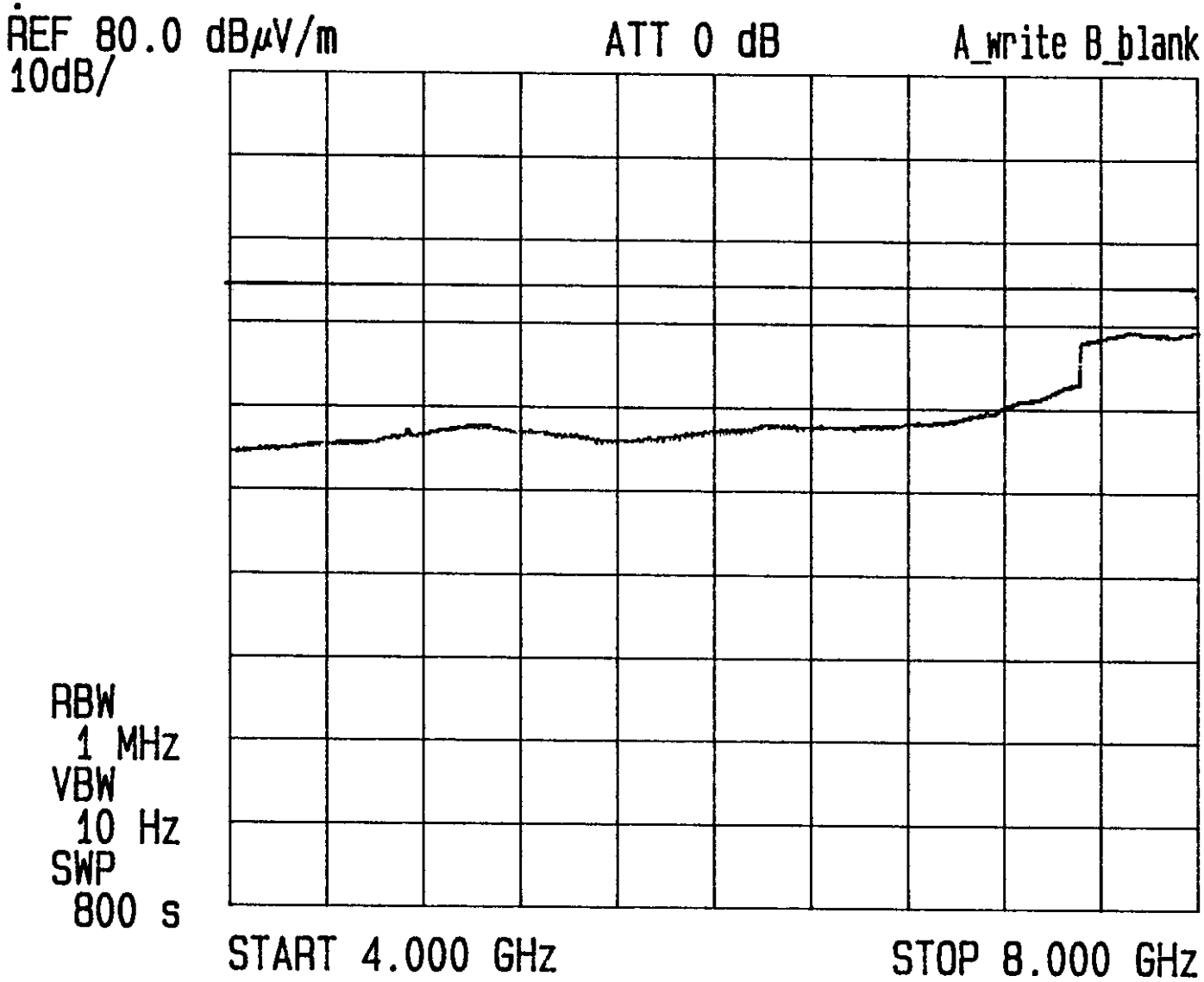
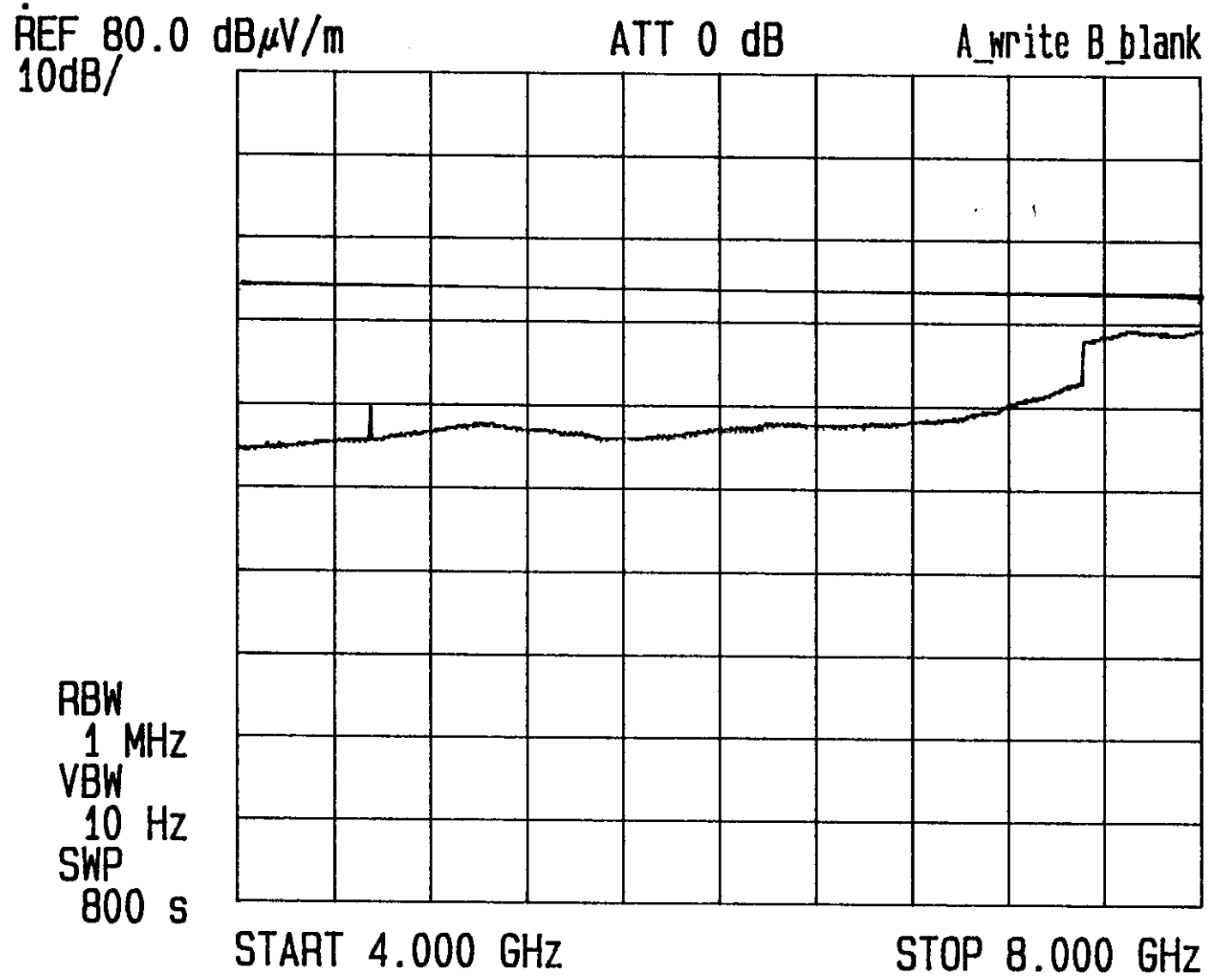
TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002	
FREQ: 1GHz-4GHz	SPEC: FCC	ANT.HT/POL: 1m	V
DETECTIOR: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION:	0
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:	



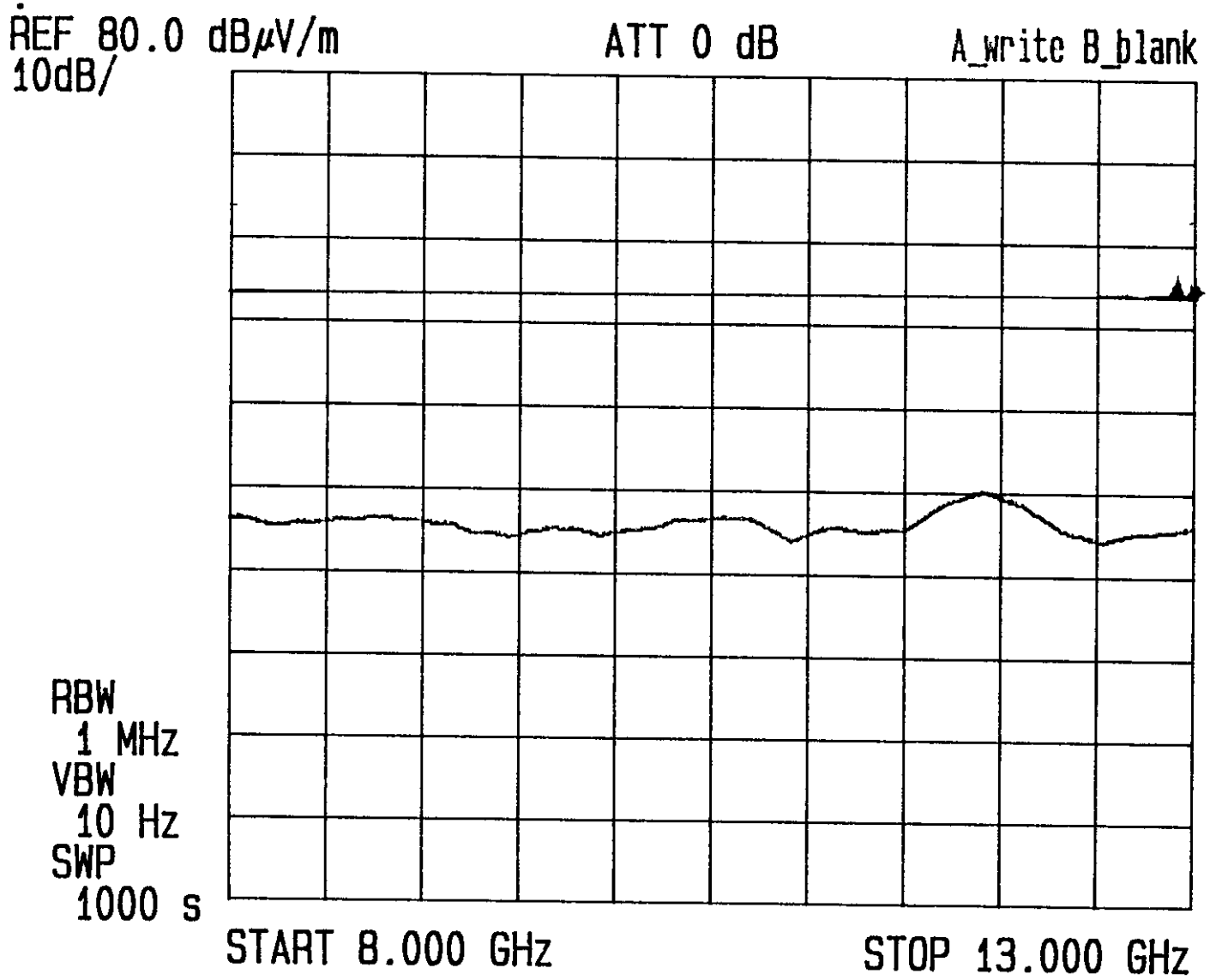
TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 4GHz-8GHz	SPEC: FCC	ANT.HT/POL: /M V
DETECTION: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: O
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER: AB



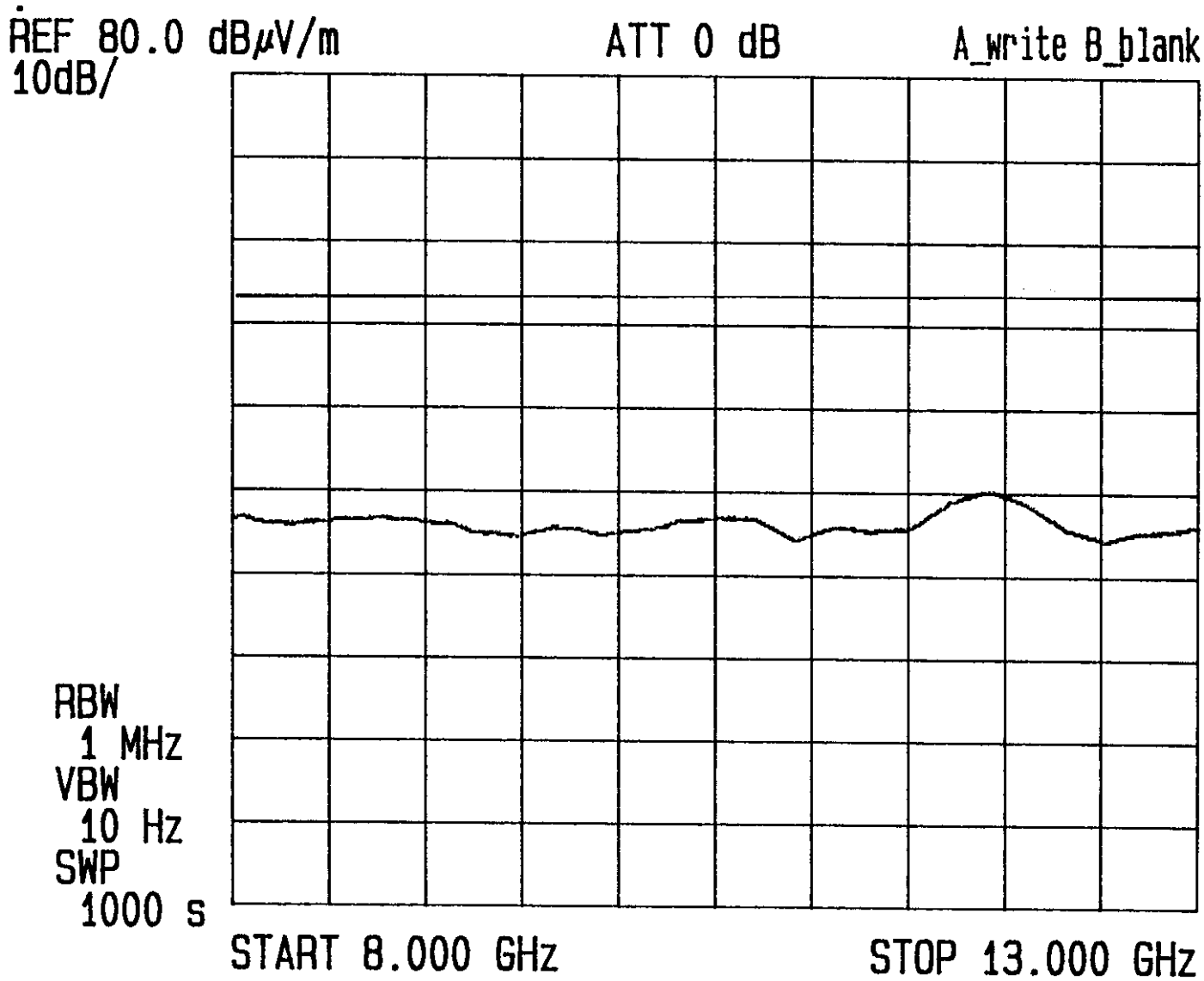
TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 4GHz-8GHz	SPEC: FCC	ANT.HT/POL: 1m H
DETECTION: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: -
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



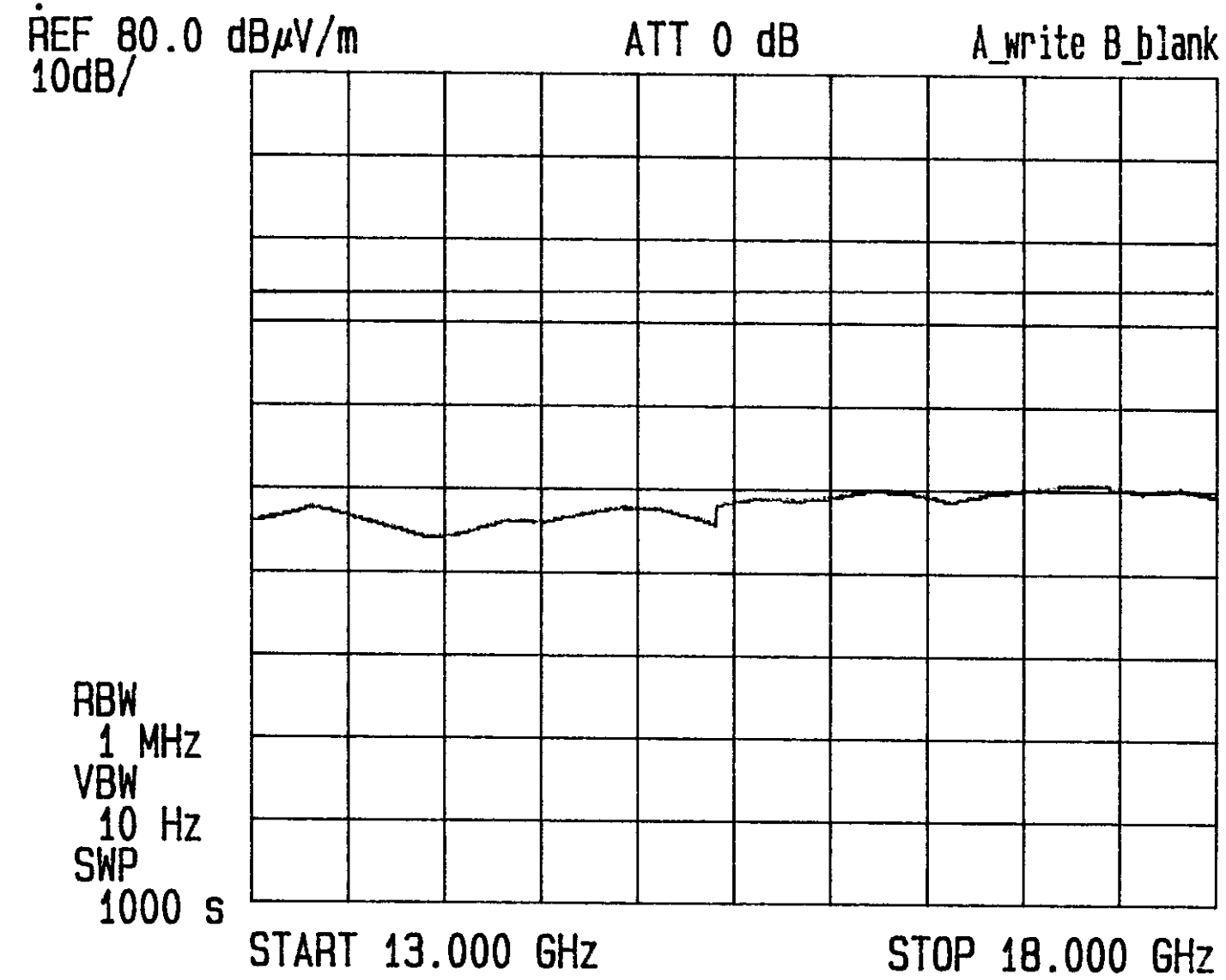
TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 8GHz-13GHz	SPEC: FCC	ANT.HT/POL: / m H
DETECTIOR: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: O
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



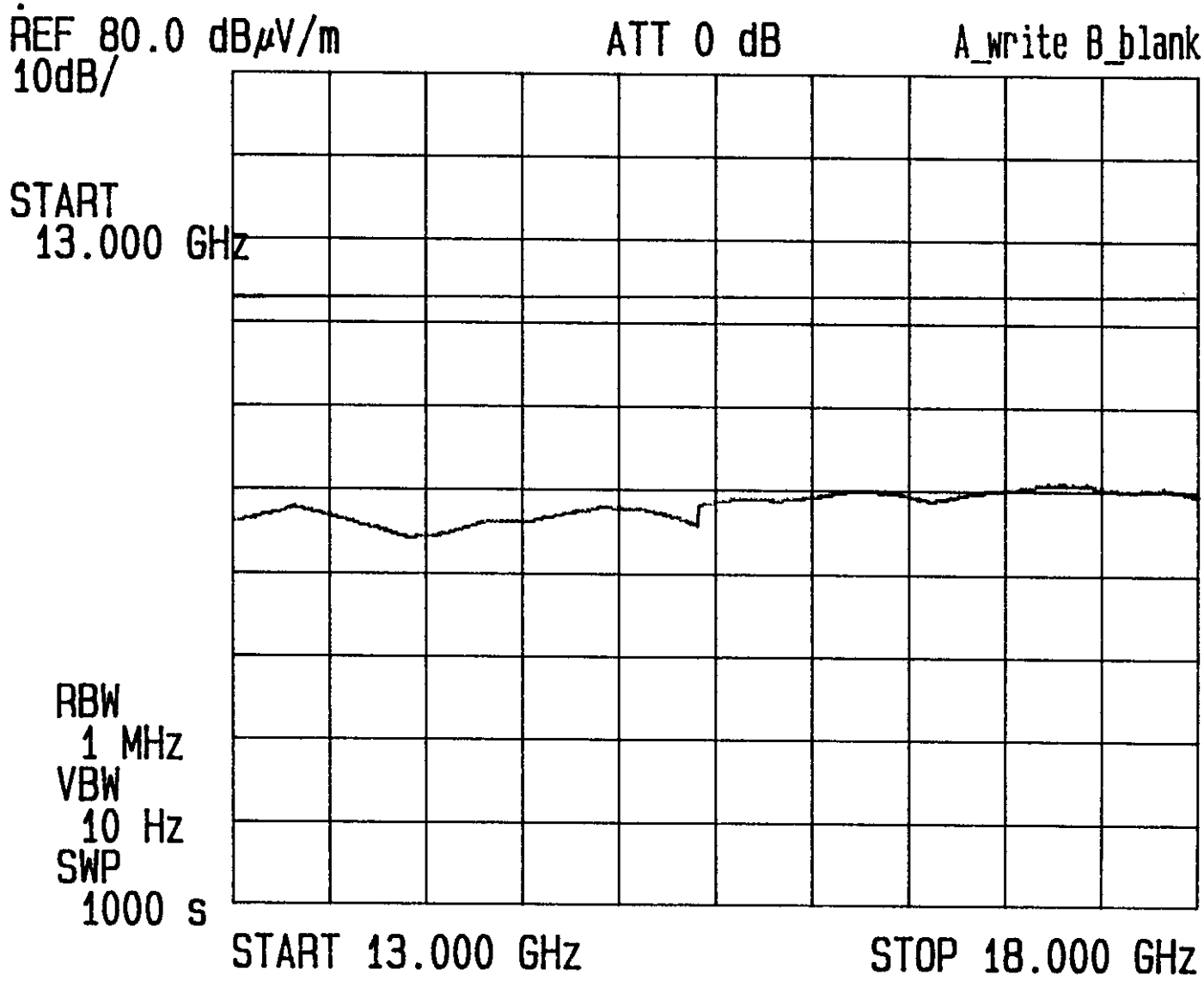
TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 8GHz-13GHz	SPEC: FCC	ANT.HT/POL: 1 m \ V
DETECTION: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: 0
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



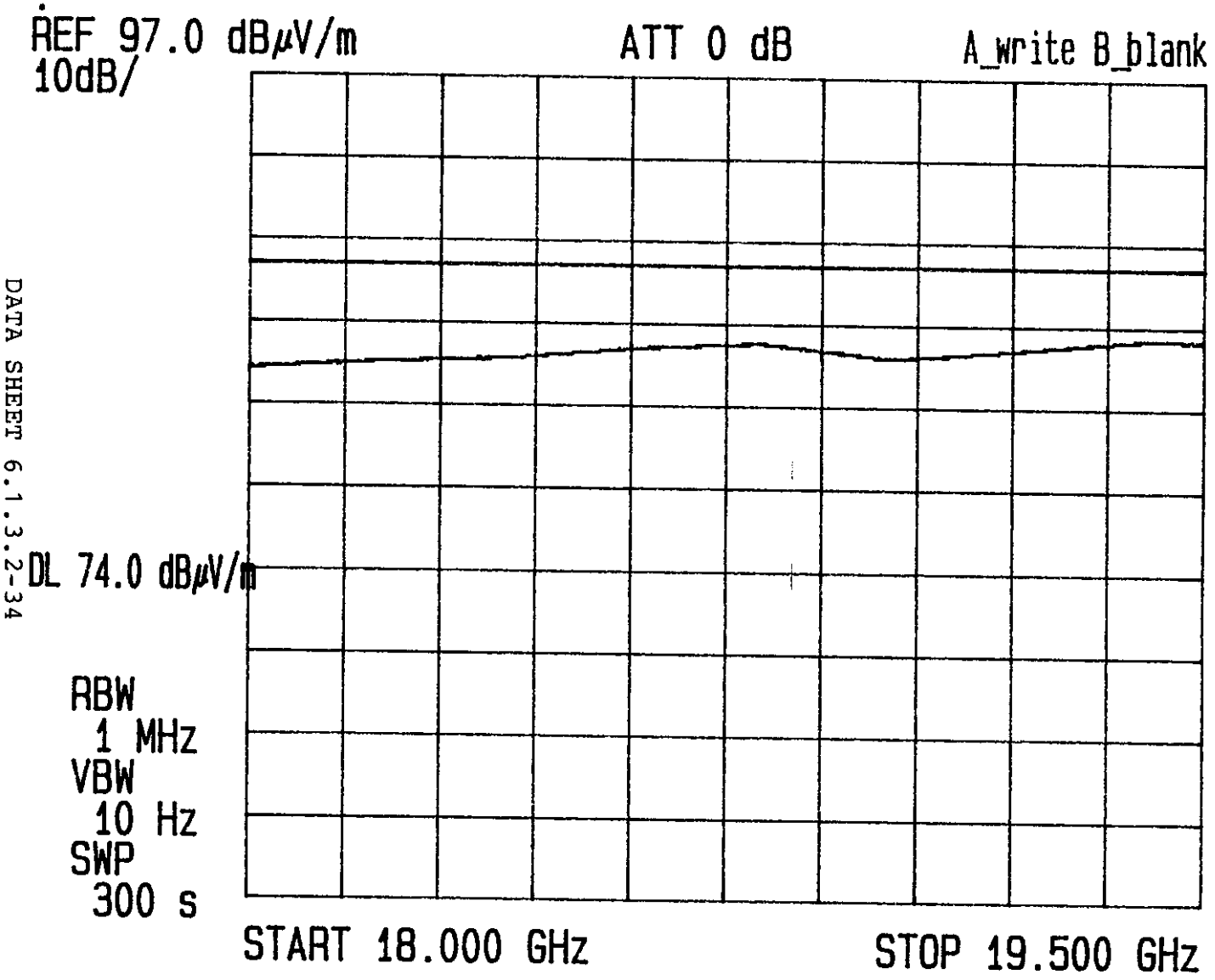
TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 13GHz-18GHz	SPEC: FCC	ANT.HT/POL: 1M H
DETECTIOR: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: 0
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



TEST: FCC RADIATED	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 13GHz-18GHz	SPEC: FCC	ANT.HT/POL: 1 m V
DETECTION: AVERAGE	LINE UNDER TEST: N/A	EUT POSITION: 0
DATE: 12-22-98	TEST SITE: O.A.T.S	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 18G-19.5GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-34

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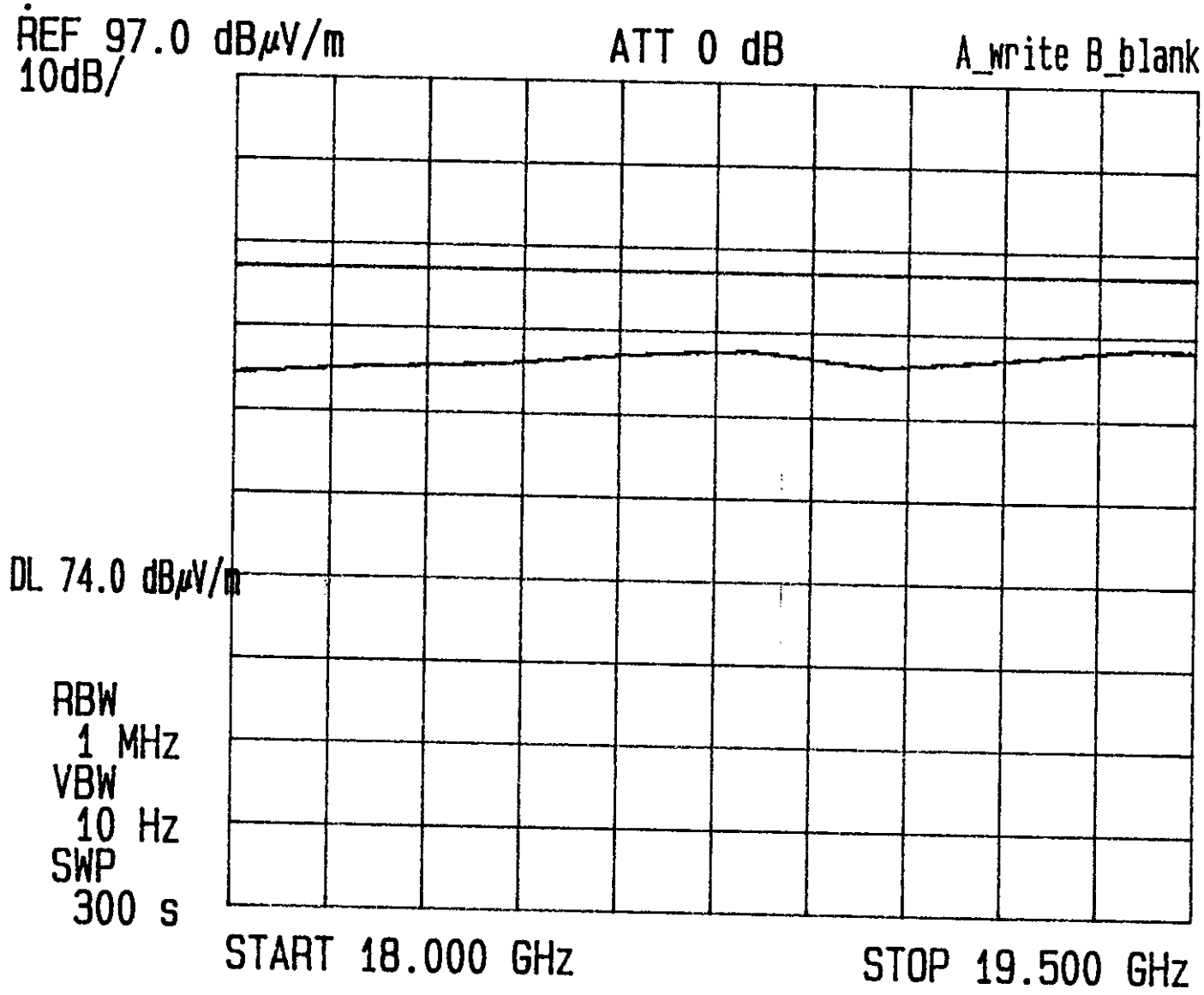
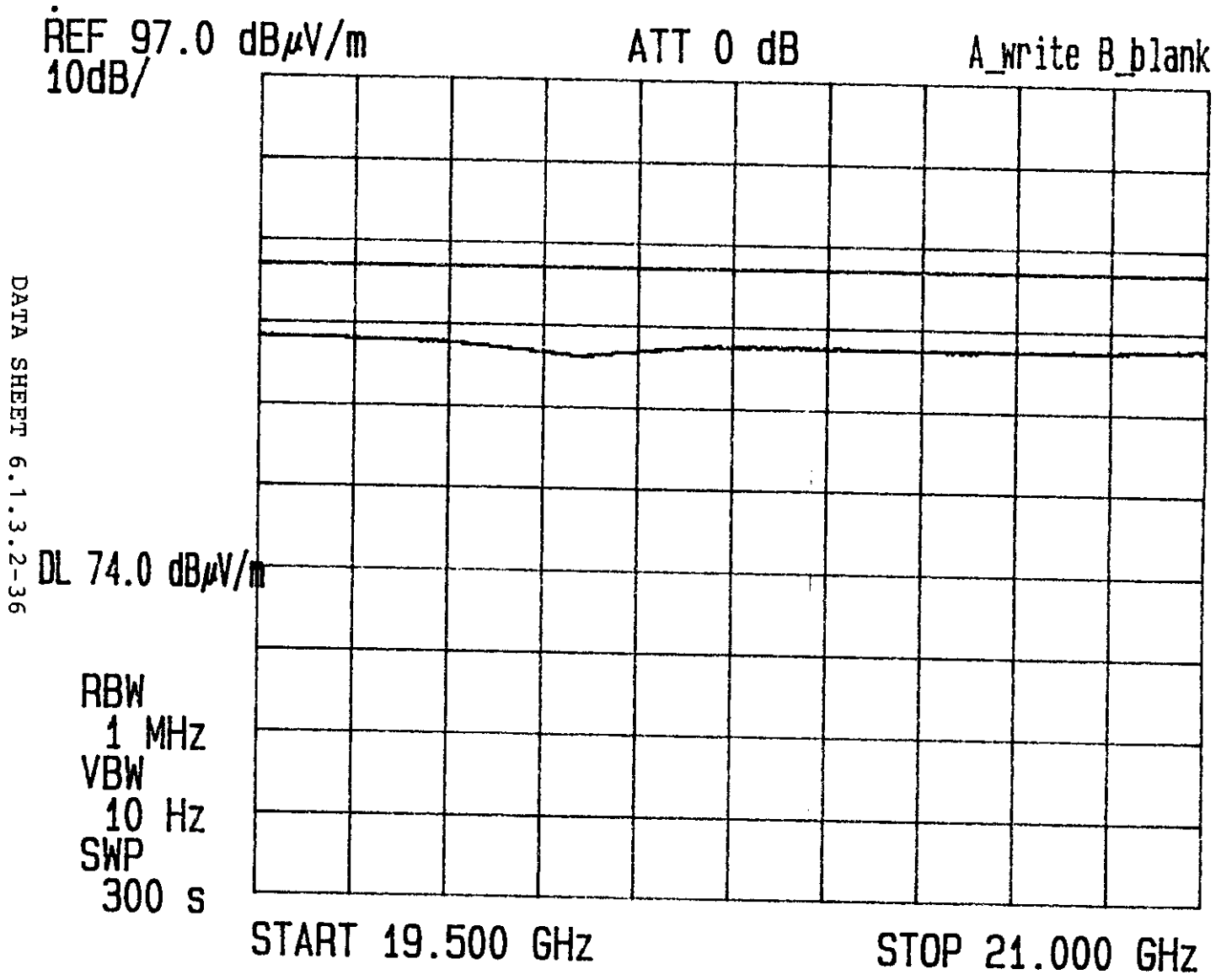
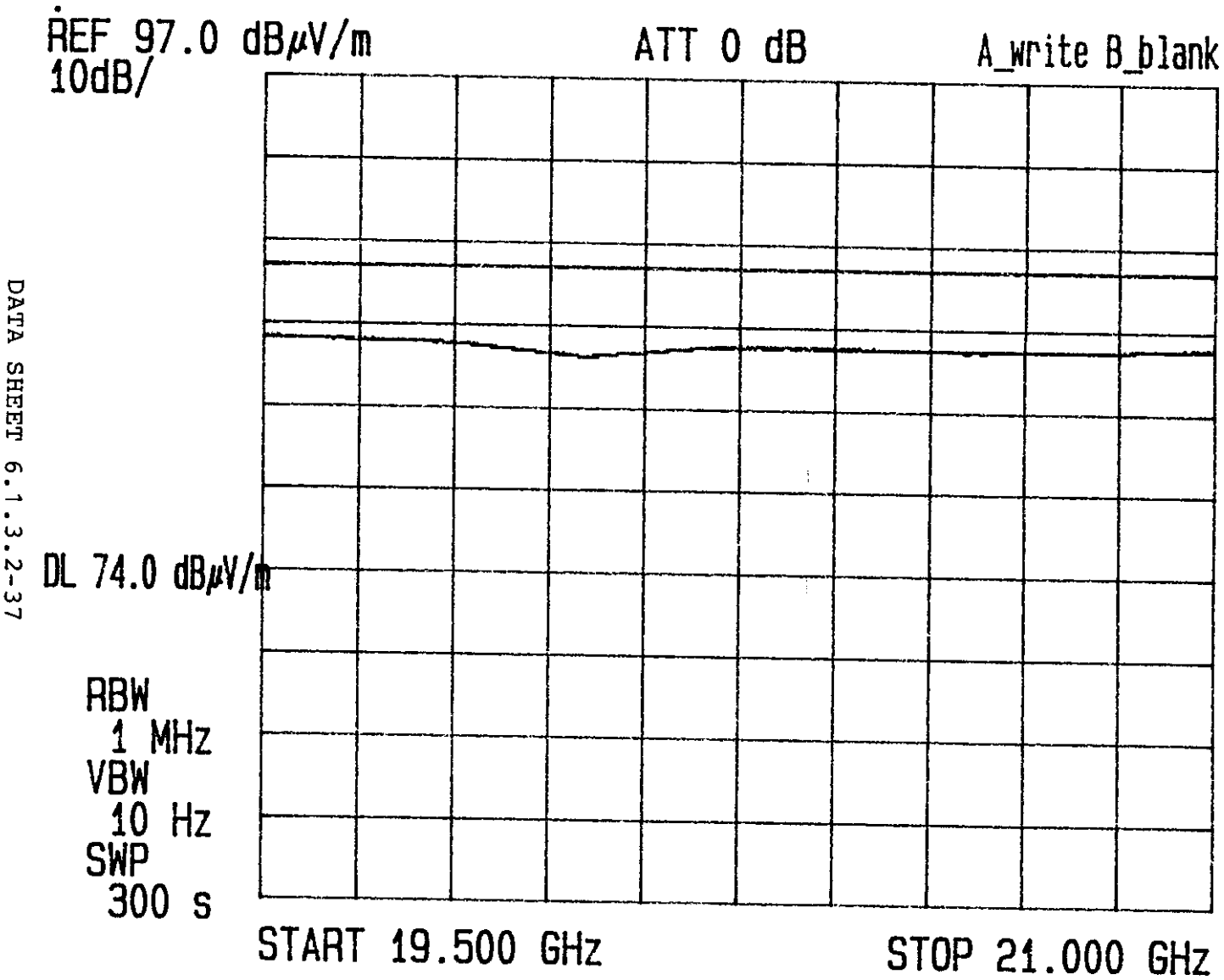
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 18G-19.5GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



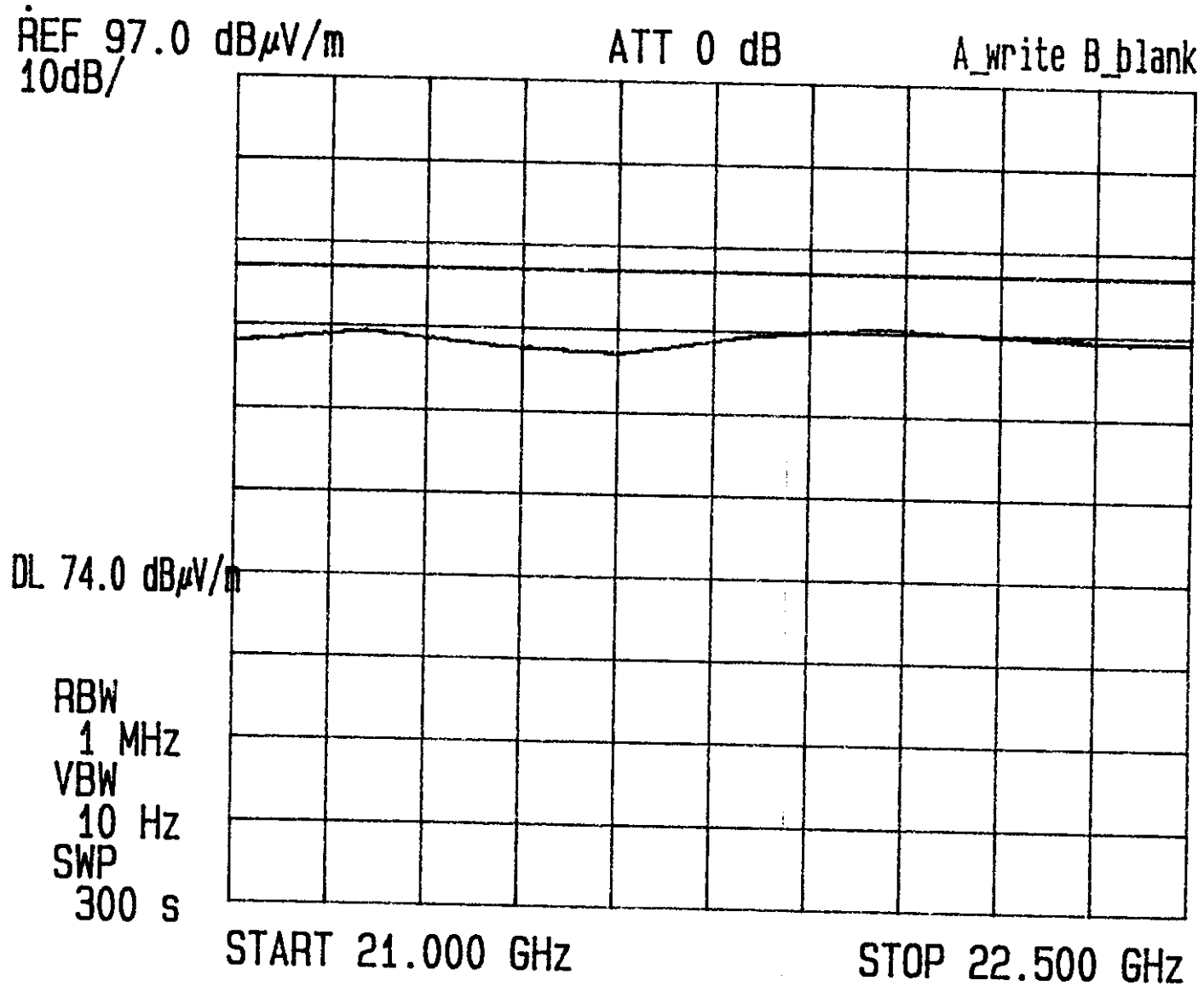
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 19.5G-21GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



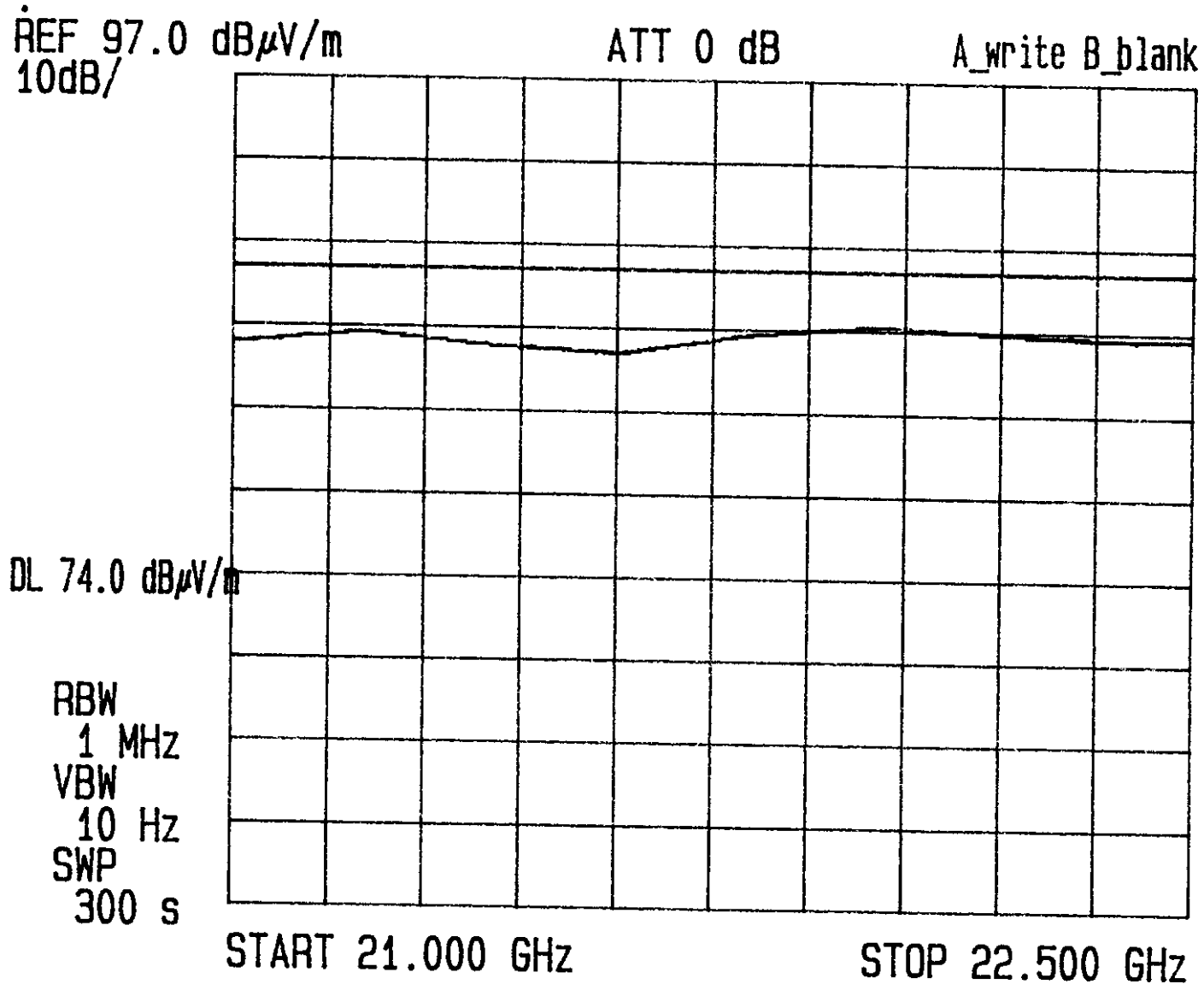
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 19.5G-21GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



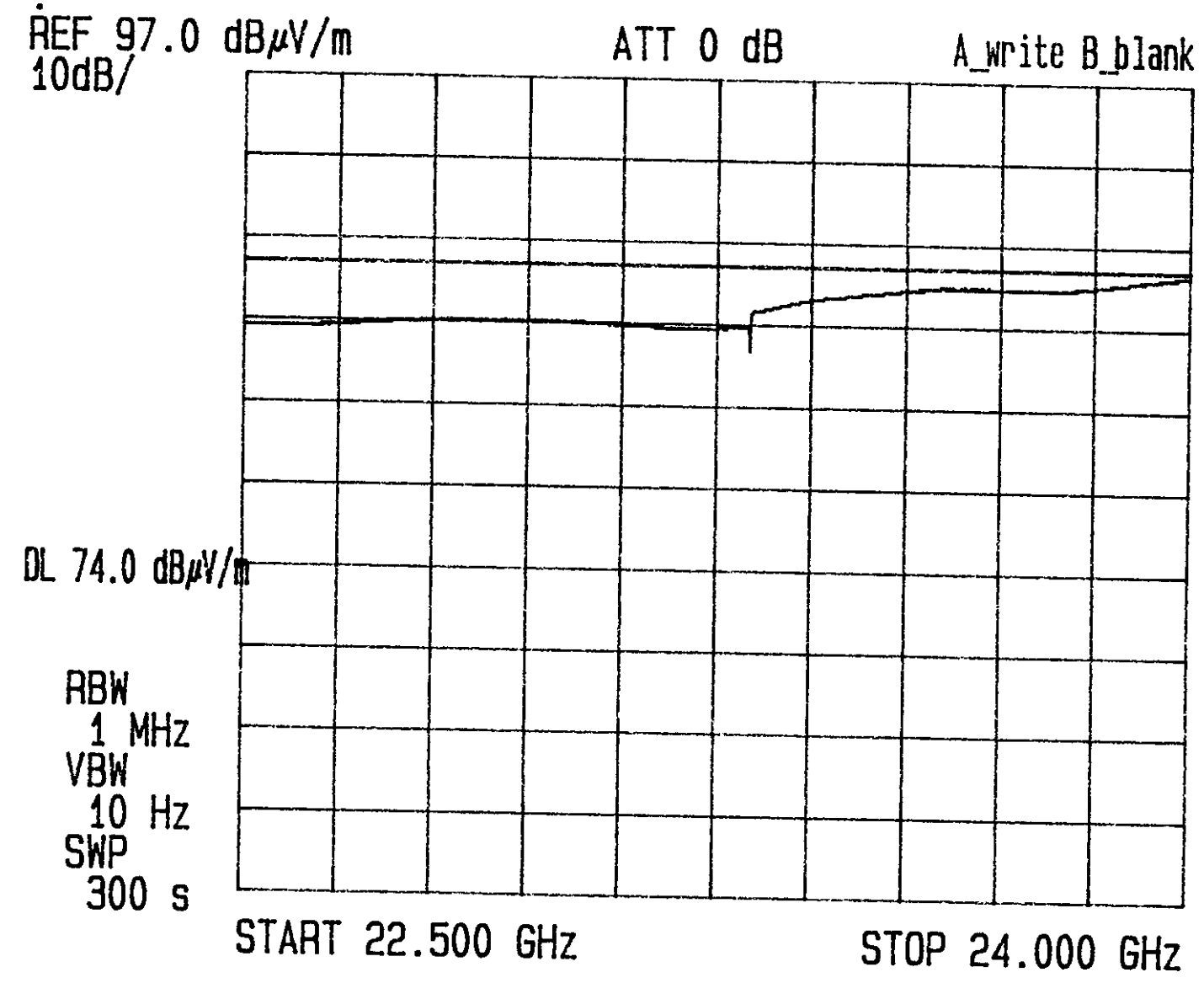
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 21G-22.5GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



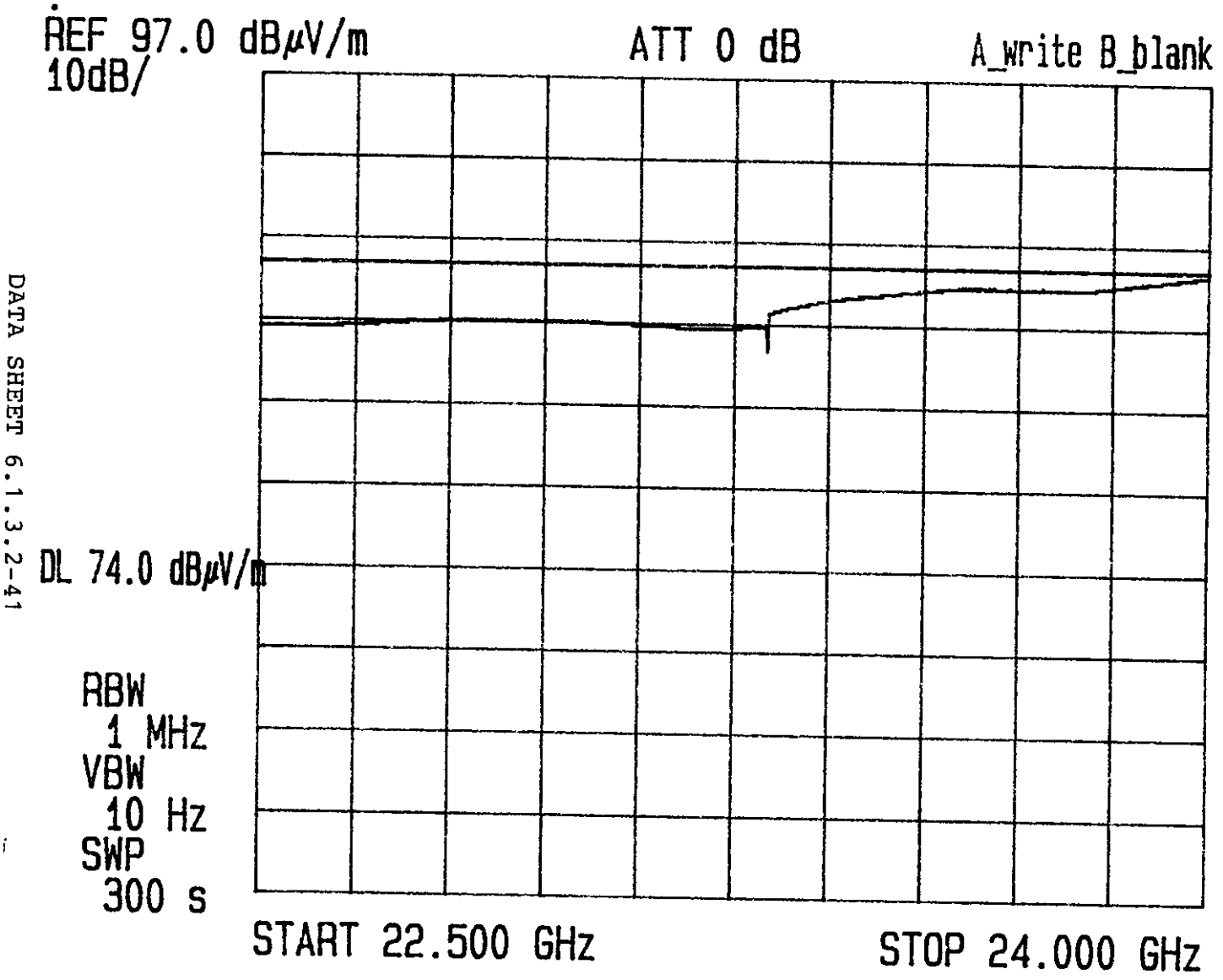
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 21G-22.5GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



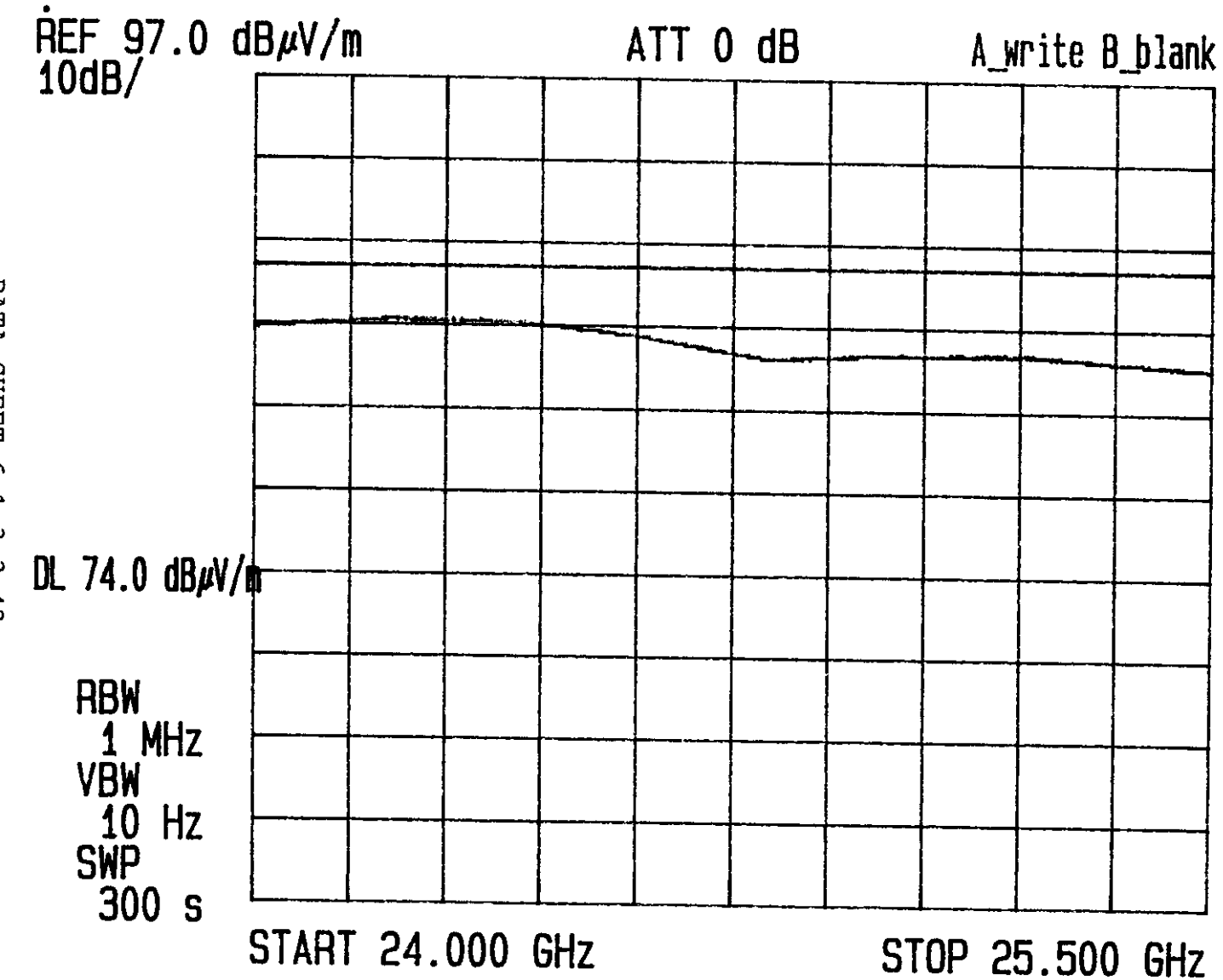
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 22.5G-24GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



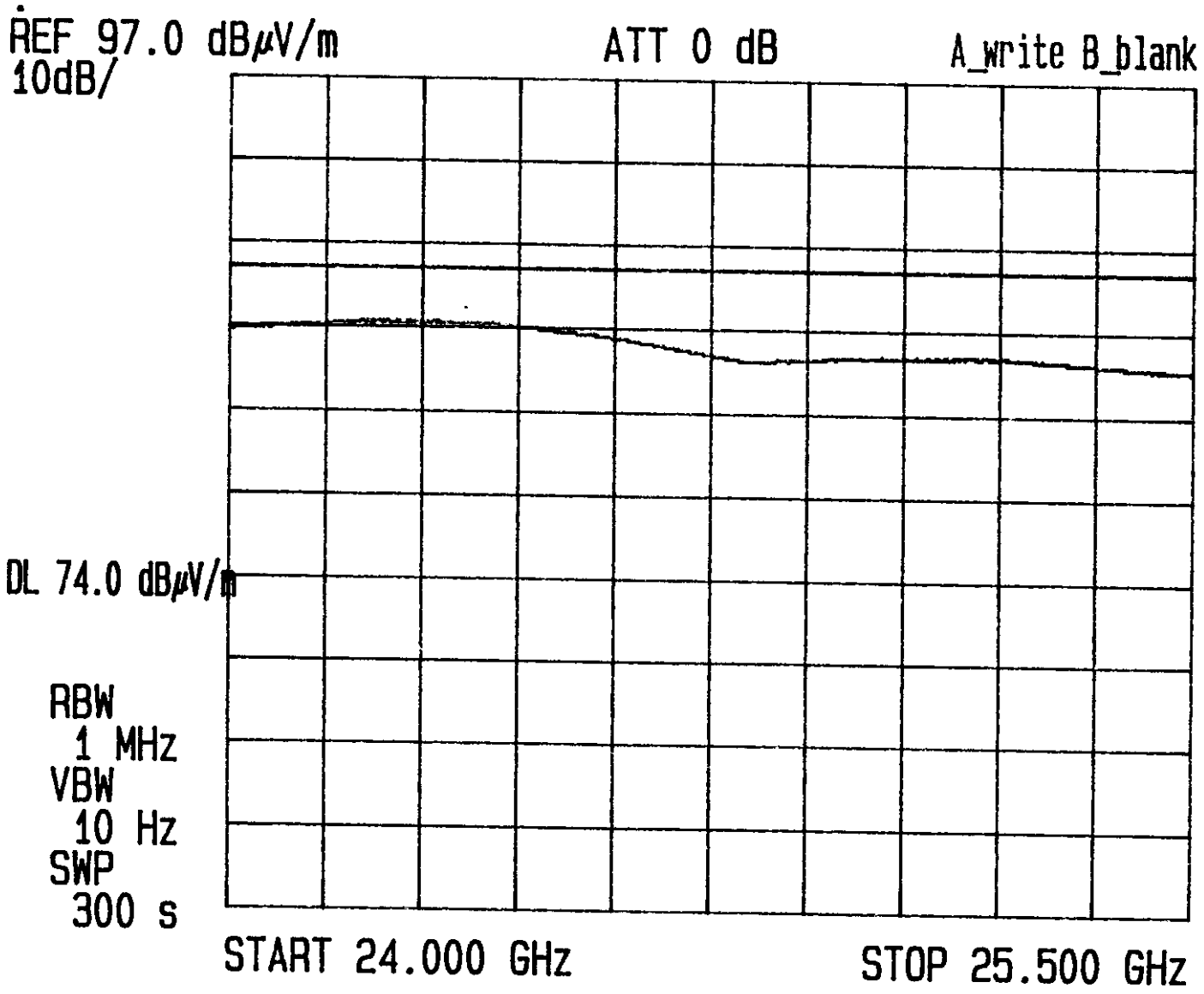
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 22.5G-24GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



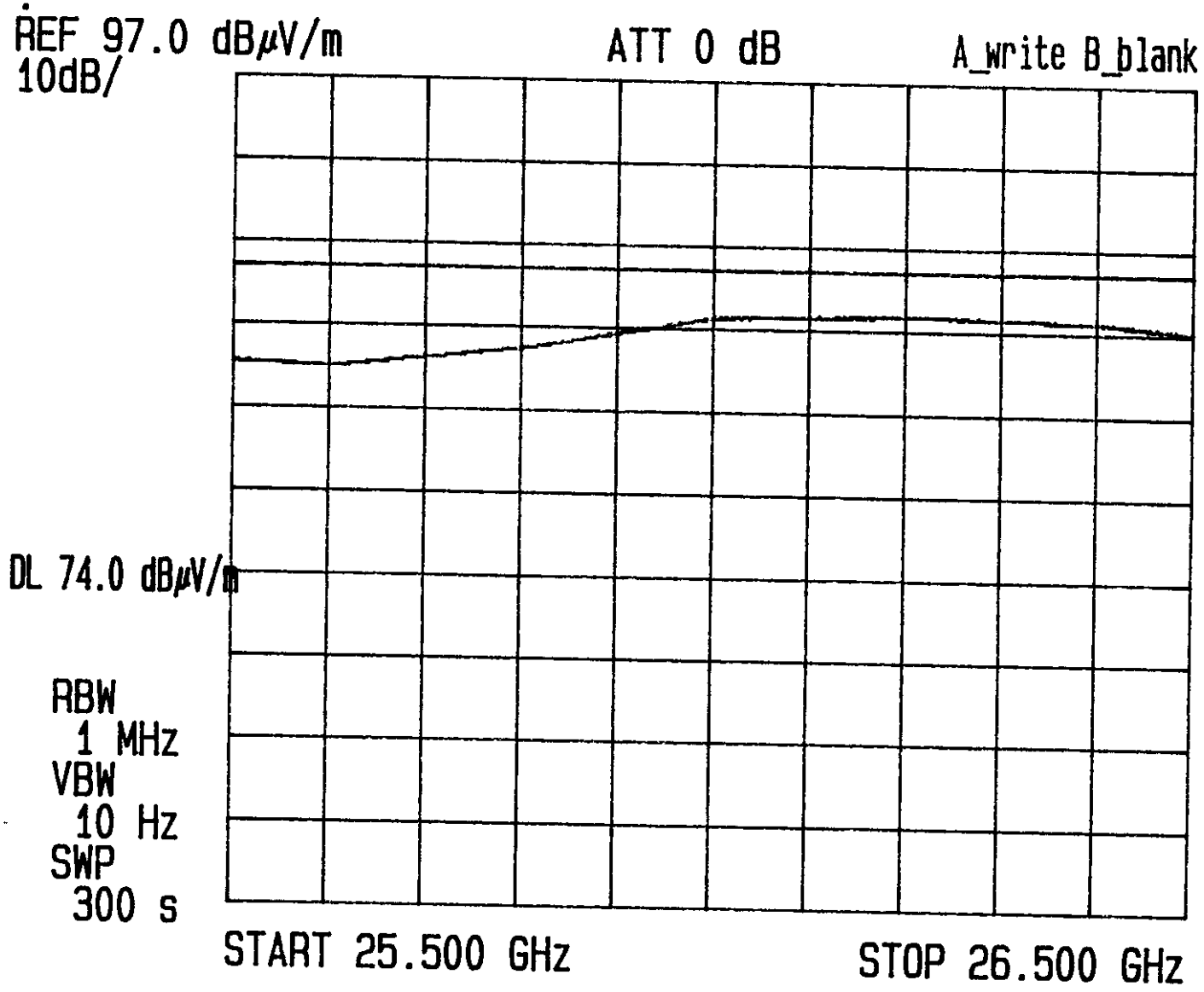
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 24G-25.5GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION: 1M
DATE: 12-18-98	TEST SITE: 3 METER	TESTER:



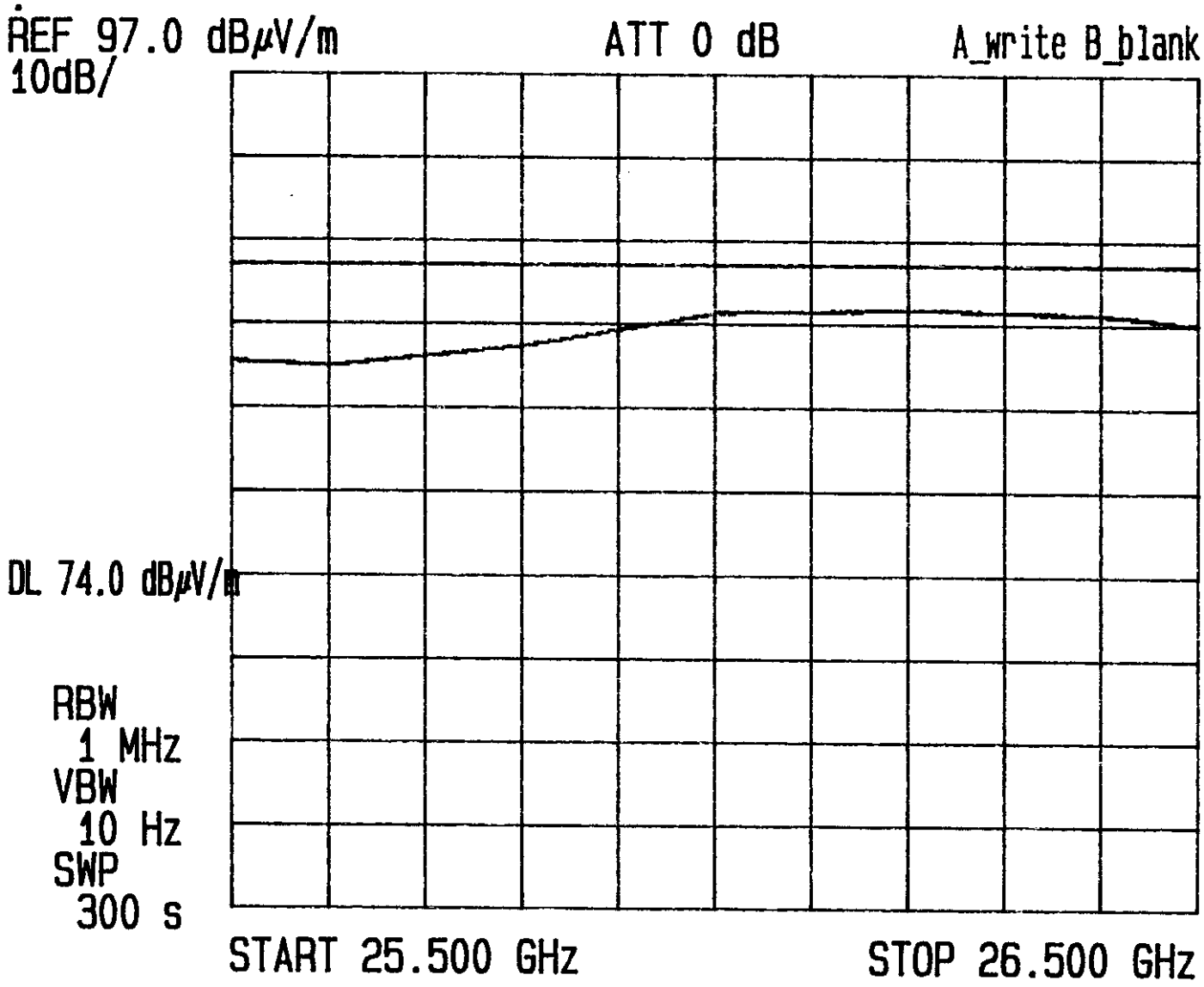
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 24G-25.5GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION: 1M
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3METERS	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 25.5G-26.5GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 25.5G-26.5GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12-18-98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-45

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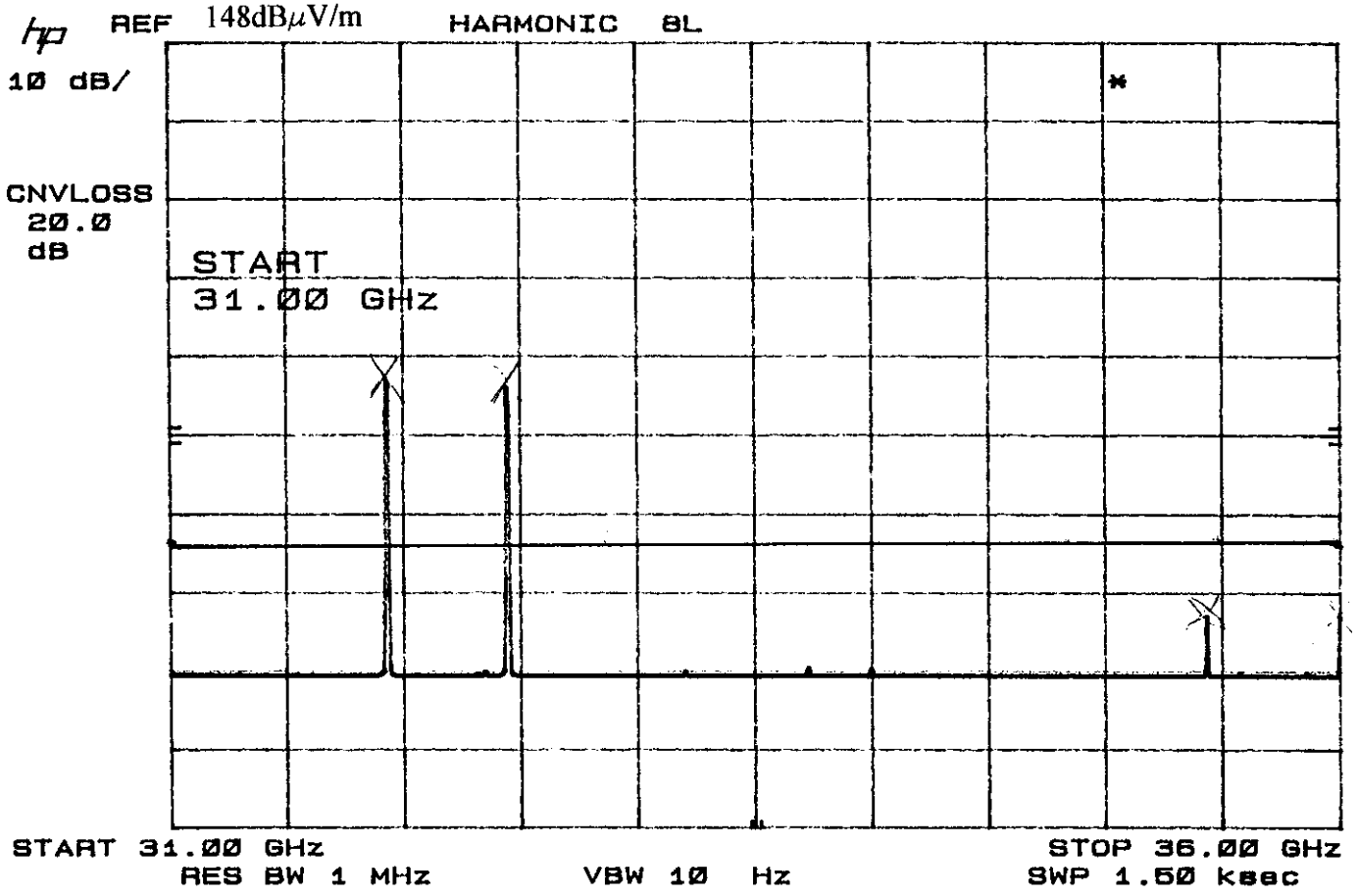
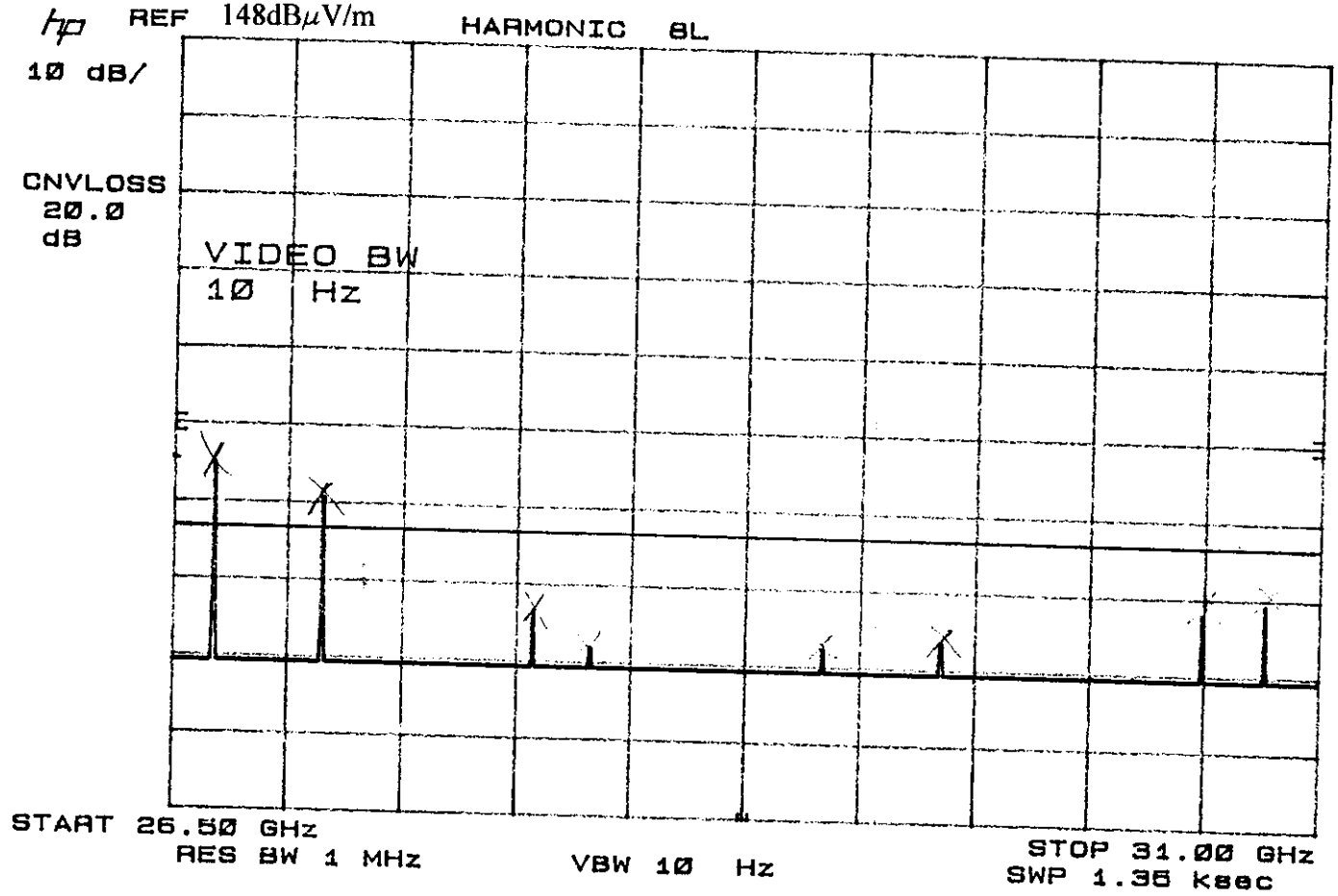
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 31G-36GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12/16/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-46

JA-1578

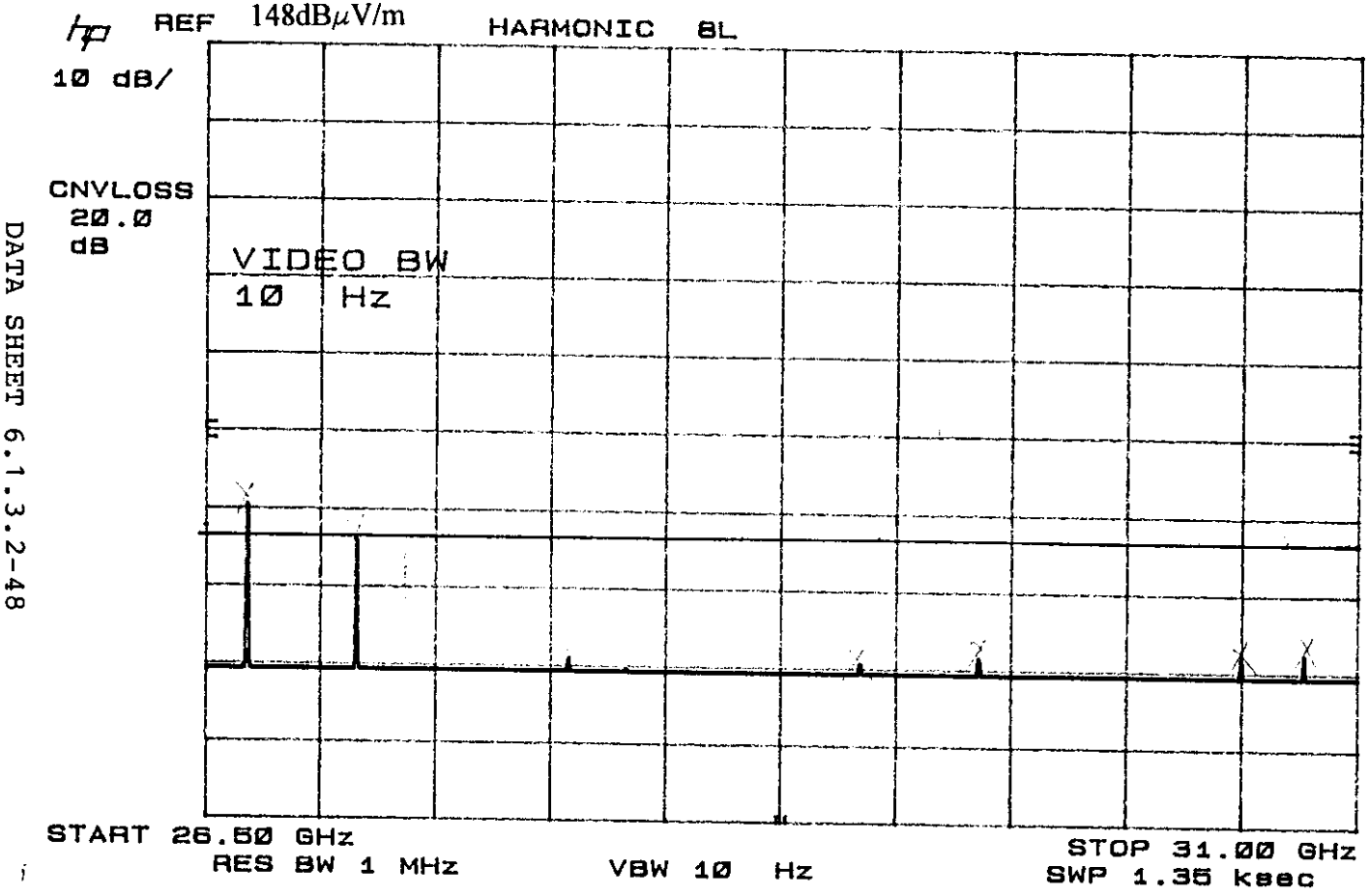
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 26.5G-31GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12/16/99	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-47

JA-1578

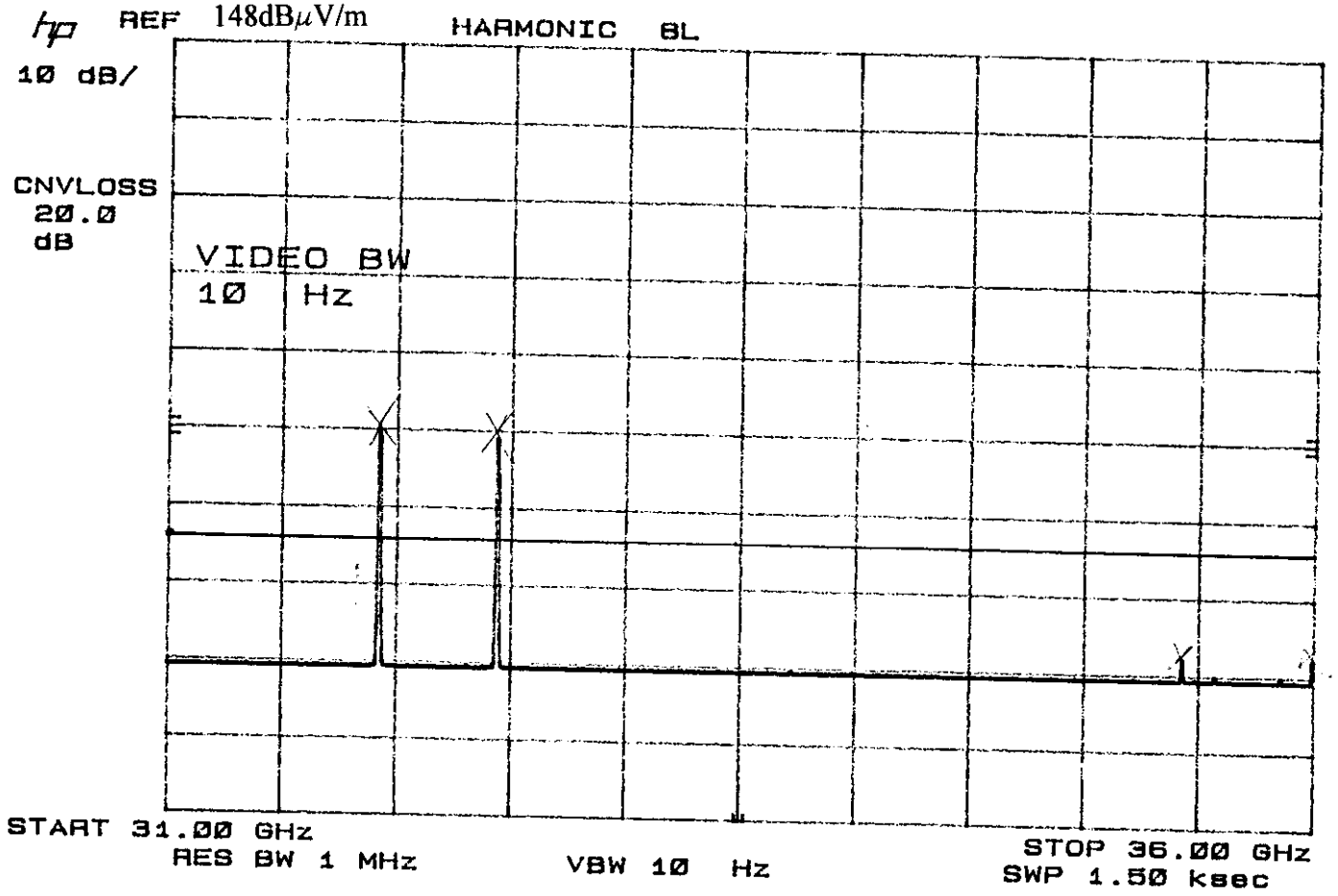
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 26.5-31GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12/16/97	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-48

JA-1578

TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 31G-36GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12/12/98	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



DATA SHEET 6.1.3.2-49

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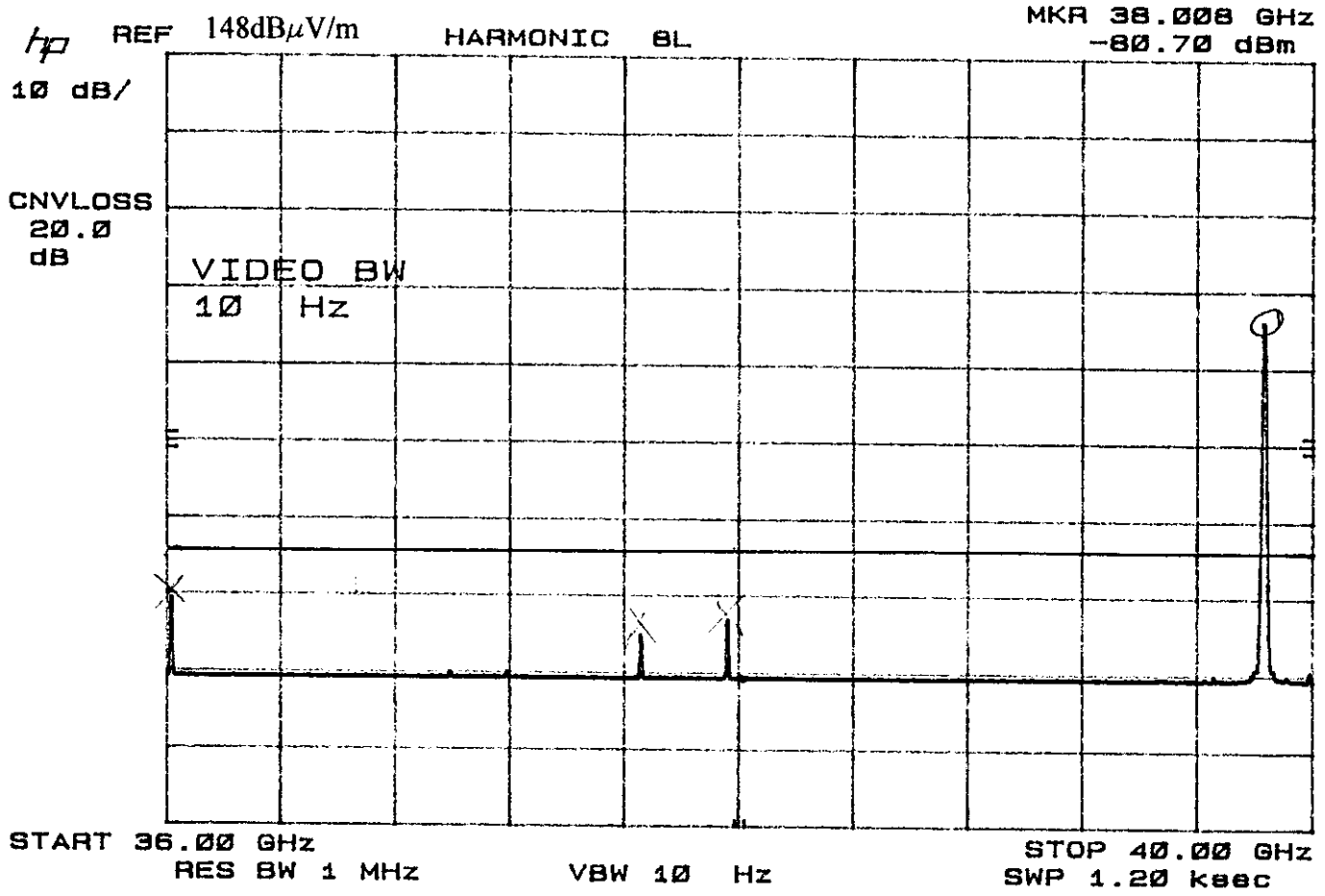
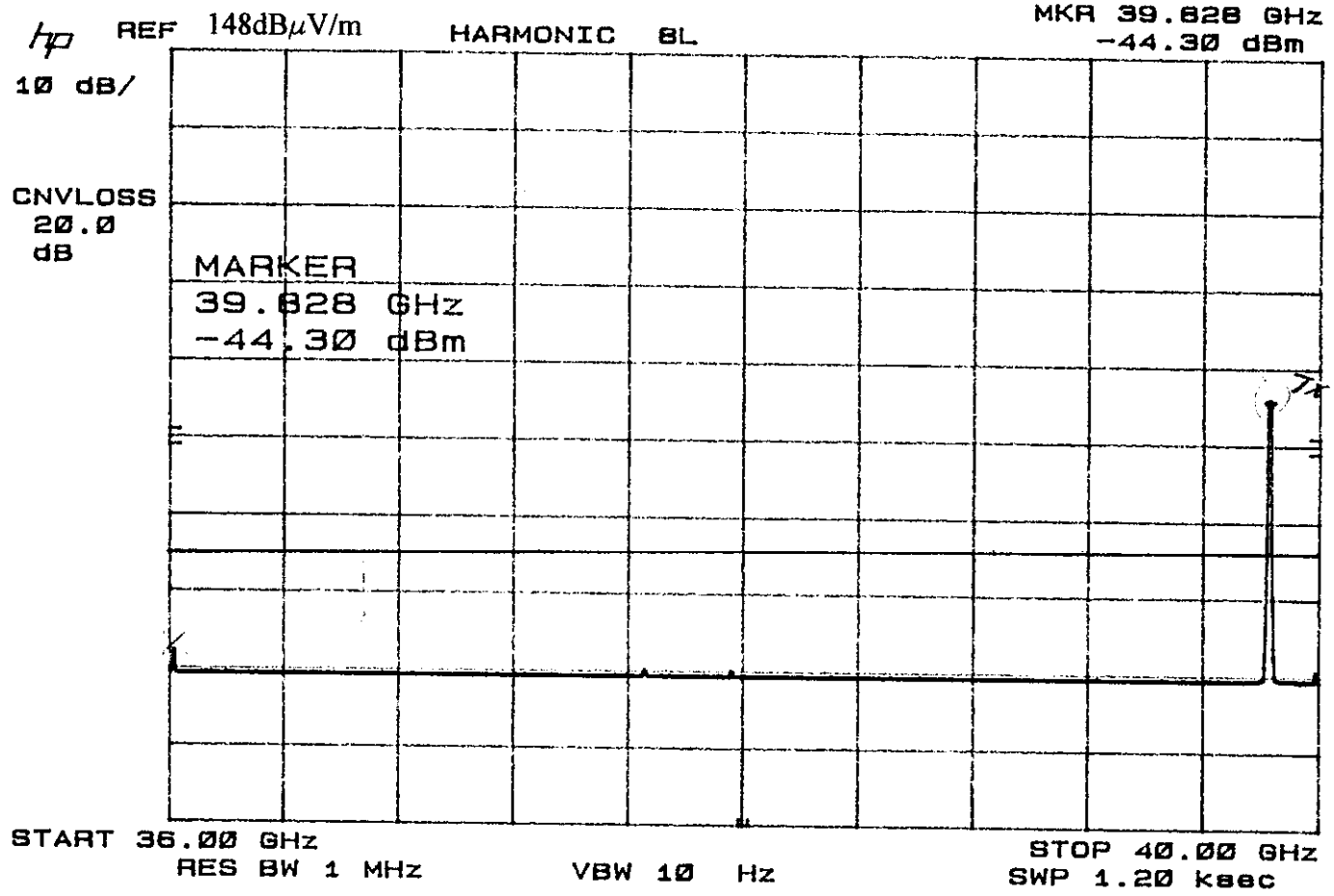
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 36G-40GHz	SPEC: FCC 101.111	ANT.HT/POL: H
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 11/17/99	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



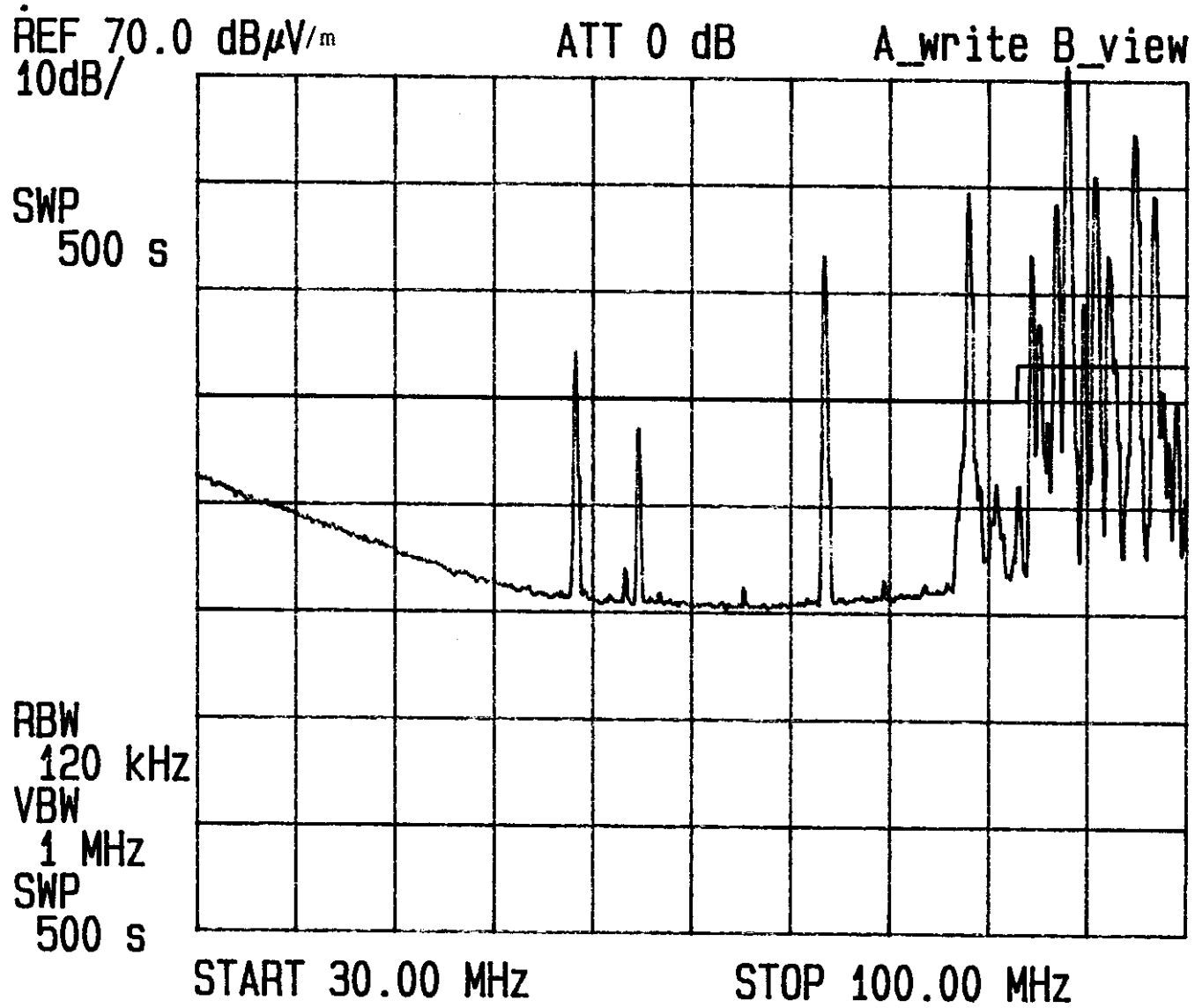
DATA SHEET 6.1.3.2-50

JA-1578

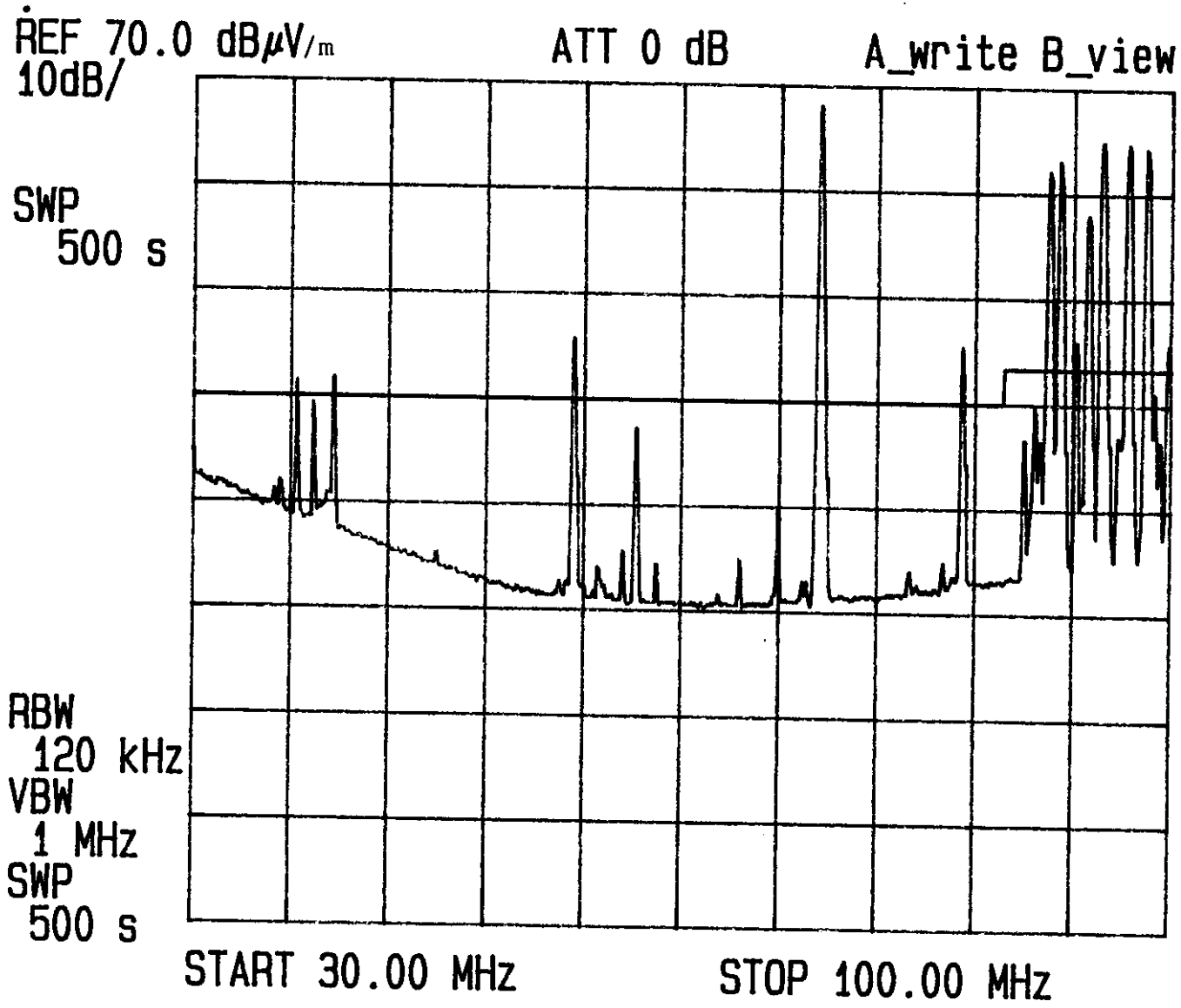
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH & ODU	S/N: 109/00002
FREQ: 36G-40GHz	SPEC: FCC 101.111	ANT.HT/POL: V
DETECTOR: AVERAGE	ANTENNA:	EUT POSITION:
DATE: 12/07/95	TEST SITE: OATS/ROOM 1 .3 M	TESTER:



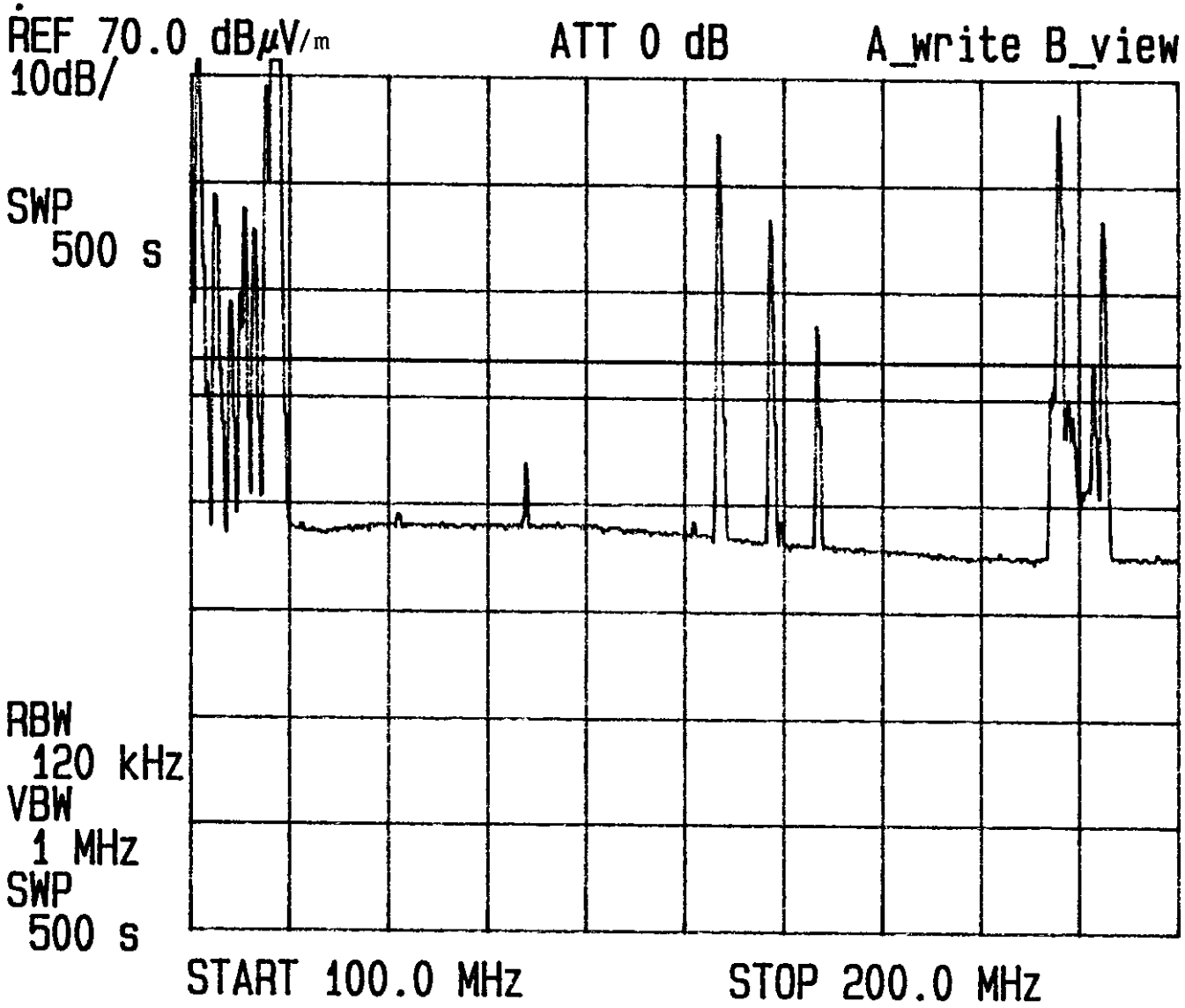
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 30M-100MHz	SPEC: FCC 15.209(a)	ANT.HT/POL: H
DETECTOR: AMBIENT	ANTENNA:	EUT POSITION:
DATE: 12/30/98	TEST SITE: 3 METER	TESTER:



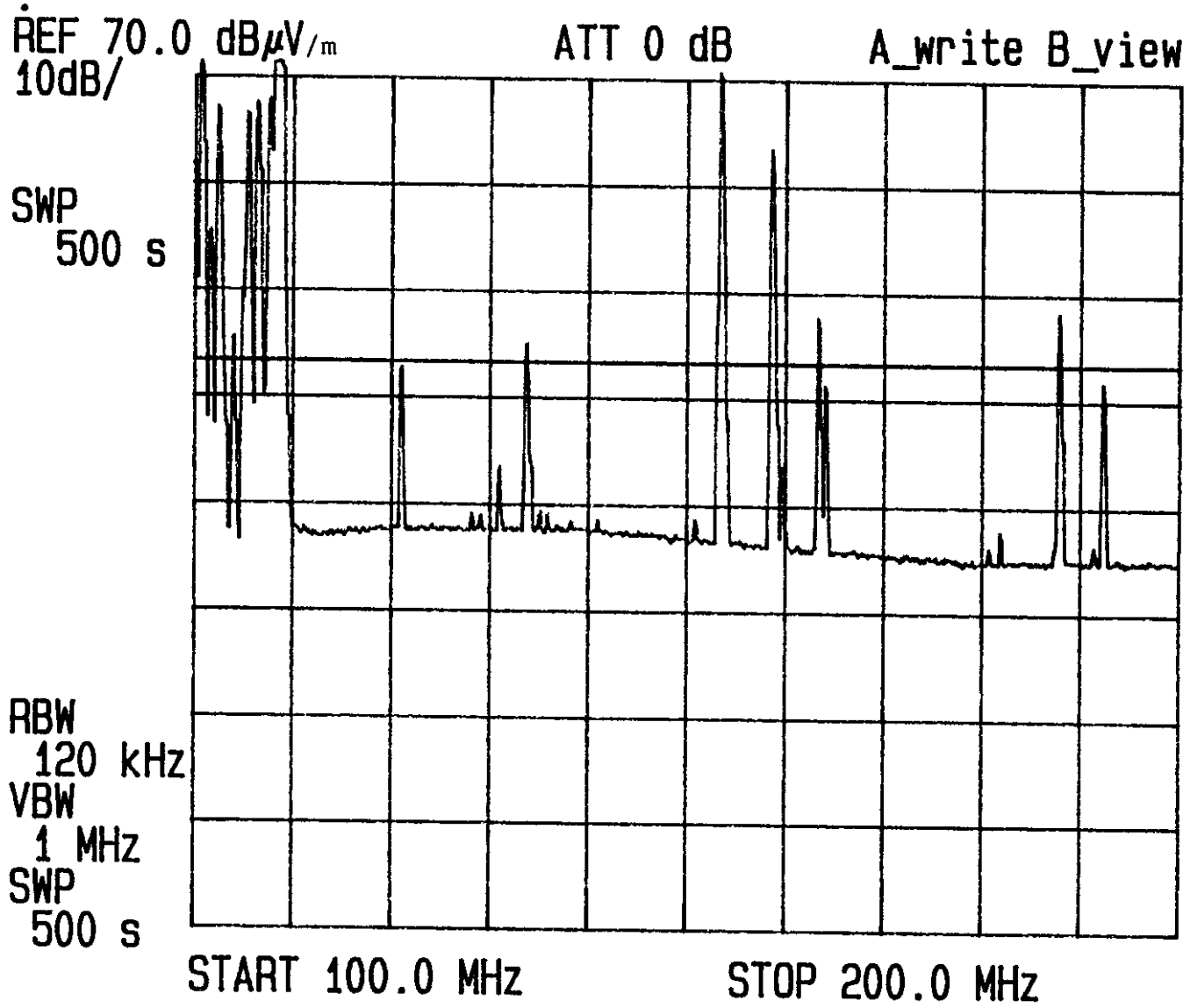
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 30M-100MHz	SPEC: FCC 15.209(a)	ANT.HT/POL: V
DETECTOR: AMBIENT	ANTENNA:	EUT POSITION:
DATE: 12/xx/14	TEST SITE: 3 METER	TESTER:



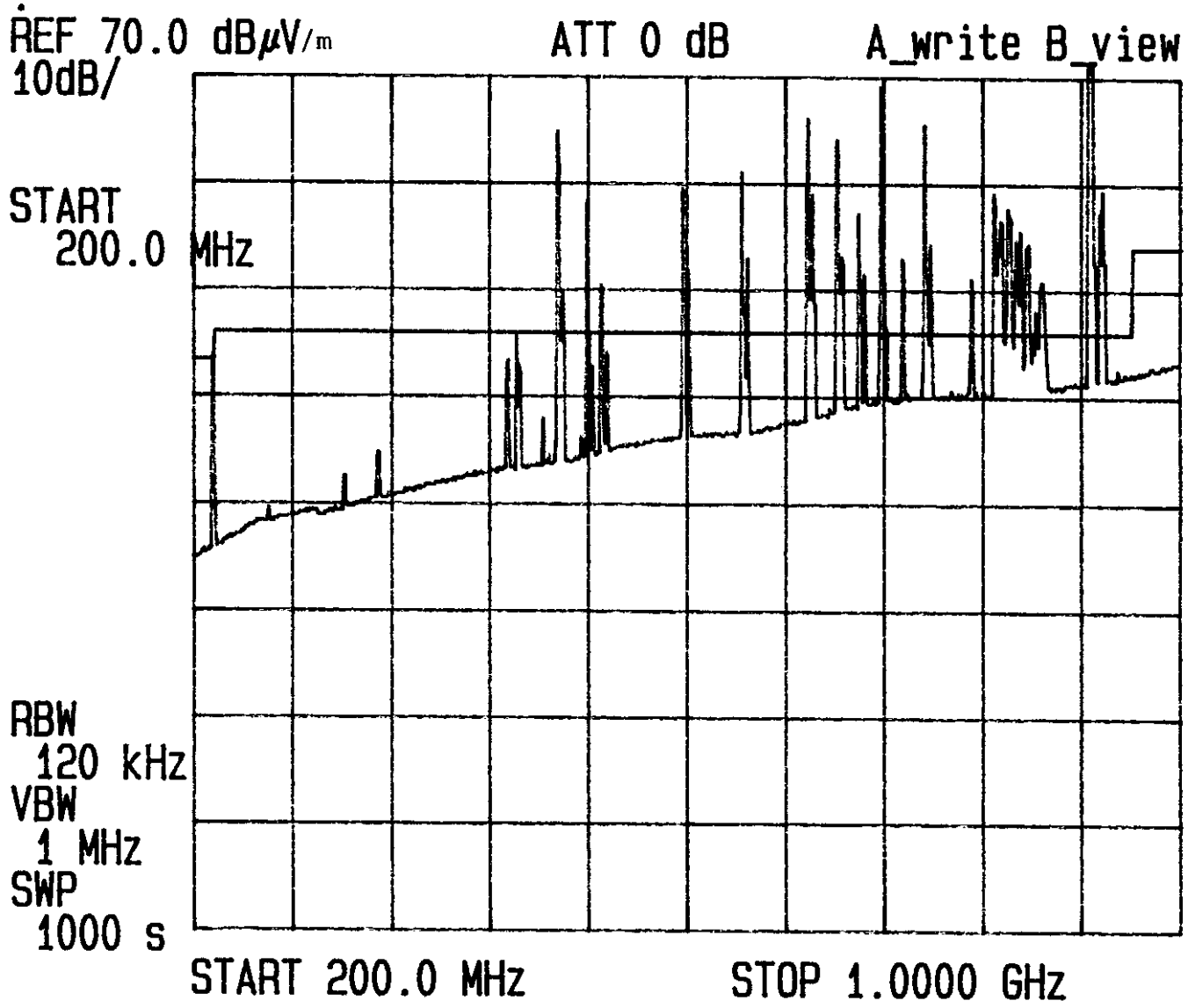
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 100M-200MHz	SPEC: FCC 15.209(a)	ANT.HT/POL: H 1.5M
DETECTOR: AMBIENT	ANTENNA:	EUT POSITION:
DATE: 12/30/98	TEST SITE: 3 METER	TESTER:



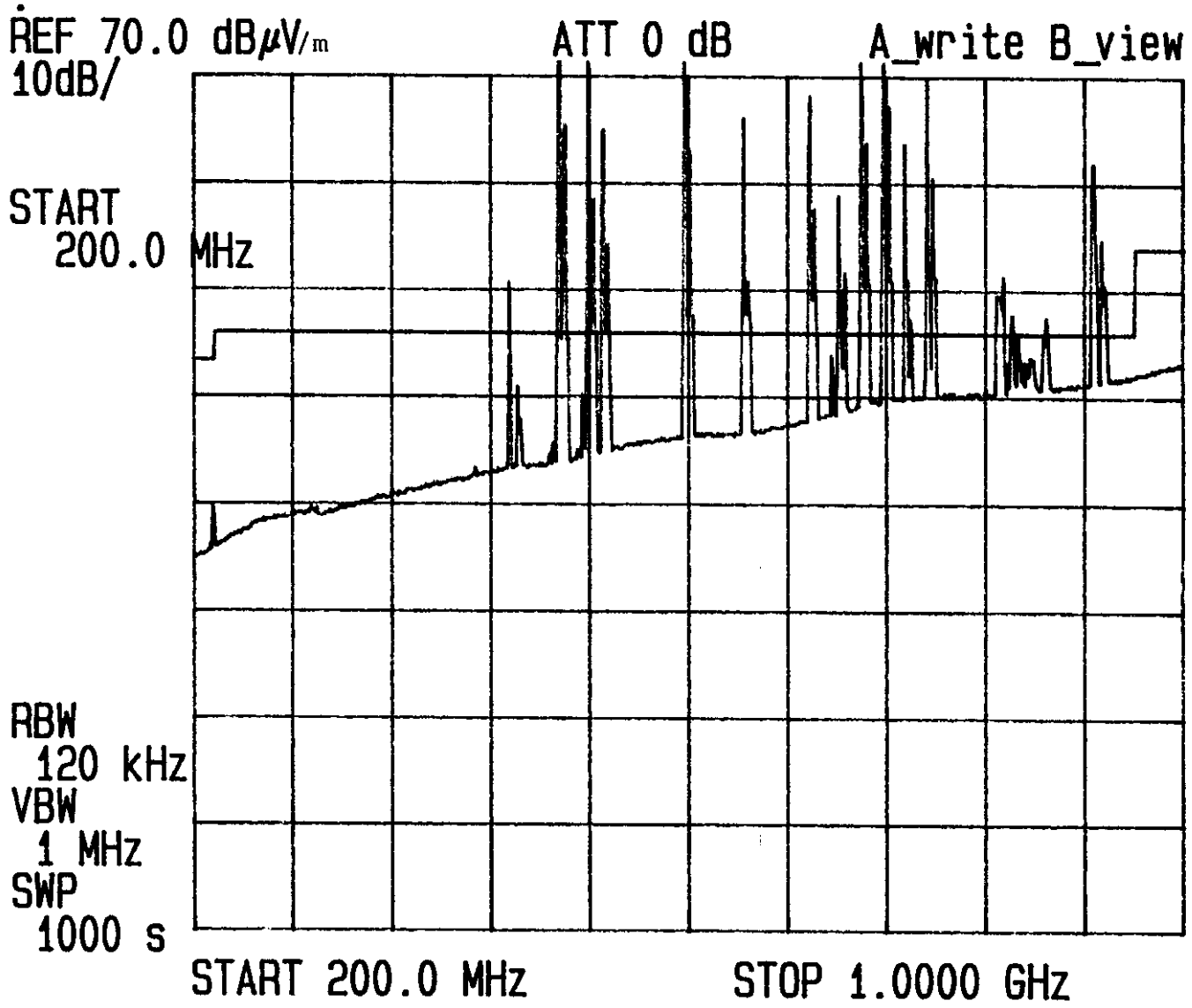
TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 100M-200MHz	SPEC: FCC 15.209(a)	ANT.HT/POL: V 1.75M
DETECTOR: AMBIENT	ANTENNA:	EUT POSITION:
DATE: 12/30/96	TEST SITE: 3 METER	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 200M-1GHz	SPEC: FCC 15.209(a)	ANT.HT/POL: V / 1.5m
DETECTOR: AMBIENT	ANTENNA:	EUT POSITION:
DATE: 12/30/98	TEST SITE: 3 METER	TESTER:



TEST: RAD. EMISSIONS	EUT: REMOTE IDU/38GHz HIGH 4 ODU	S/N: 109/00002
FREQ: 200M-1GHz	SPEC: FCC 15.209(a)	ANT.HT/POL: H
DETECTOR: AMBIENT	ANTENNA:	EUT POSITION:
DATE: 12/30/98	TEST SITE: 3 METER	TESTER:



DATA SHEET 6.1.3.2-57

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