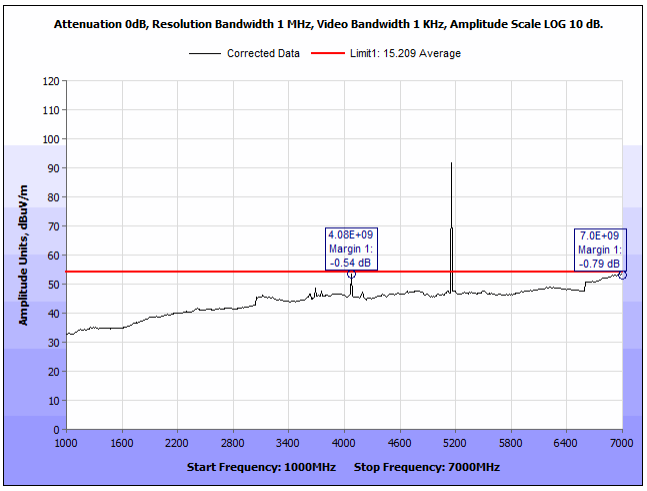
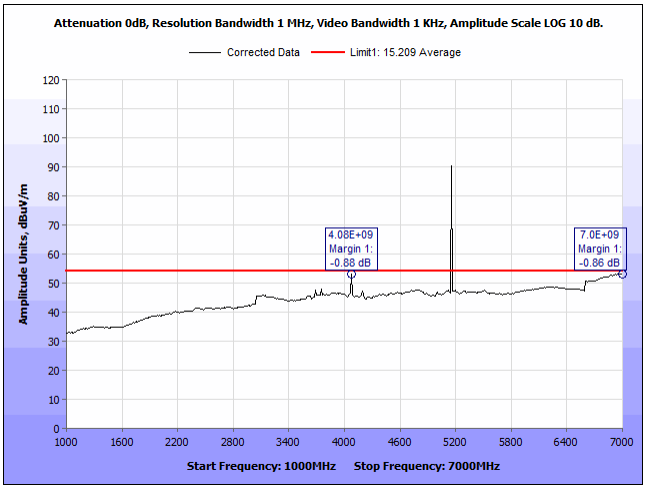
Continued from

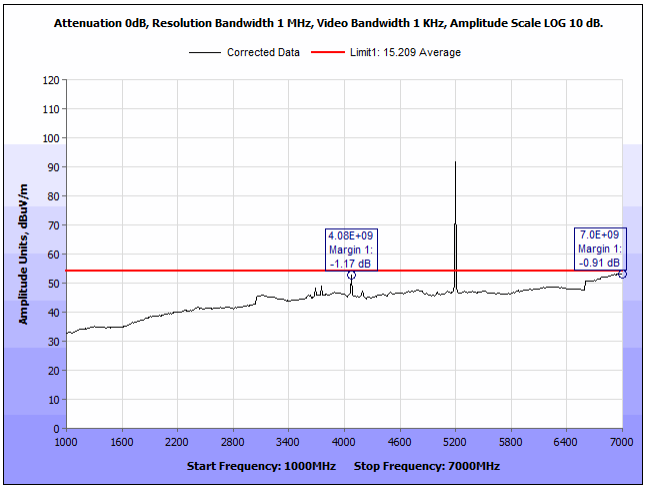
EMC94059-FCC407 UNII-1 Rev4 Part 1



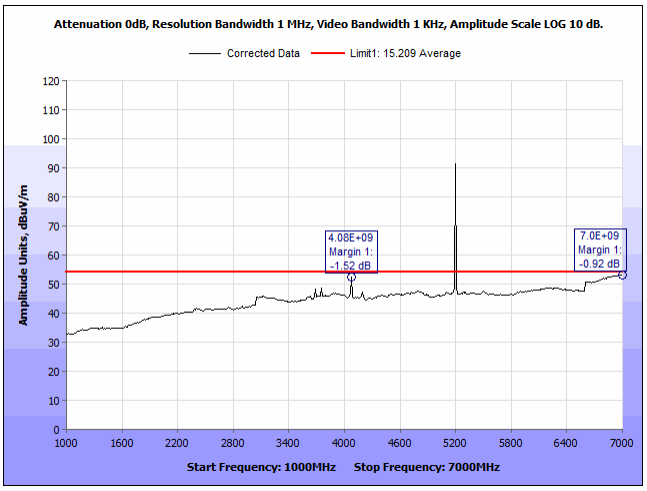
Plot 301. Undesirable Emissions, 1-7MHz Average, 5M, 5155, 3Para, Port 1



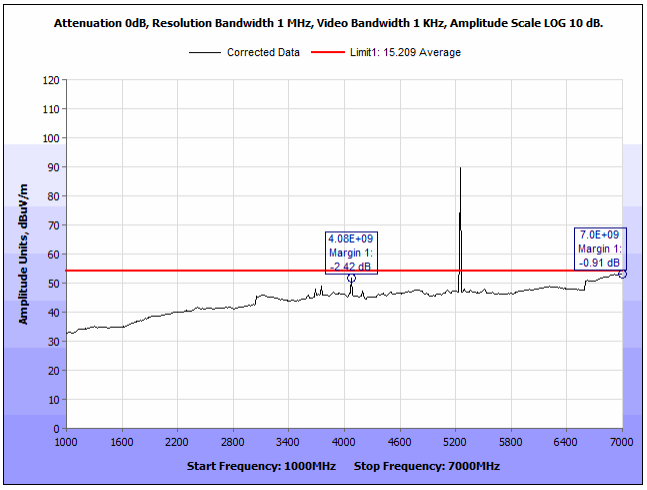
Plot 302. Undesirable Emissions, 1-7MHz Average, 5M, 5155, 3Para, Port 2



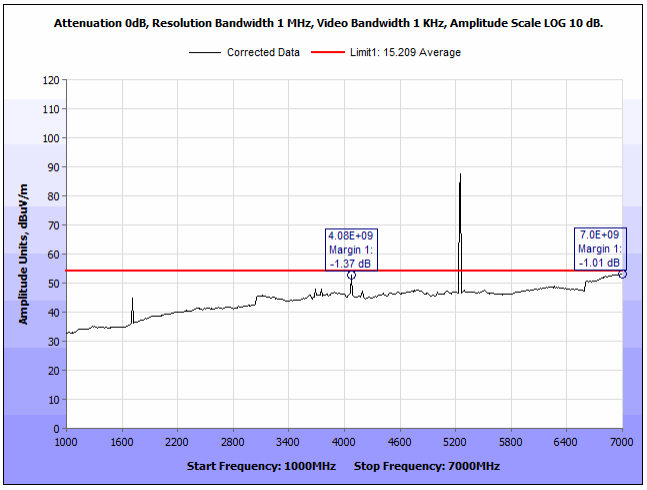
Plot 303. Undesirable Emissions, 1-7MHz Average, 5M, 5200, 3Para, Port 1



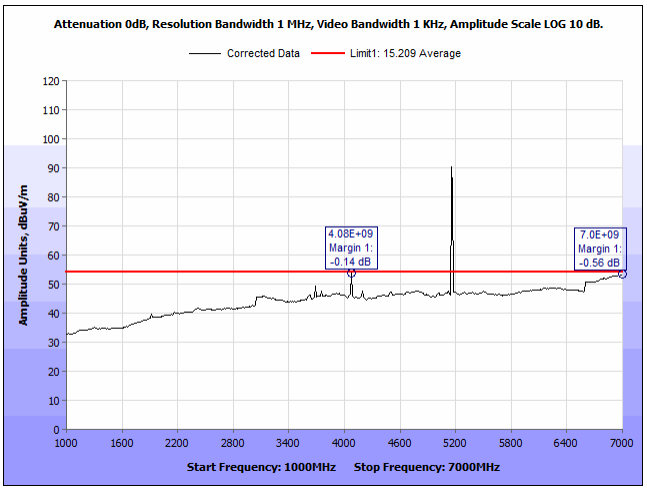
Plot 304. Undesirable Emissions, 1-7MHz Average, 5M, 5200, 3Para, Port 2



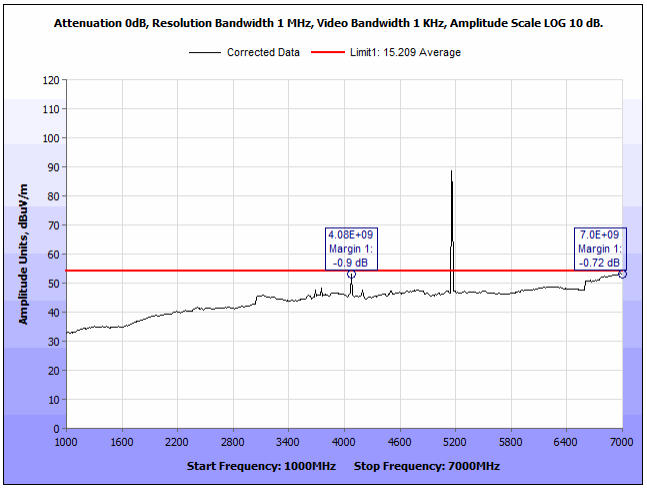
Plot 1. Undesirable Emissions, 1-7MHz Average, 5M, 5247.5, 3Para, Port 1



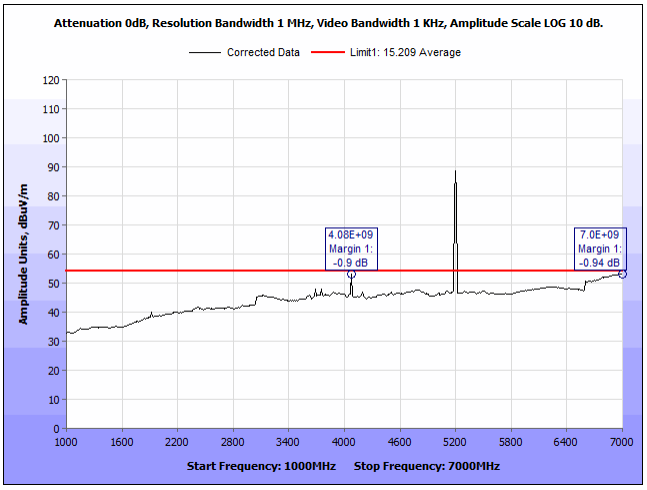
Plot 306. Undesirable Emissions, 1-7MHz Average, 5M, 5247.5, 3Para, Port 2



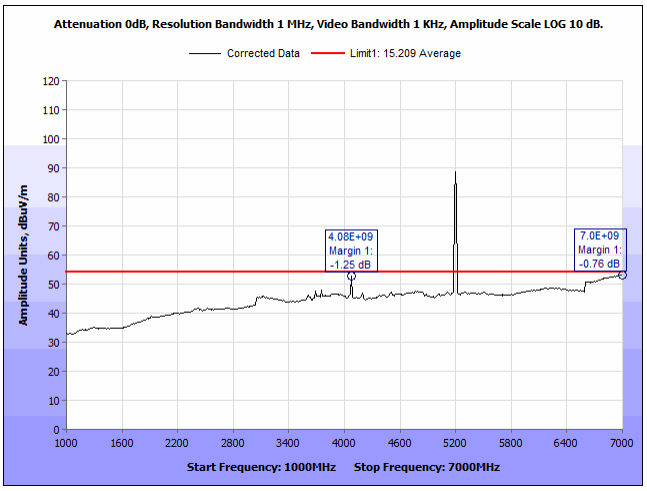
Plot 307. Undesirable Emissions, 1-7MHz Average, 10M, 5160, 3Para, Port 1



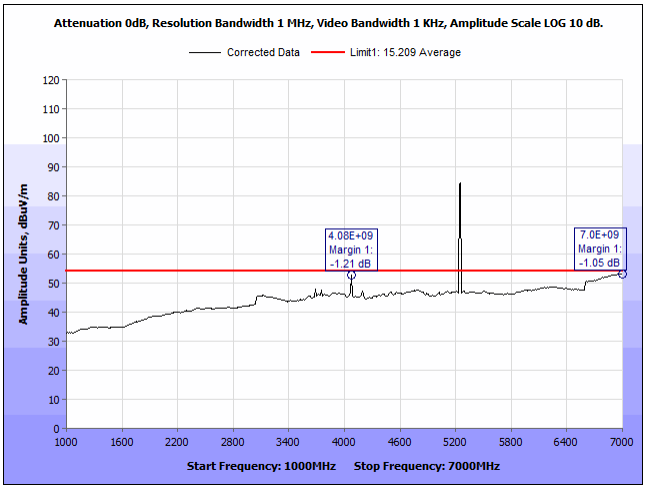
Plot 308. Undesirable Emissions, 1-7MHz Average, 10M, 5160, 3Para, Port 2



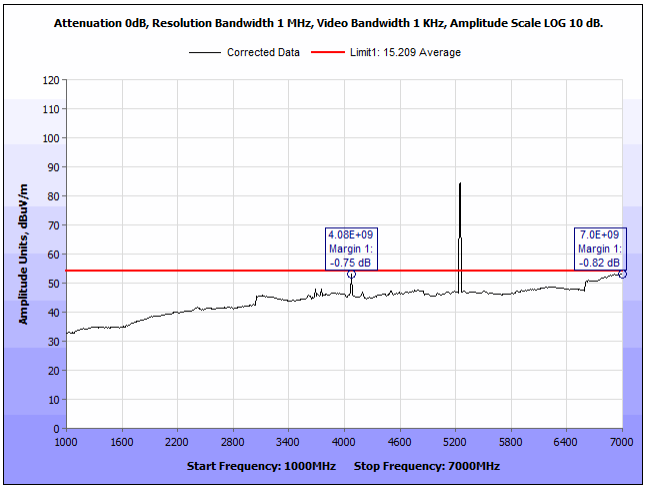
Plot 309. Undesirable Emissions, 1-7MHz Average, 10M, 5200, 3Para, Port 1



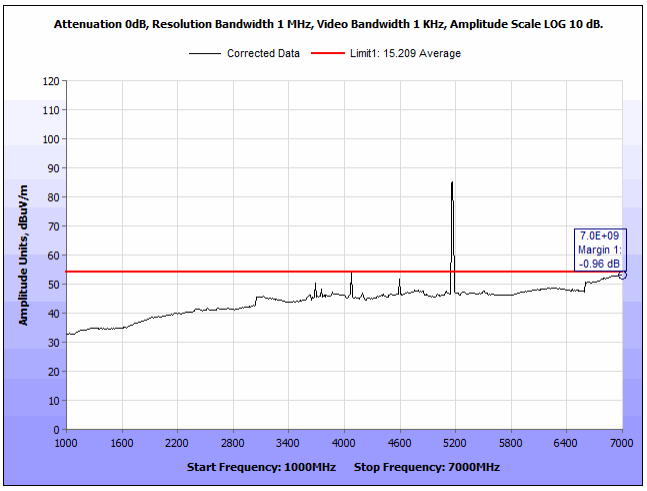
Plot 310. Undesirable Emissions, 1-7MHz Average, 10M, 5200, 3Para, Port 2



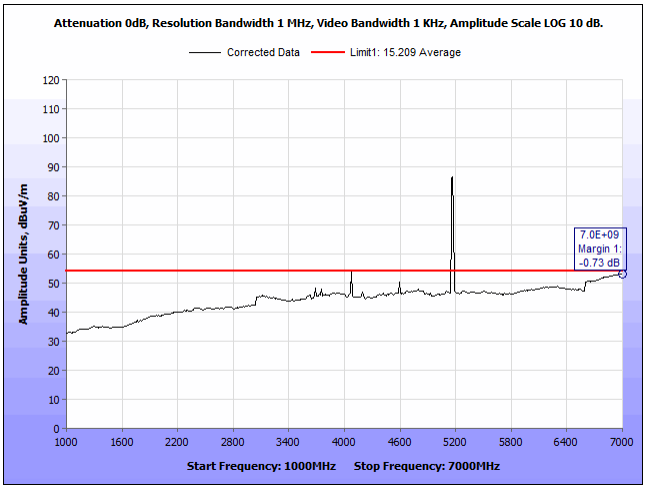
Plot 311. Undesirable Emissions, 1-7MHz Average, 10M, 5245, 3Para, Port 1



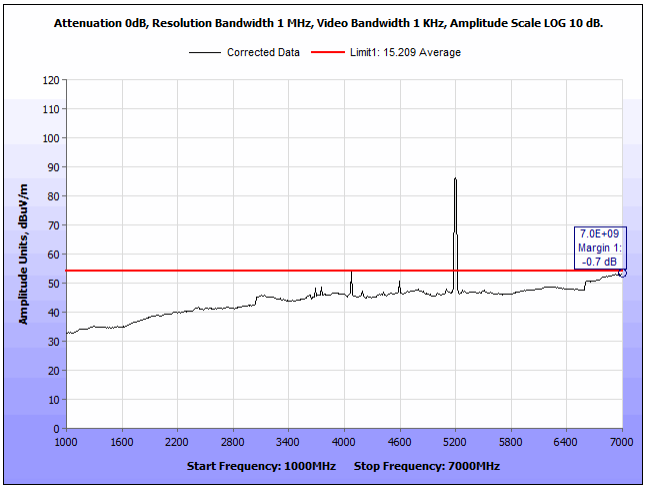
Plot 312. Undesirable Emissions, 1-7MHz Average, 10M, 5245, 3Para, Port 2



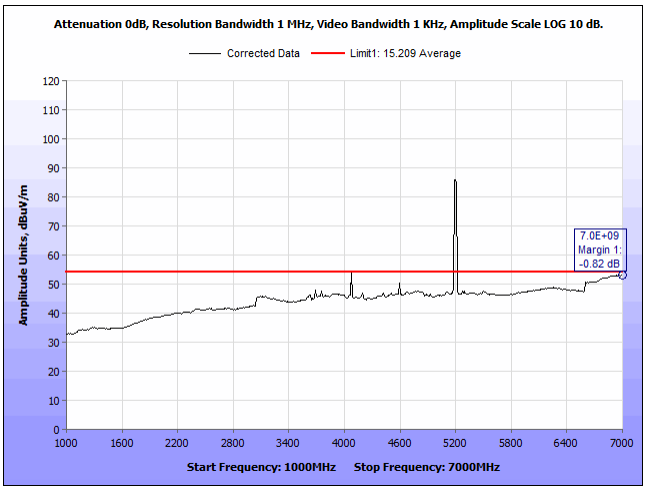
Plot 313. Undesirable Emissions, 1-7MHz Average, 20M, 5165, 3Para, Port 1



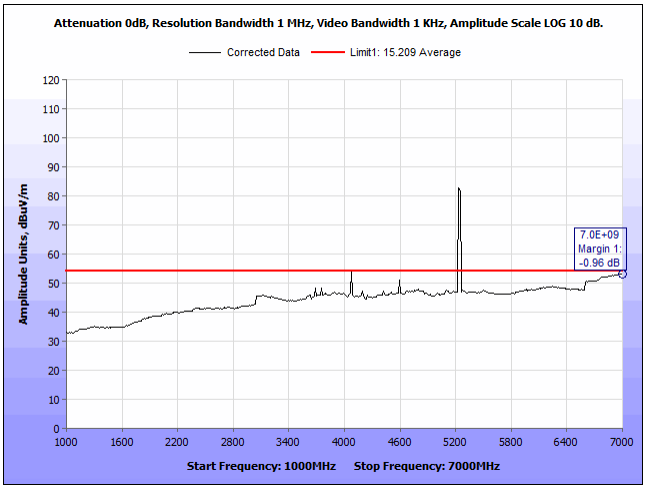
Plot 314. Undesirable Emissions, 1-7MHz Average, 20M, 5165, 3Para, Port 2



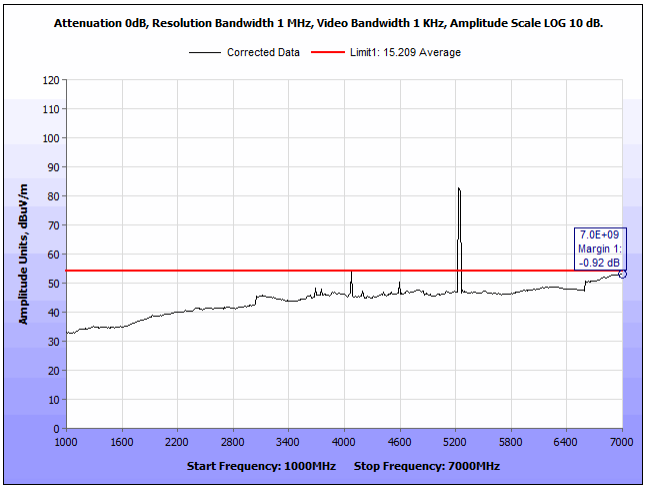
Plot 315. Undesirable Emissions, 1-7MHz Average, 20M, 5200, 3Para, Port 1



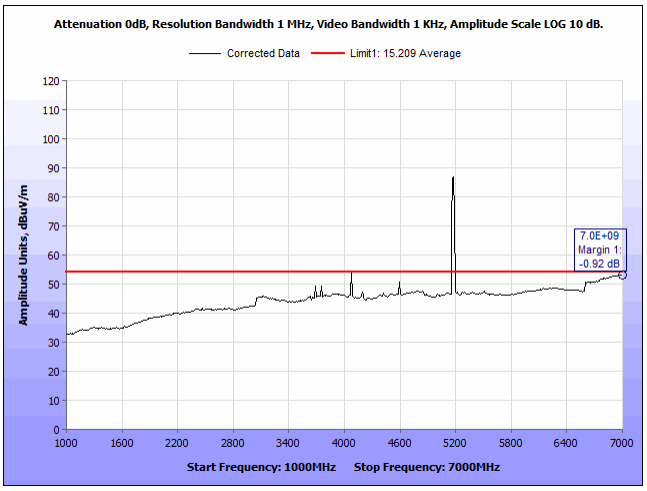
Plot 2. Undesirable Emissions, 1-7MHz Average, 20M, 5200, 3Para, Port 2



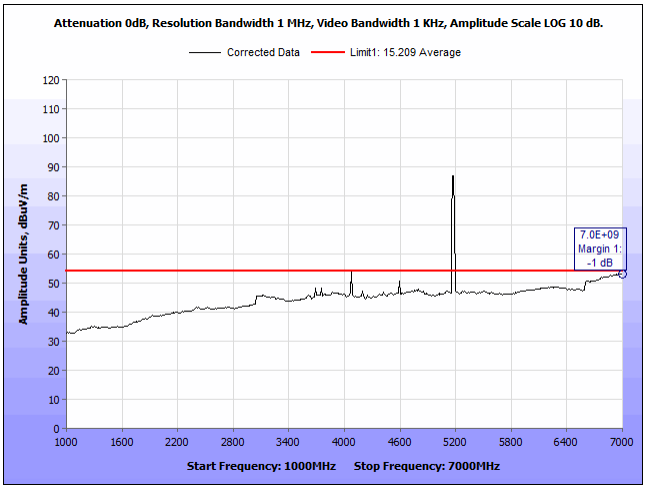
Plot 317. Undesirable Emissions, 1-7MHz Average, 20M, 5240, 3Para, Port 1



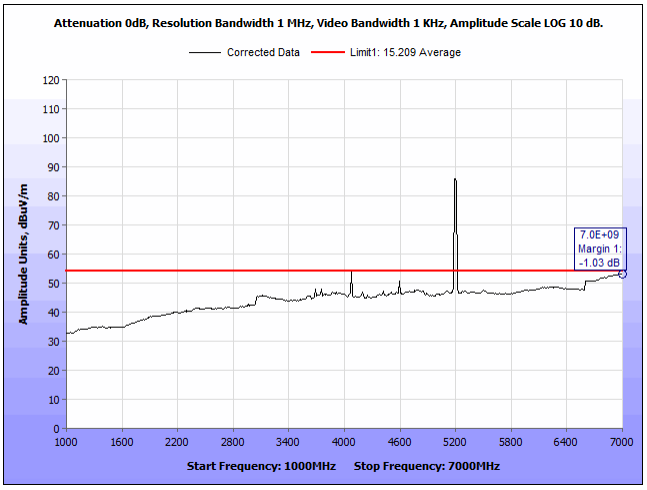
Plot 318. Undesirable Emissions, 1-7MHz Average, 20M, 5240, 3Para, Port 2



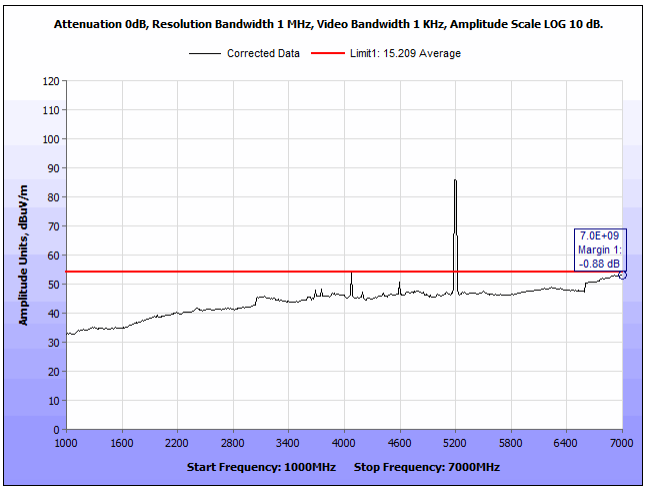
Plot 319. Undesirable Emissions, 1-7MHz Average, 40M, 5175, 3Para, Port 1



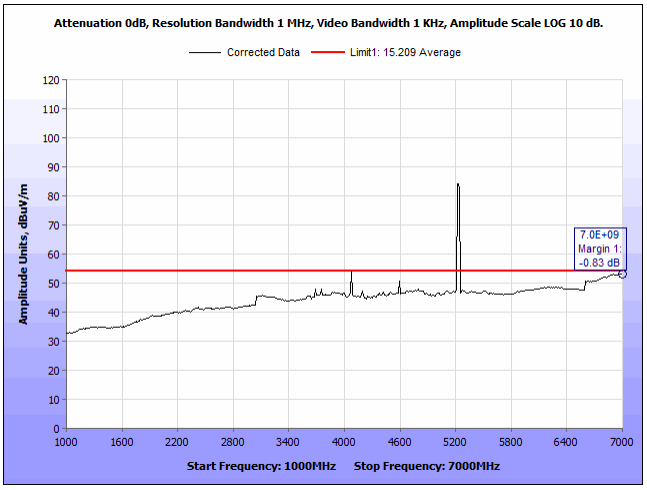
Plot 320. Undesirable Emissions, 1-7MHz Average, 40M, 5175, 3Para, Port 2



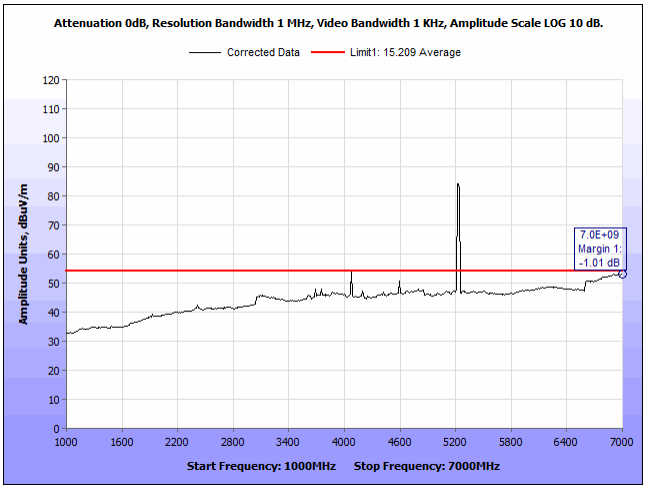
Plot 321. Undesirable Emissions, 1-7MHz Average, 40M, 5200, 3Para, Port 1



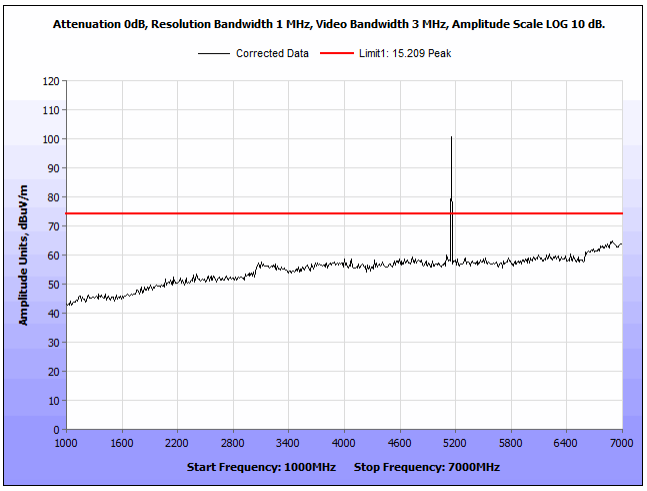
Plot 322. Undesirable Emissions, 1-7MHz Average, 40M, 5200, 3Para, Port 2



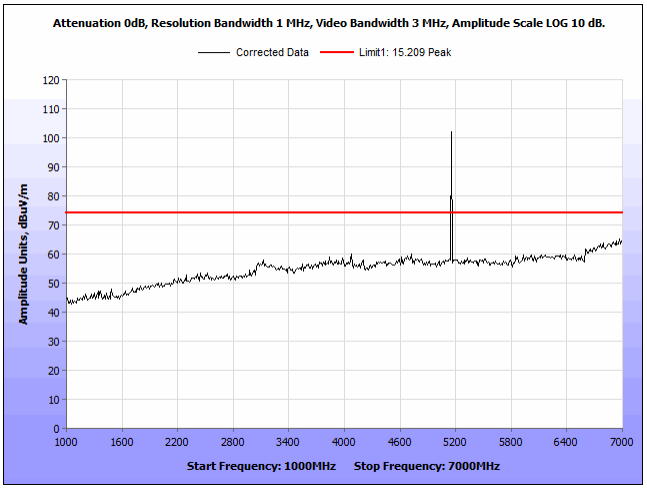
Plot 323. Undesirable Emissions, 1-7MHz Average, 40M, 5230, 3Para, Port 1



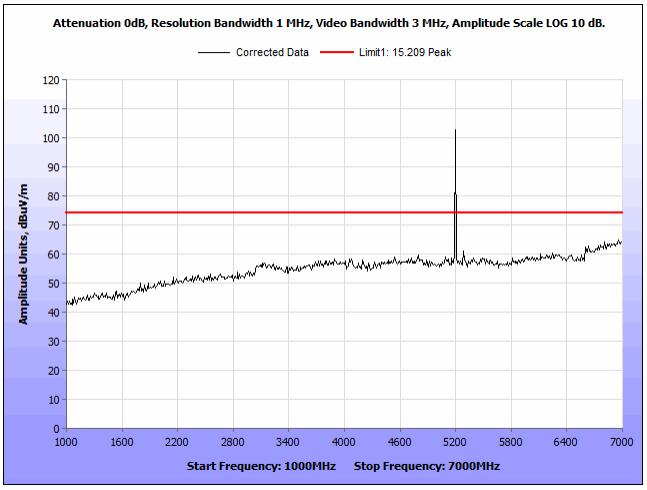
Plot 324. Undesirable Emissions, 1-7MHz Average, 40M, 5230, 3Para, Port 2



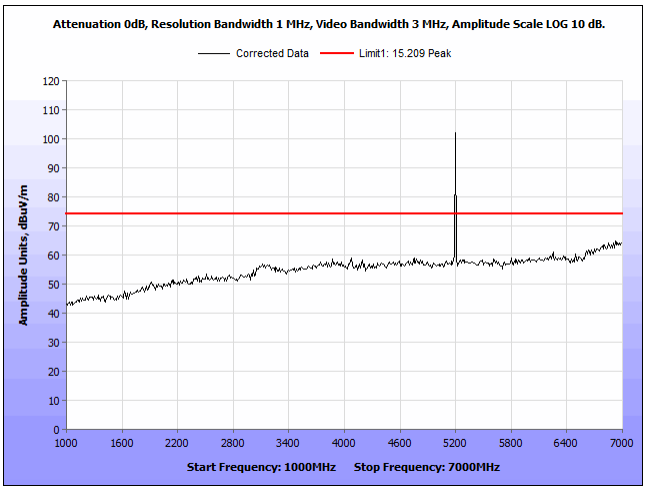
Plot 325. Undesirable Emissions, 1-7MHz Peak, 5M, 5155, 3Para, Port 1



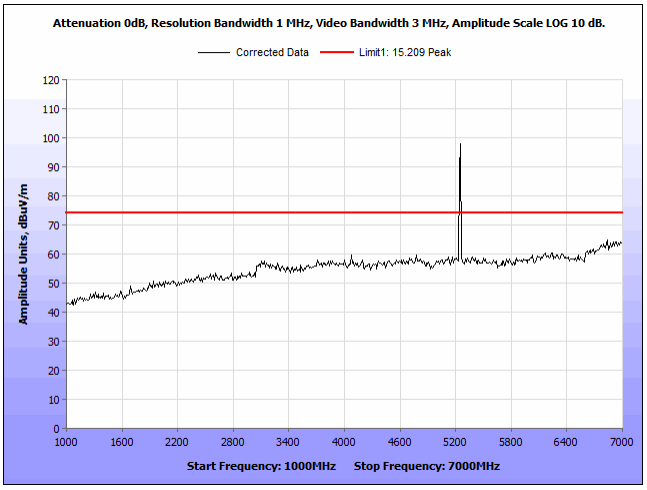
Plot 326. Undesirable Emissions, 1-7MHz Peak, 5M, 5155, 3Para, Port 2



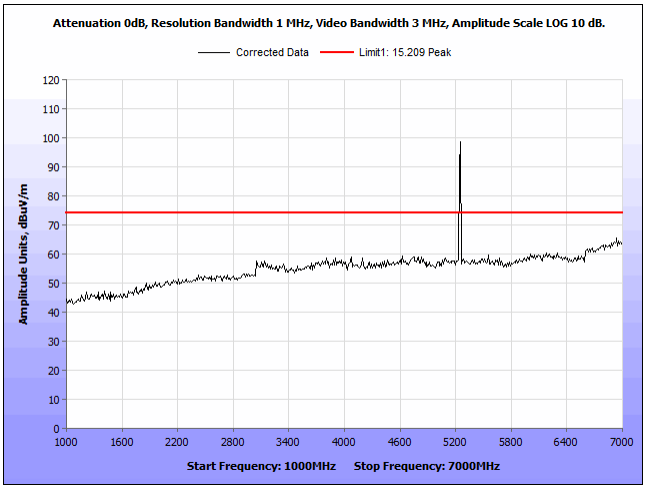
Plot 327. Undesirable Emissions, 1-7MHz Peak, 5M, 5200, 3Para, Port 1



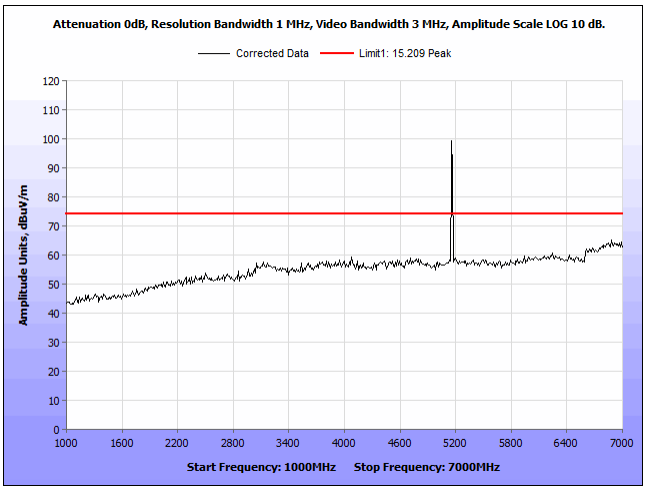
Plot 328. Undesirable Emissions, 1-7MHz Peak, 5M, 5200, 3Para, Port 2



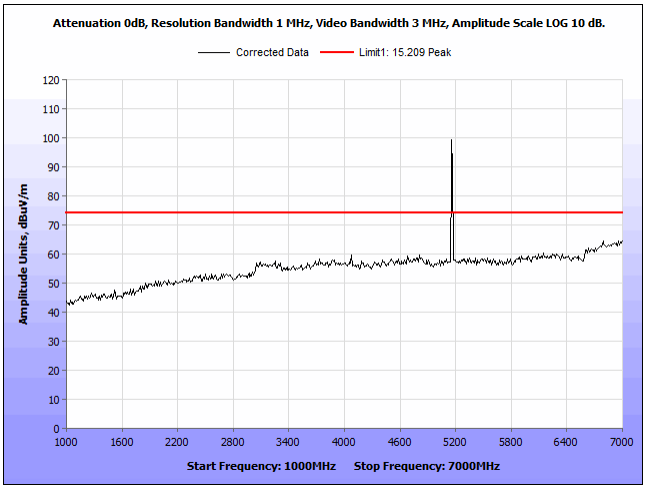
Plot 329. Undesirable Emissions, 1-7MHz Peak, 5M, 5247.5, 3Para, Port 1



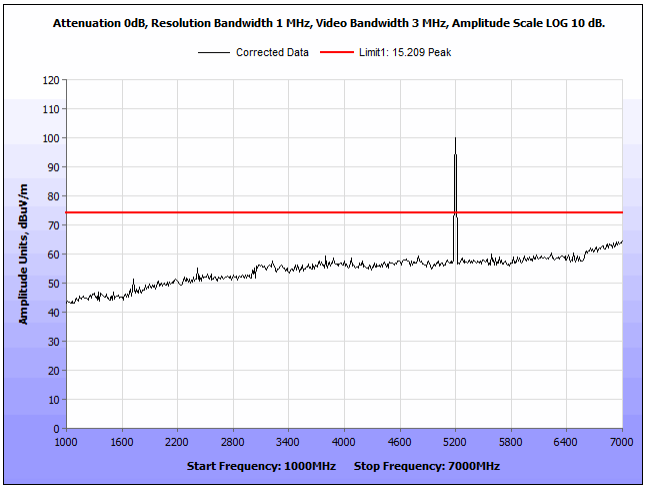
Plot 330. Undesirable Emissions, 1-7MHz Peak, 5M, 5247.5, 3Para, Port 2



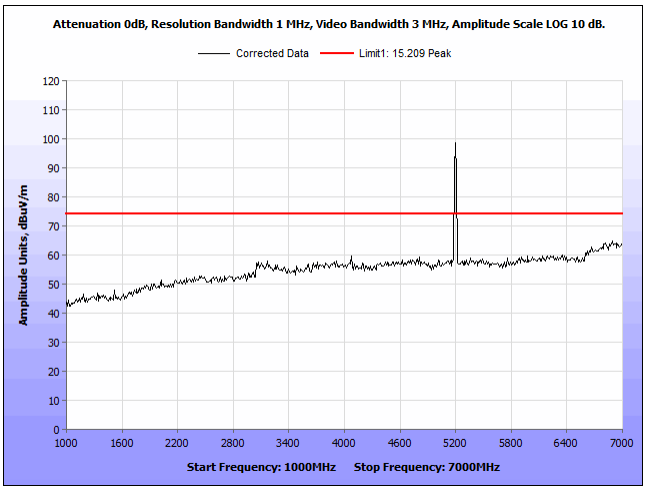
Plot 331. Undesirable Emissions, 1-7MHz Peak, 10M, 5160, 3Para, Port 1



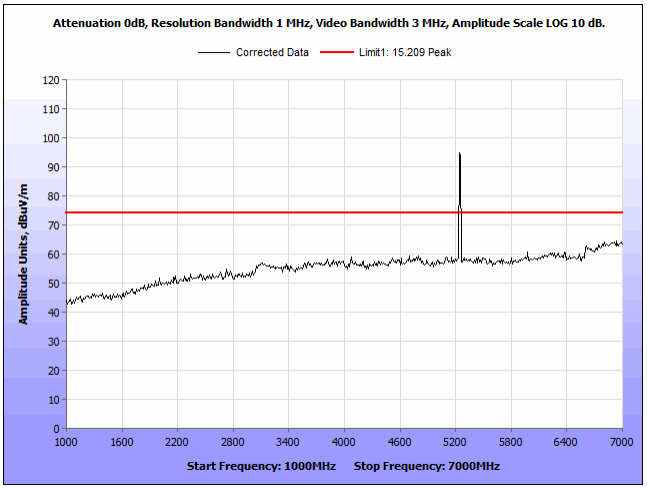
Plot 332. Undesirable Emissions, 1-7MHz Peak, 10M, 5160, 3Para, Port 2



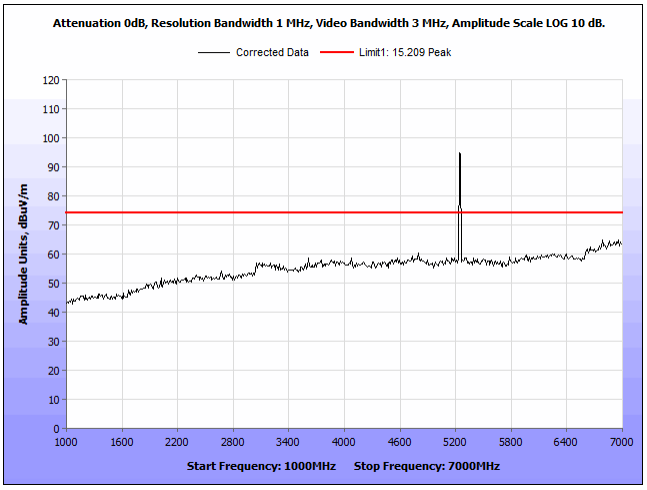
Plot 333. Undesirable Emissions, 1-7MHz Peak, 10M, 5200, 3Para, Port 1



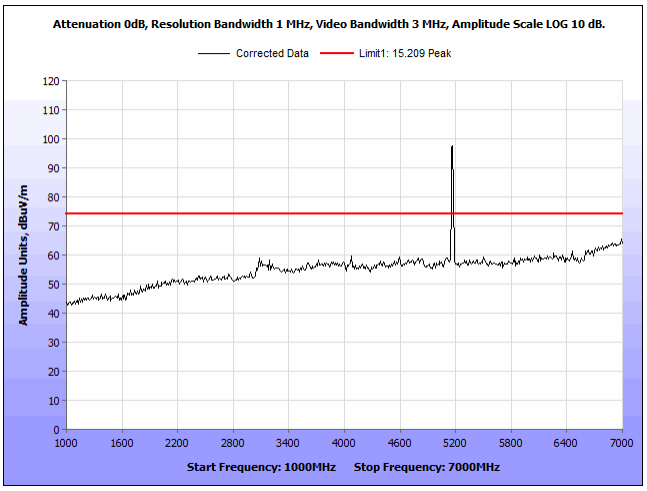
Plot 334. Undesirable Emissions, 1-7MHz Peak, 10M, 5200, 3Para, Port 2



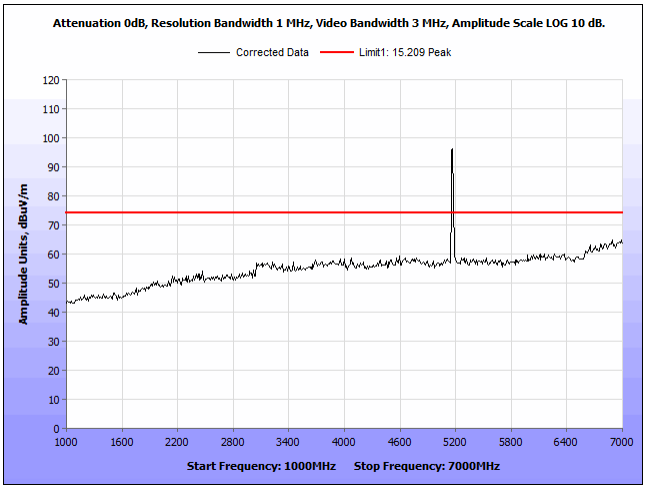
Plot 335. Undesirable Emissions, 1-7MHz Peak, 10M, 5245, 3Para, Port 1



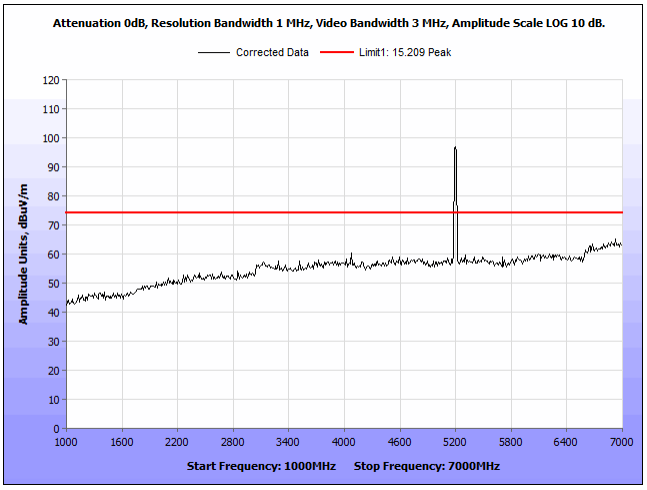
Plot 336. Undesirable Emissions, 1-7MHz Peak, 10M, 5245, 3Para, Port 2



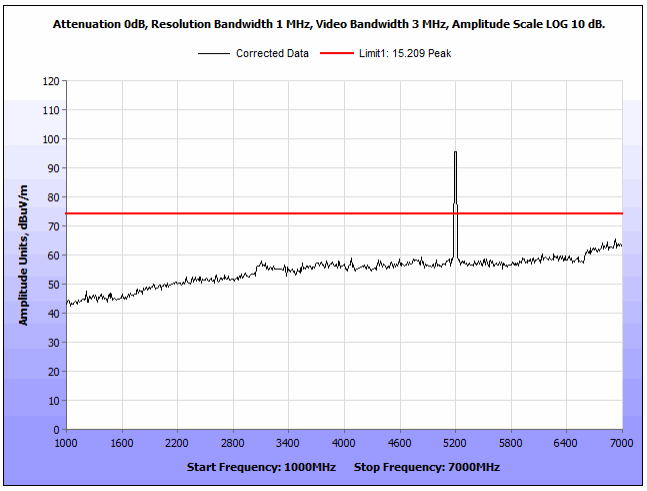
Plot 337. Undesirable Emissions, 1-7MHz Peak, 20M, 5165, 3Para, Port 1



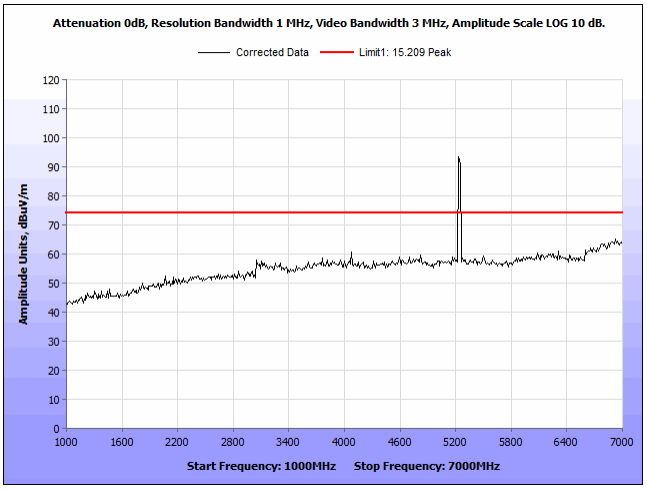
Plot 338. Undesirable Emissions, 1-7MHz Peak, 20M, 5165, 3Para, Port 2



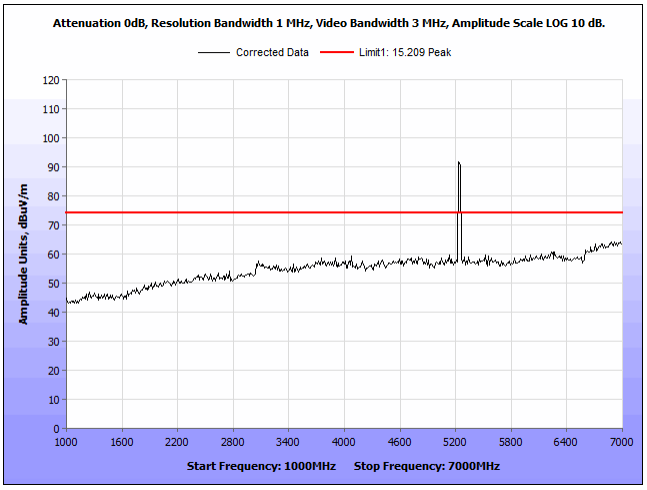
Plot 339. Undesirable Emissions, 1-7MHz Peak, 20M, 5200, 3Para, Port 1



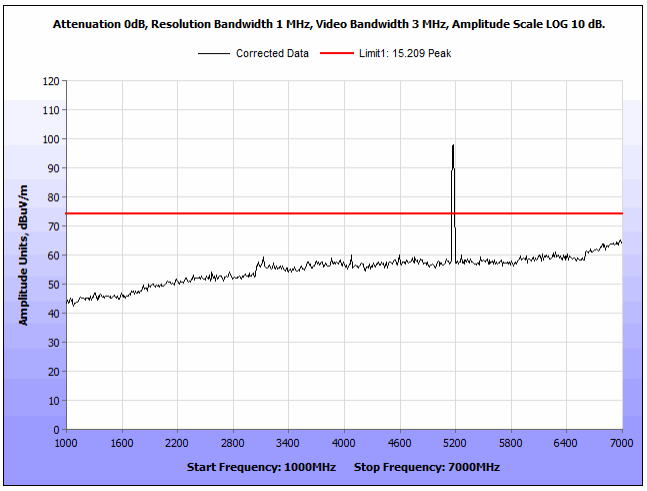
Plot 340. Undesirable Emissions, 1-7MHz Peak, 20M, 5200, 3Para, Port 2



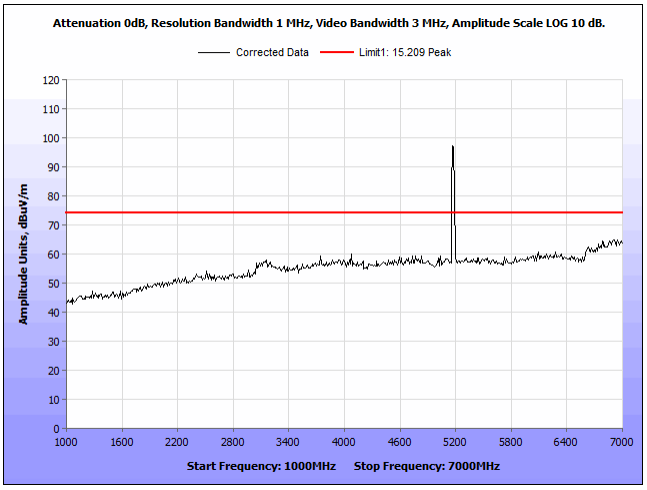
Plot 341. Undesirable Emissions, 1-7MHz Peak, 20M, 5240, 3Para, Port 1



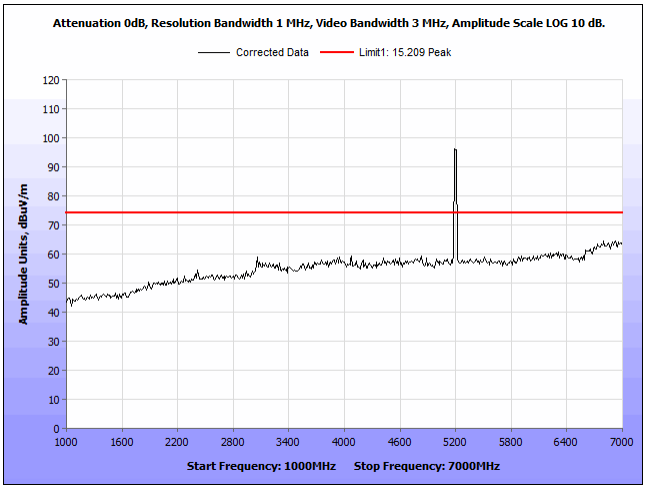
Plot 342. Undesirable Emissions, 1-7MHz Peak, 20M, 5240, 3Para, Port 2



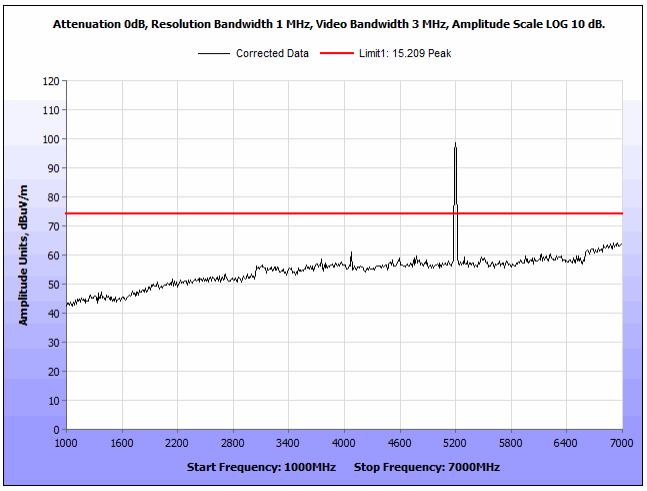
Plot 343. Undesirable Emissions, 1-7MHz Peak, 40M, 5175, 3Para, Port 1



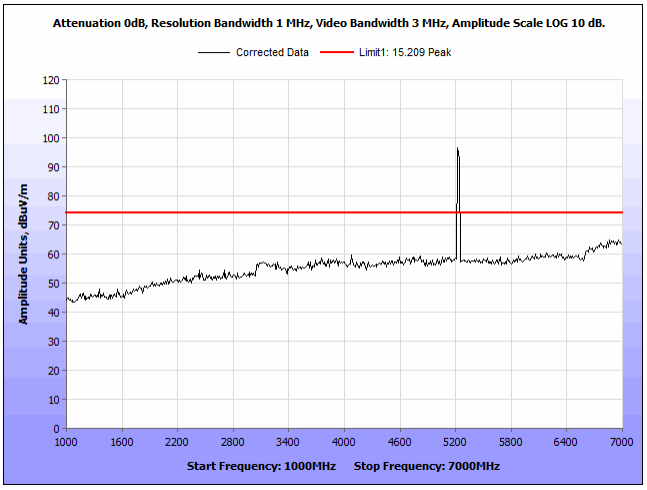
Plot 344. Undesirable Emissions, 1-7MHz Peak, 40M, 5175, 3Para, Port 2



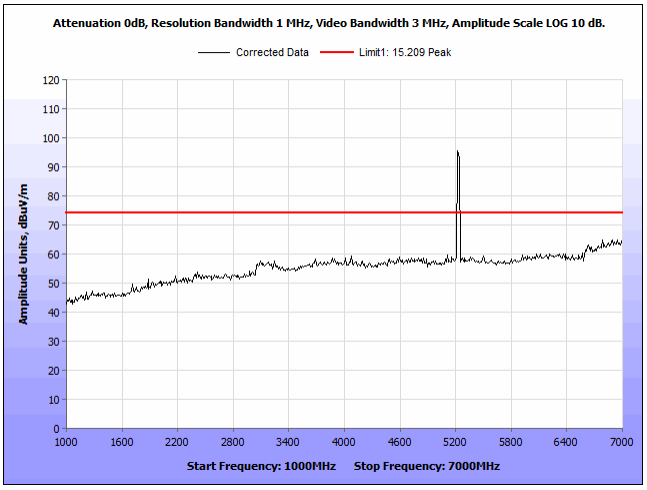
Plot 345. Undesirable Emissions, 1-7MHz Peak, 40M, 5200, 3Para, Port 1



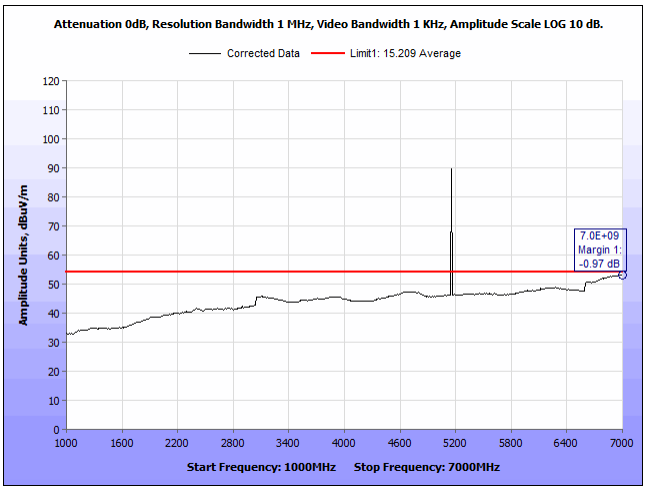
Plot 346. Undesirable Emissions, 1-7MHz Peak, 40M, 5200, 3Para, Port 2



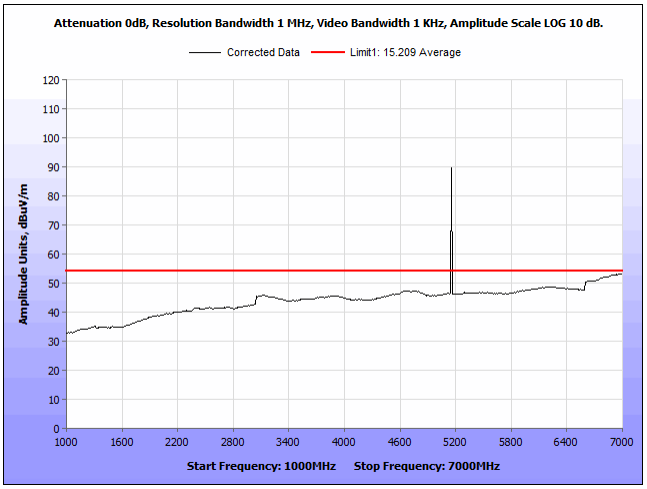
Plot 347. Undesirable Emissions, 1-7MHz Peak, 40M, 5230, 3Para, Port 1



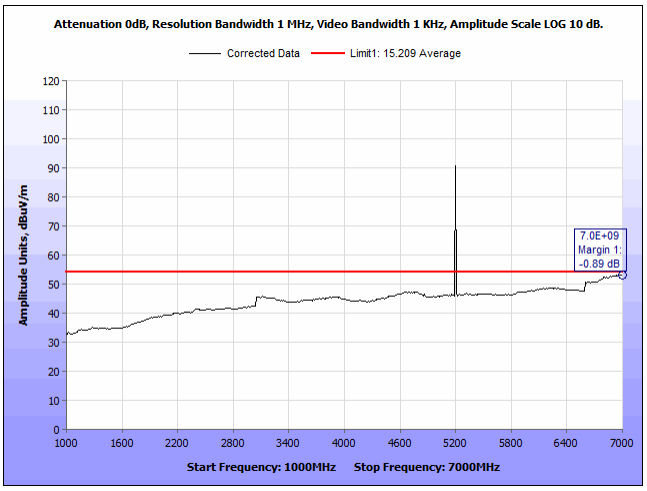
Plot 348. Undesirable Emissions, 1-7MHz Peak, 40M, 5230, 3Para, Port 2



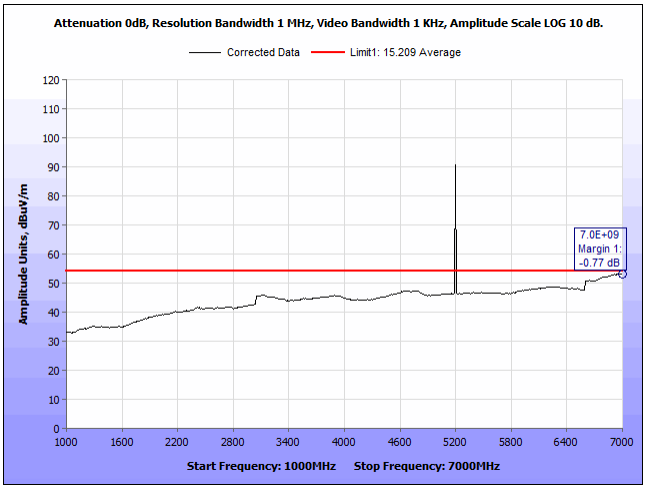
Plot 349. Undesirable Emissions, 1-7MHz Average, 5M, 5155, 90Sector, Port 1



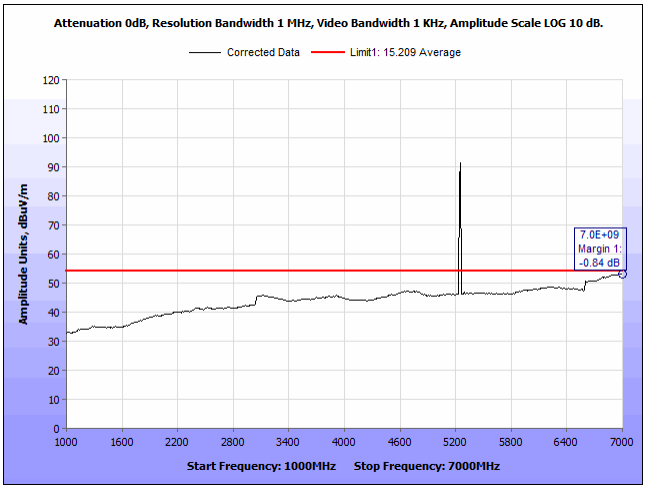
Plot 350. Undesirable Emissions, 1-7MHz Average, 5M, 5155, 90Sector, Port 2



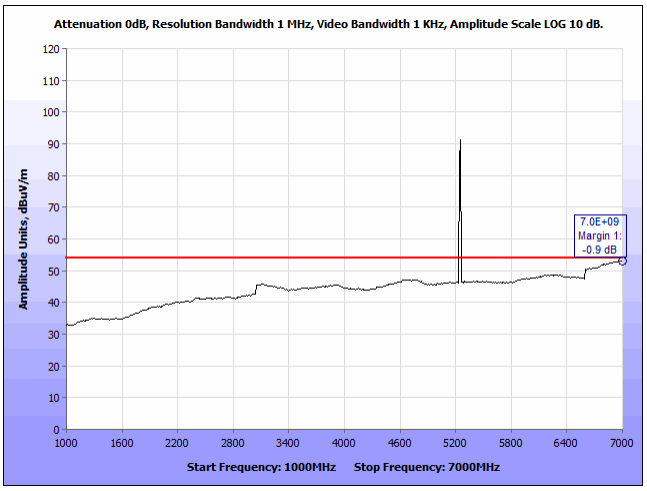
Plot 351. Undesirable Emissions, 1-7MHz Average, 5M, 5200, 90Sector, Port 1



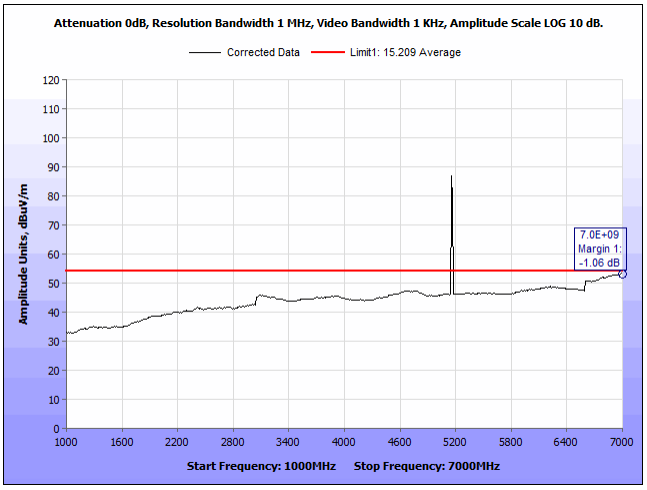
Plot 352. Undesirable Emissions, 1-7MHz Average, 5M, 5200, 90Sector, Port 2



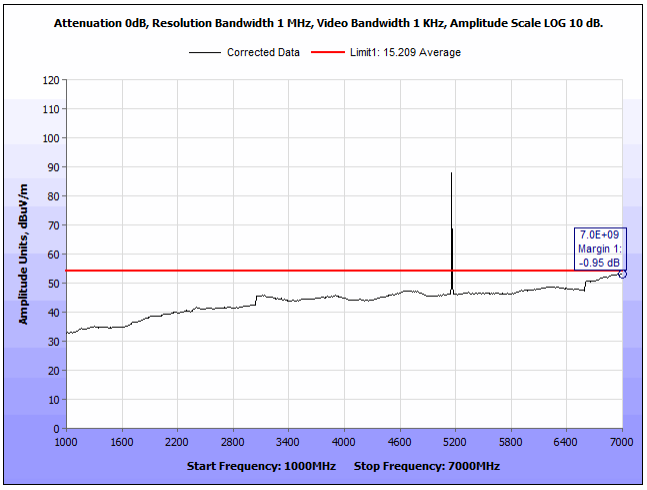
Plot 353. Undesirable Emissions, 1-7MHz Average, 5M, 5247.5, 90Sector, Port 1



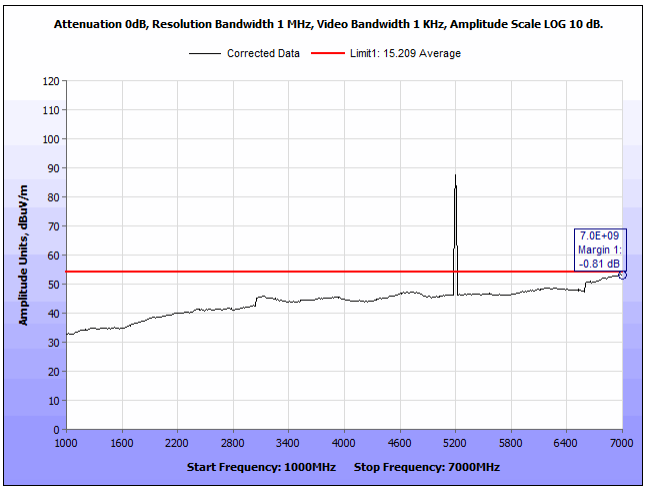
Plot 354. Undesirable Emissions, 1-7MHz Average, 5M, 5247.5, 90Sector, Port 2



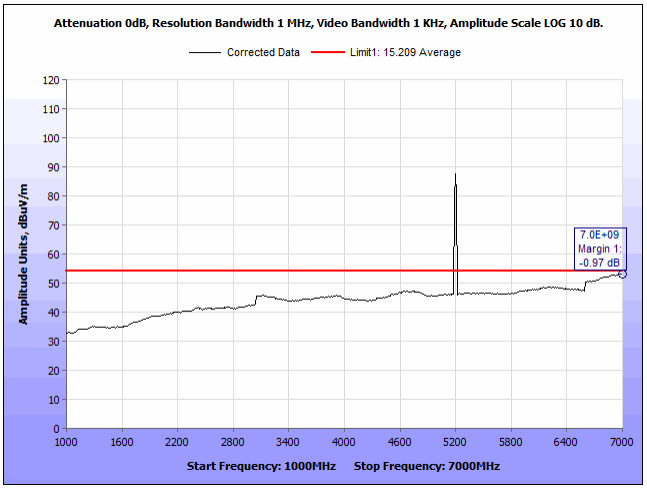
Plot 355. Undesirable Emissions, 1-7MHz Average, 10M, 5160, 90Sector, Port 1



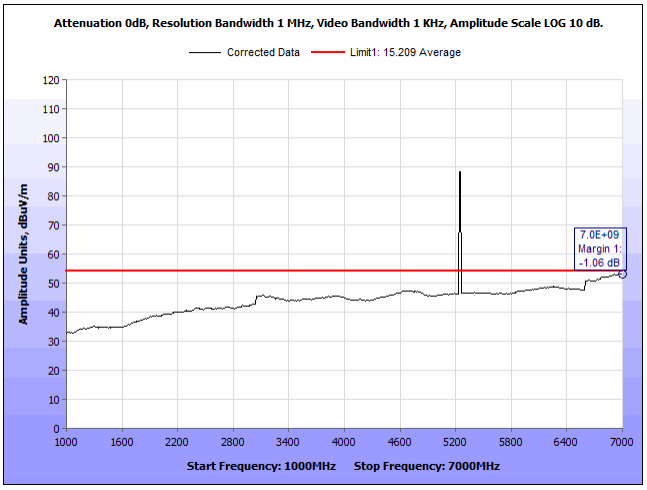
Plot 356. Undesirable Emissions, 1-7MHz Average, 10M, 5160, 90Sector, Port 2



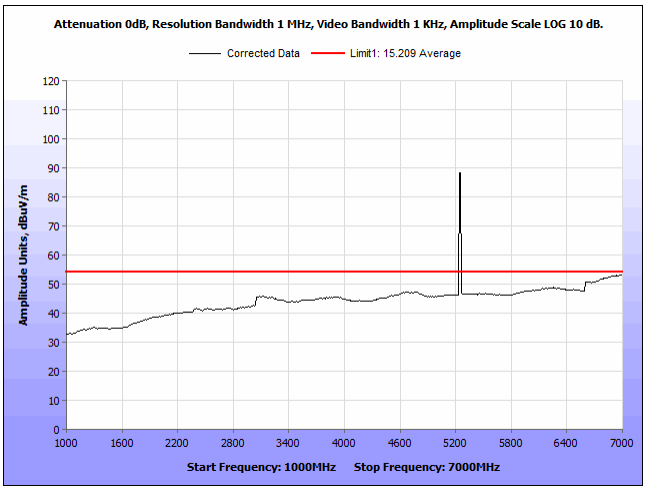
Plot 357. Undesirable Emissions, 1-7MHz Average, 10M, 5200, 90Sector, Port 1



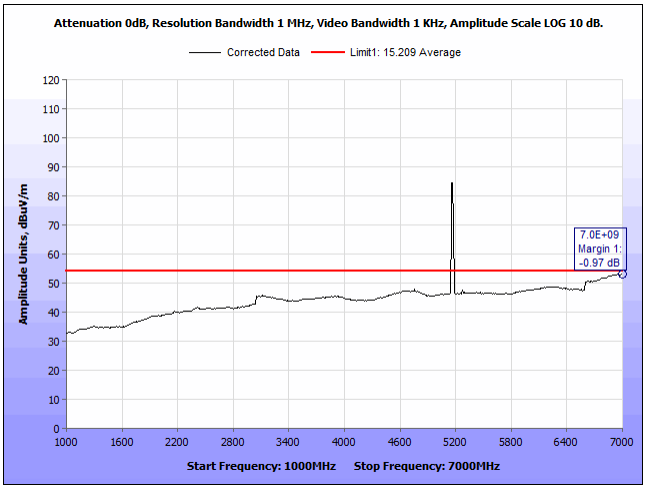
Plot 358. Undesirable Emissions, 1-7MHz Average, 10M, 5200, 90Sector, Port 2



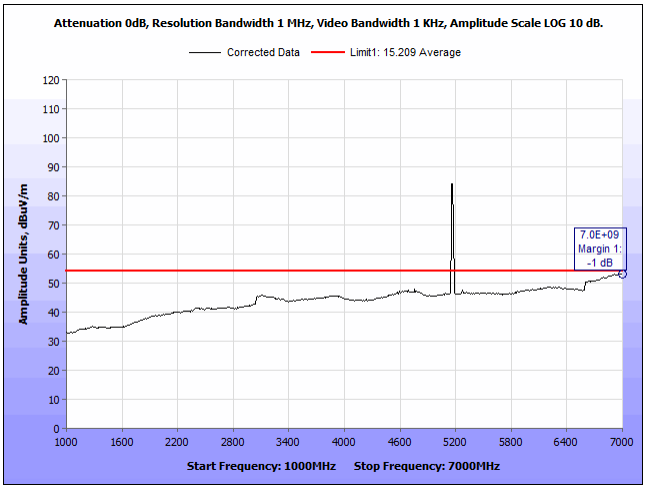
Plot 359. Undesirable Emissions, 1-7MHz Average, 10M, 5245, 90Sector, Port 1



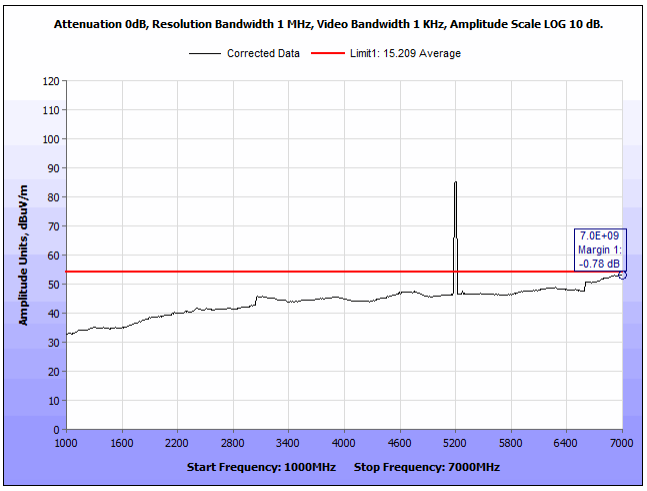
Plot 360. Undesirable Emissions, 1-7MHz Average, 10M, 5245, 90Sector, Port 2



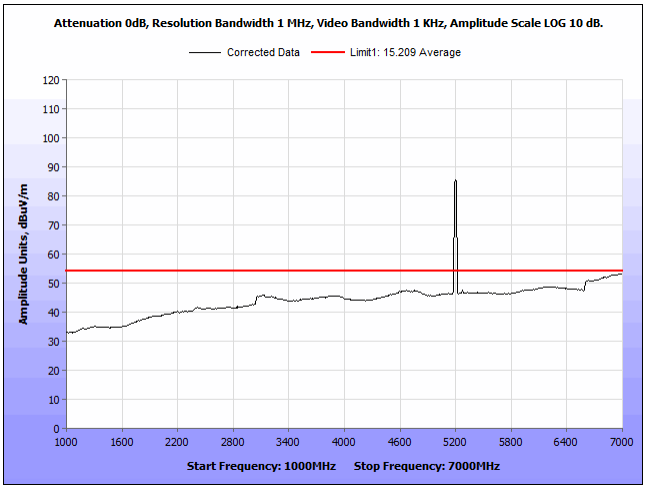
Plot 361. Undesirable Emissions, 1-7MHz Average, 20M, 5165, 90Sector, Port 1



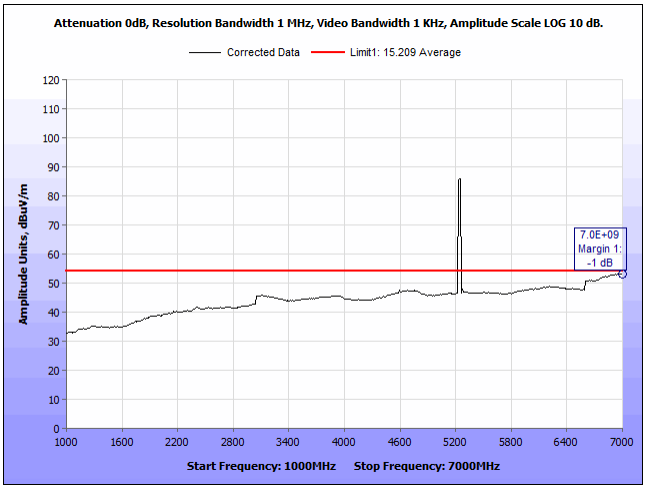
Plot 362. Undesirable Emissions, 1-7MHz Average, 20M, 5165, 90Sector, Port 2



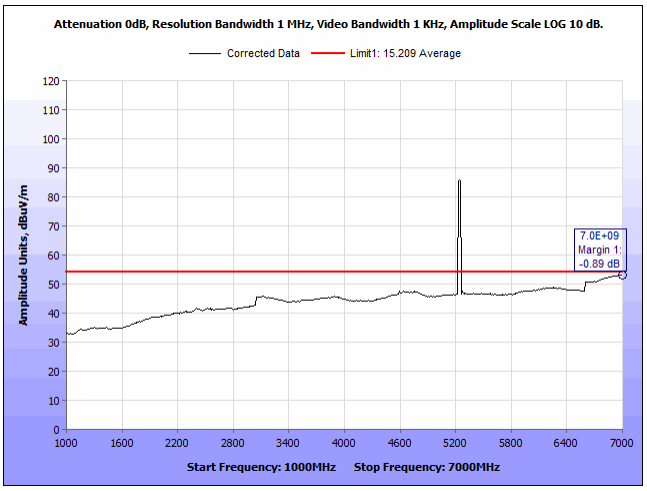
Plot 363. Undesirable Emissions, 1-7MHz Average, 20M, 5200, 90Sector, Port 1



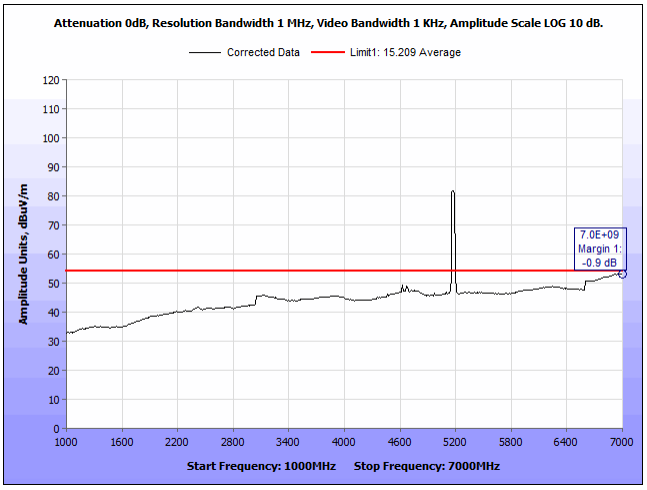
Plot 364. Undesirable Emissions, 1-7MHz Average, 20M, 5200, 90Sector, Port 2



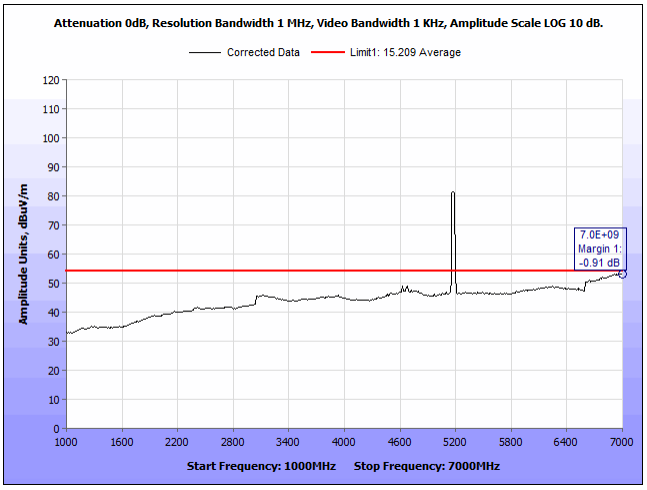
Plot 365. Undesirable Emissions, 1-7MHz Average, 20M, 5240, 90Sector, Port 1



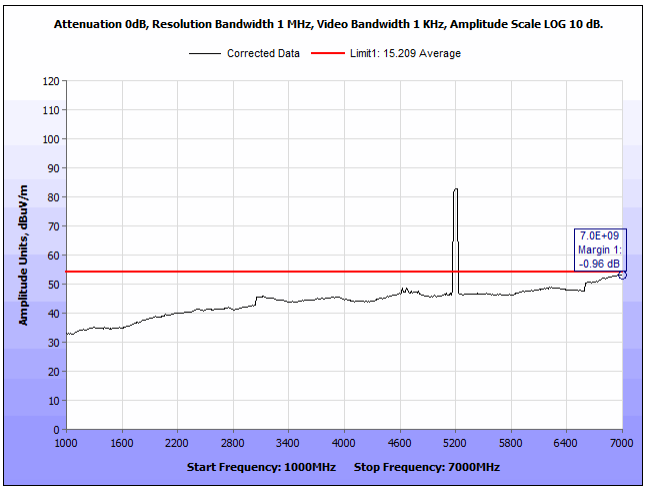
Plot 366. Undesirable Emissions, 1-7MHz Average, 20M, 5240, 90Sector, Port 2



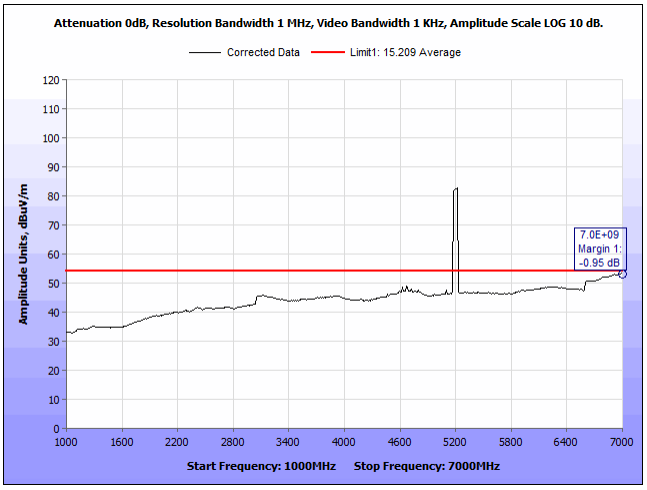
Plot 367. Undesirable Emissions, 1-7MHz Average, 40M, 5175, 90Sector, Port 1



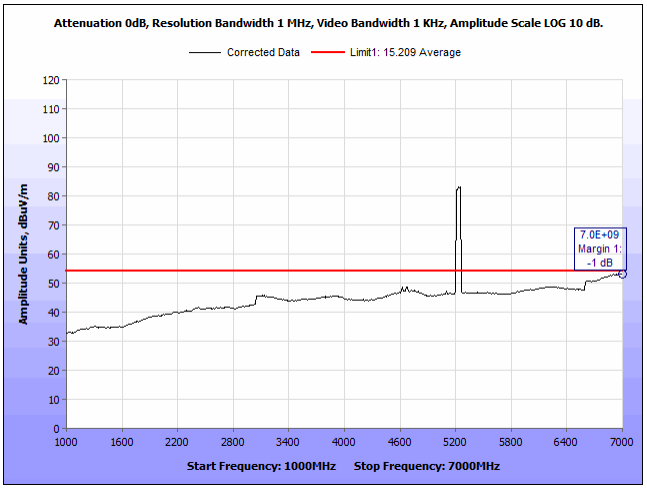
Plot 368. Undesirable Emissions, 1-7MHz Average, 40M, 5175, 90Sector, Port 2



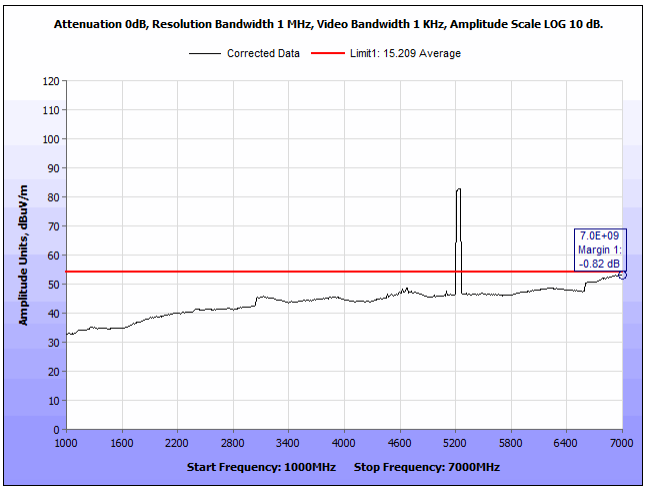
Plot 369. Undesirable Emissions, 1-7MHz Average, 40M, 5200, 90Sector, Port 1



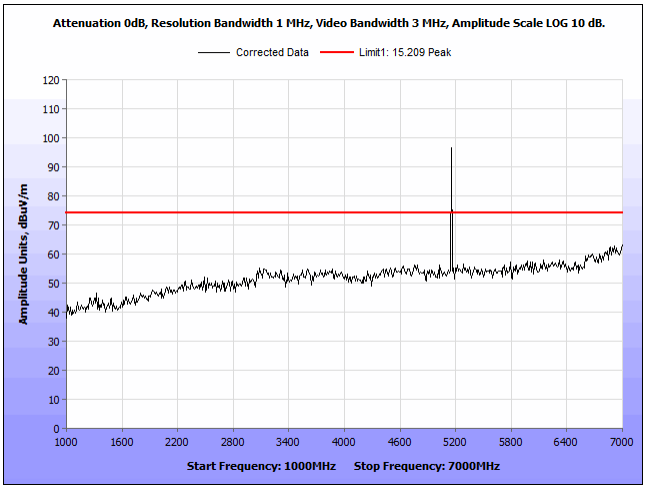
Plot 370. Undesirable Emissions, 1-7MHz Average, 40M, 5200, 90Sector, Port 2



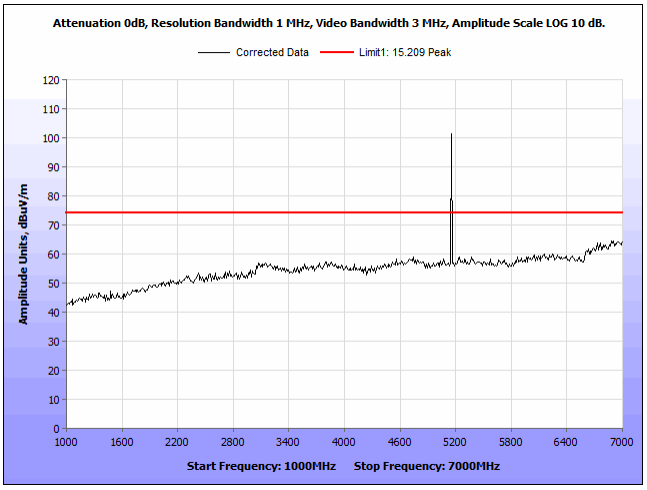
Plot 371. Undesirable Emissions, 1-7MHz Average, 40M, 5230, 90Sector, Port 1



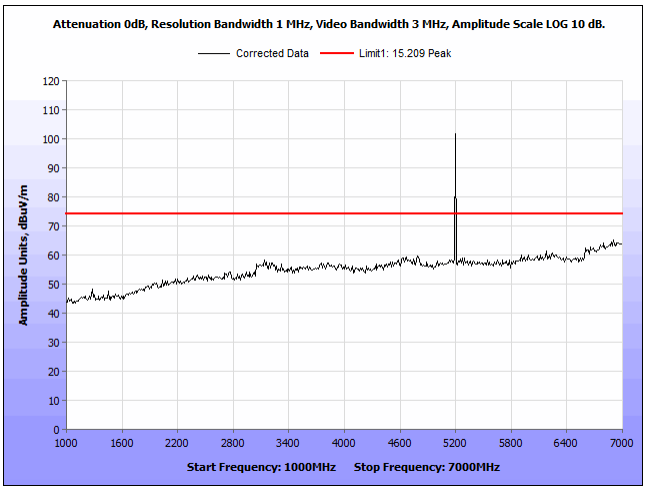
Plot 372. Undesirable Emissions, 1-7MHz Average, 40M, 5230, 90Sector, Port 2



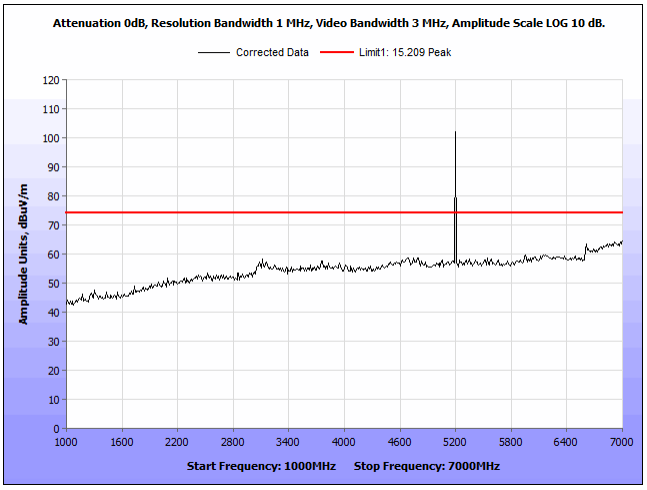
Plot 373. Undesirable Emissions, 1-7MHz Peak, 5M, 5155, 90Sector, Port 1



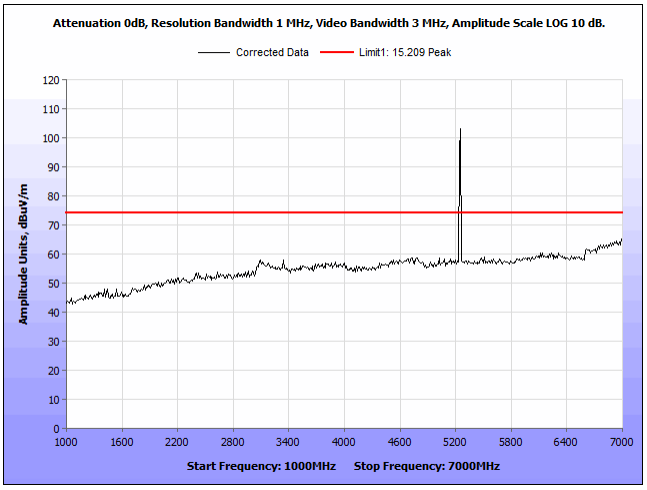
Plot 374. Undesirable Emissions, 1-7MHz Peak, 5M, 5155, 90Sector, Port 2



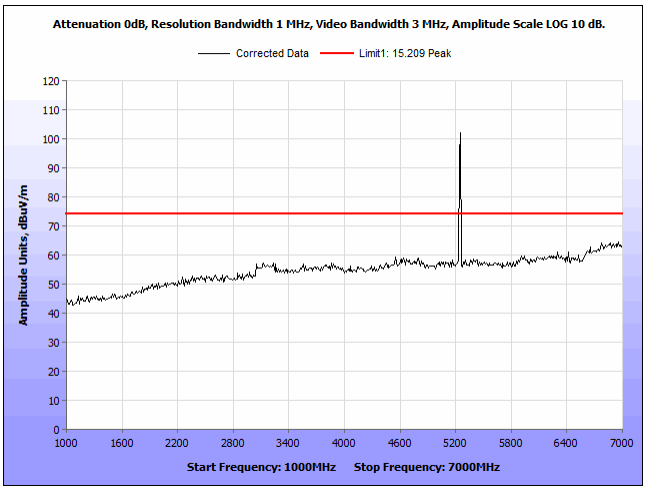
Plot 375. Undesirable Emissions, 1-7MHz Peak, 5M, 5200, 90Sector, Port 1



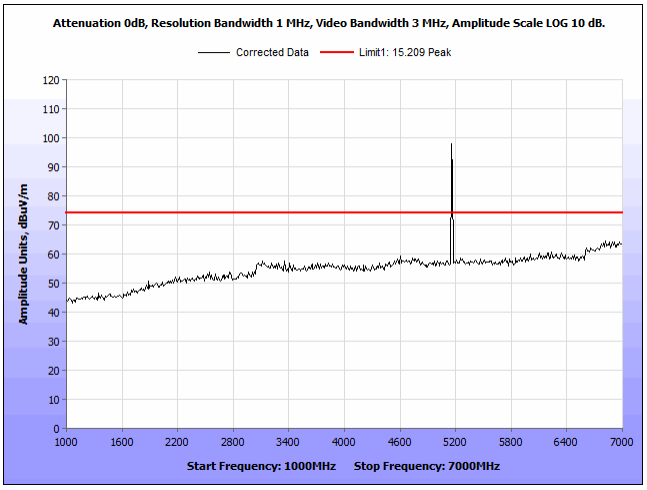
Plot 376. Undesirable Emissions, 1-7MHz Peak, 5M, 5200, 90Sector, Port 2



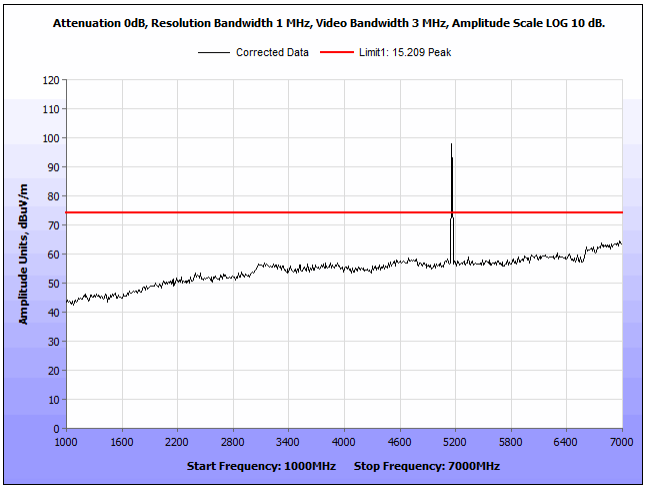
Plot 377. Undesirable Emissions, 1-7MHz Peak, 5M, 5247.5, 90Sector, Port 1



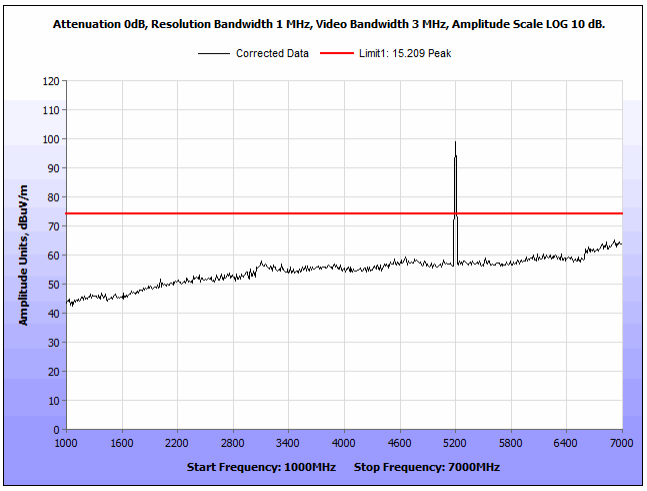
Plot 378. Undesirable Emissions, 1-7MHz Peak, 5M, 5247.5, 90Sector, Port 2



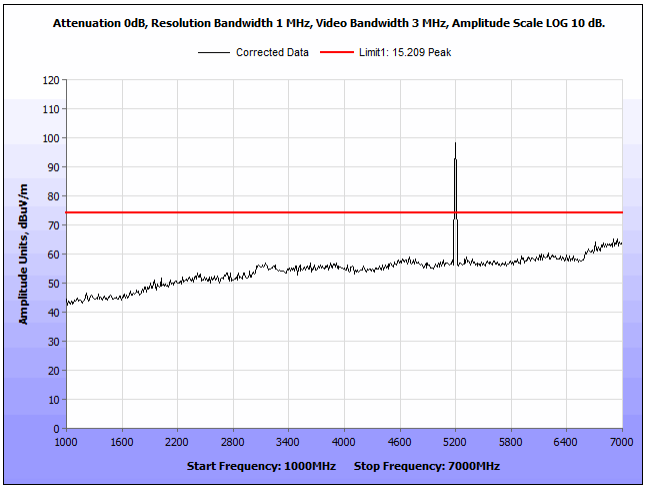
Plot 379. Undesirable Emissions, 1-7MHz Peak, 10M, 5160, 90Sector, Port 1



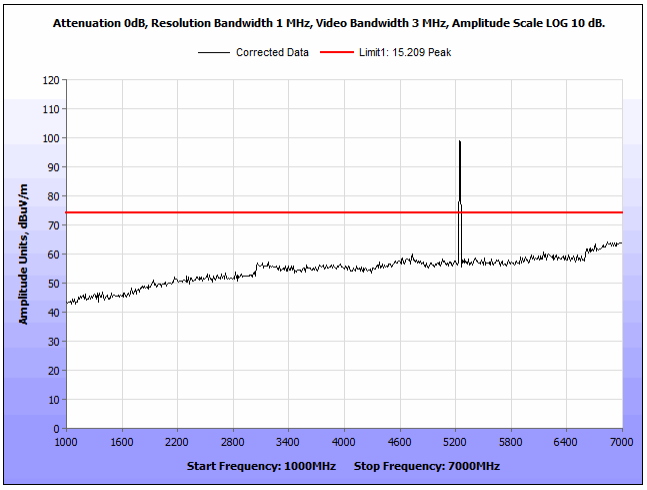
Plot 380. Undesirable Emissions, 1-7MHz Peak, 10M, 5160, 90Sector, Port 2



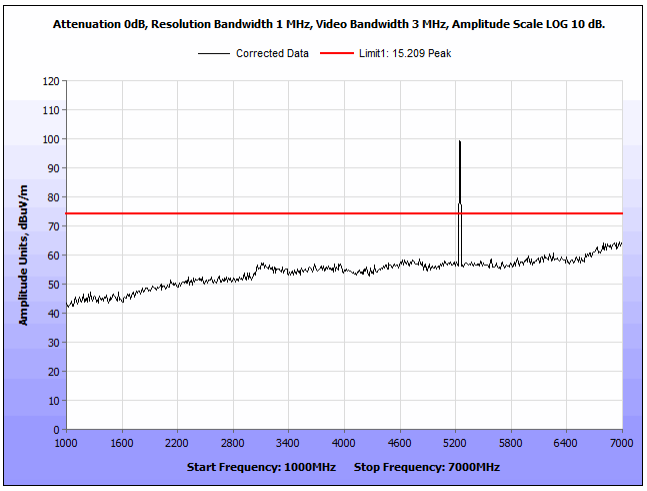
Plot 381. Undesirable Emissions, 1-7MHz Peak, 10M, 5200, 90Sector, Port 1



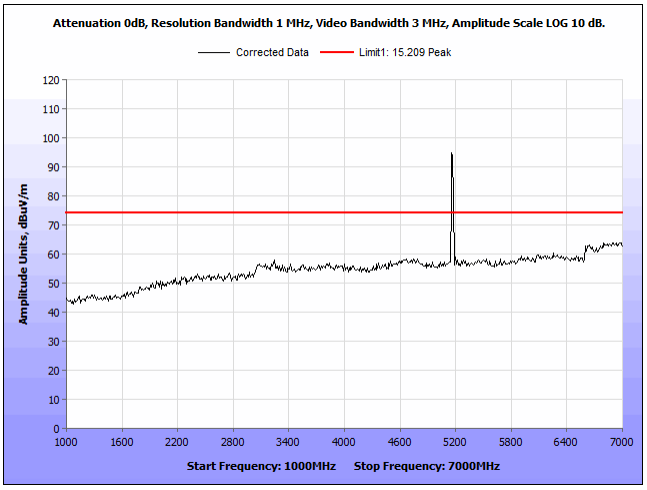
Plot 382. Undesirable Emissions, 1-7MHz Peak, 10M, 5200, 90Sector, Port 2



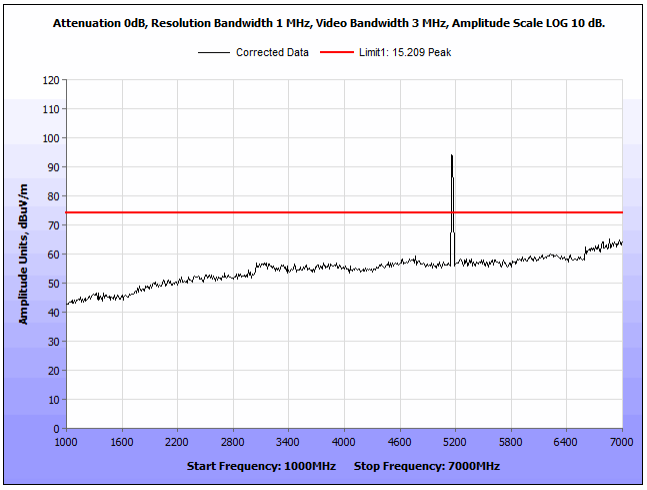
Plot 383. Undesirable Emissions, 1-7MHz Peak, 10M, 5245, 90Sector, Port 1



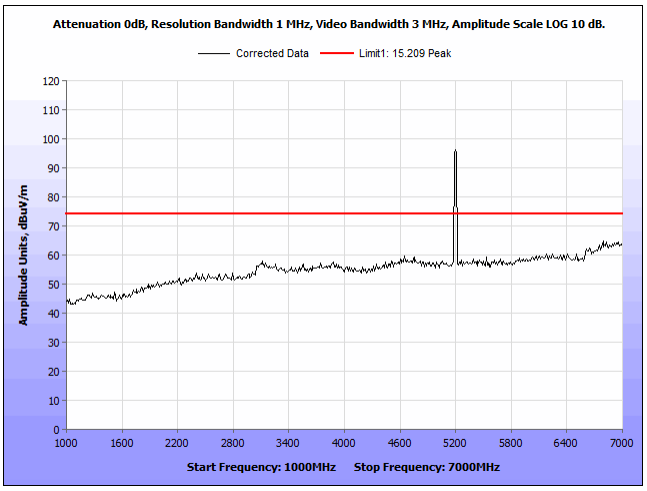
Plot 384. Undesirable Emissions, 1-7MHz Peak, 10M, 5245, 90Sector, Port 2



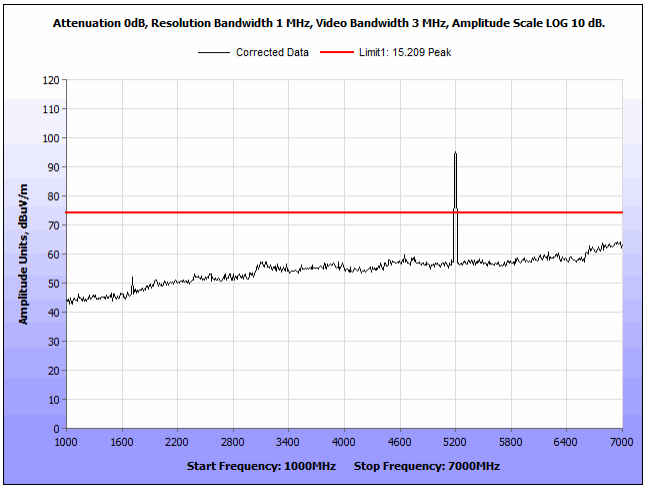
Plot 385. Undesirable Emissions, 1-7MHz Peak, 20M, 5165, 90Sector, Port 1



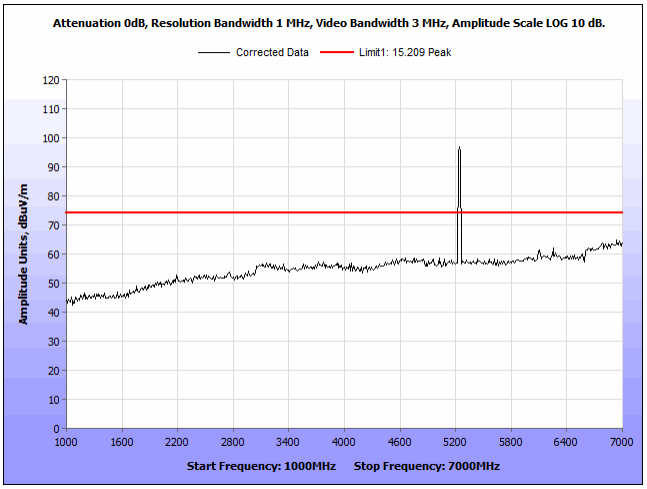
Plot 386. Undesirable Emissions, 1-7MHz Peak, 20M, 5165, 90Sector, Port 2



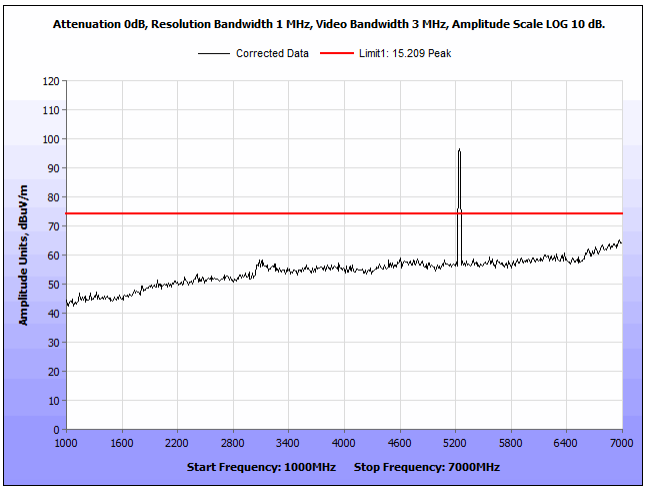
Plot 387. Undesirable Emissions, 1-7MHz Peak, 20M, 5200, 90Sector, Port 1



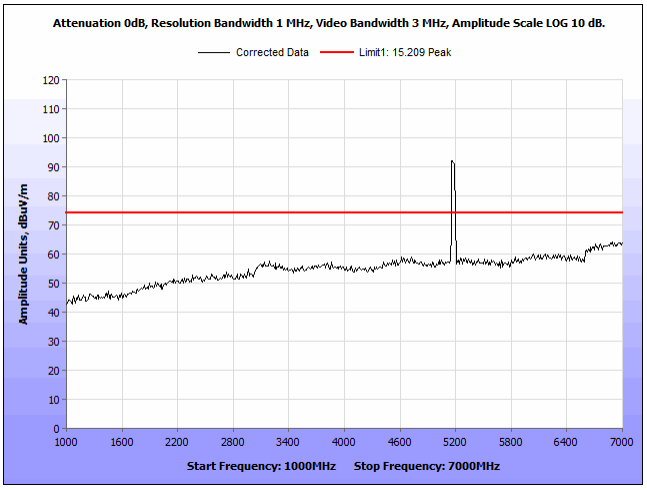
Plot 388. Undesirable Emissions, 1-7MHz Peak, 20M, 5200, 90Sector, Port 2



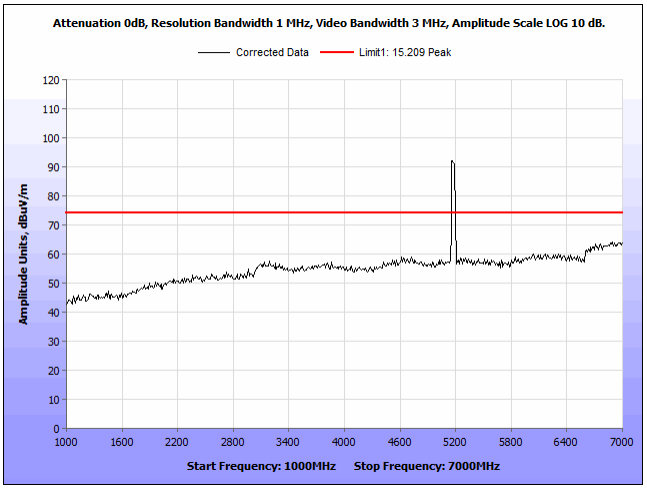
Plot 389. Undesirable Emissions, 1-7MHz Peak, 20M, 5240, 90Sector, Port 1



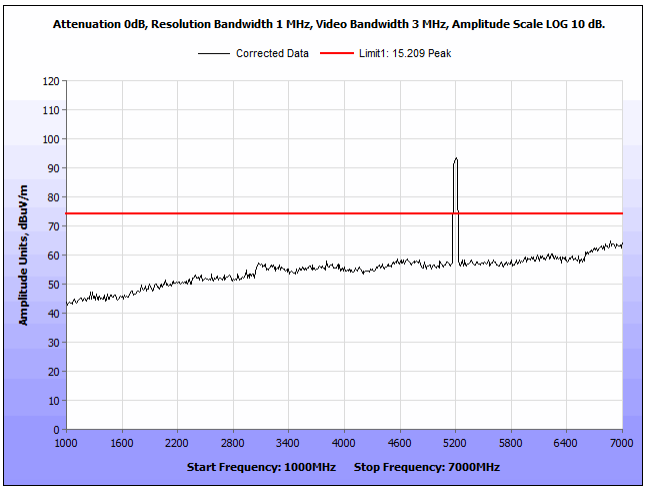
Plot 390. Undesirable Emissions, 1-7MHz Peak, 20M, 5240, 90Sector, Port 2



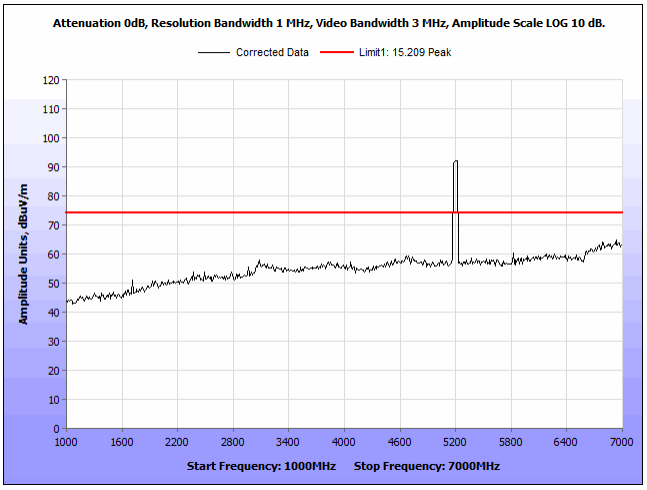
Plot 391. Undesirable Emissions, 1-7MHz Peak, 40M, 5175, 90Sector, Port 1



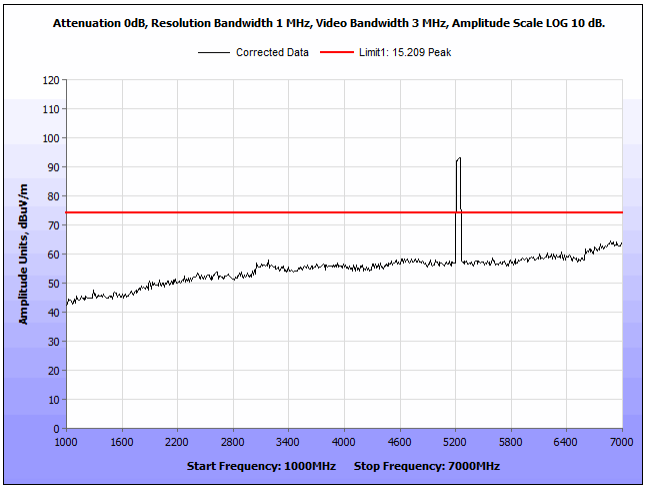
Plot 392. Undesirable Emissions, 1-7MHz Peak, 40M, 5175, 90Sector, Port 2



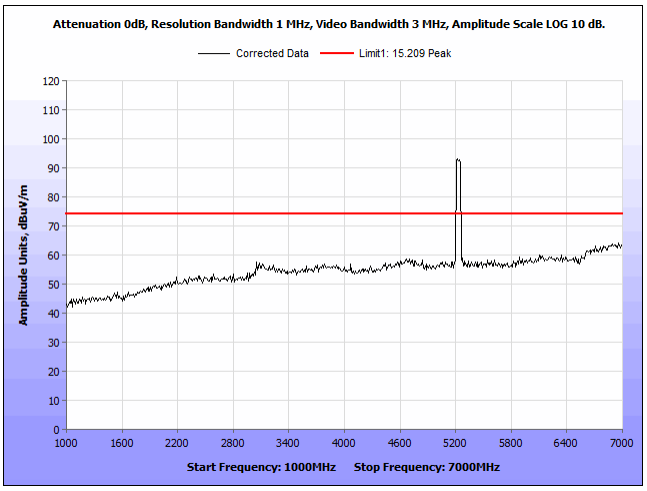
Plot 393. Undesirable Emissions, 1-7MHz Peak, 40M, 5200, 90Sector, Port 1



Plot 394. Undesirable Emissions, 1-7MHz Peak, 40M, 5200, 90Sector, Port 2



Plot 395. Undesirable Emissions, 1-7MHz Peak, 40M, 5230, 90Sector, Port 1

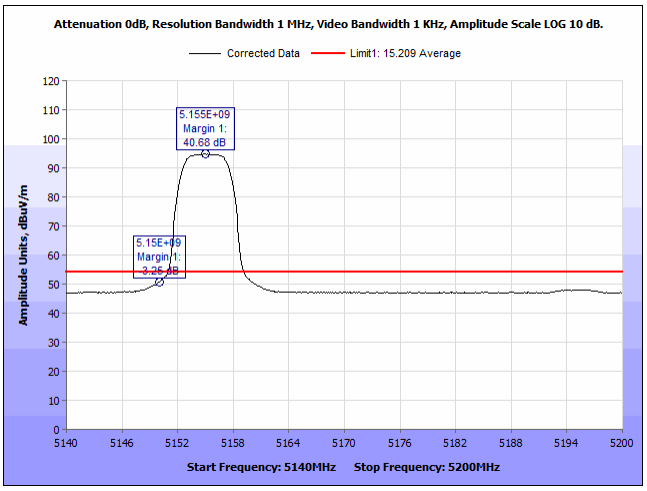


Plot 396. Undesirable Emissions, 1-7MHz Peak, 40M, 5230, 90Sector, Port 2

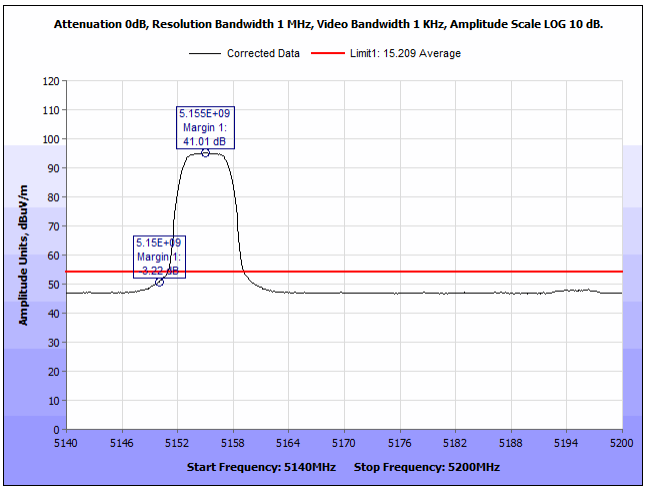
Class A - Detector Peak

Plot 397. Undesirable Emissions 30MHz – 1GHz (Worst case)

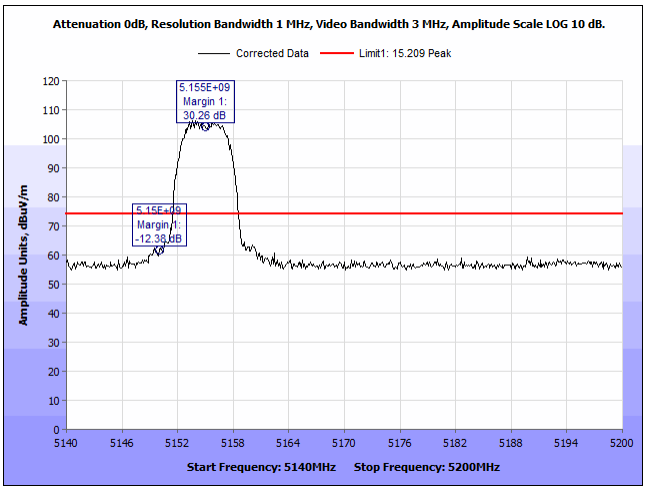
Radiated Band Edge, 8 Omni



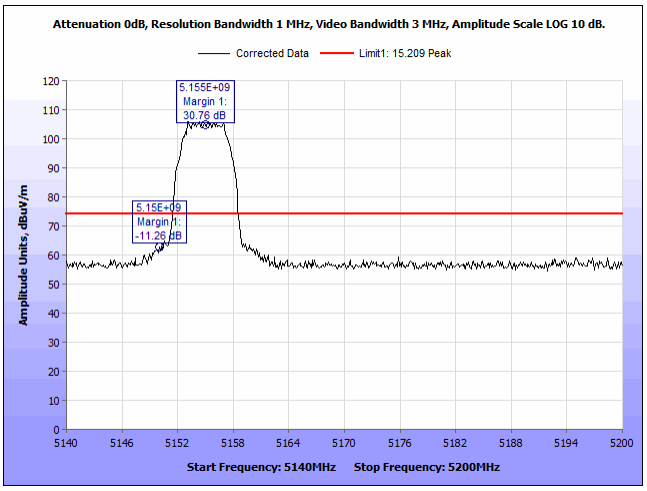
Plot 398. Radiated Band Edge, 5155MHz, BW5MHz, Average, 8Omni Port1



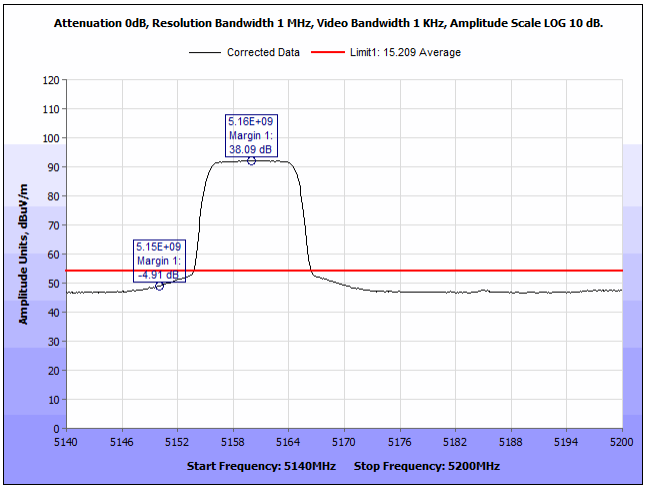
Plot 399. Radiated Band Edge, 5155MHz, BW5MHz, Average, 8Omni Port2



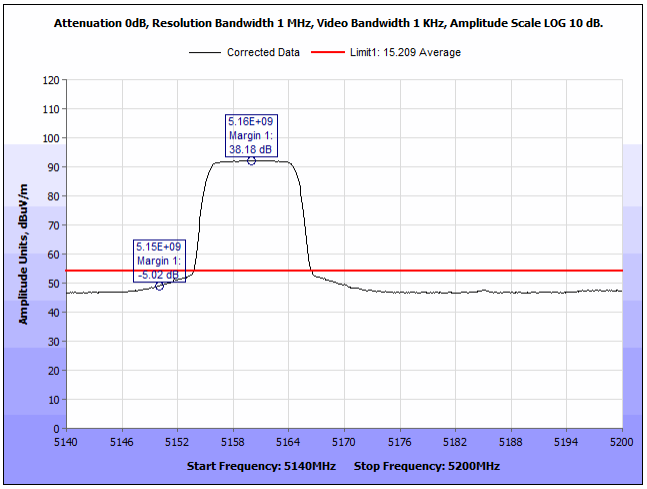
Plot 400. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 8Omni Port1



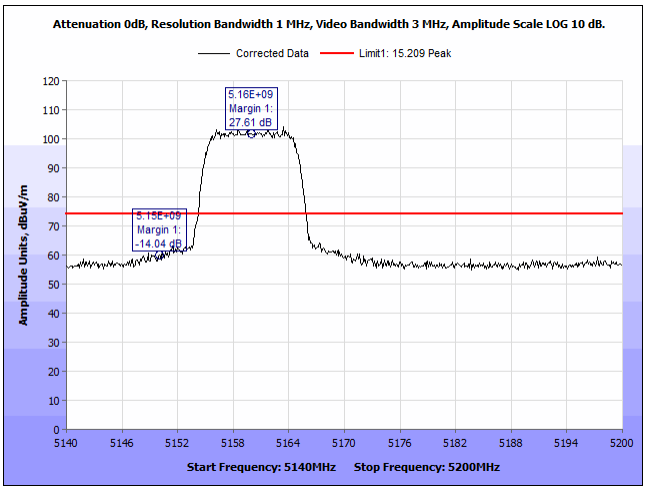
Plot 401. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 8Omni Port2



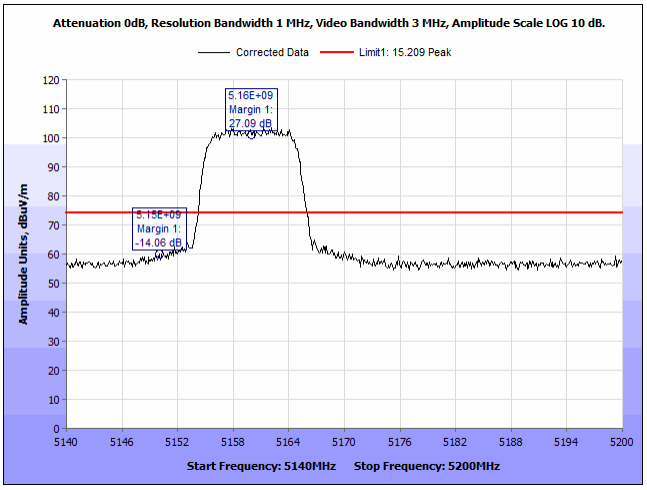
Plot 402. Radiated Band Edge, 5160MHz, BW10MHz, Average, 8Omni Port1



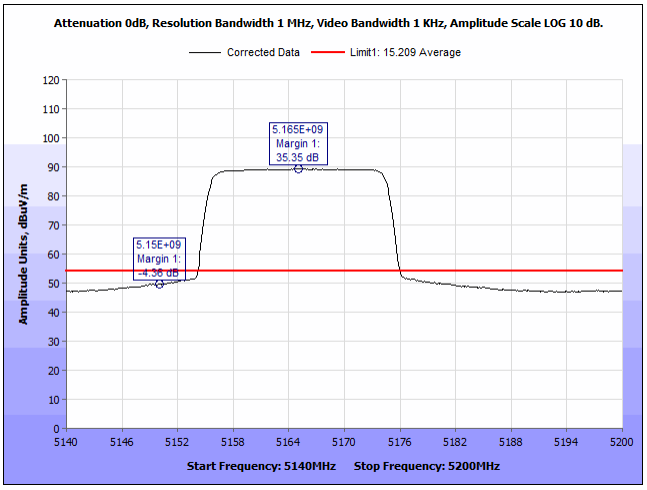
Plot 403. Radiated Band Edge, 5160MHz, BW10MHz, Average, 8Omni Port2



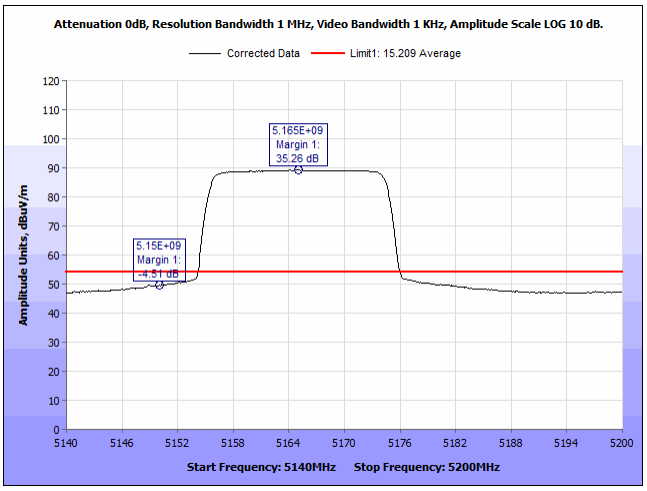
Plot 404. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 8Omni Port1



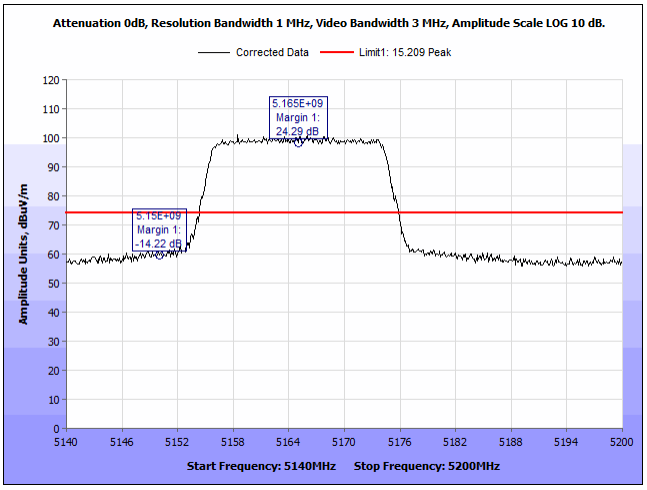
Plot 405. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 8Omni Port2



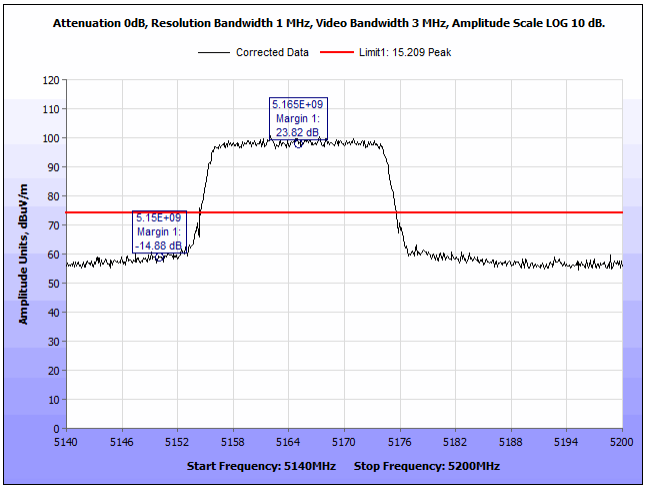
Plot 406. Radiated Band Edge, 5165MHz, BW20MHz, Average, 8Omni Port1



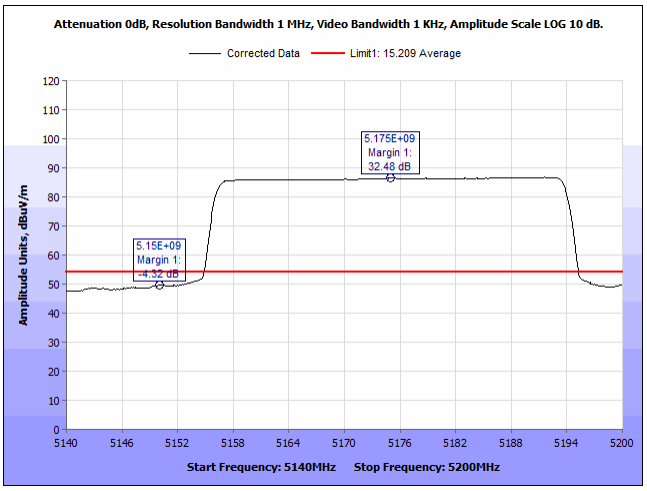
Plot 407. Radiated Band Edge, 5165MHz, BW20MHz, Average, 8Omni Port2



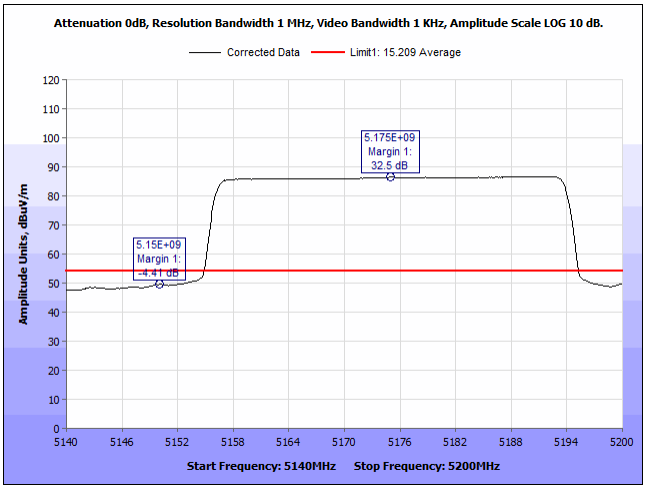
Plot 408. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 8Omni Port1



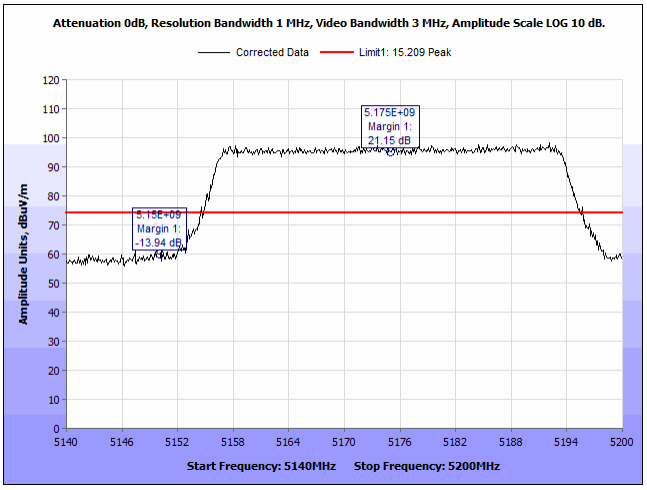
Plot 409. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 8Omni Port2



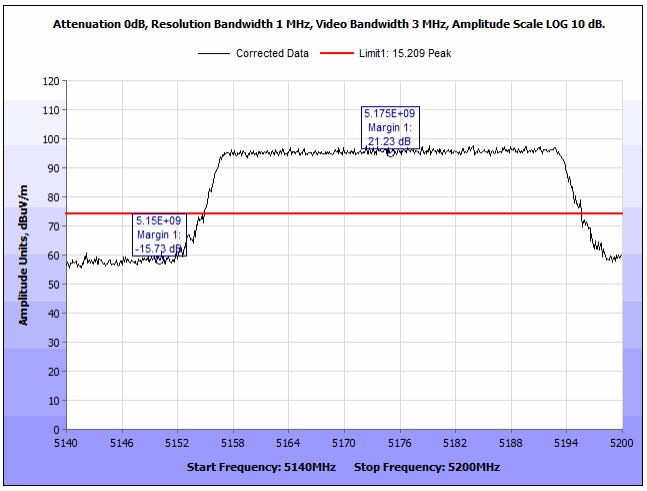
Plot 410. Radiated Band Edge, 5175MHz, BW40MHz, Average, 8Omni Port1



Plot 411. Radiated Band Edge, 5175MHz, BW40MHz, Average, 8Omni Port2

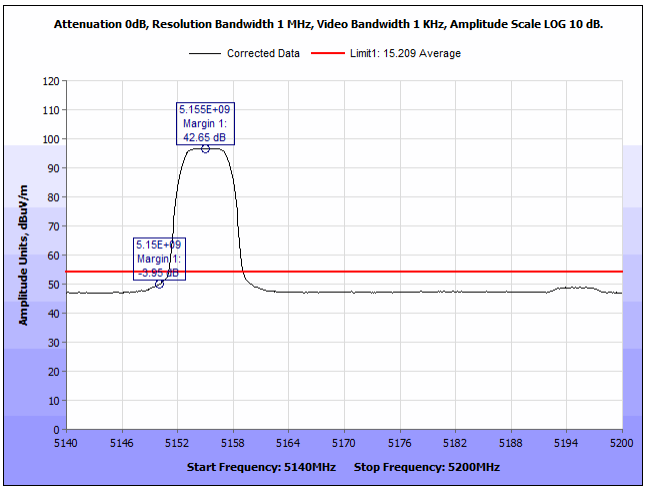


Plot 412. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 8Omni Port1

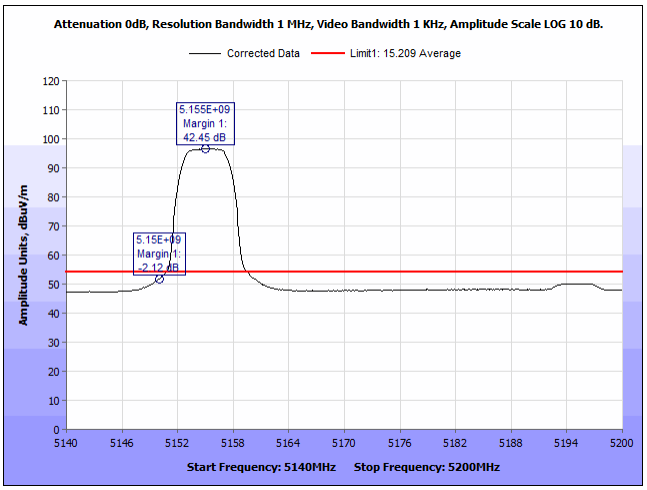


Plot 413. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 8Omni Port2

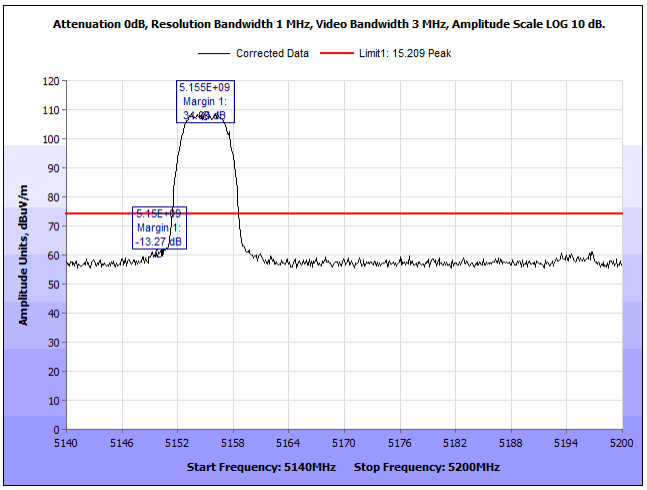
Radiated Band Edge, 3 Para



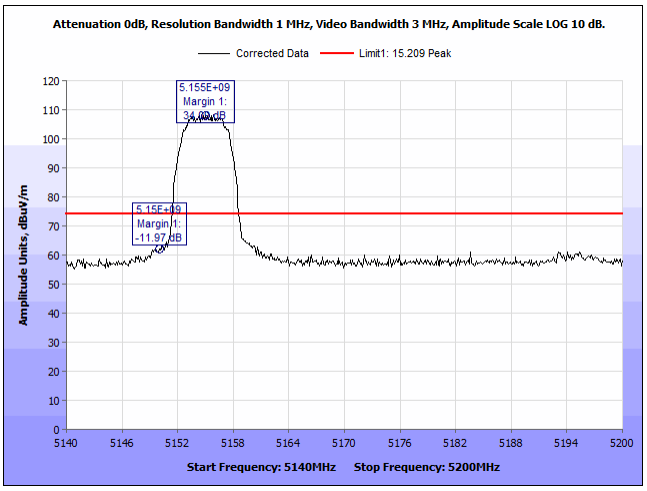
Plot 414. Radiated Band Edge, 5155MHz, BW5MHz, Average, 3Para Port1



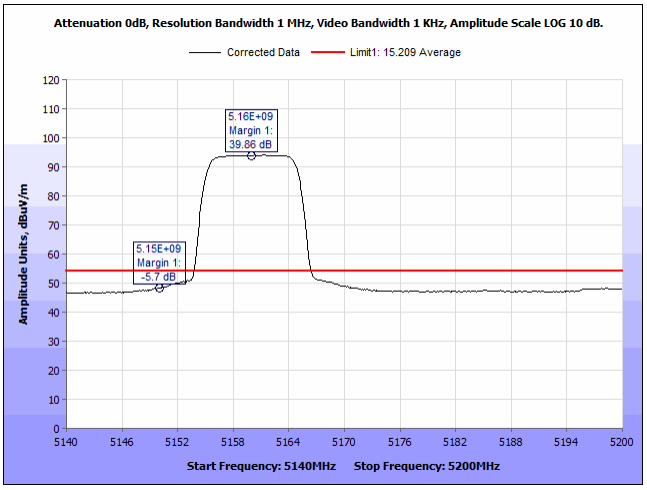
Plot 415. Radiated Band Edge, 5155MHz, BW5MHz, Average, 3Para Port2



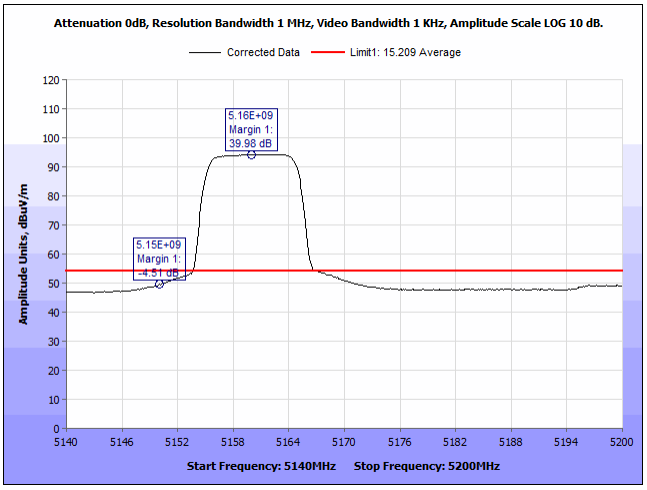
Plot 416. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 3Para Port1



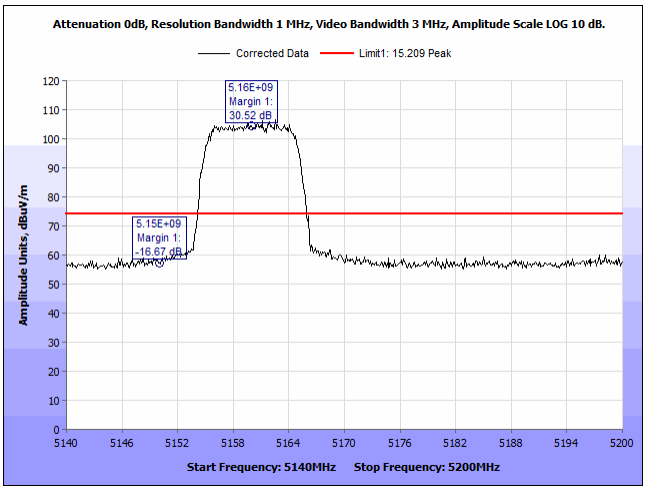
Plot 417. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 3Para Port2



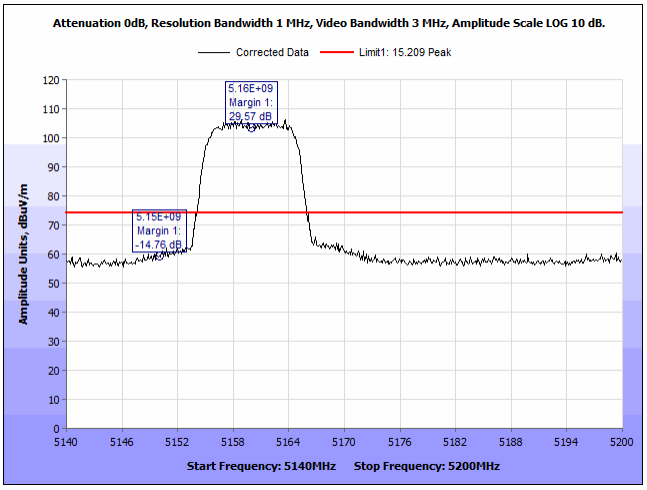
Plot 418. Radiated Band Edge, 5160MHz, BW10MHz, Average, 3Para Port1



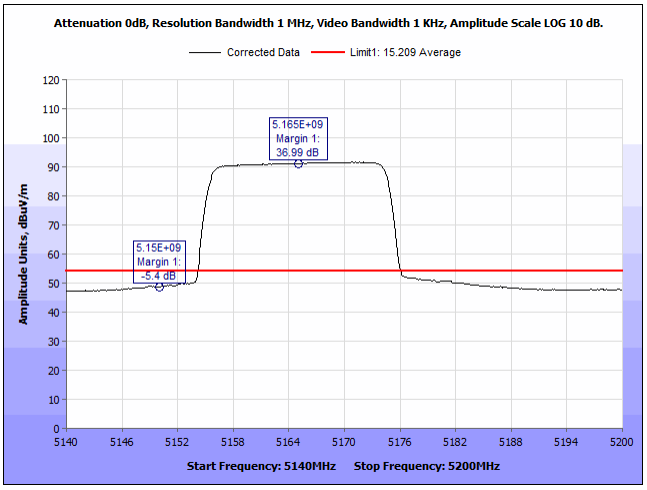
Plot 419. Radiated Band Edge, 5160MHz, BW10MHz, Average, 3Para Port2



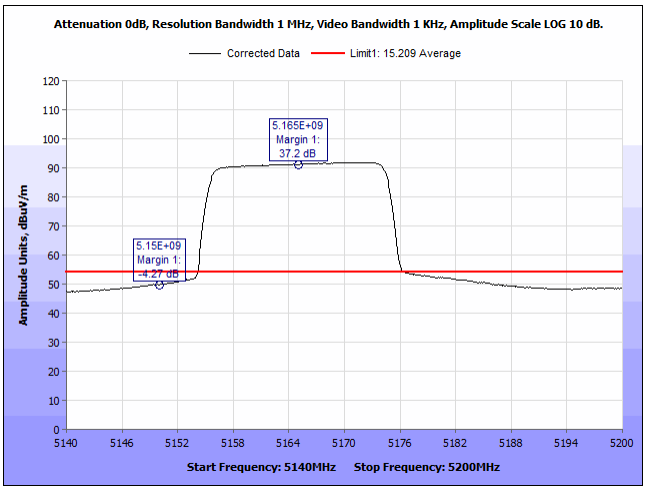
Plot 420. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 3Para Port1



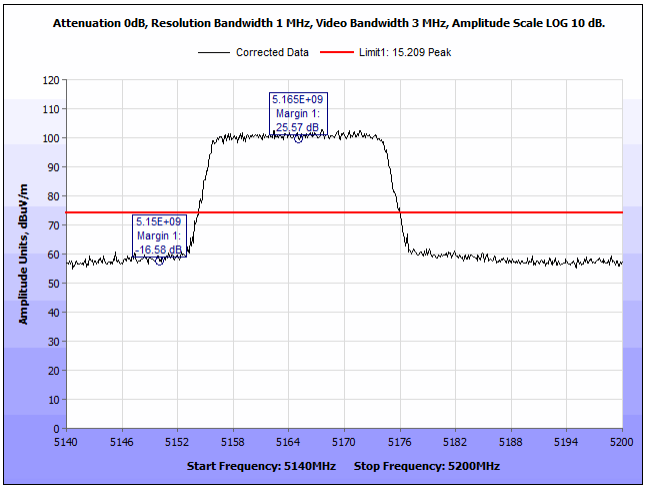
Plot 421. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 3Para Port2



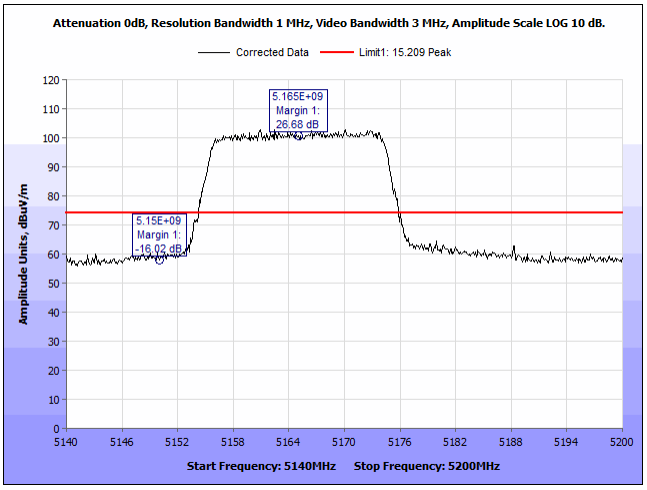
Plot 422. Radiated Band Edge, 5165MHz, BW20MHz, Average, 3Para Port1



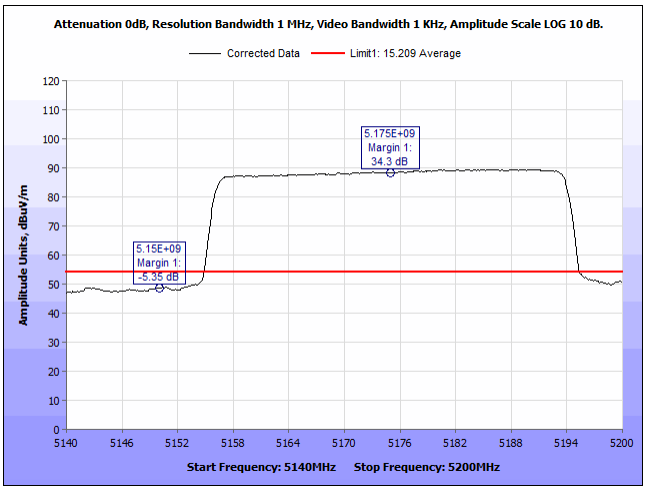
Plot 423. Radiated Band Edge, 5165MHz, BW20MHz, Average, 3Para Port2



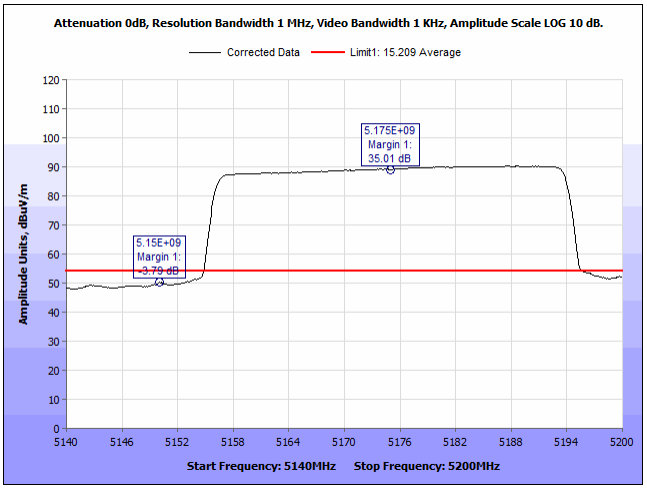
Plot 424. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 3Para Port1



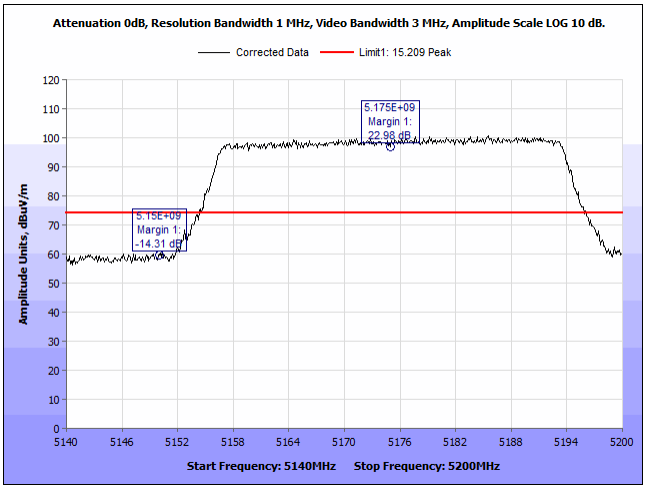
Plot 425. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 3Para Port2



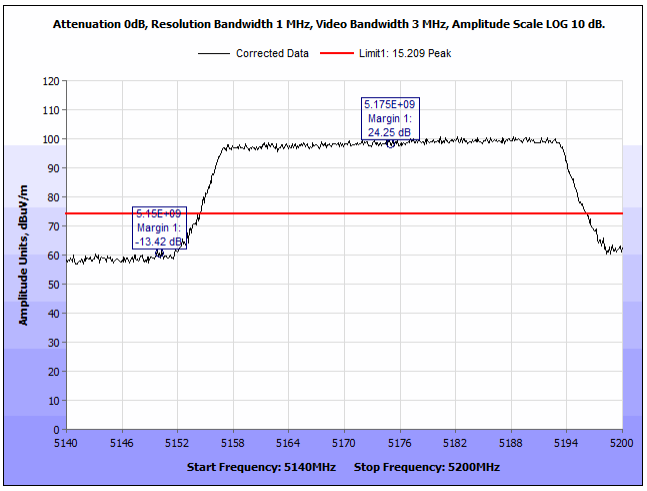
Plot 426. Radiated Band Edge, 5175MHz, BW40MHz, Average, 3Para Port1



Plot 427. Radiated Band Edge, 5175MHz, BW40MHz, Average, 3Para Port2

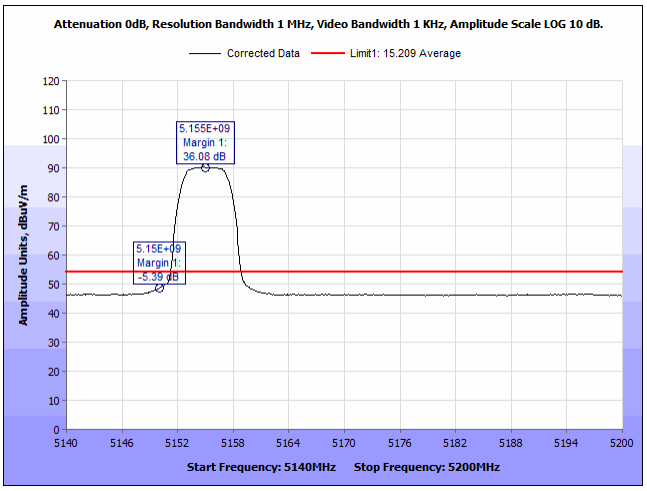


Plot 428. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 3Para Port1

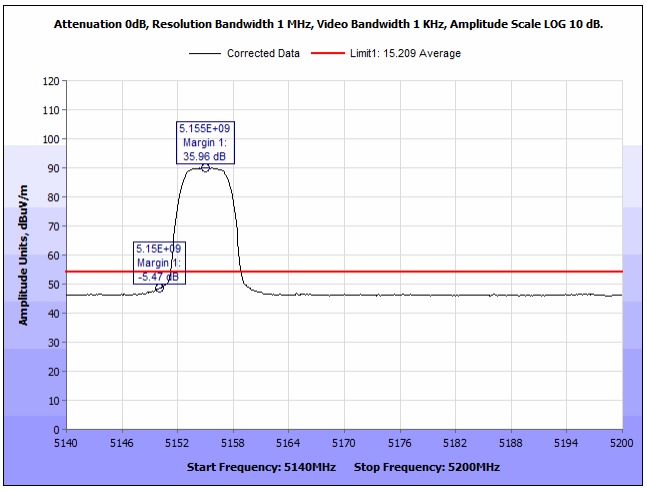


Plot 429. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 3Para Port2

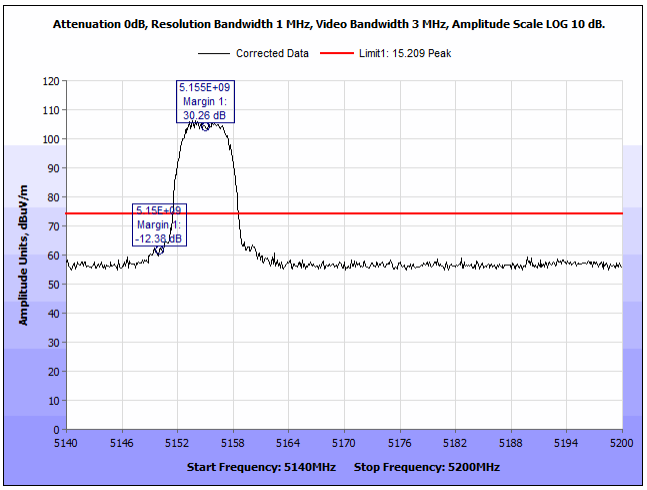
Radiated Band Edge, 90 Sector



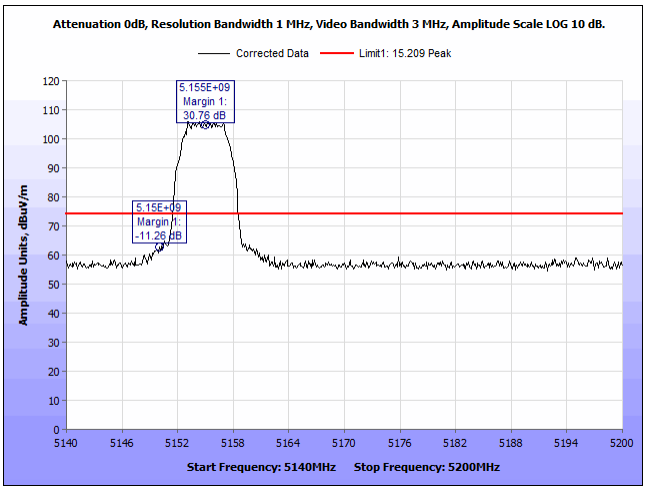
Plot 430. Radiated Band Edge, 5155MHz, BW5MHz, Average, 90Sector Port1



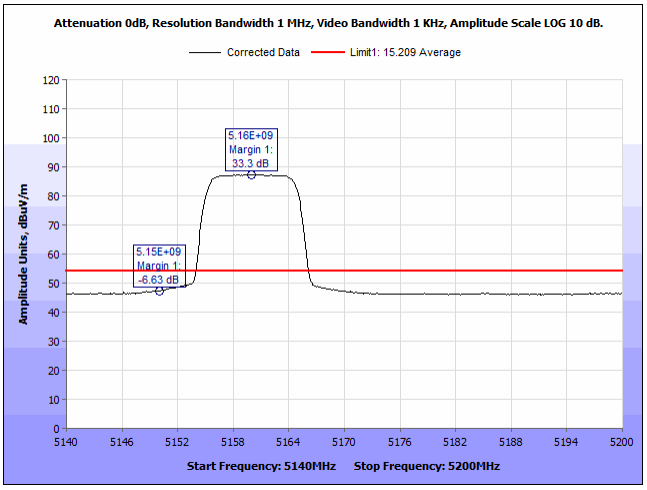
Plot 431. Radiated Band Edge, 5155MHz, BW5MHz, Average, 90Sector Port2



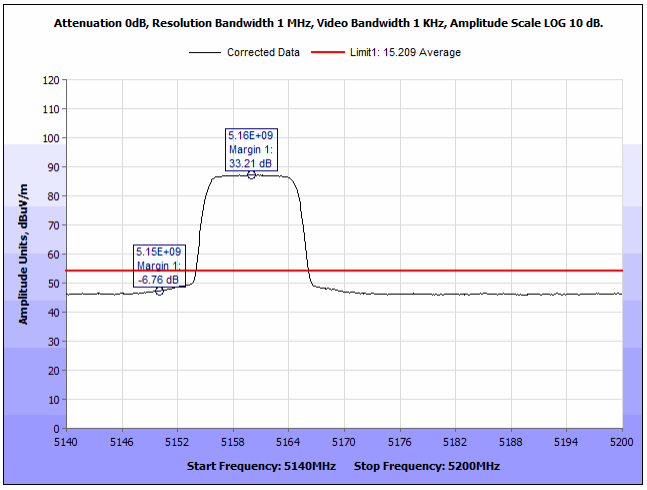
Plot 432. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 90Sector Port1



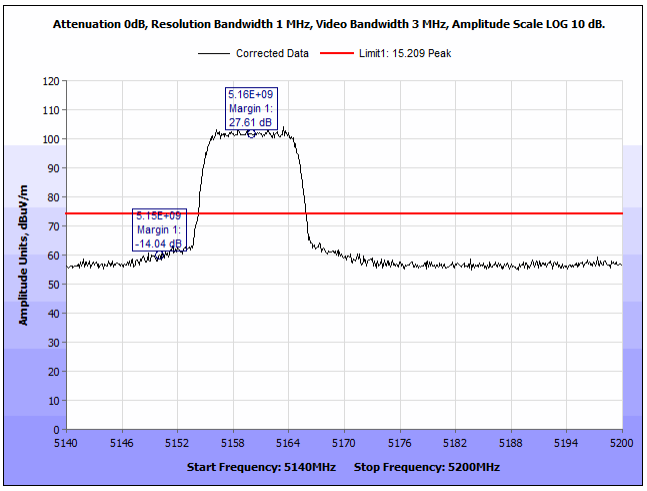
Plot 433. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 90Sector Port2



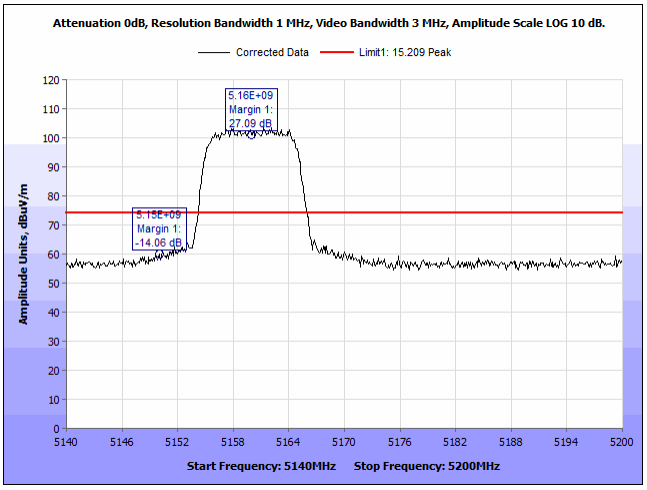
Plot 434. Radiated Band Edge, 5160MHz, BW10MHz, Average, 90Sector Port1



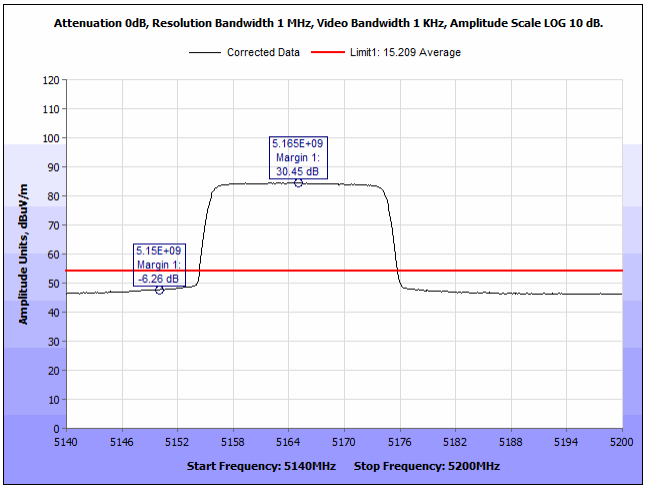
Plot 435. Radiated Band Edge, 5160MHz, BW10MHz, Average, 90Sector Port2



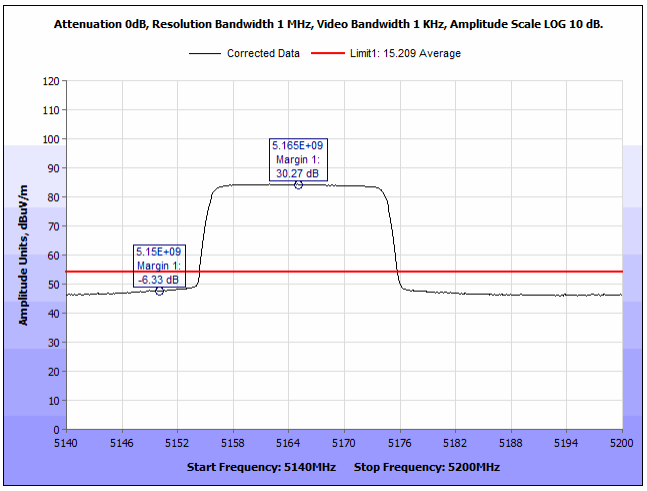
Plot 436. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 90Sector Port1



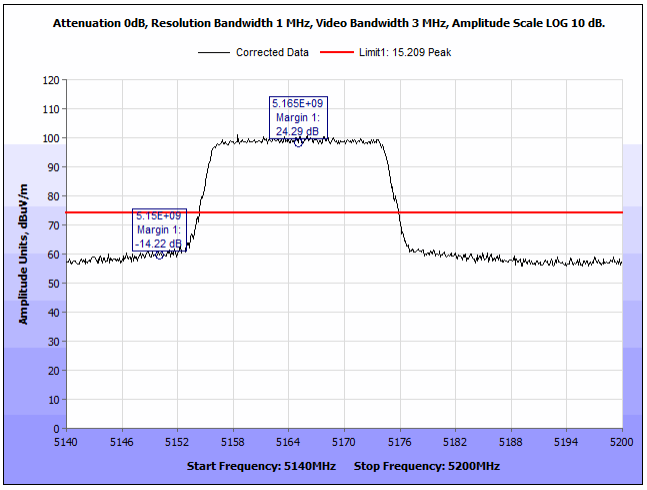
Plot 437. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 90Sector Port2



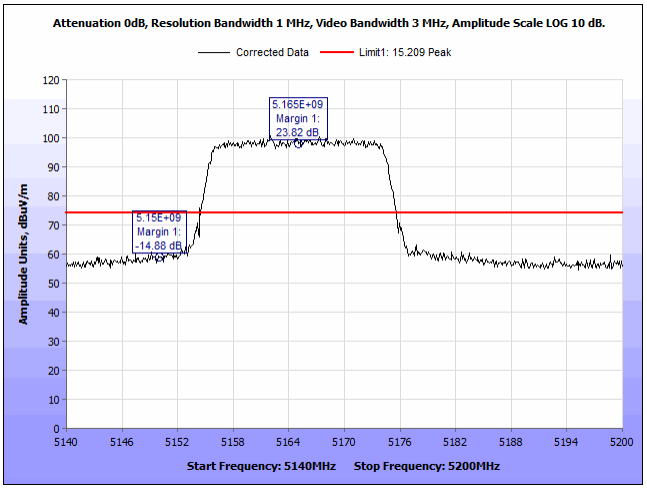
Plot 438. Radiated Band Edge, 5165MHz, BW20MHz, Average, 90Sector Port1



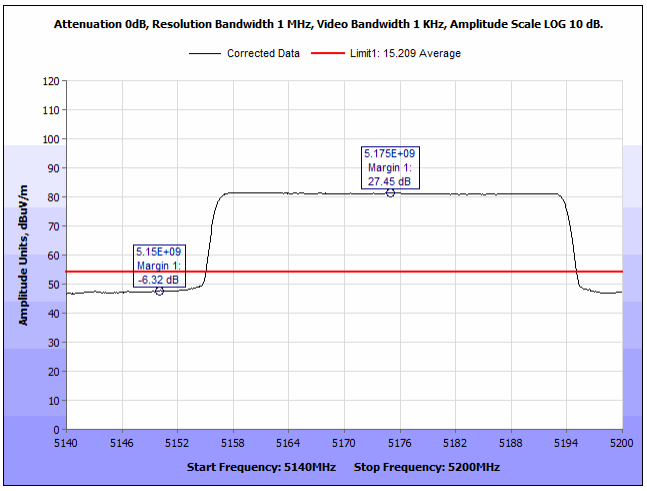
Plot 439. Radiated Band Edge, 5165MHz, BW20MHz, Average, 90Sector Port2



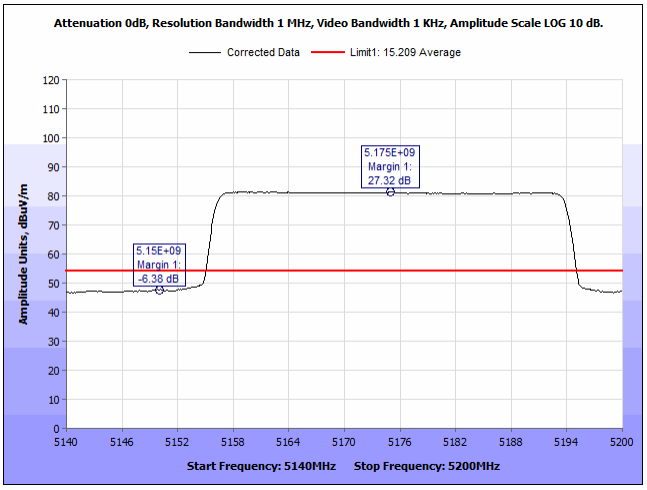
Plot 440. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 90Sector Port1



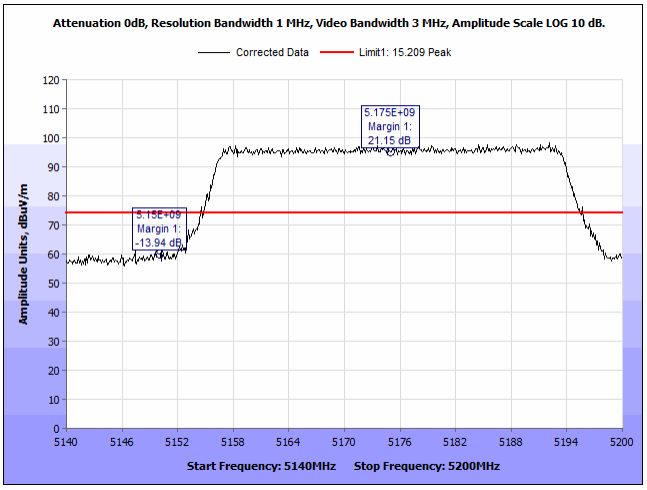
Plot 441. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 90Sector Port2



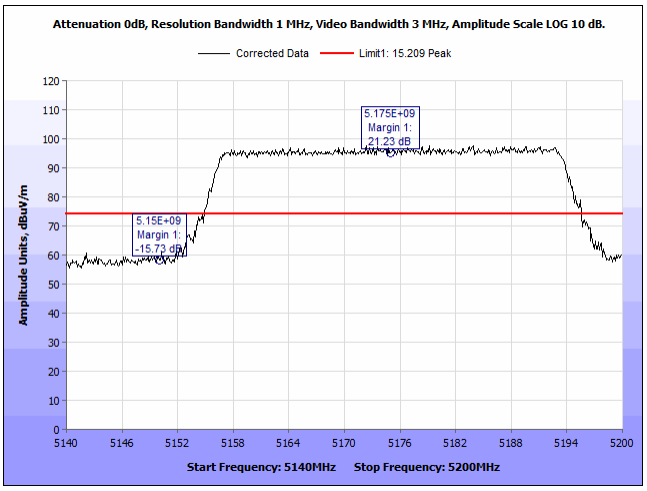
Plot 442. Radiated Band Edge, 5175MHz, BW40MHz, Average, 90Sector Port1



Plot 443. Radiated Band Edge, 5175MHz, BW40MHz, Average, 90Sector Port2

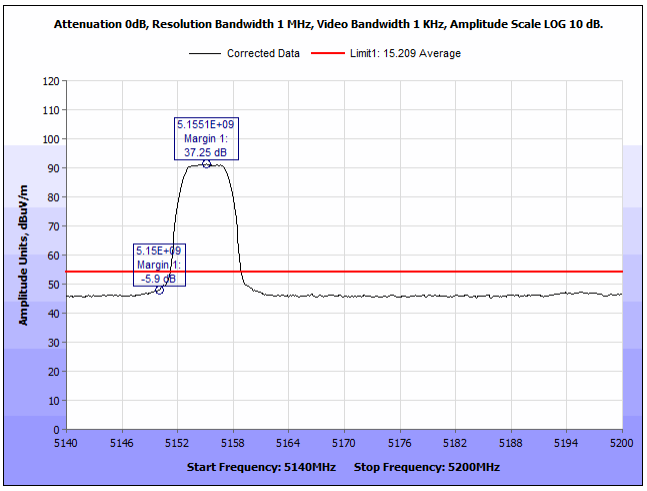


Plot 444. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 90Sector Port1

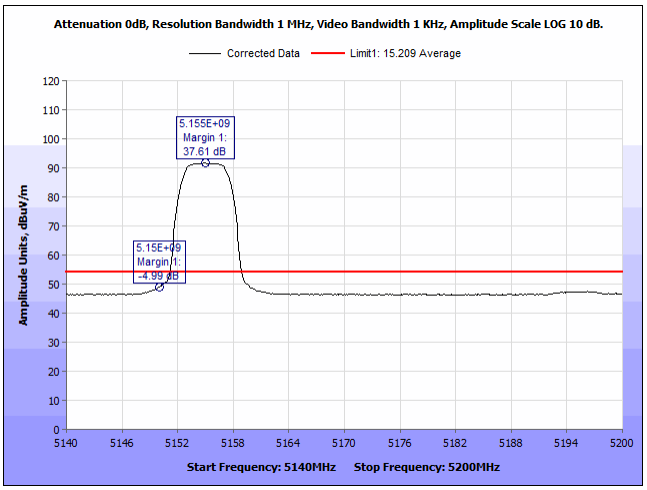


Plot 445. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 90Sector Port2

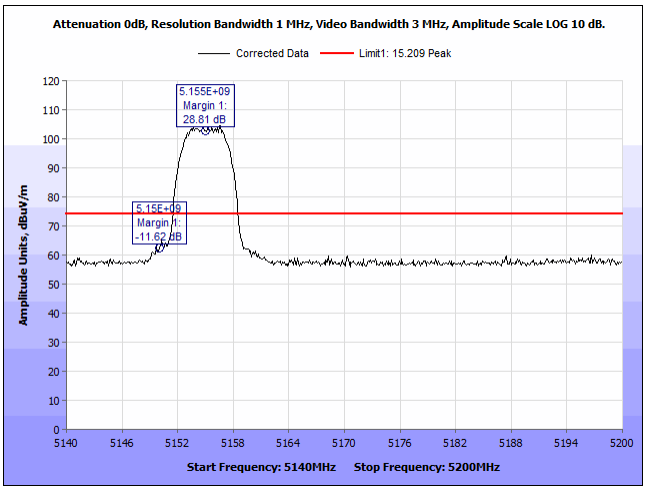
Radiated Band Edge, 2 Panel



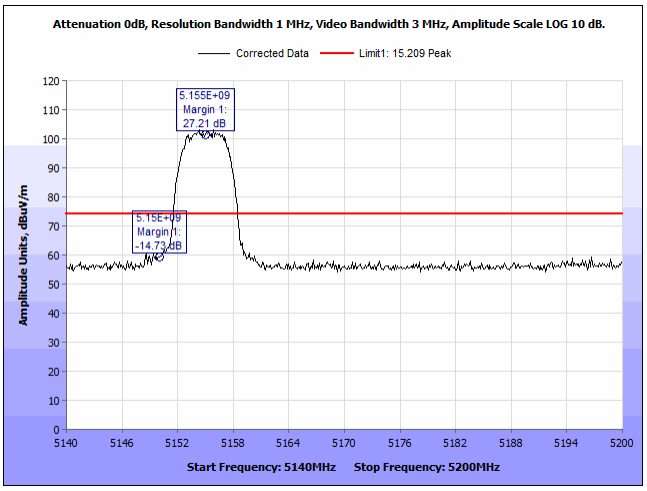
Plot 446. Radiated Band Edge, 5155MHz, BW5MHz, Average, 2Panel Port1



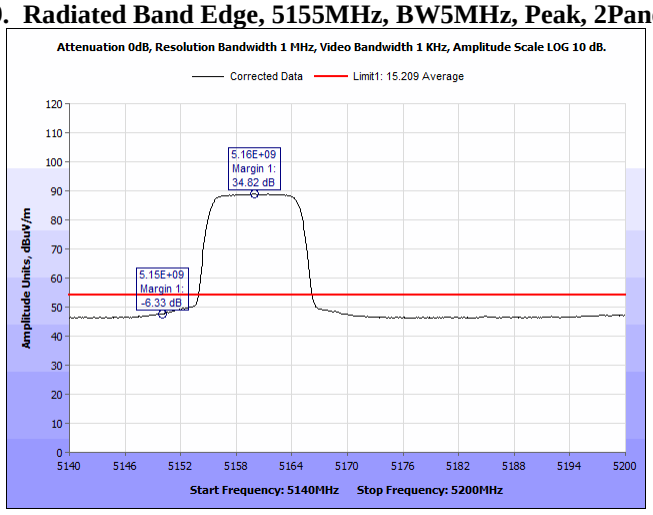
Plot 447. Radiated Band Edge, 5155MHz, BW5MHz, Average, 2Panel Port2



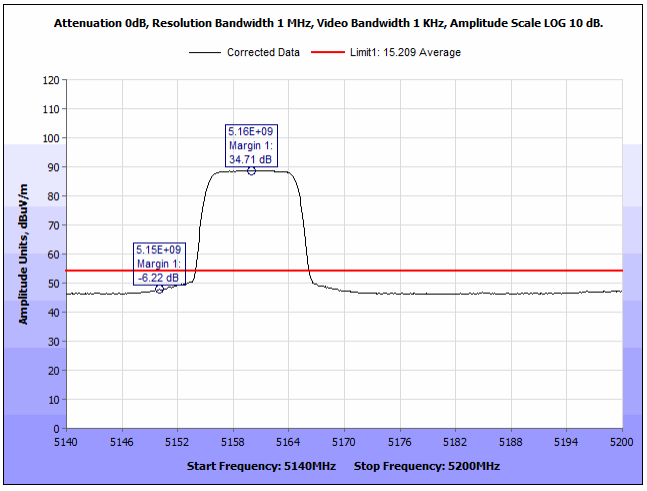
Plot 448. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 2Panel Port1



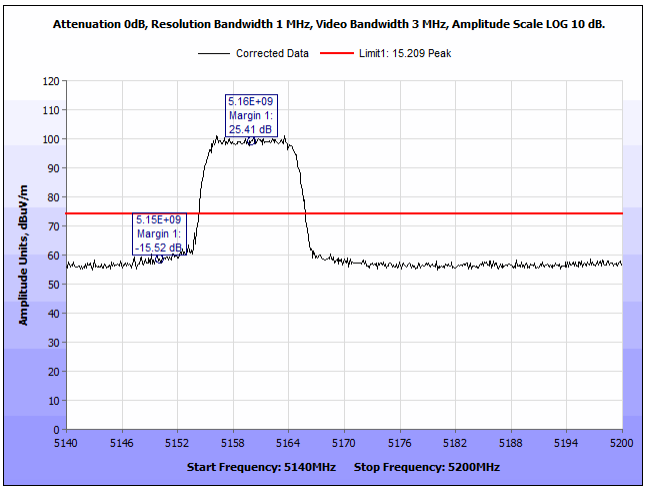
Plot 449. Radiated Band Edge, 5155MHz, BW5MHz, Peak, 2Panel Port2



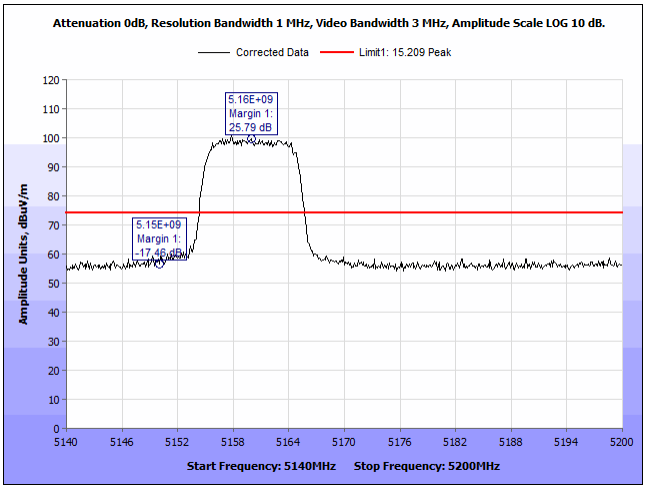
Plot 450. Radiated Band Edge, 5160MHz, BW10MHz, Average, 2Panel Port1



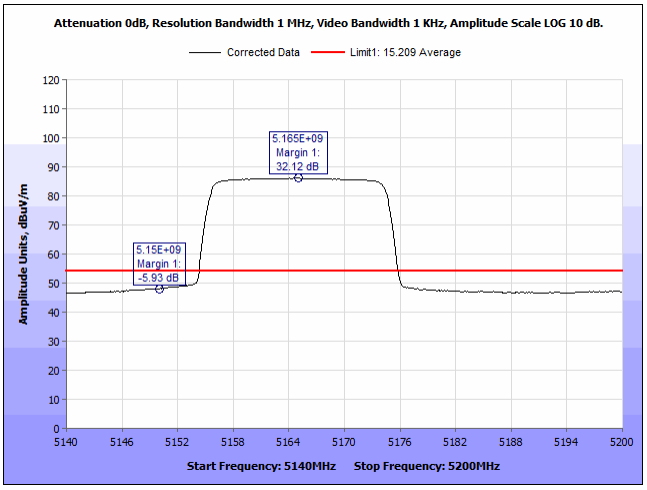
Plot 451. Radiated Band Edge, 5160MHz, BW10MHz, Average, 2Panel Port2



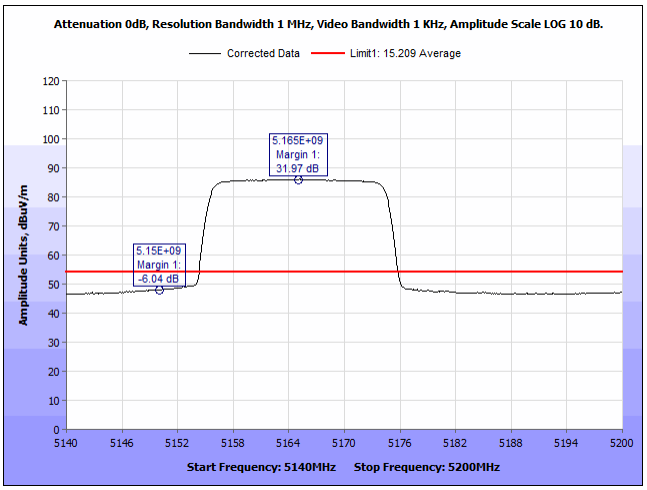
Plot 452. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 2Panel Port1



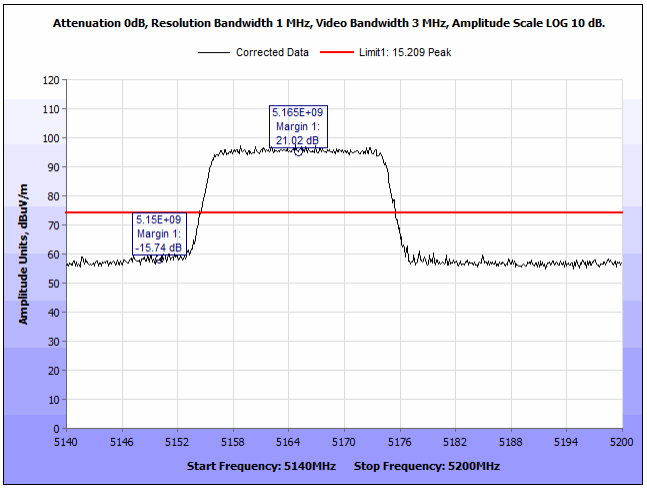
Plot 453. Radiated Band Edge, 5160MHz, BW10MHz, Peak, 2Panel Port2



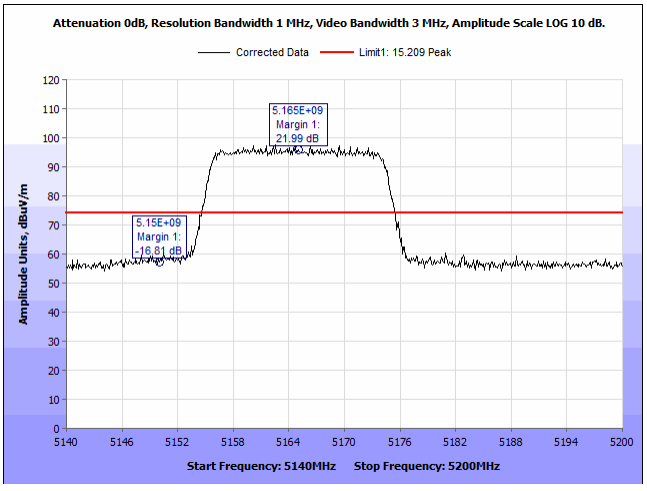
Plot 454. Radiated Band Edge, 5165MHz, BW20MHz, Average, 2Panel Port1



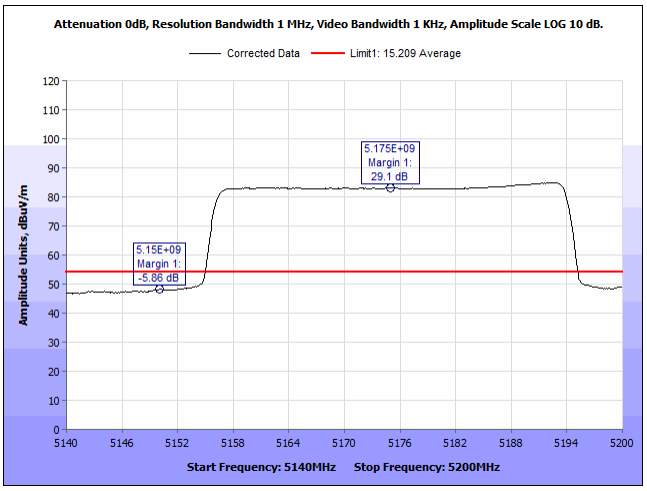
Plot 455. Radiated Band Edge, 5165MHz, BW20MHz, Average, 2Panel Port2



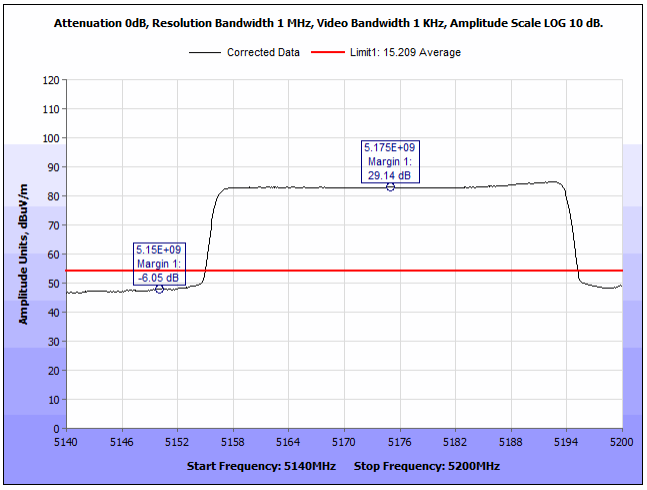
Plot 456. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 2Panel Port1



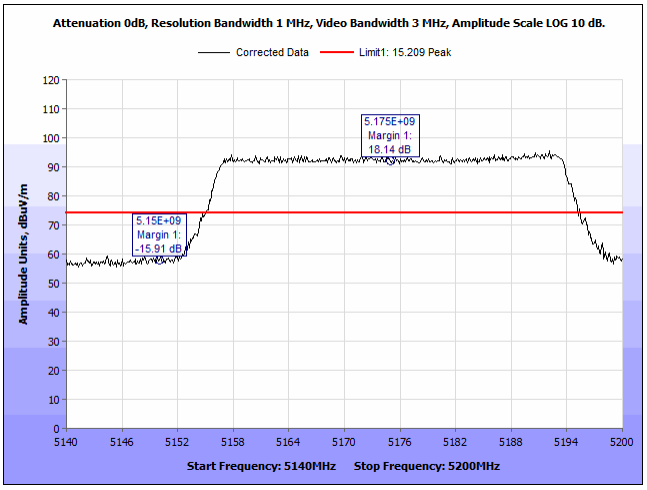
Plot 457. Radiated Band Edge, 5165MHz, BW20MHz, Peak, 2Panel Port2



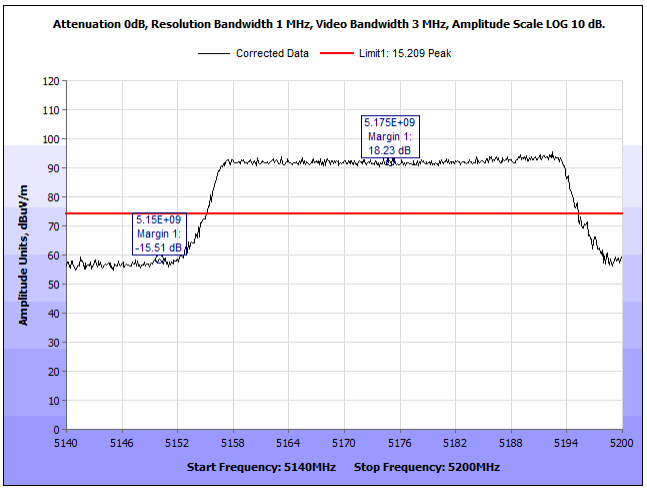
Plot 458. Radiated Band Edge, 5175MHz, BW40MHz, Average, 2Panel Port1



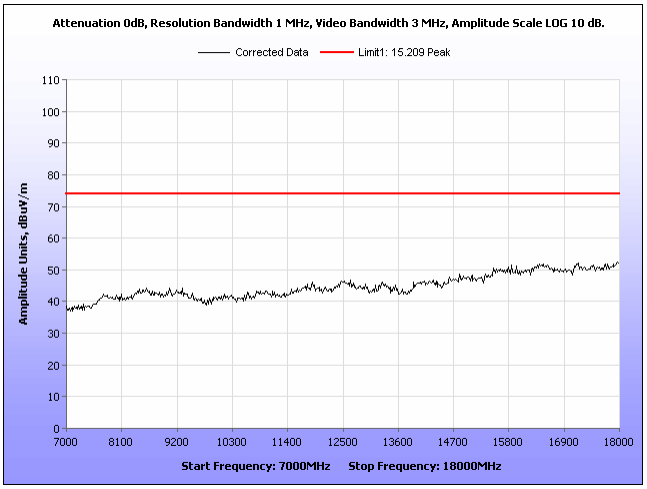
Plot 459. Radiated Band Edge, 5175MHz, BW40MHz, Average, 2Panel Port2



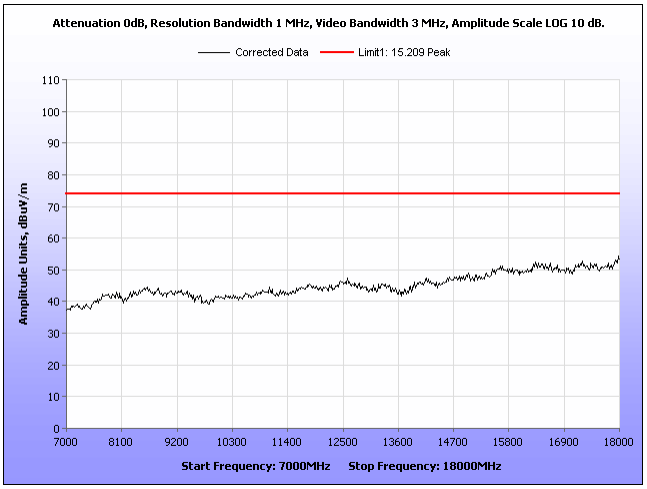
Plot 460. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 2Panel Port1



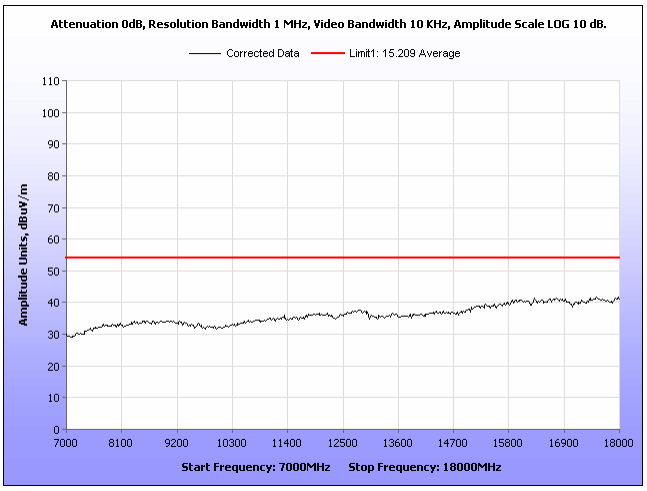
Plot 461. Radiated Band Edge, 5175MHz, BW40MHz, Peak, 2Panel Port2



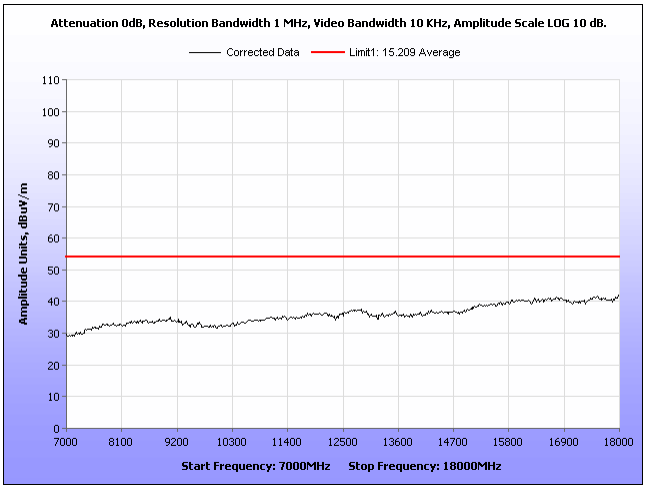
Plot 462. Undesirable Emissions, 7-18 MHz, Peak 3 Para, Worst Case, Port 1



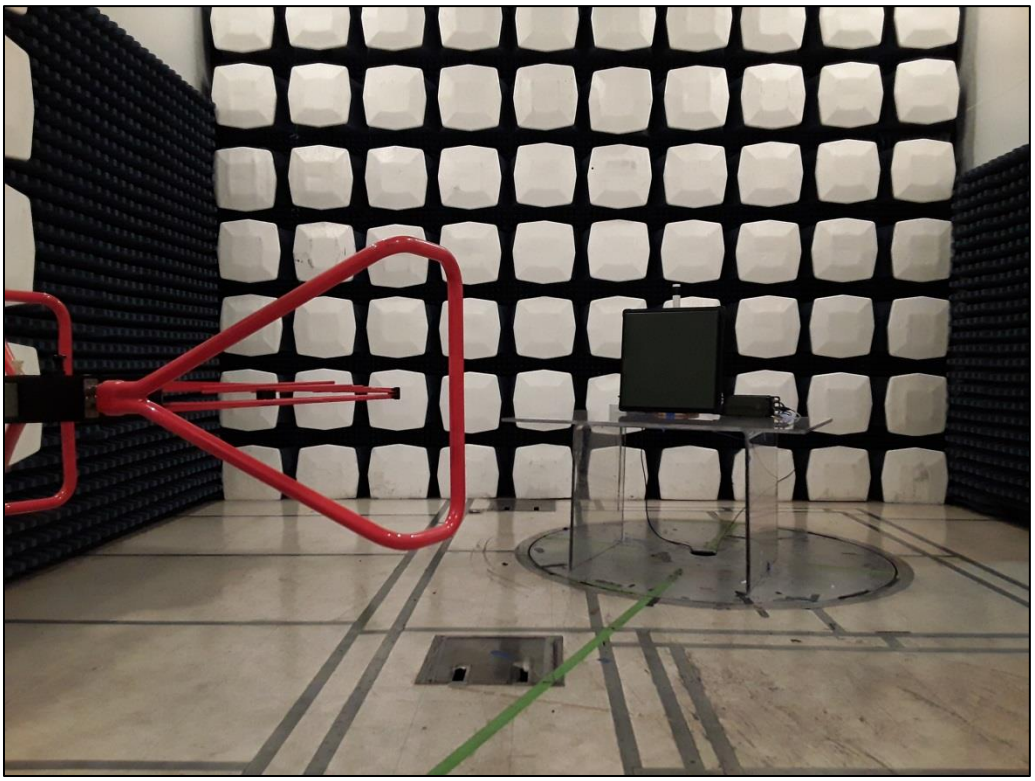
Plot 463. Undesirable Emissions, 7-18 MHz, Peak 3 Para, Worst Case, Port 2



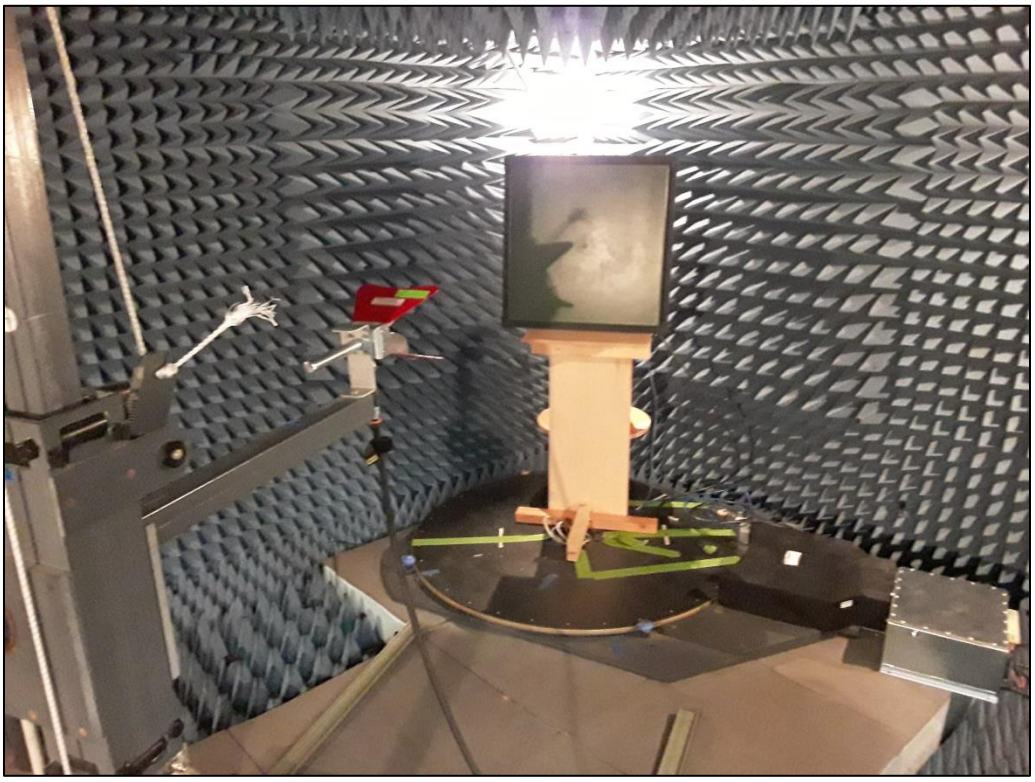
Plot 464. Undesirable Emissions, 7-18 MHz, Average 3 Para, Worst Case, Port 1



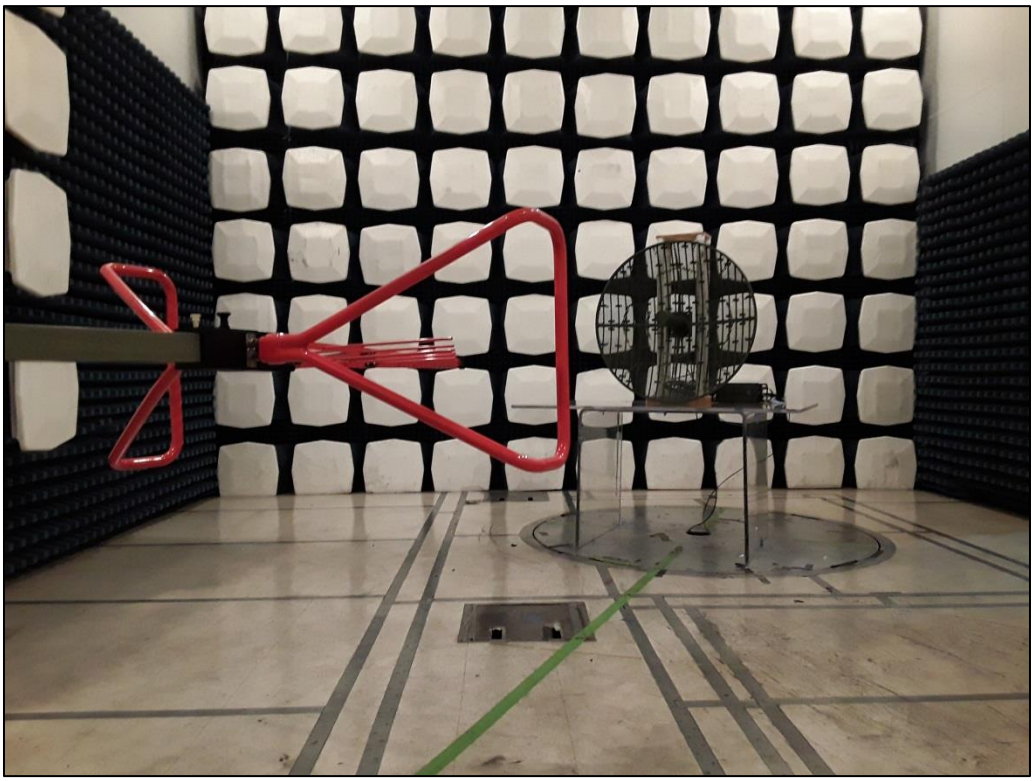
Plot 465. Undesirable Emissions, 7-18 MHz, Average 3 Para, Worst Case, Port 2



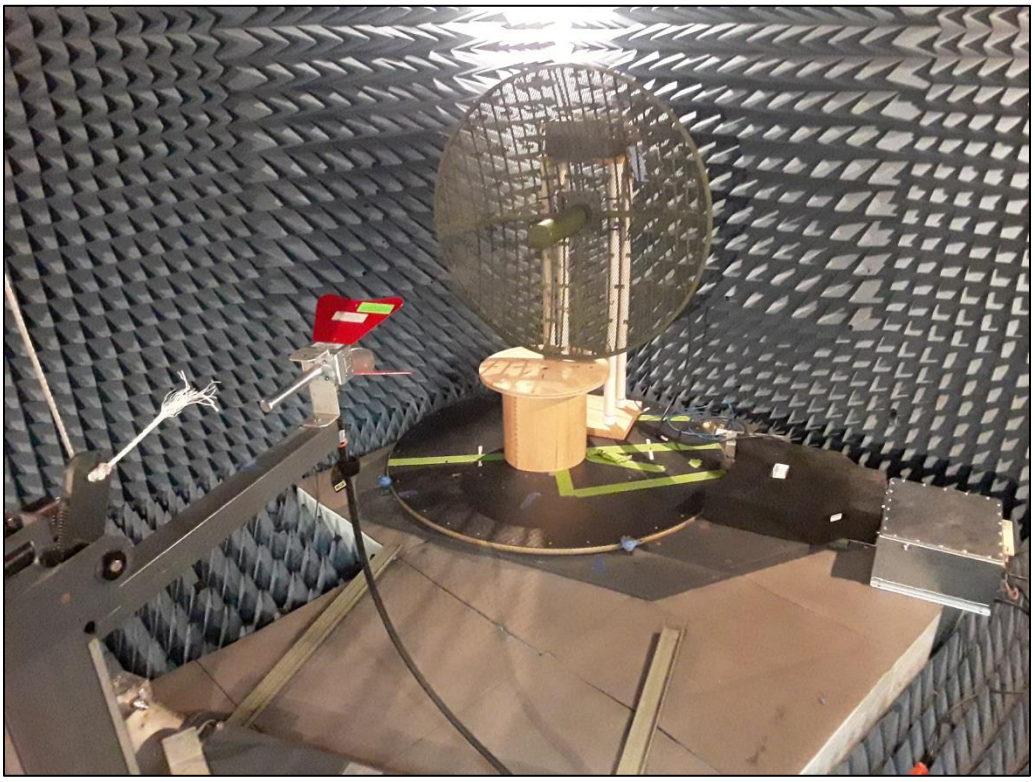
Photograph 1. Undesirable Emissions, 2' Panel below 1 GHz, Test Setup



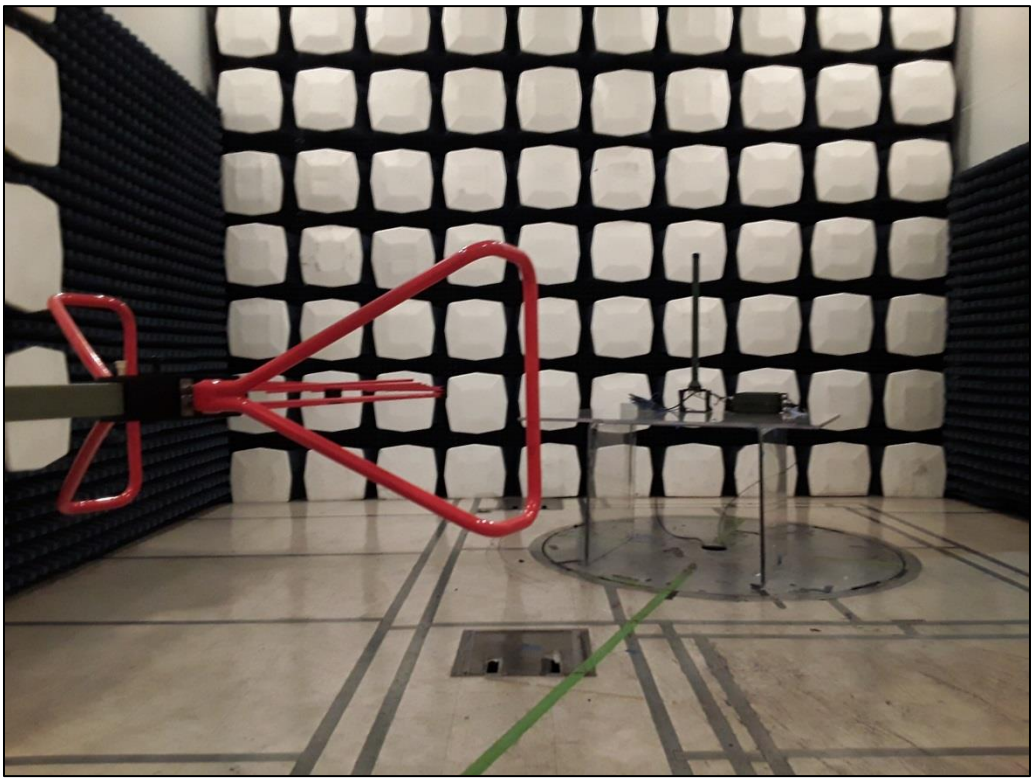
Photograph 2. Undesirable Emissions, 2' Panel above 1 GHz, Test Setup



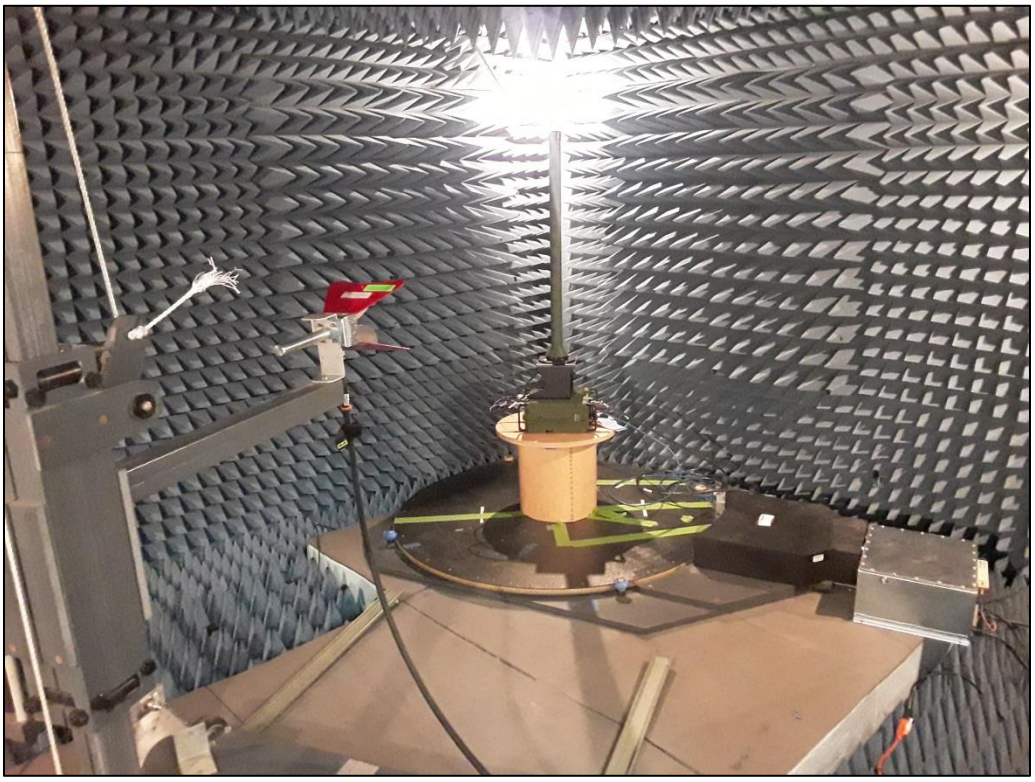
Photograph 3. Undesirable Emissions, Para below 1 GHz, Test Setup



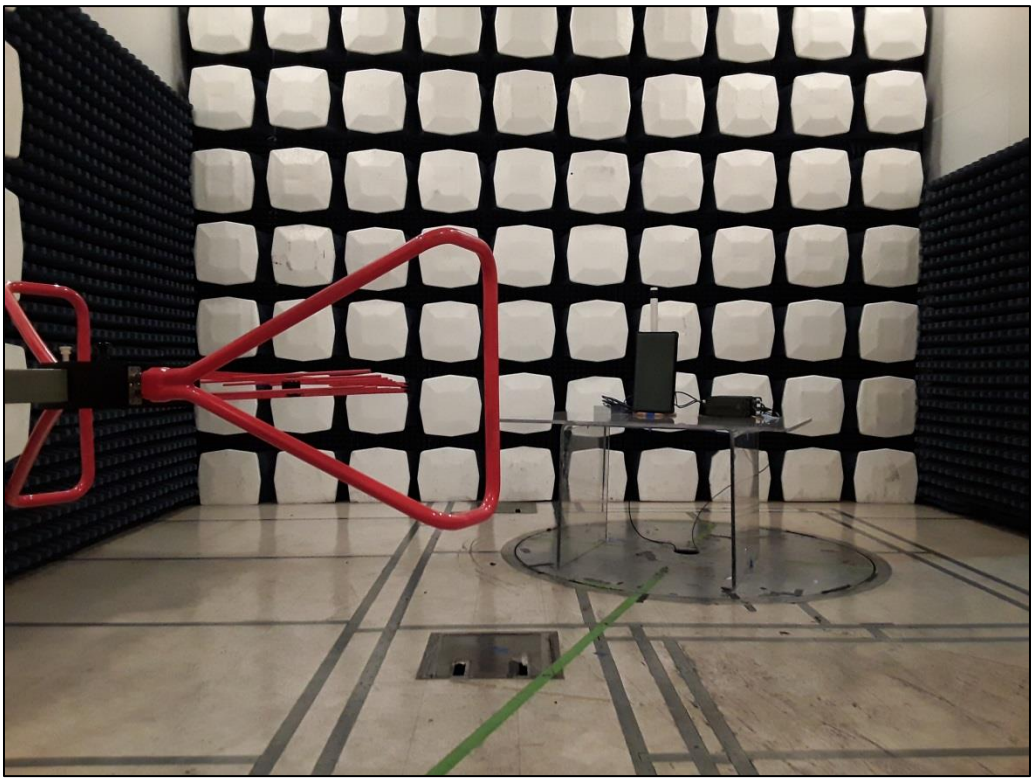
Photograph 4. Undesirable Emissions, Para above 1 GHz, Test Setup



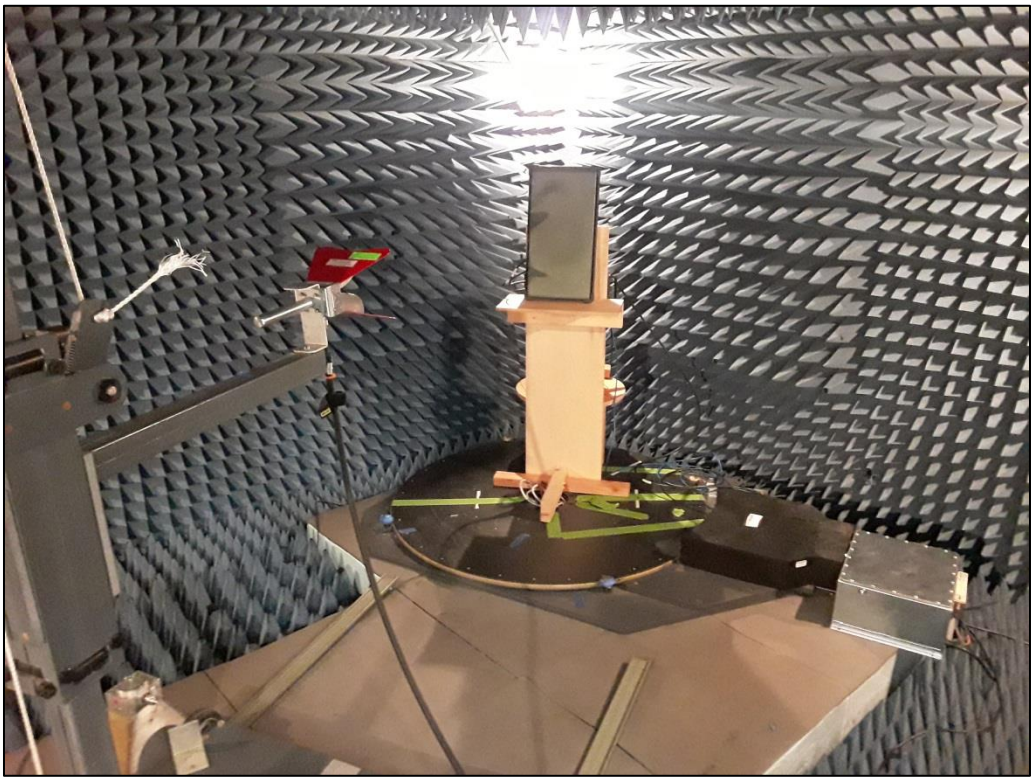
Photograph 5. Undesirable Emissions, 8 Omni below 1 GHz, Test Setup



Photograph 6. Undesirable Emissions, 8 Omni above 1 GHz, Test Setup



Photograph 7. Undesirable Emissions, 90 Sector below 1 GHz, Test Setup



Photograph 8. 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 μH/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 (dBμV)	
	Quasi-Peak	Average
* 0.15- 0.45	66 – 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

Table 19. 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 μH 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 is DC powered hence AC power conducted emissions were not applicable. .

Measured emissions were within applicable limits.

Test Engineer(s): Arsalan Hasan

Test Date(s): June 1, 2019

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/cm^2 or 10 W/m^2**

$S = PG / 4\pi R^2$ or $R = \sqrt{(PG / 4\pi S)}$

where, S = Power Density (mW/cm^2)
P = Power Input to antenna (mW)
G = Antenna Gain (numeric value)
R = Distance (cm)

For Antenna Gain → dBi = 10log(Numeric)

Test Results:

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)	Antenna Gain (dBi)	Antenna Gain (Numeric)	Power Density (mW/cm2)	Limit (mW/cm2)	Margin	Distance (cm)	Result
5200	19.14	82.0351	8	6.309	0.10302	1	0.89698	20	Pass
5230	19.19	82.9850	13.5	22.387	0.36978	1	0.63022	20	Pass
5200	19.14	82.0351	26	398.107	1	1	0	51	Pass
5200	18.29	67.4528	30	1000.000	1	1	0	74	Pass

Table 20: Maximum Permissible Exposure Calculations

III. 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
1T4612	Spectrum Analyzer	Agilent Technologies	E4407B	03/30/2018	09/30/2019
1T4565	LISN (24 AMP)	Solar Electronics Company	9252-50-R-24-BNC	08/15/2019	08/15/2019
1T6658	Spectrum Analyzer	Agilent Technologies	E4407B	12/21/2018	12/21/2019
1T4771	PSA Spectrum Analyzer	Agilent Technologies	E4446A	8/10/2017	8/10/2019
1T4753	Antenna - Bilog	Sunol Sciences	JB6	10/24/2017	10/24/2019
1T4483	Antenna; Horn	ETS-Lindgren	3117	4/19/2017	10/19/2019
1T2665	Antenna; Horn	EMCO	3115	6/22/2018	12/22/2019
1T4442	Pre-amplifier, Microwave	Miteq	AFS42-01001800-30-10P	Func Verify	
1T4149	High-Frequency Anechoic Chamber	Ray Proof	81	Not Required	
1T4300	SEMI-ANECHOIC CHAMBER # 1 (NSA)	EMC TEST SYSTEMS	NONE	2/6/2018	2/6/2020

Table 21. Test Equipment List

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

IV. 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

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.

End of Report

