TÜVRheinland®
Precisely Right.

Emissions
Test Report

EUT Name: Wireless Residential Gateway

Model No.: 5268AC

CFR 47 Part 15.247:2013 and RSS-210:2010

Prepared for:

Mark Rieger
Pace Americas
310 Providence Mine Road
Nevada City, CA 95959
Tel: (530) 274-5440
Fax: (530) 273-6340

Prepared by:

TUV Rheinland of North America, Inc.
1279 Quarry Lane, Ste. A
Pleasanton, CA 94566
Tel: (925) 249-9123
Fax: (925) 249-9124
http://www.tuv.com/

Report/Issue Date:	April 23, 2014
Reissue Date:	April 30, 2014
Report Number:	31460845.001
Project Number:	0000118910
Revision Number	1

Revisions

Revision No.	Date MM/DD/YYYY	Reason for Change	Author
0	04/24/2014	Original Document	N/A
1	04/30/2014	Revised FCC ID number (throughout report).	J. Luong

Note: Latest revision report will replace all previous reports.

Statement of Compliance

Manufacturer:	Pace Americas 310 Providence Mine Road Nevada City, CA 95959 (530) 274-5440
Requester / Applicant:	Mark Rieger
Name of Equipment:	Wireless Residential Gateway
Model No.	5268AC
Type of Equipment:	Intentional Radiator
Application of Regulations:	CFR 47 Part 15.247:2013 and RSS-210:2010
Test Dates:	26 March 2014 to 10 April 2014

Guidance Documents:

Emissions: ANSI C63.10: 2009, KDB 558074 D01 DTS Measurement Guidance v03r01

Test Methods:

Emissions: ANSI C63.10: 2009, KDB 558074 D01 DTS Measurement Guidance v03r01

The electromagnetic compatibility test and documented data described in this report has been performed and recorded by TUV Rheinland, in accordance with the standards and procedures listed herein. As the responsible authorized agent of the EMC laboratory, I hereby declare that the equipment described above has been shown to be compliant with the EMC requirements of the stated regulations and standards based on these results. If any special accessories and/or modifications were required for compliance, they are listed in the Executive Summary of this report.

This report must not be used to claim product endorsement by A2LA or any agency of the U.S. Government. This report contains data that are not covered by A2LA accreditation. This report shall not be reproduced except in full, without the written authorization of TUV Rheinland of North America.

Digitally signed by Conan Boyle
DN: cn=Conan Boyle, o=TUV Rheinland of North America, ou=SFR EMC, email=cboyle@us.tuv.com, c=US
Date: 2014.04.30 15:04:24 -07'00'

Jeremy Luong	April 23, 2014	Conan Boyle	April 30, 2014 (Reissue Date)
Test Engineer	Date	Laboratory Signatory	Date

Testing Cert #3331.02 **US5254** **2932M-1**

1 Executive Summary

1.1 Scope

This report is intended to document the status of conformance with the requirements of the CFR 47 Part 15.247:2013 and RSS-210:2010 based on the results of testing performed on 26 March 2014 through 10 April 2014 on the Wireless Residential Gateway Model 5268AC manufactured by Pace Americas. This report only applies to the specific samples tested under the stated test conditions. It is the responsibility of the manufacturer to assure that additional production units of this model are manufactured with identical or EMI equivalent electrical and mechanical components. This report is further intended to document changes and modifications to the EUT throughout its life cycle. All documentation will be included as a supplement.

1.2 Purpose

Testing was performed to evaluate the EMC performance of the EUT in accordance with the applicable requirements, procedures, and criteria defined in the application of regulations and application of standards listed in this report.

1.3 Summary of Test Results

Table 1: Summary of Test Results

Test	Test Method ANSI C63.4: 2009 / ANSI C64.10:2009	Test Parameters	Measured Value	Result
Spurious Emission in Transmitted Mode	CFR47 15.209, RSS-GEN Sect.7.2.3	Class B	-0.80 dB (margin)	**Complied**
Restricted Bands of Operation	CFR47 15.205, RSS-210 Sect.2.6	Class B		**Complied**
AC Power Conducted Emission	CFR47 15.207, RSS-GEN Sect.7.2.2	Class B	-13.46 dB (margin)	**Complied**
Occupied Bandwidth	CFR47 15.247 (a2), RSS GEN Sect.4.4.1	$\geq$ 500 kHz	8.074 MHz	**Complied**
Maximum Transmitted Power	CFR47 15.247 (b3), RSS-210 Sect. A.8.4	30 dBm w/ 6 dBi antenna	+25.74 dBm	**Complied**
Peak Power Spectral Density	CFR47 15.247 (e), RSS-210 Sect. A.8.2	8 dBm/ 3 kHz	-3.04 dBm	**Complied**
Band Edge Measurement	CFR47 15.247 (d), RSS-210 Sect. A.8.5	-30 dBr	-1.85 dB	**Complied**
RF Exposure for General Population	CFR47 15.247 (i), 2.1091	1.0 mW/cm^2	0.181 mW/cm^2	**Complied**

Note: This report is documented for the evaluation of 2412 MHz to 2462 MHz.

1.4 Special Accessories

No special accessories were necessary in order to achieve compliance.

1.5 Equipment Modifications

None.

2 Laboratory Information

2.1 Accreditations & Endorsements

2.1.1 US Federal Communications Commission

TUV Rheinland of North America at 1279 Quarry Lane, Ste. A., Pleasanton, CA 94566, is accredited by the commission for performing testing services for the general public on a fee basis. These laboratory test facilities have been fully described in reports submitted to and accepted by the FCC (FRN # US5254). The laboratory scope of accreditation includes: Title 47 CFR Parts 15, 18, and 90. The accreditation is updated every 3 years.

2.1.2 A2LA

TUV Rheinland of North America is accredited by the National Voluntary Laboratory Accreditation Program, which is administered under the auspices of the National Institute of Standards and Technology. The laboratory has been assessed and accredited in accordance with ISO Guide 17025:2005 and ISO 9002 (Lab Code 3331.02). The scope of laboratory accreditation includes emission and immunity testing. The accreditation is updated annually.

2.1.3 Canada – Industry Canada

TUV Rheinland of North America at the 1279 Quarry Ln, Pleasanton, CA 94566 address is accredited by Industry Canada for performing testing services for the general public on a fee basis. This laboratory test facilities have been fully described in reports submitted to and accepted by Industry Canada (File Number 2932M-1). This reference number is the indication to the Industry Canada Certification Officers that the site meets the requirements of RSS 212, Issue 1 (Provisional). The accreditation is updated every 3 years.

2.1.4 Japan – VCCI

The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) is a group that consists of Information Technology Equipment (ITE) manufacturers and EMC test laboratories. The purpose of the Council is to take voluntary control measures against electromagnetic interference from Information Technology Equipment, and thereby contribute to the development of a socially beneficial and responsible state of affairs in the realm of Information Technology Equipment in Japan. TUV Rheinland of North America at 1279 Quarry Ln, Pleasanton, CA 94566 has been assessed and approved in accordance with the Regulations for Voluntary Control Measures.

VCCI Registration No. for Pleasanton: A-0031

VCCI Registration No. for Santa Clara: A-0032

2.1.5 Acceptance by Mutual Recognition Arrangement

The United States has an established agreement with specific countries under the Asia Pacific Laboratory Accreditation Corporation (APLAC) Mutual Recognition Arrangement. Under this agreement, all TUV Rheinland at 1279 Quarry Ln, Pleasanton, CA 94566 test results and test reports within the scope of the laboratory NIST / A2LA accreditation will be accepted by each member country.

2.2 Test Facilities

All of the test facilities are located at 1279 Quarry Lane, Ste. A, Pleasanton, California 94566, USA. The 2305 Mission College, Santa Clara, 95054, USA location is considered a Pleasanton annex.

2.2.1 Emission Test Facility

The Semi-Anechoic chamber and AC Line Conducted measurement facility used to collect the radiated and conducted data has been constructed in accordance with ANSI C63.7:1992. The site has been measured in accordance with and verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2009, at a test distance of 3 and 5 meters. The site is listed with the FCC and accredited by A2LA (Lab Code 3331.02). The 3/5-meter semi-anechoic chamber used to collect the radiated data has been verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2009, at a test distance of 3 meter and 5 meters. A report detailing this site can be obtained from TUV Rheinland of North America.

2.2.2 Immunity Test Facility

ESD, EFT, Surge, PQF: These tests are performed in an environmentally controlled room with a 3.7 m x 4.8 m x 3.175 mm thick aluminum floor connected to PE ground.

For ESD testing, tabletop equipment is placed on an insulated mat with a surface resistivity of 10^9 Ohms/square on a 1.6 m x 0.8 m x 0.8 m high non-conductive table with a 3.175 mm aluminum top (Horizontal Coupling Plane). The HCP is connected to the main ground plane via a low impedance ground strap through two 470-kΩ resistors. The Vertical Coupling Plane consists of an aluminum plate 50 cm x 50 cm x 3.175 mm thick. The VCP is connected to the main ground plane via a low impedance ground strap through two 470-kΩ resistors.

For EFT, Surge, PQF, the HCP and VCP are removed.

RF Field Immunity testing is performed in a 7.3m x 4.3m x 4.1m anechoic chamber.

RF Conducted and Magnetic Field Immunity testing is performed on a 4.8m x 3.7m x 3.175mm thick aluminum ground plane.

All test areas allow a minimum distance of 1 meter from the EUT to walls or conducting objects.

2.3 Measurement Uncertainty

Two types of measurement uncertainty are expressed in this report, per *ISO Guide To The Expression Of Uncertainty In Measurement*, 1st Edition, 1995.

The Combined Standard Uncertainty is the standard uncertainty of the result of a measurement when that result is obtained from the values of a number of other quantities; it is equal to the positive square root of the sum of the variances or co-variances of these other quantities, weighted according to how the measurement result varies with changes in these quantities. The term *standard uncertainty* is the result of a measurement expressed as a standard deviation.

The Expanded Uncertainty defines an interval about the result of a measurement that may be expected to encompass a large fraction of the distribution of values that could reasonably be attributed to the measurand. The fraction may be viewed as the coverage probability or level of confidence of the interval.

2.3.1 Sample Calculation – radiated & conducted emissions

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength (dBμV/m) = RAW - AMP + CBL + ACF

Where: RAW = Measured level before correction (dBμV)

AMP = Amplifier Gain (dB)

CBL = Cable Loss (dB)

ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

Sample radiated emissions calculation @ 30 MHz

Measurement +Antenna Factor–Amplifier Gain+Cable loss=Radiated Emissions (dBuV/m)

25 dBuV/m + 17.5 dB – 20 dB + 1.0 dB = 23.5 dBuV/m

2.3.2 Measurement Uncertainties

Table 2: Summary of Uncertainties

	U_{lab}	U_{cispr}
Radiated Disturbance		
30 MHz – 40,000 MHz	2.47 dB	4.92 dB
Conducted Disturbance @ Mains Terminals		
150 kHz – 30 MHz	1.09 dB	2.18 dB
Disturbance Power		
30 MHz – 300 MHz	3.92 dB	4.3 dB

Note: U_{lab} is the calculated Combined Standard Uncertainty
U_{cispr} is the measurement uncertainty requirement per CISPR 16.

Measurement Uncertainty Immunity

The estimated combined standard uncertainty for ESD immunity measurements is ± 8.2%.	Per IEC 61000-4-2
The estimated combined standard uncertainty for radiated immunity measurements is ± 4.10 dB.	Per IEC 61000-4-3
The estimated combined standard uncertainty for conducted immunity measurements with CDN is ± 3.66 dB	Per IEC 61000-4-6
The estimated combined standard uncertainty for power frequency magnetic field immunity is ± 2.9%.	Per IEC 61000-4-8

Measurement Uncertainty – Radio Testing

The estimated combined standard uncertainty for frequency error measurements is ± 3.88 Hz
The estimated combined standard uncertainty for carrier power measurements is ± 1.59 dB.
The estimated combined standard uncertainty for adjacent channel power measurements is ± 1.47 dB.
The estimated combined standard uncertainty for modulation frequency response measurements is ± 0.46 dB.
The estimated combined standard uncertainty for transmitter conducted emission measurements is ± 4.01 dB

The expanded uncertainty at a level of 95% confidence is obtained by multiplying the combined standard uncertainty by a coverage factor of 2. Compliance criteria are not based on measurement uncertainty.

2.4 Calibration Traceability

All measurement instrumentation is traceable to the National Institute of Standards and Technology (NIST). Measurement method complies with ANSI/NCSL Z540-1-1994 and ISO Guide 17025:2005.

3 Product Information

3.1 Product Description

Pace Americas 5268AC is a residential gateway that provides an 802.11 a/b/g/n/ac Wi-Fi access point and Ethernet switch function for connecting personal computers and other in-home networked devices to the service provider's network. The 5168AC features:

- Bonded ADSL2+/VDSL2
- Gigabit Ethernet WAN
- HomePNA 3.1 coax port
- 4 Gigabit Ethernet LAN ports
- 5GHZ 802.11n 4x4 MIMO Wi-Fi
- 2.4GHZ 802.11n 2x2 MIMO Wi-Fi
- 2 FXS (VoIP) Lines
- USB Host Port

3.2 Equipment Configuration

A description of the equipment configuration is given in Test Plan Section. The EUT was tested as called for in the test standard and was configured and operated in a manner consistent with its intended use. The EUT was connected to rated power and allowed to reach intended operating conditions. The placement of the EUT system components was guided by the test standard and selected to represent typical installation conditions.

In the case of an EUT that can operate in more than one configuration, preliminary testing was performed to determine the configuration that produced maximum radiation.

The final configuration was selected to produce the worst case radiation for emissions testing and to place the EUT in the most susceptible state for immunity testing.

3.3 Operating Mode

A description of the operation mode is given in Test Plan Section. In the case of an EUT that can operate in more than one state, preliminary testing was performed to determine the operating mode that produced maximum radiation.

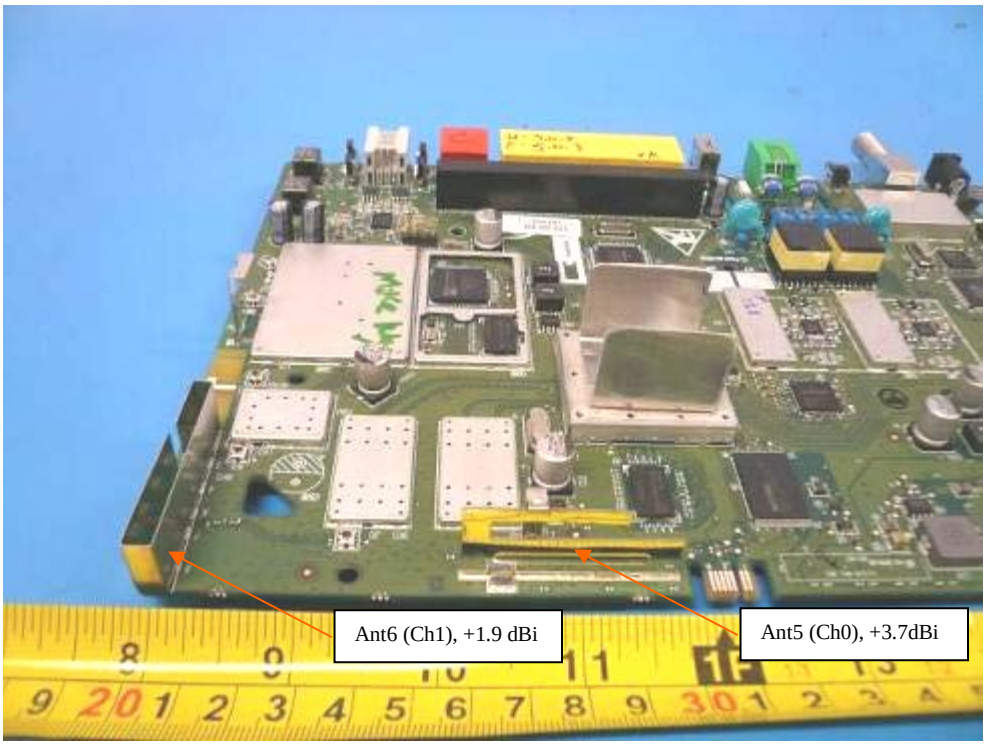
The final operating mode was selected to produce the worst case radiation for emissions testing and to place the EUT in the most susceptible state for immunity testing.

3.4 Unique Antenna Connector

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 manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of CFR47 Parts 15.211, 15.213, 15.217, 15.219, or 15.221.

3.4.1 Results

The 5268AC uses the permanently attached antennas inside the device. See EUT Photo for details.



4 Emissions

Testing was performed in accordance with CFR 47 Part 15.247:2013 and RSS-210 Annex 8:2010. These test methods are listed under the laboratory's A2LA Scope of Accreditation. This test measures the levels emanating from the EUT, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices. Procedures described in ANSI C63.10: 2009 were used.

4.1 Output Power Requirements

The maximum peak output power requirement is the maximum equivalent isotropic radiated power delivering at the transmitting antenna under specified conditions of measurements in the presence of modulation.

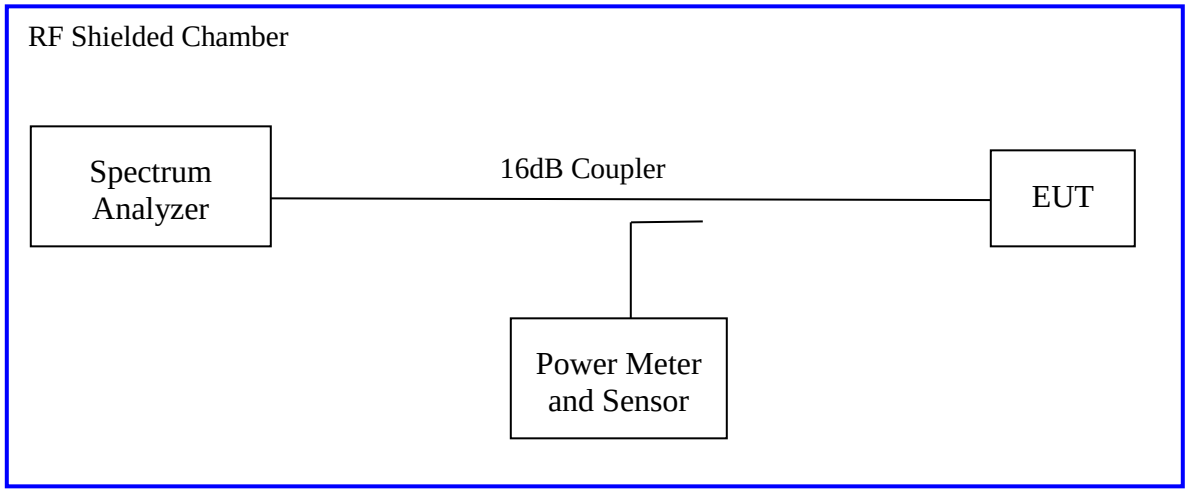
The maximum output power and harmonics shall not exceed CFR47 Part 15.247 (b3):2010 and RSS-210 A.8.4: 2010

The maximum transmitted power is +30 dBm or 1 Watt.

4.1.1 Test Method

The conducted method was used to measure the channel power output according to ANSI C63.10:2009 Section 6.10.3.1. The measurement was performed with modulation per CFR47 Part15.247 (b3):2010 and RSS-210 A.8.4: 2010. This test was conducted on 3 channels of Sample, S/N 111. The worst mode result indicated below.

Test Setup:



Method AVGSA-2 of "KDB 558074 – DTS Measurement Guidance v03r01" applies since the 5268AC *continuously transmit with duty cycle less than 98%. Sample detector was used.*

4.1.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 3: RF Output Power at the Antenna Port – Test Results

Test Conditions: Conducted Measurement, Normal Temperature					
Antenna Type: Integrated			**Power Setting:** See test plan		
Directional Antenna Gain: +5.9 dBi			**Signal State:** Modulated		
Ambient Temp.: 23 °C			**Relative Humidity:**33%		
802.11b Mode					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	+30.00	22.39			-9.75
2437 MHz	+30.00	25.08			-7.09
2462 MHz	+30.00	21.13			-10.98
Note: The highest output power was observed at 1Mbps. Only chain 0 (J9) would be active in this mode. 802.11b Mode has 99% duty cycle.					
802.11g Mode					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	+30.00	19.67	0.27	19.94	-10.06
2437 MHz	+30.00	25.29	0.27	25.56	-4.44
2462 MHz	+30.00	19.75	0.27	20.02	-9.98
Note: The highest output power was observed at 6 Mbps. Only chain 0 (J9) would be active in this mode. 802.11g Mode has 94% duty cycle.					
802.11n (HT20) Mode, 1x2					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	+30.00	19.85	0.27	20.12	-9.88
2437 MHz	+30.00	25.47	0.27	25.74	-4.26
2462 MHz	+30.00	19.98	0.27	20.25	-9.75
Note: The highest output power was observed at MCS0, 1 Data Stream. Only chain 0 (J9) would be active in this mode. 802.11 HT20 Mode has 94% duty cycle.					

802.11n (HT20) Mode, 2x2						
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Chain 1 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	+30.00	15.95	15.92	0.27	19.21	-10.79
2437 MHz	+30.00	22.52	21.95	0.27	25.52	-4.48
2462 MHz	+30.00	15.94	16.56	0.27	19.54	-10.46
Note: The highest output power was observed at MCS8, 2 active chains with 94% duty cycle. The total antenna gain is 5.9 dBi.						

802.11n (HT40) Mode, 1x2					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2422 MHz	+30.00	15.92	0.51	16.43	-13.57
2437 MHz	+30.00	20.31	0.51	20.82	-9.18
2452 MHz	+30.00	16.02	0.51	16.53	-13.47
Note: The highest output power was observed at MCS0, 1 Data Stream. HT40 has 89% duty cycle.					

802.11n (HT40) Mode, 2x2						
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Chain 1 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2422 MHz	+30.00	15.09	16.13	0.51	19.16	-10.84
2437 MHz	+30.00	18.80	19.34	0.51	22.60	-7.40
2452 MHz	+30.00	15.25	15.93	0.51	19.12	-10.88
Note: The highest output power was observed at MCS8, 2 Data Stream. HT40 has 89% duty cycle. The total antenna gain is 5.9 dBi.						

Table 4: Average Output Power at the Antenna Port – Reference Use Only

Test Conditions: Conducted Measurement, Normal Temperature					
Antenna Type: Integrated			**Power Setting:** See test plan		
Directional Antenna Gain: +5.9 dBi			**Signal State:** Modulated		
Ambient Temp.: 23 °C			**Relative Humidity:**33%		
802.11b Mode					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	N/A	22.56			N/A
2437 MHz	N/A	25.16			N/A
2462 MHz	N/A	21.45			N/A
Note: The highest output power was observed at 1Mbps. Only one chain would be active in this mode. 802.11b Mode has 99% duty cycle.					
802.11g Mode					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	N/A	19.82	0.27	20.09	N/A
2437 MHz	N/A	25.48	0.27	25.75	N/A
2462 MHz	N/A	19.93	0.27	20.20	N/A
Note: The highest output power was observed at 6 Mbps. Only one chain would be active in this mode. 802.11g Mode has 94% duty cycle.					
802.11n (HT20) Mode, 1x2					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	N/A	19.97	0.27	20.24	N/A
2437 MHz	N/A	25.62	0.27	25.89	N/A
2462 MHz	N/A	20.20	0.27	20.47	N/A
Note: The highest output power was observed at MCS0, 1 Data Stream with 94% duty cycle. Only one chain would be active in this mode.					
802.11n (HT20) Mode, 2x2					
Frequency	**Limit [dBm]**	**Chain 0 [dBm]**	**Chain 1 [dBm]**	**Duty Cycle [dB]**	**∑ Power [dBm]**	**Margin [dB]**
2412 MHz	N/A	15.35	15.32	0.27	18.62	N/A
2437 MHz	N/A	22.02	21.41	0.27	25.01	N/A
2462 MHz	N/A	15.39	16.08	0.27	19.03	N/A

Note: The highest output power was observed at MCS8, 2 Data Stream with 94% duty cycle.

802.11n (HT40) Mode, 1x2

Frequency	Limit [dBm]	Chain 0 [dBm]	Duty Cycle [dB]	∑ Power [dBm]	Margin [dB]
2422 MHz	N/A	16.05	0.51	16.56	N/A
2437 MHz	N/A	20.50	0.51	21.01	N/A
2452 MHz	N/A	16.20	0.51	16.71	N/A

Note: The highest output power was observed at MCS0, 1 Data Stream.

802.11n (HT40) Mode, 2x2

Frequency	Limit [dBm]	Chain 0 [dBm]	Chain 1 [dBm]	Duty Cycle [dB]	∑ Power [dBm]	Margin [dB]
2422 MHz	N/A	15.83	16.51	0.51	19.71	N/A
2437 MHz	N/A	19.77	19.87	0.51	23.34	N/A
2452 MHz	N/A	17.21	16.42	0.51	20.36	N/A

Note: The highest output power was observed at MCS8, 2 Data Stream.

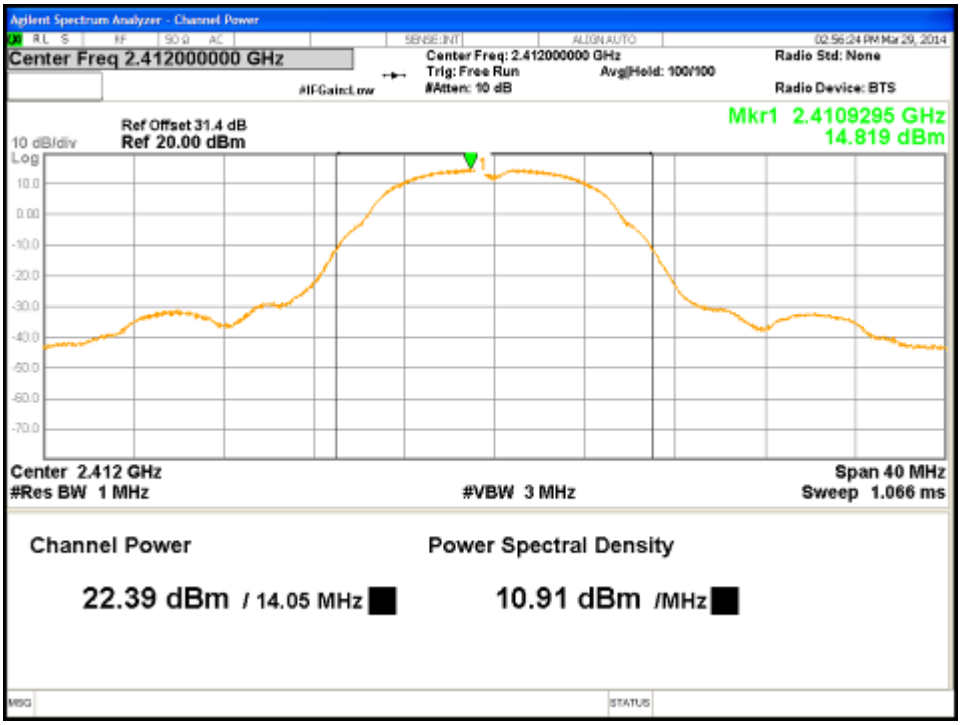


Figure 1: Maximum Conducted Output Power-2412 MHz-11b-1Mbps-Ch0

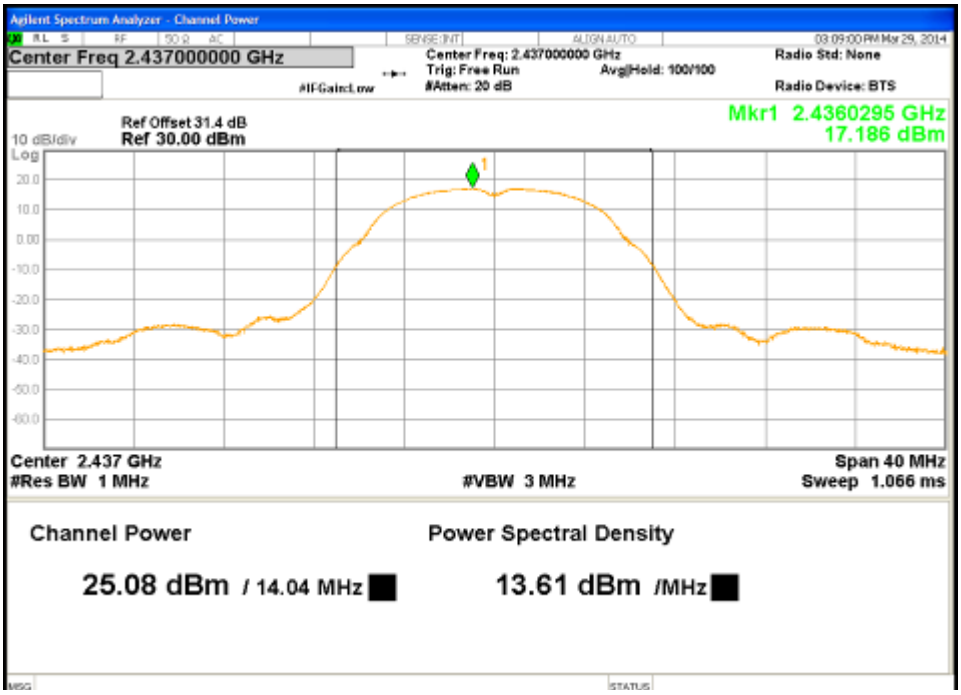


Figure 2: Maximum Conducted Output Power-2437 MHz-11b-1Mbps-Ch0

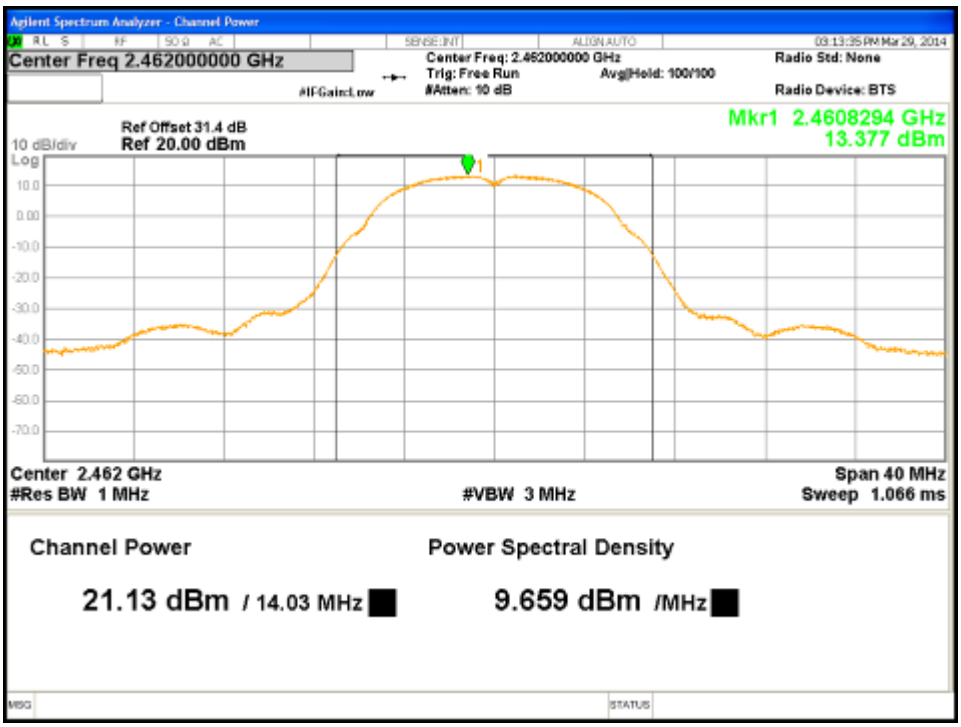


Figure 3: Maximum Conducted Output Power-2462 MHz-11b-1Mbps-Ch0

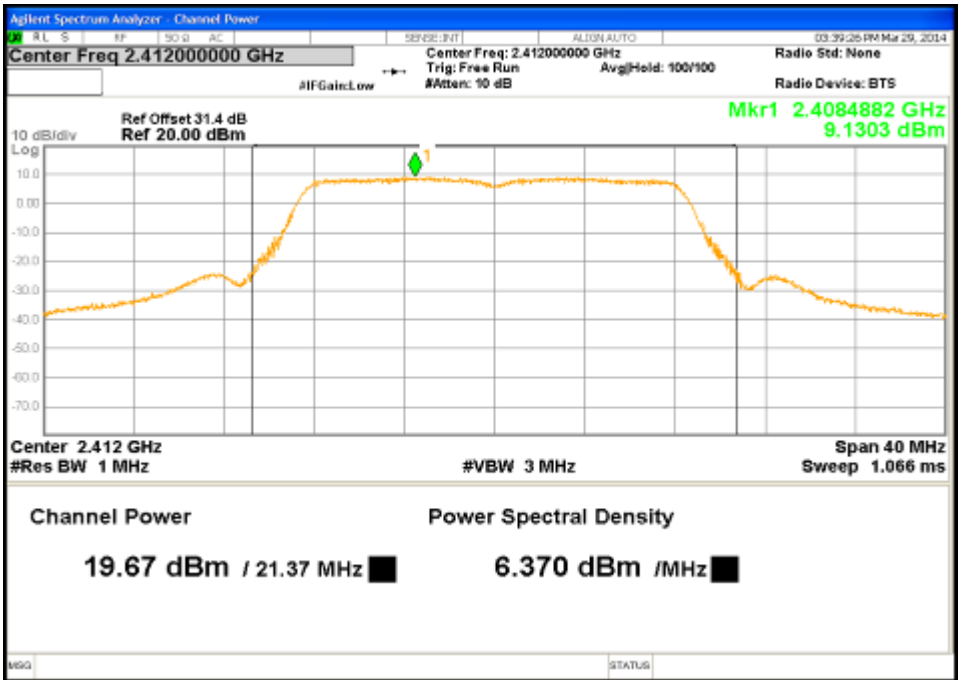


Figure 4: Maximum Conducted Output Power-2412 MHz-11g-6Mbps-Ch0

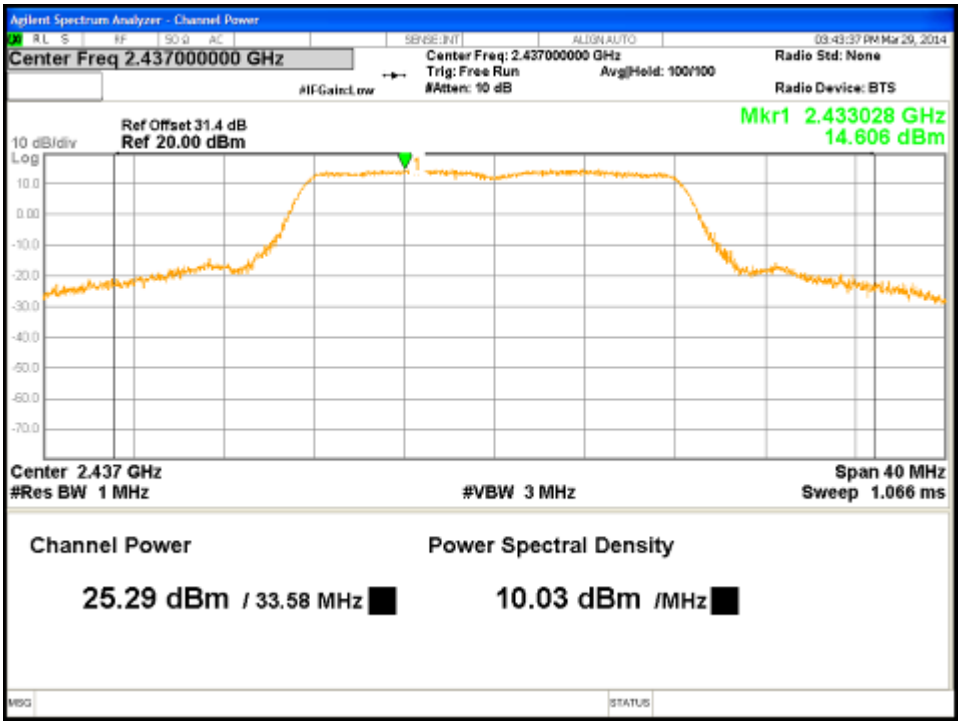


Figure 5: Maximum Conducted Output Power-2437 MHz-11g-6Mbps-Ch0

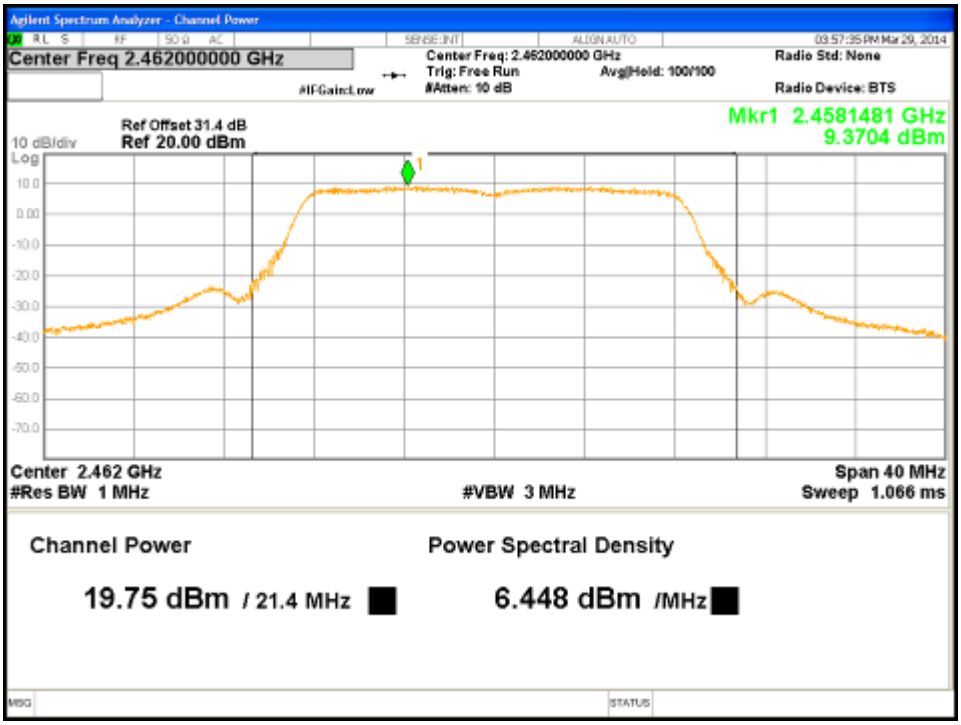


Figure 6: Maximum Conducted Output Power-2462 MHz-11g-6Mbps-Ch0

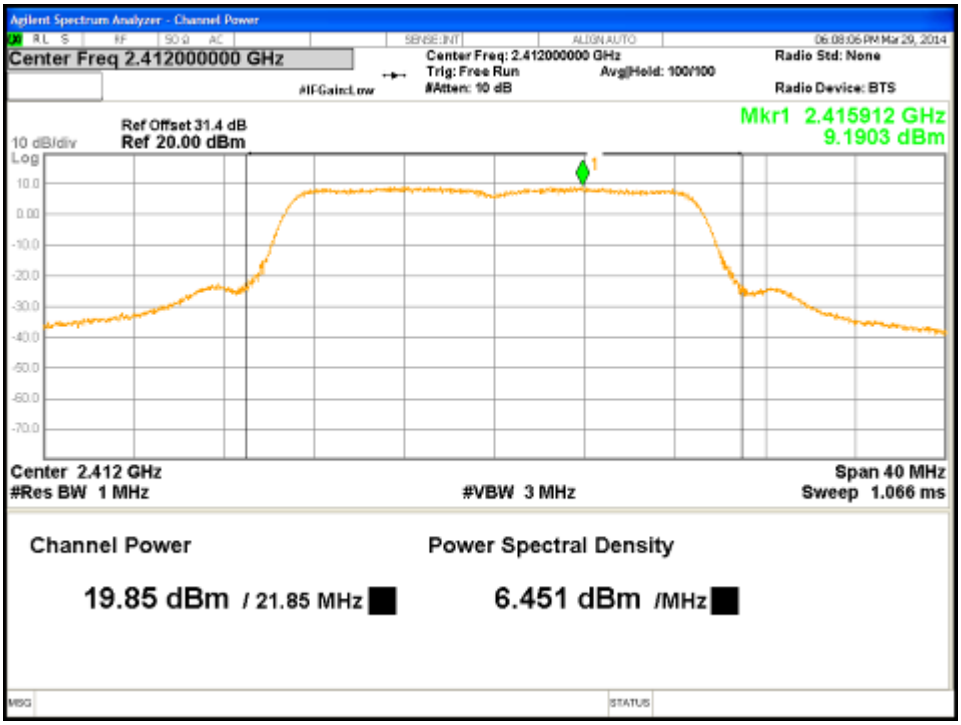


Figure 7: Maximum Conducted Output Power-2412 MHz-HT20-MCS0-Ch0

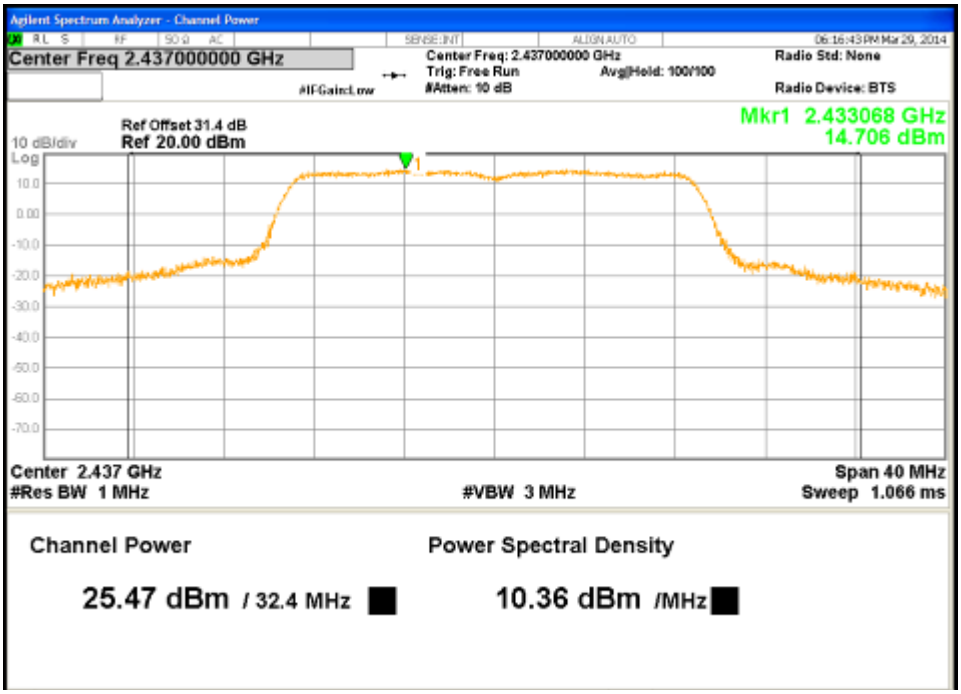


Figure 8: Maximum Conducted Output Power-2437 MHz-HT20-MCS0-Ch0

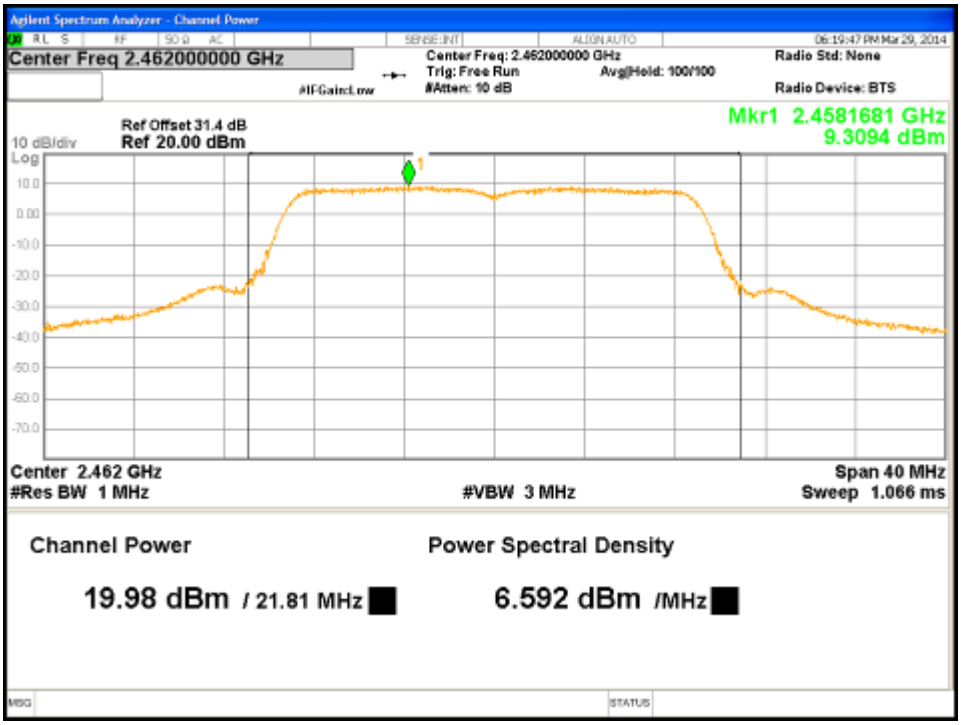


Figure 9: Maximum Conducted Output Power-2462 MHz-HT20-MCS0-Ch0

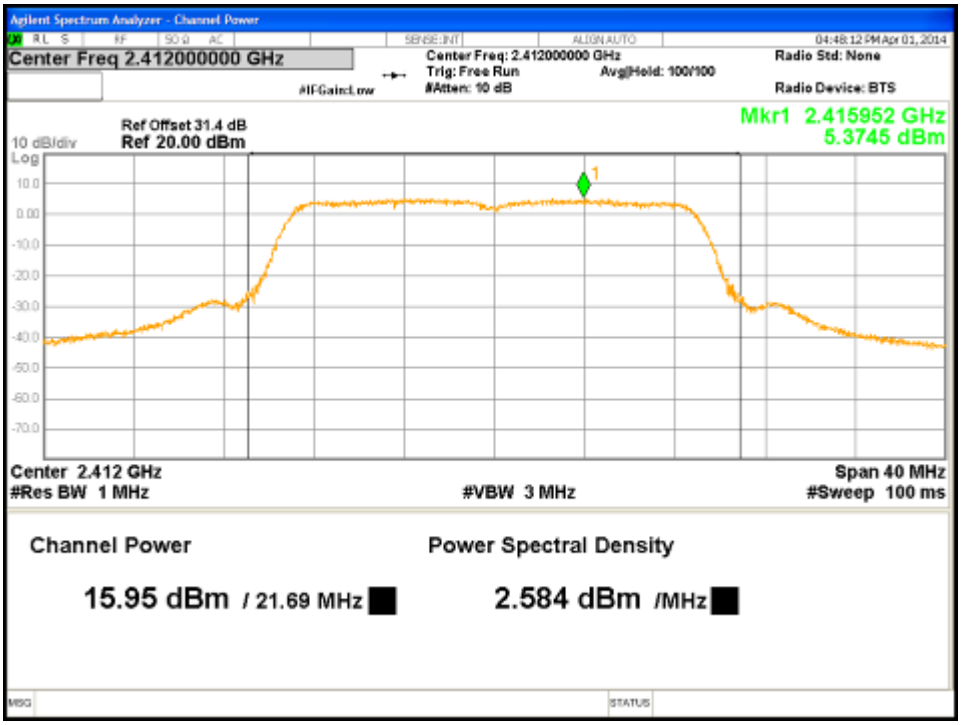


Figure 10: Maximum Conducted Output Power-2412 MHz-HT20-MCS8-Ch0

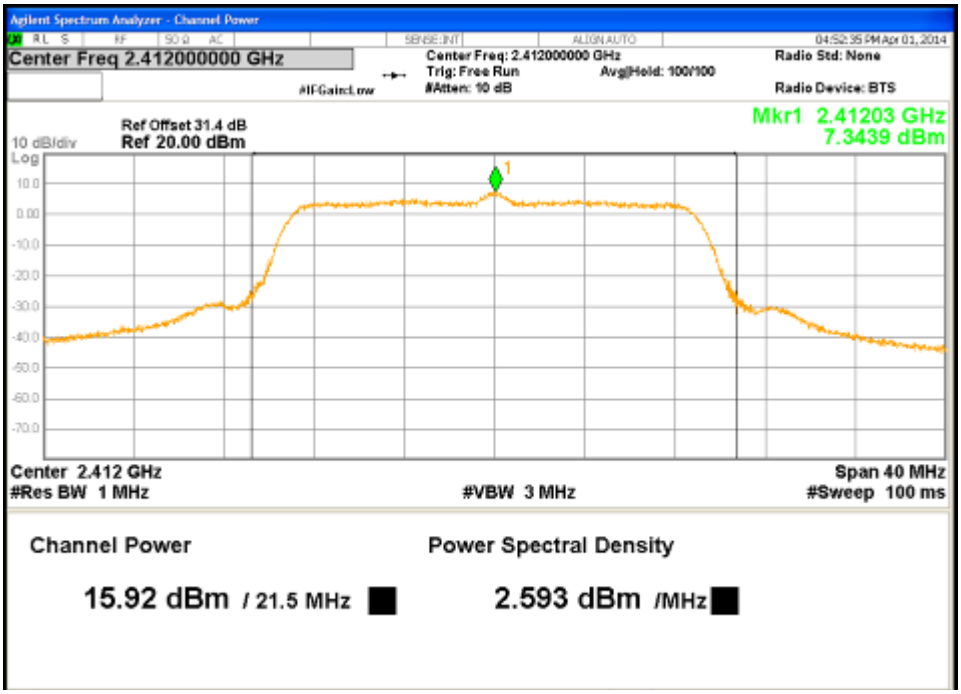


Figure 11: Maximum Conducted Output Power-2412 MHz-HT20-MCS8-Ch1

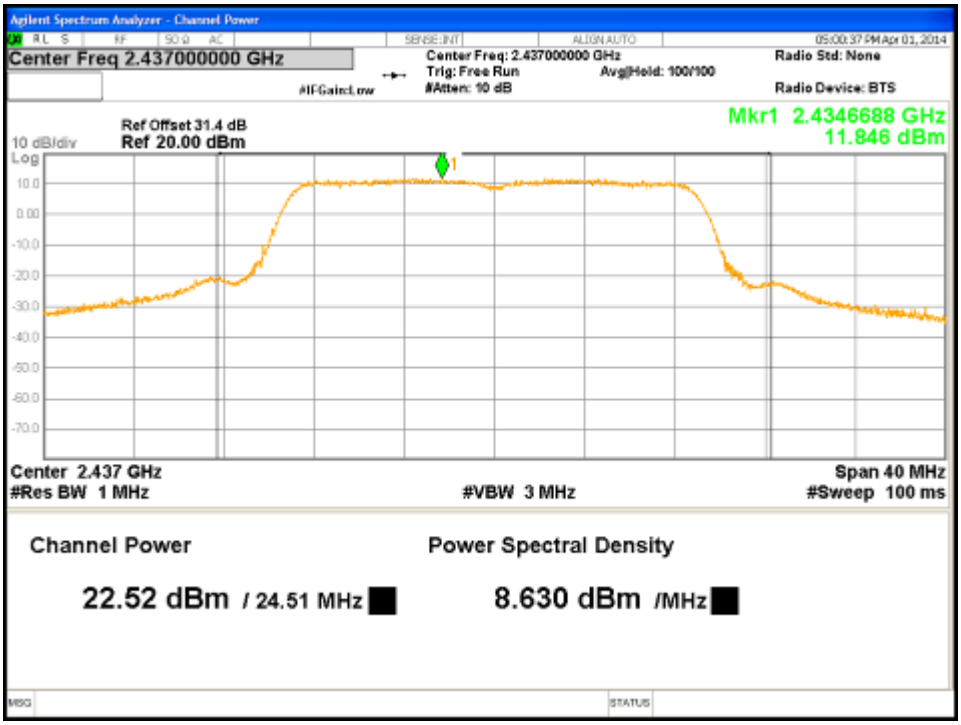


Figure 12: Maximum Conducted Output Power-2437 MHz-HT20-MCS8-Ch0

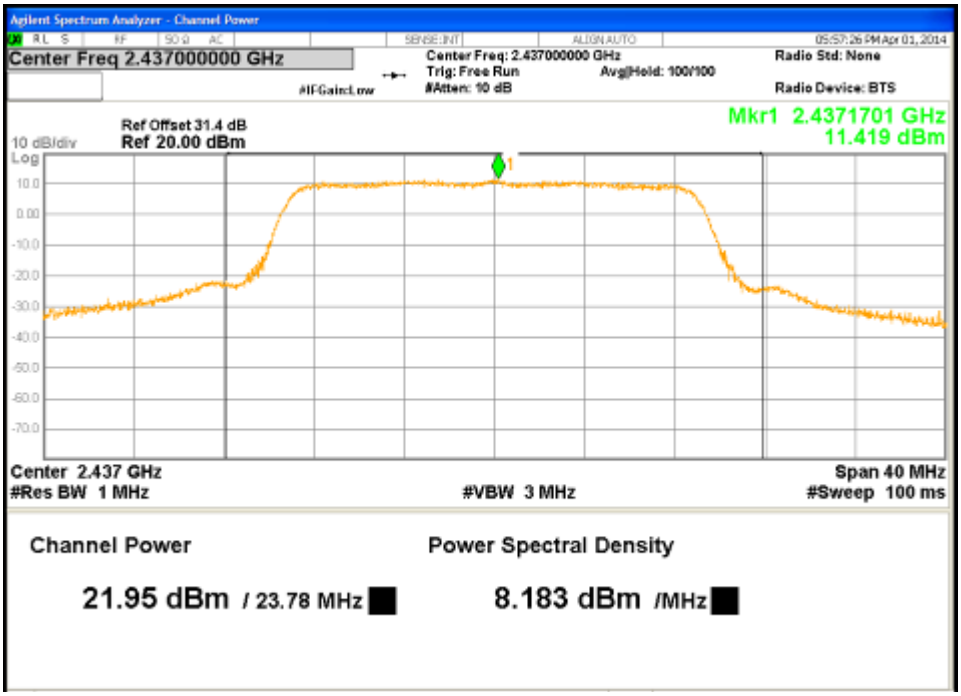


Figure 13: Maximum Conducted Output Power-2437 MHz-HT20-MCS8-Ch1

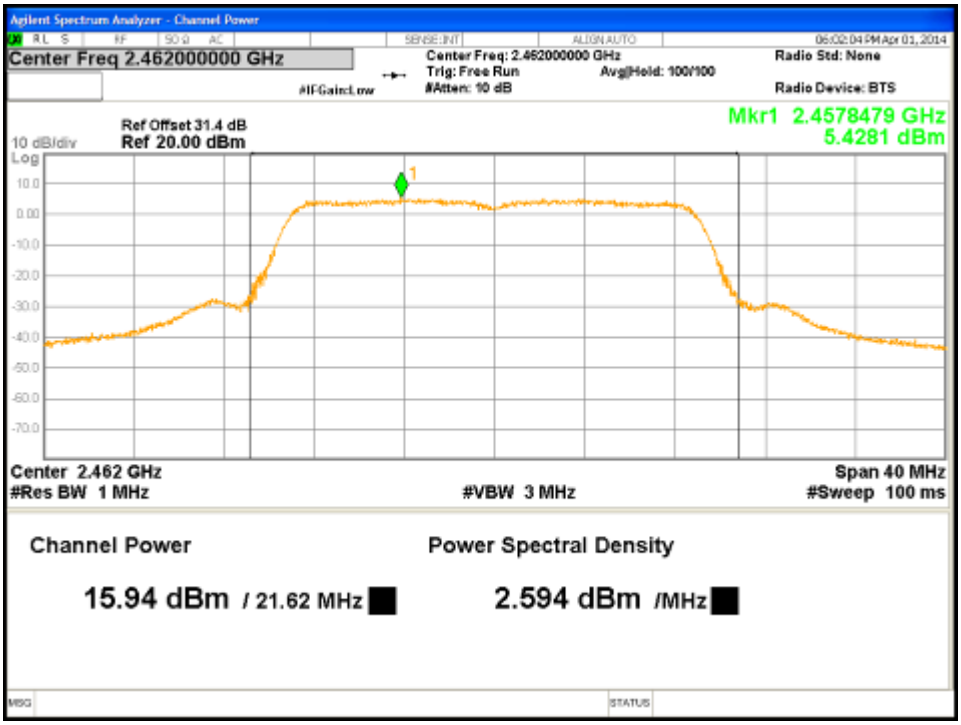


Figure 14: Maximum Conducted Output Power-2462 MHz-HT20-MCS8-Ch0

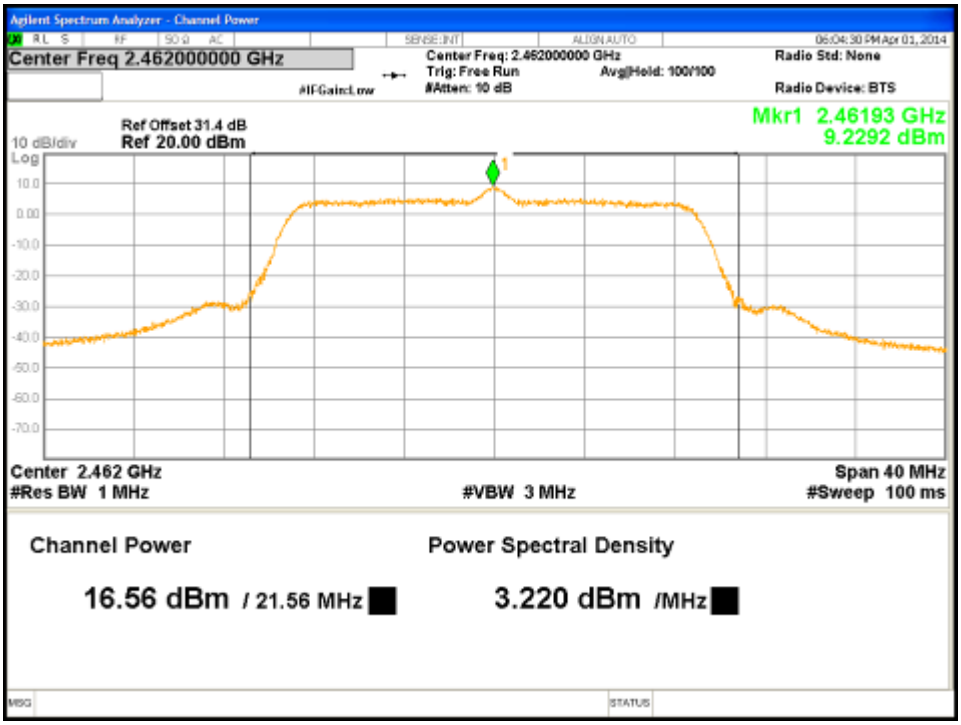


Figure 15: Maximum Conducted Output Power-2462 MHz-HT20-MCS8-Ch1

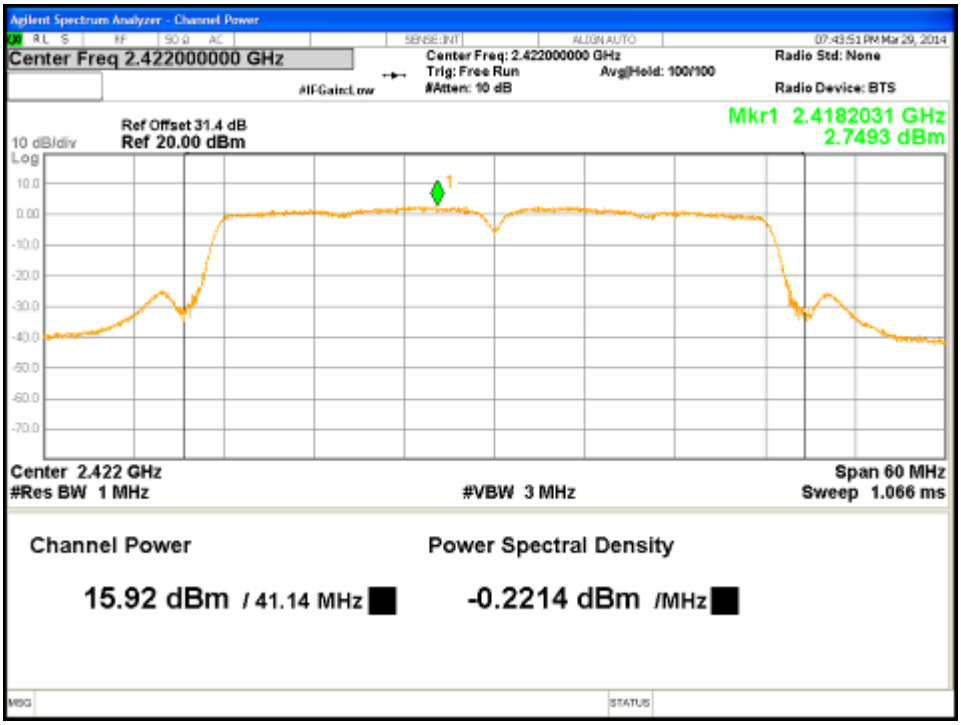


Figure 16: Maximum Conducted Output Power-2422 MHz-HT40-MCS0-Ch0

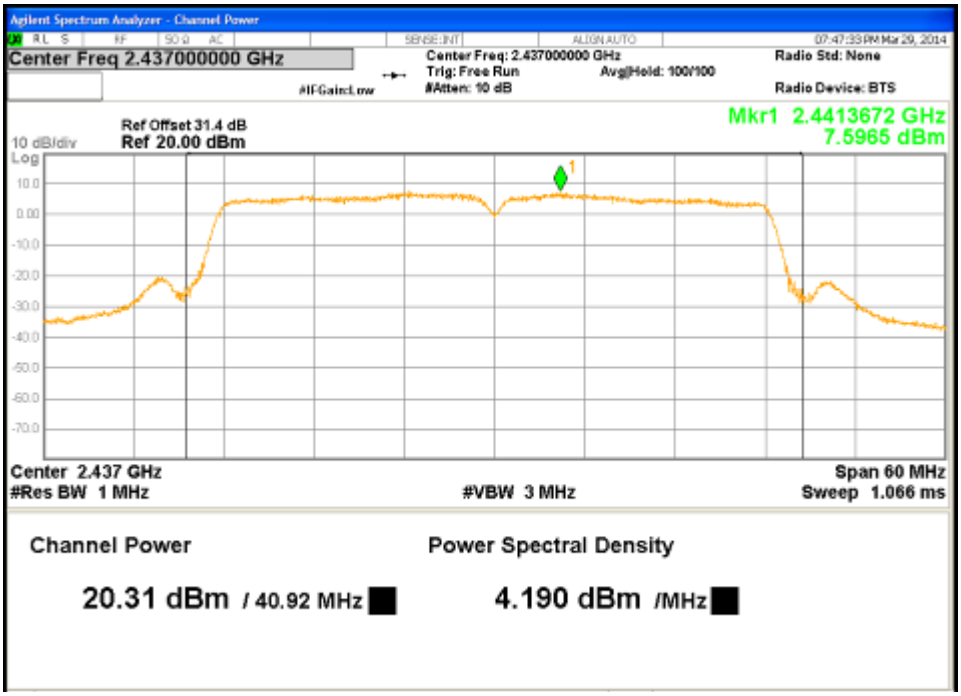


Figure 17: Maximum Conducted Output Power-2437 MHz-HT40-MCS0-Ch0

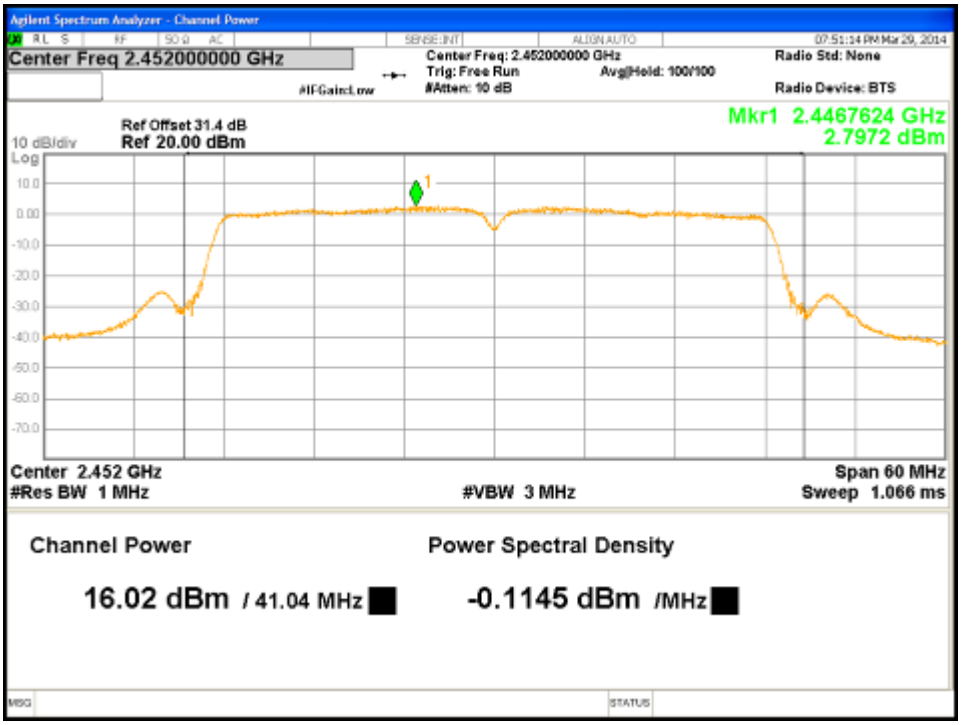


Figure 18: Maximum Conducted Output Power-2452 MHz-HT40-MCS0-Ch0

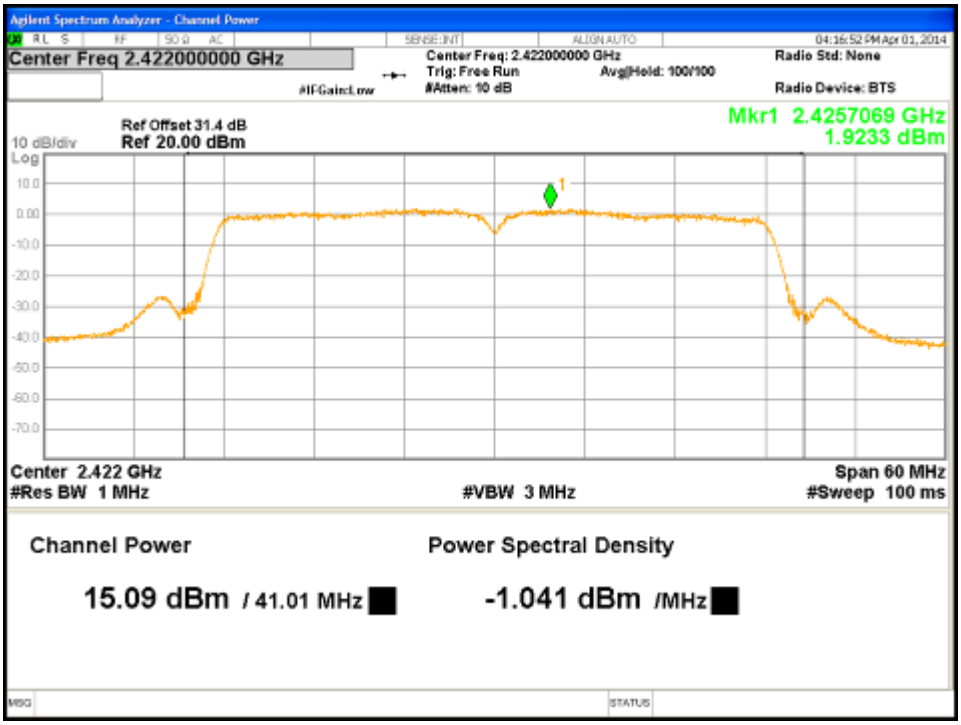


Figure 19: Maximum Conducted Output Power-2422 MHz-HT40-MCS8-Ch0

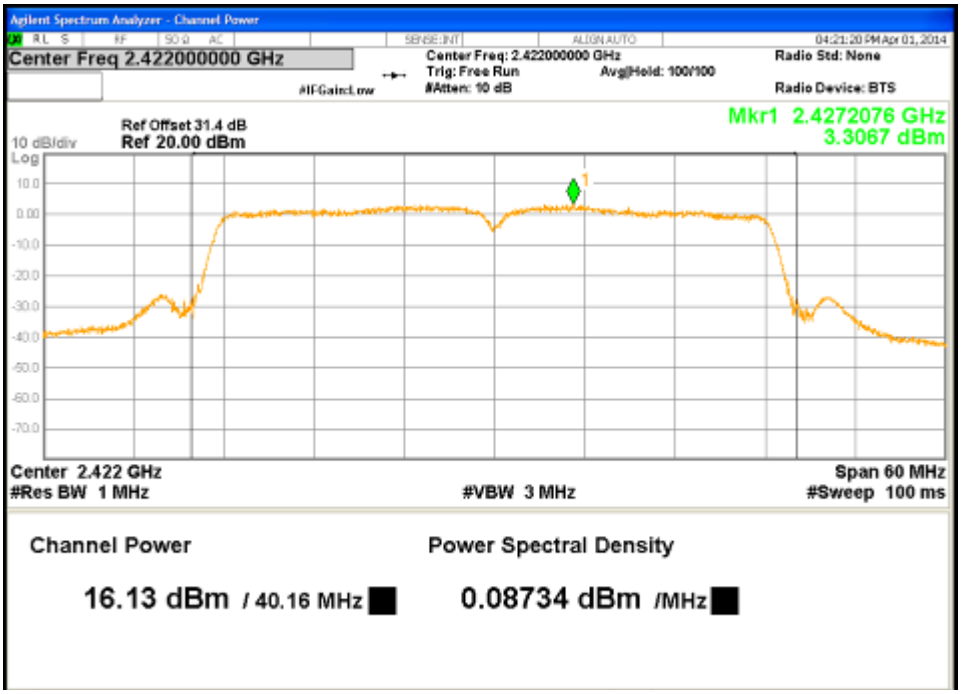


Figure 20: Maximum Conducted Output Power-2422 MHz-HT40-MCS8-Ch1

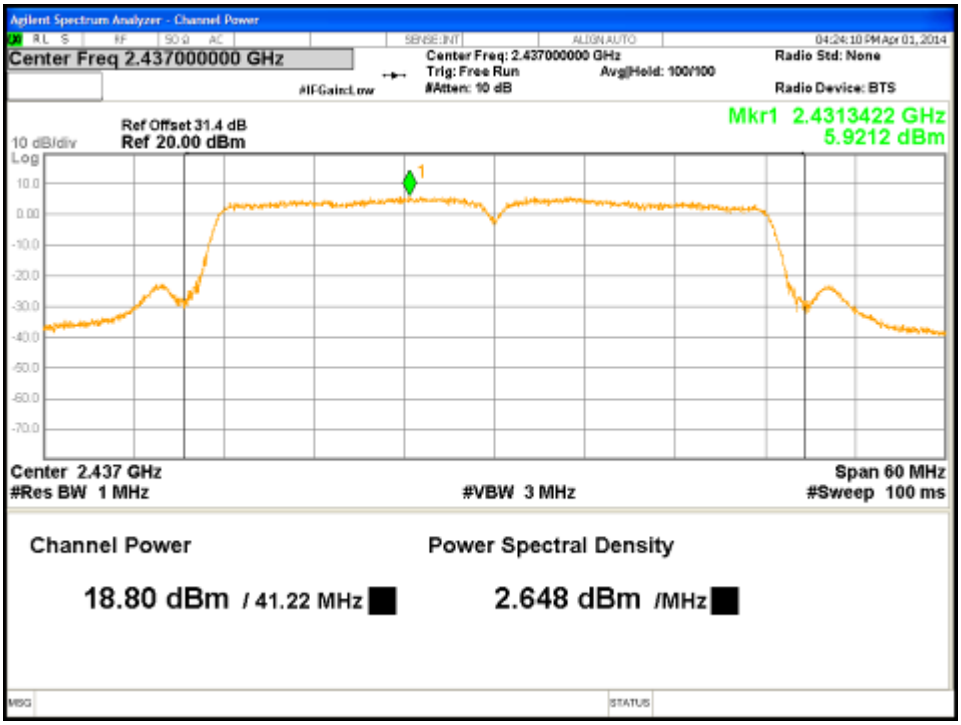


Figure 21: Maximum Conducted Output Power-2437 MHz-HT40-MCS8-Ch0

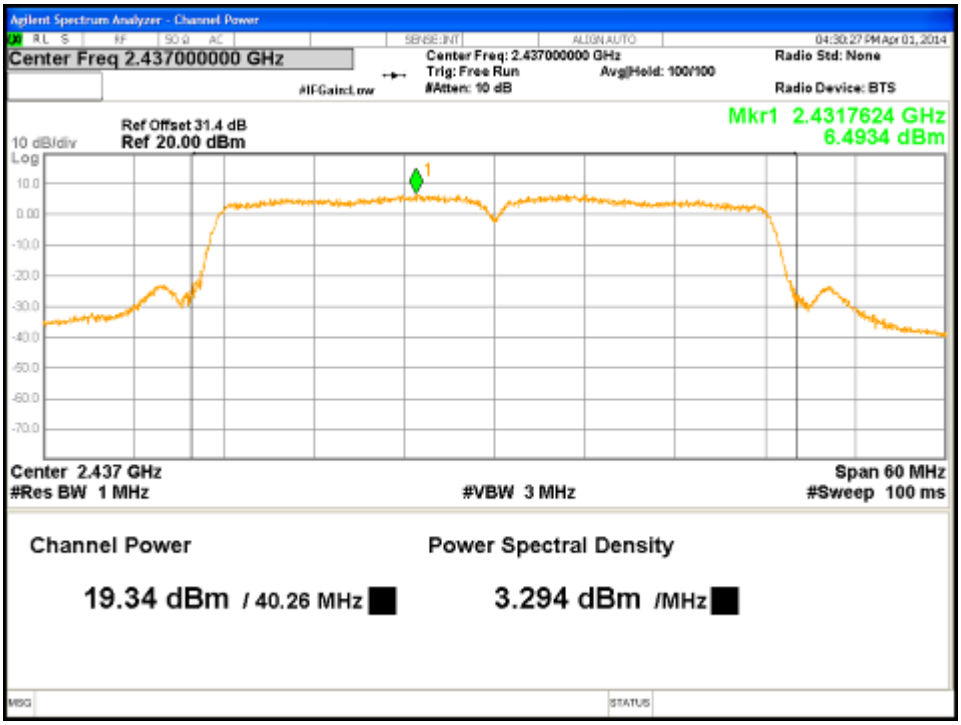


Figure 22: Maximum Conducted Output Power-2437 MHz-HT40-MCS8-Ch1

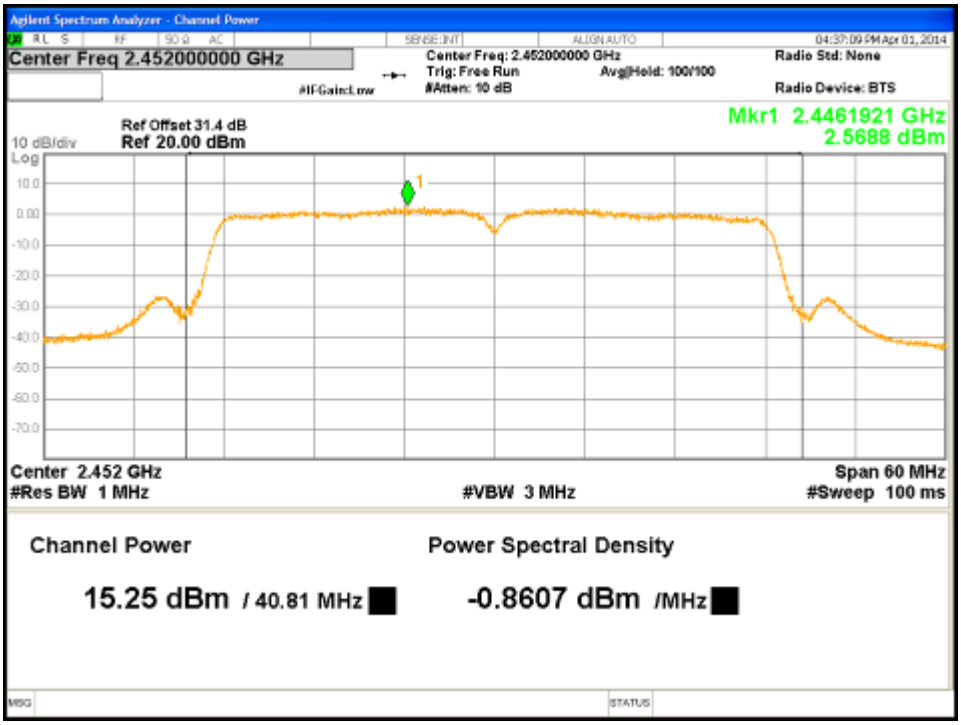


Figure 23: Maximum Conducted Output Power-2452 MHz-HT40-MCS8-Ch0

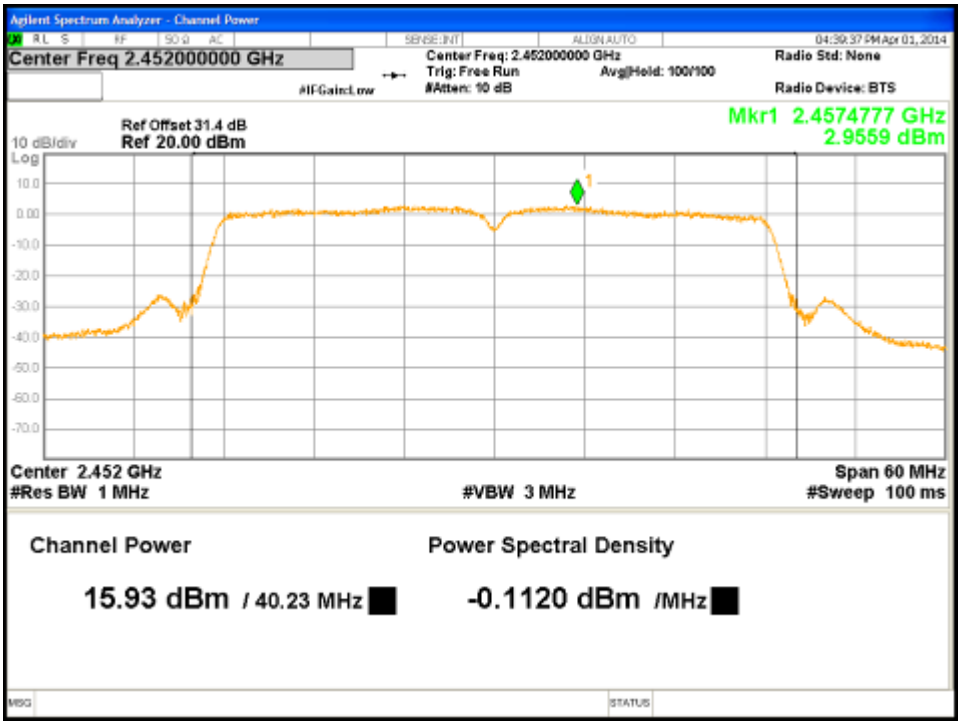


Figure 24: Maximum Conducted Output Power-2452 MHz-HT40-MCS8-Ch1

4.2 Occupied Bandwidth

The occupied bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency.

The 99% bandwidth is the bandwidth in which 99% of the transmitted power occupied.

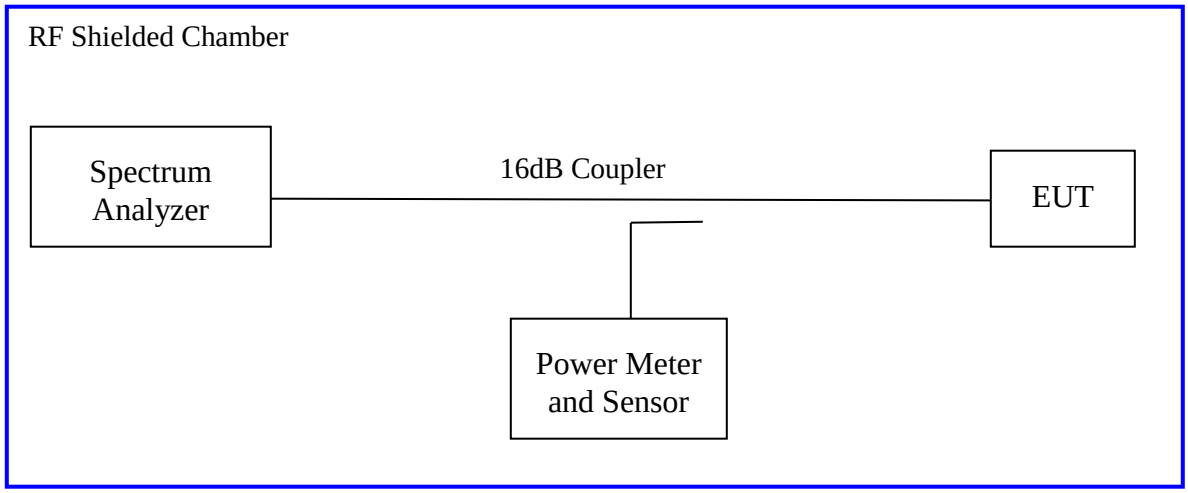
The 6dB bandwidth is defined the bandwidth of 6dBr from highest transmitted level of the fundamental frequency.

The bandwidth shall be at least 500 kHz per Section CFR47 15.247(a2) 2010 and RSS Gen Sect. 4.4.1: 2010.

4.2.1 Test Method

The conducted method was used to measure the occupied bandwidth according to ANSI C63.10:2009 Section 6.9.1. The measurement was performed with modulation per CFR47 15.247(a2) 2010 and RSS Gen Sect. 4.4.1:2010. This test was conducted on 3 channels in each mode of Sample SN 111. The worst sample result indicated below.

Test Setup:



4.2.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 5: Occupied Bandwidth – Test Results

Test Conditions: Conducted Measurement, Normal Temperature and Voltage only				
Antenna Type: Integrated		**Power Setting:** See test plan		
Directional Antenna Gain: +5.9 dBi		**Signal State:** Modulated		
Ambient Temp.: 23 °C		**Relative Humidity:**33%		
Bandwidth (MHz) for 802.11b				
Frequency (MHz)	**Limit (kHz)**	**Ch 0 99% BW**	**Ch 0 6 dB BW**	**Results**
2412	500	10.228	8.074	Pass
2437	500	10.223	8.074	Pass
2462	500	10.234	8.074	Pass
Note: The bandwidth was measured at 1Mbps for 802.11b mode.				
Bandwidth (MHz) for 802.11g				
Frequency (MHz)	**Limit (kHz)**	**Ch 0 99% BW**	**Ch 0 6 dB BW**	**Results**
2412	500	16.966	16.418	Pass
2437	500	17.076	16.358	Pass
2462	500	16.985	16.373	Pass
Note: The bandwidth was measured at 6Mbps for 802.11g mode.				
Bandwidth (MHz) for 802.11n HT20				
Frequency (MHz)	**Limit (kHz)**	**Ch 0 99% BW**	**Ch 0 6 dB BW**	**Results**
2412	500	17.885	17.619	Pass
2437	500	17.942	17.589	Pass
2462	500	17.885	17.589	Pass
Note: The bandwidth was measured at MCS0 for 1 data stream				

Bandwidth (MHz) for 802.11n HT40				
Frequency (MHz)	**Limit (kHz)**	**Ch 0 99% BW**	**Ch 0 6 dB BW**	**Results**
2422	500	36.121	35.463	Pass
2437	500	36.141	35.667	Pass
2452	500	36.118	35.131	Pass
Note: The bandwidth was observed at MCS0 at 1 data stream				

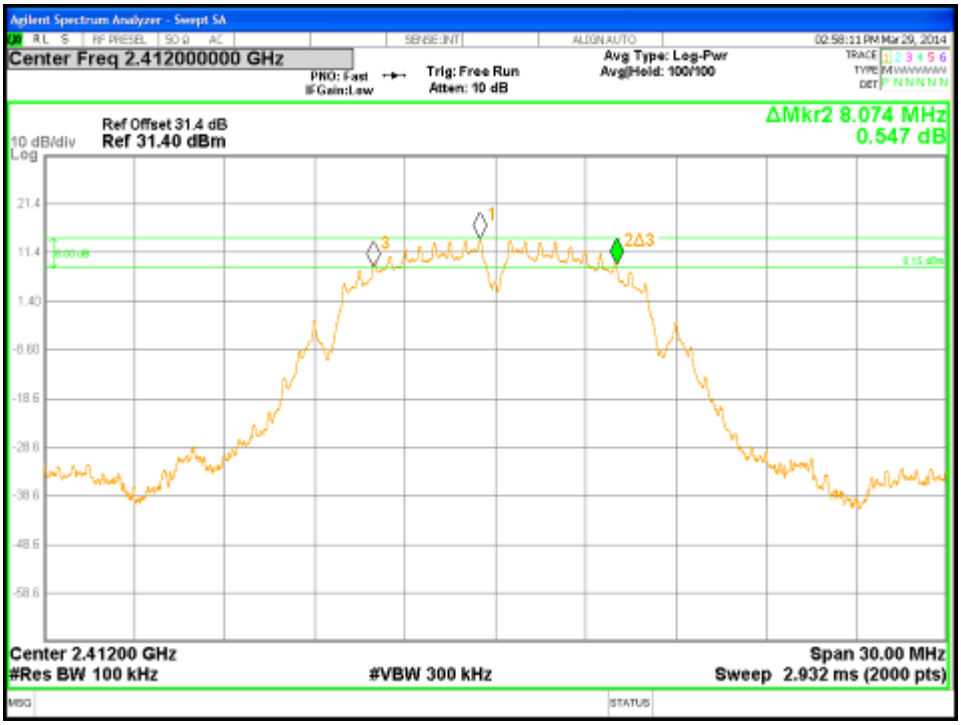


Figure 25: DTS Bandwidth-802.11b-2412 MHz-Ch0

Figure 26: DTS Bandwidth-802.11b-2437 MHz-Ch0

Figure 27: DTS Bandwidth-802.11b-2462 MHz-Ch0

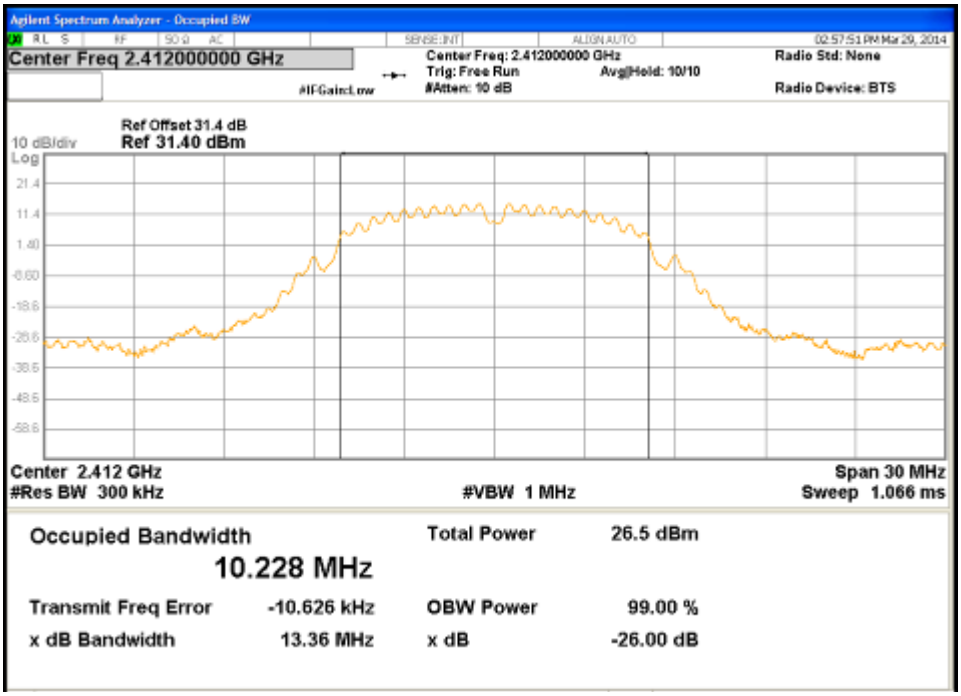


Figure 28: 99% Bandwidth-802.11b-2412 MHz-Ch0

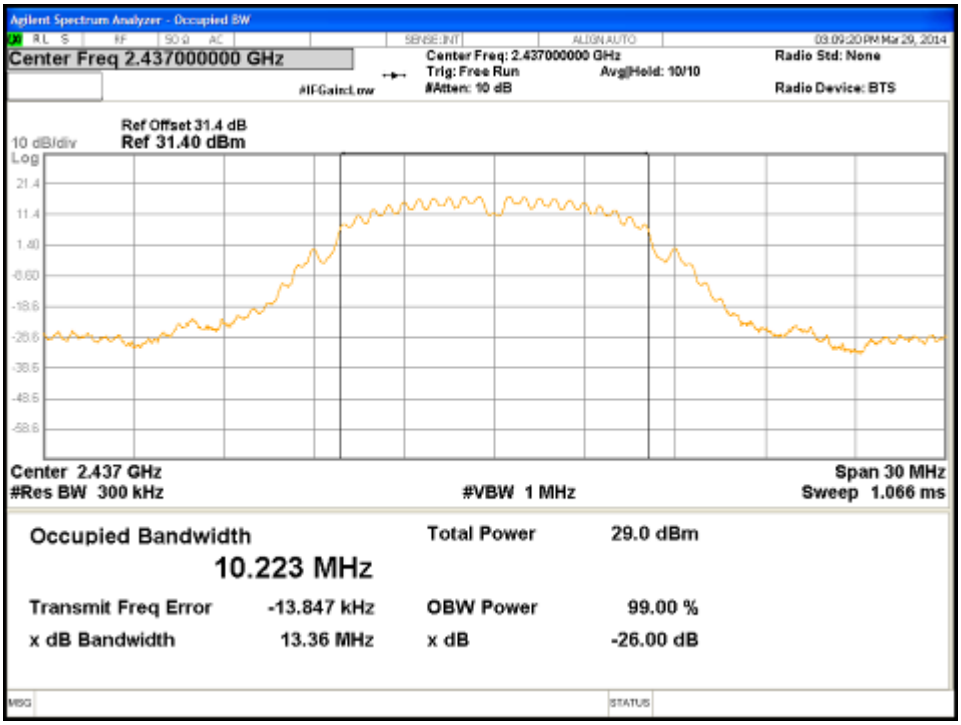


Figure 29: 99% Bandwidth-802.11b-2437 MHz-Ch0

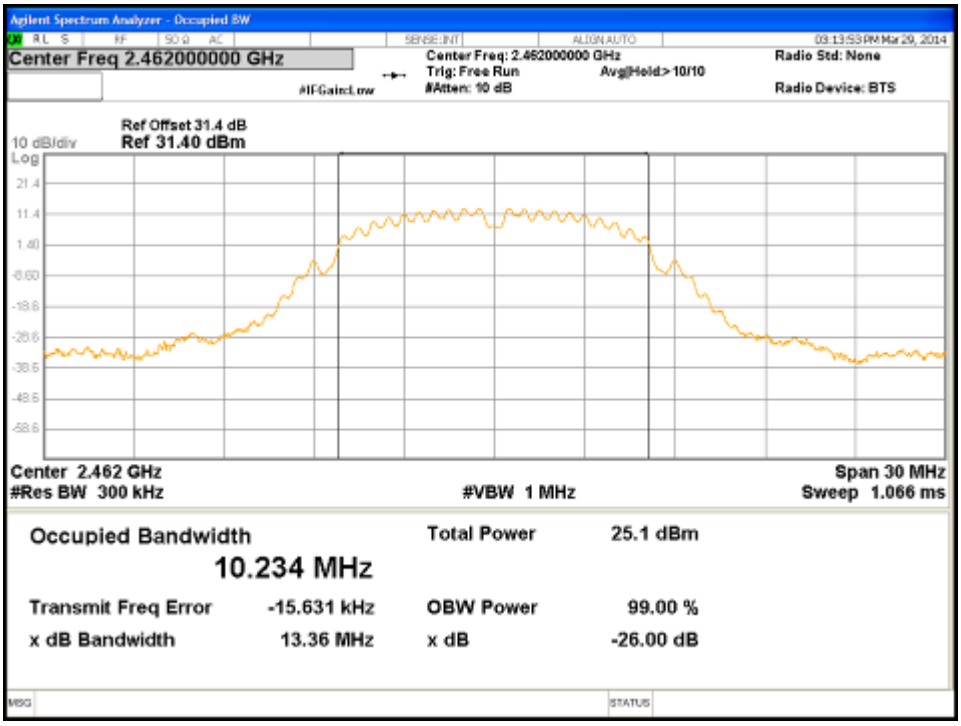


Figure 30: 99% Bandwidth-802.11b-2462 MHz-Ch0

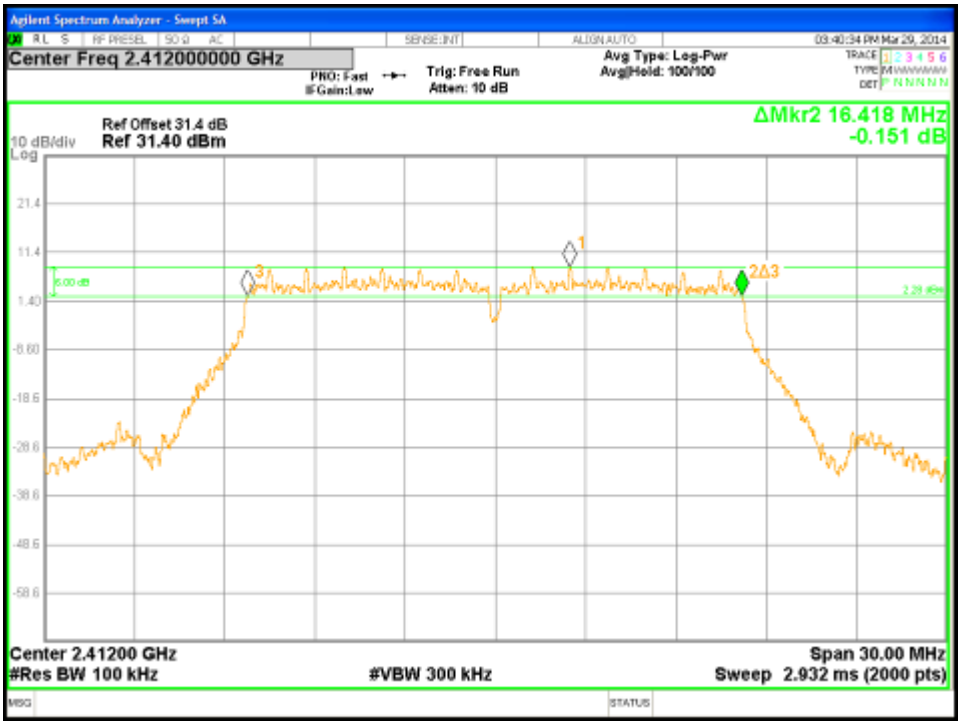


Figure 31: DTS Bandwidth-802.11g-2412 MHz-Ch0

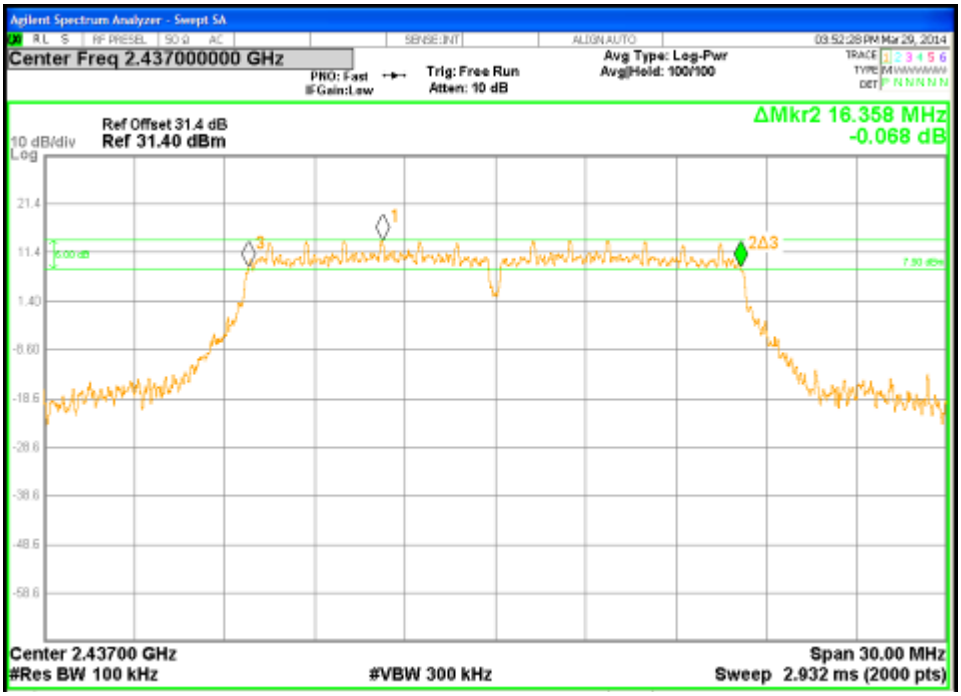


Figure 32: DTS Bandwidth-802.11g-2437 MHz-Ch0

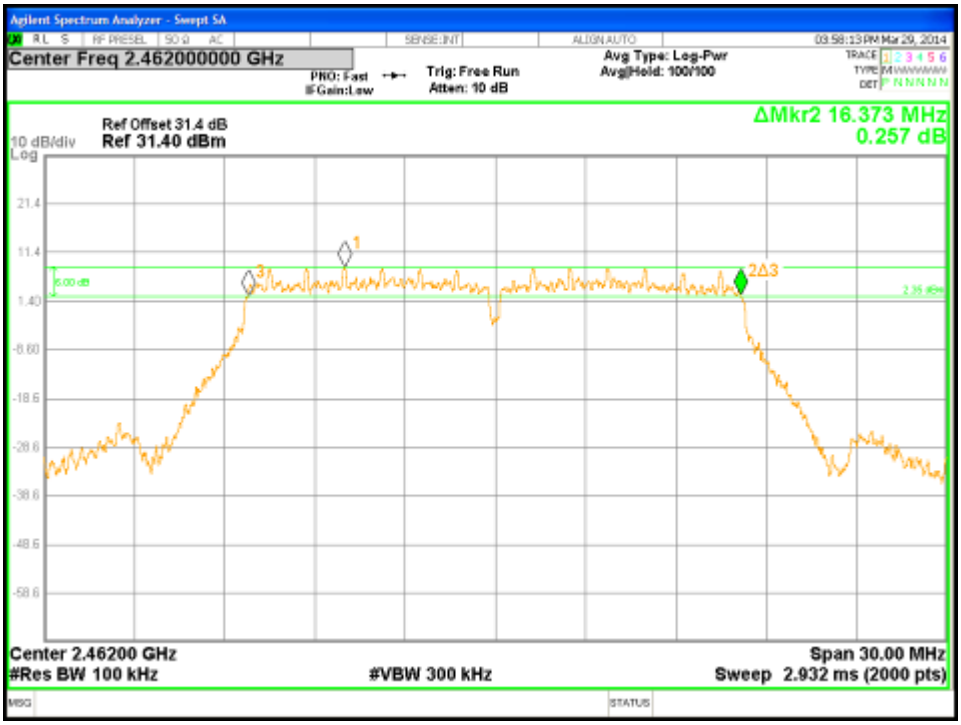


Figure 33: DTS Bandwidth-802.11g-2462 MHz-Ch0

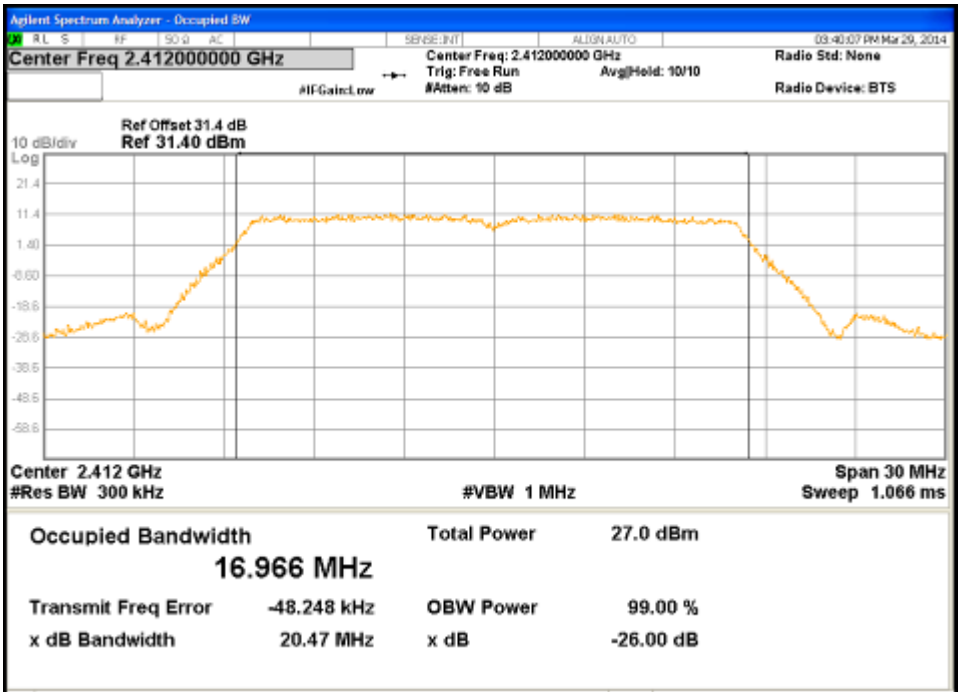


Figure 34: 99% Bandwidth-802.11g-2412 MHz-Ch0

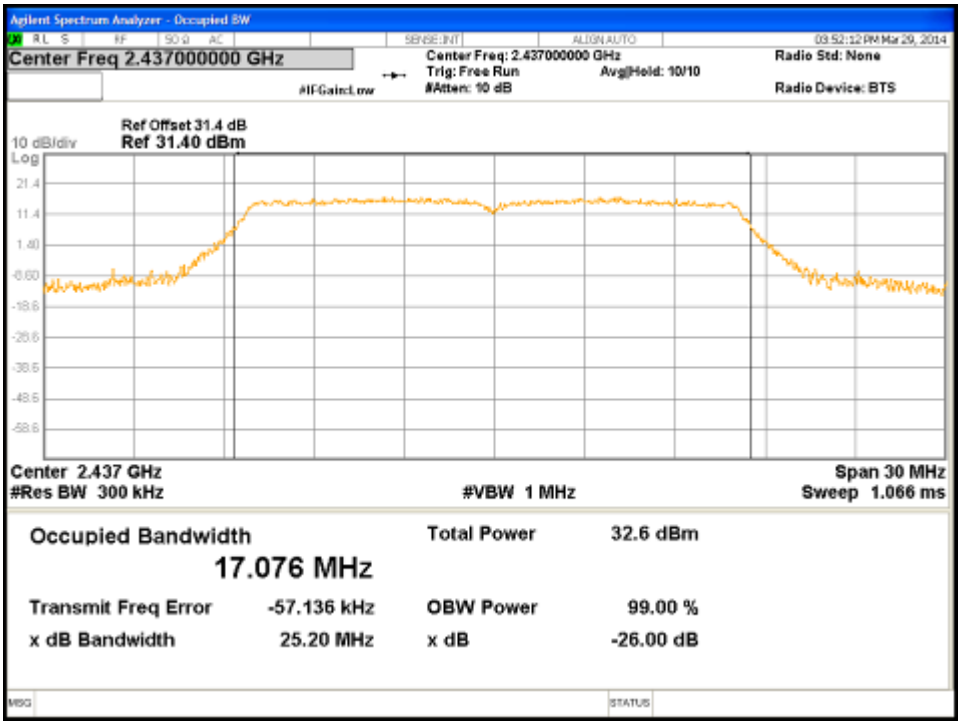


Figure 35: 99% Bandwidth-802.11g-2437 MHz-Ch0

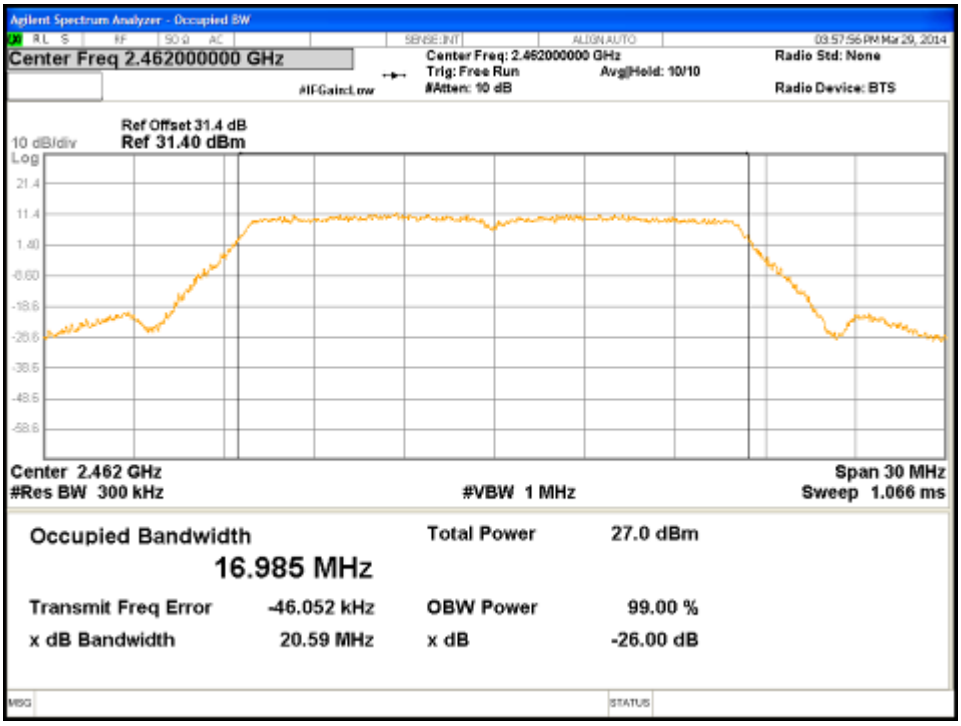


Figure 36: 99% Bandwidth-802.11g-2462 MHz-Ch0

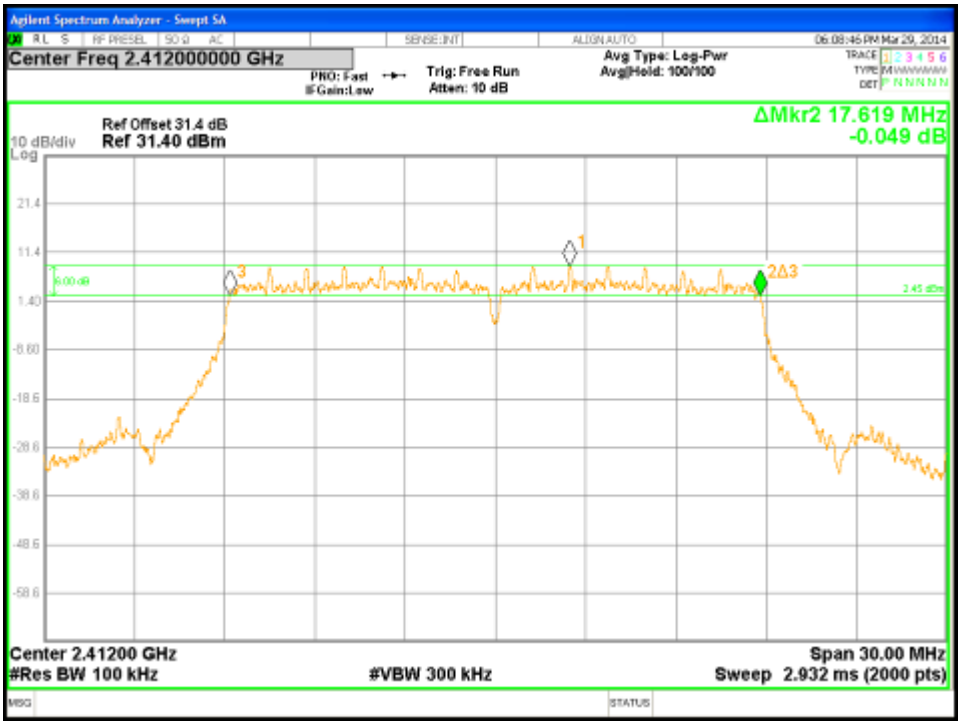


Figure 37: DTS Bandwidth-802.11n HT20-2412 MHz-Ch0

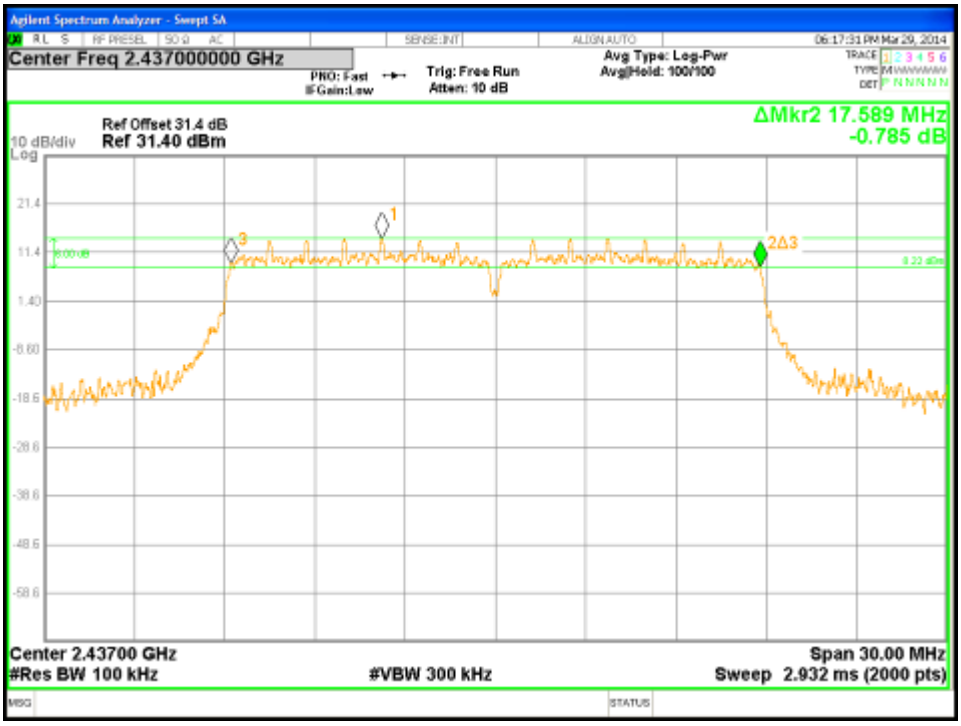


Figure 38: DTS Bandwidth-802.11n HT20-2437 MHz-Ch0

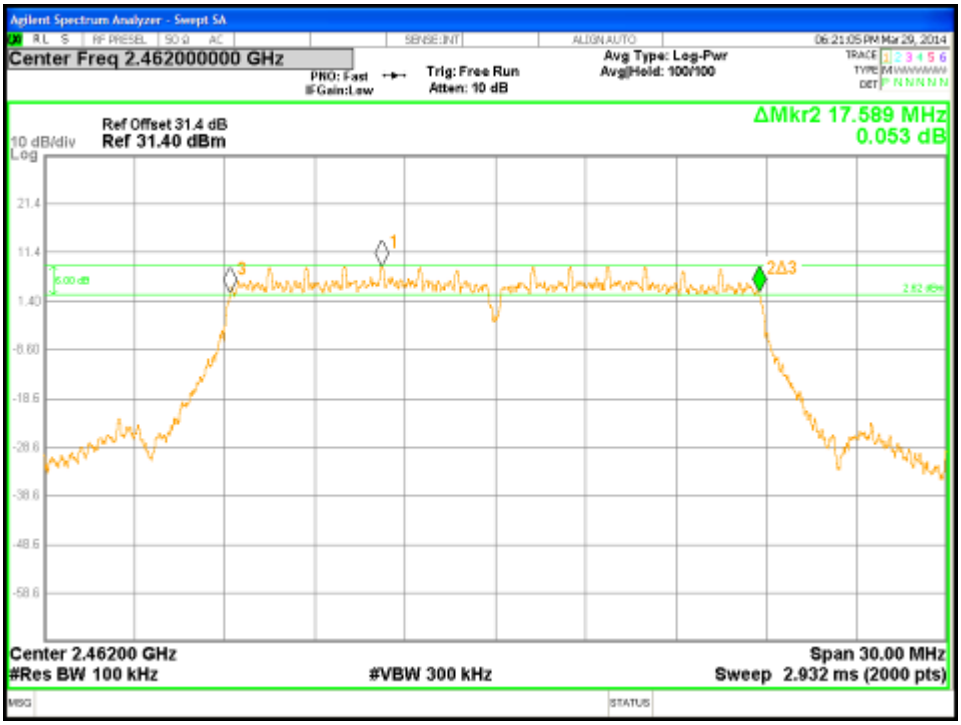


Figure 39: DTS Bandwidth-802.11n HT20-2462 MHz-Ch0

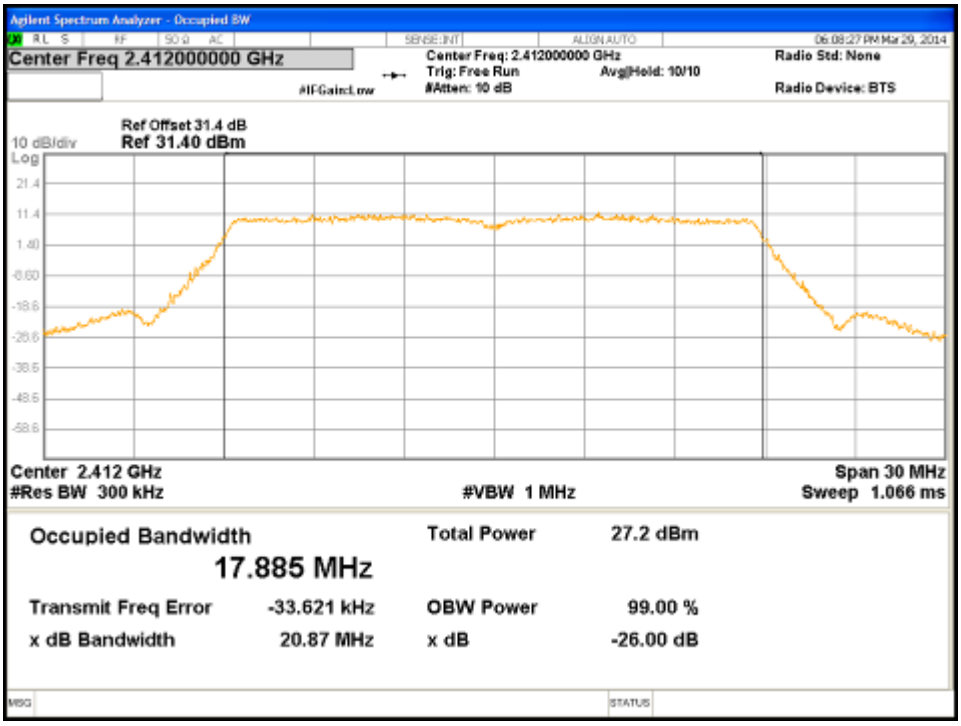


Figure 40: 99% Bandwidth-802.11n HT20-2412 MHz-Ch0

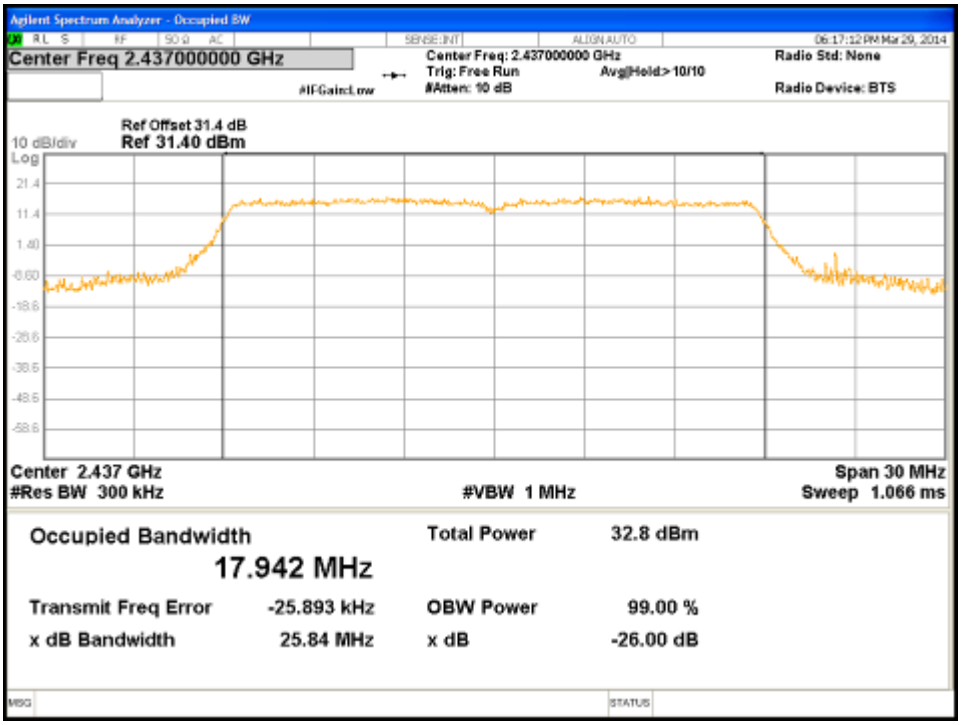


Figure 41: 99% Bandwidth-802.11n HT20-2437 MHz-Ch0

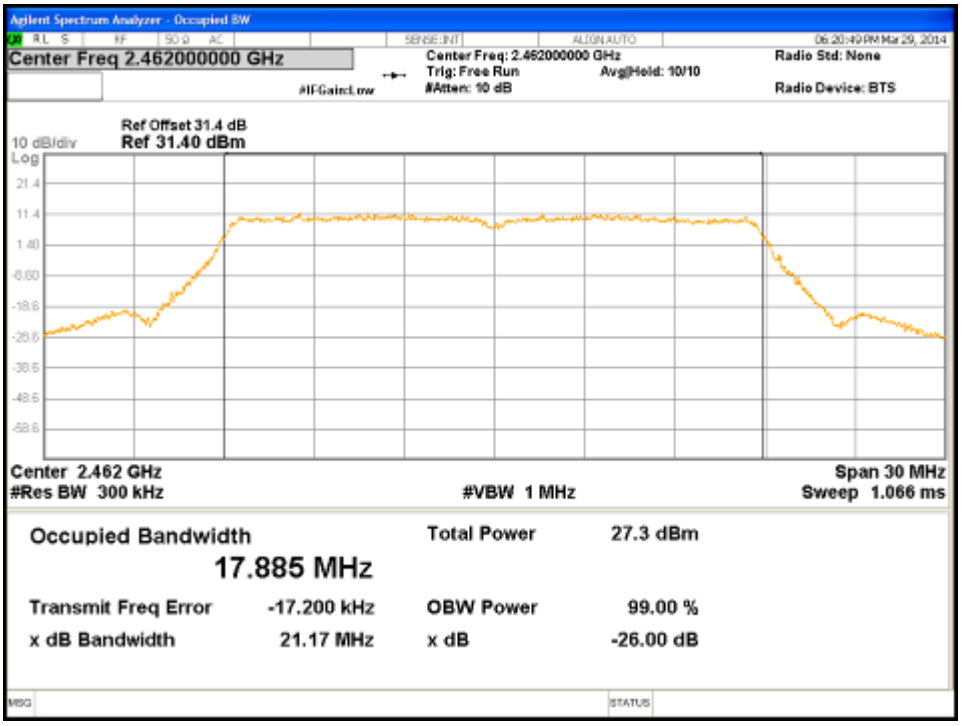


Figure 42: 99% Bandwidth-802.11n HT20-2462 MHz-Ch0

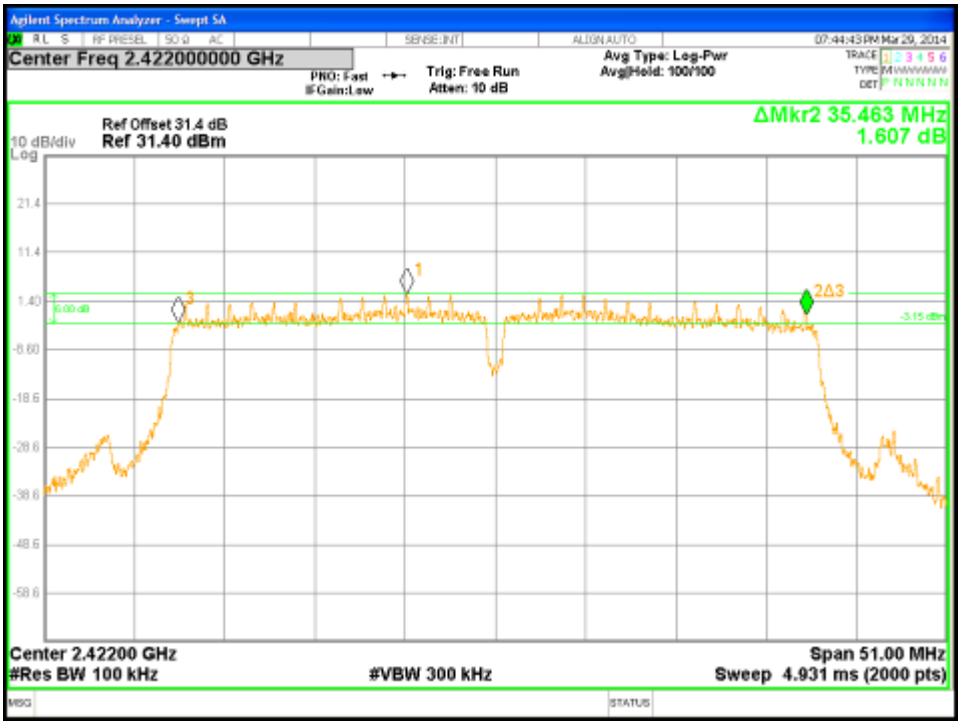


Figure 43: DTS Bandwidth-802.11n HT40-2422 MHz-Ch0

Figure 44: DTS Bandwidth-802.11n HT40-2437 MHz-Ch0

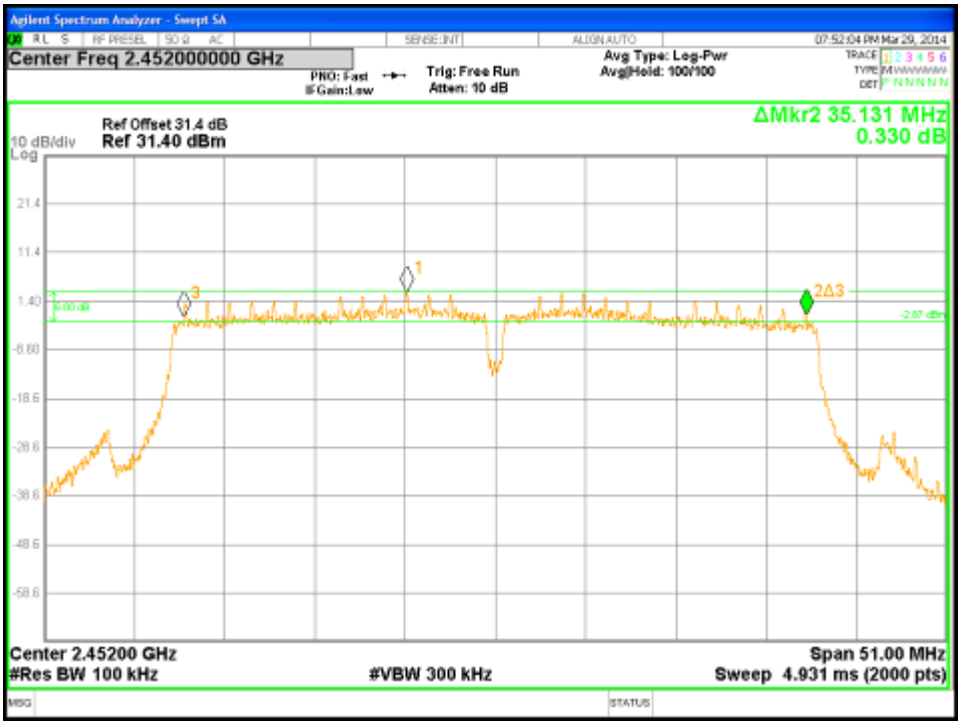


Figure 45: DTS Bandwidth-802.11n HT40-2452 MHz-Ch0

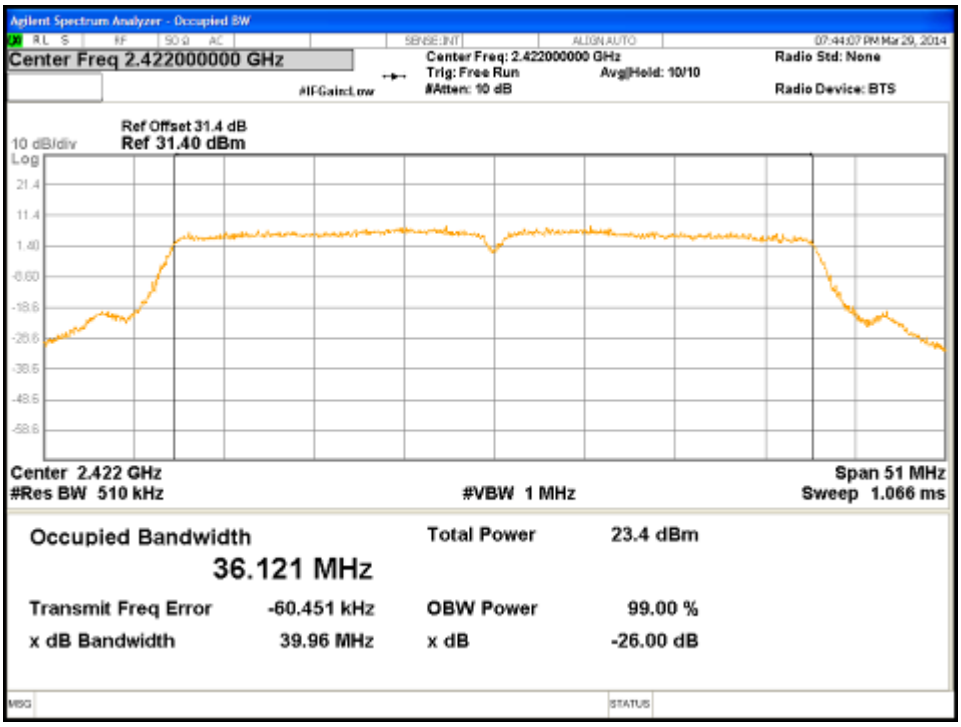


Figure 46: 99% Bandwidth-802.11n HT40-2422 MHz-Ch0

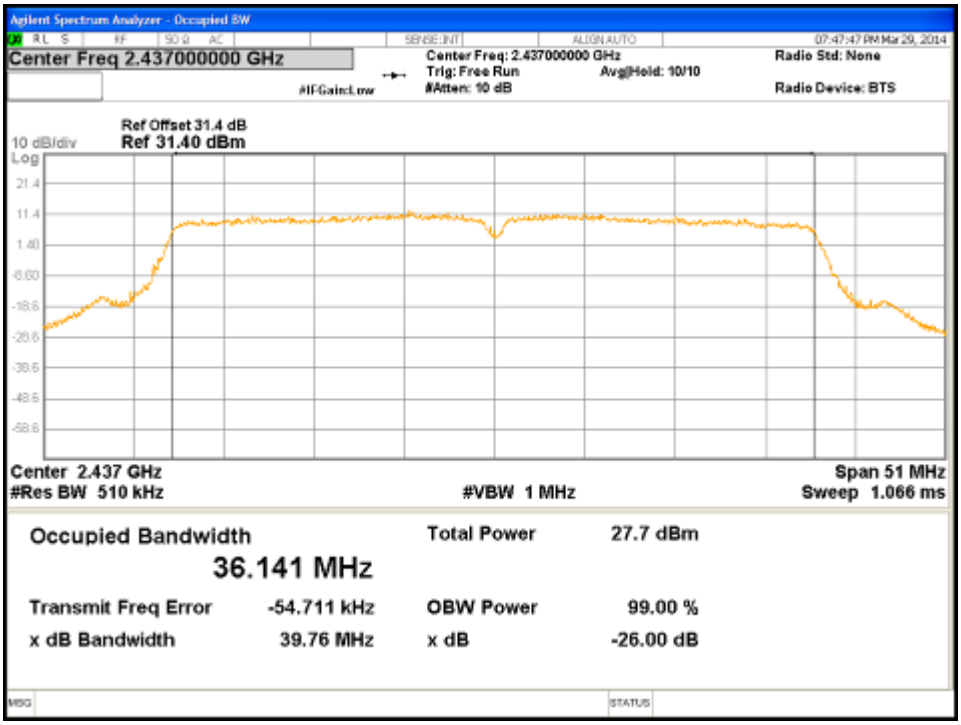


Figure 47: 99% Bandwidth-802.11n HT40-2437 MHz-Ch0

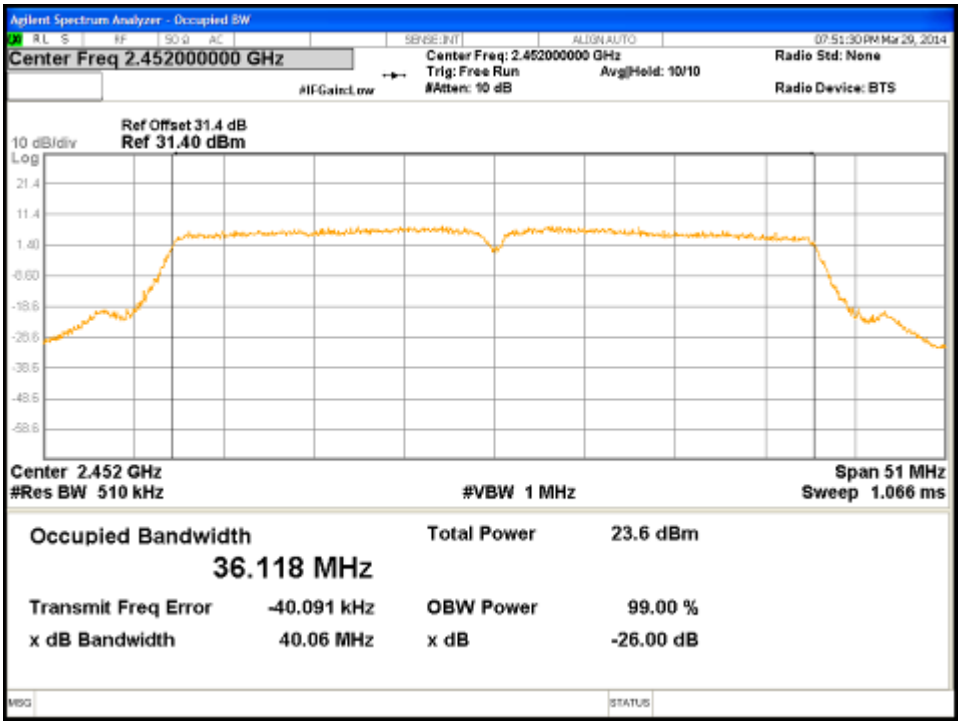


Figure 48: 99% Bandwidth-802.11n HT40-2452 MHz-Ch0

4.3 Out-of-Band Emissions

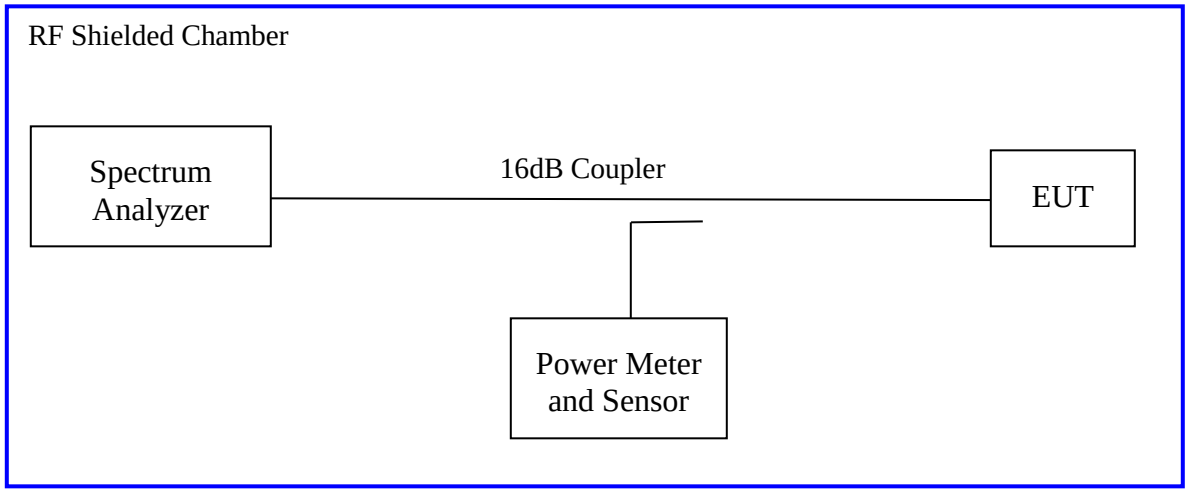
The setup was identical to RF output power measurement. Intentional radiators operating under the alternative provisions to the general emission limits, must be designed to ensure that the 20 dB or 30 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If the frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Since the transmitter complies with the conducted power limits base on the use of RMS averaging per CFR47 Part 15.247(b)(3), any frequency outside the band of 2400MHz to 2483.5 MHz, the power output level must be below 30 dB from the in-band transmitting signal; CFR 47 Part 15.215, 15.247(d) and RSS-210 A8.5

4.3.1 Test Method

The conducted method was used to measure the out-of-band emission requirement. The measurement was performed with modulation per CFR47 15.247(4)(d) 2010 and *RSS-210 A8.5: 2010*. This test was conducted on 3 channels of Sample SN 111. The worst sample result indicated below.

Test Setup:



4.3.2 Test Result

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 6: Emissions at the Band-Edge – Test Results

Test Conditions: Conducted Measurement, Normal Temperature and Voltage only				
Antenna Type: Integrated		**Power Setting:** See test plan		
Directional Antenna Gain: +5.9 dBi		**Signal State:** Modulated		
Ambient Temp.: 23 °C		**Relative Humidity:**33%		
Band-Edge Results				
Operating Channel	**Mode**	**Band-edge Level (dBm)**	**30 dBr Level (dBm)**	**Margin (dB)**
2412 MHz	1Mbps	-37.51	-15.69	-21.82
2437 MHz	1Mbps	-42.15	-13.45	-28.71
2462 MHz	1Mbps	-44.21	-17.48	-26.72
2412 MHz	6 Mbps	-26.28	-21.73	-4.55
2437 MHz	6 Mbps	-38.77	-16.08	-22.69
2462 MHz	6 Mbps	-41.40	-21.62	-19.78
2412 MHz	MCS0	-25.64	-21.43	-4.21
2437 MHz	MCS0	-37.50	-15.77	-21.74
2462 MHz	MCS0	-37.55	-21.26	-16.29
2422 MHz	13.5 Mbps	-24.77	-22.92*	-1.85
2437 MHz	13.5 Mbps	-37.75	-22.92	-14.84
2452 MHz	13.5 Mbps	-43.10	-26.86	-16.24
Note: The band-edge level must lower than the 30 dBr level. The maximum out of band emission on each individual output put is at least 30 dB below the maximum in-band PSD on that output. (*) The band-edge is compared to the highest -30 dBr level of the test mode.				

Table 7: Out of band Conducted Emission – Test Results

Test Conditions: Conducted Measurement, Normal Temperature and Voltage only			
Antenna Type: Integrated		**Power Setting:** See test plan	
Directional Antenna Gain: +5.9 dBi		**Signal State:** Modulated	
Ambient Temp.: 23 °C		**Relative Humidity:**33%	
Output of Band Results			
Operating Channel	**Mode**	**Band 30MHz- 26GHz**	**Result**
2412 MHz	1Mbps	Figure 49, 50	Pass
2437 MHz	1Mbps	Figure 51, 52	Pass
2462 MHz	1Mbps	Figure 53, 54	Pass
2412 MHz	6 Mbps	Figure 55, 56	Pass
2437 MHz	6 Mbps	Figure 57, 58	Pass
2462 MHz	6 Mbps	Figure 59, 60	Pass
2412 MHz	6.5 Mbps	Figure 61, 62	Pass
2437 MHz	6.5 Mbps	Figure 63, 64	Pass
2462 MHz	6.5 Mbps	Figure 65, 66	Pass
2422 MHz	13.5 Mbps	Figure 67, 68	Pass
2437 MHz	13.5 Mbps	Figure 69, 70	Pass
2452 MHz	13.5 Mbps	Figure 71, 72	Pass

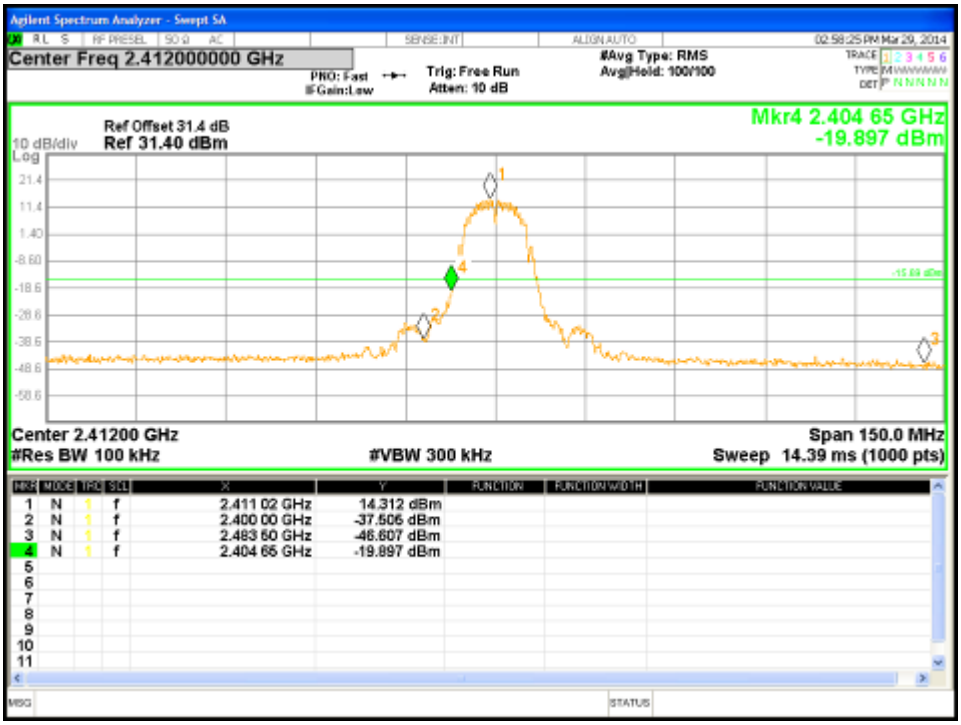


Figure 49: Conducted Band Edge-2412 MHz-11b-1Mbps-Ch0

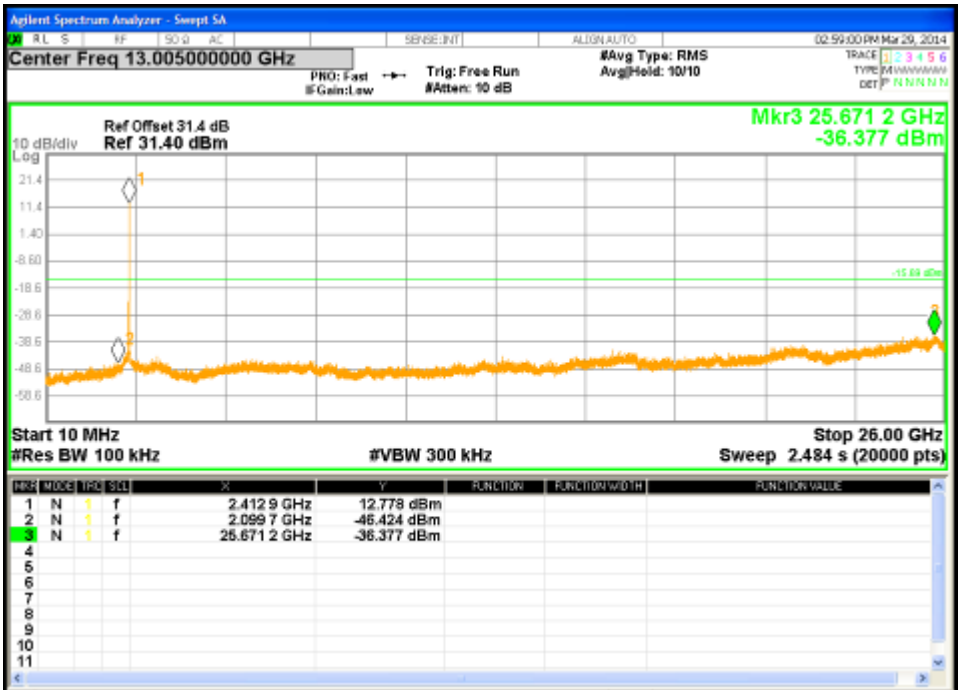


Figure 50: Out of band Emission-2412 MHz-11b-1Mbps-Ch0

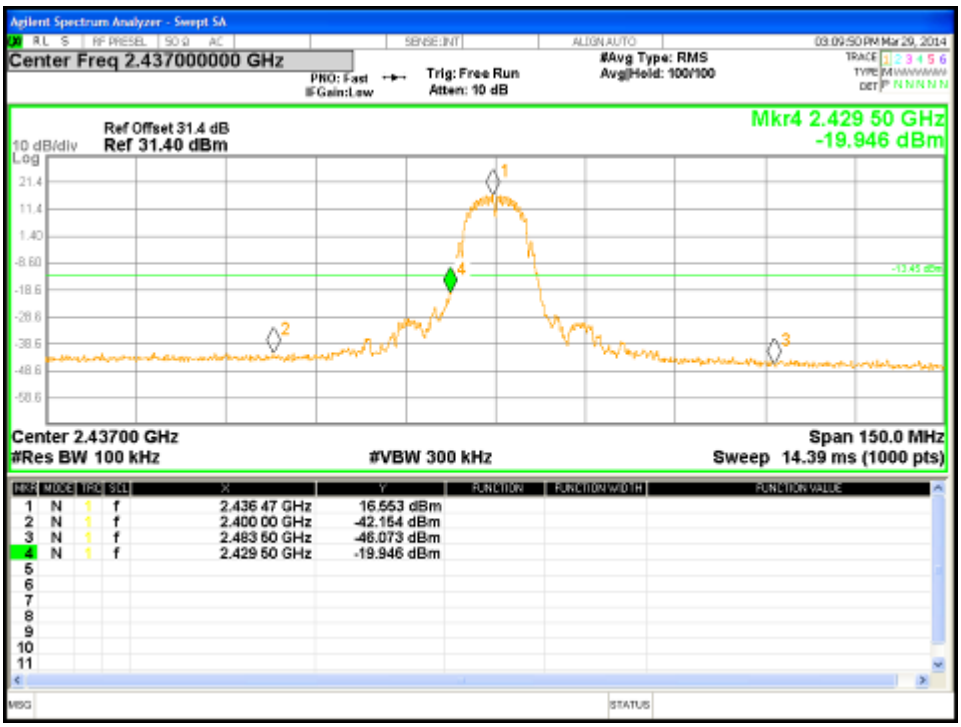


Figure 51: Conducted Band Edge-2437 MHz-11b-1Mbps-Ch0

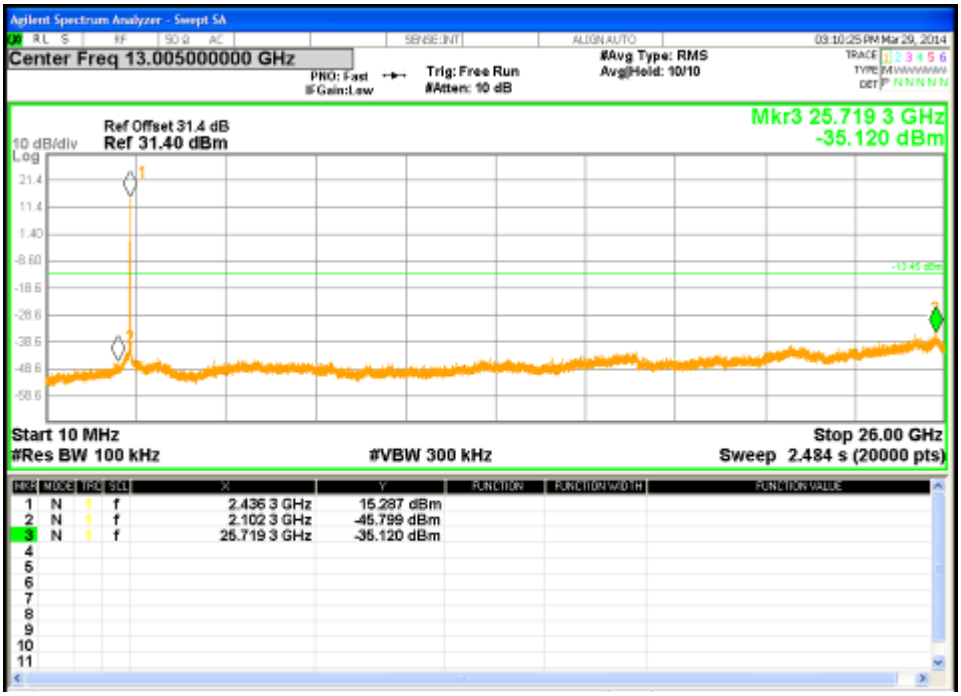


Figure 52: Out of band Emission-2437 MHz-11b-1Mbps-Ch0

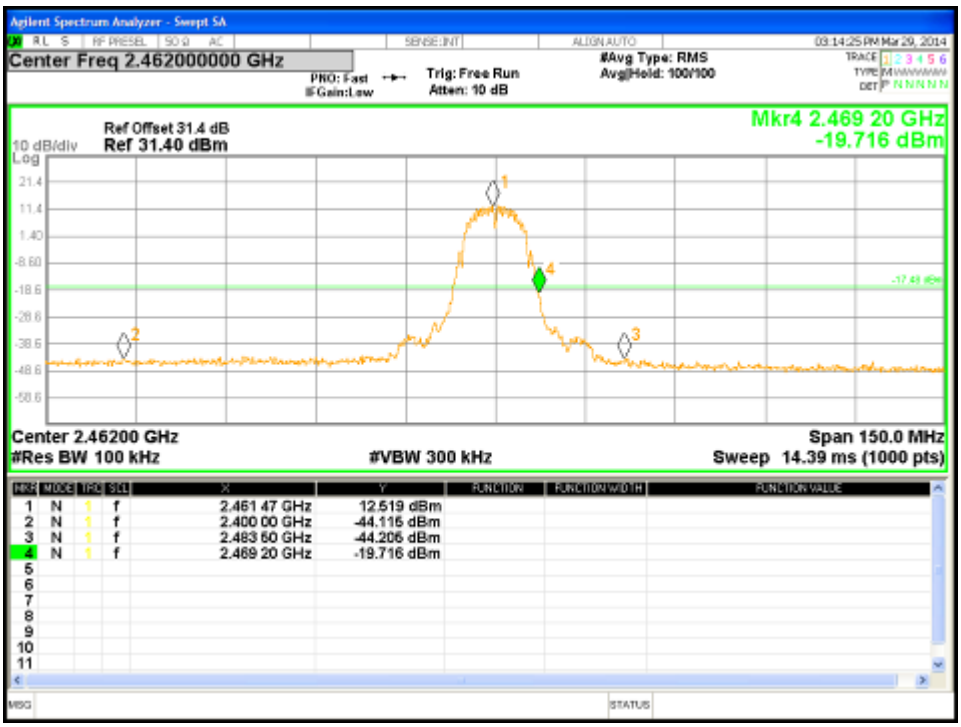


Figure 53: Conducted Band Edge-2462 MHz-11b-1Mbps-Ch0

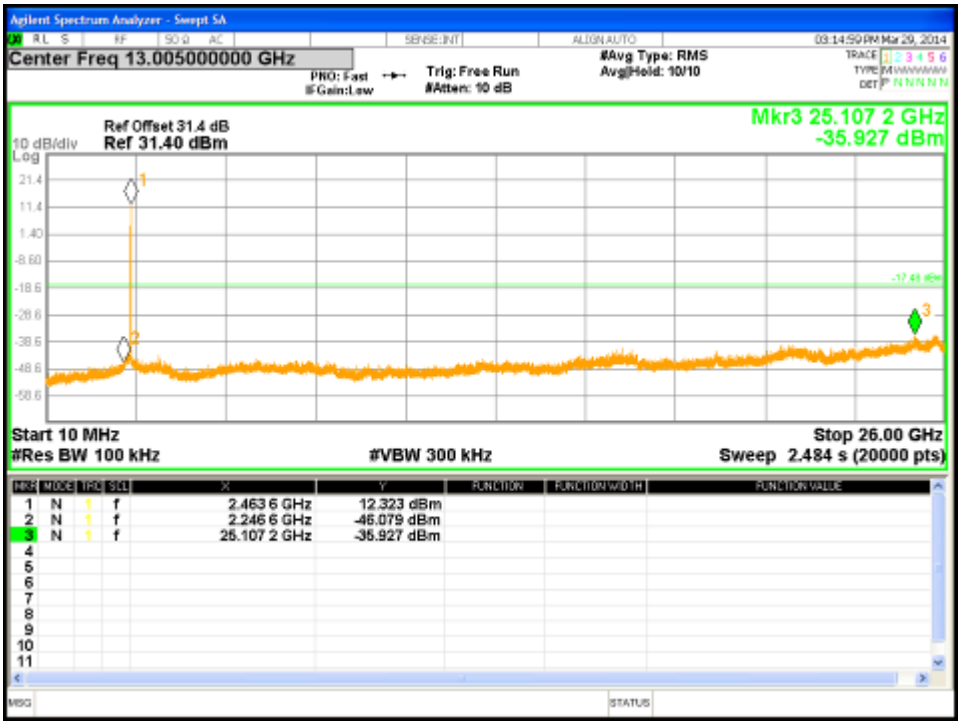


Figure 54: Out of band Emission-2462 MHz-11b-1Mbps-Ch0

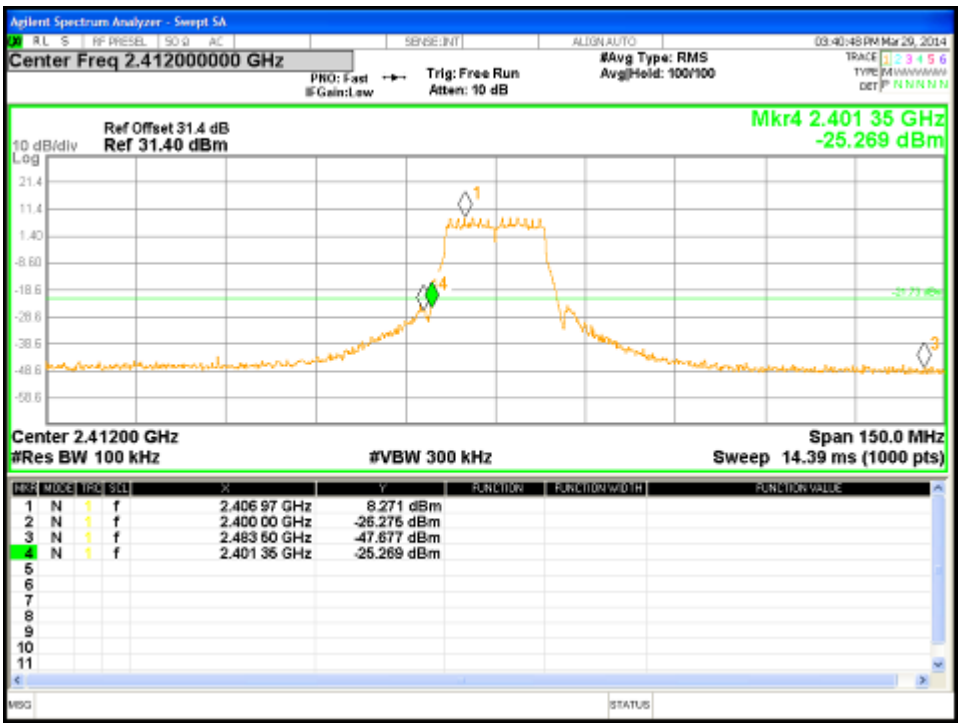


Figure 55: Conducted Band Edge-2412 MHz-11g-6Mbps-Ch0

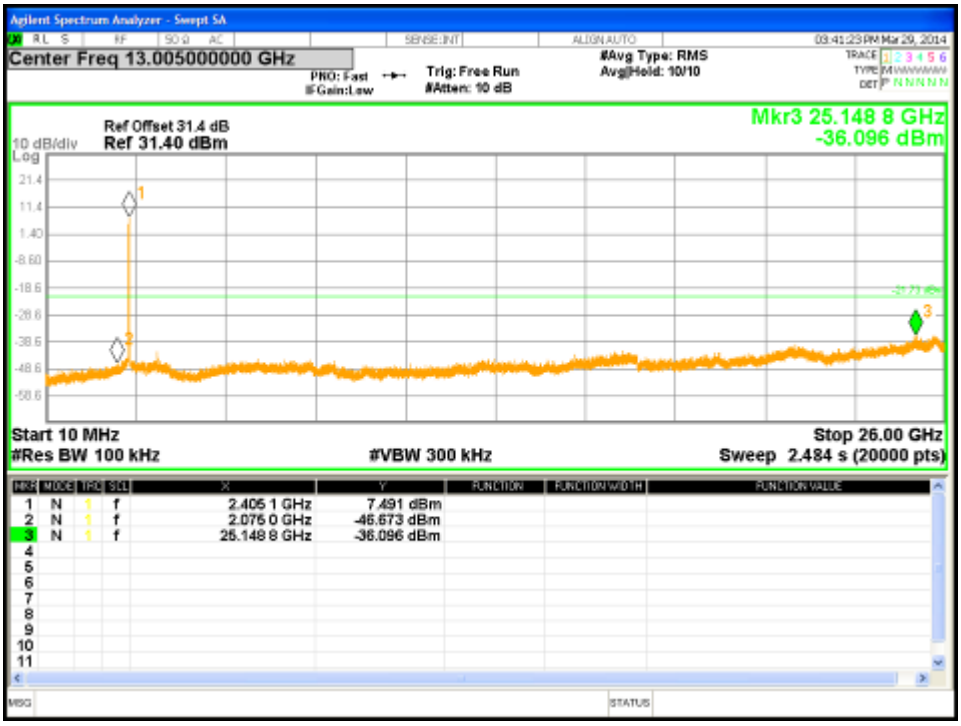


Figure 56: Out of band Emission-2412 MHz-11g-6Mbps-Ch0

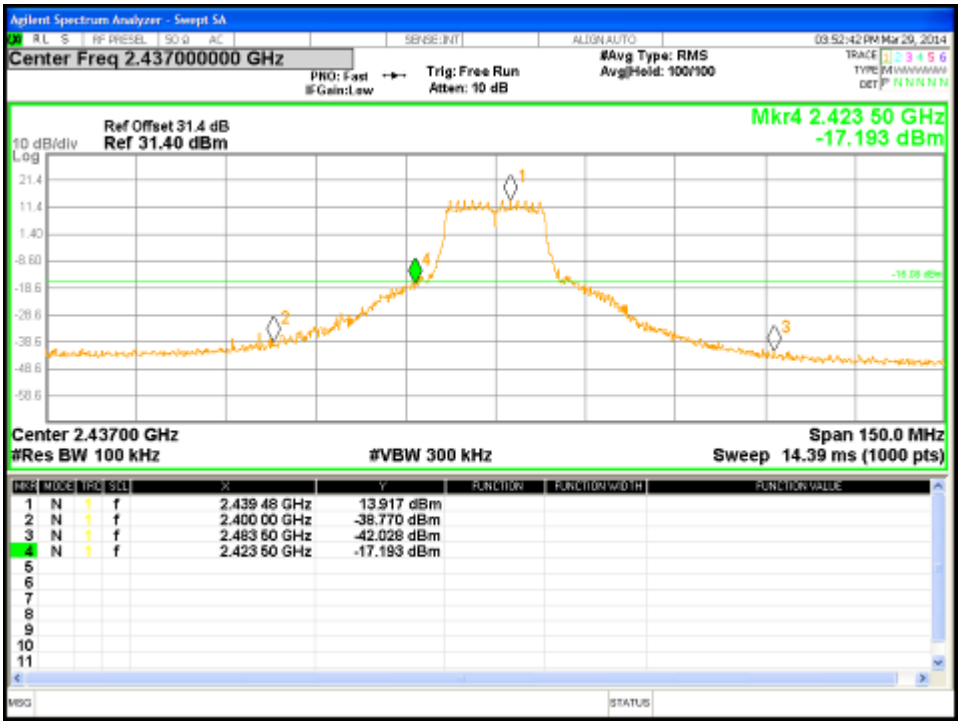


Figure 57: Conducted Band Edge-2437 MHz-11g-6Mbps-Ch0

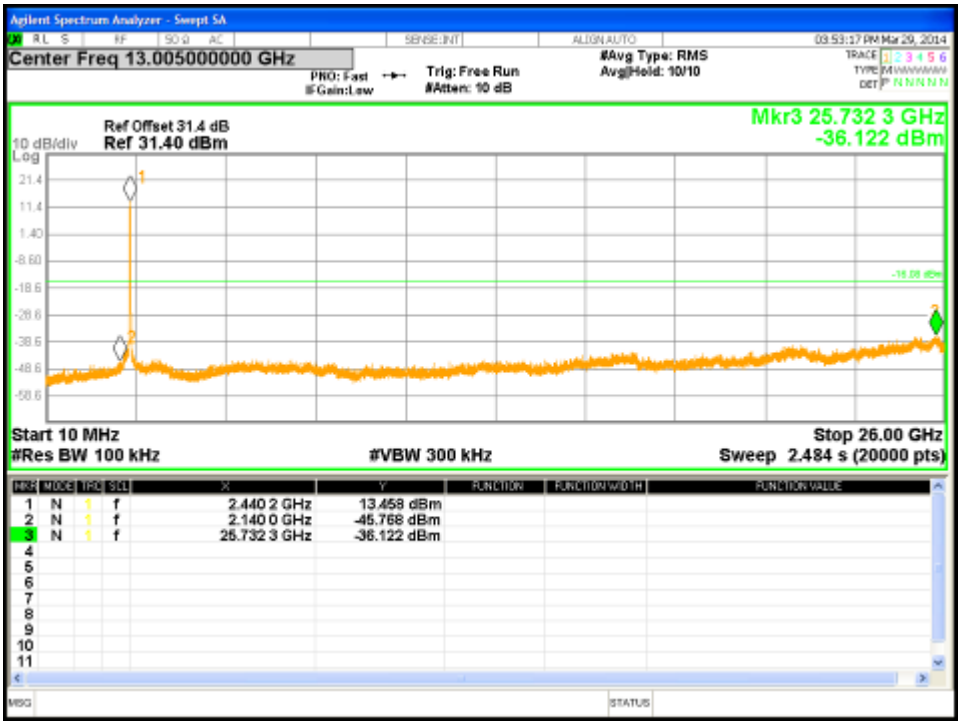


Figure 58: Out of band Emission-2437 MHz-11g-6Mbps-Ch0

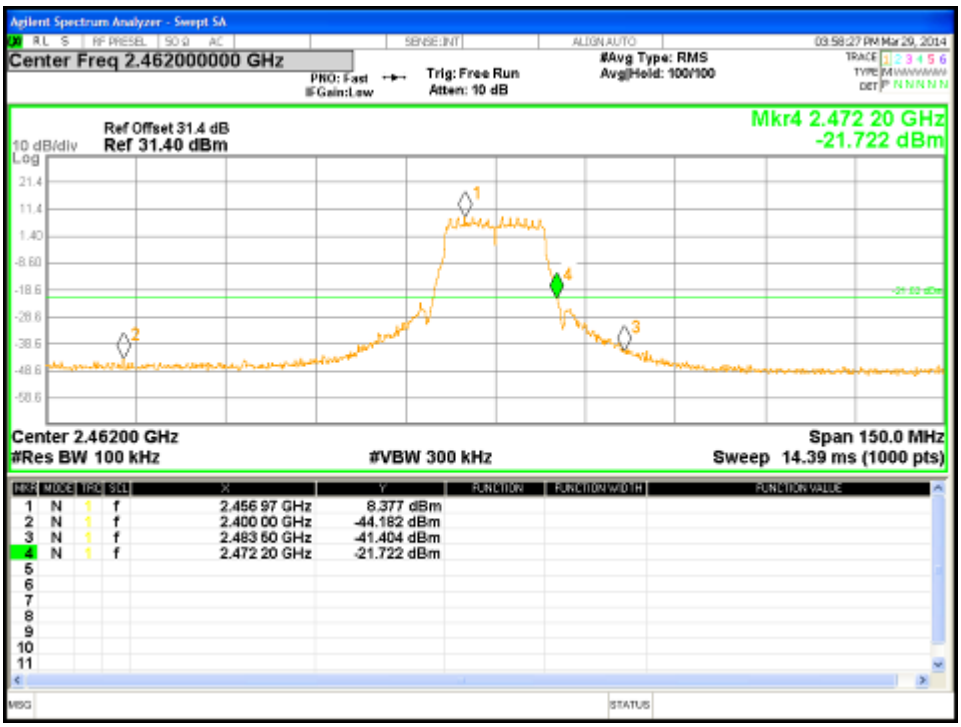


Figure 59: Conducted Band Edge-2462 MHz-11g-6Mbps-Ch0

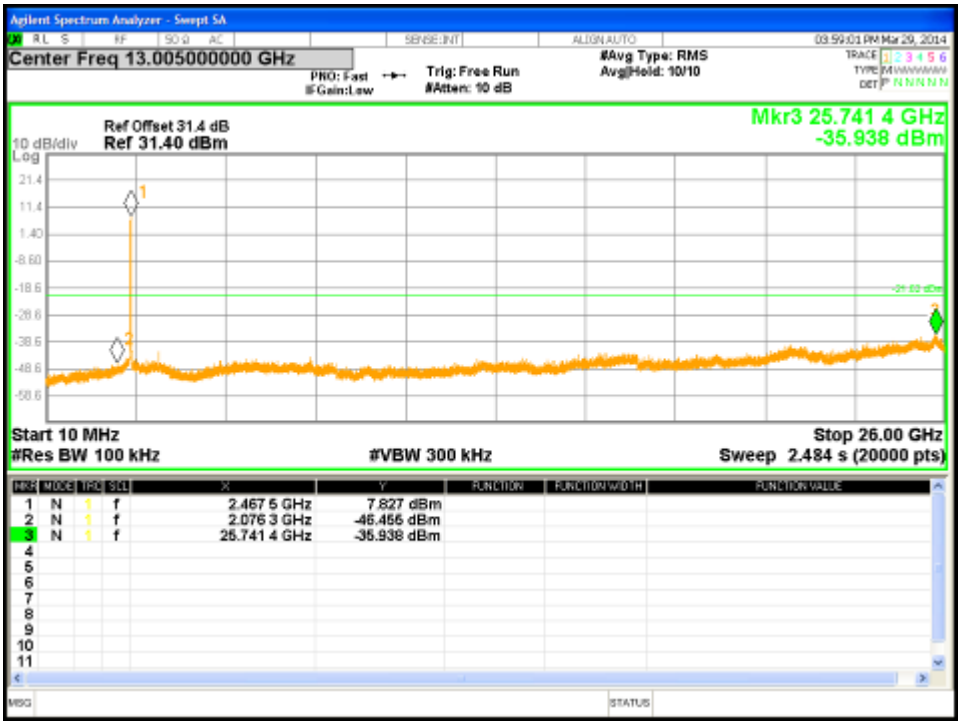


Figure 60: Out of band Emission-2462 MHz-11g-6Mbps-Ch0

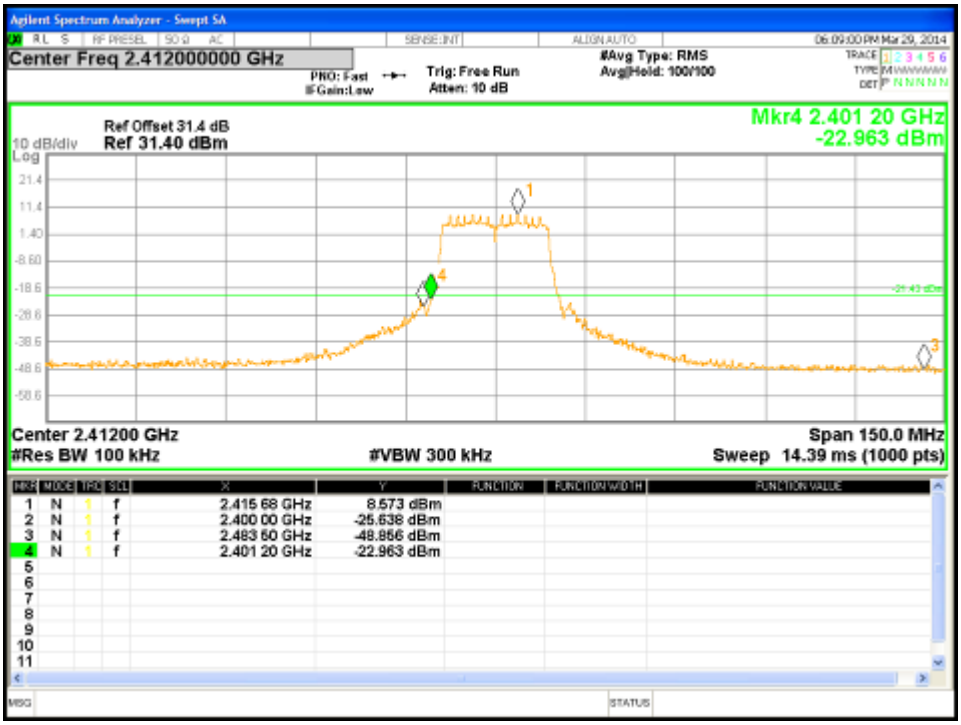


Figure 61: Conducted Band Edge-2412 MHz-HT20-MCS0-Ch0

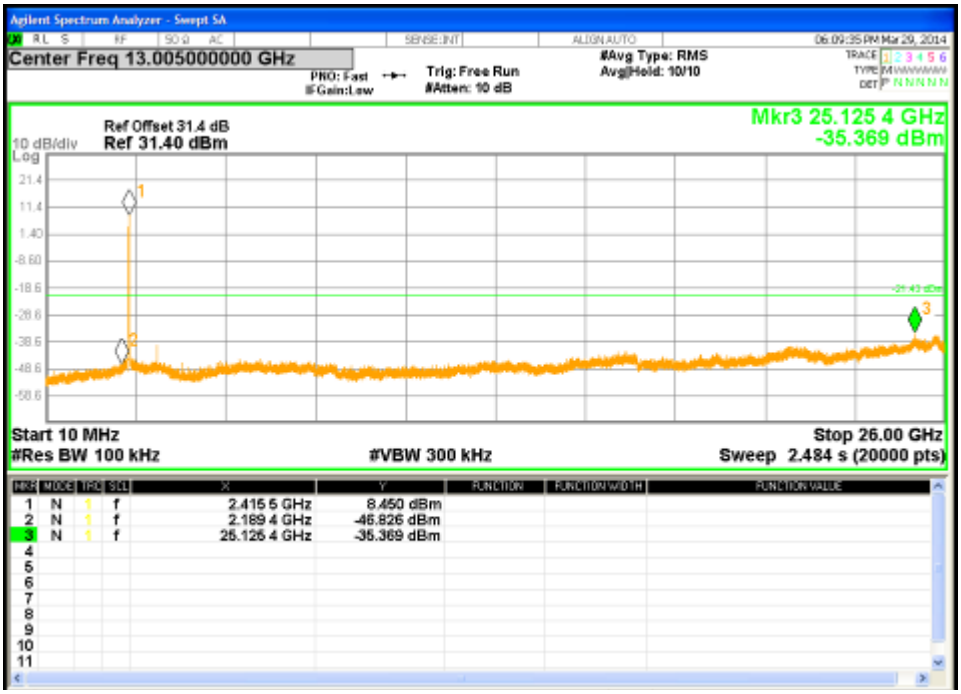


Figure 62: Out of band Emission-2412 MHz-HT20-MCS0-Ch0

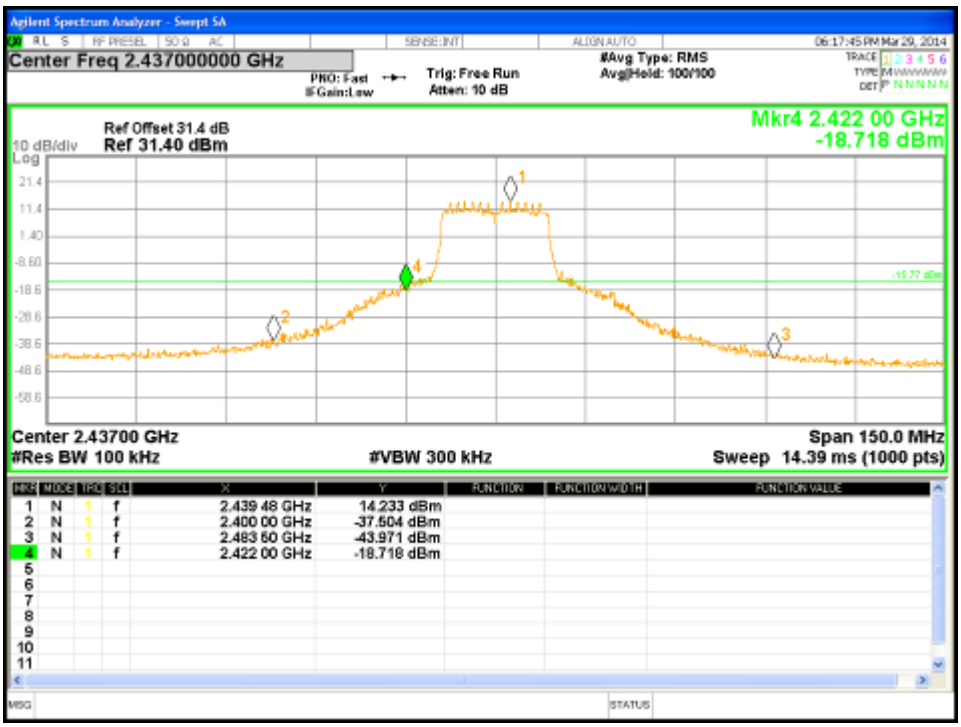


Figure 63: Conducted Band Edge-2437 MHz-HT20-MCS0-Ch0

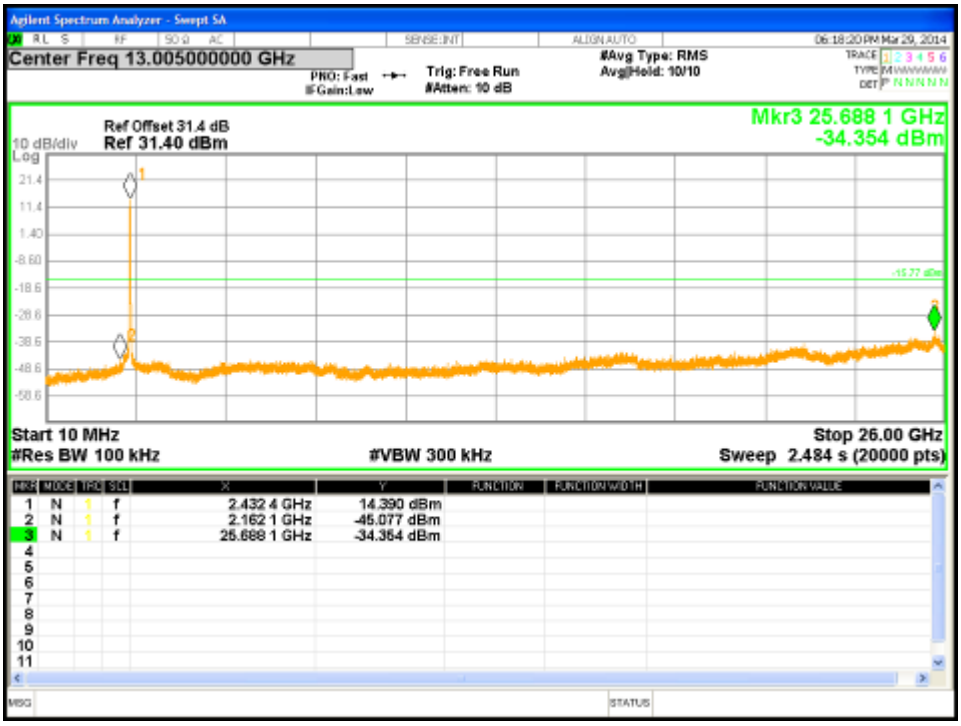


Figure 64: Out of band Emission-2437 MHz-HT20-MCS0-Ch0

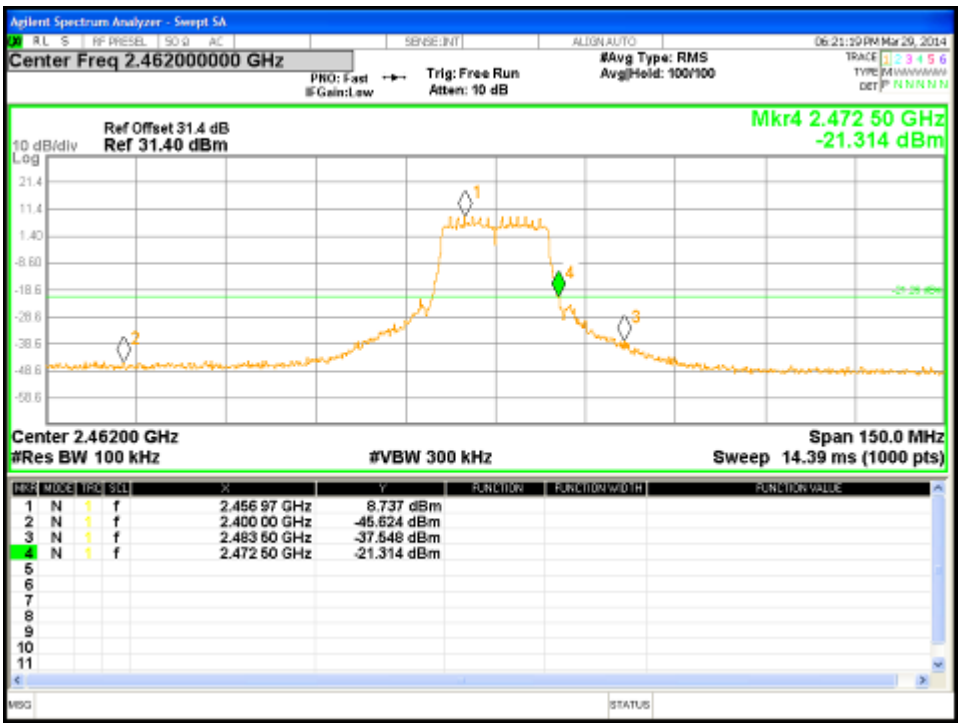


Figure 65: Conducted Band Edge-2462 MHz-HT20-MCS0-Ch0

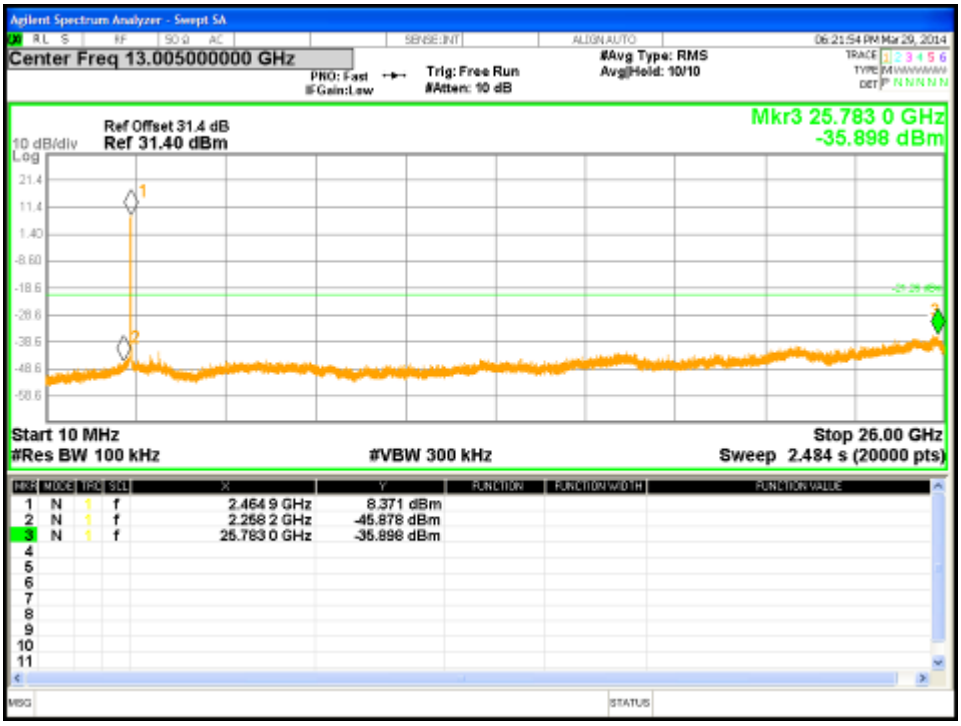


Figure 66: Out of band Emission-2462 MHz-HT20-MCS0-Ch0

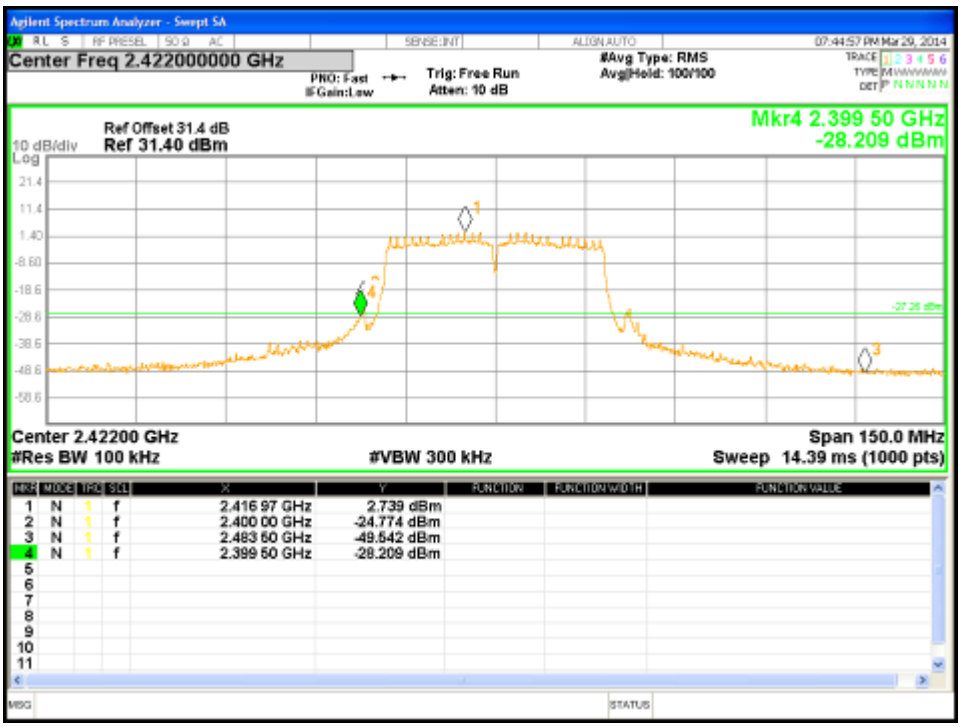


Figure 67: Conducted Band Edge-2422 MHz-HT40-MCS0-Ch0

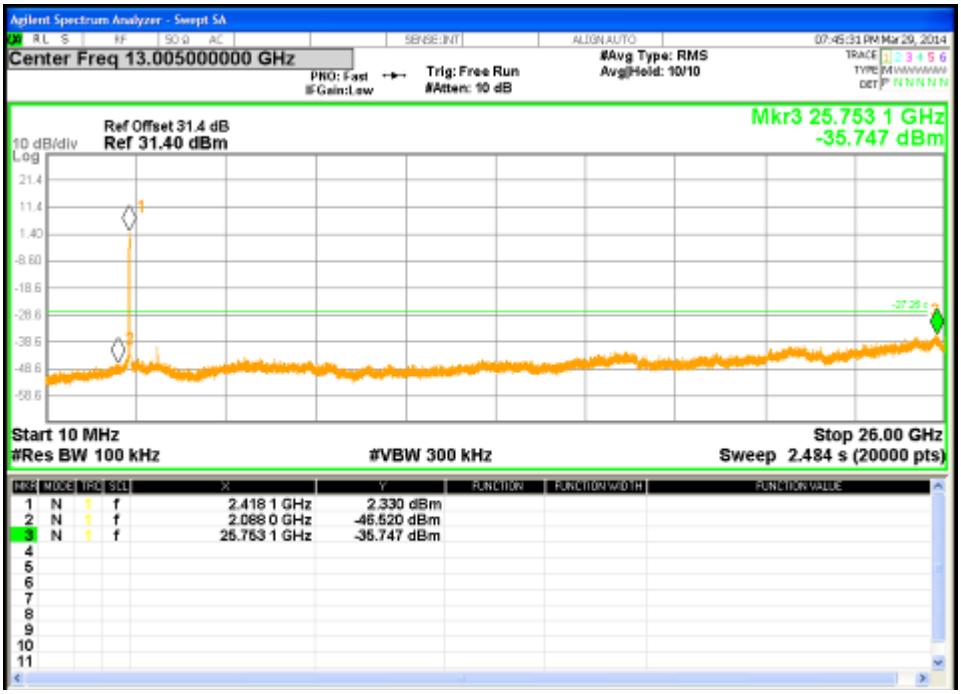


Figure 68: Out of band Emission-2422 MHz-HT40-MCS0-Ch0

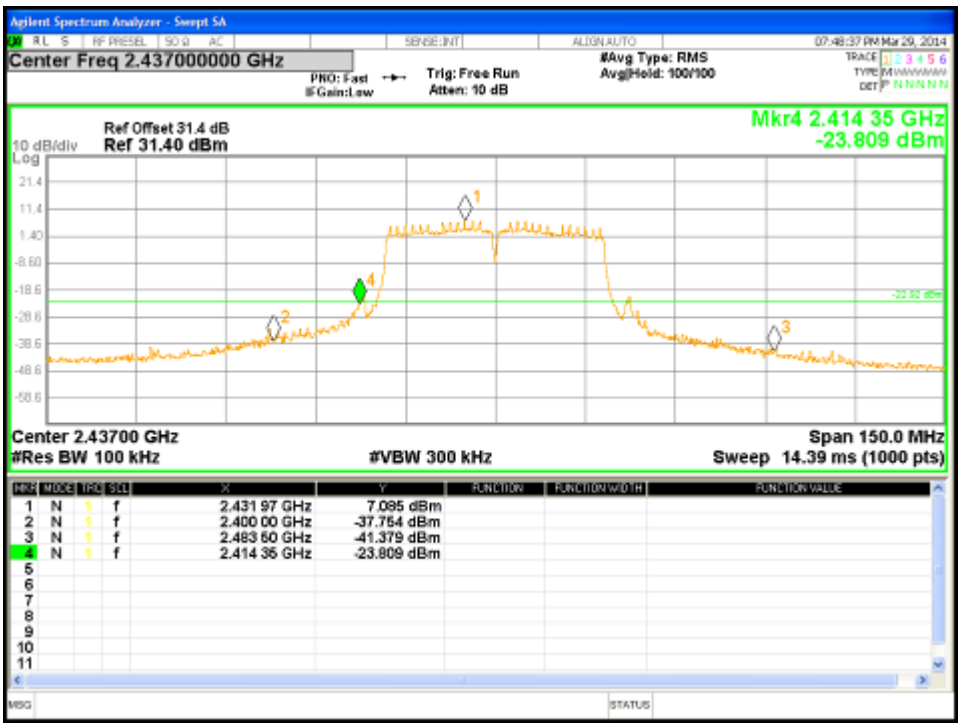


Figure 69: Conducted Band Edge-2437 MHz-HT40-MCS0-Ch0

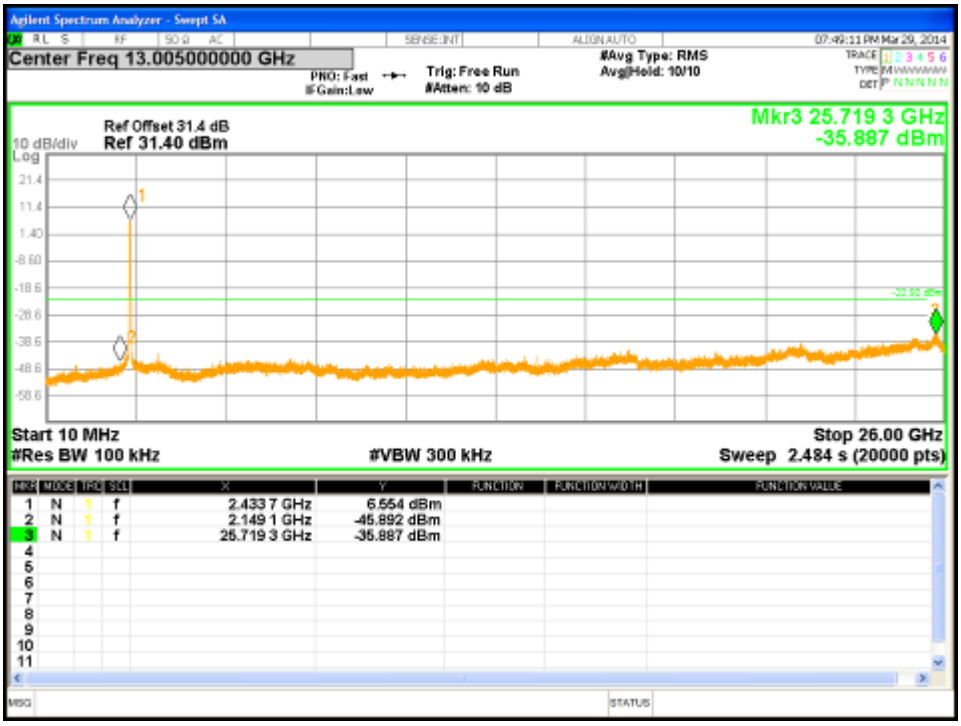


Figure 70: Out of band Emission-2437 MHz-HT40-MCS0-Ch0

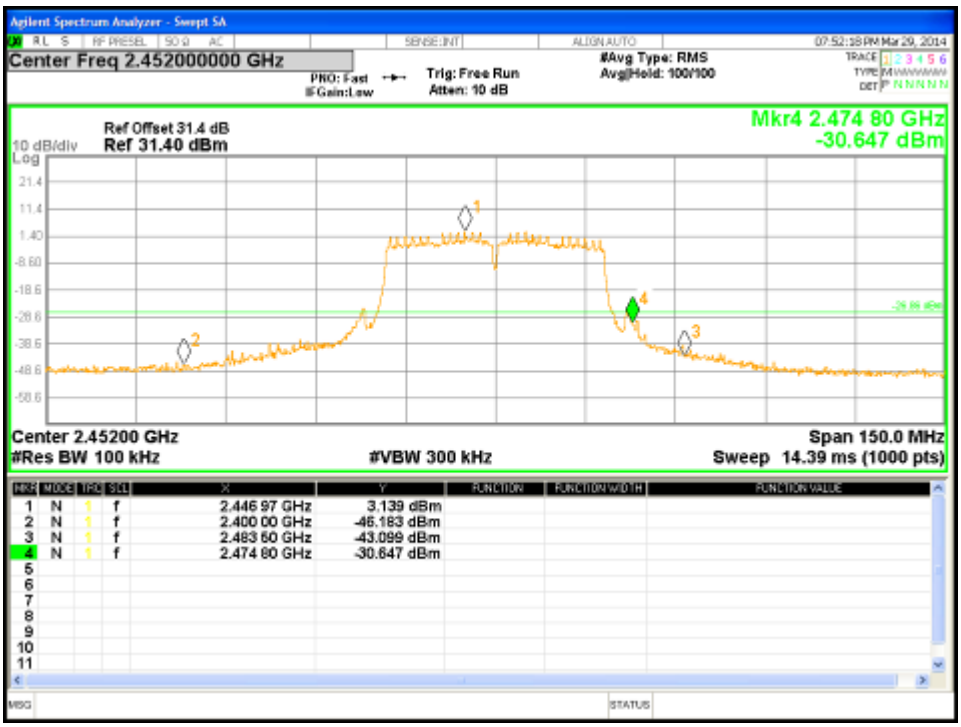


Figure 71: Conducted Band Edge-2452 MHz-HT40-MCS0-Ch0

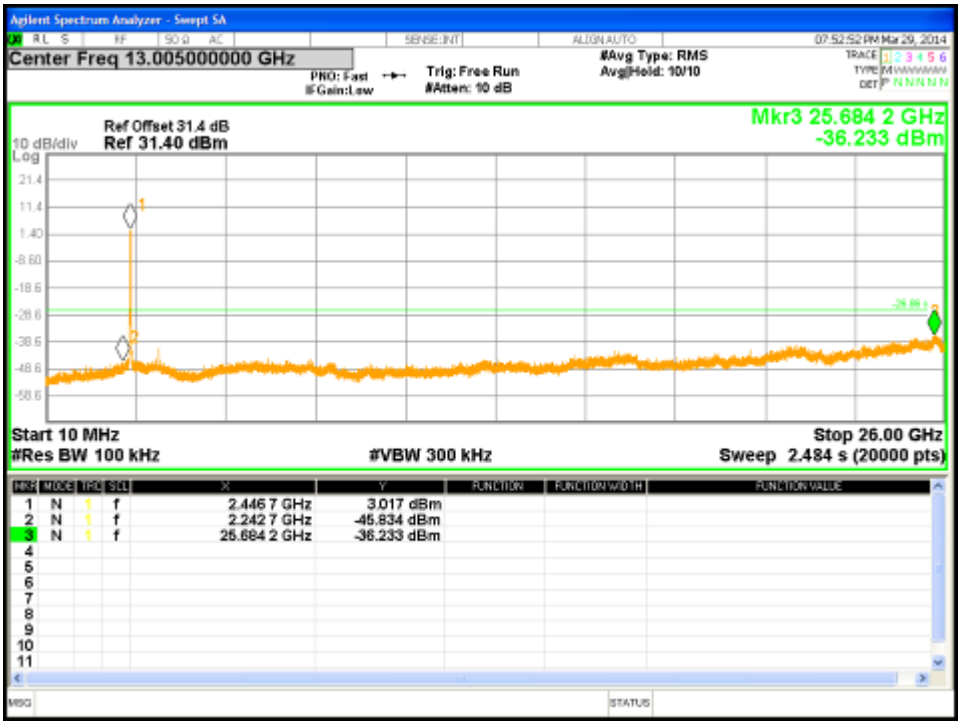


Figure 72: Out of band Emission-2452 MHz-HT40-MCS0-Ch0

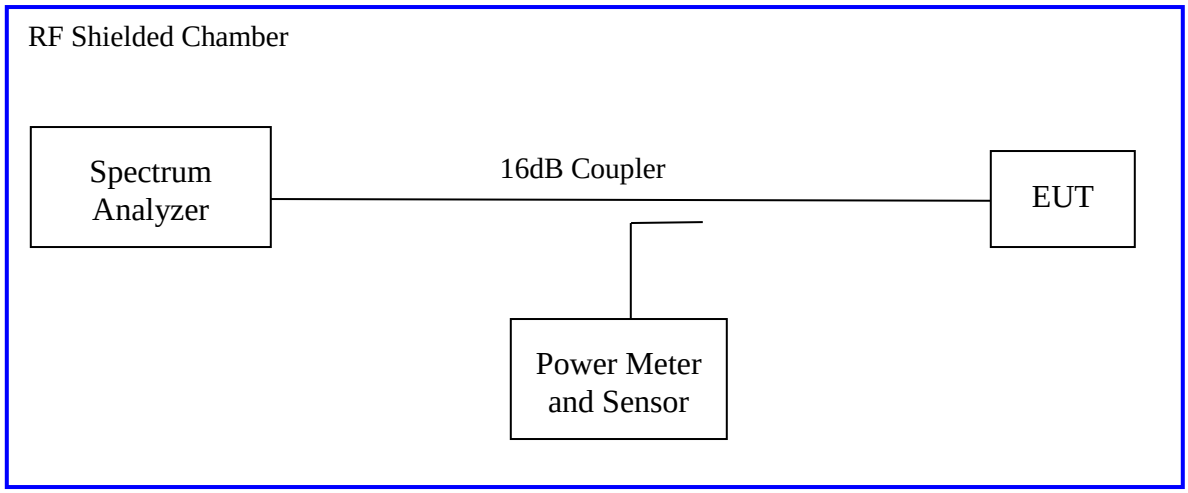
4.4 Peak Power Spectral Density

According to the CFR47 Part 15.247 (e) and RSS-210 (A8.2), the spectral power density output of the antenna port shall be less than 8dBm in any 3kHz band during any time interval of continuous transmission.

4.4.1 Test Method

The conducted method was used to measure the channel power output per ANSI C63.10:2009 Section 6.11.2. The measurement was performed with modulation per CFR47 Part 15.247 (e) and RSS-210 (A8.2). This test was conducted on 3 channels of Sample SN 111. The worst sample result indicated below.

Test Setup:



4.4.2 Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 8: Peak Power Spectral Density – Test Results

Test Conditions: Conducted Measurement, Normal Temperature and Voltage only							
Antenna Type: Integrated			**Power Setting:** See test plan				
Directional Antenna Gain: + 5.9 dBi			**Signal State:** Modulated				
Ambient Temp.: 23 °C			**Relative Humidity:**33%				
Peak Power Spectral Density							
Freq. (MHz)	**Mode**	**Chain 0 [dBm]**	**Chain 1 [dBm]**	**CF [dB]**	**Max. PPSD [dBm]**	**Limit [dBm]**	**Margin [dB]**
2412	1Mbps	5.96		-15.23	-9.27	8.00	-17.27
2437	1Mbps	8.44		-15.23	-6.80	8.00	-14.80
2462	1Mbps	4.35		-15.23	-10.89	8.00	-18.89
2412	6 Mbps	0.51		-14.96	-14.45	8.00	-22.45
2437	6 Mbps	5.78		-14.96	-9.18	8.00	-17.18
2462	6 Mbps	0.33		-14.96	-14.63	8.00	-22.63
2412	MCS0	0.13		-14.96	-14.83	8.00	-22.83
2437	MCS0	6.09		-14.96	-8.88	8.00	-16.88
2462	MCS0	0.35		-14.96	-14.61	8.00	-22.61
2412	MCS8	-2.41	5.12	-11.95	-6.12	8.00	-14.12
2437	MCS8	3.65	7.38	-11.95	-3.04	8.00	-11.04
2462	MCS8	-2.56	7.65	-11.95	-3.90	8.00	-11.90

2422	MCS0	-5.17		-14.72	-19.89	8.00	-27.89
2437	MCS0	-0.78		-14.72	-15.50	8.00	-23.50
2452	MCS0	-5.24		-14.72	-19.96	8.00	-27.96
2422	MCS8	-5.21	-3.80	-11.71	-13.15	8.00	-21.15
2437	MCS8	-1.44	-0.65	-11.71	-9.73	8.00	-17.73
2452	MCS8	-4.73	-4.26	-11.71	-13.19	8.00	-21.19

Note: CF was accounted for the number of data streams being used, 10*Log(N) per KDB 66291, duty cycle, and measured RBW.

The bandwidth ratio is 10*log (3kHz/100 kHz) or -15.23 dB.
802.11b has 100% duty cycle.
802.11g has 94% duty cycle.
802.11n HT20 has 94% duty cycle.
802.11n HT40 has 89% duty cycle.

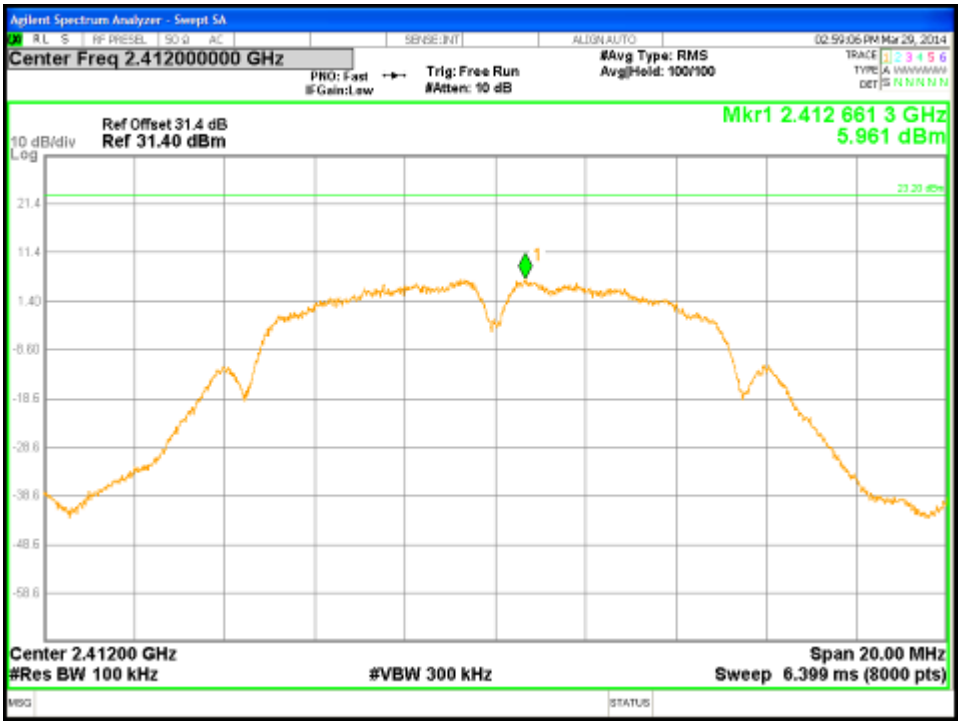


Figure 73: Maximum Power Spectral Density-2412 MHz-11b-1Mbps-Ch0

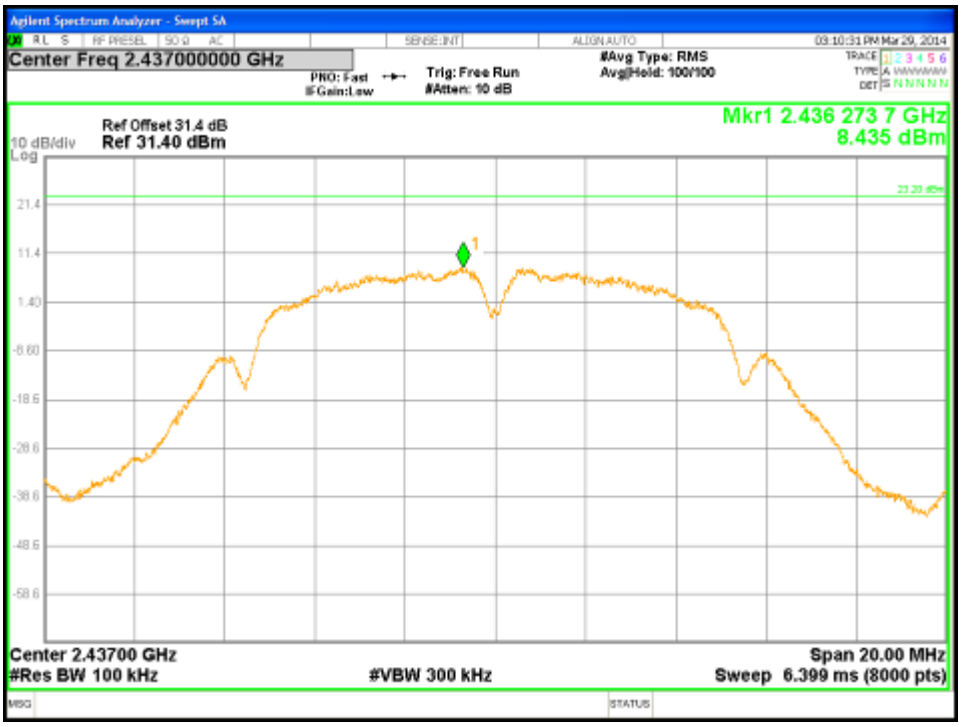


Figure 74: Maximum Power Spectral Density-2437 MHz-11b-1Mbps-Ch0

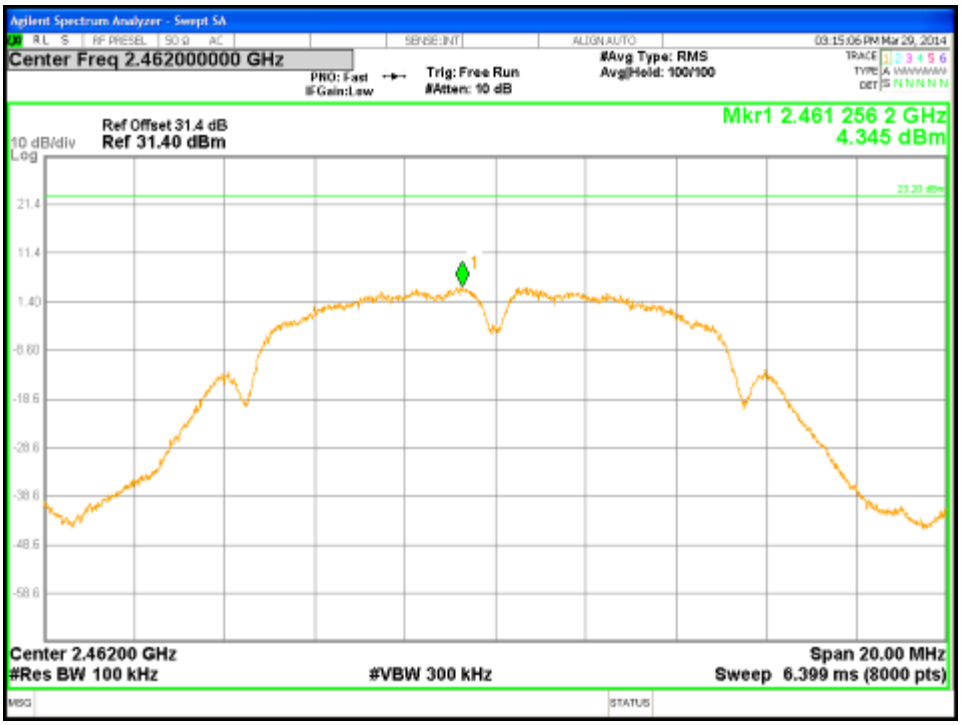


Figure 75: Maximum Power Spectral Density-2462 MHz-11b-1Mbps-Ch0

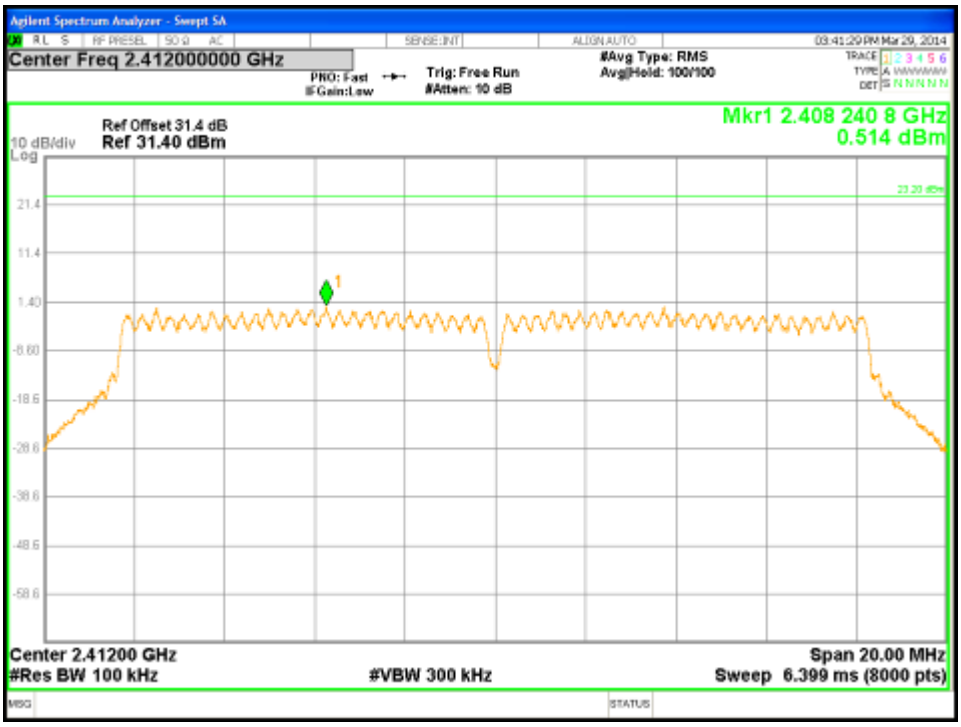


Figure 76: Maximum Power Spectral Density-2412 MHz-11g-6Mbps-Ch0

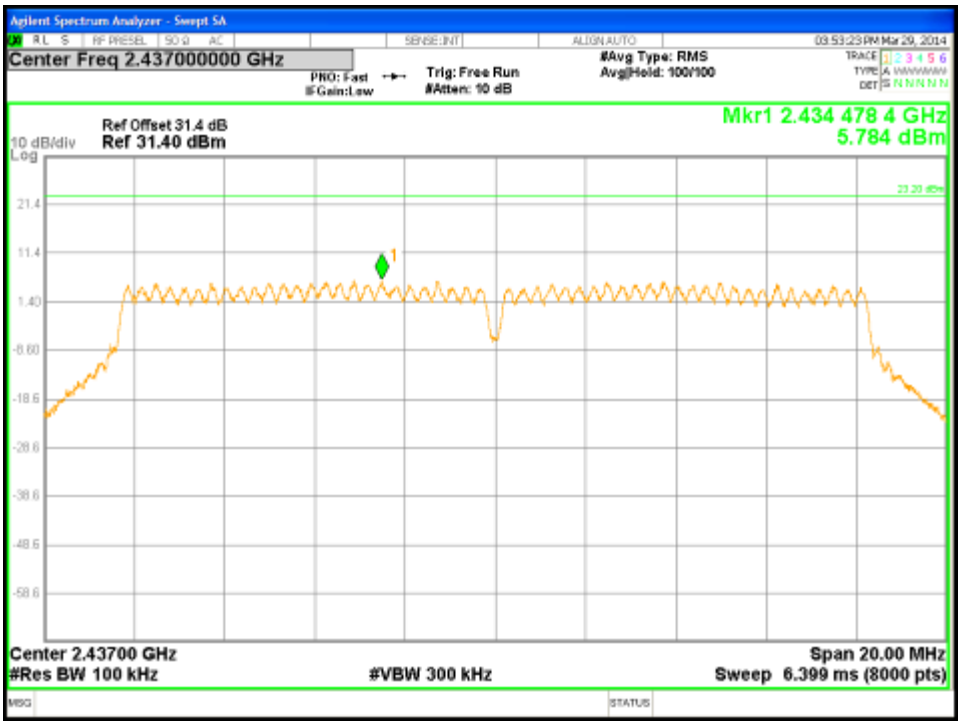


Figure 77: Maximum Power Spectral Density-2437 MHz-11g-6Mbps-Ch0

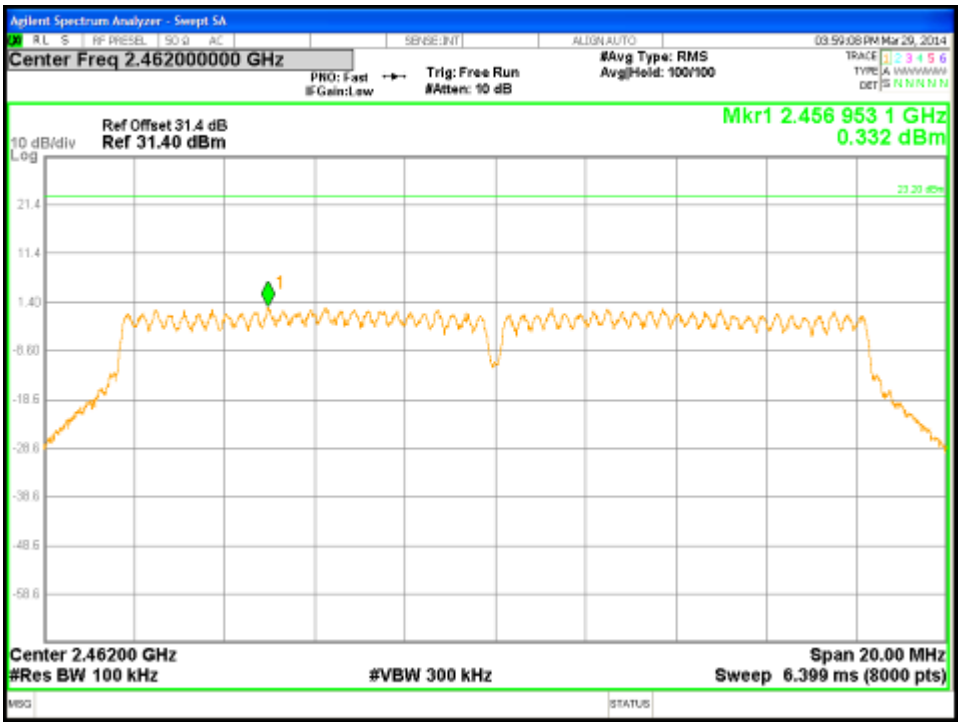


Figure 78: Maximum Power Spectral Density-2462 MHz-11g-6Mbps-Ch0

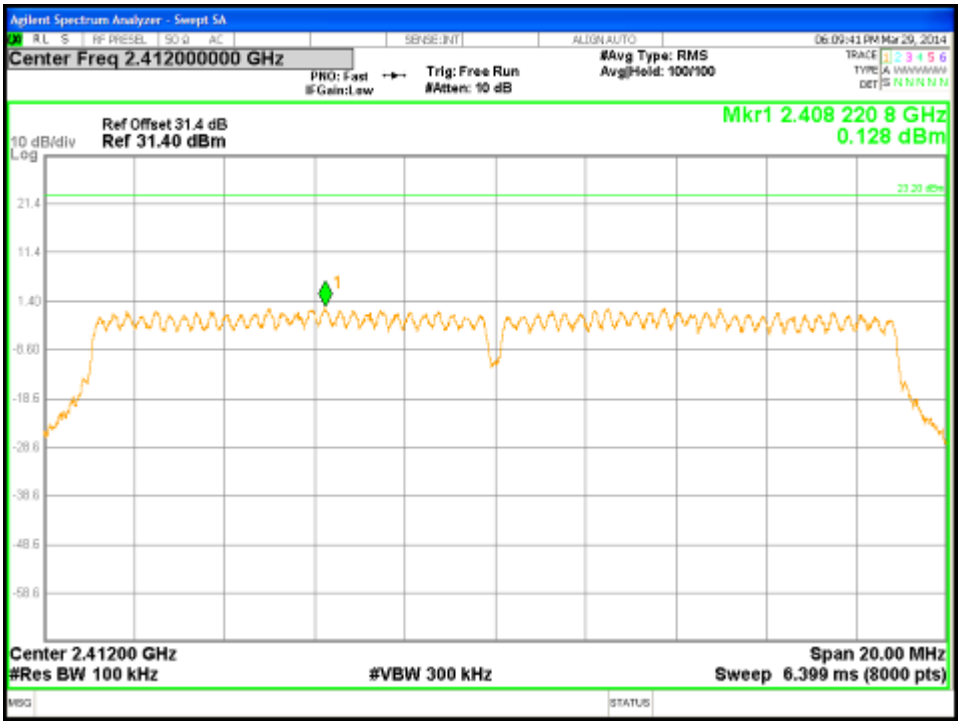


Figure 79: Maximum Power Spectral Density-2412 MHz-HT20-MCS0-Ch0

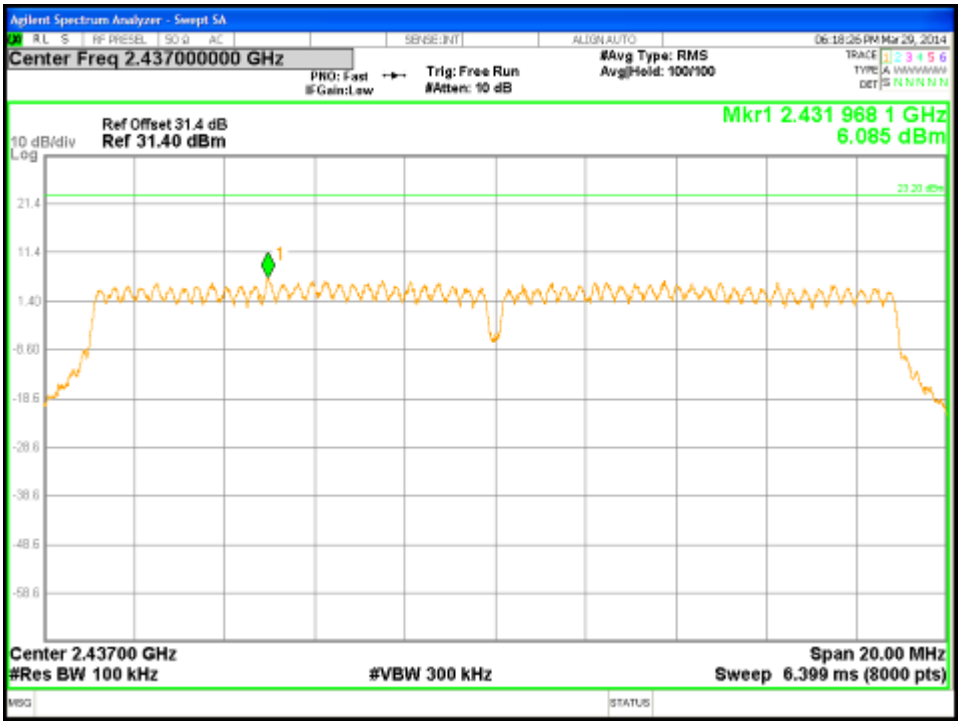


Figure 80: Maximum Power Spectral Density-2437 MHz-HT20-MCS0-Ch0

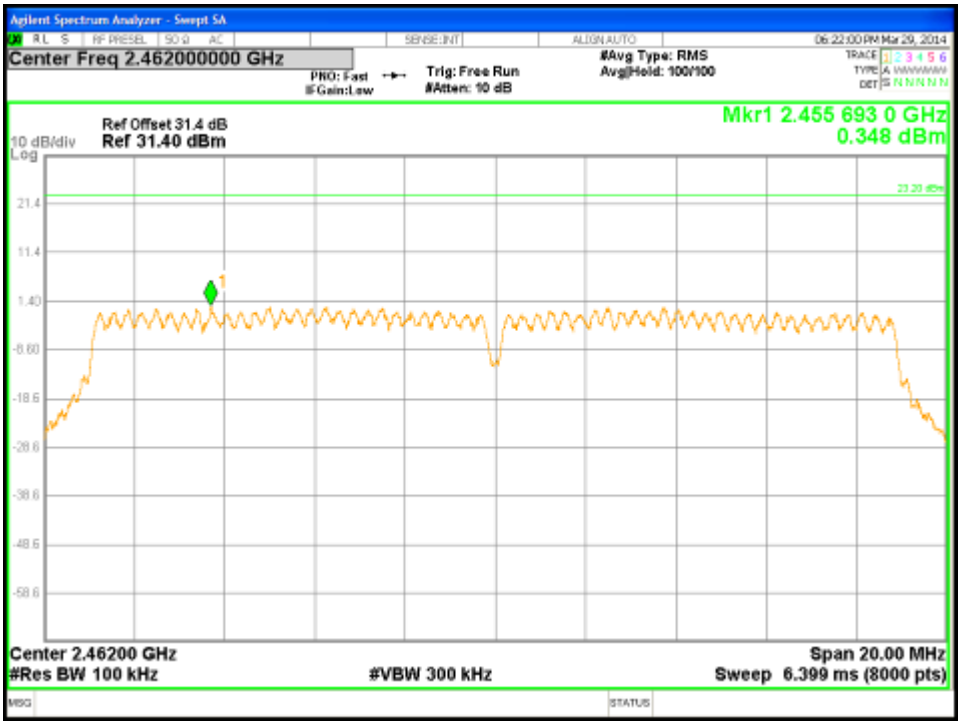


Figure 81: Maximum Power Spectral Density-2462 MHz-HT20-MCS0-Ch0

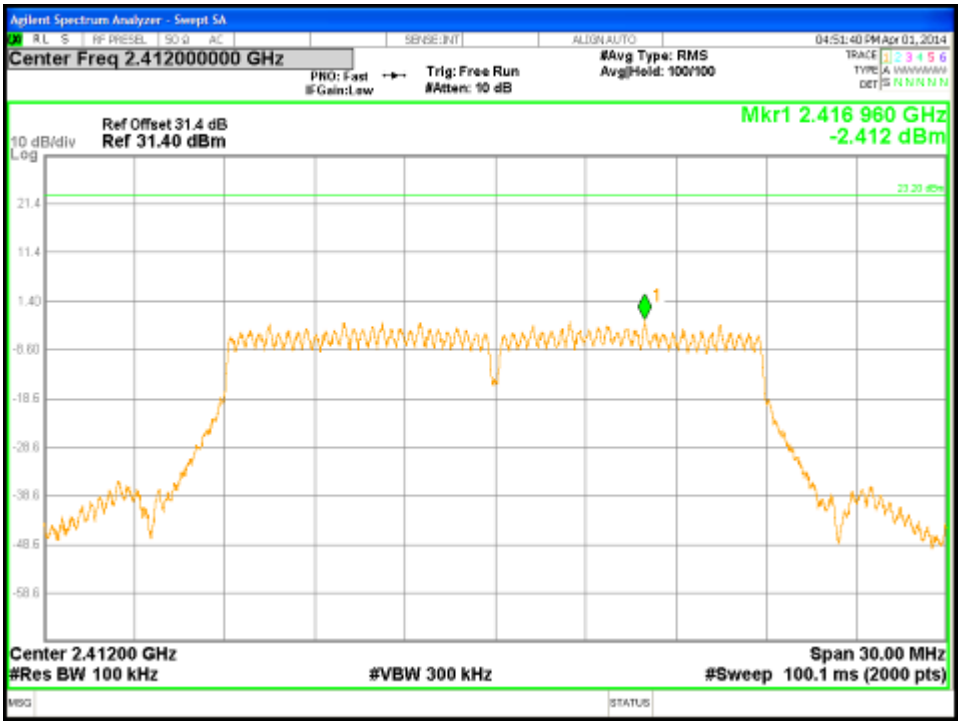


Figure 82: Maximum Power Spectral Density-2412 MHz-HT20-MCS8-Ch0

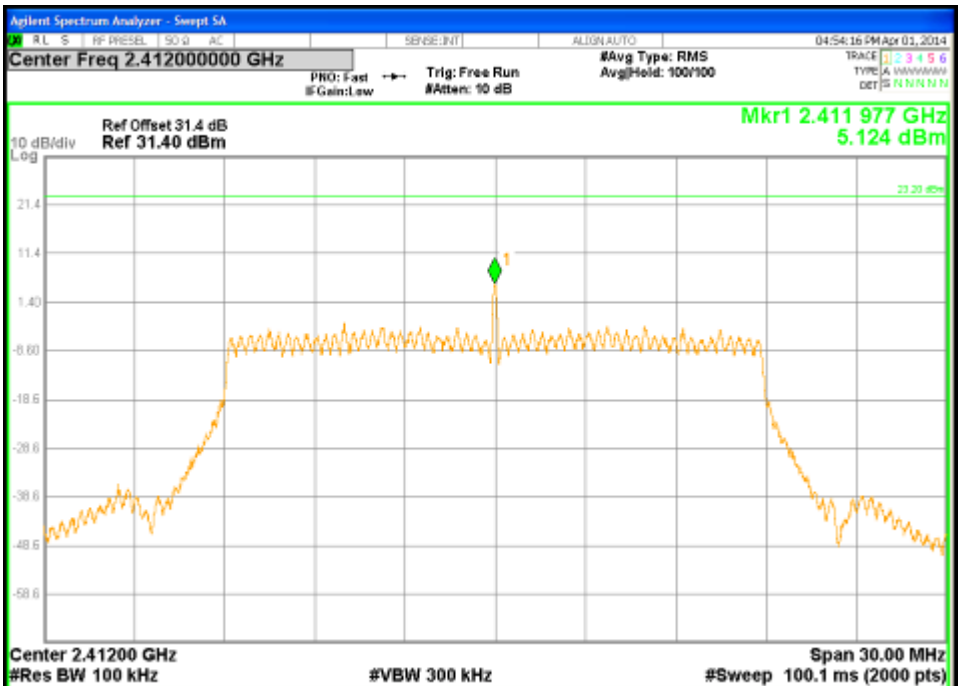


Figure 83: Maximum Power Spectral Density-2412 MHz-HT20-MCS8-Ch1

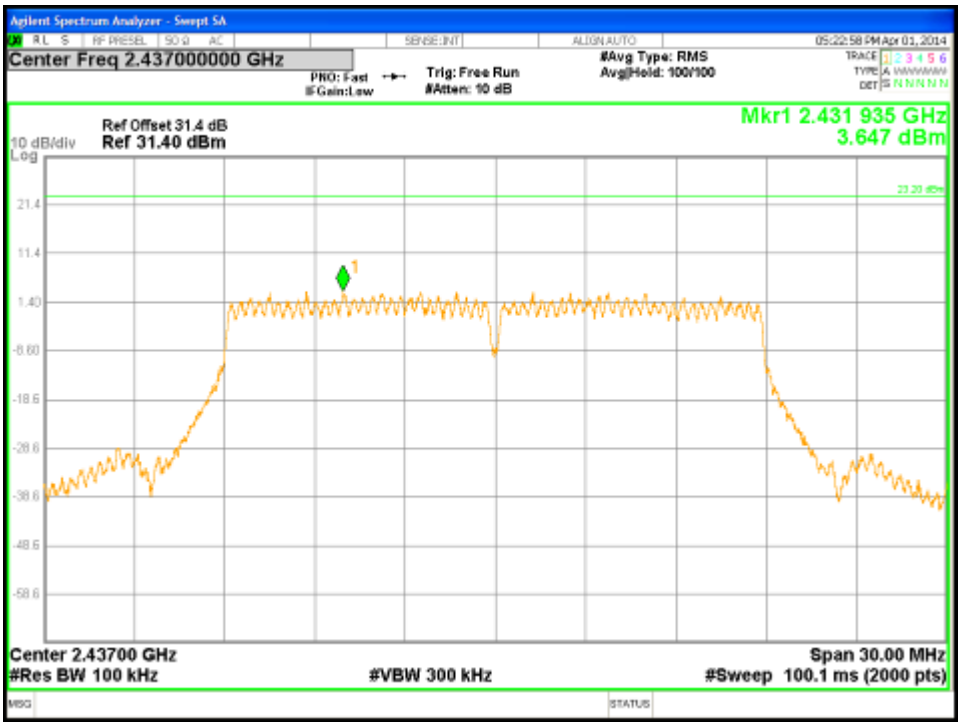


Figure 84: Maximum Power Spectral Density-2437 MHz-HT20-MCS8-Ch0

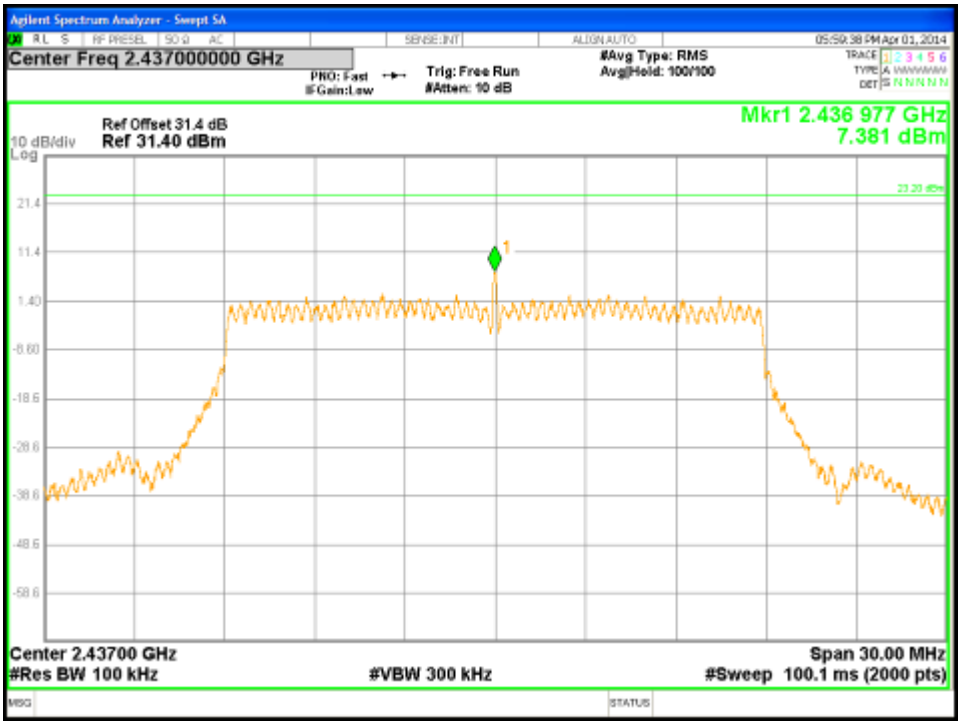


Figure 85: Maximum Power Spectral Density-2437 MHz-HT20-MCS8-Ch1

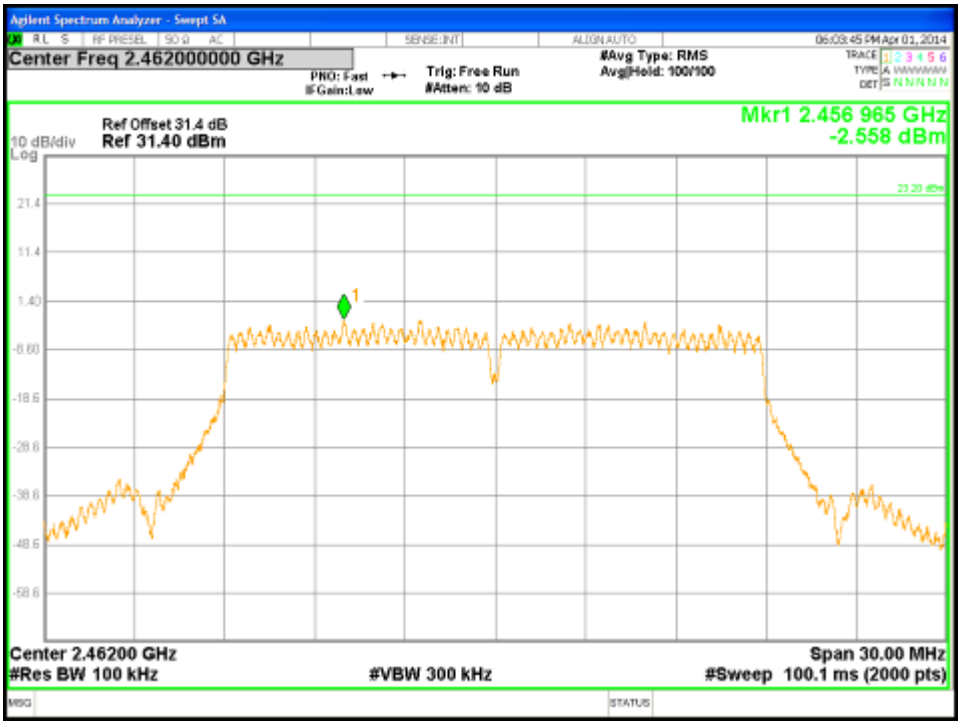


Figure 86: Maximum Power Spectral Density-2462 MHz-HT20-MCS8-Ch0

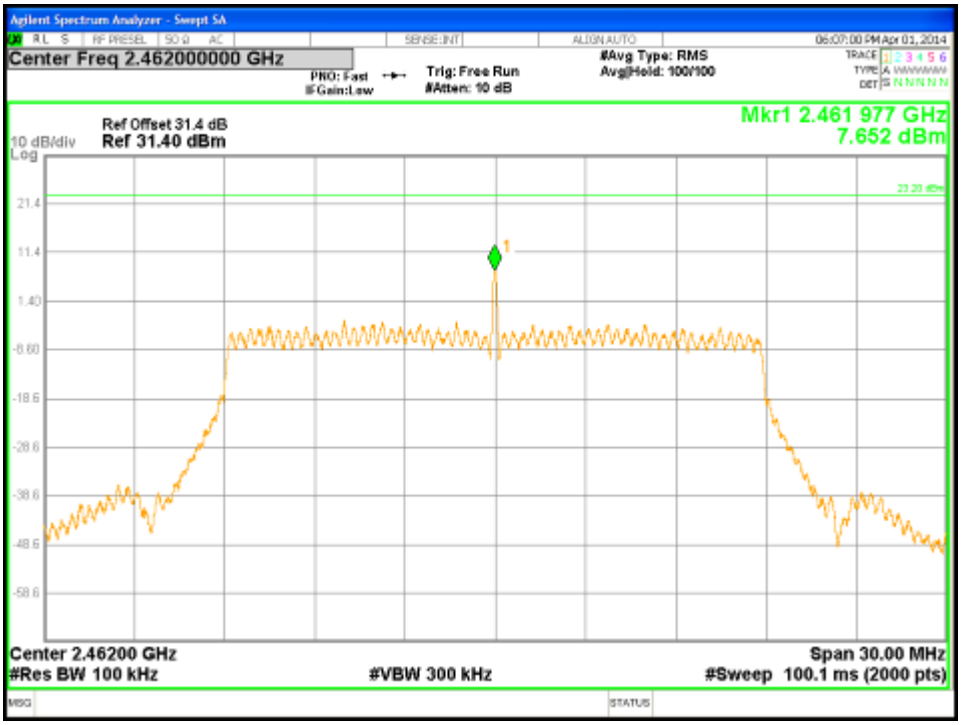


Figure 87: Maximum Power Spectral Density-2462 MHz-HT20-MCS8-Ch1

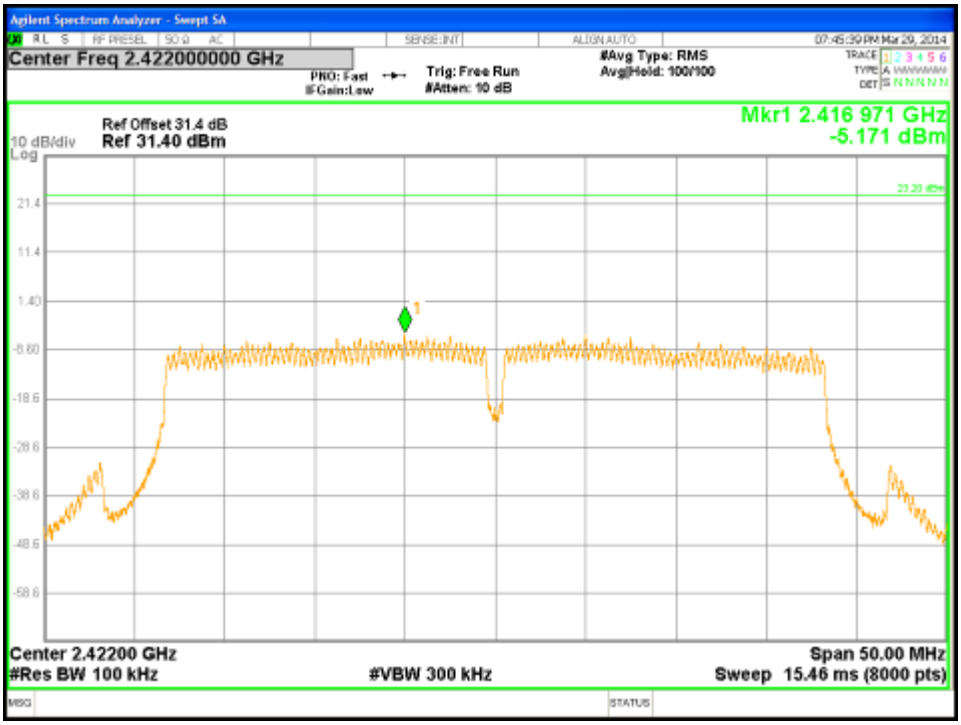


Figure 88: Maximum Power Spectral Density-2422 MHz-HT40-MCS0-Ch0

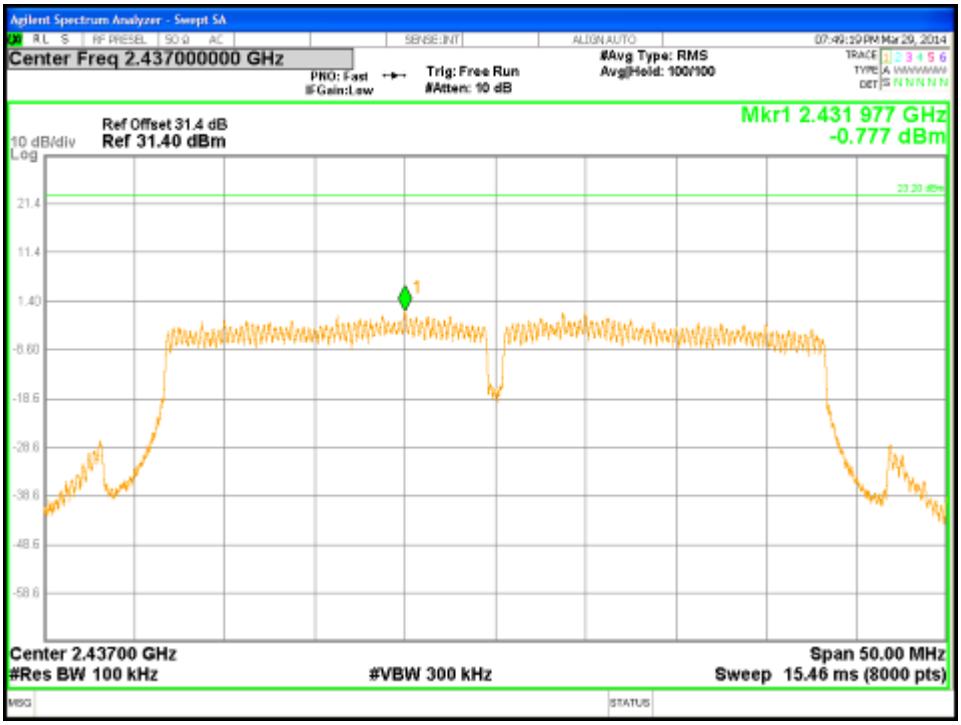


Figure 89: Maximum Power Spectral Density-2437 MHz-HT40-MCS0-Ch0

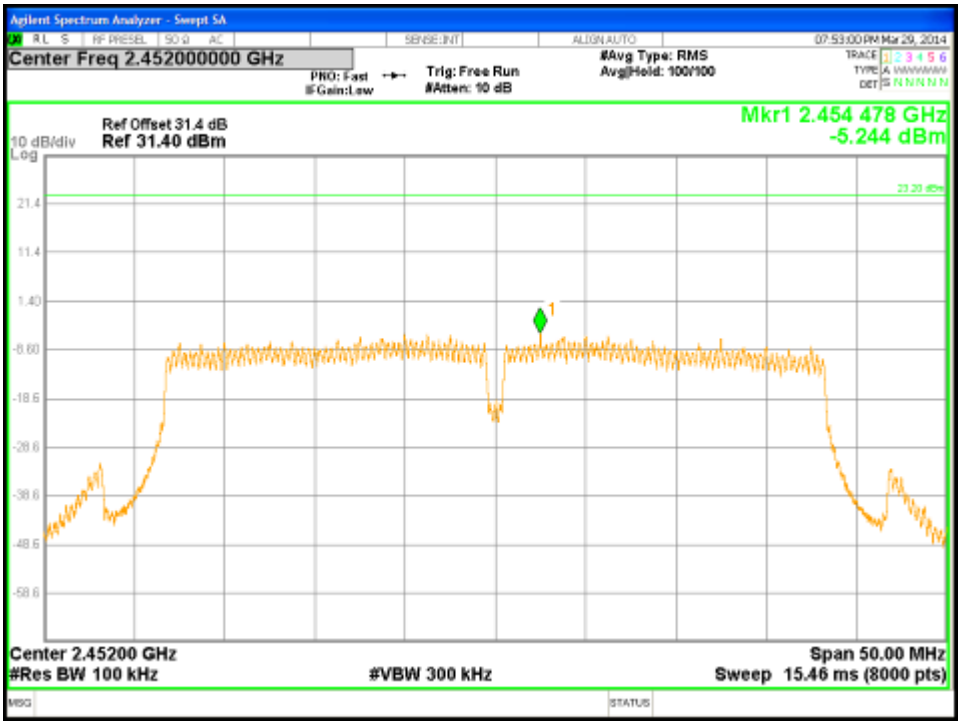


Figure 90: Maximum Power Spectral Density-2452 MHz-HT40-MCS0-Ch0

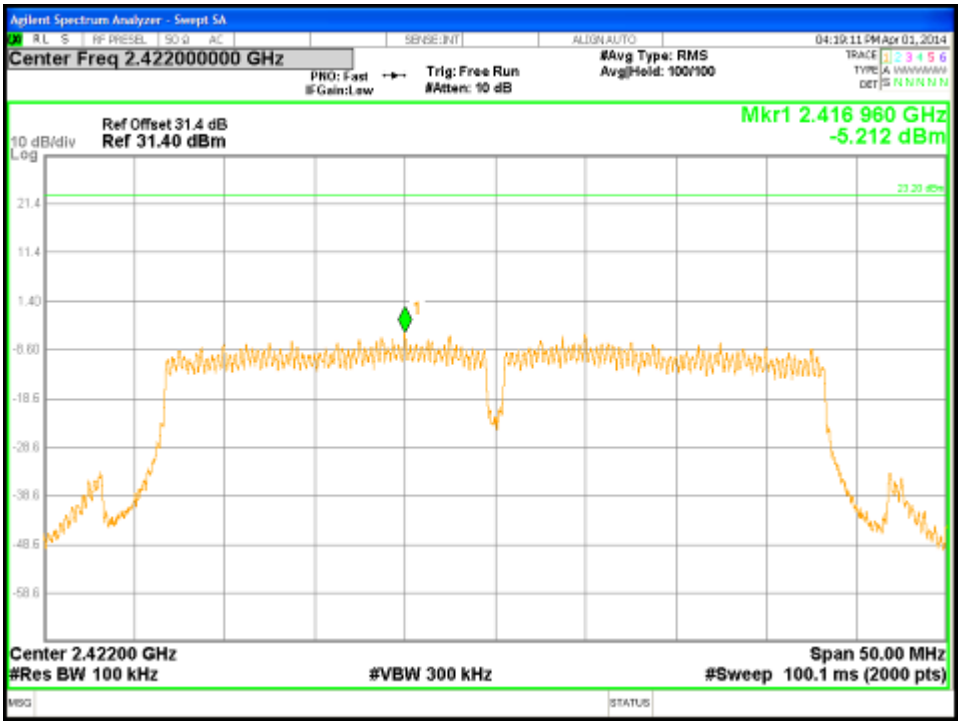


Figure 91: Maximum Power Spectral Density-2422 MHz-HT40-MCS8-Ch0

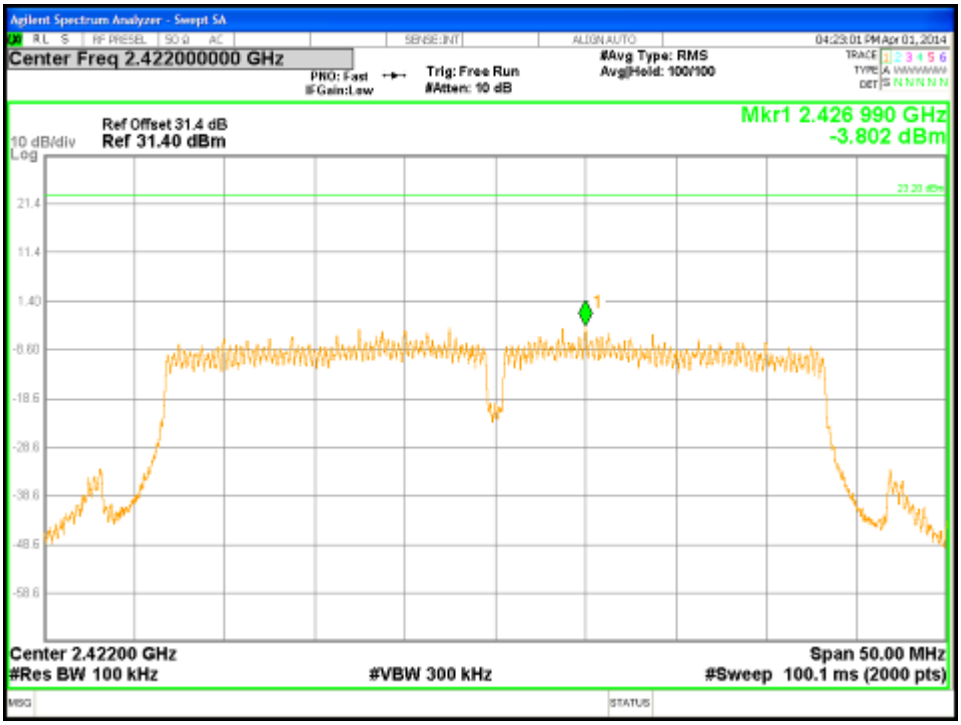


Figure 92: Maximum Power Spectral Density-2422 MHz-HT40-MCS8-Ch1

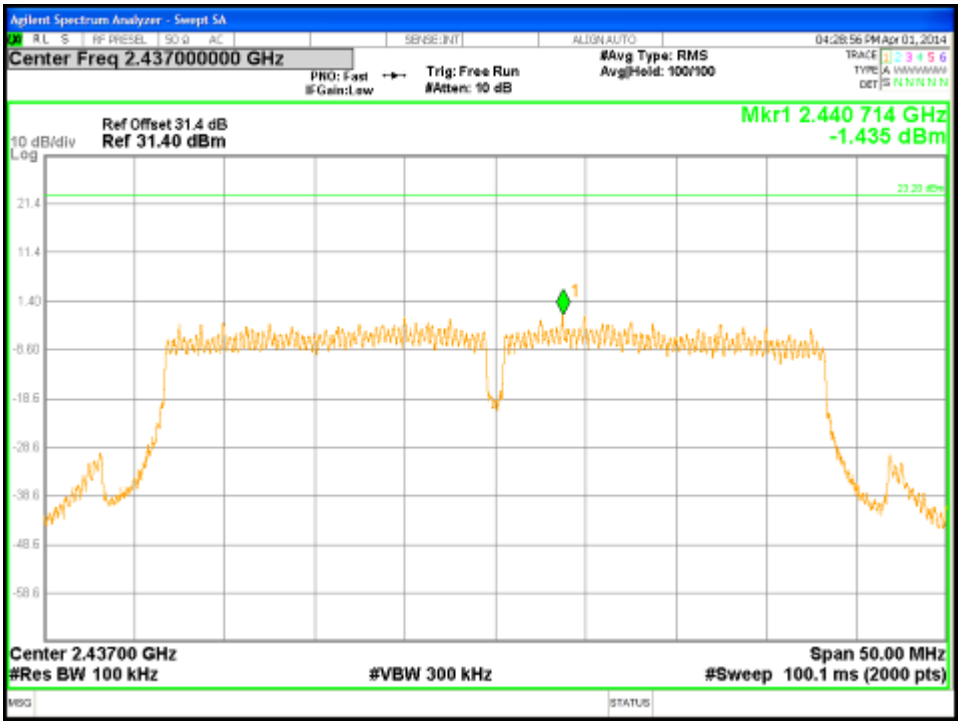


Figure 93: Maximum Power Spectral Density-2437 MHz-HT40-MCS8-Ch0

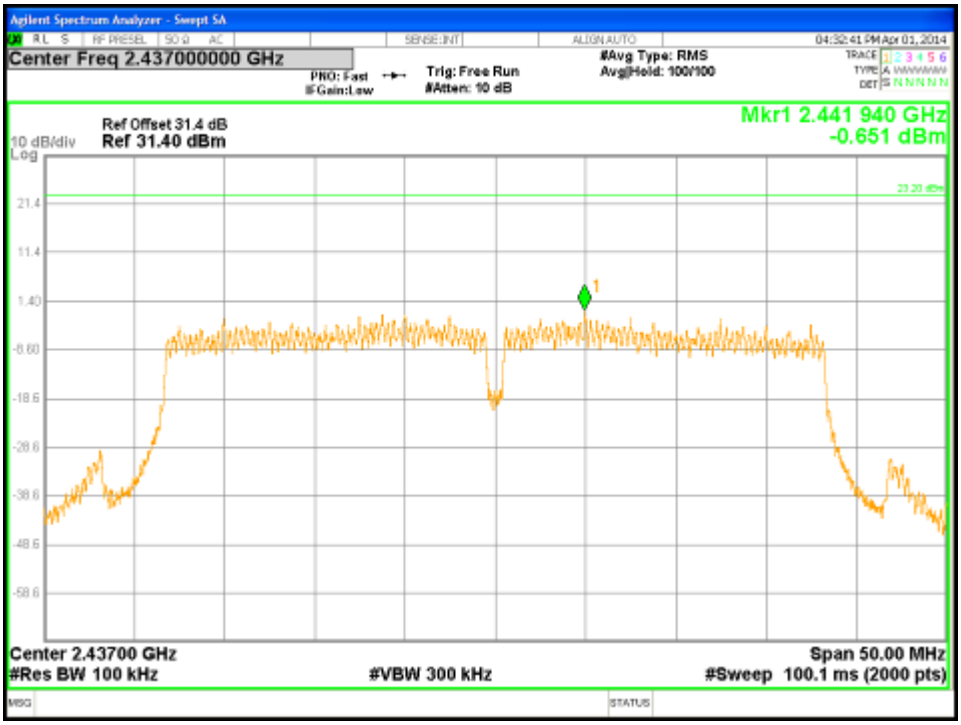


Figure 94: Maximum Power Spectral Density-2437 MHz-HT40-MCS8-Ch1

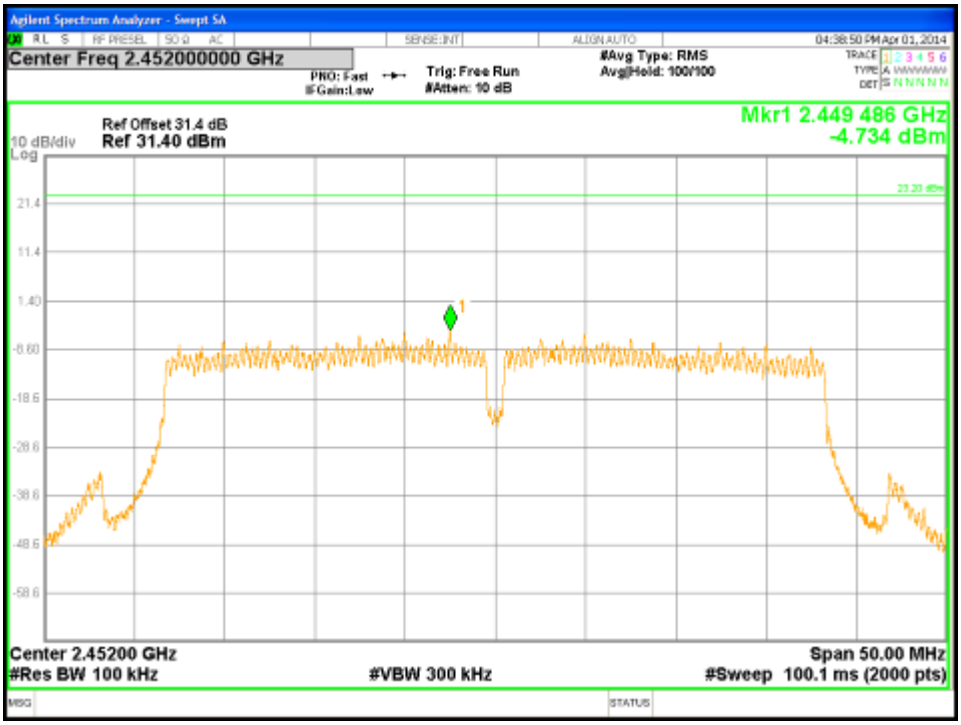


Figure 95: Maximum Power Spectral Density-2452 MHz-HT40-MCS8-Ch0

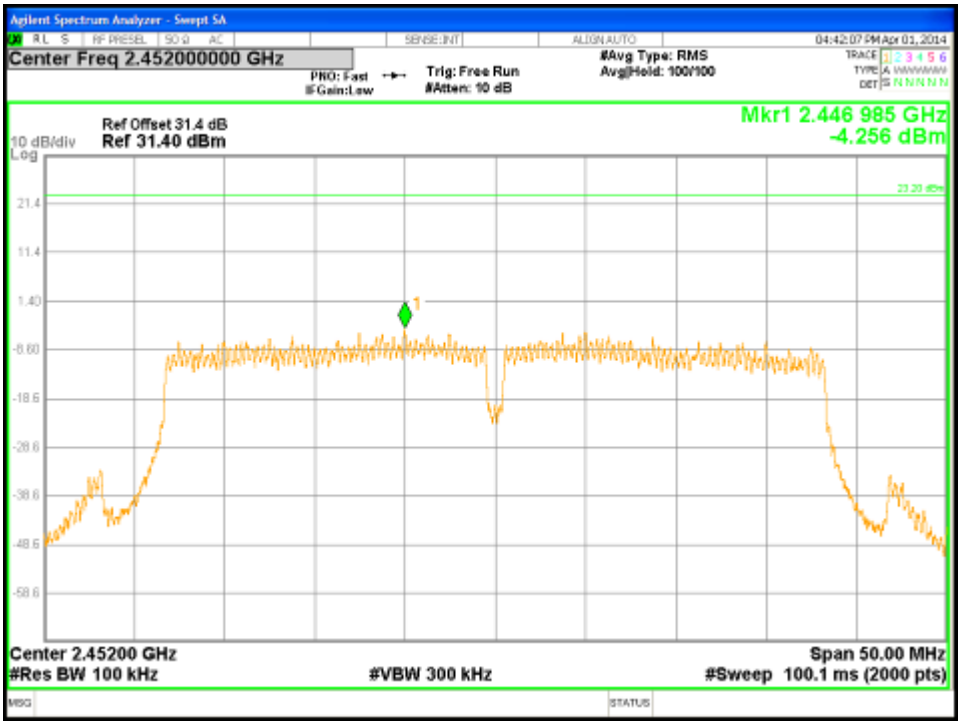


Figure 96: Maximum Power Spectral Density-2452 MHz-HT40-MCS8-Ch1

4.5 Maximum Permissible Exposure

4.5.1 Test Methodology

In this document, we try to prove the safety of radiation harmfulness to the human body for our product. The limit for Maximum Permissible Exposure (MPE) specified in FCC 1.1310 is followed. The Gain of the antenna used in this product is measured in a Semi-Anechoic Chamber, and also the maximum total power input to the antenna is measured. Through the Friis transmission formula and the maximum gain of the antenna, we can calculate the distance, away from the product, where the limit of MPE is reached.

Although the Friis transmission formula is a far field assumption, the calculated result of that is an over-prediction for near field power density. We will take that as the worst case to specify the safety range.

4.5.2 RF Exposure Limit

According to FCC 1.1310 table 1: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
(A)Limits For Occupational / Control Exposures				
300 - 1500	…	…	F/300	6
1500 - 100,000	…	…	5	6
(B)Limits For General Population / Uncontrolled Exposure				
300 - 1500	…	…	F/1500	6
1500 - 100,000	…	…	1.0	30

F = Frequency in MHz

4.5.3 EUT Operating Condition

The software provided by Manufacturer enabled the EUT to transmit data at lowest, middle and highest channel individually.

4.5.4 Classification

The antenna of the product, under normal use condition, is at least 20cm away from the body of the user. Warning statement to the user for keeping at least 20cm or more separation distance with the antenna should be included in user's manual. So, this device is classified as a **Mobile Device**.

4.5.5 Test Results

4.5.5.1 Antenna Gain

The transmitting antenna was integrated. The maximum antenna gain for the highest observed power was +3.7 dBi or 2.34 (numeric).

4.5.5.2 Output Power into Antenna & RF Exposure value at distance 20cm:

Calculations for this report are based on highest power measurement.

Limit for MPE (from FCC part 1.1310 table1) is 1.0 mW/cm^2

The highest measured power is +25.89 dBm or 388.15mW.

Using the Friss transmission formula, the EIRP is Pout*G, and R is 20cm.

Pd = (388.15*2.34) / (1600π) = 0.18111 mW/cm2, which is 0.8189 mW/cm2 below to the limit.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

4.5.6 Sample Calculation

The Friss transmission formula: $Pd = (Pout*G) / (4*\pi*R^2)$

Where;

Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = gain of antenna in linear scale
$\pi \approx 3.1416$
R = distance between observation point and center of the radiator in cm

Ref. : David K. Cheng, *Field and Wave Electromagnetics*, Second Edition, Page 640, Eq. (11-133).

4.6 Transmitter Spurious Emissions

Transmitter spurious emissions are emissions outside the frequency range of the equipment when the equipment is in transmit mode; per requirement of CFR47 15.205, 15.209, 15.247(d), RSS-210 Sect. A.8.5

4.6.1 Test Methodology

4.6.1.1 Preliminary Test

A test program that controls instrumentation and data logging was used to automate the preliminary RF emission test procedure. The frequency range of interest was divided into sub-ranges to yield a frequency resolution of approximately 120 kHz and provide a reading at each frequency for no more than 12° of turntable rotation. For each frequency sub-range the turntable was rotated 360° while peak emission data was recorded and plotted over the frequency range of interest in horizontal and vertical antenna polarization's.

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the floor. The EUT was positioned as shown in the setup photographs. The receiving antenna was placed at a distance of 3m at a fixed height of 1m. Measurement equipment was located outside of the chamber. A video camera was placed inside the chamber to view the EUT.

4.6.1.2 Final Test

For each frequency measured, the peak emission was maximized by manipulating the receiving antenna from 1 to 4 meters above the ground plane and placing it at the position that produced the maximum signal strength reading. The turntable was then rotated through 360° while observing the peak signal and placing the EUT at the position that produced maximum radiation. The six highest emissions relative to the limit were measured unless such emissions were more than 20 dB below the limit. If less than six emissions are within 20 dB of the limit, than the noise level of the receiver is measured at frequencies where emissions are expected. Multiples of all oscillator and microprocessor frequencies were also checked.

Final testing was performed on an NSA compliant test site. The EUT was placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane. The placement of EUT and cables were the same as for preliminary testing and is shown in the setup photographs.

The final scans performed on the worst axis, Y-Axis, for three operating channels in each operating mode;

2412 MHz, 2437 MHz, and 2462 MHz at 1Mbit/s for 802.11b mode,

2412 MHz, 2437 MHz, and 2462 MHz at 6Mbit/s for 802.11g mode,

2412 MHz, 2437 MHz, and 2462 MHz at 6.5Mbit/s for 802.11n HT20 mode, and

2422 MHz, 2437 MHz, and 2452 MHz at 13.5Mbit/s for 802.11n HT40 mode.

4.6.1.3 Deviations

None.

4.6.2 Transmitter Spurious Emission Limit

The spurious emissions of the transmitter shall not exceed the values in CFR47 Part 15.205, 15.209: 2010 and RSS-210 A1.1.2 2010.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490.....	2400/F(kHz)	300
0.490-1.705.....	24000/F(kHz)	30
1.705-30.0.....	30	30
30-88.....	100 **	3
88-216.....	150 **	3
216-960.....	200 **	3
Above 960.....	500	3

All harmonics and spurious emission which are outside of the restricted band shall be 20 dB below the in-band emission.

4.6.3 Test Results

The final measurement data was taken under the worst case operating modes, configurations, and/or cable positions. It also reflects the results including any modifications and/or special accessories listed in Sections 1.4 and Test Plan.

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 9: Transmit Spurious Emission at Band-Edge Requirements

Test Conditions: Radiated Measurement, Normal Temperature and Voltage only									
Antenna Type: Integrated				**Power Setting:** See Test Plan					
Directional Antenna Gain: +5.9 dBi				**Signal State:** Modulated					
Ambient Temp.: 23 °C				**Relative Humidity:**37%					
Band-Edge Results									
Center Freq.	**Mode**	**Edge Freq.**	**Pol.**	**Ant.**	**Table**	**Det.**	**Level**	**Limit**	**Margin**
MHz		MHz	V/H	cm	Deg.	Pk/Avg	dBuV/m	dBuV/m	dB
2412	1Mbps-22dBm	2390	H	194	150	Pk	66.13	74.00	−7.87
2412	1Mbps-22dBm	2390	H	194	150	Ave	53.65	54.00	−0.35
2412	1Mbps-22dBm	2390	V	244	316	Pk	62.15	74.00	−11.85
2412	1Mbps-22dBm	2390	V	244	316	Ave	48.69	54.00	−5.31
2417	1Mbps-25 dBm	2390	H	153	144	Pk	64.27	74.00	−9.73
2417	1Mbps-25 dBm	2390	H	153	144	Ave	53.74	54.00	−0.26
2417	1Mbps-25 dBm	2390	V	241	319	Pk	61.94	74.00	−12.06
2417	1Mbps-25 dBm	2390	V	241	319	Ave	50.11	54.00	−3.89
2457	1Mbps-25 dBm	2483.5	H	272	154	Pk	61.00	74.00	−13.00
2457	1Mbps-25 dBm	2483.5	H	272	154	Ave	51.18	54.00	−2.82
2457	1Mbps-25 dBm	2483.5	V	279	326	Pk	60.49	74.00	−13.51
2457	1Mbps-25 dBm	2483.5	V	279	326	Ave	47.34	54.00	−6.66
2462	1Mbps-21dBm	2483.5	H	150	150	Pk	61.96	74.00	−12.04
2462	1Mbps-21dBm	2483.5	H	150	150	Ave	52.18	54.00	−1.82
2462	1Mbps-21dBm	2483.5	V	282	329	Pk	58.99	74.00	−15.01
2462	1Mbps-21dBm	2483.5	V	282	329	Ave	47.12	54.00	−6.88
2412	6Mbps-20 dBm	2390	H	156	140	Pk	70.99	74.00	−3.01
2412	6Mbps-20 dBm	2390	H	156	140	Ave	51.22	54.00	−2.78
2412	6Mbps-20 dBm	2390	V	246	311	Pk	64.72	74.00	−9.28
2412	6Mbps-20 dBm	2390	V	246	311	Ave	48.45	54.00	−5.55
2417	6Mbps-23dBm	2390	V	241	315	Pk	70.83	74.00	−3.17
2417	6Mbps-23dBm	2390	V	241	315	Ave	49.06	54.00	−4.94
2417	6Mbps-23dBm	2390	H	158	150	Pk	70.96	74.00	−3.04
2417	6Mbps-23dBm	2390	H	158	150	Ave	50.95	54.00	−3.05
2457	6Mbps-24dBm	2483.5	V	279	323	Pk	71.06	74.00	−2.94
2457	6Mbps-24dBm	2483.5	V	279	323	Ave	49.31	54.00	−4.69
2457	6Mbps-24dBm	2483.5	H	274	157	Pk	72.33	74.00	−1.67
2457	6Mbps-24dBm	2483.5	H	274	157	Ave	51.90	54.00	−2.10

2462	6Mbps-20 dBm	2483.5	H	185	149	Pk	66.84	74.00	−7.16
2462	6Mbps-20 dBm	2483.5	H	185	149	Ave	51.79	54.00	−2.21
2462	6Mbps-20 dBm	2483.5	V	278	324	Pk	62.90	74.00	−11.10
2462	6Mbps-20 dBm	2483.5	V	278	324	Ave	48.23	54.00	−5.77
2412	HT20-MCS0-20 dBm	2390	H	111	152	Pk	66.77	74.00	−7.23
2412	HT20-MCS0-20 dBm	2390	H	111	152	Ave	48.40	54.00	−5.60
2412	HT20-MCS0-20 dBm	2390	V	336	373	Pk	66.73	74.00	−7.27
2412	HT20-MCS0-20 dBm	2390	V	336	373	Ave	49.72	54.00	−4.28
2417	HT20-MCS0-23dBm	2390	V	333	−7	Pk	69.56	74.00	−4.44
2417	HT20-MCS0-23dBm	2390	V	333	−7	Ave	49.18	54.00	−4.82
2417	HT20-MCS0-23dBm	2390	H	163	281	Pk	69.11	74.00	−4.89
2417	HT20-MCS0-23dBm	2390	H	163	281	Ave	49.59	54.00	−4.41
2457	HT20-MCS0-23dBm	2483.5	V	324	364	Pk	70.15	74.00	−3.85
2457	HT20-MCS0-23dBm	2483.5	V	324	364	Ave	46.56	54.00	−7.44
2457	HT20-MCS0-23dBm	2483.5	H	98	42	Pk	71.71	74.00	−2.29
2457	HT20-MCS0-23dBm	2483.5	H	98	42	Ave	48.70	54.00	−5.30
2462	HT20-MCS0-20 dBm	2483.5	H	158	44	Pk	62.59	74.00	−11.41
2462	HT20-MCS0-20 dBm	2483.5	H	158	44	Ave	45.09	54.00	−8.91
2462	HT20-MCS0-20 dBm	2483.5	V	323	7	Pk	60.19	74.00	−13.81
2462	HT20-MCS0-20 dBm	2483.5	V	323	7	Ave	43.15	54.00	−10.85
2412	HT20-MCS8-17dBm	2390	H	130	33	Pk	69.79	74.00	−4.21
2412	HT20-MCS8-17dBm	2390	H	130	33	Ave	51.59	54.00	−2.41
2412	HT20-MCS8-17dBm	2390	V	343	355	Pk	67.08	74.00	−6.92
2412	HT20-MCS8-17dBm	2390	V	343	355	Ave	50.57	54.00	−3.43
2417	HT20-MCS8-23dBm	2390	V	282	−12	Pk	69.07	74.00	−4.93
2417	HT20-MCS8-23dBm	2390	V	282	−12	Ave	49.84	54.00	−4.16
2417	HT20-MCS8-23dBm	2390	H	114	145	Pk	68.11	74.00	−5.89
2417	HT20-MCS8-23dBm	2390	H	114	145	Ave	49.93	54.00	−4.07
2457	HT20-MCS8-23dBm	2483.5	V	178	185	Pk	67.01	74.00	−6.99
2457	HT20-MCS8-23dBm	2483.5	V	178	185	Ave	45.30	54.00	−8.70
2457	HT20-MCS8-23dBm	2483.5	H	182	149	Pk	70.86	74.00	−3.14
2457	HT20-MCS8-23dBm	2483.5	H	182	149	Ave	51.29	54.00	−2.71
2462	HT20-MCS8-17dBm	2483.5	H	143	145	Pk	65.88	74.00	−8.12
2462	HT20-MCS8-17dBm	2483.5	H	143	145	Ave	50.94	54.00	−3.06
2462	HT20-MCS8-17dBm	2483.5	V	144	186	Pk	60.70	74.00	−13.30
2462	HT20-MCS8-17dBm	2483.5	V	144	186	Ave	43.76	54.00	−10.24
2422	HT40-MCS0-17dBm	2390	H	141	224	Pk	67.89	74.00	−6.11
2422	HT40-MCS0-17dBm	2390	H	141	224	Ave	51.30	54.00	−2.70
2422	HT40-MCS0-17dBm	2390	V	218	184	Pk	64.81	74.00	−9.19

2422	HT40-MCS0-17dBm	2390	V	218	184	Ave	47.19	54.00	−6.81
2437	HT40-MCS0-21dBm	2390	V	183	184	Pk	67.78	74.00	−6.22
2437	HT40-MCS0-21dBm	2390	V	183	184	Ave	46.21	54.00	−7.79
2437	HT40-MCS0-21dBm	2390	H	176	211	Pk	69.07	74.00	−4.93
2437	HT40-MCS0-21dBm	2390	H	176	211	Ave	47.86	54.00	−6.14
2452	HT40-MCS0-17dBm	2390	H	138	148	Pk	58.58	74.00	−15.42
2452	HT40-MCS0-17dBm	2483.5	H	138	148	Ave	45.41	54.00	−8.59
2452	HT40-MCS0-17dBm	2483.5	V	143	189	Pk	59.99	74.00	−14.01
2452	HT40-MCS0-17dBm	2483.5	V	143	189	Ave	42.07	54.00	−11.93
2422	HT40-MCS8-17dBm	2390	V	343	−5	Pk	66.78	74.00	−7.22
2422	HT40-MCS8-17dBm	2390	V	343	−5	Ave	50.35	54.00	−3.65
2422	HT40-MCS8-17dBm	2390	H	102	279	Pk	67.70	74.00	−6.30
2422	HT40-MCS8-17dBm	2390	H	102	279	Ave	51.36	54.00	−2.64
2437	HT40-MCS8-20 dBm	2390	H	102	280	Pk	68.99	74.00	−5.01
2437	HT40-MCS8-20 dBm	2390	H	102	280	Ave	48.27	54.00	−5.73
2437	HT40-MCS8-20 dBm	2390	V	282	−8	Pk	66.85	74.00	−7.15
2437	HT40-MCS8-20 dBm	2390	V	282	−8	Ave	47.50	54.00	−6.50
2452	HT40-MCS8-17dBm	2483.5	V	274	−20	Pk	61.54	74.00	−12.46
2452	HT40-MCS8-17dBm	2483.5	V	274	−20	Ave	45.05	54.00	−8.95
2452	HT40-MCS8-17dBm	2483.5	H	131	280	Pk	61.40	74.00	−12.60
2452	HT40-MCS8-17dBm	2483.5	H	131	280	Ave	45.77	54.00	−8.23

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 1 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 31, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 40%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (30MHz-1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	120 kHz/ 300 kHz
Dist/Ant Used	3m / JB3	**Performed by**	Jeremy Luong

Freq.	Raw	Cbl	AF	Level	Det.	Pol.	Hght.	Azt	Limit	Margin	Result
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 802.11b, 2437 MHz											
624.93	47.44	3.00	-18.67	31.77	QP	H	111	94	37.00	-5.23	Pass
749.97	41.03	3.32	-16.99	27.36	QP	H	162	102	37.00	-9.64	Pass
874.84	41.25	3.62	-15.36	29.51	QP	H	205	82	37.00	-7.49	Pass
58.69	50.44	0.84	-30.31	20.97	QP	V	101	90	30.00	-9.03	Pass
100.00	48.48	1.11	-27.28	22.32	QP	V	100	4	30.00	-7.68	Pass
399.98	48.40	2.36	-21.55	29.22	QP	V	137	294	37.00	-7.78	Pass

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.51 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

Note: The worst case was observed at 802.11b, 1Mbps at Channel 2437 MHz.

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 2 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 2412 MHz at 802.11b, 1Mbit/s											
4823.90	66.00	4.50	-17.40	53.10	Ave	H	209	110	54.00	-0.90	Harmonics
7236.69	51.52	5.24	-11.57	45.20	Ave	H	125	146	54.00	-8.81	Harmonics
9647.86	53.77	5.97	-8.53	51.21	Ave	H	119	142	54.00	-2.79	Harmonics
12863.93	54.57	6.94	-12.06	49.45	Ave	V	123	56	54.00	-4.55	Harmonics
Transmitted Data at 2437 MHz at 802.11b, 1Mbit/s											
3249.27	60.62	3.77	-18.98	45.41	Ave	H	141	80	54.00	-8.59	Spurious
4000.00	56.34	4.01	-17.13	43.22	Ave	H	103	84	54.00	-10.78	Spurious
4873.94	66.00	4.40	-17.20	53.20	Ave	H	104	126	54.00	-0.80	Harmonics
7311.82	54.95	5.26	-11.34	48.87	Ave	H	101	152	54.00	-5.13	Harmonics
9747.86	49.71	6.01	-8.55	47.17	Ave	H	203	140	54.00	-6.83	Harmonics
12863.93	57.83	6.94	-12.06	52.71	Ave	V	101	58	54.00	-1.29	Harmonics
Transmitted Data at 2462 MHz at 802.11b, 1Mbit/s											
3282.66	61.09	3.75	-18.84	45.99	Ave	H	170	96	54.00	-8.01	Spurious
4923.91	59.69	4.46	-17.12	47.03	Ave	H	100	118	54.00	-6.97	Harmonics
7385.00	53.40	5.29	-11.07	47.63	Ave	H	301	164	54.00	-6.38	Harmonics
12863.98	53.98	6.94	-12.06	48.85	Ave	V	110	58	54.00	-5.15	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

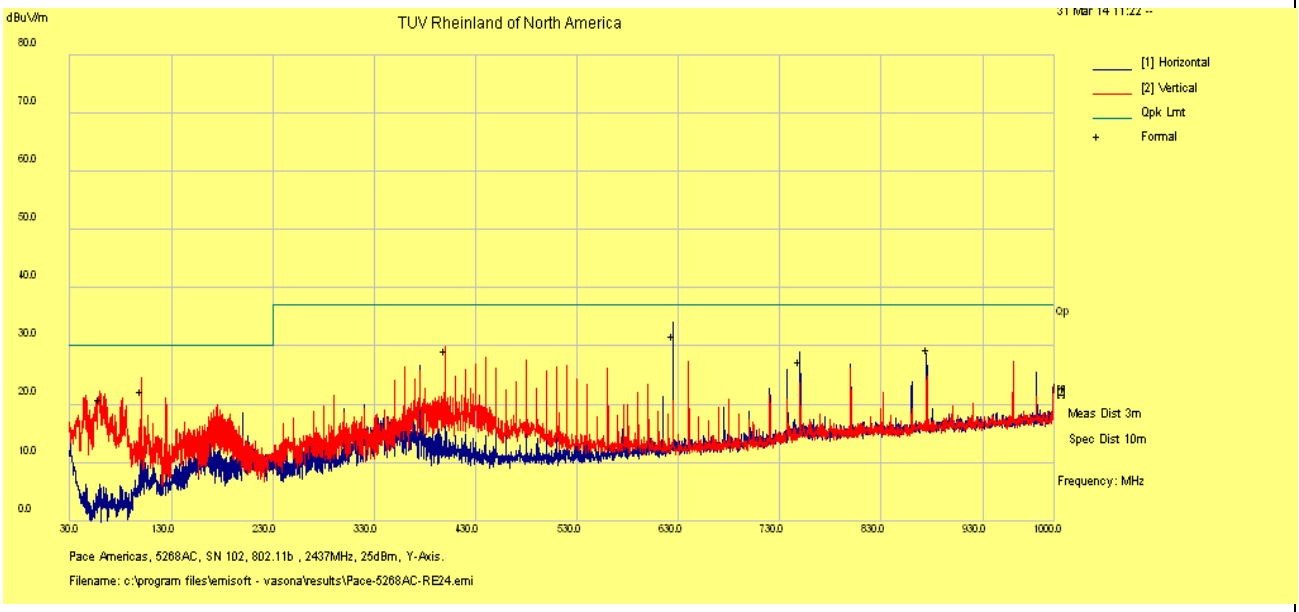
Notes: All emissions passed the spurious emission limit.

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 3 of 26

EUT Name	Wireless Residential Gateway	**Date**	March31, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 40%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (30MHz-1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	120 kHz/ 300 kHz
EUT Name	Wireless Residential Gateway	**Date**	Jeremy Luong

30MHz to 1000MHz Plot for Transmit 802.11b, 1Mbit/s Mode at 2437 MHz



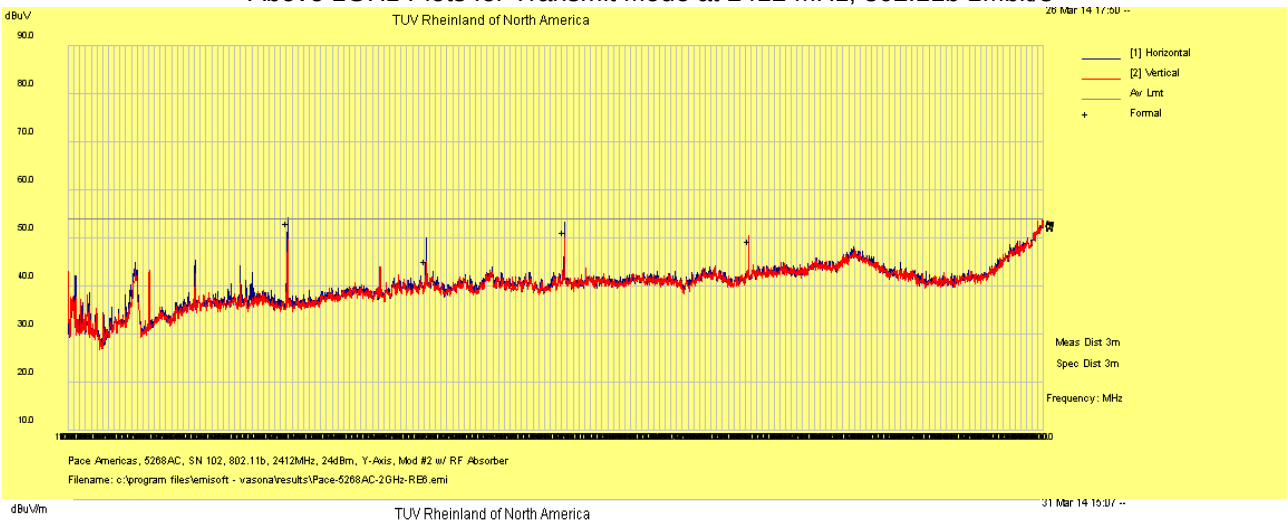
Notes: None.

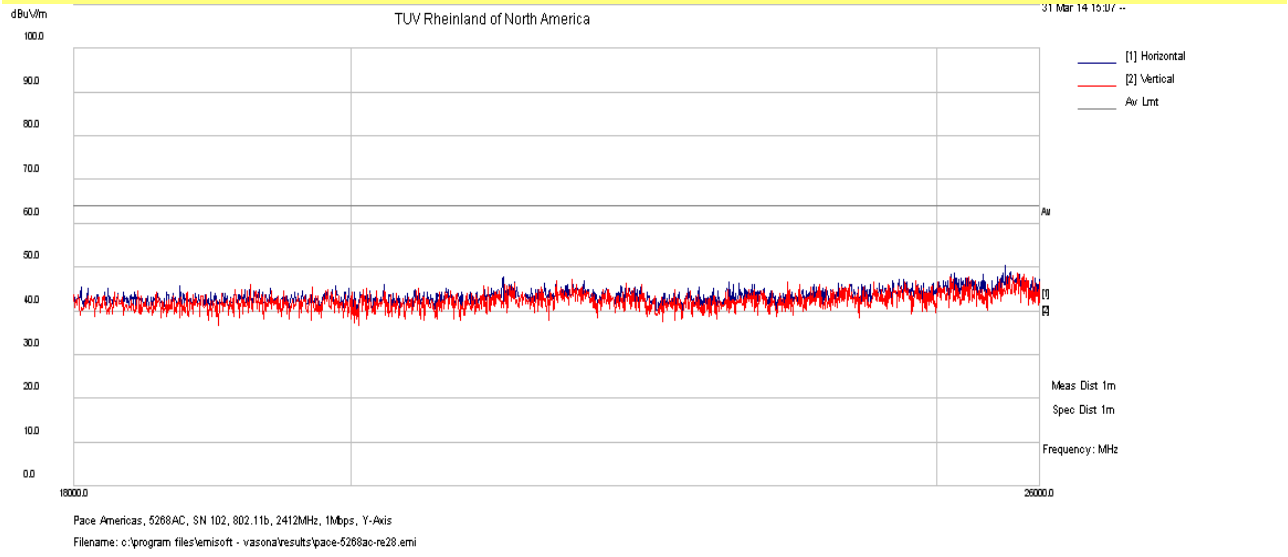
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 4 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2412 MHz, 802.11b 1Mbit/s





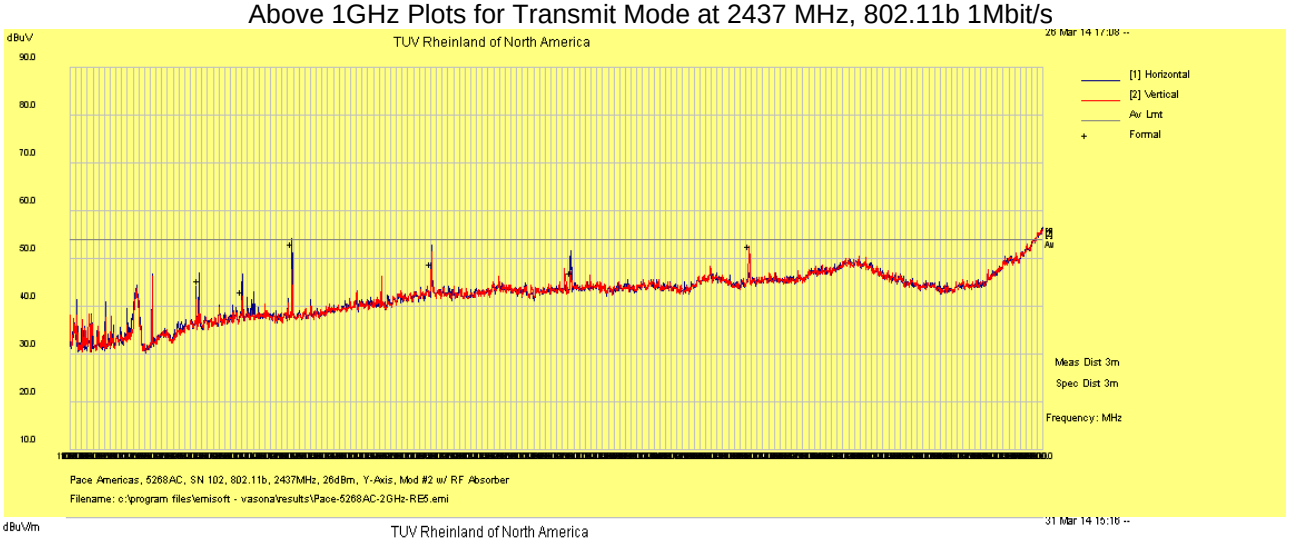
Notes: Limit was extrapolated to 1m distance for 18GHz – 26GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

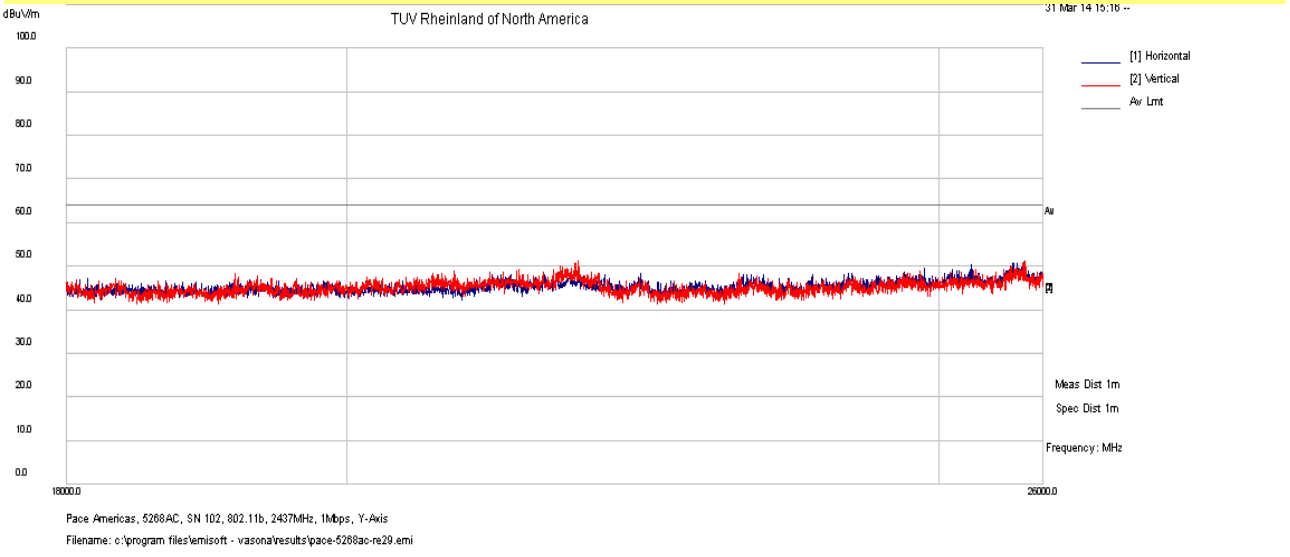
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 5 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2437 MHz, 802.11b 1Mbit/s





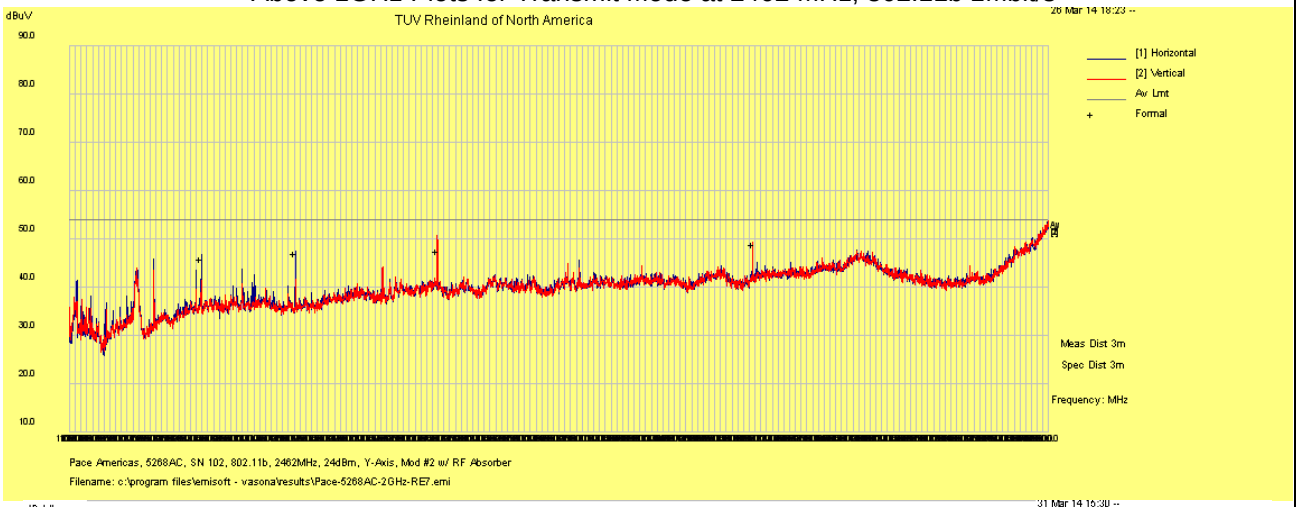
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz.

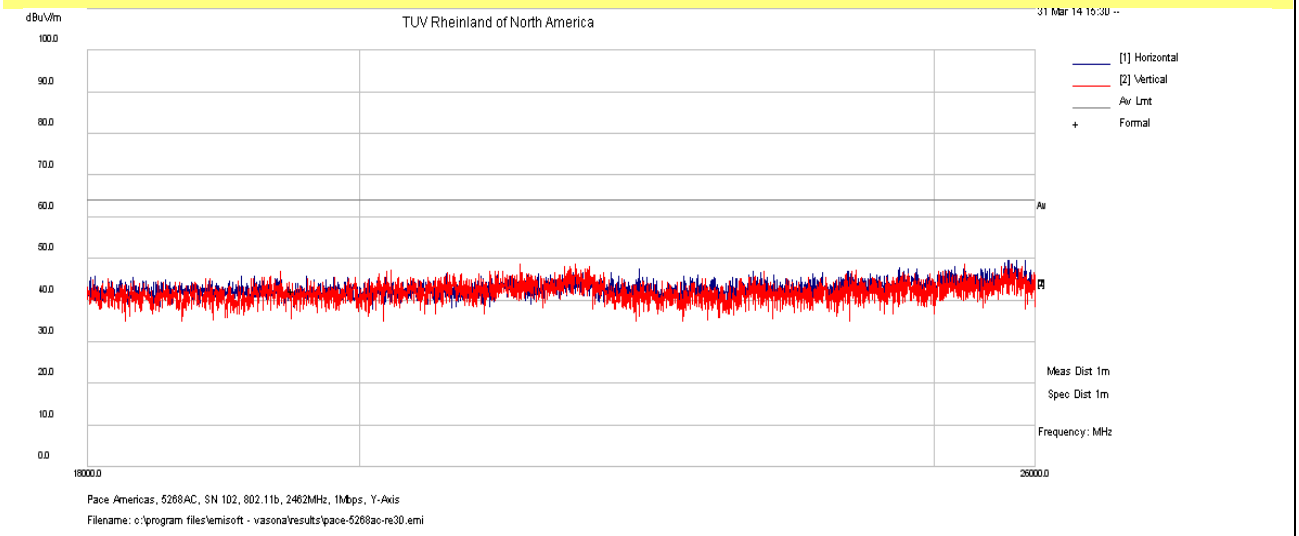
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 6 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2462 MHz, 802.11b 1Mbit/s





Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 7 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11b, 1Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 2412 MHz at 802.11g, 6Mbit/s											
2125.06	50.50	3.20	-23.00	30.70	Ave	H	166	314	54.00	-23.30	Spurious
6431.94	49.89	4.96	-14.42	40.43	Ave	H	213	228	54.00	-13.57	Spurious
9647.88	50.31	5.97	-8.53	47.75	Ave	V	202	64	54.00	-6.25	Harmonics
12863.99	54.81	6.94	-12.06	49.68	Ave	V	100	56	54.00	-4.32	Harmonics
Transmitted Data at 2437 MHz at 802.11g, 6Mbit/s											
3249.16	60.60	3.77	-18.98	45.39	Ave	H	117	80	54.00	-8.61	Spurious
4874.20	55.30	4.40	-17.20	42.50	Ave	H	100	108	54.00	-11.50	Harmonics
7316.00	45.70	5.30	-11.30	39.60	Ave	H	166	120	54.00	-14.40	Harmonics
9743.33	42.10	6.00	-8.60	39.50	Ave	H	216	142	54.00	-14.50	Harmonics
12863.80	54.16	6.94	-12.06	49.04	Ave	V	101	56	54.00	-4.96	Harmonics
Transmitted Data at 2462 MHz at 802.11g, 6Mbit/s											
3199.91	57.85	3.74	-19.07	42.51	Ave	H	127	90	54.00	-11.49	Spurious
3282.58	61.07	3.75	-18.84	45.98	Ave	H	168	88	54.00	-8.02	Spurious
7391.06	44.00	5.30	-11.10	38.20	Ave	H	119	119	54.00	-15.80	Harmonics
9647.85	45.80	5.97	-8.53	43.24	Ave	V	253	110	54.00	-10.76	Harmonics
12863.96	53.22	6.94	-12.06	48.10	Ave	V	101	62	54.00	-5.90	Harmonics

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

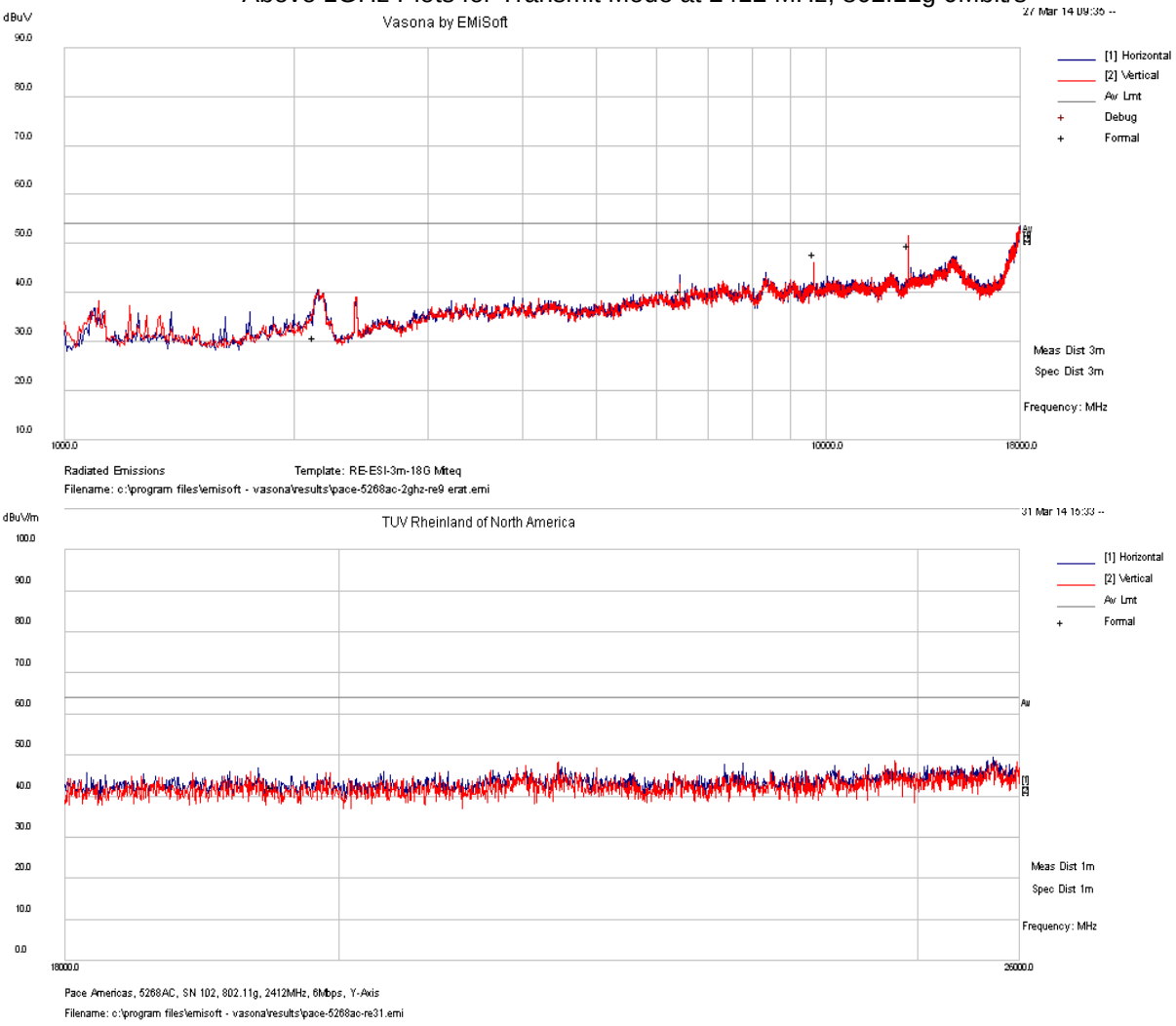
Notes: All emissions passed the spurious emission limit.

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 8 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11g, 6Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2412 MHz, 802.11g 6Mbit/s



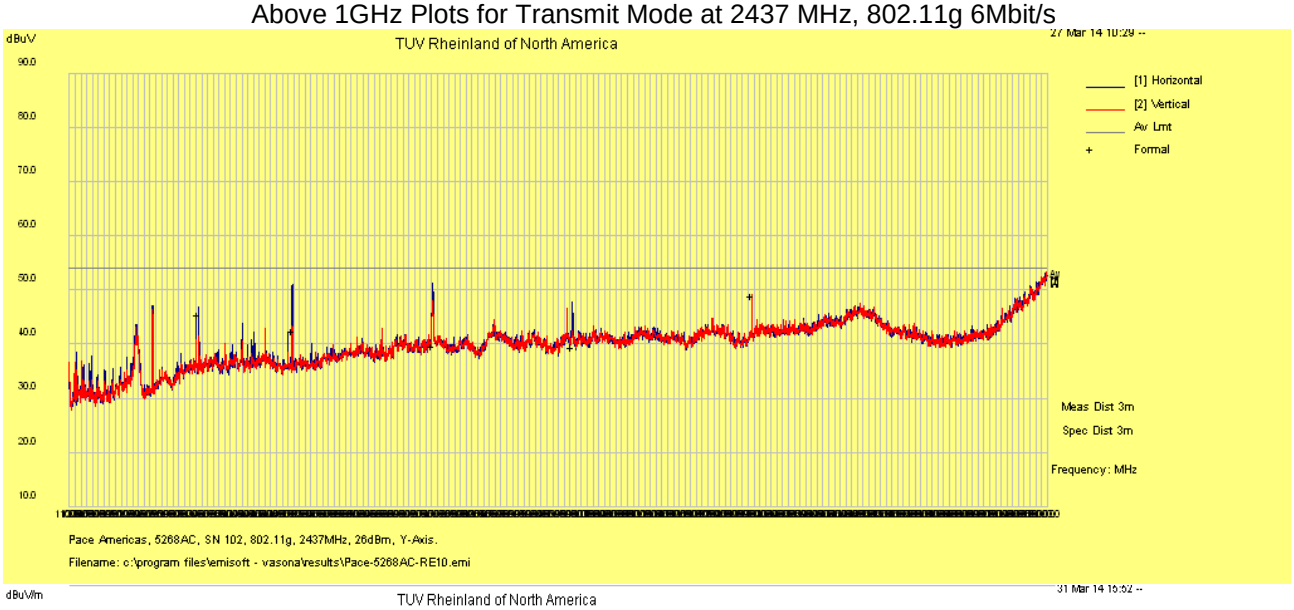
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

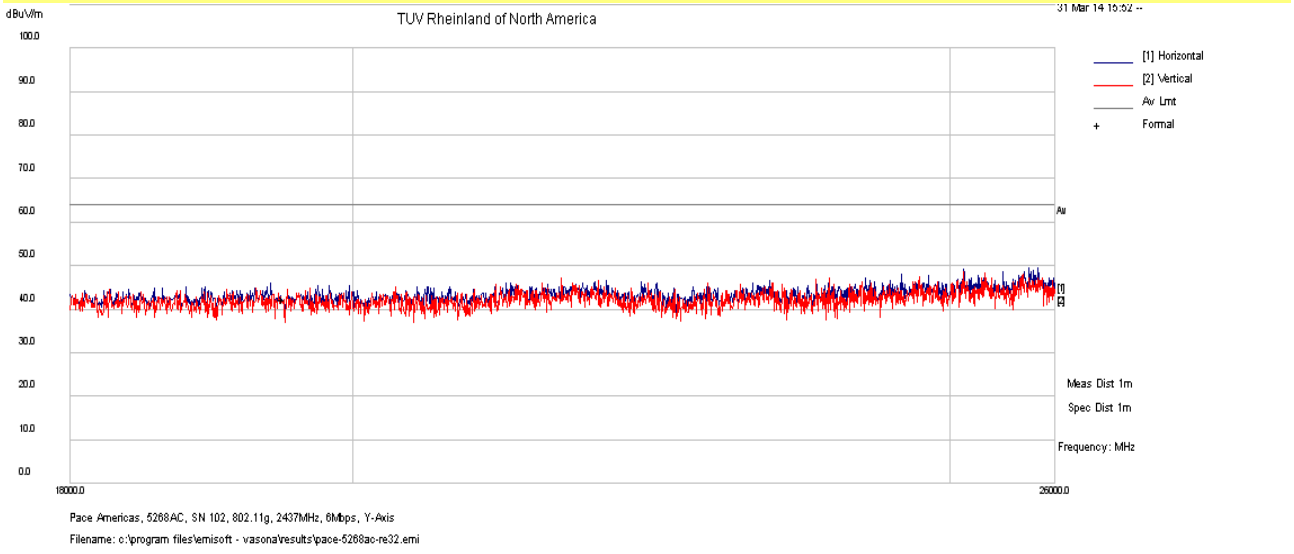
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 9 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11g, 6Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2437 MHz, 802.11g 6Mbit/s





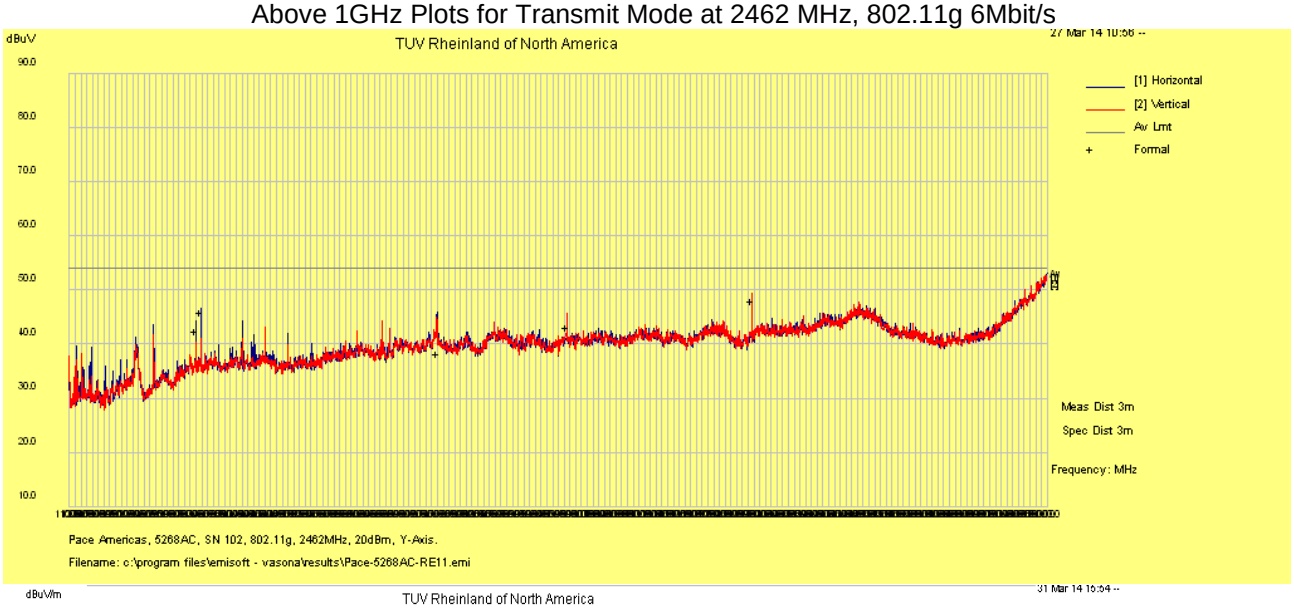
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

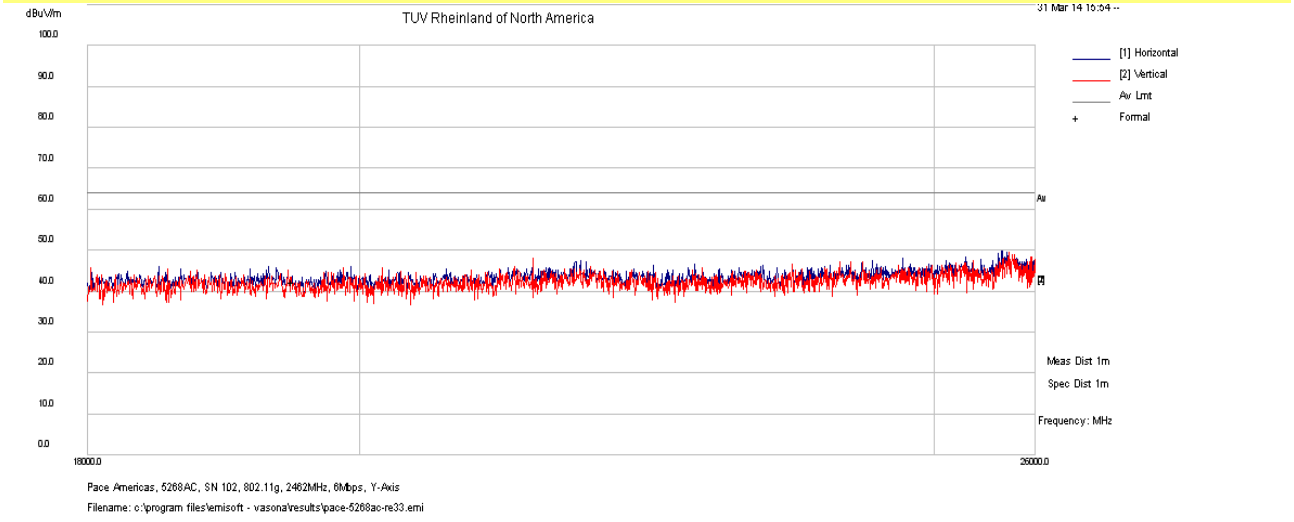
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 10 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11g, 6Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2462 MHz, 802.11g 6Mbit/s





Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 11 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 6.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 2412 MHz at 802.11n HT20 MCS0											
3215.89	65.31	3.75	-19.05	50.01	Ave	H	174	78	54.00	-3.99	Spurious
4799.99	52.51	4.39	-17.42	39.48	Ave	H	182	94	54.00	-14.52	Harmonics
6435.72	45.90	5.00	-14.40	36.40	Ave	V	108	288	54.00	-17.60	Spurious
7242.43	44.10	5.20	-11.60	37.80	Ave	V	226	308	54.00	-16.20	Harmonics
9648.00	48.23	5.97	-8.53	45.67	Ave	V	271	103	54.00	-8.33	Harmonics
12863.88	54.43	6.94	-12.06	49.30	Ave	V	106	56	54.00	-4.70	Spurious
Transmitted Data at 2437 MHz at 802.11n HT20 MCS0											
3249.16	60.78	3.77	-18.98	45.57	Ave	H	198	78	54.00	-8.43	Spurious
4873.70	57.40	4.40	-17.20	44.60	Ave	H	101	116	54.00	-9.40	Harmonics
7314.62	46.10	5.30	-11.30	40.00	Ave	H	246	100	54.00	-14.00	Harmonics
9745.11	41.10	6.00	-8.60	38.50	Ave	H	122	134	54.00	-15.50	Harmonics
12191.93	41.40	6.70	-11.60	36.50	Ave	H	126	146	54.00	-17.50	Harmonics
12864.00	50.78	6.94	-12.06	45.65	Ave	V	99	132	54.00	-8.35	Spurious
Transmitted Data at 2462 MHz at 802.11n HT20 MCS0											
3282.68	60.99	3.75	-18.84	45.90	Ave	H	228	84	54.00	-8.10	Spurious
4924.04	45.20	4.50	-17.10	32.50	Ave	H	100	68	54.00	-21.50	Harmonics
7390.43	45.50	5.30	-11.10	39.70	Ave	H	117	156	54.00	-14.30	Harmonics
6432.70	44.10	5.00	-14.40	34.60	Ave	V	248	222	54.00	-19.40	Spurious
9648.00	50.71	5.97	-8.53	48.15	Ave	V	194	76	54.00	-5.85	Harmonics
12863.90	54.16	6.94	-12.06	49.04	Ave	V	100	56	54.00	-4.96	Spurious

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

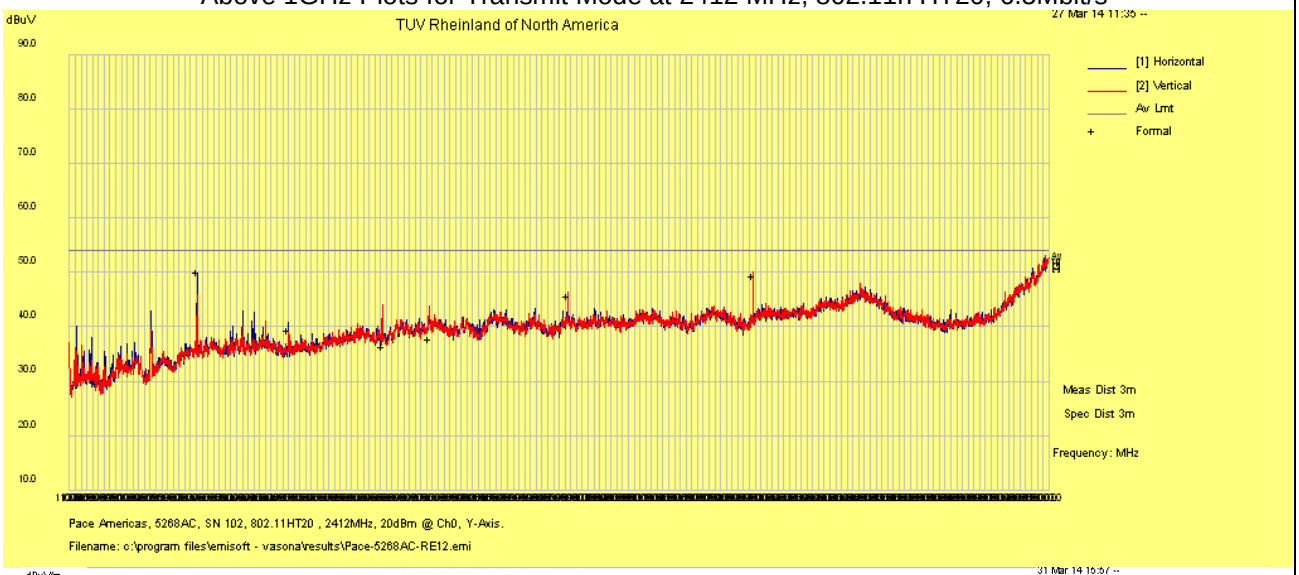
Notes: All emissions passed the spurious emission limit.

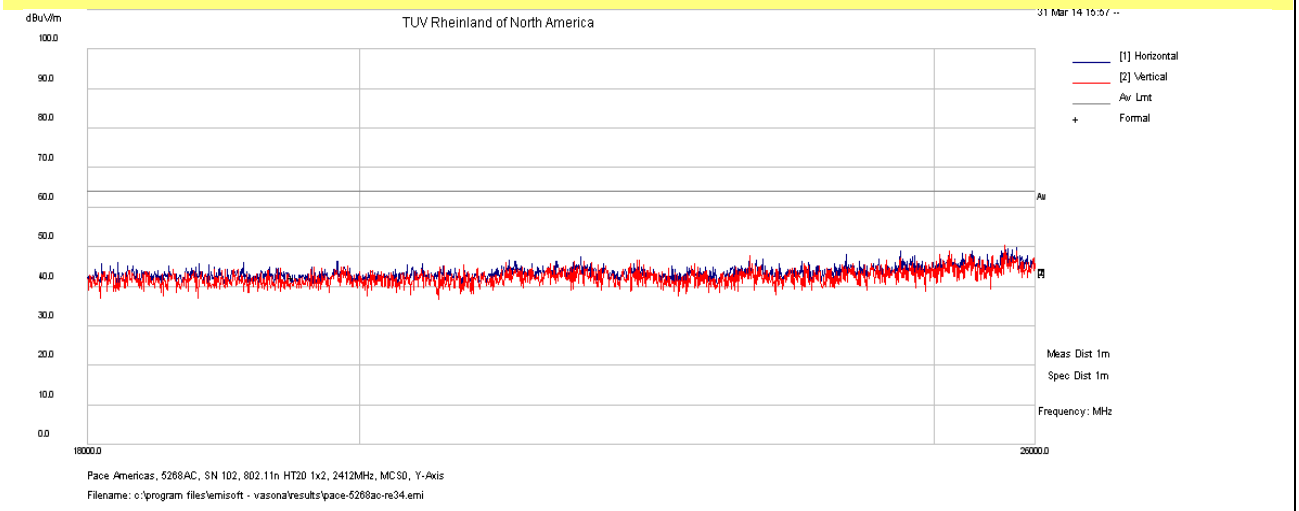
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 12 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 6.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2412 MHz, 802.11n HT20, 6.5Mbit/s





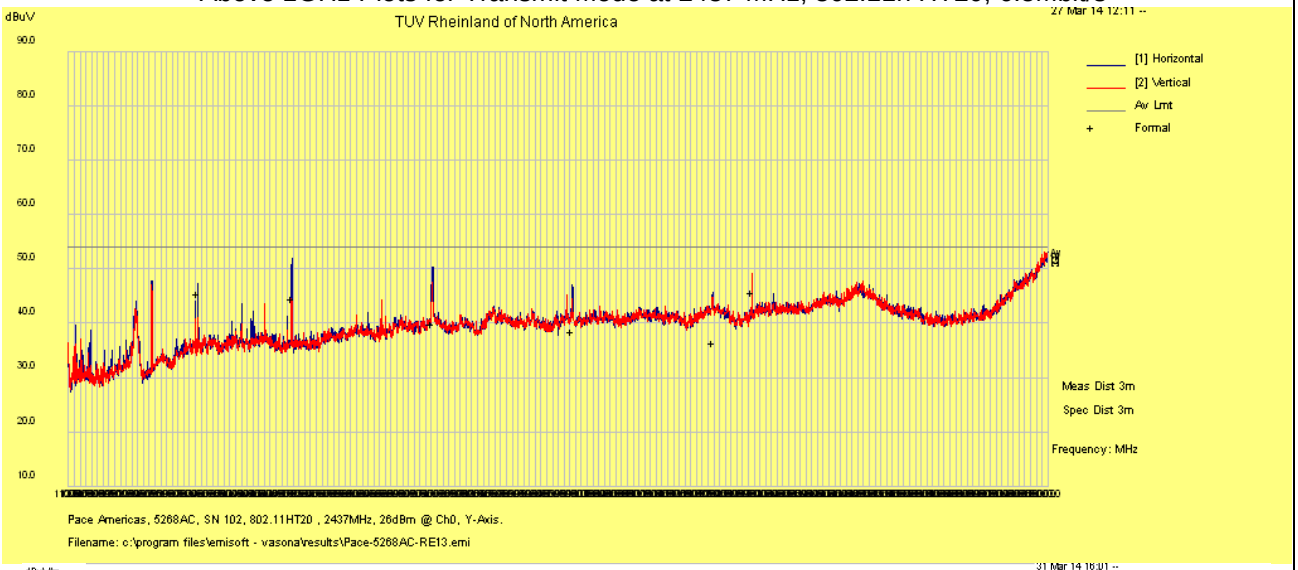
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

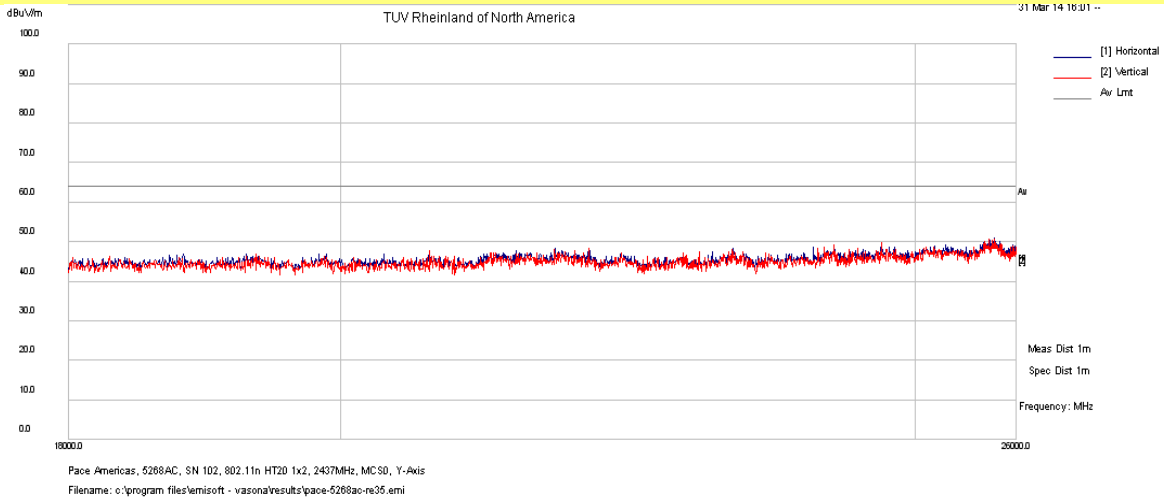
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 13 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 6.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2437 MHz, 802.11n HT20, 6.5Mbit/s





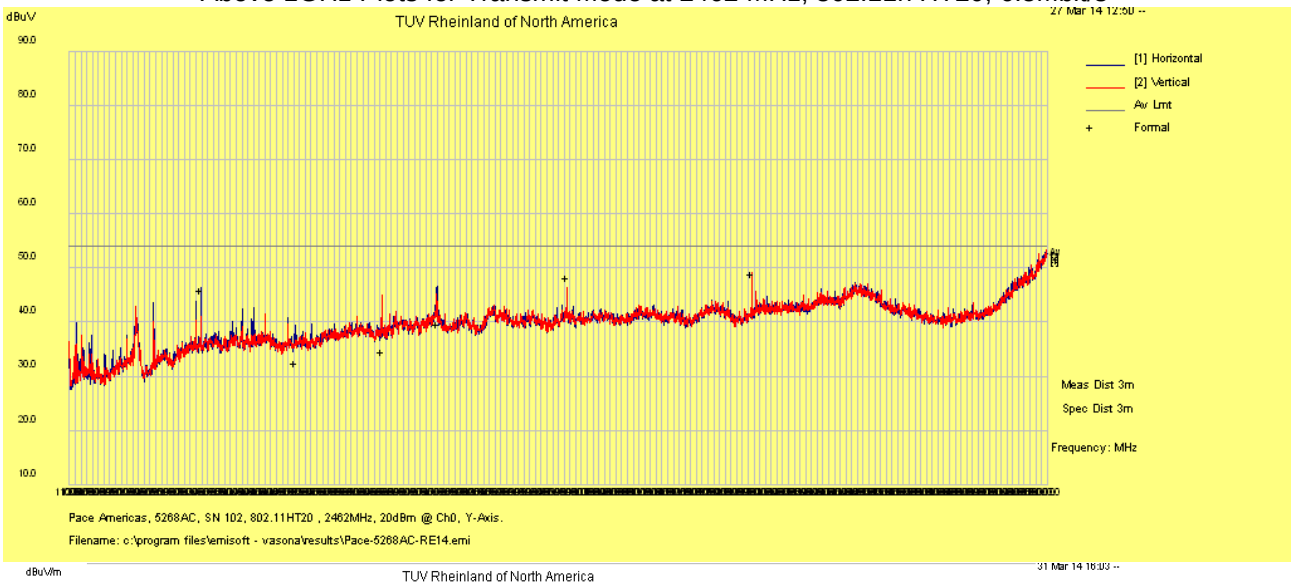
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

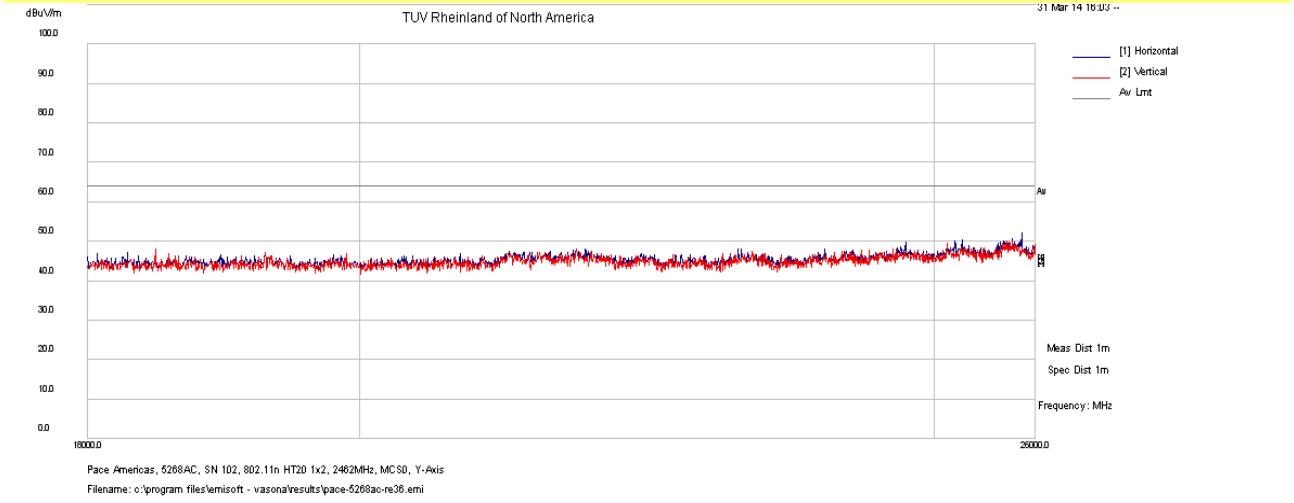
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 14 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 6.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2462 MHz, 802.11n HT20, 6.5Mbit/s





Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 15 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 13Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 2412 MHz at 802.11n HT20 MCS8											
3215.96	64.06	3.75	-19.05	48.76	Ave	H	174	82	54.00	-5.24	Spurious
7238.15	42.20	5.20	-11.60	35.90	Ave	H	193	98	54.00	-18.10	Harmonics
4824.07	45.80	4.50	-17.40	32.90	Ave	V	176	74	54.00	-21.10	Harmonics
9648.04	45.96	5.97	-8.53	43.40	Ave	V	251	108	54.00	-10.60	Spurious
12863.84	53.73	6.94	-12.06	48.61	Ave	V	100	60	54.00	-5.39	Spurious
Transmitted Data at 2437 MHz at 802.11n HT20 MCS8											
3249.19	64.46	3.77	-18.98	49.26	Ave	H	231	84	54.00	-4.75	Spurious
4874.45	45.50	4.40	-17.20	32.70	Ave	H	227	114	54.00	-21.30	Harmonics
7322.67	47.40	5.30	-11.30	41.40	Ave	H	218	64	54.00	-12.60	Harmonics
6433.39	42.60	5.00	-14.40	33.10	Ave	V	156	332	54.00	-20.90	Spurious
9647.93	44.74	5.97	-8.53	42.18	Ave	V	253	116	54.00	-11.82	Spurious
12863.80	49.18	6.94	-12.07	44.05	Ave	V	277	64	54.00	-9.95	Spurious
Transmitted Data at 2462 MHz at 802.11n HT20 MCS8											
3282.65	63.29	3.75	-18.84	48.20	Ave	H	265	92	54.00	-5.80	Spurious
4799.87	51.89	4.39	-17.42	38.86	Ave	H	178	96	54.00	-15.14	Harmonics
7389.38	45.50	5.30	-11.10	39.70	Ave	H	131	148	54.00	-14.30	Harmonics
9648.01	47.27	5.97	-8.53	44.71	Ave	V	214	52	54.00	-9.29	Spurious
12863.90	53.38	6.94	-12.06	48.25	Ave	V	99	58	54.00	-5.75	Spurious

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

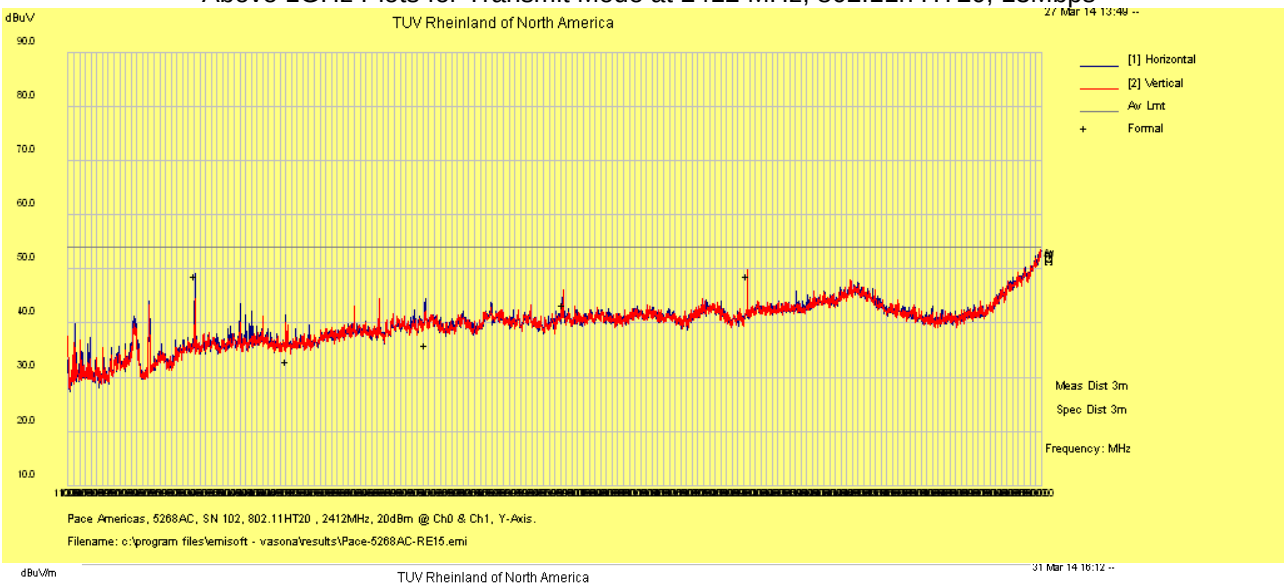
Notes: All emissions passed the spurious emission limit.

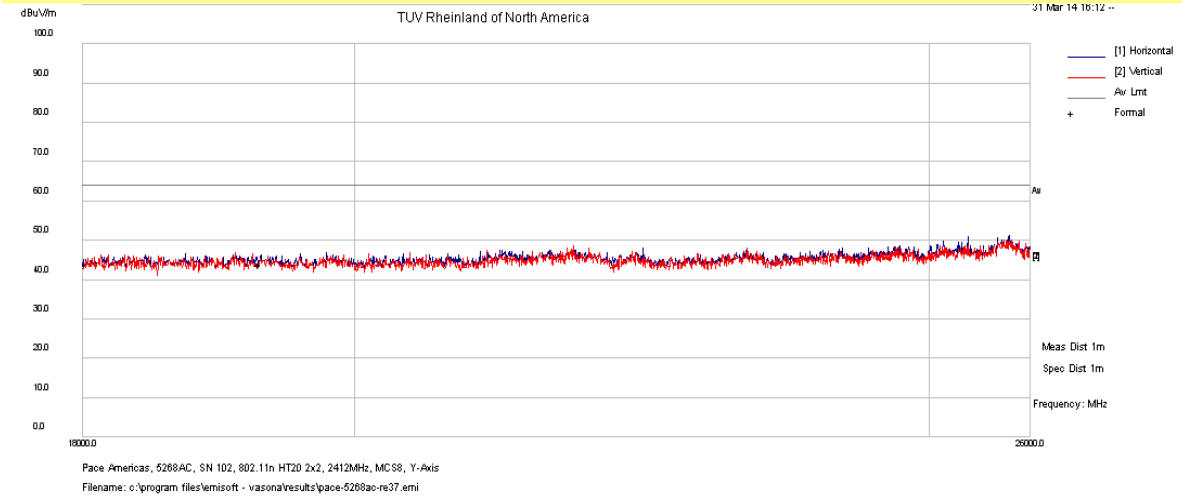
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 16 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 13Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2412 MHz, 802.11n HT20, 13Mbps





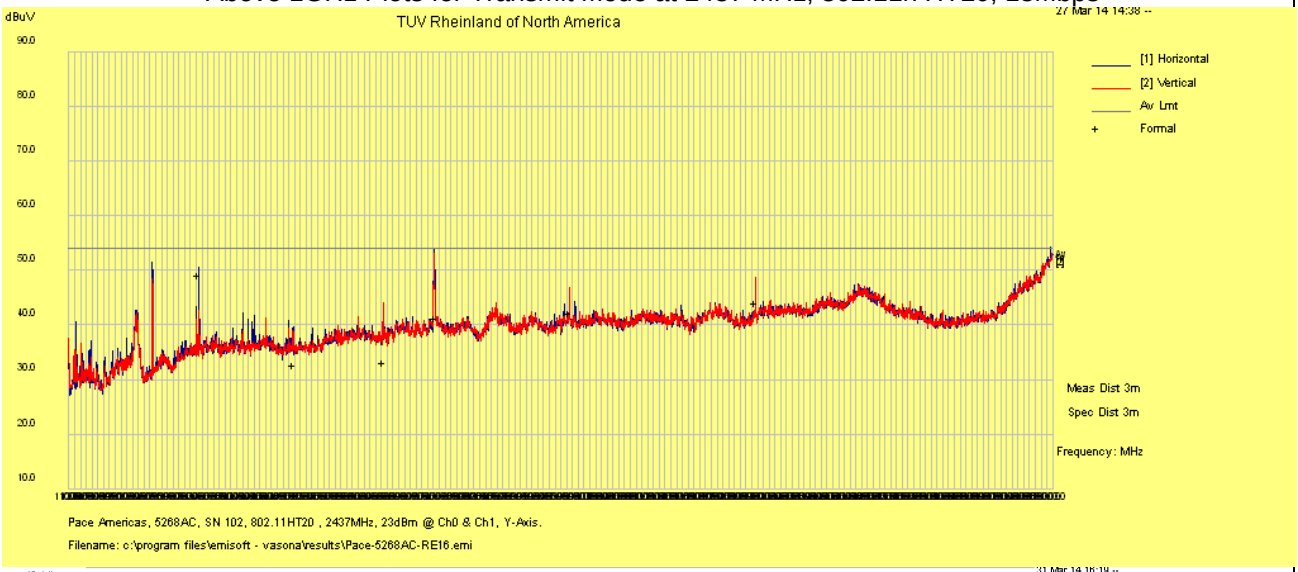
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

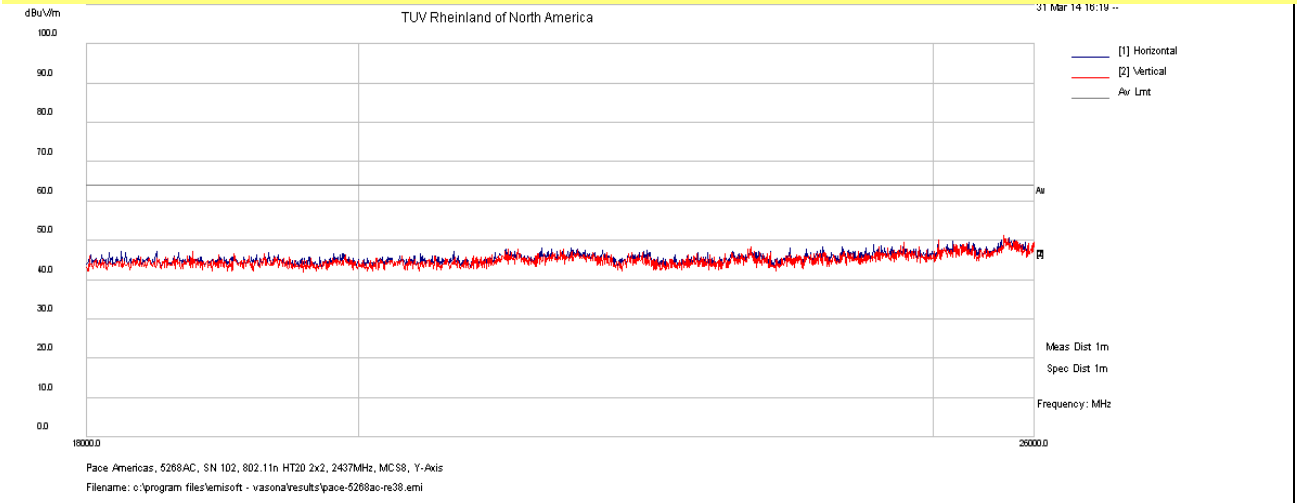
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 17 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 13Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2437 MHz, 802.11n HT20, 13Mbps





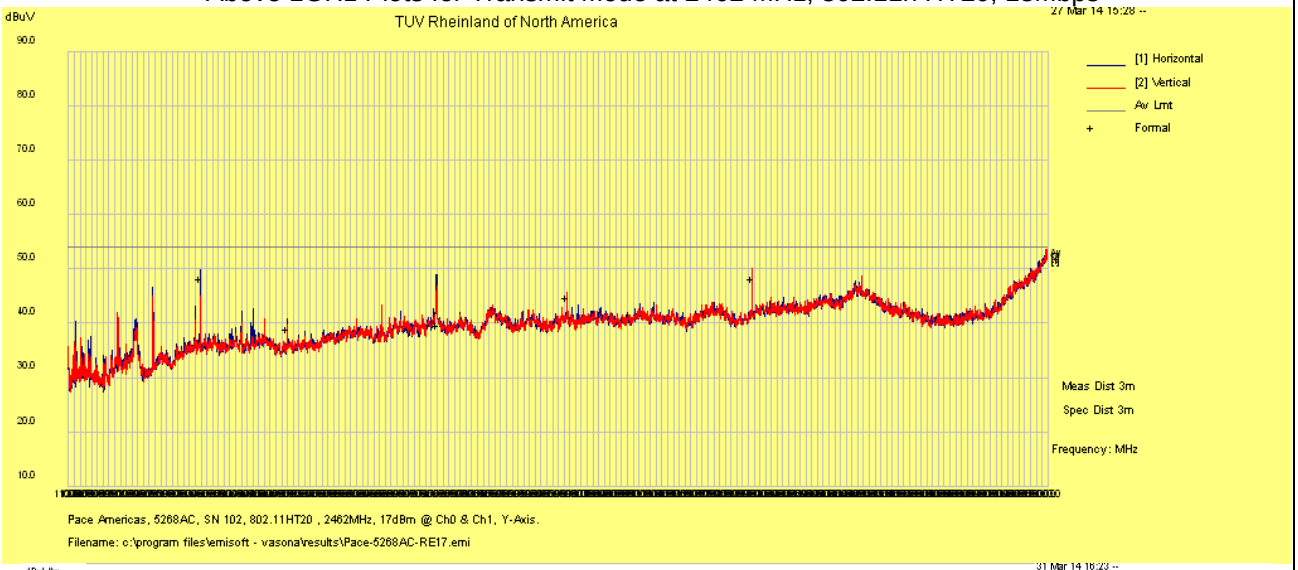
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

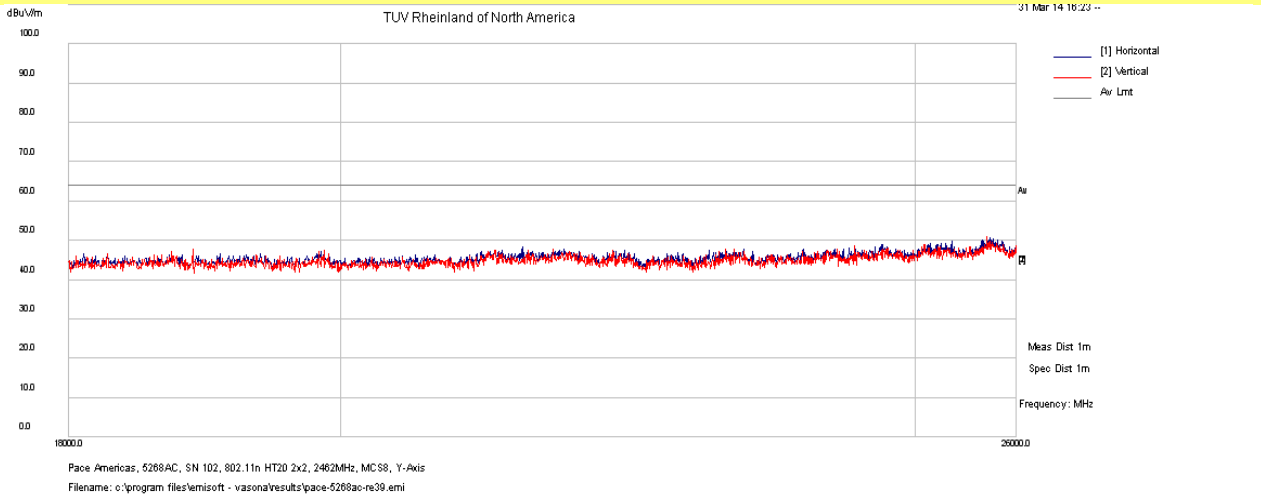
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 18 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT20, 13Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2462 MHz, 802.11n HT20, 13Mbps





Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 19 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 13.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 2422 MHz at 802.11n HT40 MCS0											
3229.36	64.02	3.76	-19.03	48.76	Ave	H	173	64	54.00	-5.25	Spurious
4844.01	45.30	4.40	-17.40	32.40	Ave	H	228	212	54.00	-21.60	Harmonics
9647.82	45.90	6.00	-8.50	43.30	Ave	V	266	114	54.00	-10.70	Spurious
12864.03	54.14	6.94	-12.06	49.02	Ave	V	99	56	54.00	-4.98	Spurious
Transmitted Data at 2437 MHz at 802.11n HT40 MCS0											
3249.14	64.10	3.77	-18.98	48.89	Ave	H	234	82	54.00	-5.11	Spurious
4874.92	44.00	4.40	-17.20	31.20	Ave	V	158	276	54.00	-22.80	Harmonics
7321.06	42.80	5.30	-11.30	36.80	Ave	V	129	94	54.00	-17.20	Harmonics
9648.01	47.36	5.97	-8.53	44.80	Ave	V	211	52	54.00	-9.20	Spurious
12863.91	53.16	6.94	-12.06	48.04	Ave	V	121	54	54.00	-5.96	Spurious
Transmitted Data at 2452 MHz at 802.11n HT40 MCS0											
3269.31	66.58	3.74	-18.89	51.43	Ave	H	228	70	54.00	-2.57	Spurious
4897.30	44.70	4.40	-17.20	32.00	Ave	H	130	186	54.00	-22.00	Harmonics
6435.64	40.60	5.00	-14.40	31.10	Ave	V	183	312	54.00	-22.90	Spurious
9647.96	45.08	5.97	-8.53	42.52	Ave	V	285	108	54.00	-11.48	Spurious
12863.99	54.70	6.94	-12.06	49.58	Ave	V	106	54	54.00	-4.42	Spurious

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

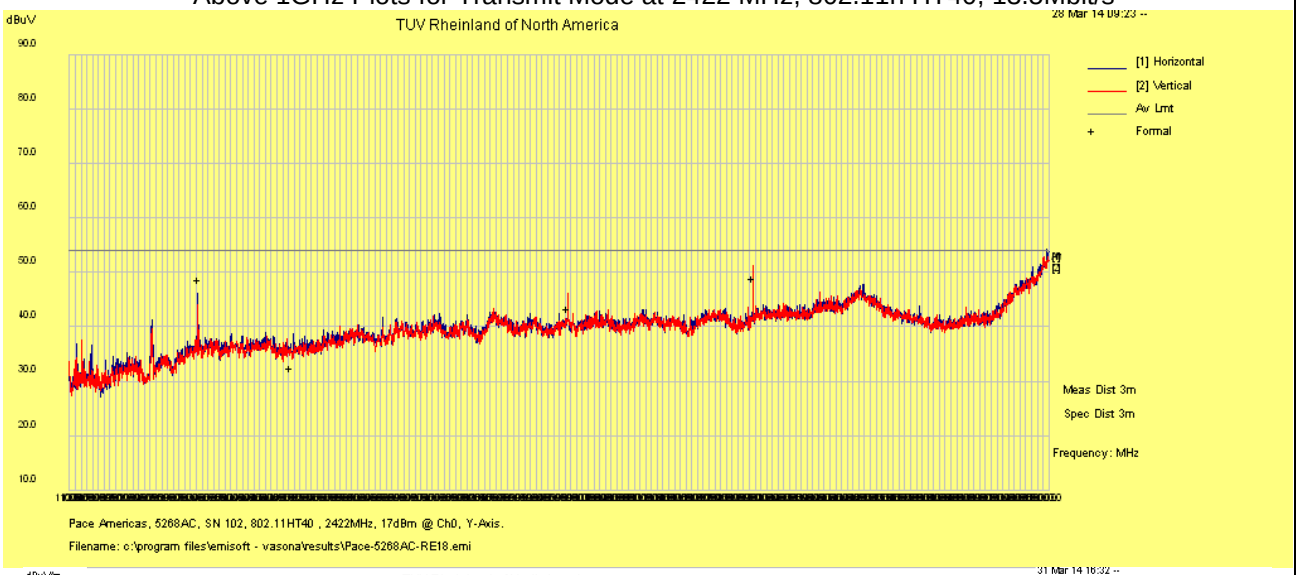
Notes: All emissions passed the spurious emission limit.

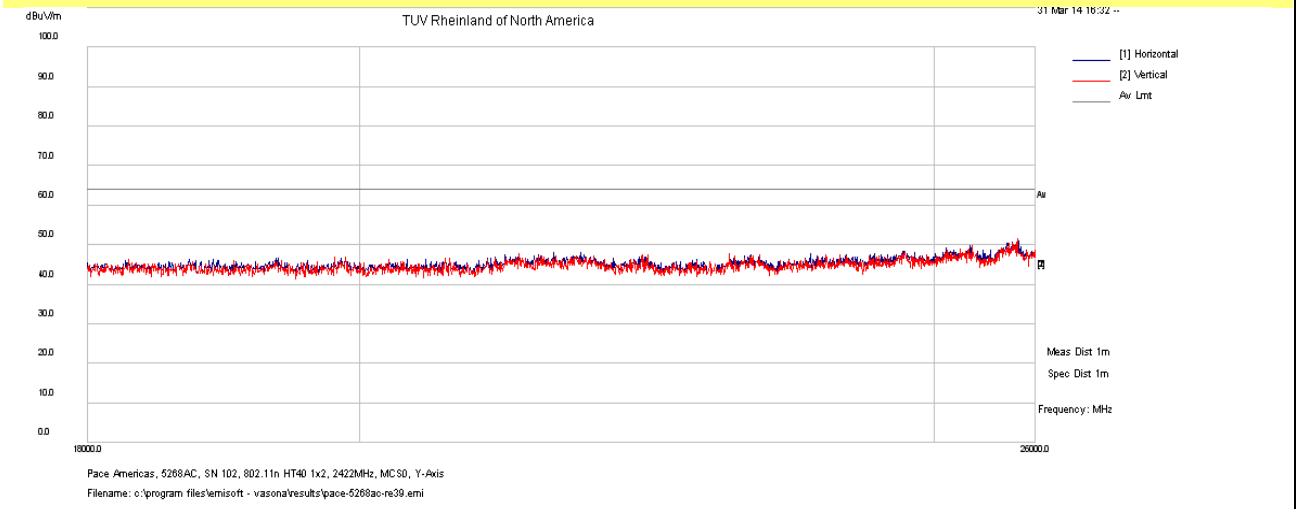
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 20 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 13.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2422 MHz, 802.11n HT40, 13.5Mbit/s





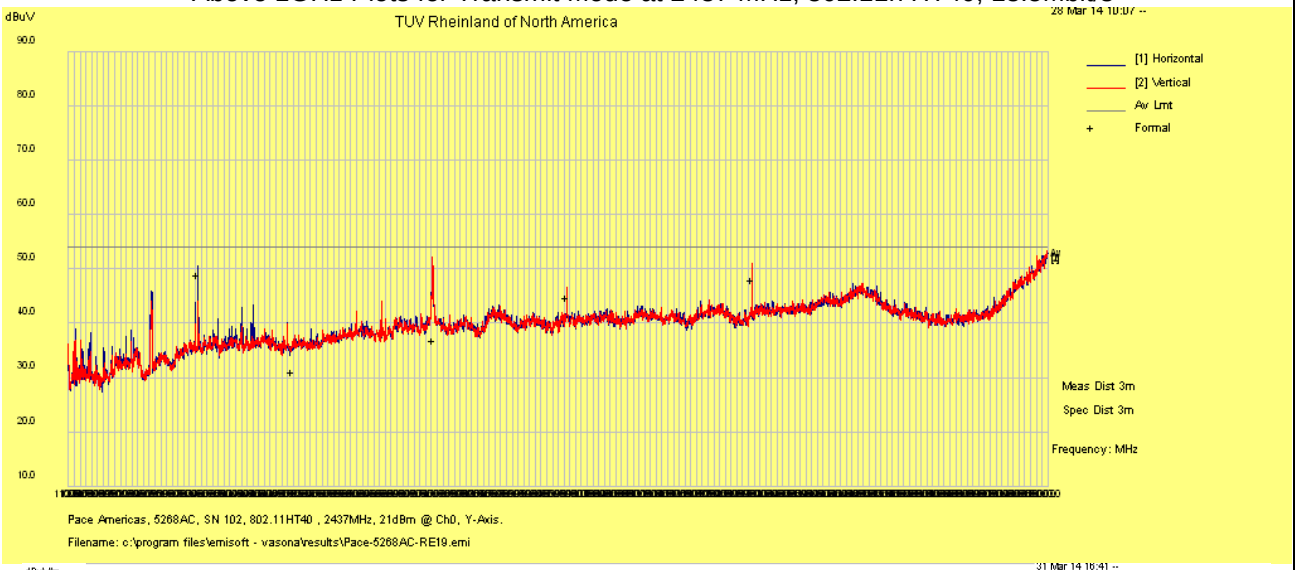
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

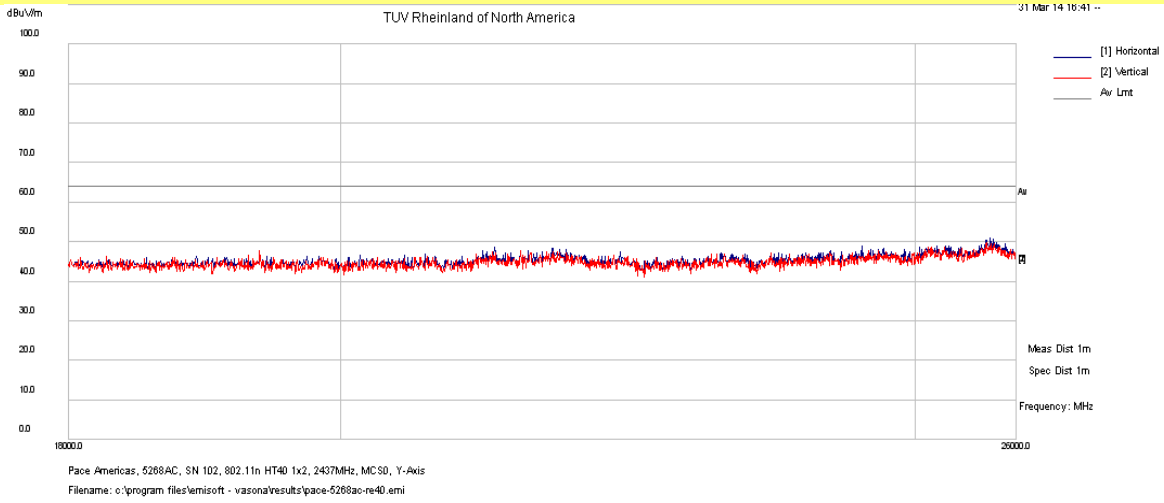
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 21 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 13.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2437 MHz, 802.11n HT40, 13.5Mbit/s





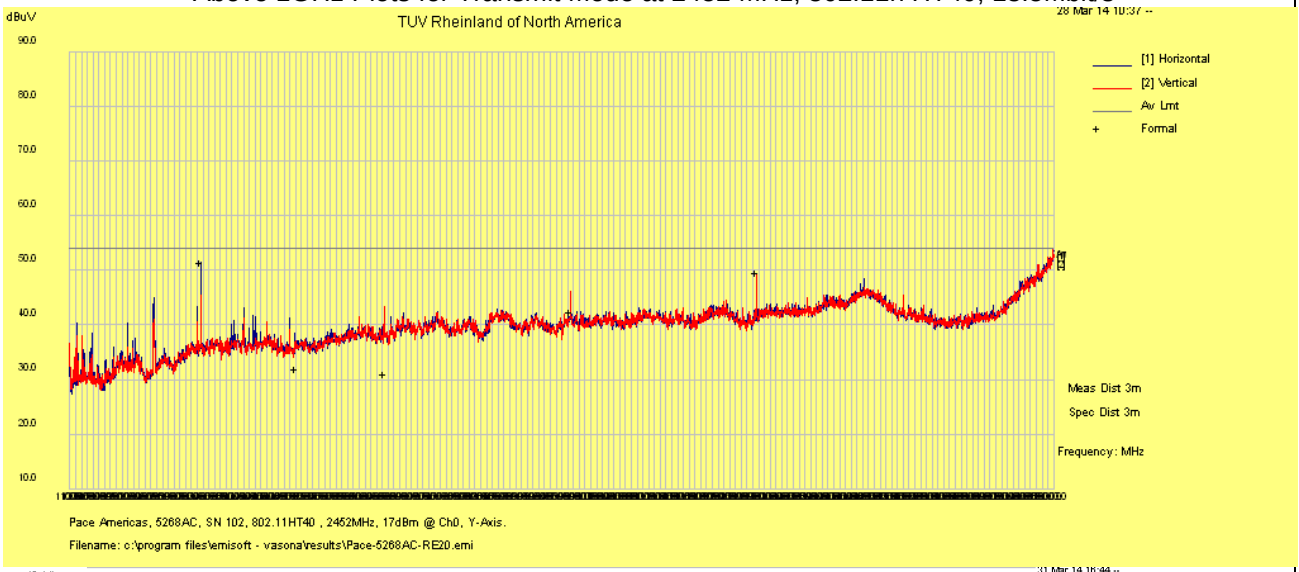
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

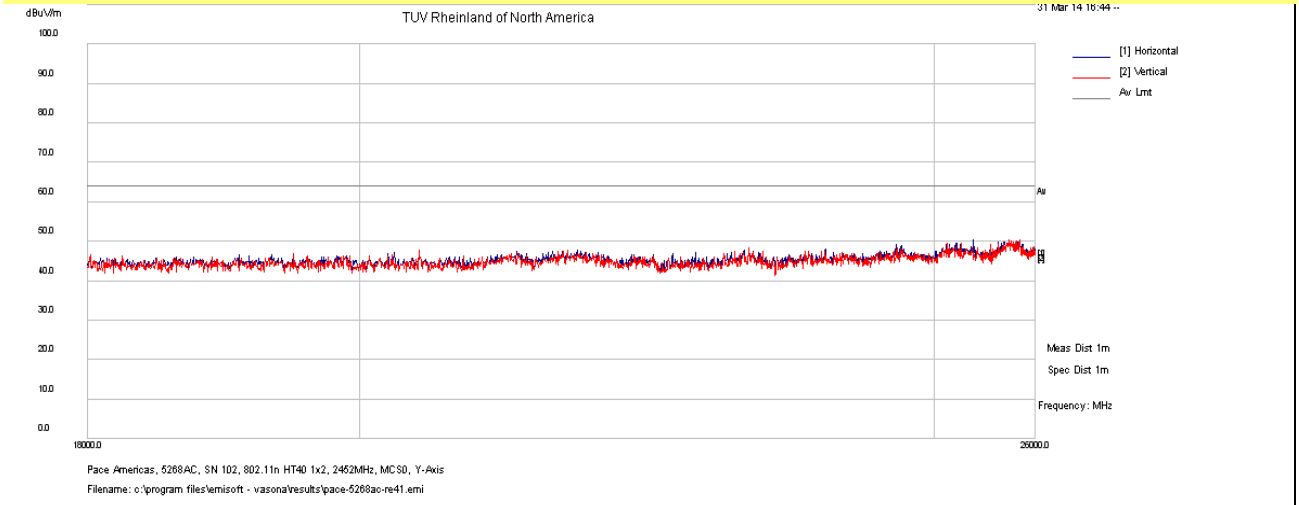
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 22 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 13.5Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2452 MHz, 802.11n HT40, 13.5Mbit/s





Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 23 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 27Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Freq	Raw	Cbl	AF	Level	Det	Pol	Hght	Azt	Limit	Margin	Comment
MHz	dBuV/m	dB	dB	dBuV/m		H/V	cm	deg	dBuV/m	dB	
Transmitted Data at 2422 MHz at 802.11n HT40 MCS8											
3229.28	62.19	3.76	-19.03	46.92	Ave	H	200	58	54.00	-7.08	Spurious
14675.17	34.56	7.55	-7.26	34.85	Ave	H	220	314	54.00	-19.15	Harmonics
4843.94	47.10	4.40	-17.40	34.20	Ave	V	168	92	54.00	-19.80	Harmonics
7266.86	40.10	5.30	-11.50	33.90	Ave	V	293	78	54.00	-20.10	Harmonics
9647.87	50.59	5.97	-8.53	48.03	Ave	V	213	64	54.00	-5.97	Spurious
12863.97	53.75	6.94	-12.06	48.63	Ave	V	99	56	54.00	-5.38	Spurious
Transmitted Data at 2437 MHz at 802.11n HT40 MCS8											
3249.17	63.66	3.77	-18.98	48.45	Ave	H	196	80	54.00	-5.55	Spurious
7326.96	39.74	5.27	-11.27	33.74	Ave	H	297	134	54.00	-20.26	Harmonics
14648.55	36.60	7.50	-7.30	36.80	Ave	H	253	200	54.00	-17.20	Spurious
4874.48	45.00	4.40	-17.20	32.20	Ave	V	231	326	54.00	-21.80	Harmonics
9647.95	48.06	5.97	-8.53	45.50	Ave	V	212	54	54.00	-8.50	Spurious
12863.93	53.82	6.94	-12.06	48.70	Ave	V	106	56	54.00	-5.30	Spurious
Transmitted Data at 2452 MHz at 802.11n HT40 MCS8											
3269.25	66.16	3.74	-18.89	51.01	Ave	H	227	70	54.00	-2.99	Spurious
4905.19	44.00	4.40	-17.10	31.30	Ave	H	195	114	54.00	-22.70	Harmonics
7343.52	42.20	5.30	-11.20	36.30	Ave	V	286	122	54.00	-17.70	Harmonics
9647.91	48.49	5.97	-8.53	45.93	Ave	V	195	60	54.00	-8.07	Spurious
12863.91	54.17	6.94	-12.06	49.04	Ave	V	100	54	54.00	-4.96	Spurious
14790.91	37.80	7.50	-7.30	38.10	Ave	V	281	186	54.00	-15.90	Spurious

Spec Margin = Level - Limit, Level = Raw+ Cbl+ CF ± Uncertainty
CF= Amp Gain + ANT Factor

Combined Standard Uncertainty $u_c(y)$ = ± 4.93dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

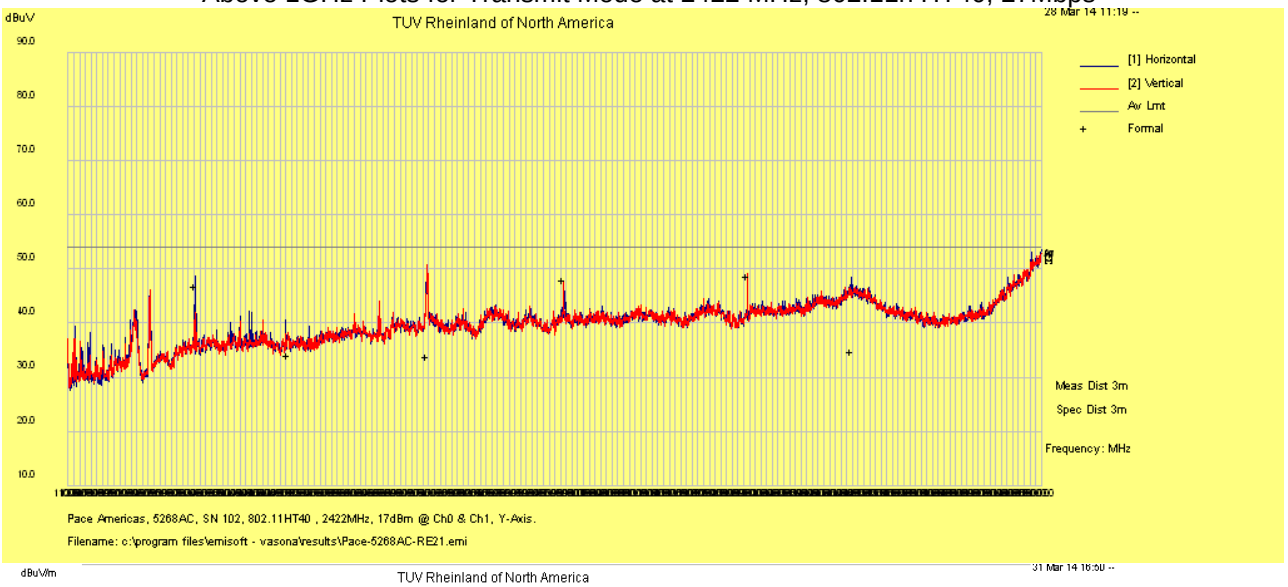
Notes: All emissions passed the spurious emission limit.

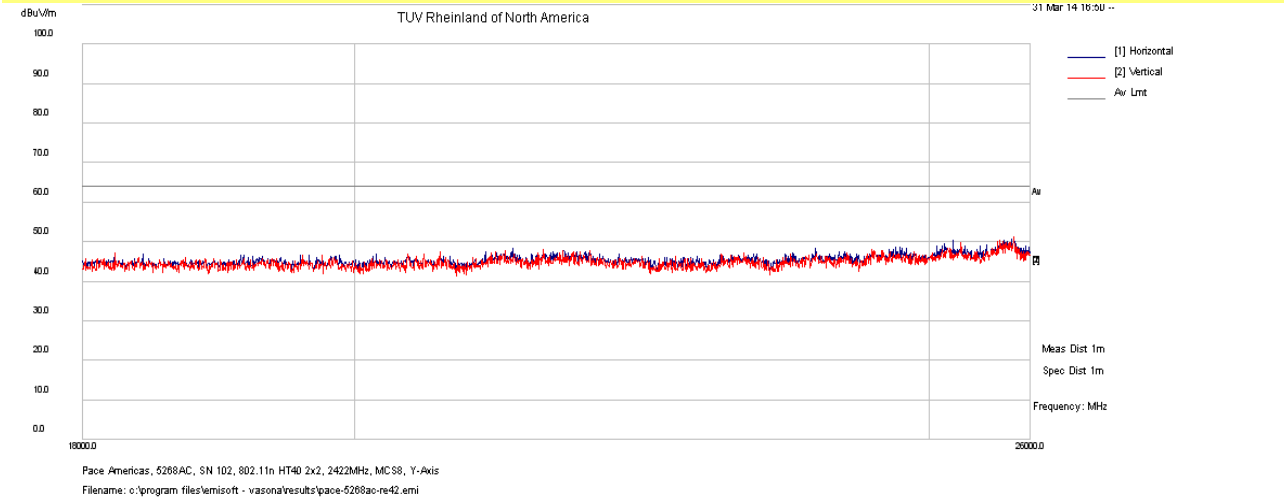
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 24 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 27Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2422 MHz, 802.11n HT40, 27Mbps





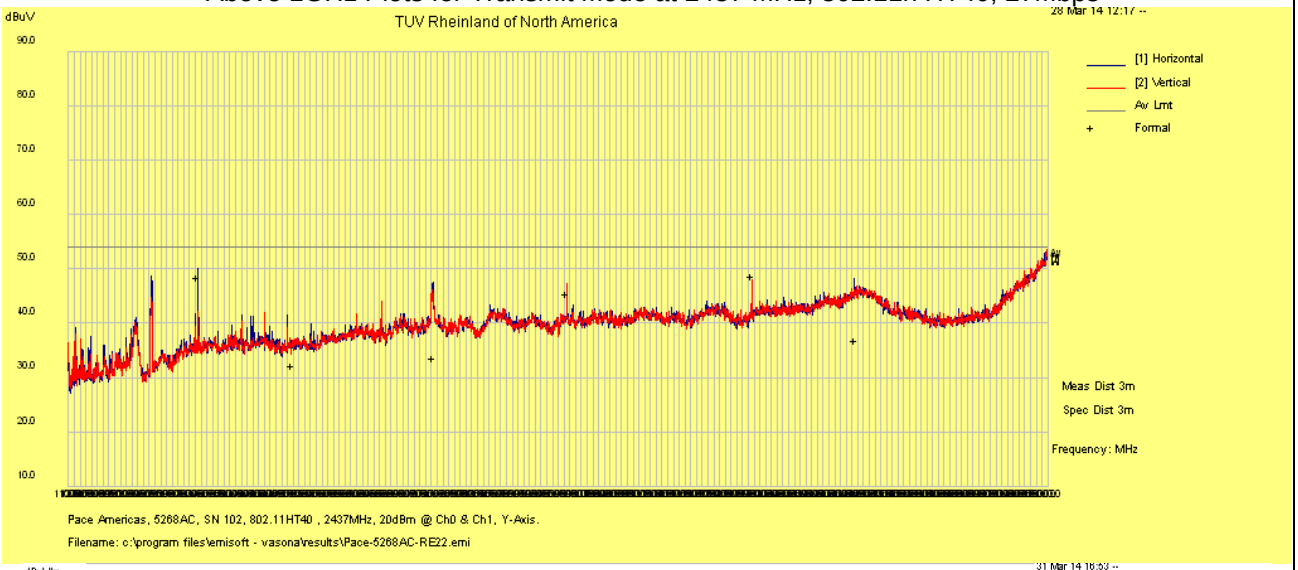
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

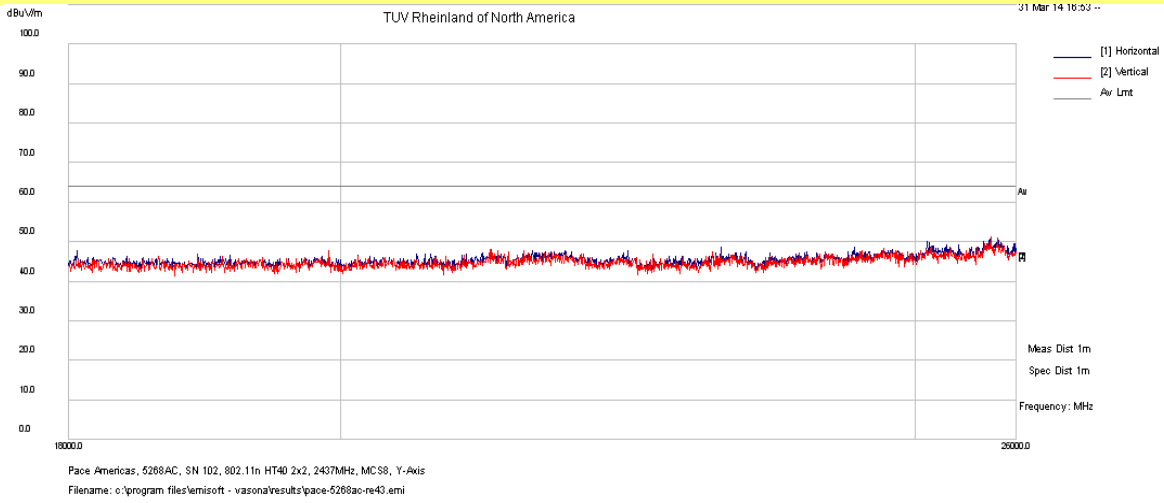
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 25 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 27Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2437 MHz, 802.11n HT40, 27Mbps





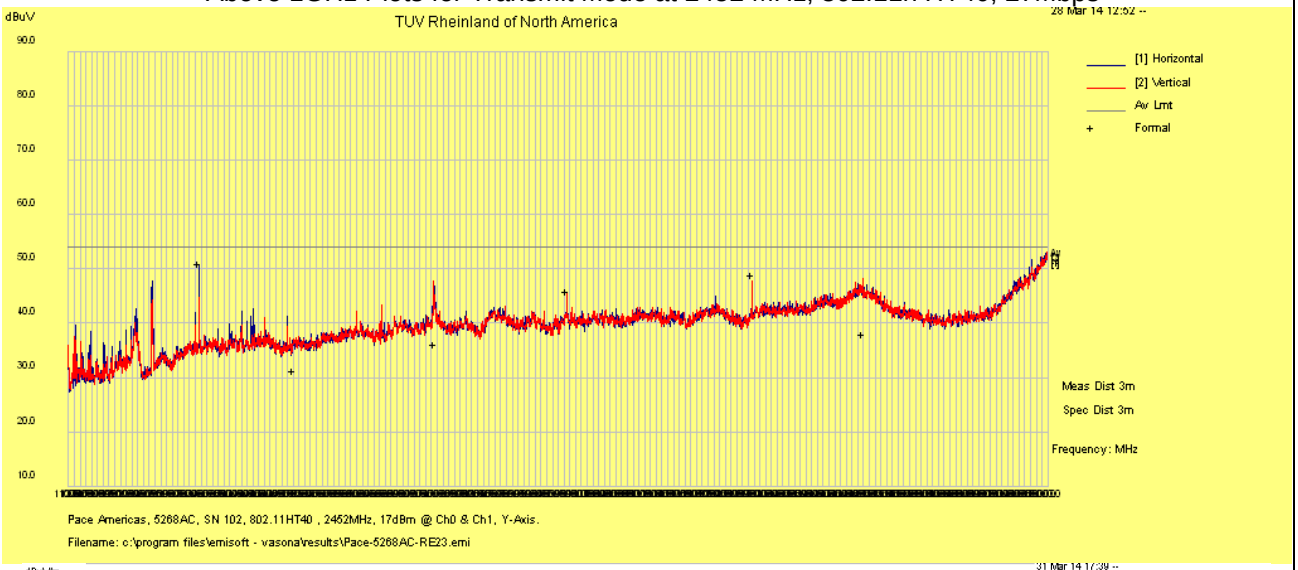
Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

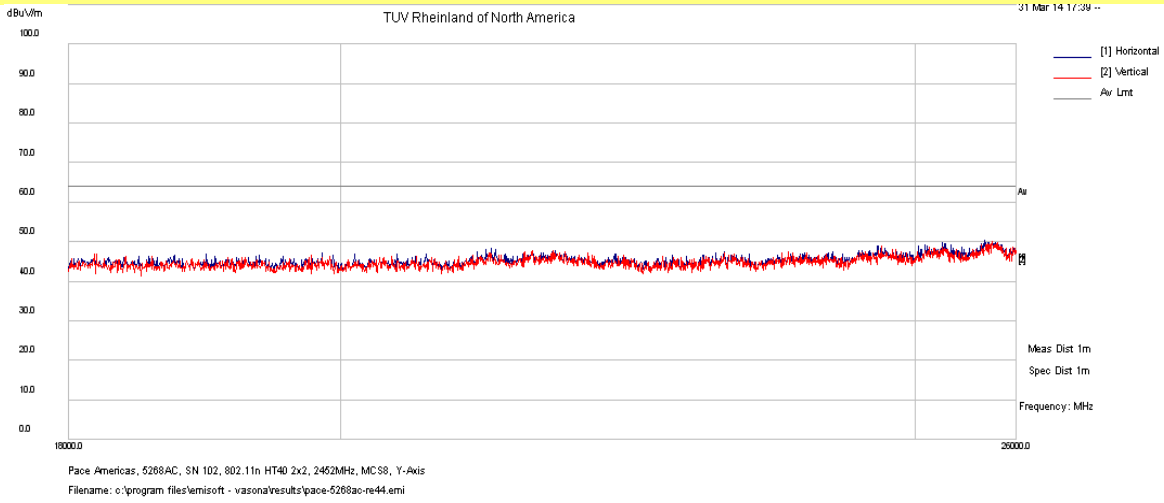
SOP 1 Radiated Emissions

Tracking # 31153119.001 Page 26 of 26

EUT Name	Wireless Residential Gateway	**Date**	March 26, 2014
EUT Model	5268AC	**Temp / Hum in**	23°C / 37%rh
EUT Serial	102	**Temp / Hum out**	N/A
EUT Config.	802.11 HT40, 27Mbps at Y-Axis (above 1GHz)	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15 Subpart C	**RBW / VBW**	1MHz / 3MHz
Dist/Ant Used	3m / DRH-118, 1m / RA42-K-F-4B-C	**Performed by**	Jeremy Luong

Above 1GHz Plots for Transmit Mode at 2452 MHz, 802.11n HT40, 27Mbps





Notes: Limit was extrapolated to 1m distance for 18GHz – 25GHz range.
1GHz – 25GHz Setting: RBW = 1MHz/ VBW = 3MHz

4.6.4 Sample Calculation

The field strength is calculated by subtracting the Amplifier Gain and adding the Cable Loss and Antenna Correction Factor to the measured reading. The basic equation is as follows:

Field Strength Level (dBμV/m) = Raw - AMP + CBL + ACF

Where: Raw = Field Intensity Meter (dBμV)
AMP = Amplifier Gain (dB)
CBL = Cable Loss (dB)
ACF = Antenna Correction Factor (dB/m)

$$\mu V/m = 10^{\frac{dB\mu V/m}{20}}$$

4.7 AC Conducted Emissions

Testing was performed in accordance with ANSI C63.4: 2003. These test methods are listed under the laboratory's A2LA Scope of Accreditation.

This test measures the levels emanating from the EUT's AC input port, thus evaluating the potential for the EUT to cause radio frequency interference to other electronic devices.

The AC conducted emissions of equipment under test shall not exceed the values in CFR47 Part 15.207: 2013 and RSS-210: 2010.

4.7.1 Test Methodology

A test program that controls instrumentation and data logging was used to automate the AC Power Line Conducted emission test procedure. The frequency range of interest was divided into sub-ranges such as to yield a frequency resolution of 9 kHz. Each phase and neutral of the AC power line were measured with respect to ground. Measurements were performed using a set of 50 μH / 50Ω LISNs.

Testing is either performed in 5m Chamber. The setup photographs clearly identify which site was used. The vertical ground plane used in the semi-anechoic chamber is a 2m x 2m solid aluminum frame and panel, and it is bonded to the horizontal ground plane.

In the case of tabletop equipment, the EUT is placed on a 1.0m x 1.5m non-conductive table 80cm above the ground plane and 40cm from a vertical ground reference plane. The rear of the EUT was positioned flush with the backside of the table and directly over the LISNs. The power and I/O cables were routed over the edge of the table and bundled approximately 40cm from the ground plane. Support equipment was powered from a separate LISN.

4.7.1.1 Deviations

There were no deviations from this test methodology.

4.7.2 Test Results

As originally tested, the EUT was found to be compliant to the requirements of the test standard(s).

Table 10: AC Conducted Emissions – Test Results

Test Conditions: Conducted Measurement at Normal Conditions only		
Antenna Type: Attached	**Power Level:** +25 dBm at 2437 MHz	
AC Power: 110 Vac/60 Hz	**Configuration:** Tabletop	
Ambient Temperature: 23° C	**Relative Humidity:** 39% RH	
Configuration	**Frequency Range**	**Test Result**
Line 1 (Hot)	0.15 to 30 MHz	Pass
Line 2 (Neutral)	0.15 to 30 MHz	Pass

SOP 2 Conducted Emissions

Tracking # 31153119.001 Page 1 of 4

EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 39% rh
EUT Serial	111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	110Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9kHz / 30 kHz
Lab/LISN	5m Chamber / L1-200, Line 1	**Performed by**	Jeremy Luong

Frequency	Raw	Limiter	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.150	43.10	10.15	-0.72	52.53	QP	Live	66.00	-13.47	Pass
0.150	29.98	10.15	-0.72	39.41	Ave	Live	56.00	-16.59	Pass
0.499	27.62	10.18	-0.31	37.49	QP	Live	56.02	-18.53	Pass
0.499	18.14	10.18	-0.31	28.01	Ave	Live	46.02	-18.01	Pass
1.361	21.04	10.26	-0.19	31.11	QP	Live	56.00	-24.89	Pass
1.361	9.07	10.26	-0.19	19.14	Ave	Live	46.00	-26.86	Pass
4.163	20.16	10.42	-0.14	30.44	QP	Live	56.00	-25.56	Pass
4.163	8.57	10.42	-0.14	18.85	Ave	Live	46.00	-27.15	Pass
4.618	24.32	10.43	-0.14	34.61	QP	Live	56.00	-21.39	Pass
4.618	14.13	10.43	-0.14	24.42	Ave	Live	46.00	-21.58	Pass
4.727	22.13	10.43	-0.14	32.43	QP	Live	56.00	-23.57	Pass
4.727	13.42	10.43	-0.14	23.72	Ave	Live	46.00	-22.28	Pass

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 2.18 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

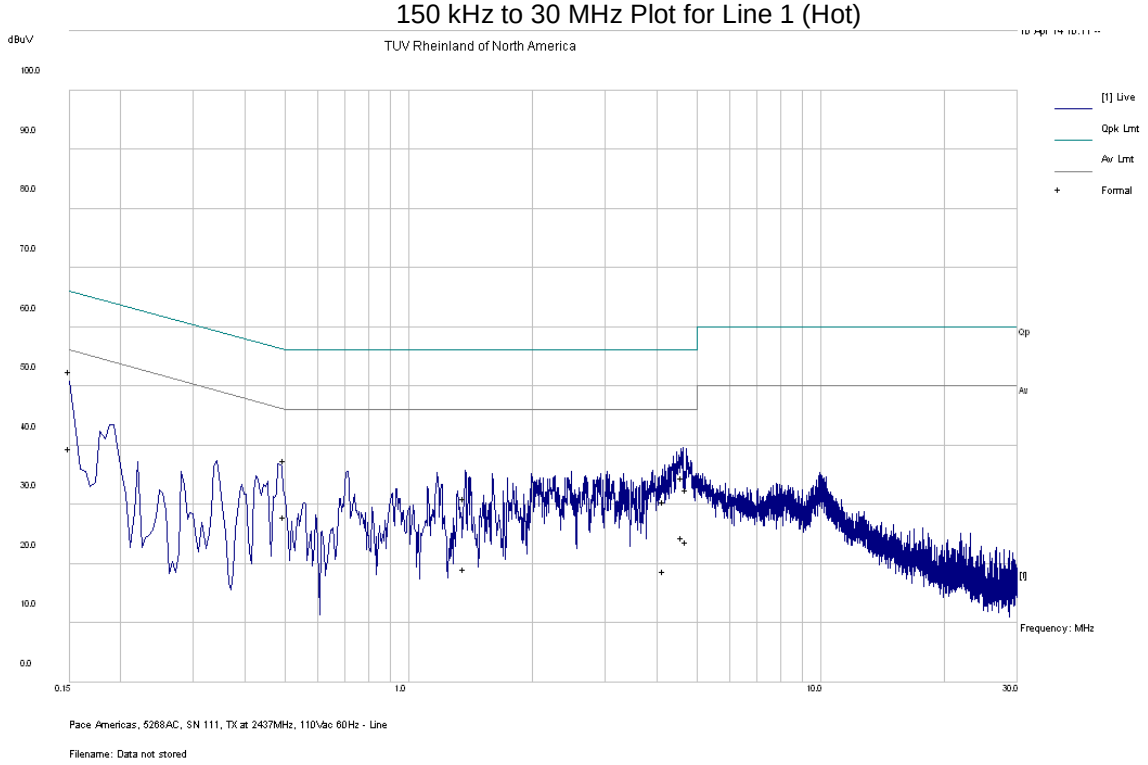
Notes: EUT was setup as table top equipment.

SOP 2 Conducted Emissions

Tracking # 31153119.001 Page 2 of 4

EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 39% rh
EUT Serial	111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9kHz / 30 kHz
Lab/LISN	5m Chamber / L1-200, Line 1	**Performed by**	Jeremy Luong

150 kHz to 30 MHz Plot for Line 1 (Hot)



Notes: Meets FCC Class B limit.

SOP 2 Conducted Emissions

Tracking # 31153119.001 Page 3 of 4

EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 39% rh
EUT Serial	111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9kHz / 30 kHz
Lab/LISN	5m Chamber / L1-200, Line 2	**Performed by**	Jeremy Luong

Frequency	Raw	Limiter	Ins. Loss	Level	Detector	Line	Limit	Margin	Result
MHz	dBuV	dB	dB	dBuV			dBuV	dB	
0.150	43.09	10.15	-0.72	52.52	QP	Neutral	65.98	-13.46	Pass
0.150	32.21	10.15	-0.72	41.64	Ave	Neutral	55.98	-14.34	Pass
0.500	27.14	10.18	-0.31	37.01	QP	Neutral	56.00	-18.99	Pass
0.500	15.78	10.18	-0.31	25.65	Ave	Neutral	46.00	-20.35	Pass
1.215	21.80	10.25	-0.20	31.85	QP	Neutral	56.00	-24.15	Pass
1.215	12.69	10.25	-0.20	22.74	Ave	Neutral	46.00	-23.26	Pass
3.971	22.34	10.41	-0.14	32.61	QP	Neutral	56.00	-23.39	Pass
3.971	8.31	10.41	-0.14	18.58	Ave	Neutral	46.00	-27.42	Pass
4.402	26.64	10.42	-0.14	36.92	QP	Neutral	56.00	-19.08	Pass
4.402	17.07	10.42	-0.14	27.35	Ave	Neutral	46.00	-18.65	Pass
4.560	27.09	10.43	-0.14	37.38	QP	Neutral	56.00	-18.62	Pass
4.560	17.77	10.43	-0.14	28.06	Ave	Neutral	46.00	-17.94	Pass
4.825	25.64	10.44	-0.13	35.94	QP	Neutral	56.00	-20.06	Pass
4.825	16.89	10.44	-0.13	27.19	Ave	Neutral	46.00	-18.81	Pass

Spec Margin = QP./Ave. - Limit, ± Uncertainty

Combined Standard Uncertainty $u_c(y)$ = ± 2.18 dB Expanded Uncertainty $U = ku_c(y)$ k = 2 for 95% confidence

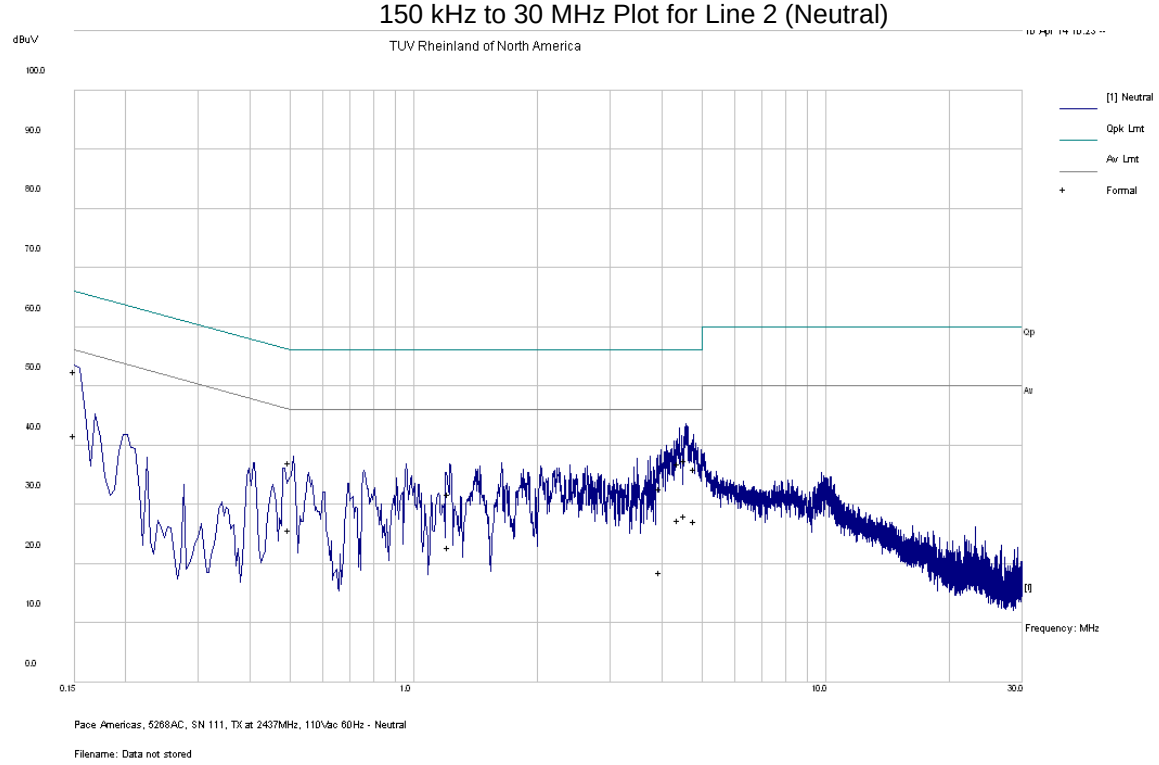
Notes: EUT was setup as table top equipment.

SOP 2 Conducted Emissions

Tracking # 31153119.001 Page 4 of 4

EUT Name	Wireless Residential Gateway	**Date**	April 10, 2014
EUT Model	5268AC	**Temp / Hum in**	23° C / 39% rh
EUT Serial	111	**Temp / Hum out**	N/A
EUT Config.	Attached Antenna	**Line AC / Freq**	120Vac/60Hz
Standard	CFR47 Part 15.207	**RBW / VBW**	9kHz / 30 kHz
Lab/LISN	5m Chamber / L1-200, Line 2	**Performed by**	Jeremy Luong

150 kHz to 30 MHz Plot for Line 2 (Neutral)



Note: Meets FCC Class B limit.

5 Test Equipment List

5.1 Equipment List

Equipment	Manufacturer	Model #	Serial/Inst #	Last Cal mm/dd/yy	Next Cal mm/dd/yy
Bilog Antenna	Sunol Sciences	JB3	A102606	05/15/2012	05/15/2014
Horn Antenna	Sunol Sciences	DRH-118	A040806	10/05/2012	10/05/2014
Horn Antenna	CMT	RA42-K-F-4B-C	020131-004	06/19/2013	06/19/2014
Spectrum Analyzer	Rohde & Schwarz	FSL6	100169	01/08/2014	02/08/2015
Spectrum Analyzer	Agilent	N9038A	MY52260210	01/08/2014	02/08/2015
Spectrum Analyzer	Rohde & Schwarz	ESIB	832427/002	01/08/2014	02/08/2015
Spectrum Analyzer	Hewlett Packard	8546A	3325A00168	11/14/2013	11/14/2014
RF Pre-Selector	Hewlett Packard	85460A	3330A00174	11/14/2013	11/14/2014
Amplifier	Hewlett Packard	8447D	2944A07996	01/07/2014	02/07/2015
Amplifier	Miteq	TTA1800-30-4G	1842452	01/08/2014	02/08/2015
Amplifier	Rhode & Schwarz	TS-PR26	100011	03/05/2013	05/04/2014
LISN	Com-Power	LI-250	12111	01/07/2014	02/07/2015
Transient Limiter	Com-Power	LIT930	531582	01/08/2014	02/08/2015
Power Meter	Agilent	E4418B	MY45103902	01/09/2014	02/09/2015
Power Sensor	Hewlett Packard	8482A	55-5131	01/09/2014	02/09/2015
Notch Filter	Micro-Tronics	BRM50702	9	01/06/2014	02/06/2016

6 EMC Test Plan

6.1 Introduction

This section provides a description of the Equipment Under Test (EUT), configurations, operating conditions, and performance acceptance criteria. It is an overview of information provided by the manufacturer so that the test laboratory may perform the requested testing.

6.2 Customer

Table 11: Customer Information

Company Name	Pace Americas
Address	310 Providence Mine Road
City, State, Zip	Nevada City, CA 95959
Country	U.S.A.
Phone	(530) 274-5440
Fax	(530) 273-6340

Table 12: Technical Contact Information

Name	Mark Rieger
E-mail	mrieger@pace.com
Phone	(530) 274-5440
Fax	(530) 273-6340

6.3 Equipment Under Test (EUT)

Table 13: EUT Specifications

EUT Specification	
Dimensions	239mm (9.41") x 177mm (6.97") x 67mm (2.64")
AC Adapter (M/N:EADP-36FB A)	Input Voltage: 100 – 240 Vac Input Current: 800 mA Output Voltage: 12 Vdc Output Current: 3.0 A
Environment	Indoor
Operating Temperature Range:	0 to 40 degrees C
Multiple Feeds:	☐ Yes and how many ☒ No
Hardware Version	4.0.8
Part Number	186-2173101
RF Software Version	Busy Box V1.10.3
Operating Mode	802.11a,b, g, n, and ac
Transmitter Frequency Band	2.412 GHz to 2.462 GHz (DSSS)
Max. Rated Power Output	See Channel Planning Table.
Power Setting @ Operating Channel	See Channel Planning Table.
Antenna Type	Attached on board
Modulation Type	☐ AM ☐ FM ☒ DSSS ☒ OFDM ☐ Other describe:
Data Rate	802.11b: 1, 2, 5.5, 11 Mbps at 1 Spatial Stream 802.11g: 6, 9, 12, 18, 24, 36, 48, 54 Mbps at 1 Spatial Stream 802.11n HT20: 1 Spatial Stream: 6.5, 13, 19.5, 26, 39, 52, 58.5, 65 Mbps 2 Spatial Streams: 13, 26, 39, 58, 78, 104, 117, 130 Mbps 802.11n HT40: 1 Spatial Stream: 13.5, 27, 40.5, 54, 81, 108, 121.5, 135 Mbps 2 Spatial Streams: 27, 54, 81, 108, 162, 216, 243, 270 Mbps
TX/RX Chain (s)	2x2
Directional Gain Type	☒ Uncorrelated ☒ No Beam-Forming ☐ Other describe:
Type of Equipment	☒ Table Top ☐ Wall-mount ☐ Floor standing cabinet ☐ Other *describe*
Note: 1. Chain 0 is the default antenna output when there is only one active stream. 2. This report is only covered for 2.4 GHz radio.	

Table 14: EUT Channel Power Specifications

No.	Frequency (MHz)	Target Power Value (dBm)					
		802.11b	802.11g	802.11n HT20		802.11n HT40	
				1 Stream	2 Stream	1 Stream	2 Stream
1	2412	22	20	20	17		
2	2417	25	23	23	23		
3	2422	25	26	26	23	17	17
4	2427	25	26	26	23	21	20
5	2432	25	26	26	23	21	20
6	2437	25	26	26	23	21	20
7	2442	25	26	26	23	21	20
8	2447	25	26	26	23	21	20
9	2452	25	26	26	23	17	17
10	2457	25	24	23	23		
11	2462	21	20	20	17		

Table 15: Interface Specifications

Interface Type	Cabled with what type of cable?	Is the cable shielded?	Maximum potential length of the cable?	Metallic (M), Coax (C), Fiber (F), or Not Applicable?
Ethernet	Terminated	☒ No	☐ Metric: 30m	☒ M
Ethernet (x3)	Unterminated	☒ No	☐ Metric: 30m	☒ M
ONT	Unterminated	☒ No	☐ Metric: 30 m	☒ M
Broadband	Unterminated	☒ No	☐ Metric: 30 m	☒ M
Telephone x2	Unterminated	☒ No	☐ Metric: 30m	☒ M
USB	Unterminated	☒ No	☐ Metric: 2.8 m	☒ M
Cable	Unterminated	☒ No	☐ Metric: 30m	☒ M

Table 16: Supported Equipment

Equipment	Manufacturer	Model	Serial	Used for
Laptop	Dell Computer	PP23LB	20336311441	Set test mode

Table 17: Description of Sample used for Testing

Device	Serial Number	Configuration	Used For
5268AC	102 and 111	Radiated Sample	Radiated Emission.
5268AC	111	Radiated Sample	AC Conducted Emission
5268AC	111	Conducted Sample	Output Power, Occupied Bandwidth, Conducted Spurious Emission, Peak Power Spectral Density
Note: None			

Table 18: Description of Test Configuration used for Radiated Measurement.

Device	Antenna	Mode	Setup Description
5268AC	Attached	Transmit & Receive	Tabletop. 5268AC positioned horizontally.
5268AC	Attached	Transmit & Receive	Tabletop. 5268AC positioned vertically.
Note: Test configuration was used in the preliminary testing.			

Table 19: Final Test Mode for 2400 MHz to 2483.5 MHz Band

Test	802.11b	802.11g	802.11n HT20	802.11n HT40
Occupied Bandwidth	2412, 2437, 2462 MHz @ 1Mbps	2412, 2437, 2462 MHz @ 6Mbps	2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps	2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps
Output Power	2412, 2437, 2462 MHz @ 1Mbps	2412, 2437, 2462 MHz @ 6Mbps	2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps	2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps 2 Streams – 27Mbps
Peak Power Spectral Density	2412, 2437, 2462 MHz @ 1Mbps	2412, 2437, 2462 MHz @ 6Mbps	2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps	2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps 2 Streams – 27Mbps
Out-of-Band (-30 dBr)	2412, 2437, 2462 MHz @ 1Mbps	2412, 2437, 2462 MHz @ 6Mbps	2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps	2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps
Band-Edge (Radiated)	2412, 2417, 2457, 2462 MHz @ 1Mbps	2412, 2417, 2457, 2462 MHz @ 6Mbps	2412, 2417, 2457, 2462 MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps	2422, 2437, 2452 MHz @ 1 Stream – 13.5Mbps 2 Streams – 27Mbps
Transmitted Spurious Emission	2412, 2437, 2462 MHz @ 1Mbps	2412, 2437, 2462 MHz @ 6Mbps	2412, 2437, 2462 MHz @ 1 Stream – 6.5Mbps 2 Streams – 13Mbps	2422, 2437, 2457 MHz @ 1 Stream – 13.5Mbps 2 Streams – 27Mbps
AC Conducted Emission	2437 MHz @ 1Mbps			

Note: 1. All tests were pre-scanned for worst case before final testing.
2. All radiated emission performed on Y-Axis.

6.4 Test Specifications

Testing requirements

Table 20: Test Specifications

Emissions and Immunity	
Standard	**Requirement**
CFR 47 Part 15.247:2013	All
RSS-210 Issue 8, 2010	All

END OF REPORT