



## **MET Laboratories, Inc.** *Safety Certification - EMI - Telecom Environmental Simulation*

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### **Electromagnetic Compatibility Criteria Test Report**

for the

#### **SkyPilot Networks Model SkyConnector Mini**

**Tested under**  
the FCC Certification Rules  
contained in  
Title 47 of the CFR, Part 15.247, Subpart C &  
Industry Canada RSS-210, Issue 7, June 2007  
for Intentional Radiators

**MET Report: EMC81159-FCC247**

October 17, 2008

#### **Prepared For:**

**SkyPilot Networks  
2055 Laurelwood Road, 2<sup>nd</sup> Floor  
Santa Clara, CA 95054**

**Prepared By:**  
**MET Laboratories, Inc.**  
3162 Belick Street  
Santa Clara, CA 95054



## Electromagnetic Compatibility Criteria Test Report

for the

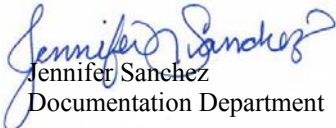
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for Intentional Radiators



Minh Ly, Project Engineer  
Electromagnetic Compatibility Lab



Jennifer Sanchez  
Documentation Department

**Engineering Statement:** The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Part 15.247 of the FCC Rules and RSS-210 of the Industry Canada Rules under normal use and maintenance.



Shawn McMillen, Wireless Manager  
Electromagnetic Compatibility Lab



## Report Status Sheet

| Revision | Report Date      | Reason for Revision           |
|----------|------------------|-------------------------------|
| Ø        | October 17, 2008 | Initial Issue.                |
| 1        | October 30, 2008 | 2 <sup>nd</sup> Draft Issued. |
| 2        | November 5, 2008 | Final Issue.                  |



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## List of Terms and Abbreviations

|              |                                                                                                                                                                                                                                                                                                                                                              |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AC           | Alternating Current                                                                                                                                                                                                                                                                                                                                          |
| ACF          | Antenna Correction Factor                                                                                                                                                                                                                                                                                                                                    |
| Cal          | Calibration                                                                                                                                                                                                                                                                                                                                                  |
| <i>d</i>     | Measurement Distance                                                                                                                                                                                                                                                                                                                                         |
| dB           | Decibels                                                                                                                                                                                                                                                                                                                                                     |
| dB $\mu$ A   | Decibels above one <b>microamp</b>                                                                                                                                                                                                                                                                                                                           |
| dB $\mu$ V   | Decibels above one <b>microvolt</b>                                                                                                                                                                                                                                                                                                                          |
| dB $\mu$ A/m | Decibels above one <b>microamp per meter</b>                                                                                                                                                                                                                                                                                                                 |
| dB $\mu$ V/m | Decibels above one <b>microvolt per meter</b>                                                                                                                                                                                                                                                                                                                |
| DC           | Direct Current $\mu$                                                                                                                                                                                                                                                                                                                                         |
| E            | Electric Field                                                                                                                                                                                                                                                                                                                                               |
| DSL          | Digital Subscriber Line                                                                                                                                                                                                                                                                                                                                      |
| ESD          | Electrostatic Discharge                                                                                                                                                                                                                                                                                                                                      |
| EUT          | Equipment Under Test                                                                                                                                                                                                                                                                                                                                         |
| <i>f</i>     | Frequency                                                                                                                                                                                                                                                                                                                                                    |
| FCC          | Federal Communications Commission                                                                                                                                                                                                                                                                                                                            |
| GR-1089-CORE | <b>(GR)</b> General Requirement(s) imposed by the NEBS standard, <b>(CORE)</b> Central Office Recovery Express (AT&T), <b>(1089)</b> specifies various parts of the General Requirements under Bellcore Technical Standard, Requirements for Electromagnetic Compatibility and Electrical Safety - Generic Criteria for Network Telecommunications Equipment |
| GRP          | Ground Reference Plane                                                                                                                                                                                                                                                                                                                                       |
| H            | Magnetic Field                                                                                                                                                                                                                                                                                                                                               |
| HCP          | Horizontal Coupling Plane                                                                                                                                                                                                                                                                                                                                    |
| Hz           | Hertz                                                                                                                                                                                                                                                                                                                                                        |
| IEC          | International Electrotechnical Commission                                                                                                                                                                                                                                                                                                                    |
| kHz          | kilo <b>hertz</b>                                                                                                                                                                                                                                                                                                                                            |
| kPa          | kilo <b>pascal</b>                                                                                                                                                                                                                                                                                                                                           |
| kV           | kilovolt                                                                                                                                                                                                                                                                                                                                                     |
| LISN         | Line Impedance Stabilization Network                                                                                                                                                                                                                                                                                                                         |
| MHz          | Mega <b>hertz</b>                                                                                                                                                                                                                                                                                                                                            |
| $\mu$ H      | <b>micro</b> henry                                                                                                                                                                                                                                                                                                                                           |
| $\mu$        | <b>micro</b> farad                                                                                                                                                                                                                                                                                                                                           |
| $\mu$ s      | <b>micro</b> seconds                                                                                                                                                                                                                                                                                                                                         |
| NEBS         | Network Equipment-Building System                                                                                                                                                                                                                                                                                                                            |
| PRF          | Pulse Repetition Frequency                                                                                                                                                                                                                                                                                                                                   |
| RF           | Radio Frequency                                                                                                                                                                                                                                                                                                                                              |
| RMS          | Root-Mean-Square                                                                                                                                                                                                                                                                                                                                             |
| TWT          | Traveling Wave Tube                                                                                                                                                                                                                                                                                                                                          |
| V/m          | Volts <b>per meter</b>                                                                                                                                                                                                                                                                                                                                       |
| VCP          | Vertical Coupling Plane                                                                                                                                                                                                                                                                                                                                      |



# **I. Executive Summary**



## A. Purpose of Test

An EMC evaluation was performed to determine compliance of the SkyPilot Networks SkyConnector Mini, with the requirements of Part 15, §15.247. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the SkyConnector Mini. SkyPilot Networks should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the SkyConnector Mini, has been **permanently** discontinued

## B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, §15.247, in accordance with SkyPilot Networks, purchase order number 5841. All tests were conducted using measurement procedure ANSI C63.4-2003.

| FCC Reference                                    | IC Reference          | Description                               | Compliance |
|--------------------------------------------------|-----------------------|-------------------------------------------|------------|
| 47 CFR Part 15.247:2005                          | RSS-210 Issue 7: 2007 | Applicable Standard                       | Compliant  |
| Title 47 of the CFR, Part 15 §15.203             | RSS-GEN (7.1.4)       | Antenna Requirement                       | Compliant  |
| Title 47 of the CFR, Part 15 §15.205             | RSS-210(A8.5)         | Emissions at Restricted Band              | Compliant  |
| Title 47 of the CFR, Part 15 §15.207(a)          | RSS-210(7.2.2)        | Conducted Emission Voltage                | Compliant  |
| Title 47 of the CFR, Part 15 §15.247(a)(1)       | RSS-210(A8.1)         | Occupied Bandwidth                        | Compliant  |
| Title 47 of the CFR, Part 15 §15.247(b)          | RSS-210(A8.4)         | RF Output Power                           | Compliant  |
| Title 47 of the CFR, Part 15 §15.247(c)          | RSS-210(A8.4)         | Antenna Gain >6dBi                        | Compliant  |
| Title 47 of the CFR, Part 15 §15.209, §15.247(d) | RSS-210(A8.5)         | Radiated and Conducted Spurious Emissions | Compliant  |
| Title 47 of the CFR, Part 15; §15.247(e)         | RSS-210(A8.3)         | Power Spectral Density                    | Compliant  |
| Title 47 of the CFR, Part 15 §15.247(i)          | RSSGen(5.5)           | Maximum Permissible Exposure              | Compliant  |
| N/A                                              | RSSGen(4.8)           | Receiver Spurious Emissions               | Compliant  |

**Table 1 Executive Summary of EMC Part 15.247 Compliance Testing**



## **II. Equipment Configuration**



## A. Overview

MET Laboratories, Inc. was contracted by SkyPilot Networks to perform testing on the SkyConnector Mini, under SkyPilot Networks's purchase order number 5841.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the SkyPilot Networks, SkyConnector Mini.

The results obtained relate only to the item(s) tested.

|                                       |                                                         |                                                   |
|---------------------------------------|---------------------------------------------------------|---------------------------------------------------|
| <b>Model(s) Tested:</b>               | SkyConnector Mini                                       |                                                   |
| <b>Model(s) Covered:</b>              | SkyConnector Mini                                       |                                                   |
| <b>EUT Specifications:</b>            | Primary Power: 120V/230V                                |                                                   |
|                                       | FCC ID: RV7-SC5111<br>IC: 5550A-SC5111                  |                                                   |
|                                       | Type of Modulations:                                    | OFDM (Orthogonal Frequency Division multiplexing) |
|                                       | Emission Designators:                                   | 16M3D7D                                           |
|                                       | Equipment Code:                                         | DTS                                               |
|                                       | Peak RF Output Power:                                   | 29.65dBm                                          |
|                                       | EUT Frequency Ranges:                                   | 5745-5825MHz                                      |
| <b>Analysis:</b>                      | The results obtained relate only to the item(s) tested. |                                                   |
| <b>Environmental Test Conditions:</b> | Temperature (15-35° C)                                  |                                                   |
|                                       | Relative Humidity (30-60%)                              |                                                   |
|                                       | Barometric Pressure (860-1060 mbar)                     |                                                   |
| <b>Evaluated by:</b>                  | Minh Ly                                                 |                                                   |
| <b>Date(s):</b>                       | October 17, 2008                                        |                                                   |

Table 2. EUT Specification Table



## B. References

|                                    |                                                                                                                                                                       |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>CFR 47, Part 15, Subpart C</b>  | Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies |
| <b>RSS-210, Issue 7, June 2007</b> | Low-power Licence-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment                                                                      |
| <b>ANSI C63.4:2003</b>             | Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz                                |
| <b>ANSI/NCSL Z540-1-1994</b>       | Calibration Laboratories and Measuring and Test Equipment - General Requirements                                                                                      |
| <b>ANSI/ISO/IEC 17025:2000</b>     | General Requirements for the Competence of Testing and Calibration Laboratories                                                                                       |

Table 3. References

## C. Test Site

All testing was performed at MET Laboratories, Inc., 3162 Belick Street, Santa Clara, CA 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by A2LA (Certificate Number 591.02).

## D. Description of Test Sample

The SkyPilot Networks SkyConnector Mini, is a high performance 802.11 outdoor CPE device specifically designed for optimized performance at 5GHz.



**Photograph 1. SkyPilot Networks SkyConnector Mini**

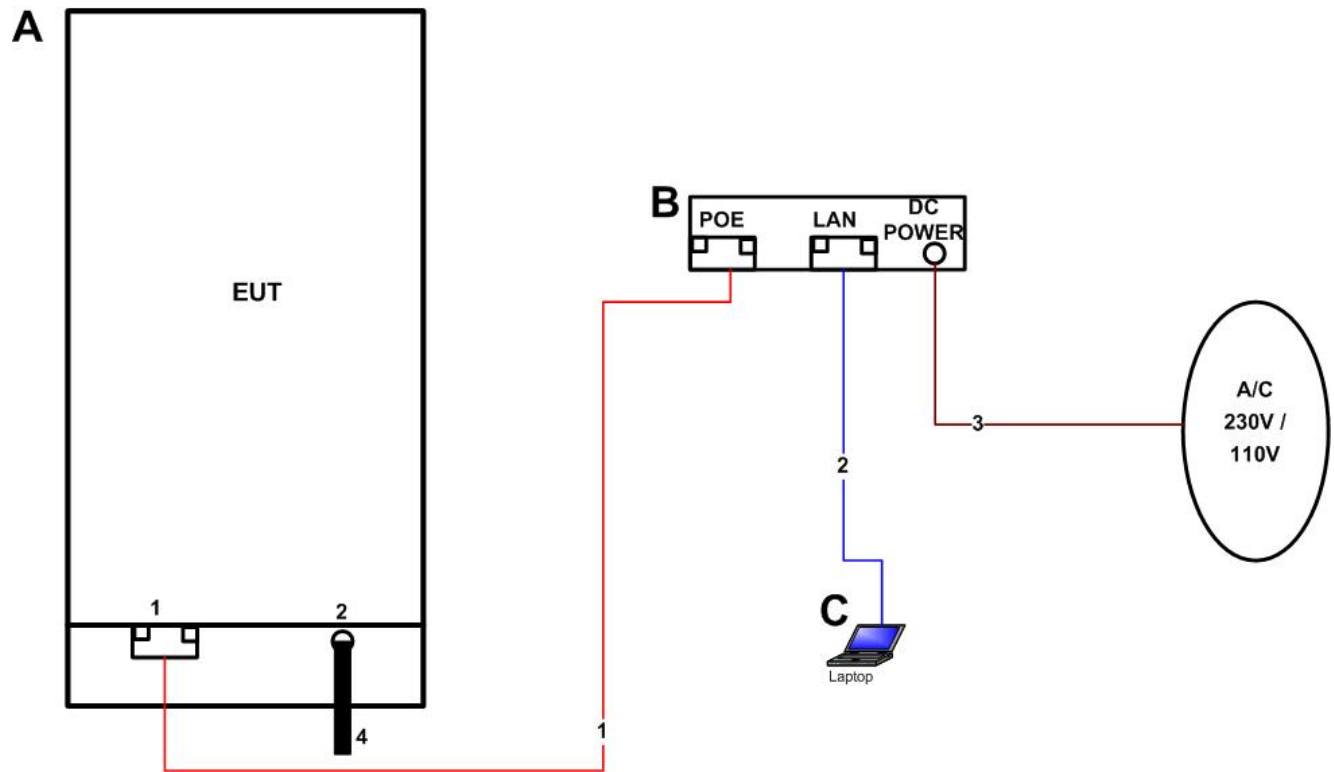


Figure 1. Block Diagram of Test Configuration



## E. Equipment Configuration

The EUT was set up as outlined in Figure 1, Block Diagram of Test Setup. All cards, racks, etc., incorporated as part of the EUT is included in the following list.

| Ref. ID | Name / Description | Model Number  | Serial Number |
|---------|--------------------|---------------|---------------|
| A       | SkyConnector Mini  | 725-05020-01R | F50000001     |

**Table 4. Equipment Configuration (Radiated Emissions)**

## F. Support Equipment

SkyPilot Networks supplied support equipment necessary for the operation and testing of the SkyConnector Mini. All support equipment supplied is listed in the following Support Equipment List.

| Ref. ID | Name / Description | Manufacturer  | Model Number  |
|---------|--------------------|---------------|---------------|
| B       | AC/DC Adaptor      | GME Switching | GFP121U-1210B |
| C       | Laptop             | DELL          | Inspiron-630m |

**Table 5. Support Equipment**



## G. Ports and Cabling Information

| Ref. ID | Port name on EUT | Cable Description or reason for no cable | Qty. | Length (m) | Shielded (Y/N) | Termination Box ID & Port ID |
|---------|------------------|------------------------------------------|------|------------|----------------|------------------------------|
| 1       | A,1              | Ethernet                                 | 1    | 2 mts      | Y              | B, POE                       |
| 2       | B, LAN           | Ethernet                                 | 1    | 2 mts      | Y              | C, Laptop                    |
| 3       | B, DC POWER      | Power Cable                              | 1    | 2 mts      | N              | 230V/110V Power Supply       |
| 4       | A, 4             | Terminated with 50 ohm load              | 1    | N/A        | N/A            | N/A                          |

Table 6. Ports and Cabling Information

## H. Mode of Operation

The EUT operates in OFDM mode.

## I. Method of Monitoring EUT Operation

A Spectrum Analyzer and a Power Meter was use to monitor the EUT's transmitter channel and power output.

## J. Modifications

### a) Modifications to EUT

No modifications were made to the EUT.

### b) Modifications to Test Standard

No modifications were made to the test standard.

## K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to SkyPilot Networks upon completion of testing.



### **III. Electromagnetic Compatibility Criteria for Intentional Radiators**



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.203 Antenna Requirement

**Test Requirement:**

**§ 15.203:** An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

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

**Results:**

The EUT as tested meets the criteria of this rule by being antenna being permanently attached and professionally installed. The EUT is compliant with §15.203.

| Gain/Model | Manufacturer      |
|------------|-------------------|
| 14dbi      | SkyPilot Networks |

**Test Engineer(s):**

Minh Ly



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.207 Conducted Emissions Limits

**Test Requirement(s):** § 15.207 (a): For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50  $\Sigma$  line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

| Frequency range<br>(MHz) | § 15.207(a), Conducted Limit (dB $\mu$ V) |         |
|--------------------------|-------------------------------------------|---------|
|                          | Quasi-Peak                                | Average |
| * 0.15- 0.45             | 66 - 56                                   | 56 - 46 |
| 0.45 - 0.5               | 56                                        | 46      |
| 0.5 - 30                 | 60                                        | 50      |

**Table 7. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)**

**Test Procedure:** The EUT was placed on a 0.8 m-high wooden table inside a semi-anechoic chamber. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50  $\Omega$ /50  $\mu$ H Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with ANSI C63.4-1992 "Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz". The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50  $\Omega$ /50  $\mu$ H LISN as the input transducer to an EMC/field intensity meter. The tests were conducted in a RF-shielded enclosure.

**Test Results:** The EUT was found compliant with the requirement(s) of this section. Measured emissions were below applicable limits.

**Test Engineer(s):** Minh Ly

**Test Date(s):** November 10, 2007



### Conducted Emissions - Voltage, AC Power, (110 VAC, 60 Hz)

| FREQ.<br>(MHz) | Corrected<br>Amplitude<br>(dBuV)<br>QP | Limit<br>(dBuV)<br>QP | Results<br>QP | Margin<br>(dB) QP | Corrected<br>Amplitude<br>(dBuV)<br>AVG | Limit<br>(dBuV)<br>AVG | Results<br>AVG | Margin<br>(dB) AVG |
|----------------|----------------------------------------|-----------------------|---------------|-------------------|-----------------------------------------|------------------------|----------------|--------------------|
| 0.165          | 60.43                                  | 79                    | PASS          | -18.57            | 33.27                                   | 66                     | PASS           | -32.73             |
| 3.89           | 31.16                                  | 73                    | PASS          | -41.84            | 19.2                                    | 60                     | PASS           | -40.8              |
| 29.236         | 44.64                                  | 73                    | PASS          | -28.36            | 42.48                                   | 60                     | PASS           | -17.52             |

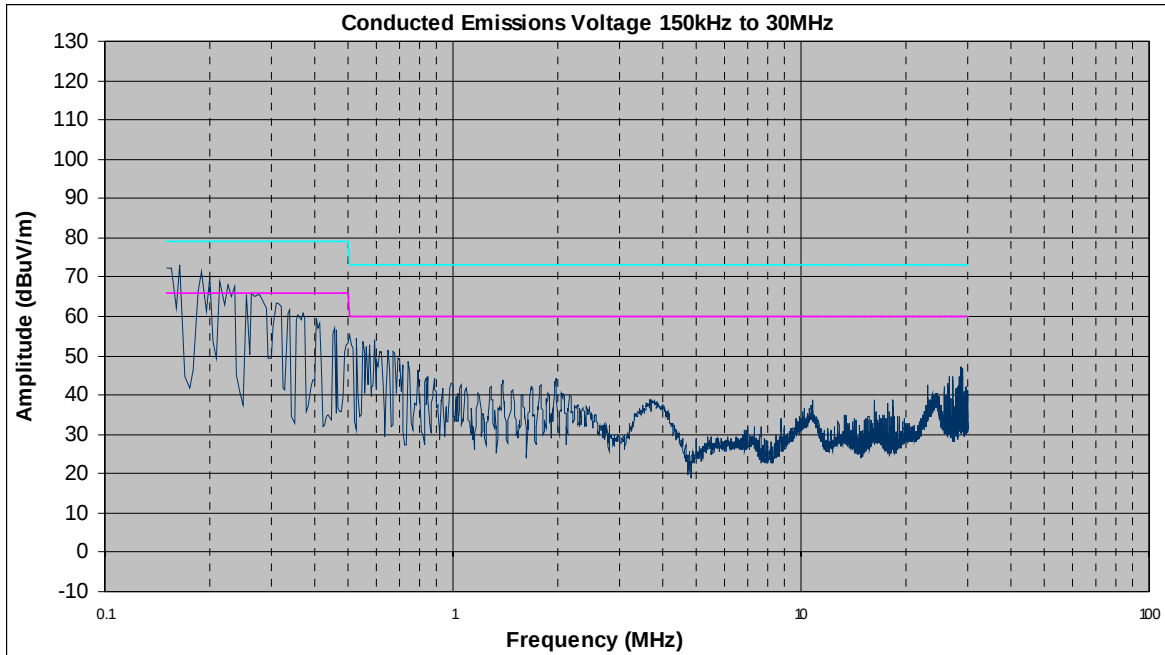
Table 8. Conducted Emissions Test Results, Phase Line

| FREQ.<br>(MHz) | Corrected<br>Amplitude<br>(dBuV)<br>QP | Limit<br>(dBuV)<br>QP | Results<br>QP | Margin<br>(dB) QP | Corrected<br>Amplitude<br>(dBuV)<br>AVG | Limit<br>(dBuV)<br>AVG | Results<br>AVG | Margin<br>(dB) AVG |
|----------------|----------------------------------------|-----------------------|---------------|-------------------|-----------------------------------------|------------------------|----------------|--------------------|
| 0.221          | 57.81                                  | 79                    | PASS          | -21.19            | 30.02                                   | 66                     | PASS           | -35.98             |
| 3.734          | 28.73                                  | 73                    | PASS          | -44.27            | 16.54                                   | 60                     | PASS           | -43.46             |
| 29.236         | 43.31                                  | 73                    | PASS          | -29.69            | 41.08                                   | 60                     | PASS           | -18.92             |

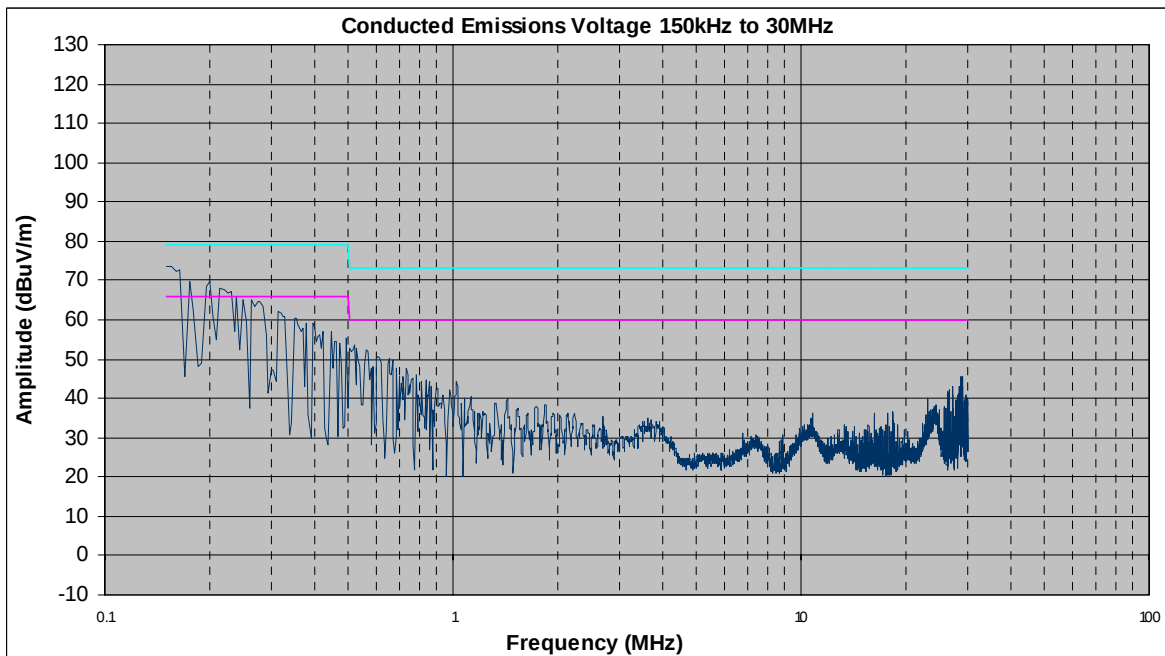
Table 9. Conducted Emissions Test Results, Neutral Line



## Conducted Emissions - Voltage, AC Power, (110 VAC, 60 Hz)



Plot 1. Conducted Emissions, Phase Line Plot



Plot 2. Conducted Emissions, Neutral Line Plot

## Conducted Emissions – Test Setup Photo



Photograph 2. Conducted Emissions Test Setup



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(a) 6 dB and 99% Bandwidth

**Test Requirements:** § 15.247(a): Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

**Test Procedure:** The transmitter was set to the mid channel at the highest output power and connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately equal to 1% of the total emission bandwidth, VBW > RBW. The 6 dB Bandwidth was measured and recorded. The measurements were repeated at the low and high channels.

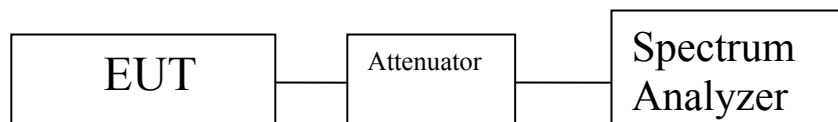
**Test Results** Equipment complies with § 15.247 (a). The 6 dB and 99% Bandwidth was determined from the plots on the following pages.

| 802.11a mode    |                 |                               |                              |
|-----------------|-----------------|-------------------------------|------------------------------|
| Carrier Channel | Frequency (MHz) | Measured 6 dB Bandwidth (MHz) | Measured 99% Bandwidth (MHz) |
| Low             | 5745            | 16.003                        | 16.6598                      |
| Mid             | 5785            | 16.309                        | 16.5080                      |
| High            | 5825            | 16.211                        | 16.6748                      |

Table 10. Occupied Bandwidth Results

**Test Engineer(s):** Minh Ly

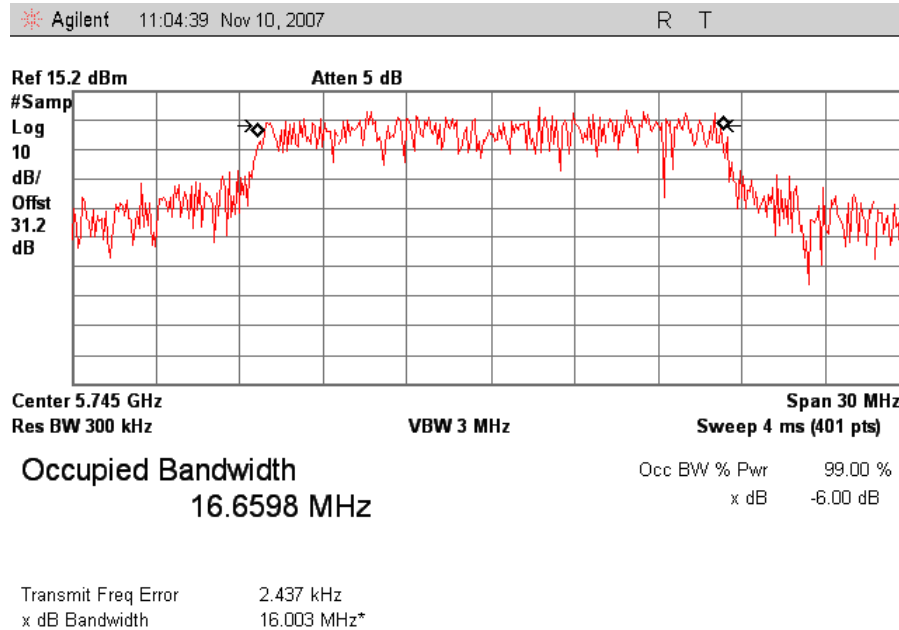
**Test Date(s):** November 10, 2007



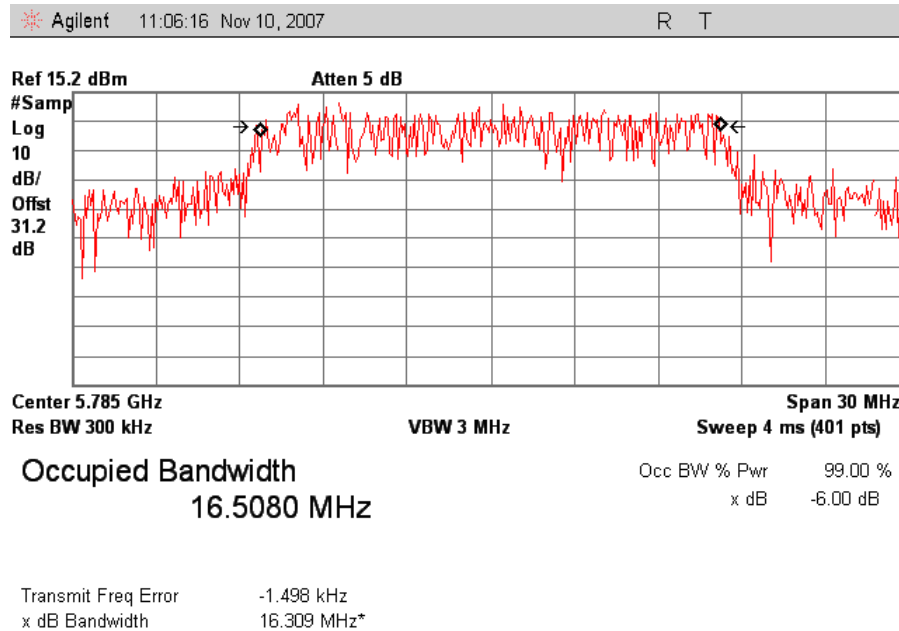
Block Diagram 1. Occupied Bandwidth Test Setup



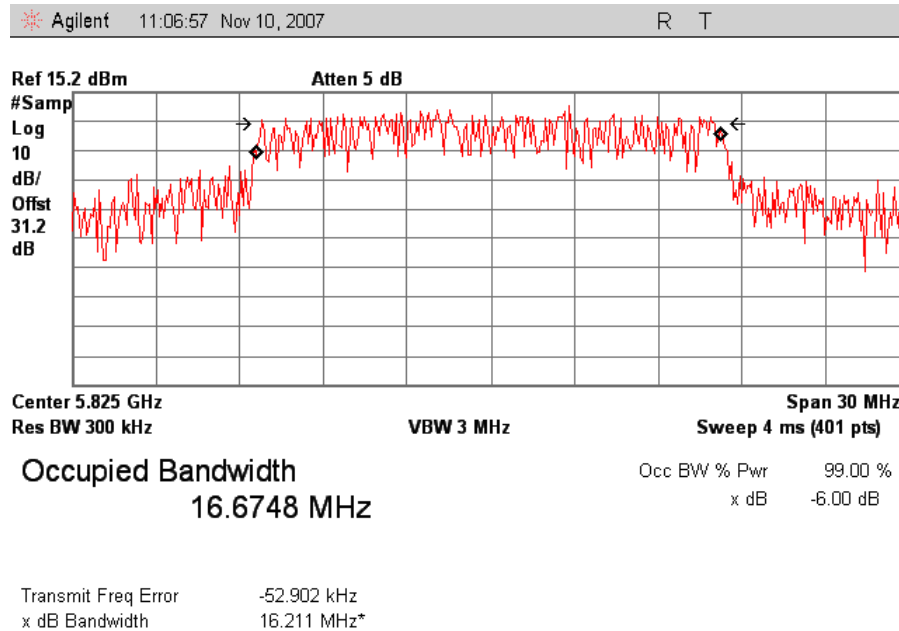
## Electromagnetic Compatibility Criteria for Intentional Radiators



### 802.11/a Low Ch Occupied Band Width



### 802.11/a Mid Ch Occupied Band Width



802.11/a High Ch Occupied Band Width



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(b) Peak Power Output and RF Exposure

**Test Requirements:** §15.247(b): The maximum peak output power of the intentional radiator shall not exceed the following:

| Digital Transmission Systems<br>(MHz) | Output Limit<br>(Watts) |
|---------------------------------------|-------------------------|
| 902-928                               | 1.000                   |
| 2400-2483.5                           | 1.000                   |
| 5725- 5850                            | 1.000                   |

**Table 11. Output Power Requirements from §15.247**

§15.247(c): if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in the Table 11, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400 – 2483.5 MHz band may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Fixed, point-to-point operation excludes the use of point-to-multipoint systems, omnidirectional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

**Test Procedure:** The transmitter was connected to a calibrated Peak Power Meter. The EUT was measured at the low, mid and high channels of each band at a data rate which gave the maximum power level.



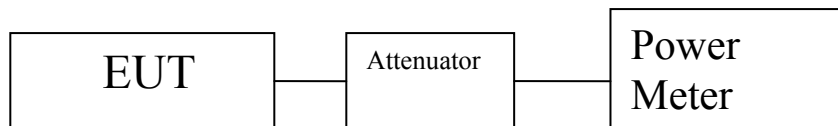
**Test Results:** Equipment complies with the Peak Power Output limits of § 15.247(b).

| 802.11a         |                 |                                  |
|-----------------|-----------------|----------------------------------|
| Carrier Channel | Frequency (MHz) | Measured Peak Output Power (dBm) |
| Low             | 5745            | 29.25                            |
| Mid             | 5785            | 29.54                            |
| High            | 5825            | 29.65                            |

**Table 12. RF Output Power Results**

**Test Engineer(s):** Minh Ly

**Test Date(s):** November 10, 2007



**Block Diagram 2. Peak Power Output Test Setup**



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(b) Peak Power Output and RF Exposure

**RF Exposure Requirements:** §1.1307(b)(1) and §1.1307(b)(2): Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

**RF Radiation Exposure Limit:** §1.1310: As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

MPE Limit Calculation: EUT's operating frequencies @ 5745 - 5825 MHz; highest conducted power = 29.65dBm (peak) therefore, **Limit for Uncontrolled exposure: 1 mW/cm<sup>2</sup> or 10 W/m<sup>2</sup>**

EUT maximum antenna gain = **14 dBi.**

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (1 mW/cm<sup>2</sup>)  
P = Power Input to antenna (922.5mW)  
G = Antenna Gain (25.11 numeric)

$$R = (922.5 * 25.11 / 4 * 3.14 * 1.0)^{1/2} = (23173.95 / 12.56)^{1/2} = \mathbf{43cm}$$



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(d) Harmonic Emissions – Radiated and Conducted

**Test Requirements:** §15.247(d); §15.205, §15.209(a): Emissions outside the frequency band.

**§15.247(d):** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a).

**§15.205(a):** Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz                           | MHz                 | MHz            | GHz              |
|-------------------------------|---------------------|----------------|------------------|
| 0.090–0.110-----              | 16.42–16.423        | 399.9–410      | 4.5–5.15         |
| <sup>1</sup> 0.495–0.505----- | 16.69475–16.69525   | 608–614        | 5.35–5.46        |
| 2.1735–2.1905-----            | 16.80425–16.80475   | 960–1240       | 7.25–7.75        |
| 4.125–4.128-----              | 25.5–25.67          | 1300–1427      | 8.025–8.5        |
| 4.17725–4.17775-----          | 37.5–38.25          | 1435–1626.5    | 9.0–9.2          |
| 4.20725–4.20775-----          | 73–74.6             | 1645.5–1646.5  | 9.3–9.5          |
| 6.215–6.218-----              | 74.8–75.2           | 1660–1710      | 10.6–12.7        |
| 6.26775–6.26825-----          | 108–121.94          | 1718.8–1722.2  | 13.25–13.4       |
| 6.31175–6.31225-----          | 123–138             | 2200–2300      | 14.47–14.5       |
| 8.291–8.294-----              | 149.9–150.05        | 2310–2390      | 15.35–16.2       |
| 8.362–8.366-----              | 156.52475–156.52525 | 2483.5–2500    | 17.7–21.4        |
| 8.37625–8.38675-----          | 156.7–156.9         | 2655–2900      | 22.01–23.12      |
| 8.41425–8.41475-----          | 162.0125–167.17     | 3260–3267      | 23.6–24.0        |
| 12.29–12.293-----             | 167.72–173.2        | 3332–3339      | 31.2–31.8        |
| 12.51975–12.52025-----        | 240–285             | 3345.8–3358.36 | 43–36.5          |
| 12.57675–12.57725-----        | 322–335.4           | 3600–4400      | ( <sup>2</sup> ) |

**Table 13. Restricted Bands of Operation**

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.

<sup>2</sup> Above 38.6



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(d) Harmonic Emissions Requirements – Radiated (802.11a)

| Frequency (MHz)      | Receive Antenna Polarity (H/V) | Uncorrected Field strength (dBμV)@ 3m | Preamp (dB) | Antenna Factor (dB) | Cable Loss (dB) | Distance Correction Factor (dB) | Corrected Field Strength @ 3m (dBμV) | Limit @ 3m (dBμV) | Margin (dB) | Measurement Type |
|----------------------|--------------------------------|---------------------------------------|-------------|---------------------|-----------------|---------------------------------|--------------------------------------|-------------------|-------------|------------------|
| 11490                | V                              | 47.3                                  | 34.7        | 39.7                | 9.4             | 0                               | 61.7                                 | 74                | -12.3       | pk               |
| 11490                | V                              | 34.3                                  | 34.7        | 39.7                | 9.4             | 0                               | 48.7                                 | 54                | -5.3        | avg              |
| 17235                | V                              | 42.3                                  | 33.0        | 44.5                | 11.8            | 0                               | 65.6                                 | 74                | -8.4        | pk               |
| Low Channel 5745MHz  |                                |                                       |             |                     |                 |                                 |                                      |                   |             |                  |
| Frequency (MHz)      | Receive Antenna Polarity (H/V) | Uncorrected Field strength (dBμV)@ 3m | Preamp (dB) | Antenna Factor (dB) | Cable Loss (dB) | Distance Correction Factor (dB) | Corrected Field Strength @ 3m (dBμV) | Limit @ 3m (dBμV) | Margin (dB) | Measurement Type |
| 11570                | V                              | 45.3                                  | 34.7        | 39.7                | 9.4             | 0                               | 59.7                                 | 74                | -14.3       | pk               |
| 11570                | V                              | 31.8                                  | 34.7        | 39.7                | 9.4             | 0                               | 46.2                                 | 54                | -7.8        | avg              |
| 17355                | V                              | 46.0                                  | 33.0        | 44.5                | 11.8            | 0                               | 69.3                                 | 74                | -4.7        | pk               |
| Mid Channel 5785MHz  |                                |                                       |             |                     |                 |                                 |                                      |                   |             |                  |
| Frequency (MHz)      | Receive Antenna Polarity (H/V) | Uncorrected Field strength (dBμV)@ 3m | Preamp (dB) | Antenna Factor (dB) | Cable Loss (dB) | Distance Correction Factor (dB) | Corrected Field Strength @ 3m (dBμV) | Limit @ 3m (dBμV) | Margin (dB) | Measurement Type |
| 11650                | V                              | 46.8                                  | 34.7        | 39.7                | 9.4             | 0                               | 61.2                                 | 74                | -12.8       | pk               |
| 11650                | V                              | 32.1                                  | 34.7        | 39.7                | 9.4             | 0                               | 46.5                                 | 54                | -7.5        | avg              |
| 17475                | V                              | 43.0                                  | 33.0        | 44.5                | 11.8            | 0                               | 66.3                                 | 74                | -7.7        | pk               |
| High Channel 5825MHz |                                |                                       |             |                     |                 |                                 |                                      |                   |             |                  |

**Note:** All other emissions were measured at the noise floor of the spectrum analyzer



**Photograph 3. Test Equipment and setup for various Radiated Measurements**



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(d) Spurious Emissions Requirements –RF Conducted

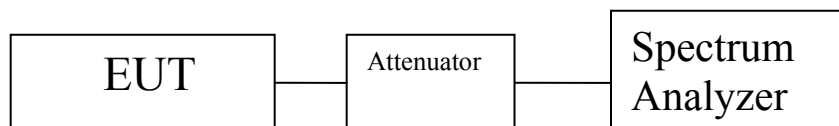
**Test Procedure:** For intentional radiators with a digital device portion which operates below 10 GHz, the spectrum was investigated as per §15.33(a)(1) and §15.33(a)(4); i.e., the lowest RF signal generated or used in the device up to the 10<sup>th</sup> harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

For frequencies 1-18GHz, measurements were made at coupler port of a 20dB directional coupler. The output of the coupler was terminated by a 50Ω load. For frequencies 18-40GHz a HP11970A and HP11970K harmonic mixer was used. Each harmonic mixer was fed with a SMA to wave guide adapter.

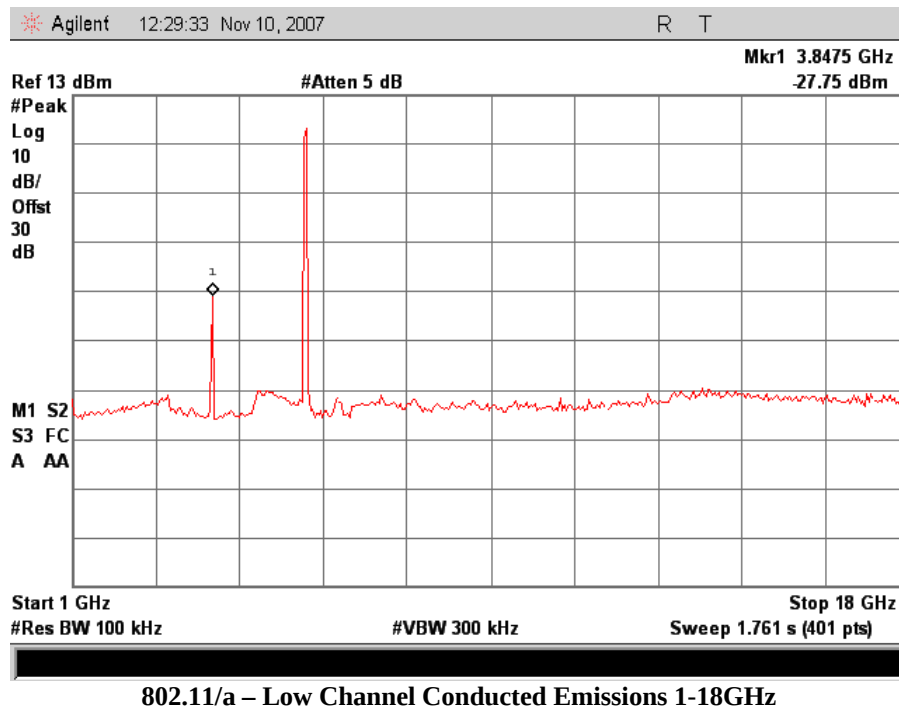
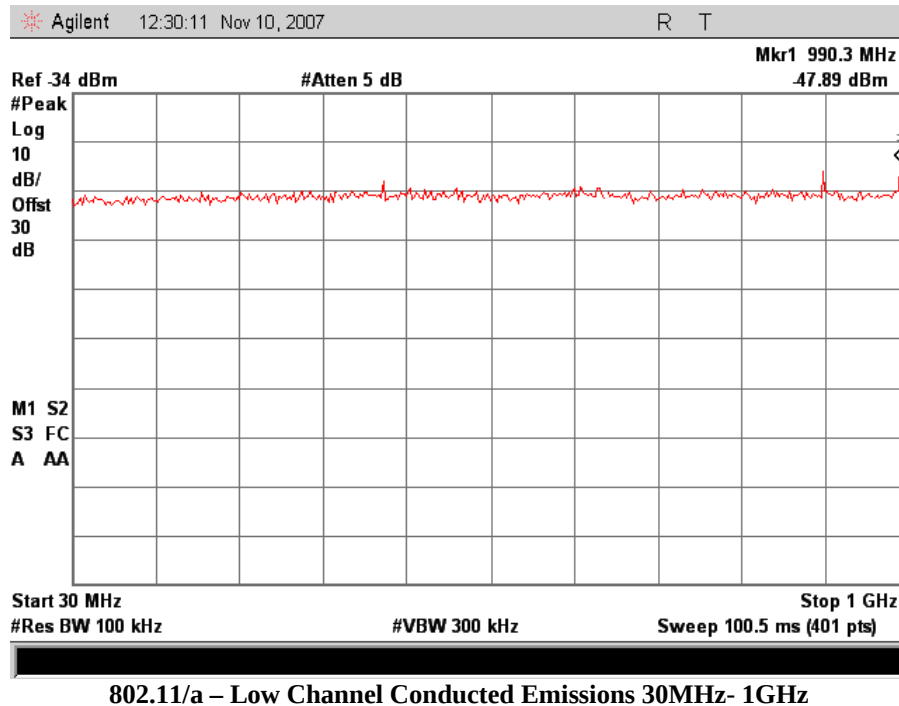
**Test Results:** Equipment complies with the Spurious Emissions Requirements – Radiated and RF Conducted limits of § 15.247 (c). For Radiated Emissions result, refer to section “§15.209: Radiated Emission Limits”. See following pages for detailed test results with RF Conducted Spurious Emissions and §15.205.

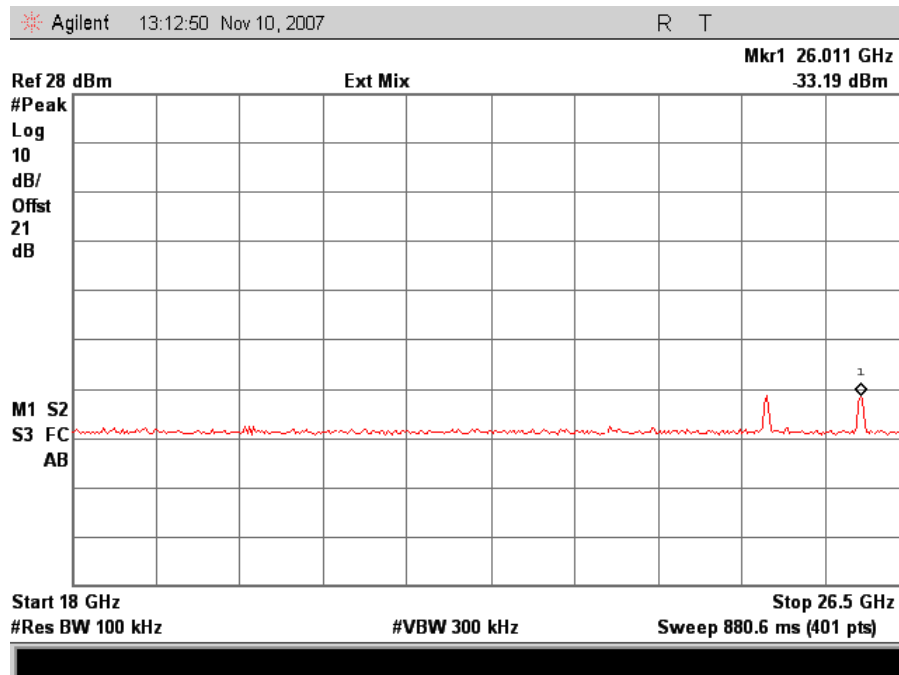
**Test Engineer(s):** Minh Ly

**Test Date(s):** November 10, 2007

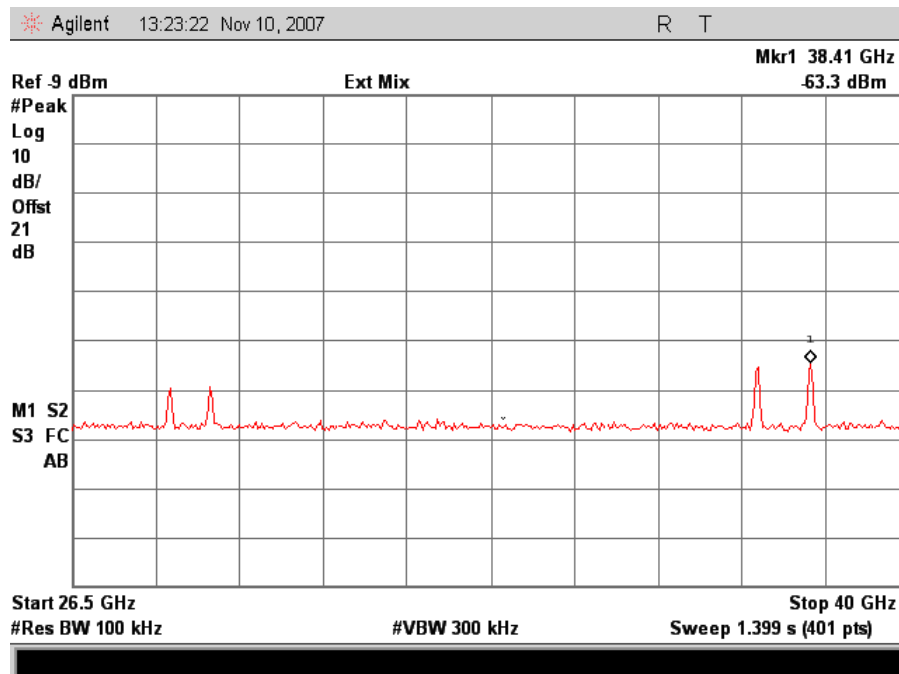


**Block Diagram 3. Spurious Conducted Emissions Test Setup**

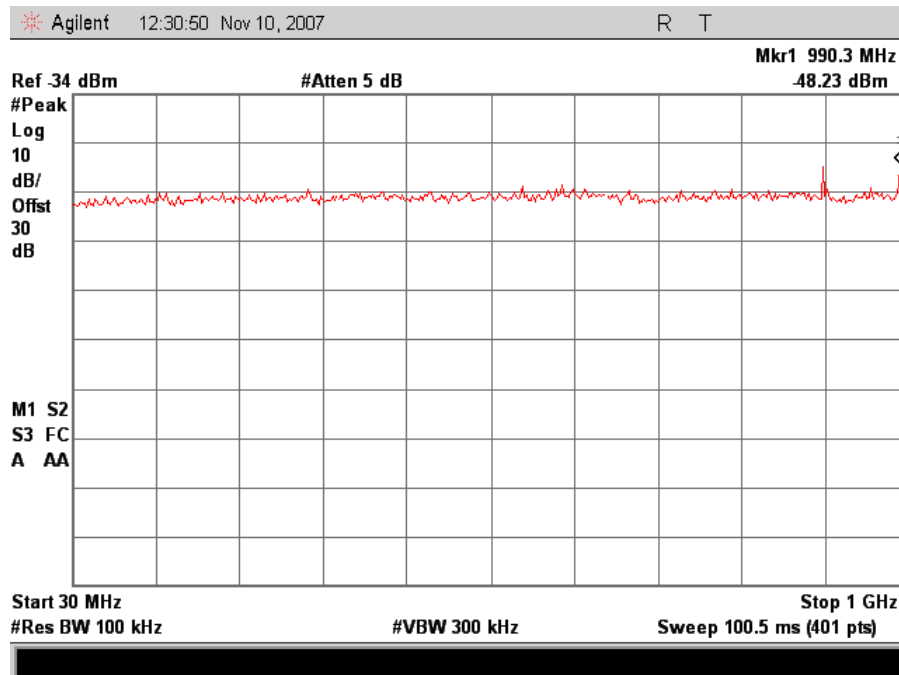




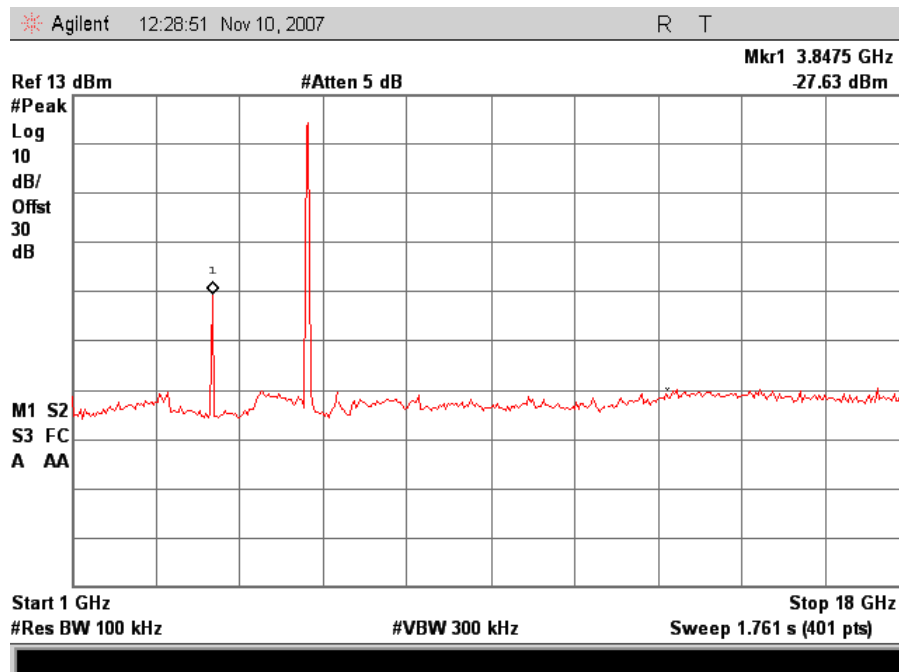
802.11/a – Low Channel Conducted Emissions 18 -26.5GHz



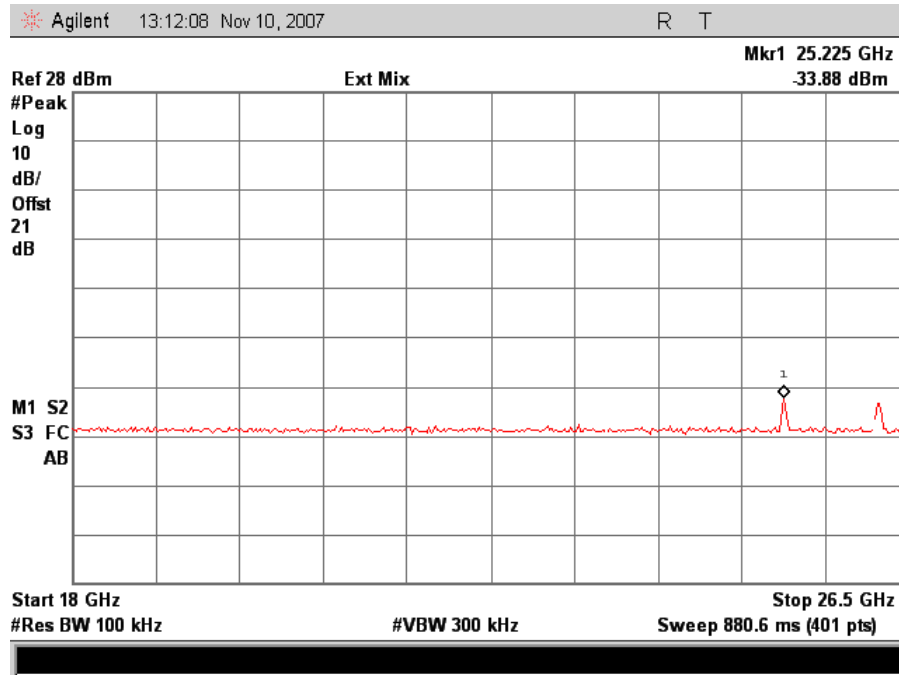
802.11/a – Low Channel Conducted Emissions 26.5 - 40GHz



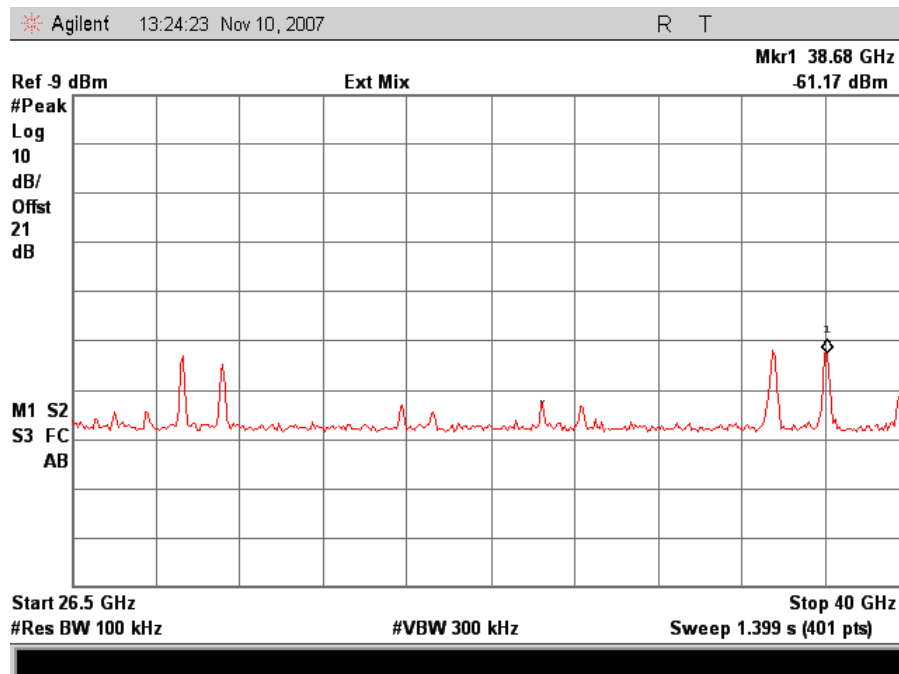
802.11/a – Mid Channel Conducted Emissions 30MHz – 1GHz



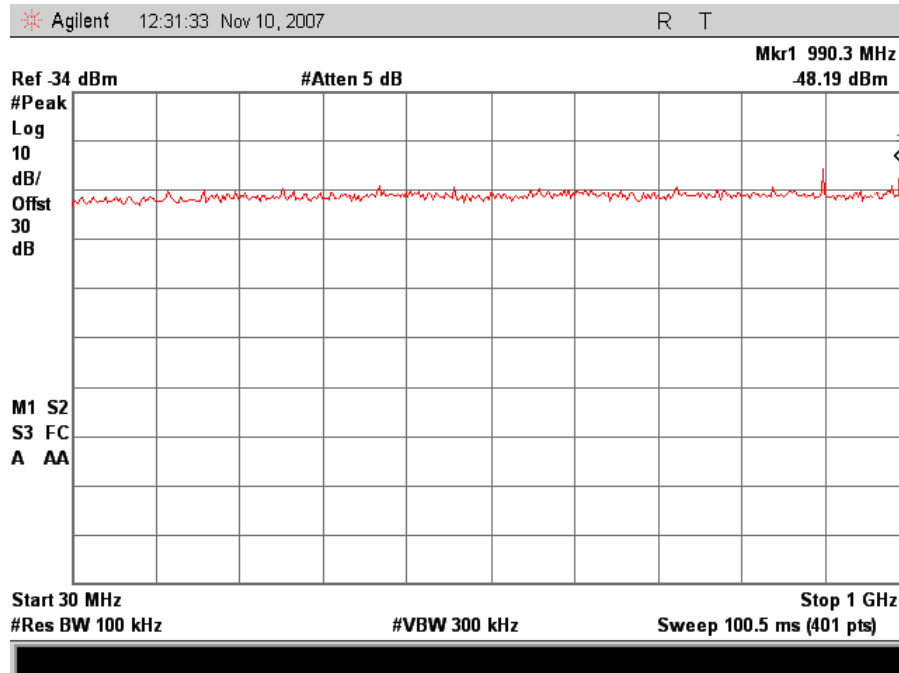
802.11/a – Mid Channel Conducted Emissions 1GHz - 18GHz



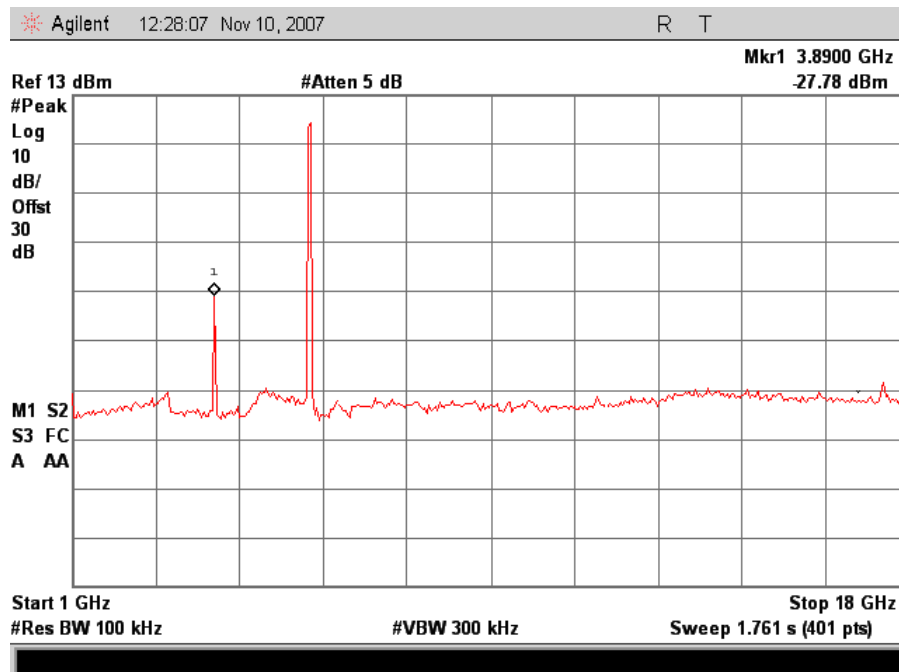
802.11/a – Mid Channel Conducted Emissions 18 - 26.5GHz



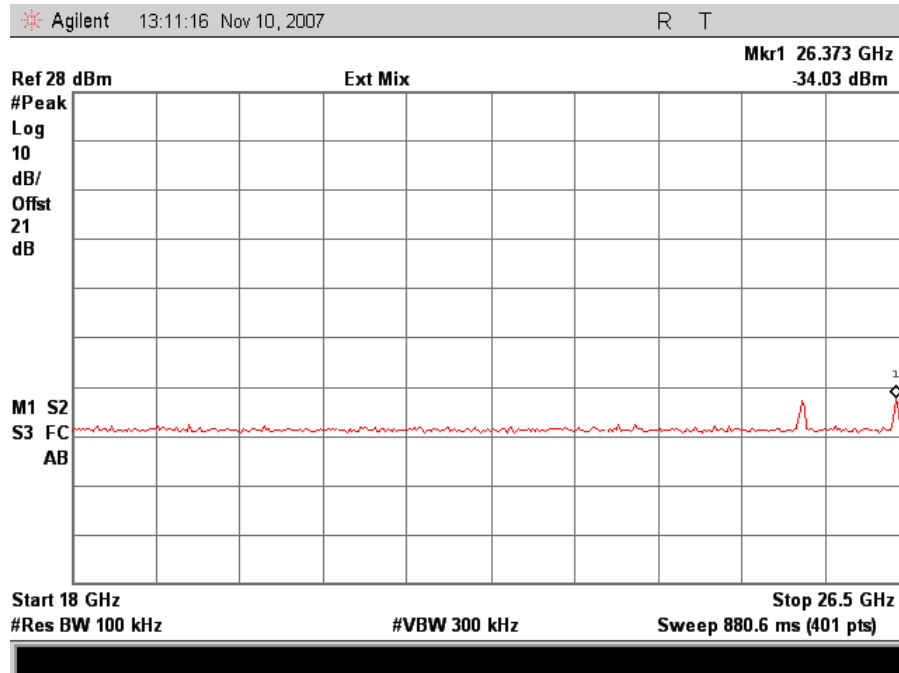
802.11/a – Mid Channel Conducted Emissions 26.5 – 40GHz



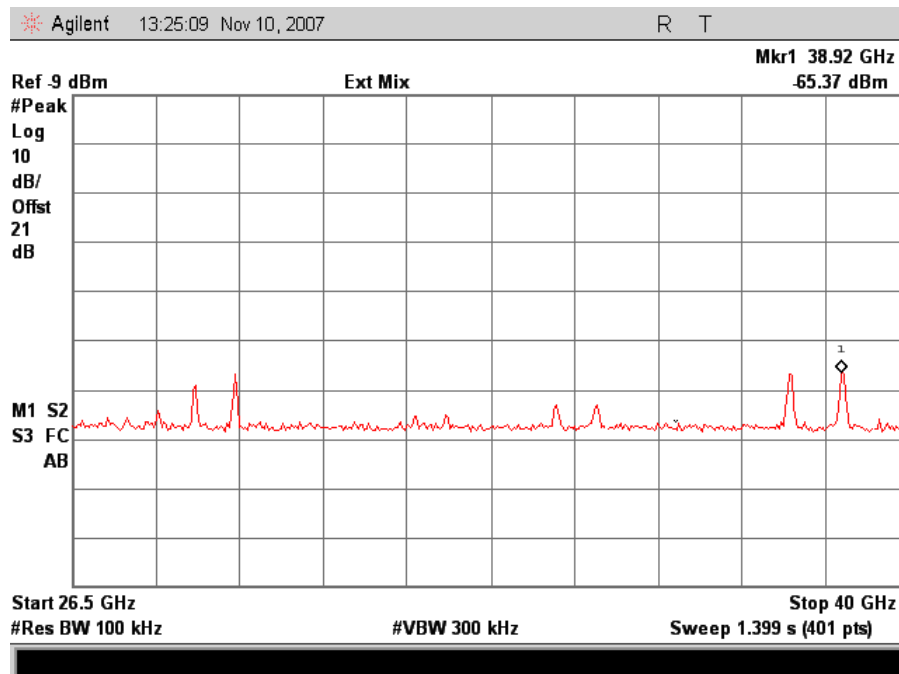
802.11/a – High Channel Conducted Emissions 30MHz – 1GHz



802.11/a – High Channel Conducted Emissions 1- 18GHz



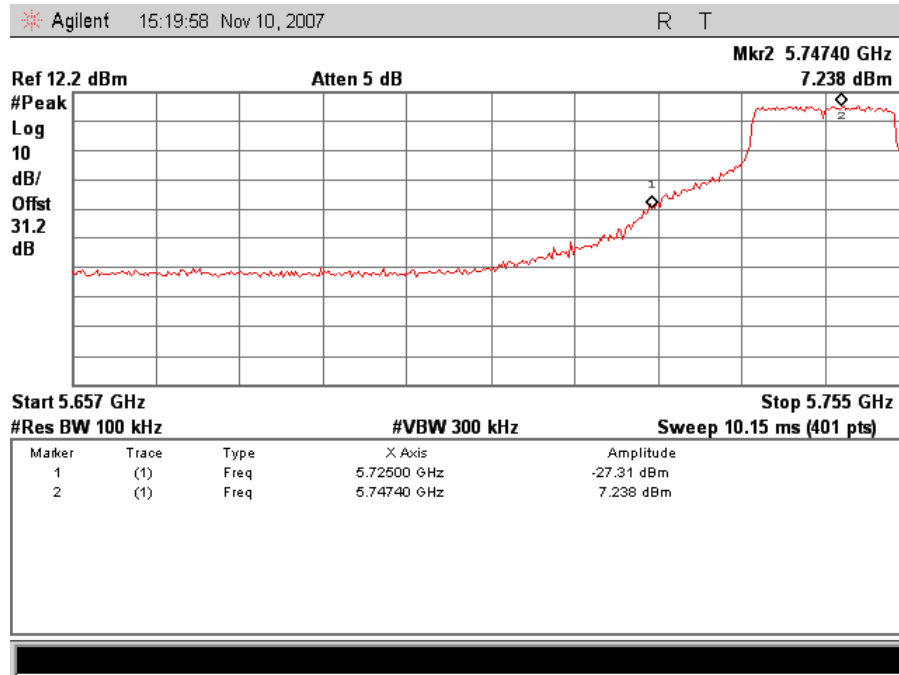
802.11/a – High Channel Conducted Emissions 18-26.5GHz



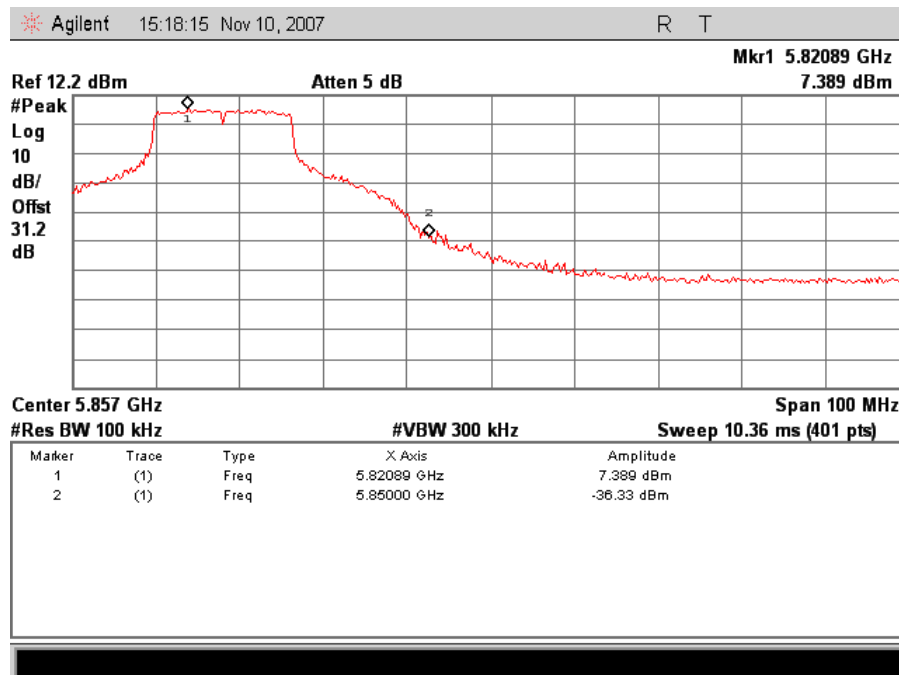
802.11/a – High Channel Conducted Emissions 26.5-40GHz

## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.205 Spurious Emissions Requirements –Band Edge (Conducted)



802.11/a – Lower Band Edge



802.11/a – Upper Band Edge



## Electromagnetic Compatibility Criteria for Intentional Radiators

### § 15.247(e) Peak Power Spectral Density

**Test Requirements:** §15.247(e): For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

**Test Procedure:** The transmitter was connected directly to a Spectrum Analyzer through a directional coupler. The power was monitored at the coupler port with a Peak Power Meter. The power level was set to the maximum level. The RBW and VBW were set to 3 kHz and a SPAN of 3.0 MHz with a 100 second sweep to the Spectrum Analyzer. Measurements were carried out at the low, mid and high channels.

**Test Results:** Equipment complies with the peak power spectral density limits of § 15.247 (e). The peak power spectral density was determined from plots on the following page(s).

| 802.11a         |                 |                     |             |             |
|-----------------|-----------------|---------------------|-------------|-------------|
| Carrier Channel | Frequency (MHz) | Measured PPSD (dBm) | Limit (dBm) | Margin (dB) |
| Low             | 5750            | -4.693              | 8           | 12.693      |
| Mid             | 5784            | -3.88               | 8           | 11.88       |
| High            | 5821            | -4.002              | 8           | 12.002      |

Table 14. Spectral Density Results

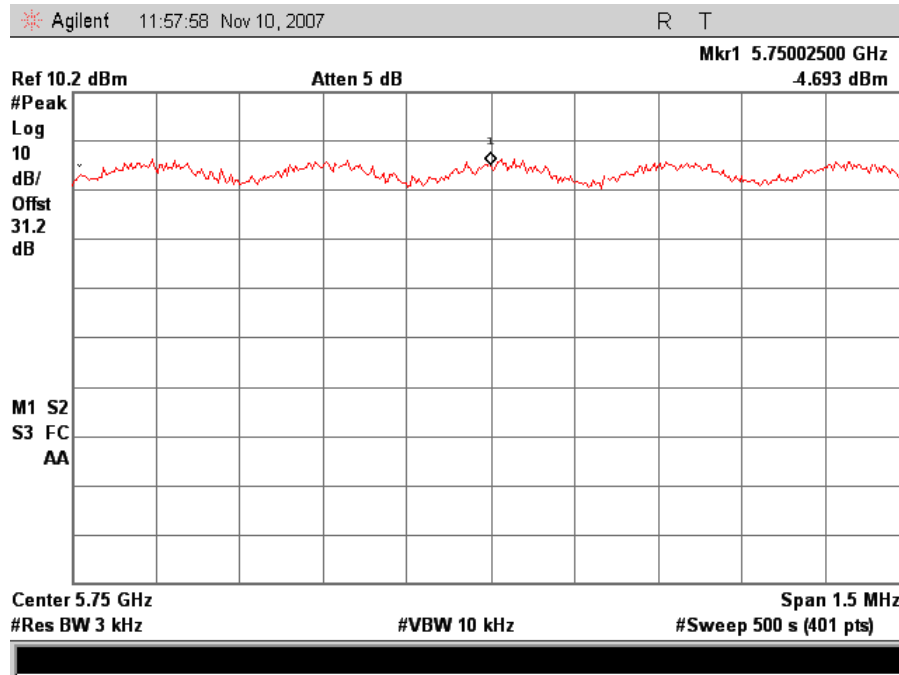
**Test Engineer:** Minh Ly

**Test Date:** November 10, 2007

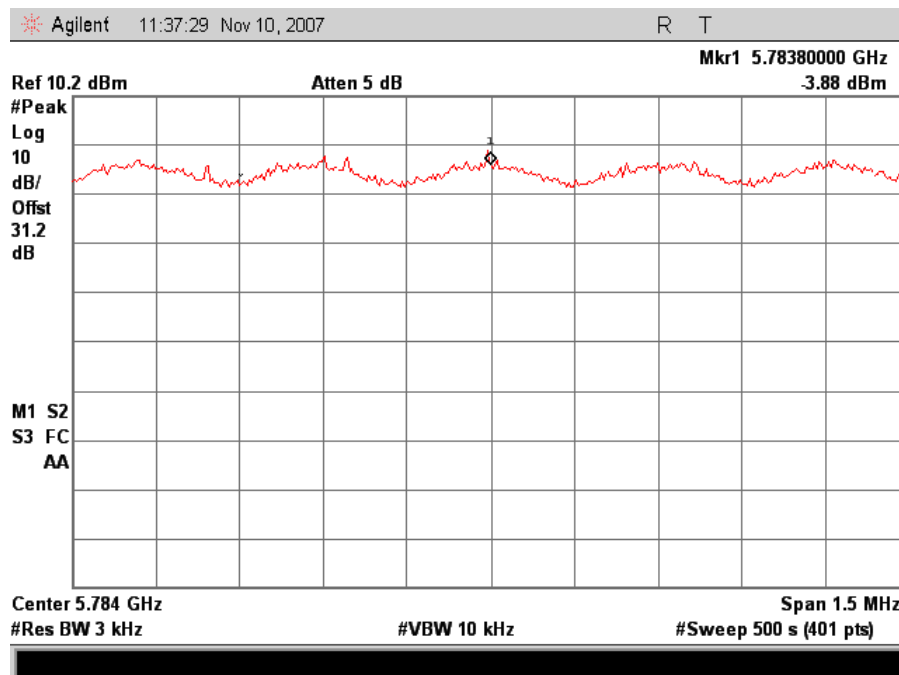


## Electromagnetic Compatibility Criteria for Intentional Radiators

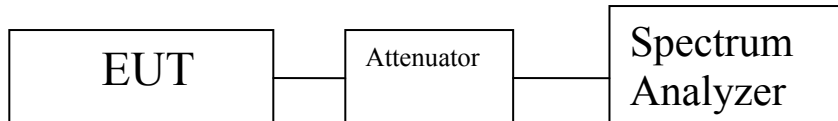
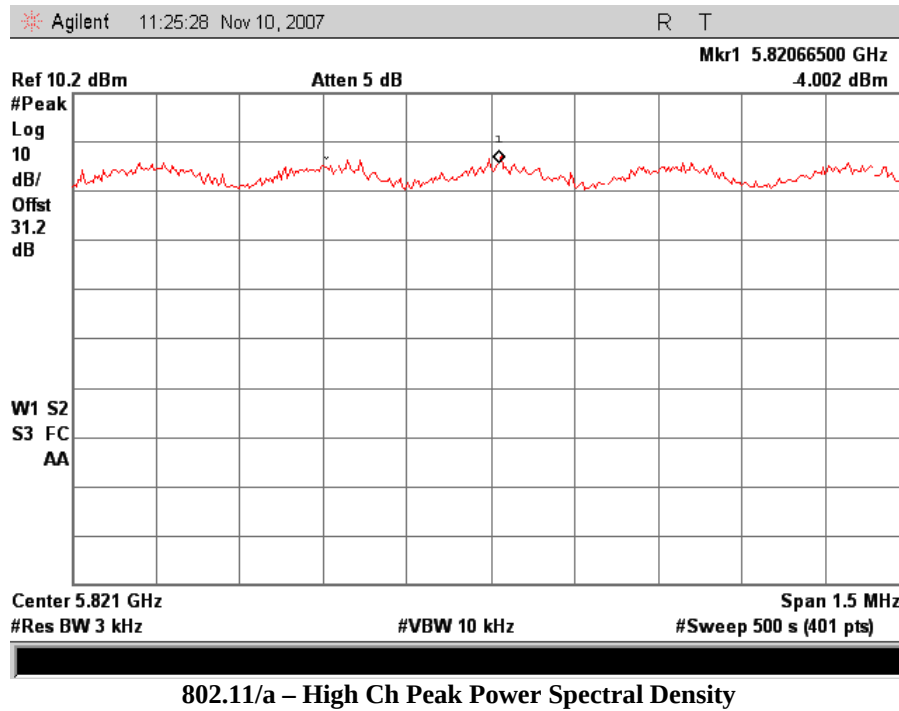
### § 15.247(e) Peak Power Spectral Density (802.11a)



802.11/a – Low Ch Peak Power Spectral Density



802.11/a – Mid Ch Peak Power Spectral Density



Block Diagram 4. Peak Power Spectral Density Test Setup



## IV. Test Equipment



## Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

| MET Asset # | Equipment                       | Manufacturer    | Model     | Last Cal Date | Cal Due Date |
|-------------|---------------------------------|-----------------|-----------|---------------|--------------|
| 1S2421      | EMI RECEIVER                    | ROHDE&SCHWARZ   | ESIB 7    | 03/27/2007    | 03/27/2008   |
| 1S2184      | BILOG ANTENNA                   | CHASE           | CBL6112A  | 01/03/2007    | 01/03/2008   |
| 1S2121      | PRE-AMPLIFIER                   | HEWLETT PACKARD | 8449B     | 10/25/2007    | 10/25/2008   |
| 1S2198      | ANTENNA, HORN                   | EMCO            | 3115      | 08/31/2007    | 08/31/2008   |
| 1S2202      | ANTENNA, HORN, 1 METER          | EMCO            | 3116      | 04/10/2007    | 04/10/2010   |
| N/A         | HIGH PASS FILTER                | MICRO-TRONICS   | HPM13146  | SEE NOTE      |              |
| 1S2263      | CHAMBER, 10 METER               | RANTEC          | N2-14     | 09/24/2007    | 09/24/2008   |
| 1S2041      | COUPLER, BI DIRECTIONAL COAXIAL | NARDA           | N/A       | SEE NOTE      |              |
| 1S2460      | Analyzer, Spectrum 9 kHz-40GHz  | Agilent         | E4407B    | 07/06/2005    | 07/06/2008   |
| 1S2430      | WIDEBAND POWER METER            | ANRITSU COMPANY | ML2488A   | 03/12/2007    | 03/12/2008   |
| 1S2432      | WIDEBAND POWER SENSOR           | ANRITSU COMPANY | MA2491A   | 03/12/2007    | 03/12/2008   |
| 1S2034      | COUPLER, DIRECTIONAL 1-20 GHz   | KRYTAR          | 101020020 | SEE NOTE      |              |
| 1S2041      | COUPLER, BI DIRECTIONAL COAXIAL | NARDA           | N/A       | SEE NOTE      |              |
| 1S2128      | Harmonic Mixer                  | Hewlett Packard | 11970A    | 10/26/2006    | 10/26/2008   |
| 1S2129      | Harmonic Mixer                  | Hewlett Packard | 11970K    | 10/26/2006    | 10/26/2008   |

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.



## **V. Certification & User's Manual Information**



## Certification & User's Manual Information

### A. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

#### § 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

- (a) The various types of radio communication transmitting devices described throughout this chapter.
- (b) *The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.*
- (c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.
- (d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

#### § 2.803 Marketing of radio frequency devices prior to equipment authorization.

- (a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:
  - (1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or
  - (2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.
- (d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.



- (e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:
- (i) *Compliance testing;*
  - (ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;
  - (iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;
  - (iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or
  - (v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.
- (e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.
- (f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.



## Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

### § 2.901 Basis and Purpose

- (a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.<sup>1</sup> *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.*
- (b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

### § 2.907 Certification.

- (a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.
- (b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

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<sup>1</sup> In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.



## Certification & User's Manual Information

### § 2.948 Description of measurement facilities.

- (a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.
  - (1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.
    - (i) *If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.*
    - (ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.
  - (2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.



## Certification & User's Manual Information

### Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

#### § 15.19 Labeling requirements.

(a) *In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:*

- (1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

- (2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

- (3) All other devices shall bear the following statement in a conspicuous location on the device:

*This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

- (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

- (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

#### § 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



## Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

### § 15.105 Information to the user.

- (a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

- (b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



## ICES-003 Procedural & Labeling Requirements

From the Industry Canada Electromagnetic Compatibility Advisory Bulletin entitled, "Implementation and Interpretation of the Interference-Causing Equipment Standard for Digital Apparatus, ICES-003" (EMCAB-3, Issue 2, July 1995):

"At present, CISPR 22: 2002 and ICES technical requirements are essentially equivalent. Therefore, if you have CISPR 22: 2002 approval by meeting CISPR Publication 22, the only additional requirements are: to attach a note to the report of the test results for compliance, indicating that these results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations; to maintain these records on file for the requisite five year period; and to provide the device with a notice of compliance in accordance with ICES-003."

### Procedural Requirements:

According to Industry Canada's Interference Causing Equipment Standard for Digital Apparatus ICES-003 Issue 4, February 2004:

- Section 6.1: A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister.
- Section 6.2: A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement in the user's manual.

### Labeling Requirements:

The suggested text for the notice, in English and in French, is provided below, from the Annex of ICES-003:

This Class [<sup>2</sup>] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [<sup>1</sup>] est conforme à la norme NMB-003 du Canada.

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<sup>2</sup> Insert either A or B but not both as appropriate for the equipment requirements.



SkyPilot Networks  
SkyConnector Mini

Electromagnetic Compatibility  
End of Report  
CFR Title 47, Part 15, Subpart C & RSS-210

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# End of Report

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