Testing Tomorrow's Technology

Application
For

Title 47 USC, Part 2, Subpart J, Paragraph 2.902, Equipment Authorization of Verification for an Unintentional Radiator per Part 15, Subpart B, Paragraphs 15.107 and 15.109

And

Part 2, Subpart J, Paragraph 2.907 Equipment Authorization of Certification for an Intentional Radiator per Part 15, Subpart C, paragraph 15.247

For the

Level Vision Electronics
Model: MUSN-FE6-T800

REPORT FOR WIFI FUNCTION ONLY
(SEPARATE BLUETOOTH REPORT AVAILABLE)

FCC ID: Z7V-LVE100

UST Project: 11-0204
Issue Date: October 24, 2011

Total Pages: 110

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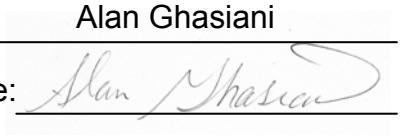
I certify that I am authorized to sign for the Test Agency and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

US TECH (Agent Responsible For Test):

By: Alan Ghasiani

Name: 

Title: Compliance Engineer – President

Date October 24, 2011

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MEASUREMENT TECHNICAL REPORT

COMPANY NAME: Level Vision Electronics

MODEL: MUSN-FE6-T800

FCC ID: Z7V-LVE100
IC ID: 9991A-LVE100

DATE: October 24, 2011

This report concerns (check one): Original grant [X]
Class II change

Equipment type: Tablet styled Personal Computer with Wifi and Bluetooth
WIFI Report Only – Bluetooth Report Submitted Separately

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes_____ No X

If yes, defer until: N/A
date
agrees to notify the Commission by N/A
date
of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

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1 General Information

1.1 Purpose of this Report

This report is prepared as a means of conveying test results for the 2.4 GHz Wifi (802.11b, 802.11g, and 802.11n) information concerning the suitability of this exact product for public distribution according to the FCC Rules and Regulations Part 15, Section 247.

1.2 Characterization of Test Sample

The sample used for testing was received by US Tech on September 12, 2011 in good operating condition.

1.3 Product Description

The Equipment Under Test (EUT) is the Level Vision Electronics Model MUSN-FE6-T800, which is a tablet styled personal computer with Wifi and Bluetooth transceiver, designed for use in residential or commercial settings.

The EUT was placed into a test mode for measuring the output characteristics of the 2.4GHz transceiver.

1.4 Configuration of Tested System

The Test Sample was tested per *ANSI C63.4, Methods of Measurement of Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (2003)* for FCC subpart B Digital equipment Verification requirements and per FCC KDB Publication number 558074 for Digital Transmission Systems Operating Under section 15.247. Also, FCC, KDB Publication No. 558074 was used as a test procedure guide.

Digital RF conducted and radiated Verification emissions data (FCC 15.107 and 109) below 1 GHz were taken with the measuring receiver (or spectrum analyzer's) resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements performed above 1.0 GHz were made with a RBW of 1 MHz. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process.

A list of EUT and Peripherals is found in Table 1 below. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are provided in separate Appendices.

1.5 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA 30004. This site has been fully described and registered with the FCC. Its designation number is 0021249222. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number 9991A.

1.6 Related Submittal(s)/Grant(s)

The EUT will be used to wirelessly send/receive data. The transceiver presented in this report will be used with other like transceivers:

The EUT is subject to the following FCC Equipment Authorizations:

a) Certification of the transmitter for Wifi (see test data presented herein) and Bluetooth (see additional test report).

b) Verification as a class B digital device.

The manufacturer desires to seek a modular approval on this device.

Table 1. EUT and Peripherals

PERIPHERAL MANUFACTURER.	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Level Vision Electronics (EUT)	MUSN-FE6-T800	Engineering Sample	Pending:	USB to Micro USB 3' U - P
DC Power Supply	PSA18R-120P	--	None	3' U-P
Laptop Computer IBM	Various	--	--	6' U -P
Power Supply IBM	Various	--	None	6' U - P 120 VAC/ 60 Hz

2 Tests and Measurements

2.1 Test Equipment

Table 2 below lists test equipment used to evaluate this product. Model numbers, serial numbers and their calibration status are included herein.

Table 2. Test Instruments

TEST INSTRUMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	10/18/2010
SPECTRUM ANALYZER	8566B	HEWLETT-PACKARD	2410A00109	10/29/10
RF PREAMP 100 kHz to 1.3 GHz	8447D	HEWLETT-PACKARD	2944A06291	9/7/10 Extended 90 days
LOOP ANTENNA 0.09 MHz to 30 MHz	SAS-200/562	Electro-Metrics	142	08/09/11 2 Year
BICONICAL ANTENNA 25 MHz to 200 MHz	BIA-25	Electro-Metrics	2451	12/29/09 2 Year
LOG PERIODIC 100 MHz to 1000 MHz	3146	EMCO	3110-3236	1/22/10 2 Year
HORN ANTENNA 1 GHz to 18 GHz	SAS-571	A. H. Systems	605	2/9/2010 2 Year
HORN ANTENNA 1 GHz to 18 GHz	EMCO 3115	EMCO	9107-3723	8/10/2011 2 Year
PREAMP 1 GHz to 26.5 GHz	8449B	HEWLETT-PACKARD	3008A00480	9/21/10 Extended 90 days
CALCULATION PROGRAM	N/A	N/A	Ver. 6.0	N/A

Note: The calibration interval of the above test instruments are 12 months unless stated otherwise and all calibrations are traceable to NIST/USA.

2.2 Modifications to EUT Hardware

No modifications were made by US Tech in order to bring the EUT into compliance with FCC Part 15, Subpart C Intentional Radiator Limits for the

transmitter portion of the EUT or the Subpart B Unintentional Radiator Limits (Receiver and Digital Device) Requirements.

2.3 Number of Measurements for Intentional Radiators (15.31(m))

Measurements of intentional radiators or receivers shall be performed and reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in Table 3 as follows:

Table 3. Number of Test Frequencies for Intentional Radiators

Frequency Range over which the device operates	Number of Frequencies	Location in the Range of operation
1 MHz or less	1	Middle
1 to 10 MHz	2	1 near the top 1 near the bottom
Greater than 10 MHz	3	1 near top 1 near middle 1 near bottom

Because the EUT operates over 2.4 GHz to 2.4835 GHz, 3 test frequencies will be used.

2.4 Frequency Range of Radiated Measurements (Part 15.33)

2.4.1 Intentional Radiator

The spectrum shall be investigated for the intentional radiator from the lowest RF signal generated in the EUT, without going below 9 kHz to the 10^{th} harmonic of the highest fundamental frequency generated or 40 GHz, whichever is the lowest.

2.4.2 Unintentional Radiator

For the digital device, an unintentional radiator, the frequency range shall be 30 MHz to 1000 MHz, or to the range specified in 2.4.1 above, whichever is the higher range of investigation.

2.5 Measurement Detector Function and Bandwidth (CFR 15.35)

The radiated and conducted emissions limits shown herein are based on the following:

2.5.1 Detector Function and Associated Bandwidth

On frequencies below 1000 MHz, the limits herein are based upon measurement equipment employing a CISPR Quasi-peak detector function and related measurement bandwidths (i.e. 9 kHz from 150 kHz to 30 MHz and 120 kHz from 30 MHz to 1000 MHz). Alternatively, measurements may be made with equipment employing a peak detector function as long as the same bandwidths specified for the Quasi-peak device are used.

2.5.2 Corresponding Peak and Average Requirements

Above 1000 MHz, radiated limits are based on measuring instrumentation employing an average detector function. When average radiated emissions are specified there is also a corresponding Peak requirement, as measured using a peak detector, of 20 dB greater than the average limit. For all measurements above 1000 MHz the Resolution Bandwidth shall be at least 1 MHz.

2.5.3 Pulsed Transmitter Averaging

When the radiated emissions limit is expressed as an average value, and the transmitter is pulsed, the measured field strength shall be determined by applying a Duty Cycle Correction Factor based upon dividing the total ON time during the first 100 ms period by 100 ms (or by the period if less than 100 ms). The duty cycle may also be expressed logarithmically in dB. Please section 2.8 herein for details.

2.6 EUT Antenna Requirements (CFR 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The EUT has a built in antenna; there is no obvious method of attaching a different antenna.

Table 4. Allowed Antenna(s)

MANUFACTURER	TYPE OF ANTENNA	MODEL	REPORT REFERENCE	GAIN dB_i	TYPE OF CONNECTOR
Level Vision	Integral Dipole	NA	NA	1.67	Permanent integral

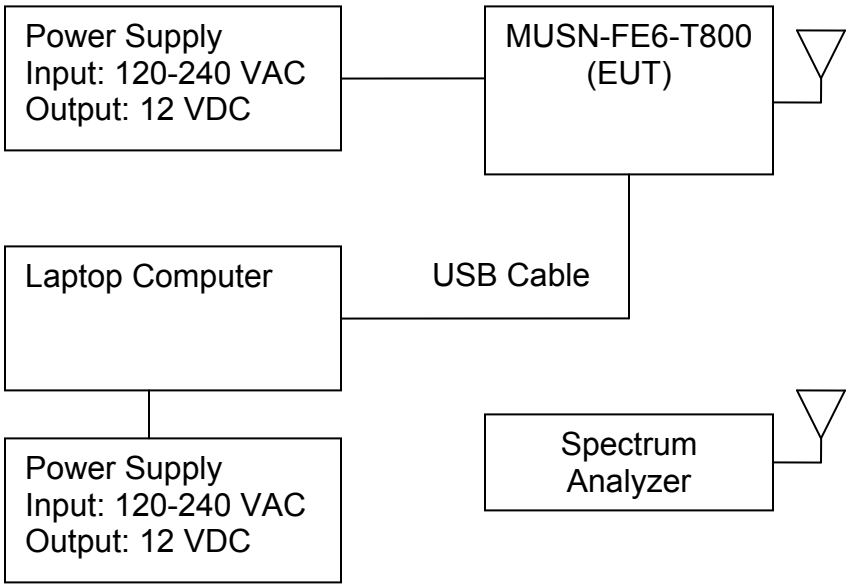


Figure 1. Test Configuration

2.7 Restricted Bands of Operation (Part 15.205)

Only spurious emissions can fall in the frequency bands of CFR 15.205. The field strength of these spurious cannot exceed the limits of 15.209. Radiated harmonics and other Spurious are examined for this requirement see paragraph 2.10.

2.8 Transmitter Duty Cycle (CFR 35 (c))

The duty cycle de-rating factor used in the calculation of average radiated limits (per CFR 15.209 and 15.35(c)) is described below. This factor was calculated by first determining the worst case scenario for system operation.

The worst-case scenario in any 100 ms timeslot, along with all transmission lengths, will be as follows:

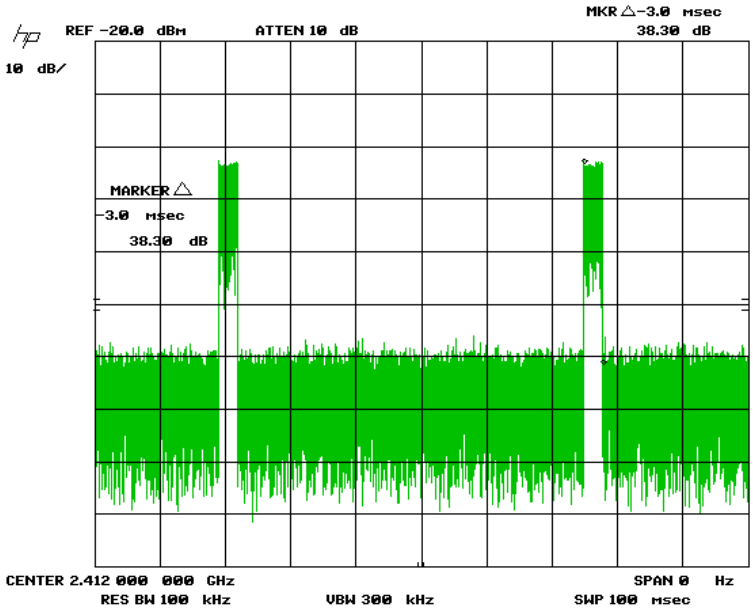


Figure 2. Duty Cycle Measurement 1

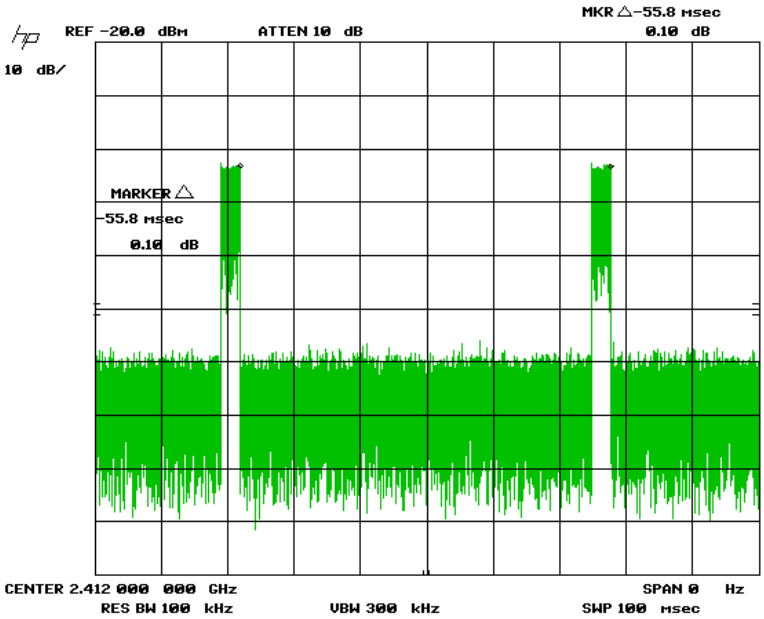


Figure 3. Duty Cycle Measurement 2

The duty cycle is computed as follows (in any 100 ms period):

Duty Cycle = (3 ms/55.8 ms) = 0.0538 ≈ 0.05 = 5%

Correction Factor = $20\log_{10}(0.0538)$ = **-25.39dB**

2.9 Intentional Radiator, Power Lines Conducted Emissions (CFR 15.207)

The power line conducted voltage emission measurements have been carried out in accordance with CFR 15.207, per ANSI C63.4, Paragraph 7, with a spectrum analyzer connected to an LISN and the EUT placed into a continuous mode of transmission.

The worst-case results for conducted emissions were determined to be produced when the EUT was operating under continuous transmission on the low channel.

Table 5. Intentional Conducted Emissions

Intentional Conducted Emissions Tested from 150 KHz to 30 MHz						
Tested By: JCW	**Specification Requirement: FCC Part 15.207 Class B**		**Project No.: 11-0204**	**Manufacturer: Level Vision Electronics Model: MUSN-FE6-T800**		
Frequency (MHz)	**Test Data (dBuV)**	**LISN+CL-PA (dB)**	**Corrected Results (dBuV)**	**Avg Limits (dBuV)**	**Margin (dB)**	**Detector**
120 VAC, 60 Hz, Phase Line						
0.1794	56.70	0.46	57.16	64.5	7.4	**PK**
0.1794	37.30	0.46	37.76	54.5	16.8	**AVG**
0.5750	36.60	0.14	36.74	46.0	9.3	**PK**
1.8080	33.70	0.26	33.96	46.0	12.0	**PK**
5.2550	25.50	0.33	25.83	50.0	24.2	**PK**
11.8400	24.00	0.56	24.56	50.0	25.4	**PK**
25.2700	24.90	1.07	25.97	50.0	24.0	**PK**
120 VAC, 60 Hz, Neutral Line						
0.1752	55.00	0.46	55.46	64.7	9.3	**PK**
0.1752	31.30	0.46	31.76	54.7	23.0	**AVG**
0.5210	33.80	0.24	34.04	46.0	12.0	**PK**
1.3000	28.90	0.36	29.26	46.0	16.7	**PK**
9.1600	27.20	0.61	27.81	50.0	22.2	**PK**
15.9500	29.90	0.75	30.65	50.0	19.4	**PK**
20.0300	23.70	0.80	24.50	50.0	25.5	**PK**

SAMPLE CALCULATIONS: At 1.808 MHz = 33.7 + (0.26) = 33.96 dBuV
Margin = 46 dBuV – 33.96 dBuV = 12.04 dB
Test Date: October 10, 2011
Tested By
Signature: John C. Wynn Name: John C. Wynn

2.10 Intentional Radiator, Radiated Emissions (Antenna Conducted) (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a))

The EUT was put into a continuous-transmit mode of operation and tested per FCC KDB Publication 558074 for conducted out of band emissions emanating from the antenna port over the frequency range of 30 MHz to 12.5 GHz. A conducted scan was performed on the EUT to identify and record spurious signals that were related to the transmitter. Antenna Conducted Emissions of a significant magnitude that fell within restricted bands were then measured as radiated emissions on the OATS. **The conducted emissions graphs for 802.11b are found in Figures 4 through 12 below. The conducted emissions graphs for 802.11g are found in Figures 13 through 21. The conducted emissions graphs for 802.11n are found in Figures 22 through 24.** The limit for antenna conducted power is 1 Watt (30 dBm) per 15.247 (b)(3).

For radiated measurements, the EUT was set into a continuous transmission mode. Below 1 GHz, the RBW of the measuring instrument was set equal to 120 kHz. Peak measurements above 1 GHz were measured using a RBW = 1 MHz, with a VBW ≥ RBW. The results of peak radiated spurious emissions falling within restricted bands are given in Table 6 below.

For Average Voltage measurements above 1 GHz, the emissions were measured using RBW = 1 MHz and VBW = 10 Hz. For a pulse-modulated transmitter, the EUT's average emissions are further modified by adding to them the worst-case duty cycle, determined by adding the EUT's total pulse widths (on time) over a 100 ms period and dividing by 100 ms.

Duo to the lack of an antenna port on the EUT, the alternative method found in KDB Publication No. 558074 was used to collect and graph emissions above 30 MHz.

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

On the OATS, the EUT was mounted on top of a non-conductive table, 80 cm above the floor, by placing it in the X-Z plane along the Z axis with its bottom cover in parallel with the ground. The front of the EUT faced the measurement antenna located 3 meters away. Each signal measured was maximized by raising and lowering the receive antenna between 1 and 4 meters in height while monitoring the ever changing spectrum analyzer display (with channel A in the Clear-Write mode and channel B in the Max-Hold mode) for the largest signal visible. That exact antenna height where the signal was maximized was recorded for reproducibility purposes. Also, the EUT was rotated about its Y-axis while monitoring the Spectrum Analyzer display for maximum. The EUT azimuth was recorded for reproducibility purposes. The EUT was measured when both maxima were simultaneously satisfied.

The test data is detailed below in for this section. Several radiated emissions above 1 GHz were measured at a distance of 1 meter. The measured value at 1 meter was then extrapolated to the resultant at 3 meters using an inverse distance extrapolation factor of -20 dB/decade. There were no test failures.

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

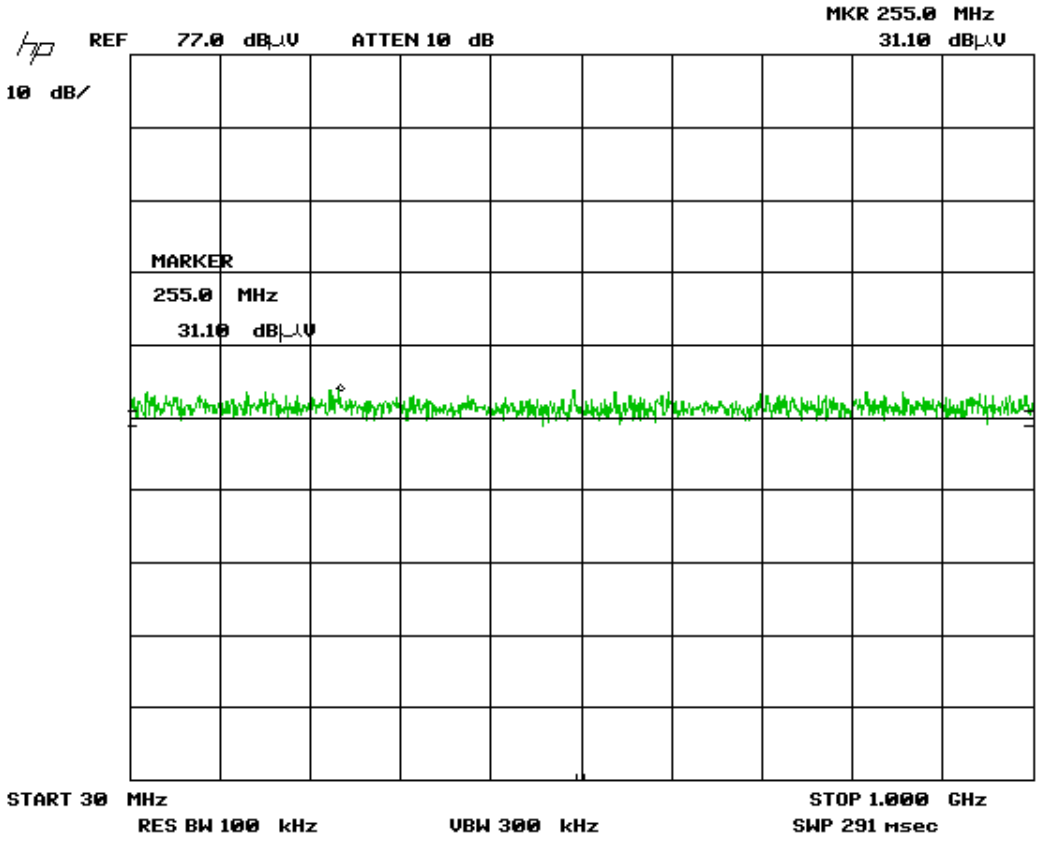


Figure 4. Emissions 802.11b - Low Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

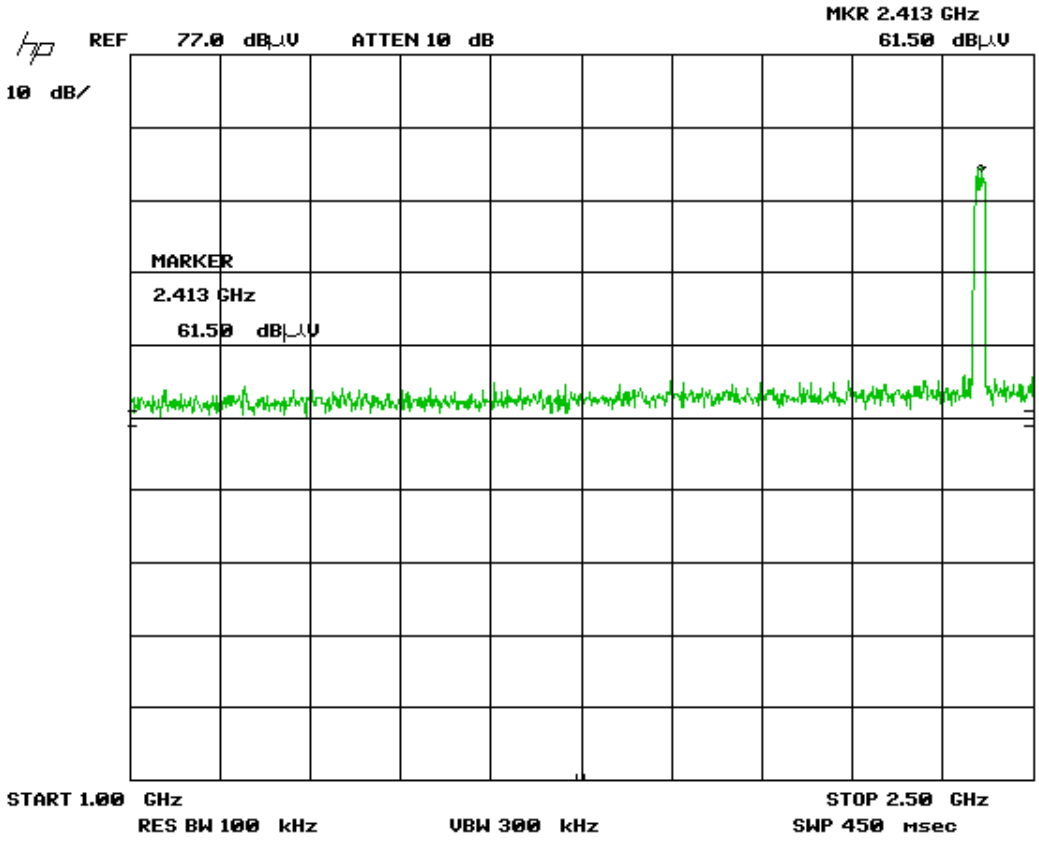


Figure 5. Emissions 802.11b - Low Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

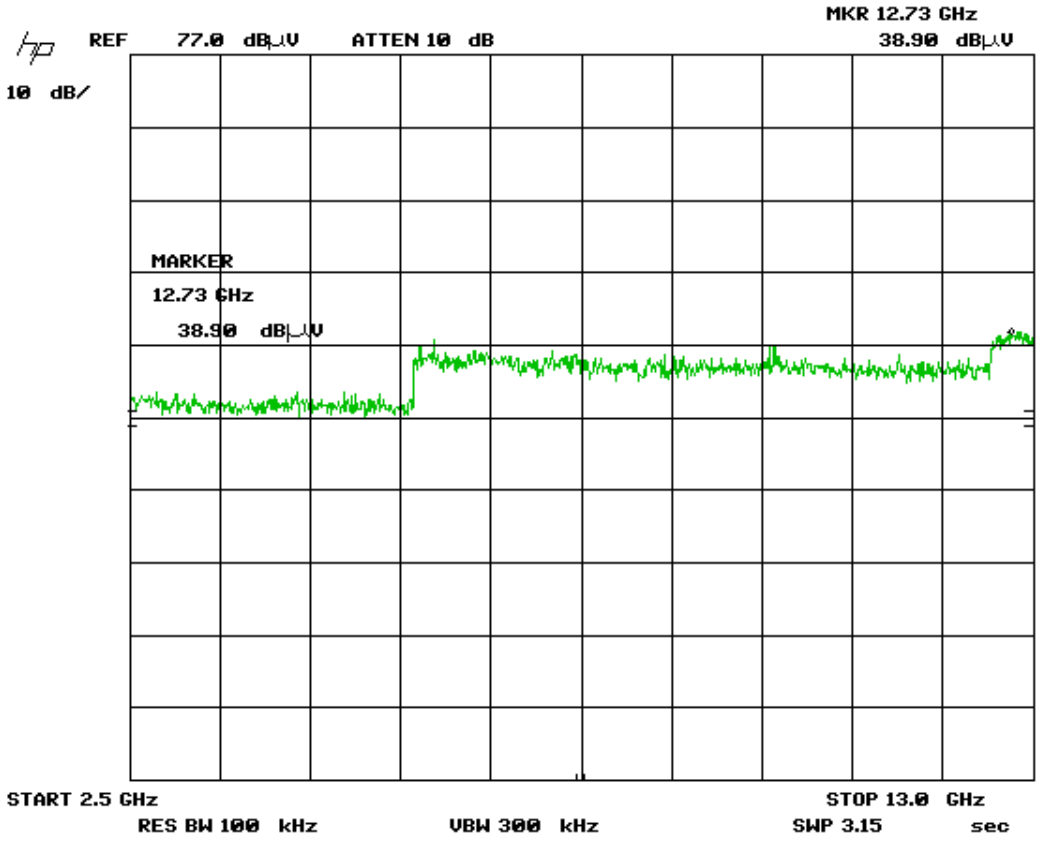


Figure 6. Emissions 802.11b - Low Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

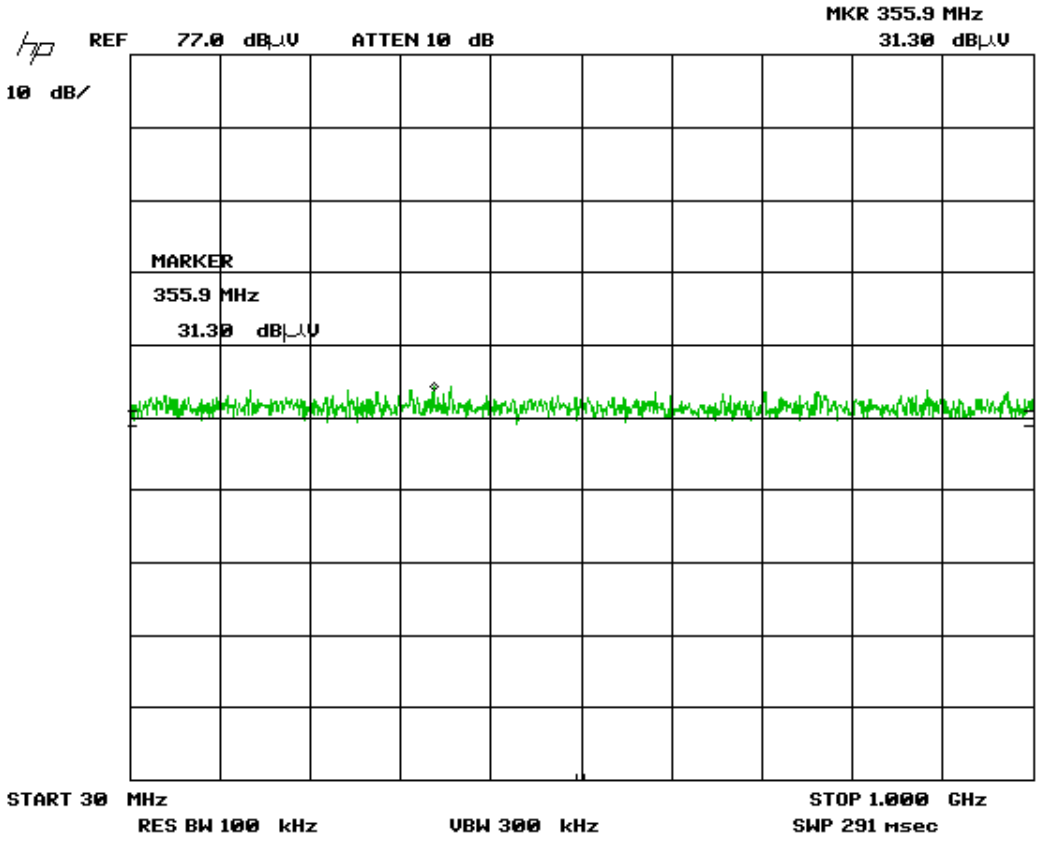


Figure 7. Emissions 802.11b - Mid Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

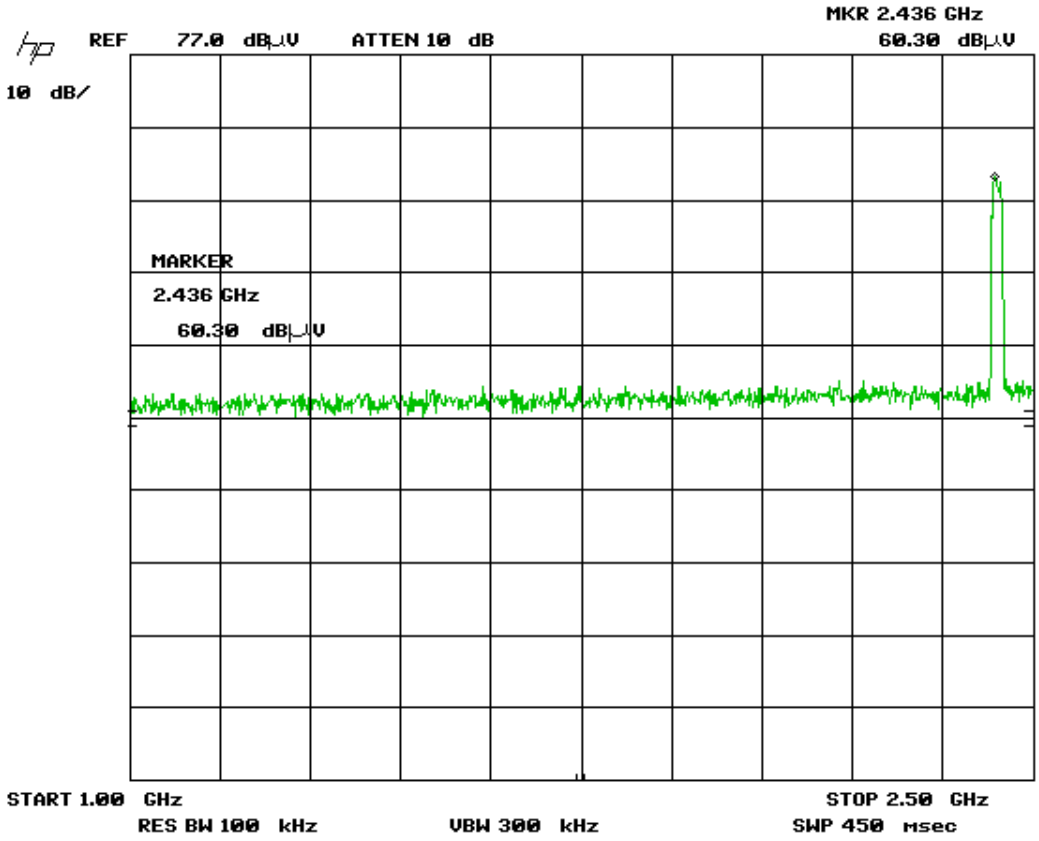


Figure 8. Emissions 802.11b - Mid Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

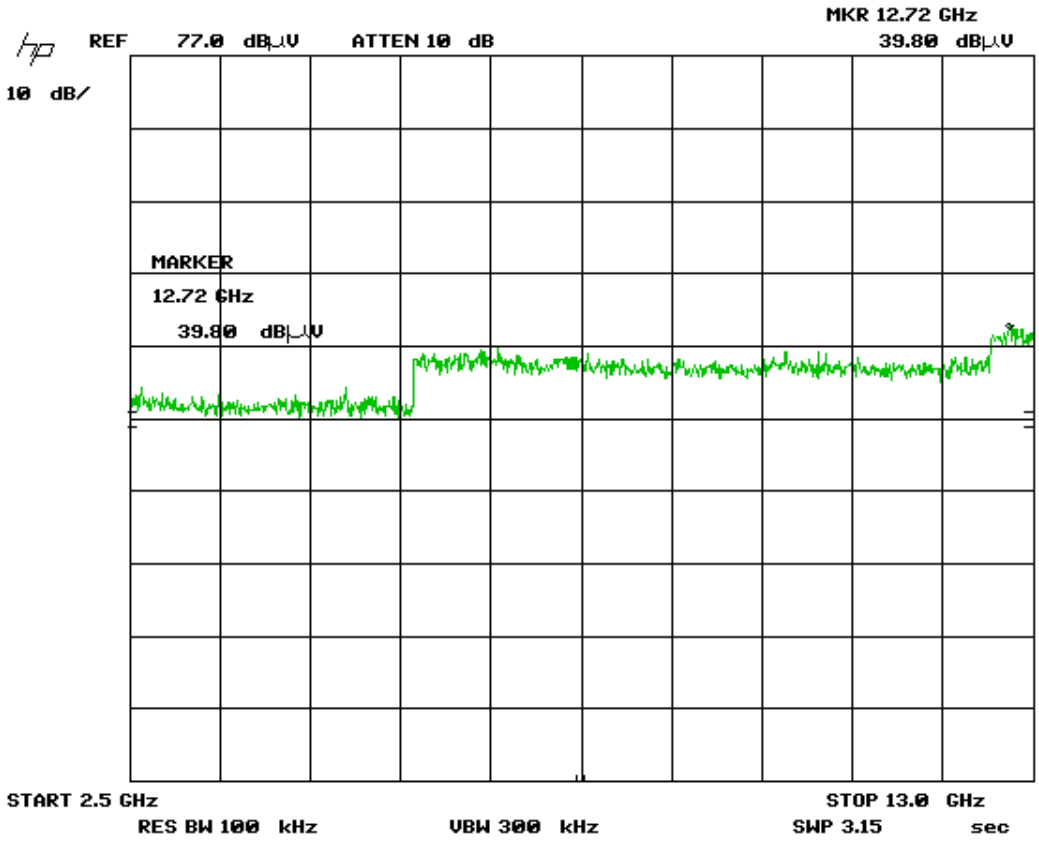


Figure 9. Emissions 802.11b - Mid Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

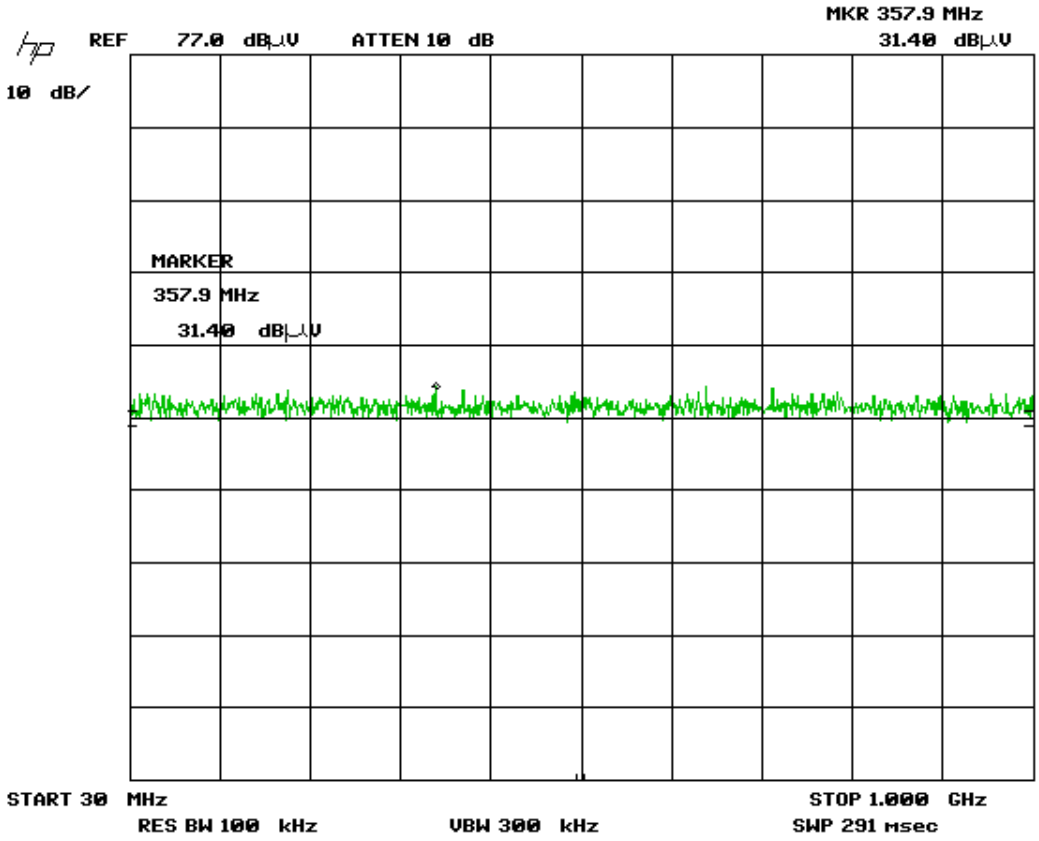


Figure 10. Emissions 802.11b - High Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

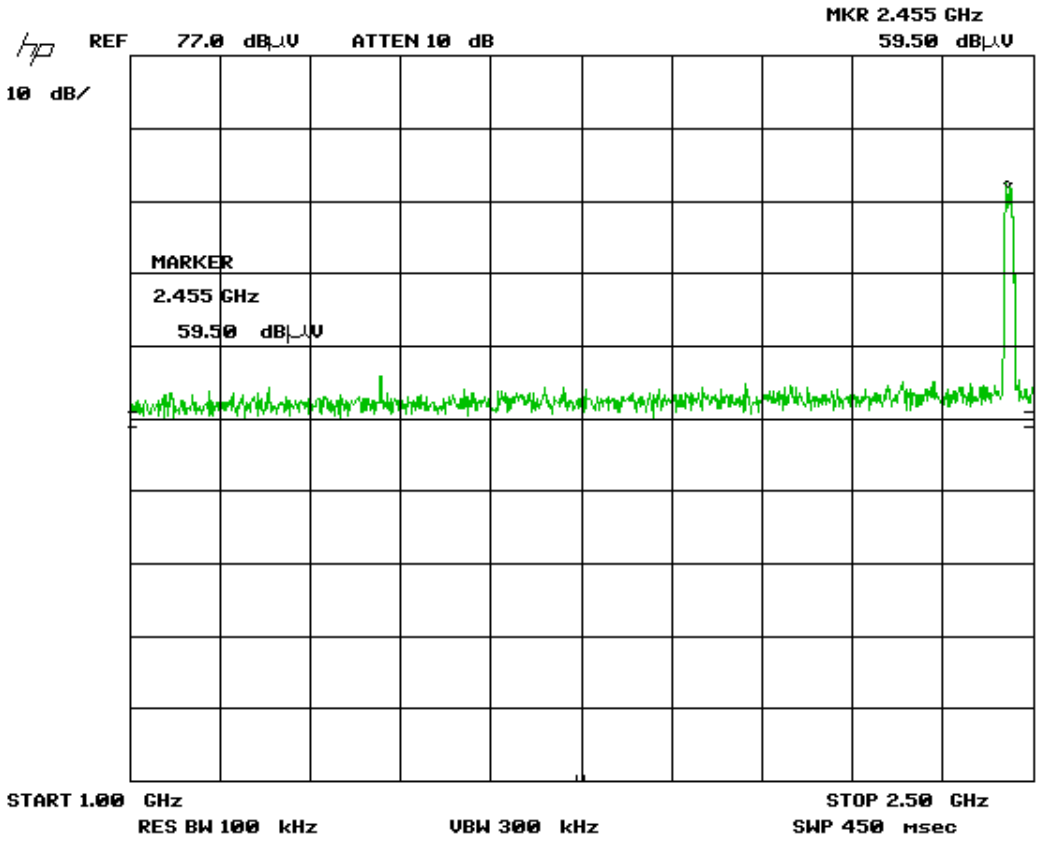


Figure 11. Emissions 802.11b - High Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd)

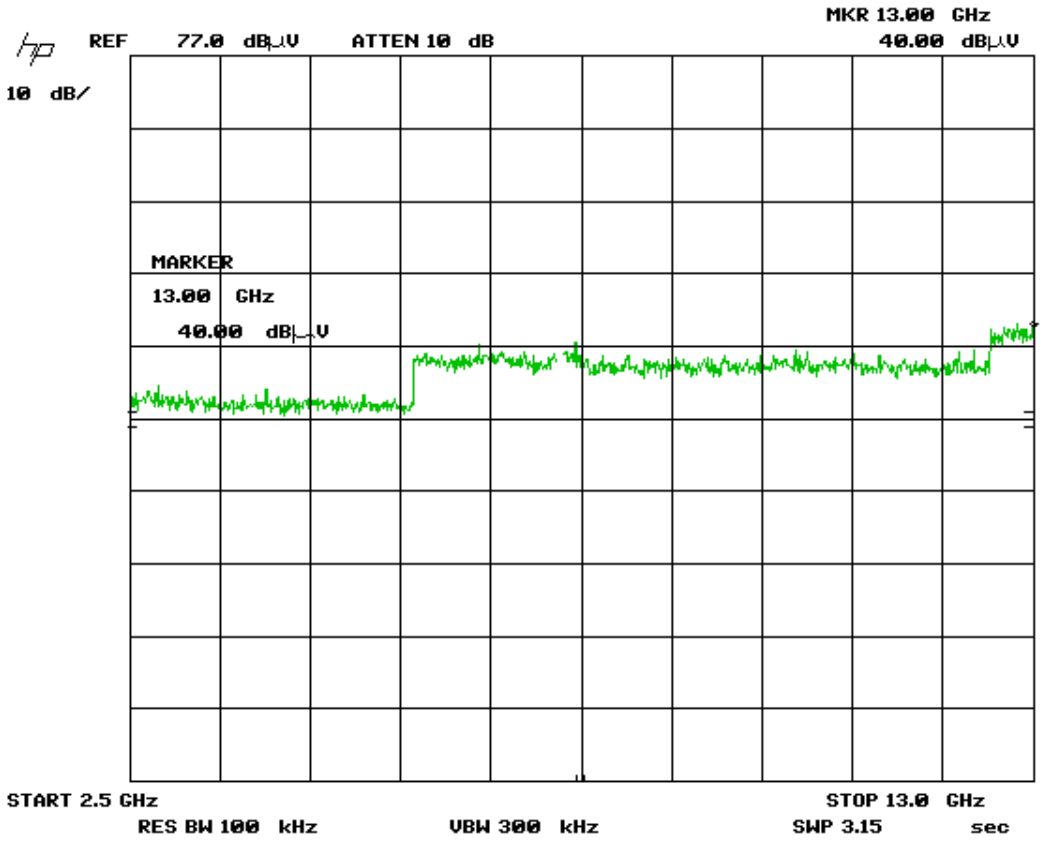


Figure 12. Emissions 802.11b - High Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd)

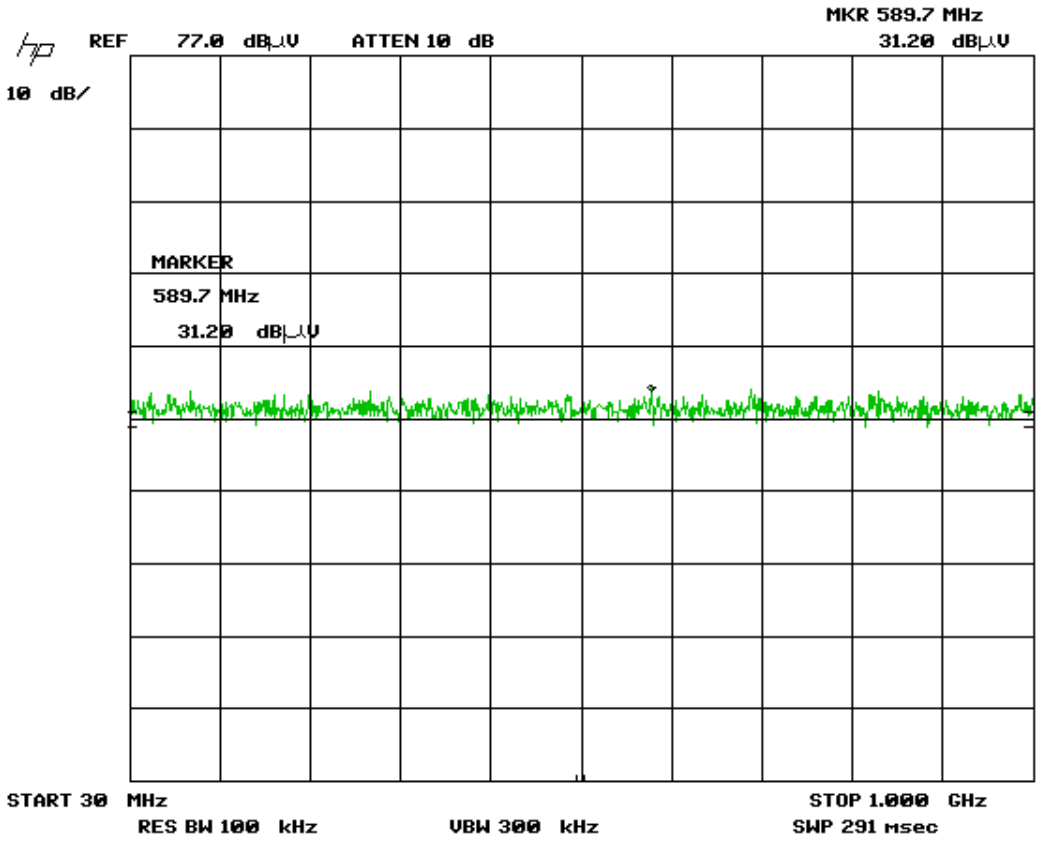


Figure 13. Emissions 802.11g - Low Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

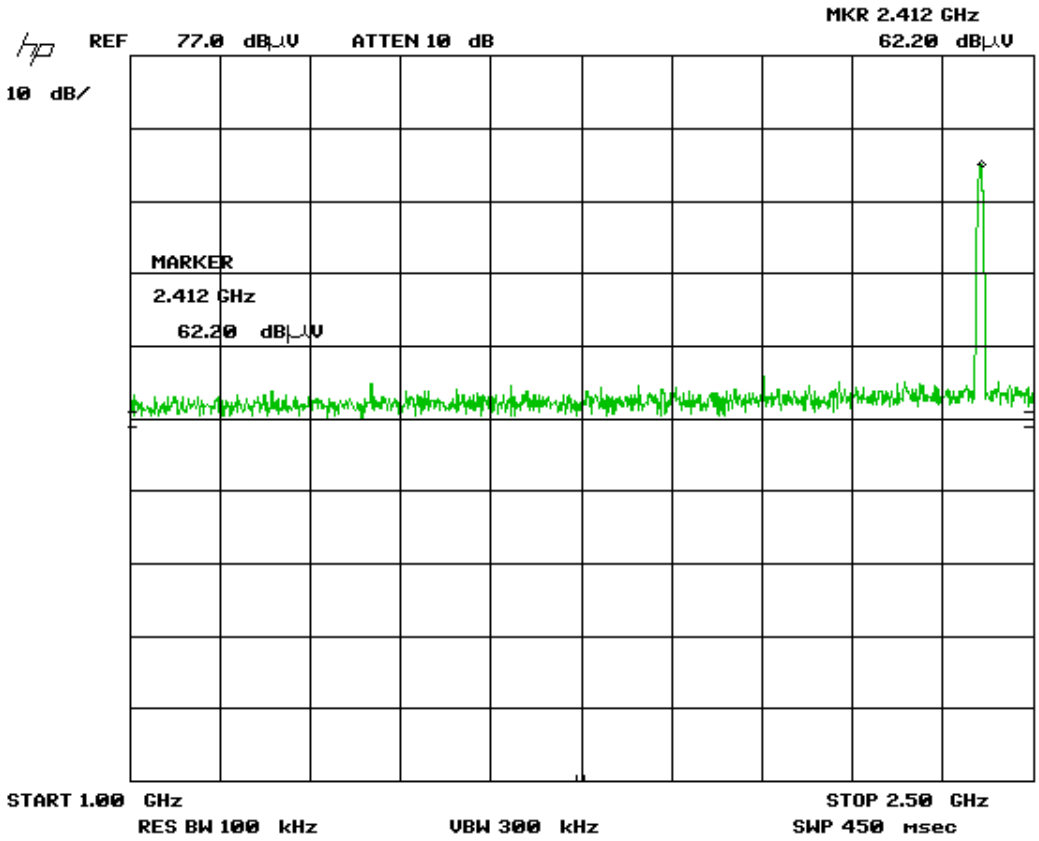


Figure 14. Emissions 802.11g - Low Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

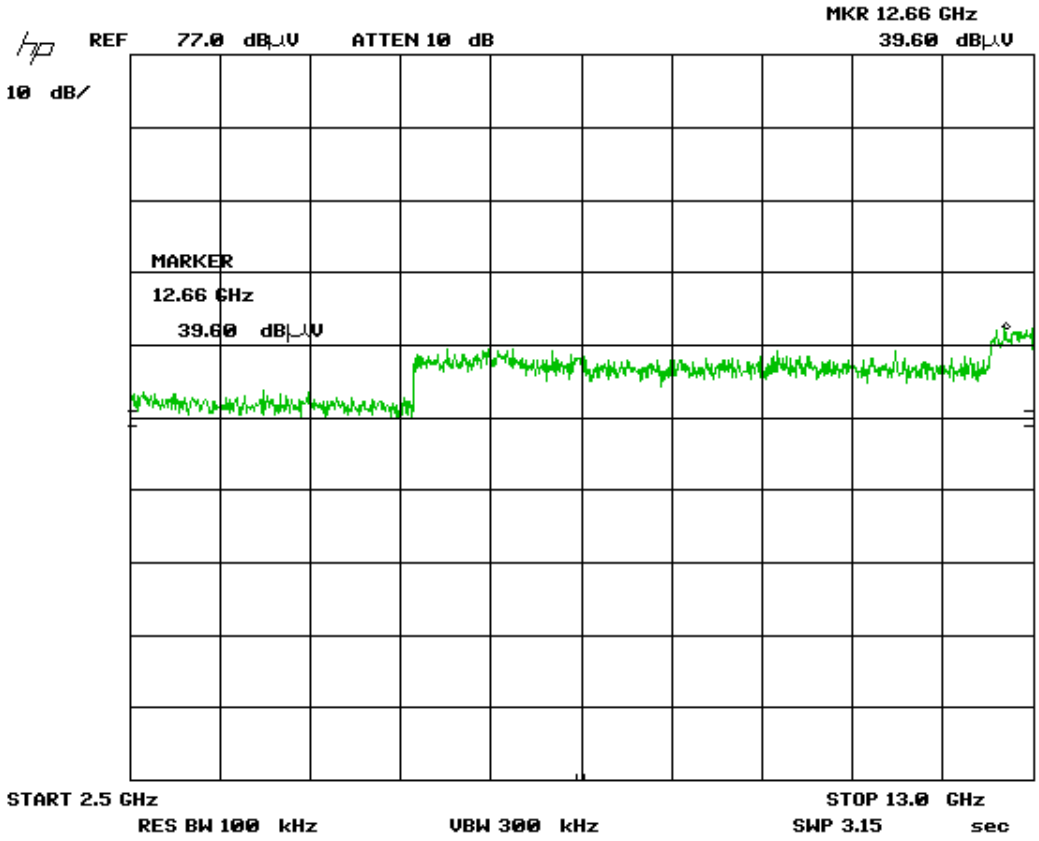


Figure 15. Emissions 802.11g - Low Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

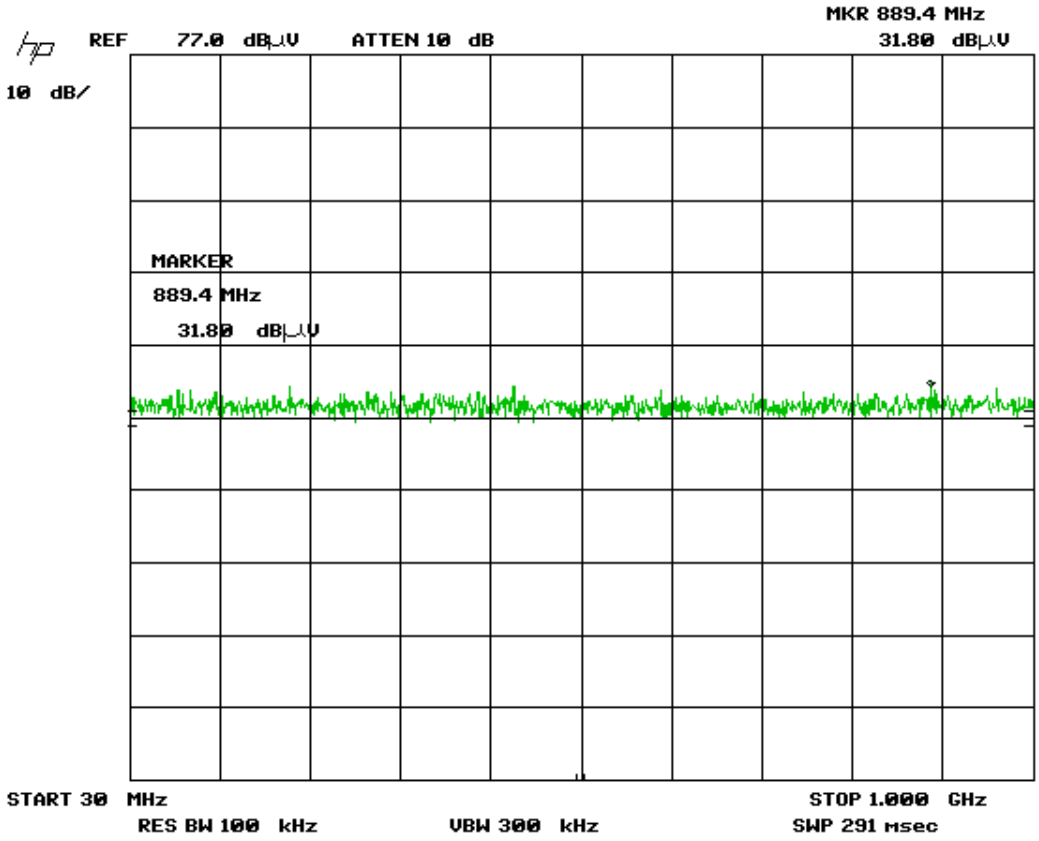


Figure 16. Emissions 802.11g - Mid Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

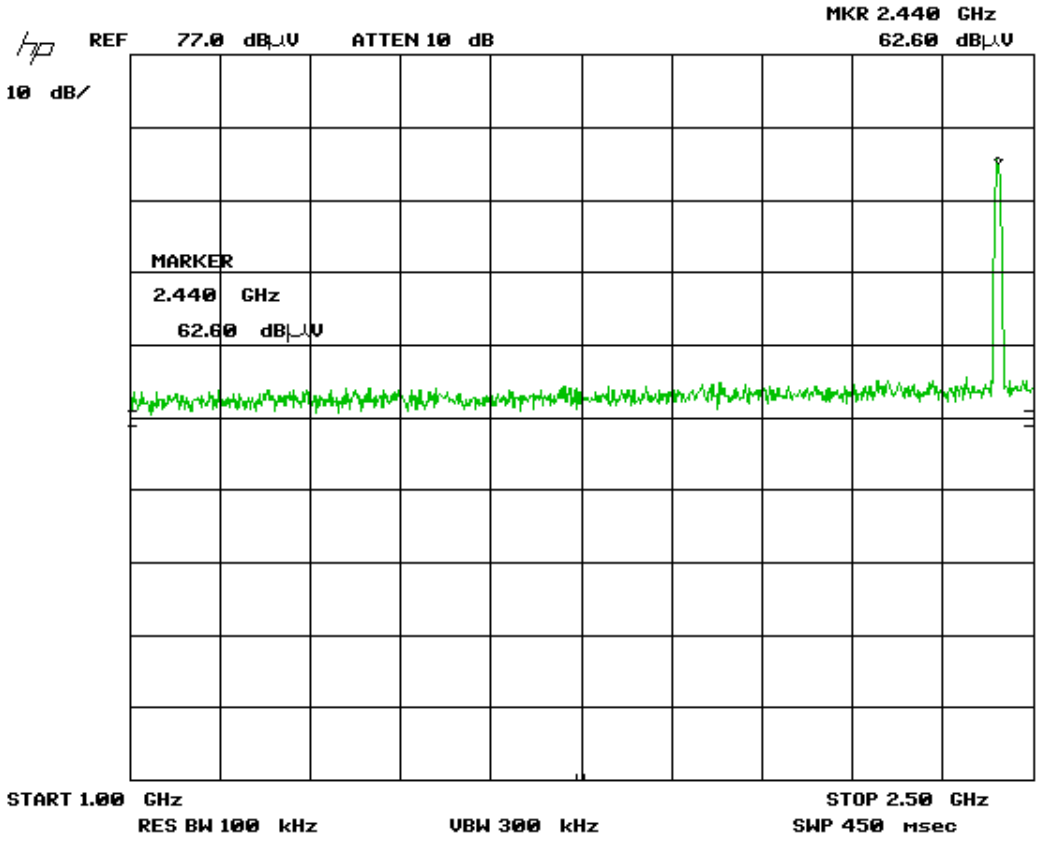


Figure 17. Emissions 802.11g - Mid Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

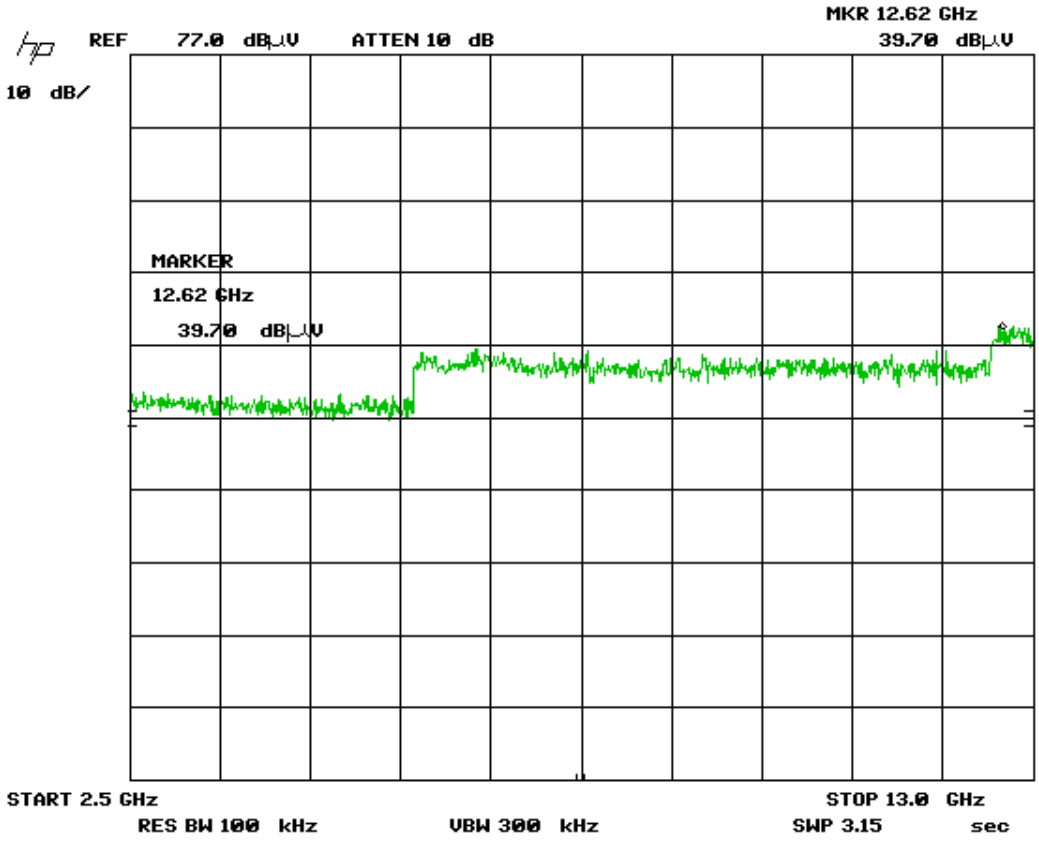


Figure 18. Emissions 802.11g - Mid Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

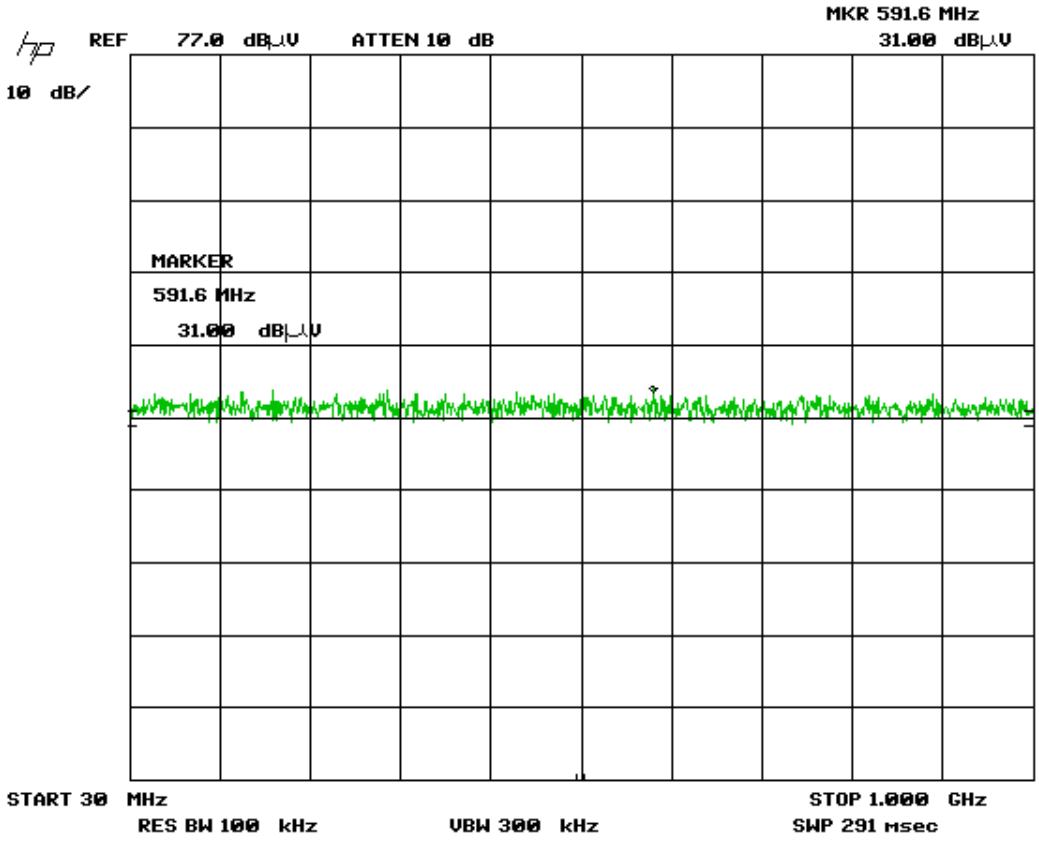


Figure 19. Emissions 802.11g - High Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

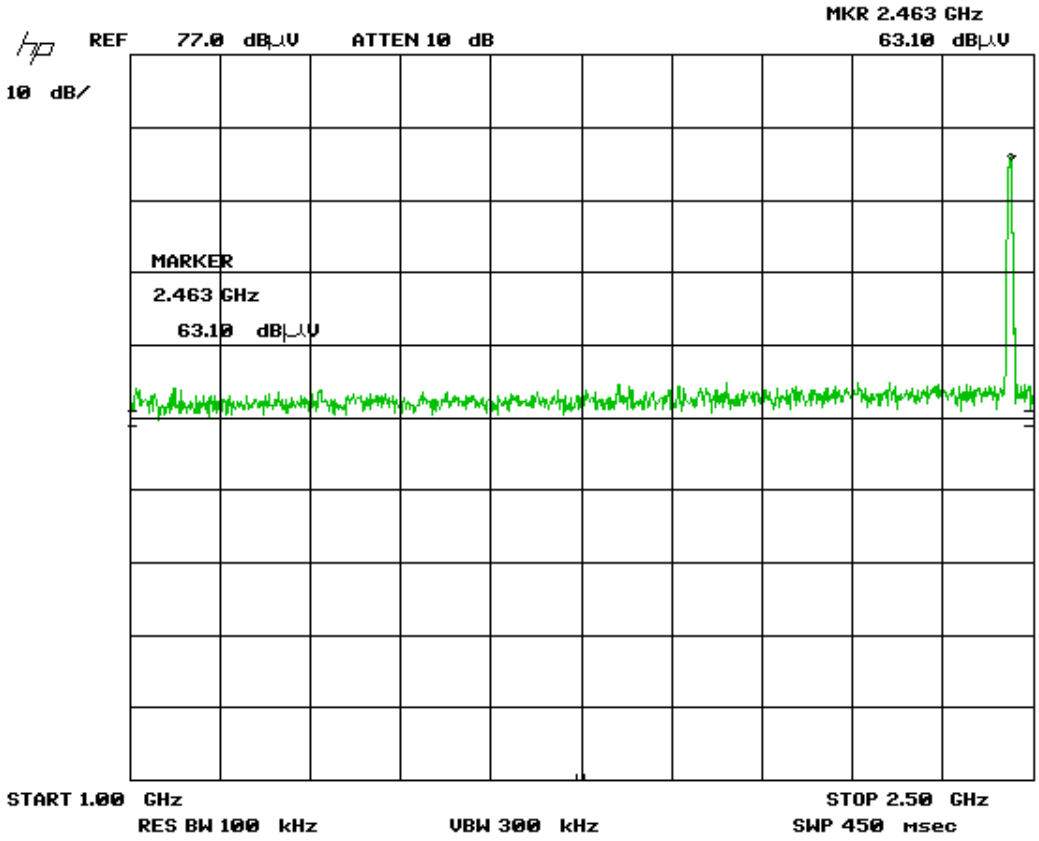


Figure 20. Emissions 802.11g - High Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

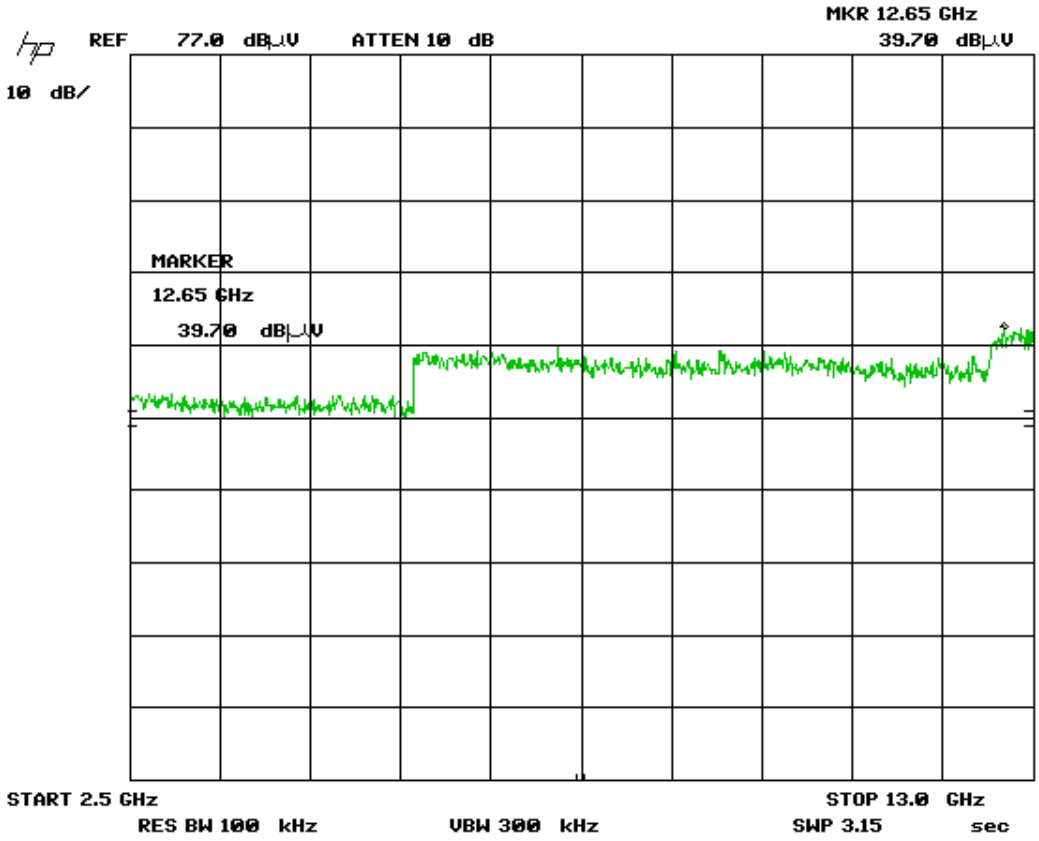


Figure 21. Emissions 802.11g - High Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

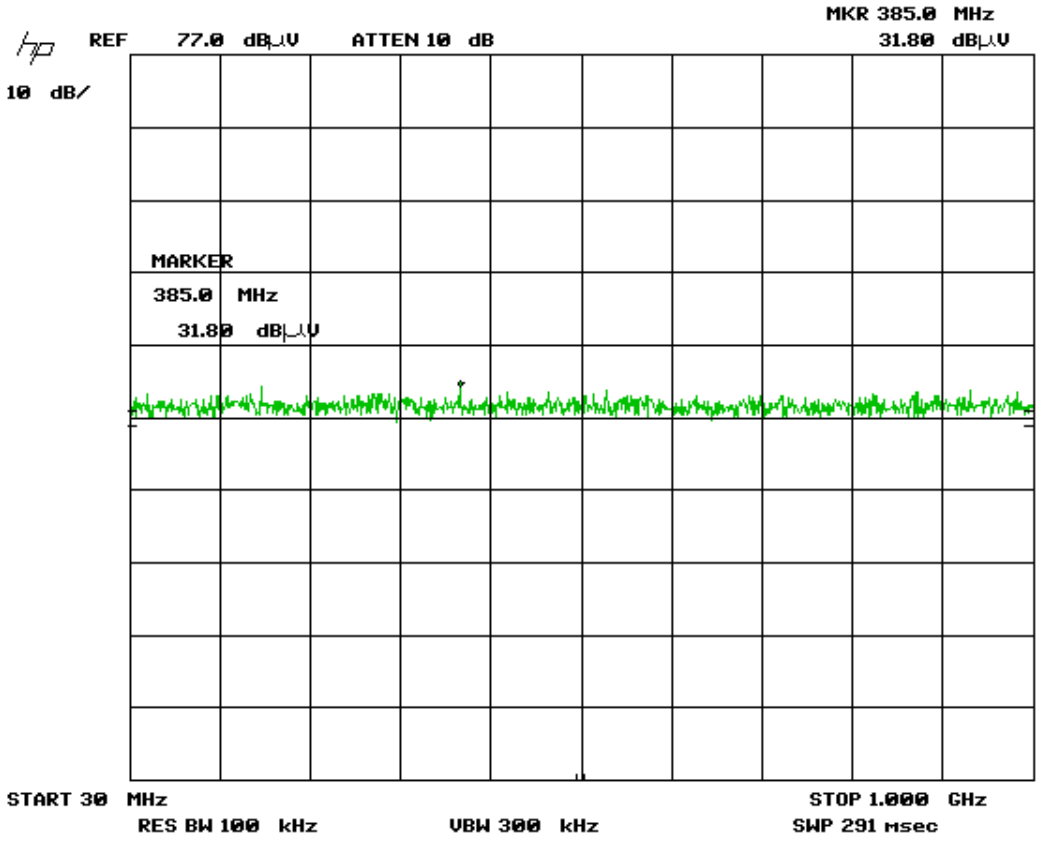


Figure 22. Emissions 802.11n - Low Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

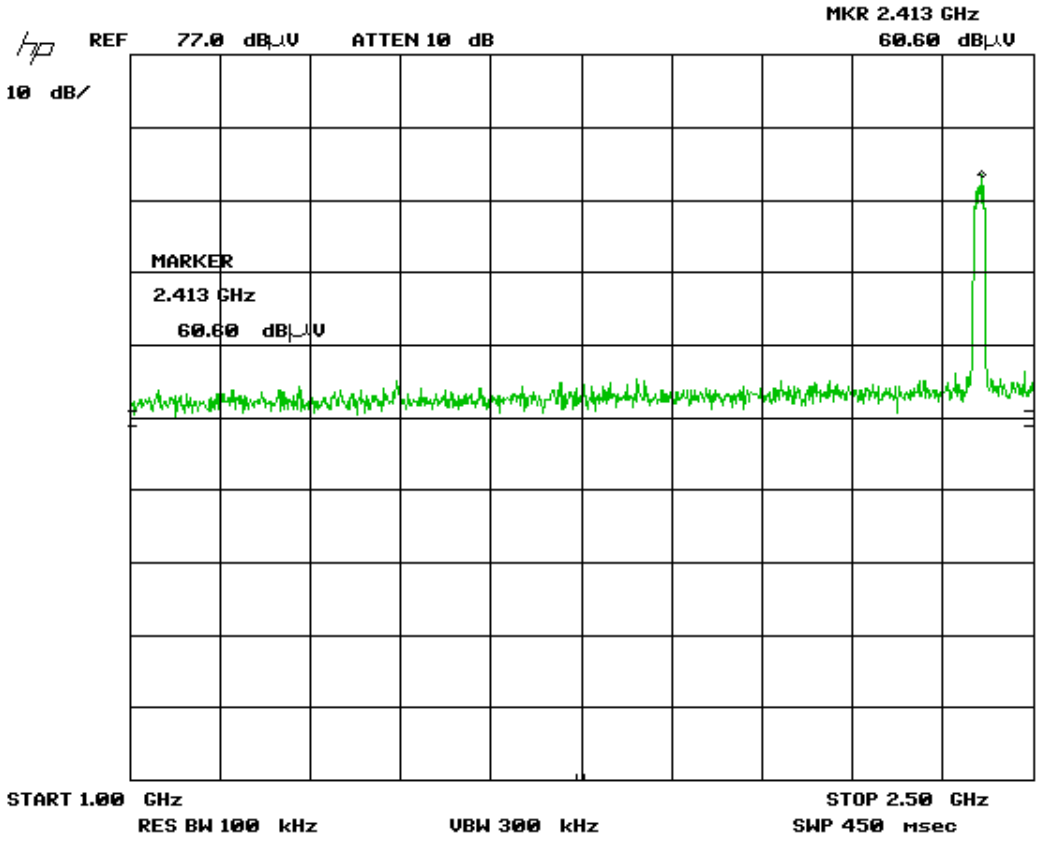


Figure 23. Emissions 802.11n - Low Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

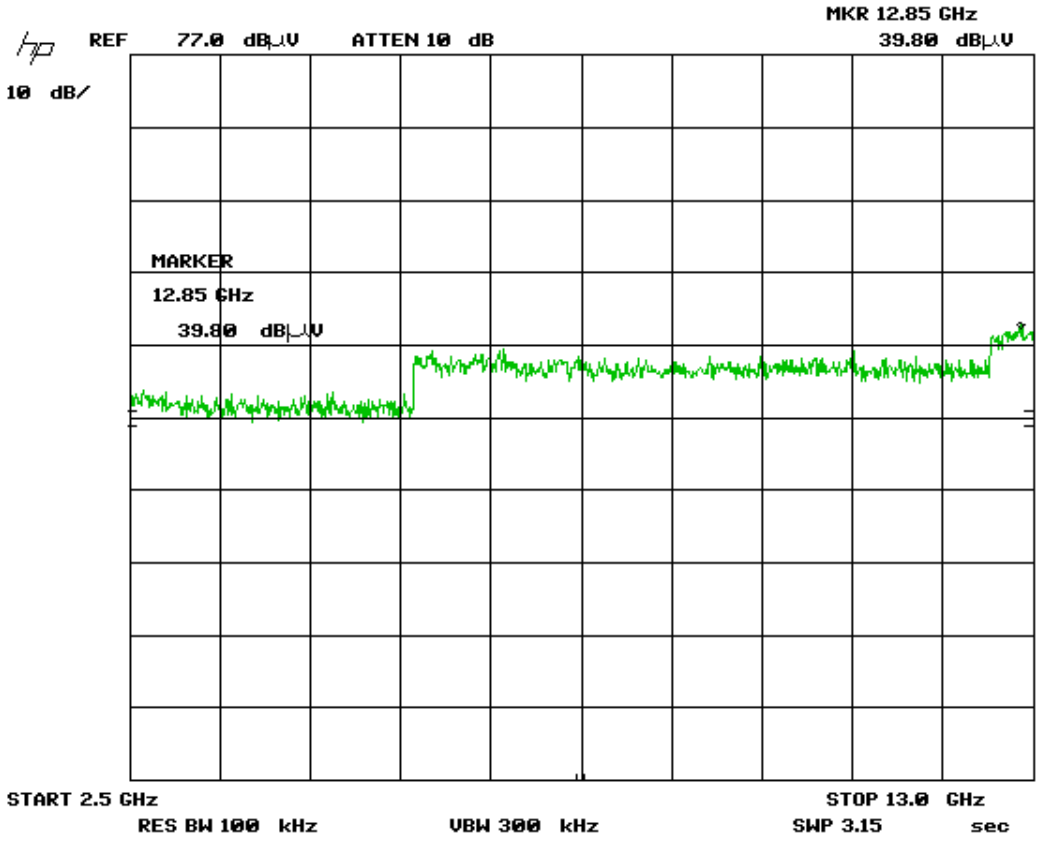


Figure 24. Emissions 802.11n - Low Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).-

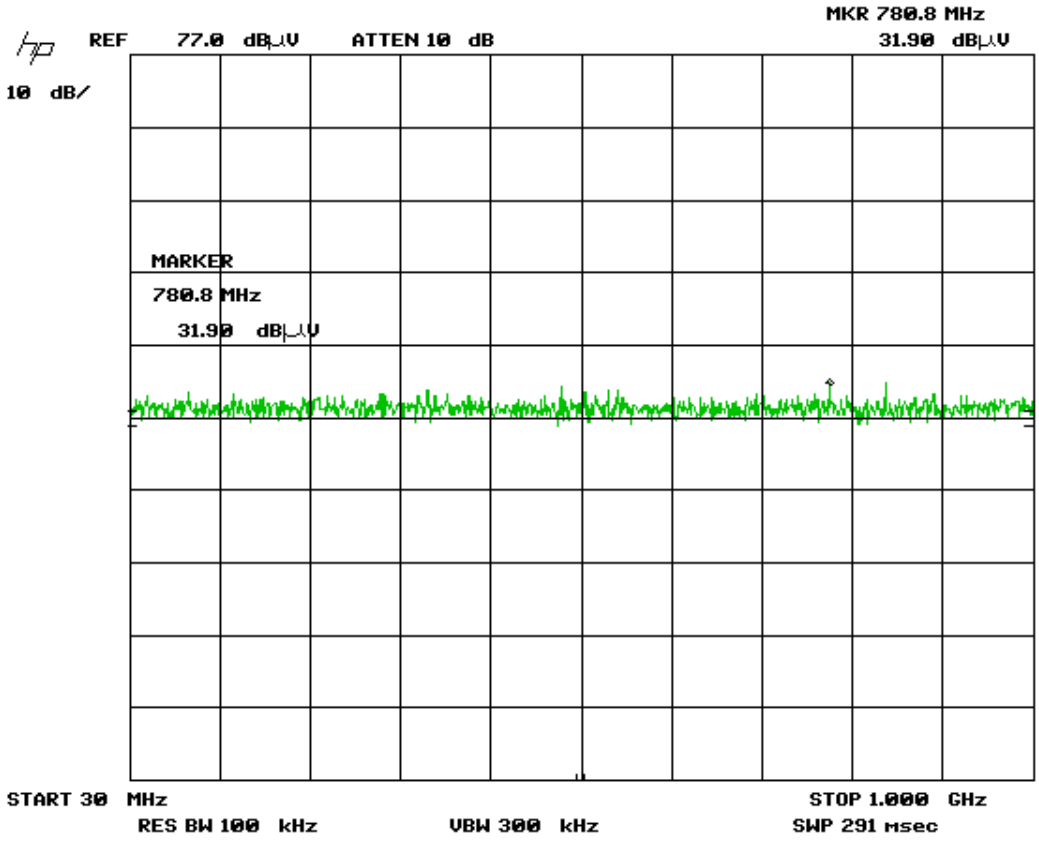


Figure 25. Emissions 802.11n - Mid Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

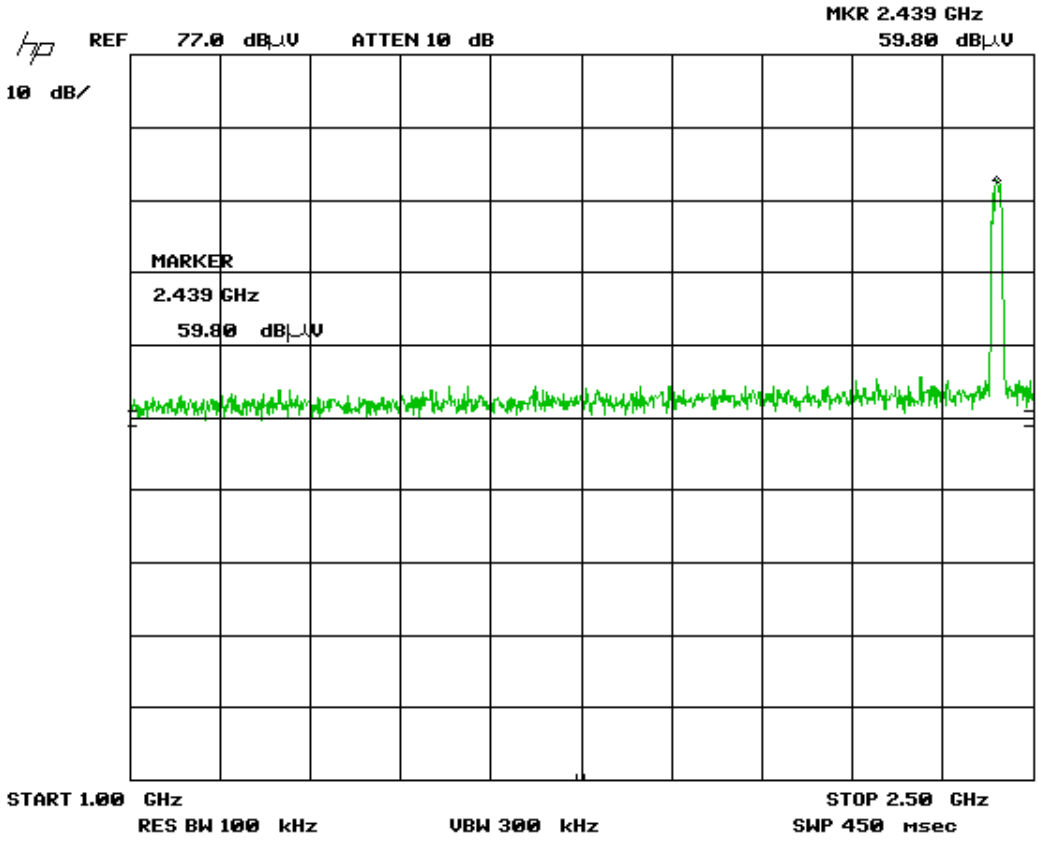


Figure 26. Emissions 802.11n - Mid Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).-

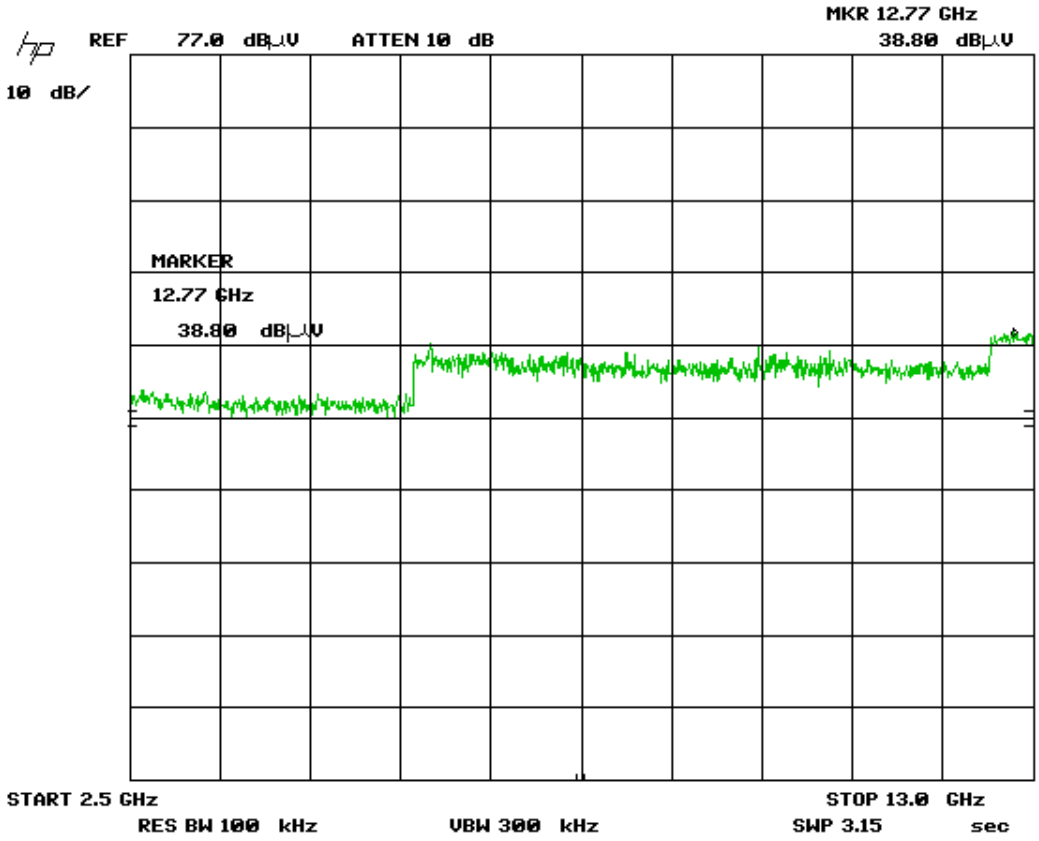


Figure 27. Emissions 802.11n - Mid Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).-

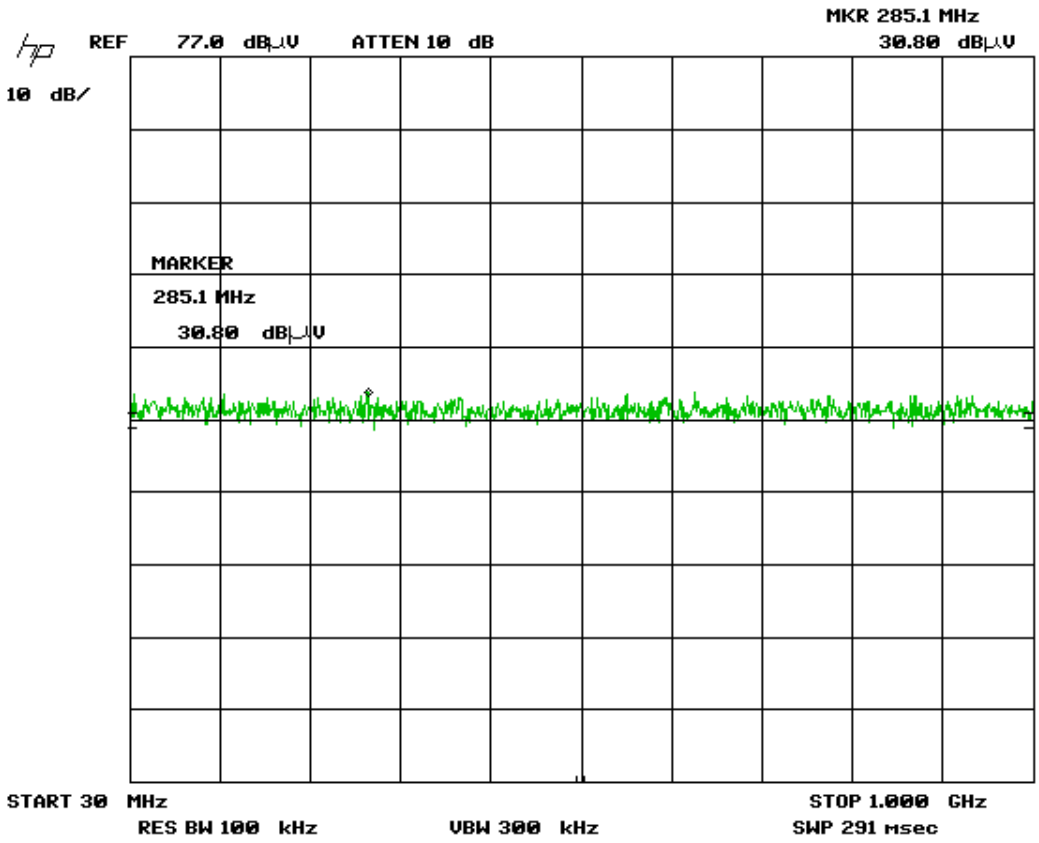


Figure 28. Emissions 802.11n - High Channel, Part 1

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Note: Large Signal shown is Fundamental Frequency

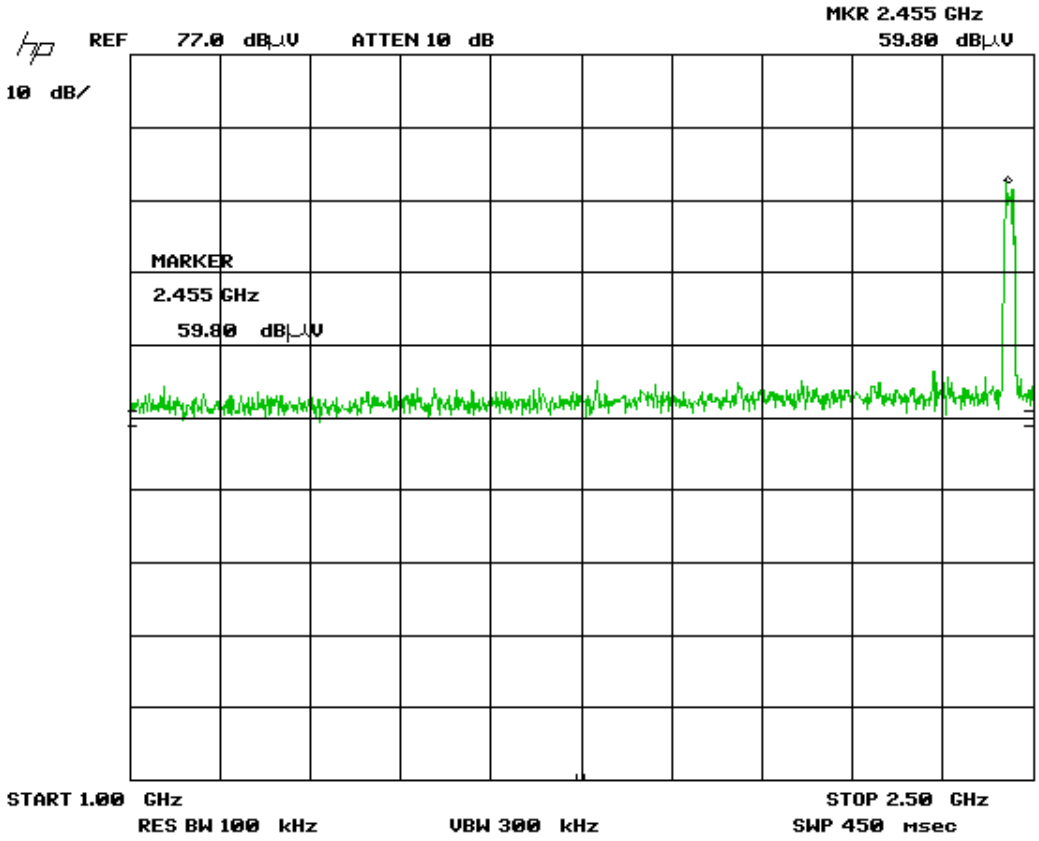


Figure 29. Emissions 802.11n - High Channel, Part 2

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

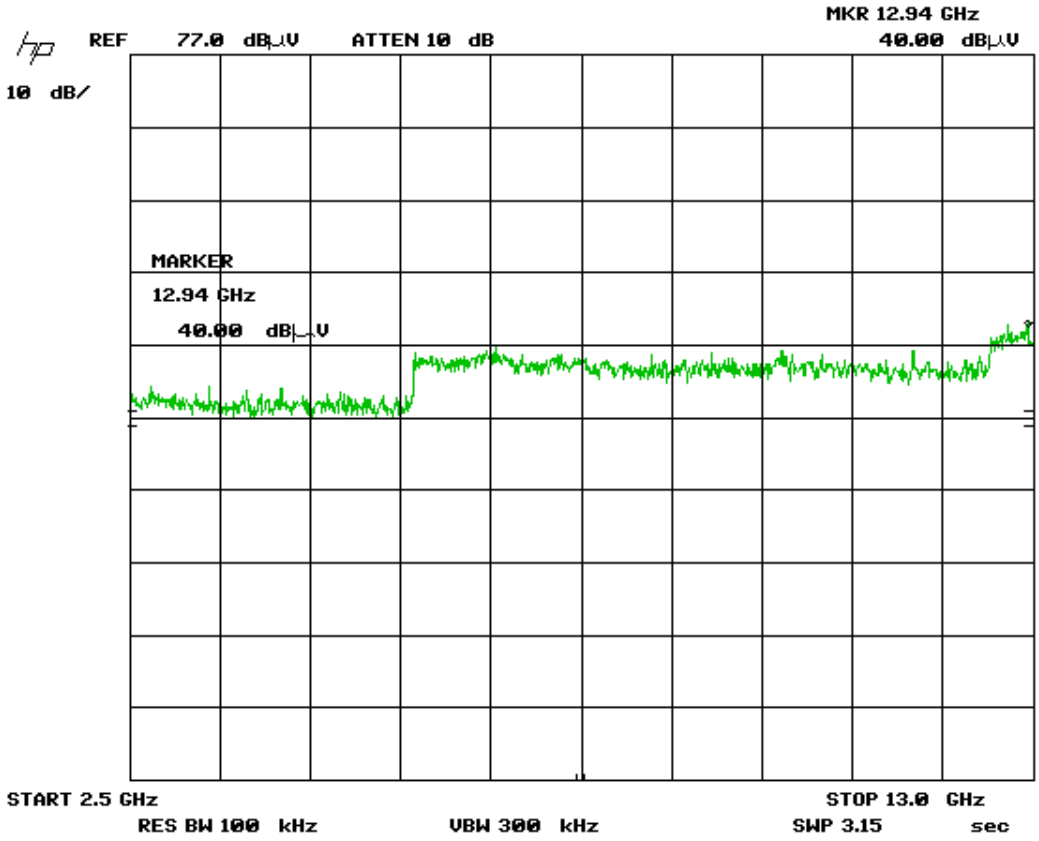


Figure 30. Emissions 802.11n - High Channel, Part 3

2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd)

Table 6. 802.11b Peak Radiated Harmonic & Spurious Emissions

Radiated Harmonic and Spurious Emissions, Tested from 30 MHz – 24 GHz							
Tested By: JCW	Test: FCC Part 15, Para 15.247(d)			Client: Level Vision Electronics			
	Project: 11-0204			Model: MUSN-FE6-T800			
Frequency (MHz)	Test Data (dBuV)	AF+CL-PA (dB/m)	Corrected Results (dBuV/m)	Limits (dBuV/m)	Distance /	Pass Margin (dB)	Detector PK / AVG
LOW BAND - PEAK							
2414.50	69.64	31.63	101.27		3.0m./		PK
4823.87	47.20	-4.58	42.62	74.0	1.0m./	31.4	PK
7233.46	47.70	-1.34	49.04	74.0	1.0m./	25.0	PK
MID BAND- PEAK							
2443.50	67.86	31.63	99.49		3.0m./		PK
4884.00	58.60	-4.56	54.04	74.0	1.0m./	19.96	PK
7333.30	48.92	1.81	50.73	74.0	1.0m./	23.3	PK
9734.00	45.60		49.22	74.0	1.0m./	24.8	PK
HIGH BAND- PEAK							
2464.00	70.28	31.89	102.17		3.0m./		PK
4917.05	43.01	-4.64	38.37	74.0	1.0m./	35.6	PK
7390.93	47.32	1.69	49.01	74.0	1.0m./	25.0	PK

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation of CFR 15.35.
2. ND = No other signals detected within 20 dB of specification limit.
SAMPLE CALCULATION:
3. Measurements taken at 1 meter distance were extrapolated to 3 meter using a factor of (-9.5 dB).
4. 1 dB loss factor is added for all measurement using the high pass filter.
RESULTS: At 4884.00 MHz: = 58.6 dBuV+ -4.56 dB/m = 54.04 dBuV/m @ 3m
Margin = (74.0 – 54.04) = 19.96 dB

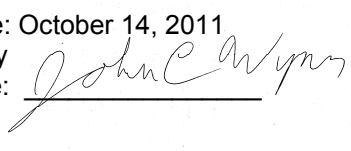
Test Date: October 14, 2011
Tested By
Signature:  Name: John C. Wynn

Table 8. 802.11g Peak Radiated Harmonic & Spurious Emissions

Radiated Harmonic and Spurious Emissions, Tested from 30 MHz – 24 GHz							
Tested By: JCW	Test: FCC Part 15, Para 15.247(d)			Client: Level Vision Electronics			
	Project: 11-0204			Model: MUSN-FE6-T800			
Frequency (MHz)	Test Data (dBuV)	AF+CL-PA (dB/m)	Corrected Results (dBuV/m)	Limits (dBuV/m)	Distance /	Pass Margin (dB)	Detector PK / AVG
LOW BAND - PEAK							
2414.63	69.8	31.63	101.43		3.0m./		PK
4823.9	47.07	-4.58	42.49	74.0	1.0m./	31.5	PK
7245.7	47.44	1.34	48.78	74.0	1.0m./	25.2	PK
MID BAND- PEAK							
2444.63	63.06	31.63	94.69		3.0m./		PK
4884.13	59.78	-4.56	55.22	74.0	1.0m./	18.8	PK
7238.1	50.54	1.18	51.72	74.0	1.0m./	22.3	PK
9648.00	46.69	3.71	50.40	74.0	1.0m./	23.6	PK
HIGH BAND- PEAK							
2464.5	71.87	31.89	103.76		3.0m./		PK
4924.3	43.16	3.11	46.27	74.0	1.0m./	27.7	PK
7387.3	47.35	9.07	56.42	74.0	1.0m./	17.6	PK

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation of CFR 15.35.
2. ND = No other signals detected within 20 dB of specification limit.
SAMPLE CALCULATION:
3. Measurements taken at 1 meter distance were extrapolated to 3 meter using a factor of (-9.5 dB).
4. 1 dB loss factor is added for all measurement using the high pass filter.
RESULTS: At 9648.0 MHz: = 46.69 dBuV + 3.71 dB/m = 50.4 dBuV/m @ 3m
Margin = (74.0 – 50.4) = 23.6 dB

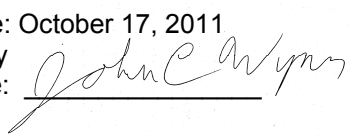
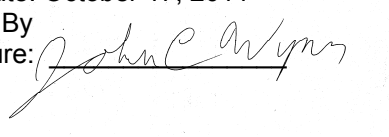
Test Date: October 17, 2011
Tested By
Signature:  Name: John C. Wynn

Table 9. 802.11n Peak Radiated Harmonic & Spurious Emissions

Radiated Harmonic and Spurious Emissions, Tested from 30 MHz – 24 GHz							
Tested By: JCW	Test: FCC Part 15, Para 15.247(d)			Client: Level Vision Electronics			
	Project: 11-0204			Model: MUSN-FE6-T800			
Frequency (MHz)	Test Data (dBuV)	AF+CL-PA (dB/m)	Corrected Results (dBuV/m)	Limits (dBuV/m)	Distance /	Pass Margin (dB)	Detector PK / AVG
LOW BAND - PEAK							
2411.25	69.27	31.63	100.90		3.0m./		PK
4822.87	44.04	4.58	39.46	74.0	1.0m./	34.5	PK
MID BAND- PEAK							
2443.16	64.70	32.90	97.60		3.0m./		PK
4885.63	45.28	-2.61	42.67	74.0	1.0m./	31.3	PK
7333.9	51.64	2.67	54.31	74.0	1.0m./	19.7	PK
HIGH BAND- PEAK							
2463.00	69.48	31.89	101.37		3.0m./		PK
4895.50	43.40	-4.56	38.84	74.0	1.0m./	35.2	PK

1. (*) Falls within the restricted bands of CFR 15.205. Limits based on CFR15.209 & 20 dB relaxation of CFR 15.35.
2. ND = No other signals detected within 20 dB of specification limit.
SAMPLE CALCULATION:
3. Measurements taken at 1 meter distance were extrapolated to 3 meter using a factor of (-9.5 dB).
4. 1 dB loss factor is added for all measurement using the high pass filter.
RESULTS: At 4885.63 MHz: = 45.28 dBuV + -2.61 dB/m = 42.67 dBuV/m @ 3m
Margin = (74.0 – 42.67) = 31.3 dB

Test Date: October 17, 2011
Tested By
Signature:  Name: John C. Wynn

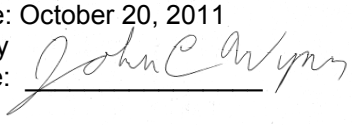
2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Table 7. 802.11b AVERAGE Radiated Harmonic & Spurious Emissions

Radiated Spurious Emissions, Tested from 30 MHz – 24 GHz							
Tested By: JCW	Test: FCC Part 15, Para 15.247(d)			Client: Level Vision Electronics			
	Project: 11-0204			Model: MUSN-FE6-T800			
Frequency (MHz)	Test Data (dBuV)	AF+CL-PA+DC (dB/m)	Corrected Results (dBuV/m)	Limits (dBuV/m)	Distance / Polarization	Pass Margin (dB)	Detector PK / AVG
LOW BAND - PEAK							
2414.50	64.53	31.63	96.16		3.0m./		**AVG**
4823.87	39.85	-4.58	35.27	54.0	1.0m./	18.7	**AVG**
MID BAND- PEAK							
2443.50	65.27	31.63	96.90		3.0m./		**AVG**
4884.00	47.42	-4.56	42.86	54.0	1.0m./	11.1	**AVG**
7333.30	38.73	1.81	40.54	54.0	1.0m./	13.5	**AVG**
9734.00	36.11	3.62	39.73	54.0	1.0m./	14.3	**AVG**
HIGH BAND- PEAK							
2464.00	65.03	31.89	96.92		3.0m./		**AVG**
4917.05	43.01	-4.64	38.37	54.0	1.0m./	35.6	**AVG**

1. (*) Falls within the restricted bands of CFR 15.205.
2. ND = No other emissions detected within 20 dB of the Part 15.209 limits for spurious emissions within Restricted Bands.
3. Test data values measured at 1 meter include a factor of -9.54 dB for distance extrapolation from a test distance of 1 meter to 3 meters.
4. Additional factors include a Duty Cycle, DC = -25.39 dB and filter factor of +1.0 dB.

SAMPLE CALCULATION:
Note: 1 dB loss factor is added for all measurement using the high pass filter.
RESULTS: At 4884 MHz: = 47.42 + -4.56 = 42.86 dBuV/m @ 3m
Margin = (54.0 – 43.86) = 11.1 dB

Test Date: October 20, 2011
Tested By
Signature:  Name: John C. Wynn

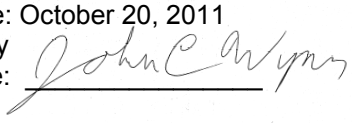
2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Table 8. 802.11g AVERAGE Radiated Harmonic & Spurious Emissions

Radiated Spurious Emissions, Tested from 30 MHz – 24 GHz							
Tested By: JCW	Test: FCC Part 15, Para 15.247(d)			Client: Level Vision Electronics			
	Project: 11-0204			Model: MUSN-FE6-T800			
Frequency (MHz)	Test Data (dBuV)	AF+CL-PA+DC (dB/m)	Corrected Results (dBuV/m)	Limits (dBuV/m)	Distance / Polarization	Pass Margin (dB)	Detector PK / AVG
LOW BAND - PEAK							
2414.63	64.49	31.63	96.12		3.0m./		**AVG**
4823.90	37.38	3.59	41.25	54.0	1.0m./	12.7	**AVG**
MID BAND- PEAK							
2444.63	60.28	31.63	91.91		3.0m./		**AVG**
4884.13	57.30	-4.56	52.74	54.0	1.0m./	1.3	**AVG**
7238.10	42.03	1.18	43.21	54.0	1.0m./	10.8	**AVG**
9648.20	40.42	3.69	44.11	54.0	1.0m./	9.9	**AVG**
HIGH BAND- PEAK							
2464.50	64.55	31.89	96.44		3.0m./		**AVG**
4931.10	43.09	3.13	46.22	54.0	1.0m./	7.78	**AVG**

1. (*) Falls within the restricted bands of CFR 15.205.
2. ND = No other emissions detected within 20 dB of the Part 15.209 limits for spurious emissions within Restricted Bands.
3. Test data values measured at 1 meter include a factor of -9.54 dB for distance extrapolation from a test distance of 1 meter to 3 meters.
4. Additional factors include a Duty Cycle, DC = -25.39 dB and filter factor of +1.0 dB.

SAMPLE CALCULATION:
Note: 1 dB loss factor is added for all measurement using the high pass filter.
RESULTS: At 4884.13 MHz: = 57.3 + -4.56 = 52.74 dBuV/m @ 3m
Margin = (54.0 – 52.74) = 1.3 dB

Test Date: October 20, 2011
Tested By
Signature:  Name: John C. Wynn

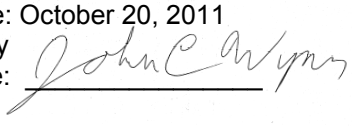
2.10 Intentional Radiator, Radiated Emissions (CFR 15.209, 15.247(d)) (IC RSS 210, A2.9 (a)) (Cont'd).

Table 9. 802.11n AVERAGE Radiated Harmonic & Spurious Emissions

Radiated Spurious Emissions, Tested from 30 MHz – 24 GHz							
Tested By: JCW	Test: FCC Part 15, Para 15.247(d)			Client: Level Vision Electronics			
	Project: 11-0204			Model: MUSN-FE6-T800			
Frequency (MHz)	Test Data (dBuV)	AF+CL-PA+DC (dB/m)	Corrected Results (dBuV/m)	Limits (dBuV/m)	Distance /	Pass Margin (dB)	Detector PK / AVG
LOW BAND - PEAK							
2411.25	52.32	31.63	83.95		3.0m./		**AVG**
4822.87	33.15	-4.58	28.57	54.0	1.0m./	25.4	**AVG**
MID BAND- PEAK							
2443.16	56.48	32.90	89.38		3.0m./		**AVG**
4885.63	31.09	-2.61	28.48	54.0	1.0m./	25.5	**AVG**
7333.90	33.59	2.67	36.26	54.0	1.0m./	17.7	**AVG**
HIGH BAND- PEAK							
2463.00	52.85	31.89	84.74		3.0m./		**AVG**
4895.50	43.40	-4.56	38.84	54.0	1.0m./	15.16	**Noise Floor**

1. (*) Falls within the restricted bands of CFR 15.205.
2. ND = No other emissions detected within 20 dB of the Part 15.209 limits for spurious emissions within Restricted Bands.
3. Test data values measured at 1 meter include a factor of -9.54 dB for distance extrapolation from a test distance of 1 meter to 3 meters.
4. Additional factors include a Duty Cycle, DC = -25.39 dB and filter factor of +1.0 dB.

SAMPLE CALCULATION:
Note: 1 dB loss factor is added for all measurement using the high pass filter.
RESULTS: At 4885.63 MHz: = 31.09 + -2.61 = 28.48 dBuV/m @ 3m
Margin = (54.0 – 28.48) = 25.5 dB

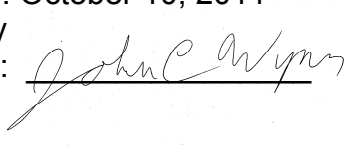
Test Date: October 20, 2011
Tested By
Signature:  Name: John C. Wynn

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a))

The EUT dos not have an antenna port; therefore the EUT could not be connected to a spectrum analyzer. Measurements were performed with an alternative method. The RBW was set to approximately 1/100 of the manufacturers claimed RBW and with the VBW ≥ RBW. The results of this test are given in Table 9 and Figures 31 through 39.

Table 10. 6 dB Bandwidth

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum FCC Bandwidth (MHz)
802.11b		
2412	6.42	0.5
2442	5.15	0.5
2462	5.8	0.5
802.11g		
2412	6.15	0.5
2442	6.45	0.5
2462	6.26	0.5
802.11n		
2412	17.25	0.5
2442	17.55	0.5
2462	17.6	0.5

Test Date: October 10, 2011
Tested By
Signature:  Name: John C. Wynn

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

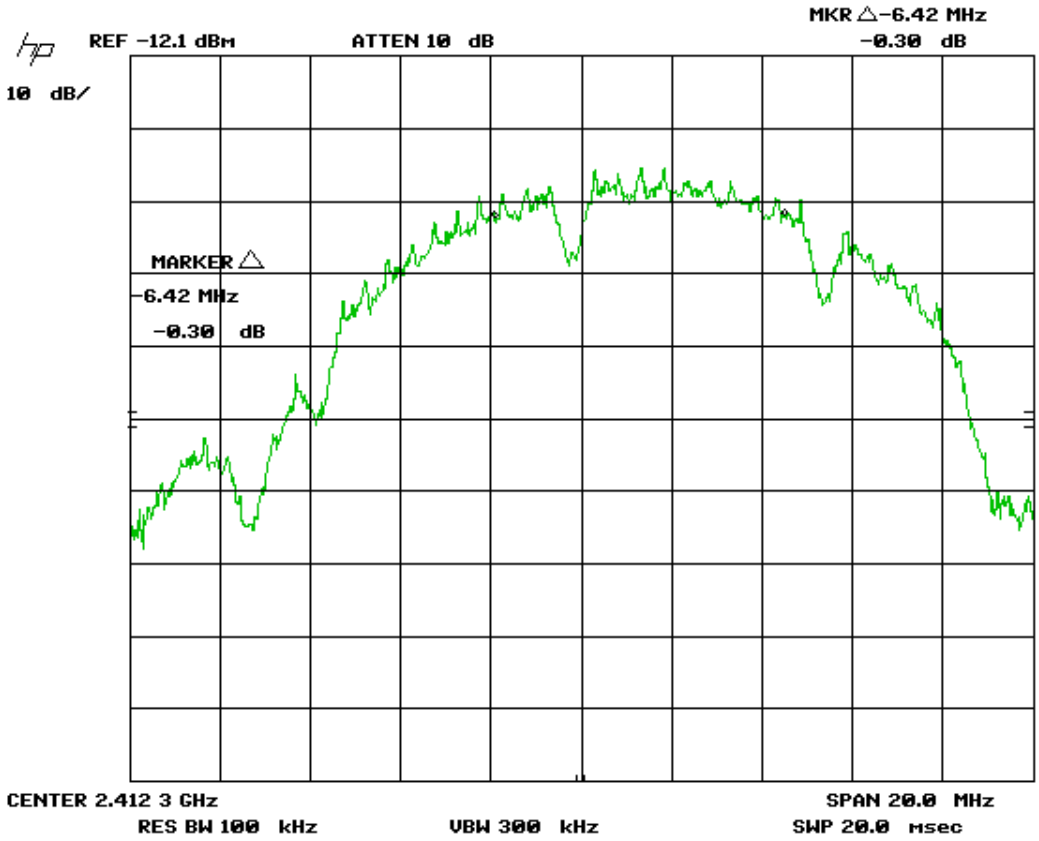


Figure 31. 6 dB Bandwidth - 15.247 (a) (2) – 802.11b – Low Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

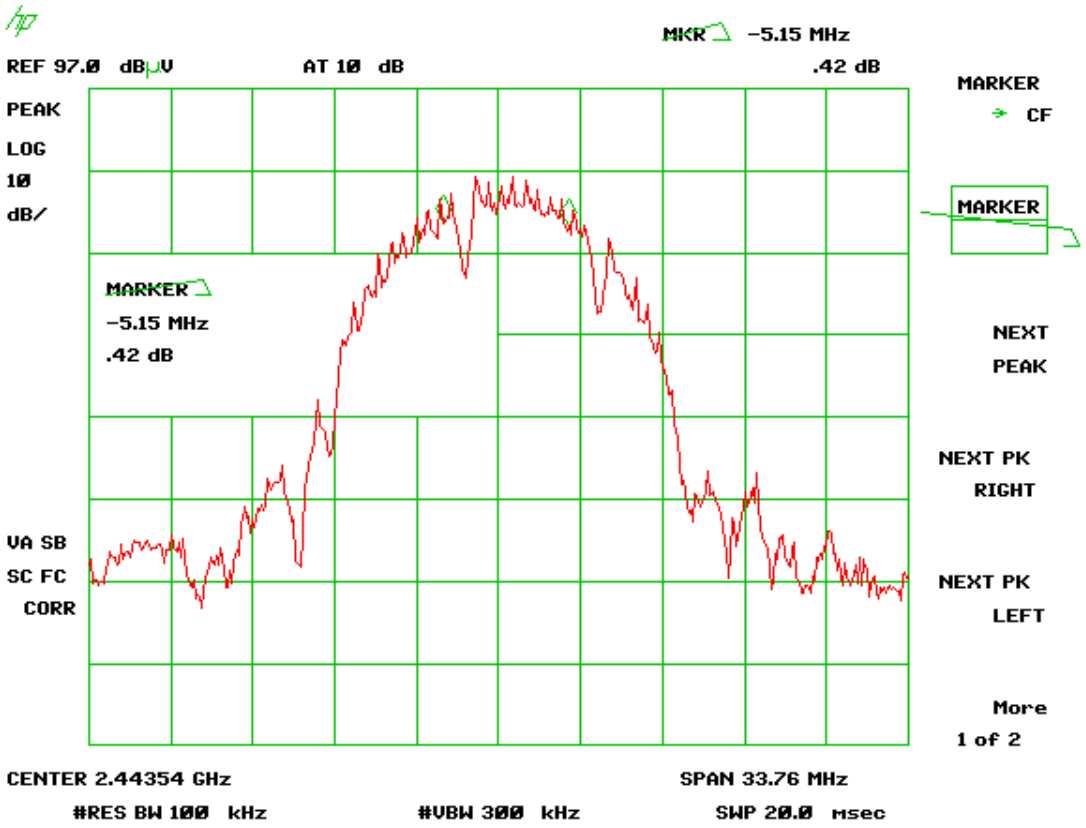


Figure 32. 6 dB Bandwidth - 15.247 (a) (2) – 802.11b – Mid Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

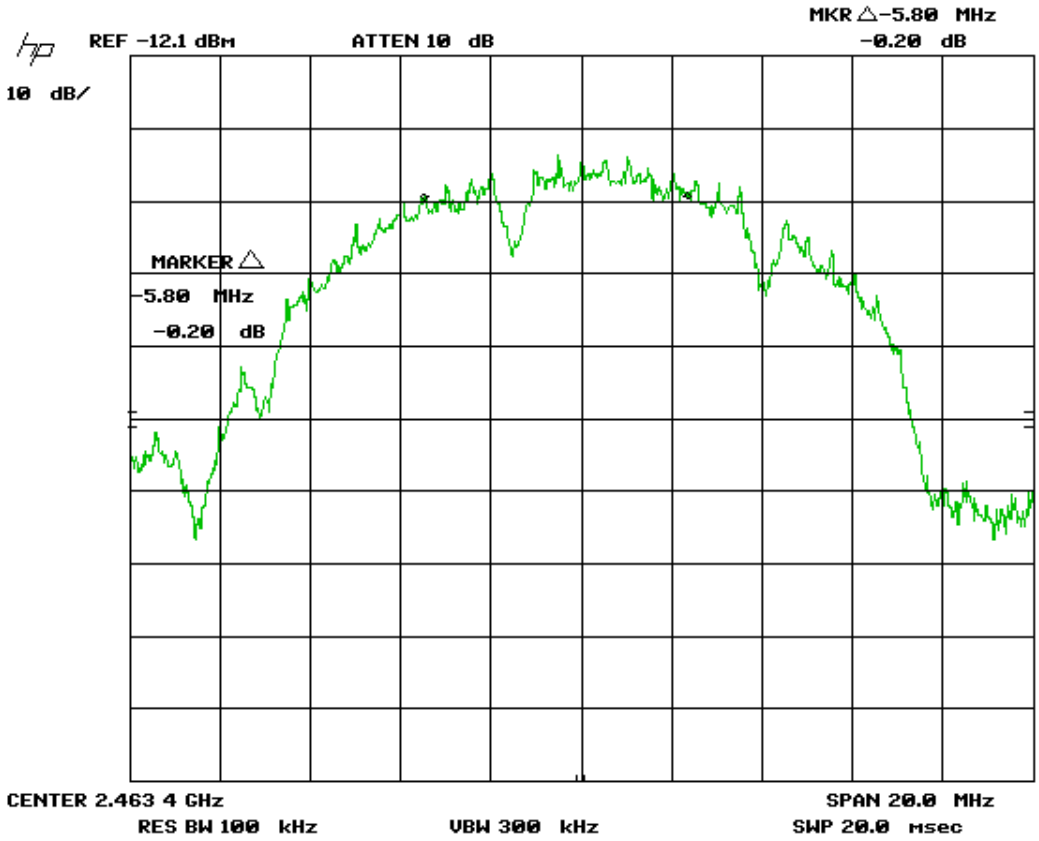


Figure 33. 6 dB Bandwidth - 15.247 (a) (2) – 802.11b – High Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

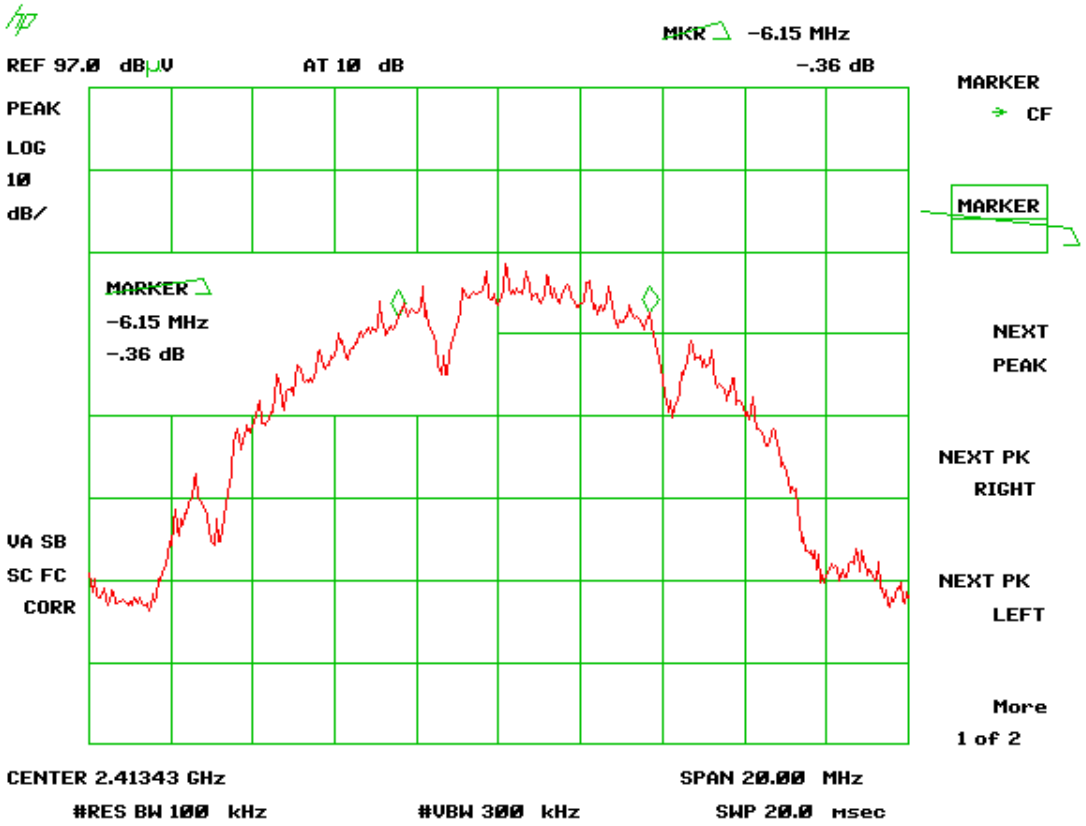


Figure 34. 6 dB Bandwidth - 15.247 (a) (2) – 802.11g – Low Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

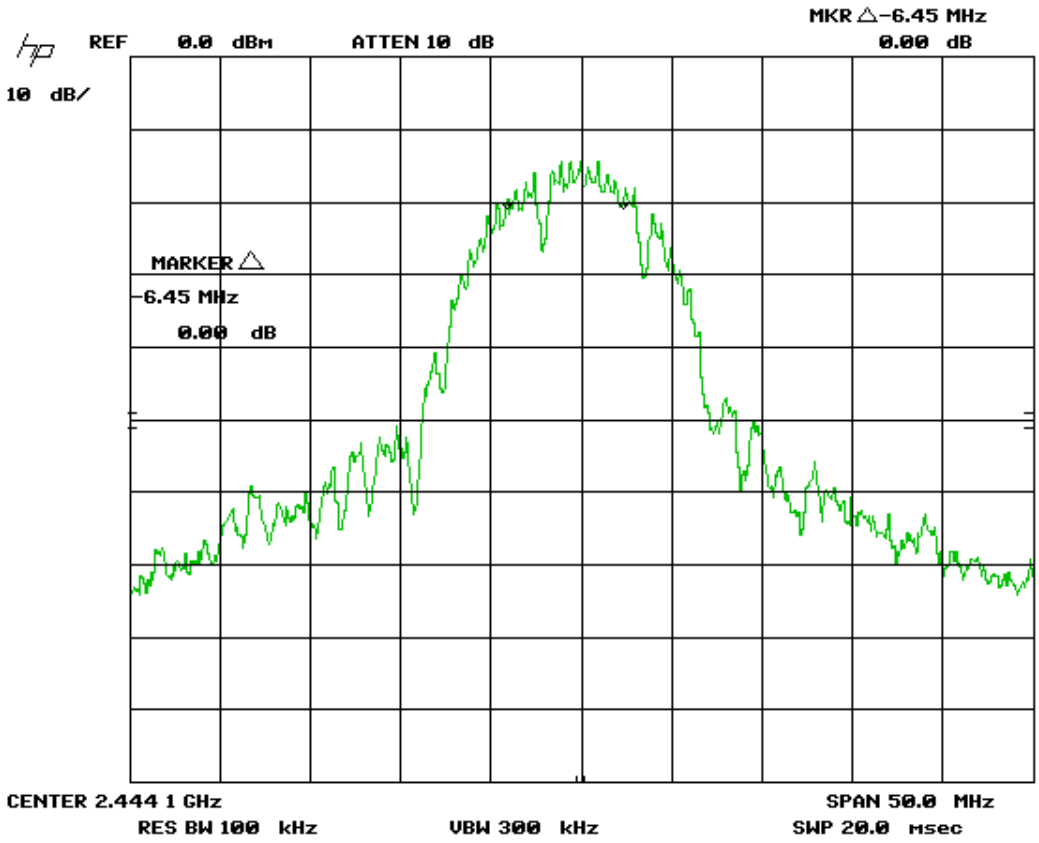


Figure 35. 6 dB Bandwidth - 15.247 (a) (2) – 802.11g – Mid Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

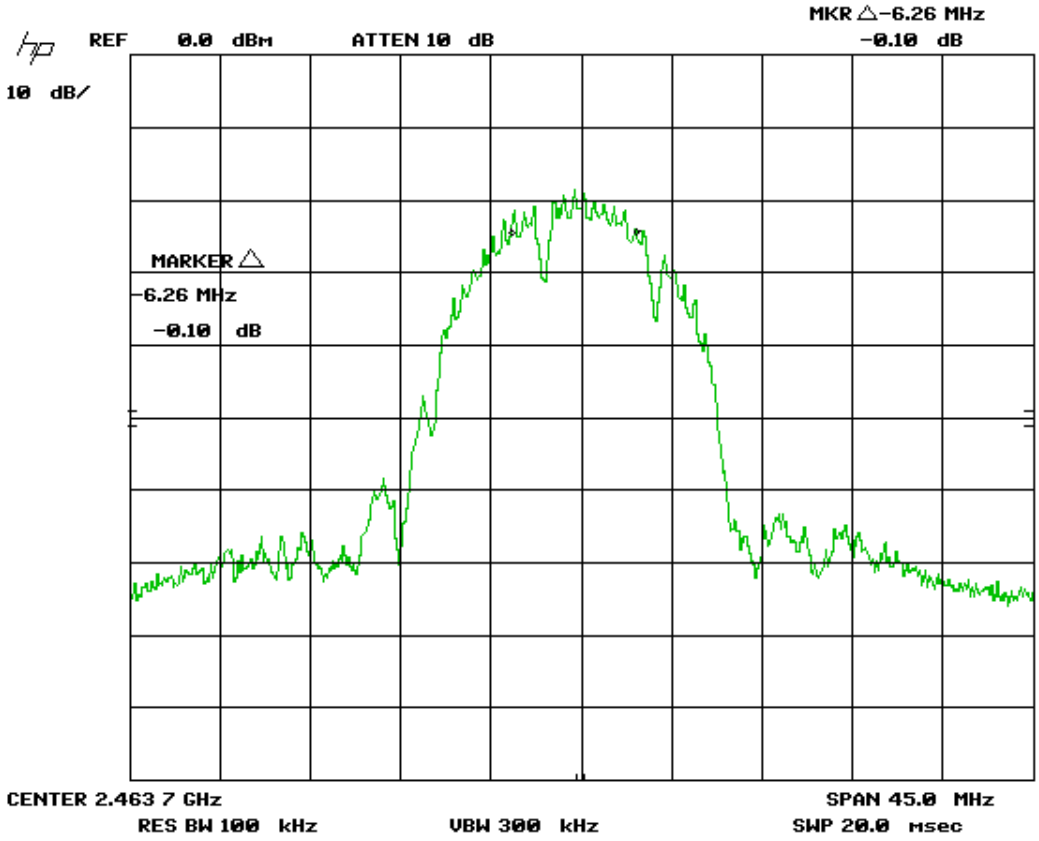


Figure 36. 6 dB Bandwidth - 15.247 (a) (2) – 802.11g – High Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

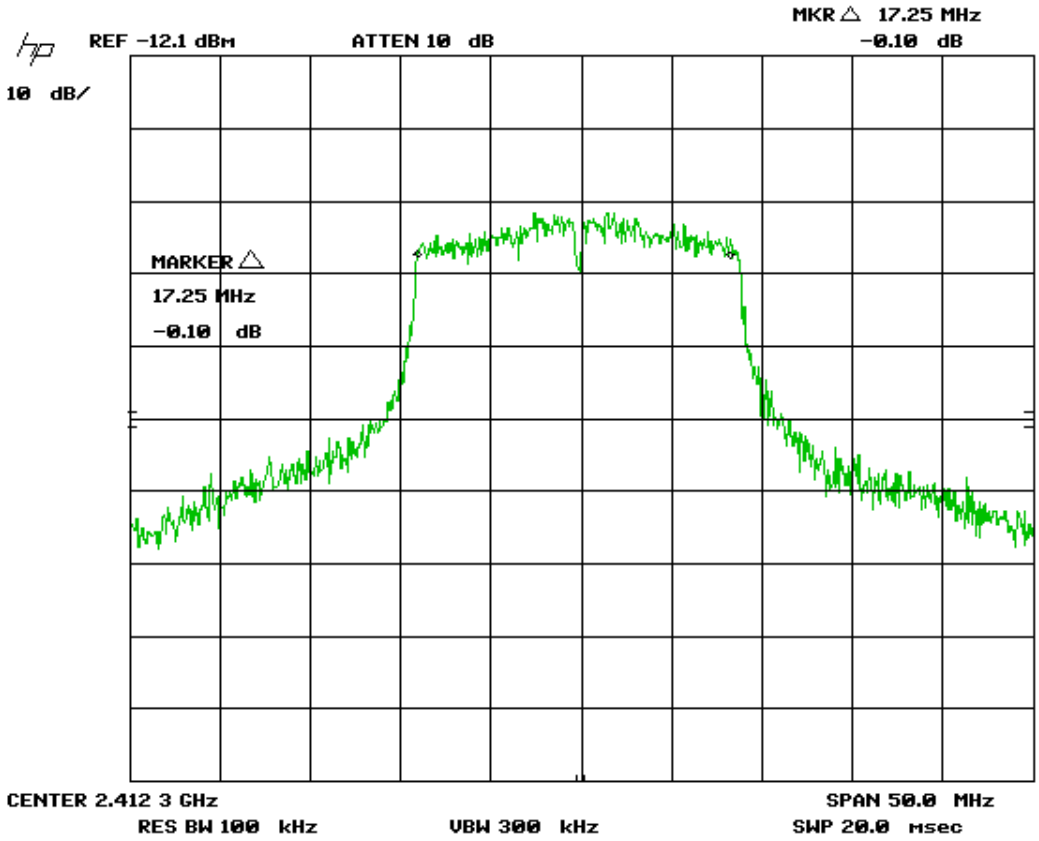


Figure 37. 6 dB Bandwidth - 15.247 (a) (2) – 802.11n – Low Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

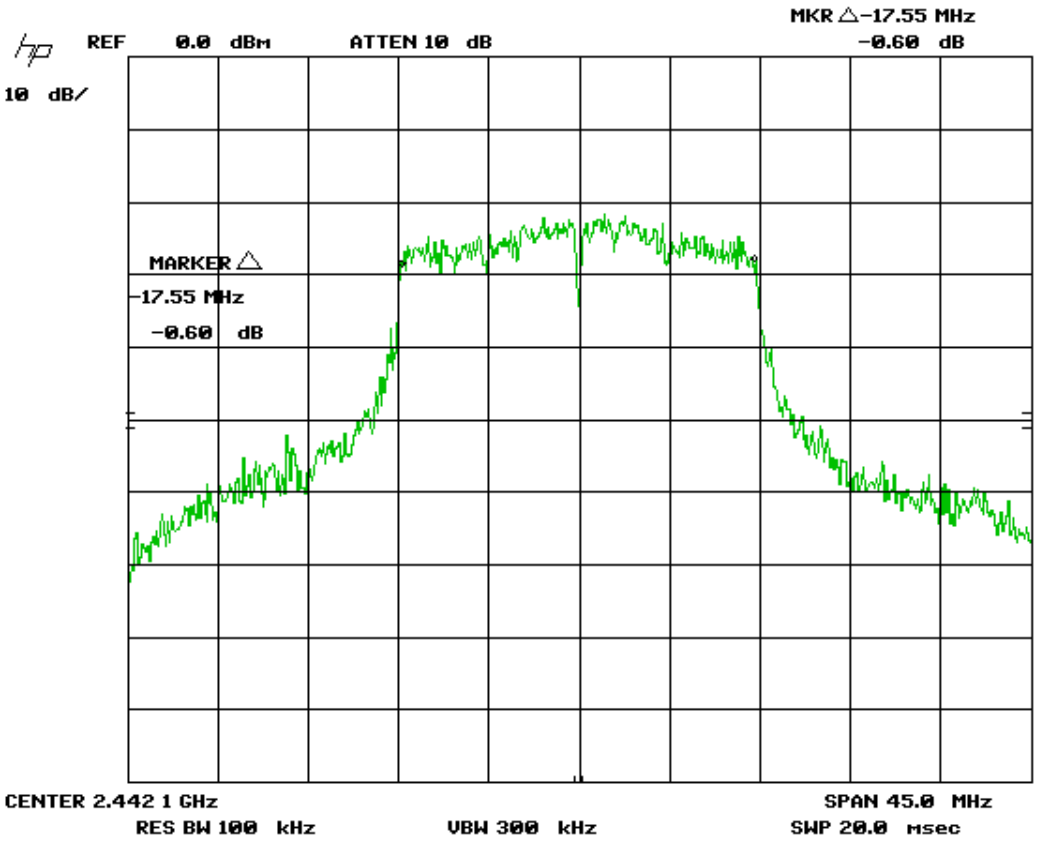


Figure 38. 6 dB Bandwidth - 15.247 (a) (2) – 802.11g – Mid Channel

2.11 6 dB Bandwidth per CFR 15.247(a)(2), (IC RSS 210, A8.2(a)), (Cont'd).

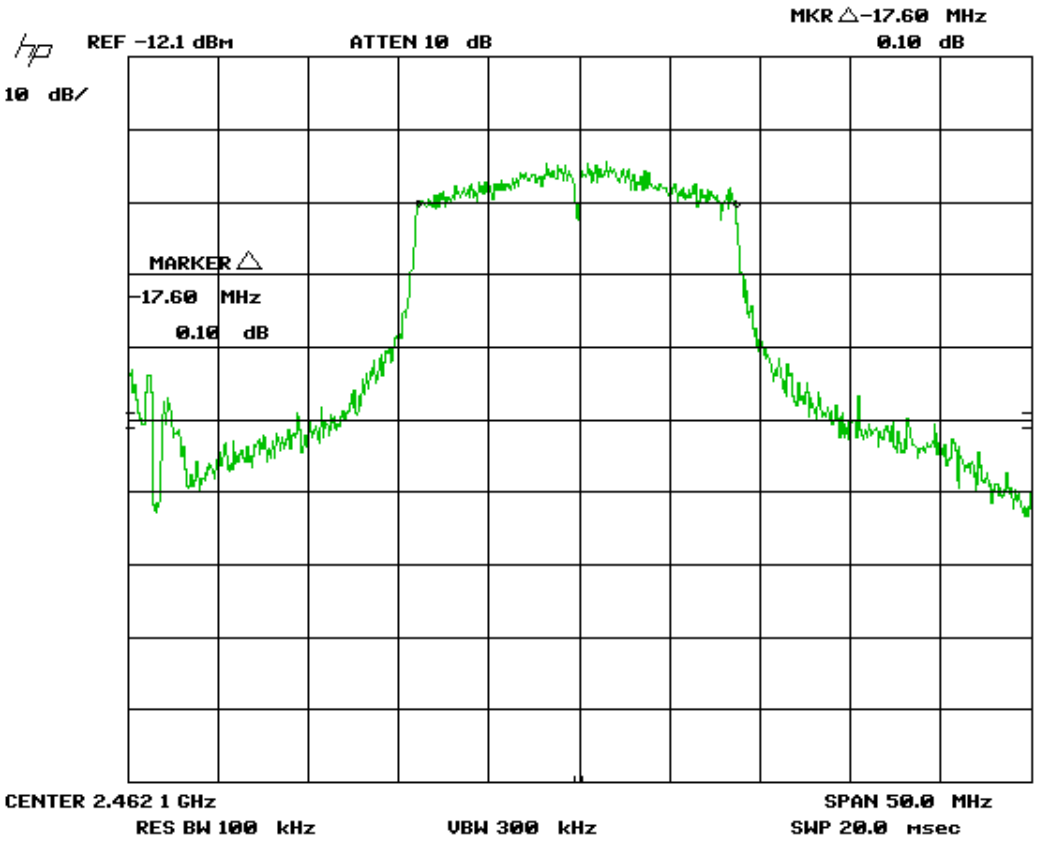


Figure 39. 6 dB Bandwidth - 15.247 (a) (2) – 802.11n – High Channel

2.12 Maximum Peak Conducted Output Power (CFR 15.247 (b) (3))

For the MUSN-FE6-T800 tablet, the transmitter was programmed to operate at a maximum of +13 dBm across the bandwidth. For this test the unit was set at 13 dBm for the lower and up channels and 20dBm for the mid channel.

Peak power within the band 2400 MHz to 2483.5 MHz was measured per FCC KDB Publication 558074 **alternative measurements** as an Antenna Conducted test with a spectrum analyzer by connecting the spectrum analyzer directly, via a short RF cable, to the antenna output terminals on the EUT. The spectrum analyzer was set for an impedance of 50 Ω with the RBW set greater than the 6 dB bandwidth of the EUT, and the VBW ≥ RBW. The loss of the short cable is 0.3 dB, and addition of an attenuator, 8.0 dB and the final corrected measurements were determined by adding 8.3 dB to the raw data measured values of Figures 18 to 20. Peak antenna conducted output power is tabulated in Table 15 below.

Peak power within the band 2400 MHz to 2483.5 MHz was measured with the FCC 15.247 Alternative Test Procedures. Using the peak field strength measurements from the intentional radiated test, the maximum conducted output power can be calculated. The following tables list the measured data and the calculated results for 802.11b, 802.11g, and 802.11n. The gain on the transmitter is assumed to be worst case, a dipole antenna (1.64).

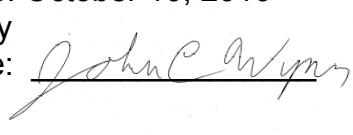
Antenna Conducted Output Power was measured at Low Channel, Mid Channel and High Channel frequencies. See Figures 18 to 20 above. The 0.3 dB loss for the RF wire is taken into consideration here (Corrected Measurement column).

Table 11. Peak Antenna Conducted Output Power per Part 15.247 (b) (3) (Same as EIRP)

Frequency of Fundamental (MHz)	Raw Test Data (dBuV)	Corrected Measurement (dBuV/m)	Calculated Power Output (mW)	FCC Limit (mW Maximum)
802.11b				
2414.50	69.64	101.27	**2.73**	1000
2443.50	67.86	99.49	**1.81**	1000
2464.00	70.28	102.17	**3.36**	1000
802.11g				
2414.63	69.8	101.43	**2.84**	1000
2444.63	63.06	94.69	**0.61**	1000
2464.5	71.87	103.76	**4.85**	1000
802.11n				
2411.25	69.27	100.90	**2.51**	1000
2443.16	64.70	97.60	**1.18**	1000
2463.00	69.48	101.37	**2.80**	1000

SAMPLE CALCULATION:
802.11b @ 2443.5 MHz
V/M = (10^((dBuV/m)/20)) * 1.0e-6
V/M = (10^((99.49)/20)) * 1.0e-6
V/M = 0.0943

Power Output = (V/M*3)^2 /(30* Antenna $Gain_{numeric}$)
Power Output = (0.0943V/M*3)^2 /(30* 1.46)
Power Output = 1.8 mW

Test Date: October 10, 2010
Tested By
Signature:  Name: John C. Wynn

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5)

The transmitter was placed into a continuous mode of operation at all applicable frequencies. The measurements were performed per the procedures of FCC KDB Procedure 558074. The RBW was set to 3 kHz and the Video Bandwidth was set to ≥ RBW. The trace capture time was set to (Span/3 kHz).

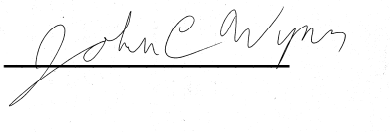
In accordance with 15.247 (e), the power spectral density shall be no greater than +8 dBm per any 3 kHz band.

Results are shown in Table 12, 13 and 14 and Figures 40 through 48 below. Results are corrected by adding 0.5 dB to the measured value to account for the cable loss. All are less than +8 dBm per 3 kHz band.

Table 12. Power Spectral Density for 802.11b Low, Mid and High Bands

Frequency (MHz)	Test Data (dBm/3 KHz)	Results (dBm/3 kHz)	FCC Limit (dBm/3 kHz)
Low-2412	-50.98	-11.03	+8.0
Mid-2442	-51.41	-11.46	+8.0
High- 2462	-48.82	-8.61	+8.0

Note: reference adjusted for correction factor.

Test Date: October 20, 2011
Tested By
Signature:  Name: John C. Wynn

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

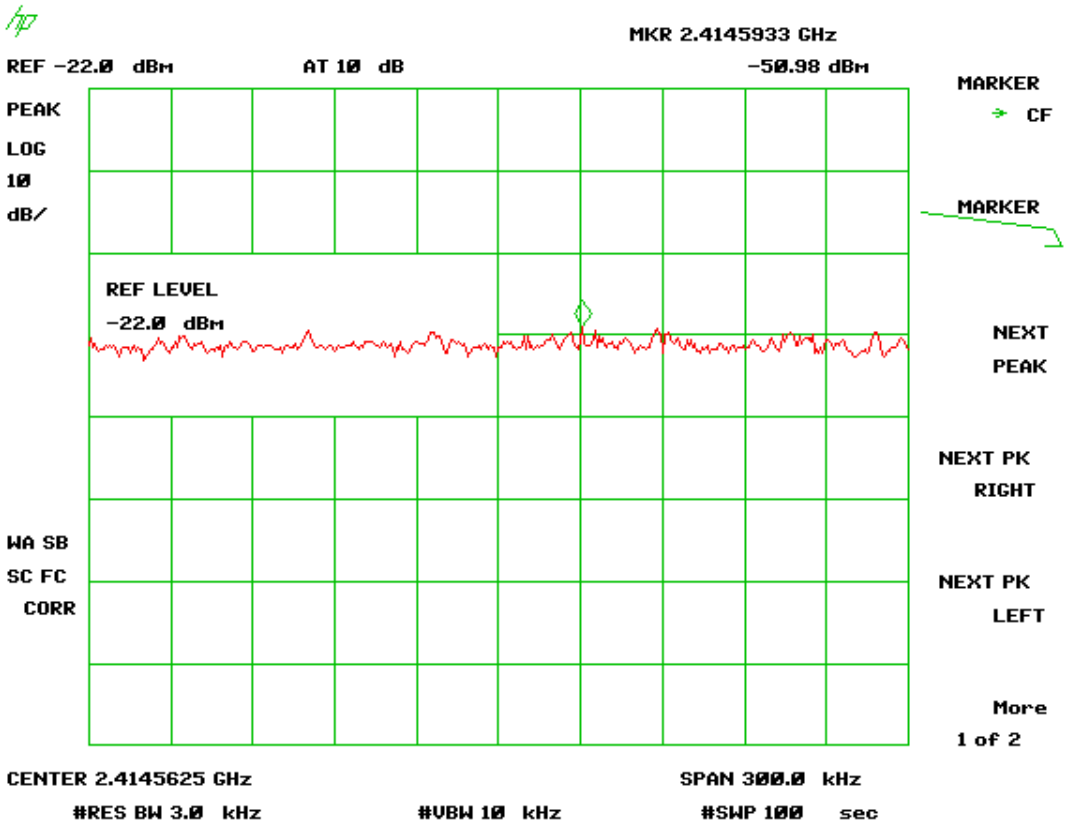


Figure 40. Peak Power Spectral Density - Part 15.247 (e) - Low Channel

Note: Reference NOT adjusted for correction factor.

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

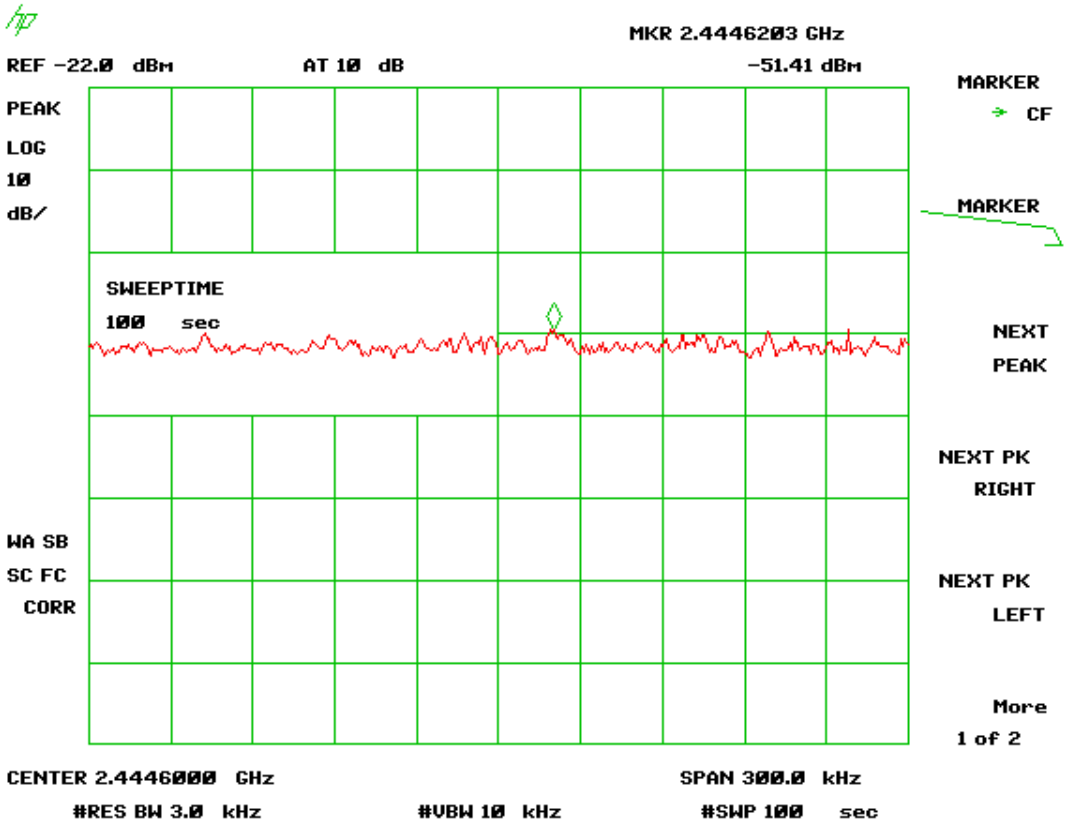


Figure 41. Power Spectral Density - Part 15.247 (e) - Mid Channel

Note: Reference NOT adjusted for correction factor.

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

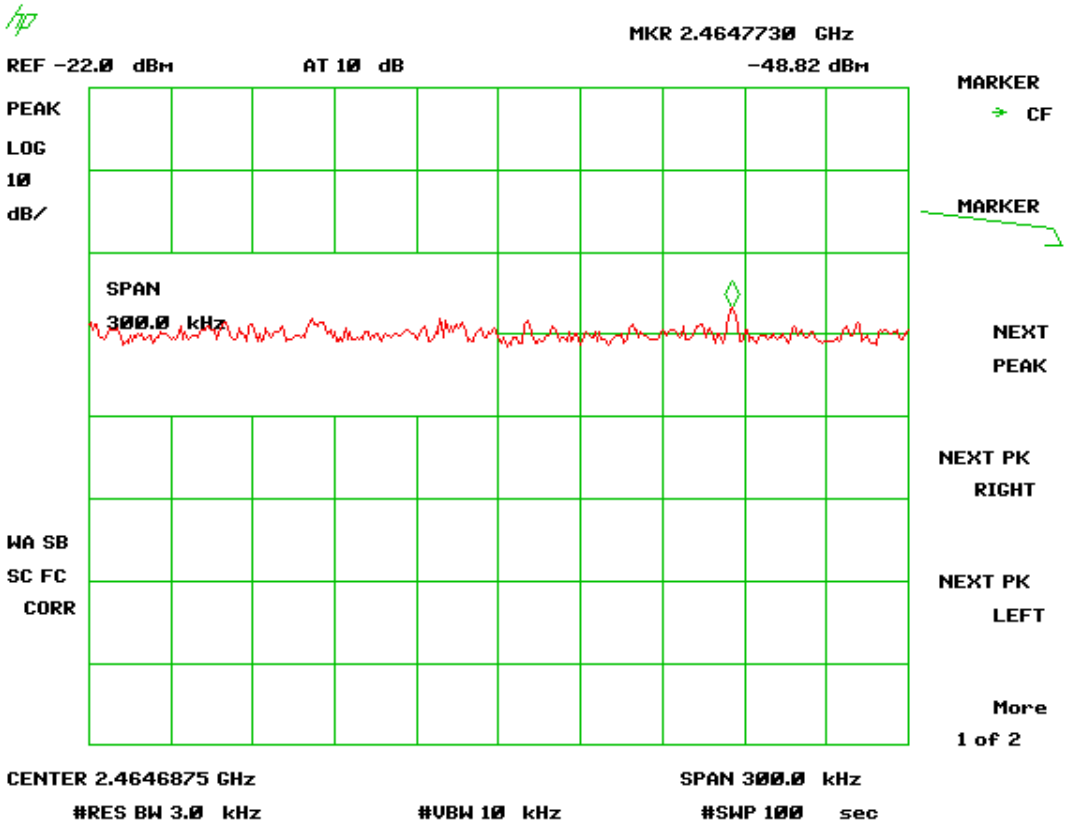


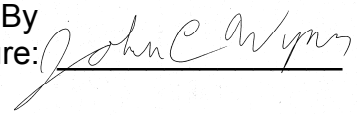
Figure 42. Peak Power Spectral Density - Part 15.247 (e) - High Channel

Note: Reference NOT adjusted for correction factor.

Table 13. Power Spectral Density for 802.11g Low, Mid and High Bands

Frequency (MHz)	Test Data (dBm/3 KHz)	Results (dBm/3 kHz)	FCC Limit (dBm/3 kHz)
Low-2414	-50.34	-10.39	+8.0
Mid-2444	-54.83	-14.88	+8.0
High- 2464	-47.27	-7.06	+8.0

Note: Reference adjusted for correction factor.

Test Date: October 20, 2011
Tested By
Signature:  Name: John C. Wynn

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

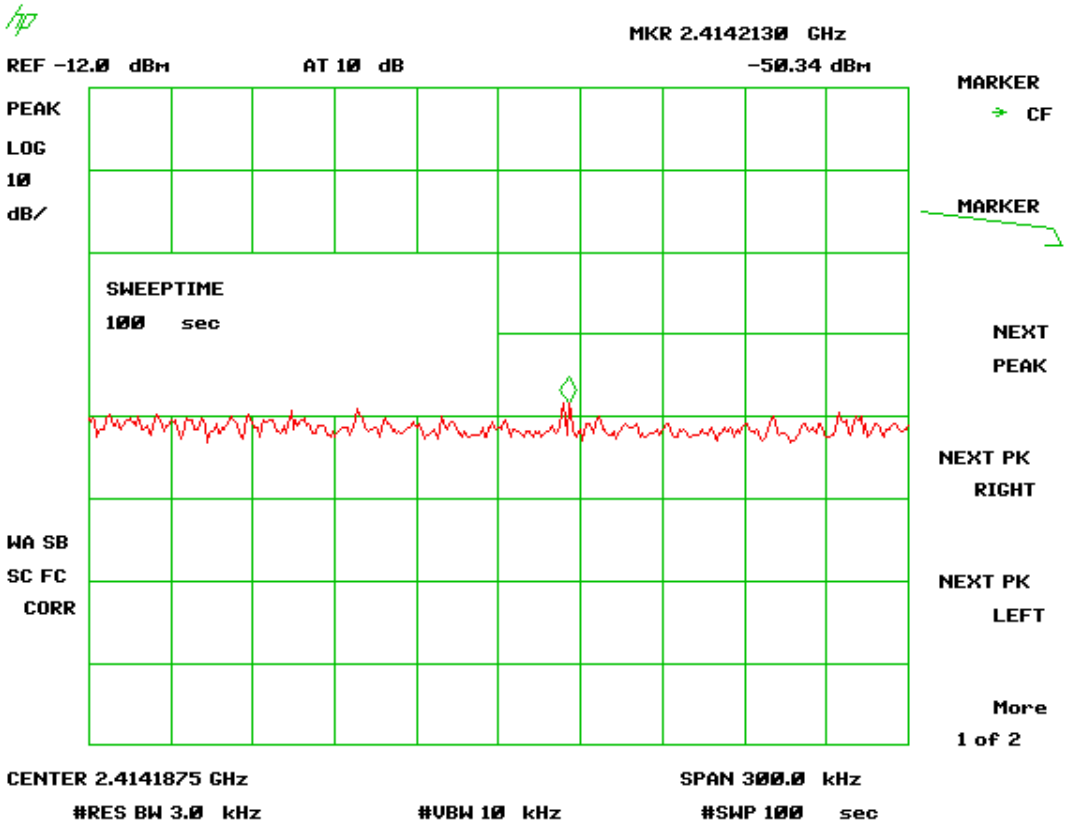


Figure 43. Peak Power Spectral Density - Part 15.247 (e) - Low Channel

Note: Reference NOT adjusted for correction factor.

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

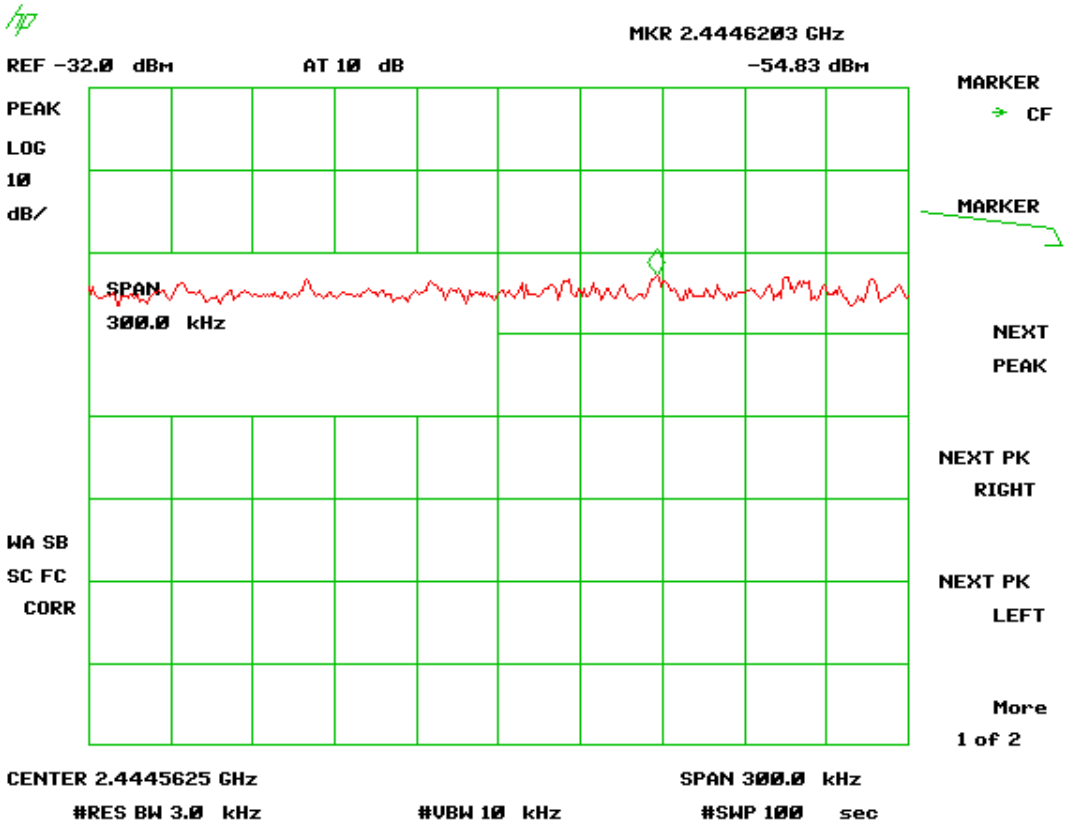


Figure 44. Peak Power Spectral Density - Part 15.247 (e) - Mid Channel

Note: Reference NOT adjusted for correction factor.

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

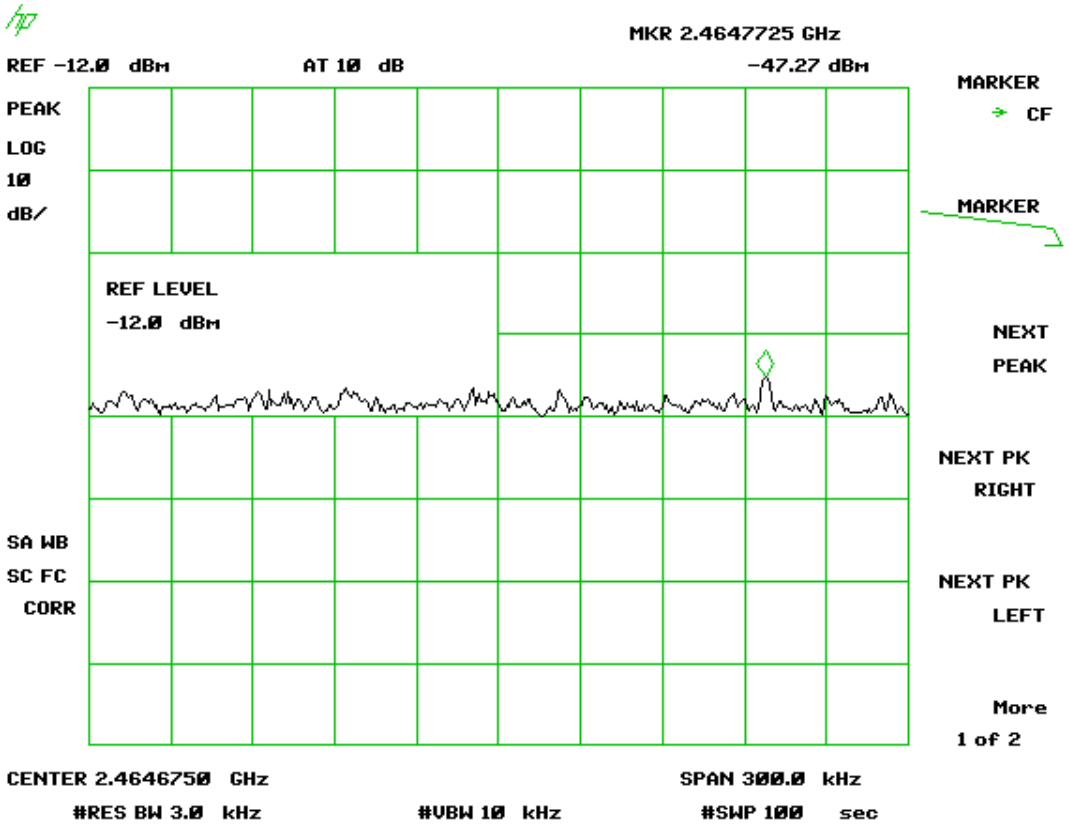


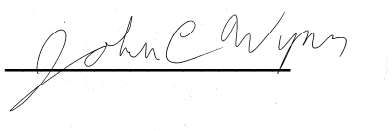
Figure 45. Peak Power Spectral Density - Part 15.247 (e) - High Channel

Note: Reference NOT adjusted for correction factor.

Table 14. Power Spectral Density for 802.11n Low, Mid and High Bands

Frequency (MHz)	Test Data (dBm/3 KHz)	Results (dBm/3 kHz)	FCC Limit (dBm/3 kHz)
Low-2410	-53.91	-13.96	+8.0
Mid-2444	-54.23	-14.28	+8.0
High- 2460	-53.40	-13.19	+8.0

Note: Reference adjusted for correction factor.

Test Date: October 20, 2011
Tested By
Signature:  Name: John C. Wynn

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

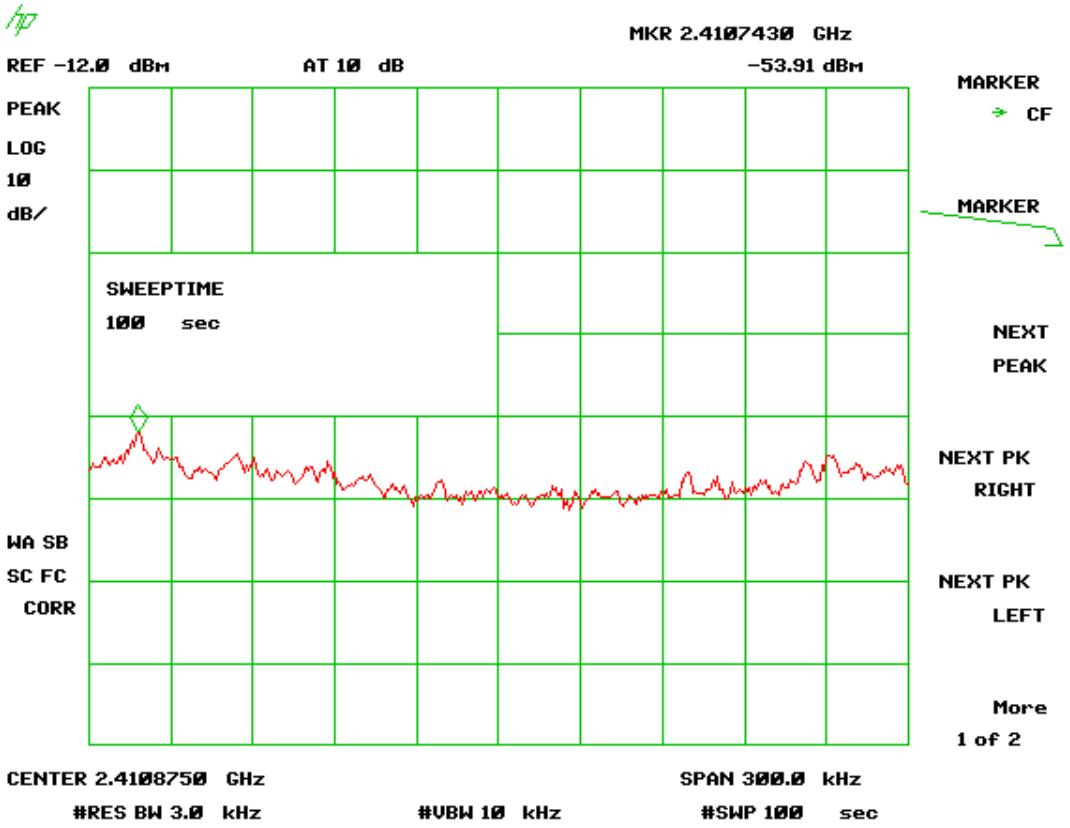


Figure 46. Peak Power Spectral Density - Part 15.247 (e) - Low Channel

Note: Reference NOT adjusted for correction factor

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

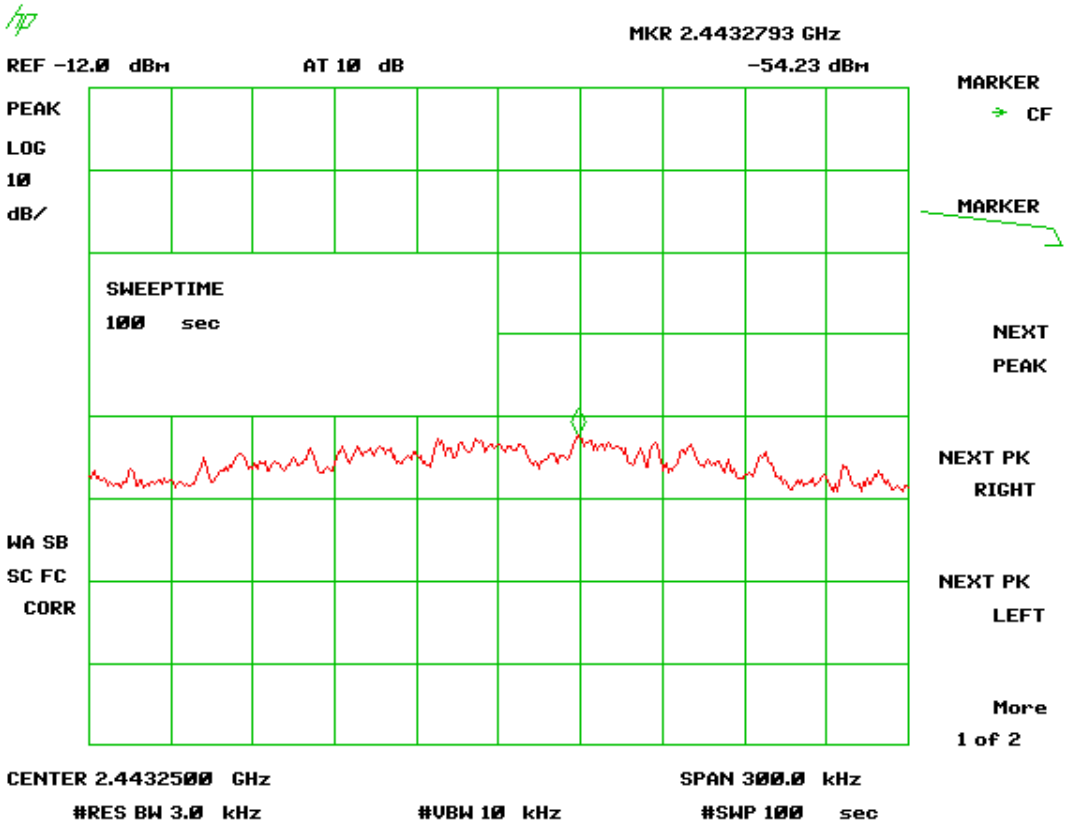


Figure 47. Peak Power Spectral Density - Part 15.247 (e) - Mid Channel

Note: Reference NOT adjusted for correction factor.

2.13 Power Spectral Density (CFR 15.247(e)) (IC RSS 210 A8.5), (Cont'd).

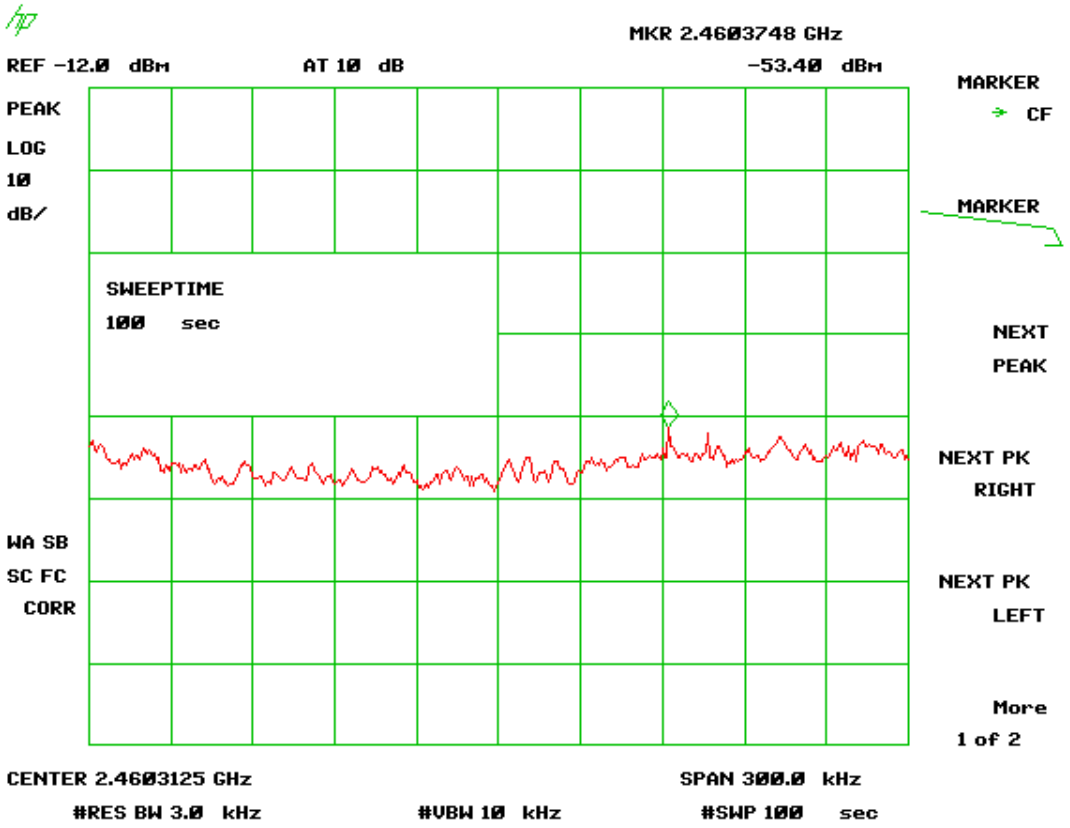


Figure 48. Peak Power Spectral Density - Part 15.247 (e) - High Channel

Note: Reference NOT adjusted for correction factor.

2.14 Band Edge Measurements – (CFR 15.247 (d))

Band Edge measurements are made following the guidelines in FCC KDB Publication No. 558074 with the EUT initially operating on the Lowest Channel and then operating on the Highest Channel within its band of operation. Antenna port conducted measurements were not possible the **alternative method** was used to demonstrate compliance with the requirement of 15.247(d) that all emissions outside of the band edges be attenuated by at least 20 dB when compared to its highest in-band value (contained in a 100 kHz band). Because these frequencies occur above 1000 MHz they have both a peak and average requirement.

To capture the band edge set the Spectrum Analyzer frequency span large enough (usually around 10 MHz) to capture the peak level of the emission operating on the channel closest to the band edge as well as any modulation products falling outside of the authorized band of operation. Conducted measurements are performed with RBW ≥1% of the frequency span. In all cases, the VBW is set ≥ RBW. See figure 24 and 24 below.

2.14 Band Edge (Cont'd)

Table 15. 802.11b Upper Band Edge - Radiated Emissions

Peak Radiated Higher Band Edge Measurements								
Test By: JCW	**Test: FCC Part 15.247**				**Client: Level Vision Electronics**			
	Project: 11-0204		**Class: B**		**Model: MUSN-FE6-T800**			
Frequency (MHz)	**AF table**	**Test data**	**AF+CA-AMP+DC dB/m**	**Corrected Results (dBuV/m)**	**Limits (dBuV/m)**	**Distance /**	**Margin (dB)**	**Detector PK / AVG**
Internal Antenna								
Fund. 2464.00	1HN3mV	65.03	31.89	96.92	--	3m./	--	**AVG**
Band Edge 2483.5	--	(96.92 -46.1)	--	50.82	54.0	3m./	See calculation below	**PK**

The limit for the average value of radiated emissions in a Restricted Band is 54 dBuV/m. To compute the average values of the band edge emissions, the duty cycle correction factor of -25.39 dB is applied to the values in the Corrected Results column. After this correction the EUT is found to have met the restrictions placed on average radiated emissions in Restricted Bands. The worst-case measurement is computed below.

CALCULATION OF WORST-CASE AVERAGE UPPER BAND EDGE MEASUREMENT:
Results = Peak Corrected Results + Duty Cycle Correction Factor
Results = 50.82+ (-25.39) = 25.43 dBuV/m
Margin = Limit – Results = 54 – 25.43= 28.57 dB

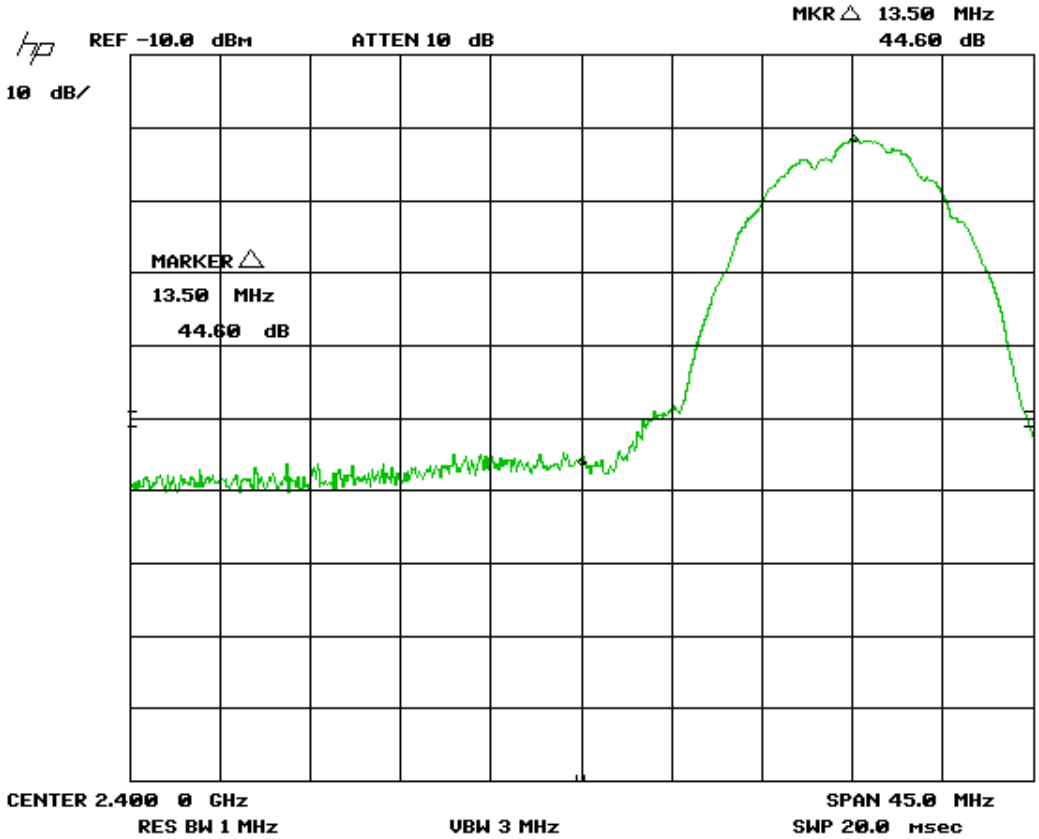


Figure 49. 802.11b – Band Edge Compliance – Low Channel Delta - Peak

Note: Conducted emissions shown here are worst case.

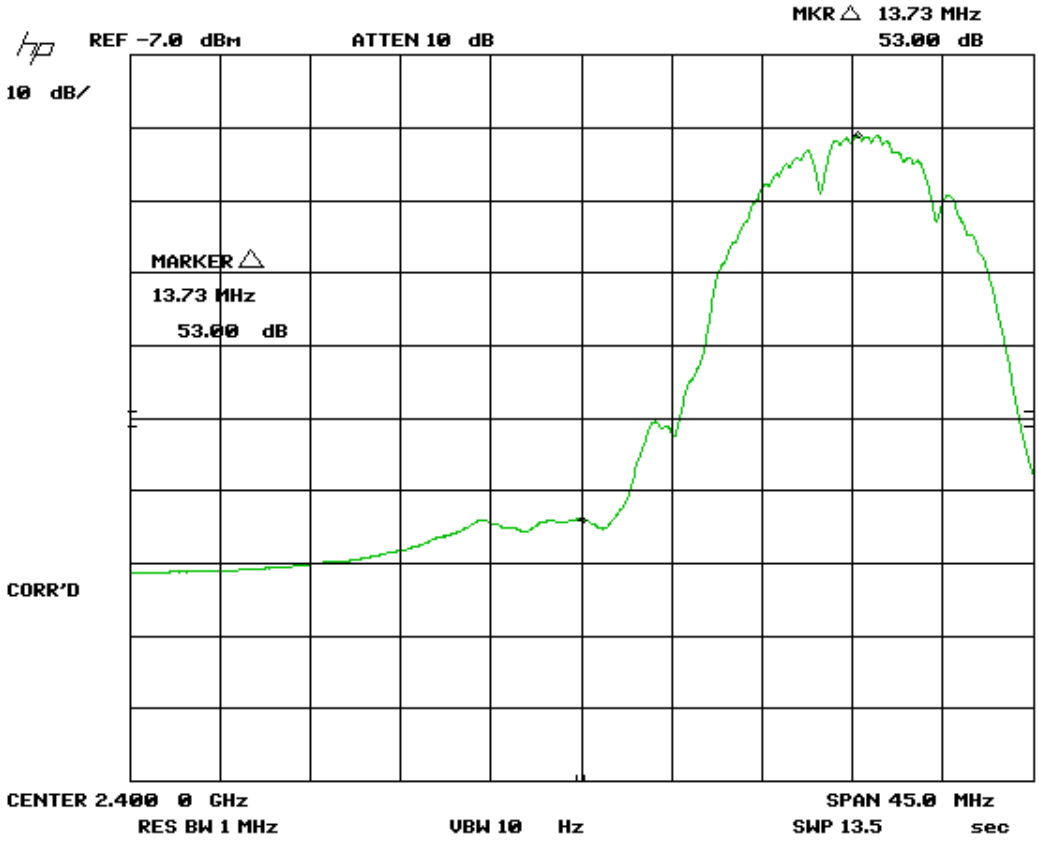


Figure 50. 802.11b – Band Edge Compliance – Low Channel Delta - AVG

Note: Conducted emissions shown here are worst case.

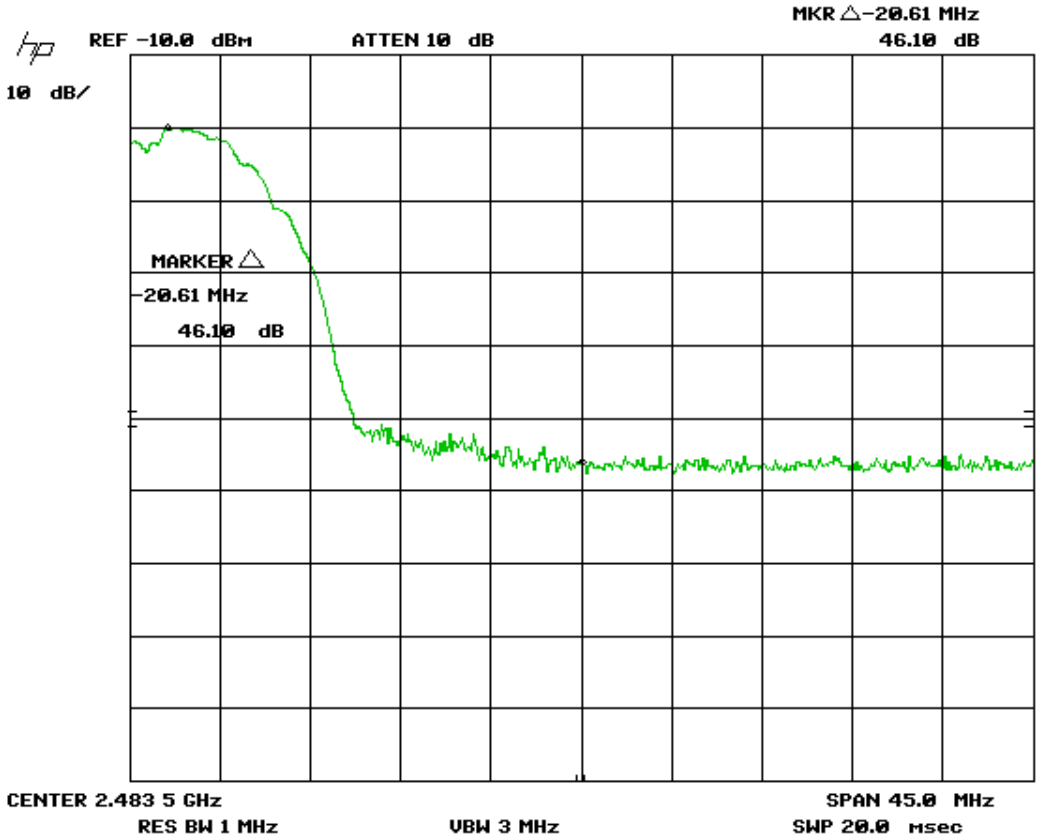


Figure 51. 802.11b – Band Edge Compliance – High Channel Delta - Peak

Note: Conducted emissions shown here are worst case.

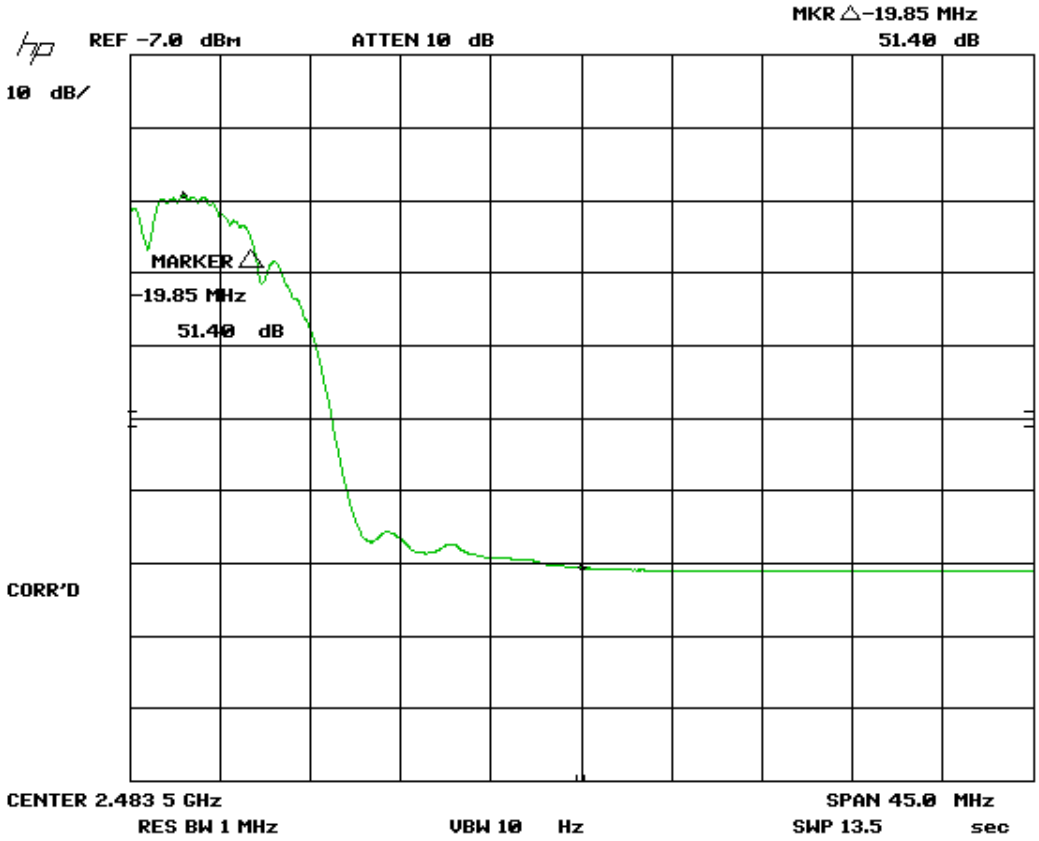


Figure 52. 802.11b – Band Edge Compliance – High Channel Delta - AVG

Note: Conducted emissions shown here are worst case.

2.14 Band Edge (Cont'd)

Table 13. 802.11g Upper Band Edge - Radiated Emissions

Peak Radiated Higher Band Edge Measurements								
Test By: JCW	**Test: FCC Part 15.247**				**Client: Level Vision Electronics**			
	Project: 11-0204		**Class: B**		**Model: MUSN-FE6-T800**			
Frequency (MHz)	**AF table**	**Test data**	**AF+CA-AMP+DC dB/m**	**Corrected Results (dBuV/m)**	**Limits (dBuV/m)**	**Distance /**	**Margin (dB)**	**Detector PK / AVG**
Internal Antenna								
Fund. 2464.50	1HN3mV	64.55	31.89	96.44	--	3m./	--	**AVG**
Band Edge 2483.5	--	(96.44 -40.3)	--	56.14	54.0	3m./	See calculation below	**PK**

The limit for the average value of radiated emissions in a Restricted Band is 54 dBuV/m. To compute the average values of the band edge emissions, the duty cycle correction factor of -25.39 dB is applied to the values in the Corrected Results column. After this correction the EUT is found to have met the restrictions placed on average radiated emissions in Restricted Bands. The worst-case measurement is computed below.

CALCULATION OF WORST-CASE AVERAGE UPPER BAND EDGE MEASUREMENT:
Results = Peak Corrected Results + Duty Cycle Correction Factor
Results = 56.14+ (-25.39) = 30.75dBuV/m
Margin = Limit – Results = 54 – 30.75 = 23.25 dB

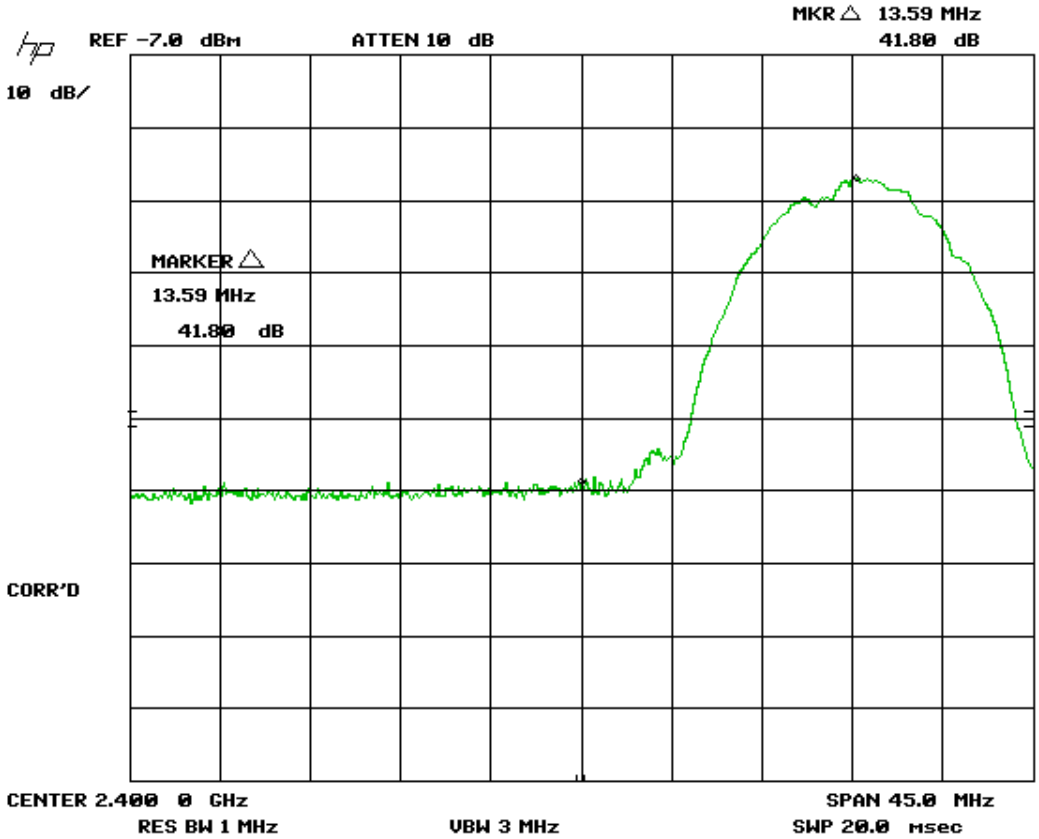


Figure 53. 802.11g – Band Edge Compliance – Low Channel Delta - Peak

Note: Conducted emissions shown here are worst case.

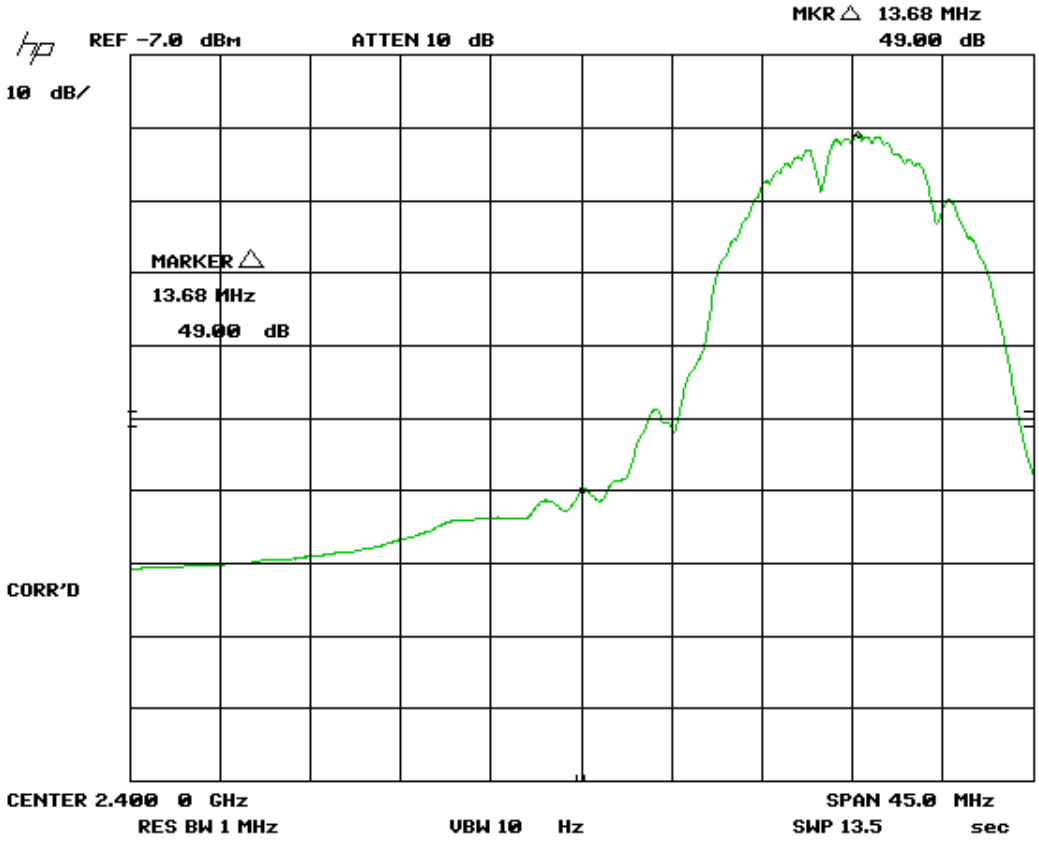


Figure 54. 802.11g – Band Edge Compliance – Low Channel Delta - AVG

Note: Conducted emissions shown here are worst case.

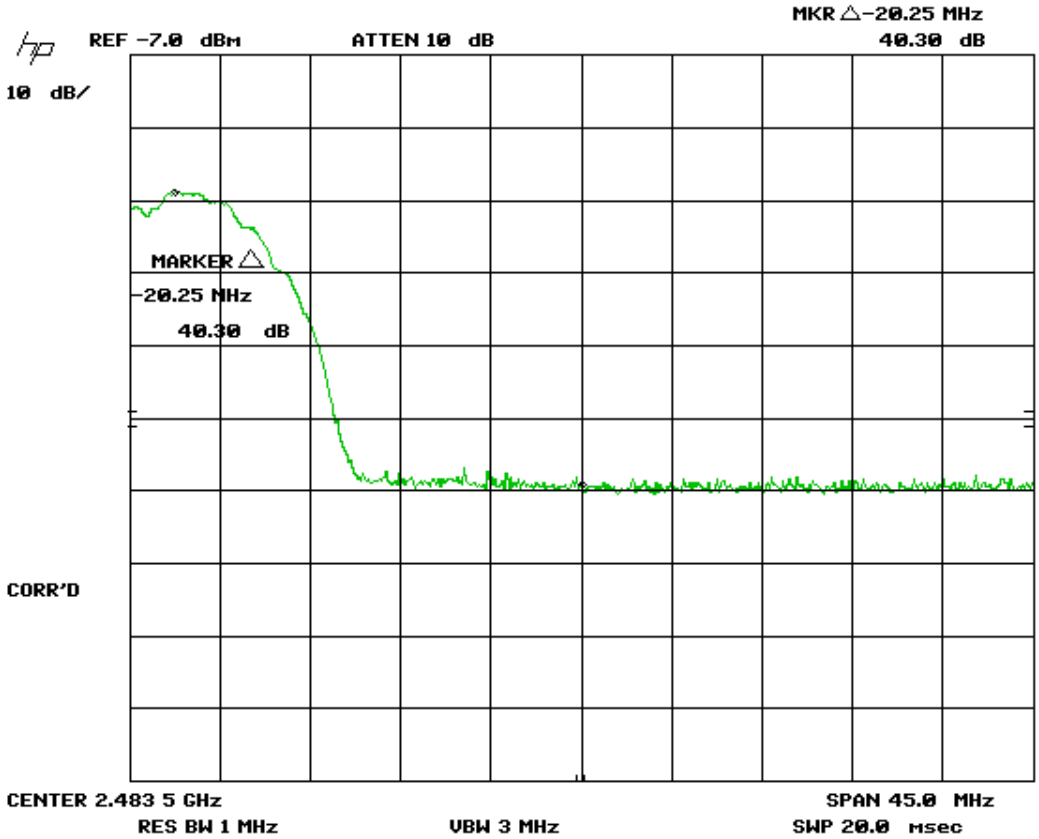


Figure 55. 802.11g – Band Edge Compliance – High Channel Delta - Peak

Note: Conducted emissions shown here are worst case.

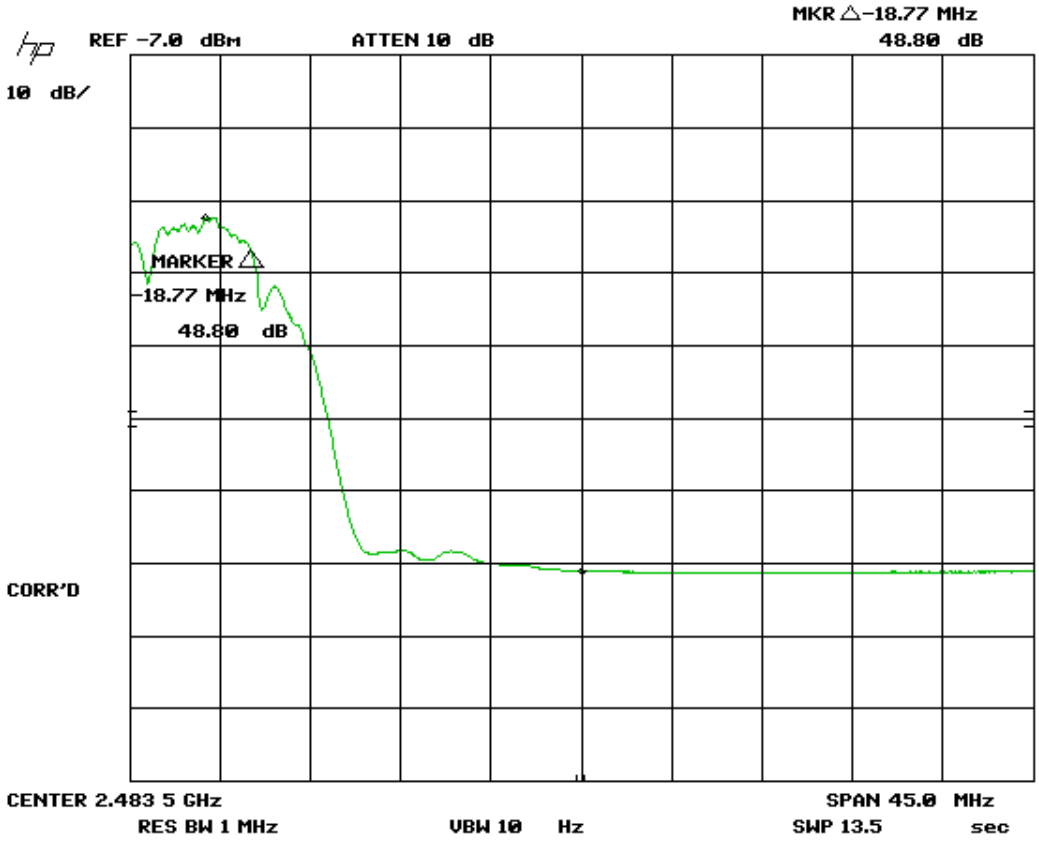


Figure 56. 802.11g – Band Edge Compliance – High Channel Delta - AVG

Note: Conducted emissions shown here are worst case.

2.14 Band Edge (Cont'd)

Table 13. 802.11n Upper Band Edge - Radiated Emissions

Peak Radiated Higher Band Edge Measurements								
Test By: JCW	**Test: FCC Part 15.247**				**Client: Level Vision Electronics**			
	Project: 11-0204		**Class: B**		**Model: MUSN-FE6-T800**			
Frequency (MHz)	**AF table**	**Test data**	**AF+CA-AMP+DC dB/m**	**Corrected Results (dBuV/m)**	**Limits (dBuV/m)**	**Distance /**	**Margin (dB)**	**Detector PK / AVG**
Internal Antenna								
Fund. 2463.00	1HN3mV	52.85	31.89	84.74	--	3m./	--	**AVG**
Band Edge 2483.5	--	(84.74 -38.7)	--	46.04	54.0	3m./	See calculation below	**PK**

The limit for the average value of radiated emissions in a Restricted Band is 54 dBuV/m. To compute the average values of the band edge emissions, the duty cycle correction factor of -25.39 dB is applied to the values in the Corrected Results column. After this correction the EUT is found to have met the restrictions placed on average radiated emissions in Restricted Bands. The worst-case measurement is computed below.

CALCULATION OF WORST-CASE AVERAGE UPPER BAND EDGE MEASUREMENT:
Results = Peak Corrected Results + Duty Cycle Correction Factor
Results = 46.04+ (-25.39) = 20.65dBuV/m
Margin = Limit – Results = 54 – 20.65 = 33.35 dB

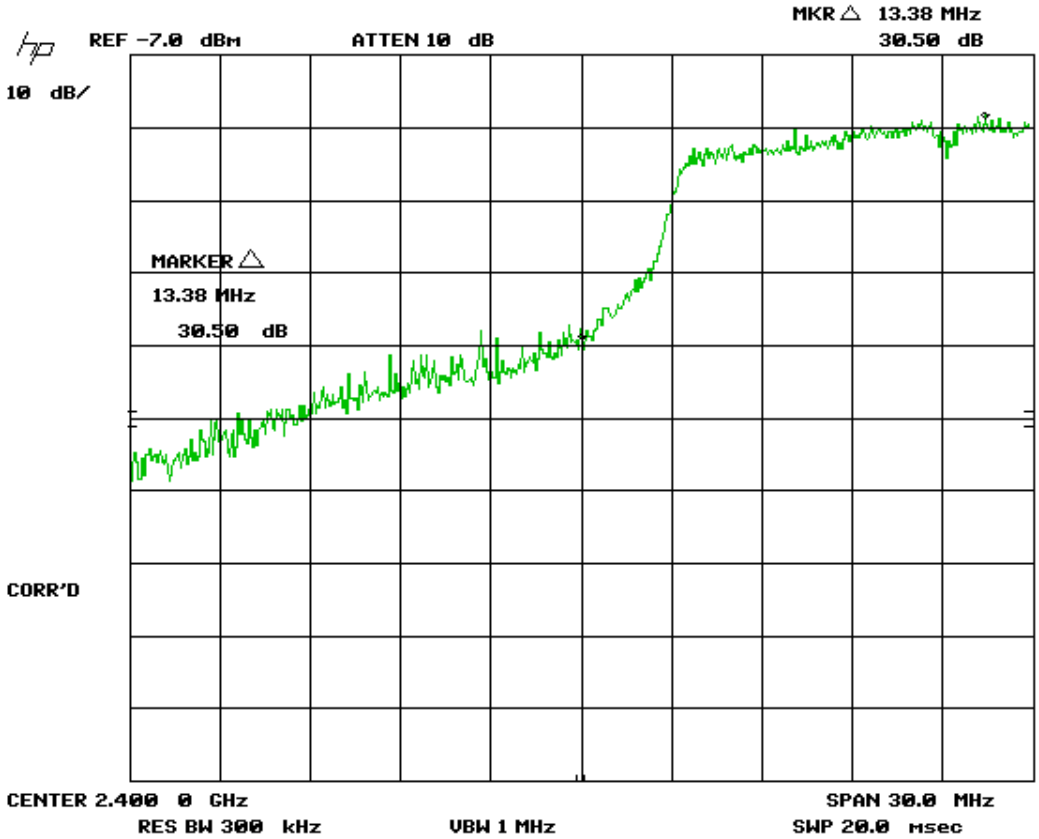


Figure 57. 802.11n – Band Edge Compliance – Low Channel Delta - Peak

Note: Conducted emissions shown here are worst case.

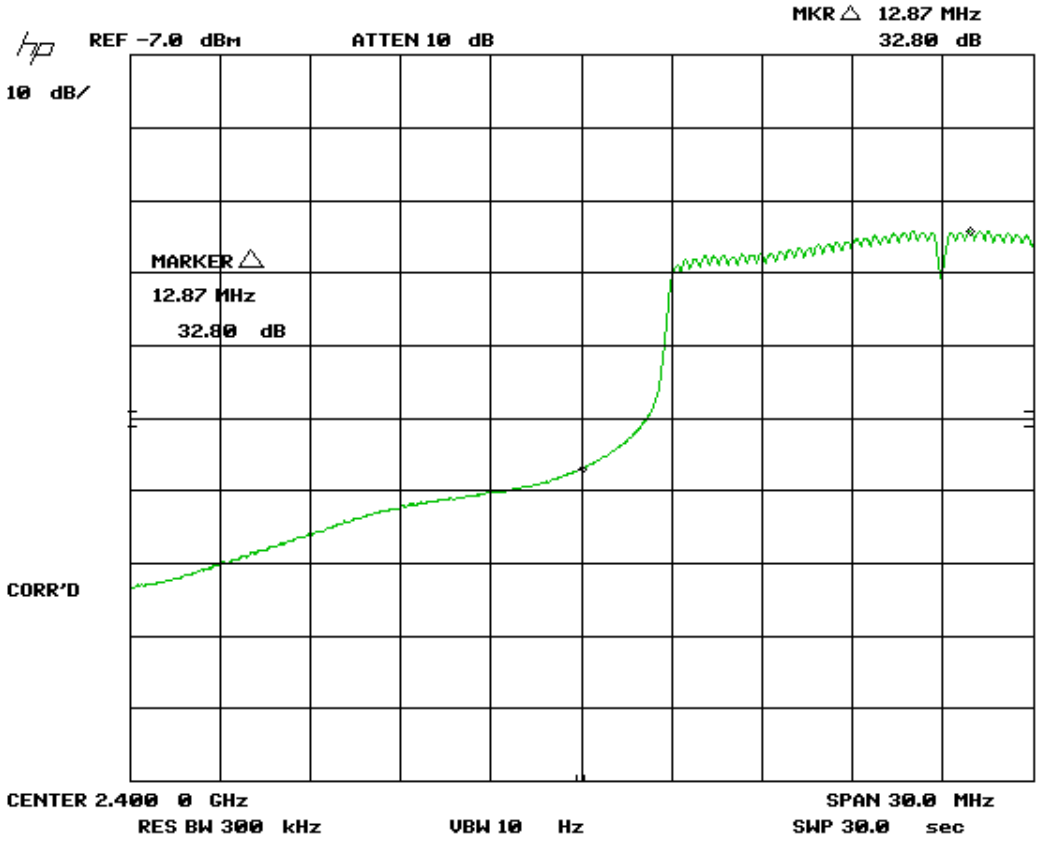


Figure 58. 802.11n – Band Edge Compliance – Low Channel Delta - AVG

Note: Conducted emissions shown here are worst case.

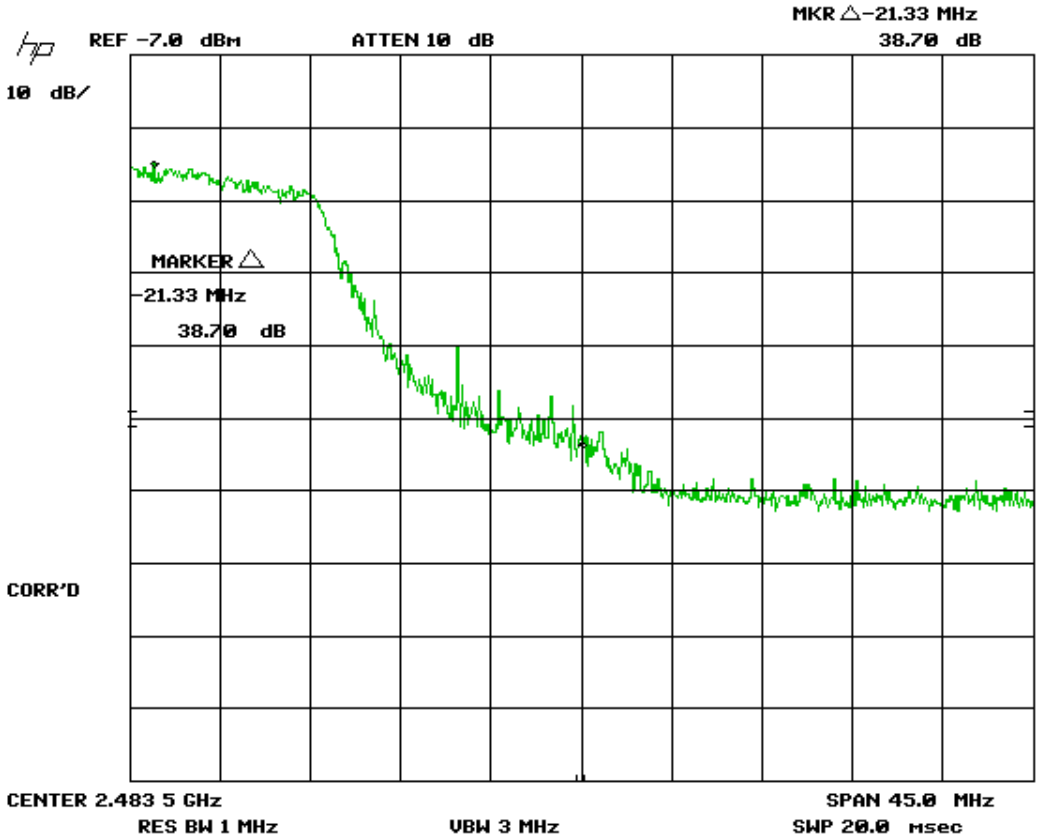


Figure 59. 802.11n – Band Edge Compliance – High Channel Delta - Peak

Note: Conducted emissions shown here are worst case.

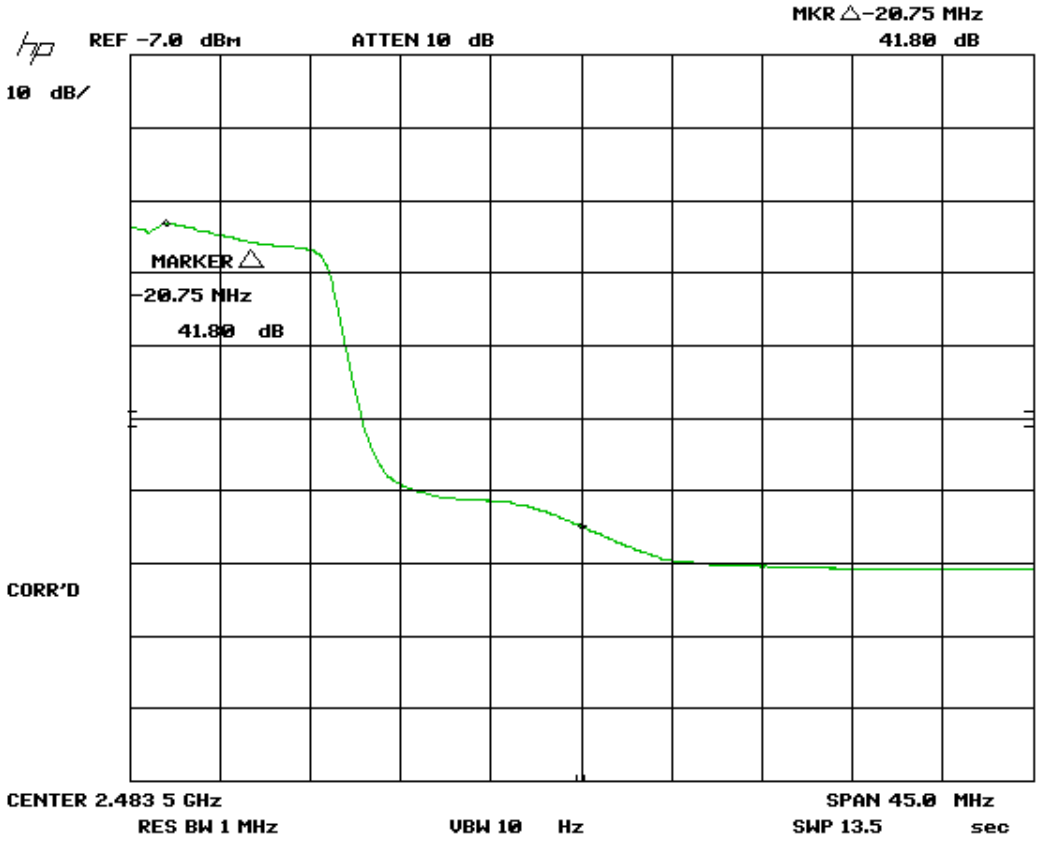


Figure 60. 802.11n – Band Edge Compliance – High Channel Delta - AVG

Note: Conducted emissions shown here are worst case.

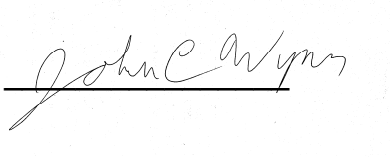
2.15 20 dB Bandwidth Measurement per CFR 15.247, 99% Occupied Bandwidth (IC RSS 210, A8.1)

The EUT does not have an accessible antenna port; the alterative method was used to collect measurements per the FCC, KDB Publication No. 558074 for a bandwidth of 20 dB. The RBW was set to approximately 1/100 of the manufacturers claimed RBW and with the VBW ≥ RBW. The results of this test are given in Table 15 through 17 and Figures 61 through 69.

Table 16. 802.11b 20 dB Bandwidth and 99% Occupied Bandwidth

Frequency (MHz)	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
2412.65	13.08	13.08
2443.38	12.66	12.66
2463.2	12.29	12.29

Test Date: October 6, 2011

Tested By
Signature:  Name: John C. Wynn

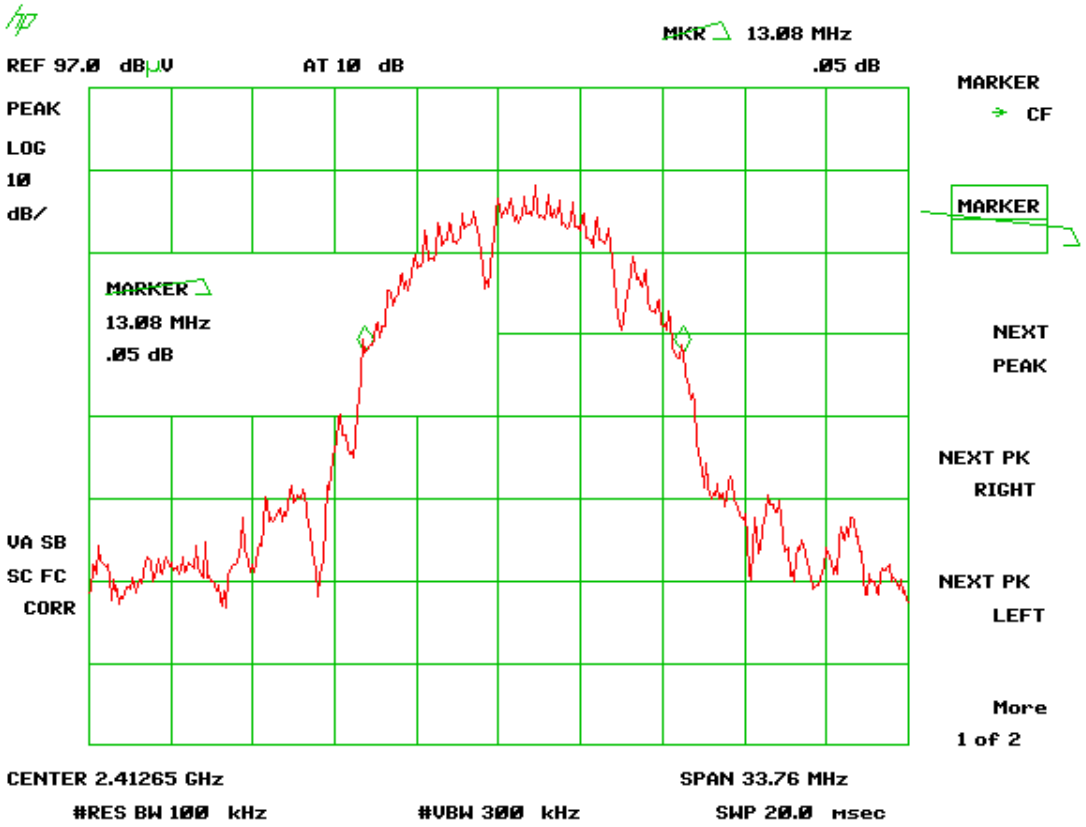


Figure 61. 802.11b - Low Channel 99% Bandwidth

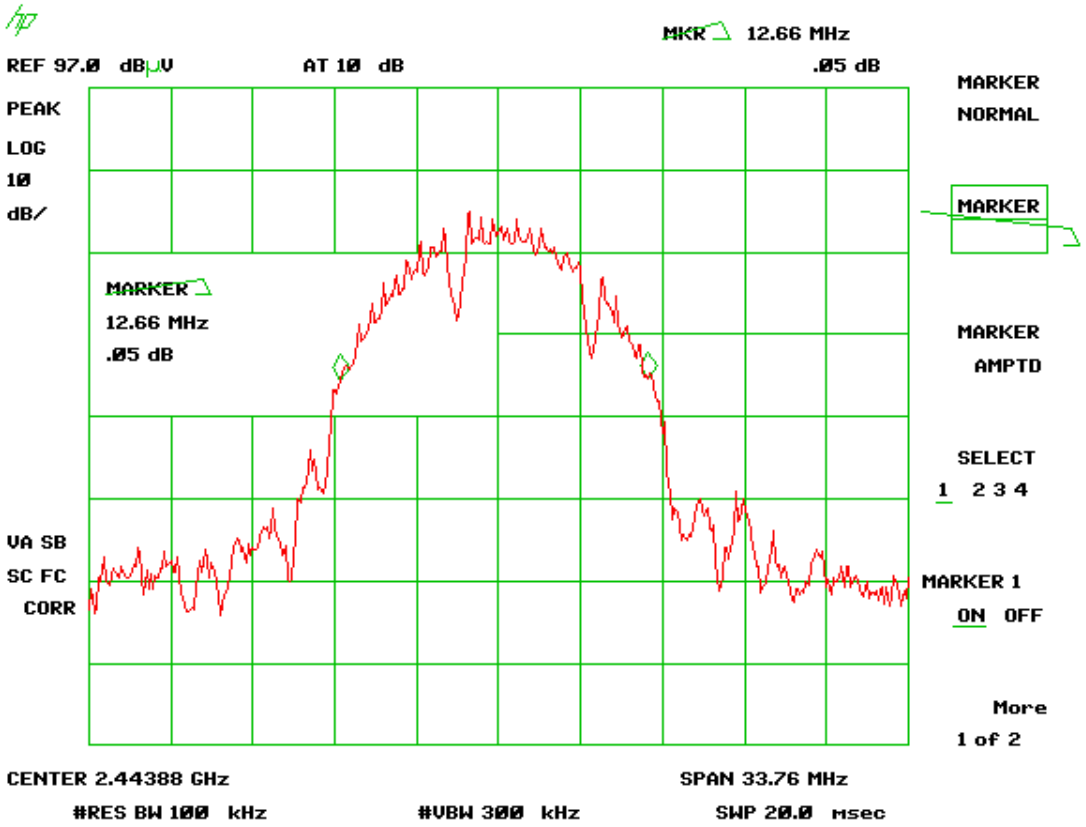


Figure 62. 802.11b - Mid Channel 99% Bandwidth

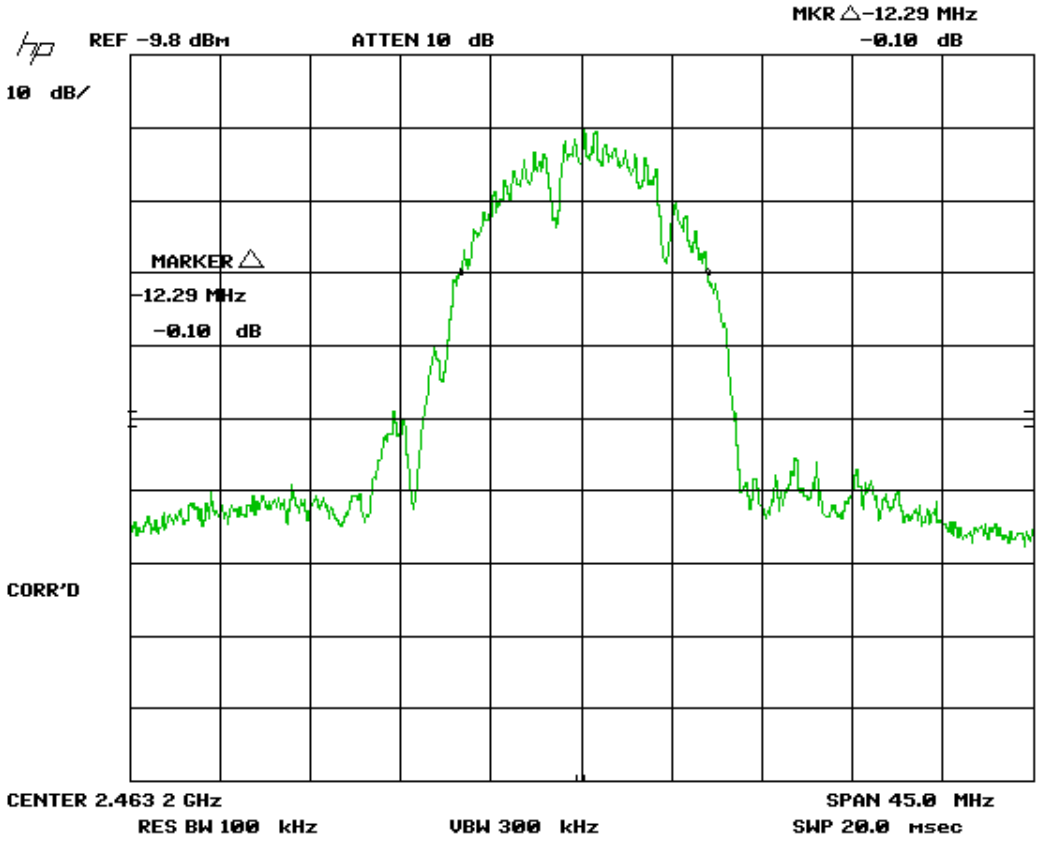
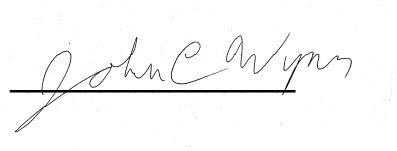


Figure 63. 802.11b - High Channel 99% Bandwidth

Table 17. 802.11g 20 dB Bandwidth and 99% Occupied Bandwidth

Frequency (MHz)	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
2443.5	12.42	12.42
2443.5	13.14	13.14
2462.6	12.38	12.38

Test Date: October 6, 2011

Tested By
Signature:  Name: John C. Wynn

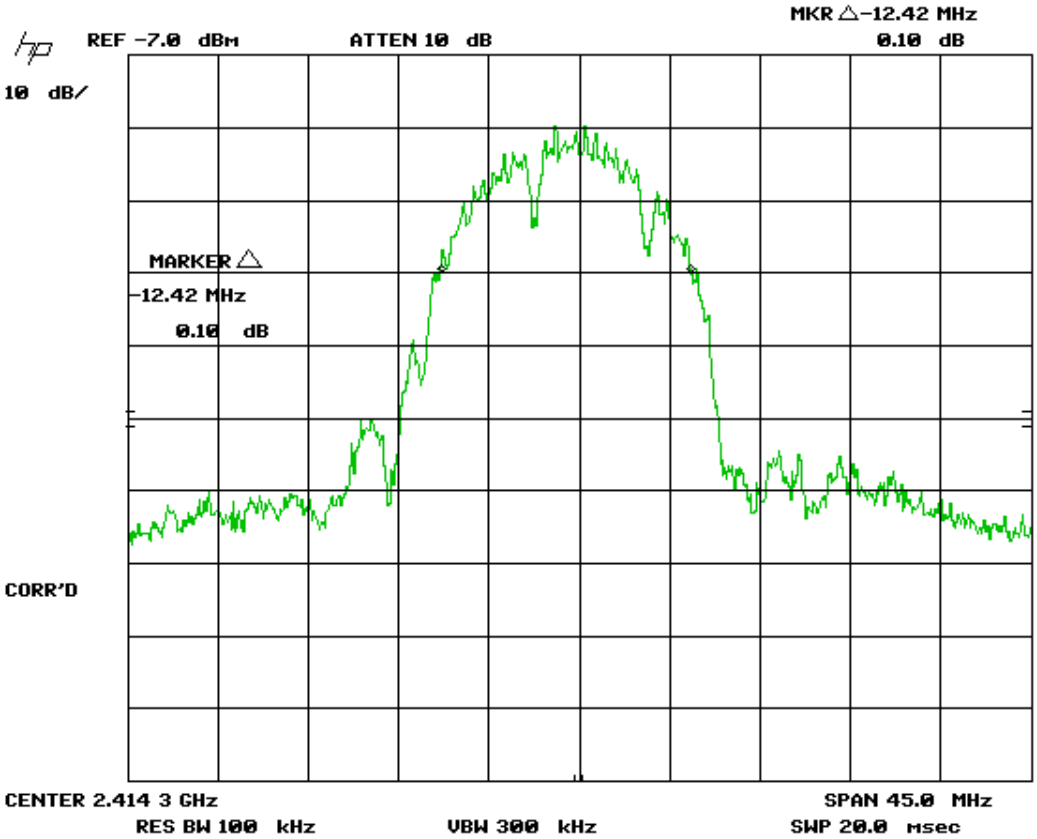


Figure 64. 802.11g - Low Channel 99% Bandwidth

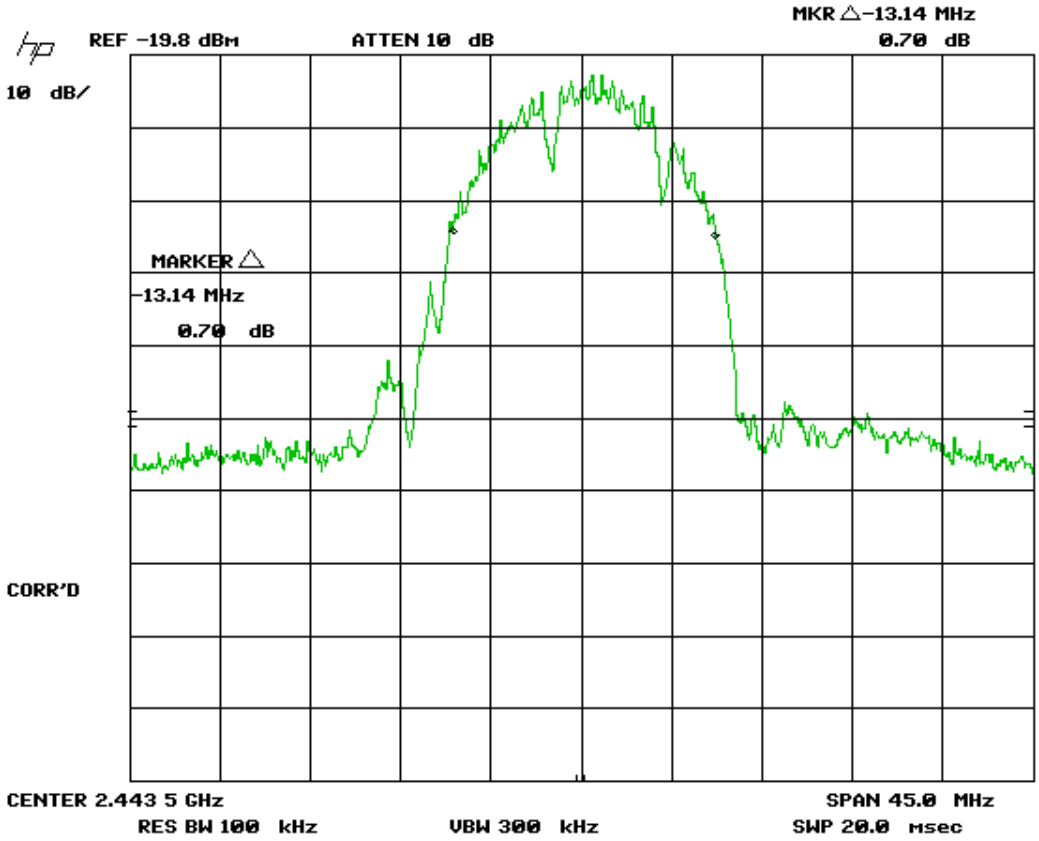


Figure 65. 802.11g - Mid Channel 99% Bandwidth

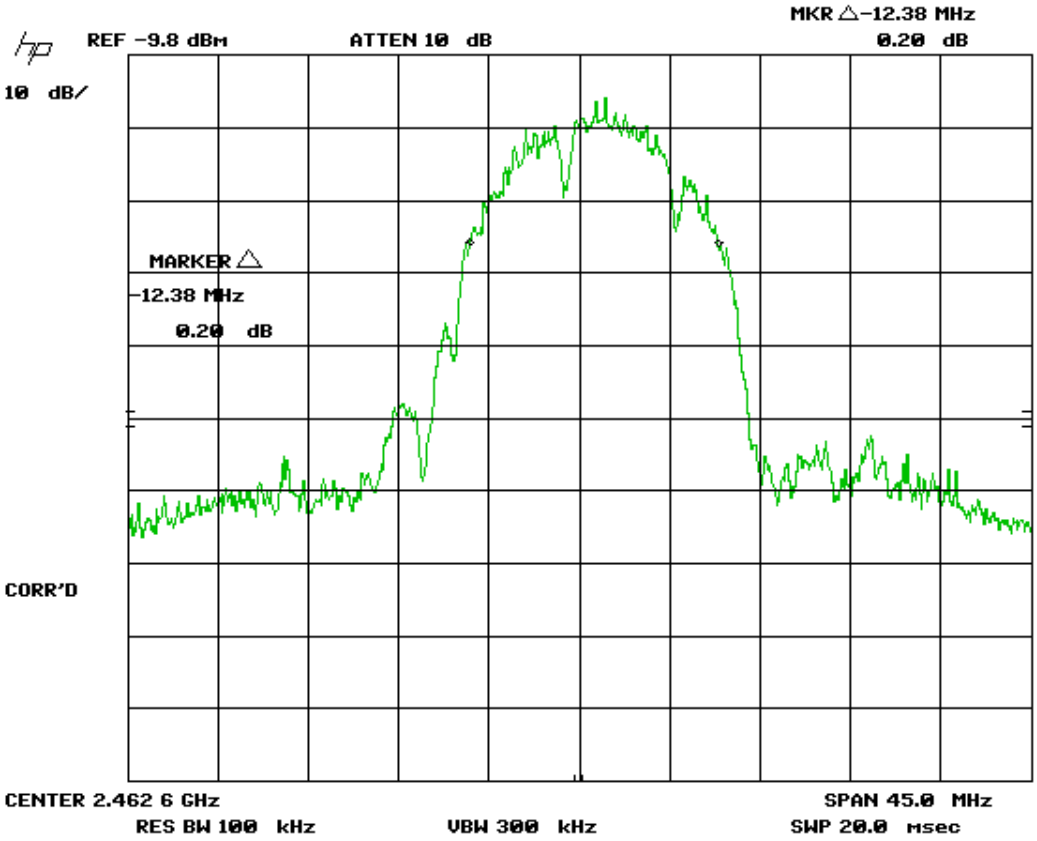
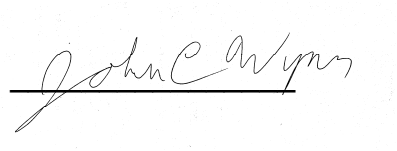


Figure 66. 802.11g - High Channel 99% Bandwidth

Table 18. 802.11n 20 dB Bandwidth and 99% Occupied Bandwidth

Frequency (MHz)	20 dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
2411.7	18.45	18.45
2442.1	18.68	18.68
2462.0	18.63	18.63

Test Date: October 6, 2011

Tested By
Signature:  Name: John C. Wynn

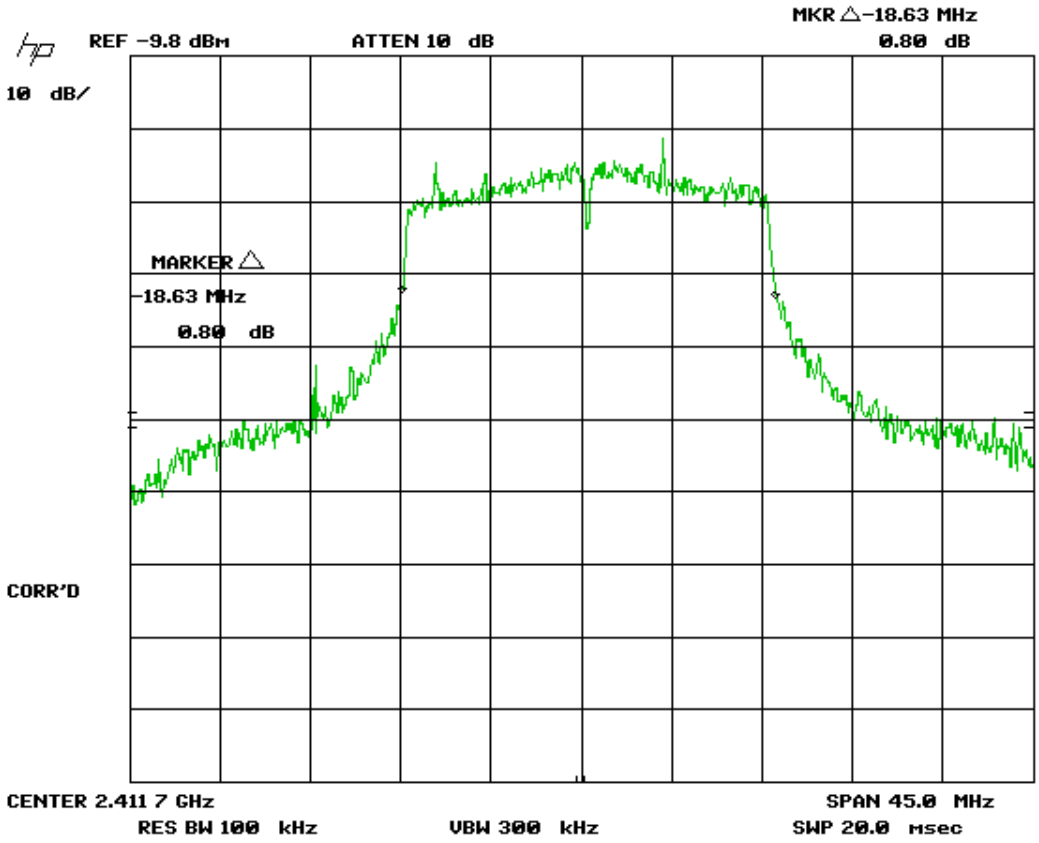


Figure 67. 802.11n - Low Channel 99% Bandwidth

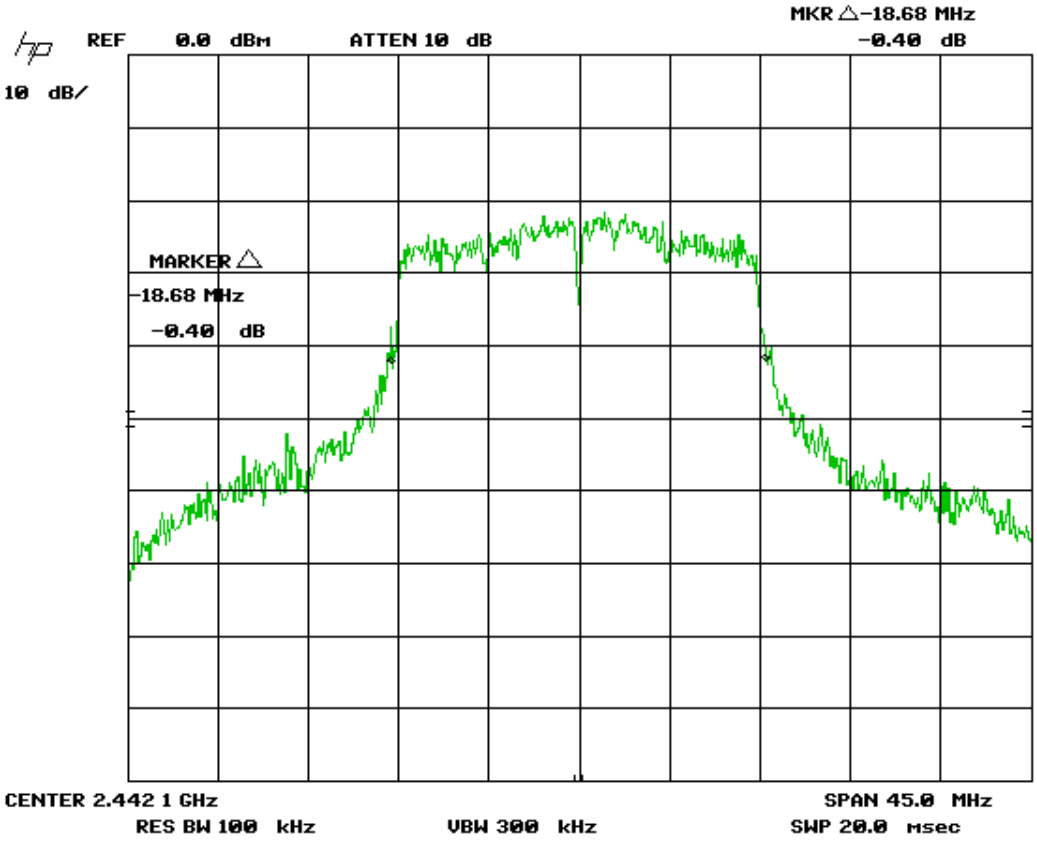


Figure 68. 802.11n - Mid Channel 99% Bandwidth

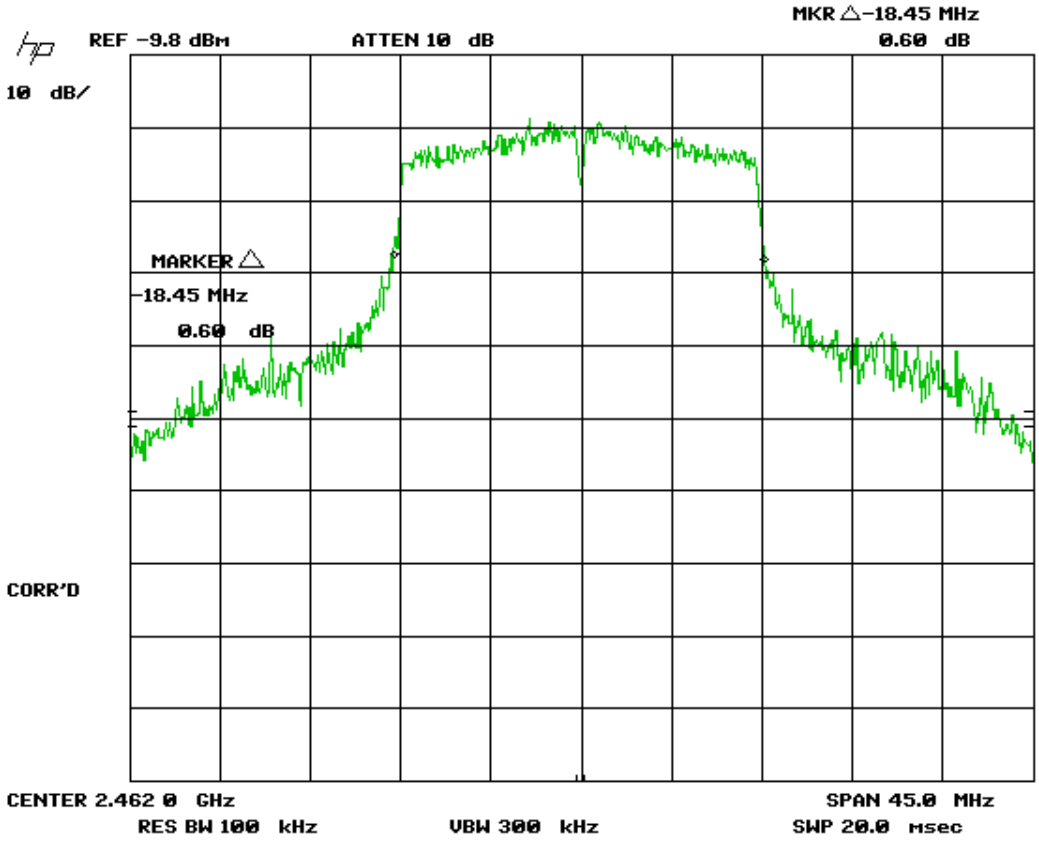


Figure 69. 802.11n - High Channel 99% Bandwidth

2.16 Unintentional Radiator Power Lines Conducted Emissions (CFR 15.107)

The test data provided herein is to support the Verification requirement for the digital apparatus. The power line conducted voltage measurements for Receiver and Digital Devices have been carried out in accordance with CFR 15.107 and ANSI C63.4, Paragraph 7, with a spectrum analyzer connected to an LISN and the EUT placed into an idle condition or a continuous mode of receive (non-transmitting). Please refer to the results as shown in Table 18 below.

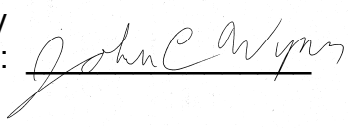
The testing was done with the Wifi turned on and the Blue Tooth tuned off. There were no signals within 7.4 dB of the average limits. Those results are given in Table 19 below.

2.16 Unintentional Radiator Power Lines Conducted Emissions (Cont'd)

Table 19. Power Line Conducted Emissions Data, Class B Part 15.107, Peak Measurement vs. Avg. Limits

CONDUCTED EMISSIONS 150 kHz to 30 MHz						
Tested By: JCW	**Specification Requirement: FCC Part 15.207 Class B**		**Project No.: 11-0204**	**Manufacturer: Level Vision Electronics Model: MUSN-FE6-T800**		
Frequency (MHz)	**Test Data (dBuV)**	**LISN+CL-PA (dB)**	**Corrected Results (dBuV)**	**Avg Limits (dBuV)**	**Margin (dB)**	**Detector**
120 VAC, 60 Hz, Phase Line						
0.1794	56.70	0.46	57.16	64.5	7.4	**PK**
0.1794	37.30	0.46	37.76	54.5	16.8	**AVG**
0.5750	36.60	0.14	36.74	46.0	9.3	**PK**
1.8080	33.70	0.26	33.96	46.0	12.0	**PK**
5.2550	25.50	0.33	25.83	50.0	24.2	**PK**
11.8400	24.00	0.56	24.56	50.0	25.4	**PK**
25.2700	24.90	1.07	25.97	50.0	24.0	**PK**
120 VAC, 60 Hz, Neutral Line						
0.1752	55.00	0.46	55.46	64.7	9.3	**PK**
0.1752	31.30	0.46	31.76	54.7	23.0	**AVG**
0.5210	33.80	0.24	34.04	46.0	12.0	**PK**
1.3000	28.90	0.36	29.26	46.0	16.7	**PK**
9.1600	27.20	0.61	27.81	50.0	22.2	**PK**
15.9500	29.90	0.75	30.65	50.0	19.4	**PK**
20.0300	23.70	0.80	24.50	50.0	25.5	**PK**

SAMPLE CALCULATIONS: At 1.808 MHz = 33.7 + (0.26) = 33.96 dBuV

Test Date: October 10, 2011
Tested By
Signature: 

Name: John C. Wynn

2.17 Unintentional Radiator, Radiated Emissions (CFR 15.109, 15.209)

The test data provided herein supports the verification requirement for digital devices. Radiated emissions coming from the EUT in a non-transmit state per 15.109 and radiated emissions coming for the EUT in a transmitting state per 15.209 were evaluated from 30 MHz to 12.5 GHz as detailed in ANSI C63.4, Paragraph 8. The worst case is presented herein.

Measurements were made with the analyzer's resolution bandwidth set to 120 kHz for measurements made below 1 GHz and with the analyzer's resolution bandwidth set to 1 MHz for measurements made above 1 GHz. The video bandwidth was set to three times the resolution bandwidth; 1 MHz RBW and 3 MHz VBW. The test data were maximized for magnitude by rotating the turn-table through 360 degrees and raising and lowering the receiving antenna between 1 to 4 meters in height as a part of the measurement procedure. All measured signals were at least 15.1 dB below the specification limit. The results are shown in Table 20 below.

For EUT with oscillator circuits that generate a frequency below 30 MHz, measurements were made with the analyzer's resolution bandwidth set to 9 KHz and a calibrated Loop Antenna was used. At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade) (CFR15.31f(2)).

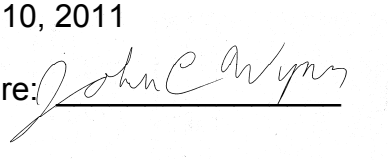
All emission within the range of 1.705 MHz to 30 MHz was less than 20 dBm from the applicable limit. The test was conducted using a calibrated loop antenna on US Tech's OATS site at a distance of 3 meters.

Table 20 . Unintentional Radiator, Radiated Emissions.

Unintentional Radiator, Radiated Emissions							
Test By: JCW	**Test: FCC Part 15.109, 15.209**			**Client: Level Vision Electronics**			
	Project: 11-0204 Class: B			**Model: MUSN-FE6-T800**			
Frequency (MHz)	**Test Data (dBuV)**	**AF+CL-PA (dB)**	**Results (dBuV/m)**	**Limits (dBuV/m)**	**Distance /**	**Margin (dB)**	**DETECTOR PK / QP**
Tested from 1.705 MHz to 12.5 GHz							
168.0410	35.40	-10.61	24.79	43.5	m./	18.7	**PK**
46.4540	37.80	-15.64	22.17	40.0	m./	17.8	**PK**
167.8700	32.60	-11.71	20.89	43.5	m./	22.6	**PK**
345.5940	36.50	-8.43	28.07	46.0	m./	17.9	**PK**
596.3110	35.00	-4.11	30.89	46.0	m./	15.1	**PK**
596.3500	35.20	-4.41	30.79	46.0	m./	15.2	**PK**
365.1470	31.80	-8.13	23.67	46.0	m./	22.3	**PK**
168.2800	37.40	-11.71	25.69	43.5	m./	17.8	**PK**
1903.8000	45.50	-15.75	29.75	54.0	m./	24.2	**PK**
1912.1400	45.21	-15.73	29.48	54.0	m./	24.5	**PK**
6260.0000	40.20	-4.74	35.46	54.0	m./	18.5	**PK**
6255.5000	40.74	-4.71	36.03	54.0	m./	18.0	**PK**

No other emissions detected within 20 dB of the FCC Part 15.109 &15.209 limits
AF is antenna factor. CL is cable loss. PA is preamplifier gain
SAMPLE CALCULATION: At 345.59 MHz: = 36.5 + (-8.43) = 28.07 dBuV/m @ 3m
Margin = (46.0 – 28.07) = 17.9 dB

Test Date: October 10, 2011

Tested By Signature:  Name: John C. Wynn