

---

Project 07144-10

**NEC INFRONTIA  
1613 MOBILE TERMINAL**

**Electromagnetic Emission Test Report**

Prepared for:

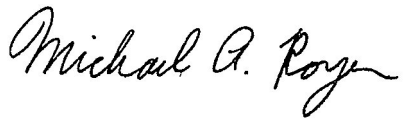
NEC Infrontia  
6535 N. State Highway 161  
Irving TX 75039

By

Professional Testing (EMI), Inc.  
1601 FM 1460, Suite B  
Round Rock, Texas 78664

14 September 2006  
REV 5

---

| Reviewed by                                                                         | Written by                                                                           |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
|  |  |
| Michael Royer<br>Regulatory Department Manager                                      | Eric Lifsey<br>EMC Engineer                                                          |

## **TABLE OF CONTENTS**

|                                           |    |
|-------------------------------------------|----|
| Title Page .....                          | 1  |
| Table of Contents .....                   | 2  |
| Certificate of Compliance .....           | 5  |
| 1.0 EUT Description .....                 | 5  |
| 1.1 Applicable Rule Parts .....           | 5  |
| 1.2 EUT Operation .....                   | 5  |
| 1.3 Test Facility .....                   | 5  |
| 1.4 Test Results .....                    | 5  |
| 2.0 AC Mains Conducted Emissions .....    | 6  |
| 2.1 Test Procedure .....                  | 6  |
| 2.2 Test Criteria .....                   | 6  |
| 3.0 Peak Output Power .....               | 6  |
| 3.1 Test Procedure .....                  | 6  |
| 3.2 Test Criteria .....                   | 6  |
| 4.0 Minimum 6 dB Occupied Bandwidth ..... | 7  |
| 4.1 Test Procedure .....                  | 7  |
| 4.2 Test Criteria .....                   | 7  |
| 5.0 Power Spectral Density .....          | 7  |
| 5.1 Test Procedure .....                  | 7  |
| 5.2 Test Criteria .....                   | 7  |
| 6.0 Peak Excursion .....                  | 7  |
| 6.1 Test Procedure .....                  | 7  |
| 6.2 Test Criteria .....                   | 7  |
| 7.0 Band Edge Spurious Emissions .....    | 8  |
| 7.1 Test Procedure .....                  | 8  |
| 7.2 Test Criteria .....                   | 8  |
| 8.0 Out of Band Spurious Emissions .....  | 8  |
| 8.1 Test Procedure .....                  | 8  |
| 8.2 Test Criteria .....                   | 8  |
| 9.0 Antenna Requirements .....            | 9  |
| 9.1 Evaluation Procedure .....            | 9  |
| 9.2 Evaluation Criteria .....             | 9  |
| 10.0 Timing Assessment .....              | 9  |
| 10.1 Test Procedure .....                 | 10 |
| 10.2 Test Criteria .....                  | 10 |
| 11.0 Radio Frequency Exposure .....       | 10 |
| 11.1 Evaluation Procedure .....           | 10 |
| 11.2 Evaluation Criteria .....            | 10 |
| 12.0 Receiver Requirements .....          | 10 |
| 12.1 Power line Conducted Emissions ..... | 10 |
| 12.1.1 Test Procedure .....               | 10 |
| 12.1.2 Test Criteria .....                | 10 |
| 12.2 Spurious Radiated Emissions .....    | 11 |
| 12.2.1 Test Procedure .....               | 11 |
| 12.2.2 Test Criteria .....                | 11 |
| 13.0 Test Equipment List .....            | 11 |
| 14.0 Modifications .....                  | 13 |

## **TABLE OF APPENDICES**

|                                                                                  |    |
|----------------------------------------------------------------------------------|----|
| APPENDIX A Test Setup Figures .....                                              | 14 |
| APPENDIX B Test Results.....                                                     | 17 |
| APPENDIX C Policy, Evaluation and Rationale of EMC Measurement Uncertainty ..... | 70 |

### **Revision History**

#### **REV 1 of 29 Aug 2006 - EL**

Correct page number in Table of Appendices for Appendix C.  
Update/verify equipment list.

#### **REV 2 of 11 Sep 2006 - EL**

Removed field-strength based measurements, added conducted method measurements, revise procedures.  
Add measurements of band-edge spurious in restricted bands adjacent to 2400-2483.5 MHz band, b & g modes.  
Corrected power limit references.  
Correct peak power spectral density measurements for UNII-1, added plotted data.  
Attest to measurements of both harmonics & non-harmonic spurious to 25 or 40 GHz as applies.

#### **REV 3 of 14 Sep 2006 - EL**

Re-measure peak excursion with 3 MHz & 300 kHz VBW by conducted. Correct limit to 13 dB.

#### **REV 4 of 14 Sep 2006 - EL**

Re-measure peak power spectral density for all 15.247 bands using conducted method.

#### **REV 5 of 14 Sep 2006 - EL**

Remove RF exposure section to an individual document.

NOTICE: (1) This Report must not be used to claim product endorsement, by NVLAP, NIST, the FCC or any other Agency. This report also does not warrant certification by NVLAP or NIST. This report shall not be reproduced except in full, without the written approval of Professional Testing (EMI), Inc. The significance of this report is dependent on the representative character of the test sample submitted for evaluation and the results apply only in reference to the sample tested. The manufacturer must continuously implement the changes shown herein to attain and maintain the required degree of compliance.



# Certificate Of Compliance

Applicant: NEC Infrontia

Applicant's Address: NEC Infrontia  
6535 N. State Highway 161  
Irving TX 75039

Project Number: 07144-10

Test Dates: 24 Jul 2006 - 18 Aug 2006, 6 Sep 2006 – 8 Sep 2006

I, Michael A. Royer, for Professional Testing (EMI), Inc., being familiar with the FCC and Industry Canada rules and test procedures have reviewed the test setup, measured data and this report. I believe them to be true and accurate.

The **NEC Infrontia, 1613 Mobile Terminal** was tested to and found to comply with FCC Part 15 Subpart C for an intentional radiator.

The highest emissions generated by the above equipment are listed below:

| 802.11 Band Mode | Applicable FCC Rule | Frequency (MHz) | Measured Power (dBm) | Power Limit (dBm) | Margin (dB) |
|------------------|---------------------|-----------------|----------------------|-------------------|-------------|
| b                | 15.247              | 2412 – 2480     | 8.9                  | 30                | -21.1       |
| g                | 15.247              | 2412 – 2480     | 8.6                  | 30                | -21.4       |
| a (UNII-1)       | 15.407              | 5180 – 5240     | 4.8                  | 17                | -12.2       |
| a (UNII-3)       | 15.247              | 5745 – 5805     | 7.4                  | 30                | -22.6       |

**\*UNII-1 measured bandwidths: 24.5 & 20.7 MHz (Smallest BW figure used for UNII-1 Power Limit calculation.)**

| Other Emissions | Frequency (MHz) | Level                   | Limit         | Margin (dB) |
|-----------------|-----------------|-------------------------|---------------|-------------|
| Harmonics       | 11610           | 62.6 dB $\mu$ V/m (avg) | 63.5          | -0.9        |
| Spurious        | 375             | 41.5 dB $\mu$ V/m (pk)  | 46            | -4.5        |
| Mains Conducted | 1.25803         | 41.1 dB $\mu$ V (avg)   | 46 dB $\mu$ V | -4.9        |

Michael A. Royer, BSEE, NCE  
Regulatory Department Manager

This report has been reviewed and accepted by the applicant. The undersigned is responsible for ensuring that the equipment named above will continue to comply with the FCC and Industry Canada rules.

## 1.0 EUT Description

The Equipment Under Test (EUT) is a battery-powered touch-screen tablet PC and docking station. The tablet PC boots the Microsoft Embedded XP operating system and presents a display measuring 10.4 inches diagonally. The wireless features (based on a MiniPCI card) of the tablet PC are subject to certification with the contribution of the entire system considered.

All of the EUT's wireless electronics for IEEE 802.11 {a b g} operation, and antennas (2), reside within the tablet PC. The tablet PC has a built-in numeric keypad adjacent to the LCD display, and the LCD screen is touch-sensitive.

The docking station provides a USB hub and passes through power from the AC Adapter, which provides power to operate and re-charge the 1613 Mobile Terminal.

The system tested consisted of the following:

| Manufacturer  | Model    | FCC ID Number | IC Identifier |
|---------------|----------|---------------|---------------|
| NEC Infrontia | S1613-01 | UI3S1613-01   | 140L-S161301  |

### 1.1 Applicable Rule Parts

| Guidelines                  | FCC Rules              | IC Rules            |                            |
|-----------------------------|------------------------|---------------------|----------------------------|
|                             | Part 15                | RSS-GEN Issue 1     | RSS-210 Issue 6            |
| Transmitter Characteristics | 15.247, 15.407*        | 4.1-4.6, 7          | 2.2, 2.6-2.7, A2.9, A8, A9 |
| Spurious Radiated Power     | 15.225, 15.209, 15.407 | 4.2, 4.7, 4.8, 6, 7 | 2.2, 2.6-2.7, A2.9, A8, A9 |
| Power Line Conducted        | 15.207                 | 4.2, 4.7, 7.2       |                            |
| Antenna Requirement         | 15.203                 | 7.1, 7.1.4          |                            |

\*In addition, the provisions of FCC DA-02-2138a1 apply for measurement methods.

### 1.2 EUT Operation

The EUT were operated in continuous transmit mode at programmed maximum power settings and data rates to measure fundamental, harmonics, and spurious radiation. Receive mode spurious emissions were also measured. The EUT was configured and operated in a manner consistent with typical applications.

### 1.3 Test Facility

The tests documented herein were performed at Professional Testing, in Round Rock, Texas.

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates and expressions thereof for EMC testing. PTI's policy for EMC Measurement Uncertainty is provided in Appendix C.

### 1.4 Test Results

The data collected from the tests listed this report are presented entirely in Appendix B.

## 2.0 AC Mains Conducted Emissions

### 2.1 Test Procedure

The EUT AC mains conducted emissions were measured using a LISN and spectrum analyzer. Peripheral equipment was powered from an auxiliary LISN. Excess lengths of power or interface cable were separately bundled in a non-inductive arrangement at the approximate center of the cable with the bundle 30 to 40 centimeters in length to limit total length to 1 meter.

Measurements are performed in a fully shielded room. The EUT is placed on a wood table 0.4 meters from the vertical reference plane and 0.8 meters above the horizontal reference plane.

### 2.2 Test Criteria

The limits of FCC Part 15 Class B were applied.

| Frequency<br>(MHz) | Conducted Limits (dBuV) |            |
|--------------------|-------------------------|------------|
|                    | Average                 | Quasi-Peak |
| 0.15 – .50         | 66-56*                  | 56 – 46*   |
| .50 - 5            | 56                      | 46         |
| 5 – 30             | 60                      | 50         |

The tighter limit shall apply at the edge between two frequency bands.

\*The limit decreases with the logarithm of the frequency.

## 3.0 Peak Output Power

### 3.1 Test Procedure

Conducted power measurements were taken from the EUT for designated frequencies in each band and all supported data rates. A peak reading RF power meter is directly connected to the EUT antenna port for these measurements.

### 3.2 Test Criteria

The table below shows the relevant FCC radiated limits.

| Commonly Known Band Designation | Spectrum Regulated<br>(At channel centers.)<br>MHz | EIRP Power<br>dBm (mW)            |
|---------------------------------|----------------------------------------------------|-----------------------------------|
| IEEE 802.11b                    | 2412 – 2462                                        | 30 (1000)                         |
| IEEE 802.11g                    | 2412 – 2462                                        | 30 (1000)                         |
| IEEE 802.11a UNII-1             | 5180 – 5240                                        | 17 (50)                           |
| IEEE 802.11a UNII-3/ISM         | 5745 – 5805/5825                                   | 30 (1000) {Highest channel 5805.} |

## 4.0 Minimum 6 dB Occupied Bandwidth

### 4.1 Test Procedure

The occupied bandwidth was measured with a spectrum analyzer connected to a double-ridged guide horn while the EUT was operating in continuous transmit mode at the appropriate center frequency. The analyzer center frequency was set to the EUT carrier frequency. Display line and marker delta functions were used to measure the 6 dB occupied bandwidth of the EUT. Measurements were made at either of two or three frequencies according to band size. A drawing showing the test setup is given in Appendix A.

### 4.2 Test Criteria

The minimum 6 dB occupied bandwidth for the EUT is 500 kHz.

## 5.0 Power Spectral Density

### 5.1 Test Procedure

The fundamental emission of the EUT is maximized and the spectrum analyzer is tuned to the highest point. The analyzer is then set with VBW > RBW and peak measured according to the table below. The test setup is included in Appendix A.

For the UNII bands PSD is measured by conduction, while other bands are measured as radiated field strength then converted mathematically to transmit power.

| Commonly Known Band Designation | Span (kHz) | RBW (kHz)           | Sweep Time (seconds)    | Criteria |
|---------------------------------|------------|---------------------|-------------------------|----------|
| IEEE 802.11b                    | 300        | 3                   | 100                     | 8 dBm    |
| IEEE 802.11g                    | 300        | 3                   | 100                     | 8 dBm    |
| IEEE 802.11a UNII-1             | EBW        | 1000 (100 averages) | EBW <sub>(MHz)</sub> *1 | 4 dBm    |
| IEEE 802.11a UNII-3/ISM         | 300        | 3                   | 100                     | 8 dBm    |

### 5.2 Test Criteria

Where 15.247 is applied, the maximum power spectral density is +8 dBm in any 3 kHz bandwidth. Where 15.407 is applied, the measurement is averaged for 100 sweeps using sample mode detection with each sweep being 1 second long.

## 6.0 Peak Excursion

### 6.1 Test Procedure

For UNII bands this procedure measures the max-hold peak fundamental emission at 1 MHz and 300 kHz video bandwidths and compares the difference. Resolution bandwidth is kept at 1 MHz.

A plot is recorded of the result.

### 6.2 Test Criteria

The two measurements must be within 13 dB.

## **7.0 Band Edge Spurious Emissions**

### **7.1 Test Procedure**

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable, which allows 360-degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. Rotating the EUT maximized the emissions.

The spectrum analyzer was set for peak detection using a 100 kHz resolution bandwidth. The span is set such that the band edge is within the display. Measurement is made at the band edge to determine if the EUT meets the test criteria. The test setup is included in Appendix A.

### **7.2 Test Criteria**

Band edge spurious emissions must be 20 dB below the highest peak in the operating band in any 100 kHz bandwidth. If the frequency falls in the restricted bands of 15.205, then the maximum permitted average must be below the field strength listed in 15.209.

Alternatively, the band edge spurious emissions will meet criteria if they are attenuated below the limits specified in FCC 15.209 or RSS-210.

## **8.0 Out of Band Spurious Emissions**

### **8.1 Test Procedure**

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable, which allows 360-degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. Rotating the EUT maximized the emissions.

For spurious emissions below 1 GHz quasi-peak detection is used with a resolution bandwidth of 120 kHz. For spurious/harmonic emissions above 1 GHz peak detection with a resolution bandwidth of 1 MHz. Average detection above 1 GHz is used to determine compliance of the EUT if the peak does not meet the average limit. A resolution bandwidth of 1 MHz and video bandwidth of 10 Hz is used for average detection. The test setup is included in Appendix A.

Measurements above 18 GHz are done with harmonic mixers and small horns at 25 cm distance with the mixer/horn assembly held by hand and the EUT rotated to search for emissions.

Testing was completed with a representative frequency in the center of the band to determine compliance.

### **8.2 Test Criteria**

The 3 meter radiated limits of FCC 15.209 and RSS-210 are shown below. The limits are quasi-peak for emissions below 1 GHz and average for emissions above 1 GHz. In addition, above 1 GHz the peak limit is 20 dB above the average limit.

Upper limit of measurement is 5 times the receive frequency and the lower figure of 10 times the transmit frequency or 40 GHz. Harmonics and non-harmonic spurious emissions in these ranges are investigated.

| Frequency<br>MHz | Test Distance<br>(Meters) | Field Strength |                |
|------------------|---------------------------|----------------|----------------|
|                  |                           | ( $\mu$ V/m)   | (dB $\mu$ V/m) |
| 30 to 88         | 3                         | 100            | 40.0           |
| 88 to 216        | 3                         | 150            | 43.5           |
| 216 to 960       | 3                         | 200            | 46.0           |
| Above 960        | 3                         | 500            | 54.0           |

Note: Emissions above 1 GHz were measured at a distance of 1 meter. The 3-meter limit was increased by 9.5 dB. Emissions above 18 GHz were measured at a distance of 25 cm and the 3-meter limit increased by 21.6 dB.

Additional limits in non-restricted bands where 15.407 is applied:

| Commonly Known Band<br>Designation | Specified EIRP Limit<br>Power in dBm | Converted to Field<br>Strength in dB $\mu$ V<br>At 3 Meters | Field Strength in<br>dB $\mu$ V at 1 Meter |
|------------------------------------|--------------------------------------|-------------------------------------------------------------|--------------------------------------------|
| IEEE 802.11a UNII-1                | -27                                  | 68.3                                                        | 78.1                                       |
| IEEE 802.11a UNII-2                | -27                                  | 68.3                                                        | 78.1                                       |

Conversion method: Field Strength at 3 meters =  $1000000 * [(30 * \text{Power})^{0.5}] / 3$

Spurious measurements are compared to the 15.209 limits unless individual signals attributed to the UNII bands listed above qualify for the relaxed non-restricted band limits set above.

## 9.0 Antenna Requirements

### 9.1 Evaluation Procedure

The antenna of the EUT is analyzed with respect to the rules of FCC 15.203 and RSS-210 5.5. Gain of the antenna is assessed by reviewing the manufacturer's data sheet.

### 9.2 Evaluation Criteria

Section 15.203 and RSS-210 of the rules states that the subject device must meet at least one of the following criteria:

- Antenna is permanently attached to the unit.
- Antenna must use a unique type of connector to attach to the EUT.
- Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Section 15.247(b)(4)(i) states that if the transmitting antenna has a directional gain greater than 6 dBi the power shall be reduced the amount in dB that the directional gain is greater than 6 dBi.

## 10.0 Timing Assessment

The timing between transmissions and duration of each transmission on the **EUT** was assessed to determine an appropriate peak to average correction factor for typical operation.

## 10.1 Test Procedure

Using a spectrum analyzer set in zero span two pulses are captured on the screen. The ratio of on-time to off-time is calculated and converted to the dB scale. A maximum time period of 100 milliseconds applies in any case. The test setup is included in Appendix A.

## 10.2 Test Criteria

There is no criteria associated with this assessment. This correction factor is used to determine the average value of an emission if the peak exceeds the average limit for the emission being measured.

## 11.0 Radio Frequency Exposure

### 11.1 Evaluation Procedure

The FRIIS transmission formula was applied to the peak power measurements. The minimum distance from the body is obtained where radio frequency exposure reaches the limit. The distance is compared with the normal distance of operation from the body.

### 11.2 Evaluation Criteria

According to FCC 1.1307(b) the limits for maximum permissible exposure (MPE) from 1.1310 must be used to evaluate the impact of human exposure to radio frequency radiation. The limits from 1.1310 are listed below:

| Frequency<br>MHz                                           | Power Density<br>(mW/cm <sup>2</sup> ) | Average Time<br>(Minutes) |
|------------------------------------------------------------|----------------------------------------|---------------------------|
| (B) Limits for Occupational / Controlled Exposures         |                                        |                           |
| 30-300                                                     | 1.0                                    | 6                         |
| 300-1500                                                   | f/300                                  | 6                         |
| 1500-100,000                                               | 5                                      | 6                         |
| (B) Limits for General Population / Uncontrolled Exposures |                                        |                           |
| 30-300                                                     | 0.2                                    | 30                        |
| 300-1500                                                   | f/1500                                 | 30                        |
| 1500-100,000                                               | 1.0                                    | 30                        |

## 12.0 Receiver Requirements

### 12.1 Power line Conducted Emissions

Conducted emissions measurements were made on the Class II Power Supply mains terminals of the EUT to determine the line-to-ground radio noise emitted from each power-input terminal.

#### 12.1.1 Test Procedure

The procedure here is consistent with the procedure stated in section 2.1 for Power line Conducted Emissions except the EUT is operated in a receive/standby mode.

#### 12.1.2 Test Criteria

The FCC 15.107 and RSS-210 7.4 conducted emissions limits are given below.

| Frequency<br>(MHz) | Conducted Limits (dB $\mu$ V) |            |
|--------------------|-------------------------------|------------|
|                    | Average                       | Quasi-Peak |
| 0.15 – .50         | 66-56                         | 56 - 46    |
| .50 - 5            | 56                            | 46         |
| 5 – 30             | 60                            | 50         |

The lower limit shall apply at the transition frequency.

## 12.2 Spurious Radiated Emissions

Measurements were made of the radiated spurious emission levels for the **EUT** receiver. Tests of the device were performed to determine the worst case polarization of the devices. The spurious emissions of the device were measured with the EUT in the three orthogonal axes

### 12.2.1 Test Procedure

The procedure here is consistent with the procedure stated in section 7.1 for Spurious Radiated Emissions except the EUT is operated in a receive/standby mode.

### 12.2.2 Test Criteria

The radiated limits of FCC 15.209 and RSS-210 are shown below. The limits specified are at 3 meters. The limits are quasi-peak for emissions below 1 GHz and average for emissions above 1 GHz. Also above 1 GHz the peak limit is 20 dB above the average limit.

| Frequency<br>MHz | Test Distance<br>(Meters) | Field Strength |                |
|------------------|---------------------------|----------------|----------------|
|                  |                           | ( $\mu$ V/m)   | (dB $\mu$ V/m) |
| 30 to 88         | 3                         | 100            | 40.0           |
| 88 to 216        | 3                         | 150            | 43.5           |
| 216 to 960       | 3                         | 200            | 46.0           |
| Above 960        | 3                         | 500            | 54.0           |

Note: Emissions above 1 GHz were measured at a distance of 1 meter. The limit was increased by 9.5 dB. Emissions above 18 GHz were measured at a distance of 25 cm and the limit increased by 21.6 dB.

## 13.0 Test Equipment List

The following test equipment was employed.

### Mains Conducted Emissions

| Asset # | Manufacturer | Model # | Description               | Calibration Due      |
|---------|--------------|---------|---------------------------|----------------------|
| C025    | Belden       | RG223   | Coaxial Cable             | Calibrate Before Use |
| 0081    | Elgar        | 1751SL  | Variable AC Power Source  | Calibrate Before Use |
| 0572    | PTI          | CISPR16 | High Pass Filter          | 26 Sep 2006          |
| 0759    | Solar        | 8012    | LISN                      | 5 Oct 2006           |
| 0027    | EMCO         | 3825/2  | Auxiliary LISN            | 11 Jul 2006          |
| 0045    | HP           | 85662A  | Spectrum Analyzer Display | Not Required         |
| 0237    | HP           | 8568B   | Spectrum Analyzer         | 14 Dec 2006          |
| 0239    | HP           | 85650A  | Quasi-peak Adapter        | 14 Dec 2006          |

|      |     |        |                |             |
|------|-----|--------|----------------|-------------|
| 0990 | HP  | 85685A | RF Preselector | 14 Dec 2006 |
| 0474 | PTI | 3dB    | Limiter        | 16 Sep 2006 |

## &lt; 1 GHz

| Asset # | Manufacturer | Model # | Description                  | Calibration Due |
|---------|--------------|---------|------------------------------|-----------------|
| C005    | None         | None    | Underground Coaxial Cable    | 8 Dec 2006      |
| 1494    | EMCO         | 3110B   | Biconical Dipole Antenna     | 20 Apr 2007     |
| 0290    | EMCO         | 3146    | Log Periodic Antenna         | 22 May 2007     |
| 0483    | HP           | 8447D   | Preamplifier, < 1 GHz        | 12 Jan 2007     |
| 0043    | HP           | 8567A   | Spectrum Analyzer            | 28 Mar 2007     |
| 0044    | HP           | 85662A  | Spectrum Analyzer Display    | 28 Mar 2007     |
| 0085    | HP           | 85650A  | Spectrum Analyzer QP Adapter | 26 Sep 2006     |
| 0483    | Tektronix    | 2706    | RF Preselector               | 27 Oct 2007     |

## &gt; 1 GHz

| Asset # | Manufacturer | Model #   | Description               | Calibration Due      |
|---------|--------------|-----------|---------------------------|----------------------|
| C025    | Belden       | RG223     | Coaxial Cable             | Calibrate Before Use |
| 0081    | Elgar        | 1751SL    | Variable AC Power Source  | Calibrate Before Use |
| 1525    | HP           | 8566B     | Spectrum Analyzer         | 10 Jul 2007          |
| 1526    | HP           | 8566B     | Spectrum Analyzer Display | 28 Jun 2007          |
| 0950    | HP           | 8566B     | Spectrum Analyzer         | 30 May 2007          |
| 0949    | HP           | 8566B     | Spectrum Analyzer Display | 30 May 2007          |
| 0897    | Miteq        | -         | Preamplifier, > 1 GHz     | 16 May 2007          |
| 0582    | EMCO         | 3115      | Horn 1 – 18 GHz           | 21 Jul 2007          |
| 0910    | HP           | 11971T    | Harmonic Mixer Set        | CBU                  |
| 1057    | HP           | 11517A    | Mixer, 12.4 – 40 GHz      | CBU                  |
| 0989    | MicroTronics | HPM50111  | 2.5 GHz High Pass Filter  | CBU                  |
| 1527    | MicroTronics | HPM501121 | 6.3 GHz High Pass Filter  | 11 Aug 2007          |

| Asset # | Manufacturer | Model # | Description    | Calibration Due |
|---------|--------------|---------|----------------|-----------------|
| 1093    | Boonton      | 4532    | RF Power Meter | 28 Aug 2007     |
| 1503    | Boonton      | -       | RF Power Probe | 28 Aug 2007     |

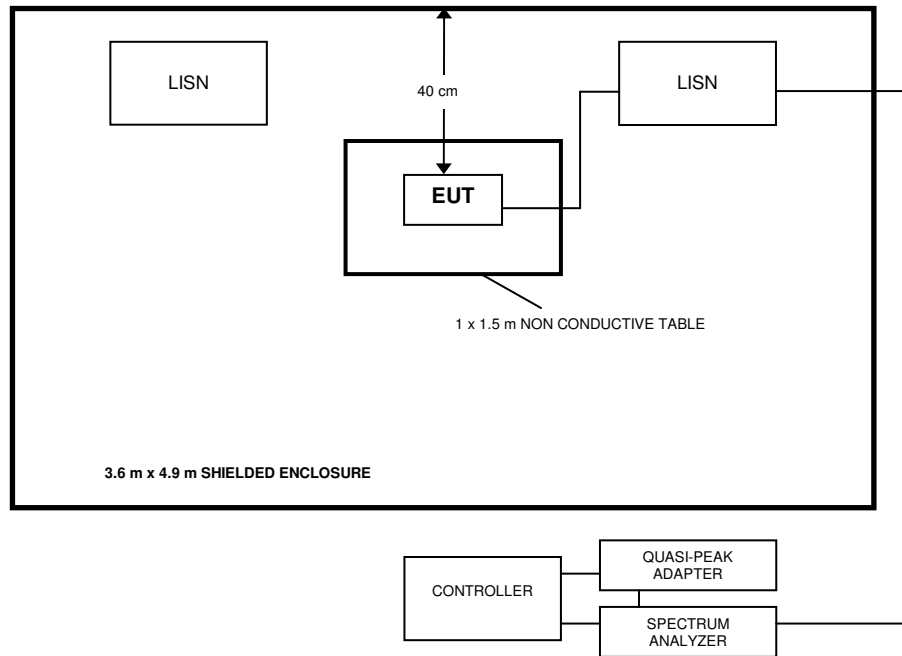
## **14.0 Modifications**

No modifications were made to the EUT during the performance of the test program.

## **Appendix A**

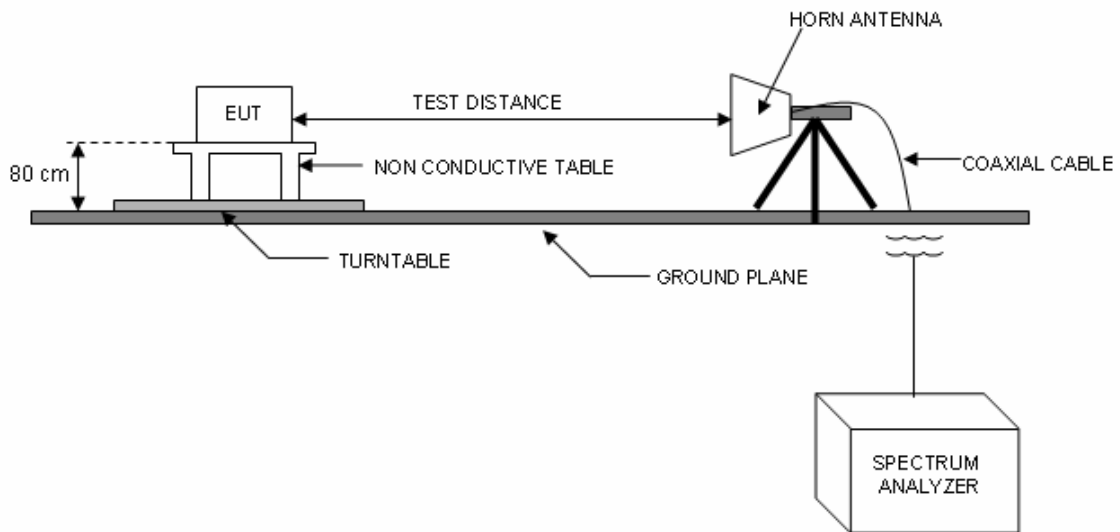
## **Test Setup Figures**

## Conducted Test Setup

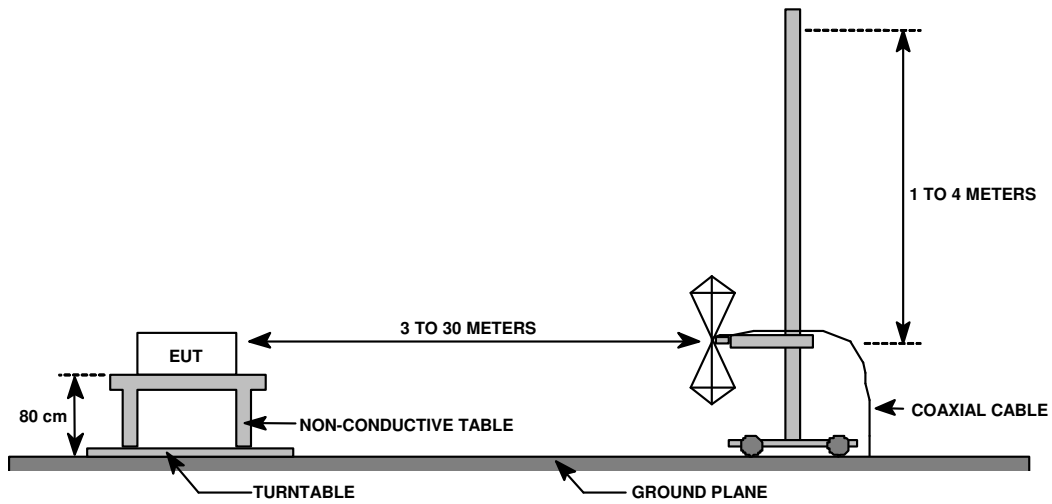


## Radiated Test Setup

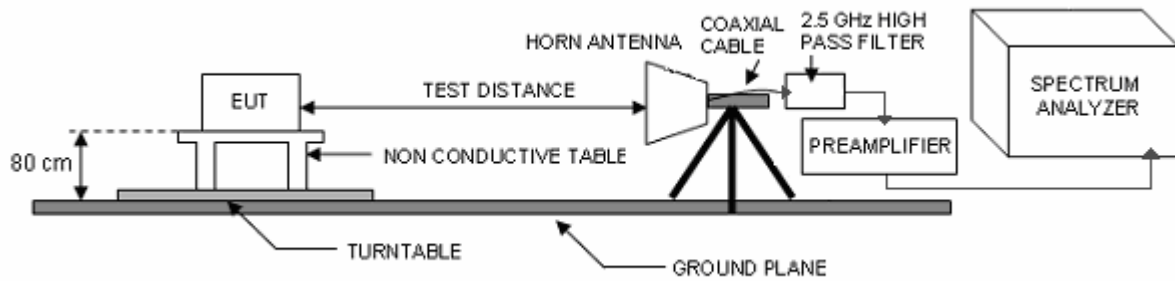
Peak Power, Occupied Bandwidth, Power Spectral Density,  
Timing Assessment, Band Edge Spurious, Adjacent Restricted Bands



## Radiated Test Setup Spurious



## Radiated Test Setup Harmonics (A 6 GHz high pass filter is employed for 5 GHz transmit modes.)



## Appendix B

## Test Results

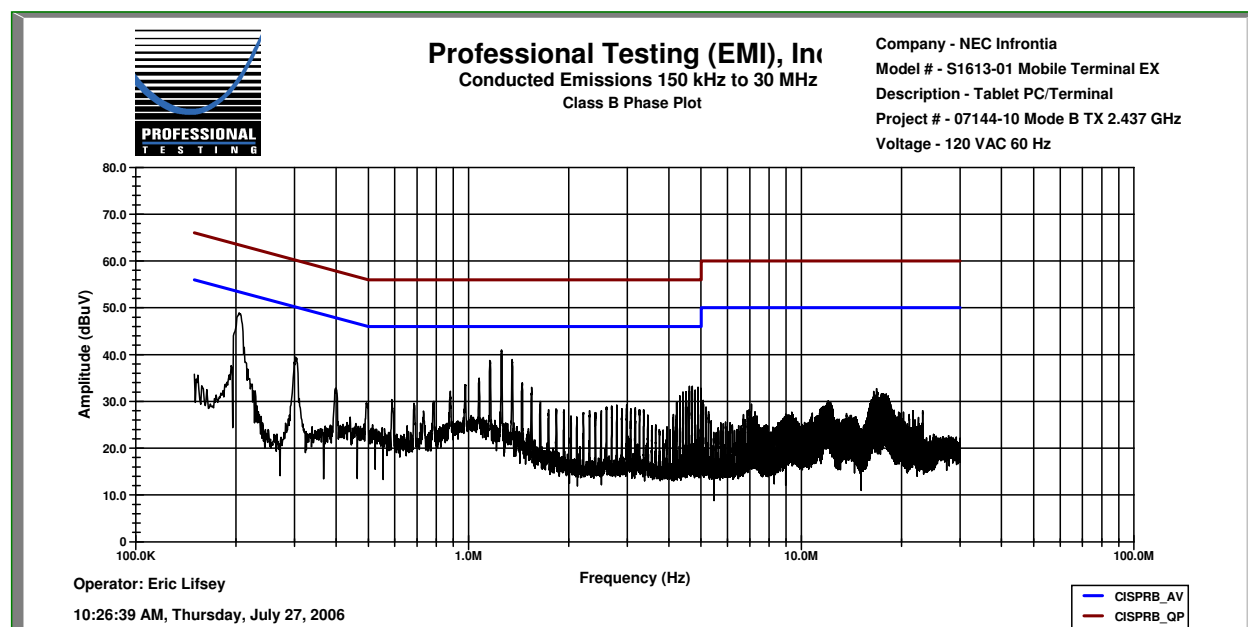
---

## 802.11b Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE  | POWER SOURCE |
|-----------|--------------|-------|-------|--------------|
| 07144-10  | 27 July 2006 | FCC B | PHASE | AC 120/60    |

|         |              |
|---------|--------------|
| COMMENT | Transmitting |
|---------|--------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20442         | 48.3                      | 34.3                   | 64.4                    | -16.2                  | 54.4                 | -20.2               |
| 0.30222         | 39.0                      | 27.8                   | 61.7                    | -22.6                  | 51.7                 | -23.9               |
| 1.16090         | 37.7                      | 37.1                   | 56.0                    | -18.3                  | 46.0                 | -8.9                |
| 1.25515         | 40.5                      | 40.0                   | 56.0                    | -15.5                  | 46.0                 | -6.0                |
| 1.34965         | 38.0                      | 37.3                   | 56.0                    | -18.0                  | 46.0                 | -8.7                |
| 16.5414         | 29.1                      | 24.2                   | 60.0                    | -30.9                  | 50.0                 | -25.8               |
| 16.8266         | 29.1                      | 24.8                   | 60.0                    | -30.9                  | 50.0                 | -25.2               |
| 16.9236         | 28.8                      | 25.2                   | 60.0                    | -31.2                  | 50.0                 | -24.8               |
| 17.4005         | 29.0                      | 24.9                   | 60.0                    | -31.0                  | 50.0                 | -25.1               |
| 17.4943         | 29.3                      | 25.0                   | 60.0                    | -30.7                  | 50.0                 | -25.0               |



Graphical data for overview only.

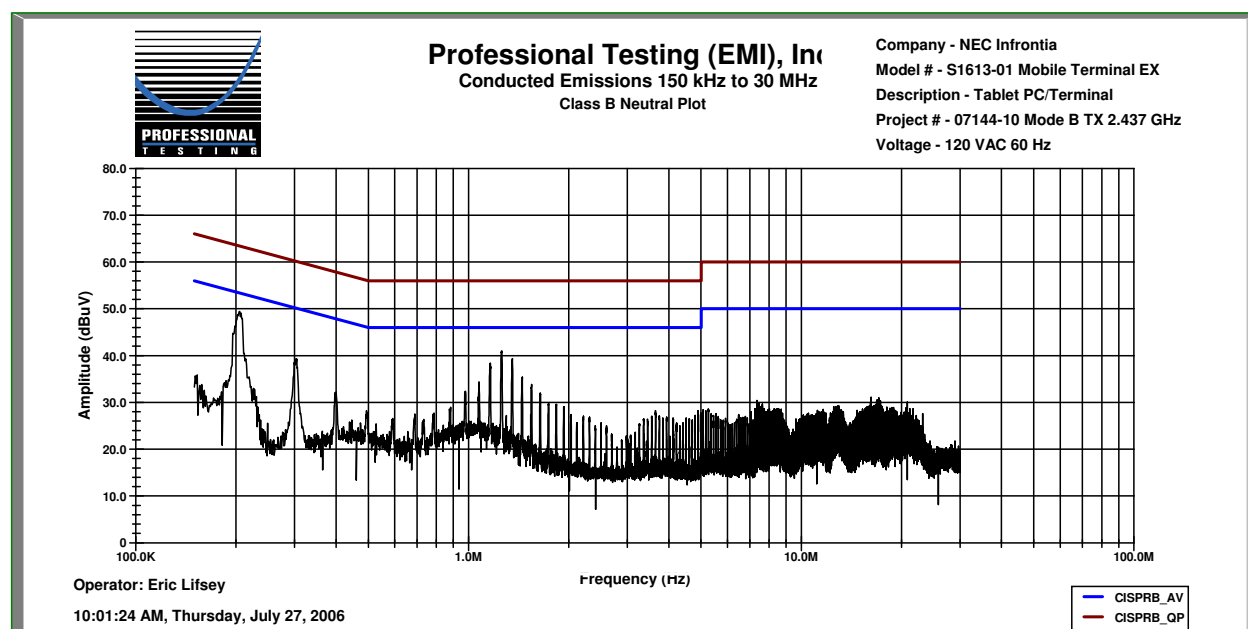
TEST ENGINEER: ERIC LIFSEY

## 802.11b Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE    | POWER SOURCE |
|-----------|--------------|-------|---------|--------------|
| 07144-10  | 27 July 2006 | FCC B | NEUTRAL | AC 120/60    |

|         |              |
|---------|--------------|
| COMMENT | Transmitting |
|---------|--------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20437         | 48.5                      | 34.5                   | 64.4                    | -15.9                  | 54.4                 | -19.9               |
| 0.29874         | 38.8                      | 25.5                   | 61.8                    | -23.0                  | 51.8                 | -26.2               |
| 1.16314         | 36.9                      | 36.4                   | 56.0                    | -19.1                  | 46.0                 | -9.6                |
| 1.25437         | 40.6                      | 39.9                   | 56.0                    | -15.4                  | 46.0                 | -6.1                |
| 1.35332         | 38.7                      | 37.9                   | 56.0                    | -17.3                  | 46.0                 | -8.1                |
| 7.36563         | 27.9                      | 22.7                   | 60.0                    | -32.1                  | 50.0                 | -27.3               |
| 16.2444         | 27.9                      | 22.6                   | 60.0                    | -32.1                  | 50.0                 | -27.4               |
| 16.9168         | 28.3                      | 24.5                   | 60.0                    | -31.7                  | 50.0                 | -25.5               |
| 17.0130         | 28.2                      | 24.3                   | 60.0                    | -31.8                  | 50.0                 | -25.7               |
| 17.1072         | 28.2                      | 24.4                   | 60.0                    | -31.8                  | 50.0                 | -25.6               |



Graphical data for overview only.

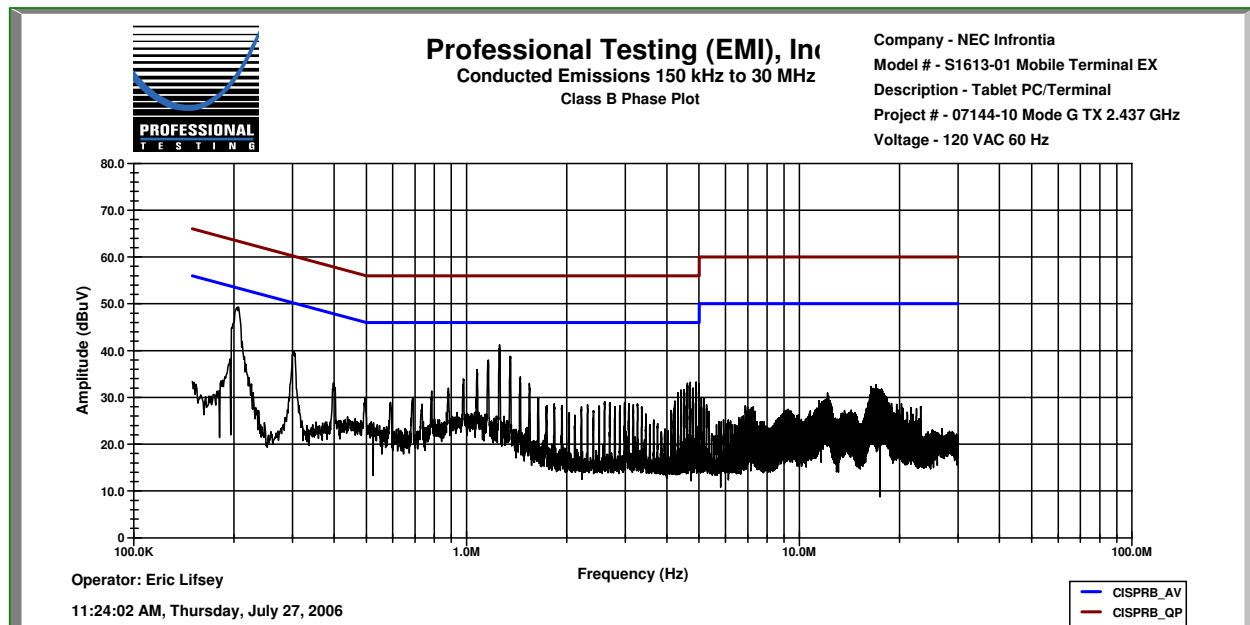
TEST ENGINEER: ERIC LIFSEY

## 802.11g Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE  | POWER SOURCE |
|-----------|--------------|-------|-------|--------------|
| 07144-10  | 27 July 2006 | FCC B | PHASE | AC 120/60    |

|         |              |
|---------|--------------|
| COMMENT | Transmitting |
|---------|--------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20442         | 48.3                      | 34.3                   | 64.4                    | -16.2                  | 54.4                 | -20.2               |
| 0.30222         | 39.0                      | 27.8                   | 61.7                    | -22.6                  | 51.7                 | -23.9               |
| 1.16090         | 37.7                      | 37.1                   | 56.0                    | -18.3                  | 46.0                 | -8.9                |
| 1.25515         | 40.5                      | 40.0                   | 56.0                    | -15.5                  | 46.0                 | -6.0                |
| 1.34965         | 38.0                      | 37.3                   | 56.0                    | -18.0                  | 46.0                 | -8.7                |
| 16.5414         | 29.1                      | 24.2                   | 60.0                    | -30.9                  | 50.0                 | -25.8               |
| 16.8266         | 29.1                      | 24.8                   | 60.0                    | -30.9                  | 50.0                 | -25.2               |
| 16.9236         | 28.8                      | 25.2                   | 60.0                    | -31.2                  | 50.0                 | -24.8               |
| 17.4005         | 29.0                      | 24.9                   | 60.0                    | -31.0                  | 50.0                 | -25.1               |
| 17.4943         | 29.3                      | 25.0                   | 60.0                    | -30.7                  | 50.0                 | -25.0               |



Graphical data for overview only.

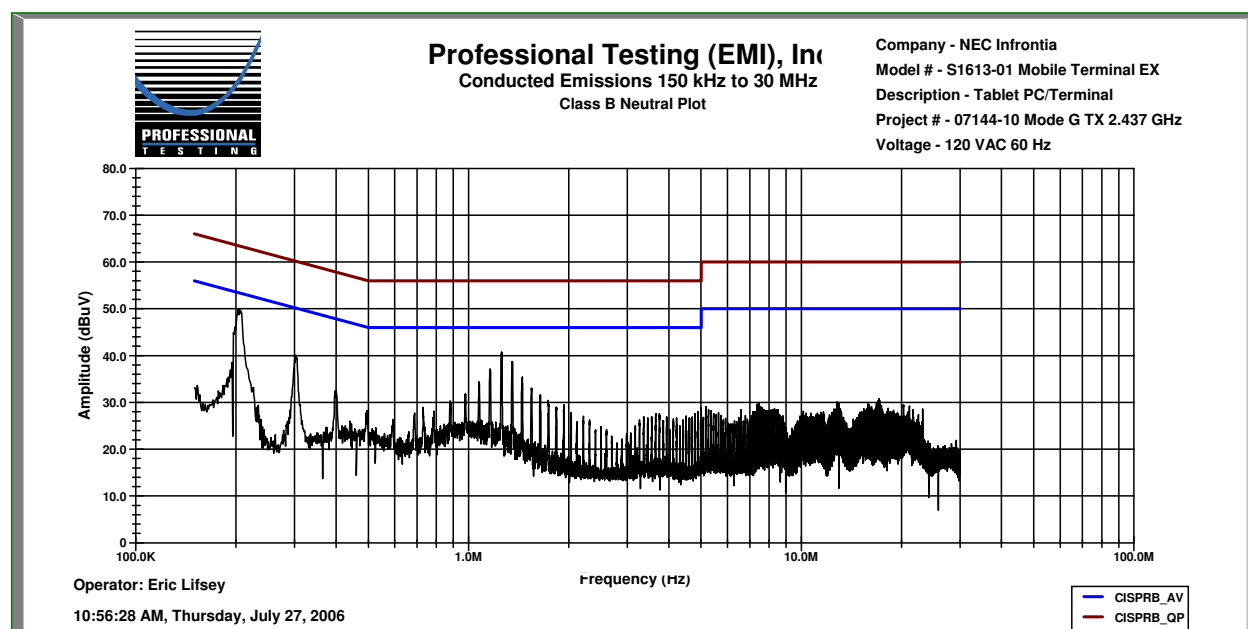
TEST ENGINEER: ERIC LIFSEY

# **802.11g** **Conducted Emissions Data Sheet**

| PROJECT # | DATE         | CLASS | LINE    | POWER SOURCE |
|-----------|--------------|-------|---------|--------------|
| 07144-10  | 27 July 2006 | FCC B | NEUTRAL | AC 120/60    |

|         |              |
|---------|--------------|
| COMMENT | Transmitting |
|---------|--------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20437         | 48.7                      | 34.8                   | 64.4                    | -15.7                  | 54.4                 | -19.7               |
| 0.20470         | 48.8                      | 34.7                   | 64.4                    | -15.6                  | 54.4                 | -19.7               |
| 0.29914         | 39.2                      | 25.8                   | 61.7                    | -22.5                  | 51.7                 | -25.9               |
| 1.25674         | 40.3                      | 39.9                   | 56.0                    | -15.7                  | 46.0                 | -6.1                |
| 1.35062         | 38.5                      | 37.8                   | 56.0                    | -17.5                  | 46.0                 | -8.2                |
| 12.8199         | 26.8                      | 22.5                   | 60.0                    | -33.2                  | 50.0                 | -27.5               |
| 13.0100         | 26.8                      | 22.7                   | 60.0                    | -33.2                  | 50.0                 | -27.3               |
| 17.0185         | 28.3                      | 24.5                   | 60.0                    | -31.7                  | 50.0                 | -25.5               |
| 17.1178         | 28.3                      | 24.6                   | 60.0                    | -31.7                  | 50.0                 | -25.4               |
| 17.2078         | 27.9                      | 24.4                   | 60.0                    | -32.1                  | 50.0                 | -25.6               |



Graphical data for overview only.

TEST ENGINEER: ERIC LIFSEY

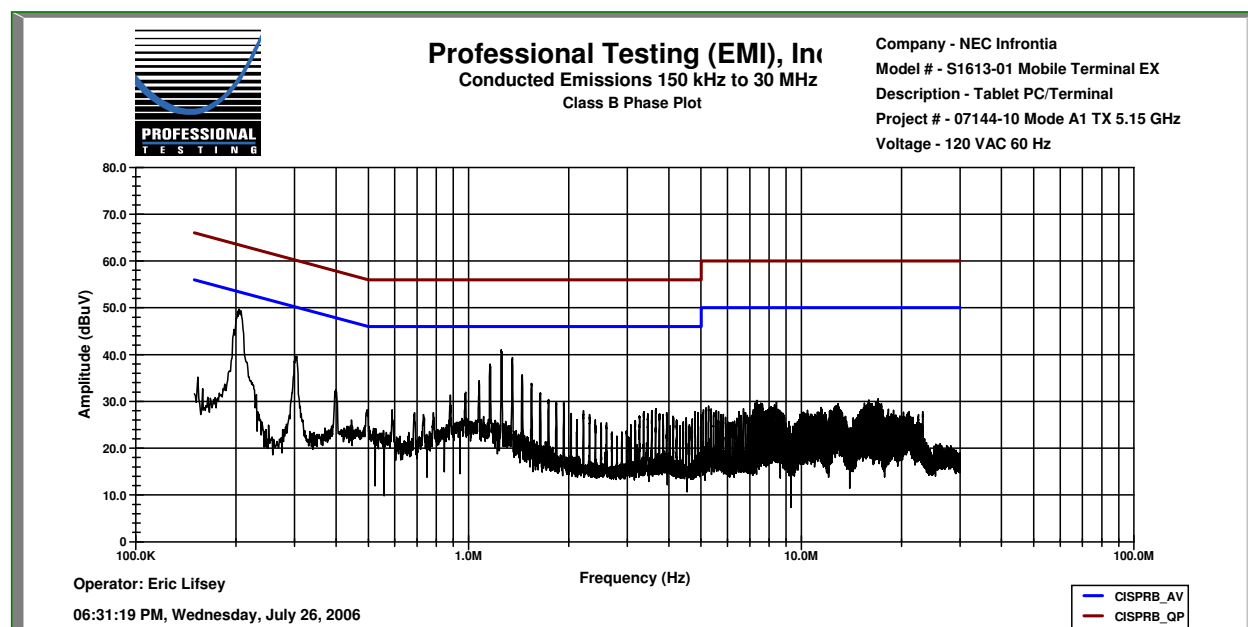
## 802.11a UNII-1

### Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE  | POWER SOURCE |
|-----------|--------------|-------|-------|--------------|
| 07144-10  | 26 July 2006 | FCC B | PHASE | AC 120/60    |

|         |                         |
|---------|-------------------------|
| COMMENT | Transmitting (5150 MHz) |
|---------|-------------------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20437         | 48.8                      | 35.2                   | 64.4                    | -15.7                  | 54.4                 | -19.2               |
| 0.30079         | 39.1                      | 26.3                   | 61.7                    | -22.6                  | 51.7                 | -25.4               |
| 1.15954         | 36.8                      | 36.2                   | 56.0                    | -19.2                  | 46.0                 | -9.8                |
| 1.25716         | 40.4                      | 39.9                   | 56.0                    | -15.6                  | 46.0                 | -6.1                |
| 1.34864         | 38.9                      | 38.1                   | 56.0                    | -17.1                  | 46.0                 | -7.9                |
| 7.27327         | 27.2                      | 19.9                   | 60.0                    | -32.8                  | 50.0                 | -30.1               |
| 7.36913         | 27.4                      | 21.6                   | 60.0                    | -32.6                  | 50.0                 | -28.4               |
| 8.42073         | 26.7                      | 24.1                   | 60.0                    | -33.3                  | 50.0                 | -25.9               |
| 15.9676         | 27.1                      | 22.4                   | 60.0                    | -32.9                  | 50.0                 | -27.6               |
| 17.0140         | 27.7                      | 23.9                   | 60.0                    | -32.3                  | 50.0                 | -26.1               |



Graphical data for overview only.

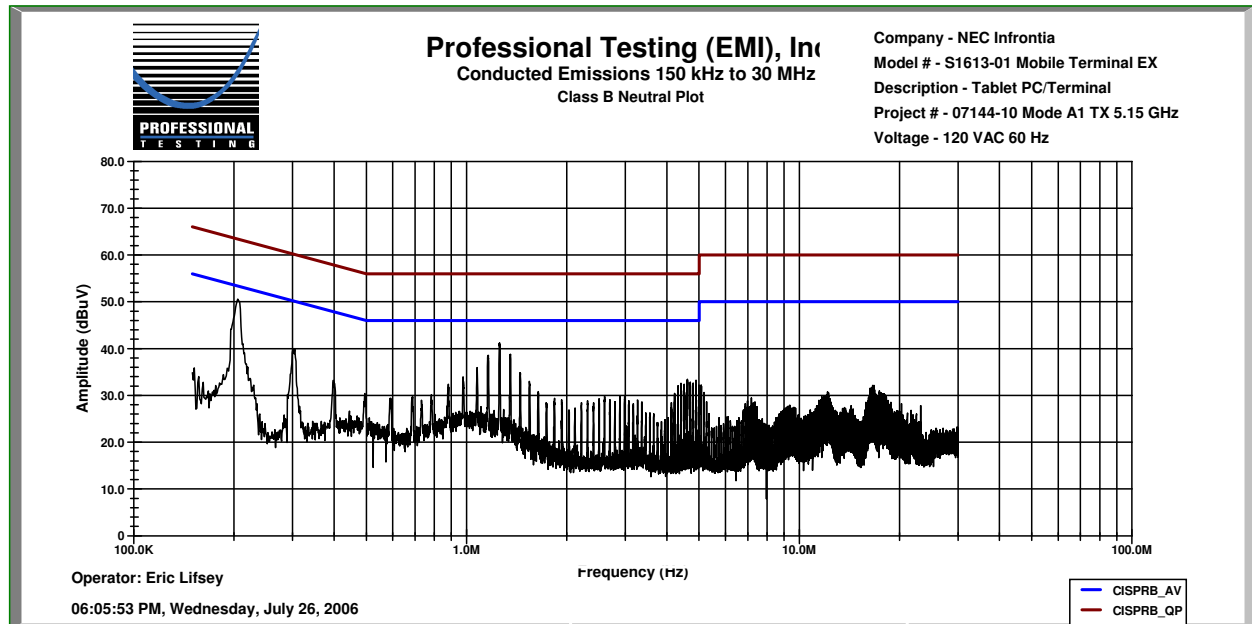
TEST ENGINEER: ERIC LIFSEY

# 802.11a UNII-1 Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE    | POWER SOURCE |
|-----------|--------------|-------|---------|--------------|
| 07144-10  | 26 July 2006 | FCC B | NEUTRAL | AC 120/60    |

|         |                         |
|---------|-------------------------|
| COMMENT | Transmitting (5150 MHz) |
|---------|-------------------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20439         | 48.9                      | 35.7                   | 64.4                    | -15.5                  | 54.4                 | -18.8               |
| 0.30004         | 39.5                      | 28.5                   | 61.7                    | -22.2                  | 51.7                 | -23.2               |
| 1.15997         | 37.7                      | 37.1                   | 56.0                    | -18.3                  | 46.0                 | -8.9                |
| 1.25557         | 40.5                      | 40.0                   | 56.0                    | -15.5                  | 46.0                 | -6.0                |
| 1.35061         | 38.5                      | 37.8                   | 56.0                    | -17.5                  | 46.0                 | -8.2                |
| 5.07727         | 28.4                      | 20.5                   | 60.0                    | -31.6                  | 50.0                 | -29.5               |
| 16.3514         | 28.7                      | 23.6                   | 60.0                    | -31.3                  | 50.0                 | -26.4               |
| 16.5431         | 29.1                      | 23.5                   | 60.0                    | -30.9                  | 50.0                 | -26.5               |
| 16.6363         | 29.4                      | 24.1                   | 60.0                    | -30.6                  | 50.0                 | -25.9               |
| 16.7337         | 29.3                      | 24.9                   | 60.0                    | -30.7                  | 50.0                 | -25.1               |



Graphical data for overview only.

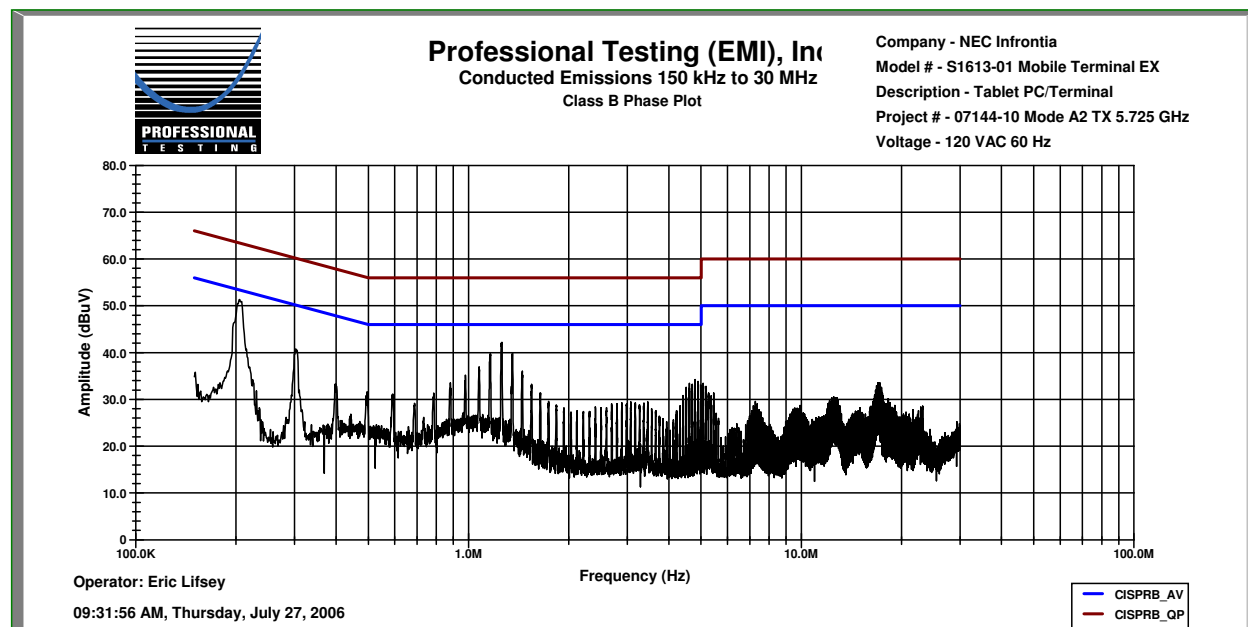
TEST ENGINEER: ERIC LIFSEY

### 802.11a UNII-3 Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE  | POWER SOURCE |
|-----------|--------------|-------|-------|--------------|
| 07144-10  | 27 July 2006 | FCC B | PHASE | AC 120/60    |

|         |                         |
|---------|-------------------------|
| COMMENT | Transmitting (5725 MHz) |
|---------|-------------------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20437         | 49.9                      | 35.8                   | 64.4                    | -14.6                  | 54.4                 | -18.6               |
| 0.30089         | 39.6                      | 28.5                   | 61.7                    | -22.1                  | 51.7                 | -23.2               |
| 1.15828         | 38.8                      | 38.0                   | 56.0                    | -17.2                  | 46.0                 | -8.0                |
| 1.25792         | 41.7                      | 40.9                   | 56.0                    | -14.3                  | 46.0                 | -5.1                |
| 1.35119         | 38.4                      | 37.8                   | 56.0                    | -17.6                  | 46.0                 | -8.2                |
| 5.07157         | 30.0                      | 22.0                   | 60.0                    | -30.0                  | 50.0                 | -28.0               |
| 5.16932         | 29.5                      | 22.2                   | 60.0                    | -30.5                  | 50.0                 | -27.8               |
| 17.0088         | 29.9                      | 25.5                   | 60.0                    | -30.1                  | 50.0                 | -24.5               |
| 17.1037         | 29.4                      | 25.6                   | 60.0                    | -30.6                  | 50.0                 | -24.4               |
| 17.1984         | 28.9                      | 25.3                   | 60.0                    | -31.1                  | 50.0                 | -24.7               |



Graphical data for overview only.

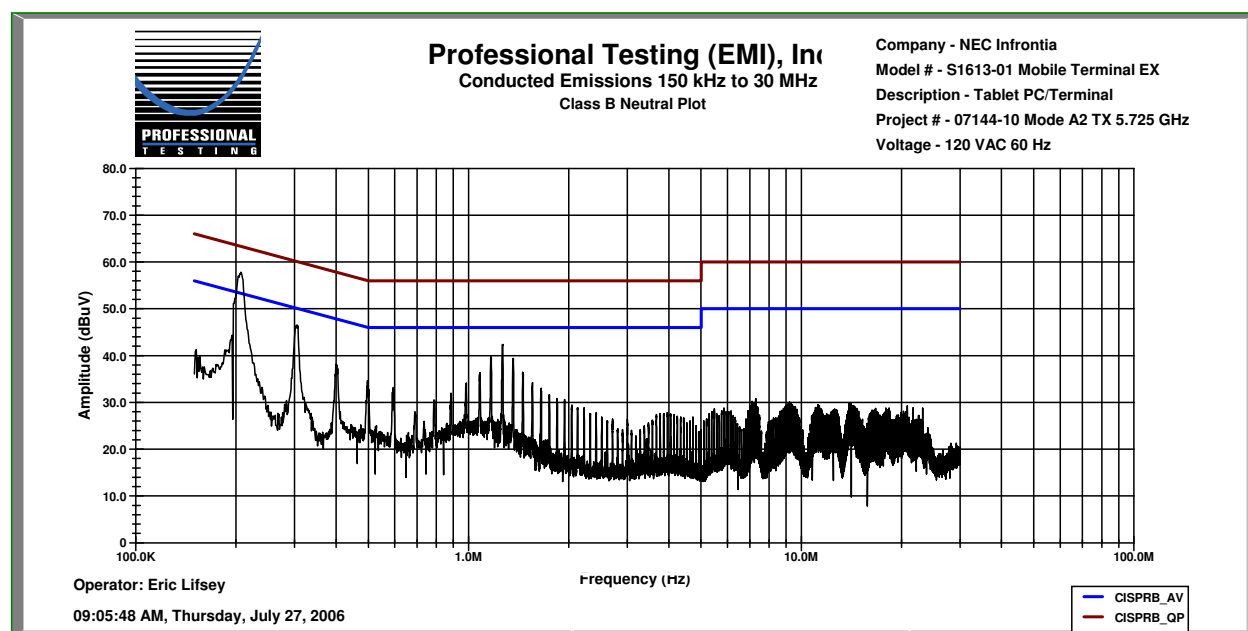
TEST ENGINEER: ERIC LIFSEY

### 802.11a UNII-3 Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE    | POWER SOURCE |
|-----------|--------------|-------|---------|--------------|
| 07144-10  | 27 July 2006 | FCC B | NEUTRAL | AC 120/60    |

|         |                         |
|---------|-------------------------|
| COMMENT | Transmitting (5725 MHz) |
|---------|-------------------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.150167        | 31.3                      | 22.1                   | 66.0                    | -34.7                  | 56.0                 | -33.9               |
| 0.20543         | 53.3                      | 40.0                   | 64.4                    | -11.2                  | 54.4                 | -14.4               |
| 0.20787         | 53.8                      | 40.4                   | 64.3                    | -10.5                  | 54.3                 | -13.9               |
| 0.30218         | 42.3                      | 28.7                   | 61.7                    | -19.4                  | 51.7                 | -22.9               |
| 1.25803         | 41.6                      | 41.1                   | 56.0                    | -14.4                  | 46.0                 | -4.9                |
| 7.09263         | 26.8                      | 24.3                   | 60.0                    | -33.2                  | 50.0                 | -25.7               |
| 7.18605         | 25.4                      | 23.2                   | 60.0                    | -34.6                  | 50.0                 | -26.8               |
| 7.27923         | 23.0                      | 19.8                   | 60.0                    | -37.0                  | 50.0                 | -30.2               |
| 9.18555         | 26.3                      | 23.9                   | 60.0                    | -33.7                  | 50.0                 | -26.1               |
| 14.1081         | 18.6                      | 12.0                   | 60.0                    | -41.4                  | 50.0                 | -38.0               |



Graphical data for overview only.

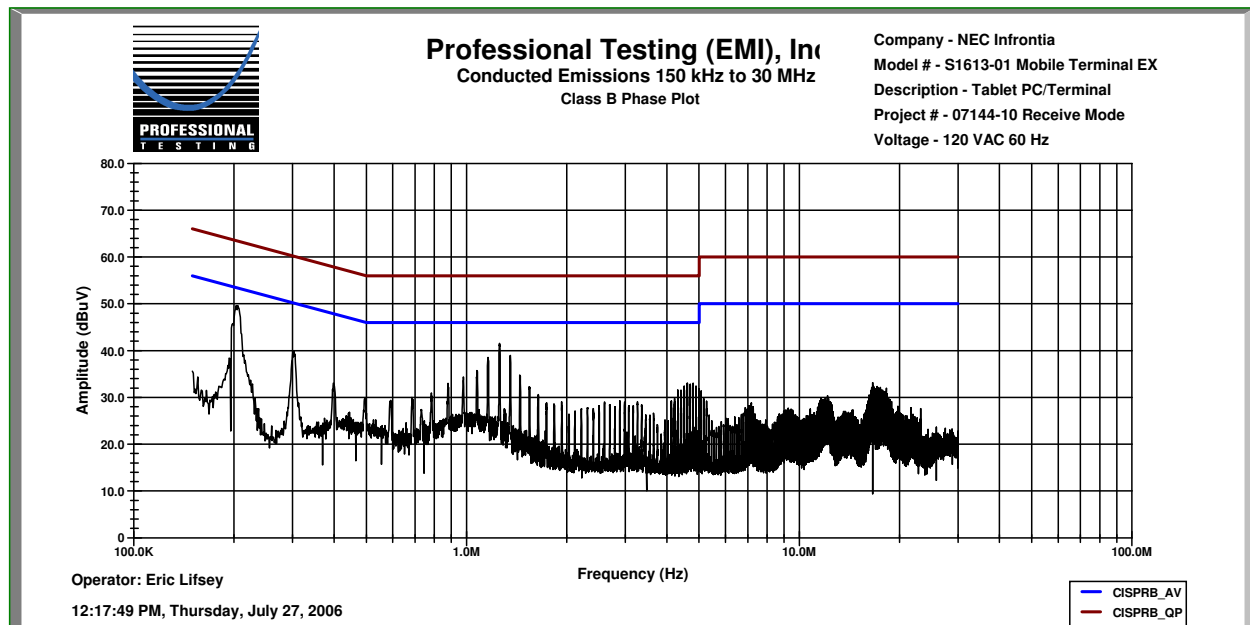
TEST ENGINEER: ERIC LIFSEY

### 802.11a UNII-3 Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE  | POWER SOURCE |
|-----------|--------------|-------|-------|--------------|
| 07144-10  | 27 July 2006 | FCC B | PHASE | AC 120/60    |

|         |                      |
|---------|----------------------|
| COMMENT | Receiving (5725 MHz) |
|---------|----------------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20500         | 48.6                      | 34.7                   | 64.4                    | -15.9                  | 54.4                 | -19.7               |
| 0.30019         | 38.8                      | 28.4                   | 61.7                    | -22.9                  | 51.7                 | -23.3               |
| 1.15914         | 37.7                      | 37.1                   | 56.0                    | -18.3                  | 46.0                 | -8.9                |
| 1.25735         | 40.7                      | 40.1                   | 56.0                    | -15.3                  | 46.0                 | -5.9                |
| 1.35276         | 38.8                      | 38.1                   | 56.0                    | -17.2                  | 46.0                 | -7.9                |
| 16.5377         | 29.7                      | 24.9                   | 60.0                    | -30.3                  | 50.0                 | -25.1               |
| 16.6301         | 30.0                      | 25.5                   | 60.0                    | -30.0                  | 50.0                 | -24.5               |
| 16.7281         | 30.1                      | 25.7                   | 60.0                    | -29.9                  | 50.0                 | -24.3               |
| 17.1056         | 28.9                      | 25.9                   | 60.0                    | -31.1                  | 50.0                 | -24.1               |
| 17.4846         | 29.6                      | 25.8                   | 60.0                    | -30.4                  | 50.0                 | -24.2               |



Graphical data for overview only.

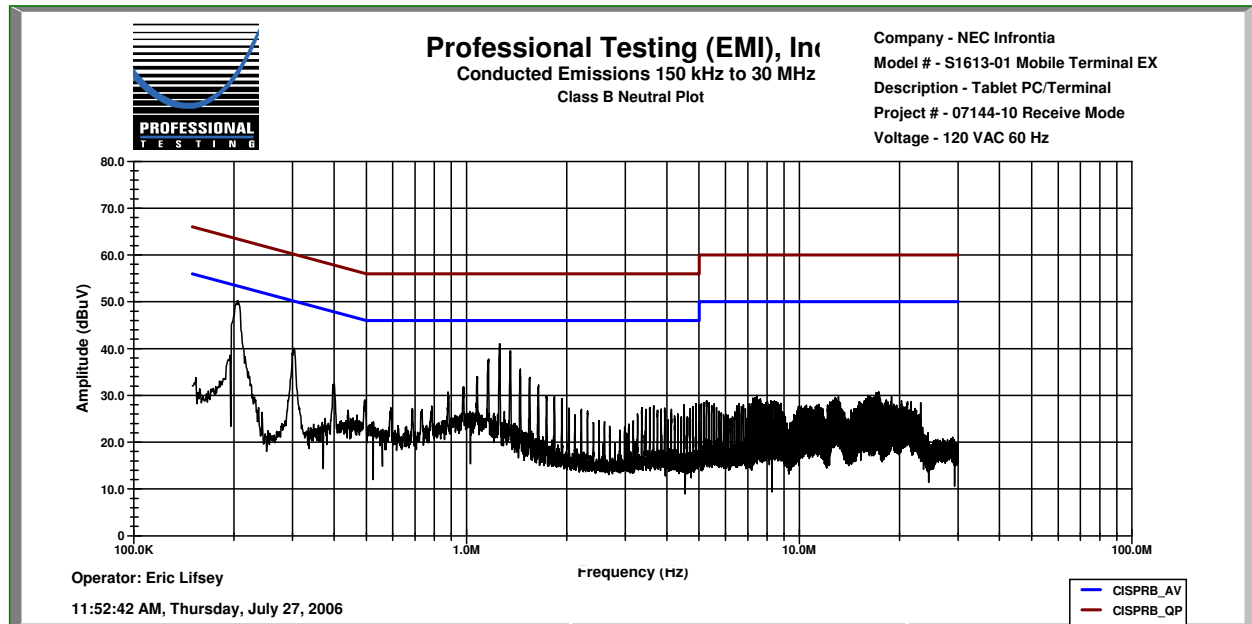
TEST ENGINEER: ERIC LIFSEY

# 802.11a UNII-3 Conducted Emissions Data Sheet

| PROJECT # | DATE         | CLASS | LINE    | POWER SOURCE |
|-----------|--------------|-------|---------|--------------|
| 07144-10  | 27 July 2006 | FCC B | NEUTRAL | AC 120/60    |

|         |                      |
|---------|----------------------|
| COMMENT | Receiving (5725 MHz) |
|---------|----------------------|

| Frequency (MHz) | Quasi-peak Reading (dBμV) | Average Reading (dBμV) | Quasi-peak Limit (dBμV) | Quasi-peak Margin (dB) | Average Limit (dBμV) | Average Margin (dB) |
|-----------------|---------------------------|------------------------|-------------------------|------------------------|----------------------|---------------------|
| 0.20407         | 49.0                      | 35.0                   | 64.5                    | -15.4                  | 54.5                 | -19.4               |
| 0.20762         | 49.0                      | 35.1                   | 64.4                    | -15.4                  | 54.4                 | -19.2               |
| 0.29941         | 39.2                      | 25.8                   | 61.7                    | -22.6                  | 51.7                 | -25.9               |
| 1.25702         | 40.5                      | 39.8                   | 56.0                    | -15.5                  | 46.0                 | -6.2                |
| 1.35232         | 39.0                      | 38.1                   | 56.0                    | -17.0                  | 46.0                 | -7.9                |
| 7.46138         | 27.4                      | 23.1                   | 60.0                    | -32.6                  | 50.0                 | -26.9               |
| 17.0165         | 28.7                      | 25.6                   | 60.0                    | -31.3                  | 50.0                 | -24.4               |
| 17.1120         | 28.7                      | 25.4                   | 60.0                    | -31.3                  | 50.0                 | -24.6               |
| 17.2066         | 28.5                      | 25.3                   | 60.0                    | -31.5                  | 50.0                 | -24.7               |
| 17.3027         | 28.2                      | 25.1                   | 60.0                    | -31.8                  | 50.0                 | -24.9               |



Graphical data for overview only.

TEST ENGINEER: ERIC LIFSEY

**Fundamental Peak Power  
Power Spectral Density  
All Bands and Modes  
Conducted RF Emissions Data Sheet**

| PROJECT # | DATE                      | COUPLING | DETECTOR                                                            |
|-----------|---------------------------|----------|---------------------------------------------------------------------|
| 07144-10  | 8 Sep 2006<br>14 Sep 2006 | Direct   | Power Meter Peak (Power)<br>Peak Detection (Power Spectral Density) |

| COMMENT |
|---------|
|---------|

| Power Setting:                            | 10 dBm   |       |       | 12 dBm   |       |       | 7 dBm          |      | 12 dBm         |       |       |
|-------------------------------------------|----------|-------|-------|----------|-------|-------|----------------|------|----------------|-------|-------|
| Power (dBm)                               | 802.11 b |       |       | 802.11 g |       |       | UNII-1 802.11a |      | UNII-3 802.11a |       |       |
| Frequency (MHz):                          | 2412     | 2437  | 2462  | 2412     | 2437  | 2462  | 5180           | 5240 | 5745           | 5765  | 5805  |
| Rate                                      |          |       |       |          |       |       |                |      |                |       |       |
| 1 Mb Long                                 | 8.9      | 8.7   | 8.8   | 8.2      | 8.1   | 8.1   |                |      |                |       |       |
| 2 Mb Long                                 | 8.8      | 8.7   | 8.7   | 7.7      | 7.8   | 7.8   |                |      |                |       |       |
| 5.5 Mb Long                               | 8.7      | 8.6   | 8.7   | 8.3      | 8.3   | 8.1   |                |      |                |       |       |
| 11 Mb Long                                | 8.7      | 8.6   | 8.7   | 7.8      | 7.9   | 7.6   |                |      |                |       |       |
| 6 Mb                                      |          |       |       | 8.3      | 8.6   | 8.4   | 4.8            | 3.9  | 7.2            | 7.0   | 6.4   |
| 9 Mb                                      |          |       |       | 7.9      | 7.9   | 8.1   | 4.7            | 3.6  | 7.0            | 6.7   | 6.4   |
| 12 Mb                                     |          |       |       | 8.4      | 8.4   | 8.2   | 4.7            | 3.6  | 7.0            | 6.8   | 6.4   |
| 18 Mb                                     |          |       |       | 7.8      | 7.8   | 8.0   | 4.7            | 3.5  | 7.0            | 6.7   | 6.4   |
| 24 Mb                                     |          |       |       | 8.2      | 8.3   | 8.0   | 4.6            | 4.1  | 7.4            | 6.9   | 6.3   |
| 36 Mb                                     |          |       |       | 8.3      | 8.2   | 8.1   | 4.6            | 3.4  | 7.0            | 6.7   | 6.3   |
| 48 Mb                                     |          |       |       | 8.2      | 8.1   | 8.1   | 4.6            | 3.4  | 7.0            | 6.7   | 6.3   |
| 54 Mb                                     |          |       |       | 7.9      | 8.0   | 7.9   | 4.6            | 3.8  | 7.2            | 6.7   | 6.2   |
|                                           |          |       |       |          |       |       |                |      |                |       |       |
|                                           |          |       |       |          |       |       |                |      |                |       |       |
| Channel Maximums:                         | 8.9      | 8.7   | 8.8   | 8.4      | 8.6   | 8.4   | 4.8            | 4.1  | 7.4            | 7.0   | 6.4   |
| Band Maximums:                            | 8.9      |       |       | 8.6      |       |       | 4.8            |      | 7.4            |       |       |
| Highest Emission Rate:                    | 1 Mb     | 1 Mb  | 1 Mb  | 12 Mb    | 6 Mb  | 6 Mb  |                |      | 24 Mb          | 6 Mb  | 12 Mb |
| Power Spectral Density 3kHz (2006-09-14)* | -12.5    | -12.4 | -11.7 | -14.9    | -14.6 | -12.9 |                |      | -12.9          | -13.6 | -17.1 |

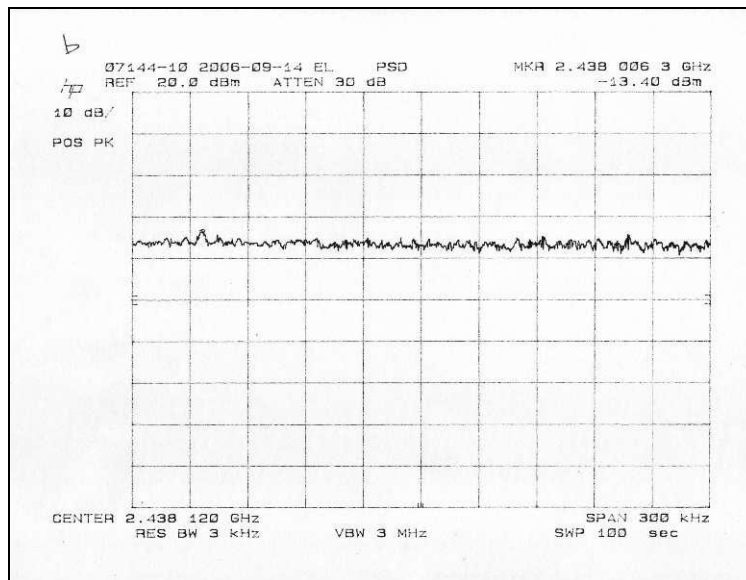
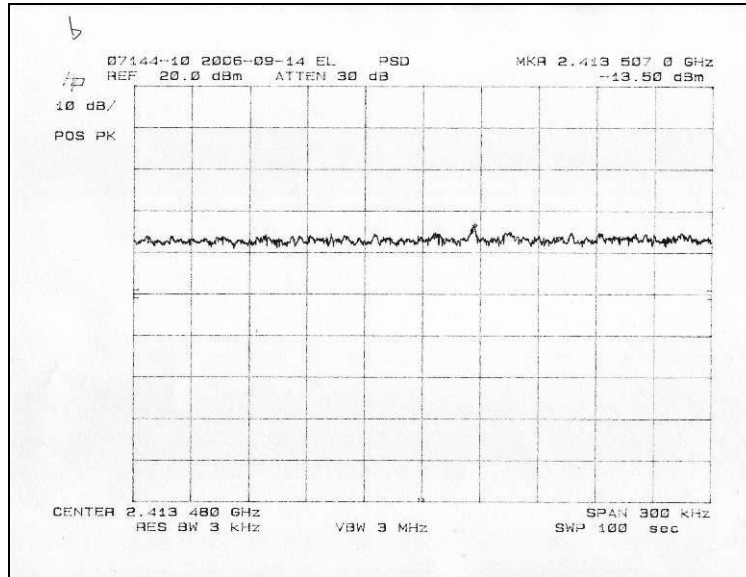
\*Cable factors applied: 2.4 GHz = 1.0 dB, 5.7 GHz = 1.1 dB. PSD measured in established highest emission rate.

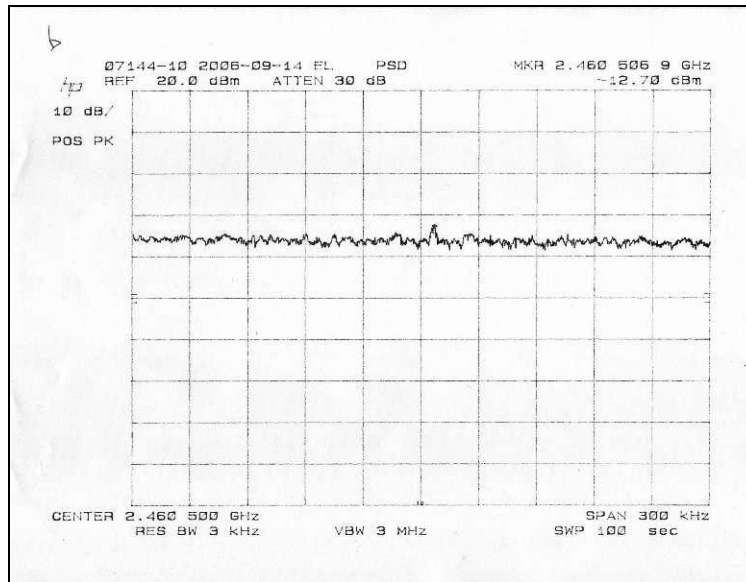
Power Spectral Density for the UNII-1 band is presented in a following section.

# **802.11b** **Power Spectral Density** **Radiated Emissions Data Sheet**

| PROJECT # | DATE        | CLASS | DISTANCE  | ANTENNA | RBW   | VBW   | DETECTOR |
|-----------|-------------|-------|-----------|---------|-------|-------|----------|
| 07144-10  | 14 Sep 2006 | FCC B | Conducted | NA      | 3 kHz | 3 MHz | Peak     |

|         |                                                    |
|---------|----------------------------------------------------|
| COMMENT | Increase measured emission by 1 dB for cable loss. |
|---------|----------------------------------------------------|



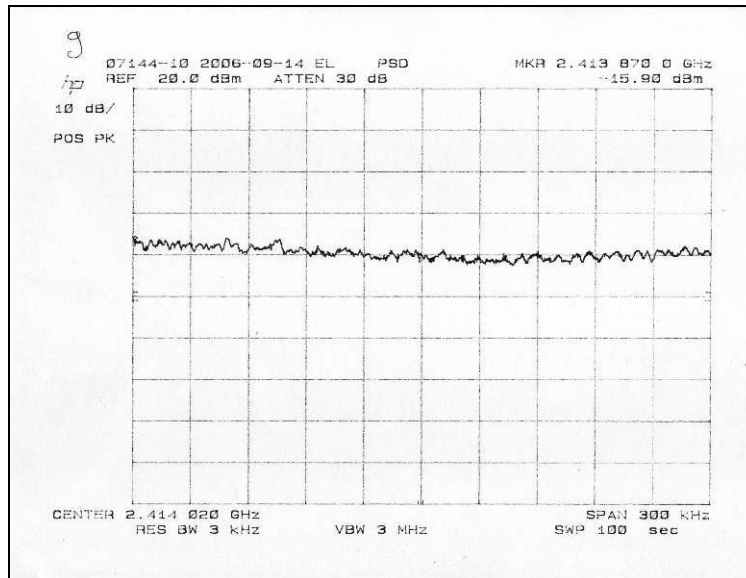
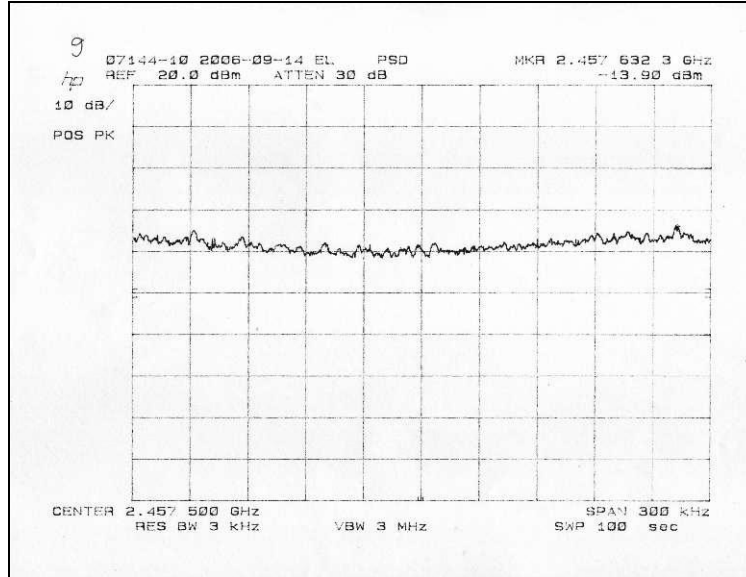


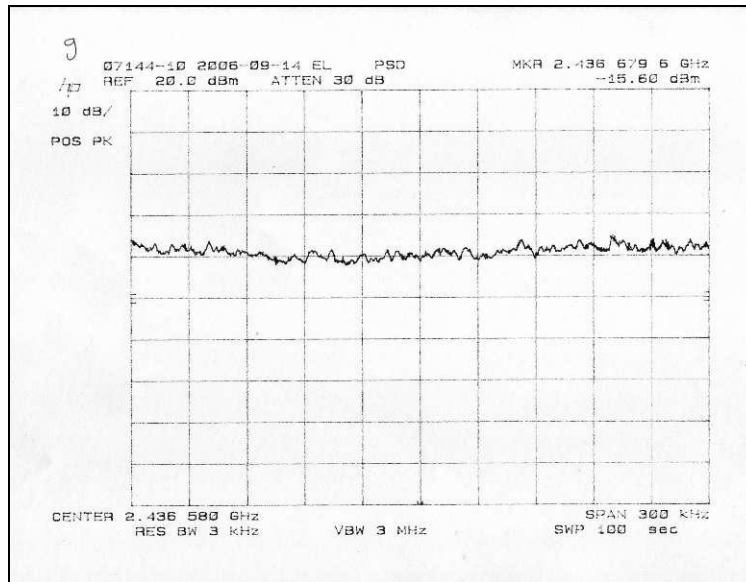
TEST ENGINEER: ERIC LIFSEY

# **802.11g** **Power Spectral Density** **Radiated Emissions Data Sheet**

| PROJECT # | DATE        | CLASS | DISTANCE  | ANTENNA | RBW   | VBW   | DETECTOR |
|-----------|-------------|-------|-----------|---------|-------|-------|----------|
| 07144-10  | 14 Sep 2006 | FCC B | Conducted | NA      | 3 kHz | 3 MHz | Peak     |

|         |                                                    |
|---------|----------------------------------------------------|
| COMMENT | Increase measured emission by 1 dB for cable loss. |
|---------|----------------------------------------------------|



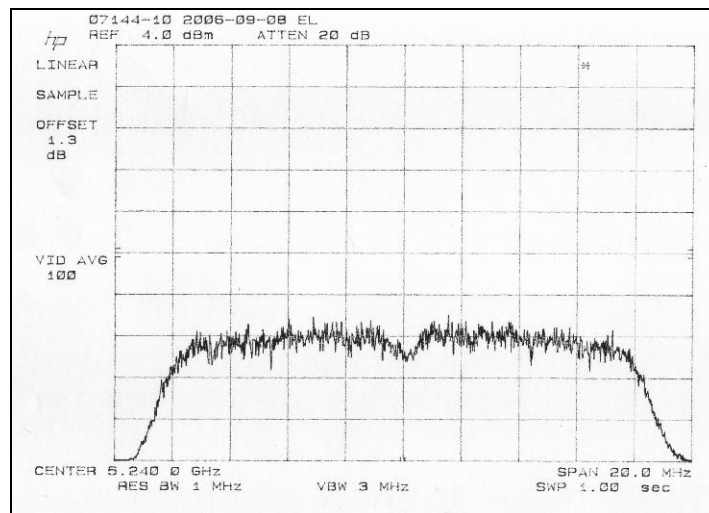
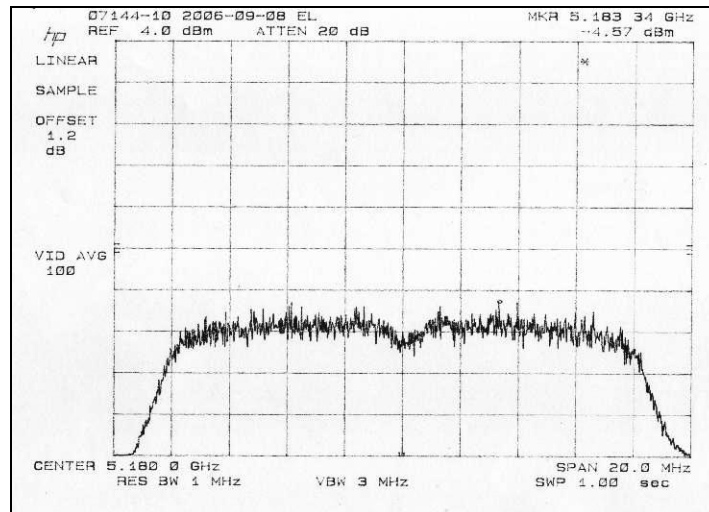


TEST ENGINEER: ERIC LIFSEY

# 802.11a UNII-1 Power Spectral Density Emissions Data Sheet

| PROJECT # | DATE       | CLASS | DISTANCE  | ANTENNA   | RBW   | VBW   | DETECTOR                        |
|-----------|------------|-------|-----------|-----------|-------|-------|---------------------------------|
| 07144-10  | 8 Sep 2006 | FCC B | Conducted | Conducted | 1 MHz | 3 MHz | Sample<br>(Averaged 100 Sweeps) |

| COMMENT               |
|-----------------------|
| Low and high channels |



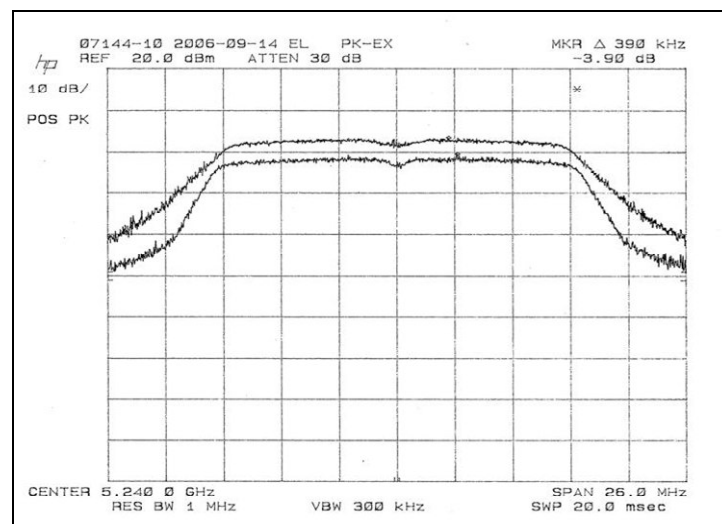
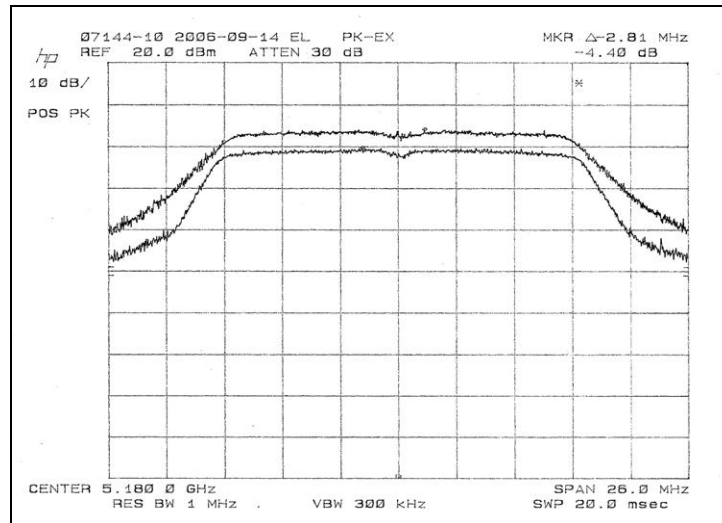
| Power Spectral Density<br>Measured Maximum (dBm)<br>1 MHz RBW 100 Averages | Limit (dBm) | Margin | Conclusion |
|----------------------------------------------------------------------------|-------------|--------|------------|
| -4.57                                                                      | 4           | -8.57  | PASS       |

TEST ENGINEER: ERIC LIFSEY

# 802.11a UNII-1 Peak Power Excursion

| PROJECT # | DATE       | CLASS | DISTANCE  | ANTENNA   | RBW   | VBW              | DETECTOR         |
|-----------|------------|-------|-----------|-----------|-------|------------------|------------------|
| 07144-10  | 8 Sep 2006 | FCC B | Conducted | Conducted | 1 MHz | 3 MHz<br>300 kHz | Peak<br>Max-Hold |

|         |                                                                |
|---------|----------------------------------------------------------------|
| COMMENT | Low and high channels, display line set to measured peak power |
|---------|----------------------------------------------------------------|



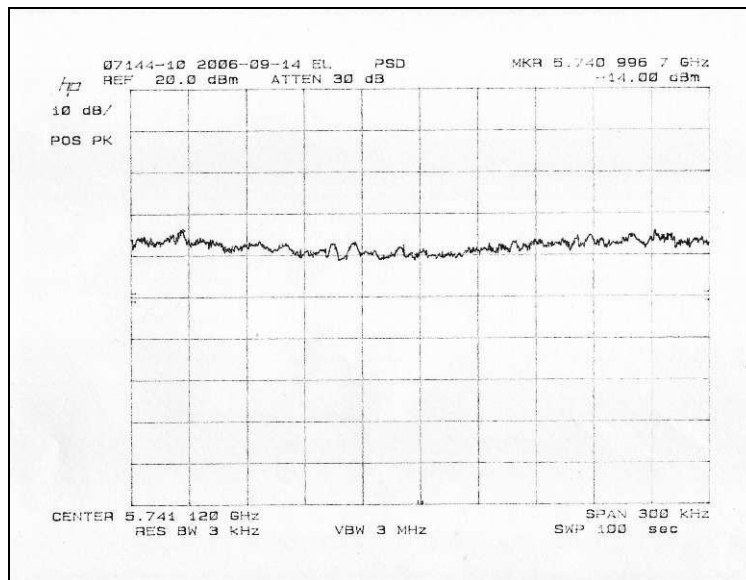
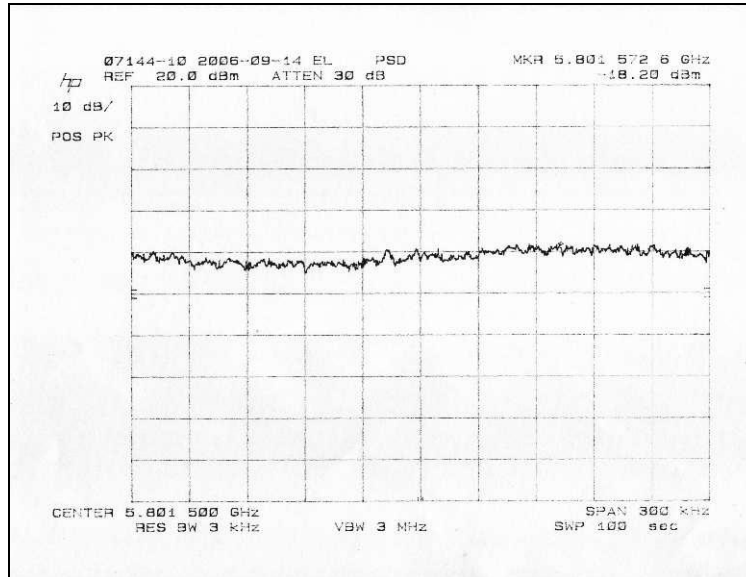
| Channel       | Measured Peak Excursion | Excursion Limit dB | Margin | Conclusion |
|---------------|-------------------------|--------------------|--------|------------|
| Low 5180 MHz  | 4.4                     | 13                 | -8.6   | PASS       |
| High 5240 MHz | 3.9                     | 13                 | -9.1   | PASS       |

TEST ENGINEER: ERIC LIFSEY

# **802.11a UNII-3** **Power Spectral Density** **Radiated Emissions Data Sheet**

| PROJECT # | DATE        | CLASS | DISTANCE  | ANTENNA | RBW   | VBW   | DETECTOR |
|-----------|-------------|-------|-----------|---------|-------|-------|----------|
| 07144-10  | 14 Sep 2006 | FCC B | Conducted | NA      | 3 kHz | 3 MHz | Peak     |

|         |                                                                                  |
|---------|----------------------------------------------------------------------------------|
| COMMENT | Increase measured emission by 1.1 dB for cable loss. Center channel not plotted. |
|---------|----------------------------------------------------------------------------------|



TEST ENGINEER: ERIC LIFSEY