RF TEST REPORT

SIEMIC
GLOBAL TESTING & CERTIFICATIONS
YOUR CHOICE FOR- TCB FCB CB NB CAB RCB

Report No.: FCC_RF_SL14071801-RUC-010_UNII Rev1.2
Supersede Report No.: FCC_RF_SL14071801-RUC-010_UNII Rev1.1

Applicant	:	Ruckus Wireless, Inc.
Product Name	:	Access Point
Model No.	:	R600
Test Standard	:	47 CFR 15.407: 2013
Test Method	:	ANSI C63.10: 2009 789033 D02 General UNII Test Procedures New Rules v01
FCC ID	:	S9GR600
IC ID	:	5912A-R600
Dates of test	:	August 26, 2014 to September 23, 2014
Issue Date	:	10/28/2014
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:	
	
Nima Molaei	**David Zhang**
Test Engineer	Engineer Reviewer

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

ilac-MRA
ACCREDITED
TESTING CERT # 2742-01

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/RRA, 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

Report No.	Report Version	Description	Issue Date
FCC_RF_SL14071801-RUC-010_UNII	None	Original	09/24/2014
FCC_RF_SL14071801-RUC-010_UNII Rev1.0	Rev1.0	Update FCC ID and EUT info	10/17/2014
FCC_RF_SL14071801-RUC-010_UNII Rev1.1	Rev1.1	Update applicant info	10/24/2014
FCC_RF_SL14071801-RUC-010_UNII Rev1.2	Rev1.2	Update technical information	10/27/2014

2 Executive Summary

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

Company: Ruckus Wireless, Inc.
Product: Access Point
Model: R600

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.	:	R600
Trade Name	:	Ruckus
Serial No.	:	141406000029
Host Model No.	:	N/A
Input Power	:	48VDC (PoE) and 12 VDC (AC/DC Adapter)
Power Adapter Manu/Model	:	N/A
Power Adapter SN	:	N/A
Hardware version	:	N/A
Software version	:	N/A
Date of EUT received	:	08/10/2014
Equipment Class/ Category	:	DTS, UNII
Clock Frequencies	:	N/A
Port/Connectors	:	PoE, Ethernet, Console

6.2 Radio Description

Radio Type	802.11b	802.11g	802.11a	802.11n-20M	802.11n-40M	802.11ac-80M
Operating Frequency	2412-2472MHz	2412-2472MHz	5180-5240MHz 5745-5825MHz	2412-2472MHz 5180-5240MHz 5745-5825MHz	2422-2462MHz 5190-5230MHz 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	13	13	9	11(2.4GH) 9 (5GHz)	9(2.4GH) 5(5GHz)	4
Antenna Type	Internal Patch Antenna					
Antenna Gain (Peak)	1 dBi (2.4GHz), 3 dBi (5 GHz)					
Antenna Connector Type	SMA					
Note	EUT has 3 antenna, 1 antenna is in horizontal polarity, and 2 antennas in vertical polarity. The 802.11b/g/a is in CDD mode with all 3 antenna transmit simultaneously. Since they're in 90 deg phase shift between the horizontal and vertical antenna, for radiated limit, the result from different polarization antenna will not be combined. So only the result for 2 vertical poparity antennas will be combined for MIMO mode.For cross-polarized antenna, the total gain—including array gain—is computed separately for each of the two (or three) polarizations using the procedures presented in this document. The highest of the total gains shall apply. For this case, the highest of the total gain will be the directional gain of 2 vertical antennas. For conducted limit like power and psd, the result from all 3 chains will be summed. For 802.11b/g/a mode under CDD mode, the array gain for power will be 0 and for PSD will be 10 log (Nant/Nss) dB to be calculated separately for horizontal and vertical polarity.Reference to the following KDB for clarification. 662911 D01 Multiple Transmitter Output v02r01 662911 D02 MIMO with Cross-Polarized Antennas v01					

EUT ART Power level setting

Mode	Frequency (MHz)	ART Power setting
802.11-b	2412	22
802.11-b	2437	22
802.11-b	2462	22
802.11-g	2412	22
802.11-g	2437	22
802.11-g	2462	22
802.11-n-20	2412	21
802.11-n-20	2437	22
802.11-n-20	2462	22
802.11-n-40	2422	18
802.11-n-40	2437	22
802.11-n-40	2452	22
802.11-a	5180	22
802.11-a	5220	22
802.11-a	5240	22
802.11-n-20	5180	20
802.11-n-20	5220	22
802.11-n-20	5240	22
802.11-n-40	5190	16.5
802.11-n-40	5230	22
802.11-ac-80	5210	14
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

Top View

Bottom View

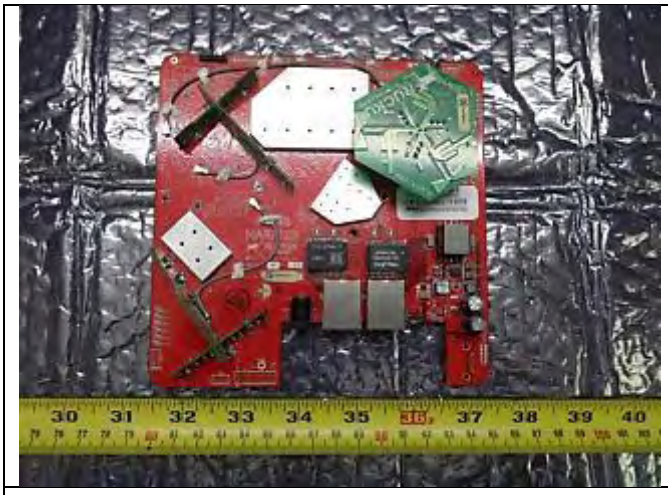
Front View

Rear View

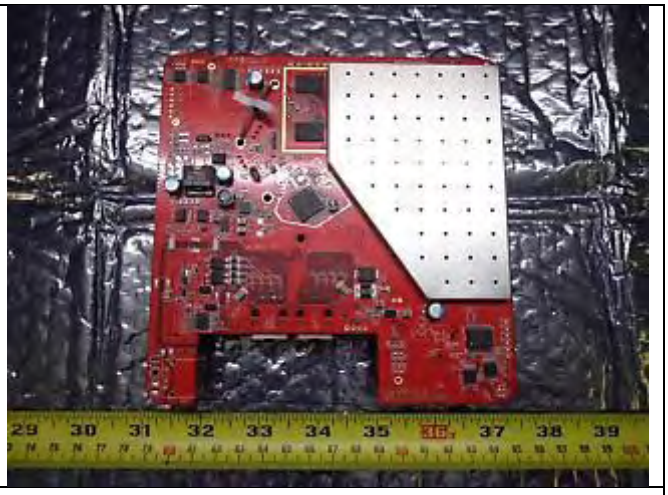
Left Side View

Right Side View

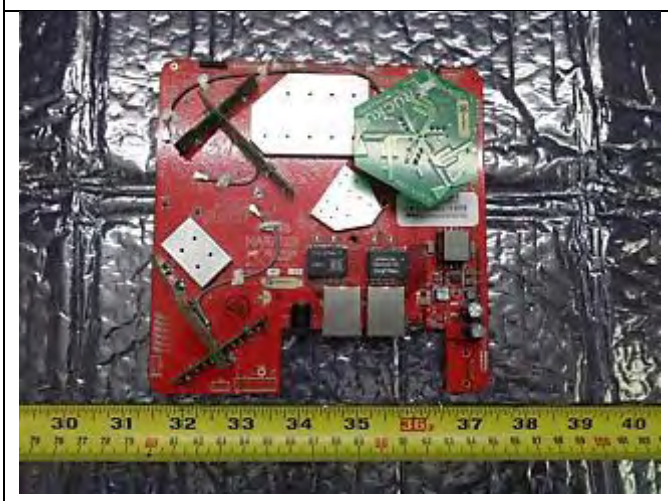
6.4 EUT Photos - Internal



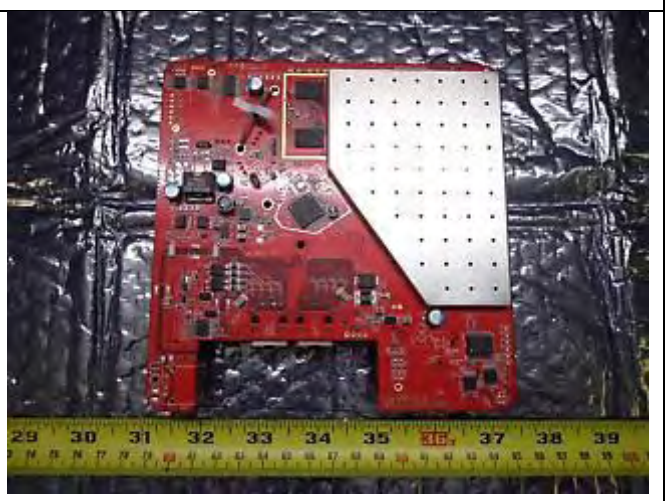
Main PCBA Board Top View



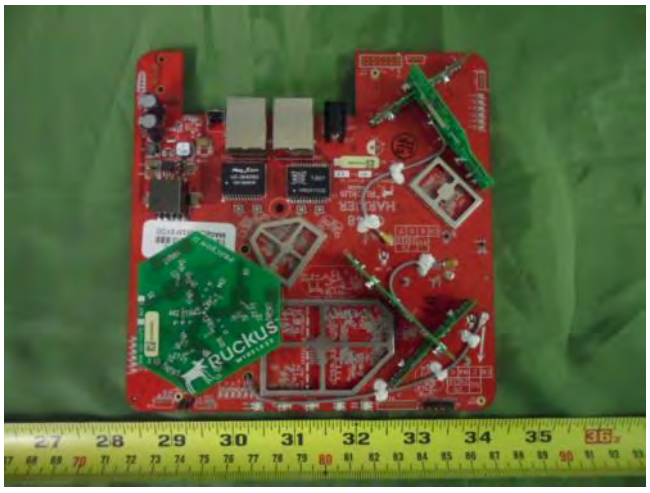
Main PCBA Board Bottom View



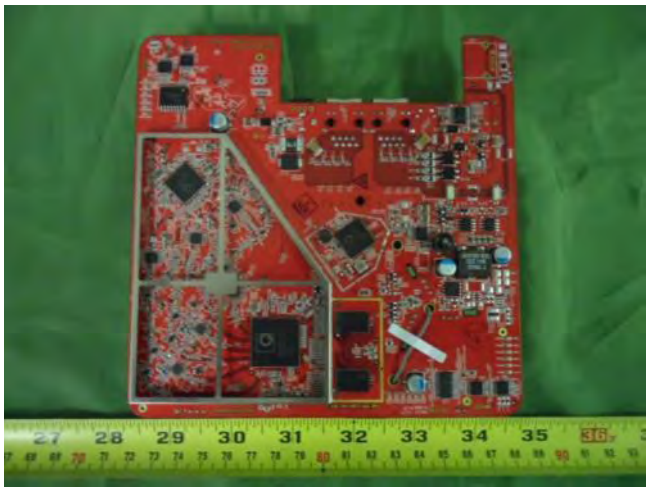
Main PCBA Board Top View



Main PCBA Board Bottom View

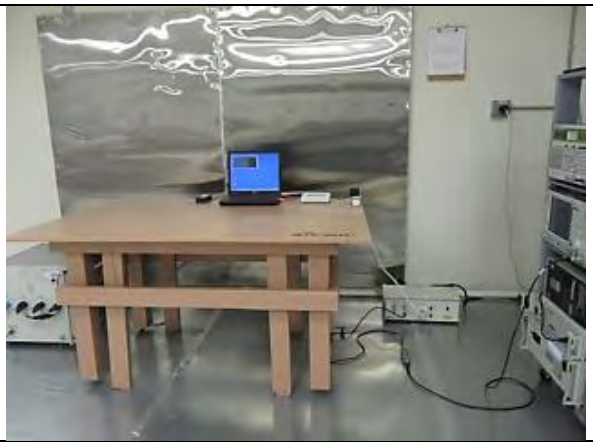


Main PCBA Board-without shielding Top View

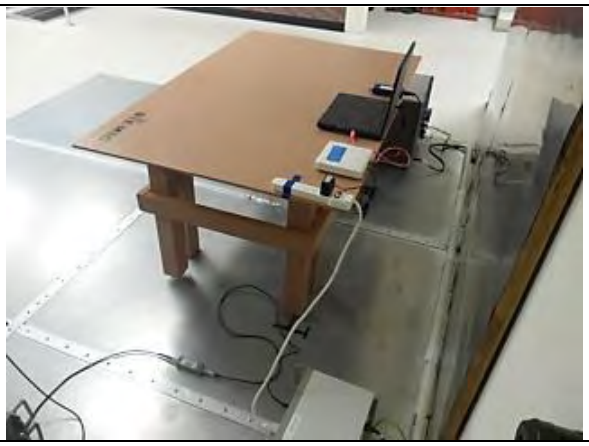


Main PCBA Board-without shielding Bottom View

6.5 EUT Test Setup Photos

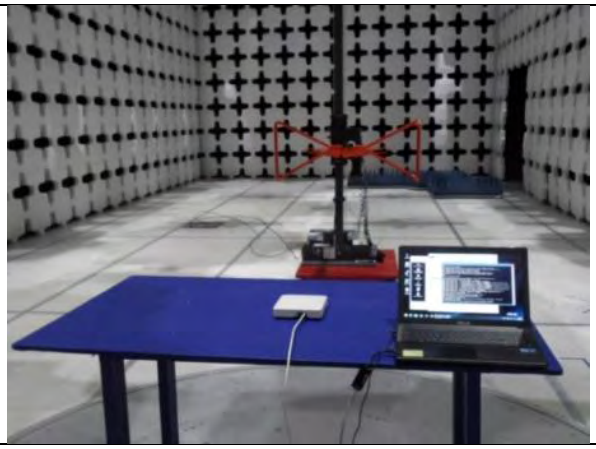


AC Line Conducted Emissions – Front View



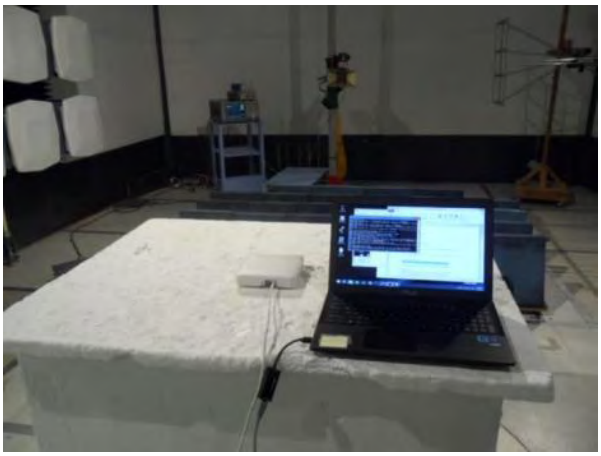
AC Line Conducted Emissions – Rear View

Radiated Emissions (<1GHz) – Front View

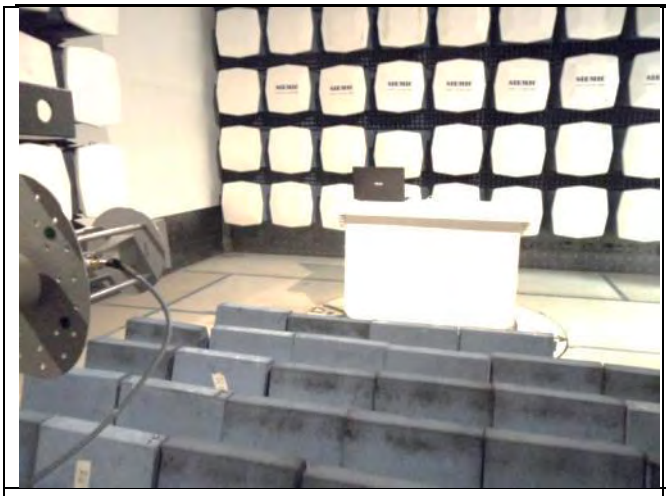


Radiated Emissions (<1GHz) – Rear View

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	PP01L Latitude C610	CN-06P823-48643-37P-4153	Dell	-
2	EUT power Supply	HK-AD-120A100-US	740-64190-011	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	
-	-	-	-	-	-	-	-

7.3 Test Software Description

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

8 Test Summary

Test Item	Test standard		Test Method/Procedure	Pass / Fail
Restricted Band of Operation	FCC	15.205	ANSI C63.10 – 2009 789033 D01 General UNII Test Procedures v01r03	☒ Pass ☐ N/A
AC Conducted Emissions Voltage	FCC	15.207(a)	ANSI C63.10 – 2009	☒ 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 C63.10 – 2009 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
Peak Excursion Ratio	FCC	15.407(a)(6)	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	1. All measurement uncertainties are not taken into consideration for all presented test result. 2. 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

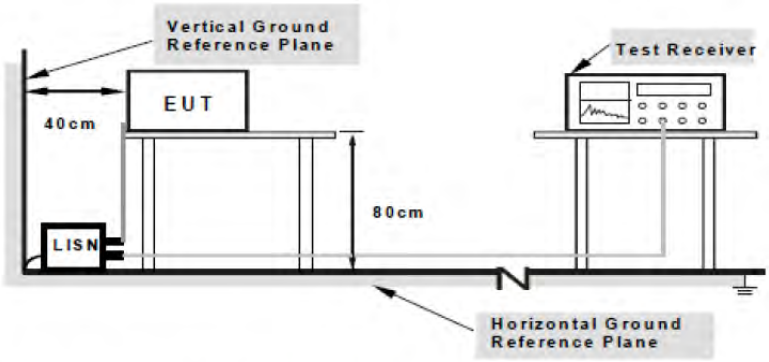
Emissions			
Test Item	**Frequency Range**	**Description**	**Uncertainty**
Band Edge and Radiated Spurious Emissions	30MHz – 1GHz	Confidence level of approximately 95% (in the case where distributions are normal), with a coverage factor of 2 (for EUTs < 0.5m X 0.5m X 0.5m)	+5.6dB/-4.5dB
Band Edge and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

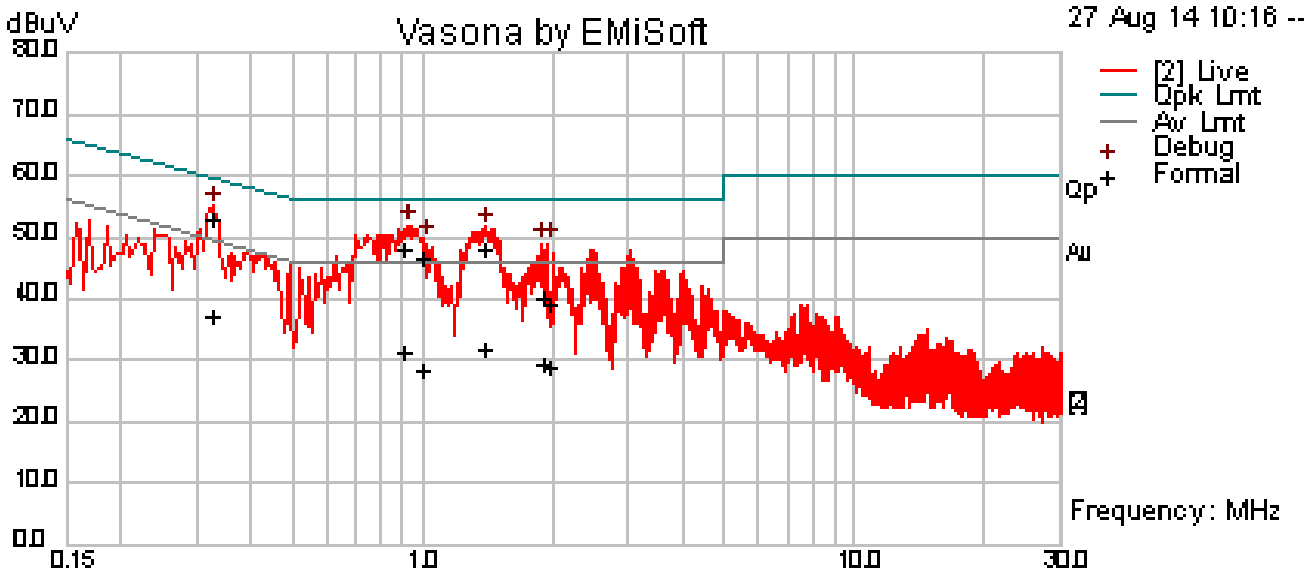
Spec	Item	Requirement	Applicable
47CFR§15.207	a)	For Low-power radio-frequency devices that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/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 tested with AC 110V 60Hz		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Conducted Emission Test Results (Live)

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	22	Result:	☒ Pass ☐ Fail
	Humidity (%):	40		
	Atmospheric(mbar):	1022		
Mains Power:	120Vac, 60Hz			
Tested by:	George Arias			
Test Date:	08/27/2014			
Remarks	N/A			

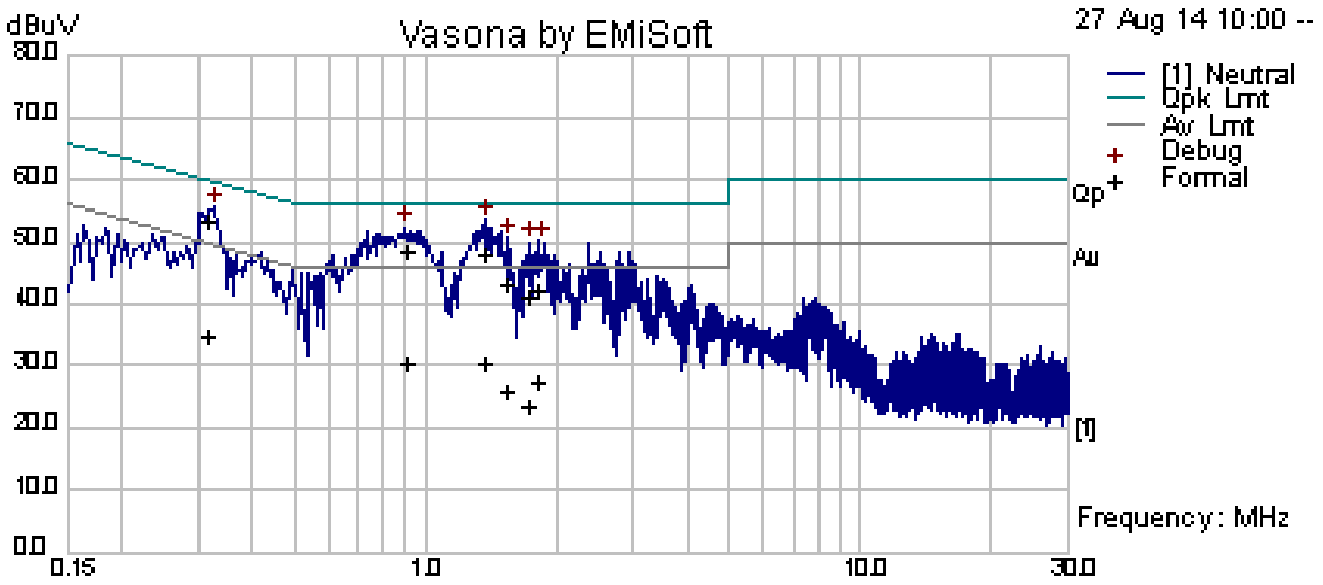


Live Line Plot at 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.32	42.42	10.01	0.71	53.13	Quasi Peak	Live	59.59	-6.46	Pass
0.90	37.40	10.01	0.77	48.19	Quasi Peak	Live	56.00	-7.81	Pass
0.99	35.60	10.02	0.78	46.4	Quasi Peak	Live	56.00	-9.60	Pass
1.40	36.95	10.02	0.85	47.83	Quasi Peak	Live	56.00	-8.17	Pass
1.90	29.11	10.02	0.93	40.06	Quasi Peak	Live	56.00	-15.94	Pass
1.96	28.17	10.02	0.94	39.13	Quasi Peak	Live	56.00	-16.87	Pass
0.32	26.32	10.01	0.71	37.04	Average	Live	49.59	-12.55	Pass
0.90	20.41	10.01	0.77	31.20	Average	Live	46.00	-14.80	Pass
0.99	17.54	10.02	0.78	28.33	Average	Live	46.00	-17.67	Pass
1.40	21.03	10.02	0.85	31.9	Average	Live	46.00	-14.10	Pass
1.90	18.60	10.02	0.93	29.56	Average	Live	46.00	-16.44	Pass
1.96	18.04	10.02	0.94	29.00	Average	Live	46.00	-17.00	Pass

Conducted Emission Test Results (Neutral)

Test specification:	Conducted Emissions			
Environmental Conditions:	Temp(°C):	22	Result:	☒ Pass ☐ Fail
	Humidity (%):	40		
	Atmospheric(mbar):	1022		
Mains Power:	120Vac, 60Hz			
Tested by:	George Arias			
Test Date:	08/27/2014			
Remarks	N/A			



Neutral Line@ 120Vac, 60Hz

Frequency (MHz)	Raw (dBuV)	Cable Loss (dB)	Factors (dB)	Level (dBuV)	Measurement Type	Line	Limit (dBuV)	Margin (dB)	Pass /Fail
0.31	42.57	10.00	0.71	53.29	Quasi Peak	Neutral	59.87	-6.59	Pass
0.90	37.72	10.01	0.77	48.51	Quasi Peak	Neutral	56.00	-7.49	Pass
1.36	37.21	10.02	0.85	48.08	Quasi Peak	Neutral	56.00	-7.92	Pass
1.54	32.39	10.02	0.88	43.29	Quasi Peak	Neutral	56.00	-12.71	Pass
1.74	30.13	10.02	0.91	41.06	Quasi Peak	Neutral	56.00	-14.94	Pass
1.82	31.10	10.02	0.92	42.04	Quasi Peak	Neutral	56.00	-13.96	Pass
0.31	23.97	10.00	0.71	34.68	Average	Neutral	49.87	-15.19	Pass
0.90	19.47	10.01	0.77	30.26	Average	Neutral	46.00	-15.74	Pass
1.36	19.55	10.02	0.85	30.42	Average	Neutral	46.00	-15.58	Pass
1.54	15.35	10.02	0.88	26.25	Average	Neutral	46.00	-19.75	Pass
1.74	12.58	10.02	0.91	23.51	Average	Neutral	46.00	-22.49	Pass
1.82	16.64	10.02	0.92	27.58	Average	Neutral	46.00	-18.42	Pass

Note: The results above show only the worst case.

10.2 26 dB & 6dB 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 26dB Emission bandwidth measurement procedure (Other than 5.725-5.85 GHz) - 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. 6 dB Minimum emission bandwidth measurement procedure (for 5.725-5.85 GHz) - 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	08/12/2014 – 09/24/2014	Environmental condition	Temperature 23°C Relative Humidity 42% Atmospheric Pressure 1021mbar
Remark	N/A		
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	-

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

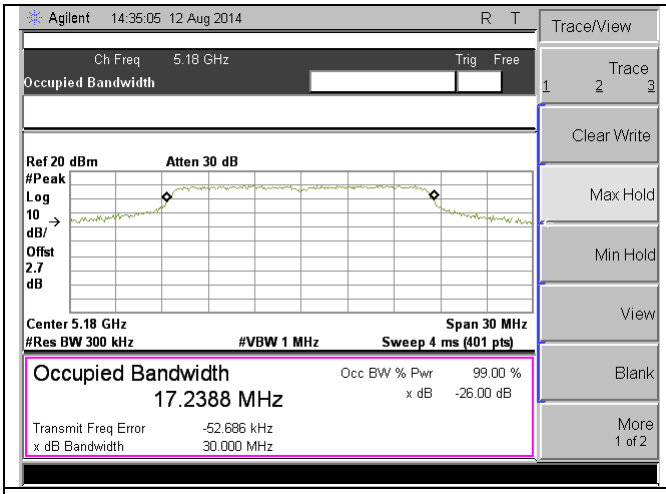
26dB Bandwidth measurement result for 5.1GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
26dB BW	802.11a	5180	Low	30.000	-	-
26dB BW	802.11a	5200	Mid	28.567	-	-
26dB BW	802.11a	5240	High	30.000	-	-
26dB BW	802.11n-20	5180	Low	29.896	-	-
26dB BW	802.11n-20	5200	Mid	29.888	-	-
26dB BW	802.11n-20	5240	High	30.000	-	-
26dB BW	802.11n-40	5190	Low	40.510	-	-
26dB BW	802.11n-40	5230	High	46.300	-	-
26dB BW	802.11ac-80	5210	Mid	83.920	-	-

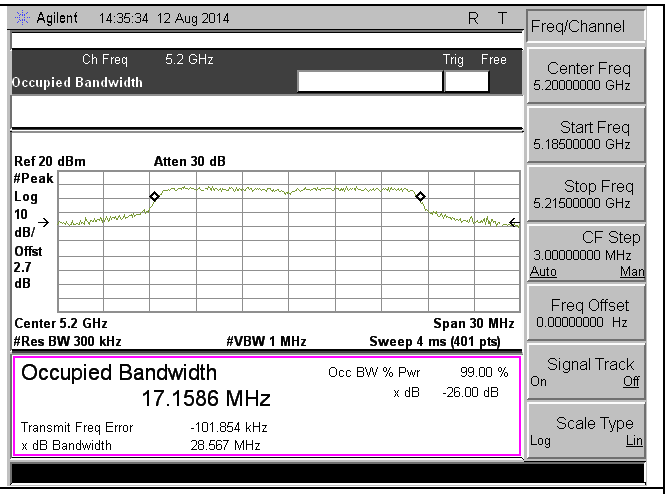
6dB Bandwidth measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Result (MHz)	Limit (MHz)	Result
6dB BW	802.11a	5745	Low	16.45	≥0.5	Pass
6dB BW	802.11a	5785	Mid	16.47	≥0.5	Pass
6dB BW	802.11a	5825	High	16.49	≥0.5	Pass
6dB BW	802.11n-20	5745	Low	17.61	≥0.5	Pass
6dB BW	802.11n-20	5785	Mid	17.57	≥0.5	Pass
6dB BW	802.11n-20	5825	High	17.65	≥0.5	Pass
6dB BW	802.11n-40	5755	Low	36.33	≥0.5	Pass
6dB BW	802.11n-40	5795	High	36.47	≥0.5	Pass
6dB BW	802.11ac-80	5775	Mid	75.78	≥0.5	Pass

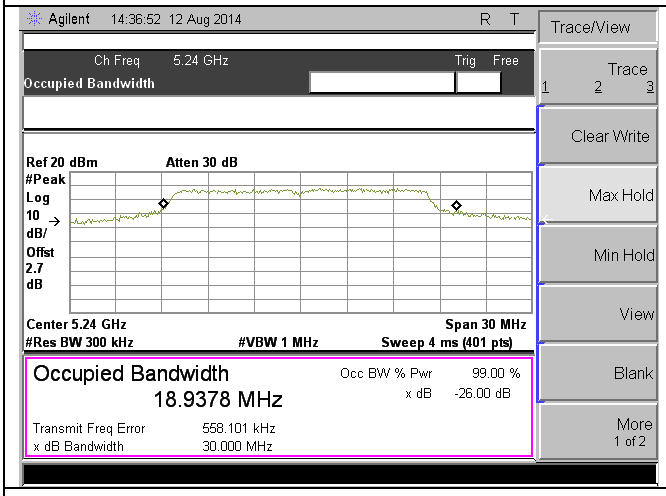
26dB Bandwidth Test Plots



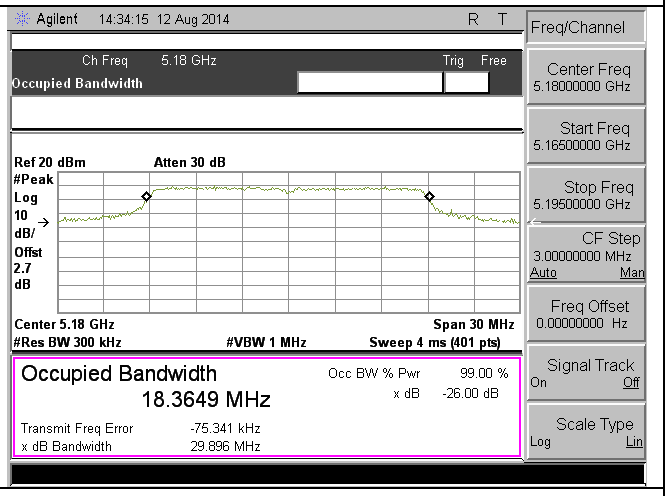
26dB BW -802.11a 5180MHz



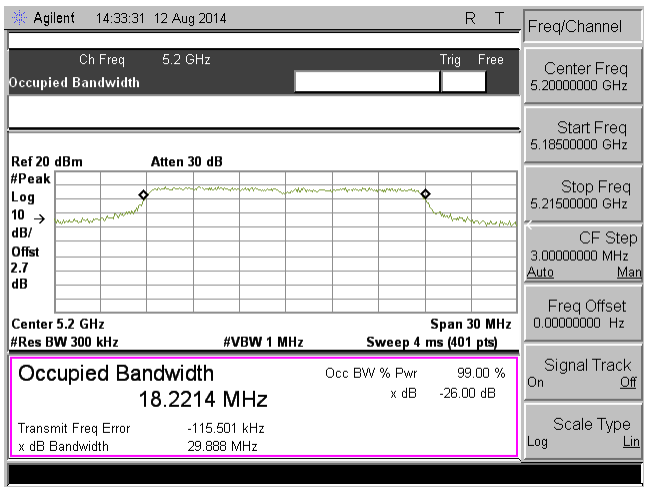
26dB BW -802.11a 5200MHz



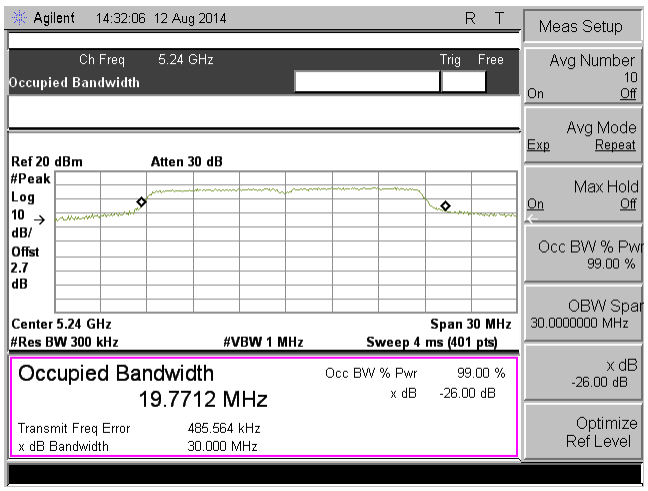
26dB BW -802.11a 5240MHz



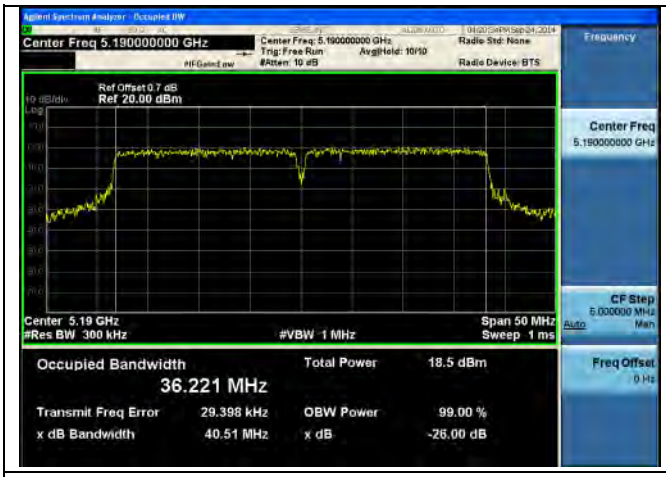
26dB BW -802.11n-20M 5180MHz



26dB BW -802.11n-20M 5200MHz

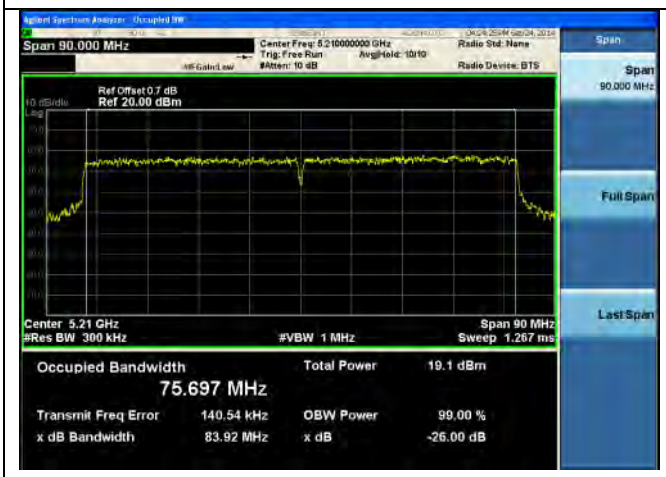


26dB BW -802.11n-20M 5240MHz



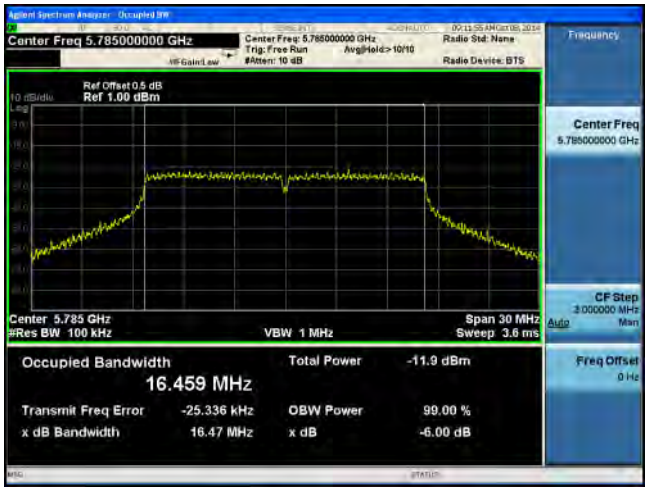
26dB BW -802.11n-40M 5190MHz

26dB BW -802.11n-40M 5230MHz

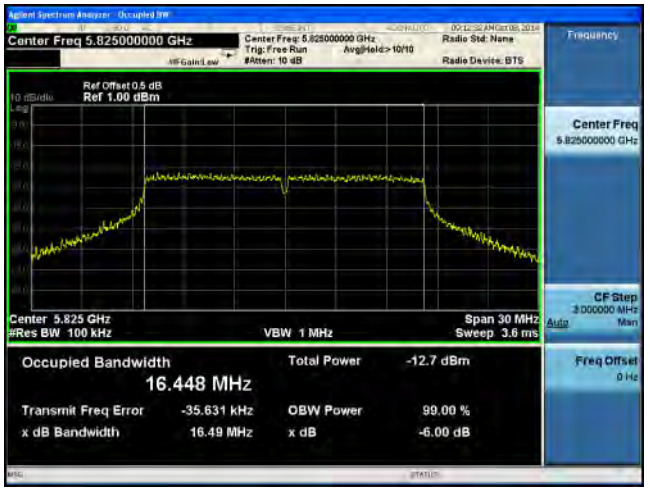


26dB BW -802.11ac-80M 5210MHz

6dB BW -802.11a 5745MHz

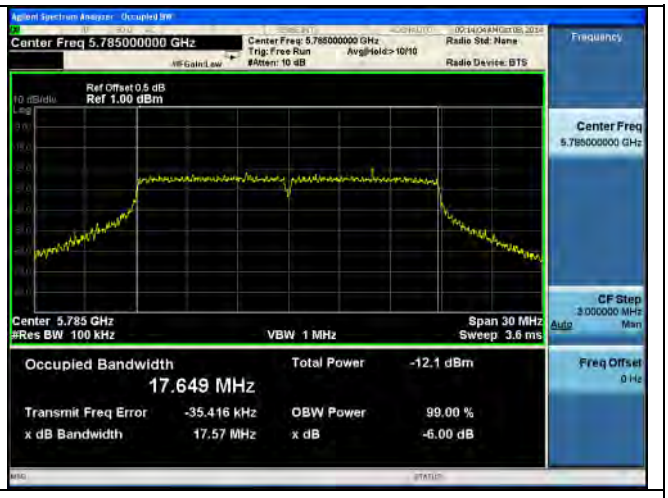


6dB BW -802.11a 5785MHz



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 Measurement using a Power Meter (PM) 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	08/13/2014	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	23°C 44% 1021mbar
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	Chain2	Combined Power		
Output Power	802.11a	5180	Low	19.7	19.5	20.3	24.6	≤30	Pass
Output Power	802.11a	5200	Mid	19.8	19.5	20.2	24.6	≤30	Pass
Output Power	802.11a	5240	High	19.9	20.1	20.0	24.8	≤30	Pass
Output Power	802.11n-20M	5180	Low	19.0	18.6	19.7	23.9	≤30	Pass
Output Power	802.11n-20M	5200	Mid	19.5	19.5	20.2	24.5	≤30	Pass
Output Power	802.11n-20M	5240	High	19.9	20.0	20.0	24.7	≤30	Pass
Output Power	802.11n-40M	5190	Low	13.6	13.5	14.4	18.6	≤30	Pass
Output Power	802.11n-40M	5230	High	19.1	19.0	19.3	23.9	≤30	Pass
Output Power	802.11ac-80M	5210	Mid	11.6	11.2	12.4	16.5	≤30	Pass

Output Power measurement result for 5.8GHz

Type	Test mode	Freq (MHz)	CH	Conducted Power (dBm)				Limit (dBm)	Result
				Chain0	Chain1	Chain2	Combined Power		
Output power	802.11a	5745	Low	22.6	21.9	21.6	26.8	≤30	Pass
Output power	802.11a	5785	Mid	20.7	20.1	19.7	25.0	≤30	Pass
Output power	802.11a	5825	High	20.8	20.4	20.3	25.3	≤30	Pass
Output power	802.11n-20M	5745	Low	21.9	21.1	20.9	26.1	≤30	Pass
Output power	802.11n-20M	5785	Mid	19.7	19.1	18.7	24.0	≤30	Pass
Output power	802.11n-20M	5825	High	20.0	19.6	19.4	24.4	≤30	Pass
Output power	802.11n-40M	5755	Low	21.0	21.1	20.9	25.8	≤30	Pass
Output power	802.11n-40M	5795	High	19.2	19.1	18.7	23.8	≤30	Pass
Output power	802.11ac-80M	5775	Mid	19.2	18.4	18.4	23.5	≤30	Pass

10.4 Band Edge

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.407	b)(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.	☒
	b)(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 e.i.r.p. of −27 dBm/MHz.	☐
	b)(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 e.i.r.p. of −27 dBm/MHz.	☐
	b)(4)	For transmitters operating in the 5.725-5.85 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 e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.	☒

Test Setup			
Test Procedure	789033 D02 General UNII Test Procedures New Rules v01 Band Edge measurement procedure (Integration Method) - Set analyzer center frequency to the frequency of the emission to be measured. - Set the span to 2 MHz. - Set RBW = 100 kHz - Set VBW ⩾ 3 · RBW - Detector = RMS - Averaging type = power - Sweep time = auto - Perform a trace average of at least 100 traces if the transmission is continuous. If the transmission is not continuous, the number of traces shall be increased by a factor of 1/x, where x is the duty cycle. For example, with 50 percent duty cycle, at least 200 traces shall be averaged. (If a specific emission is demonstrated to be continuous—i.e.,100 percent duty cycle—rather than turning on and off with the transmit cycle, at least 100 traces shall be averaged.)		
Test Date	08/20/2014	Environmental condition	Temperature 22ºC Relative Humidity 46% Atmospheric Pressure 1020mbar
Remark	-		
Result	☒ Pass ☐ Fail		

Equipment Setting

TEST	RBW	VBW	SPAN	Detector	SWEEP	Trace	NOTES
Band Edge	100KHz	⩾ 3 · RBW	2MHz	RMS	Auto	Average	-

Test Data ☒ Yes ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Band Edge measurement result for horizontal antenna chain (single antenna) – 5.1GHz

Type	Freq (MHz)	CH	Conducted Band Edge (dBm/MHz)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
			Chain0				
802.11a Band Edge	5150	Low	-31.97	3	-28.97	≤-27	Pass
802.11a Band Edge	5250	High	-32.05	3	-29.05	≤-27	Pass
802.11n-20M Band Edge	5150	Low	-38.58	3	-35.58	≤-27	Pass
802.11n-20M Band Edge	5250	High	-39.59	3	-36.59	≤-27	Pass
802.11n-40M Band Edge	5150	Low	-37.02	3	-34.02	≤-27	Pass
802.11n-40M Band Edge	5250	High	-35.55	3	-32.55	≤-27	Pass
802.11ac-80M Band Edge	5150	Low	-36.87	3	-33.87	≤-27	Pass
802.11ac-80M Band Edge	5250	High	-37.77	3	-34.77	≤-27	Pass

Band Edge measurement result for vertical antenna chain (two antennas) – 5.1GHz

Type	Freq (MHz)	CH	Conducted Band Edge (dBm/MHz)			Antenna Gain (dBi)	EIRP (dBm)	Limit (dB)	Result
			Chain1	Chain2	Combined Power or Highest Power				
802.11a Band Edge	5150	Low	-34.17	-39.87	-34.17	3	-31.17	≤-27	Pass
802.11a Band Edge	5250	High	-33.06	-32.16	-32.16	3	-29.16	≤-27	Pass
802.11n-20M Band Edge	5150	Low	-38.29	-38.20	-35.23	6	-29.23	≤-27	Pass
802.11n-20M Band Edge	5250	High	-39.56	-39.74	-36.63	6	-30.63	≤-27	Pass
802.11n-40M Band Edge	5150	Low	-37.04	-36.13	-33.55	6	-27.55	≤-27	Pass
802.11n-40M Band Edge	5250	High	-37.50	-35.71	-33.50	6	-27.50	≤-27	Pass
802.11ac-80M Band Edge	5150	Low	-39.44	-39.33	-36.37	6	-30.37	≤-27	Pass
802.11ac-80M Band Edge	5250	High	-37.61	-37.77	-34.68	6	-28.68	≤-27	Pass

Band Edge measurement result for horizontal antenna chain (single antenna) – 5.8GHz

Type	Freq (MHz)	CH	Conducted Band Edge (dBm/MHz)	Antenna Gain (dBi)	EIRP (dBm)	Limit (dB)	Result
			Chain0				
802.11a Band Edge	5725	Low	-20.13	3	-17.13	≤-17	Pass
802.11a Band Edge	5850	High	-30.20	3	-27.20	≤-17	Pass
802.11n-20M Band Edge	5725	Low	-20.88	3	-17.88	≤-17	Pass
802.11n-20M Band Edge	5850	High	-28.11	3	-25.11	≤-17	Pass
802.11n-40M Band Edge	5725	Low	-26.00	3	-23.00	≤-17	Pass
802.11n-40M Band Edge	5850	High	-35.43	3	-32.43	≤-17	Pass
802.11ac-80M Band Edge	5725	Low	-26.42	3	-23.42	≤-17	Pass
802.11ac-80M Band Edge	5850	High	-23.66	3	-20.66	≤-17	Pass

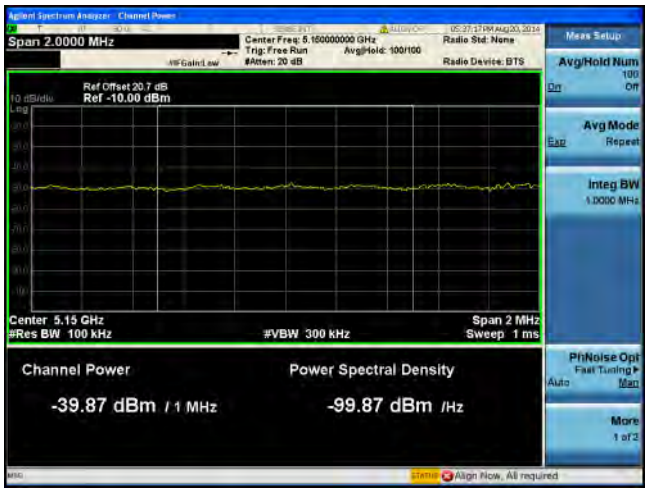
Band Edge measurement result for vertical antenna chain (two antennas) – 5.8GHz

Type	Freq (MHz)	CH	Conducted Band Edge (dBm/MHz)			Antenna Gain (dBi)	EIRP (dBm)	Limit (dB)	Result
			Chain1	Chain2	Combined Power or Highest Power				
802.11a Band Edge	5725	Low	-24.14	-26.69	-24.14	3	-19.22	≤-17	Pass
802.11a Band Edge	5850	High	-31.09	-30.69	-30.69	3	-24.88	≤-17	Pass
802.11n-20M Band Edge	5725	Low	-26.15	-26.48	-23.30	6	-17.30	≤-17	Pass
802.11n-20M Band Edge	5850	High	-31.28	-29.58	-27.34	6	-21.34	≤-17	Pass
802.11n-40M Band Edge	5725	Low	-26.20	-26.20	-23.19	6	-17.19	≤-17	Pass
802.11n-40M Band Edge	5850	High	-36.91	-36.77	-33.83	6	-27.83	≤-17	Pass
802.11ac-80M Band Edge	5725	Low	-26.06	-26.33	-23.18	6	-17.18	≤-17	Pass
802.11ac-80M Band Edge	5850	High	-27.14	-27.07	-24.09	6	-18.09	≤-17	Pass

Test Plots

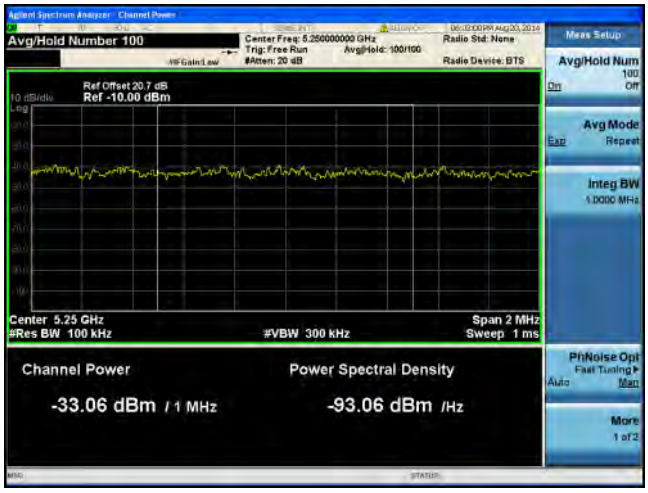
Band Edge-5.1G-802.11a Low-Chain0

Band Edge-5.1G-802.11a Low-Chain1



Band Edge-5.1G-802.11a Low-Chain2

Band Edge-5.1G-802.11a High-Chain0



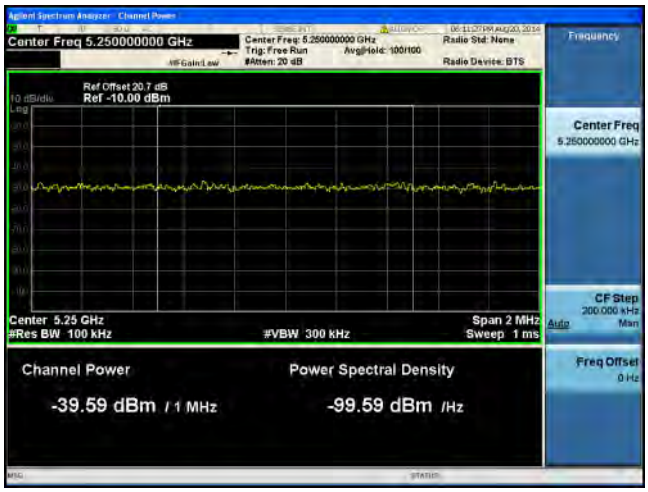
Band Edge-5.1G-802.11a High-Chain1

Band Edge-5.1G-802.11a High-Chain2

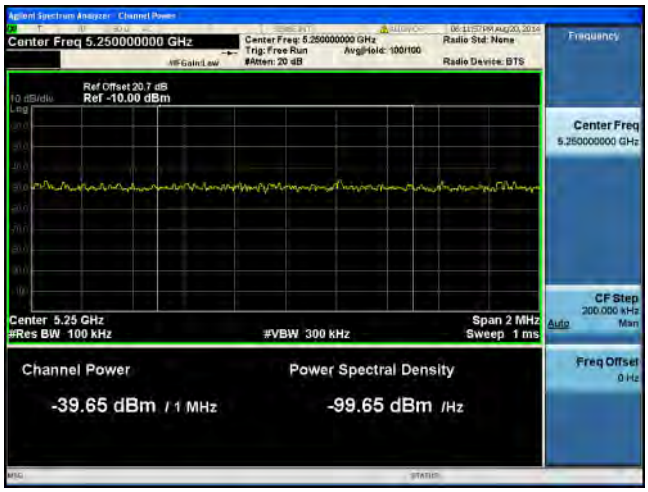
Band Edge-5.1G-802.11n-20M Low-Chain0

Band Edge-5.1G-802.11n-20M Low-Chain1

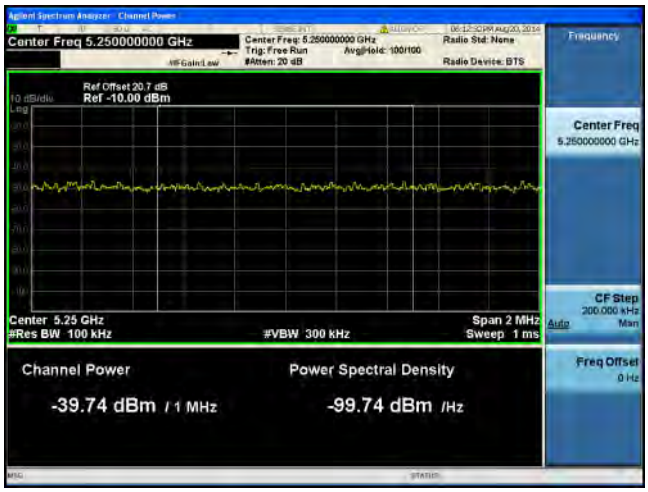
Band Edge-5.1G-802.11n-20M Low-Chain2



Band Edge-5.1G-802.11n-20M High-Chain0

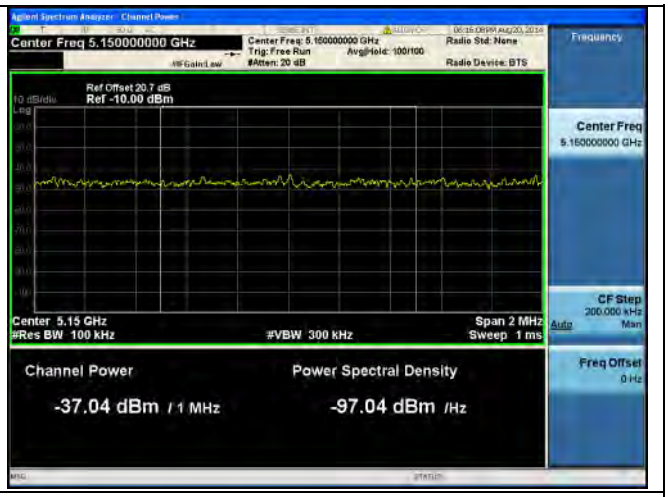


Band Edge-5.1G-802.11n-20M High-Chain1

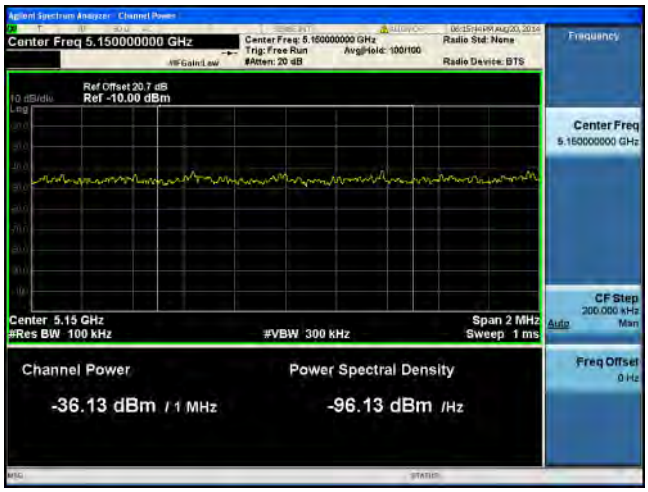


Band Edge-5.1G-802.11n-20M High-Chain2

Band Edge-5.1G-802.11n-40M Low-Chain0



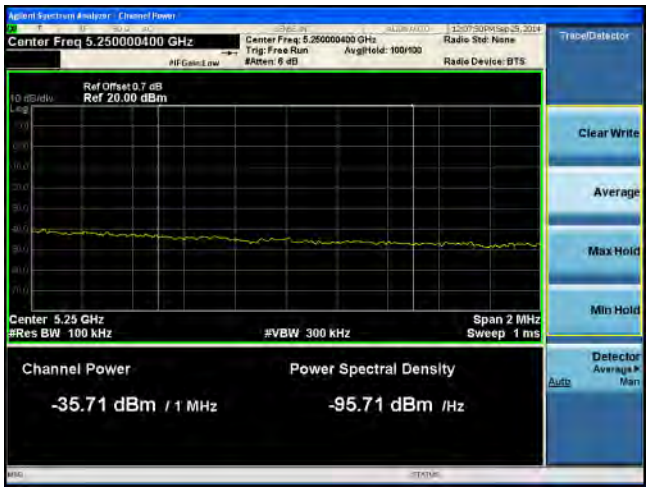
Band Edge-5.1G-802.11n-40M Low-Chain1



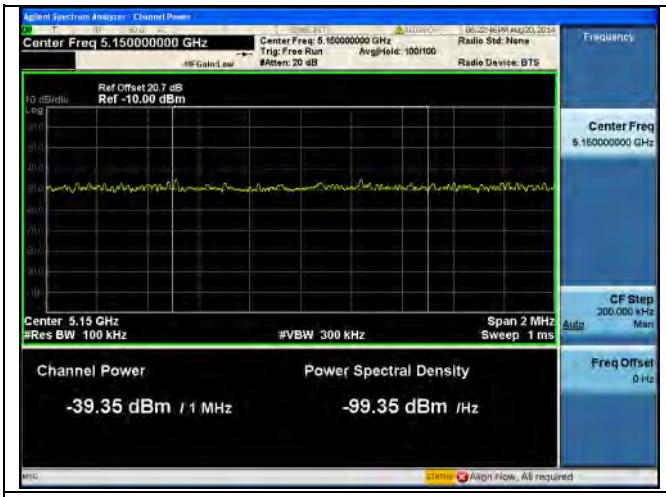
Band Edge-5.1G-802.11n-40M Low-Chain2

Band Edge-5.1G-802.11n-40M High-Chain0

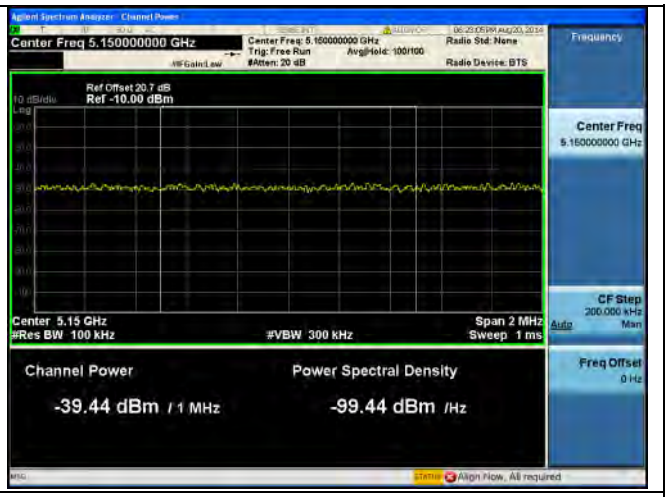
Band Edge-5.1G-802.11n-40M High-Chain1



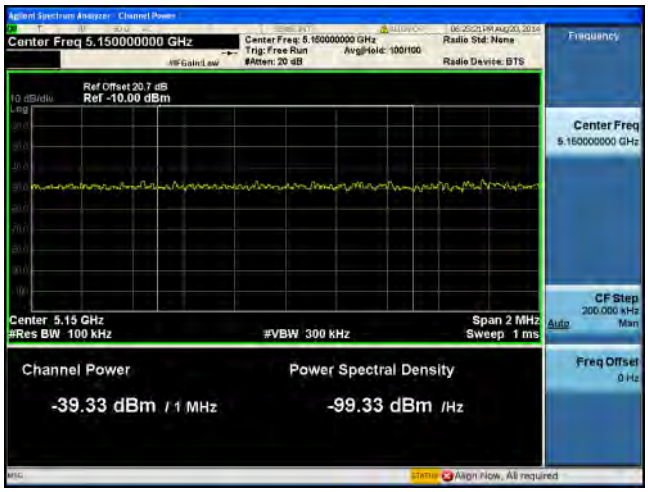
Band Edge-5.1G-802.11n-40M High-Chain2



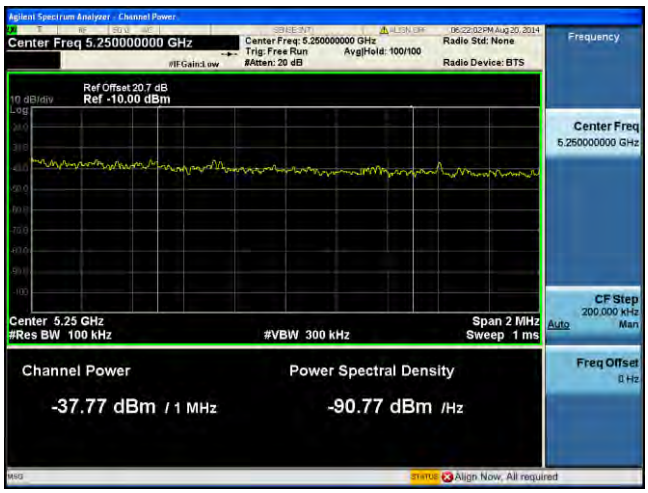
Band Edge-5.1G-802.11ac-80M Low-Chain0



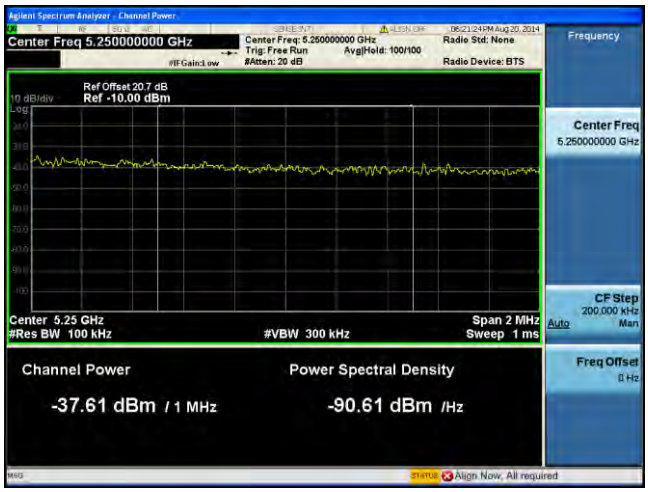
Band Edge-5.1G-802.11ac-80M Low-Chain1



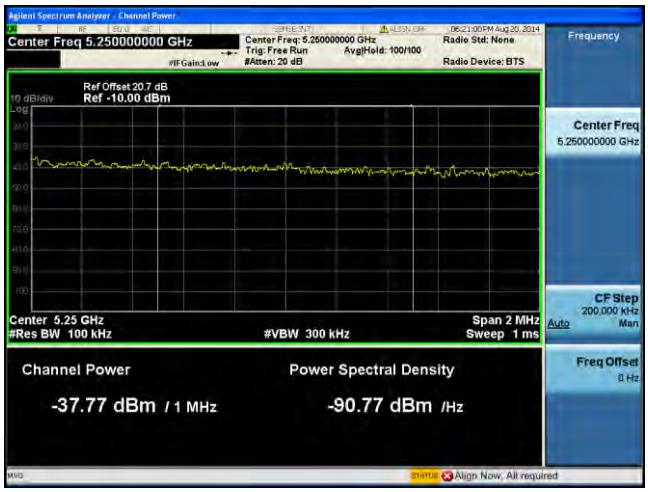
Band Edge-5.1G-802.11ac-80M Low-Chain2



Band Edge-5.1G-802.11ac-80M High-Chain0

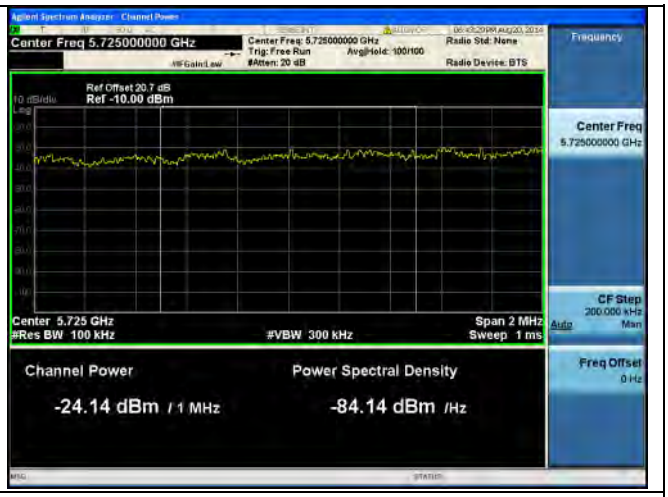


Band Edge-5.1G-802.11ac-80M High-Chain1

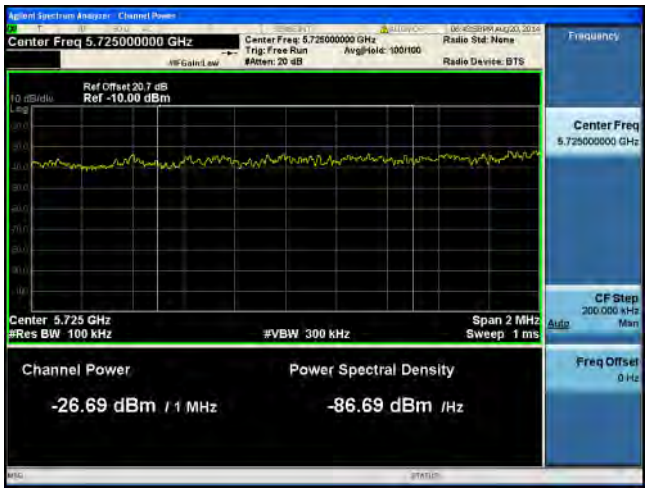


Band Edge-5.1G-802.11ac-80M High-Chain2

Band Edge-5.8G-802.11a Low-Chain0



Band Edge-5.8G-802.11a Low-Chain1

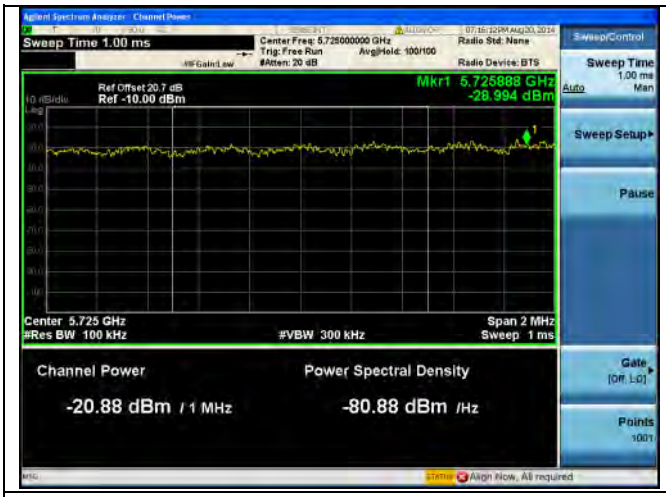


Band Edge-5.8G-802.11a Low-Chain2

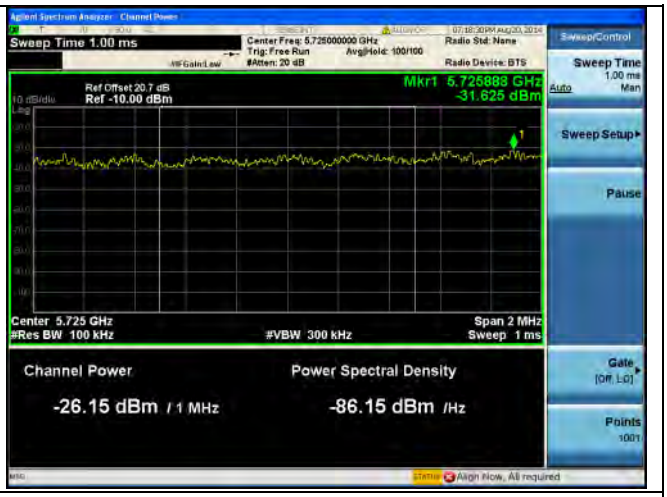
Band Edge-5.8G-802.11a High-Chain0

Band Edge-5.8G-802.11a High-Chain1

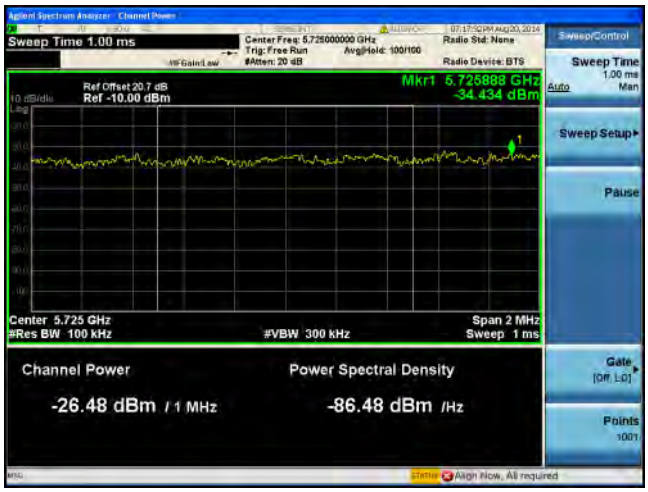
Band Edge-5.8G-802.11a High-Chain2



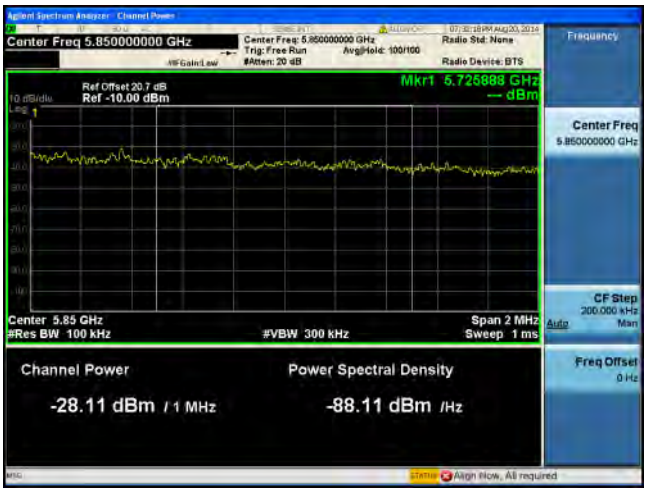
Band Edge-5.8G-802.11n-20M Low-Chain0



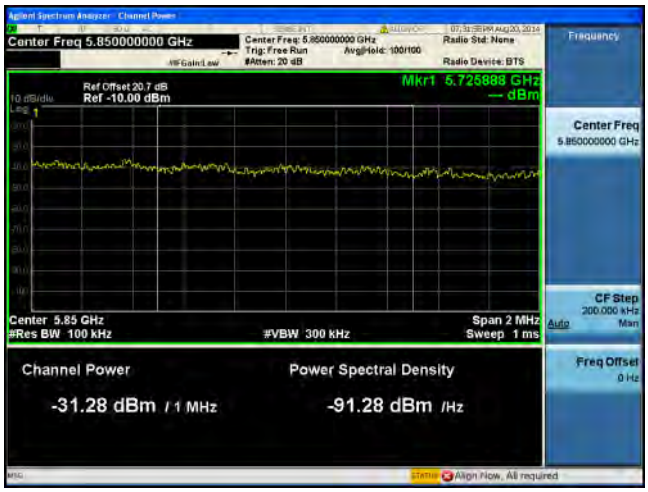
Band Edge-5.8G-802.11n-20M Low-Chain1



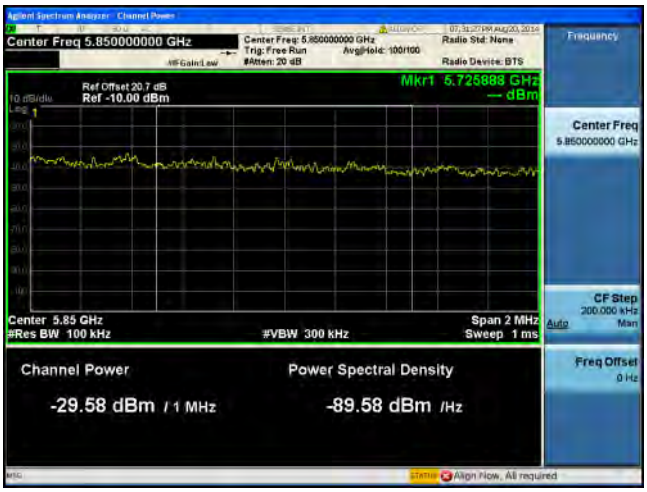
Band Edge-5.8G-802.11n-20M Low-Chain2



Band Edge-5.8G-802.11n-20M High-Chain0

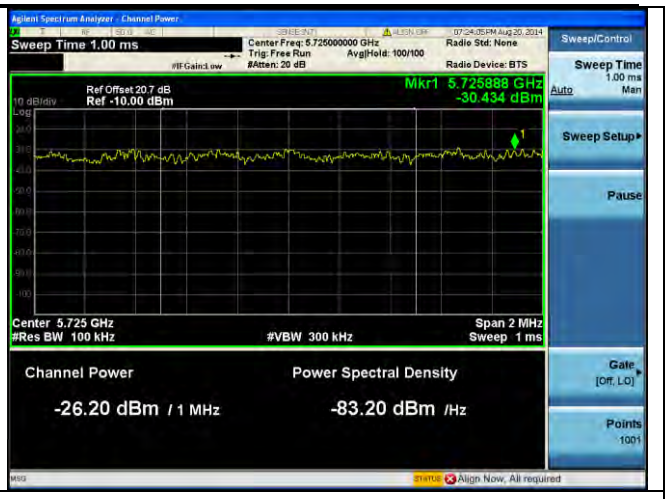


Band Edge-5.8G-802.11n-20M High-Chain1

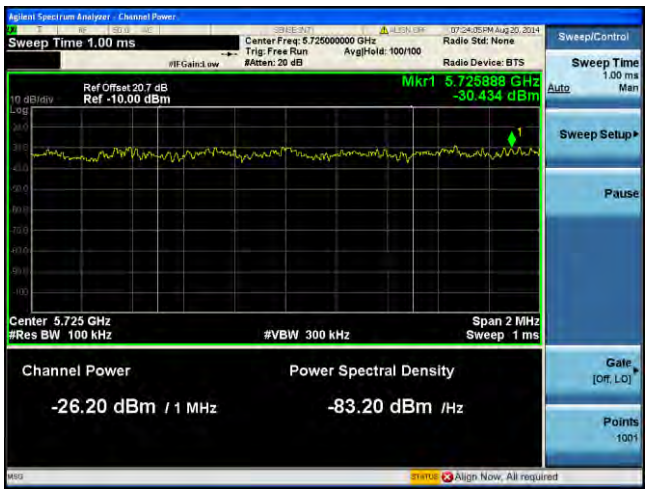


Band Edge-5.8G-802.11n-20M High-Chain2

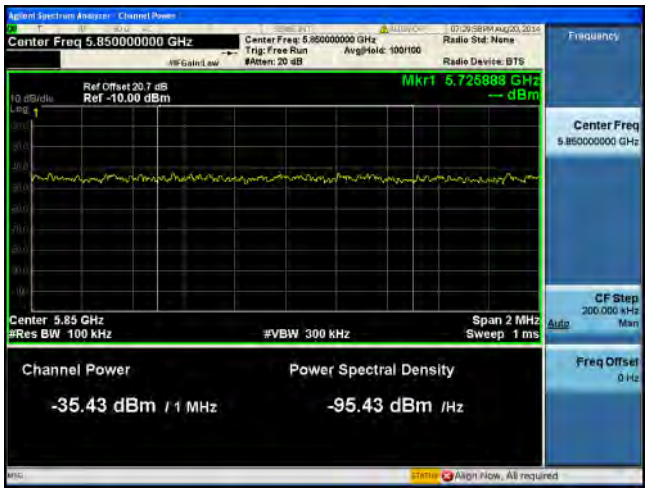
Band Edge-5.8G-802.11n-40M Low-Chain0



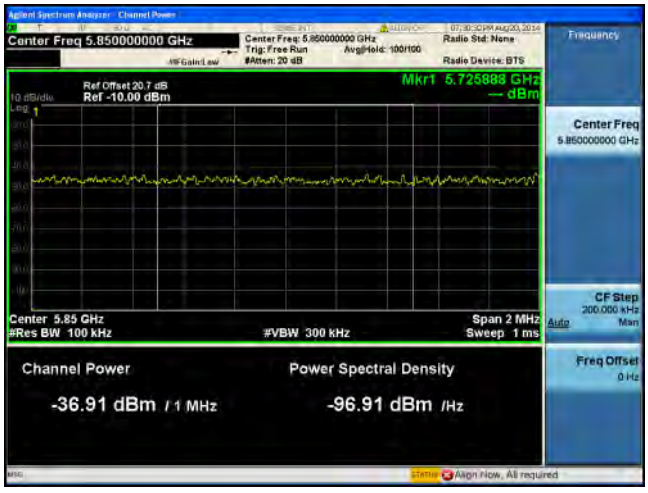
Band Edge-5.8G-802.11n-40M Low-Chain1



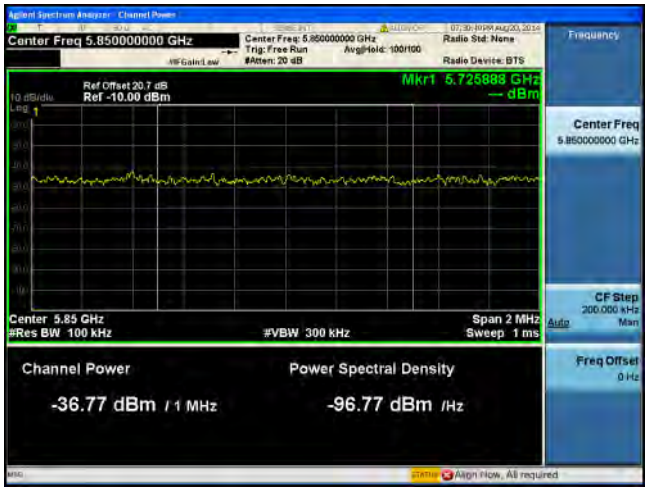
Band Edge-5.8G-802.11n-40M Low-Chain2



Band Edge-5.8G-802.11n-40M High-Chain0

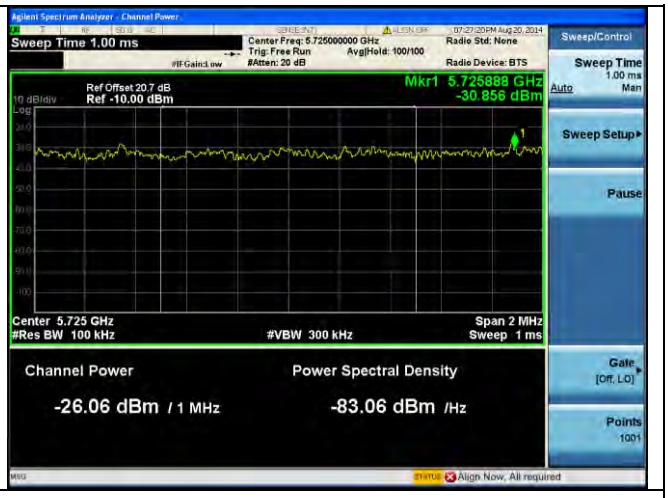


Band Edge-5.8G-802.11n-40M High-Chain1

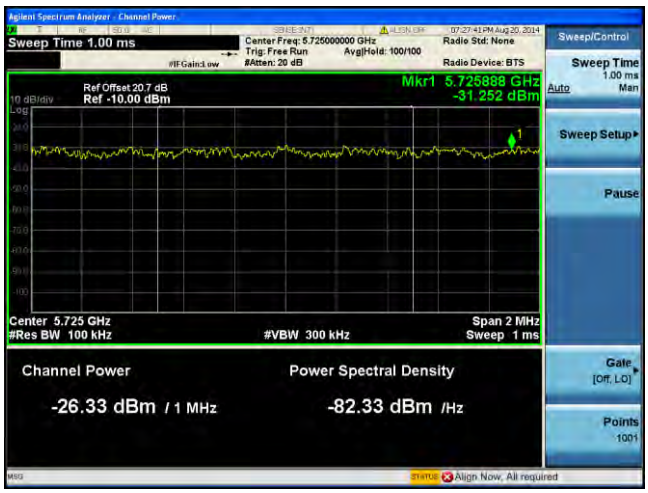


Band Edge-5.8G-802.11n-40M High-Chain2

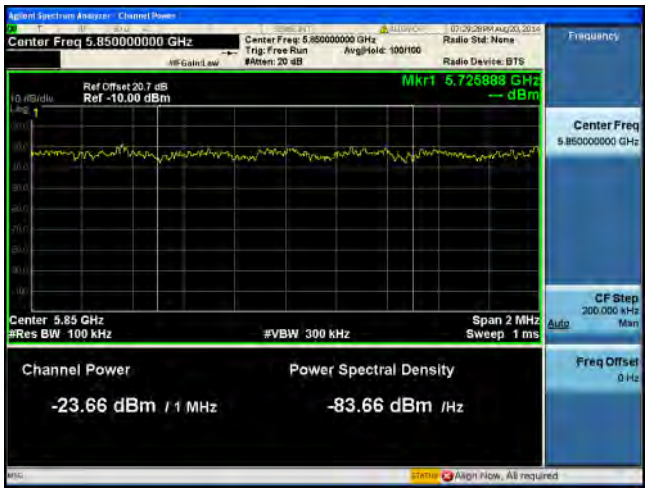
Band Edge-5.8G-802.11ac-80M Low-Chain0



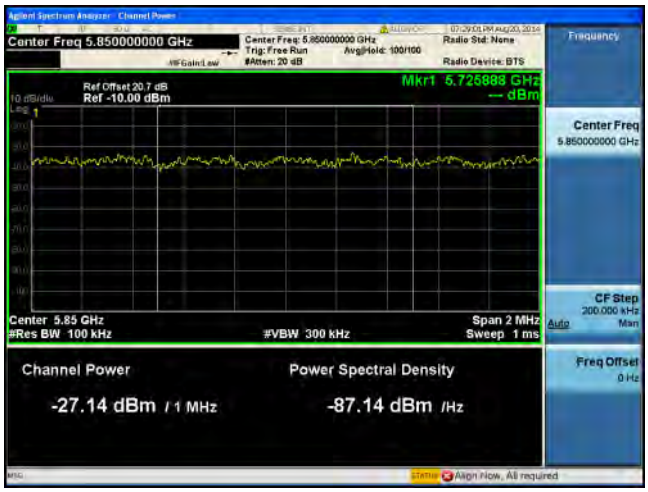
Band Edge-5.8G-802.11ac-80M Low-Chain1



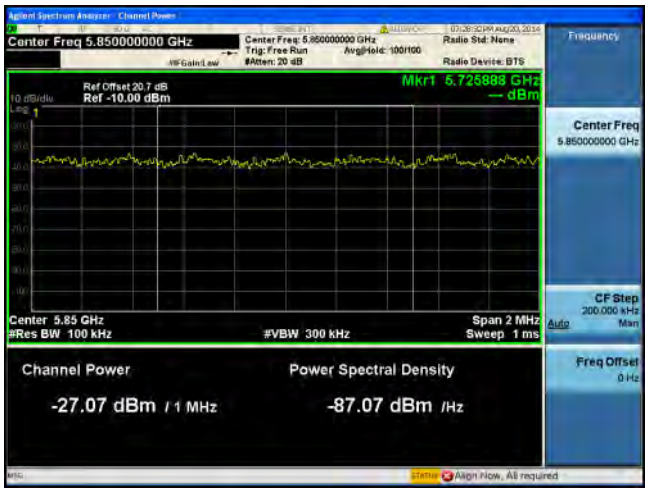
Band Edge-5.8G-802.11ac-80M Low-Chain2



Band Edge-5.8G-802.11ac-80M High-Chain0



Band Edge-5.8G-802.11ac-80M High-Chain1



Band Edge-5.8G-802.11ac-80M High-Chain2

10.5 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 Maximum spectral density measurement procedure - 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	08/16/2014	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	22ºC 46% 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

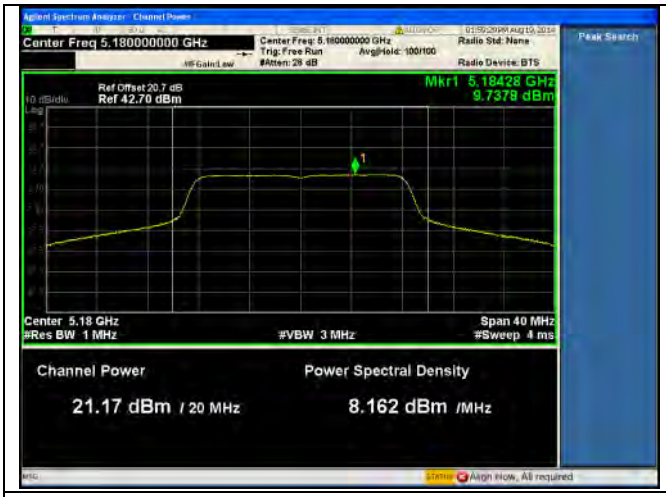
PSD measurement result for 5.1GHz

Type	Test mode	Freq (MHz)	CH	Conducted PSD (dBm/MHz)				Limit (dBm/MHz)	Result
				Chain0	Chain1	Chain2	Combined Power		
PSD	802.11a	5180	Low	9.74	9.73	10.34	14.72	≤17	Pass
PSD	802.11a	5200	Mid	9.89	9.60	10.01	14.61	≤17	Pass
PSD	802.11a	5240	High	9.77	10.03	9.77	14.63	≤17	Pass
PSD	802.11n-20M	5180	Low	8.79	8.43	9.17	13.58	≤17	Pass
PSD	802.11n-20M	5200	Mid	9.59	9.18	9.70	14.27	≤17	Pass
PSD	802.11n-20M	5240	High	9.28	9.50	9.14	14.08	≤17	Pass
PSD	802.11n-40M	5190	Low	0.86	0.79	1.21	5.73	≤17	Pass
PSD	802.11n-40M	5230	High	6.01	5.99	5.90	10.74	≤17	Pass
PSD	802.11ac-80M	5210	Mid	-2.21	-4.29	-3.93	1.39	≤17	Pass

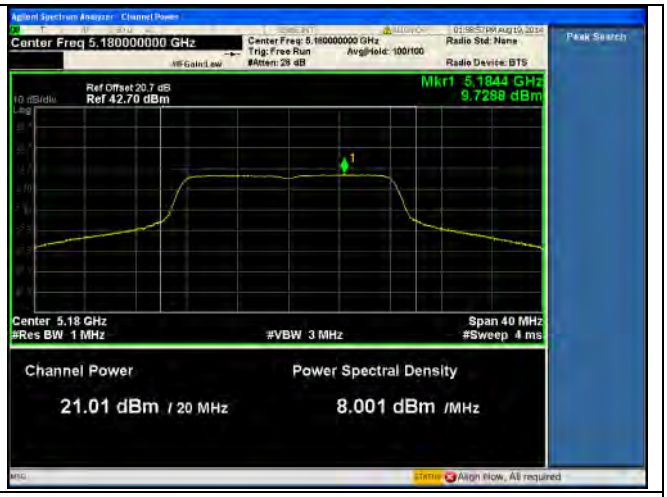
PSD measurement result for vertical antenna chains (two antennas) – 5.8GHz

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	Chain2	Combined Power				
PSD	802.11a	5745	Low	0.705	0.246	0.161	5.149	6.99	12.139	≤30	Pass
PSD	802.11a	5785	Mid	0.249	-0.407	0.310	4.834	6.99	11.824	≤30	Pass
PSD	802.11a	5825	High	0.384	-0.175	0.283	4.942	6.99	11.932	≤30	Pass
PSD	802.11n-20M	5745	Low	-0.081	-0.604	-0.976	4.233	6.99	11.223	≤30	Pass
PSD	802.11n-20M	5785	Mid	-0.654	-0.989	-1.030	3.884	6.99	10.874	≤30	Pass
PSD	802.11n-20M	5825	High	-1.008	-0.857	-0.820	3.877	6.99	10.867	≤30	Pass
PSD	802.11n-40M	5755	Low	-3.705	-4.775	-3.747	0.723	6.99	7.713	≤30	Pass
PSD	802.11n-40M	5795	High	-3.628	-4.945	-4.241	0.533	6.99	7.523	≤30	Pass
PSD	802.11ac-80M	5775	Mid	-7.091	-7.760	-7.642	-2.717	6.99	4.273	≤30	Pass
Note		BW correction factor = 10log(500kHz/RBW)									

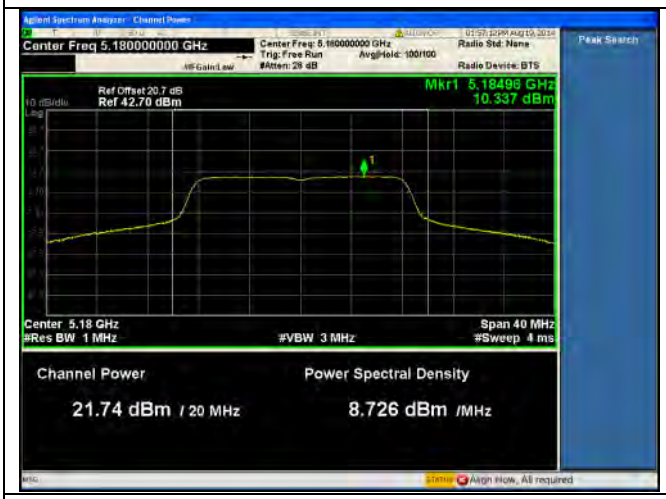
Test Plots



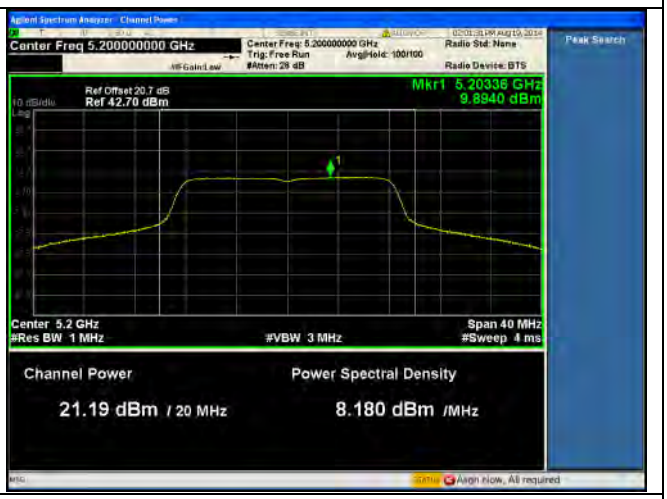
PSD-5.1G-802.11a Low-chain0



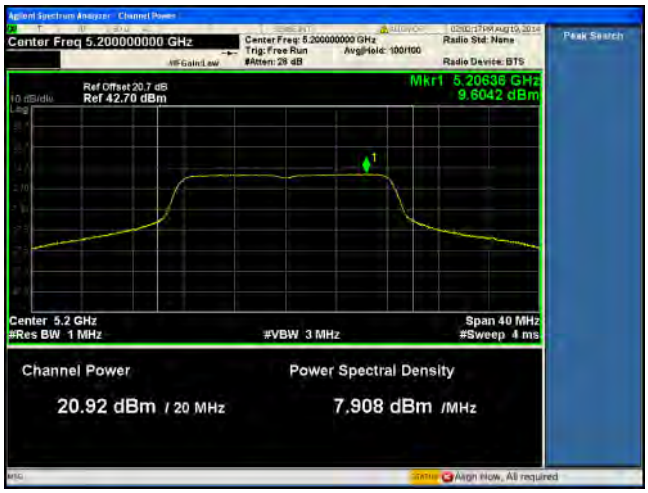
PSD-5.1G-802.11a Low-chain1



PSD-5.1G-802.11a Low-chain2

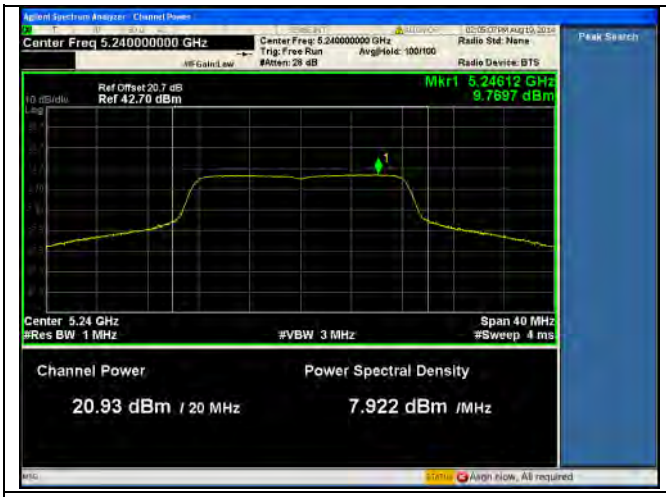


PSD-5.1G-802.11a Mid-chain0

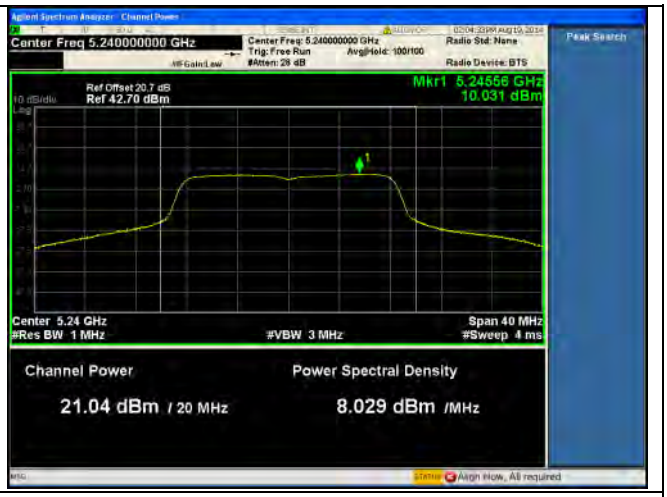


PSD-5.1G-802.11a Mid-chain1

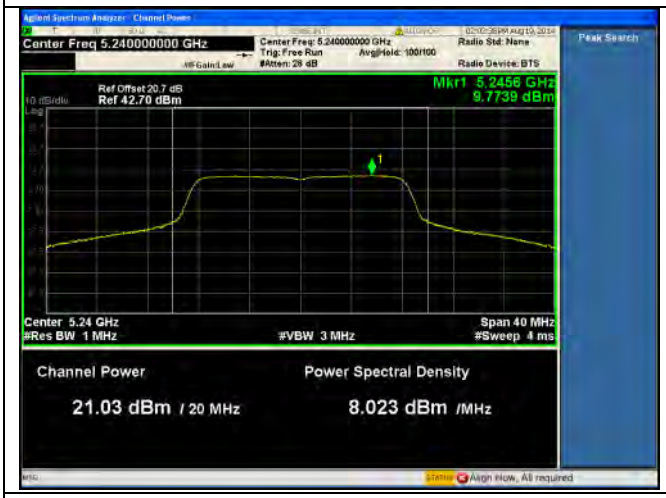
PSD-5.1G-802.11a Mid-chain2



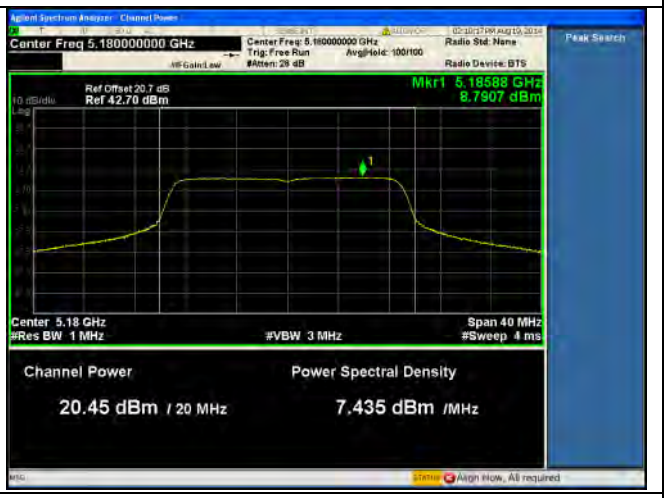
PSD-5.1G-802.11a High-chain0



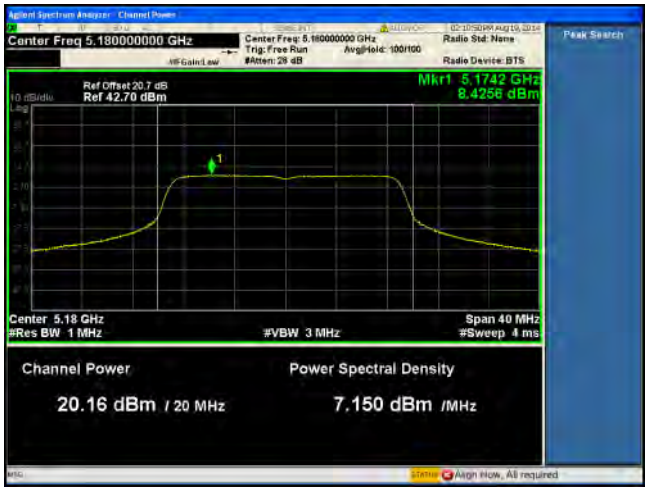
PSD-5.1G-802.11a High-chain1



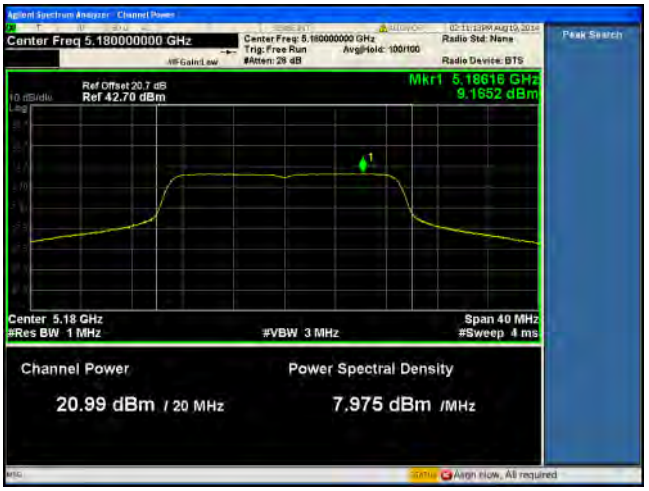
PSD-5.1G-802.11a High-chain2



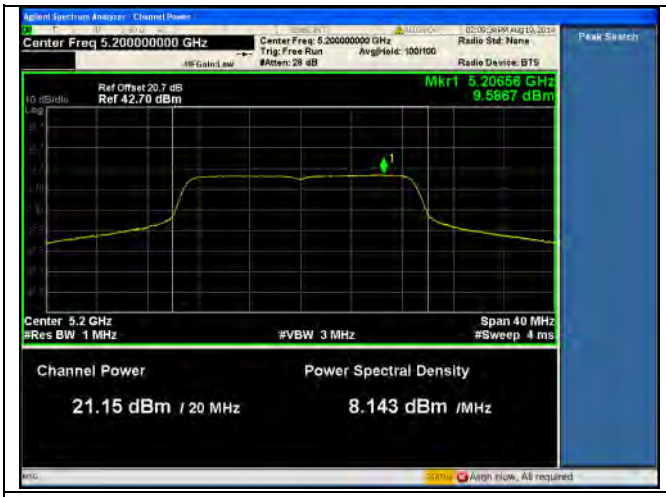
PSD-5.1G-802.11n-20M Low-chain0



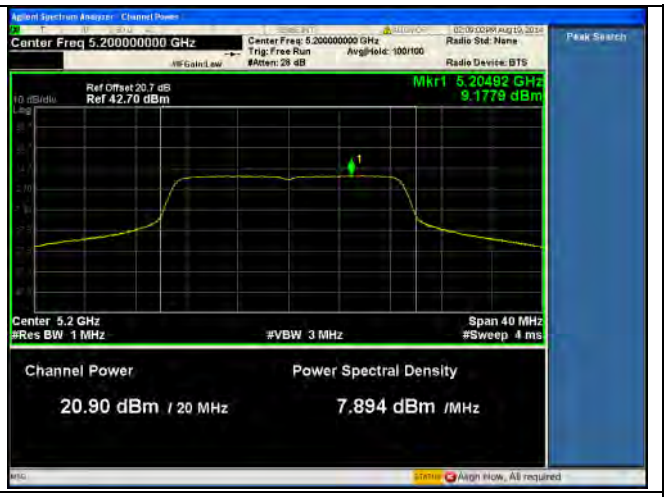
PSD-5.1G-802.11n-20M Low-chain1



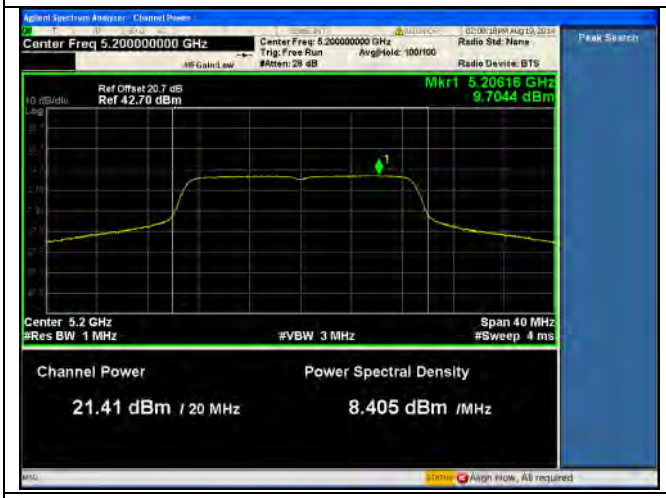
PSD-5.1G-802.11n-20M Low-chain2



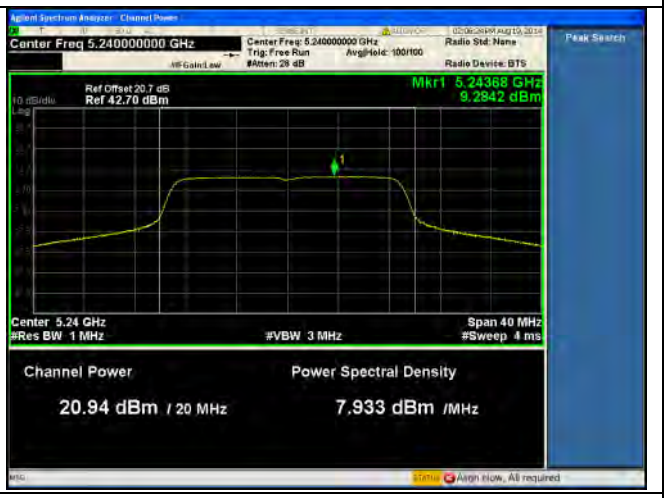
PSD-5.1G-802.11n-20M Mid-chain0



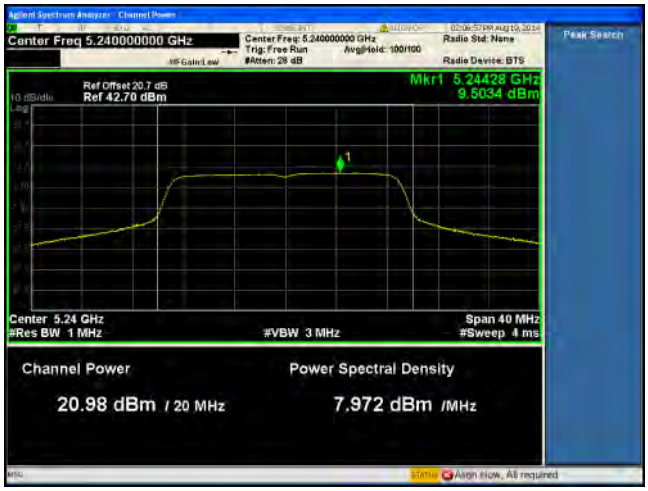
PSD-5.1G-802.11n-20M Mid-chain1



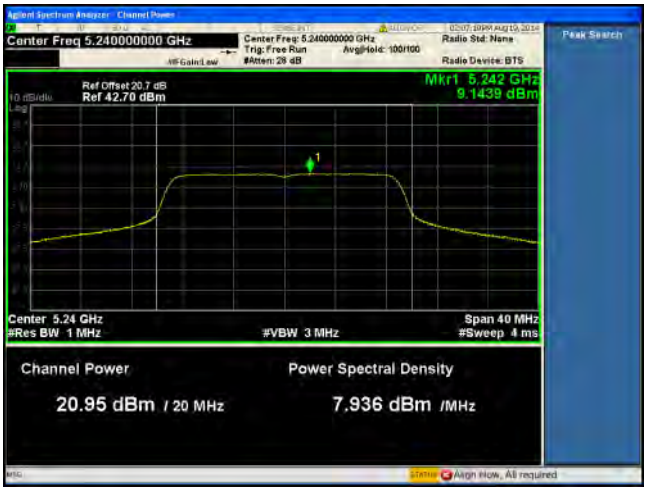
PSD-5.1G-802.11n-20M Mid-chain2



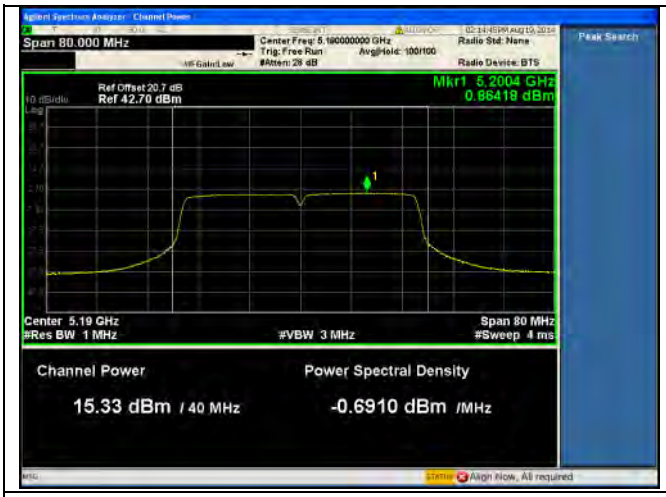
PSD-5.1G-802.11n-20M High-chain0



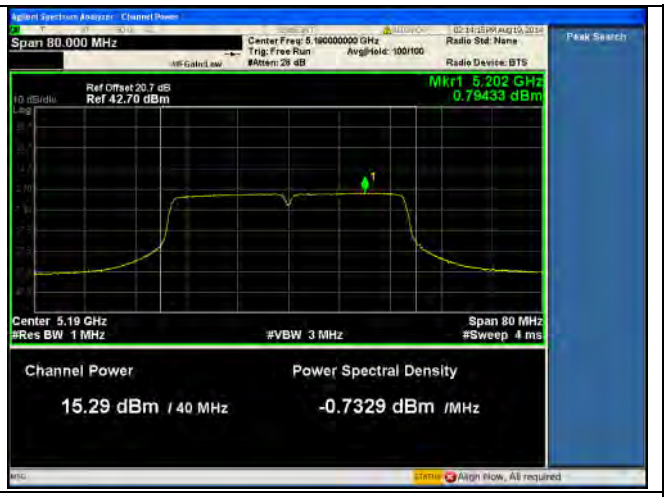
PSD-5.1G-802.11n-20M High-chain1



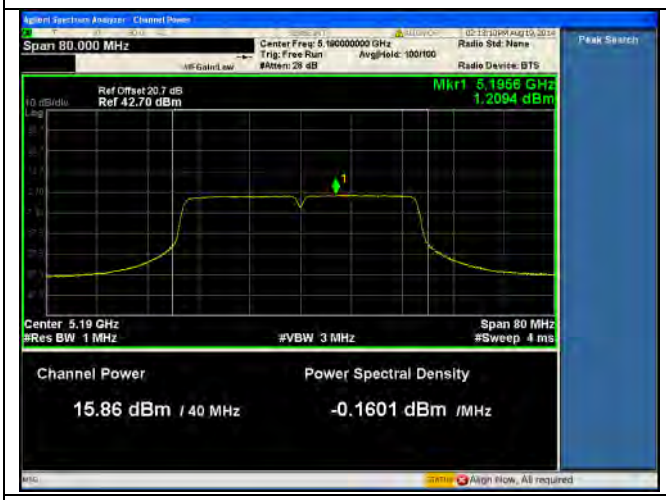
PSD-5.1G-802.11n-20M High-chain2



PSD-5.1G-802.11n-40M Low-chain0

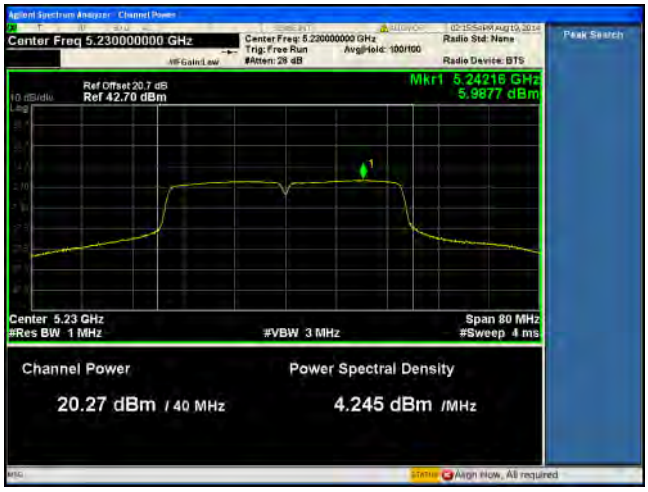


PSD-5.1G-802.11n-40M Low-chain1

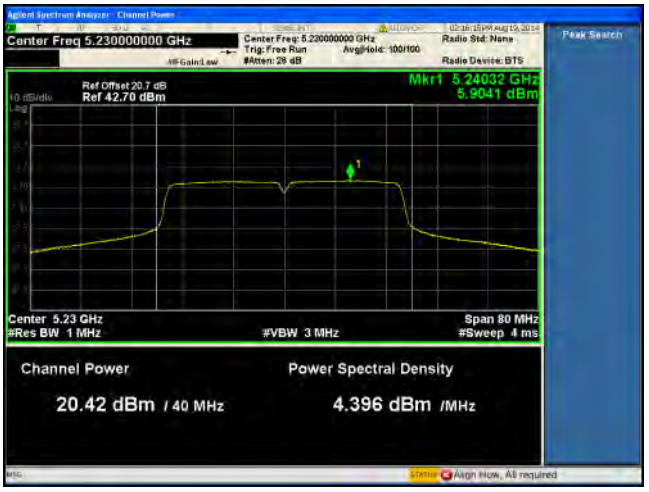


PSD-5.1G-802.11n-40M Low-chain2

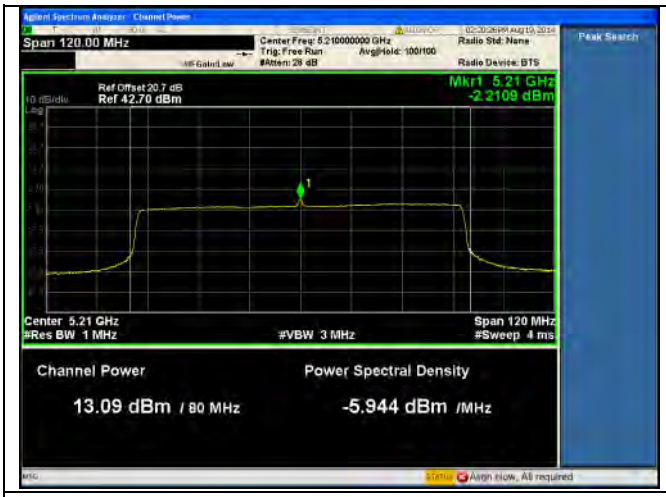
PSD-5.1G-802.11n-40M High-chain0



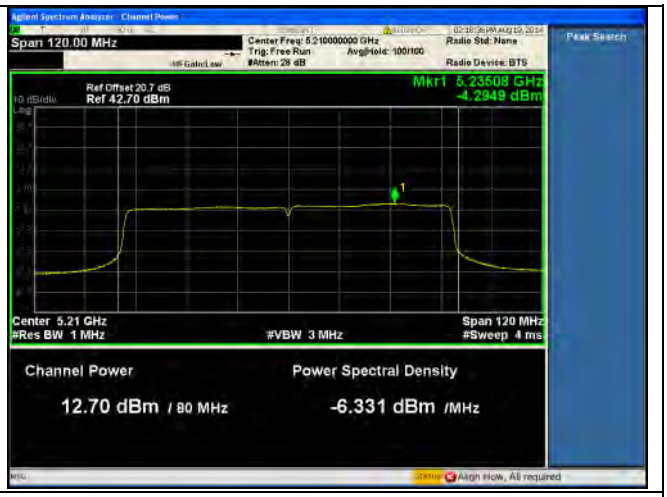
PSD-5.1G-802.11n-40M High-chain1



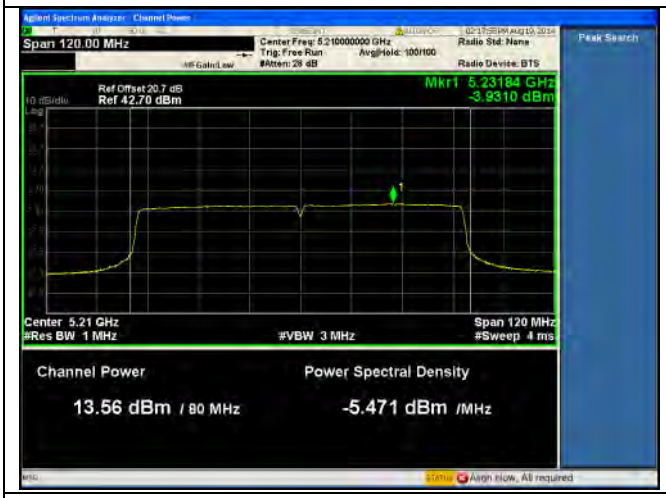
PSD-5.1G-802.11n-40M High-chain2



PSD-5.1G-802.11ac-80M Mid-chain0

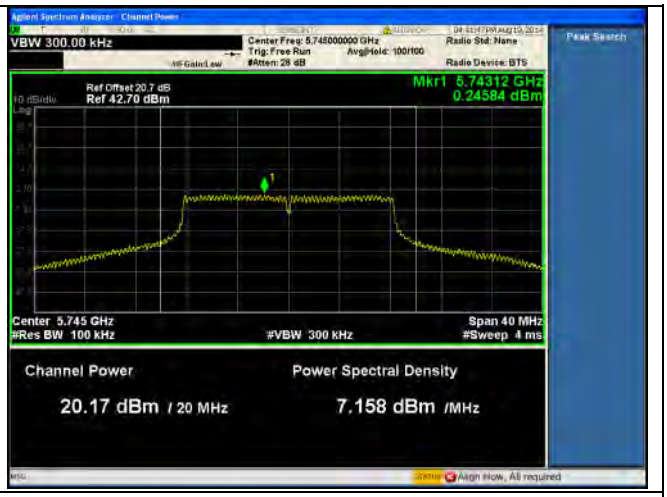


PSD-5.1G-802.11ac-80M Mid-chain1

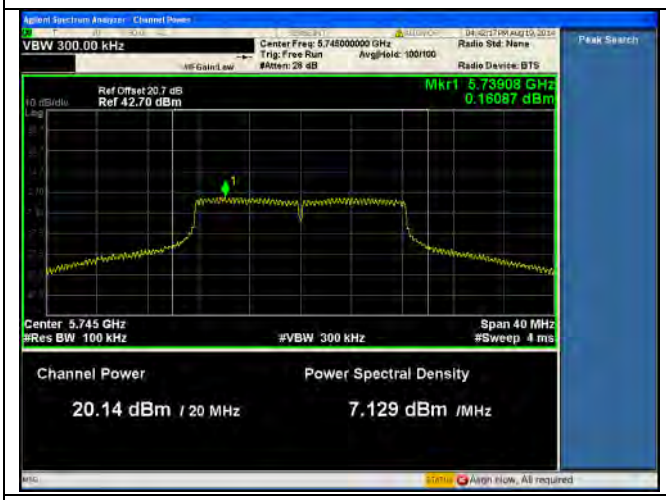


PSD-5.1G-802.11ac-80M Mid-chain2

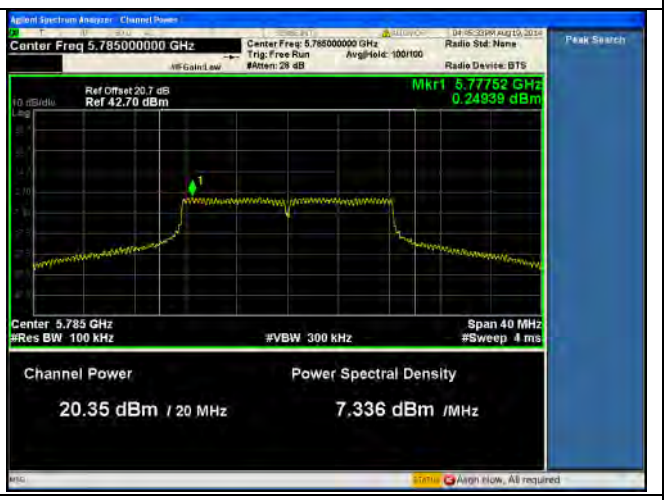
PSD-5.8G-802.11a Low-chain0



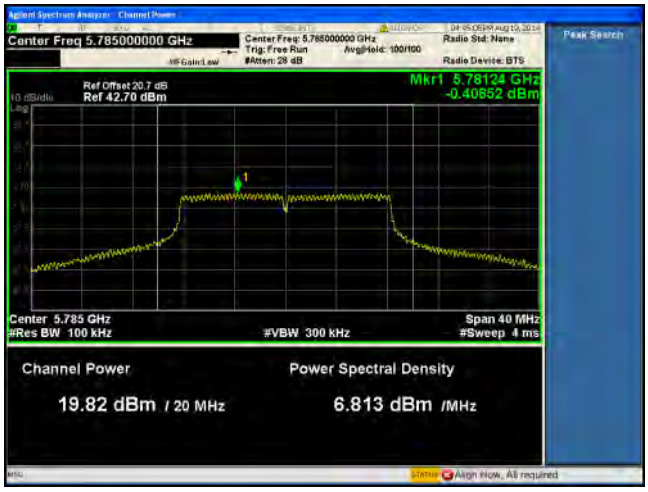
PSD-5.8G-802.11a Low-chain1



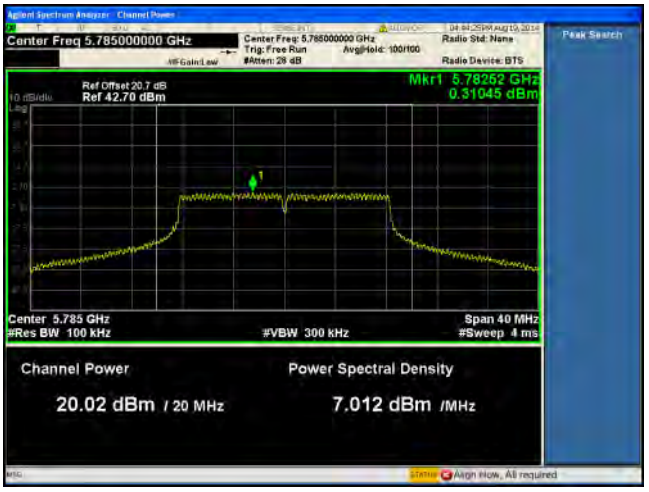
PSD-5.8G-802.11a Low-chain2



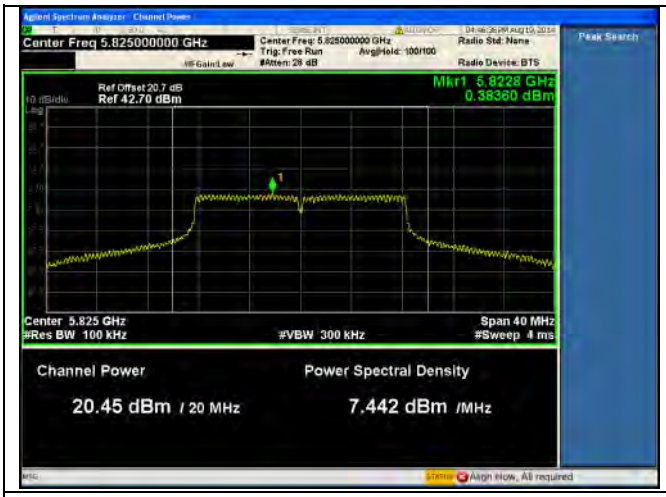
PSD-5.8G-802.11a Mid-chain0



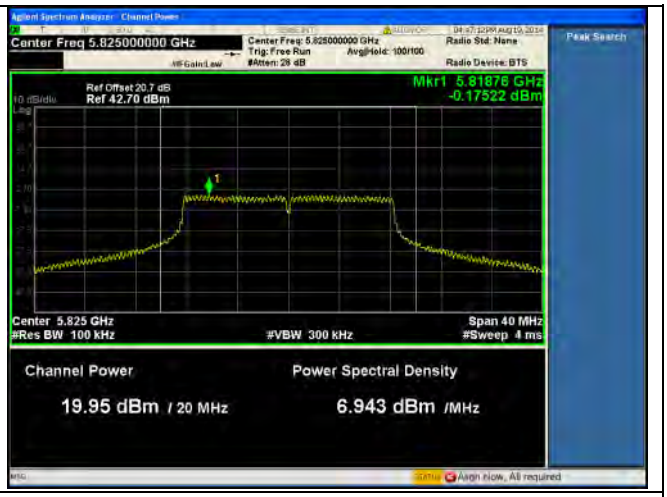
PSD-5.8G-802.11a Mid-chain1



PSD-5.8G-802.11a Mid-chain2

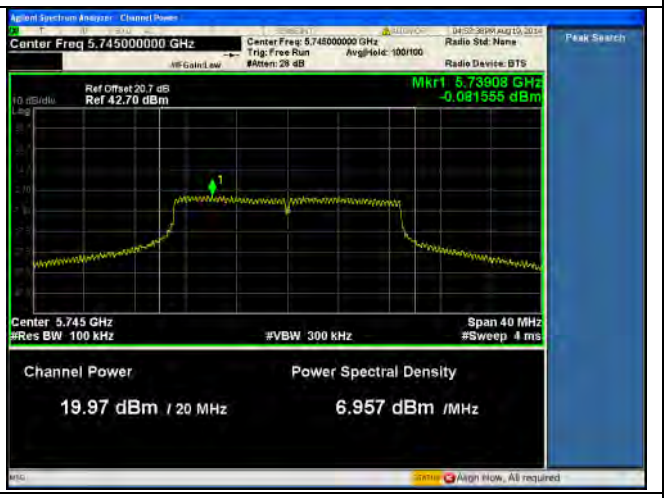


PSD-5.8G-802.11a High-chain0

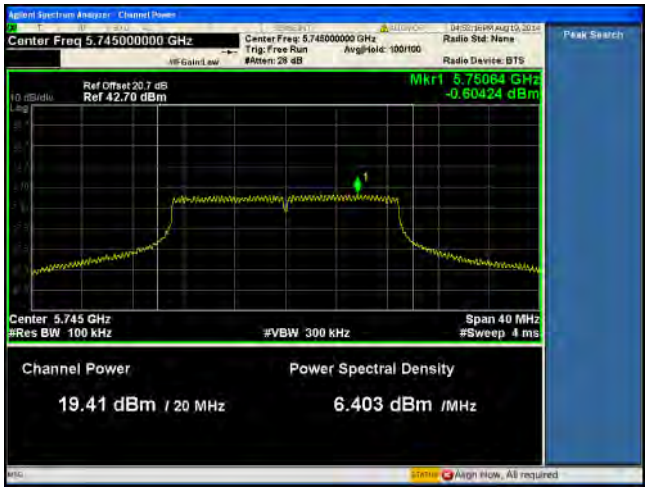


PSD-5.8G-802.11a High-chain1

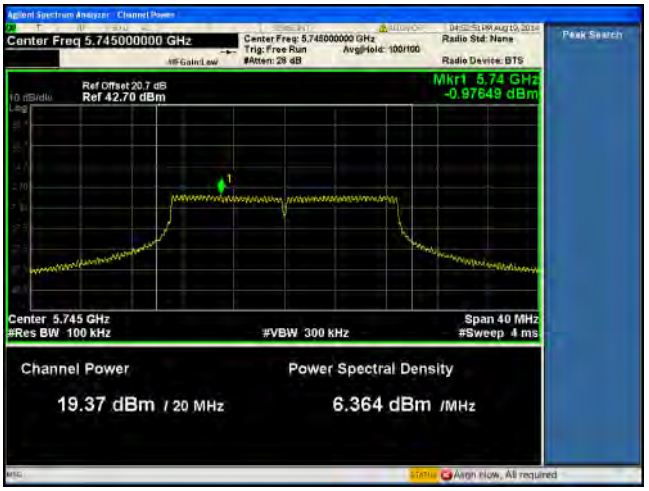
PSD-5.8G-802.11a High-chain2



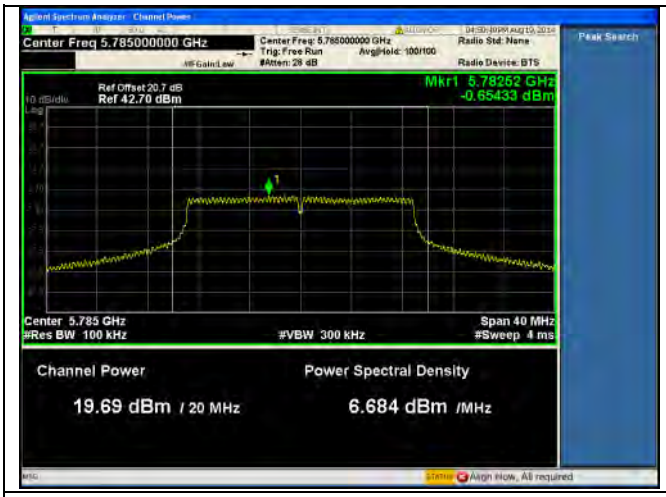
PSD-5.8G-802.11n-20M Low-chain0



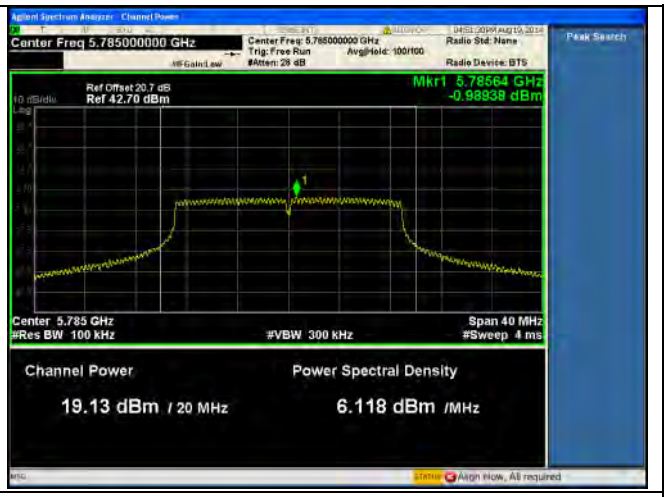
PSD-5.8G-802.11n-20M Low-chain1



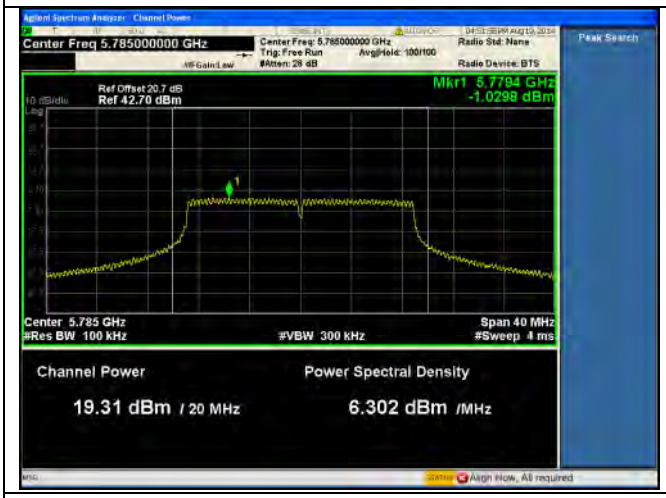
PSD-5.8G-802.11n-20M Low-chain2



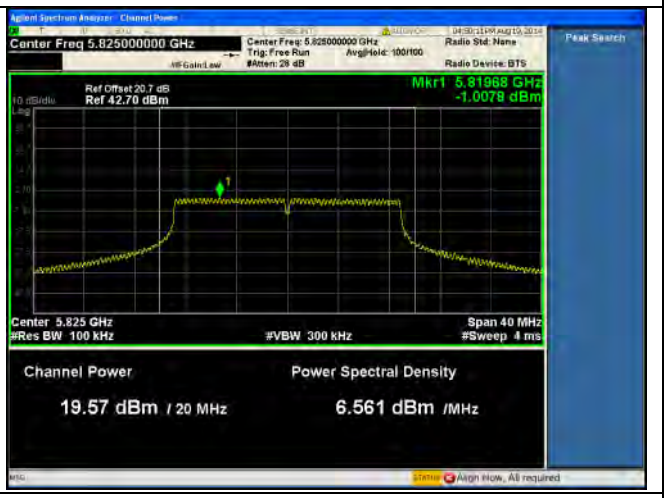
PSD-5.8G-802.11n-20M Mid-chain0



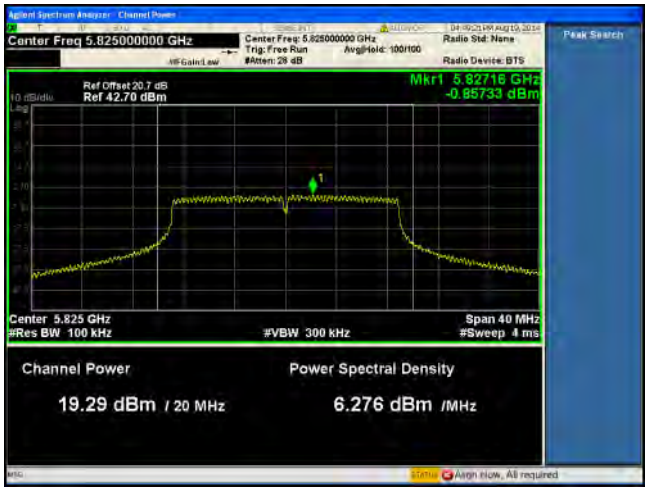
PSD-5.8G-802.11n-20M Mid-chain1



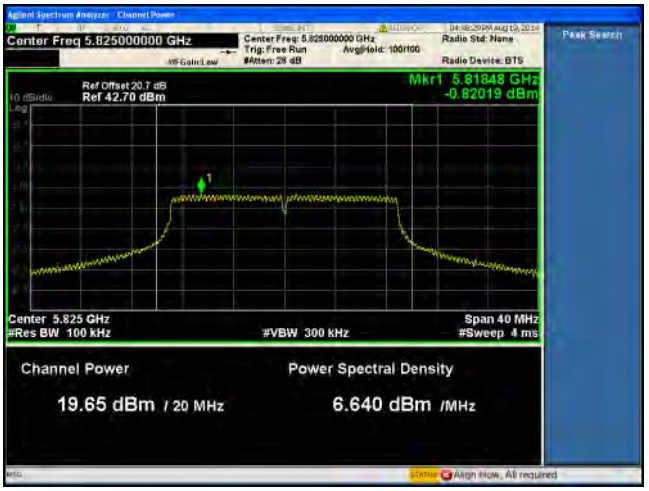
PSD-5.8G-802.11n-20M Mid-chain2



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

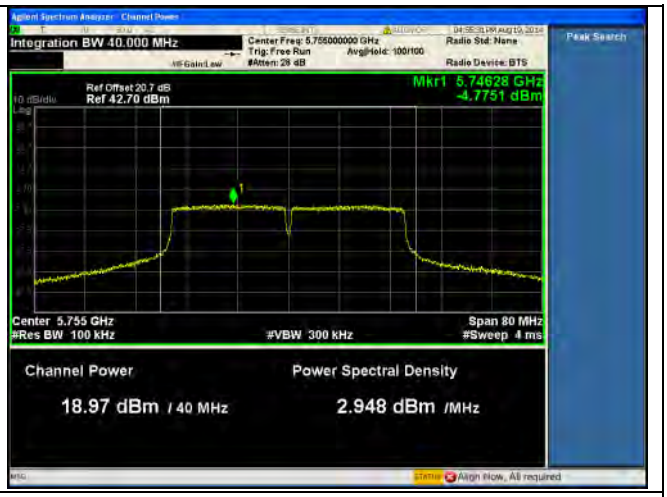


PSD-5.8G-802.11n-20M High-chain1

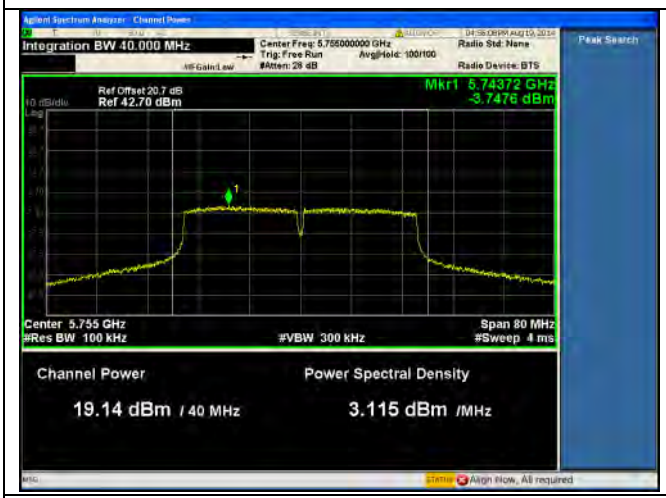


PSD-5.8G-802.11n-20M High-chain2

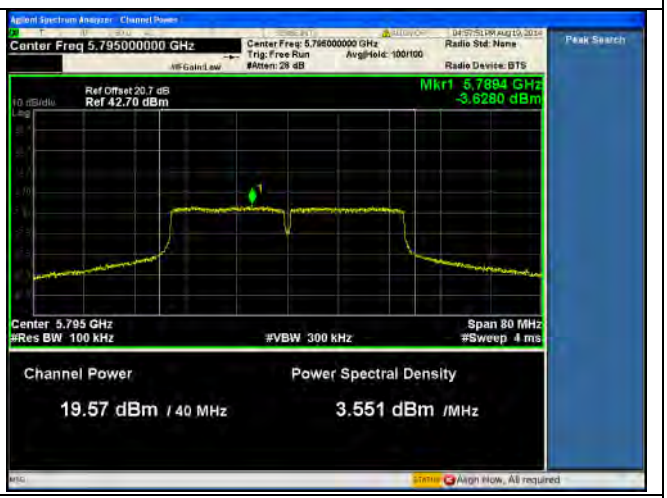
PSD-5.8G-802.11n-40M Low-chain0



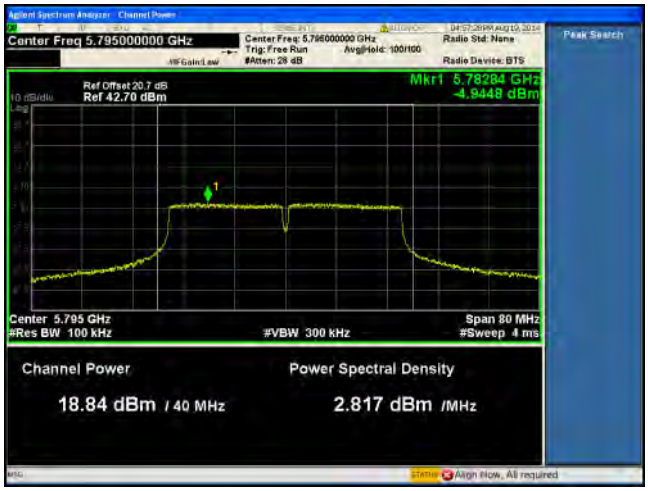
PSD-5.8G-802.11n-40M Low-chain1



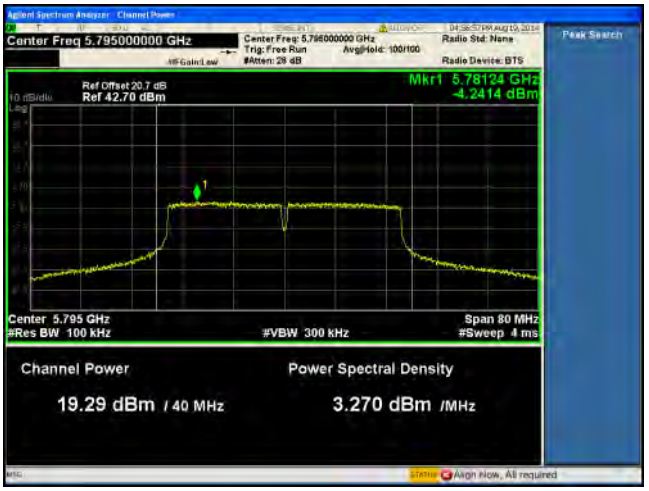
PSD-5.8G-802.11n-40M Low-chain2



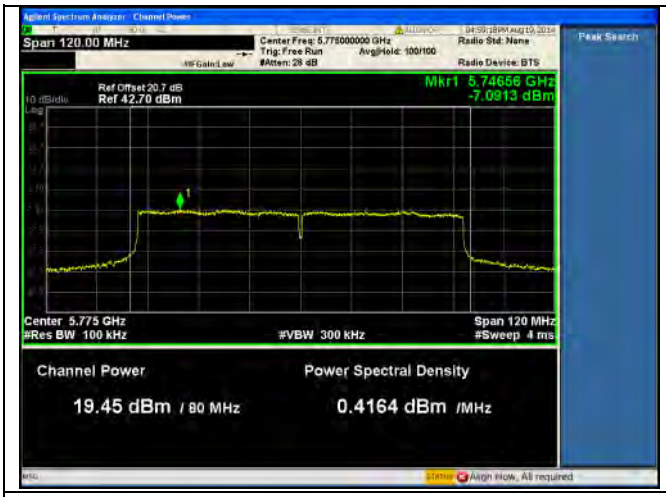
PSD-5.8G-802.11n-40M High-chain0



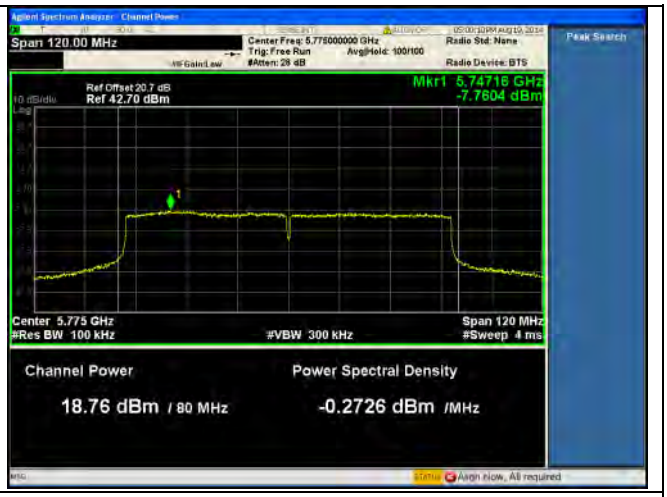
PSD-5.8G-802.11n-40M High-chain1



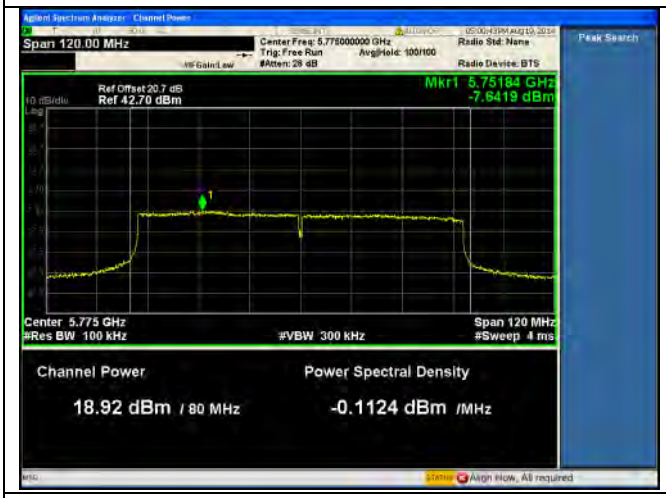
PSD-5.8G-802.11n-40M High-chain2



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



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



PSD-5.8G-802.11ac-80M Mid-chain2

10.6 Conducted Spurious Emissions in non-restricted band

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.	☒
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	-		
Result	☒ Pass ☐ Fail		

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

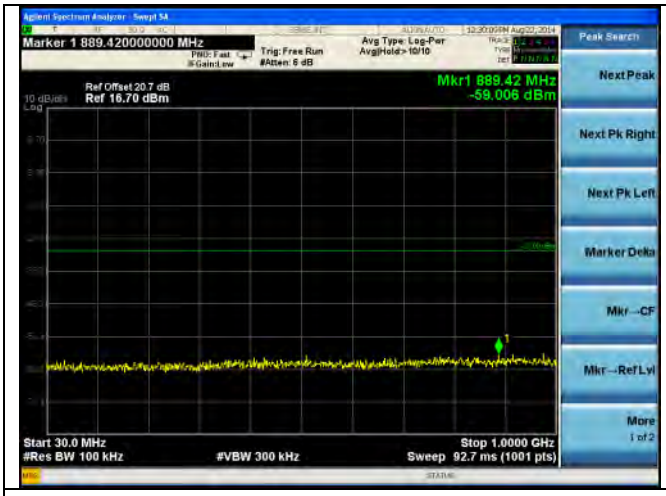
- **Conducted Spurious Emissions in non-restricted band**

Type	Test mode	Frequency Range (MHz)	Freq (MHz)	Level(dBm)	Limit (dBm)	Result
WLAN - 5.1GHz	802.11a–Low CH-Chain 0	30 -1000	889.42	-59.006	-27	Pass
		1000 - 26500	6916	-40.386	-27	Pass
WLAN - 5.1GHz	802.11a–Mid CH-Chain 0	30 -1000	461.65	-58.429	-27	Pass
		1000 - 26500	6916	-28.394	-27	Pass
WLAN - 5.1GHz	802.11a–High CH-Chain 0	30 -1000	652.74	-58.696	-27	Pass
		1000 - 26500	25608	-30.231	-27	Pass
WLAN - 5.1GHz	802.11a–Low CH-Chain 1	30 -1000	867.11	-58.799	-27	Pass
		1000 - 26500	24639	-31.761	-27	Pass
WLAN - 5.1GHz	802.11a–Mid CH-Chain 1	30 -1000	767.2	-58.716	-27	Pass
		1000 - 26500	6942	-29.239	-27	Pass
WLAN - 5.1GHz	802.11a–High CH-Chain 1	30 -1000	747.8	-58.63	-27	Pass
		1000 - 26500	6942	-32.344	-27	Pass
WLAN - 5.1GHz	802.11a–Low CH-Chain 2	30 -1000	925.31	-57.109	-27	Pass
		1000 - 26500	6993	-41.842	-27	Pass
WLAN - 5.1GHz	802.11a–Mid CH-Chain 2	30 -1000	369.5	-58.706	-27	Pass
		1000 - 26500	6993	-33.231	-27	Pass
WLAN - 5.1GHz	802.11a–High CH-Chain 2	30 -1000	959.26	-58.778	-27	Pass
		1000 - 26500	6993	-35.555	-27	Pass
WLAN - 5.1GHz	802.11n-20–Low CH-Chain 0	30 -1000	773.99	-59.228	-27	Pass
		1000 - 26500	6916	-40.393	-27	Pass
WLAN - 5.1GHz	802. 11n-20–Mid CH-Chain 0	30 -1000	207.51	-59.535	-27	Pass
		1000 - 26500	6916	-28.305	-27	Pass
WLAN - 5.1GHz	802. 11n-20–High CH-Chain 0	30 -1000	742.95	-59.046	-27	Pass
		1000 - 26500	6916	-30.727	-27	Pass
WLAN - 5.1GHz	802. 11n-20–Low CH-Chain 1	30 -1000	760.41	-59.565	-27	Pass
		1000 - 26500	6942	-40.804	-27	Pass
WLAN - 5.1GHz	802. 11n-20–Mid CH-Chain 1	30 -1000	910.76	-58.922	-27	Pass
		1000 - 26500	6942	-29.864	-27	Pass
WLAN - 5.1GHz	802. 11n-20–High CH-Chain 1	30 -1000	918.52	-58.853	-27	Pass
		1000 - 26500	6942	-32.806	-27	Pass
WLAN - 5.1GHz	802. 11n-20–Low CH-Chain 2	30 -1000	778.84	-59.323	-27	Pass
		1000 - 26500	24664	-31.436	-27	Pass
WLAN - 5.1GHz	802. 11n-20–Mid CH-Chain 2	30 -1000	858.38	-59.249	-27	Pass
		1000 - 26500	6993	-33.285	-27	Pass
WLAN - 5.1GHz	802. 11n-20–High CH-Chain 2	30 -1000	788.34	-58.723	-27	Pass
		1000 - 26500	6993	-36.182	-27	Pass
Note	Anntenna gain is considered in the result.					

Type	Test mode	Frequency Range (MHz)	Freq (MHz)	Level(dBm)	Limit (dBm)	Result
WLAN – 5.1GHz	802.11n-40M–Low CH-Chain 0	30 -1000	989.33	-59.424	-27	Pass
		1000 - 26500	6916	-38.009	-27	Pass
WLAN – 5.1GHz	802.11n-40M –High CH-Chain 0	30 -1000	811.82	-59.61	-27	Pass
		1000 - 26500	6916	-29.579	-27	Pass
WLAN – 5.1GHz	802.11n-40M –Low CH-Chain 1	30 -1000	704.15	-59.219	-27	Pass
		1000 - 26500	6916	-31.973	-27	Pass
WLAN – 5.1GHz	802.11n-40M–High CH-Chain 1	30 -1000	893.3	-58.192	-27	Pass
		1000 - 26500	6967	-34.108	-27	Pass
WLAN – 5.1GHz	802.11n-40M–Low CH-Chain 2	30 -1000	896.21	-58.909	-27	Pass
		1000 - 26500	6967	-37.005	-27	Pass
WLAN – 5.1GHz	802.11n-40M–High CH-Chain 2	30 -1000	928.22	-59.274	-27	Pass
		1000 - 26500	6942	-39.572	-27	Pass
WLAN – 5.1GHz	802.11ac-80M–Mid CH-Chain 0	30 -1000	437.4	-58.865	-27	Pass
		1000 - 26500	6942	-36.482	-27	Pass
WLAN – 5.1GHz	802.11ac-80M–Mid CH-Chain 1	30 -1000	754.59	-58.349	-27	Pass
		1000 - 26500	6942	-35.466	-27	Pass
WLAN – 5.1GHz	802.11ac-80M–Mid CH-Chain 2	30 -1000	989.33	-59.424	-27	Pass
		1000 - 26500	6916	-38.009	-27	Pass
WLAN – 5.8GHz	802.11a–Low CH-Chain 0	30 -1000	917.55	-58.966	-27	Pass
		1000 - 26500	25225	-30.455	-27	Pass
WLAN – 5.8GHz	802.11a–Mid CH-Chain 0	30 -1000	490.75	-58.61	-27	Pass
		1000 - 26500	24639	-31.956	-27	Pass
WLAN – 5.8GHz	802.11a–High CH-Chain 0	30 -1000	768.17	-62.437	-27	Pass
		1000 - 26500	25327	-31.599	-27	Pass
WLAN – 5.8GHz	802.11a–Low CH-Chain 1	30 -1000	810.85	-59.091	-27	Pass
		1000 - 26500	24690	-31.73	-27	Pass
WLAN – 5.8GHz	802.11a–Mid CH-Chain 1	30 -1000	788.54	-58.835	-27	Pass
		1000 - 26500	24613	-31.627	-27	Pass
WLAN – 5.8GHz	802.11a–High CH-Chain 1	30 -1000	768.17	-59.201	-27	Pass
		1000 - 26500	24690	-32.051	-27	Pass
WLAN – 5.8GHz	802.11a–Low CH-Chain 2	30 -1000	488.81	-59.621	-27	Pass
		1000 - 26500	24664	-32.525	-27	Pass
WLAN – 5.8GHz	802.11a–Mid CH-Chain 2	30 -1000	738.1	-59.123	-27	Pass
		1000 - 26500	24639	-31.363	-27	Pass
WLAN – 5.8GHz	802.11a–High CH-Chain 2	30 -1000	485.85	-58.422	-27	Pass
		1000 - 26500	24129	-31.145	-27	Pass
Note	Anntenna gain is considered in the result.					

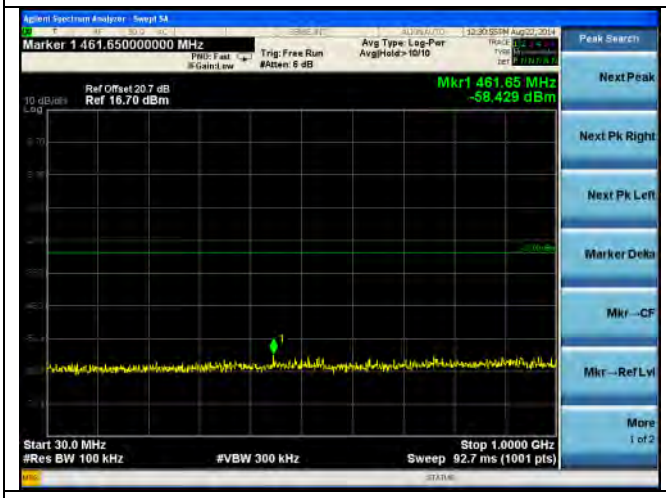
Type	Test mode	Frequency Range (MHz)	Freq (MHz)	Level(dBm)	Limit (dBm)	Result
WLAN – 5.8GHz	802.11n-20–Low CH-Chain 0	30 -1000	738.1	-59.597	-27	Pass
		1000 - 26500	24664	-30.749	-27	Pass
WLAN – 5.8GHz	802. 11n-20–Mid CH-Chain 0	30 -1000	910.76	-58.661	-27	Pass
		1000 - 26500	25786	-30.901	-27	Pass
WLAN – 5.8GHz	802. 11n-20–High CH-Chain 0	30 -1000	358.83	-59.243	-27	Pass
		1000 - 26500	24741	-31.521	-27	Pass
WLAN – 5.8GHz	802. 11n-20–Low CH-Chain 1	30 -1000	539.25	-59.187	-27	Pass
		1000 - 26500	25633	-31.364	-27	Pass
WLAN – 5.8GHz	802. 11n-20–Mid CH-Chain 1	30 -1000	484.93	-58.861	-27	Pass
		1000 - 26500	25863	-29.75	-27	Pass
WLAN – 5.8GHz	802. 11n-20–High CH-Chain 1	30 -1000	890.39	-59.357	-27	Pass
		1000 - 26500	25837	-30.722	-27	Pass
WLAN – 5.8GHz	802. 11n-20–Low CH-Chain 2	30 -1000	517.91	-58.626	-27	Pass
		1000 - 26500	24027	-31.86	-27	Pass
WLAN – 5.8GHz	802. 11n-20–Mid CH-Chain 2	30 -1000	872.93	-59.16	-27	Pass
		1000 - 26500	24639	-31.858	-27	Pass
WLAN – 5.8GHz	802. 11n-20–High CH-Chain 2	30 -1000	986.42	-59.062	-27	Pass
		1000 - 26500	24103	-32.342	-27	Pass
WLAN – 5.8GHz	802.11n-40M–Low CH-Chain 0	30 -1000	983.51	-59.373	-27	Pass
		1000 - 26500	24638	-32.017	-27	Pass
WLAN – 5.8GHz	802.11n-40M –High CH-Chain 0	30 -1000	907.85	-58.788	-27	Pass
		1000 - 26500	24027	-32.279	-27	Pass
WLAN – 5.8GHz	802.11n-40M –Low CH-Chain 1	30 -1000	291.9	-59.25	-27	Pass
		1000 - 26500	24715	-30.023	-27	Pass
WLAN – 5.8GHz	802.11n-40M–High CH-Chain 1	30 -1000	826.37	-58.695	-27	Pass
		1000 - 26500	24690	-32.305	-27	Pass
WLAN – 5.8GHz	802.11n-40M–Low CH-Chain 2	30 -1000	533.43	-58.914	-27	Pass
		1000 - 26500	24664	-31.692	-27	Pass
WLAN – 5.8GHz	802.11n-40M–High CH-Chain 2	30 -1000	723.55	-58.631	-27	Pass
		1000 - 26500	25225	-31.055	-27	Pass
WLAN – 5.8GHz	802.11ac-80M–Mid CH-Chain 0	30 -1000	943.74	-59.797	-27	Pass
		1000 - 26500	24154	-32.635	-27	Pass
WLAN – 5.8GHz	802.11ac-80M–Mid CH-Chain 1	30 -1000	993.21	-58.839	-27	Pass
		1000 - 26500	24078	-32.462	-27	Pass
WLAN – 5.8GHz	802.11ac-80M–Mid CH-Chain 2	30 -1000	448.07	-58.791	-27	Pass
		1000 - 26500	25174	-31.473	-27	Pass
Note	Anntenna gain is considered in the result.					

- **Conducted Spurious Emissions Plots:**



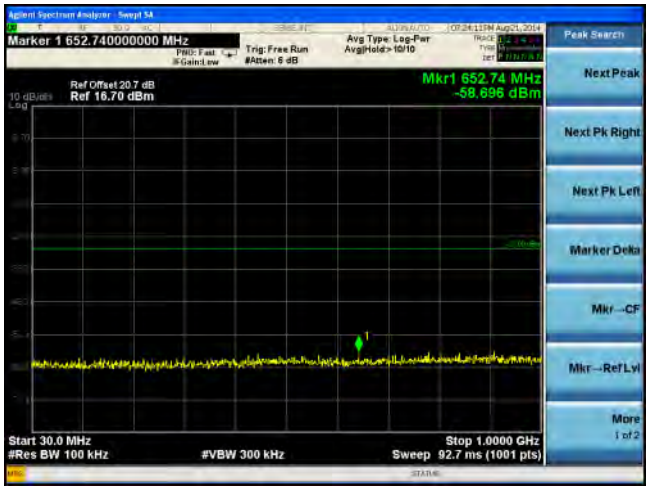
CSE-5.1GHz-Below 1GHz-802.11a Low-chain0

CSE-5.1GHz-Above 1GHz-802.11a Low-chain0



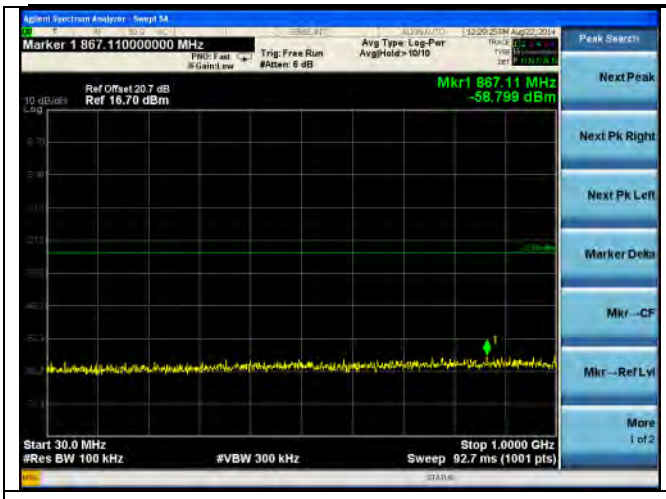
CSE-5.1GHz-Below 1GHz-802.11a Low-chain1

CSE-5.1GHz-Above 1GHz-802.11a Low-chain1



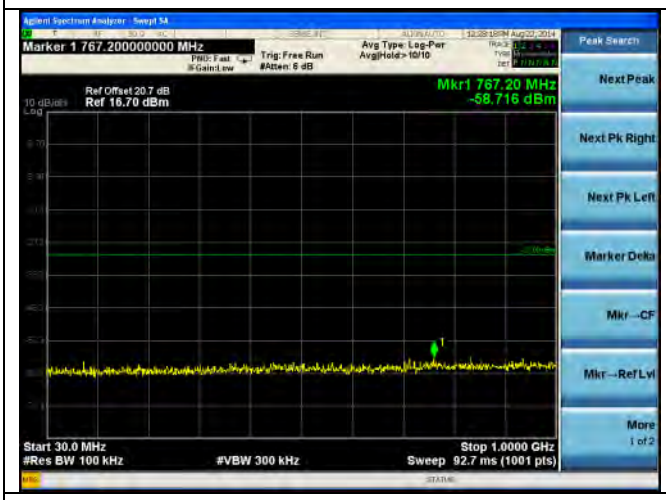
CSE-5.1GHz-Below 1GHz-802.11a Low-chain2

CSE-5.1GHz-Above 1GHz-802.11a Low-chain2



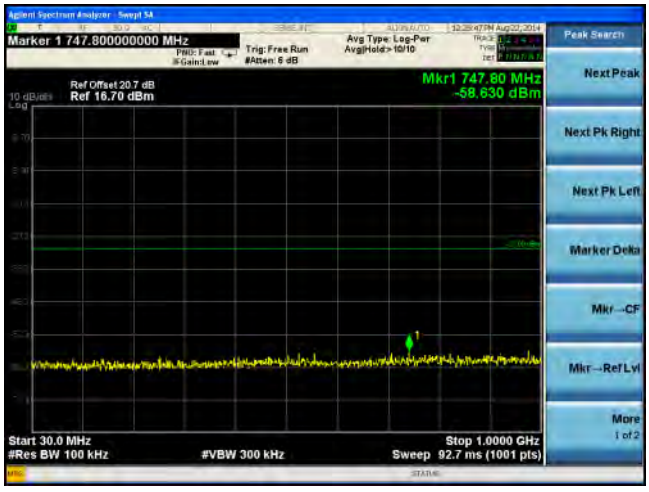
CSE-5.1GHz-Below 1GHz-802.11a Mid-chain0

CSE-5.1GHz-Above 1GHz-802.11a Mid-chain0



CSE-5.1GHz-Below 1GHz-802.11a Mid-chain1

CSE-5.1GHz-Above 1GHz-802.11a Mid-chain1

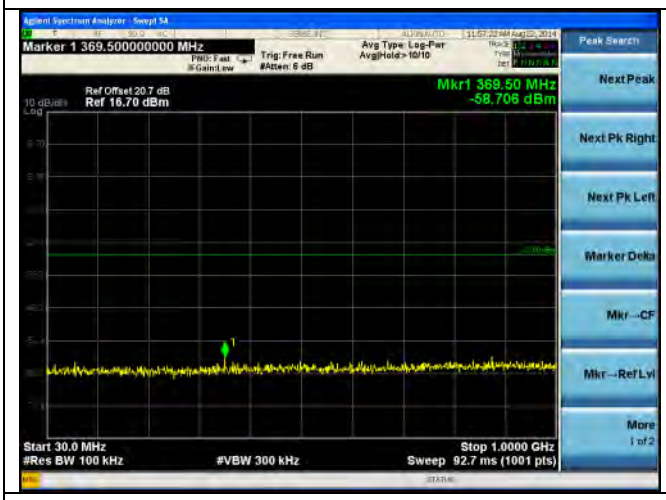


CSE-5.1GHz-Below 1GHz-802.11a Mid-chain2

CSE-5.1GHz-Above 1GHz-802.11a Mid-chain2

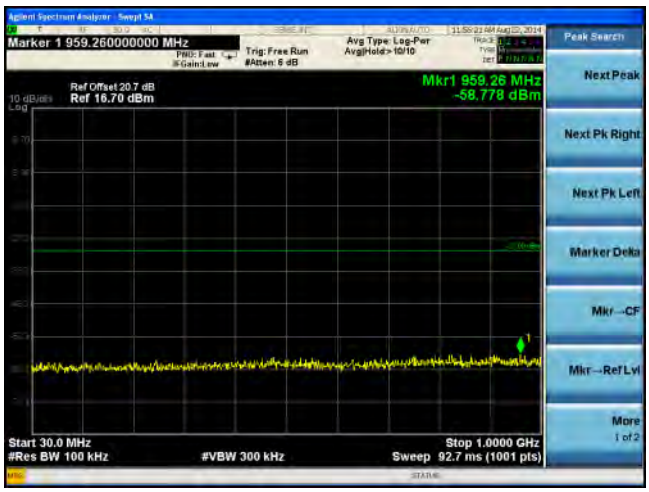
CSE-5.1GHz-Below 1GHz-802.11a High-chain0

CSE-5.1GHz-Above 1GHz-802.11a High-chain0



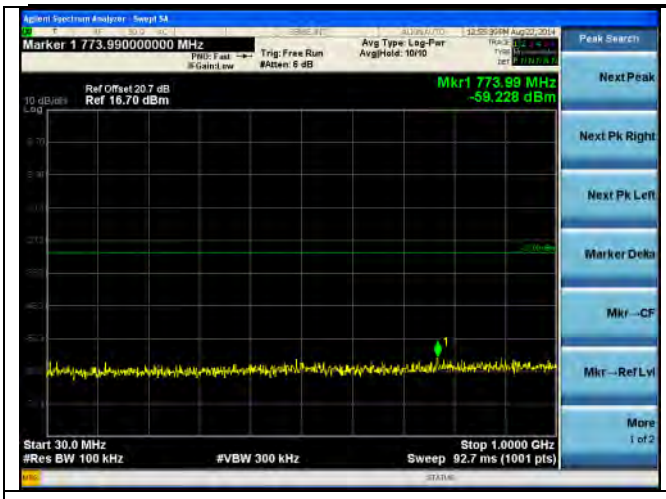
CSE-5.1GHz-Below 1GHz-802.11a High-chain1

CSE-5.1GHz-Above 1GHz-802.11a High-chain1



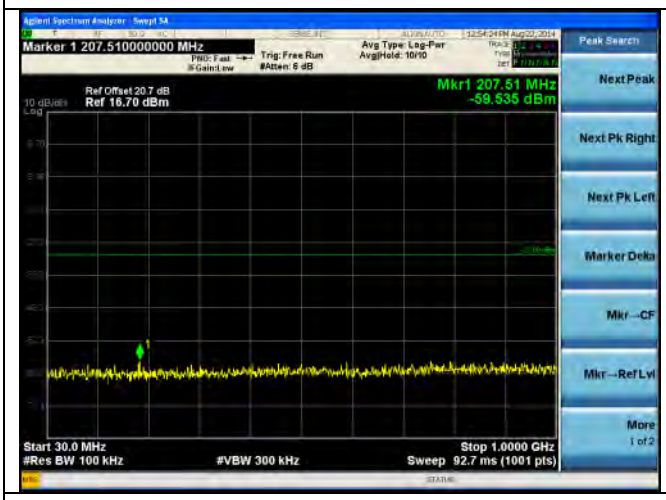
CSE-5.1GHz-Below 1GHz-802.11a High-chain2

CSE-5.1GHz-Above 1GHz-802.11a High-chain2



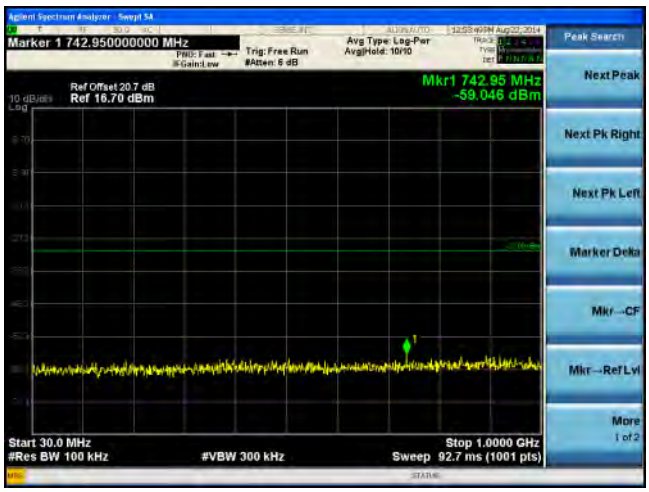
CSE-5.1GHz-Below 1GHz-802.11n-20M Low-chain0

CSE-5.1GHz-Above 1GHz-802.11n-20M Low-chain0



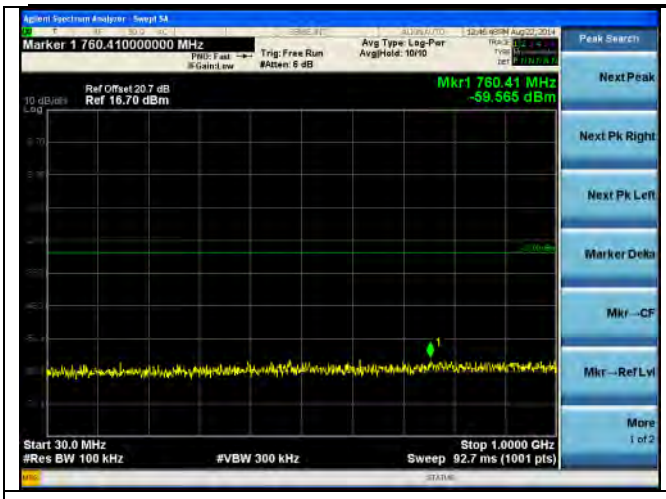
CSE-5.1GHz-Below 1GHz-802.11n-20M Low-chain1

CSE-5.1GHz-Above 1GHz-802.11n-20M Low-chain1



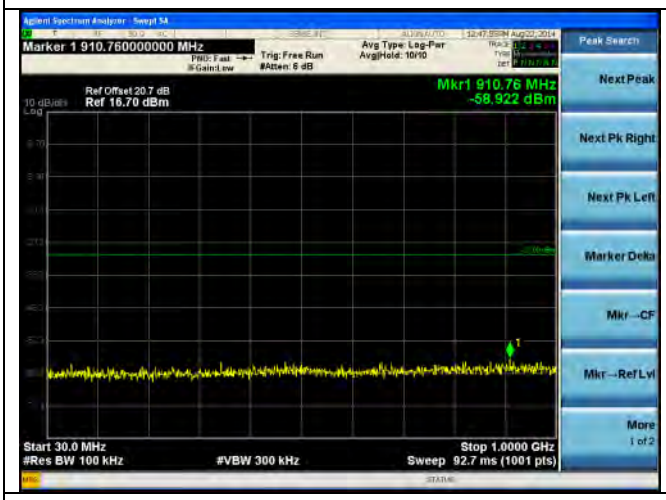
CSE-5.1GHz-Below 1GHz-802.11n-20M Low-chain2

CSE-5.1GHz-Above 1GHz-802.11n-20M Low-chain2



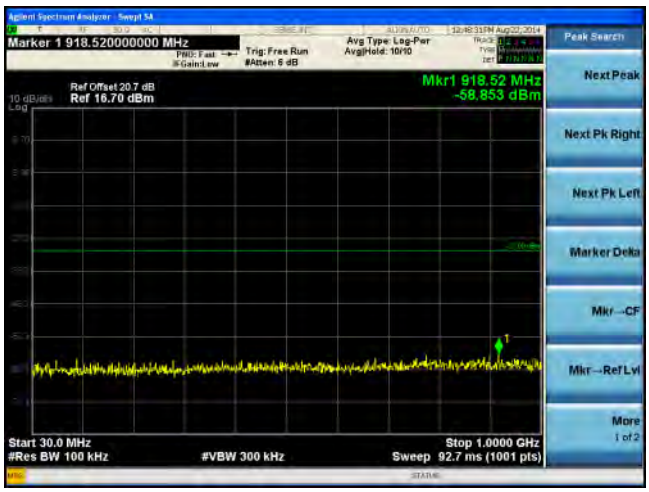
CSE-5.1GHz-Below 1GHz-802.11n-20M Mid-chain0

CSE-5.1GHz-Above 1GHz-802.11n-20M Mid-chain0



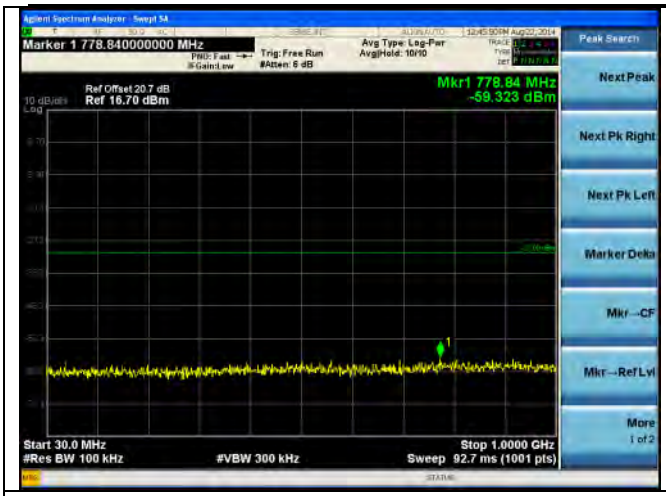
CSE-5.1GHz-Below 1GHz-802.11n-20M Mid-chain1

CSE-5.1GHz-Above 1GHz-802.11n-20M Mid-chain1



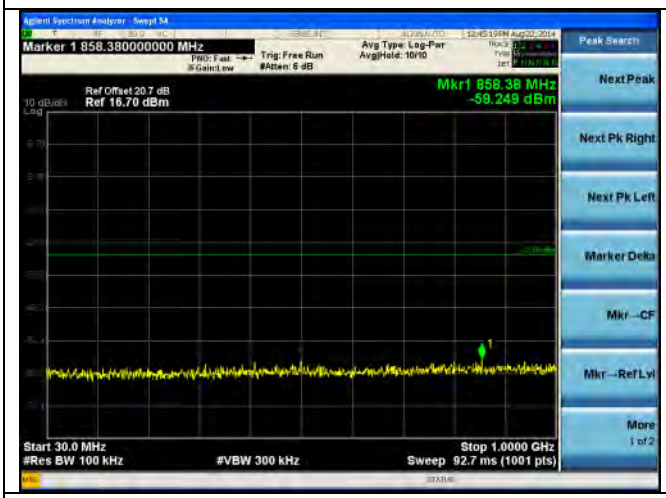
CSE-5.1GHz-Below 1GHz-802.11n-20M Mid-chain2

CSE-5.1GHz-Above 1GHz-802.11n-20M Mid-chain2



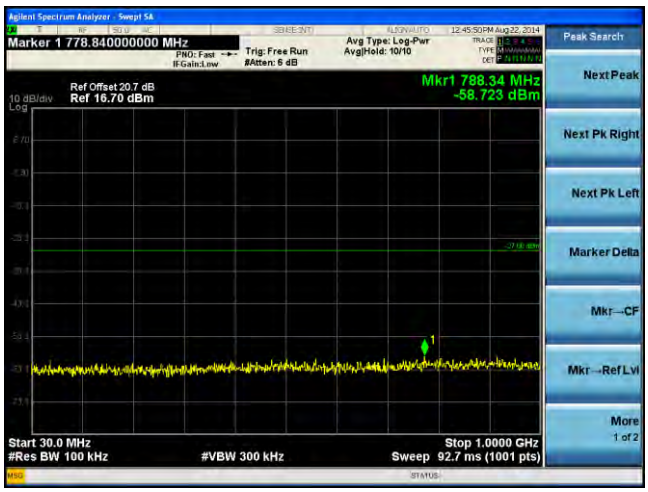
CSE-5.1GHz-Below 1GHz-802.11n-20M High-chain0

CSE-5.1GHz-Above 1GHz-802.11n-20M High-chain0



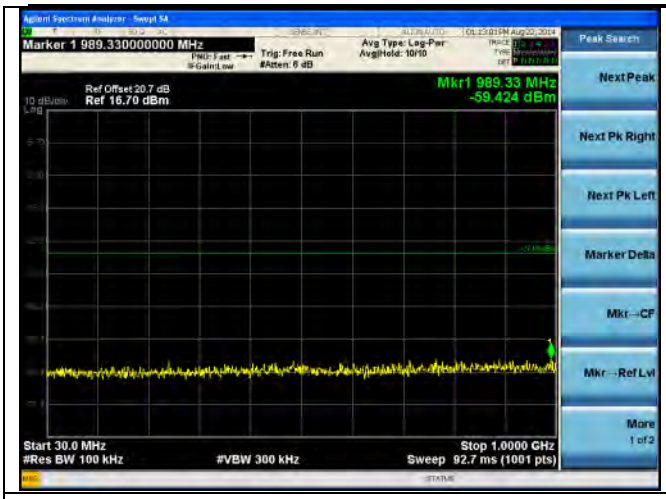
CSE-5.1GHz-Below 1GHz-802.11n-20M High-chain1

CSE-5.1GHz-Above 1GHz-802.11n-20M High-chain1



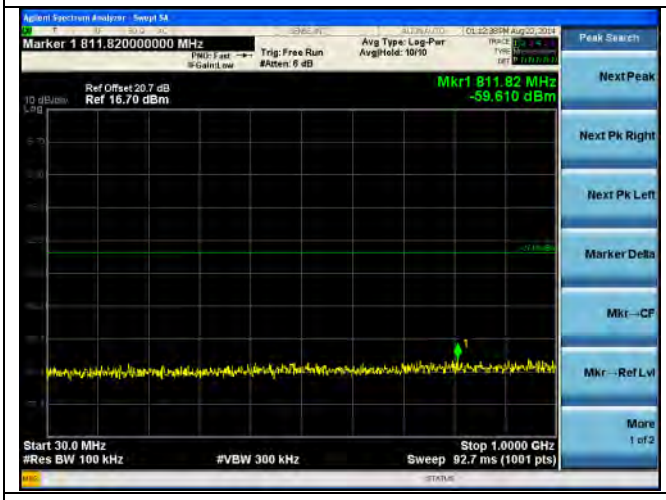
CSE-5.1GHz-Below 1GHz-802.11n-20M High-chain2

CSE-5.1GHz-Above 1GHz-802.11n-20M High-chain2



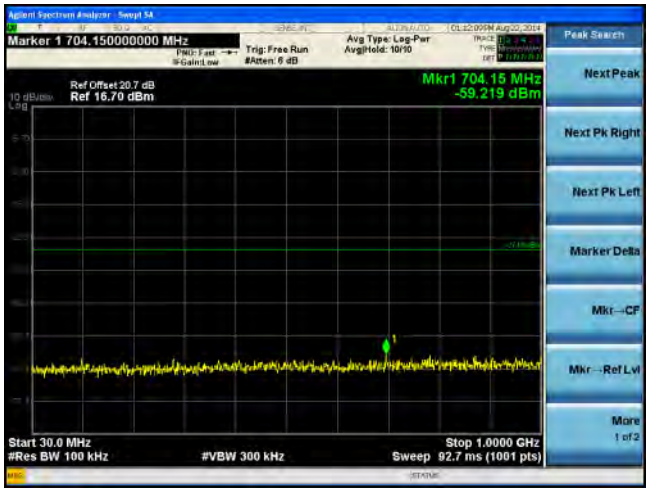
CSE-5.1GHz-Below 1GHz-802.11n-40M Low-chain0

CSE-5.1GHz-Above 1GHz-802.11n-40M Low-chain0



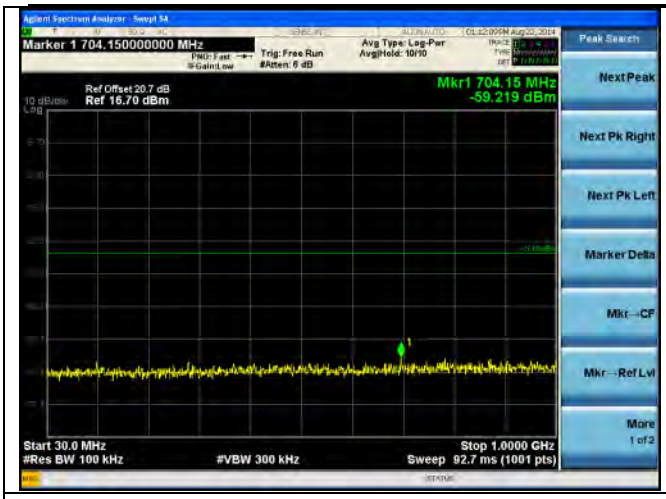
CSE-5.1GHz-Below 1GHz-802.11n-40M Low-chain1

CSE-5.1GHz-Above 1GHz-802.11n-40M Low-chain1



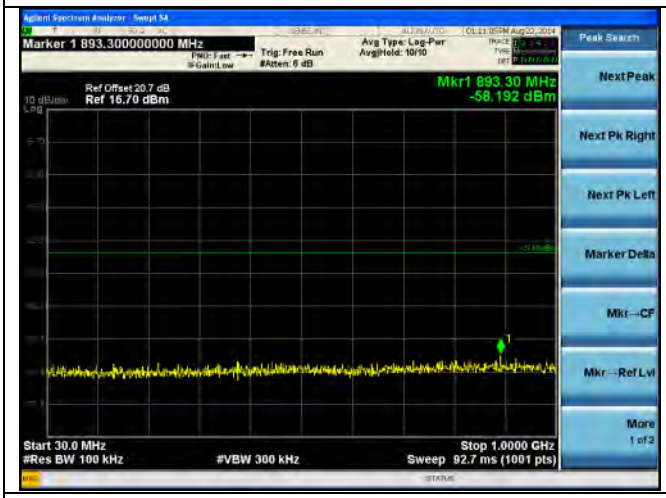
CSE-5.1GHz-Below 1GHz-802.11n-40M Low-chain2

CSE-5.1GHz-Above 1GHz-802.11n-40M Low-chain2



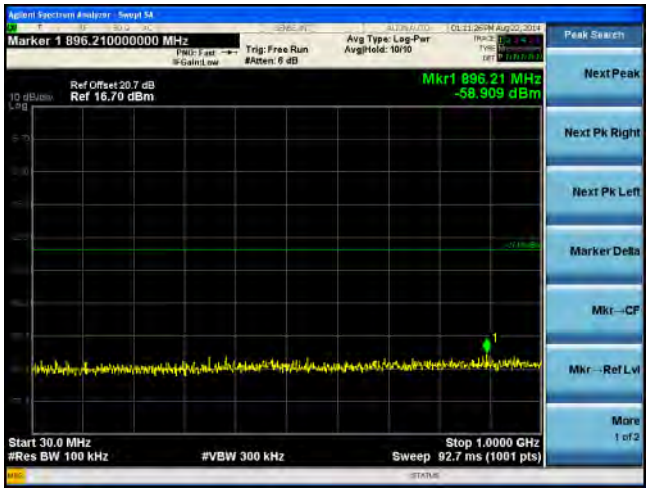
CSE-5.1GHz-Below 1GHz-802.11n-40M High-chain0

CSE-5.1GHz-Above 1GHz-802.11n-40M High-chain0



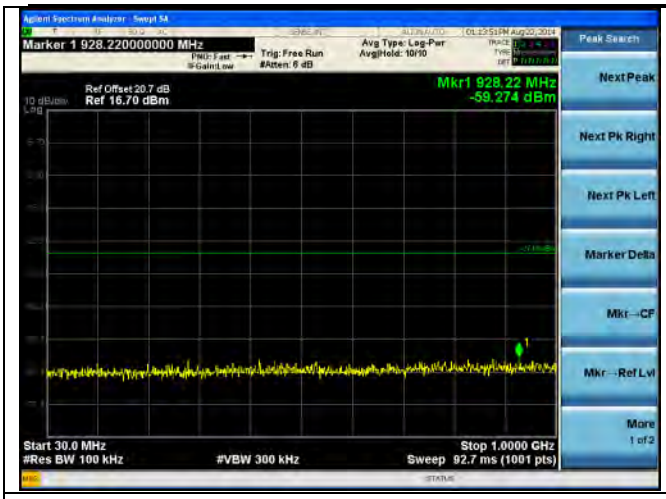
CSE-5.1GHz-Below 1GHz-802.11n-40M High-chain1

CSE-5.1GHz-Above 1GHz-802.11n-40M High-chain1



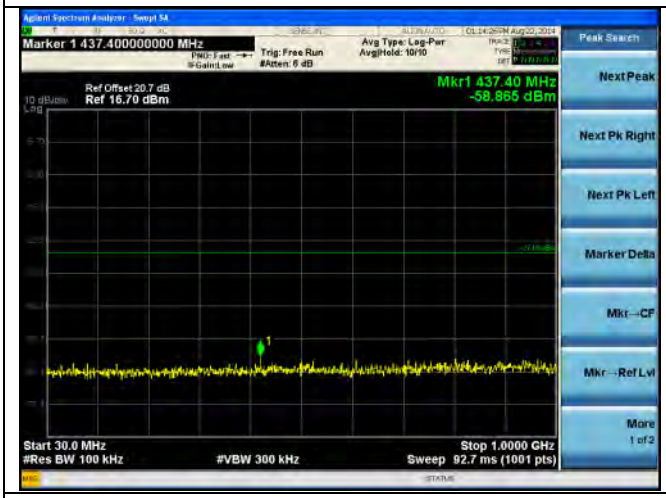
CSE-5.1GHz-Below 1GHz-802.11n-40M High-chain2

CSE-5.1GHz-Above 1GHz-802.11n-40M High-chain2



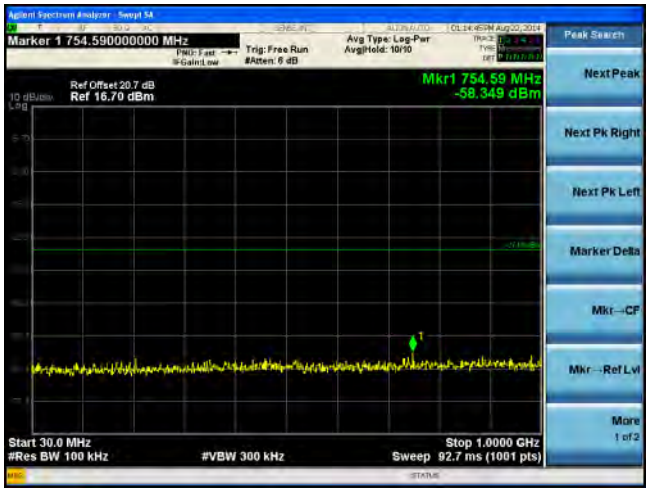
CSE-5.1GHz-Below 1GHz-802.11ac-80M Mid-chain0

CSE-5.1GHz-Above 1GHz-802.11ac-80M Mid-chain0



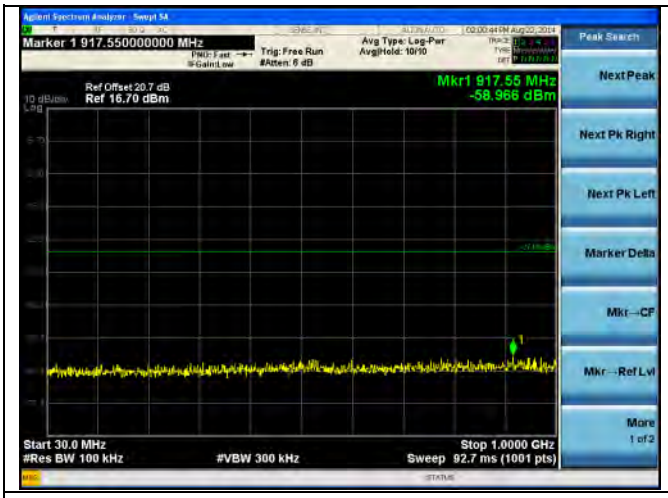
CSE-5.1GHz-Below 1GHz-802.11ac-80M Mid-chain1

CSE-5.1GHz-Above 1GHz-802.11ac-80M Mid-chain1



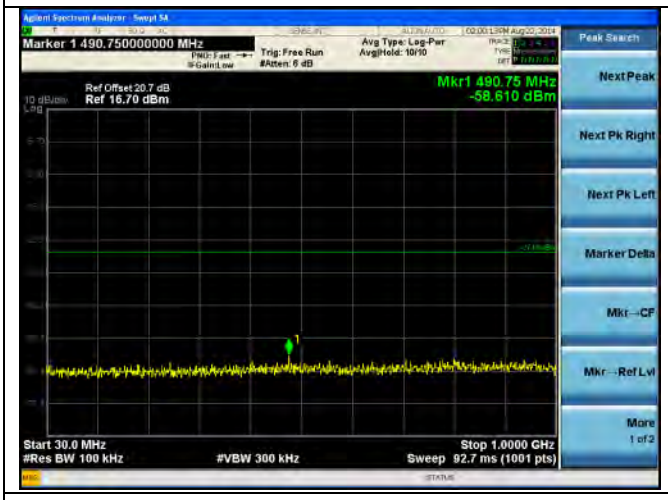
CSE-5.1GHz-Below 1GHz-802.11ac-80M Mid-chain2

CSE-5.1GHz-Above 1GHz-802.11ac-80M Mid-chain2



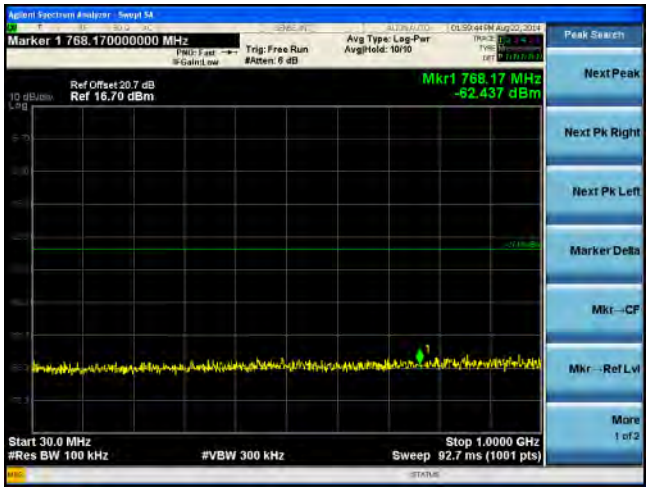
CSE-5.8 GHz-Below 1GHz-802.11a Low-chain0

CSE-5.8 GHz-Above 1GHz-802.11a Low-chain0



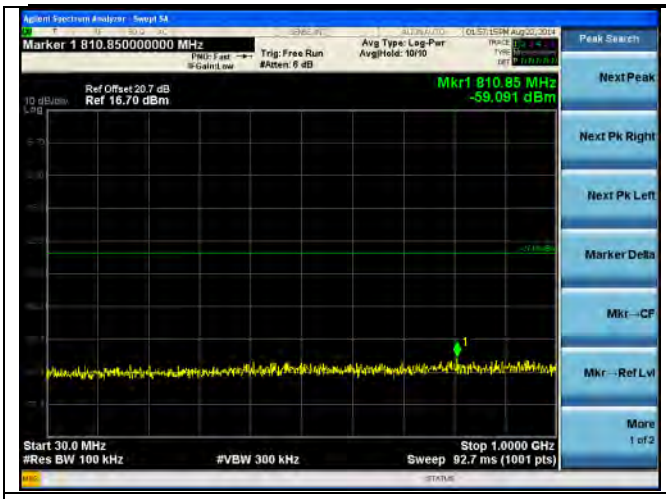
CSE-5.8 GHz-Below 1GHz-802.11a Low-chain1

CSE-5.8 GHz-Above 1GHz-802.11a Low-chain1



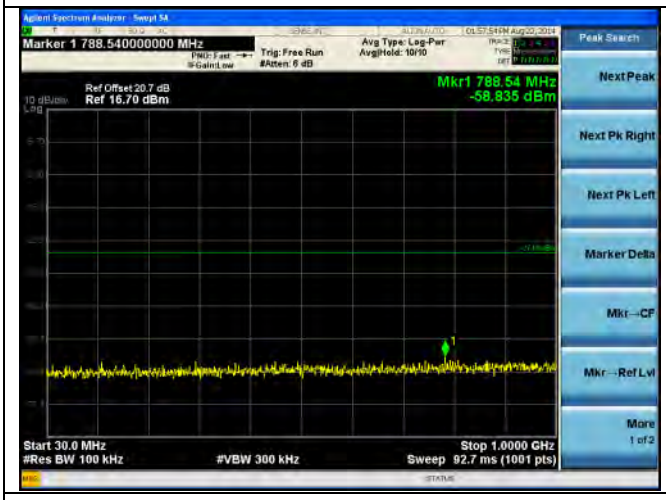
CSE-5.8 GHz-Below 1GHz-802.11a Low-chain2

CSE-5.8 GHz-Above 1GHz-802.11a Low-chain2



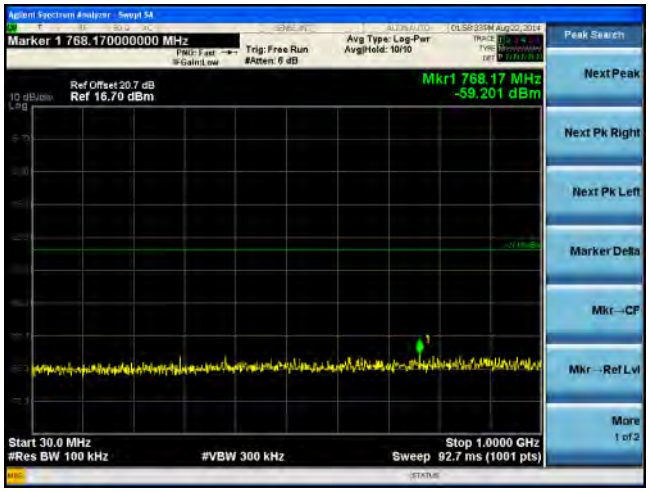
CSE-5.8 GHz-Below 1GHz-802.11a Mid-chain0

CSE-5.8 GHz-Above 1GHz-802.11a Mid-chain0



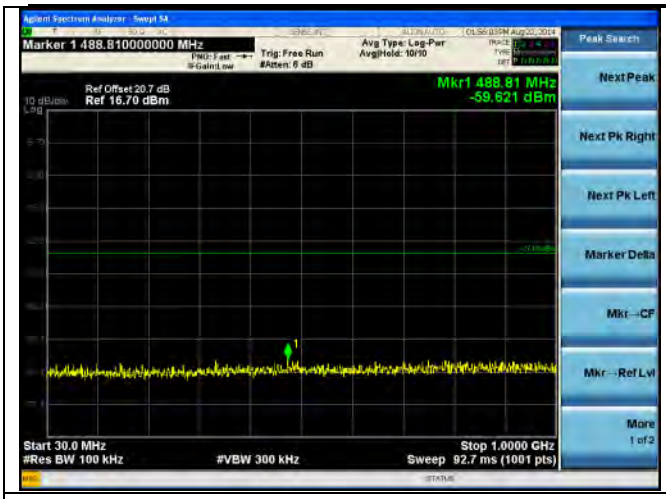
CSE-5.8 GHz-Below 1GHz-802.11a Mid-chain1

CSE-5.8 GHz-Above 1GHz-802.11a Mid-chain1



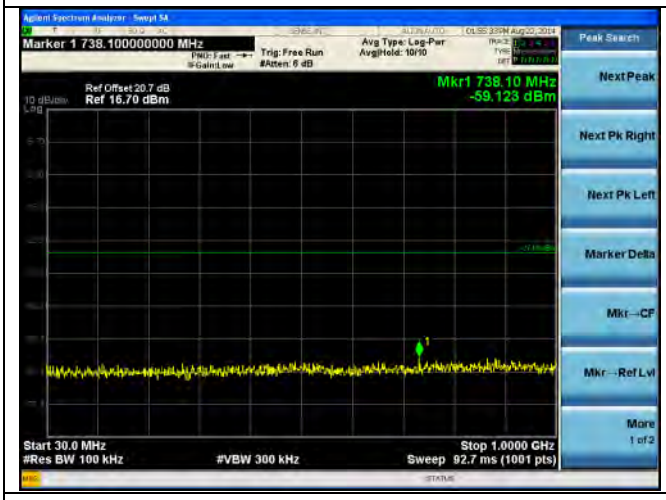
CSE-5.8 GHz-Below 1GHz-802.11a Mid-chain2

CSE-5.8 GHz-Above 1GHz-802.11a Mid-chain2



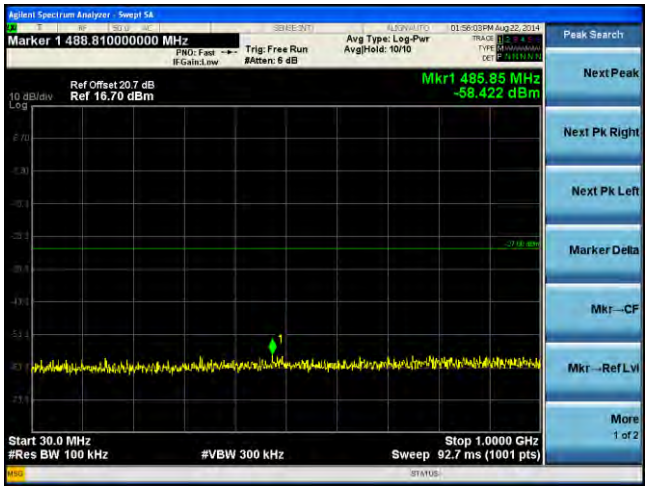
CSE-5.8 GHz-Below 1GHz-802.11a High-chain0

CSE-5.8 GHz-Above 1GHz-802.11a High-chain0



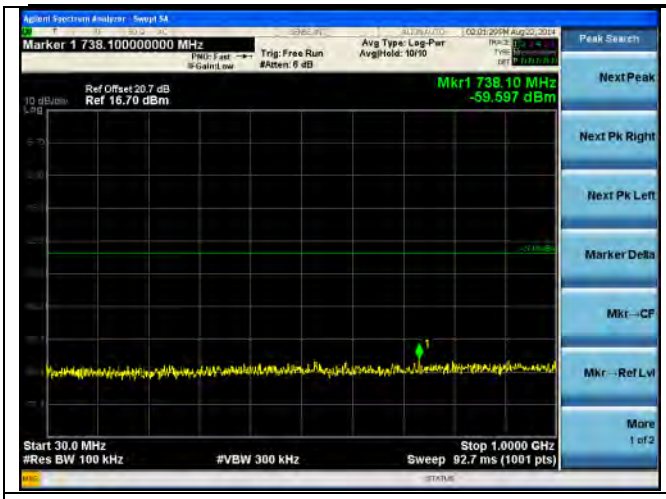
CSE-5.8 GHz-Below 1GHz-802.11a High-chain1

CSE-5.8 GHz-Above 1GHz-802.11a High-chain1



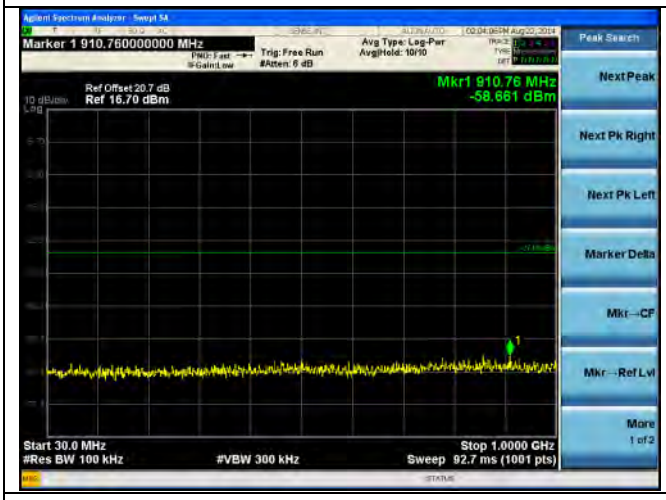
CSE-5.8 GHz-Below 1GHz-802.11a High-chain2

CSE-5.8 GHz-Above 1GHz-802.11a High-chain2



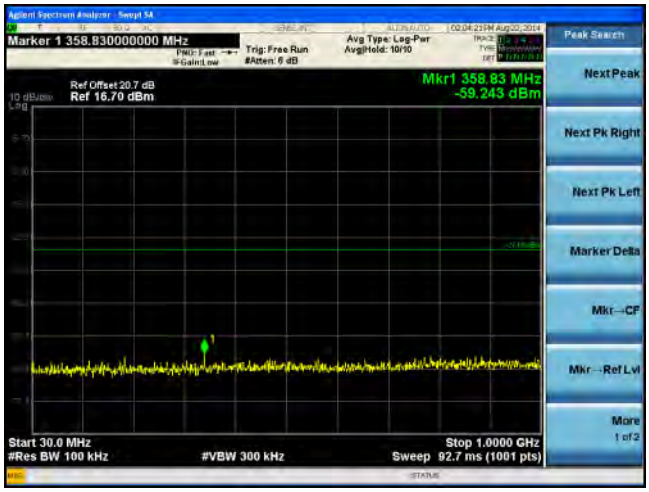
CSE-5.8 GHz-Below 1GHz-802.11n-20M Low-chain0

CSE-5.8 GHz-Above 1GHz-802.11n-20M Low-chain0



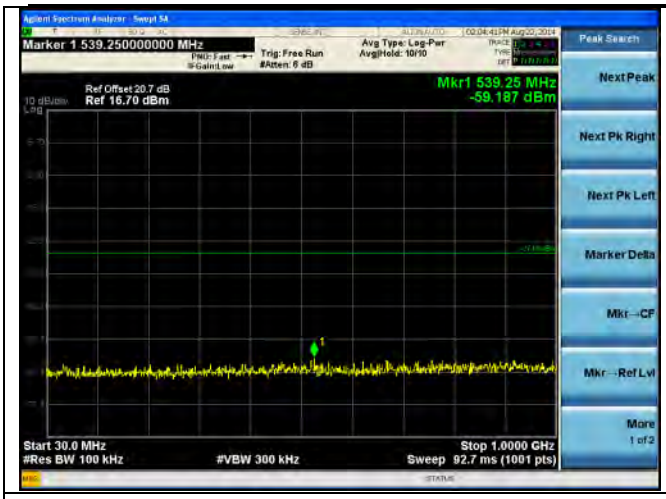
CSE-5.8 GHz-Below 1GHz-802.11n-20M Low-chain1

CSE-5.8 GHz-Above 1GHz-802.11n-20M Low-chain1



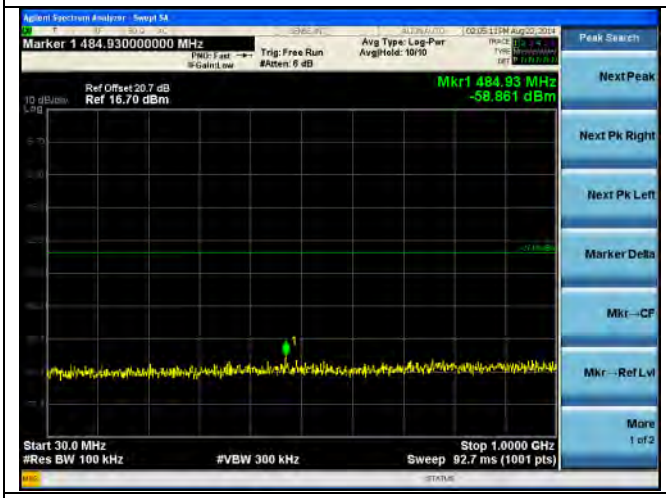
CSE-5.8 GHz-Below 1GHz-802.11n-20M Low-chain2

CSE-5.8 GHz-Above 1GHz-802.11n-20M Low-chain2



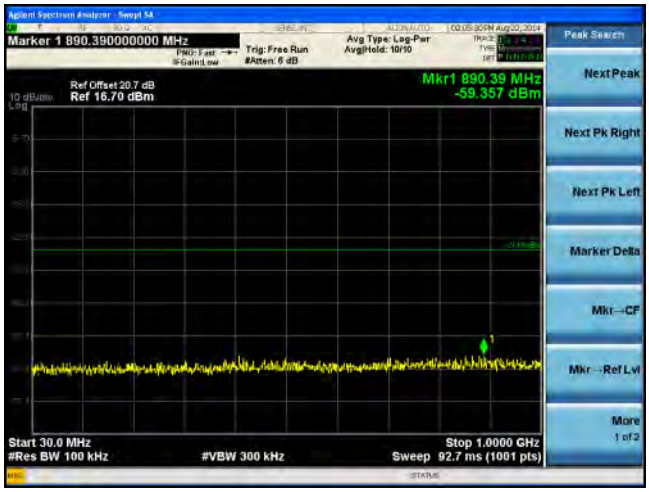
CSE-5.8 GHz-Below 1GHz-802.11n-20M Mid-chain0

CSE-5.8 GHz-Above 1GHz-802.11n-20M Mid-chain0



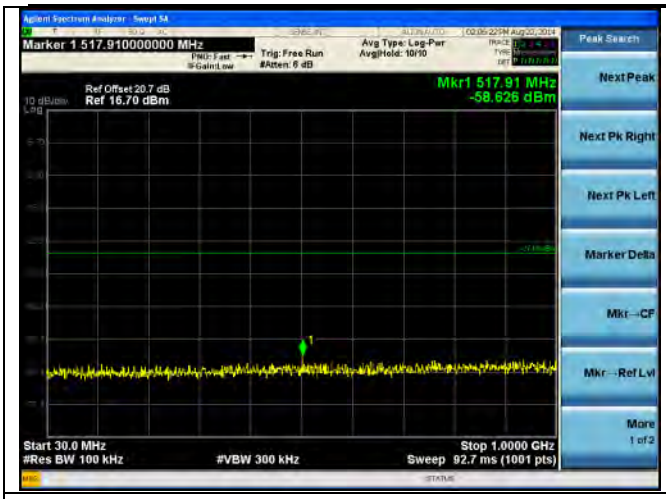
CSE-5.8 GHz-Below 1GHz-802.11n-20M Mid-chain1

CSE-5.8 GHz-Above 1GHz-802.11n-20M Mid-chain1



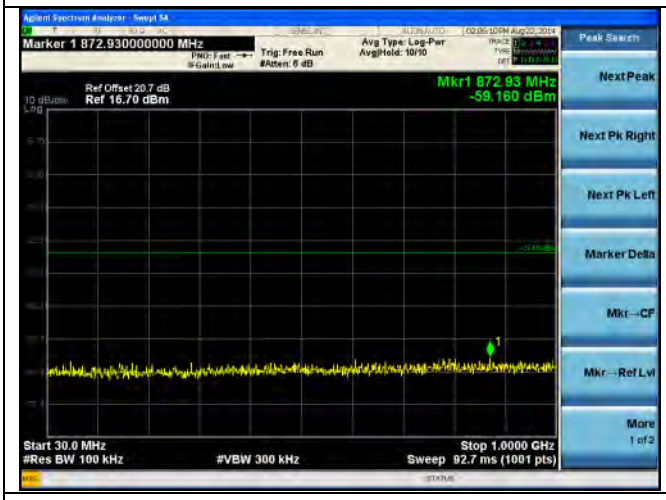
CSE-5.8 GHz-Below 1GHz-802.11n-20M Mid-chain2

CSE-5.8 GHz-Above 1GHz-802.11n-20M Mid-chain2



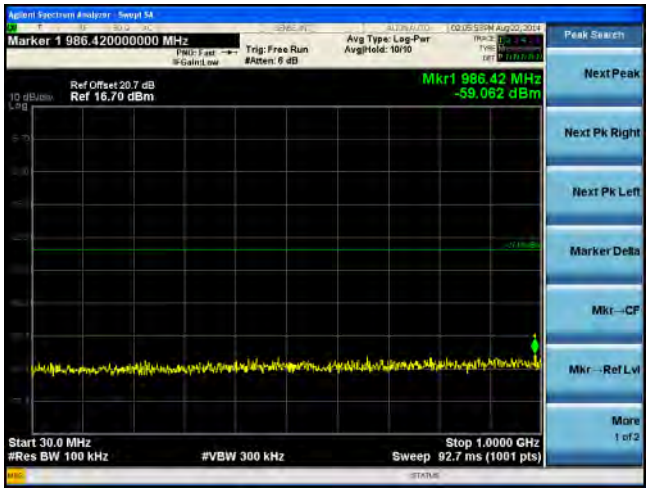
CSE-5.8 GHz-Below 1GHz-802.11n-20M High-chain0

CSE-5.8 GHz-Above 1GHz-802.11n-20M High-chain0



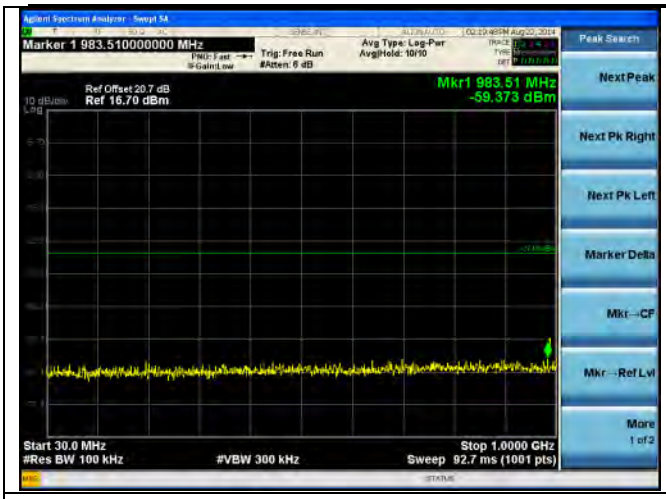
CSE-5.8 GHz-Below 1GHz-802.11n-20M High-chain1

CSE-5.8 GHz-Above 1GHz-802.11n-20M High-chain1



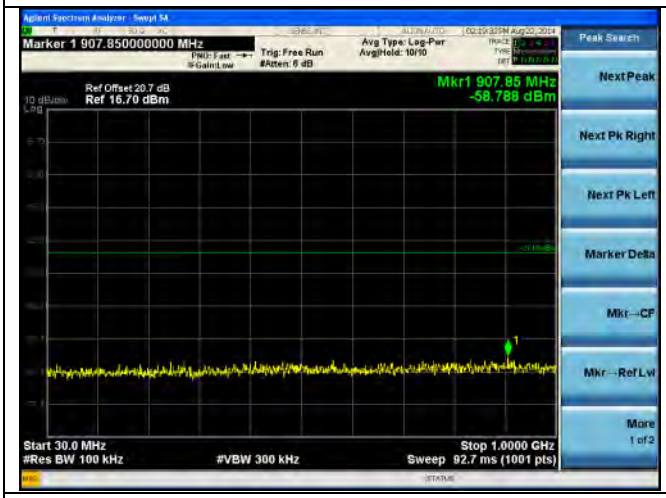
CSE-5.8 GHz-Below 1GHz-802.11n-20M High-chain2

CSE-5.8 GHz-Above 1GHz-802.11n-20M High-chain2



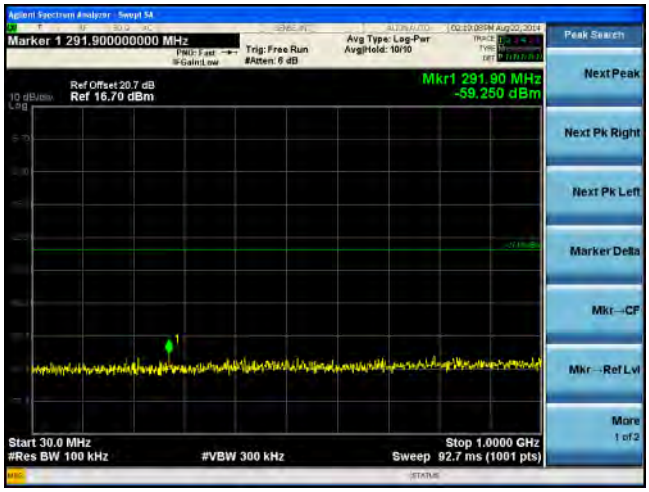
CSE-5.8 GHz-Below 1GHz-802.11n-40M Low-chain0

CSE-5.8 GHz-Above 1GHz-802.11n-40M Low-chain0



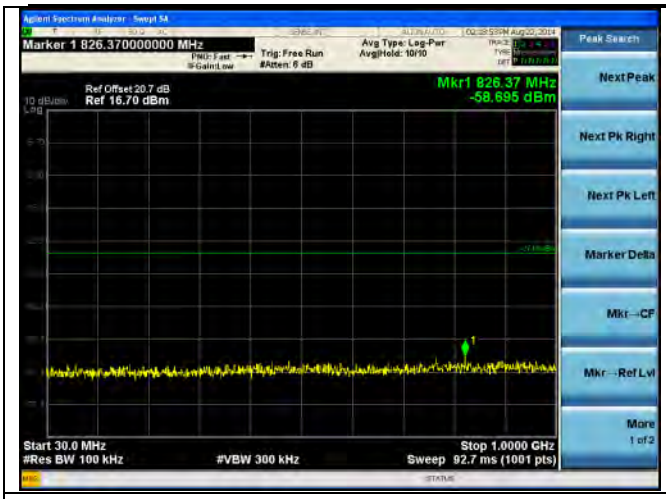
CSE-5.8 GHz-Below 1GHz-802.11n-40M Low-chain1

CSE-5.8 GHz-Above 1GHz-802.11n-40M Low-chain1



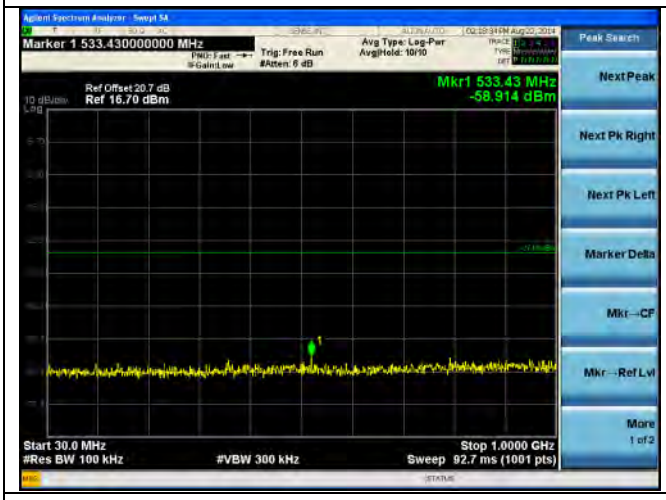
CSE-5.8 GHz-Below 1GHz-802.11n-40M Low-chain2

CSE-5.8 GHz-Above 1GHz-802.11n-40M Low-chain2



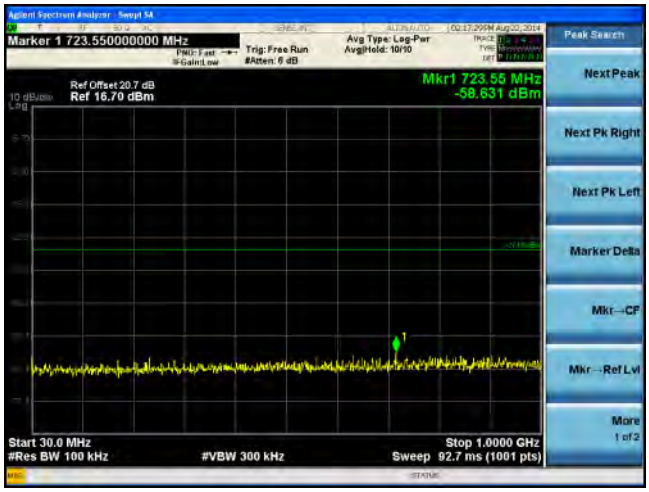
CSE-5.8 GHz-Below 1GHz-802.11n-40M High-chain0

CSE-5.8 GHz-Above 1GHz-802.11n-40M High-chain0



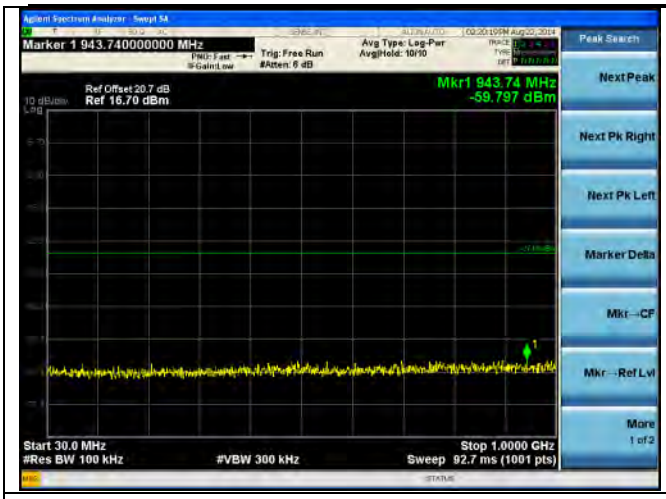
CSE-5.8 GHz-Below 1GHz-802.11n-40M High-chain1

CSE-5.8 GHz-Above 1GHz-802.11n-40M High-chain1



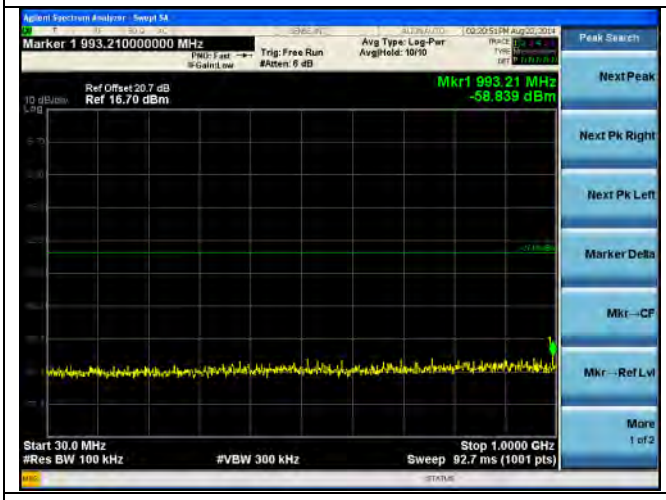
CSE-5.8 GHz-Below 1GHz-802.11n-40M High-chain2

CSE-5.8 GHz-Above 1GHz-802.11n-40M High-chain2



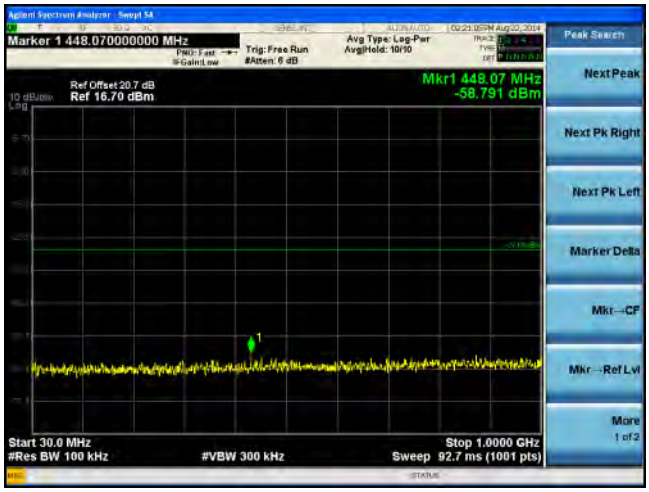
CSE-5.8 GHz-Below 1GHz-802.11ac-80M Mid-chain0

CSE-5.8 GHz-Above 1GHz-802.11ac-80M Mid-chain0



CSE-5.8 GHz-Below 1GHz-802.11ac-80M Mid-chain1

CSE-5.8 GHz-Above 1GHz-802.11ac-80M Mid-chain1



CSE-5.8 GHz-Below 1GHz-802.11ac-80M Mid-chain2

CSE-5.8 GHz-Above 1GHz-802.11ac-80M Mid-chain2

10.7 Conducted Spurious Emissions in restricted band

Requirement(s):

Spec	Item	Requirement	Applicable
§ 15.247	-	Restricted band, emission must also comply with the radiated emission limits specified in 15.209	☒

Test Setup	
Procedure	558074 D01 DTS Meas Guidance v03r02 Conducted Spurious Emissions measurement procedure for restricted band - Measure the conducted output power (in dBm) using the detector specified - Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the EIRP level - Add the appropriate maximum ground reflection factor to the EIRP level (6 dB for frequencies ≤30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz). - For devices with multiple antenna-ports, measure the power of each individual chain and sum the EIRP of all chains in linear terms (e.g., Watts, mW). - Convert the resultant EIRP level to an equivalent electric field strength using the following relationship: E = EIRP – 20log D + 104.8 where: E = electric field strength in dBμV/m, EIRP = equivalent isotropic radiated power in dBm D = specified measurement distance in meters. f) Compare the resultant electric field strength level to the applicable limit.

Test Date	08/21/2014-09/30/2014	Environmental condition	Temperature Relative Humidity Atmospheric Pressure	24°C 47% 1020mbar
Remark	N/A			
Result	☒ Pass ☐ Fail			

Test Data ☒ Yes (See below) ☐ N/A

Test Plot ☒ Yes (See below) ☐ N/A

Restricted Band Edge measurement result for horizontal antenna chain (single antenna) – 5.1GHz

Test Mode	Frequency (MHz)	Conducted Measurement (dBm) Chain 2	Antenna Gain (dBi)	Level (dBuV/m)	Measurement Type	Limit (dBuV/m)	Margin dB	Result
802.11a Low Channel	5150.00	-32.74	3	65.49	Peak Max	74	-8.51	Pass
	5150.00	-49.39	3	48.84	Average Max	54	-5.16	Pass
802.11n-20 Low Channel	5150.00	-38.16	3	60.07	Peak Max	74	-13.93	Pass
	5150.00	-51.26	3	46.97	Average Max	54	-7.03	Pass
802.11n-40 Low Channel	5150.00	-38.65	3	59.58	Peak Max	74	-14.42	Pass
	5150.00	-51.23	3	47.00	Average Max	54	-7.00	Pass
802.11ac-80 Mid Channel	5150.00	-39.53	3	58.7	Peak Max	74	-15.3	Pass
	5150.00	-50.24	3	47.99	Average Max	54	-6.01	Pass
Note:	Both low (5150MHz) and high (5250MHz) channel were investigated. The results show only the worst case.							

Restricted Band Edge measurement result for vertical antenna chains (two antennas) – 5.1GHz

Test Mode	Frequency (MHz)	Conducted Measurement (dBm) Chain 0	Chain 1	Combined Power or Highest Power	Combined Antenna Gain (dBi)	Level (dBuV/m)	Measurement Type	Limit (dBuV/m)	Margin dB	Result
802.11a Low Channel	5150.00	-32.90	-34.28	-32.90	3	65.33	Peak Max	74	-8.67	Pass
	5150.00	-49.19	-51.15	-49.19	3	49.04	Average Max	54	-4.96	Pass
802.11n-20 Low Channel	5150.00	-41.24	-39.40	-37.21	6	64.02	Peak Max	74	-9.98	Pass
	5150.00	-50.96	-51.91	-48.4	6	52.83	Average Max	54	-1.17	Pass
802.11n-40 Low Channel	5150.00	-39.20	-37.02	-34.96	6	66.27	Peak Max	74	-7.73	Pass
	5150.00	-51.88	-52.33	-49.09	6	52.14	Average Max	54	-1.86	Pass
802.11ac-80 Mid Channel	5150.00	-36.97	-37.98	-34.44	6	66.79	Peak Max	74	-7.21	Pass
	5150.00	-51.58	-50.81	-48.17	6	53.06	Average Max	54	-0.94	Pass
Note:	Both low (5150MHz) and high (5250MHz) channel were investigated. The results show only the worst case.									

Restricted Band spurious emission measurement result for horizontal antenna chain (single antenna)

Test Mode	Frequency (MHz)	Conducted Measurement (dBm) Chain 0	Antenna Gain (dBi)	Level (dBuV/m)	Measurement Type	Limit (dBuV/m)	Margin dB	Result
5.1GHz 802.11a-20–Low	889.42	-59.01	3	39.22	Peak Max	46	-6.78	Pass
	11360.00	-55.83	3	42.40	Peak Max	74	-31.60	Pass
	11360.00	-66.99	3	31.24	Average Max	54	-22.76	Pass
5.1GHz 802.11a-20–Mid	461.65	-58.43	3	39.80	Peak Max	46	-6.20	Pass
	10400.00	-53.04	3	45.19	Peak Max	74	-28.81	Pass
	10400.00	-66.25	3	31.98	Average Max	54	-22.02	Pass
5.1GHz 802.11a-20–High	652.74	-58.70	3	39.53	Peak Max	46	-6.47	Pass
	10480.00	-58.83	3	39.40	Peak Max	74	-34.60	Pass
	10480.00	-59.82	3	38.41	Average Max	54	-15.59	Pass
5.1GHz 802.11n-20–Low	773.99	-69.02	3	29.21	Peak Max	46	-16.79	Pass
	11360.00	-59.56	3	38.67	Peak Max	74	-35.33	Pass
	11360.00	-60.32	3	37.91	Average Max	54	-16.09	Pass
5.1GHz 802.11n-20–Mid	207.51	-59.54	3	38.70	Peak Max	43.5	-4.80	Pass
	10400.00	-57.42	3	40.81	Peak Max	74	-33.19	Pass
	10400.00	-72.09	3	26.14	Average Max	54	-27.86	Pass
5.1GHz 802.11n-20–High	742.95	-59.05	3	39.18	Peak Max	46	-6.82	Pass
	10480.00	-60.60	3	37.63	Peak Max	74	-36.37	Pass
	10480.00	-73.59	3	24.64	Average Max	54	-29.36	Pass
5.1GHz 802.11n-40–Low	989.33	-59.42	3	38.81	Peak Max	46	-7.19	Pass
	10380.00	-56.78	3	41.45	Peak Max	74	-32.55	Pass
	10380.00	-60.43	3	37.80	Average Max	54	-16.20	Pass
5.1GHz 802.11n-40–High	811.82	-69.43	3	28.80	Peak Max	46	-17.20	Pass
	10460.00	-59.55	3	38.68	Peak Max	74	-35.32	Pass
	10460.00	-61.92	3	36.31	Average Max	54	-17.69	Pass
5.1GHz 802.11ac-80–Mid	437.4	-58.87	3	39.37	Peak Max	46	-6.64	Pass
	10420.00	-61.24	3	36.99	Peak Max	74	-37.01	Pass
	10420.00	-72.61	3	25.62	Average Max	54	-28.38	Pass
Note:	The ground reflection factor of 4.7 dB for 30 MHz – 1GHz frequency range has been consider in the raw reading from conducted port.							

Restricted Band spurious emission measurement result for vertical antenna chains (two antennas)

Test Mode	Frequency (MHz)	Conducted Measurement (dBm)			Combined Antenna Gain (dBi)	Level (dBuV/m)	Measurement Type	Limit (dBuV/m)	Margin dB	Result
		Chain 1	Chain 2	Combined Power or Highest Power						
5.1GHz 802.11a-20–Low	867.11	-63.80	-63.21	-60.48	3	37.75	Peak Max	46	-8.25	Pass
	11360.00	-57.15	-58.71	-54.85	3	43.38	Peak Max	74	-30.62	Pass
	11360.00	-68.41	-70.42	-66.29	3	31.94	Average Max	54	-22.06	Pass
5.1GHz 802.11a-20–Mid	767.2	-63.72	-63.83	-60.76	3	37.47	Peak Max	46	-8.53	Pass
	10400.00	-54.33	-55.78	-51.98	3	46.25	Peak Max	74	-27.75	Pass
	10400.00	-67.66	-69.64	-65.53	3	32.70	Average Max	54	-21.30	Pass
5.1GHz 802.11a-20–High	747.8	-63.63	-63.82	-60.71	3	37.52	Peak Max	46	-8.48	Pass
	10480.00	-60.17	-61.86	-57.92	3	40.31	Peak Max	74	-33.69	Pass
	10480.00	-61.17	-62.90	-58.94	3	39.29	Average Max	54	-14.71	Pass
5.1GHz 802.11n-20–Low	760.41	-63.57	-62.32	-59.89	6	41.34	Peak Max	46	-4.66	Pass
	11360.00	-60.91	-62.62	-58.67	6	42.56	Peak Max	74	-31.44	Pass
	11360.00	-61.68	-63.42	-59.45	6	41.78	Average Max	54	-12.22	Pass
5.1GHz 802.11n-20–Mid	910.76	-63.92	-63.73	-60.81	6	40.42	Peak Max	46	-5.58	Pass
	10400.00	-58.75	-60.38	-56.48	6	44.75	Peak Max	74	-29.25	Pass
	10400.00	-73.55	-75.77	-71.51	6	29.72	Average Max	54	-24.28	Pass
5.1GHz 802.11n-20–High	918.52	-63.85	-63.33	-60.57	6	40.66	Peak Max	46	-5.34	Pass
	10480.00	-61.96	-63.71	-59.74	6	41.49	Peak Max	74	-32.51	Pass
	10480.00	-75.07	-77.34	-73.05	6	28.18	Average Max	54	-25.82	Pass
5.1GHz 802.11n-40–Low	704.15	-62.22	-62.05	-59.12	6	42.11	Peak Max	46	-3.89	Pass
	10380.00	-58.10	-59.71	-55.82	6	45.41	Peak Max	74	-28.59	Pass
	10380.00	-61.79	-63.54	-59.57	6	41.66	Average Max	54	-12.34	Pass
5.1GHz 802.11n-40–High	893.3	-63.19	-63.22	-60.19	6	41.04	Peak Max	46	-4.96	Pass
	10460.00	-60.90	-62.61	-58.66	6	42.57	Peak Max	74	-31.43	Pass
	10460.00	-63.29	-65.10	-61.09	6	40.14	Average Max	54	-13.86	Pass
5.1GHz 802.11ac-80–Mid	754.59	-63.35	-63.87	-60.59	6	40.64	Peak Max	46	-5.36	Pass
	10420.00	-62.60	-64.39	-60.39	6	40.84	Peak Max	74	-33.16	Pass
	10420.00	-74.08	-76.31	-72.04	6	29.19	Average Max	54	-24.81	Pass
Note	The ground reflection factor of 4.7 dB for 30 MHz – 1GHz frequency range has been consider in the raw reading from conducted port.									

Test Mode	Frequency (MHz)	Conducted Measurement (dBm) Chain 0	Antenna Gain (dBi)	Level (dBuV/m)	Measurement Type	Limit (dBuV/m)	Margin dB	Result
5.8GHz 802.11a-20–Low	917.55	-58.97	3	39.26	Peak Max	46	-6.74	Pass
	11490.00	-58.44	3	39.79	Peak Max	74	-34.21	Pass
	11490.00	-70.13	3	28.10	Average Max	54	-25.90	Pass
5.8GHz 802.11a-20–Mid	490.75	-58.61	3	39.62	Peak Max	46	-6.38	Pass
	11570.00	-55.52	3	42.71	Peak Max	74	-31.29	Pass
	11570.00	-69.35	3	28.88	Average Max	54	-25.12	Pass
5.8GHz 802.11a-20–High	768.17	-62.44	3	35.79	Peak Max	46	-10.21	Pass
	11650.00	-61.59	3	36.64	Peak Max	74	-37.36	Pass
	11650.00	-62.62	3	35.61	Average Max	54	-18.39	Pass
5.8GHz 802.11n-20–Low	738.1	-59.60	3	38.63	Peak Max	46	-7.37	Pass
	11490.00	-62.35	3	35.88	Peak Max	74	-38.12	Pass
	11490.00	-63.15	3	35.08	Average Max	54	-18.92	Pass
5.8GHz 802.11n-20–Mid	910.76	-58.66	3	39.57	Peak Max	46	-6.43	Pass
	11570.00	-60.11	3	38.12	Peak Max	74	-35.88	Pass
	11570.00	-75.47	3	22.76	Average Max	54	-31.24	Pass
5.8GHz 802.11n-20–High	358.83	-59.24	3	38.99	Peak Max	46	-7.01	Pass
	11650.00	-63.44	3	34.79	Peak Max	74	-39.21	Pass
	11650.00	-77.04	3	21.19	Average Max	54	-32.81	Pass
5.8GHz 802.11n-40–Low	983.51	-59.37	3	38.86	Peak Max	46	-7.14	Pass
	11510.00	-59.44	3	38.79	Peak Max	74	-35.21	Pass
	11510.00	-63.26	3	34.97	Average Max	54	-19.03	Pass
5.8GHz 802.11n-40–High	907.85	-58.79	3	39.44	Peak Max	46	-6.56	Pass
	11590.00	-62.34	3	35.89	Peak Max	74	-38.11	Pass
	11590.00	-64.82	3	33.41	Average Max	54	-20.59	Pass
5.8GHz 802.11ac-80–Mid	943.74	-59.80	3	38.43	Peak Max	46	-7.57	Pass
	11550.00	-64.11	3	34.12	Peak Max	74	-39.88	Pass
	11550.00	-76.01	3	22.22	Average Max	54	-31.78	Pass
Note:	The ground reflection factor of 4.7 dB for 30 MHz – 1GHz frequency range has been consider in the raw reading from conducted port.							

Restricted Band spurious emission measurement result for vertical antenna chains (two antennas)

Test Mode	Frequency (MHz)	Conducted Measurement (dBm)			Combined Antenna Gain (dBi)	Level (dBuV/m)	Measurement Type	Limit (dBuV/m)	Margin dB	Result
		Chain 1	Chain 2	Combined Power or Highest Power						
5.8GHz 802.11a-20–Low	810.85	-62.52	-61.71	-59.09	3	39.14	Peak Max	46	-6.86	Pass
	11490.00	-65.62	-65.62	-62.61	3	35.62	Peak Max	74	-38.38	Pass
	11490.00	-78.59	-78.59	-75.58	3	22.65	Average Max	54	-31.35	Pass
5.8GHz 802.11a-20–Mid	788.54	-62.25	-62.89	-59.55	3	38.68	Peak Max	46	-7.32	Pass
	11570.00	-62.38	-62.38	-59.37	3	38.86	Peak Max	74	-35.14	Pass
	11570.00	-77.72	-77.72	-74.71	3	23.52	Average Max	54	-30.48	Pass
5.8GHz 802.11a-20–High	768.17	-62.63	-62.77	-59.69	3	38.54	Peak Max	46	-7.46	Pass
	11650.00	-69.12	-69.12	-66.11	3	32.12	Peak Max	74	-41.88	Pass
	11650.00	-70.26	-70.26	-67.25	3	30.98	Average Max	54	-23.02	Pass
5.8GHz 802.11n-20–Low	539.25	-62.62	-61.61	-59.08	6	42.15	Peak Max	46	-3.85	Pass
	11490.00	-69.96	-69.96	-66.95	6	34.28	Peak Max	74	-39.72	Pass
	11490.00	-70.85	-70.85	-67.84	6	33.39	Average Max	54	-20.61	Pass
5.8GHz 802.11n-20–Mid	484.93	-62.27	-60.64	-58.37	6	42.86	Peak Max	46	-3.14	Pass
	11570.00	-67.47	-67.47	-64.46	6	36.77	Peak Max	74	-37.23	Pass
	11570.00	-84.51	-84.51	-81.50	6	19.73	Average Max	54	-34.27	Pass
5.8GHz 802.11n-20–High	890.39	-62.80	-63.35	-60.06	6	41.17	Peak Max	46	-4.83	Pass
	11650.00	-71.17	-71.17	-68.16	6	33.07	Peak Max	74	-40.93	Pass
	11650.00	-86.25	-86.25	-83.24	6	17.99	Average Max	54	-36.01	Pass
5.8GHz 802.11n-40–Low	291.9	-62.69	-61.71	-59.16	6	42.07	Peak Max	46	-3.93	Pass
	11510.00	-66.73	-66.73	-63.72	6	37.51	Peak Max	74	-36.49	Pass
	11510.00	-70.97	-70.97	-67.96	6	33.27	Average Max	54	-20.73	Pass
5.8GHz 802.11n-40–High	826.37	-62.10	-62.33	-59.20	6	42.03	Peak Max	46	-3.97	Pass
	11590.00	-69.95	-69.95	-66.94	6	34.29	Peak Max	74	-39.71	Pass
	11590.00	-72.70	-72.70	-69.69	6	31.54	Average Max	54	-22.46	Pass
5.8GHz 802.11ac-80–Mid	993.21	-62.25	-62.21	-59.22	6	42.01	Peak Max	54	-11.99	Pass
	11550.00	-71.91	-71.91	-68.90	6	32.33	Peak Max	74	-41.67	Pass
	11550.00	-85.11	-85.11	-82.10	6	19.13	Average Max	54	-34.87	Pass
Note	The ground reflection factor of 4.7 dB for 30 MHz – 1GHz frequency range has been consider in the raw reading from conducted port.									

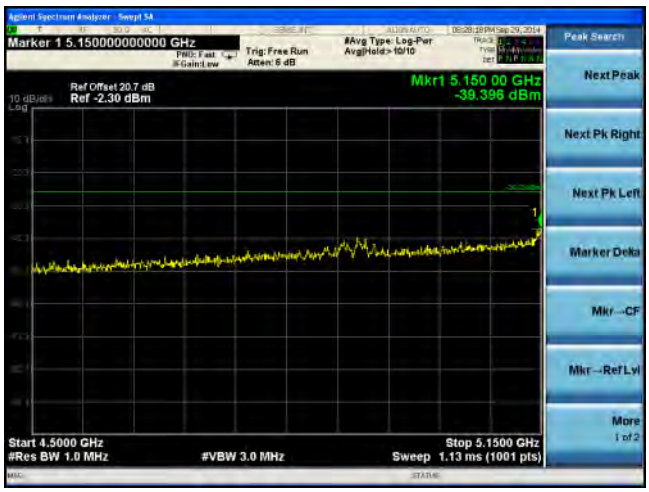
- **Restricted Band Measurement (Peak) Plots:**

Lower Restriced Band-802.11a-low-chain0

Lower Restriced Band-802.11a-low-chain1

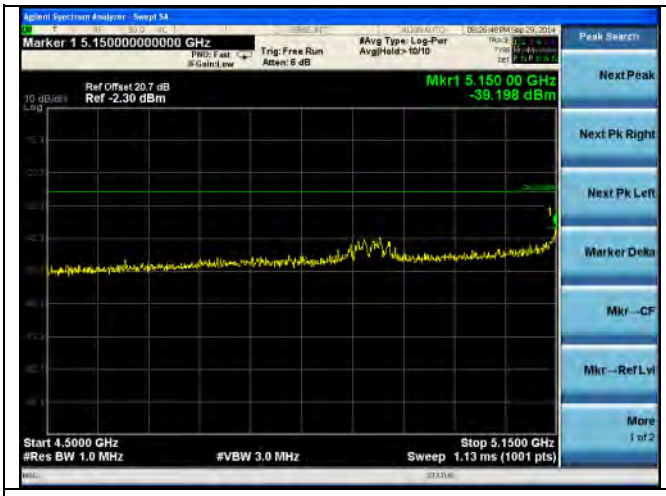
Lower Restriced Band-802.11a-low-chain2

Lower Restriced Band-802.11n-20-low-chain0



Lower Restriced Band-802.11n-20-low-chain1

Lower Restriced Band-802.11n-20-low-chain2



Lower Restriced Band-802.11n-40-low-chain0

Lower Restriced Band-802.11n-40-low-chain1

Lower Restriced Band-802.11n-40-low-chain2

Lower Restriced Band-802.11ac-80-low-chain0

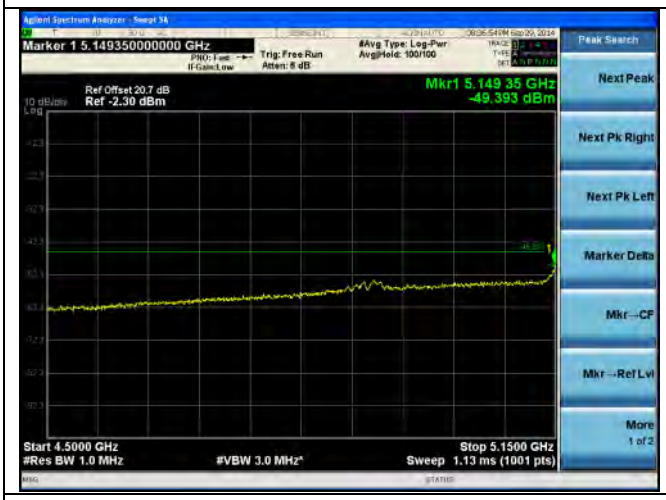
Lower Restriced Band-802.11ac-80-low-chain1

Lower Restriced Band-802.11ac-80-low-chain2

- **Restricted Band Measurement (Average) Plots:**

Lower Restriced Band-802.11a-low-chain0

Lower Restriced Band-802.11a-low-chain1



Lower Restriced Band-802.11a-low-chain2

Lower Restriced Band-802.11n-20-low-chain0

Lower Restriced Band-802.11n-20-low-chain1

Lower Restriced Band-802.11n-20-low-chain2

Lower Restriced Band-802.11n-40-low-chain0

Lower Restriced Band-802.11n-40-low-chain1

Lower Restriced Band-802.11n-40-low-chain2

Lower Restriced Band-802.11ac-80-low-chain0

Lower Restriced Band-802.11ac-80-low-chain1

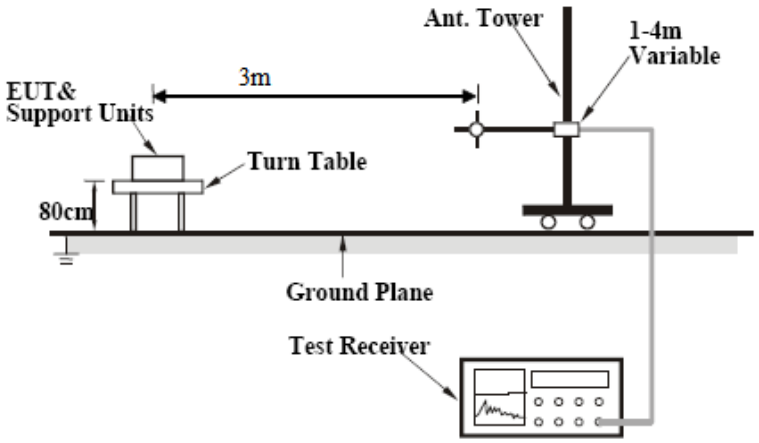
Lower Restriced Band-802.11ac-80-low-chain2

10.8 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	☒

Frequency range (MHz)	Field Strength (uV/m)
30 – 88	100
88 – 216	150
216 960	200
Above 960	500

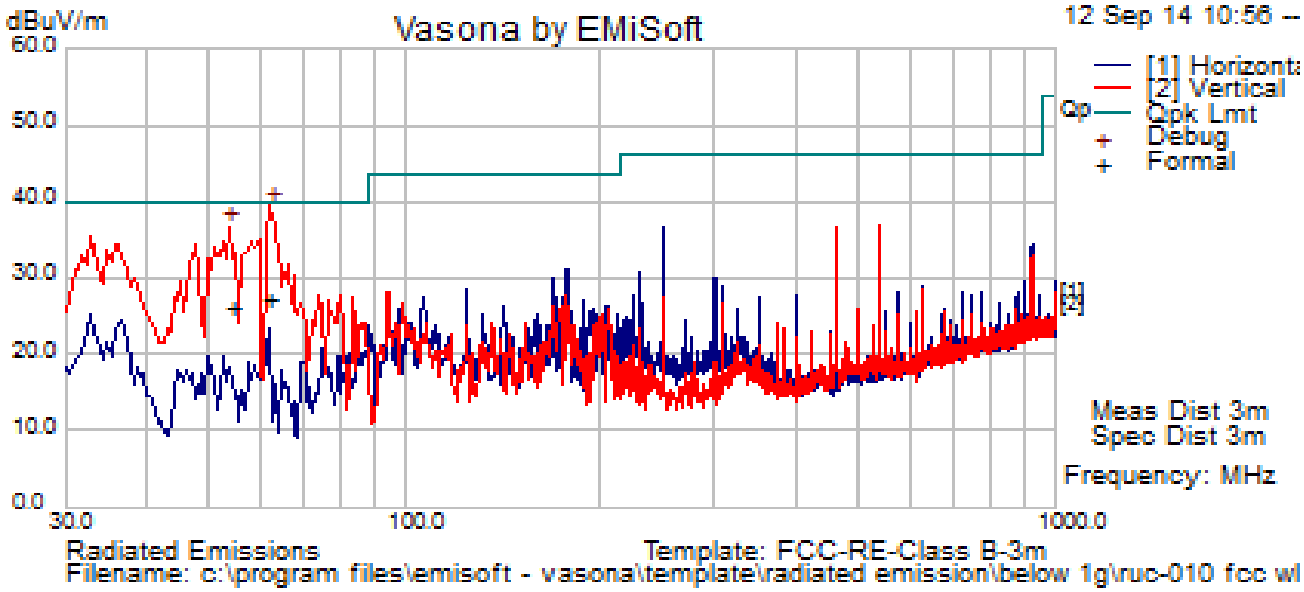
Test Setup	
Procedure	1. The EUT was switched on and allowed to warm up to its normal operating condition. 2. The test was carried out at the selected frequency points obtained from the EUT characterisation. Maximization of the emissions, was carried out by rotating the EUT, changing the antenna polarization, 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)

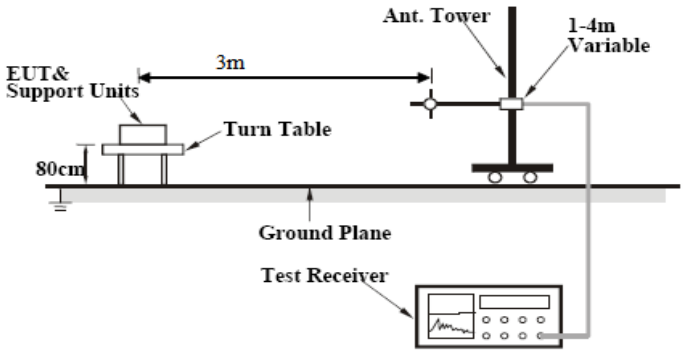
Test specification	below 1GHz			
Environmental Conditions:	Temp (°C):	26.1	Result	Pass
	Humidity (%)	47.5		
	Atmospheric (mbar):	1020		
Mains Power:	110VAC, 60Hz			
Tested by:	Teody Manansala			
Test Date:	Sep 12th, 2014			
Remarks:	N/A			



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
61.80	57.17	1.31	-31.34	27.14	Quasi Max	V	270.00	151.00	40.00	-12.86	Pass
53.88	56.09	1.21	-31.33	25.98	Quasi Max	V	166.00	296.00	40.00	-14.02	Pass

10.9 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.	☒
Test Setup			
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. An average 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 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 - 25 GHz	Peak	Auto	Max hold	PK Measurement
Radiated Spurious Emission	1MHz	10Hz	1GHz - 25 GHz	Peak	Auto	Max hold	Ave Measurement

Test Data ☒ Yes (See below) ☐ N/A
Test Plot ☐ Yes (See below) ☒ N/A

Radiated Emission Test Results (Above 1GHz)

Above 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
4275.86	25.91	2.39	-0.24	28.06	Peak Max	V	277.00	12.00	74.00	-45.94	Pass
4275.86	16.90	2.39	-0.24	19.05	Average Max	V	277.00	12.00	54.00	-34.95	Pass
6653.21	28.83	3.42	2.34	34.58	Peak Max	V	244.00	314.00	68.30	-33.72	Pass

Above 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
4177.56	25.67	2.36	-0.22	27.81	Peak Max	V	251.00	93.00	74.00	-46.19	Pass
4177.56	16.74	2.36	-0.22	18.88	Average Max	V	251.00	93.00	54.00	-35.12	Pass
1166.03	24.91	0.89	-6.85	18.95	Peak Max	V	258.00	152.00	74.00	-55.05	Pass
1166.03	16.24	0.89	-6.85	10.28	Average Max	V	258.00	152.00	54.00	-43.72	Pass

Above 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
4092.52	25.93	2.34	-0.20	28.07	Peak Max	V	214.00	183.00	74.00	-45.93	Pass
4092.52	16.91	2.34	-0.20	19.05	Average Max	V	214.00	183.00	54.00	-34.95	Pass
1468.40	24.02	1.12	-6.33	18.81	Peak Max	V	295.00	236.00	74.00	-55.19	Pass
1468.40	15.66	1.12	-6.33	10.45	Average Max	V	295.00	236.00	54.00	-43.55	Pass

Above 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
17745.63	39.38	5.59	13.61	58.57	Peak Max	V	251.00	321.00	74.00	-15.43	Pass
17745.63	25.68	5.59	13.61	44.88	Average Max	V	251.00	321.00	54.00	-9.12	Pass
3894.26	26.05	2.26	-0.38	27.93	Peak Max	H	324.00	116.00	74.00	-46.07	Pass
3894.26	16.99	2.26	-0.38	18.87	Average Max	H	324.00	116.00	54.00	-35.13	Pass

Above 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
17947.88	39.35	5.61	14.29	59.25	Peak Max	H	318.00	132.00	74.00	-14.75	Pass
17947.88	25.66	5.61	14.29	45.56	Average Max	H	318.00	132.00	54.00	-8.44	Pass
3963.11	25.52	2.29	-0.25	27.56	Peak Max	V	105.00	200.00	74.00	-46.44	Pass
3963.11	16.64	2.29	-0.25	18.68	Average Max	V	105.00	200.00	54.00	-35.32	Pass

Above 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
17781.87	39.99	5.59	13.73	59.31	Peak Max	V	210.00	286.00	74.00	-14.69	Pass
17781.87	26.08	5.59	13.73	45.40	Average Max	V	210.00	286.00	54.00	-8.60	Pass
3952.91	25.52	2.29	-0.27	27.54	Peak Max	V	104.00	242.00	74.00	-46.46	Pass
3952.91	16.64	2.29	-0.27	18.66	Average Max	V	104.00	242.00	54.00	-35.34	Pass

Above 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
17881.53	39.73	5.60	14.07	59.40	Peak Max	V	101.00	215.00	74.00	-14.60	Pass
17881.53	25.91	5.60	14.07	45.58	Average Max	V	101.00	215.00	54.00	-8.42	Pass
7406.71	41.18	3.48	3.46	48.12	Peak Max	V	100.00	41.00	74.00	-25.88	Pass
7406.71	26.85	3.48	3.46	33.79	Average Max	V	100.00	41.00	54.00	-20.21	Pass

Above 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
17776.46	39.74	5.59	13.71	59.05	Peak Max	H	173.00	176.00	74.00	-14.95	Pass
17776.46	25.91	5.59	13.71	45.21	Average Max	H	173.00	176.00	54.00	-8.79	Pass
4599.49	25.63	2.49	-0.16	27.96	Peak Max	V	219.00	264.00	74.00	-46.04	Pass
4599.49	16.71	2.49	-0.16	19.04	Average Max	V	219.00	264.00	54.00	-34.96	Pass

Above 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
17959.91	39.72	5.61	14.33	59.66	Peak Max	H	100.00	139.00	74.00	-14.34	Pass
17959.91	25.90	5.61	14.33	45.84	Average Max	H	100.00	139.00	54.00	-8.16	Pass
3699.12	25.36	2.17	-0.76	26.78	Peak Max	H	213.00	304.00	74.00	-47.22	Pass
3699.12	16.54	2.17	-0.76	17.95	Average Max	H	213.00	304.00	54.00	-36.05	Pass

Above 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
17993.32	39.95	7.02	14.44	61.41	Peak Max	V	288.00	95.00	74.00	-12.59	Pass
17993.32	26.67	7.02	14.44	48.12	Average Max	V	288.00	95.00	54.00	-5.88	Pass
7373.70	41.66	4.37	3.40	49.43	Peak Max	H	306.00	290.00	74.00	-24.57	Pass
7373.70	28.66	4.37	3.40	36.43	Average Max	H	306.00	290.00	54.00	-17.57	Pass

Above 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
17864.29	40.51	7.00	14.01	61.52	Peak Max	H	295.00	61.00	74.00	-12.48	Pass
17864.29	26.75	7.00	14.01	47.75	Average Max	H	295.00	61.00	54.00	-6.25	Pass
3790.16	36.45	2.77	-0.58	38.64	Peak Max	H	103.00	117.00	74.00	-35.36	Pass
3790.16	23.61	2.77	-0.58	25.80	Average Max	H	103.00	117.00	54.00	-28.20	Pass

Above 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
17966.35	39.35	7.01	14.35	60.71	Peak Max	H	100.00	160.00	74.00	-13.29	Pass
17966.35	26.65	7.01	14.35	48.01	Average Max	H	100.00	160.00	54.00	-5.99	Pass
8326.58	40.91	4.03	5.08	50.02	Peak Max	V	148.00	37.00	74.00	-23.98	Pass
8326.58	28.00	4.03	5.08	37.11	Average Max	V	148.00	37.00	54.00	-16.89	Pass

Above 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
17948.65	39.35	7.01	14.29	60.65	Peak Max	V	306.00	81.00	74.00	-13.35	Pass
17948.65	26.75	7.01	14.29	48.05	Average Max	V	306.00	81.00	54.00	-5.95	Pass
4274.56	36.58	2.99	-0.24	39.33	Peak Max	V	236.00	214.00	74.00	-34.67	Pass
4274.56	23.61	2.99	-0.24	26.36	Average Max	V	236.00	214.00	54.00	-27.64	Pass

Above 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
17924.27	39.72	7.01	14.21	60.94	Peak Max	H	100.00	334.00	74.00	-13.06	Pass
17924.27	26.72	7.01	14.21	47.94	Average Max	H	100.00	334.00	54.00	-6.06	Pass
3966.63	36.20	2.87	-0.24	38.83	Peak Max	V	126.00	95.00	74.00	-35.17	Pass
3966.63	23.28	2.87	-0.24	25.91	Average Max	V	126.00	95.00	54.00	-28.09	Pass

Above 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
17998.22	39.71	7.02	14.46	61.18	Peak Max	H	193.00	100.00	74.00	-12.82	Pass
17998.22	26.69	7.02	14.46	48.16	Average Max	H	193.00	100.00	54.00	-5.84	Pass
5121.07	39.68	3.29	0.49	43.46	Peak Max	H	181.00	190.00	74.00	-30.54	Pass
5121.07	26.98	3.29	0.49	30.75	Average Max	H	181.00	190.00	54.00	-23.25	Pass

Above 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
17888.11	39.36	7.00	14.09	60.45	Peak Max	V	187.00	18.00	74.00	-13.55	Pass
17888.11	26.72	7.00	14.09	47.81	Average Max	V	187.00	18.00	54.00	-6.19	Pass
3792.96	36.45	2.77	-0.57	38.65	Peak Max	H	192.00	226.00	74.00	-35.35	Pass
3792.96	23.47	2.77	-0.57	25.67	Average Max	H	192.00	226.00	54.00	-28.33	Pass

Above 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
17708.68	40.65	6.98	13.48	61.11	Peak Max	V	216.00	253.00	74.00	-12.89	Pass
17708.68	26.95	6.98	13.48	47.41	Average Max	V	216.00	253.00	54.00	-6.59	Pass
7462.12	41.25	4.31	3.56	49.13	Peak Max	V	161.00	182.00	74.00	-24.87	Pass
7462.12	28.14	4.31	3.56	36.02	Average Max	V	161.00	182.00	54.00	-17.98	Pass

Above 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
17939.95	40.09	7.01	14.26	61.36	Peak Max	H	198.00	70.00	74.00	-12.64	Pass
17939.95	26.67	7.01	14.26	47.95	Average Max	H	198.00	70.00	54.00	-6.05	Pass
5123.44	39.93	3.29	0.50	43.71	Peak Max	H	113.00	215.00	74.00	-30.29	Pass
5123.44	26.88	3.29	0.50	30.66	Average Max	H	113.00	215.00	54.00	-23.34	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
10629.33	36.41	5.05	5.98	47.43	Peak Max	V	148.00	4.00	74.00	-26.57	Pass
10629.33	23.74	5.05	5.98	34.77	Average Max	V	148.00	4.00	54.00	-19.23	Pass
1262.42	58.40	1.24	-6.42	53.23	Peak Max	H	173.00	184.00	68.30	-15.07	Pass
3791.20	39.39	2.82	-0.20	42.02	Peak Max	H	174.00	308.00	74.00	-31.98	Pass
3791.20	25.69	2.82	-0.20	28.31	Average Max	H	174.00	308.00	54.00	-25.69	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	10/13/2013	1 Year	10/13/2014	☑
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. USER MANUAL, BLOCK & CIRCUIT DIAGRAM

Please see attachment

Annex C. 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