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Report On

Application for Grant of Equipment Authorization of the
Accriva Diagnostics
GEM Hemochron 100 Whole Blood Microcoagulation System

FCC Part 15 Subpart E §15.407
RSS-247 Issue 2 February 2017

Report No. 72139034B

November 2018




REPORT ON Radio Testing of the
Accriva Diagnostics
Whole Blood Microcoagulation System

TEST REPORT NUMBER 72139034B

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DATED November 02, 2018



Revision History

72139034B Accriva Diagnostics Whole Blood Microcoagulation System GEM Hemochron 100					
DATE	OLD REVISION	NEW REVISION	REASON	PAGES AFFECTED	APPROVED BY
11/02/2018	Initial Release				Ferdinand Custodio



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SECTION 1

REPORT SUMMARY

Radio Testing of the
Accriva Diagnostics
Whole Blood Microcoagulation System



1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Accriva Diagnostics Whole Blood Microcoagulation System to the requirements of FCC Part 15 Subpart E §15.407 and RSS-247 Issue 2 February 2017.

Objective	To perform Radio Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Accriva Diagnostics
Model Number(s)	GEM100
FCC ID Number	2AQV3-GEM100
IC Number	24216-GEM100
Serial Number(s)	TUV1 (Conducted Sample) and TUV2 (Radiated sample)
Number of Samples Tested	2
Test Specification/Issue/Date	<ul style="list-style-type: none">• FCC Part 15 Subpart E §15.407 (October 1, 2017).• RSS-247 Issue 2 February 2017 - Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices.• RSS-Gen - General Requirements for Compliance of Radio Apparatus (Issue 5, April 2018).• 789033 D02 General UNII Test Procedures New Rules v02r01 (Guidelines for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E) December 14, 2017.• ANSI C63.10-2013. American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
Start of Test	July 16, 2018
Finish of Test	October 24, 2018
Name of Engineer(s)	Ivan Retana
Related Document(s)	<ul style="list-style-type: none">• Report 1 802.11a and n DFS for Client Device.pdf• Report 2 802.11a Port-1 5GHz.pdf• Report 3 802.11a Port-2 5GHz.pdf• Report 4 802.11n Port-1 5GHz 40MHz.pdf• Report 5 802.11n Port-1 5GHz.pdf• Report 6 802.11n Port-2 5GHz 40MHz.pdf• Report 7 802.11n Port-2 5GHz.pdf



1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC Part 15 Subpart E §15.407 with cross-reference to the corresponding IC RSS standard is shown below.

Operation in the U-NII 1 and U-NII 3 Bands (New Rules)					
Section	Spec Clause	RSS	Test Description	Result	Comments/ Base Standard
2.1	§15.407(b)(6)	RSS-Gen 8.8	Conducted Emissions	Compliant	
	§15.403(i)		26 dB Bandwidth	As reported*	Report 2 to 7
		RSS-Gen 6.7	99% Emission Bandwidth	As reported*	Report 2 to 7
	§15.407(e)	RSS-247 6.2.4(1)	Minimum 6dB Bandwidth	Compliant*	Report 2 to 7
2.2	§15.407(a)	RSS-247 6.2	Maximum Conducted Output Power	Compliant	
	§15.407(a)	RSS-247 6.2	Maximum Power Spectral Density (PSD)	Compliant*	Report 2 to 7
2.3	§15.407(b)	RSS-247 6.2	Unwanted Emissions Measurement	Compliant	Report 2 to 7
	§15.407(b)	RSS-247 6.2	Band-Edge Measurements	Compliant*	Report 2 to 7
	§15.407(h)(2)(iii)	RSS-247 6.3 (2)(c)	Channel Move Time	Compliant*	Report 1
	§15.407(h)(2)(iii)	RSS-247 6.3 (2)(d)	Channel Closing Transmission Time	Compliant*	Report 1
	§15.407(h)(2)(iv)	RSS-247 6.3 (2)(e)	Non-Occupancy Period	Compliant*	Report 1
-	§15.407(g)	RSS-Gen 6.11	Frequency Stability	Client Declaration. Refer to User Manual	
-		RSS-247 6.2.1	Indoor Operation Only	Client Declaration. Refer to User Manual	

* Test case performed using Rohde & Schwarz TS8997 Test System. Report (1 to 7) generated by the system was used as a separate exhibit.



1.3 PRODUCT INFORMATION

1.3.1 Technical Description

The Equipment Under Test (EUT) was an Accriva Diagnostics Model GEM Hemochron 100 Whole Blood Microcoagulation System. The EUT is a point of care Whole Blood Microcoagulation System. The EUT is a battery-operated portable instrument that performs individual in vitro quantitative coagulation testing on fresh whole blood..The WLAN radio functions of the EUT were verified in this test report.

1.3.2 EUT General Description

EUT Description	Whole Blood Microcoagulation System
Model Name	GEM Hemochron 100
Model Number(s)	GEM100
Rated Voltage	12VDC 3.4A AC Adapter (7.2VDC 20.88Wh internal rechargeable lithium-ion battery)
Frequency	5180 MHz to 5320 MHz / 5500 MHz to 5825 MHz (20MHz BW Channels)
Mode Verified	802.11a and n in 5GHz band (U-NII-1, U-NII-2A, U-NII-2C and U-NII-3)
Capability	802.11 a/b/g and n (20MHz BW in 2.4GHz band / 20MHz and 40MHz BW in U-NII bands)
Operational Mode	<input type="checkbox"/> Master <input checked="" type="checkbox"/> Client Without Radar Detection <input type="checkbox"/> Client With Radar Detection
Primary Unit (EUT)	<input checked="" type="checkbox"/> Production <input type="checkbox"/> Pre-Production <input type="checkbox"/> Engineering
Antenna Type	Internal, PIFA Antenna
Antenna Manufacturer	molex®
Antenna Model Number	47950-****
Antenna Gain	2.27 dBi (2.4GHz to 2.5GHz) 4.9 dBi (5.15GHz to 5.85GHz)



1.3.3 Frequency Table

Band	Frequency Band (MHz)	Total Power (both transmit chains)	
		mW	dBm
U-NII-1	5180 - 5240	50.921	17.069
U-NII-2A	5260 - 5320	62.257	17.942
U-NII-2C	5500 - 5700	77.656	18.902
U-NII-3	5745 - 5825	70.372	18.474



1.4 EUT TEST CONFIGURATION

1.4.1 Test Configuration Description

Test Configuration	Description
A	FTP Test Mode. The EUT was connected to the support laptop via FTP connection. Traffic was generated, and the amount of data being transferred were adjusted to the maximum the EUT can support in normal operation.
B	Conducted Test Mode. Android ADB or Android Debug Bridge was used to control RF configuration of the EUT to simulate test mode for power measurements (>98% duty cycle). This mode was used for power measurement.

1.4.2 EUT Exercise Software

Android ADB or Android Debug Bridge which is a command line interface was used to program the EUT during power measurements. Android Jelly Bean version 4.3 was used for this task. For all other tests, FTP test mode was used as this represents worst case in normal operation as declared by the manufacturer.

1.4.3 Support Equipment and I/O cables

Manufacturer	Equipment/Cable	Description
Cisco	Access Point	AIR-AP2802E-B-K9 S/N FJC2207M33C
Cisco	Ethernet Switch with POE	WS-C2960X-24PS-L V05 S/N: FCW2204B1Z6SW Version15.2(2)E7
Cisco	Wireless Controller	AIR-CT2504-5-K9 V09S/N 74-7363-06 SW Version 8.2.166.0
Dell	Support Laptop	Latitude 5289 S/N D1MY3M2 Windows 10 DHCP Server/FTP Client
-	RF Cable (x2)	150 mm coax cable U.FL (connected to the circuit board) to a SMA male connector

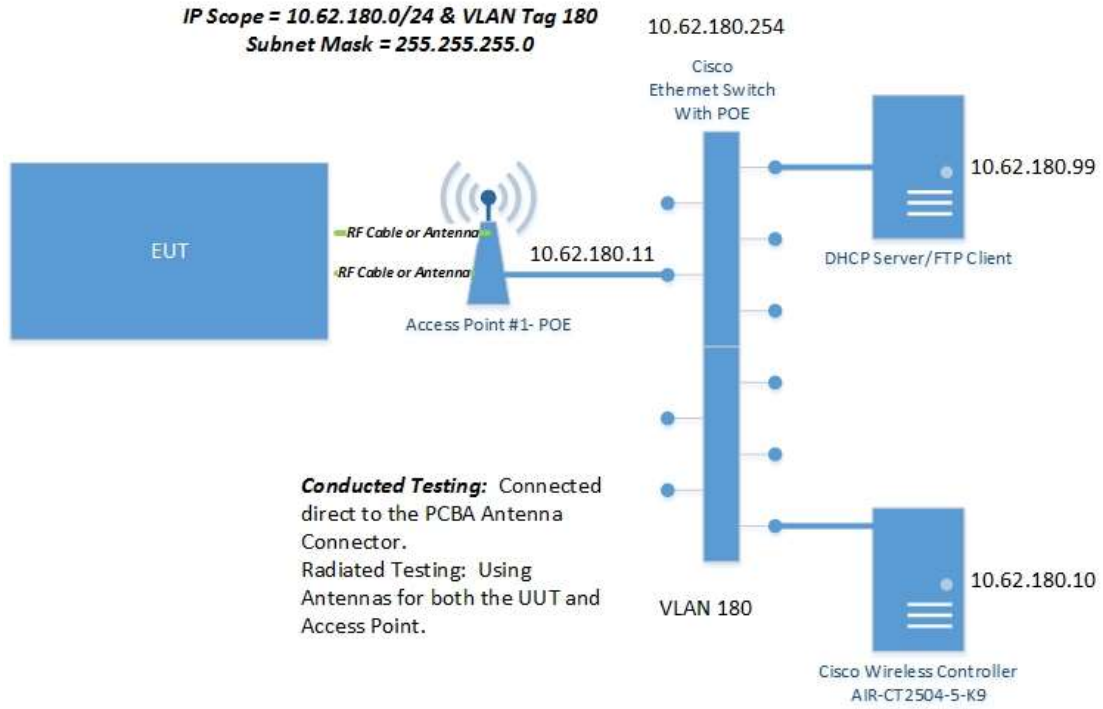
1.4.4 Worst Case Configuration

Worst-case configuration used in this test report as per preliminary prescans performed on the EUT:

Mode	Bandwidth	Data Rate
802.11a	20 MHz	6 Mbps
802.11n	20 MHz	MCS0 6.5 Mbit
802.11n	40 MHz	MCS0 13.0 Mbit

1.4.5 Simplified Test Configuration Diagram

Wireless Test Network





1.5 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

1.6 MODIFICATION RECORD

Description of Modification	Modification Fitted By	Date Modification Fitted
Serial Number TUV1 and TUV2		
N/A		

The table above details modifications made to the EUT during the test programme. The modifications incorporated during each test (if relevant) are recorded on the appropriate test pages.

1.7 TEST METHODOLOGY

All measurements contained in this report were conducted with ANSI C63.10-2013. American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

For conducted and radiated emissions the equipment under test (EUT) was configured to measure its highest possible emission level. This level was based on the maximized cable configuration from exploratory testing per ANSI C63.4-2014. The test modes were adapted according to the Operating Instructions provided by the manufacturer/client.

1.1 TEST FACILITY REGISTRATION

1.1.1 FCC – Registration No.: US1146

TUV SUD America Inc. (San Diego), is an accredited test facility with the site description report on file and has met all the requirements specified in §2.948 of the FCC rules. The acceptance letter from the FCC is maintained in our files and the Designation is US1146.

1.1.2 Innovation, Science and Economic Development Canada (IC) Registration No.: 3067A-1 & 22806-1

The 10m Semi-anechoic chamber of TUV SUD America Inc. (San Diego Rancho Bernardo) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 3067A-1.

The 3m Semi-anechoic chamber of TUV SUD America Inc. (San Diego Mira Mesa) has been registered by Certification and Engineering Bureau of Innovation, Science and Economic Development Canada for radio equipment testing with Registration No. 22806-1.



1.1.3 BSMI – Laboratory Code: SL2-IN-E-028R (US0102)

TUV Product Service Inc. (San Diego) is a recognized EMC testing laboratory by the BSMI under the MRA (Mutual Recognition Arrangement) with the United States. Accreditation includes CNS 13438 up to 6GHz.

1.1.4 NCC (National Communications Commission - US0102)

TUV SUD America Inc. (San Diego) is listed as a Foreign Recognized Telecommunication Equipment Testing Laboratory and is accredited to ISO/IEC 17025 (A2LA Certificate No.2955.13) which under APEC TEL MRA Phase 1 was designated as a Conformity Assessment Body competent to perform testing of equipment subject to the Technical Regulations covered under its scope of accreditation including RTTE01, PLMN01 and PLMN08 for TTE type of testing and LP002 for Low-Power RF Device type of testing.

1.1.5 VCCI – Registration No. A-0280 and A-0281

TUV SUD America Inc. (San Diego) is a VCCI registered measurement facility which includes radiated field strength measurement, radiated field strength measurement above 1GHz, mains port interference measurement and telecommunication port interference measurement.

1.1.6 RRA – Identification No. US0102

TUV SUD America Inc. (San Diego) is National Radio Research Agency (RRA) recognized laboratory under Phase I of the APEC Tel MRA.

1.1.7 OFCA – U.S. Identification No. US0102

TUV SUD America Inc. (San Diego) is recognized by Office of the Communications Authority (OFCA) under Appendix B, Phase I of the APEC Tel MRA.



SECTION 2

TEST DETAILS

Radio Testing of the
Accriva Diagnostics
Whole Blood Microcoagulation System



2.1 CONDUCTED EMISSIONS

2.1.1 Specification Reference

Part 15 Subpart C §15.207(a) and RSS-Gen 8.8

2.1.2 Standard Applicable

An intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

**Decreases with the logarithm of the frequency.*

2.1.3 Equipment Under Test and Modification State

Serial No: TUV1 / Test Configuration B

2.1.4 Date of Test/Initial of test personnel who performed the test

August 06, 2018/IR

2.1.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.6 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Mira Mesa facility

Ambient Temperature 27.2 °C
 Relative Humidity 52.9 %
 ATM Pressure 99.8 kPa

2.1.7 Additional Observations

Measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.1.8 for sample computation.



2.1.8 Sample Computation (Conducted Emission – Quasi Peak)

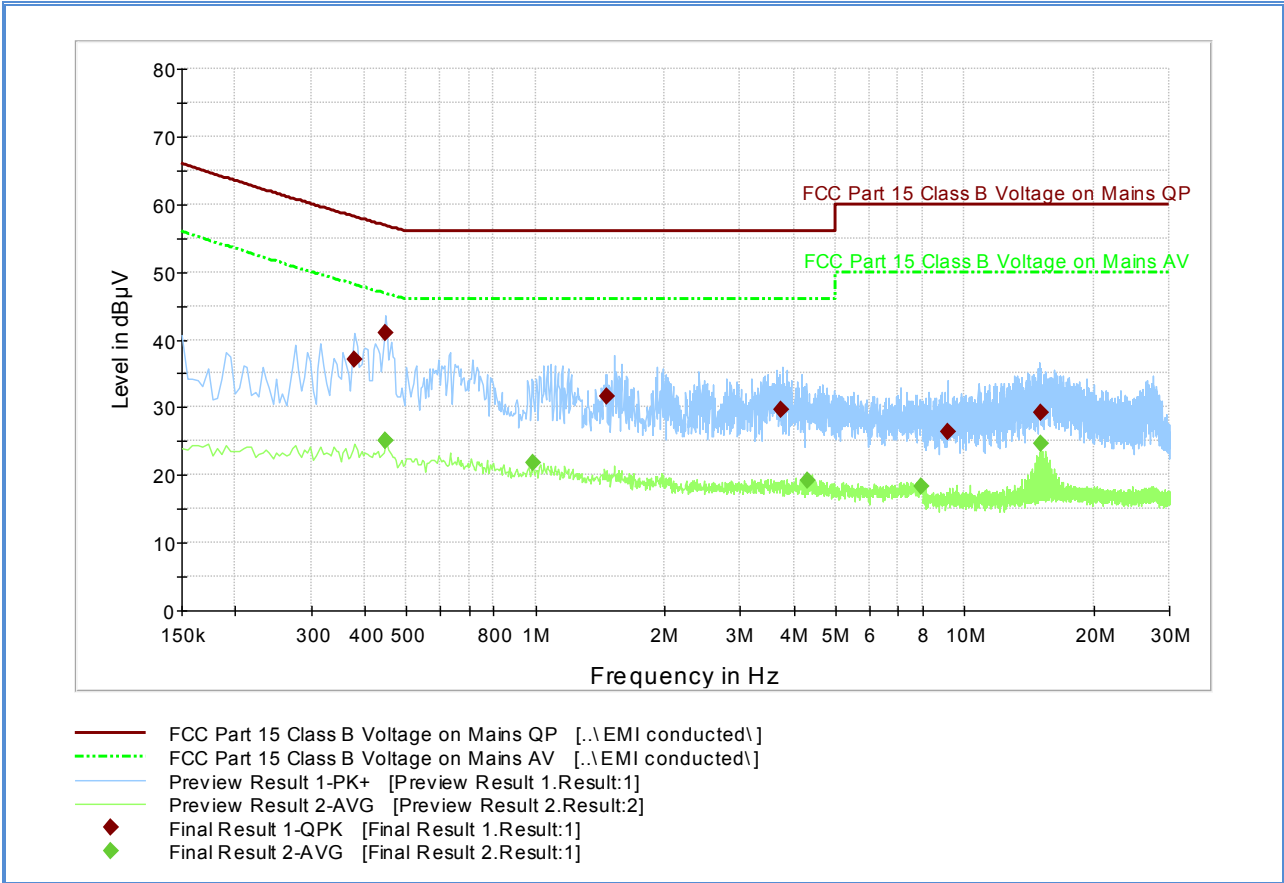
Measuring equipment raw measurement (db μ V) @ 150kHz		5.5
Correction Factor (dB)	Asset# 8607 (20 dB attenuator)	19.9
	Asset# 1177 (cable)	0.15
	Asset# 1176 (cable)	0.35
	Asset# 7568 (LISN)	0.30
Reported QuasiPeak Final Measurement (dbμV) @ 150kHz		26.2

2.1.9 Test Results

Compliant. See attached plots and tables.



2.1.10 Line 1 (120VAC/60Hz)



Quasi Peak Result

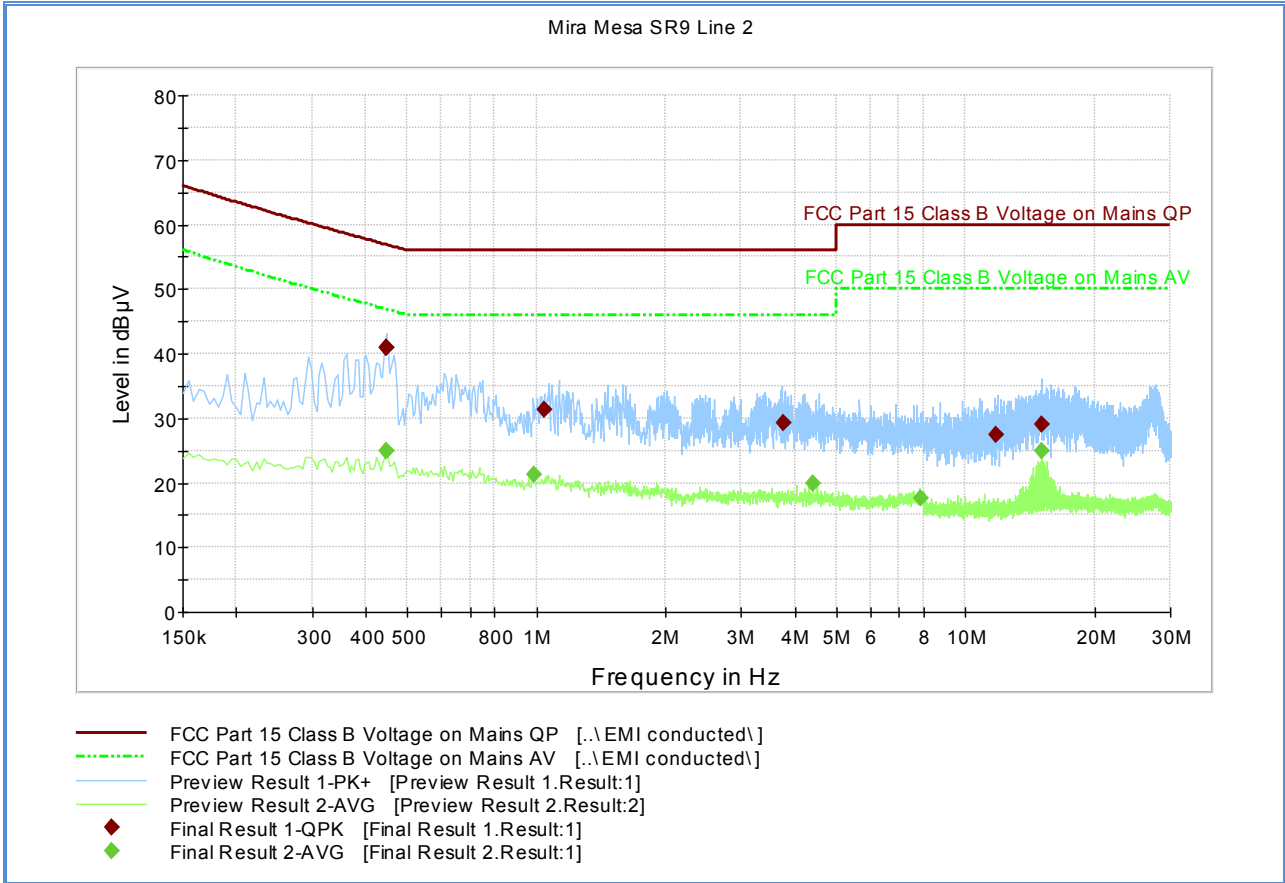
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.379500	37.0	1000.0	9.000	Off	L1	20.1	21.2	58.1
0.447000	41.0	1000.0	9.000	Off	L1	20.1	15.9	56.9
1.464000	31.6	1000.0	9.000	Off	L1	19.9	24.4	56.0
3.745500	29.5	1000.0	9.000	Off	L1	19.8	26.5	56.0
9.109500	26.3	1000.0	9.000	Off	L1	19.8	33.7	60.0
15.009000	29.3	1000.0	9.000	Off	L1	20.4	30.7	60.0

Average Result

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.447000	25.0	1000.0	9.000	Off	L1	20.1	21.8	46.8
0.447000	25.2	1000.0	9.000	Off	L1	20.1	21.7	46.8
0.987000	21.7	1000.0	9.000	Off	L1	20.0	24.3	46.0
4.317000	19.3	1000.0	9.000	Off	L1	19.8	26.7	46.0
7.921500	18.2	1000.0	9.000	Off	L1	19.8	31.8	50.0
15.009000	24.7	1000.0	9.000	Off	L1	20.4	25.3	50.0



2.1.11 Line 2 "Neutral" (120VAC/60Hz)



Quasi Peak Result

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - QPK (dB)	Limit - QPK (dBµV)
0.447000	41.0	1000.0	9.000	Off	N	19.8	15.8	56.9
0.447000	41.0	1000.0	9.000	Off	N	19.8	15.9	56.9
1.045500	31.3	1000.0	9.000	Off	N	19.6	24.7	56.0
3.763500	29.2	1000.0	9.000	Off	N	19.5	26.8	56.0
11.805000	27.5	1000.0	9.000	Off	N	19.5	32.5	60.0
15.013500	29.0	1000.0	9.000	Off	N	20.1	31.0	60.0

Average Result

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin - Ave (dB)	Limit - Ave (dBµV)
0.447000	25.0	1000.0	9.000	Off	N	19.8	21.9	46.8
0.447000	24.9	1000.0	9.000	Off	N	19.8	21.9	46.8
0.987000	21.2	1000.0	9.000	Off	N	19.6	24.8	46.0
4.411500	20.0	1000.0	9.000	Off	N	19.5	26.0	46.0
7.867500	17.6	1000.0	9.000	Off	N	19.5	32.4	50.0
15.108000	24.9	1000.0	9.000	Off	N	20.2	25.1	50.0



2.2 MAXIMUM CONDUCTED OUTPUT POWER

2.2.1 Specification Reference

Part 15 Subpart E §15.407(a) and RSS-247 6.2

2.2.2 Standard Applicable

(iv) For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

2.2.3 Equipment Under Test and Modification State

Serial No: TUV1 / Test Configuration B

2.2.4 Date of Test/Initial of test personnel who performed the test

October 24, 2018/FSC

2.2.5 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.



2.2.6 Environmental Conditions

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature 25.1 °C
 Relative Humidity 48.4 %
 ATM Pressure 98.6 kPa

2.2.7 Additional Observations

- This is a conducted test using direct connection to a power meter.
- Initial prescan performed on the EUT determined the worst-case configuration used (see Section 1.4.4 of this test report for details).
- Presented measurements are Peak values which is worst case than measured over any interval of continuous transmission using instrumentation calibrated in terms of an rms-equivalent voltage.
- Test methodology is per Clause 11.9.1.3 of ANSI C63.10.

2.2.8 Test Results

Band	Mode	Channel	Frequency (MHz)	Tx1 (mW)	Tx2 (mW)	Total (mW)	Limit (mW)	Compliance
5200 MHz	A	36	5180	22.131	28.119	50.250	200	Pass
		40	5200	22.439	25.645	48.084	200	Pass
		44	5220	24.889	20.137	45.026	200	Pass
		48	5240	23.442	27.479	50.921	200	Pass
		52	5260	22.646	21.979	44.625	250	Pass
		56	5280	25.235	28.510	53.745	250	Pass
		60	5300	23.281	32.063	55.344	250	Pass
		64	5320	23.442	38.815	62.257	250	Pass
	N	36	5180	19.099	25.061	44.160	250	Pass
		40	5200	19.143	22.699	41.841	250	Pass
		44	5220	20.941	20.701	41.643	250	Pass
		48	5240	21.086	28.314	49.400	250	Pass
		52	5260	19.099	22.803	41.902	250	Pass
		56	5280	18.967	30.061	49.028	250	Pass
		60	5300	23.014	31.989	55.003	250	Pass
		64	5320	21.777	38.726	60.503	250	Pass

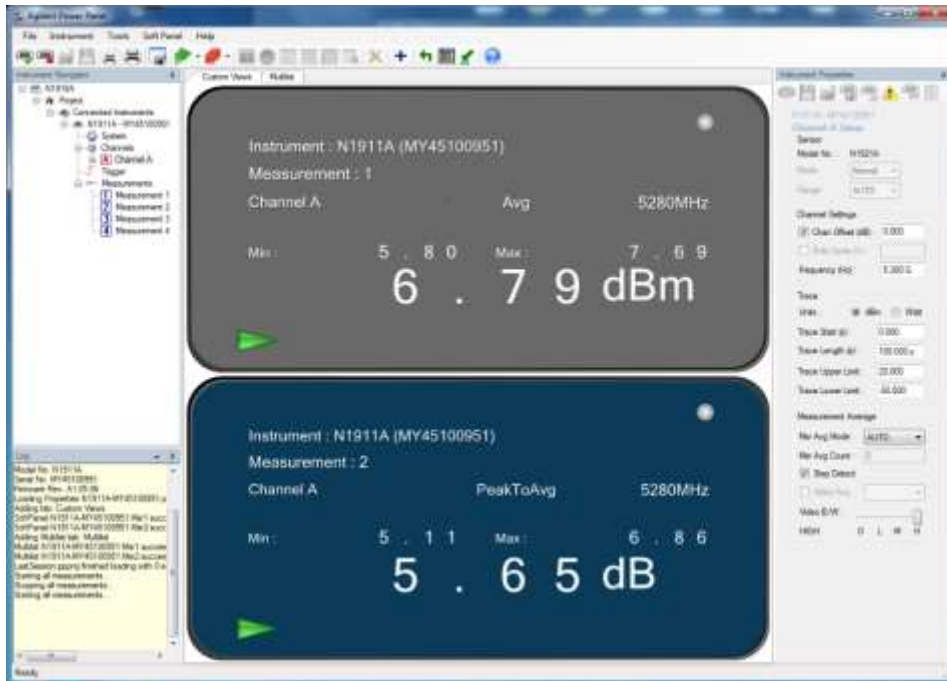


5600 MHz	A	100	5500	25.119	51.404	76.523	250	Pass
		104	5520	22.387	48.084	70.471	250	Pass
		108	5540	22.594	49.545	72.139	250	Pass
		112	5560	22.439	52.360	74.799	250	Pass
		116	5580	22.182	43.853	66.035	250	Pass
		120	5600	22.491	49.888	72.379	250	Pass
		124	5620	25.177	45.394	70.571	250	Pass
		128	5640	22.336	45.814	68.150	250	Pass
		132	5660	22.387	40.179	62.566	250	Pass
		136	5680	27.925	40.832	68.757	250	Pass
		140	5700	24.604	38.194	62.798	250	Pass
	N	100	5500	22.387	51.404	73.792	250	Pass
		104	5520	23.281	47.424	70.705	250	Pass
		108	5540	21.928	48.865	70.793	250	Pass
		112	5560	24.266	45.709	69.975	250	Pass
		116	5580	27.416	45.604	73.019	250	Pass
		120	5600	24.831	48.865	73.697	250	Pass
		124	5620	24.774	46.774	71.548	250	Pass
		128	5640	24.322	53.333	77.656	250	Pass
		132	5660	24.155	48.865	73.020	250	Pass
		136	5680	24.547	40.926	65.473	250	Pass
		140	5700	24.547	38.282	62.830	250	Pass
5800 MHz	A	149	5745	28.973	32.434	61.407	1000	Pass
		153	5765	29.717	31.989	61.706	1000	Pass
		157	5785	27.990	33.884	61.874	1000	Pass
		161	5805	25.704	36.559	62.263	1000	Pass
		165	5825	25.704	44.668	70.372	1000	Pass

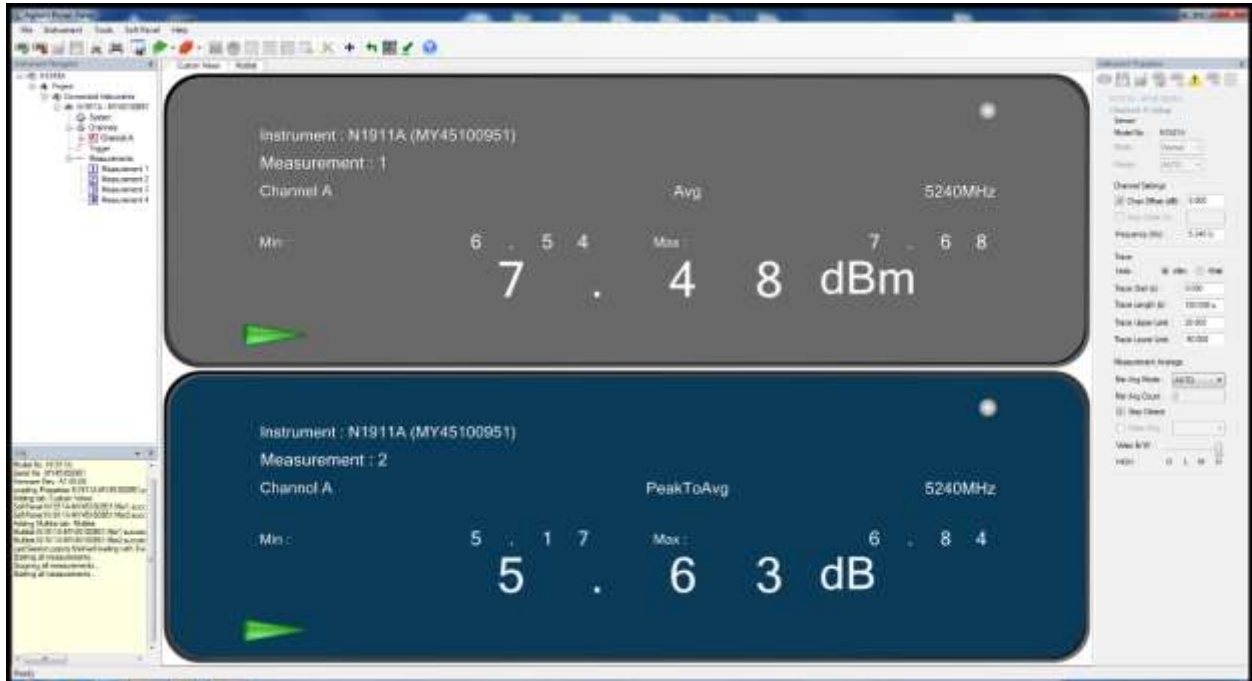


N	149	5745	24.266	32.734	57.000	1000	Pass
	153	5765	27.102	31.405	58.507	1000	Pass
	157	5785	26.002	32.810	58.811	1000	Pass
	161	5805	24.099	36.559	60.659	1000	Pass
	165	5825	25.942	42.658	68.600	1000	Pass

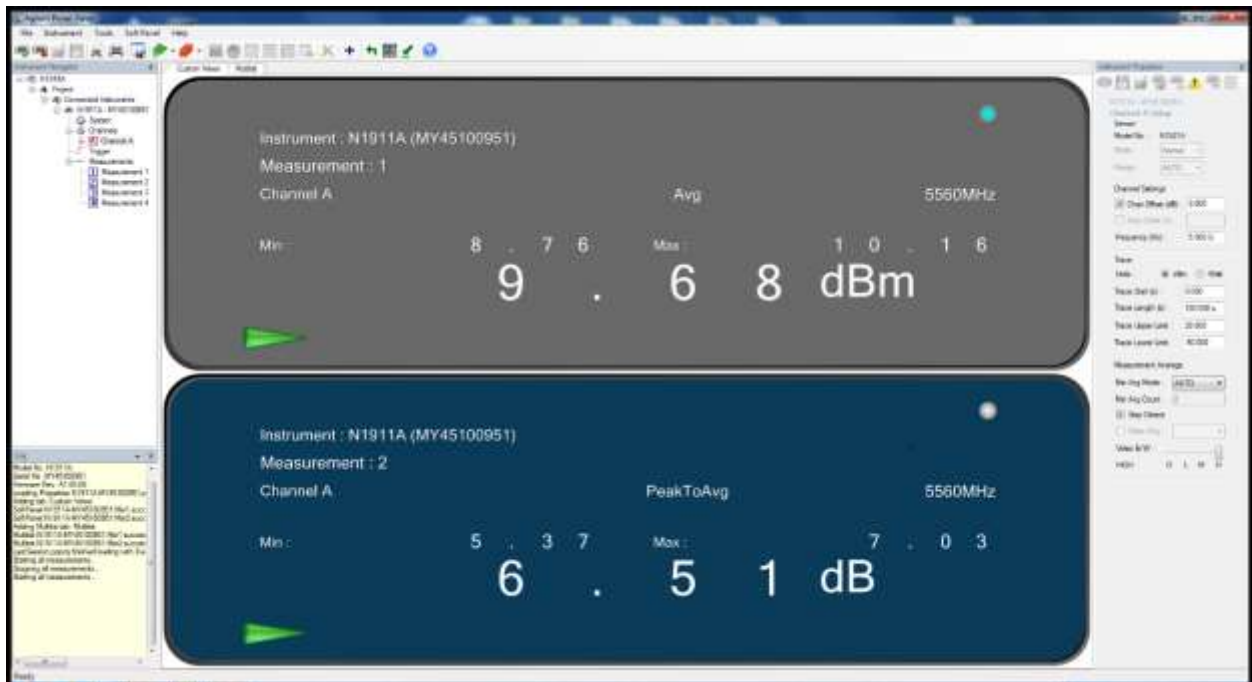
2.2.9 Sample Test Plots



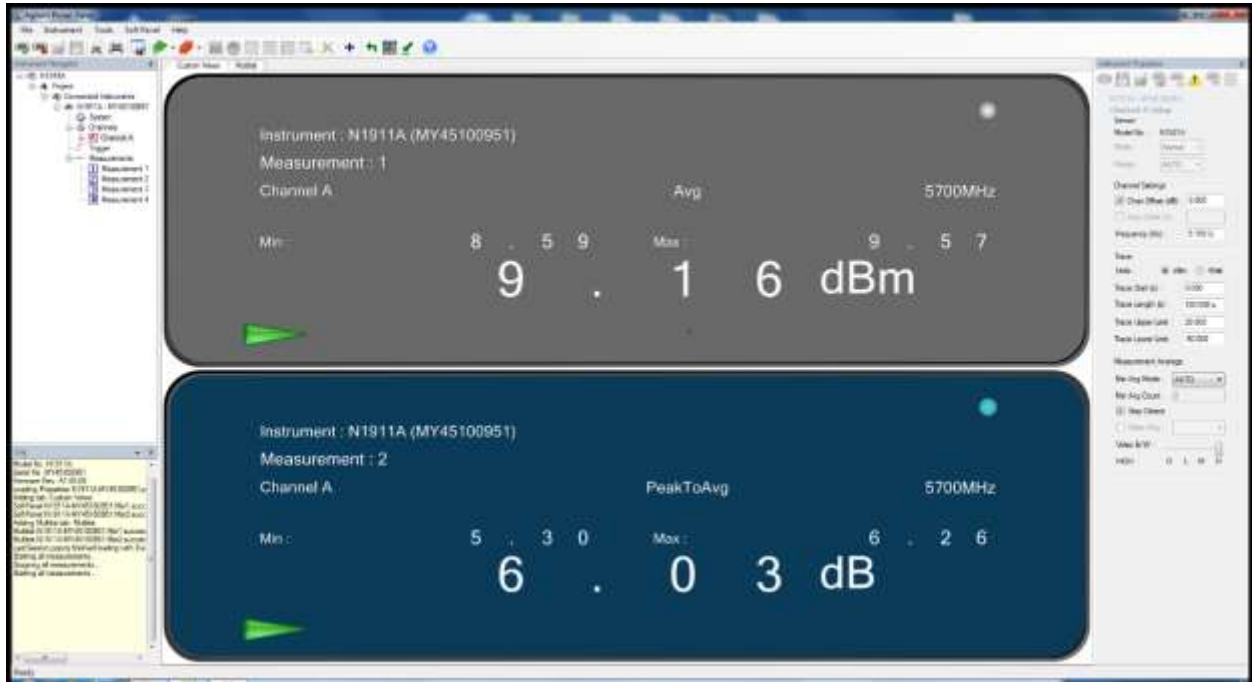
802.11a Channel 56 5280MHz



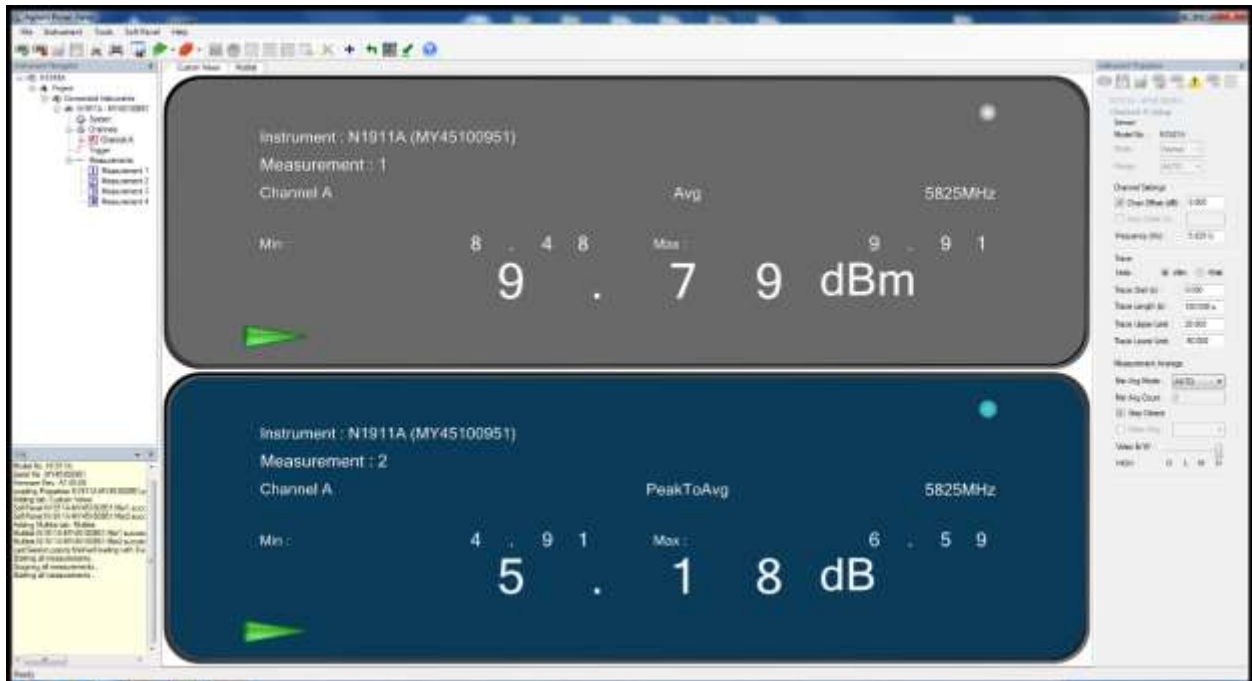
802.11n Channel 48 5240MHz



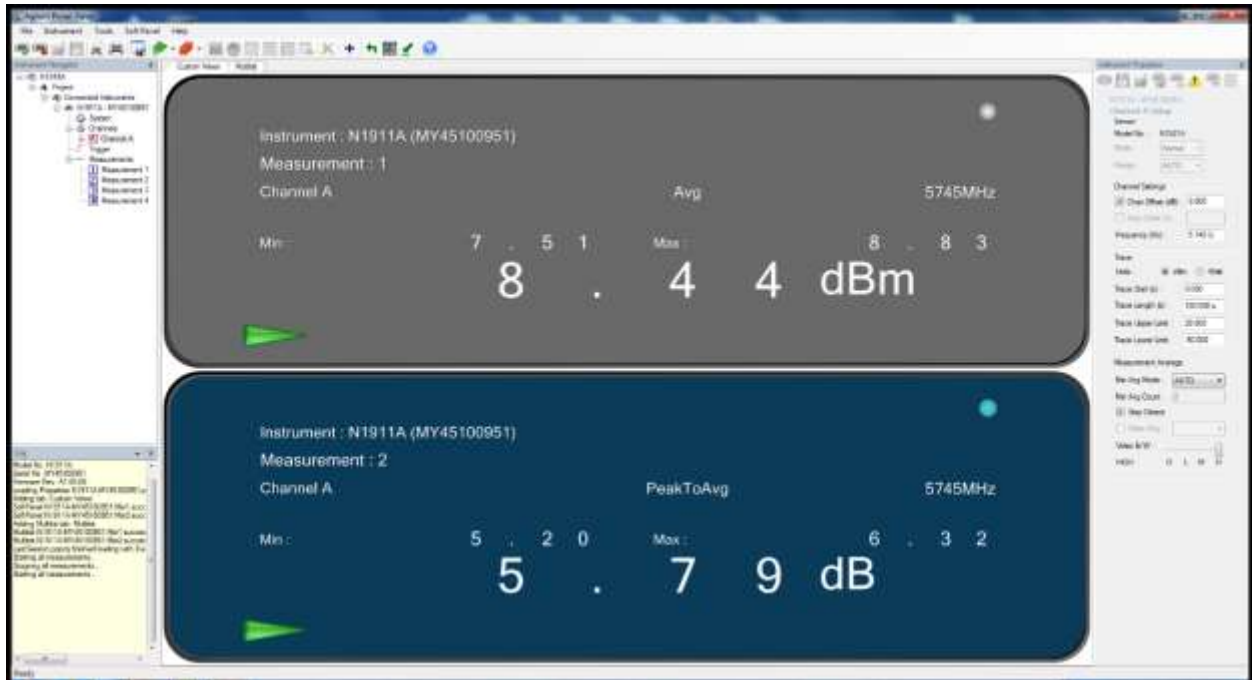
802.11a Channel 112 5560MHz



802.11n Channel 140 5700MHz



802.11a Channel 165 5825MHz



802.11n Channel 149 5745MHz



2.3 UNWANTED EMISSIONS MEASUREMENT

2.3.1 Specification Reference

Part 15 Subpart E §15.407(b)(1),(4)(i) and (7) / 15.209 and RSS-247 6.2.1 (2) and 6.2.4 (2)

2.3.2 Standard Applicable

(b) Undesirable emission limits. Except as shown in paragraph (b)(7) of this section, the maximum emissions outside of the frequency bands of operation shall be attenuated in accordance with the following limits:

(1) For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(7) The provisions of §15.205 apply to intentional radiators operating under this section.

6.2.4 (2) For the band 5725-5850 MHz, emissions at frequencies from the band edges to 10 MHz above or below the band edges shall not exceed -17 dBm/MHz e.i.r.p.

For emissions at frequencies more than 10 MHz above or below the band edges, the emissions power shall not exceed -27 dBm/MHz.

2.3.3 Test Methodology

Section II (G) Unwanted Emission Measurement of 789033 D02 General UNII Test Procedures v01r02

2.3.4 Equipment Under Test and Modification State

Serial No: TUV1 and TUV2 / Test Configuration A and B

2.3.5 Date of Test/Initial of test personnel who performed the test

July 17, 2018/FSC

2.3.6 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.



2.3.7 Environmental Conditions/ Test Location

Test performed at TÜV SÜD America Inc. Rancho Bernardo facility

Ambient Temperature 26.7 °C
 Relative Humidity 45.8 %
 ATM Pressure 99.9 kPa

2.3.8 Additional Observations

- This is an antenna-port conducted measurement test plus radiated cabinet spurious emissions measurements.
- Only the worst-case data rate/modulation presented.
- Transducer Factor (TDF) was added to compensate for the antenna gain, external attenuator and cable used.
- Only worst-case configuration (channel, data rate or MCS and BW) used for radiated cabinet spurious emissions test.
- Radiated measurement was done using EMC32 automated software. Reported level is the actual level with all the correction factors factored in. Correction Factor column is for informational purposes only. See Section 2.3.9 for sample computation.

2.3.9 Sample Computation (Radiated Emission)

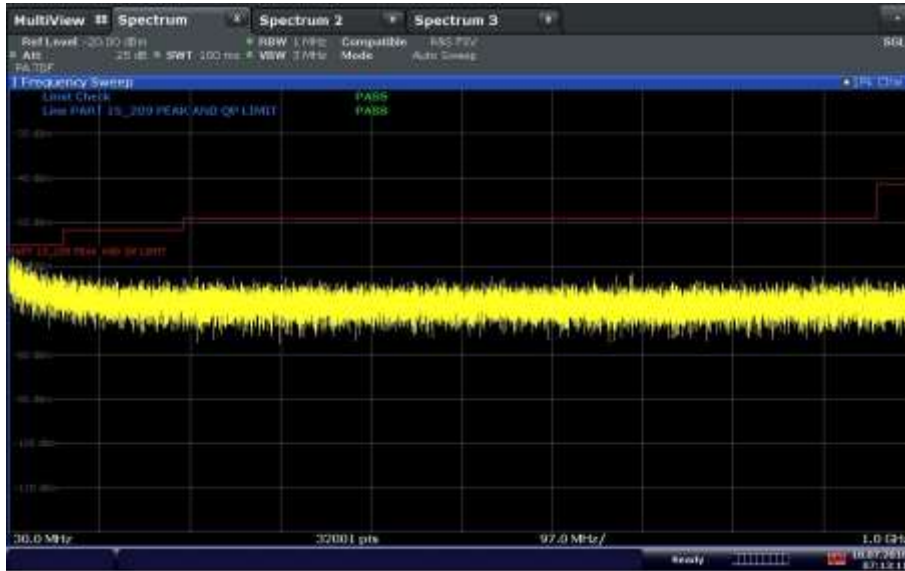
Measuring equipment raw measurement (dbµV) @ 30 MHz		24.4
Correction Factor (dB)	Asset# 1066 (cable)	0.3
	Asset# 1172 (cable)	0.3
	Asset# 1016 (preamplifier)	-30.7
	Asset# 1175(cable)	0.3
	Asset# 1002 (antenna)	17.2
Reported QuasiPeak Final Measurement (dbµV/m) @ 30MHz		11.8

2.3.10 Test Results

See attached plots.

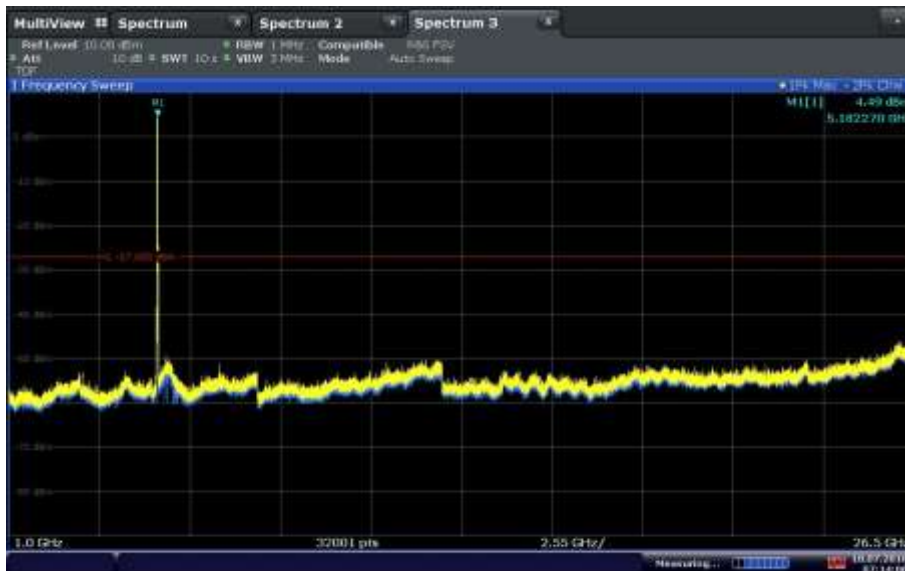


2.3.11 Test Plots



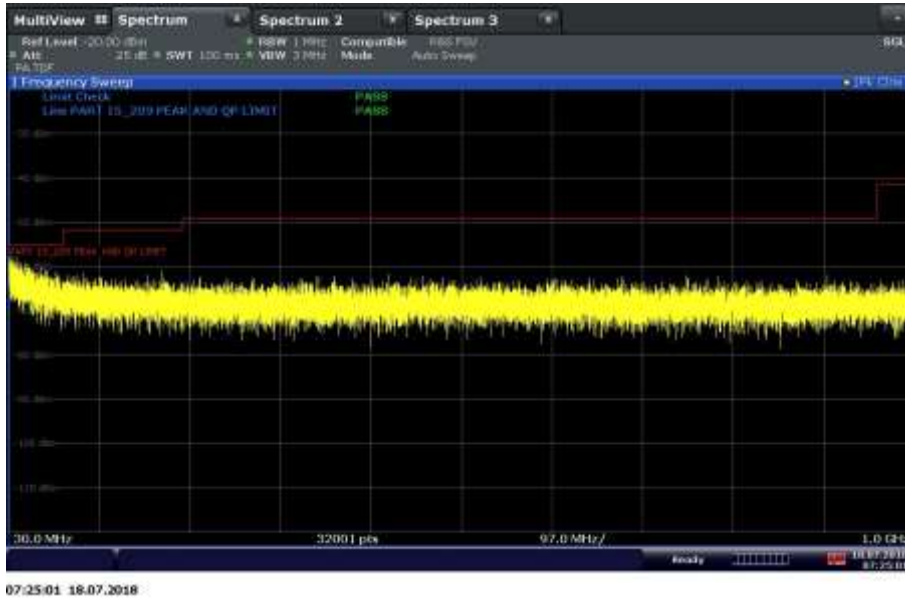
07:13:12 18.07.2018

802.11a U-NII 1 Low Channel below 1GHz

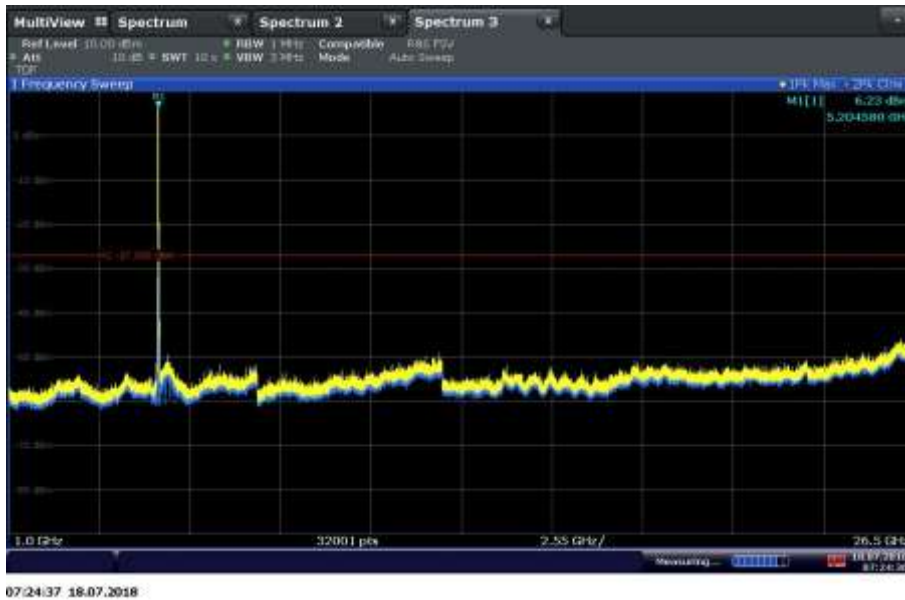


07:14:06 18.07.2018

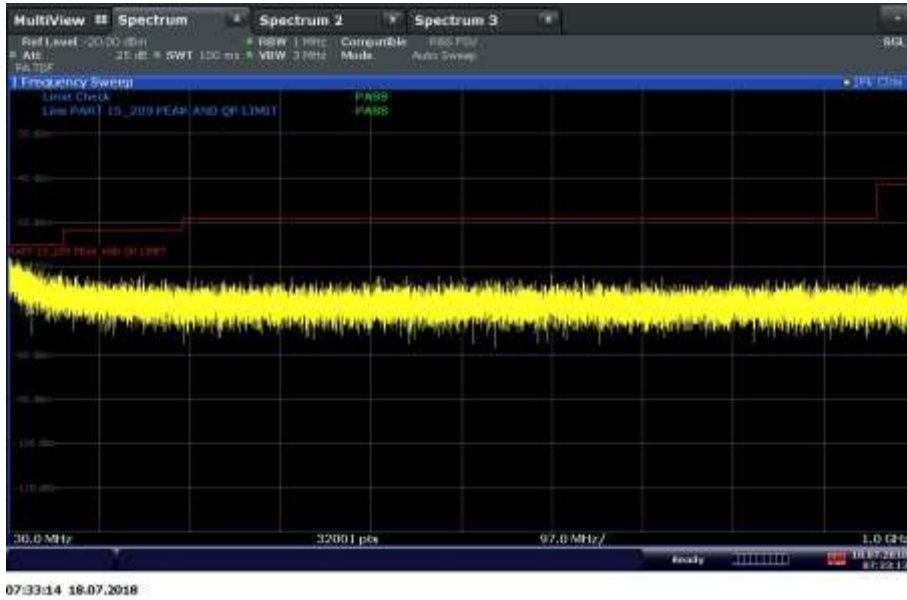
802.11a U-NII 1 Low Channel above 1GHz



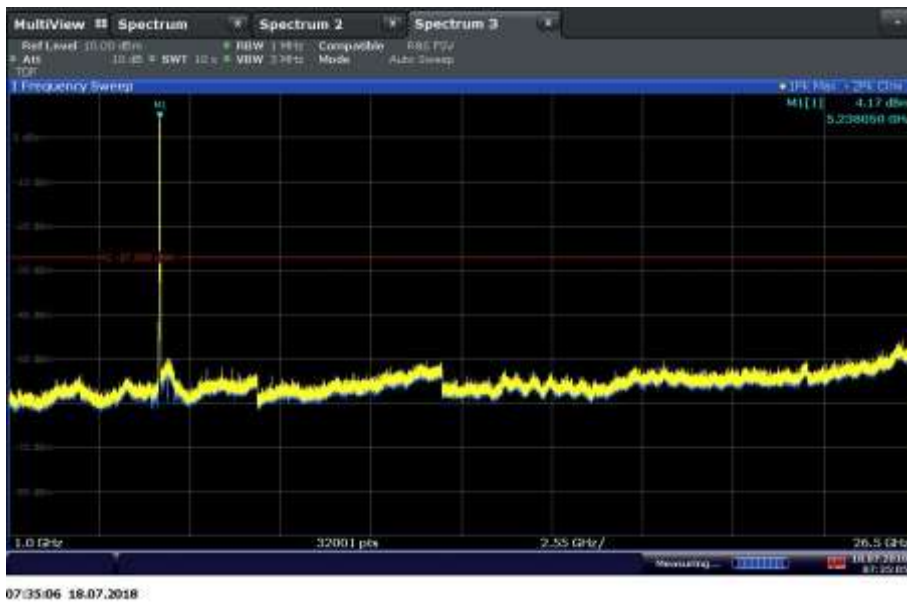
802.11a U-NII 1 Mid Channel below 1GHz



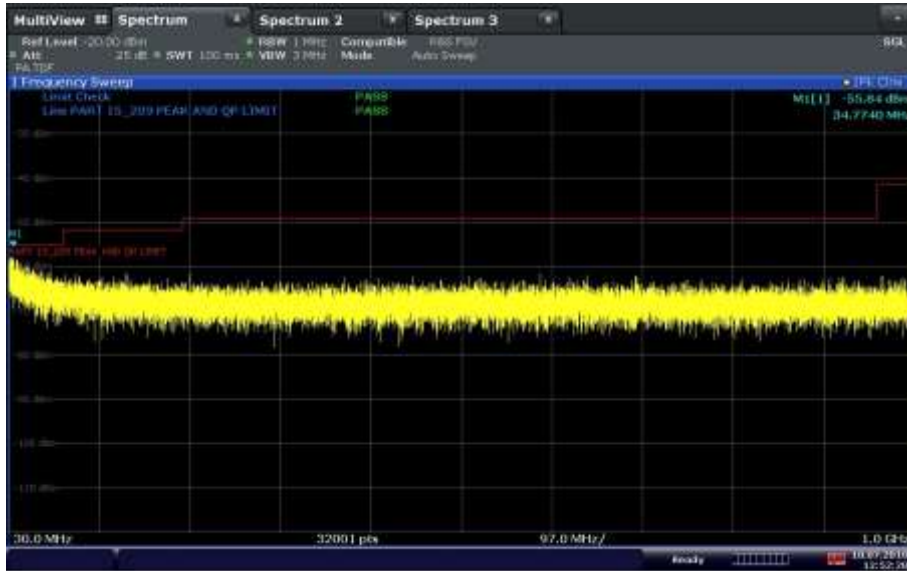
802.11a U-NII 1 Mid Channel above 1GHz



802.11a U-NII 1 High Channel below 1GHz

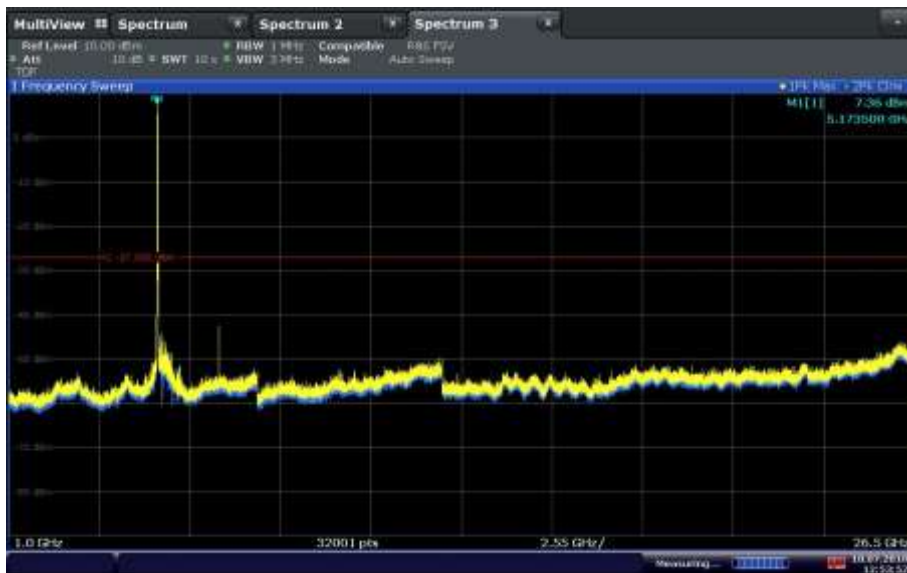


802.11a U-NII 1 High Channel above 1GHz



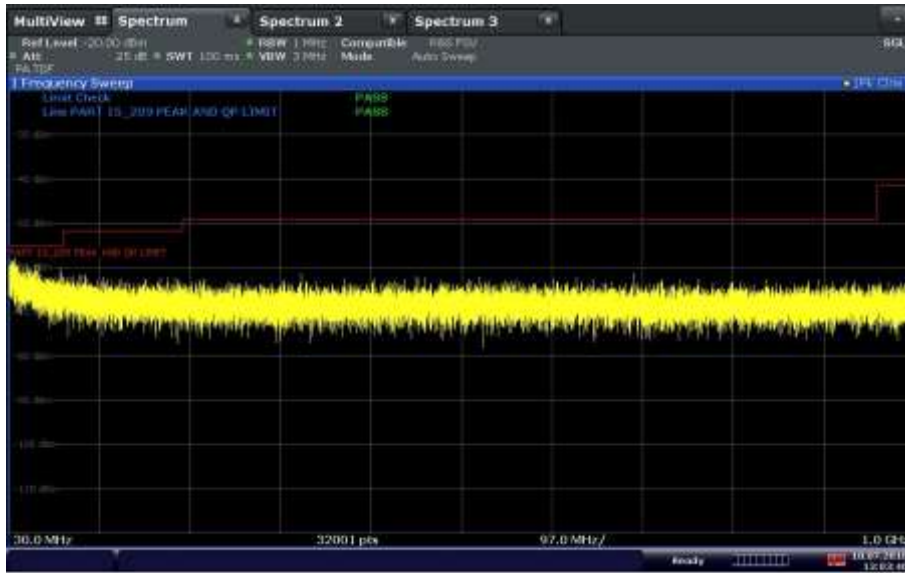
12:52:28 18.07.2018

802.11 n (20 MHz) U-NII 1 Low Channel below 1GHz



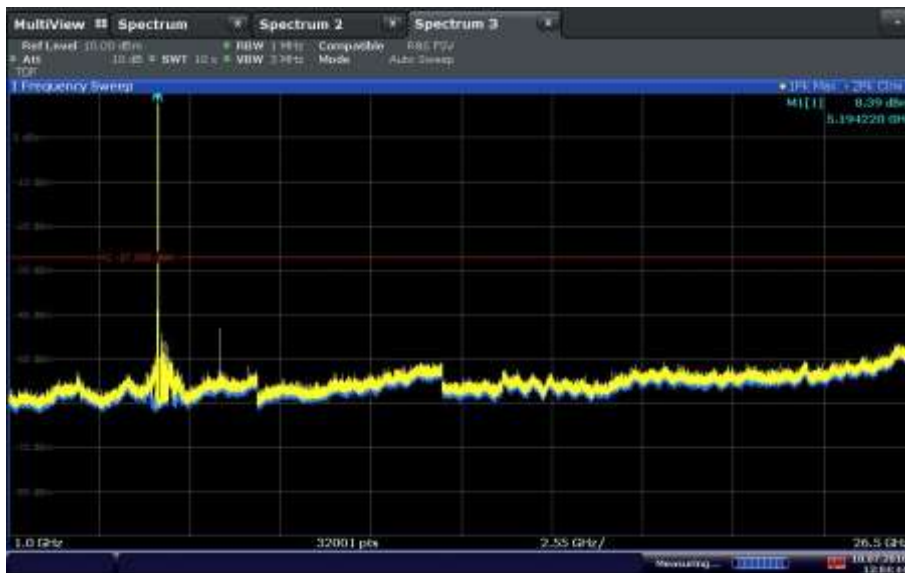
12:53:53 18.07.2018

802.11 n (20 MHz) U-NII 1 Low Channel above 1GHz



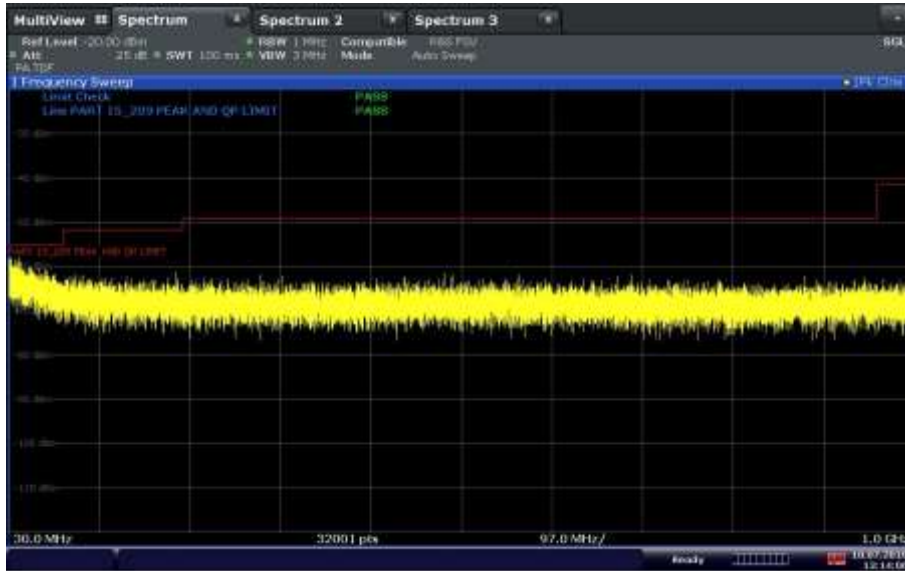
13:03:47 18.07.2018

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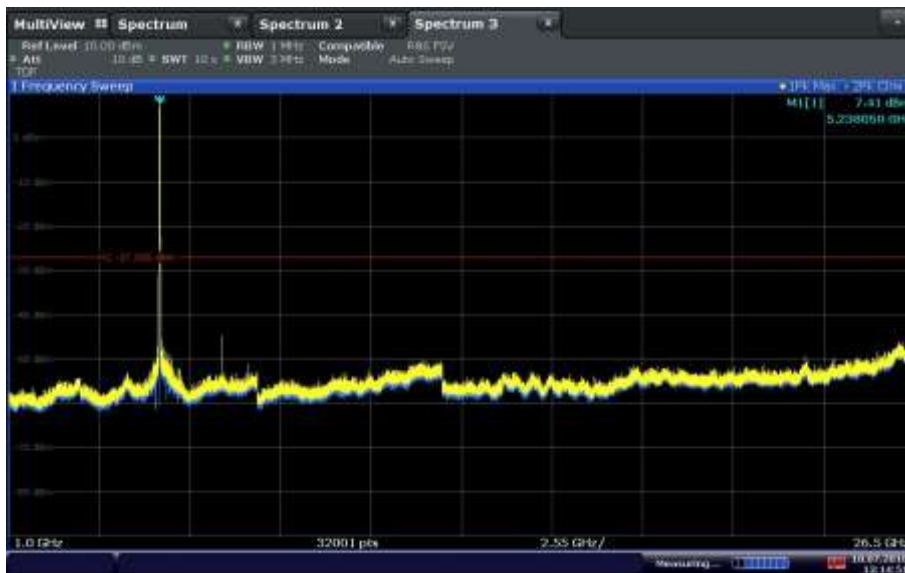


13:04:45 18.07.2018

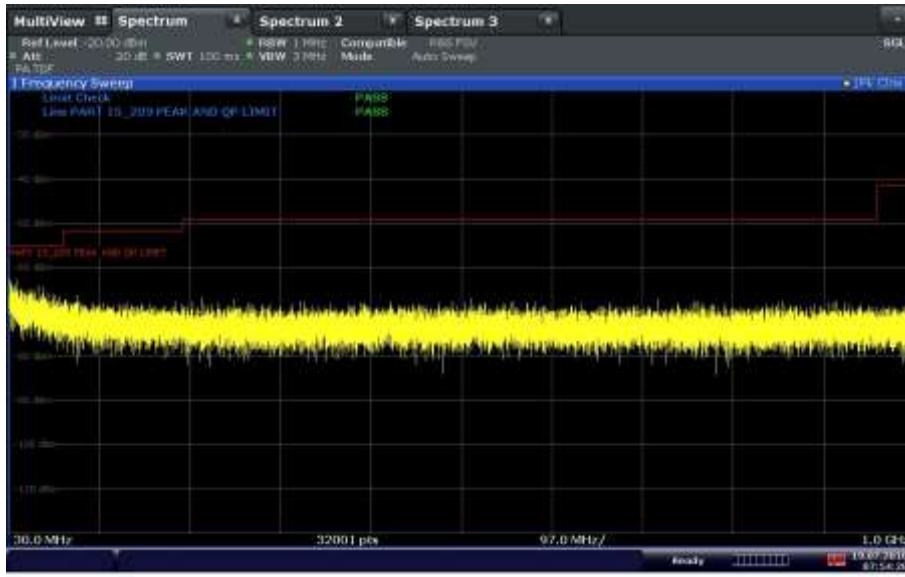
802.11 n (20 MHz) U-NII 1 Mid Channel above 1GHz



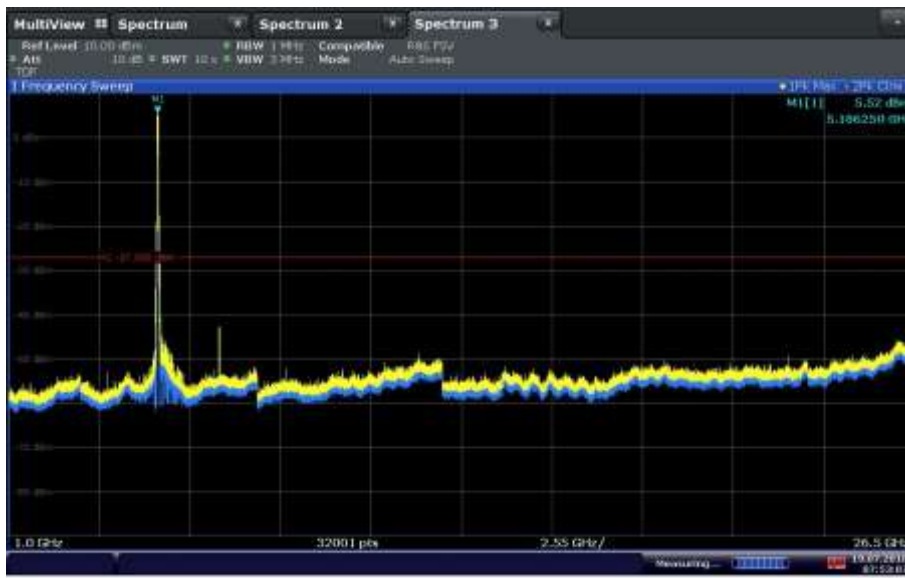
802.11 n (20 MHz) U-NII 1 High Channel below 1GHz



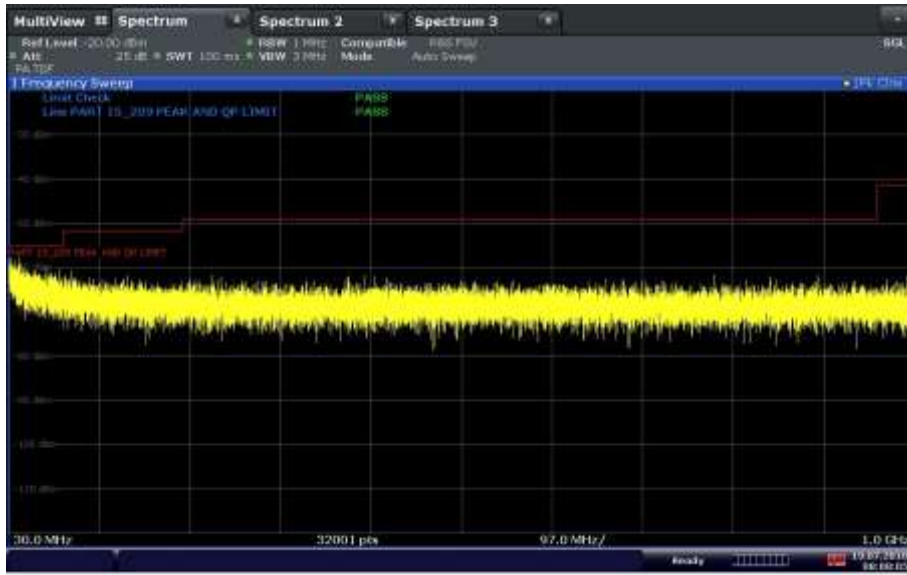
802.11 n (20 MHz) U-NII 1 High Channel above 1GHz



802.11 n (40 MHz) U-NII 1 Low Channel below 1GHz

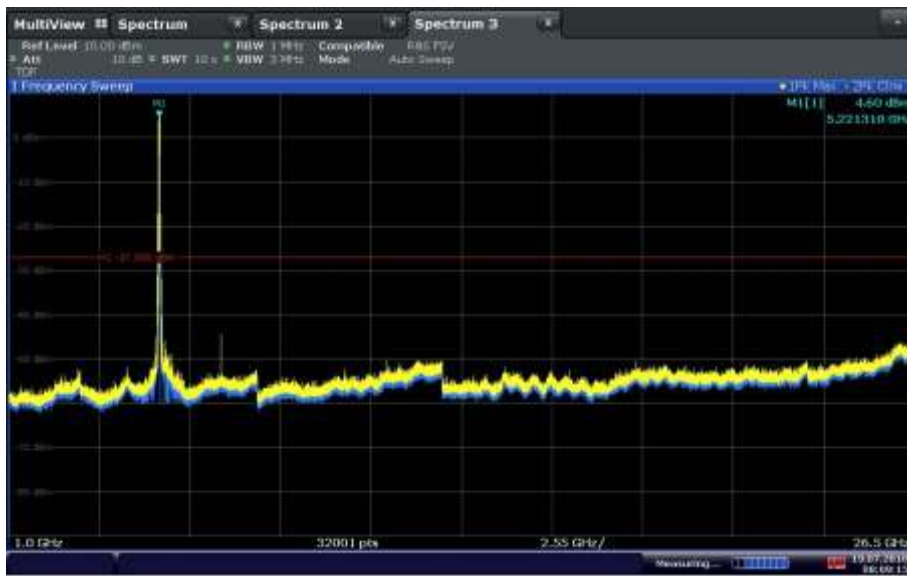


802.11 n (40 MHz) U-NII 1 Low Channel above 1GHz



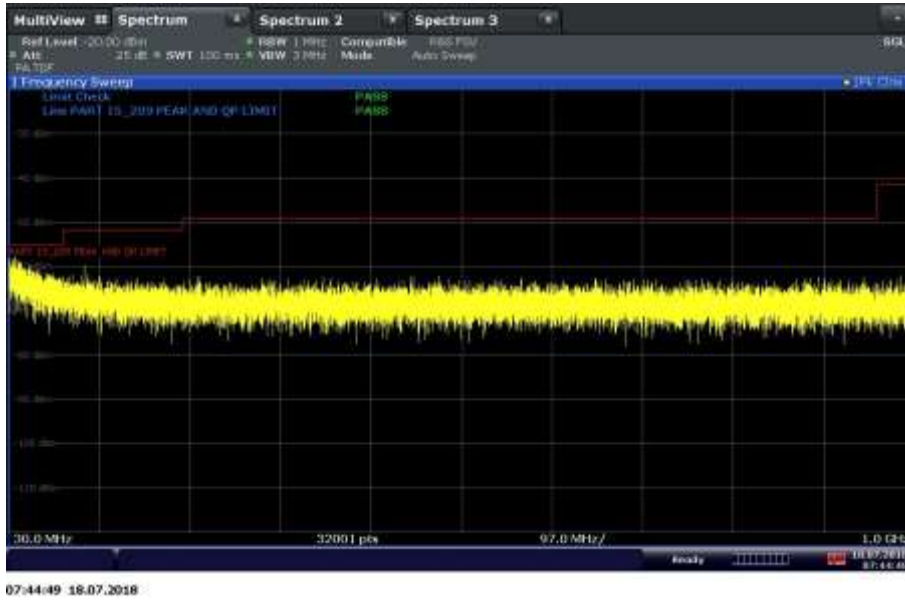
08:08:05 19.07.2018

802.11 n (40 MHz) U-NII 1 High Channel below 1GHz

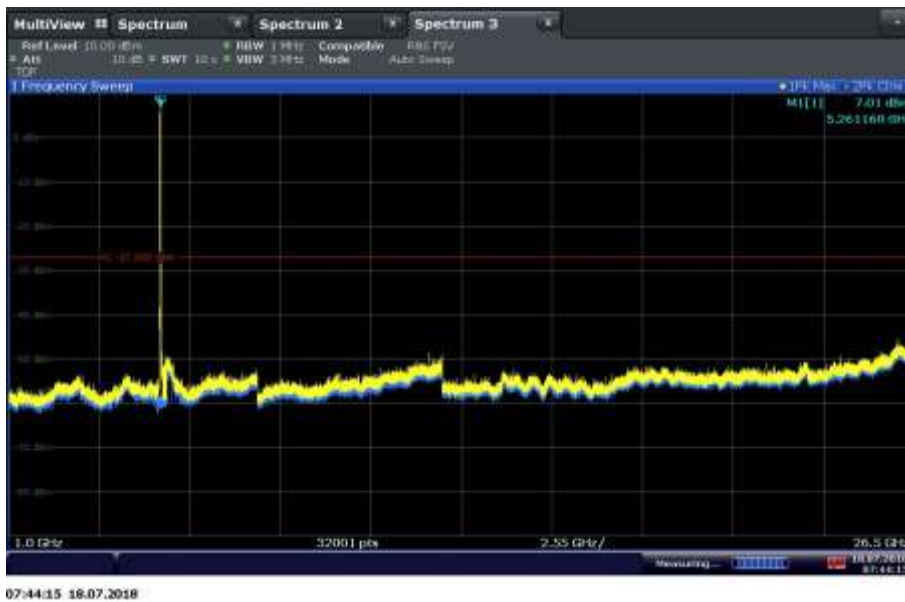


08:09:16 19.07.2018

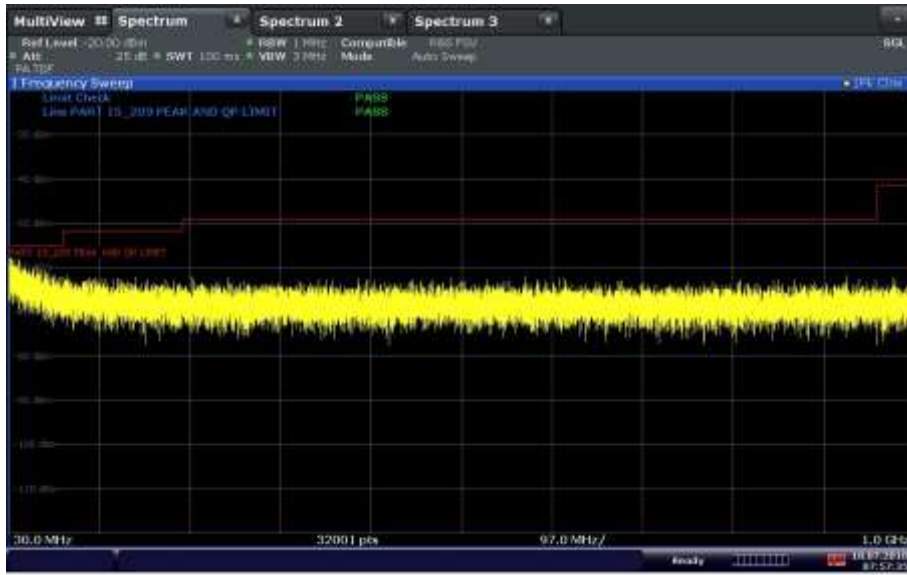
802.11 n (40 MHz) U-NII 1 High Channel above 1GHz



802.11a (20 MHz) U-NII 2 Low Channel below 1GHz

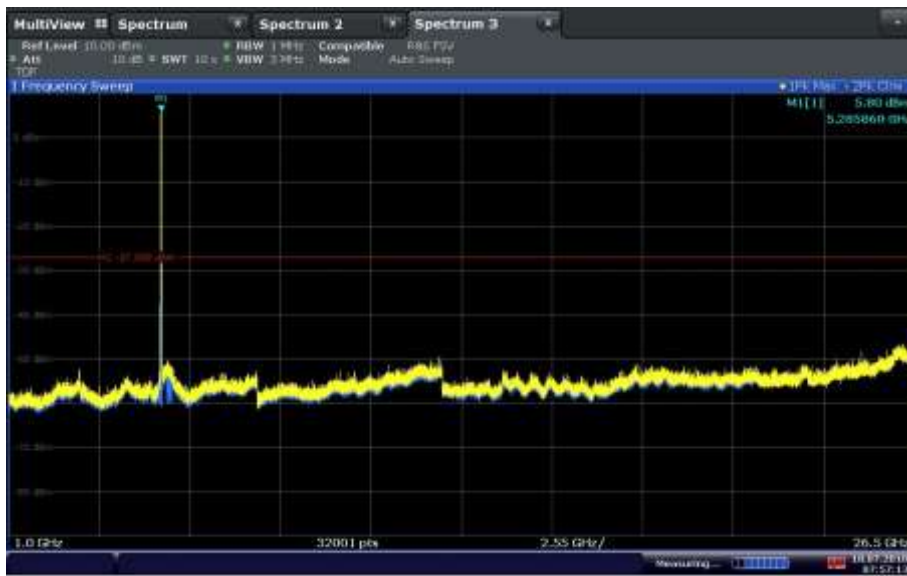


802.11 a (20 MHz) U-NII 2 Low Channel above 1GHz



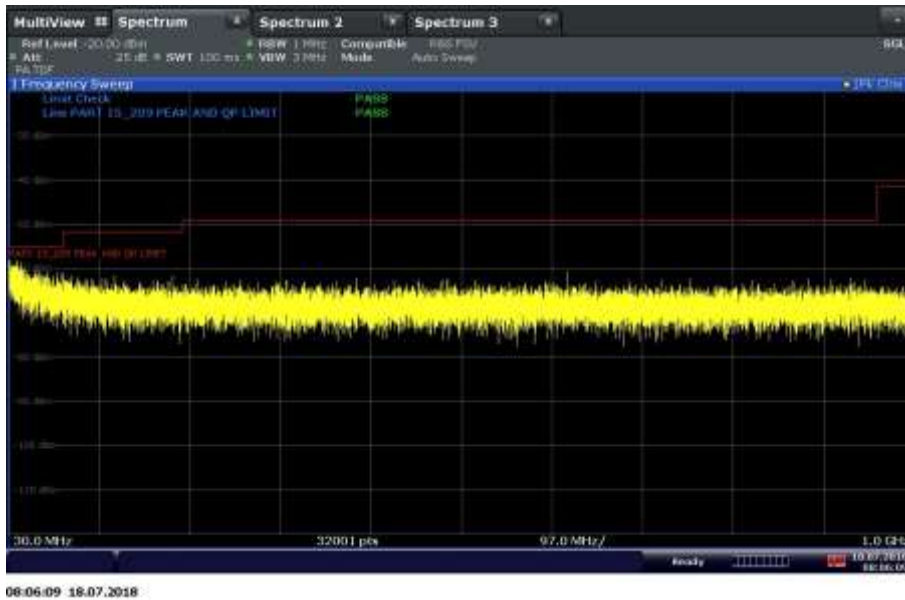
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802.11 a (20 MHz) U-NII 2 Mid Channel below 1GHz

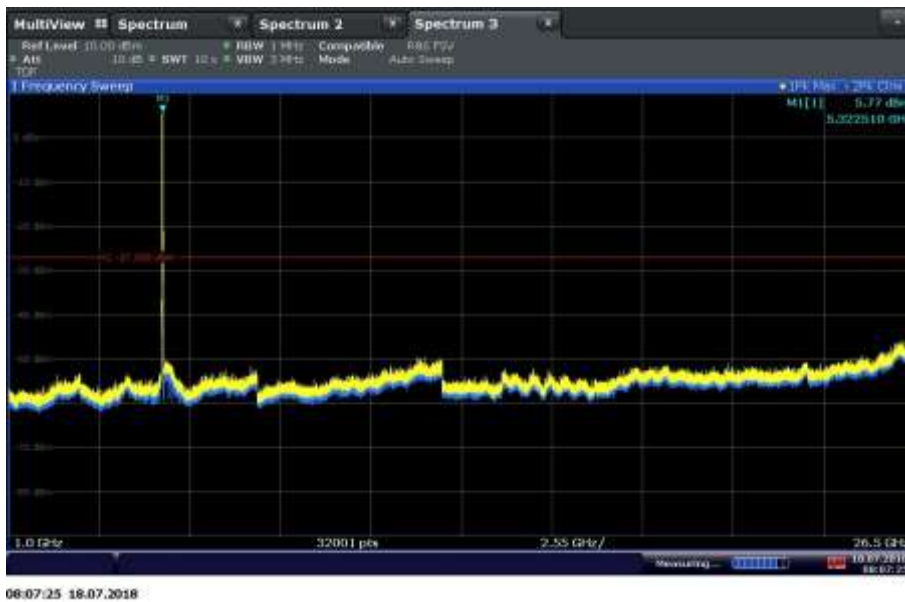


07:57:14 18.07.2018

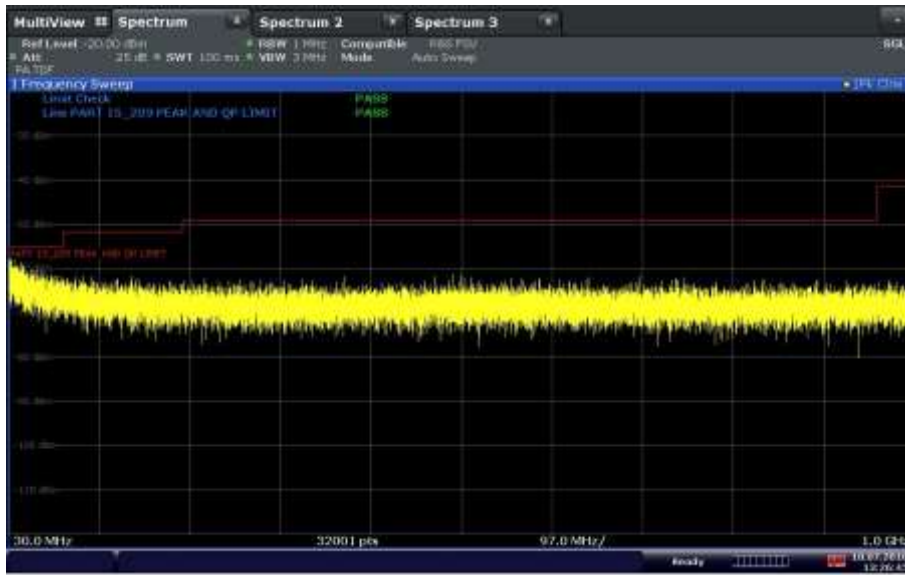
802.11 a (20 MHz) U-NII 2 Mid Channel above 1GHz



802.11 a(20 MHz) U-NII 2 High Channel below 1GHz

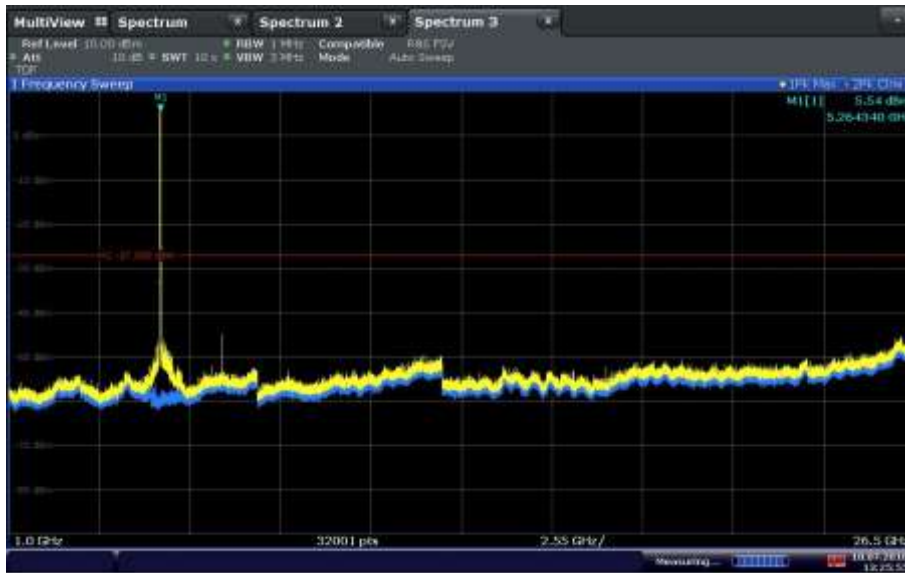


802.11 a (20 MHz) U-NII 2 High Channel above 1GHz



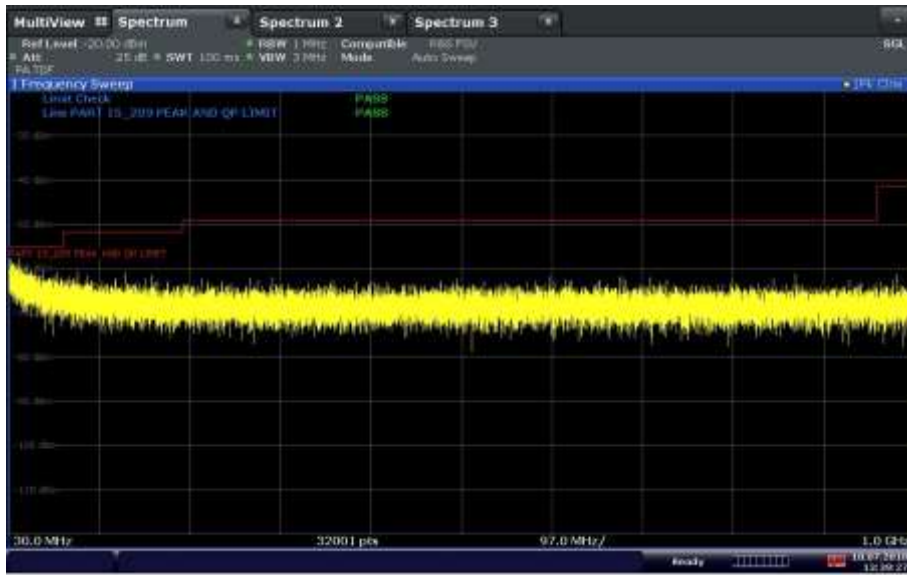
13:26:46 18.07.2018

802.11 n (20 MHz) U-NII 2 Low Channel below 1GHz

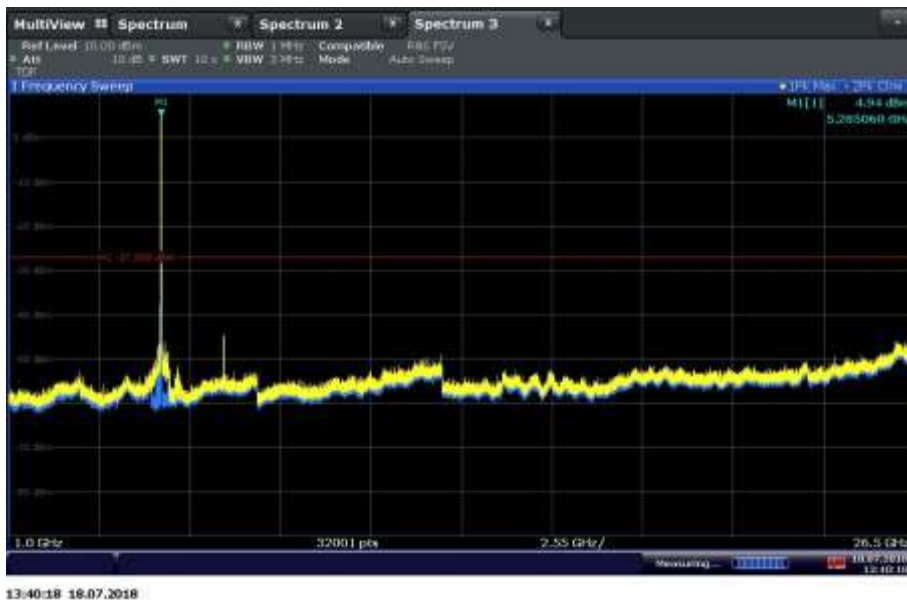


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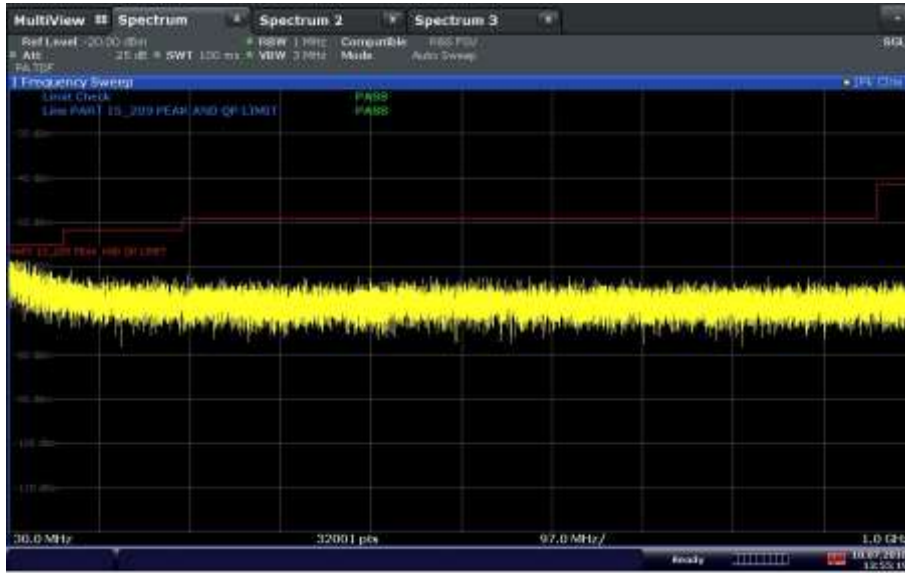
802.11 n (20 MHz) U-NII 2 Low Channel above 1GHz



802.11 n (20 MHz) U-NII 1 Mid Channel below 1GHz

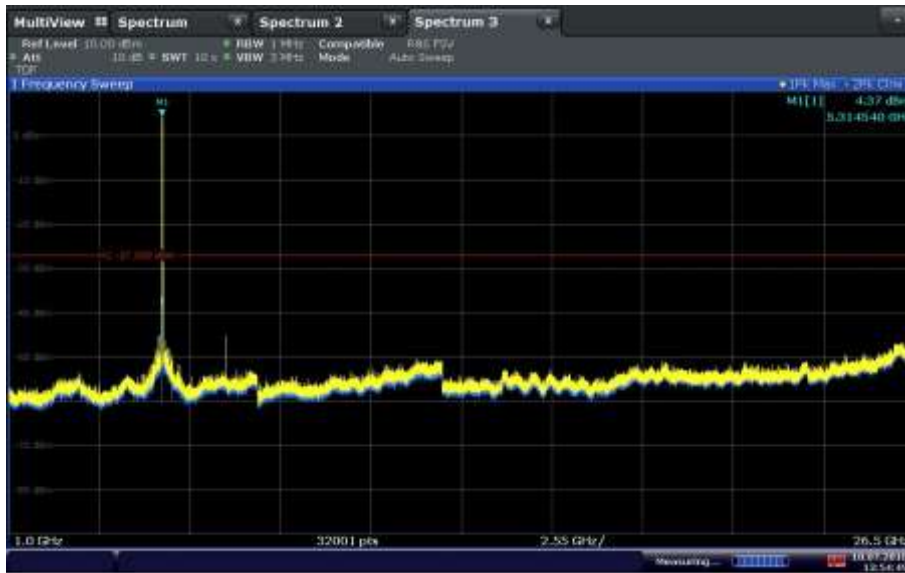


802.11 n (20 MHz) U-NII 1 Mid Channel above 1GHz



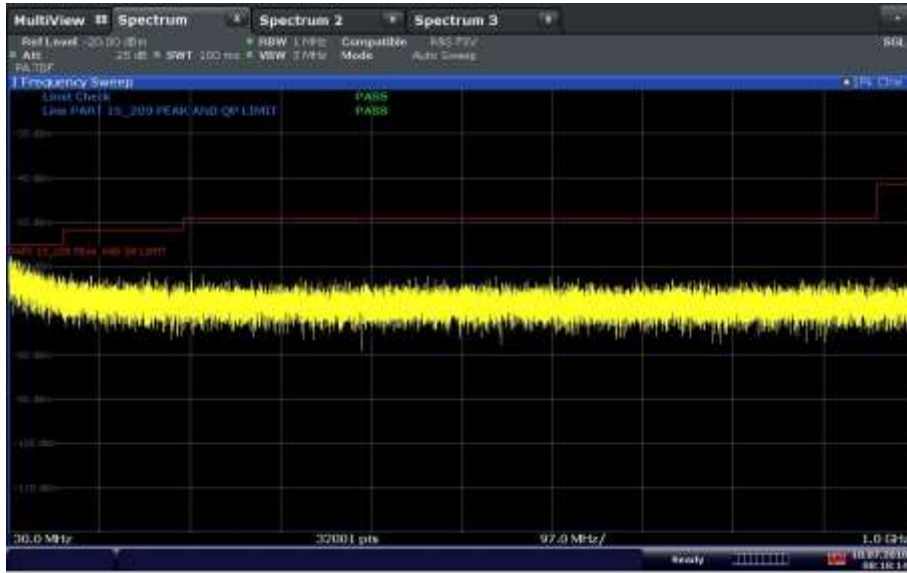
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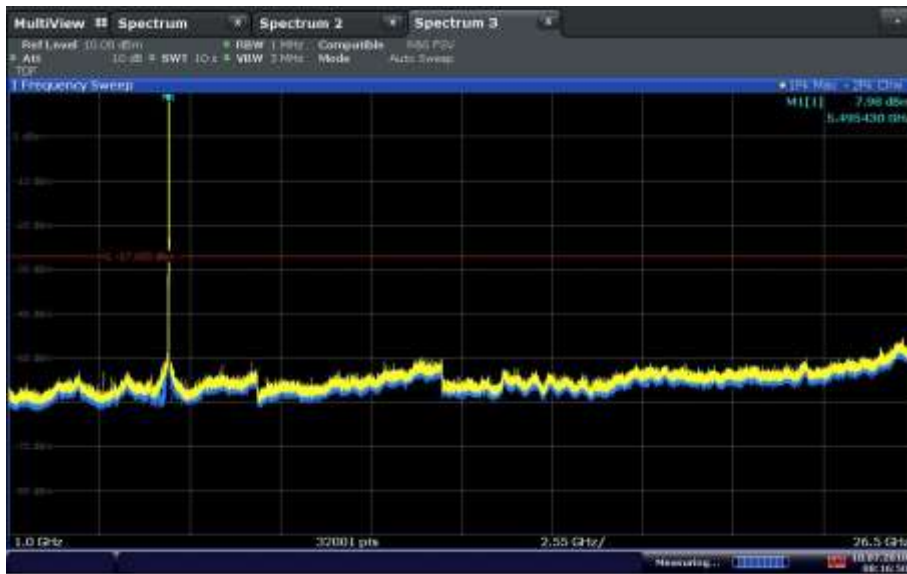
13:54:49 18.07.2018

802.11 n (20 MHz) U-NII 1 High Channel above 1GHz



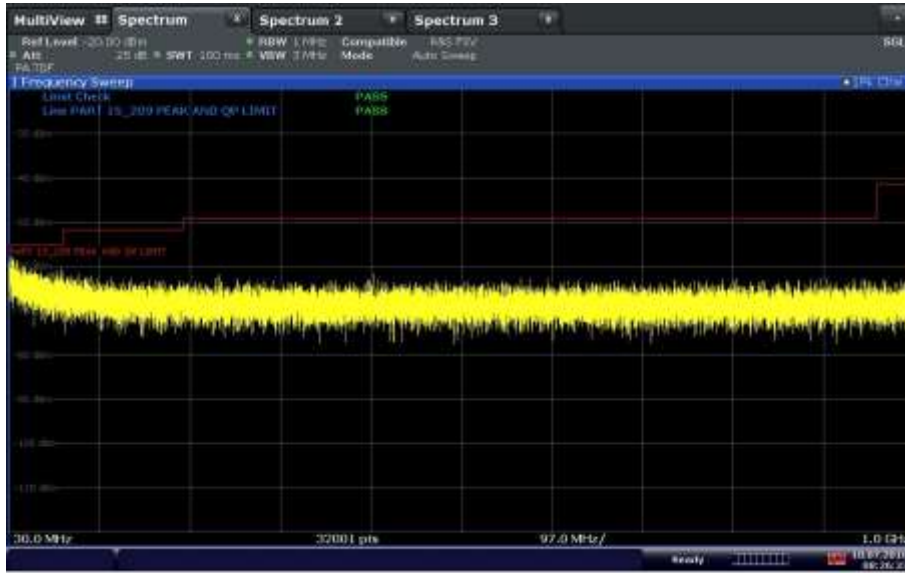
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802.11 a (20 MHz) U-NII 2-Ext Low Channel below 1GHz

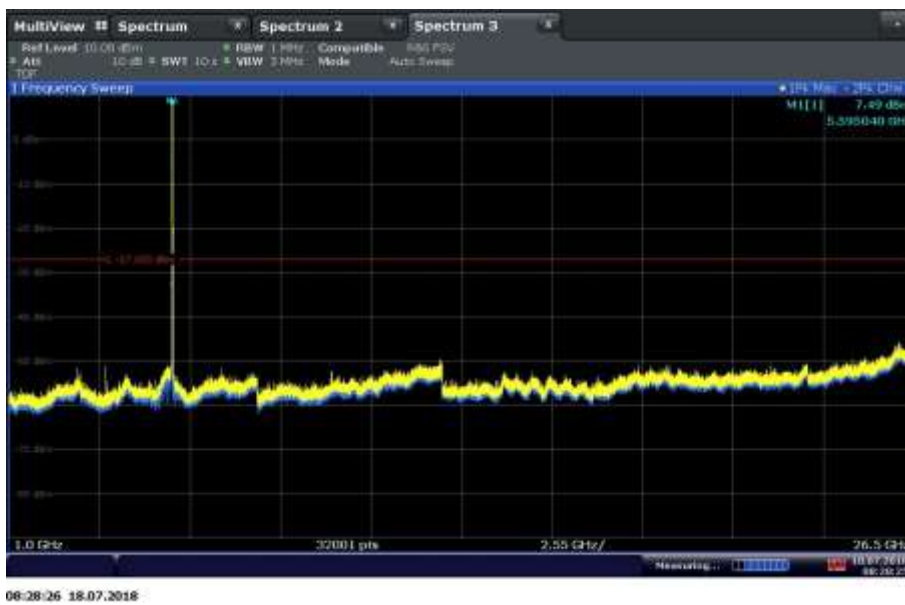


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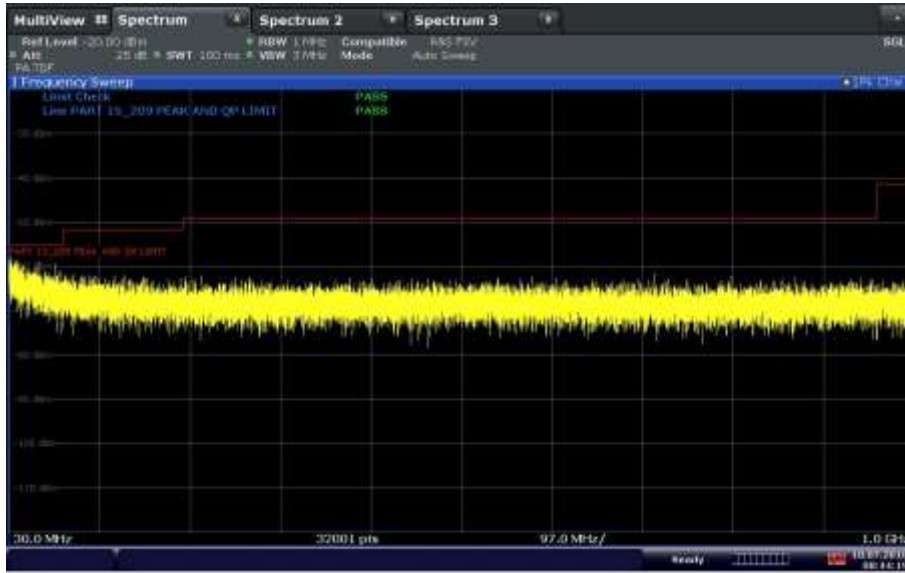
802.11 a (20 MHz) U-NII 2-Ext Low Channel Above 1GHz



802.11 a (20 MHz) U-NII 2-Ext Mid Channel below 1GHz

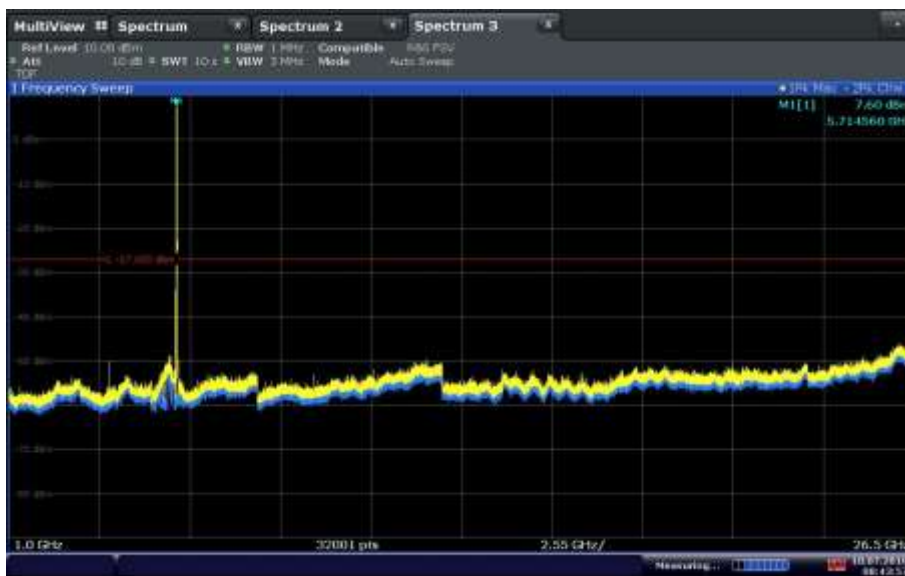


802.11 a (20 MHz) U-NII 2-Ext Mid Channel Above 1GHz



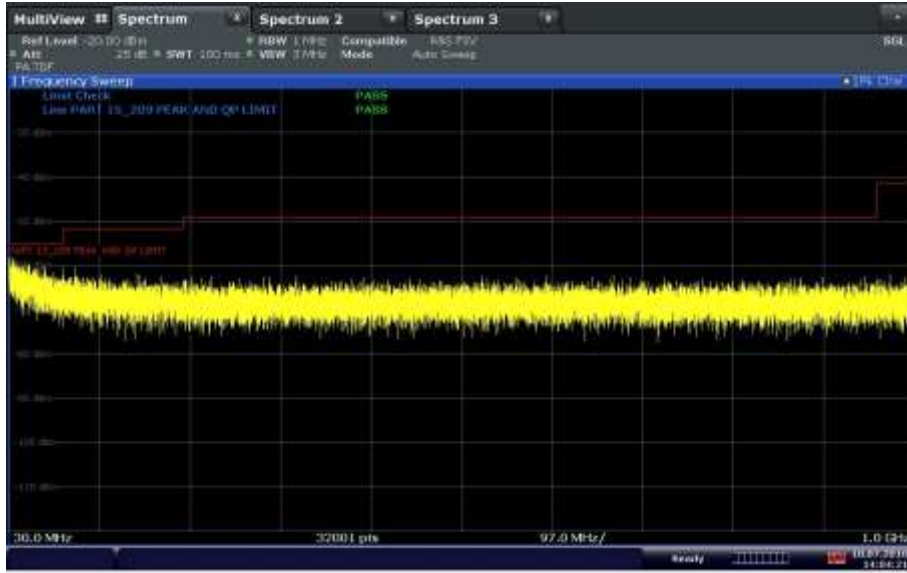
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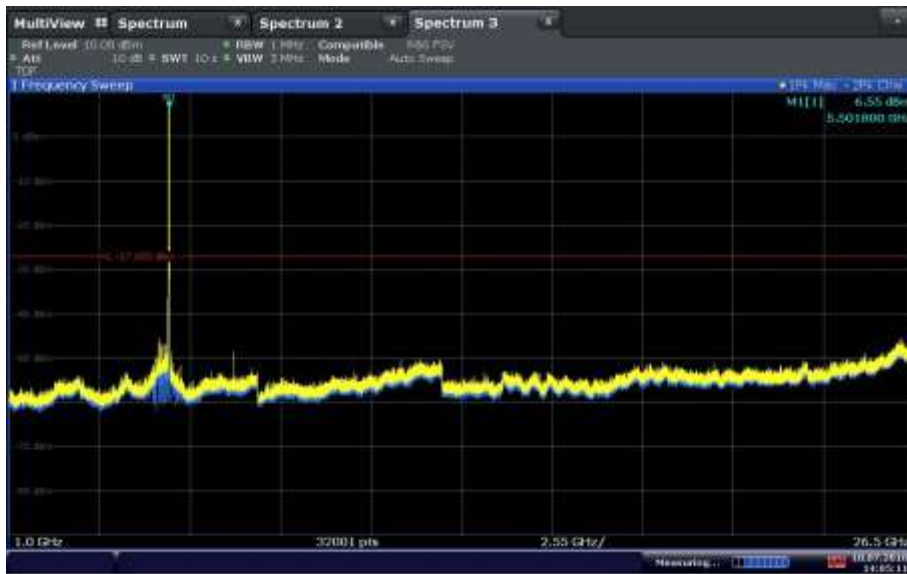
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802.11 a (20 MHz) U-NII 2-Ext High Channel Above 1GHz



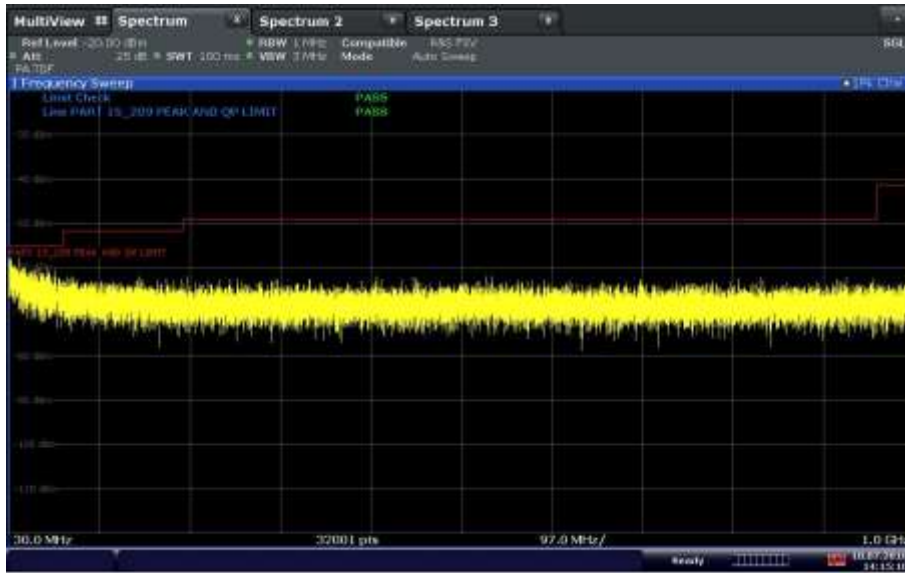
14:04:21 18.07.2018

802.11 n (20 MHz) U-NII 2-Ext Low Channel below 1GHz



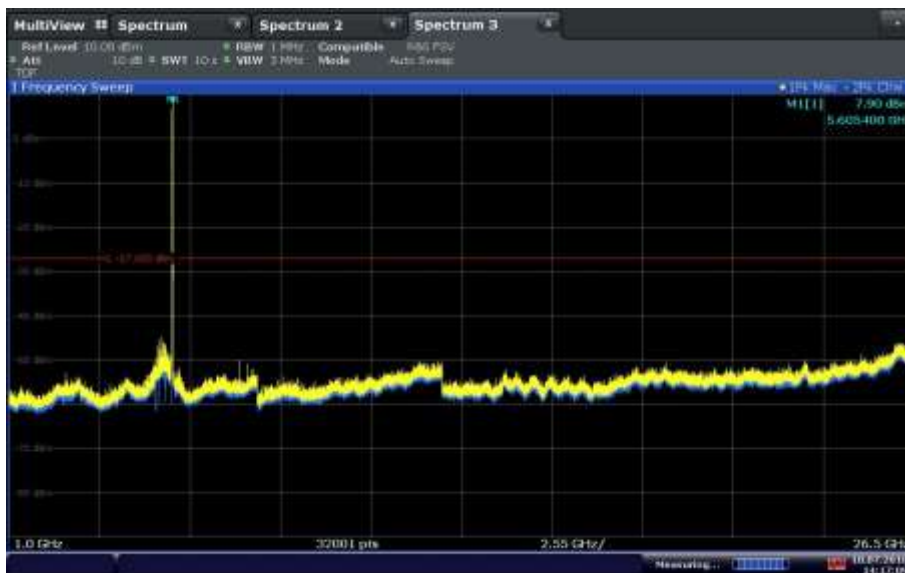
14:05:12 18.07.2018

802.11 n (20 MHz) U-NII 2-Ext Low Channel Above 1GHz



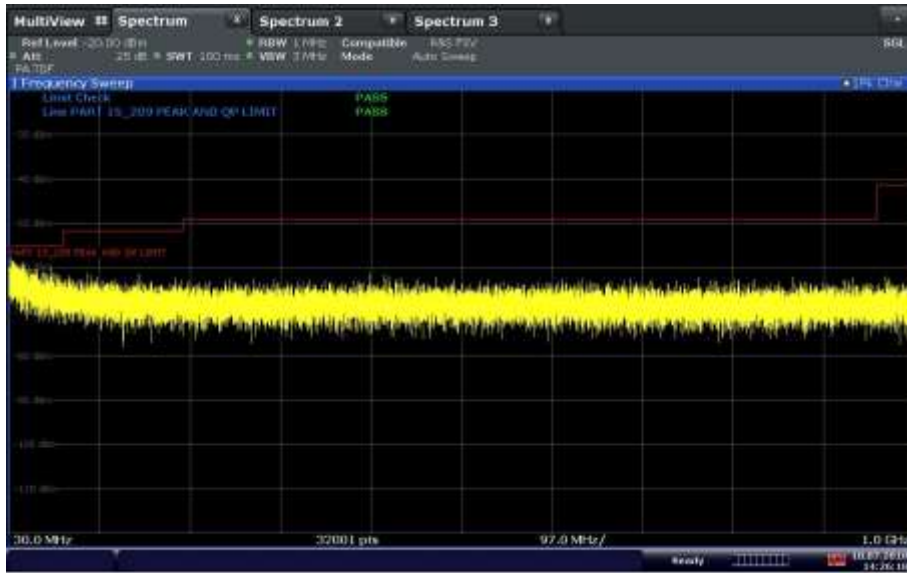
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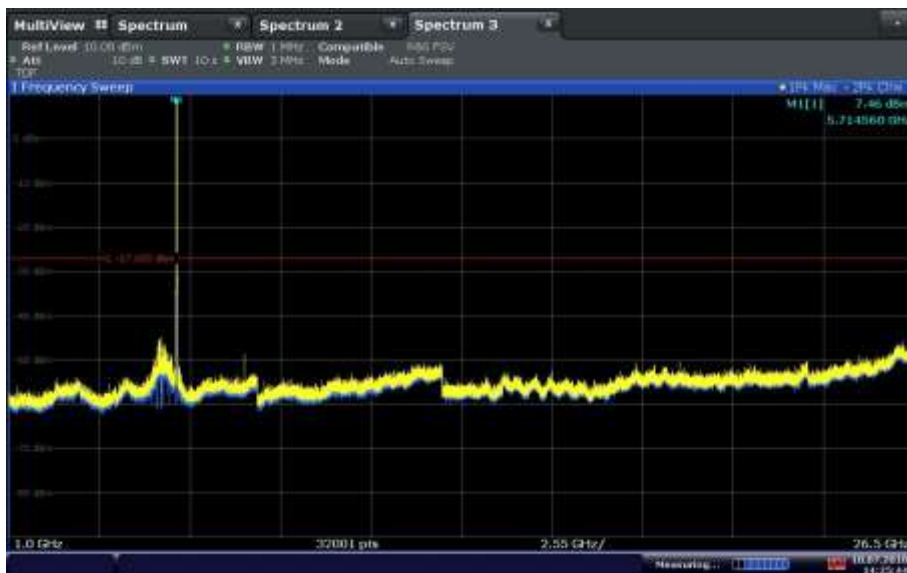
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802.11 n (20 MHz) U-NII 2-Ext Mid Channel Above 1GHz



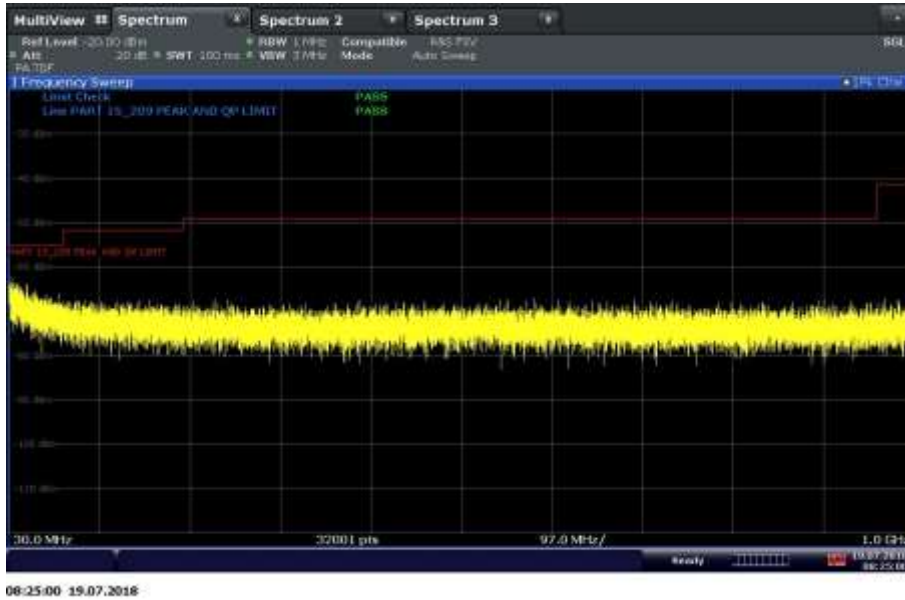
14:26:18 18.07.2018

802.11 n (20 MHz) U-NII 2-Ext High Channel below 1GHz

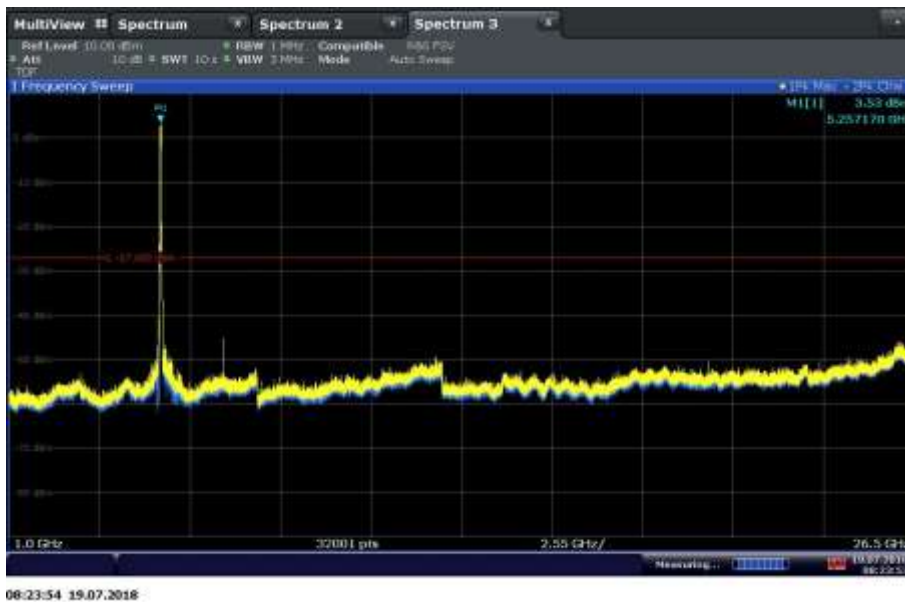


14:25:45 18.07.2018

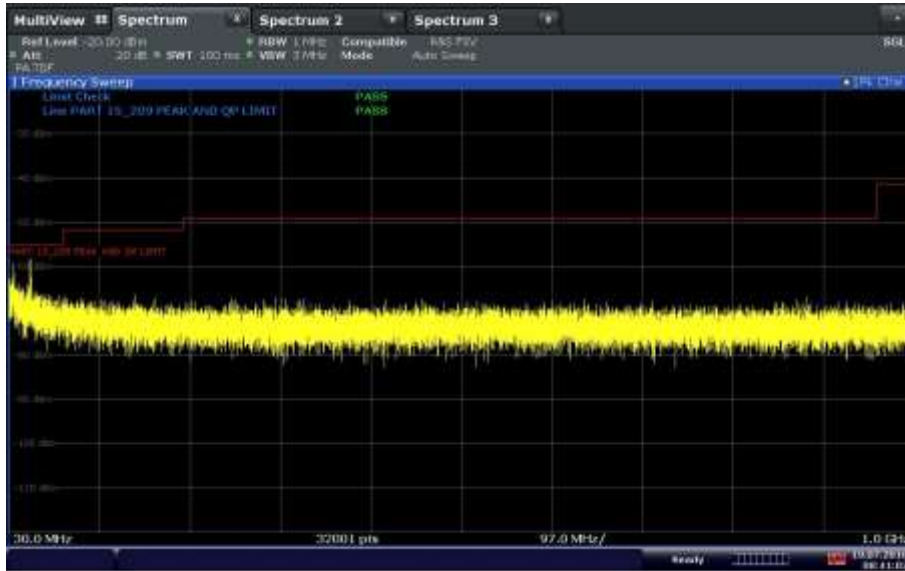
802.11 n (20 MHz) U-NII 2-Ext High Channel Above 1GHz



802.11 n (40 MHz) U-NII 2a Low Channel below 1GHz

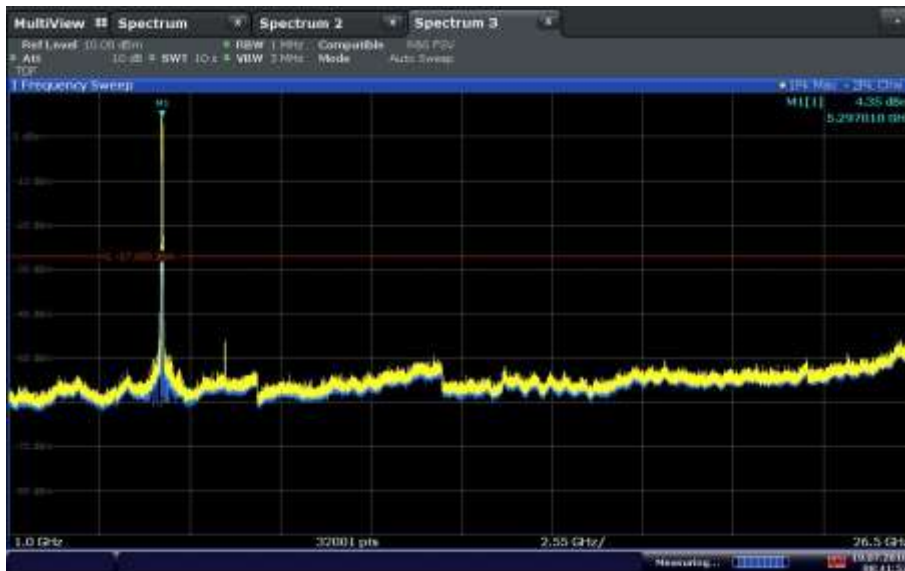


802.11 n (40 MHz) U-NII 2a Low Channel Above 1GHz



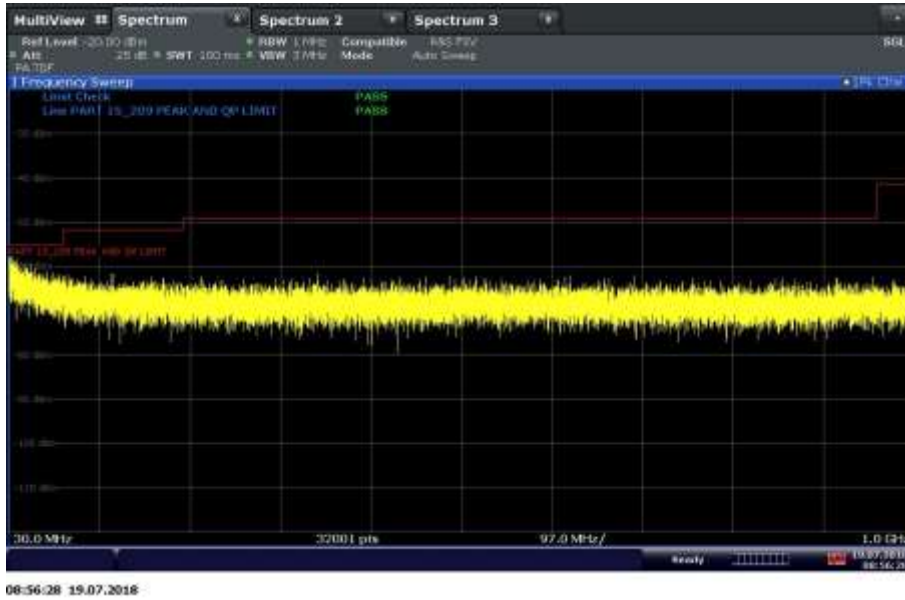
08:41:03 19.07.2018

802.11 n (40 MHz) U-NII 2a High Channel below 1GHz

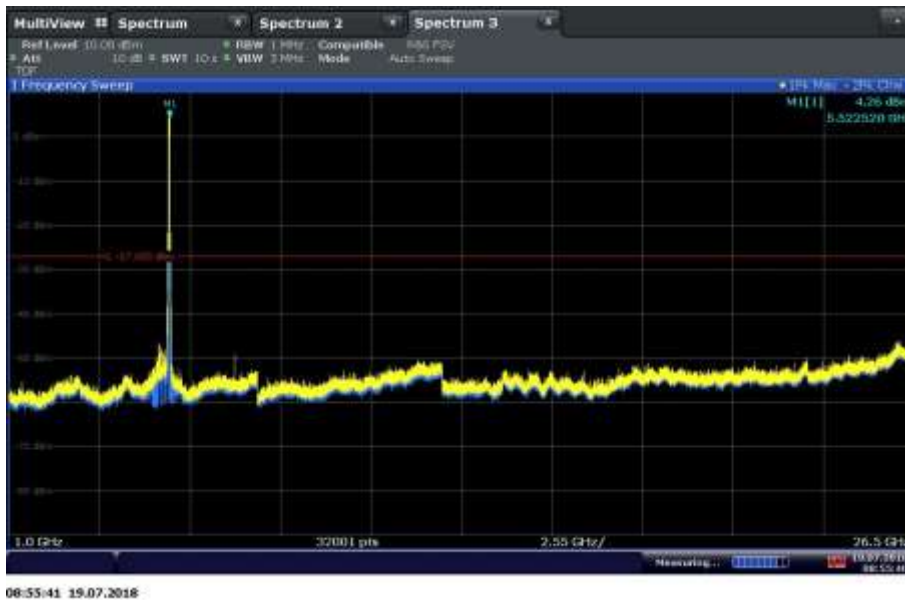


08:41:52 19.07.2018

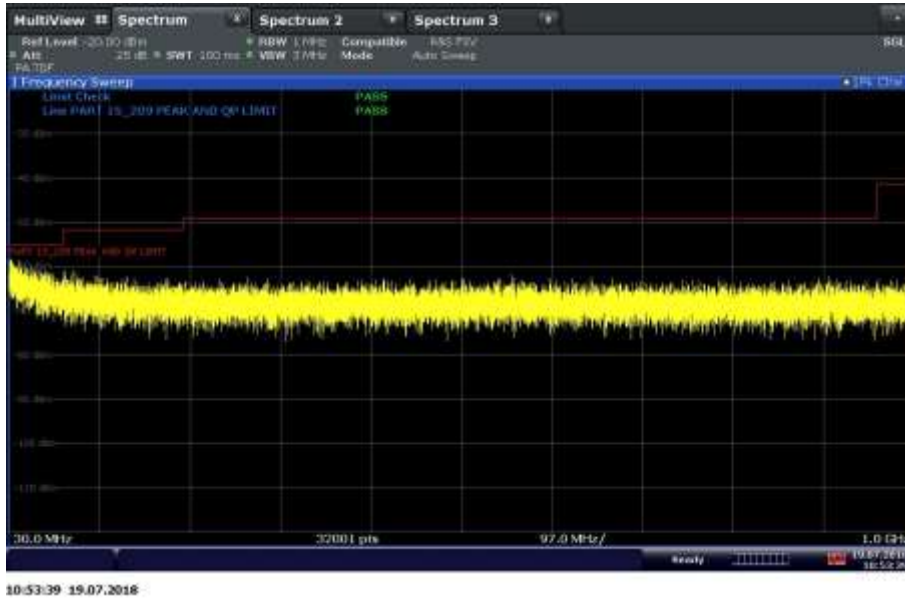
802.11 n (40 MHz) U-NII 2a High Channel Above 1GHz



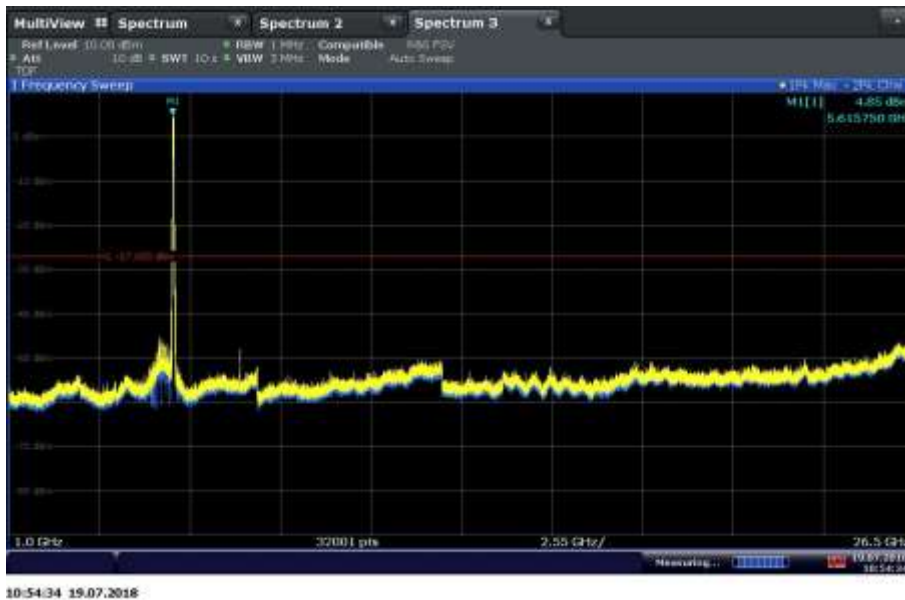
802.11 n (40 MHz) U-NII 2c Low Channel below 1GHz



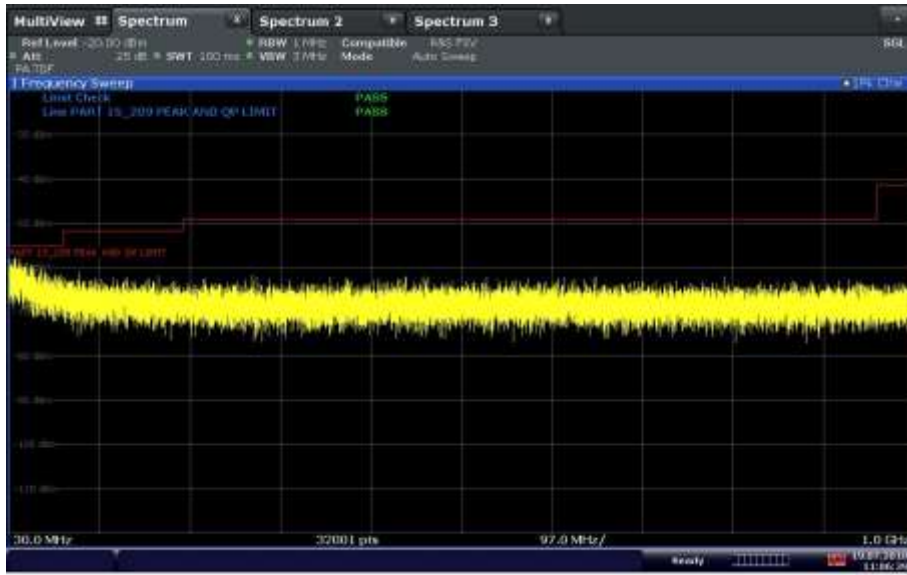
802.11 n (40 MHz) U-NII 2c Low Channel Above 1GHz



802.11 n (40 MHz) U-NII 2c Mid Channel below 1GHz

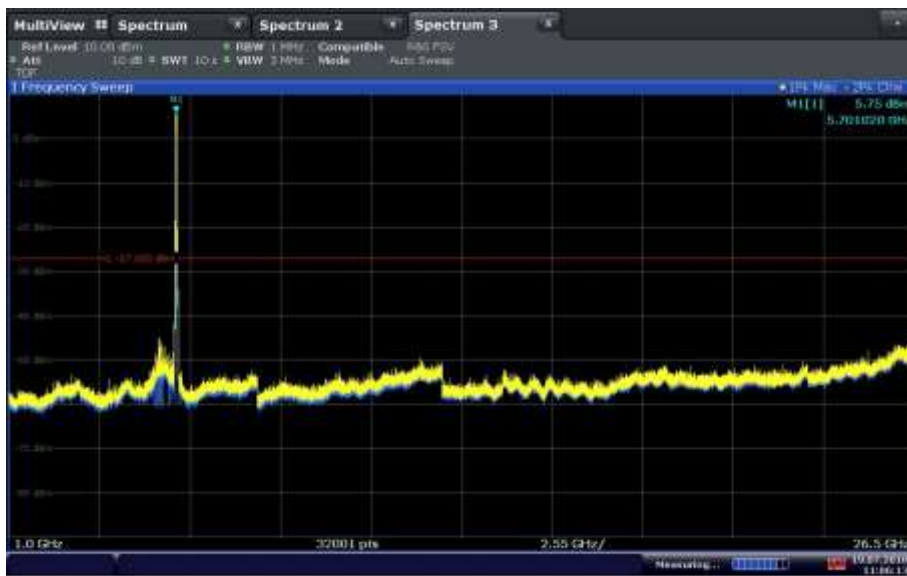


802.11 n (40 MHz) U-NII 2c Mid Channel Above 1GHz



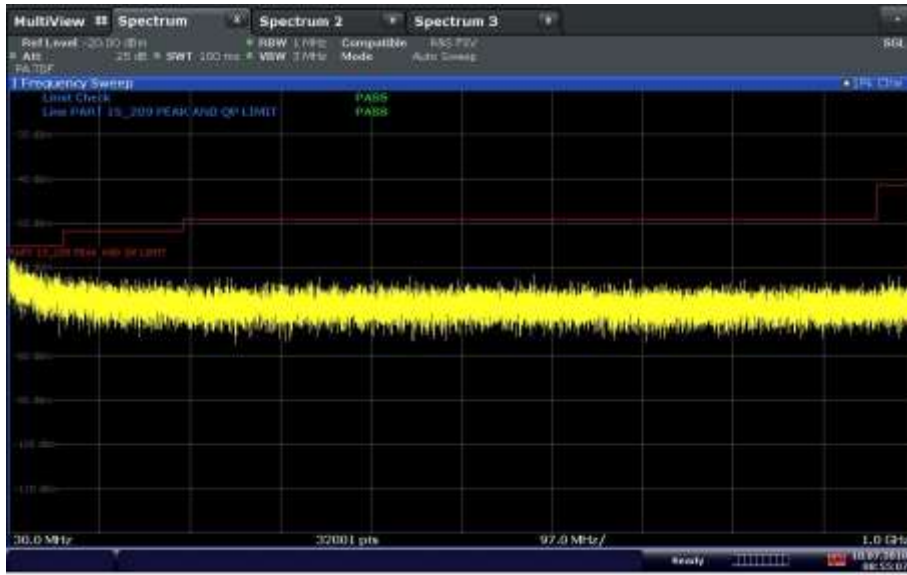
11:06:09 19.07.2018

802.11 n (40 MHz) U-NII 2c High Channel below 1GHz

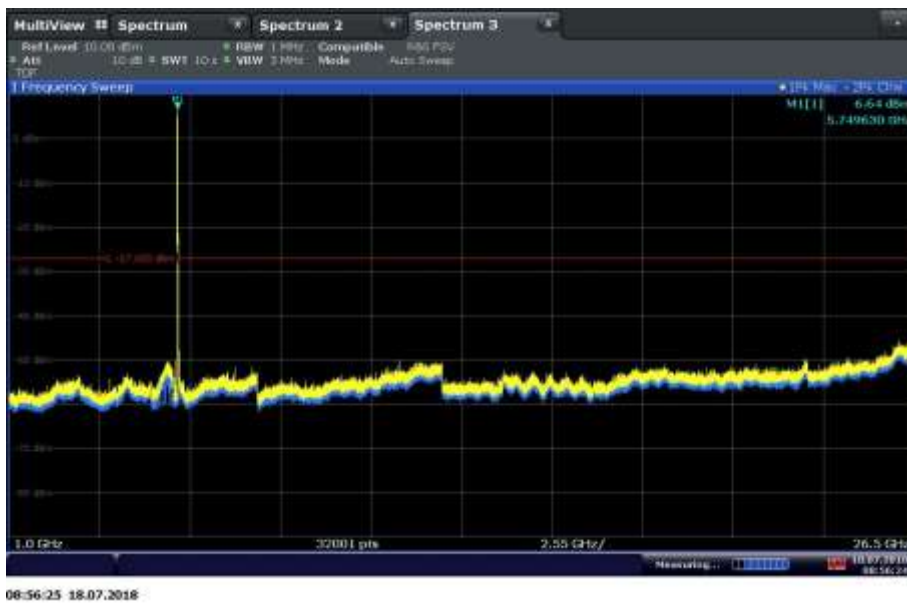


11:06:14 19.07.2018

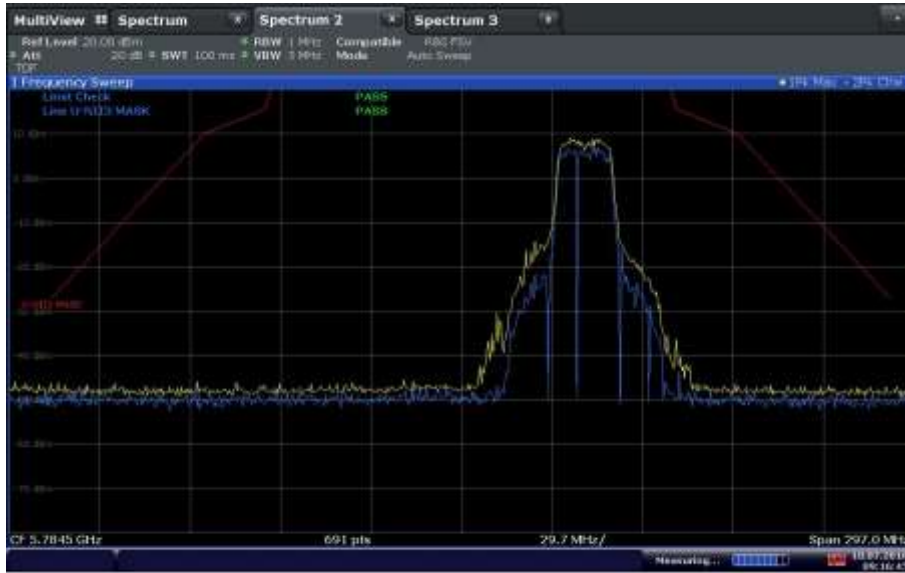
802.11 n (40 MHz) U-NII 2c High Channel Above 1GHz



802.11 a (20 MHz) U-NII 3 Low Channel below 1GHz

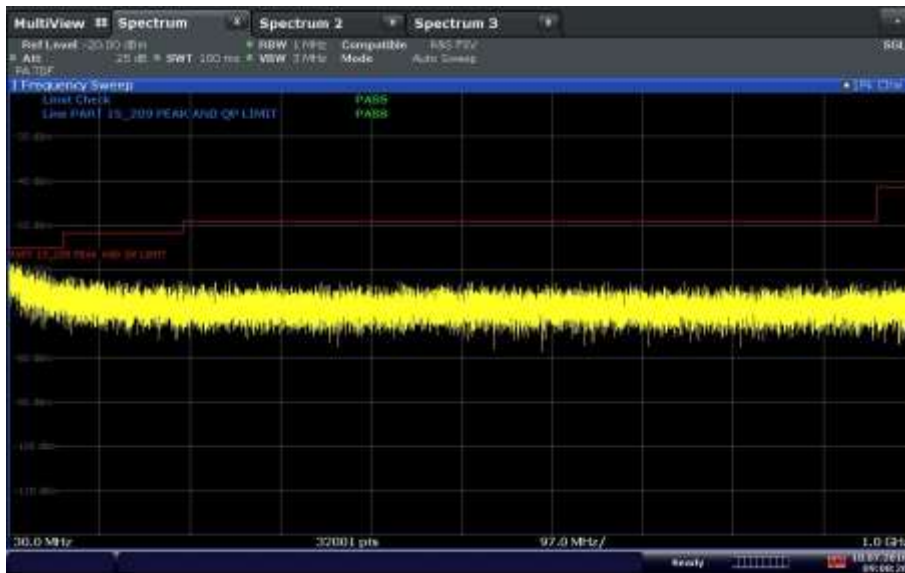


802.11 a (20 MHz) U-NII 3 Low Channel Above 1GHz



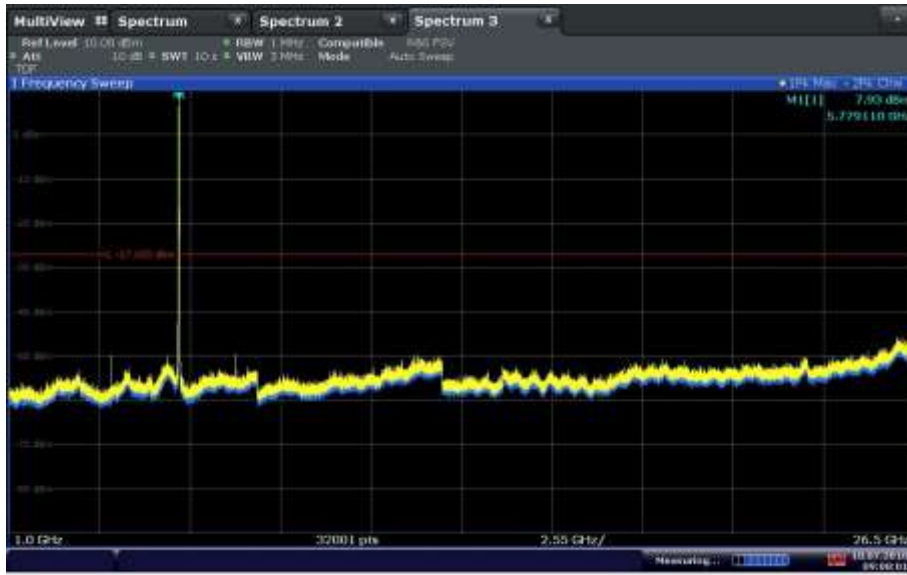
09:16:46 18.07.2018

802.11 a (20 MHz) U-NII 3 Low Channel Mask



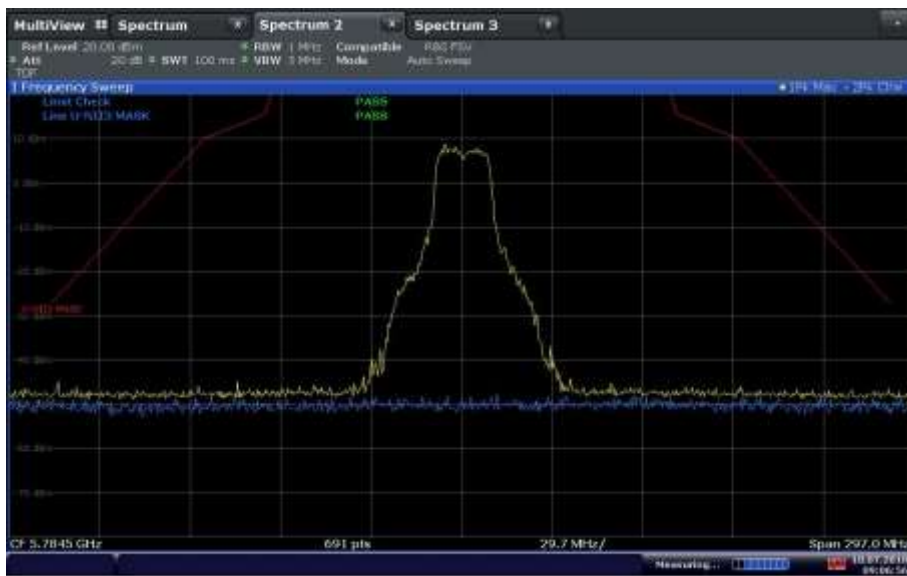
09:08:26 18.07.2018

802.11 a (20 MHz) U-NII 3 Mid Channel below 1GHz



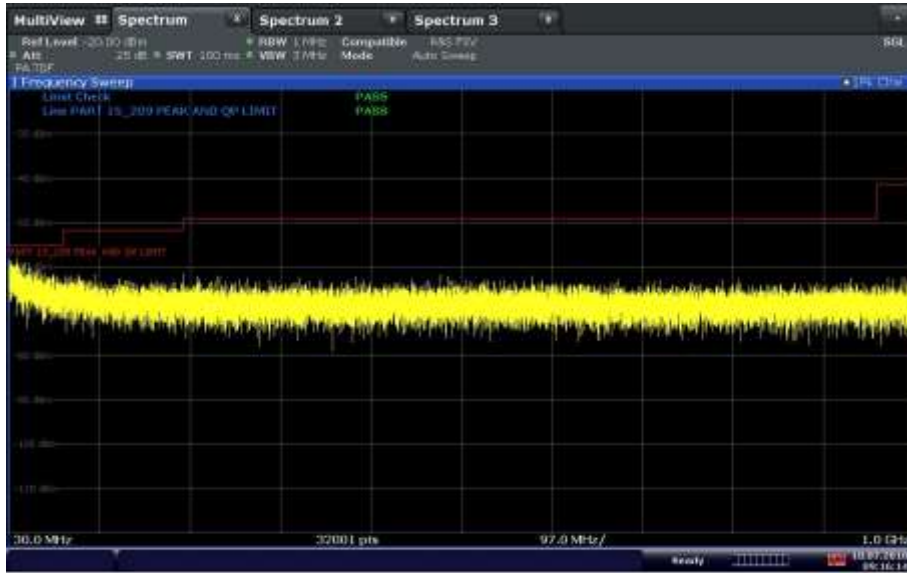
09:08:01 18.07.2018

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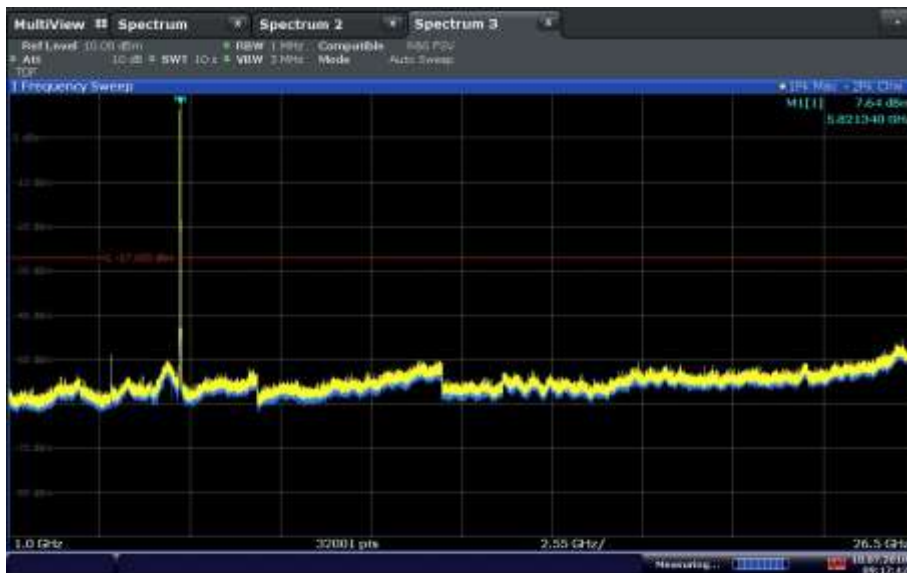
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802.11 a (20 MHz) U-NII 3 Mid Channel Mask



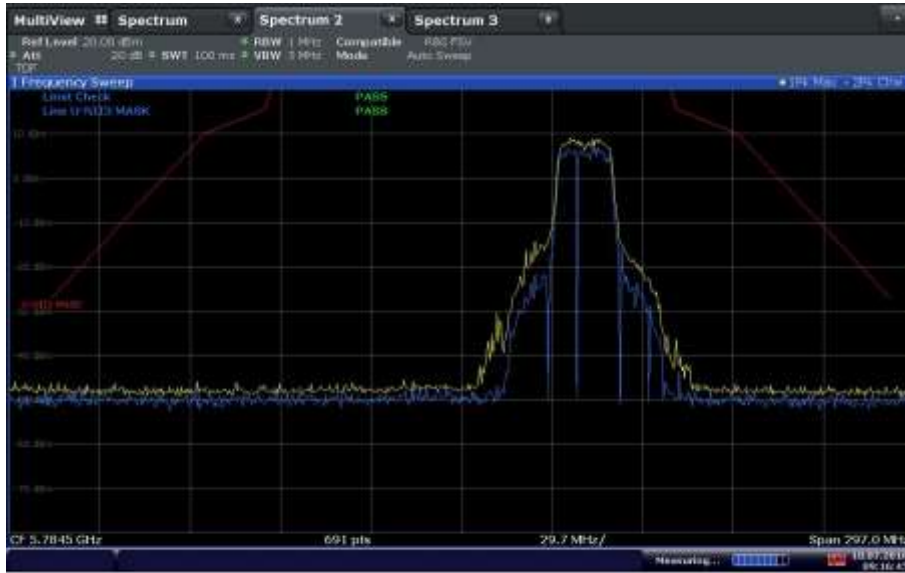
09:16:14 18.07.2018

802.11 a (20 MHz) U-NII 3 High Channel below 1GHz



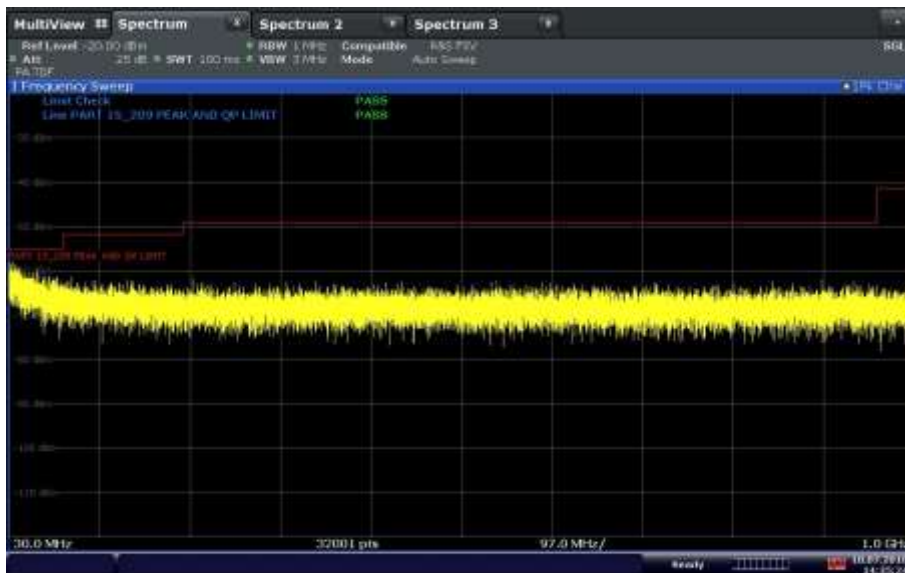
09:17:43 18.07.2018

802.11 a (20 MHz) U-NII 3 High Channel Above 1GHz



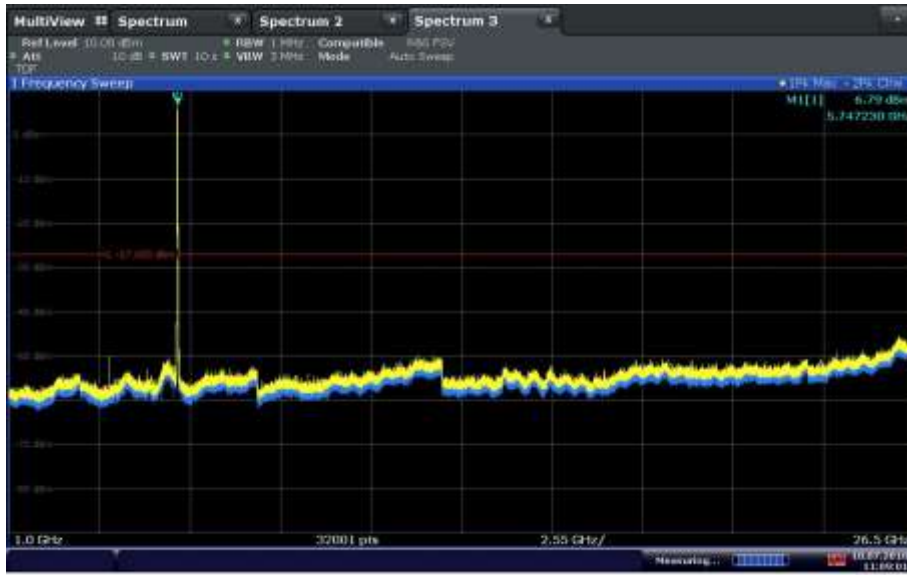
09:16:46 18.07.2018

802.11 a (20 MHz) U-NII 3 High Channel Mask



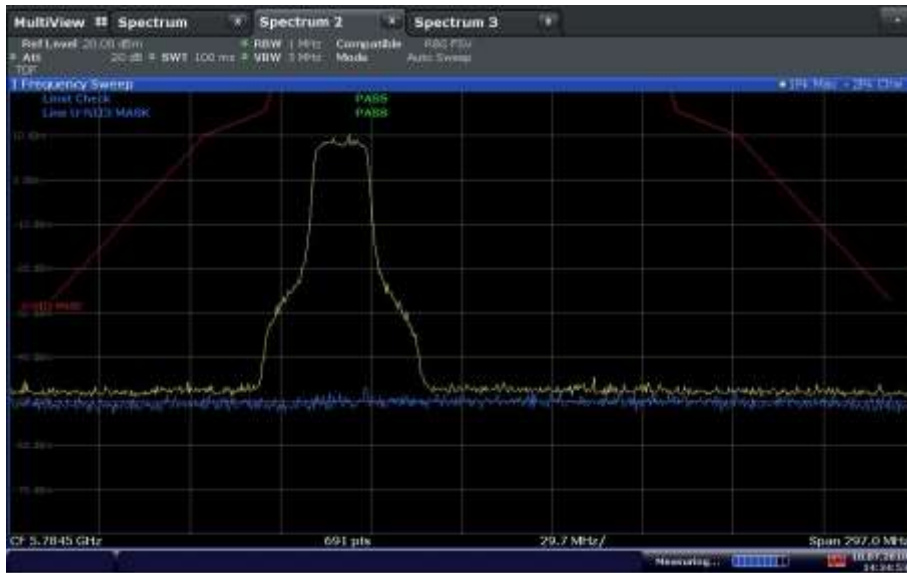
14:35:25 18.07.2018

802.11 n (20 MHz) U-NII 3 Low Channel below 1GHz



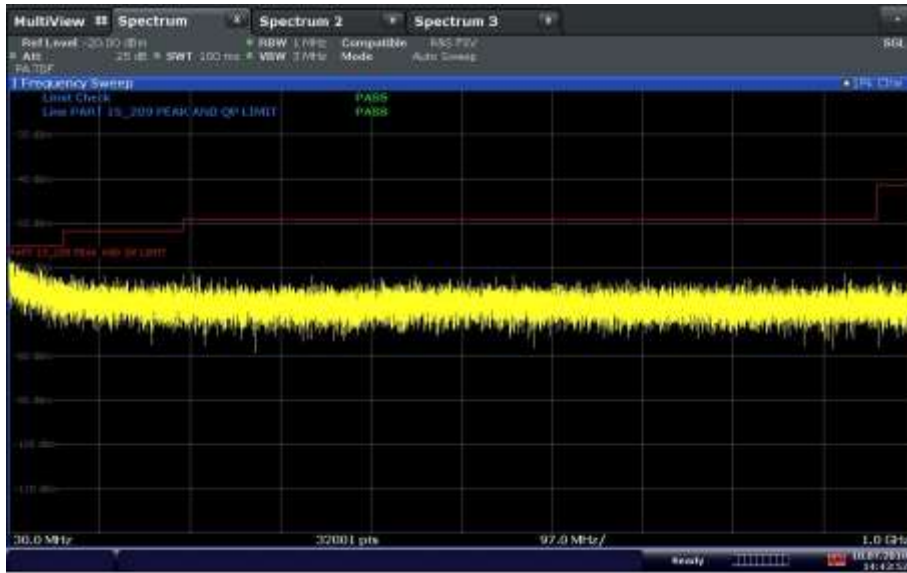
11:09:02 18.07.2018

802.11 n (20 MHz) U-NII 3 Low Channel Above 1GHz



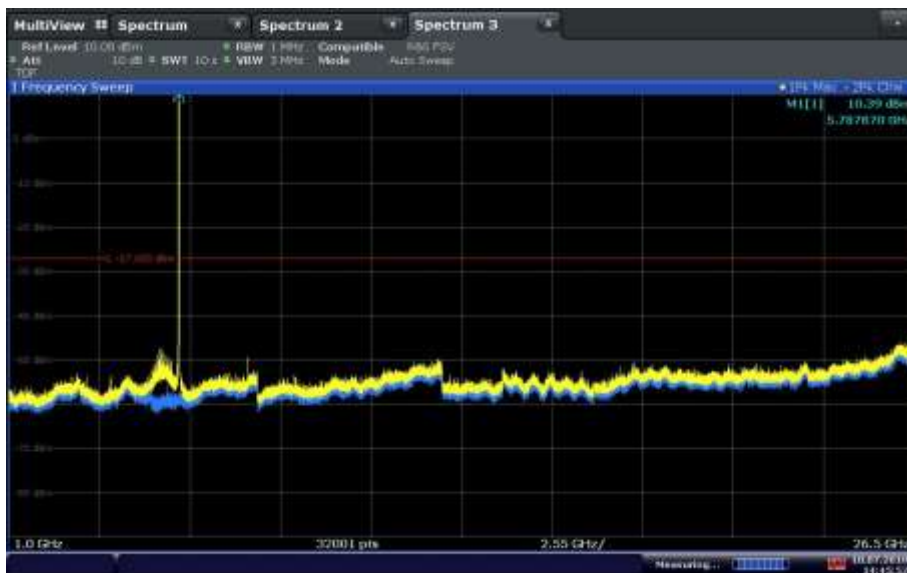
14:04:54 18.07.2018

802.11 n (20 MHz) U-NII 3 Low Channel Mask



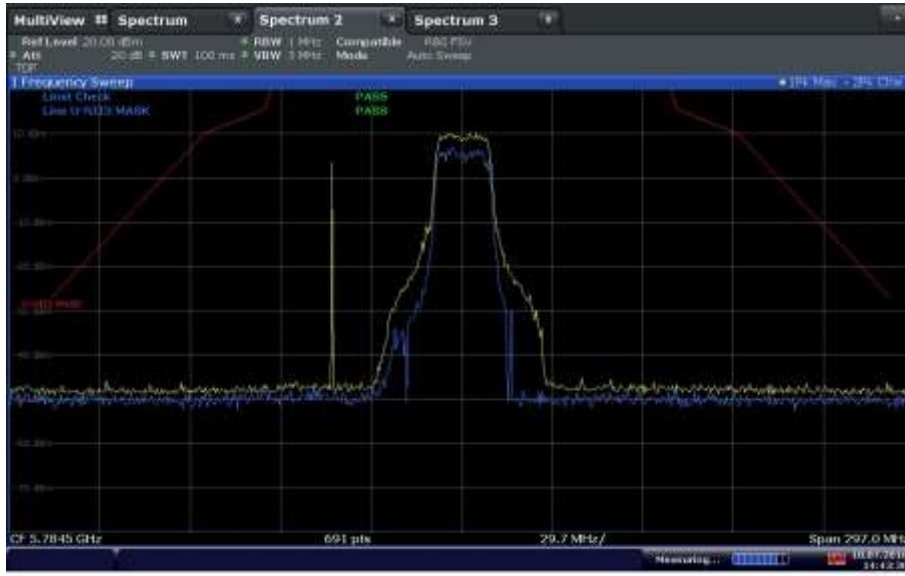
14:43:53 18.07.2018

802.11 n (20 MHz) U-NII 3 Mid Channel below 1GHz



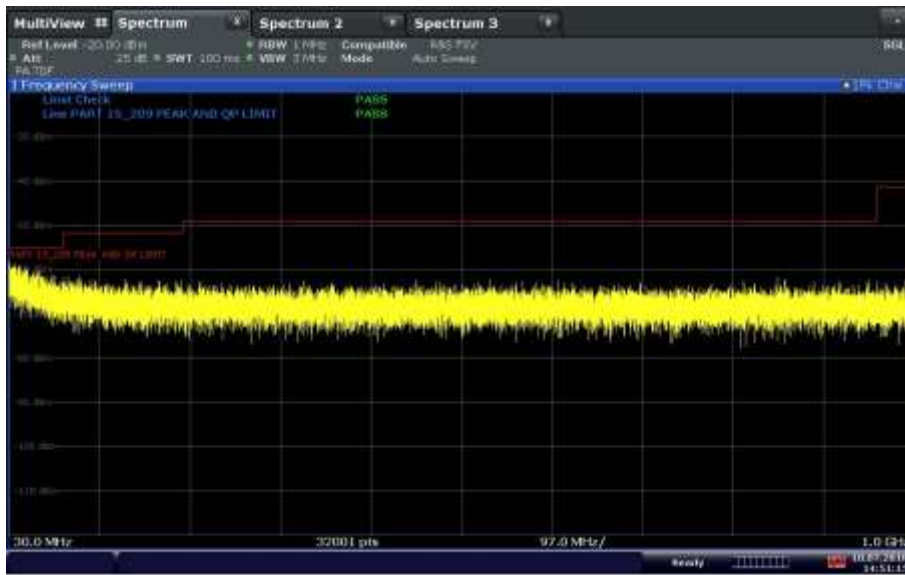
14:45:53 18.07.2018

802.11 n (20 MHz) U-NII 3 Mid Channel Above 1GHz



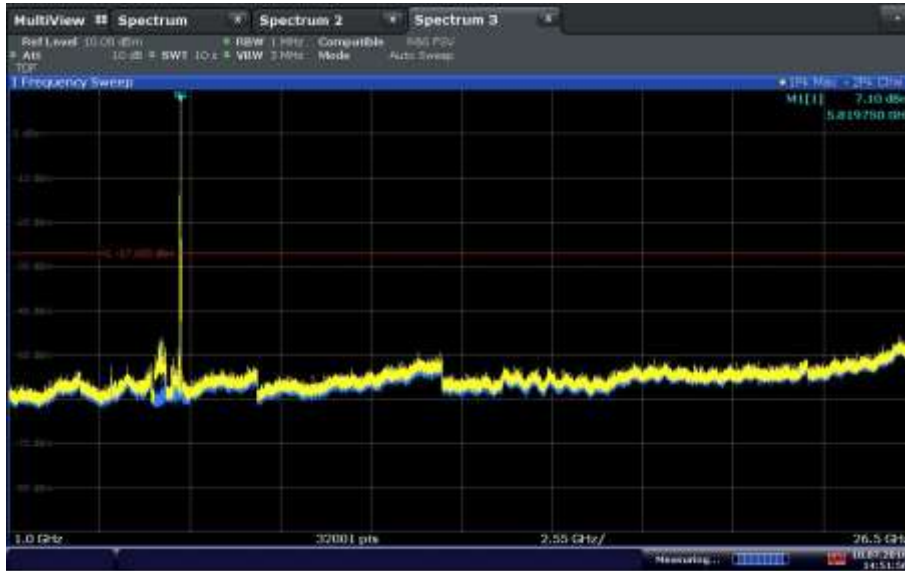
14:43:31 18.07.2018

802.11 n (20 MHz) U-NII 3 Mid Channel Mask



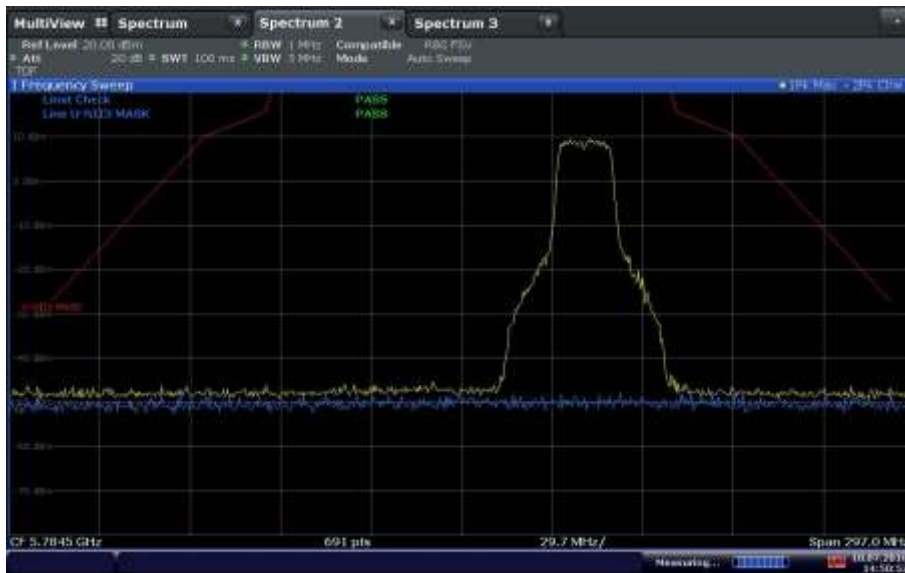
14:51:16 18.07.2018

802.11 n (20 MHz) U-NII 3 High Channel below 1GHz



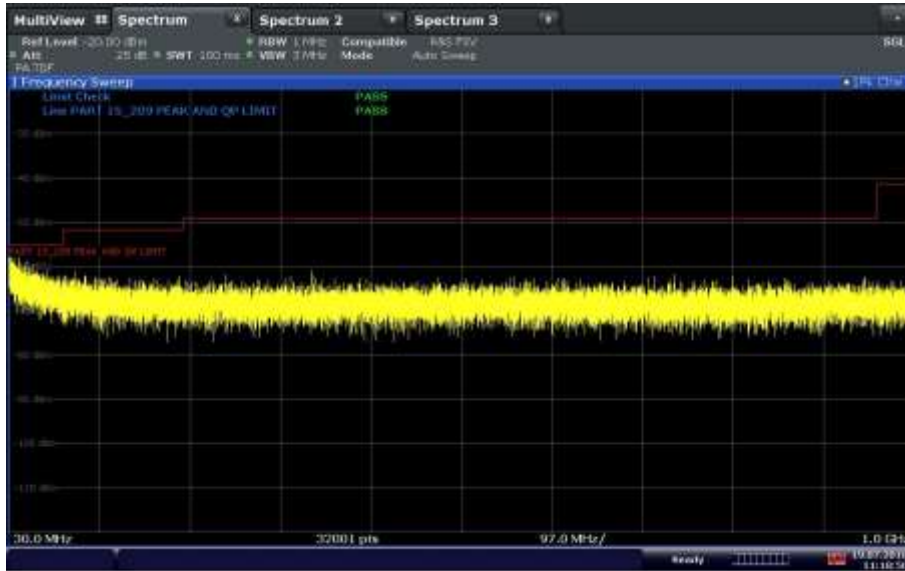
14:51:56 18.07.2018

802.11 n (20 MHz) U-NII 3 High Channel Above 1GHz



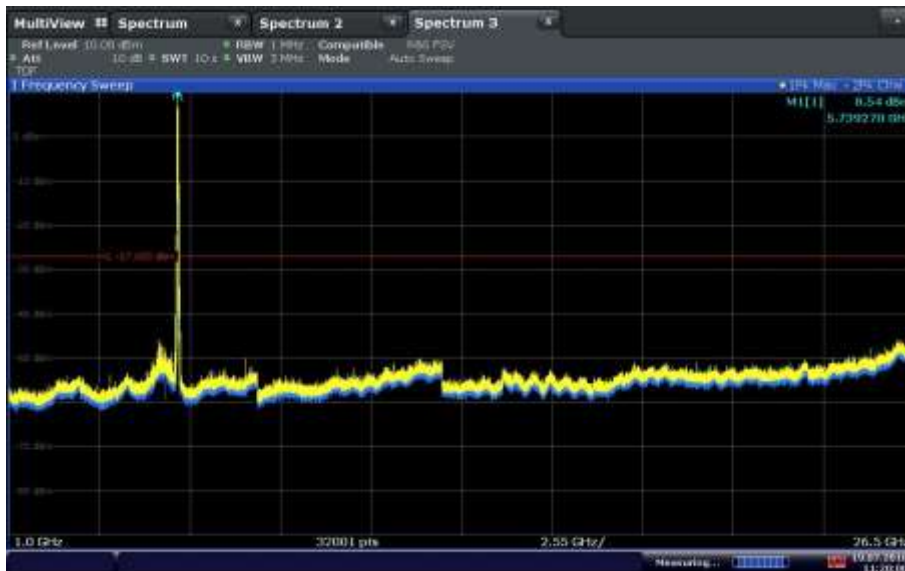
14:50:53 18.07.2018

802.11 n (20 MHz) U-NII 3 High Channel Mask



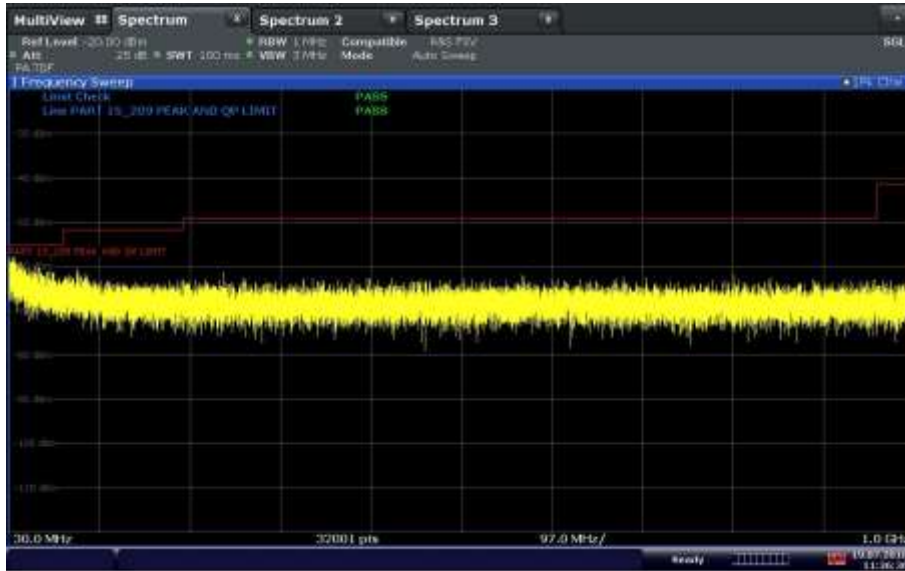
11:18:50 19.07.2018

802.11 n (40 MHz) U-NII 3 Low Channel below 1GHz



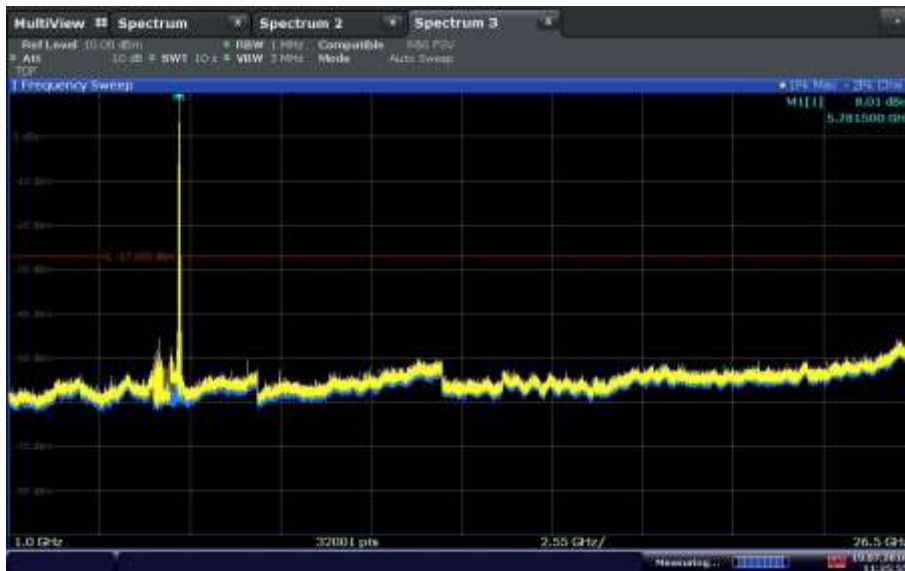
11:20:00 19.07.2018

802.11 n (40 MHz) U-NII 3 Low Channel Above 1GHz



11:36:36 19.07.2018

802.11 n (40 MHz) U-NII 3 High Channel below 1GHz

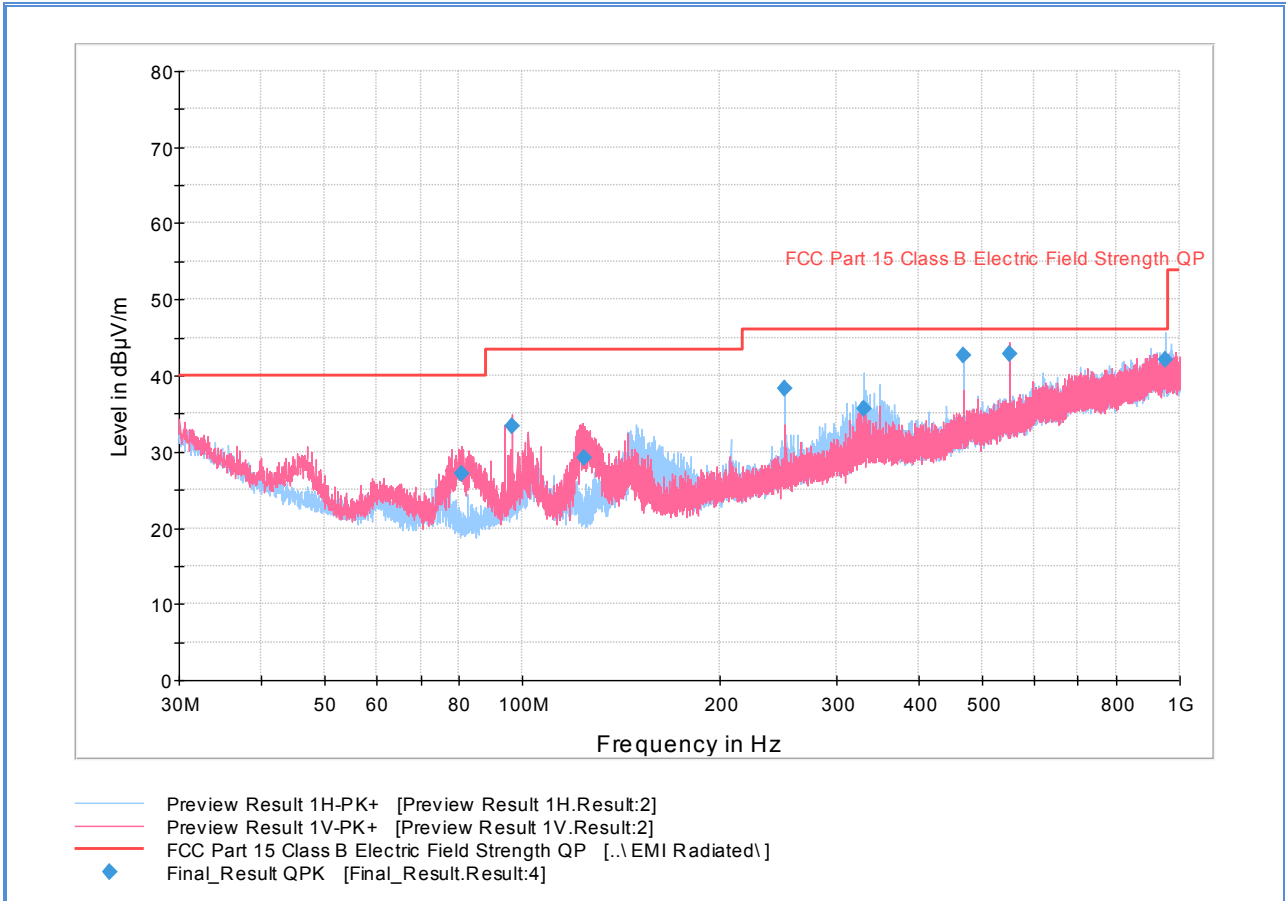


11:35:55 19.07.2018

802.11 n (40 MHz) U-NII 3 High Channel Above 1GHz



2.3.12 Test Results Below 1GHz (Cabinet Spurious Emissions 802.11a U-NII 1)



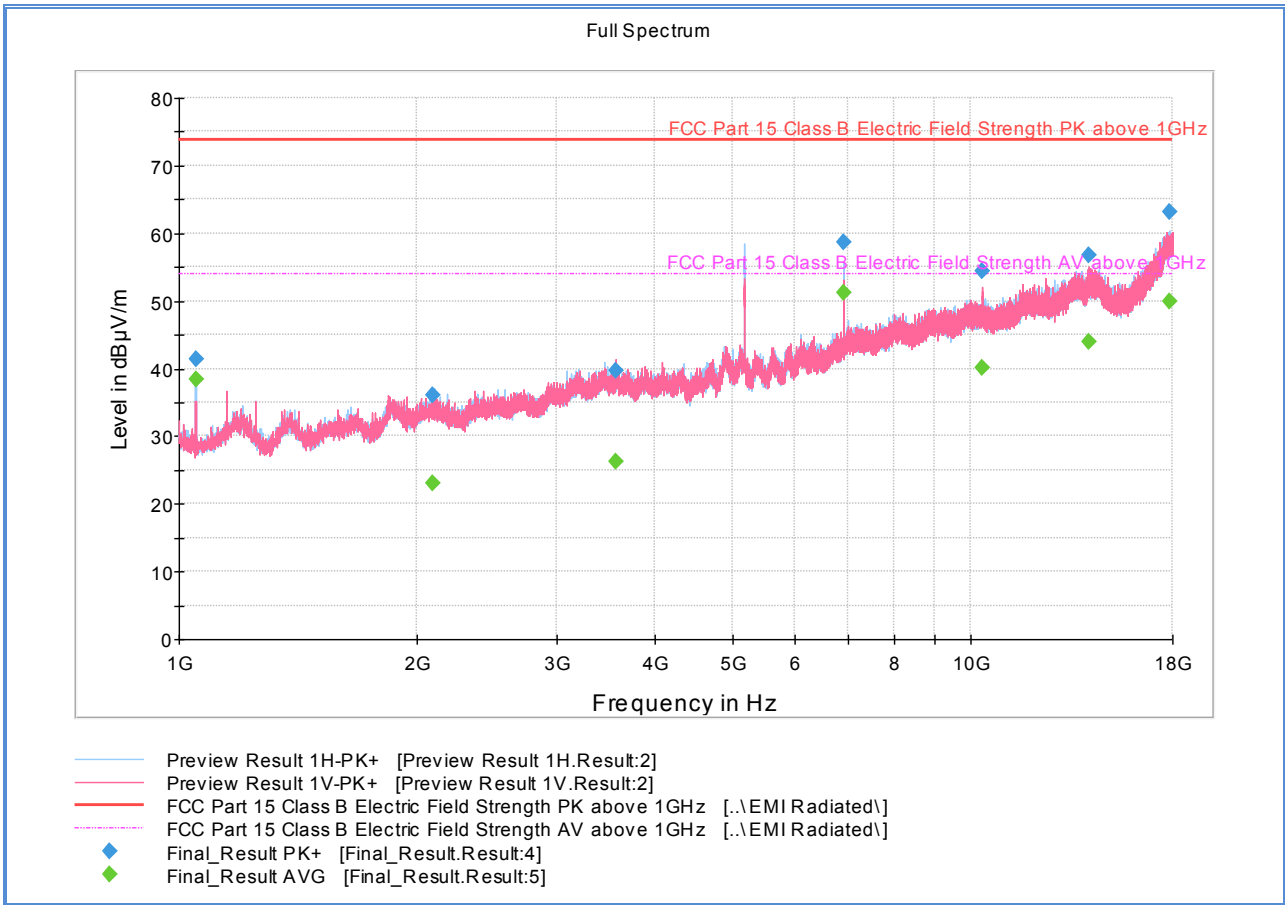
Quasi Peak Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
80.826333	27.03	40.00	12.97	1000.0	120.000	99.8	V	187.0	14.1
96.509667	33.29	43.50	10.21	1000.0	120.000	125.3	V	218.0	16.0
124.306333	29.27	43.50	14.23	1000.0	120.000	125.3	V	217.0	15.0
249.996000	38.29	46.00	7.71	1000.0	120.000	99.7	H	122.0	20.9
331.337333	35.63	46.00	10.37	1000.0	120.000	106.1	H	240.0	23.4
467.987333	42.71	46.00	3.29	1000.0	120.000	174.7	H	91.0	27.1
549.984667	42.87	46.00	3.13	1000.0	120.000	103.9	V	52.0	28.5
949.980333	42.12	46.00	3.88	1000.0	120.000	125.3	H	38.0	34.2

Test Notes: Only the worst-case configuration presented.



2.3.13 Test Results Above 1GHz (Cabinet Spurious Emissions 802.11a U-NII 1)



Peak Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1049.900000	41.41	73.90	32.49	1000.0	1000.000	99.8	H	6.0	-4.0
2091.933333	36.04	73.90	37.86	1000.0	1000.000	224.9	H	156.0	0.6
3567.600000	39.59	73.90	34.31	1000.0	1000.000	224.9	V	167.0	6.0
6906.566667	58.65	73.90	15.25	1000.0	1000.000	220.7	H	112.0	16.0
10362.366666	54.46	73.90	19.44	1000.0	1000.000	121.0	V	231.0	21.6
14098.066666	56.72	73.90	17.18	1000.0	1000.000	306.3	V	258.0	26.3
17859.566666	63.10	73.90	10.80	1000.0	1000.000	121.0	H	128.0	32.2

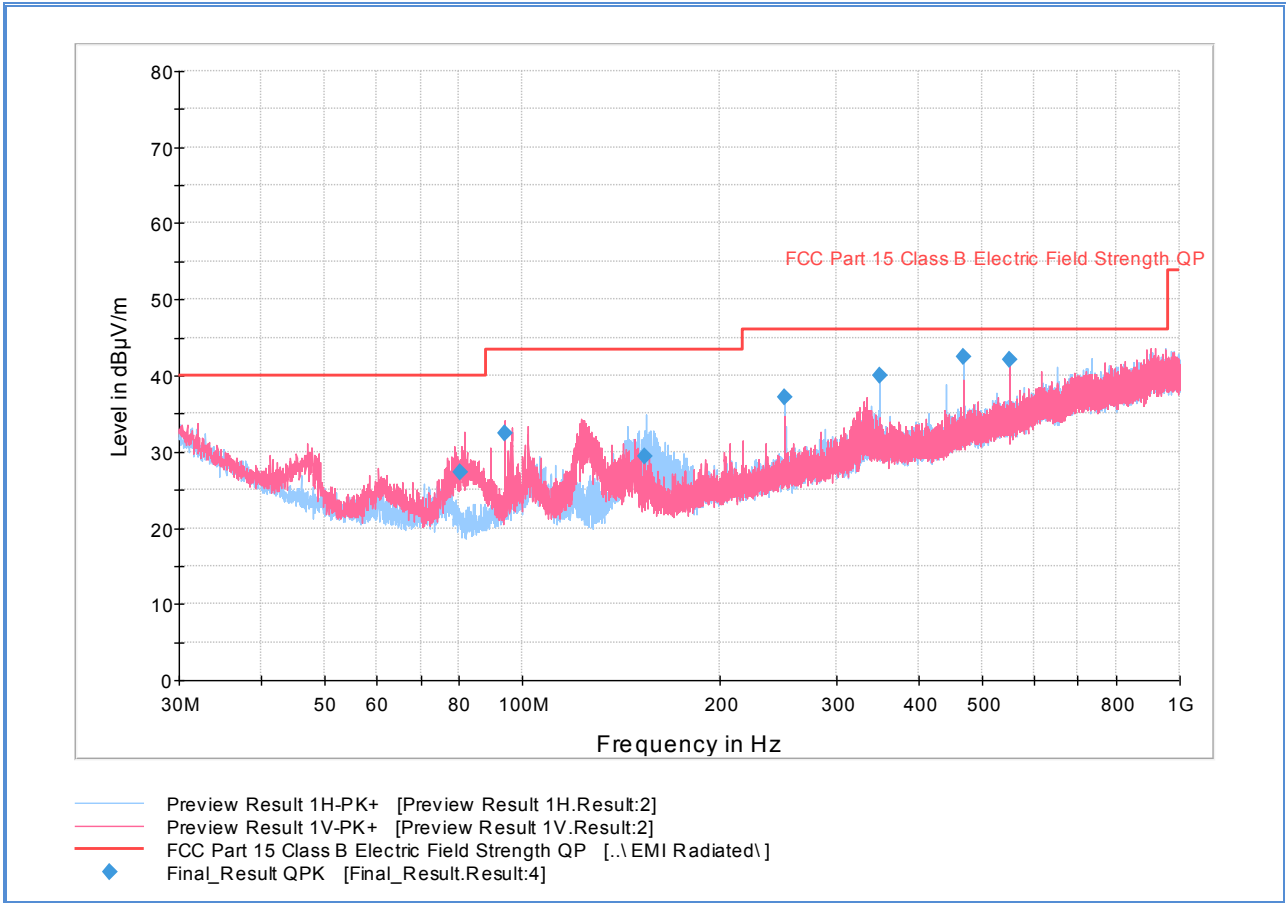
Average Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1049.900000	38.34	53.90	15.56	1000.0	1000.000	99.8	H	6.0	-4.0
2091.933333	22.94	53.90	30.96	1000.0	1000.000	224.9	H	156.0	0.6
3567.600000	26.21	53.90	27.69	1000.0	1000.000	224.9	V	167.0	6.0
6906.566667	51.22	53.90	2.68	1000.0	1000.000	220.7	H	112.0	16.0
10362.366666	40.14	53.90	13.76	1000.0	1000.000	121.0	V	231.0	21.6
14098.066666	44.05	53.90	9.85	1000.0	1000.000	306.3	V	258.0	26.3
17859.566666	49.98	53.90	3.92	1000.0	1000.000	121.0	H	128.0	32.2

Test Notes: No significant emissions observed above 18GHz. Only the worst-case configuration presented.



2.3.14 Test Results Below 1GHz (Cabinet Spurious Emissions 802.11a U-NII 3)



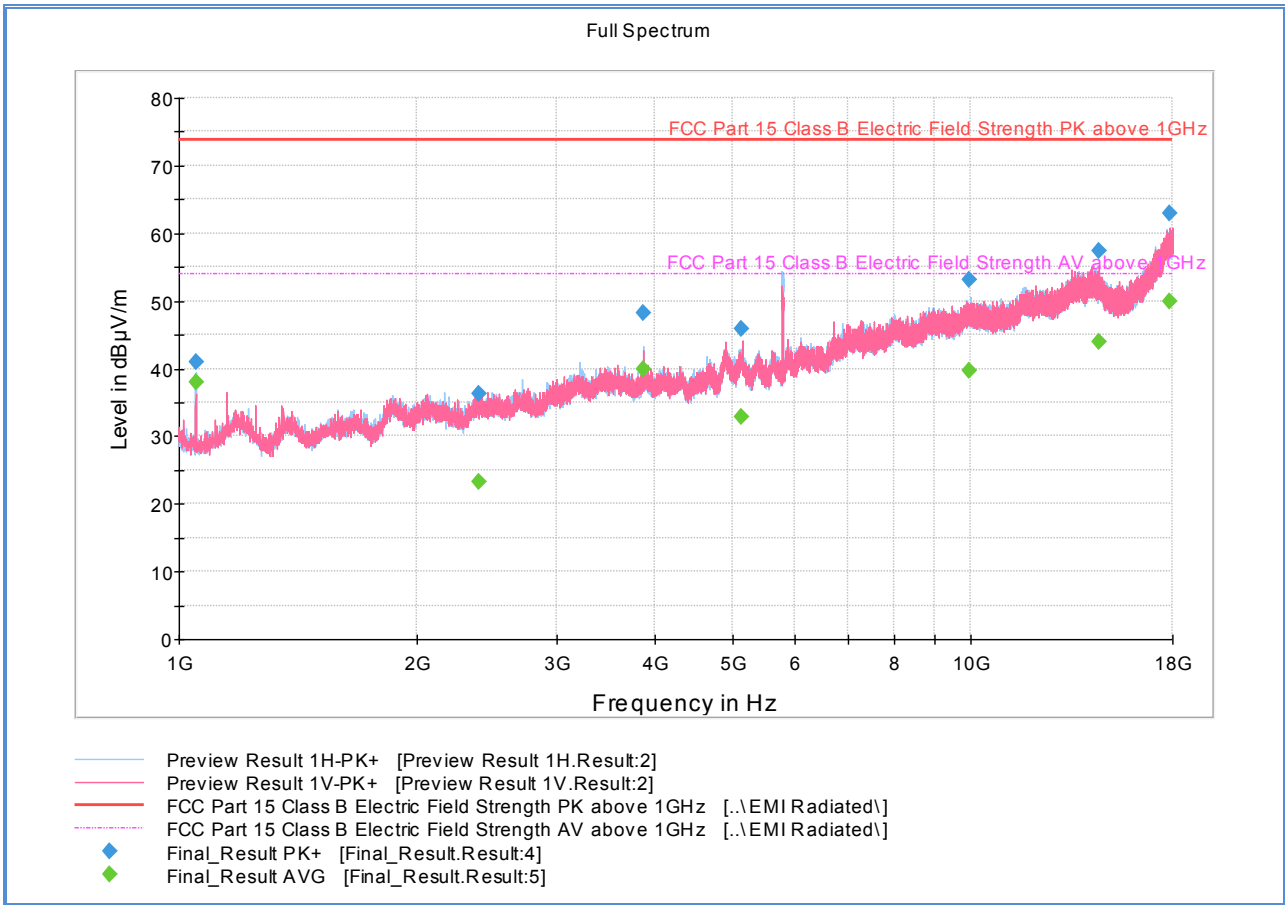
Quasi Peak Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
80.381000	27.27	40.00	12.73	1000.0	120.000	99.8	V	189.0	14.1
94.149333	32.50	43.50	11.00	1000.0	120.000	107.5	V	213.0	15.7
153.470667	29.42	43.50	14.08	1000.0	120.000	204.2	H	105.0	17.0
249.996000	37.14	46.00	8.86	1000.0	120.000	104.4	H	120.0	20.9
350.003000	39.98	46.00	6.02	1000.0	120.000	99.8	H	250.0	24.3
467.979667	42.48	46.00	3.52	1000.0	120.000	204.1	H	269.0	27.1

Test Notes: Only the worst-case configuration presented.



2.3.15 Test Results Above 1GHz (Cabinet Spurious Emissions 802.11a U-NII 3)



Peak Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1050.066667	41.06	73.90	32.84	1000.0	1000.000	99.8	H	10.0	-4.0
2395.300000	36.24	73.90	37.66	1000.0	1000.000	324.9	V	356.0	1.3
3856.600000	48.18	73.90	25.72	1000.0	1000.000	315.4	H	298.0	7.6
5141.533333	45.80	73.90	28.10	1000.0	1000.000	392.2	V	314.0	11.5
9981.900000	53.13	73.90	20.77	1000.0	1000.000	99.8	H	1.0	21.8
14541.00000	57.29	73.90	16.61	1000.0	1000.000	312.8	V	290.0	26.0
17859.86666	63.00	73.90	10.90	1000.0	1000.000	121.0	V	20.0	32.2

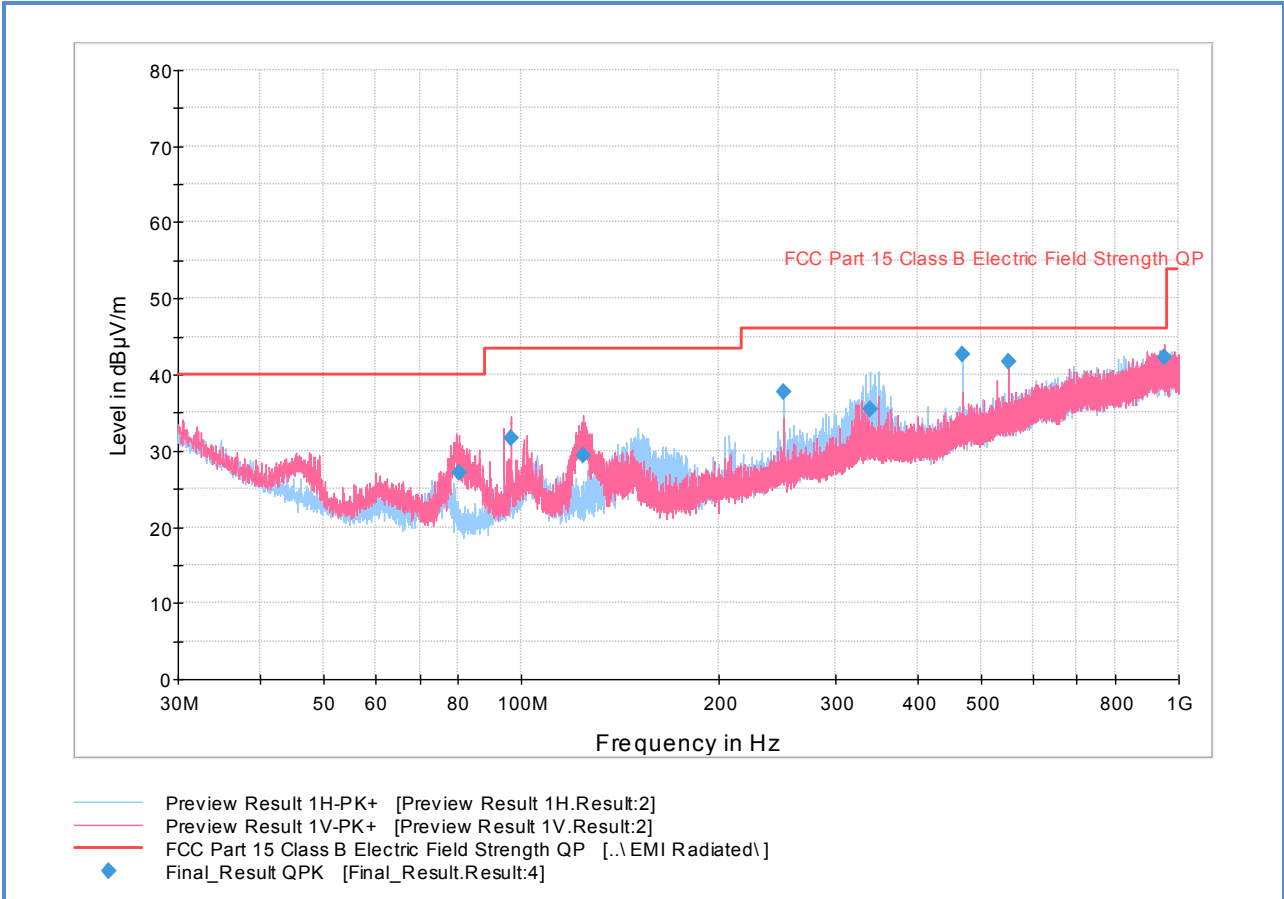
Average Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1050.066667	38.01	53.90	15.89	1000.0	1000.000	99.8	H	10.0	-4.0
2395.300000	23.27	53.90	30.63	1000.0	1000.000	324.9	V	356.0	1.3
3856.600000	39.93	53.90	13.97	1000.0	1000.000	315.4	H	298.0	7.6
5141.533333	32.88	53.90	21.02	1000.0	1000.000	392.2	V	314.0	11.5
9981.900000	39.79	53.90	14.11	1000.0	1000.000	99.8	H	1.0	21.8
14541.00000	43.87	53.90	10.03	1000.0	1000.000	312.8	V	290.0	26.0
17859.86666	50.01	53.90	3.89	1000.0	1000.000	121.0	V	20.0	32.2

Test Notes: No significant emissions observed above 18GHz. Only the worst case configuration presented.



2.3.16 Test Results Below 1GHz (Cabinet Spurious Emissions 802.11n U-NII 1)



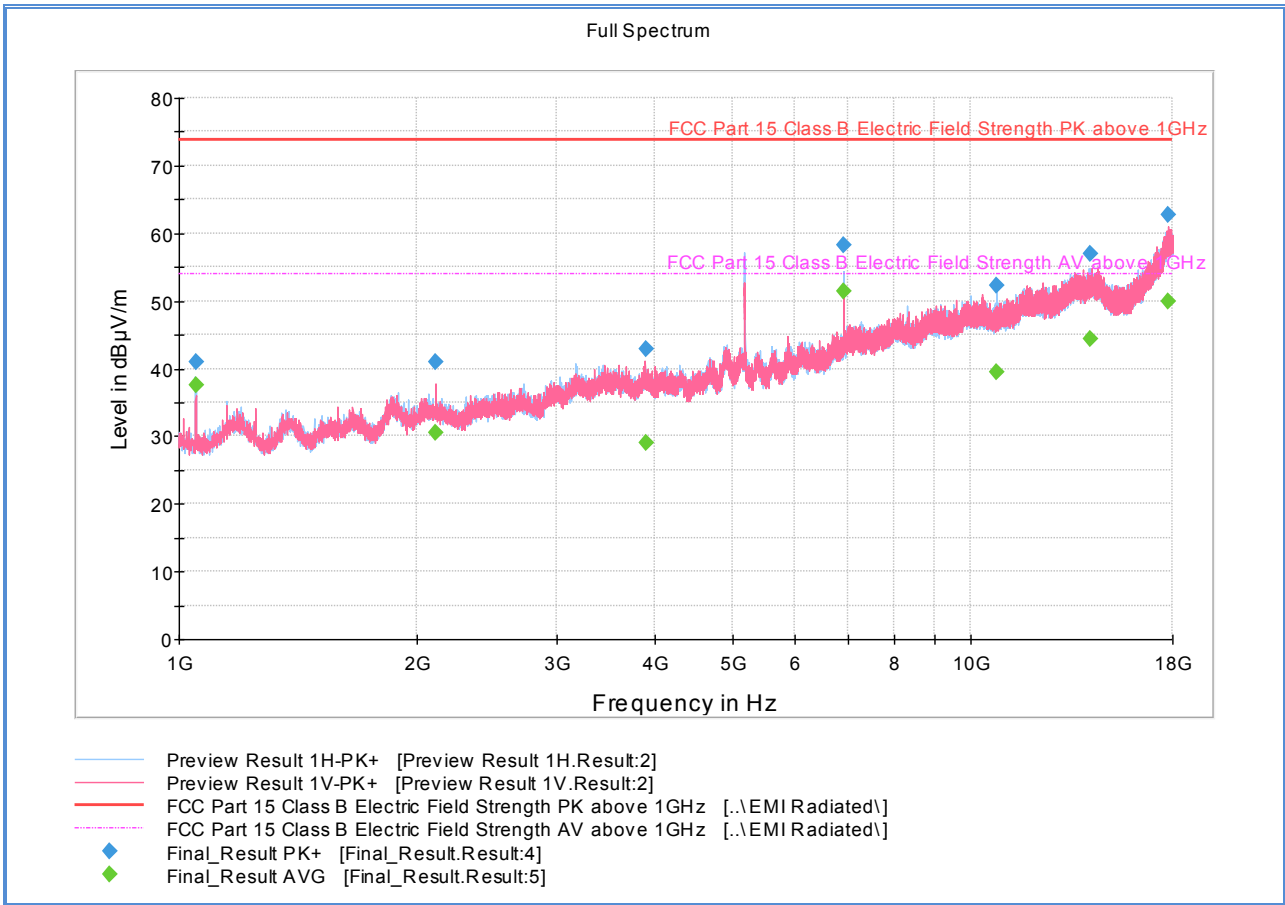
Quasi Peak Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
80.454667	27.17	40.00	12.83	1000.0	120.000	99.9	V	133.0	14.1
96.485000	31.62	43.50	11.88	1000.0	120.000	105.0	V	202.0	16.0
124.025333	29.35	43.50	14.15	1000.0	120.000	104.1	V	196.0	15.0
249.996000	37.82	46.00	8.18	1000.0	120.000	125.3	H	126.0	20.9
339.463333	35.46	46.00	10.54	1000.0	120.000	103.9	H	246.0	23.9
467.987333	42.57	46.00	3.43	1000.0	120.000	202.0	H	269.0	27.1
549.984667	41.63	46.00	4.37	1000.0	120.000	104.3	V	248.0	28.5
949.980333	42.37	46.00	3.63	1000.0	120.000	99.8	V	136.0	34.2

Test Notes: Only the worst-case configuration presented.



2.3.17 Test Results Above 1GHz (Cabinet Spurious Emissions 802.11n U-NII 1)



Peak Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1049.900000	40.86	73.90	33.04	1000.0	1000.000	99.8	H	17.0	-4.0
2111.833333	40.94	73.90	32.96	1000.0	1000.000	105.8	V	88.0	0.5
3893.333333	42.96	73.90	30.94	1000.0	1000.000	108.6	V	284.0	7.7
6906.566667	58.27	73.90	15.63	1000.0	1000.000	224.9	H	113.0	16.0
10800.20000	52.30	73.90	21.60	1000.0	1000.000	314.3	H	52.0	21.8
14189.96666	56.90	73.90	17.00	1000.0	1000.000	121.2	H	69.0	26.4
17799.96666	62.77	73.90	11.13	1000.0	1000.000	110.4	V	318.0	32.0

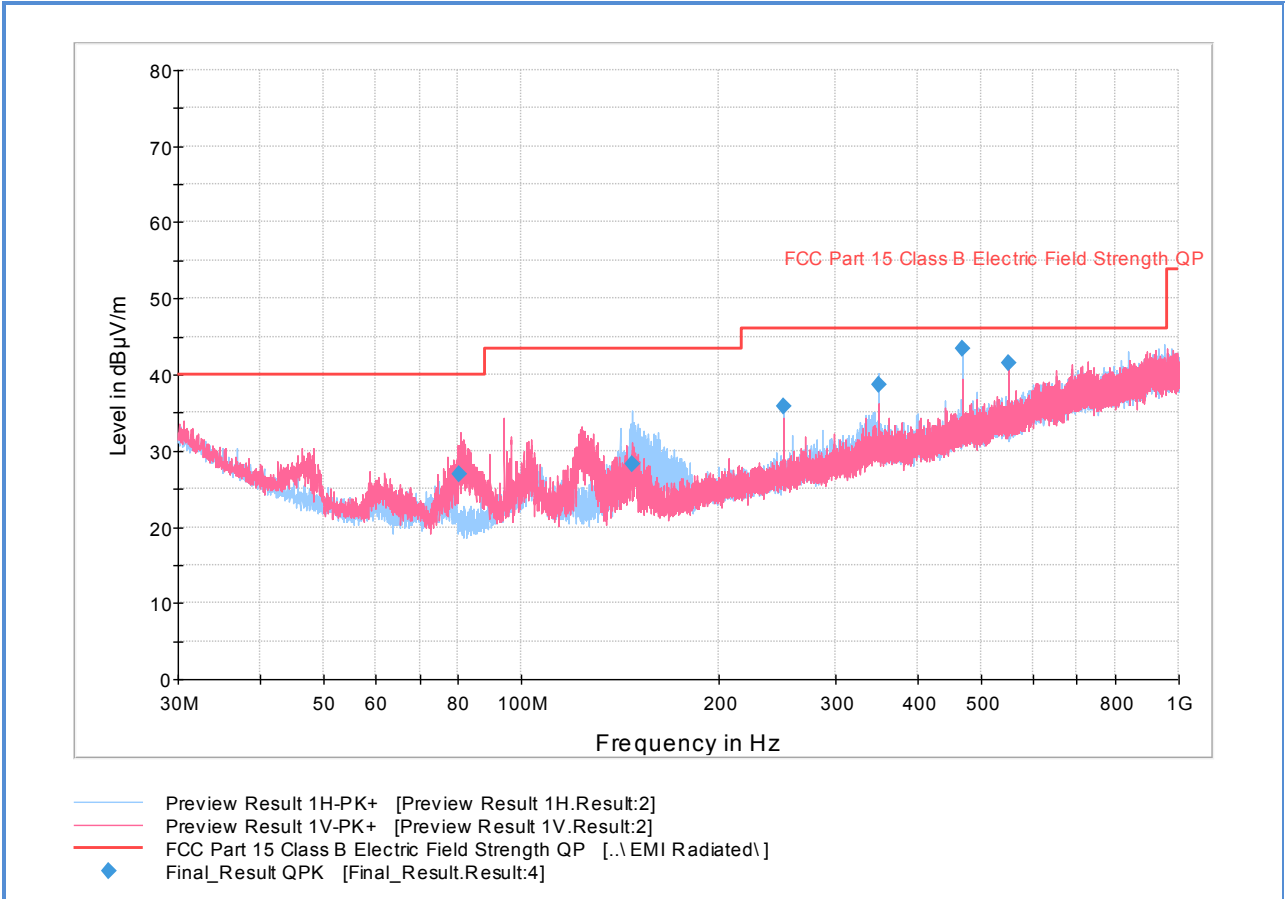
Average Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1049.900000	37.62	53.90	16.28	1000.0	1000.000	99.8	H	17.0	-4.0
2111.833333	30.59	53.90	23.31	1000.0	1000.000	105.8	V	88.0	0.5
3893.333333	29.02	53.90	24.88	1000.0	1000.000	108.6	V	284.0	7.7
6906.566667	51.36	53.90	2.54	1000.0	1000.000	224.9	H	113.0	16.0
10800.20000	39.52	53.90	14.38	1000.0	1000.000	314.3	H	52.0	21.8
14189.96666	44.31	53.90	9.59	1000.0	1000.000	121.2	H	69.0	26.4
17799.96666	50.01	53.90	3.89	1000.0	1000.000	110.4	V	318.0	32.0

Test Notes: No significant emissions observed above 18GHz. Only the worst-case configuration presented.



2.3.18 Test Results Below 1GHz (Cabinet Spurious Emissions 802.11n U-NII 3)



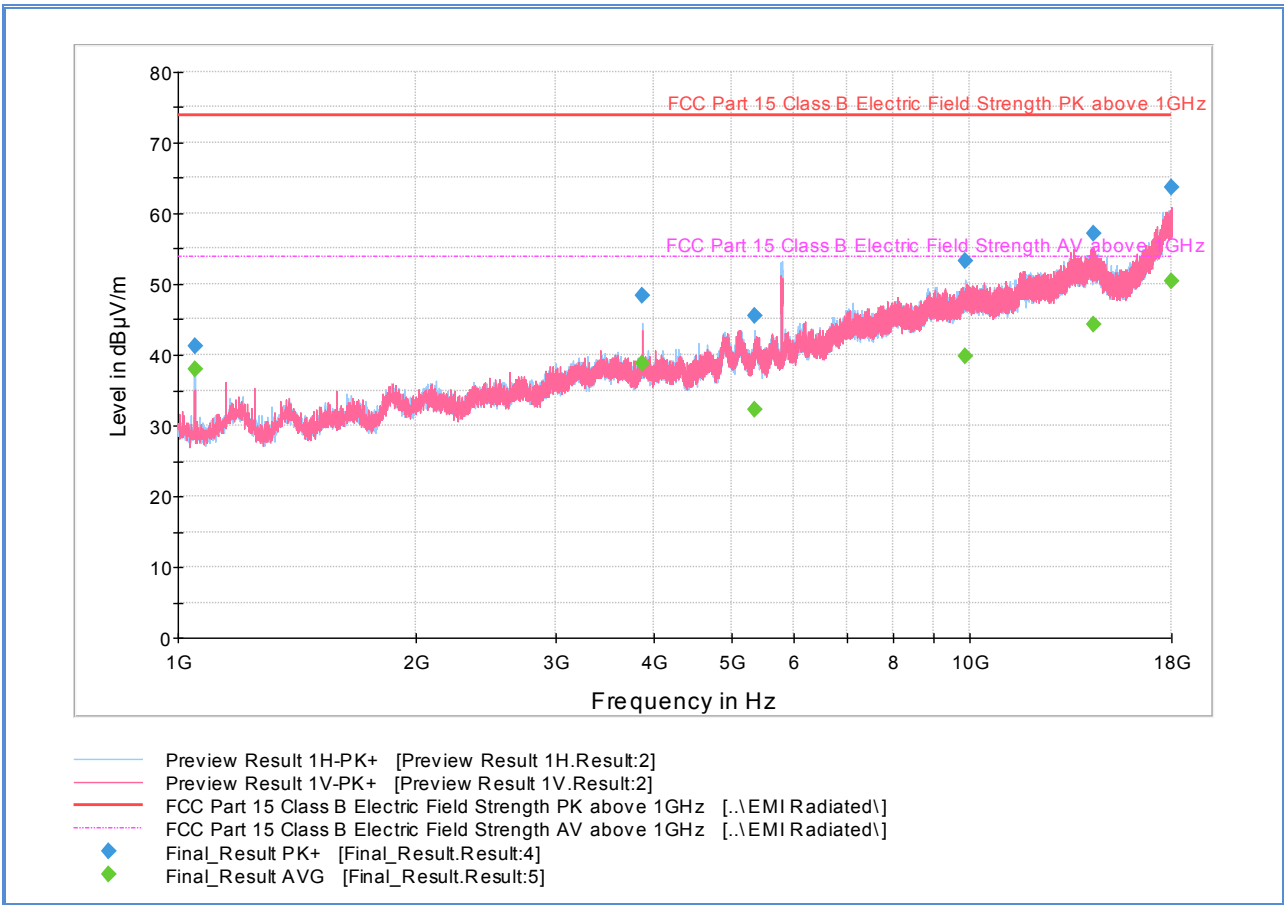
Quasi Peak Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
80.274000	26.88	40.00	13.12	1000.0	120.000	99.8	V	179.0	14.1
147.594667	28.34	43.50	15.16	1000.0	120.000	193.2	H	118.0	16.5
249.996000	35.86	46.00	10.14	1000.0	120.000	125.1	H	198.0	20.9
349.963000	38.74	46.00	7.26	1000.0	120.000	99.8	H	234.0	24.3
467.987333	43.32	46.00	2.68	1000.0	120.000	212.6	H	262.0	27.1
549.984667	41.57	46.00	4.43	1000.0	120.000	99.9	V	100.0	28.5

Test Notes: Only the worst-case configuration presented.



2.3.19 Test Results Above 1GHz (Cabinet Spurious Emissions 802.11n U-NII 3)



Peak Result

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1049.900000	41.27	73.90	32.63	1000.0	1000.000	99.9	H	10.0	-4.0
3856.766667	48.29	73.90	25.61	1000.0	1000.000	121.0	H	323.0	7.6
5364.566667	45.45	73.90	28.45	1000.0	1000.000	192.5	H	8.0	12.1
9888.333333	53.20	73.90	20.70	1000.0	1000.000	121.2	H	249.0	21.7
14341.366666	57.08	73.90	16.82	1000.0	1000.000	325.0	V	4.0	26.5
17989.500000	63.62	73.90	10.28	1000.0	1000.000	291.5	V	22.0	32.7

Average Result

Frequency (MHz)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1049.900000	38.02	53.90	15.88	1000.0	1000.000	99.9	H	10.0	-4.0
3856.766667	38.69	53.90	15.21	1000.0	1000.000	121.0	H	323.0	7.6
5364.566667	32.30	53.90	21.60	1000.0	1000.000	192.5	H	8.0	12.1
9888.333333	39.71	53.90	14.19	1000.0	1000.000	121.2	H	249.0	21.7
14341.366666	44.21	53.90	9.69	1000.0	1000.000	325.0	V	4.0	26.5
17989.500000	50.37	53.90	3.53	1000.0	1000.000	291.5	V	22.0	32.7

Test Notes: No significant emissions observed above 18GHz. Only the worst case configuration presented.



SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

ID Number (SDGE/SDRB)	Test Equipment	Type	Serial Number	Manufacturer	Cal Date	Cal Due Date
Antenna Conducted Port Setup						
7662	P-Series Power Meter	N1911A	MY45100951	Agilent	06/15/18	06/15/19
7661	50MHz-18GHz Wideband Power Sensor	N1921A	MY45241383	Agilent	06/15/18	06/15/19
7611	Signal/Spectrum Analyzer	FSW26	102017	Rhode & Schwarz	05/09/18	05/09/19
7643	Signal/Spectrum Analyzer	FSV30	1321.3008K30/103166	Rhode & Schwarz	04/11/18	04/11/19
7655	Vector Signal Generator	SMBV100A	260734	Rhode & Schwarz	11/13/17	11/13/18
7654	Signal Generator	SMB 100A	175750	Rhode & Schwarz	11/07/17	11/07/18
7656	OSP with B157	OSP120	101310	Rhode & Schwarz	12/27/17	12/27/18
8825	20dB Attenuator	46-20-34	BK5773	Weinschel Corp.	Verified by 7643 and 7654	
8832	20dB Attenuator	34-20-34	BP4150	MCE/Weinschel	Verified by 7643 and 7654	
AC Conducted Emissions Test Setup						
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	07/13/18	07/13/19
7568	LISN	FCC-LISN-50-25-2-10	120305	Fischer Custom Comm.	02/08/18	02/08/19
7567	LISN	FCC-LISN-50-25-2-10	120304	Fischer Custom Comm.	12/14/17	12/14/18
8822	20dB Attenuator	34-20-34	N/A	MCE / Weinschel	03/06/18	03/06/19
8824	20dB Attenuator	34-20-34	N/A	MCE / Weinschel	03/06/18	03/06/19
Radiated Test Setup						
1002	Bilog Antenna	3142C	00058717	ETS-Lindgren	11/20/17	11/20/19
1016	Pre-amplifier	PAM-0202	187	PAM	02/06/18	02/06/19
7575	Double-ridged waveguide horn antenna	3117	00155511	EMCO	06/16/18	06/16/20
1049	EMI Test Receiver	ESU	100133	Rhode & Schwarz	07/13/18	07/13/19
6815	2.4GHz Band Notch Filter	BRM50702	008	Micro-Tronics	Verified by 7643 and 7654	
8628	Pre-amplifier	QLJ 01182835-JO	8986002	QuinStar Technologies Inc.	03/06/18	03/06/19
1153	High-frequency cable	SucoFlex 100 SX	N/A	Suhner	Verified by 7643 and 7654	
8543	High-frequency cable	Micropore 19057793	N/A	United Microwave Products	Verified by 7643 and 7654	
Miscellaneous						
6708	Multimeter	34401A	US36086974	Hewlett Packard	07/18/18	07/18/19
7554	Barometer/Temperature/Humidity Transmitter	iBTHX-W	0400706	Omega	05/25/18	05/25/19



3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:

3.2.1 Radiated Measurements (Below 1GHz)

Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.45	0.26	0.07
2	Cables	Rectangular	0.50	0.29	0.08
3	Preamp	Rectangular	0.75	0.44	0.19
4	Antenna	Rectangular	3.52	1.44	2.07
5	Site	Rectangular	1.00	0.58	0.33
6	EUT Setup	Rectangular	0.45	0.26	0.07
Combined Uncertainty (u_c):					1.66
Coverage Factor (k):					2
Expanded Uncertainty:					3.31

3.2.2 Radiated Emission Measurements (Above 1GHz)

Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.57	0.33	0.11
2	Cables	Rectangular	0.70	0.40	0.16
3	Preamp	Rectangular	0.50	0.29	0.08
4	Antenna	Rectangular	0.37	0.21	0.05
5	Site	Rectangular	3.00	1.22	1.50
6	EUT Setup	Rectangular	1.00	0.58	0.33
Combined Uncertainty (u_c):					1.49
Coverage Factor (k):					2
Expanded Uncertainty:					2.99

3.2.3 Conducted Antenna Port Measurements

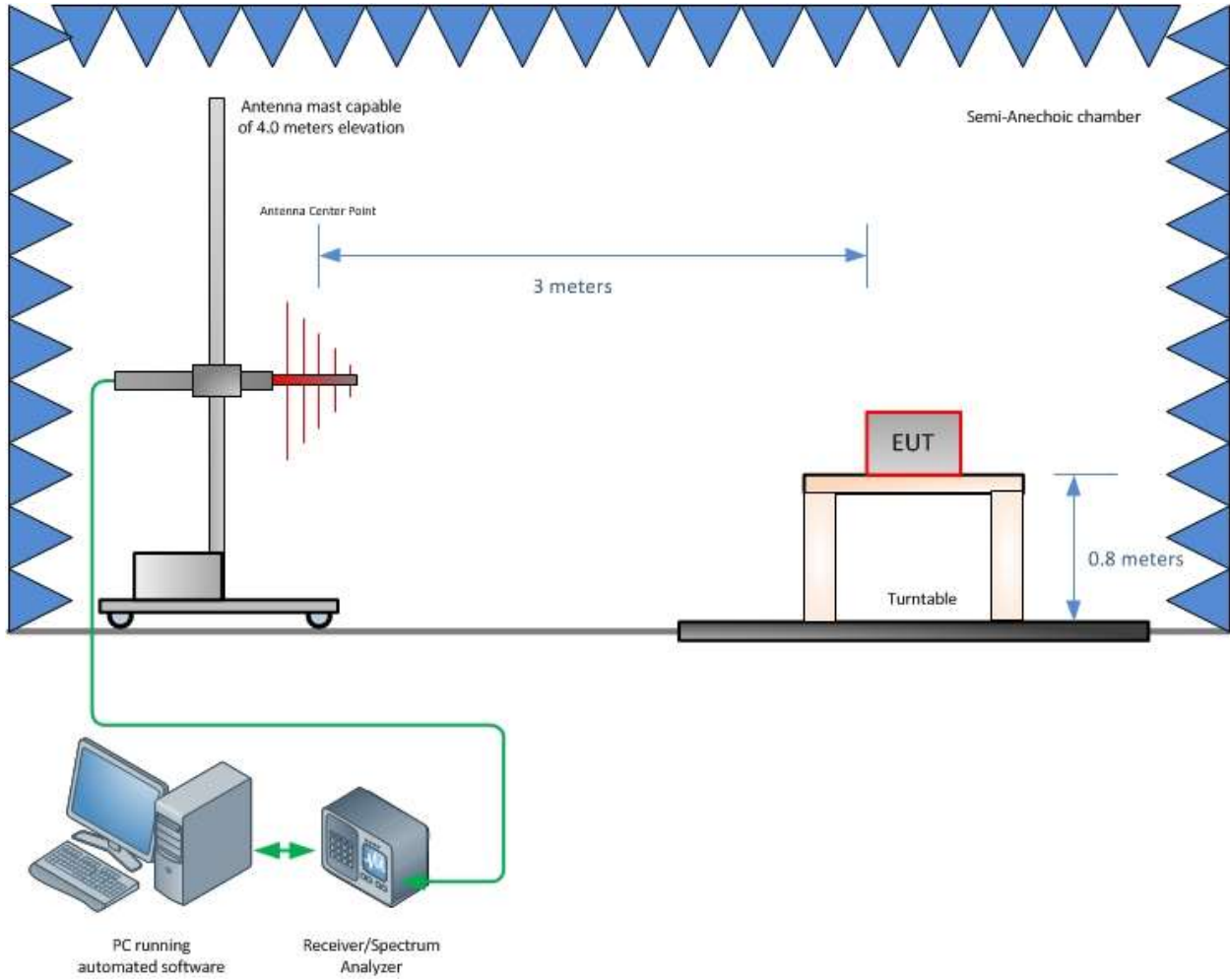
Contribution		Probability Distribution Type	Probability Distribution x_i	Standard Uncertainty $u(x_i)$	$[u(x_i)]^2$
1	Receiver/Spectrum Analyzer	Rectangular	0.08	0.05	0.00
2	Cables	Rectangular	0.30	0.17	0.03
3	EUT Setup	Rectangular	0.50	0.29	0.08
Combined Uncertainty (u_c):					0.34
Coverage Factor (k):					1.96
Expanded Uncertainty:					0.67



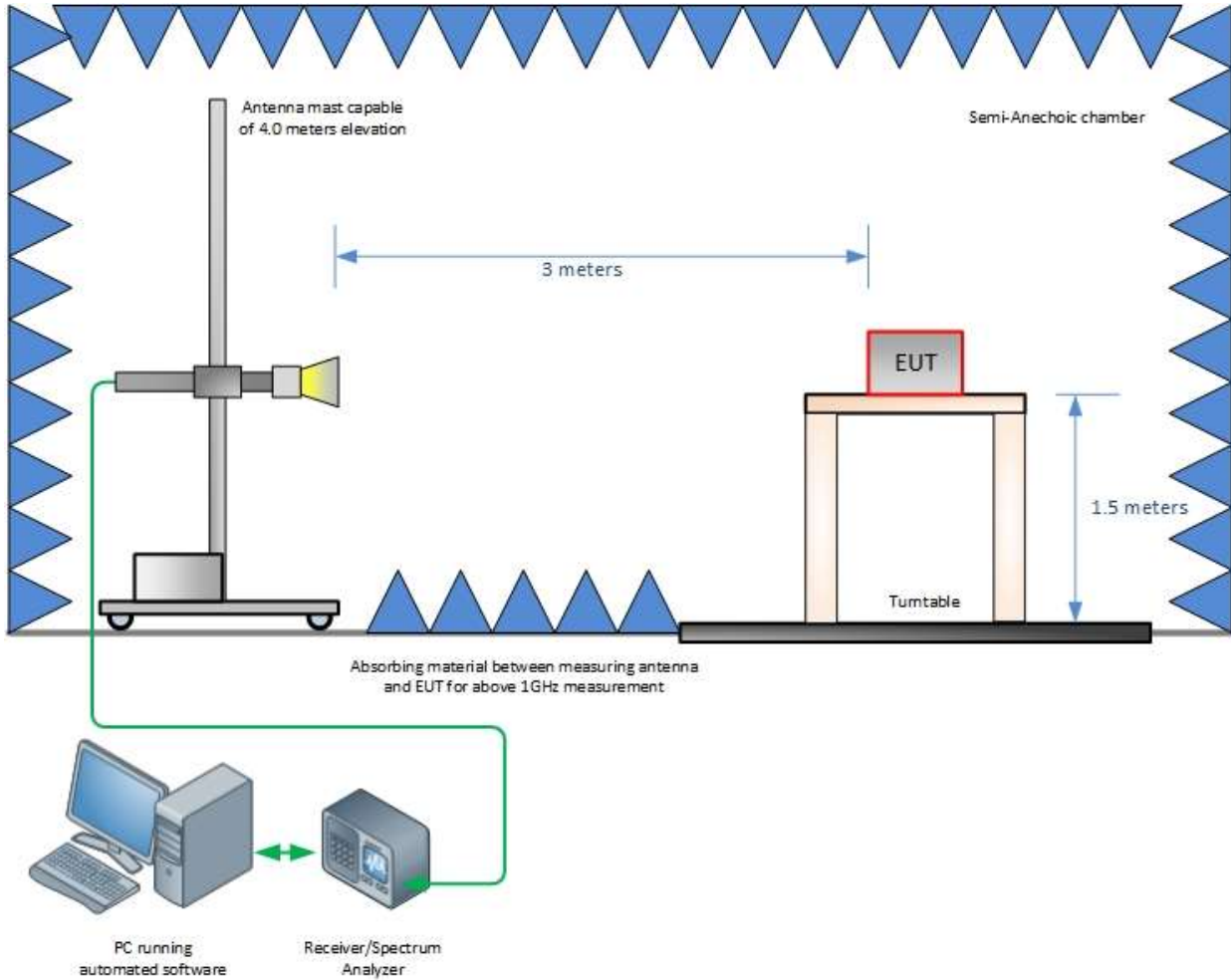
SECTION 4

DIAGRAM OF TEST SETUP

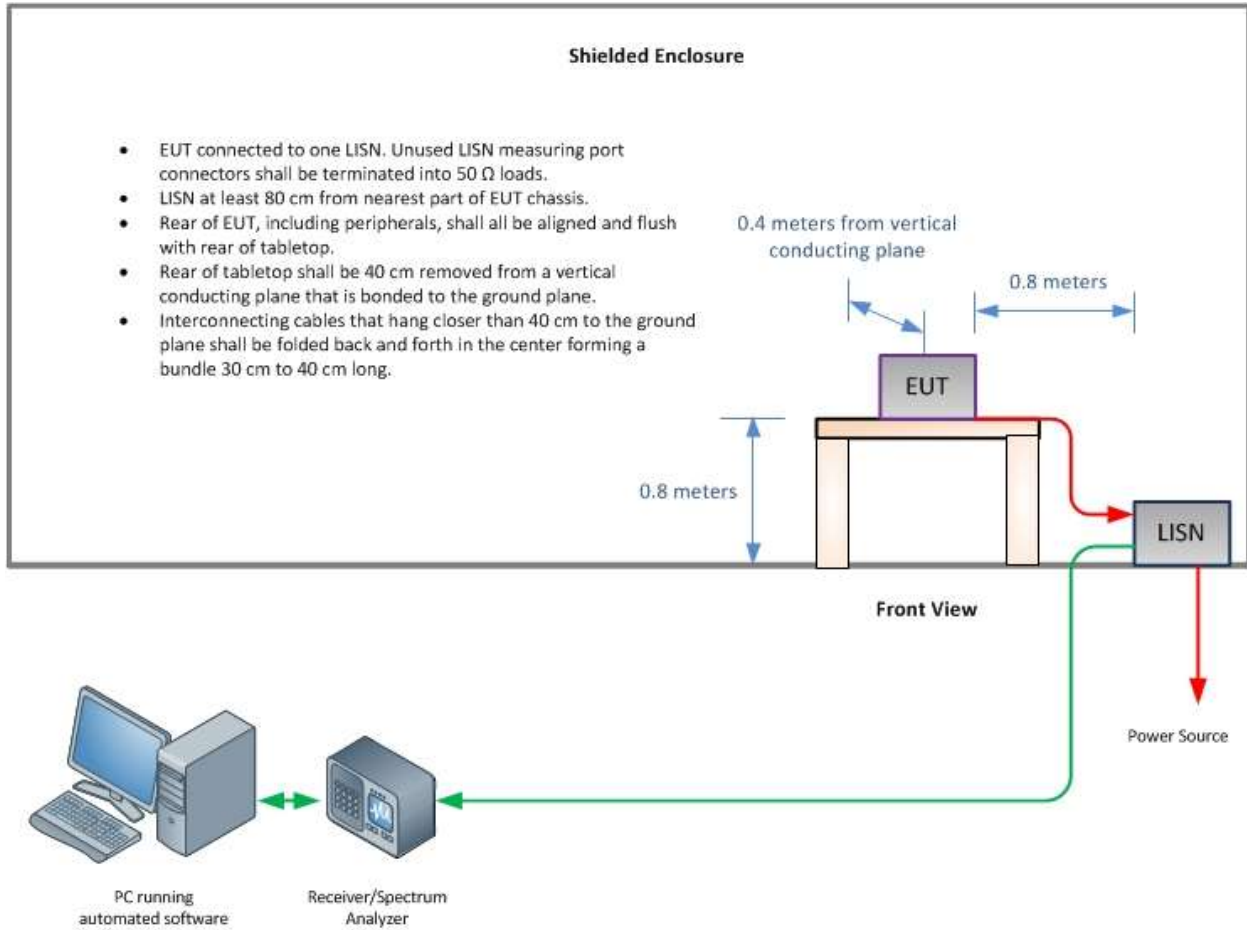
4.1 TEST SETUP DIAGRAM



Radiated Emission Test Setup (Below 1GHz)



Radiated Emission Test Setup (Above 1GHz)





SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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