


**Electromagnetic Compatibility Criteria  
Test Report  
For the  
Omega Engineering, Inc.  
RFID Tag Reader  
Model:OM-80-RD1**

**Tested Under**  
FCC Certification Rules  
Contained in  
CFR Title 47, Part 15 Subpart B  
& §15.225 Subpart C  
For Intentional Radiators  
And Industry Canada Regulations  
RSS-210 Issue 7 & RSS-GEN Issue 2(June 2007)  
For Class A Digital Devices  
**Wednesday, February 24, 2010**

Prepared For:

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Customer Review:



Analab Report # 1628F Issue 3

630 Heron Drive, P.O. Box 336, Bridgeport, NJ 08014  
FRN 0007-8959-64 Test Site #793819  
Industry Canada Test Site #8329A-1

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<b>Issue</b>	<b>Report Date</b>	<b>Reason for Revision</b>
<b>1</b>	<b>September 13, 2009</b>	<b>Initial Issue</b>
<b>2</b>	<b>February 12,2010</b>	<b>Revised to include TCB requirements</b>
<b>3</b>	<b>February 24, 2010</b>	<b>Further Modifications per TCB requirements</b>

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## 1.0 Administration

### 1.1 Purpose of Test:

The purpose of this test suite is to establish the compliance of Omega Engineering OM-80 RFID Tag Reader with the requirements of CFR Part 15 §15.225 (IC: RSS-210 A2.6). All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accord with §2.1033 this document is provided with the test results of the OM-80 in support for the certification of the product. Omega Engineering has been advised that this document and the information contained herein, must be kept on file for two (2) years after the permanent discontinuance of manufacture of the OM-80.

### 1.2 Summary of Test Results:

Table 1 contains a listing of the tests performed on the product sample of the OM-80 and the results of those tests. All tests were conducted using measurement procedures outlined in ANSI C63.4-2003.

FCC Reference	Industry Canada Reference	Description	Results
§15.225 (a,b,c)	RSS-210 A2.6(a,b,c)	Maximum Field Strength & Modulation Bandwidth	Compliant
§15.225(d), §15.209	RSS-210	Spurious Radiation	Compliant
§15.225 (e)	RSS-210 A2.6 B	Carrier Frequency Stability Under Extreme Conditions	Compliant
§15.207	RSS-GEN §7.2.2	Conducted RF Emissions	Compliant
	RSS-GEN §4.6.1	99% Occupied Bandwidth RSS- GEN §4.6.1	Compliant

**Figure 1. Executive Summary of EMC Part 15.225 Compliance Testing.**

**Test Period:**

**Start:** Tuesday, 28-July-2009

**Completion:** Thursday, 13-Aug-2009

**Location of Test Facility:**

Analab Llc.  
630 Heron Drive  
Bridgeport, NJ 08014

**Test Personnel:**

**Analab Llc.**  
Frank Welsh

## 2.0 Overview

This document is a report of the results of testing the subject product to the requirements of the FCC per the requirements in table 1. The equipment under test (EUT) is a Radio Frequency Identification (RFID) Tag Reader. It is designed to deliver logged semi-passive RFID Tag information on demand to a PC connected to the unit. Communication to the PC is established over an Universal Serial Bus (USB). The tags used in the scenario employ a load modulation protocol; hence they do not emit intentional radiation of their own. They have been verified separately to comply with the requirements of 15.109 for Class A emissions from non intentional radiators.

This EUT has endured the testing scrutiny of the table 1 requirements and has been found to be compliant with the parameters set forth therein.

Test setups and procedures are described in this report and test results are presented herein. The results contained in the present document relate only to the product tested.

<b>Model Tested:</b>	OM-80-RD1	
<b>EUT Specifications:</b>	Primary Power: 5.0 VDC (USB Powered)	
	<b>FCC ID:</b> WR3-OM80RD1	
	<b>IC ID:</b> 8205A-OM80RD1	
	<b>Modulation Type:</b>	AM
	<b>Emission Designators:</b>	3K30A2D
	<b>Equipment Code:</b>	DXX
	<b>EUT Frequency Range:</b>	13.56 MHz
<b>Environmental Test Conditions:</b>	Temperature (22° C +/-5)	
	Relative Humidity (30-60%)	
	Barometric Pressure (860-1060 mbar)	
<b>Evaluated By:</b>	Frank Welsh	
<b>Report Date:</b>	9/8/09	

**Figure 2. EUT Specifications**

## 2.1 Test Specifications

CFR 47 Part 15 Subpart C	<i>Federal Communications Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment and Use of Radio Frequencies.</i>
CFR 47, Part 15, Subpart B	<i>Electromagnetic Compatibility: Criteria for Radio Frequency Devices.</i>
ANSI C63.4: 2009	<i>Methods of Measurement of Radio Noise Emissions from low voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.</i>
RSS-210 Issue 7 June 2007	<i>Low-power License-Exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment.</i>
RSS-Gen, Issue 2 June 2007	<i>General requirements and Information for the Certification of Radiocommunication Equipment.</i>

## 2.2 Test Site

All testing was performed at the facilities of Analab Llc. | 630 Heron Drive | Bridgeport, NJ 08014; FRN 0007-8959-64 Test Site #793819 ( IC Test Site # 8329A-1). All equipment used in measurements is current in calibration, accurate in performance and bears traceability to the National Institute of Standards and Technology.

## 2.3 Description of Test Sample

*Circuit description omitted due to long term confidentiality requirements.*

The test sample was a production sample unit. Due to the intermittent nature of the transmitter in normal operation, a special test code was embedded into the test sample to facilitate constant modulation (Read Tag) mode to ease measurement of operational extremes.

**Figure 3. Block Diagram – Removed due to Long Term Confidentiality requirements.**

#### **2.4 Equipment Configuration**

The EUT was set up as outlined in the previous section. Since the operational scenario discussed above presented a worst case set of transmitted energies, no RFID was present during testing.

<b>Ref. ID</b>	<b>Name / Description</b>	<b>Model Number</b>	<b>Serial Number</b>	<b>Rev. #</b>
N/A	Passive Tag Reader	OM-80-RD1	<b>emc_test_unit</b>	N/A



## **2.5 Supporting Equipment**

The EUT being designed to be powered from the USB port of the host computer, power during testing was supplied via a modified USB Cable from a bench type DC power supply. This configuration also facilitated testing at limit supply voltage conditions cited later in the present document.

## **2.6 Ports and Cabling Information**

No ports exist on the EUT except for the USB interface.

## **2.7 Mode of Operation**

As indicated earlier, special firmware was installed in the EUT causing the unit to transmit the modulated carrier energy constantly; thus easing the measurement and test process. Since the EUT is designed to be powered from the host PC that it is operating with, and since it is tested in stand alone operation, connection to an external source was required. The external source was provided from a laboratory bench top power supply.

## **2.8 Method of Monitoring EUT Operation**

Presence of the transmitted signal at the transmitted frequency indicates the EUT is operational. No other indication is required.

## **2.9 Modifications**

### **2.9.1 Modifications to EUT.**

No modifications were made to the EUT, other than the installation of the special firmware cited earlier.

## **2.10 Disposition of EUT.**

The test sample and all supporting equipment submitted to Analab were returned to Omega Engineering upon completion of testing.

### 3.0 Electromagnetic Compatibility Criteria for Unintentional Radiators

#### § 15.209 Radiated Emission Limits

**Test Requirements:** 15.209 Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

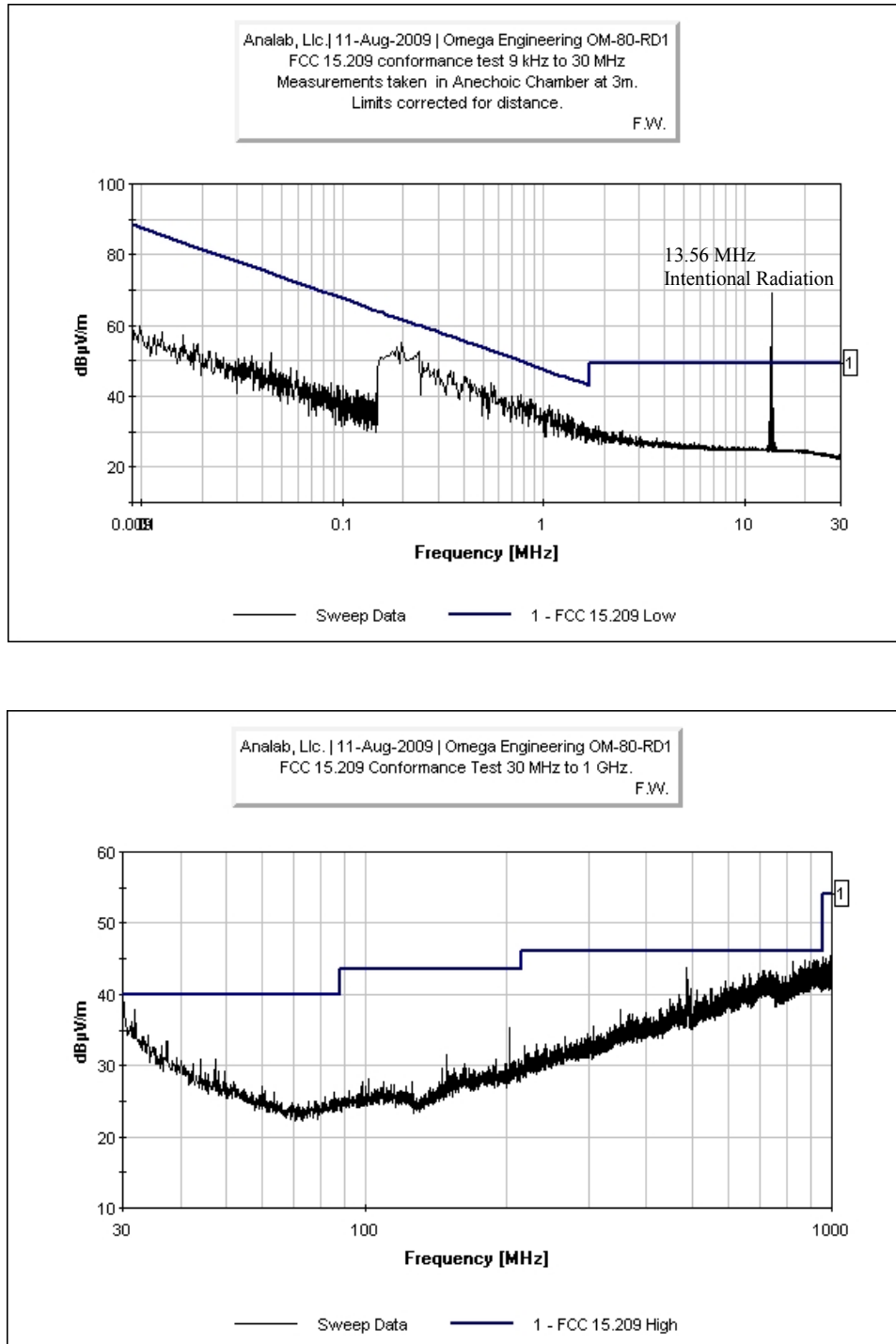
Frequency Range (MHz)	Field Strength ( $\mu\text{V}/\text{m}$ )	
	§15.209 (a) Limit ( $\mu\text{V}/\text{m}$ )	Distance (meters)
0.009 - 0.490	2400/F (kHz)	300
0.490 - 1.705	24000/F (kHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

**Figure 4. Radiated Emission Limits Taken from FCC Part 15 §15.209 (a)**

**Test Procedure:** For energies from 30 MHz to 1 GHz:  
 The EUT was placed on a 0.8m high wooden table in the Open Area Test Site (OATS) on a turntable directed from the test station inside the lab. Using the methods of testing and test conditions prescribed in ANSI C63.4 an antenna mounted on an adjustable mast was positioned 3m from the EUT. A prescan was first performed in an anechoic chamber to establish prominent RF peak emissions. For final measurements, investigations at each frequency of interest were performed. At each aspect frequency, the EUT was rotated and the antenna height was varied from 1 to 4 meters in height to maximize the detection level. If significant energies were discovered, measurements would have been taken using quasi-peak detector with a 120 kHz bandwidth. No significant energies were found.

For energies from 9kHz to 30 MHz:  
 The EUT was placed on a non ferro-magnetic cart at the OATS at the 10m location while the Magnetic Loop Antenna was placed in the radio-lucent environmental (RLE) chamber on the turntable; configured to allow accurate rotation about the center normal. Using the prescan data as a guide as with the higher band, the EUT energies were examined. Readings were corrected for changes in the distances per the specification.

**Test Results:** The EUT was found compliant with Class A requirements of this section. No correlatable emissions were found at the frequencies of interest inferred from the prescans, nor at any other frequencies.



**Figure 5. Radiated Emissions Pre-Scan of the Omega Engineering OM-80**



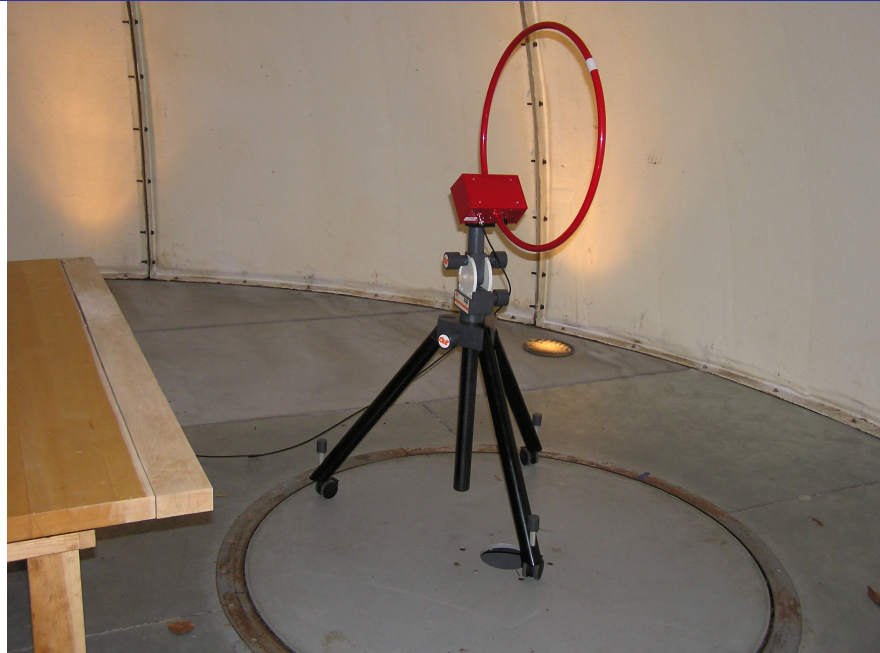
OM-80 test unit located for low frequency emissions measurement outside of the radio lucent environmental, (RLE) chamber.

OM-80 test unit situated on test non-ferromagnetic environmentally cart outside the OATS in preparation for low frequency emissions testing.





Open Area Test Site showing the RLE chamber with the antenna mast located at the three meter position. The center of the loop is 1m above the ground plane.



**Figure 5. Photographs of test setup of EUT for Radiated Emissions Testing.**

N.B. It is recognized that per ANSI 63.5 a ground plane is not required for low frequency measurements of this domain. It is also stated therein that the effect of the ground plane would be to increase the measured value; therefore it was reasoned that passage of the tests at the present location was sufficient to prove conformity. Testing was spot checked at a local location without a ground plane and this effect was found to be consistent.

## 4.0 Electromagnetic Compliance Testing for Intentional Radiators

### 4.1 Radiated Field Strength of Fundamental CFR 47 §15.225 & RSS-210 A2.6

**Requirement:** The field strength of any emissions within the band 13.553-13.567 MHz shall not exceed 15,848 microvolts/meter (84 dB $\mu$ V/m) at 30 meters. Other energies shall be limited by the limits stated in subsections (b), (c) and (d).

**Test Procedure:** The product was placed on a non ferro-magnetic cart at the OATS outside the RLE at the 10m position with the receiving antenna inside on the turntable. Since the test distance was changed from the 30m requirement, the required test limit was accordingly modified by +9.54 dB to 93.54 dBuV / m. The EUT was powered from a bench type power supply set for 5V. From within the control room, the antenna was rotated for maximum output peak reading. The center frequency was measured at 13.5623 MHz. The CISPR receiver was then set to QP mode and the quasi peak reading was taken. The EUT was then moved to the inside lab and mounted in the test fixture of figure 9. The internally mounted H field probe was terminated into a 50 $\Omega$  3dB attenuator to ensure VSWR was minimized; the signal was then connected to the EMI Receiver. The receiver display was then calibrated to correspond to the peak reading taken at the OATS, and the span was set to correspond to the parameters in the specification. The modulation bandwidth mask generated by those parameters was placed on the performance curve to establish conformatv to the specification.

**Test Result:** The EUT is compliant with §15.225 for fundamental field strength and modulation bandwidth performance. See figure 7 for the quasi peak readings. See figure 8 for the modulation bandwidth limit performance.

Raw Reading (dB $\mu$ V)	Cable Factors (dB)	Antenna Correction Factors	Final Value (dB $\mu$ V/m)	Limit Spec. (@ 10m) (dB $\mu$ v/m)	Margin (dB)
48	1.3	10.55	59.85	93.54	33.69

**Figure 6. Fundamental Field Strength Readings**

11:13:05 FEB 12, 2010

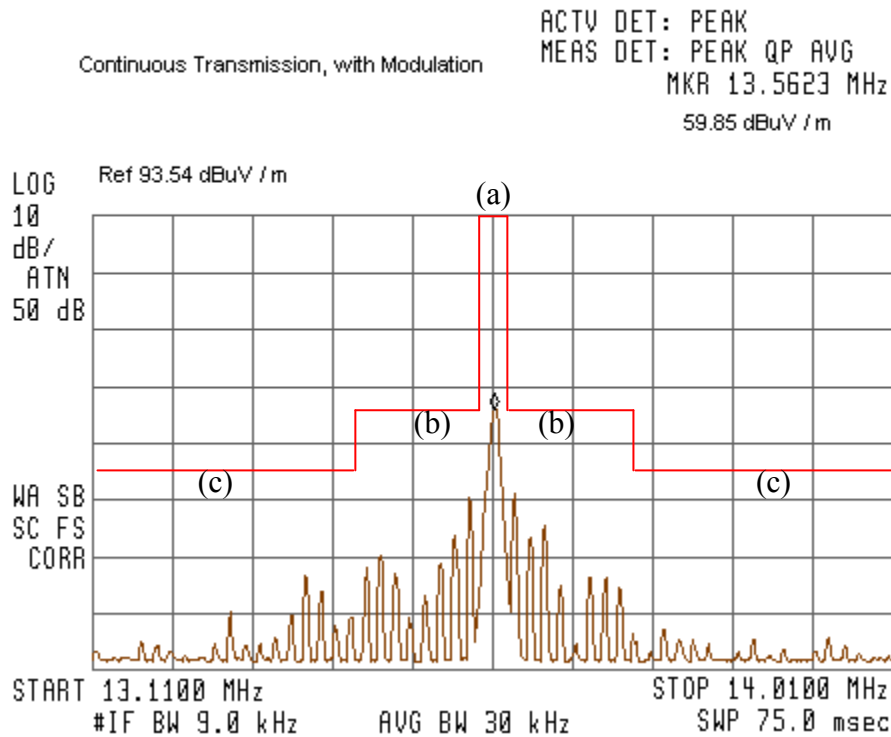


Figure 7. §15.225 Modulation Bandwidth Compliance

#### 4.2 Intentional Radiator Frequency Stability §15.225 (e)

**Requirement:** The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.01\%$  of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

**Procedure:** The EUT was placed in a special fixture composed of plastic which positioned an 'H' field probe at a fixed distance from the EUT. The test assembly was then placed in an environmental chamber, powered to 5V with a benchtop power supply, and brought to the required temperature. A soak time of 30 min was imposed prior to making the measurements once the test equipment indicated that the chamber had arrived at the target temperature. Finally, the chamber was returned to 20° C. Once stable the power supply was changed first to 4.25 V then to 5.75 V. At each supply level, the frequency of the EUT was measured.

**Result:** The EUT was found to be compliant with this section; no change in frequency under any of the required extremes could be observed; i.e. all measurements were 13.5623 MHz.



**Figure 8. Setup Intentional Frequency Stability at Extremes**

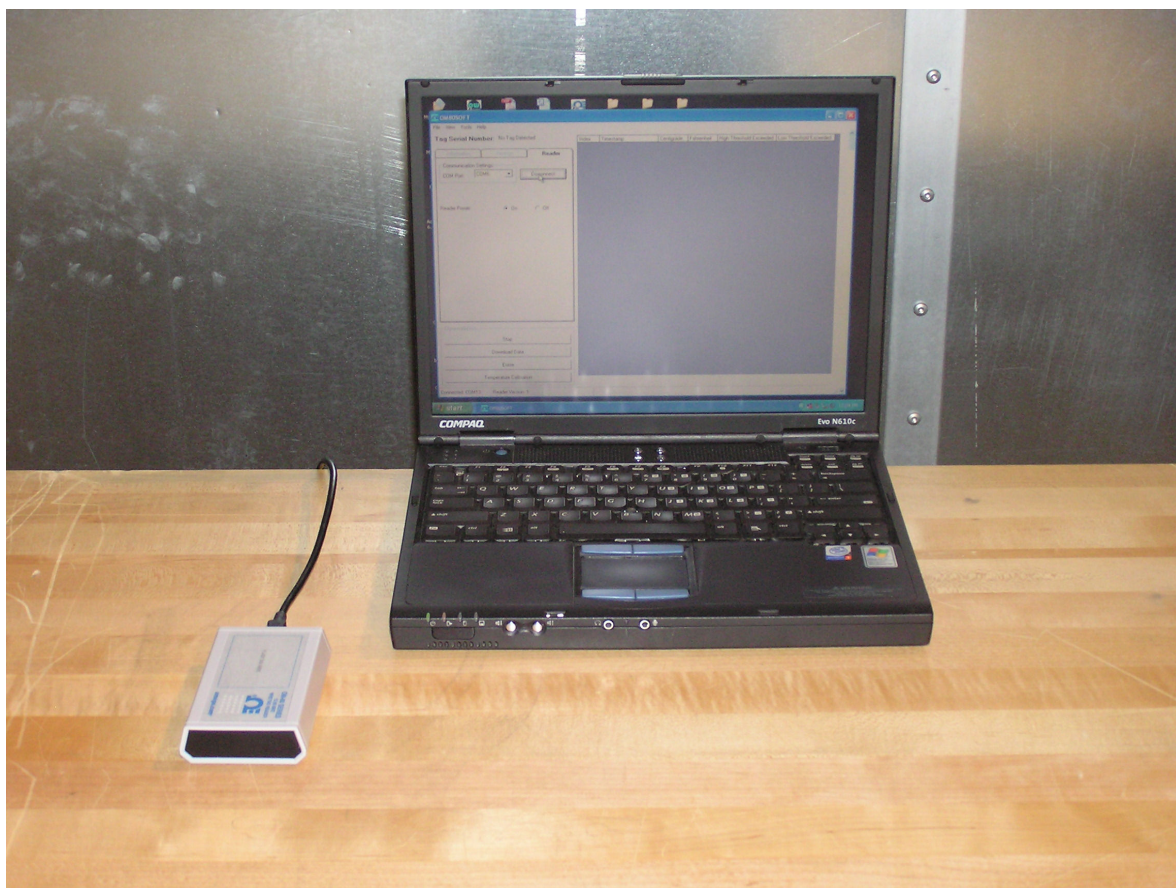


### 4.3 Conducted RF Emissions §15.207 & RSS-GEN §7.2.2

**Requirement:** 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 30 MHz, shall not exceed the limits of §15.207 & RSS-Gen §7.2.2 for conducted emanations, as measured using a 50  $\mu$ H / 50  $\Omega$  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.

**Procedure:** Per the setup requirements of C63.4: 2003 the EUT was placed on a non-conductive table inside the test shield room. The table was situated 40 cm in front of the vertical ground plane (the wall) of the room and the equipment was arranged on the table per the referenced ANSI specification. The EUT was interfaced to the test computer and the computer was powered through a Line Impedance Stabilization Network (LISN), Analab #151. The measurement port of the LISN was interfaced to an EMI Receiver (#210 & 211) where the signal was analyzed and recorded.

**Test Results:** The EUT passed the scrutiny. The resultant measured energies are given in the peak scans of figures 10, and the conducted emissions at the specific intended frequency of figure 11. The levels detected are well within the requirements of both the FCC and IC specifications. Measurements as shown were made on the phase and the neutral supply lines of the host computer.



**Figure 9. Conducted RF Emissions §15.207 Test Setup**

L1 Measurements -- Top 5

Frequency (MHz)	Final Value (dBuV)	Specification (dBuV)	Margin (dB)	Quasi Peak Value (dBuV)	Average (dBuV)
0.186452	49.7	64.2	-14.5	46.06	25.63
0.295806	40.5	60.4	-19.9	34.16	9.74
0.693126	35.5	56.0	-20.5	24.34	14.45
1.094	34.7	56.0	-21.3	34.66	32.63
1.293	33.4	56.0	-22.6	24.17	17.14

L2 Measurements -- Top 5

Frequency (MHz)	Final Value (dBuV)	Specification (dBuV)	Margin (dB)	Quasi Peak Value (dBuV)	Average (dBuV)
0.188275	51.5	64.1	-12.6	46.28	35.19
0.297629	42.4	60.3	-17.9	36.23	11.24
0.877205	34.9	56	-21.1	26.16	8.51
0.499934	33.8	56	-22.2	27.74	3.38
1.013	33.6	56	-22.4	25.96	5.13

**Figure 10. Conducted RF Highest Found Emissions**

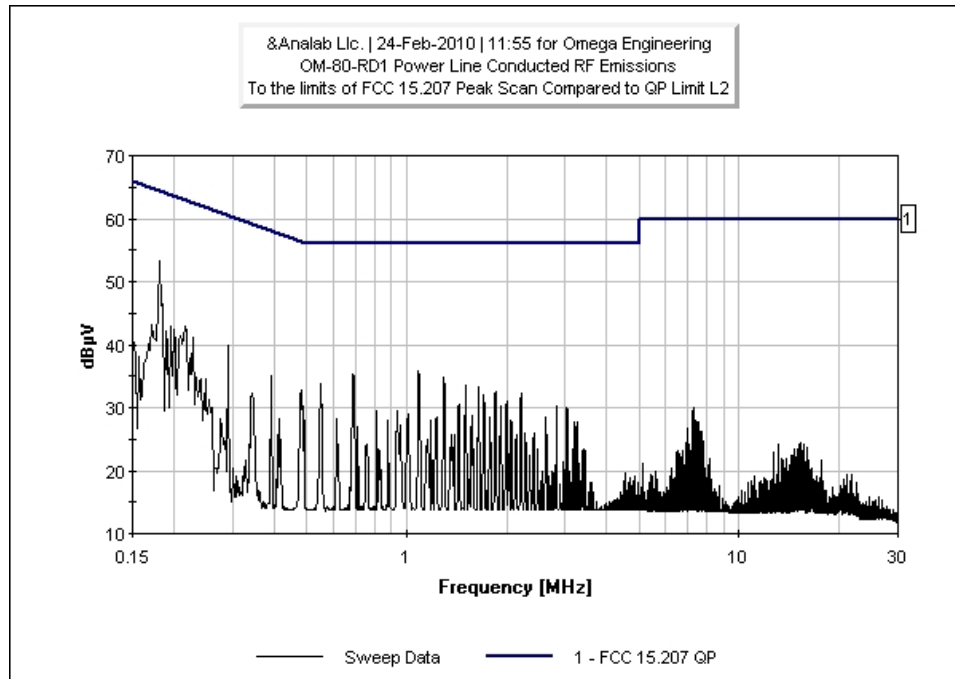
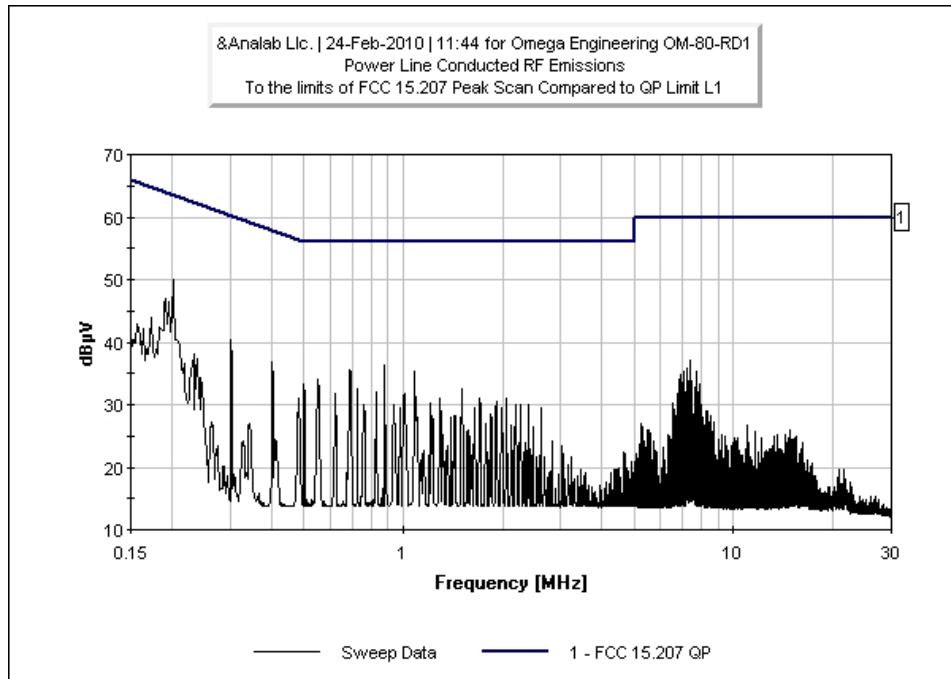
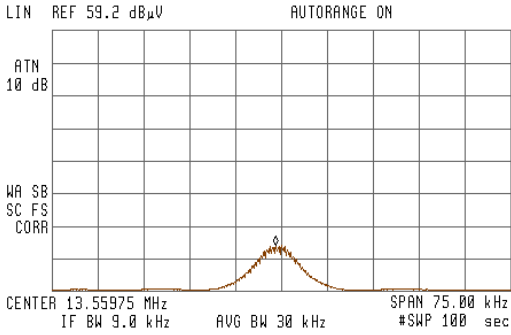
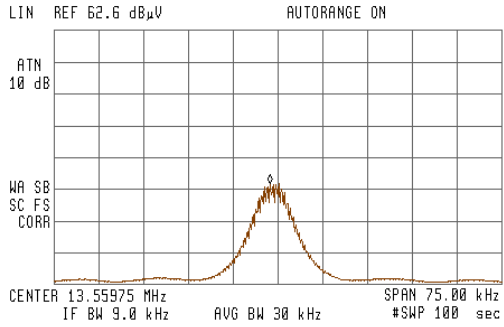


Figure 11. Conducted RF Emissions §15.207 Peak Scan Results

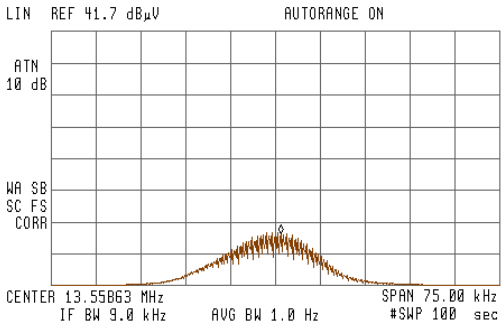
11:43:32 FEB 24, 2010  
 OM 00 RD1 CONDUCTED EMISSIONS L1  
 ACTV DET: QPD  
 MEAS DET: PEAK QP AVG  
 MKR 13.55881 MHz  
 44.10 dB $\mu$ V



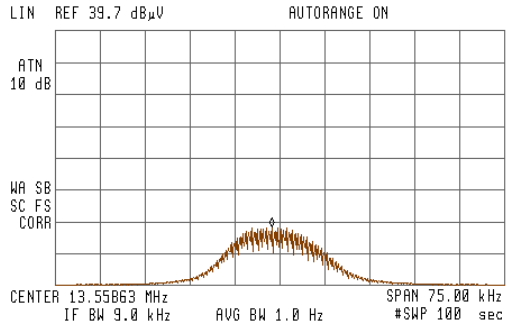
11:52:26 FEB 24, 2010  
 OM 00 RD1 CONDUCTED EMISSIONS L2  
 ACTV DET: QPD  
 MEAS DET: PEAK QP AVG  
 MKR 13.55844 MHz  
 54.55 dB $\mu$ V



12:13:09 FEB 24, 2010  
 OM 00 RD1 CONDUCTED EMISSIONS L1  
 ACTV DET: AVG  
 MEAS DET: PEAK QP AVG  
 MKR 13.55956 MHz  
 27.85 dB $\mu$ V



12:02:01 FEB 24, 2010  
 OM 00 RD1 CONDUCTED EMISSIONS L2  
 ACTV DET: AVG  
 MEAS DET: PEAK QP AVG  
 MKR 13.55731 MHz  
 26.03 dB $\mu$ V



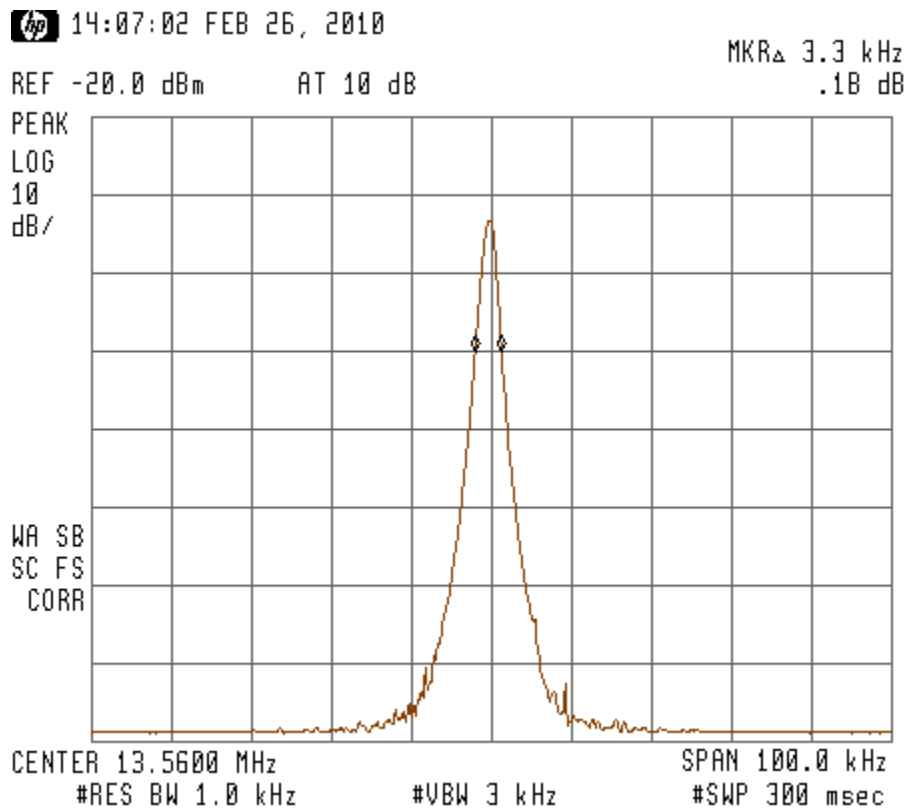
**Figure 12. Conducted RF Emissions Measurements of Intended Signal Using Quasi-Peak and Average Detectors**

### 4.4 99% Occupied Bandwidth RSS-GEN §4.6.1

**Requirement:** When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

**Procedure:** The EUT was placed in the forementioned test fixture. The output of the EUT was measured on an EMI receiver (# 210 & 211). The 99% power bandwidth of the EUT was measured utilizing the automated function of the equipment.

**Test Results:** The 99% Occupied Bandwidth was measured to be 3.3 kHz. The curve with the measurement markers is shown in figure 13.



**Figure 13. 99% Occupied Bandwidth Measurement**

## 5.0 Test Equipment

Analab #	Description	Manufacturer	Model #	Serial #	Calibration Due Date
100	Biconilog Ant.	ETS	3142C	00083057	25-Mar-10
102	Biconical Ant.	EMCO	3110B	9603-2390	21-Nov-10
110	Log Periodic Ant.	EMCO	3146	9606-4565	26-Nov-10
151	LISN	EMCO	3816/2	9605-1044	23-Jan-11
120	Horn Antenna	A.H. Systems	SAS 200/571	253	20-Nov-10
NA	Loop Antenna	ETS	6502	00102007	30-Apr-10
200	EMI Receiver	H/P Agilent	85462A	3325A00116	9-Jan-10
201	RF Filter Section	H/P Agilent	85460A	3330A00124	9-Jan-10
202	Spectrum Analyzer	Agilent	8565EC	4103A00428	4-Jun-10
210	EMI Receiver	H/P Agilent	8546A	3325A00118	8-Dec-10
211	RF Filter Section	H/P Agilent	85460A	3330A00155	8-Dec-10
304	Signal Generator	Rohde & Schwarz	SMB 100A	100761	1-Jun-10
901	Position Controller	EMCO	2090	9607-1155	NA
902	Antenna Mast	EMCO	2070-5	9604-1964	NA
903	EUT turntable	EMCO	2081		NA

**Figure 14. Test Equipment Used in Test Sequence of the Present Report**

## **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 radiofrequency device is any device which in its operation is capable of emitting radiofrequency energy by radiation, conduction, or other means. Radiofrequency 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 radiofrequency 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 section, 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 Sec. 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 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.

**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. *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 representations and test data submitted by the applicant.
- (b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Sec. 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Sec. 2.1043.

**§2.901 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 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.

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 user's 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.

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

### **§15.105 Information to 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 his 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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, 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.

**End of Report**