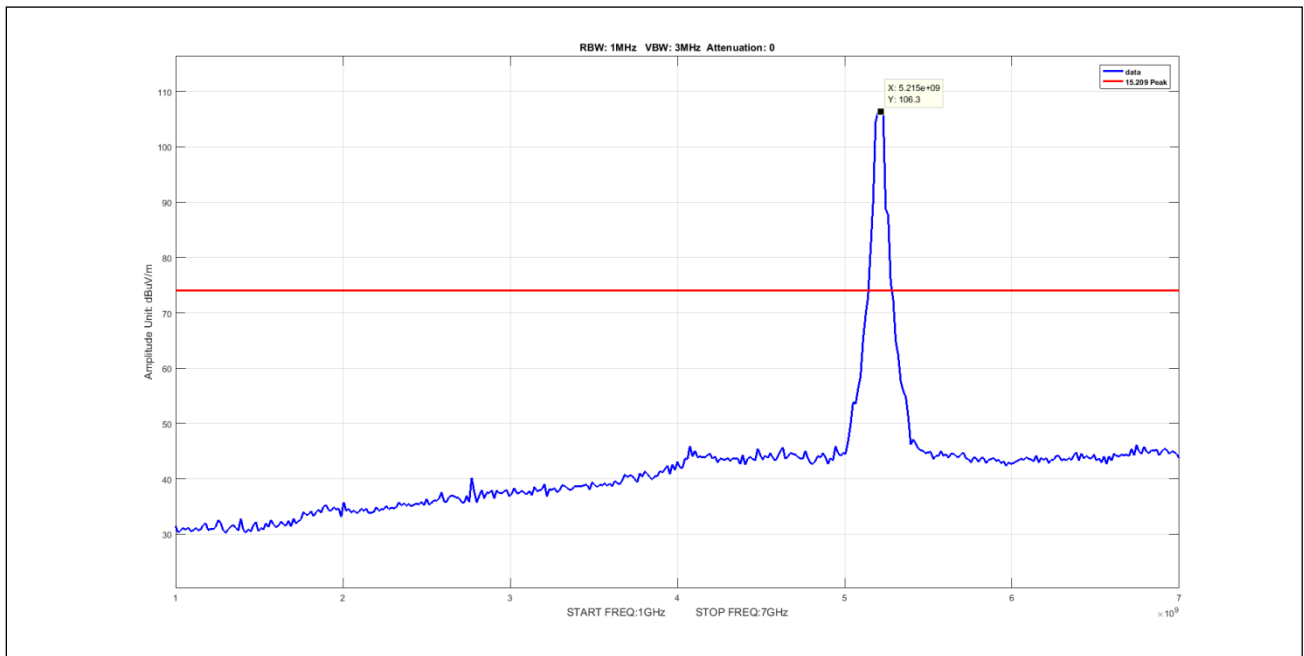
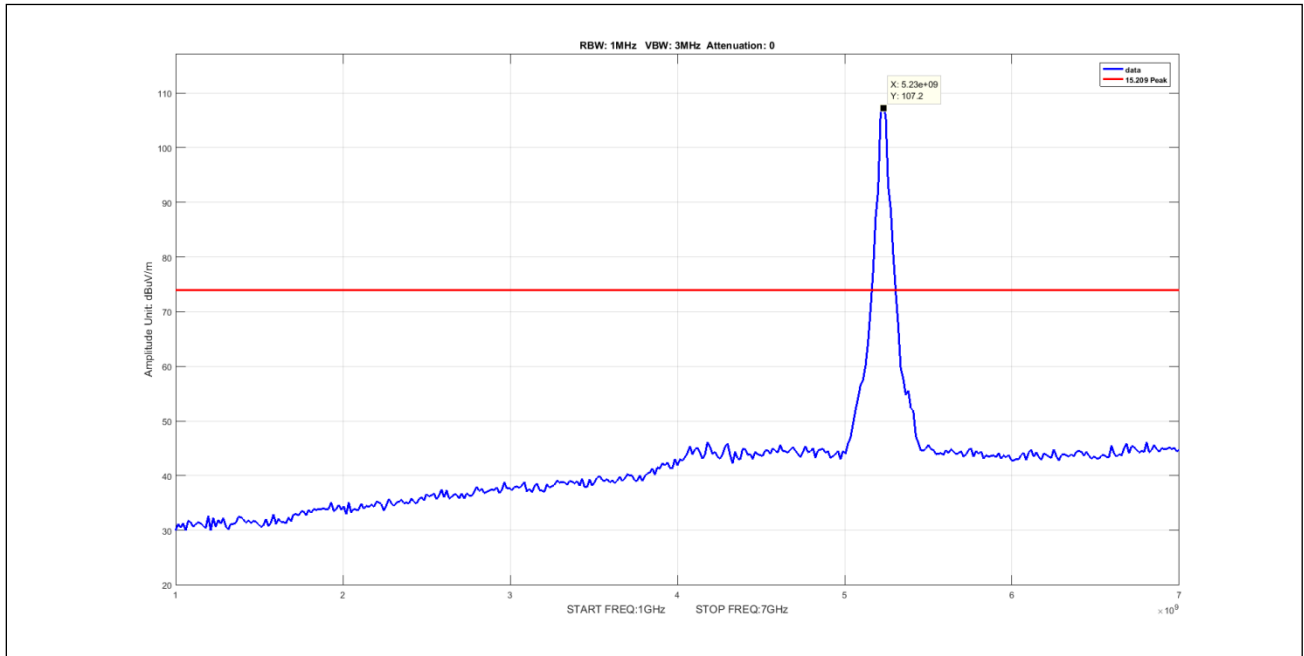


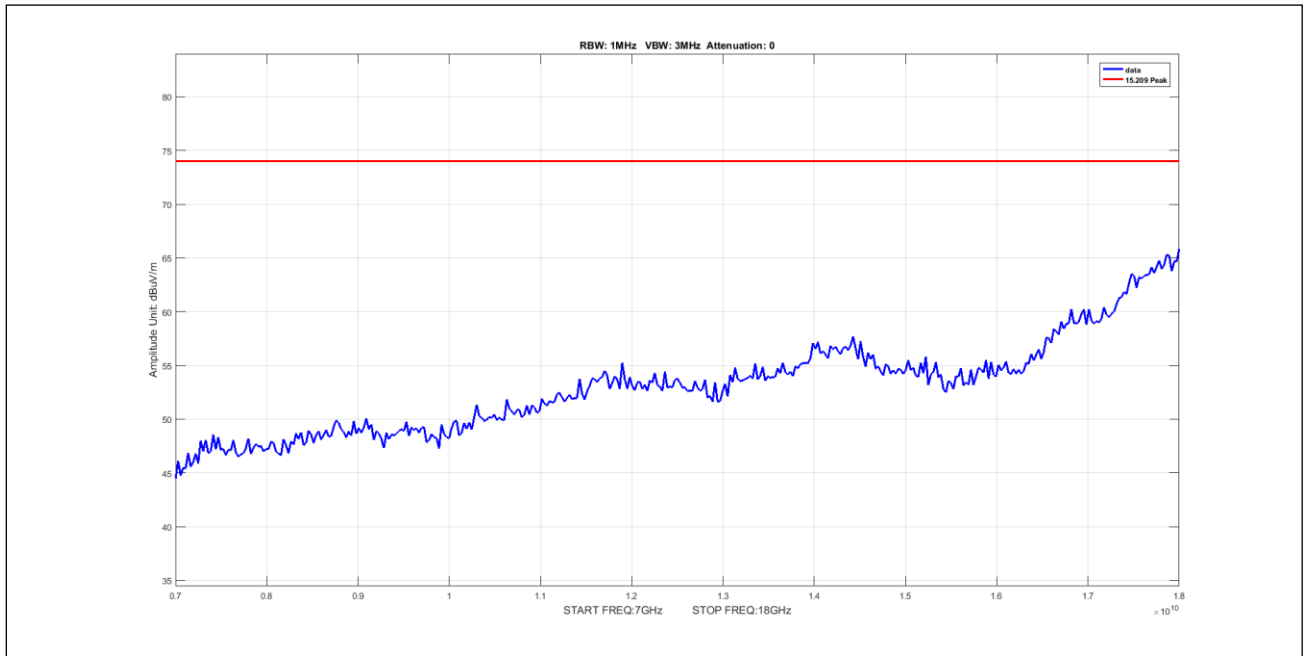
Plot 643. Undesirable Emissions, 90Sector Peak 1-7GHz 40M 5170 pow0



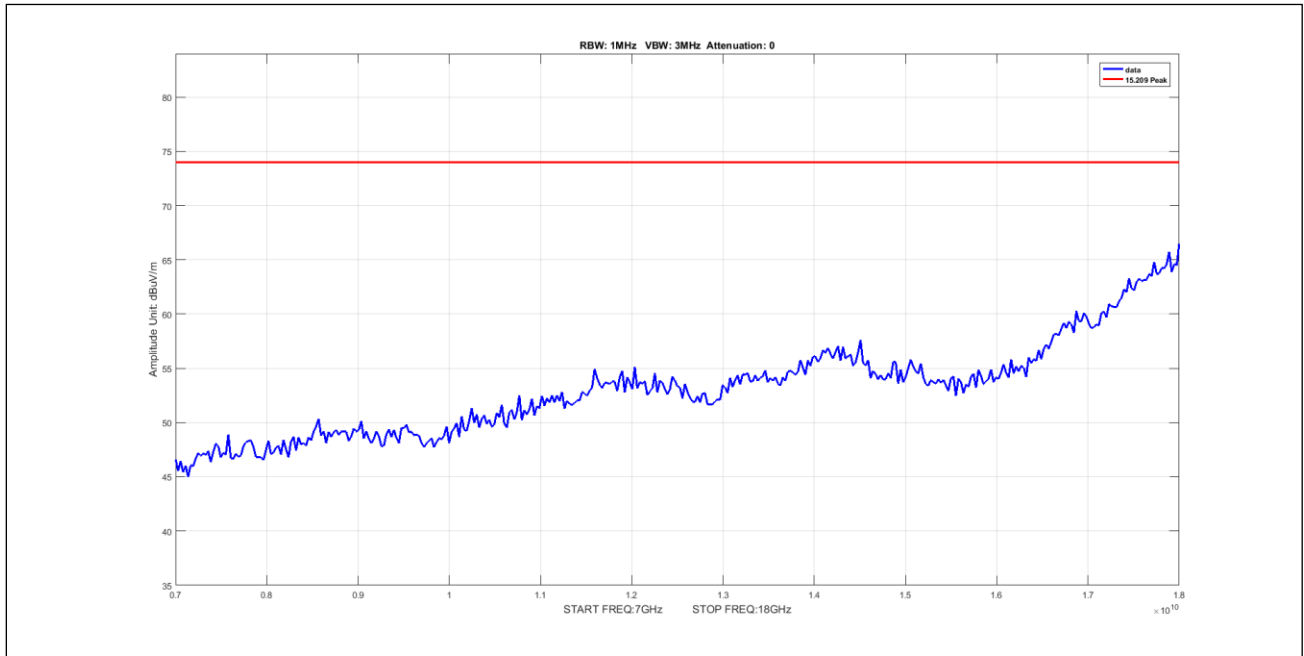
Plot 644. Undesirable Emissions, 90Sector Peak 1-7GHz 40M 5210 pow16



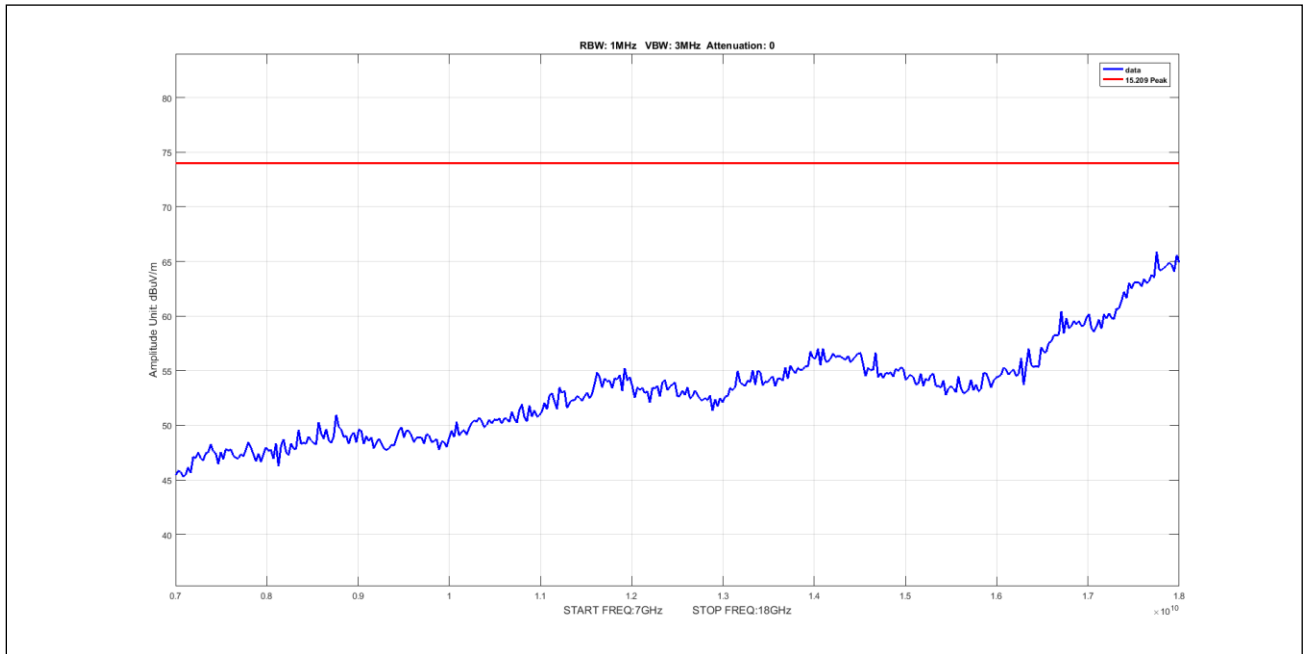
Plot 645. Undesirable Emissions, 90Sector Peak 1-7GHz 40M 5230 pow16



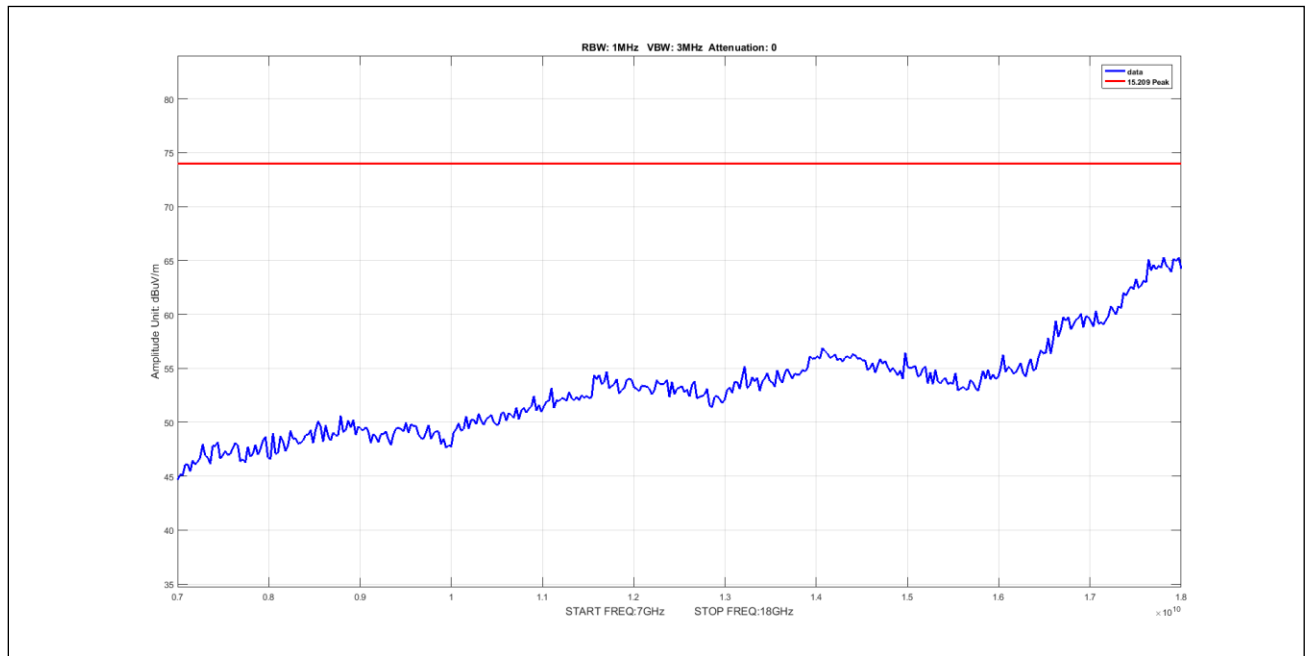
Plot 646. Undesirable Emissions, 90Sector Peak 7-18GHz 5M 5170 pow7



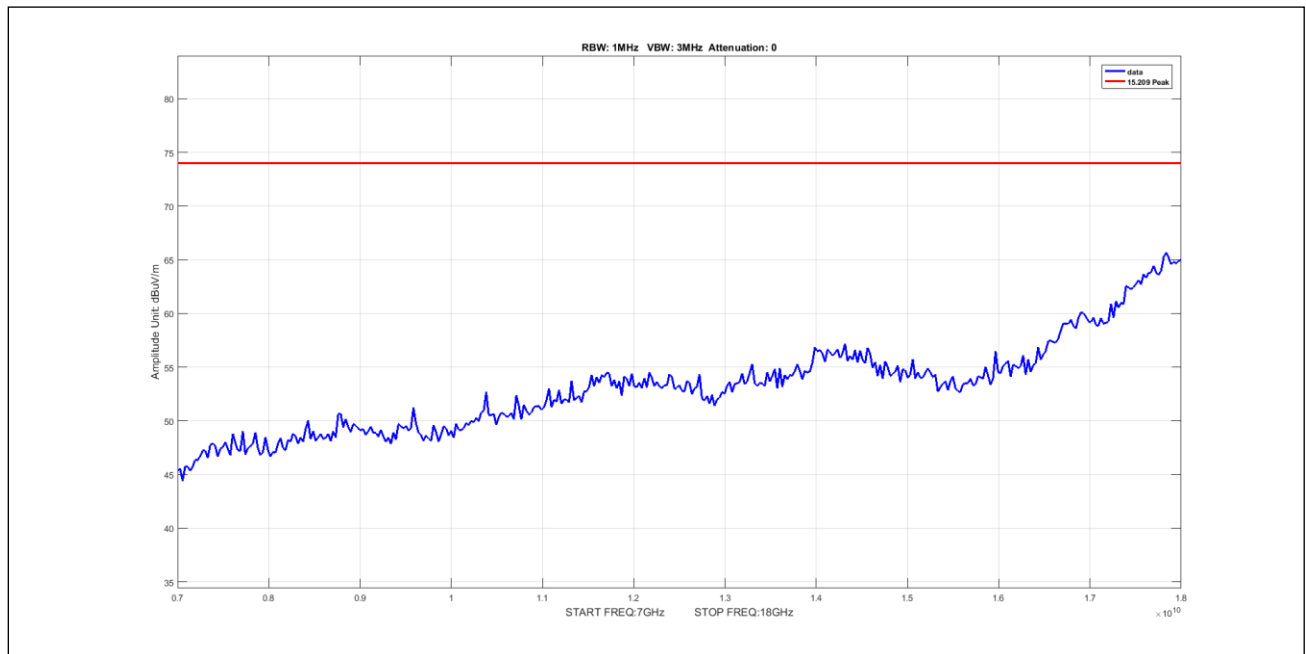
Plot 647. Undesirable Emissions, 90Sector Peak 7-18GHz 5M 5210 pow6



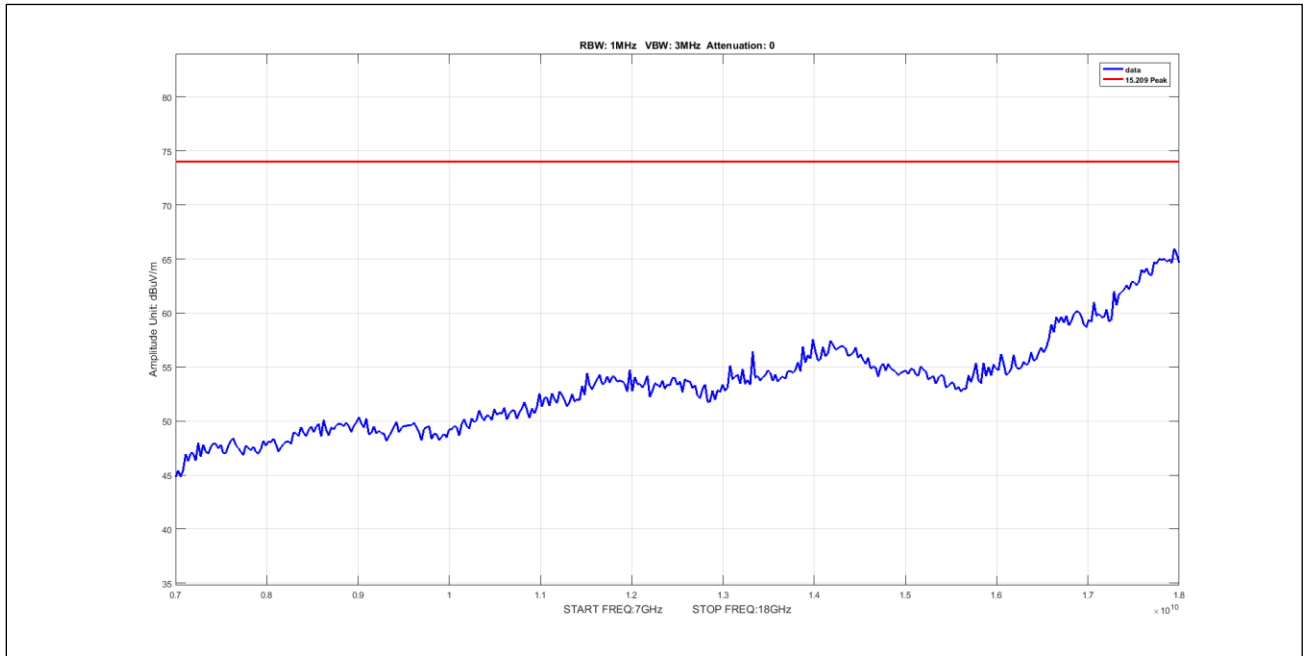
Plot 648. Undesirable Emissions, 90Sector Peak 7-18GHz 5M 5247.5 pow7



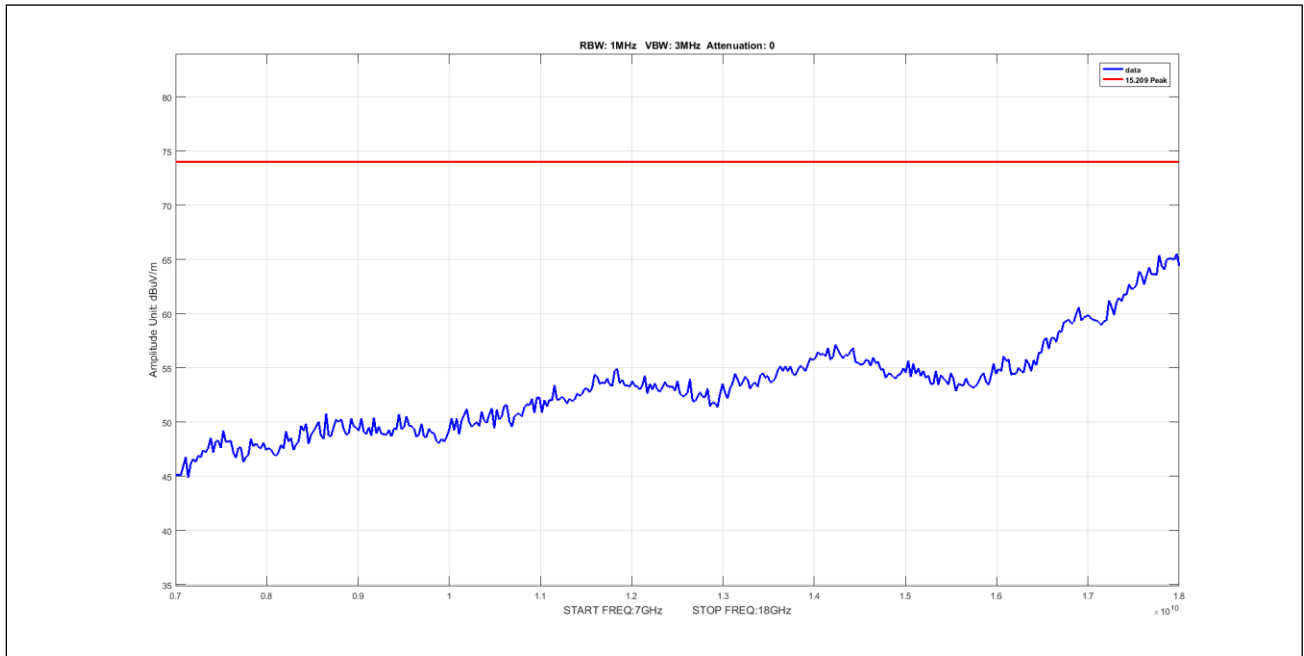
Plot 649. Undesirable Emissions, 90Sector Peak 7-18GHz 10M 5170 pow10



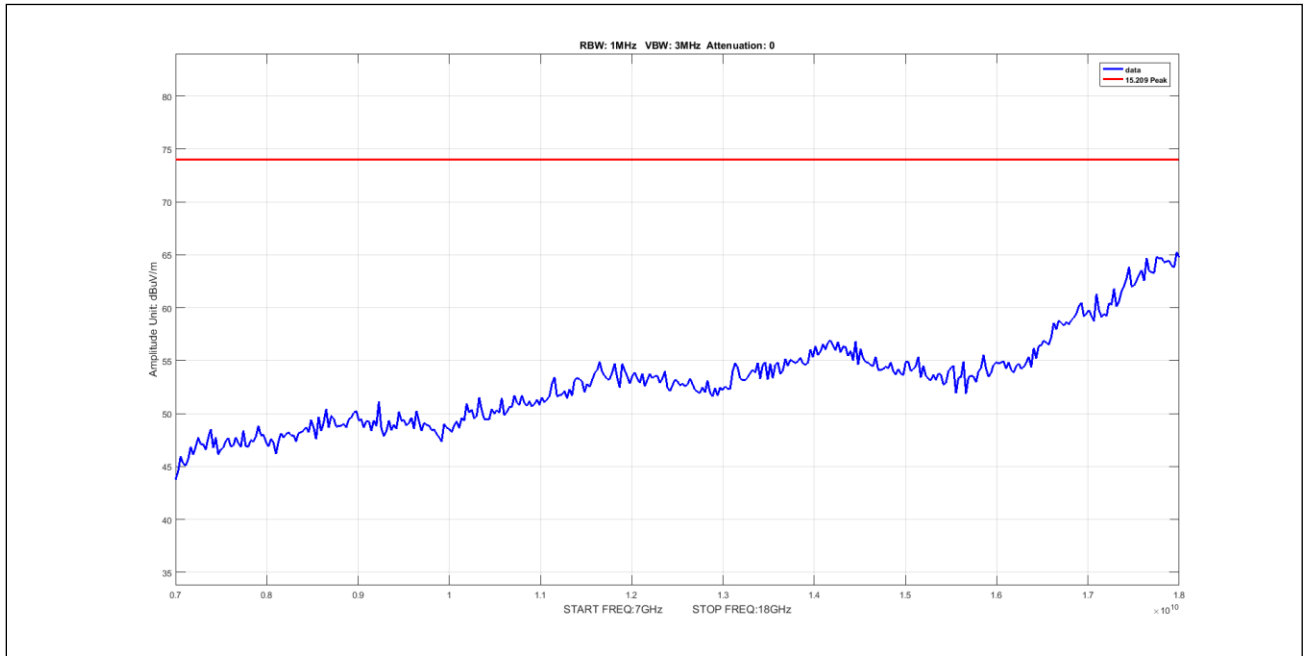
Plot 650. Undesirable Emissions, 90Sector Peak 7-18GHz 10M 5210 pow9



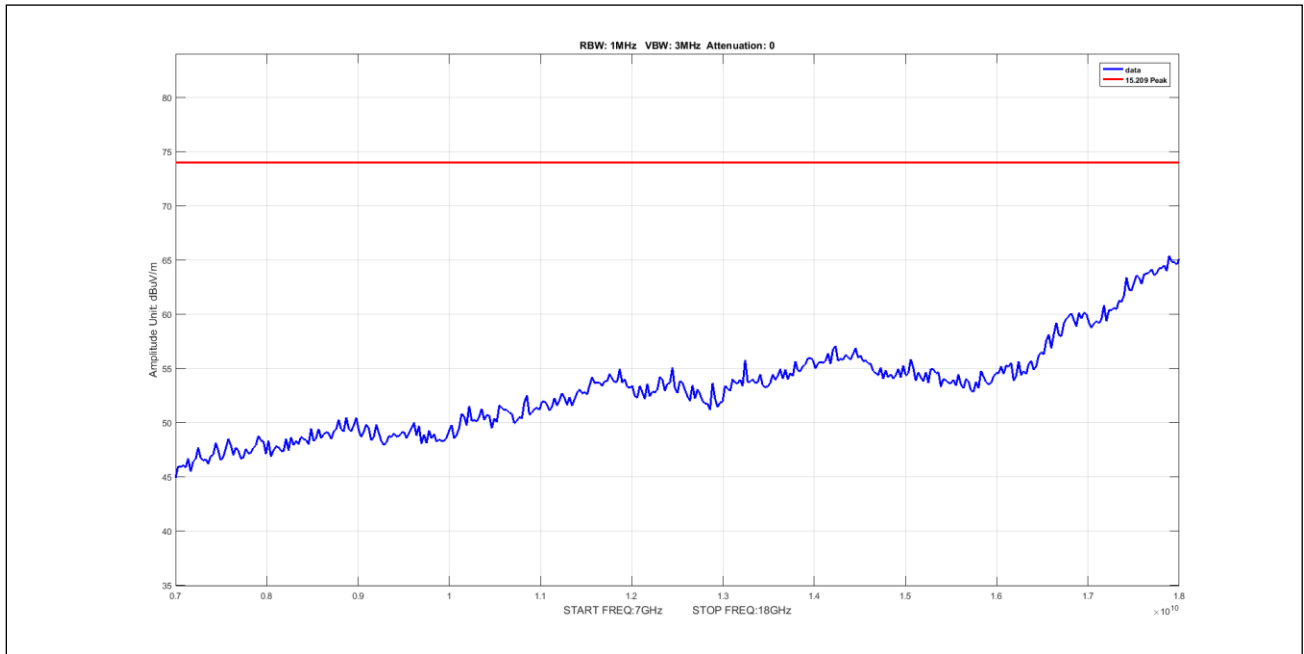
Plot 651. Undesirable Emissions, 90Sector Peak 7-18GHz 10M 5245 pow9



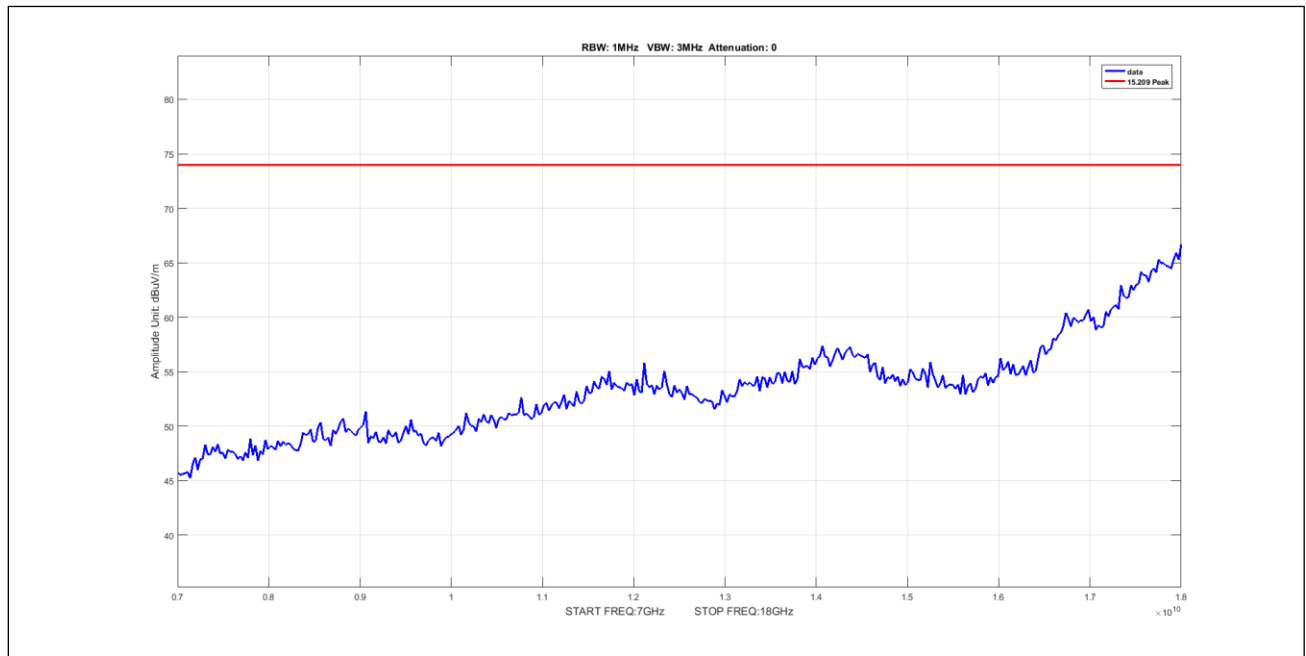
Plot 652. Undesirable Emissions, 90Sector Peak 7-18GHz 20M 5170 pow6



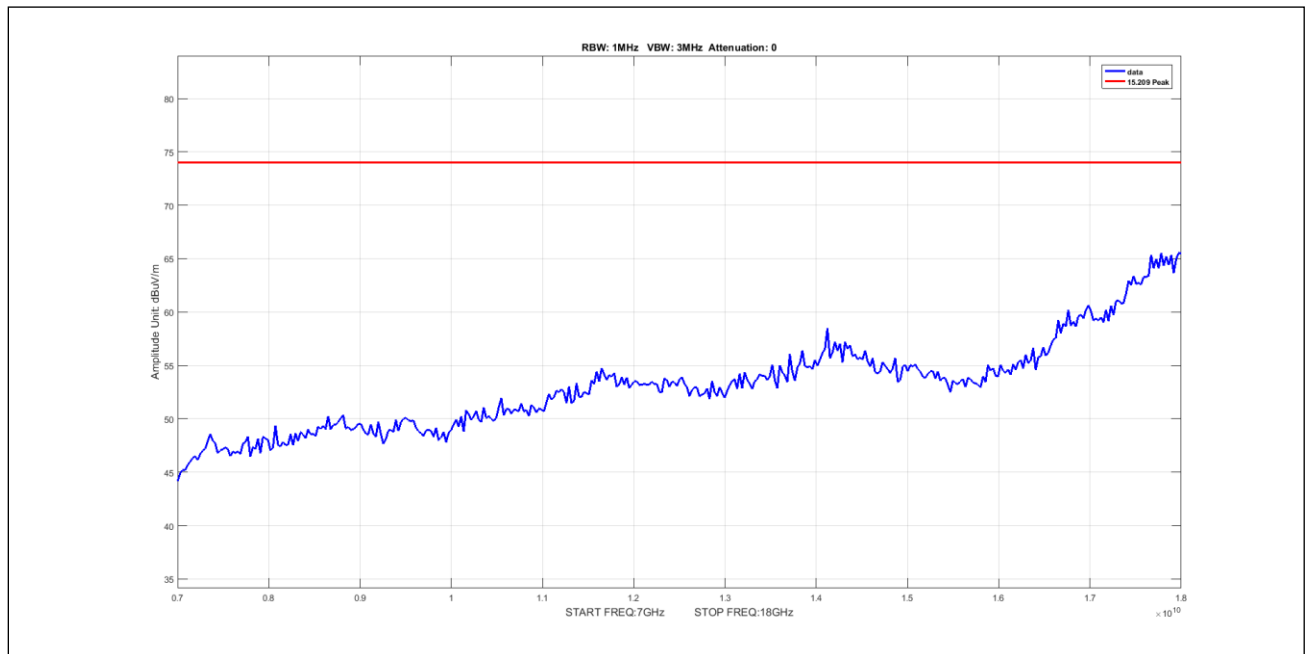
Plot 653. Undesirable Emissions, 90Sector Peak 7-18GHz 20M 5210 pow12



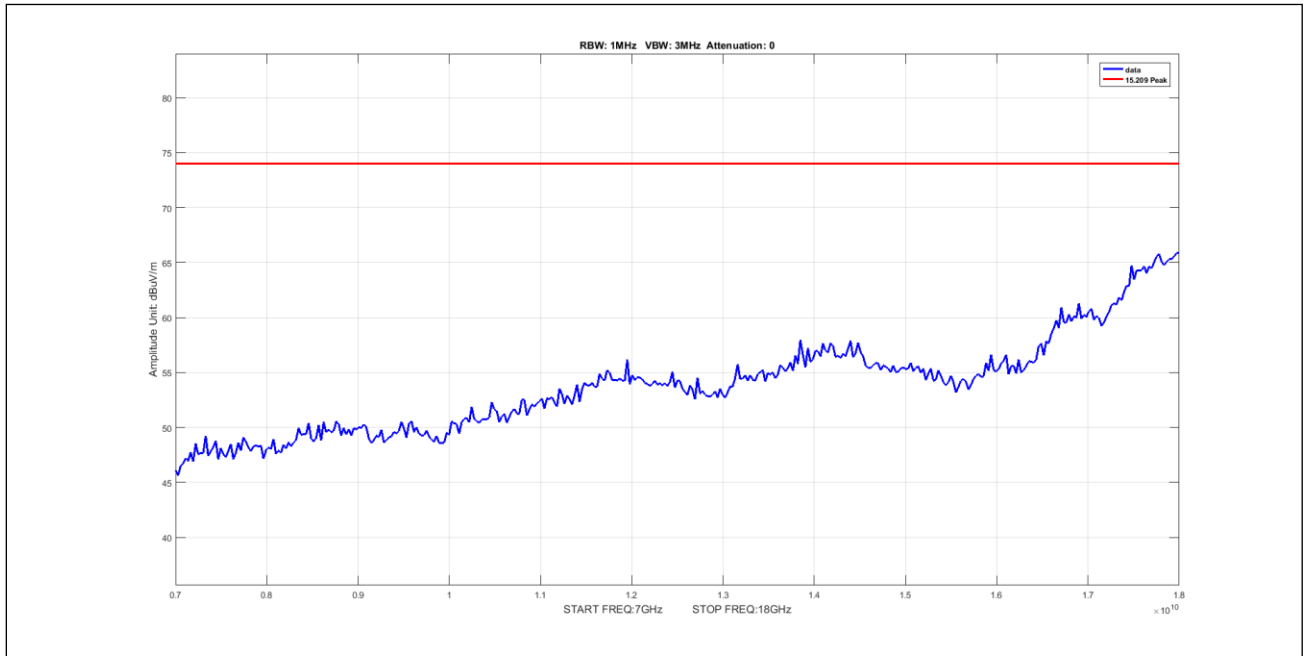
Plot 654. Undesirable Emissions, 90Sector Peak 7-18GHz 20M 5240 pow12



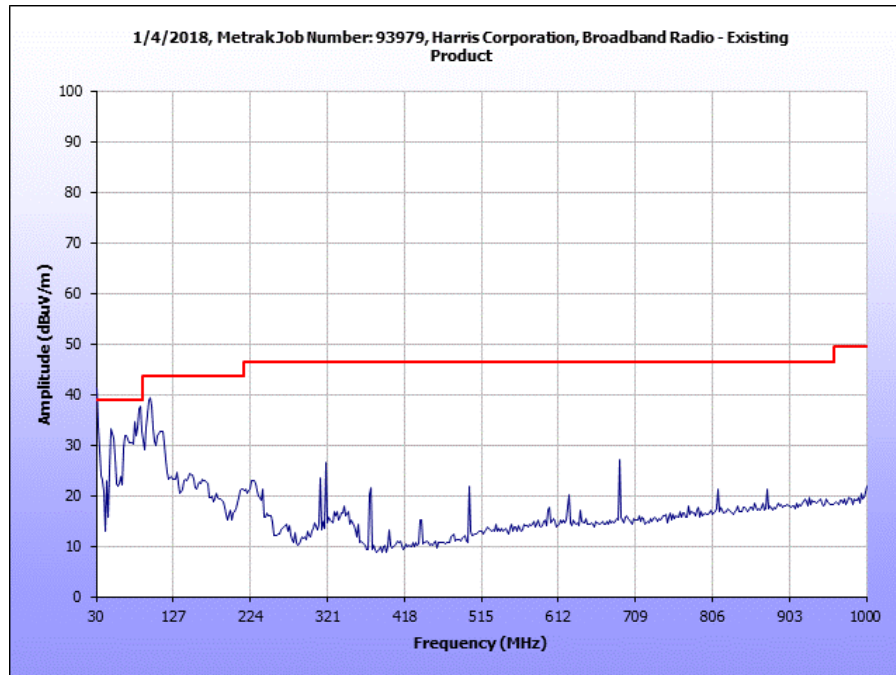
Plot 655. Undesirable Emissions, 90Sector Peak 7-18GHz 40M 5170 pow0



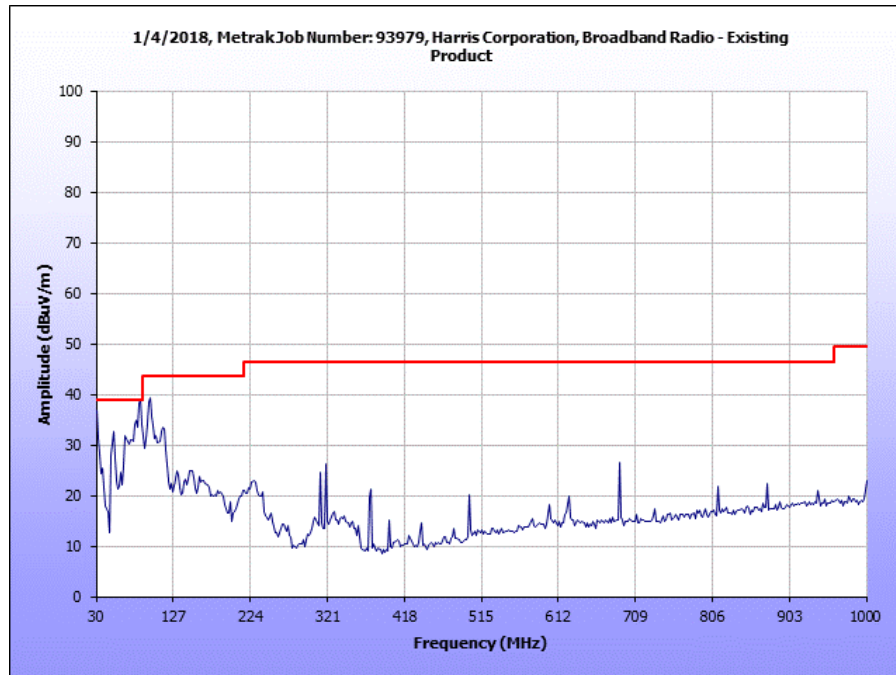
Plot 656. Undesirable Emissions, 90Sector Peak 7-18GHz 40M 5210 pow16



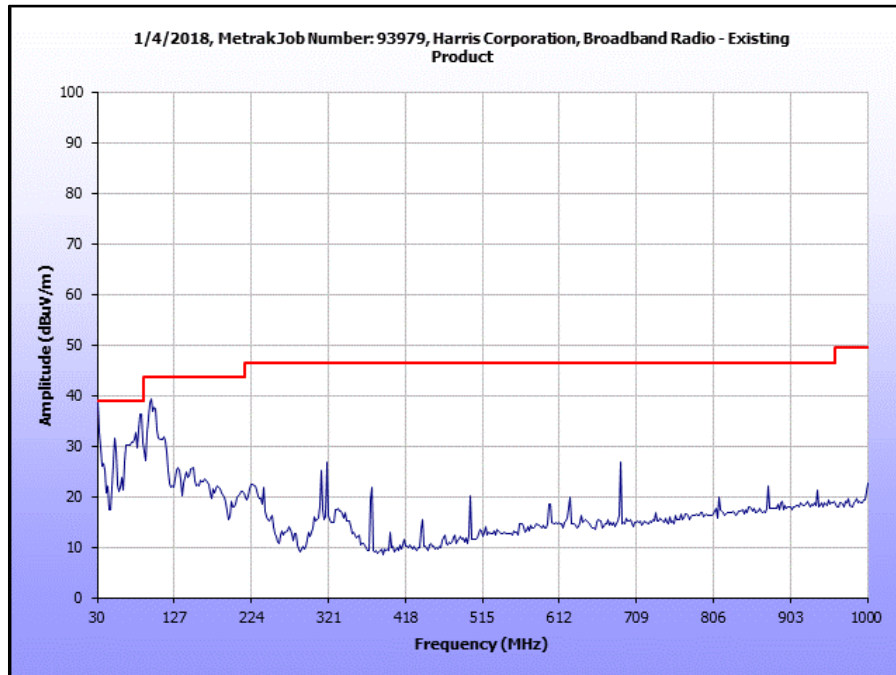
Plot 657. Undesirable Emissions, 90Sector Peak 7-18GHz 40M 5230 pow16



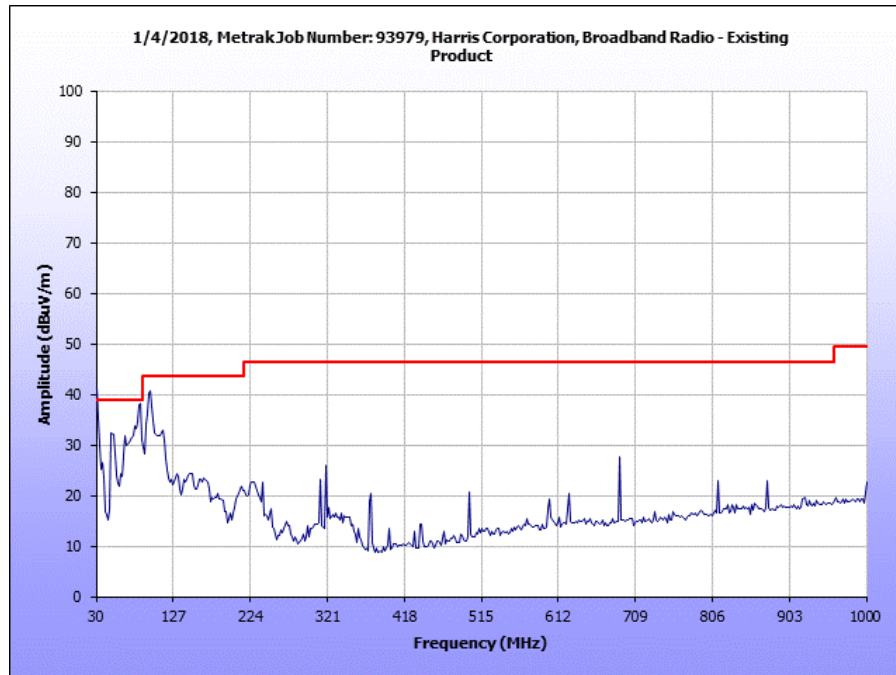
Plot 658. Undesirable Emissions, 1 panel



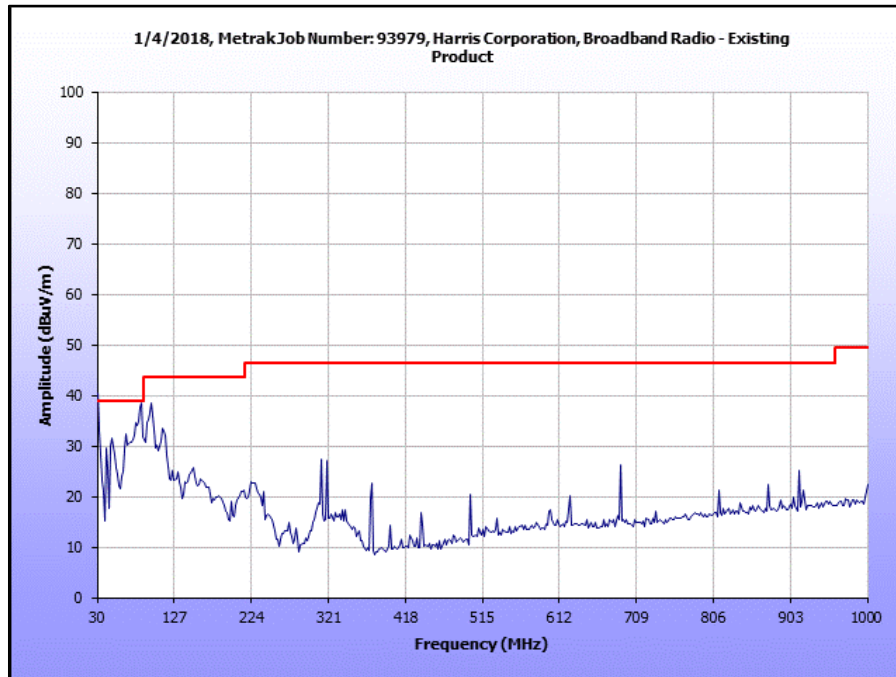
Plot 659. Undesirable Emissions, 2 panel



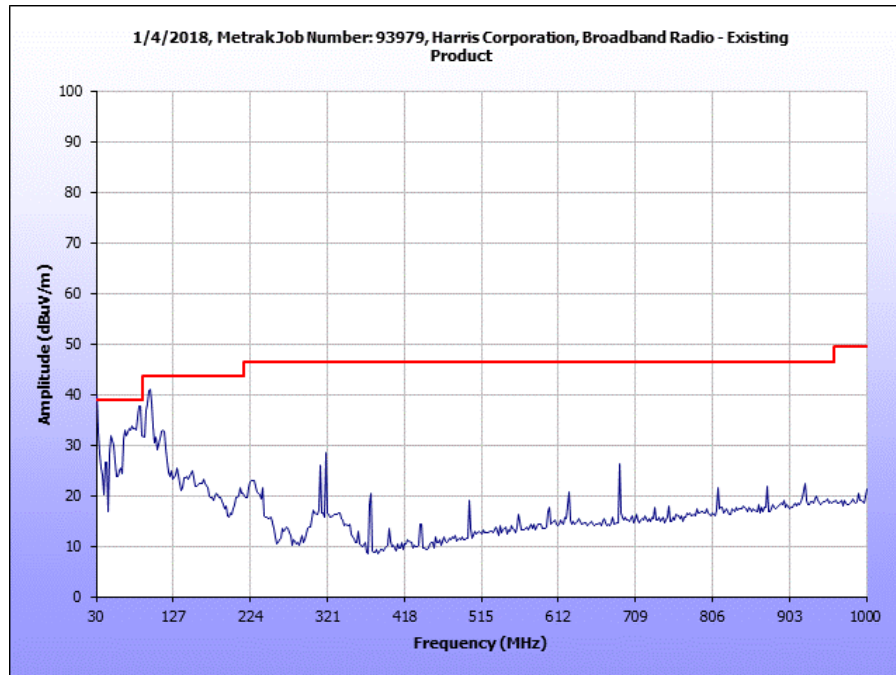
Plot 660. Undesirable Emissions, 3 para



Plot 661. Undesirable Emissions, 90 Sector



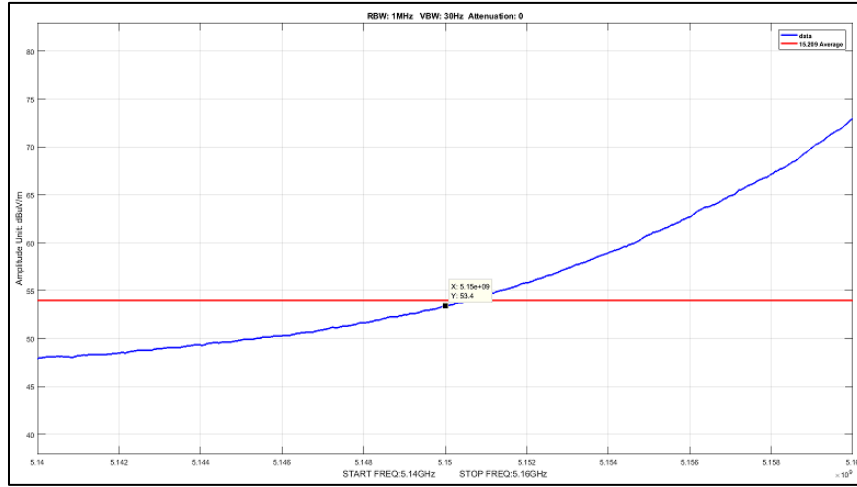
Plot 662. Undesirable Emissions, Omni 5



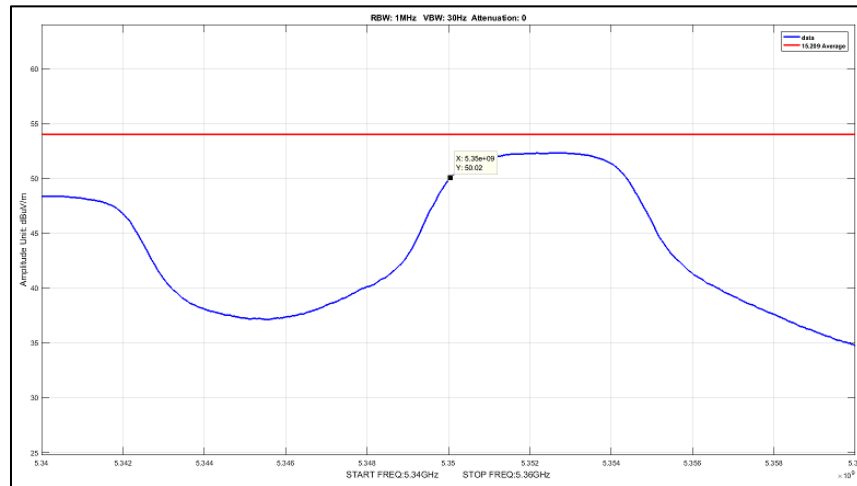
Plot 663. Undesirable Emissions, Omni 8



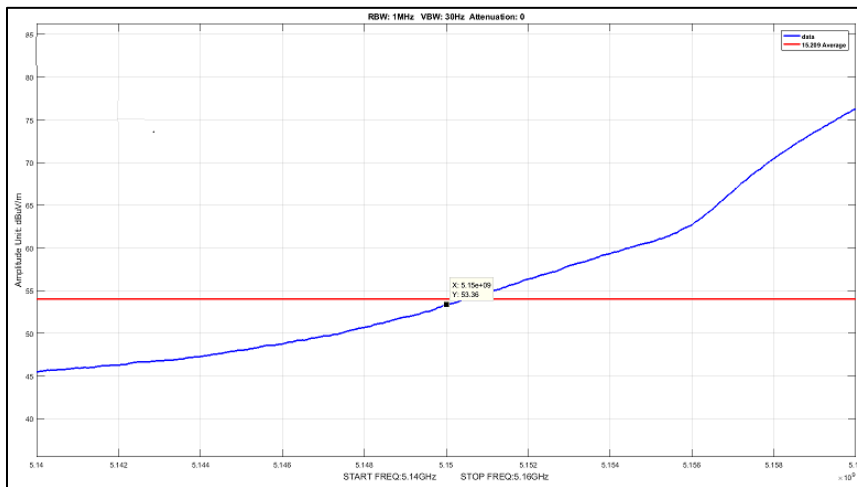
Radiated Band Edge, 1Panel



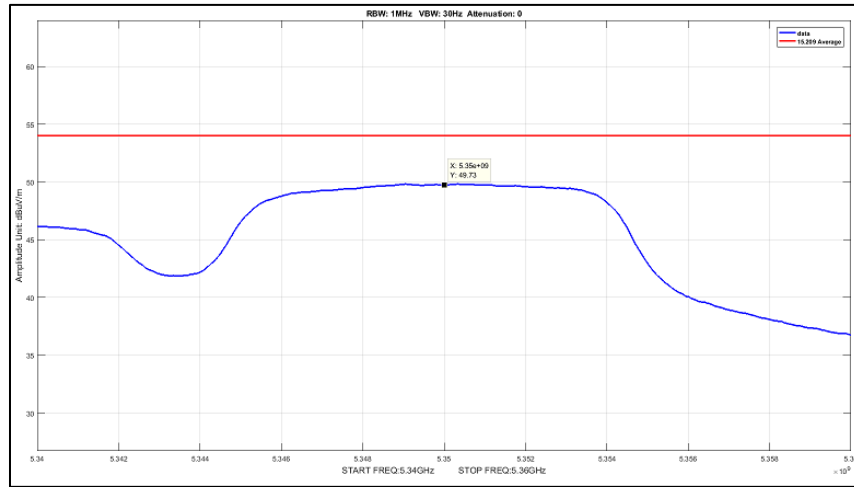
Plot 664. Radiated Band Edge, 1Panel, Average, 5M, 5170, pow15



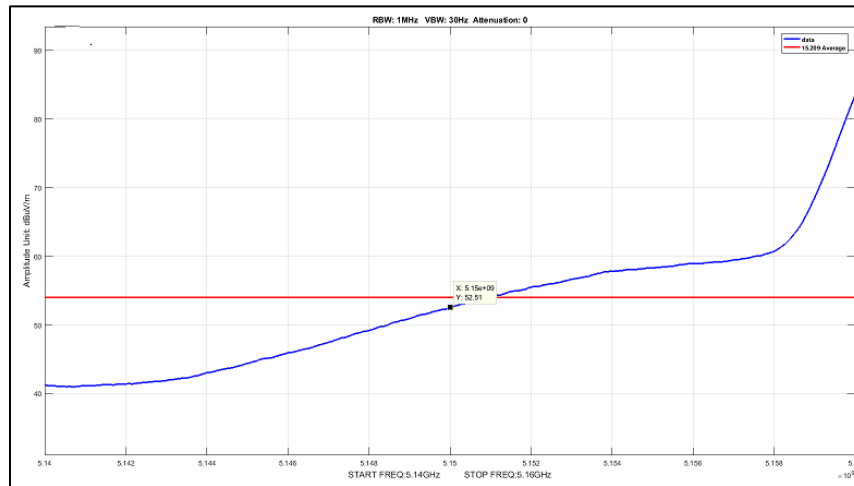
Plot 665. Radiated Band Edge, 1Panel, Average, 5M, 5247.5, pow22



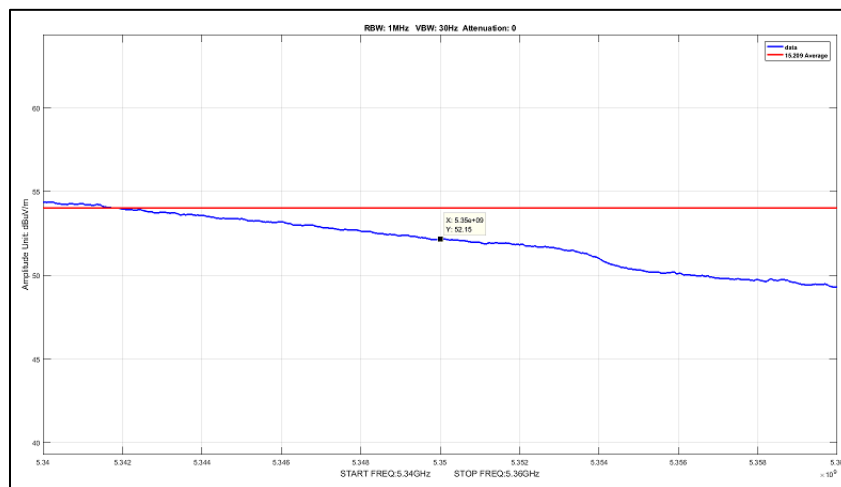
Plot 666. Radiated Band Edge, 1Panel, Average, 10M, 5170, pow6



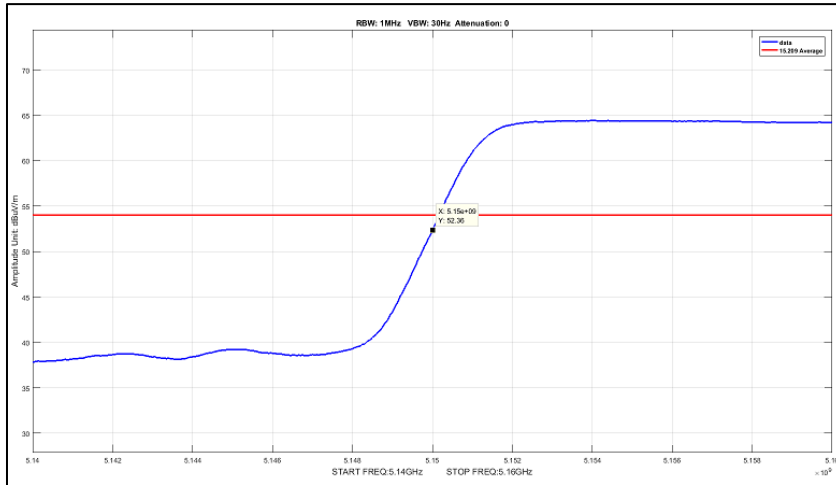
Plot 667. Radiated Band Edge, 1Panel, Average, 10M, 5245, pow22



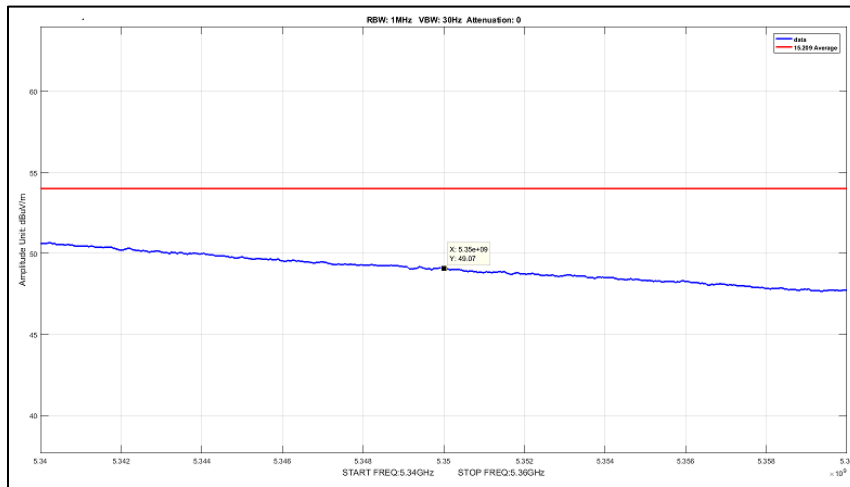
Plot 668. Radiated Band Edge, 1Panel, Average, 20M, 5170, pow-1



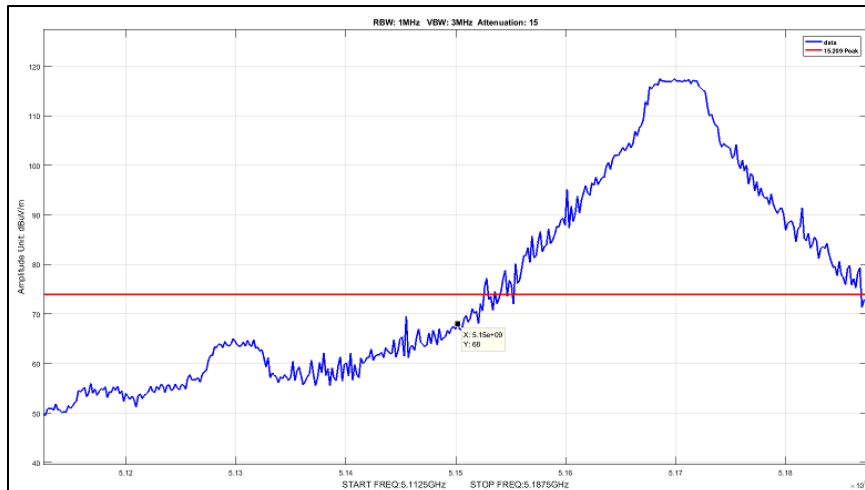
Plot 669. Radiated Band Edge, 1Panel, Average, 20M, 5240, pow22



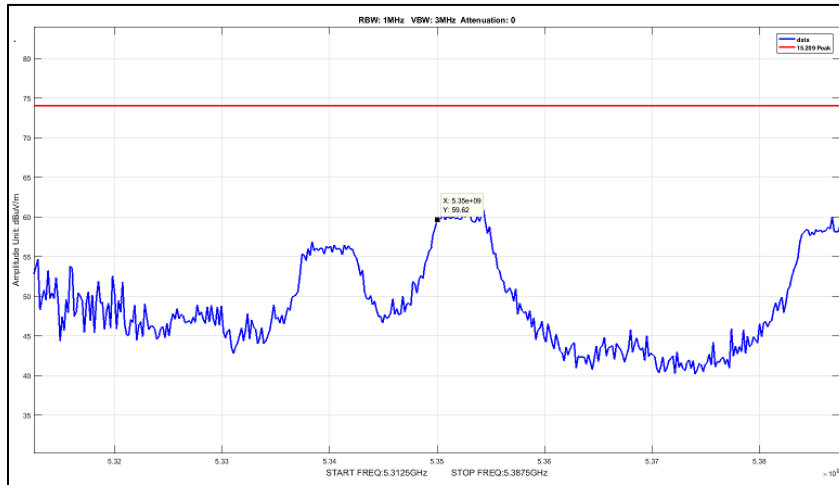
Plot 670. Radiated Band Edge, 1Panel, Average, 40M, 5170, pow-10



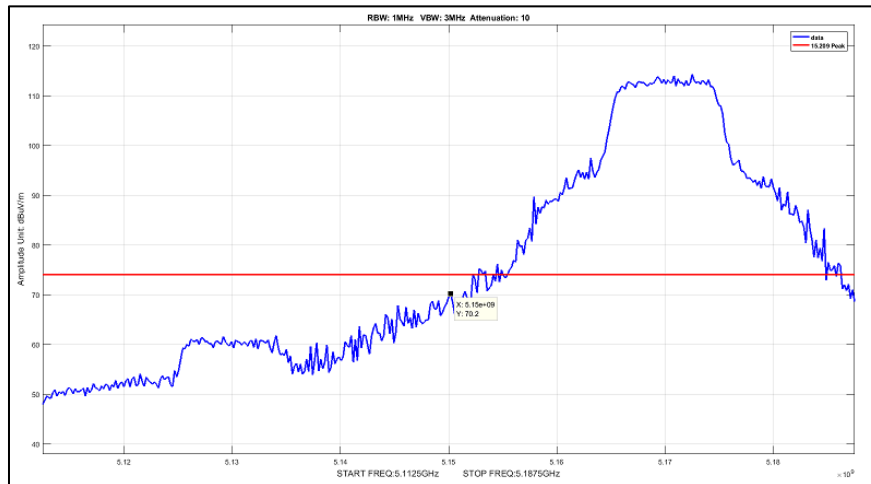
Plot 671. Radiated Band Edge, 1Panel, Average, 40M, 5230, pow15



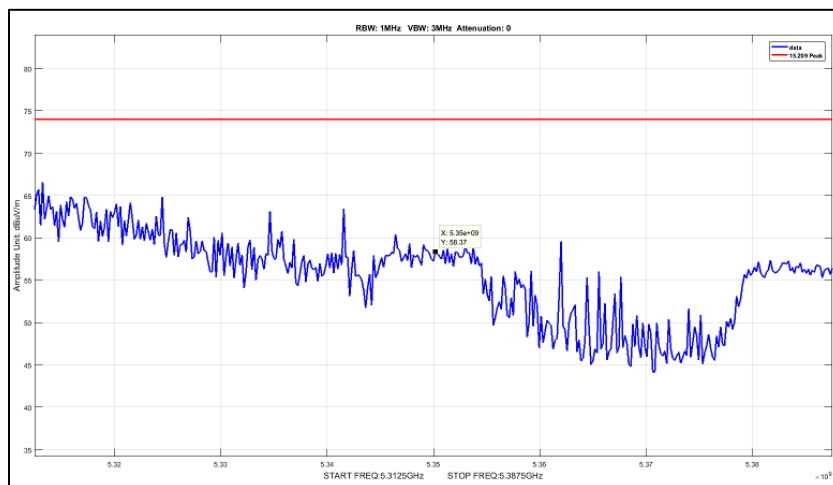
Plot 672. Radiated Band Edge, 1Panel, Peak, 5M, 5170, pow15



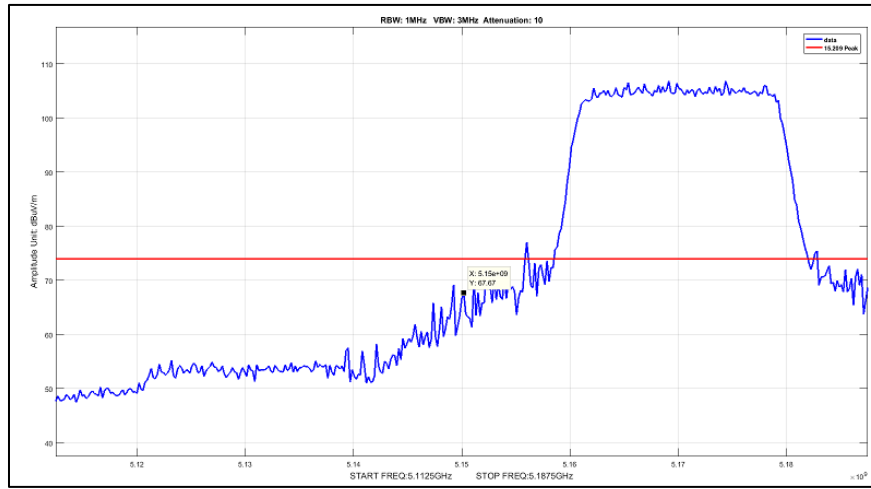
Plot 673. Radiated Band Edge, 1Panel, Peak, 5M, 5247.5, pow22



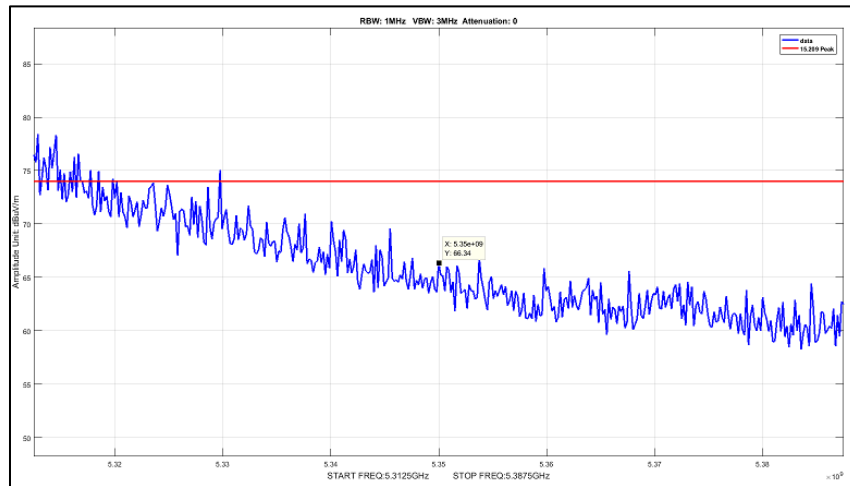
Plot 674. Radiated Band Edge, 1Panel, Peak, 10M, 5170, pow6



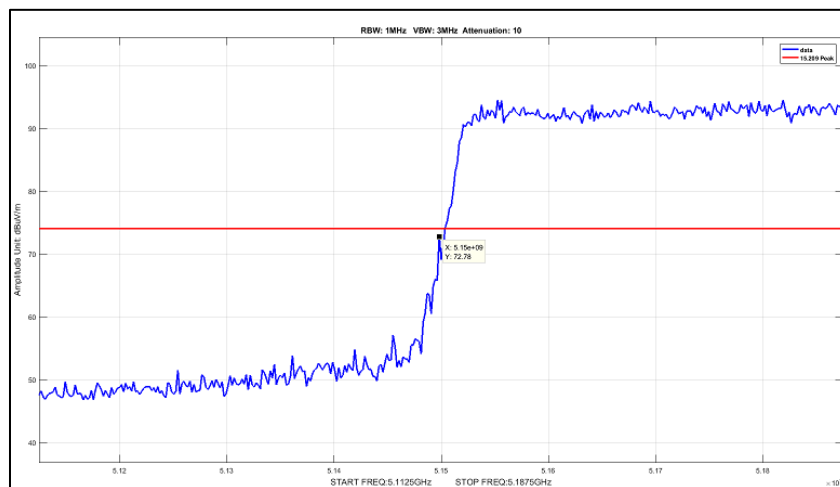
Plot 675. Radiated Band Edge, 1Panel, Peak, 10M, 5245, pow22



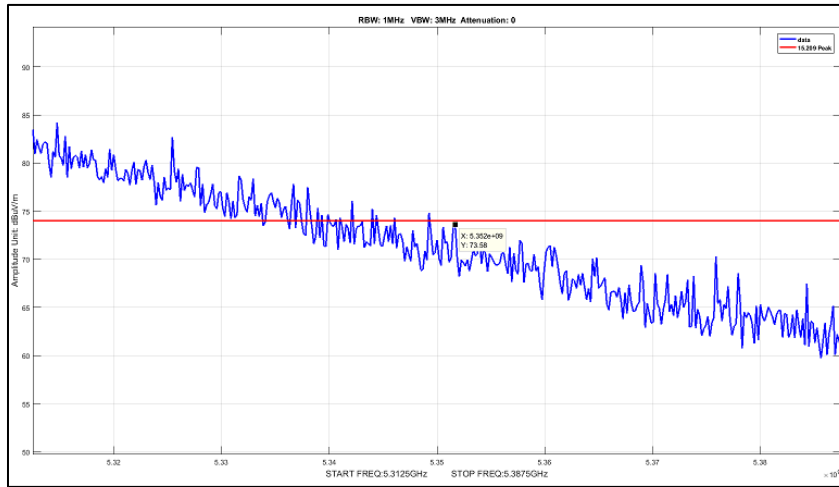
Plot 676. Radiated Band Edge, 1Panel, Peak, 20M, 5170, pow-1



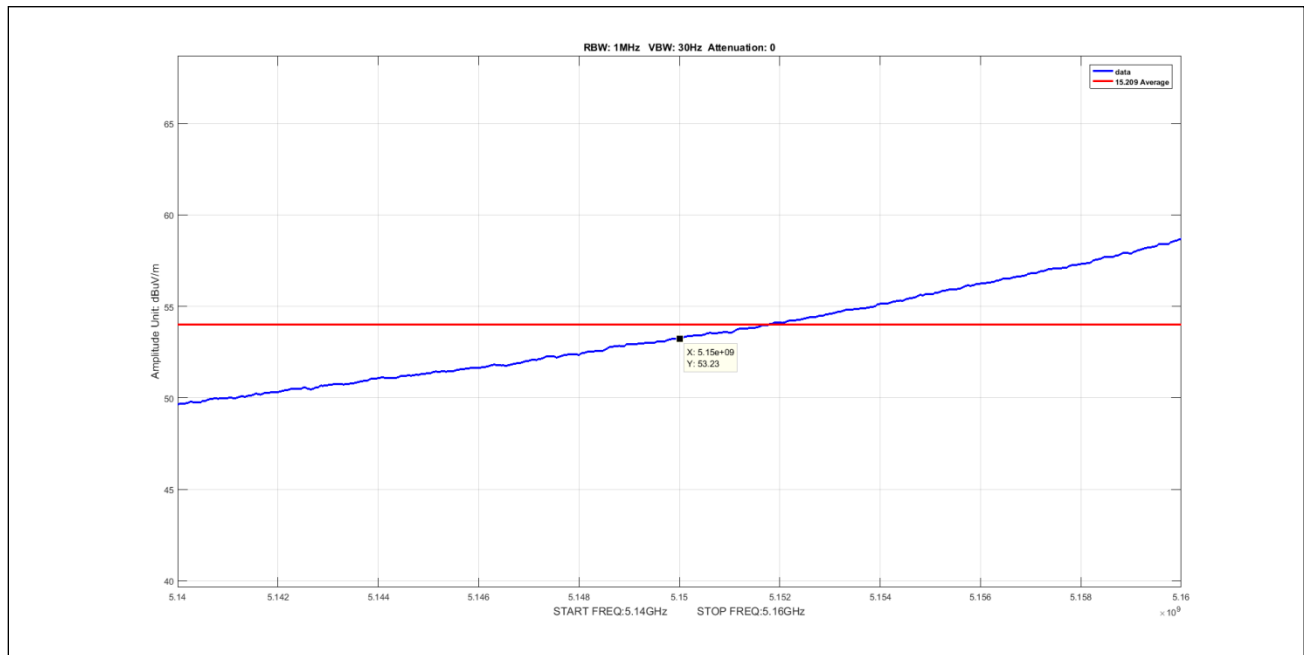
Plot 677. Radiated Band Edge, 1Panel, Peak, 20M, 5240, pow22



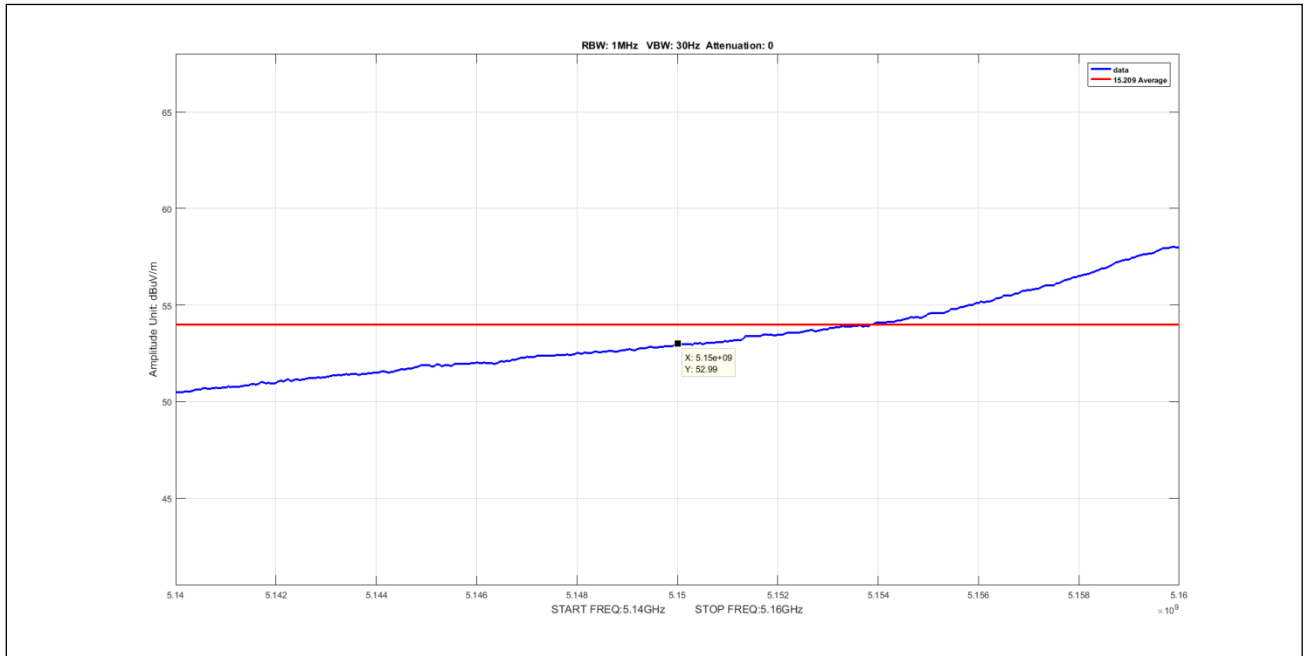
Plot 678. Radiated Band Edge, 1Panel, Peak, 40M, 5170, pow-10



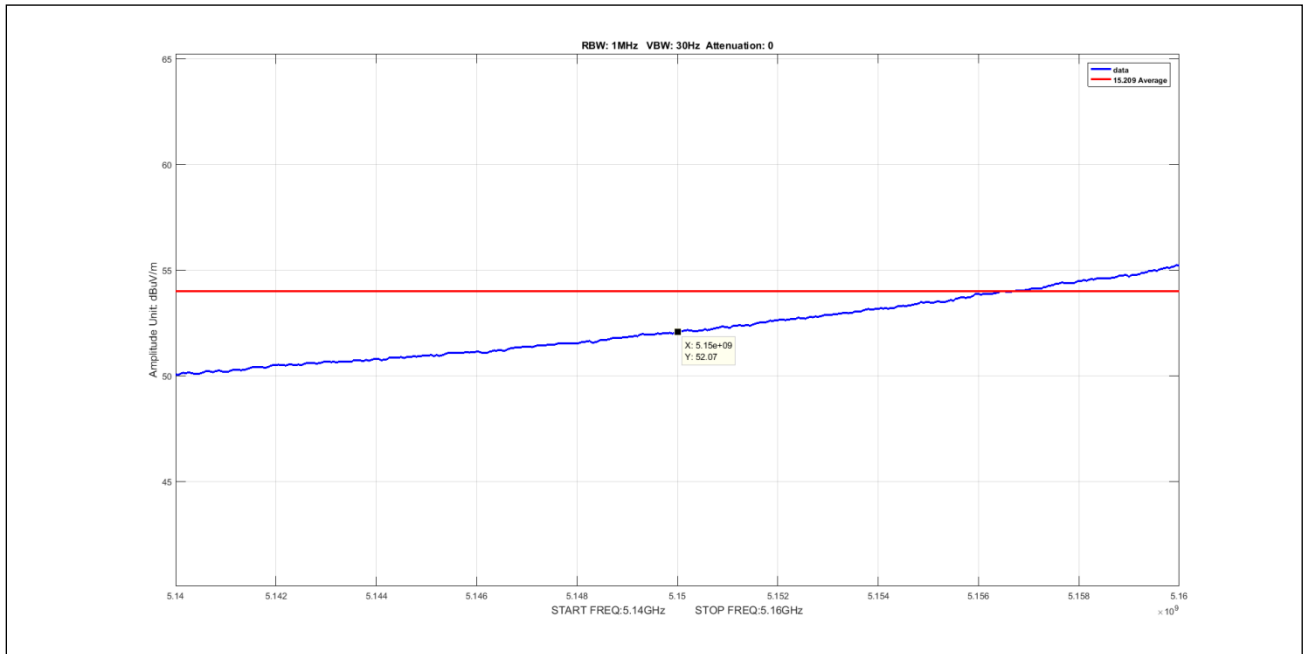
Plot 679. Radiated Band Edge, 1Panel, Peak, 40M, 5230, pow15



Plot 680. Undesirable Emissions, 1Panel Avg 1-7GHz 20M 5210 pow15 bandedge zoom

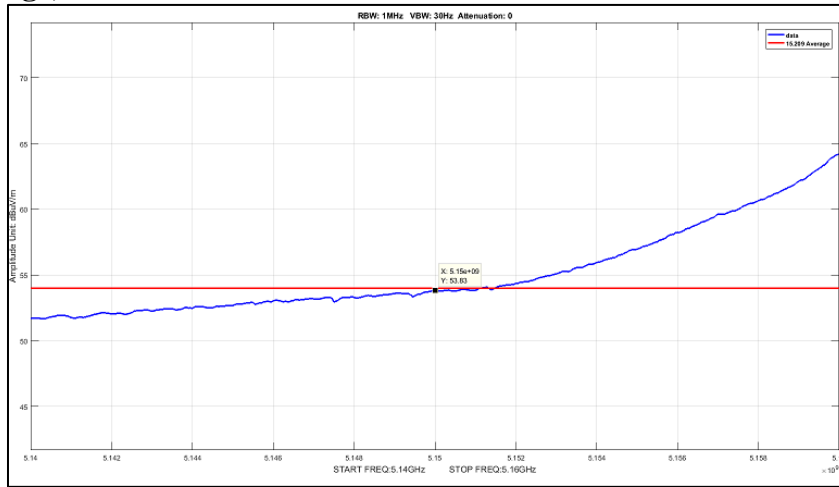


Plot 681. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5210 pow10 bandedge zoom

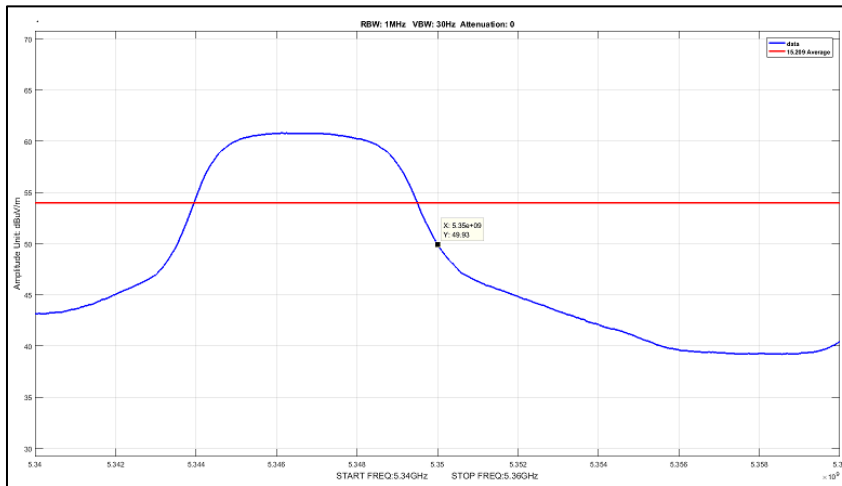


Plot 682. Undesirable Emissions, 1Panel Avg 1-7GHz 40M 5230 pow14 bandedge zoom

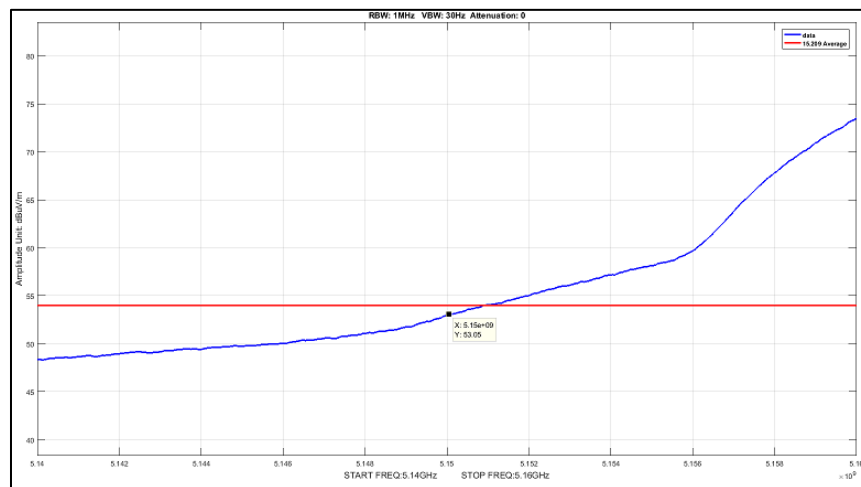
Radiated Band Edge, 2Panel



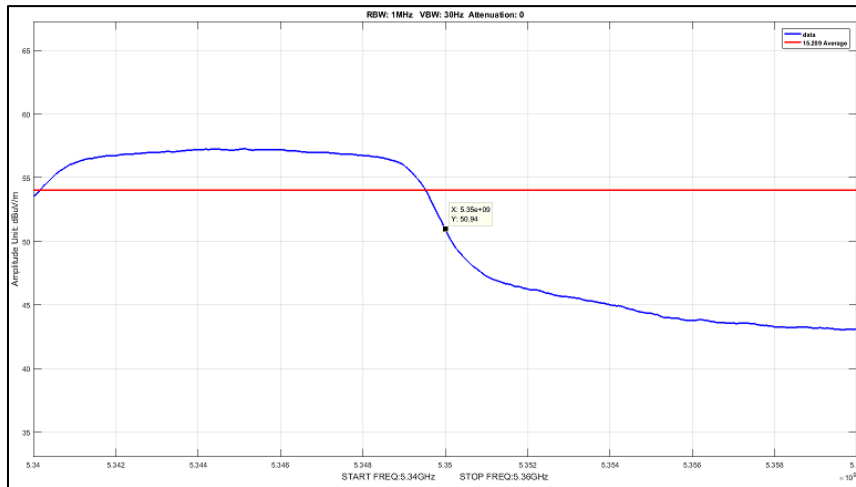
Plot 683. Radiated Band Edge, 2Panel, 2.5M, Average, 5M, 5170, pow9



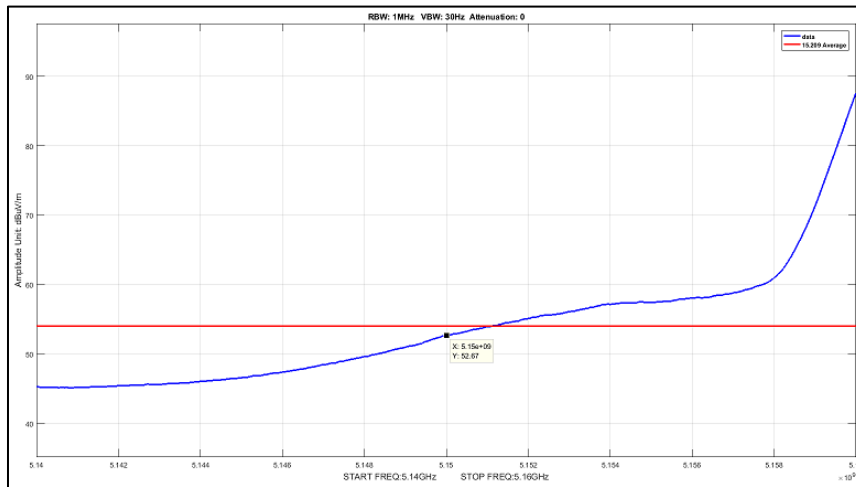
Plot 684. Radiated Band Edge, 2Panel, 2.5M, Average, 5M, 5245.5, pow22



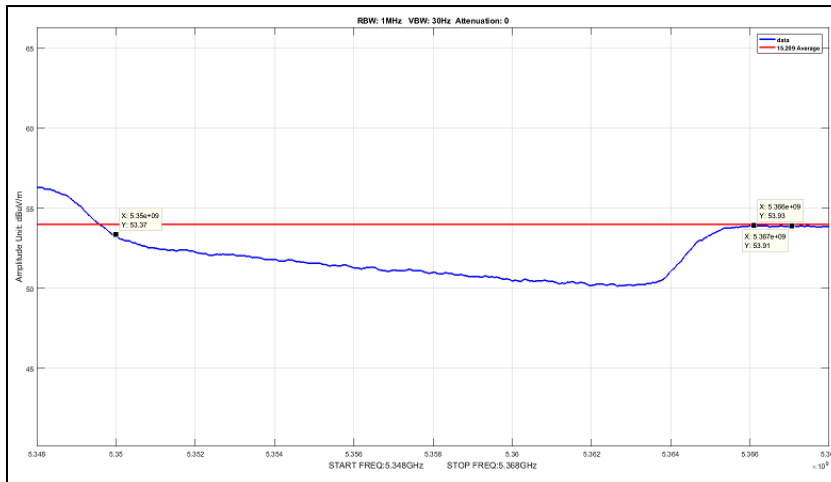
Plot 685. Radiated Band Edge, 2Panel, 2.5M, Average, 10M, 5170, pow4



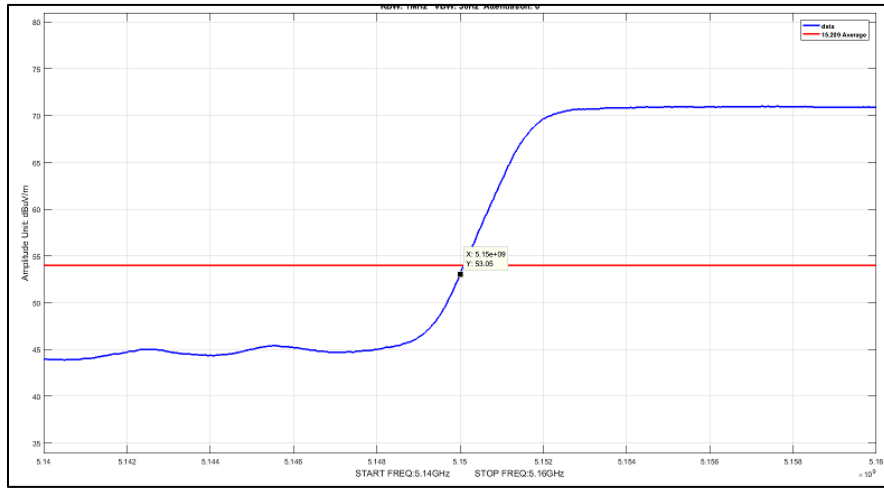
Plot 686. Radiated Band Edge, 2Panel, 2.5M, Average, 10M, 5240.5, pow22



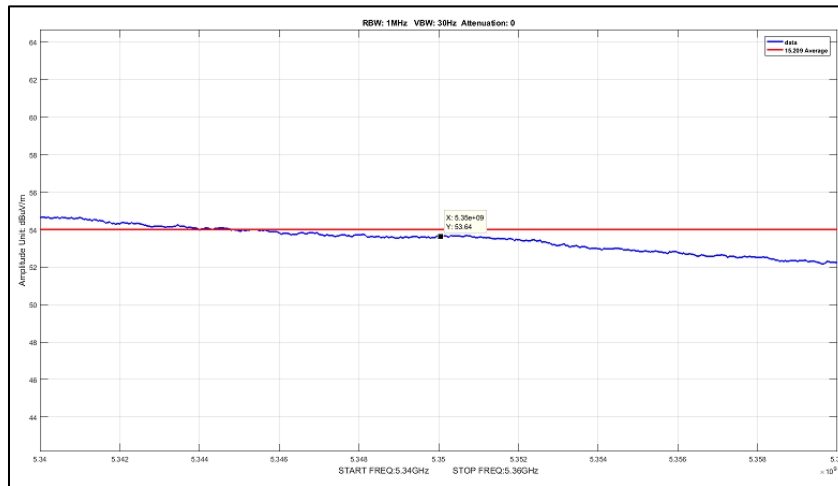
Plot 687. Radiated Band Edge, 2Panel, 2.5M, Average, 20M, 5170, pow-2



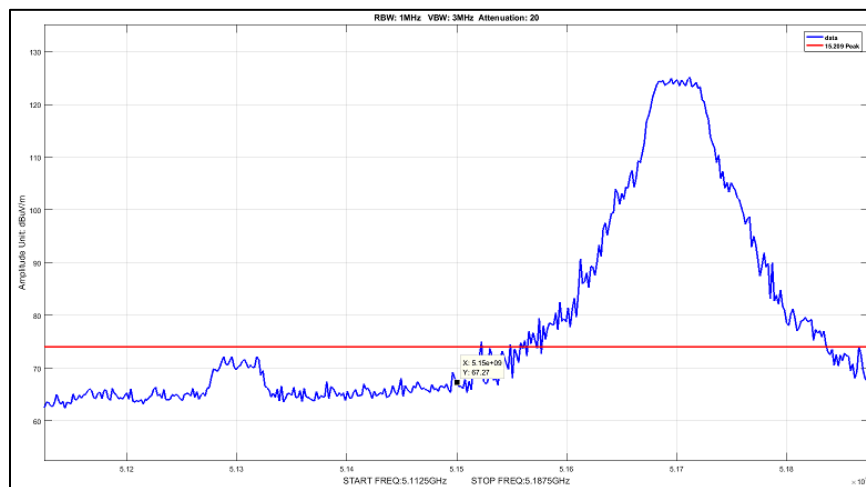
Plot 688. Radiated Band Edge, 2Panel, 2.5M, Average, 20M, 5235.5, pow20



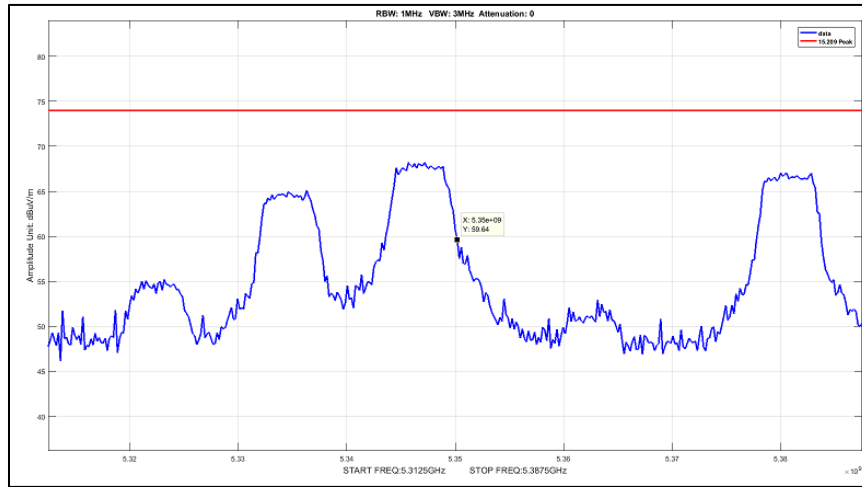
Plot 689. Radiated Band Edge, 2Panel, 2.5M, Average, 40M, 5170.5, pow-10



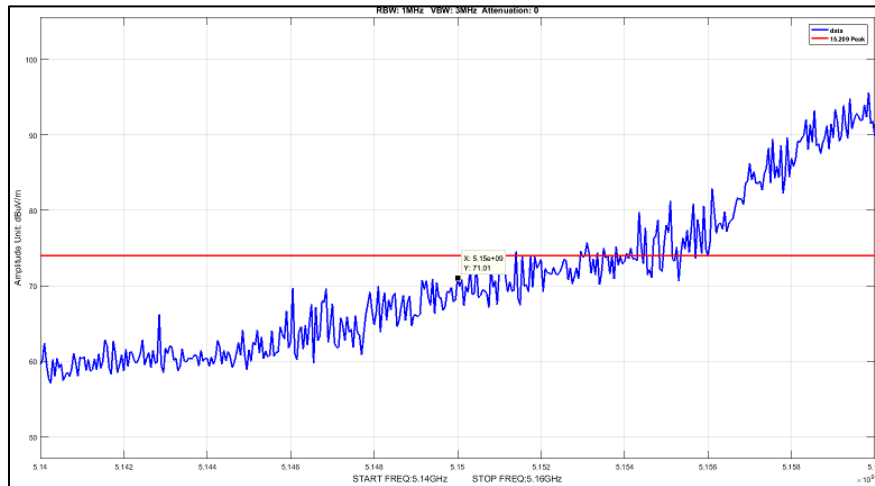
Plot 690. Radiated Band Edge, 2Panel, 2.5M, Average, 40M, 5230, pow15



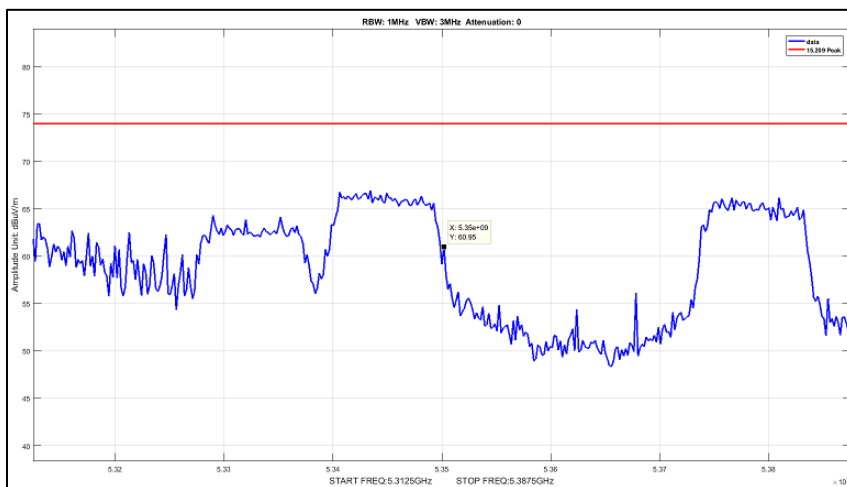
Plot 691. Radiated Band Edge, 2Panel, 2.5M, Peak, 5M, 5170, pow9



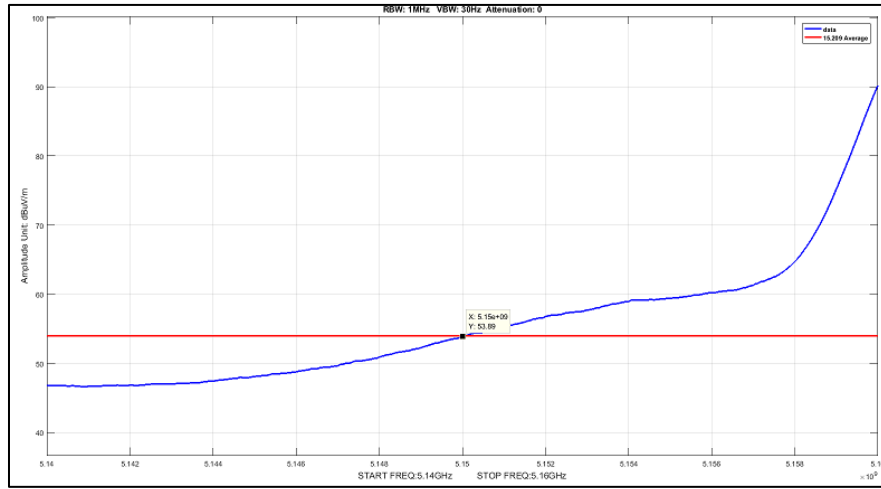
Plot 692. Radiated Band Edge, 2Panel, 2.5M, Peak, 5M, 5245.5, pow22



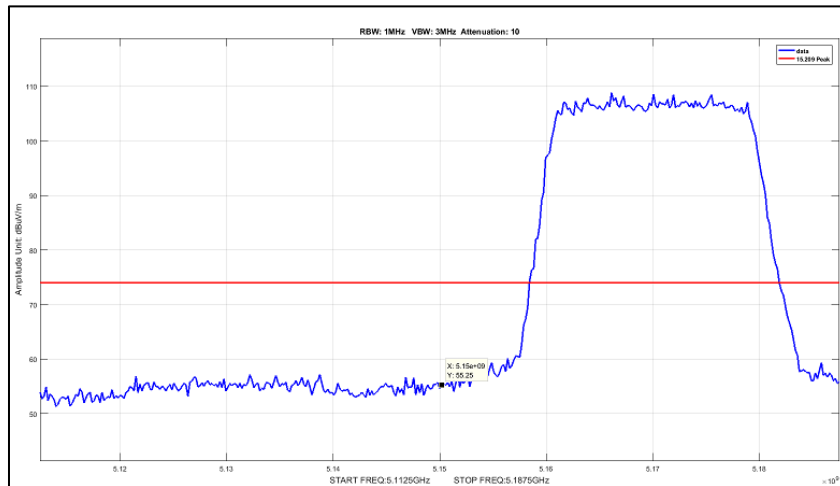
Plot 693. Radiated Band Edge, 2Panel, 2.5M, Peak, 10M, 5170, pow4



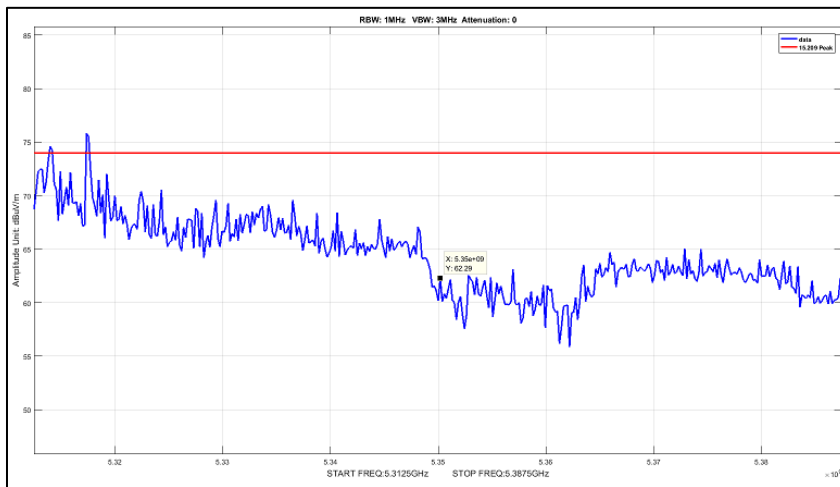
Plot 694. Radiated Band Edge, 2Panel, 2.5M, Peak, 10M, 5240.5, pow22



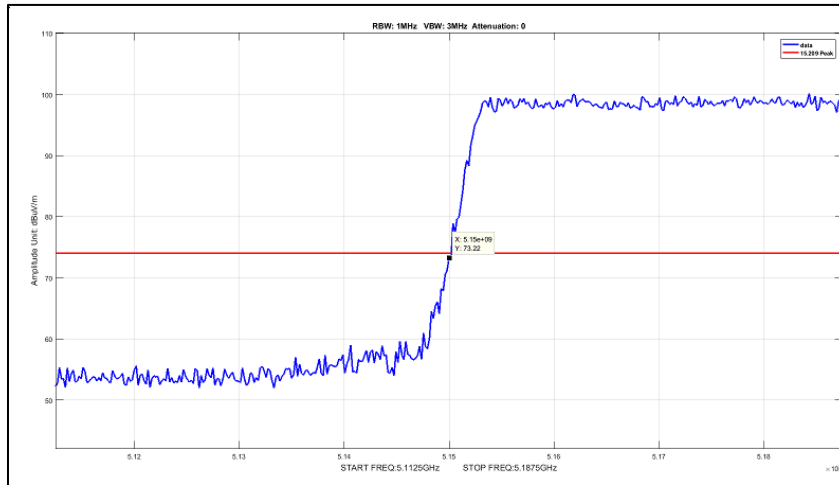
Plot 695. Radiated Band Edge, 2Panel, 2.5M, Peak, 20M, 5170, pow-1



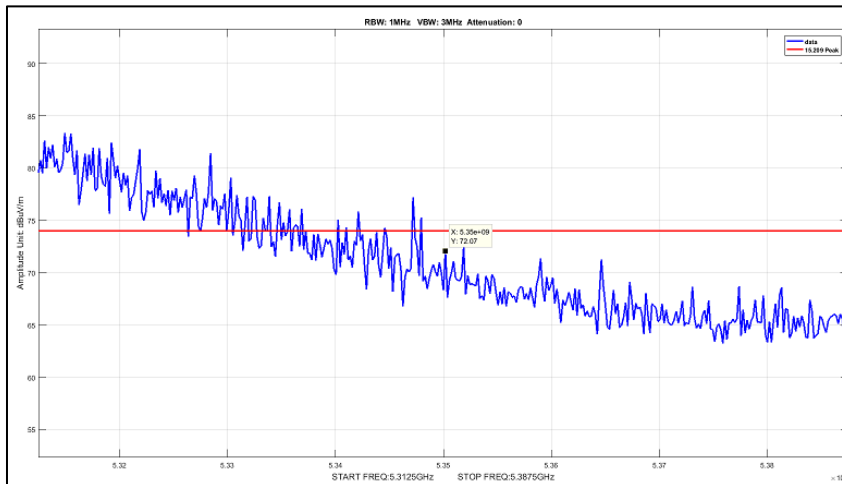
Plot 696. Radiated Band Edge, 2Panel, 2.5M, Peak, 20M, 5170, pow-2



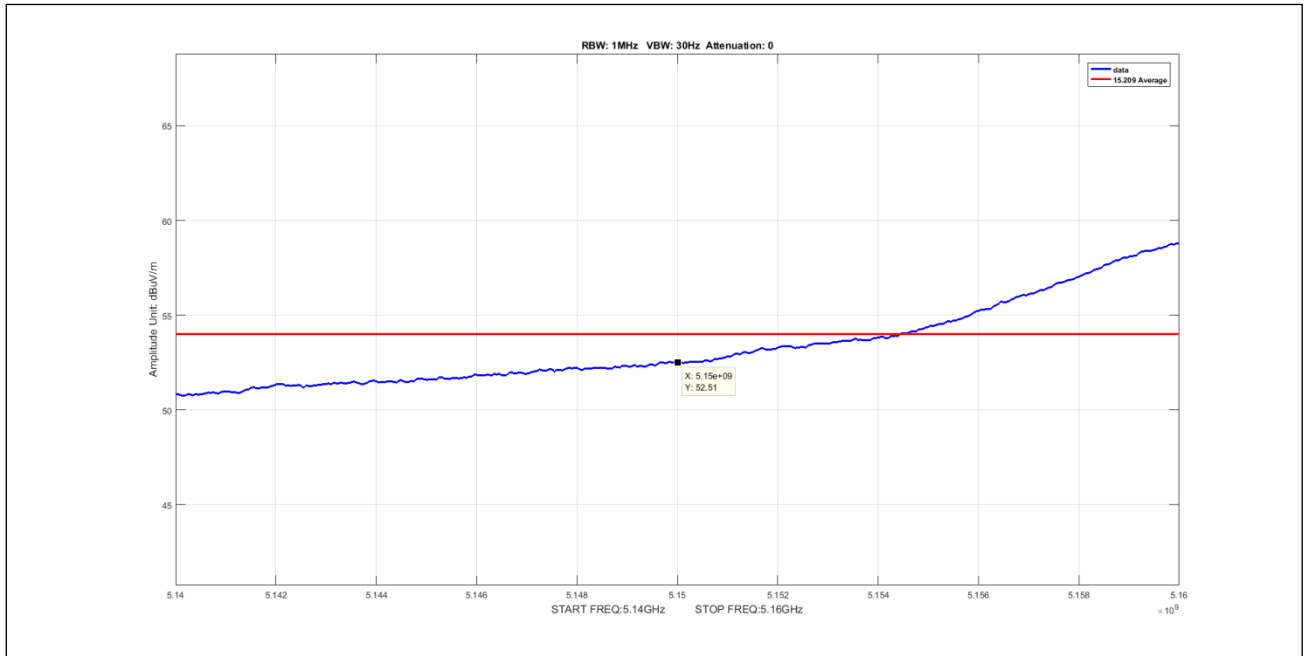
Plot 697. Radiated Band Edge, 2Panel, 2.5M, Peak, 20M, 5235.5, pow20



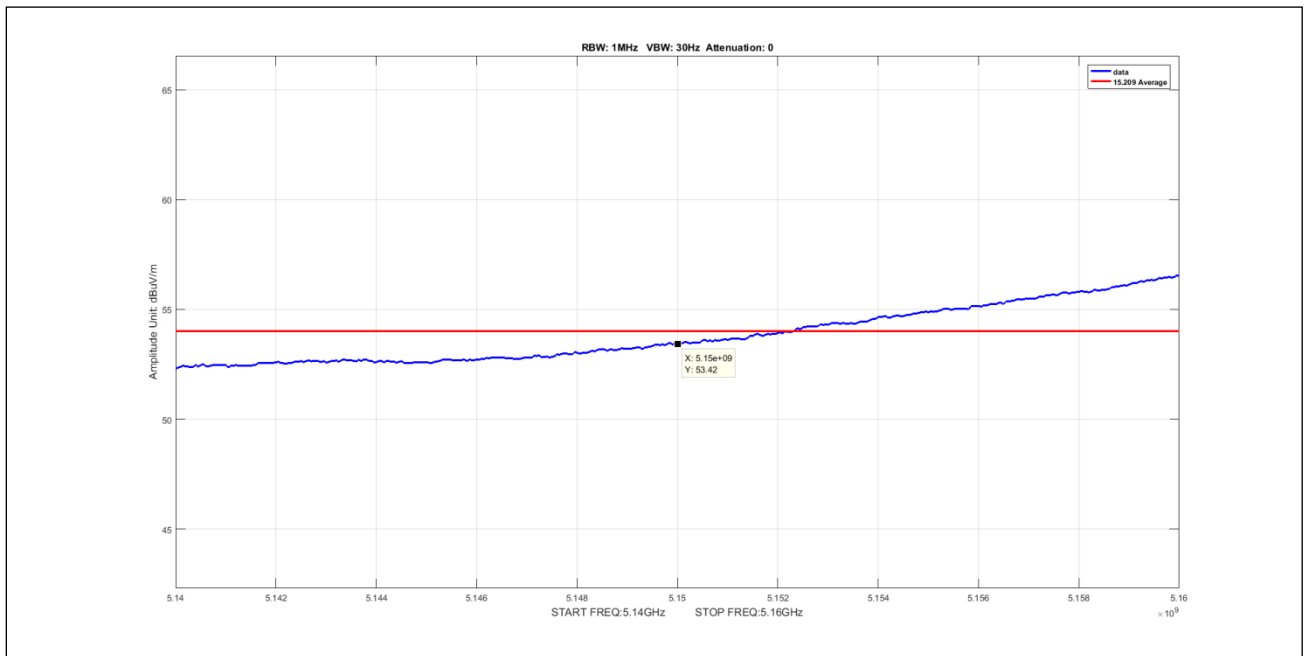
Plot 698. Radiated Band Edge, 2Panel, 2.5M, Peak, 40M, 5171, pow-10



Plot 699. Radiated Band Edge, 2Panel, 2.5M, Peak, 40M, 5230, pow15



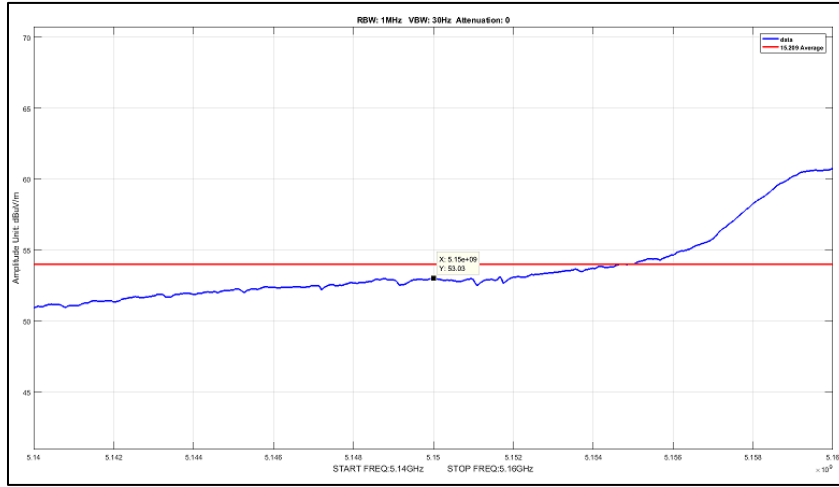
Plot 700. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5210 pow7 zoom on bandedge



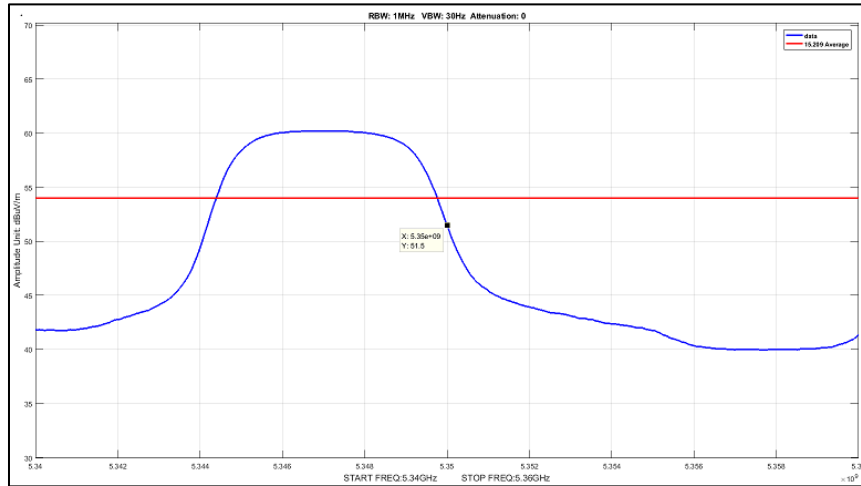
Plot 701. Undesirable Emissions, 2Panel Avg 1-7GHz 40M 5230 pow10 zoom on bandedge



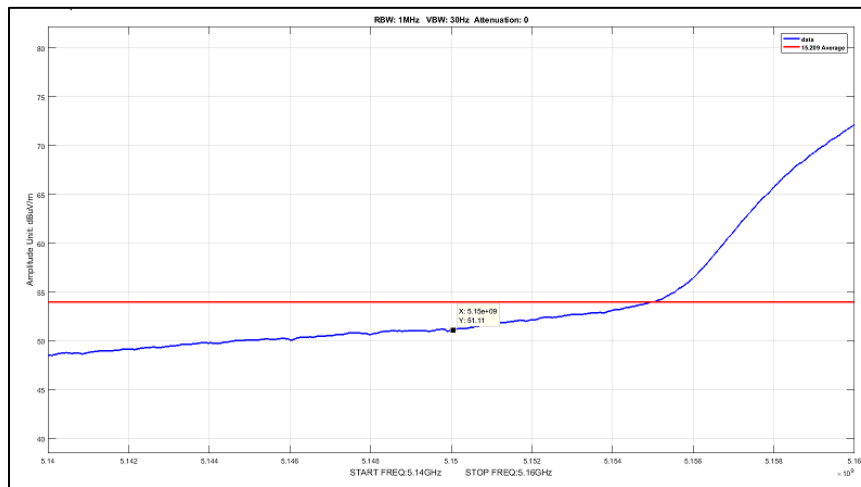
Radiated Band Edge, 3 Para



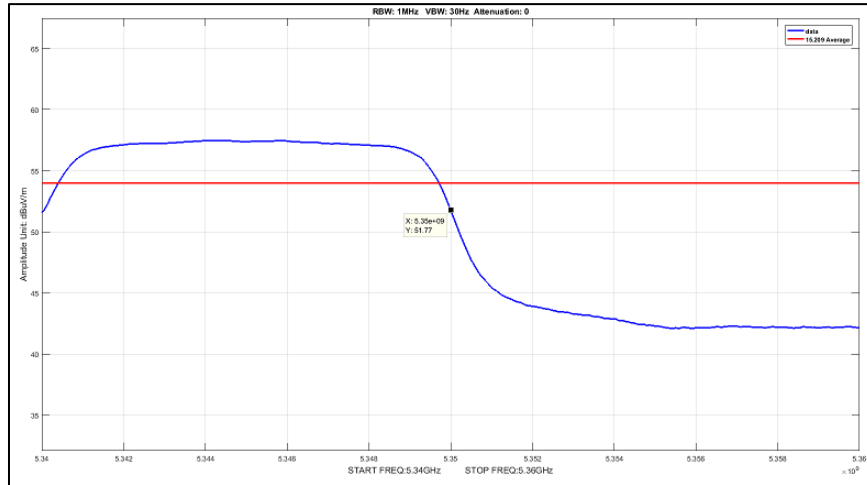
Plot 702. Radiated Band 3Para, 2.5M, Average, 5M, 5170, pow15



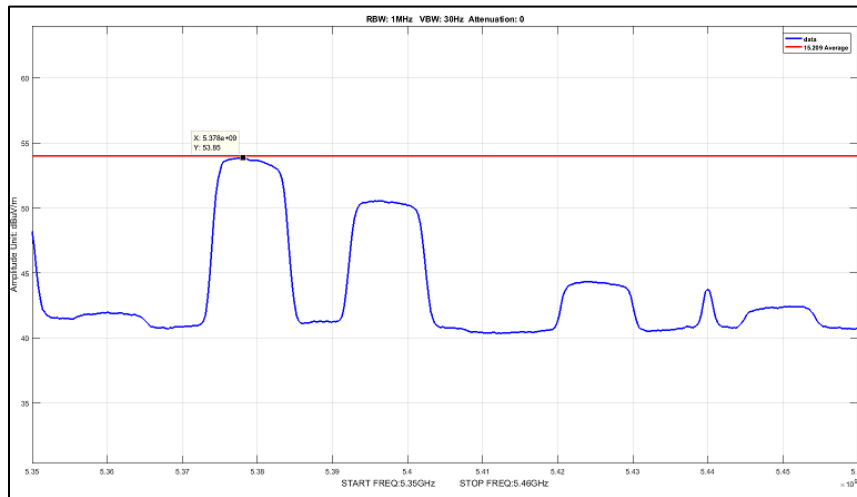
Plot 703. Radiated Band 3Para, 2.5M, Average, 5M, 5242.5, pow22



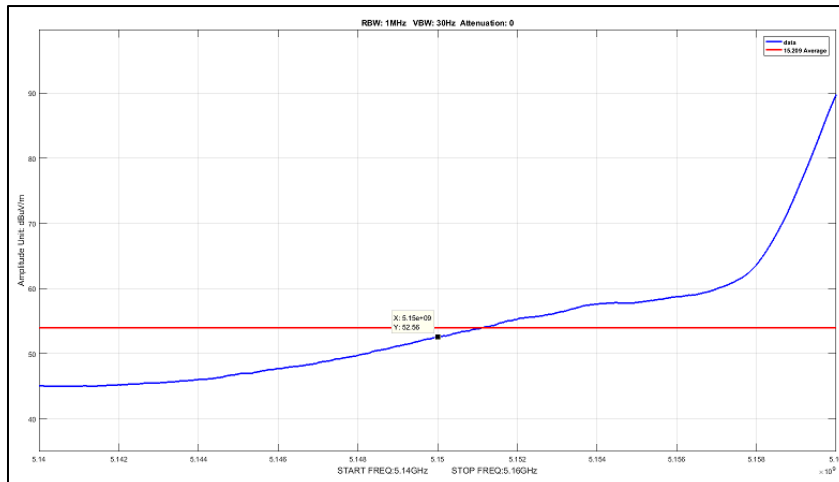
Plot 704. Radiated Band 3Para, 2.5M, Average, 10M, 5170, pow12



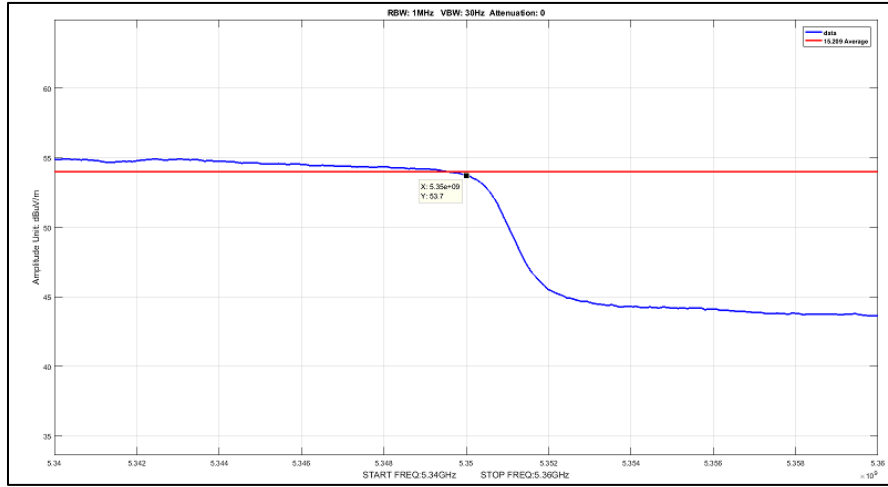
Plot 705. Radiated Band 3Para, 2.5M, Average, 10M, 5240.5, pow22



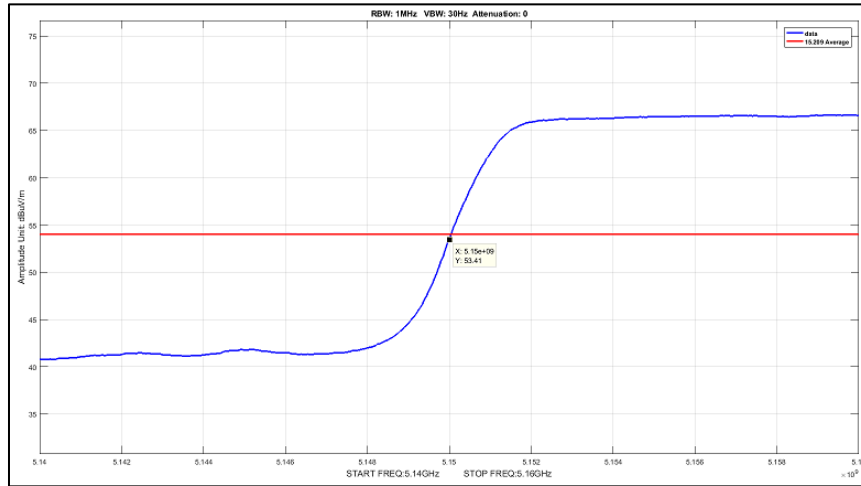
Plot 706. Radiated Band 3Para, 2.5M, Average, 10M, 5350 - 5460, pow16



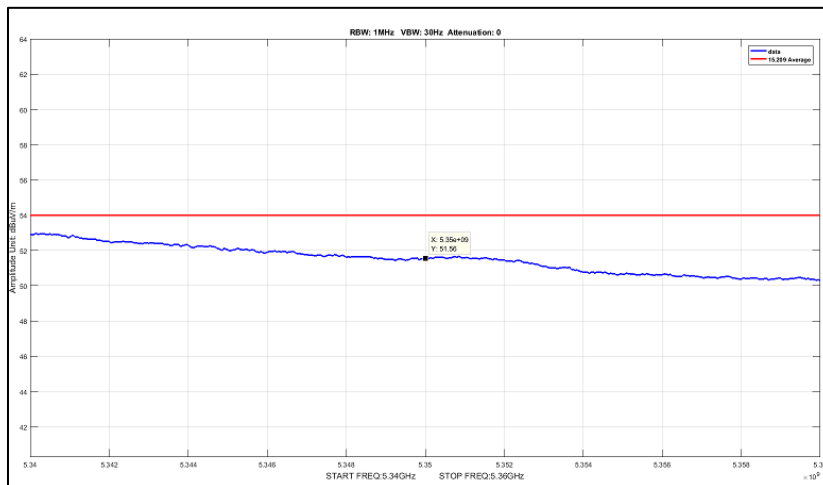
Plot 707. Radiated Band 3Para, 2.5M, Average, 20M, 5170, pow6



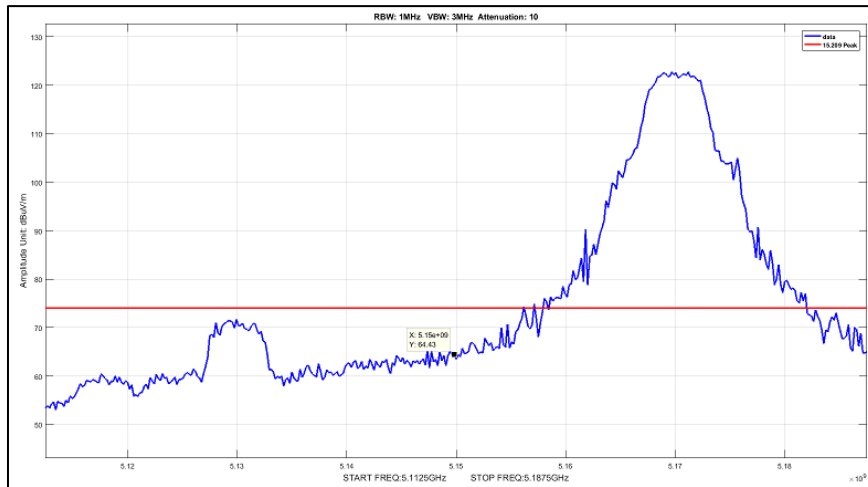
Plot 708. Radiated Band 3Para, 2.5M, Average, 20M, 5237, pow22



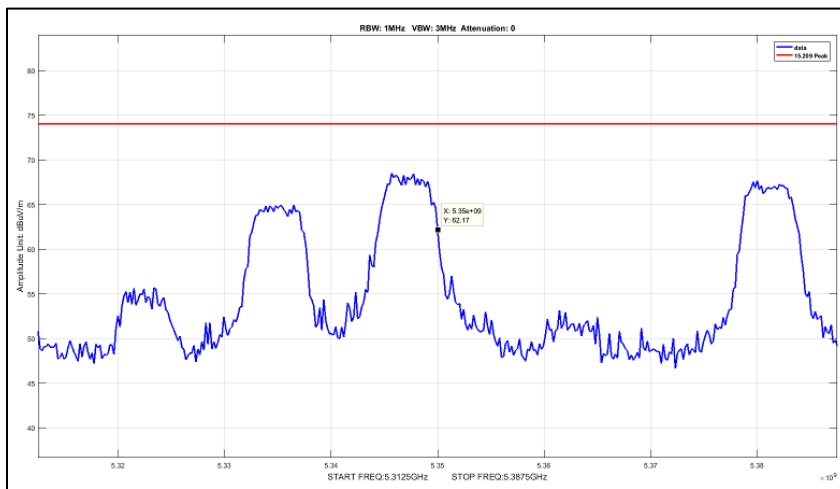
Plot 709. Radiated Band 3Para, 2.5M, Average, 40M, 5170, pow-10



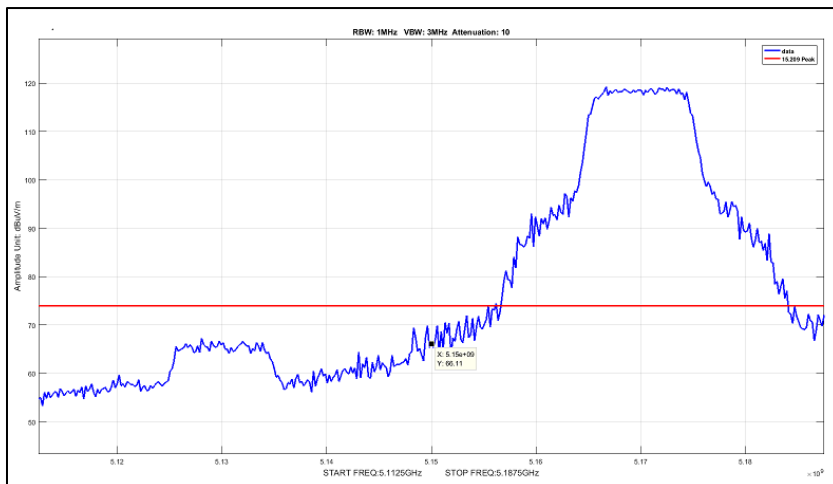
Plot 710. Radiated Band 3Para, 2.5M, Average, 40M, 5230, pow22



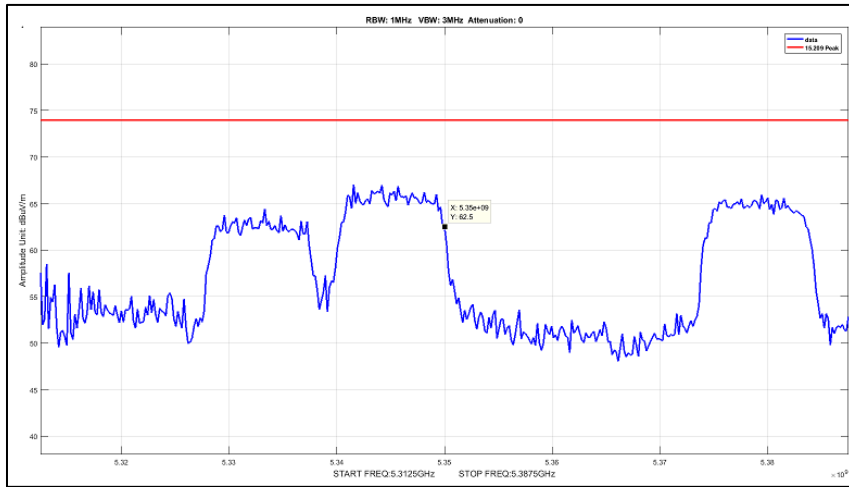
Plot 711. Radiated Band 3Para, 2.5M, Peak, 5M, 5170, pow15



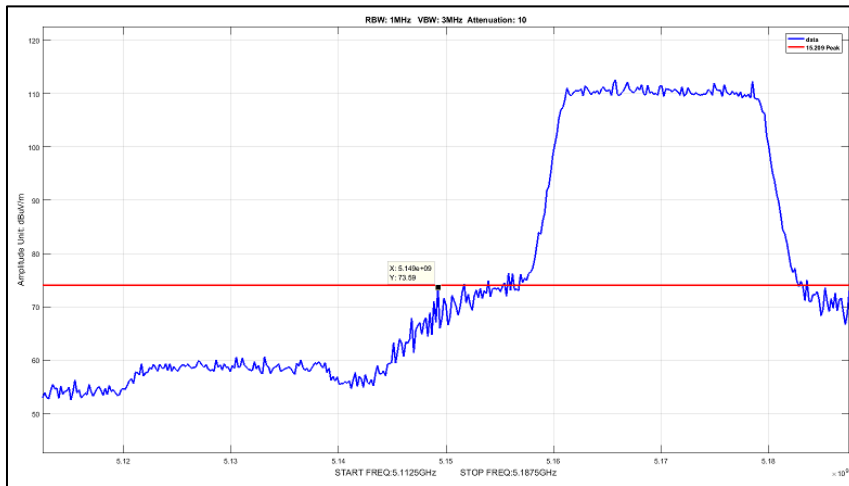
Plot 712. Radiated Band 3Para, 2.5M, Peak, 5M, 5242.5, pow22



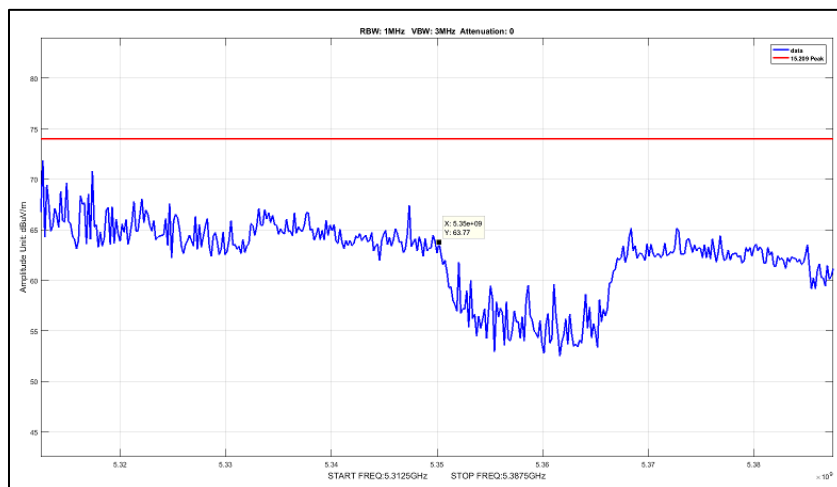
Plot 713. Radiated Band 3Para, 2.5M, Peak, 10M, 5170, pow12



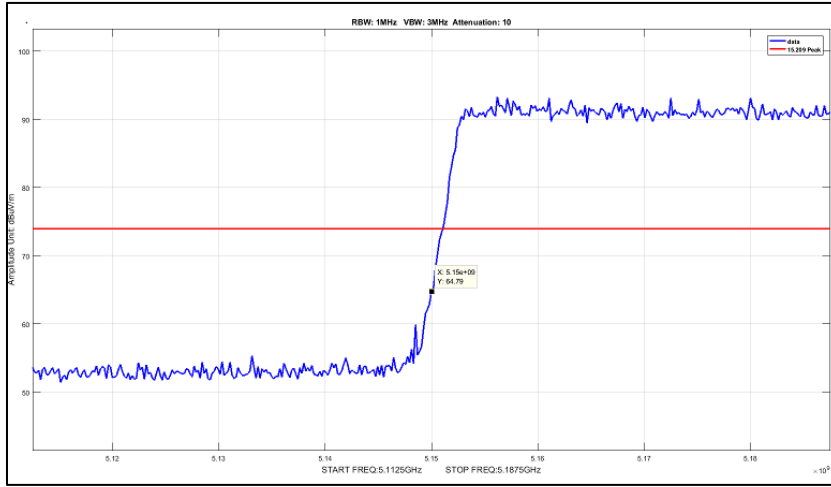
Plot 714. Radiated Band 3Para, 2.5M, Peak, 10M, 5240.5, pow22



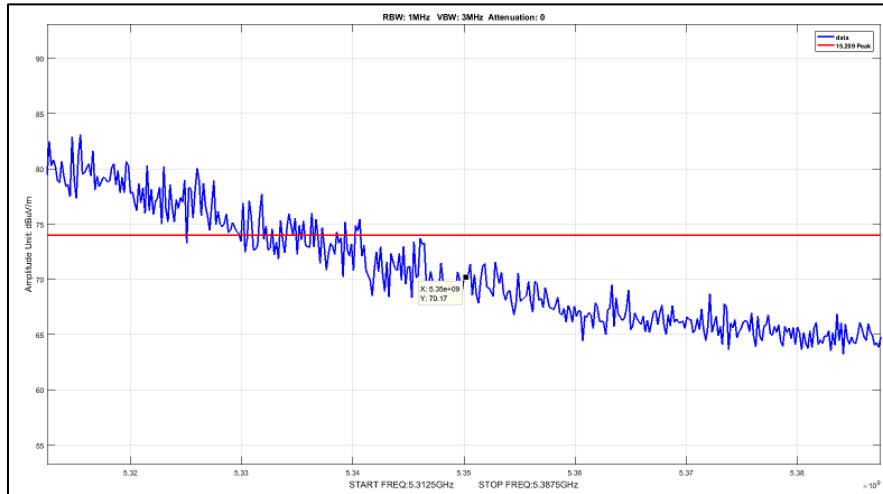
Plot 715. Radiated Band 3Para, 2.5M, Peak, 20M, 5170, pow6



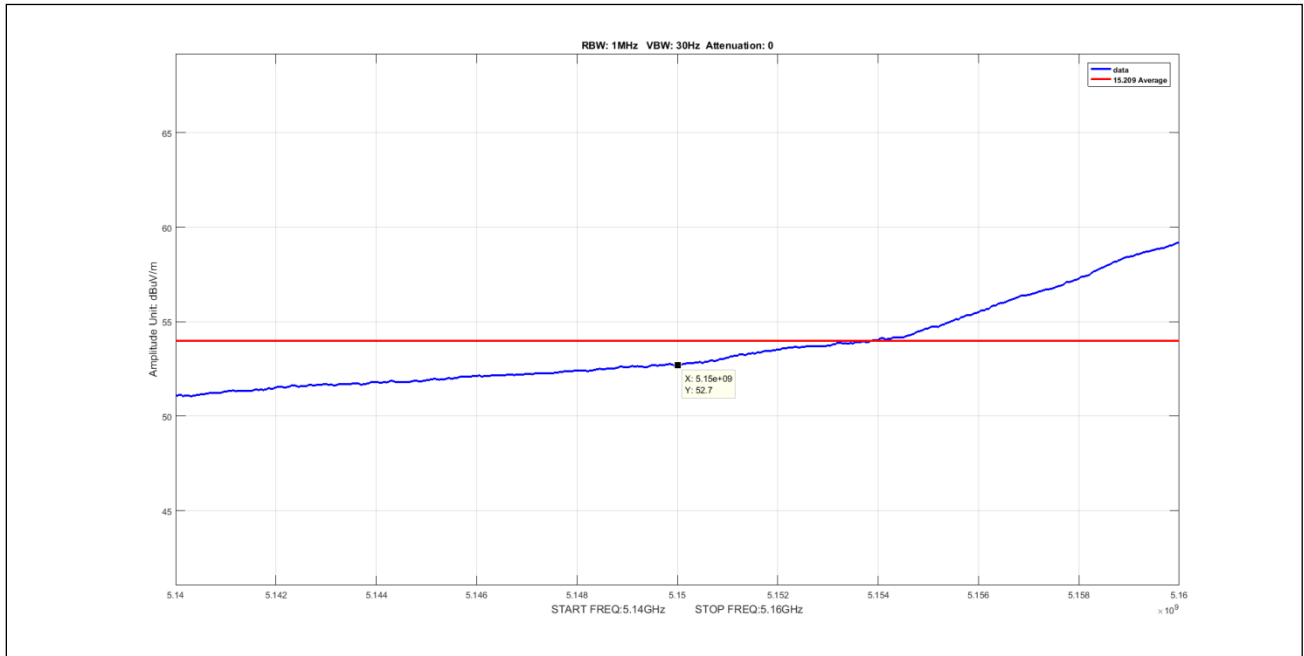
Plot 716. Radiated Band 3Para, 2.5M, Peak, 20M, 5237, pow22



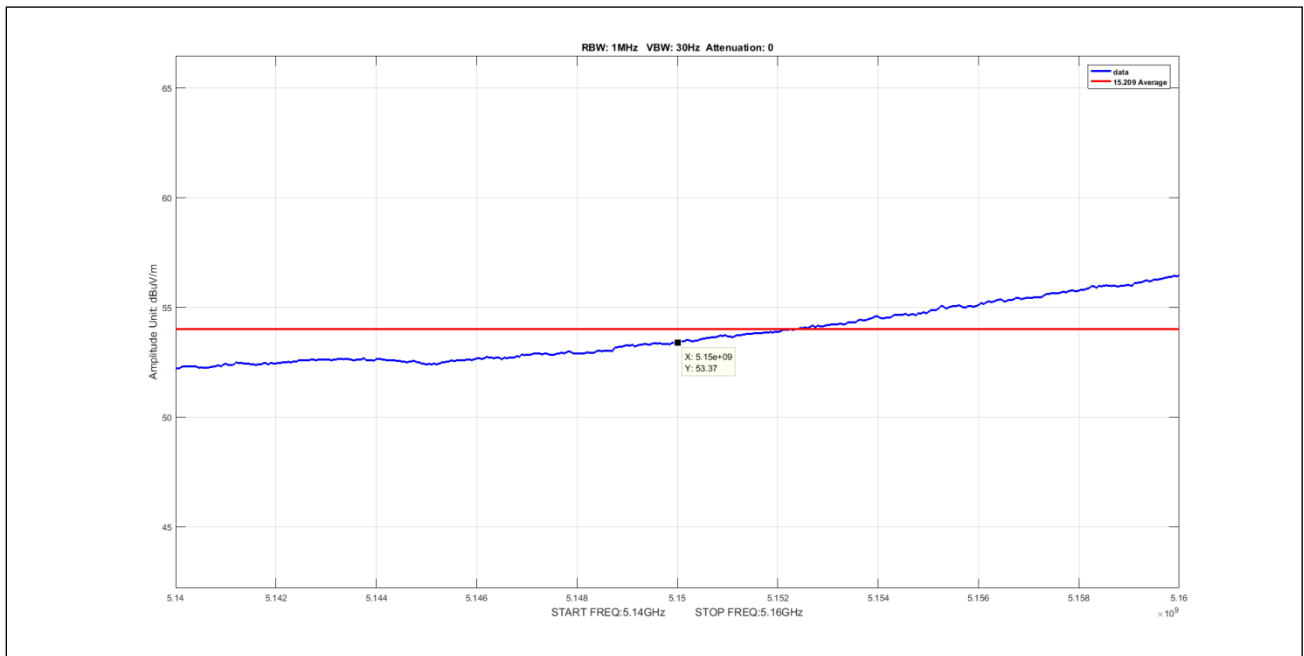
Plot 717. Radiated Band 3Para, 2.5M, Peak, 40M, 5171, pow-10



Plot 718. Radiated Band 3Para, 2.5M, Peak, 40M, 5230, pow21



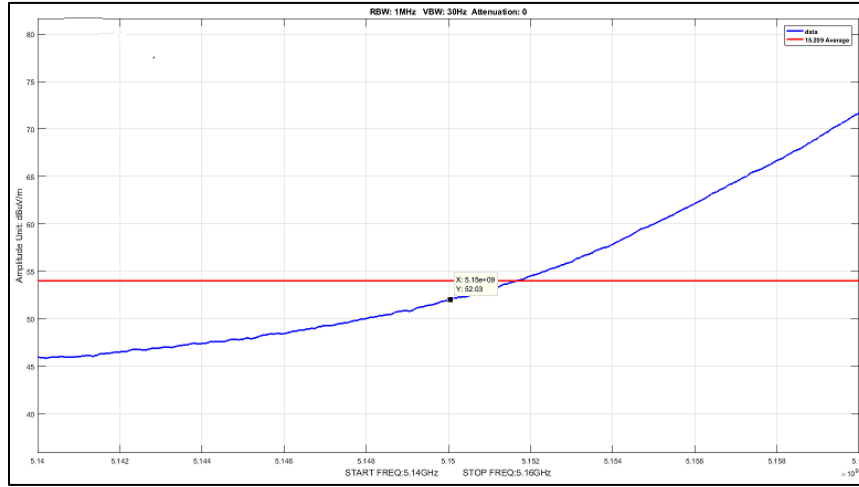
Plot 719. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5210 pow5 bandedge zoom



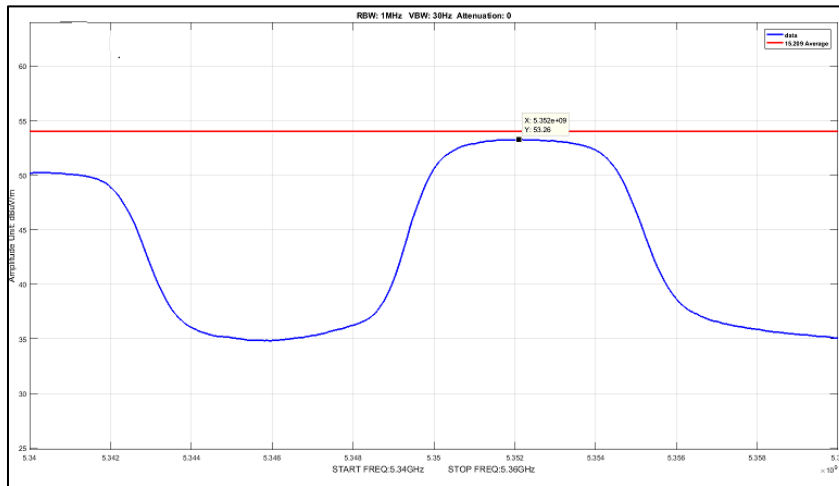
Plot 720. Undesirable Emissions, 3Para Avg 1-7GHz 40M 5230 pow8 bandedge zoom



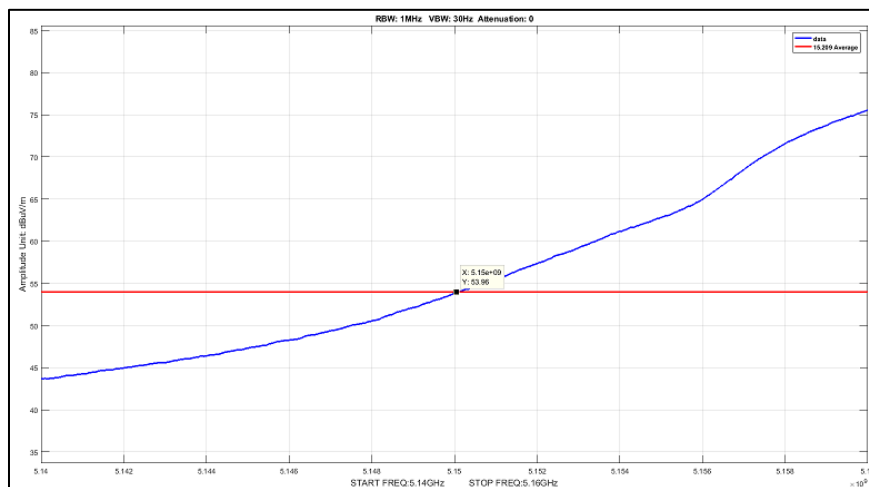
Radiated Band Edge, 90 Sector



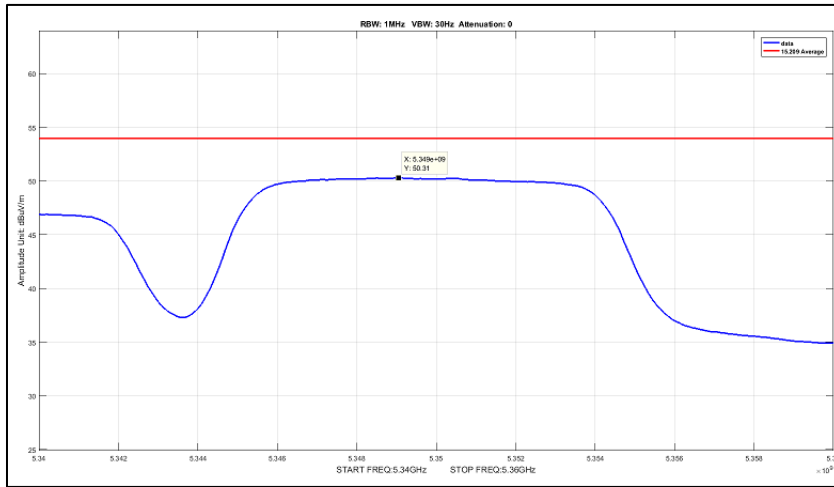
Plot 721. Radiated Band Edge, 90 Sector, Average, 5M, 5170, pow21



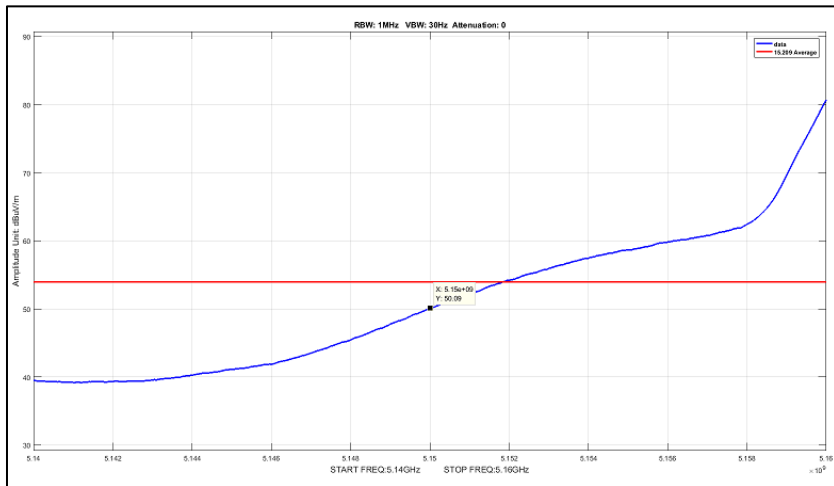
Plot 722. Radiated Band Edge, 90 Sector, Average, 5M, 5247.5, pow22



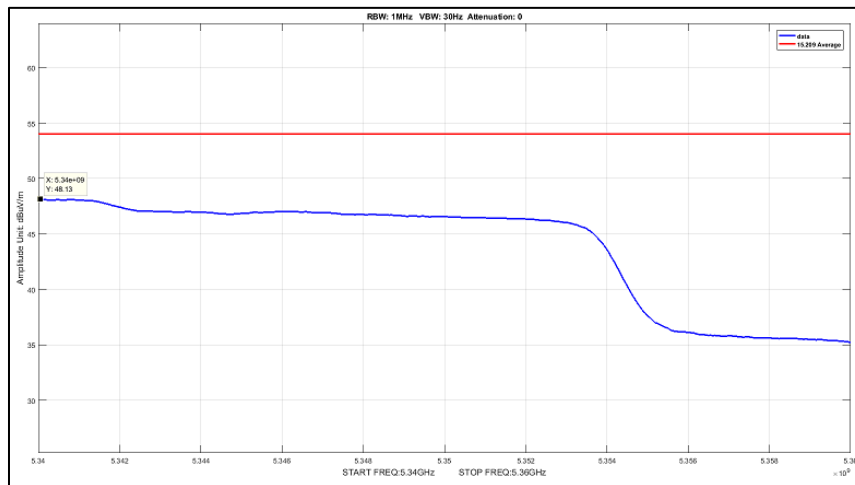
Plot 723. Radiated Band Edge, 90 Sector, Average, 10M, 5170, pow13



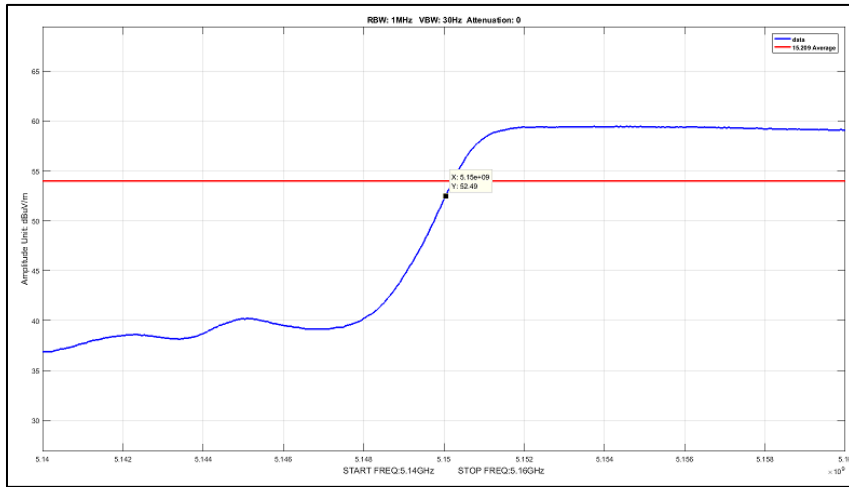
Plot 724. Radiated Band Edge, 90 Sector, Average, 10M, 5245, pow22



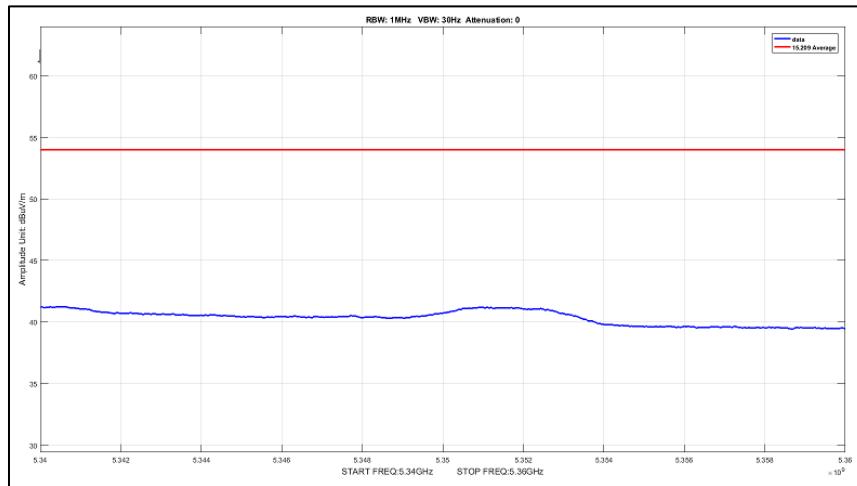
Plot 725. Radiated Band Edge, 90 Sector, Average, 20M, 5170, pow6



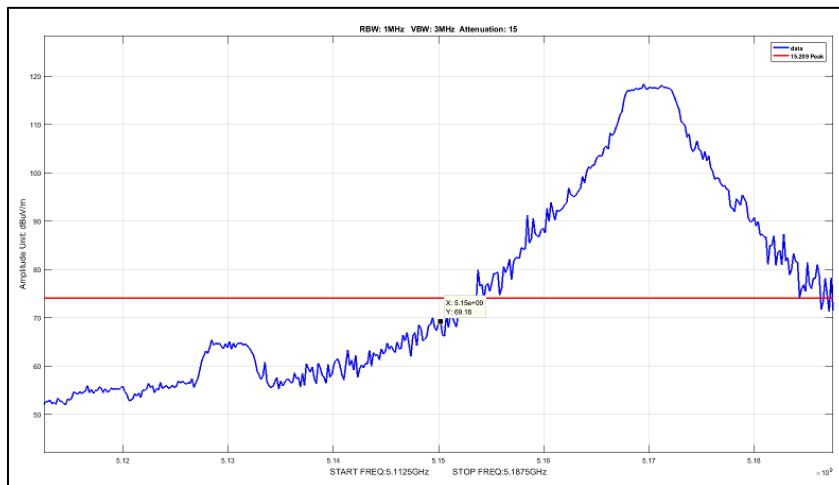
Plot 726. Radiated Band Edge, 90 Sector, Average, 20M, 5240, pow22



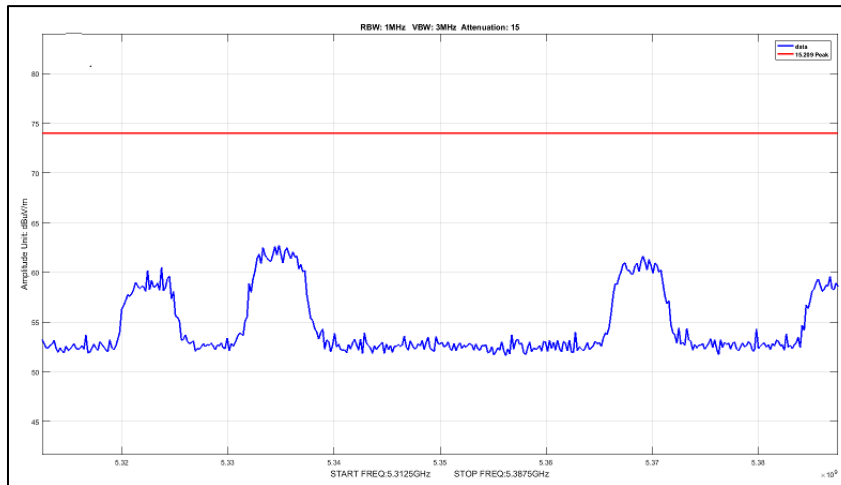
Plot 727. Radiated Band Edge, 90 Sector, Average, 40M, 5170, pow0



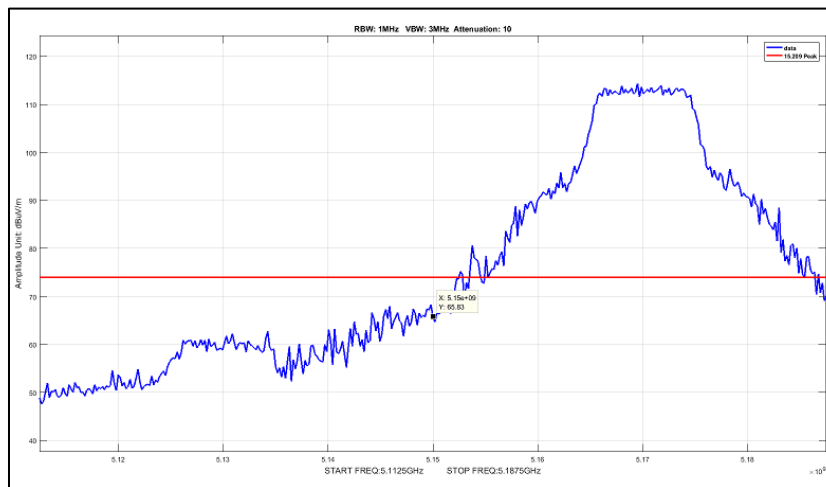
Plot 728. Radiated Band Edge, 90 Sector, Average, 40M, 5230, pow22



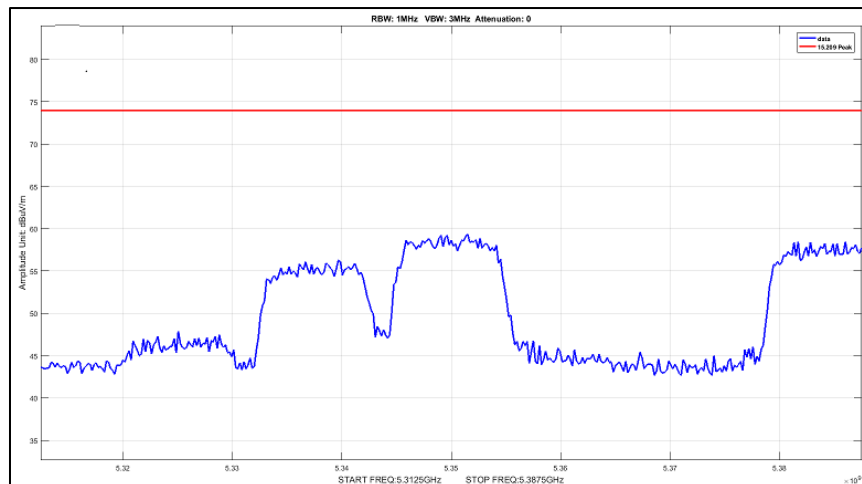
Plot 729. Radiated Band Edge, 90 Sector, Peak, 5M, 5170, pow21



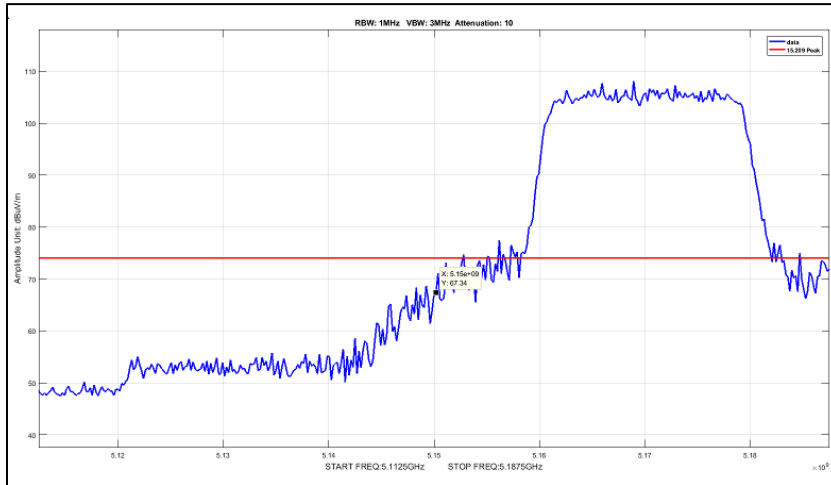
Plot 730. Radiated Band Edge, 90 Sector, Peak, 5M, 5247.5, pow22



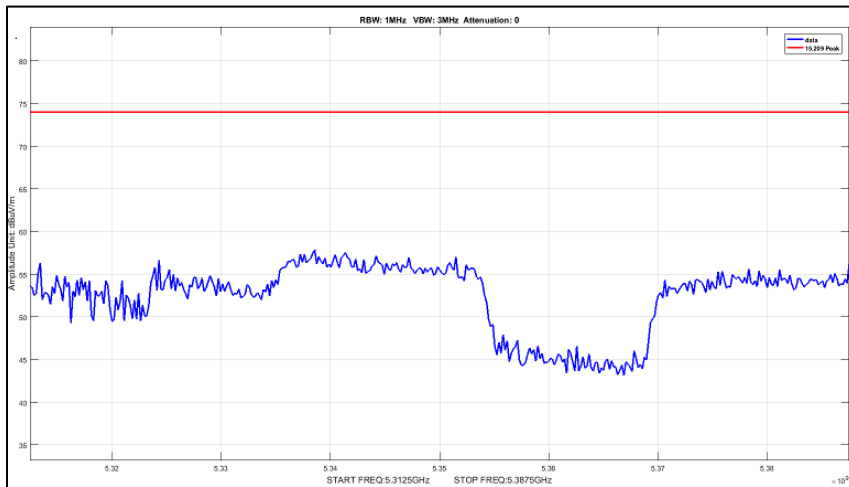
Plot 731. Radiated Band Edge, 90 Sector, Peak, 10M, 5170, pow13



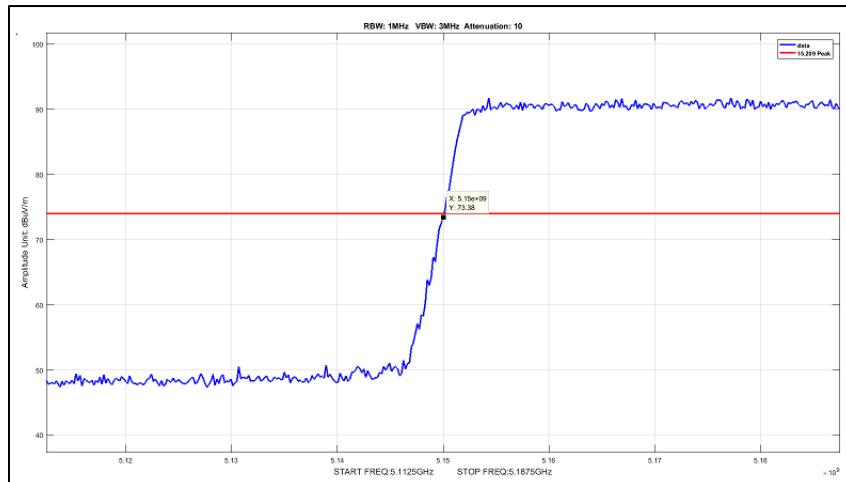
Plot 732. Radiated Band Edge, 90 Sector, Peak, 10M, 5245, pow22



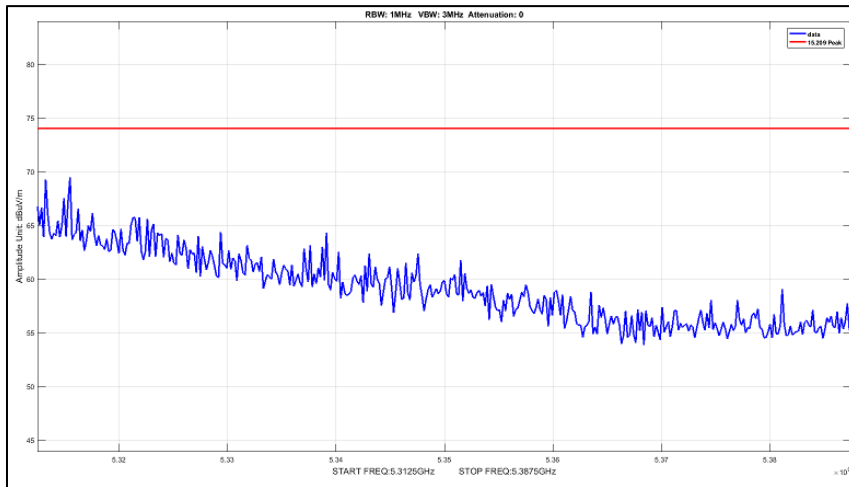
Plot 733. Radiated Band Edge, 90 Sector, Peak, 20M, 5170, pow6



Plot 734. Radiated Band Edge, 90 Sector, Peak, 20M, 5240, pow22



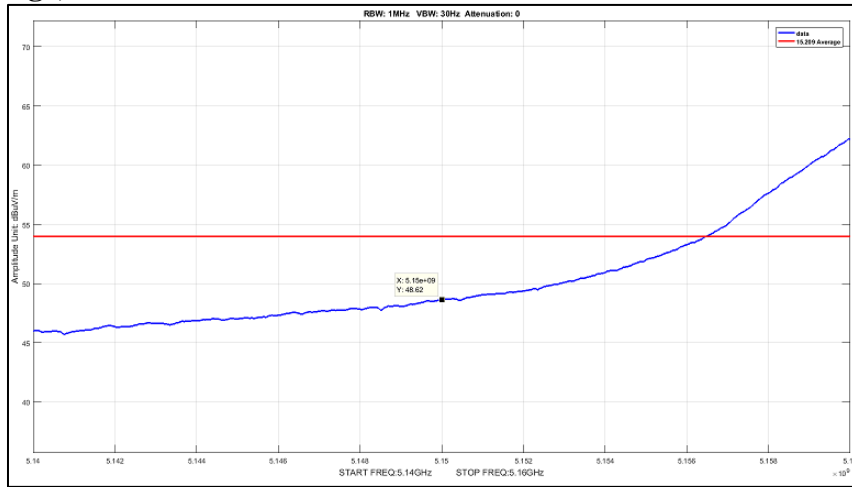
Plot 735. Radiated Band Edge, 90 Sector, Peak, 40M, 5170, pow0



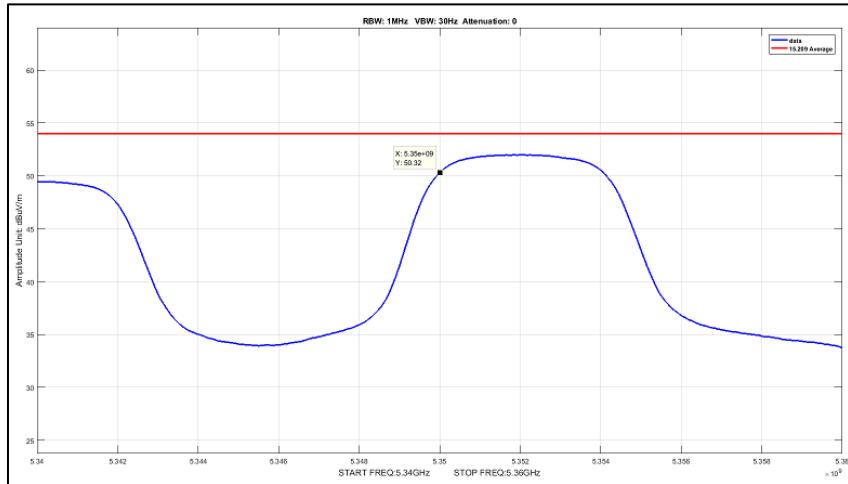
Plot 736. Radiated Band Edge, 90 Sector, Peak, 40M, 5230, pow22



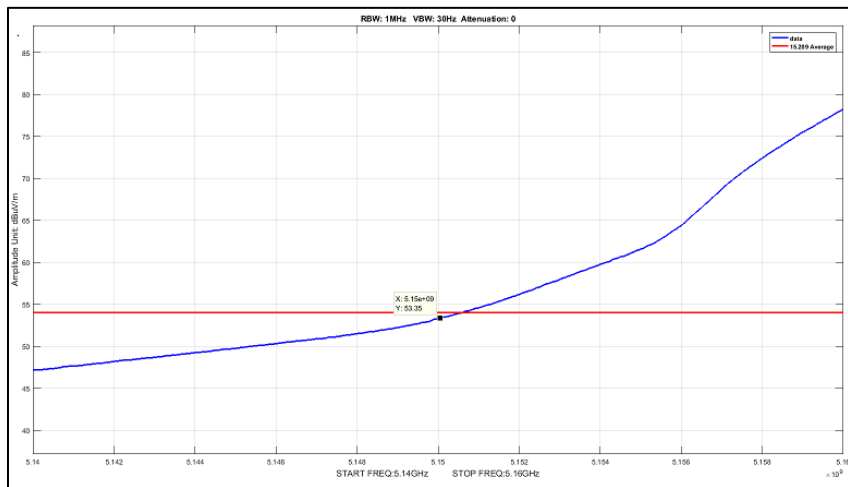
Radiated Band Edge, 5 Omni



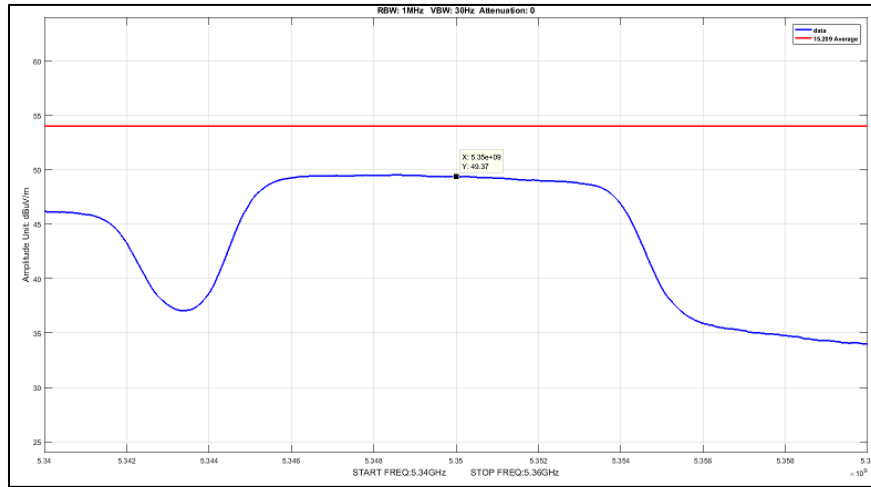
Plot 737. Radiated Band Edge, 5 Omni, Average, 5M, 5170, pow22



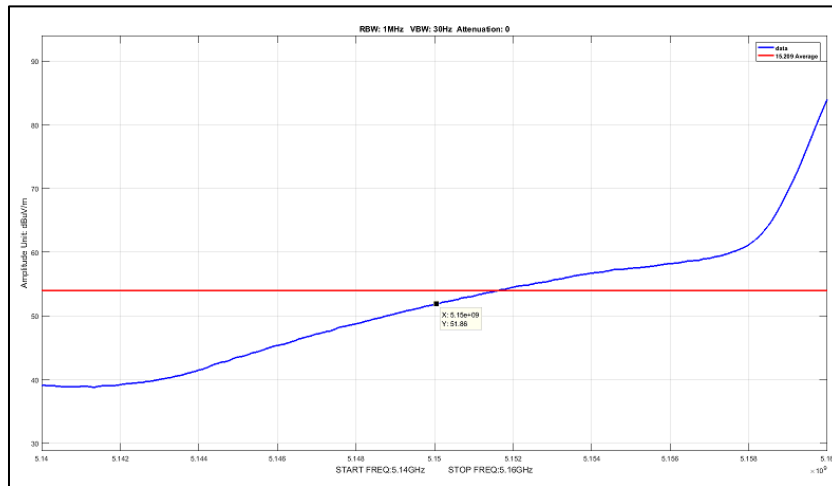
Plot 738. Radiated Band Edge, 5 Omni, Average, 5M, 5247.5, pow22



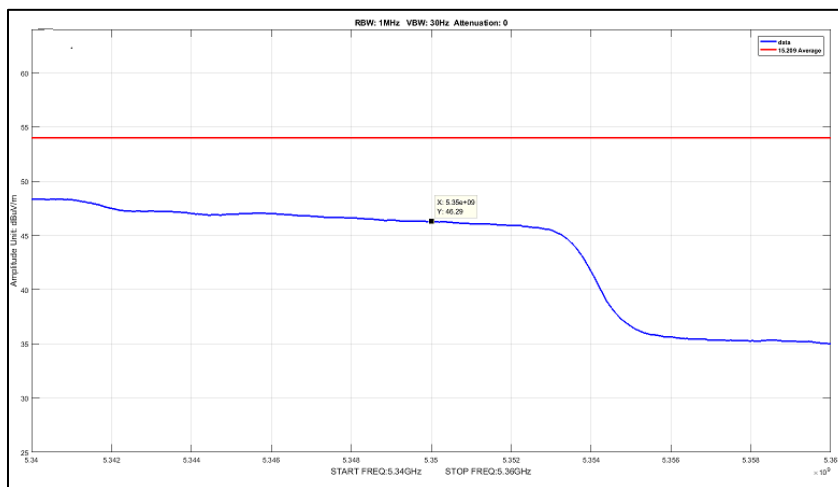
Plot 739. Radiated Band Edge, 5 Omni, Average, 10M, 5170, pow19



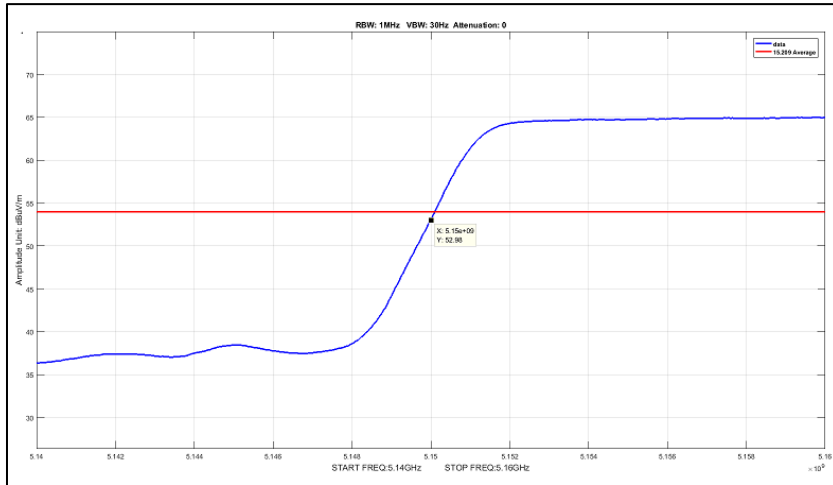
Plot 740. Radiated Band Edge, 5 Omni, Average, 10M, 5245, pow22



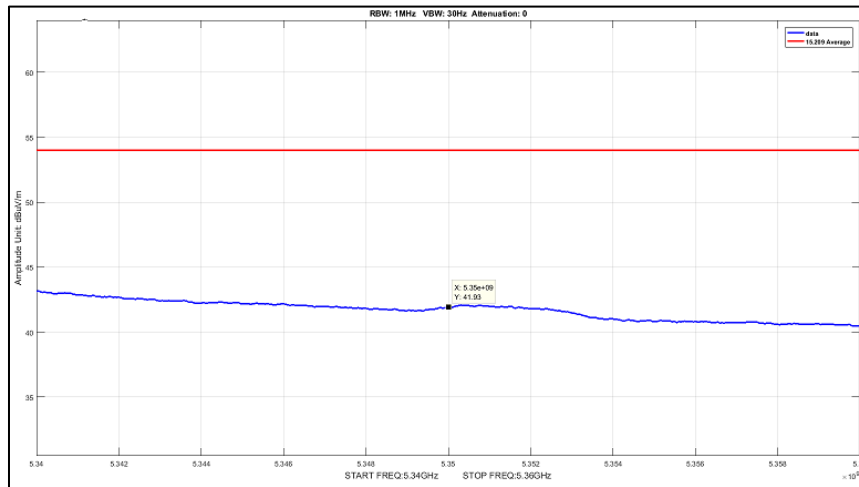
Plot 741. Radiated Band Edge, 5 Omni, Average, 20M, 5170, pow10



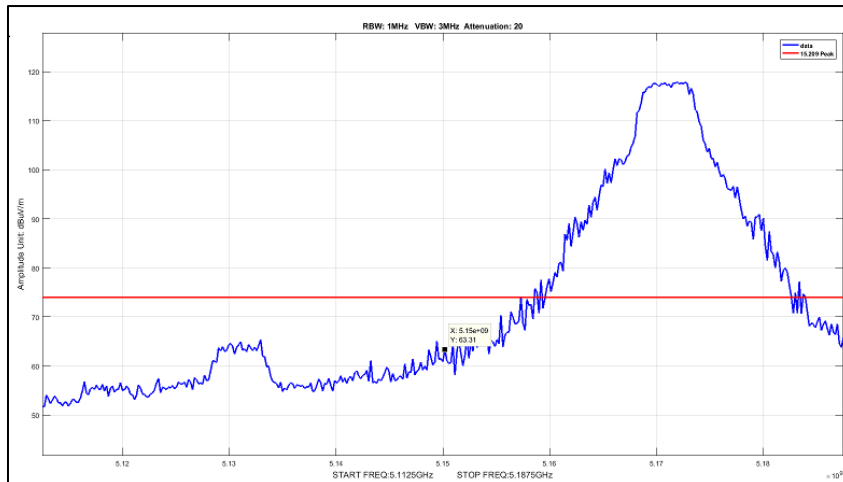
Plot 742. Radiated Band Edge, 5 Omni, Average, 20M, 5240, pow22



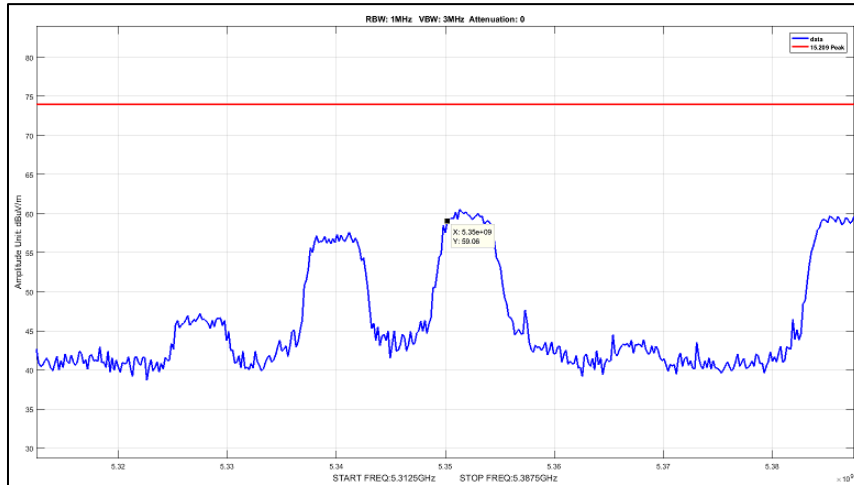
Plot 743. Radiated Band Edge, 5 Omni, Average, 40M, 5170, pow3



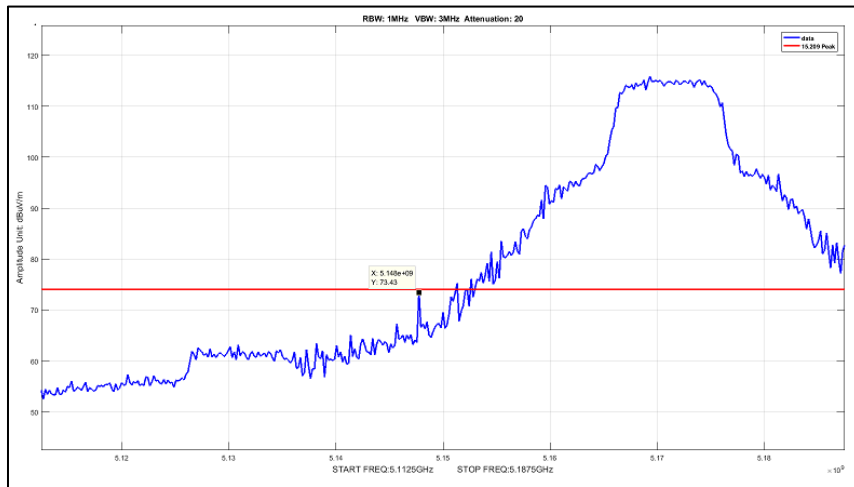
Plot 744. Radiated Band Edge, 5 Omni, Average, 40M, 5230, pow22



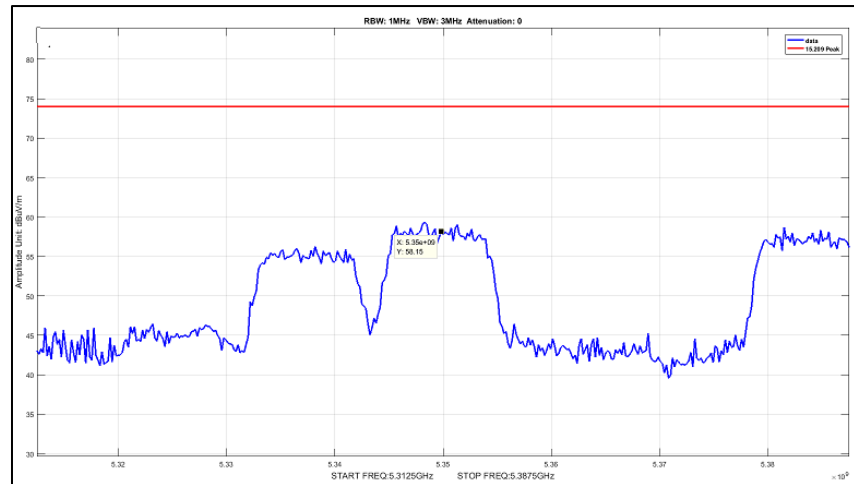
Plot 745. Radiated Band Edge, 5 Omni, Peak, 5M, 5170, pow22



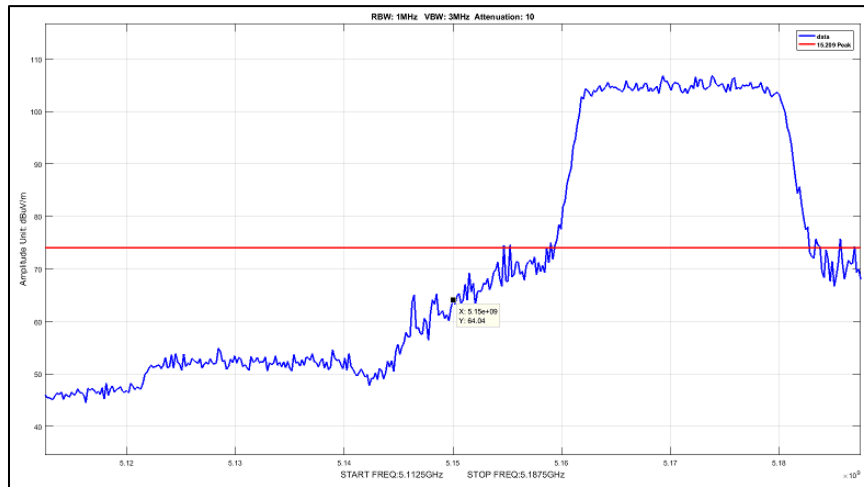
Plot 746. Radiated Band Edge, 5 Omni, Peak, 5M, 5247.5, pow22



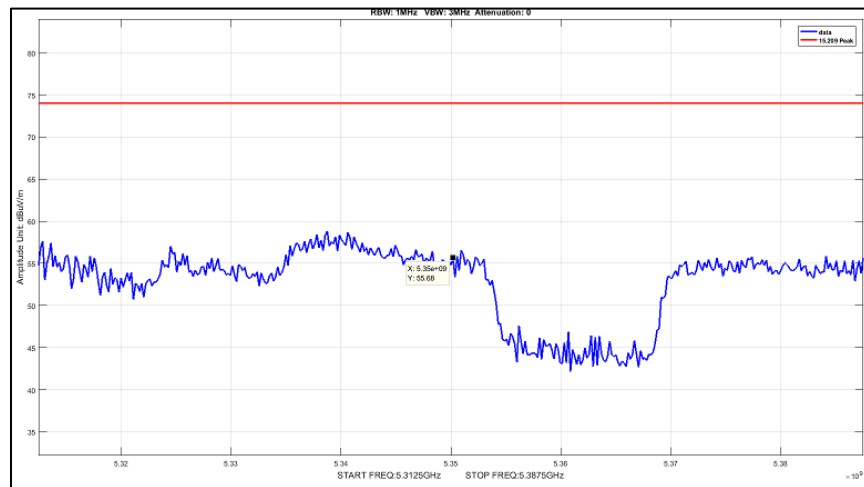
Plot 747. Radiated Band Edge, 5 Omni, Peak, 10M, 5170, pow19



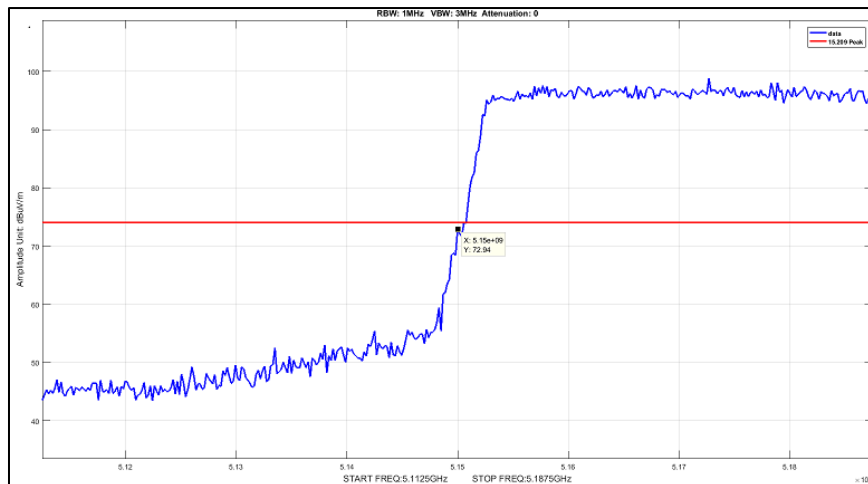
Plot 748. Radiated Band Edge, 5 Omni, Peak, 10M, 5245, pow22



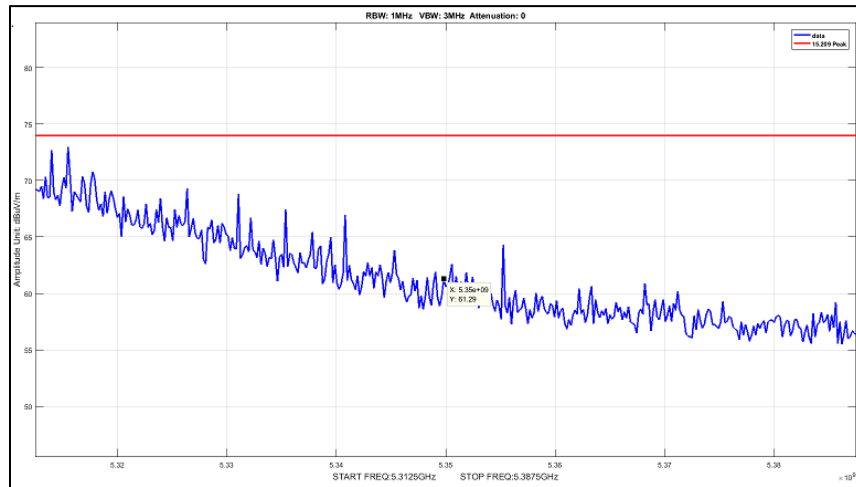
Plot 749. Radiated Band Edge, 5 Omni, Peak, 20M, 5170, pow10



Plot 750. Radiated Band Edge, 5 Omni, Peak, 20M, 5240, pow22

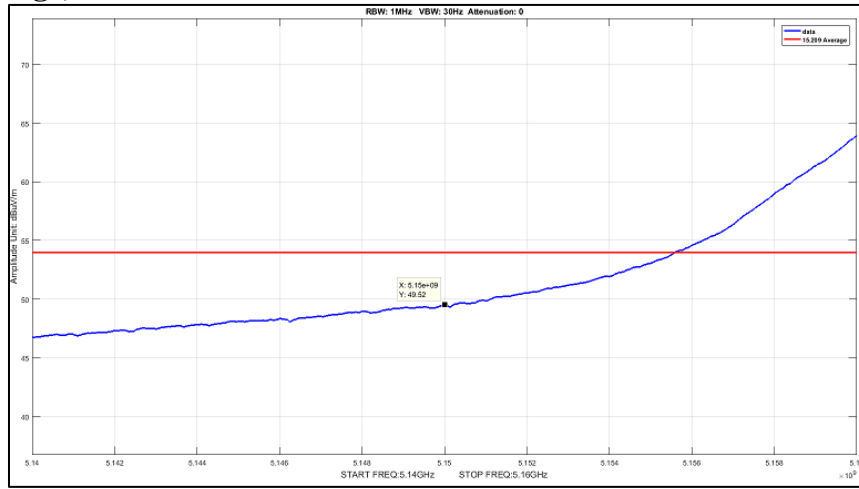


Plot 751. Radiated Band Edge, 5 Omni, Peak, 40M, 5171, pow3

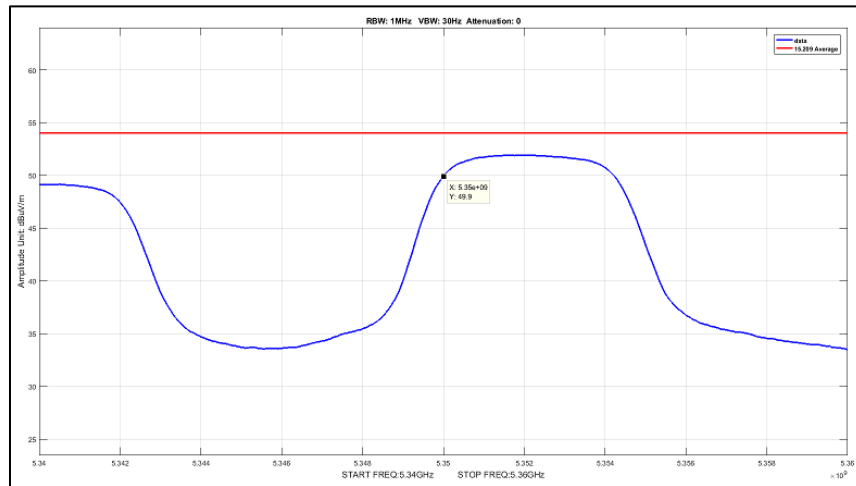


Plot 752. Radiated Band Edge, 5 Omni, Peak, 40M, 5230, pow22

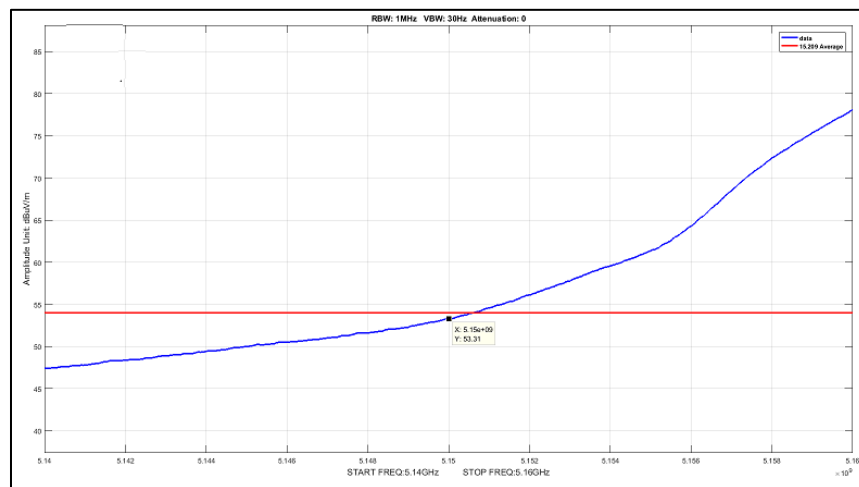
Radiated Band Edge, 8 Omni



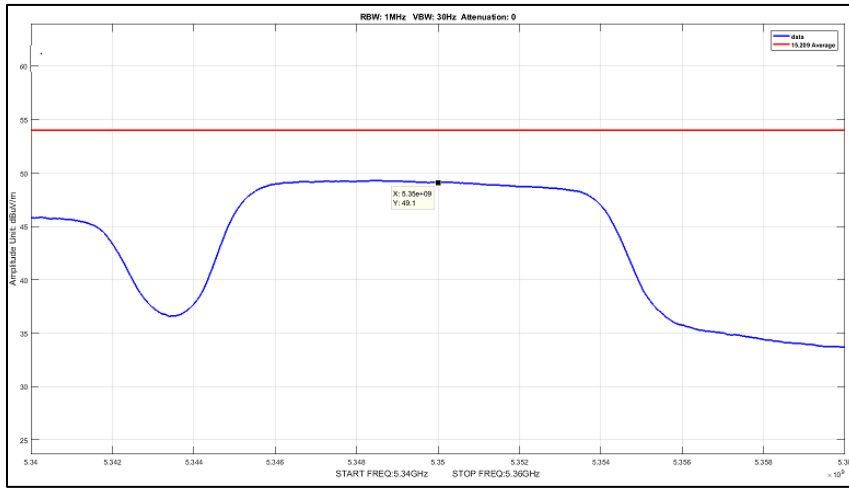
Plot 753. Radiated Band Edge, Average, 8 Omni, 5M, 5170, pow22



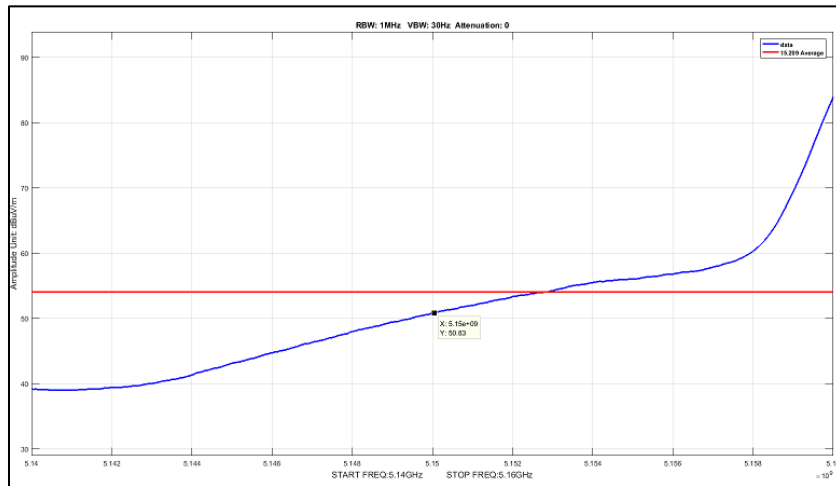
Plot 754. Radiated Band Edge, 8 Omni, Average, 5M, 5247.5, pow22



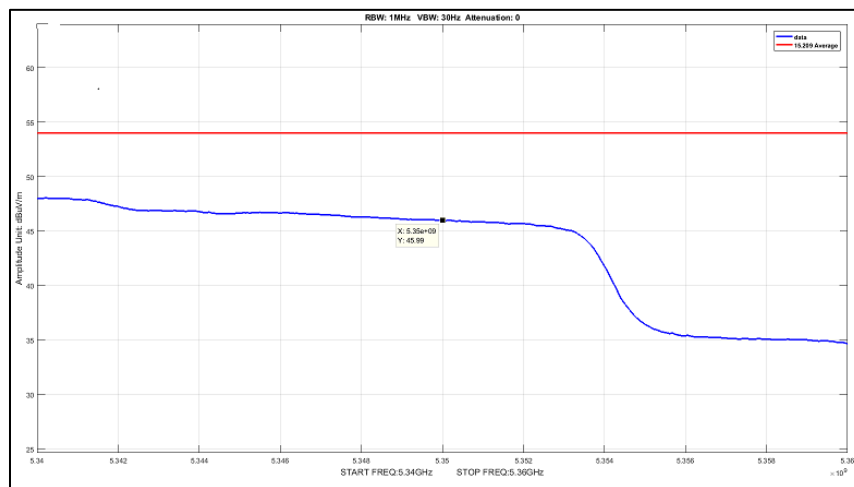
Plot 755. Radiated Band Edge, 8 Omni, Average, 10M, 5170, pow18



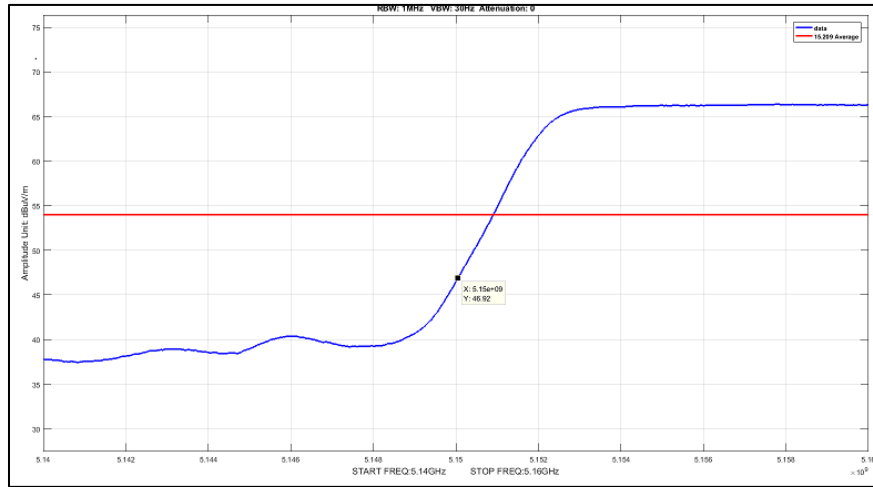
Plot 756. Radiated Band Edge, 8 Omni, Average, 10M, 5245, pow22



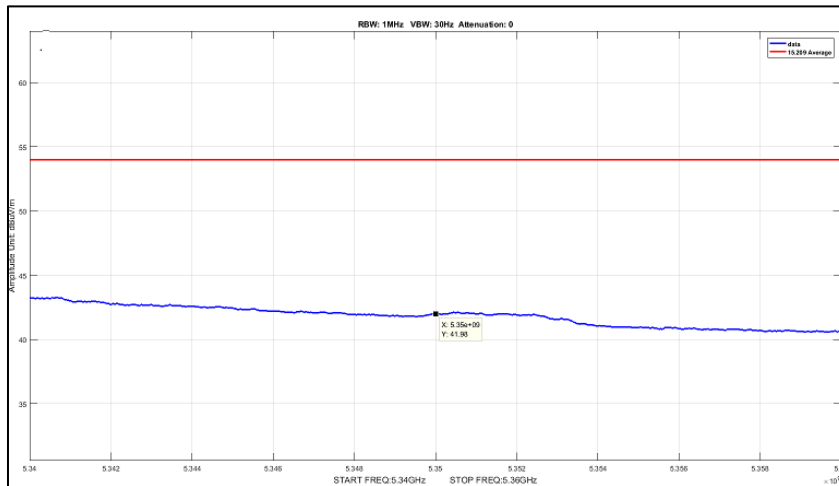
Plot 757. Radiated Band Edge, 8 Omni, Average, 20M, 5170, pow9



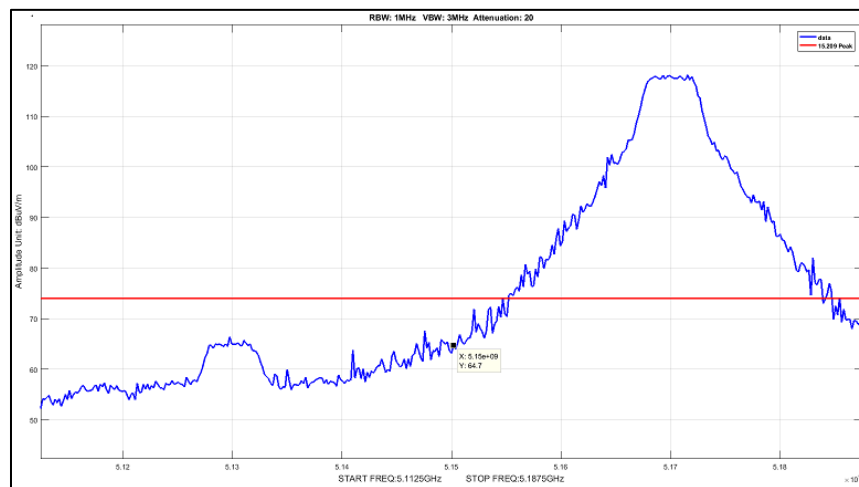
Plot 758. Radiated Band Edge, 8 Omni, Average, 20M, 5240, pow22



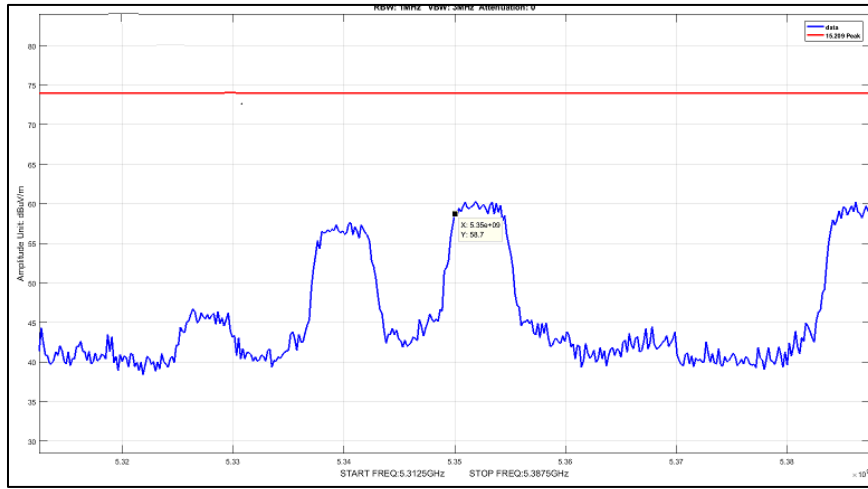
Plot 759. Radiated Band Edge, 8 Omni, Average, 40M, 5171, pow4



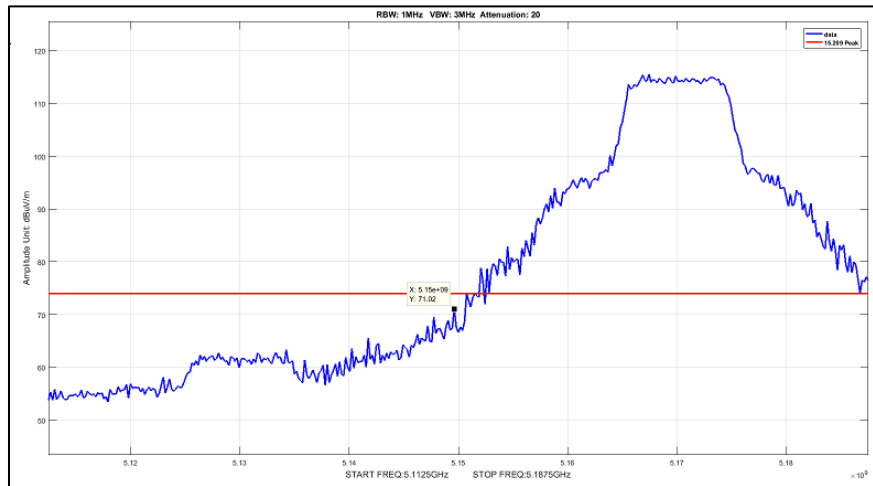
Plot 760. Radiated Band Edge, 8 Omni, Average, 40M, 5230, pow22



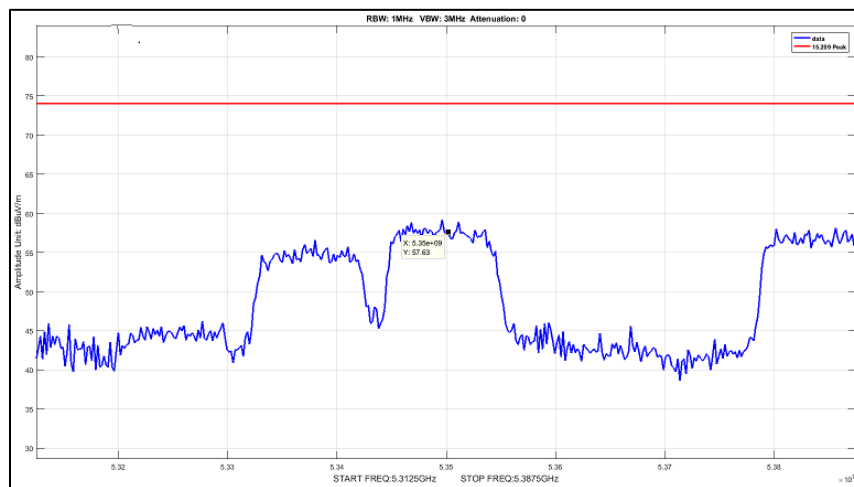
Plot 761. Radiated Band Edge, 8 Omni, Peak, 5M, 5170, pow22



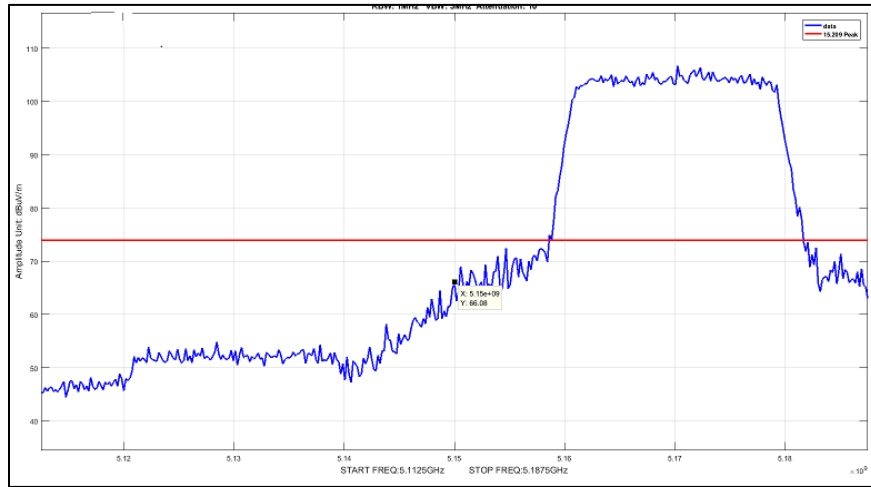
Plot 762. Radiated Band Edge, 8 Omni, Peak, 5M, 5247.5, pow22



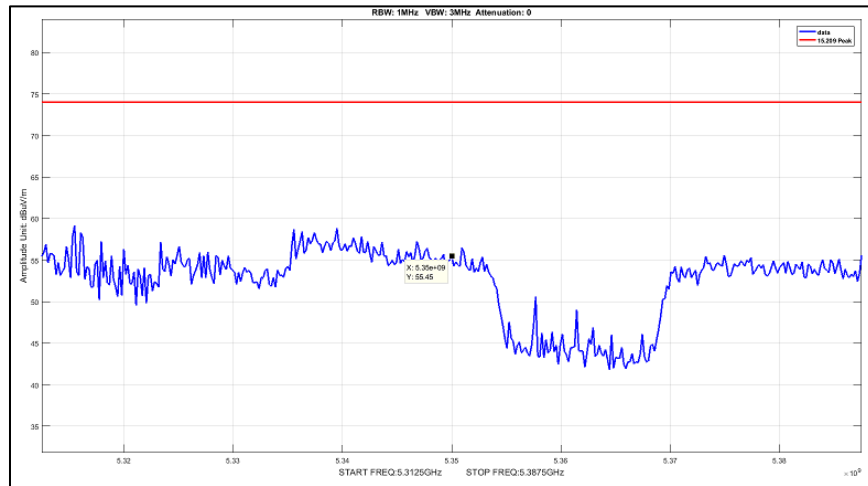
Plot 763. Radiated Band Edge, 8 Omni, Peak, 10M, 5170, pow18



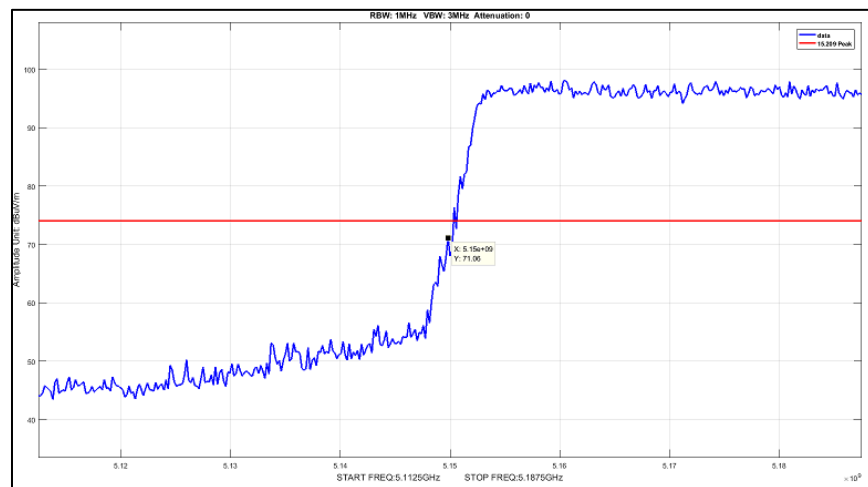
Plot 764. Radiated Band Edge, 8 Omni, Peak, 10M, 5245, pow22



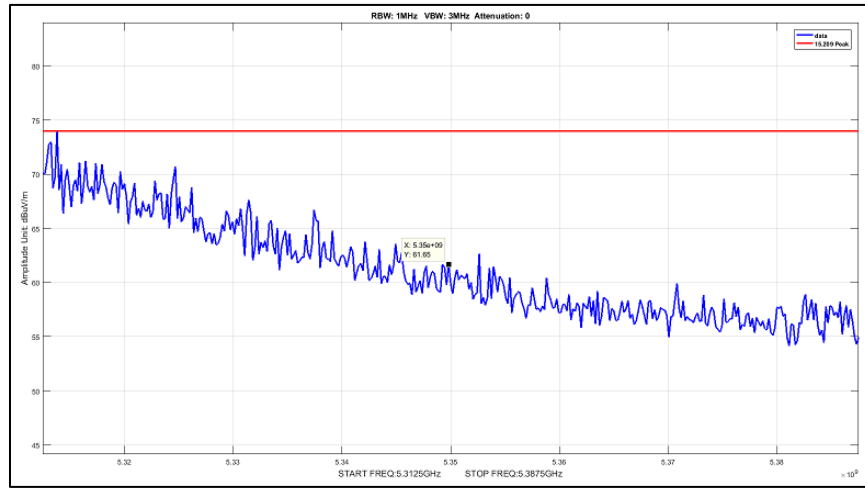
Plot 765. Radiated Band Edge, 8 Omni, Peak, 20M, 5170, pow9



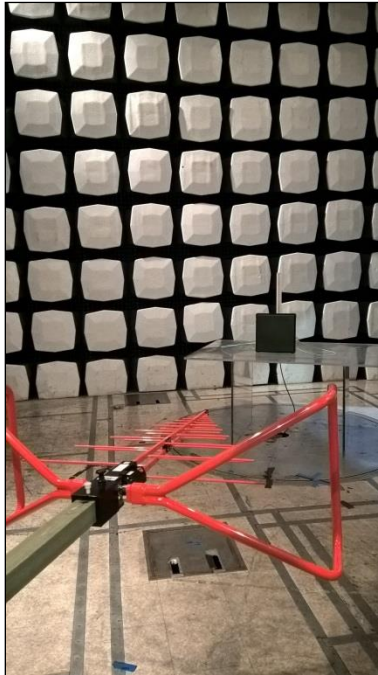
Plot 766. Radiated Band Edge, 8 Omni, Peak, 20M, 5240, pow22



Plot 767. Radiated Band Edge, 8 Omni, Peak, 40M, 5171, pow4



Plot 768. Radiated Band Edge, 8 Omni, Peak, 40M, 5230, pow22



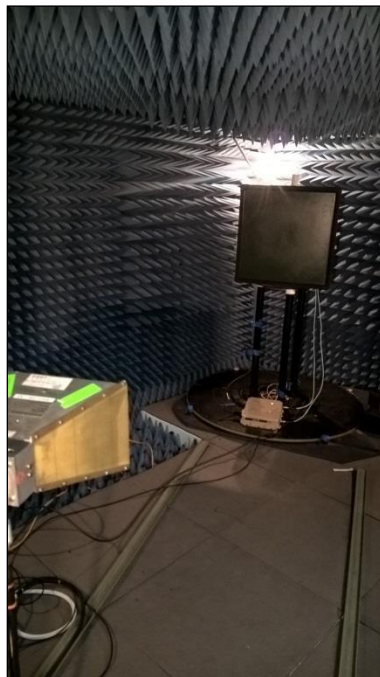
Photograph 1. Undesirable Emissions, 1' Panel below 1 GHz, Test Setup



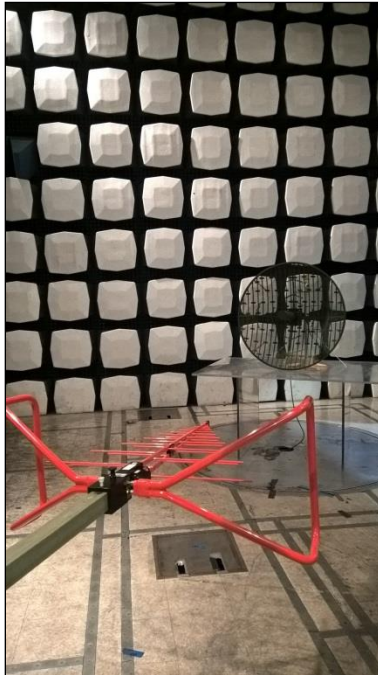
Photograph 2. Undesirable Emissions, 1' Panel above 1 GHz, Test Setup



Photograph 3. Undesirable Emissions, 2' Panel below 1 GHz, Test Setup



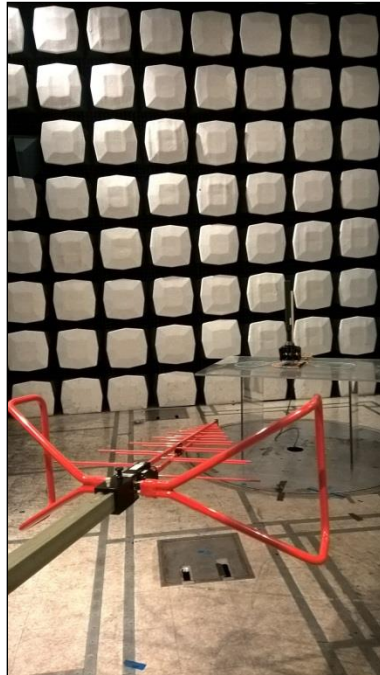
Photograph 4. Undesirable Emissions, 2' Panel above 1 GHz, Test Setup



Photograph 5. Undesirable Emissions, Para below 1 GHz, Test Setup



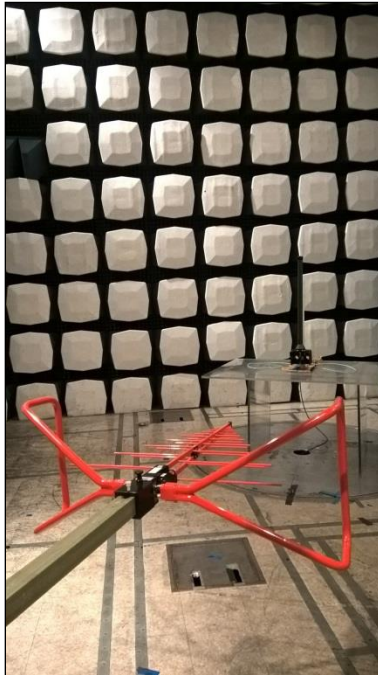
Photograph 6. Undesirable Emissions, Para above 1 GHz, Test Setup



Photograph 7. Undesirable Emissions, 5 Omni below 1 GHz, Test Setup



Photograph 8. Undesirable Emissions, 5 Omni above 1 GHz, Test Setup



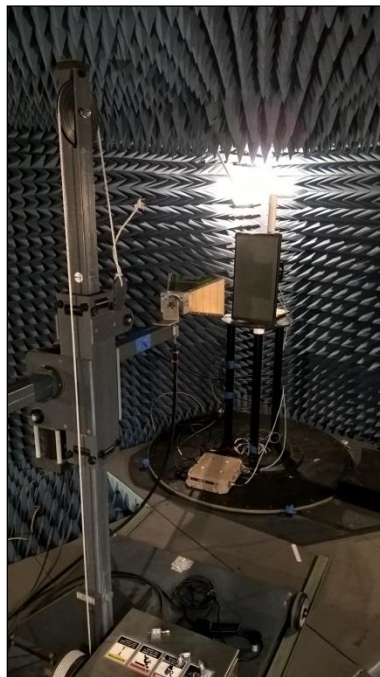
Photograph 9. Undesirable Emissions, 8 Omni below 1 GHz, Test Setup



Photograph 10. Undesirable Emissions, 8 Omni above 1 GHz, Test Setup



Photograph 11. Undesirable Emissions, 90 Sector below 1 GHz, Test Setup



Photograph 12. Undesirable Emissions, 90 Sector above 1 GHz, Test Setup

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(b)(6) Conducted Emissions

Test Requirement(s): § 15.407 (b)(6): Any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in §15.207.

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

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dB μ V)	
	Quasi-Peak	Average
* 0.15- 0.45	66 – 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

Table 28. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Test Procedure: The EUT was placed on a non-metallic table inside a screen room. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50 Ω /50 μ H Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with ANSI C63.4-2014 "Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz". Scans were performed with the transmitter on.

Test Results: The EUT was compliant with requirements of this section.

Measured emissions were within applicable limits.

Test Engineer(s): Bradley Jones

Test Date(s): November 29, 2017

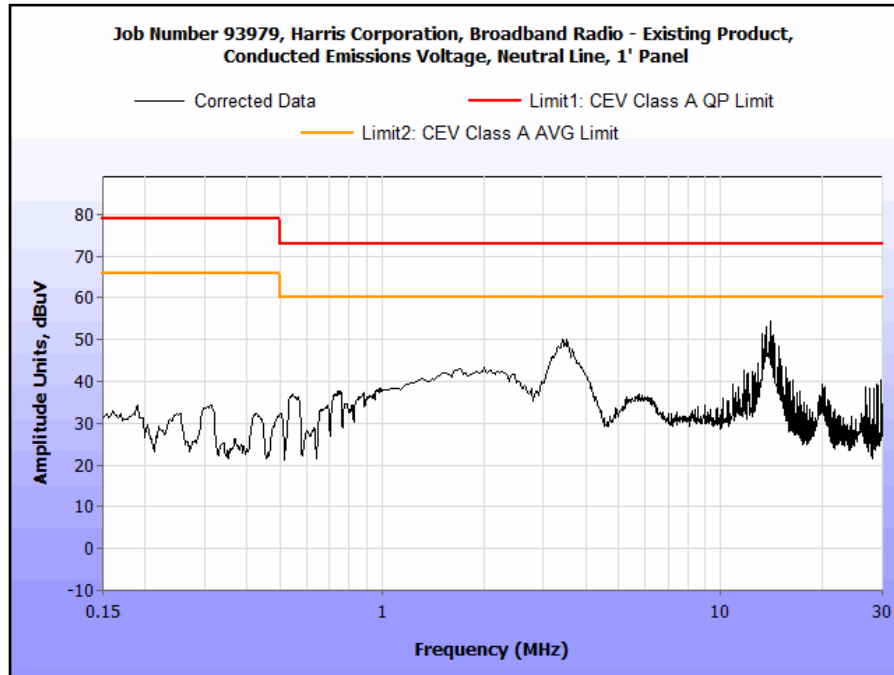


Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
13.29	54.07	0	54.07	73	-18.93	52.07	0	52.07	60	-7.93
3.417	45.39	0	45.39	73	-27.61	31.39	0	31.39	60	-28.61

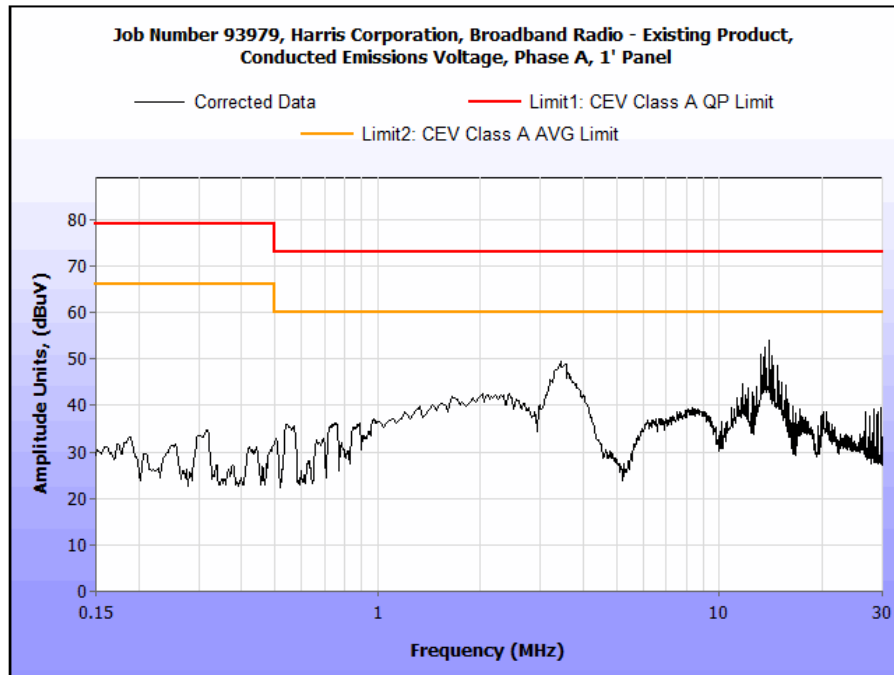
Table 29. Conducted Emissions, Phase Line, Test Results

Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
13.24	53.27	0	53.27	73	-19.73	52.05	0	52.05	60	-7.95
3.478	47.12	0	47.12	73	-25.88	35.52	0	35.52	60	-24.48

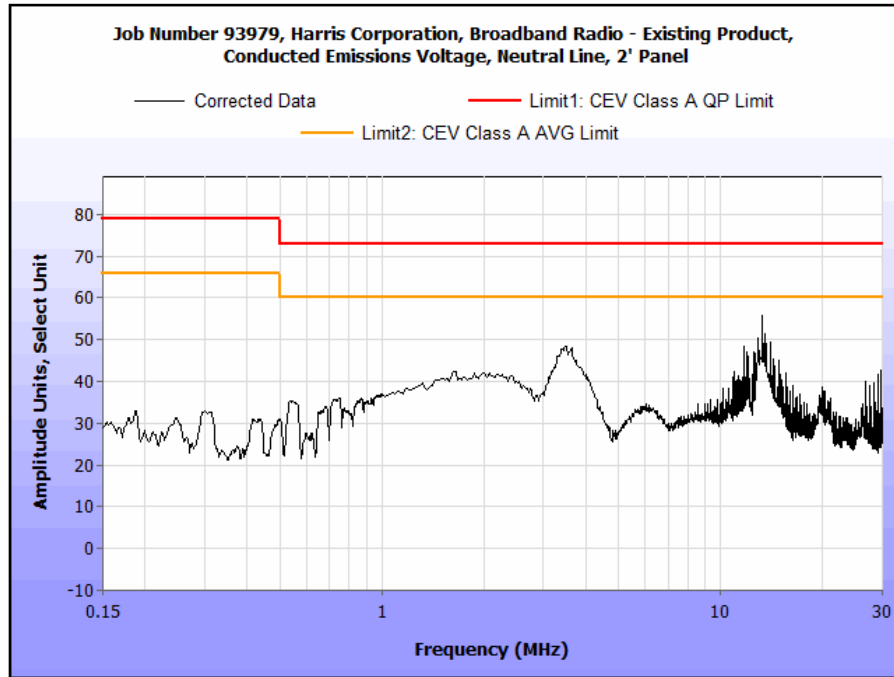
Table 30. Conducted Emissions, Neutral Line, Test Results



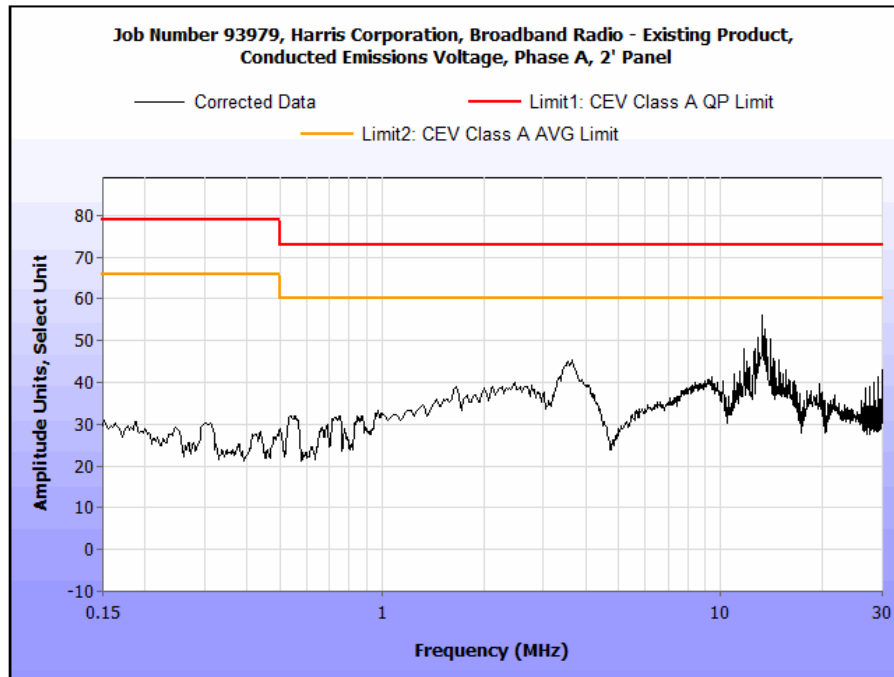
Plot 769. Conducted Emissions, 1' Panel Neutral



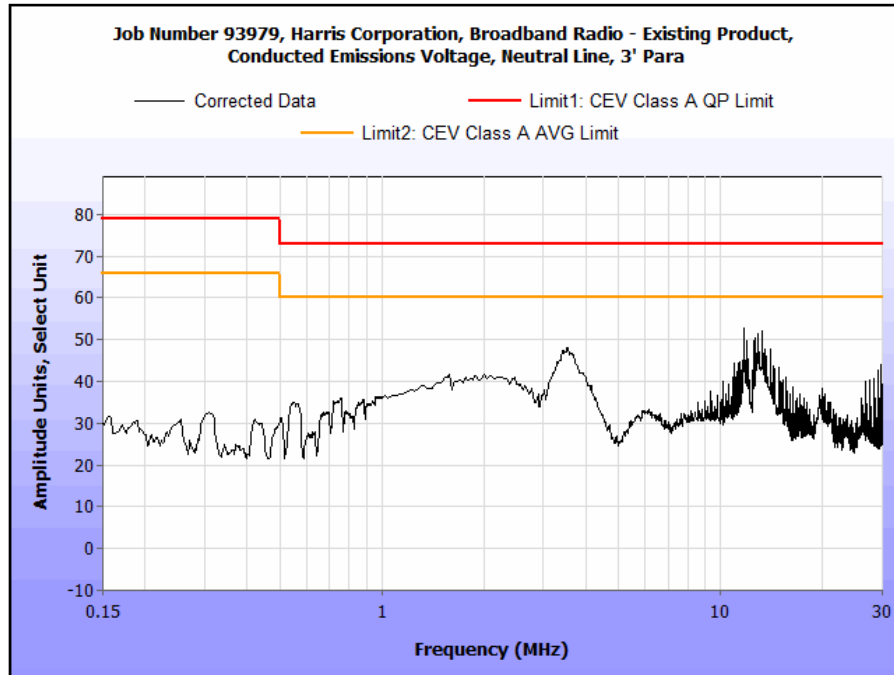
Plot 770. Conducted Emissions, 1' Panel Phase



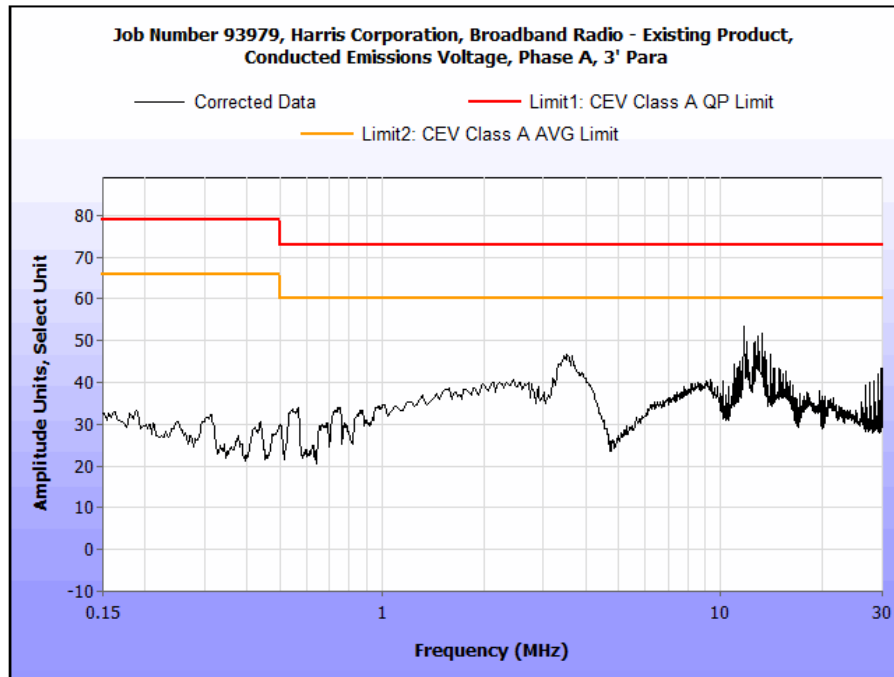
Plot 771. Conducted Emissions, 2' Panel Neutral



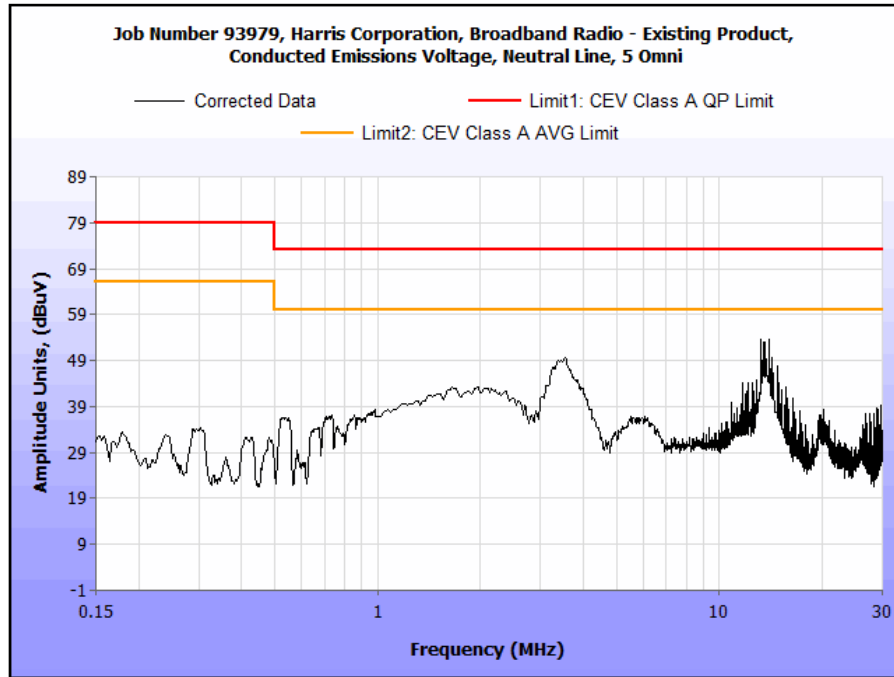
Plot 772. Conducted Emissions, 2' Panel



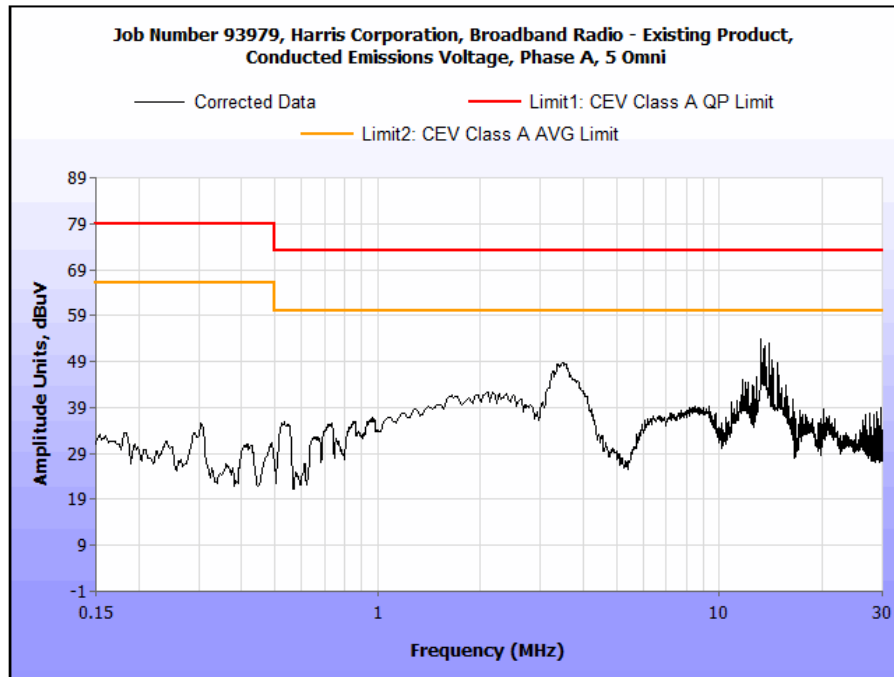
Plot 773. Conducted Emissions, 3' Panel Neutral



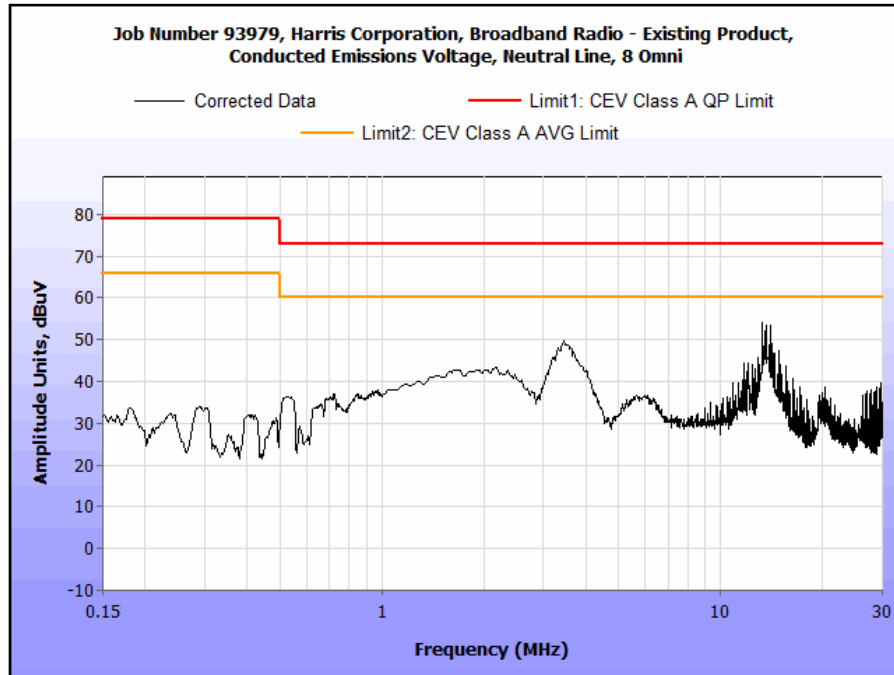
Plot 774. Conducted Emissions, 3' Panel Phase



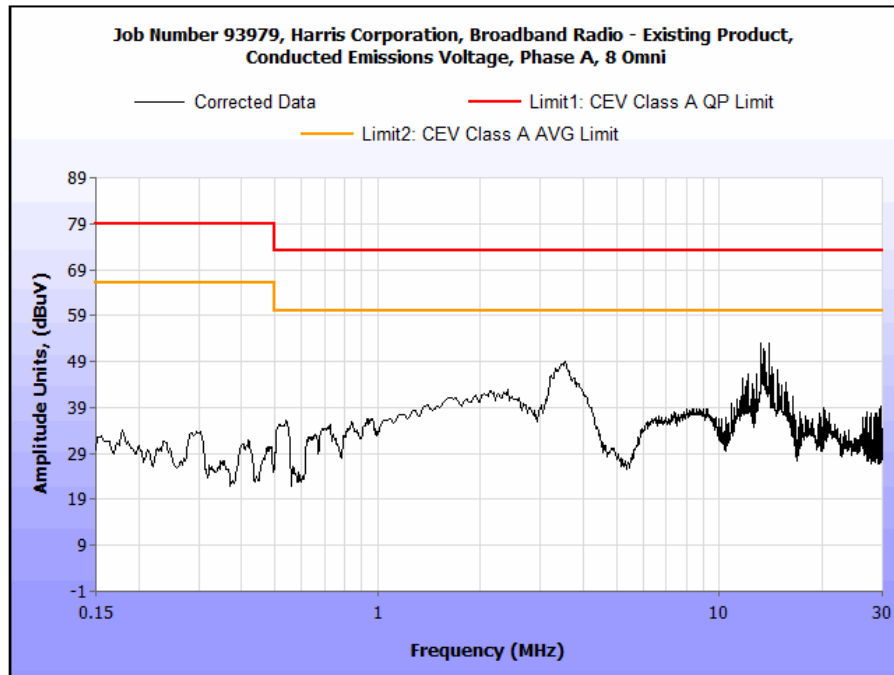
Plot 775. Conducted Emissions, 5 Omni Neutral



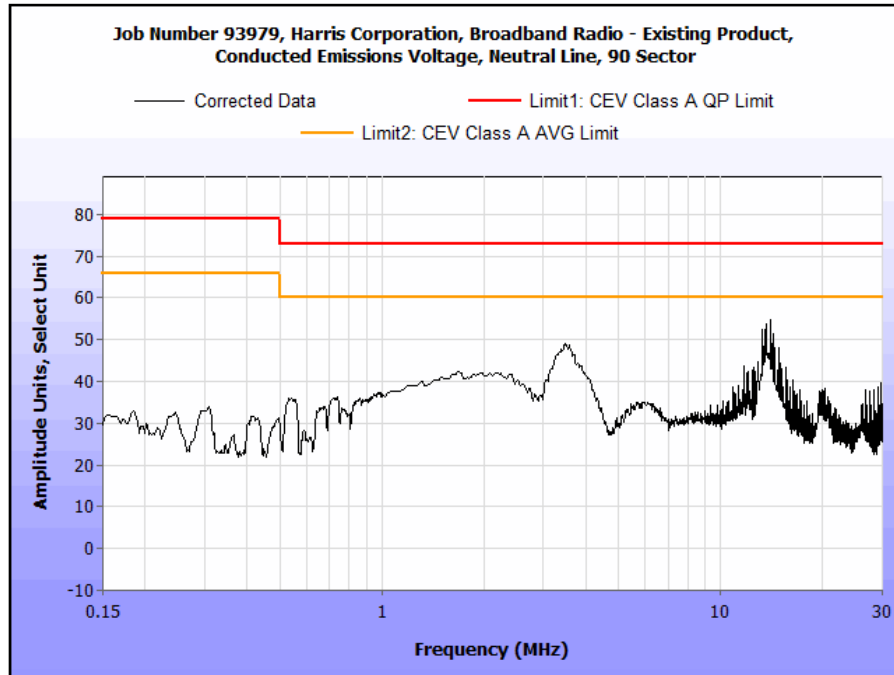
Plot 776. Conducted Emissions, 5 Omni Phase



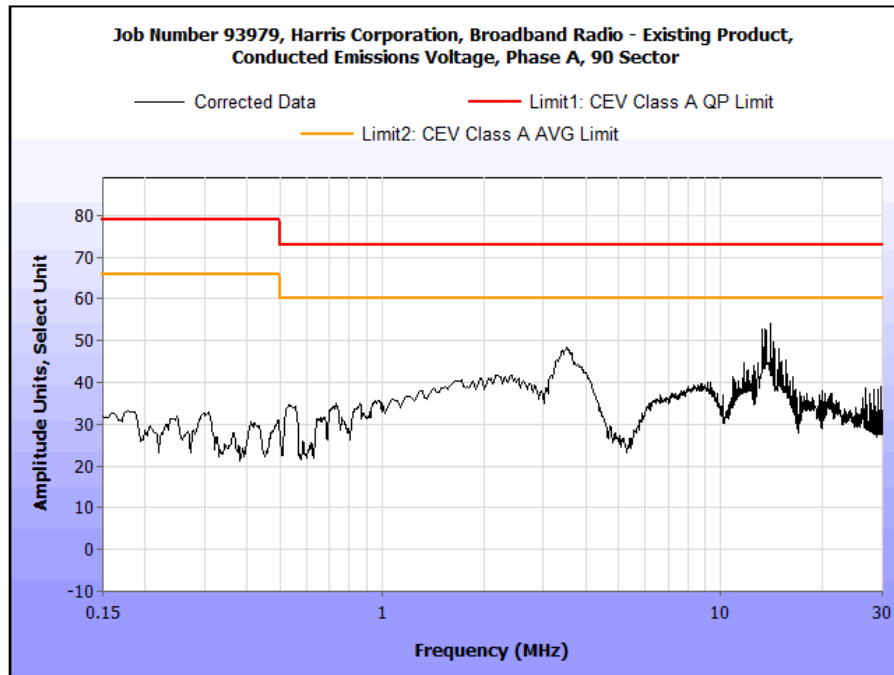
Plot 777. Conducted Emissions, 8 Omni Neutral



Plot 778. Conducted Emissions, 8 Omni Phase



Plot 779. Conducted Emissions, 90 Sector Neutral



Plot 780. Conducted Emissions, 90 Sector Phase



Photograph 13. Conducted Emissions, 1' Panel, Test Setup



Photograph 14. Conducted Emissions, 2' Panel, Test Setup



Photograph 15. Conducted Emissions, 3' Para, Test Setup



Photograph 16. Conducted Emissions, 5 Omni, Test Setup



Photograph 17. Conducted Emissions, Omni 8, Test Setup



Photograph 18. Conducted Emissions, 90 Sector, Test Setup



Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(f) Maximum Permissible Exposure

Test Requirement(s): §15.407(f): U-NII devices are subject to the radio frequency radiation exposure requirements specified in §1.1307(b), §2.1091 and §2.1093 of this chapter, as appropriate. All equipment shall be considered to operate in a “general population/uncontrolled” environment.

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

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

MPE Limit: EUT’s operating frequencies @ 5150-5250 MHz; **Limit for Uncontrolled exposure: 1 mW/cm² or 10 W/m²**

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

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

where, S = Power Density (mW/cm²)
P = Power Input to antenna (mW)
G = Antenna Gain (numeric value)
R = Distance (cm)

Test Results:

FCC									
Frequency (MHz)	Con. Pwr. (dBm)	Con. Pwr. (mW)	Ant. Gain (dBi)	Ant. Gain numeric	Pwr. Density (mW/cm ²)	Limit (mW/cm ²)	Margin	Distance (cm)	Result
5236	12.93	19.634	30	1000	1	1	0	39.527	Pass
5230	15.004	31.652	26	398.107	1	1	0	31.666	Pass
5210	15.91	38.994	21	125.893	0.97663	1	0.02337	20	Pass
5230	21.06	127.644	14	25.119	0.63787	1	0.36213	20	Pass
5230	27.17	521.195	8	6.31	0.65423	1	0.34577	20	Pass
5210	21.605	144.71	5	3.162	0.09104	1	0.90896	20	Pass

The safe distance where Power Density is less than the MPE Limit listed above was found to be the following for each of the antennae: 39.527 cm for the 3' Param, 31.666 cm for the 2' Panel, and 20 cm for the 1' Panel, 90 Sector, 8 Omni and 5 Omni antennas.



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
1T4455	Compass	SUUNTO	KB-14/360	Functional verified	
1T4712	Gauss Meter	F.W. Bell	5180	11/7/2014	5/7/2016
1T4486	1,3 Phase Power Line Filter	Schaffner	FN258-55-07	See Note	
1T4870	Therm./Clock/Humidity Monitor	Control Company	06-662-4, FB70258	3/14/2014	3/14/2016
1T4406	HELMHOLTZ COIL	MET Laboratories	N/A	See Note	
1T4442	Pre-amplifier, Microwave	Miteq	AFS42-01001800-30-10P	See Note.	
1T4149	High-Frequency Anechoic Chamber	Ray Proof	81	8/23/2001	8/23/2002
1T8818	Spectrum Analyzer	Agilent Technologies	E4407B	2/24/2017	2/24/2018
1T2665	Antenna; Horn	EMCO	3115	6/22/2017	12/22/2018
1T4612	Spectrum Analyzer	Agilent Technologies	E4407B	3/30/2017	9/30/2018
1T4753	Antenna - Bilog	Sunol Sciences	JB6	10/24/2016	4/24/2018
1T4409	EMI Receiver	Rohde & Schwarz	ESIB7	12/7/2016	12/7/2018
1T4300A	SEMI-ANECHOIC CHAMBER # 1 (FCC)	EMC TEST SYSTEMS	NONE	1/31/2016	1/31/2019

Table 31. 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

N. 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

Label and User's Manual Information

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

§ 15.19 Labeling requirements.

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

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

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

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

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

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

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

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

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

§ 15.21 Information to user.

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



Verification & User's Manual Information

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

§ 15.105 Information to the user.

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

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

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

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

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