*FCC Certification Test Report*

# FCC Certification Test Report for Industrial Design & Mfg. LLC R9N-SD201

**August 30, 2004**

Prepared for:

**Industrial Design & Mfg. LLC**
**2655 Huntington Road**
**Apple Grove, West Virginia 25502**

Prepared By:

**Washington Laboratories, Ltd.**
**7560 Lindbergh Drive**
**Gaithersburg, Maryland 20879**

# FCC Certification Test Program

# FCC Certification Test Report
# for the
# Industrial Design & Mfg. LLC
# SD201 Stay Dri Transmitter
# R9N-SD201

**August 30, 2004**

WLL JOB# 8212

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Reviewed by: Michael F. Violette
President

# Abstract

This report has been prepared on behalf of Industrial Design & Mfg. LLC to support the attached Application for Equipment Authorization. The test report and application are submitted for a Intentional Radiator under Part 15.249 of the FCC Rules and Regulations. This Federal Communication Commission (FCC) Certification Test Report documents the test configuration and test results for an Industrial Design & Mfg. LLC SD201 Stay Dri Transmitter.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

The Industrial Design & Mfg. LLC SD201 Stay Dri Transmitter complies with the limits for an Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

Table of Contents



List of Tables



List of Figures

# 1 Introduction

## 1.1 Compliance Statement

The Industrial Design & Mfg. LLC SD201 Stay Dri Transmitter complies with the limits for an Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

This test report reflects the testing performed for the certification of the SD201. Separate testing was performed for the digital and receiver portion under the DoC process.

## 1.2 Test Scope

Tests for radiated and conducted emissions were performed. All measurements were performed according to the 2001 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

## 1.3 Contract Information

| | |
|---|---|
| Customer: | Industrial Design & Mfg. LLC<br>2655 Huntington Road<br>Apple Grove, West Virginia 25502 |
| Client Purchase Order: | 127 |
| WLL Quotation Number: | 61657-A |

## 1.4 Test Dates

Testing was performed from June 14 to June 16, 2004.

## 1.5 Test and Support Personnel

| | |
|---|---|
| Washington Laboratories, LTD | Ken Gemmell |
| Client Representative | Chuck Tavares |

## 1.6 Abbreviations

| | |
|---|---|
| A | Ampere |
| Ac | alternating current |
| AM | Amplitude Modulation |
| Amps | Amperes |
| b/s | bits per second |
| BW | Bandwidth |
| CE | Conducted Emission |
| cm | centimeter |
| CW | Continuous Wave |
| dB | decibel |
| dc | direct current |
| EMI | Electromagnetic Interference |
| EUT | Equipment Under Test |
| FM | Frequency Modulation |
| G | giga - prefix for $10^9$ multiplier |
| Hz | Hertz |
| IF | Intermediate Frequency |
| k | kilo - prefix for $10^3$ multiplier |
| M | Mega - prefix for $10^6$ multiplier |
| m | Meter |
| μ | micro - prefix for $10^{-6}$ multiplier |
| NB | Narrowband |
| LISN | Line Impedance Stabilization Network |
| RE | Radiated Emissions |
| RF | Radio Frequency |
| rms | root-mean-square |
| SN | Serial Number |
| S/A | Spectrum Analyzer |
| V | Volt |

# 2 Equipment Under Test

## 2.1 EUT Identification & Description

This product is a system intended for use in nursing homes to provide a method to notify the staff that a patient has urinated in bed and consists of the three following components:

- Stay Dri Transmitter Model SD-201
- Stay Dri Receiver Model SD-301
- Stay Dri Repeater Model SD-401

The patient's bed will have a pad that measures approximately 3 by 3 feet containing two internal electrodes that connect to 4 snaps. These snaps provide both electrical connection and mounting for an attached Stay Dri Transmitter unit. When the pad becomes wet, the Stay Dri Transmitter detects this condition and transmits three short bursts of data via a 902 MHz radio link either directly to or via a Stay Dri Repeater to the Stay Dri Receiver. The Stay Dri Receiver passes data via an RS232 cable to a PC located at the nurse's station. This data identifies the Stay Dri Transmitters serial number so the patient's name and/or room number can be determined. Under normal conditions, i.e. no alarm, the Stay Dri Transmitter sends a message approximately every 3 minutes indicating that the bed is dry for the purpose of confirming system integrity.

The Industrial Design & Mfg. LLC SD201 Stay Dri Transmitter is contained in a 1x2x3 inch plastic box. It consists of a PIC16F870 micro-controller running at 3.6864 MHz, a Lynx TXM-900-HP3-PPO transmitter module connected to a -1 dBi internal antenna and some additional analog circuitry. The **Stay Dri Transmitter** is powered by two (2) AA alkaline cells via a low power switching regulator. The exact transmitting frequency will be determined during manufacturing by selecting one of 8 predetermined frequencies that the Lynx module supports and will not be user selectable. The TXM-900-HP3-PPO output is nominally 0 dBm (+/- 3 dB).and provisions have been made for a T-pad attenuator, if needed, to comply with the 50mV/m FCC limit.

**Table 1. Device Summary**

| ITEM | DESCRIPTION |
|---|---|
| Manufacturer: | Industrial Design & Mfg. LLC |
| FCC ID Number | R9N-SD201 |
| EUT Name: | Stay Dri Transmitter |
| Model: | SD201 |
| FCC Rule Parts: | §15.249 |
| Frequency Range: | 902 – 928MHz |
| Maximum Output Power: | 0dBm |
| Modulation: | FM and FSK |
| Occupied Bandwidth: | |
| Keying: | Automatic |
| Type of Information: | Data |
| Number of Channels: | 1 of 8, determined and fixed during manufacture |
| Power Output Level | Fixed |
| Antenna Type | External, proprietary connector |
| Interface Cables: | RS232 interface |
| Power Source & Voltage: | 3 Vdc battery |

## 2.2 Test Configuration

The SD201 was powered by two AA batteries and set for continuous operation.

## 2.3 Testing Algorithm

The SD201 was operated continuously.

Worst case emission levels are provided in the test results data.

## 2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

## 2.5 Measurements

### 2.5.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards (ANSI/TIA/EIA-603-93)

## 2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ±2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5\ (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB.

# 3 Test Equipment

Table 2 shows a list of the test equipment used for measurements along with the calibration information.

**Table 2: Test Equipment List**

| Equipment | Identification | Calibration Due |
|---|---|---|
| Sunol JB1 Biconilog Antenna | A090501 | 10/21/04 |
| ARA DRG118/A Microwave Horn Antenna | 1236 | 4/17/05 |
| Hewlett-Packard 8568B Spectrum Analyzer | 2928A04750 | 7/01/05 |
| Hewlett-Packard 85650A Quasi-Peak Adapter | 3303A01786 | 7/08/04 |
| Hewlett-Packard 85685A RF Preselector | 3146A01296 | 7/06/05 |
| Hewlett-Packard 8593A Spectrum Analyzer | 3009A00739 | 6/25/04 |
| Hewlett-Packard 8449B Microwave Preamp | 3008A00385 | 9/29/05 |
| Solar Electronics LISN 8012-50-R-24-BNC | 8379493 | 9/30/04 |

# 4 Test Results

## 4.1 Duty Cycle Correction

Measurements may be adjusted where pulsed RF is utilized to find the average level associated with a quantity. This calculation is applied to limits for pulsed licensed and unlicensed devices.

On time = $N_1L_1+N_2L_2+...+N_{N-1}L_{N-1}+N_NL_N$, where $N_1$ is number of type 1 pulses, $L_1$ is length of type 1 pulses, etc.

- For Licensed Transmitters basic formula can be stated as 20log[Duty Cycle]
- For Unlicensed Intentional Radiators under 47CFR Part 15, all duty cycle measurements compared to a 100 millisecond period
- i.e. duty cycle = on time/100 milliseconds or period, whichever is less
- Restating the basic formula:
    - Duty cycle = $(N_1L_1+N_2L_2+...+N_{N-1}L_{N-1}+N_NL_N)/100$ or T, whichever is less

Where T is the period of the pulse train.

The following Figures show the plots of the modulated carrier. The spectrum analyzer was set to Zero Span and the video triggered to collect the pulse train of the modulation. Calculations of the duty cycle correction factor were obtained from time data provided by the plots.

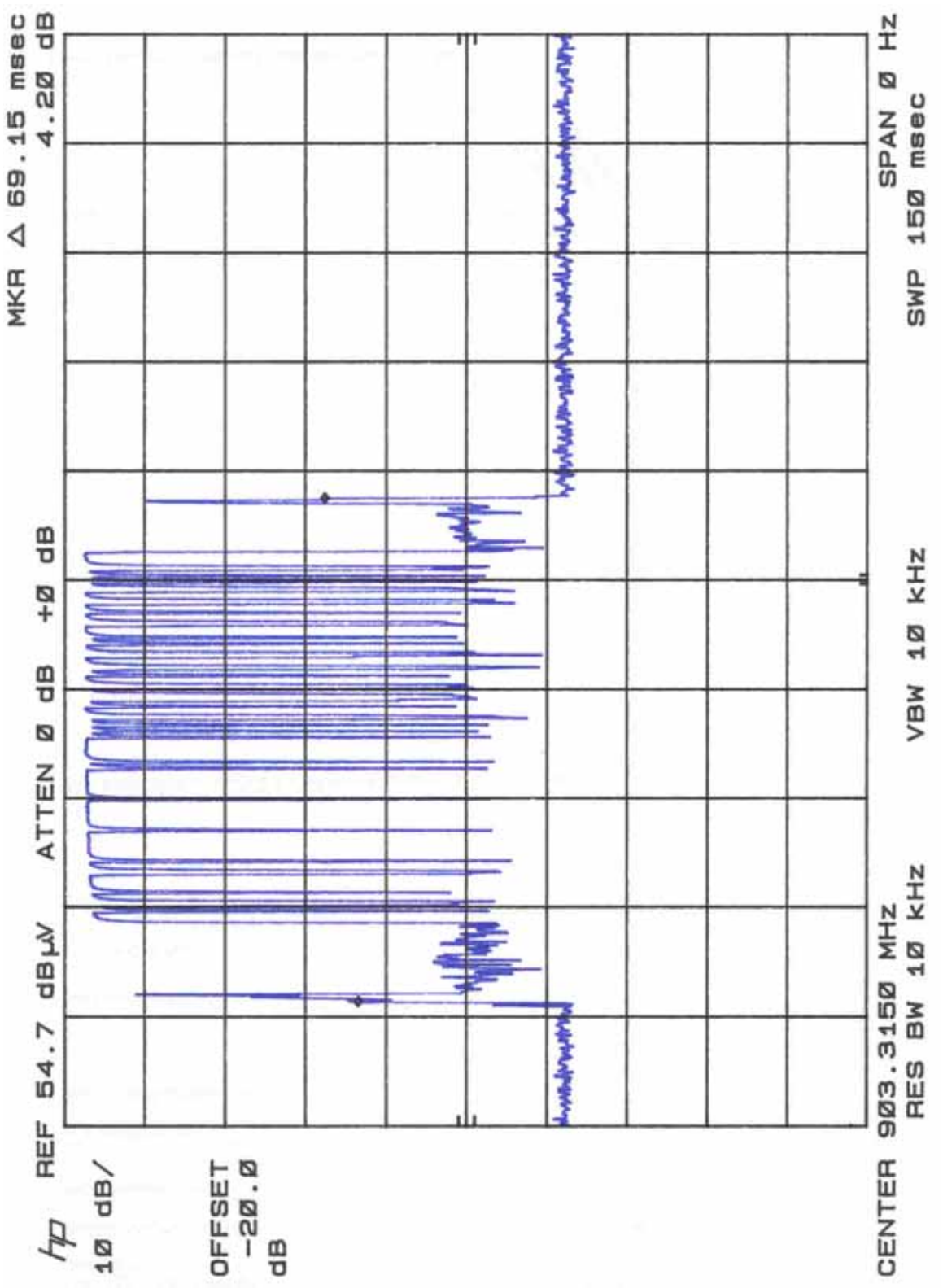


**Figure 1. Duty Cycle Plot – Worst Case 100ms and Pulse Train**

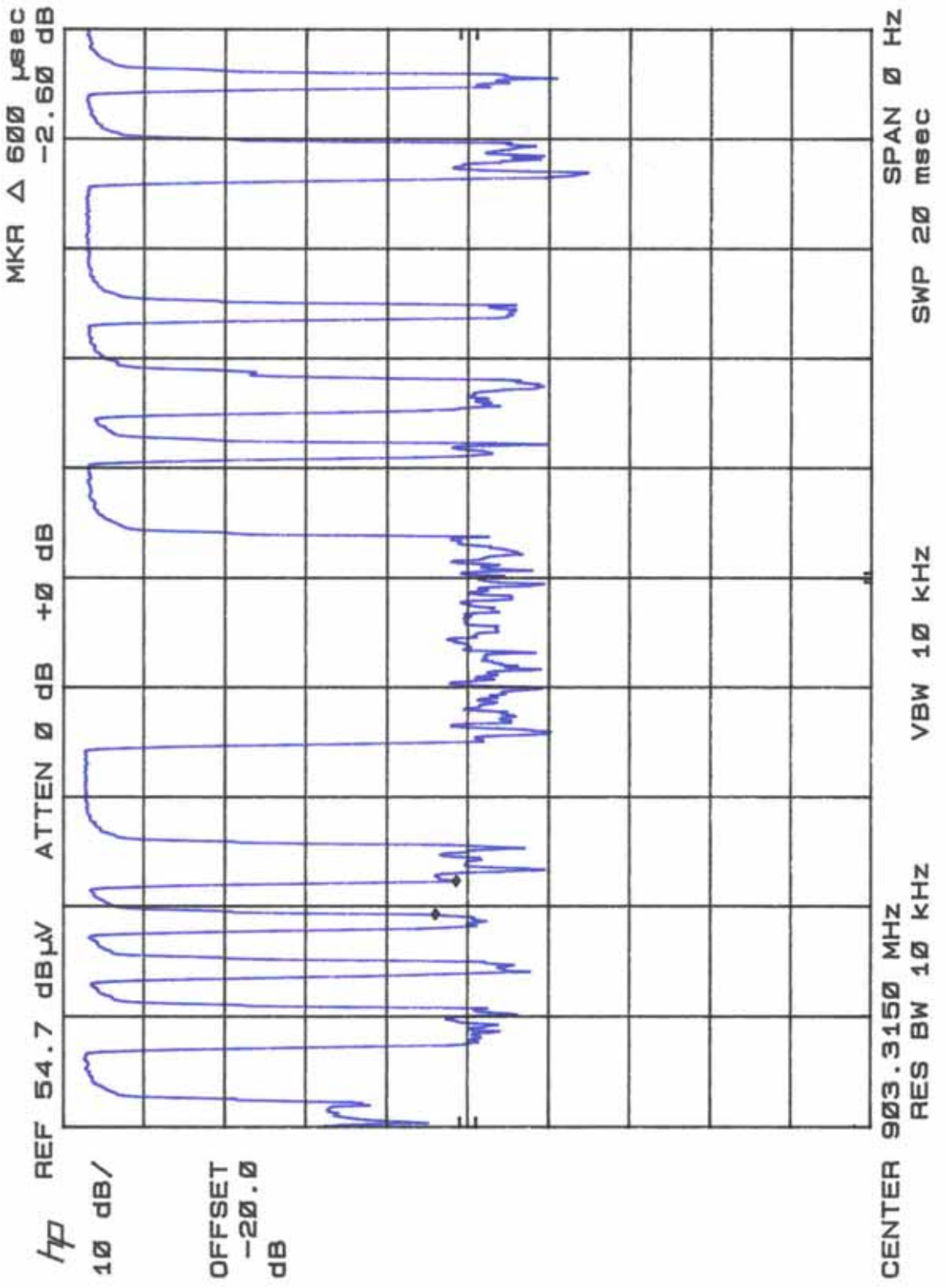


**Figure 2. Duty Cycle Plot – Pulse Width: Short Pulse**

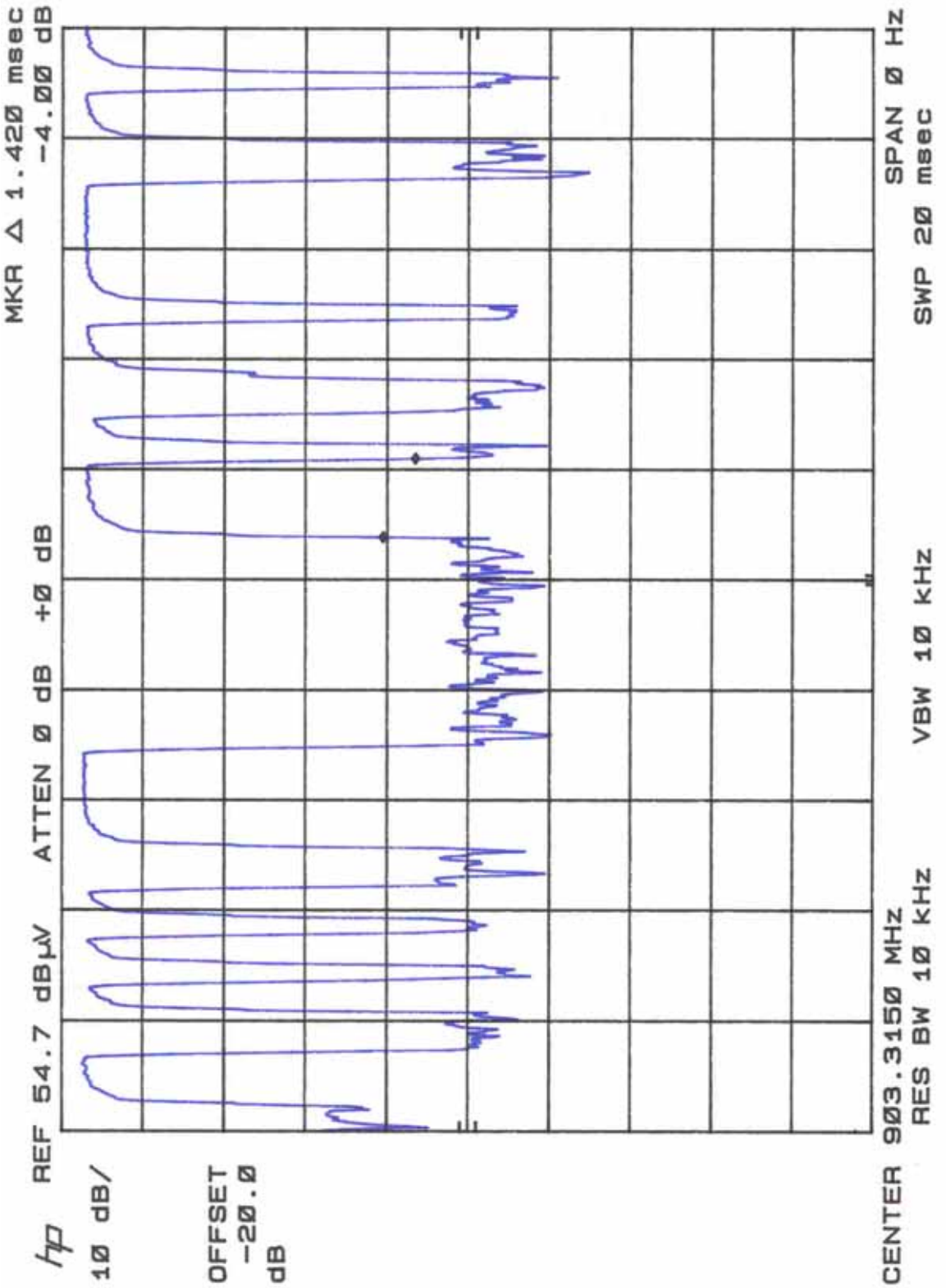


**Figure 3. Duty Cycle Plot – Pulse Width: Medium Pulse**

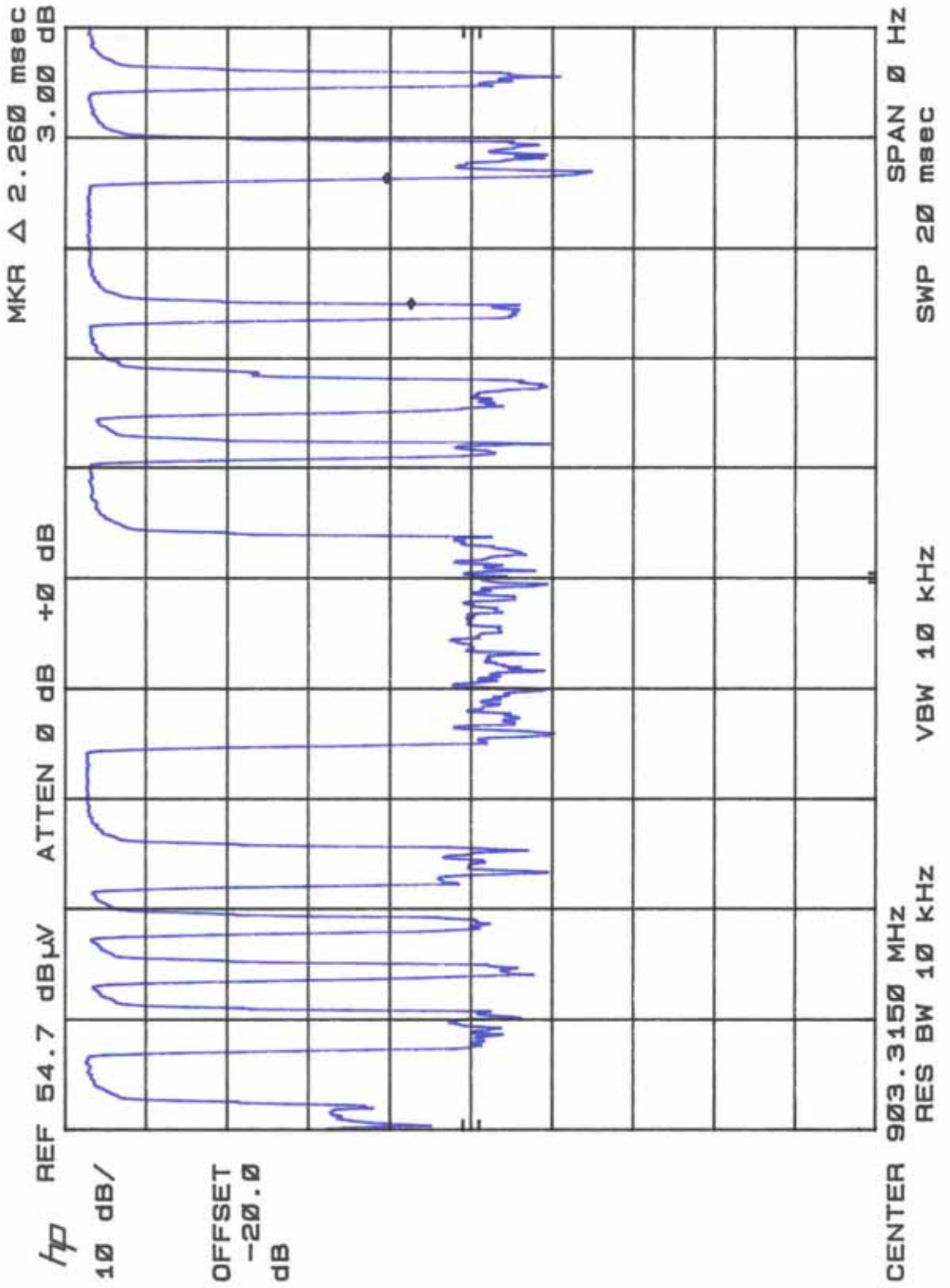


**Figure 4. Duty Cycle Plot – Pulse Width: Long Pulse**

## Duty Cycle Data Sheet

| | | | |
|---|---|---|---|
| CLIENT: | IDM | DATE: | 6/14/2004 |
| TESTER: | Ken Gemmell | JOB #: | 8212 |

**EUT Information:**

| | | |
|---|---|---|
| EUT: | Stay Dri Transmitter | S/N: |

| | Pulse 1 | Pulse 2 | Pulse 3 | Pulse 4 | Pulse 5 | Pulse 6 |
|---|---|---|---|---|---|---|
| Number | 4 | 4 | 23 | 0 | 0 | 0 |
| | | | | | | |
| Pulse Width (microseconds) | 2260 | 1420 | 600 | 0 | 0 | 0 |
| | | | | | | |
| Total Time in (microseconds) | 9040 | 5680 | 13800 | 0 | 0 | 0 |
| | | | | | | |
| Total Time in (ms) | 9.04 | 5.68 | 13.8 | 0 | 0 | 0 |

| | | | |
|---|---|---|---|
| Total time for both types Pulses | | | 28.52 |

| | | | |
|---|---|---|---|
| Worst Case Percent of 100 ms | | | 28.52% |

| | |
|---|---|
| Duty Cycle Correction Factor | -10.89701 dB |

### 4.2 Occupied Bandwidth: (FCC Part §2.1049)

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer.

At full modulation, the occupied bandwidth was measured as shown:

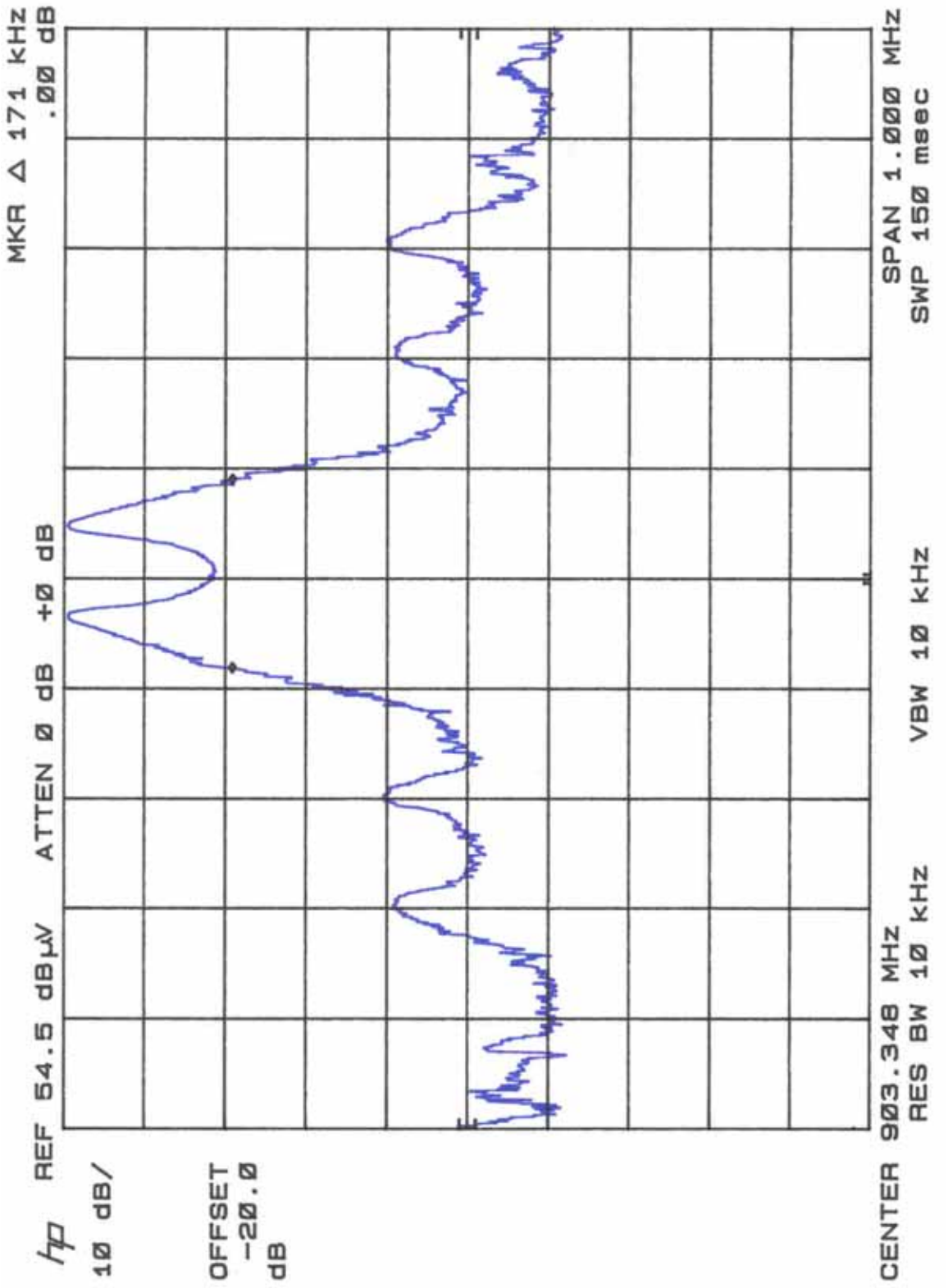


**Figure 5. Occupied Bandwidth, Low Channel**

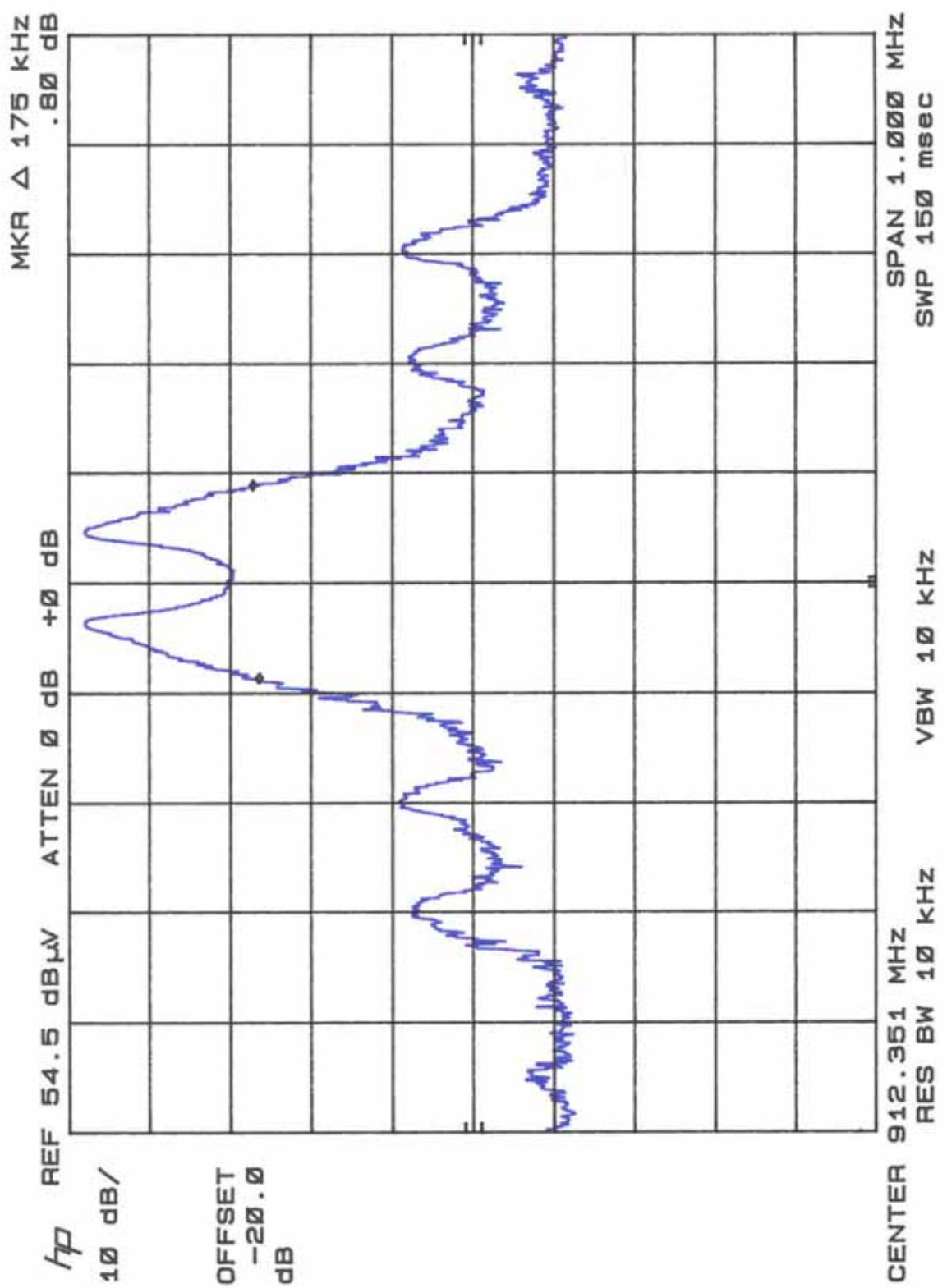


**Figure 6. Occupied Bandwidth, Middle Channel**

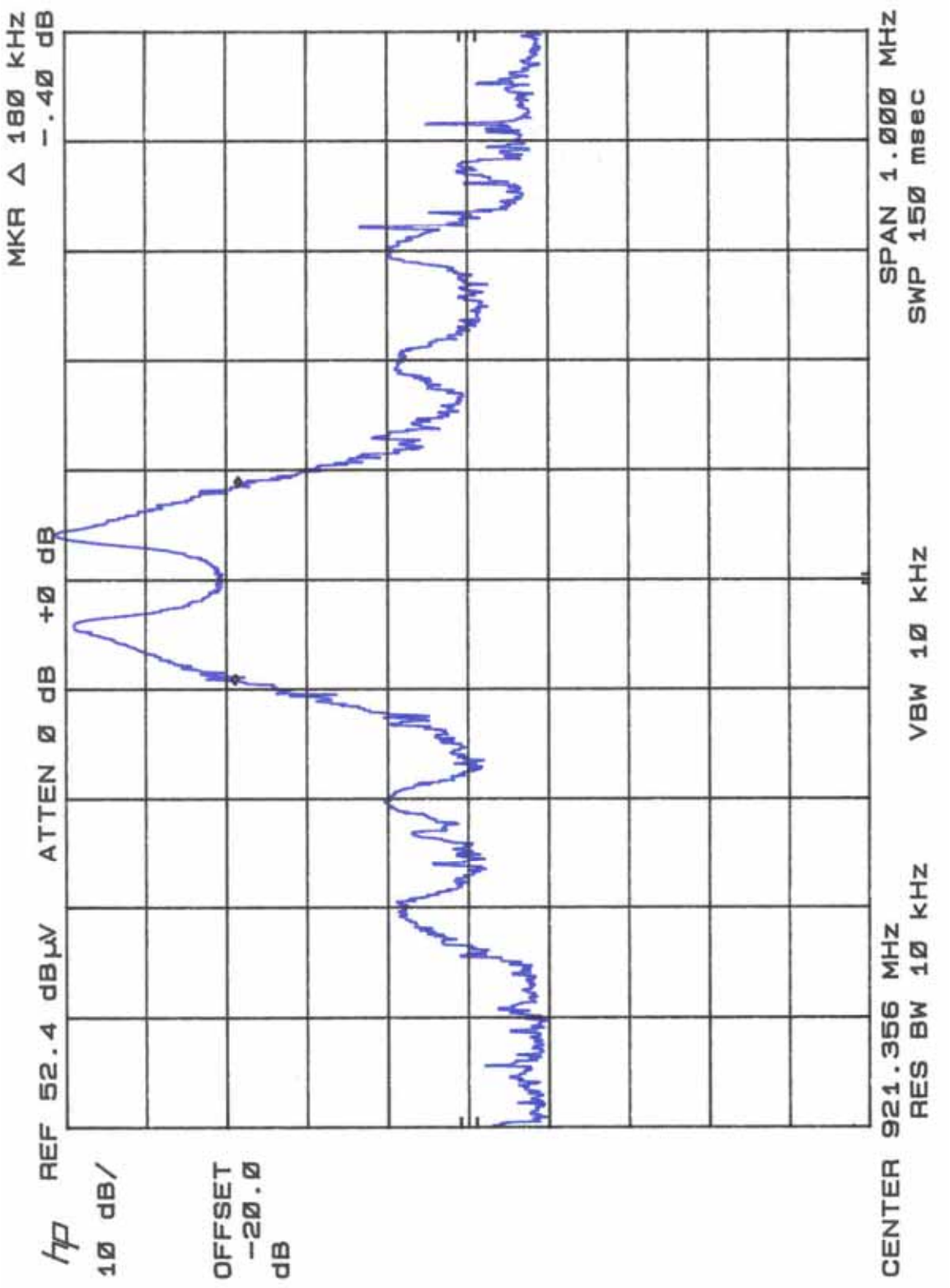


**Figure 7. Occupied Bandwidth, High Channel**

Table 3 provides a summary of the Occupied Bandwidth Results.

**Table 3. Occupied Bandwidth Results**

| Frequency MHz | Bandwidth kHz |
|---|---|
| 903.34 | 171 |
| 912.35 | 175 |
| 921.35 | 180 |

### 4.3 Radiated Emissions: (FCC Part §2.1053)

The EUT must comply with the radiated emission limits of 15.249(a). The limits are as shown in the following table.

**Table 4. Radiated Emissions Limits**

| Fundamental Frequency | Field Strength of Fundamental (µV/m) | Field Strength of Harmonics (µV/m) |
|---|---|---|
| 902 – 928 MHz | 50,000 | 500 |
| 2400 – 2483.5 MHz | 50,000 | 500 |
| 5725 – 5875 MHz | 50,000 | 500 |
| 24.00 – 24.25 GHz | 250,000 | 2500 |

#### 4.3.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The peripherals were placed on the table in accordance with ANSI C63.4-2001. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The emissions were measured using the following resolution bandwidths:

| Frequency Range | Resolution Bandwidth | Video Bandwidth |
|---|---|---|

| | | |
|---|---|---|
| 30MHz-1000 MHz | 100kHz | >100kHz |
| >1000 MHz | 1 MHz | 1MHz (peak) |

Emissions were measured to the 10th harmonic of the transmit frequency. Worst case emission levels are reported.

The following is a sample calculation used in the data tables for calculating the final field strength of spurious emissions and comparing these levels to the specified limits.

Sample Calculation:

Spectrum Analyzer Voltage (SA Level): V dBµV

Antenna Factor (Ant Corr): AFdB/m

Cable Loss Correction (Cable Corr): CCdB

Duty Cycle Correction (Average) DCCdB

Amplifier Gain: GdB

Electric Field (Corr Level): EdBµV/m = VdBµV + AFdB/m + CCdB + DCCdB - GdB

**Table 5. Radiated Emissions Test Data, Fundamental**

| | | | |
|---|---|---|---|
| CLIENT: | IDM | DATE: | 6/14/2004 |
| TESTER: | Ken Gemmell | JOB #: | 8212 |
| **EUT Information:** | | **Test Requirements:** | |
| EUT: | SD201 | TEST STANDARD: | FCC Part 15 |
| CLASS: | B | DISTANCE: | 3m |
| **Test Equipment/Limit:** | | | |
| ANTENNA: | A_00382 | LIMIT: | LFCC_3m_Class_B |
| CABLE: | CSITE1_3m | AMPLIFIER (dB) | None |

| Frequency (MHz) | Polarity H/V | Az Deg | Ant. Hght (m) | SA Level (QP) (dBµV) | Ant. Corr. (dB/m) | Cable Corr. (dB) | Corr. Level (dBµV/m) | Corr. Level (µV/m) | Limit (µV/m) | Margin dB | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 903.41 | V | 90.0 | 1.0 | 55.9 | 22.2 | 3.8 | 81.9 | 12424.1 | 50000.0 | -12.1 | X |
| 903.41 | H | 45.0 | 1.0 | 62.7 | 22.2 | 3.8 | 88.7 | 27118.5 | 50000.0 | -5.3 | X |
| 912.32 | V | 180.0 | 1.0 | 53.7 | 22.4 | 3.9 | 80.0 | 9974.1 | 50000.0 | -14.0 | X |
| 912.32 | H | 0.0 | 1.0 | 59.1 | 22.4 | 3.9 | 85.4 | 18572.6 | 50000.0 | -8.6 | X |
| 921.37 | V | 315.0 | 1.0 | 54.1 | 22.9 | 3.9 | 80.9 | 11036.4 | 50000.0 | -13.1 | X |
| 921.37 | H | 0.0 | 1.0 | 59.5 | 22.9 | 3.9 | 86.3 | 20550.7 | 50000.0 | -7.7 | X |

## Table 6. Radiated Emissions Data, Channel 1 Harmonics

| | | | |
|---|---|---|---|
| CLIENT: | IDM | DATE: | 6/14/2004 |
| TESTER: | Ken Gemmell | JOB #: | 8212 |
| **EUT Information:** | | **Test Requirements:** | |
| EUT: | SD201 | TEST STANDARD: | FCC Part 15 |
| DISTANCE: | 3m | CLASS: | B |
| **Test Equipment/Limit:** | | | |
| ANTENNA: | A_00004 | LIMIT: | LFCC_3m_Class_B |
| CABLE: | CSITE1_HF | AMPLIFIER (dB) | A_00312 |

| Frequency (MHz) | Polarity H/V | Az Deg | Ant. Hght (m) | SA Level (QP) (dBµV) | Ant. Corr. (dB/m) | Cable Corr. (dB) | Duty Cycle Corr. (dB) | Amp Gain (dB) | Corr. Level (dBµV/m) | Corr. Level (µV/m) | Limit (µV/m) | Margin dB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1806.82 | V | 90.0 | 1.0 | 50.1 | 27.5 | 2.4 | -10.9 | 34.1 | 35.1 | 56.6 | 500.0 | -18.9 |
| 2710.23 | V | 0.0 | 1.0 | 51.1 | 29.5 | 3.2 | -10.9 | 34.4 | 38.4 | 83.2 | 500.0 | -15.6 |
| 3613.64 | V | 45.0 | 1.0 | 49.9 | 30.7 | 3.7 | -10.9 | 34.6 | 38.8 | 87.0 | 500.0 | -15.2 |
| 4517.05 | V | 45.0 | 1.0 | 44.9 | 32.0 | 4.0 | -10.9 | 34.5 | 35.5 | 59.5 | 500.0 | -18.5 |
| 5420.46 | V | 0.0 | 1.0 | 42.4 | 33.5 | 4.2 | -10.9 | 34.5 | 34.8 | 54.7 | 500.0 | -19.2 **a** |
| 6323.87 | V | 0.0 | 1.0 | 41.1 | 35.3 | 4.6 | -10.9 | 34.6 | 35.6 | 60.0 | 500.0 | -18.4 **a** |
| 7227.28 | V | 0.0 | 1.0 | 41.2 | 37.1 | 5.0 | -10.9 | 34.8 | 37.6 | 75.9 | 500.0 | -16.4 **a** |
| 8130.69 | V | 0.0 | 1.0 | 41.2 | 37.4 | 5.3 | -10.9 | 34.3 | 38.7 | 86.0 | 500.0 | -15.3 **a** |
| 9034.10 | V | 0.0 | 1.0 | 41.2 | 38.0 | 5.5 | -10.9 | 33.0 | 40.8 | 109.7 | 500.0 | -13.2 **a** |
| 1806.82 | H | 90.0 | 1.0 | 51.4 | 27.5 | 2.4 | -10.9 | 34.1 | 36.3 | 65.5 | 500.0 | -17.7 |
| 2710.23 | H | 90.0 | 1.0 | 46.7 | 29.5 | 3.2 | -10.9 | 34.4 | 34.0 | 50.2 | 500.0 | -20.0 |
| 3613.64 | H | 45.0 | 1.0 | 49.7 | 30.7 | 3.7 | -10.9 | 34.6 | 38.6 | 85.6 | 500.0 | -15.3 |
| 4517.05 | H | 180.0 | 1.0 | 42.8 | 32.0 | 4.0 | -10.9 | 34.5 | 33.4 | 46.6 | 500.0 | -20.6 |
| 5420.46 | H | 0.0 | 1.0 | 41.4 | 33.5 | 4.2 | -10.9 | 34.5 | 33.8 | 48.8 | 500.0 | -20.2 **a** |
| 6323.87 | H | 0.0 | 1.0 | 41.0 | 35.3 | 4.6 | -10.9 | 34.6 | 35.4 | 59.1 | 500.0 | -18.6 **a** |
| 7227.28 | H | 0.0 | 1.0 | 40.5 | 37.1 | 5.0 | -10.9 | 34.8 | 36.8 | 69.5 | 500.0 | -17.1 **a** |
| 8130.69 | H | 0.0 | 1.0 | 41.6 | 37.4 | 5.3 | -10.9 | 34.3 | 39.0 | 89.3 | 500.0 | -15.0 **a** |
| 9034.10 | H | 0.0 | 1.0 | 40.7 | 38.0 | 5.5 | -10.9 | 33.0 | 40.4 | 104.5 | 500.0 | -13.6 **a** |

a = ambient reading

## Table 7. Radiated Emissions Data, Channel 4 Harmonics

| | | | |
|---|---|---|---|
| CLIENT: | IDM | DATE: | 6/14/2004 |
| TESTER: | Ken Gemmell | JOB #: | 8212 |
| **EUT Information:** | | **Test Requirements:** | |
| EUT: | SD201 | TEST STANDARD: | FCC Part 15 |
| DISTANCE: | 3m | CLASS: | B |
| **Test Equipment/Limit:** | | | |
| ANTENNA: | A_00004 | LIMIT: | LFCC_3m_Class_B |
| CABLE: | CSITE1_HF | AMPLIFIER (dB) | A_00312 |

| Frequency (MHz) | Polarity H/V | Az Deg | Ant. Hght (m) | SA Level (QP) (dBµV) | Ant. Corr. (dB/m) | Cable Corr. (dB) | Duty Cycle Corr. (dB) | Amp Gain (dB) | Corr. Level (dBµV/m) | Corr. Level (µV/m) | Limit (µV/m) | Margin dB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1824.60 | V | 45.0 | 1.0 | 49.4 | 27.5 | 2.4 | -10.9 | 34.1 | 34.4 | 52.4 | 500.0 | -19.6 |
| 2736.90 | V | 0.0 | 1.0 | 51.3 | 29.5 | 3.2 | -10.9 | 34.4 | 38.7 | 85.9 | 500.0 | -15.3 |
| 3649.20 | V | 90.0 | 1.0 | 49.6 | 30.7 | 3.7 | -10.9 | 34.6 | 38.6 | 85.0 | 500.0 | -15.4 |
| 4561.50 | V | 135.0 | 1.0 | 45.7 | 32.1 | 4.0 | -10.9 | 34.5 | 36.4 | 65.9 | 500.0 | -17.6 |
| 5473.80 | V | 0.0 | 1.0 | 42.8 | 33.6 | 4.2 | -10.9 | 34.5 | 35.3 | 57.9 | 500.0 | -18.7 **a** |
| 6386.10 | V | 0.0 | 1.0 | 41.0 | 35.5 | 4.7 | -10.9 | 34.6 | 35.7 | 60.7 | 500.0 | -18.3 **a** |
| 7298.40 | V | 0.0 | 1.0 | 40.4 | 37.1 | 5.0 | -10.9 | 34.8 | 36.9 | 69.8 | 500.0 | -17.1 **a** |
| 8210.70 | V | 0.0 | 1.0 | 42.3 | 37.5 | 5.3 | -10.9 | 34.2 | 39.9 | 99.3 | 500.0 | -14.0 **a** |
| 9123.00 | V | 0.0 | 1.0 | 41.4 | 38.1 | 5.5 | -10.9 | 33.0 | 41.2 | 114.3 | 500.0 | -12.8 **a** |
| 1824.60 | H | 0.0 | 1.0 | 52.2 | 27.5 | 2.4 | -10.9 | 34.1 | 37.2 | 72.2 | 500.0 | -16.8 |
| 2736.90 | H | 45.0 | 1.0 | 47.6 | 29.5 | 3.2 | -10.9 | 34.4 | 35.0 | 56.1 | 500.0 | -19.0 |
| 3649.20 | H | 90.0 | 1.0 | 50.2 | 30.7 | 3.7 | -10.9 | 34.6 | 39.2 | 91.5 | 500.0 | -14.8 |
| 4561.50 | H | 180.0 | 1.0 | 44.2 | 32.1 | 4.0 | -10.9 | 34.5 | 34.8 | 55.0 | 500.0 | -19.2 |
| 5473.80 | H | 0.0 | 1.0 | 42.3 | 33.6 | 4.2 | -10.9 | 34.5 | 34.8 | 54.7 | 500.0 | -19.2 **a** |
| 6386.10 | H | 0.0 | 1.0 | 42.8 | 35.5 | 4.7 | -10.9 | 34.6 | 37.5 | 74.7 | 500.0 | -16.5 **a** |
| 7298.40 | H | 0.0 | 1.0 | 41.2 | 37.1 | 5.0 | -10.9 | 34.8 | 37.6 | 76.1 | 500.0 | -16.4 **a** |
| 8210.70 | H | 0.0 | 1.0 | 42.1 | 37.5 | 5.3 | -10.9 | 34.2 | 39.7 | 96.9 | 500.0 | -14.2 **a** |
| 9123.00 | H | 0.0 | 1.0 | 41.1 | 38.1 | 5.5 | -10.9 | 33.0 | 40.8 | 110.1 | 500.0 | -13.1 **a** |

a = ambient reading

## Table 8. Radiated Emissions Data, Channel 8 Harmonics

| | | | |
|---|---|---|---|
| CLIENT: | IDM | DATE: | 6/14/2004 |
| TESTER: | Ken Gemmell | JOB #: | 8212 |
| **EUT Information:** | | **Test Requirements:** | |
| EUT: | SD201 | TEST STANDARD: | FCC Part 15 |
| DISTANCE: | 3m | CLASS: | B |
| **Test Equipment/Limit:** | | | |
| ANTENNA: | A_00004 | LIMIT: | LFCC_3m_Class_B |
| CABLE: | CSITE1_HF | AMPLIFIER (dB) | A_00312 |

| Frequency (MHz) | Polarity H/V | Az Deg | Ant. Hght (m) | SA Level (QP) (dBµV) | Ant. Corr. (dB/m) | Cable Corr. (dB) | Duty Cycle Corr. (dB) | Amp Gain (dB) | Corr. Level (dBµV/m) | Corr. Level (µV/m) | Limit (µV/m) | Margin dB |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1842.74 | V | 90.0 | 1.0 | 51.5 | 27.6 | 2.4 | -10.9 | 34.0 | 36.6 | 67.6 | 500.0 | -17.4 |
| 2764.11 | V | 180.0 | 1.0 | 53.1 | 29.6 | 3.2 | -10.9 | 34.4 | 40.5 | 106.0 | 500.0 | -13.5 |
| 3685.48 | V | 135.0 | 1.0 | 51.5 | 30.8 | 3.7 | -10.9 | 34.6 | 40.6 | 106.6 | 500.0 | -13.4 |
| 4606.85 | V | 180.0 | 1.0 | 45.2 | 32.2 | 4.0 | -10.9 | 34.5 | 35.9 | 62.3 | 500.0 | -18.1 |
| 5528.22 | V | 0.0 | 1.0 | 42.7 | 33.7 | 4.3 | -10.9 | 34.4 | 35.3 | 58.2 | 500.0 | -18.7 **a** |
| 6449.59 | V | 0.0 | 1.0 | 42.5 | 35.6 | 4.7 | -10.9 | 34.6 | 37.3 | 73.2 | 500.0 | -16.7 **a** |
| 7370.96 | V | 0.0 | 1.0 | 41.7 | 37.1 | 5.0 | -10.9 | 34.8 | 38.2 | 81.4 | 500.0 | -15.8 **a** |
| 8292.33 | V | 0.0 | 1.0 | 42.7 | 37.5 | 5.3 | -10.9 | 34.1 | 40.5 | 106.2 | 500.0 | -13.5 **a** |
| 9213.70 | V | 0.0 | 1.0 | 41.7 | 38.2 | 5.6 | -10.9 | 33.0 | 41.5 | 118.7 | 500.0 | -12.5 **a** |
| 1833.74 | H | 180.0 | 1.0 | 52.1 | 27.6 | 2.4 | -10.9 | 34.1 | 37.2 | 72.3 | 500.0 | -16.8 |
| 2746.11 | H | 180.0 | 1.0 | 50.9 | 29.6 | 3.2 | -10.9 | 34.4 | 38.3 | 82.4 | 500.0 | -15.7 |
| 3658.48 | H | 90.0 | 1.0 | 51.8 | 30.8 | 3.7 | -10.9 | 34.6 | 40.8 | 109.4 | 500.0 | -13.2 |
| 4570.85 | H | 180.0 | 1.0 | 45.1 | 32.1 | 4.0 | -10.9 | 34.5 | 35.7 | 61.2 | 500.0 | -18.2 |
| 5483.22 | H | 0.0 | 1.0 | 42.7 | 33.6 | 4.2 | -10.9 | 34.4 | 35.2 | 57.5 | 500.0 | -18.8 **a** |
| 6395.59 | H | 0.0 | 1.0 | 41.9 | 35.5 | 4.7 | -10.9 | 34.6 | 36.5 | 66.9 | 500.0 | -17.5 **a** |
| 7307.96 | H | 0.0 | 1.0 | 42.0 | 37.1 | 5.0 | -10.9 | 34.8 | 38.4 | 83.5 | 500.0 | -15.5 **a** |
| 8220.33 | H | 0.0 | 1.0 | 41.4 | 37.5 | 5.3 | -10.9 | 34.2 | 39.1 | 89.8 | 500.0 | -14.9 **a** |
| 9132.70 | H | 0.0 | 1.0 | 40.5 | 38.1 | 5.5 | -10.9 | 33.0 | 40.3 | 102.9 | 500.0 | -13.7 **a** |

a = ambient reading

### 4.4 Conducted Emissions (AC Power Line)

Conducted Emissions testing was not performed, as the unit is battery powered.