EMC Test Report

Project Number: 4195027

Report Number: 4195027EMC01 **Revision Level:** 0

Client: Stanley Black and Decker

Equipment Under Test: Outdoor Access Point

Model: DCT100

FCC ID: YJ7DCT100

IC ID: 9082A-DCT100

Applicable Standards: FCC Part 15 Subpart C, § 15.247
RSS-247, Issue 2
ANSI C63.10: 2013

Report issued on: 24 October 2017

Test Result: Compliant

Tested by: _____
Fabian Nica, Senior Engineering Technician

Reviewed by: _____
David Schramm, Operations Manager

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.

Table of Contents

1 Summary of Test Results

Test Description	Test Specification		Test Result
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

1.1 *Modifications Required for Compliance*

None

2 General Information

2.1 *Client Information*

Name:	Stanley Black and Decker
Address:	701 E. Joppa Road
City, State, Zip, Country:	Towson, MD 21286, 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*

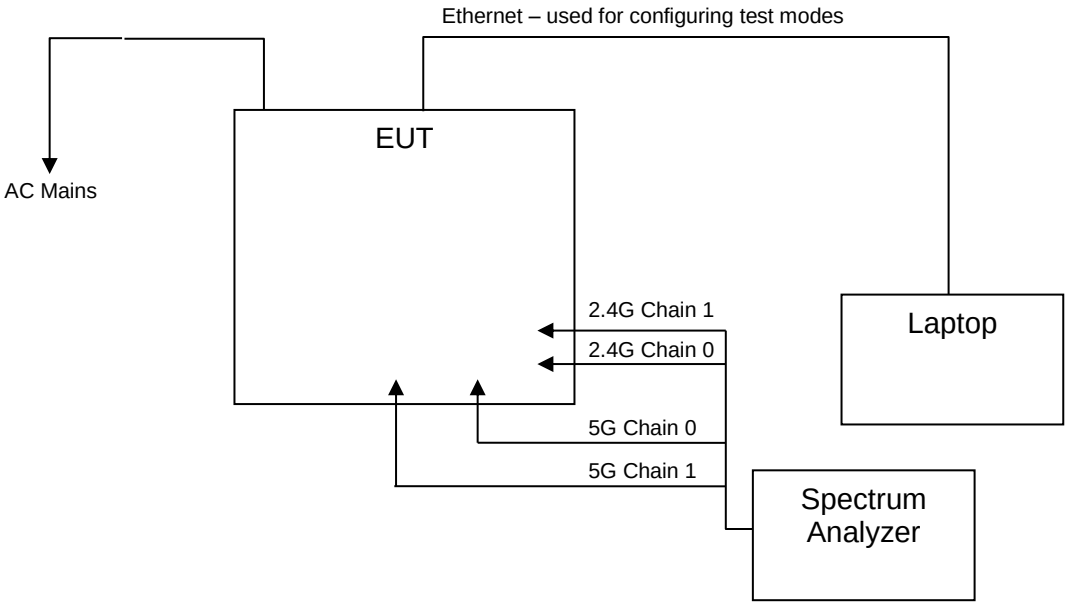
Type of Product:	Outdoor Access Point
Model Number:	DCT100
Serial Number:	DCT100-46361 (Conducted Measurements) DCT100-46384 (Radiated Measurements)
Frequency Range:	2400-2483.5MHz
Data Modes:	802.11b, 802.11g, 802.11n (HT20), 802.11n (HT40)
Antenna:	Internal, 2x2 MIMO (4dBi Max Gain)
Rated Voltage:	100-240Vac, 50/60Hz
Test Voltage:	120Vac, 60Hz
Sample Received Date:	04 and 10 October 2017
Dates of testing:	04 - 16 October 2017

2.4 *Operating Modes and Conditions*

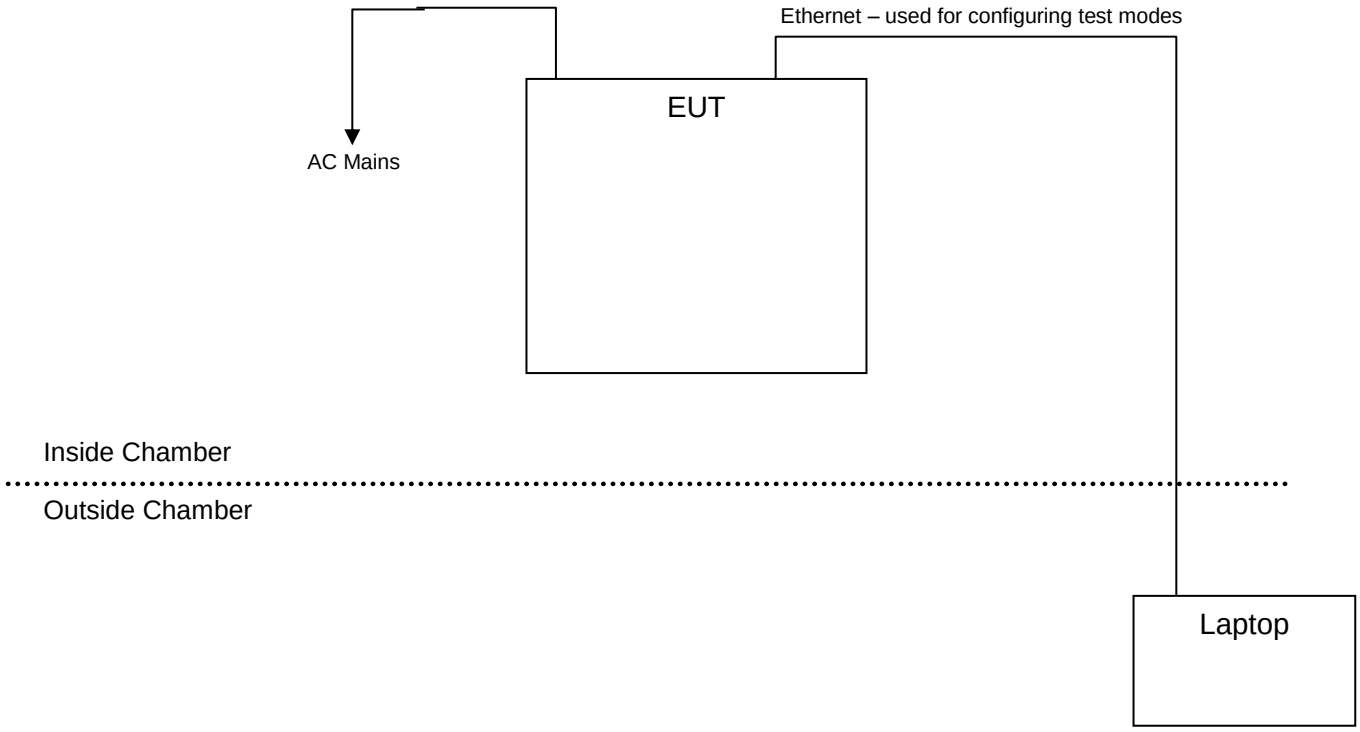
For spurious emissions measurements, only the worst-case mode with respect to peak power was investigated: 802.11b, 1Mbps. Investigations covered the low, middle, and high channels in the 2400-2483.5MHz band.

Continuous traffic was generated using test commands. Where the duty cycle measured below 99% and an RMS detector was employed, corrections of 10*LOG(1/D) were applied according to KDB publication 558074 D01 DTS Meas Guidance v04.

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	Stanley Black and Decker	Outdoor Access Point	DCT100	DCT100-46361 (Conducted Measurements) DCT100-46384 (Radiated Measurements)

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: 23.3 °C
Relative Humidity: 52.7 %

3.4 *Test Equipment*

Test End Date: 13-Oct-2017 Tester: JOP/FN

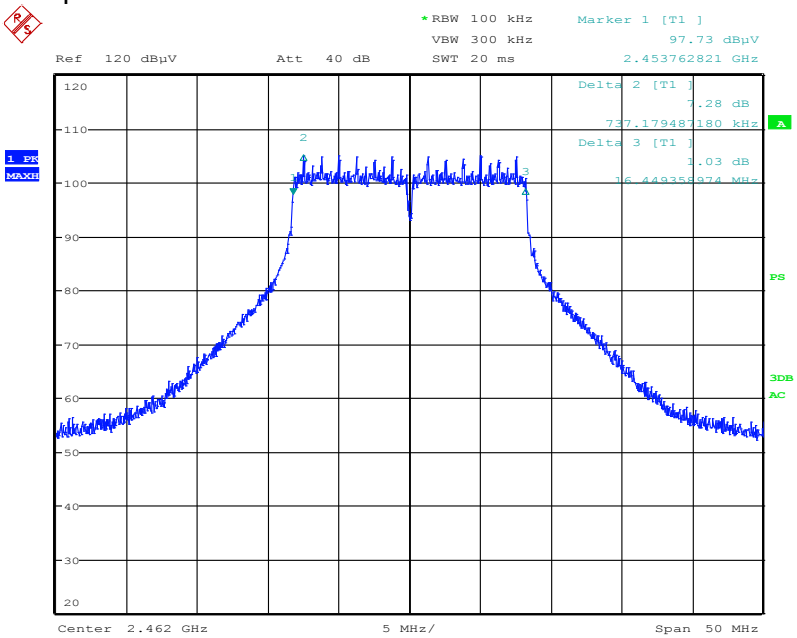
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year.

3.5 *Test Data*

Protocol	Channel	Data Rate	6dB Bandwidth (MHz)	Occupied Bandwidth (99%) (MHz)
802.11b	1	1 Mbps	12.12	15.7
802.11b	6	1 Mbps	12.00	15.67
802.11b	11	1 Mbps	12.01	15.69
802.11g	1	6 Mbps	15.78	16.54
802.11g	6	6 Mbps	15.68	16.53
802.11g	11	6 Mbps	15.78	16.54
802.11n (HT20)	1	MCS0	15.83	16.54
802.11n (HT20)	6	MCS0	15.54	16.53
802.11n (HT20)	11	MCS0	16.45	16.55
802.11n (HT40)	3	MCS0	33.49	36.1
802.11n (HT40)	6	MCS0	37.43	36.1
802.11n (HT40)	9	MCS0	36.2	36.27

Sample Plots



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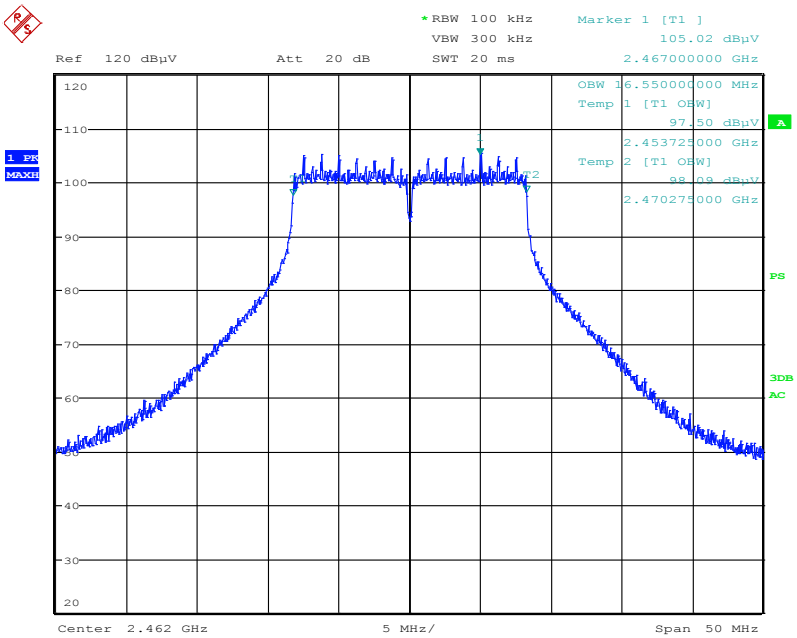

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4 Output Power

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 average power procedures from ANSI C63.10: 2013 clause 11.9 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: 23.3 °C

Relative Humidity: 52.7 %

4.4 *Test Equipment*

Test End Date: 12-Oct-2017 Tester: FN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year.

4.5 *Test Data*

802.11b 20MHz						
Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Total Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
1	16.8	16.4	19.62	4	30	-10.38
6	16.1	16.6	19.37	4	30	-10.63
11	15.7	16.33	19.04	4	30	-10.96

802.11g 20MHz						
Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Total Power	Antenna Gain(dBi)	Power Limit dBm	Margin
1	13.93	13.22	16.6	4	30	-13.4
6	16.8	17.5	20.18	4	30	-9.82
11	13.05	12.63	15.86	4	30	-14.14

802.11n 20MHz						
Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Total Power	Antenna Gain(dBi)	Power Limit dBm	Margin
1	13.92	13.19	16.59	4	30	-13.41
6	17.05	17.47	20.28	4	30	-9.72
11	12.94	12.88	15.93	4	30	-14.07

802.11n 40MHz						
Channel (WLAN)	Chain 0 (dBm)	Chain 1 (dBm)	Total Power	Antenna Gain(dBi)	Power Limit dBm	Margin
3	6.34	4.64	8.59	4	30	-21.41
6	9.42	9.43	12.44	4	30	-17.56
9	5.56	5.65	8.62	4	30	-21.38

Note: Antenna gain is directional gain provided by applcant.

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: 23.3 °C
Relative Humidity: 52.7 %

5.4 *Test Equipment*

Test End Date: 13-Oct-2017 Tester: JOP/FN

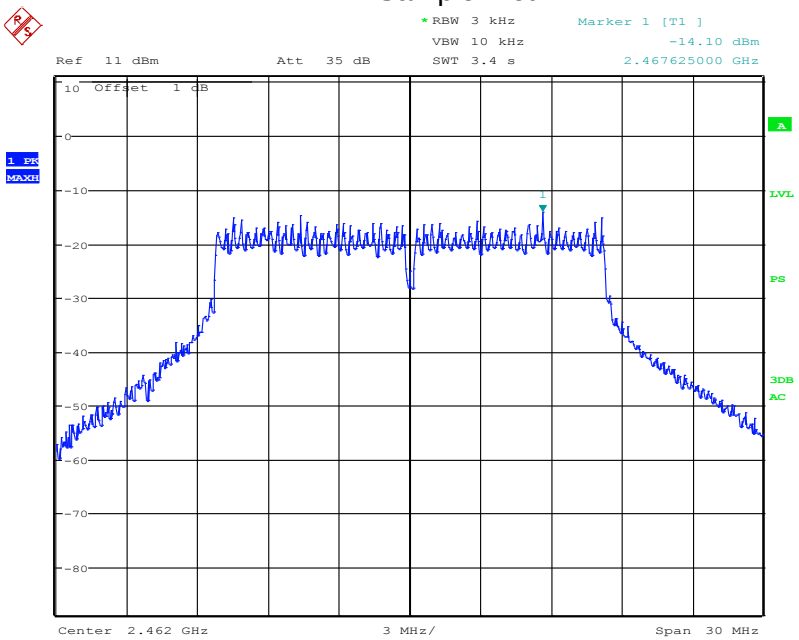
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year.

5.5 *Test Data*

Protocol	Channel	PSD Chain 0 (dBm)	PSD Chain 1 (dBm)	PSD Summed (dBm)	Limit (dBm)	Margin (dB)
802.11b	1	-9.47	-7.00	0.97	8	-7.03
802.11b	6	-8.20	-7.71	1.37	8	-6.63
802.11b	11	-8.34	-7.91	0.97	8	-7.03
802.11g	1	-12.45	-8.98	0.55	8	-7.45
802.11g	6	-8.32	-8.45	0.86	8	-7.14
802.11g	11	-13.61	-8.39	0.43	8	-7.57
802.11n (HT20)	1	-13.16	-8.20	0.33	8	-7.67
802.11n (HT20)	6	-13.24	-8.00	0.30	8	-7.70
802.11n (HT20)	11	-14.1	-8.02	0.25	8	-7.75
802.11n (HT40)	3	-15.08	-8.27	0.13	8	-7.87
802.11n (HT40)	6	-16.22	-10.07	0.10	8	-7.90
802.11n (HT40)	9	-16.80	-8.60	0.09	8	-7.91

Sample Plot



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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 average conducted peak output power was used to determine compliance with the output power limits, the limit is 30 dB below the maximum in-band peak PSD level in 100 kHz.

6.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 23.3 °C
Relative Humidity: 52.7 %

6.4 *Test Equipment*

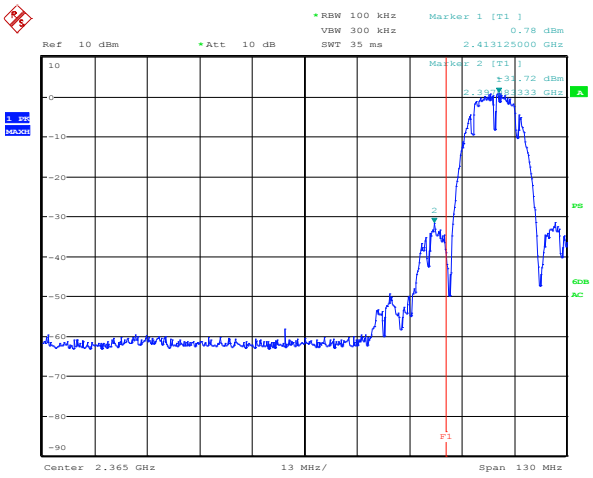
Test End Date: 13-Oct-2017 Tester: JOP/FN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018
SPECTRUM ANALYZER	FSV30	ROHDE & SCHWARZ	101106	20-Sep-2018

Note: The equipment calibration period is 1 year.

6.5 *Test Data – DTS Bandedge*

802.11b
Lower band edge / Upper band edge
Channel 1 / Channel 11
1Mbit/s



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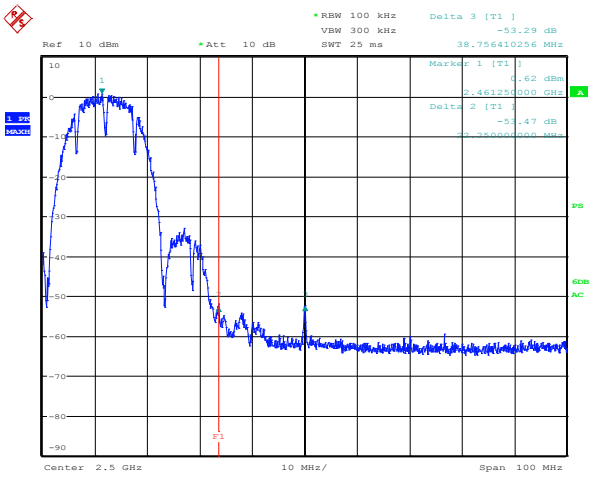

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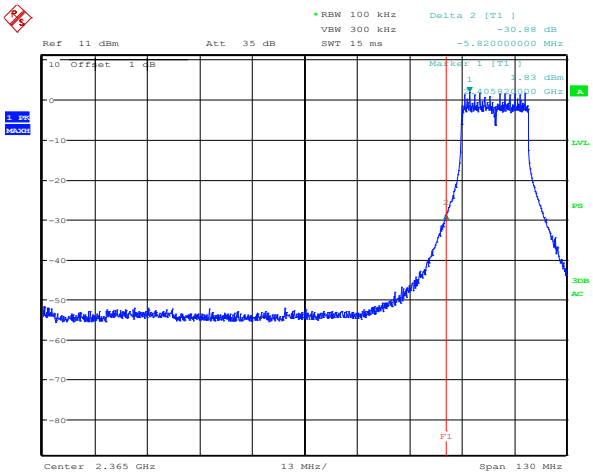
802.11g
Lower band edge / Upper band edge
Channel 1 / Channel 11
6Mbit/s



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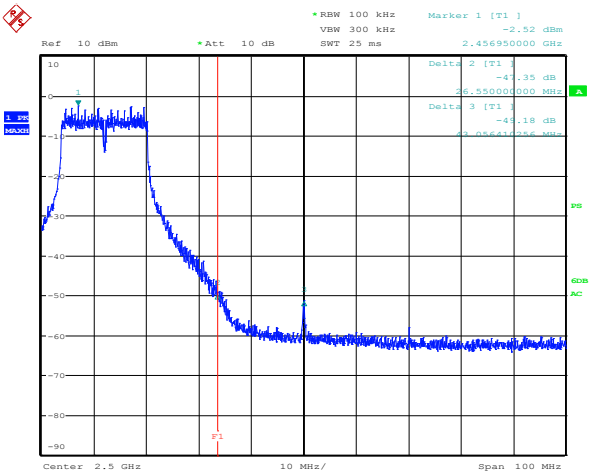
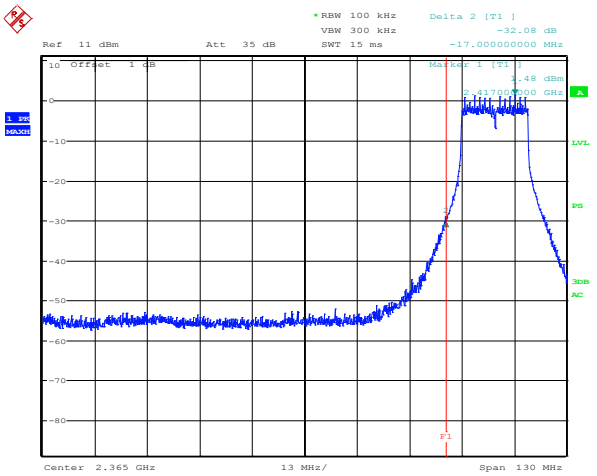


Date: 13.OCT.2017 15:39:35

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



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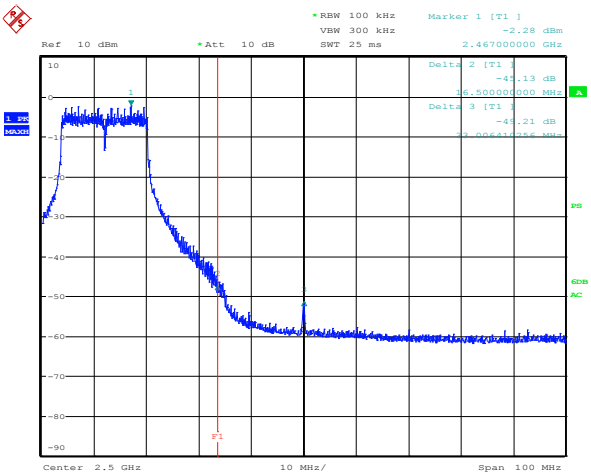

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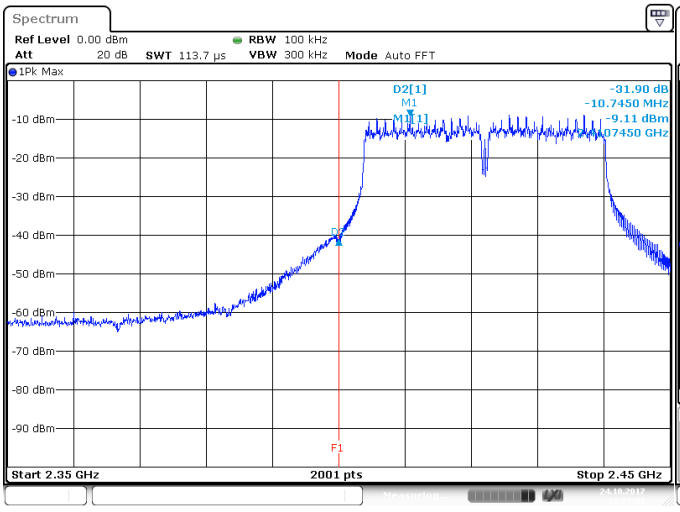
802.11n (HT40)
Lower band edge / Upper band edge
Channel 3 / Channel 9
MCS13



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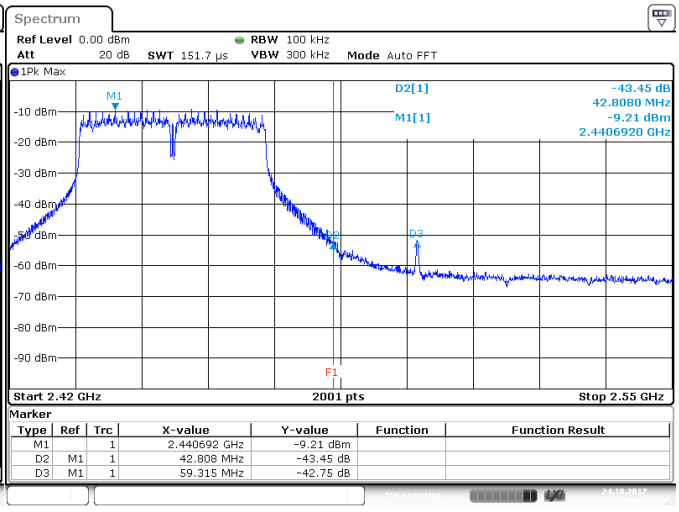

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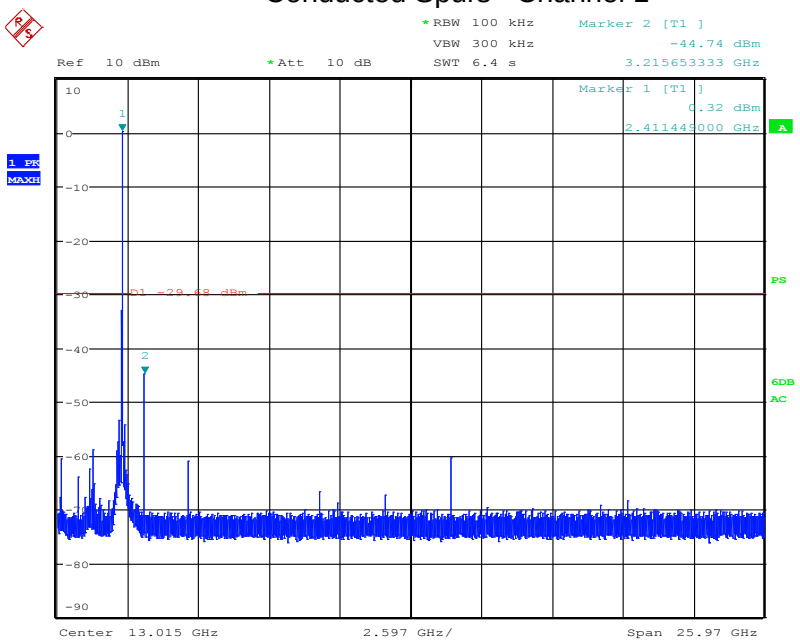
6.6 *Test Data – Conducted Spurious Emissions*

Conducted Spurs –Channel 1



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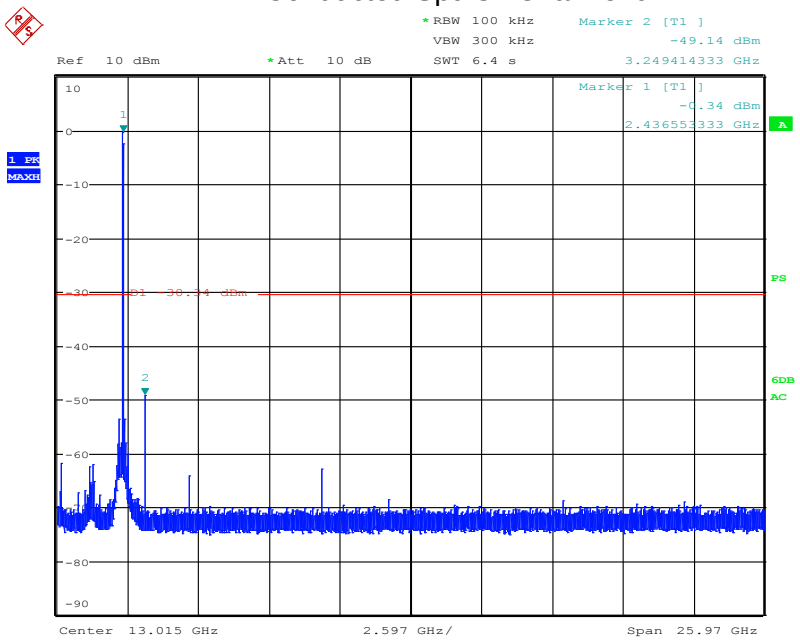
Conducted Spurs –Channel 6



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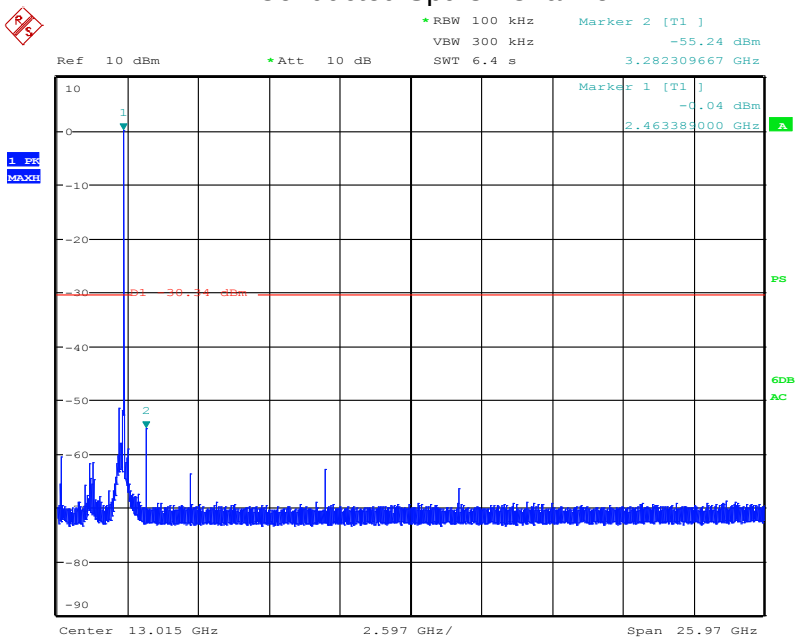
Conducted Spurs –Channel 11



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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 10th 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 – The EUT to measurement antenna distance was 3 meters
30 to 1000 MHz - The EUT to measurement antenna distance was 3 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(1)		Peak Limits dBuV/m
	Microvolts/m	dBuV/m	
30 - 88 MHz	100	40 (2)	--
88 - 216 MHz	150	43.5 (2)	--
216 - 960 MHz	200	46 (2)	--
960 - 1000 MHz	500	54 (2)	--
1 - 40 GHz	500	54 (3)	74

(1) These limits are applicable to emissions outside of the intentional transmit frequency band.
(2) Quasi-peak limit
(3) Average limit

7.3 *Test Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 23.3 °C
Relative Humidity: 52.7 %

7.4 *Test Equipment*

Test End Date: 23-Oct-2017 Tester: FN

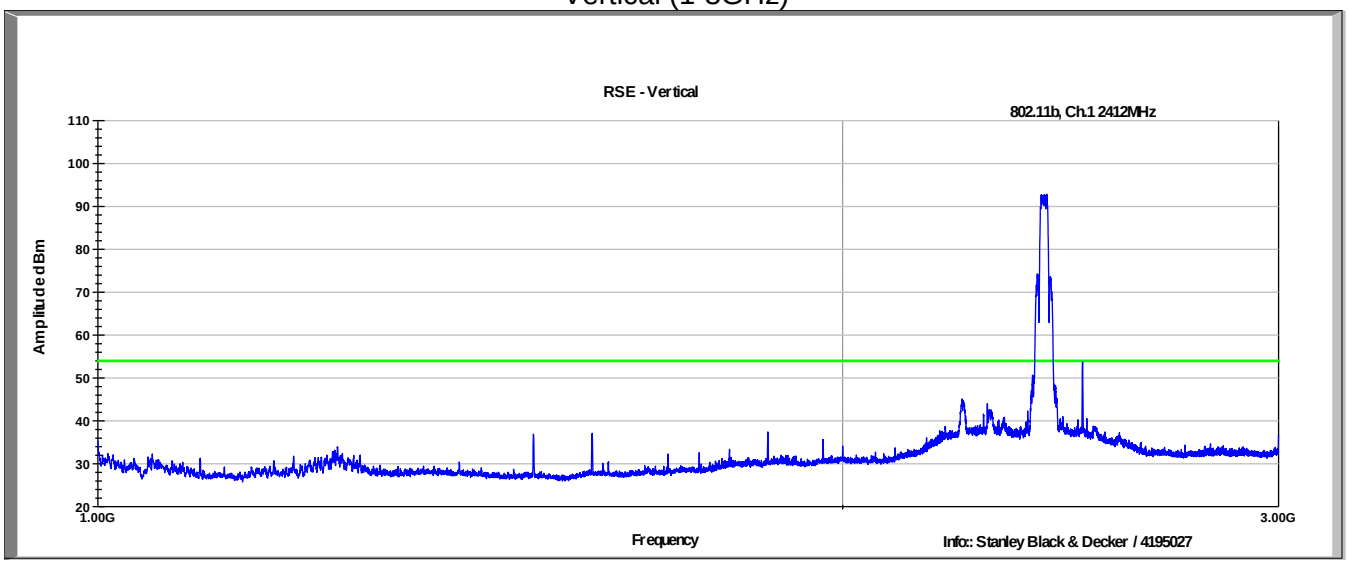
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	25-Jul-2018
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
ANTENNA, BILOG	JB6	SUNOL	B079690	10-Nov-2017
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079699	16-May-2018
ANTENNA, DRG HORN (MEDIUM)	3117	ETS LINDGREN	B079691	27-Jul-2018
RF CABLE	SF106	HUBER & SUHNER	B079712	24-Jul-2018
RF CABLE	NFS-290-78.7-NFS	FLORIDA RF LABS	B095019	24-Jul-2018
RF CABLE	CBL-25FT-NMNM	MINI-CIRCUITS	B094941	25-Jul-2018
RF CABLE	104PE	HUBER & SUHNER	B079793	24-Jul-2018
RF CABLE	SF106	HUBER & SUHNER	B079661	25-Jul-2018
RF CABLE	SUCOFLEX 100	HUBER & SUHNER	B108523	24-Jul-2018
FILTER, HIGH PASS (>2800MHZ)	HPM50111	MICRO-TRONICS	B085747	27-Jul-2018
FILTER, HIGH PASS (>6250MHZ)	HPM50112	MICRO-TRONICS	B093647	27-Jul-2018
RF CABLE	SF106	HUBER & SUHNER	B079716	24-Jul-2018
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	15003	28-Jul-2018
LOW NOISE AMPLIFIER	TS-PR18	ROHDE & SCHWARZ	B094463	22-Feb-2018
RF CABLE	SF106	HUBER & SUHNER	B079659	25-Jul-2018
RF CABLE	SUCOFLEX 100	HUBER & SUHNER	B108523	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	B079824	26-Jul-2018
LOW NOISE AMPLIFIER	NSP1840-HG	MITEQ	B087572	28-Jul-2018

Note: The equipment calibration period is 1 year.

7.5 *Peak Plots*

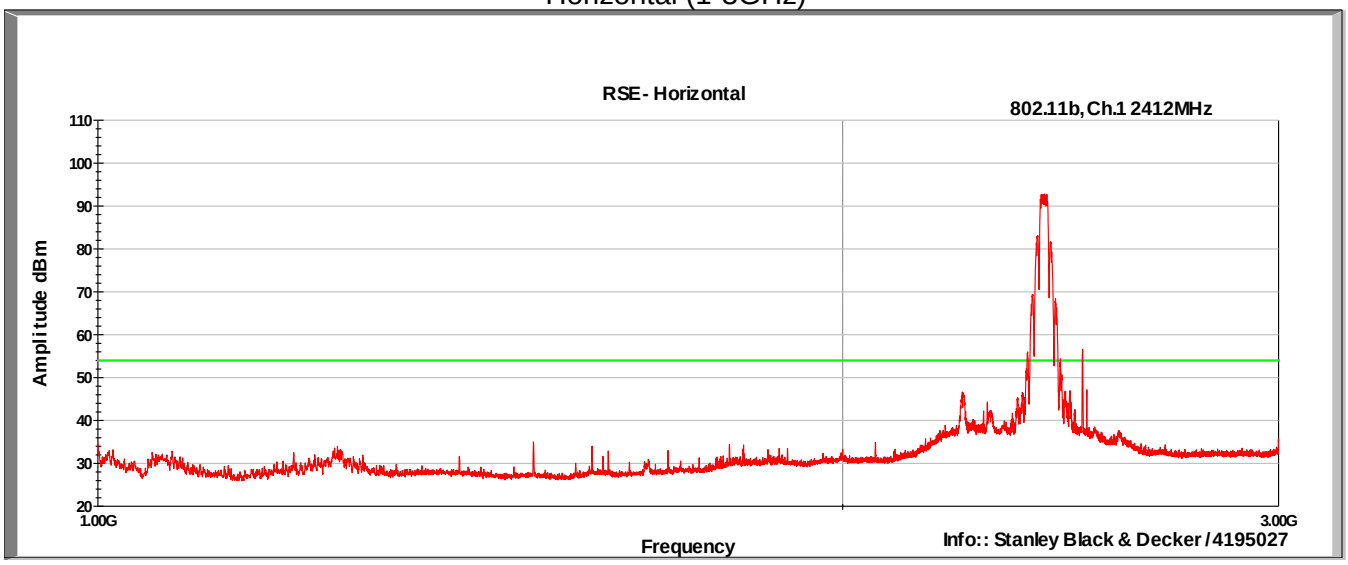
No emissions were detected in the range 9kHz to 30MHz.

Channel 1
Vertical (1-3GHz)



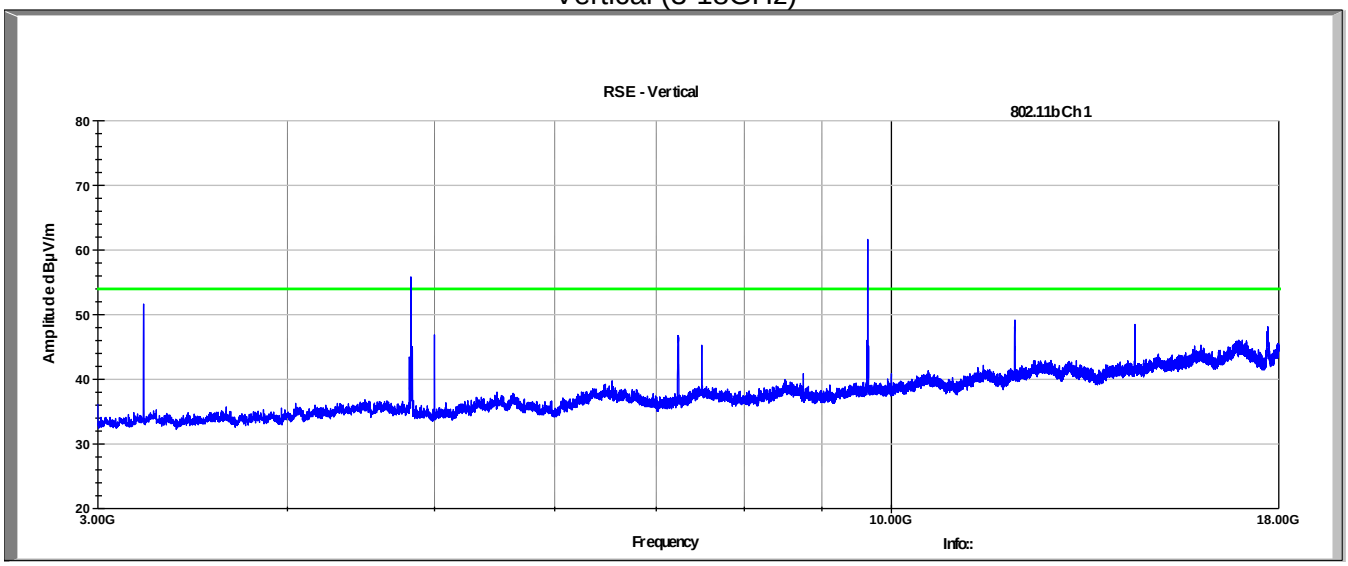
Emissions at multiples of 2.5GHz were digital and were tested under the requirements of Part 15, Subpart B

Horizontal (1-3GHz)

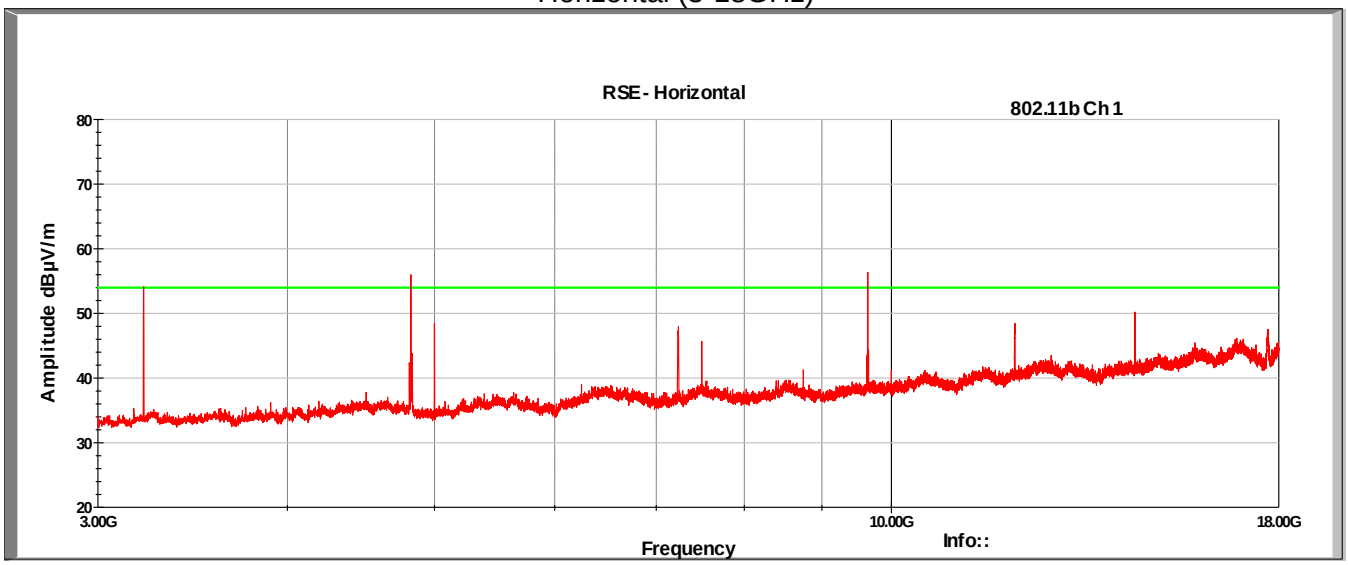


Emissions at multiples of 2.5GHz were digital and were tested under the requirements of Part 15, Subpart B

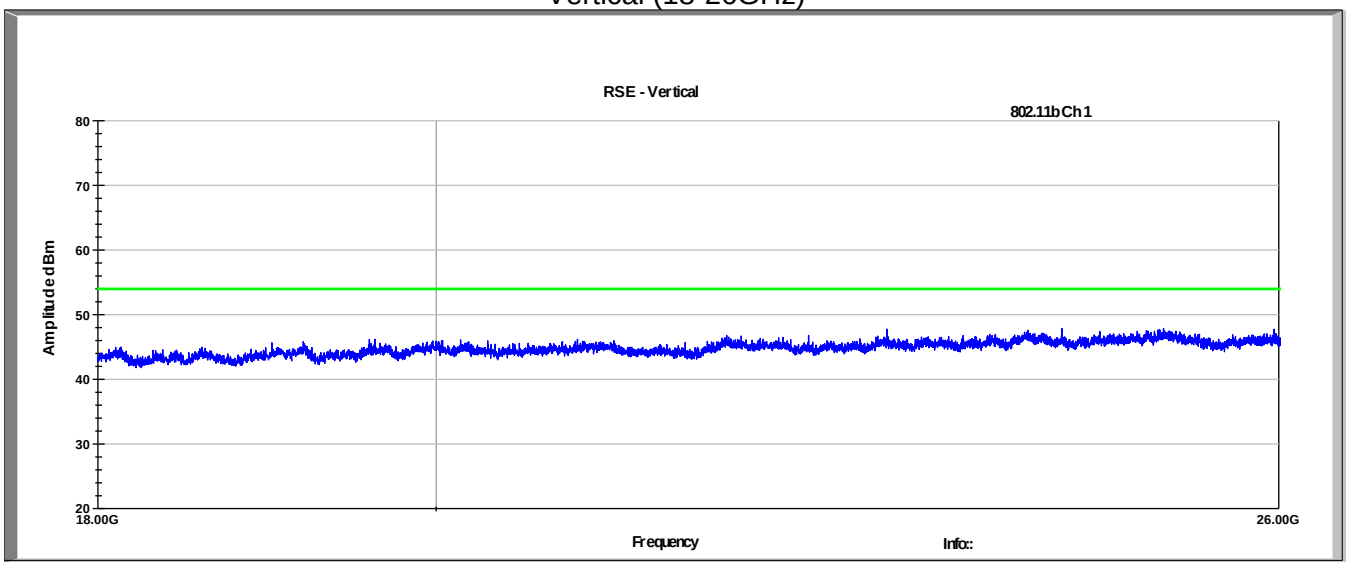
Channel 1
Vertical (3-18GHz)



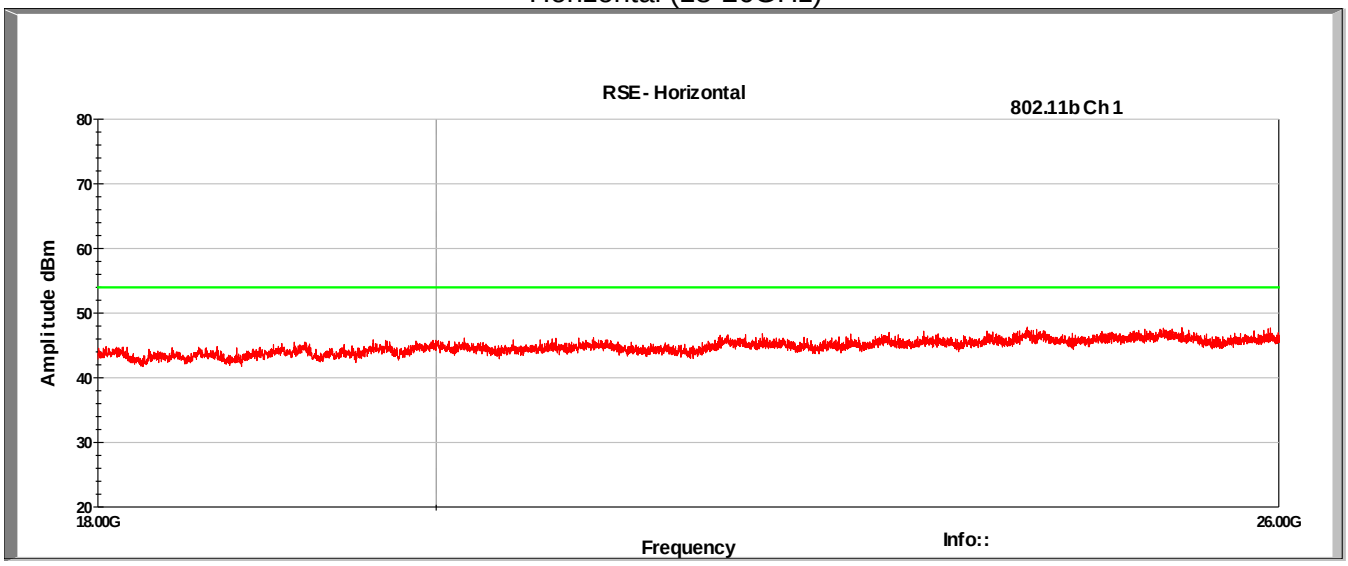
Horizontal (3-18GHz)



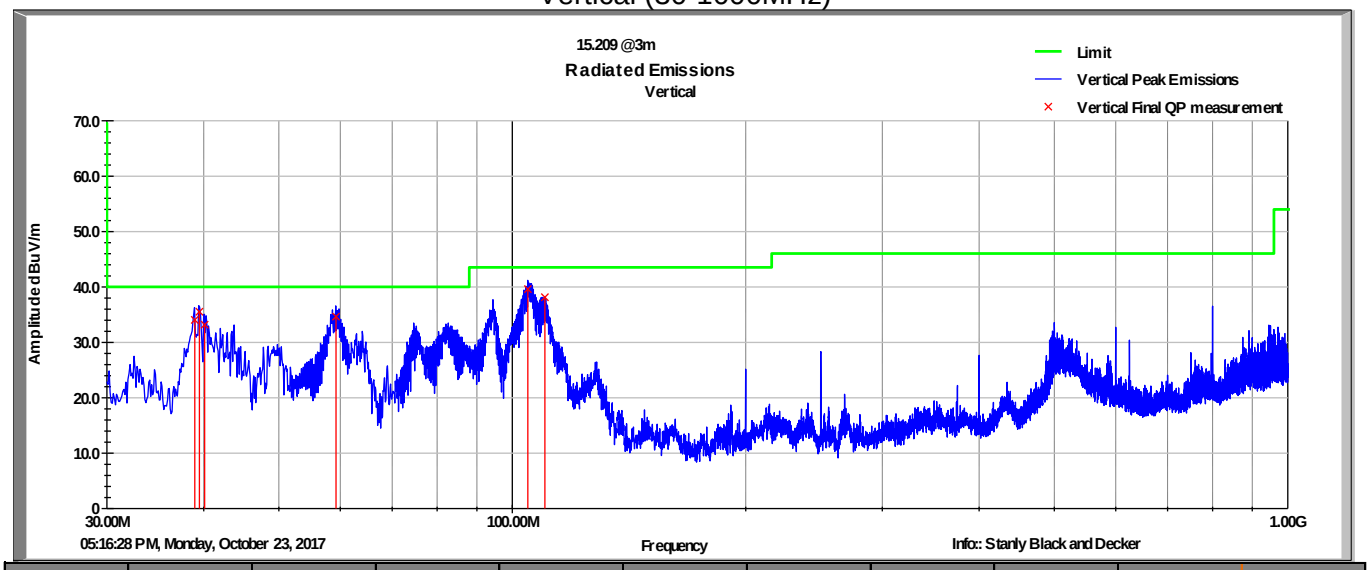
Channel 1
Vertical (18-26GHz)



Horizontal (18-26GHz)

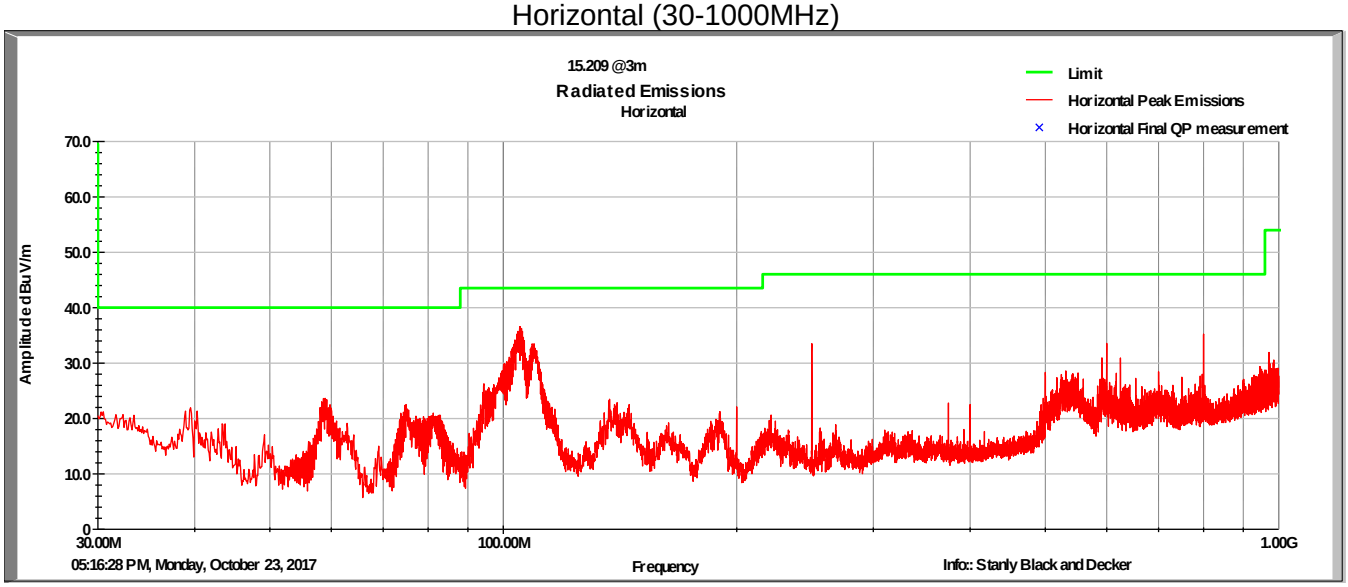


Channel 6
Vertical (30-1000MHz)

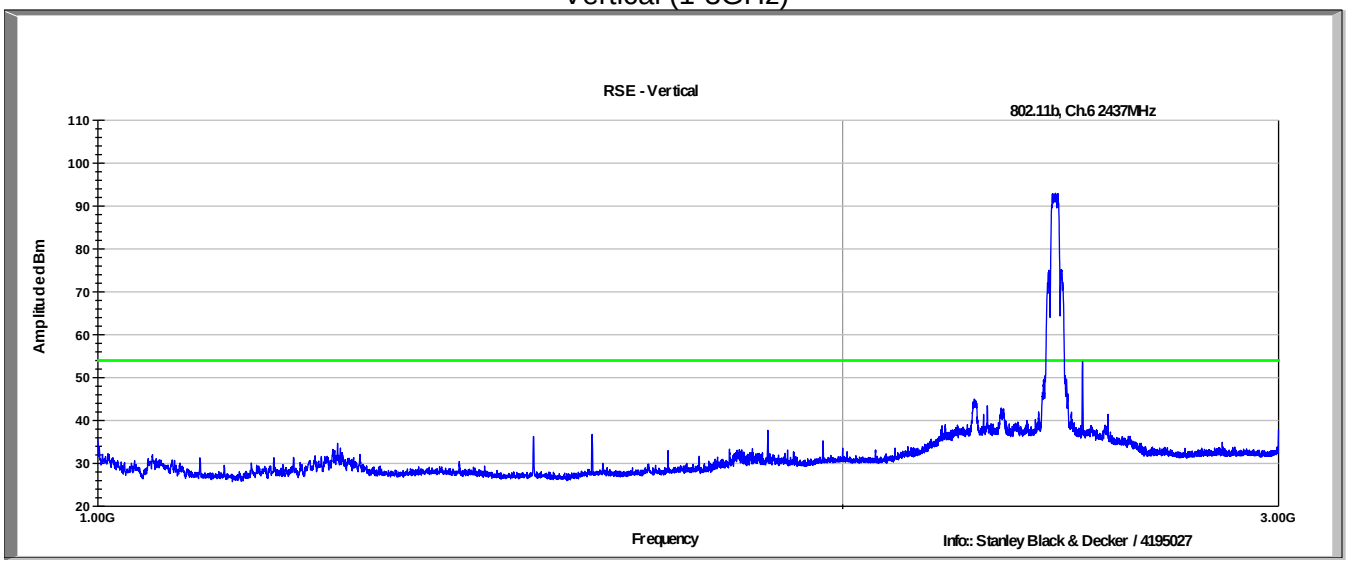


Frequency MHz	Raw QP (dBuV)	Polarity (V/H)	Azimuth (degrees)	Height (cm)	AF (dB/m)	Loss (dB)	Amp (dB)	QP Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
38.94	49.9	V	294.0	127.0	15.0	0.8	31.8	34.0	40.0	-6.0
39.49	51.9	V	221.0	120.0	14.6	0.8	31.8	35.5	40.0	-4.5
40.11	50.1	V	322.0	120.0	14.1	0.9	31.8	33.2	40.0	-6.8
59.23	59.0	V	310.0	120.0	7.5	1.1	33.0	34.6	40.0	-5.4
104.71	60.2	V	93.0	120.0	11.7	1.5	33.7	39.6	43.5	-3.9
110.14	57.6	V	118.0	120.0	12.7	1.5	33.7	38.1	43.5	-5.4
QP Value = Level + AF + CL - Amp										
Margin = QP Value - Limit										

Horizontal (30-1000MHz)

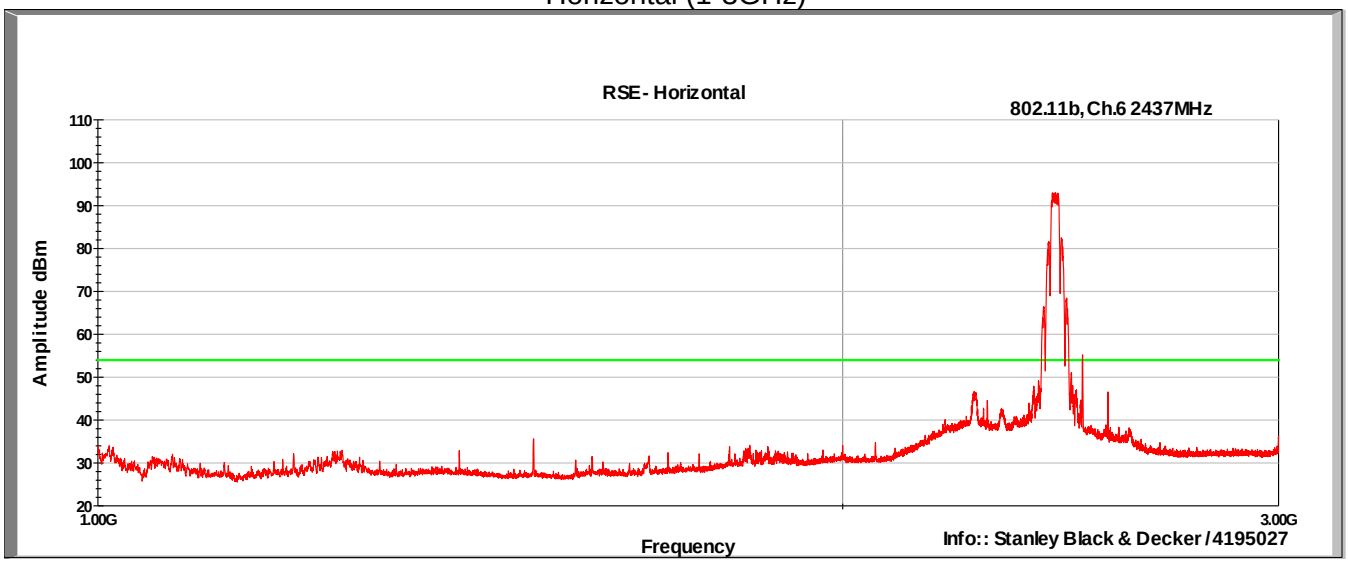


Channel 6
Vertical (1-3GHz)



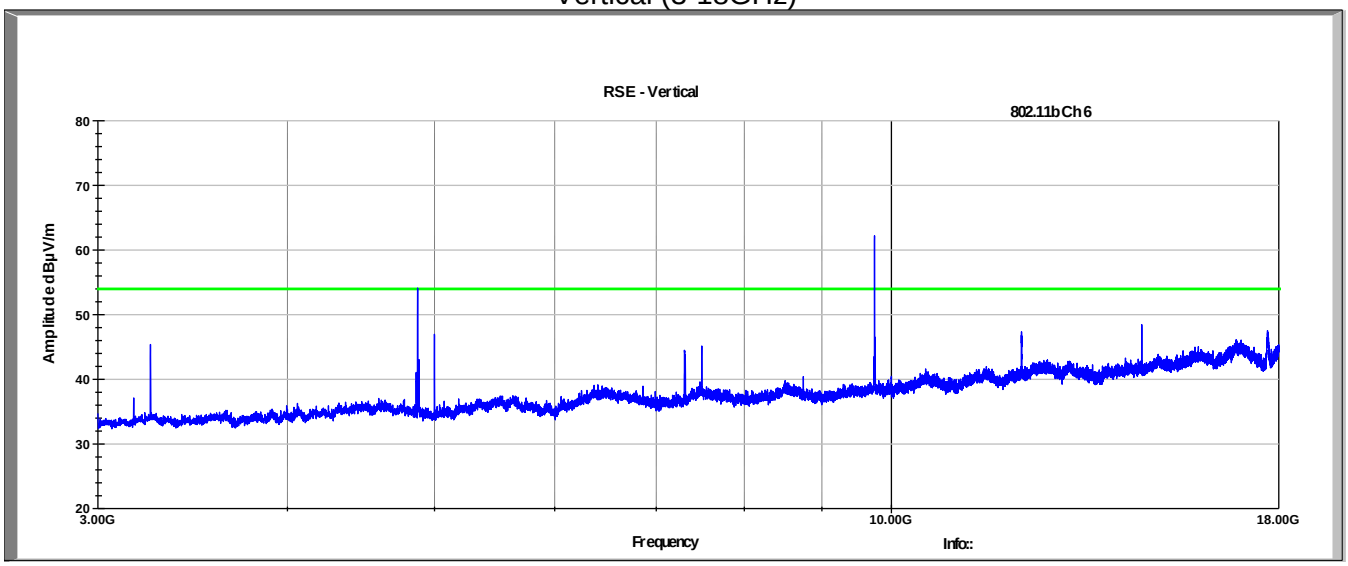
Emissions at multiples of 2.5GHz were digital and were tested under the requirements of Part 15, Subpart B

Horizontal (1-3GHz)

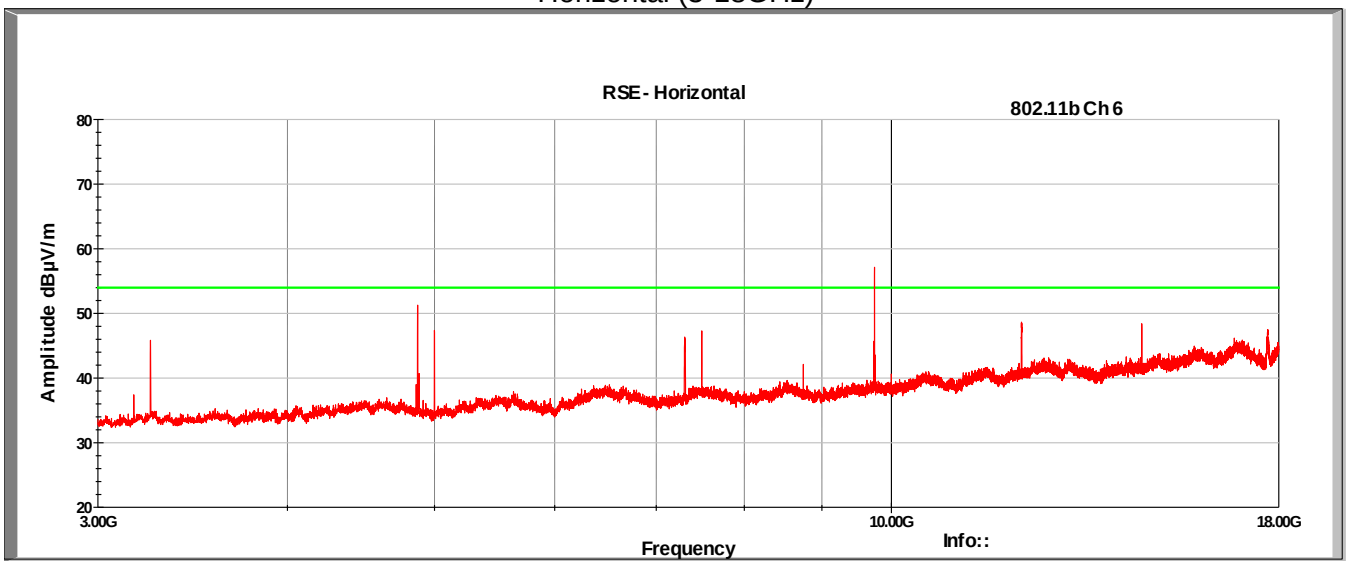


Emissions at multiples of 2.5GHz were digital and were tested under the requirements of Part 15, Subpart B

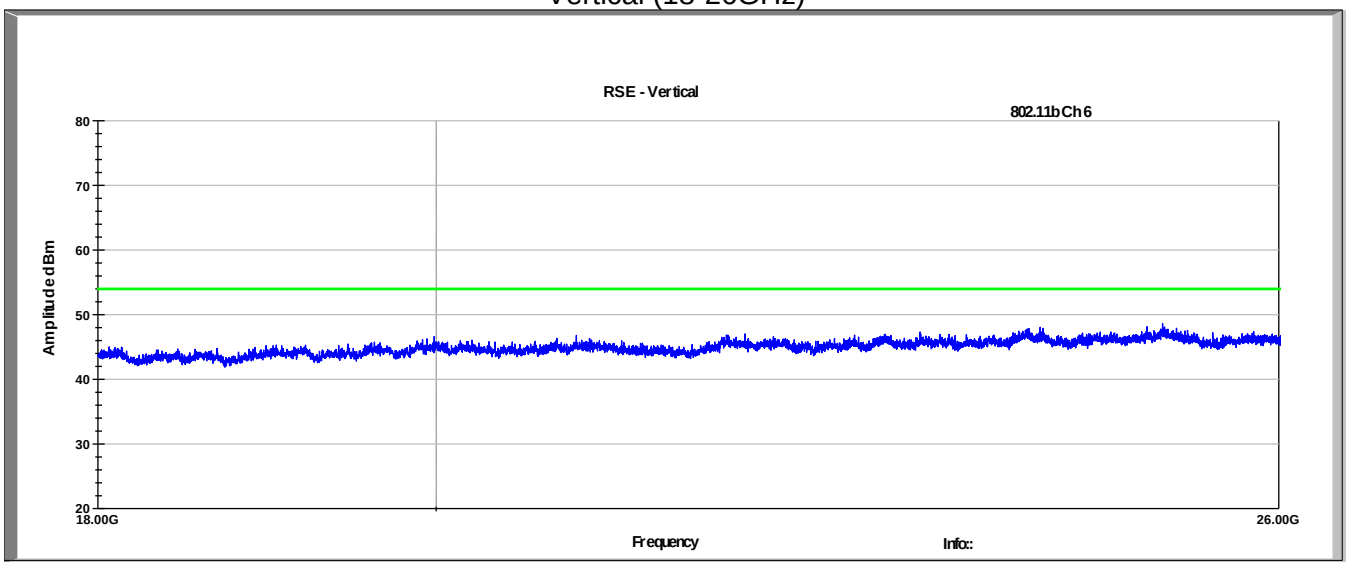
Channel 6
Vertical (3-18GHz)



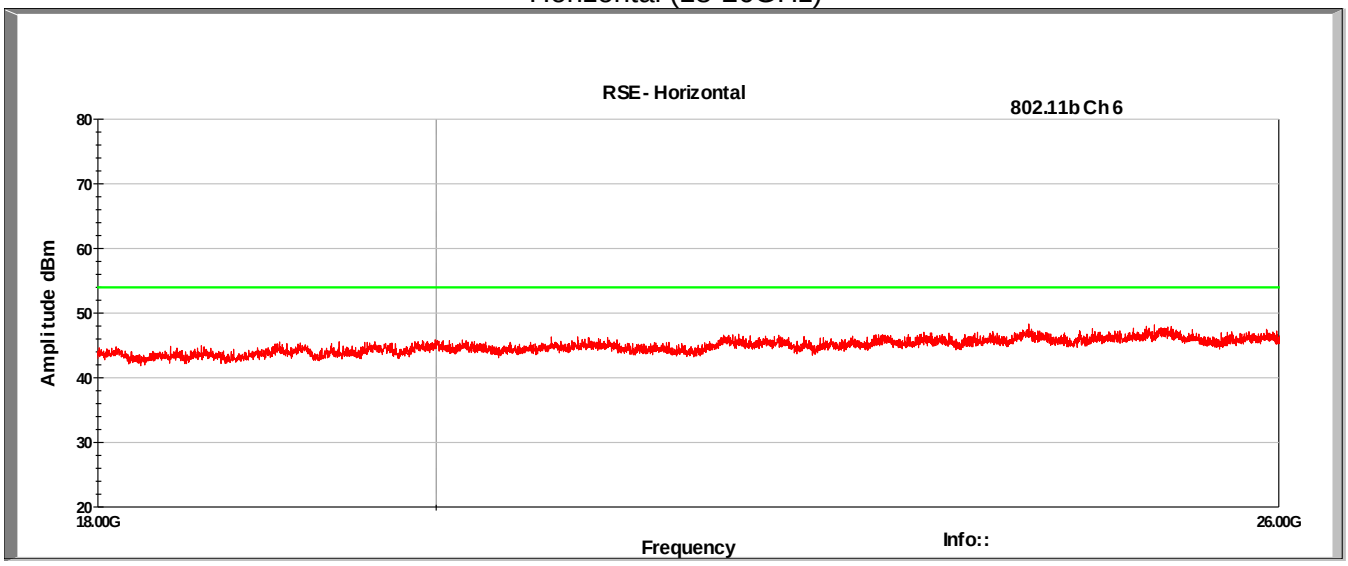
Horizontal (3-18GHz)



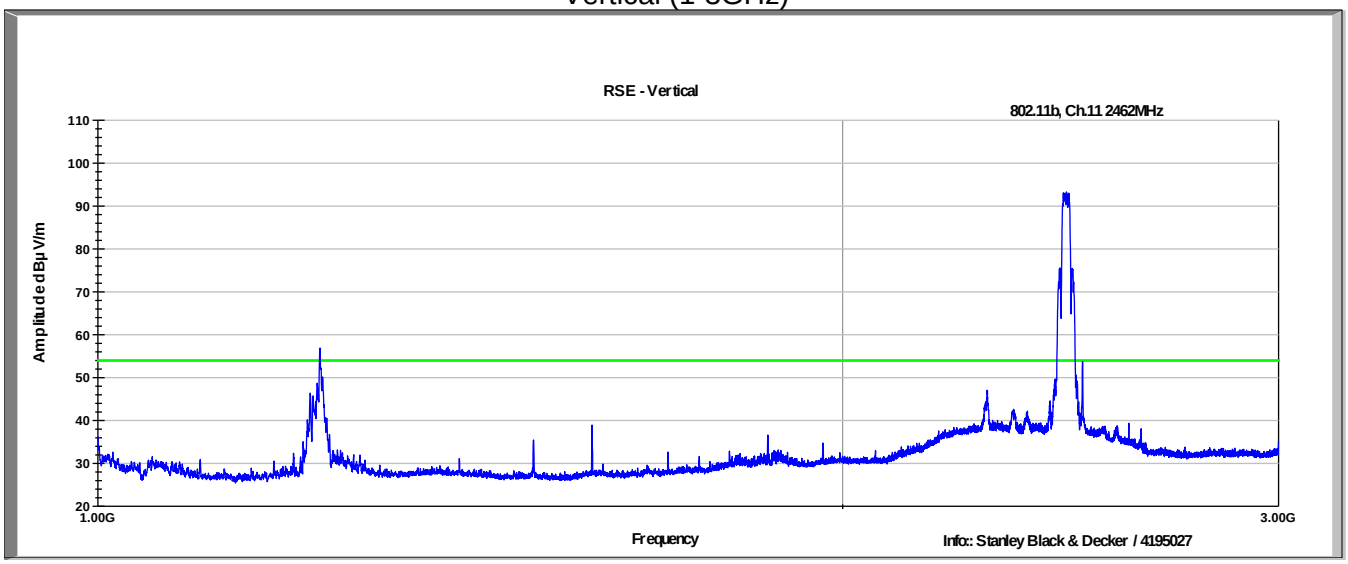
Channel 6
Vertical (18-26GHz)



Horizontal (18-26GHz)

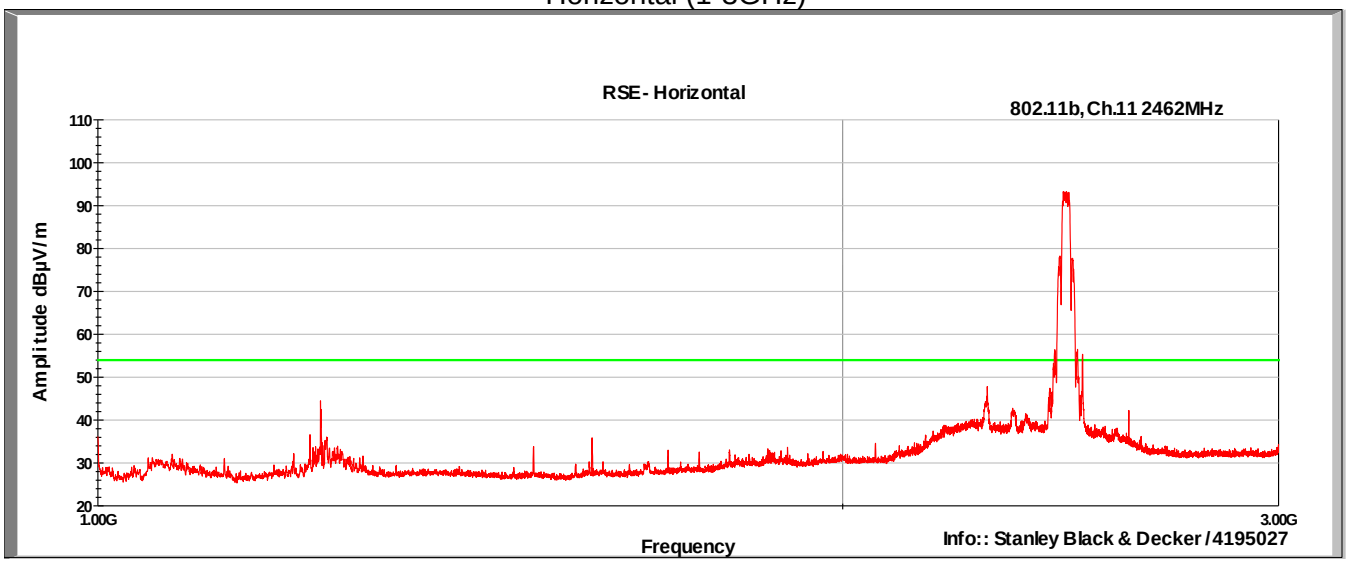


Channel 11
Vertical (1-3GHz)



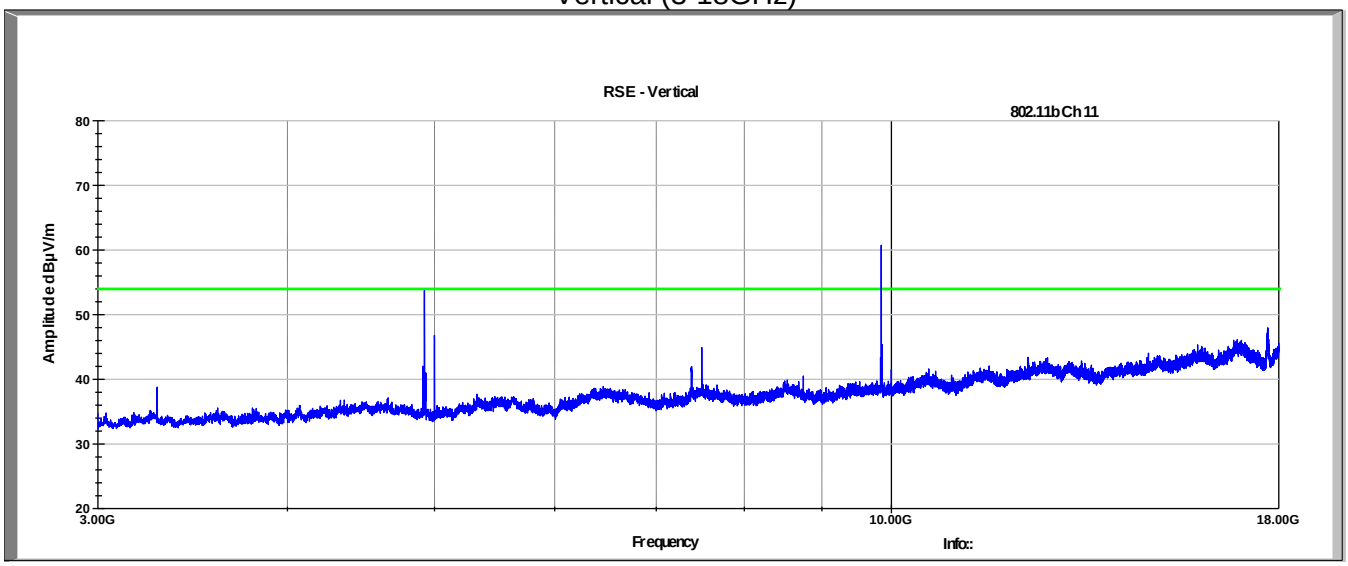
Emissions at multiples of 2.5GHz were digital and were tested under the requirements of Part 15, Subpart B

Horizontal (1-3GHz)

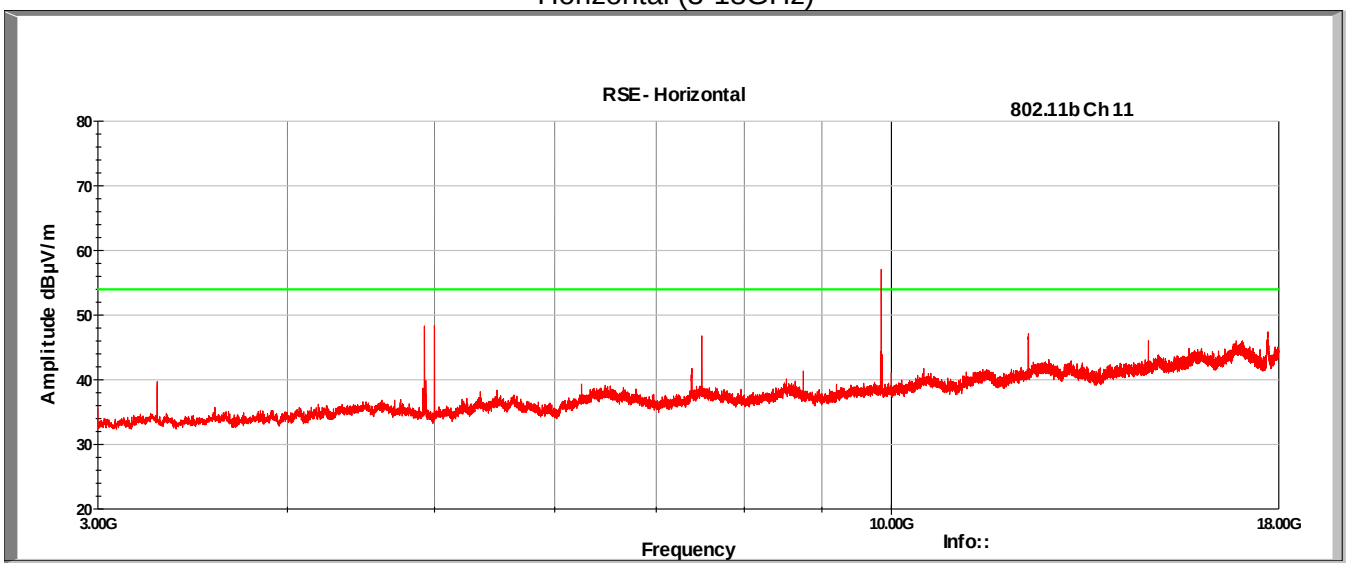


Emissions at multiples of 2.5GHz were digital and were tested under the requirements of Part 15, Subpart B

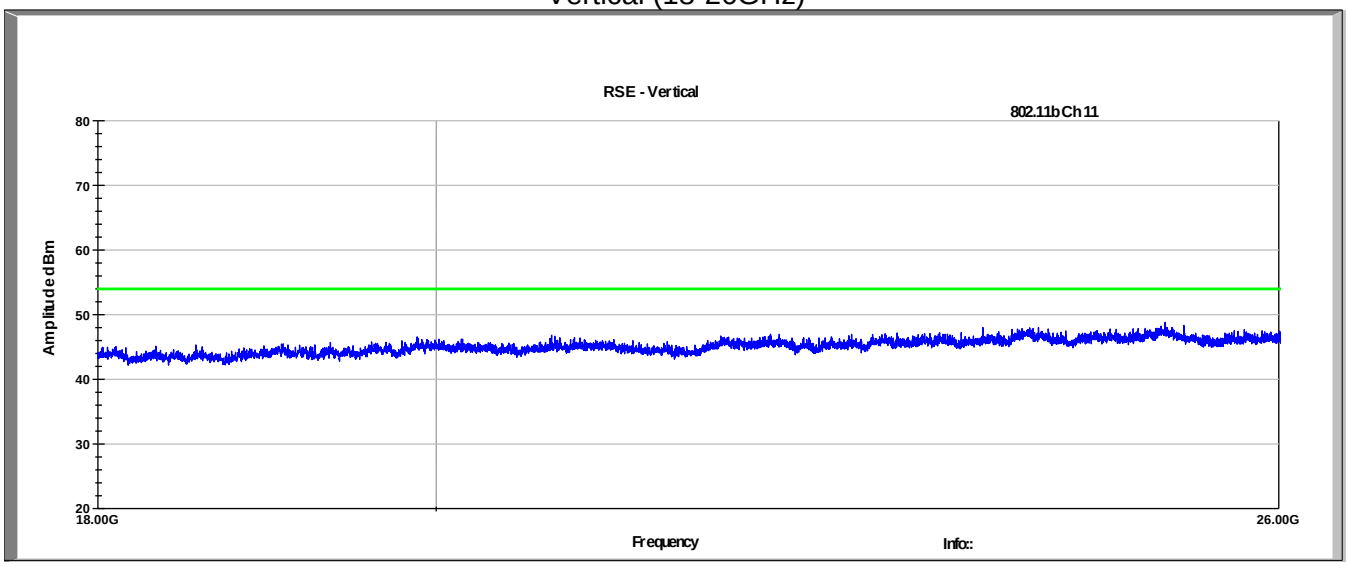
Channel 11
Vertical (3-18GHz)



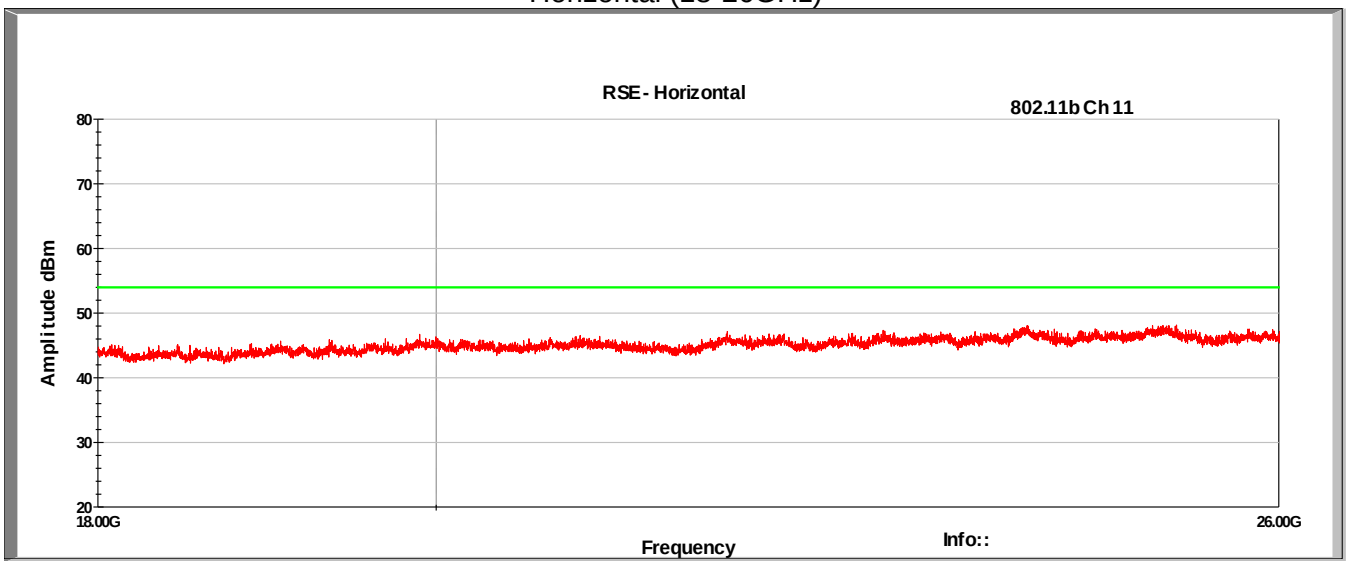
Horizontal (3-18GHz)



Channel 11
Vertical (18-26GHz)



Horizontal (18-26GHz)



7.6 *Tabular Data*

Frequency MHz	Raw Meas (dBuV)	Polarity (V/H)	Correction (dB/m)	Corr Value dBuV/m	Limit (dBuV/m)	Margin (dB)	Detector	
4824.00	52.5	V	3.3	55.8	74.0	-18.2	Peak	
4824.00	46.4	V	3.3	49.7	54.0	-4.3	Average	
4824.00	52.7	H	3.3	56.0	74.0	-18.0	Peak	
4824.00	46.6	H	3.3	49.9	54.0	-4.1	Average	
7236.00	41.6	V	5.2	46.8	NA	NA	Peak	*
7236.00	35.5	V	5.2	40.7	NA	NA	Average	*
7236.00	42.7	H	5.2	47.9	NA	NA	Peak	*
7236.00	36.6	H	5.2	41.8	NA	NA	Average	*
9648.00	54.7	V	6.9	61.6	NA	NA	Peak	*
9648.00	48.6	V	6.9	55.5	NA	NA	Average	*
9648.00	39.4	H	6.9	46.3	NA	NA	Peak	*
9648.00	33.3	H	6.9	40.2	NA	NA	Average	*
4874.00	50.8	V	3.3	54.1	74.0	-19.9	Peak	
4874.00	44.7	V	3.3	48.0	54.0	-6.0	Average	
4874.00	47.9	H	3.3	51.2	74.0	-22.8	Peak	
4874.00	41.8	H	3.3	45.1	54.0	-8.9	Average	
7311.00	39.3	V	5.2	44.5	74.0	-29.5	Peak	
7311.00	33.2	V	5.2	38.4	54.0	-15.6	Average	
7311.00	41.0	H	5.2	46.2	74.0	-27.8	Peak	
7311.00	34.9	H	5.2	40.1	54.0	-13.9	Average	
9748.00	55.3	V	6.9	62.2	NA	NA	Peak	*
9748.00	49.2	V	6.9	56.1	NA	NA	Average	*
9748.00	50.2	H	6.9	57.1	NA	NA	Peak	*
9748.00	44.1	H	6.9	51.0	NA	NA	Average	*
4924.00	50.4	V	3.3	53.7	74.0	-20.3	Peak	
4924.00	44.3	V	3.3	47.6	54.0	-6.4	Average	
4924.00	45.0	H	3.3	48.3	74.0	-25.7	Peak	
4924.00	38.9	H	3.3	42.2	54.0	-11.8	Average	
7386.00	36.6	V	5.4	42.0	74.0	-32.0	Peak	
7386.00	30.5	V	5.4	35.9	54.0	-18.1	Average	
7386.00	36.4	H	5.4	41.8	74.0	-32.2	Peak	
7386.00	30.3	H	5.4	35.7	54.0	-18.3	Average	
9848.00	53.8	V	6.9	60.7	NA	NA	Peak	*
9848.00	47.7	V	6.9	54.6	NA	NA	Average	*
9848.00	50.2	H	6.9	57.1	NA	NA	Peak	*
9848.00	44.1	H	6.9	51.0	NA	NA	Average	*

* These emissions did not fall in restricted bands.

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 6.

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*

Peak and average field strength measurements were performed at the restricted band edges of 2390MHz and 2483.5MHz. Measurements were made using the radiated methods defined in FCC KDB publication 558074 D01 DTS Meas Guidance v04.

8.3 *Test Site*

3m Absorber Lined Shielded Enclosure (ALSE), Suwanee, GA

Environmental Conditions

Temperature: 23.3°C
Relative Humidity: 52.7 %

8.4 *Test Equipment*

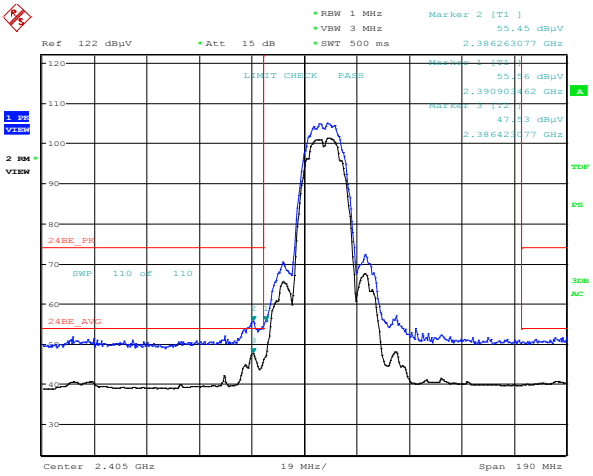
Test End Date: 12-Oct-2017 Tester: FN

Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU40	ROHDE & SCHWARZ	B079629	25-Apr-2018
RF CABLE	SF102	HUBER & SUHNER	B079823	26-Jul-2018

Note: The equipment calibration period is 1 year.

8.5 *Test Data*

802.11b



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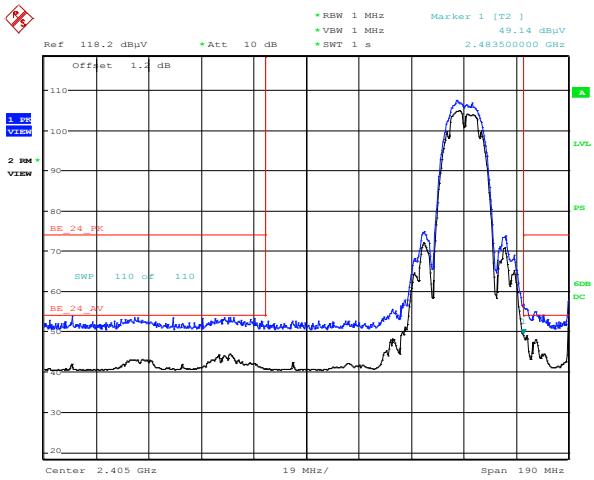

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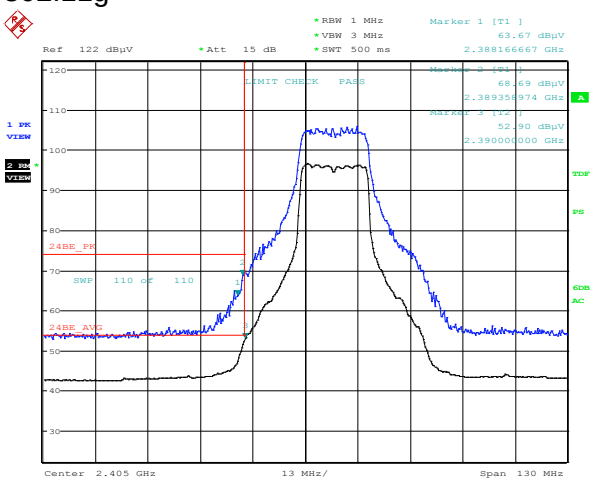
802.11g



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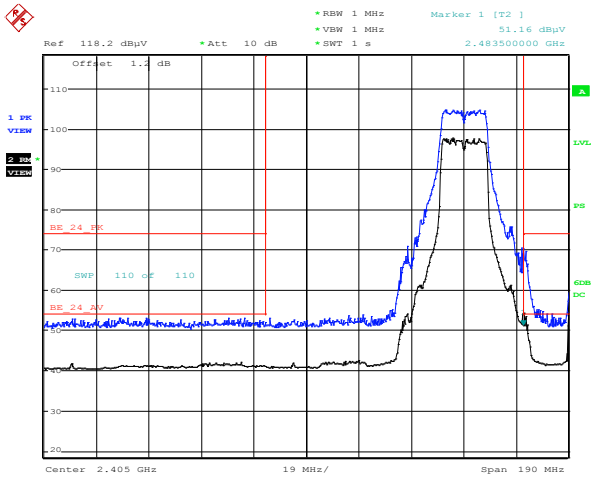

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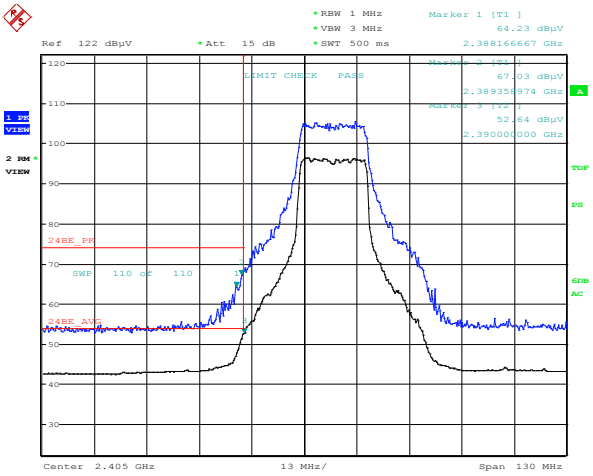
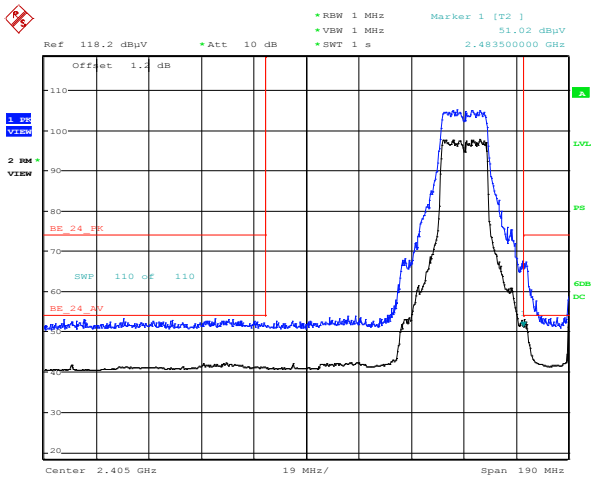
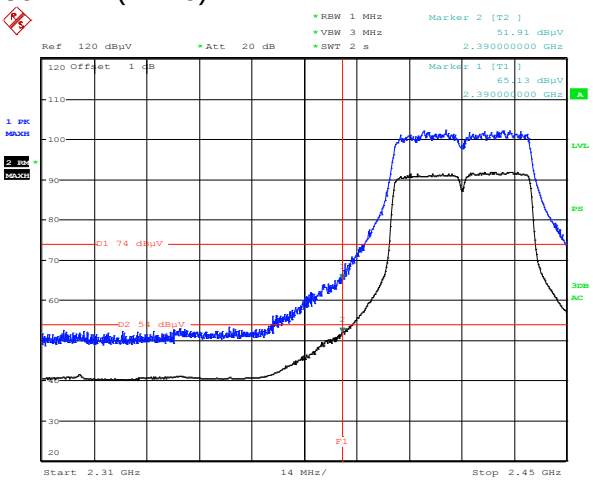
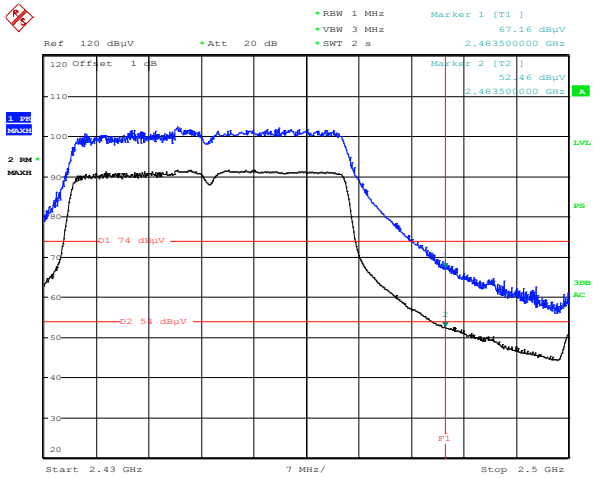
802.11n (HT20)





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 receiver's 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 Site*

SGS EMC Laboratory, Suwanee, GA

Environmental Conditions
Temperature: 24.6°C
Relative Humidity: 55.3%

9.4 *Test Equipment*

Test End Date: 21-Sep-2017 Tester: FRN

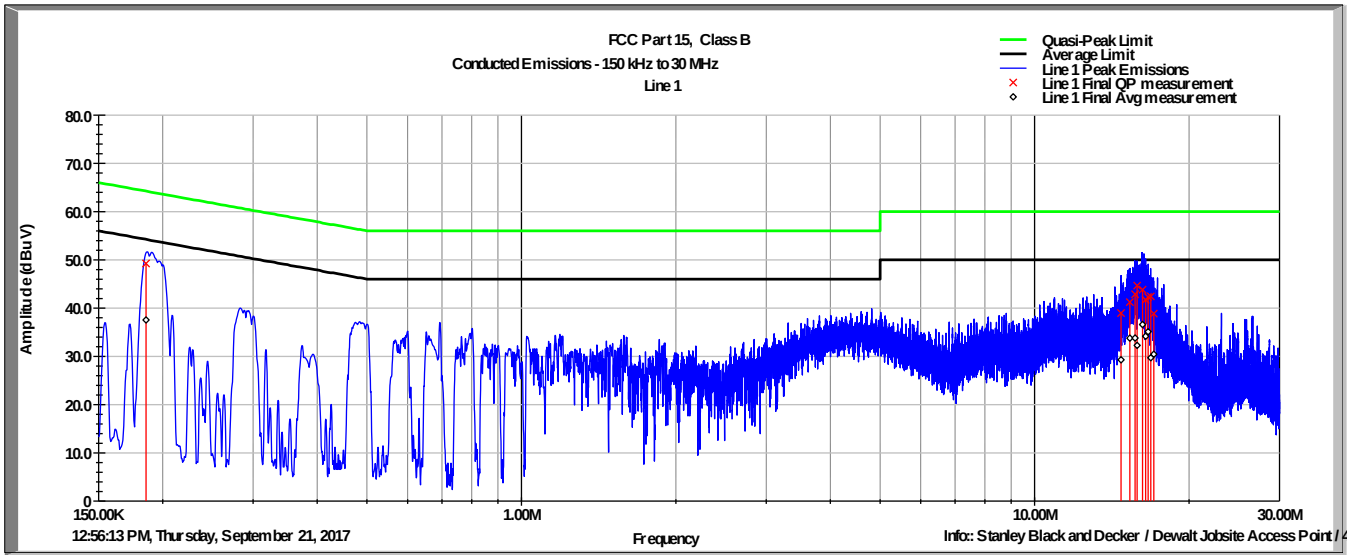
Equipment	Model	Manufacturer	Asset Number	Cal Due Date
EMI TEST RECEIVER	ESU8	ROHDE & SCHWARZ	B085759	25-Jul-2018
LINE IMPEDANCE STABILIZATION NETWORK	NNB 51	TESEQ	B085882	1-Nov-2017
RF CABLE	UC-N-MM-78	MAURY MICROWAVE	17016	25-Jul-2018

Note: The equipment calibration period is 1 year.

Software:
"Conducted Emissions" TILE! profile dated Dec 2015

9.5 *Test Data*

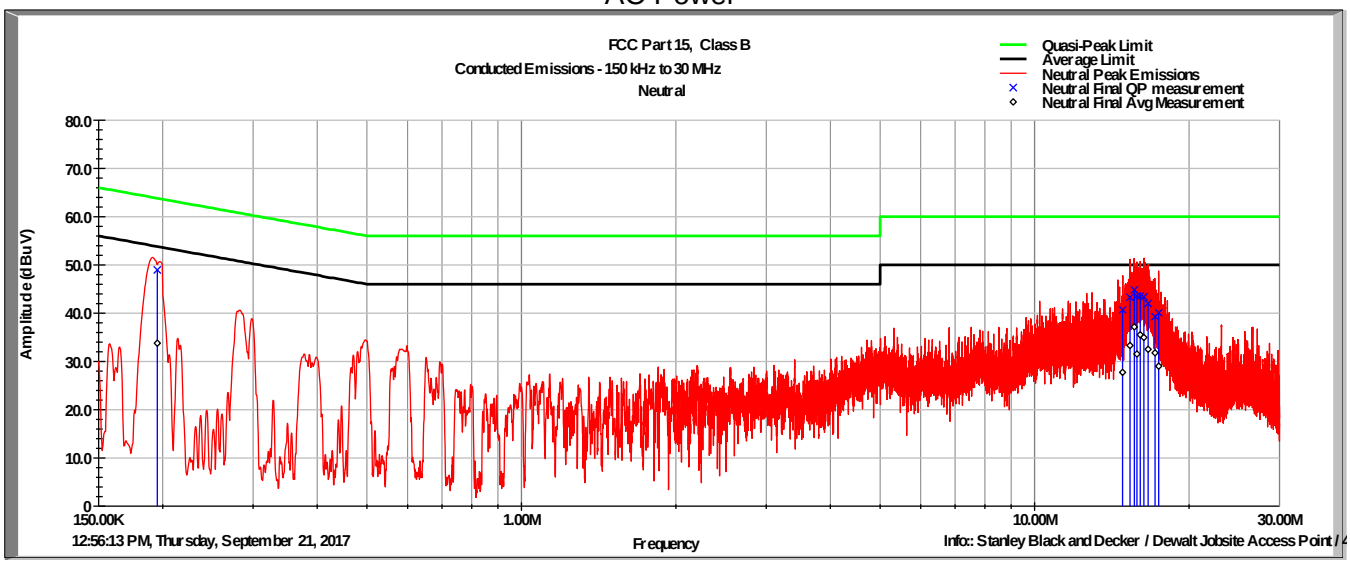
Line 1 Conducted Emissions Plot 150-30MHz
AC Power



Line 1 Conducted Emissions Data 150-30MHz
AC Power

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.186	49.2	64.3	-15.0	37.5	54.3	-16.7
14.737	39.0	60.0	-21.0	29.3	50.0	-20.7
15.328	41.2	60.0	-18.8	33.8	50.0	-16.2
15.695	42.9	60.0	-17.1	33.8	50.0	-16.2
15.840	44.6	60.0	-15.4	32.3	50.0	-17.7
16.230	43.8	60.0	-16.2	36.6	50.0	-13.4
16.457	41.7	60.0	-18.3	34.2	50.0	-15.8
16.639	42.3	60.0	-17.7	35.1	50.0	-14.9
16.845	42.4	60.0	-17.6	29.7	50.0	-20.3
17.069	38.9	60.0	-21.1	30.4	50.0	-19.6

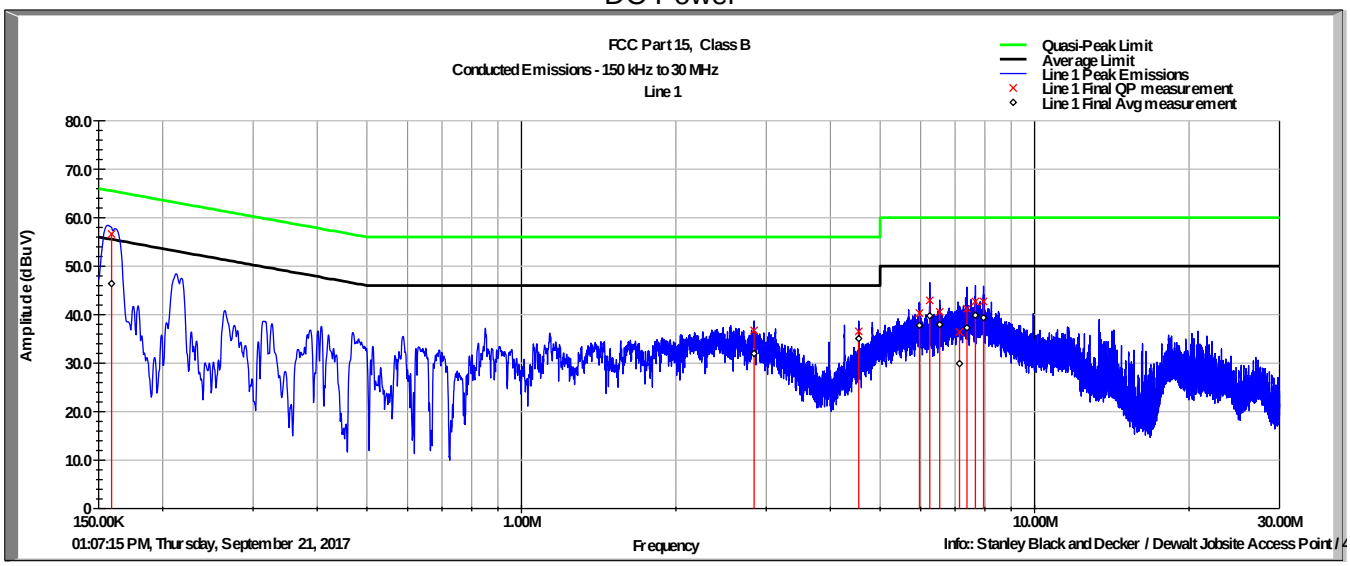
Neutral Conducted Emissions Plot 150-30MHz
AC Power



Neutral Conducted Emissions Data 150-30MHz
AC Power

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.195	49.0	63.8	-14.8	33.8	53.8	-20.0
14.843	40.7	60.0	-19.3	27.7	50.0	-22.3
15.343	43.3	60.0	-16.7	33.3	50.0	-16.7
15.644	44.8	60.0	-15.2	37.2	50.0	-12.8
15.827	43.6	60.0	-16.4	31.5	50.0	-18.5
16.068	43.5	60.0	-16.5	35.5	50.0	-14.5
16.331	43.4	60.0	-16.6	35.0	50.0	-15.0
16.640	42.0	60.0	-18.0	32.5	50.0	-17.5
17.165	39.3	60.0	-20.7	31.8	50.0	-18.2
17.452	40.1	60.0	-19.9	29.0	50.0	-21.0

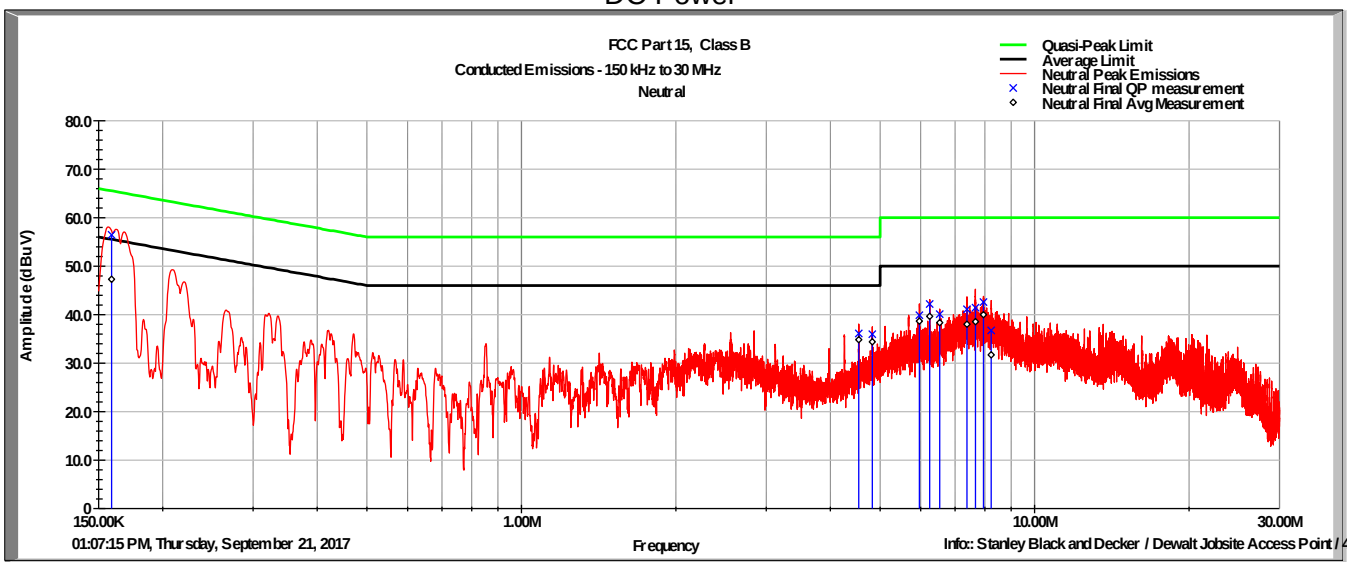
Line 1 Conducted Emissions Plot 150-30MHz
DC Power



Line 1 Conducted Emissions Data 150-30MHz
DC Power

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.159	56.6	65.5	-8.9	46.4	55.5	-9.1
2.840	36.7	56.0	-19.3	32.0	46.0	-14.0
4.543	36.6	56.0	-19.4	35.1	46.0	-10.9
5.966	40.3	60.0	-19.7	37.8	50.0	-12.2
6.248	42.9	60.0	-17.1	39.8	50.0	-10.2
6.533	40.6	60.0	-19.4	37.9	50.0	-12.1
7.139	36.4	60.0	-23.6	29.9	50.0	-20.1
7.382	41.2	60.0	-18.8	37.3	50.0	-12.7
7.669	42.7	60.0	-17.3	39.9	50.0	-10.1
7.952	42.7	60.0	-17.3	39.4	50.0	-10.6

Neutral Conducted Emissions Plot 150-30MHz
DC Power



Neutral Conducted Emissions Data 150-30MHz
DC Power

Frequency MHz	QP Value dBuV	QP Limit dBuV	QP Margin dB	Avg Value dBuV	Avg Limit dBuV	Avg Margin dB
0.159	56.4	65.5	-9.1	47.3	55.5	-8.3
4.543	36.1	56.0	-19.9	34.8	46.0	-11.2
4.827	36.0	56.0	-20.0	34.4	46.0	-11.6
5.962	39.9	60.0	-20.1	38.7	50.0	-11.3
6.247	42.2	60.0	-17.8	39.7	50.0	-10.3
6.531	40.1	60.0	-19.9	38.3	50.0	-11.7
7.383	41.1	60.0	-18.9	38.0	50.0	-12.0
7.670	41.4	60.0	-18.6	38.5	50.0	-11.5
7.951	42.6	60.0	-17.4	40.0	50.0	-10.0
8.229	36.7	60.0	-23.3	31.7	50.0	-18.3

10 Revision History

Revision Level	Description of changes	Revision Date
0	Initial release	24 October 2017