

WLAN PC Card

Model No: HWB3163

FCC ID: OSZ3163B1

FCC Part 15, Subpart C, Para. 15.247
Direct Sequence Spread Spectrum (DSSS) Transmitters
Operating in the Frequency Band from 2400 - 2483.5MHz.

TESTED FOR:

Intersil Corporation
2401 Palm Bay Road N. E.
Palm Bay, FL USA 32905
1-888-INTERSIL
www.intersil.com

PREPARED BY:

Robert J. Rood, Staff Engineer

DATE: November 17, 1999

CONFIDENTIAL

intersil

November 17, 1999

Federal Communication Commission
Equipment Approval Service
Attn: Authorization and Evaluation Division

Reference: Intersil FCC ID:

To Whom It May Concern:

Pursuant to Section 0.457 (d)(1)(ii) and 0.459 of the Commission's rules, the Applicant hereby requests confidential treatment of the Intersil supplied information accompanying this application. The confidential information includes the following:

The Intersil "HWB3163-EVAL PRISM II™ 11Mbps PCMCIA Wireless LAN Evaluation Kit Users Guide" AN9864
The Intersil Radio Schematic
The Intersil Bill of Material "BOM PRISM II™ HWB3163-04-REF Rev. B4"
The Intersil Block Diagram

The material contains trade secrets and proprietary information. Public disclosure of this information might be harmful to Intersil and provide unjustified benefits to our competitors.

Intersil understands that pursuant to 0.457 (d)(1)(ii), disclosure of the Application and all accompanying documentation will not be made before the date of the grant.

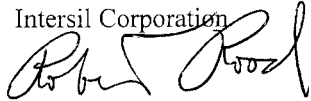
Intersil Corporation

Robert Rood
Prism II Radio Project Leader
Engineering

EXHIBIT 1. ***Rubicom FCC Test Report***
 1.0 Introduction
 2.0 Applicable Documents
 3.0 Test Site Description
 4.0 Test Instrumentation
 5.0 Test Sample Setup and Configurations
 6.0 Procedures and Results
 Appendix A

EXHIBIT 2. ***Appendix B***
 Intersil Corporation Certification Report
 Testing for Compliance with FCC Rules 15-247e
 Theoretical BER Curves for the IEEE 1 and 2Mbps Modulations
 11Mbps Channel 1 Processing Gain
 11Mbps Channel 6 Processing Gain
 11Mbps Channel 11 Processing Gain
 2Mbps Channel 6 Processing Gain

EXHIBIT 3. ***Appendix C***
 IC Labeling and Location
 Photographs of Equipment Under Test
 HWB3163-EVAL Data Sheet, FN4794
 HWB3163-EVAL Prism II™ 11Mbps PCMCIA Wireless LAN
 Evaluation Kit User's Guide, AN9864
 Schematic Diagrams
 BOM PRISM II™ HWB3163-04-REF Rev. B4
 Block Diagram
 Environmental RF Exposure

RUBICOM SYSTEMS, INC.

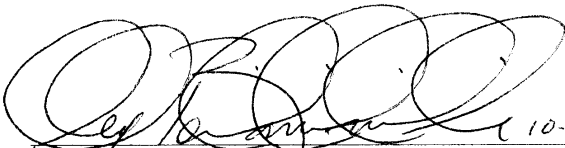
**FCC TEST REPORT
(INTENTIONAL RADIATOR)
FOR THE
INTERSIL CORPORATION
PRISM II 2.4GHz
WIRELESS TRANSMITTER
COPY 1**



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

THIS REPORT SHALL NOT BE REPRODUCED
EXCEPT IN FULL WITHOUT THE WRITTEN
APPROVAL OF THE TESTING LABORATORY

**FCC TEST REPORT
(INTENTIONAL RADIATOR)
FOR THE
INTERSIL CORPORATION
PRISM II 2.4GHz
WIRELESS TRANSMITTER
S/N: 9936-0027**

Prepared by:  10-12-99
Alex Belardinelli

Tested by:  10-12-99
Alex Belardinelli

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

Performed for:
INTERSIL CORPORATION
P.O. Box 883
Melbourne, Florida 32901

Received: September 20, 1999

Completed: October 8, 1999

TABLE OF CONTENTS

| <u>Paragraph</u> | <u>Title</u> | <u>Page</u> |
|-------------------|---|-------------|
| | CERTIFICATION | 1 |
| | ABSTRACT | 2 |
| 1.0 | INTRODUCTION | 3 |
| 1.1 | Purpose | 3 |
| 1.2 | Requirements | 3 |
| 1.3 | Unit Under Test Description | 5 |
| 1.4 | Summary of Results | 5 |
| 2.0 | APPLICABLE DOCUMENTS | 6 |
| 3.0 | TEST SITE DESCRIPTION | 7 |
| 3.1 | Environmental Conditions | 7 |
| 4.0 | TEST INSTRUMENTATION | 8 |
| 5.0 | TEST SAMPLE SETUP AND CONFIGURATIONS | 9 |
| 6.0 | PROCEDURES AND RESULTS | 11 |
| 6.1 | General | 11 |
| 6.2 | Power Line Conducted 15.207 | 12 |
| 6.3 | Radiated Emissions 15.209/15.205 | 12 |
| 6.3.1 | <u>Radiated Emissions (Pre-Scans)</u> | 12 |
| 6.3.2 | <u>Radiated Emissions 15.209/15.205</u> | 14 |
| 6.3.3 | <u>Peak Ambient (EUT Off/Support Equipment "On")</u> | 14 |
| 6.4 | Operation Within The Bands (2.4GHz-2.4835GHz) 15.247(2)(b)(c)(d) | 77 |
| 6.4.1 | <u>6dB Bandwidth 15.247(2)</u> | 77 |
| 6.4.2 | <u>Peak Output Power 15.247(2)(b)</u> | 82 |
| 6.4.3 | <u>Out of Band Emission 15.247(2)(c)</u> | 82 |
| 6.4.4 | <u>Power Spectral Density 15.247(2)(d)</u> | 108 |
| APPENDIX A | COMPLIANCE LETTER | 116 |

CERTIFICATION

Rubicom Systems, Inc. certifies the information obtained in this report was performed consistent with the requirements of ANSI C63.4-1992. The Intersil Corp. PRISM II Wireless Transmitter complies with the requirements of CFR 47 Part 15 for Intentional Radiators as required in Paragraph 15.247(a)(2)(b)(1)(c) and (d).

This data was obtained while testing a PRISM II, serial number 9936-0027, furnished by Intersil Corp. Any modifications to the unit as tested may invalidate the data and void this certification.

ABSTRACT

This report presents test results of the emanations found emitting from the Intersil Corp. 2.4GHz PRISM II Wireless Transmitter and the comparison of these emissions to the requirements of FCC, Title 47, Part 15, Subpart C for Intentional Radiators as required for direct sequence type spread spectrum systems operating in the 2.4 to 2.4835GHz range.

This testing was performed on a 3 meter open field test site at Rubicom Systems, Inc. (RSI). The testing was performed for Intersil under purchase order 0400244252. The results of this test effort demonstrate compliance of the Intersil Corp. 2.4GHz PRISM II Wireless Transmitter to FCC, Title 47, Part 15, Subpart C Intentional Radiators (Paragraph 247(2)). The unit under test was serial number 9936-0027 for the radiated and conducted measurements.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to show compliance of the Intersil PRISM II Wireless Transmitter to the requirements of Part 15 of the FCC Rules and Regulations (47CFR, Part 15, Subpart C) for Intentional radiators. The applicable paragraphs covered by this report are 15.247(2) (b), (c).

1.2 Requirements

The test requirements for an Intentional Radiator are as follows:

RADIATED (15.205)

| <u>Frequency (MHZ)</u> | <u>Field Strength (μV/m)</u> | <u>Measurement Distance (m)</u> |
|------------------------|---|---------------------------------|
| 0.009-0.490 | 2400/F (KHz) | 300 |
| 0.490-1.705 | 240000/F (KHz) | 30 |
| 1.705-30.0 | 30 | 30 |
| 30-88 | 100 | 3 |
| 88-216 | 150 | 3 |
| 216-960 | 200 | 3 |
| Above 960 | 500 Average | 3 |

CONDUCTED (15.207)

| <u>Freq. (MHz)</u> | <u>μVolts</u> | <u>dB>μV</u> |
|--------------------|------------------------------|--------------------------------|
| .450-30MHz | 250 | 48 |

DIRECT SEQUENCE SPREAD SPECTRUM SYSTEM

15.247(2) Bandwidth

The minimum 6dB bandwidth shall be greater than 500KHz.

15.247(2)(b) Maximum Peak Power

The maximum peak output power of the transmitter shall not exceed 1 watt.

15.247(2)(c) Out of Band Emissions, Radiated & Conducted

Power produced by Modulation Products of the Spreading Sequence, Information Sequence and the Carrier Frequency.

Levels in any 100KHz outside the frequency band shall be 20dB below that of any 100KHz band within the band that contains the highest level of the desired power or the requirements of 15.209, whichever results in lesser attenuation. All other emissions shall not exceed the limits of Section 15.209(a). Section 15.205 requirements are applicable.

15.247(d) Power Density

Transmitted power density averaged over any one (1) second interval shall not be greater than 8dBm in any 3KHz bandwidth.

1.3 Unit Under Test Description

PRISM was the first comprehensive chip set solution for 2.4GHz Direct Sequence Spread Spectrum (DSSS) applications which takes the complexity out of the design of wireless systems: wireless local area network links, handheld transceivers and point-to-point microwave communications systems.

PRISM II is the latest generation chip set which packs a high-level system architecture into 5 interoperable IC's with data rates of 1,2, 5.5 and 11MBPS applications based on the IEEE802.11 global standard for WLAN applications.

1.4 Summary of Results

Paragraph 6.0 of this document presents the detailed results of each required test for the PRISM II. Each paragraph lists the signals determined to be emanating from the PRISM II.

No modifications were required of the unit under test for this test effort.

The data shows compliance to the requirements stated in paragraph 1.2 of this document.

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

This test effort was performed from 21 September, 1999 through 6 October, 1999. Typical conditions for the test site during this testing was:

| | |
|--------------|-----------------------------|
| Temperature: | 75° - 82° F |
| Barometer: | 29.40 - 29.70 inches |
| Humidity: | 70 - 80% |

4.0 TEST INSTRUMENTATION

The following test equipment was used to perform this testing.

| <u>Qty.</u> | <u>Description</u> | <u>Manufacturer</u> | <u>Model No.</u> | <u>Cal.Due</u> | <u>Cal Cycle</u> |
|-------------|--------------------------|---------------------|--------------------|----------------|------------------|
| 1 | Spectrum Analyzer | Advantest | R3271A | 04/07/00 | 1 yr. |
| 2 | Bi-Log antenna | Chase | CLB6111B | 07/10/00 | 1 yr. |
| 1 | Plotter | Hewlett Packard | 7440A | NCR | |
| 1 | Ridge Guide Horn Antenna | Electro Metrics | RGA-180 1-18GHz | 01/15/00 | 1 yr. |
| 1 | Power Meter (Peak) | Wavetek | 1018B | 06/16/00 | 1 yr. |
| 1 | Pre-Amplifier | Hewlett Packard | 8449B | 05/25/01 | 2 yr. |
| 1 | Bandreject Filter | Lorch Microwave | 6BR6-2440 | 03/04/01 | 2 yr. |

5.0 TEST SAMPLE SETUP AND CONFIGURATIONS

The PRISM II was placed on a nonconductive table inside a shielded enclosure. The PRISM II was installed into a Compaq Armada 1700 Laptop computer. During conducted measurements the output was coupled directly to the spectrum analyzer.

During radiated emissions the PRISM II was placed on the turn table. The transmitter was put into operation with a 1MBPS modulation during the radiated measurements.

Photo 1 presents the unit placed on the turntable during radiated testing.

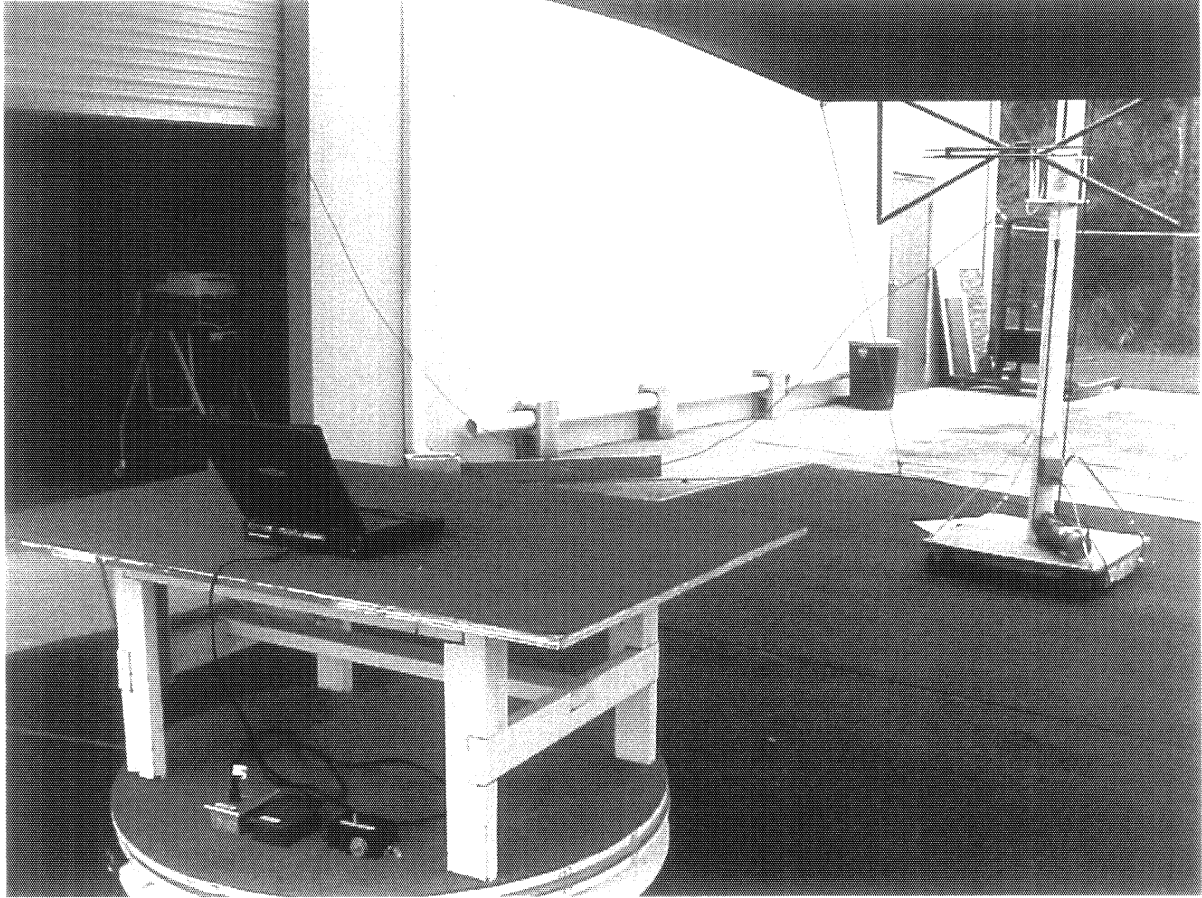


PHOTO 1

6.0 PROCEDURES AND RESULTS

6.1 General

The data presented in this report is provided using the Advantest Spectrum Analyzers. The analyzer allows the antenna factors/cable loss, etc., to be listed in tables on a memory card. Test setups for recall are programmed. This method allows the tester to plot data instantaneously against the specification requirement. The specification limits are presented with the extrapolation for distance (20dB/decade) where necessary. When external attenuation is required for analyzer protection, the reference level offset is used.

Signal identification is partially accomplished by turning the system power "on" and "off" while observing the spectrum. All signals found to be emitting from the EUT are maximized in azimuth and elevation. Should the need arise to have more than a single plot of the frequency range the maximized signal would be linked to the proper plot.

The displayed levels are calculated in the analyzer as follows: MTR Reading + Antenna Factor + Cable Loss - Gain (where appropriate) = Signal level.

NOTE: The correction factors and conversion factors are combined in the memory card.

6.2 Power Line Conducted 15.207

The unit was installed into a Compaq Armada 1700 Laptop computer. Power line conducted was then run on the laptop. Both the phase and neutral leads were tested using a Solar Model 8012-50-24-BNC PLISN (50 μ H/50ohm). Data Sheets 6.2-1 and 6.2-2 present the 450KHz-30MHz Quasi Peak sweeps. Photo 2 presents the conducted emissions described.

6.3 Radiated Emissions 15.209/15.205

6.3.1 Radiated Emissions (Pre-Scans)

Radiated emission pre-testing was performed on the system inside the shielded enclosure. Pre-scans were performed over the frequency range of 30MHz-1GHz. These scans are for frequency content in the high ambient range. This test is performed at 1 meter. No significant signals were detected during this evaluation. Data Sheets 6.3.1-1 through 6.3.1-12 present the results of this testing.

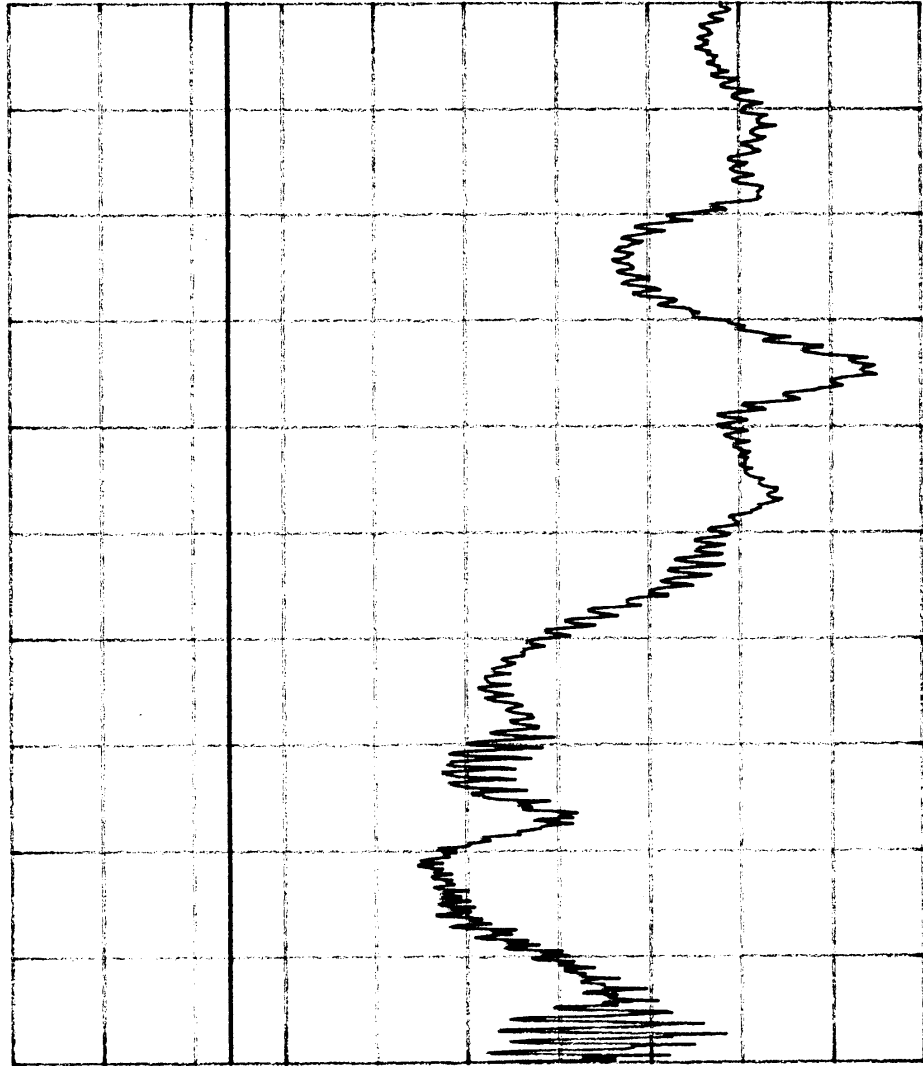


PHOTO 2



TEST: FCC CONDUCTED EUT: Intersil PRISM II S/N: 007-07
FREQ: 450KHz-30MHz SPEC: 15.247 ANT.HT/POL: N/A
DETECTOR: QUASI PEAK LINE UNDER TEST: PHASE EUT POSITION: FRONT
DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

REF 60.0 dB μ V ATT 0 dB A_write B_blank
5dB/



RBW 9 KHZ
VBW 1 MHZ
SWP 200 S

START 450 KHZ STOP 30.00 MHZ

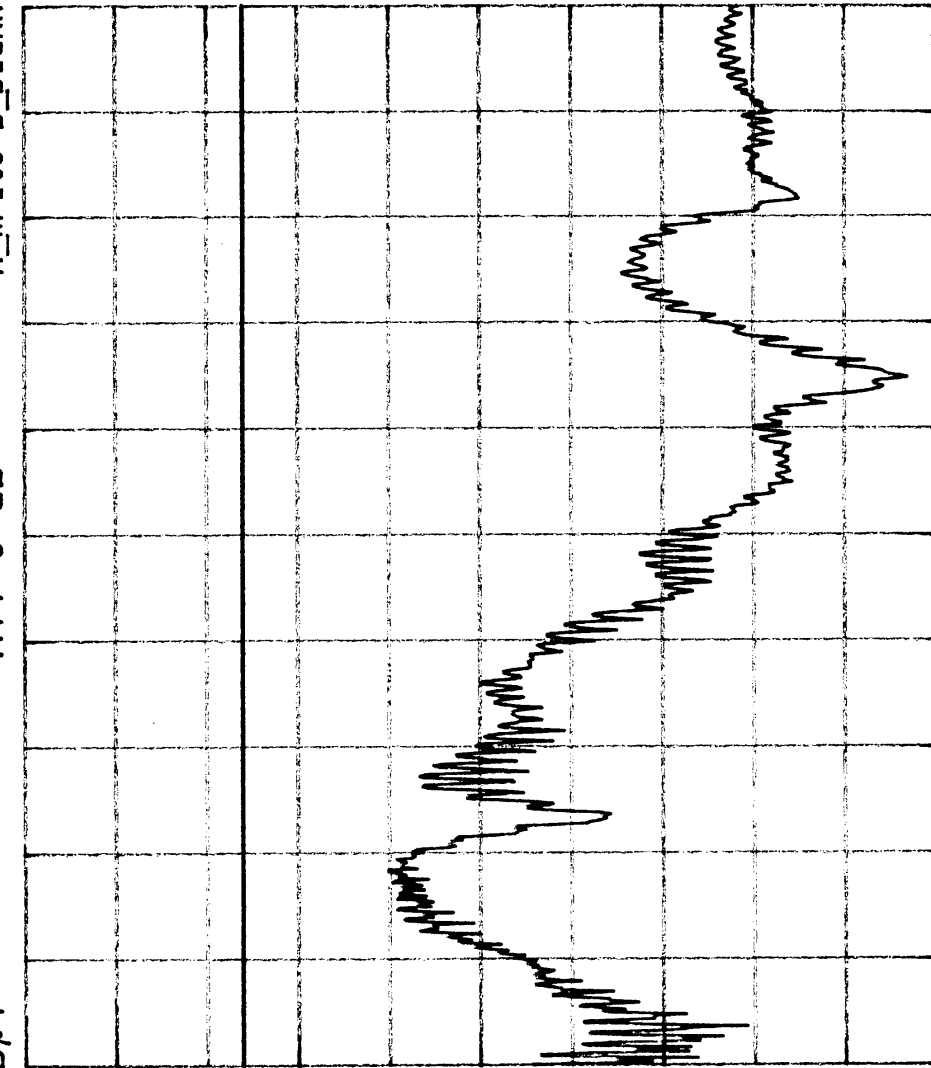
JA-1652

DATA SHEET 6.2-1



TEST: FCC CONDUCTED EUT: Intersil PRISM II S/N: 007-07
 FREQ: 450KHZ-30MHZ SPEC: 15.247 ANT.HT/POL: N/A
 DETECTOR: QUASI PEAK LINE UNDER TEST: NEUTRAL EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

REF 60.0 dB μ V ATT 0 dB A_write B_blank



RBW 9 KHZ
 VBW 1 MHZ
 SWP 200 S

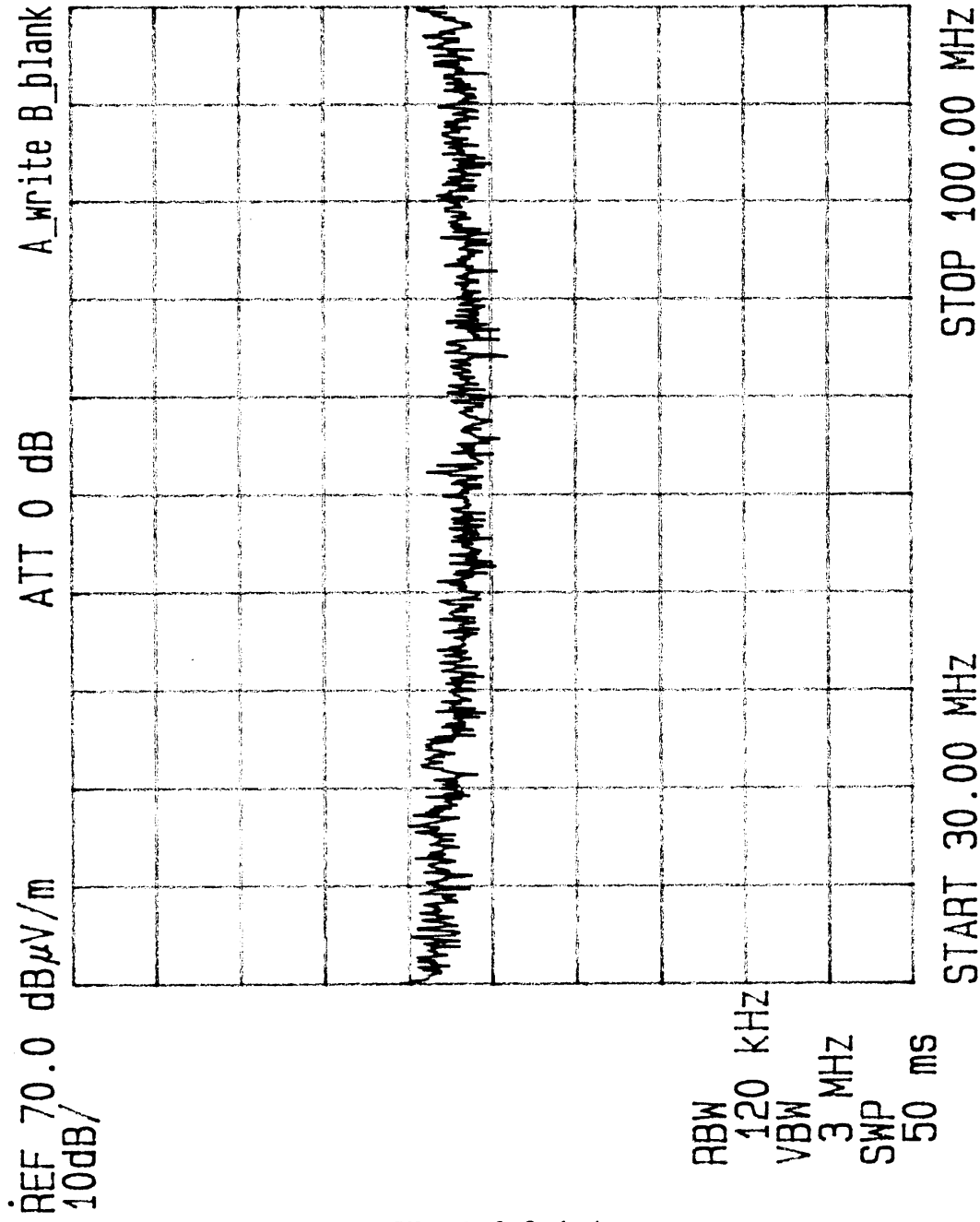
START 450 KHZ STOP 30.00 MHZ

JA-1652

DATA SHEET 6.2-2



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 30M-100MHZ SPEC: 15.247 ANT.HT/POL: 1M/ H
 DETECTOR: PEAK LINE UNDER TEST: N/A EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER:

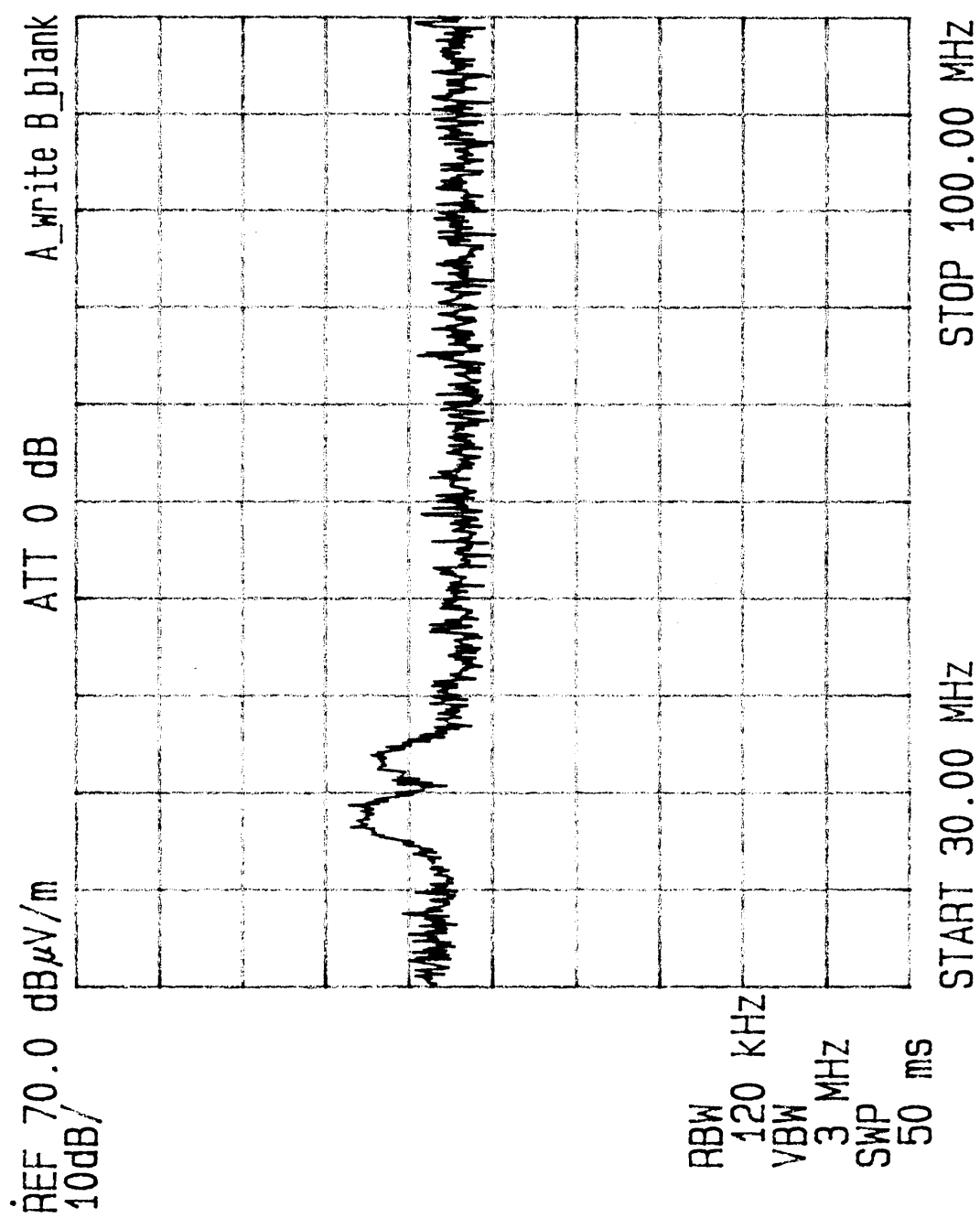


JA-1652

DATA SHEET 6.3.1-1



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 30M-100MHZ SPEC: 15.247 ANT.HT/POL: 1M/ V
 DETECTOR: PEAK LINE UNDER TEST: N/A EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*



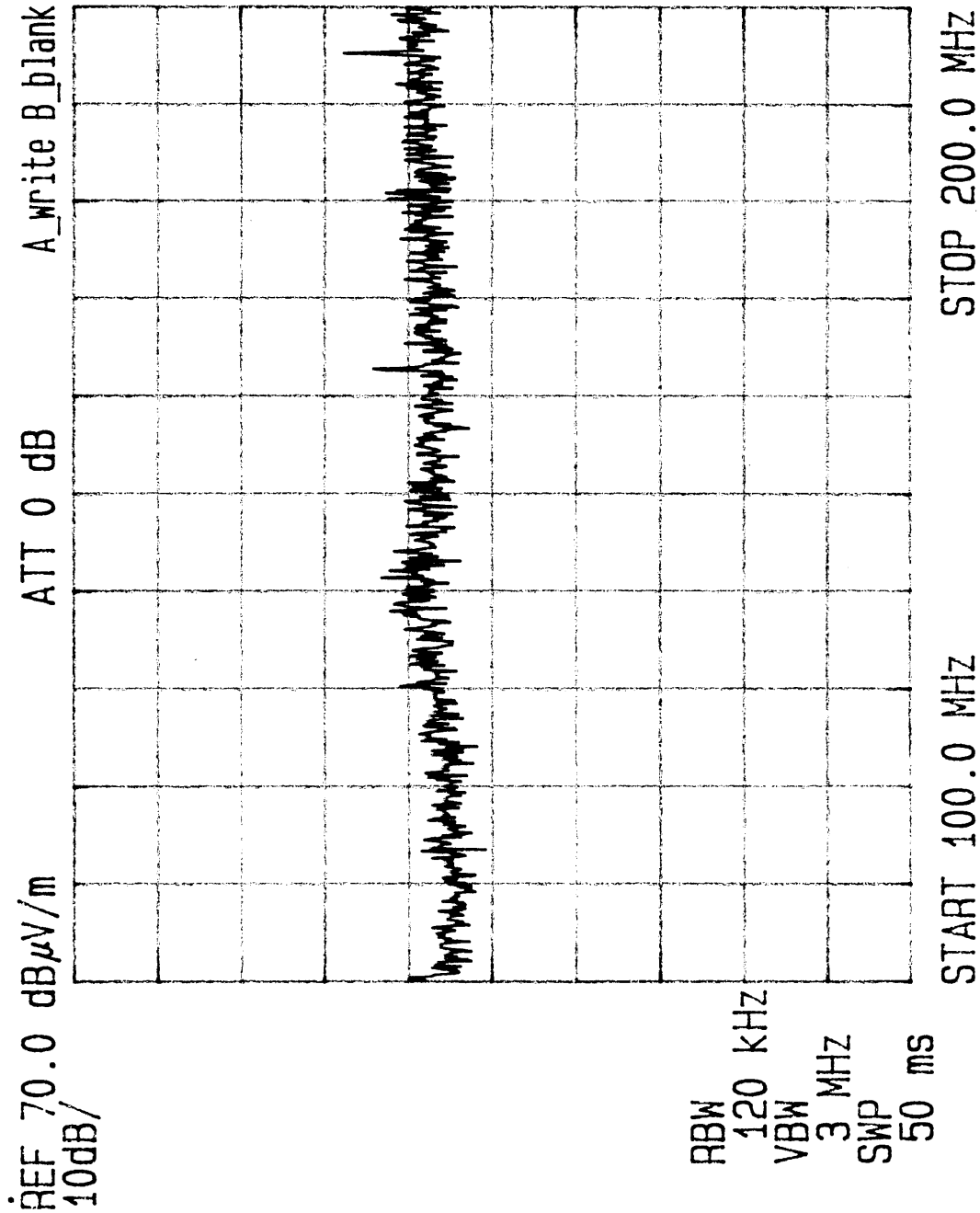
JA-1652

DATA SHEET 6.3.1-2



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 100M-200MHZ SPEC: 15.247 ANT.HT/POL: 1M/ H
 DETECTOR: PEAK LINE UNDER TEST: N/A EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER:

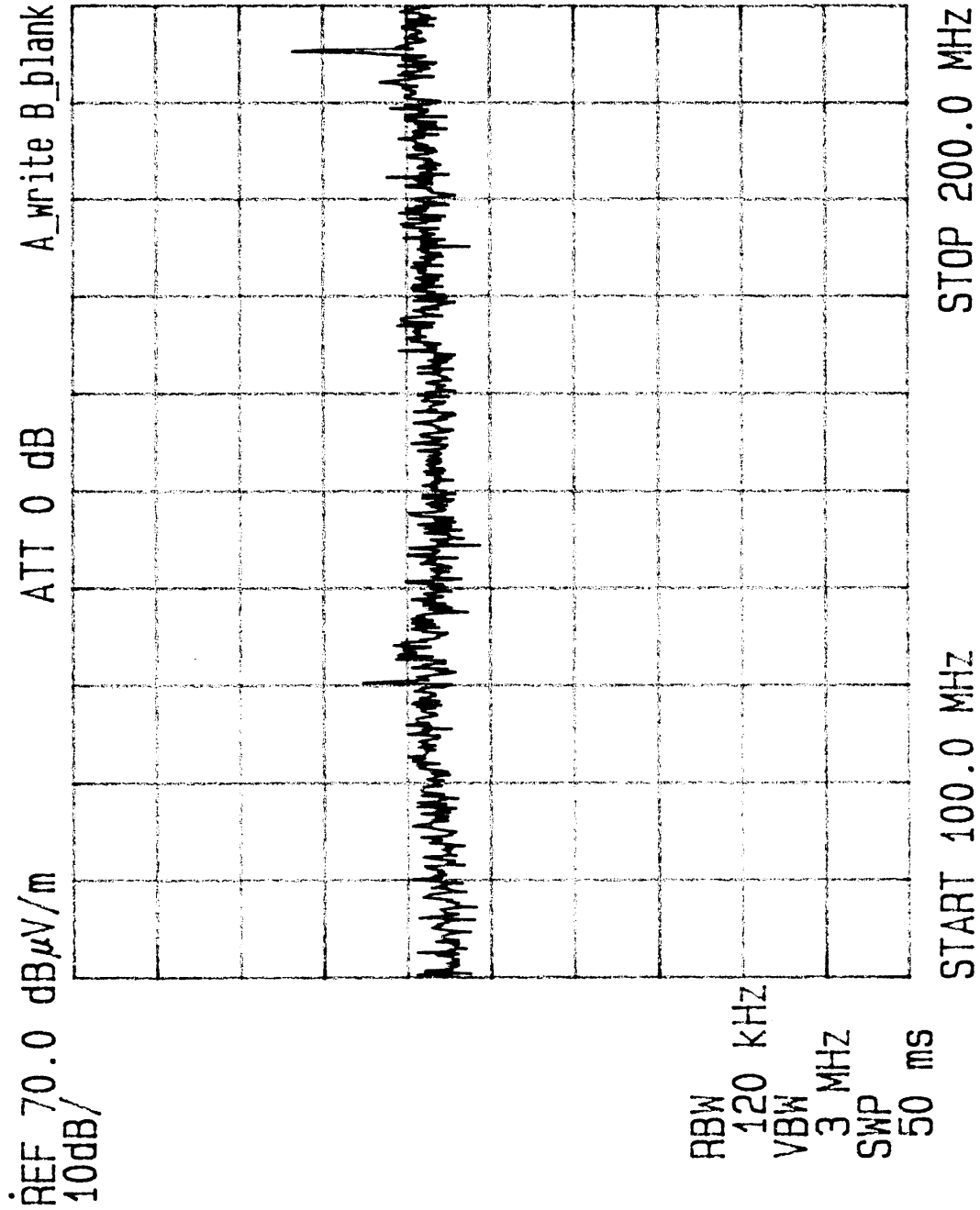
JA-1652



DATA SHEET 6.3.1-3



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 100M-200MHZ SPEC: 15.247 ANT. HT/POL: 1M/ V
 DETECTOR: PEAK LINE UNDER TEST: N/A EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

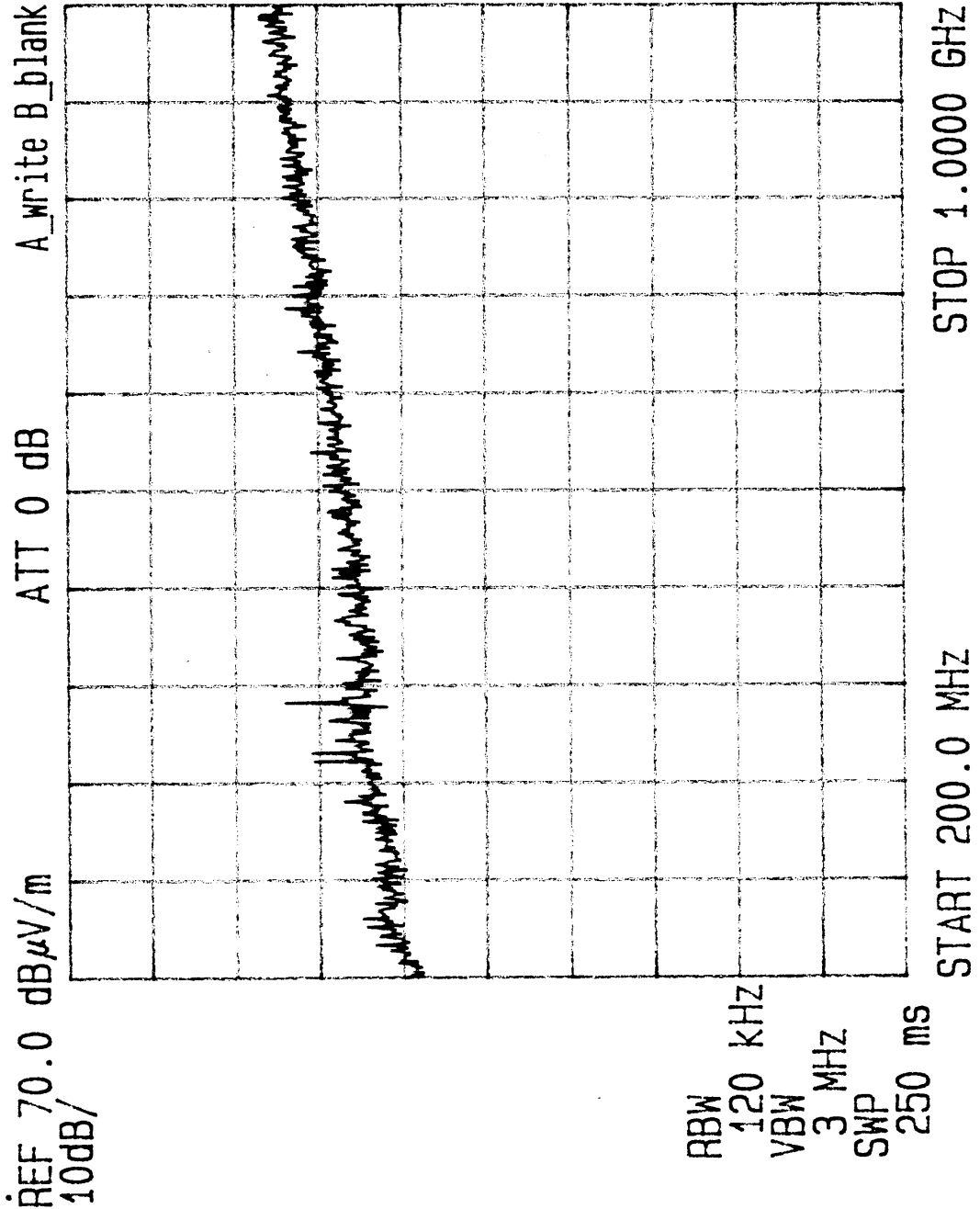


JA-1652

DATA SHEET 6.3.1-4



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 200M-1GHz SPEC: 15.247 ANT.HT/POL: 1M/ H
 DETECTOR: PEAK LINE UNDER TEST: N/A EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*



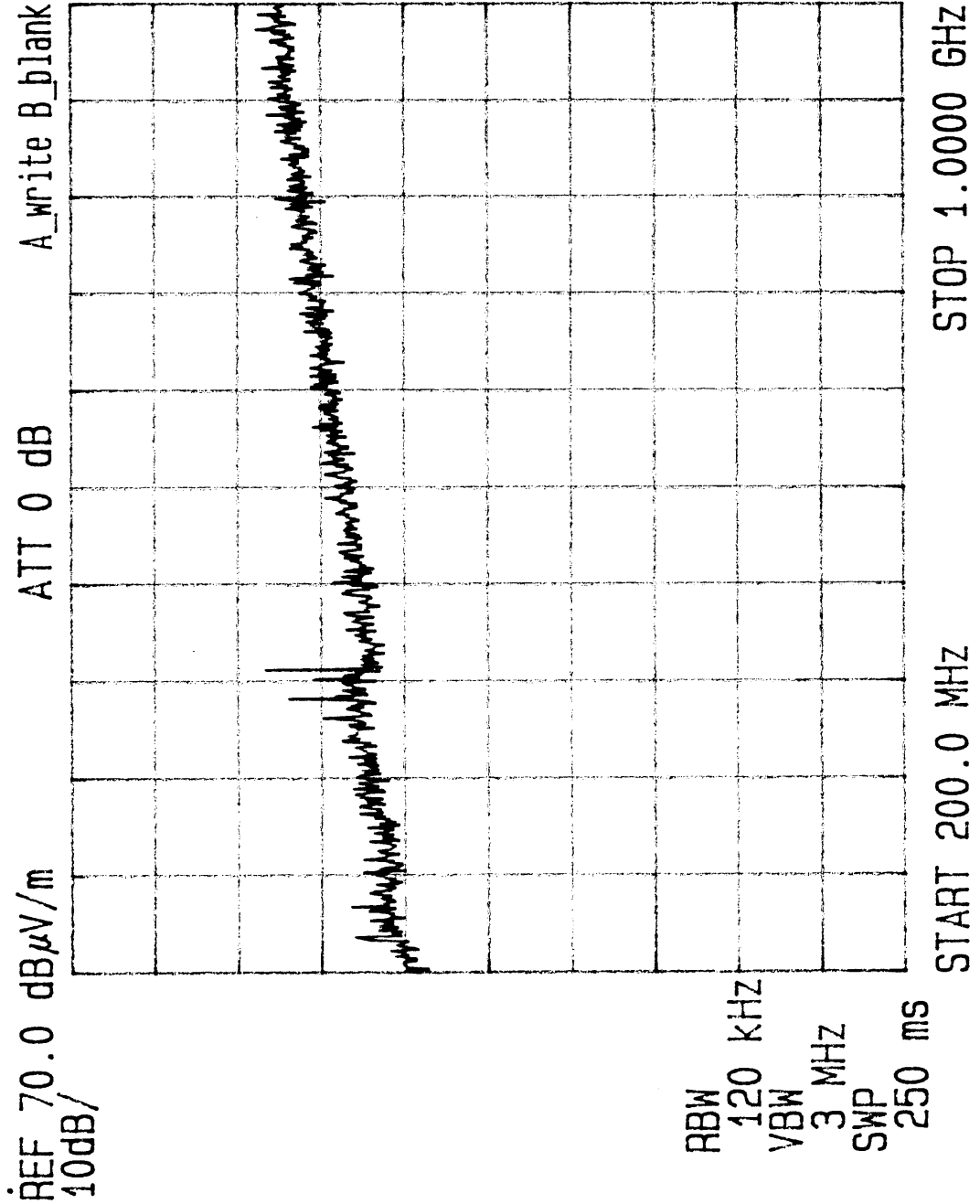
JA-1652

DATA SHEET 6.3.1-5



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 200M-1GHZ SPEC: 15.247 ANT.HT/POL: 1M/ V
 DETECTOR: PEAK LINE UNDER TEST: N/A EUT POSITION: FRONT
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

JA-1652

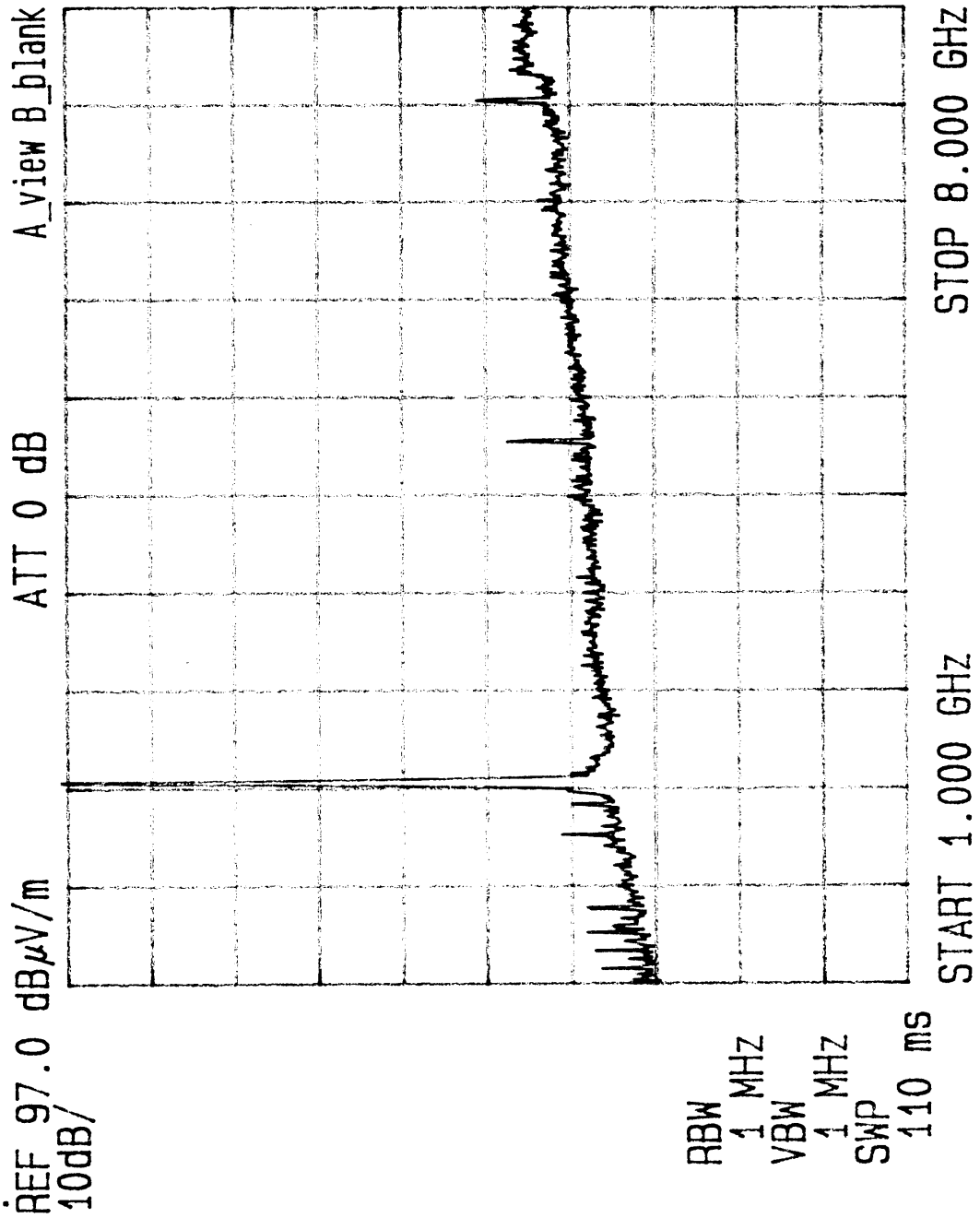


DATA SHEET 6.3.1-6



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
FREQ: 1G-8GHZ SPEC: 15.247 ANT.HT/POL: H
DETECT: PEAK LINE UNDER TEST: N/A EUT POSITION:
DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

JA-1652

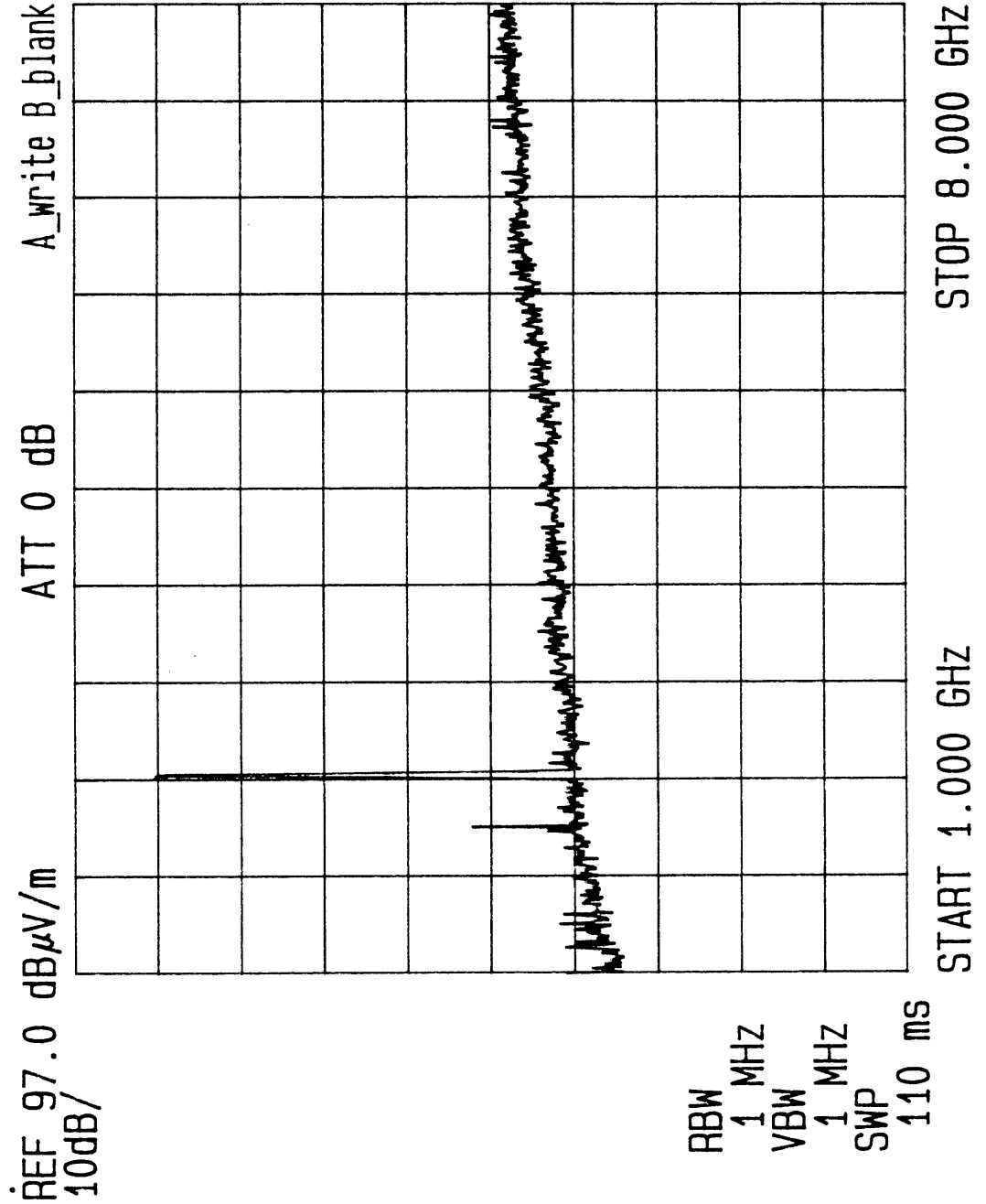


DATA SHEET 6.3.1-7



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 1G-8GHZ SPEC: 15.247 ANT.HT/POL: V
 DETECT: PEAK LINE UNDER TEST: N/A EUT POSITION:
 DATE: 4-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

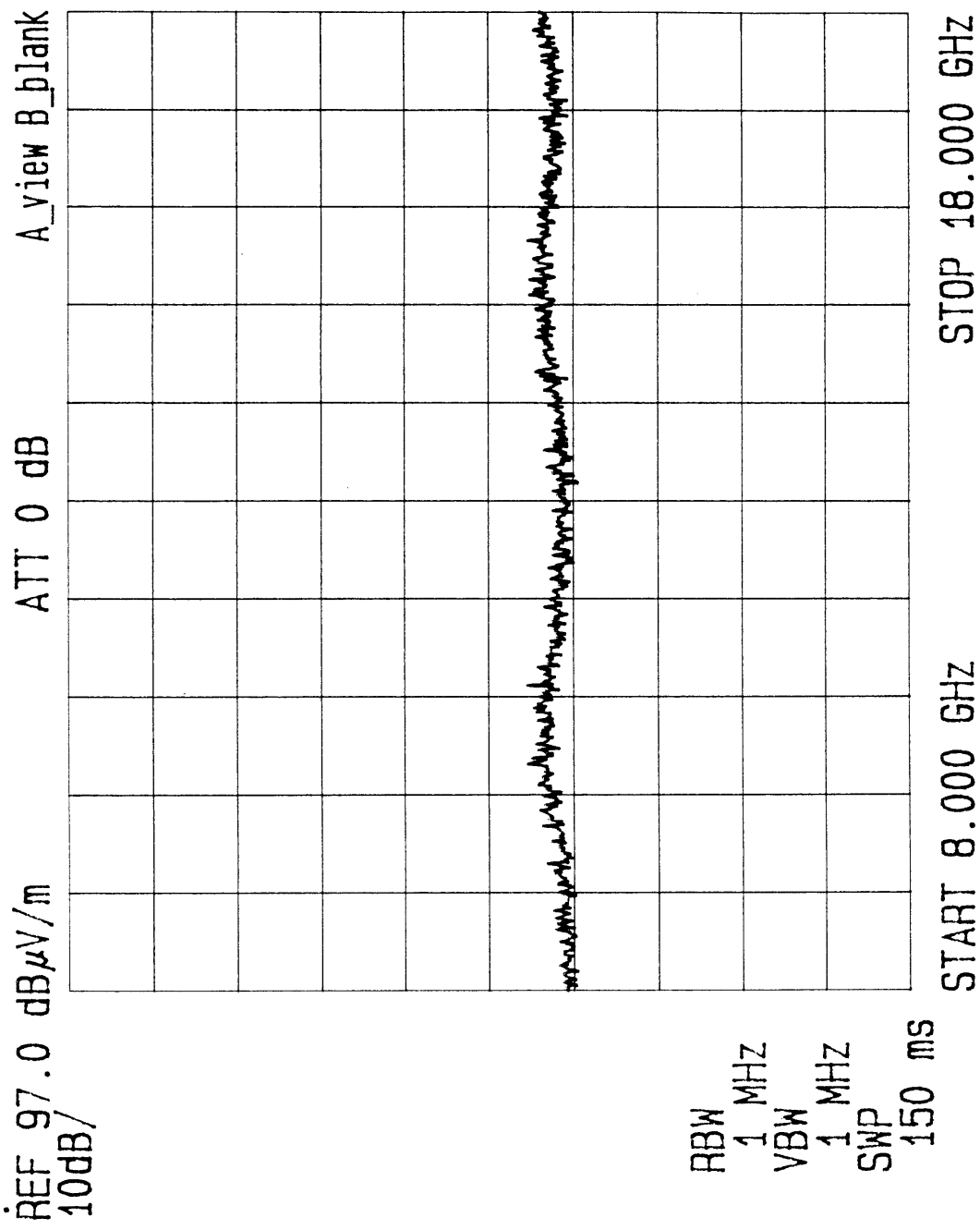
JA-1652



DATA SHEET 6.3.1-8



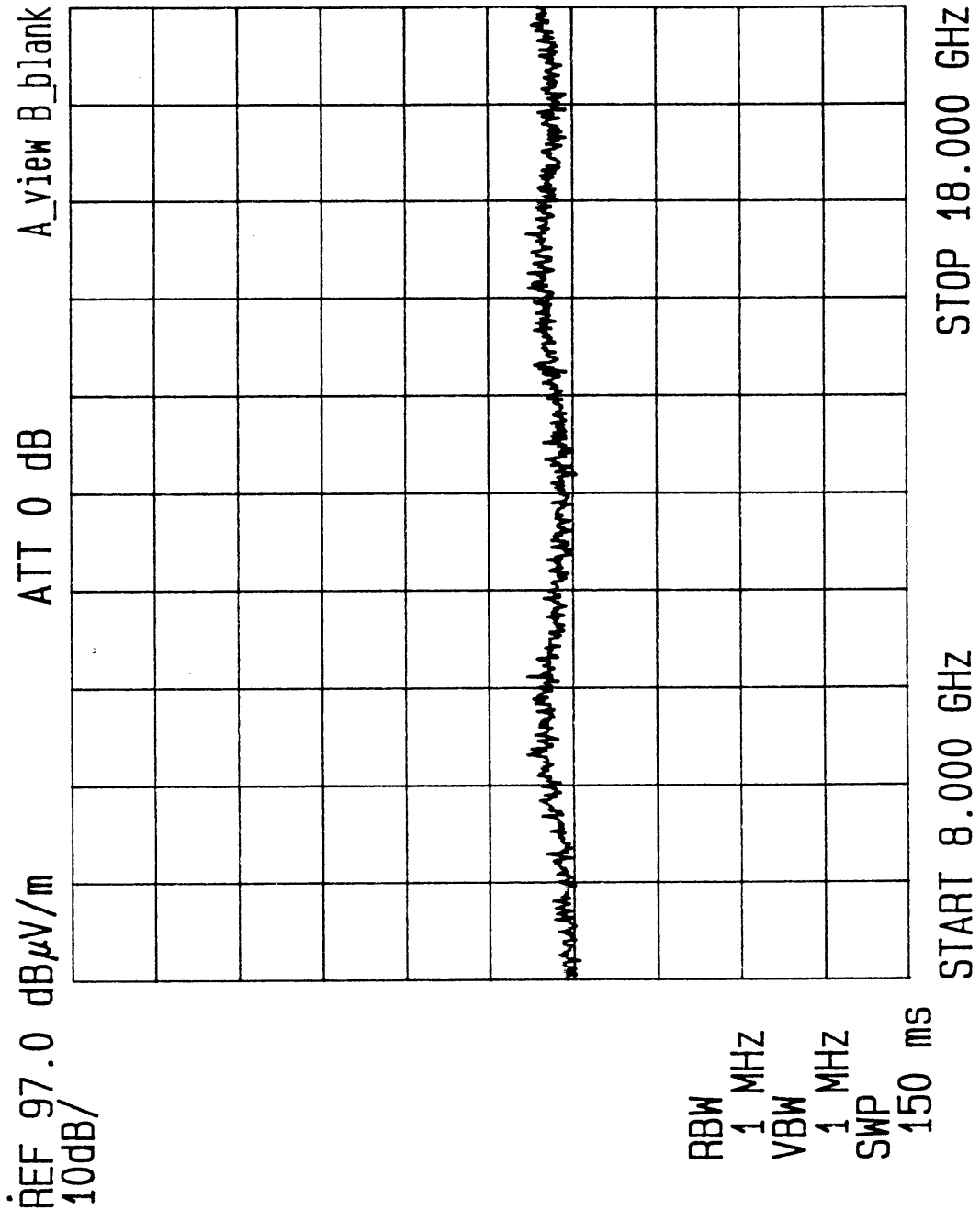
TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 8G-18GHZ SPEC: 15.247 ANT.HT/POL: H
 DETECT: PEAK LINE UNDER TEST: N/A EUT POSITION:
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]* *[Signature]*



JA-1652



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 8G-18GHZ SPEC: 15.247 ANT.HT/POL: V
 DETECT: PEAK LINE UNDER TEST: N/A EUT POSITION:
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

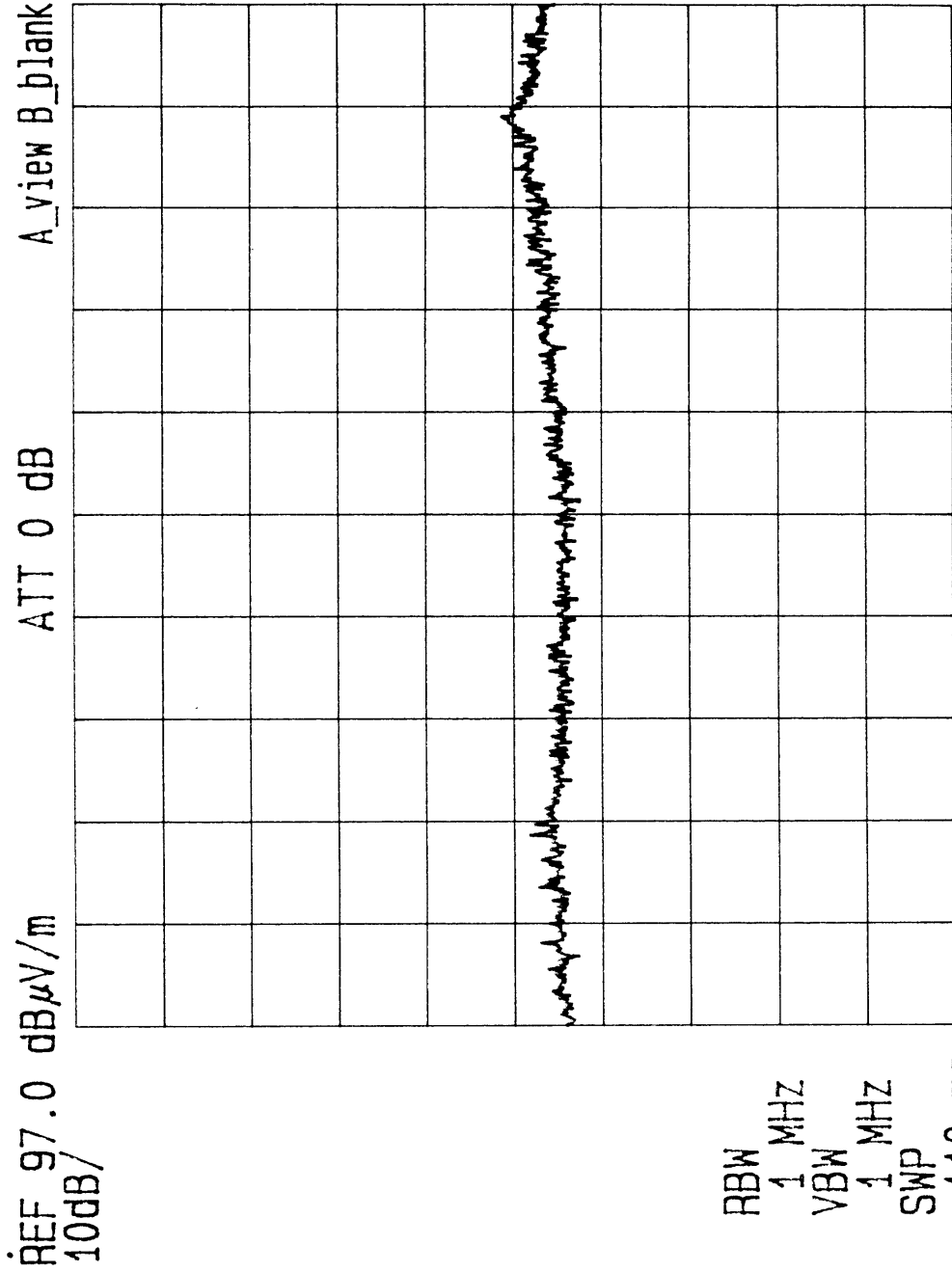


JA-1652

DATA SHEET 6.3.1-10



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 18GHz-25GHz SPEC: 15.247 ANT.HT/POL: H
 DETECT: PEAK LINE UNDER TEST: N/A EUT POSITION:
 DATE: 9-30-99 TEST SITE: ROOM 1 TESTER: *[Signature]*

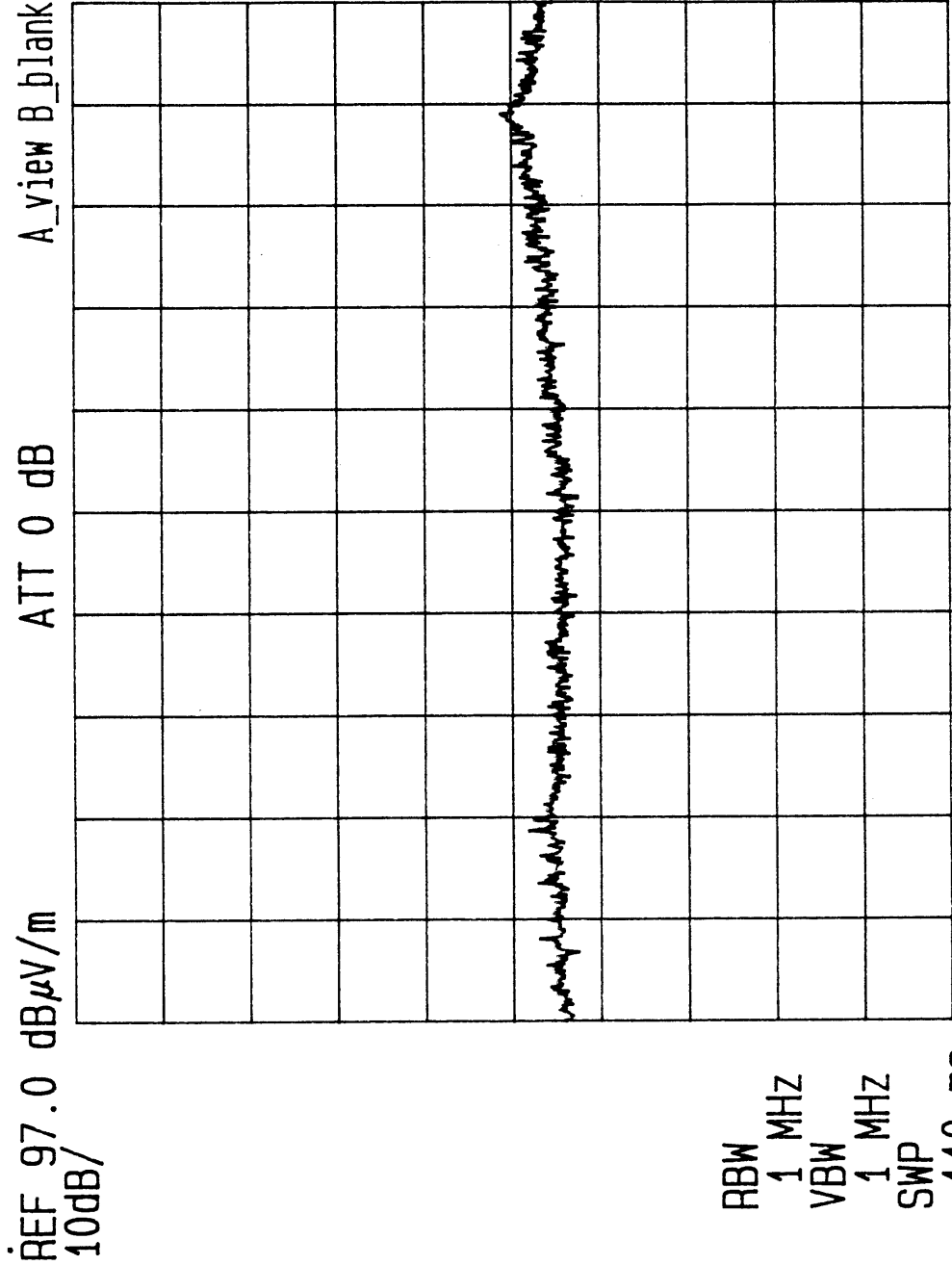


START 18.000 GHz STOP 25.000 GHz

JA-1652



TEST: FCC RADIATED EUT: Intersil PRISM II S/N: 9936-0027
 FREQ: 18GHz-25GHz SPEC: 15.247 ANT.HT/POL: V
 DETECT: PEAK LINE UNDER TEST: N/A EUT POSITION:
 DATE: 9-30-92 TEST SITE: ROOM 1 TESTER: *[Signature]*



JA-1652