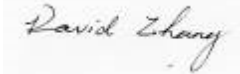


RF TEST REPORT



Report No.: FCC_RF_SL14091001-RUC-015_UNII Rev1.0
Supersede Report No.: FCC_RF_SL14091001-RUC-015_UNII

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	Access Point
Model No.	:	H500
Test Standard	:	47 CFR 15.407
Test Method	:	ANSI C63.4: 2014 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	S9GH500
IC ID	:	5912A-H500
Dates of test	:	11/08/ 2014 – 12/10/2014
Issue Date	:	02/06/2015
Test Result	:	☒ Pass ☐ Fail
Equipment complied with the specification [X] Equipment did not comply with the specification []		

This Test Report is Issued Under the Authority of:	
	
Angel Escamilla	David Zhang
Test Engineer	Engineer Reviewer
This test report may be reproduced in full only Test result presented in this test report is applicable to the tested sample only	

Issued By:
SIEMIC Laboratories
775 Montague Expressway, Milpitas, 95035 CA



775 Montague Expressway, Milpitas, CA 95035, USA • Phone: (+1) 408 526 1188 • Facsimile (+1) 408 526 1088

Visit us at: www.siemic.com; Follow us at:



Laboratory Introduction

SIEMIC, headquartered in the heart of Silicon Valley, with superior facilities in US and Asia, is one of the leading independent testing and certification facilities providing customers with one-stop shop services for Compliance Testing and Global Certifications.



In addition to testing and certification, SIEMIC provides initial design reviews and compliance management throughout a project. Our extensive experience with China, Asia Pacific, North America, European, and International compliance requirements, assures the fastest, most cost effective way to attain regulatory compliance for the global markets.

Accreditations for Conformity Assessment

Country/Region	Accreditation Body	Scope
USA	FCC, A2LA	EMC, RF/Wireless, Telecom
Canada	IC, A2LA, NIST	EMC, RF/Wireless, Telecom
Taiwan	BSMI, NCC, NIST	EMC, RF, Telecom, Safety
Hong Kong	OFTA, NIST	RF/Wireless, Telecom
Australia	NATA, NIST	EMC, RF, Telecom, Safety
Korea	KCC/RRR, NIST	EMI, EMS, RF, Telecom, Safety
Japan	VCCI, JATE, TELEC, RFT	EMI, RF/Wireless, Telecom
Mexico	NOM, COFETEL, Caniety	Safety, EMC, RF/Wireless, Telecom
Europe	A2LA, NIST	EMC, RF, Telecom, Safety
Israel	MOC, NIST	EMC, RF, Telecom, Safety

Accreditations for Product Certifications

Country	Accreditation Body	Scope
USA	FCC TCB, NIST	EMC, RF, Telecom
Canada	IC FCB, NIST	EMC, RF, Telecom
Singapore	iDA, NIST	EMC, RF, Telecom
EU	NB	EMC & R&TTE Directive
Japan	MIC (RCB 208)	RF, Telecom
Hong Kong	OFTA (US002)	RF, Telecom

CONTENTS

1	REPORT REVISION HISTORY	4
2	EXECUTIVE SUMMARY	5
3	CUSTOMER INFORMATION	5
4	TEST SITE INFORMATION	5
5	MODIFICATION	5
6	EUT INFORMATION	6
6.1	EUT Description	6
6.2	Radio Description	6
6.3	EUT Photos - External	8
6.4	EUT Photos - Internal	9
6.5	EUT Test Setup Photos	10
7	SUPPORTING EQUIPMENT/SOFTWARE AND CABLING DESCRIPTION	12
7.1	Supporting Equipment	12
7.2	Cabling Description	12
7.3	Test Software Description	12
8	TEST SUMMARY	13
9	MEASUREMENT UNCERTAINTY	14
10	MEASUREMENTS, EXAMINATION AND DERIVED RESULTS	15
10.1	Conducted Emissions	15
10.2	26 dB Bandwidth & 6 dB Bandwidth	18
10.3	Peak Output Power	24
10.4	Peak Spectral Density	26
10.5	Conducted Spurious Emissions	35
10.6	Radiated Emissions below 1GHz	48
10.7	Radiated Spurious Emissions above 1GHz	51
ANNEX A. TEST INSTRUMENT		62
ANNEX B. SIEMIC ACCREDITATION		63

1 Report Revision History

Report No.	Report Version	Description	Issue Date
FCC_RF_SL14091001-RUC-015_UNII	None	Original	01/26/2015
FCC_RF_SL14091001-RUC-015_UNII Rev1.0	Rev1.0	Update test result and test plots	02/06/2015

2 Executive Summary

The purpose of this test program was to demonstrate compliance of following product

Company: Ruckus Wireless, Inc.
Product: Access Point
Model: H500

against the current Stipulated Standards. The specified model product stated above has demonstrated compliance with the Stipulated Standard listed on 1st page.

3 Customer information

Applicant Name	:	Ruckus Wireless, Inc.
Applicant Address	:	350 West Java Drive, Sunnyvale, California 94089 U.S.A
Manufacturer Name	:	Ruckus Wireless, Inc.
Manufacturer Address	:	350 West Java Drive, Sunnyvale, California 94089 U.S.A

4 Test site information

Lab performing tests	SIEMIC Laboratories
Lab Address	775 Montague Expressway, Milpitas, CA 95035
FCC Test Site No.	881796
IC Test Site No.	4842D-2
VCCI Test Site No.	A0133

5 Modification

Index	Item	Description	Note
-	-	-	-

6 EUT Information

6.1 EUT Description

Product Name	:	Access Point
Model No.	:	H500
Trade Name	:	Ruckus
Serial No.	:	431406000022
Host Model No.	:	N/A
Input Power	:	48VDC (PoE) and 12 VDC (AC/DC Adapter)
Power Adapter Manu/Model	:	100VAC - 240VAC
Power Adapter SN	:	CN3210372
Hardware version	:	N/A
Software version	:	N/A
Date of EUT received	:	11/08/2014
Equipment Class/ Category	:	DTS, UNII
Clock Frequencies	:	N/A
Port/Connectors	:	PoE, Ethernet, USB

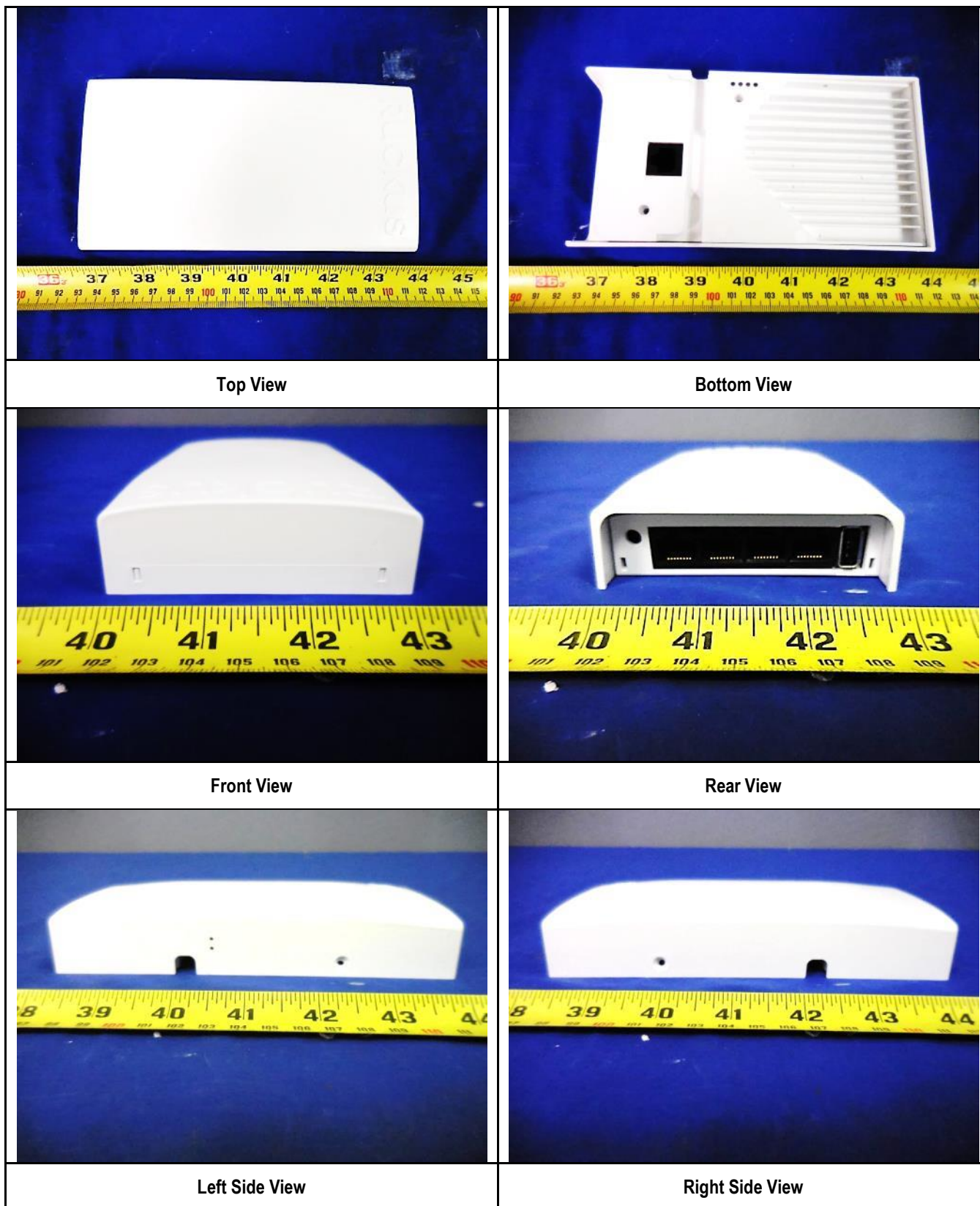
6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	2412-2462MHz	2412-2462MHz	5180-5240MHz 5745-5825MHz	2412-2462MHz 5180-5240MHz 5745-5825MHz	2422-2452MHz 5190-5310MHz 5755-5795MHz	5210MHz, 5775MHz
Modulation	DSSS (CCK, DQPSK, DBPSK)	OFDM-CCK (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)	OFDM (BPSK, QPSK, 16QAM, 64QAM)
Channel Spacing	5MHz	5MHz	20MHz	5MHz(2.4GHz), 20MHz (5GHz)	40MHz	80MHz
Number of Channels	11	11	9	11(2.4GH) 9 (5GHz)	9(2.4GH) 5(5GHz)	2
Antenna Type	Internal Omni PCB Antennas					
Antenna Gain (Peak)	0 dBi (2.4GHz), 1 dBi (5 GHz)					
Antenna Connector Type	U.FL					
Note	N/A					

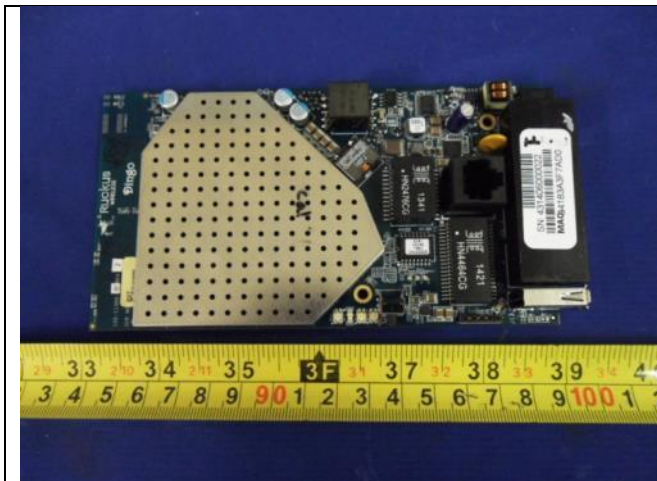
EUT ART Power Level Settings

Mode	Frequency	ART Power Setting
802.11-a	5180	22
802.11-a	5200	22
802.11-a	5240	22
802.11-n-20	5180	22
802.11-n-20	5200	22
802.11-n-20	5240	22
802.11-n-40	5190	22
802.11-n-40	5230	22
802.11-ac-80	5210	22
802.11-a	5745	22
802.11-a	5785	22
802.11-a	5825	22
802.11-n-20	5745	22
802.11-n-20	5785	22
802.11-n-20	5825	22
802.11-n-40	5755	22
802.11-n-40	5795	22
802.11-ac-80	5775	22

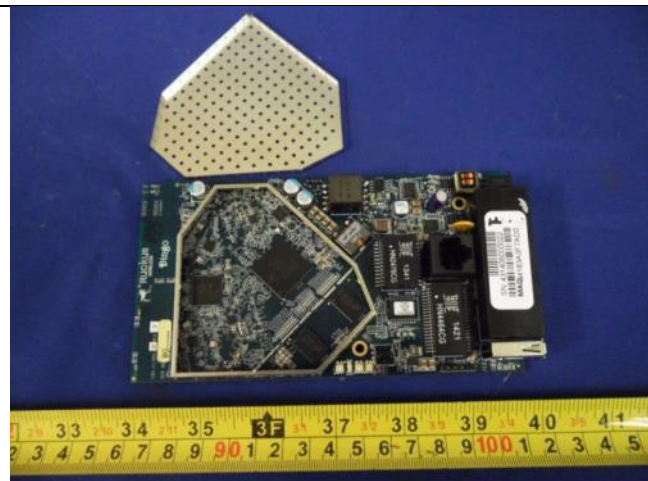
6.3 EUT Photos - External



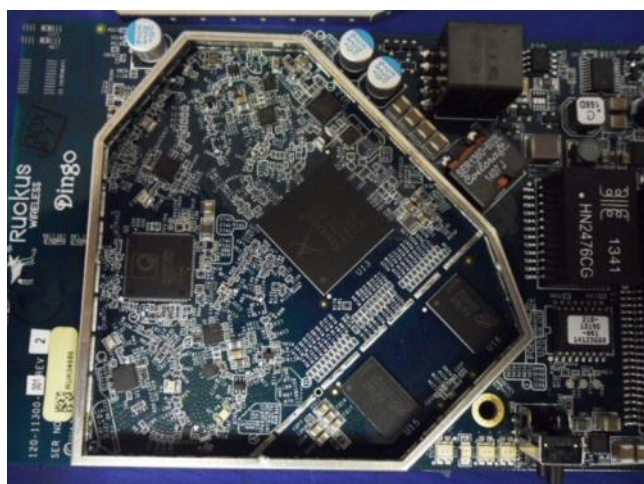
6.4 EUT Photos - Internal



EUT with Shielding Top View



EUT without Shielding Top View



EUT without Shielding Close View



EUT Bottom View

6.5 EUT Test Setup Photos



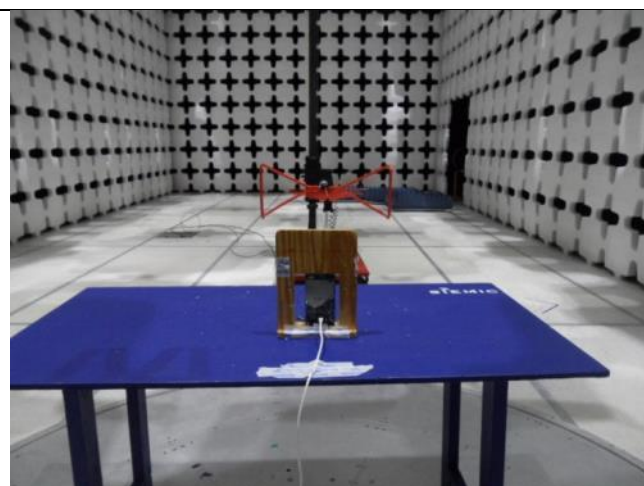
AC Line Conducted Emissions – Front View



AC Line Conducted Emissions – Rear View



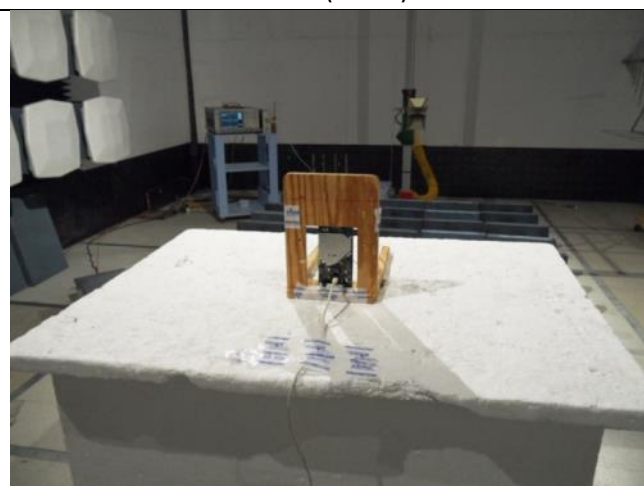
Radiated Emissions (<1GHz) – Front View



Radiated Emissions (<1GHz) – Rear View



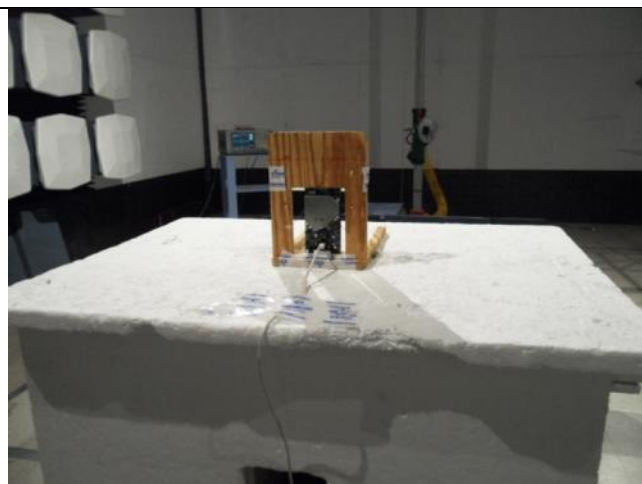
Radiated Emissions (>1GHz) – Front View



Radiated Emissions (>1GHz) – Rear View



Radiated Emissions (>18GHz) – Front View



Radiated Emissions (>18GHz) – Rear View

7 Supporting Equipment/Software and cabling Description

7.1 Supporting Equipment

Item	Supporting Equipment Description	Model	Serial Number	Manufacturer	Note
1	Laptop	S551M	E5NOCX02795518E	ASUS	-
2	POE Adapter	740-64157-001	133279963	Ruckus	-

7.2 Cabling Description

Name	Connection Start		Connection Stop		Length / shielding Info		Note
	From	I/O Port	To	I/O Port	Length (m)	Shielding	
RJ45	EUT	RJ45	POE	RJ45	2	Unshielded	-
RJ45	POE	RJ45	Laptop	RJ45	3	Unshielded	-

7.3 Test Software Description

Test Item	Software	Description
RF Testing	Command Line in windows	Set the EUT to transmit continuously in diferent test modes and channels

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Restricted Band of Operation	FCC	15.205	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.4 – 2014	☒ Pass ☐ N/A

Test Item	Test standard		Test Method/Procedure	Pass / Fail
26 & 6 dB Emission Bandwidth	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Maximum conducted Output Power	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power reduction (Antenna Gain > 6 dBi)	FCC	15.407 (a) (2)	-	☐ Pass ☒ N/A
Band Edge and Radiated Spurious Emissions	FCC	15.407(b)(2), 15.407(b)(6)	ANSI C63.4 – 2014 789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Power Spectral Density	FCC	15.407 (a) (2)	789033 D02 General UNII Test Procedures New Rules v01	☒ Pass ☐ N/A
Frequency Stability	FCC	15.407 (g)	-	☐ Pass ☒ N/A
Transmit Power Control (TPC)	FCC	15.407 (h)(1)	-	☐ Pass ☒ N/A
User Manual	FCC	-	-	☒ Pass ☐ N/A
Remark	- All measurement uncertainties are not taken into consideration for all presented test result. - The applicant shall ensure frequency stability by showing that an emission is maintained within the band of operation under all normal operating conditions as specified in the user's manual.			

9 Measurement Uncertainty

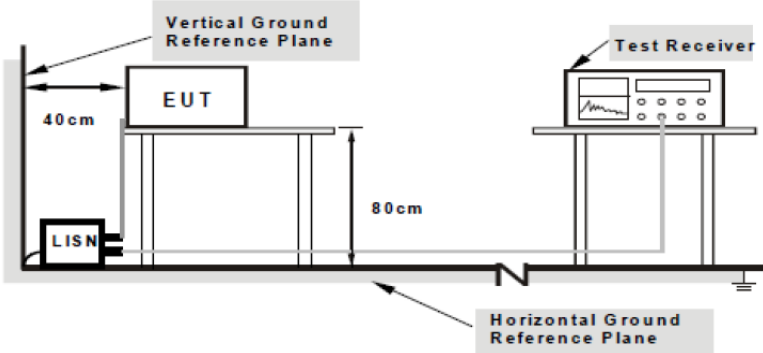
Emissions			
Test Item	Frequency Range	Description	Uncertainty
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and Radiated Spurious Emissions	1GHz – 40GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+4.3dB/-4.1dB

10 Measurements, Examination and Derived Results

10.1 Conducted Emissions

Conducted Emission Limit

Frequency ranges (MHz)	Limit (dBuV)	
	QP	Average
0.15 ~ 0.5	66 – 56	56 – 46
0.5 ~ 5	56	46
5 ~ 30	60	50

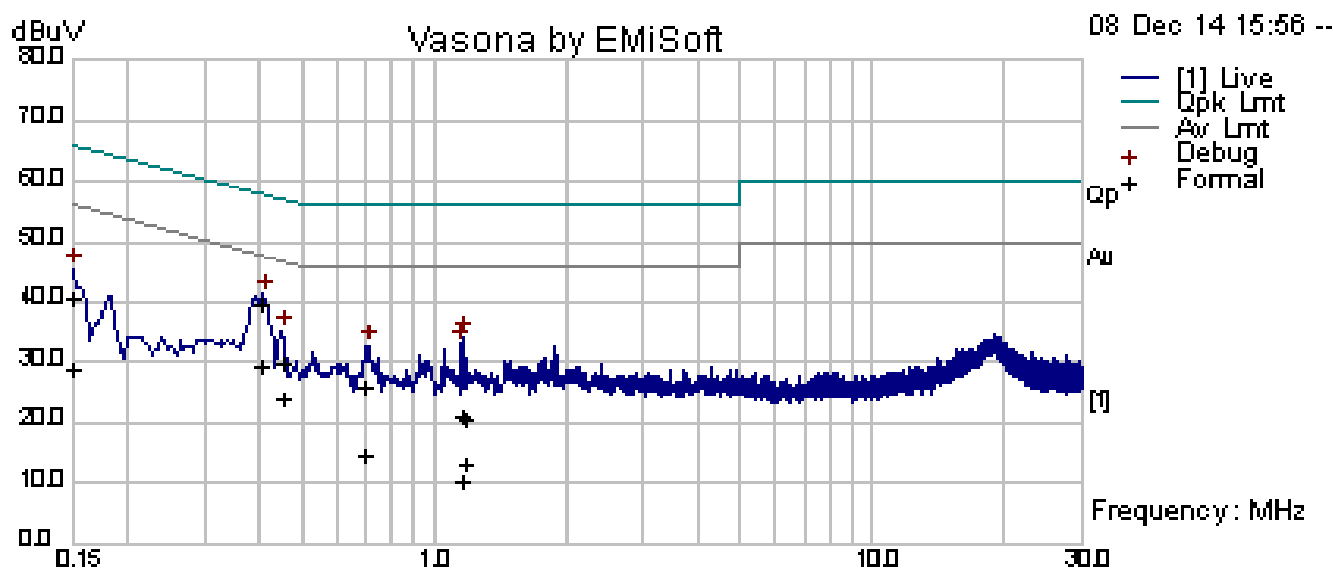
Spec	Item	Requirement	Applicable
47CFR§15.207	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). The lower limit applies at the boundary between the frequency ranges.	☒
Test Setup	 Note: 1. Support units were connected to second LISN. 2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.		
Procedure	- The EUT and supporting equipment were set up in accordance with the requirements of the standard on top of a 1.5m x 1m x 0.8m high, non-metallic table, as shown in Annex B. - The power supply for the EUT was fed through a 50Ω/50μH EUT LISN, connected to filtered mains. - The RF OUT of the EUT LISN was connected to the EMI test receiver via a low-loss coaxial cable. - All other supporting equipment was powered separately from another main supply.		
Remark	EUT was tested at 120VAC, 60Hz		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	George Arias			
Test Date:	12/08/2014			
Remarks	Line			

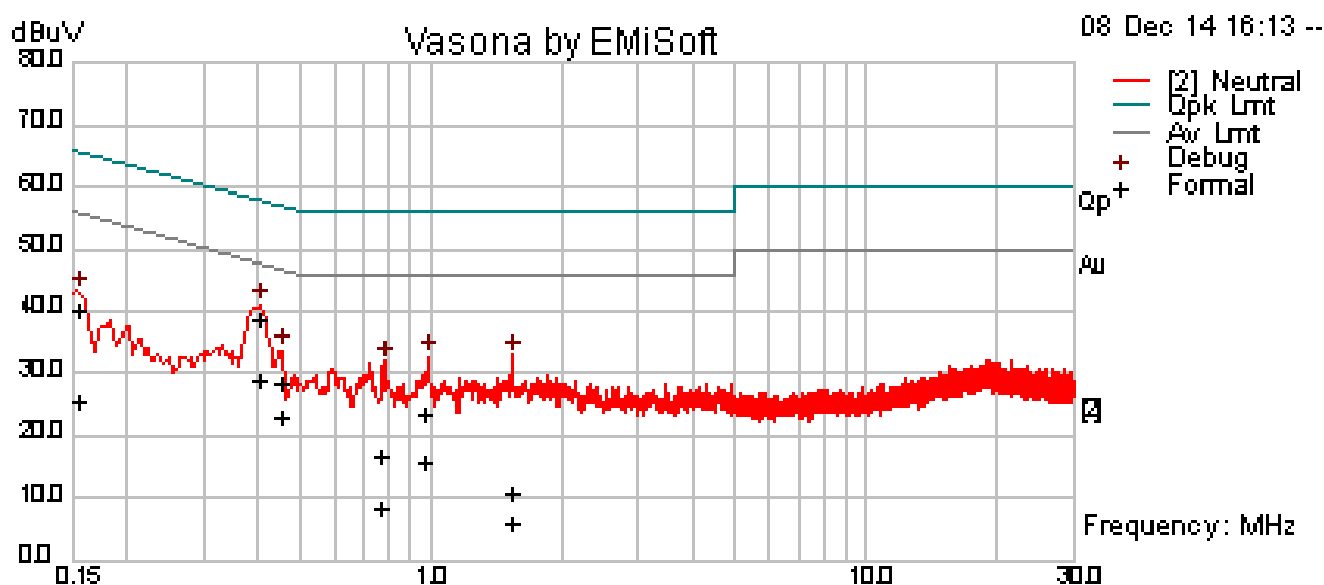


Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.15	29.77	10.00	0.76	40.53	Quasi Peak	Line	66.00	-25.46	Pass
0.40	28.86	10.01	0.73	39.60	Quasi Peak	Line	57.81	-18.21	Pass
0.45	19.12	10.01	0.73	29.86	Quasi Peak	Line	56.87	-27.01	Pass
0.70	15.06	10.01	0.75	25.83	Quasi Peak	Line	56.00	-30.17	Pass
1.16	10.24	10.02	0.81	21.07	Quasi Peak	Line	56.00	-34.93	Pass
1.17	10.03	10.02	0.81	20.86	Quasi Peak	Line	56.00	-35.14	Pass
0.15	18.00	10.00	0.76	28.76	Average	Line	56.00	-27.24	Pass
0.40	18.93	10.01	0.73	29.66	Average	Line	47.81	-18.14	Pass
0.45	13.07	10.01	0.73	23.81	Average	Line	46.87	-23.07	Pass
0.70	4.17	10.01	0.75	14.93	Average	Line	46.00	-31.07	Pass
1.16	-0.43	10.02	0.81	10.40	Average	Line	46.00	-35.60	Pass
1.17	2.48	10.02	0.81	13.31	Average	Line	46.00	-32.69	Pass

Conducted Emission Test Results

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	42		
	Atmospheric(mbar):	1021		
Mains Power:	120Vac, 60Hz			
Tested by:	George Arias			
Test Date:	12/08/2014			
Remarks	Neutral			



Neutral Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.15	29.22	10.00	0.76	39.97	Quasi Peak	Neutral	65.78	-25.81	Pass
0.40	28.17	10.01	0.73	38.90	Quasi Peak	Neutral	57.83	-18.92	Pass
0.45	17.74	10.01	0.73	28.48	Quasi Peak	Neutral	56.84	-28.36	Pass
0.77	5.94	10.01	0.76	16.71	Quasi Peak	Neutral	56.00	-39.29	Pass
0.97	12.90	10.02	0.78	23.70	Quasi Peak	Neutral	56.00	-32.30	Pass
1.53	0.02	10.02	0.88	10.92	Quasi Peak	Neutral	56.00	-45.08	Pass
0.15	14.59	10.00	0.76	25.35	Average	Neutral	55.78	-30.43	Pass
0.40	18.43	10.01	0.73	29.16	Average	Neutral	47.83	-18.66	Pass
0.45	12.11	10.01	0.73	22.85	Average	Neutral	46.84	-23.99	Pass
0.77	-2.41	10.01	0.76	8.36	Average	Neutral	46.00	-37.64	Pass
0.97	5.16	10.02	0.78	15.95	Average	Neutral	46.00	-30.05	Pass
1.53	-4.84	10.02	0.88	6.06	Average	Neutral	46.00	-39.94	Pass

10.2 26 dB Bandwidth & 6 dB Bandwidth

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	-	26 dB Emission BW: Report only for reference.	☒
	a) (2)	26 dB Emission BW: Report only for power limit calculation.	☐
	e)	Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 <u>26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz)</u> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 26dB BW. - o Set RBW = around 1% of emission bandwidth - o Set VBW > RBW - o Detector = Peak - o Trace mode = max hold - Capture the plot. - Repeat above steps for different test channel and other modulation type. <u>6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz)</u> - Allow the trace to stabilize. - Use the spectrum analyzer built-in measurement function to determine the 6dB BW. - o Set RBW = 100 KHz - o Set VBW ≥ 3 x RBW - o Detector = Peak - o Trace mode = max hold - o Sweep = auto couple - Capture the plot. - Repeat above steps for different test channel and other modulation type.		
Test Date	11/10/2014	Environmental condition	Temperature 22°C Relative Humidity 38% Atmospheric Pressure 1020mbar
Remark	99% BW result is presented here to show the channels in 5.1GHz is not crossing to DFS channel since the 26 dB BW is too wide.		
Result	☒ Pass ☐ Fail		

Equipment Setting

Test	RBW	VBW	Span	Detector	Sweep	Trace	Notes
26 dB Emission Bandwidth	1% of 26 dB EBW	>RBW	>EBW	PK	Auto	Maxhold	-
6 dB Bandwidth	100 KHz	≥3 x RBW	1.5 - 5 times of OBW	PK	Auto	Maxhold	-
99% OBW	1% - 5% of EBW	>RBW	>EBW	PK	Auto	Maxhold	-

Test Data ☒ Yes ☐ N/A
Test Plot ☒ Yes ☐ N/A

26dB Bandwidth measurement result for 5.1GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
26dB BW	802.11a	5180	Low	30.00	-
26dB BW	802.11a	5200	Mid	30.00	-
26dB BW	802.11a	5240	High	29.98	-
26dB BW	802.11n-20	5180	Low	29.99	-
26dB BW	802.11n-20	5200	Mid	29.94	-
26dB BW	802.11n-20	5240	High	30.00	-
26dB BW	802.11n-40	5190	Low	44.71	-
26dB BW	802.11n-40	5230	High	50.00	-
26dB BW	802.11ac-80	5210	Mid	87.92	-

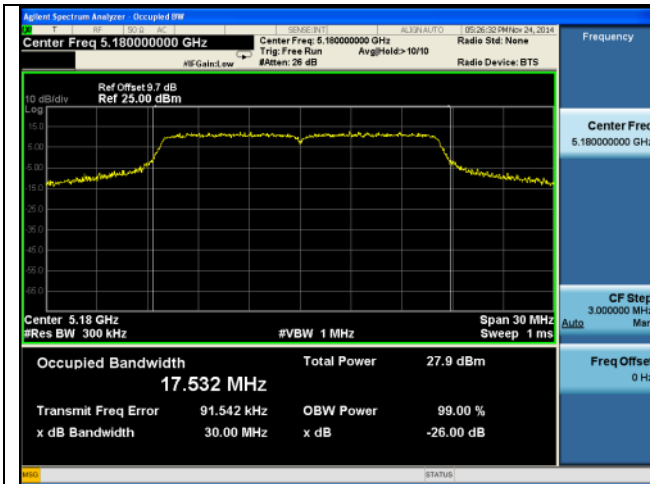
6dB Bandwidth measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11a	5745	Low	16.93	≥0.5	Pass
6dB BW	802.11a	5785	Mid	16.43	≥0.5	Pass
6dB BW	802.11a	5825	High	16.38	≥0.5	Pass
6dB BW	802.11n-20	5745	Low	17.82	≥0.5	Pass
6dB BW	802.11n-20	5785	Mid	17.67	≥0.5	Pass
6dB BW	802.11n-20	5825	High	17.82	≥0.5	Pass
6dB BW	802.11n-40	5755	Low	36.39	≥0.5	Pass
6dB BW	802.11n-40	5795	High	36.43	≥0.5	Pass
6dB BW	802.11ac-80	5775	Mid	76.42	≥0.5	Pass

99% Occupied Bandwidth measurement result for 5.1GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)
99% OBW	802.11a	5180	Low	17.53	-
99% OBW	802.11a	5200	Mid	17.49	-
99% OBW	802.11a	5240	High	17.49	-
99% OBW	802.11n-20	5180	Low	18.25	-
99% OBW	802.11n-20	5200	Mid	18.32	-
99% OBW	802.11n-20	5240	High	18.41	-
99% OBW	802.11n-40	5190	Low	36.74	-
99% OBW	802.11n-40	5230	High	36.84	-
99% OBW	802.11ac-80	5210	Mid	75.92	-

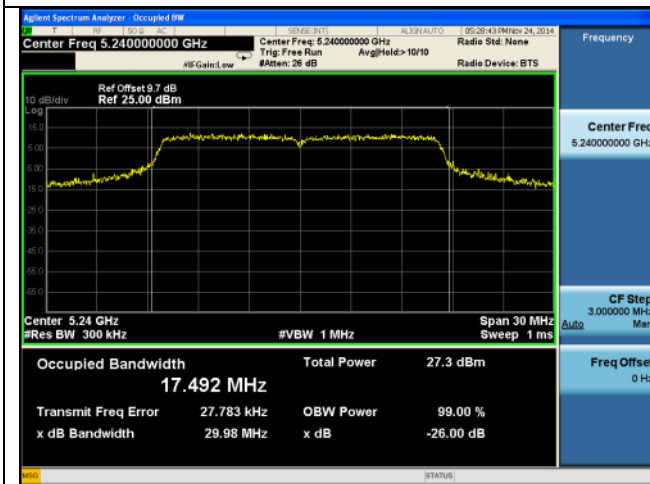
26dB Bandwidth Test Plots



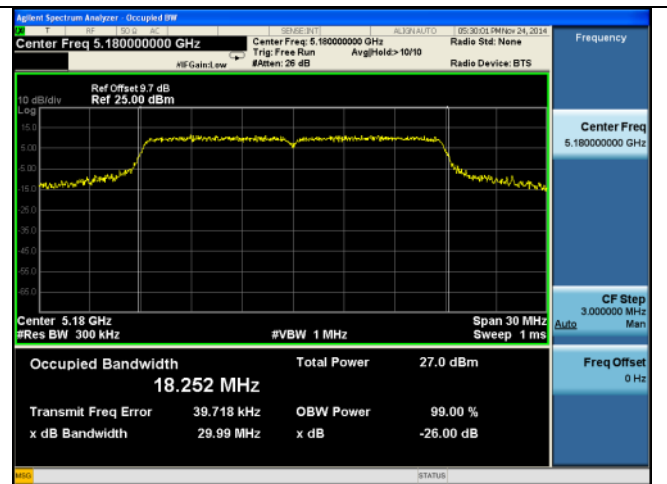
26dB BW - 802.11a 5180MHz



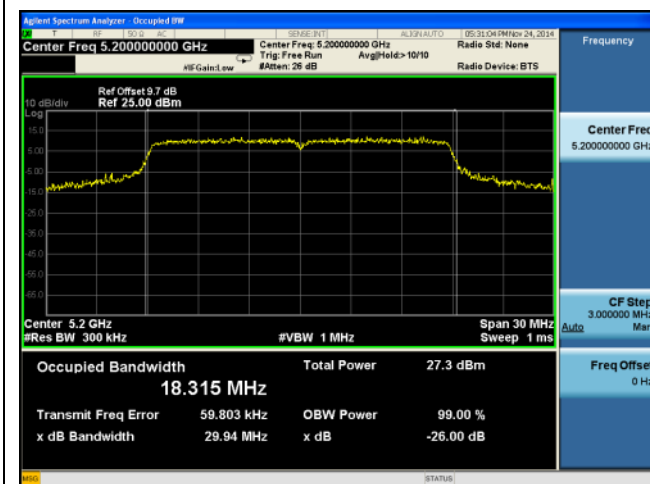
26dB BW - 802.11a 5200MHz



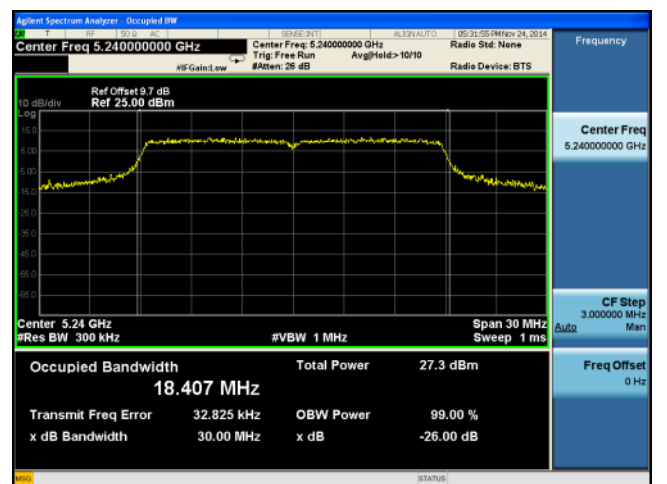
26dB BW - 802.11a 5240MHz



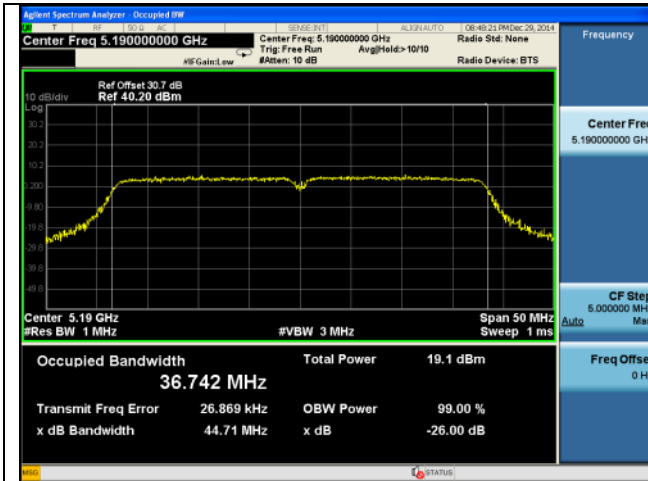
26dB BW - 802.11n-20M 5180MHz



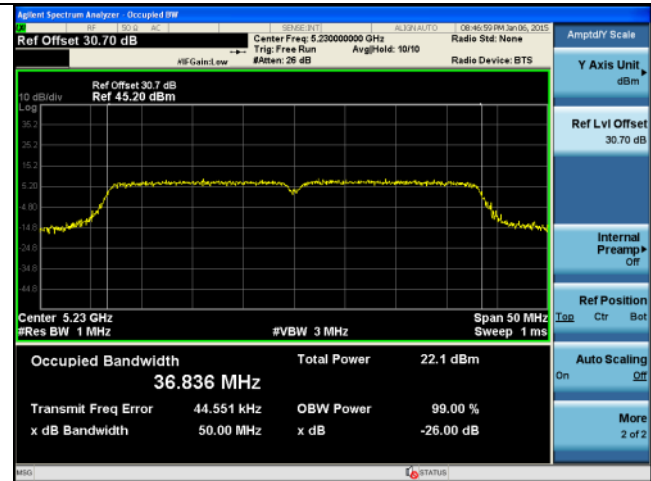
26dB BW - 802.11n-20M 5200MHz



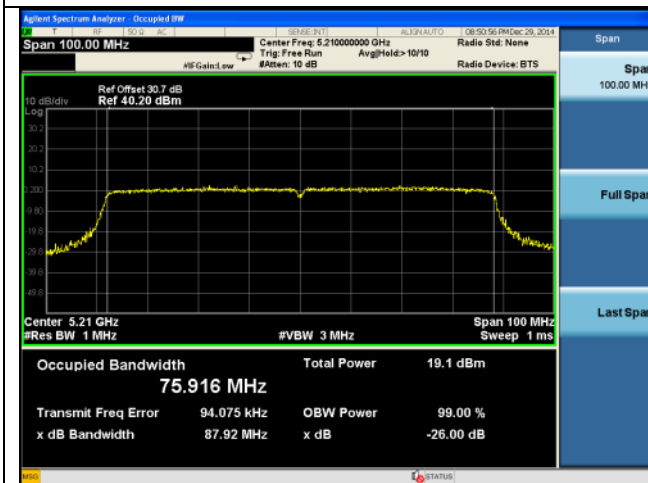
26dB BW - 802.11n-20M 5240MHz



26dB BW - 802.11n-40M 5190MHz

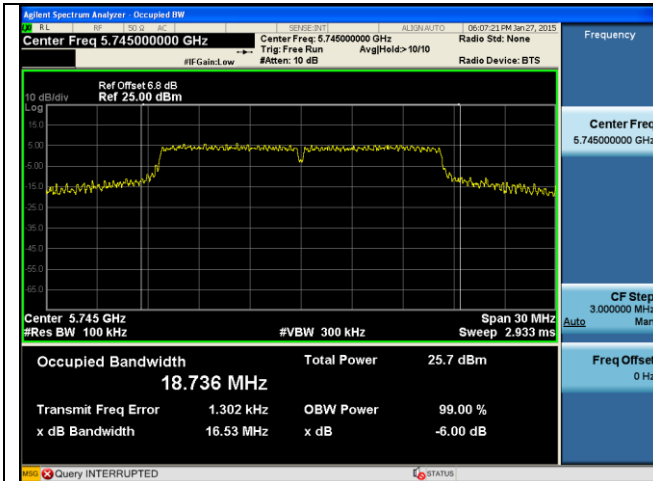


26dB BW - 802.11n-40M 5230MHz

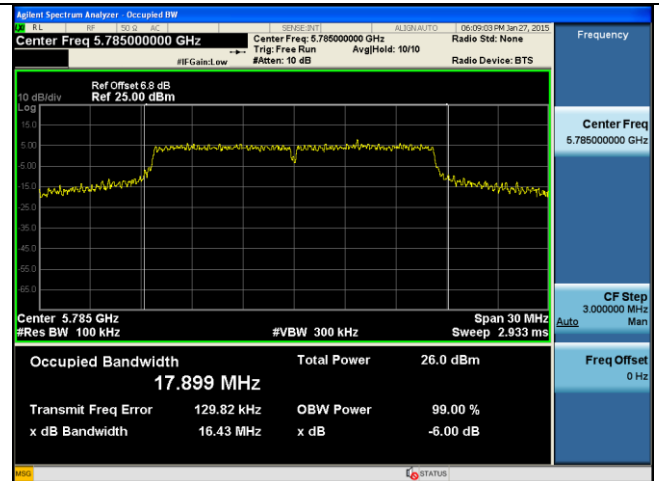


26dB BW - 802.11ac-80M 5210MHz

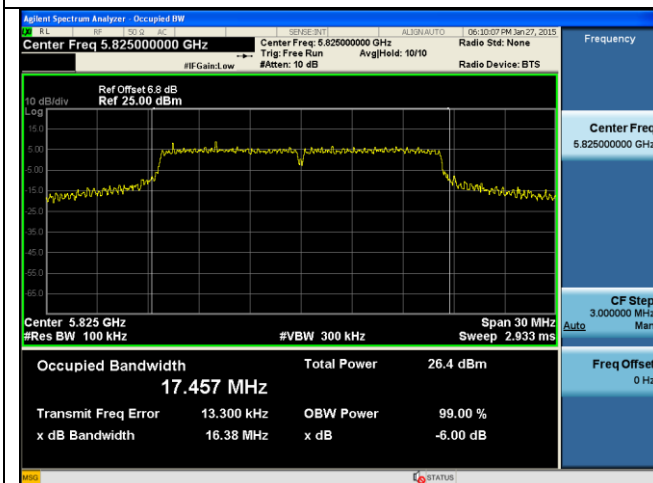
6dB Bandwidth Test Plots



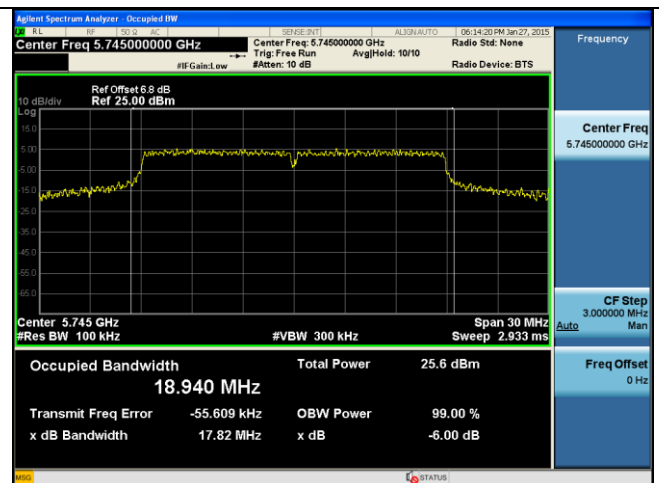
6dB BW 802.11a 5745MHz



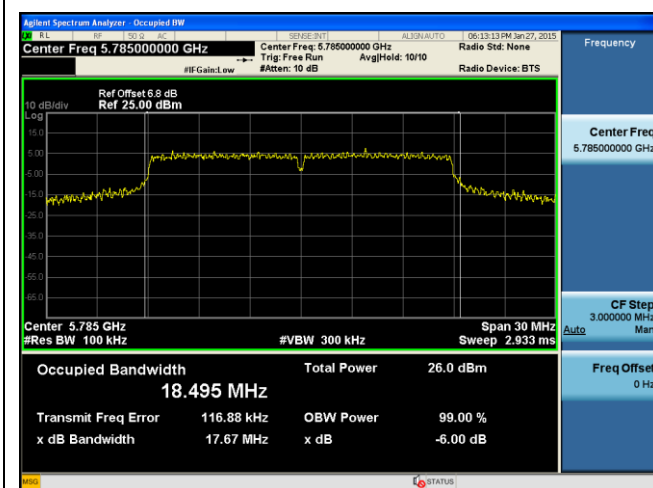
6dB BW 802.11a 5785MHz



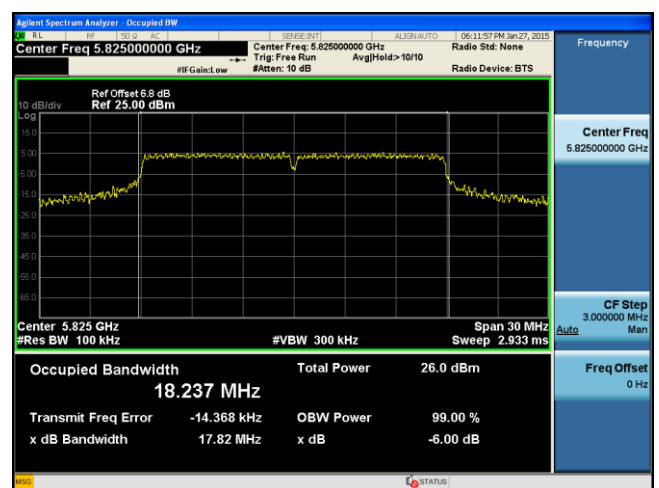
6dB BW 802.11a 5825MHz



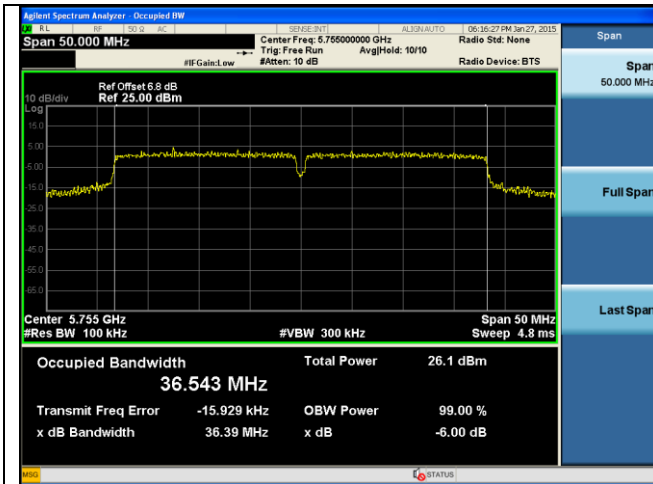
6dB BW 802.11n-20M 5745MHz



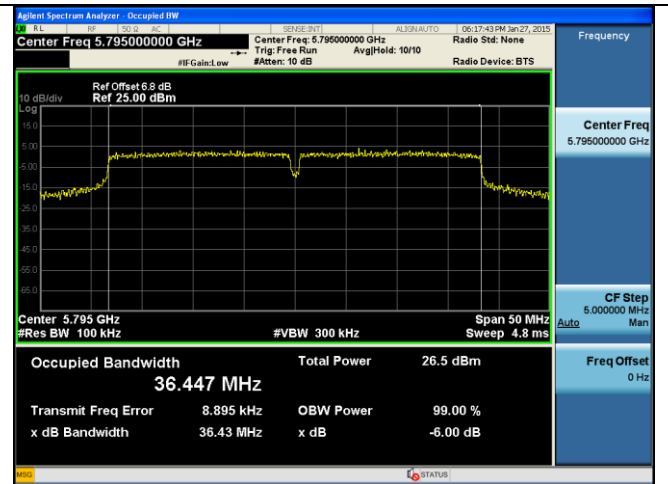
6dB BW 802.11n-20M 5785MHz



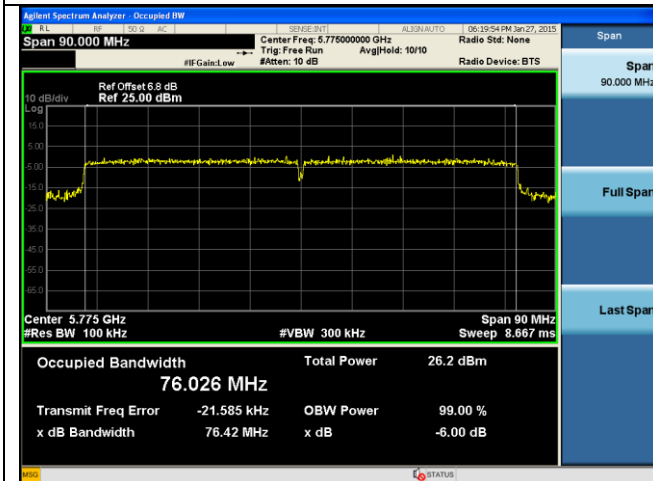
6dB BW 802.11n-20M 5825MHz



6dB BW 802.11n-40M 5755MHz



6dB BW 802.11n-40M 5795MHz



6dB BW 802.11ac-80M 5775MHz

10.3 Peak Output Power

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. The maximum e.i.r.p. at any elevation angle above 30 degrees as measured from the horizon must not exceed 125 mW (21 dBm).	☐
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi.	☒
	a)(1)(iii)	For fixed point-to-point access points operating in the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. Fixed point-to-point U-NII devices may employ antennas with directional gain up to 23 dBi without any corresponding reduction in the maximum conducted output power or maximum power spectral density. For fixed point-to-point transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in maximum conducted output power and maximum power spectral density is required for each 1 dB of antenna gain in excess of 23 dBi.	☐
	a)(1)(iv)	For mobile and portable 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.	☐
	a)(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 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz.	☐
	a)(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.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 <u>Measurement using a Power Meter (PM)</u> Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required. - Connect EUT's RF output power to power meter - Set EUT to be continuous transmission mode - Measurement the average output power using power meter and record the result - Repeat above steps for different test channel and other modulation type.		
Test Date	11/22/2014	Environmental condition	Temperature 21°C Relative Humidity 40% Atmospheric Pressure 1019mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

Output Power measurement result for 5.1GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output Power	802.11a	5180	Low	22.70	22.70	25.71	≤30	Pass
Output Power	802.11a	5200	Mid	22.80	22.80	25.81	≤30	Pass
Output Power	802.11a	5240	High	22.20	22.20	25.21	≤30	Pass
Output Power	802.11n-20	5180	Low	22.60	22.70	25.66	≤30	Pass
Output Power	802.11n-20	5200	Mid	22.20	22.20	25.21	≤30	Pass
Output Power	802.11n-20	5240	High	22.20	22.10	25.16	≤30	Pass
Output Power	802.11n-40	5190	Low	22.50	21.70	25.13	≤30	Pass
Output Power	802.11n-40	5230	High	21.70	21.70	24.71	≤30	Pass
Output Power	802.11ac-80	5210	Mid	21.50	21.50	24.51	≤30	Pass

Output Power Measurement Results for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)			Limit (dBm)	Result
				Chain0	Chain1	Combined Power		
Output power	802.11a	5745	Low	20.60	20.20	23.41	≤30	Pass
Output power	802.11a	5785	Mid	20.50	20.10	23.31	≤30	Pass
Output power	802.11a	5825	High	20.30	20.00	23.16	≤30	Pass
Output power	802.11n-20M	5745	Low	20.60	20.10	23.37	≤30	Pass
Output power	802.11n-20M	5785	Mid	20.50	20.00	23.27	≤30	Pass
Output power	802.11n-20M	5825	High	20.50	20.10	23.31	≤30	Pass
Output power	802.11n-40M	5755	Low	20.90	19.70	23.35	≤30	Pass
Output power	802.11n-40M	5795	High	20.70	19.70	23.24	≤30	Pass
Output power	802.11ac-80M	5775	Mid	20.60	19.40	23.05	≤30	Pass

10.4 Peak Spectral Density

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	a)(1)(i)	For an outdoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☐
	a)(1)(ii)	For an indoor access point operating in the band 5.15-5.25 GHz, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band.	☒
	a)(2)	For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.	☐
	a)(3)	For the band 5.725-5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.	☒
Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01, II.F. Method SA-1 <u>Maximum spectral density measurement procedure</u> - Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal. - Set RBW = 1 MHz - Set VBW ≥ 3 MHz - Detector = RMS. - Sweep time = auto couple. - Trace mode = max hold. - Trace average at least 100 traces in power averaging - Use the peak marker function to determine the maximum amplitude level within the RBW. Apply correction to the result if different RBW is used.		
Test Date	11/21/2014	Environmental condition	Temperature 22°C Relative Humidity 42% Atmospheric Pressure 1020mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Equipment Setting

Test	RBW	VBW	Span	Detector	Sweep	Trace	Notes
PSD	1MHz	≥3MHz	>EBW	RMS	Auto	Average	-

Test Data ☒ Yes ☐ N/A

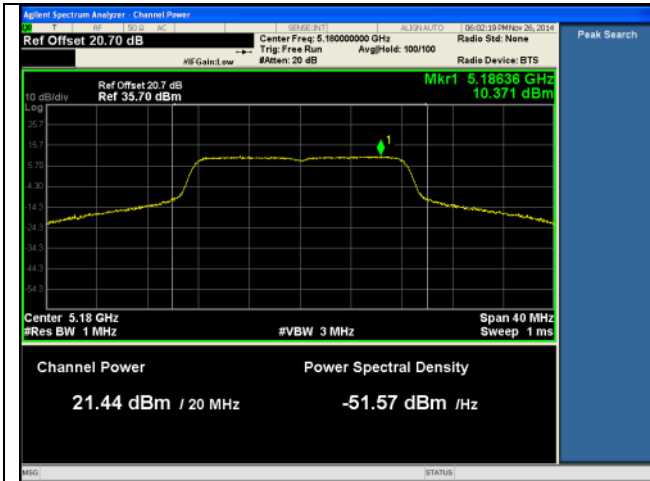
Test Plot ☒ Yes (See below) ☐ N/A

PSD measurement result

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)			Limit (dBm/MHz)	Result
				Chain0	Chain1	Combined PSD		
PSD	802.11a	5180	Low	10.371	11.018	13.717	≤17	Pass
PSD	802.11a	5200	Mid	10.471	11.072	13.792	≤17	Pass
PSD	802.11a	5240	High	10.377	10.449	13.423	≤17	Pass
PSD	802.11n-20	5180	Low	10.429	10.581	13.516	≤17	Pass
PSD	802.11n-20	5200	Mid	10.054	10.287	13.182	≤17	Pass
PSD	802.11n-20	5240	High	10.252	10.147	13.210	≤17	Pass
PSD	802.11n-40	5190	Low	7.598	6.699	10.182	≤17	Pass
PSD	802.11n-40	5230	High	6.669	6.771	9.730	≤17	Pass
PSD	802.11ac-80	5210	Mid	3.672	3.642	6.667	≤17	Pass

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/100KHz)			BW correction factor (dB)	Correctede PSD (dBm/500KHz)	Limit (dBm/500 KHz)	Result
				Chain0	Chain1	Combined PSD				
PSD	802.11a	5745	Low	0.586	0.064	3.343	6.99	10.333	≤30	Pass
PSD	802.11a	5785	Mid	0.195	-0.206	3.009	6.99	9.999	≤30	Pass
PSD	802.11a	5825	High	0.449	0.106	3.291	6.99	10.281	≤30	Pass
PSD	802.11n-20M	5745	Low	0.170	-0.499	2.859	6.99	9.849	≤30	Pass
PSD	802.11n-20M	5785	Mid	-0.176	-0.382	2.733	6.99	9.723	≤30	Pass
PSD	802.11n-20M	5825	High	0.166	-0.388	2.908	6.99	9.898	≤30	Pass
PSD	802.11n-40M	5755	Low	-2.787	-3.884	-0.291	6.99	6.699	≤30	Pass
PSD	802.11n-40M	5795	High	-2.892	-3.841	-0.330	6.99	6.660	≤30	Pass
PSD	802.11ac-80M	5775	Mid	-6.530	-7.387	-3.927	6.99	3.063	≤30	Pass
Note	BW correction factor = 10log(500kHz/RBW)									

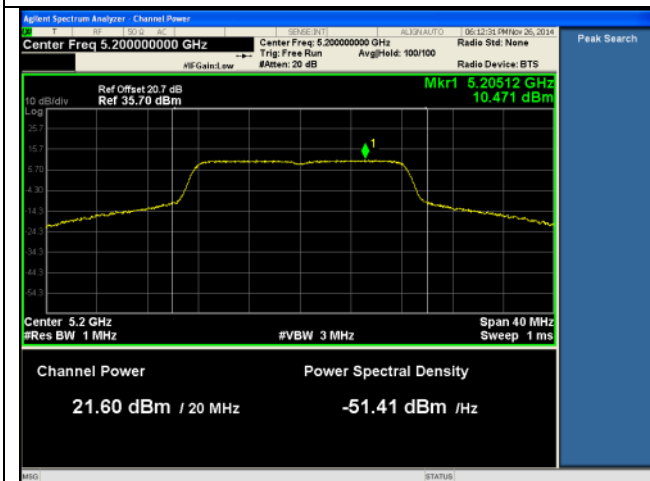
Test Plots



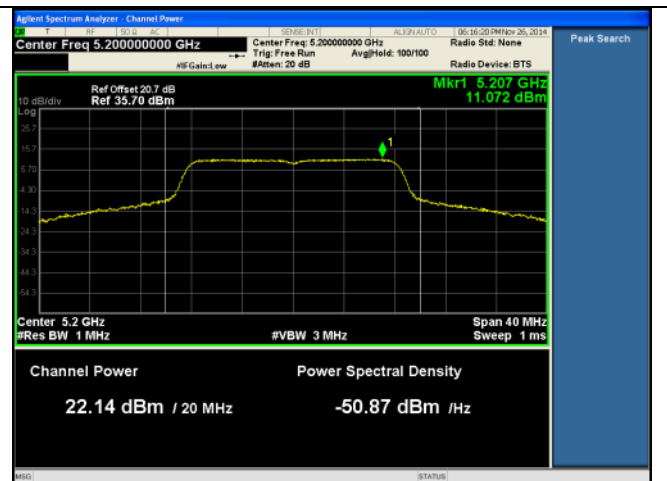
PSD-802.11a-5180M-chain0



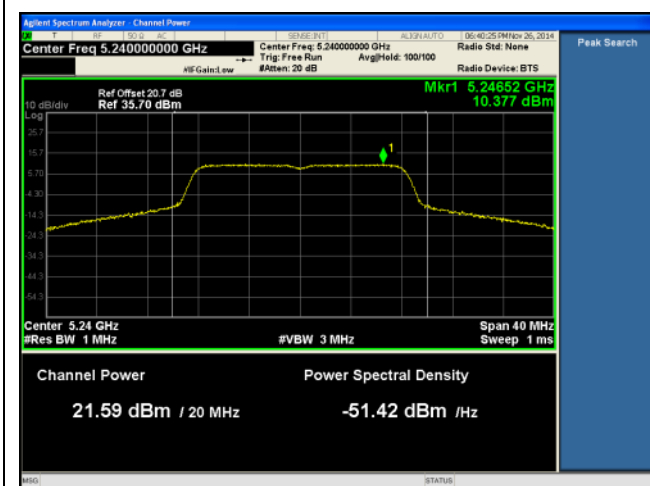
PSD-802.11a-5180M-chain1



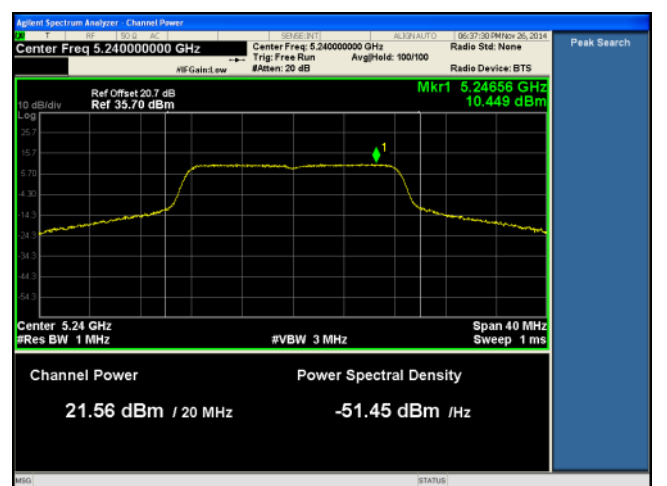
PSD-802.11a-5200M-chain0



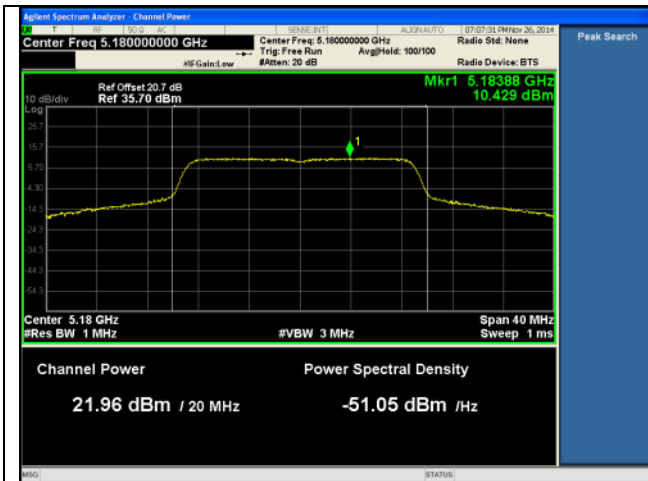
PSD-802.11a-5200M-chain1



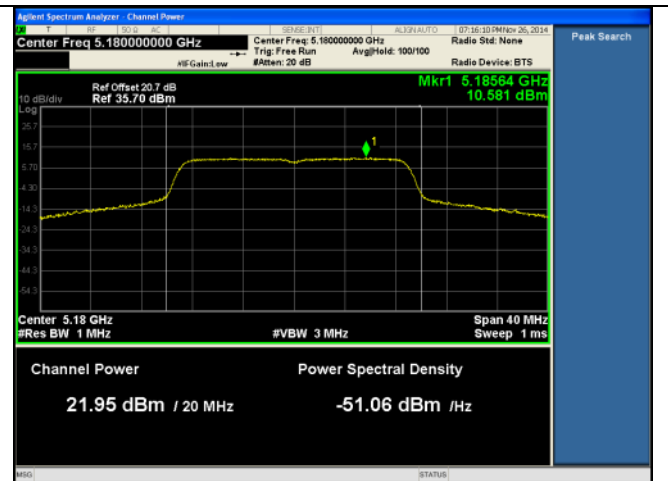
PSD-802.11a-5240M-chain0



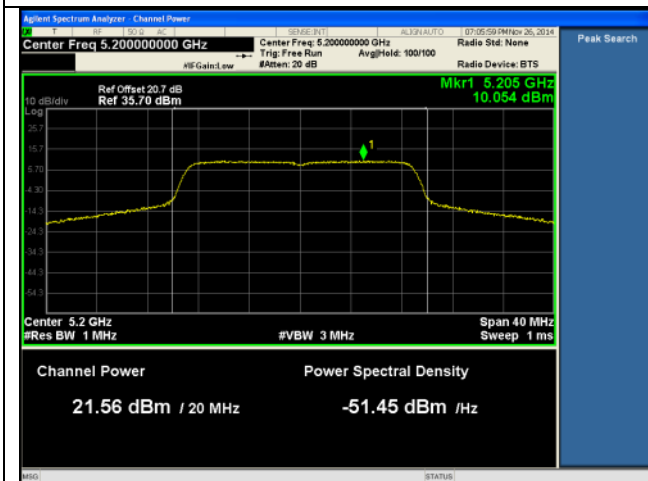
PSD-802.11a-5240M-chain1



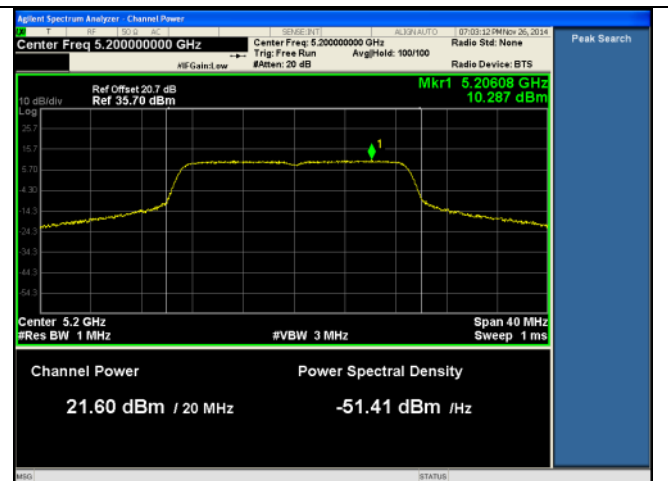
PSD-802.11n-20M-5180M-chain0



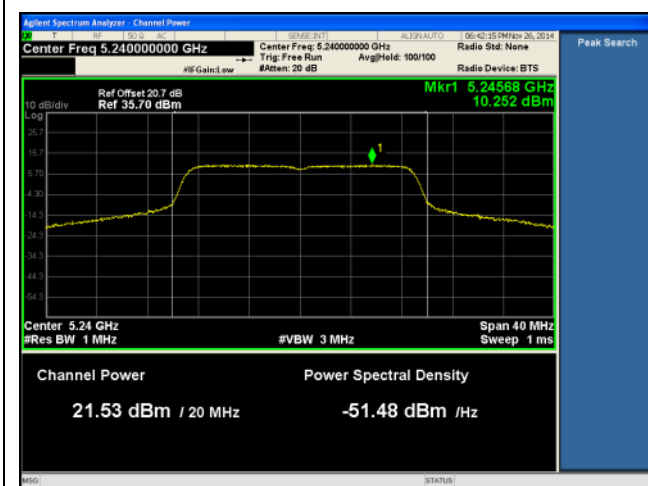
PSD-802.11n-20M-5180M-chain1



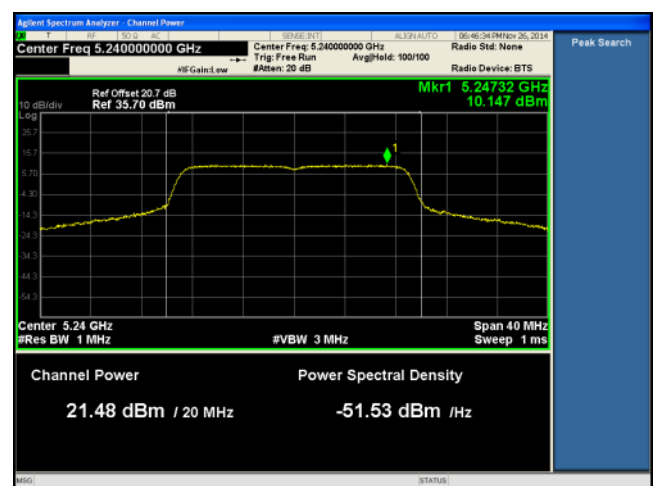
PSD-802.11n-20M-5200M-chain0



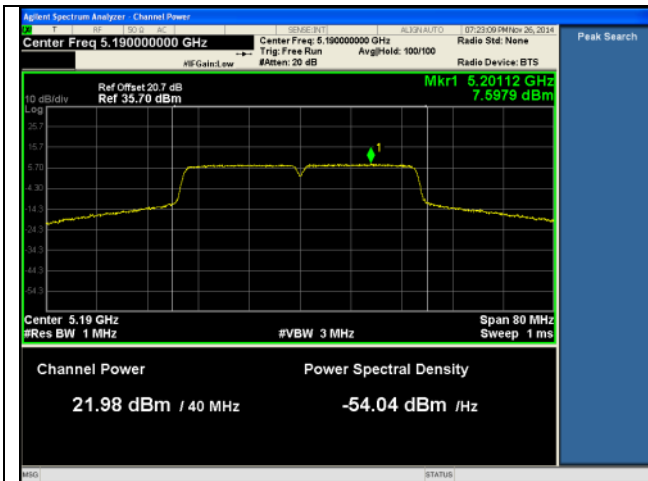
PSD-802.11n-20M-5200M-chain1



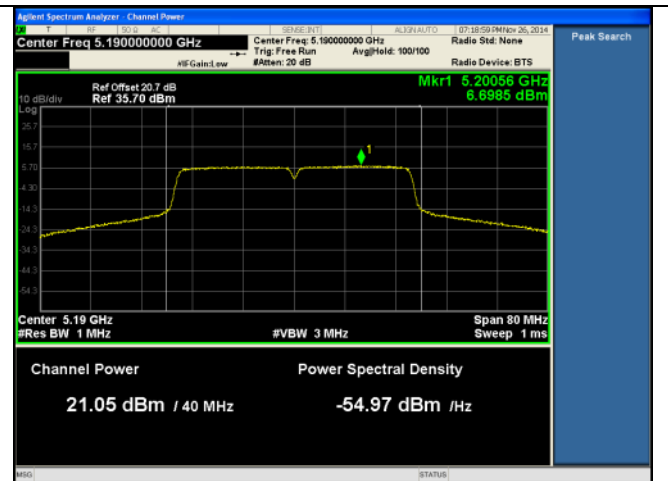
PSD-802.11n-20M-5240M-chain0



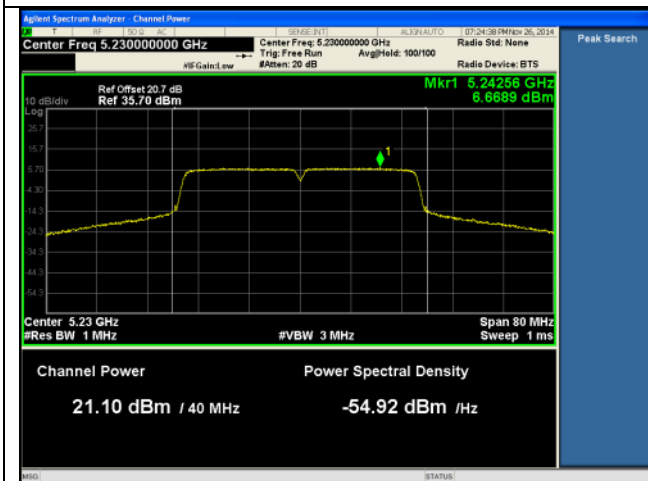
PSD-802.11n-20M-5240M-chain1



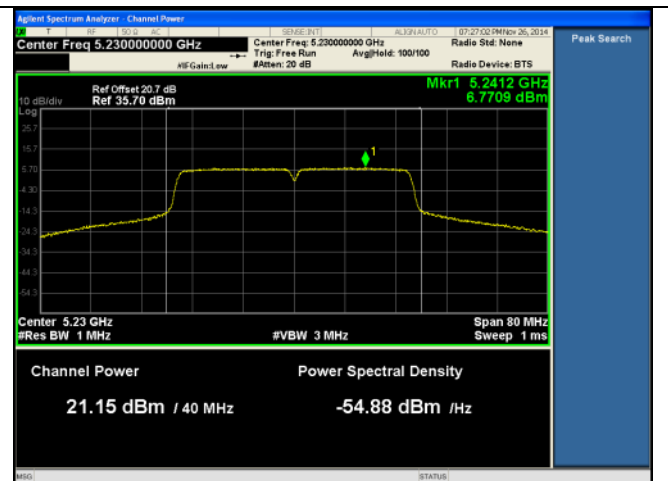
PSD-802.11n-40M-5190M-chain0



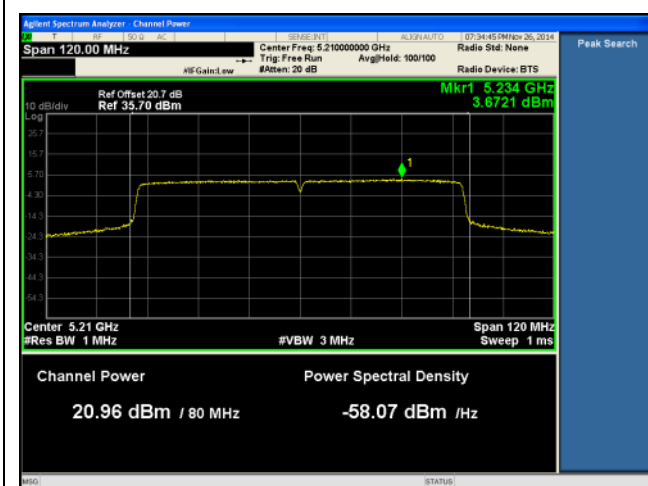
PSD-802.11n-40M-5190M-chain1



PSD-802.11n-40M-5230M-chain0



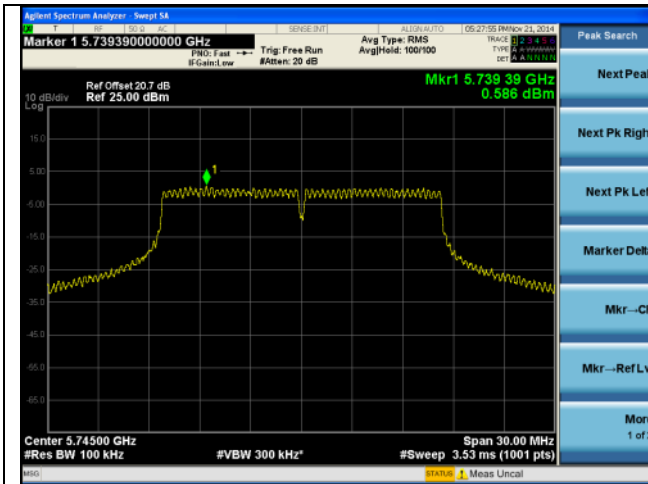
PSD-802.11n-40M-5230M-chain1



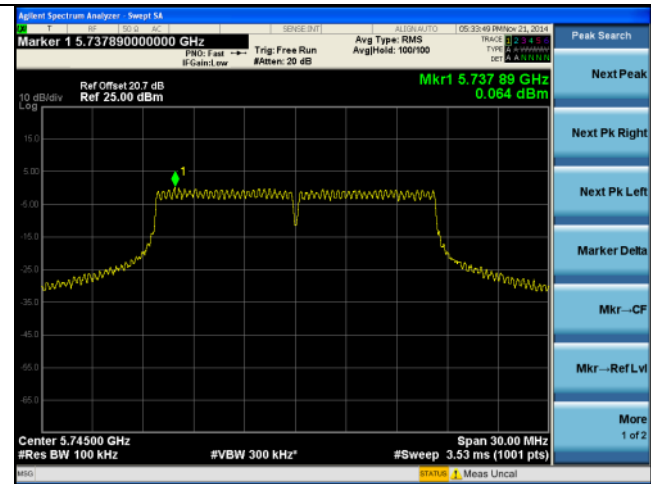
PSD-802.11ac-80M-5210M-chain0



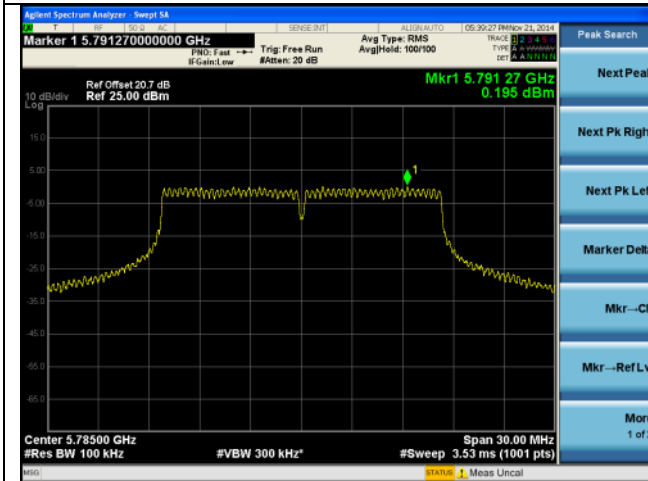
PSD-802.11ac-80M-5210M-chain1



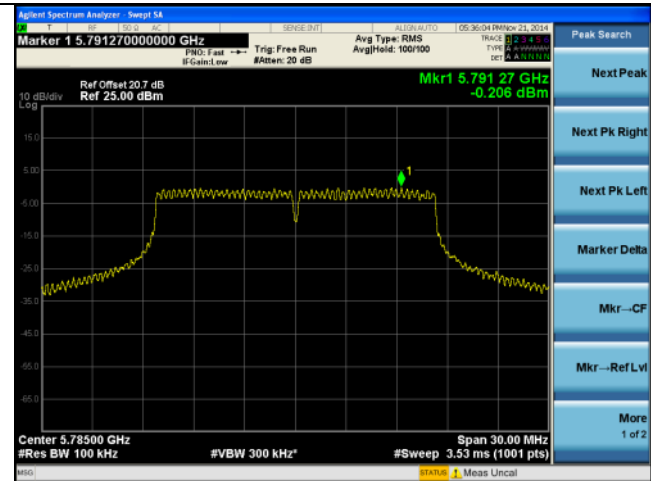
PSD-5.8G-802.11a Low-chain0



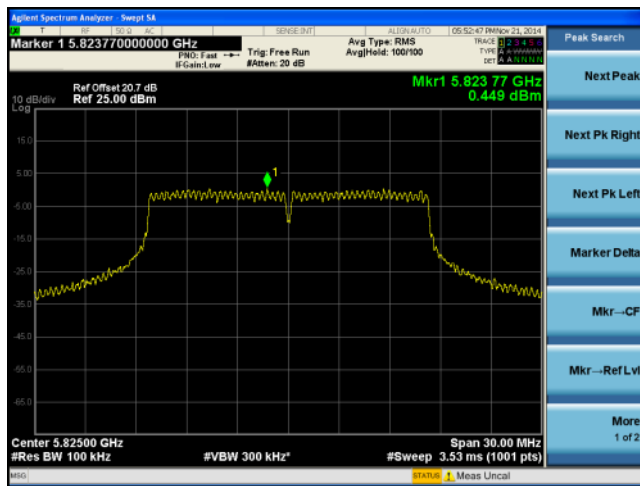
PSD-5.8G-802.11a Low-chain1



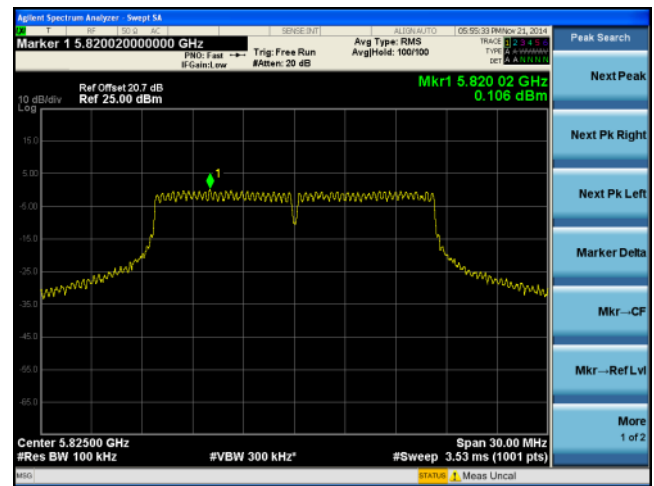
PSD-5.8G-802.11a Mid-chain0



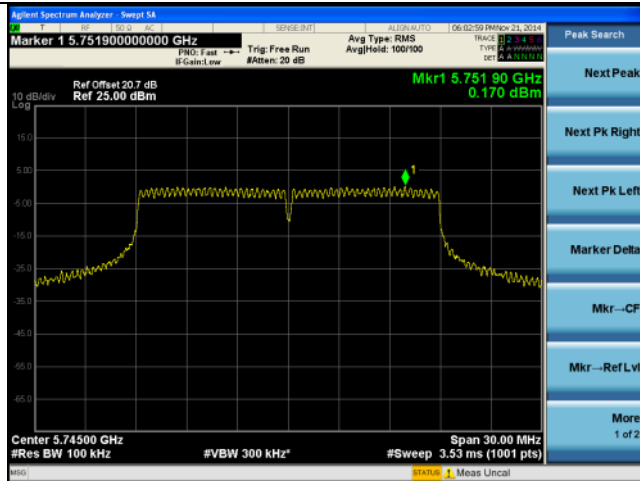
PSD-5.8G-802.11a Mid-chain1



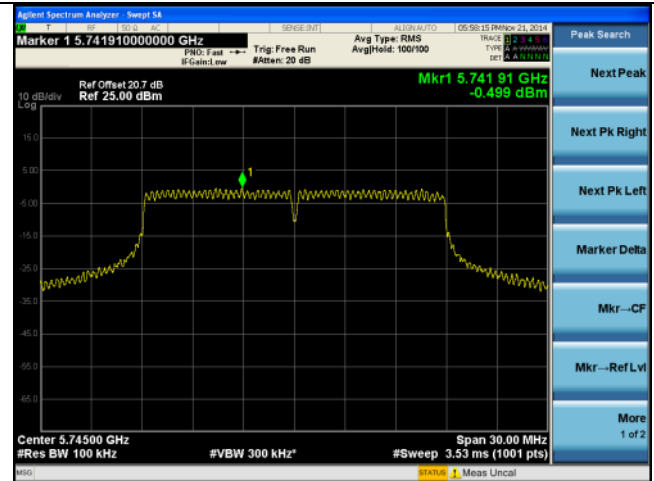
PSD-5.8G-802.11a High-chain0



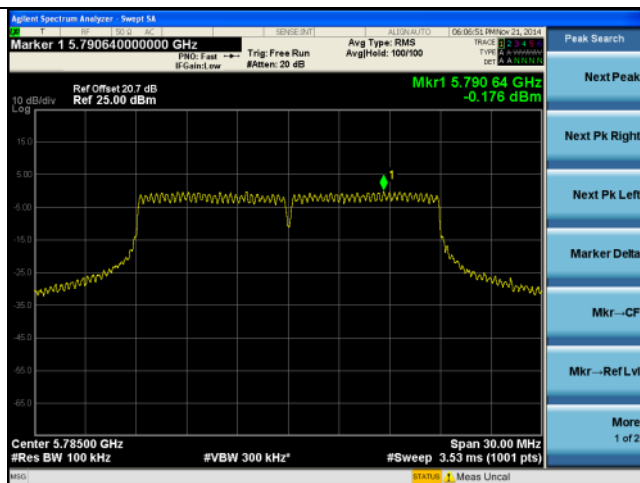
PSD-5.8G-802.11a High-chain1



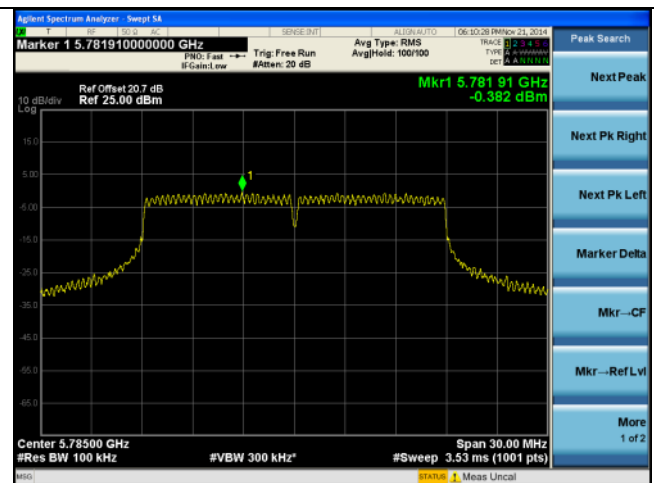
PSD-5.8G-802.11n-20M Low-chain0



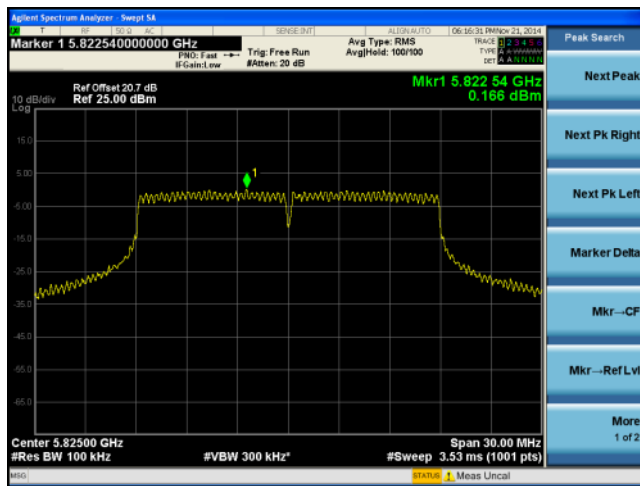
PSD-5.8G-802.11n-20M Low-chain1



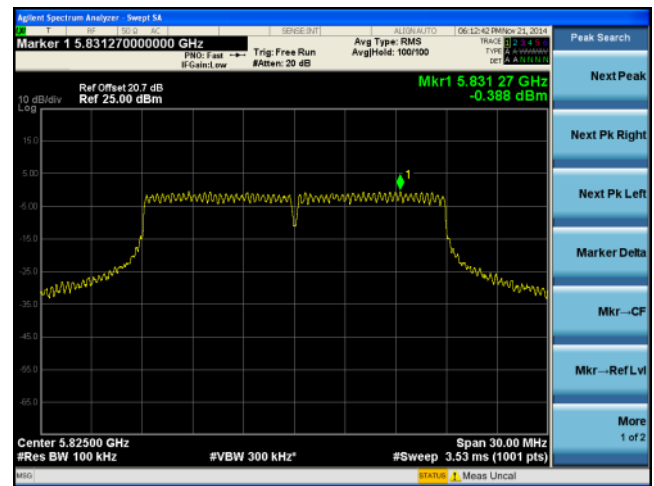
PSD-5.8G-802.11n-20M Mid-chain0



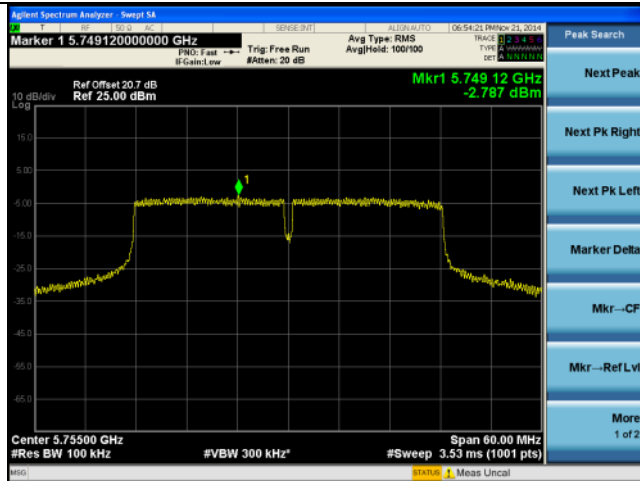
PSD-5.8G-802.11n-20M Mid-chain1



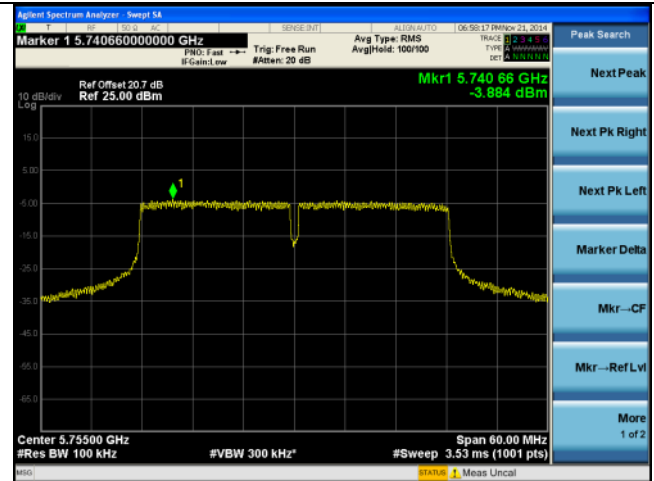
PSD-5.8G-802.11n-20M High-chain0



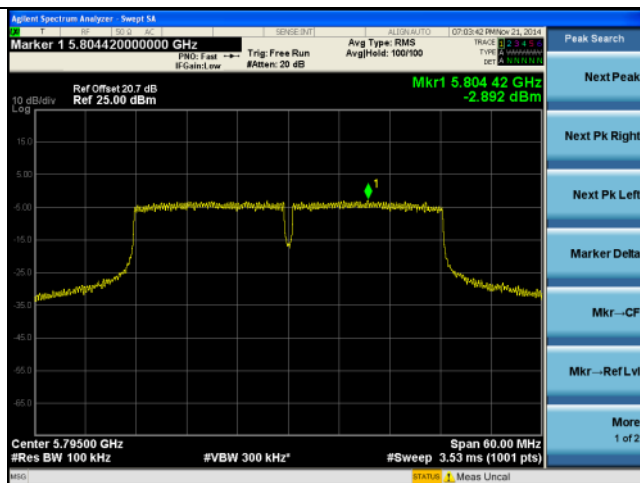
PSD-5.8G-802.11n-20M High-chain1



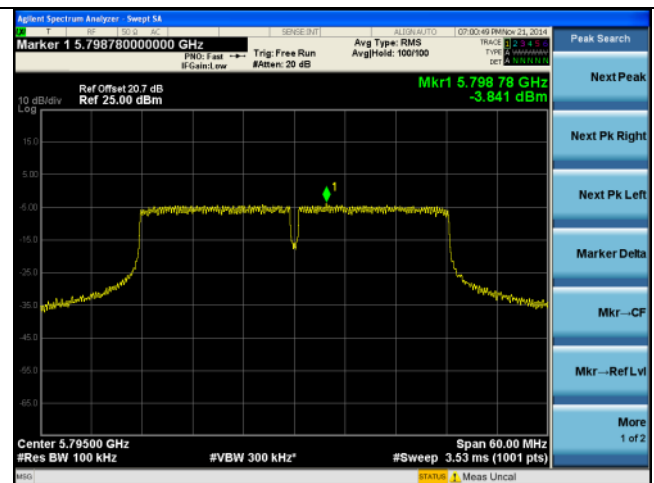
PSD-5.8G-802.11n-40M Low-chain0



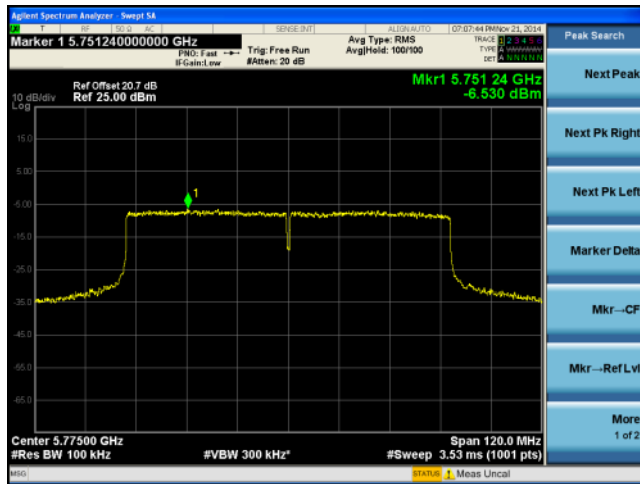
PSD-5.8G-802.11n-40M Low-chain1



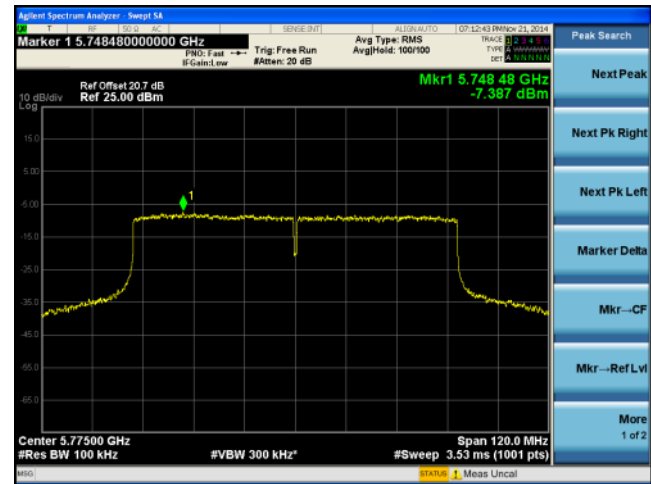
PSD-5.8G-802.11n-40M High-chain0



PSD-5.8G-802.11n-40M High-chain1



PSD-5.8G-802.11ac-80M Mid-chain0



PSD-5.8G-802.11ac-80M Mid-chain1

10.5 Conducted Spurious Emissions

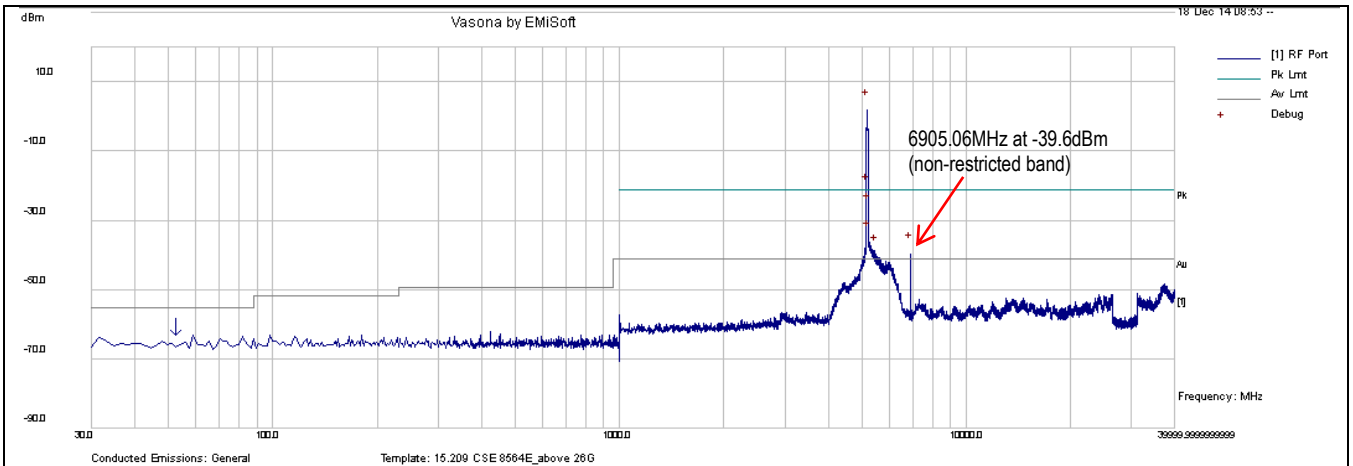
Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§ 15.407(b)(2), 15.407(b)(6)	(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 EIRP of -27 dBm/MHz.	☒
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☐
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☐
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☒
	-	Restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure	The unwanted emission limits in both the restricted and non-restricted bands are based on radiated measurements; however, as an alternative, antenna-port conducted measurements in conjunction with cabinet emissions tests will be permitted to demonstrate compliance provided that the following steps are performed: (i) Cabinet emissions measurements. A radiated test shall be performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna may be replaced by a termination matching the nominal impedance of the antenna. (ii) Impedance matching. Conducted tests shall be performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT. (iii) EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.		
Remark	Per KDB 662911 D01 Multiple Transmitter Output v02r01, c), the measurement trace result on each plot has been added with 10 log(NANT) dB, where NANT is the number of outputs, to account for the summing of power due to MIMO mode.		
Result	☒ Pass ☐ Fail		

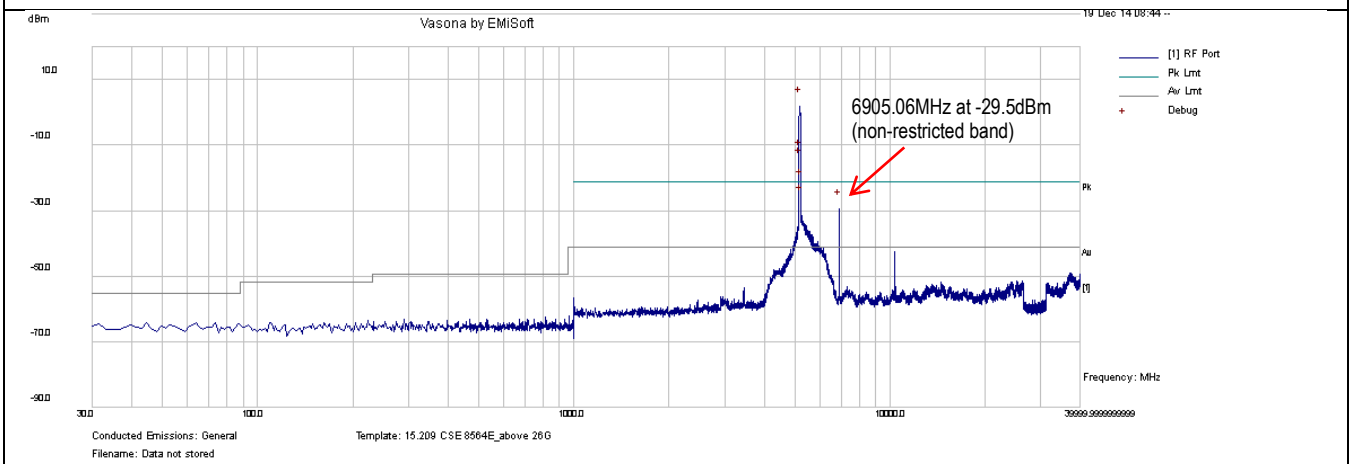
Test Data ☐ Yes (See below) ☒ N/A

Test Plot ☒ Yes (See below) ☐ N/A

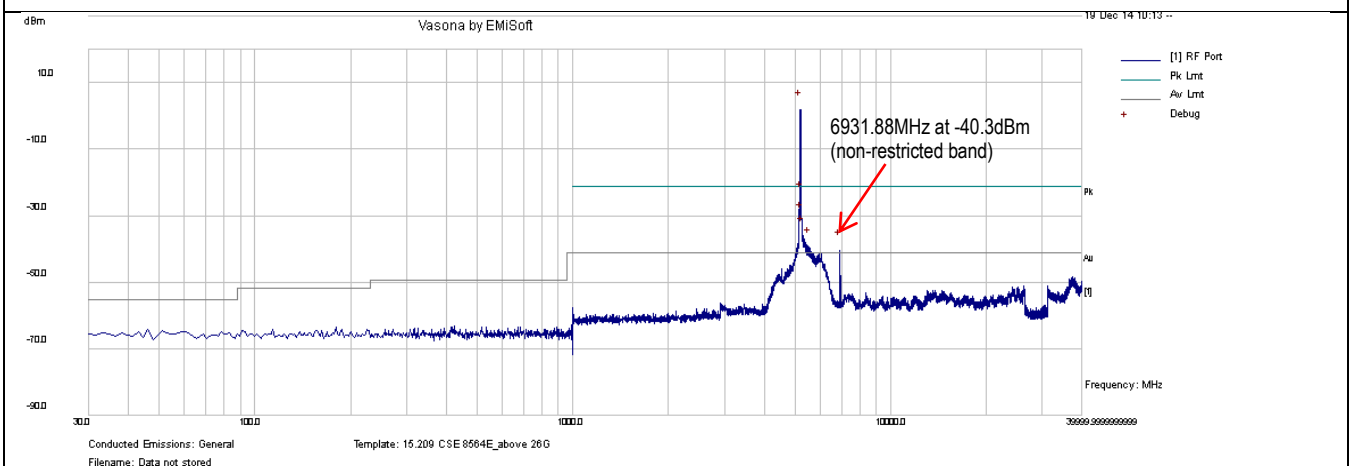
Conducted Spurious Emissions Plots:



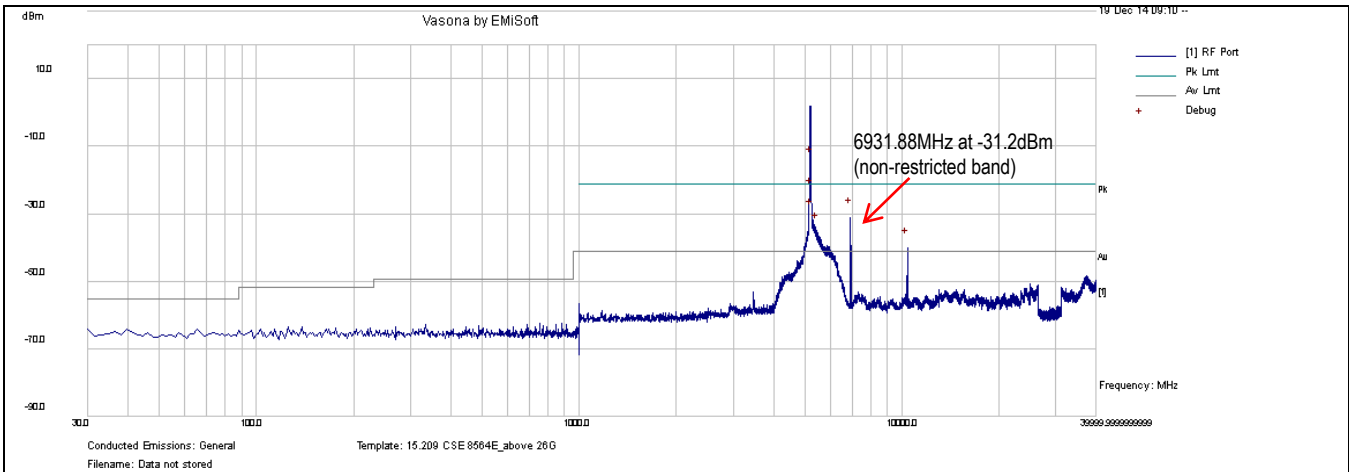
CSE-802.11a 5180MHz-chain0



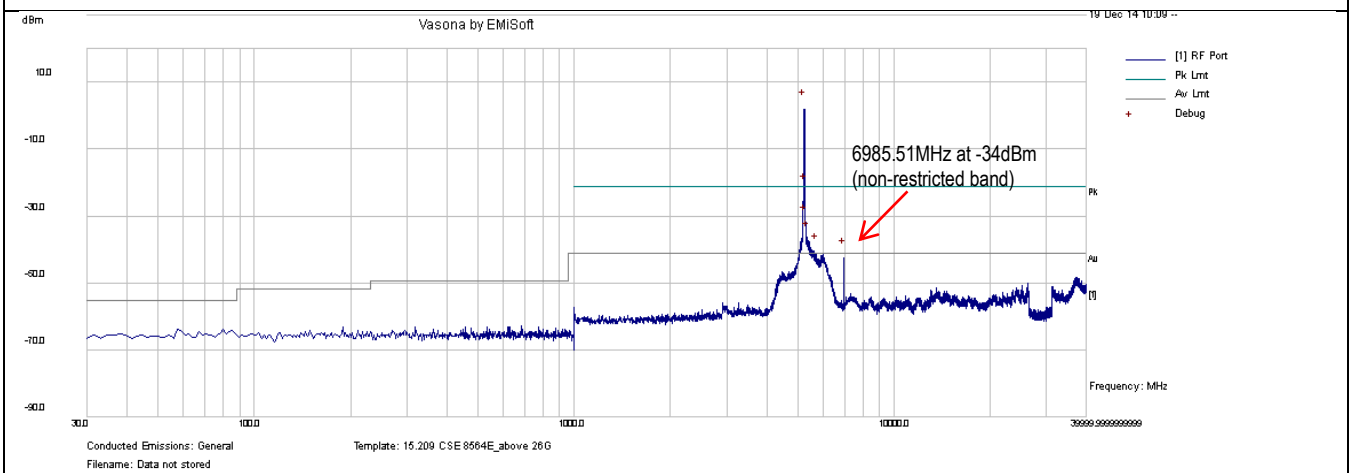
CSE-802.11a 5180MHz-chain1



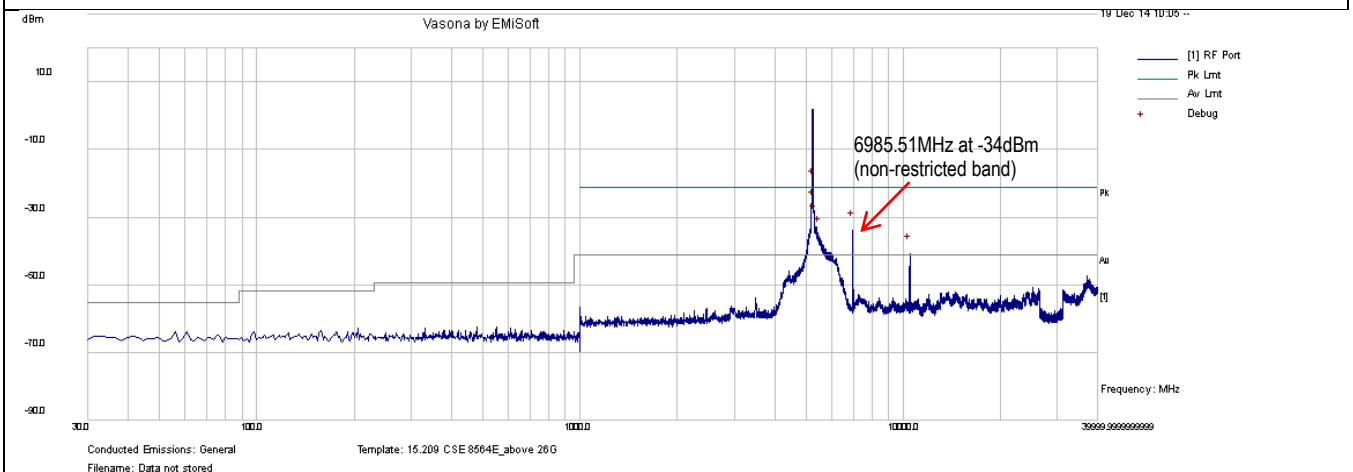
CSE-802.11a 5200MHz-chain0



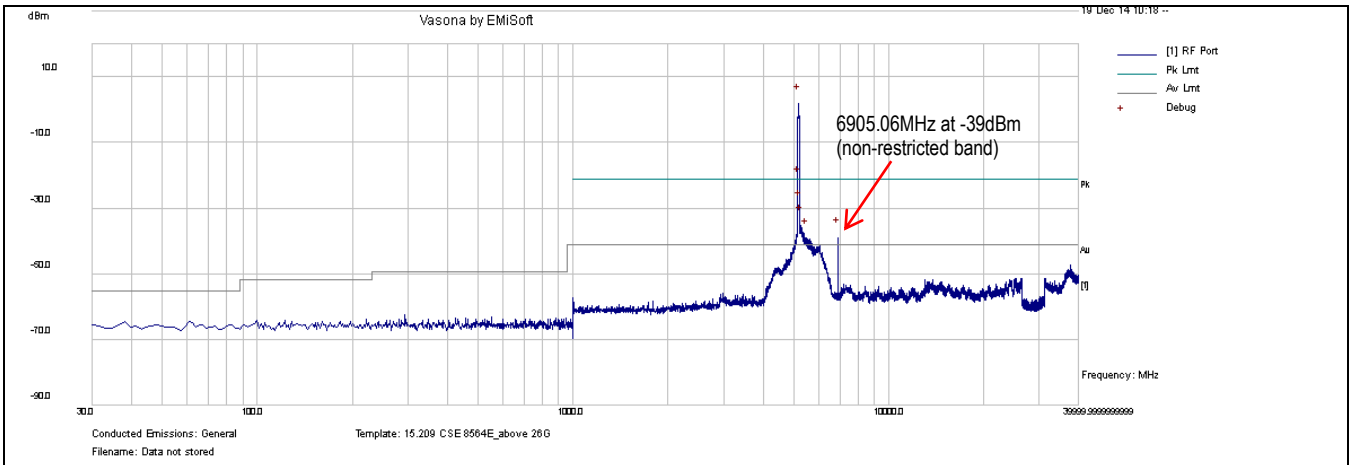
CSE-802.11a 5200MHz-chain1



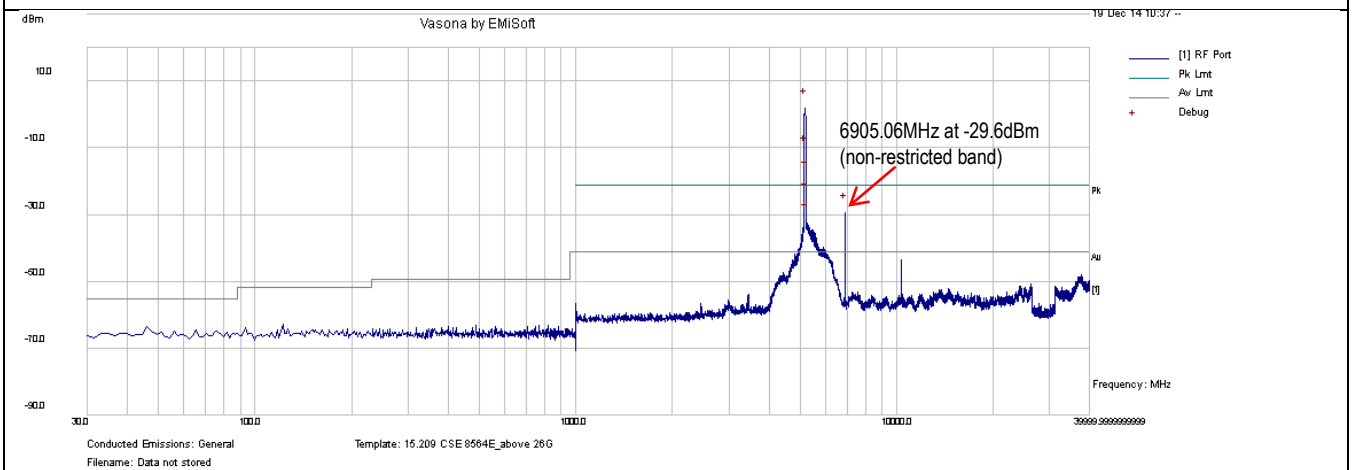
CSE-802.11a 5240MHz-chain0



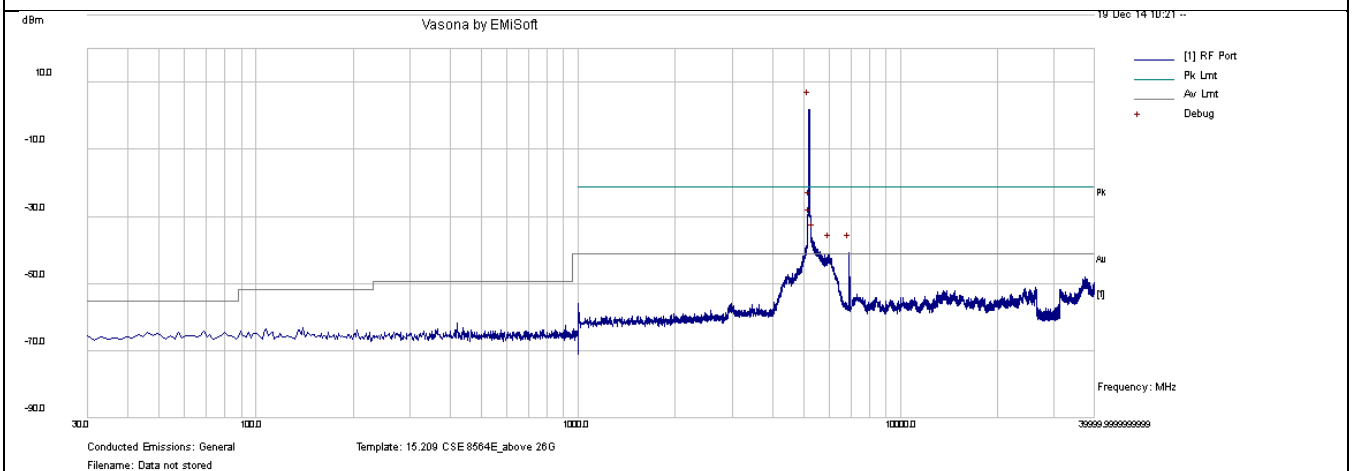
CSE-802.11a 5240MHz-chain1



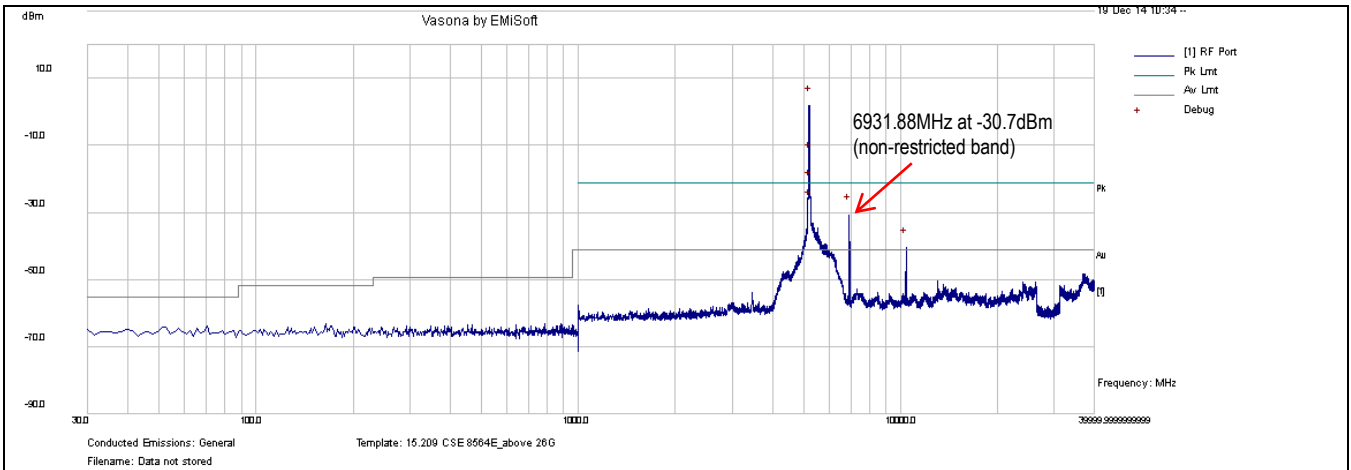
CSE-802.11n-20M 5180MHz-chain0



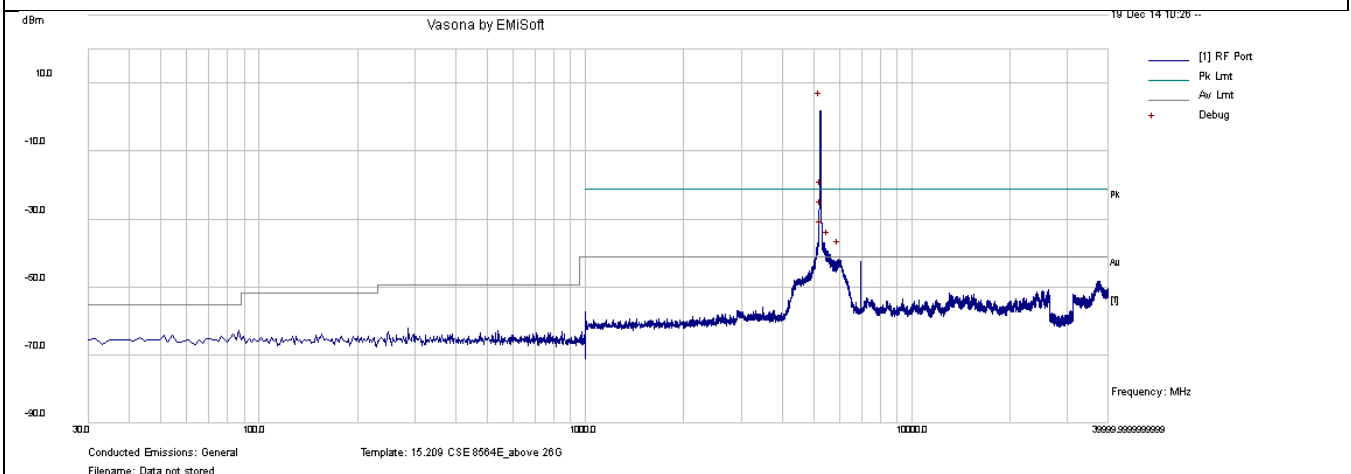
CSE-802.11n-20M 5180MHz-chain1



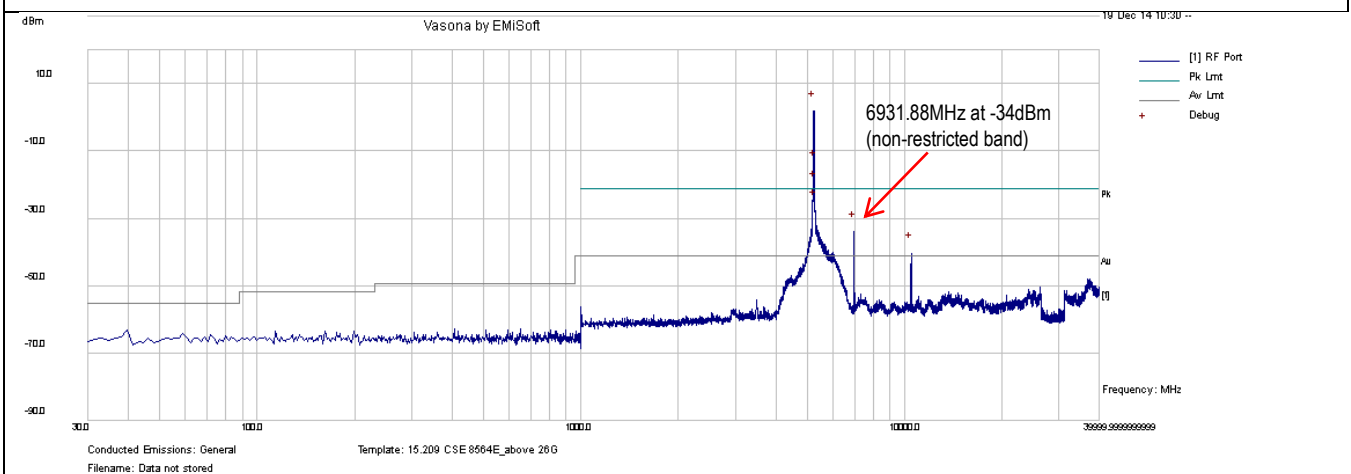
CSE-802.11n-20M 5200MHz-chain0



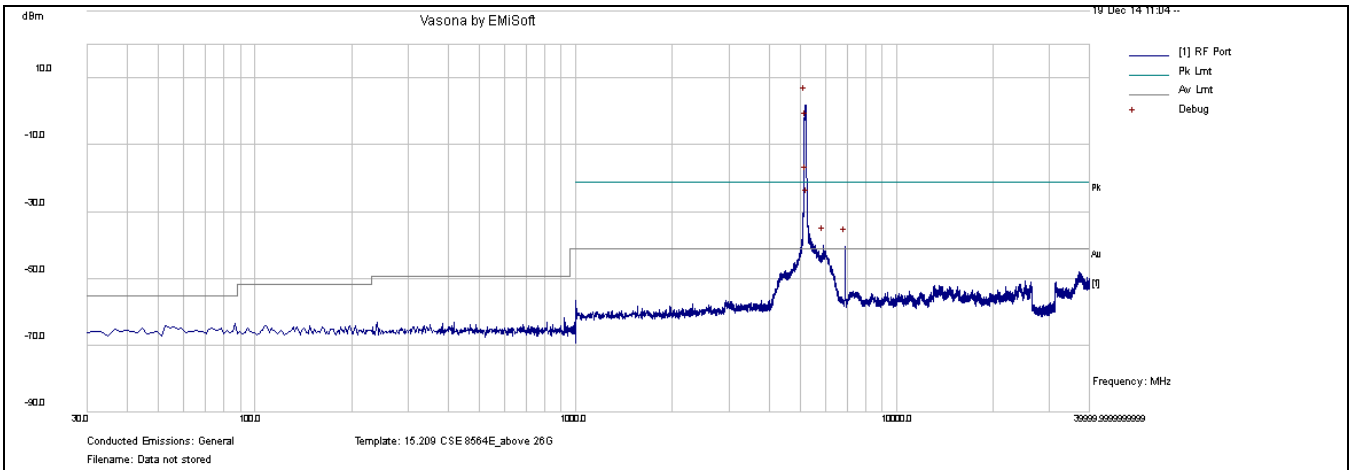
CSE-802.11n-20M 5200MHz-chain1



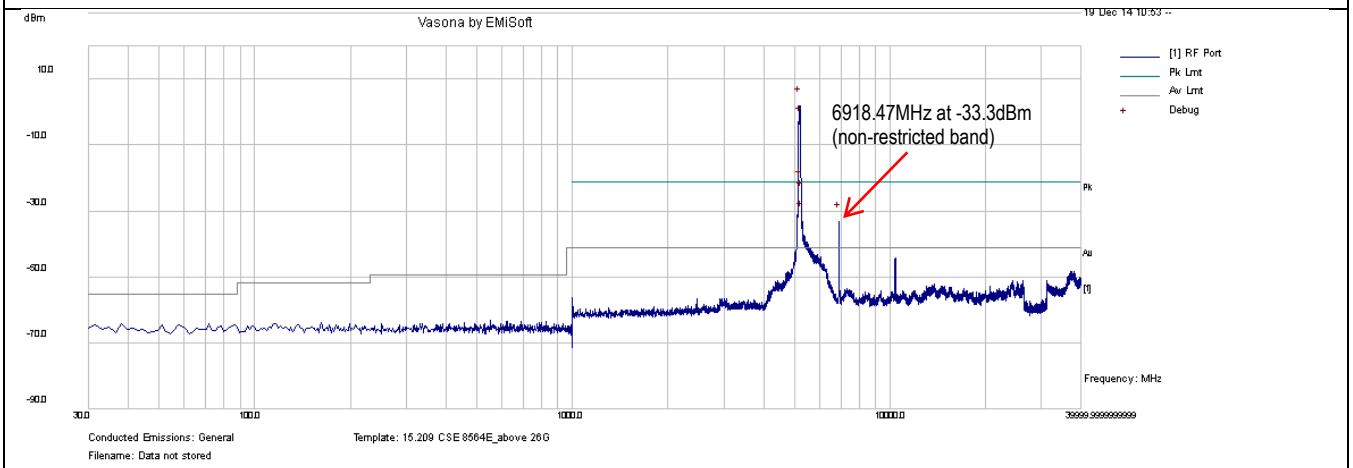
CSE-802.11n-20M 5240MHz-chain0



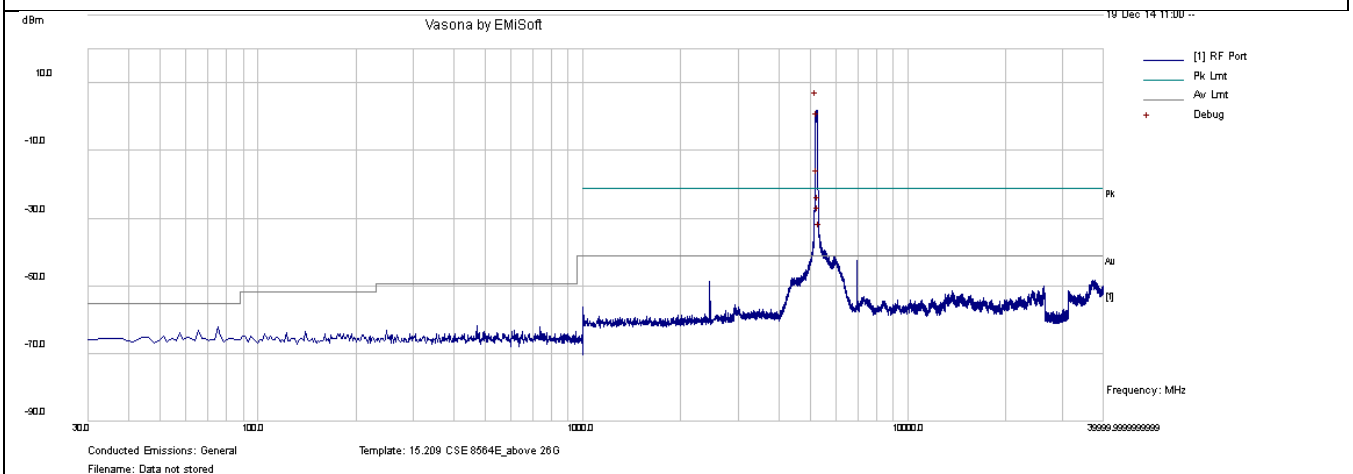
CSE-802.11n-20M 5240MHz-chain1



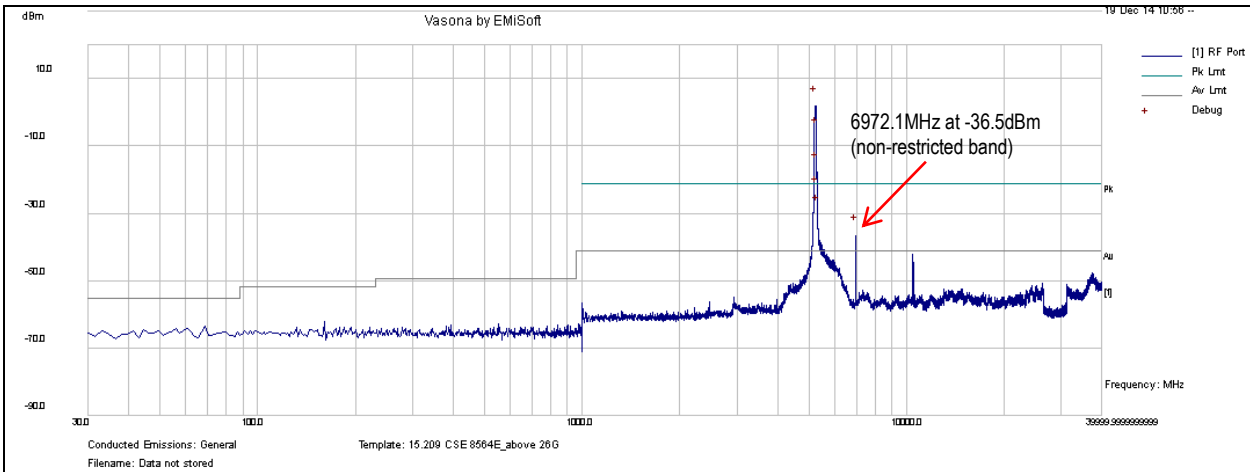
CSE-802.11n-40M 5190MHz-chain0



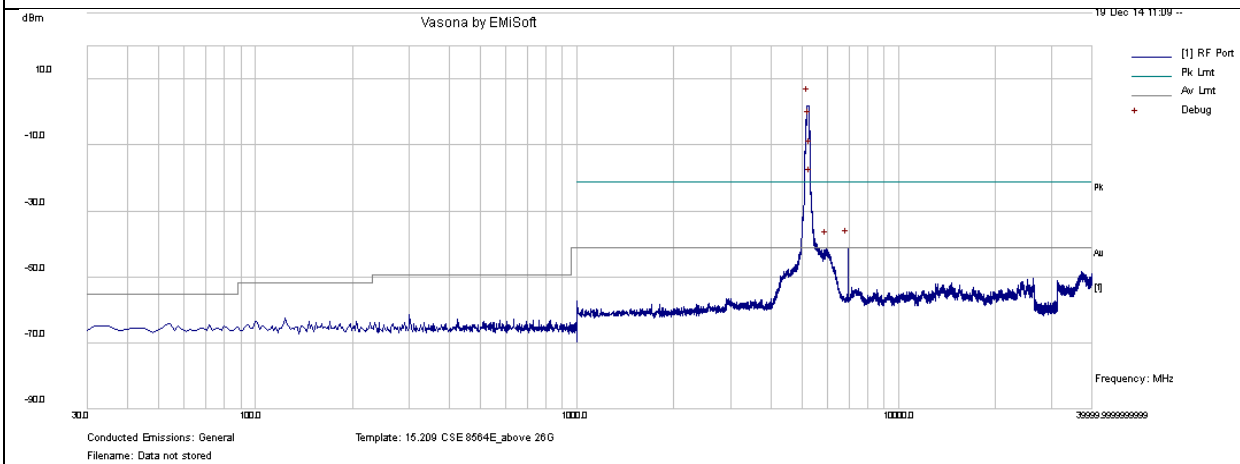
CSE-802.11n-40M 5190MHz-chain1



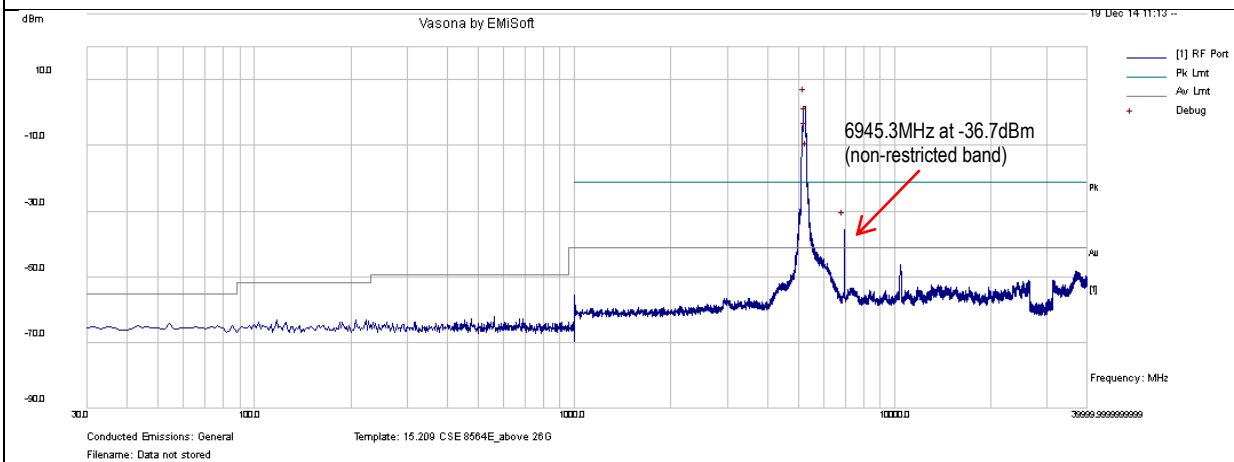
CSE-802.11n-40M 5230MHz-chain0



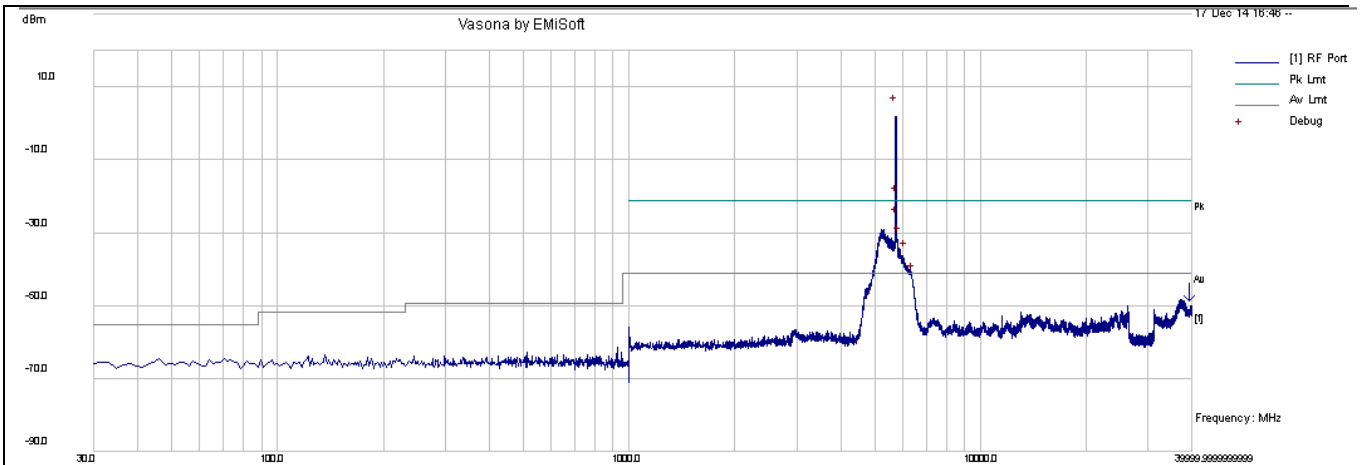
CSE-802.11n-40M 5230MHz-chain1



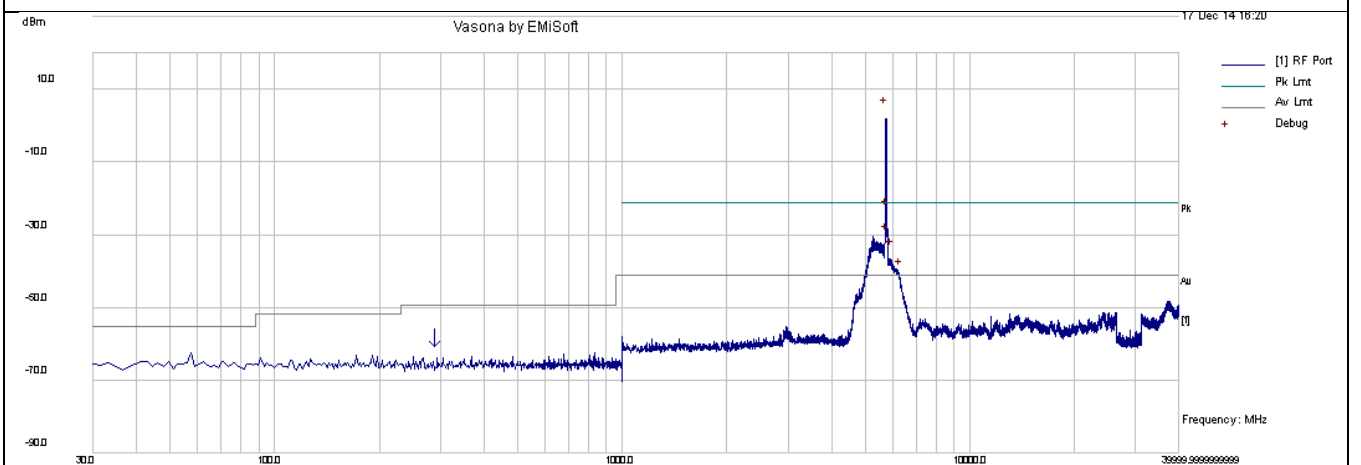
CSE-802.11ac-80M 5210MHz-chain0



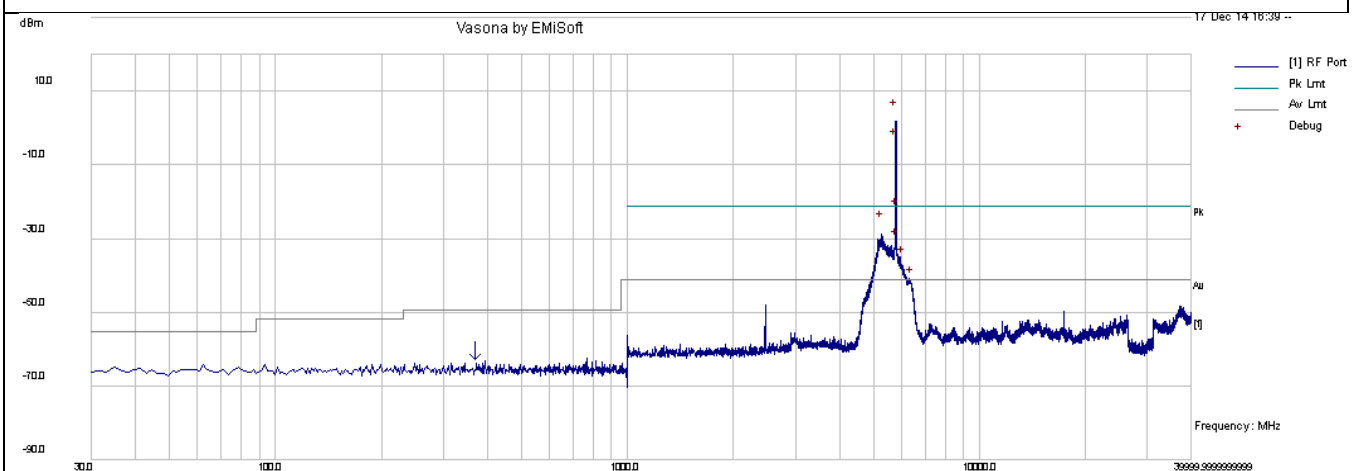
CSE-802.11ac-80M 5210MHz-chain1



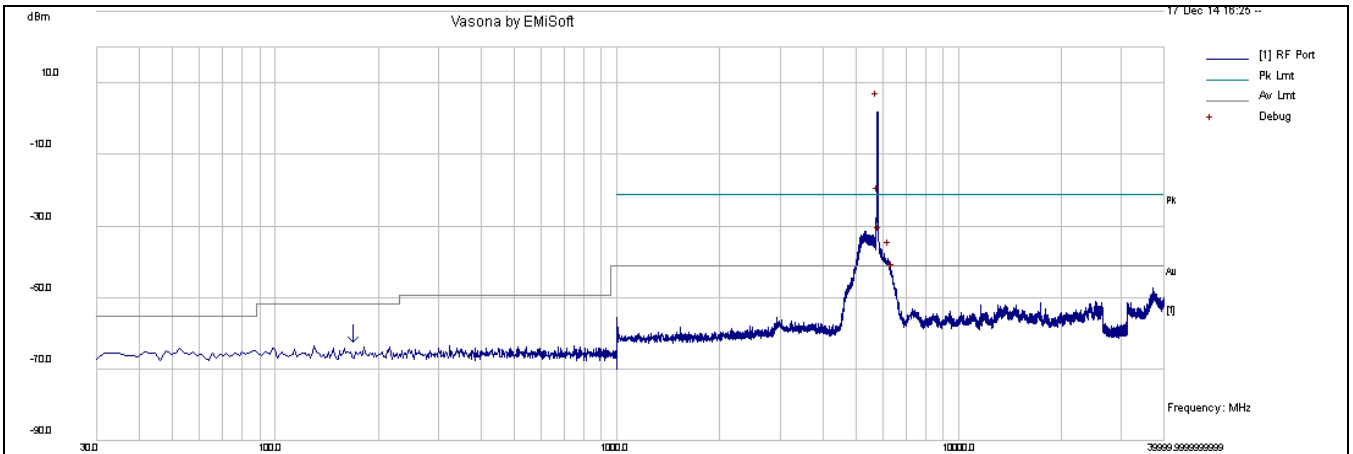
CSE-802.11a 5745MHz-chain0



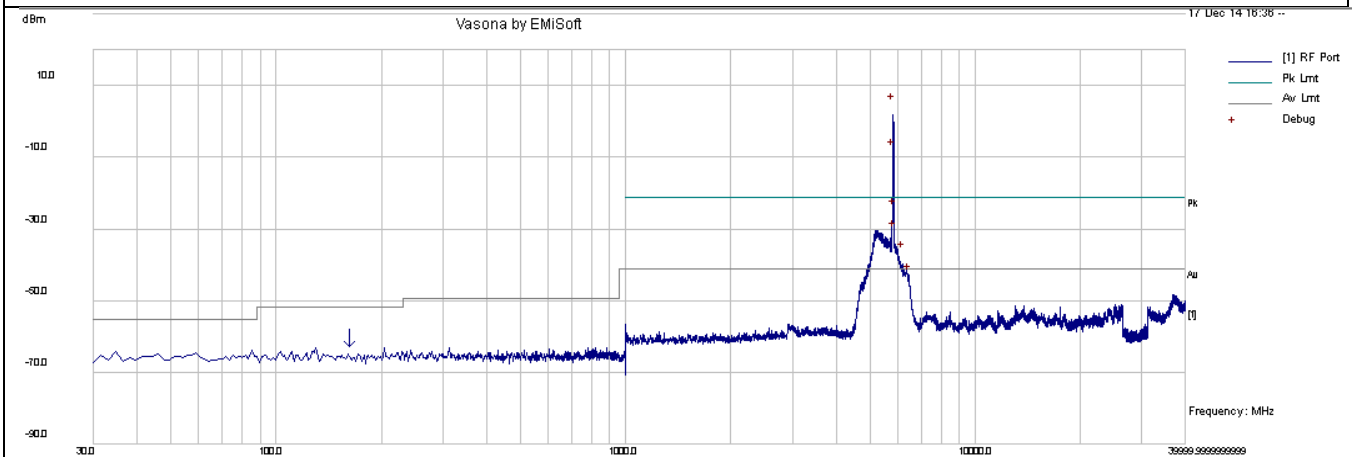
CSE-802.11a 5745MHz-chain1



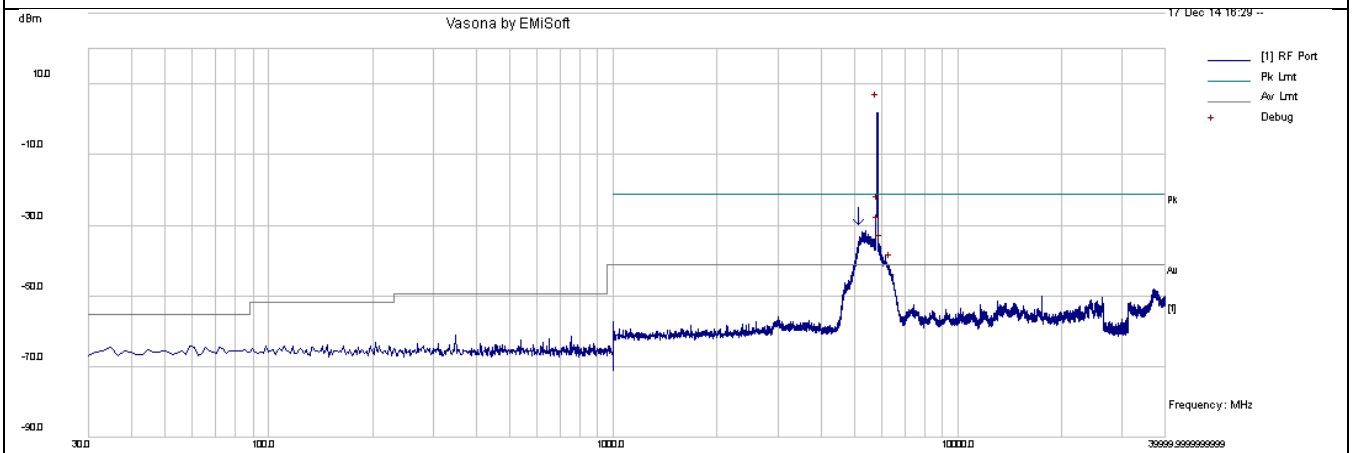
CSE-802.11a 5785MHz-chain0



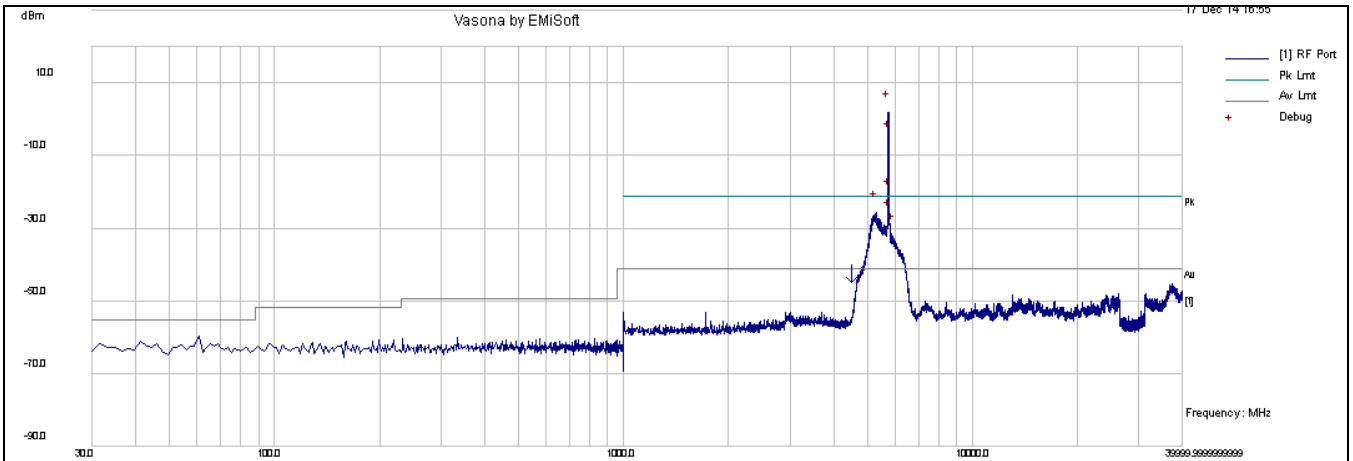
CSE-802.11a 5785MHz-chain1



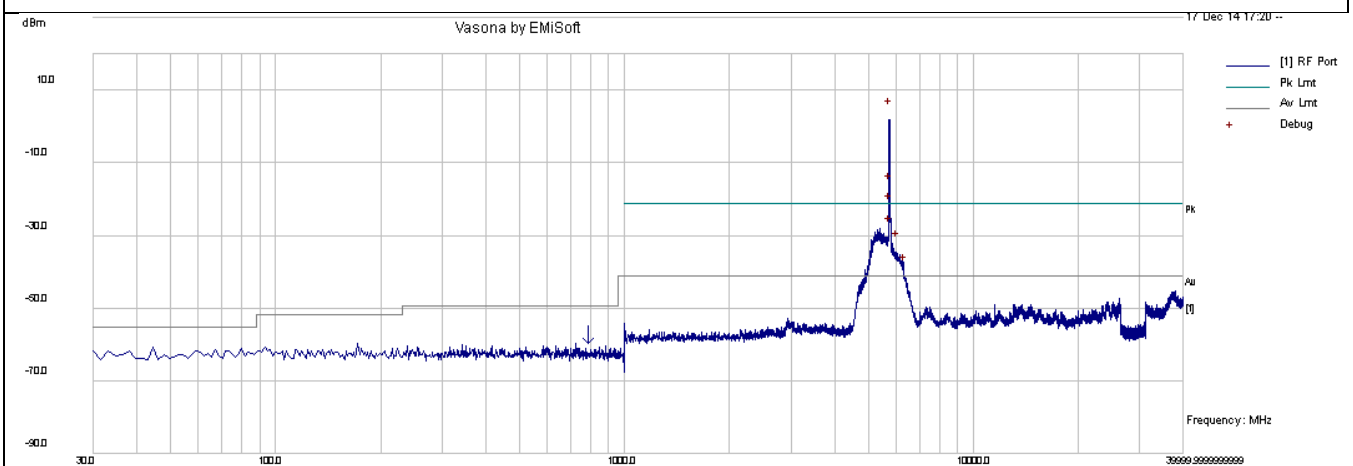
CSE-802.11a 5825MHz-chain0



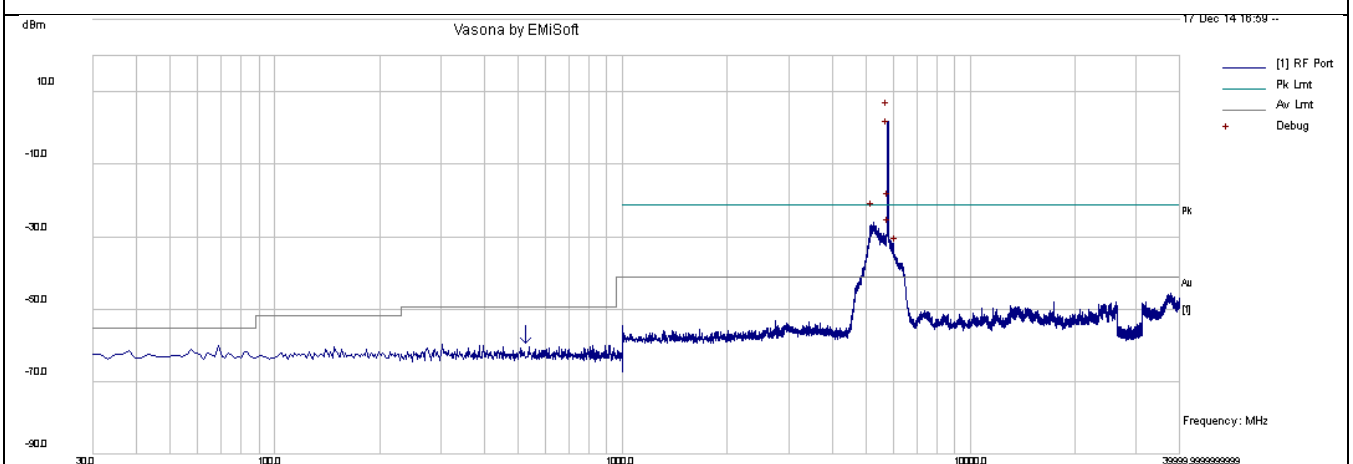
CSE-802.11a 5825MHz-chain1



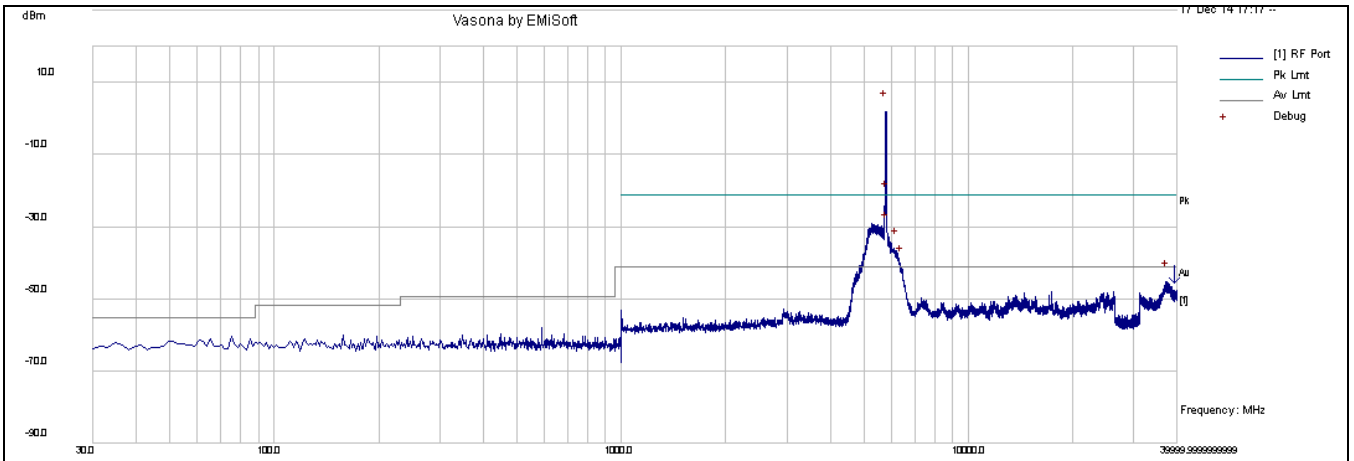
CSE-802.11n-20M 5745MHz-chain0



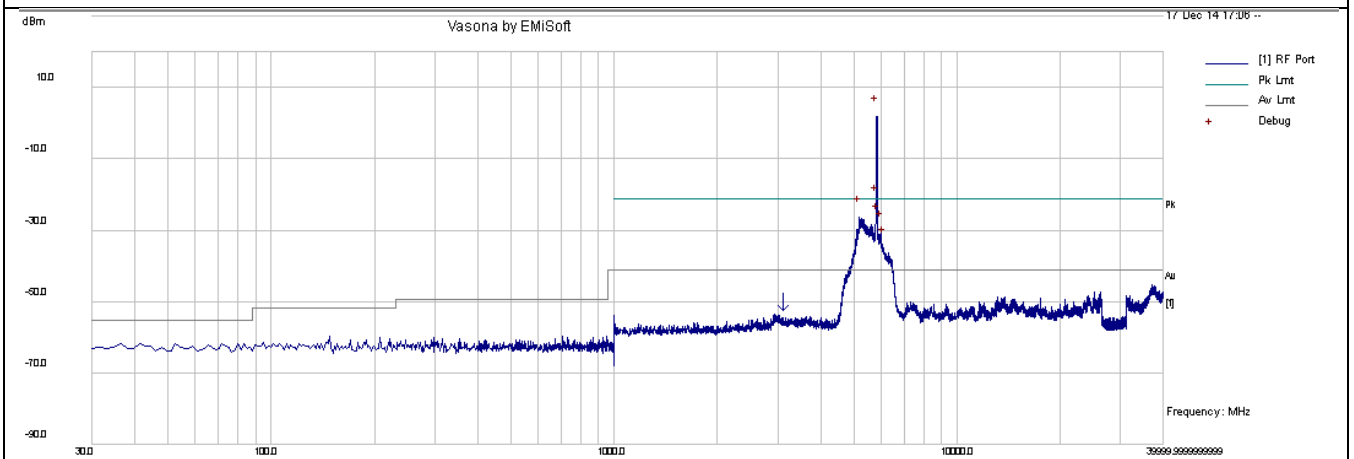
CSE-802.11n-20M 5745MHz-chain1



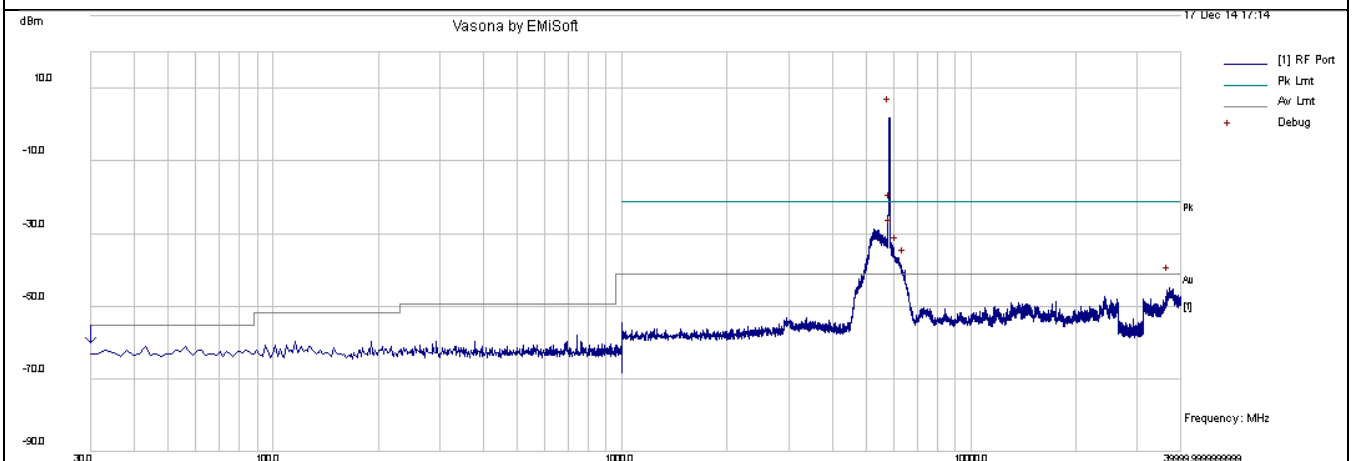
CSE-802.11n-20M 5785MHz-chain0



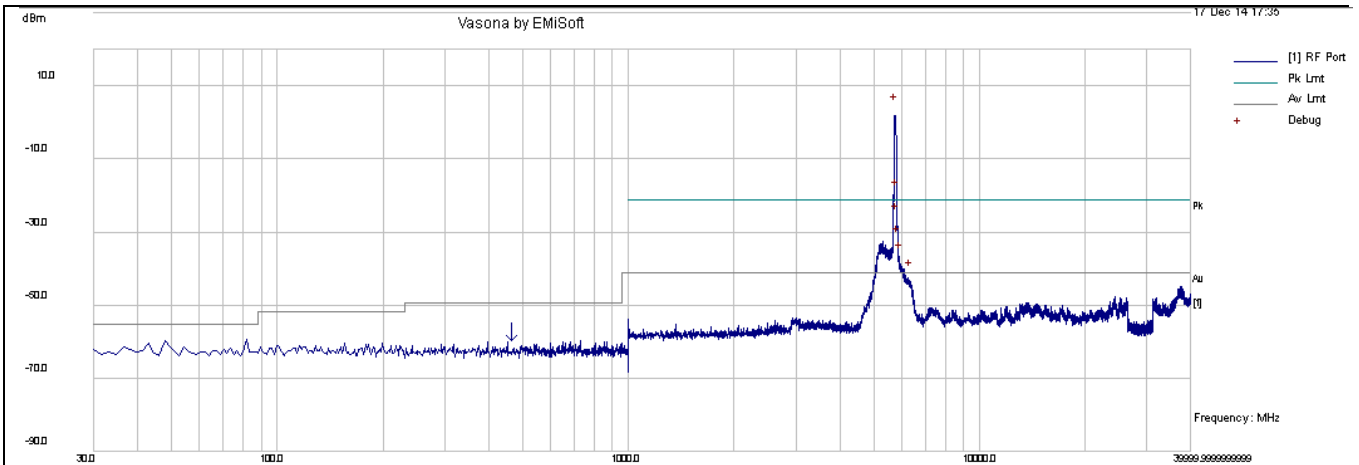
CSE-802.11n-20M 5785MHz-chain1



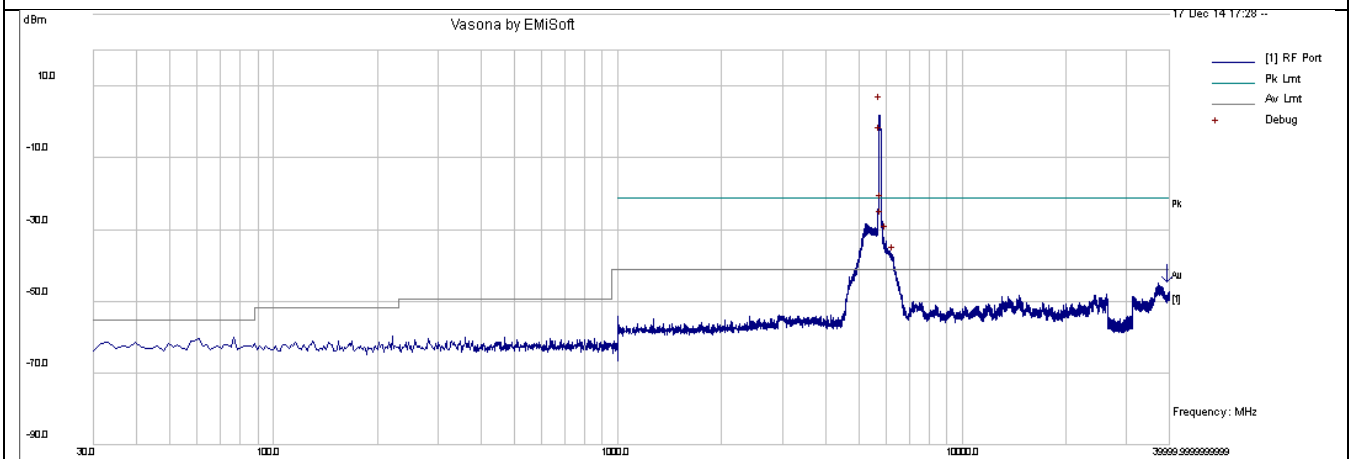
CSE-802.11n-20M 5825MHz-chain0



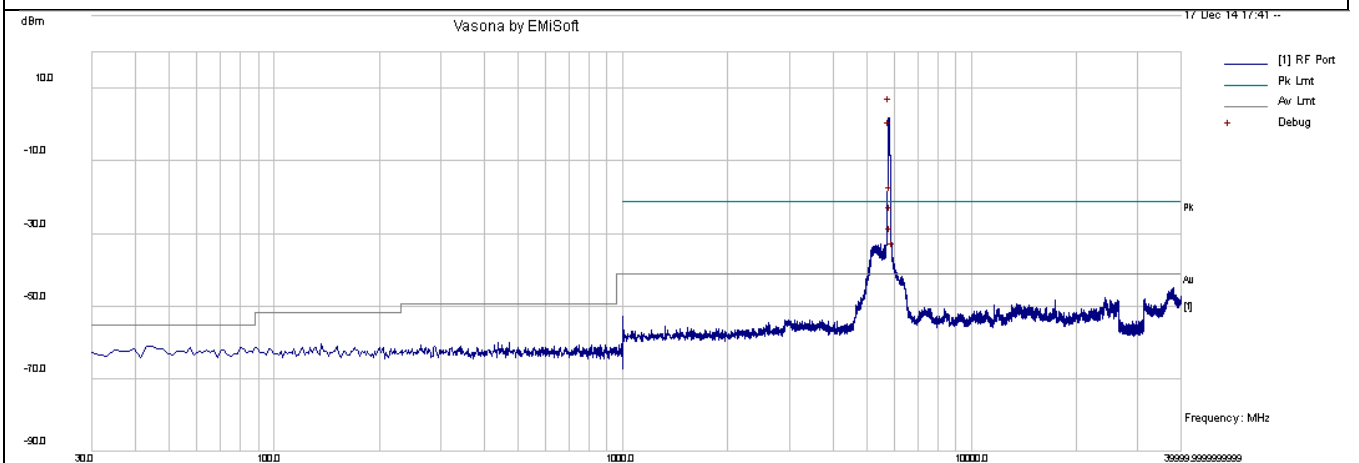
CSE-802.11n-20M 5825MHz-chain1



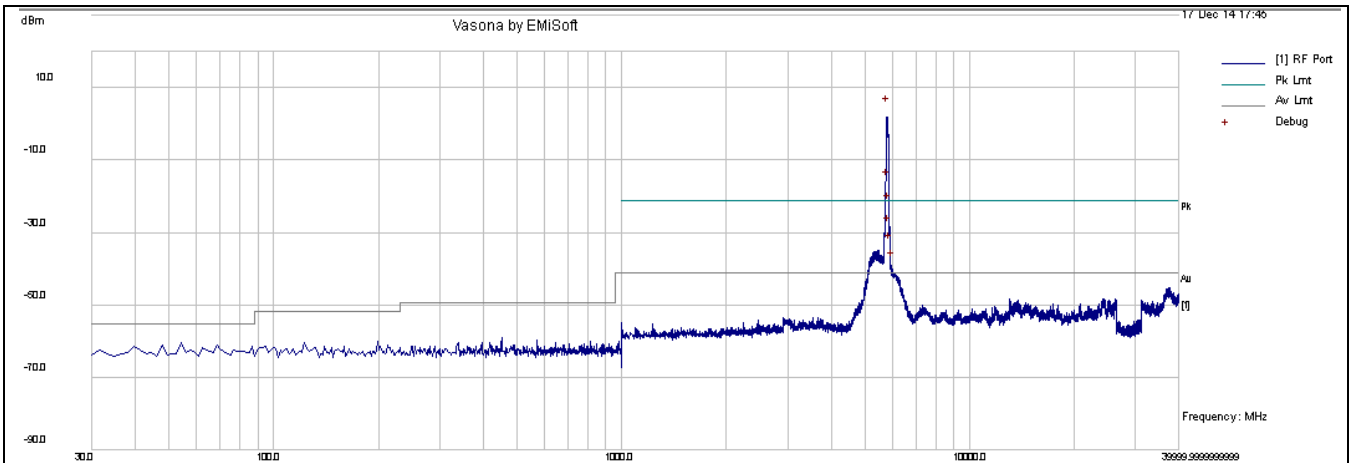
CSE-802.11n-40M 5755MHz-chain0



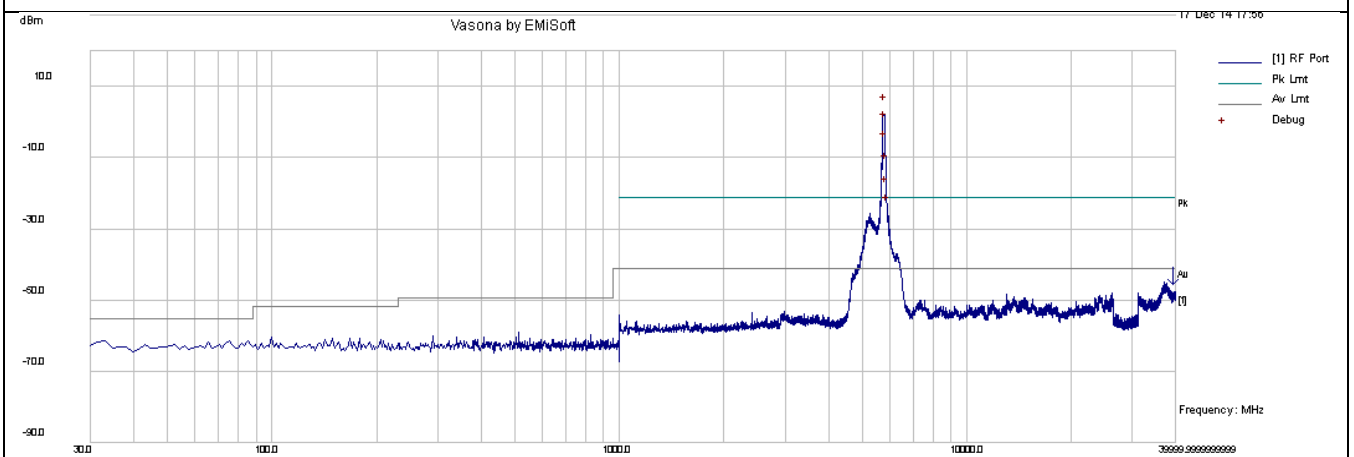
CSE-802.11n-40M 5755MHz-chain1



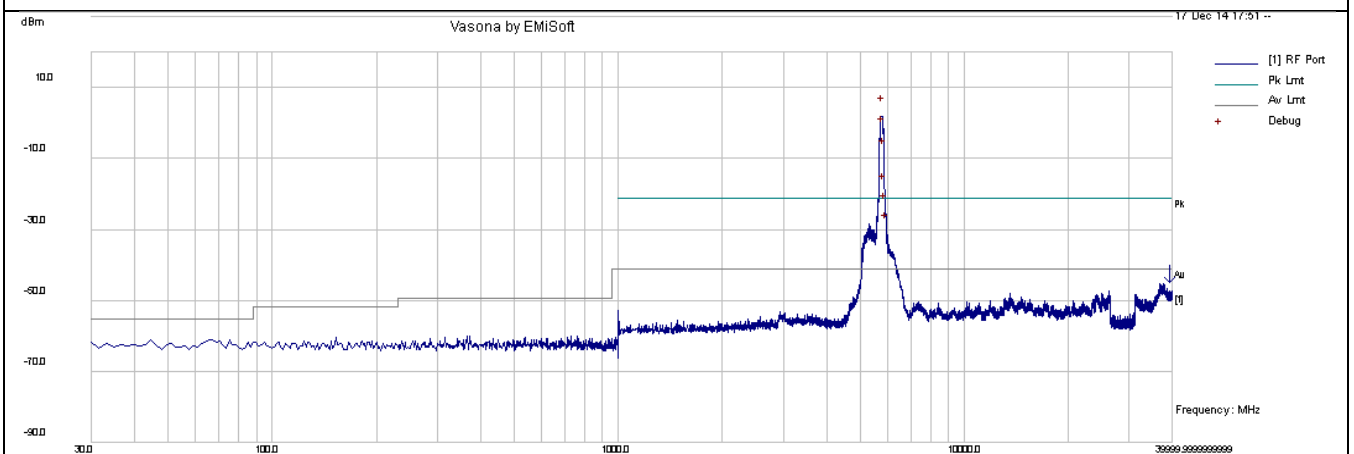
CSE-802.11n-40M 5795MHz-chain0



CSE-802.11n-40M 5795MHz-chain1



CSE-802.11ac-80M 5775-chain0



CSE-802.11ac-80M 5775-chain1

10.6 Radiated Emissions below 1GHz

Requirement(s):

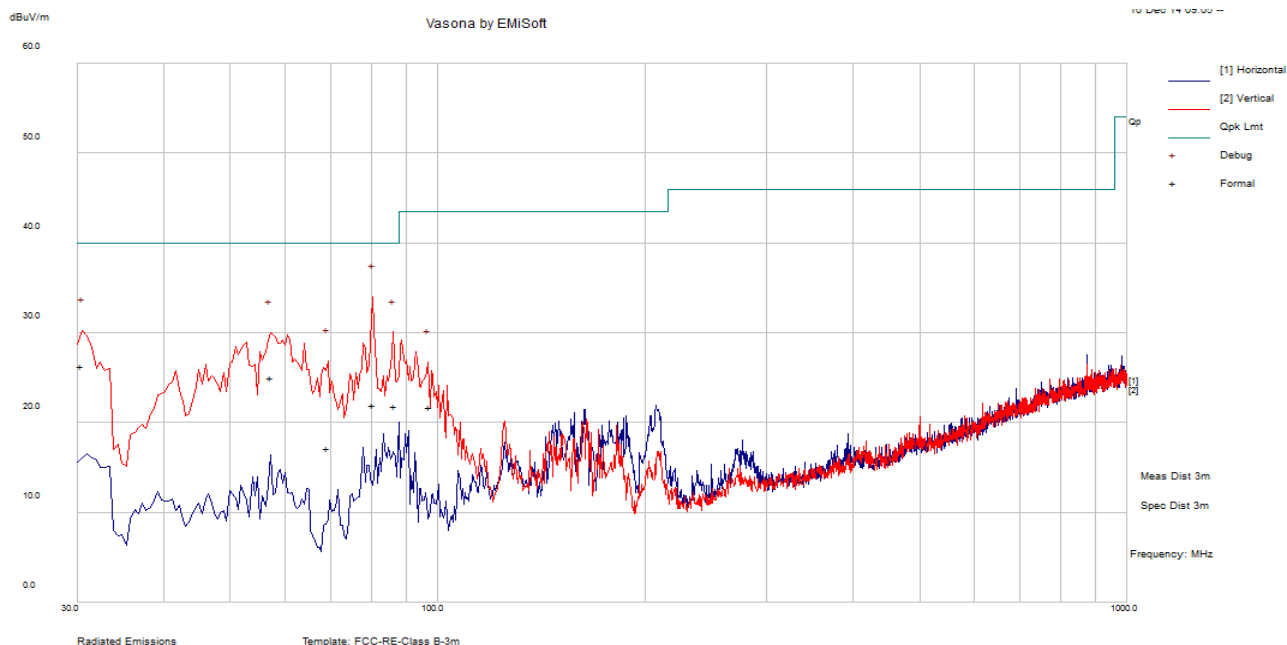
Spec	Requirement	Applicable										
47CFR§ 15.407(b) 15.209 (a)	Except higher limit as specified elsewhere in other section, the emissions from the low-power radio-frequency devices shall not exceed the field strength levels specified in the following table and the level of any unwanted emissions shall not exceed the level of the fundamental emission. The tighter limit applies at the band edges <table><tr><th>Frequency range (MHz)</th><th>Field Strength (uV/m)</th></tr><tr><td>30 – 88</td><td>100</td></tr><tr><td>88 – 216</td><td>150</td></tr><tr><td>216 960</td><td>200</td></tr><tr><td>Above 960</td><td>500</td></tr></table>	Frequency range (MHz)	Field Strength (uV/m)	30 – 88	100	88 – 216	150	216 960	200	Above 960	500	☒
Frequency range (MHz)	Field Strength (uV/m)											
30 – 88	100											
88 – 216	150											
216 960	200											
Above 960	500											
Test Setup	The diagram illustrates the test setup on a ground plane. On the left, 'EUT & Support Units' are placed on a 'Turn Table' at a height of '80cm'. A horizontal distance of '3m' separates the turn table from the 'Ant. Tower' on the right. The antenna is mounted on a '1-4m Variable' height structure. A 'Test Receiver' is connected to the antenna via a cable. The entire setup sits on a 'Ground Plane'.											
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: a. Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. b. The EUT was then rotated to the direction that gave the maximum emission. c. Finally, the antenna height was adjusted to the height that gave the maximum emission. 3. A Quasi-peak measurement was then made for that frequency point. 4. Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.											
Remark	The EUT was scanned up to 1GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.											
Result	☒ Pass ☐ Fail											

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Radiated Emission Test Results (Below 1GHz)

Test specification:	Radiated Emission			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	40		
	Atmospheric(mbar):	1019		
Mains Power:	120VAC, 60Hz			
Tested by:	Angel Escamilla			
Test Date:	12-10-2014			
Remarks:	802.11ac-80MHz: EUT Tx continuously at 5210MHz			

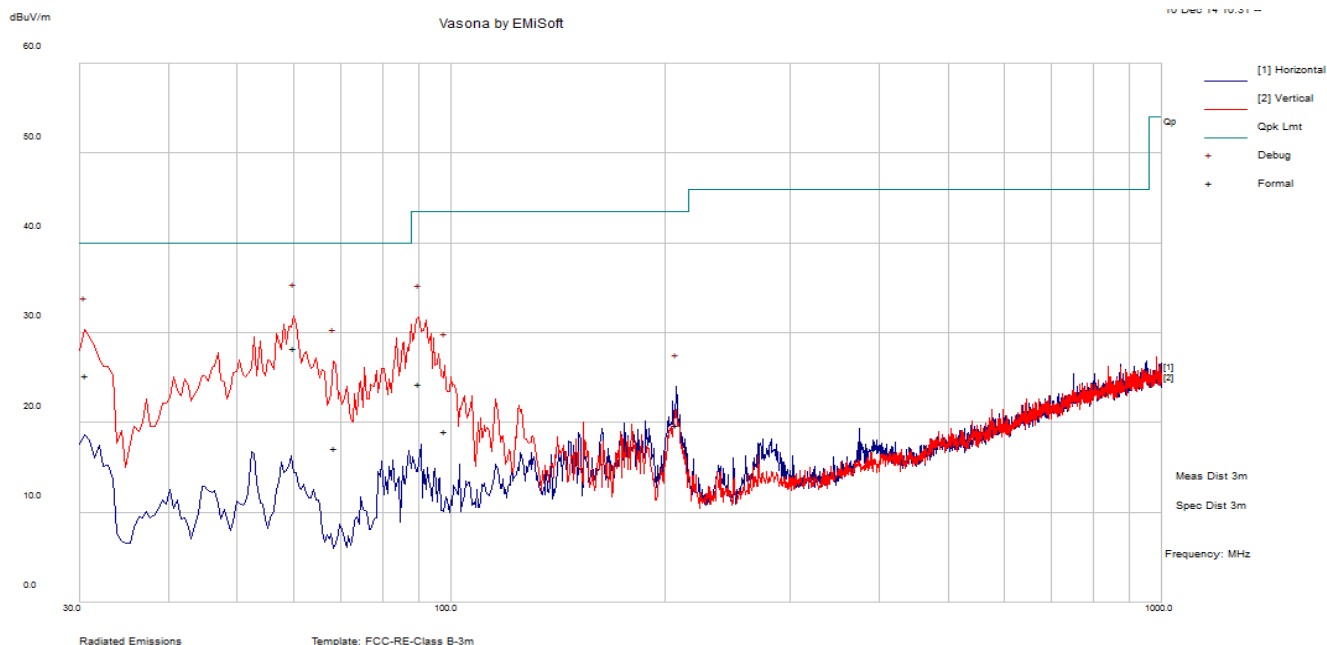


30MHz – 1000MHz at 3 meters

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
30.36	44.53	1.16	-19.45	26.25	Quasi Max	V	102.00	11.00	40.00	-13.75	Pass
57.38	55.37	1.26	-31.56	25.06	Quasi Max	V	116.00	185.00	40.00	-14.94	Pass
69.06	46.78	1.39	-30.96	17.21	Quasi Max	V	212.00	174.00	40.00	-22.79	Pass
80.61	52.10	1.51	-31.63	21.98	Quasi Max	V	102.00	217.00	40.00	-18.02	Pass
86.47	52.28	1.62	-32.06	21.84	Quasi Max	V	105.00	304.00	40.00	-18.16	Pass
97.15	50.53	1.79	-30.56	21.76	Quasi Max	V	130.00	172.00	43.50	-21.74	Pass

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

Test specification:	Radiated Emission			
Environmental Conditions:	Temp(°C):	21	Result:	☒ Pass ☐ Fail
	Humidity (%):	40		
	Atmospheric(mbar):	1019		
Mains Power:	120VAC, 60Hz			
Tested by:	Angel Escamilla			
Test Date:	12-10-2014			
Remarks:	802.11ac-80MHz: EUT Tx continuously at 5775MHz			



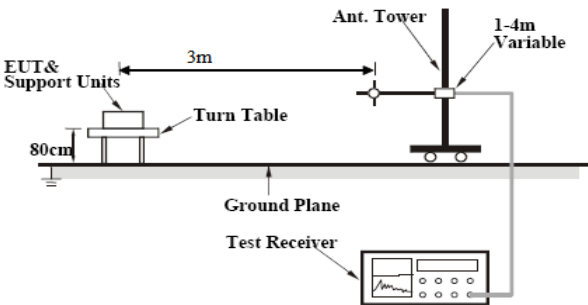
30MHz – 1000MHz at 3 meters

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	AF (dB)	Level (dBuV/m)	Measurement Type	Pol (V/H)	Hgt (cm)	Azt (Deg)	Limit (dBuV/m)	Margin (dB)	Pass /Fail
30.62	43.72	1.16	-19.58	25.30	Quasi Max	V	174.00	208.00	40.00	-14.70	Pass
60.06	58.48	1.29	-31.45	28.32	Quasi Max	V	100.00	182.00	40.00	-11.68	Pass
68.50	46.80	1.39	-30.99	17.20	Quasi Max	V	179.00	113.00	40.00	-22.80	Pass
90.25	54.65	1.68	-32.00	24.32	Quasi Max	V	133.00	226.00	43.50	-19.18	Pass
98.05	47.55	1.80	-30.28	19.07	Quasi Max	V	159.00	247.00	43.50	-24.43	Pass
207.56	46.09	2.55	-28.92	19.72	Quasi Max	H	146.00	96.00	43.50	-23.78	Pass

Note: Both horizontal and vertical polarities were investigated. The results above show only the worst case.

10.7 Radiated Spurious Emissions above 1GHz

Requirement(s):

Spec	Item	Requirement	Applicable
47CFR§ 15.407(b)(2), 15.407(b)(6)	(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 EIRP of -27 dBm/MHz.	☒
	(2)	For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.	☐
	(3)	For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.	☐
	(4)	For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of -27 dBm/MHz.	☒
	(5)	Restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒
Test Setup			
Procedure	- The EUT was switched on and allowed to warm up to its normal operating condition. - The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, and adjusting the antenna height in the following manner: - Vertical or horizontal polarisation (whichever gave the higher emission level over a full rotation of the EUT) was chosen. - The EUT was then rotated to the direction that gave the maximum emission. - Finally, the antenna height was adjusted to the height that gave the maximum emission. - An average measurement was then made for that frequency point. - Steps 2 and 3 were repeated for the next frequency point, until all selected frequency points were measured.		
Remark	The EUT was scanned up to 40GHz. Both horizontal and vertical polarities were investigated. The results show only the worst case.		
Result	☒ Pass ☐ Fail		

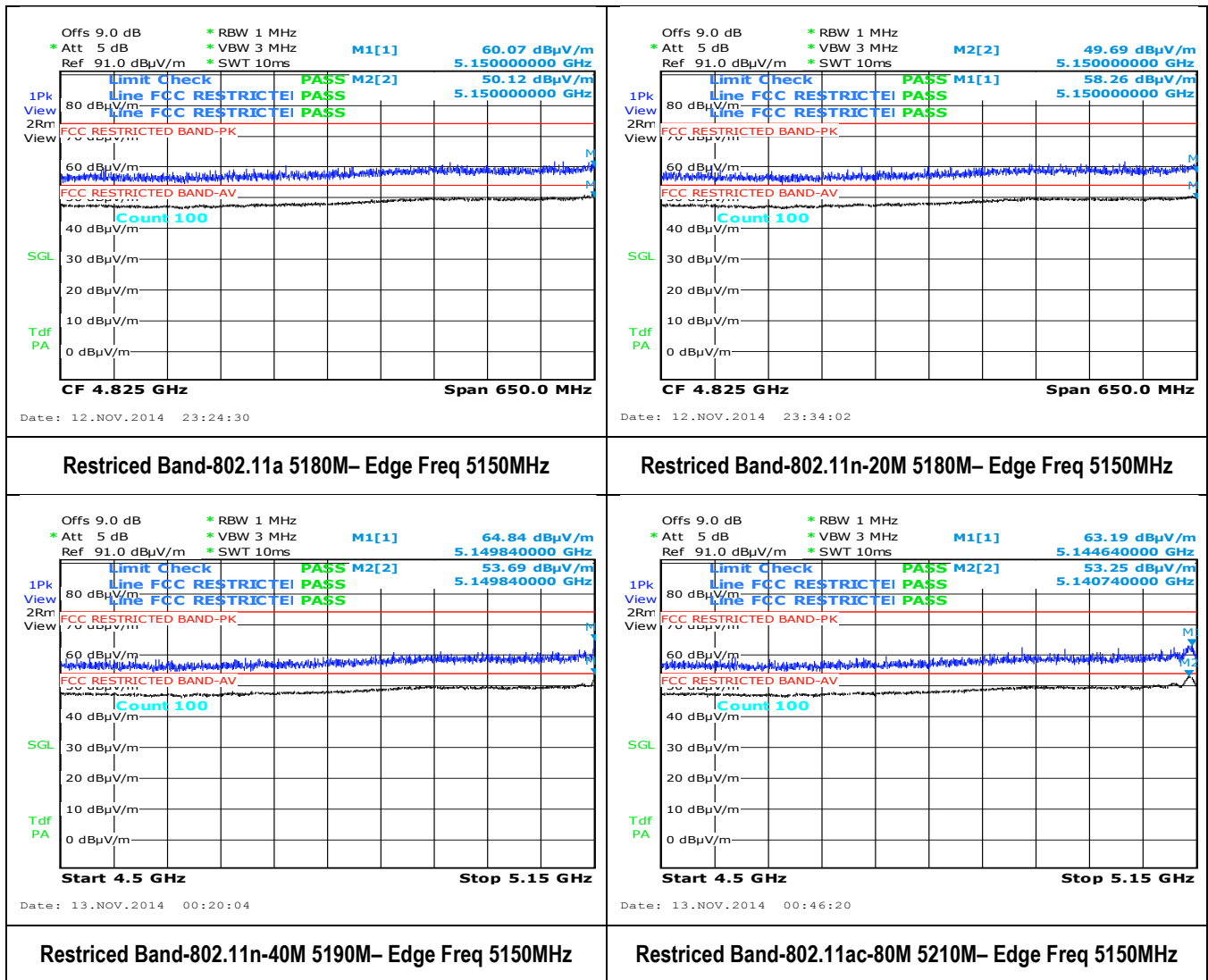
Equipment Setting

Test	RBW	VBW	Span	Detector	Sweep	Trace	Notes
Radiated Spurious Emission	1MHz	3MHz	1GHz - 40 GHz	Peak	Auto	Max hold	PK Measurement
Radiated Spurious Emission	1MHz	10Hz	1GHz - 40 GHz	Peak	Auto	Max hold	Ave Measurement

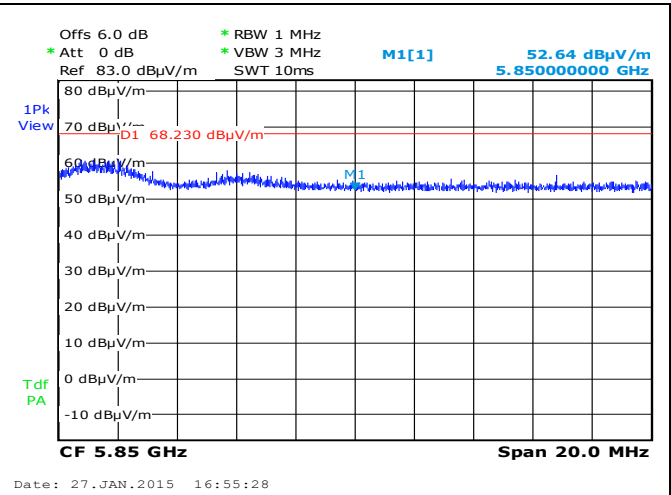
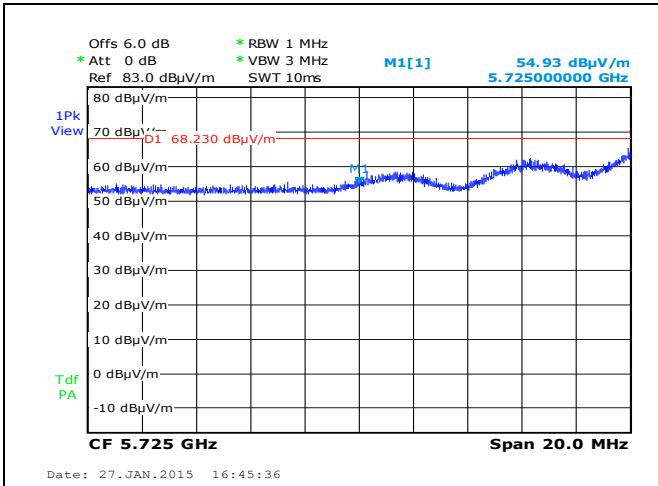
Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☐ Yes (See below) ☒ N/A

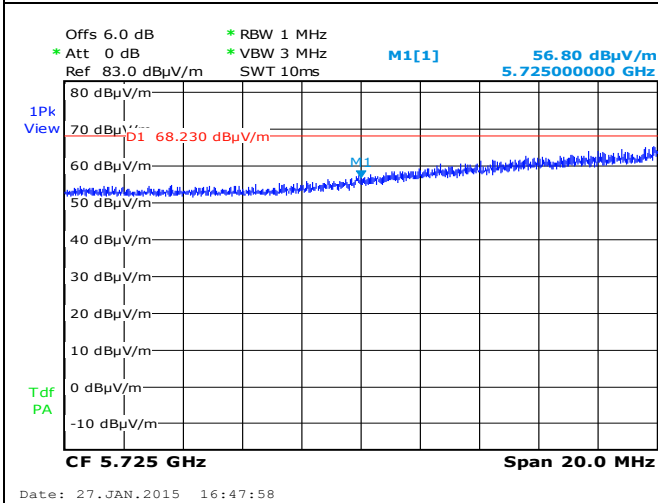
Restricted Band Measurement Plots:



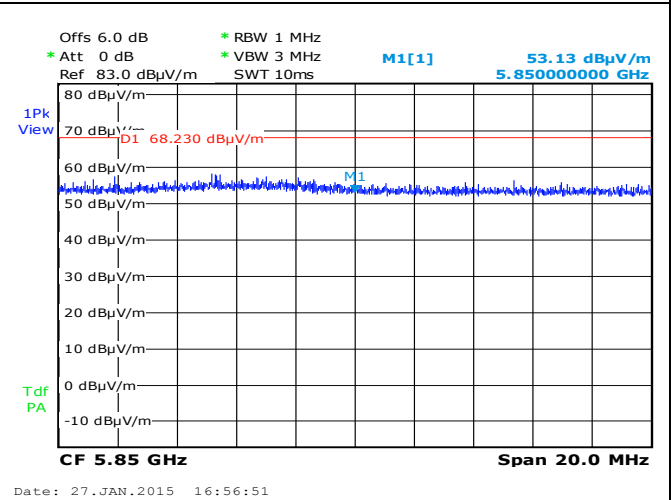
Radiated Band Edge Measurement Plots:



Radiated Band Edge-802.11a 5745M– Edge Freq 5725MHz

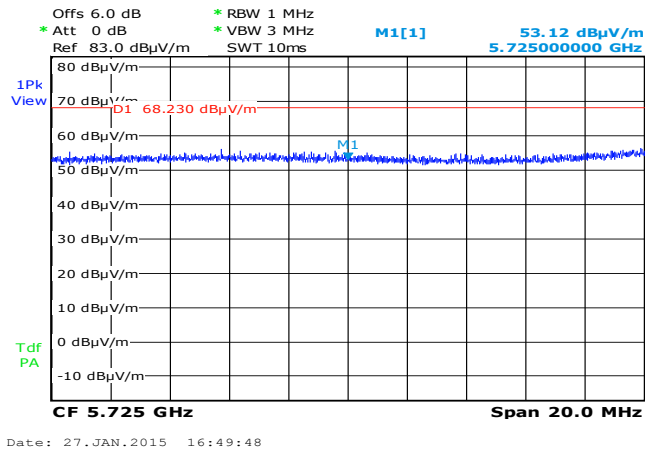


Radiated Band Edge-802.11a 5825M– Edge Freq 5850MHz

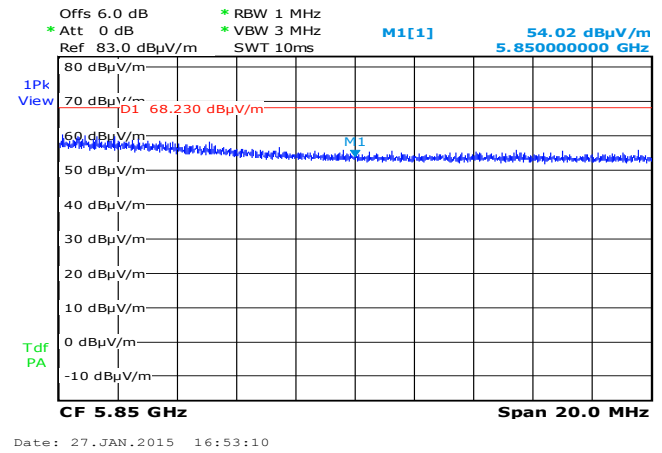


Radiated Band Edge-802.11n 5745M– Edge Freq 5725MHz

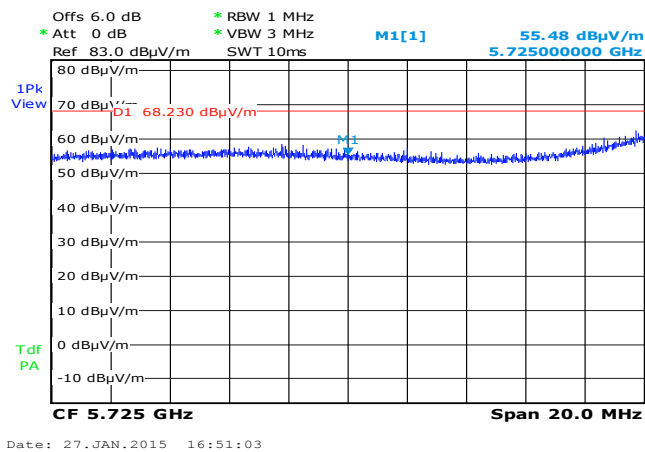
Radiated Band Edge-802.11n 5825M– Edge Freq 5850MHz



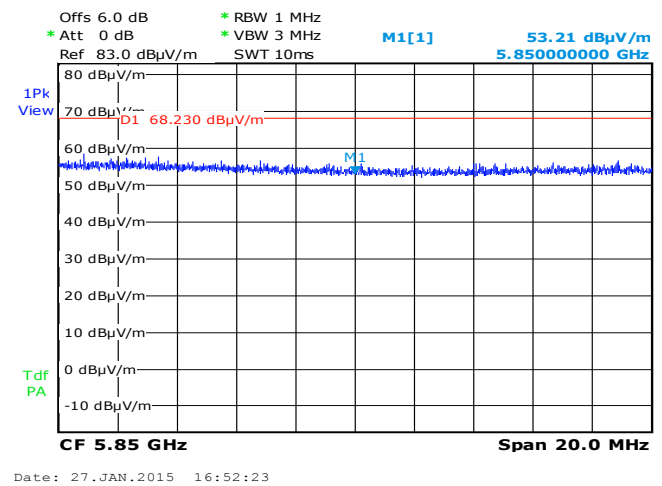
Radiated Band Edge-802.11n 5755M– Edge Freq 5725MHz



Radiated Band Edge-802.11n 5795M– Edge Freq 5850MHz



Restrictd Band-802.11ac 5750M– Edge Freq 5725MHz



Radiated Band Edge-802.11ac 5775M– Edge Freq 5850MHz

Radiated Emission Test Results (Above 1GHz)

1GHz-40GHz – 802.11a – 5180MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
8330.20	45.45	4.94	5.09	55.47	Peak Max	H	217.00	282.00	74.00	-18.53	Pass
10322.04	42.65	5.22	6.02	53.88	Peak Max	V	272.00	112.00	74.00	-20.12	Pass
15500.10	41.15	5.67	10.22	57.04	Peak Max	V	164.00	326.00	74.00	-16.96	Pass
8330.20	32.44	4.94	5.09	42.46	Average Max	H	217.00	282.00	54.00	-11.54	Pass
10322.04	29.60	5.22	6.02	40.83	Average Max	V	272.00	112.00	54.00	-13.17	Pass
15500.10	28.00	5.67	10.22	43.89	Average Max	V	164.00	326.00	54.00	-10.11	Pass

1GHz-40GHz – 802.11a – 5200MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
3220.59	45.98	2.54	-1.64	46.88	Peak Max	V	220.00	171.00	74.00	-27.12	Pass
8567.25	44.59	5.21	5.45	55.25	Peak Max	V	176.00	158.00	74.00	-18.75	Pass
10340.02	42.55	5.23	5.98	53.76	Peak Max	H	260.00	235.00	74.00	-20.24	Pass
3220.59	32.67	2.54	-1.64	33.56	Average Max	V	220.00	171.00	54.00	-20.44	Pass
8567.25	31.82	5.21	5.45	42.48	Average Max	V	176.00	158.00	54.00	-11.52	Pass
10340.02	29.43	5.23	5.98	40.64	Average Max	H	260.00	235.00	54.00	-13.36	Pass

1GHz-40GHz – 802.11a – 5240MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
9625.63	44.75	5.16	6.59	56.50	Peak Max	H	100.00	9.00	74.00	-17.50	Pass
10351.80	42.44	5.24	5.96	53.63	Peak Max	V	144.00	188.00	74.00	-20.37	Pass
15705.38	41.35	6.62	8.40	56.37	Peak Max	V	222.00	175.00	74.00	-17.63	Pass
9625.63	30.83	5.16	6.59	42.58	Average Max	H	100.00	9.00	54.00	-11.42	Pass
10351.80	29.35	5.24	5.96	40.54	Average Max	V	144.00	188.00	54.00	-13.46	Pass
15705.38	27.78	6.62	8.40	42.80	Average Max	V	222.00	175.00	54.00	-11.20	Pass

1GHz-40GHz – 802.11n-20M – 5180MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
8647.49	46.02	5.26	5.49	56.78	Peak Max	H	322.00	319.00	74.00	-17.22	Pass
10351.10	42.43	5.24	5.96	53.63	Peak Max	H	190.00	97.00	74.00	-20.37	Pass
15534.25	41.65	5.83	9.91	57.40	Peak Max	V	235.00	321.00	74.00	-16.60	Pass
8647.49	32.10	5.26	5.49	42.85	Average Max	H	322.00	319.00	54.00	-11.15	Pass
10351.10	29.32	5.24	5.96	40.52	Average Max	H	190.00	97.00	54.00	-13.48	Pass
15534.25	28.15	5.83	9.91	43.89	Average Max	V	235.00	321.00	54.00	-10.11	Pass

1GHz-40GHz – 802.11n-20M – 5200MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
9567.16	45.13	5.32	6.59	57.04	Peak Max	H	201.00	285.00	74.00	-16.96	Pass
10355.83	42.57	5.24	5.95	53.76	Peak Max	V	289.00	139.00	74.00	-20.24	Pass
15665.29	41.19	6.44	8.75	56.38	Peak Max	H	282.00	63.00	74.00	-17.62	Pass
9567.16	31.01	5.32	6.59	42.91	Average Max	H	201.00	285.00	54.00	-11.09	Pass
10355.83	29.33	5.24	5.95	40.52	Average Max	V	289.00	139.00	54.00	-13.48	Pass
15665.29	27.88	6.44	8.75	43.07	Average Max	H	282.00	63.00	54.00	-10.93	Pass

1GHz-40GHz – 802.11n-20M – 5240MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
8661.23	45.44	5.27	5.50	56.21	Peak Max	H	159.00	82.00	74.00	-17.79	Pass
10358.27	42.32	5.24	5.95	53.51	Peak Max	H	116.00	111.00	74.00	-20.49	Pass
15414.55	42.34	5.55	9.98	57.88	Peak Max	H	269.00	235.00	74.00	-16.12	Pass
8661.23	32.00	5.27	5.50	42.78	Average Max	H	159.00	82.00	54.00	-11.22	Pass
10358.27	29.35	5.24	5.95	40.54	Average Max	H	116.00	111.00	54.00	-13.46	Pass
15414.55	28.71	5.55	9.98	44.25	Average Max	H	269.00	235.00	54.00	-9.75	Pass

1GHz-40GHz – 802.11n-40M – 5190MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
8642.35	45.52	5.26	5.49	56.27	Peak Max	H	107.00	165.00	74.00	-17.73	Pass
10353.10	42.44	5.24	5.96	53.63	Peak Max	V	284.00	218.00	74.00	-20.37	Pass
15621.38	41.67	6.24	9.14	57.05	Peak Max	H	282.00	115.00	74.00	-16.95	Pass
8642.35	32.10	5.26	5.49	42.85	Average Max	H	107.00	165.00	54.00	-11.15	Pass
10353.10	29.36	5.24	5.96	40.56	Average Max	V	284.00	218.00	54.00	-13.44	Pass
15621.38	27.95	6.24	9.14	43.33	Average Max	H	282.00	115.00	54.00	-10.67	Pass

1GHz-40GHz – 802.11n-40M – 5230MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
9590.88	44.73	5.25	6.59	56.58	Peak Max	H	212.00	30.00	74.00	-17.42	Pass
10347.64	42.43	5.23	5.97	53.63	Peak Max	V	202.00	128.00	74.00	-20.37	Pass
16223.58	42.36	5.90	6.39	54.65	Peak Max	H	159.00	86.00	74.00	-19.35	Pass
9590.88	30.84	5.25	6.59	42.68	Average Max	H	212.00	30.00	54.00	-11.32	Pass
10347.64	29.34	5.23	5.97	40.55	Average Max	V	202.00	128.00	54.00	-13.45	Pass
16223.58	29.24	5.90	6.39	41.53	Average Max	H	159.00	86.00	54.00	-12.47	Pass

1GHz-40GHz – 802.11ac-80M – 5210MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
8587.10	45.07	5.23	5.46	55.76	Peak Max	H	263.00	25.00	74.00	-18.24	Pass
10329.69	42.53	5.22	6.00	53.76	Peak Max	H	272.00	42.00	74.00	-20.24	Pass
15423.10	42.19	5.57	10.01	57.76	Peak Max	V	276.00	170.00	74.00	-16.24	Pass
8587.10	31.95	5.23	5.46	42.63	Average Max	H	263.00	25.00	54.00	-11.37	Pass
10329.69	29.53	5.22	6.00	40.75	Average Max	H	272.00	42.00	54.00	-13.25	Pass
15423.10	28.71	5.57	10.01	44.28	Average Max	V	276.00	170.00	54.00	-9.72	Pass

1GHz-40GHz – 802.11a – 5745MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
1011.54	48.35	1.02	-7.16	42.20	Peak Max	V	156.00	311.00	74.00	-31.80	Pass
9464.91	45.37	5.29	6.52	57.18	Peak Max	H	288.00	136.00	74.00	-16.82	Pass
15462.18	42.21	5.62	10.12	57.94	Peak Max	V	100.00	14.00	74.00	-16.06	Pass
1011.54	34.96	1.02	-7.16	28.81	Average Max	V	156.00	311.00	54.00	-25.19	Pass
9464.91	31.73	5.29	6.52	43.54	Average Max	H	288.00	136.00	54.00	-10.46	Pass
15462.18	28.37	5.62	10.12	44.11	Average Max	V	100.00	14.00	54.00	-9.89	Pass

1GHz-40GHz- 802.11a– 5785MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4076.49	45.32	3.56	-0.20	48.68	Peak Max	V	108.00	122.00	74.00	-25.32	Pass
8784.00	44.58	5.10	5.57	55.25	Peak Max	V	187.00	203.00	74.00	-18.75	Pass
10346.83	42.94	5.23	5.97	54.14	Peak Max	H	293.00	61.00	74.00	-19.86	Pass
4076.49	31.58	3.56	-0.20	34.95	Average Max	V	108.00	122.00	54.00	-19.05	Pass
8784.00	31.85	5.10	5.57	42.51	Average Max	V	187.00	203.00	54.00	-11.49	Pass
10346.83	29.43	5.23	5.97	40.64	Average Max	H	293.00	61.00	54.00	-13.36	Pass

1GHz-40GHz- 802.11a - 5825MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
3981.17	44.44	3.69	-0.21	47.92	Peak Max	V	193.00	151.00	74.00	-26.08	Pass
9296.15	45.08	4.28	6.22	55.57	Peak Max	H	203.00	98.00	74.00	-18.43	Pass
10338.68	42.93	5.23	5.99	54.14	Peak Max	H	124.00	38.00	74.00	-19.86	Pass
3981.17	31.45	3.69	-0.21	34.93	Average Max	V	193.00	151.00	54.00	-19.07	Pass
9296.15	31.67	4.28	6.22	42.17	Average Max	H	203.00	98.00	54.00	-11.83	Pass
10338.68	29.52	5.23	5.99	40.73	Average Max	H	124.00	38.00	54.00	-13.27	Pass

1GHz-40GHz – 802.11n-20M – 5745MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4162.16	44.70	3.45	-0.22	47.93	Peak Max	H	210.00	69.00	74.00	-26.07	Pass
9476.53	44.89	5.36	6.54	56.79	Peak Max	V	226.00	179.00	74.00	-17.21	Pass
10364.47	42.45	5.24	5.94	53.63	Peak Max	V	101.00	224.00	74.00	-20.37	Pass
4162.16	31.56	3.45	-0.22	34.79	Average Max	H	210.00	69.00	54.00	-19.21	Pass
9476.53	31.65	5.36	6.54	43.55	Average Max	V	226.00	179.00	54.00	-10.45	Pass
10364.47	29.44	5.24	5.94	40.63	Average Max	V	101.00	224.00	54.00	-13.37	Pass

1GHz-40GHz- 802.11n-20M– 5785MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4065.56	44.78	3.58	-0.20	48.16	Peak Max	V	262.00	351.00	74.00	-25.84	Pass
9540.09	44.27	5.39	6.58	56.24	Peak Max	V	239.00	322.00	74.00	-17.76	Pass
15417.75	42.20	5.56	9.99	57.76	Peak Max	V	139.00	360.00	74.00	-16.24	Pass
4065.56	31.58	3.58	-0.20	34.96	Average Max	V	262.00	351.00	54.00	-19.04	Pass
9540.09	31.18	5.39	6.58	43.15	Average Max	V	239.00	322.00	54.00	-10.85	Pass
15417.75	28.71	5.56	9.99	44.26	Average Max	V	139.00	360.00	54.00	-9.74	Pass

1GHz-40GHz- 802.11n-20M - 5825MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4862.51	42.54	3.24	0.18	45.97	Peak Max	H	202.00	211.00	74.00	-28.03	4862.51
7770.54	44.02	5.60	4.07	53.69	Peak Max	V	209.00	348.00	74.00	-20.31	7770.54
10368.63	42.83	5.25	5.93	54.01	Peak Max	H	261.00	72.00	74.00	-19.99	10368.63
4862.51	29.21	3.24	0.18	32.63	Average Max	H	202.00	211.00	54.00	-21.37	4862.51
7770.54	31.91	5.60	4.07	41.58	Average Max	V	209.00	348.00	54.00	-12.42	7770.54
10368.63	29.44	5.25	5.93	40.61	Average Max	H	261.00	72.00	54.00	-13.39	10368.63

1GHz-40GHz – 802.11n-40M – 5755MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4203.65	45.17	3.39	-0.23	48.34	Peak Max	H	292.00	220.00	74.00	-25.66	Pass
4879.15	42.68	3.25	0.20	46.14	Peak Max	H	169.00	211.00	74.00	-27.86	Pass
10330.20	44.14	5.22	6.00	55.36	Peak Max	V	108.00	272.00	74.00	-18.64	Pass
4203.65	31.96	3.39	-0.23	35.12	Average Max	H	292.00	220.00	54.00	-18.88	Pass
4879.15	29.46	3.25	0.20	32.91	Average Max	H	169.00	211.00	54.00	-21.09	Pass
10330.20	29.72	5.22	6.00	40.95	Average Max	V	108.00	272.00	54.00	-13.05	Pass

1GHz-40GHz- 802.11n-40M– 5795MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
9573.19	44.45	5.30	6.59	56.34	Peak Max	H	174.00	164.00	74.00	-17.66	Pass
10352.71	42.44	5.24	5.96	53.63	Peak Max	H	245.00	56.00	74.00	-20.37	Pass
16280.60	42.49	5.87	6.53	54.89	Peak Max	V	145.00	301.00	74.00	-19.11	Pass
9573.19	31.16	5.30	6.59	43.04	Average Max	H	174.00	164.00	54.00	-10.96	Pass
10352.71	29.42	5.24	5.96	40.61	Average Max	H	245.00	56.00	54.00	-13.39	Pass
16280.60	28.98	5.87	6.53	41.38	Average Max	V	145.00	301.00	54.00	-12.62	Pass

1GHz-40GHz- 802.11ac-80M - 5775MHz

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4150.29	45.39	3.46	-0.21	48.64	Peak Max	V	286.00	360.00	74.00	-25.36	Pass
9580.70	44.73	5.28	6.59	56.60	Peak Max	H	116.00	185.00	74.00	-17.40	Pass
10327.92	42.66	5.22	6.01	53.88	Peak Max	H	117.00	132.00	74.00	-20.12	Pass
13978.29	42.82	6.11	9.94	58.87	Peak Max	H	120.00	37.00	74.00	-15.13	Pass
4150.29	31.61	3.46	-0.21	34.86	Average Max	V	286.00	360.00	54.00	-19.14	Pass
9580.70	31.07	5.28	6.59	42.94	Average Max	H	116.00	185.00	54.00	-11.06	Pass
10327.92	29.62	5.22	6.01	40.84	Average Max	H	117.00	132.00	54.00	-13.16	Pass
13978.29	29.98	6.11	9.94	46.03	Average Max	H	120.00	37.00	54.00	-7.97	Pass

Above 1GHz-25GHz- Collocation testing (2.4GHz WLAN & 5GHz WLAN on the main-board transmitting simultaneously)

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail
4340.26	44.66	3.09	-0.26	47.49	Peak Max	V	119.00	96.00	74.00	-26.51	Pass
8654.95	45.20	5.27	5.50	55.97	Peak Max	V	283.00	257.00	74.00	-18.03	Pass
10334.75	42.92	5.22	5.99	54.14	Peak Max	H	146.00	53.00	74.00	-19.86	Pass
4340.26	31.35	3.09	-0.26	34.18	Average Max	V	119.00	96.00	54.00	-19.82	Pass
8654.95	32.04	5.27	5.50	42.81	Average Max	V	283.00	257.00	54.00	-11.19	Pass
10334.75	29.47	5.22	5.99	40.68	Average Max	H	146.00	53.00	54.00	-13.32	Pass

Annex A. TEST INSTRUMENT

Instrument	Model	Serial #	Cal Date	Cal Cycle	Cal Due	In use
Conducted Emissions						
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☒
R&S LISN	ESH2-Z5	861741/013	05/18/2014	1 Year	05/18/2015	☒
CHASE LISN	MN2050B	1018	07/24/2014	1 Year	07/24/2015	☒
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☒
Radiated Emissions						
R & S Receiver	ESL6	100178	03/01/2014	1 Year	03/01/2015	☒
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☒
ETS-Lingren Loop Antenna	6512	00049120	05/13/2014	1 Year	05/13/2015	☐
Bi-Log antenna (30MHz~2GHz)	JB1	A030702	07/03/2014	1 Year	07/03/2015	☒
Horn Antenna (1-26.5GHz)	3115	10SL0059	04/26/2014	1 Year	04/26/2015	☒
Horn Antenna (18-40 GHz)	AH-840	101013	04/23/2014	1 Year	04/23/2015	☒
Pre-Amplifier (1-26.5GHz)	8449B	3008A00715	05/30/2014	1 Year	05/30/2015	☒
Microwave Preamplifier (18-40 GHz)	PA-840	181251	05/30/2014	1 Year	05/30/2015	☒
3 Meters SAC	3M	N/A	10/13/2014	1 Year	10/13/2015	☒
10 Meters SAC	10M	N/A	06/05/2014	1 Year	06/05/2015	☒
Sekonic Hygro Hermograph	ST-50	HE01-000092	05/25/2014	1 Year	05/25/2015	☒
RF Conducted Measurement						
Spectrum Analyzer	N9010A	MY50210206	05/30/2014	1 Year	05/30/2015	☒
Spectrum Analyzer	E4407B	US88441016	05/31/2014	1 Year	05/31/2015	☐
R & S Receiver	ESIB 40	100179	04/20/2014	1 Year	04/20/2015	☒

Annex B. SIEMIC Accreditation

Accreditations	Document	Scope / Remark
ISO 17025 (A2LA)		Please see the documents for the detailed scope
ISO Guide 65 (A2LA)		Please see the documents for the detailed scope
TCB Designation		A1 , A2 , A3 , A4 , B1 , B2 , B3 , B4 , C
FCC DoC Accreditation		FCC Declaration of Conformity Accreditation
FCC Site Registration		3 meter site
FCC Site Registration		10 meter site
IC Site Registration		3 meter site
IC Site Registration		10 meter site
EU NB		Radio & Telecommunications Terminal Equipment: EN45001 – EN ISO/IEC 17025
		Electromagnetic Compatibility: EN45001 – EN ISO/IEC 17025
Singapore iDA CB(Certification Body)		Phase I , Phase II
Vietnam MIC CAB Accreditation		Please see the document for the detailed scope
Hong Kong OFCA		(Phase II) OFCA Foreign Certification Body for Radio and Telecom
		(Phase I) Conformity Assessment Body for Radio and Telecom
Industry Canada CAB		Radio: Scope A – All Radio Standard Specification in Category I
		Telecom: CS-03 Part I, II, V, VI, VII, VIII

Japan Recognized Certification Body Designation		Radio: A1. Terminal equipment for purpose of calling Telecom: B1. Specified radio equipment specified in Article 38-2, Paragraph 1, Item 1 of the Radio Law
Korea CAB Accreditation		EMI: KCC Notice 2008-39, RRL Notice 2008-3: CA Procedures for EMI KN22: Test Method for EMI EMS: KCC Notice 2008-38, RRL Notice 2008-4: CA Procedures for EMS KN24, KN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8, -4-11: Test Method for EMS Radio: RRL Notice 2008-26, RRL Notice 2008-2, RRL Notice 2008-10, RRL Notice 2007-49, RRL Notice 2007-20, RRL Notice 2007-21, RRL Notice 2007-80, RRL Notice 2004-68 Telecom: President Notice 20664, RRL Notice 2007-30, RRL Notice 2008-7 with attachments 1, 3, 5, 6; President Notice 20664, RRL Notice 2008-7 with attachment 4
Taiwan NCC CAB Recognition		LP0002, PSTN01, ADSL01, ID0002, IS6100, CNS14336, PLMN07, PLMN01, PLMN08
Taiwan BSMI CAB Recognition		CNS 13438
Japan VCCI		R-3083: Radiation 3 meter site C-3421: Main Ports Conducted Interference Measurement T-1597: Telecommunication Ports Conducted Interference Measurement
Australia CAB Recognition		EMC: AS/NZS CISPR 11, AS/NZS CISPR 14.1, AS/NZS CISPR22, AS/NZS 61000.6.3, AS/NZS 61000.6.4 Radio communications: AS/NZS 4281, AS/NZS 4268, AS/NZS 4280.1, AS/NZS 4280.2, AS/NZS 4295, AS/NZS 4582, AS/NZS 4583, AS/NZS 4769.1, AS/NZS 4769.2, AS/NZS 4770, AS/NZS 4771 Telecommunications: AS/ACIF S002:05, AS/ACIF S003:06, AS/ACIF S004:06 AS/ACIF S006:01, AS/ACIF S016:01, AS/ACIF S031:01, AS/ACIF S038:01, AS/ACIF S040:01, AS/ACIF S041:05, AS/ACIF S043.2:06, AS/ACIF S60950.1
Australia NATA Recognition		AS/ACIF S002, AS/ACIF S003, AS/ACIF S004, AS/ACIF S006, AS/ACIF S016, AS/ACIF S031, AS/ACIF S038, AS/ACIF S040, AS/ACIF S041, AS/ACIF S043.2