



**FCC Certification Test Report  
for  
Ness Security Products Pty Ltd  
FCC ID: 02K-1B315**

**February 28, 2003**

Prepared for:

**Ness Security Products Pty Ltd  
4/167 Prospect Highway  
Seven Hills, NSW 2147  
Australia**

Prepared By:

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7560 Lindbergh Drive  
Gaithersburg, Maryland 20879**



## **FCC Certification Test Program**

**FCC Certification Test Report  
for the  
Ness Security Products Pty Ltd  
SmartLink™ Medi-Call Radio Key Pendant  
FCC ID:02K-1B315**

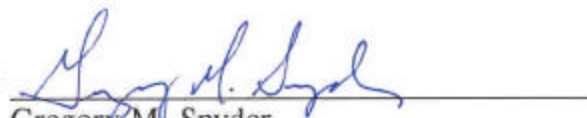
**February 28, 2003**

WLL JOB# 7258

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## **Abstract**

This report has been prepared on behalf of Ness Security Products Pty Ltd to support the attached Application for Equipment Authorization. The test report and application are submitted for a Periodic Intentional Radiator under Part 15.231 of the FCC Rules and Regulations. This Federal Communication Commission (FCC) Certification Test Report documents the test configuration and test results for a Ness Security Products Pty Ltd SmartLink™ Medi-Call Radio Key Pendant.

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 Ness Security Products Pty Ltd SmartLink™ Medi-Call Radio Key Pendant complies with the limits for a Periodic Intentional Radiator device under Part 15.231 of the FCC Rules and Regulations.

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## **1 Introduction**

### **1.1 Compliance Statement**

The Ness Security Products Pty Ltd SmartLink™ Medi-Call Radio Key Pendant complies with the limits for a Periodic Intentional Radiator device under Part 15.231 of the FCC Rules and Regulations.

### **1.2 Test Scope**

Tests for radiated emissions were performed. All measurements were performed according to the 1992 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: Ness Security Products Pty Ltd  
4/167 Prospect Highway  
Seven Hills, NSW 2147

Purchase Order Number: 109915

Quotation Number: 60246-A

### **1.4 Test Dates**

Testing was performed September and October, 2002.

### **1.5 Test and Support Personnel**

Washington Laboratories, LTD

Ken Gemmell

## 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                                   |
| $\mu$ | 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

The Ness Security Products Pty Ltd SmartLink™ Medi-Call Radio Key Pendant is part of the Medi-Call emergency alert system. The pendant is worn by the user on a wristband or a necklace. When the key is depressed a control signal is sent to the SmartLink™ dialer base unit (separate certification) so that the dialer unit can call 911.

The following table is a summary of the pendant device.

**Table 1. Device Summary**

| ITEM                    | DESCRIPTION                    |
|-------------------------|--------------------------------|
| Manufacturer:           | Ness Security Products Pty Ltd |
| FCC ID Number           | 02K-1B315                      |
| EUT Name:               | Radio Key Pendant              |
| Model:                  | SmartLink™ Medi-Call           |
| FCC Rule Parts:         | §15.231                        |
| Frequency Range:        | 315MHz                         |
| Maximum Output Power:   | <1mW                           |
| Modulation:             | Pulsed                         |
| Occupied Bandwidth:     | 157.5 kHz                      |
| Keying:                 | Manual                         |
| Type of Information:    | Control                        |
| Number of Channels:     | 1                              |
| Power Output Level      | Fixed                          |
| Antenna Type            | Integral                       |
| Frequency Tolerance:    | N/A                            |
| Interface Cables:       | None                           |
| Power Source & Voltage: | Internal Battery               |

### 2.2 Test Configuration

The SmartLink™ Medi-Call Radio Key Pendant was configured with the neck chain option to maximize the radiated signal and was tested in a constant transmit mode. Conducted emissions testing was not performed as the unit is battery powered.

### 2.3 Testing Algorithm

The SmartLink™ Medi-Call Radio Key Pendant was configured for continuous transmission by continuously depressing the button.

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  $\pm 2.3$  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**

| Manufacturer | Model/Type      | Function           | Identification | Cal. Due |
|--------------|-----------------|--------------------|----------------|----------|
| HP           | 8568B           | Spectrum Analyzer  | 2634A02888     | 7/03/03  |
| HP           | 85650A          | Quasi-Peak Adapter | 3303A01786     | 7/05/03  |
| Solar        | 8012-50-R-24BNC | LISN               | 8379493        | 6/20/03  |
| ARA          | LPB-2520        | BiconiLog Antenna  | 1044           | 6/19/03  |
| HP           | 85685A          | RF Preselector     | 3221A01395     | 5/17/03  |
| HP           | 8564E           | Spectrum Analyzer  | 3643A00657     | 4/18/03  |
| HP           | 8449B           | RF Pre-Amplifier   | 3008A00385     | 9/26/03  |
| ARA          | DRG-118/A       | Horn Antenna       | 1010           | 11/28/02 |

## 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 =  $N_1L_1 + N_2L_2 + \dots + N_{N-1}L_{N-1} + N_NL_N$ , 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  $20\log[\text{Duty Cycle}]$
- 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:
  - o Duty cycle =  $(N_1L_1 + N_2L_2 + \dots + N_{N-1}L_{N-1} + N_NL_N)/100$  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.

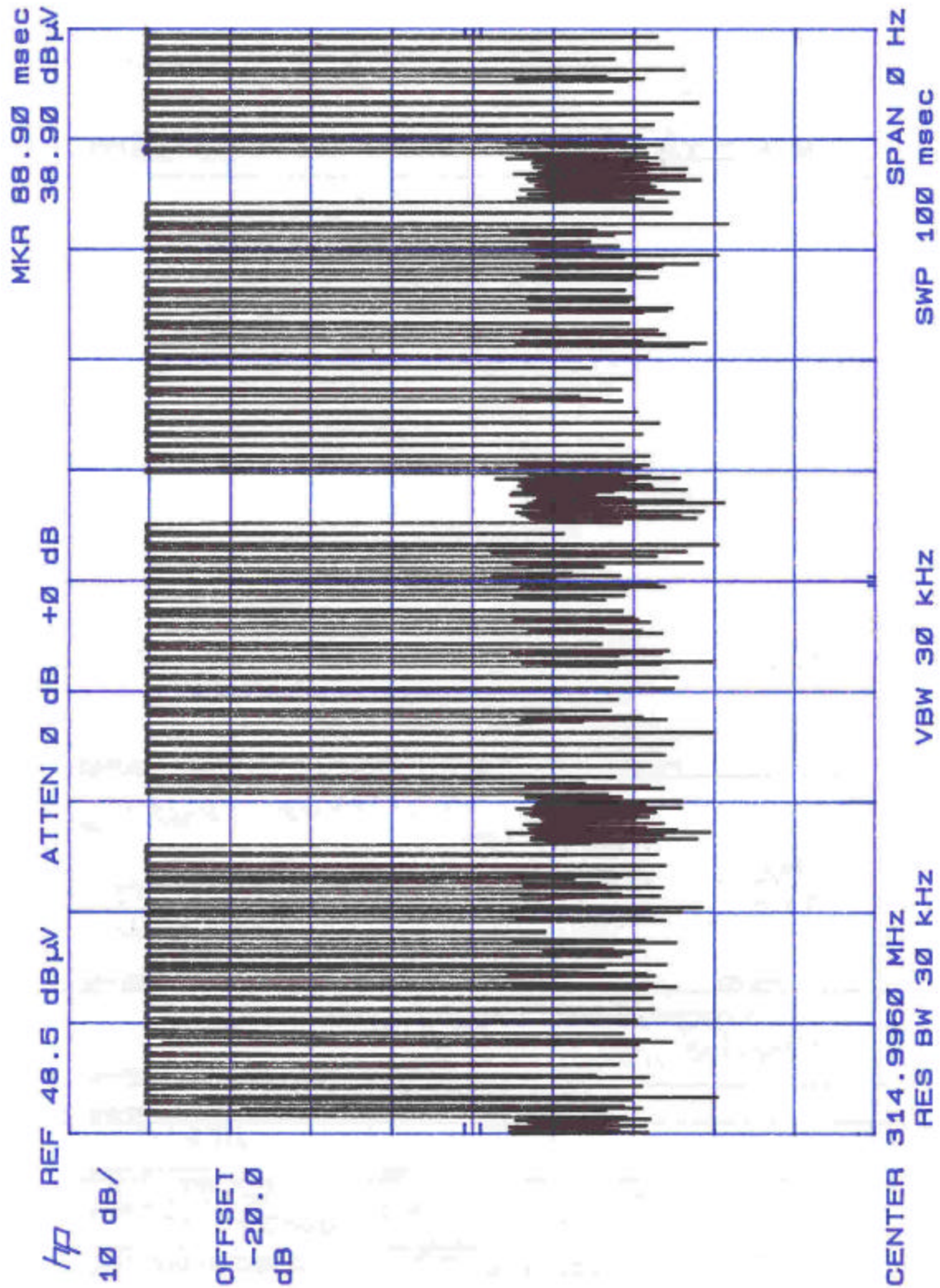


Figure 1. Duty Cycle Plots Full Period

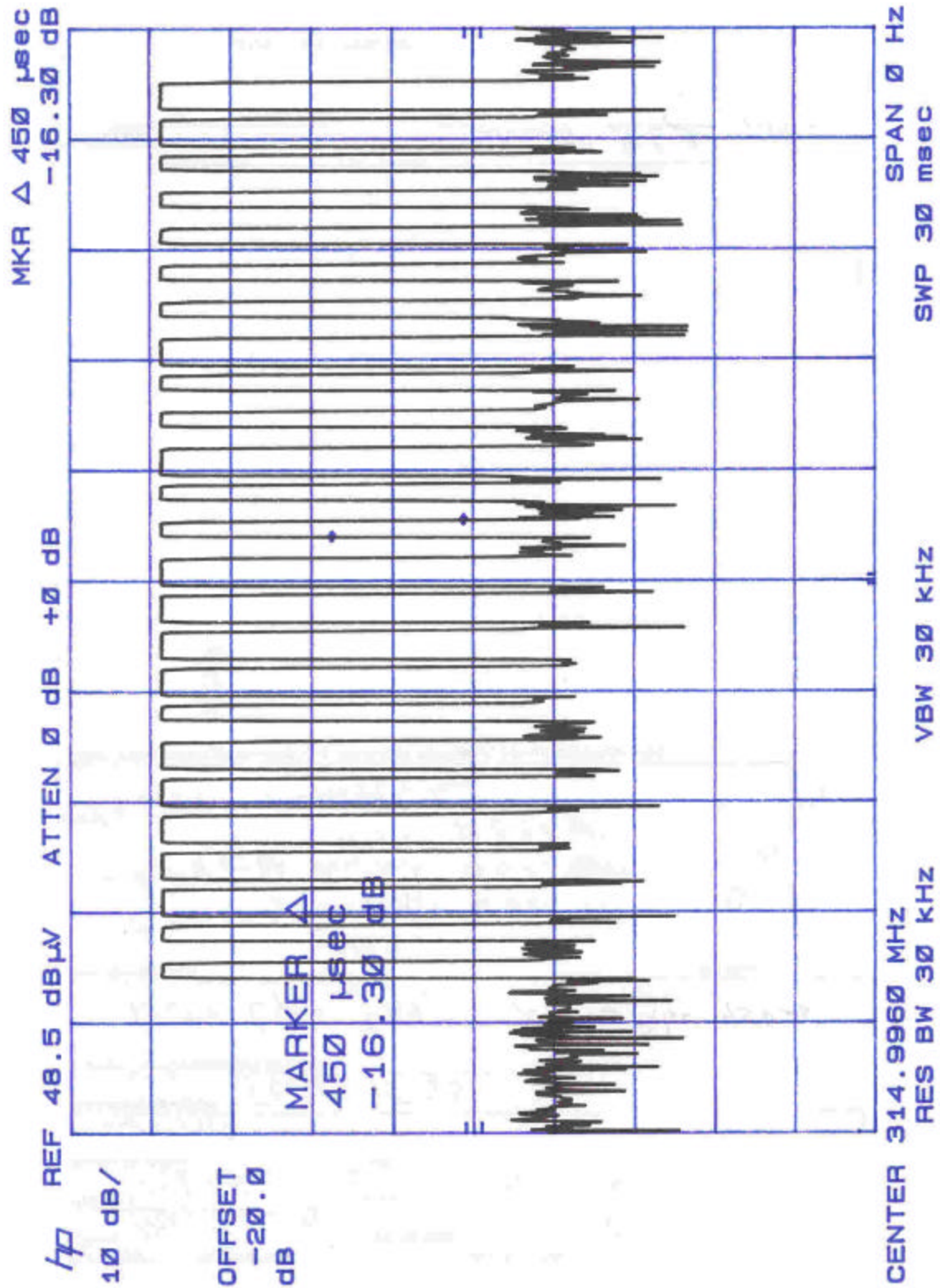


Figure 2. Duty Cycle Plot "Narrow Pulse Width"

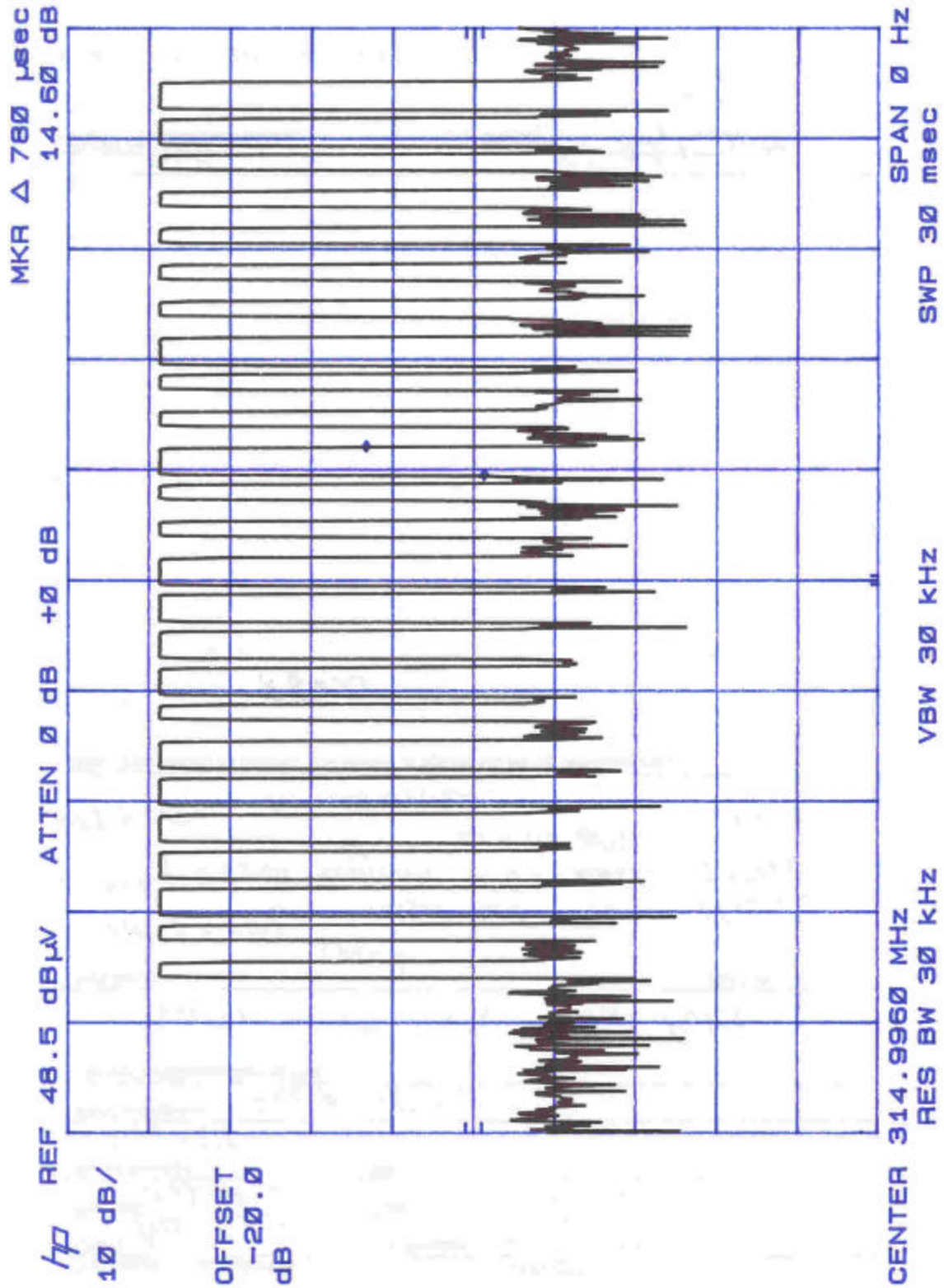


Figure 3. Duty Cycle Plot "Wide Pulse Width"

From the data in Figure 1 and Figure 2, the following calculations are made.

Total Time Per Code Group:

29ms

On Time Per Code Group:

$(12 \times 450\text{us}) + (13 \times 780\text{us}) = 15.54\text{ms}$

The data are summarized in the following table.

**Table 3. Duty Cycle Correction**

| Measurement Time | Total ON Time | Duty Cycle (%) | Duty Cycle (dB) |
|------------------|---------------|----------------|-----------------|
| 29ms             | 15.54ms       | 0.536          | -5.42           |

#### **4.2 RF Power Output: (FCC Part §2.1046)**

N/A – Integral Antenna

#### **4.3 Modulation Characteristics: (FCC Part §2.1047); Audio Frequency Response**

N/A

#### **4.4 Occupied Bandwidth: (FCC Part §2.1049)**

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

FCC Part 15.231 states that the 20 dB bandwidth of the modulated carrier shall be as follows:

| Frequency Range (MHz) | Occupied Bandwidth Limit |
|-----------------------|--------------------------|
| 70-900 MHz            | 0.25%                    |
| > 900 MHz             | 0.5%                     |

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

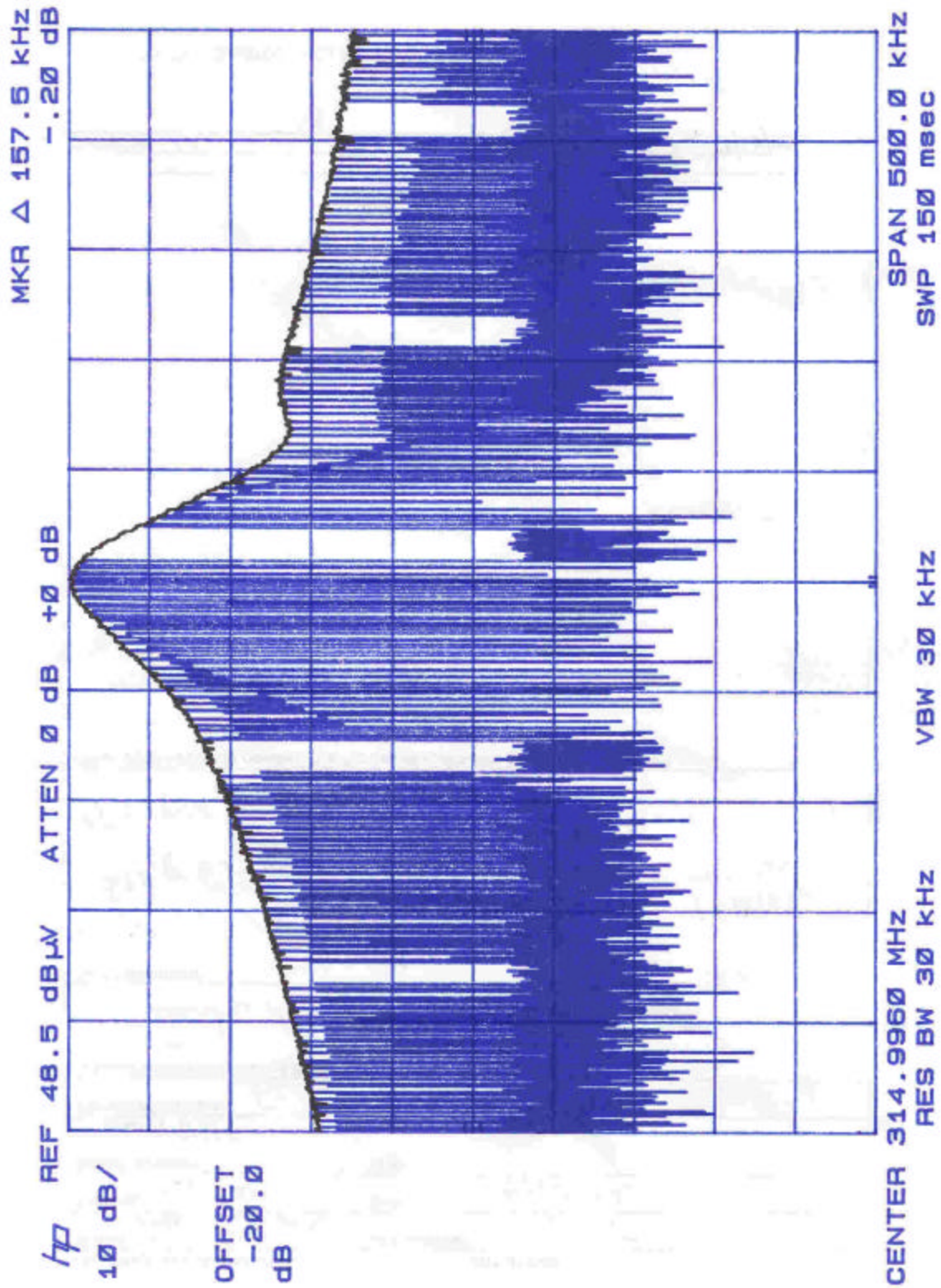


Figure 4. Occupied Bandwidth

Table 4 provides a summary of the Occupied Bandwidth Results.

**Table 4. Occupied Bandwidth Results**

| Frequency | Bandwidth | Limit     | Pass/Fail |
|-----------|-----------|-----------|-----------|
| 315 MHz   | 157.5 kHz | 787.5 kHz | Pass      |

#### 4.5 Radiated Spurious Emissions: (FCC Part §2.1053)

The EUT must comply with requirements for radiated spurious emissions. The limits are as shown in the following table.

**Table 5. Radiated Spurious Emissions Limits**

| Frequency        | Fundamental | Harmonic Level<br>(-dBc or E-Field) |
|------------------|-------------|-------------------------------------|
| Fundamental      | 6040.4 uV/m |                                     |
| Harmonics        |             |                                     |
| Restricted bands |             | 500 uV/m                            |

##### 4.5.1 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 C63.4-1992. 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                | 10Hz (avg), 1MHz (peak) |

Emissions were measured to the 10<sup>th</sup> harmonic of the transmit frequency.

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:                | DCdB                                                                                                       |
| Amplifier Gain*:                      | GdB                                                                                                        |
| Electric Field (Corr Level):          | $\text{EdB}\mu\text{V/m} = \text{VdB}\mu\text{V} + \text{AFdB/m} + \text{CCdB} + \text{DCdB} - \text{GdB}$ |

**Table 6: Radiated Emission Test Data**

CLIENT: Ness Security Products DATE: 9/24/02  
TESTER: Ken Gemmell JOB #: 7258

**EUT Information:**

EUT: Pendant  
TEST STANDARD: FCC Part 15.231  
DISTANCE: 3m

**Test Requirements:**

**Low Frequency Test Equipment/Limit:**

ANTENNA: A\_00007  
CABLE: CSITE2\_3m  
LIMIT: LFCC\_3m\_Class\_B  
TX Frequency 314.97

**High Frequency Test Equipment/Limit:**

ANTENNA: A\_00004  
CABLE: CSITE2\_HF

**Peak Data - Harmonics X orientation**

| Freq.   | Pol. | Azimuth | Ant. Hght | SA Level (Peak) | Ant. Corr. | Cable Corr. | Amp. | Duty Cycle | Corr. Level | Corr. Level | Limit  | Margin |
|---------|------|---------|-----------|-----------------|------------|-------------|------|------------|-------------|-------------|--------|--------|
| (MHz)   | H/V  | Degree  | (m)       | (dBuV)          | (dB/m)     | (dB)        | (dB) | (dB)       | (dBuV/m)    | (uV/m)      | (uV/m) | dB     |
| 314.97  | V    | 270.0   | 1.0       | 46.9            | 14.6       | 3.9         | 0.0  | -5.4       | 60.02       | 1002.5      | 6040.4 | -15.6  |
| 629.94  | V    | 180.0   | 1.0       | 11.6            | 18.9       | 5.9         | 0.0  | -5.4       | 31.00       | 35.5        | 604.0  | -24.6  |
| 944.91  | V    | 180.0   | 1.0       | 5.9             | 22.9       | 7.8         | 0.0  | -5.4       | 31.19       | 36.3        | 604.0  | -24.4  |
| 1259.88 | V    | 180.0   | 1.0       | 57.7            | 26.1       | 1.9         | 36.1 | -5.4       | 44.09       | 160.1       | 604.0  | -11.5  |
| 1574.85 | V    | 180.0   | 1.0       | 58.6            | 27.5       | 2.6         | 35.8 | -5.4       | 47.44       | 235.6       | 500.0  | -6.5   |
| 1889.82 | V    | 180.0   | 1.0       | 47.6            | 28.6       | 3.2         | 35.6 | -5.4       | 38.37       | 82.9        | 604.0  | -17.2  |
| 2204.79 | V    | 180.0   | 1.0       | 53.6            | 29.3       | 3.3         | 35.5 | -5.4       | 45.26       | 183.3       | 500.0  | -8.7   |
| 2519.76 | V    | 180.0   | 1.0       | 54.0            | 29.9       | 3.0         | 35.6 | -5.4       | 45.97       | 198.8       | 604.0  | -9.7   |
| 2834.73 | V    | 180.0   | 1.0       | 54.4            | 30.4       | 2.8         | 35.7 | -5.4       | 46.60       | 213.7       | 500.0  | -7.4   |
| 3149.70 | V    | 180.0   | 1.0       | 50.1            | 30.9       | 2.8         | 35.6 | -5.4       | 42.65       | 135.6       | 604.0  | -13.0  |
| 314.97  | H    | 0.0     | 1.0       | 56.3            | 14.6       | 3.9         | 0.0  | -5.4       | 69.42       | 2958.5      | 6040.4 | -6.2   |
| 629.94  | H    | 90.0    | 1.0       | 14.5            | 18.9       | 5.9         | 0.0  | -5.4       | 33.90       | 49.5        | 604.0  | -21.7  |
| 944.91  | H    | 180.0   | 1.0       | 11.2            | 22.9       | 7.8         | 0.0  | -5.4       | 36.49       | 66.8        | 604.0  | -19.1  |
| 1259.88 | H    | 180.0   | 1.0       | 61.1            | 26.1       | 1.9         | 36.1 | -5.4       | 47.52       | 237.7       | 604.0  | -8.1   |
| 1574.85 | H    | 180.0   | 1.0       | 58.4            | 27.5       | 2.6         | 35.8 | -5.4       | 47.24       | 230.2       | 500.0  | -6.7   |
| 1889.82 | H    | 180.0   | 1.0       | 54.5            | 28.6       | 3.2         | 35.6 | -5.4       | 45.36       | 185.4       | 604.0  | -10.3  |
| 2204.79 | H    | 180.0   | 1.0       | 56.3            | 29.3       | 3.3         | 35.5 | -5.4       | 47.95       | 249.9       | 500.0  | -6.0   |
| 2519.76 | H    | 180.0   | 1.0       | 57.6            | 29.9       | 3.0         | 35.6 | -5.4       | 49.55       | 300.2       | 604.0  | -6.1   |
| 2834.73 | H    | 180.0   | 1.0       | 54.8            | 30.4       | 2.8         | 35.7 | -5.4       | 46.97       | 223.0       | 500.0  | -7.0   |
| 3149.70 | H    | 180.0   | 1.0       | 48.2            | 30.9       | 2.8         | 35.6 | -5.4       | 40.72       | 108.6       | 604.0  | -14.9  |

Table 6: Radiated Emission Test Data (continued)

Peak Data - Harmonics Y orientation

| Freq.   | Pol. | Azimuth | Ant.<br>Hght | SA<br>Level<br>(Peak) | Ant.<br>Corr. | Cable<br>Corr. | Amp. | Duty<br>Cycle | Corr.<br>Level | Corr.<br>Level | Limit  | Margin |
|---------|------|---------|--------------|-----------------------|---------------|----------------|------|---------------|----------------|----------------|--------|--------|
| (MHz)   | H/V  | Degree  | (m)          | (dBuV)                | (dB/m)        | (dB)           | (dB) | (dB)          | (dBuV/m)       | (uV/m)         | (uV/m) | dB     |
| 314.97  | V    | 180     | 1            | 46.6                  | 14.6          | 3.9            | 0.0  | -5.4          | 59.68          | 963.8          | 6040.4 | -15.9  |
| 629.94  | V    | 180     | 1            | 14.8                  | 18.9          | 5.9            | 0.0  | -5.4          | 34.18          | 51.2           | 604.0  | -21.4  |
| 944.91  | V    | 180     | 1            | 6.2                   | 22.9          | 7.8            | 0.0  | -5.4          | 31.48          | 37.5           | 604.0  | -24.1  |
| 1259.88 | V    | 180     | 1            | 57                    | 26.1          | 1.9            | 36.1 | -5.4          | 43.44          | 148.6          | 604.0  | -12.2  |
| 1574.85 | V    | 180     | 1            | 58.9                  | 27.5          | 2.6            | 35.8 | -5.4          | 47.77          | 244.5          | 500.0  | -6.2   |
| 1889.82 | V    | 180     | 1            | 53.8                  | 28.6          | 3.2            | 35.6 | -5.4          | 44.63          | 170.4          | 604.0  | -11.0  |
| 2204.79 | V    | 180     | 1            | 54.4                  | 29.3          | 3.3            | 35.5 | -5.4          | 46.05          | 200.8          | 500.0  | -7.9   |
| 2519.76 | V    | 180     | 1            | 54.7                  | 29.9          | 3              | 35.6 | -5.4          | 46.58          | 213.3          | 604.0  | -9.0   |
| 2834.73 | V    | 180     | 1            | 55                    | 30.4          | 2.8            | 35.7 | -5.4          | 47.11          | 226.8          | 500.0  | -6.9   |
| 3149.7  | V    | 180     | 1            | 53.5                  | 30.9          | 2.8            | 35.6 | -5.4          | 46.13          | 202.6          | 604.0  | -9.5   |
| 314.97  | H    | 90      | 1            | 55.2                  | 14.6          | 3.9            | 0.0  | -5.4          | 68.28          | 2594.2         | 6040.4 | -7.3   |
| 629.94  | H    | 180     | 1            | 8.6                   | 18.9          | 5.9            | 0.0  | -5.4          | 27.98          | 25.1           | 604.0  | -27.6  |
| 944.91  | H    | 180     | 1            | 7.3                   | 22.9          | 7.8            | 0.0  | -5.4          | 32.58          | 42.6           | 604.0  | -23.0  |
| 1259.88 | H    | 180     | 1            | 52.3                  | 26.1          | 1.9            | 36.1 | -5.4          | 38.74          | 86.5           | 604.0  | -16.9  |
| 1574.85 | H    | 180     | 1            | 56.2                  | 27.5          | 2.6            | 35.8 | -5.4          | 45.07          | 179.2          | 500.0  | -8.9   |
| 1889.82 | H    | 180     | 1            | 50.4                  | 28.6          | 3.2            | 35.6 | -5.4          | 41.23          | 115.2          | 604.0  | -14.4  |
| 2204.79 | H    | 180     | 1            | 55.2                  | 29.3          | 3.3            | 35.5 | -5.4          | 46.85          | 220.2          | 500.0  | -7.1   |
| 2519.76 | H    | 180     | 1            | 57.2                  | 29.9          | 3              | 35.6 | -5.4          | 49.08          | 284.4          | 604.0  | -6.5   |
| 2834.73 | H    | 180     | 1            | 55.1                  | 30.4          | 2.8            | 35.7 | -5.4          | 47.21          | 229.4          | 500.0  | -6.8   |
| 3149.7  | H    | 180     | 1            | 48.2                  | 30.9          | 2.8            | 35.6 | -5.4          | 40.83          | 110.1          | 604.0  | -14.8  |

Table 6: Radiated Emission Test Data (continued)

Peak Data - Harmonics Z orientation

| Freq.   | Pol. | Azimuth | Ant.<br>Hght | SA<br>Level<br>(Peak) | Ant.<br>Corr. | Cable<br>Corr. | Amp. | Duty<br>Cycle | Corr.<br>Level | Corr.<br>Level | Limit  | Margin |
|---------|------|---------|--------------|-----------------------|---------------|----------------|------|---------------|----------------|----------------|--------|--------|
| (MHz)   | H/V  | Degree  | (m)          | (dBuV)                | (dB/m)        | (dB)           | (dB) | (dB)          | (dBuV/m)       | (uV/m)         | (uV/m) | dB     |
| 314.97  | V    | 180     | 1            | 48.3                  | 14.6          | 3.9            | 0.0  | -5.4          | 61.38          | 1172.2         | 6040.4 | -14.2  |
| 629.94  | V    | 180     | 1            | 10.7                  | 18.9          | 5.9            | 0.0  | -5.4          | 30.08          | 31.9           | 604.0  | -25.5  |
| 944.91  | V    | 180     | 1            | 8.9                   | 22.9          | 7.8            | 0.0  | -5.4          | 34.18          | 51.2           | 604.0  | -21.4  |
| 1259.88 | V    | 180     | 1            | 62                    | 26.1          | 1.9            | 36.1 | -5.4          | 48.44          | 264.3          | 604.0  | -7.2   |
| 1574.85 | V    | 180     | 1            | 57.8                  | 27.5          | 2.6            | 35.8 | -5.4          | 46.67          | 215.4          | 500.0  | -7.3   |
| 1889.82 | V    | 180     | 1            | 51.9                  | 28.6          | 3.2            | 35.6 | -5.4          | 42.73          | 136.9          | 604.0  | -12.9  |
| 2204.79 | V    | 180     | 1            | 54.4                  | 29.3          | 3.3            | 35.5 | -5.4          | 46.05          | 200.8          | 500.0  | -7.9   |
| 2519.76 | V    | 180     | 1            | 56.3                  | 29.9          | 3              | 35.6 | -5.4          | 48.18          | 256.4          | 604.0  | -7.4   |
| 2834.73 | V    | 180     | 1            | 53.1                  | 30.4          | 2.8            | 35.7 | -5.4          | 45.21          | 182.2          | 500.0  | -8.8   |
| 3149.7  | V    | 180     | 1            | 49.4                  | 30.9          | 2.8            | 35.6 | -5.4          | 42.03          | 126.4          | 604.0  | -13.6  |
| 314.97  | H    | 90      | 1            | 53.2                  | 14.6          | 3.9            | 0.0  | -5.4          | 66.28          | 2060.6         | 6040.4 | -9.3   |
| 629.94  | H    | 135     | 1            | 11.3                  | 18.9          | 5.9            | 0.0  | -5.4          | 30.68          | 34.2           | 604.0  | -24.9  |
| 944.91  | H    | 180     | 1            | 7.8                   | 22.9          | 7.8            | 0.0  | -5.4          | 33.08          | 45.1           | 604.0  | -22.5  |
| 1259.88 | H    | 180     | 1            | 52.8                  | 26.1          | 1.9            | 36.1 | -5.4          | 39.24          | 91.7           | 604.0  | -16.4  |
| 1574.85 | H    | 180     | 1            | 55.2                  | 27.5          | 2.6            | 35.8 | -5.4          | 44.07          | 159.7          | 500.0  | -9.9   |
| 1889.82 | H    | 180     | 1            | 51                    | 28.6          | 3.2            | 35.6 | -5.4          | 41.83          | 123.4          | 604.0  | -13.8  |
| 2204.79 | H    | 180     | 1            | 54.8                  | 29.3          | 3.3            | 35.5 | -5.4          | 46.45          | 210.2          | 500.0  | -7.5   |
| 2519.76 | H    | 180     | 1            | 55.3                  | 29.9          | 3              | 35.6 | -5.4          | 47.18          | 228.5          | 604.0  | -8.4   |
| 2834.73 | H    | 180     | 1            | 53.8                  | 30.4          | 2.8            | 35.7 | -5.4          | 45.91          | 197.5          | 500.0  | -8.1   |
| 3149.7  | H    | 180     | 1            | 52.9                  | 30.9          | 2.8            | 35.6 | -5.4          | 45.53          | 189.1          | 604.0  | -10.1  |

#### **4.6 Frequency Stability: (FCC Part §2.1055)**

N/A