



Engineering Solutions & Electromagnetic Compatibility Services

**Certification Application Report for  
FCC Part 15.247 & Industry Canada RSS-247**

<b>Test Lab:</b> Rhein Tech Laboratories, Inc.    Tel: 703-689-0368 360 Herndon Parkway                Fax: 703-689-2056 Suite 1400                                www.rheintech.com Herndon, VA 20170 E-Mail: atcbinfo@rheintech.com		<b>Applicant:</b> Owlet Baby Care, Inc.    Tel: (844) 334-5330 32 W Center St Suite 201 Provo, UT 84601 Contact: Zack Bomsta	
<b>FCC ID/IC</b>	2AIEP-OBS1B 21386-OBS1B	<b>Test Report Date</b>	August 23, 2016
<b>Platform</b>	Base Station	<b>RTL Work Order #</b>	2016195
<b>Model</b>	OBS 1.1	<b>RTL Quote #</b>	QRTL16-195A
<b>American National Standard Institute</b>	FCC: ANSI C63.10-2013: American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices		
<b>FCC Classification</b>	DTS – Part 15 Digital Transmission System		
<b>FCC Rule Part(s)/Guidance</b>	FCC Rules Part 15.247: Operation within the bands 920-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz Direct Sequence System (2015)		
<b>Industry Canada</b>	RSS-247 Issue 1: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices RSS-Gen Issue 4: General Requirements for Compliance of Radio Apparatus		
<b>Frequency Range (MHz)</b>	<b>Output Power (W)*</b>	<b>Frequency Tolerance</b>	<b>Emission Designator</b>
2412 – 2462	0.204	N/A	17M9FXD

\* power is peak conducted

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, Industry Canada RSS-247, RSS-Gen, and ANSI C63.10.

Signature: 

Date: August 23, 2016

Typed/Printed Name: Desmond A. Fraser

Position: President

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*These test(s) are accredited under Rhein Tech Laboratories, Inc. ISO/IEC 17025 accreditation issued by ANAB. Refer to certificate and scope of accreditation AT-1445.*

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## 1 General Information

### 1.1 Scope

This is an original FCC and Industry Canada certification application request.

Applicable Standards:

- FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.
- Industry Canada RSS-247: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
- Industry Canada RSS-Gen: General Requirements for Compliance of Radio Apparatus

### 1.2 Description of EUT

<b>Equipment Under Test</b>	Transceiver
<b>Model</b>	OBS 1.1
<b>Power Supply</b>	5 VDC from USB Adapter
<b>Modulation Type</b>	DSSS
<b>Frequency Range</b>	2412 – 2462 MHz
<b>Antenna Type &amp; Gain</b>	Interior Metal Frame

### 1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

### 1.4 Related Submittal(s)/Grant(s)

This is an original certification application for Owlet Baby Care, Inc., Model OBS 1.1 Base Station, FCC ID: 2AIEP-OBS1B, IC: 21386-OBS1B.

### 1.5 Modifications

No modifications were made to the equipment during testing in order to achieve compliance with these standards.

## 2 Test Information

### 2.1 Description of Test Modes

In accordance with FCC 15.31(m), and because the EUT utilizes an operating band greater than 10 MHz, the following frequencies were tested. All modulations were investigated; the test results in this report were determine to be worst-case and are representative of all modulations.

**Table 2-1: Channels Tested**

Channel	Frequency
Low	2412
Middle	2437
High	2462

### 2.2 Exercising the EUT

The EUT was supplied with test firmware programmed with a low, middle, and high channel for testing. The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that information was being transmitted. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

### 2.3 Test Result Summary

**Table 2-2: Test Result Summary – FCC Part 15 Subpart C (Section 15.247); IC RSS-247**

FCC Standard	IC Standard	C63.10-2013	Test	Pass/Fail or N/A
15.247(b)(3)	RSS-247 5.4(4), RSS-Gen 6.12	11.9.1.2	Maximum Peak Power Output	Pass
15.247(d)	RSS-Gen 8.10	11.13	Band Edge Measurement	Pass
15.247(d)	RSS-247 5.5	6.7	Antenna Conducted Spurious Emissions	Pass
15.247(a)(2)	RSS-247 5.2(1)	11.8.2	6 dB Bandwidth	Pass
15.247(e)	RSS-247 5.2(2)	11.10.2	Power Spectral Density	Pass
15.209	RSS-247 5.5, RSS-Gen 6.13	6.5, 6.6, 11.12, 11.13	Radiated Emissions	Pass

## 2.4 Test System Details

The test samples were received on August 19, 2016. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following table.

**Table 2-3: Equipment under Test**

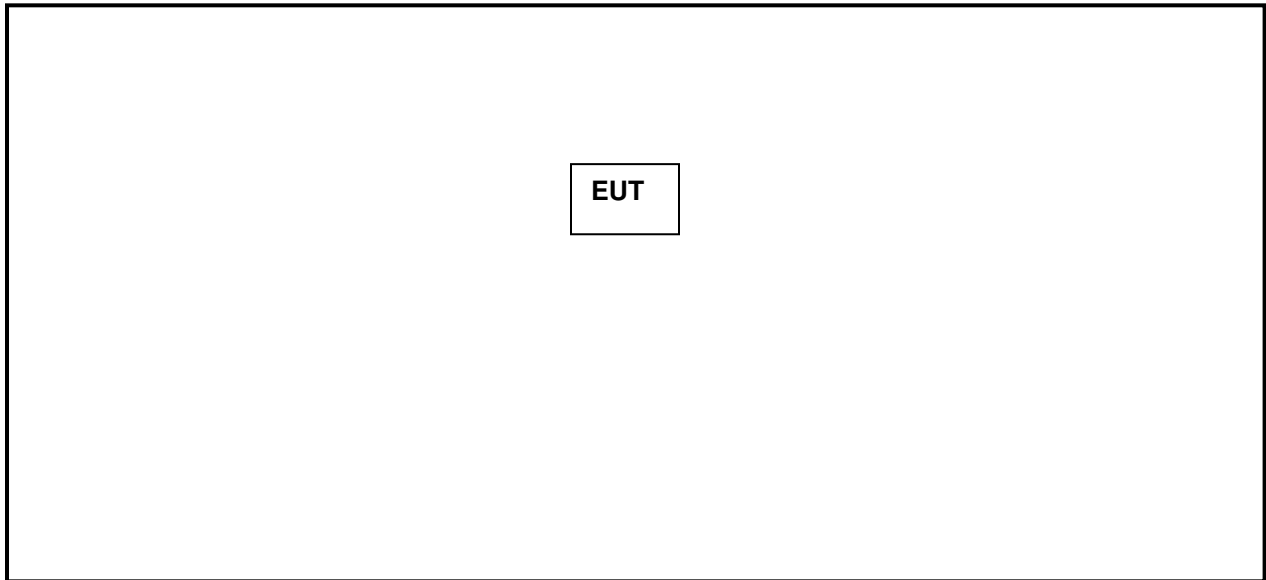
Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Conducted Antenna Base Station Transceiver	Owlet Baby Care, Inc.	OBS 1.1	N/A	2AIEP-OBS1B	1m unshielded USB-A to micro USB-B	21824
Base Station Transceiver	Owlet Baby Care, Inc.	OBS 1.1	N/A	2AIEP-OBS1B	1m unshielded USB-A to micro USB-B	21825
AC Adapter 5.2 VDC	Asus	PA-1070-07	130523	N/A	N/A	21826

Provided modes of operation:

802.11b Rates		802.11g rates		802.11n MCS scheme	
1	1Mbps	6	6Mbps	0	MCS0
2	2Mbps	9	9Mbps	1	MCS1
5.5	5.5Mbps	12	12Mbps	2	MCS2
11	11Mbps	18	18Mbps	3	MCS3
		24	24Mbps	4	MCS4
		36	36Mbps	5	MCS5
		48	48Mbps	6	MCS6
		54	54Mbps	7	MCS7

All modes were investigated and the data presented represents the worst case based on 11 Mbps (802.11b), 48 Mbps (802.11g), and MCS2 (802.11n)

## 2.5 Configuration of Tested System



**Figure 2-1: Configuration of System under Test**



**3 Peak Output Power - 15.247(b)(3); IC RSS-247 5.4(4), RSS-Gen 6.12**

**3.1 Power Output Test Procedure**

A conducted power measurement of the EUT was taken. ANSI C63.10 11.9.1.2 Integrated method.

**Table 3-1: Power Output Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

**3.2 Power Output Test Data**

**Table 3-2: Power Output Test Data - 802.11b (11 mbps)**

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)
Low	2412	22.9
Middle	2437	22.9
High	2462	23.1

**Table 3-3: Power Output Test Data - 802.11g (48 mbps)**

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)
Low	2412	19.6
Middle	2437	18.1
High	2462	18.5

**Table 3-4: Power Output Test Data - 802.11n (MCS2)**

Channel	Frequency (MHz)	Peak Power Conducted Output (dBm)
Low	2412	19.8
Middle	2437	19.5
High	2462	19.6

**Test Personnel:**

Dan Baltzell  
 Test Engineer



Signature

August 20, 2016  
 Date of Test

#### 4 Compliance with the Band Edge – FCC 15.247(d); RSS-247 8.10

##### 4.1 Band Edge Test Procedure

The transmitter output was connected to its appropriate antenna. A conducted antenna port delta measurement was performed from the highest peak in the restricted band to the peak of the fundamental, and subtracted from the radiated field strength; the result was compared to the limit. ANSI C63.10 11.13

**Table 4-1: Band Edge Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/9/18
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter Antenna Mast, Polarizing	Outdoor Range 1	Not Required
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/3/17
901242	Rhein Tech Laboratories	WRT-000-0003	Wood Rotating Table	N/A	Not Required
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

## 4.2 Band Edge Test Results

### 4.2.1 Calculation of Lower Band Edge – 802.11b

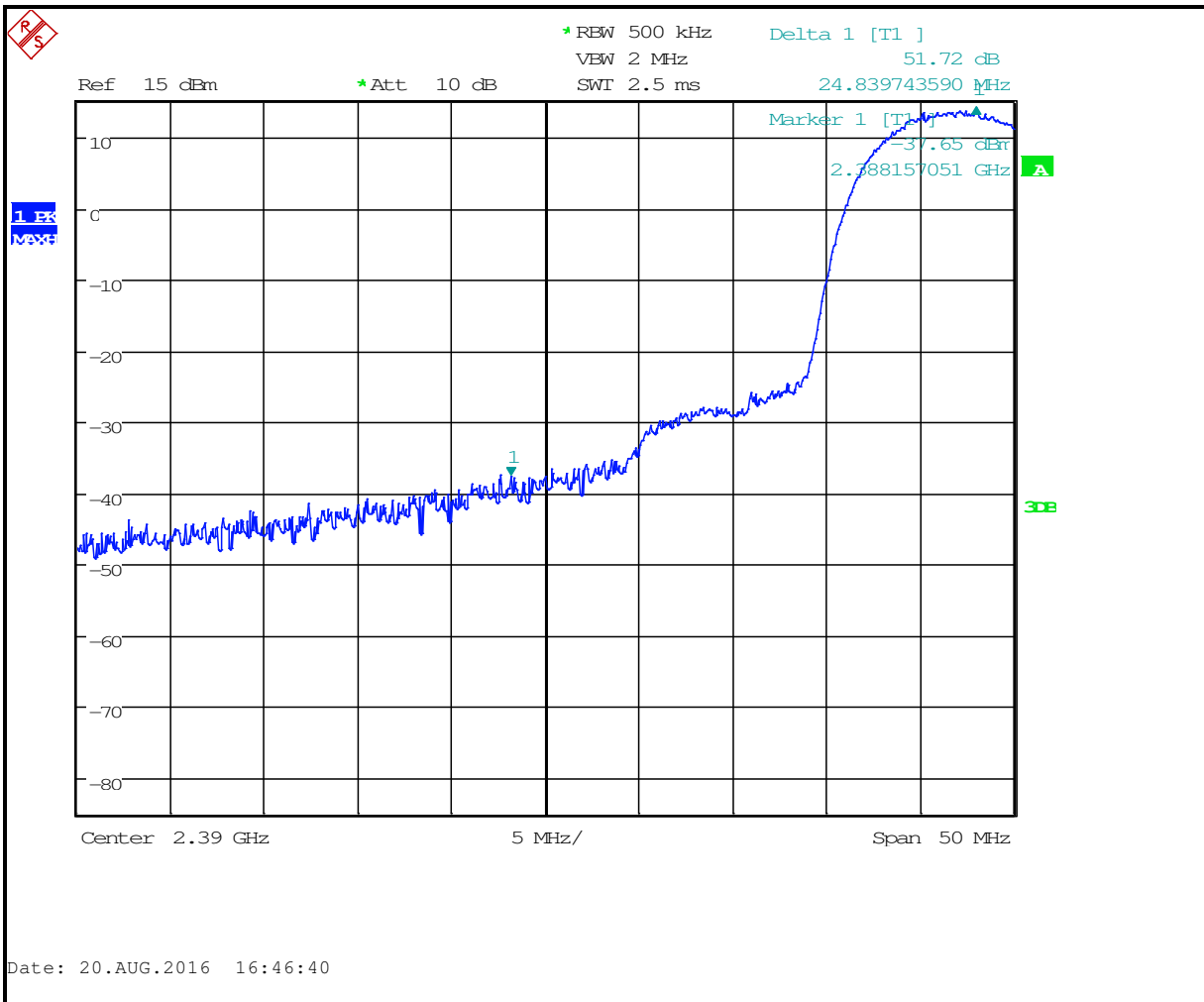
105.2 dBuV/m is the field strength measurement, from which the delta measurement of 51.7 dB is subtracted, resulting in a level of 53.5 dB. This level has a margin of 0.5 dB below the limit of 54 dBuV/m.

Calculation:  $105.2 \text{ dBuV/m} - 51.7 \text{ dB} - 54 \text{ dBuV/m} = -0.5 \text{ dB}$

Peak Field Strength of Lower Band Edge = 109.4 dBuV/m  
 Average Field Strength of Lower Band Edge = 105.2 dBuV/m  
 Delta measurement = 51.7 dB

### 4.2.2 Lower Band Edge – Conducted Delta Plot – 802.11b

Plot 4-1: Lower Band Edge – 802.11b



#### 4.2.3 Calculation of Upper Band Edge – 802.11b

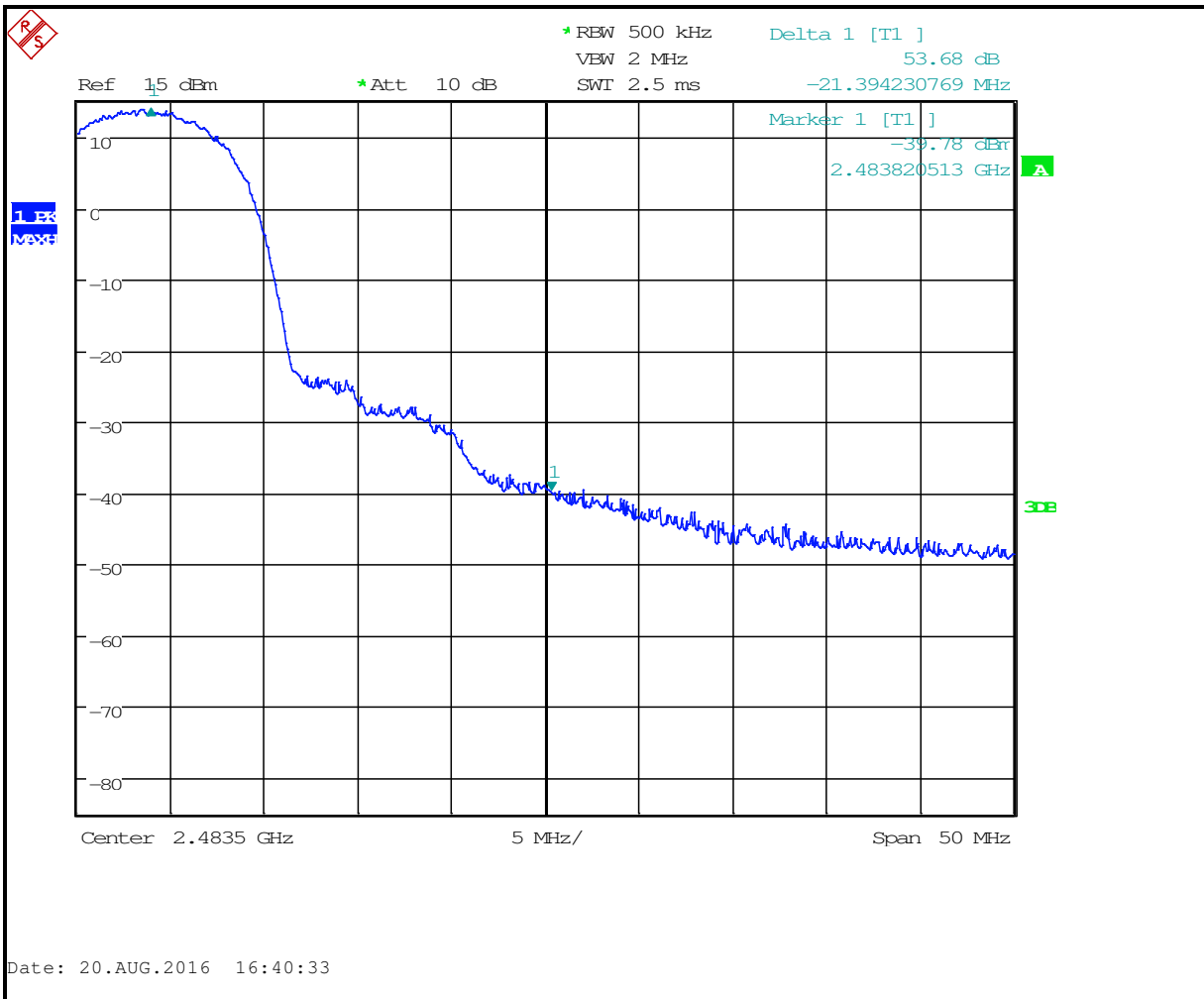
105.8 dBuV/m is the field strength measurement, from which the delta measurement of 53.7 dB is subtracted, resulting in a level of 52.1 dB. This level has a margin of 1.9 dB below the limit of 54 dBuV/m.

Calculation:  $105.8 \text{ dBuV/m} - 53.7 \text{ dB} - 54 \text{ dBuV/m} = -1.9 \text{ dB}$

Peak Field Strength of Lower Band Edge = 108.9 dBuV/m  
 Average Field Strength of Lower Band Edge = 105.8 dBuV/m  
 Delta measurement = 53.7 dB

#### 4.2.4 Upper Band Edge – Conducted Delta Plot – 802.11b

Plot 4-2: Upper Band Edge - 802.11b



#### 4.2.5 Calculation of Lower Band Edge – 802.11g

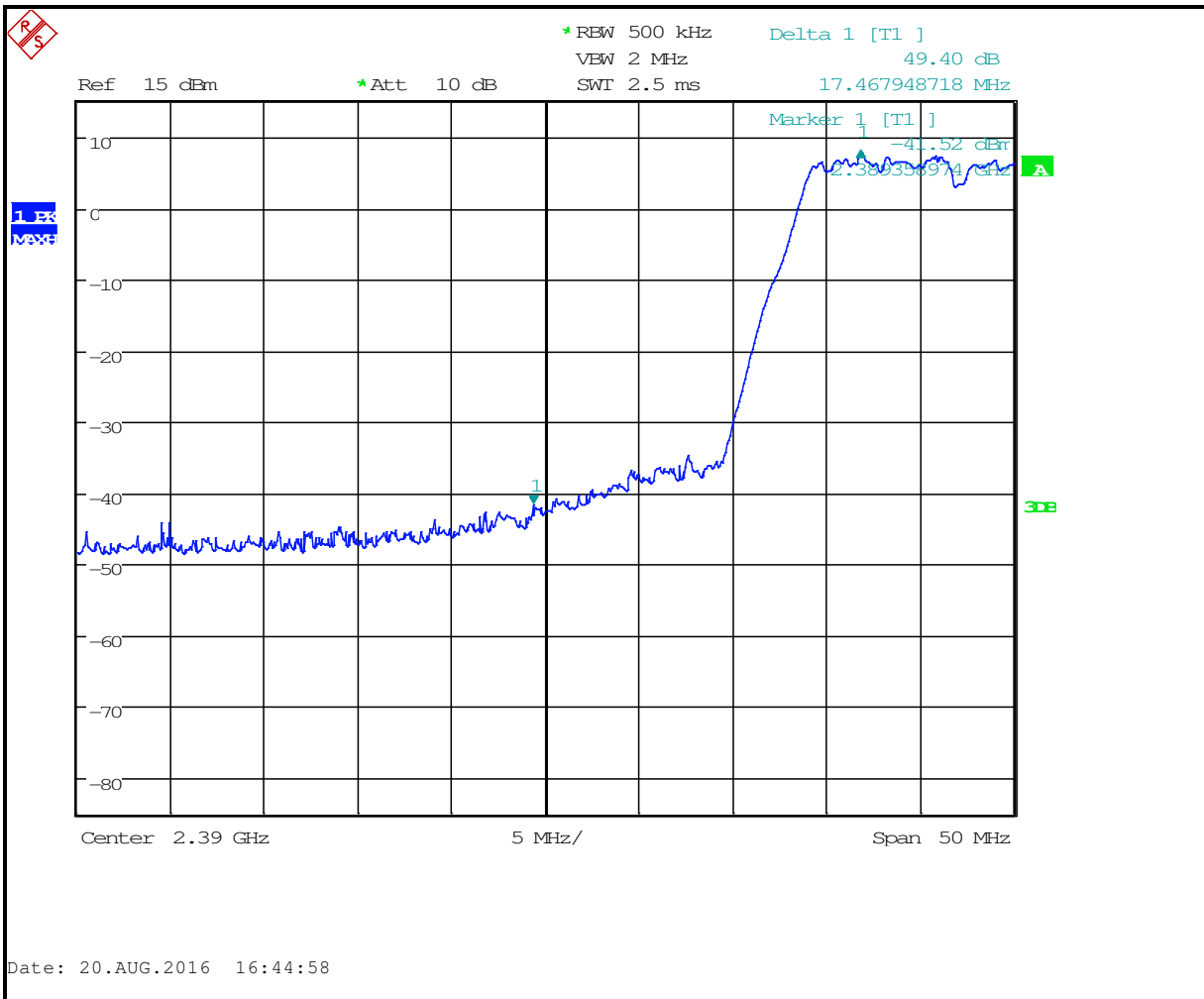
96.9 dBuV/m is the field strength measurement, from which the delta measurement of 49.4 dB is subtracted, resulting in a level of 47.5 dB. This level has a margin of 6.5 dB below the limit of 54 dBuV/m.

Calculation:  $96.9 \text{ dBuV/m} - 49.4 \text{ dB} - 54 \text{ dBuV/m} = -6.5 \text{ dB}$

Peak Field Strength of Lower Band Edge = 103.2 dBuV/m  
 Average Field Strength of Lower Band Edge = 96.9 dBuV/m  
 Delta measurement = 49.4 dB

#### 4.2.6 Lower Band Edge – Conducted Delta Plot – 802.11g

Plot 4-3: Lower Band Edge – 802.11g



#### 4.2.7 Calculation of Upper Band Edge – 802.11g

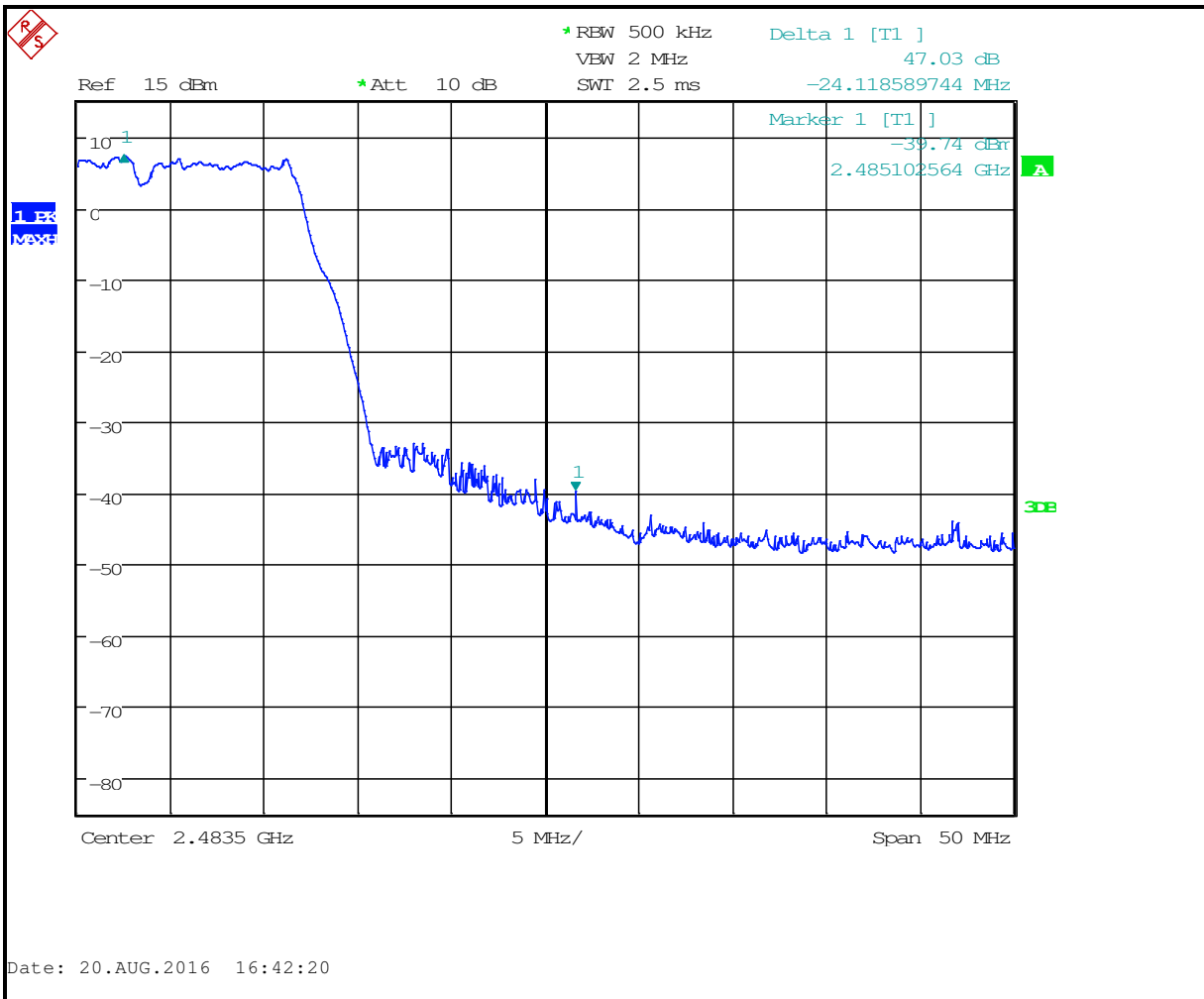
97.5 dBuV/m is the field strength measurement, from which the delta measurement of 47.0 dB is subtracted, resulting in a level of 50.5 dB. This level has a margin of 3.5 dB below the limit of 54 dBuV/m.

Calculation:  $97.5 \text{ dBuV/m} - 47.0 \text{ dB} - 54 \text{ dBuV/m} = -3.5 \text{ dB}$

Peak Field Strength of Lower Band Edge = 102.6 dBuV/m  
 Average Field Strength of Lower Band Edge = 97.5 dBuV/m  
 Delta measurement = 47.0 dB

#### 4.2.8 Upper Band Edge – Conducted Delta Plot – 802.11g

Plot 4-4: Upper Band Edge - 802.11g



#### 4.2.9 Calculation of Lower Band Edge – 802.11n

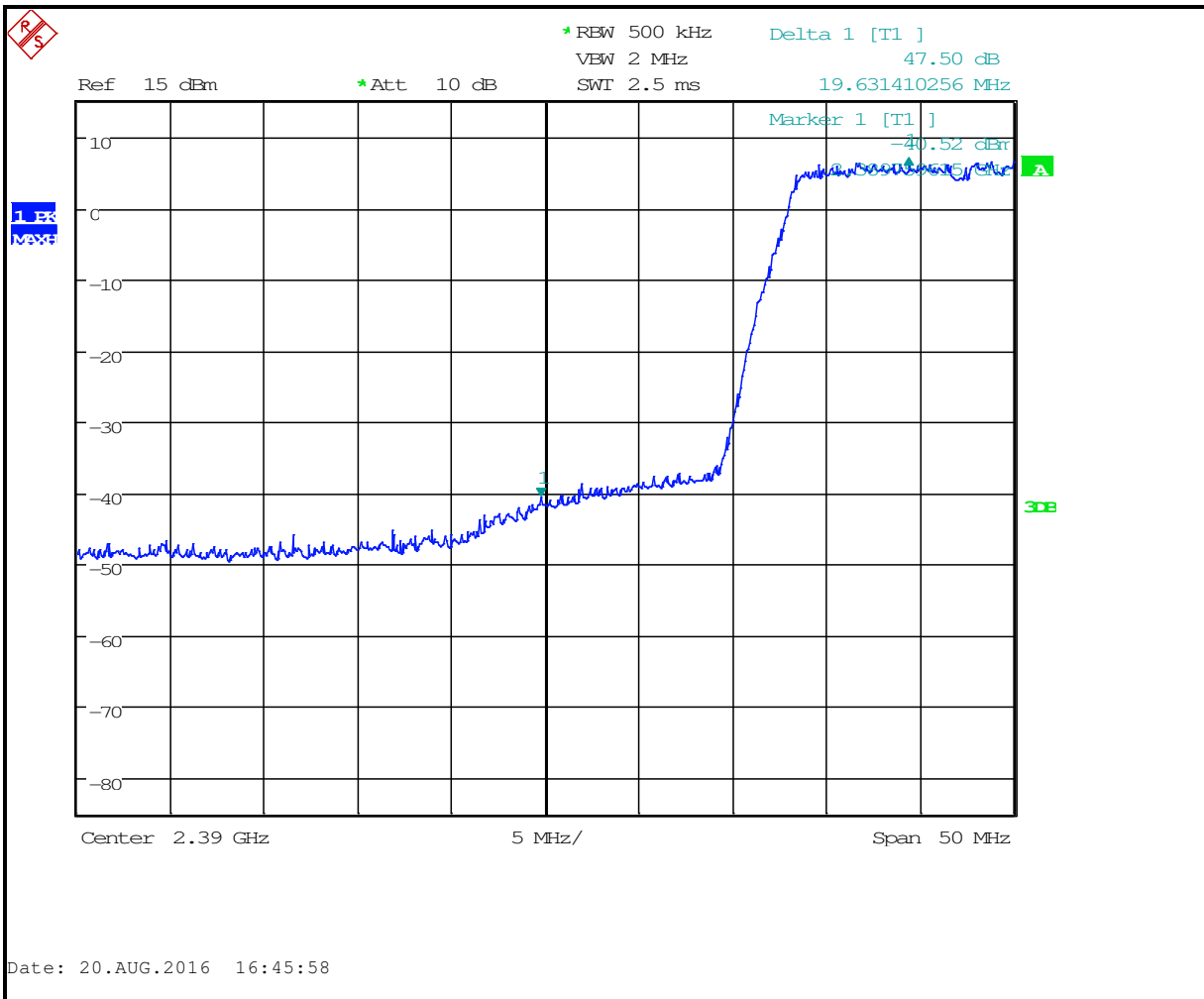
95.5 dBuV/m is the field strength measurement, from which the delta measurement of 47.5 dB is subtracted, resulting in a level of 48.0 dB. This level has a margin of 6.0 dB below the limit of 54 dBuV/m.

Calculation:  $95.5 \text{ dBuV/m} - 47.5 \text{ dB} - 54 \text{ dBuV/m} = -6.0 \text{ dB}$

Peak Field Strength of Lower Band Edge = 100.6 dBuV/m  
Average Field Strength of Lower Band Edge = 95.5 dBuV/m  
Delta measurement = 47.5 dB

#### 4.2.10 Lower Band Edge – Conducted Delta Plot – 802.11n

Plot 4-5: Lower Band Edge – 802.11n



#### 4.2.11 Calculation of Upper Band Edge – 802.11n

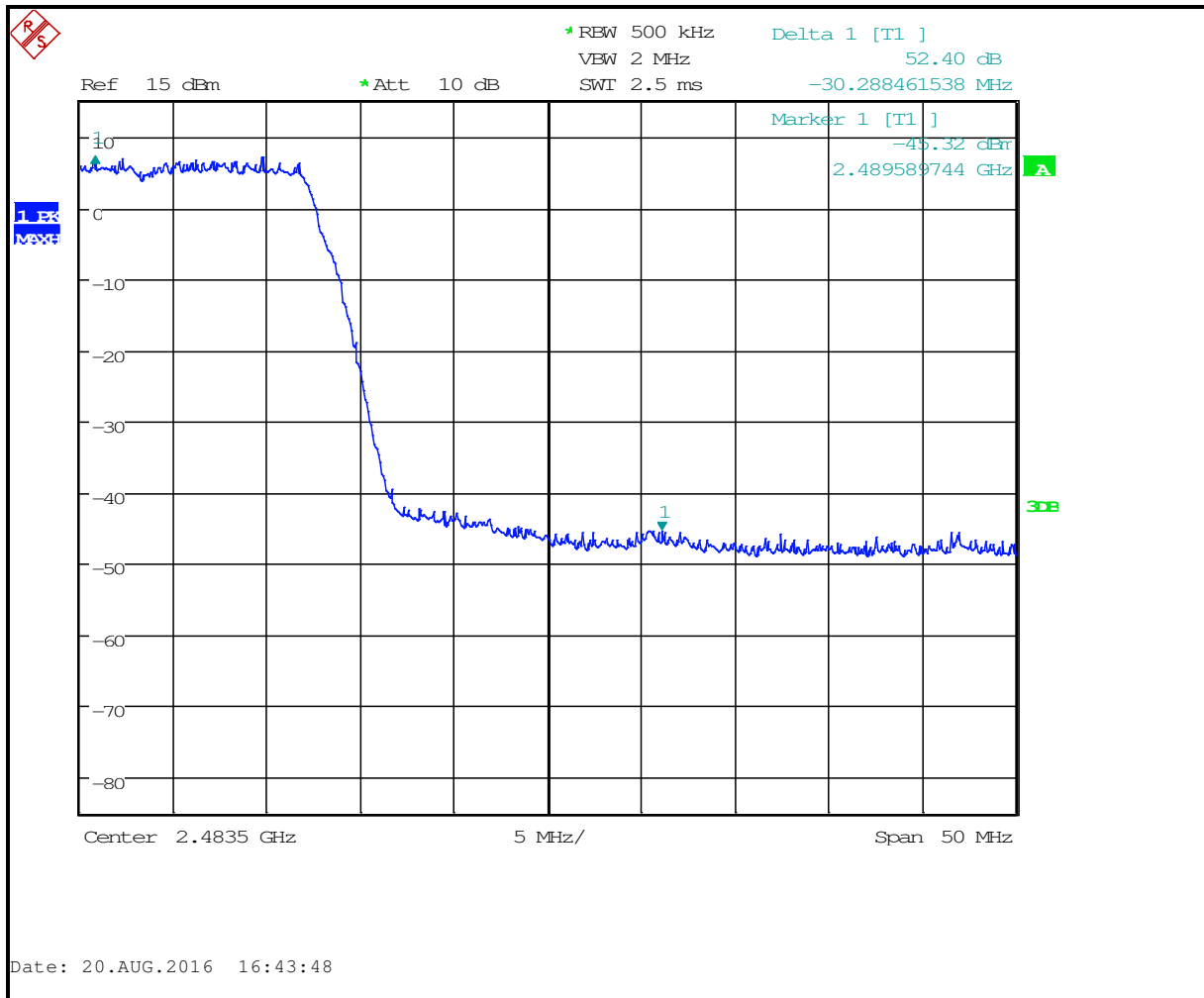
96.2 dBuV/m is the field strength measurement, from which the delta measurement of 52.4 dB is subtracted, resulting in a level of 43.8 dB. This level has a margin of 10.2 dB below the limit of 54 dBuV/m.

Calculation:  $96.2 \text{ dBuV/m} - 52.4 \text{ dB} - 54 \text{ dBuV/m} = -10.2 \text{ dB}$

Peak Field Strength of Lower Band Edge = 102.7 dBuV/m  
 Average Field Strength of Lower Band Edge = 96.2 dBuV/m  
 Delta measurement = 52.4 dB

#### 4.2.12 Upper Band Edge – Conducted Delta Plot – 802.11n

Plot 4-6: Upper Band Edge - 802.11n



#### Test Personnel:

Dan Baltzell  
 Test Engineer

Signature

August 20-21, 2016  
 Date of Test



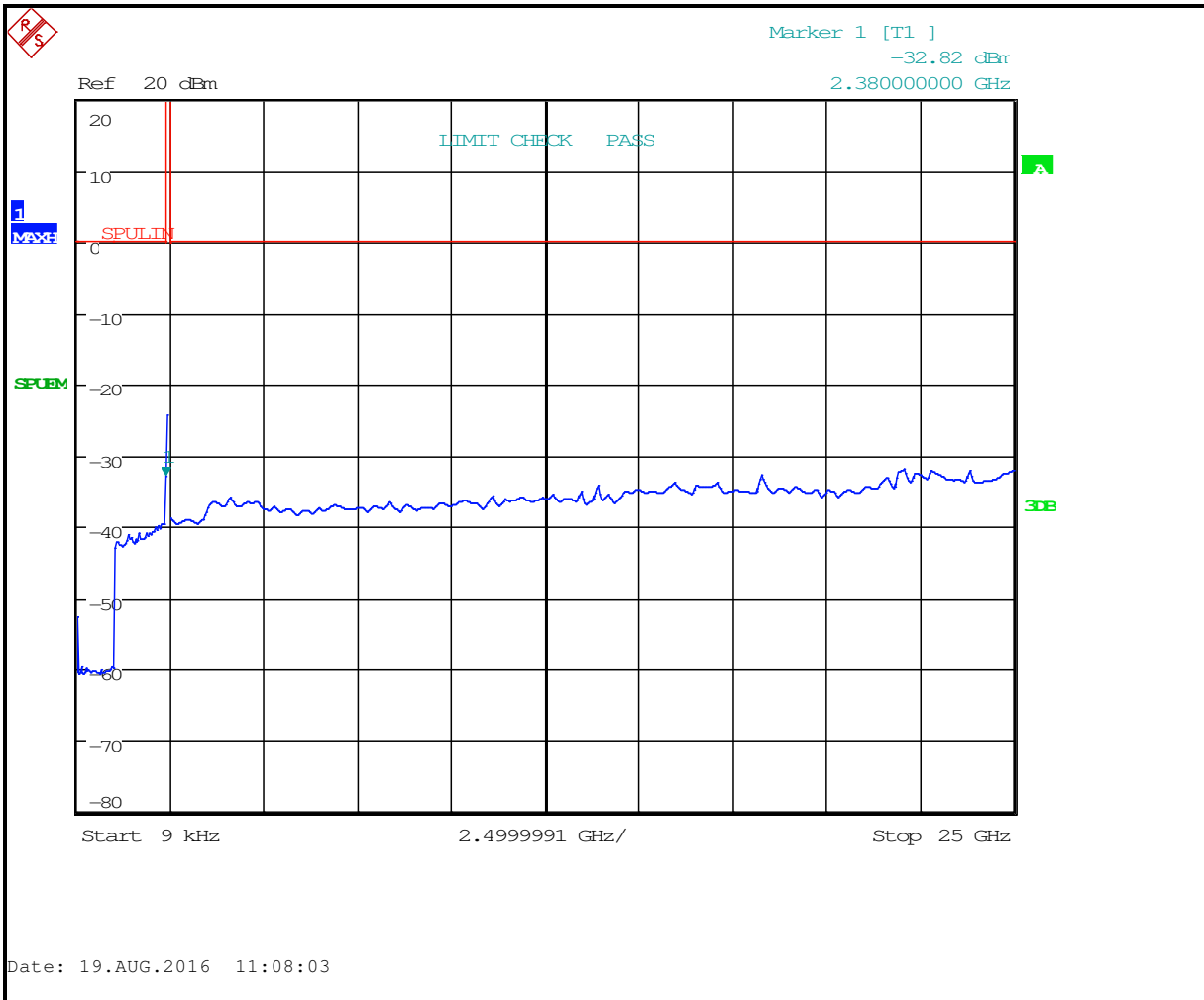
## 5 Antenna Conducted Spurious Emissions - 15.247(d); RSS-247 5.5

### 5.1 Antenna Conducted Spurious Emissions Test Procedures

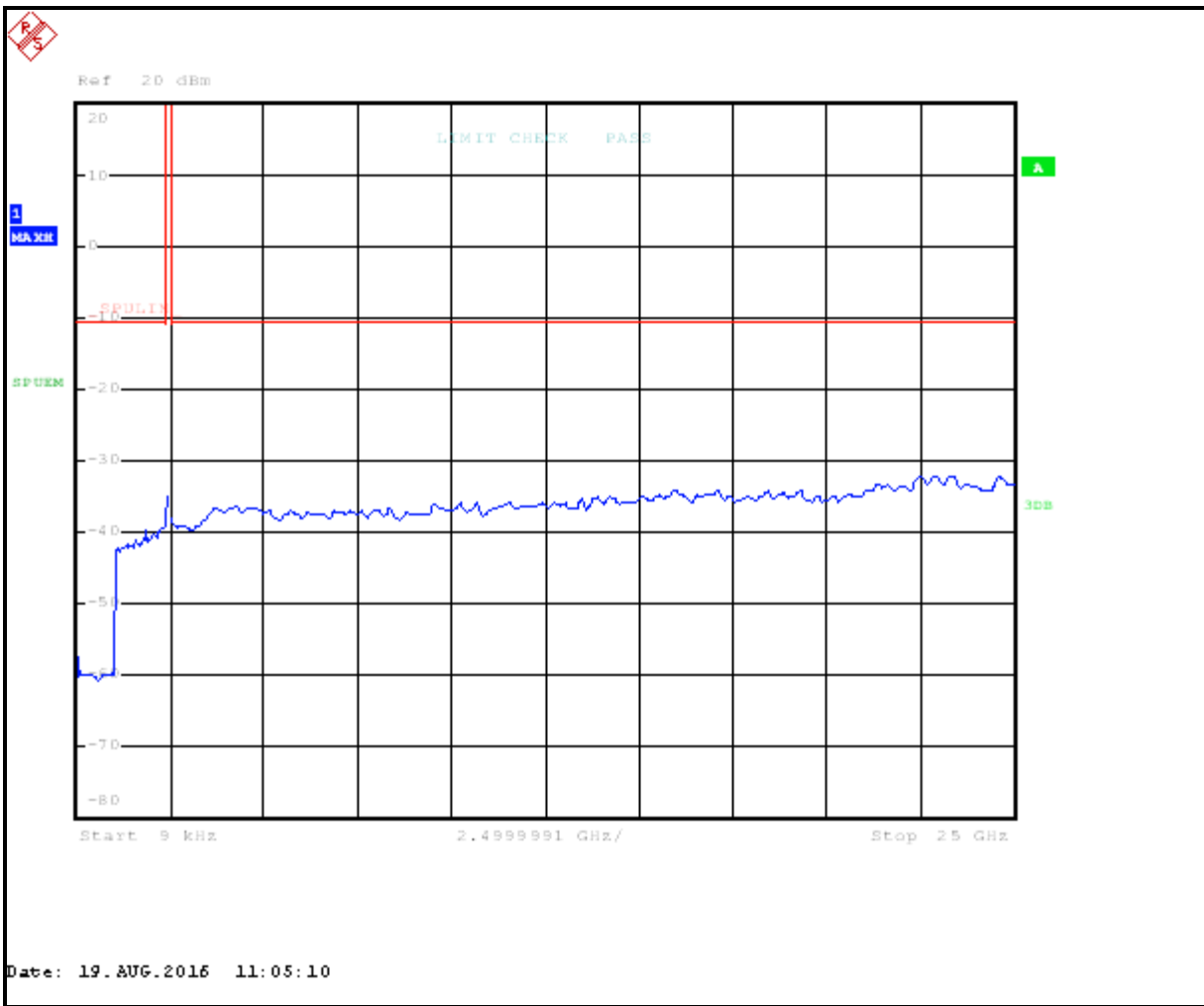
Antenna spurious emissions per FCC 15.247(d) and C63.10-2013 6.7 was measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The modulated carrier was identified at the following frequencies: 2412 MHz, 2437 MHz and 2462 MHz.

### 5.2 Antenna Conducted Spurious Emissions Data

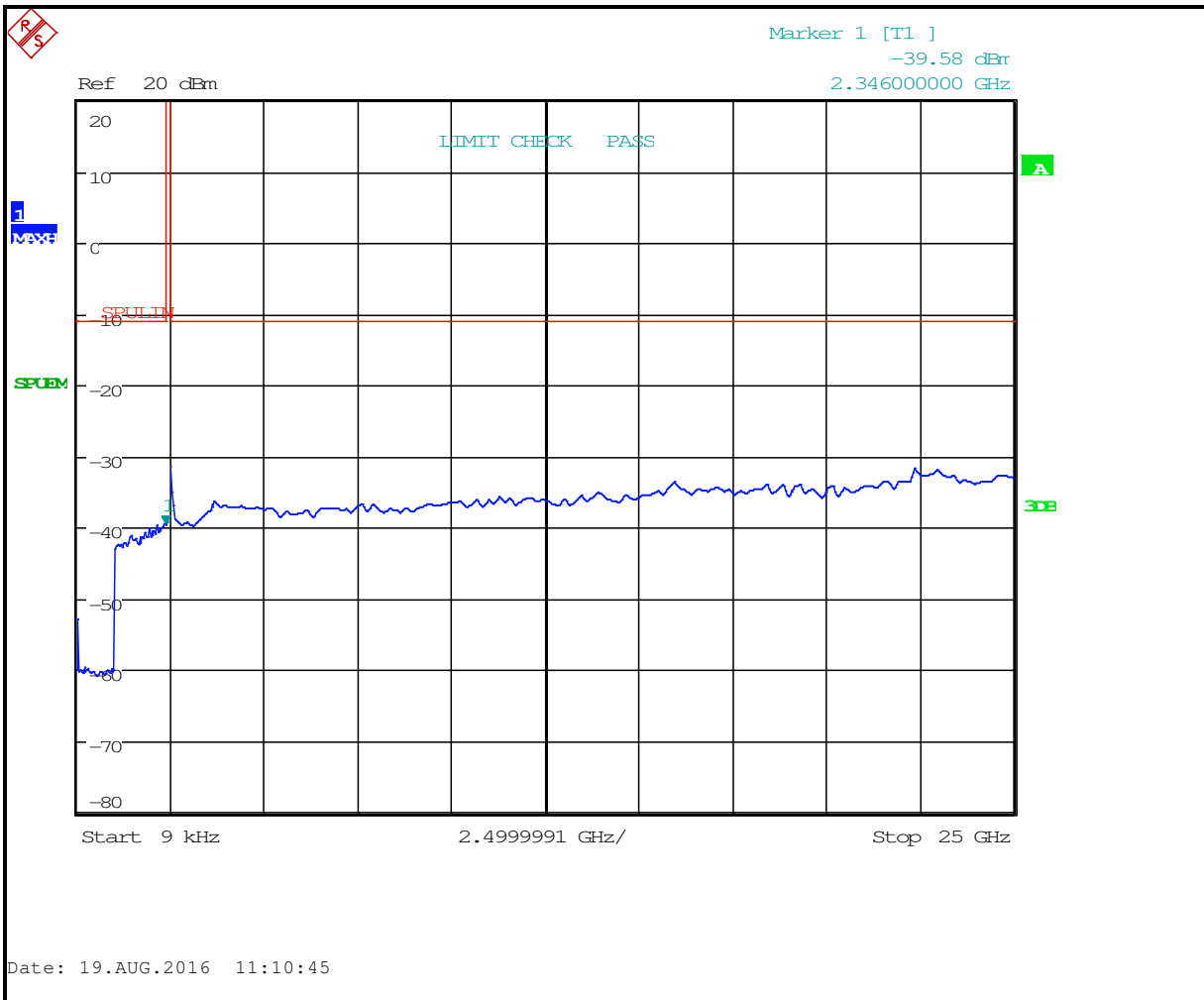
Plot 5-1: Out of Band Antenna Conducted Spurious Emissions – 2412 MHz - 802.11b



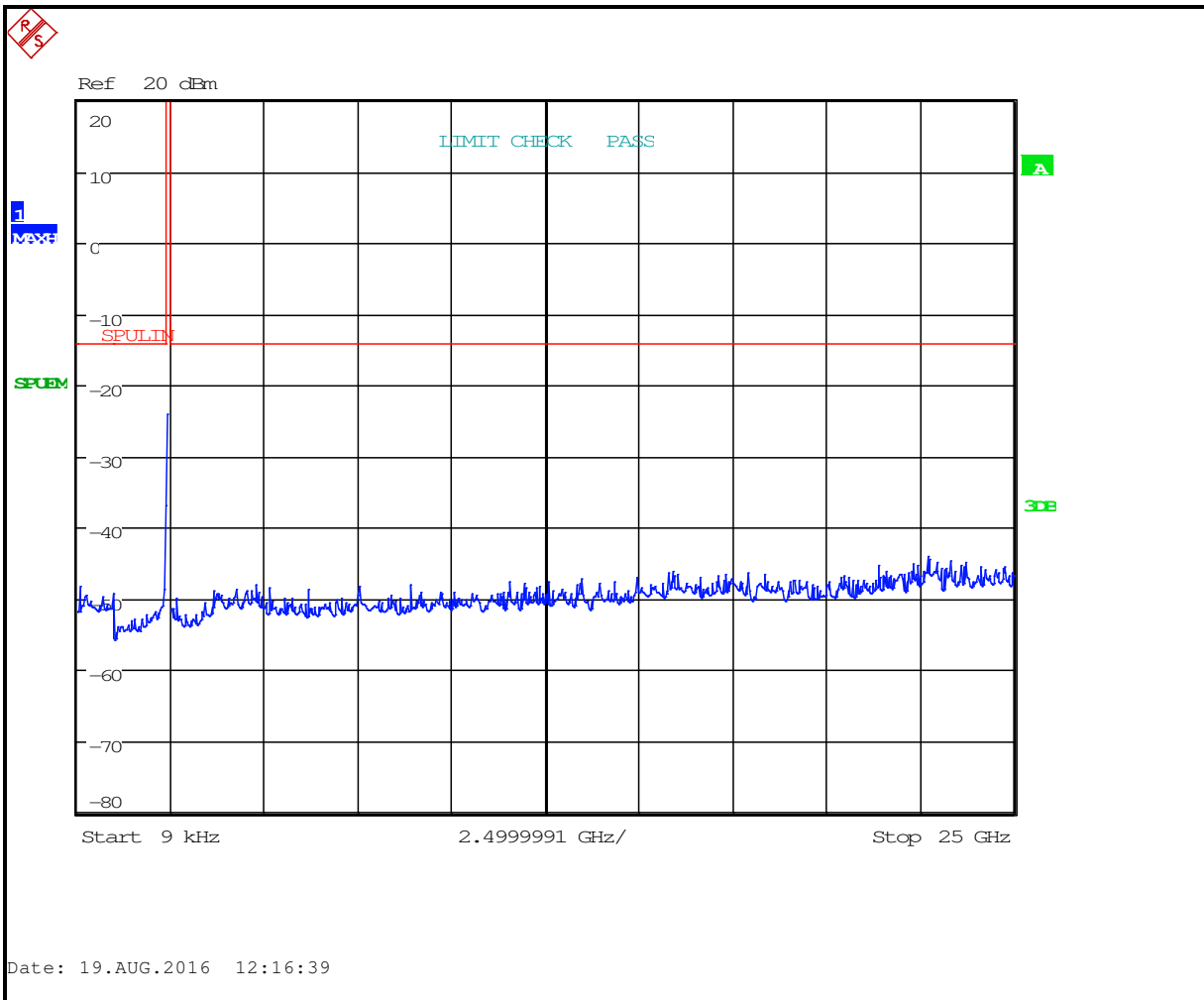
**Plot 5-2: Out of Band Antenna Conducted Spurious Emissions – 2437 MHz - 802.11b**



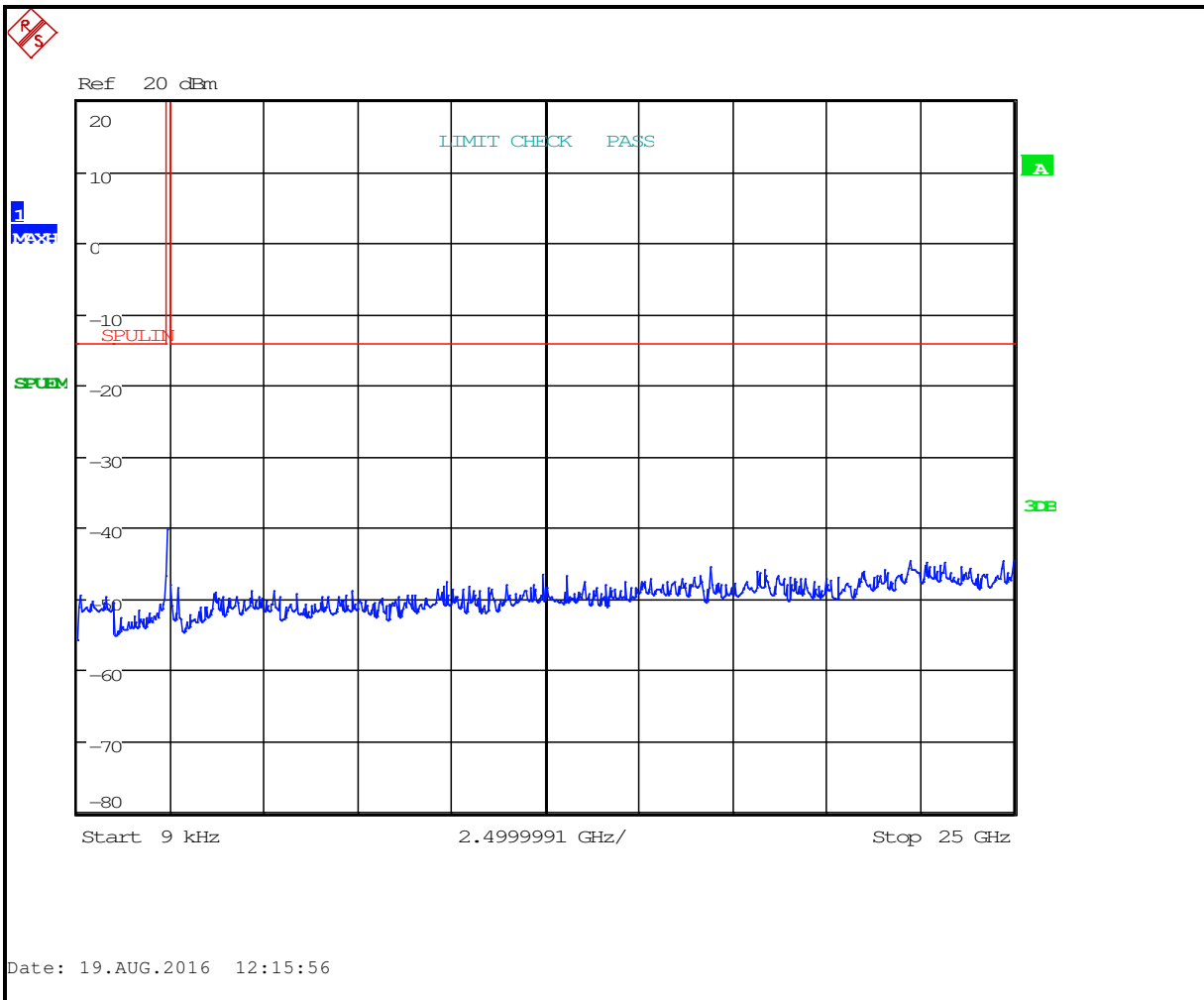
**Plot 5-3: Out of Band Antenna Conducted Spurious Emissions – 2462 MHz - 802.11b**



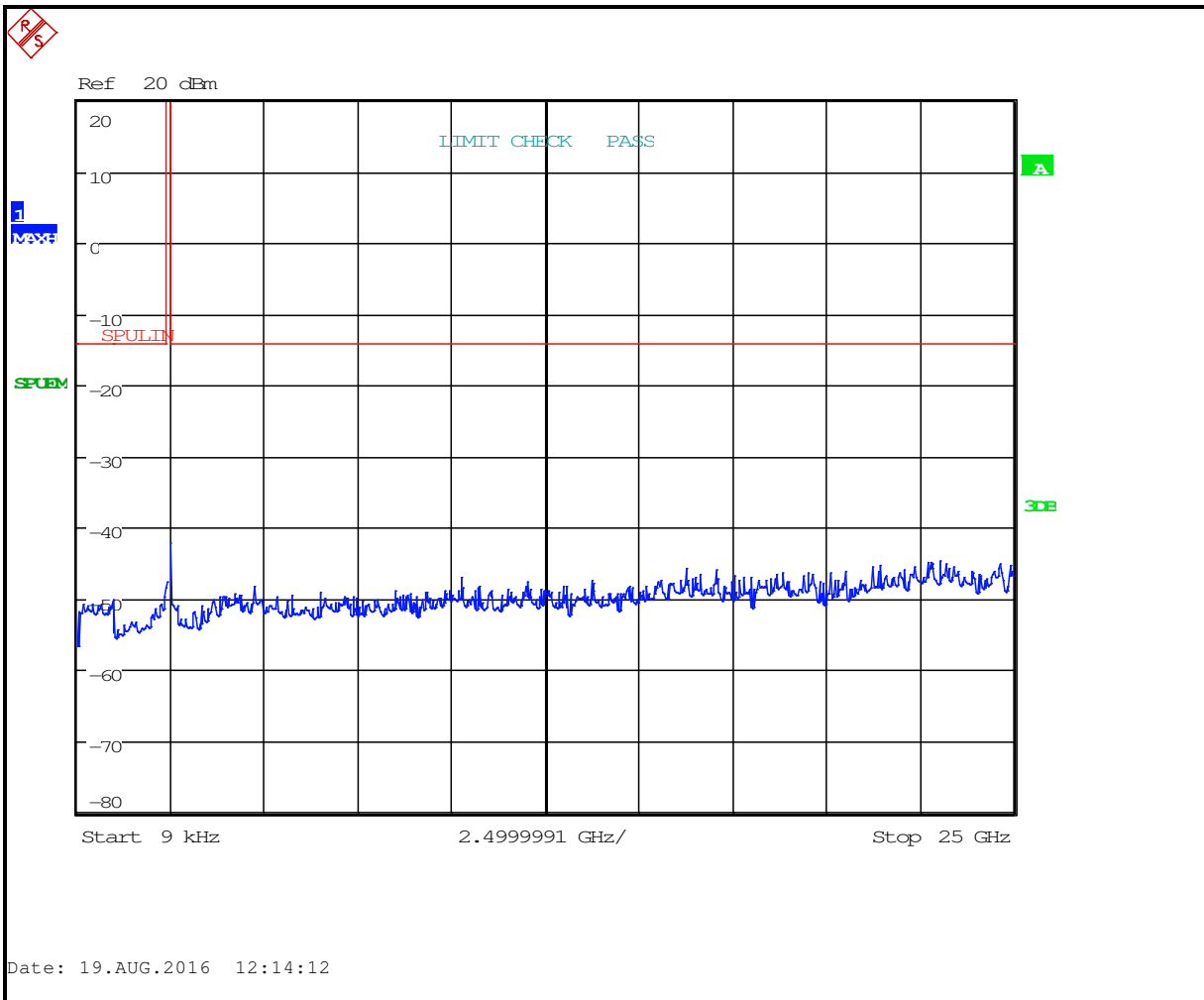
**Plot 5-4: Out of Band Antenna Conducted Spurious Emissions – 2412 MHz - 802.11g**



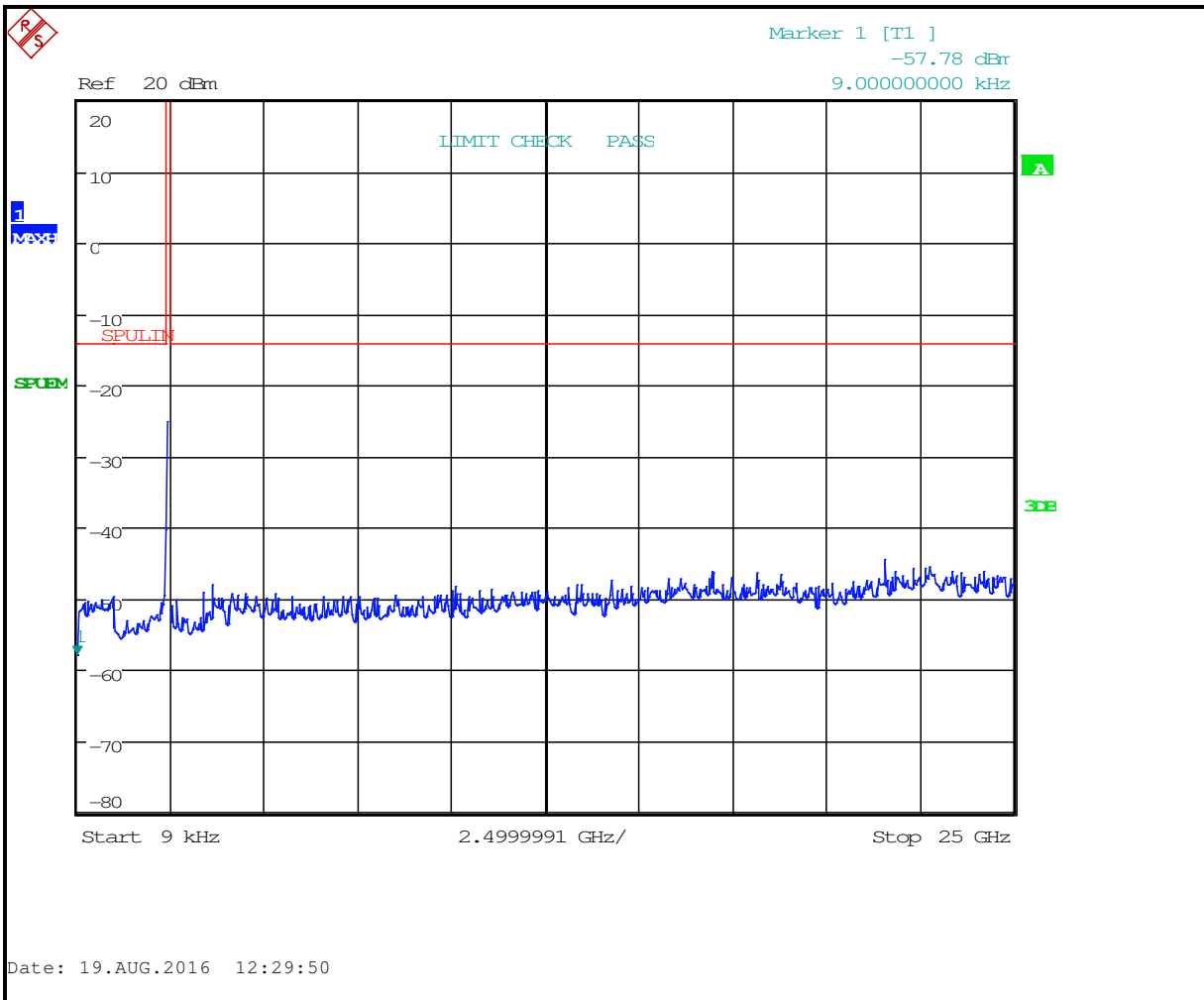
**Plot 5-5: Out of Band Antenna Conducted Spurious Emissions – 2437 MHz - 802.11g**



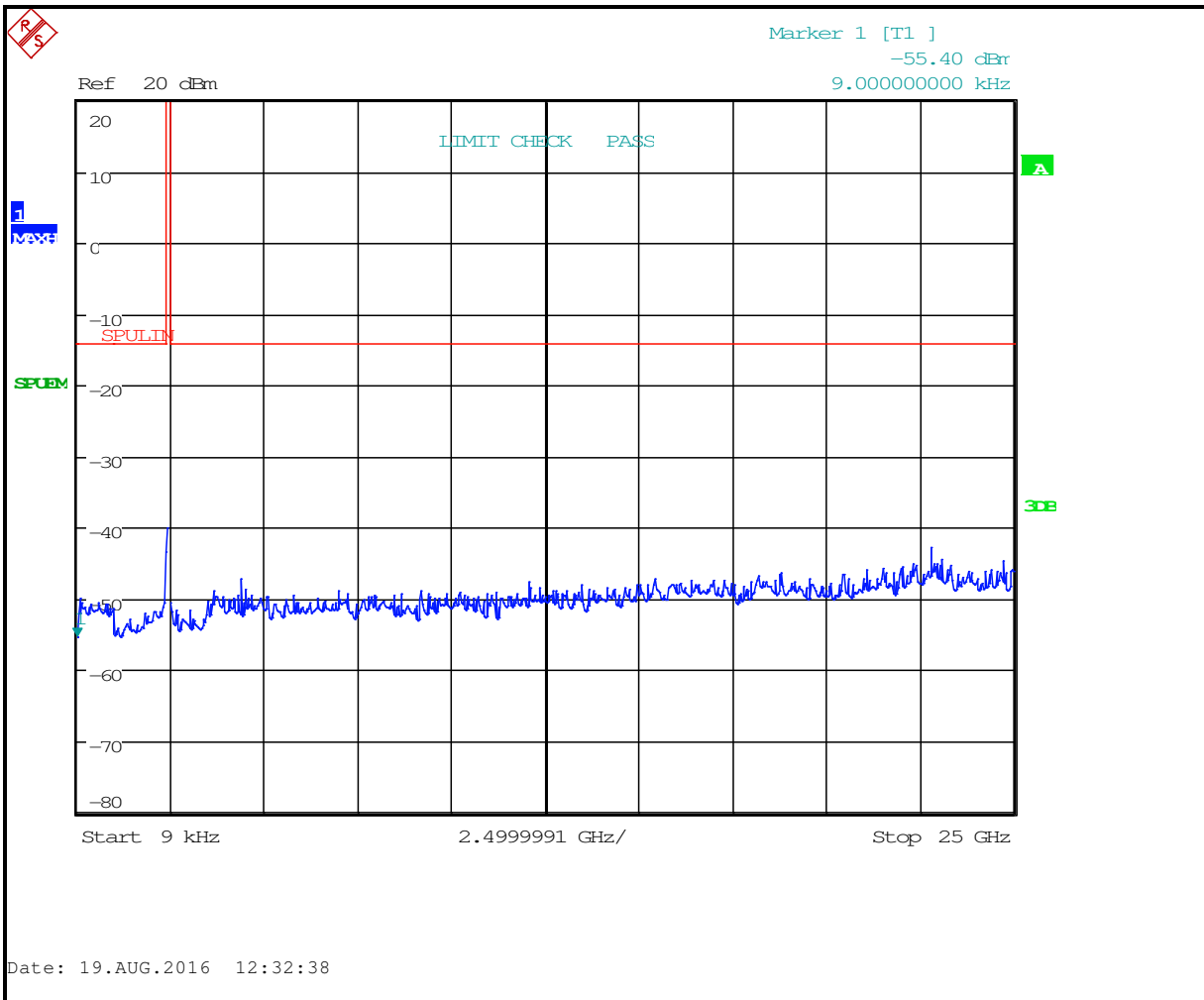
**Plot 5-6: Out of Band Antenna Conducted Spurious Emissions – 2462 MHz - 802.11g**



**Plot 5-7: Out of Band Antenna Conducted Spurious Emissions – 2412 MHz- 802.11n**

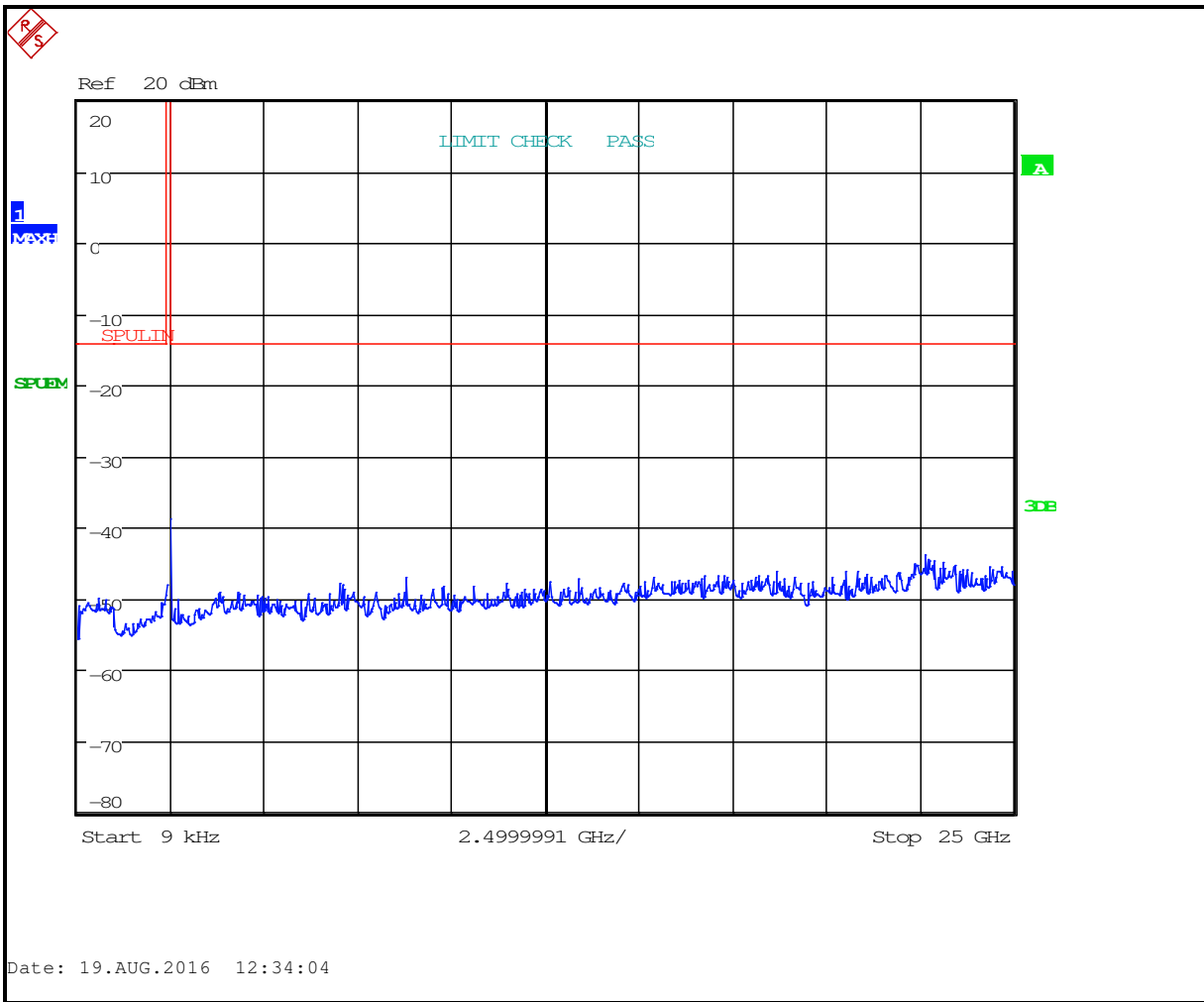


**Plot 5-8: Out of Band Antenna Conducted Spurious Emissions – 2437 MHz - 802.11n**





**Plot 5-9: Out of Band Antenna Conducted Spurious Emissions – 2462 MHz - 802.11n**



**Table 5-1: Antenna Conducted Spurious Emissions Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

**Test Personnel:**

Dan Baltzell  
 Test Engineer

Signature

August 19, 2016  
 Date of Test

**6 6 dB Bandwidth - 15.247(a)(2); RSS-247 5.2(1)**

**6.1 6 dB Bandwidth Test Procedure – Minimum 6 dB Bandwidth**

The minimum 6 dB bandwidths per FCC 15.247(a)(2) were measured using a 50 ohm spectrum analyzer. The device was modulated. The minimum 6 dB bandwidths are presented below. ANSI C63.10 11.8.2

**Table 6-1: 6 dB Bandwidth Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

**6.2 6 dB Bandwidth Test Results**

**Table 6-2: 6 dB Bandwidth Test Data – 802.11b**

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/Fail
2412	8.7	0.5	Pass
2437	8.8	0.5	Pass
2462	8.7	0.5	Pass

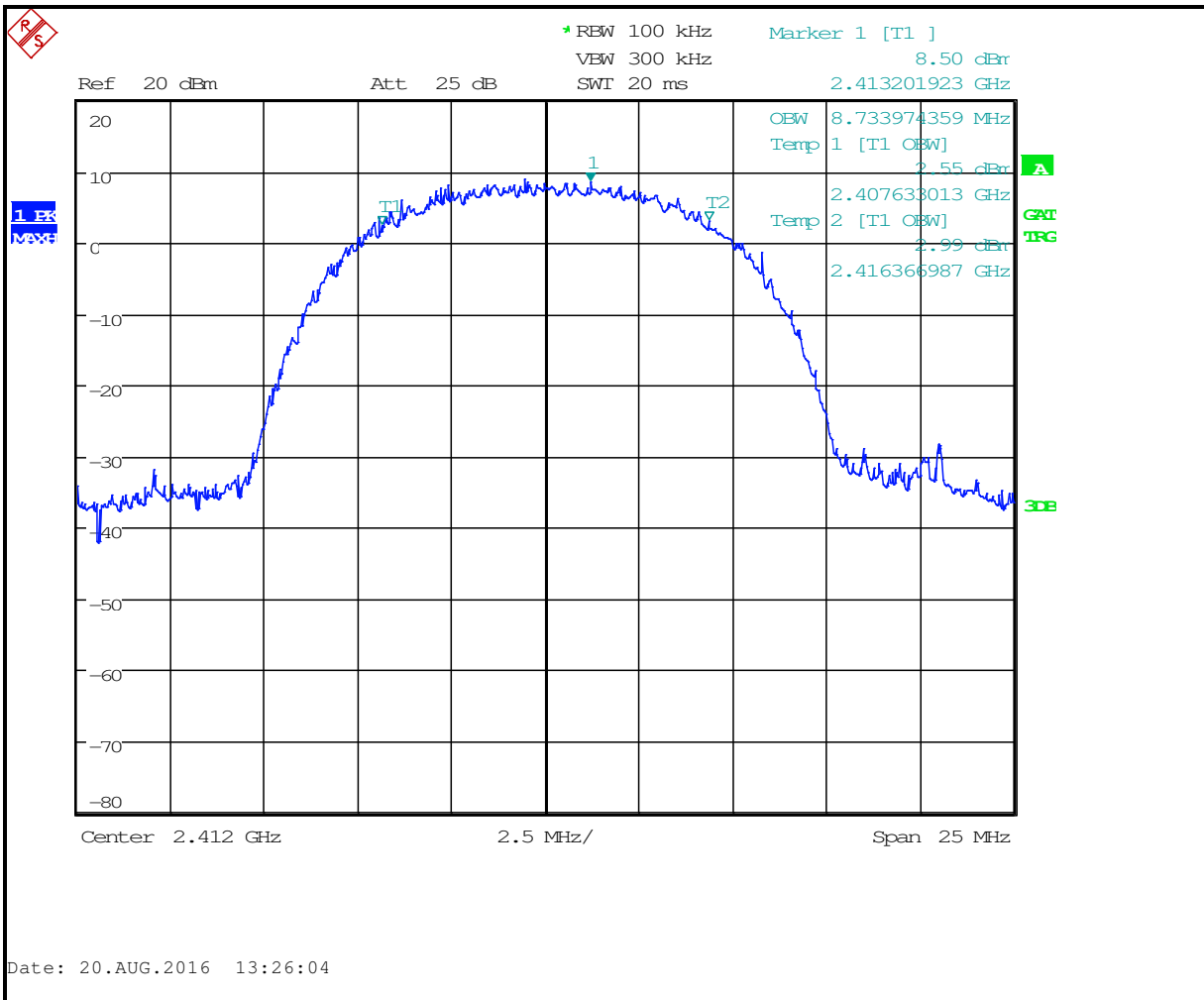
**Table 6-3: 6 dB Bandwidth Test Data – 802.11g**

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/Fail
2412	16.5	0.5	Pass
2437	16.5	0.5	Pass
2462	16.5	0.5	Pass

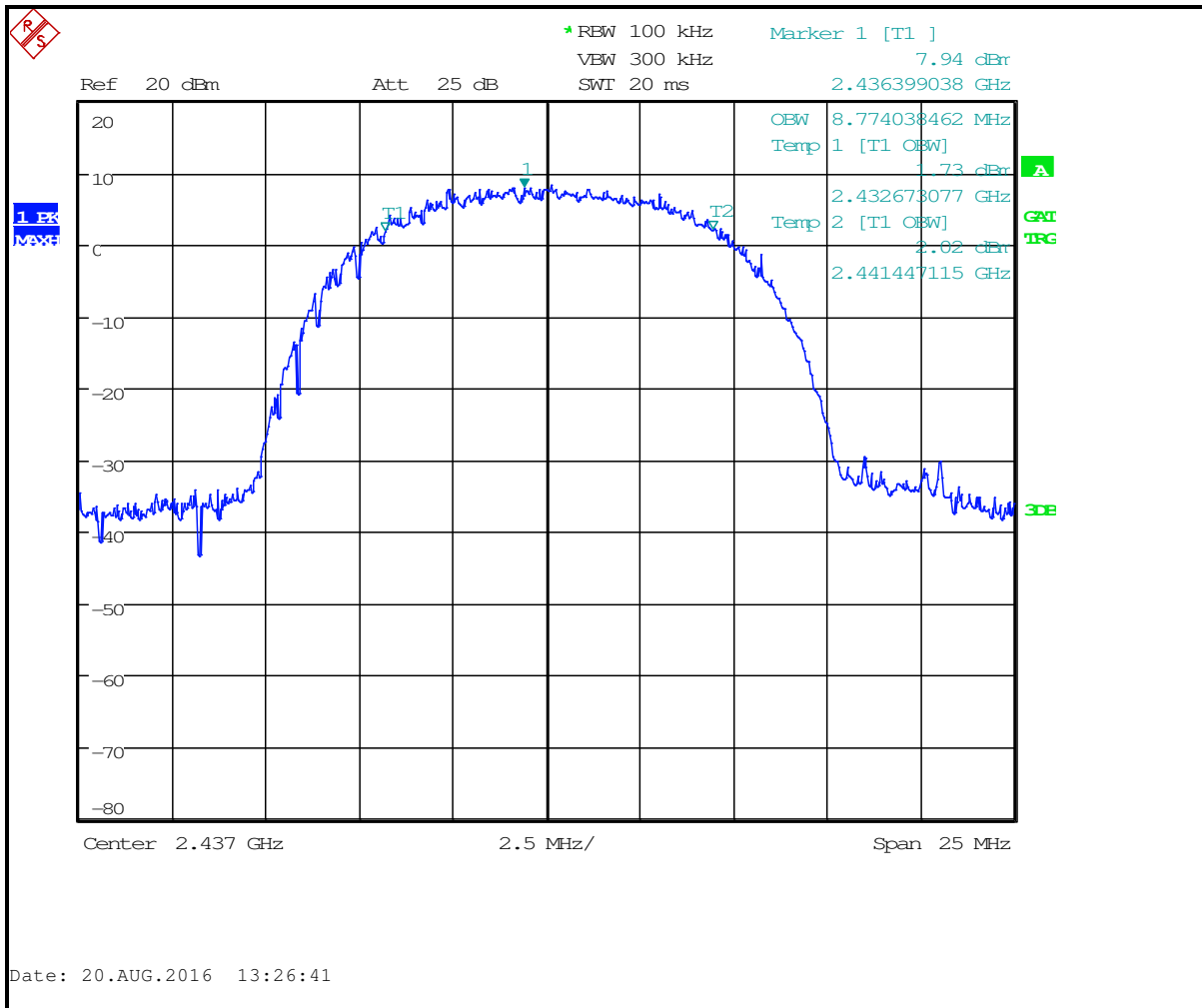
**Table 6-4: 6 dB Bandwidth Test Data – 802.11n**

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/Fail
2412	17.9	0.5	Pass
2437	17.9	0.5	Pass
2462	17.9	0.5	Pass

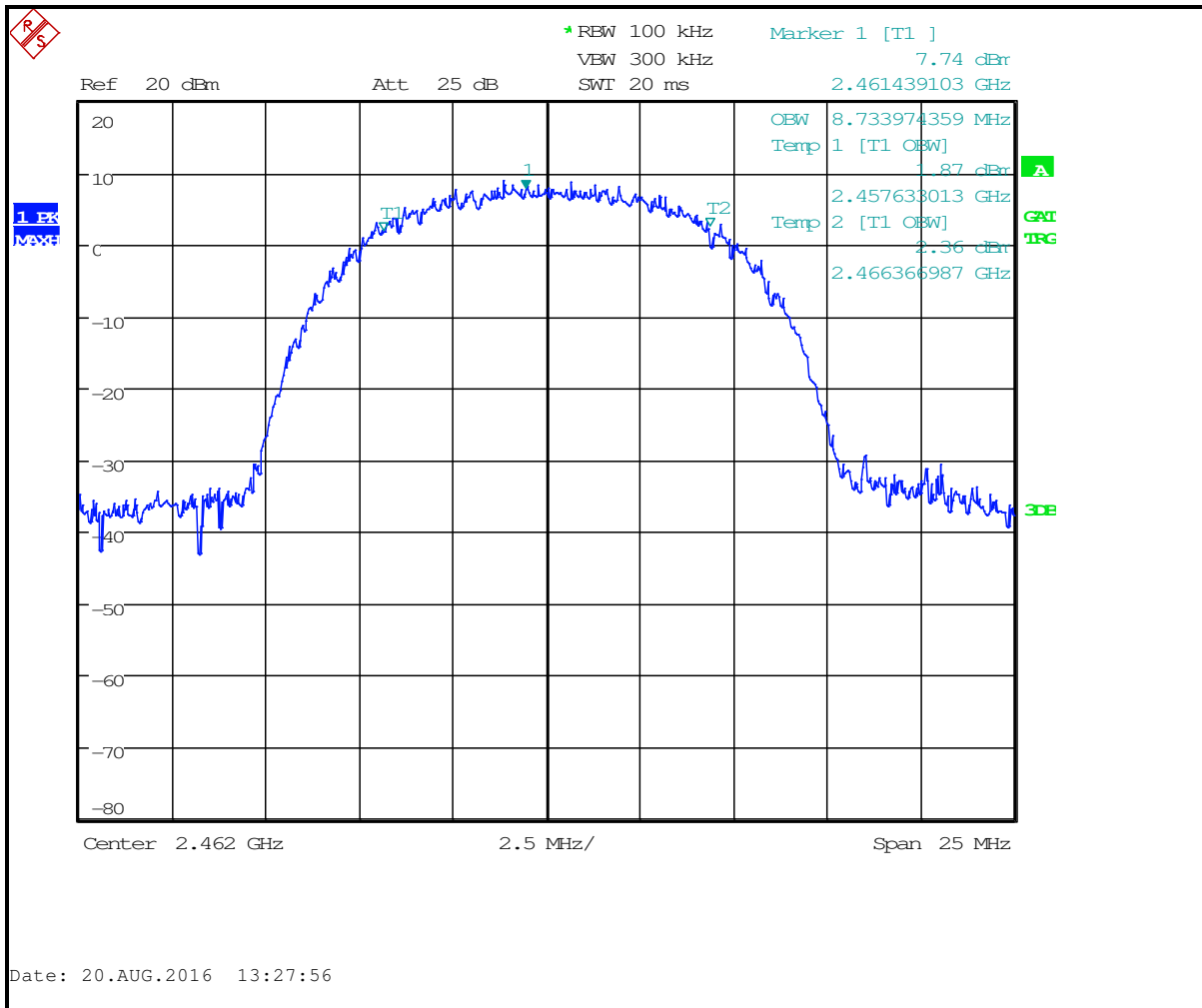
**Plot 6-1: 6 dB Bandwidth – 2412 MHz - 802.11b**



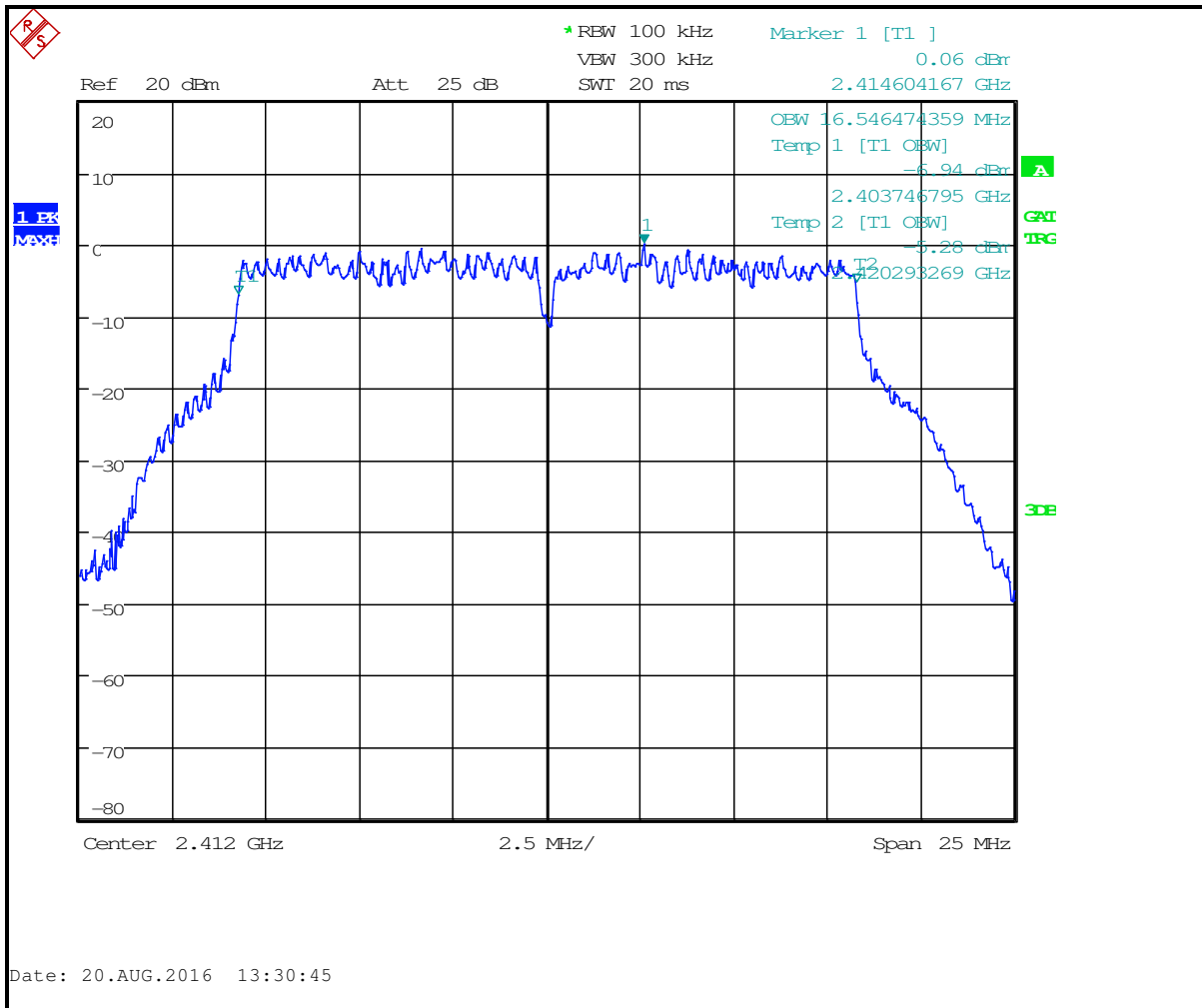
**Plot 6-2: 6 dB Bandwidth – 2437 MHz - 802.11b**



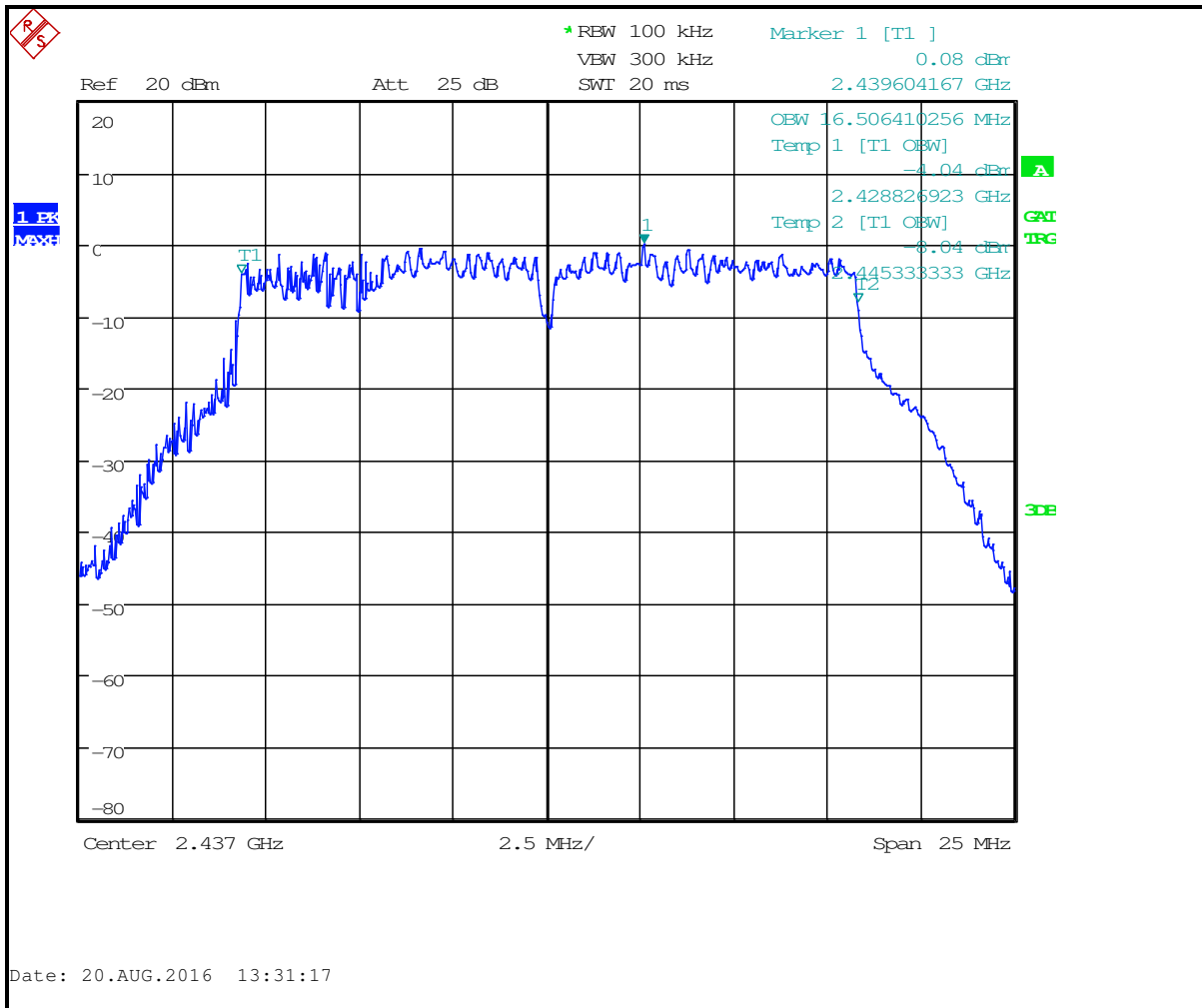
**Plot 6-3: 6 dB Bandwidth – 2462 MHz - 802.11b**



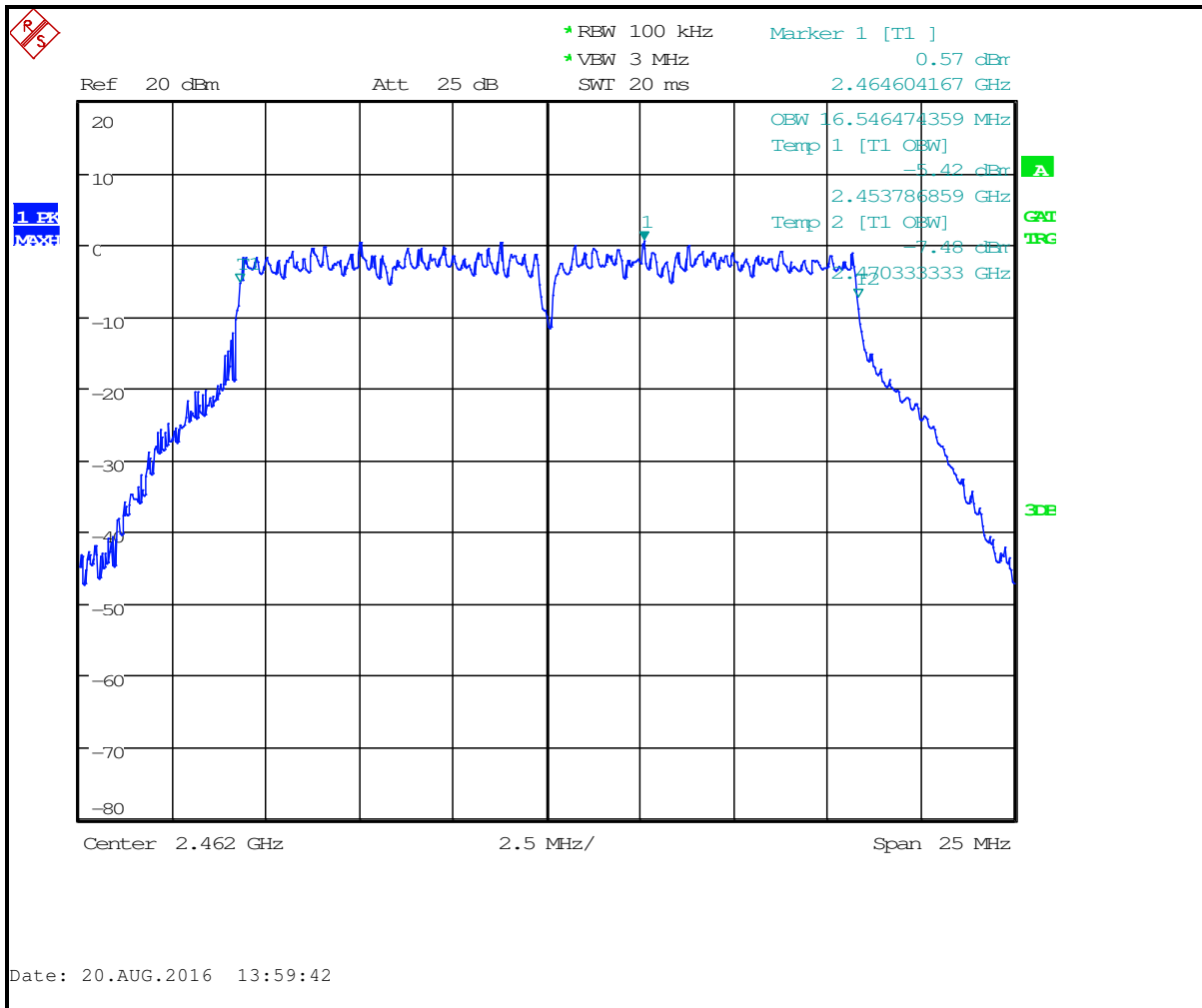
**Plot 6-4: 6 dB Bandwidth – 2412 MHz - 802.11g**



**Plot 6-5: 6 dB Bandwidth – 2437 MHz - 802.11g**

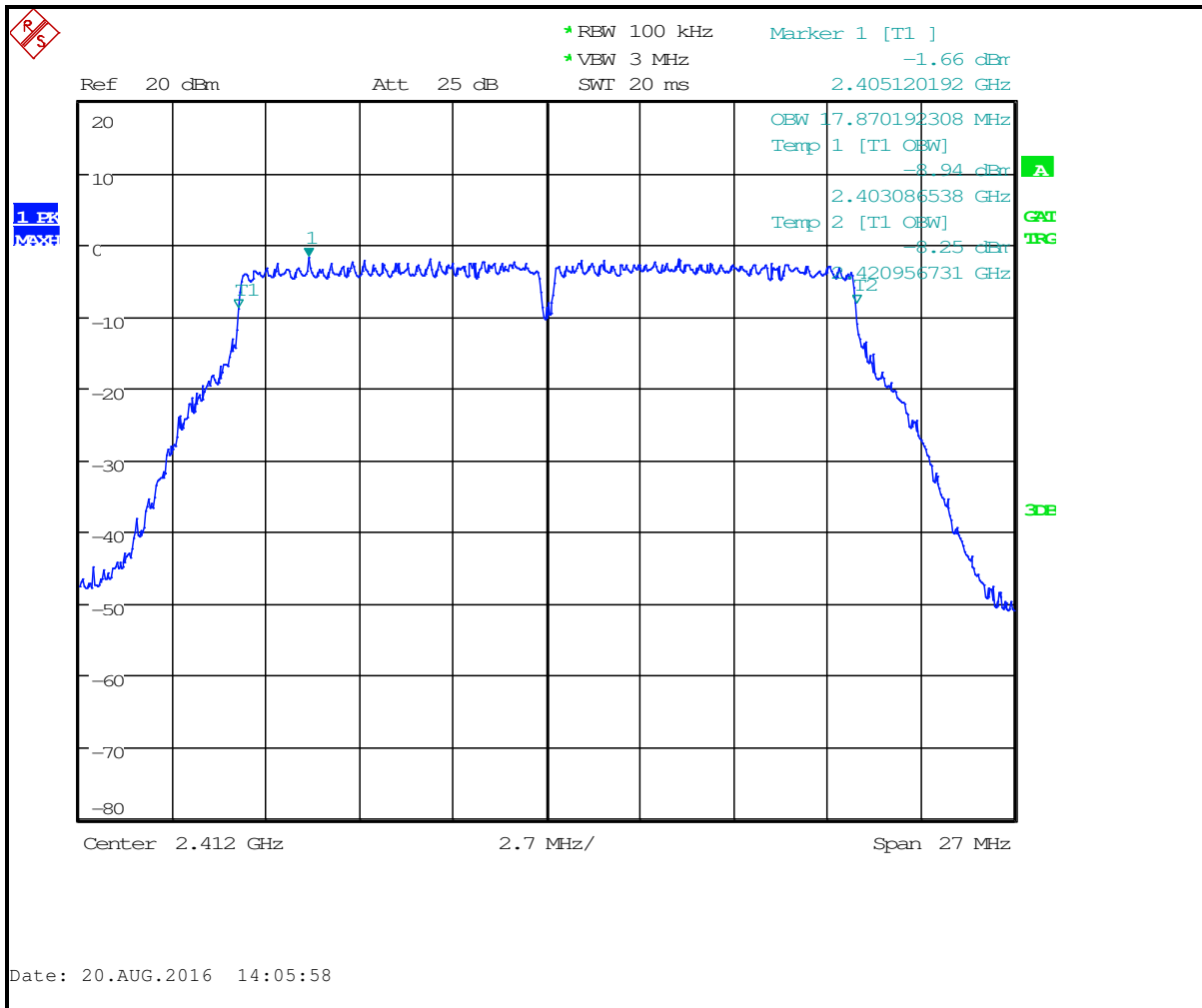


**Plot 6-6: 6 dB Bandwidth – 2462 MHz - 802.11g**

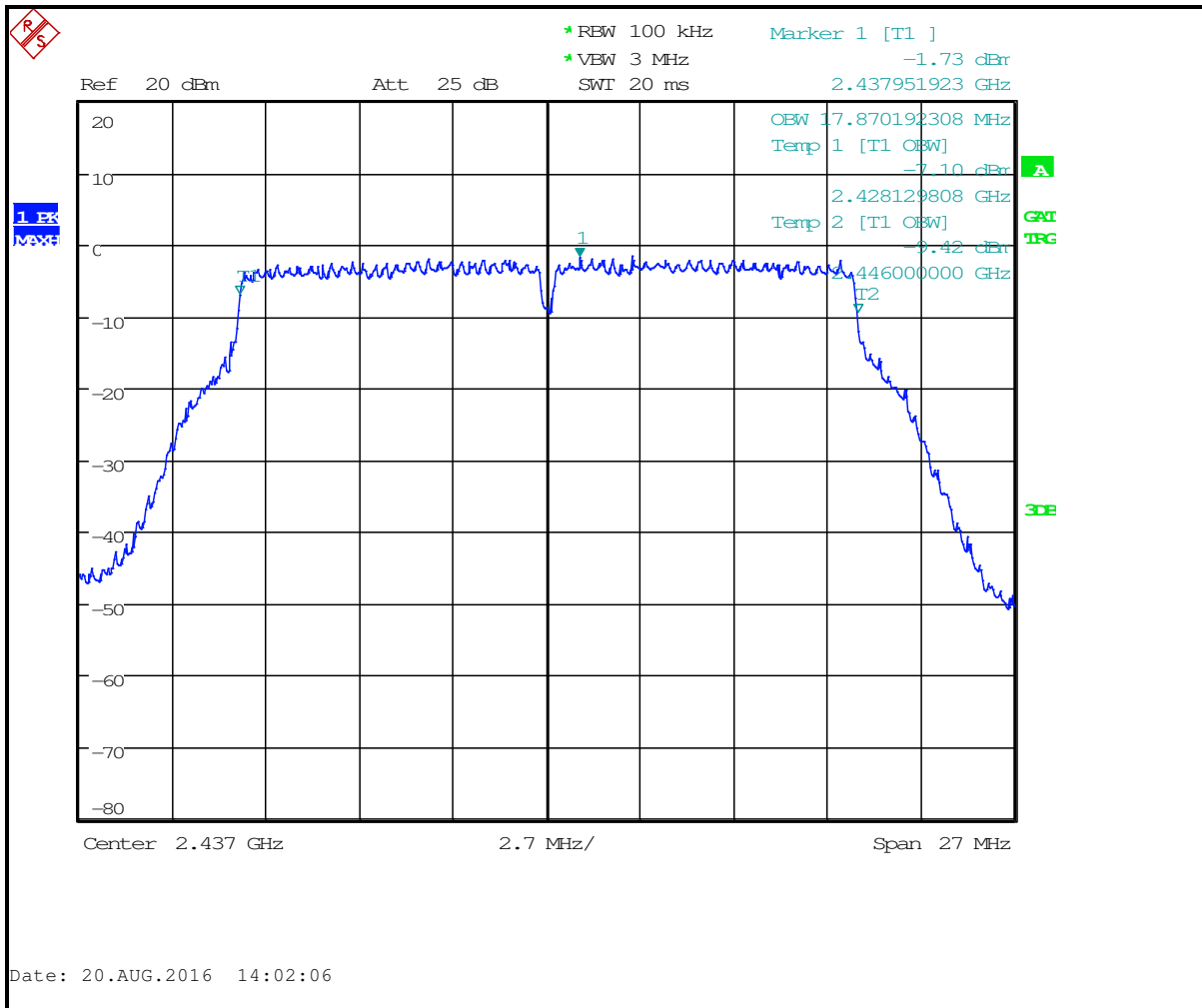




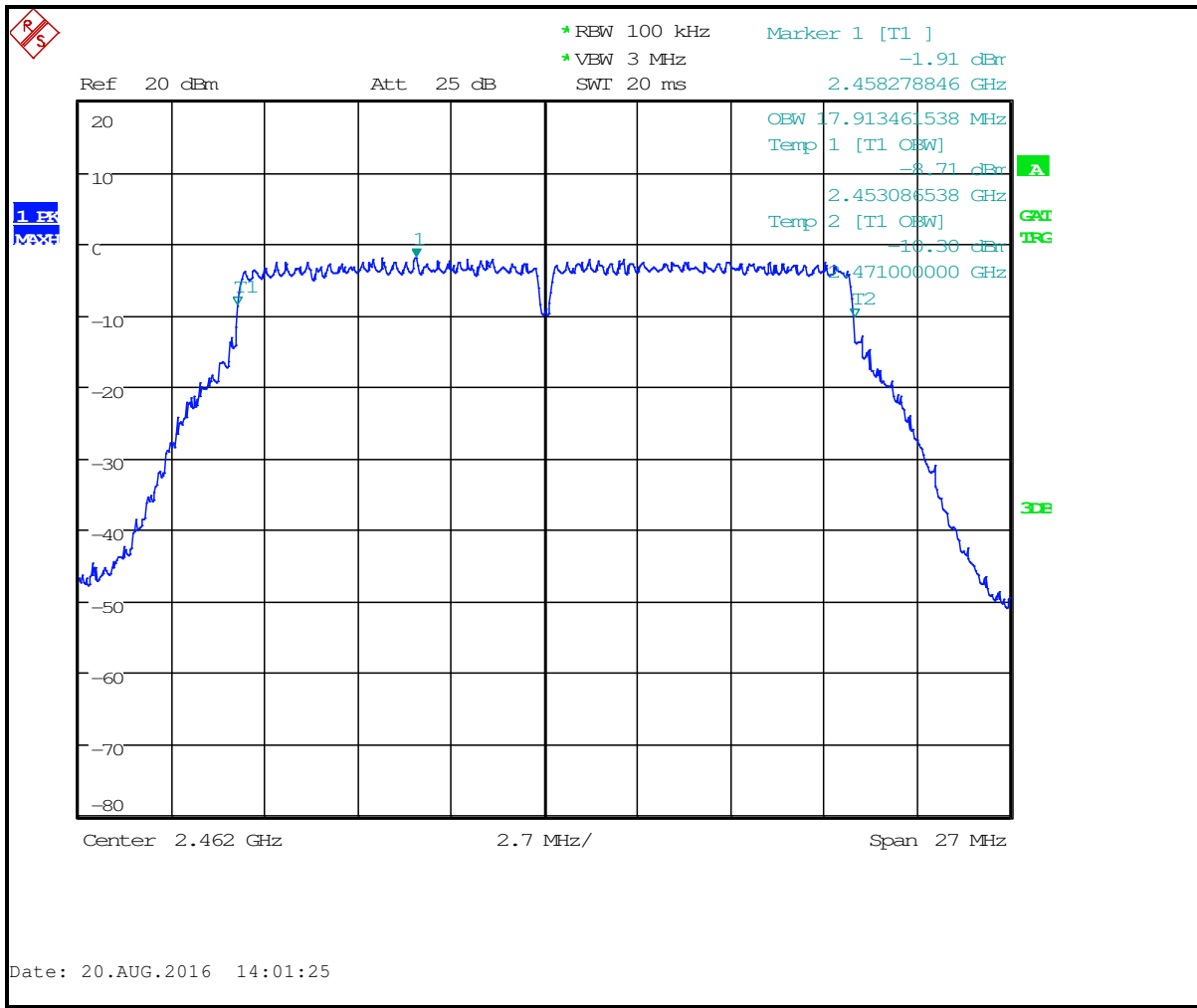
**Plot 6-7: 6 dB Bandwidth – 2412 MHz - 802.11n**



**Plot 6-8: 6 dB Bandwidth – 2437 MHz - 802.11n**



**Plot 6-9: 6 dB Bandwidth – 2462 MHz - 802.11n**



**Test Personnel:**

Dan Baltzell  
 Test Engineer

Signature

August 20, 2016  
 Date of Test

## 7 Power Spectral Density - 15.247(e); RSS-247 5.2(2)

### 7.1 Power Spectral Density Test Procedure

The power spectral density per FCC 15.247(e) was measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 3 kHz, the video bandwidth set at 10 kHz, and the sweep time set at 150 seconds. The spectral lines were resolved for the modulated carriers at 2412, 2437 and 2462 MHz. These levels are below the +8 dBm limit. See the power spectral density table and plots. ANSI C63.10 11.10.2

**Table 7-1: Power Spectral Density Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18

### 7.2 Power Spectral Density Test Data

**Table 7-2: Power Spectral Density Test Data – 802.11b**

Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8dBm	Pass/Fail
2412	-5.9	8	Pass
2437	-6.2	8	Pass
2462	-6.2	8	Pass

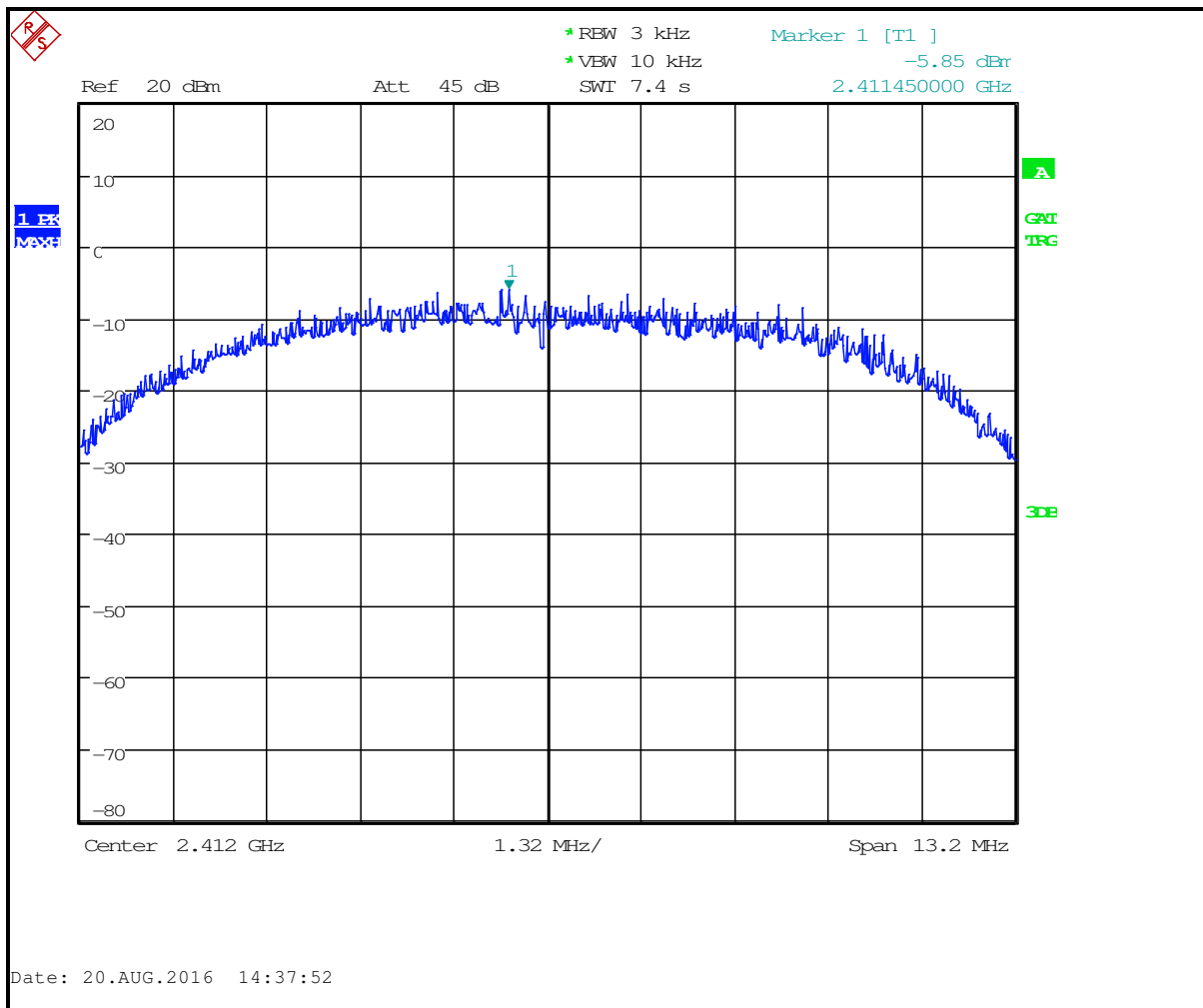
**Table 7-3: Power Spectral Density Test Data – 802.11g**

Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8dBm	Pass/Fail
2412	-13.7	8	Pass
2437	-13.7	8	Pass
2462	-14.2	8	Pass

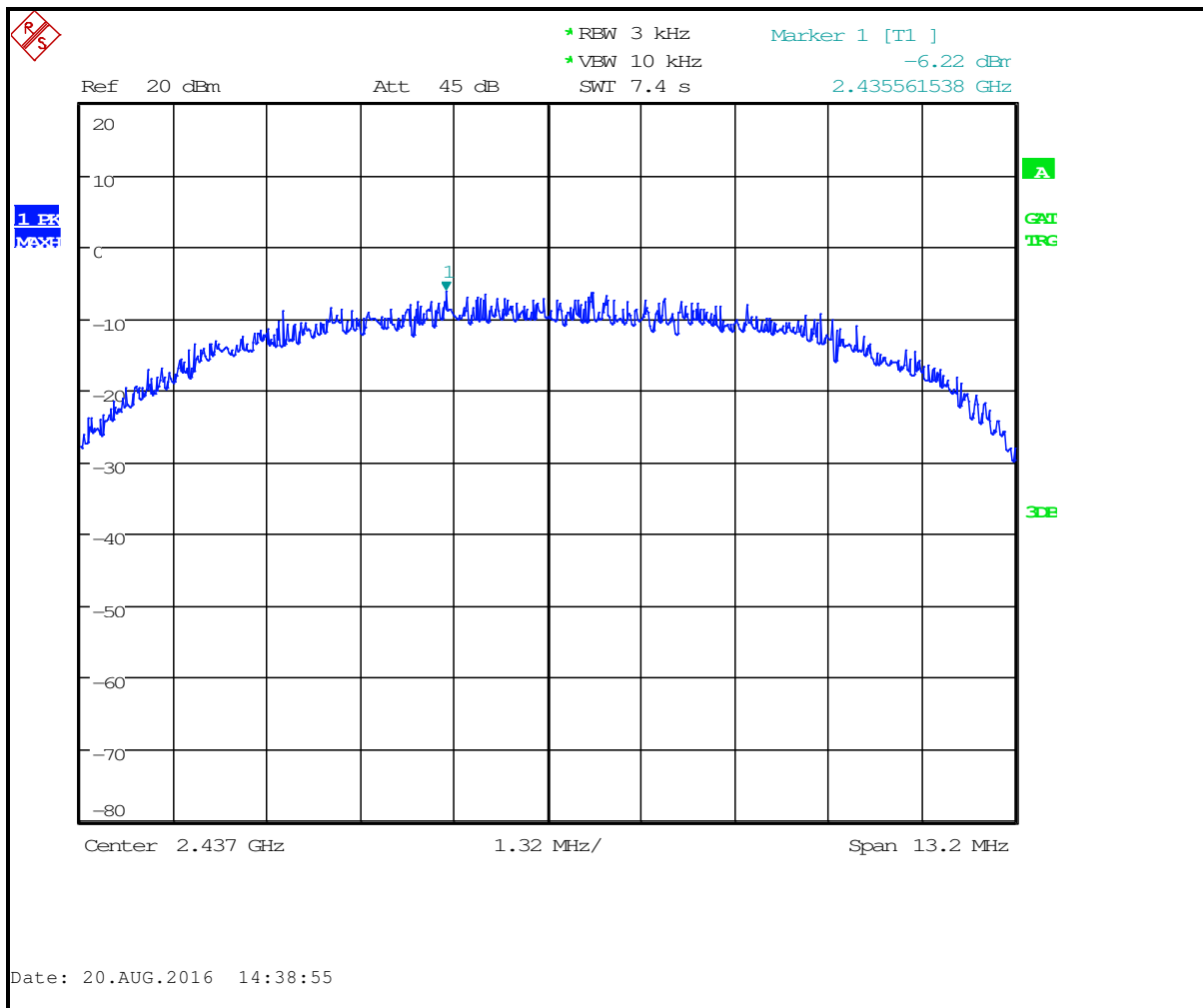
**Table 7-4: Power Spectral Density Test Data – 802.11n**

Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8dBm	Pass/Fail
2412	-13.4	8	Pass
2437	-13.8	8	Pass
2462	-13.9	8	Pass

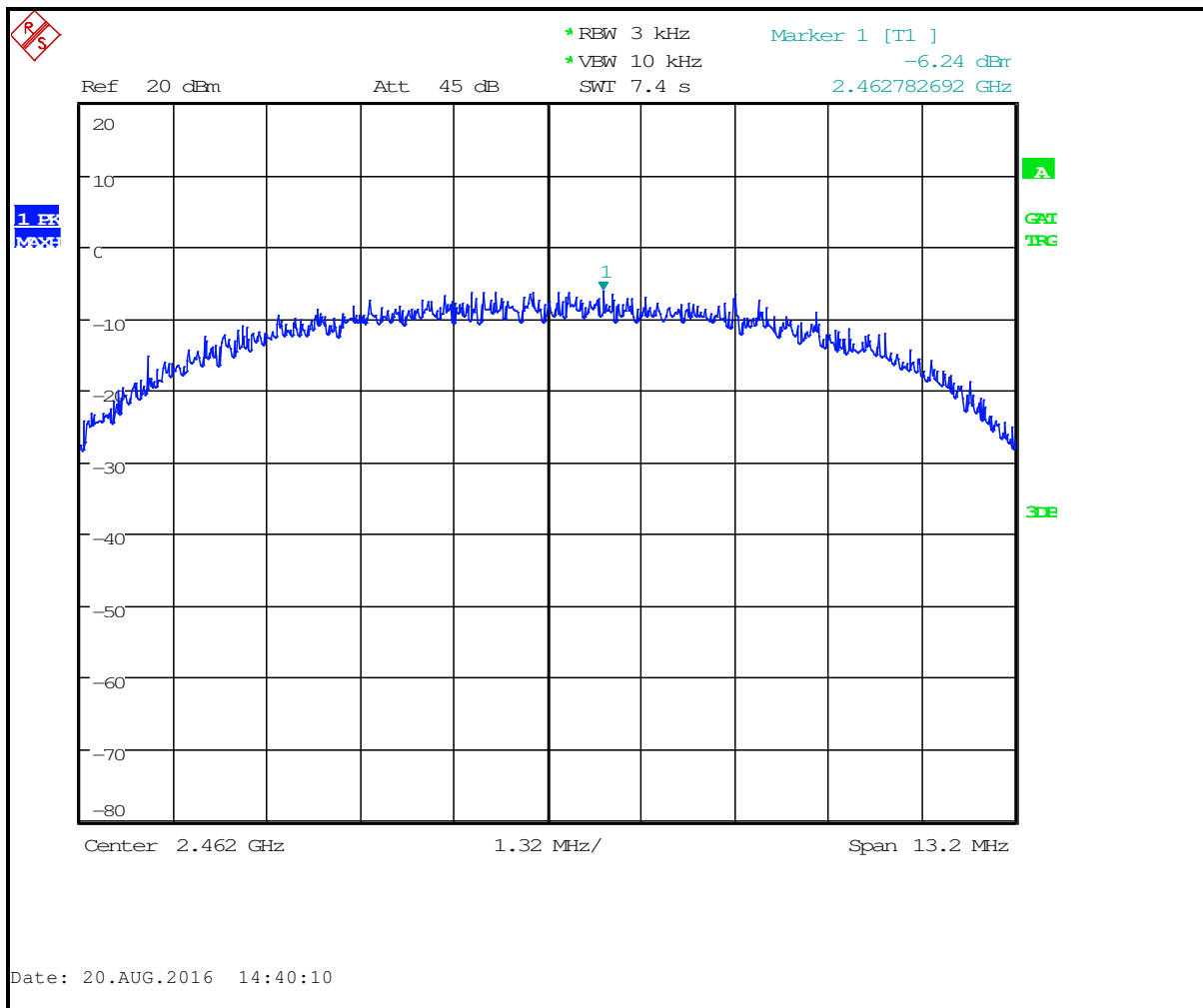
**Plot 7-1: Power Spectral Density – 2412 MHz – 802.11b**



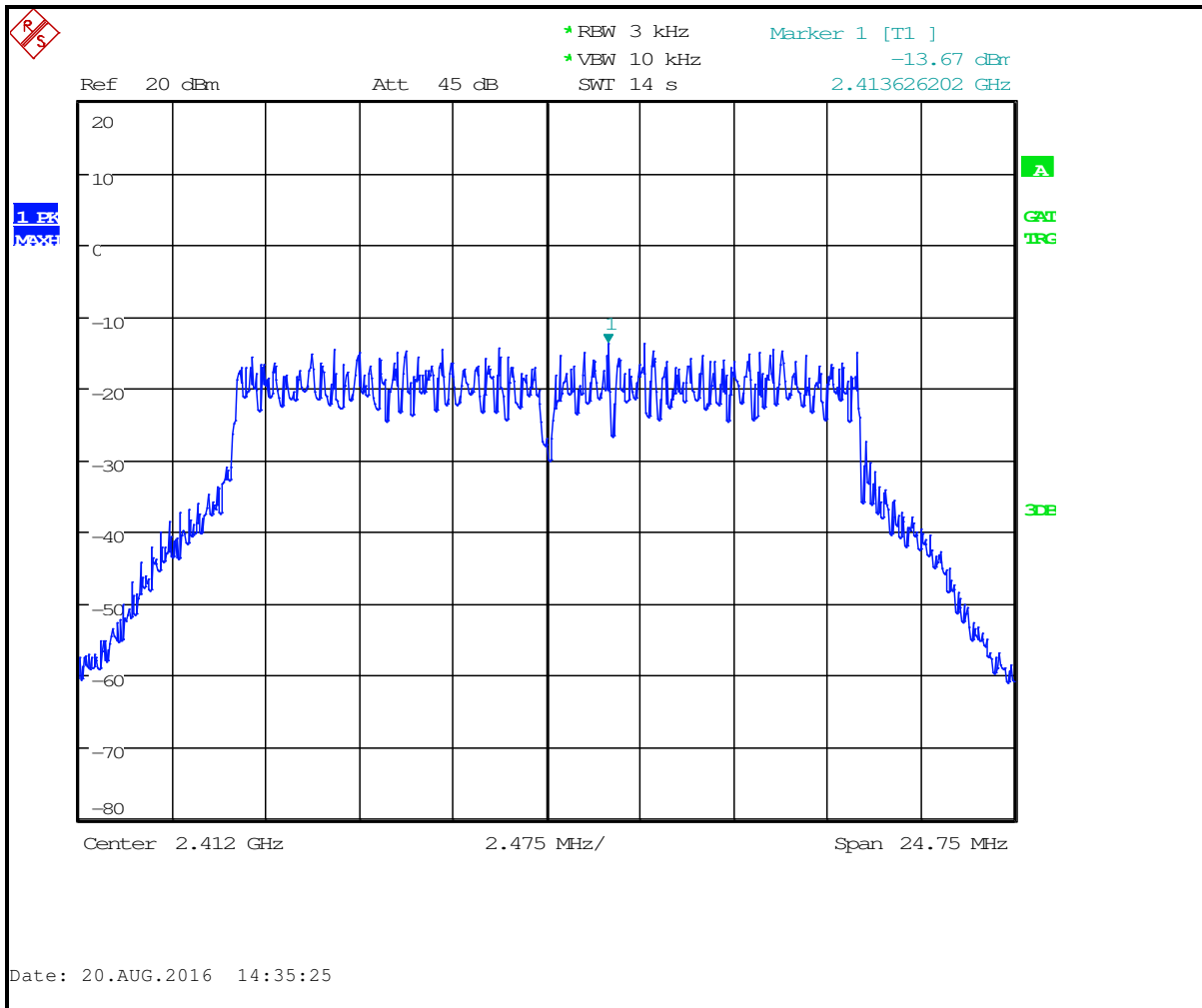
**Plot 7-2: Power Spectral Density – 2437 MHz – 802.11b**



**Plot 7-3: Power Spectral Density – 2462 MHz – 802.11b**

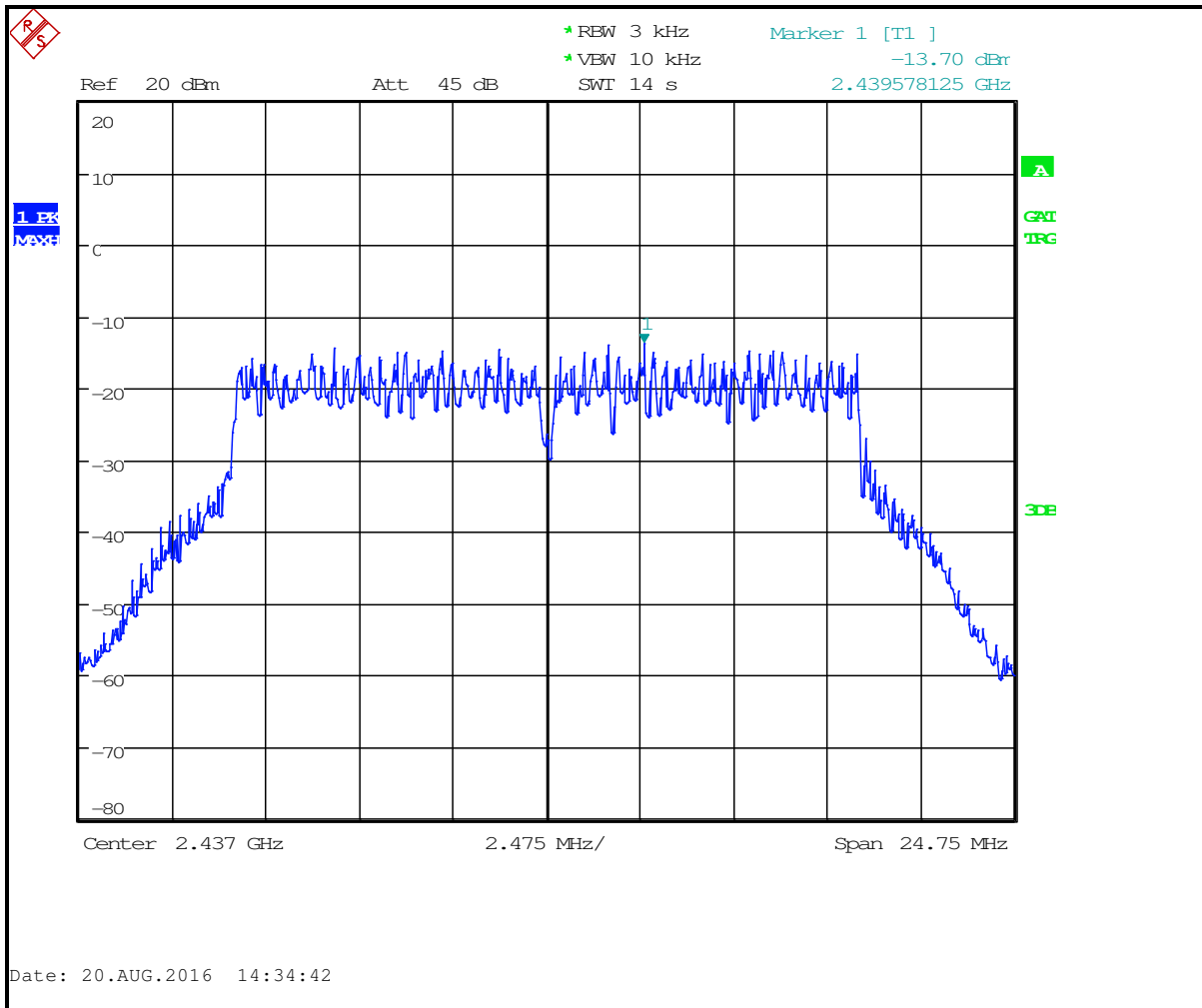


**Plot 7-4: Power Spectral Density – 2412 MHz – 802.11g**

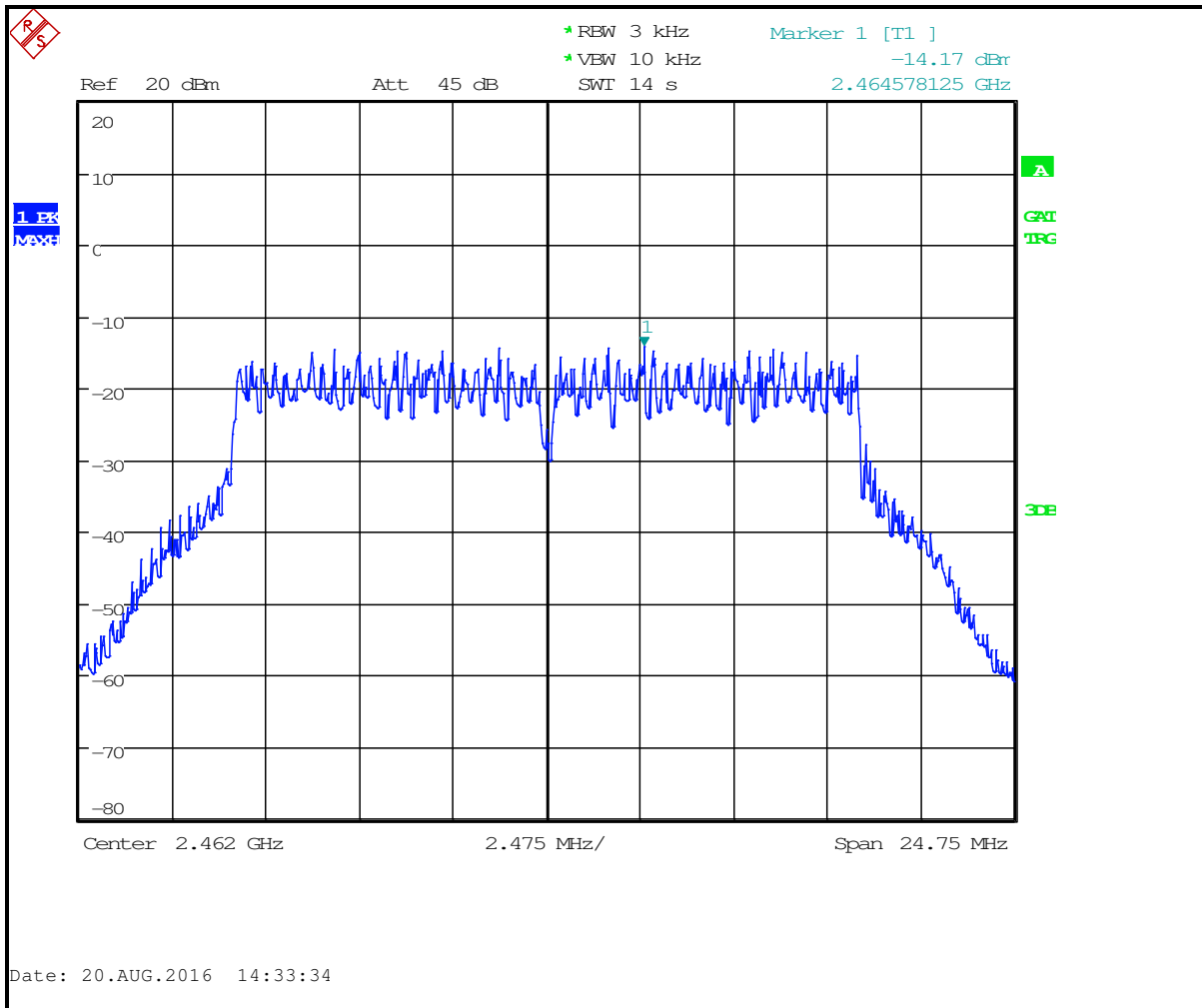




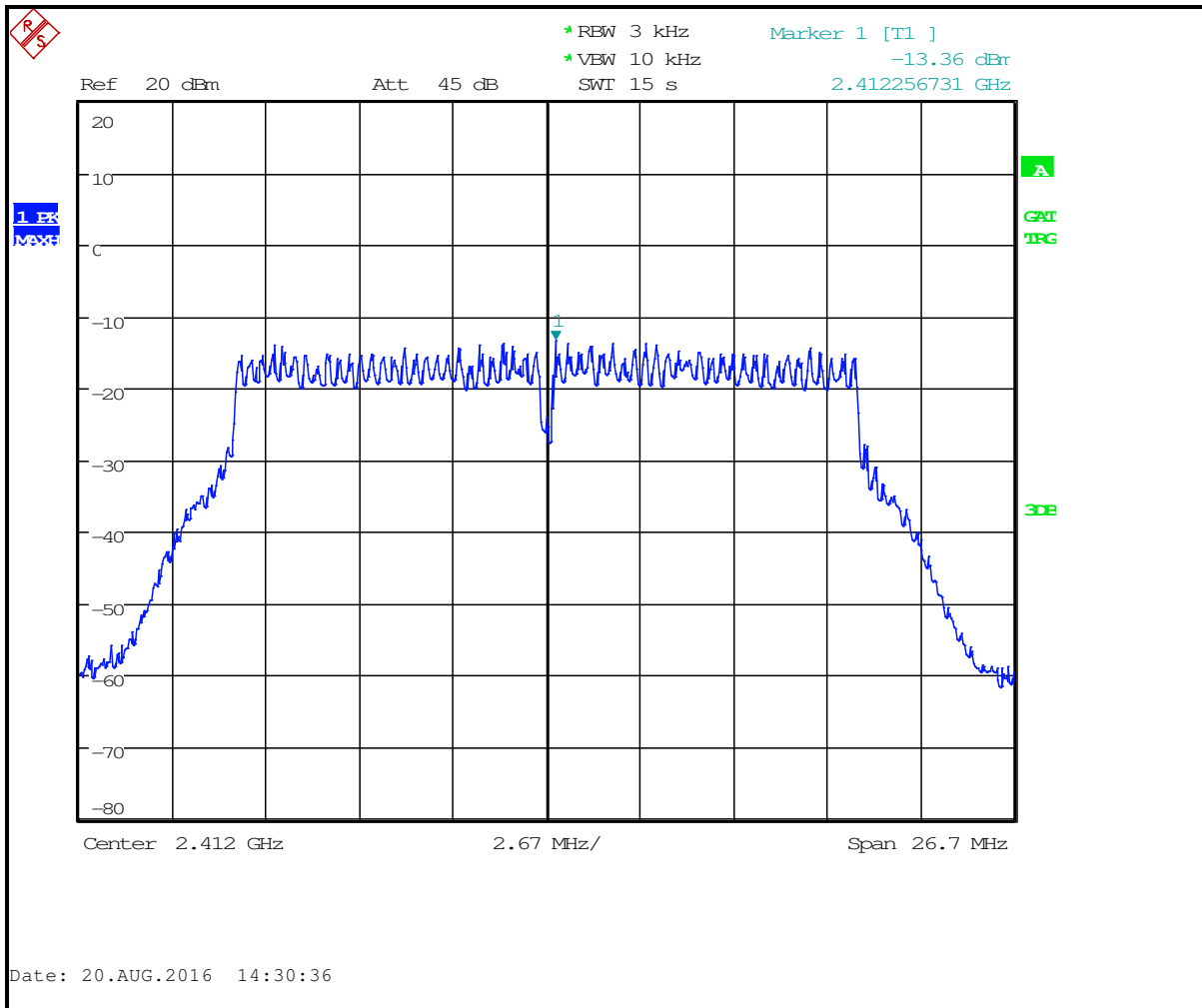
**Plot 7-5: Power Spectral Density – 2437 MHz – 802.11g**



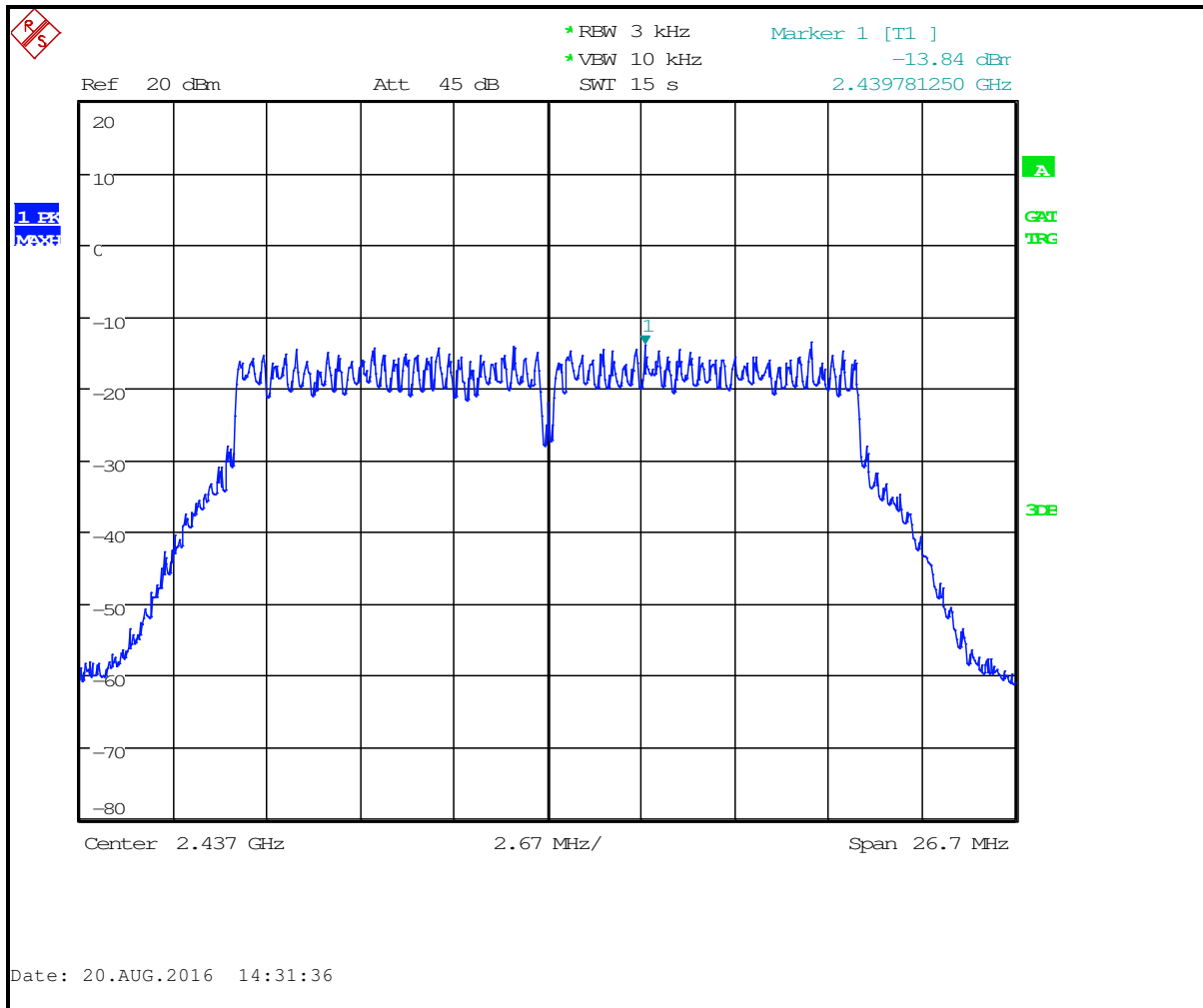
**Plot 7-6: Power Spectral Density – 2462 MHz – 802.11g**



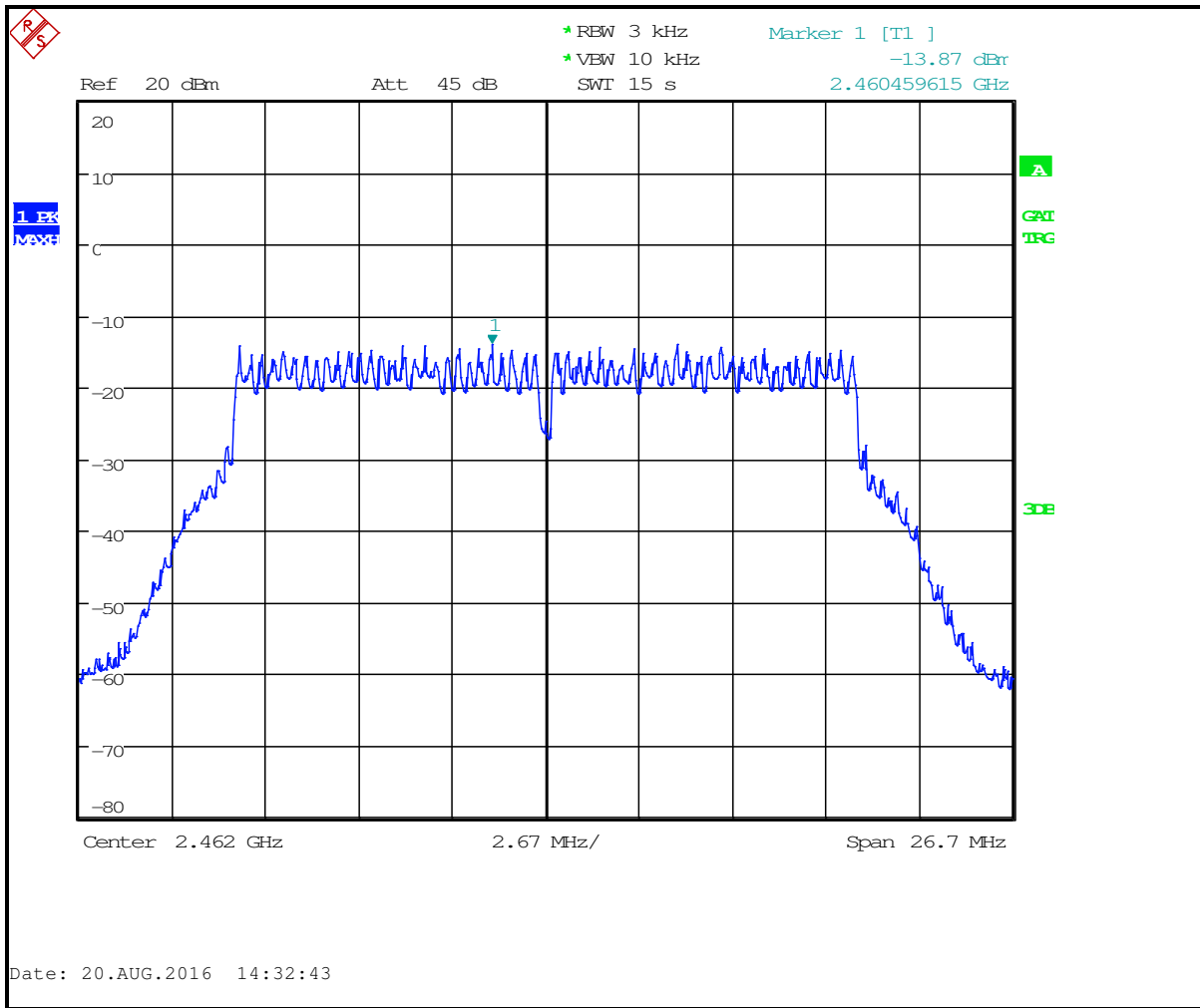
**Plot 7-7: Power Spectral Density – 2412 MHz – 802.11n**



**Plot 7-8: Power Spectral Density – 2437 MHz – 802.11n**



**Plot 7-9: Power Spectral Density – 2462 MHz – 802.11n**



**Test Personnel:**

Dan Baltzell  
 Test Engineer

Signature

August 20, 2016  
 Date of Test

## 8 Radiated Emissions – FCC 15.209; RSS-247 5.5; RSS-Gen 6.13

### 8.1 Limits of Radiated Emissions Measurement

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/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

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

### 8.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10<sup>th</sup> harmonic of the highest fundamental transmitter frequency (24.8 GHz).

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report. Per ANSI C63.10 11.12

**Table 8-1: Radiated Emissions Test Equipment**

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter Antenna Mast, Polarizing	Outdoor Range 1	Not Required
901592	Insulated Wire Inc.	KPS-1503-3600-KPR	SMK RF Cables 20'	NA	8/3/17
901242	Rhein Tech Laboratories	WRT-000-0003	Wood Rotating Table	N/A	Not Required
901581	Rohde & Schwarz	FSU	Spectrum Analyzer	1166.1660.50	3/22/18
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	4/9/18
900321	EMCO	3161-03	Horn Antenna (4.0 - 8.2 GHz)	9508-1020	4/9/18
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	4/9/18
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	4/9/18
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	4/9/18
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	6/11/17

**8.3 Radiated Emissions Test Results**

**8.3.1 Radiated Emissions Harmonics/Spurious Test Data**

**Table 8-2: Radiated Emissions Harmonics/Spurious - Peak - 2412 MHz – 802.11b**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4824.0	11.4	33.5	44.9	74.0	-29.1
12060.0	13.2	44.0	57.2	74.0	-16.8
14472.0	14.4	47.9	62.3	74.0	-11.7
19296.0	5.1	52.9	58.0	74.0	-16.0

**Table 8-3: Radiated Emissions Harmonics/Spurious – Average - 2412 MHz – 802.11b**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4824.0	3.3	33.5	36.8	54.0	-17.2
12060.0	2.2	44.0	46.2	54.0	-7.8
14472.0	2.4	47.9	50.3	54.0	-3.7
19296.0	-6.2	52.9	46.7	54.0	-7.3

**Table 8-4: Radiated Emissions Harmonics/Spurious – Peak - 2437 MHz – 802.11b**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4874.0	13.9	33.6	47.5	74.0	-26.5
7311.0	14.2	35.7	49.9	74.0	-24.1
12185.0	14.6	44.0	58.6	74.0	-15.4
19496.0	5.0	53.0	58.0	74.0	-16.0

**Table 8-5: Radiated Emissions Harmonics/Spurious – Average - 2437 MHz – 802.11b**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4874.0	2.5	33.6	36.1	54.0	-17.9
7311.0	2.6	35.7	38.3	54.0	-15.7
12185.0	2.9	44.0	46.9	54.0	-7.1
19496.0	-6.4	53.0	46.6	54.0	-7.4

**Table 8-6: Radiated Emissions Harmonics/Spurious – Peak - 2462 MHz – 802.11b**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4924.0	14.6	33.7	48.3	74.0	-25.7
7386.0	13.7	35.7	49.4	74.0	-24.6
12310.0	9.7	44.0	53.7	74.0	-20.3
19696.0	4.8	53.1	57.9	74.0	-16.1
22158.0	5.3	54.2	59.5	74.0	-14.5



**Table 8-7: Radiated Emissions Harmonics/Spurious – Average - 2462 MHz – 802.11b**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4924.0	4.6	33.7	38.3	54.0	-15.7
7386.0	2.3	35.7	38.0	54.0	-16.0
12310.0	4.4	44.0	48.4	54.0	-5.6
19696.0	-6.5	53.1	46.6	54.0	-7.4
22158.0	-6.1	54.2	48.1	54.0	-5.9

**Table 8-8: Radiated Emissions Harmonics/Spurious - Peak - 2412 MHz – 802.11g**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4824.0	13.7	33.5	47.2	74.0	-26.8
12060.0	14.8	44.0	58.8	74.0	-15.2
14472.0	14.8	47.9	62.7	74.0	-11.3
19296.0	5.1	52.9	58.0	74.0	-16.0

**Table 8-9: Radiated Emissions Harmonics/Spurious – Average - 2412 MHz – 802.11g**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4824.0	2.5	33.5	36.0	54.0	-18.0
12060.0	2.7	44.0	46.7	54.0	-7.3
14472.0	3.5	47.9	51.4	54.0	-2.6
19296.0	-6.5	52.9	46.4	54.0	-7.6

**Table 8-10: Radiated Emissions Harmonics/Spurious – Peak - 2437 MHz – 802.11g**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4874.0	13.2	33.6	46.8	74.0	-27.2
7311.0	13.7	35.7	49.4	74.0	-24.6
12185.0	14.5	44.0	58.5	74.0	-15.5
19496.0	4.7	53.0	57.7	74.0	-16.3

**Table 8-11: Radiated Emissions Harmonics/Spurious – Average - 2437 MHz – 802.11g**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4874.0	3.2	33.6	36.8	54.0	-17.2
7311.0	2.5	35.7	38.2	54.0	-15.8
12185.0	2.8	44.0	46.8	54.0	-7.2
19496.0	-6.8	53.0	46.2	54.0	-7.8

**Table 8-12: Radiated Emissions Harmonics/Spurious – Peak - 2462 MHz – 802.11g**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4924.0	13.9	33.7	47.6	74.0	-26.4
7386.0	13.3	35.7	49.0	74.0	-25.0
12310.0	13.9	44.0	57.9	74.0	-16.1
19696.0	4.5	53.1	57.6	74.0	-16.4
22158.0	5.3	54.2	59.5	74.0	-14.5

**Table 8-13: Radiated Emissions Harmonics/Spurious – Average - 2462 MHz – 802.11g**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4924.0	2.4	33.7	36.1	54.0	-17.9
7386.0	2.1	35.7	37.8	54.0	-16.2
12310.0	2.5	44.0	46.5	54.0	-7.5
19696.0	-6.7	53.1	46.4	54.0	-7.6
22158.0	-6.6	54.2	47.6	54.0	-6.4

**Table 8-14: Radiated Emissions Harmonics/Spurious - Peak - 2412 MHz – 802.11n**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4824.0	13.5	33.5	47.0	74.0	-27.0
12060.0	13.2	44.0	57.2	74.0	-16.8
14472.0	14.6	47.9	62.5	74.0	-11.5
19296.0	4.4	52.9	57.3	74.0	-16.7

**Table 8-15: Radiated Emissions Harmonics/Spurious – Average - 2412 MHz – 802.11n**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4824.0	2.3	33.5	35.8	54.0	-18.2
12060.0	2.3	44.0	46.3	54.0	-7.7
14472.0	3.2	47.9	51.1	54.0	-2.9
19296.0	-6.6	52.9	46.3	54.0	-7.7

**Table 8-16: Radiated Emissions Harmonics/Spurious – Peak - 2437 MHz – 802.11n**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4874.0	13.0	33.6	46.6	74.0	-27.4
7311.0	13.1	35.7	48.8	74.0	-25.2
12185.0	13.3	44.0	57.3	74.0	-16.7
19496.0	4.0	53.0	57.0	74.0	-17.0

**Table 8-17: Radiated Emissions Harmonics/Spurious – Average - 2437 MHz – 802.11n**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4874.0	2.2	33.6	35.8	54.0	-18.2
7311.0	2.0	35.7	37.7	54.0	-16.3
12185.0	2.5	44.0	46.5	54.0	-7.5
19496.0	-7.2	53.0	45.8	54.0	-8.2

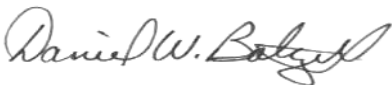
**Table 8-18: Radiated Emissions Harmonics/Spurious – Peak - 2462 MHz – 802.11n**

Emission Frequency (MHz)	Peak Analyzer Reading (dBuV) (1 MHz RBW/VBW)	Site Correction Factor (dB/m)	Peak Emission Level (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)
4924.0	13.7	33.7	47.4	74.0	-26.6
7386.0	12.7	35.7	48.4	74.0	-25.6
12310.0	13.5	44.0	57.5	74.0	-16.5
19696.0	4.1	53.1	57.2	74.0	-16.8
22158.0	4.5	54.2	58.7	74.0	-15.3

**Table 8-19: Radiated Emissions Harmonics/Spurious – Average - 2462 MHz – 802.11n**

Emission Frequency (MHz)	Average Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Average Emission Level (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)
4924.0	2.5	33.7	36.2	54.0	-17.8
7386.0	1.9	35.7	37.6	54.0	-16.4
12310.0	2.5	44.0	46.5	54.0	-7.5
19696.0	-6.8	53.1	46.3	54.0	-7.7
22158.0	-6.7	54.2	47.5	54.0	-6.5

**Test Personnel:**

Daniel W. Baltzell		August 21, 2016
Test Engineer	Signature	Date of Test

**9 Conclusion**

The data in this measurement report shows that the EUT as tested, Owlet Baby Care, Inc., Model OBS 1.1 Base Station, FCC ID: 2AIEP-OBS1B, IC: 21386-OBS1B, complies with the applicable requirements of Parts 2 and 15 of the FCC Rules and Regulations and Industry Canada RSS-247 and RSS-Gen.

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