**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
13501 MCCALLEN PASS • AUSTIN, TEXAS 78753 • PHONE (512) 287-2500 • FAX (512) 287-2513

August 23, 2017

Cyberonics
100 Cyberonics Blvd.
Houston, TX 77058

Dear Stefan Robert,

Enclosed is the EMC Wireless test report for compliance testing of the Cyberonics, NGP Wand as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), 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: (\Cyberonics\EMCA92283-FCC209 Rev. 3)

# Electromagnetic Compatibility Criteria
# Test Report

for the

**Cyberonics**
**NGP Wand**

**Tested under**
the FCC Certification Rules
contained in
15.209 Subpart C for Intentional Radiators

**MET Report: EMCA92283-FCC209 Rev. 3**

August 23, 2017

**Prepared For:**

**Cyberonics**
**100 Cyberonics Blvd.**
**Houston, TX 77058**

**Prepared By:**
**MET Laboratories, Inc.**
13501 McCallen Pass,
Austin TX 78753

# Electromagnetic Compatibility Criteria
# Test Report

for the

## Cyberonics
## NGP Wand

**Tested under**
the FCC Certification Rules
contained in
15.209 Subpart C for Intentional Radiators

Kristine Cabrera, 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 Part 15.209 under normal use and maintenance.

Asad Bajwa,
Director, Electromagnetic Compatibility Lab

# Report Status Sheet

| Revision | Report Date | Reason for Revision |
|---|---|---|
| ∅ | April 13, 2017 | Initial Issue. |
| 1 | May 30, 2017 | Updated modulation type. |
| 2 | July 20, 2017 | Editorial correction. |
| 3 | August 23, 2017 | Editorial correction; updated data for new RF circuitry. |

  

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# List of Terms and Abbreviations

| | |
|---|---|
| **AC** | **A**lternating **C**urrent |
| **ACF** | **A**ntenna **C**orrection **F**actor |
| **Cal** | **Cal**ibration |
| ***d*** | **M**easurement **D**istance |
| **dB** | **D**eci**b**els |
| **dBµA** | **D**eci**b**els above one **micro**amp |
| **dBµV** | **D**eci**b**els above one **micro**volt |
| **dBµA/m** | **D**eci**b**els above one **micro**amp **per m**eter |
| **dBµV/m** | **D**eci**b**els above one **micro**volt **per m**eter |
| **DC** | **D**irect **C**urrent |
| **E** | **E**lectric Field |
| **DSL** | **D**igital **S**ubscriber **L**ine |
| **ESD** | **E**lectro**s**tatic **D**ischarge |
| **EUT** | **E**quipment **U**nder **T**est |
| ***f*** | **F**requency |
| **FCC** | **F**ederal **C**ommunications **C**ommission |
| **GRP** | **G**round **R**eference **P**lane |
| **H** | Magnetic Field |
| **HCP** | **H**orizontal **C**oupling **P**lane |
| **Hz** | **H**ert**z** |
| **IEC** | **I**nternational **E**lectrotechnical **C**ommission |
| **kHz** | **k**ilo**h**ert**z** |
| **kPa** | **k**ilo**pa**scal |
| **kV** | **k**ilo**v**olt |
| **LISN** | **L**ine **I**mpedance **S**tabilization **N**etwork |
| **MHz** | **M**ega**h**ertz |
| **µH** | **microh**enry |
| **µ** | **microf**arad |
| **µs** | **micros**econds |
| **NEBS** | **N**etwork **E**quipment-**B**uilding **S**ystem |
| **PRF** | **P**ulse **R**epetition **F**requency |
| **RF** | **R**adio **F**requency |
| **RMS** | **R**oot-**M**ean-**S**quare |
| **TWT** | **T**raveling **W**ave **T**ube |
| **V/m** | **V**olts **per m**eter |
| **VCP** | **V**ertical **C**oupling **P**lane |

# I. Executive Summary

## A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Cyberonics NGP Wand, with the requirements of Part 15, §15.209. 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 NGP Wand. Cyberonics should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the NGP Wand, 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, §15.209, in accordance with Cyberonics, purchase order number PO133817. All tests were conducted using measurement procedure ANSI C63.10-2013.

| FCC Reference 47 CFR Part 15.209 | Description | Compliance |
|---|---|---|
| Title 47 of the CFR, Part 15 §15.209(a); §15.205 | Radiated Spurious Emissions Requirements | Compliant |

**Table 1. Executive Summary of EMC Part 15.209 ComplianceTesting**

# II. Equipment Configuration

# A. Overview

MET Laboratories, Inc. was contracted by Cyberonics to perform testing on the NGP Wand, under Cyberonics's purchase order number PO133817.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Cyberonics, NGP Wand.

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

| | | |
|---|---|---|
| **Model(s) Tested:** | NGP Wand | |
| **Model(s) Covered:** | NGP Wand | |
| **EUT Specifications:** | Primary Power: 3 VDC | |
| | FCC ID: RW62000TRX | |
| | Type of Modulations: | OOK |
| | EUT Frequency Ranges: | 82.0 kHz – 89.0 kHz |
| | Peak RF Output Power | 7.54 dBµV/m @300m |
| | Data Rate(s): | Single Data Rate |
| **Analysis:** | The results obtained relate only to the item(s) tested. | |
| **Environmental Test Conditions:** | Temperature: 15-35º C | |
| | Relative Humidity: 30-60% | |
| | Barometric Pressure: 860-1060 mbar | |
| **Evaluated by:** | Kristine Cabrera | |
| **Report Date(s):** | August 23, 2017 | |

**Table 2. EUT Summary Table**

## 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 |
| **ANSI C63.4:2014** | 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 C63.10-2013** | American National Standard for Testing Unlicensed Wireless Devices |

**Table 3. References**

## C. Test Site

All testing was performed at MET Laboratories, Inc., 13501 McCallen Pass, Austin TX 78753. 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 10 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 Cyberonics NGP Wand, Equipment Under Test (EUT), is part of a Medical Electrical System that consists of a tablet computer, USB cable and programming wand. The NGP Wand is used to interface with implantable neurostimulators through inductive telemetry. The programming system is used to change settings, verify status, turn off or enable features in the implantable device.

The NGP Programming Wand's role in the NGP Programming system act as the inductive interface between the tablet computer and the implantable device. This system is only used by physicians as part of the surgical procedure or at the doctor's office when performing follow ups with the patient.

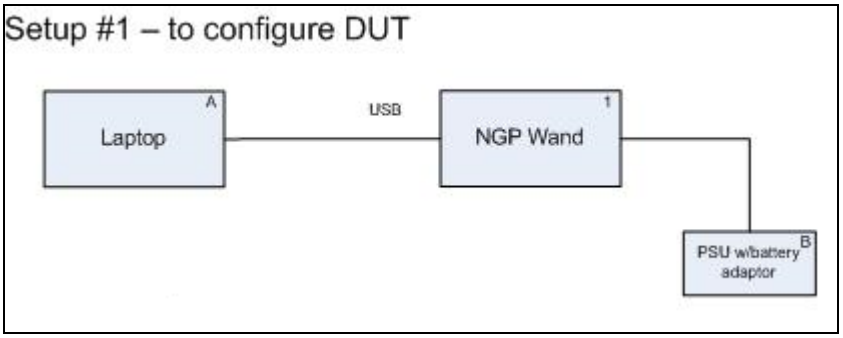



**Figure 1. Block Diagram of Test Configuration**

## 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 | Part Number | Serial Number | Revision |
|---|---|---|---|---|---|
| 1 | NGP Wand | 2000 | N/A | EA199 | N/A |
| 1 | NGP Wand | 2000 | N/A | EA200 | N/A |

**Table 4. Equipment Configuration**

## F. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

| Ref. ID | Name / Description | Manufacturer | Model Number |
|---|---|---|---|
| A | Laptop | HP | ProBook 450 G3 |
| B | Battery Adapter | N/A | N/A |

**Table 5. Support Equipment**

## G. Ports and Cabling Information

| Ref. ID | Port name on EUT | Cable Description or reason for no cable | Qty | Length as tested (m) | Max Length (m) | Shielded? (Y/N) | Termination Box ID & Port Name |
|---|---|---|---|---|---|---|---|
| 1 | USB | USB Type C- Type C | 1 | 2.87 | 2.99 | Yes | B. TX |

**Table 6. Ports and Cabling Information**

## H. Mode of Operation

This device has four radios:

1. Bluetooth radio to communicate to a tablet computer.

2. Inductive Telemetry at 89 kHz to communicate with an implantable device (legacy implantable device model 102/102R) (Coil X).

3. Inductive Telemetry at 89 kHz to communicate with an implantable device at 600 BAUD (Legacy implantable device model 102/102R) (Coil Y).

4. Inductive Telemetry at 82 kHz to communicate with an implantable at 600 BAUD and 2400 BAUD depending on the implantable device (implantable device models 103, 104, 105, 106 and 1000) (Coil Z).

The test samples provided are loaded with special test software that can control the radios for testing.

## I. Method of Monitoring EUT Operation

Device is performing its function when:

1. Solid or flickering "white" lead (generator symbol) will indicate that the device is sending/receiving data through the inductive telemetry (when inductive telemetry is turned on and communicating with an implantable device).
2. A green light will show that the wand is powered and turned on.

## 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 Cyberonics upon completion of testing.

# III. Electromagnetic Compatibility Criteria for Intentional Radiators

# Electromagnetic Compatibility Criteria for Intentional Radiators

## § 15.209(a) Radiated Spurious Emissions Requirements and Band Edge

**Test Requirements:** **§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 7. Restricted Bands of Operation**

[1] Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.
[2] Above 38.6

**§ 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 8.

| Frequency (MHz) | § 15.209(a),Radiated Emission Limits (dBµV) | Measurement Distance (meters) |
|---|---|---|
| 0.009 - 0.490 | 20*log(2400/f) (kHz) | 300 |
| 0.490 - 1.705 | 20*log(24000/f) (kHz) | 30 |
| 1.705 - 30.0 | 29.54 | 30 |
| 30 - 88 | 40.00 | 3 |
| 88 - 216 | 43.50 | 3 |
| 216 - 960 | 46.00 | 3 |
| Above 960 | 54.00 | 3 |

**Table 8. Radiated Emissions Limits Calculated from FCC Part 15, § 15.209 (a)**

**Test Procedures:** The transmitter was turned on. Measurements were performed on the two available channels. The EUT was rotated a full 360° and with the shielded loop antenna at parallel and perpendicular polarities. Plots shown are corrected for both antenna correction factor and distance and compared to the appropriate limit line. Per **§ 15.33**, the span of frequencies evaluated were up to the tenth harmonic of the highest fundamental frequency. The highest fundamental frequency was 89 kHz. The emissions were measured using a peak detector (worst case) against the average limit line.

**Test Results:** The EUT was compliant with the Radiated Spurious Emission limits of **§ 15.209(a)**.

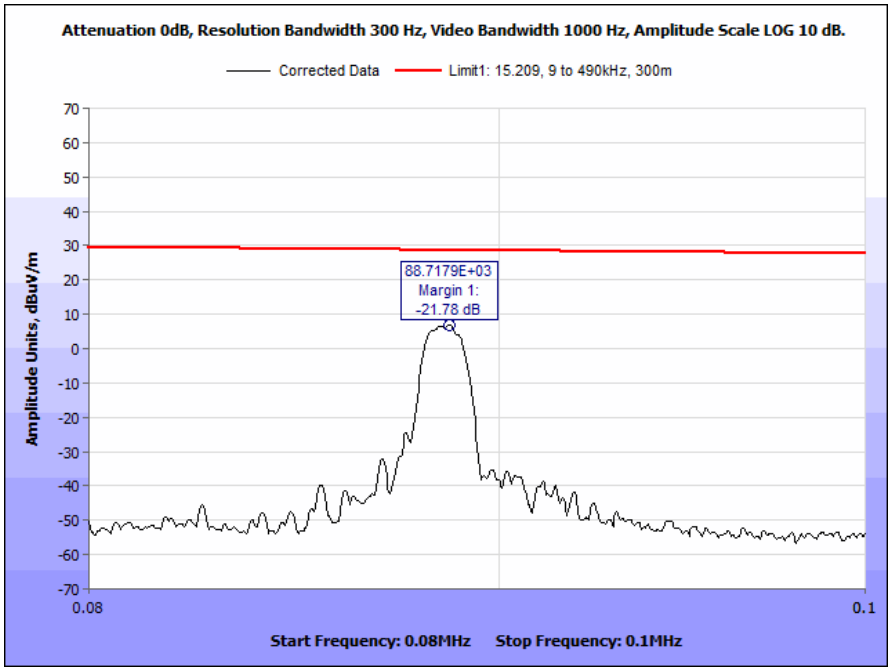
**Test Engineer(s):** Giuliano Messina

**Test Date(s):** 08/16/2017

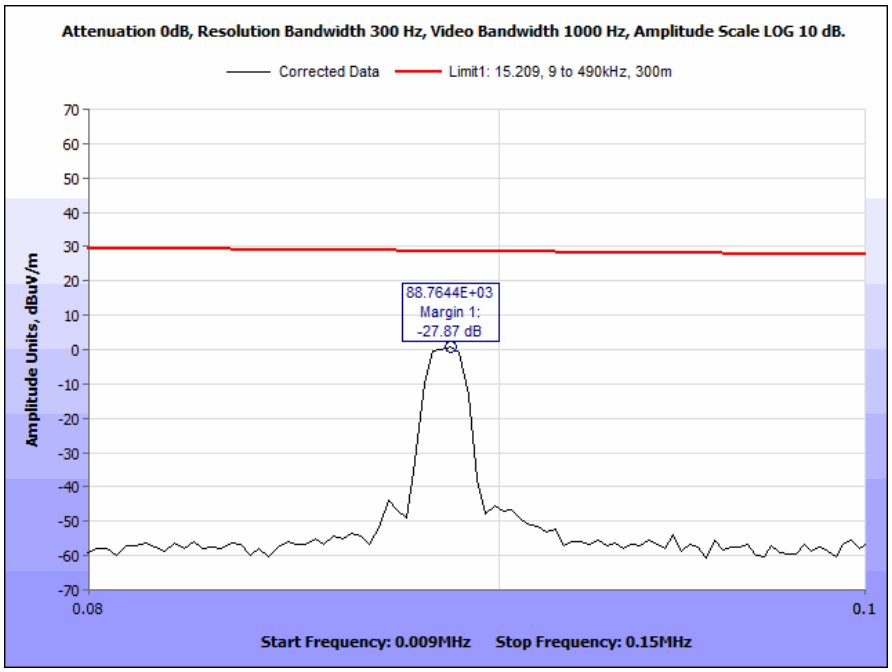
| Coil | Loop Orientation (°) | Frequency (kHz) | Meter Reading (dBuV) | Distance Correction Factor (dB) | ACF (dB) | Cable Loss Factor (dB) | Corrected Measurement (dBuV/m) | 15.209 Limit (dBuV/m) | Margin (dB) |
|---|---|---|---|---|---|---|---|---|---|
| X | 0 | 88.7179 | 74.33 | -80 | 11.95 | 0.58 | 6.86 | 28.64 | -21.78 |
| X | 90 | 88.7644 | 68.24 | -80 | 11.94 | 0.58 | 0.77 | 28.64 | -27.87 |
| Y | 0 | 88.7179 | 75.01 | -80 | 11.95 | 0.58 | 7.54 | 28.64 | -21.1 |
| Y | 90 | 88.3974 | 71.25 | -80 | 11.95 | 0.58 | 3.78 | 28.68 | -24.9 |
| Z (hi) | 0 | 82.1635 | 71.3 | -80 | 11.97 | 0.58 | 3.85 | 29.31 | -25.46 |
| Z (hi) | 90 | 81.9712 | 67.23 | -80 | 11.97 | 0.58 | -0.21 | 29.33 | -29.54 |
| Z (lo) | 0 | 82.0192 | 62.58 | -80 | 11.97 | 0.58 | -4.87 | 29.33 | -34.2 |
| Z (lo) | 90 | 81.7308 | 57.76 | -80 | 11.97 | 0.58 | -9.69 | 29.36 | -39.05 |

**Table 9. Peak Output Power Data**

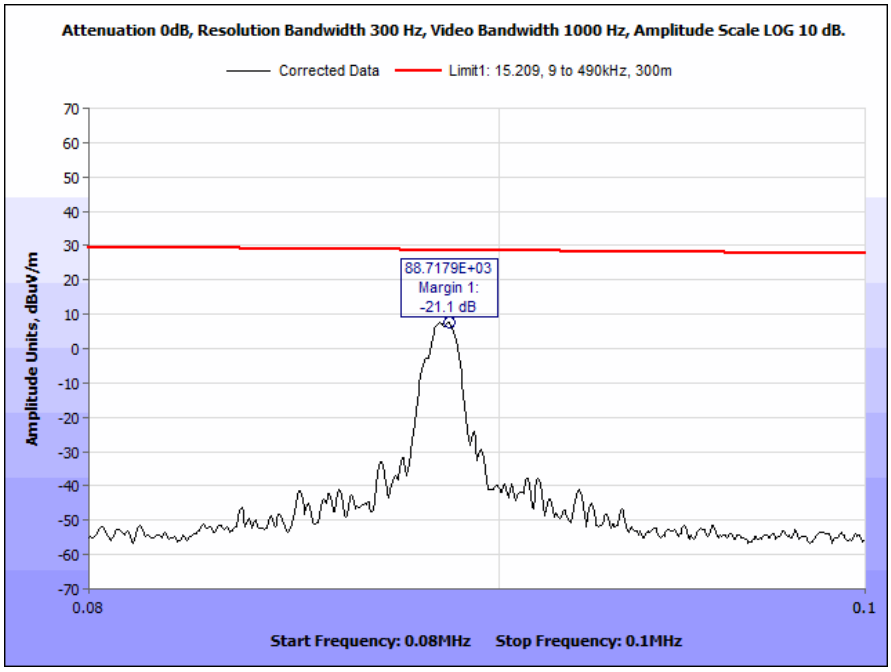
## Peak Output Power



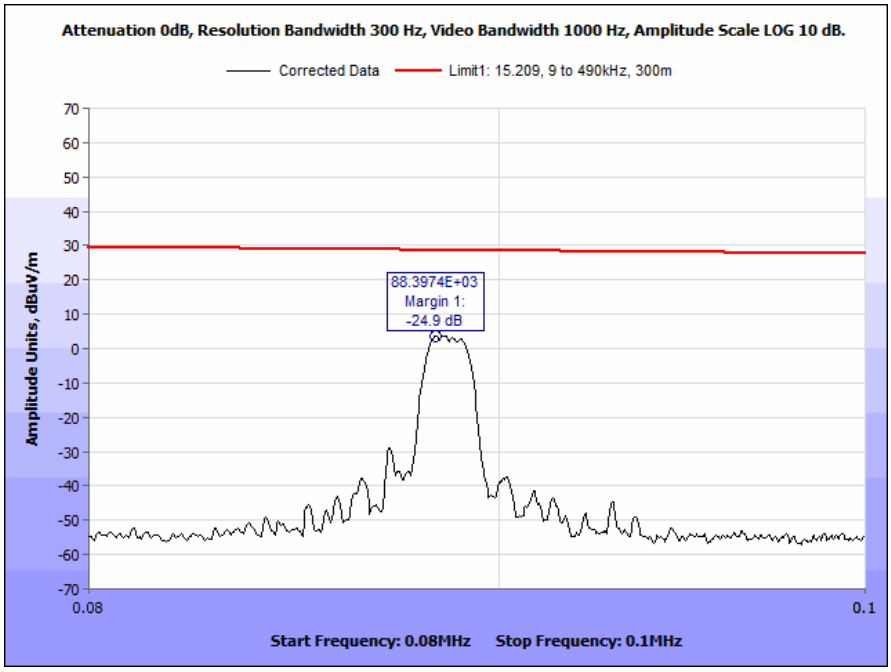

**Plot 1. Peak Output Power, Coil X, Loop 0°, 89 kHz**




**Plot 2. Peak Output Power, Coil X, Loop 90°, 89 kHz**

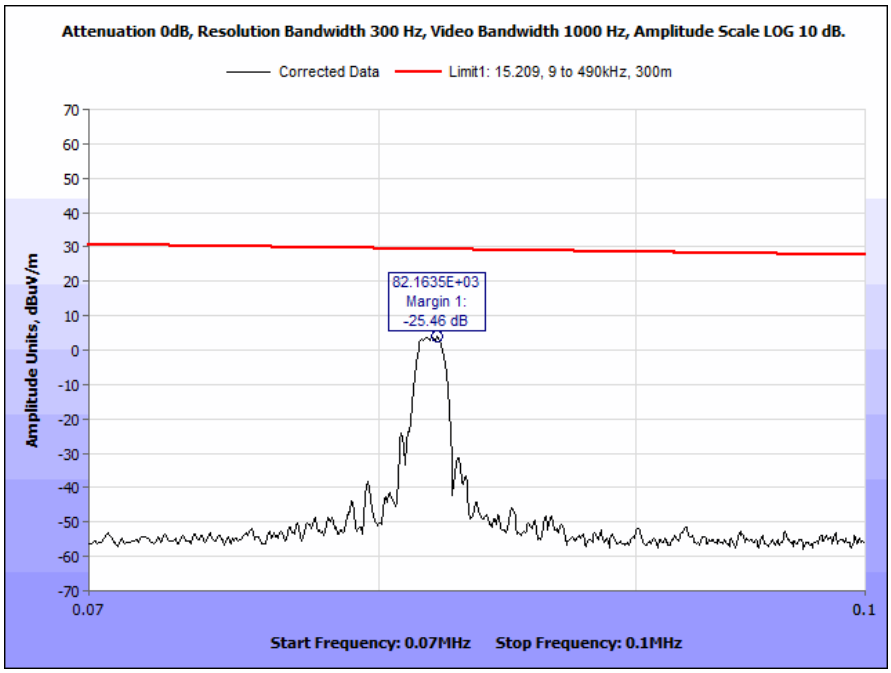



**Plot 3. Peak Output Power, Coil Y, Loop 0°, 89 kHz**

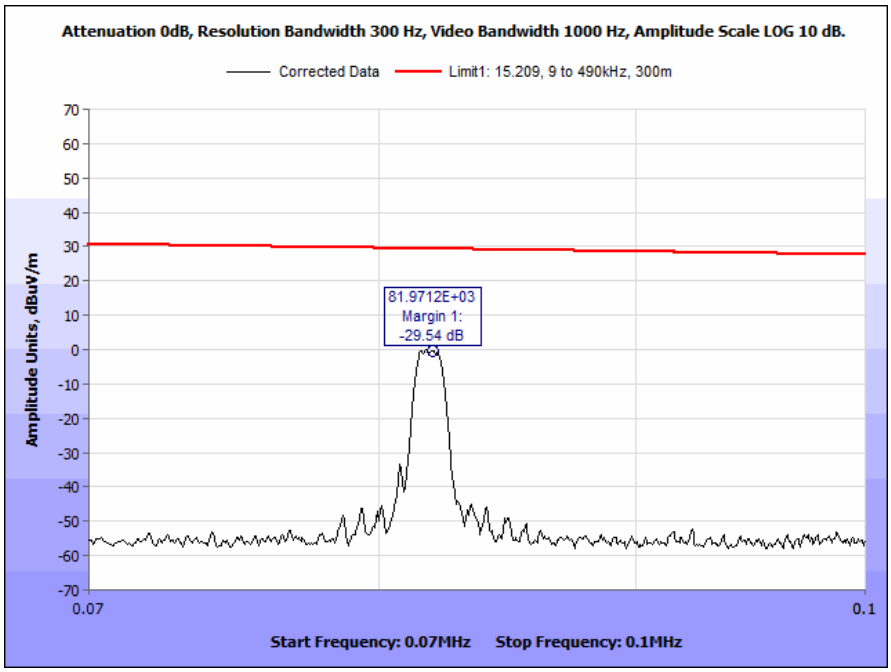



**Plot 4. Peak Output Power, Coil Y, Loop 90°, 89 kHz**

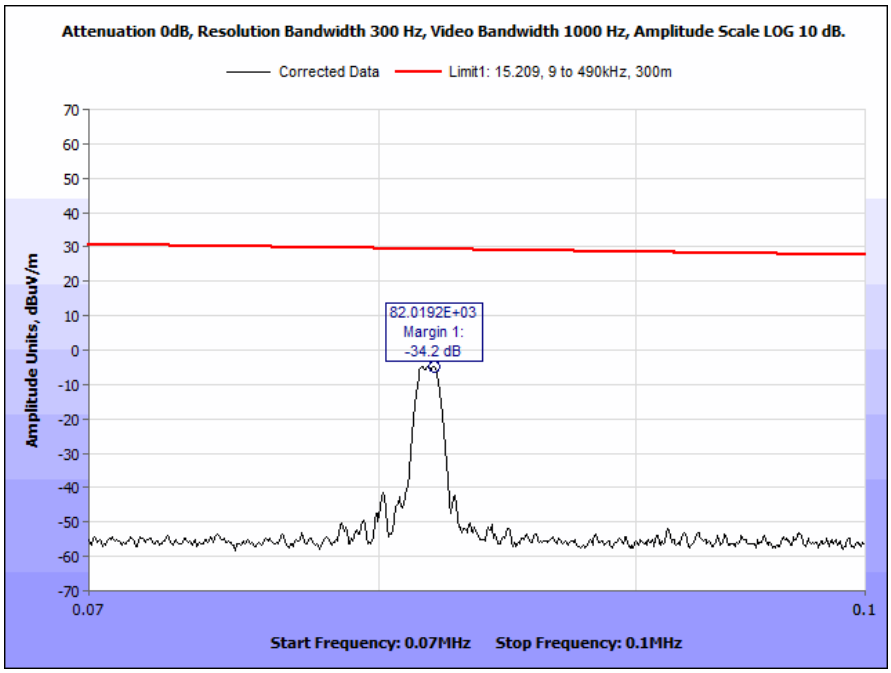
  



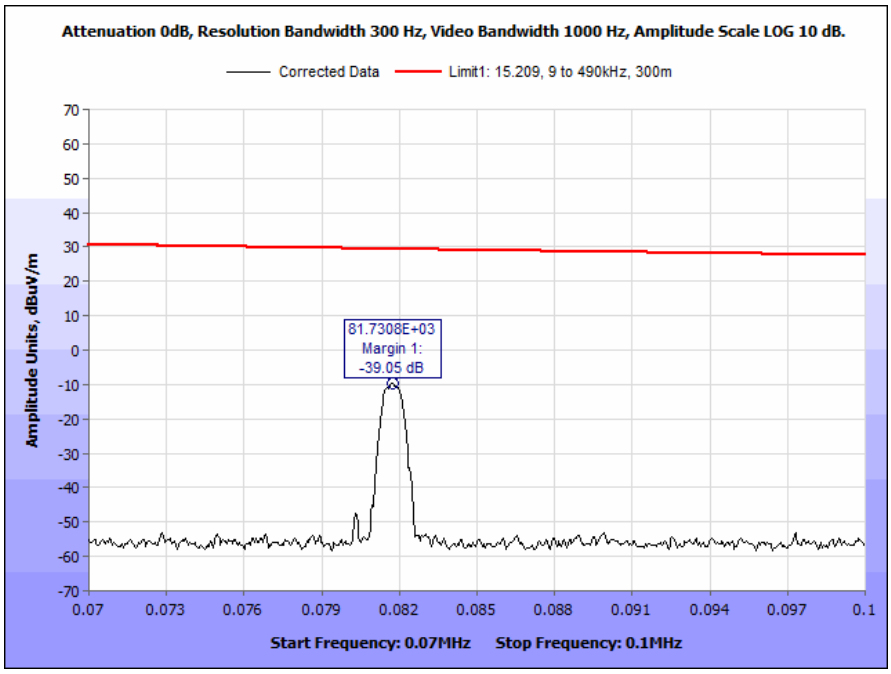

**Plot 5. Peak Output Power, Coil Z (hi), Loop 0°, 82 kHz**




**Plot 6. Peak Output Power, Coil Z (hi), Loop 90°, 82 kHz**

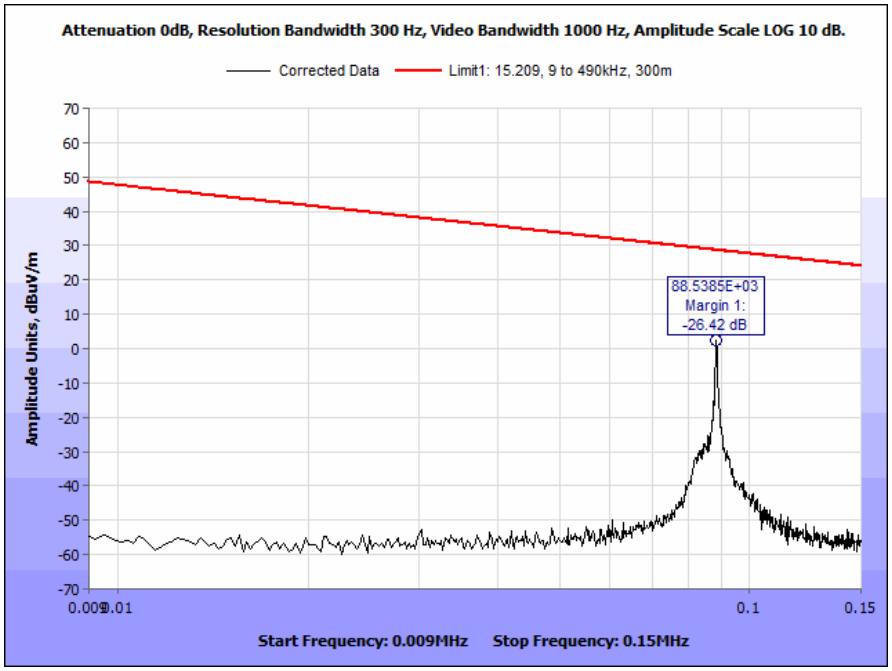



**Plot 7. Peak Output Power, Coil Z (lo), Loop 0°, 82 kHz**

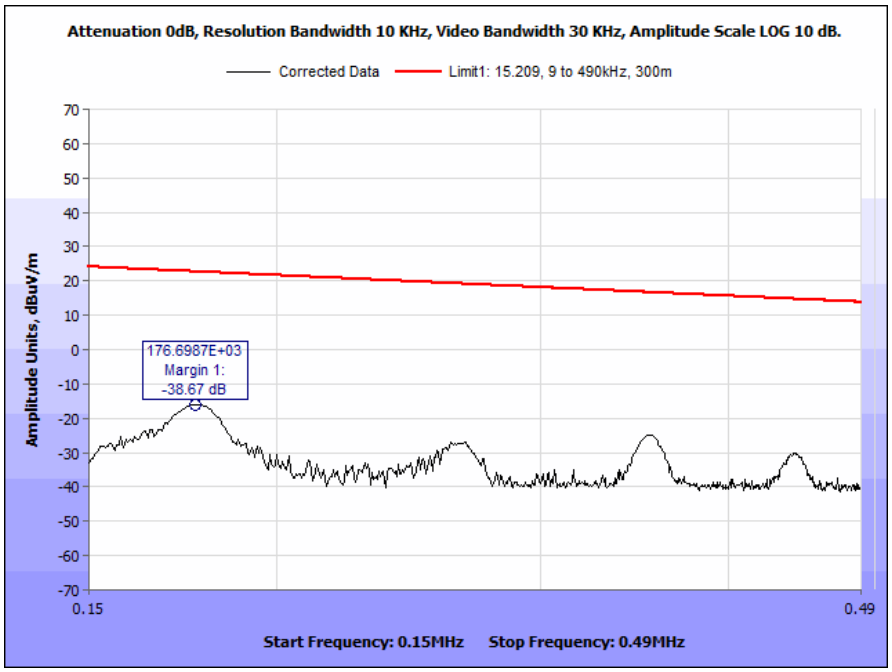



**Plot 8. Peak Output Power, Coil Z (lo), Loop 90°, 82 kHz**

## Radiated Spurious Emissions

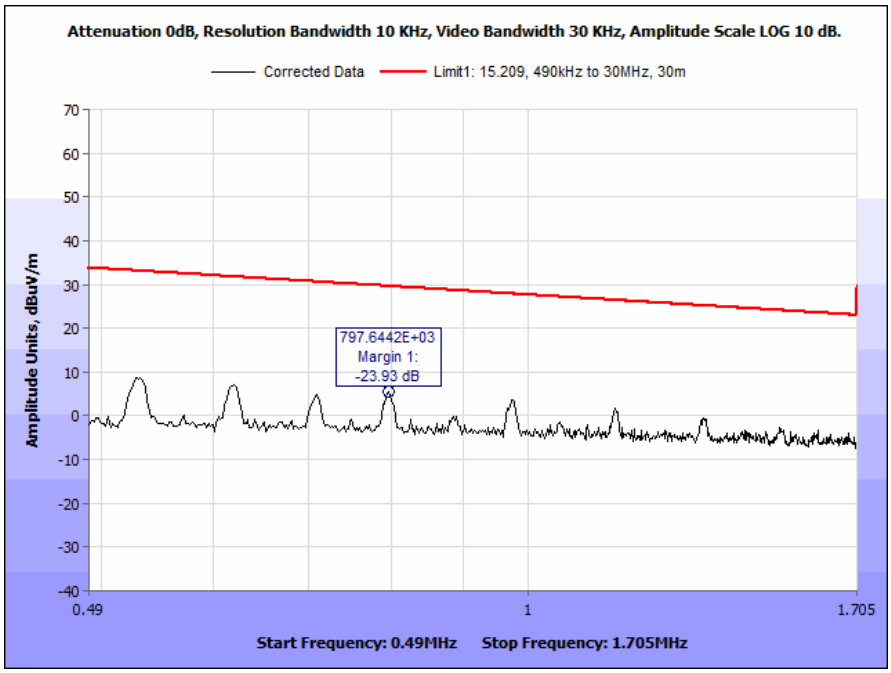



**Plot 9. Radiated Spurious Emissions, Coil X, Loop 0°, 9 kHz – 150 kHz**

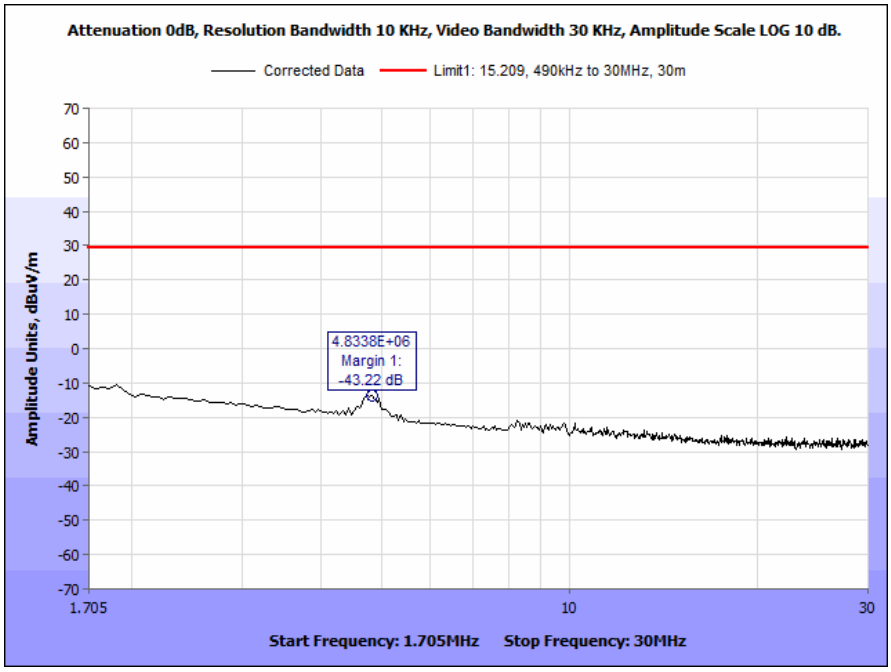



**Plot 10. Radiated Spurious Emissions, Coil X, Loop 0°, 150 kHz – 490 kHz**

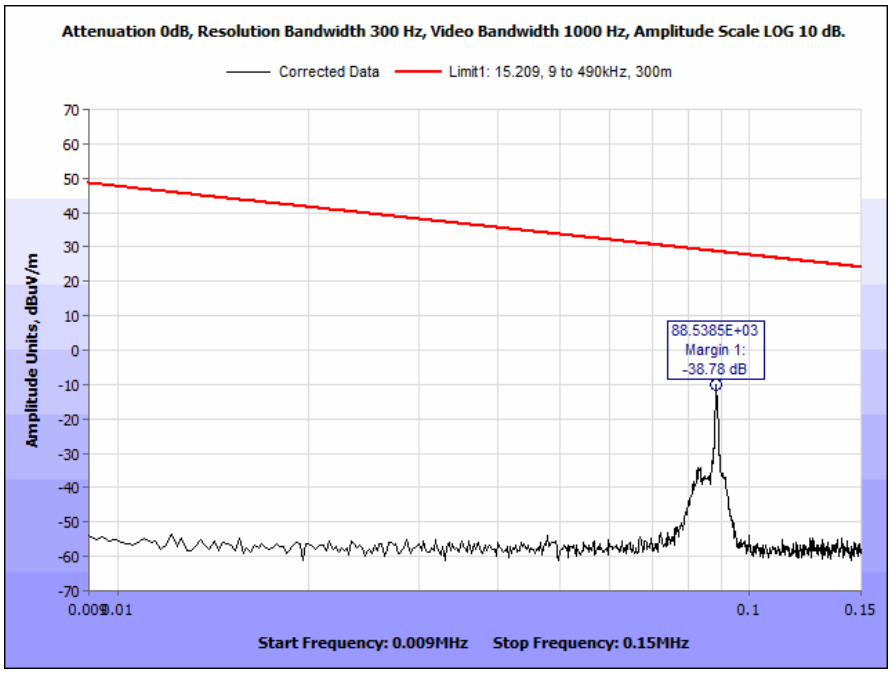
  



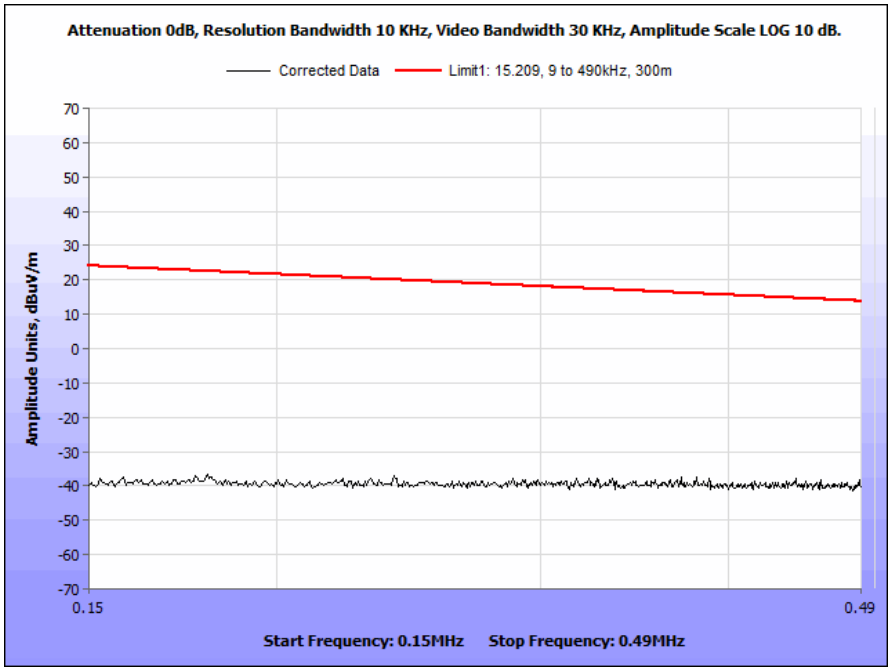

**Plot 11. Radiated Spurious Emissions, Coil X, Loop 0°, 490 kHz – 1705 kHz**




**Plot 12. Radiated Spurious Emissions, Coil X, Loop 0°, 1705 kHz – 30 MHz**

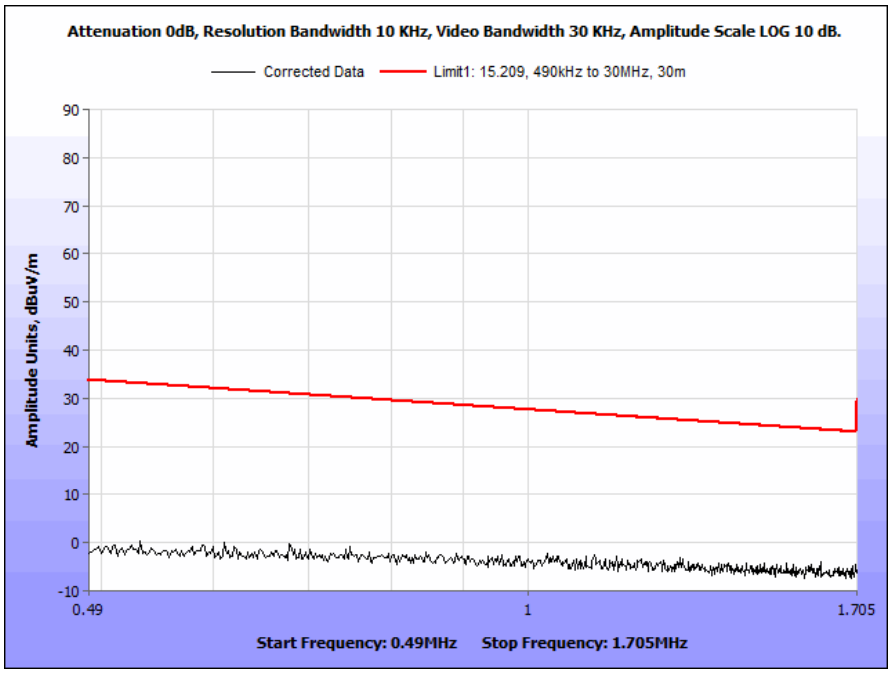



**Plot 13. Radiated Spurious Emissions, Coil X, Loop 90°, 9 kHz – 150 kHz**

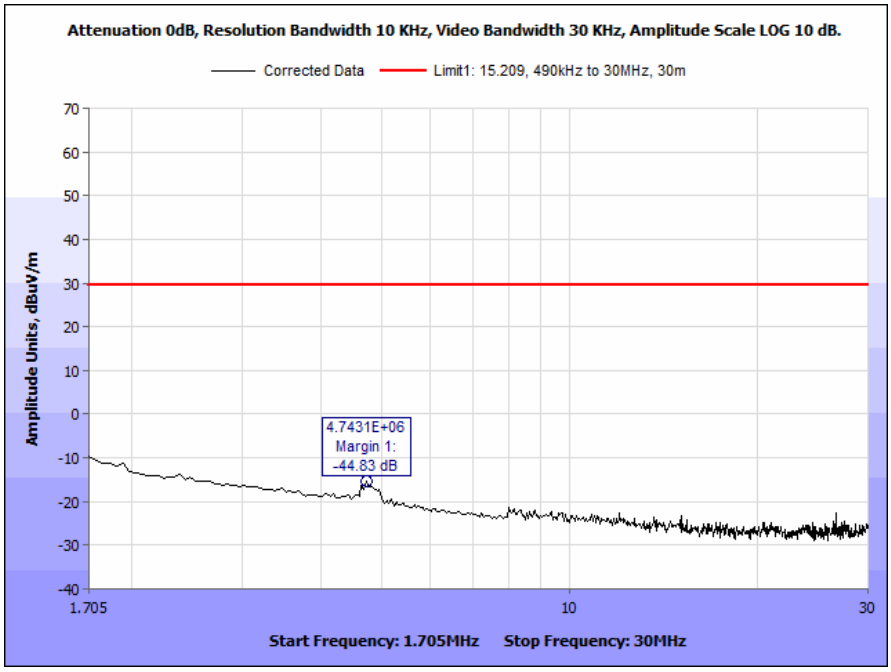



**Plot 14. Radiated Spurious Emissions, Coil X, Loop 90°, 150 kHz – 490 kHz**

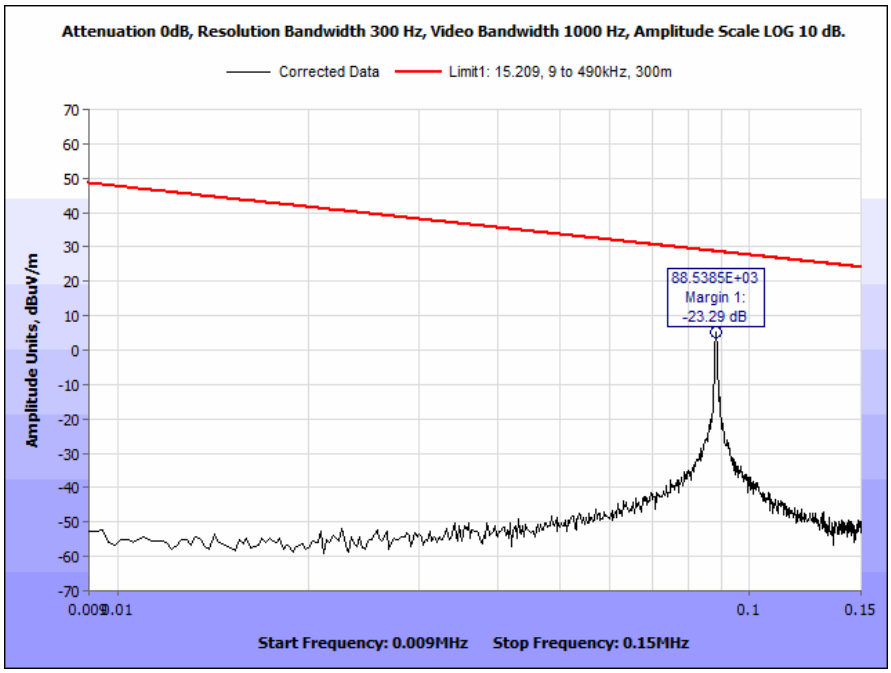
  



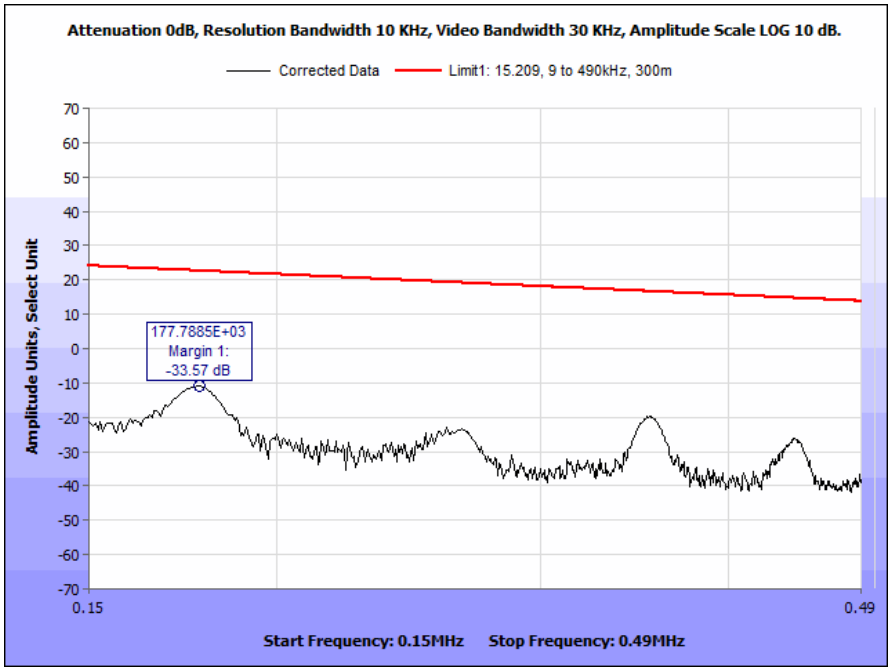

**Plot 15. Radiated Spurious Emissions, Coil X, Loop 90°, 490 kHz – 1705 kHz**




**Plot 16. Radiated Spurious Emissions, Coil X, Loop 90°, 1705 kHz – 30 MHz**

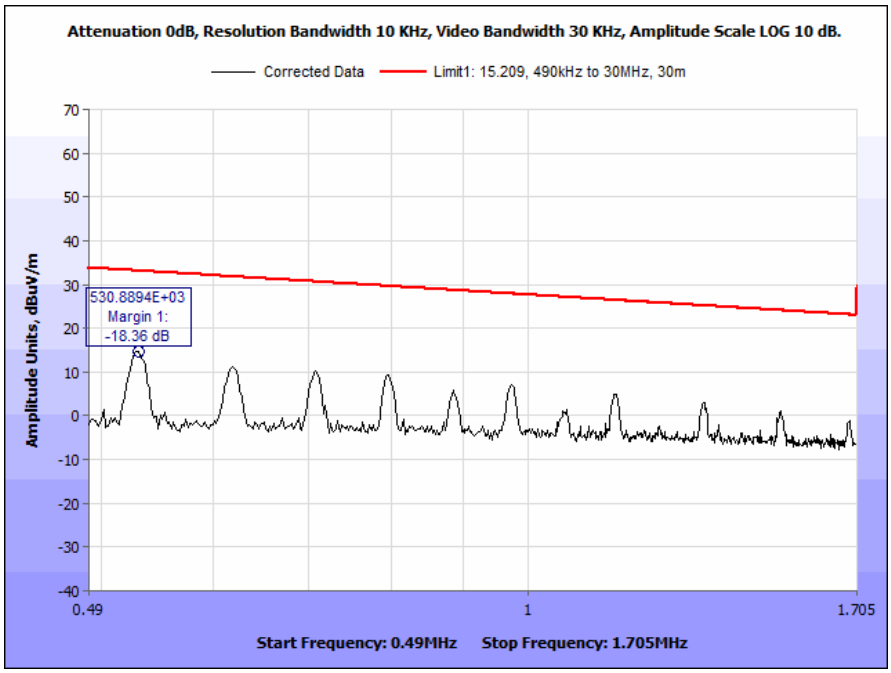



**Plot 17. Radiated Spurious Emissions, Coil Y, Loop 0°, 9 kHz – 150 kHz**

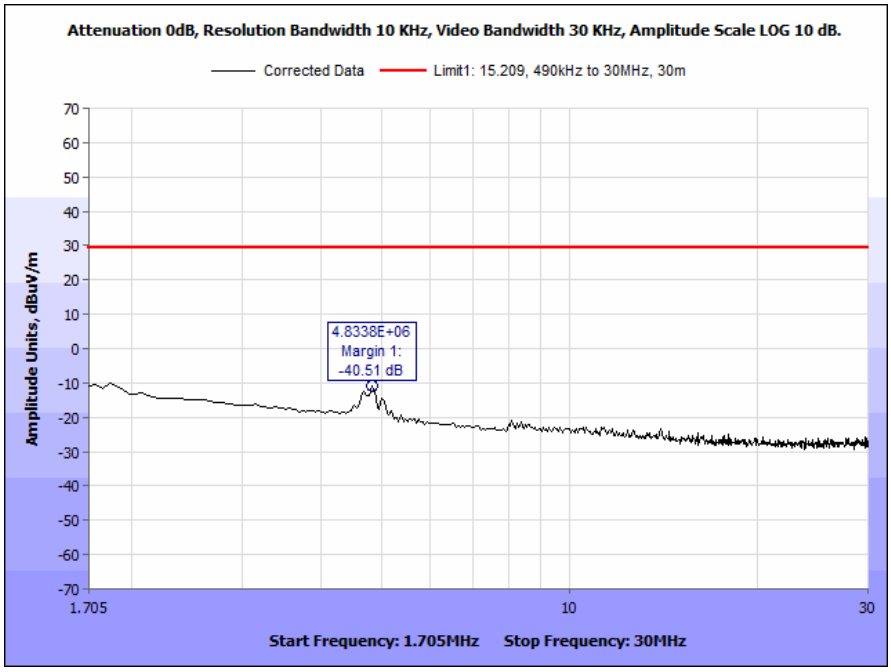



**Plot 18. Radiated Spurious Emissions, Coil Y, Loop 0°, 150 kHz – 490 kHz**

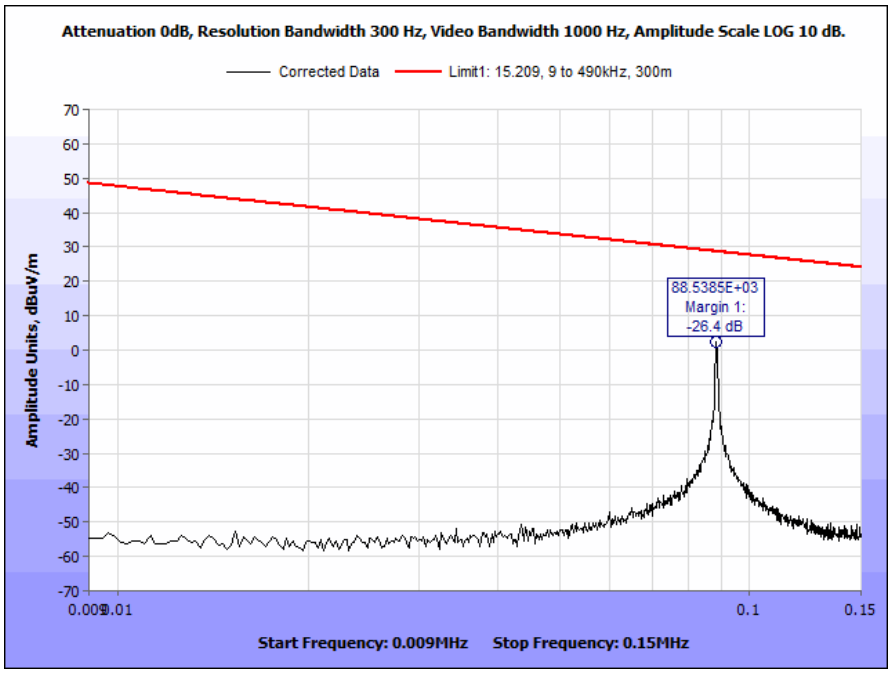
  



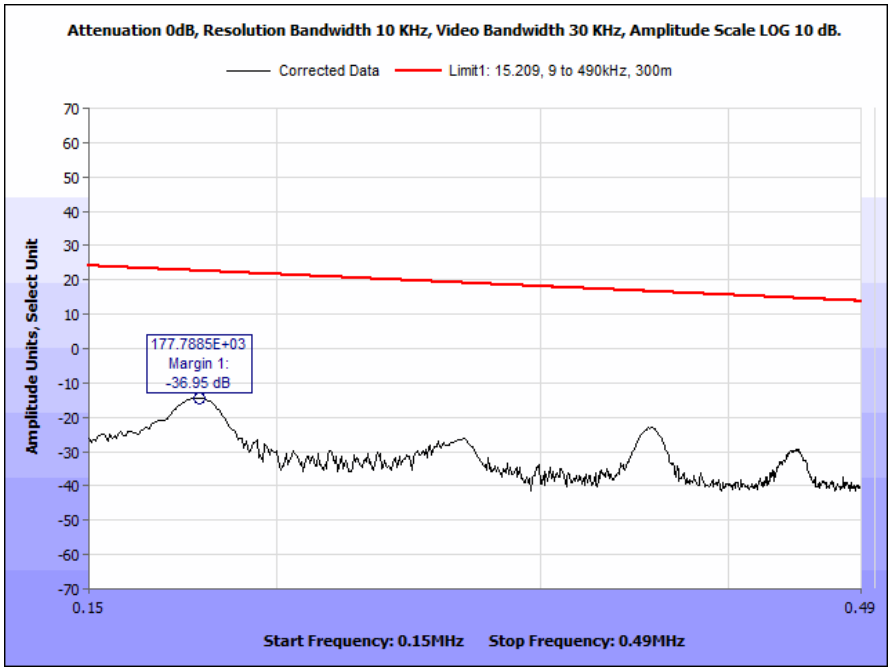

**Plot 19. Radiated Spurious Emissions, Coil Y, Loop 0°, 490 kHz – 1705 kHz**




**Plot 20. Radiated Spurious Emissions, Coil Y, Loop 0°, 1705 kHz – 30 MHz**

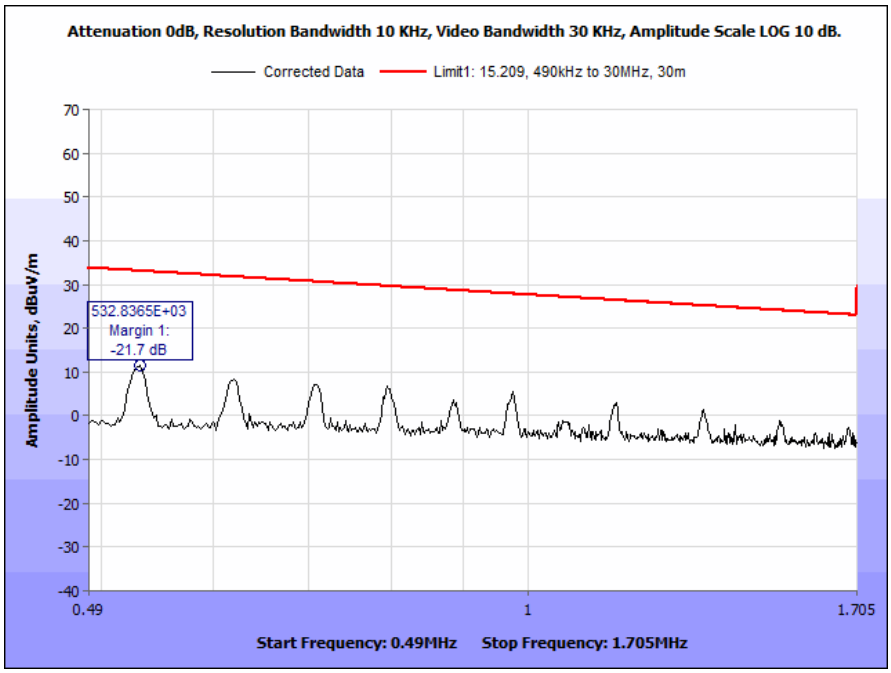



**Plot 21. Radiated Spurious Emissions, Coil Y, Loop 90°, 9 kHz – 150 kHz**

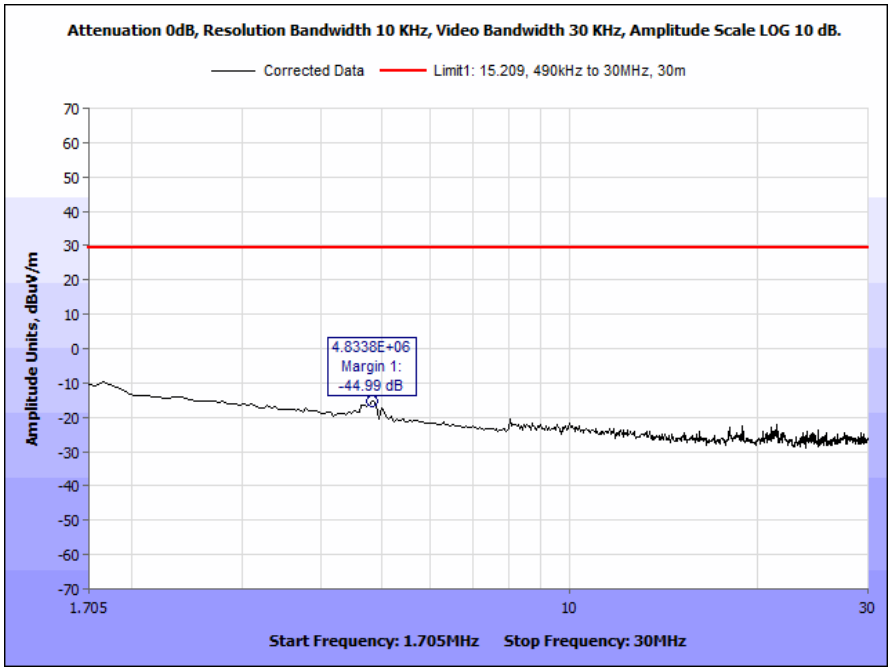



**Plot 22. Radiated Spurious Emissions, Coil Y, Loop 90°, 150 kHz – 490 kHz**

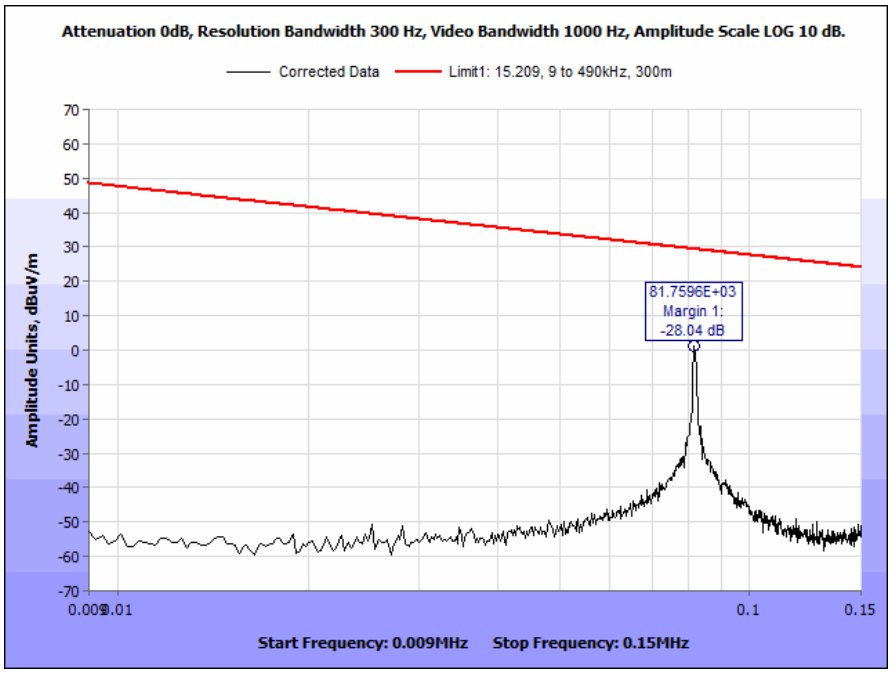



**Plot 23. Radiated Spurious Emissions, Coil Y, Loop 90°, 490 kHz – 1705 kHz**

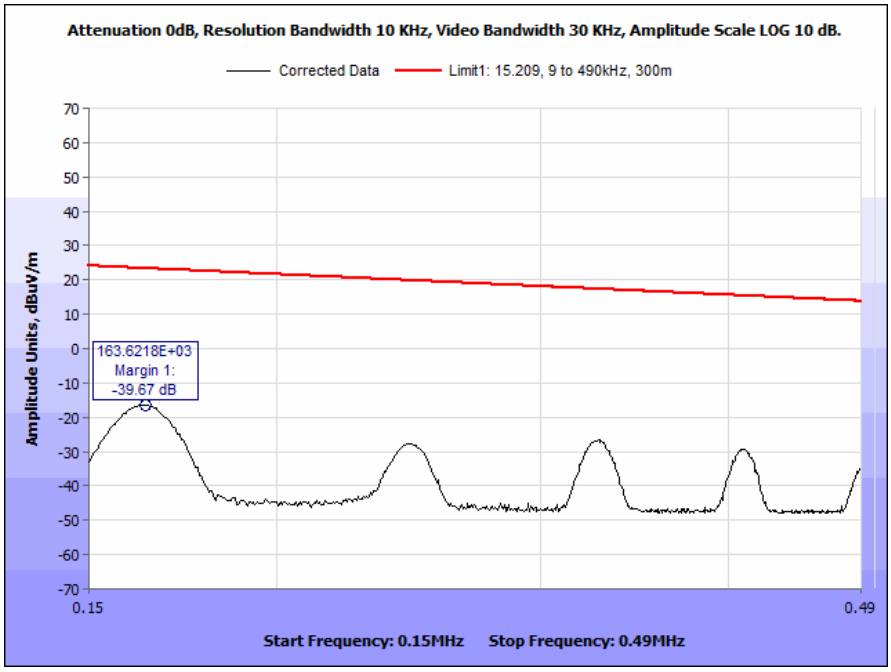



**Plot 24. Radiated Spurious Emissions, Coil Y, Loop 90°, 1705 kHz – 30 MHz**

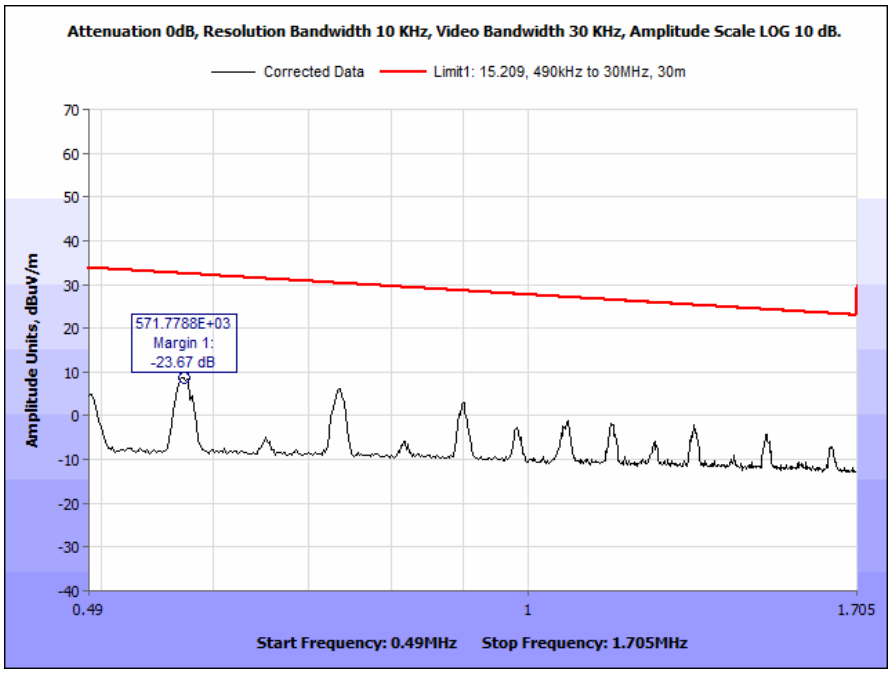



**Plot 25. Radiated Spurious Emissions, Coil Z (hi), Loop 0°, 9 kHz – 150 kHz**

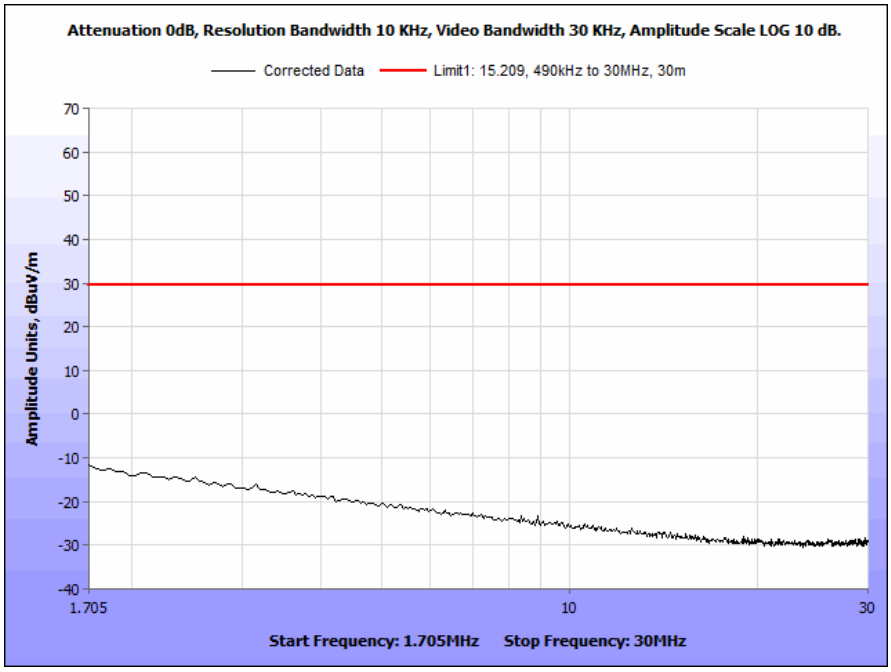



**Plot 26. Radiated Spurious Emissions, Coil Z (hi), Loop 0°, 150 kHz – 490 kHz**

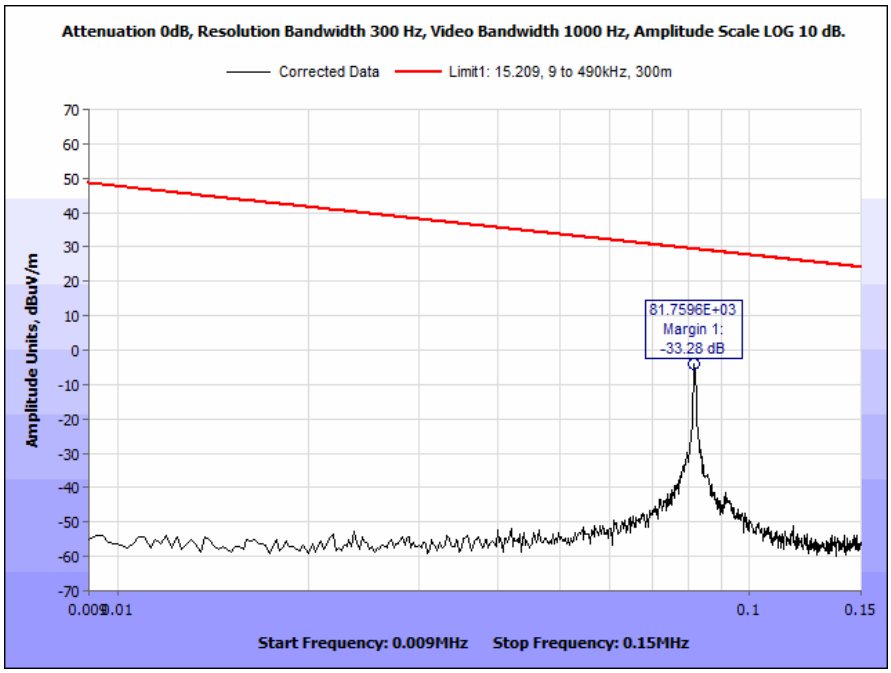



**Plot 27. Radiated Spurious Emissions, Coil Z (hi), Loop 0°, 490 kHz – 1705 kHz**

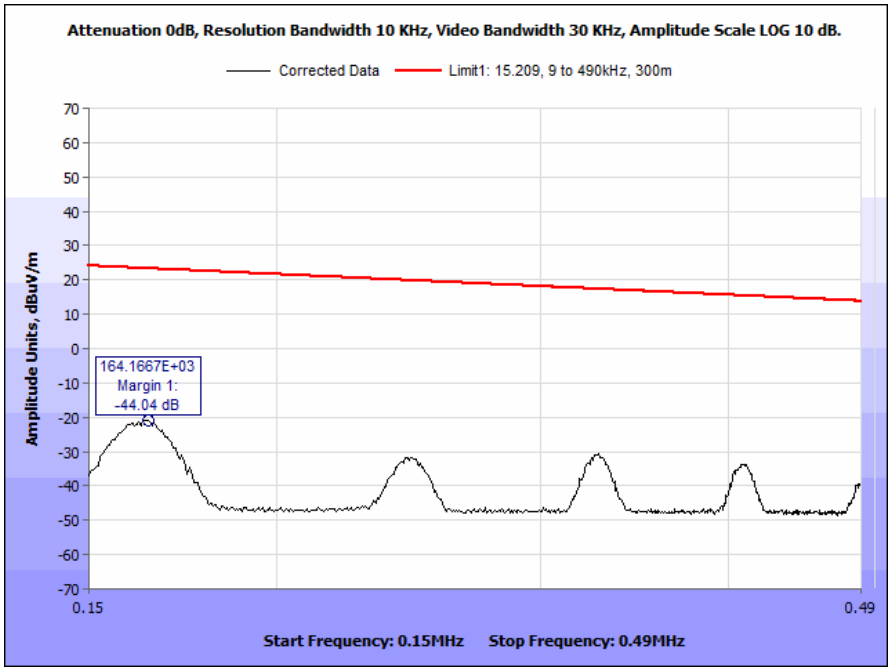



**Plot 28. Radiated Spurious Emissions, Coil Z (hi), Loop 0°, 1705 kHz – 30 MHz**

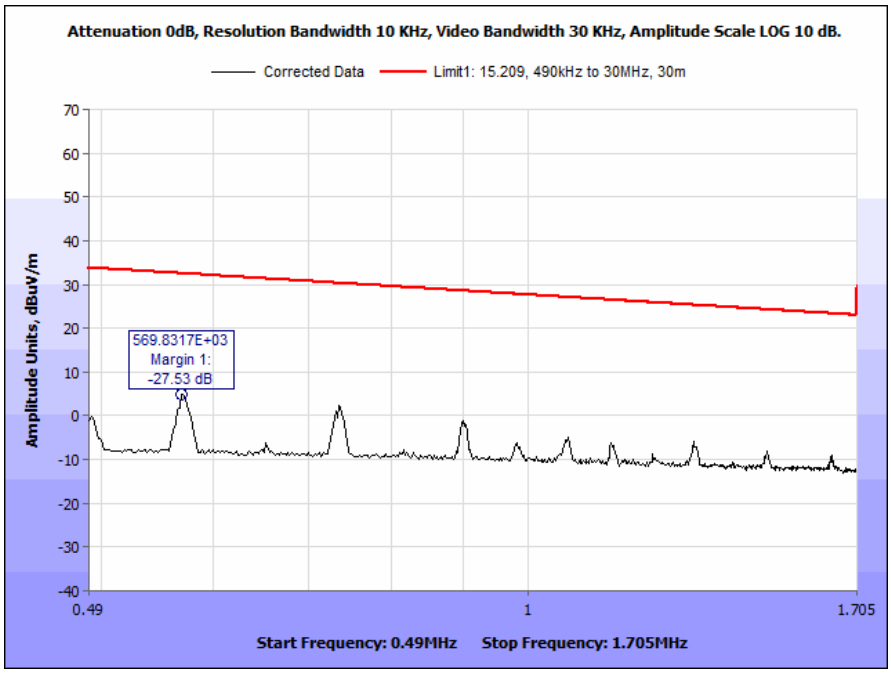
  



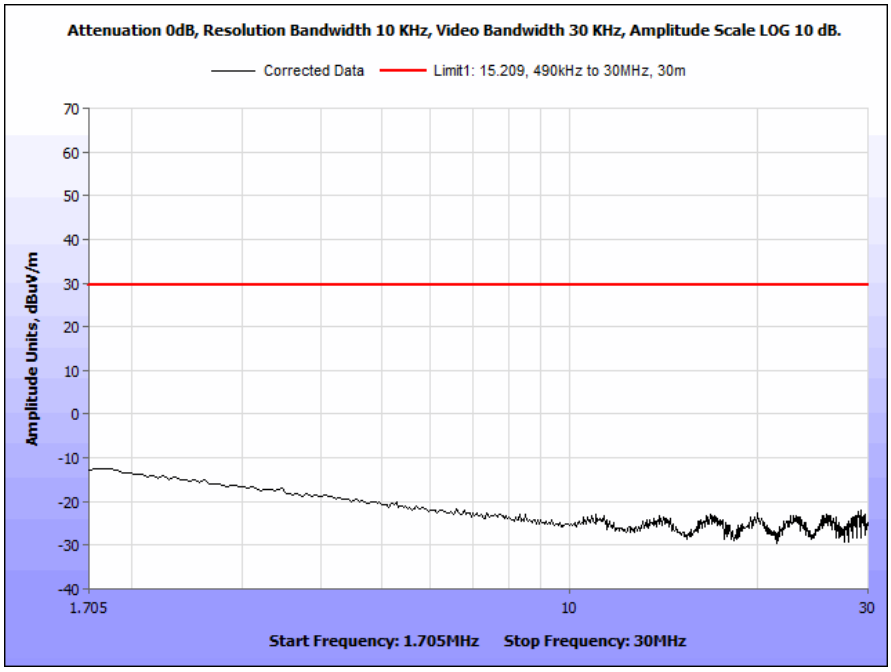

**Plot 29. Radiated Spurious Emissions, Coil Z (hi), Loop 90°, 9 kHz – 150 kHz**




**Plot 30. Radiated Spurious Emissions, Coil Z (hi), Loop 90°, 150 kHz – 490 kHz**

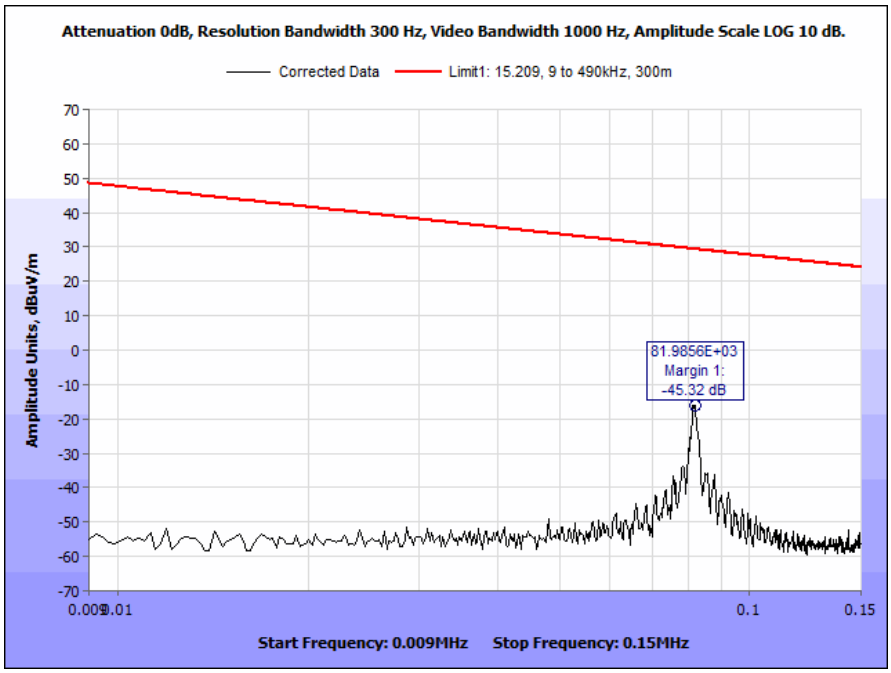



**Plot 31. Radiated Spurious Emissions, Coil Z (hi), Loop 90°, 490 kHz – 1705 kHz**

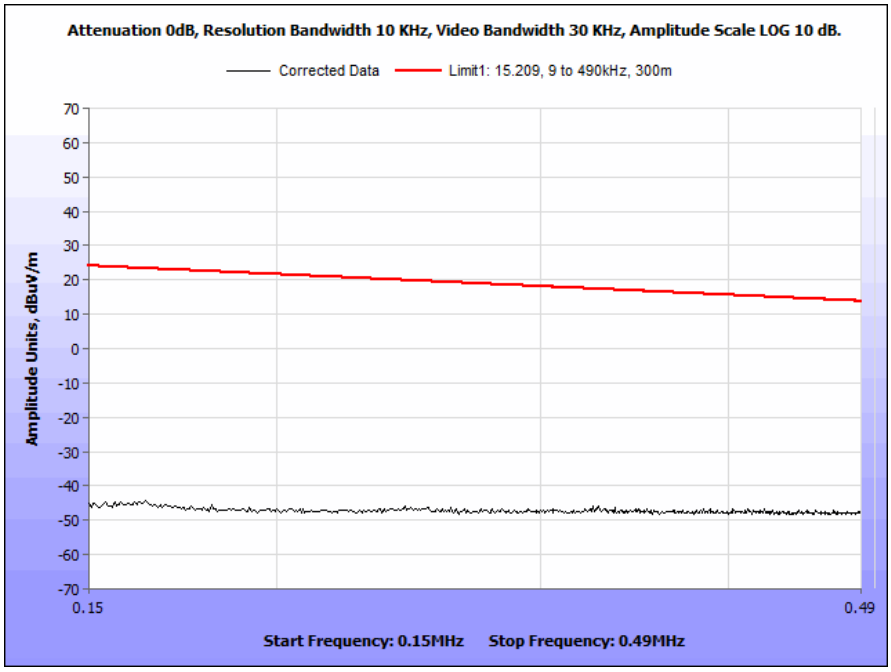



**Plot 32. Radiated Spurious Emissions, Coil Z (hi), Loop 90°, 1705 kHz – 30 MHz**

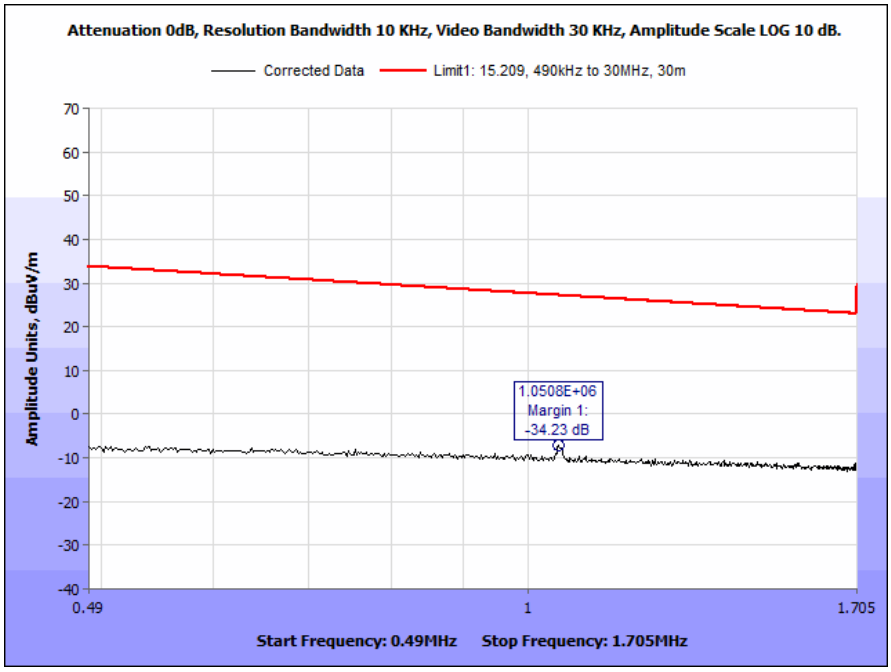
  



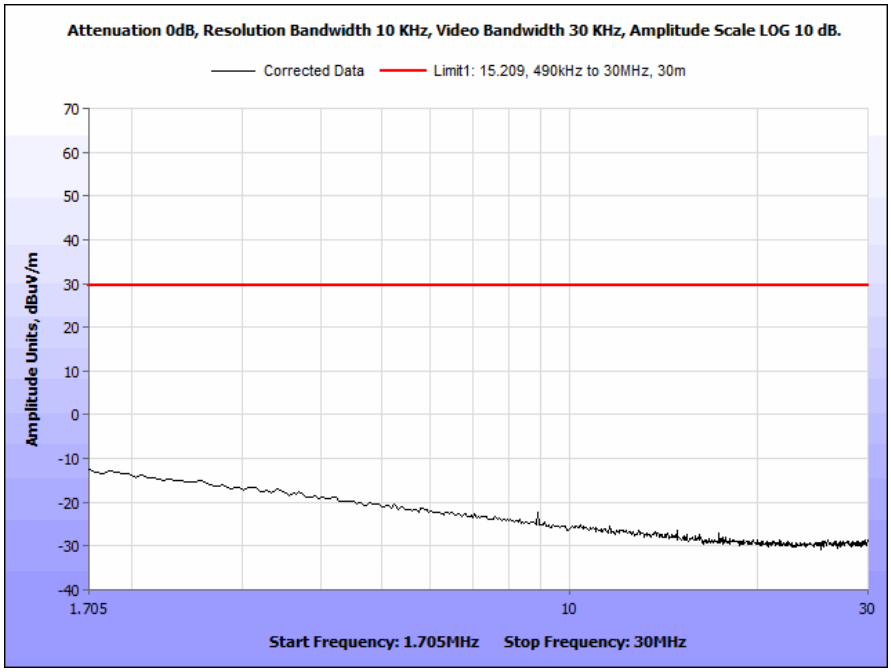

**Plot 33. Radiated Spurious Emissions, Coil Z (lo), Loop 0°, 9 kHz – 150 kHz**



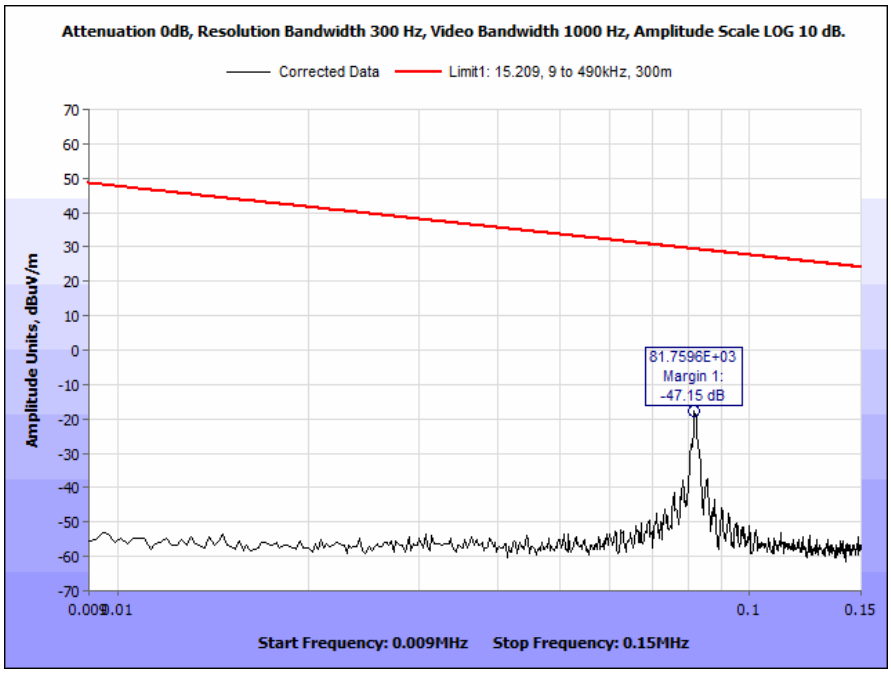

**Plot 34. Radiated Spurious Emissions, Coil Z (lo), Loop 0°, 150 kHz – 490 kHz**



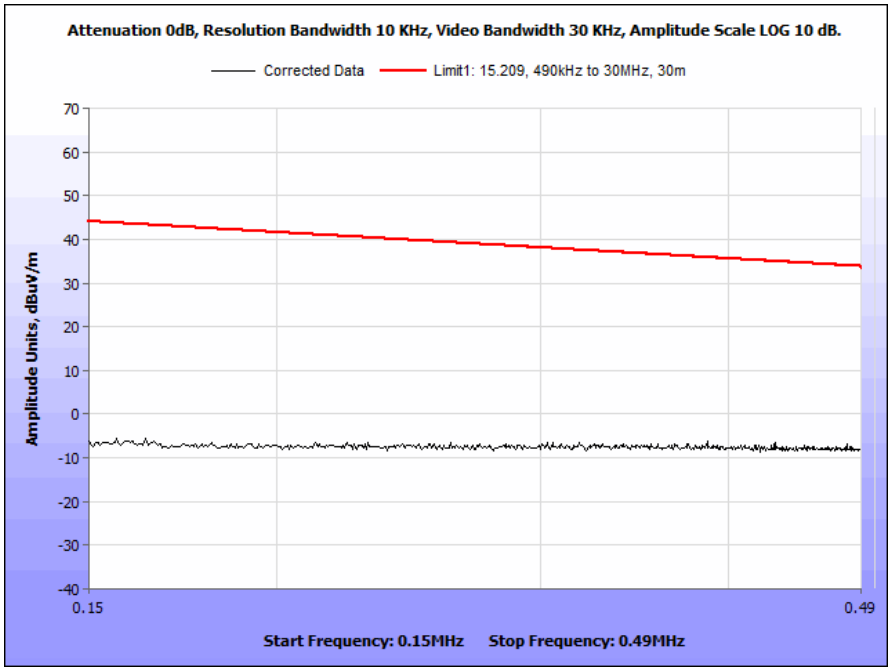

**Plot 35. Radiated Spurious Emissions, Coil Z (lo), Loop 0°, 490 kHz – 1705 kHz**



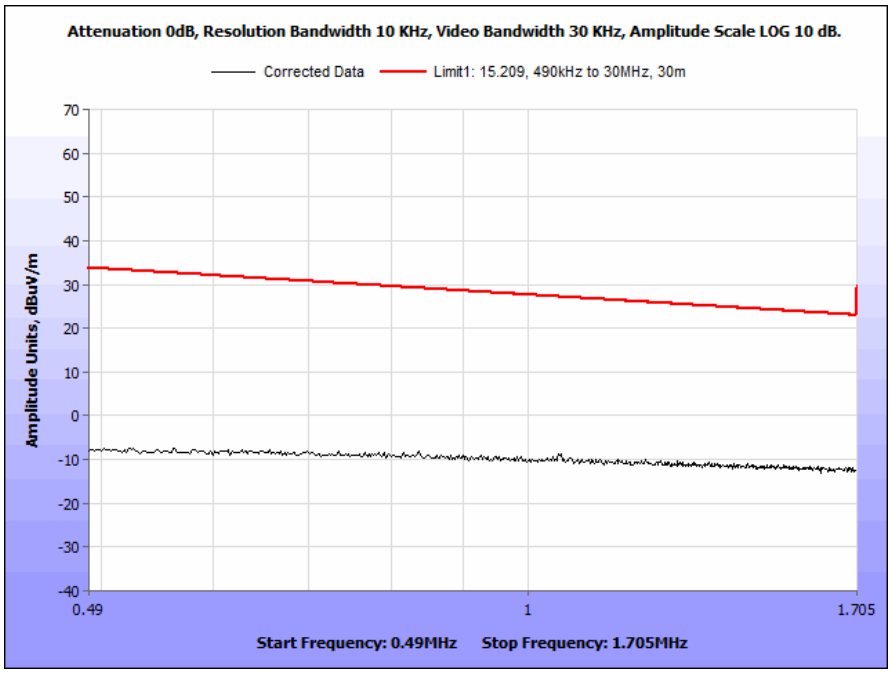

**Plot 36. Radiated Spurious Emissions, Coil Z (lo), Loop 0°, 1705 kHz – 30 MHz**



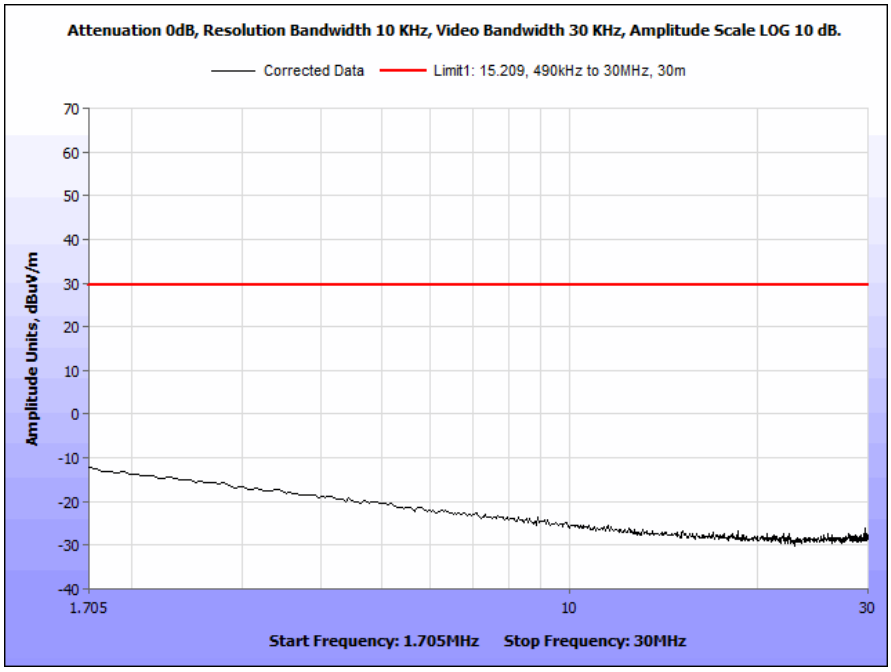

**Plot 37. Radiated Spurious Emissions, Coil Z (lo), Loop 90°, 9 kHz – 150 kHz**




**Plot 38. Radiated Spurious Emissions, Coil Z (lo), Loop 90°, 150 kHz – 490 kHz**




**Plot 39. Radiated Spurious Emissions, Coil Z (lo), Loop 90°, 490 kHz – 1705 kHz**

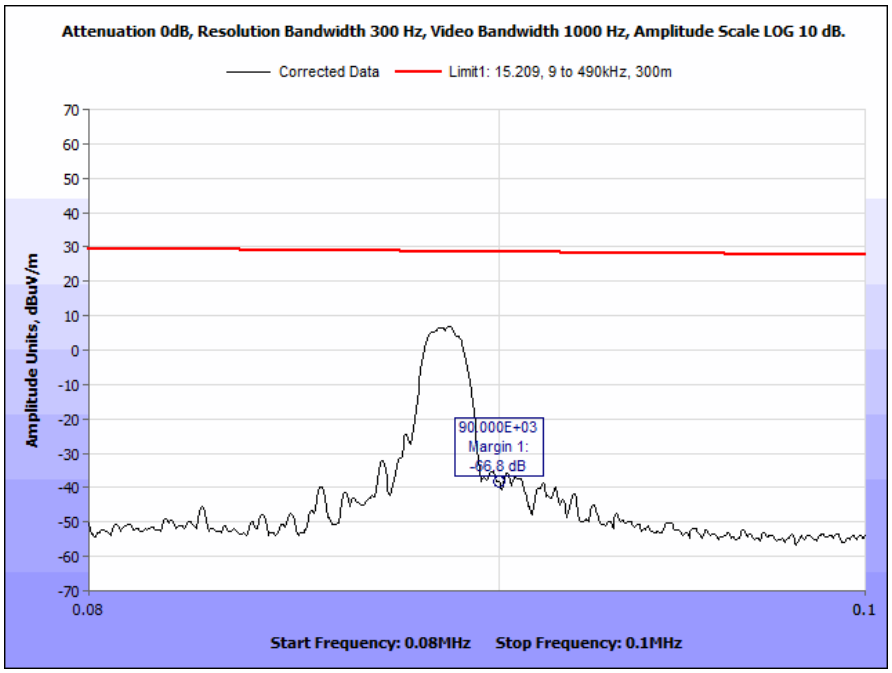



**Plot 40. Radiated Spurious Emissions, Coil Z (lo), Loop 90°, 1705 kHz – 30 MHz**

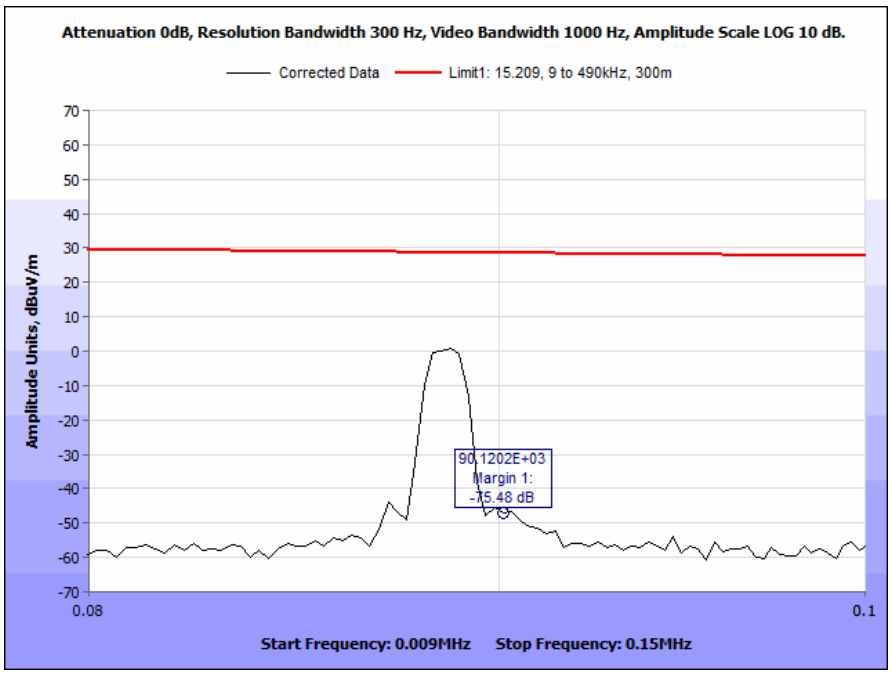
  

## Radiated Band Edge Measurements

**Test Procedures:** The transmitter was turned on. Measurements were performed on the two available channels. The EUT was rotated a full 360° and with the shielded loop antenna at parallel and perpendicular polarities. Plots shown are corrected for both antenna correction factor and distance and compared to the appropriate limit line.

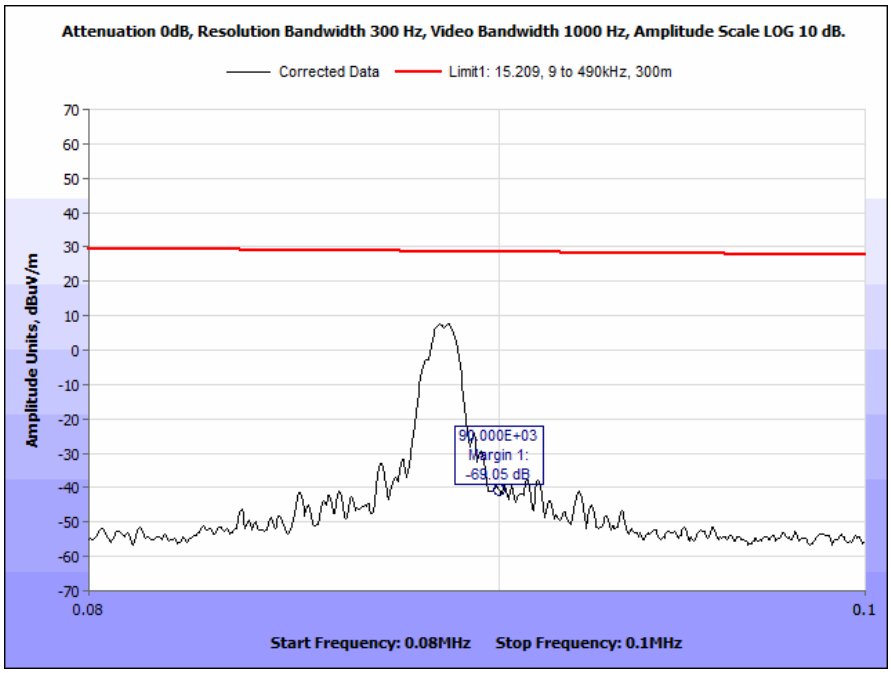



**Plot 41. Radiated Spurious Emissions, Coil X, Loop 0°, 9 kHz – 150 kHz, Band Edge**

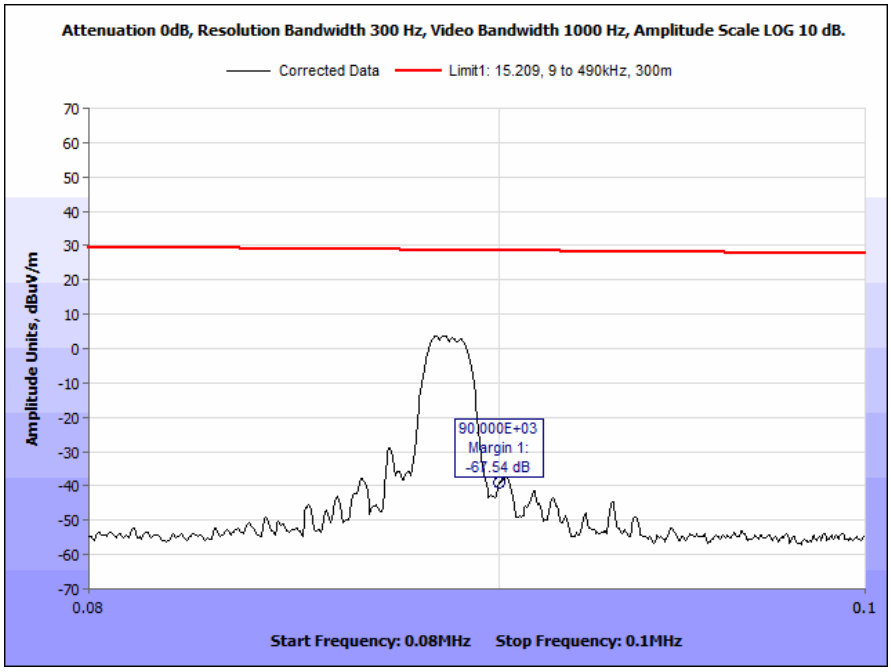



**Plot 42. Radiated Spurious Emissions, Coil X, Loop 90°, 9 kHz – 150 kHz, Band Edge**

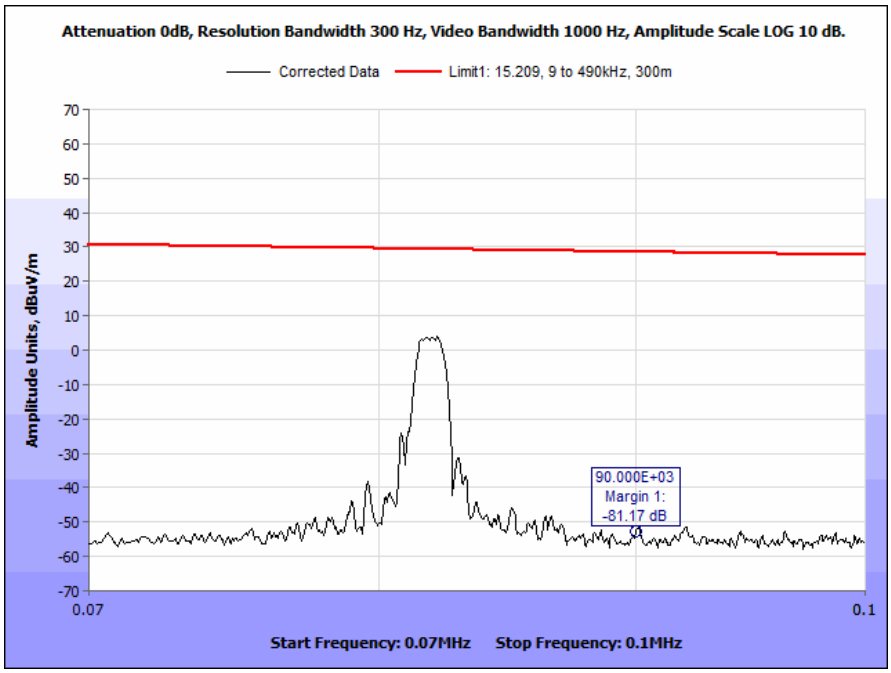



**Plot 43. Radiated Spurious Emissions, Coil Y, Loop 0°, 9 kHz – 150 kHz, Band Edge**

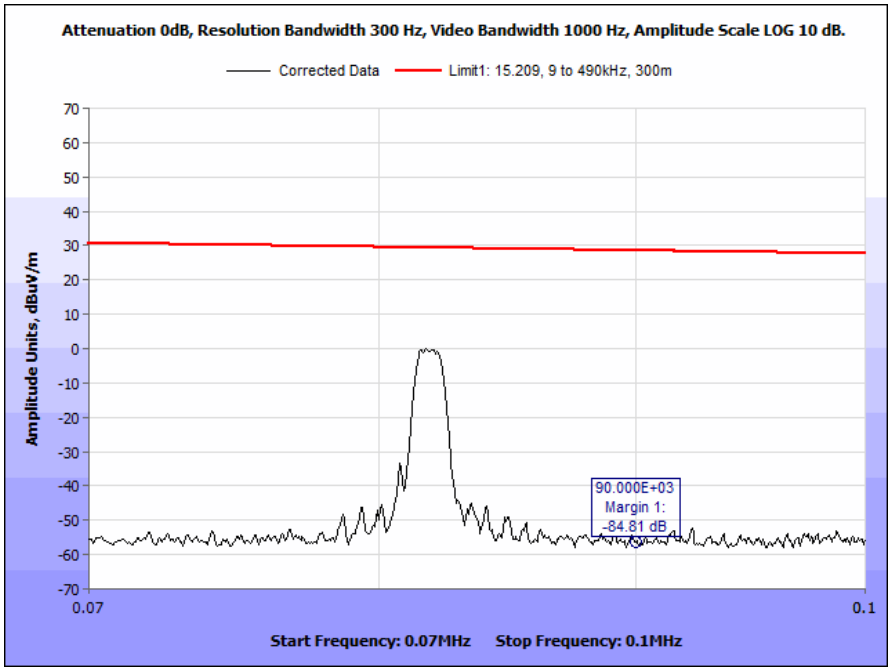



**Plot 44. Radiated Spurious Emissions, Coil Y, Loop 90°, 9 kHz – 150 kHz, Band Edge**

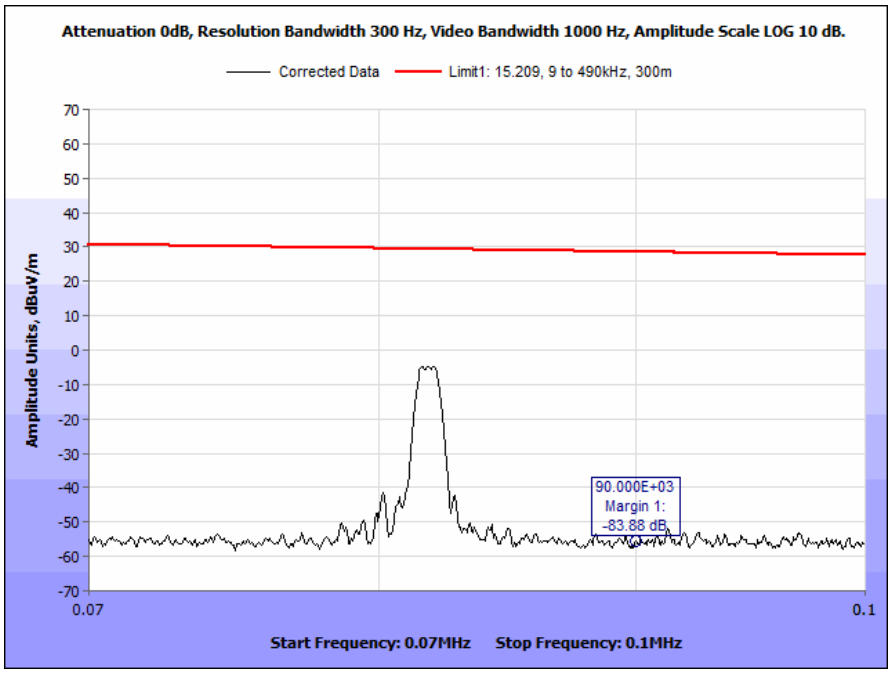



**Plot 45. Radiated Spurious Emissions, Coil Z (hi), Loop 0°, 9 kHz – 150 kHz, Band Edge**

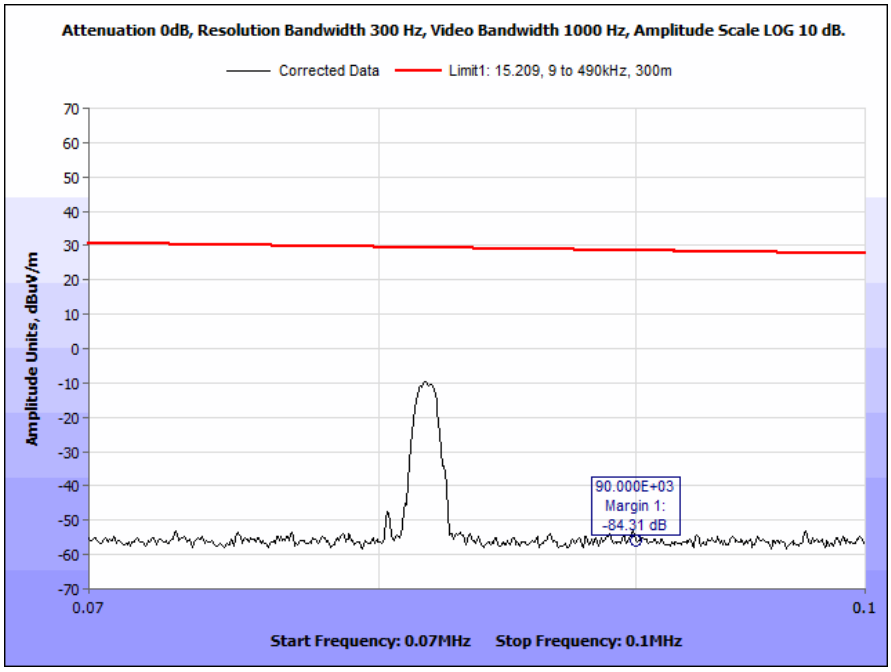



**Plot 46. Radiated Spurious Emissions, Coil Z (hi), Loop 90°, 9 kHz – 150 kHz, Band Edge**




**Plot 47. Radiated Spurious Emissions, Coil Z (lo), Loop 0°, 9 kHz – 150 kHz, Band Edge**




**Plot 48. Radiated Spurious Emissions, Coil Z (lo), Loop 90°, 9 kHz – 150 kHz, Band Edge**

# 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 |
|---|---|---|---|---|---|
| 1A1083 | EMI RECEIVER | ROHDE & SCHWARZ | ESU40 | 08/02/2016 | 09/02/2017 |
| 1A1176 | ACTIVE LOOP ANTENNA | ETS | 6502 | 11/19/2016 | 05/19/2018 |
| 1A1106A | 10M CHAMBER (FCC) | ETS | SEMI-ANECHOIC | 03/31/2017 | 03/31/2019 |
| 1A1079 | CONDUCTED COMB GENERATOR | COM-POWER CORP | CGC-255 | SEE NOTE | |
| 1A1044 | GENERATOR | COM-POWER CORP | CG-520 | SEE NOTE | |
| 1A1073 | MULTI DEVICE CONTROLLER | ETS EMCO | 2090 | SEE NOTE | |
| 1A1074 | SYSTEM CONTROLLER | PANASONIC | WV-CU101 | SEE NOTE | |
| 1A1075 | SYSTEM CONTROLLER | PANASONIC | WV-CU101 | SEE NOTE | |
| 1A1080 | MULTI DEVICE CONTROLLER | ETS EMCO | 2090 | SEE NOTE | |
| 1A1099 | GENERATOR | COM-POWER CORP | CGO-51000 | SEE NOTE | |

**Table 10. 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