


# EMC Test Report

**Project Number: 4198004****Report Number: 4198004EMC01****Revision Level: 0****Client: ITRON DEM Inc.****Equipment Under Test: WiFi Board****Model: BRD-000021-02****FCC ID: RAB-IPDL-WT1****Applicable Standards: FCC Part 15 Subpart C, § 15.247****RSS-247, Issue 2****ANSI C63.10: 2013****Report issued on: 25 September 2017****Test Result: Compliant**

Tested by:

  
\_\_\_\_\_  
Jeremy Pickens, Senior EMC Engineer

Reviewed by:

  
\_\_\_\_\_  
Shawn McGuinness, EMC Engineering Leader

*Remarks: This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.*

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## 1 Summary of Test Results

Test Description	Test Specification		Test Result
Antenna Requirement	15.203	RSS-GEN, S8.3	Compliant (1)
Bandwidth	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	Compliant
Transmitter Output Power	15.247(b)(3)	RSS-247 S5.4 (4)	Compliant
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	Compliant
Conducted Spurious Emissions / Band edge	15.247(d)	RSS-247 S5.5	Compliant
Radiated Spurious Emissions / Restricted Bands	15.35(b),15.209	RSS-GEN S6.13 RSS-GEN S8.10	Compliant
AC Powerline Conducted Emission	15.107, 15.207	RSS-GEN S8.8	Compliant

(1) The antenna was a non-detachable PCB trace antenna.

### 1.1 **Modifications Required for Compliance**

None

## 2 General Information

### 2.1 Client Information

Name: ITRON DEM Inc.  
Address: 5390 Triangle Parkway Suite 300  
City, State, Zip, Country: Norcross, GA 30092 USA

### 2.2 Test Laboratory

Name: SGS North America, Inc.  
Address: 620 Old Peachtree Road NW, Suite 100  
City, State, Zip, Country: Suwanee, GA 30024, USA

Accrediting Body: A2LA  
Type of lab: Testing Laboratory  
Certificate Number: 3212.01

### 2.3 General Information of EUT

Type of Product: WiFi Board  
Model Number: BRD-000021-02  
Serial Number: 4645041

Frequency Range: 2400-2483.5MHz  
Data Modes: 802.11b, 802.11g, 802.11n (HT20), 802.11n (HT40),  
Antenna: PCB Trace Antenna, Tuned Dipole, 2.15dBi

Rated Voltage: 120Vac, 60Hz  
Test Voltage: 120Vac, 60Hz

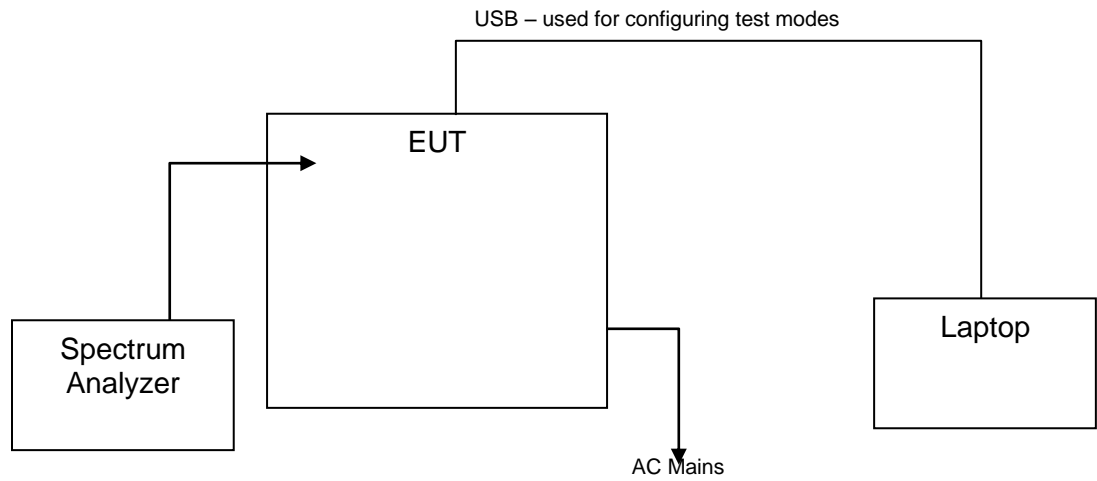
Sample Received Date: 17 August 2017  
Dates of testing: 17 August - 22 September 2017

### 2.4 Operating Modes and Conditions

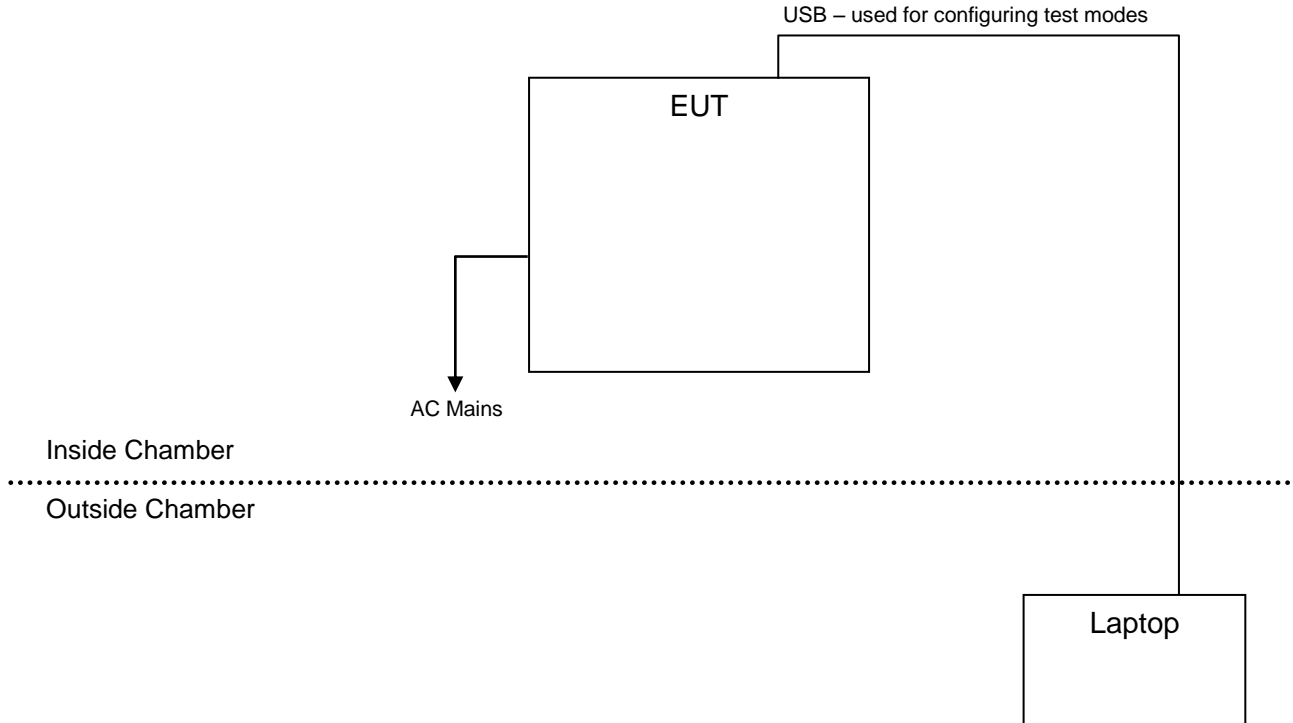
For spurious emissions measurements, only the worst-case mode with respect to peak power was investigated: 802.11b, 1Mbps. Investigations covered the low, middle, and high channels in the 2400-2483.5MHz band. For antenna port conducted measurements each mode was tested and the lowest data rate for each was found to be worst-case.

Continuous traffic was generated using test command and the duty cycle was >99% during all testing.

## 2.5 EUT Connection Block Diagram – Conducted Measurements



## 2.6 EUT Connection Block Diagram – Radiated Measurements



## 2.7 System Configurations

Device reference	Manufacturer	Description	Model Number	Serial Number
A	ITRON DEM Inc.	WiFi Board	BRD-000021-02	4645041

### 3 Bandwidth

#### 3.1 Test Result

Test Description	Test Specification		Test Result
6 dB bandwidth / 99% OBW	15.247(d)	RSS-247 S5.2 (1) RSS-GEN S6.6	Compliant

#### 3.2 Test Method

The procedures from ANSI C63.10: 2013 clause 11.8 and 558074 D01 DTS Meas Guidance v04 were used to determine the 6 dB bandwidth and 99% OBW.

#### 3.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.6 °C

Relative Humidity: 55.0 %

#### 3.4 Test Equipment

Test Date: 21-Sep-2017

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

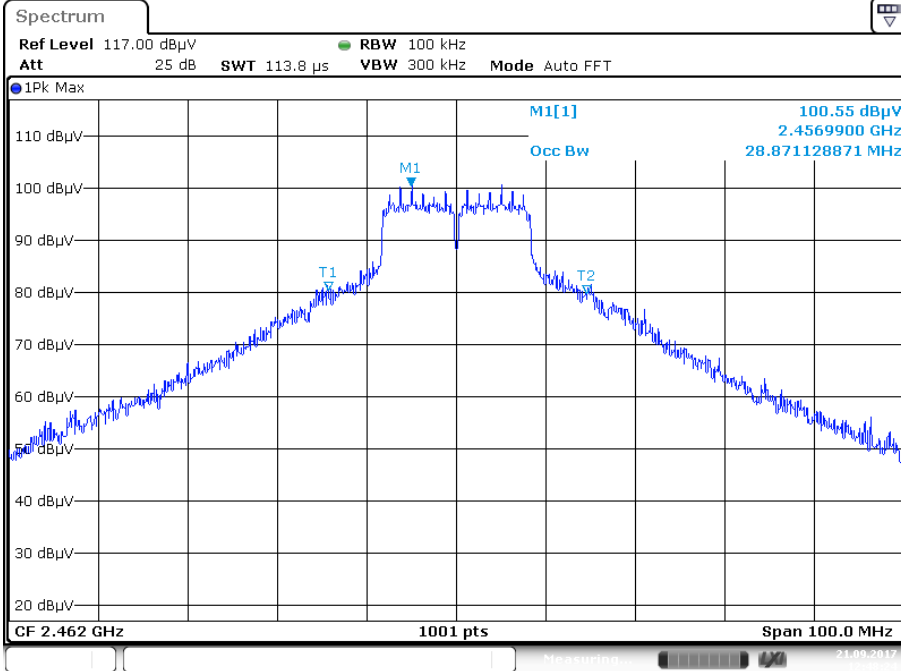
Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

#### 3.5 Test Data

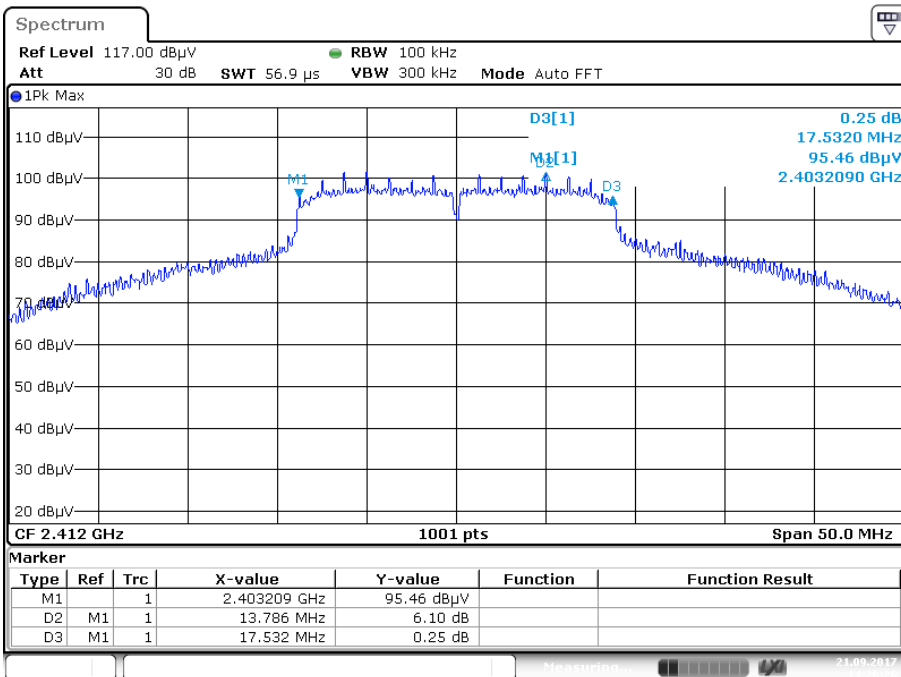
Protocol	Channel	Data Rate	6dB Bandwidth (MHz)	Occupied Bandwidth (99%) (MHz)
802.11b	1	1 Mbps	11.99	15.984
802.11b	6	1 Mbps	11.99	17.083
802.11b	11	1 Mbps	12.04	16.484
802.11g	1	6 Mbps	16.38	26.873
802.11g	6	6 Mbps	16.38	28.372
802.11g	11	6 Mbps	16.58	29.77
802.11n (HT20)	1	MCS0	17.532	27.622
802.11n (HT20)	6	MCS0	17.533	30.47
802.11n (HT20)	11	MCS0	17.532	31.518
802.11n (HT40)	3	MCS0	35.96	59.74
802.11n (HT40)	6	MCS0	36.26	60.139
802.11n (HT40)	9	MCS0	36.36	68.731



## Sample Plots



Date: 21.SEP.2017 12:48:24



Date: 21.SEP.2017 14:26:26

## 4 Output Power

### 4.1 Test Result

Test Description	Test Specification		Test Result
Peak Output Power	15.247(b) (3)	RSS-247 S5.4 (4)	Compliant

### 4.2 Test Method

Fundamental power measurements were recorded using the peak power procedures from ANSI C63.10: 2013 and KDB 558074 D01 Measurement Guidance v04. The lowest data rate for each modulation was found to be the worst-case.

#### Limit

(3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. For using antennas with greater than 6dBi of gain, the limit is reduced in dB by the amount the gain exceeds 6dBi (e.g. for a 7.4dBi antenna, the limit is reduced from 30dBm to 28.6dBm)

### 4.3 Test Site

SGS EMC Laboratory, Suwanee, GA

#### Environmental Conditions

Temperature: 23.6 °C  
Relative Humidity: 55.0 %

### 4.4 Test Equipment

Test Date: 21-Sep-2017

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

#### 4.5 Test Data

Mode	RateMbps	Channel	Peak Power dBm	Limit dBm	Margin dB
802.11b	1	1	8.8	30	-21.2
		6	8.9	30	-21.1
		11	7	30	-23
802.11g	6	1	10.2	30	-19.8
		6	12.3	30	-17.7
		11	6.8	30	-23.2
802.11n (HT20)	MCS0	1	7.7	30	-22.3
		6	11.3	30	-18.7
		11	5.3	30	-24.7
802.11n (HT40)	MCS0	3	5.7	30	-24.3
		6	7.4	30	-22.6
		9	3.4	30	-26.6

## 5 Power Spectral Density

### 5.1 Test Result

Test Description	Test Specification		Test Result
Power Spectral Density	15.247(e)	RSS-247 S5.2 (2)	Compliant

### 5.2 Test Method

Fundamental power measurements were recorded using the peak PSD procedures from ANSI C63.10: 2013 clause 11.10 and KDB 558074 D01 Measurement Guidance v04. The lowest data rate for each modulation was determined to be the worst-case.

#### Limit

The limit is 8 dBm.

### 5.3 Test Site

SGS EMC Laboratory, Suwanee, GA

#### Environmental Conditions

Temperature: 23.6 °C  
Relative Humidity: 55.0 %

### 5.4 Test Equipment

Test Date: 21-Sep-2017

Tester: JOP

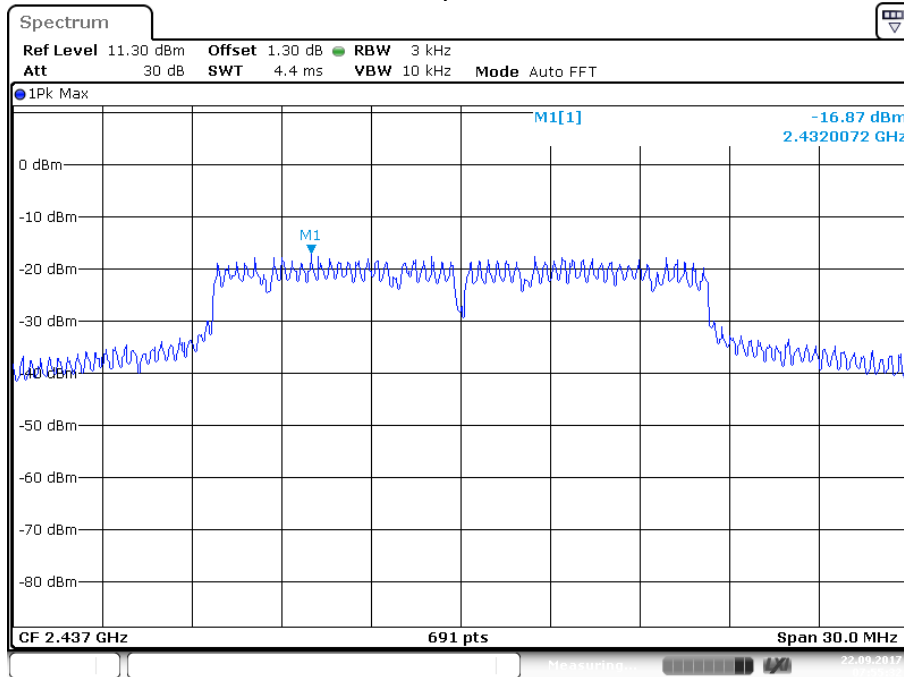
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

### 5.5 Test Data

Mode	RateMbps	Channel	PSD (dBm)	Limit (dBm)	Margin (dB)
802.11b	1	1	-18.3	8	-26.3
		6	-18.1	8	-26.1
		11	-20.2	8	-28.2
802.11g	6	1	-18.9	8	-26.9
		6	-16.9	8	-24.9
		11	-21.4	8	-29.4
802.11n (HT20)	MCS0	1	-20.2	8	-28.2
		6	-17.7	8	-25.7
		11	-22.8	8	-30.8
802.11n (HT40)	MCS0	3	-24.8	8	-32.8
		6	-23.2	8	-31.2
		9	-27	8	-35

## Sample Plot



Date: 22.SEP.2017 07:55:33

## 6 Conducted Spurious Emissions

### 6.1 Test Result

Test Description	Test Specification		Test Result
Conducted Spurious Emissions	15.247(d)	RSS-247 S5.5	Compliant

### 6.2 Test Method

Spurious emissions in non-restricted frequency bands were recorded using the methods defined in ANSI C63.10: 2013 clause 11.11 and KDB 558074 D01 Measurement Guidance v04.

Lowest, middle, and highest channels were investigated. Only the worst-case (lowest data rate) for each modulation was reported.

Because the peak conducted peak output power was used to determine compliance with the output power limits, the limit is 20 dB below the maximum in-band peak PSD level in 100 kHz.

### 6.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 23.8 °C

Relative Humidity: 54.5 %

### 6.4 Test Equipment

Test End Date: 22-Sep-2017

Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
SIGNAL ANALYZER	FSV30	ROHDE & SCHWARZ	B085749	8-Oct-2017
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

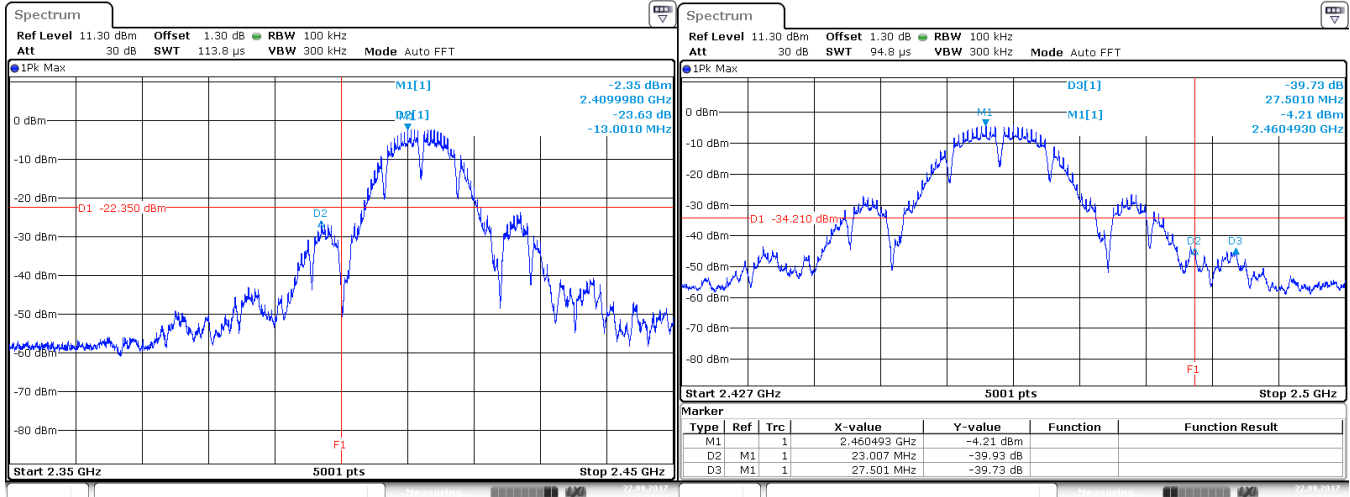
### 6.5 Test Data – DTS Bandedge

802.11b

Lower band edge / Upper band edge

Channel 1 / Channel 11

1Mbit/s



Date: 22.SEP.2017 11:37:03

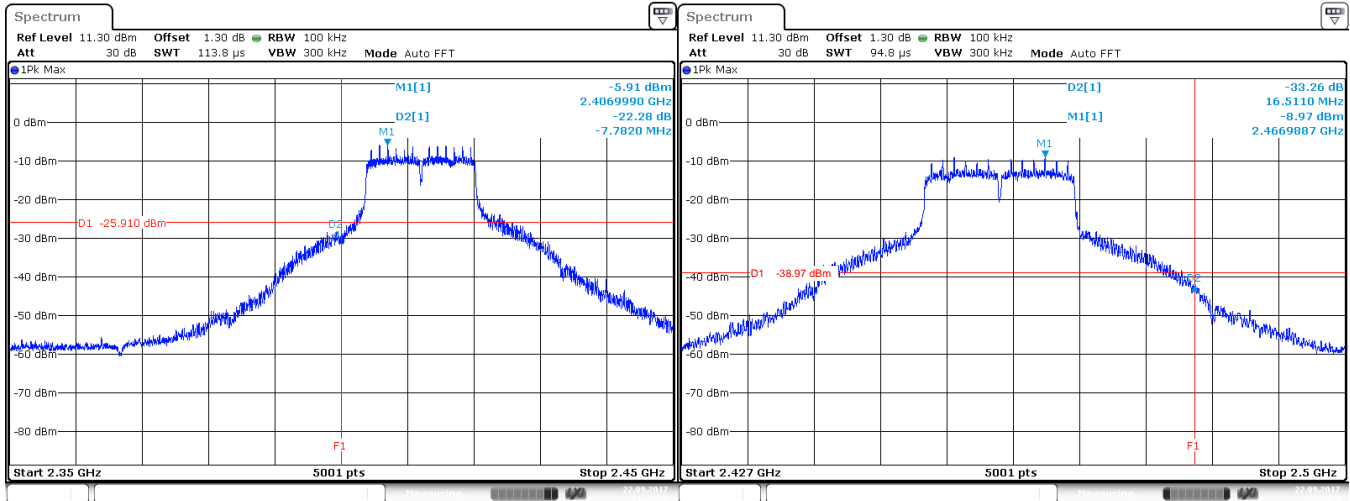
Date: 22.SEP.2017 10:44:10

802.11g

Lower band edge / Upper band edge

Channel 1 / Channel 11

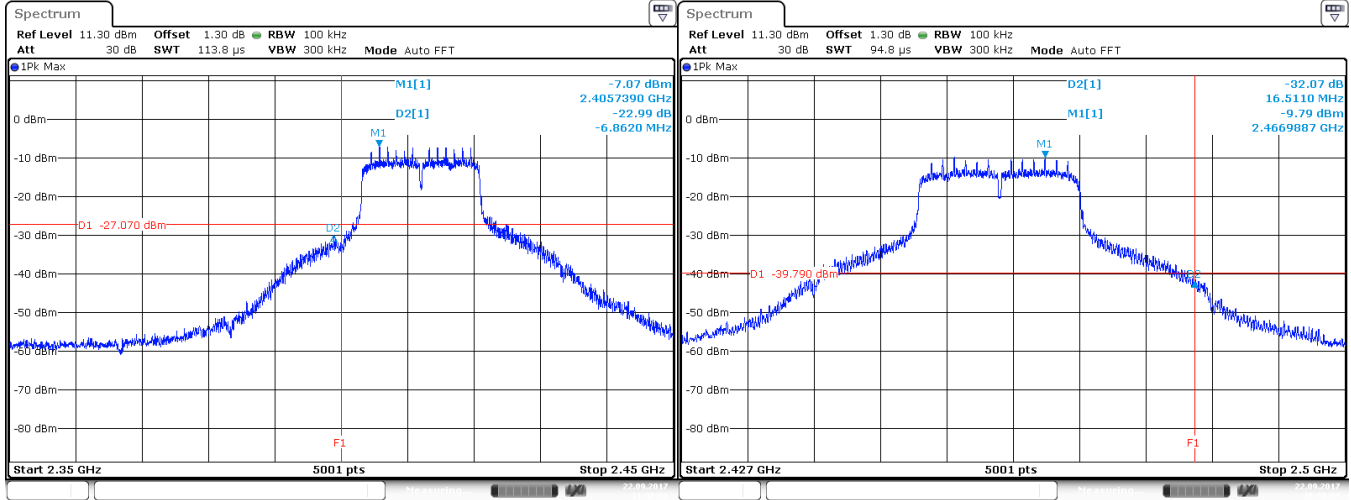
6Mbit/s



Date: 22.SEP.2017 11:23:59

Date: 22.SEP.2017 10:07:24

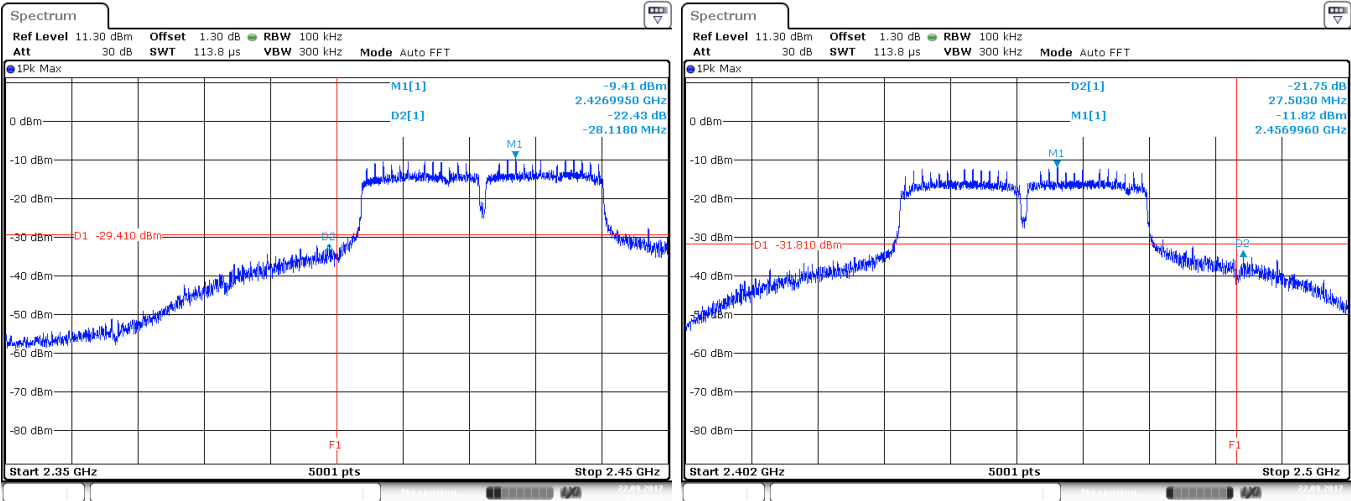
802.11n (HT20)  
 Lower band edge / Upper band edge  
 Channel 1 / Channel 11  
 MCS0



Date: 22.SEP.2017 11:48:01

Date: 22.SEP.2017 10:30:04

802.11n (HT20)  
 Lower band edge / Upper band edge  
 Channel 3 / Channel 9  
 MCS0



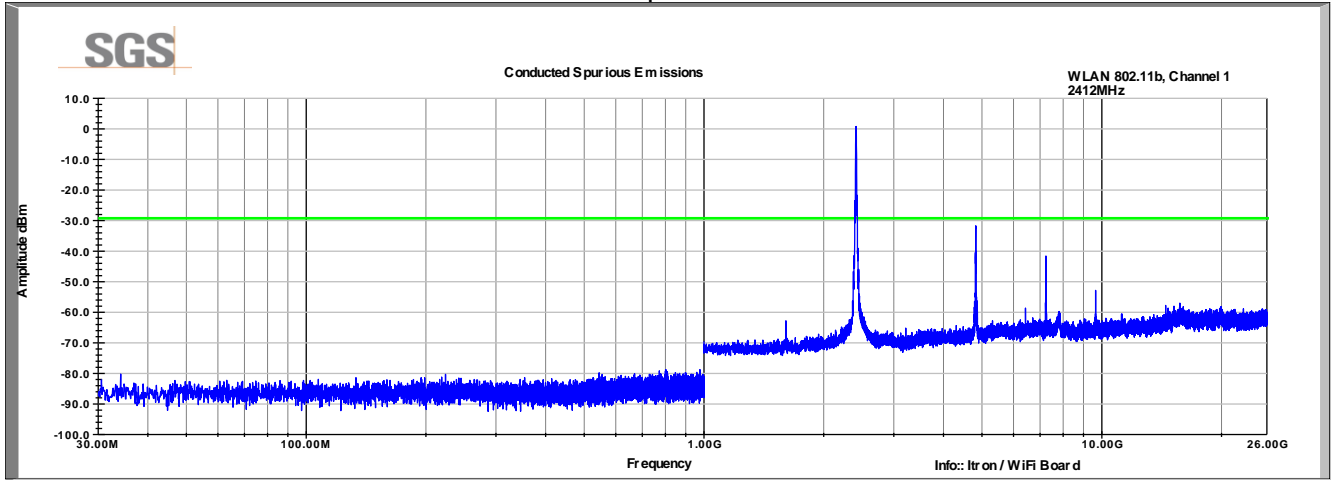
Date: 22.SEP.2017 11:50:52

Date: 22.SEP.2017 12:08:36

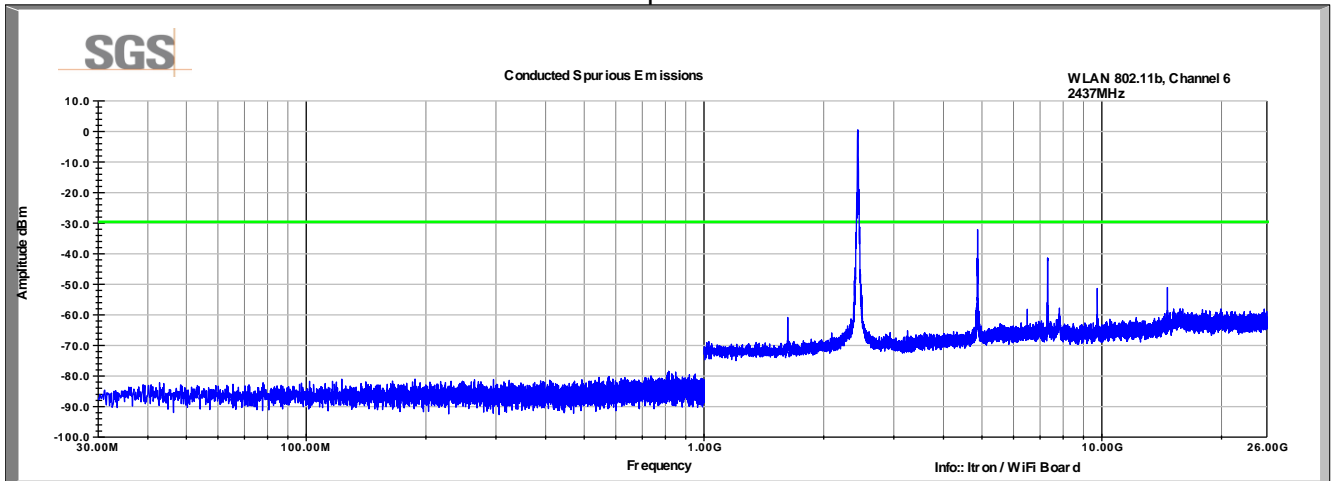


## 6.6 Test Data – Conducted Spurious Emissions

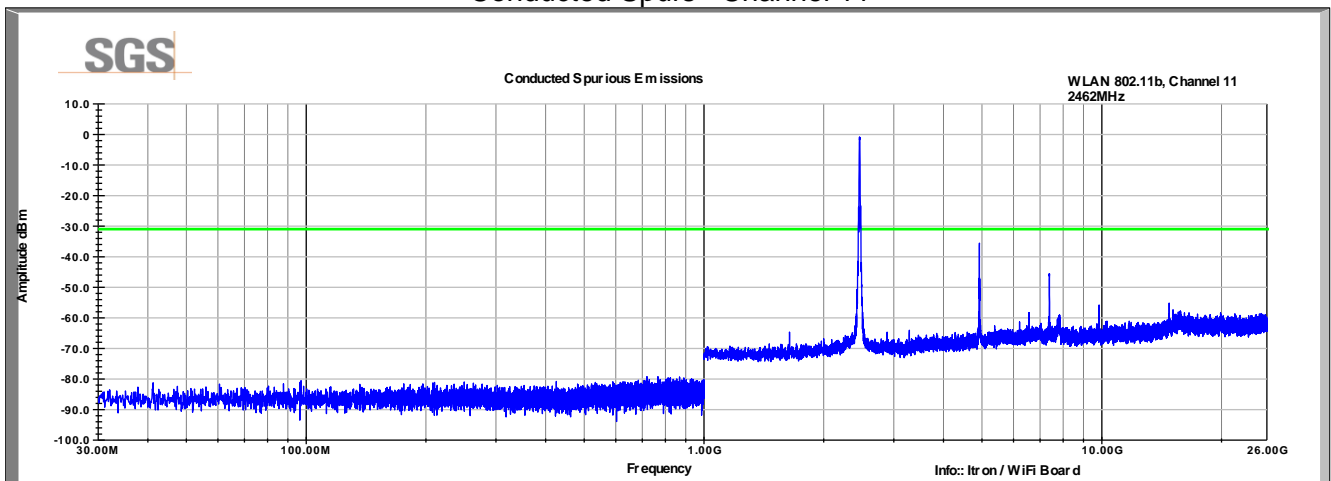
### Conducted Spurs –Channel 1



### Conducted Spurs –Channel 6



### Conducted Spurs –Channel 11



## 7 Field Strength of Spurious Radiation

### 7.1 Test Result

Test Description	Test Specification		Test Result
Spurious Emissions	15.247 (d) and 15.209	RSS-247 S5.5	Compliant

### 7.2 Test Method

Radiated spurious emissions measurements were recorded with the device configured to transmit at the lowest, middle, and highest channels. The frequency range investigated was up through the 10<sup>th</sup> harmonic of the fundamental transmit frequency. The methods defined in ANSI C63.10: 2013 were used.

Lowest, middle, and highest channels were investigated. Only the worst-case (802.11b, 1Mbps) was reported except at the restricted band edges where all three modulations were measured.

Test distance:

- 9k to 30 MHz – Near field prescan to determine if there were any emissions.
- 30 to 1000 MHz - The EUT to measurement antenna distance was 10 meters
- 1 to 18 GHz - The EUT to measurement antenna distance was 3 meters
- 18 to 26 GHz - The EUT to measurement antenna distance was 1 meter

Limits within restricted bands of operation:

Frequency	Limits <sup>(1)</sup>		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 <sup>(2)</sup>	--
88 - 216 MHz	150	43.5 <sup>(2)</sup>	--
216 - 960 MHz	200	46 <sup>(2)</sup>	--
960 - 1000 MHz	500	54 <sup>(2)</sup>	--
1 - 40 GHz	500	54 <sup>(3)</sup>	74

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.

(2) Quasi-peak limit

(3) Average limit

Note: No emissions associated with the radio were detected below 1GHz; therefore, in this frequency range, the Class A limits defined in §15.109 were applied to the system as a whole.

### 7.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 22.5 °C

Relative Humidity: 44.6 %

## 7.4 Test Equipment

Test End Date: 29-Sep-2017

Tester: JOP

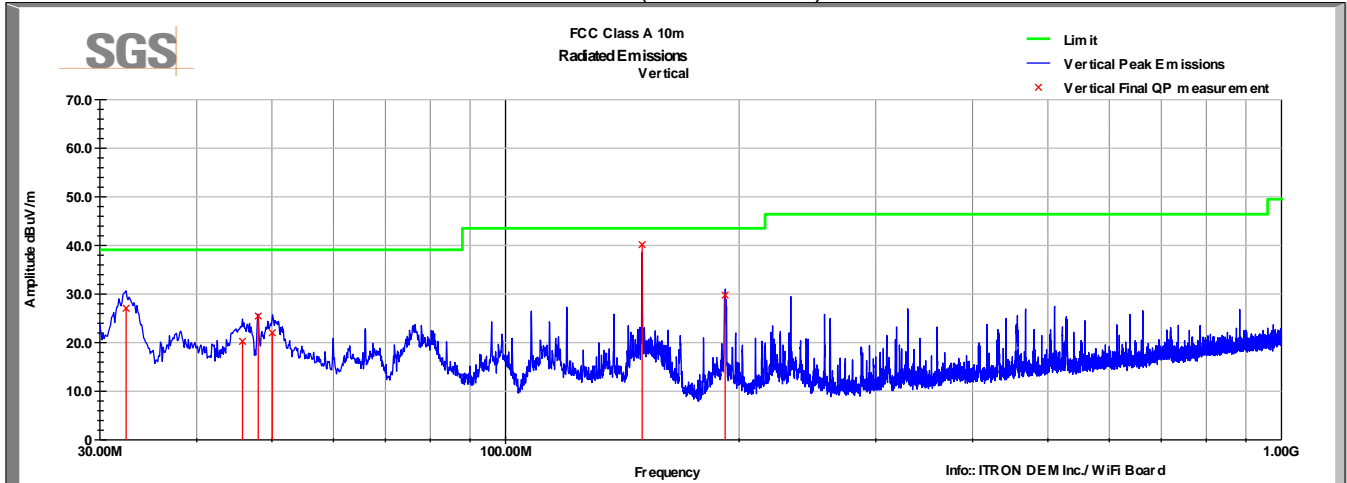
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079699	16-May-2018
RF CABLE	SF106	HUBER & SUHNER	B079712	24-Jul-2018
HORN(SMALL)	LB-180400-20-C-KF	A-INFO	15007	21-Mar-2018
RF CABLE	SF102	HUBER & SUHNER	B079822	27-Jul-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018
LOW NOISE AMPLIFIER	NSP1840-HG	MITEQ	B087572	28-Jul-2018
ANTENNA, BILOG	JB6	SUNOL	B079690	10-Nov-2017
RF CABLE	HPA190	RF LOGIC	17014	24-Jul-2018
RF CABLE	SF106	HUBER & SUHNER	B079717	24-Jul-2018
RF CABLE	SF106	HUBER & SUHNER	B079659	25-Jul-2018
RF CABLE	SUCOFLEX 100	HUBER & SUHNER	B108523	24-Jul-2018
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	22-Feb-2018

Note: The equipment calibration period is 1 year.

### 7.5 Peak Plots

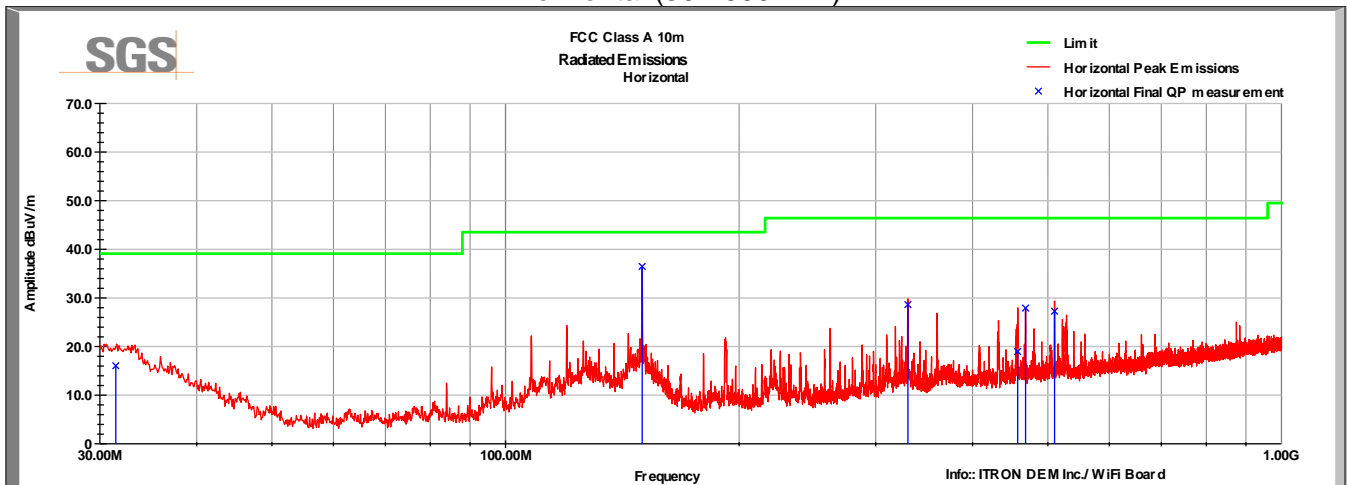
No emissions were detected in the range 9kHz to 30MHz.

Channel 1  
Vertical (30-1000MHz)



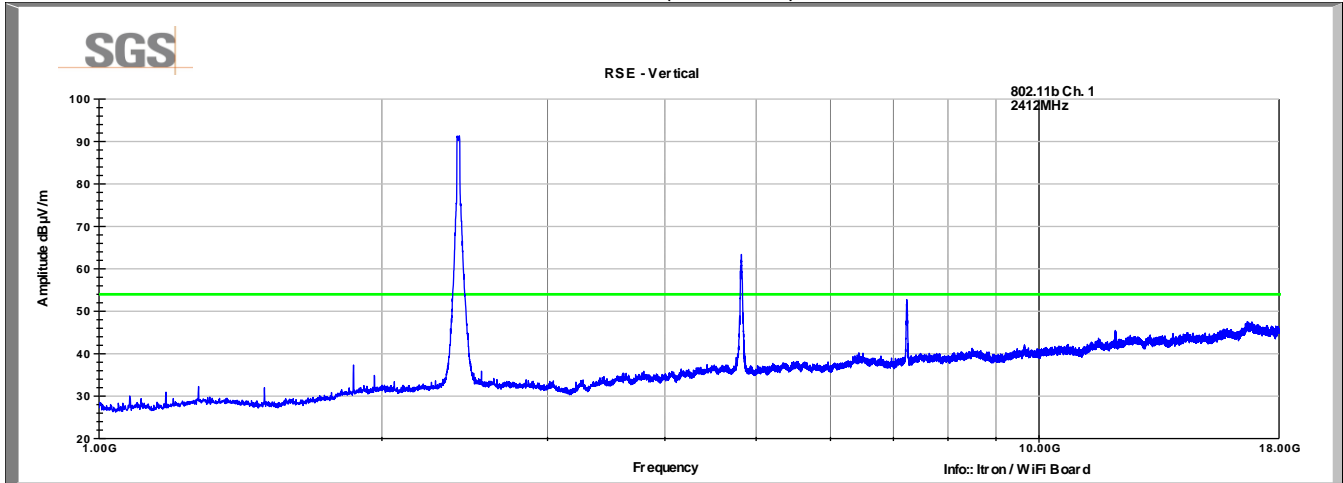
No emissions associated with the WLAN radio were detected below 1GHz

Horizontal (30-1000MHz)

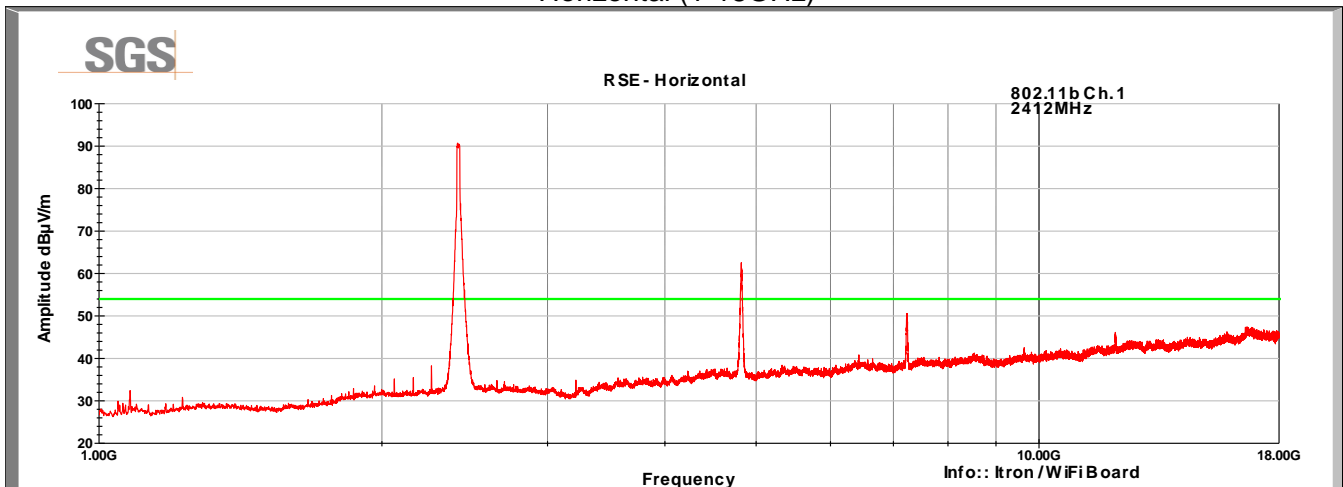


No emissions associated with the WLAN radio were detected below 1GHz

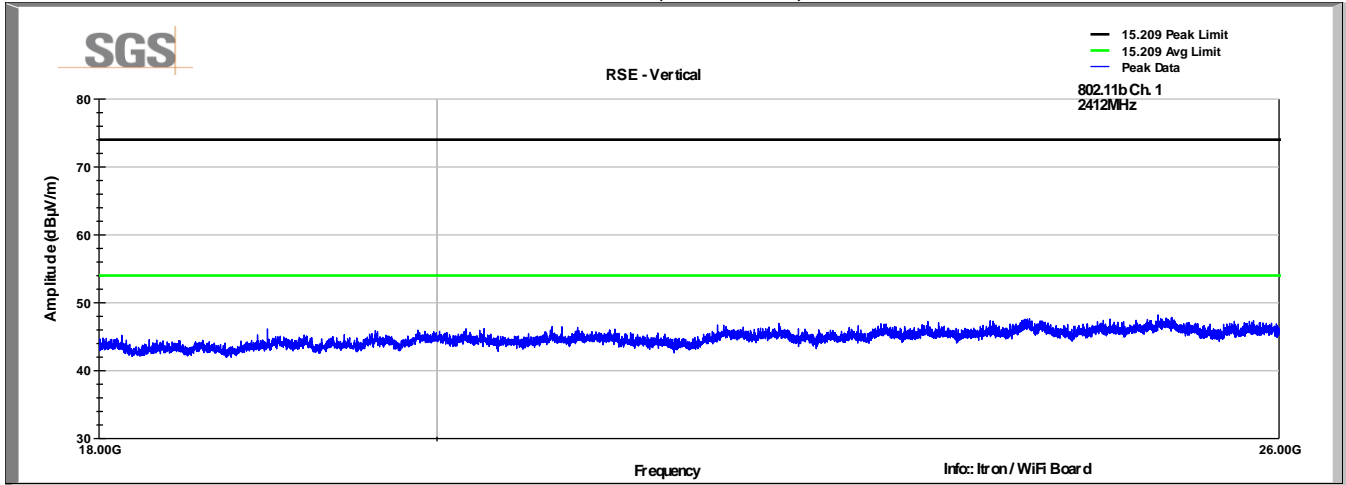
Channel 1  
Vertical (1-18GHz)



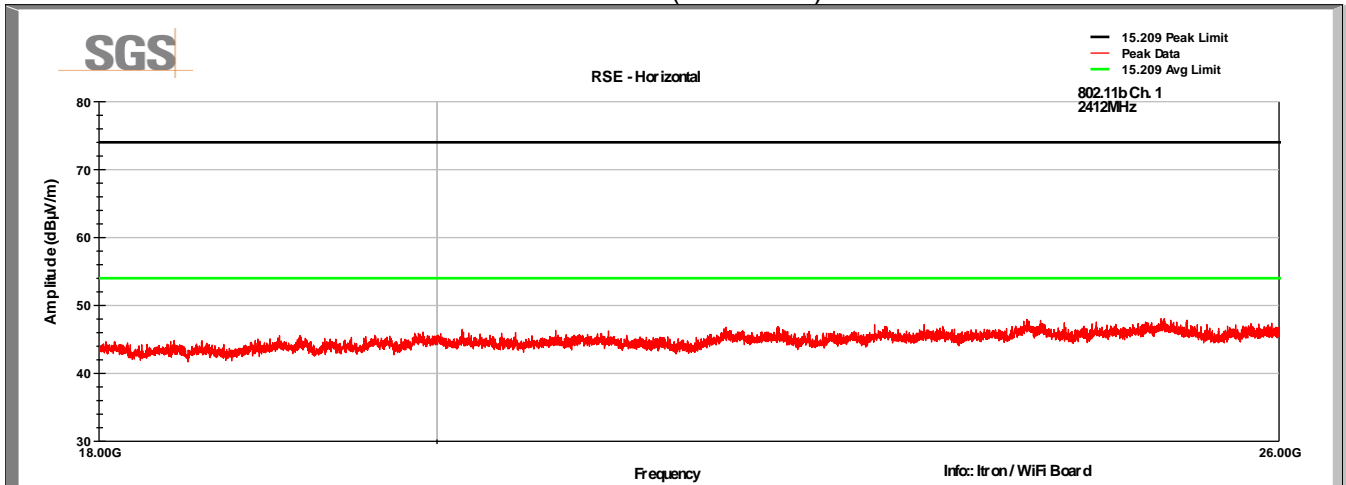
Horizontal (1-18GHz)



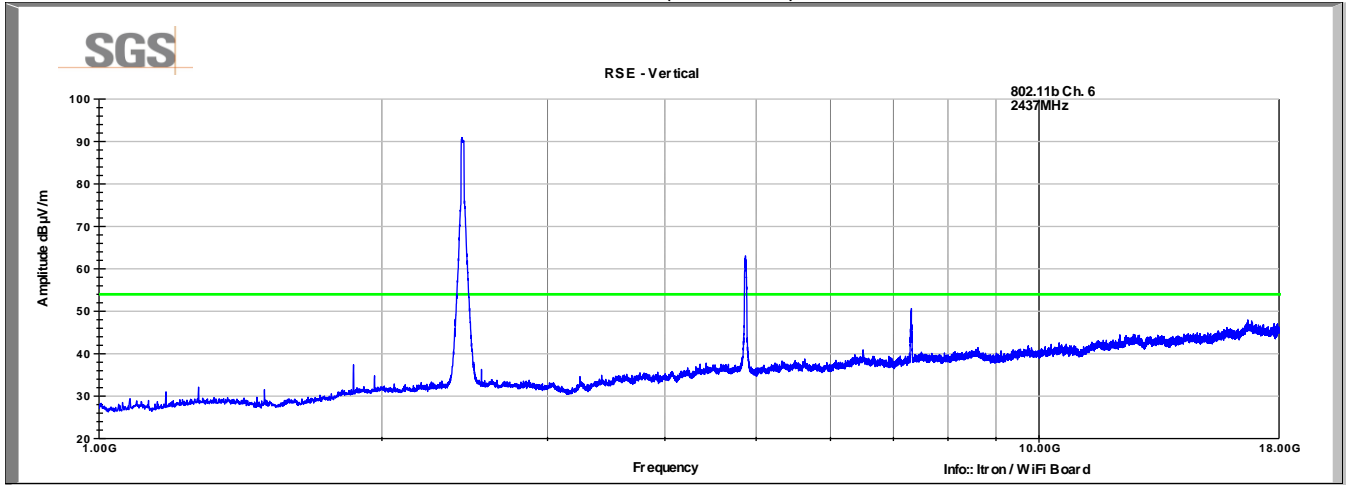
Channel 1  
Vertical (18-26GHz)



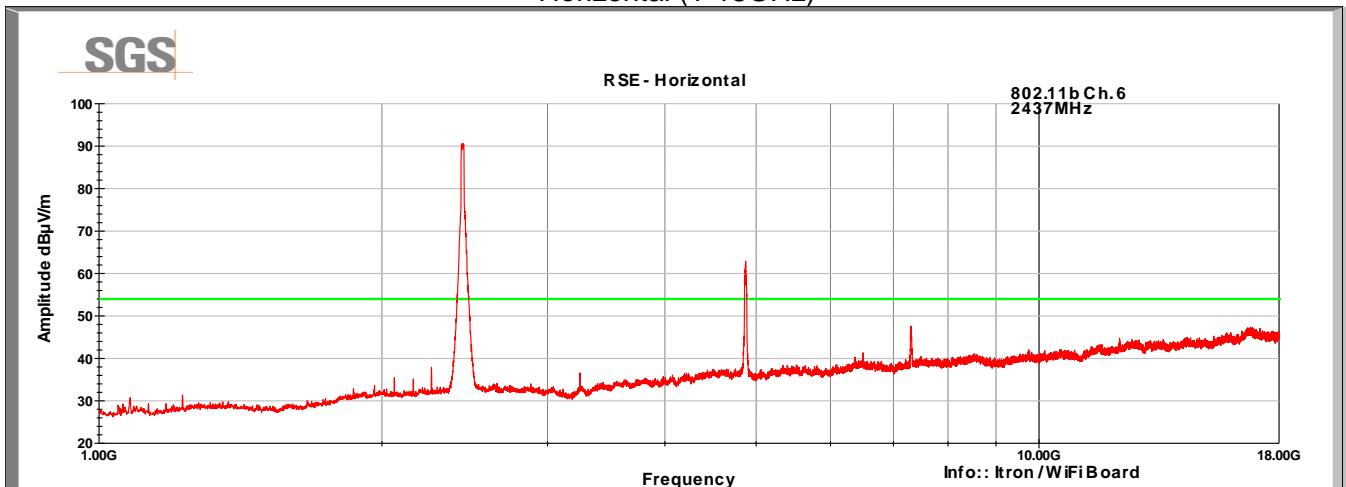
Horizontal (18-26GHz)



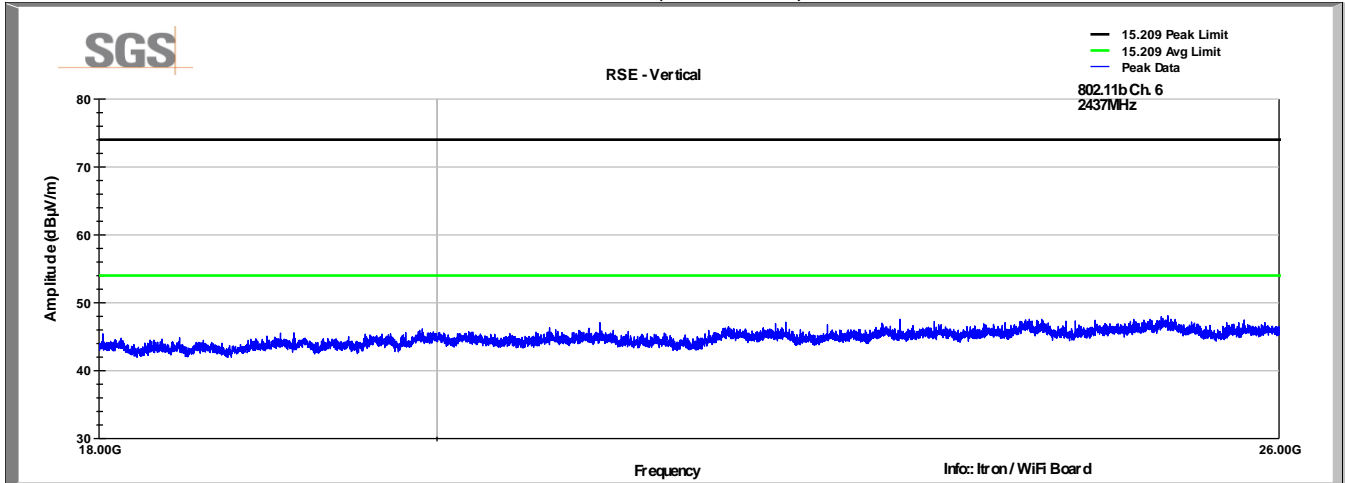
Channel 6  
Vertical (1-18GHz)



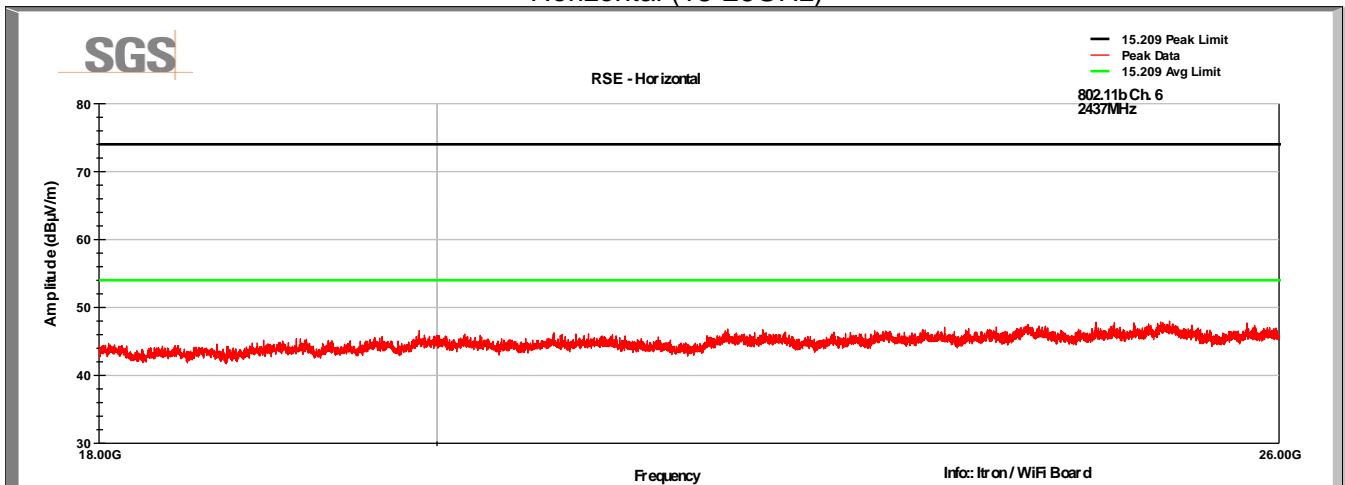
Horizontal (1-18GHz)



Channel 6  
Vertical (18-26GHz)

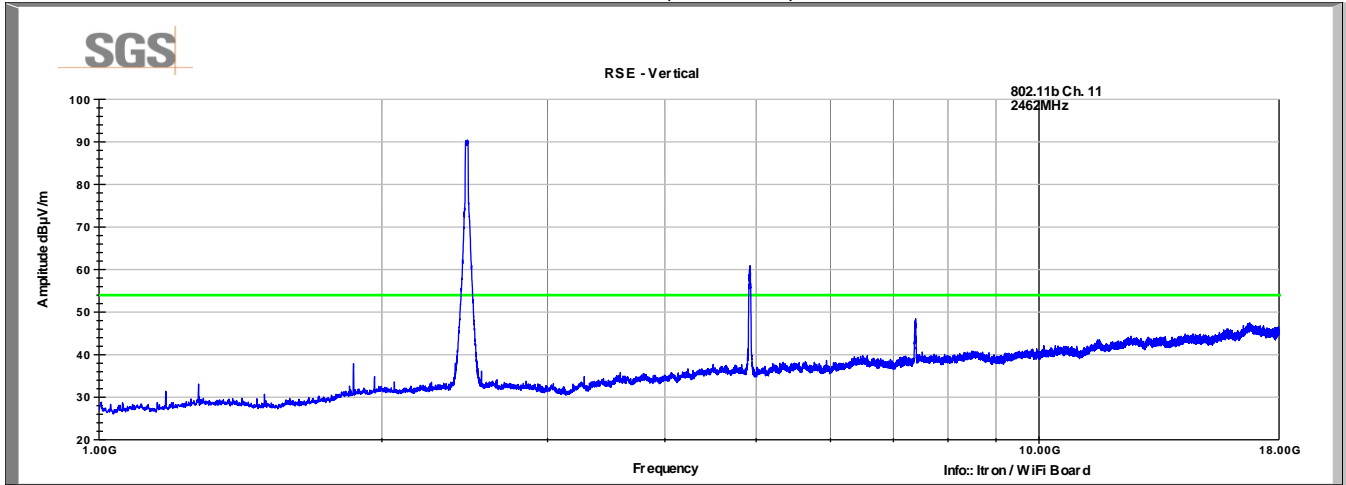


Horizontal (18-26GHz)

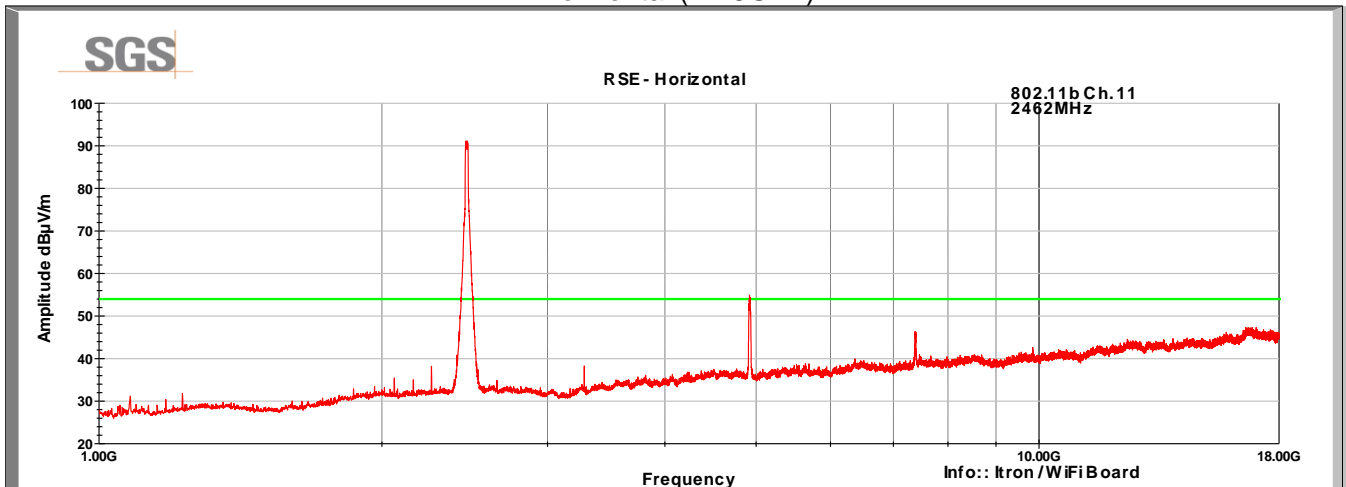




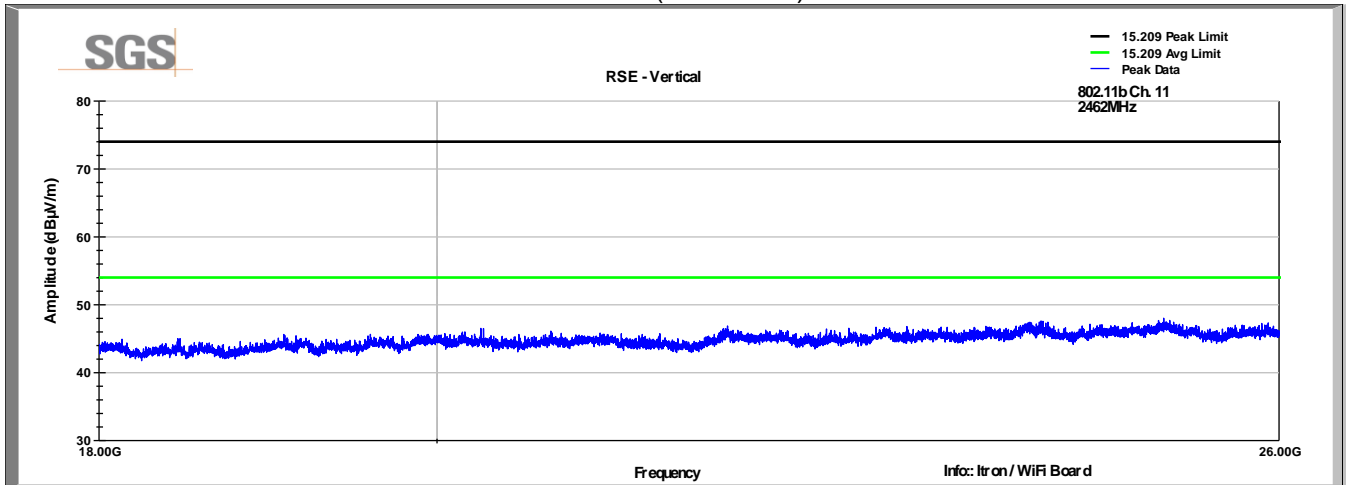
Channel 11  
Vertical (1-18GHz)



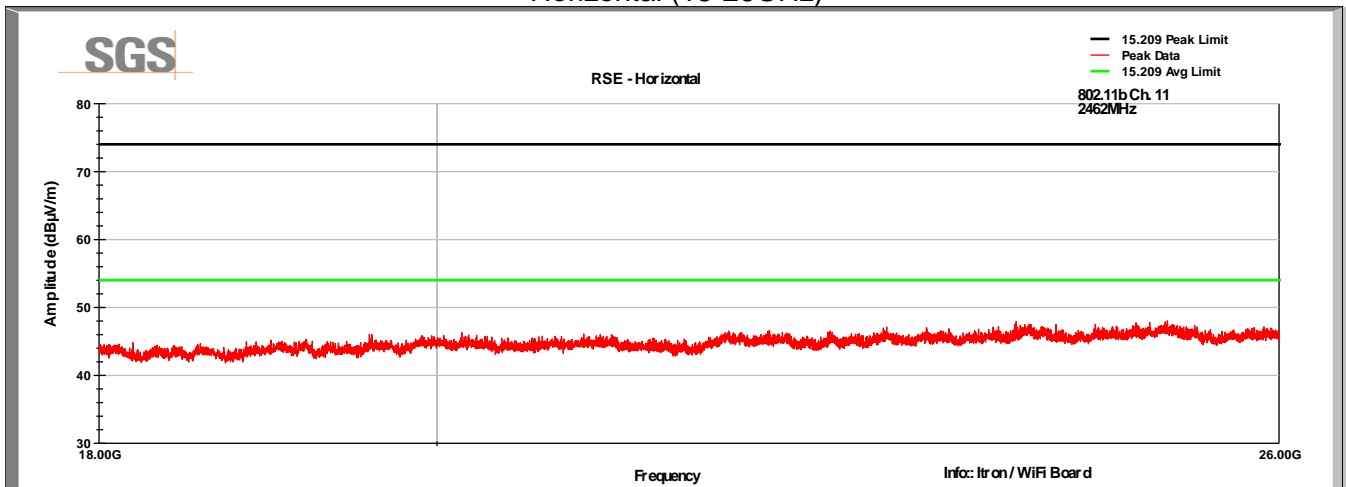
Horizontal (1-18GHz)



Channel 11  
Vertical (18-26GHz)



Horizontal (18-26GHz)



### 7.6 Tabular Data (<1GHz)

Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.44	38.2	V	0.0	149.0	19.5	0.6	31.3	27.1	39.1	-12.0
45.82	41.9	V	263.0	100.0	10.0	0.8	32.4	20.3	39.1	-18.8
48.01	48.4	V	230.0	250.0	8.8	0.8	32.5	25.5	39.1	-13.6
50.04	45.9	V	158.0	213.0	8.0	0.8	32.7	22.0	39.1	-17.1
150.00	60.0	V	250.0	100.0	12.6	1.4	33.8	40.2	43.5	-3.3
191.90	50.9	V	252.0	100.0	11.1	1.5	33.8	29.8	43.5	-13.7
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										
Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
31.45	26.3	H	114.0	185.0	20.3	0.6	31.2	16.0	39.1	-23.1
150.00	56.3	H	130.0	382.0	12.6	1.4	33.8	36.5	43.5	-7.0
330.00	46.1	H	141.0	325.0	14.2	2.0	33.7	28.6	46.4	-17.8
457.21	33.0	H	291.0	119.0	17.1	2.4	33.6	19.0	46.4	-27.4
468.01	41.7	H	264.0	233.0	17.4	2.4	33.6	27.9	46.4	-18.5
509.99	40.3	H	325.0	176.0	18.0	2.5	33.6	27.3	46.4	-19.1
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Note: There was no discernible difference in the measurement data below 1GHz when transmitting at different channels. QP measurements were only recorded with the device transmitting on Channel 1.

### 7.7 Tabular Data (>1GHz)

Frequency MHz	Raw Meas (dBuV)	Polarity (V/H)	Correction (dB/m)	Corr Value dBuV/m	Limit (dBuV/m)	Margin (dB)	Detector
4824.00	59.2	V	4.2	63.4	74.0	-10.6	Peak
4824.00	47.5	V	4.2	51.7	54.0	-2.3	Average
4824.00	58.1	H	4.2	62.3	74.0	-11.7	Peak
4824.00	46.4	H	4.2	50.6	54.0	-3.4	Average
7236.00	46.3	V	6.4	52.7	74.0	-21.3	Peak
7236.00	34.6	V	6.4	41.0	54.0	-13.0	Average
7236.00	44.2	H	6.4	50.6	74.0	-23.4	Peak
7236.00	32.5	H	6.4	38.9	54.0	-15.1	Average
4874.00	58.8	V	4.2	63.0	74.0	-11.0	Peak
4874.00	47.1	V	4.2	51.3	54.0	-2.7	Average
4874.00	58.7	H	4.2	62.9	74.0	-11.1	Peak
4874.00	47.0	H	4.2	51.2	54.0	-2.8	Average
7311.00	44.2	V	6.4	50.6	74.0	-23.4	Peak
7311.00	32.5	V	6.4	38.9	54.0	-15.1	Average
7311.00	41.0	H	6.4	47.4	74.0	-26.6	Peak
7311.00	29.3	H	6.4	35.7	54.0	-18.3	Average
4924.00	56.7	V	4.2	60.9	74.0	-13.1	Peak
4924.00	45.0	V	4.2	49.2	54.0	-4.8	Average
4924.00	50.6	H	4.2	54.8	74.0	-19.2	Peak
4924.00	38.9	H	4.2	43.1	54.0	-10.9	Average
7386.00	42.0	V	6.4	48.4	74.0	-25.6	Peak
7386.00	30.3	V	6.4	36.7	54.0	-17.3	Average
7386.00	40.0	H	6.4	46.4	74.0	-27.6	Peak
7386.00	28.3	H	6.4	34.7	54.0	-19.3	Average

## 8 Radiated Emissions at Band Edge / Restricted Band

### 8.1 Test Result

Test Description	Test Specification	Test Result
Field strength of spurious radiation	15.247 (d) and 15.209	Compliant

### 8.2 Test Method

Field strength measurements were performed at the restricted band edges of 2390MHz and 2483.5MHz for each modulation. Measurements were made using the conducted methods defined in Section 12 of FCC publication D01 DTS Meas Guidance v04.

#### Offset Calculations:

Offset calculations so that conducted measurements on the spectrum analyzer in dB $\mu$ V represent field strength measurements in dB $\mu$ V/m.

$$\text{Offset} = -20\text{Log}(D) + 104.8 - 107 + \text{CL} + \text{DC} + \text{AG}$$

$$\text{Offset}_{3\text{m}} = -11.7 + \text{CL} + \text{DC} + \text{AG}$$

D = 3m	Distance
CL = 1.3 dB	Cable Loss
DC = 0 dB (>98%)	Duty Cycle Correction Factor
AG = 2.15 dB*	Antenna Gain

$$\text{Offset} = -8.3 \text{ dB}$$

- The actual antenna gain was calculated to be 0.5dBi. 2 dB correction is the minimum allowed by the test method.

### 8.3 Test Site

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions

Temperature: 24.2 °C

Relative Humidity: 52.4 %

### 8.4 Test Equipment

Test Date: 14-Sep-2017

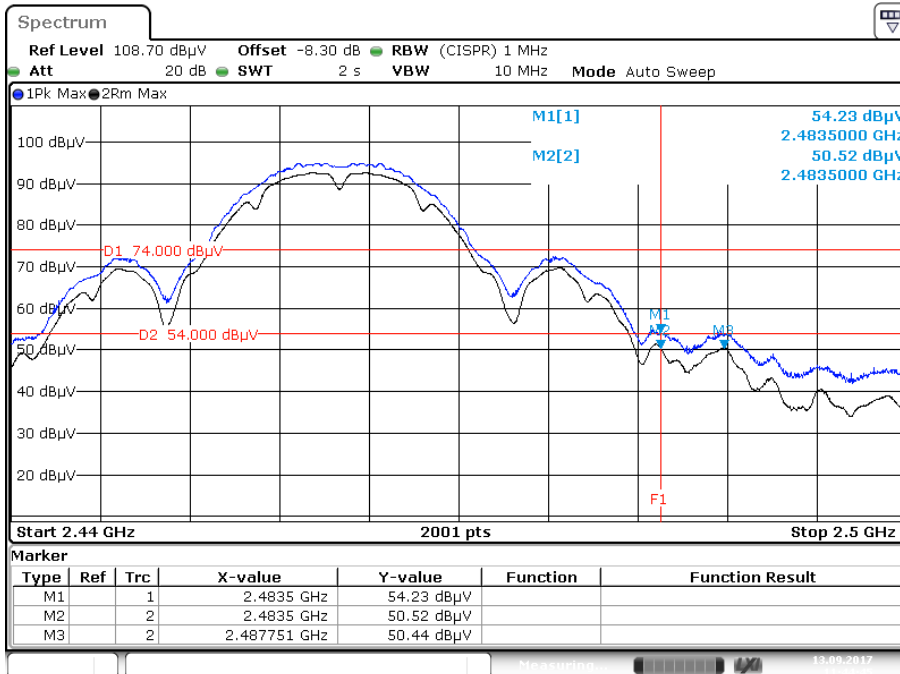
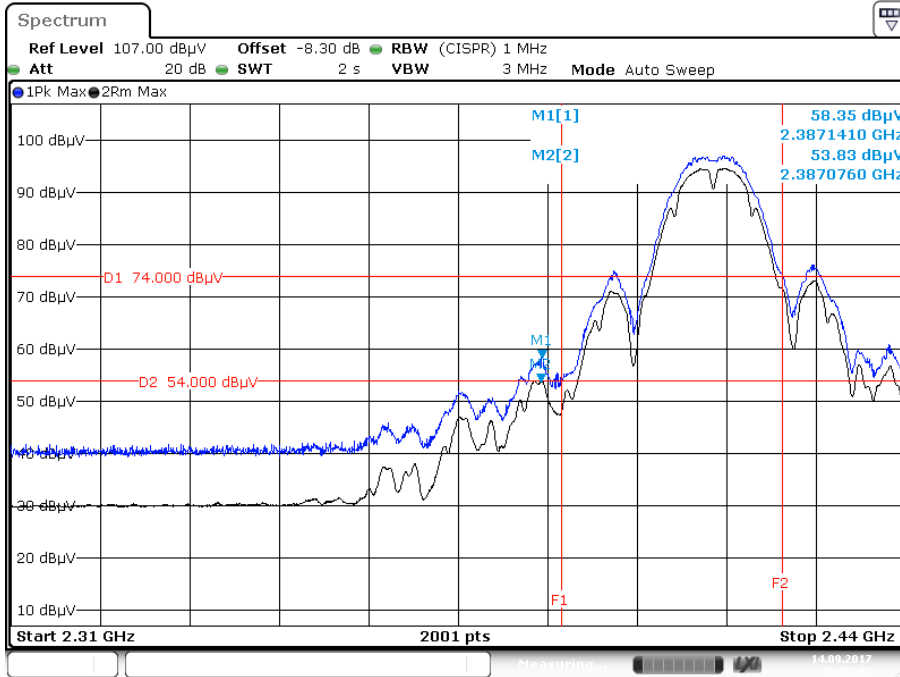
Tester: JOP

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
CAPACITIVE VOLTAGE PROBE	CVP 2200A	TESEQ	B085749	8-Oct-2017
ATTENUATOR 1K $\Omega$	INA 265A	TESEQ	B079823	26-Jul-2018

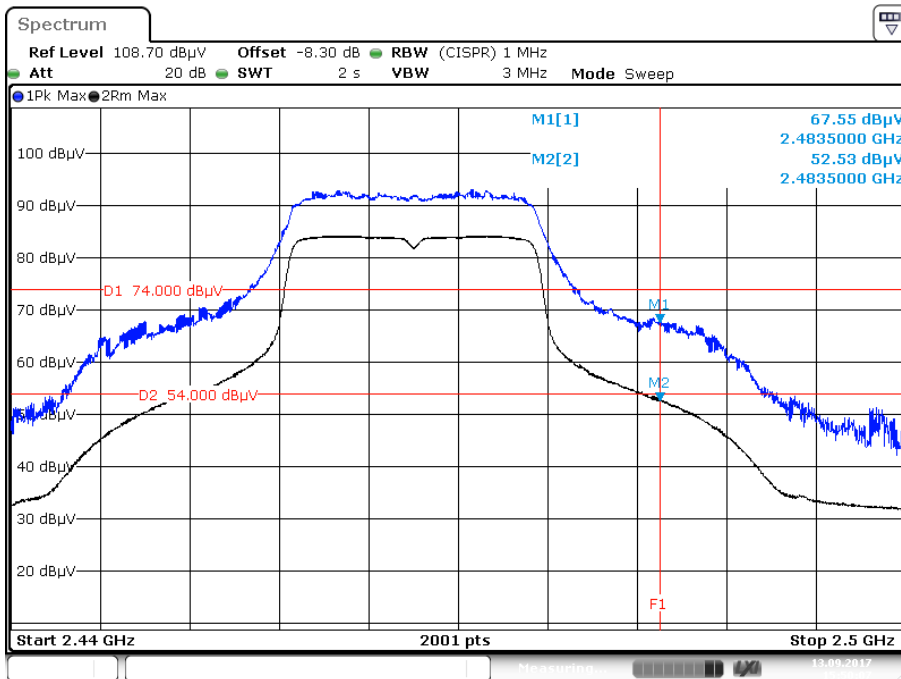
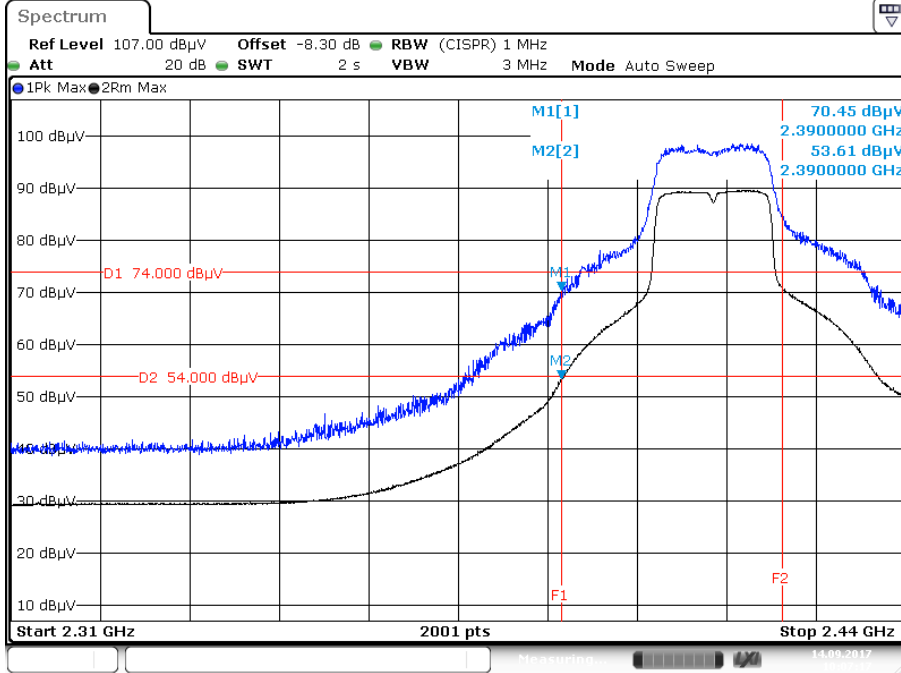
Note: The equipment calibration period is 1 year except for the FSV which is on a 2 year cycle.

### 8.5 Test Data

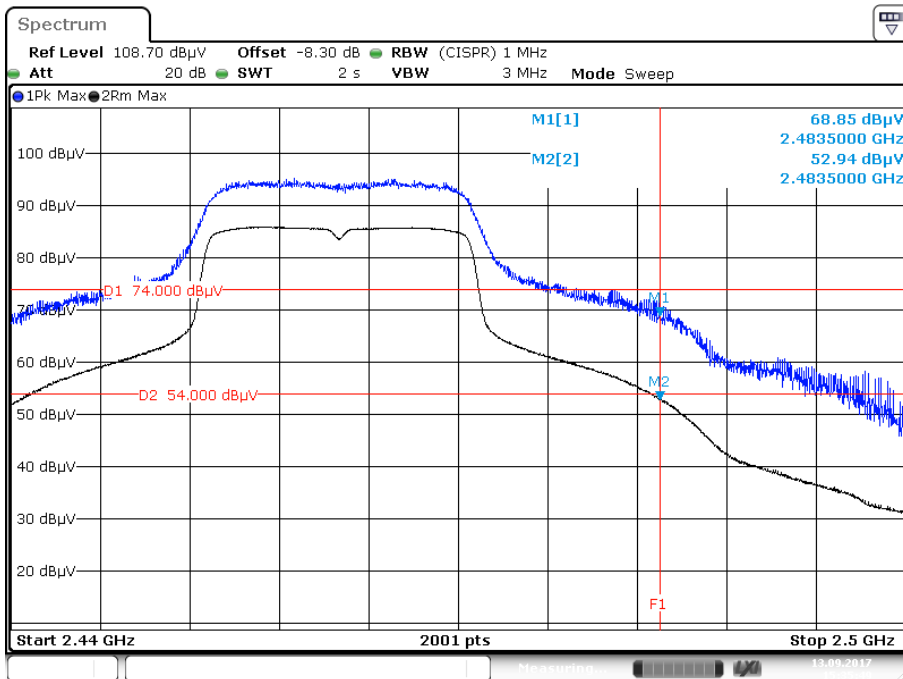
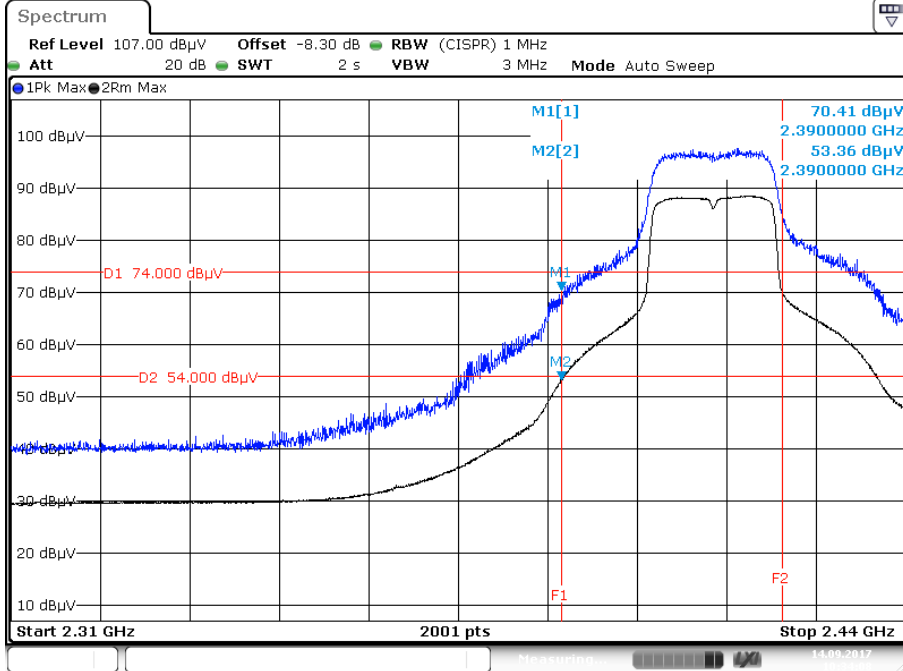
#### 802.11b



## 802.11g

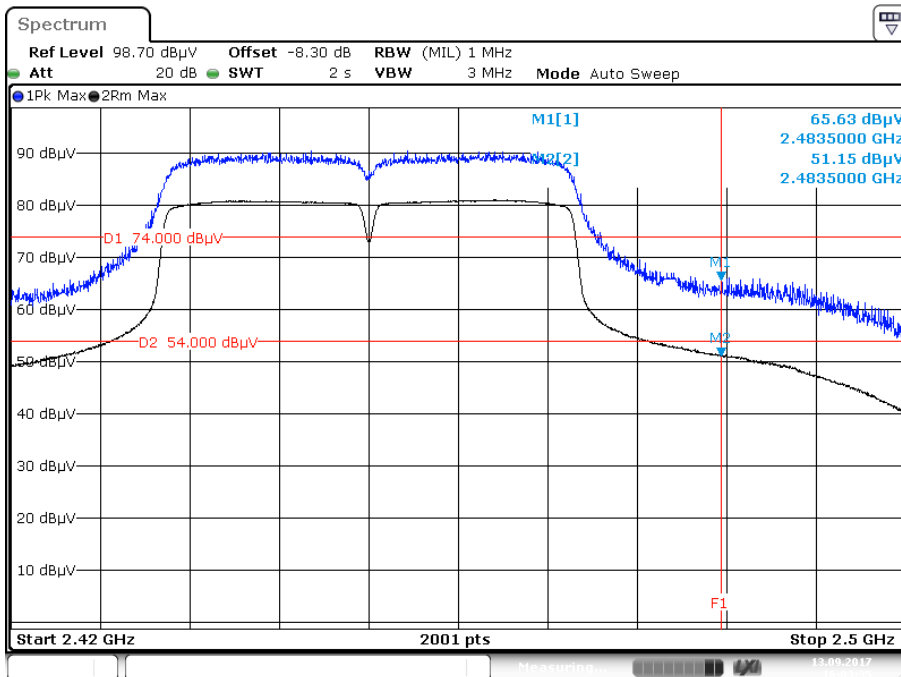
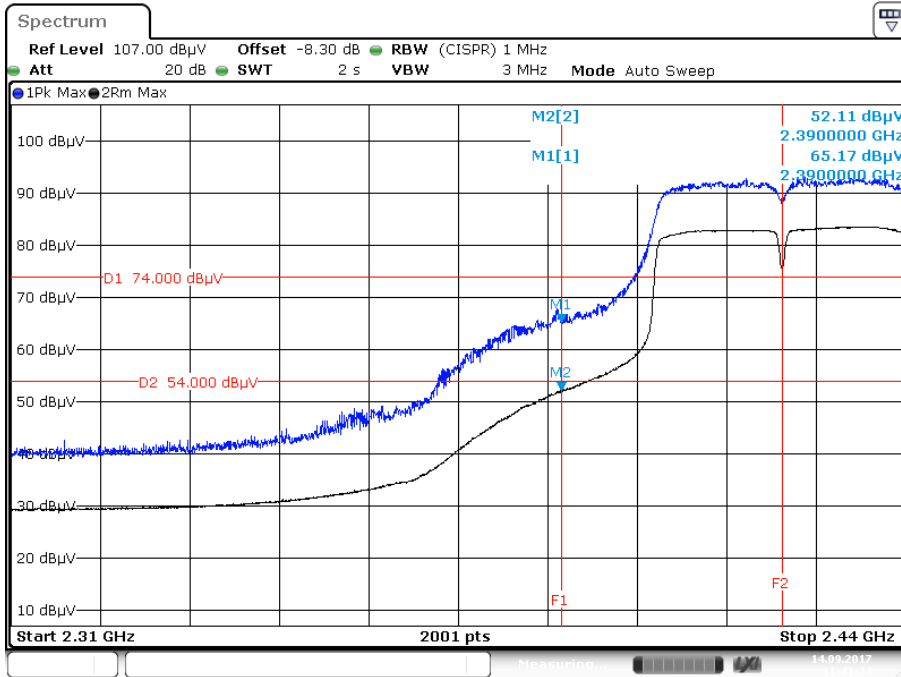


## 802.11n (HT20)





802.11n (HT40)



## 9 Conducted Emissions

### 9.1 Test Result

Test Description	Basic Standards	Test Result
Conducted Emissions, Class B	RSS-GEN, Issue 4 ANSI C63.4:2014	Compliant

### 9.2 Test Method

With the receivers resolution bandwidth was set to 9 kHz the initial preliminary exploratory scans were performed over the measuring frequency range (0.15MHz to 30MHz) using a max hold mode incorporating a Peak detector and Average detector and using the TILE! software. The final test data was measured using a Quasi-Peak detector and Average detector and compared against the limits indicated in the table below.

Frequency Range	Class A Limits (dBuV)	Class B Limits (dBuV) CISPR
0.15 to 0.5 MHz	Avg 66 QP 79	Avg 56 to 46 QP 66 to 56
0.5 to 5 MHz	Avg 60 QP 73	Avg 46 Pk 56
5 to 30 MHz	Avg 60 QP 73	Avg 50 Pk 60

### 9.3 Test Equipment

Test End Date: 17-Aug-2017

Tester: ASF

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
CONDUCTED COMB GENERATOR	CGC-255	COM-POWER	B079696	CNR
LINE IMPEDANCE STABILIZATION NETWORK	NNB 51	TESEQ	B085882	1-Nov-2017
RF CABLE	SF106	HUBER & SUHNER	B079660	25-Jul-2018
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018

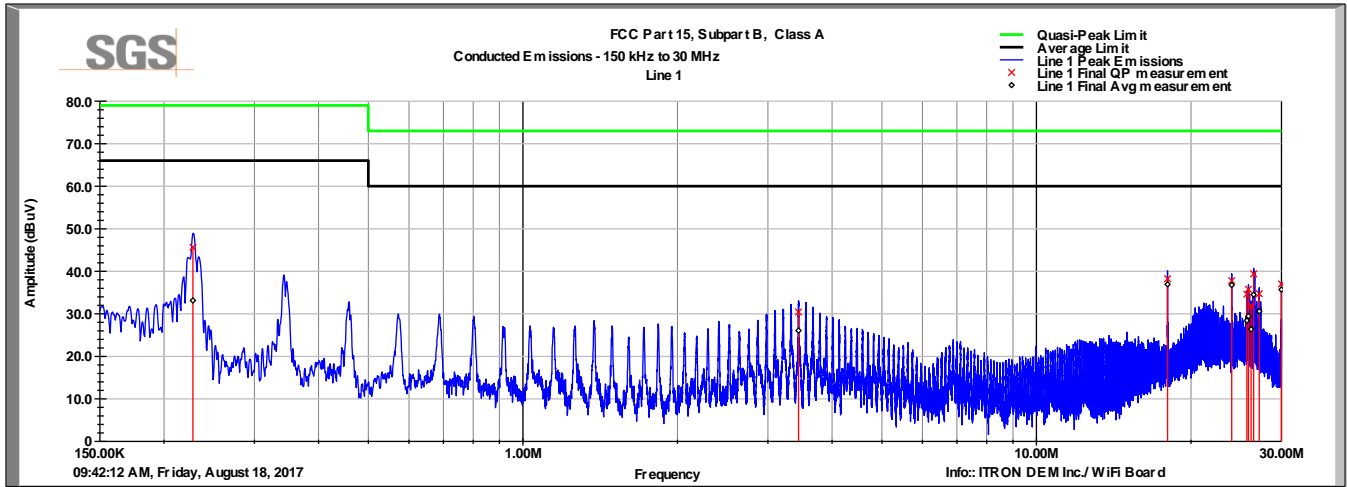
Note: The equipment calibration period is 1 year.

Software:

TILE! software profile: Conducted Emissions\_2015.TIL

### 9.4 Test Data

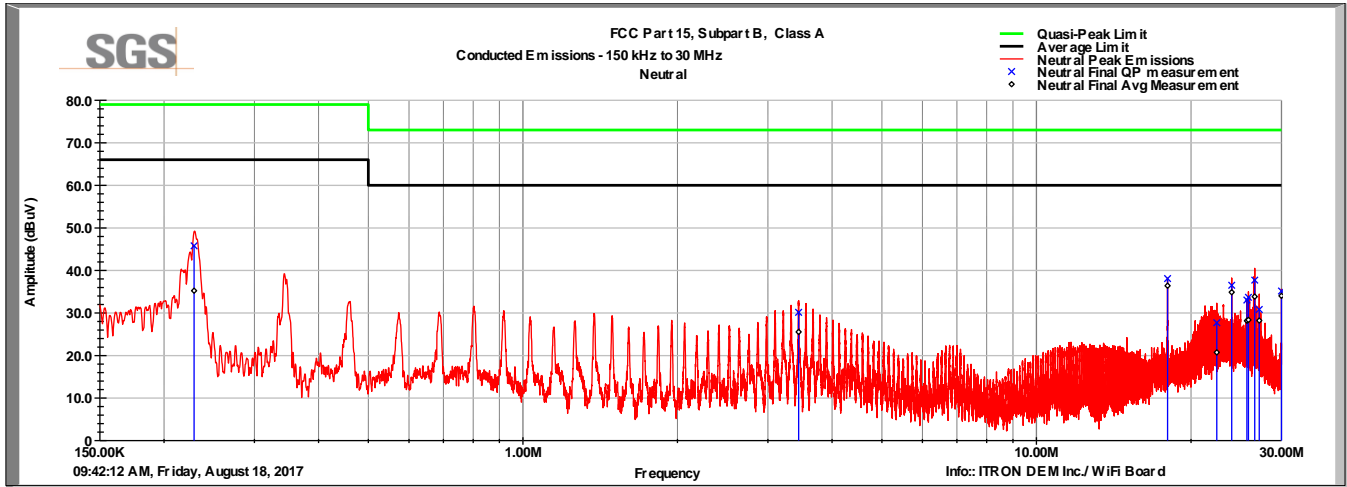
Line 1 Conducted Emissions Plot



Line 1 Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.228	45.6	79.0	-33.4	33.1	66.0	-32.9
3.441	30.4	73.0	-42.6	26.0	60.0	-34.0
18.000	38.2	73.0	-34.8	36.9	60.0	-23.1
24.000	37.8	73.0	-35.2	36.7	60.0	-23.3
25.694	34.6	73.0	-38.4	28.4	60.0	-31.6
25.878	35.7	73.0	-37.3	29.5	60.0	-30.5
26.184	31.9	73.0	-41.1	26.3	60.0	-33.7
26.490	39.4	73.0	-33.6	34.5	60.0	-25.5
27.161	34.7	73.0	-38.3	30.6	60.0	-29.4
30.000	37.0	73.0	-36.0	35.7	60.0	-24.3

### Neutral Conducted Emissions Plot



### Neutral Conducted Emissions Data

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.229	45.8	79.0	-33.2	35.2	66.0	-30.8
3.443	30.1	73.0	-42.9	25.5	60.0	-34.5
18.000	38.1	73.0	-34.9	36.4	60.0	-23.6
22.458	27.7	73.0	-45.3	20.7	60.0	-39.3
24.000	36.5	73.0	-36.5	34.8	60.0	-25.2
25.695	33.0	73.0	-40.0	28.2	60.0	-31.8
25.878	33.7	73.0	-39.3	28.4	60.0	-31.6
26.610	37.7	73.0	-35.3	33.8	60.0	-26.2
27.164	30.8	73.0	-42.2	28.2	60.0	-31.8
30.000	35.2	73.0	-37.8	34.0	60.0	-26.0

## 10 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	29 September 2017