



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

914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313

33439 WESTERN AVENUE • UNION CITY, CALIFORNIA 94587 • PHONE (510) 489-6300 • FAX (510) 489-6372

3162 BELICK STREET • SANTA CLARA, CA 95054 • PHONE (408) 748-3585 • FAX (510) 489-6372

13301 MCCALLEN PASS • AUSTIN, TEXAS 78753 • PHONE (512) 287-2500 • FAX (512) 287-2513

August 14, 2013

Artann Laboratories
1459 Lower Ferry Road
Trenton, NJ 08618

Dear Tomasz Wojtera,

Enclosed is the EMC Wireless Class II Permissive Change test report for compliance testing of the Artann Laboratories, Colonoscopy Force Monitor – CFM 4.9 as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Part 15, Subpart B for a Class A Digital Device, and FCC Part 15 Subpart C for Intentional Radiators.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\Artann Laboratories\EMC37782-FCC247 Rev. 1)

Certificates and reports shall not be reproduced except in full, without the written permission of MET Laboratories, Inc.

Electromagnetic Compatibility Criteria Class II Permissive Change Test Report

for the

**Artann Laboratories
Colonoscopy Force Monitor – CFM 4.9**

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR, Parts 15 Subpart B
for Class A Digital Devices
&
15.247 Subpart C for Intentional Radiators

MET Report: EMC37782-FCC247 Rev. 1

August 14, 2013

Prepared For:

**Artann Laboratories
1459 Lower Ferry Road
Trenton, NJ 08618**

Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230

Electromagnetic Compatibility Criteria Class II Permissive Change Test Report

for the

Artann Laboratories Colonoscopy Force Monitor – CFM 4.9

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR, Parts 15 Subpart B
for Class A Digital Devices
&
15.247 Subpart C for Intentional Radiators



Benjamin Taylor, Project Engineer
Electromagnetic Compatibility Lab



Jennifer Warnell
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 the FCC Rules Parts 15B, 15.247 under normal use and maintenance.



Asad Bajwa,
Director, Electromagnetic Compatibility Lab



Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	July 17, 2013	Initial Issue.
1	August 14, 2013	Revised to reflect engineer corrections.

Table of Contents

I.	Executive Summary	1
	A. Purpose of Test	2
	B. Executive Summary	2
II.	Equipment Configuration	3
	A. Overview.....	4
	B. References.....	5
	C. Test Site	5
	D. Description of Test Sample.....	6
	E. Equipment Configuration.....	8
	F. Support Equipment	8
	G. Ports and Cabling Information.....	8
	H. Mode of Operation.....	9
	I. Method of Monitoring EUT Operation	9
	J. Modifications	9
	a) Modifications to EUT	9
	b) Modifications to Test Standard.....	9
	K. Disposition of EUT	9
III.	Electromagnetic Compatibility Criteria for Intentional Radiators.....	10
	§ 15.247(d) Radiated Spurious Emissions Requirements and Band Edge.....	11
IV.	Test Equipment	29
V.	Certification & User's Manual Information	31
	A. Certification Information	32
	B. Label and User's Manual Information	36

List of Tables

Table 1. Executive Summary of EMC Part 15.247 Compliance Testing	2
Table 2. EUT Summary Table.....	4
Table 3. References	5
Table 4. Equipment Configuration	8
Table 5. Ports and Cabling Information	8
Table 6. Restricted Bands of Operation.....	11
Table 7. Radiated Emissions Limits Calculated from FCC Part 15, § 15.209 (a)	12
Table 8. Test Equipment List	30

List of Plots

Plot 1. Out of Band Emissions, 30 MHz – 1 GHz, Digital Emissions Only	13
Plot 2. Out of Band Emissions, 30 MHz – 1 GHz, Low Channel/Low Channel	13
Plot 3. Out of Band Emissions, 30 MHz – 1 GHz, Low Channel/Mid Channel	14
Plot 4. Out of Band Emissions, 30 MHz – 1 GHz, Low Channel/High Channel	14
Plot 5. Out of Band Emissions, 30 MHz – 1 GHz, Mid Channel/Mid Channel	15
Plot 6. Out of Band Emissions, 30 MHz – 1 GHz, High Channel/High Channel	15
Plot 7. Out of Band Emissions, 1 GHz – 10 GHz, Low Channel/Low Channel	16
Plot 8. Out of Band Emissions, 1 GHz – 10 GHz, Low Channel/Mid Channel	16
Plot 9. Out of Band Emissions, 1 GHz – 10 GHz, Low Channel/High Channel	17
Plot 10. Out of Band Emissions, 1 GHz – 10 GHz, Mid Channel/Mid Channel	17
Plot 11. Out of Band Emissions, 1 GHz – 10 GHz, High Channel/High Channel	18
Plot 12. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Low Channel/Low Channel	18
Plot 13. Out of Band Emissions, 10 GHz – 18 GHz, Average, Low Channel/Low Channel	19
Plot 14. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Low Channel/Mid Channel	19
Plot 15. Out of Band Emissions, 10 GHz – 18 GHz, Average, Low Channel/Mid Channel	20
Plot 16. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Low Channel/High Channel	20
Plot 17. Out of Band Emissions, 10 GHz – 18 GHz, Average, Low Channel/High Channel	21
Plot 18. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Mid Channel/Mid Channel	21
Plot 19. Out of Band Emissions, 10 GHz – 18 GHz, Average, Mid Channel/Mid Channel	22
Plot 20. Out of Band Emissions, 10 GHz – 18 GHz, Peak, High Channel/High Channel	22
Plot 21. Out of Band Emissions, 10 GHz – 18 GHz, Average, High Channel/High Channel	23
Plot 22. Out of Band Emissions, Band Edge, Low Channel, Peak	23
Plot 23. Out of Band Emissions, Band Edge, Low Channel, Average	24
Plot 24. Out of Band Emissions, Band Edge, Low Channel, -20 dBc	24
Plot 25. Out of Band Emissions, Band Edge, High Channel, Peak	25
Plot 26. Out of Band Emissions, Band Edge, High Channel, Average	25
Plot 27. Out of Band Emissions, Band Edge, High Channel, -20 dBc	26

List of Figures

Figure 1. Component Diagram for the Colonoscopy Force Monitor.....	6
Figure 2. Electrical Diagram for the Colonoscopy Force Monitor	7

List of Photographs

Photograph 1. Radiated Spurious Emissions, Test Setup, 30 MHz – 1 GHz.....	27
Photograph 2. Radiated Spurious Emissions, Test Setup, Above 1 GHz	28

List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB_μA	Decibels above one microamp
dB_μV	Decibels above one microvolt
dB_μA/m	Decibels above one microamp per meter
dB_μV/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	kilohertz
kPa	kilopascal
kV	kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μH	microhenry
μ	microfarad
μs	microseconds
NEBS	Network Equipment-Building System
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane

I. Executive Summary

A. Purpose of Test

The purpose of the testing is to perform a class II permissive change on the BT module (FCC ID: SNV-CFM0413) to allow for co-location with a 2nd module with same FCC ID inside a specific host. Artann Laboratories should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Colonoscopy Force Monitor – CFM 4.9, 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 Artann Laboratories, purchase order number 2/20/2013-02. All tests were conducted using measurement procedure ANSI C63.4-2003.

FCC Reference 47 CFR Part 15.247:2005	Description	Compliance
Title 47 of the CFR, Part 15 §15.247(d); §15.209; §15.205	Radiated Spurious Emissions Requirements	Compliant

Table 1. Executive Summary of EMC Part 15.247 Compliance Testing

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by Artann Laboratories to perform testing on the Colonoscopy Force Monitor – CFM 4.9, under Artann Laboratories’s purchase order number 2/20/2013-02.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Artann Laboratories, Colonoscopy Force Monitor – CFM 4.9.

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

Model(s) Tested:	Colonoscopy Force Monitor – CFM 4.9 with BT module		
Model(s) Covered:	Colonoscopy Force Monitor – CFM 4.9 with BT module		
EUT Specifications:	Primary Power: 120 VAC, 60 Hz		
	FCC ID of module: SNV-CFM0413		
	Type of Modulations:	GFSK, $\Pi/4$ -DQPSK (2 Mbps), 8-DPSK (3Mbps)	
	Equipment Code:	FHSS	
	Peak RF Output Power:	-4.55dBm	
	EUT Frequency Ranges:	2402-2480MHz	
Analysis:	The results obtained relate only to the item(s) tested.		
Environmental Test Conditions:	Temperature: 15-35° C		
	Relative Humidity: 30-60%		
	Barometric Pressure: 860-1060 mbar		
Evaluated by:	Benjamin Taylor		
Report Date(s):	August 14, 2013		

Table 2. EUT Summary Table

Note: The host device shall have a label stating, “Contains FCC ID: SNV-CFM0413).

B. References

CFR 47, Part 15, Subpart C	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices

Table 3. References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., Baltimore, MD 21230. 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 3 meter 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.

D. Description of Test Sample

The Artann Laboratories Colonoscopy Force Monitor – CFM 4.9, Equipment Under Test (EUT), is a handheld wireless attachment that mounts to the colonoscope insertion tube to provide measurements of the applied force and torque. These data are transmitted to a laptop for real time visualization. The CFM is comprised of two handgrip halves (hook and post) which are connected together at the C-hinge. Each half comprises 3-D magnetic sensors, Bluetooth module and rechargeable battery. The CFM charging dock enables charging of each handgrip half in independent cradles. The CFM can be used in clinical setting, training and education facilities.

Intended Use:

The Colonoscopy Force Monitor (CFM) is a handheld wireless accessory to measure linear and rotational forces applied by an operator to advance and withdraw the insertion tube of an endoscope. The device is intended for use by a physician or medical personal.

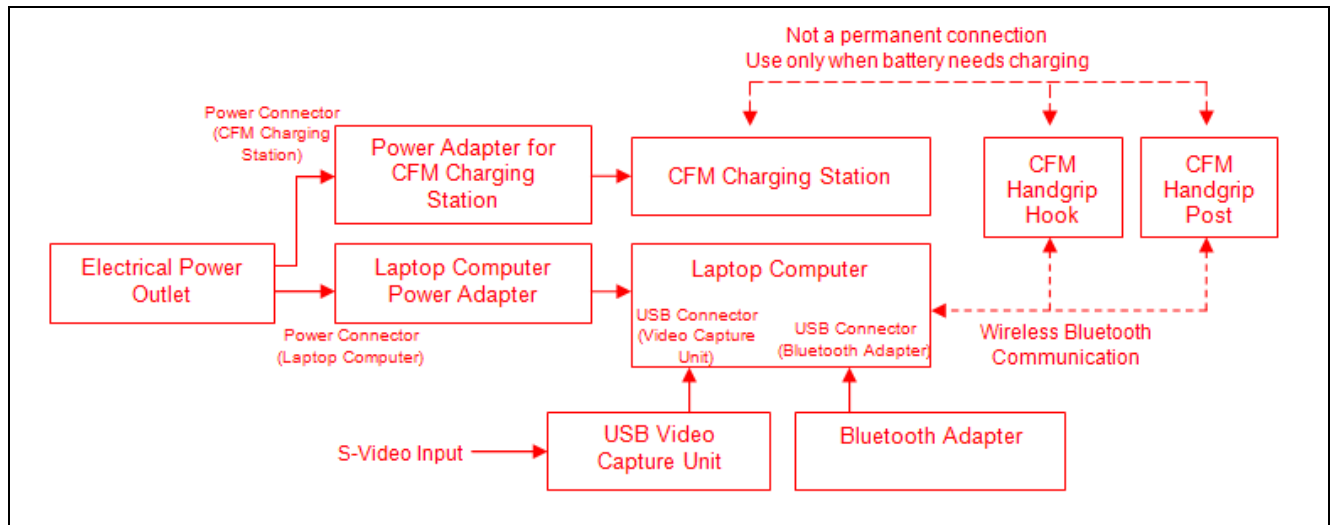


Figure 1. Component Diagram for the Colonoscopy Force Monitor

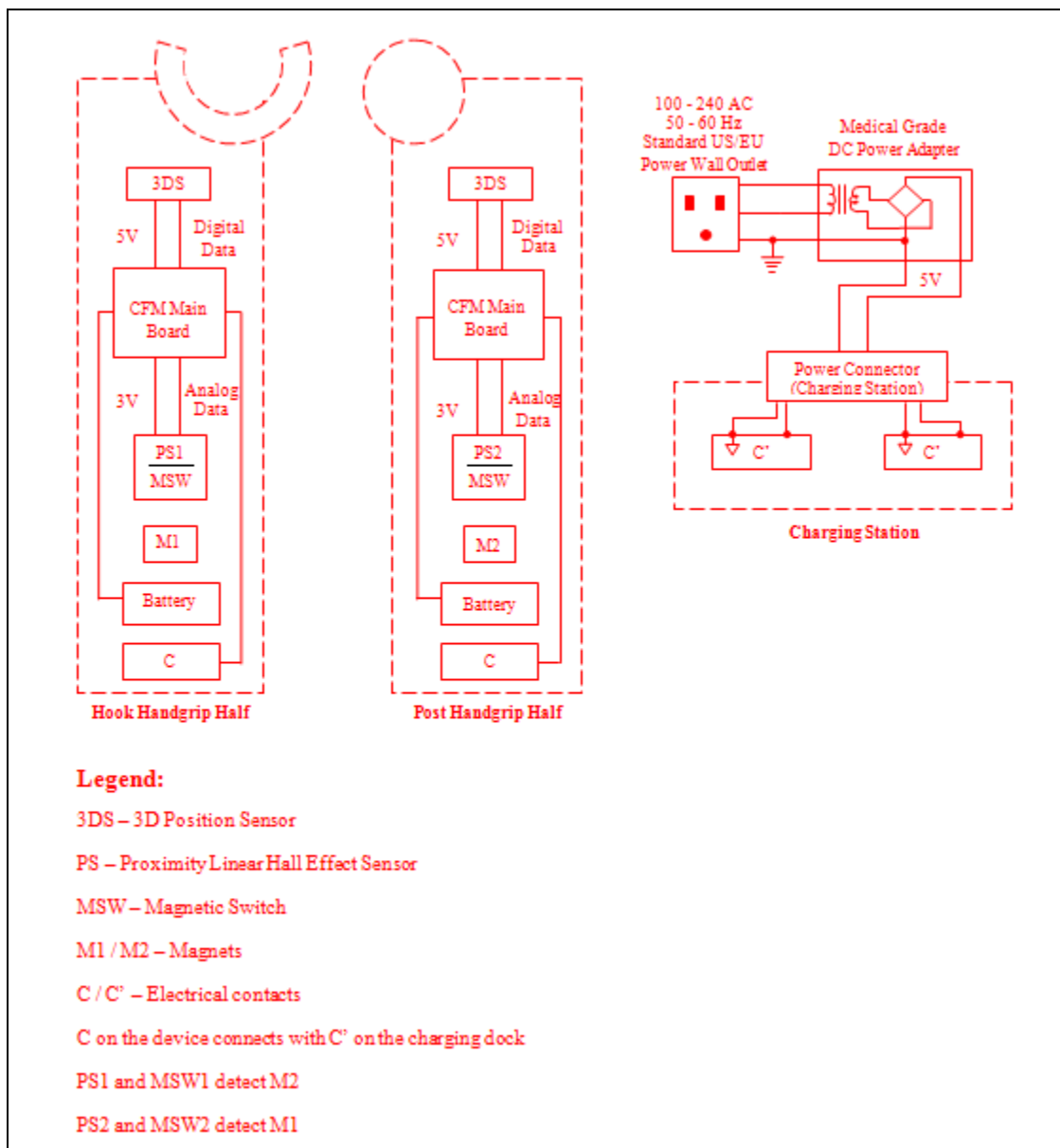


Figure 2. Electrical Diagram for the Colonoscopy Force Monitor

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
1	CFM Handgrip	CFM 4.9	H.001, P.001 H.002, P.002 H.005, P.005
2	CFM Charging Station	CFM 4 Series	-
3	Laptop Computer	Probook 6470b	CNU23897WZ
4	Bluetooth Adapter	BTA6310	-
5	USB Video Capture Unit	iGrabber Nano	2011020020
6	Power Adapter (for CFM Charging Station)	KTPS05-05015U	-
7	Laptop Computer Power Adapter	PPP009H	F12921232087836
8	S-Video Cable	SVHS-12	-

Table 4. Equipment Configuration

F. Support Equipment

The EUT did not require any support equipment for operation or monitoring.

G. Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
1	Power Connector (laptop computer)	Laptop Computer AC Adapter	1	3.65	Y	-
2	USB connector	USB Video Capture Unit	1	0.30	Y	-
3	USB connector	Bluetooth Adapter	1	N/A	Y	-
4	Power Connector (CFM charging station)	AC Adapter	1	1.52	Y	-

Table 5. Ports and Cabling Information

H. Mode of Operation

Normal operation:

1. Turn on the laptop computer and wait for the operating system to boot up. The CFM software will launch automatically.
2. Snap the two CFM handgrip halves together
3. Pushing the CFM handgrip halves towards each 3 times over 3 seconds will turn both the CFM handgrip halves on.
4. A message will appear in the CFM interface stating the CFM number and connection status.
5. Connection and battery indicators located in the top status bar will be green if the connection to both CFM handgrip halves was successful.
6. Press the “New Exam” button.
7. Type a Study Number into the box of Patient Info window.
8. Press “next” button, you will be switched in examination panel.
9. A red-dot indicator should be visible on the screen (passing through the zero line of force and torque graphs).
10. Press “start exam” button to initiate data recording.
11. Closing the CFM handgrip halves together should result in a blue line on both force and torque graphs.
12. Press “end exam” to stop data recording.

I. Method of Monitoring EUT Operation

1. When the device is functional, the two indicators (each for one CFM halve) will be green in the top status bar in the CFM interface, which means that CFM is communicating with the computer. Also, when an insertion tube is gripped between the CFM halves and linear or rotational forces are applied, the red circle in the real-time graphs on the CFM interface will convert to a solid blue line showing the applied force and torque.
2. When the CFM is not communicating with the computer, either one or both indicators for CFM halves will be **red** in the top status bar in the CFM interface. Also, when an insertion tube is gripped between the CFM handgrips and linear or rotational forces are applied, the red circle in the real-time graphs on the CFM interface will **not** convert to a solid blue line.

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 Artann Laboratories upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) Radiated Spurious Emissions Requirements and Band Edge

Test Requirements: §15.247(d); §15.205: 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
¹ 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	(²)

Table 6. Restricted Bands of Operation

¹ Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.

² Above 38.6

Test Requirement(s): § 15.209 (a): Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in Table 7.

Frequency (MHz)	§ 15.209(a), Radiated Emission Limits (dBµV) @ 3m
30 - 88	40.00
88 - 216	43.50
216 - 960	46.00
Above 960	54.00

Table 7. Radiated Emissions Limits Calculated from FCC Part 15, § 15.209 (a)

Test Procedures: The transmitter was turned on. Measurements were performed of the low, mid and high Channels. The EUT was rotated orthogonally through all three axes. Plots shown are corrected for both antenna correction factor and distance and compared to a 3 m limit line. Only noise floor was measured above 18 GHz.

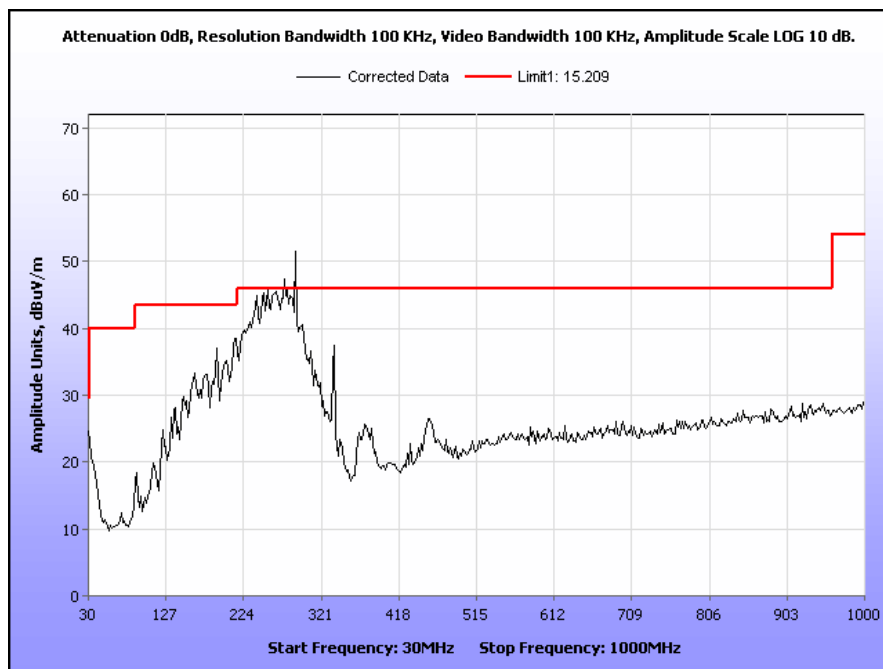
Test Results: The EUT was compliant with the Radiated Spurious Emission limits of § 15.247(d). The BT modules were configured to transmit on simultaneously. A matrix of channel configurations were tested for out of band emissions.

Test Engineer(s): Benjamin Taylor

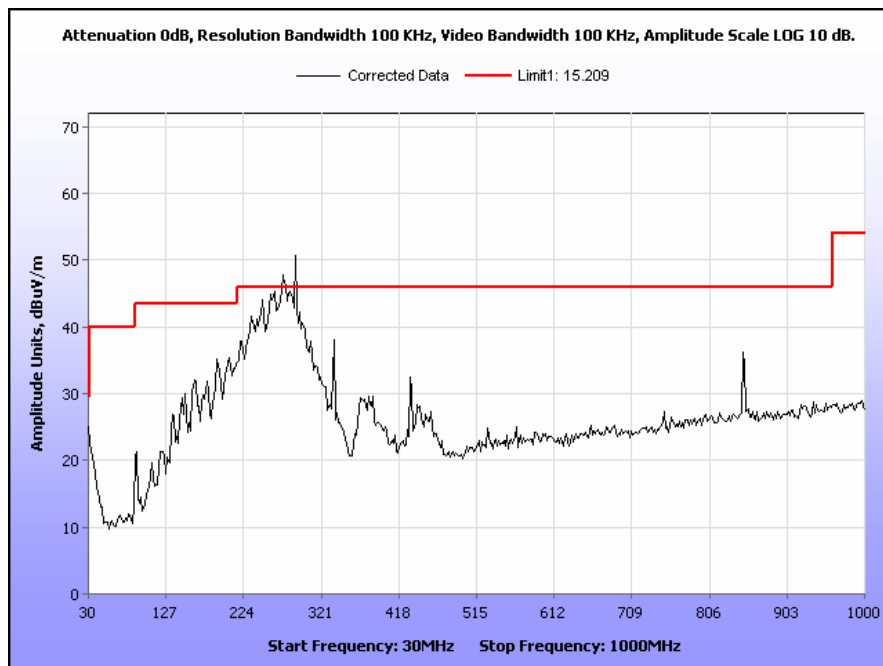
Test Date(s): 06/27/13

Note: This 15.247 report contains only 15.209 data, as this device employs two of the preapproved module, FCC ID SNV-CFM0413.

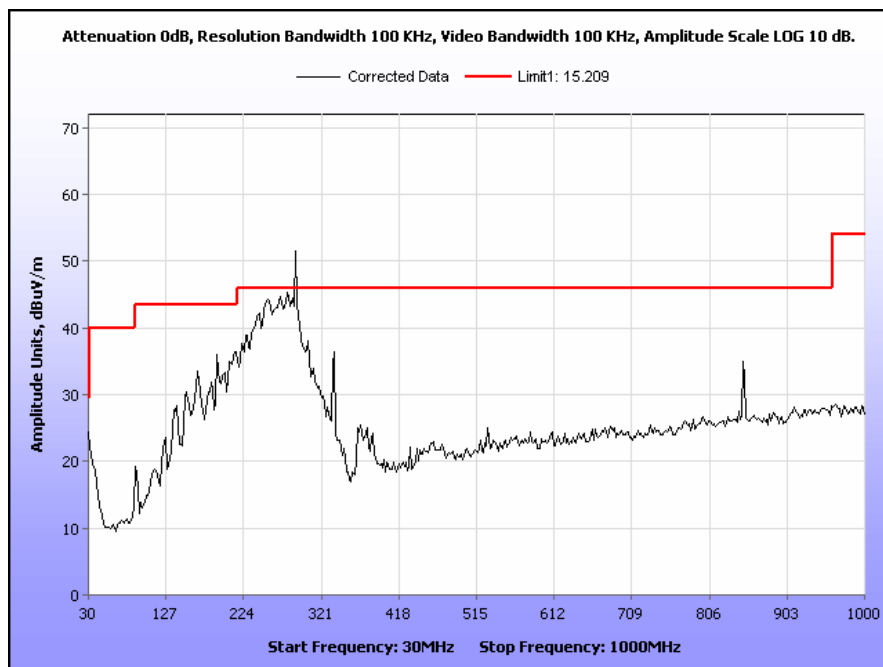
Radiated Spurious Emissions Test Results



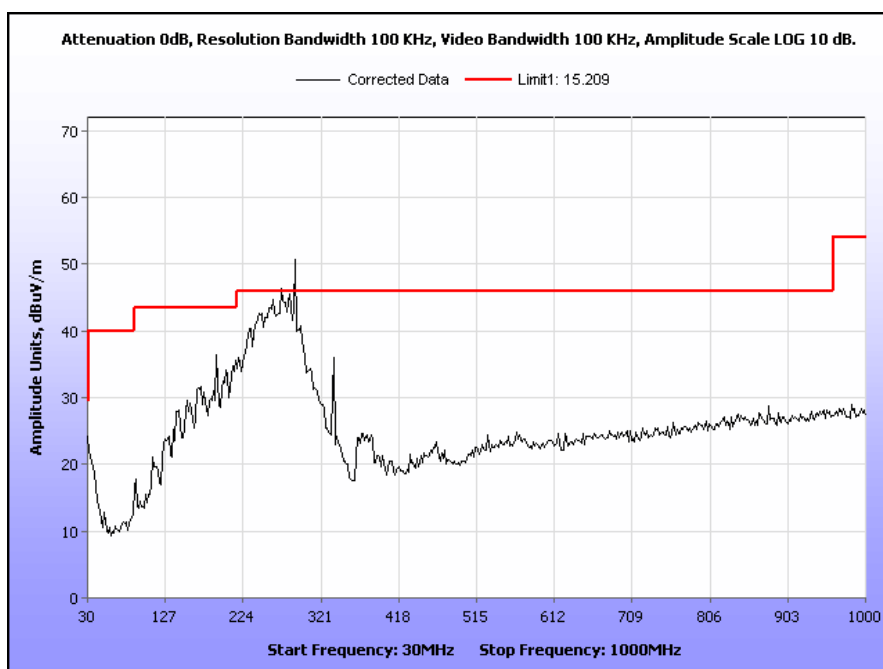
Plot 1. Out of Band Emissions, 30 MHz – 1 GHz, Digital Emissions Only



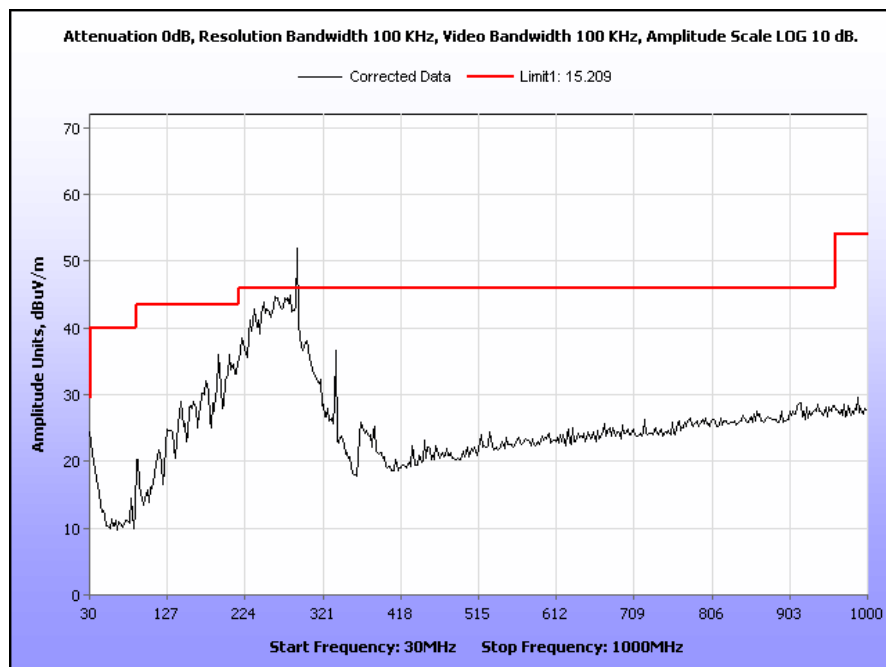
Plot 2. Out of Band Emissions, 30 MHz – 1 GHz, Low Channel/Low Channel



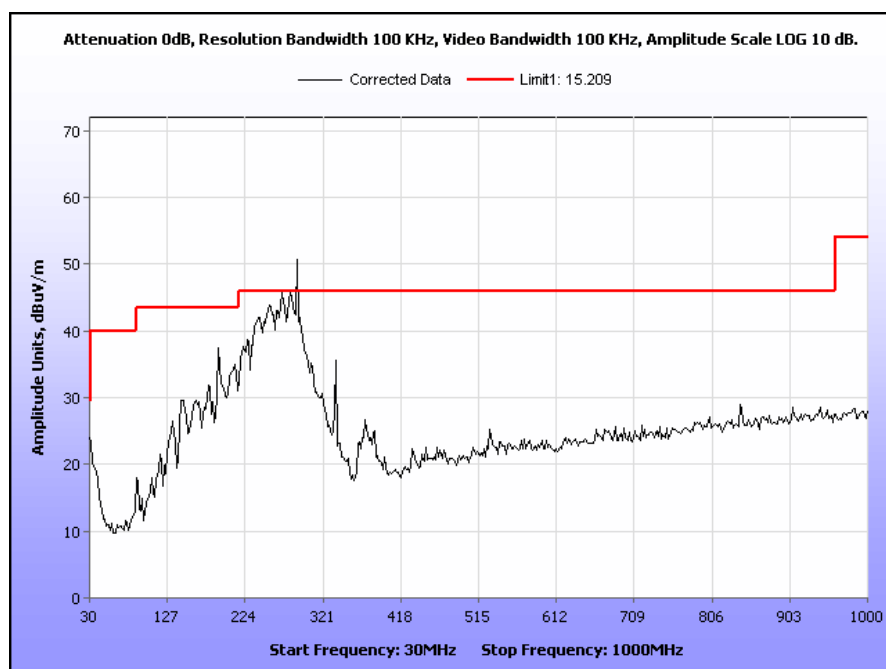
Plot 3. Out of Band Emissions, 30 MHz – 1 GHz, Low Channel/Mid Channel



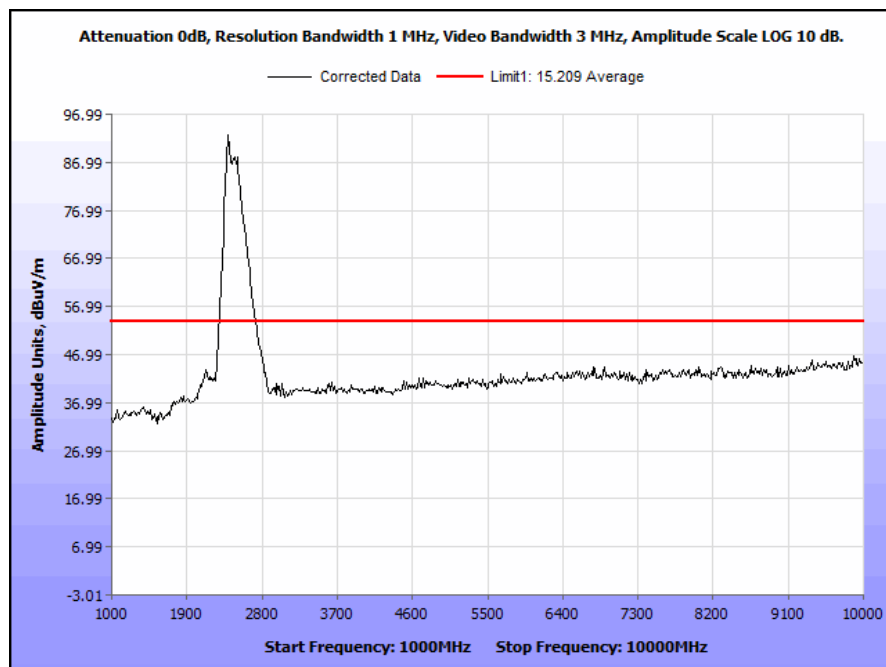
Plot 4. Out of Band Emissions, 30 MHz – 1 GHz, Low Channel/High Channel



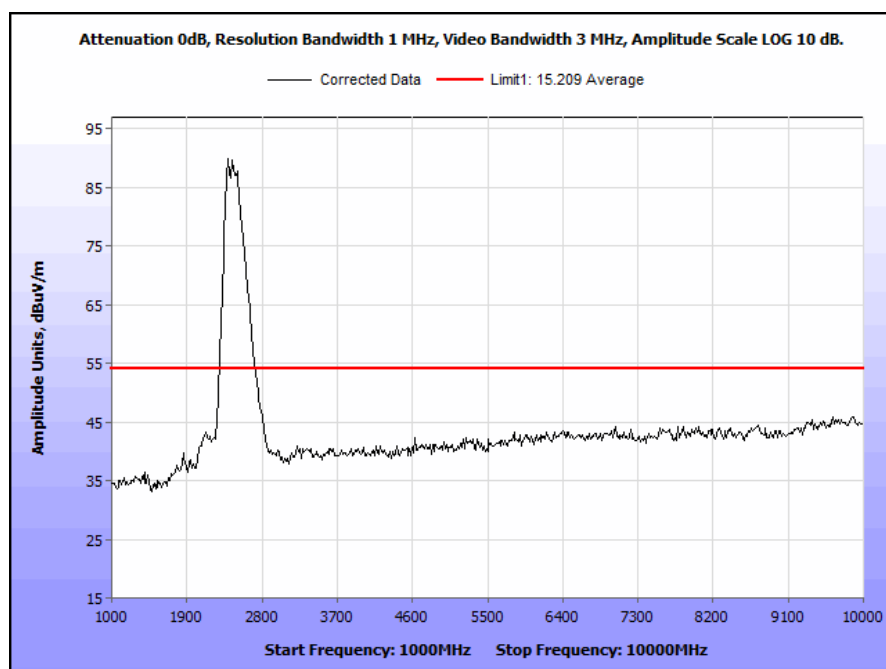
Plot 5. Out of Band Emissions, 30 MHz – 1 GHz, Mid Channel/Mid Channel



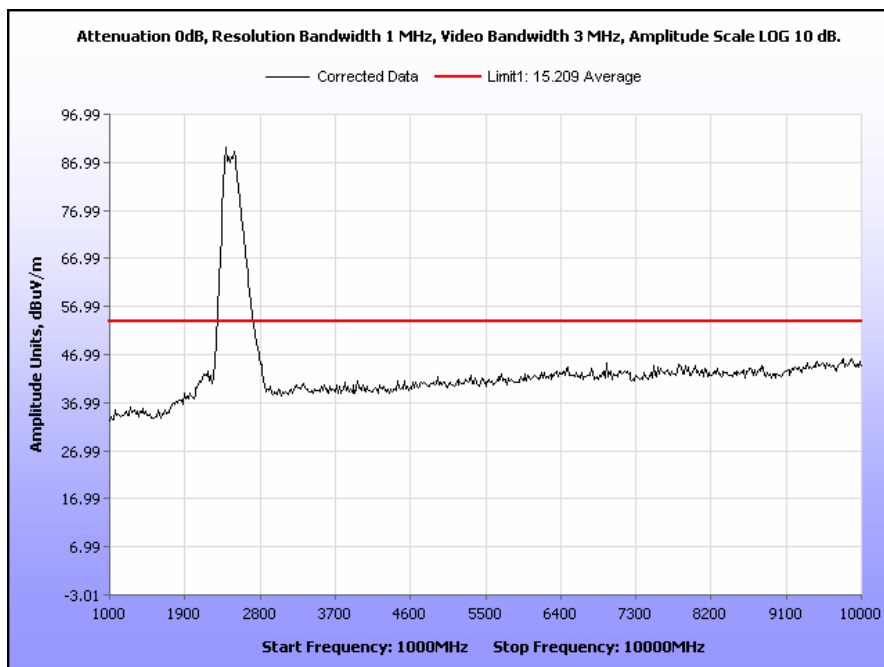
Plot 6. Out of Band Emissions, 30 MHz – 1 GHz, High Channel/High Channel



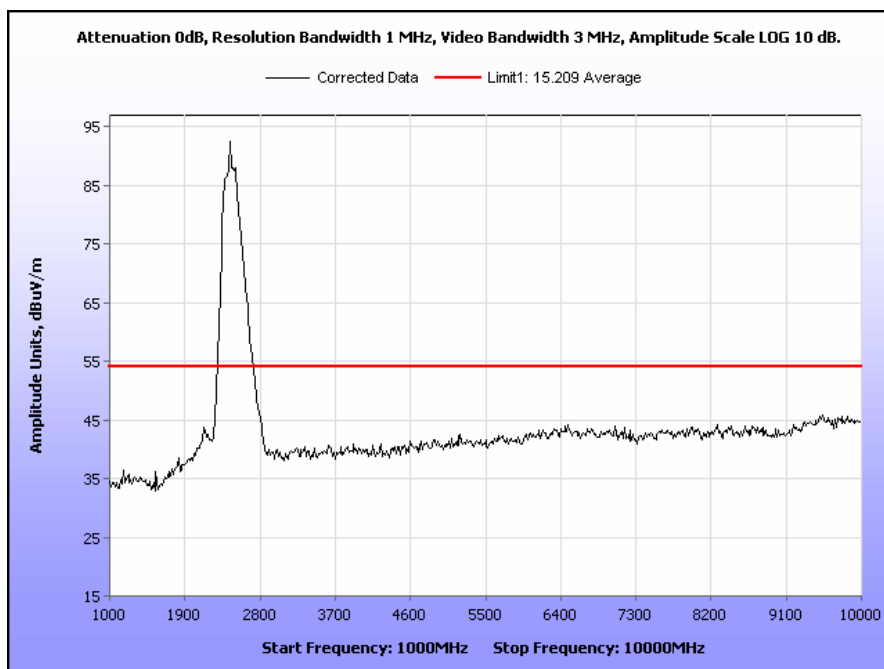
Plot 7. Out of Band Emissions, 1 GHz – 10 GHz, Low Channel/Low Channel



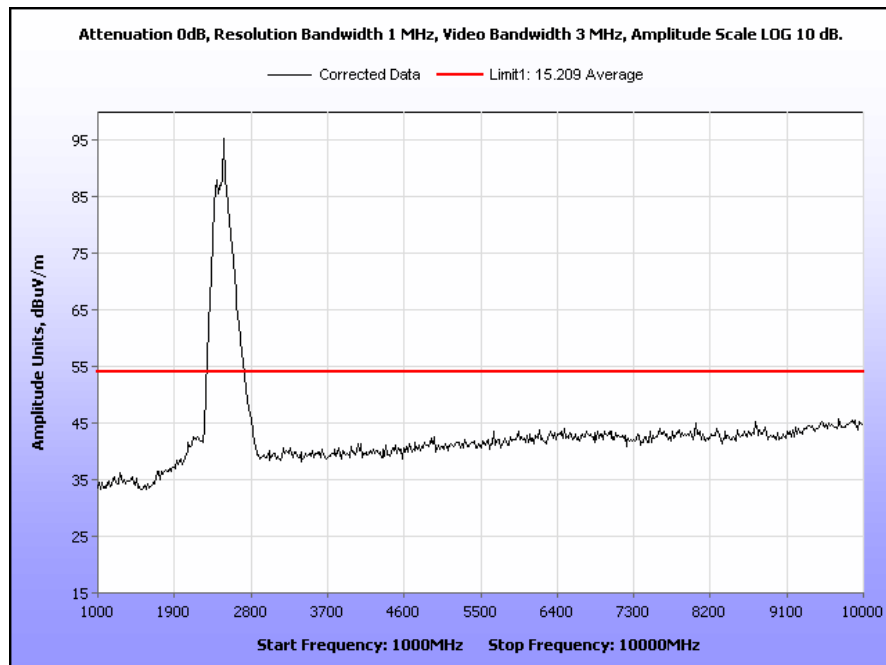
Plot 8. Out of Band Emissions, 1 GHz – 10 GHz, Low Channel/Mid Channel



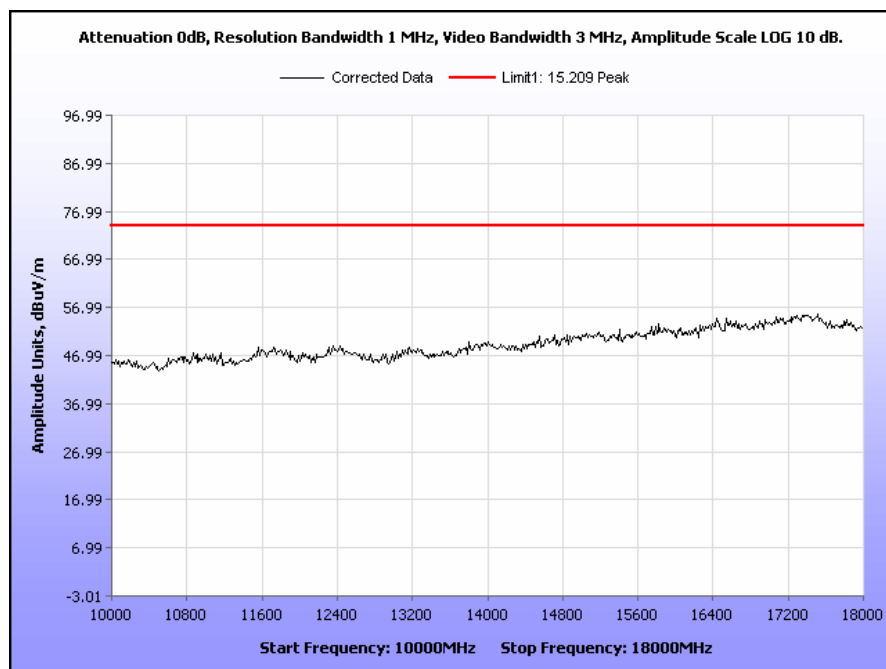
Plot 9. Out of Band Emissions, 1 GHz – 10 GHz, Low Channel/High Channel



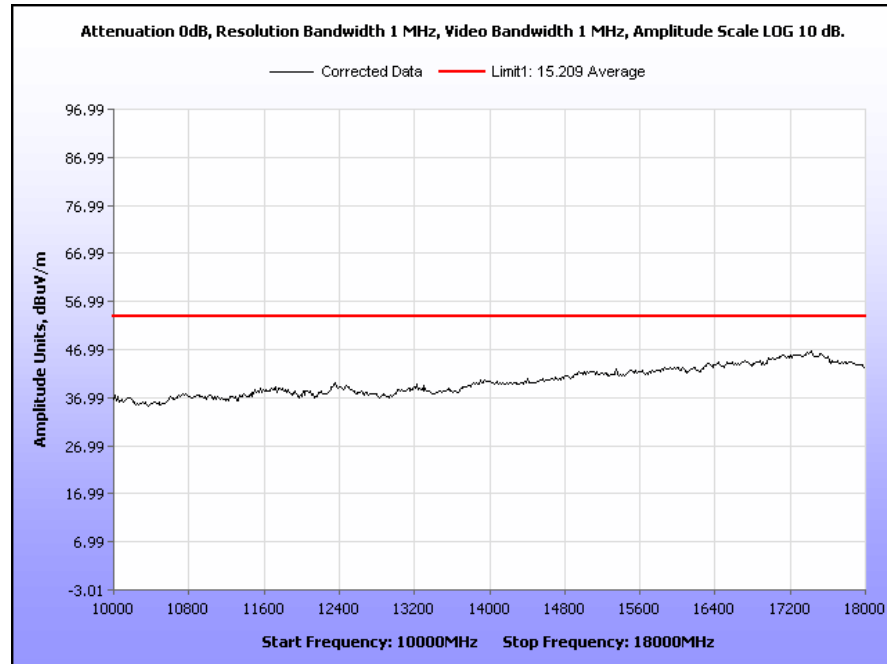
Plot 10. Out of Band Emissions, 1 GHz – 10 GHz, Mid Channel/Mid Channel



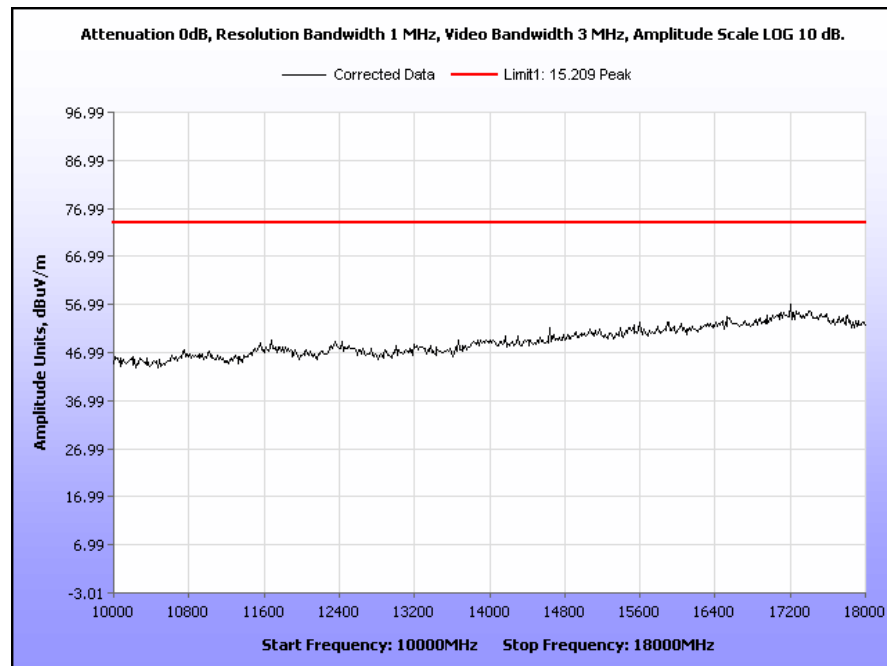
Plot 11. Out of Band Emissions, 1 GHz – 10 GHz, High Channel/High Channel



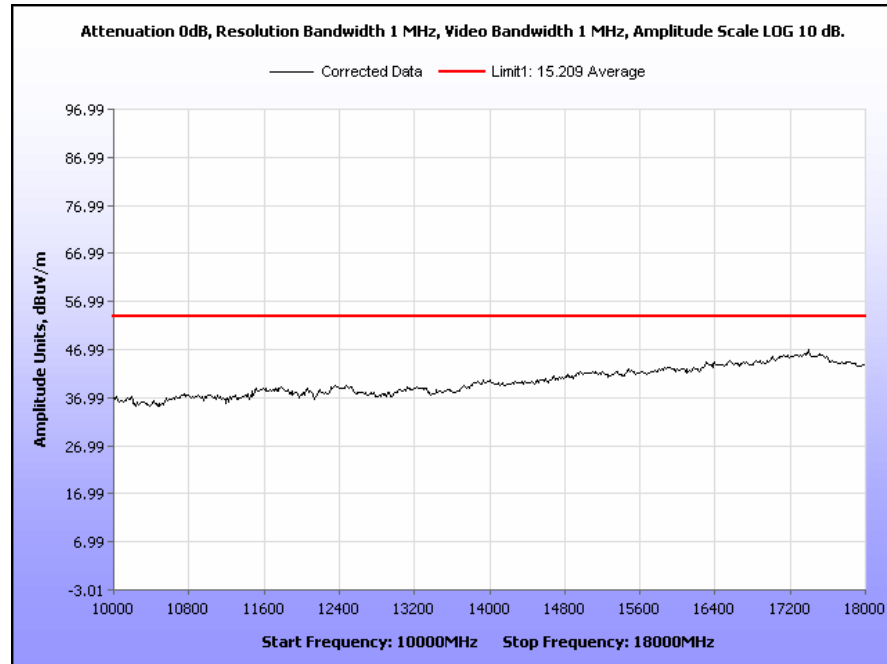
Plot 12. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Low Channel/Low Channel



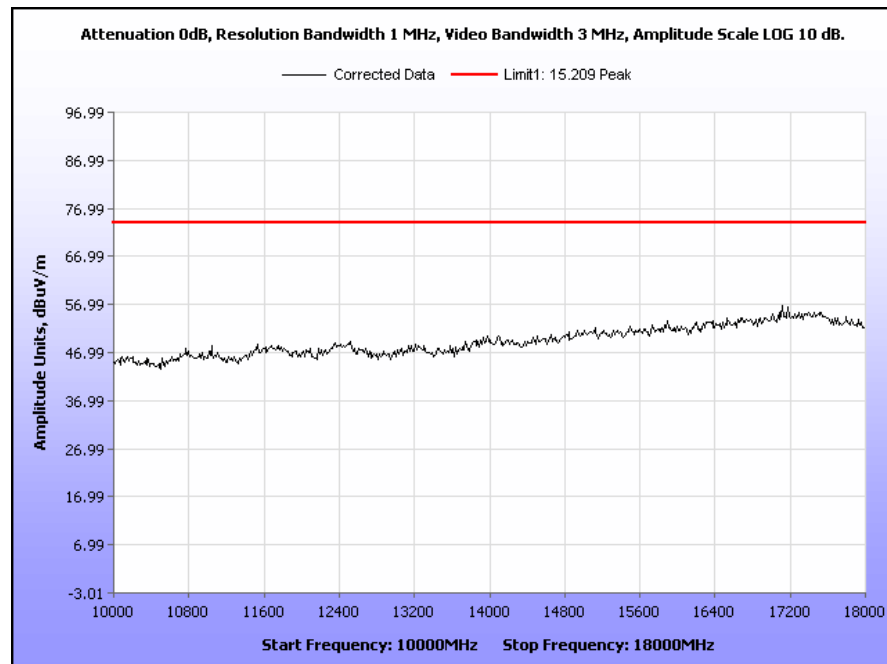
Plot 13. Out of Band Emissions, 10 GHz – 18 GHz, Average, Low Channel/Low Channel



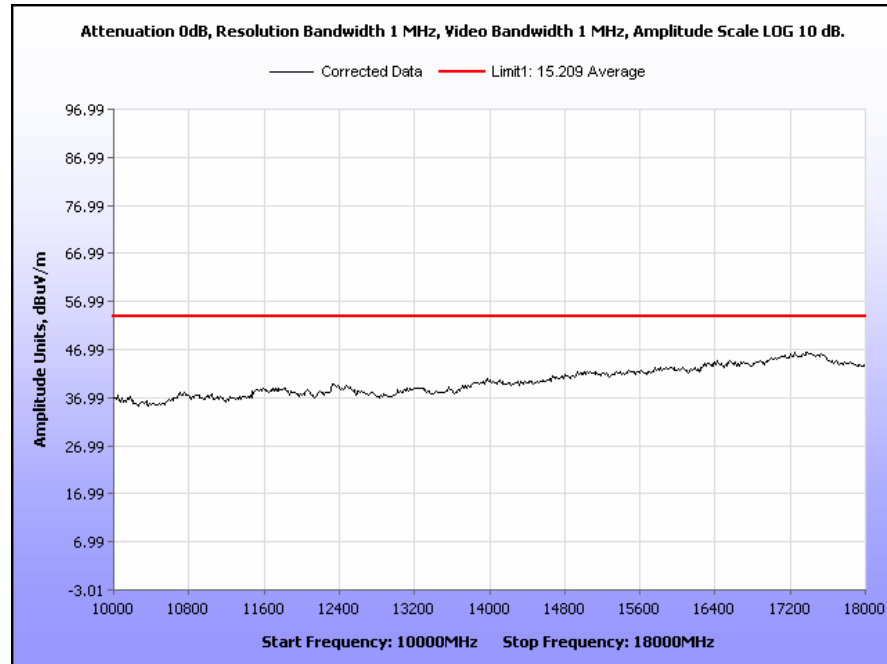
Plot 14. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Low Channel/Mid Channel



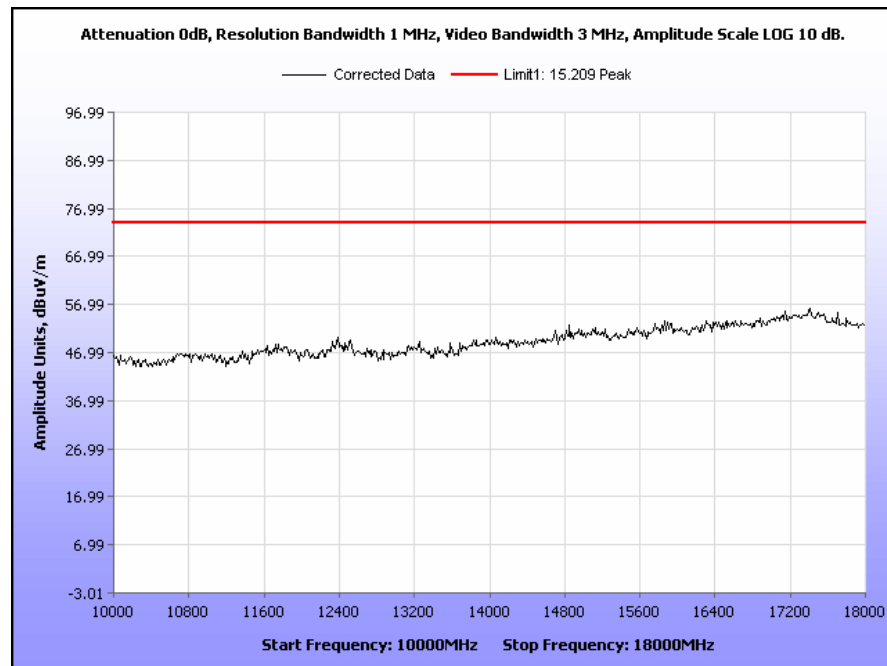
Plot 15. Out of Band Emissions, 10 GHz – 18 GHz, Average, Low Channel/Mid Channel



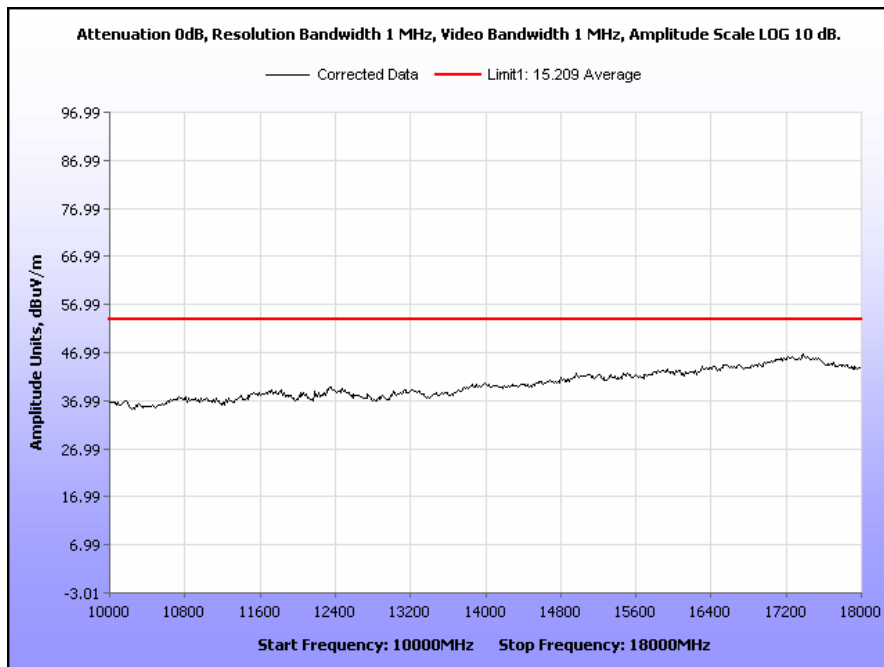
Plot 16. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Low Channel/High Channel



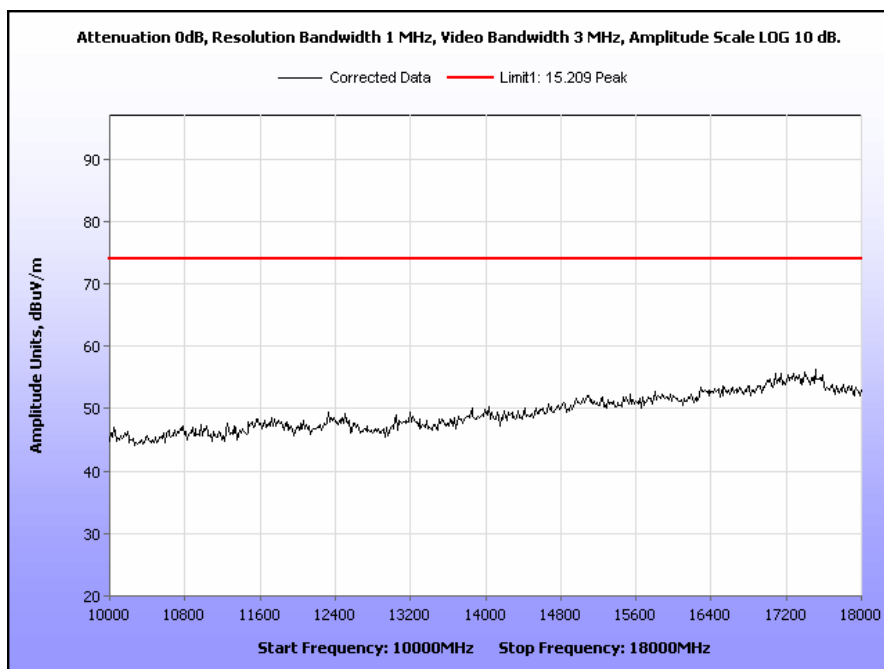
Plot 17. Out of Band Emissions, 10 GHz – 18 GHz, Average, Low Channel/High Channel



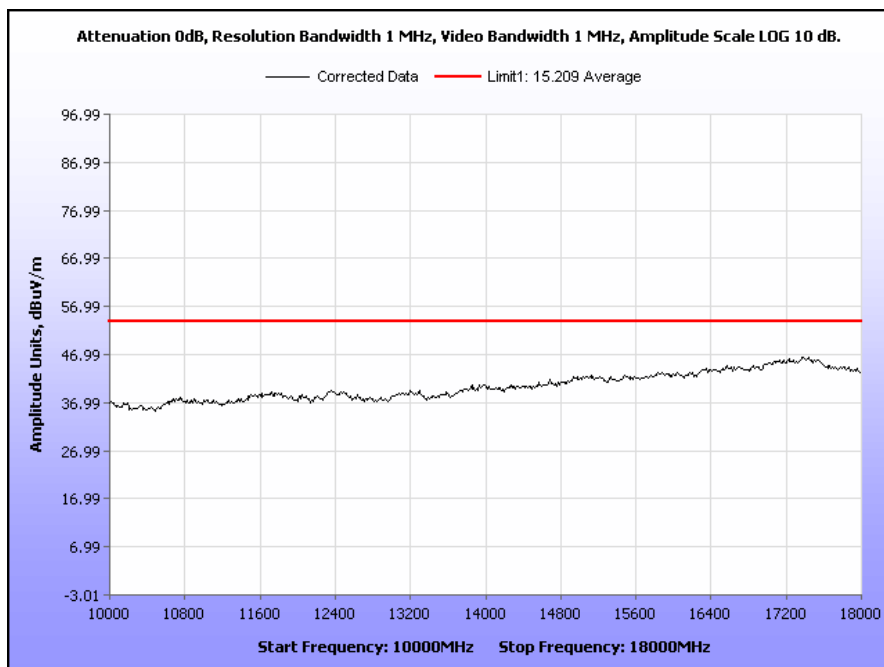
Plot 18. Out of Band Emissions, 10 GHz – 18 GHz, Peak, Mid Channel/Mid Channel



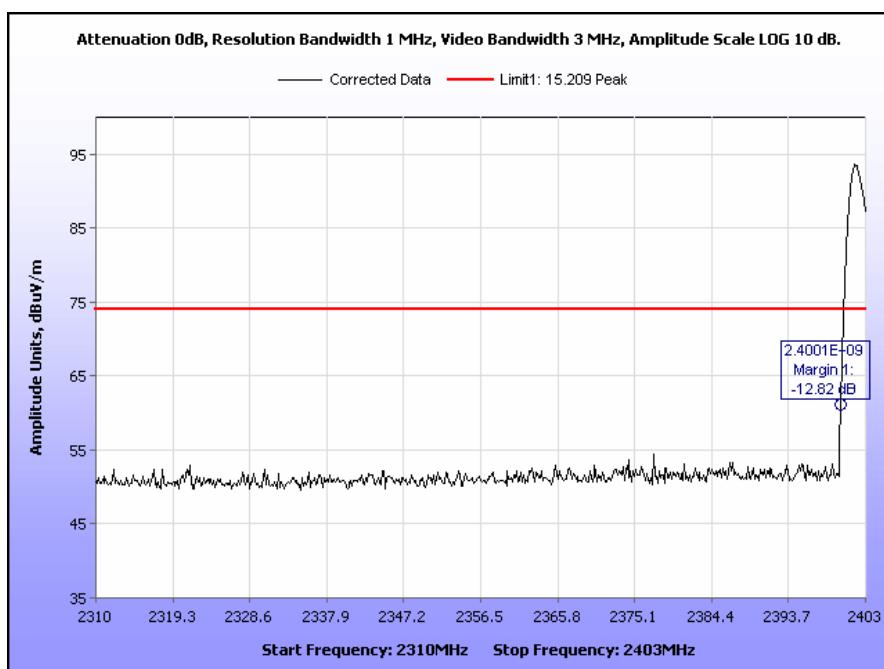
Plot 19. Out of Band Emissions, 10 GHz – 18 GHz, Average, Mid Channel/Mid Channel



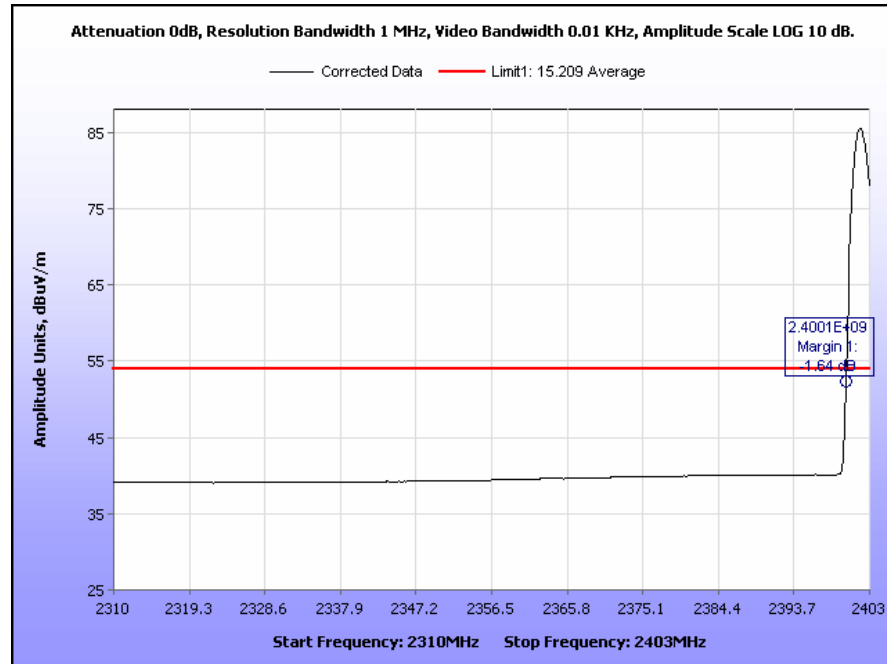
Plot 20. Out of Band Emissions, 10 GHz – 18 GHz, Peak, High Channel/High Channel



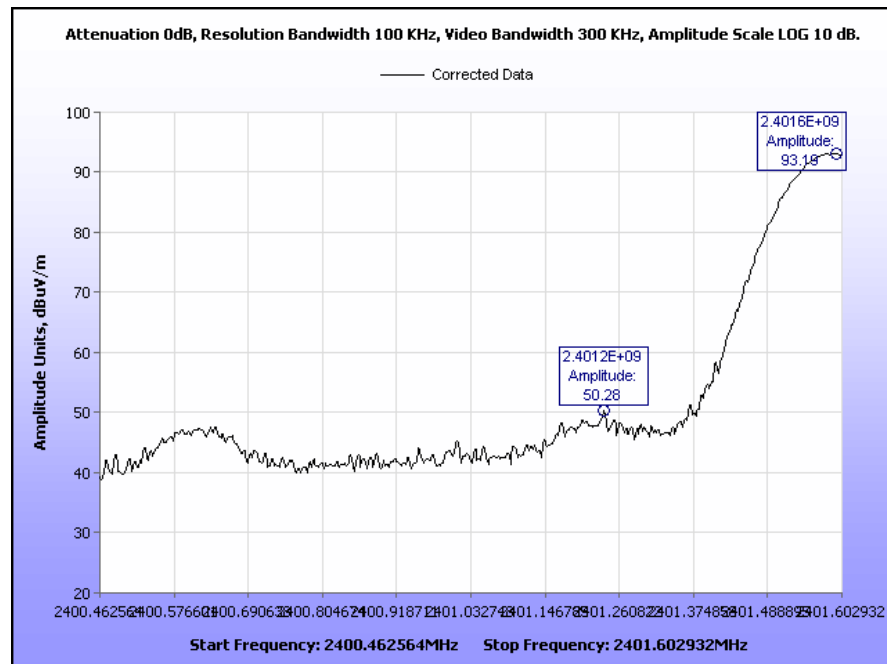
Plot 21. Out of Band Emissions, 10 GHz – 18 GHz, Average, High Channel/High Channel



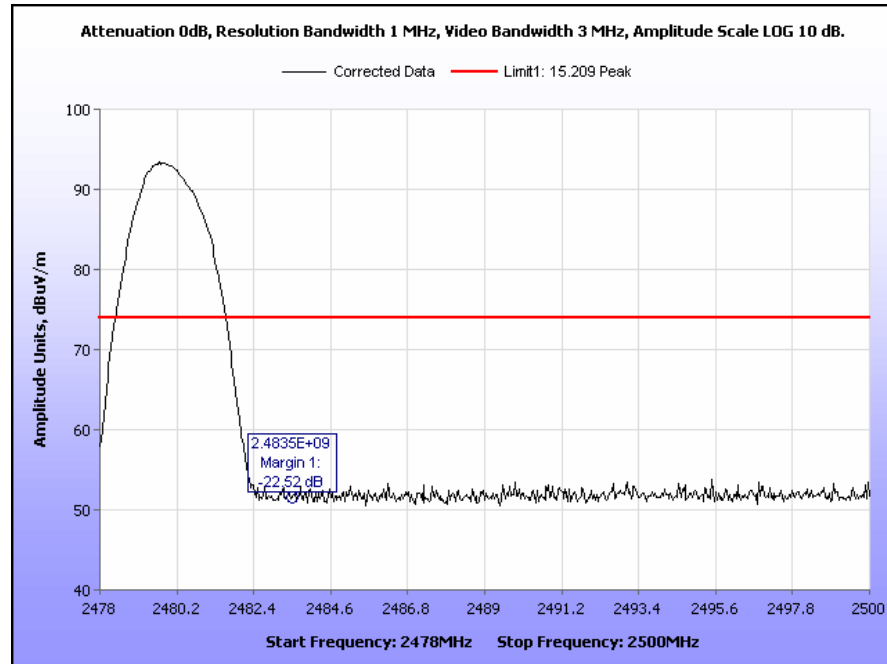
Plot 22. Out of Band Emissions, Band Edge, Low Channel, Peak



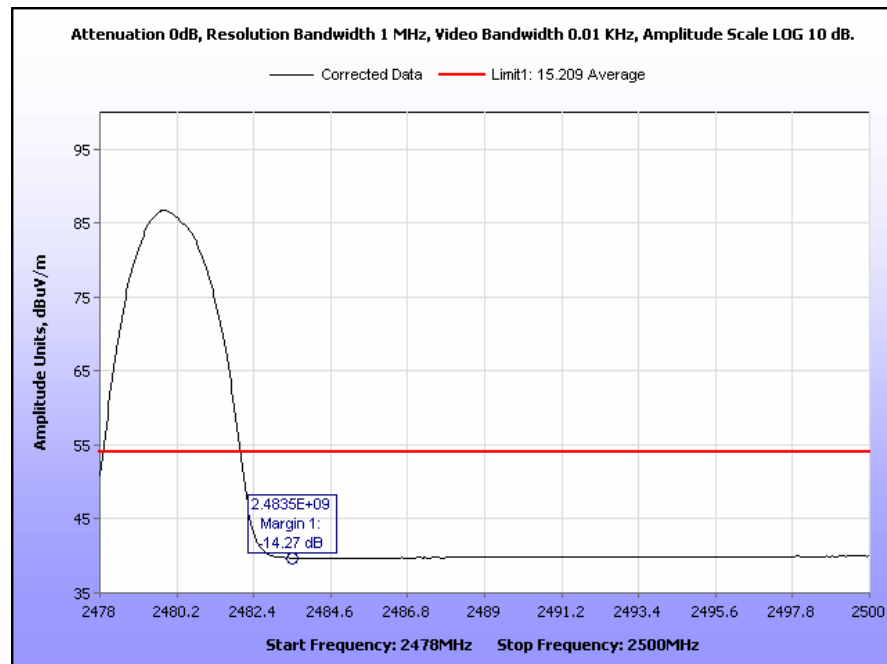
Plot 23. Out of Band Emissions, Band Edge, Low Channel, Average



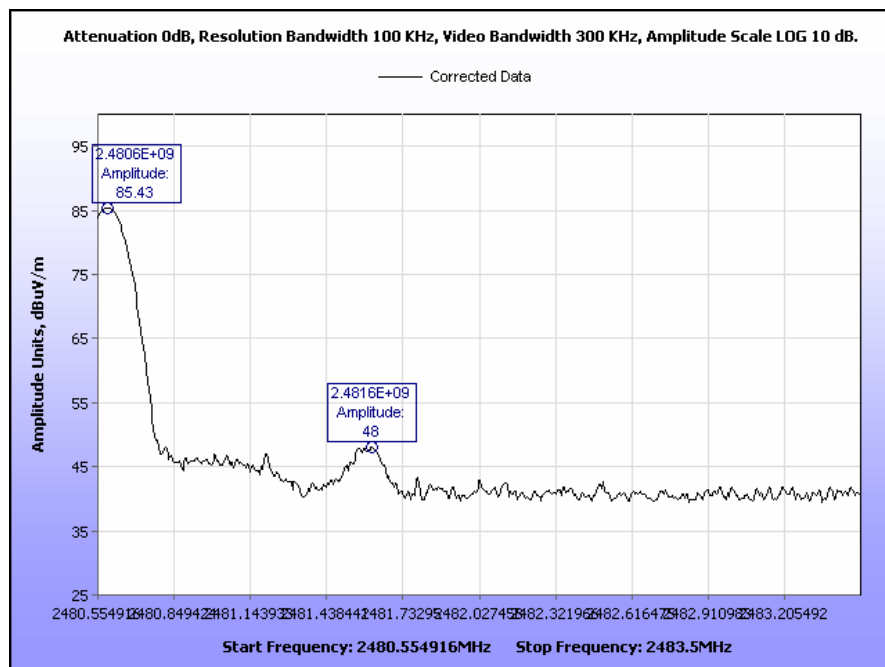
Plot 24. Out of Band Emissions, Band Edge, Low Channel, -20 dBc



Plot 25. Out of Band Emissions, Band Edge, High Channel, Peak

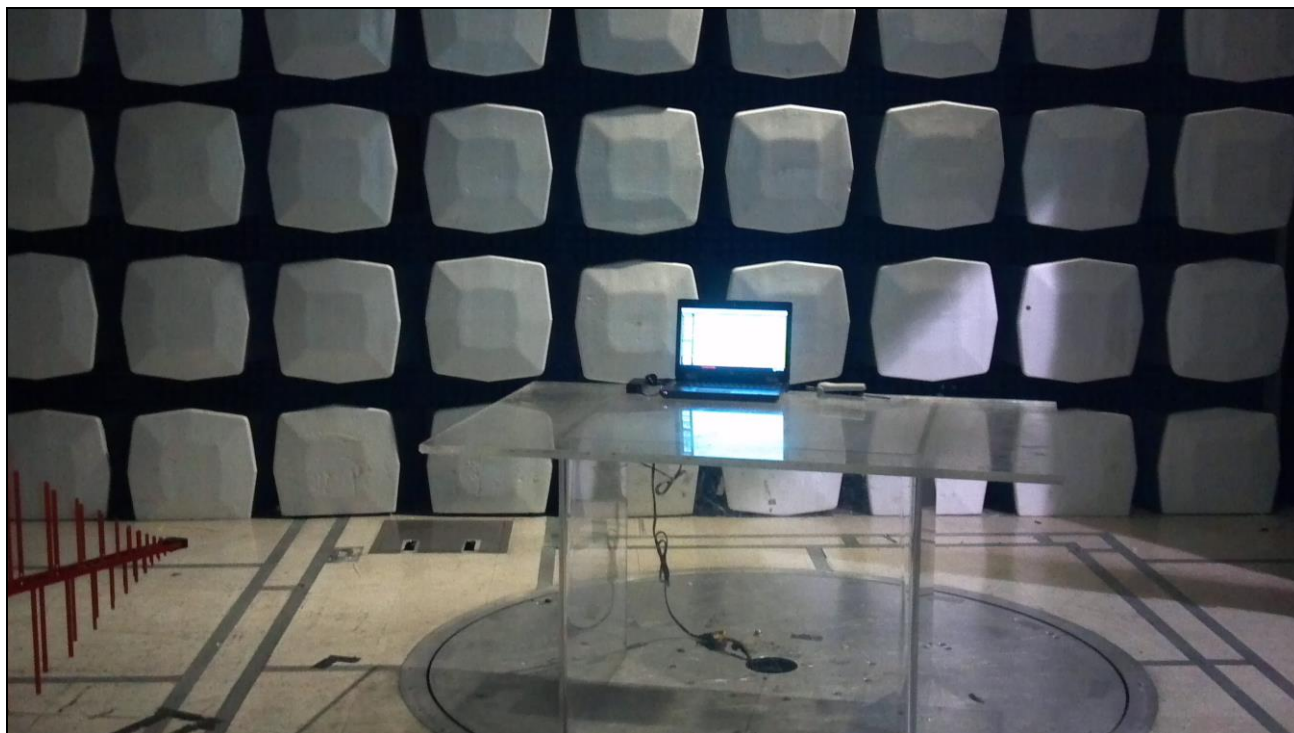


Plot 26. Out of Band Emissions, Band Edge, High Channel, Average

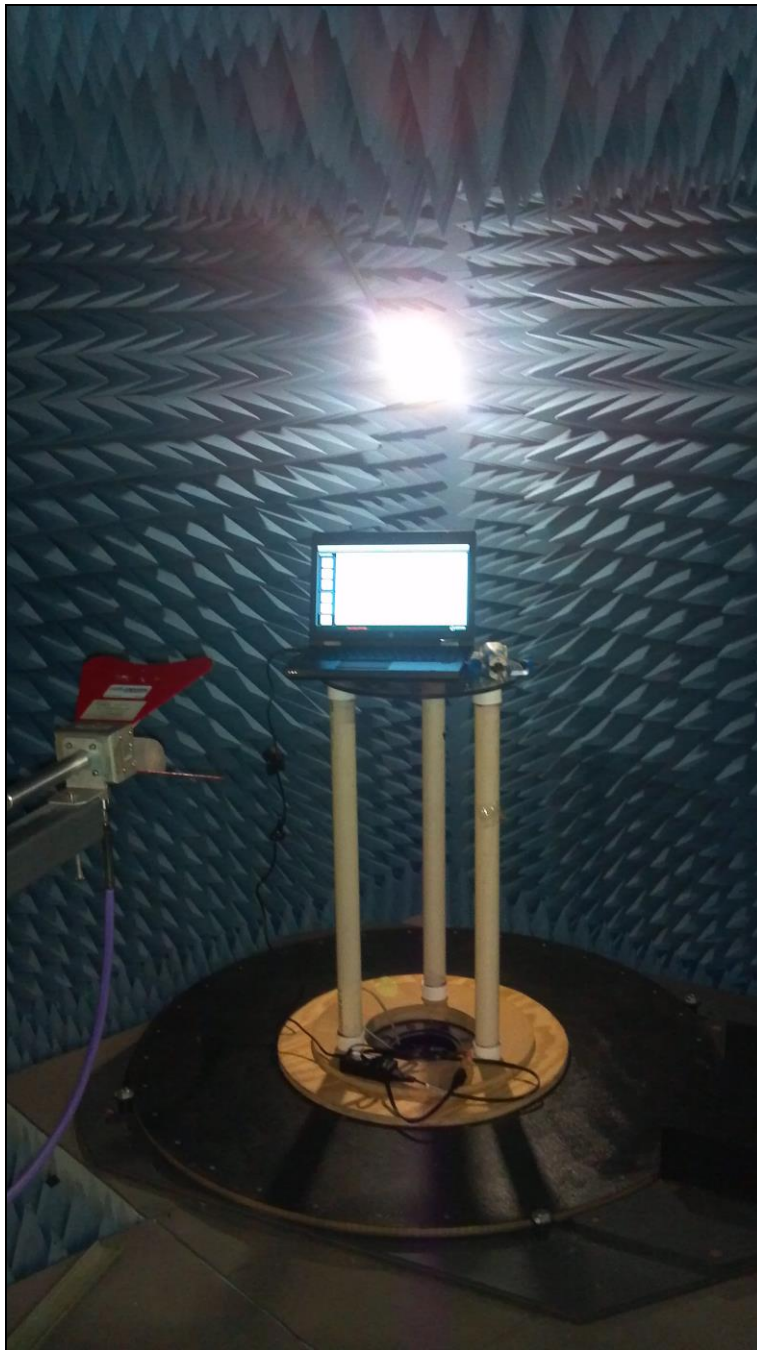


Plot 27. Out of Band Emissions, Band Edge, High Channel, -20 dBc

Radiated Spurious Emissions Test Setup



Photograph 1. Radiated Spurious Emissions, Test Setup, 30 MHz – 1 GHz



Photograph 2. Radiated Spurious Emissions, Test Setup, Above 1 GHz

IV. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4442	PRE-AMPLIFIER, MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T4771	PSA SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4446A	02/15/2013	08/15/2014
1T4483	ANTENNA; HORN	ETS-LINDGREN	3117	08/06/2012	02/06/2014
1T4563	LISN (10 AMP)	SOLAR ELECTRONICS	9322-50-R-10-BNC	11/27/2012	05/27/2014
1T4787	HYGROMETER / THERMOMETER / BAROMETER / DEW POINT PEN	CONTROL COMPANY	15-078-198, FB70423, 245CD	02/15/2012	02/15/2014
1T4502	COMB GENERATOR	COM-POWER	CGC-255	08/21/2012	02/21/2014
1T4818	COMB GENERATOR	COM-POWER	CGO-520	SEE NOTE	
1T4149	HIGH-FREQUENCY ANECHOIC CHAMBER	RAY-PROOF	81	NOT REQUIRED	

Table 8. Test Equipment List

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.¹ *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.

¹ 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

1. 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 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.



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.



End of Report